



**Ajuntament de  
la Palma de Cervelló**

PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA  
DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ

## **DOCUMENT N°1: MEMORIA TECNICA**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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### MEMÒRIA TÈCNICA

#### 1. OBJECTE DEL PROJECTE:

L'objectiu del present projecte és la descripció de les característiques millora de l'eficeincia energetica i arrenjament dels defectes de baixatensió que presenten els diferents quadres sobre les quals es desenvoluparà de l'enllumenat públic al terme municipal de La Palma de Cervelló.

#### 2. PETICIONARI:

AJUNTAMENT DE LA PALMA DE CERVELLÓ, amb domicili social al carrer Sant Cristòfol, s/n, de La Palma de Cervelló (08756-Barcelona) i C.I.F. P-5831301-F. -----

#### 3. CARACTERÍSTIQUES DE LES INSTAL·LACIONS ELÈCTRIQUES:

Defectes de la instal·lació elèctrica segons pla director :

##### Quadre elèctric Q01:

- Manca tapa al mòdul de doble aïllament del comptador.
- Manca tapa al mòdul de doble aïllament del comptador.
- No existeix esquema de la instal·lació al quadre.
- Endoll no fixat a carril DIN.
- Valors de resistència d'aïllament molt inferiors a 0,5 mohms a I2 i I3.
- No existeix d'interruptor general automàtic ni de protector contra sobretensions permanents i transitòries.
- No existeix rotulació adequada dels elements de protecció del quadre.
- Manca còpia de la legalització de la instal·lació elèctrica existent.



Quadre elèctric Q01

Quadre elèctric Q02:

- Falta tapa al mòdul de doble aïllament al bornes de sortida i al comptador.
- No existeix d'interruptor general automàtic ni de protector contra sobretensions permanents i transitòries.
- Pany de la porta del quadre elèctric trencat.
- Surten dos cables d'un mateix borne de sortida (alimentació projectors).
- Endoll cetac no fixat correctament.
- No existeix diferencial a la línia 2 (base cetac).
- Manca còpia de la legalització de la instal·lació elèctrica existent.
- Valors de resistència d'aïllament molt inferiors a 0,5 mohms a l1.
- No existeix esquema de la instal·lació al quadre.
- No existeix rotulació adequada dels elements de protecció del quadre.



- Cablejat d'alimentació dels projectors de la plaça, ubicada davant darrera del quadre, inferior a 4mm<sup>2</sup>.



*Quadre elèctric Q02*

### Quadre elèctric Q03:

- No existeix esquema de la instal·lació al quadre.
- No existeix posta a terra de la instal·lació.
- No existeix d'interruptor general automàtic ni de protector contra sobretensions permanents i transitòries.
- Manca còpia de la legalització de la instal·lació elèctrica existent.
- No existeix rotulació adequada dels elements de protecció del quadre.
- No existeix protecció diferencial a la línia d'enllumenat.
- Falta tapa al mòdul de doble aïllament al comptador.



Quadre elèctric Q03

Quadre elèctric Q04:

- No existeix esquema de la instal·lació al quadre.
- Manca còpia de la legalització de la instal·lació elèctrica existent.
- No existeix d'interruptor general automàtic ni de protector contra sobretensions permanents i transitòries.
- No existeix rotulació adequada dels elements de protecció del quadre.
- No existeix diferencial a la línia 2.
- Valors de resistència d'aïllament inferiors a 0,5 mohms a I2 i a I3.



Quadre elèctric Q04

SubQuadre elèctric Q04:

- No existeix esquema de la instal·lació al quadre.
- Manca còpia de la legalització de la instal·lació elèctrica existent.
- Valor de posta a terra del quadre elèctric elevada (+ de 30 ohms).



SubQuadre elèctric Q04





Quadre elèctric Q05:

- No existeix protecció diferencial a la línia I2
- No existeix d'interruptor general automàtic ni de protector contra sobretensions permanents i transitòries.
- Manca còpia de la legalització de la instal·lació elèctrica existent.
- No existeix esquema de la instal·lació al quadre.



Quadre elèctric Q05



### Quadre elèctric Q06:

- El rellotge del quadre va connectat a l'endoll impedint que es pugui col·locar la tapa del mòdul de doble aïllament.
- Manca còpia de la legalització de la instal·lació elèctrica existent.
- Valors de resistència d'aïllament inferiors a 0,5 mohms a I1 i a I2.
- A les línies I1 i I2 es fa servir cablejat de terra (groc i verd) com a neutre.



Quadre elèctric Q06

### Quadre elèctric Q07:

- Secció de la línia 4 és inferior a 6mm<sup>2</sup>.
- Manca còpia de la legalització de la instal·lació elèctrica existent.
- Valor de posta a terra del quadre elèctric elevada (+ de 30 ohms).
- Alimentació de caixa d'endolls (ubicada fora del quadre) des dels fusibles d'entrada sense passar pel comptador.



Quadre elèctric Q07

Quadre elèctric Q08:

- No existeix rotulació adequada dels elements de protecció del quadre.
- Manca còpia de la legalització de la instal·lació elèctrica existent.
- No existeix esquema de la instal·lació al quadre.
- Falta tapa transparent al mòdul de doble aïllament del comptador.
- No existeix d'interruptor general automàtic ni de protector contra sobretensions permanents i transitòries.



*Quadre elèctric Q08*

SubQuadre elèctric Q08:

- No existeix rotulació adequada dels elements de protecció del quadre.
- Manca còpia de la legalització de la instal·lació elèctrica existent.
- No existeix esquema de la instal·lació al quadre.
- Es fa servir cablejat de terra (groc-verd) com a neutre.



*SubQuadre elèctric Q08*



Quadre elèctric Q09:

- Manca còpia de la legalització de la instal·lació elèctrica existent.



*SubQuadre elèctric Q09*

**4.- SUBMINISTRAMENT DE CORRENT, TENSIÓ I FREQUÈNCIA:**

El subministrament de corrent de les instal·lacions d'enllumenat es realitzarà en els punts que es grafia al plànol en planta, corresponent a la situació de cada quadre d'escomesa, proteccions i maniobra.

**5.- DESCRIPCIÓ DE LES OBRES:**

Les obres que comprenen el present projecte, són:

5.0.- Arreglar defectes de la instal·lació elèctrica segons pla director.

5.1.- Comprovar les línies amb problemes d'aïllament i/o valors baixos inferiors a 10 Mega Ohms, renovar els trams afectats i punts de llum existents en els carrers afectats. -----

5.2.- Condicionament i adequació dels quadres d'escomesa actual del sector, que consisteix en l'eliminació de les proteccions que alimenten als punts de llum existents, comprovacions sectorials per trams del aïllament i realitzar la comprovació de la pressa a terra. -----



5.3.- Instal·lació de noves línies de distribució de potència trifàsiques III-400 V o III-230 V. 50Hz+N en traçat soterrat, per alimentar els punts de llums dels passos peatonals, amb línia equipotencial de terra Cu-1x35 m/m<sup>2</sup> despullat, i pressa de terra per lluminària amb pica de DN-14 m/m i L = 2 m. i terminal de Cu-1x16 m/m<sup>2</sup> / 750 v. color verd-groc, inclòs obres civils d'obertura i tapat de rasa i reposició de paviments de calçada i voreres, -----

5.4.- Instal·lació de columnes, braços i llumeneres distribuïdes segons plànols i formades segons fitxes tècniques. -----

La instal·lació elèctrica; Es farà de conformitat amb el vigent "Reglament Electrò tècnic per a instal·lacions de Baixa Tensió " (Decret 842/2002 de 2 d'agost, BOE núm. 224 de 18 de setembre del 2002) i en especial conforme a les instruccions ITC-BT-09. -----

## 6.- INSTAL·LACIÓ ELÈCTRICA:

### 6.1.- Caigudes de tensió:

Les caigudes de tensió al final dels circuits de fase seran inferiors al 3% i en les línies de maniobra inferiors al 5%. -----

### 6.2.- Distribució d'energia elèctrica:

La distribució d'energia elèctrica, es realitzarà a traves de canalitzacions subterrànies amb unes fondàries de rasa variables segons la tipologia de rases. -----

Rasa Jardí: Obertura de rasa de 0,40 m. d'amplada i de 0,70 m de fondària, en les quals es posarà un tub corrugat de Ø no inferior a 75 m/m. per línia de distribució i dins d'un dau de formigó, i rebliment i piconat de la rasa amb material de la pròpia excavació seleccionat (veure detalls adjunts).-----

Encreuament de calçada: Obertura de rasa de 0,40 m. d'amplada i de 0,80 m de fondària, en les quals es posarà dos tubs PVC de Ø exterior 110 m/m. separats un mínim de 5 cm entre ells i dins d'un dau de formigó, i rebliment i piconat de la rasa amb material de la pròpia excavació seleccionat fins a la cota de aglomerat.(veure detalls adjunts).-----



Vorera de formigó: Obertura de rasa de 0,40 m. d'amplada i de 0,50 m de fondària, en les quals es posarà un tub corrugat de Ø no inferior a 75 m/m. per línia de distribució, i rebliment i piconat de la rasa amb material de la pròpia excavació seleccionat , fins a la cota de paviment acabat. -----

Vorera de pannot: Obertura de rasa de 0,40 m. d'amplada i de 0,50 m de fondària, en les quals es posarà un tub corrugat de Ø no inferior a 75 m/m. per línia de distribució, i rebliment i piconat de la rasa amb material de la pròpia excavació seleccionat , fins a la cota de paviment acabat. -----

Distribució aèria per façana: La distribució de la energia elèctrica trifàsica tetrapolar es realitzarà sobre façana amb conductor de fase de secció de 4,- mm<sup>2</sup> i aïllament de Cu-0,6/1kV. -----

Amb aquestes tipologies de rases, i fondàries s'acompleix les instruccions ITC-BT-07 i ITC-BT-21.

### 6.3.- Escomesa :

Les escomeses s'efectuaran d'acord amb el "Reglament Electrò tècnic per a Instal·lacions de Baixa Tensió" vigent i les corresponents normes UNE. La instal·lació d'enllumenat públic no requereix d'un punt d'escomesa de nova contractació. -----  
La escomesa anirà de 5 a 35 KW, no excedint mai d'aquesta potencia per treballar segons vademecun de CIA amb models T-MF1. -----

### 6.4.- Caixa general de protecció:

Les escomeses es troben ubicades lo mes a prop possible de la Xarxa de distribució, en un punt de trànsit general, amb fàcil i permanent accés.. -----  
El tipus i característiques de la Caixa General de Protecció, així con el calibre dels fusibles de protecció, seran indicats per l'Empresa Subministradora. -----

### 6.5.- Línia repartidora:

Per tractar-se de subministrament a un sol abonat, no existeix línia repartidora. La caixa general de protecció enllaçarà directament amb el comptador de l'abonat (ITC-BT-12).-----



**6.6.- Derivacions individuals:**

Per tractar-se de subministrament a un sol abonat, no existeix derivacions individuals. La caixa general de protecció enllaçarà directament amb el comptador de l'abonat. El comptador de l'abonat enllaçarà directament amb els dispositius de protecció i comandament. -----

**6.7.- Comptadors:**

Per a la seva col·locació del comptador, s'utilitzarà la forma indicada per l'empresa distribuïdora en les seves normes particulars. -----

**6.8.- Dispositius de protecció i comandament:**

Els quadre de protecció i comandament, hauran de ser del tipus Cleverlighting, Arelsa o similar, i estaran preparats amb comptadors electrònics propis i comptadors per a clients tipus 4 del mercat liberalitzat, i amb equip astronòmic de telegestió, acceptat pel Servei de Manteniment, per tal que sigui compatible amb les aplicacions informàtiques i equips existents . -----

Les sortides hauran d'anar amb telerruptors cablejats fins l'equip de control, per controlar individualment la caiguda d'aquestes. -----

Es col·locarà un mesurador d'aïllament per controlar l'envelliment i les avaries per fuites que es produeixin. -----

Aquest seran d'acer inoxidable, (pintat o polit), de 3 mm de gruix com a mínim, amb dues portes (3 en cas d'equips amb regulador de flux) i separació interior entre l'escomesa de CIA (on s'ubicarà l'ICPM) i la maniobra i sortides (partint de l'IGA general). -----

Les dimensions seran les adequades per que càpiguen tots els elements, complint amb les especificacions de CIA en la part d'escomesa, i d'una folgança de 5cm per banda en la part de maniobra. Quan es tracti de noves construccions s'acceptaran armaris d'obra encastats a façana amb porta metàl·lica. -----





## 7.- DESCRIPCIÓ DELS MATERIALS:

### 7.1.- Conductors elèctrics:

Seràn del tipus unipolar, de 0,6/1kV. en les seccions assenyalades en cada cas. Estaran formats en tot moment per fil de coure electròlitic aïllat mitjançant aliatge especial de policlorur de vinil i fàcil per donar-li forma cilíndric mitjançant goma vulcanitzada. -----

La coberta exterior serà de policlorur de vinil de color negre per a tenir una resistència més elevada a grasses, dissolvents i elements externs, i no deixar passar els raigs ultra violats. -----

Les seccions a utilitzar compliran les següents seccions mínimes:

- De placa de born fins a làmpada : 2,50 mm<sup>2</sup> Cu-0,6/1kV.
- Línia instal·lada sota terra : 6,00 mm<sup>2</sup> Cu-0,6/1kV per l'enllumenat públic.
- Línia instal·lada a façana : 4,00 mm<sup>2</sup> Cu-0,6/1kV per l'enllumenat públic.

En el traçat soterrat als conductors aniran estesos a l'interior de tub de PVC de Ø 90 m/m. (tub de paret llisa) el qual, donada la naturalesa del terreny, anirà adossat a la vorera de la vorada per la seva part interior i recobert d'una carrera de formigó conforme es grafia en els plànols adjunts.

Els creuaments de carrers es faran perpendicularment a les mateixes en rases de 1,00 m. de fondària segons fitxa adjunta. -----

Les empiuladures dels conductors es faran sempre en la base dels bàculs, repises, o caixes d'empiulament i sota cap concepte en l'interior dels tubs.

Les caixes de derivació individual, seràn de model estàndard per enllumenat públic, aquestes seràn estanques IP-44 amb fusibles de poder de tall de 6A incorporats, dins de la mateixa caixa.



S'utilitzaran borns de connexió, no acceptant empiuladures directes per retorçiment o qualsevol altre sistema que no siguin els borns de connexió ubicats a l'interior d'una caixa de derivació individual.

Les seccions de cada una de la línies que ens ocupen, queden reflectides en els CÀLCULS ELÈCTRICS I L'ESQUEMA UNIFAMILIAR. -----

El cablejat d'alimentació dels fanals serà amb coberta aïllant de 1000VV, rígid o flexible, excepte el cable de terra que serà, segons les situacions que contempla el REBT, de 35mm nu o 1KV i de 750V (unió entre la línia general de terres i els bàculs o columnes amb cable de 16mm<sup>2</sup> groc-verd aïllat dins de tub). -----

Les seccions aniran en la línia d'alimentació de 4mm, 6mm per soterrat, a 16mm, i en les derivacions individuals la secció serà de 2,5mm mínim; i no hi haurà cap unió, empalme o connexió fora de caixa. -----

### 7.2.- Sistema de telegestió i regulació proposat:

El sistema de telegestio proposat es de cleverlighting o similar, que es el sistema que esta implantant en tots els quadres d'enllumenat public de la Palma de Cervelló. El sistema de regulació de flux, es realitzar en les noves lluminàries led , es temporitzat, i esta establerta segons les enceses normalitzades del ajuntament de la Palma de Cervelló.-----

### 7.3.- Columnes i llumeneres:

Les característiques principals que han de complir les columnes i les llumeneres són les següents:

- Tots els suport de ferro, hauran de ser galvanitzats en calent.-----
- Hauran de ser accessibles per als vehicles de manteniment, amb una alçada màxima de lluminàries inferior als 14m. -----
- Les columnes i bàculs tindran aro (cèrcol inferior) de reforç i carteles i el gruix de la xapa serà de 3-4 mm fins a 8m i de 4mm per alçades superiors. Els troncocònics tindran una conicitat 20/1000 per altures de fins 4,5m, i del 12 al 13 per 1000 els d'altures superiors.
- Els suport es col·locaran amb els ancoratges prescriptius de cada fabricant. -----
- Hauran de complir amb les Especificacions Tècniques i Homologacions de Bàculs i Columnes dictades, pel Real Decret 2642/1985 de 18-12 i 401/1989 de 14-04.



L'Ordre Ministerial de 16-05-1989. (Pel que s'haurà d'aportar certificació AENOR com justificant del seu compliment).-----

- Tots els suports hauran de portar encunyat en lloc visible i no separable el nom del fabricant, el número de contracte AENOR i data de fabricació. -----
- Els braços de paret, seran de diàmetre 42 i es col·locaran a una alçada tal que la lluminària quedi a 6m respecte el terra.
- En ambients agressius, els suports seran de material plàstic, alumini o acer inoxidable.

Les columnes, braços i llumeneres son les següents:

Per les llumeneres, s'ha optat per els següents models i característiques:

Llumenera marca Novatilum o similar model Milan S o equivalent, amb potencia nominal de fins a 60w, inlos adaptador per a braç o columna, amb temperatura de color 3000 °k, amb protecció del bloc òptic i de la envolvent de ip66 i IK-10, amb flux de contaminació atmosfèrica inferior al 1%, amb driver programable amb cinc esglaons de regulació, amb protector de sobretensions inclòs de característiques mínimes 10 kV / 10 kA, Clase 2, color ral a definir per d.f., tancada, amb allotjament per a equip i acoblada al suport. inclou cofrets de connexions i conductor de coure unev 0,6/1kv de 3x2,50 mm<sup>2</sup>. garantia del material 5 anys.

Llumenera marca Novatilum o similar model Innova B o equivalent d'alçada fins a 760 mm, amb potencia nominal de fins a 60w, inlos adaptador per a braç o columna, amb temperatura de color 3000 °k, amb protecció del bloc òptic i de la envolvent de ip66 i IK-10, amb flux de contaminació atmosfèrica inferior al 1%, amb driver programable amb cinc esglaons de regulació, amb protector de sobretensions inclòs de característiques mínimes 10 kv / 10 ka, clase 2, color ral a definir per d.f., tancada, amb allotjament per a equip i acoblada al suport. inclou cofrets de connexions i conductor de coure unev 0,6/1kv de 3x2,50 mm<sup>2</sup>. garantia del material 5 anys.

Llumenera marca Novatilum o similar model Neovilla o equivalent d'alçada fins a 750 mm, amb potencia nominal de fins a 60w, inlos adaptador per a braç o columna, amb temperatura de color 3000 °k, amb protecció del bloc òptic i de la envolvent de ip66 i IK-10, amb flux de contaminació atmosfèrica inferior al 1%, amb driver programable amb cinc esglaons de regulació, amb protector de sobretensions inclòs de



característiques mínimes 10 kv / 10 ka, clase 2, color ral a definir per d.f., tancada, amb allotjament per a equip i acoblada al suport. inclou cofrets de connexions i conductor de coure univ 0,6/1kv de 3x2,50 mm<sup>2</sup>. garantia del material 5 anys

Llumenera per a vials marca Novatilum o similar model projector m Milan S APM140 o equivalent d'alçada , amb potencia nominal de fins a 140w, inclòs adaptador per a braç o columna, amb temperatura de color 3000 °k, amb protecció del bloc òptic i de la envoltant de ip66 i IK-10, amb flux de contaminació atmosfèrica inferior al 1%, amb driver programable amb cinc esglaons de regulació, amb protector de sobretensions inclòs de característiques mínimes 10 kv / 10 ka, clase 2, color ral a definir per d.f., tancada, amb allotjament per a equip i acoblada al suport. inclou cofrets de connexions i conductor de coure univ 0,6/1kv de 3x2,50 mm<sup>2</sup>. garantia del material 5 anys.

Muntatge de fluorescent Leed en llumenera existent , amb potencia nominal de fins a 15w, amb temperatura de color 3000 °k, , amb flux de contaminació atmosfèrica inferior al 1%, amb driver programable amb cinc esglaons de regulació, amb protector de sobretensions inclòs de característiques mínimes 10 kv / 10 ka, clase 2, color ral a definir per d.f., tancada, amb allotjament per a equip i acoblada al suport. inclou cofrets de connexions i conductor de coure univ 0,6/1kv de 3x2,50 mm<sup>2</sup>. garantia del material 5 anys.

Llumenera Novatilum o similar model projector P Milan S APMS o equivalent , amb potencia nominal de fins a 60w, inclòs adaptador per a braç o columna, amb temperatura de color 3000 °k, amb protecció del bloc òptic i de la envoltant de ip66 i ik-10, amb flux de contaminació atmosfèrica inferior al 1%, amb driver programable amb cinc esglaons de regulació, amb protector de sobretensions inclòs de característiques mínimes 10 kv / 10 ka, clase 2, color ral a definir per d.f., tancada, amb allotjament per a equip i acoblada al suport. inclou cofrets de connexions i conductor de coure univ 0,6/1kv de 3x2,50 mm<sup>2</sup>. garantia del material 5 anys.

Per els braços i columnes, s'ha optat per els següents models i característiques:

Muntatge i instal·lació de braç de 1,50 metre de diàmetre 42 mm. inclòs tot el necessari per la seva correcta fixació segons lo establert per d.f.



Columna troncoconica de 8,00 metres d'alçada , amb base , platina i porta,,amb cartela i aro de reforç col•locada sobre dau de formigo. inclou pernns d'ancoratge, cofred de connexions i conductor de coure designacio une rv 0,6/1kv de 5x2,50 mm2 les noves columnes o bàculs hauran de venir amb:

- carteles i aros de reforç fins a250mm.
- galvanitzades en calent en iso1461.
- portella rasant amb reforç interior.
- els punts de llum compliran l'apartat 6.1 de la itc-bt-09 del rebt amb els aclariment de la guia tècnica i disposaran del marcatge de lace.

les columnes i bàculs d'acer galvanitzat tindran un recobriment protector amb poliamida termoplàstica en pols de tipus rilsan o equivalent aplicada per immersió. aquest procés s'aplicarà des de la base de columna fins a l'alçada de la portella per la part interior com l'exterior tenint cura que la presa de terra no quedi recoberta per aquest tractament. aquest procés s'aplicarà després d'un decapat i granallat sobre la superfície a tractar.

Columna tipus Nicolson de 4,00 metres d'alçada , amb base , platina i porta,,amb cartela i aro de reforç col•locada sobre dau de formigó. inclou pernns d'ancoratge, cofred de connexions i conductor de coure designació une rv 0,6/1kv de 5x2,50 mm2 les noves columnes o bàculs hauran de venir:

- carteles i aros de reforç fins a250mm.
- galvanitzades en calent en iso1461.
- portella rasant amb reforç interior.
- els punts de llum compliran l'apartat 6.1 de la itc-bt-09 del rebt amb els aclariment de la guia tècnica i disposaran del marcatge de lace.

Les columnes i bàculs d'acer galvanitzat tindran un recobriment protector amb poliamida termoplàstica en pols de tipus rilsan o equivalent aplicada per immersió. aquest procés s'aplicarà des de la base de columna fins a l'alçada de la portella per la part interior com l'exterior tenint cura que la presa de terra no quedi recoberta per aquest tractament. aquest procés s'aplicarà després d'un decapat i granallat sobre la superfície a tractar.



## 8.- OBRA CIVIL:

L'obra civil es realitzarà de la següent manera:

### 8.1.- Fonaments:

Totes les columnes aniran col·locades sobre formigó de 250 Kgr/cm<sup>2</sup> de resistència, quedant subjectes als mateixos mitjançant pernys, segons fitxa adjunta. -----  
Abans de fer la fonamentació, quedaran col·locats els tubs de protecció del conductor i del cable de terra. -----

El càlcul d'aquestes cimentacions, així com el fust de les columnes s'ha realitzat amb un factor de seguretat superior a 3, tal i com indiquen les normes. -----

### 8.2.- Arquetes de registre:

L'arqueta de registre es l'accés a la canalització des de la superfície. Tant les arquetes com la seva unió amb els tubs es realitzaran de manera que estigui assegurada la total impermeabilitat de la xarxa de distribució. -----

La base de les arquetes serà netejada amb cura de runa per a col·locar una capa de sorra de 5,- cm. de gruix. -----

Els tubs es col·locaran a una distància mínima dels fons de l'arqueta de 150 m/m. -----  
Els pericons seran registrables amb tapa de fosa dúctil amb tancament hidràulic segons la Norma EN-124, de 60 x 60 cm i amb la inscripció "Enllumenat Públic" o "EP", del tipus:

- D-400 per calçades amb trànsit de vehicles.
- C-250 per voreres.
- B-125 per llocs on no puguin accedir vehicles.

### 8.3.- Tubulars:

Els tubulars hauran de ser vermells, de doble capa, i amb índex de duresa 9, senyalitzats i instal·lats complint el detall constructiu que s'adjunten i l'establen al (Real Decreto 842/2002, Instrucció ICT-BT-09). -----

## 9.- CIRCUIT DE TERRA:

### 9.1- Condicions de seguretat i posta a terra:

Seguin el recorregut de cada circuit i exteriorment al tub de protecció, anirà el cable de terra constituït per conductor de coure nu de 35 m/m<sup>2</sup> de secció.

Aquest cable farà entrada i sortida en cada una de les columnes quedant connectat al punt de posta a terra mitjançant cargol, terminal, arandel·la grober i femella. Des



d'aquest punt sortirà una derivació de 16 m/m<sup>2</sup> / Cu-750 V color verd-groc que anirà fins la piqueta de terra, que existirà una per punt de llum. Aquesta piqueta serà d'acer, recoberta de coure, de 2 m. de longitud i 14 m/m. de diàmetre.

Les instal·lacions quedaran convenientment protegides contra sobre intensitats sobrecarregues i contactes indirectes pels corresponents interruptors magnetotèrmics i diferencials.

#### **10.- CÀLCULS ELÈCTRICS:**

Pel càlcul de les línies d'alimentació s'ha fixat una caiguda màxima de tensió pel punt de llum més allunyat d'un 3% de la tensió nominal (400 V.) per ésser un sistema trifàsic equilibrat, el que equival a una caiguda de tensió de 12,00 Volts. -----

A l'annex de CÀLCULS ELÈCTRICS queden reflectits els resultats obtinguts. -----

#### **11.- REVISIÓ DE PREUS:**

No s'inclou cap formula de revisió de preus perquè es tracta d'una obra amb un termini d'execució inferior als 12 (dotze) mesos, d'acord amb l'especificat a l'article 1, apartat b, paràgraf segons el Decret 461/1971 d'11 de març (Hisenda), a conseqüència del qual es desenvolupa el Decret-Llei 2/1964 de 4 de febrer, sobre la inclusió de clàusules de revisió en els contracte de l'Estat o Organismes autònoms. ----

#### **12.- SEGURETAT I SALUT:**

S'inclou al document nº 5 l'Estudi basic de Seguretat i Salut. -----

#### **13.- CLASSIFICACIÓ DEL CONTRACTISTA:**

En compliment de l'article 65 del Reial Decret legislatiu 3/2011, de 14 de novembre, pel qual s'aprova el text refós de la Llei de contractes del sector públic, en la seva versió modificada per la Llei 25/2015 de 27 de desembre, d'impuls de la factura electrònica i creació del registre contable de factures en el Sector Públic, i als articles corresponents del Real Decreto 1098/2001 de 12 d'octubre, pel qual s'aprova el Reglamento General de la Ley de Contratos de las Administraciones Públicas, no és exigible classificació al contractista, donat que el valor estimat del contracte és inferior a 500.000 €.



#### **14.- CARÀCTER DE L'OBRA:**

En compliment de l'últim paràgraf de l'article 64 del Reglament de Contractació de l'Estat, es manifesta que el present Projecte es tracta d'una obra completa, en el sentit exigint en l'Article 58 de l'esmentat Reglament, donat que l'obra projectada compren tots i cadascun dels elements necessaris per a la seva utilització, i per això es susceptible d'ésser lliurada a l'ús públic. -----

Es fa constar explícitament que aquest projecte compleix amb la normativa vigent. -----

#### **15.- DOCUMENTS QUE INTEGREN EL PROJECTE:**

##### **DOCUMENT N° 1. MEMÒRIA I ANNEXES**

- Memòria
- Annexes

Annex 1. Estudi luminotècnic

Annex 2. Fitxes de productes

Annex 3. Pla d'obra

Annex 4. Programa de Control de Qualitat

Annex 5. Pla de protecció del arbrat

##### **DOCUMENT N° 2. PLÀNOLS**

##### **DOCUMENT N° 3. PLEC DE CONDICIONS**

##### **DOCUMENT N° 4. PRESSUPOST**

- 1.- Amidaments
- 2.-Quadre de preus n°1.
- 3.-Quadre de preus n°2.
- 4.- Pressupostos parcials
- 5.- Pressupost General

##### **DOCUMENT N° 5. ESTUDI BASIC DE SEGURETAT I SALUT**

#### **17.- PRESSUPOST:**

El pressupost de les obres totalitza:





	<u>IMPORT TOTAL</u>
- TOTAL D'EXECUCIÓ MATERIAL	196.790,06 €
- TOTAL BASE IMPOSABLE	196.790,06 €
- DESPESES GENERALS: 13 %	25.582,71 €
- BENEFICI INDUSTRIAL: 6%	11.807,40 €
- TOTAL PRESSUPOST D'EXECUCIÓ PER CONTRACTE	234.180,17 €
IVA	49.177,84 €
- TOTAL D'EXECUCIÓ	<b>283.358,01 €</b>
- CONTROL DE QUALITAT	----
(Aquesta partida no suma al pressupost, ja que queda inclosa a les despeses generals del Contractista).	
<b>- TOTAL GENERAL</b>	<b>283.358,01 €</b>

El pressupost general de les obres totalitza la quantitat de: **283.358,01 €** (DOS-CENTS VUITANTA-TRES MIL TRES-CENTS CINQUANTA-VUIT EUROS AMB U CÈNTIMS), considerant inclòs en aquest pressupost, a més a més de les partides i detalls indicats, tot allò que sigui necessari per a que l'obra estigui del tot acabada.-----

La Palma de Cervelló, a novembre del 2022  
L'enginyer Industrial

Josep Ibañez Gassiot



**ANNEX N°1: Estudi luminotècnic**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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## **2022\_1087\_Licitació 2022 - Palma de Cervelló**

Estudi realitzat amb mòduls i lluminàries BENITO\_NOVATILU

E21-E27

Fecha: 11.11.2022

Proyecto elaborado por: Lighting Dept.

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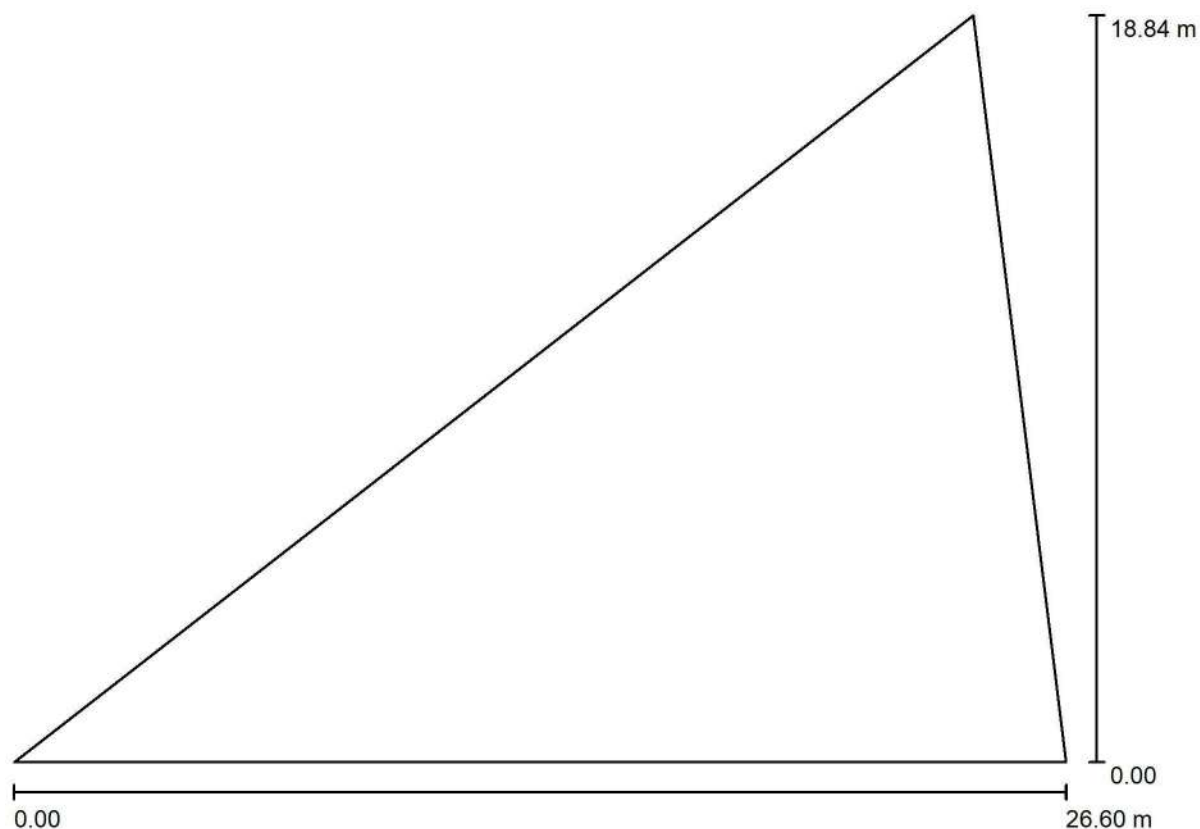
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## E27 Plaça de l'Esglesia / Datos de planificación



Factor mantenimiento: 0.85, ULR (Upward Light Ratio): 0.0%

Escala 1:191

### Lista de piezas - Luminarias

N°	Pieza	Designación (Factor de corrección)	Φ (Luminaria) [lm]	Φ (Lámparas) [lm]	P [W]
1	5	Novatilu ARLC20 A3 3 BENITO-NOVATILU 20 A3 3000K 16 (Tipo 1)* (1.000)	770	770	6.0
*Especificaciones técnicas modificadas			Total: 3850	Total: 3850	30.0

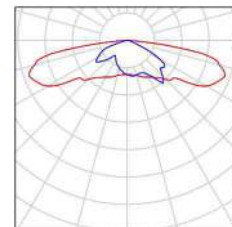
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## E27 Plaça de l'Esglesia / Lista de luminarias

5 Pieza Novatilu ARLC20 A3 3 BENITO-NOVATILU 20  
A3 3000K 16 (Tipo 1)  
Nº de artículo: ARLC20 A3 3  
Flujo luminoso (Luminaria): 770 lm  
Flujo luminoso (Lámparas): 770 lm  
Potencia de las luminarias: 6.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 22 53 88 100 100  
Lámpara: 1 x Definido por el usuario (Factor de  
corrección 1.000).

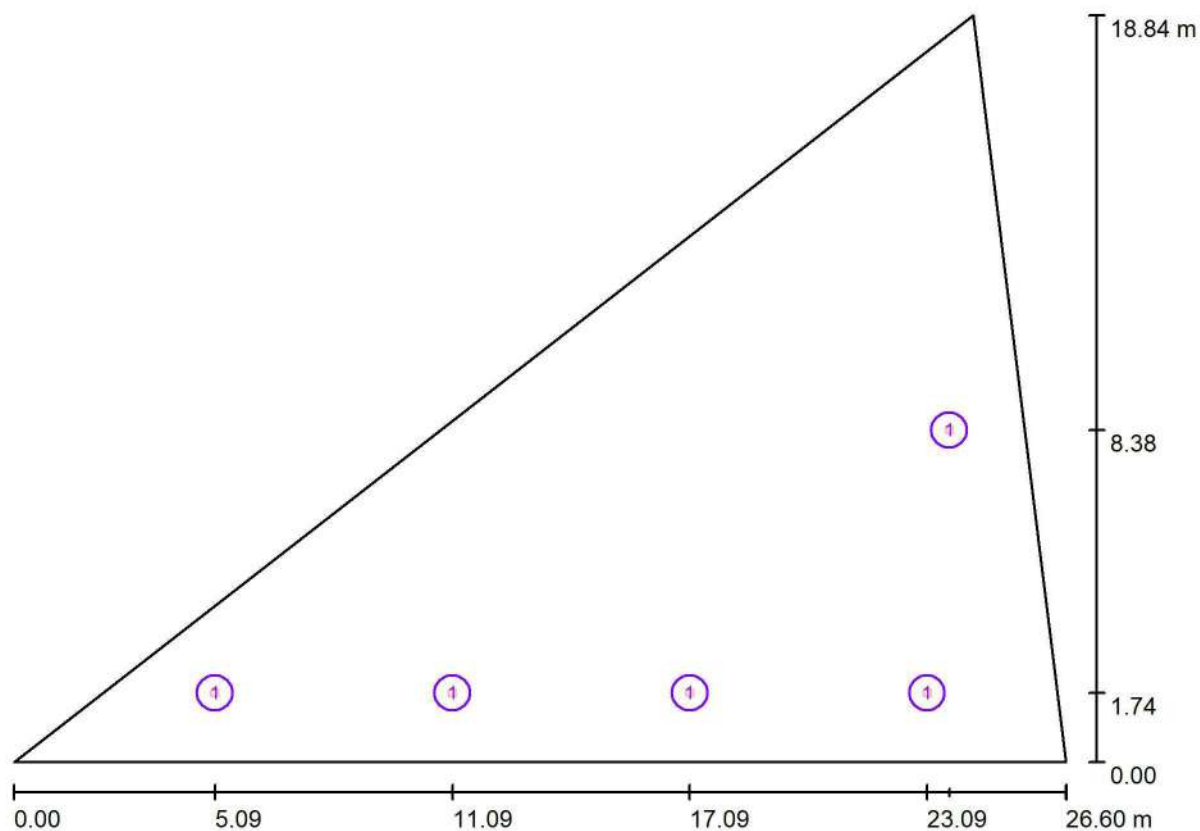
Dispone de una imagen  
de la luminaria en  
nuestro catálogo de  
luminarias.



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## E27 Plaça de l'Esglesia / Luminarias (ubicación)



Escala 1 : 191

### Lista de piezas - Luminarias

N°	Pieza	Designación
1	5	Novatilu ARLC20 A3 3 BENITO-NOVATILU 20 A3 3000K 16 (Tipo 1)*

\*Especificaciones técnicas modificadas



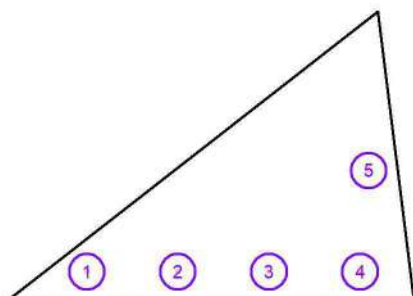
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## E27 Plaça de l'Esglesia / Luminarias (lista de coordenadas)

### Novatilu ARLC20 A3 3 BENITO-NOVATILU 20 A3 3000K 16 (Tipo 1)

770 lm, 6.0 W, 1 x 1 x Definido por el usuario (Factor de corrección 1.000).

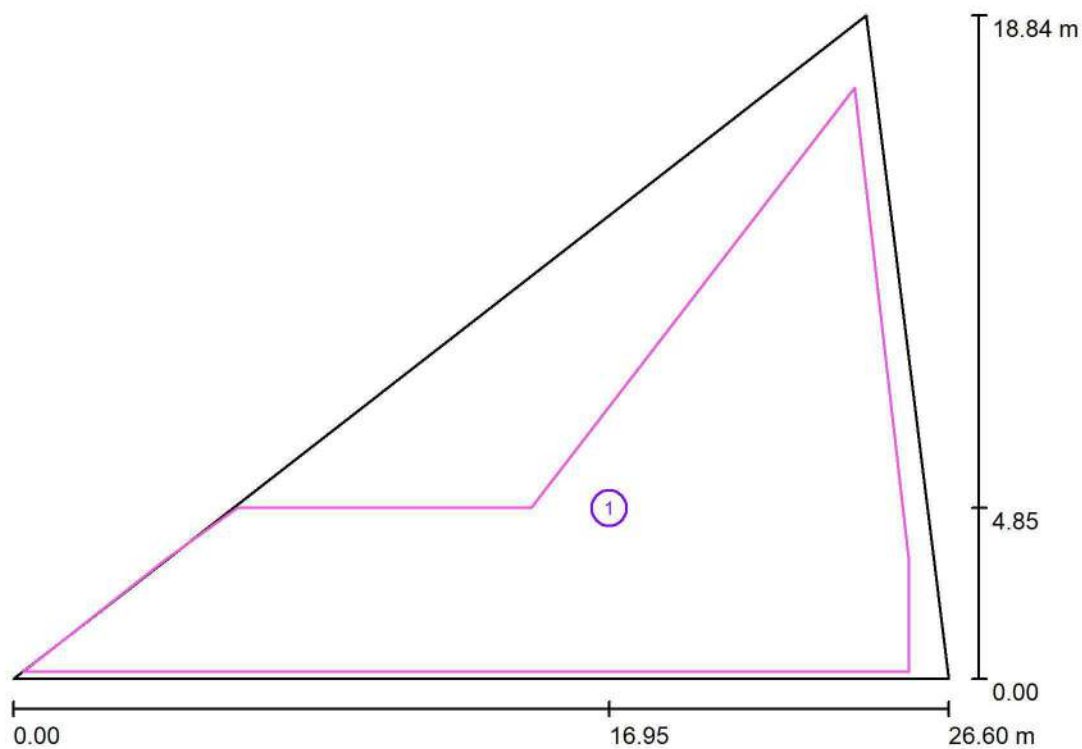


N°	Posición [m]			Rotación [°]		
	X	Y	Z	X	Y	Z
1	5.086	1.743	3.700	0.0	0.0	0.0
2	11.086	1.743	3.700	0.0	0.0	0.0
3	17.086	1.743	3.700	0.0	0.0	0.0
4	23.086	1.743	3.700	0.0	0.0	0.0
5	23.644	8.382	3.700	0.0	0.0	90.0

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## E27 Plaça de l'Esglesia / Superficie de càlculo (sumario de resultados)



Escala 1 : 215

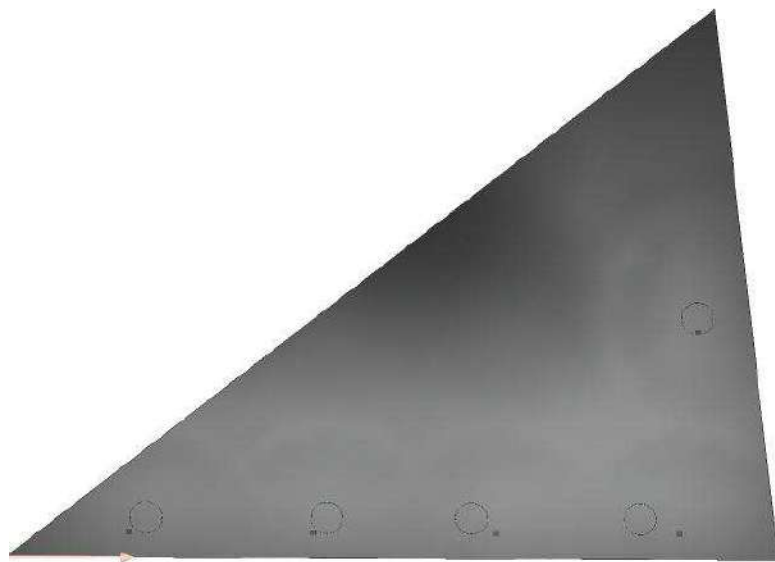
### Lista de superficies de cálculo

Nº	Designación	Tipo	Trama	$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
1	Plaça	perpendicular	13 x 11	8.52	2.89	12	0.339	0.232

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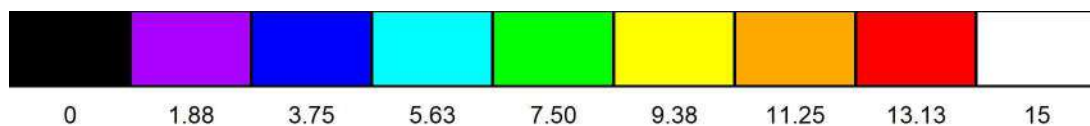
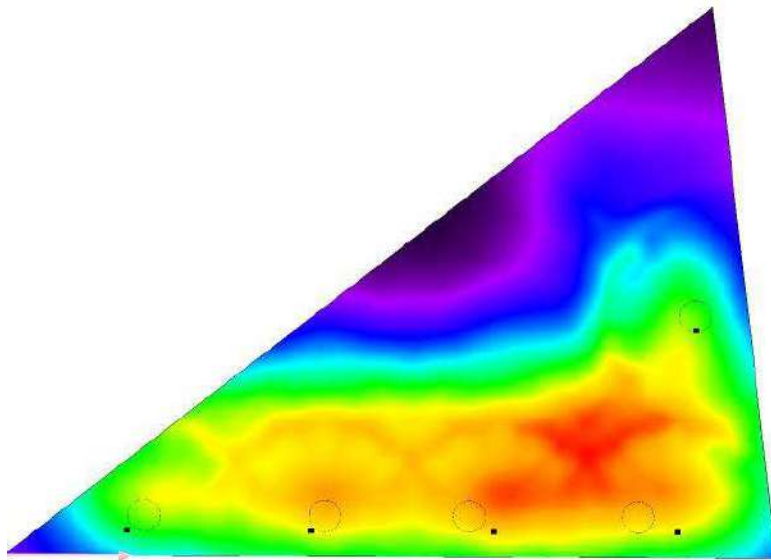
## E27 Plaça de l'Esglesia / Rendering (procesado) en 3D



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## E27 Plaça de l'Esglesia / Rendering (procesado) de colores falsos

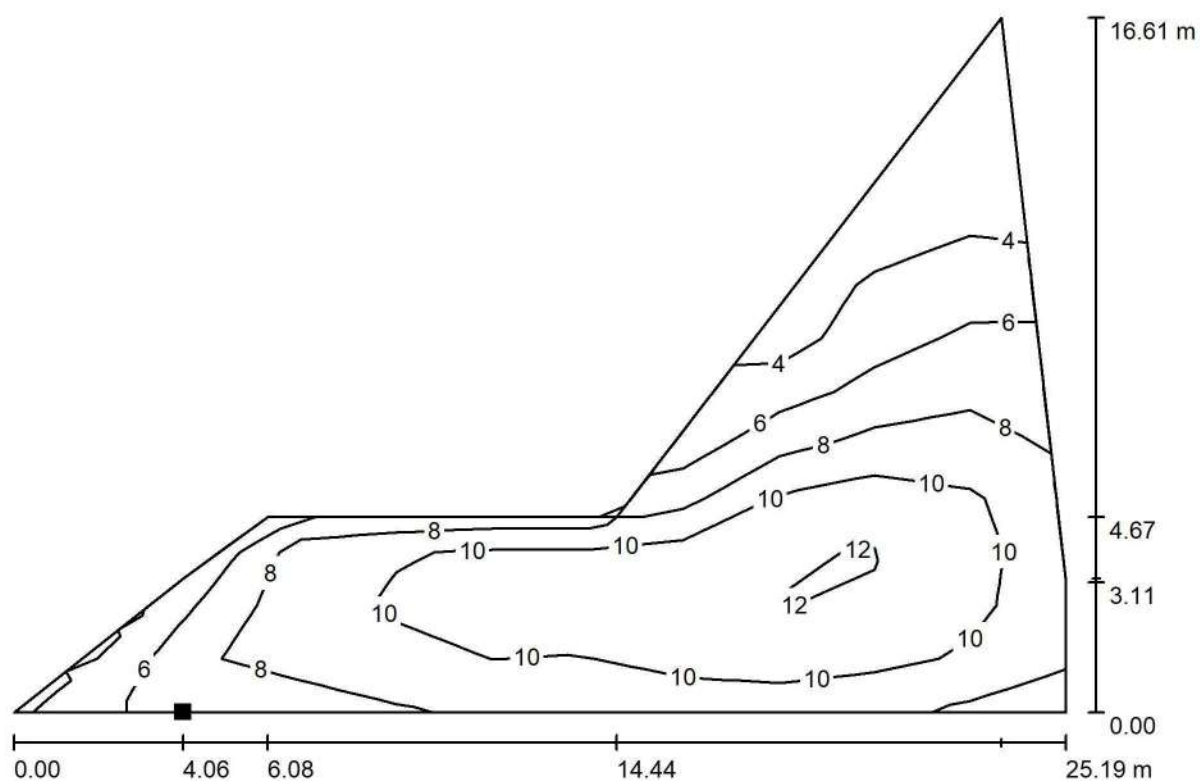


lx

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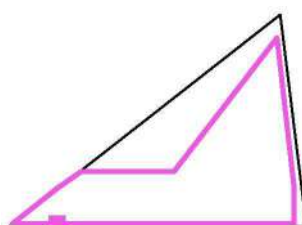
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### E27 Plaça de l'Esglesia / Plaça / Isolínies (E, perpendicular)



Valores en Lux, Escala 1 : 181

Situación de la superficie en la  
escena exterior:  
Punto marcado:  
(4.339 m, 0.190 m, 0.000 m)



Trama: 13 x 11 Puntos

$E_m$  [lx]  
8.52

$E_{min}$  [lx]  
2.89

$E_{max}$  [lx]  
12

$E_{min} / E_m$   
0.339

$E_{min} / E_{max}$   
0.232

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## E21 Conexio peatonal entre C. Gabarres i C. Montsant / Datos de planificación

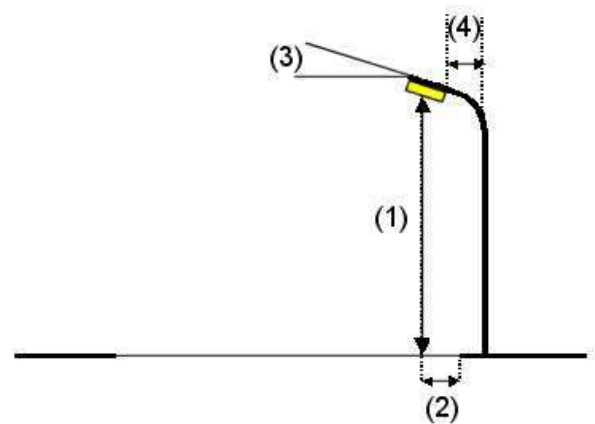
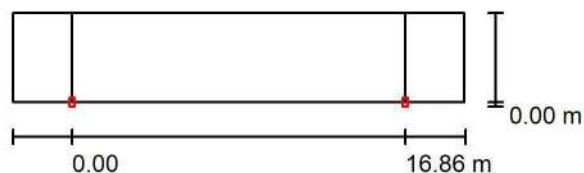
### Perfil de la vía pública

Camino peatonal 1

(Anchura: 4.500 m)

Factor mantenimiento: 0.85

### Disposiciones de las luminarias



Luminaria:	Novatilu ALMLS20 AE 3 MILAN S 20 AE 3000K 16
Flujo luminoso (Luminaria):	1988 lm
Flujo luminoso (Lámparas):	1988 lm
Potencia de las luminarias:	15.0 W
Organización:	unilateral abajo
Distancia entre mástiles:	16.860 m
Altura de montaje (1):	5.500 m
Altura del punto de luz:	5.420 m
Saliente sobre la calzada (2):	0.000 m
Inclinación del brazo (3):	0.0 °
Longitud del brazo (4):	0.000 m

Valores máximos de la intensidad lumínica	
con 70°:	508 cd/klm
con 80°:	29 cd/klm
con 90°:	0.71 cd/klm

Respectivamente en todas las direcciones que forman los ángulos especificados con las verticales inferiores (con luminarias instaladas aptas para el funcionamiento).

Ninguna intensidad lumínica por encima de 90°. La disposición cumple con la clase de intensidad lumínica G3.

La disposición cumple con la clase del índice de deslumbramiento D.6.

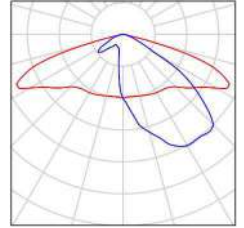
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## E21 Conexio peatonal entre C. Gabarres i C. Montsant / Lista de luminarias

Novatilu ALMLS20 AE 3 MILAN S 20 AE 3000K  
16 (Tipo 1)  
Nº de artículo: ALMLS20 AE 3  
Flujo luminoso (Luminaria): 1988 lm  
Flujo luminoso (Lámparas): 1988 lm  
Potencia de las luminarias: 15.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 33 72 97 100 100  
Lámpara: 1 x Definido por el usuario (Factor de  
corrección 1.000).

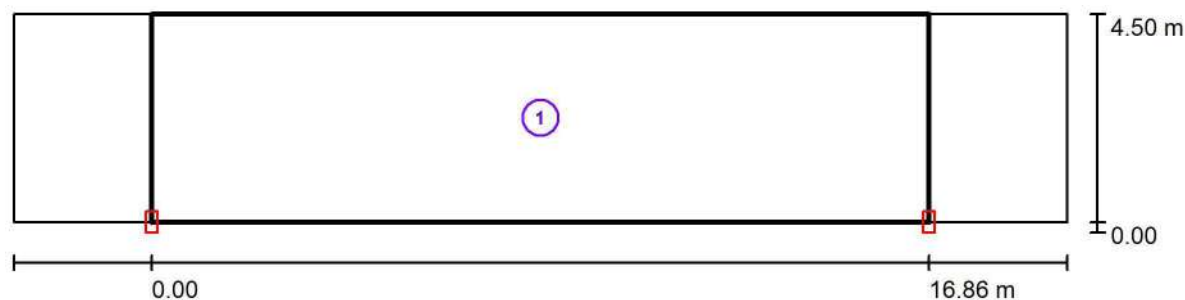
Dispone de una imagen  
de la luminaria en  
nuestro catálogo de  
luminarias.



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## E21 Conexio peatonal entre C. Gabarres i C. Montsant / Resultados luminotécnicos



Factor mantenimiento: 0.85

Escala 1:164

### Lista del recuadro de evaluación

- 1 Recuadro de evaluación Camino peatonal 1  
 Longitud: 16.860 m, Anchura: 4.500 m  
 Trama: 10 x 3 Puntos  
 Elemento de la vía pública respectivo: Camino peatonal 1.  
 Clase de iluminación seleccionada: S2 (Se cumplen todos los requerimientos fotométricos.)

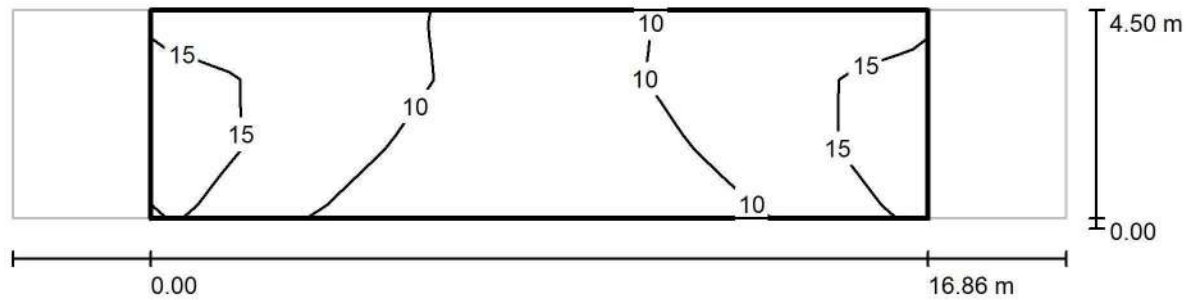
	$E_m$ [lx]	$E_{min}$ [lx]
Valores reales según cálculo:	11.79	6.96
Valores de consigna según clase:	$\geq 10.00$	$\geq 3.00$
Cumplido/No cumplido:	✓	✓



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### E21 Conexio peatonal entre C. Gabarres i C. Montsant / Recuadro de evaluación Camino peatonal 1 / Isolíneas (E)



Valores en Lux, Escala 1 : 164

Trama: 10 x 3 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
12	6.96	18	0.590	0.388

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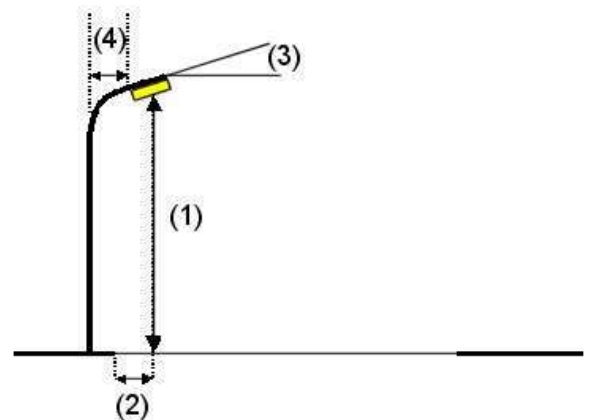
## E22 C. Gabarres / Datos de planificación

### Perfil de la vía pública

Camino peatonal 2	(Anchura: 1.500 m)
Carril de estacionamiento 1	(Anchura: 5.000 m)
Calzada 1	(Anchura: 3.500 m, Cantidad de carriles de tránsito: 1, Revestimiento de la calzada: R3, q0: 0.070)
Camino peatonal 1	(Anchura: 1.500 m)

Factor mantenimiento: 0.85

### Disposiciones de las luminarias



Luminaria:	Novatilu ALMLS30 AE 3 MILAN S 30 AE 3000K 16
Flujo luminoso (Luminaria):	3958 lm
Flujo luminoso (Lámparas):	3958 lm
Potencia de las luminarias:	30.0 W
Organización:	unilateral arriba
Distancia entre mástiles:	17.870 m
Altura de montaje (1):	6.000 m
Altura del punto de luz:	5.920 m
Saliente sobre la calzada (2):	-5.000 m
Inclinación del brazo (3):	0.0 °
Longitud del brazo (4):	0.000 m

Valores máximos de la intensidad lumínica  
con 70°: 521 cd/klm  
con 80°: 58 cd/klm  
con 90°: 0.98 cd/klm

Respectivamente en todas las direcciones que forman los ángulos especificados con las verticales inferiores (con luminarias instaladas aptas para el funcionamiento).

Ninguna intensidad lumínica por encima de 95°.  
La disposición cumple con la clase de intensidad lumínica G3.

La disposición cumple con la clase del índice de deslumbramiento D.5.

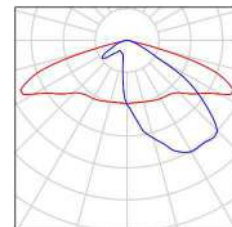
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## E22 C. Gabarres / Lista de luminarias

Novatilu ALMLS30 AE 3 MILAN S 30 AE 3000K  
16  
Nº de artículo: ALMLS30 AE 3  
Flujo luminoso (Luminaria): 3958 lm  
Flujo luminoso (Lámparas): 3958 lm  
Potencia de las luminarias: 30.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 33 72 97 100 100  
Lámpara: 1 x BENITO-NOVATILU (5050) (Factor  
de corrección 1.000).

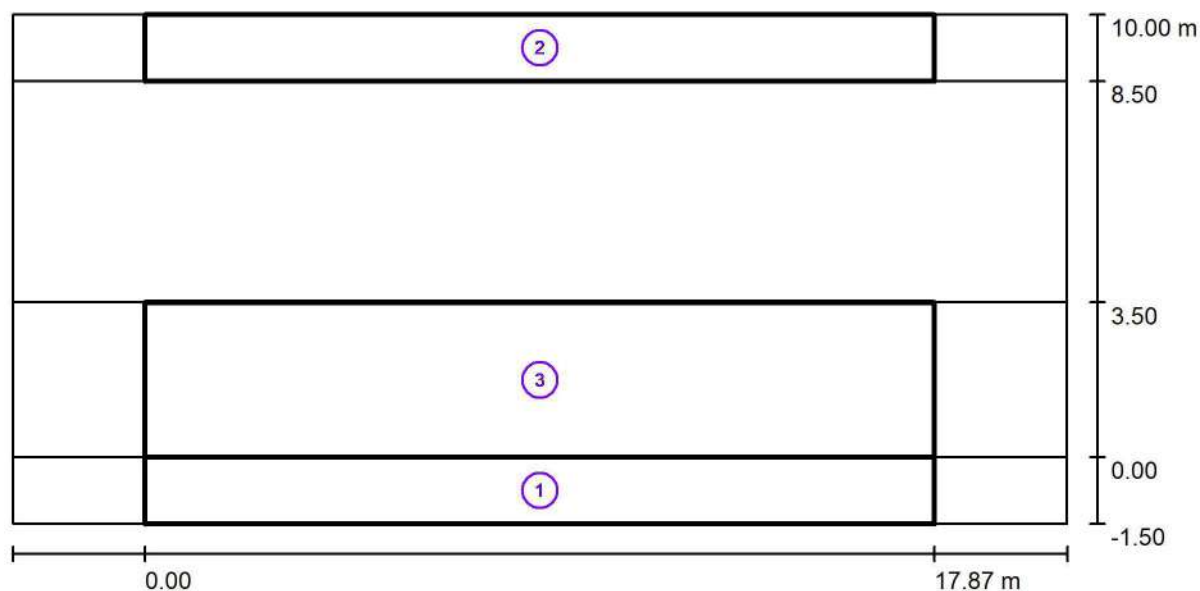
Dispone de una imagen  
de la luminaria en  
nuestro catálogo de  
luminarias.



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## E22 C. Gabarres / Resultados luminotécnicos



Factor mantenimiento: 0.85

Escala 1:171

### Lista del recuadro de evaluación

#### 1 Recuadro de evaluación Camino peatonal 1

Longitud: 17.870 m, Anchura: 1.500 m

Trama: 10 x 3 Puntos

Elemento de la vía pública respectivo: Camino peatonal 1.

Clase de iluminación seleccionada: S4 (Se cumplen todos los requerimientos fotométricos.)

	$E_m$ [lx]	$E_{min}$ [lx]
Valores reales según cálculo:	5.11	3.97
Valores de consigna según clase:	$\geq 5.00$	$\geq 1.00$
Cumplido/No cumplido:	✓	✓

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## E22 C. Gabarres / Resultados luminotécnicos

### Lista del recuadro de evaluación

#### 2 Recuadro de evaluación Camino peatonal 2

Longitud: 17.870 m, Anchura: 1.500 m

Trama: 10 x 3 Puntos

Elemento de la vía pública respectivo: Camino peatonal 2.

Clase de iluminación seleccionada: S3 (Se cumplen todos los requerimientos fotométricos.)

Valores reales según cálculo:

$E_m$  [lx]  $E_{min}$  [lx]

8.96 5.37

Valores de consigna según clase:

$\geq 7.50$   $\geq 1.50$

Cumplido/No cumplido:

✓ ✓

#### 3 Recuadro de evaluación Calzada 1

Longitud: 17.870 m, Anchura: 3.500 m

Trama: 10 x 3 Puntos

Elemento de la vía pública respectivo: Calzada 1.

Clase de iluminación seleccionada: S2 (Se cumplen todos los requerimientos fotométricos.)

Valores reales según cálculo:

$E_m$  [lx]  $E_{min}$  [lx]

11.93 7.18

Valores de consigna según clase:

$\geq 10.00$   $\geq 3.00$

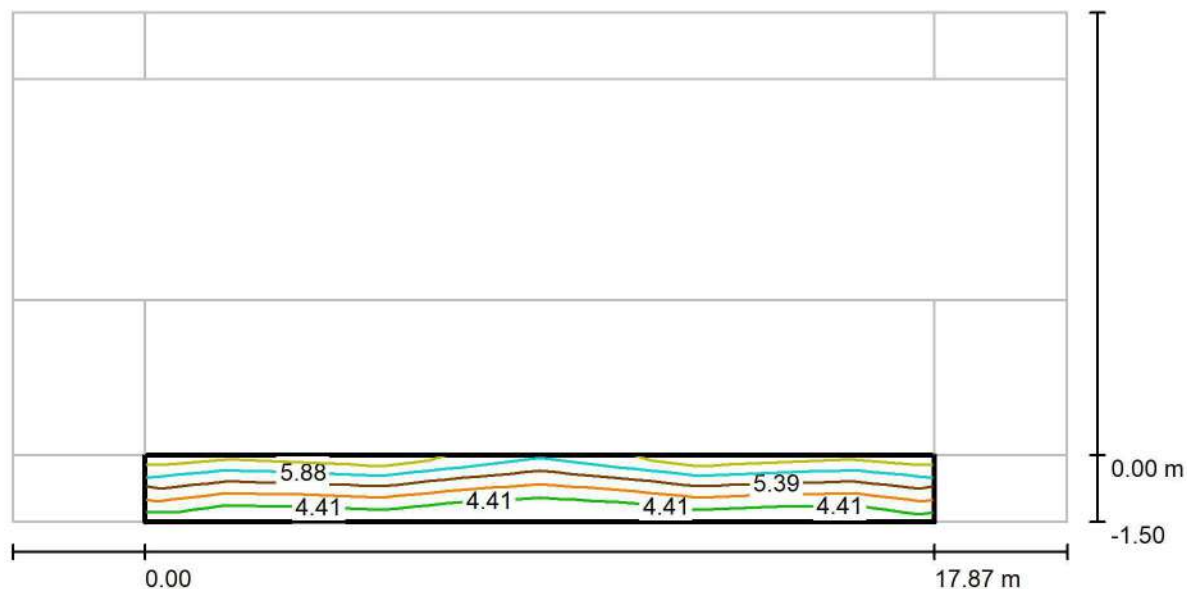
Cumplido/No cumplido:

✓ ✓

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### E22 C. Gabarres / Recuadro de evaluación Camino peatonal 1 / Isolíneas (E)



Valores en Lux, Escala 1 : 171

Trama: 10 x 3 Puntos

$E_m$  [lx]  
5.11

$E_{min}$  [lx]  
3.97

$E_{max}$  [lx]  
6.42

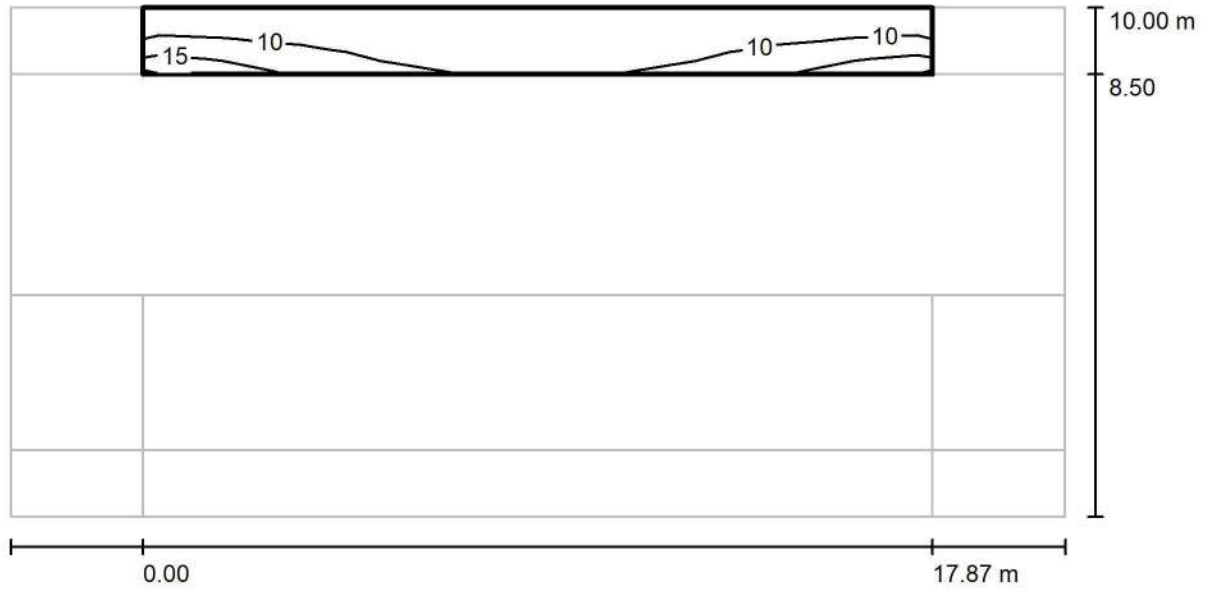
$E_{min} / E_m$   
0.775

$E_{min} / E_{max}$   
0.618

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### E22 C. Gabarres / Recuadro de evaluación Camino peatonal 2 / Isolíneas (E)



Valores en Lux, Escala 1 : 171

Trama: 10 x 3 Puntos

$E_m$  [lx]  
8.96

$E_{min}$  [lx]  
5.37

$E_{max}$  [lx]  
17

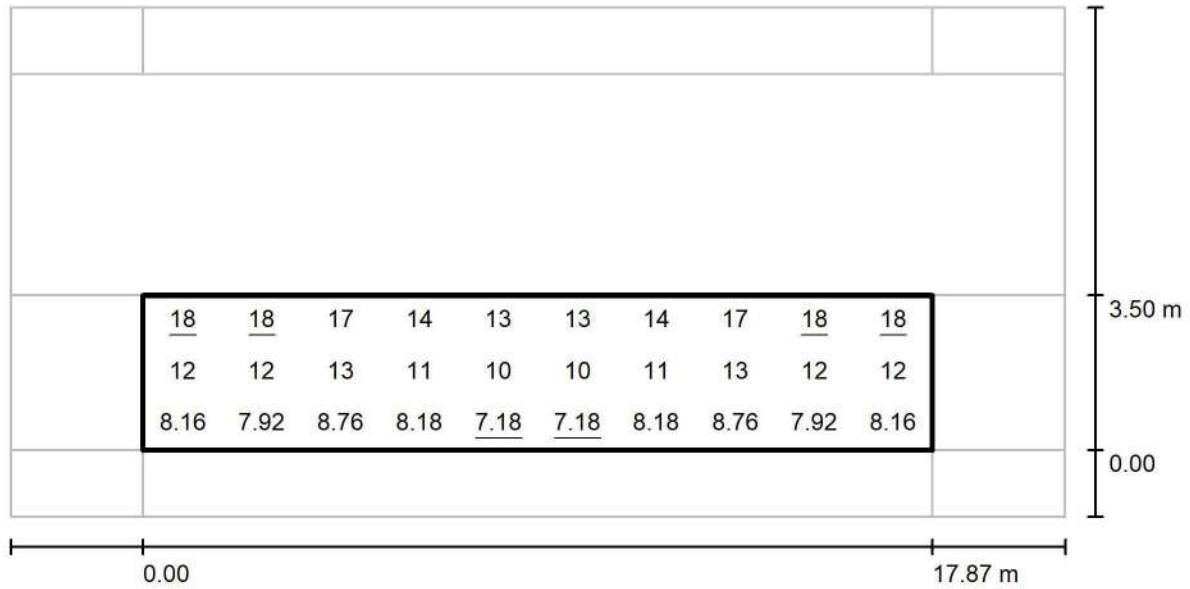
$E_{min} / E_m$   
0.600

$E_{min} / E_{max}$   
0.323

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### E22 C. Gabarres / Recuadro de evaluación Calzada 1 / Gráfico de valores (E)



Valores en Lux, Escala 1 : 171

Trama: 10 x 3 Puntos

$E_m$  [lx]  
12

$E_{min}$  [lx]  
7.18

$E_{max}$  [lx]  
18

$E_{min} / E_m$   
0.602

$E_{min} / E_{max}$   
0.394



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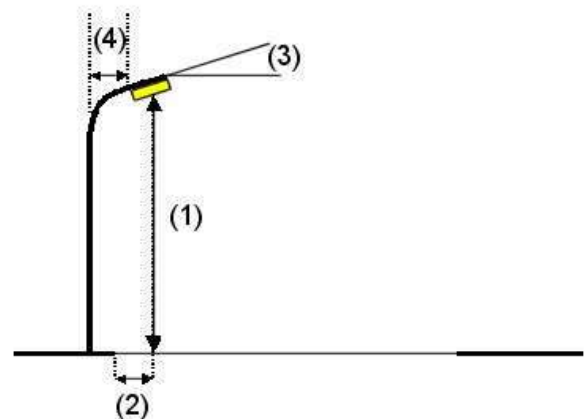
## E23 Carrer de Alberes / Datos de planificación

### Perfil de la vía pública

Camino peatonal 2	(Anchura: 1.500 m)
Carril de estacionamiento 1	(Anchura: 2.400 m)
Calzada 1	(Anchura: 3.500 m, Cantidad de carriles de tránsito: 1, Revestimiento de la calzada: R3, q0: 0.070)
Carril de estacionamiento 2	(Anchura: 2.400 m)
Camino peatonal 1	(Anchura: 1.500 m)

Factor mantenimiento: 0.85

### Disposiciones de las luminarias



Luminaria:	Novatilu ALMLS30 AE 3 MILAN S 30 AE 3000K 16	
Flujo luminoso (Luminaria):	2903 lm	Valores máximos de la intensidad lumínica con 70°: 530 cd/klm con 80°: 95 cd/klm con 90°: 1.16 cd/klm
Flujo luminoso (Lámparas):	2903 lm	
Potencia de las luminarias:	22.0 W	
Organización:	unilateral arriba	Respectivamente en todas las direcciones que forman los ángulos especificados con las verticales inferiores (con luminarias instaladas aptas para el funcionamiento). Ninguna intensidad lumínica por encima de 95°. La disposición cumple con la clase de intensidad lumínica G3. La disposición cumple con la clase del índice de deslumbramiento D.5.
Distancia entre mástiles:	20.000 m	
Altura de montaje (1):	7.000 m	
Altura del punto de luz:	6.920 m	
Saliente sobre la calzada (2):	-2.400 m	
Inclinación del brazo (3):	0.0 °	
Longitud del brazo (4):	0.000 m	

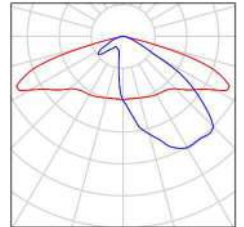
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## E23 Carrer de Alberes / Lista de luminarias

Novatilu ALMLS30 AE 3 MILAN S 30 AE 3000K  
16 (Tipo 1)  
Nº de artículo: ALMLS30 AE 3  
Flujo luminoso (Luminaria): 2903 lm  
Flujo luminoso (Lámparas): 2903 lm  
Potencia de las luminarias: 22.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 33 72 97 100 100  
Lámpara: 1 x Definido por el usuario (Factor de  
corrección 1.000).

Dispone de una imagen  
de la luminaria en  
nuestro catálogo de  
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## E23 Carrer de Alberes / Resultados luminotécnicos



Factor manteniment: 0.85

Escala 1:186

### Lista del recuadro de evaluación

- 1 Recuadro de evaluación Camino peatonal 1  
 Longitud: 20.000 m, Anchura: 1.500 m  
 Trama: 10 x 3 Puntos  
 Elemento de la vía pública respectivo: Camino peatonal 1.  
 Clase de iluminación seleccionada: S4 (Se cumplen todos los requerimientos fotométricos.)

	$E_m$ [lx]	$E_{min}$ [lx]
Valores reales según cálculo:	5.05	3.93
Valores de consigna según clase:	$\geq 5.00$	$\geq 1.00$
Cumplido/No cumplido:	✓	✓

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## E23 Carrer de Alberes / Resultados luminotécnicos

### Lista del recuadro de evaluación

#### 2 Recuadro de evaluación Camino peatonal 2

Longitud: 20.000 m, Anchura: 1.500 m

Trama: 10 x 3 Puntos

Elemento de la vía pública respectivo: Camino peatonal 2.

Clase de iluminación seleccionada: S4 (Se cumplen todos los requerimientos fotométricos.)

Valores reales según cálculo:

$E_m$  [lx]  $E_{min}$  [lx]

5.04 3.13

Valores de consigna según clase:

$\geq 5.00$   $\geq 1.00$

Cumplido/No cumplido:

✓ ✓

#### 3 Recuadro de evaluación Calzada 1

Longitud: 20.000 m, Anchura: 3.500 m

Trama: 10 x 3 Puntos

Elemento de la vía pública respectivo: Calzada 1.

Clase de iluminación seleccionada: S2 (Se cumplen todos los requerimientos fotométricos.)

Valores reales según cálculo:

$E_m$  [lx]  $E_{min}$  [lx]

11.40 8.40

Valores de consigna según clase:

$\geq 10.00$   $\geq 3.00$

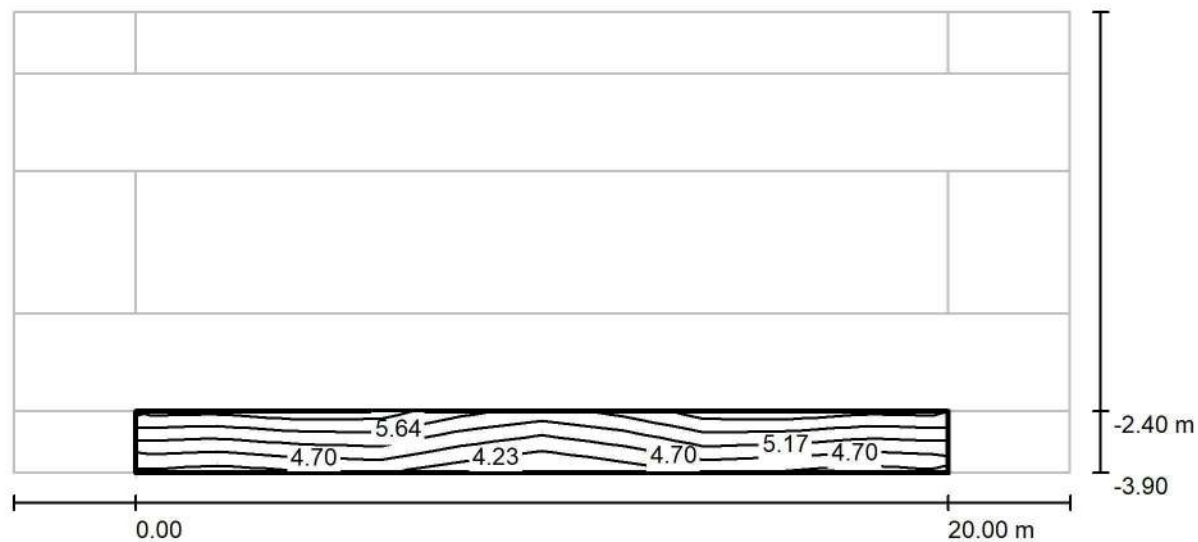
Cumplido/No cumplido:

✓ ✓

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### E23 Carrer de Alberes / Recuadro de evaluación Camino peatonal 1 / Isolíneas (E)



Valores en Lux, Escala 1 : 186

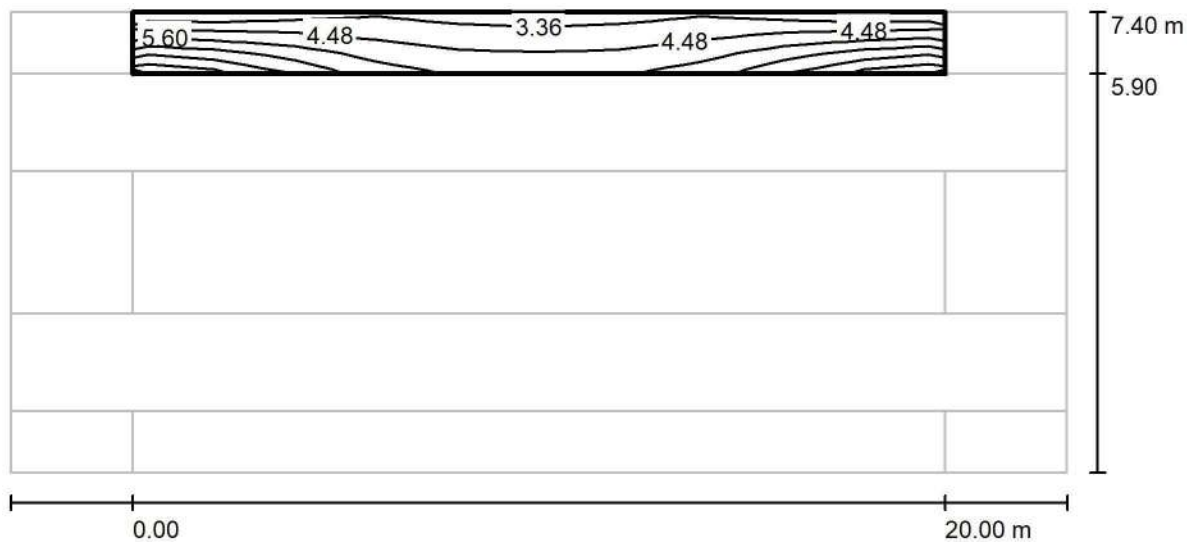
Trama: 10 x 3 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
5.05	3.93	6.27	0.779	0.627

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### E23 Carrer de Alberes / Recuadro de evaluación Camino peatonal 2 / Isolíneas (E)



Valores en Lux, Escala 1 : 186

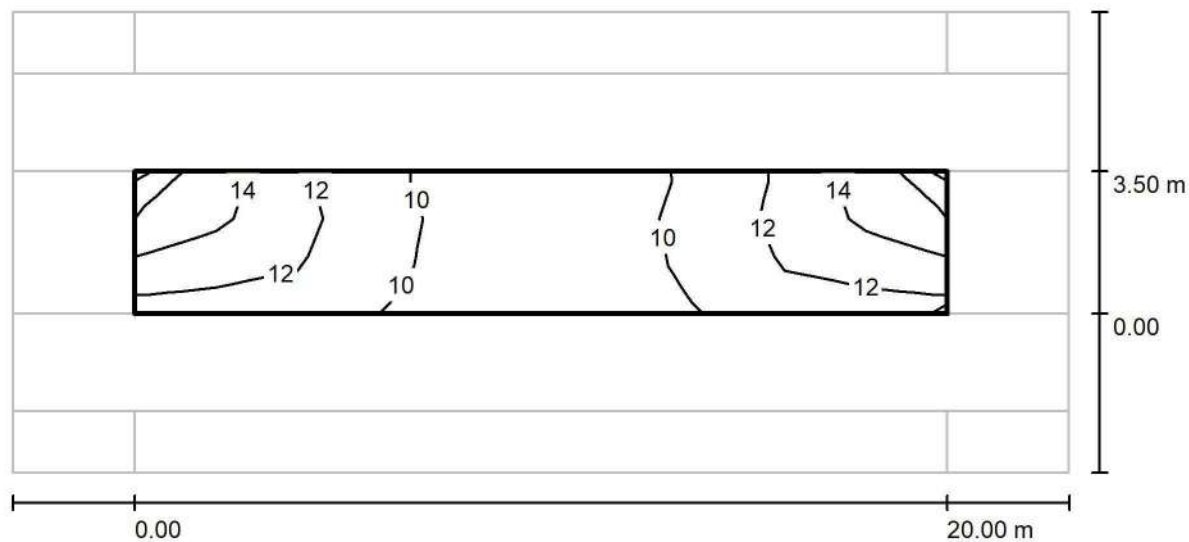
Trama: 10 x 3 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
5.04	3.13	8.74	0.620	0.358

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### E23 Carrer de Alberes / Recuadro de evaluación Calzada 1 / Isolíneas (E)



Valores en Lux, Escala 1 : 186

Trama: 10 x 3 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
11	8.40	16	0.737	0.531

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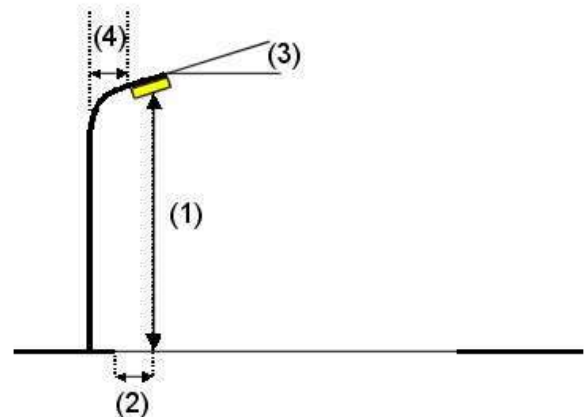
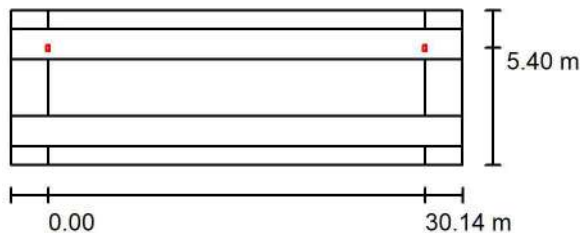
## E24 Carrer Alfàbia / Datos de planificación

### Perfil de la vía pública

Camino peatonal 2	(Anchura: 1.500 m)
Carril de estacionamiento 1	(Anchura: 2.400 m)
Calzada 1	(Anchura: 4.500 m, Cantidad de carriles de tránsito: 1, Revestimiento de la calzada: R3, q0: 0.070)
Carril de estacionamiento 2	(Anchura: 2.400 m)
Camino peatonal 1	(Anchura: 1.500 m)

Factor mantenimiento: 0.85

### Disposiciones de las luminarias



Luminaria:	Novatilu ALMLS40 AE 3 MILAN S 40 AE 3000K 16
Flujo luminoso (Luminaria):	4336 lm
Flujo luminoso (Lámparas):	4336 lm
Potencia de las luminarias:	33.0 W
Organización:	unilateral arriba
Distancia entre mástiles:	30.140 m
Altura de montaje (1):	8.000 m
Altura del punto de luz:	7.920 m
Saliente sobre la calzada (2):	-0.900 m
Inclinación del brazo (3):	0.0 °
Longitud del brazo (4):	1.500 m

Valores máximos de la intensidad lumínica	
con 70°:	446 cd/klm
con 80°:	31 cd/klm
con 90°:	2.86 cd/klm

Respectivamente en todas las direcciones que forman los ángulos especificados con las verticales inferiores (con luminarias instaladas aptas para el funcionamiento).

La disposición cumple con la clase de intensidad lumínica G3.

La disposición cumple con la clase del índice de deslumbramiento D.5.



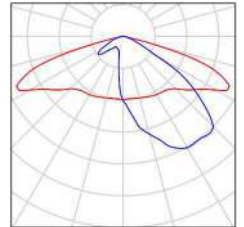
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## E24 Carrer Alfàbia / Lista de luminarias

Novatilu ALMLS40 AE 3 MILAN S 40 AE 3000K  
16 (Tipo 1)  
Nº de artículo: ALMLS40 AE 3  
Flujo luminoso (Luminaria): 4336 lm  
Flujo luminoso (Lámparas): 4336 lm  
Potencia de las luminarias: 33.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 33 72 97 100 100  
Lámpara: 1 x Definido por el usuario (Factor de  
corrección 1.000).

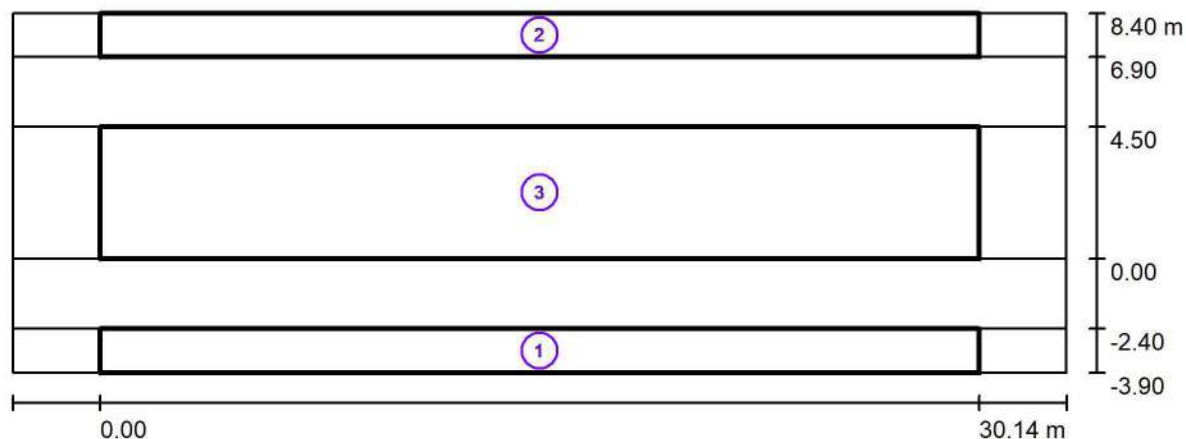
Dispone de una imagen  
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nuestro catálogo de  
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## E24 Carrer Alfàbia / Resultados luminotécnicos



Factor mantenimiento: 0.85

Escala 1:259

### Lista del recuadro de evaluación

1 Recuadro de evaluación Camino peatonal 1

Longitud: 30.140 m, Anchura: 1.500 m

Trama: 11 x 3 Puntos

Elemento de la vía pública respectivo: Camino peatonal 1.

Clase de iluminación seleccionada: S5

(Se cumplen todos los requerimientos fotométricos.)

Valores reales según cálculo:

$E_m$  [lx]  
4.39

$E_{min}$  [lx]  
3.43

Valores de consigna según clase:

$\geq 3.00$

$\geq 0.60$

Cumplido/No cumplido:

✓

✓

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## E24 Carrer Alfàbia / Resultados luminotécnicos

### Lista del recuadro de evaluación

#### 2 Recuadro de evaluación Camino peatonal 2

Longitud: 30.140 m, Anchura: 1.500 m

Trama: 11 x 3 Puntos

Elemento de la vía pública respectivo: Camino peatonal 2.

Clase de iluminación seleccionada: S5 (Se cumplen todos los requerimientos fotométricos.)

Valores reales según cálculo:

$E_m$  [lx]  $E_{min}$  [lx]

4.04 2.60

Valores de consigna según clase:

$\geq 3.00$   $\geq 0.60$

Cumplido/No cumplido:

✓ ✓

#### 3 Recuadro de evaluación Calzada 1

Longitud: 30.140 m, Anchura: 4.500 m

Trama: 11 x 3 Puntos

Elemento de la vía pública respectivo: Calzada 1.

Clase de iluminación seleccionada: S2 (Se cumplen todos los requerimientos fotométricos.)

Valores reales según cálculo:

$E_m$  [lx]  $E_{min}$  [lx]

11.34 5.97

Valores de consigna según clase:

$\geq 10.00$   $\geq 3.00$

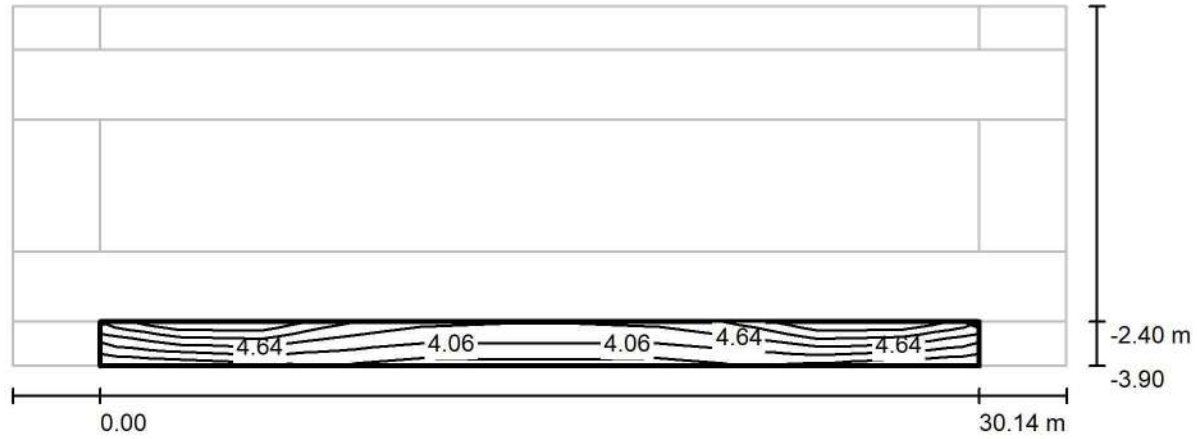
Cumplido/No cumplido:

✓ ✓

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### E24 Carrer Alfàbia / Recuadro de evaluación Camino peatonal 1 / Isolíneas (E)



Valores en Lux, Escala 1 : 259

Trama: 11 x 3 Puntos

$E_m$  [lx]  
4.39

$E_{min}$  [lx]  
3.43

$E_{max}$  [lx]  
6.34

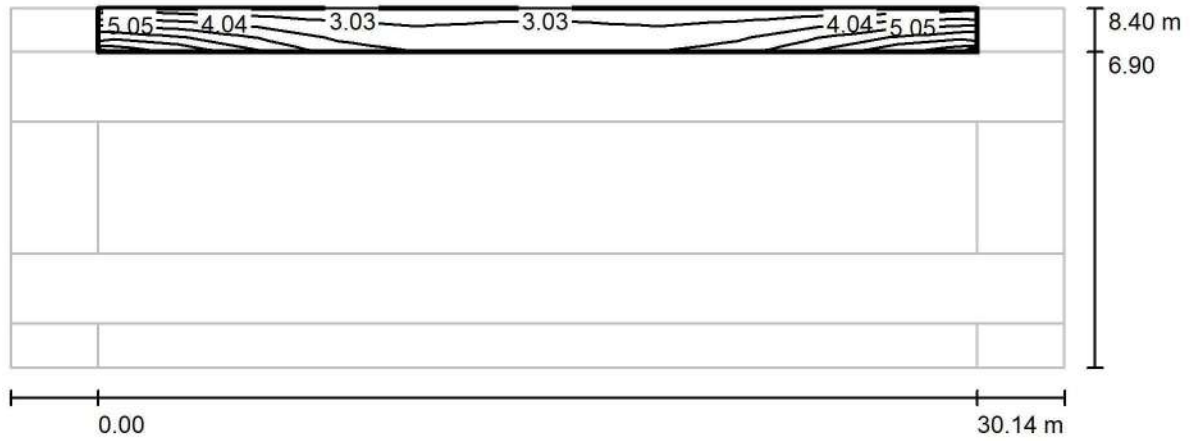
$E_{min} / E_m$   
0.780

$E_{min} / E_{max}$   
0.541

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### E24 Carrer Alfàbia / Recuadro de evaluación Camino peatonal 2 / Isolíneas (E)



Valores en Lux, Escala 1 : 259

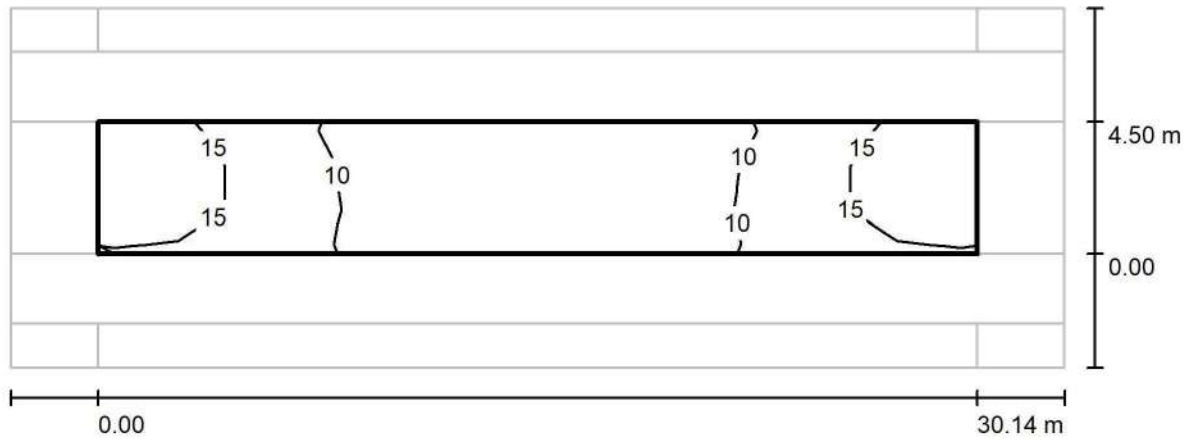
Trama: 11 x 3 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
4.04	2.60	7.65	0.642	0.340

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### E24 Carrer Alfàbia / Recuadro de evaluación Calzada 1 / Isolíneas (E)



Valores en Lux, Escala 1 : 259

Trama: 11 x 3 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
11	5.97	19	0.526	0.319

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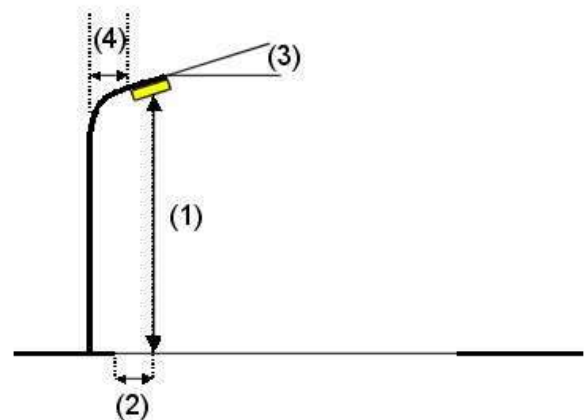
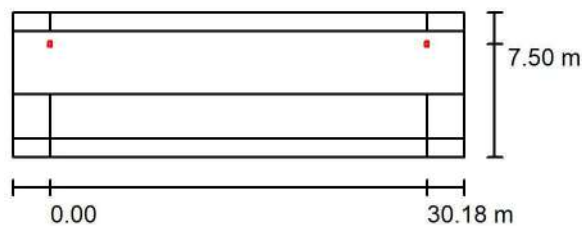
## E25 Montsant / Datos de planificación

### Perfil de la vía pública

Camino peatonal 2	(Anchura: 1.500 m)
Carril de estacionamiento 1	(Anchura: 5.000 m)
Calzada 1	(Anchura: 3.500 m, Cantidad de carriles de tránsito: 1, Revestimiento de la calzada: R3, q0: 0.070)
Camino peatonal 1	(Anchura: 1.500 m)

Factor mantenimiento: 0.85

### Disposiciones de las luminarias



Luminaria:	Novatilu ALMLS40 AE 3 MILAN S 40 AE 3000K 16	Valores máximos de la intensidad lumínica con 70°: 508 cd/klm con 80°: 29 cd/klm con 90°: 0.71 cd/klm
Flujo luminoso (Luminaria):	5256 lm	
Flujo luminoso (Lámparas):	5256 lm	
Potencia de las luminarias:	40.0 W	
Organización:	unilateral arriba	Respectivamente en todas las direcciones que forman los ángulos especificados con las verticales inferiores (con luminarias instaladas aptas para el funcionamiento). Ninguna intensidad lumínica por encima de 90°. La disposición cumple con la clase de intensidad lumínica G3. La disposición cumple con la clase del índice de deslumbramiento D.6.
Distancia entre mástiles:	30.180 m	
Altura de montaje (1):	7.000 m	
Altura del punto de luz:	6.920 m	
Saliente sobre la calzada (2):	-4.000 m	
Inclinación del brazo (3):	0.0 °	
Longitud del brazo (4):	1.500 m	

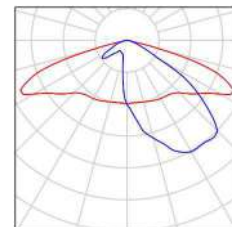
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## E25 Montsant / Lista de luminarias

Novatilu ALMLS40 AE 3 MILAN S 40 AE 3000K  
16  
Nº de artículo: ALMLS40 AE 3  
Flujo luminoso (Luminaria): 5256 lm  
Flujo luminoso (Lámparas): 5256 lm  
Potencia de las luminarias: 40.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 33 72 97 100 100  
Lámpara: 1 x BENITO-NOVATILU (5050) (Factor  
de corrección 1.000).

Dispone de una imagen  
de la luminaria en  
nuestro catálogo de  
luminarias.

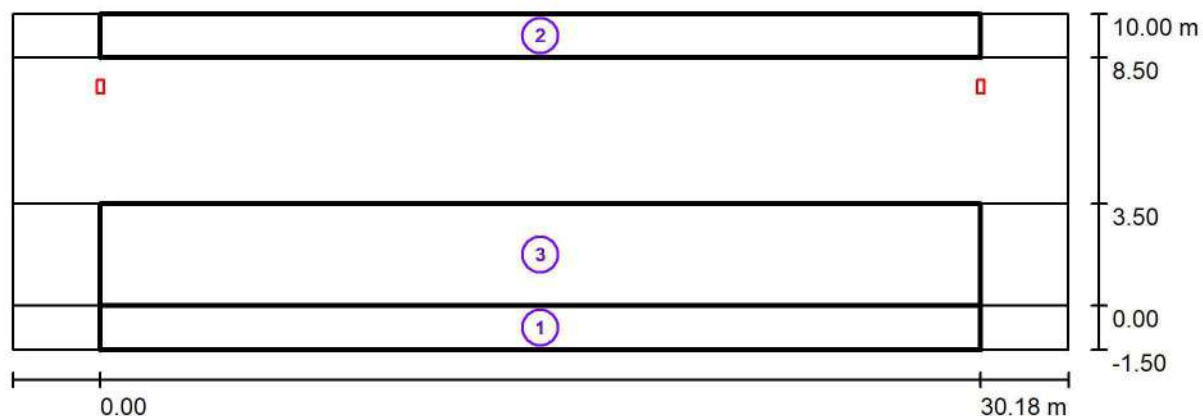




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## E25 Montsant / Resultados luminotécnicos



Factor mantenimiento: 0.85

Escala 1:259

### Lista del recuadro de evaluación

- 1 Recuadro de evaluación Camino peatonal 1  
 Longitud: 30.180 m, Anchura: 1.500 m  
 Trama: 11 x 3 Puntos  
 Elemento de la vía pública respectivo: Camino peatonal 1.  
 Clase de iluminación seleccionada: S4 (Se cumplen todos los requerimientos fotométricos.)

	$E_m$ [lx]	$E_{min}$ [lx]
Valores reales según cálculo:	6.82	4.79
Valores de consigna según clase:	$\geq 5.00$	$\geq 1.00$
Cumplido/No cumplido:	✓	✓

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## E25 Montsant / Resultados luminotécnicos

### Lista del recuadro de evaluación

#### 2 Recuadro de evaluación Camino peatonal 2

Longitud: 30.180 m, Anchura: 1.500 m

Trama: 11 x 3 Puntos

Elemento de la vía pública respectivo: Camino peatonal 2.

Clase de iluminación seleccionada: S5 (Se cumplen todos los requerimientos fotométricos.)

	$E_m$ [lx]	$E_{min}$ [lx]
Valores reales según cálculo:	3.94	2.17
Valores de consigna según clase:	$\geq 3.00$	$\geq 0.60$
Cumplido/No cumplido:	✓	✓

#### 3 Recuadro de evaluación Calzada 1

Longitud: 30.180 m, Anchura: 3.500 m

Trama: 11 x 3 Puntos

Elemento de la vía pública respectivo: Calzada 1.

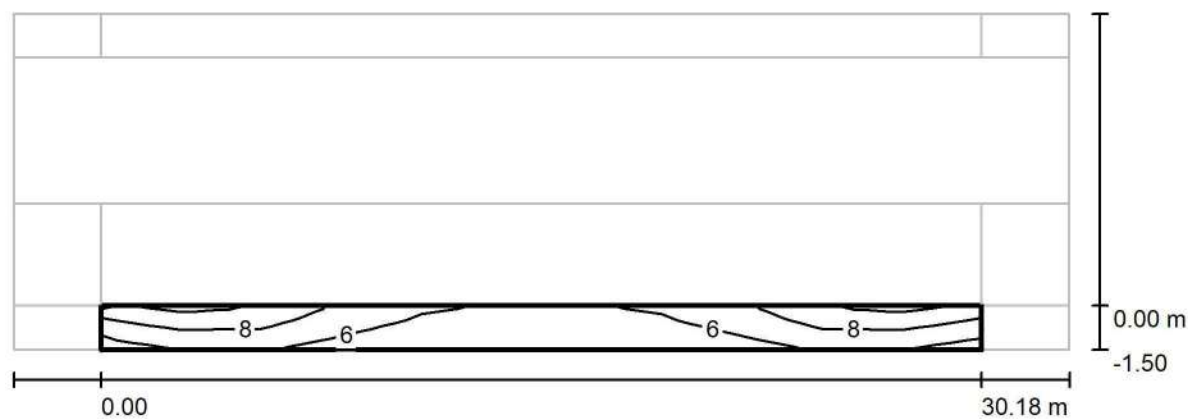
Clase de iluminación seleccionada: S2 (Se cumplen todos los requerimientos fotométricos.)

	$E_m$ [lx]	$E_{min}$ [lx]
Valores reales según cálculo:	11.96	5.96
Valores de consigna según clase:	$\geq 10.00$	$\geq 3.00$
Cumplido/No cumplido:	✓	✓

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### E25 Montsant / Recuadro de evaluación Camino peatonal 1 / Isolíneas (E)



Valores en Lux, Escala 1 : 259

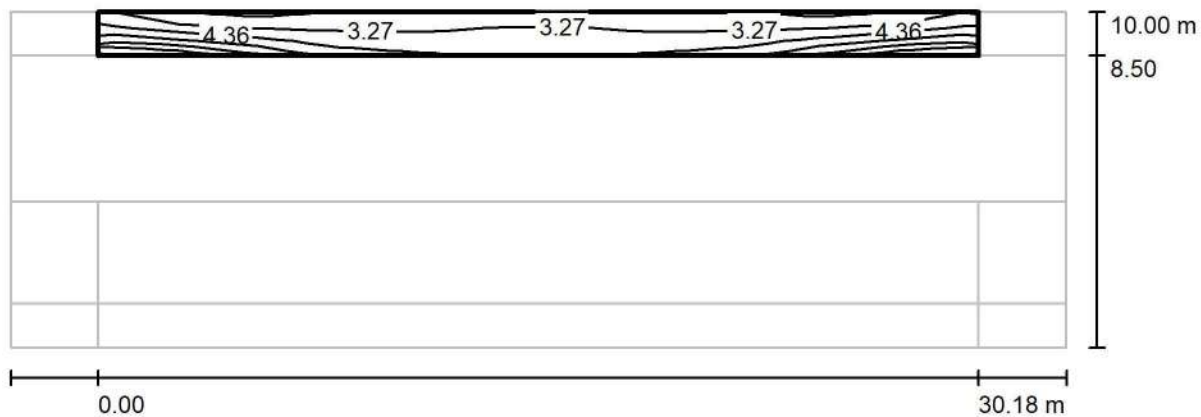
Trama: 11 x 3 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
6.82	4.79	11	0.703	0.455

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### E25 Montsant / Recuadro de evaluación Camino peatonal 2 / Isolíneas (E)



Valores en Lux, Escala 1 : 259

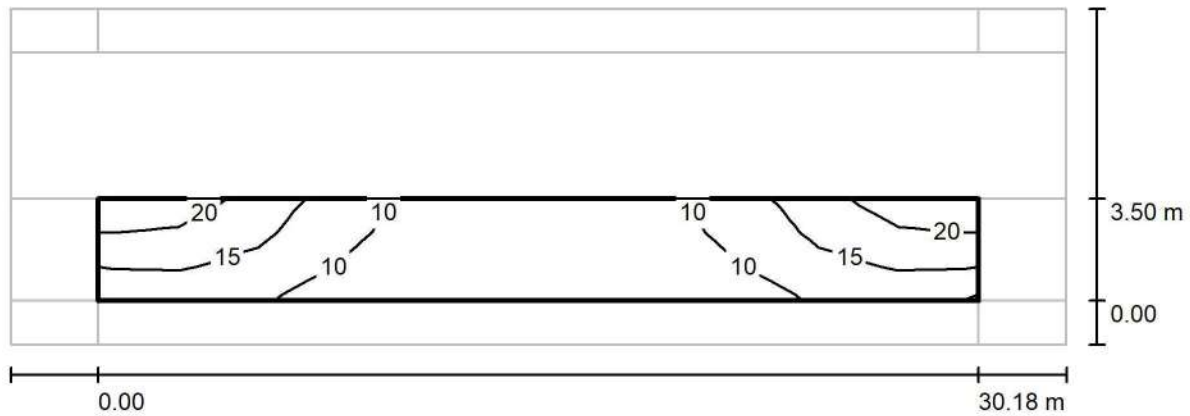
Trama: 11 x 3 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
3.94	2.17	7.61	0.551	0.285

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### E25 Montsant / Recuadro de evaluación Calzada 1 / Isolíneas (E)



Valores en Lux, Escala 1 : 259

Trama: 11 x 3 Puntos

$E_m$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	$E_{min} / E_m$	$E_{min} / E_{max}$
12	5.96	22	0.498	0.273

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## E26 Conexio peatonal entre Carrer Alfàbia i C. Montsant / Datos de planificación

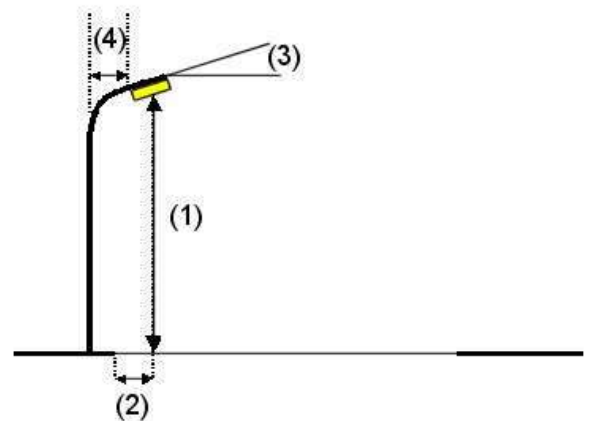
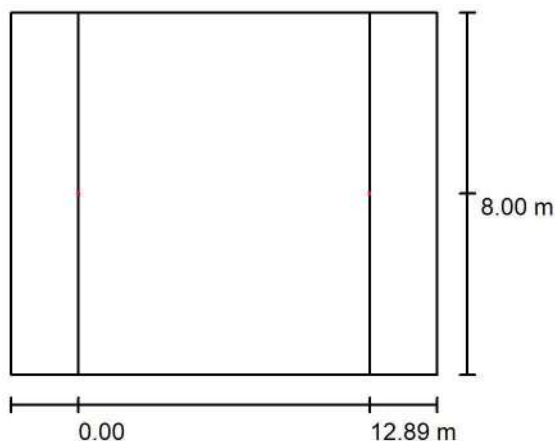
### Perfil de la vía pública

Camino peatonal 1

(Anchura: 16.000 m)

Factor mantenimiento: 0.85

### Disposiciones de las luminarias



Luminaria:	Novatilu ALIBL60 A1S 3 INNOVA B 60 A1S 3000K
Flujo luminoso (Luminaria):	3569 lm
Flujo luminoso (Lámparas):	3566 lm
Potencia de las luminarias:	28.0 W
Organización:	unilateral arriba
Distancia entre mástiles:	12.890 m
Altura de montaje (1):	3.800 m
Altura del punto de luz:	3.791 m
Saliente sobre la calzada (2):	8.000 m
Inclinación del brazo (3):	0.0 °
Longitud del brazo (4):	0.000 m

Valores máximos de la intensidad lumínica	
con 70°:	346 cd/klm
con 80°:	153 cd/klm
con 90°:	30 cd/klm

Respectivamente en todas las direcciones que forman los ángulos especificados con las verticales inferiores (con luminarias instaladas aptas para el funcionamiento).

Ninguna intensidad lumínica por encima de 95°.  
La disposición cumple con la clase de intensidad lumínica G1.

La disposición cumple con la clase del índice de deslumbramiento D.1.

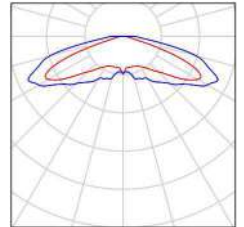
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## E26 Conexio peatonal entre Carrer Alfàbia i C. Montsant / Lista de luminarias

Novatilu ALIBL60 A1S 3 INNOVA B 60 A1S  
3000K (Tipo 1)  
Nº de artículo: ALIBL60 A1S 3  
Flujo luminoso (Luminaria): 3569 lm  
Flujo luminoso (Lámparas): 3566 lm  
Potencia de las luminarias: 28.0 W  
Clasificación luminarias según CIE: 100  
Código CIE Flux: 19 50 89 100 100  
Lámpara: 1 x Definido por el usuario (Factor de  
corrección 1.000).

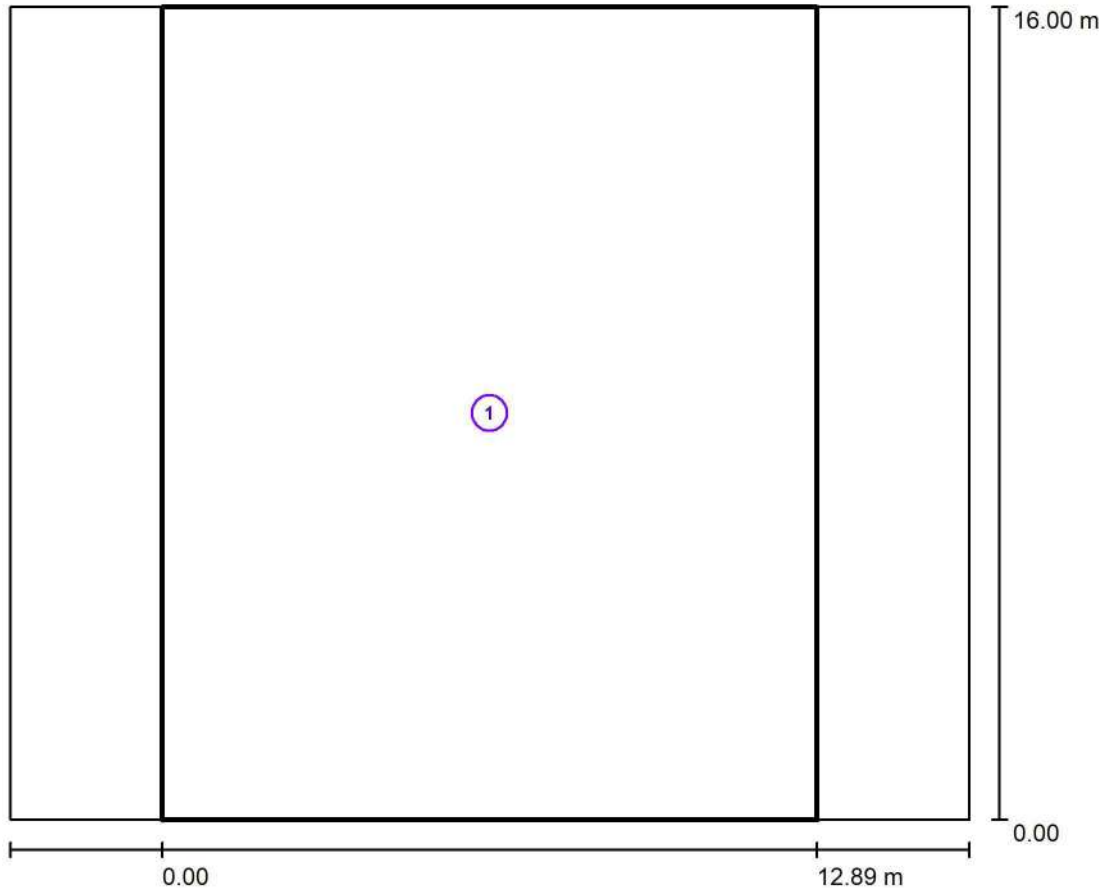
Dispone de una imagen  
de la luminaria en  
nuestro catálogo de  
luminarias.



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## E26 Conexio peatonal entre Carrer Alfàbia i C. Montsant / Resultados luminotécnicos



Factor mantenimiento: 0.85

Escala 1:149

### Lista del recuadro de evaluación

- 1 Recuadro de evaluación Camino peatonal 1  
 Longitud: 12.890 m, Anchura: 16.000 m  
 Trama: 10 x 11 Puntos  
 Elemento de la vía pública respectivo: Camino peatonal 1.  
 Clase de iluminación seleccionada: S2 (Se cumplen todos los requerimientos fotométricos.)

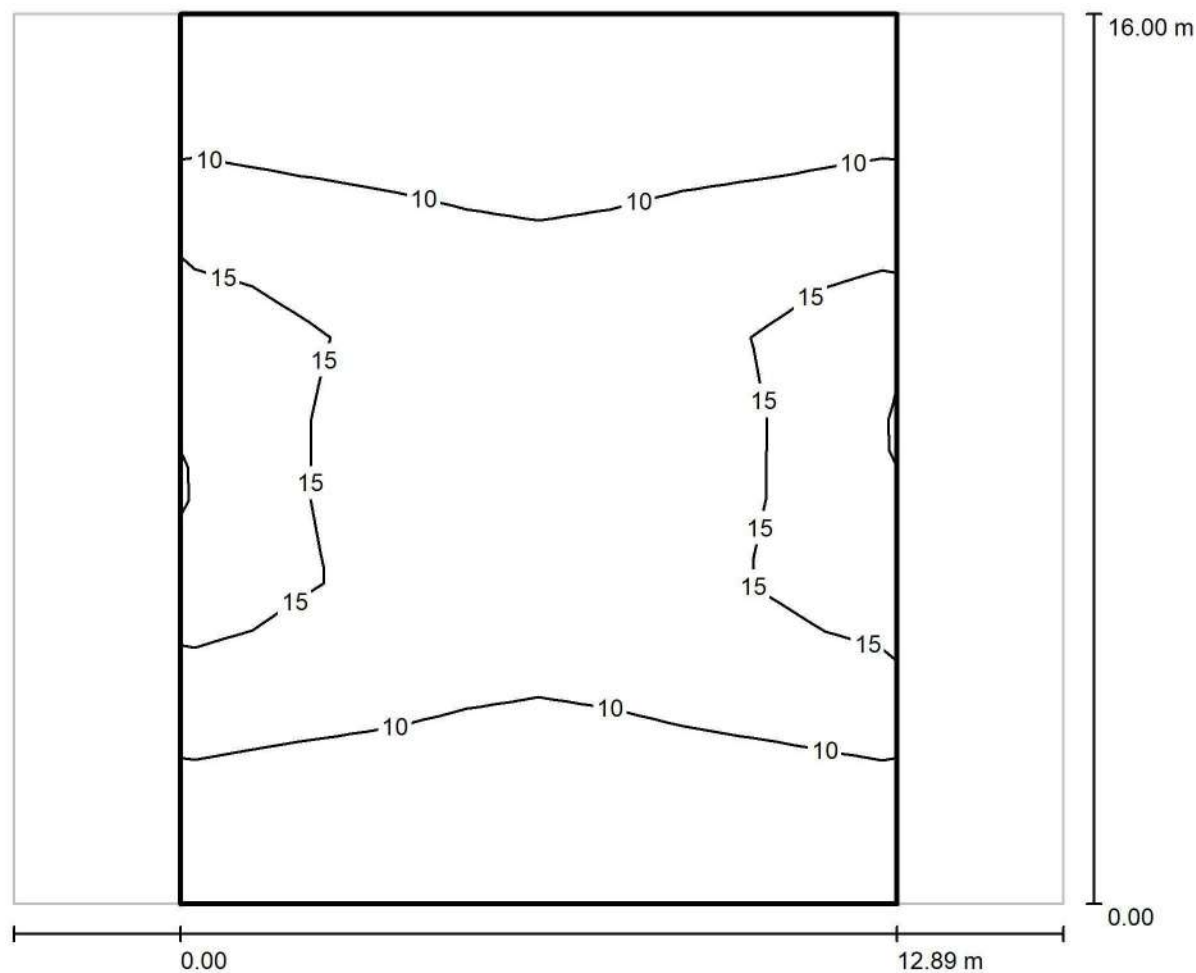
	$E_m$ [lx]	$E_{min}$ [lx]
Valores reales según cálculo:	11.25	6.46
Valores de consigna según clase:	$\geq 10.00$	$\geq 3.00$
Cumplido/No cumplido:	✓	✓



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### E26 Conexio peatonal entre Carrer Alfàbia i C. Montsant / Recuadro de evaluación Camino peatonal 1 / Isolíneas (E)



Valores en Lux, Escala 1 : 136

Trama: 10 x 11 Puntos

$E_m$  [lx]  
11

$E_{min}$  [lx]  
6.46

$E_{max}$  [lx]  
20

$E_{min} / E_m$   
0.574

$E_{min} / E_{max}$   
0.319



**ANNEX N°2. Fitxes productes**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

---

# INNOVA B

Documentación técnica IDAE



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EXPERTOS EN  
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*UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.*  
*UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.*  
*UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas. Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.*  
*Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE- EN 62262.*

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*UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2 Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16A)*  
*UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.*  
*UNE-EN 61547. Equipos para alumbrado*

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---	-----

*UNE-EN 62031. Módulos LED para alumbrado general. Requisitos de seguridad. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.)*  
*Ficha técnica PCB*  
*Ficha técnica LED*  
*UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos.*  
*UNE-EN 62384. Dispositivos de control electrónicos. Requisitos de funcionamiento.*  
*Certificado CE y ENEC del Driver*  
*Ficha técnica Driver \*Sujeto a cambio en función de prescripción*

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## 3 Informes de Pruebas o Certificados de la Luminaria

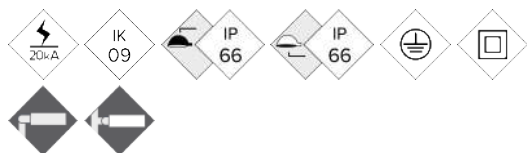
3.1 Tabla de Verificación (Anexo 4) CEI - IDAE .....	204
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*Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes.*  
*Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4.*  
*Ensayo colorimétrico de la luminaria según la norma UNE EN 13032-4.*  
*Ensayo de medidas eléctricas y de seguridad*

ALIB

Luminaria

# INNOVA B



Luminaria Ambiental de diseño innovador muy adecuado en ambientes residenciales urbanos. De perfil estrecho, fijación a columna mediante rótula, siendo adaptable en distintos entornos, desde viales residenciales a plazas y zonas ajardinadas. Potencia disponible de 20W hasta 100W gracias a su gran capacidad de disipación térmica, ofrece una gran robustez y fiabilidad. Preparada para cualquier sistema de telegestión.

## VENTAJAS:

- Alta eficiencia. Hasta 145 lm/W reales
- Adaptable mediante rótula, brazo o suspendida.
- Doble cavidad, Driver y Grupo Óptico
- Apertura fácil sin herramientas
- 18 Distribuciones lumínicas distintas
- Estándar Zhaga (Book 15)
- Ready 4IoT. Preparada para la conectividad

## APLICACIONES:

- Calles Residenciales
- Plazas y Zonas Ajardinadas
- Carriles Bici i Zonas 30

## DETALLES:



Eficiencia LED.



Fijación mediante rótula.



Apertura sin herramientas.

[Ficha de proyecto](#) | [CAD](#) | [Catálogo](#) | [Instrucciones montaje](#) | [BIM](#) | [Imagen HD](#)

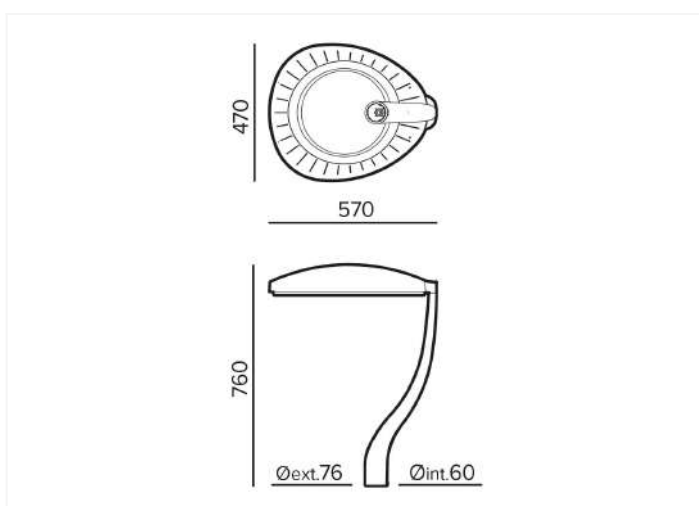
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## CARACTERÍSTICAS:

Material cuerpo:	Fundición de aluminio inyectado a presión del tipo EN AC-43000, EN AC-43100, EN AC-43400, EN AC-44100, EN AC-47100 según la norma UNE EN 1706.
Difusor (cerramiento cavidad óptica):	Vidrio Templado de 5 mm. Filtra los UV.
Tornillería:	Acero Inoxidable 18/8 - AISI 304
Cuerpo:	Doble Cavidad: Driver / Módulo LEDs
Juntas de estanqueidad:	Espuma de Silicona
Índice de protección IP de la luminaria:	IP66
Índice de protección IP del Grupo Óptico:	IP66
Índice de protección IK:	IK09
Disipación térmica de los LEDs:	Disipación térmica a través del cuerpo de la luminaria, sin aletas externas ni fluidos conductores. Disipación pasiva por convección y asegurando el contacto térmico de los módulos de LEDs a través de material de transferencia térmica de alta conductividad.
Válvula anti condensación:	Válvula de compensación de presiones que asegura la evacuación de la humedad, evitando la condensación, manteniendo el grado de estanqueidad IP de la luminaria.
Pintura:	Recubrimiento de pintura en polvo de poliéster, pulverizado electrostáticamente y sublimado al horno. Resistente a la corrosión.
Color:	Color RAL 9022 y RAL 7043 y otros colores bajo pedido
Fijación:	Fijación Top Ø60mm
Orientable:	Luminaria orientable de -90° a 90° de inclinación
Mantenimiento:	De apertura fácil sin herramientas específicas. Módulos reemplazables: LEDs, Drivers, SPD.
Altura de montaje recomendada:	4 - 6 m
Driver:	Driver regulable y programable de corriente constante. Incorporado dentro de la luminaria, precableado sobre placa de acero galvanizada.
Regulación driver:	Driver Regulable 0-10V, programable en 5 niveles y con opción DALI 2. Con las características de Wireless, AOC, MTP, DTL.
Opciones de reducción de flujo:	<ul style="list-style-type: none"> <li>- Multinivel Temporizado o Media Noche Virtual</li> <li>- Ready4IoT</li> <li>- Reducción de flujo en Cabecera</li> <li>- Doble Nivel con Línea de Mando</li> </ul>
Protector de sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.

## PLANO:



## INSTALACIÓN:





## CUADRO TÉCNICO:

REF.	Nº LEDs	Potencia W	I Driver mA	Flujo Lumínico Real (T) =85°C)		Flujo Lumínico Inicial (T) =25°C)	
				Flujo lm	Eficiencia lm/W	Flujo lm	Eficiencia lm/W
INNOVA B	24	20	250	2842	142	3240	162
	24	40	500	5642	141	6432	161
	24	60	750	8443	141	9625	160
	36	80	667	11193	140	12760	160
	36	100	833	14066	141	16035	160
	ALIB						

LEDs: 5050

Eficiencia Nominal del LED: 172 lm/W.

Corriente máxima LED: 1000 mA.

Corriente LED = Corriente Driver/2.

Vida Media L90B10: >100,000 horas.

Flujos Lumínicos y Eficiencias a 4000°K y CRI>70.

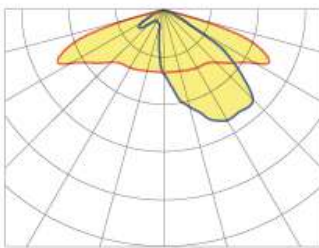
Tolerancia del flujo lumínico < +/-3%.

Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.

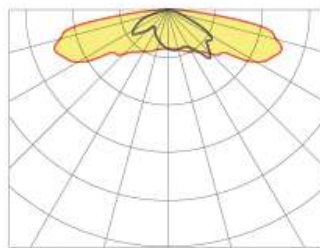


## FOTOMETRÍAS:

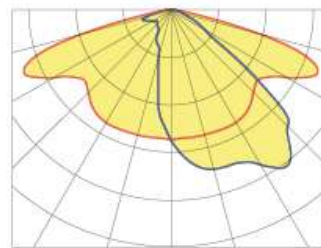
Asimétrico Super-Extensivo (AE)



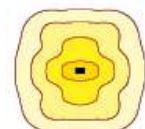
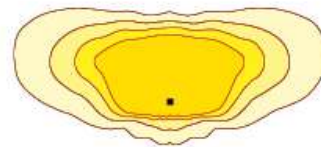
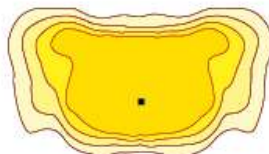
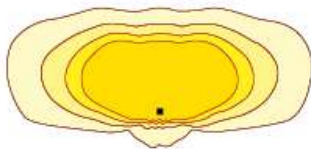
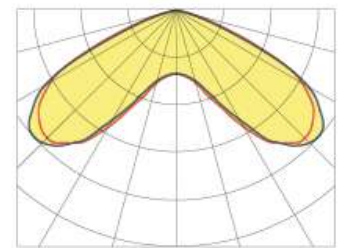
Asimétrico Extensivo (A3)



Asimétrico Extensivo (AM)



Simétrico Super Extensivo Circular (SE)



\*Consultar otras distribuciones lumínicas

El Grupo BENITO NOVATILU se reserva el derecho de realizar modificaciones a sus productos sin previo aviso.

## MÓDULO LED'S:

Módulo de LEDs:	BENITO-NOVATILU Formato Zhaga de 8, 12 y 16 LEDs. Consultar Temperaturas de Color, CRI y Distribuciones Lumínicas.	
Módulo sustituible:	Si	
LED:	5050	
Nº de LED's:	24-36	
Formato PCBs:	2 o 3 Zhaga (Book 15) 2x4	
Eficiencia nominal del LED:	172	
Temperatura de Color:	PC Ámbar, 2K2, 2K7, 3K, 4K, 5K	
Rendimiento Cromático CRI:	>70 (opcional >80)	
Vida Media de los LED - L90B10:	L90B10 >100.000 horas	

## ESPECIFICACIONES ÓPTICAS:

Sistema Óptico:	Lentes de PMMA 2x2	
Distribución Lumínica:	18 Distribuciones Lumínicas disponibles	
Flujo Hemisferio Superior (FHS) ULOR:	0%	
Flujo Hemisferio Inferior DLOR:	100%	
Índice de Deslumbramiento:	Entre D5 y D6 (depende de la distribución lumínica)	
Categoría Intensidad Luminosa:	Entre G*4 y G*6 (depende de la distribución lumínica)	
Flujo Luminoso CIE n°3:	>95%	
Seguridad Fotobiológica:	RG0 (exento de riesgo)	
Flujo lumínico Inicial Tj=25°C (hasta):	lm	16035
Eficiencia Lumínica Inicial Tj=25°C (hasta):	lm/W	160
Flujo lumínico Real Tj=85°C (UNE EN 13032-4) (hasta):	lm	14066
Eficiencia Lumínica Real Tj=85°C (UNE EN 13032-4) (hasta):	lm/W	141

## ESPECIFICACIONES ELÉCTRICAS:

Potencia máxima nominal (LED's):	W	90
Potencia máxima consumida (Luminaria):	W	100
Rango de Potencias:	W	20-100W
Corriente máxima del LED:	mA	<450 (<50% Imax)
Clase de Protección Eléctrica IEC:	Clase I y II	
Protector de Sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.	
Nivel de protección de tensión modo común y diferencial (SPD) Udc:	kV	10 y NTC opcional
Corriente máxima de descarga (8/20) (SPD):	kA	20
Desconexión Térmica de la Fase (SPD):	Si	
Tensión de Entrada:	Vac	220-240
Tensión de Entrada (rango máximo):	Vac	198-264
Frecuencia de Entrada:	Hz	47-63
Corriente de arranque:	A	<65
Duración del pico de arranque:	ms	<0,3
Eficiencia del Driver:	>90%	
Factor de potencia 100% consumo:	>0,98	
Factor de potencia 50% consumo:	>0,95	
Distorsión Harmónica Total (THD):	<10	
Consumo de Energía en reposo:	W	<0,4
Clasificación Energética:	A++ IPEA>1,15	

## CONDICIONES DE TRABAJO:

Vida Media de los LED - L90B10:	horas	>100.000
Vida Media del Driver a Tp<70°C:	horas	100.000
Vida Media de la Luminaria L80B10 (TM-21):	horas	
Temperatura ambiente de trabajo:	°C	de -35°C a +50°C
Superficie al viento:	m2	0,111
Test anti vibraciones (15Hz en 3 ejes):		
Test fuerza del viento:	m/s	
Período de Garantía:	años	5 años (opcional hasta 10)

## DIMENSIONES EMBALAJE:

Peso neto	kg	9
Peso Bruto	kg	10,5
Dimensiones Luminaria (LxAxH)	mm	570x470x760
Dimensiones Embalaje (LxAxH)	mm	570x510x155
Unidades por Embalaje		1
Cantidad por contenedor de 20"		
Cantidad por contenedor de 40"		

## CERTIFICACIONES:

Certificaciones Seguridad:	Certificaciones EMC:	Otras Certificaciones:
EN 60598-1 / EN 60598-2-3 EN 62493 / IEC 62471	EN 55015 / EN 61547 / EN 61000-3-2 / EN 61000-3-3 EN 61347-2-13 / EN 61347-1 / EN 62384	IEC 62262 / EN 13032-4 / EN 62717 / EN 6272-1 EN 6272-2-1 / EN 61643-11



## 1.2 Tabla (Anexo 1): Datos Generales de la Empresa

DATOS GENERALES DE LA EMPRESA FABRICANTE DE LA LUMINARIA LED		
1	Nombre de la empresa	BENITO URBAN, S.L.U.
2	Actividad social de la empresa	Fabricación, Comercialización y Distribución de Alumbrado Público
3	Código Identificación Fiscal	B59987529
4	Dirección postal	Calle Lleida, 10, 08500 Vic. Barcelona.
5	Dirección correo electrónico	mhoms@benito.com
6	Página/s web	www.benito.com
7	Nº Teléfono y Fax	T. 938 521 000 y F. 938 521 001
8	Persona de contacto	Mateu Homs
9	Certificado UNE-EN ISO 9001	OCA GLOBAL ENAC 34/5200/19/8038
10	Certificado UNE-EN ISO 14001	OCA GLOBAL ENAC 34/5400/19/8039
11	Catálogo Digital Publicado de Producto	<a href="https://www.benito.com/es/descargas-alumbrado-publico/catalogo-light.html">https://www.benito.com/es/descargas-alumbrado-publico/catalogo-light.html</a>
12	Certificado de la empresa de adhesión a un sistema integrado de gestión de residuos (SIG)	SI

Para más información consultar pack IDAE Empresa



**Barcelona T +34 938 521 000 Madrid T+34 916 436 964 info@benito.com www.benito.com**

EUROPE: France +33 0 468 210 992 Portugal +35 1 308 802 832 Italy +39 0 289 877 711 Romania +40 318 110 991 Poland +48 223 971 508 Russia +7 499 504 28 76  
 AMERICA: USA +1 617 778 29 47 Argentina +54 1 159 844 113 Chile +56 2 938 20 35 Mexico +52 5 546 319 722 Brazil +55 1 139 570 340 Peru +51 1707 1369  
 ASIA China +86 1 063 705 530

## 1.2 Tabla (Anexo 2) CEI – IDAE Requerimientos Técnicos Luminaria

DATOS Y DOCUMENTACIÓN TÉCNICA DE LA LUMINARIA TIPO FUNCIONAL																							
1	Marca y Modelo	NOVATILU - INNOVA B																					
2	Ficha Técnica	Si - ALIB																					
3	Marcado CE	Si																					
4	Material de Fabricación conforme el apartado 5.	Si																					
5	Sustitución independiente de los sistemas integrantes compartimento óptico (módulo y lente) y equipos auxiliares	Si																					
6	Grado de estanqueidad en la luminaria IP 66	IP 66																					
7	Grado de protección ante impactos en la luminaria mínimo IK 08	IK 09																					
8	Rango de temperatura de funcionamiento -10°C a 35°C	Si, -35°C a 50°C																					
9	Número de distribuciones fotométricas, al menos 5	18																					
10	Curvas Fotométricas y de utilización de la luminaria, al menos 5	Si																					
11	FHSINST , máximo permitido 3%	<1%																					
12	Temperatura de color en K de la luz emitida por la luminaria, máxima permitida (4000K)	PC-Ámbar, 2200K, 2700K, 3000K, 4000K, 5000K (estadios deportivos)																					
Eficacia de salida de la luminaria (lm/W)																							
13	<table border="1"> <thead> <tr> <th>TIPO DE LED</th> <th>lm/W min</th> </tr> </thead> <tbody> <tr> <td>LED NEUTRO 4000°K</td> <td>110</td> </tr> <tr> <td>LED CÁLIDO 3000°K</td> <td>100</td> </tr> <tr> <td>LED CÁLIDO 2700°K</td> <td>90</td> </tr> <tr> <td>LED CÁLIDO 2200°K</td> <td>85</td> </tr> <tr> <td>LED ÁMBAR (Phosphor-Converted)*</td> <td>70</td> </tr> <tr> <td>LED ÁMBAR PURO (monocromático)*</td> <td>40</td> </tr> </tbody> </table>	TIPO DE LED	lm/W min	LED NEUTRO 4000°K	110	LED CÁLIDO 3000°K	100	LED CÁLIDO 2700°K	90	LED CÁLIDO 2200°K	85	LED ÁMBAR (Phosphor-Converted)*	70	LED ÁMBAR PURO (monocromático)*	40	<table border="1"> <thead> <tr> <th>lm/W</th> </tr> </thead> <tbody> <tr> <td>&gt;120</td> </tr> <tr> <td>&gt;110</td> </tr> <tr> <td>&gt;100</td> </tr> <tr> <td>&gt;90</td> </tr> <tr> <td>&gt;75</td> </tr> <tr> <td>-</td> </tr> </tbody> </table>	lm/W	>120	>110	>100	>90	>75	-
	TIPO DE LED	lm/W min																					
	LED NEUTRO 4000°K	110																					
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lm/W																							
>120																							
>110																							
>100																							
>90																							
>75																							
-																							
14	Clase Eléctrica	I y II																					
15	Medidas Eléctricas: Tensión, corriente, potencia total consumida y Factor de potencia (>0.9)	Tensión 230V / Potencia 40W / FP >0,98																					
16	Vida útil estimada de la luminaria (Se considerará como máximo 100.000h)	L90B10 >100.000 horas																					
17	Ficha Técnica del LED utilizado en la luminaria y marcado CE	Si																					
18	Número de LEDs y Corriente de Alimentación	24 o 36(>60W) LED 375mA																					
19	Ficha Técnica Driver y marcado CE	Si																					
20	Ficha Técnica de otros dispositivos (SPD, OLC,...etc) y marcado CE, que se estimen oportunos	Si																					

## 2 Informes de Pruebas y Certificados de la Luminaria por OEC

### 2.1 Tabla de Verificación (Anexo 3) CEI – IDAE

Informes de Pruebas y Certificados emitidos por OEC acreditada sobre La luminaria y sus elementos integrantes	
1	Documento del alcance de la acreditación del certificador/es de estos informes o certificados.
2	UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.
3	UNE EN 60598-2-3 o 60598-2-5 Luminarias. Requisitos particulares. Luminarias de Alumbrado público o proyectores.
4	UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan Lámparas, o según IEC/TR 62778 que es su norma de aplicación.
5	Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.
6	El Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria)
7	UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2: Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16A por fase)
8	UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.
9	UNE-EN 61547. Equipos para alumbrado de uso general. Requisitos de inmunidad CEM.
10	UNE-EN 62031. Módulos LED para alumbrado general. Requisitos de seguridad. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.
11	UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.
12	UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED. Requisitos de funcionamiento.
13	Informe de ensayo en relación al material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda. A – Luminaria modelo funcional



## 2.2 Requisitos de Seguridad

- UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.
- UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.
- UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas.
- Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.
- Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262.

## TEST REPORT

The following sample(s) was/were submitted and identified on behalf of the client as:

**Applicant / address:** NOVATILU, S.L.U  
Via Ausetania, 11-13 08560 Manlleu Barcelona Spain  
**Manufacturer / address:** Same as applicant  
Same as applicant  
**Test laboratory / address:** SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.  
588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China  
**Test specifications / Test standard :** IEC 60598-2-3:2002 + A1:2011 (only test clause 3.13 (9.2.2 and 9.2.7))  
IEC 60598-1:2014  
IEC 62262:2002 (IK09)

**Test item description:** LED LAMP (LED STREET LIGHTING)

**Trade mark:**

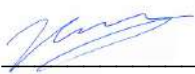


**Model/Type reference:** INNOVA

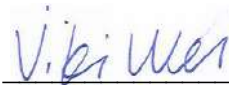
**Ratings:** 100 V – 240 V; 50 Hz / 60 Hz; 80 W; IP66; IK09; Class I

**Test result :** In the opinion of SGS-CSTC the submitted samples were found to be in compliance with the test specification as indicated in the details on the following pages.

**Remark :** According to client's requirement, only test clause 3.13 (9.2.2 and 9.2.7) and IK09 of the above standards were conducted.



Henry Hu  
Reviewer  
Safety Laboratory



Viki Wei  
Project Engineer

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Unless otherwise stated: (a) the results shown in this document refer only to the sample(s) tested and (b) such sample(s) are retained for 3 months. This document cannot be reproduced except in full, without prior approval of the company.

**Summary of testing:**

According to the client's requirement, only test clause 3.13 (9.2.2 and 9.2.7) and IK09 of the below standards was performed on the model INNOVA. The provided samples were found to meet the clause 3.13 (9.2.2 and 9.2.7) and IK09 of the below standards:  
IEC 60598-2-3:2002 + A1: 2011  
IEC 60598-1:2014  
IEC 62262:2002

**Copy of marking plate:**

N/A

<b>Test item particulars</b> .....	LED STREET LIGHTING
Classification of installation and use .....	Fixed appliance
Supply Connection .....	Terminal block
.....	
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object.....	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement .....	F (Fail)
<b>Testing</b> .....	
Date of receipt of test item .....	2017-03-09
Date (s) of performance of tests .....	2017-03-09 to 2017-03-10
<b>General product information:</b>	
The products were LED street lighting, IP66 degree.	

**TEST RESULTS:**

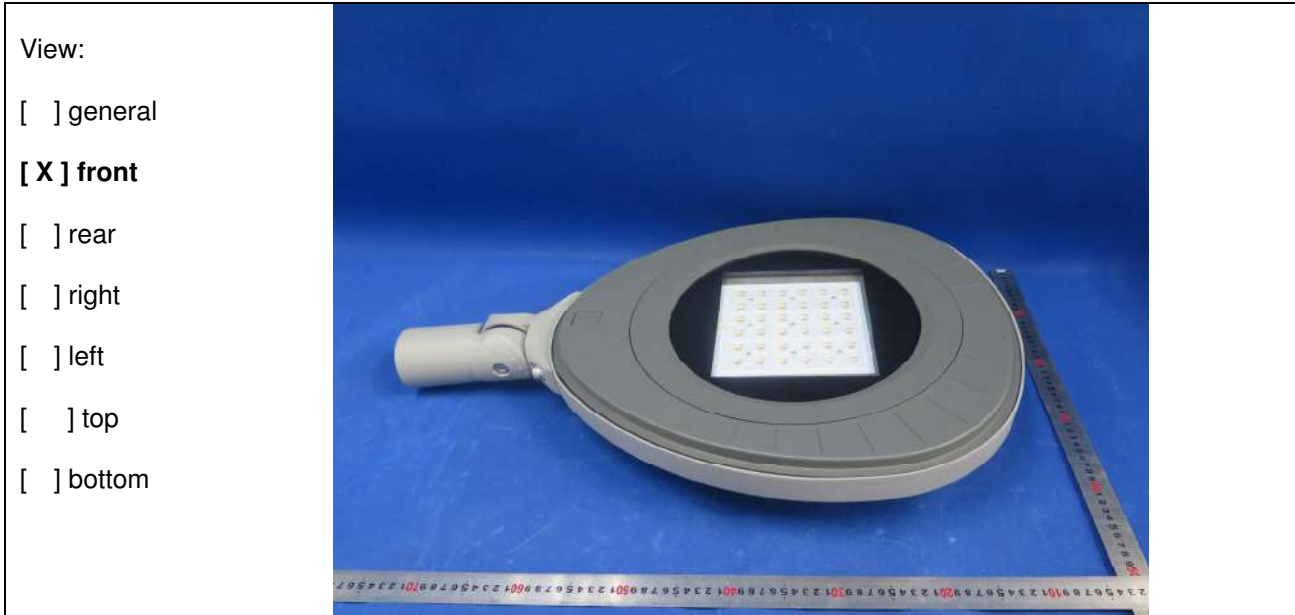
<u>Clause</u>	<u>Requirement + Test</u>	<u>Remarks</u>	<u>Verdict</u>
3.13 (9.2.2)	IP6X Test	—	P
3.13 (9.2.7)	IPX6 Test	—	P
IEC 62262	IK09 Test	—	P

**ANNEX I: Data Table**

<u>ELECTRIC STRENGTH MEASUREMENTS:</u>		
Test voltage applied between:	Voltage (V)	Breakdown (Yes/No)
Between live parts of different polarity	1480	No
Between live parts and the mounting surface	1480	No
Between live parts and earthed metal parts of the luminaire	1480	No
Between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts	1480	No
Between live parts and unearthed parts of the luminaire	2960	No

## ANNEX II: Photo documentation

Details of: INNOVA



Details of: INNOVA





Details of: INNOVA



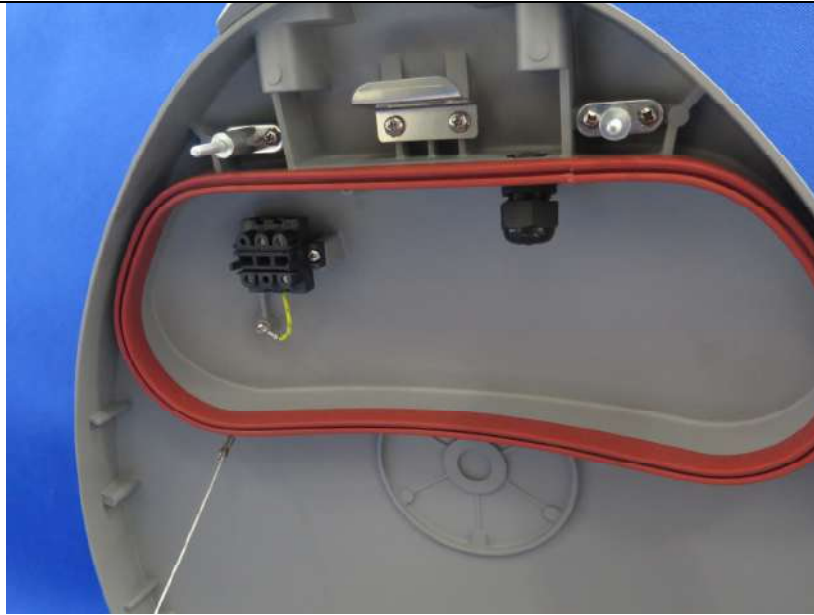
Details of: INNOVA



Details of: INNOVA

View:

- general
- front
- rear
- right
- left
- top
- bottom



- - - End of Report - - -



Test Report issued under the responsibility of:



**TEST REPORT**  
**IEC 60598-2-3**  
**Luminaires**  
**Part 2: Particular requirements**  
**Section 3: Luminaires for road and street lighting**

**Report Number** ..... : NBES190701248601  
**Date of issue** ..... : 2019-07-30  
**Total number of pages** ..... : 45

**Name of Testing Laboratory preparing the Report** ..... : SGS-CSTC Standards Technical Services Co., Ltd. Ningbo Branch

**Applicant's name** ..... : NOVATILU, S.L.

**Address** ..... : Schlüterstr. Via Ausetania, 11-13 08560 MANLLEU Barcelona Spain

**Test specification:**

**Standard** ..... : IEC 60598-2-3:2002, AMD1:2011 used in conjunction with IEC 60598-1:2014, AMD1:2017

**Test procedure** ..... : CB Scheme

**Non-standard test method** ..... : N/A

**Test Report Form No.** ..... : IEC60598\_2\_3L

**Test Report Form(s) Originator** .... : Intertek Semko AB

**Master TRF** ..... : Dated 2018-03-09

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**General disclaimer:**

The test results presented in this report relate only to the object tested.

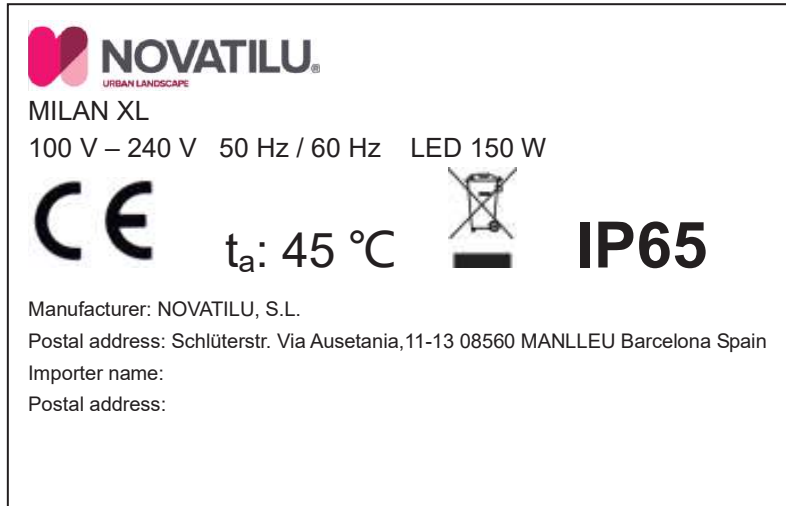
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<b>Test item description</b> ..... :	LED Street Lighting (LED Road Lighting)	
<b>Trade Mark</b> ..... :		
<b>Manufacturer</b> .....	Same as applicant	
<b>Model/Type reference</b> .....	AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL	
<b>Ratings</b> .....	100 V – 240 V; 50 Hz / 60 Hz; IP65; t <sub>a</sub> : 45 °C; Class I	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	SGS-CSTC Standards Technical Services Co., Ltd. Ningbo Branch
<b>Testing location/ address</b> ..... :	No.1177, Lingyun Road, Hi-Tech Zone, Ningbo, Zhejiang, China	
<b>Tested by (name, function, signature)</b> .....	Chris Chen, PE	<i>Chris Chen</i>
<b>Approved by (name, function, signature)</b> ...	Steven Bao, Reviewer	<i>Steven Bao</i>
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 1:</b>	
<b>Testing location/ address</b> ..... :		
<b>Tested by (name, function, signature)</b> ..... :		
<b>Approved by (name, function, signature)</b> ...		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 2:</b>	
<b>Testing location/ address</b> ..... :		
<b>Tested by (name + signature)</b> .....		
<b>Witnessed by (name, function, signature) . :</b>		
<b>Approved by (name, function, signature)</b> ...		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>	
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>	
<b>Testing location/ address</b> ..... :		
<b>Tested by (name, function, signature)</b> ..... :		
<b>Witnessed by (name, function, signature) . :</b>		
<b>Approved by (name, function, signature)</b> ...		
<b>Supervised by (name, function, signature) :</b>		

<p><b>List of Attachments (including a total number of pages in each attachment):</b></p> <ol style="list-style-type: none"> <li>1. Attachment A – Requirement of IEC 62031 – 6 pages</li> <li>2. Attachment B – Photo documentation – 21 pages</li> <li>3. Attachment C – Circuit diagram - 3 pages</li> </ol>	
<p><b>Summary of testing:</b></p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>Full tests except for IEC / TR 62778</p> <p>IEC / TR 62778</p>	<p><b>Testing location:</b></p> <p>SGS-CSTC Standards Technical Services Co., Ltd. Ningbo Branch No.1177, Lingyun Road, Hi-Tech Zone, Ningbo, Zhejiang, China</p> <p>SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China</p>
<p><b>Summary of compliance with National Differences:</b></p> <p><b>List of countries addressed</b></p> <p>N/A</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements of _____</b></p> <p>IEC 60598-2-3: 2002 + A1: 2011 IEC 60598-1: 2014 + A1:2017</p>	

**Copy of marking plate:**

**The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.**



(min. dimensions: width x height = 100 mm x 60 mm)

On the cover



**Note:**

1. As declared by the applicant, the importer's name, registered trade name or registered trade mark and the postal address were not decided at the time of application, but will be marked on the products before being placed on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities.

2. Marking on the packaging or in a document accompanying the electrical equipment is only acceptable if it is not possible to place such markings on the product.

3: The height of graphical symbols shall not be less than 5 mm, except for symbols for class II classification which may be reduced to a minimum of 3 mm where the space available for marking is restricted, and the height of letters and numerals shall not be less than 2 mm. The height of WEEE symbol shall not be less than 7 mm. The height of symbol for electric shock risk shall not be less than 15 mm

Copy of marking plates for other models were the same as above ones except for model names and electrical data.

<b>Test item particulars</b> .....:	
<b>Classification of installation and use</b> .....: Fixed appliance	
<b>Supply Connection</b> .....: Terminal block	
.....:	
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object.....: N/A	
- test object does meet the requirement.....: P (Pass)	
- test object does not meet the requirement.....: F (Fail)	
<b>Testing</b> .....:	
<b>Date of receipt of test item</b> .....: 2019-07-11	
<b>Date (s) of performance of tests</b> .....: 2019-07-11 to 2019-07-30	
<b>General remarks:</b>	
<p>"(See Enclosure #)" refers to additional information appended to the report.          "(See appended table)" refers to a table appended to the report.</p> <p><b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b></p> <p>This document is issued by the Company subject to its General Conditions of Service, available on request or accessible at <a href="http://www.sgs.com/en/Terms-and-Conditions.aspx">http://www.sgs.com/en/Terms-and-Conditions.aspx</a> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx">http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.</p> <p>Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 1 month only.</p> <p><b>Clause numbers between brackets refer to clauses in IEC 60598-1</b></p>	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC 02:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....:	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>Not applicable</b>
<b>When differences exist; they shall be identified in the General product information section.</b>	

<b>Name and address of factory (ies) .....</b>	Ningbo King-Bridge Lighting Technology Co., Ltd. 8, Xingfu Road, Xinqiao Industry Zone, Yangming Street, Yuyao, 315400 Zhejiang Province, China
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**General product information:**

There were 6 models in the report. The appliances were class I street Lighting which equipped with independent LED driver and LED module.

They shared similar construction, circuit diagram and series LED driver. See below table for details:

Model AVENUE S was similar to MILAN XL except the appearance and installing pole.

Model INNOVA was similar to INNOVA B except installing pole.

Model MILAN S and MILAN M were similar to MILAN XL except the size and LED number.

See below table for details:

Model	Ratings	Power	Size (mm)	Maximum projected area	Assembling height	LED number
AVENUE S	100 V – 240 V; 50 Hz / 60 Hz; IP65; t <sub>a</sub> : 45 °C	60 W	532 x 220 x 78	0,09 m <sup>2</sup>	5 – 8 m	16
INNOVA		80 W	730 x 470 x 108	0,2083 m <sup>2</sup>	5 – 8 m	36
INNOVA B		80 W	730 x 470 x 108	0,272 m <sup>2</sup>	4 – 7 m	36
MILAN S		60 W	525 x 255 x 105	0,106 m <sup>2</sup>	5 – 8 m	24
MILAN M		100 W	625 x 290 x 105	0,143 m <sup>2</sup>	5 – 8 m	48
MILAN XL		150 W	780 x 325 x 105	0,2055 m <sup>2</sup>	5 – 8 m	64

After review, all tests were performed on the model INNOVA B and MILAN XL according to IEC 60598-2-3:2002 + A1:2011 used in conjunction with IEC 60598-1:2014 + A1:2017.

Clause 3.6.3.1, 3.13 (9.2), 3.12 (12.4) were performed on the model AVENUE S. Construction check was checked other models.

All the tests according to IEC 62031: 2008 + A1: 2012 + A2: 2014 were performed on the LED module of model INNOVA B and MILAN XL.

The standard IEC/TR 62778 was also considered necessary at SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. (588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China). Model MILAN XL was classified as **RG1 at 200 mm** according to IEC/TR 62778.

Factory Location: Ningbo King-Bridge Lighting Technology Co., Ltd.

Xinqiao Industry Zone, Yangming Street, Yuyao, 315400 Zhejiang Province, China



IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
<b>3.2 (0)</b>	<b>GENERAL TEST REQUIREMENTS</b>		<b>P</b>
3.2 (0.3)	More sections applicable..... :	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Section/s:	—
3.2 (0.5)	Components	(see Annex 1)	—
<b>3.2 (0.7)</b>	<b>Information for luminaire design in light sources standards</b>		—
3.2 (0.7.2)	Light source safety standard .....	IEC 62031	—
	Luminaire design in the light source safety standard		N/A

<b>3.4 (2)</b>	<b>CLASSIFICATION OF LUMINAIRES</b>		<b>P</b>
3.4 (2.2)	Type of protection .....	Class I	<b>P</b>
3.4 (2.3)	Degree of protection..... :	IP65	—
3.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
3.4 (2.5)	Luminaire for normal use .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
3.4 (-)	Modes of installation of road or street lighting		—
	a) on a pipe	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	b) on a mast arm	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	c) on a post top	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	d) on span or suspension wires	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	e) on a wall	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

<b>3.5 (3)</b>	<b>MARKING</b>		—
3.5 (3.2)	Mandatory markings		<b>P</b>
	Position of the marking		<b>P</b>
	Format of symbols/text		<b>P</b>
3.5 (3.3)	Additional information		<b>P</b>
	Language of instructions	English	<b>P</b>
3.5 (3.3.1)	Combination luminaires		N/A
3.5 (3.3.2)	Nominal frequency in Hz	50 Hz / 60 Hz	<b>P</b>
3.5 (3.3.3)	Operating temperature		N/A
3.5 (3.3.5)	Wiring diagram		N/A
3.5 (3.3.6)	Special conditions		N/A
3.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.5 (3.3.8)	Limitation for semi-luminaires		N/A
3.5 (3.3.9)	Power factor and supply current		P
3.5 (3.3.10)	Suitability for use indoors		N/A
3.5 (3.3.11)	Luminaires with remote control		N/A
3.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
3.5 (3.3.13)	Specifications of protective shields		N/A
3.5 (3.3.14)	Symbol for nature of supply		P
3.5 (3.3.15)	Rated current of socket outlet		N/A
3.5 (3.3.16)	Rough service luminaire		N/A
3.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N/A
3.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
3.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
3.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
3.5 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided		P
3.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
3.5 (3.3.23)	Luminaire without controlgear provided with necessary information for selection of appropriate component		N/A
3.5 (3.3.24)	If not supplied with terminal block, information on the packaging		N/A
3.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
3.5 (-)	Additional information in instruction leaflet		P
	a) Design attitude		P
	b) Weight		P
	c) Overall dimensions		P
	d) Maximum projected area if applicable		P
	e) Cross-sectional area of wires if applicable		N/A
	f) Suitability for indoors use		N/A
	g) Dimensions of the compartment		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	h) Torque setting to be applied to bolts or screws		P
	i) Maximum mounting height		P
<b>3.6 (4)</b>	<b>CONSTRUCTION</b>		—
3.6 (4.2)	Components replaceable without difficulty		P
3.6 (4.3)	Wireways smooth and free from sharp edges		P
<b>3.6 (4.4)</b>	<b>Lampholders</b>		N/A
3.6 (4.4.1)	Integral lampholder		N/A
3.6 (4.4.2)	Wiring connection		N/A
3.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
3.6 (4.4.4)	Positioning		N/A
	- pressure test (N) .....		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....		—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
3.6 (4.4.5)	Peak pulse voltage		N/A
3.6 (4.4.6)	Centre contact		N/A
3.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
3.6 (4.4.8)	Lamp connectors		N/A
3.6 (4.4.9)	Caps and bases correctly used		N/A
3.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
<b>3.6 (4.5)</b>	<b>Starter holders</b>		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
<b>3.6 (4.6)</b>	<b>Terminal blocks</b>		N/A
	Tails		N/A
	Unsecured blocks		N/A
<b>3.6 (4.7)</b>	<b>Terminals and supply connections</b>		P
3.6 (4.7.1)	Contact to metal parts		P
3.6 (4.7.2)	Test 8 mm live conductor		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Test 8 mm earth conductor		P
3.6 (4.7.3)	Terminals for supply conductors		P
3.6 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.3.2.3 and 15.6.3.2.4		N/A
3.6 (4.7.4)	Terminals other than supply connection		P
3.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
3.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
<b>3.6 (4.8)</b>	<b>Switches</b>		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
<b>3.6 (4.9)</b>	<b>Insulating lining and sleeves</b>		N/A
3.6 (4.9.1)	Retainment		N/A
	Method of fixing .....		N/A
3.6 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) .....		N/A
<b>3.6 (4.10)</b>	<b>Double or reinforced insulation</b>		<b>P</b>
3.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
3.6 (4.10.3)	Retention of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
3.6 (4.10.4)	Protective impedance device		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
<b>3.6 (4.11)</b>	<b>Electrical connections and current-carrying parts</b>		<b>P</b>
3.6 (4.11.1)	Contact pressure		P
3.6 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
3.6 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N/A
3.6 (4.11.4)	Material of current-carrying parts		P
3.6 (4.11.5)	No contact to wood or mounting surface		P
3.6 (4.11.6)	Electro-mechanical contact systems		N/A
<b>3.6 (4.12)</b>	<b>Screws and connections (mechanical) and glands</b>		<b>P</b>
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part..... :	MILAN XL: Screw for fixing glass cover: 2,5 Nm	P
	Torque test: torque (Nm); part..... :	INNOVA B, MILAN XL: Earthing screw: 1,2 Nm; Screw for fixing LED driver: 1,2 Nm	P
	Torque test: torque (Nm); part..... :	INNOVA B, MILAN XL: Screw for fixing the pillar: 17,0 Nm	P
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm) .....		N/A
	- lampholder; torque (Nm) .....		N/A
	- push-button switches; torque 0,8 Nm .....		N/A
3.6 (4.12.5)	Screwed glands; force (Nm).....	5 Nm	P
<b>3.6 (4.13)</b>	<b>Mechanical strength</b>		<b>P</b>
3.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) .....	The glass cover: 0,5 Nm	P
	- other parts; energy (Nm).....	The plastic enclosure: 0,7 Nm, The metal enclosure: 0,7 Nm	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
3.6 (4.13.2)	Metal parts have adequate mechanical strength		P
3.6 (4.13.3)	Straight test finger		P
3.6 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
3.6 (4.13.6)	Tumbling barrel		N/A
<b>3.6 (4.14)</b>	<b>Suspensions, fixings and means of adjusting</b>		<b>N/A</b>
3.6 (4.14.1)	Mechanical load:		N/A
	A) four times the weight		N/A
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm).....		N/A
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) .....		N/A
	Metal rod. diameter (mm) .....		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
3.6 (4.14.2)	Load to flexible cables		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Mass (kg) .....		—
	Stress in conductors (N/mm <sup>2</sup> ) .....		N/A
	Mass (kg) of semi-luminaire .....		N/A
	Bending moment (Nm) of semi-luminaire .....		N/A
3.6 (4.14.3)	Adjusting devices:		N/A
	- flexing test; number of cycles.....		N/A
	- strands broken .....		N/A
	- electric strength test afterwards		N/A
3.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
3.6 (4.14.5)	Guide pulleys		N/A
3.6 (4.14.6)	Strain on socket-outlets		N/A
<b>3.6 (4.15)</b>	<b>Flammable materials</b>		<b>P</b>
	- glow-wire test 650°C .....	See Test Table 3.15 (13.3.2)	P
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
3.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
<b>3.6 (4.16)</b>	<b>Luminaires for mounting on normally flammable surfaces</b>		<b>P</b>
	No lamp control gear .....	(compliance with Section 12)	N/A
	Provided with adaptor for a track meet the requirements for direct mounting on normally flammable surfaces		N/A
3.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
3.6 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
3.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
<b>3.6 (4.17)</b>	<b>Drain holes</b>		N/A
	Clearance at least 5 mm		N/A
<b>3.6 (4.18)</b>	<b>Resistance to corrosion</b>		P
3.6 (4.18.1)	- rust-resistance		P
3.6 (4.18.2)	- season cracking in copper		N/A
3.6 (4.18.3)	- corrosion of aluminium		P
3.6 (4.19)	Igniters compatible with ballast		N/A
3.6 (4.20)	Rough service vibration		N/A
<b>3.6 (4.21)</b>	<b>Protective shield</b>		N/A
3.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
3.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
3.6 (4.21.3)	No direct path		N/A
3.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment..... :	See Test Table 3.15 (13.3.2)	N/A
3.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
3.6 (4.23)	Semi-luminaires comply Class II		N/A
<b>3.6 (4.24)</b>	<b>Photobiological hazards</b>		N/A
3.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
3.6 (4.24.2)	Retinal blue light hazard		P
	Class of risk group assessed according to IEC/TR 62778 .....	RG1	—
	Luminaires with $E_{thr}$ :		P
	a) Fixed luminaires		P
	- distance x m, borderline between RG1 and RG2 .. :		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
<b>3.6 (4.25)</b>	<b>Mechanical hazard</b>		<b>P</b>
	No sharp point or edges		P
<b>3.6 (4.26)</b>	<b>Short-circuit protection</b>		N/A
3.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
3.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
<b>3.6 (4.27)</b>	<b>Terminal blocks with integrated screwless earthing contacts</b>		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
<b>3.6 (4.28)</b>	<b>Fixing of thermal sensing control</b>		N/A
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		N/A
	Max. temperature on adhesive material (°C) ..... :		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
<b>3.6 (4.29)</b>	<b>Luminaires with non-replaceable light source</b>		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
<b>3.6 (4.30)</b>	<b>Luminaires with non-user replaceable light source</b>		<b>P</b>
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Minimum two fixing means		P
<b>3.6 (4.31)</b>	<b>Insulation between circuits</b>		<b>P</b>
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
3.6 (4.31.1)	SELV circuits		P
	Used SELV source		P
	Voltage $\leq$ ELV		P
	Insulating of SELV circuits from LV supply		P
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV circuits insulated from accessible parts according Table X.1		P
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage $\leq$ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
<b>3.6 (4.32)</b>	<b>Overvoltage protective devices</b>		P
	Comply with IEC 61643-11		P
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
3.6.1 (-)	At least IP X3 or X5 respectively. IP .....	IP65	P
	Column-integrated luminaires:		N/A
	- parts below 2,5 m. IP .....		N/A
	- parts above 2,5 m. IP .....		N/A
3.6.2 (-)	Suspension on span wires		N/A
3.6.3 (-)	Means for attaching the luminaire or external parts to its support appropriate to the weight		N/A
3.6.3.1 (-)	Static load test		P
	- drag coefficient.....	1,2	P
	- loaded area (m <sup>2</sup> ).....	AVENUE S: 0,09 m <sup>2</sup> ; INNOVA B: 0,272 m <sup>2</sup> ; MILAN XL: 0,2055 m <sup>2</sup>	P
	- used load (N).....	AVENUE S: 134 N; INNOVA B: 405 N; MILAN XL: 306 N	P
	- measured deformation (cm/m) .....	AVENUE S: 0,7 cm/m; INNOVA B: 0,5 cm/m; MILAN XL: 1,2 cm/m	P
	- no rotation		P
3.6.4 (-)	Adjustable lampholders		N/A
3.6.5 (-)	Luminaires installed above 5 m, glass covers shall be:		P

<b>IEC 60598-2-3</b>			
Clause	Requirement + Test	Result - Remark	Verdict
	a) glass that fractures into small pieces (test according to 3.6.5.1), or		P
	b) glass having a high impact shock resistance (test according to 3.6.5.2), or		N/A
	c) protected by any means to retain glass fragments		N/A
	For tunnel luminaires 3.6.5.1 apply		N/A
	Method of protection declared by the manufacturer		N/A
3.6.5.1 (-)	Protection by the use of glass that fractures into small pieces		P
	- number of particles is more than 40.....:	INNOVA B: 51; MILAN XL: 45	P
3.6.5.2 (-)	Protection by the use of high impact resistant glass		N/A
3.6.5.2.1 (-)	Glass covers have high mechanical strength		N/A
	Test according IEC 62262 with test apparatus according IEC 60068-2-75 with impact energy of 5J on preconditioned sample		N/A
3.6.5.2.2 (-)	Glass covers not break into large pieces		N/A
	- test according 3.6.5.1, number of particles is more than 20 .....		N/A
3.6.6 (-)	Connection compartment of column-integrated luminaire		N/A
	- provides adequate space		N/A
	- means for attachment		N/A
	- means for attachment of metal corrosion-resistant		N/A
3.6.7 (-)	Compliance with ISO standard or other .....		N/A
3.6.8 (-)	Doors of column-integrated luminaires:		N/A
	- corrosion-resistant		N/A
	- opening only possible for an authorized person		N/A
	- impact test 5 Nm		N/A
	- sample show no damage		N/A
3.6.9 (-)	Column-integrated luminaire:		N/A
	- dimension of the cable entry slot (mm).....:		N/A
	- cable path from the slot to the connection compartment (mm) .....		N/A
	- cable path free from obstruction that might cause abrasion of the cable		N/A
<b>3.7 (11)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		—
3.7 (11.2.1)	Impulse withstand category (Normal category II)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Category III according Annex U		N/A
	Protected against pollution, reduced creepage and clearance according Annex P of IEC 61347-1		N/A
3.7 (11.2.2)	Creepage distances for frequency up to 30 kHz	See Test Table 3.7 (11.2) I	P
	Creepage distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $\hat{U}_{OUT}$ and $f_{UOUT}$ according IEC 61347-1, clause 7.1, item w	See Test Table 3.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 3.7 (11.2) II	N/A
3.7 (11.2.3)	Clearances for frequency up to 30 kHz	See Test Table 3.7 (11.2) I	P
	Clearances distances for frequency over 30 kHz:		N/A
	- Controlgear marked with $U_P$	See Test Table 3.7 (11.2) II	N/A
	- Requirements according IEC 60664-4 for controlgear not covered by IEC 61347	See Test Table 3.7 (11.2) II	N/A

3.8 (7)	PROVISION FOR EARTHING		—
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω..... :	INNOVA B: 17 mΩ; MILAN XL: 20 mΩ	P
	Self-tapping screws used		P
	Thread-forming screws		N/A
	Thread-forming screw used in a groove		N/A
	Earth makes contact first		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		N/A
3.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
3.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
3.8 (7.2.6)	Earth terminal adjacent to mains terminals		P

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Clause	Requirement + Test	Result - Remark	Verdict
3.8 (7.2.7)	Electrolytic corrosion of the earth terminal		P
3.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
3.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
3.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P
3.8.1 (-)	Attachment prevented from rotation		N/A
<b>3.9 (14)</b>	<b>SCREW TERMINALS</b>		—
	Separately approved; component list	(see Annex 1)	P
	Part of the luminaire	(see Annex 3)	N/A
<b>3.9 (15)</b>	<b>SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS</b>		—
	Separately approved; component list..... :	(see Annex 1)	N/A
	Part of the luminaire .....	(see Annex 4)	N/A
<b>3.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		—
<b>3.10 (5.2)</b>	<b>Supply connection and external wiring</b>		<b>P</b>
3.10 (5.2.1)	Means of connection .....	Terminal block	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		P
3.10 (5.2.2)	Type of cable .....	H05RN-F	P
	Nominal cross-sectional area (mm <sup>2</sup> ) .....	3 x1,0 mm <sup>2</sup>	P
	Cables equal to IEC 60227 or IEC 60245		P
3.10 (5.2.3)	Type of attachment, X, Y or Z		N/A
3.10 (5.2.5)	Type Z not connected to screws		N/A
3.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
3.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
3.10 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
3.10 (5.2.9)	Locking of screwed bushings		N/A
3.10 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
3.10 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
3.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
3.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... : 60 N		P
	- torque test: torque (Nm) ..... : 0,25 Nm		P
	- displacement $\leq$ 2 mm	MILAN XL: 0,5 mm; INNOVA B: 0,6 mm;	P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
3.10 (5.2.11)	External wiring passing into luminaire		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.2.12)	Looping-in terminals		N/A
3.10 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
3.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
3.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
3.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
3.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
<b>3.10 (5.3)</b>	<b>Internal wiring</b>		<b>P</b>
3.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A) .....		N/A
	- temperatures .....	(see Annex 2)	N/A
	Green-yellow for earth only		P
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm <sup>2</sup> ).....	(see Annex 1)	P
	Insulation thickness (mm) .....		P
	Extra insulation added where necessary		N/A
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Cross-sectional area (mm <sup>2</sup> ).....	(see Annex 1)	P
3.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.3.1.4)	Conductors without insulation		N/A
3.10 (5.3.1.5)	SELV current-carrying parts		N/A
3.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
3.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		P
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
3.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
3.10 (5.3.4)	Joints and junctions effectively insulated		N/A
3.10 (5.3.5)	Strain on internal wiring		N/A
3.10 (5.3.6)	Wire carriers		N/A
3.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
<b>3.10 (5.4)</b>	<b>Test to determine suitability of conductors having a reduced cross-sectional area</b>		N/A
	Under test the temperature of the luminaire wiring insulation not exceed the limits stated in Table 12.2	(see Annex 2)	N/A
	No damage to luminaire wiring after test		N/A
3.10.1 (-)	Cord anchorage if applicable		P
	- pull test: 25 times; pull (N) .....	60 N	P
	- torque test: torque (Nm) .....	0,25 Nm	P
<b>3.11 (8)</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		—
3.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		P
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high-pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
3.11 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
3.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
3.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load (V)..... :		N/A
	- no-load voltage (V)..... :		N/A
	- touch current if applicable (mA) ..... :		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage (V) ..... :		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
3.11 (8.2.4)	Portable luminaire has protection independent of supporting surface		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
3.11 (8.2.6)	Covers reliably secured		P
3.11 (8.2.7)	Luminaire other than below with capacitor > 0,5 µF not exceed 50 V 1 min after disconnection	MILAN XL: 12 V; INNOVA B: 14 V	P
	Portable luminaire with capacitor > 0,1 µF (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 µF (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

<b>3.12 (12)</b>	<b>ENDURANCE TEST AND THERMAL TEST</b>		—
3.12.2 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 3.13		—
<b>3.12 (12.2)</b>	<b>Selection of lamps and ballasts</b>		—
	Lamp used according Annex B	(Lamp used see Annex 2)	—
	Controlgear if separate and not supplied	(Controlgear used see Annex 2)	—
<b>3.12 (12.3)</b>	<b>Endurance test</b>		<b>P</b>
	a) mounting-position .....	On the pillar	—
	b) test temperature (°C) .....	55 °C	—
	c) total duration (h) .....	240 h	—
	d) supply voltage (V) .....	240 x 1,1= 264 V	—
	d) if not equipped with controlgear, constant voltage/current (V) or (A) .....	--	—
	e) luminaire ceases to operate		—
3.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
<b>3.12 (12.4)</b>	<b>Thermal test (normal operation)</b>		P
<b>3.12 (12.5)</b>	<b>Thermal test (abnormal operation)</b>		P
<b>3.12 (12.6)</b>	<b>Thermal test (failed lamp control gear condition):</b>		N/A
3.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- case of abnormal conditions .....		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured mounting surface temperature (°C) at 1,1 Un .....		N/A
	- calculated mounting surface temperature (°C) .....		N/A
	- track-mounted luminaires		N/A
3.12 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions .....		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C) .....		N/A
	- track-mounted luminaires		N/A
<b>3.12 (12.7)</b>	<b>Thermal test (failed lamp control gear in plastic luminaires):</b>		N/A
3.12 (12.7.1)	Luminaire without temperature sensing control		N/A
3.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....		—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions .....		—
	- Ballast failure at supply voltage (V) .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions .....		—
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test .....	See Test Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- case of abnormal conditions .....		—
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test .....	See Test Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
3.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- case of abnormal conditions .....		—
	- highest measured temperature of fixing point/exposed part (°C): .....		—
	Ball-pressure test: .....	See Test Table 3.15 (13.2.1)	N/A
3.12.1 (-)	Temperature reduction if for outdoor use only		N/A
3.12.2 (-)	(See above)		—
3.12.3 (-)	Glass covers used within the thermal limits declared by the glass manufacturer		P

<b>3.13 (9)</b>	<b>RESISTANCE TO DUST AND MOISTURE</b>		—
3.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 3.12		P
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP .....	IP65	—
	- mounting position during test .....	On the pillar	—
	- fixing screws tightened; torque (Nm) .....	Two-thirds of that specified in the clause 3.6 (4.12.1)	—
	- tests according to clauses .....	9.2.2 and 9.2.6	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c.1) For luminaires without drain holes – no water entry		P
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		P
3.13 (9.3)	Humidity test 48 h		P

<b>3.14 (10)</b>	<b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>		—
3.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....		—
	Insulation resistance (MΩ) .....	See below	—
	SELV		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface..... :	>99 MΩ	P
	- between current-carrying parts and metal parts of the luminaire..... :	>99 MΩ	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV		P
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....	>99 MΩ	P
	- between live parts and metal parts .....	>99 MΩ	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts of different polarity through action of a switch..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :	>99 MΩ	P
	- Insulation bushings as described in Section 5 ..... :		N/A
3.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V)..... :	See below	P
	SELV		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface..... :	500 V	P
	- between current-carrying parts and metal parts of the luminaire..... :	500 V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :		N/A
	- Insulation bushings as described in Section 5 ..... :		N/A
	Other than SELV		P
	- between live parts of different polarity ..... :		N/A
	- between live parts and mounting surface ..... :	1480 V	P
	- between live parts and metal parts ..... :	Between live part and earthed metal part: 1480 V; Between live part and unearthed metal part and glass cover: 2960 V	P
	- between live parts of different polarity through action of a switch..... :		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts..... :	1480 V	P
	- Insulation bushings as described in Section 5 ..... :		N/A
3.14 (10.3)	Touch current or protective conductor current (mA):	INNOVA B and MILAN XL: 0,08 mA	P

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Clause	Requirement + Test	Result - Remark	Verdict
<b>3.15 (13)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		—
3.15 (13.2.1)	Ball-pressure test .....	See Test Table 3.15 (13.2.1)	P
3.15 (13.3.1)	Needle-flame test (10 s) .....	See Test Table 3.15 (13.3.1)	P
3.15 (13.3.2)	Glow-wire test (650°C) .....	See Test Table 3.15 (13.3.2)	P
3.15 (13.4)	Proof tracking test (IEC 60112) .....	See Test Table 3.15 (13.4)	P

**For model: INNOVA B**

<b>3.7 (11.2)</b>	<b>TABLE I: Creepage distances and clearances</b>						—
	<b>Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages</b>						P
	<b>Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*</b>						P
	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:	B	1)	1,5	11.1B	1)	2,5	11.1A
Working voltage (V) .....					240		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage or $U_P$ if applicable (kV) .....					N/A		—
Supplementary information: 1) Between L and N: Cr.= 2,6 mm, Cl.= 2,6 mm; Between live part and earthed metal part: Cr.= Cl.= 2,6 mm; Between cable clamped and accessible metal parts: Cr.= Cl.= 2,6 mm;							
Distance 2:	S	2)	1,5	11.1B	2)	2,5	11.1A
Working voltage (V) .....					240		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage or $U_P$ if applicable (kV) .....					N/A		—
Supplementary information: 2) Between internal wire and unearthed metal part and glass cover: Cr.= Cl.= 2,6 mm							
Distance 3:	R	3)	3,0	11.1B	3)	5,0	11.1A
Working voltage (V) .....					240		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage or $U_P$ if applicable (kV) .....					N/A		—
Supplementary information: 3) Between live part and unearthed metal part and glass cover: Cr.= Cl.= 5,1 mm;							

\*\* Insulation type: B – Basic; S – Supplementary; R – Reinforced. See also IEC 60598-1 Annex M.



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Clause	Requirement + Test	Result - Remark	Verdict

**For model: MILAN XL**

<b>3.7 (11.2)</b>	<b>TABLE I: Creepage distances and clearances</b>						—
	<b>Minimum distances (mm) for a.c. up to 30 kHz sinusoidal voltages</b>						P
	<b>Applicable part of IEC 60598-1 Table 11.1.A*, 11.1.B* and 11.2*</b>						P
	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:	B	1)	1,5	11.1B	1)	2,5	11.1A
Working voltage (V) .....					240		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage or $U_P$ if applicable (kV) .....					N/A		—
Supplementary information:							
1) Between L and N: Cr.= 2,6 mm, Cl.= 2,6 mm; Between live part and earthed metal part: Cr.= Cl.= 2,6 mm; Between cable clamped and accessible metal parts: Cr.= Cl.= 2,6 mm;							
Distance 2:	S	2)	1,5	11.1B	2)	2,5	11.1A
Working voltage (V) .....					240		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage or $U_P$ if applicable (kV) .....					N/A		—
Supplementary information:							
2) Between internal wire and unearthed metal part and glass cover: Cr.= Cl.= 2,6 mm							
Distance 3:	R	3)	3,0	11.1B	3)	5,0	11.1A
Working voltage (V) .....					240		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage or $U_P$ if applicable (kV) .....					N/A		—
Supplementary information:							
3) Between live part and unearthed metal part and glass cover: Cr.= Cl.= 5,1 mm;							

\*\* Insulation type: B – Basic; S – Supplementary; R – Reinforced. See also IEC 60598-1 Annex M.

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

3.7 (11.2)	TABLE II: Creepage distances and clearances						N/A
Minimum distances (mm) for a.c. higher than 30 kHz sinusoidal voltages							
Applicable part of IEC 61347-1 Table 7 and 8* or IEC 60664-4 Table 1 and 2							
Distances	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:	--	--	--	--	--	--	--
Working voltage (V) .....					--	---	
Frequency if applicable (kHz) .....					--	---	
PTI .....					< 600 <input type="checkbox"/>	≥ 600 <input type="checkbox"/>	
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....					--	---	
Supplementary information:							
Distance 2:	--	--	--	--	--	--	--
Working voltage (V) .....					--	---	
Frequency if applicable (kHz) .....					--	---	
PTI .....					< 600 <input type="checkbox"/>	≥ 600 <input type="checkbox"/>	
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....					--	---	
Supplementary information:							
Distance 3:	--	--	--	--	--	--	--
Working voltage (V) .....					--	---	
Frequency if applicable (kHz) .....					--	---	
PTI .....					< 600 <input type="checkbox"/>	≥ 600 <input type="checkbox"/>	
Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....					--	---	
Supplementary information:							

\*\* Insulation type: B – Basic; S – Supplementary; R – Reinforced.

3.15 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) .....				2
Object/ Part No./ Material		Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)
The plastic gland		See Annex 1	75	1,2
DC Connector		See Annex 1	125	0,9
Wire connector		See Annex 1	125	1,3
Supplementary information: N/A				

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

3.15 (13.3.1)	TABLE: Needle-flame test (IEC 60695-11-5)				P
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
DC Connector	See Annex 1	10	No	0	P
Wire connector	See Annex 1	10	No	0	P
Supplementary information: N/A					

3.15 (13.3.2)	TABLE: Glow-wire test (IEC 60695-2-11)				P
Glow wire temperature .....		650°C	—		
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
The plastic gland	See Annex 1	No	0	P	
LED Lens	See Annex 1	No	0	P	
Insulation tape	See Annex 1	No	0	P	
Supplementary information: N/A					

3.15 (13.4)	TABLE: Proof tracking test (IEC 60112)				P
Test voltage PTI .....		175 V	—		
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
DC Connector	See Annex 1	No breakdown	No breakdown	No breakdown	P
Wire connector	See Annex 1	No breakdown	No breakdown	No breakdown	P
Supplementary information: N/A					

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	TABLE: Critical components information						P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
Terminal block (For model AVENUE S)	B	Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.	CD-100/3	250 V, 16 A, 85°C	EN 61984 (2009)	TUV (R 50280145)	
(Alternative)	D	Ninghai Chengguan Fangzheng Rubber & Plastic Hardware Factory	KP10A	450 V, T110, 32 A	EN 60998-2-1 (2004) EN 60998-1 (2004)	VDE (40019217)	
(Alternative)	D	Ningbo Kimbetter Electrical Co., Ltd.	PA10	450 V~, T110, 24 A	EN 60998-2-1 (2004) EN 60998-1 (2004)	VDE (40025212)	
Connector (for all models except for AVENUE S)	B	Ningbo King-Bridge Lighting Technology Co., Ltd	Q-02 (K)	250 V, 6 A, T100	EN 61995-1 (2009)	TUV (R 50336340)	
Insulation tape (For model AVENUE S)	C	Jintan City Hongwei Electricity Insulating Material Factory Co., Ltd.	6520-23	Min.thickness: 0,15 mm, GWT 650 °C	IEC 60598-2-3 (2011) IEC 60598-1 (2017)	Tested with appliance	
Independent controlgear (for model AVENUE S)	B	Mean Well Enterprises Co., Ltd.	HLG-60H-54	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 54 V d.c., t <sub>a</sub> : 60 °C, t <sub>c</sub> : 80 °C, IP65, SELV	IEC 61347-2-13 (2014) IEC 61347-1 (2015)	TUV (DE 2-020427-A1)	
Independent controlgear (for model INNOVA and INNOVA B)	B	Mean Well Enterprises Co., Ltd.	HLG-80H-42A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 42 V d.c., 1,95 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 80 °C, IP65, SELV	IEC 61347-2-13 (2014) IEC 61347-1 (2015)	TUV ((R 50202561)	
Independent controlgear (for model MILAN S)	B	Mean Well Enterprises Co., Ltd.	HLG-60H-42A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 42 V d.c., 1,45 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 80 °C, IP65, SELV	IEC 61347-2-13 (2014) IEC 61347-1 (2015)	TUV (DE 2-020427-A1)	

IEC 60598-2-3						
Clause	Requirement + Test			Result - Remark		Verdict
Independent controlgear (for MILAN M)	B	Mean Well Enterprises Co., Ltd.	HLG-100H-42A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 42 V d.c., 2,28 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 90 °C, IP65, SELV	IEC 61347-2-13 (2014) IEC 61347-1 (2015)	TUV (R 50213993)
Independent controlgear (for MILAN XL)	B	Mean Well Enterprises Co., Ltd.	HLG-150H-54A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 54 V d.c., 2,8 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 90 °C, IP65, SELV	IEC 61347-2-13 (2014) IEC 61347-1 (2015)	TUV (DE 2-017562-M2)
Wire connector	C	Heavy Power Co., Ltd.	CE2	150 °C	IEC 60598-2-3 (2011) IEC 60598-1 (2017)	UL (E113650) + tested with appliance
(Alternative)	D	Wago-Kontakttechnik GmbH Co., KG	221-412	AC 450 V; 32 A; T85	EN 60998-2-2 (2004) EN 60998-1 (2004)	ENEC (2168803.01 )
Internal wiring (lead to LED) (only for AVENUE S)	C	Cixi Shuanghong Wire Co., Ltd.	H05SJ-K	1 x 0,75 mm <sup>2</sup>	EN 50525-2-41 (2011)	VDE (40017324)
Internal wiring (lead to LED) (for all models except for AVENUE S)	B	Ningbo Xuanhua Electric Co. Ltd.	H05RN-F 60245 IEC 57	2 x 1,0 mm <sup>2</sup>	EN 50525-2-21 (2011)	VDE (40036306)
Internal wiring (lead to LED) (for all models)	B	Jiangyin Haocheng Electrical Appliances Wire & Cable Co., Ltd.	(N)6YAF	1 x 0,75-1,5 mm <sup>2</sup>	DIN 57250Teil 106 (1982)	VDE (40027987)
DC Connector	C	Ningbo Ecomomic & Technical Development Zone Hengda Electrical Co., LTD.	TB-L02	160 VDC, T105	EN 60998-1 (2004) EN 60998-2-2 (2004)	TUV (R 50396618)
(Alternative)	D	Wago-Kontakttechnik GmbH Co., KG	2060	320 V; 9 A; T105	EN 60947-7-1 (2009)	DEKRA (NTR NL 7534)
LED	C	CREE	XTER5	2,85 V - 3,4 V, Max. 1500 mA	IEC / TR 62778 (2014)	Tested with appliance
PCB of LED module	C	Ningbo KJPCB Electronic Technology Co., Ltd.	Metal-based CCL	Min. thickness: 1,5 mm	IEC 60598-2-3 (2011) IEC 60598-1 (2017)	Tested with appliance

IEC 60598-2-3						
Clause	Requirement + Test			Result - Remark		Verdict
Plastic gland	C	Beisit Electric (Hangzhou) Co., Ltd.	M2012	GWT 650 °C	IEC 60598-2-3 (2011) IEC 60598-1 (2017)	UL (E360400) + tested with appliance
Earthing wire	B	Cixi Shuanghong Wire Co., Ltd.	H05SJ-K	1 x 0,75 mm <sup>2</sup>	EN 50525-2-41	VDE (40017324)
(Alternative)	D	Jiangyin Haocheng Electrical Appliances Wire & Cable Co., Ltd.	H05SJ-K	1 x 0,75 mm <sup>2</sup>	EN 50525-2-41 (2011)	VDE (40017754)
Glass	C	Ningbo Cixi Eastglass Co.,Ltd.	Toughened glass	Thinckness: 4mm; Min. - 100°C, Max. 280°C	IEC 60598-2-3 (2011) IEC 60598-1 (2017)	Tested with appliance
LED lens	C	OSYS	PC	GWT 650°C	IEC 60598-2-3 (2011) IEC 60598-1 (2017)	Tested with appliance
<p>Supplementary information:</p> <p><sup>1)</sup> Provided evidence ensures the agreed level of compliance. See OD-CB2039.</p> <p>The codes above have the following meaning:</p> <p>A - The component is replaceable with another one, also certified, with equivalent characteristics</p> <p>B - The component is replaceable if authorised by the test house</p> <p>C - Integrated component tested together with the appliance</p> <p>D - Alternative component</p>						

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference .....	MILAN XL	—
	Lamp used.....	LED lamp	—
	Lamp control gear used.....	HLG-150H-54A	—
	Mounting position of luminaire .....	On the pillar	—
	Supply wattage (W).....	151,0 W	—
	Supply current (A) .....	0,65 A	—
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....	45 °C	—
	- abnormal operating mode .....	1. Output of LED driver was short-circuited, the circuit was protected 2. 10 % LEDs were shorted	—
1.12 (12.4)	- test 1: rated voltage .....	240 V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1,06 x 240 = 254,4 V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A	—
	Through wiring or looping-in wiring loaded by a current of A during the test .....	1,1 x 240 = 264 V	—
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	N/A	—

**Temperature measurements (°C)**

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Supply cord	--	--	62,0	--	170	--	--
Connector	--	--	61,5	--	100	--	--
Internal wire (lead to LED)	--	--	74,6	--	170	--	--
t <sub>c</sub> of LED driver	--	73,8	--	--	90	--	--
DC Connector	--	--	81,2	--	105	--	--
Mounting surface	--	--	59,0	--	90	1. 46,3 2. 54,0	130
Seal ring	--	--	72,3	--	230	--	--
Glass	--	--	86,0	--	200	--	--
LED lens	--	--	112,9	--	For reference	--	--

IEC 60598-2-3							
Clause	Requirement + Test				Result - Remark		Verdict
Object surface	--	--	55,1	--	90	1. 45,7 2. 57,4	175
PCB of LED module	--	--	87,6	--	For reference	--	--
Supplementary information: N/A							



IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference .....	INNOVA B	—
	Lamp used.....	LED lamp	—
	Lamp control gear used.....	HLG-80H-42A	—
	Mounting position of luminaire .....	On the pillar	—
	Supply wattage (W).....	81,0 W	—
	Supply current (A) .....	0,33 A	—
	Temperatures in test 1 - 4 below are corrected for $t_a$ (°C) .....	45 °C	—
	- abnormal operating mode .....	1. Output of LED driver was short-circuited, the circuit was protected 2. 10 % LEDs were shorted	—
1.12 (12.4)	- test 1: rated voltage .....	240 V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1,06 x 240 = 254,4 V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A	—
	Through wiring or looping-in wiring loaded by a current of A during the test .....	1,1 x 240 = 264 V	—
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	N/A	—

**Temperature measurements (°C)**

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Supply cord	--	--	55,1	--	170	--	--
Connector	--	--	55,1	--	100	--	--
Internal wire (lead to LED)	--	--	67,0	--	170	--	--
$t_c$ of LED driver	--	57,8	--	--	80	--	--
DC Connector	--	--	68,8	--	105	--	--
Mounting surface	--	--	51,3	--	90	1. 47,3 2. 50,1	130
Seal ring	--	--	55,3	--	230	--	--
Glass	--	--	73,4	--	200	--	--
LED lens	--	--	119,3	--	For reference	--	--

IEC 60598-2-3							
Clause	Requirement + Test				Result - Remark		Verdict
Object surface	--	--	66,5	--	90	1. 46,8 2. 61,7	175
PCB of LED module	--	--	71,7	--	For reference	--	--
Supplementary information: N/A							

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Thermal tests of Section 12		P
	Type reference .....	AVENUE S	—
	Lamp used.....	LED lamp	—
	Lamp control gear used.....	HLG-60H-54	—
	Mounting position of luminaire .....	On the pillar	—
	Supply wattage (W).....	66,39 W	—
	Supply current (A) .....	0,273 A	—
	Temperatures in test 1 - 4 below are corrected for ta (°C) .....	45 °C	—
	- abnormal operating mode .....	1. Output of LED driver was short-circuited, the circuit was protected 2. 10 % LEDs were shorted	—
1.12 (12.4)	- test 1: rated voltage .....	240 V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	1,06 x 240 = 254,4 V	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A	—
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A	—
1.12 (12.5)	- test 4: 1,1 times rated voltage or 1,05 times rated wattage or 1,1 times constant voltage/current .....	N/A	—

**Temperature measurements (°C)**

Part	Ambient	Cl. 12.4 – normal				Cl. 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Supply cord	--	--	57,4	--	170	--	--
Terminal block	--	--	57,0	--	85	--	--
Internal wire (lead to LED)	--	--	58,7	--	170	--	--
t <sub>c</sub> of LED driver	--	60,3	--	--	80	--	--
DC Connector	--	--	59,8	--	105	--	--
Mounting surface	--	--	47,8	--	90	--	--
Seal ring	--	--	54,5	--	230	--	--
Glass	--	--	60,3	--	200	--	--
LED lens	--	--	127,0	--	For reference	--	--
Object surface	--	--	48,1	--	90	--	--

IEC 60598-2-3							
Clause	Requirement + Test				Result - Remark		Verdict
PCB of LED module	--	--	69,3	--	For reference	--	--
Supplementary information: N/A							

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ANNEX 3</b>	<b>Screw terminals (part of the luminaire)</b>		N/A
<b>(14)</b>	<b>SCREW TERMINALS</b>		N/A
(14.2)	Type of terminal..... :		—
	Rated current (A)..... :		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm <sup>2</sup> )..... :		—
(14.3.3)	Conductor space (mm)..... :		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) ..... :	M	N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm) ..... :		N/A
	Torque (Nm)..... :		N/A
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N)..... :		N/A
(14.4.8)	Without undue damage		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ANNEX 4</b>	<b>Screwless terminals (part of the luminaire)</b>		N/A
<b>(15)</b>	<b>SCREWLESS TERMINALS</b>		N/A
(15.2)	Type of terminal..... :		—
	Rated current (A)..... :		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5)	Terminals and connections for internal wiring		N/A
(15.5.1)	Mechanical tests		N/A
(15.5.1.1.1)	Pull test spring-type terminals (4 N, 4 samples) .....		N/A
(15.5.1.1.2)	Pull test pin or tab terminals (4 N, 4 samples) .....		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples)..... :		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... :		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... :		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples) .....		N/A
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples) .....		N/A
(15.6)	Terminals and connections for external wiring		N/A
(15.6.1)	Conductors		N/A

IEC 60598-2-3											
Clause	Requirement + Test									Result - Remark	Verdict
	Terminal size and rating										N/A
15.6.2	Mechanical tests										N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....										N/A
(15.6.2.2)	Pull test pin or tab terminals (4 samples); pull (N) .....										N/A
(15.6.3)	Electrical tests										N/A
	Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1										N/A
<b>(15.6.3.1)</b> <b>(15.6.3.2)</b>	<b>TABLE: Contact resistance test / Heating tests</b>										N/A
	Voltage drop (mV) after 1 h										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
	Voltage drop of two inseparable joints										N/A
	Voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
	Voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
	Continued ageing: voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
	Continued ageing: voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV) .....										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)										N/A	
										N/A	
Supplementary information:											

— End of test report —

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>GENERAL REQUIREMENTS</b>		—
4.4	Integral modules tested assembled in the luminaire		P
4.5	Independent modules comply with requirements in IEC 60598-1		N/A
<b>5</b>	<b>GENERAL TEST REQUIREMENTS</b>		—
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	Approved LED driver approved	N/A
	General conditions for tests in Annex A	(see Annex A)	P
<b>6</b>	<b>CLASSIFICATION</b>		—
	Built-in module .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	Independent module.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	Integral module .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—
<b>7</b>	<b>MARKING</b>		N/A
	Integral module		N/A
<b>8</b>	<b>TERMINALS</b>		N/A
	No such terminals		N/A
<b>9 (9)</b>	<b>PROVISION FOR PROTECTIVE EARTHING</b>		N/A
	Refer to main report		—
<b>10 (10)</b>	<b>PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS</b>		—
- (10.1)	Controlgear protected against accidental contact with live parts		P
- (A2)	The current flowing between the part concerned and earth is measured and does not exceed 0,7 mA (peak) or 2 mA d.c. ....:		N/A
- (A2)	For frequencies above 1 kHz, the current does not exceed 0,7 mA (peak) multiplied by the value of the frequency in kilohertz or 70 mA (peak) .....		N/A
- (A3)	The voltage between the part concerned and any accessible part is measured and does not exceed 34 V (peak).....:		N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		P
	Adequate mechanical strength on parts providing protection		P



<b>IEC 62031</b>			
Clause	Requirement + Test	Result - Remark	Verdict
- (10.2)	Capacitors > 0,5 µF: voltage after 1 min (V): < 50 V .....:		N/A
- (10.3)	Controlgear providing SELV		N/A
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N/A
	No connection between output circuit and the body or protective earthing circuit		N/A
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1		N/A
- (10.4)	Accessible conductive parts in SELV circuits		N/A
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N/A
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. ....:		N/A
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
<b>11 (11)</b>	<b>MOISTURE RESISTANCE AND INSULATION</b>		<b>P</b>
	Refer to main report		—
<b>12 (12)</b>	<b>ELECTRIC STRENGTH</b>		<b>P</b>
	Refer to main report		—
<b>13 (14)</b>	<b>FAULT CONDITIONS</b>		—
- (14)	When operated under fault conditions the controlgear:		<b>P</b>
	- does not emit flames or molten material		<b>P</b>
	- does not produce flammable gases		<b>P</b>
	- protection against accidental contact not impaired		<b>P</b>

<b>IEC 62031</b>			
Clause	Requirement + Test	Result - Remark	Verdict
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	N/A
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N/A
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	N/A
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance $\geq 1 \text{ M}\Omega$ .....		P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.6)	Relevant fault condition tests with high-power supply		P
<b>13.2</b>	<b>Overpower condition</b>		P
	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	No fire, smoke or flammable gas is produced		P
	Molten material does not ignite tissue paper, spread below the module		P
<b>15</b>	<b>CONSTRUCTION</b>		—
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
<b>16 (16)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		P
	Refer to main report		—
<b>17 (17)</b>	<b>SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS</b>		P
	Refer to main report		—

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict
<b>18 (18)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		P
	Refer to main report		—
<b>19 (19)</b>	<b>RESISTANCE TO CORROSION</b>		P
	Refer to main report		—
<b>20</b>	<b>INFORMATION FOR LUMINAIRE DESIGN</b>		P
	Information in Annex D (informative)		—
<b>21</b>	<b>HEAT MANAGEMENT</b>		N/A
	No such parts		—
<b>22</b>	<b>PHOTOBIOLOGICAL SAFETY</b>		—
<b>22.1</b>	<b>UV radiation</b>		N/A
	Luminous radiation not exceed 2mW/klm		N/A
<b>22.2</b>	<b>Blue light hazard</b>		P
	Assessed according to IEC TR 62778		P
<b>22.3</b>	<b>Infrared radiation</b>		N/A
	Requirements for infrared radiation when required		N/A
<b>A</b>	<b>ANNEX A - TESTS</b>		—
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		P
<b>13 (14)</b>	<b>TABLE: tests of fault conditions</b>		P
<b>Part</b>	<b>Simulated fault</b>		<b>Hazard</b>
LED of model INNOVA B	SC, not work and no hazard		No
LED of model MILAN XL	SC, not work and no hazard		No

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ANNEX 1</b>	<b>SELV-operated LED modules</b>		N/A
	No such parts		—

<b>ANNEX 2</b>		<b>TABLE: Critical components information</b>					P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
Refer to main report for details							
Supplementary information: <sup>1)</sup> Provided evidence ensures the agreed level of compliance. See OD-CB2039. The codes above have the following meaning: A - The component is replaceable with another one, also certified, with equivalent characteristics B - The component is replaceable if authorised by the test house C - Integrated component tested together with the appliance D - Alternative component							

IEC 62031			
Clause	Requirement + Test	Result - Remark	Verdict

	<b>ANNEX 3: screw terminals (part of the luminaire)</b>		N/A
	No such parts		N/A

	<b>ANNEX 4: screwless terminals (part of the luminaire)</b>		N/A
	No such parts		N/A

—End of Attachment A —

Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

Detail of: MILAN XL



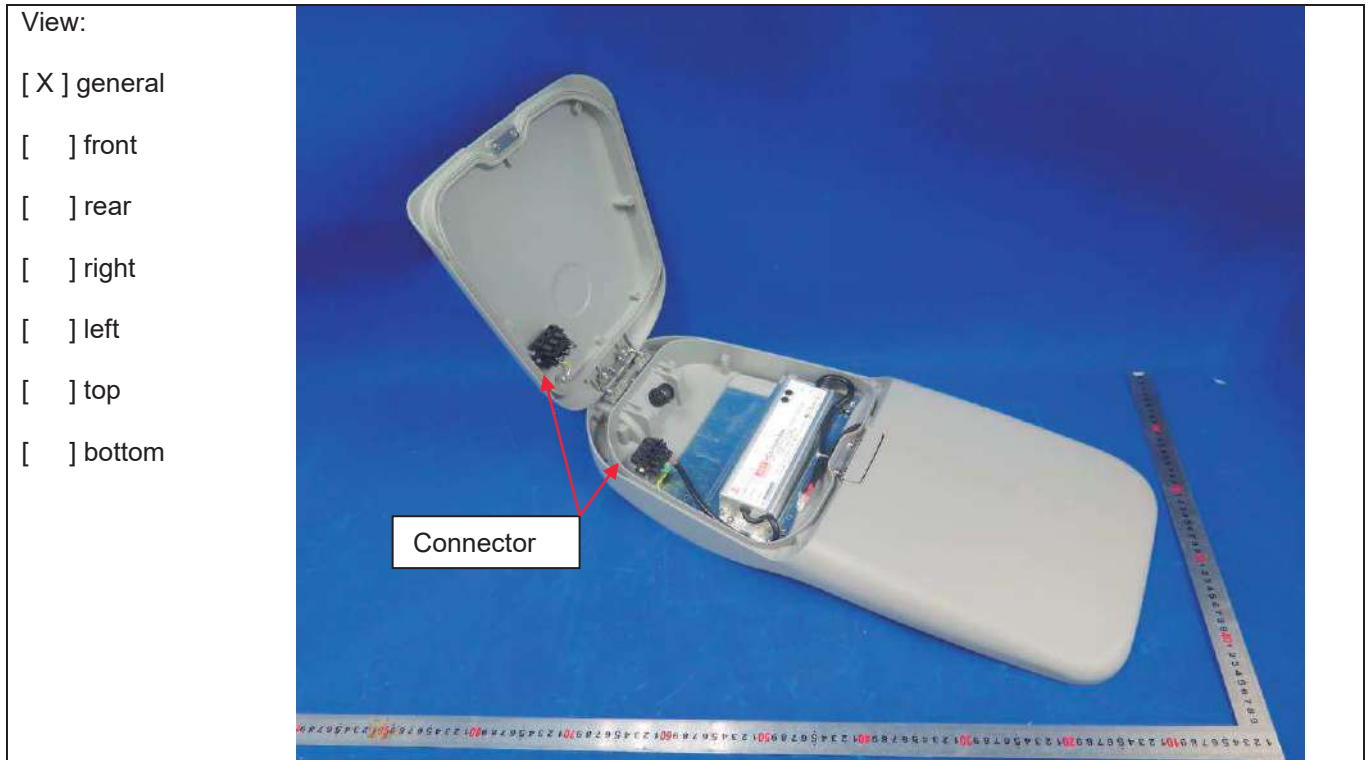
Detail of: MILAN XL



Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

Detail of: MILAN XL



Detail of: MILAN XL



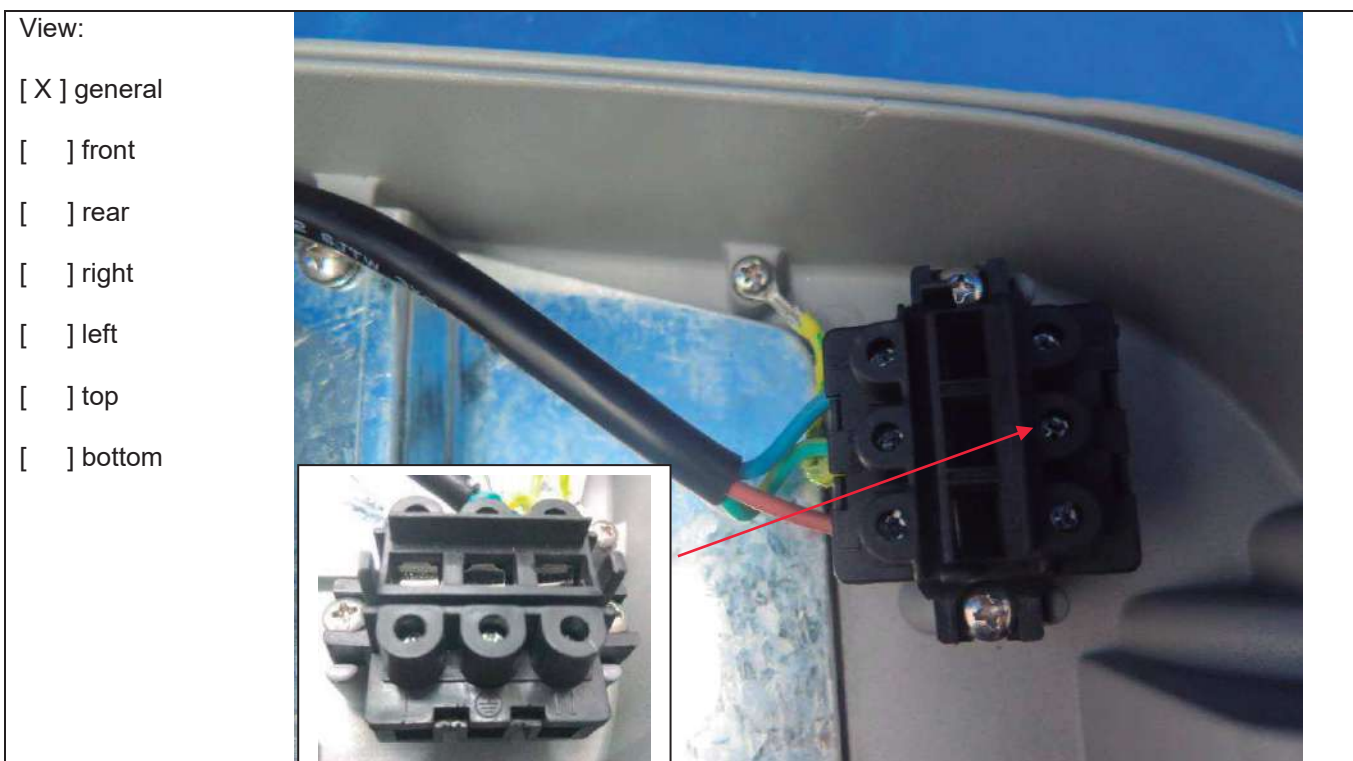
Attachment B  
 Photo documentation  
 LED street lighting (LED Road Lighting)  
 AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

**Detail of:** Independent controlgear for MILAN XL



**Detail of:** Connector for model INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

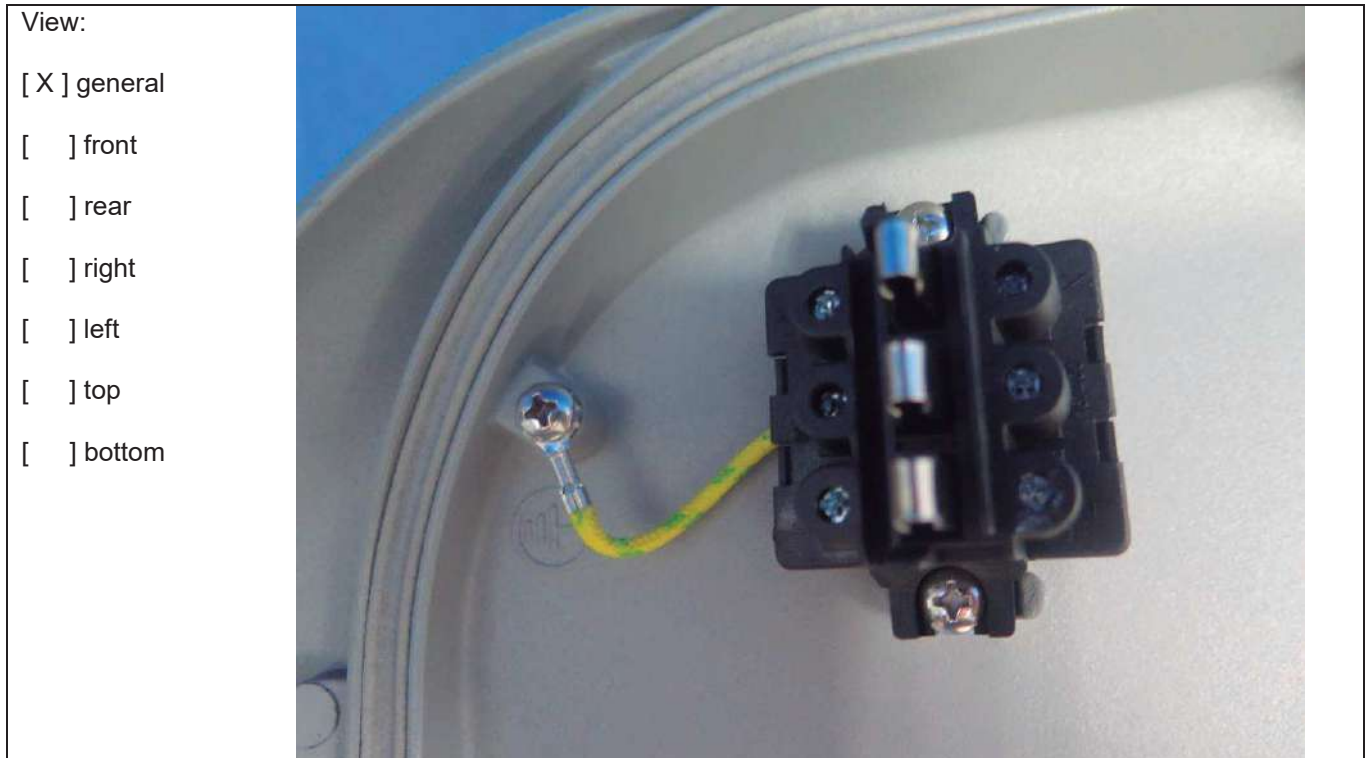




Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

**Detail of:** Connector for model INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL



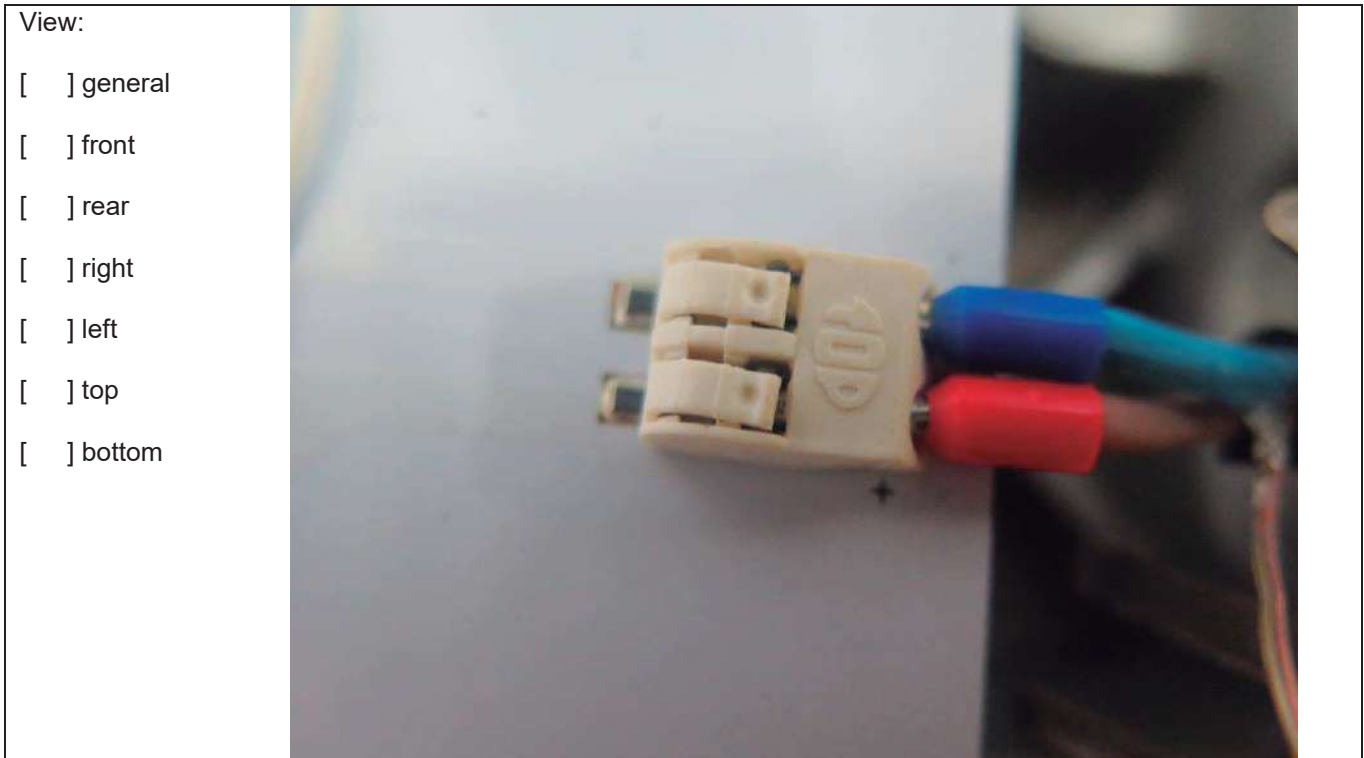
**Detail of:** LED module for model MILAN XL



Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

**Detail of:** DC Connector for all models



**Detail of:** LED for all models



Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

Detail of: AVENUE S



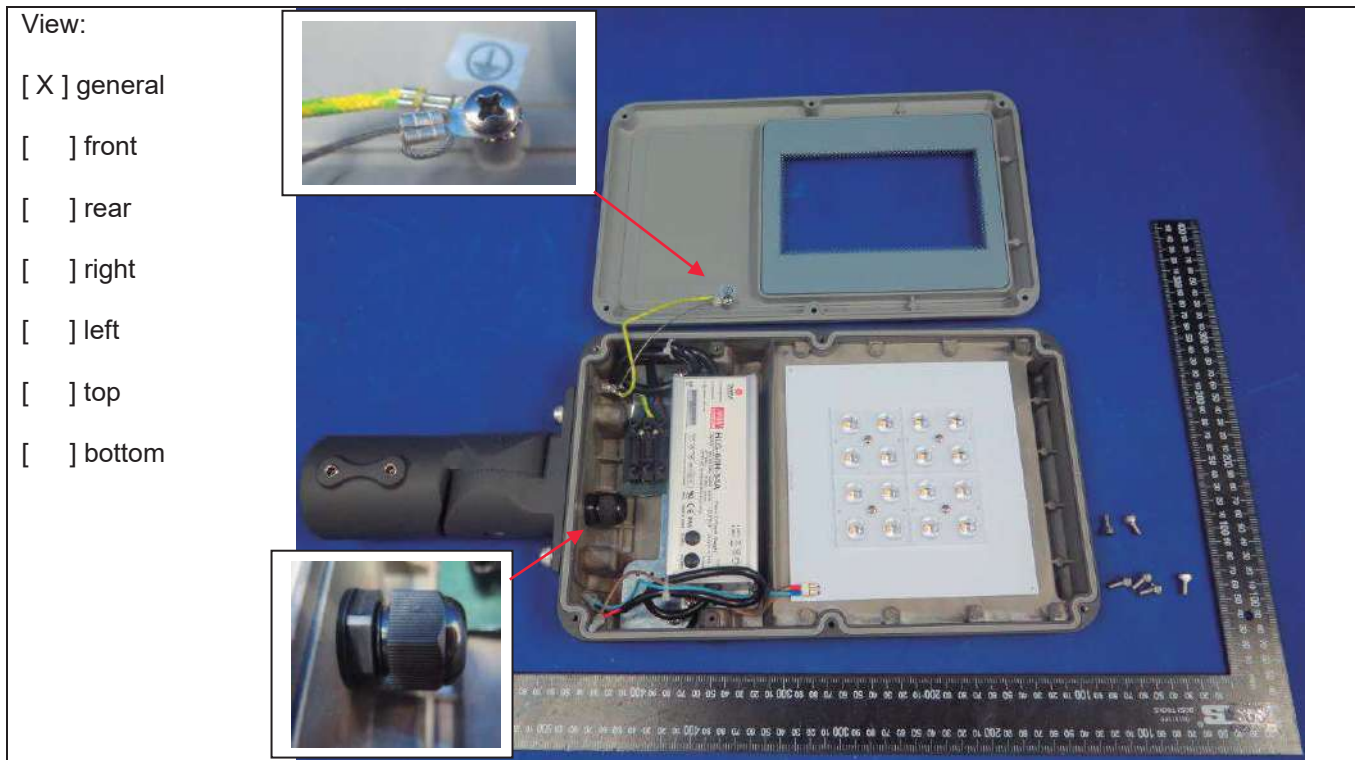
Detail of: AVENUE S



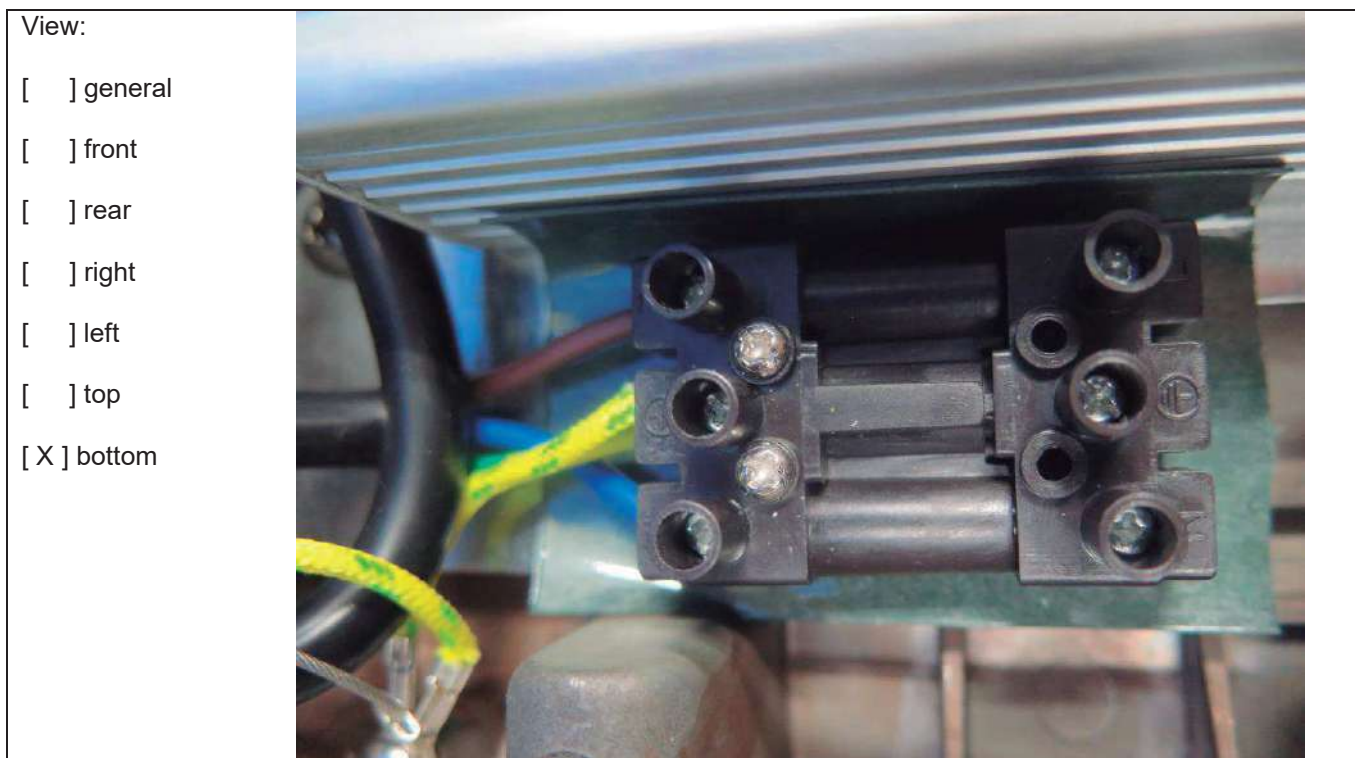
Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

**Detail of:** AVENUE S



**Detail of:** Terminal block for model AVENUE S



Attachment B  
 Photo documentation  
 LED street lighting (LED Road Lighting)  
 AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

**Detail of:** Earth screw for model AVENUE S

View:

- general
- front
- rear
- right
- left
- top
- bottom



**Detail of:** Independent controlgear for model AVENUE S

View:

- general
- front
- rear
- right
- left
- top
- bottom



TAIWAN  
 ESTABLISHED 1985

ACL (BROWN)  
 ACN (BLUE)  
 (GREEN / YELLOW)

**MW**  
 MEAN WELL

**HLG-60H-54A** Class 2 Power Supply

INPUT: 100-240VAC 0.64A 50/60Hz  
 277VAC 0.30A 50/60Hz  
 (277VAC for North America only)

OUTPUT: +54VDC 1.15A

V+ (RED) ○  
 V- (BLACK) ○

S/N: HB49C30012

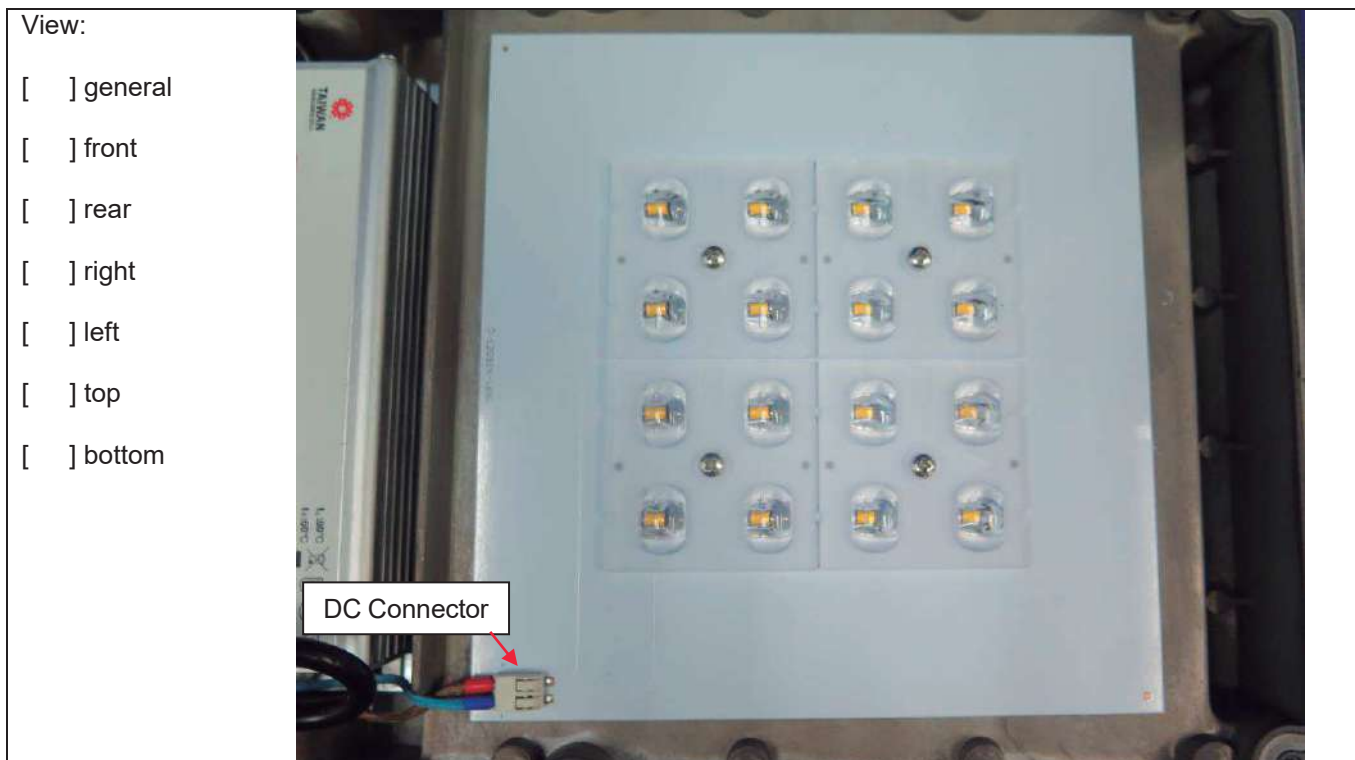
SELV  
 CE IP65  
 MADE IN CHINA

Io ADJ. Vo ADJ.

Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

**Detail of:** LED module for model AVENUE S



**Detail of:** INNOVA



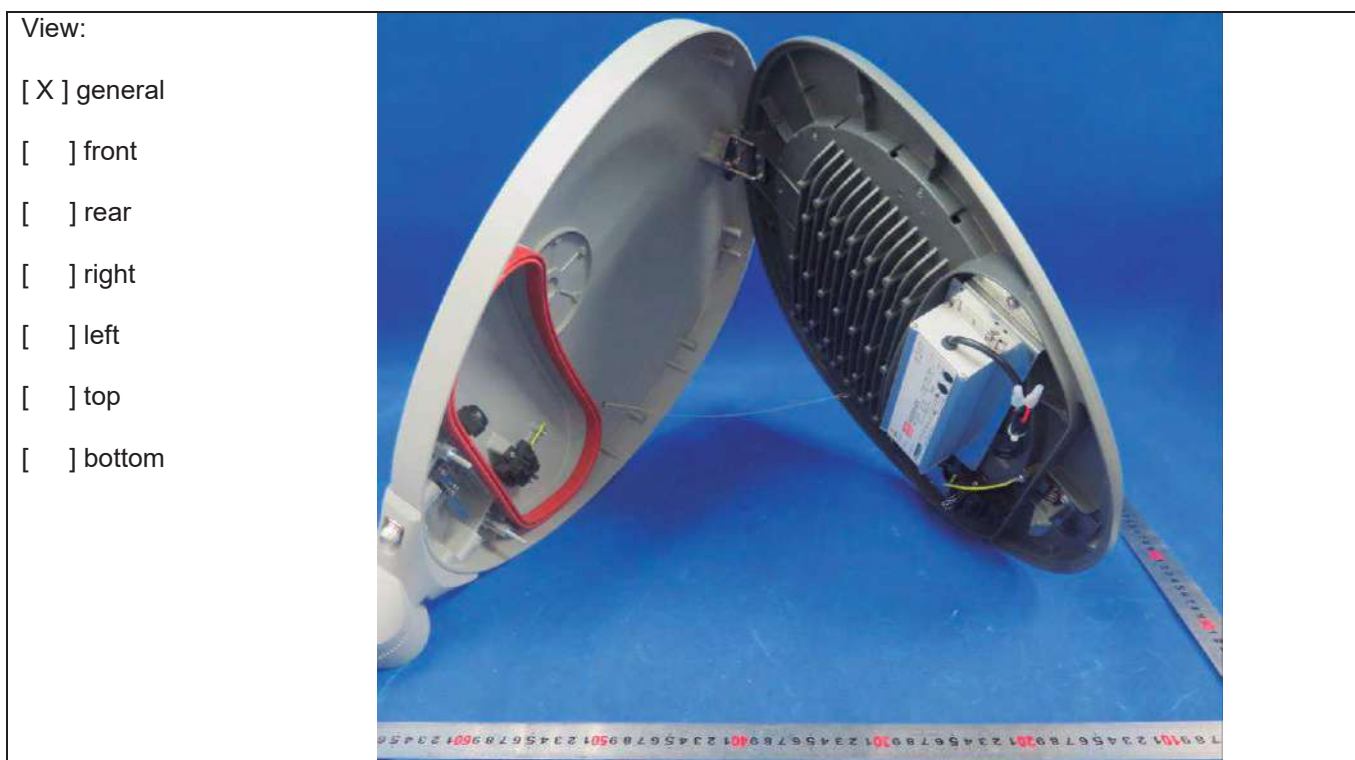
Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

Detail of: INNOVA



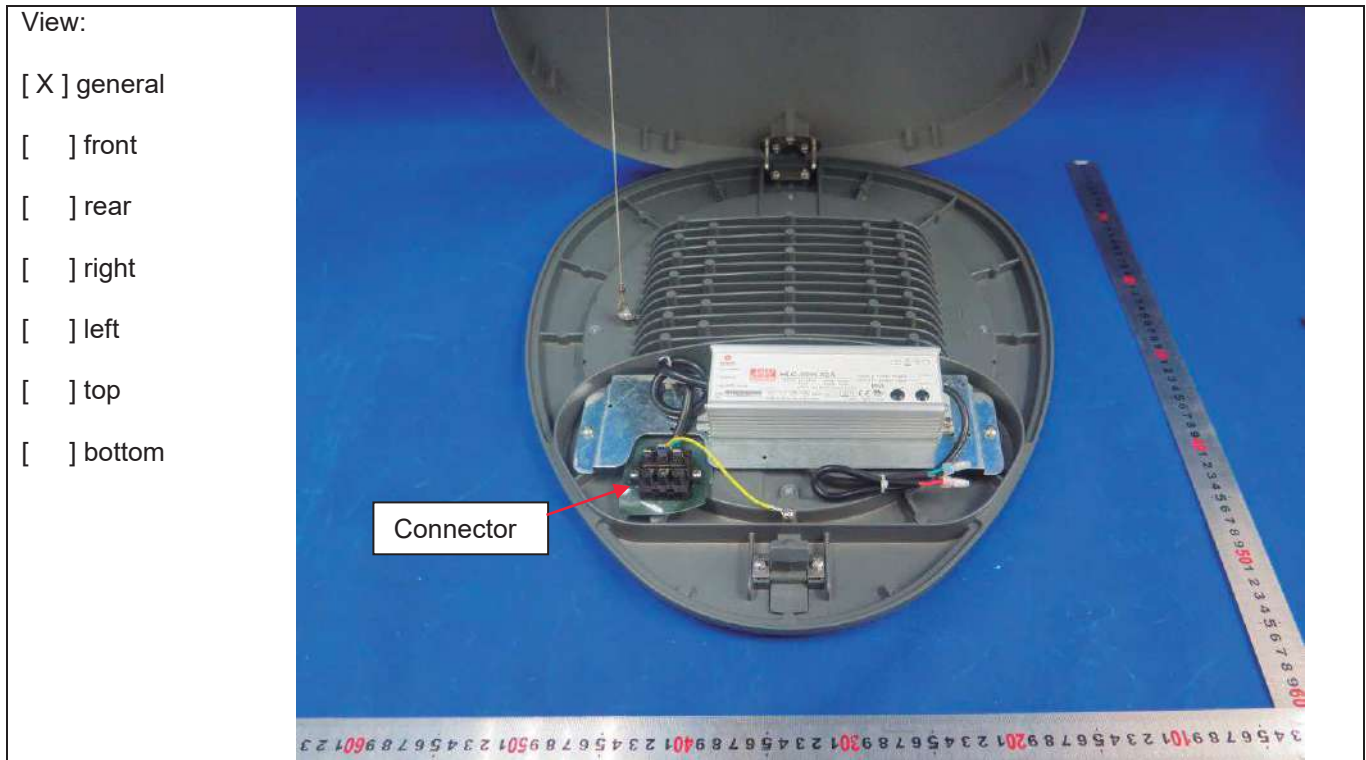
Detail of: Internal view for model INNOVA and INNOVA B



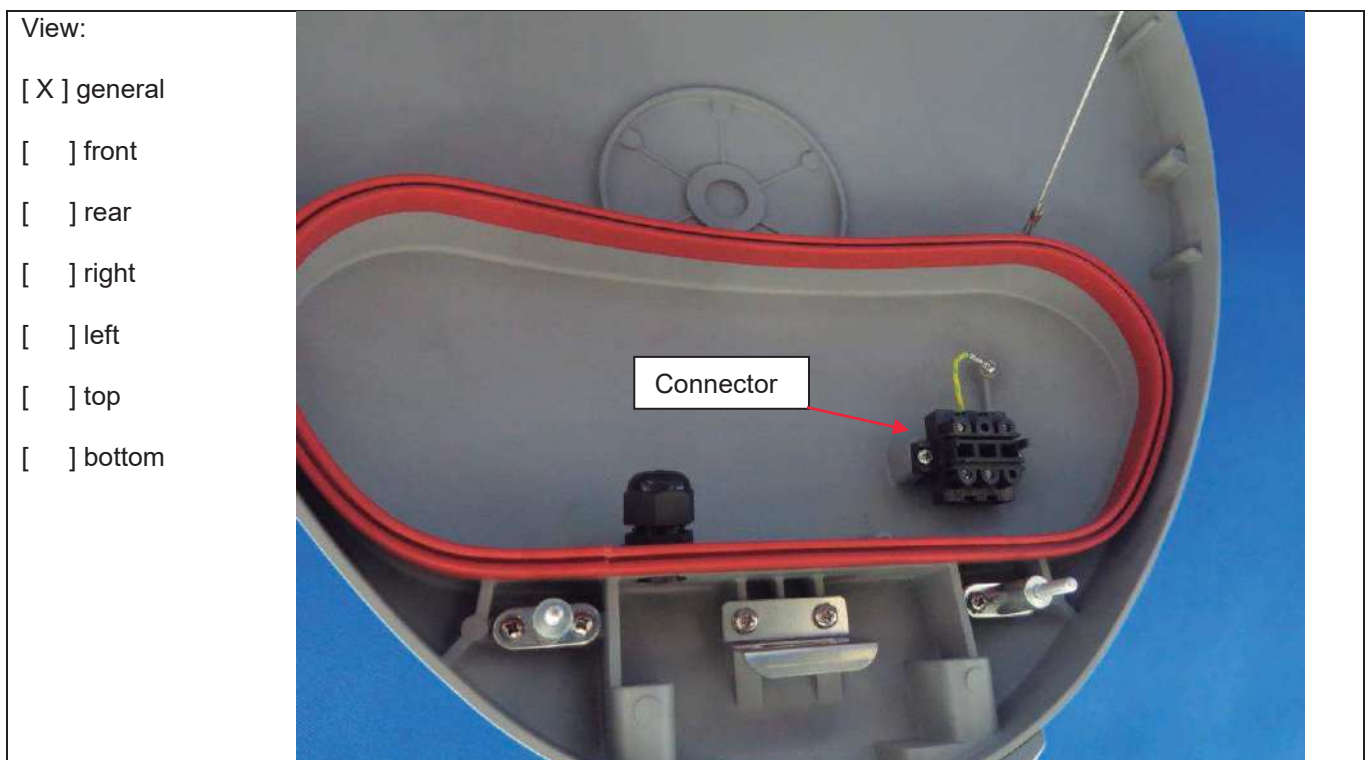
Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

**Detail of:** INNOVA and INNOVA B



**Detail of:** INNOVA and INNOVA B







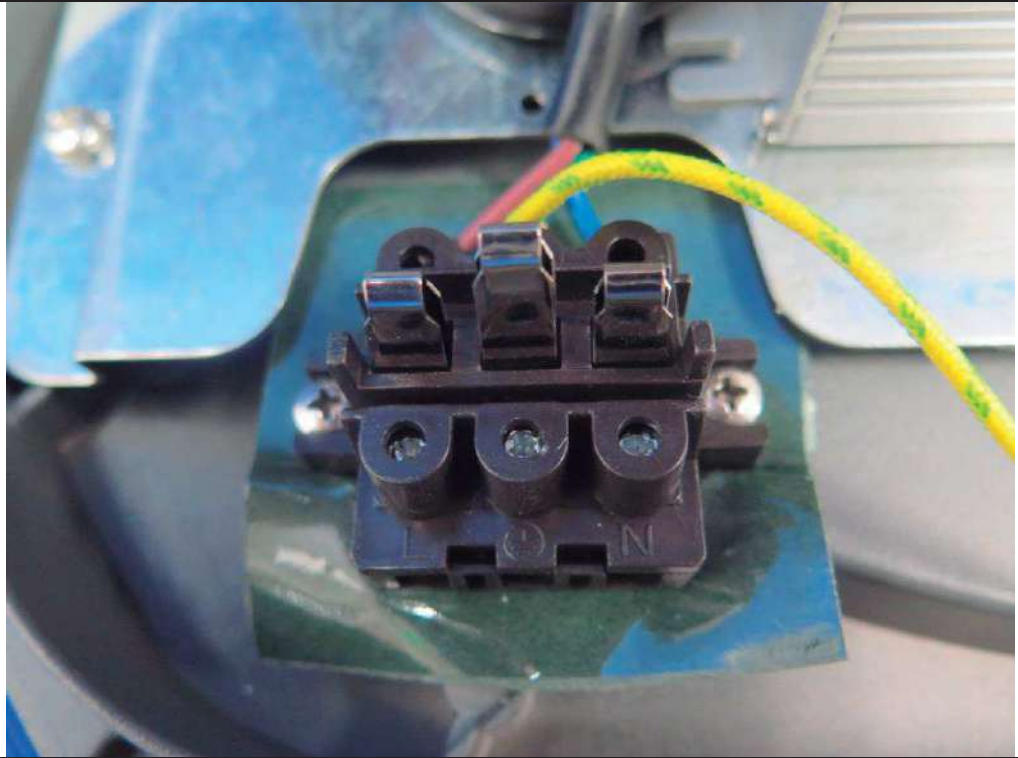
Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

**Detail of:** Connector for model INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

View:

- [ X ] general
- [ ] front
- [ ] rear
- [ ] right
- [ ] left
- [ ] top
- [ ] bottom



**Detail of:** LED module for model INNOVA, INNOVA B

View:

- [ X ] general
- [ ] front
- [ ] rear
- [ ] right
- [ ] left
- [ ] top
- [ ] bottom



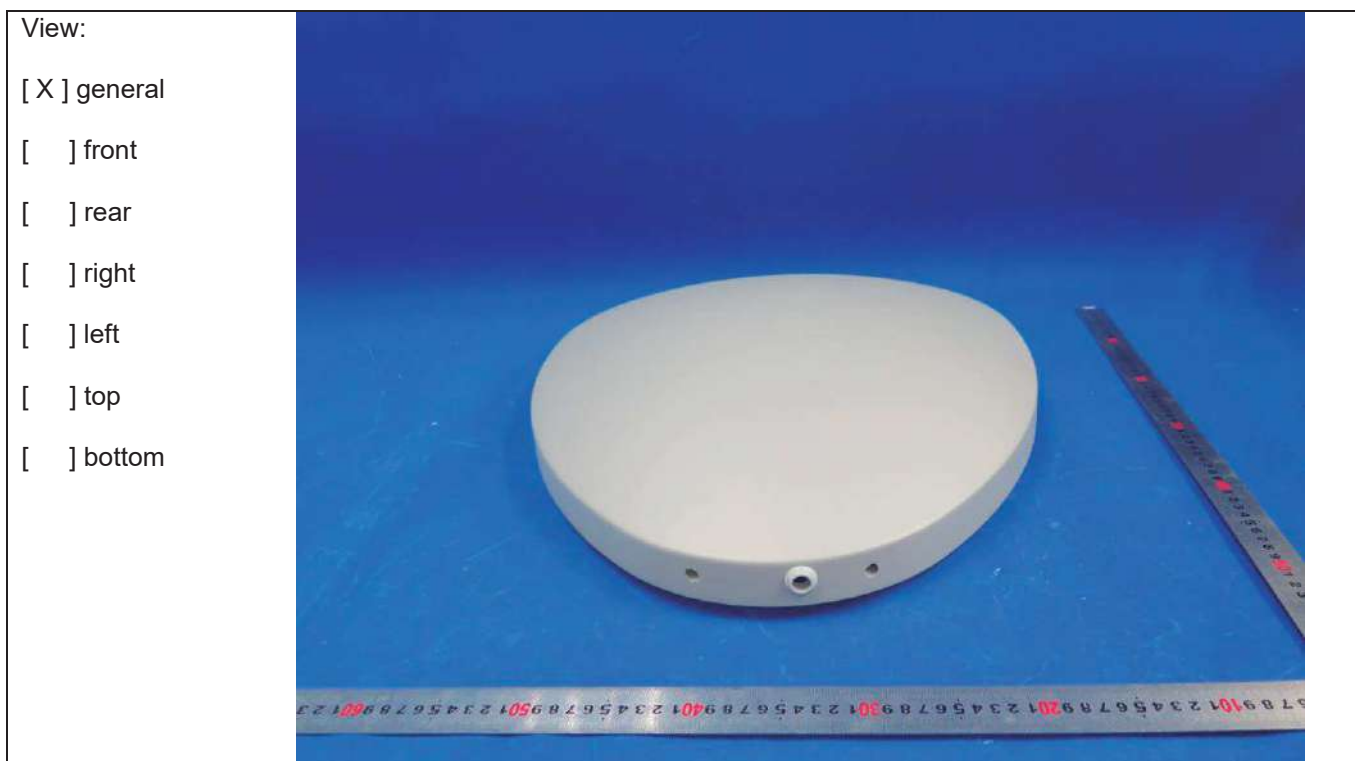
Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

Detail of: INNOVA B



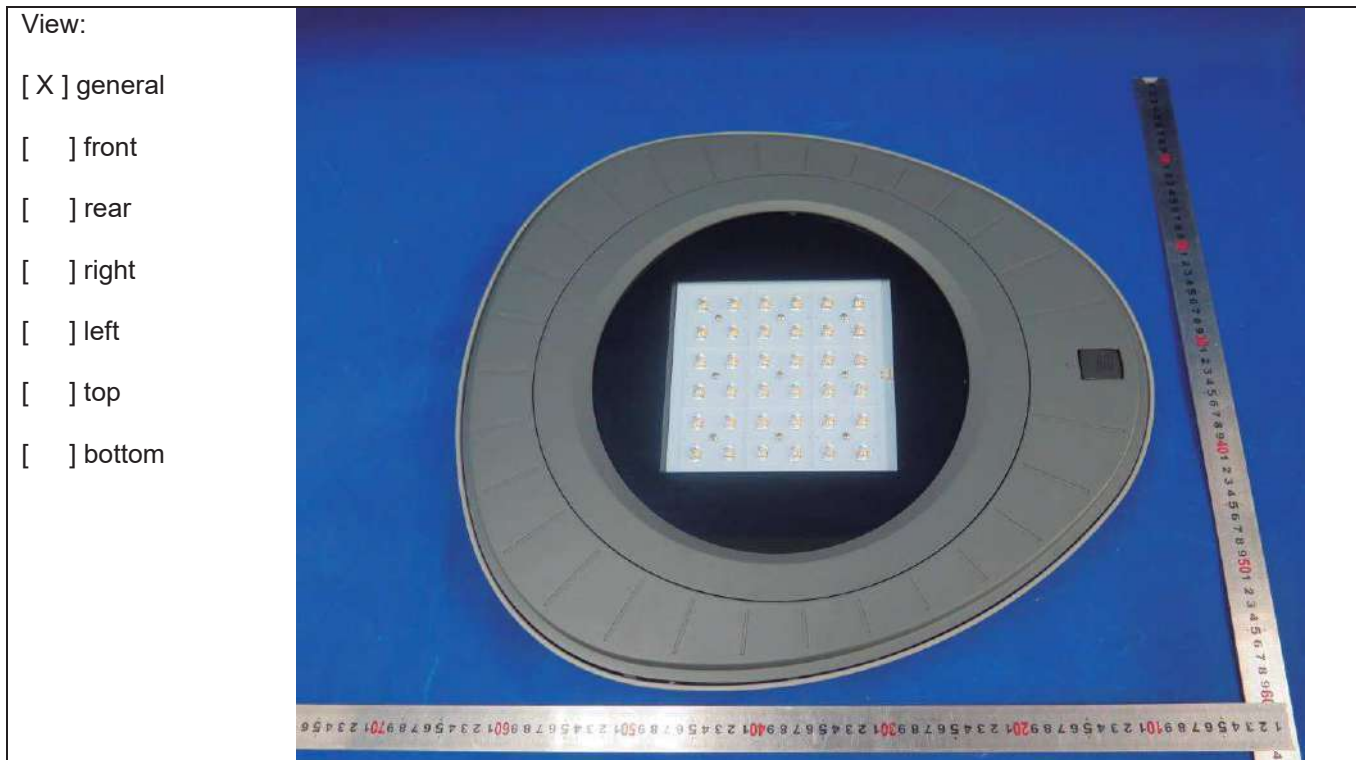
Detail of: INNOVA B



Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

Detail of: INNOVA B



Detail of: MILAN S



Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

Detail of: MILAN S



Detail of: MILAN S



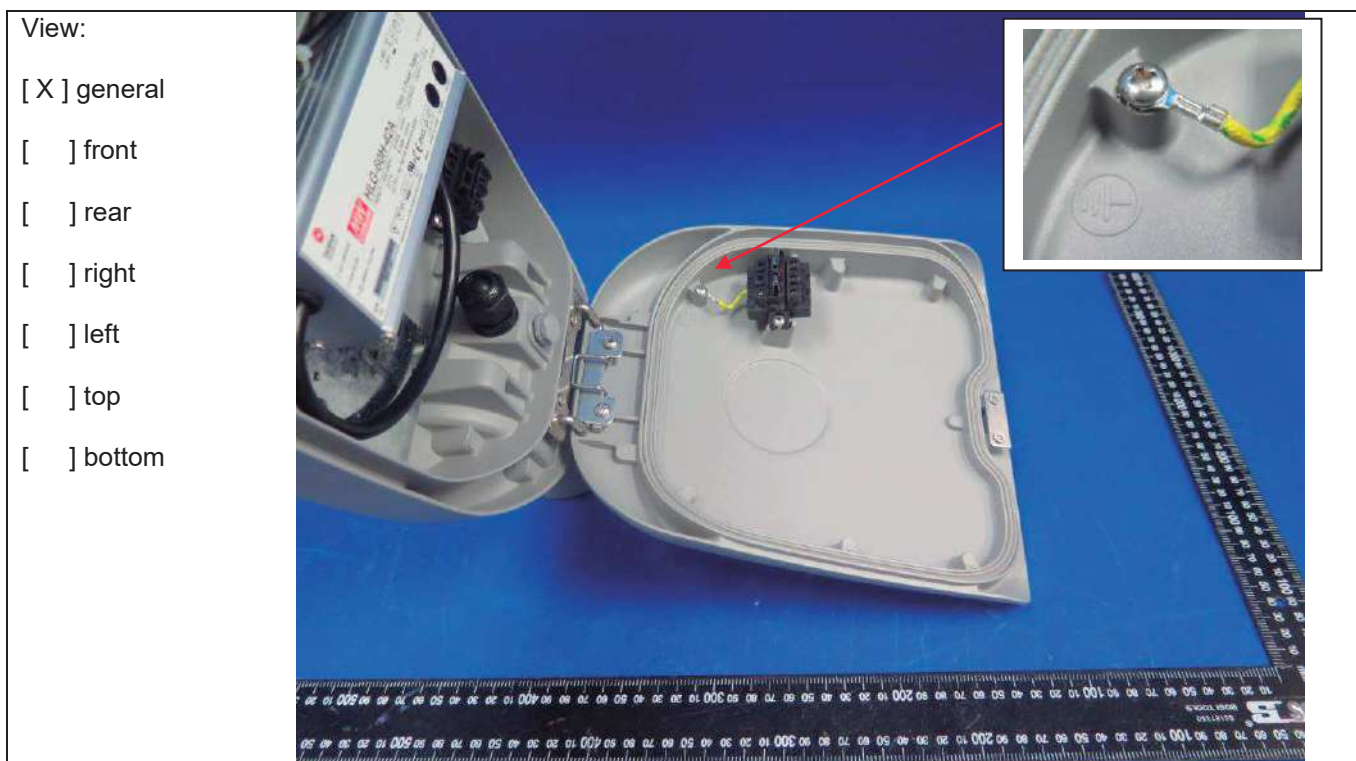
Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

Detail of: MILAN S



Detail of: MILAN S



Attachment B  
 Photo documentation  
 LED street lighting (LED Road Lighting)  
 AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

**Detail of:** Independent controlgear for model MILAN S

View:

- general
- front
- rear
- right
- left
- top
- bottom



**Detail of:** LED module for model MILAN S

View:

- general
- front
- rear
- right
- left
- top
- bottom



Attachment B  
Photo documentation  
LED street lighting (LED Road Lighting)  
AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

Detail of: MILAN M



Detail of: MILAN M





Attachment B  
 Photo documentation  
 LED street lighting (LED Road Lighting)  
 AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

Detail of: MILAN M

View:

- general
- front
- rear
- right
- left
- top
- bottom



Detail of: MILAN M

View:

- general
- front
- rear
- right
- left
- top
- bottom



Attachment B  
 Photo documentation  
 LED street lighting (LED Road Lighting)  
 AVENUE S, INNOVA, INNOVA B, MILAN S, MILAN M, MILAN XL

Report No.: NBES190701248601

**Detail of:** Independent controlgear for MILAN M

View:

- general
- front
- rear
- right
- left
- top
- bottom



**Detail of:** LED module for model MILAN M

View:

- general
- front
- rear
- right
- left
- top
- bottom



- End of Attachment B -

Attachment C

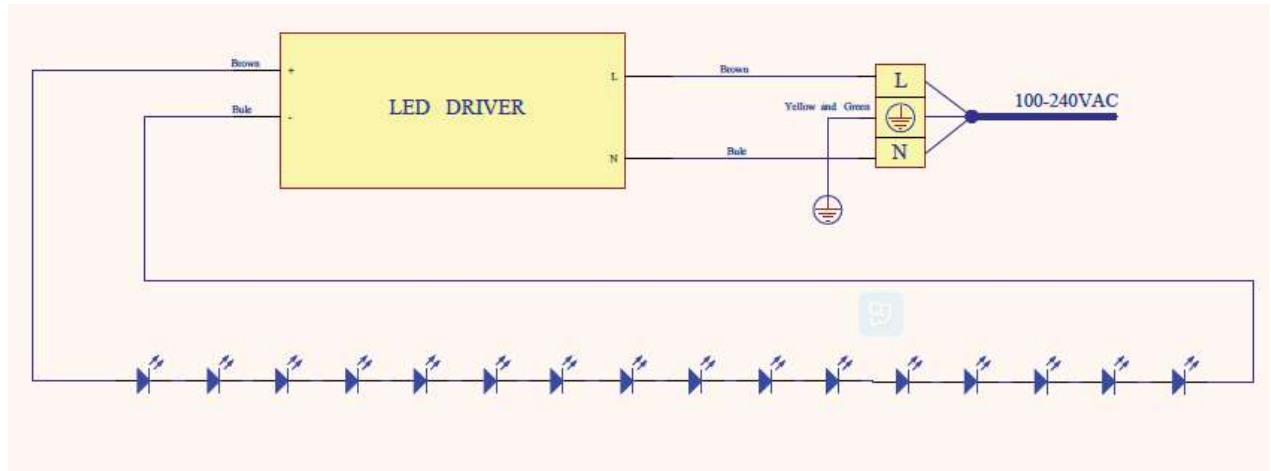
Circuit diagram

LED street lighting (LED Road Lighting)

AVENUE S

100 V – 240 V, 50 Hz / 60 Hz, 60 W, Class I; IP65

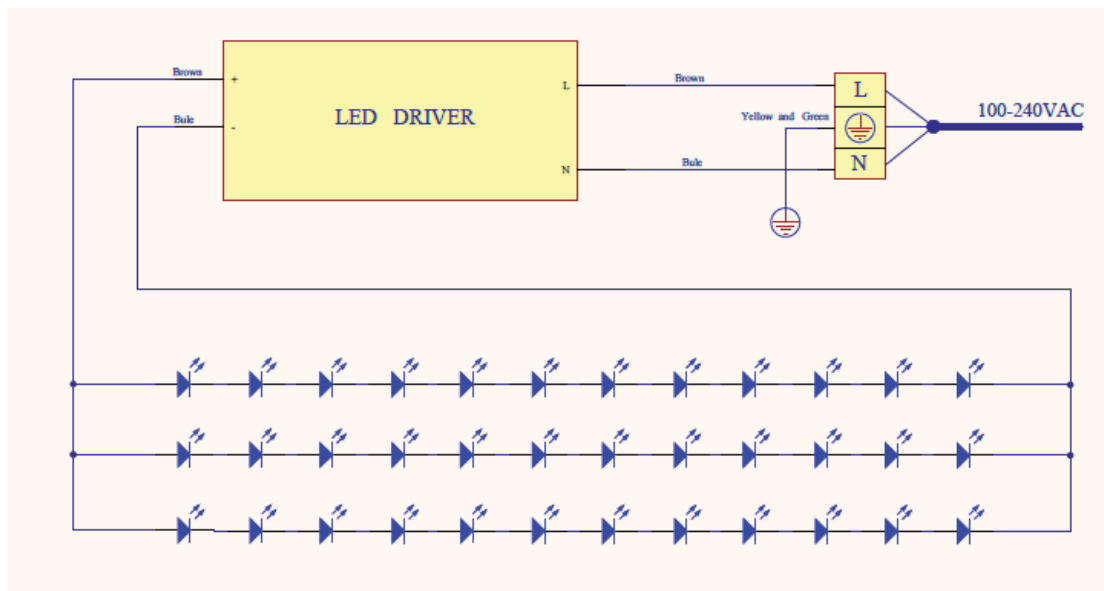
Electric circuit:



INNOVA, INNOVA B

100 V – 240 V, 50 Hz / 60 Hz, 80 W, Class I; IP65

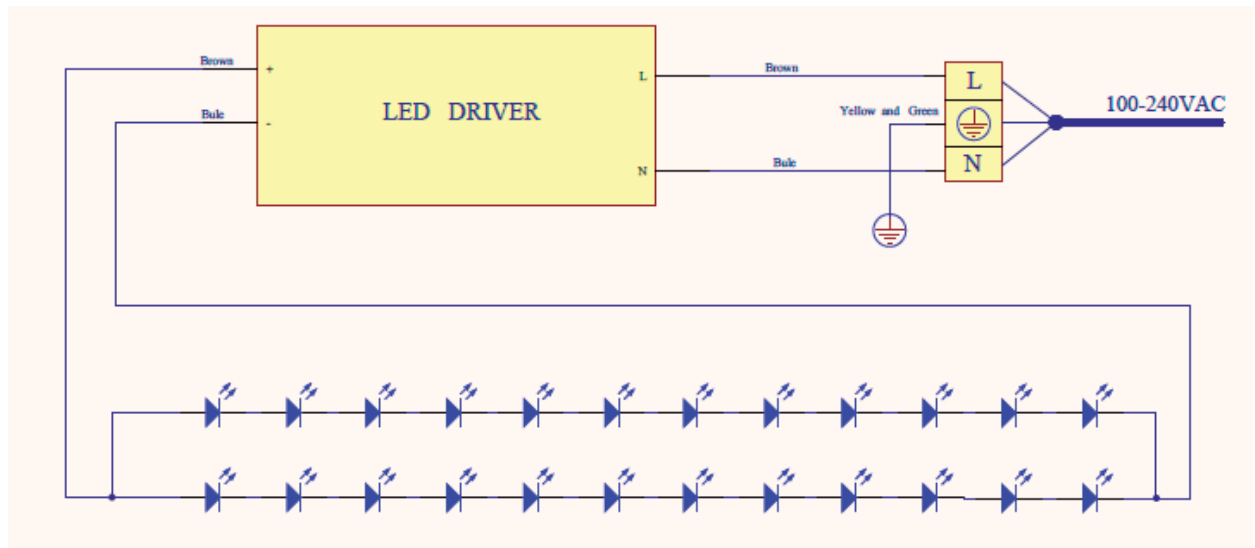
Electric circuit:



### MILAN S

100 V – 240 V, 50 Hz / 60 Hz, 60 W, Class I; IP65

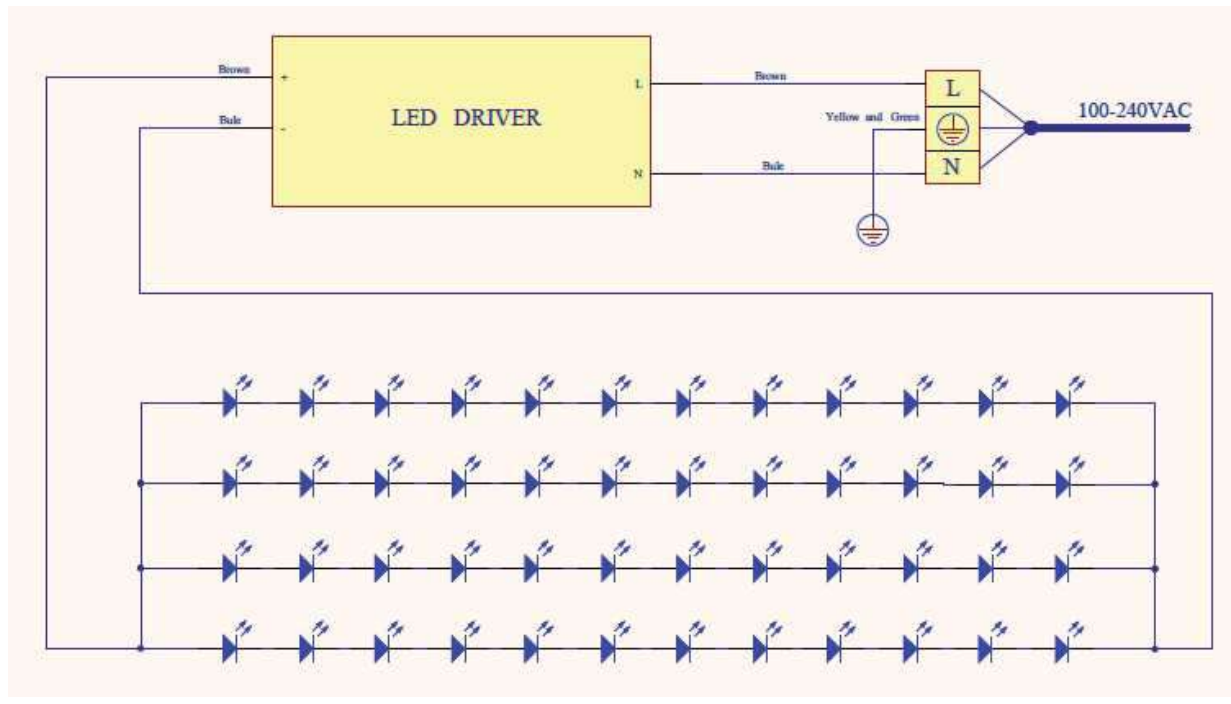
Electric circuit:



### MILAN M

100 V – 240 V, 50 Hz / 60 Hz, 100 W, Class I; IP65

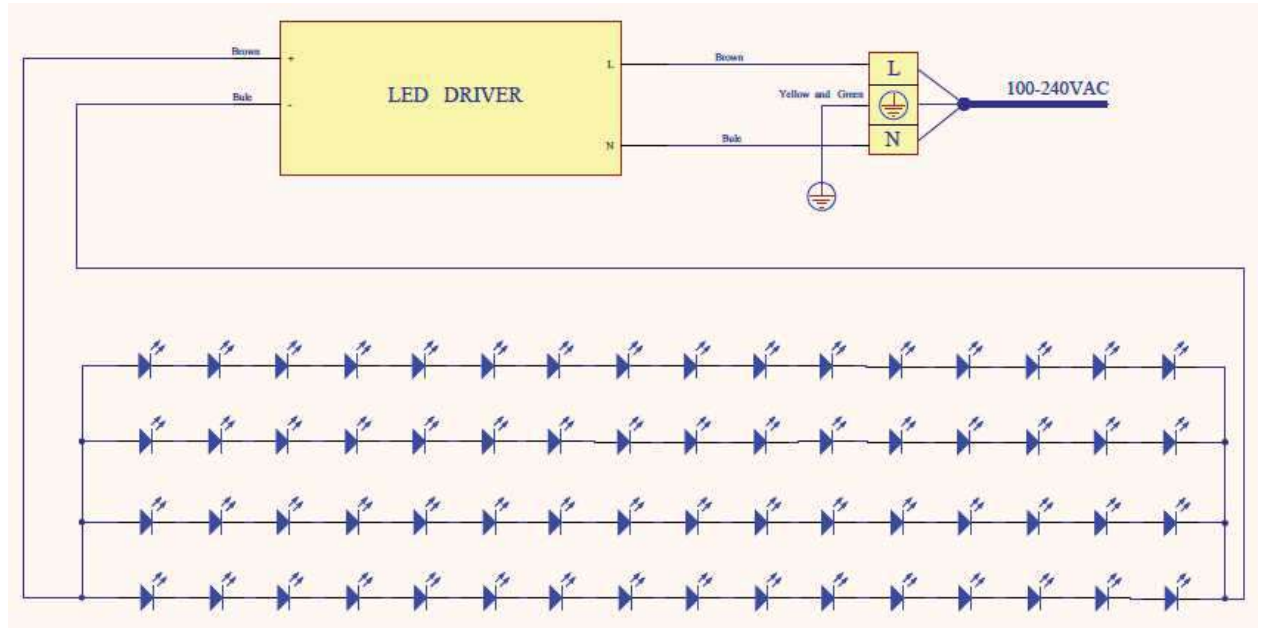
Electric circuit:



MILAN XL

100 V – 240 V, 50 Hz / 60 Hz, 150 W, Class I; IP65

Electric circuit:




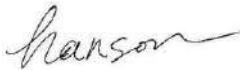
- End of Attachment C -



Test Report issued under the responsibility of:



<b>TEST REPORT</b> <b>IEC TR 62778</b> <b>Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires</b>	
Report Number.....	: 3194758.51P
Date of issue .....	: 2016-08-30
Total number of pages .....	: 16
<b>Name of Testing Laboratory preparing the Report .....</b>	: DEKRA Testing and Certification (Shanghai) Ltd. 3/F, #250, Jiangchangsan Road building 16 Headquarter Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436
<b>Applicant's name .....</b>	: Lumileds Commercial (Shanghai) Co., Ltd
<b>Address.....</b>	: No. 9, Lane 888, Tianlin Road, Shanghai, China
<b>Test specification:</b>	
<b>Standard .....</b>	: IEC TR 62778:2014 (Second Edition)
<b>Test procedure.....</b>	: CB Scheme
<b>Non-standard test method.....</b>	: N/A
<b>Test Report Form No. ....</b>	: IEC62778A
<b>Test Report Form(s) Originator ....</b>	: TÜV SÜD Product Service GmbH
<b>Master TRF .....</b>	: Dated 2016-02
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<b>General disclaimer:</b>	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.	

<b>Test item description</b> .....	LUXEON 5050	
<b>Trade Mark</b> .....	LUMILEDS	
<b>Manufacturer</b> .....	Lumileds Commercial (Shanghai) Co., Ltd No. 9, Lane 888, Tianlin Road, Shanghai, China	
<b>Model/Type reference</b> .....	LUXEON 5050 series Detailed lists refer to Appendix 2: Model List	
<b>Ratings</b> .....	Max voltage: 27 Vdc, Max current: 240 mA Detailed information please refer to Appendix 2: Model List.	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/> <b>CB Testing Laboratory:</b>	DEKRA Testing and Certification (Shanghai) Ltd.	
<b>Testing location/ address</b> .....	3/F, #250, Jiangchangsan Road building 16 Headquater Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436	
<input type="checkbox"/> <b>Associated CB Testing Laboratory:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....	Zhijun Wang	
<b>Approved by (name, function, signature)</b> .....	Hanson Zhang	
<b>Testing procedure: CTF Stage 1:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> .....		
<b>Testing procedure: CTF Stage 2:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name + signature)</b> .....		
<b>Witnessed by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> .....		
<b>Testing procedure: CTF Stage 3:</b>		
<b>Testing procedure: CTF Stage 4:</b>		
<b>Testing location/ address</b> .....		

Tested by (name, function, signature) .....		
Witnessed by (name, function, signature) .....		
Approved by (name, function, signature) .....		
Supervised by (name, function, signature) .....		



<p><b>List of Attachments (including a total number of pages in each attachment):</b></p> <ul style="list-style-type: none"> <li>● Appendix 1: Photo Documentation</li> <li>● Appendix 2: Model List</li> <li>● Appendix 3: Relative Spectrum Of Tested Sample(s)</li> <li>● Appendix 4: Table 6.1 Based On IEC 62471:2006</li> <li>● Appendix 5: Table 6.1 Based On EN62471:2008, Attachment To IEC 62471 European Group Differences And National Differences</li> </ul>	
<p><b>Summary of testing:</b></p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>These tests fulfil the requirements of standard ISO/IEC 17025. When determining the test conclusion, the Measurement Uncertainty of test has been considered.</p> <p>The tested sample of L150-44705024SCP00 from LUXEON 5050 series list at appendix 2 Have been tested according to the IEC 62471 (first edition, 2006-07) <b>at 200mm</b> and been classified as <b>RG 2</b>. Have been tested according to the EN 62471:2008 <b>at 200mm</b> and been classified as <b>RG 2</b>. Have been tested according to the IEC/TR62778:2014 and been classified as <b>RG 2 for blue light hazard</b></p>	<p><b>Testing location:</b></p> <p>DEKRA Testing and Certification (Shanghai) Ltd. 3/F, #250, Jiangchangsan Road building 16 Headquater Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436</p>
<p><b>Summary of compliance with National Differences (List of countries addressed): EN Standards</b></p> <p>EN 62471:2008</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements</b></p>	

**Copy of marking plate:**

**The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.**

N/A

<b>Test item particulars.....: See below</b>	
<b>Product evaluated.....:</b>	<input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire
<b>Rated voltage (V) .....</b>	Max: 27 Vdc
<b>Rated current (mA) .....</b>	Max:240 mA
<b>Rated CCT (K).....</b>	2600K / 3340K // 4000K / 4360K Details information please refer to Appendix 2: Model List.
<b>Rated Luminance (Mcd/m<sup>2</sup>) .....</b>	--
<b>Component report data used .....</b>	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp Report number: --
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object..... : N/A	
- test object does meet the requirement..... : P (Pass)	
- test object does not meet the requirement..... : F (Fail)	
<b>Testing..... : --</b>	
<b>Date of receipt of test item .....</b>	2016-08-25
<b>Date (s) of performance of tests .....</b>	2016-08-25 to 2016-08-30
<b>General remarks:</b>	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.  <b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b>  The product complied with the following standards: <input checked="" type="checkbox"/> IEC 62471:2006 <input checked="" type="checkbox"/> EN 62471:2008 <input type="checkbox"/> IEC/TR 62471-2:2009 <input checked="" type="checkbox"/> IEC/TR 62778:2014	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC 62471-2:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable

**When differences exist; they shall be identified in the General product information section.**

**Name and address of factory (ies) .....** : Lumileds Commercial (Shanghai) Co., Ltd  
No. 9, Lane 888, Tianlin Road, Shanghai, China

**General product information:**

L150-44705024SCP00, with ANSI bin 4360K, is part of the LUXEON 5050 product family. The sample measured, L150-44705024SCP00 has the highest typical flux density (lumens per mm<sup>2</sup> of light emitting surface (LES) area), highest typical device luminance level and highest CCT within the listed LUXEON 5050 product family. The present classification is thus valid (worst case) for all LUXEON 5050 with part number L 1 5 0 - A A B 5 0 2 4 C C C 0 0 where AA represents nominal ANSI CCT bins could be equal to 4360K or lower, BB represents CRI could be from 68 to 90 (see TR IEC62778). See the appendix below for an explanation of the type designation.

The products considered as worst case which should be evaluated at 200mm.

The sample of L150-44705024SCP00 was tested at 200mm from the light source. CCT of spectral irradiance was found at 4544 K.

Base on the Model list which listed on the appendix 2, The tested sample can be considered as  
 typical product  worst product

Which the results can be reference used for the other models.

Type test was performed according to IEC 62471:2006 procedure.

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict
<b>7</b>	<b>MEASUREMENT INFORMATION FLOW</b>		<b>P</b>
<b>7.1</b>	<b>Basic flow</b>		<b>P</b>
	'Law of conservation of luminance' applied		N/A
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		N/A
	In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution		N/A
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		<b>P</b>
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
<b>7.3</b>	<b>Special cases (I): Replacement by a lamp or LED module of another type</b>		<b>N/A</b>
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
<b>7.4</b>	<b>Special cases (II): Arrays and clusters of primary light sources</b>		<b>N/A</b>
	LED package is evaluated as ..... : <input type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited		N/A
	$E_{thr}$ of LED package applies to array		N/A
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		<b>P</b>
	Risk group achieved:		P
	- ..Risk Group 0 unlimited		N/A
	- ..Risk Group 1 unlimited		N/A
	- $E_{thr}$ ..... (lx) : - Distance to reach RG1..... (mm) ::	Refer to the Supplementary information of <b>TABLE:Spectroradiometric measurement</b> as following	P

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE:Spectroradiometric measurement				
	<b>Measurement performed on:</b>	<input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire		
	<b>Model number</b> .....	L150-44705024SCP00		
	<b>Test voltage (V)</b> .....	27 Vdc		—
	<b>Test current (mA)</b> .....	240 mA		—
	<b>Test frequency (Hz)</b> .....	--		—
	<b>Ambient, t(°C)</b> .....	25°C		—
	<b>Measurement distance</b> .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		—
	<b>Source size</b> .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small :		—
	<b>Field of view</b> .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		—
Item	Symb ol	Units	Result	Remark
Correlated colour temperature	CCT	K	4544	
x/y colour coordinates			0,3669/ 0,4076	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	1,70E+04	@11mrad
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	--	
Luminance	L	cd/m <sup>2</sup>	2,82E+07	@11mrad
Illuminance	E	lx	8,23E+03	
Supplementary information: Per IEC/TR 62778:2014 E <sub>thr</sub> =1655 lx D <sub>min</sub> = 446 mm				

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

	<b>TABLE: Angular light distribution</b>	<b>N/A</b>

**List of test equipment used:**

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to CTF stage 1 or CTF stage 2 procedure has been used.

Note: This page may be removed when CTF stage 1 CTF stage 2 are not used. See also clause 4.8 in OD 2020 for more details.

Clause	Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Last Calibration date	Calibration due date
7	Irradiance measurements Radiance measurements	IDR 300 Monochromator (SH 344)	200-3000nm	/	/
7	Radiance measurements	S009 Telescope (SH 345)	300-1400nm	/	/
7	Radiance measurements	SRS 12 Radiance Standard (SH 348)	300-1400nm	2016/3/22	2017/3/22
7	Irradiance measurements	CL6 Spectral irradiance standard (SH 350)	300-3000nm	2016/3/22	2017/3/22
7	Irradiance measurements	CL7 Spectral irradiance standard (SH 351)	200-400nm	2016/3/22	2017/3/22
7	Irradiance measurements	Photometric detector head (SH 359)	380nm-800nm	2016/3/22	2017/3/22
7	Irradiance measurements Radiance measurements	Wattmeter (SH070)	500V,40A	2015/10/16	2016/10/16



Appendix 1: Photo Documentation



Overview (tested)

Appendix 2: Model List:

L150-44705024SCP00, with ANSI bin 4360K, is part of the LUXEON 5050 product family. The sample measured, L150-44705024SCP00 has the highest typical flux density (lumens per mm<sup>2</sup> of light emitting surface (LES) area), highest typical device luminance level and highest CCT within the listed LUXEON 5050 product family. The present classification is thus valid (worst case) for all LUXEON 5050 with part number L 1 5 0 - A A B B 5 0 2 4 C C C 0 0 where AA represents nominal ANSI CCT bins could be equal to 4360K or lower, BB represents CRI could be from 68 to 90 (see TR IEC62778). See the appendix below for an explanation of the type designation.

L 1 5 0 - **A A B B** 5 0 2 4 C C C 0 0

Where:

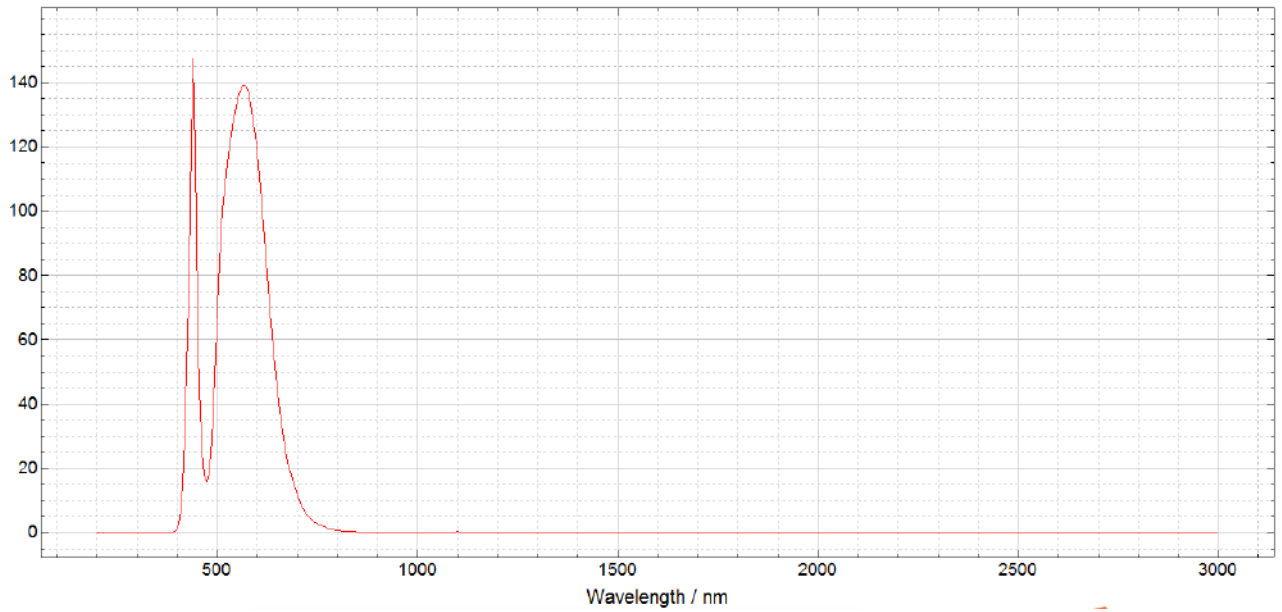
**AA** - designates nominal ANSI CCT

**BB** - designates minimum CRI

**CCC** - designates standard color point or customized one

Part number	CRI	CCT	typical flux (lm)	LES (mm <sup>2</sup> )	flux density	Max voltage	max current
L150-26705024SCP00	≥68	2600K	590	16.3	36	27	240
L150-33705024SCP00	≥68	3340K	625	16.3	38	27	240
L150-40705024SCP00	≥68	4000K	655	16.3	40	27	240
L150-44705024SCP00	≥68	4360K	655	16.3	40	27	240

Appendix 3: Relative Spectrum Of Tested Sample(s)



Appendix 4: Table 6.1 Based On IEC 62471:2006

DUT: L150-44705024SCP00, Evaluation Distance: 200mm, Test current: 240mA, Angular subtense of the apparent source  $\alpha$ : 25mrad

IEC 62471									
Clause	Requirement + Test				Result – Remark				Verdict
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps								P
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	0,0000	0,003		0,03	
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	0,0000	33		100	
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	5,08E+02	10000	1,70E+04	4000000	1,80E+04
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	--	1,0		400	
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ $\alpha$	2,23E+05	28000/ $\alpha$		71000/ $\alpha$	
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	6000/ $\alpha$	--	6000/ $\alpha$		6000/ $\alpha$	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0,04	570		3200	
* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian.									
** Involves evaluation of non-GLS source									

Appendix 5: Table 6.1 Based On EN62471:2008, Attachment To IEC 62471 European Group Differences And National Differences

DUT: L150-44705024SCP00, Evaluation Distance: 200mm, Test current: 240mA, Angular subtense of the apparent source  $\alpha$ : 25mrad

EN 62471										
Clause	Requirement + Test			Result – Remark				Verdict		
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)								P	
Risk	Action spectrum	Symbol	Units	Emission Measurement						
				Exempt		Low risk		Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	0,0000	--	--	--	--	
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	0,0000	--	--	--	--	
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	5,08E+02	10000	1,70E+04	4000000	1,80E+04	
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	--	1,0		400		
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ $\alpha$	2,23E+05	28000/ $\alpha$		71000/ $\alpha$		
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 0,0017 $\leq \alpha \leq$ 0,011	--					
				6000/ $\alpha$ 0,011 $\leq \alpha \leq$ 0,1	--					
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0,04	570		3200		
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2  The applicable aperture diameters: see 4.2.1  The limitations for the angular subtenses: see 4.2.2  The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p>										

## 2.3 Compatibilidad Electromagnética

- UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2 Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16 A por fase)
- UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.
- UNE-EN 61547. Equipos para alumbrado

Reference No. : WTN21N04040061E  
Applicant : NOVATILU,S.L.  
Address : Via Ausetania,11-13 08560 MANLLEU Barcelona Spain  
Manufacturer : NOVATILU,S.L.  
Address : Via Ausetania,11-13 08560 MANLLEU Barcelona Spain  
Product : LED STREET LIGHTING  
Model No. : MILAN XL, others see attachment  
Technical data : 220-240V~, 50-60Hz, other details see attachment



### Test Standards:

EN IEC 55015:2019+A11:2020  
EN 61547:2009  
EN IEC 61000-3-2:2019  
EN 61000-3-3:2013+A1:2019

The above product has been tested by us with the listed standards and found in compliance with the European Electromagnetic Compatibility Directive 2014/30/EU. It is possible to use CE marking to demonstrate the compliance with this EMC Directive.

**EN IEC 55015: Limits and methods of measurement of radio Disturbance characteristics of electrical lighting and similar equipment.**  
**EN 61547: Equipment for general lighting purposes — EMC immunity requirements**  
**EN IEC 61000-3-2: Electromagnetic Compatibility (EMC) Part 3-2: Limits for harmonic current emissions(Equipment input current up to and including 16A per phase)**  
**EN 61000-3-3: Electromagnetic Compatibility (EMC) Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection**

The referred test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements in the above mentioned EU Directive. Other relevant Directives have to be observed.

After preparation of the necessary technical documentation as well as the EU Declaration of Conformity , the CE marking as shown below can be affixed on the equipment under the sole responsibility of the manufacturer.



The statement is based on a single evaluation of the sample of above mentioned product. It does not imply an assessment of the whole production.

**Waltek Testing Group (Ningbo) Co., Ltd.**

Hotline: 400-840-2288 E-mail: [info@waltek.com.cn](mailto:info@waltek.com.cn)  
[Http://www.waltek.com.cn](http://www.waltek.com.cn)

Ver.11.20, WALTEK is registered trademark. Utilisation and application requires prior approval.

# Attachment

## Model list



WTN21N04040061E

No.	Model	Rated Input	Rated power	Note
1.	MILAN XL	220-240V~, 50-60Hz	180W	/
2.	MILAN M	220-240V~, 50-60Hz	150W	/
3.	MILAN S	220-240V~, 50-60Hz	100W	/
4.	MILAN S ALMSL	220-240V~, 50-60Hz	40W	/
5.	INNOVA	220-240V~, 50-60Hz	80W	/
6.	INNOVA B	220-240V~, 50-60Hz	80W	/
7.	AVENUE S	220-240V~, 50-60Hz	60W	/







中国认可  
国际互认  
检测  
TESTING  
CNAS L11210



# TEST REPORT

**Reference No.** : WTN21N04040061E  
**Applicant** : NOVATILU,S.L.  
**Address** : Via Ausetania,11-13 08560 MANLLEU Barcelona Spain  
**Manufacturer** : NOVATILU,S.L.  
**Address** : Via Ausetania,11-13 08560 MANLLEU Barcelona Spain  
**Product Name** : LED STREET LIGHTING  
**Model No.** : Refer to section 3.2  
**Standards** : EN IEC 55015:2019+A11:2020  
 EN 61547:2009  
 EN IEC 61000-3-2:2019  
 EN 61000-3-3:2013+A1:2019  
**Date of Receipt sample** : 2021-04-27  
**Date of Test** : 2021-04-27 to 2021-04-28  
**Date of Issue** : 2021-05-07  
**Test Report Form No.** : WEL-55015A-03A  
**Test Result** : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

**Waltek Testing Group (Ningbo) Co., Ltd.**

Address: 1/F., No.6, Building, No.1177, Lingyun Road, Ningbo Hi-Tech Zone, Yinzhou District, Ningbo, Zhejiang, China

Tel: +86-574-8749 3888

Fax: +86-574-8386 8018

Compiled by:

*Shouyin Wang*

Shouyin wang / Project Engineer

Approved by:



Wanzhong Mao / Manager



## 1 Test Summary

EMISSION			
Test Item	Test Standard	Class / Severity	Result
Mains Terminal Disturbance Voltage, 9kHz to 30MHz	EN IEC 55015:2019+A11:2020	Clause 4.3.1	Pass
Radiated electromagnetic disturbance, 9kHz to 30MHz	EN IEC 55015:2019+A11:2020	Clause 4.5.2	Pass
Radiated Emission, 30MHz to 1000MHz	EN IEC 55015:2019+A11:2020	Clause 4.5.3	Pass
Harmonic Current emission	EN IEC 61000-3-2:2019	Clause 7	Pass
Voltage Fluctuation and Flicker	EN 61000-3-3:2013+A1:2019	Clause 5	Pass
IMMUNITY (EN 61547:2009)			
Test Item	Test Method	Performance Criteria	Result
Electrostatic Discharge(ESD)	IEC 61000-4-2:2008	B	Pass
Radio-frequency electromagnetic fields (80MHz to 1GHz)	IEC 61000-4-3:2006+A1:2007	A	Pass
Electrical Fast Transients (EFT)	IEC 61000-4-4:2004	B	Pass
Surge	IEC 61000-4-5:2005	C	Pass
Injected Currents, 0.15MHz to 80MHz	IEC 61000-4-6:2008	A	Pass
Power-frequency magnetic field	IEC 61000-4-8:1993+A1:2000	A	N/A
Voltage Dips	IEC 61000-4-11:2004	C	Pass
Voltage short interruptions		B	Pass

Remark:

Pass

Test item meets the requirement

Fail

Test item does not meet the requirement

N/A

Test case does not apply to the test object



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### 3 General Information

#### 3.1 General Description of E.U.T.

- Product Name** ..... : LED STREET LIGHTING
- Model No.** ..... : Refer to section 3.2
- Protection Class** ..... : Class I
- Remark** ..... :
1. The EUT (equipment under test) is an ordinary LED STREET LIGHTING for Lighting and similar use. For the further information, refer to the user's manual.
  2. In electrical characteristics, all models are similar circuit principle and PCB layout, except for rated power and appearance. For detailed information, refer to section 3.2.
  3. For the test results, the EUT had been tested with the rated input range. But only the worst case was shown in test report.

#### 3.2 Details of E.U.T.

Technical Data .....

No.	Model	Rated Input	Rated power	Note
1.	MILAN XL	220-240V~, 50-60Hz	180W	/
2.	MILAN M	220-240V~, 50-60Hz	150W	/
3.	MILAN S	220-240V~, 50-60Hz	100W	/
4.	MILAN S ALMSL	220-240V~, 50-60Hz	40W	/
5.	INNOVA	220-240V~, 50-60Hz	80W	/
6.	INNOVA B	220-240V~, 50-60Hz	80W	/
7.	AVENUE S	220-240V~, 50-60Hz	60W	/

#### 3.3 Description of Support Units

The EUT has been tested as an independent unit. MILAN S ALMSL and MILAN XL are the tested samples. All tests were performed in the condition of 230V~, 50Hz input.

#### 3.4 Standards Applicable for Testing

The tests were performed according to following standards:

- |                            |  |
|----------------------------|--|
| EN IEC 55015:2019+A11:2020 | Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment                      |
| EN 61547:2009              | Equipment for general lighting purposes — EMC immunity requirements  |
| EN IEC 61000-3-2:2019      | Electromagnetic compatibility (EMC) Part 3-2: Limits — Limits for harmonic current emissions (equipment input current ≤ 16 A per phase). |



EN 61000-3-3:2013+A1:2019

Electromagnetic compatibility (EMC) Part 3-3: Limits — Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection.

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### 3.5 Subcontracted

Whether parts of tests for the product have been subcontracted to other labs:

Yes  No

If Yes, list the related test items and lab information:

Test items: Radio-frequency electromagnetic fields (80MHz to 1GHz)

Lab information: Waltek Testing Group (Foshan) Co., Ltd.

### 3.6 Abnormalities from Standard Conditions

None.

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#### 4 Equipment Used during Test

<b>Mains Terminal Disturbance Voltage (Conducted Emission)</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
1	EMI Test Receiver	R&S	ESCI	101406	Valid
2	TWO-LINE V-NETWORK	R&S	ENV216	101208	Valid
<b>Radiated electromagnetic disturbance(9kHz to 30MHz)</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
1	EMI Test Receiver	R&S	ESCI	101406	Valid
2	3-dimensional large loop antenna	SCHWARZBECK	HXYZ9170	256	Valid
<b>3m Semi-anechoic Chamber for Radiated Emission</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
1	EMI Test Receiver	R&S	ESR7	101777	Valid
2	TRILOG Biconic logarithmic periodic broadband antenna	SCHWARZBECK	VULB9163	01025	Valid
3	coupling-Decoupling Network	SCHWARZBECK	CDNE M3	00081	Valid
4	coupling-Decoupling Network	SCHWARZBECK	CDNE M2	00093	Valid
<b>Harmonics Measuring System</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
1	Harmonics /Flicker Analyzer	KIKUSUI	KHA1000	TL002966	Valid
2	line Power Supply	KIKUSUI	PCR4000LE	TL003094	Valid
3	Line Impedance Network	KIKUSUI	LIN40MA-PCR-LE	TM001297	Valid
<b>ESD</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
1	electrostatic discharge generator	TESEQ	NSG437	699	Valid
<b>Radio-frequency electromagnetic fields</b>					
<b>Item</b>	<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Calibration Status</b>
1	RF Power Amplifier	OPHIR	5225R	1051/1712	Valid
2	RF Power Amplifier	OPHIR	5293RE	1051/171	Valid
3	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP9128E-SPECIAL	142	Valid
4	Stacked double logarithmic periodic antenna	SCHWARZBECK	STLP 9149	476	Valid





5	RF signal generator	Agilent	N5181A	MY48080720	Valid
6	Power meter	RS	NRP6A	101133	Valid
7	Power meter	RS	NRP6A	101134	Valid
8	Electric field probe	Narda	EP 601	611WX70311	Valid
<b>EFT &amp; Voltage Dips and Interruptions</b>					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	Multifunction Generator Systems	TESEQ	NSG3040	2094	Valid
2	Single way manual Step regulator	TESEQ	INA 6501	243	Valid
<b>Surge</b>					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1.	Multifunction Generator Systems	TESEQ	NSG3060	1654	Valid
2	coupling-Decoupling Network	TESEQ	CDN3061	1485	Valid
<b>Injected Currents</b>					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	Test System for Conducted and Radiated Immunity	TESEQ	NSG4070	37519	Valid
2	Coupling and Decoupling Network	TESEQ	CDN M016	37358	Valid
3	Attenuator	TESEQ	ATN6075	36917	Valid

#### 4.1 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Mains Terminal Disturbance Voltage	9kHz~30MHz	±2.66dB	(1)
Radiated electromagnetic disturbance	9kHz~30MHz	±3.00dB	(1)
Radiated Emission	30MHz~1000MHz	±5.03dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .



## 5 Emission Test Results

### 5.1 Mains Terminals Disturbance Voltage, 9kHz to 30MHz

Test Requirement.....	: EN IEC 55015
Test Method.....	: CIPR 16-2-1 and Clause 8.3 of EN IEC 55015
Test Result.....	: Pass
Frequency Range.....	: 9kHz to 30MHz
Class/Severity.....	: Table 1 of EN IEC 55015

#### 5.1.1 E.U.T. Operation

##### Operating Environment:

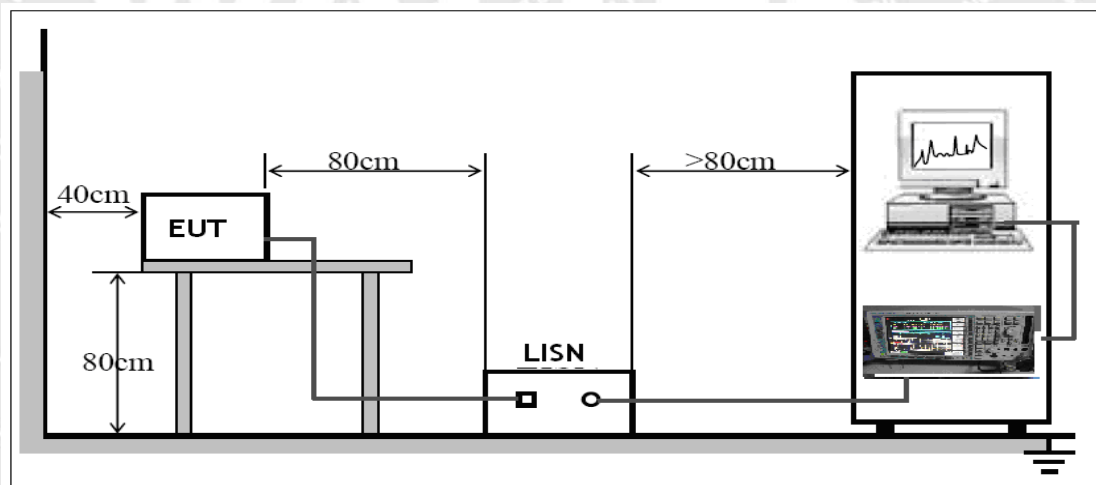
Temperature.....	: 22.6°C
Humidity.....	: 54%RH

##### EUT Operation:

Input Voltage.....	: 230V~, 50Hz
Operating Mode.....	: On mode

#### 5.1.2 Block Diagram of Test Setup

The Mains Terminals Disturbance Voltage tests were performed in accordance with the EN IEC 55015.



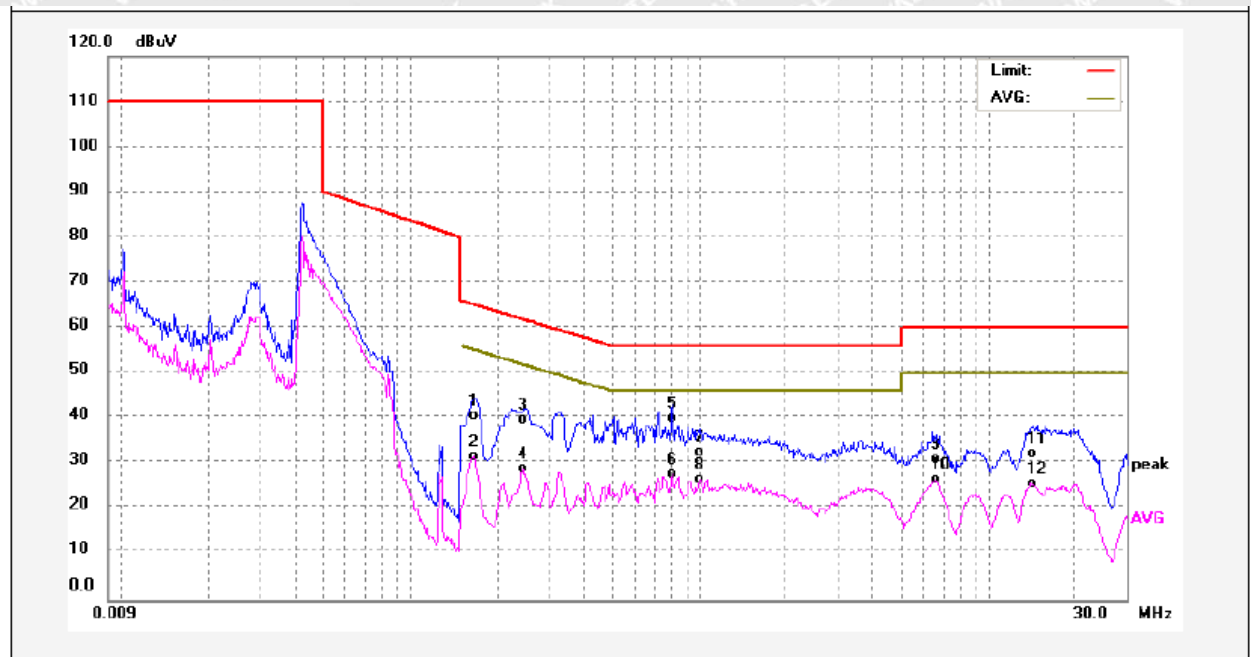
#### 5.1.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.



### 5.1.4 Mains Terminals Disturbance Voltage Test Data

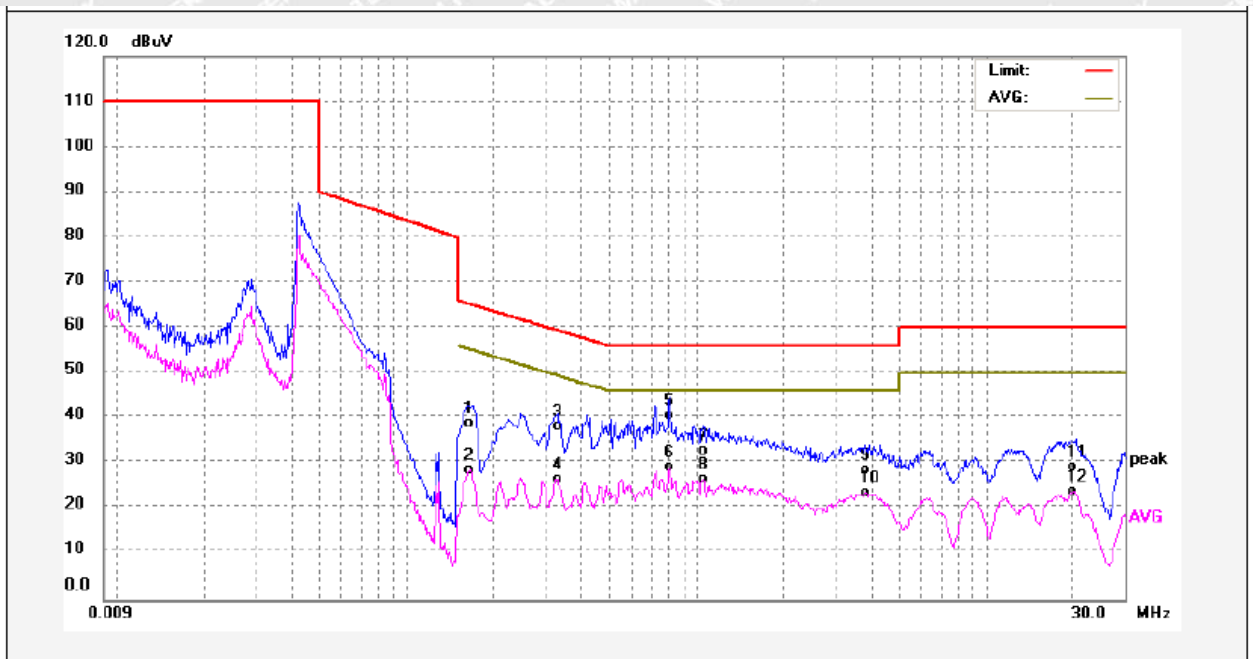
Live Line, MILAN S ALMSL



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1661	31.05	9.64	40.69	65.15	-24.46	QP	
2	0.1661	22.04	9.64	31.68	55.15	-23.47	AVG	
3	0.2461	30.04	9.63	39.67	61.88	-22.21	QP	
4	0.2461	19.18	9.63	28.81	51.88	-23.07	AVG	
5	0.8061	30.51	9.65	40.16	56.00	-15.84	QP	
6	0.8061	18.02	9.65	27.67	46.00	-18.33	AVG	
7	1.0060	22.80	9.67	32.47	56.00	-23.53	QP	
8	1.0060	17.02	9.67	26.69	46.00	-19.31	AVG	
9	6.6341	21.17	9.83	31.00	60.00	-29.00	QP	
10	6.6341	16.62	9.83	26.45	50.00	-23.55	AVG	
11	14.1981	22.25	10.05	32.30	60.00	-27.70	QP	
12	14.1981	15.65	10.05	25.70	50.00	-24.30	AVG	



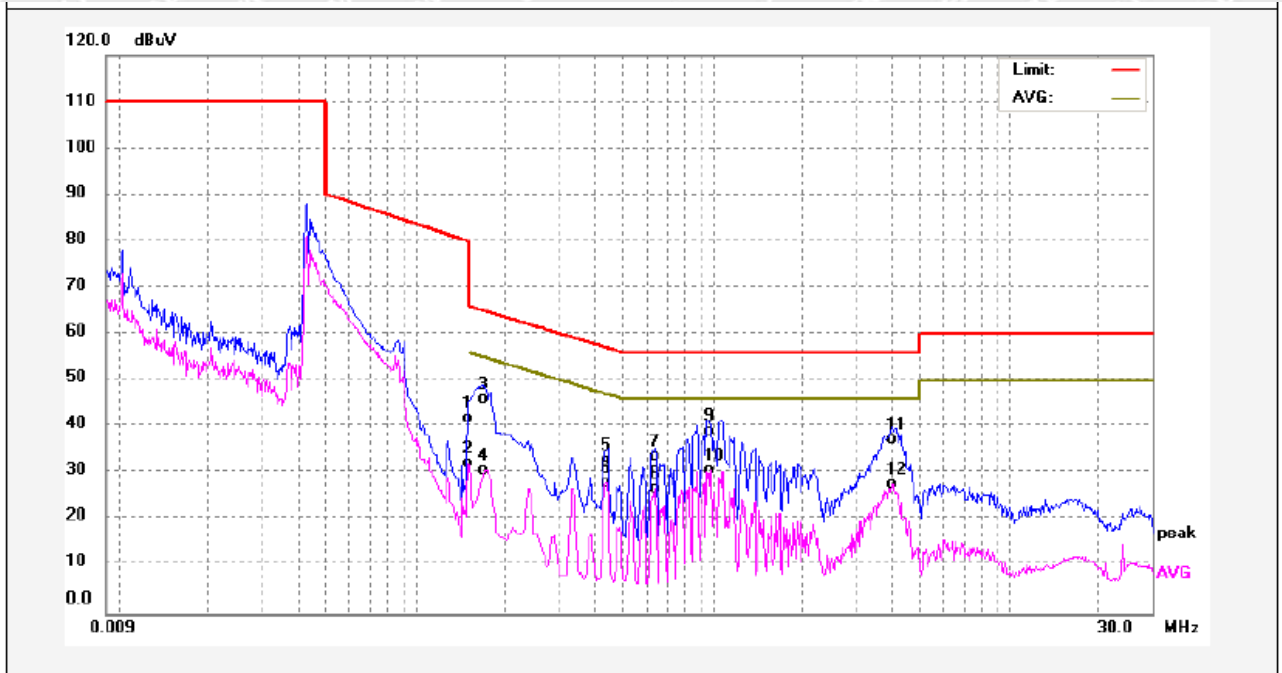
Neutral Line, MILAN S ALMSL



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1661	29.31	9.64	38.95	65.15	-26.20	QP	
2	0.1661	18.93	9.64	28.57	55.15	-26.58	AVG	
3	0.3301	28.59	9.63	38.22	59.45	-21.23	QP	
4	0.3301	16.88	9.63	26.51	49.45	-22.94	AVG	
5	0.8061	30.98	9.65	40.63	56.00	-15.37	QP	
6	0.8061	19.64	9.65	29.29	46.00	-16.71	AVG	
7	1.0580	23.14	9.67	32.81	56.00	-23.19	QP	
8	1.0580	16.82	9.67	26.49	46.00	-19.51	AVG	
9	3.8821	18.89	9.76	28.65	56.00	-27.35	QP	
10	3.8821	13.72	9.76	23.48	46.00	-22.52	AVG	
11	20.1181	19.19	10.17	29.36	60.00	-30.64	QP	
12	20.1181	13.64	10.17	23.81	50.00	-26.19	AVG	



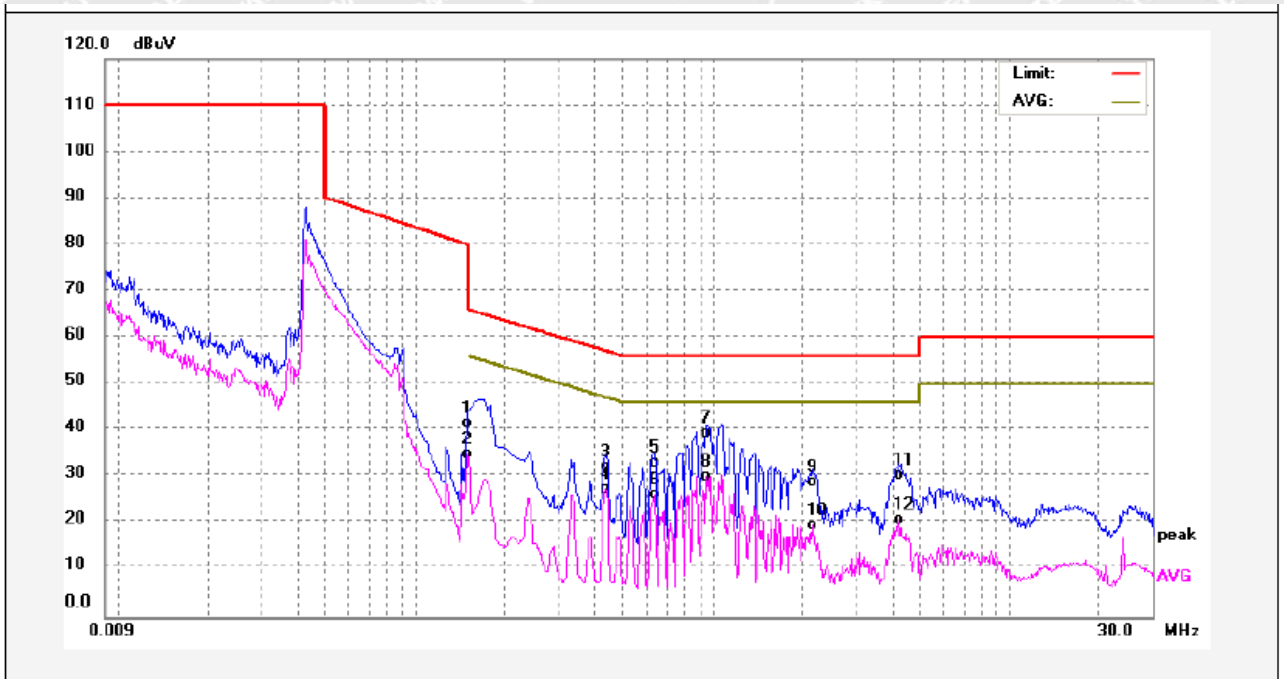
Live Line, MILAN XL



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	32.23	9.63	41.86	65.99	-24.13	QP	
2	0.1500	22.69	9.63	32.32	55.99	-23.67	AVG	
3	0.1701	36.47	9.64	46.11	64.95	-18.84	QP	
4	0.1701	21.25	9.64	30.89	54.95	-24.06	AVG	
5	0.4381	23.25	9.63	32.88	57.10	-24.22	QP	
6	0.4381	18.52	9.63	28.15	47.10	-18.95	AVG	
7	0.6341	24.16	9.64	33.80	56.00	-22.20	QP	
8	0.6341	17.18	9.64	26.82	46.00	-19.18	AVG	
9	0.9821	29.55	9.67	39.22	56.00	-16.78	QP	
10	0.9821	21.02	9.67	30.69	46.00	-15.31	AVG	
11	4.0421	27.45	9.76	37.21	56.00	-18.79	QP	
12	4.0421	18.08	9.76	27.84	46.00	-18.16	AVG	



Neutral Line, MILAN XL



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1500	31.79	9.63	41.42	65.99	-24.57	QP	
2	0.1500	25.35	9.63	34.98	55.99	-21.01	AVG	
3	0.4381	22.67	9.63	32.30	57.10	-24.80	QP	
4	0.4381	17.74	9.63	27.37	47.10	-19.73	AVG	
5	0.6341	23.53	9.64	33.17	56.00	-22.83	QP	
6	0.6341	16.75	9.64	26.39	46.00	-19.61	AVG	
7	0.9541	29.92	9.67	39.59	56.00	-16.41	QP	
8	0.9541	20.61	9.67	30.28	46.00	-15.72	AVG	
9	2.1621	19.13	9.70	28.83	56.00	-27.17	QP	
10	2.1621	9.96	9.70	19.66	46.00	-26.34	AVG	
11	4.2341	20.60	9.76	30.36	56.00	-25.64	QP	
12	4.2341	10.99	9.76	20.75	46.00	-25.25	AVG	



## 5.2 Radiated Electromagnetic Disturbance, 9kHz to 30MHz

<b>Test Requirement</b> .....	:	EN IEC 55015
<b>Test Method</b> .....	:	CISPR 16-2-3 and Clause 9.3.2 of EN IEC 55015
<b>Test Result</b> .....	:	Pass
<b>Frequency Range</b> .....	:	9kHz to 30MHz
<b>Class/Severity</b> .....	:	Table 7 and Table 8 of EN IEC 55015

### 5.2.1 E.U.T. Operation

#### Operating Environment:

<b>Temperature</b> .....	:	22.6°C
<b>Humidity</b> .....	:	54%RH

#### EUT Operation:

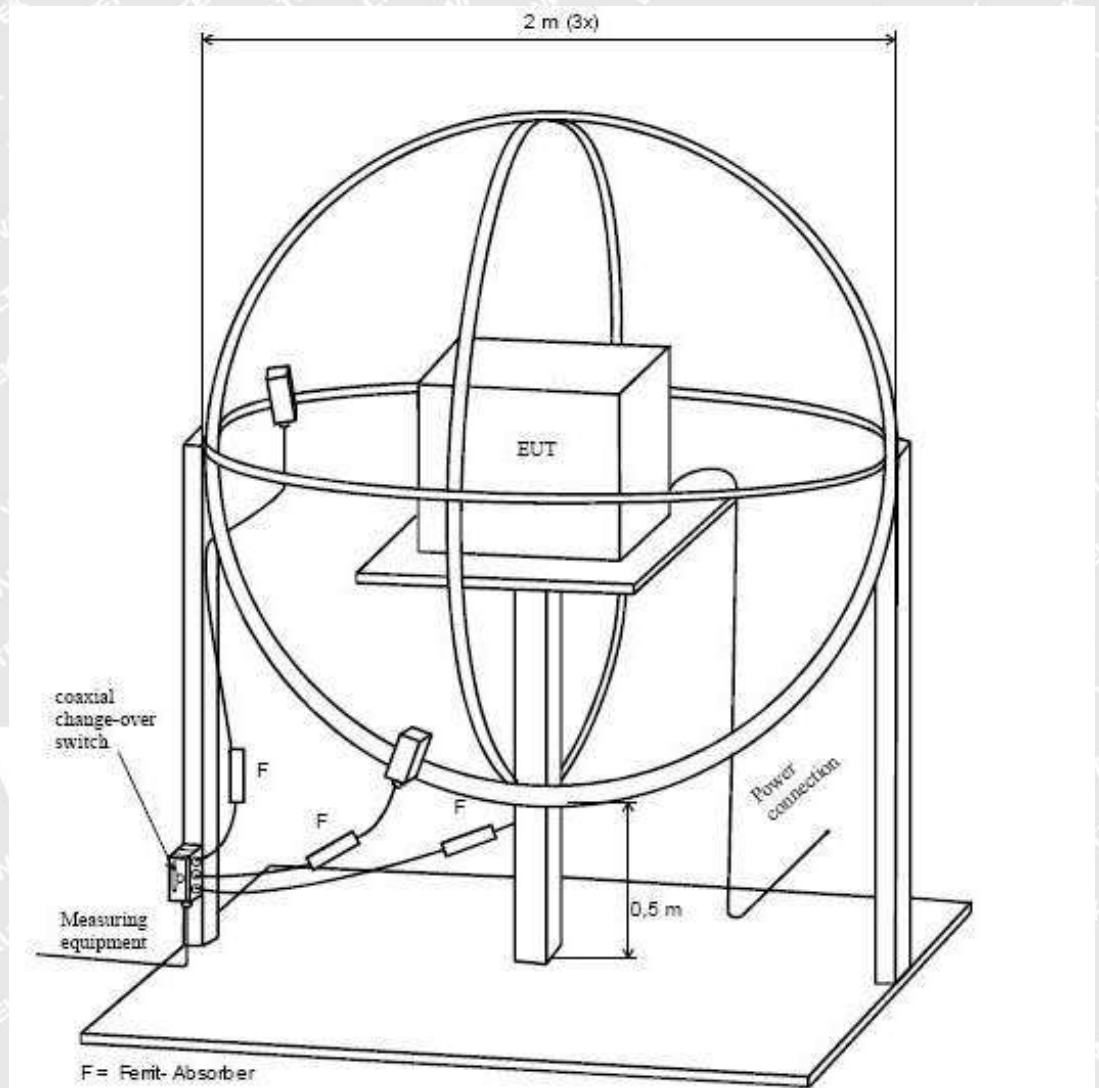
<b>Input Voltage</b> .....	:	230V~, 50Hz
<b>Operating Mode</b> .....	:	On mode

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### 5.2.2 Block Diagram of Test Setup

The Radiated Electromagnetic Disturbance (9kHz to 30MHz) test was performed in accordance with the EN IEC 55015.



### 5.2.3 Measurement Data

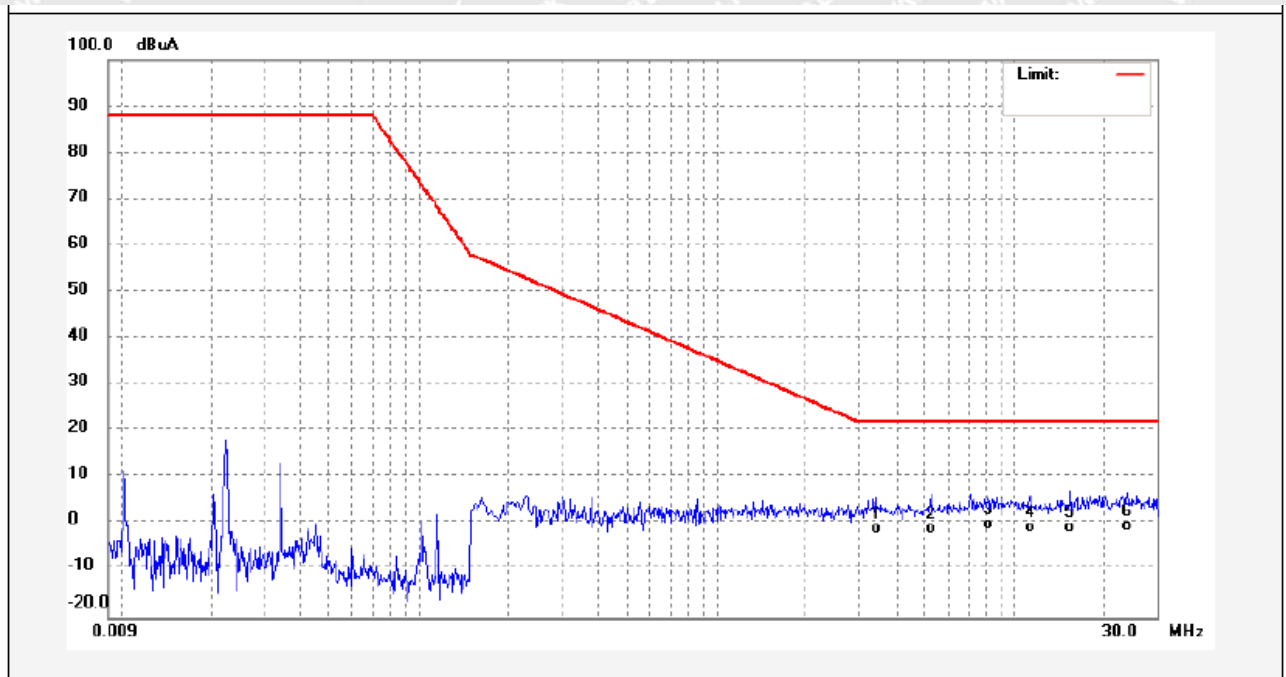
According to the data in section 5.2.4, the EUT complied with the EN IEC 55015 standards.





## 5.2.4 Radiated Electromagnetic Disturbance test data, 9kHz to 30MHz

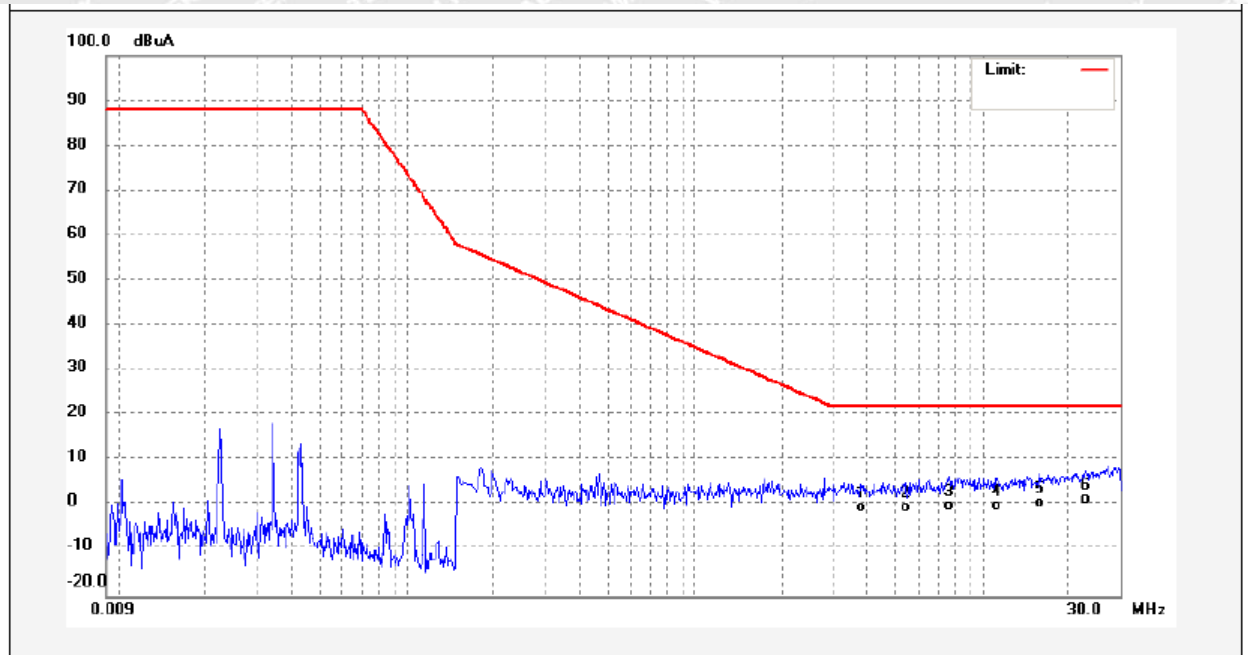
### Loop X, MILAN S ALMSL



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.4261	-34.45	33.60	-0.85	22.00	-22.85	QP	
2	5.2341	-34.74	33.67	-1.07	22.00	-23.07	QP	
3	8.1340	-33.82	33.70	-0.12	22.00	-22.12	QP	
4	11.2581	-34.47	33.87	-0.60	22.00	-22.60	QP	
5	15.3621	-34.68	33.95	-0.73	22.00	-22.73	QP	
6	23.8501	-34.15	33.87	-0.28	22.00	-22.28	QP	



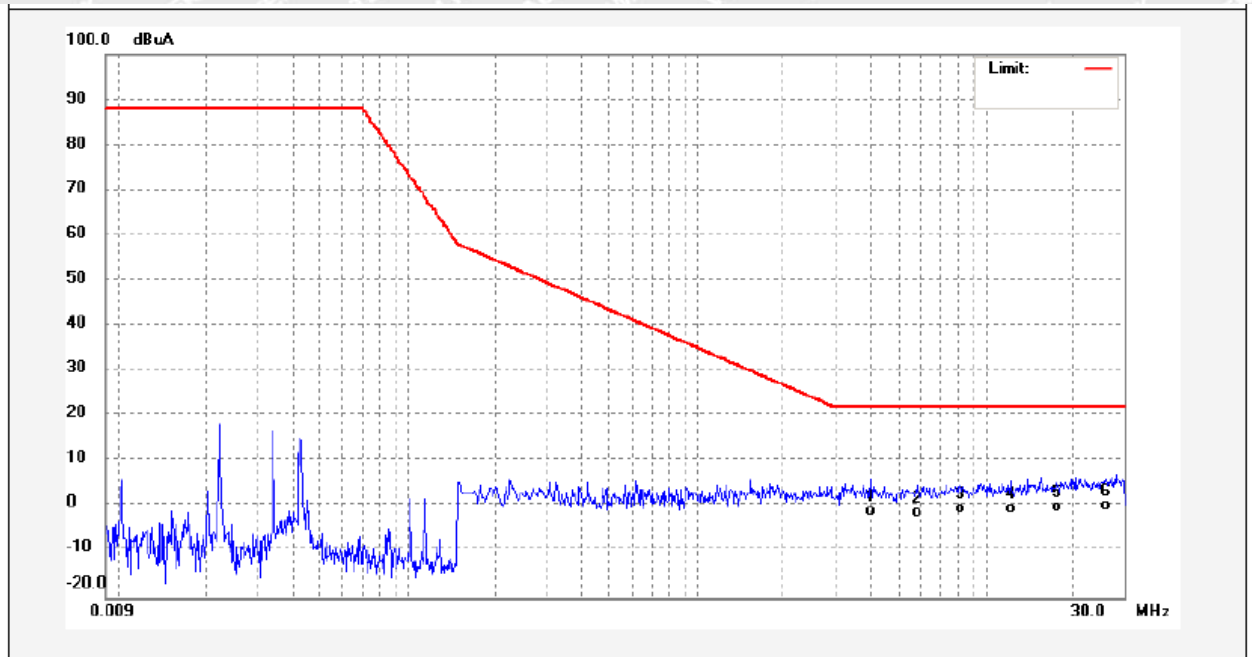
## Loop Y, MILAN S ALMSL



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.7901	-34.53	34.07	-0.46	22.00	-22.46	QP	
2	5.3781	-34.73	34.25	-0.48	22.00	-22.48	QP	
3	7.6661	-34.31	34.21	-0.10	22.00	-22.10	QP	
4	11.2421	-34.46	34.47	0.01	22.00	-21.99	QP	
5	15.7461	-34.39	34.91	0.52	22.00	-21.48	QP	
6	22.9301	-34.23	35.71	1.48	22.00	-20.52	QP	



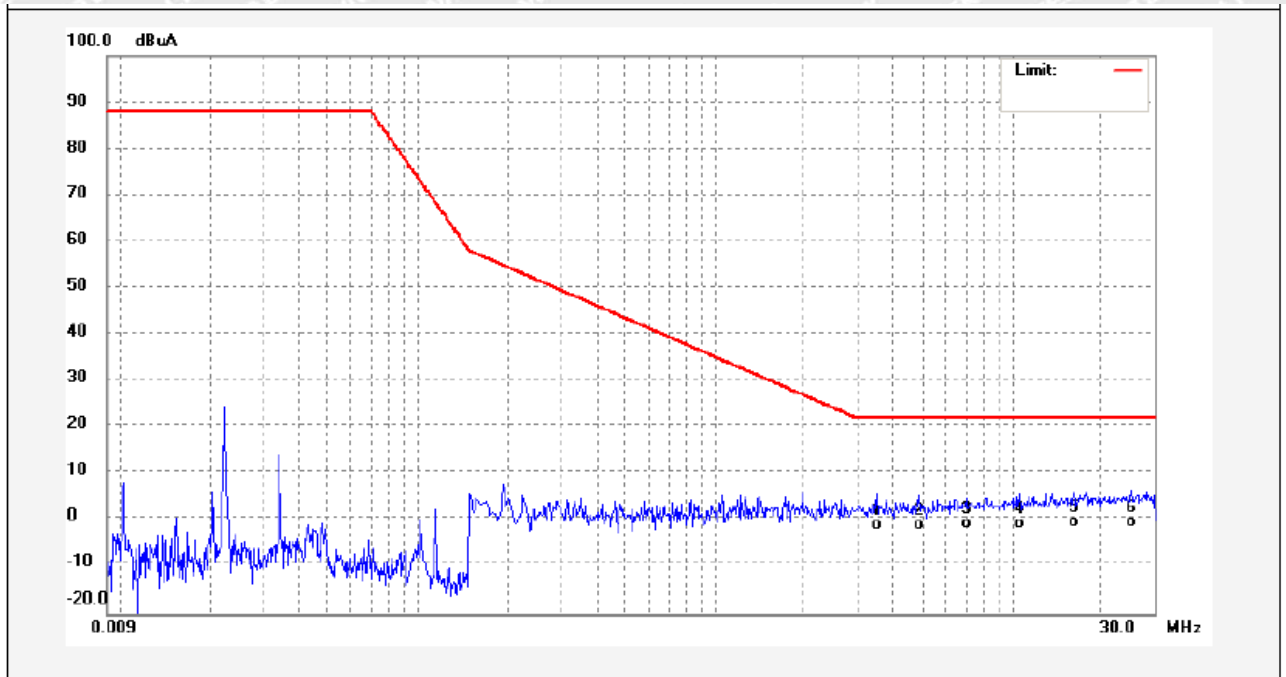
**Loop Z, MILAN S ALMSL**



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Detector	Remark
1	3.9901	-34.50	33.56	-0.94	22.00	-22.94	QP	
2	5.7461	-34.87	33.71	-1.16	22.00	-23.16	QP	
3	8.1301	-33.91	33.60	-0.31	22.00	-22.31	QP	
4	12.1061	-34.39	33.97	-0.42	22.00	-22.42	QP	
5	17.6261	-34.39	34.30	-0.09	22.00	-22.09	QP	
6	26.0501	-34.06	34.42	0.36	22.00	-21.64	QP	



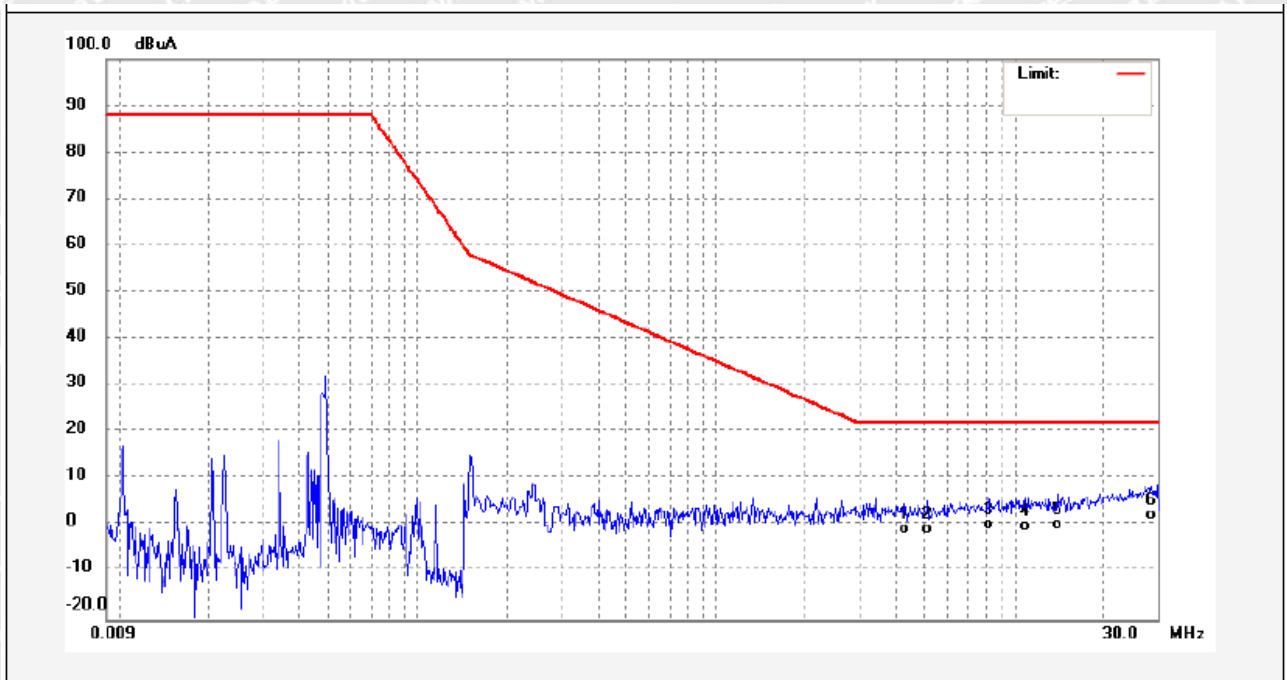
Loop X, MILAN XL



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	3.5141	-34.51	33.59	-0.92	22.00	-22.92	QP	
2	4.8740	-34.61	33.63	-0.98	22.00	-22.98	QP	
3	7.0181	-34.43	33.71	-0.72	22.00	-22.72	QP	
4	10.5781	-34.47	33.85	-0.62	22.00	-22.62	QP	
5	16.0941	-34.43	33.96	-0.47	22.00	-22.47	QP	
6	25.1021	-34.17	33.81	-0.36	22.00	-22.36	QP	



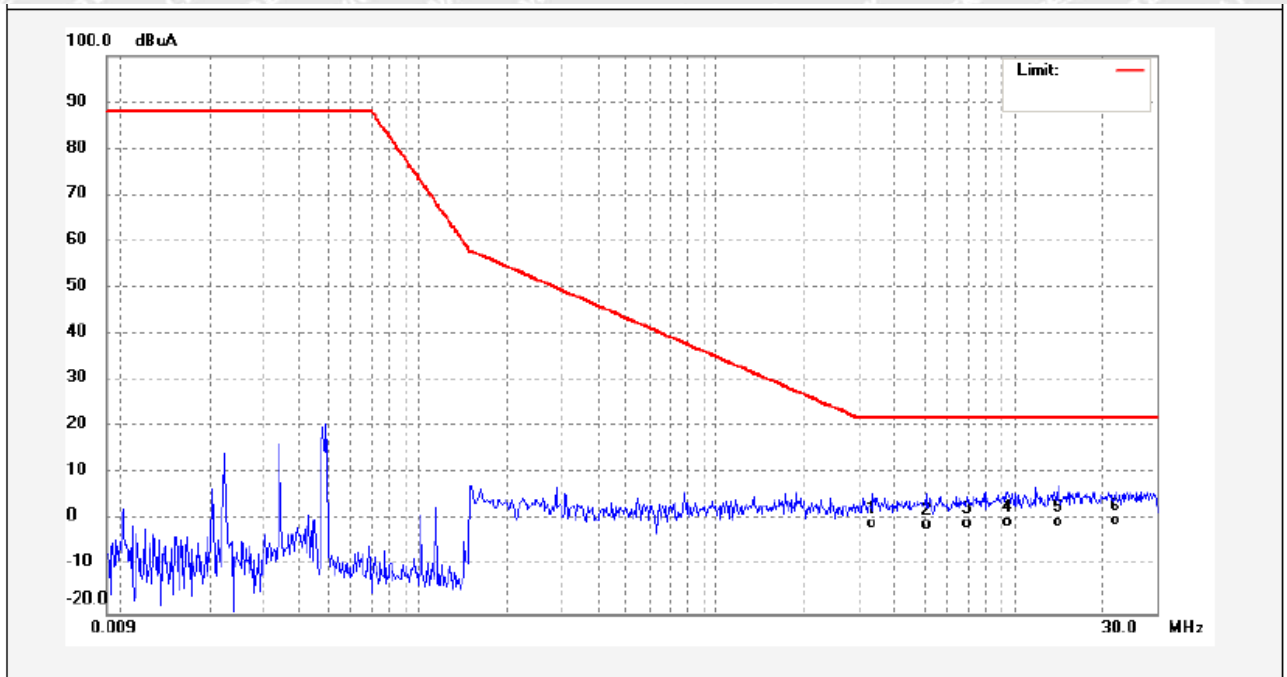
Loop Y, MILAN XL



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit dBuA	Margin (dB)	Detector	Remark
1	4.2661	-34.60	34.10	-0.50	22.00	-22.50	QP	
2	5.1181	-34.91	34.21	-0.70	22.00	-22.70	QP	
3	8.1621	-33.93	34.20	0.27	22.00	-21.73	QP	
4	10.8821	-34.49	34.43	-0.06	22.00	-22.06	QP	
5	13.8301	-34.58	34.73	0.15	22.00	-21.85	QP	
6	28.5861	-34.08	36.42	2.34	22.00	-19.66	QP	



Loop Z, MILAN XL



No.	Freq. (MHz)	Reading (dBUA)	Factor (dB)	Result (dBUA)	Limit dBUA	Margin (dB)	Detector	Remark
1	3.3341	-34.39	33.60	-0.79	22.00	-22.79	QP	
2	5.0620	-34.71	33.65	-1.06	22.00	-23.06	QP	
3	6.9621	-34.42	33.66	-0.76	22.00	-22.76	QP	
4	9.4901	-34.05	33.78	-0.27	22.00	-22.27	QP	
5	14.0221	-34.49	34.09	-0.40	22.00	-22.40	QP	
6	21.6981	-34.43	34.44	0.01	22.00	-21.99	QP	



### 5.3 Radiated Emission, 30MHz to 1GHz

Test Requirement.....	: EN IEC 55015
Test Method.....	: CISPR 16-2-3
Test Result.....	: Pass
Frequency Range.....	: 30MHz to 1GHz
Class/Severity.....	: Table 10 of EN IEC 55015

#### 5.3.1 E.U.T. Operation

##### Operating Environment:

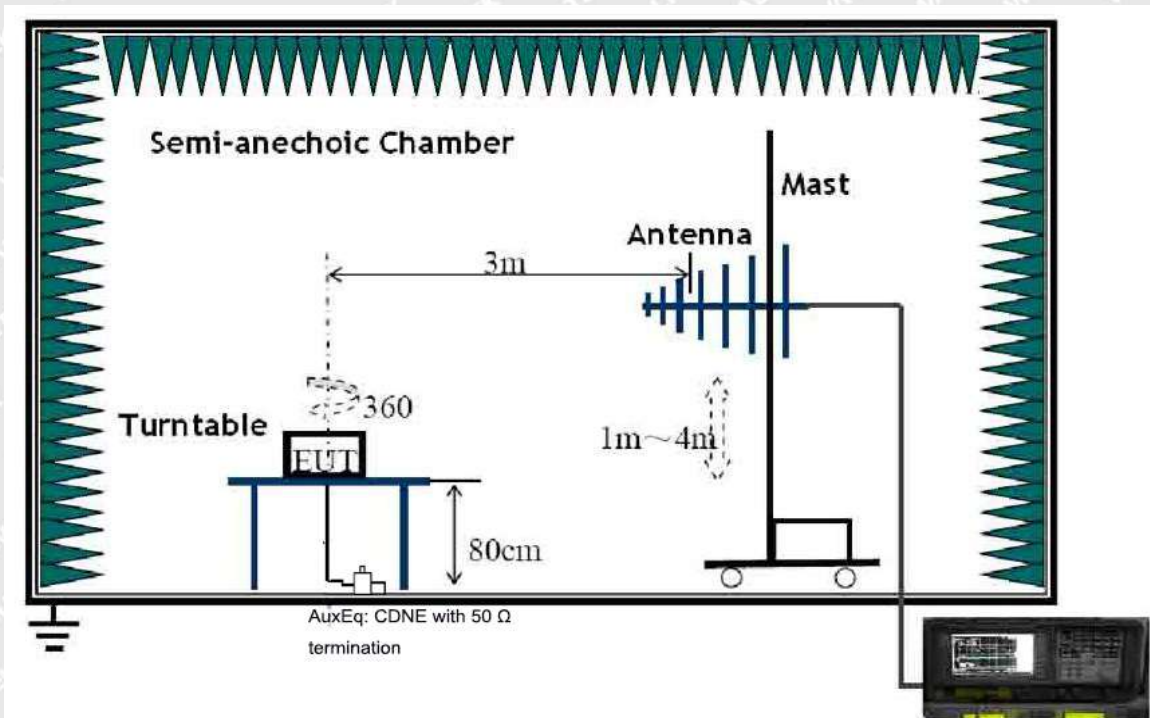
Temperature.....	: 24.8°C
Humidity.....	: 47%RH

##### EUT Operation :

Input Voltage.....	: 230V~, 50Hz
Operating Mode.....	: On mode

#### 5.3.2 Block Diagram of Setup

The Radiated Emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the CISPR 32.



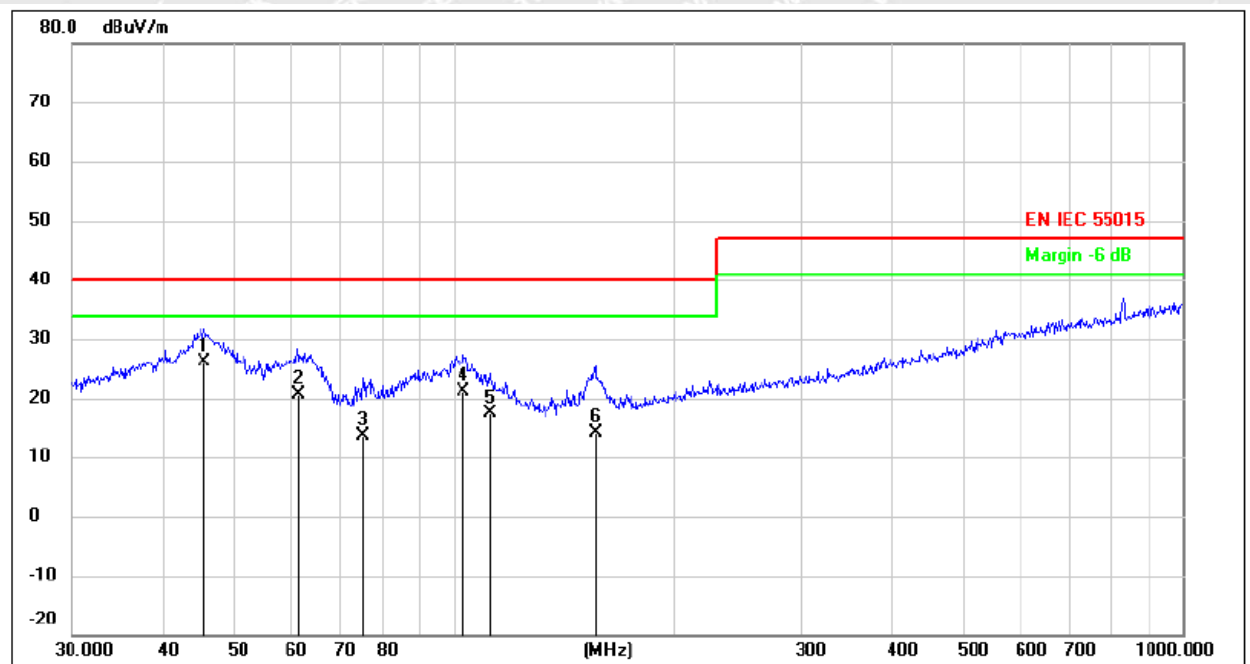
#### 5.3.3 Measurement Data

The maximised peak emissions from the EUT was scanned and measured for Horizontal & Vertical polarisation. Quasi-peak measurements were performed if peak emissions were within 6dB of the limit line. According to the data in section 5.3.4, the EUT complied with the EN IEC 55015 standards.



### 5.3.4 Radiated Emission test data,30MHz to 300MHz

Vertical, MILAN S ALMSL

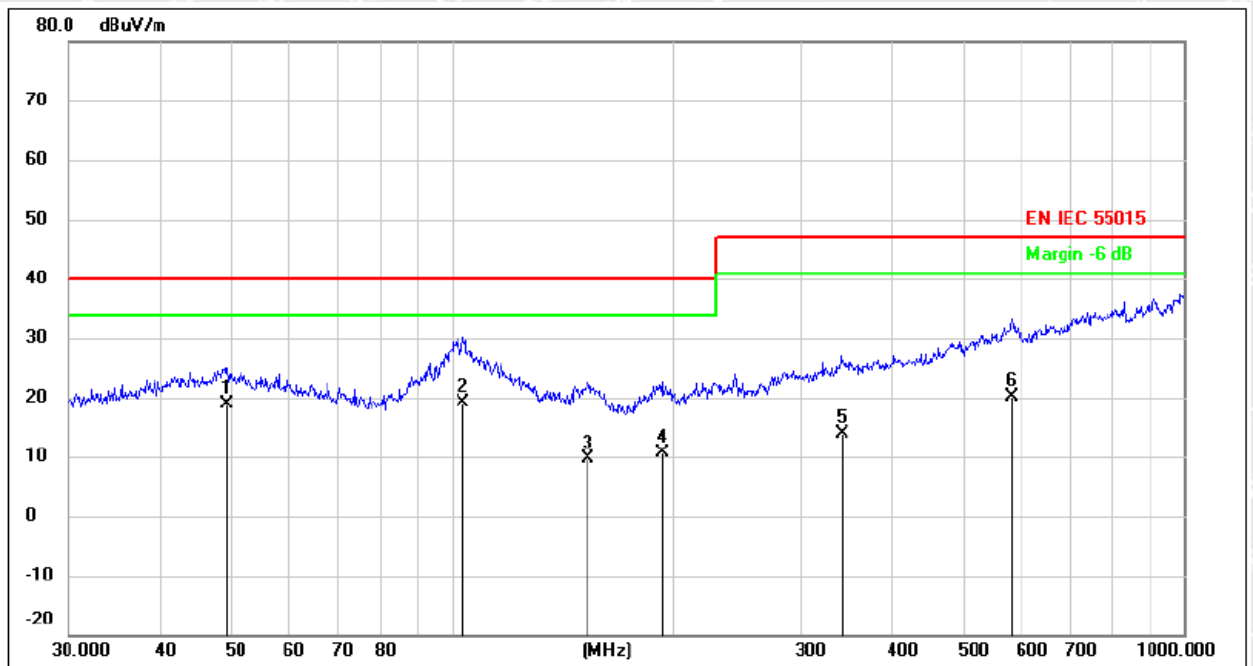


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	45.5348	12.50	13.66	26.16	40.00	-13.84	QP
2	61.1316	8.80	11.81	20.61	40.00	-19.39	QP
3	75.1822	5.08	8.53	13.61	40.00	-26.39	QP
4	103.4421	9.54	11.61	21.15	40.00	-18.85	QP
5	112.1305	6.18	11.14	17.32	40.00	-22.68	QP
6	156.4578	6.03	8.19	14.22	40.00	-25.78	QP





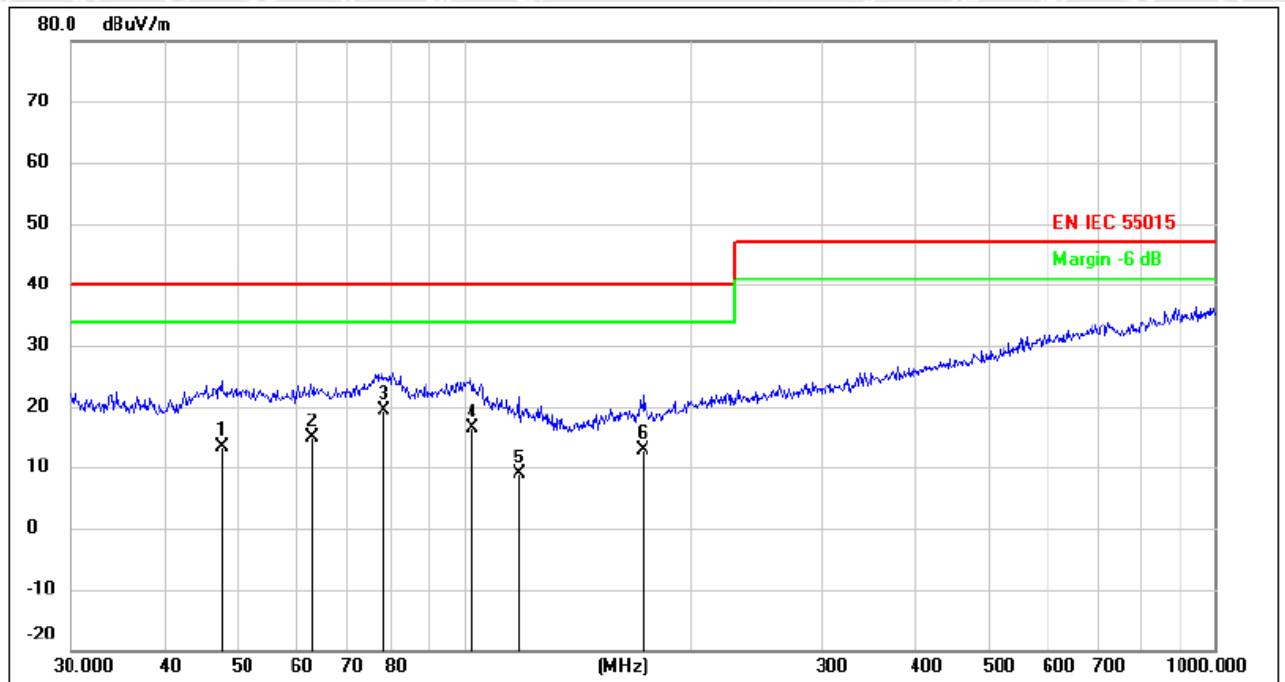
**Horizontal, MILAN S ALMSL**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	49.3594	4.00	14.97	18.97	40.00	-21.03	QP
2	103.8054	6.48	12.59	19.07	40.00	-20.93	QP
3	153.7384	1.13	8.45	9.58	40.00	-30.42	QP
4	193.7727	-0.45	11.16	10.71	40.00	-29.29	QP
5	340.7817	-2.43	16.21	13.78	47.00	-33.22	QP
6	582.7424	-1.26	21.40	20.14	47.00	-26.86	QP



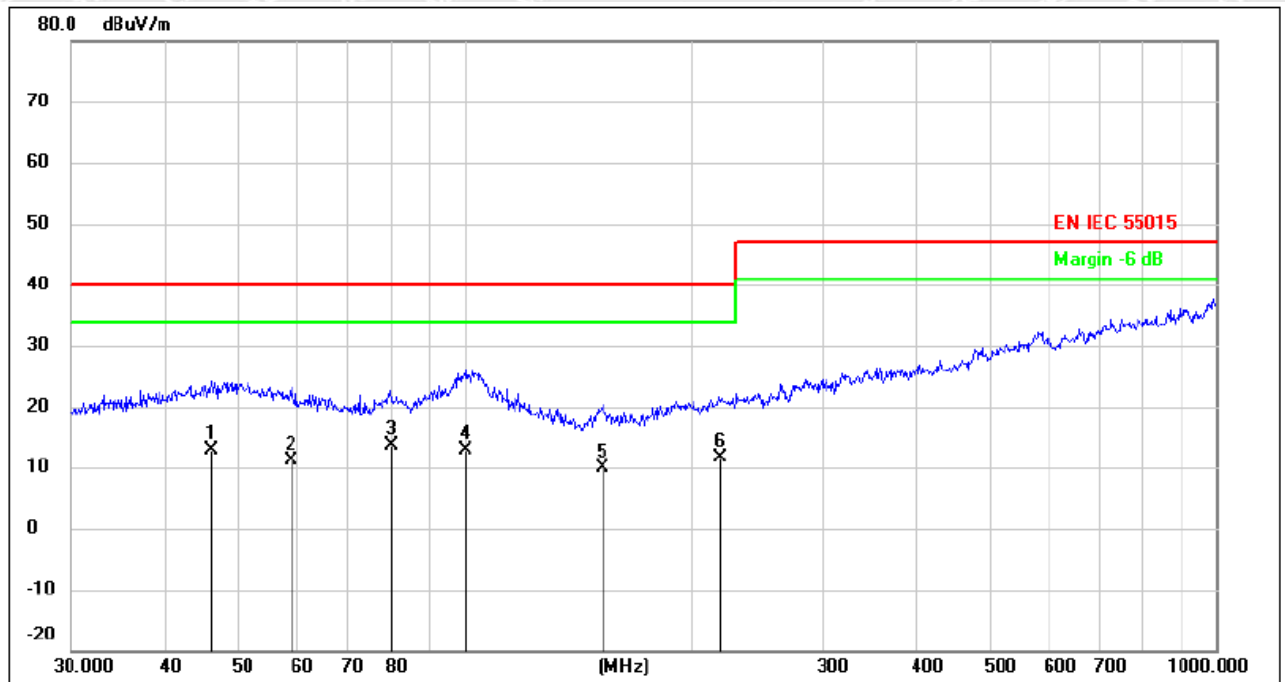
**Vertical, MILAN XL**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	47.6586	-0.38	13.66	13.28	40.00	-26.72	QP
2	62.6507	3.51	11.41	14.92	40.00	-25.08	QP
3	78.1389	11.47	7.98	19.45	40.00	-20.55	QP
4	102.3597	4.86	11.62	16.48	40.00	-23.52	QP
5	118.6014	-1.00	10.00	9.00	40.00	-31.00	QP
6	173.8135	3.79	8.97	12.76	40.00	-27.24	QP



## Horizontal, MILAN XL



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	46.1779	-1.56	14.36	12.80	40.00	-27.20	QP
2	58.8185	-2.23	13.34	11.11	40.00	-28.89	QP
3	79.8002	5.12	8.58	13.70	40.00	-26.30	QP
4	100.5806	-0.26	13.06	12.80	40.00	-27.20	QP
5	152.6640	1.31	8.55	9.86	40.00	-30.14	QP
6	218.3085	0.28	11.41	11.69	40.00	-28.31	QP



## 5.4 Harmonics Current Emission

**Test Requirement**..... : EN IEC 61000-3-2

**Test Method**..... : EN IEC 61000-3-2

**Test Result**..... : Pass

**Class/Severity**..... : Class C

### 5.4.1 E.U.T. Operation

#### Operating Environment:

**Temperature** ..... : 24.2°C

**Humidity**..... : 51.6%RH

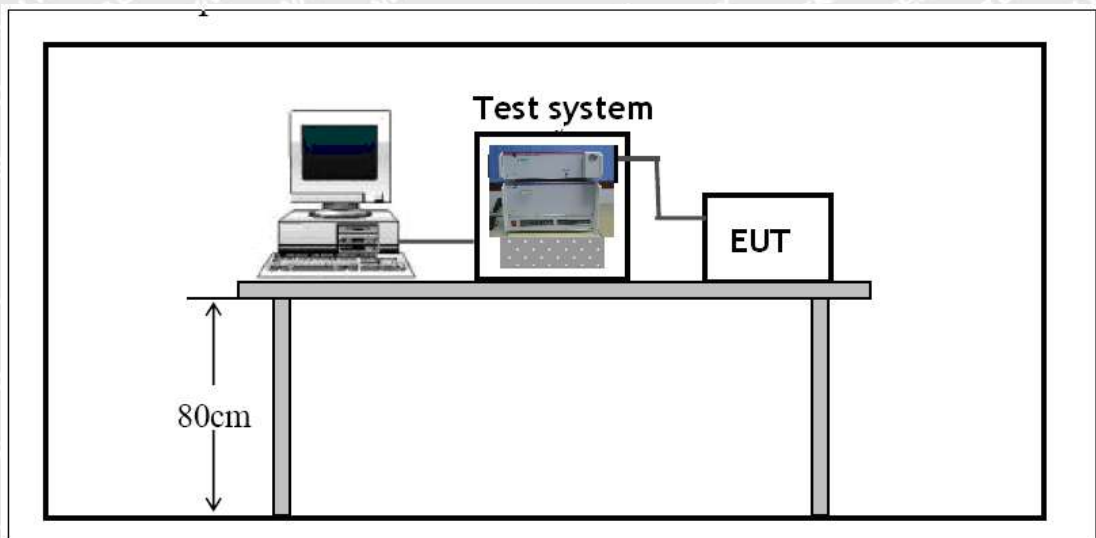
#### EUT Operation:

**Input Voltage** ..... : 230V~, 50Hz

**Operating Mode**..... : On mode

### 5.4.2 Block Diagram of Setup

The Harmonics Current emission test was performed in accordance with the EN IEC 61000-3-2.





### 5.4.3 Harmonic Current Emission Test Data

#### MILAN S ALMSL

Final Test Result	<b>Pass</b>	Tobs	Quasi-Stationary
Voltage	230.08 V	THC	0.0126 A
Current	0.1744 A	POHC/Limit	0.0012 A / 0.0164 A *3
Power	39.58 W	Nominal	230 V / 50 Hz
Power Factor	0.9863	Fundamental Current	0.1739 A
Apparent Power	40.1 VA	Measuring Period	150 s
THD (max)	7.24 %	Margin	100 %

Order	Limit1(A rms)	Limit2(A rms)	Ave(A rms)	Max(A rms)	Judge
1	----	----	0.1738	0.1739	N/A
2	0.0035	0.0052	0.0001	0.0002	N/A
3	0.0515	0.0772	0.0061	0.0063	Pass
4	----	----	0.0001	0.0001	N/A
5	0.0174	0.0261	0.0030	0.0031	N/A
6	----	----	0.0001	0.0001	N/A
7	0.0122	0.0183	0.0067	0.0067	Pass
8	----	----	0.0001	0.0001	N/A
9	0.0087	0.0130	0.0061	0.0062	Pass
10	----	----	0.0001	0.0001	N/A
11	0.0052	0.0078	0.0042	0.0042	N/A
12	----	----	0.0001	0.0001	N/A
13	0.0052	0.0078	0.0022	0.0023	N/A
14	----	----	0.0001	0.0001	N/A
15	0.0052	0.0078	0.0015	0.0015	N/A
16	----	----	0.0001	0.0001	N/A
17	0.0052	0.0078	0.0012	0.0013	N/A
18	----	----	0.0001	0.0001	N/A
19	0.0052	0.0078	0.0009	0.0009	N/A
20	----	----	0.0001	0.0001	N/A
21	0.0078	0.0078	0.0003	0.0004	N/A
22	----	----	0.0001	0.0001	N/A
23	0.0078	0.0078	0.0002	0.0002	N/A
24	----	----	0.0001	0.0001	N/A
25	0.0078	0.0078	0.0003	0.0003	N/A
26	----	----	0.0001	0.0001	N/A
27	0.0078	0.0078	0.0004	0.0004	N/A
28	----	----	0.0001	0.0001	N/A
29	0.0078	0.0078	0.0005	0.0005	N/A
30	----	----	0.0001	0.0001	N/A
31	0.0078	0.0078	0.0005	0.0005	N/A
32	----	----	0.0001	0.0001	N/A
33	0.0078	0.0078	0.0004	0.0004	N/A
34	----	----	0.0001	0.0001	N/A
35	0.0078	0.0078	0.0004	0.0004	N/A
36	----	----	0.0001	0.0001	N/A
37	0.0078	0.0078	0.0004	0.0004	N/A
38	----	----	0.0001	0.0001	N/A
39	0.0078	0.0078	0.0004	0.0004	N/A
40	----	----	0.0001	0.0001	N/A

N/A : Not Apply

**MILAN XL**

Final Test Result	<b>Pass</b>	Tobs	Quasi-Stationary
Voltage	230.06 V	THC	0.0502 A
Current	0.7926 A	POHC/Limit	0.0038 A / 0.0749 A *3
Power	180.48 W	Nominal	230 V / 50 Hz
Power Factor	0.9898	Fundamental Current	0.7910 A
Apparent Power	182.3 VA	Measuring Period	150 s
THD (max)	6.42 %	Margin	100 %

Order	Limit1(A rms)	Limit2(A rms)	Ave(A rms)	Max(A rms)	Judge
1	----	----	0.7895	0.7910	N/A
2	0.0158	0.0237	0.0016	0.0057	Pass
3	0.2349	0.3523	0.0292	0.0304	Pass
4	----	----	0.0009	0.0035	N/A
5	0.0791	0.1187	0.0213	0.0218	Pass
6	----	----	0.0006	0.0020	N/A
7	0.0554	0.0831	0.0197	0.0200	Pass
8	----	----	0.0005	0.0017	N/A
9	0.0396	0.0593	0.0170	0.0170	Pass
10	----	----	0.0003	0.0013	N/A
11	0.0237	0.0356	0.0130	0.0133	Pass
12	----	----	0.0004	0.0012	N/A
13	0.0237	0.0356	0.0097	0.0099	Pass
14	----	----	0.0005	0.0012	N/A
15	0.0237	0.0356	0.0070	0.0073	Pass
16	----	----	0.0004	0.0011	N/A
17	0.0237	0.0356	0.0046	0.0048	N/A
18	----	----	0.0003	0.0009	N/A
19	0.0237	0.0356	0.0030	0.0032	N/A
20	----	----	0.0003	0.0008	N/A
21	0.0356	0.0356	0.0017	0.0021	N/A
22	----	----	0.0004	0.0008	N/A
23	0.0356	0.0356	0.0008	0.0010	N/A
24	----	----	0.0004	0.0008	N/A
25	0.0356	0.0356	0.0006	0.0008	N/A
26	----	----	0.0004	0.0008	N/A
27	0.0356	0.0356	0.0007	0.0008	N/A
28	----	----	0.0003	0.0007	N/A
29	0.0356	0.0356	0.0009	0.0012	N/A
30	----	----	0.0003	0.0007	N/A
31	0.0356	0.0356	0.0011	0.0013	N/A
32	----	----	0.0004	0.0007	N/A
33	0.0356	0.0356	0.0010	0.0012	N/A
34	----	----	0.0004	0.0007	N/A
35	0.0356	0.0356	0.0012	0.0013	N/A
36	----	----	0.0004	0.0006	N/A
37	0.0356	0.0356	0.0009	0.0010	N/A
38	----	----	0.0004	0.0007	N/A
39	0.0356	0.0356	0.0009	0.0012	N/A
40	----	----	0.0004	0.0006	N/A

N/A : Not Apply



## 5.5 Voltage Fluctuation and Flicker

**Test Requirement** : EN 61000-3-3

**Test Method** : EN 61000-3-3

**Test Result** : Pass

According to EN 61000-3-3 which states: " Incandescent lamp luminaires with ratings less than or equal to 1000 W and discharge and LED lamp luminaires with ratings less than or equal to 600 W, are deemed to comply with the dc, dmax and Tmax limits in this standard and are not required to be tested. And LED luminaires with ratings less than or equal to 600 W, are deemed to comply with the dc, dmax and Tmax limits in this standard and are not required to be tested."

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## 6 Immunity Test Results

### 6.1 Performance Criteria

**Performance criterion A:** During the test, no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.

**Performance criterion B:** During the test, the luminous intensity may change to any value. After the test, the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test, but after the test, the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.

**Performance criterion C:** During and after the test, any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal, if necessary by temporary interruption of the mains supply and/or operating the regulating control.

### 6.2 Electrostatic Discharge (ESD)

<b>Test Requirement</b> .....	:	EN 61547
<b>Test Method</b> .....	:	IEC 61000-4-2
<b>Test Result</b> .....	:	Pass
<b>Discharge Impedance</b> .....	:	330Ω / 150pF
<b>Discharge Voltage</b> .....	:	Air Discharge: ±8kV Contact Discharge: ±4kV HCP & VCP: ±4kV
<b>Polarity</b> .....	:	Positive & Negative
<b>Number of Discharge</b> .....	:	Minimum 10 times at each test point
<b>Discharge Mode</b> .....	:	Single Discharge
<b>Discharge Period</b> .....	:	1 second minimum

#### 6.2.1 E.U.T. Operation

##### Operating Environment:

<b>Temperature</b> .....	:	21.7°C
<b>Humidity</b> .....	:	50.6%RH
<b>Barometric Pressure</b> .....	:	100.3kPa

##### EUT Operation:

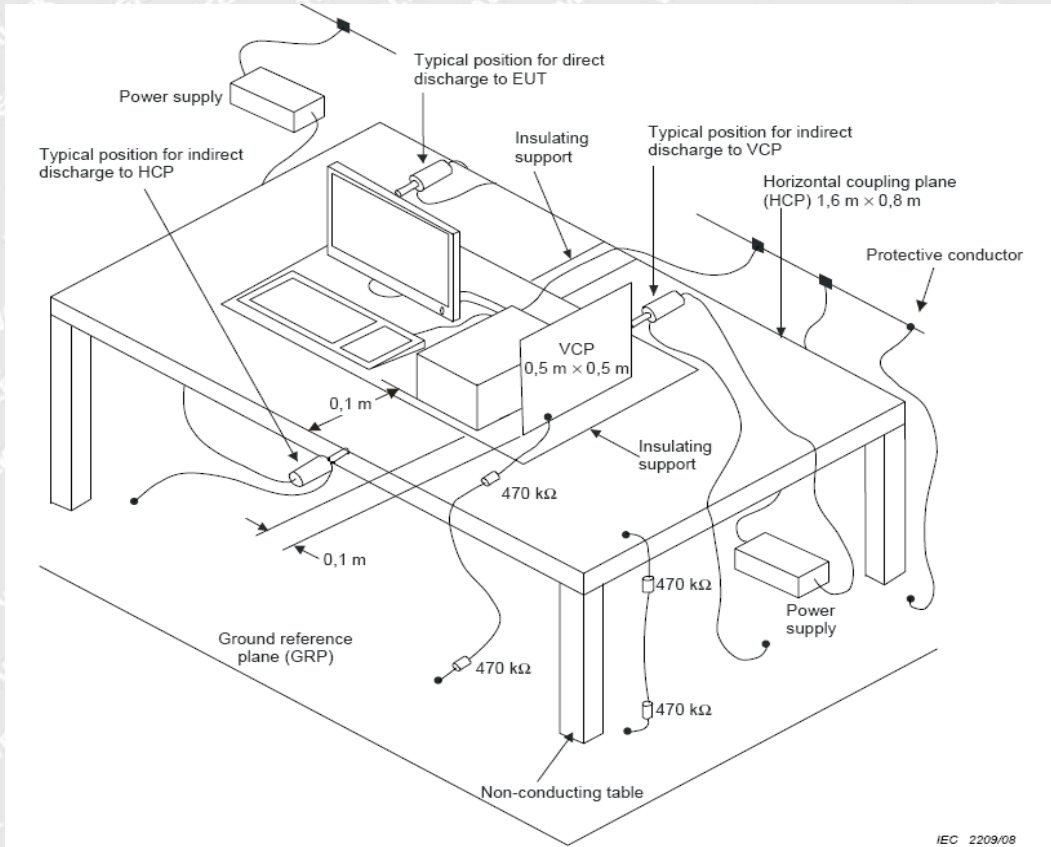
<b>Input Voltage</b> .....	:	230V~, 50Hz
<b>Operating Mode</b> .....	:	On mode





## 6.2.2 Block Diagram of Setup

The ESD test was performed in accordance with the IEC 61000-4-2.



## 6.2.3 Direct Discharge Test Results

Observations:

Test points:

1. All Exposed Surface & Seams;
2. All metallic part

Direct Discharge			Test Results		
Applied Voltage (kV)	Performance Criterion	Test Point	Contact Discharge	Air Discharge	Actual performance
±8	B	1	N/A	Pass*	A
±4	B	2	Pass*	N/A	A

Remark:

- \* During the test no deviation was detected to the selected operation mode(s)



## 6.2.4 Indirect Discharge Test Results

Observations: Test points: 1. All sides.

Indirect Discharge			Test Results		
Applied Voltage (kV)	Performance Criterion	Test Point	Horizontal Coupling	Vertical Coupling	Actual performance
±4	B	1	Pass*	Pass*	A

Remark:

\* During the test no deviation was detected to the selected operation mode(s)

## 6.3 Radio-frequency electromagnetic fields, 80MHz to 1GHz

Test Requirement..... : EN 61547  
 Test Method..... : IEC 61000-4-3  
 Test Result..... : Pass  
 Frequency Range..... : 80MHz to 1GHz  
 Test level..... : 3V/m  
 Modulation..... : 80%, 1kHz Amplitude Modulation.  
 Face of EUT..... : Front, Back, Left, Right  
 Antenna polarisation .... : Horizontal& Vertical

### 6.3.1 E.U.T. Operation

Operating Environment:

Temperature..... : 21.9°C  
 Humidity..... : 52.8%RH

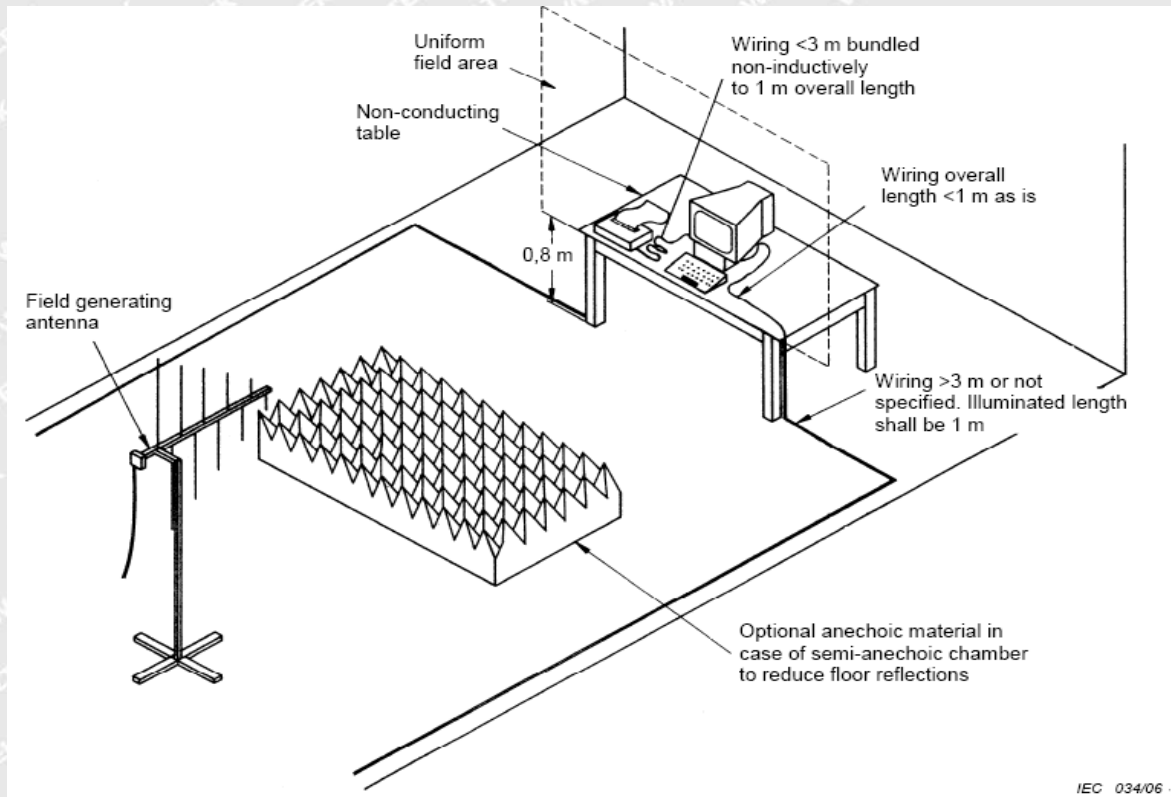
EUT Operation:

Input Voltage..... : 230V~, 50Hz  
 Operating Mode..... : On mode



### 6.3.2 Block Diagram of Setup

The Radio-frequency electromagnetic fields Immunity test was performed in accordance with the IEC 61000-4-3.



### 6.3.3 Test Results

Frequency	Face of EUT	Antenna polarisation	Test Level	Step Size	Dwell Time	Performance Criterion	Result	Actual performance
80 to 1000MHz	Front, Back, Left, Right	Horizontal	3V/m	1%	3s	A	Pass*	A
80 to 1000MHz	Front, Back, Left, Right	Vertical	3V/m	1%	3s	A	Pass*	A

Remark:

\* During the test no deviation was detected to the selected operation mode(s)



## 6.4 Electrical Fast Transients (EFT)

<b>Test Requirement</b> .....	:	EN 61547
<b>Test Method</b> .....	:	IEC 61000-4-4
<b>Test Result</b> .....	:	Pass
<b>Test Level</b> .....	:	1.0kV on AC Mains
<b>Polarity</b> .....	:	Positive & Negative
<b>Repetition Frequency</b> ....	:	5kHz
<b>Burst Duration</b> .....	:	300ms
<b>Test Duration</b> .....	:	2 minutes per level & polarity

### 6.4.1 E.U.T. Operation

#### Operating Environment:

<b>Temperature</b> .....	:	21.7°C
<b>Humidity</b> .....	:	50.6%RH

#### EUT Operation:

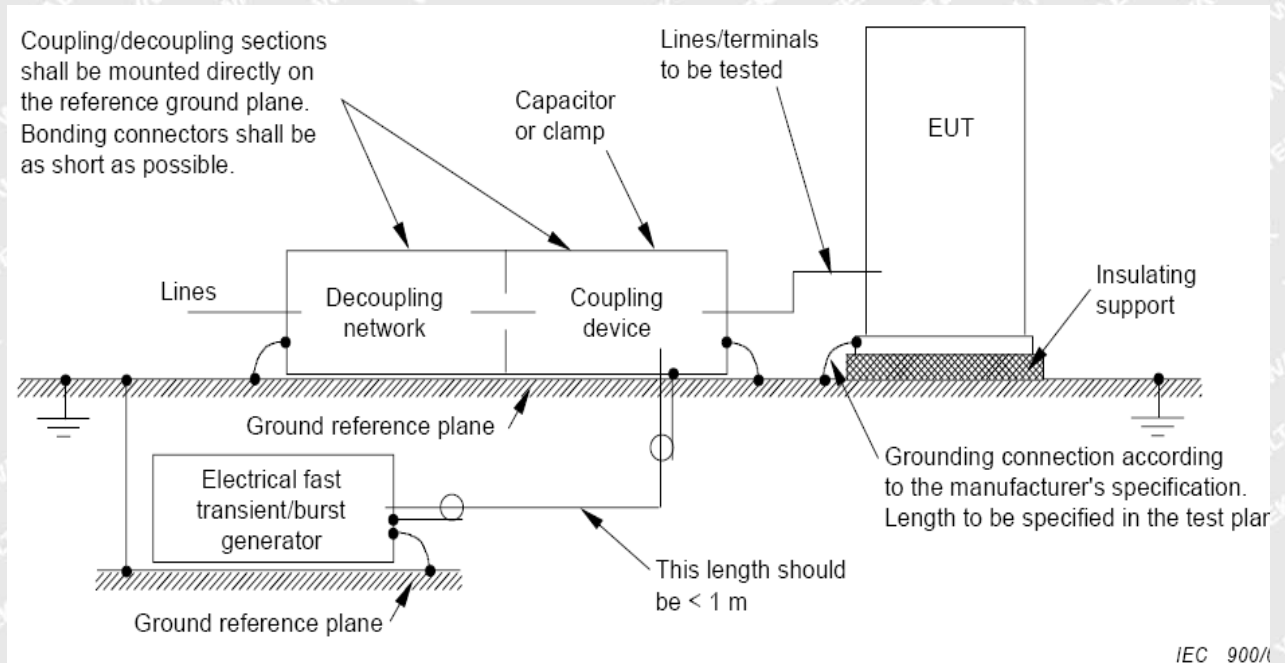
<b>Input Voltage</b> .....	:	230V~, 50Hz
<b>Operating Mode</b> .....	:	On mode

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### 6.4.2 Block Diagram of Setup

The Electrical Fast Transients Immunity test was performed in accordance with the IEC 61000-4-4.



### 6.4.3 Test Results

Test Port	Test Level(kV)	Performance Criterion	Result	Actual performance
Line-Neutral-PE	±1.0	B	Pass*	A

Remark:

- \* During the test no deviation was detected to the selected operation mode(s)



## 6.5 Surge

<b>Test Requirement</b> .....	: EN 61547
<b>Test Method</b> .....	: IEC 61000-4-5
<b>Test Result</b> .....	: Pass
<b>Test level</b> .....	: Table 10 of EN 61547
<b>Interval</b> .....	: 60s between each surge
<b>No. of surges</b> .....	: 5 positive at 90°, 5 negative at 270°.

### 6.5.1 E.U.T. Operation

#### Operating Environment:

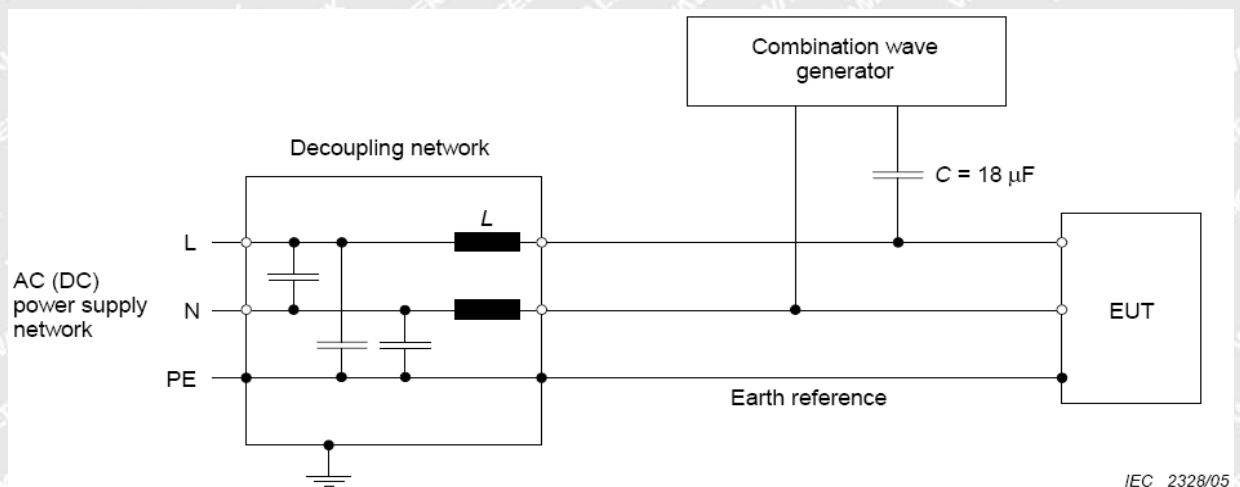
<b>Temperature</b> .....	: 21.7°C
<b>Humidity</b> .....	: 50.6%RH

#### EUT Operation:

<b>Input Voltage</b> .....	: 230V~, 50Hz
<b>Operating Mode</b> .....	: On mode

### 6.5.2 Block Diagram of Setup

The Surge Immunity test was performed in accordance with the IEC 61000-4-5.



### 6.5.3 Test Results

Test Port	Applied Voltage (kV)	Performance criterion	Result	Actual performance
Between Live And Neutral	±1	C	Pass*	B
Between Live And Earth	±2	C	Pass*	B
Between Neutral And Earth	±2	C	Pass*	B

Remark:

- \* During the test no deviation was detected to the selected operation mode(s)



## 6.6 Injected Currents Immunity 0.15MHz to 80MHz

Test Requirement.....	: EN 61547
Test Method .....	: IEC 61000-4-6
Test Result .....	: Pass
Frequency Range .....	: 0.15MHz to 80MHz
Test level .....	: 3V r.m.s. (unmodulated emf into 150 Ω)
Modulation .....	: 80%, 1kHz Amplitude Modulation.

### 6.6.1 E.U.T. Operation

#### Operating Environment:

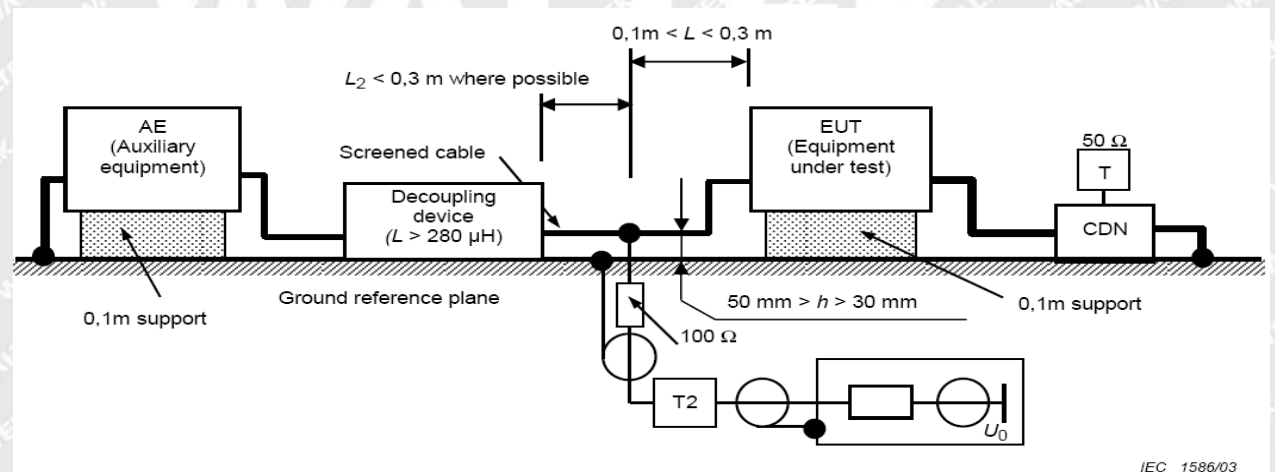
Temperature .....	: 23.8°C
Humidity .....	: 50.9%RH

#### EUT Operation:

Input Voltage .....	: 230V~, 50Hz
Operating Mode.....	: On mode

### 6.6.2 Block Diagram of Setup

The Injected Currents Immunity test was performed in accordance with the IEC 61000-4-6.



### 6.6.3 Test Results

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Performance Criterion	Result	Actual performance
0.15MHz to 80MHz	3 Wire AC Supply Cables	3Vr.m.s.	80%, 1kHz Amp. Mod.	1%	3s	A	Pass*	A

Remark:

- \* During the test no deviation was detected to the selected operation mode(s)



## 6.7 Voltage Dips and Interruptions

Test Requirement.....	EN 61547
Test Method.....	IEC 61000-4-11
Test Result.....	Pass
Test Level(Voltage reduction)	0%&70 % of $U_T$ (Supply Voltage)
No. of Dips / Interruptions.....	1 per Level at 20ms intervals

### 6.7.1E.U.T. Operation

#### Operating Environment:

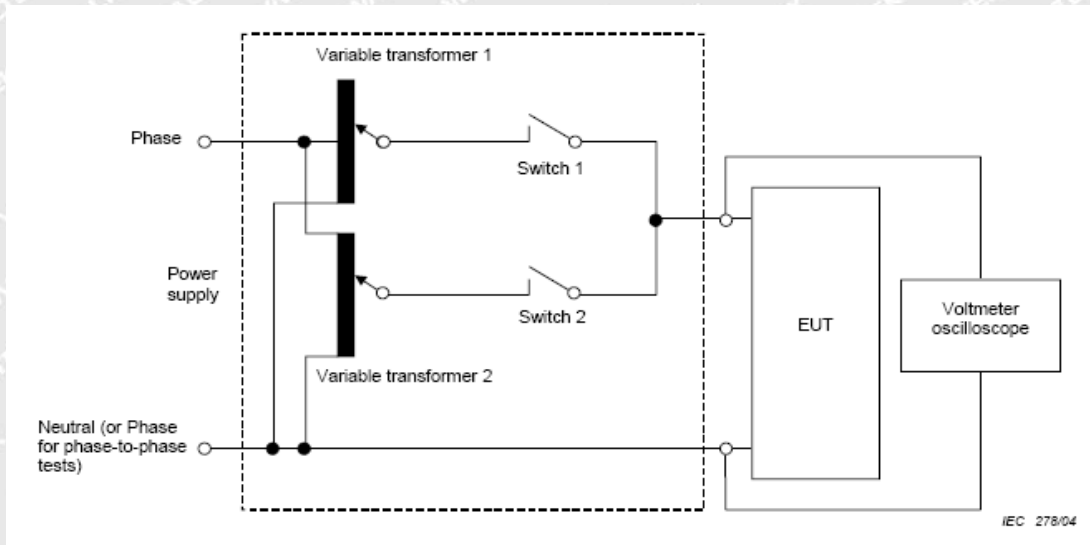
Temperature.....	21.7°C
Humidity.....	50.6%RH

#### EUT Operation:

Input Voltage.....	230V~, 50Hz
Operating Mode.....	On mode

### 6.7.2 Block Diagram of Setup

The Voltage Dips and Interruptions Immunity test was performed in accordance with the IEC 61000-4-11.



### 6.7.3 Test Results

Test Level in % $U_T$	Phase	Performance criterion	Duration	Result	Actual performance
0	0° & 180°	B	0.5	Pass*	B
70	0° & 180°	C	10	Pass*	B

Remark:

- \* During the test no deviation was detected to the selected operation mode(s)





## 7 Photographs – Test Setup

### 7.1 Photograph – Mains Terminal Disturbance Voltage Test Setup



### 7.2 Photograph – Radiated electromagnetic disturbance Test Setup, 9kHz to 30MHz





### 7.3 Photograph – Radiated Emission Test Setup, 30MHz to 1000MHz



### 7.4 Photograph – Harmonic Current Test Setup





### 7.5 Photograph – ESD Immunity Test Setup



### 7.6 Photograph – Radio-frequency electromagnetic fields Immunity Test Setup





### 7.7 Photograph – EFT & Voltage Dips and Interruptions Immunity Test Setup



### 7.8 Photograph – Surge Immunity Test Setup





## 7.9 Photograph – Injected Currents Immunity Test Setup



# WALTEK



## 8 Photographs – Constructional Details

### 8.1 EUT –Front View



### 8.2 EUT –Back View



====End of Report====

## 2.4 Componentes de las Luminarias

- UNE-EN 62031. Módulos LED para alumbrado general.  
Requisitos de seguridad. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.)
- UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13:  
Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.
- UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED.
- Requisitos de funcionamiento.



Product Service

# Attestation of Compliance

No. N5A 17 11 02897 001

**Holder of Certificate: NOVATILU, S.L.U**Via Ausetania 11  
08560 Manlleu  
SPAIN**Product: LED Module**

This Attestation of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of Low Voltage Directive 2014/35/EU. The essential requirements are fulfilled accordingly based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for testing and certification. See also notes overleaf.

**Test report no.:** 701281718401-00**Date,** 2017-11-16( Binwen Zhang )  


Other relevant European directives have to be observed. If they require CE marking, it may be affixed on the product after preparation of the necessary technical documentation as well as the EU declaration of conformity.

Page 1 of 3





Product Service

**Attestation of Compliance**  
**No. N5A 17 11 02897 001**

**Model(s):** AML079XXX,AML0612XXX,AML0616XXX,  
AML0624XXX,AML0632XXX,ANL16LXXX,  
ANL32LXXX,AML0412XXX,AML0315XXX,  
AML0248XXX,AML0236XXX,AML0224XXX,  
AML0130XXX

**Brand:** NOVATILU

**Parameters:**

Rated voltage:	See attachment
Protection Class:	Class III
Rated power:	See attachment
Degree of protection:	IP66
tc:	85°C
ta:	45°C

**Tested according to:** EN 62031:2008/A2:2015  
EN 62493:2015  
EN 62471:2008

**Attestation of Compliance**  
**No. N5A 17 11 02897 001**



Product Service

Model type	Max. Wattage(W)	Voltage (dc.V)	Quantity of LEDs
AML079XXX	30	21,6~36	9
AML0612XXX	30	25,2~42	12
AML0616XXX	40	32,4~54	16
AML0624XXX	60	25,2~42	24
AML0632XXX	80	32,4~54	32
ANL16LXXX	40	32,4~54	16
ANL32LXXX	80	32,4~54	32
AML0412XXX	80	25,2~42	12
AML0315XXX	40	32,4~54	15
AML0248XXX	100	25,2~42	48
AML0236XXX	80	25,2~42	36
AML0224XXX	60	25,2~42	24
AML0130XXX	60	21,6~36	30

Note: XXX can be 001-100, represents the rated power of product, e.g. 005=5W



APL

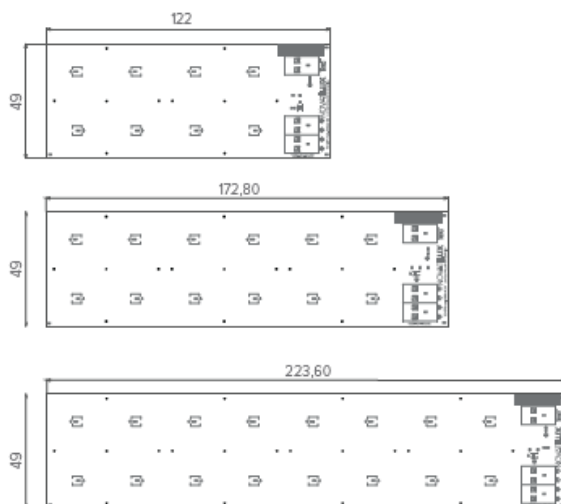
# PCB



El módulo de LED del Grupo Benito Novatilu mediante su tecnología propia ofrece un alto rendimiento lumínico con las máximas garantía de seguridad y una óptima calidad fotométrica, gracias al principio de adiciones donde cada LED dispone de su lente específica.

- MCPCB de Aluminio de Alta Transferencia Térmica en formatos (8, 12 y 16 LEDs) según Estándar Zhaga Book 15.
- Tecnología LED de Alta Eficiencia en formato 5050 con rendimiento >172lm/W.
- Control del flujo lumínico mediante lentes PMMA 2x2 de alta transparencia. Disponibilidad >18 distribuciones lumínicas diferentes.
- Doble Protección de sobretensiones Transitorias.
- Incluye sensor NTC de Temperatura para la protección Térmica del LED.
- Disponible en Diferentes Temperaturas de Color (de PC Ambar a 5000K) y distintos índices de reproducción cromática IRC (>70 o >80).

PLANO:

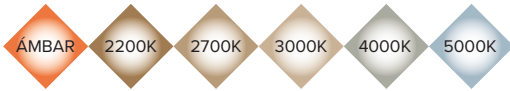


CONFIGURACIONES:

- APL16ZH - 48Vdc
- APL12ZH - 36Vdc
- APL8ZH - 24Vdc

El Grupo BENITO NOVATILU se reserva el derecho de realizar modificaciones a sus productos sin previo aviso

## RANGO DE TEMPERATURA DE COLOR



## LAS VERSIONES DE PCB BENITO NOVATILU

REF.	Nº LEDs	I <sub>max</sub> (mA)	W <sub>max</sub> (W)	Flujo lumínico Real (T) (=85°C)	Eficiencia lm/W	Flujo lumínico Real (T) (=25°C)	Eficiencia lm/W
<APL8ZH	8	1050	25,2	3881	154	4208	167
<APL12ZH	12	1050	37,8	5821	154	6313	167
<APL16ZH	16	1050	50,4	7762	154	8417	167

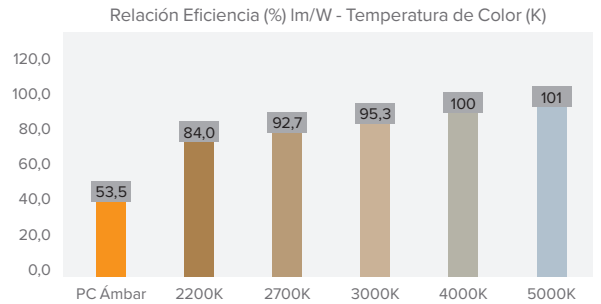
L90B10 >100.000h según TM21 (Certificado por Laboratorio ENAC).

Temperatura de Funcionamiento -35°C - + 60°C.

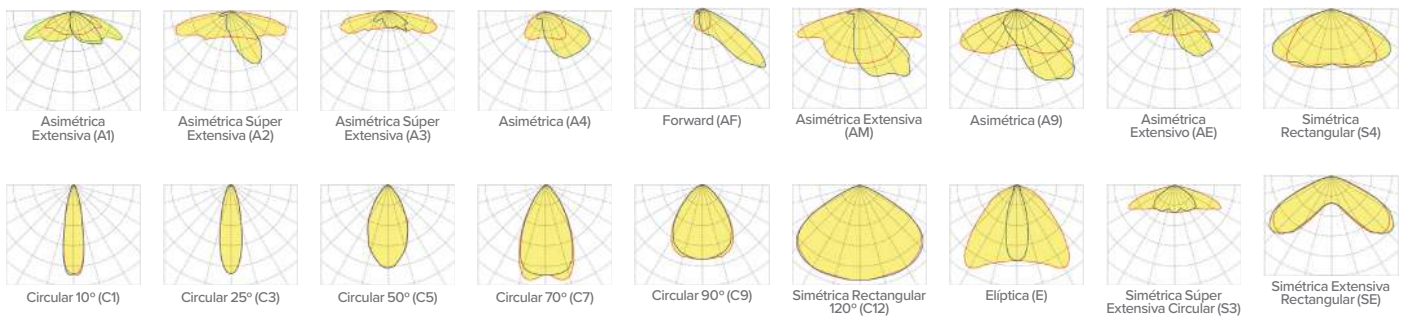
Corriente del LED = Corriente Driver /2 (I<sub>max</sub> - 525mA).

Tolerancia del flujo lumínico < +/-3%.

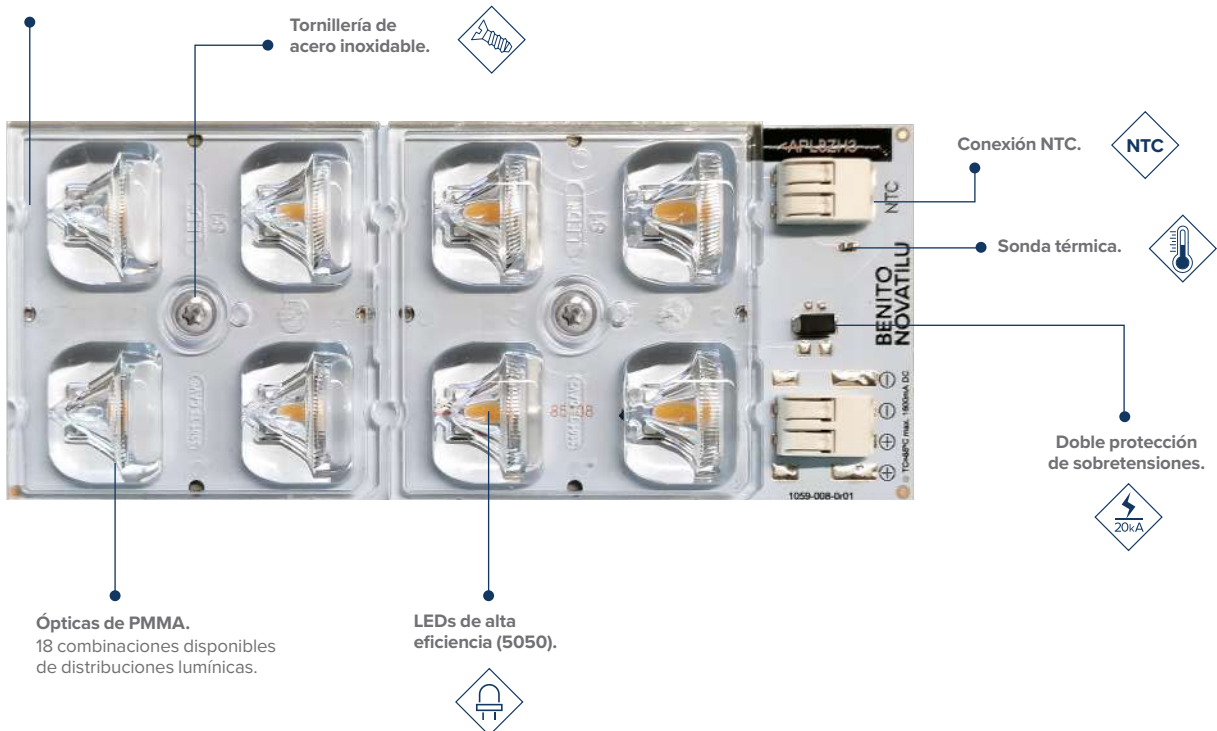
Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.



## DISTRIBUCIONES LUMÍNICAS DISPONIBLES



PCB BENITO NOVATILU de aluminio de alta transferencia térmica en 3 formatos standard Zhaga (Book15) (8, 12 y 16 LED). Consultar temperaturas de color y distribuciones lumínicas.

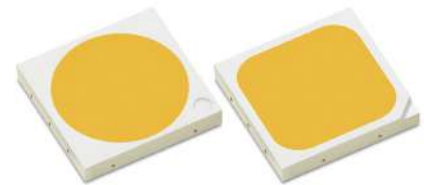


El Grupo BENITO NOVATILU se reserva el derecho de realizar modificaciones a sus productos sin previo aviso

# LUXEON 5050

High efficacy and superior robustness in a multi-die, high power package, enabling cost-effective system design

LUXEON 5050 is a multi-die, high power package that provides high luminance from a super robust package to enable cost effective, single optic and directional fixture designs. LUXEON 5050 uses an industry standard 5050 surface mount package with a small Light Emitting Surface (LES). LUXEON 5050 comes in 70CRI, 80CRI and 90CRI with a wide range of CCTs, and offers hot-color targeting to ensure that the LEDs are within color target at application conditions of 85°C.



## FEATURES AND BENEFITS

- Superior lm/W enables outstanding efficacy in end application
- Extremely reliable package design affirms long lifetime in harsh environments <sup>[1]</sup>
- Two voltage configurations are compatible with low cost high efficacy drivers
- Low  $R_{th}$  enables effective thermal dissipation design for higher efficiency
- Hot-color targeting ensures color is within ANSI bin at 85°C
- 3-step and 5-step MacAdam ellipse binning structure ensures excellent color uniformity

1. Refer to reliability datasheet for more details.

## PRIMARY APPLICATIONS

- High Bay
- Low Bay
- Floodlights
- Wall Pack
- [More...](#)

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# General Product Information

## Product Test Conditions

LUXEON 5050 LEDs are tested with a 20ms monopulse specified below at a junction temperature,  $T_j$ , of 25°C. Forward voltage and luminous flux are binned at a  $T_j$  of 25°C, while color is hot-targeted at a  $T_j$  of 85°C.

- 160mA - LUXEON 5050 (Round LES) – 24V and LUXEON 5050 (Square LES) – 30V
- 640mA - LUXEON 5050 (Round LES) – 6V
- 800mA - LUXEON 5050 (Square LES) – 6V

## Part Number Nomenclature

Part numbers for LUXEON 5050 follow the convention below:

L 1 5 0 – **A A B B** 5 0 **C C** 0 0 0 **D** 0

Where:

- A A** - designates nominal ANSI CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K 40=4000K, 50=5000K, 57=5700K, 65=6500K)
- B B** - designates minimum CRI (70=70CRI, 80=80CRI, 90=90CRI)
- C C** - designates voltage (06=6V, 24=24V, 30=30V)
- D** - designates product type (0=Round LES, S=Square LES)

Therefore, the following part number is used for a LUXEON 5050 Square LES, 3000K 80CRI, 30V:

L 1 5 0 – **3 0 8 0** 5 0 **3 0** 0 0 0 **S** 0

## Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

## Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON 5050 is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

# Performance Characteristics

## Product Selection Guide

Table 1. Product performance of LUXEON 5050 at specified test current,  $T_j=25^\circ\text{C}$ .

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Round LES) 24V	2200K	70	515	550	140	160	L150-2270502400000
	2700K	70	535	605	154	160	L150-2770502400000
	3000K	70	553	625	159	160	L150-3070502400000
	3500K	70	600	635	162	160	L150-3570502400000
	4000K	70	580	675	172	160	L150-4070502400000
	5000K	70	580	672	171	160	L150-5070502400000
	5700K	70	570	661	169	160	L150-5770502400000
	6500K	70	570	655	167	160	L150-6570502400000
	2200K	80	440	475	121	160	L150-2280502400000
	2700K	80	500	550	140	160	L150-2780502400000
	3000K	80	516	590	151	160	L150-3080502400000
	3500K	80	527	595	152	160	L150-3580502400000
	4000K	80	539	615	157	160	L150-4080502400000
	5000K	80	539	615	157	160	L150-5080502400000
	5700K	80	539	615	157	160	L150-5780502400000
	6500K	80	539	615	157	160	L150-6580502400000
	2700K	90	414	475	121	160	L150-2790502400000
	3000K	90	428	490	125	160	L150-3090502400000
	3500K	90	445	510	130	160	L150-3590502400000
	4000K	90	456	530	135	160	L150-4090502400000
	5000K	90	456	530	135	160	L150-5090502400000
5700K	90	456	530	135	160	L150-5790502400000	
LUXEON 5050 (Round LES) 6V	2200K	70	515	550	140	640	L150-2270500600000
	2700K	70	535	605	154	640	L150-2770500600000
	3000K	70	553	625	159	640	L150-3070500600000
	3500K	70	600	635	162	640	L150-3570500600000
	4000K	70	580	675	172	640	L150-4070500600000
	5000K	70	580	672	171	640	L150-5070500600000
	5700K	70	570	661	169	640	L150-5770500600000
	6500K	70	570	655	167	640	L150-6570500600000
	2200K	80	440	475	121	640	L150-2280500600000
	2700K	80	500	550	140	640	L150-2780500600000
	3000K	80	516	590	151	640	L150-3080500600000
	3500K	80	527	595	152	640	L150-3580500600000
	4000K	80	539	615	157	640	L150-4080500600000
	5000K	80	539	615	157	640	L150-5080500600000
	5700K	80	539	615	157	640	L150-5780500600000
	6500K	80	539	615	157	640	L150-6580500600000
	2700K	90	414	475	121	640	L150-2790500600000
	3000K	90	428	490	125	640	L150-3090500600000
	3500K	90	445	510	130	640	L150-3590500600000
	4000K	90	456	530	135	640	L150-4090500600000
	5000K	90	456	530	135	640	L150-5090500600000
5700K	90	456	530	135	640	L150-5790500600000	

Table 1 continued on next page:

1. Correlated color temperature is not targeted at  $T_j=85^\circ\text{C}$ .
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at  $T_j=25^\circ\text{C}$ . Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of  $\pm 2$  on CRI and  $\pm 7\%$  on luminous flux measurements.



Table 1. Product performance of LUXEON 5050 at specified test current, T<sub>j</sub>=25°C, Continued.

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER	
			MINIMUM	TYPICAL				
LUXEON 5050 (Square LES) 30V	2200K	70	621	690	141	160	L150-22705030000S0	
	2700K	70	693	770	158	160	L150-27705030000S0	
	3000K	70	720	800	164	160	L150-30705030000S0	
	3500K	70	729	810	166	160	L150-35705030000S0	
	4000K	70	743	825	169	160	L150-40705030000S0	
	5000K	70	743	825	169	160	L150-50705030000S0	
	5700K	70	738	820	168	160	L150-57705030000S0	
	6500K	70	720	800	164	160	L150-65705030000S0	
	2200K	80	586	630	129	160	L150-22805030000S0	
	2700K	80	650	695	142	160	L150-27805030000S0	
	3000K	80	665	715	147	160	L150-30805030000S0	
	3500K	80	679	730	150	160	L150-35805030000S0	
	4000K	80	700	750	154	160	L150-40805030000S0	
	5000K	80	702	755	155	160	L150-50805030000S0	
	5700K	80	700	750	154	160	L150-57805030000S0	
	6500K	80	688	740	152	160	L150-65805030000S0	
	2700K	90	558	600	123	160	L150-27905030000S0	
	3000K	90	586	630	129	160	L150-30905030000S0	
	3500K	90	600	640	131	160	L150-35905030000S0	
	4000K	90	609	655	134	160	L150-40905030000S0	
	5000K	90	618	665	136	160	L150-50905030000S0	
	5700K	90	605	650	133	160	L150-57905030000S0	
	LUXEON 5050 (Square LES) 6V	2200K	70	621	690	141	800	L150-22705006000S0
		2700K	70	693	770	158	800	L150-27705006000S0
		3000K	70	720	800	164	800	L150-30705006000S0
		3500K	70	729	810	166	800	L150-35705006000S0
		4000K	70	743	825	169	800	L150-40705006000S0
		5000K	70	743	825	169	800	L150-50705006000S0
5700K		70	738	820	168	800	L150-57705006000S0	
6500K		70	720	800	164	800	L150-65705006000S0	
2200K		80	586	630	129	800	L150-22805006000S0	
2700K		80	650	695	142	800	L150-27805006000S0	
3000K		80	665	715	147	800	L150-30805006000S0	
3500K		80	679	730	150	800	L150-35805006000S0	
4000K		80	700	750	154	800	L150-40805006000S0	
5000K		80	702	755	155	800	L150-50805006000S0	
5700K		80	700	750	154	800	L150-57805006000S0	
6500K		80	688	740	152	800	L150-65805006000S0	
2700K		90	558	600	123	800	L150-27905006000S0	
3000K		90	586	630	129	800	L150-30905006000S0	
3500K		90	600	640	131	800	L150-35905006000S0	
4000K		90	609	655	134	800	L150-40905006000S0	
5000K		90	618	665	136	800	L150-50905006000S0	
5700K		90	605	650	133	800	L150-57905006000S0	

Notes for Table 1:

1. Correlated color temperature is not targeted at T<sub>j</sub>=85°C.
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at T<sub>j</sub>=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7% on luminous flux measurements.

# Optical Characteristics

Table 2. Optical characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE <sup>[1]</sup>	TYPICAL VIEWING ANGLE <sup>[2]</sup>
L150-xxxx50xx000x0	138°	116°

**Notes for Table 2:**

- Total angle at which 90% of total luminous flux is captured.
- Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.

# Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	FORWARD VOLTAGE <sup>[1]</sup> ( $V_f$ )			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE <sup>[2]</sup> (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L150-xxxx502400000	23.5	24.4	26.5	-12	2.4
L150-xxxx500600000	5.8	6.1	6.6	-3	2.4
L150-xxxx5030000S0	29.0	30.5	32.0	-15	1.4
L150-xxxx5006000S0	5.8	6.1	6.6	-3	1.4

**Notes for Table 3:**

- Lumileds maintains a tolerance of ±1% on forward voltage measurements.
- Measured between 25°C and 85°C.

# Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON 5050.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current <sup>[1,2]</sup>	240mA for L150-xxxx502400000 800mA for L150-xxxx500600000 240mA for L150-xxxx5030000S0 1000mA for L150-xxxx5006000S0
Peak Pulsed Forward Current <sup>[1,3]</sup>	300mA for L150-xxxx502400000 1000mA for L150-xxxx500600000 300mA for L150-xxxx5030000S0 1250mA for L150-xxxx5006000S0
LED Junction Temperature <sup>[1]</sup> (DC & Pulse)	125°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 2
Operating Case Temperature <sup>[1]</sup>	105°C
LED Storage Temperature	-40°C to 105°C
Allowable Reflow Cycles	3
Reverse Voltage ( $V_{reverse}$ )	LUXEON LEDs are not designed to be driven in reverse bias

**Notes for Table 4:**

- Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
- Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," are acceptable if the following conditions are met:
  - The frequency of the ripple current is 100Hz or higher
  - The average current for each cycle does not exceed the maximum allowable DC forward current
  - The maximum amplitude of the ripple does not exceed the maximum peak pulsed forward current
- At 10% duty cycle with pulse width of 10ms.

# Characteristic Curves

## Spectral Power Distribution Characteristics

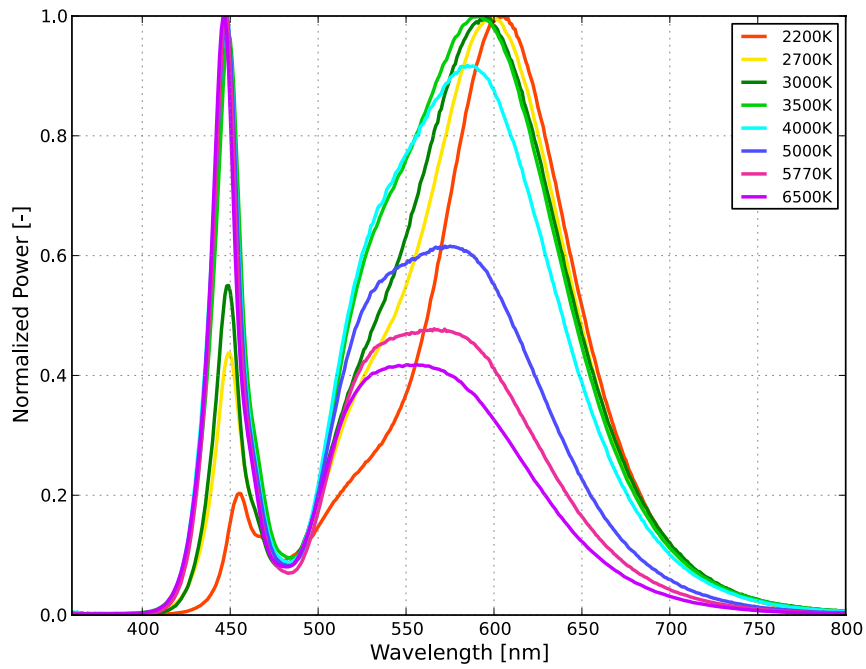


Figure 1a. Typical normalized power vs. wavelength for L150-xx7050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

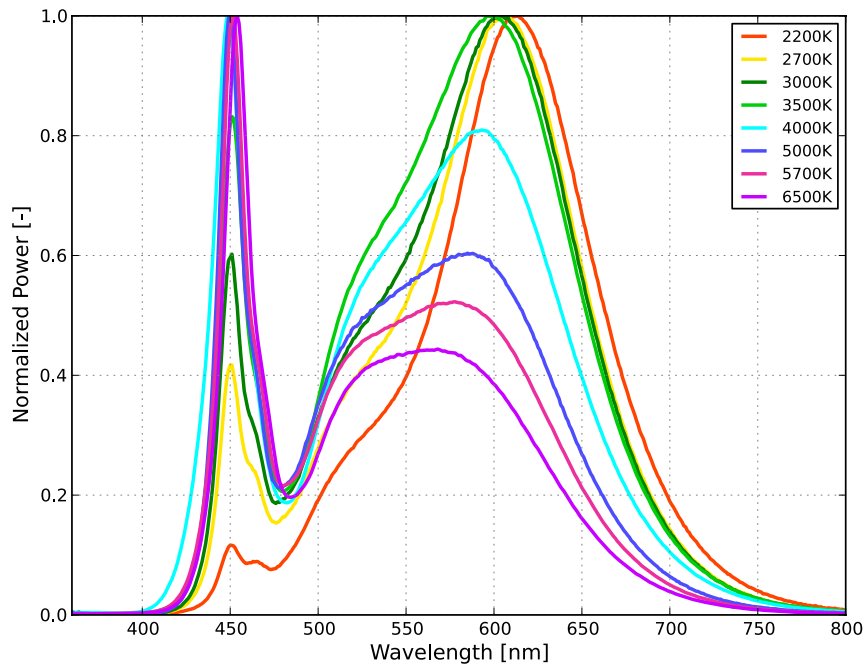


Figure 1b. Typical normalized power vs. wavelength for L150-xx8050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

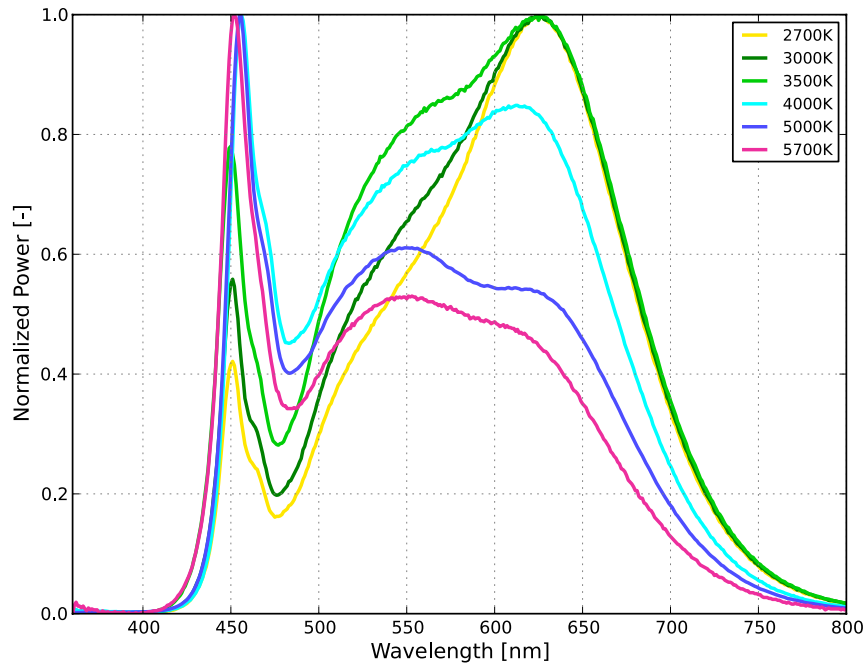


Figure 1c. Typical normalized power vs. wavelength for L150-xx9050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

## Light Output Characteristics

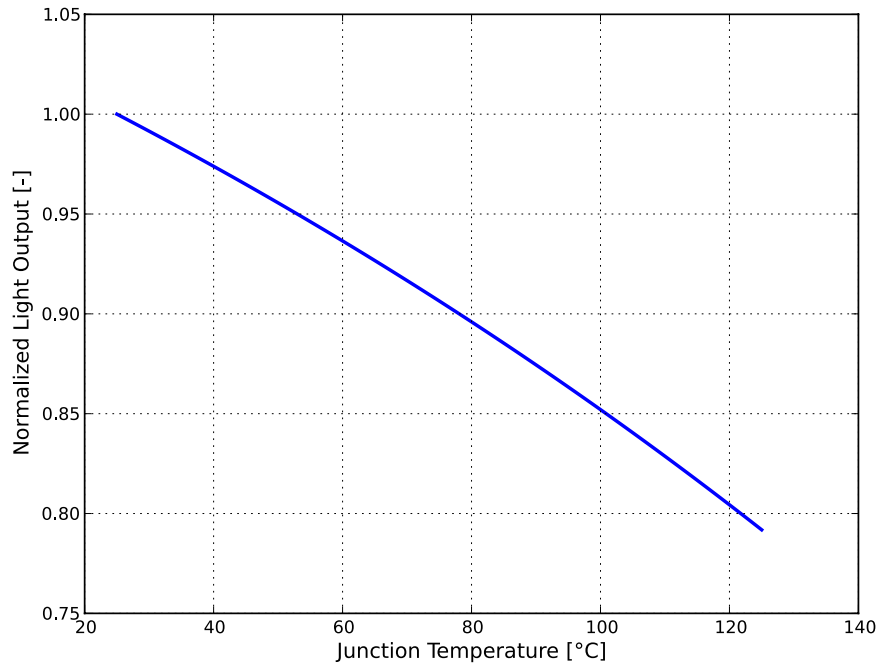


Figure 2. Typical normalized light output vs. junction temperature for L150-xxx50xx000x0 at specified test current.

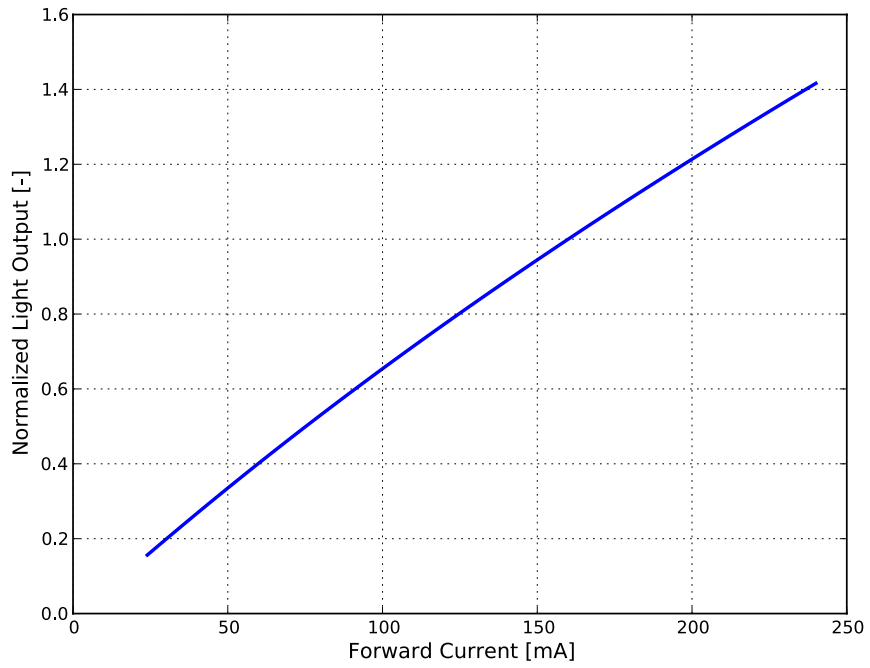


Figure 3a. Typical normalized light output vs. forward current for L150-xxxx50x000x0,  $T_j=25^\circ\text{C}$ .

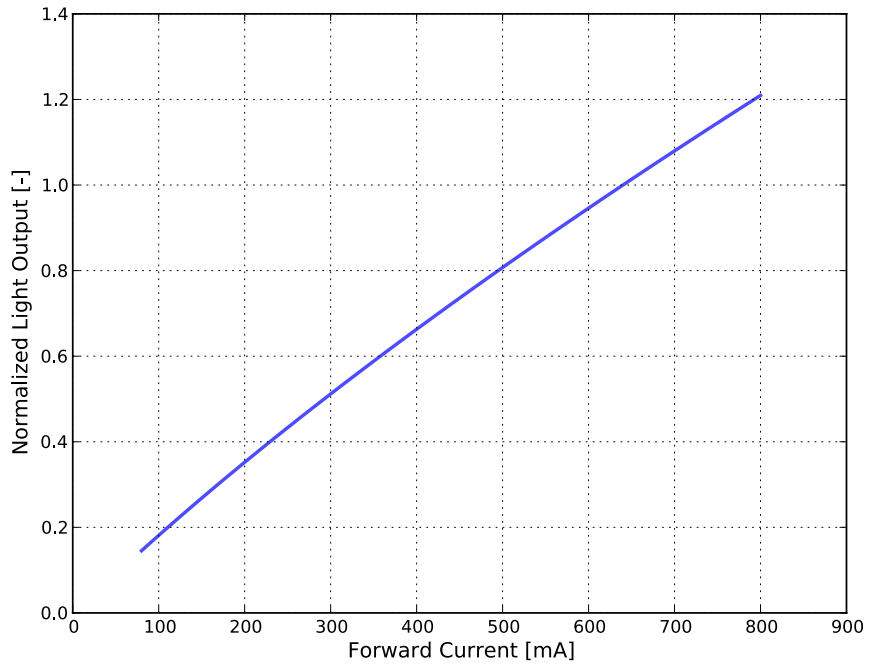


Figure 3b. Typical normalized light output vs. forward current for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

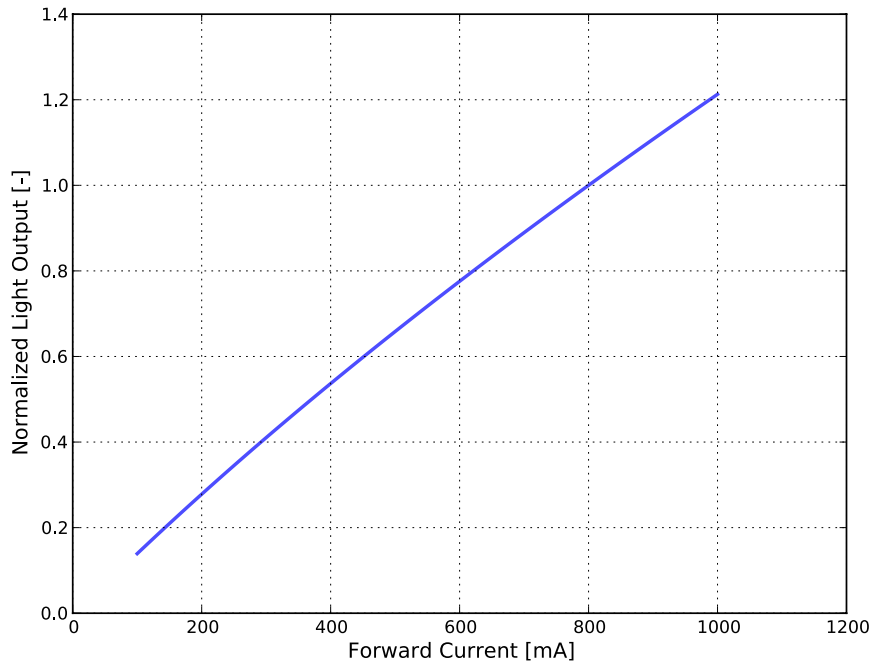


Figure 3c. Typical normalized light output vs. forward current for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Forward Current Characteristics

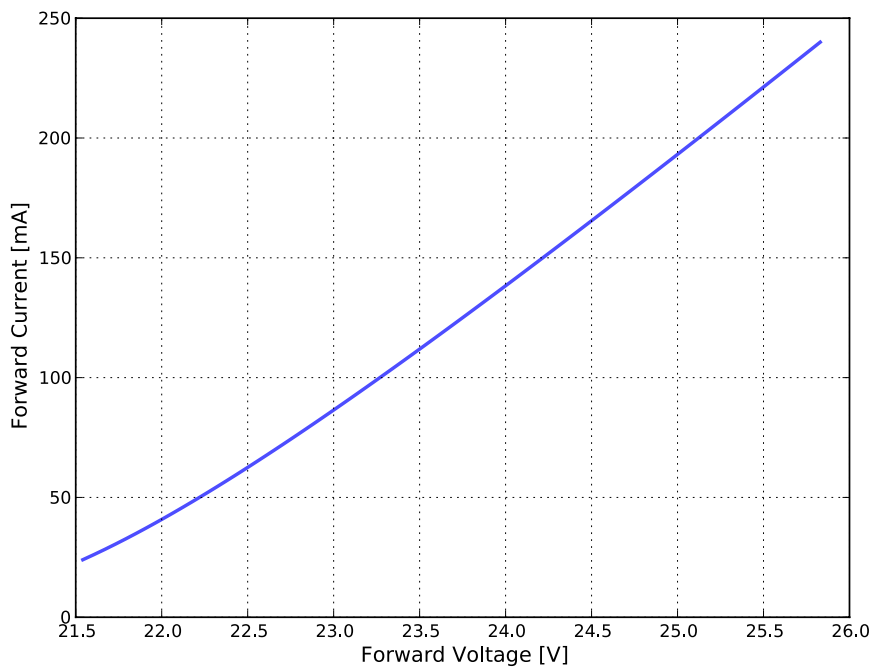


Figure 4a. Typical forward current vs. forward voltage for L150-xxxx502400000,  $T_j=25^\circ\text{C}$ .

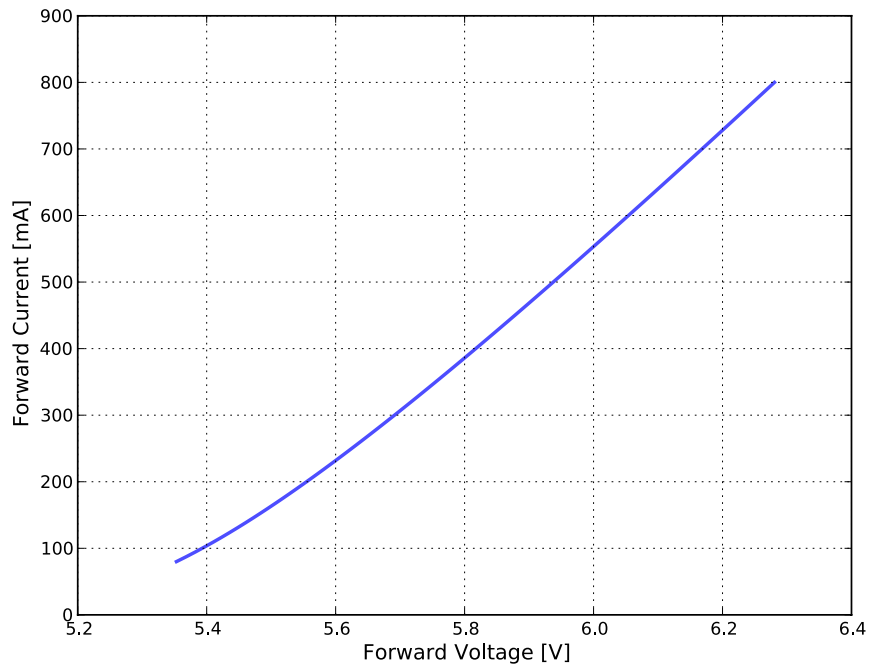


Figure 4b. Typical forward current vs. forward voltage for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

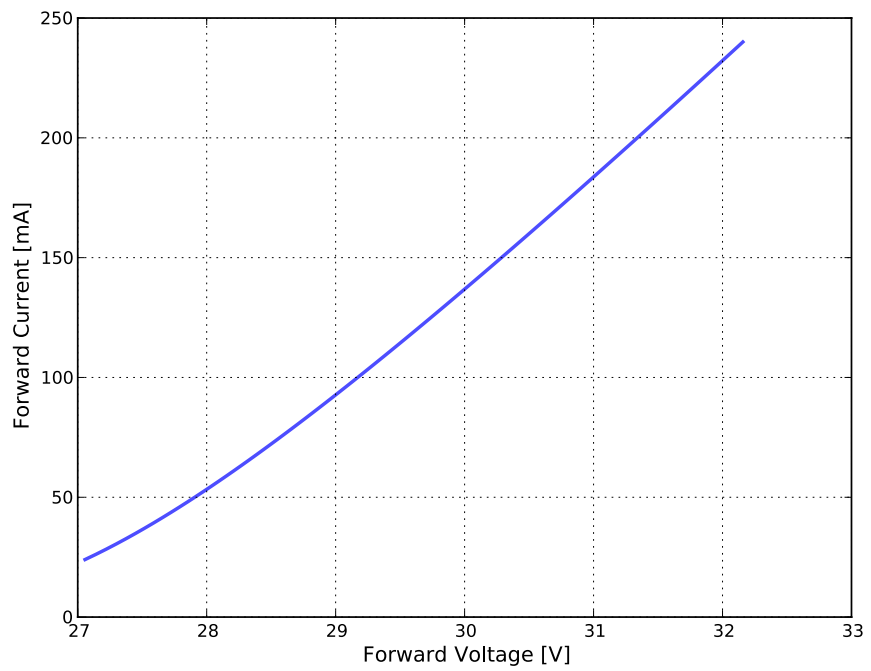


Figure 4c. Typical forward current vs. forward voltage for L150-xxxx503000050,  $T_j=25^\circ\text{C}$ .

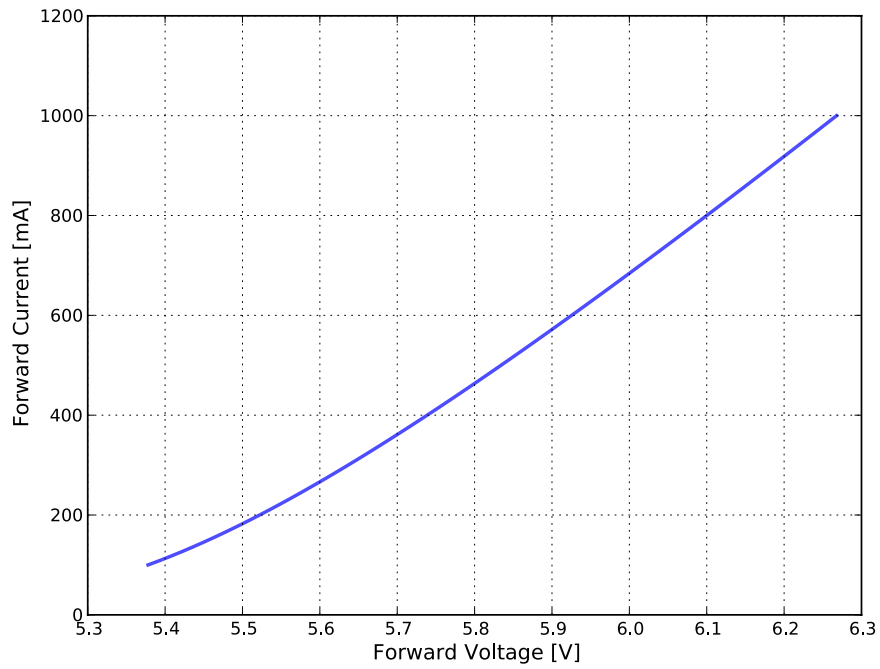


Figure 4d. Typical forward current vs. forward voltage for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Radiation Pattern Characteristics

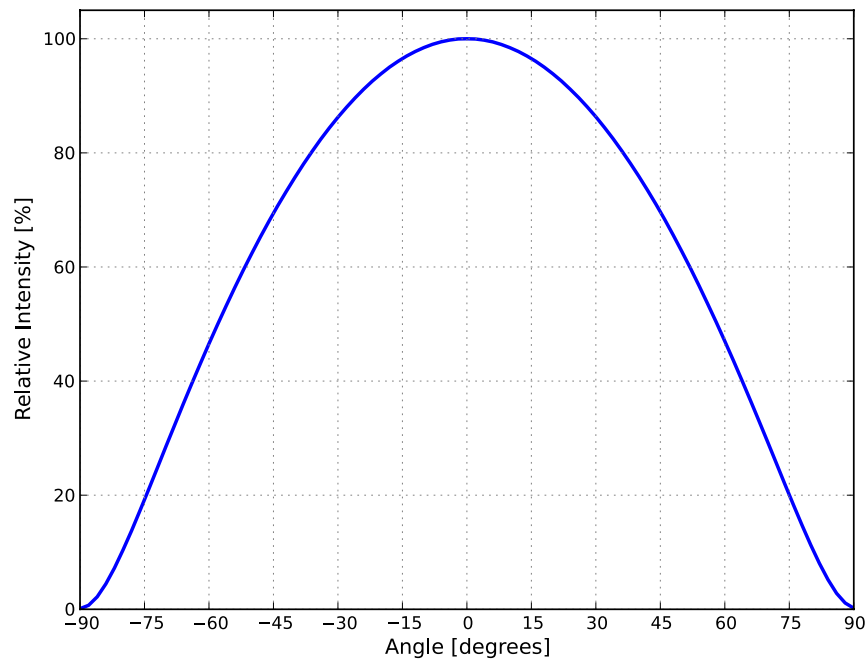


Figure 5. Typical radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .



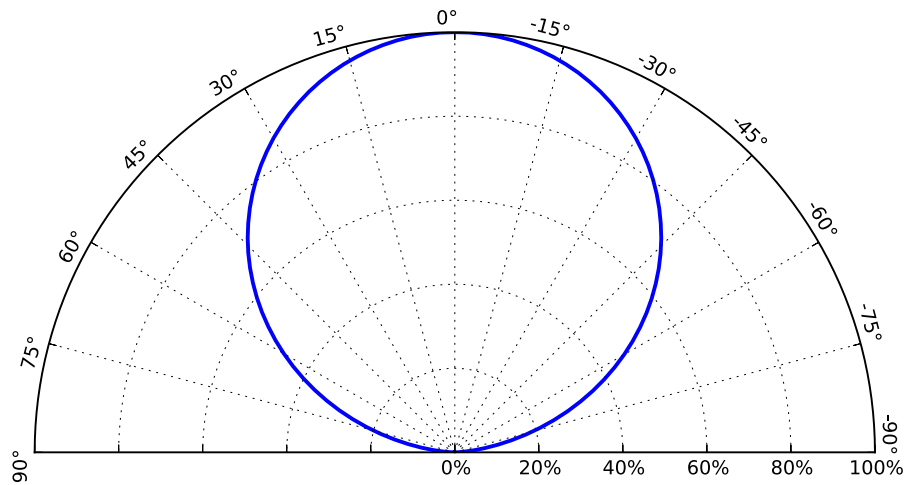


Figure 6. Typical polar radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

## Product Bin and Labeling Definitions

### Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON 5050 (Round LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B C C**

Where:

- A** - designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B** - designates color bin (example: 3=3 SDCM, 5=5 SDCM parts)
- C C** - designates forward voltage bin (example: A1, A2, B1, B2)

Therefore, a LUXEON 5050 (Round LES) with a lumen range of 600 to 650 lm, color bin of 3 and forward voltage range of 23.5 to 24.2V has the following CAT code:

**L 3 A 1**

LUXEON 5050 (Square LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B B C**

Where:

- A** – designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B B** – designates color bin: (example: 83=2700K and 3 SDCM, 35=5000K and 5 SDCM)
- C** – designates forward voltage bin (example: A, B, C, D)

Therefore, a LUXEON 5050 (Square LES) with a lumen range of 600 to 650 lm, color bin of 83 and forward voltage range of 29.0 to 30.0V has the following CAT code:

**L 8 3 A**

## Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON 5050 LEDs. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

**Table 5. Luminous flux bin definitions for LUXEON 5050, T<sub>j</sub>=25°C.**

BIN	LUMINOUS FLUX <sup>(1)</sup> (lm)	
	MINIMUM	MAXIMUM
G	400	450
H	450	500
J	500	550
K	550	600
L	600	650
M	650	700
N	700	750
P	750	800
Q	800	850
R	850	900
S	900	950
T	950	1000

Notes for Table 5:

1. Lumileds maintains a tolerance of ±7% on luminous flux measurements.

## Color Bin Definitions

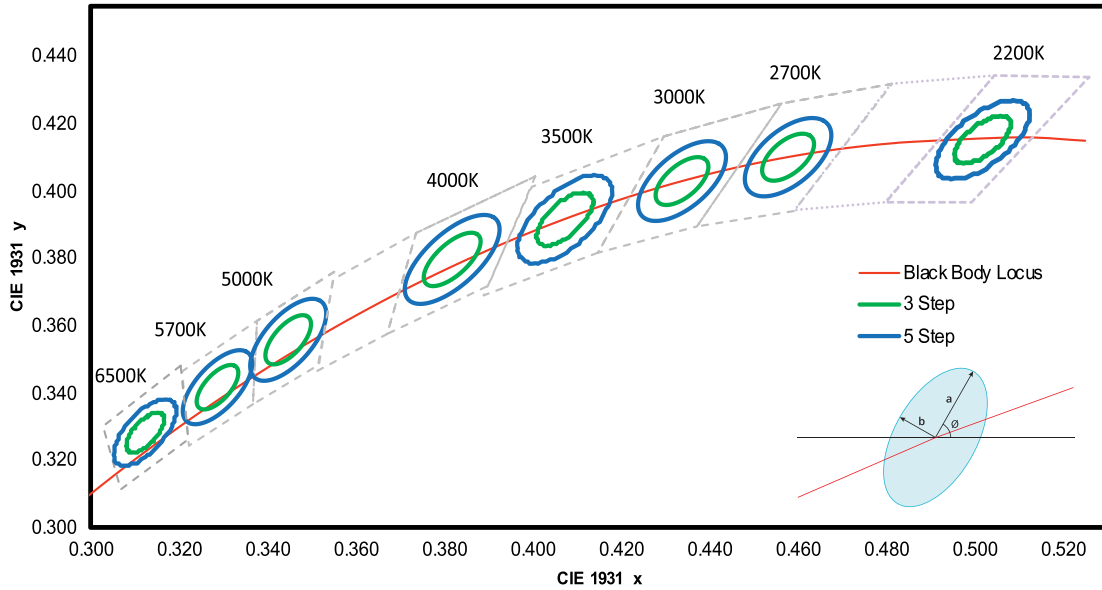


Figure 7. 3- and 5-step MacAdam ellipse illustration for hot-color targeting expected at 85°C.

Table 6. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 5050 at test current, hot-color targeted at  $T_j=85^\circ\text{C}$ .

NOMINAL CCT	COLOR SPACE	CENTER POINT <sup>(1)</sup> (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, $\theta$	LUXEON 5050 (ROUND LES) COLOR BIN CODE	LUXEON 5050 (SQUARE LES) COLOR BIN CODE
2200K	Single 3-step MacAdam ellipse	(0.5018, 0.4153)	0.00863	0.00398	49.27°	3	A3
2700K	Single 3-step MacAdam ellipse	(0.4578, 0.4101)	0.00810	0.00420	53.70°	3	83
3000K	Single 3-step MacAdam ellipse	(0.4338, 0.4030)	0.00834	0.00408	53.22°	3	73
3500K	Single 3-step MacAdam ellipse	(0.4073, 0.3917)	0.00927	0.00414	54.00°	3	63
4000K	Single 3-step MacAdam ellipse	(0.3818, 0.3797)	0.00939	0.00402	53.72°	3	53
5000K	Single 3-step MacAdam ellipse	(0.3447, 0.3553)	0.00822	0.00354	59.62°	3	33
5700K	Single 3-step MacAdam ellipse	(0.3287, 0.3417)	0.00745	0.00320	59.09°	3	23
6500K	Single 3-step MacAdam ellipse	(0.3123, 0.3282)	0.00669	0.00285	58.57°	3	13
2200K	Single 5-step MacAdam ellipse	(0.5018, 0.4153)	0.01438	0.00663	49.27°	5	A5
2700K	Single 5-step MacAdam ellipse	(0.4578, 0.4101)	0.01350	0.00700	53.70°	5	85
3000K	Single 5-step MacAdam ellipse	(0.4338, 0.4030)	0.01390	0.00680	53.22°	5	75
3500K	Single 5-step MacAdam ellipse	(0.4073, 0.3917)	0.01545	0.00690	54.00°	5	65
4000K	Single 5-step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°	5	55
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°	5	35
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°	5	25
6500K	Single 5-step MacAdam ellipse	(0.3123, 0.3282)	0.01115	0.00475	58.57°	5	15

**Notes for Table 6:**

1. Lumileds maintains a tolerance of  $\pm 0.005$  on x and y coordinates in the CIE 1931 color space.

## Forward Voltage Bins

Table 7. Forward voltage bin definitions for LUXEON 5050,  $T_j=25^\circ\text{C}$ .

PART NUMBER	BIN	FORWARD VOLTAGE <sup>(1)</sup> ( $V_f$ )	
		MINIMUM	MAXIMUM
L150-xxxx502400000	A1	23.5	24.2
	A2	24.2	25.0
	B1	25.0	25.8
	B2	25.8	26.5
L150-xxxx500600000	A1	5.8	6.0
	A2	6.0	6.2
	B1	6.2	6.4
	B2	6.4	6.6
L150-xxxx5030000S0	A	29.0	30.0
	B	30.0	31.0
	C	31.0	32.0
L150-xxxx5006000S0	A	5.8	6.0
	B	6.0	6.2
	C	6.2	6.4
	D	6.4	6.6

**Notes for Table 7:**

1. Lumileds maintains a tolerance of  $\pm 0.1\text{V}$  on forward voltage measurements.

# Mechanical Dimensions

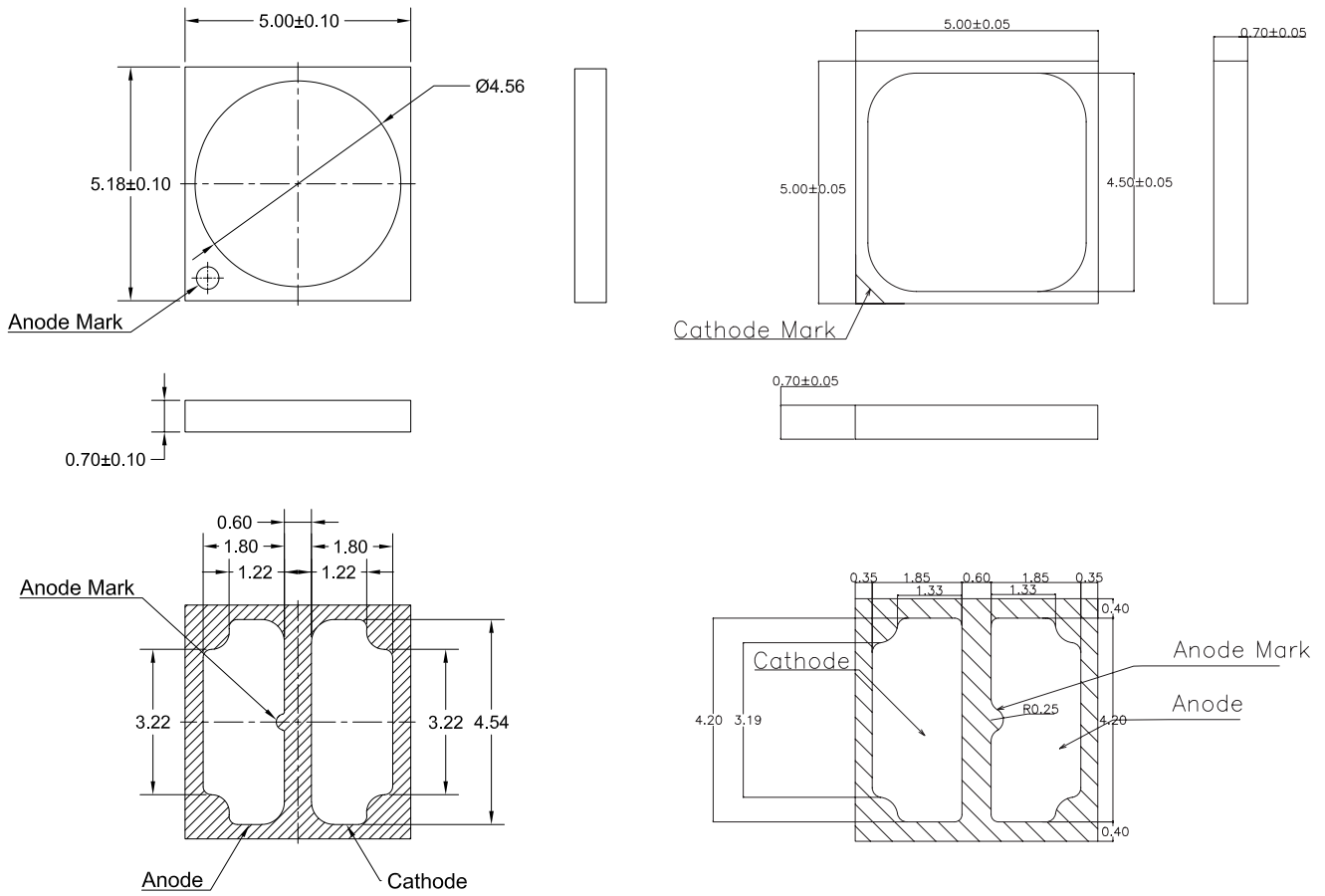


Figure 8. Mechanical dimensions for LUXEON 5050 (Round LES), left, and LUXEON 5050 (Square LES), right.

**Notes for Figure 8:**

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Reflow Soldering Guidelines

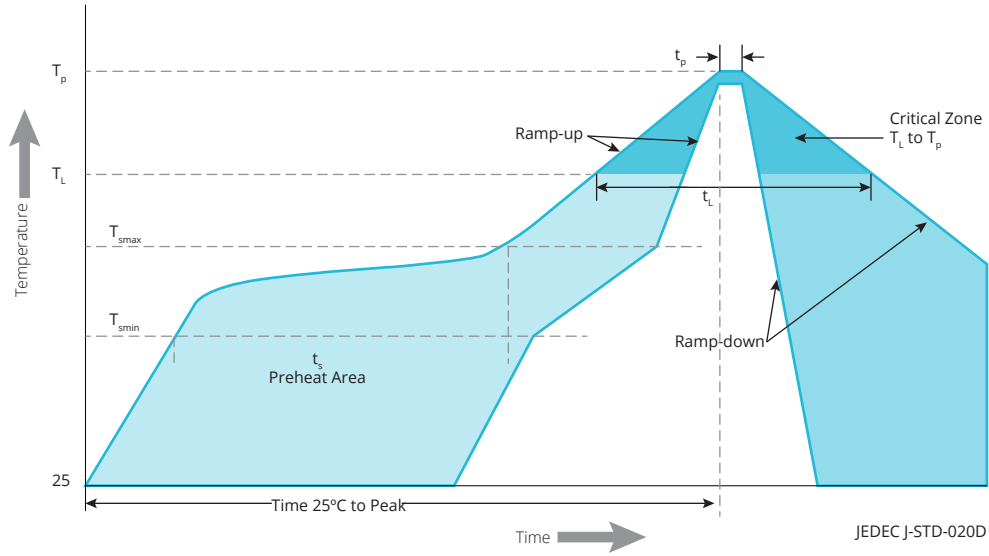


Figure 9. Visualization of the acceptable reflow temperature profile as specified in Table 8.

Table 8. Reflow profile characteristics for LUXEON 5050.

PROFILE FEATURE	LEAD-FREE ASSEMBLY
Preheat Minimum Temperature ( $T_{smin}$ )	150°C
Preheat Maximum Temperature ( $T_{smax}$ )	200°C
Preheat Time ( $t_{smin}$ to $t_{smax}$ )	60 to 180 seconds
Ramp-Up Rate ( $T_L$ to $T_p$ )	3°C / second maximum
Liquidous Temperature ( $T_L$ )	217°C
Time Maintained Above Temperature $T_L$ ( $t_t$ )	60 to 150 seconds
Peak / Classification Temperature ( $T_p$ )	260°C
Time Within 5°C of Actual Peak Temperature ( $t_p$ )	20 to 40 seconds
Ramp-Down Rate ( $T_p$ to $T_L$ )	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

## JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON 5050.

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
3	168 Hours	≤30°C / 60% RH	192 Hours +5 / -0	30°C / 60% RH

## Solder Pad Design

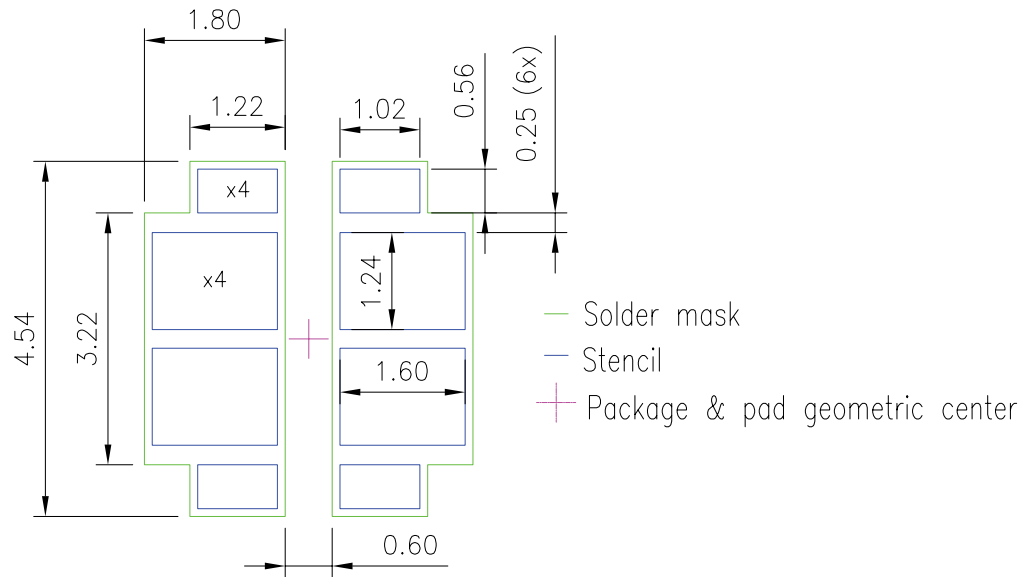


Figure 10. Recommended PCB solder pad layout for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

### Notes for Figure 10:

1. Drawings are not to scale.
2. All dimensions are in millimeters.
3. Refer to application brief [AB174](#) for additional details regarding recommended PCB layout design.

## Packaging Information

### Pocket Tape Dimensions

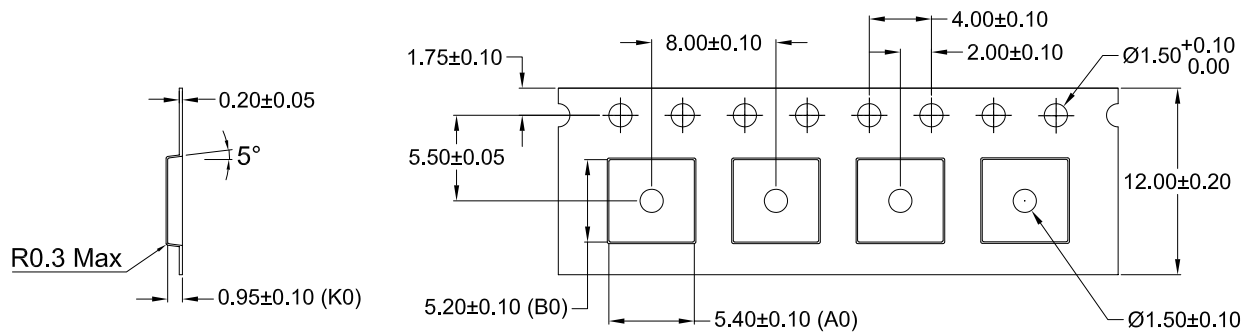
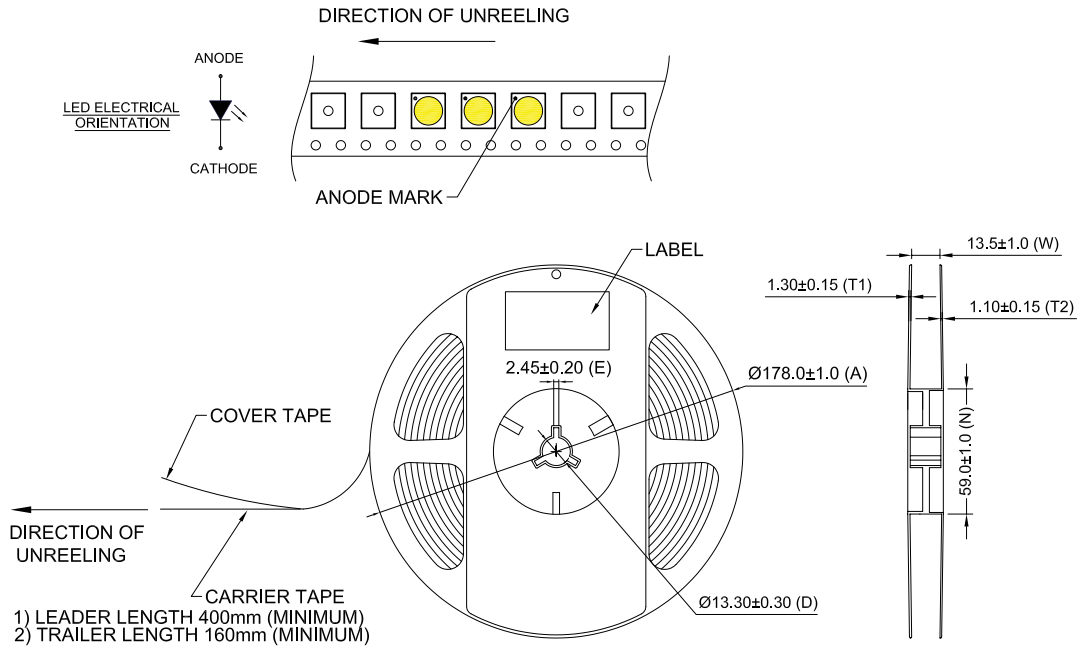


Figure 11. Pocket tape dimensions for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

### Notes for Figure 11:

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Reel Dimensions



12a. Reel dimensions for LUXEON 5050 (Round LES).

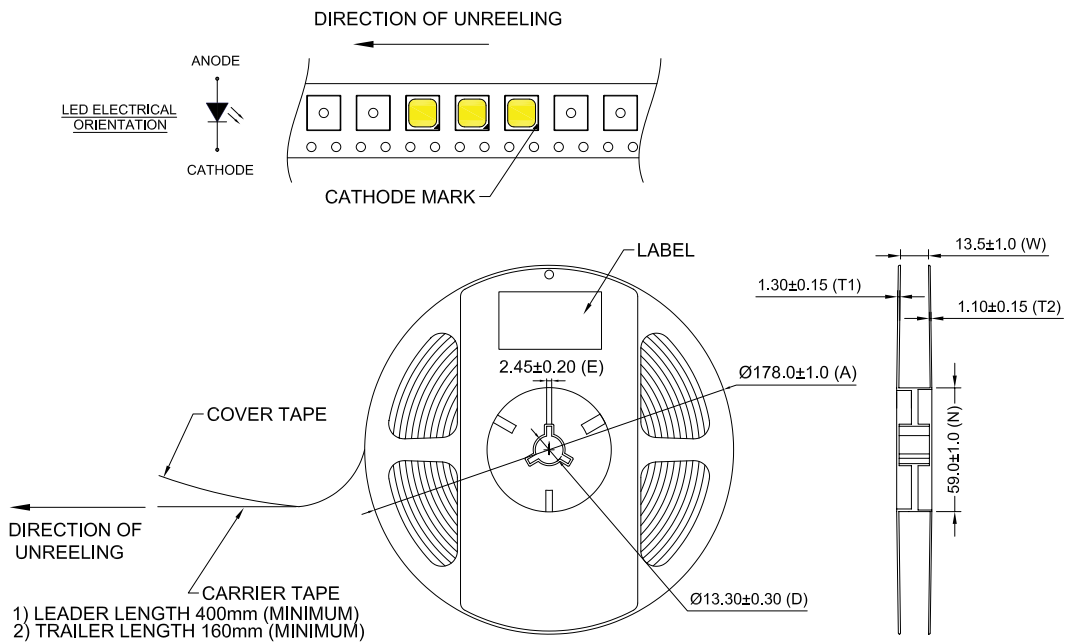


Figure 12b. Reel dimensions for LUXEON 5050 (Square LES).

Notes for Figures 12a and 12b:  
1. Drawings are not to scale.  
2. All dimensions are in millimeters.



## About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit [lumileds.com](http://lumileds.com).



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## EU Declaration of Conformity

Document No.: 2021A0012

Year in which CE Mark was first affixed: 2021

### 1. Product Range / Model:

Product Range / Model:

NAME: LED driver

DESCRIPTION: See Annex

### 2. Manufacturer Name & Address:

**Signify**

I.B.R.S./C.C.R.I. /Numéro 10461

5600 VB Eindhoven, The Netherlands

**3. This declaration of conformity is issued under the sole responsibility of the manufacturer.**

### 4. Object of the declaration:

Product Code:

The Unique product ID number of all products under the family described above, please refer to the Annex: Specification of the products

**5&6. The object of the declaration described above is in conformity with the following relevant Union harmonization legislation and with the applicable requirements of the following harmonized standards:**

#### Low Voltage Directive (LVD), 2014/35/EU

- EN 61347-1:2015
- EN 61347-2-13:2014+A1:2017

#### Electromagnetic compatibility Directive (EMC), 2014/30/EU

- EN IEC 55015: 2019+A11:2020
- EN 61547:2009
- EN IEC 61000-3-2:2019
- EN 61000-3-3:2014+A1:2019

#### EcoDesign requirements for energy-related products Directive (ErP), 2009/125/EC and applicable Implementing Measures

- Regulation EU/1194/2012
- Regulation EU/2019/2020 Article 7

#### Restriction of the use of certain Hazardous Substances in electrical and electronic equipment Directive (RoHS), 2011/65/EU

- EN IEC 63000: 2018

**7. Additional information: The product in this declaration is produced under a quality scheme at least in conformity with ISO 9001 or CENELEC permanent documents.**

Signed for and on behalf of:

2021-05-31, Eindhoven

**Ms. C. Sweegers**

Regulatory Affairs Manager

High Tech Campus 48

5656 AE Eindhoven, The Netherlands





## EU Declaration of Conformity

Document No.: 2021A0012

### Annex: Specification of the products:

12NC	10NC	Product Description	Brand	Remarks
929002872806	9290028728	Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt	PHILIPS	N/A
929002872906	9290028729	Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt	PHILIPS	N/A
929002873006	9290028730	Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt	PHILIPS	N/A
929002873106	9290028731	Xi FP 110W 0.2-0.7A SNLDAE 230V C133 sXt	PHILIPS	N/A
929002873206	9290028732	Xi FP 110W 0.3-1.0A SNLDAE 230V C133 sXt	PHILIPS	N/A

# CERTIFICATE

Issued to:  
Applicant:  
**Signify Netherlands B.V.**  
**High Tech Campus 48**  
**5656 AE Eindhoven, The Netherlands**

Licensee:  
**Signify Netherlands B.V.**  
**High Tech Campus 48**  
**5656 AE Eindhoven, The Netherlands**

Product : LED driver  
Trade name(s) : PHILIPS  
Type(s)/model(s) : Xi FP 75W .3-1A SNLDAE 230 C133 TR sXt,  
Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt,  
Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt and  
Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt

The product and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

DEKRA hereby declares that the above-mentioned product has been certified on the basis of:

- a type test according to the standard EN 61347-1:2015, EN 61347-1:2015/A1:2021, EN 61347-2-13:2014, EN 61347-2-13:2014/A1:2017, EN 62384:2006 and EN 62384:2006/A1:2009
- an inspection of the factory location according to CENELEC Operational Document CIG 021
- a DEKRA certification agreement with the number 947556

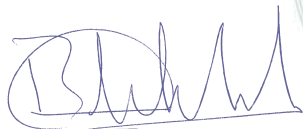
DEKRA hereby grants the right to use the ENEC certification mark.

The ENEC certification mark may be applied to the product as specified in this certificate for the duration and under the conditions of the ENEC certification agreement.

This certificate is issued on 6 April 2021 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 31-114939 REV.1

DEKRA Certification B.V.



B.T.M. Holtus  
Managing Director



K. Lin  
Certification Manager

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ACCREDITED BY THE  
DUTCH ACCREDITATION  
COUNCIL



**SPECIFICATION OF THE CERTIFIED PRODUCT****Product data**

Product	: LED driver
Trade name(s)	: PHILIPS
Type(s)/model(s)	: Xi FP 75W .3-1A SNLDAE 230 C133 TR sXt, Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt, Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt and Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt
Rated voltage	: 220-240 Vac or 186-250 Vdc
Nature of supply	: AC or DC
Rated frequency	: 50/60 Hz at AC
Power factor	: 0,95
Rated input current	: 0,4-0,34 Aac or 0,48 Adc
Rated input power	: 84W
Output power	: 75 W
Max. case temperature (tc)	: 80 °C
Ambient temperature (ta)	: -40 °C...+55 °C
Temperature declared thermally protection	: 130 °C
Description	: Built-in with double/reinforced insulation

**Product data – type Xi FP 75W .3-1A SNLDAE 230 C133 TR sXt**

Output current	: 300-1050 mA
Output voltage	: 35-108 Vdc; 150 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt**

Output current	: 200-700 mA
Output voltage	: 50-150 Vdc; 220 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt**

Output current	: 300-1050 mA
Output voltage	: 35-108 Vdc; 150 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt**

Output current	: 500-1500 mA
Output voltage	: 25-71 Vdc; 120 Vdc MAX (open-circuit); SELV

**TESTS****Test requirements**

EN 61347-1:2015  
EN 61347-1:2015/A1:2021  
EN 61347-2-13:2014  
EN 61347-2-13:2014/A1:2017  
EN 62384:2006  
EN 62384:2006/A1:2009

**Test result**

The test results are laid down in DEKRA test report 609701100.

**Additional information**

constant current type with screwless terminal block  
LED driver is completely potted with asphalt  
Double/reinforced insulation between PRI and SEC

The tests were performed by the manufacturer under the conditions of the agreement concerning the manufacturer's right to conduct type tests for the KEMA-KEUR / ENEC certification system under supervision of DEKRA (CTF Stage 3).

This certificate replaces certificate No. 31-114939 which we hereby declare invalid.

The list of components is laid down in test report 6097011.50.

**Conclusion**

The examination proved that all requirements were met.

**Factory locations**

The factory locations are registered with the numbers 674666 and 1845.

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT  
(IECEE) CB SCHEME

## CB TEST CERTIFICATE

Product

LED driver

Name and address of the applicant

Signify Netherlands B.V.  
High Tech Campus 48, 5656 AE Eindhoven,  
The Netherlands

Name and address of the manufacturer

Signify Netherlands B.V.  
High Tech Campus 48, 5656 AE Eindhoven,  
The Netherlands

Name and address of the factory

 Additional information on page 2

Note: When more than one factory, please report on page 2

Ratings and principal characteristics

Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt:  
Uin: 220-240 Vac; fn: 50/60 Hz; Iin: 0,4-0,34 Aac; Pin: 84 W;  
Uin: 186-250 Vdc; Iin: 0,48 Adc max; PF: 0,95;  
Iout: 200-700 mA; Pout: 75 W; Uout: 50-150 Vdc, 220 Vmax;  
ta: -40...+55 °C; tc: 80 °C; Built-in; isolatingXi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt:  
Uin: 220-240 Vac; fn: 50/60 Hz; Iin: 0,4-0,34 Aac; Pin: 84 W;  
Uin: 186-250 Vdc; Iin: 0,48 Adc max; PF: 0,95;  
Iout: 300-1050 mA; Pout: 75 W; Uout: 35-108 Vdc, 150 Vmax;  
ta: -40...+55 °C; tc: 80 °C; Built-in; isolatingXi FP 75W .3-1A SNLDAE 230 C133 TR sXt:  
Uin: 220-240 Vac; fn: 50/60 Hz; Iin: 0,4-0,34 Aac; Pin: 84 W; PF: 0,95;  
Iout: 300-1050 mA; Pout: 75 W; Uout: 35-108 Vdc, 150 Vmax;  
ta: -40...+55 °C; tc: 80 °C; Built-in; isolatingXi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt:  
Uin: 220-240 Vac; fn: 50/60 Hz; Iin: 0,4-0,34 Aac; Pin: 84 W;  
Uin: 186-250 Vdc; Iin: 0,48 Adc max; PF: 0,95;  
Iout: 500-1500 mA; Pout: 75 W; Uout: 25-71 Vdc, 120 Vmax;  
ta: -40...+55 °C; tc: 80 °C; Built-in; SELV

Trademark (if any)

Customer's Testing Facility (CTF) Stage used

CTF Stage 3

This CB Test Certificate is issued by the National Certification Body

DEKRA Certification B.V.  
Meander 1051, NL-6825 MJ Arnhem, Netherlands

**IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT  
(IECEE) CB SCHEME**

Model / Type Ref.

Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt  
Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt  
Xi FP 75W .3-1A SNLDAE 230 C133 TR sXt  
Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt

Additional information (if necessary may also be reported on page 2)

 Additional information on page 2

This certificate replaces NL-67121 dated on 2020-07-27 due to technical modification.

A sample of the product was tested and found to be in conformity with

IEC 61347-1:2015, IEC 61347-1:2015/AMD1:2017, IEC 61347-2-13:2014, IEC 61347-2-13:2014/AMD1:2016, IEC 62384:2006, IEC 62384:2006/AMD1:2009

National differences:

EU Group Differences

As shown in the Test Report Ref. No. which forms part of this Certificate

6097011.50 and 6097011.51

This CB Test Certificate is issued by the National Certification Body

DEKRA Certification B.V.  
Meander 1051, NL-6825 MJ Arnhem, Netherlands





IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT  
(IECEE) CB SCHEME

Additional factory

This CB Test Certificate is issued by the National Certification Body

DEKRA Certification B.V.  
Meander 1051, NL-6825 MJ Arnhem, Netherlands



# PHILIPS

## Xitanium

### LED driver



## Datasheet

# Xitanium FULL Prog LED Xtreme drivers

## Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt

### Xitanium FULL Prog LED Xtreme drivers

Philips Xitanium Full Programmable LED drivers are specifically designed to deliver the highest performance, protection and configurability. The portfolio offers both central and standalone dimming protocols further increasing the energy savings and CO<sub>2</sub> reductions achieved with LED lighting. The Xtreme technology ensures maximum robustness and protection combined with a very long lifetime.

In this product family Philips introduces new drivers in a compact form factor with state-of-the-art features, which offer high value for both OEM customers and end-users. The products can replace the existing programmable outdoor LED drivers and will bring significant improvement in programming, assembly into a luminaire and electrical performance.

#### Benefits

- Ultimate robustness, offering peace of mind and lower maintenance costs
- Fully programmable LED-drivers designed for the new digital and connected lighting world
- Extended diagnostics via MultiOne
- Easy to design-in, configure and install for insulation Class I and Class II applications
- Energy savings through high efficiency and via multiple dimming options

#### Features

- High surge immunity (CM/DM)
- Long lifetime and robust protection against moisture, vibration and temperature
- Configurable operating windows (AOC)
- Multiple control interfaces: DALI, AmpDim, 1-step and 3-step LineSwitch
- Autonomous dimming via integrated DynaDimmer
- Adjustable thermal protection for driver (DTL, on select models) and LED module (MTP)
- Constant Light Output (CLO)
- Adjustable Start-up Time (AST)
- Adjustable Light Output (ALO)
- End-Of-Life indicator (EOL)

#### Application

- Road and street lighting
- Area lighting
- Tunnel lighting
- Industrial lighting

## Electrical input data

Specification item	Value	Unit	Condition
Rated input voltage range	202...254	V <sub>ac</sub>	Performance range
Rated input voltage	230	V <sub>ac</sub>	
Rated input frequency range	47...63	Hz	Performance range
Rated input current	0.34	A	@ rated output power @ rated input voltage
Max. input current	0.4	A	@ rated output power @ minimum performance input voltage
Rated input power	84	W	@ rated output power @ rated input voltage
Power factor	≥ 0.99		@ rated output power @ rated input voltage
Total harmonic distortion	≤ 8	%	@ rated output power @ rated input voltage
Efficiency	≤ 90.5	%	@ rated output power @ rated input voltage
Rated input voltage DC range	186...250	V <sub>dc</sub>	Performance range
Rated input current DC range	≤ 0.48	A <sub>dc</sub>	Performance range
Input voltage AC range	80...264	V <sub>ac</sub>	Safety operational range
Input frequency AC range	45...66	Hz	Safety operational range
Input voltage DC range	168...275	V <sub>dc</sub>	Safety operational range
Standby Power	0.45	W	
Isolation input to output	SELV		

## Electrical output data

Specification item	Value	Unit	Condition
Regulation method	Constant Current		
Output voltage	25...71	V <sub>dc</sub>	
Output voltage max.	120	V	Maximum voltage at open load
Output current	0.1...1.5	A	
Output current min programmable	500	mA	
Output current min dimming	100	mA	
Output current tolerance	± 3	%	
Output current ripple LF	≤ 4	%	Ripple = peak / average @ < 1kHz
Output current ripple HF	≤ 4	%	
Output power	2.5...75	W	

## Electrical data controls input

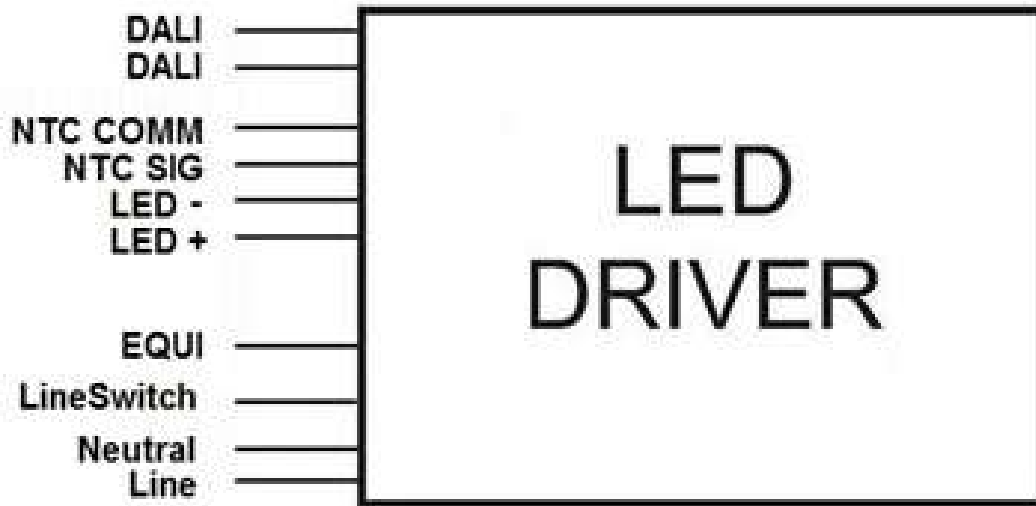
Specification item	Value	Unit	Condition
Control method	AmpDim, DALI, Dynadimmer, LineSwitch 3-step, LineSwitch single-step		Output current amplitude dimming
Dimming range	10...100	%	DALI acc. IEC62386-101, -102 Ed. 2.0; LineSwitch: Vlow: < 160Vac Vhigh: 170 ... 264Vac
Galvanic Isolation	Double		

## Logistical data

Specification item	Value
Product name	Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt
Order code	871869675571600
Logistic code 12NC	9290 014 08606
Pieces per box	12

## Wiring & Connections

Specification item	Value	Unit	Condition
Input wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Input wire strip length	8.5...9.5	mm	
Output wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Output wire strip length	8.5...9.5	mm	
Dimming wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Dimming wire strip length	8.5...9.5	mm	
Maximum cable length	600	mm	Total length of wiring including LED module, one way
Maximum NTC output cable length	0.6	m	

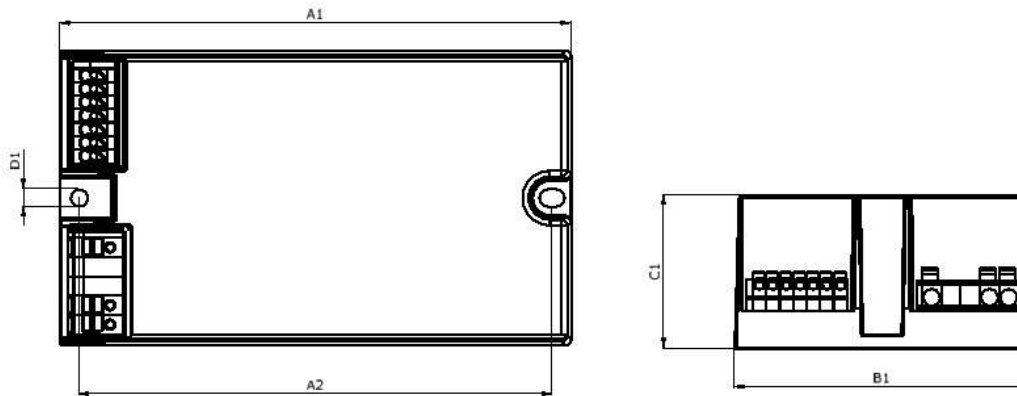


## Insulation

Insulation	Mains	EQUI	LED + NTC	LineSwitch	DALI
Mains		Double	SELV	NA	Basic
EQUI	Double		Basic	Double	Double
LED + NTC	SELV	Basic		SELV	Double
LineSwitch	NA	Double	SELV		Basic
DALI	Basic	Double	Double	Basic	

## Dimensions and weight

Specification item	Value	Unit	Condition
Length (A1)	133	mm	
Width (B1)	77	mm	
Height (C1)	40	mm	
Fixing hole diameter (D1)	4.2	mm	
Fixing hole distance (A2)	122	mm	
Weight	550	gram	



## Operational temperatures and humidity

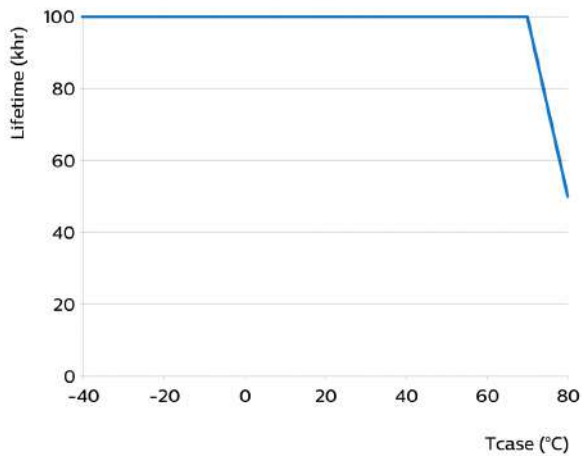
Specification item	Value	Unit	Condition
Ambient temperature	-40...+55	°C	Higher ambient temperature allowed as long as Tcase-max is not exceeded.
Tcase-max	80	°C	Maximum temperature measured at T <sub>case</sub> -point
Tcase-life	70	°C	Measured at T <sub>case</sub> -point
Maximum housing temperature	130	°C	In case of a failure
Relative humidity	10...90	%	Non-condensing

## Storage temperature and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-40...+80	°C	
Relative humidity	5...95	%	Non-condensing

## Lifetime

Specification item	Value	Unit	Condition
Driver lifetime	100,000	hours	Measured temperature at $T_{case}$ -point is $T_{case}$ -life. Maximum failures = 10%



## Programmable features

Specification item	Value	Remark	Condition
Set output current (AOC)	Programmable, SimpleSet	See Design-in guide.	Default output current: = 1050 mA
LED module temperature derating (MTP)	Yes		
Driver Temperature Limit (DTL)	Yes		
Constant Lumen Over Lifetime (CLO)	Yes		
DC emergency dimming (DCemDIM)	Yes		Default: AOC = 15%. EOFx = 10 ... 60%. No external DC rated fuse required
Diagnostics	Yes		
Adjustable Light Output (ALO)	Yes		
Ampdim	Yes		
LineSwitch single-step	Yes		
LineSwitch 3-step	Yes		
Adjustable Start-up Time (AST)	Yes		
Integrated Dynadimmer	Yes		5-step, light turn-off possible
End Of Life indicator	Yes		

## Features

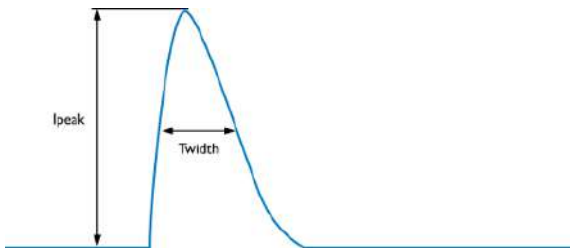
Specification item	Value	Remark	Condition
Open load protection	Yes		Automatic recovering
Short circuit protection	Yes		Automatic recovering
Over power protection	Yes		Automatic recovering
Hot wiring	No		
Suitable for fixtures with protection class	I and II		per IEC60598
Over temperature protection driver	Yes		Automatic recovering
Overheating protection	Yes		Automatic recovering

## Certificates and standards

Specification item	Value
Approval marks	CB / CCC / CE / EL / ENEC
Ingress Protection classification (IP)	20

## Inrush current

Specification item	Value	Unit	Condition
Inrush current $I_{peak}$	43	A	Input voltage 230V
Inrush current $T_{width}$	260	$\mu$ s	Input voltage 230V, measured at 50% $I_{peak}$
Drivers / MCB 16A type B	$\leq 10$	pcs	



MCB	Rating	Relative number of LED drivers
B	10A	63%
B	13A	81%
B	16A	100% (stated in datasheet)
B	20A	125%
B	25A	156%
C	10A	104%
C	13A	135%
C	16A	170%
C	20A	208%
C	25A	260%

## Driver touch current / protective conductor current

Specification item	Value	Unit	Condition
Typical touch current (ins. Class II)	< 0.28	mA peak	Acc. IEC61347-1. LED module contribution not included
Typical protective conductor current (ins. Class I)	< 0.2	mA rms	Acc. IEC61347-1. LED module contribution not included

## Surge immunity

Specification item	Value	Unit	Condition
Mains surge immunity (diff. mode)	6	kV	L-N, Ls-L, Ls-N, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Mains surge immunity (comm. mode)	10	kV	L/N/Ls - EQUI 10kV acc. EN61547; 8kV acc. IEC61000-4-5, 12 Ohm 1.2/50us,8/20us
Control surge immunity (diff. mode)	0.9	kV	DALI, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Control surge immunity (comm. mode)	6	kV	DALI - EQUI acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us
DALI surge immunity (comm. mode)	6	kV	DALI - L/N/Ls acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us

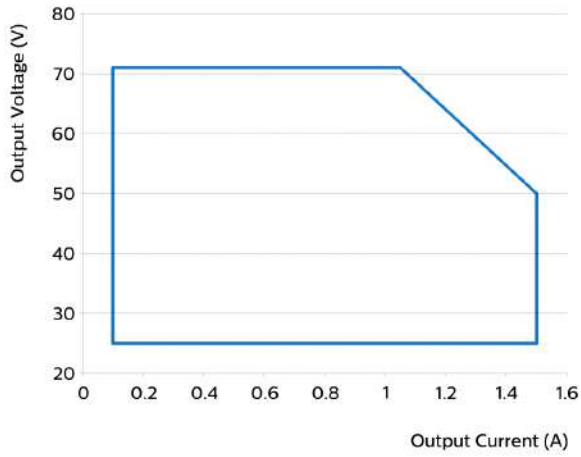
## Additional information

Specification item	Default setting	Remark	Condition
AOC	1050	mA	
LineSwitch	ON		
CLO	OFF		
MTP	OFF		
Dynadimmer	OFF		
EOL	OFF		

## Graphs

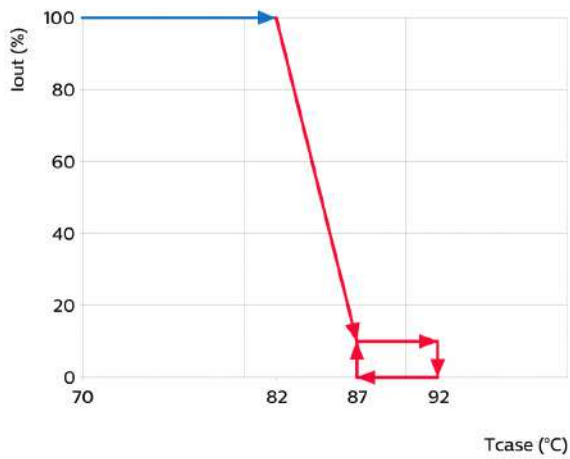
### Operating window

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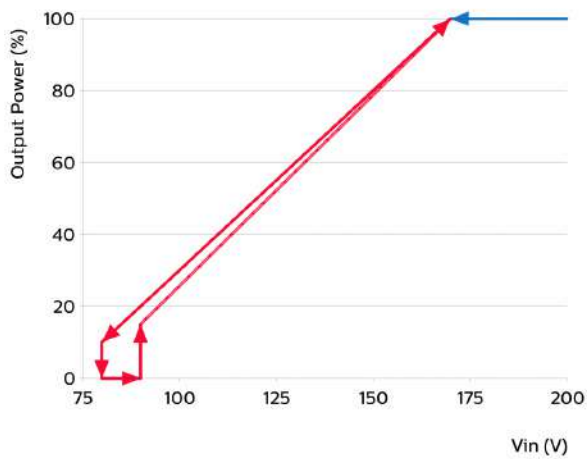
### Thermal Guard

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### Mains Guard

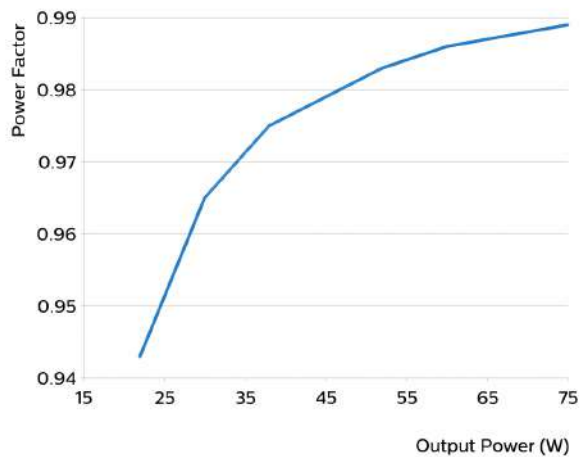
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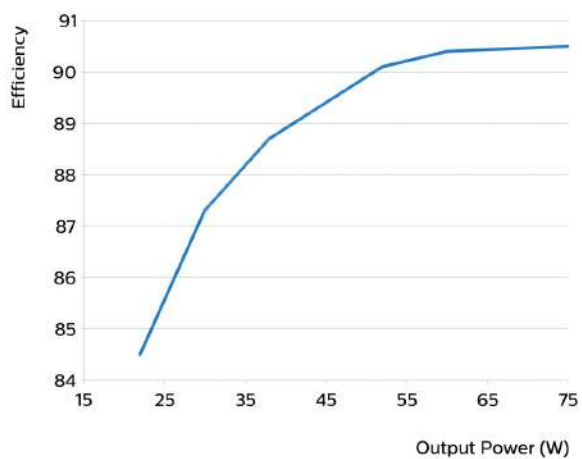
### Power factor versus output power

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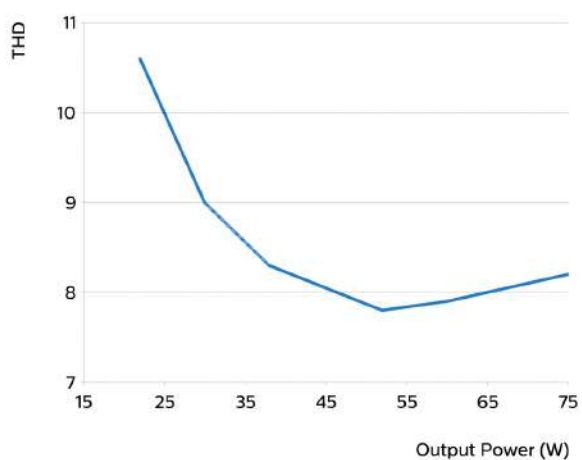
### Efficiency versus output power

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### THD versus output power

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This document contains information relating to the Philips Lighting portfolio, intended for companies who may be interested in developing their product offering. Note that the information provided is subject to change. Philips Lighting does not give any representation or warranty as to the accuracy or completeness of the information included herein and shall not be liable for any action in reliance thereon. The information presented in this document is not intended as any commercial offer and does not form part of any quotation or contract.


Date of release: June 6, 2018 v2

[www.philips.com/technology](http://www.philips.com/technology)

## **2.5 Materiales de las luminarias**

Informe de ensayo en relación con el material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda.

### **a. Luminaria modelo funcional**

 Relva, 27 A - Torneiros 36410 PORRIÑO - Pontevedra Tel. +34 986 344 000 Fax. +34 986 337 302 e-mail: aimen@aimen.es www.aimen.es C.I.F. G - 36.606.291	Nº Informe Report No.	1142147.2.3	Página Page	1 de 1 1 of 1
	Cliente Customer	IMQ TECNOCREA SL C/ Sèquia de Benàger, P.I.Alquería de Moret 23 - 46210 PICANYA - Valencia (España)		

<b>Datos de la muestra</b> Sample data		Fecha de recepción Receipt date	23.12.2020	Fecha de pedido Receipt date of order	17.12.2020
Descripción Description		Carcasa de aluminio Aluminium housing		Pedido Order	ACEPTACIÓN OFERTA
Id. AIMEN Id. AIMEN		†Referencia del Cliente †Customer's reference			
1142147-B		Luminaria Milan. Luminaria Grupo Benito/Novatilu			

<b>Ensayo de Tracción</b> Tensile Test		Condiciones de ensayo Test conditions		UNE-EN ISO 6892-1:2020 A224				Fecha de ensayo Date of test		11.01.2021	
Id.	Probeta / Specimen			R <sub>p0.2</sub> (MPa)	R <sub>p1</sub> (MPa)	R <sub>eH</sub> (MPa)	R <sub>m</sub> (MPa)	A (%)	Z (%)		
	Orientación Orientation	Tipo Type	Dimensiones Size (mm)								
1142147-B	TRANSVERSAL A LA MUESTRA TRANSVERSE TO THE SAMPLE	P	12,458 x 2,252	185	---	---	242	*1,1	---		
Incertidumbre k=2 Uncertainty				0,053·R <sub>p0.2</sub>	0,053·R <sub>p1</sub>	0,053·R <sub>eH</sub>	0,030·R <sub>m</sub>	0,13·A	0,095·Z		
Observaciones Remarks		*La elongación porcentual tras la rotura se obtiene mediante el extensómetro MTS 50mm N°HMEDEX_007 (31030/7-08) *The percentage elongation after breakage is obtained by means of the MTS 50mm extensometer N°HMEDEX_007 (31030/7-08)									
Leyenda Legend		R <sub>p0.2</sub> : Limite elástico a 0,2% de deformación / 0,2% offset yieldstrength. R <sub>p1</sub> : Limite elástico a 1% de deformación / 1% Offset yieldstrength. R <sub>eH</sub> : Limite superior de cedencia / Upperyieldstrength.			R <sub>m</sub> : Resistencia a tracción / Tensilestrength. A: Alargamiento tras la fractura / Elongationafter fracture. Z: Coeficiente de estricción / Reduction of area.		Orientación / Orientation: L: Longitudinal. T: Transversal. Z: Perpendicular al espesor / Through thickness. A: All Weld.		Probeta tipo / Specimentype: P: Prismática / Flat. C: Cilíndrica / Round. T: Tubocompleto / Tube complete. B: Banda de pared de tubo / Strip of tubewall.		

<b>Análisis químico</b> Chemical Analysis										Fecha de ensayo Date of test		14.01.2021	
Muestra Sample		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Pb#	Sn#	Al
B	% peso wt %	11,10	0,947	0,703	0,334	0,507	<0,028	<0,04	0,777	<0,02	0,036	0,015	Matriz Matrix
	Incert. Uncert.	0,36	0,031	0,030	0,017	0,028	----	----	0,075	----	----	----	----
Método de ensayo Test method		B	B	B	B	B	B	B	B	B	B	B	----
<b>Técnicas de análisis</b> Analysis techniques													
<p>A) Absorción infrarroja tras combustión en horno de inducción: Procedimiento A/PE/AFM.Q/09. / Infrared absorption after induction furnace combustion: Procedure A/PE/AFM.Q/09.</p> <p>B) Espectrometría de emisión por chispa en aleación de aluminio: Procedimiento A/PE/AFM.Q/08 / Spark Emission Spectrometry in aluminium alloy: Procedure A/PE/AFM.Q/08</p> <p>C) Conductividad térmica tras fusión en corriente de gas inerte: Procedimiento A/PE/AFM.Q/11. Thermal conductivity after melting in an inert gas stream: Procedure A/PE/AFM.Q/11.</p> <p>D) ICP-OES: Procedimiento A/PE/AFM.Q/03 / ICP-OES: Procedure A/PE/AFM.Q/03</p>													
Observaciones Remarks		<p>*La composición química de la muestra analizada es característica de una aleación de aluminio EN 1706 EN AC-47100, pero las concentraciones de magnesio (Mg) Y cinc (Zn) están por encima de las indicadas en la norma. *Chemical composition of the sample analyzed is similar to an EN 1706 EN AC-47100 aluminum alloy, but the elements: magnesium (Mg) and zinc (Zn) don't fulfill the values indicate in the standard.</p> <p>La declaración de conformidad está basada en el criterio de aceptación simple según la guía ILAC G8, con una probabilidad de aceptación o rechazo falsos inferior al 50% The statement of conformity is based on the simple acceptance criterion according to the ILAC G8 guide, with a false acceptance or rejection probability of less than 50%".</p>											

Porriño, 16 de febrero de 2021  
Porriño, 16<sup>th</sup> February 2021


Jorge Delgado Guirao  
Coordinador de Análisis Metalográfico y Químico  
Head of Metallography and Chemical Analysis

Agustín Paz Gestoso  
Responsable de Ensayos y Análisis  
Testing and analysis manager

Mauricio Ruibal Acuña  
Coordinador de Ensayos Mecánicos y END  
Mechanical Testing and NDT Coordinator

**Este informe anula y sustituye a nuestro informe nº 1142147.2.2 de fecha 8 de febrero de 2021**  
**This report supersedes our report no. 1142147.2.2 dated 8th February, 2021**

Descripción de los cambios / Description of changes.  
Modificación para incluir la clasificación de la aleación por solicitud del cliente. / Modification to include alloy classification as requested by the customer.

 Las actividades marcadas con # no están amparadas por la acreditación de ENAC Activities marked with # are not included in the scope of accreditation	Los resultados reflejados en este informe se refieren únicamente a la(s) muestra(s) reseñada(s). La información acompañada del superíndice † ha sido facilitada por el cliente, por lo tanto AIMEN no puede asumir responsabilidades sobre su veracidad. Este informe no podrá ser reproducido parcialmente sin la autorización escrita de AIMEN. The information market with the superscript † has been provided by the client, therefore AIMEN cannot assume responsibility for its veracity. This report may not be reproduced except in full without the written authorisation of AIMEN. The English version is a translation. In case of doubt, the Spanish text of this report is valid.

## DECLARACIÓN DE CONFORMIDAD

### Equipos Alumbrado Público BENITO NOVATILU

**BENITO URBAN SLU**, como fabricante de luminarias, de módulos LED, de protectores de sobretensión, y suministrador de fuentes de alimentación y sistemas de control y regulación, con domicilio social en c/ Lleida, 10 de 08500 VIC (Barcelona – España), con CIF B 59.987.529 y miembro del grupo BENITO NOVATILU.

DECLARA:

Que todas las luminarias del grupo BENITO NOVATILU están fabricadas en aluminio de alta pureza y cumplen con los requerimientos de una aleación de aluminio EN AC-44100 según Norma Europea EN 1706.

Y para que así conste, se expide este documento.

Vic, 4 de febrero de 2022.







**BENITO URBAN S.L.U**  
C.I.F. E3 859 987 529

**Lighting Department**  
Albert de Ramos Pons

### 3 Informe de Pruebas o Certificados de la Luminaria.

#### 3.1 Tabla Verificación (Anexo 4) CEI – IDAE

Informe de Pruebas o Certificados emitidos por el fabricante de la luminaria o entidad OEC acreditada	
1	Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes. (Propio de la empresa) 
2	Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4. 
3	Ensayo colorimétrico de la luminaria según la Norma UNE EN 13032-4. 
4	Ensayo de medidas eléctricas: tensión, corriente de alimentación, potencia nominal leds y potencia total consumida por luminaria con todos sus elementos integrantes y factor de potencia. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria. 



**FABRICANTE:** NOVATILU, SLU  
**MANUFACTURER:** C/ Via Ausetània, 11-13  
08560 Manlleu (Barcelona) – Spain  
Tel.: (+34) 961 401 000

Certificamos y declaramos bajo nuestra responsabilidad que el siguiente producto:  
*Certify and declare under our responsibility that the following product:*

**Marca:** Benito Novatilu  
**Brand:** Benito Novatilu  
**Modelo:** Luminarias: AGIL / AVENUE / COSMO-LED / ESKADE-LED / VILLA LUXE-LED / VILLA  
**Model:** IG-LED / FERNANDINA-LED / INNOVA / SIENA / FORMA / CIRCULAR / UFO / MILAN /  
P. MILAN / APOLO / VOLGA / STARK / CORBA / CORBA LIRA / PLANET / GARDEN /  
TOMSK / Módulos NOVATILUX

Está conforme a las siguientes directivas y normativas:  
*It is according to the following directives and norms:*

UNE-EN-61000-3-2:2006+A1:2010+A2:2010  
UNE-EN-61000-3-3:2009  
UNE-EN-61547:2011  
UNE-EN-55015:2007+A1:2008+A2:2009

UNE-EN-60598-2-3:1997  
UNE-EN-60598:2009+A11:2  
UNE-EN-62031:2009

Compatibilidad electromagnética (CEM).  
- Límites emisiones corrientes armónicas  
- Limitación variación tensión y flicker en redes públicas  
- Requisitos de Inmunidad  
- Límites perturbación radioeléctrica  
*Electromagnetic compatibility (EMC).*  
*-Limits harmonic current emissions*  
*-Limiting voltage variation and flicker in electrical networks*  
*-Immunity requirements*  
*-Limits radio electrical disturbance*

Luminarias Alumbrado Público  
- Requisitos generales y ensayos  
- Módulos LED. Requisitos de seguridad  
*Street Lighting Luminaires*  
*- General requirements and tests*  
*- LED Modules. Safety requirement*

**Fecha de emisión:** Mayo de 2021  
*Issued on:*

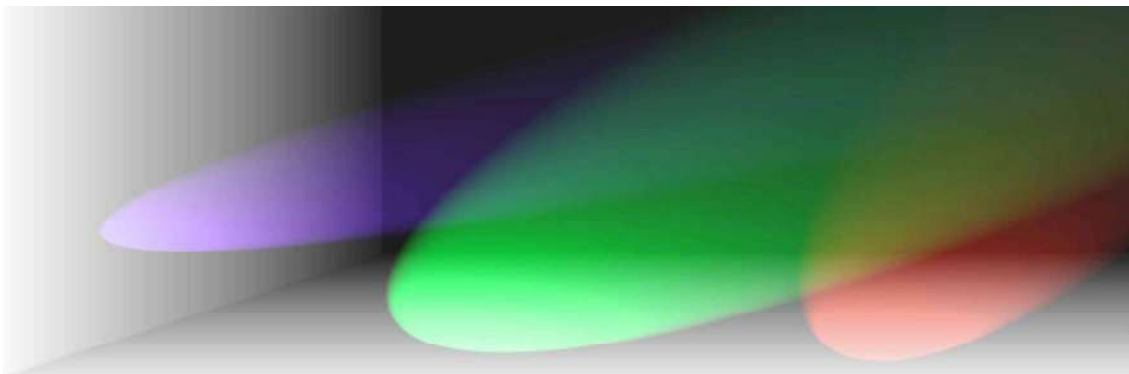
**Firmado:**  
*Signed:*



Jordi Puig Rovira  
Ingeniero Técnico Telecomunicación (col. 903055)  
**Design & Engineering**  
**Lighting Department**

Los ensayos marcados con \* no están amparados por la acreditación ENAC

# INFORME DE ENSAYO



## Asselum luminotècnics, SL

Polígono Industrial Can Roqueta  
C/ Ca n'Alzina 76 08202 Barcelona

Tel - Fax: 93.725.98.10

[www.asselum.com](http://www.asselum.com)

**Cliente:** BENITO – NOVATILU

**Dirección:** C/Lleida 10, 08500, Vic

**Provincia:** Barcelona

**País:** España

**Teléfono:** 938521000

**Nombre muestra<sup>1</sup>:** Innova 40W 4K

**Código muestra<sup>1</sup>:** ALI - ALIB

**Nº muestra:** RM21072804.7

**Fecha del ensayo:** 15/11/2021

**Código de ensayo:** CL237A21F012V

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

### Informe revisado:

43564191Y  
MARC  
BALLBE (R: B62741152)  
BALLBE (R: B62741152)  
gn=MARC c=ES  
o=ASSELUM  
LUMINOTECNICS SL  
Motivo: He revisado este documento  
Ubicación:  
Fecha: 2021-11-17  
12:23+01:00

**Marc Ballbé**  
**Director técnico**

Los resultados obtenidos en el presente informe se refieren únicamente a la muestra ensayada conforme en el apartado 1.1. No se podrá reproducir total o parcialmente el informe sin el consentimiento de **ASSELUM assessorsluminotècnics, S.L.** La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa.

Cualquier impresión del presente informe será considerada como una copia del mismo.  
**Assessors luminotècnics, SL Pol. Ind. Can Roqueta C/. Ca n'Alzina, 76 - 08202 Sabadell Barcelona**  
**Tel. 93 725 98 10 [www.asselum.com](http://www.asselum.com)**



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## 1. Descripción de la muestra y del ensayo

### 1.1. Ficha técnica del producto

Tipo	Módulo
Código Producto <sup>1</sup>	ALI - ALIB
Nombre <sup>1</sup>	Innova 40W 4K
Dimensiones [mm]	Ø630 x 60
Área luminosa [mm]	150 x 110 x 0
Tipo fuente de luz	LED
Flujo luminoso[Im]	5446
Potencia del conjunto[W]	39,5
Eficacia luminosa[Im/W]	138,2

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

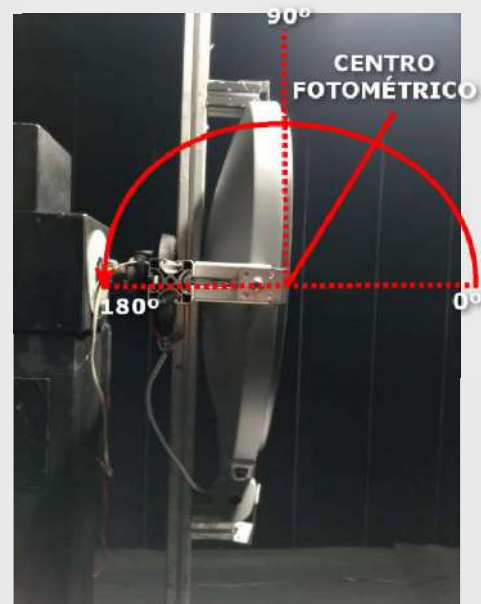
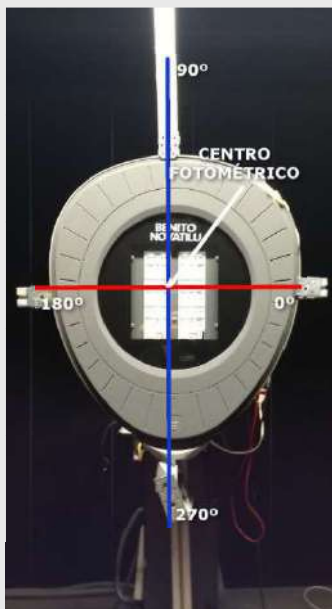
#### 1.1.1. Imagen de la muestra



## 1.2. Ficha del ensayo

Normas de referencia	UNE-EN 13032-4:2016 EN 13032-4: 2015 CIE S 025: 2015 CIE 34:1977 CIE 52:1982 CIE 117:1995 IES TM-15:07
Sistema de medición	$C-\gamma$ , $C = \Delta 15^\circ$ , $G = \Delta 2,5^\circ$

### Sistema de referencia y centro fotométrico




## 1.3. Parámetros del test eléctrico

Tipo de alimentación	Fuente estabilizada
Alimentación eléctrica	230V AC $\pm$ 0,4%
Distorsión armónica	< 0,5%
Frecuencia	50 Hz $\pm$ 0.1%

## 1.4. Condiciones ambientales

Temperatura del laboratorio [°C]	25°C $\pm$ 1,2°C
Humedad relativa	<60%
Movimiento del aire	< 0,25 m/s

## 1.5. Instrumentos utilizados

Goniofotómetro	<p>Goniofotómetro T2 de rotación de la luminaria acuerdo con las normas y recomendaciones:</p> <ul style="list-style-type: none"> <li>❖ EN 13032-1 2005 cap. 6.1.1.1 – tipo de goniofotómetro 1.1, 1.2 y 1.3</li> <li>❖ Recomendación CIE 121 Cap.5 Tipo 1 y 2</li> </ul> <p>Nº identificativo: E-001 Distancia de medición: 6,44 m</p>
Posición de ensayo de la muestra	El ensayo se realiza con la muestra en posición en horizontal y se aplica un factor de corrección entregando el resultado en función de la posición de diseño.
Fuente de alimentación	Fuente de alimentación AC ET-System modelo EAC-S-1000 Nº identificativo: E-019
Multímetro	MULTIMETRO NEWTON 4TH. MODELO PPA 1510 Nº identificativo: E-020
Luxómetro	Luxómetro CZIULA&GRUNDMANN Nº identificativo: E-003
Anemómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Termómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Espectroradiómetro	JETI SPECOS 1211 Nº identificativo: E-036
Termómetro	TERMOMETRO DIGITAL PCE-T 390 Nº identificativo: E-018
	

## 2. Parámetros eléctricos medidos

### 2.1. Medición del conjunto

Tensión de alimentación [V]	230,2
Intensidad [A]	0,177
Potencia [W]	39,5
Factor de potencia	0,97

### 3. Observaciones

- Queda prohibida la reproducción parcial de este documento.
- Este Informe no puede presentar enmiendas o raspaduras, en caso contrario será considerado nulo.
- La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa, en la instrucción técnica IT10 de ASSELUM.

### 4. Resultados del ensayo de fotometría

## 4.1. Resumen

### Luminaria

Código ALI - ALIB  
Nombre Innova 40W 4K

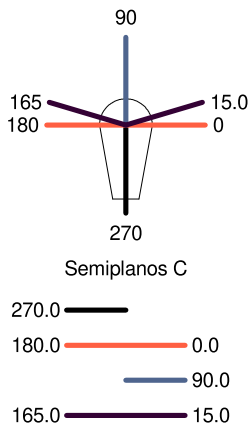
### Ensayo

Código CL237A21F012V  
Nombre Innova 40W 4K

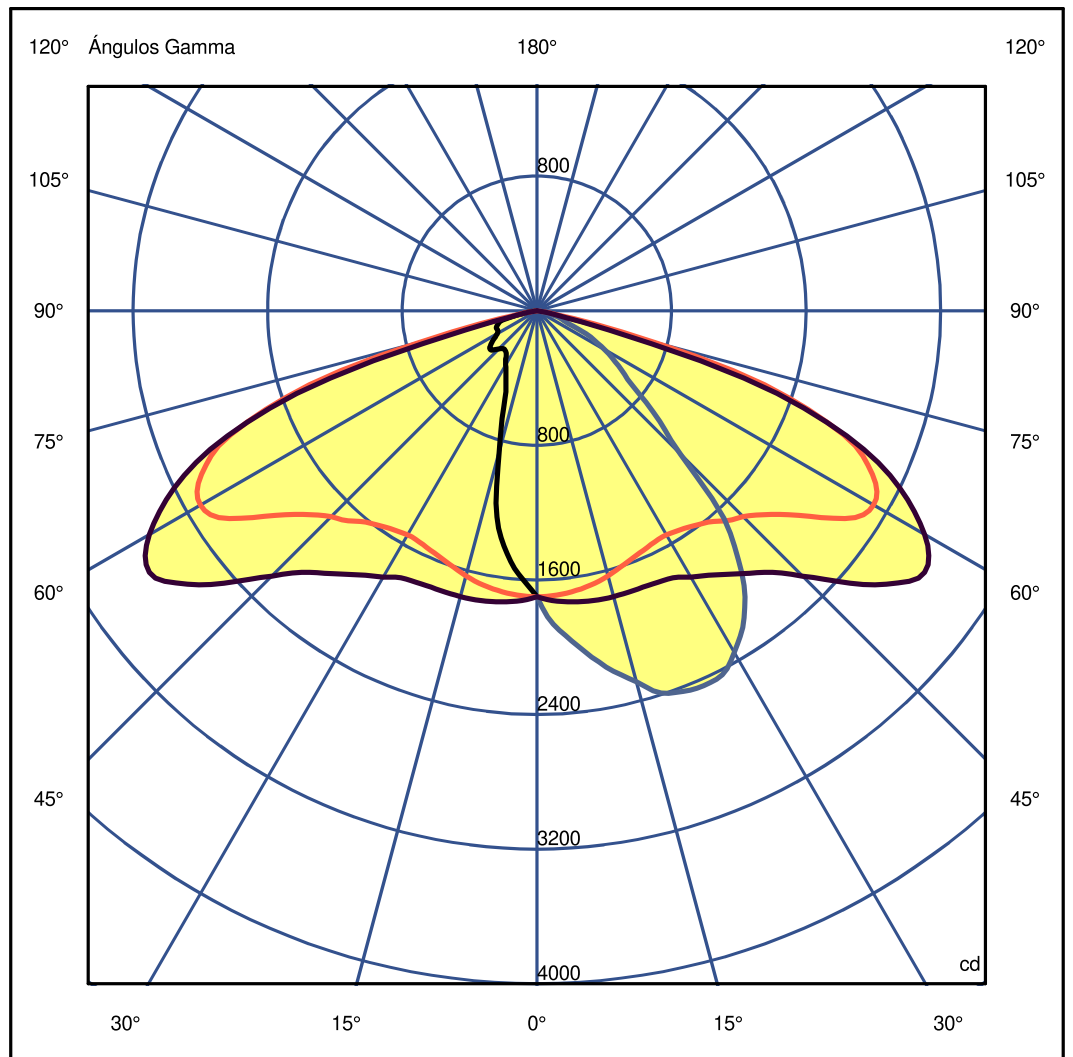
Flujo Luminaria	5466.40 lm	Potencia Luminaria	39.54 W	Eficacia	138.25 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	5466.40 lm	Valor Máximo	2767.99 cd	Posición	C=15.00 G=55.00	CG Sim. en los planos 270-90	
Luminaria Redonda		Diam.	630 mm	Altura	60 mm	Altura	0 mm
Área Luminosa Rectangular		Longit.	150 mm	Anchura	110 mm		
Área Luminosa Horizontal	0.016500 m2			Área Emisión sobre Pl. 180°		0.000000 m2	
Área Emisión sobre Pl. 0°	0.000000 m2			Área Emisión sobre Pl. 270°		0.000000 m2	
Área Emisión sobre Pl. 90°	0.000000 m2			Área de deslumbramiento a 76°		0.003992 m2	
Sist. de Coord.		CG viales	15-11-2021	Tipo de Simetría		Sim. en los planos 270-90	
Fecha			6.44	Máximo Ángulo Gamma		180	
Distancia de Ensayo				Flujo de Ensayo		5466.40 lm	
Operador		Asselum T2		Tensión Nominal		230.18 V	
Temperatura		25.50 °C		Corriente Nominal		0.18 A	
Humedad		34.80 %		Fotocélula		Prc	
Notas		RM21072804.7					

### Fuentes de luz de la Luminaria

Familia	Código	Nombre	Flujo [lm]	Pot. [W]	Cant.
	5050	Lumiled 5050	5466.40	39.54	1
C.I.E.	42 76 97 100 100	D DIN 5040	A30		



ULOR 0.09 %  
DLOR 99.91 %  
RN 0.09 %

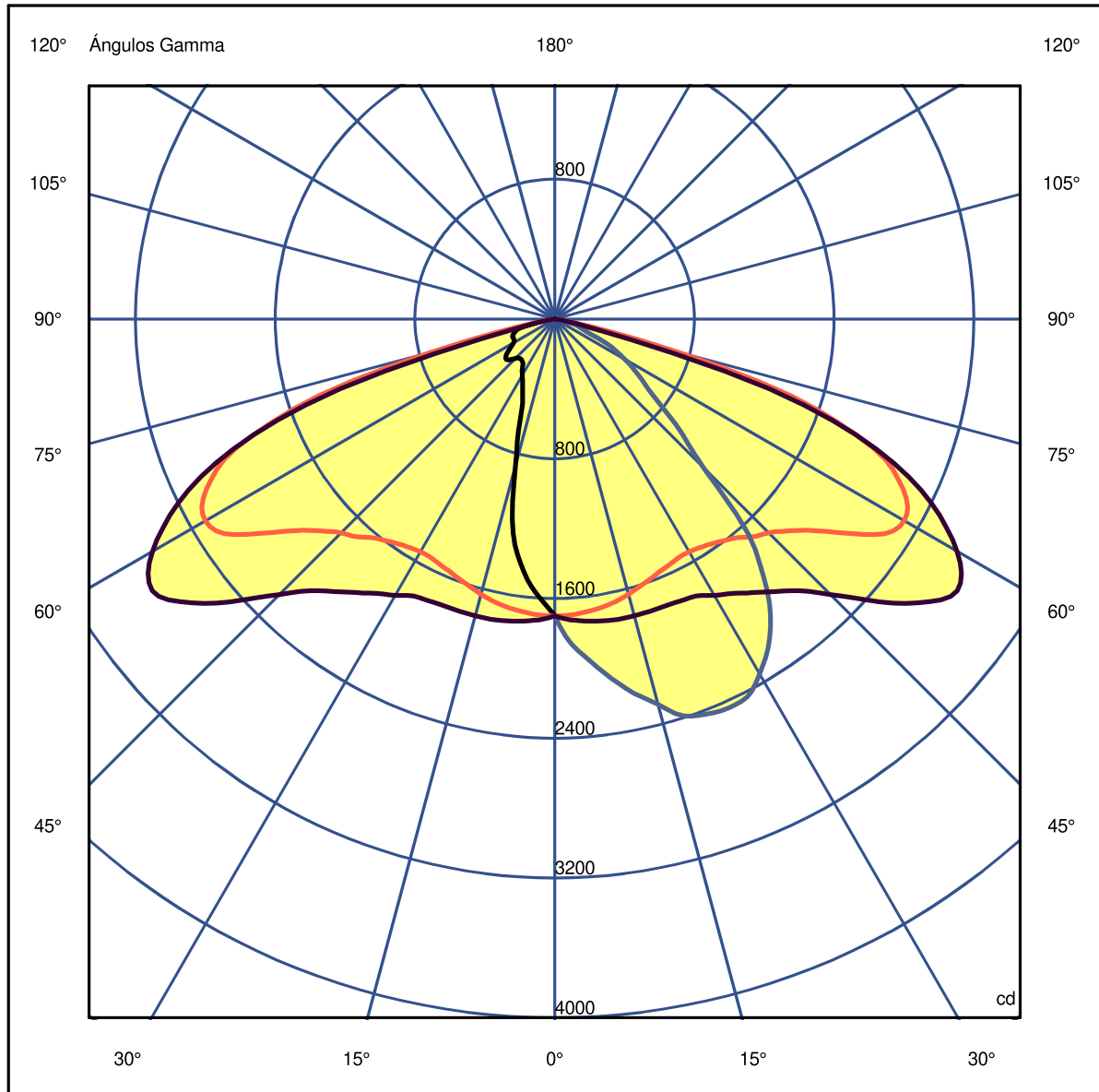




### 4.3. Distribución polar de intensidades (Cd)

**Luminaria**  
 Código ALI - ALIB  
 Nombre Innova 40W 4K  
**Ensayo**  
 Código CL237A21F012V  
 Nombre Innova 40W 4K

Flujo Luminaria	5466.40 lm	Potencia Luminaria	39.54 W	Eficacia	138.25 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	5466.40 lm	Valor Máximo	2767.99 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

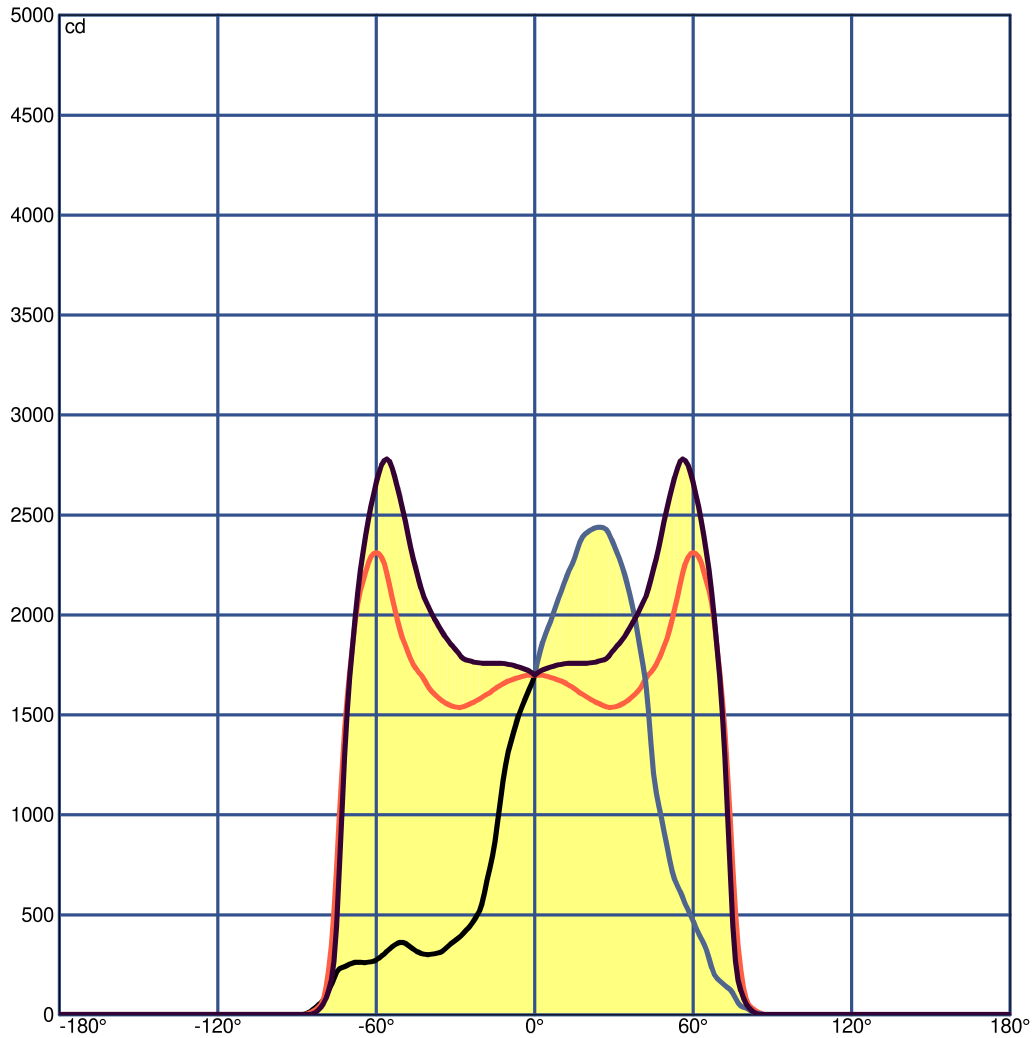




### 4.4. Distribución cartesiana de intensidades (Cd)

**Luminaria**  
 Código ALI - ALIB  
 Nombre Innova 40W 4K  
**Ensayo**  
 Código CL237A21F012V  
 Nombre Innova 40W 4K

Flujo Luminaria	5466.40 lm	Potencia Luminaria	39.54 W	Eficacia	138.25 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	5466.40 lm	Valor Máximo	2767.99 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90



## 4.5. Flujo zonal

**Luminaria**  
 Código ALI - ALIB  
 Nombre Innova 40W 4K  
**Ensayo**  
 Código CL237A21F012V  
 Nombre Innova 40W 4K

Flujo Luminaria	5466.40 lm	Potencia Luminaria	39.54 W	Eficacia	138.25 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	5466.40 lm	Valor Máximo	2767.99 cd	Posición	C=15.00 G=55.00	CG Sim. en los planos 270-90	

Flujo Total=5466.40 Flujo Luminaria=5466.40

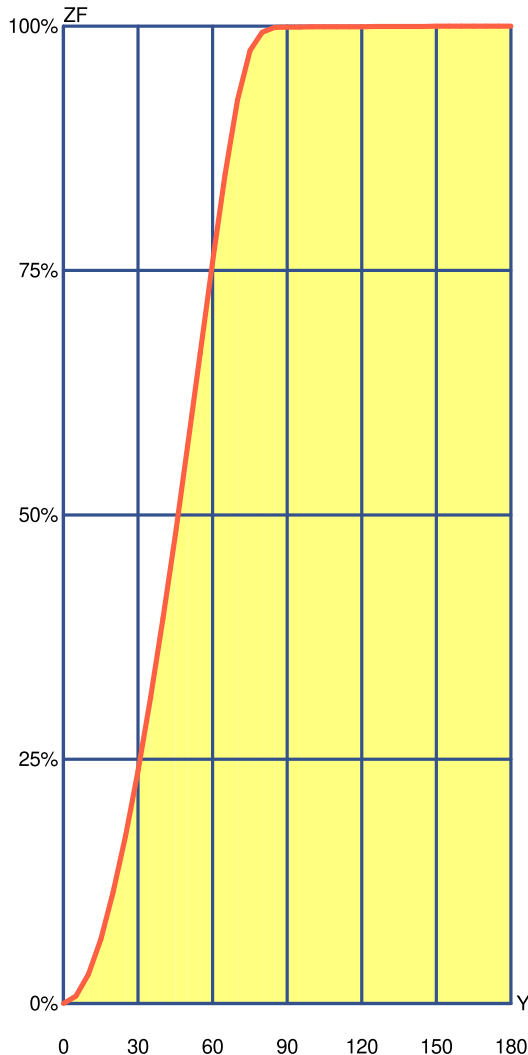
RI	0.60	0.80	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	10.00	20.00
DRR	0.27	0.35	0.43	0.51	0.57	0.66	0.72	0.77	0.83	0.86	0.94	0.97
RC	6	6	6	6	6	5	5	5	5	5	4	3

Flujo Zonal por 1000 Lúmenes

Y°	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
ZF(Y)	30	114	238	394	571	759	925	994	999	999	999	1000	1000	1000	1000	1000	1000	1000

Códigos de Flujo C.I.E.  
 42 76 97 100 100

C.I.E.	6/6/6/6/6/5/5/5/5/4/3	LOR	100.00000 %
D DIN 5040	A30	ULOR	0.08635 %
F UTE	1.00 E	DLOR	99.91365 %
B NBN	BZ 5	UFF	0.08635 %
RN	0.08635 %	DFF	99.91365 %
BLF	1.0	FFR	0.08643 %



Flujo Zonal				
Gamma °	Flujo	Suma lm	Flujo [%]	Suma [%]
0°	0.00	0.00	0.00%	0.00 %
5°	7.44	7.44	0.74 %	0.74 %
10°	22.24	29.68	2.22 %	2.97 %
15°	36.02	65.70	3.60 %	6.57 %
20°	47.80	113.50	4.78 %	11.35 %
25°	57.77	171.28	5.78 %	17.13 %
30°	66.66	237.94	6.67 %	23.79 %
35°	74.57	312.51	7.46 %	31.25 %
40°	81.43	393.94	8.14 %	39.39 %
45°	86.40	480.34	8.64 %	48.03 %
50°	90.35	570.69	9.03 %	57.07 %
55°	93.97	664.66	9.40 %	66.47 %
60°	94.41	759.08	9.44 %	75.91 %
65°	89.42	848.50	8.94 %	84.85 %
70°	76.26	924.75	7.63 %	92.48 %
75°	50.39	975.14	5.04 %	97.51 %
80°	18.82	993.96	1.88 %	99.40 %
85°	4.63	998.59	0.46 %	99.86 %
90°	0.55	999.14	0.05 %	99.91 %
95°	0.06	999.19	0.01 %	99.92 %
100°	0.05	999.25	0.01 %	99.92 %
105°	0.06	999.31	0.01 %	99.93 %
110°	0.07	999.37	0.01 %	99.94 %
115°	0.07	999.44	0.01 %	99.94 %
120°	0.07	999.51	0.01 %	99.95 %
125°	0.07	999.58	0.01 %	99.96 %
130°	0.07	999.65	0.01 %	99.96 %
135°	0.06	999.71	0.01 %	99.97 %
140°	0.06	999.76	0.01 %	99.98 %
145°	0.05	999.81	0.01 %	99.98 %
150°	0.05	999.86	0.00 %	99.99 %
155°	0.04	999.90	0.00 %	99.99 %
160°	0.03	999.93	0.00 %	99.99 %
165°	0.03	999.96	0.00 %	100.00 %
170°	0.02	999.98	0.00 %	100.00 %
175°	0.01	1000.00	0.00 %	100.00 %
180°	0.00	1000.00	0.00 %	100.00 %

## 4.6. Diagrama Isolux

**Luminaria**

Código ALI - ALIB  
 Nombre Innova 40W 4K

**Ensayo**

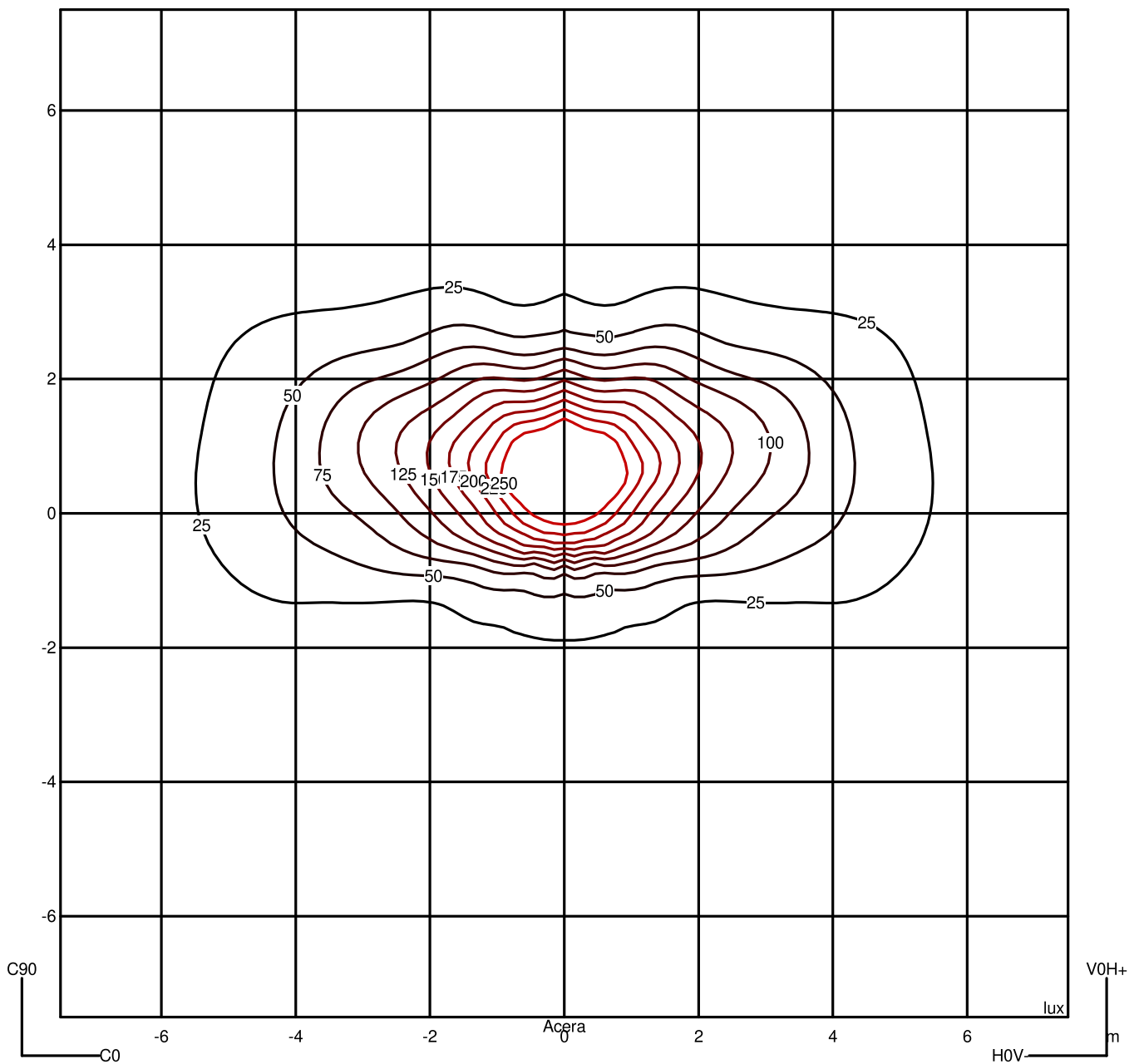
Código CL237A21F012V  
 Nombre Innova 40W 4K

Flujo Luminaria	5466.40 lm	Potencia Luminaria	39.54 W	Eficacia	138.25 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	5466.40 lm	Valor Máximo	2767.99 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

Isolux (Suelo)

Posición Luminaria X=0.00m Y=0.00m Z=2.50m

Vial



### 4.7. Factor de utilización

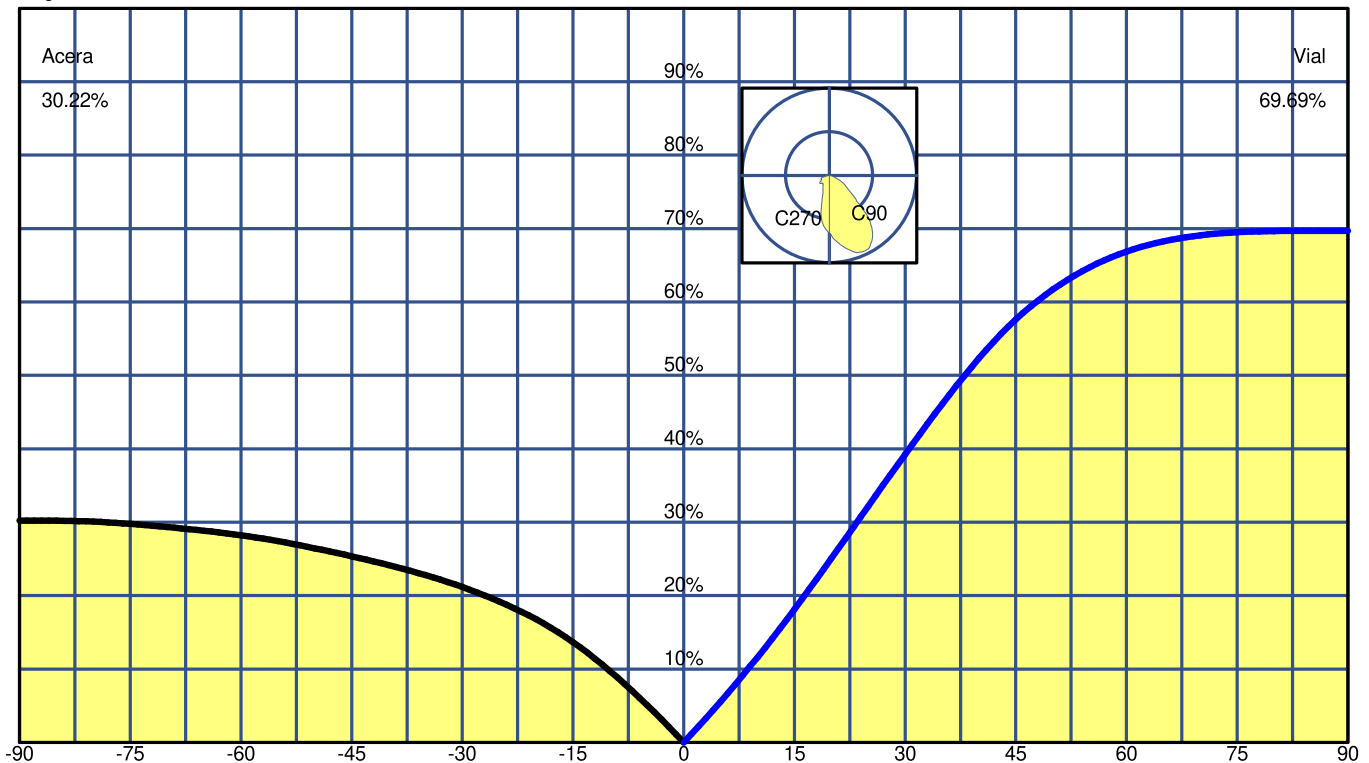
**Luminaria**  
 Código ALI - ALIB  
 Nombre Innova 40W 4K  
**Ensayo**  
 Código CL237A21F012V  
 Nombre Innova 40W 4K

Flujo Luminaria	5466.40 lm	Potencia Luminaria	39.54 W	Eficacia	138.25 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	5466.40 lm	Valor Máximo	2767.99 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

Acera			Vial		
Ángulo	0	0.00%	Ángulo	0	0.00%
Ángulo	-5	5.10%	Ángulo	5	5.55%
Ángulo	-10	9.72%	Ángulo	10	11.60%
Ángulo	-15	13.66%	Ángulo	15	18.14%
Ángulo	-20	16.76%	Ángulo	20	25.05%
Ángulo	-25	19.19%	Ángulo	25	32.15%
Ángulo	-30	21.17%	Ángulo	30	39.23%
Ángulo	-35	22.79%	Ángulo	35	46.05%
Ángulo	-40	24.15%	Ángulo	40	52.30%
Ángulo	-45	25.35%	Ángulo	45	57.59%
Ángulo	-50	26.44%	Ángulo	50	61.68%
Ángulo	-55	27.41%	Ángulo	55	64.71%
Ángulo	-60	28.21%	Ángulo	60	66.85%
Ángulo	-65	28.83%	Ángulo	65	68.25%
Ángulo	-70	29.33%	Ángulo	70	69.07%
Ángulo	-75	29.77%	Ángulo	75	69.49%
Ángulo	-80	30.07%	Ángulo	80	69.65%
Ángulo	-85	30.20%	Ángulo	85	69.69%
Ángulo	-90	30.22%	Ángulo	90	69.69%

Ángulo de Inclinación = 0.0

DLOR = 99.91%



Spread	39.3° Estrecho	DLOR	99.91365 %
Throw	56.1° Corto	ULOR	0.08635 %
SLI	6.1 Concentrado	Eficiencia	100.00000 %
Cutoff CIE	Cutoff - Max: C=15.0° Gamma=55.0°	RN	0.08635 %
Cutoff lesna	Cutoff	Clase de Intensidad Luminosa	G*6
DIN5044	KB1	Índice de Deslumbramiento	D4

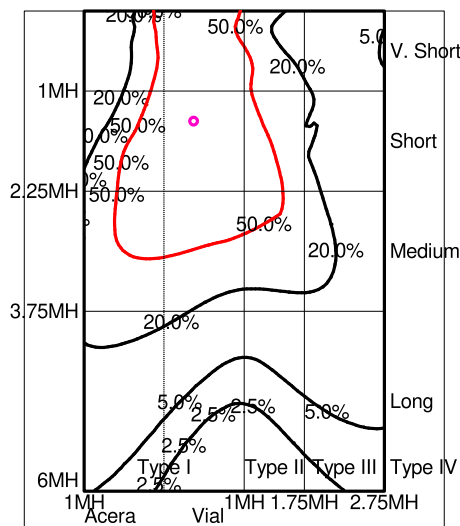
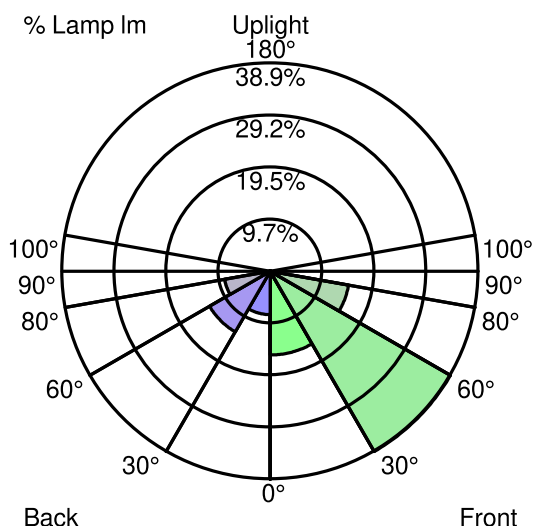
IESNA Type II Short Asymmetrical

### 4.8. Clasificación vial según IES TM-15

**Luminaria**  
 Código ALI - ALIB  
 Nombre Innova 40W 4K  
**Ensayo**  
 Código CL237A21F012V  
 Nombre Innova 40W 4K

Flujo Luminaria	5466.40 lm	Potencia Luminaria	39.54 W	Eficacia	138.25 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	5466.40 lm	Valor Máximo	2767.99 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

US ROAD STANDARDS



Luminaire Classification System (LCS)			
LCS Zone		Lumens	%Lamp %Lum
FL	0° -- 30°	856.9 lm	15.7 % 15.7 %
FM	30° -- 60°	2129.0 lm	38.9 % 38.9 %
FH	60° -- 80°	814.6 lm	14.9 % 14.9 %
FVH	80° -- 90°	9.3 lm	0.2 % 0.2 %
BL	0° -- 30°	444.0 lm	8.1 % 8.1 %
BM	30° -- 60°	715.9 lm	13.1 % 13.1 %
BH	60° -- 80°	474.0 lm	8.7 % 8.7 %
BVH	80° -- 90°	18.0 lm	0.3 % 0.3 %
UL	90° -- 100°	0.6 lm	0.0 % 0.0 %
UH	100° -- 180°	4.1 lm	0.1 % 0.1 %
<b>TOTALS</b>		<b>5466.4 lm</b>	<b>100.0 % 100.0 %</b>
BUG B1 U1 G1 Type II Short Asymmetrical			

# MILAN S 60

Documentación técnica IDAE



**BENITO  
NOVATILU**

EXPERTOS EN  
ILUMINACIÓN EFICIENTE

+34 93 852 1000 / info@[benito.com](mailto:info@benito.com)

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*UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.*

*UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.*

*UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas.*

*Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.*

*Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE- EN 62262.*

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*UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2*

*Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16A)*

*UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.*

*UNE-EN 61547. Equipos para alumbrado*

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*UNE-EN 62031. Módulos LED para alumbrado general. Requisitos de seguridad. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.)*

*Ficha técnica PCB*

*Ficha técnica LED*

*UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos.*

*UNE-EN 62384. Dispositivos de control electrónicos. Requisitos de funcionamiento.*

*Certificado CE y ENEC del Driver*

*Ficha técnica Driver \*Sujeto a cambio en función de prescripción*

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## 3 Informes de Pruebas o Certificados de la Luminaria

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*Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes.*

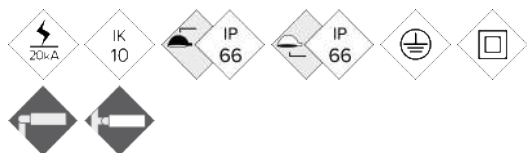
*Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4.*

*Ensayo colorimétrico de la luminaria según la norma UNE EN 13032-4.*

*Ensayo de medidas eléctricas y de seguridad*

ALMS60

# Luminaria MILAN S 60



Luminaria Funcional o de Vial con forma aerodinámica, plana, con baja resistencia al viento. Sus cinco medidas distintas con un amplio rango de potencias, entre 20W y 300W, la hacen muy versátil para cubrir las necesidades de cualquier proyecto. Además de su alta eficiencia, es una solución fiable y de alta calidad, que permite rápidos retornos de la inversión. Preparada para cualquier sistema de telegestión.

## VENTAJAS:

- Alta eficiencia. Hasta 145 lm/W reales
- 5 Medidas distintas. De 20W hasta 300W
- Doble cavidad, Driver y Grupo Óptico
- Apertura fácil sin herramientas
- 18 Distribuciones lumínicas distintas
- Estándar Zhaga (Book 15)
- Ready 4IoT. Preparada para la conectividad

## APLICACIONES:

- Carriles Bici y Zonas 30
- Vías Urbanas y Calles Residenciales
- Avenidas urbanas
- Zonas Industriales y Aparcamientos
- Carreteras Interurbanas y Rotondas
- Autovías y Autopistas

## DETALLES:



Doble cavidad.



Sistema de apertura sin herramientas.



Válvula anti condensación.

[Catálogo](#) | [Instrucciones montaje](#) | [Imagen HD](#)

**BENITO  
NOVATILU**

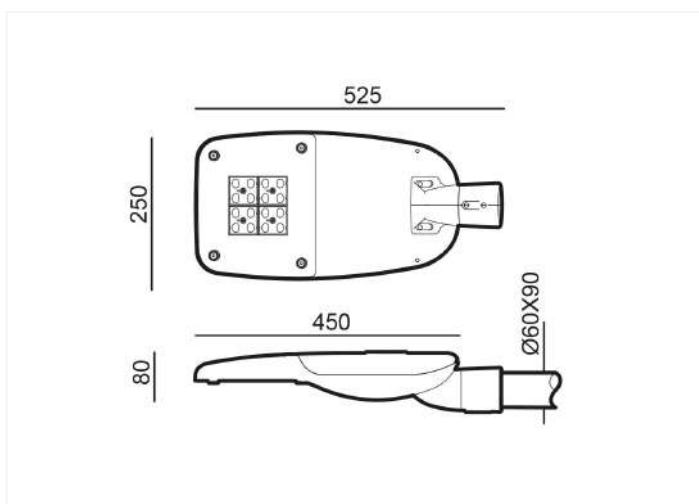
info@benito.com  
tel. +34 93 852 1000 / +34 961 401 000



## CARACTERÍSTICAS:

Material cuerpo:	Fundición de aluminio inyectado a presión del tipo EN AC-43000, EN AC-43100, EN AC-43400, EN AC-44100, EN AC-47100 según la norma UNE EN 1706
Difusor (cerramiento cavidad óptica):	Vidrio Templado de 5 mm. Filtra los UV.
Tornillería:	Acero Inoxidable 18/8 - AISI 304
Cuerpo:	Doble Cavidad: Driver / Módulo LEDs
Juntas de estanqueidad:	Espuma de Silicona
Índice de protección IP de la luminaria:	IP66
Índice de protección IP del Grupo Óptico:	IP66
Índice de protección IK:	IK10
Disipación térmica de los LEDs:	Disipación térmica a través del cuerpo de la luminaria, sin aletas externas ni fluidos conductores. Disipación pasiva por convección y asegurando el contacto térmico de los módulos de LEDs a través de material de transferencia térmica de alta conductividad
Válvula anti condensación:	Válvula de compensación de presiones que asegura la evacuación de la humedad, evitando la condensación, manteniendo el grado de estanqueidad IP de la luminaria.
Pintura:	Recubrimiento de pintura en polvo de poliéster, pulverizado electrostáticamente y sublimado al horno. Resistente a la corrosión.
Color:	Color RAL 9022, y otros colores bajo pedido
Fijación:	Fijación Post - Top Ø60mm
Orientable:	Luminaria orientable de -15° a 15° de inclinación
Mantenimiento:	De apertura fácil sin herramientas específicas. Módulos reemplazables: LEDs, Drivers, SPD.
Altura de montaje recomendada:	6 - 8m
Driver:	Driver regulable y programable de corriente constante. Incorporado dentro de la luminaria, precableado sobre placa de acero galvanizada.
Regulación driver:	Driver Regulable 0-10V, programable en 5 niveles y con opción DALI 2. Con las características de Wireless, AOC, MTP, DTL.
Opciones de reducción de flujo:	<ul style="list-style-type: none"> <li>- Multinivel Temporizado o Media Noche Virtual</li> <li>- Ready4IoT</li> <li>- Reducción de flujo en Cabecera</li> <li>- Doble Nivel con Línea de Mando</li> </ul>
Protector de sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.

## PLANO:



## INSTALACIÓN:





## CUADRO TÉCNICO:

REF.	Nº LEDs	Potencia W	I Driver mA	Flujo Lumínico Real (T) =85°C		Flujo Lumínico Inicial (T) =25°C		
				Flujo lm	Eficiencia lm/W	Flujo lm	Eficiencia lm/W	
Milan S	ALMS60	24	40	500	5680	142	6475	162
		24	50	625	7090	142	8083	162
		24	60	750	8443	141	9625	160

LEDs: 5050

Eficiencia Nominal del LED: 172 lm/W.

Corriente máxima LED: 1000 mA.

Corriente LED = Corriente Driver/2.

Vida Media L90B10: >100,000 horas.

Flujos Lumínicos y Eficiencias a 4000°K y CRI>70.

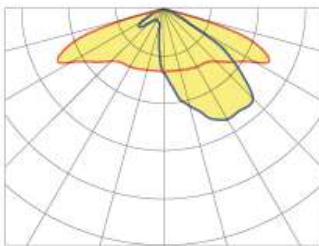
Tolerancia del flujo lumínico < +/-3%.

Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.

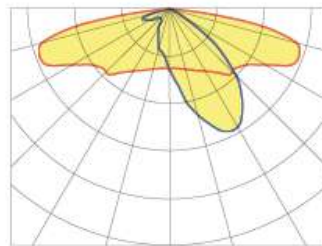


## FOTOMETRÍAS:

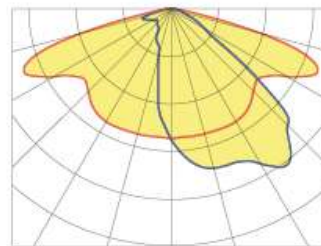
Asimétrico Super-Extensivo (AE)



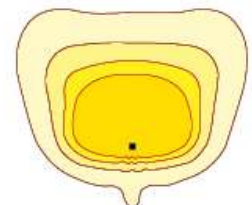
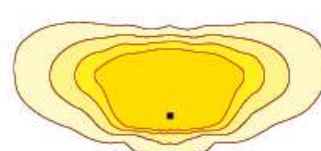
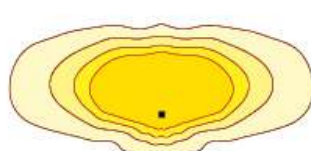
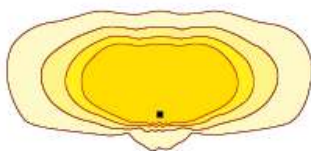
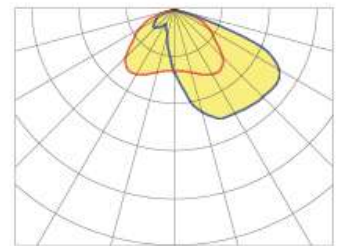
Asimétrico Super-Extensivo ( A2)



Asimétrico Extensivo (AM)



Asimétrico (A4)



\*Consultar otras distribuciones lumínicas

El Grupo BENITO NOVATILU se reserva el derecho de realizar modificaciones a sus productos sin previo aviso.

## MÓDULO LED'S:

Módulo de LEDs:	BENITO-NOVATILU Formato Zhaga de 8, 12 y 16 LEDs. Consultar Temperaturas de Color, CRI y Distribuciones Lumínicas.	
Módulo sustituible:	Si	
LED:	5050	
Nº de LED's:	24	
Formato PCBs:	3 Zhaga (Book 15) 2x4	
Eficiencia nominal del LED:	172	
Temperatura de Color:	PC Ámbar, 2K2, 2K7, 3K, 4K, 5K	
Rendimiento Cromático CRI:	>70 (opcional >80)	
Vida Media de los LED - L90B10:	L90B10 >100.000 horas	

## ESPECIFICACIONES ÓPTICAS:

Sistema Óptico:	Lentes de PMMA 2x2	
Distribución Lumínica:	18 Distribuciones Lumínicas disponibles	
Flujo Hemisferio Superior (FHS) ULOR:	0%	
Flujo Hemisferio Inferior DLOR:	100%	
Índice de Deslumbramiento:	Entre D5 y D6 (depende de la distribución lumínica)	
Categoría Intensidad Luminosa:	Entre G*4 y G*6 (depende de la distribución lumínica)	
Flujo Luminoso CIE n°3:	>95%	
Seguridad Fotobiológica:	RG0 (exento de riesgo)	
Flujo lumínico Inicial Tj=25°C (hasta):	lm	9625
Eficiencia Lumínica Inicial Tj=25°C (hasta):	lm/W	162
Flujo lumínico Real Tj=85°C (UNE EN 13032-4) (hasta):	lm	8493
Eficiencia Lumínica Real Tj=85°C (UNE EN 13032-4) (hasta):	lm/W	142

## ESPECIFICACIONES ELÉCTRICAS:

Potencia máxima nominal (LED's):	W	54
Potencia máxima consumida (Luminaria):	W	60
Rango de Potencias:	W	40W - 60W
Corriente máxima del LED:	mA	<400 (<50% I <sub>max</sub> )
Clase de Protección Eléctrica IEC:	Clase I y II	
Protector de Sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.	
Nivel de protección de tensión modo común y diferencial (SPD) Udc:	kV	10
Corriente máxima de descarga (8/20) (SPD):	kA	20
Desconexión Térmica de la Fase (SPD):	SI	
Tensión de Entrada:	Vac	220-240
Tensión de Entrada (rango máximo):	Vac	198-264
Frecuencia de Entrada:	Hz	47-63
Corriente de arranque:	A	<65
Duración del pico de arranque:	ms	<0,3
Eficiencia del Driver:	>90%	
Factor de potencia 100% consumo:	>0,98	
Factor de potencia 50% consumo:	>0,95	
Distorsión Harmónica Total (THD):	<10	
Consumo de Energía en reposo:	W	<0,4
Clasificación Energética:	A++ IPEA>1,15	

## CONDICIONES DE TRABAJO:

Vida Media de los LED - L90B10:	horas	>100.000
Vida Media del Driver a T <sub>p</sub> <70°C:	horas	100.000
Vida Media de la Luminaria L80B10 (TM-21):	horas	72.167
Temperatura ambiente de trabajo:	°C	de -35°C a +50°C
Superficie al viento:	m <sup>2</sup>	0,042
Test anti vibraciones (15Hz en 3 ejes):		
Test fuerza del viento:	m/s	
Período de Garantía:	años	5 años (opcional hasta 10)

## DIMENSIONES EMBALAJE:

Peso neto	kg	5,3
Peso Bruto	kg	6,2
Dimensiones Luminaria (LxAxH)	mm	525x250x80
Dimensiones Embalaje (LxAxH)	mm	585x285x155
Unidades por Embalaje	1	
Cantidad por contenedor de 20"	1200	
Cantidad por contenedor de 40"	2475	

## CERTIFICACIONES:

Certificaciones Seguridad:	Certificaciones EMC:	Otras Certificaciones:
EN 60598-1 / EN 60598-2-3 / EN 62493 / IEC 62471	EN 55015 / EN 61547 / EN 61000-3-2 / EN 61000-3-3 / EN 61347-2-13 / EN 61347-1 / EN 62384	IEC 62262 / EN 13032-4 / EN 62717 / EN 6272-1 / EN 6272-2-1 / EN 61643-11

## 1.2 Tabla (Anexo 1): Datos Generales de la Empresa

DATOS GENERALES DE LA EMPRESA FABRICANTE DE LA LUMINARIA LED		
1	Nombre de la empresa	BENITO URBAN, S.L.U.
2	Actividad social de la empresa	Fabricación, Comercialización y Distribución de Alumbrado Público
3	Código Identificación Fiscal	B59987529
4	Dirección postal	Calle Lleida, 10, 08500 Vic. Barcelona.
5	Dirección correo electrónico	mhoms@benito.com
6	Página/s web	www.benito.com
7	Nº Teléfono y Fax	T. 938 521 000 y F. 938 521 001
8	Persona de contacto	Mateu Homs
9	Certificado UNE-EN ISO 9001	OCA GLOBAL ENAC 34/5200/19/8038
10	Certificado UNE-EN ISO 14001	OCA GLOBAL ENAC 34/5400/19/8039
11	Catálogo Digital Publicado de Producto	<a href="https://www.benito.com/es/descargas-alumbrado-publico/catalogo-light.html">https://www.benito.com/es/descargas-alumbrado-publico/catalogo-light.html</a>
12	Certificado de la empresa de adhesión a un sistema integrado de gestión de residuos (SIG)	SI

Para más información consultar pack IDAE Empresa



**Barcelona T +34 938 521 000 Madrid T+34 916 436 964 info@benito.com www.benito.com**

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 AMERICA: USA +1 617 778 29 47 Argentina +54 1 159 844 113 Chile +56 2 938 20 35 Mexico +52 5 546 319 722 Brazil +55 1 139 570 340 Peru +51 1707 1369  
 ASIA China +86 1 063 705 530

### 1.3 Tabla (Anexo 2) CEI – IDAE Requerimientos Técnicos Luminaria

DATOS Y DOCUMENTACIÓN TÉCNICA DE LA LUMINARIA TIPO FUNCIONAL																							
1	Marca y Modelo	NOVATILU - MILAN S 60																					
2	Ficha Técnica	Si - ALMS60																					
3	Marcado CE	Si																					
4	Material de Fabricación conforme el apartado 5.	Si																					
5	Sustitución independiente de los sistemas integrantes compartimento óptico (módulo y lente) y equipos auxiliares	Si																					
6	Grado de estanqueidad en la luminaria IP 66	IP 66																					
7	Grado de protección ante impactos en la luminaria mínimo IK 08	IK 10																					
8	Rango de temperatura de funcionamiento -10°C a 35°C	Si, -30°C - 50°C																					
9	Número de distribuciones fotométricas, al menos 5	18																					
10	Curvas Fotométricas y de utilización de la luminaria, al menos 5	Si																					
11	FHSINST , máximo permitido 3%	<1%																					
12	Temperatura de color en K de la luz emitida por la luminaria, máxima permitida (4000K)	PC-Ámbar, 2200K, 2700K, 3000K, 4000K, 5000K (estadios deportivos)																					
Eficacia de salida de la luminaria (lm/W)																							
13	<table border="1"> <thead> <tr> <th>TIPO DE LED</th> <th>lm/W min</th> </tr> </thead> <tbody> <tr> <td>LED NEUTRO 4000°K</td> <td>110</td> </tr> <tr> <td>LED CÁLIDO 3000°K</td> <td>100</td> </tr> <tr> <td>LED CÁLIDO 2700°K</td> <td>90</td> </tr> <tr> <td>LED CÁLIDO 2200°K</td> <td>85</td> </tr> <tr> <td>LED ÁMBAR (Phosphor-Converted)*</td> <td>70</td> </tr> <tr> <td>LED ÁMBAR PURO (monocromático)*</td> <td>40</td> </tr> </tbody> </table>	TIPO DE LED	lm/W min	LED NEUTRO 4000°K	110	LED CÁLIDO 3000°K	100	LED CÁLIDO 2700°K	90	LED CÁLIDO 2200°K	85	LED ÁMBAR (Phosphor-Converted)*	70	LED ÁMBAR PURO (monocromático)*	40	<table border="1"> <thead> <tr> <th>lm/W</th> </tr> </thead> <tbody> <tr> <td>&gt;120</td> </tr> <tr> <td>&gt;110</td> </tr> <tr> <td>&gt;100</td> </tr> <tr> <td>&gt;90</td> </tr> <tr> <td>&gt;75</td> </tr> <tr> <td>-</td> </tr> </tbody> </table>	lm/W	>120	>110	>100	>90	>75	-
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lm/W																							
>120																							
>110																							
>100																							
>90																							
>75																							
-																							
14	Clase Eléctrica	I y II																					
15	Medidas Eléctricas: Tensión, corriente, potencia total consumida y Factor de potencia (>0.9)	Tensión 230V / Potencia 60W / FP >0,98																					
16	Vida útil estimada de la luminaria (Se considerará como máximo 100.000h)	L90B10 >100 000 horas																					
17	Ficha Técnica del LED utilizado en la luminaria y marcado CE	Si																					
18	Número de LEDs y Corriente de Alimentación	24 Led / 375mA																					
19	Ficha Técnica Driver y marcado CE	Si																					
20	Ficha Técnica de otros dispositivos (SPD, OLC,.etc) y marcado CE, que se estimen oportunos	Si																					



## 2 Informes de Pruebas y Certificados de la Luminaria por OEC


### 2.1 Tabla de Verificación (Anexo 3) CEI – IDAE

Informes de Pruebas y Certificados emitidos por OEC acreditada sobre La luminaria y sus elementos integrantes	
1	Documento del alcance de la acreditación del certificador/es de estos informes o certificados. 
2	UNE EN 60598-1 Luminarias. Requisitos generales y ensayos. 
3	UNE EN 60598-2-3 o 60598-2-5 Luminarias. Requisitos particulares. Luminarias de Alumbrado público o proyectores. 
4	UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan Lámparas, o según IEC/TR 62778 que es su norma de aplicación. 
5	Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria. 
6	El Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria) 
7	UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2: Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16A por fase) 
8	UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares. 
9	UNE-EN 61547. Equipos para alumbrado de uso general. Requisitos de inmunidad CEM. 
10	UNE-EN 62031. Módulos LED para alumbrado general. Requisitos de seguridad. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria. 
11	UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED. 
12	UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED. Requisitos de funcionamiento. 
13	Informe de ensayo en relación al material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda. A – Luminaria modelo funcional 

## 2.2 Requisitos de Seguridad

- UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.
- UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.
- UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas.
- Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.
- Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262.

## VERIFICATION OF COMPLIANCE

No.: LVD NBES170901575201LMC  
Applicant: NOVATILU, S.L.U  
Via Ausetania, 11-13 08560 Manlleu Barcelona Spain  
Manufacturer: Same as applicant  
Product Name: LED lamp  
Product Description: LED Street Lighting  
Model No.: AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE,  
ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M,  
MILAN XL  
Trade Mark:   
Rating: (see page 2 for details)  
Protection against Electric Shock: Class I  
Degree of Protection: IP66  
Additional Information (if any): None  
Sufficient samples of the product have been tested and found to be in conformity with  
Test Standard: EN 60598-2-3:2003 + A1:2011  
EN 60598-1:2015  
EN 62493:2015  
as shown in the  
Test Report Number(s): NBES170901575201

This Verification of Compliance has been granted to the applicant based on the results of tests, performed by Laboratory of SGS-CSTC Standards Technical Services Co., Ltd. on sample of the above-mentioned product in accordance with the provisions of the relevant harmonized standards under the Low Voltage Directive 2014/35/EU. The CE marking as shown below can be affixed, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The affixing of the CE marking presumes in addition that the conditions in annexes III and IV of the Directive are fulfilled.



Leo Du   
E&E Safety Lab Section Manager  
SGS-CSTC



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No.:

LVD NBES170901575201LMC

Rating:

Model	Ratings
AGIL XL	100 V – 240 V; 50 Hz / 60 Hz; 150 W; t <sub>a</sub> : 35 °C
AGIL	100 V – 240 V; 50 Hz / 60 Hz; 80 W; t <sub>a</sub> : 35 °C
AGIL S	100 V – 240 V; 50 Hz / 60 Hz; 40 W; t <sub>a</sub> : 45 °C
AVENUE M	200 V – 240 V; 50 Hz / 60 Hz; 60 W; t <sub>a</sub> : 35 °C
AVENUE XL	100 V – 240 V; 50 Hz / 60 Hz; 100 W; t <sub>a</sub> : 35 °C
ESKADE	100 V – 240 V; 50 Hz / 60 Hz; 80 W; t <sub>a</sub> : 45 °C
ESKADE-1	100 V – 240 V; 50 Hz / 60 Hz; 80 W; t <sub>a</sub> : 45 °C
ESKADE UP	100 V – 240 V; 50 Hz / 60 Hz; 80 W; t <sub>a</sub> : 45 °C
CORBA	100 V – 240 V; 50 Hz / 60 Hz; 80 W; t <sub>a</sub> : 45 °C
BEL	100 V – 240 V; 50 Hz / 60 Hz; 80 W; t <sub>a</sub> : 45 °C
MILAN S	100 V – 240 V; 50 Hz / 60 Hz; 60 W; t <sub>a</sub> : 45 °C
MILAN M	100 V – 240 V; 50 Hz / 60 Hz; 100 W; t <sub>a</sub> : 45 °C
MILAN XL	100 V – 240 V; 50 Hz / 60 Hz; 150 W; t <sub>a</sub> : 45 °C

Leo Du *Leo Du*  
 E&E Safety Lab Section Manager  
 SGS-CSTC



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<b>TEST REPORT</b> <b>IEC 60598-2-3</b> <b>Luminaires</b> <b>Part 2: Particular requirements</b> <b>Section 3: Luminaires for road and street lighting</b>	
<b>Report Number</b> .....	NBES170901575201
<b>Date of issue</b> .....	2017-09-29
<b>Total number of pages</b> .....	45
<b>Name of Testing Laboratory preparing the Report</b> .....	SGS-CSTC Standards Technical Services Co., Ltd. Ningbo Branch
<b>Applicant's name</b> .....	NOVATILU, S.L.U
<b>Address</b> .....	Via Ausetania, 11-13 08560 Manlleu Barcelona Spain
<b>Test specification:</b>	
<b>Standard</b> .....	EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2015
<b>Test procedure</b> .....	CE-LVD
<b>Non-standard test method</b> .....	N/A
<b>Test Report Form No.</b> .....	IEC60598_2_3K
<b>Test Report Form(s) Originator</b> ....	Intertek Semko AB
<b>Master TRF</b> .....	2016-09
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<b>General disclaimer:</b>	
<p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.</p>	



<b>Test item description</b> .....	LED Street Lighting (LED lamp)
<b>Trade Mark</b> .....	
<b>Manufacturer</b> .....	Same as applicant
<b>Model/Type reference</b> .....	AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL
<b>Ratings</b> .....	50 Hz / 60 Hz; IP66; Class I (details to see P.7)

<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/>	<b>Testing Laboratory:</b>	SGS-CSTC Standards Technical Services Co., Ltd. Ningbo Branch
<b>Testing location/ address.....:</b>		1-5/F West No. 4 Building, Lingyun Industry Park, No. 1177, Lingyun Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang, China
<input type="checkbox"/>	<b>Associated Testing Laboratory:</b>	N/A
<b>Testing location/ address.....:</b>		N/A
<b>Tested by (name, function, signature).....:</b>		Zara Fan, PE <i>Zara Fan</i>
<b>Approved by (name, function, signature)....:</b>		Leo Du, Reviewer <i>Leo Du</i>
<hr/>		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 1:</b>	N/A
<b>Testing location/ address.....:</b>		
<b>Tested by (name, function, signature).....:</b>		
<b>Approved by (name, function, signature)....:</b>		
<hr/>		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 2:</b>	N/A
<b>Testing location/ address.....:</b>		
<b>Tested by (name + signature).....:</b>		
<b>Witnessed by (name, function, signature) .:</b>		
<b>Approved by (name, function, signature)....:</b>		
<hr/>		
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>	N/A
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>	N/A
<b>Testing location/ address.....:</b>		
<b>Tested by (name, function, signature).....:</b>		
<b>Witnessed by (name, function, signature) .:</b>		
<b>Approved by (name, function, signature)....:</b>		
<b>Supervised by (name, function, signature) :</b>		

<p><b>List of Attachments (including a total number of pages in each attachment):</b></p> <ol style="list-style-type: none"> <li>1. Attachment A – European group differences according to EN 60598-2-3: 2003 + A1:2011 used in conjunction with EN 60598-1: 2015 (2 pages in total)</li> <li>2. Attachment B – Requirement of IEC / EN 62031 (6 pages in total)</li> <li>3. Attachment C – Photo documentation (42 pages in total)</li> </ol>	
<p><b>Summary of testing:</b></p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>All tests above except for IEC / TR 62778 and EN 62493 IEC / TR 62778 and EN 62493</p>	<p><b>Testing location:</b></p> <p>Refer to P.3</p> <p>SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China</p>
<p><b>Summary of compliance with National Differences:</b></p> <p><b>List of countries addressed</b></p> <ol style="list-style-type: none"> <li>1. EU Group Differences: YES</li> <li>2. EU Special National Conditions: None</li> <li>3. EU A-deviations: None</li> </ol> <p><input checked="" type="checkbox"/> The product fulfils the requirements of EN 60598-2-3:2003 + A1:2011 EN 60598-1:2015 EN 62493:2015</p>	

**Copy of marking plate:**

**The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.**



(min. dimensions: width x height = 100 mm x 60 mm)

On the cover



Note:

1. As declared by the applicant, the importer's name, registered trade name or registered trade mark and the postal address were not decided at the time of application, but will be marked on the products before being placed on the market. The contact details shall be in a language easily understood by end-users and market surveillance authorities.
2. Marking on the packaging or in a document accompanying the electrical equipment is only acceptable if it is not possible to place such markings on the product.
3. The height of graphical symbols shall not be less than 5 mm, except for symbols for class II and class III classification which may be reduced to a minimum of 3 mm where the space available for marking is restricted, and the height of letters and numerals shall not be less than 2 mm. The height of WEEE symbol shall not be less than 7 mm. The height of symbol for "Caution, risk of electric shock" shall not be less than 15 mm.

Copy of marking plates for other models were the same as above ones except for model names and electrical data.

<b>Test item particulars</b> .....: LED Street Lighting (LED lamp)	
<b>Classification of installation and use</b> .....: Fixed appliance	
<b>Supply Connection</b> .....: Terminal block	
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object.....: N/A	
- test object does meet the requirement.....: P (Pass)	
- test object does not meet the requirement.....: F (Fail)	
<b>Testing</b> .....:	
<b>Date of receipt of test item</b> .....: 2017-01-16	
<b>Date (s) of performance of tests</b> .....: 2017-01-16 - 2017-03-10	
<b>General remarks:</b>	
<p>"(See Attachment #)" refers to additional information appended to the report.          "(See appended table)" refers to a table appended to the report.</p> <p><b>Throughout this report a comma point is used as the decimal separator.</b>          This document is issued by the Company subject to its General Conditions of Service, available on request or accessible at <a href="http://www.sgs.com/en/Terms-and-Conditions.aspx">http://www.sgs.com/en/Terms-and-Conditions.aspx</a> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <a href="http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx">http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx</a>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.</p> <p>Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.</p> <p>Clause numbers between brackets refer to clauses in IEC 60598-1</p>	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC 02:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....:	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>Not applicable</b>
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies)</b> .....: Same as applicant	

**General product information:**

There were 13 models in the report. The appliances were class I street Lighting which equipped with independent LED driver and LED module. The Max. mounting height is 8m.

They shared similar construction, circuit diagram and appearance.

Model AGIL S and AGIL were similar to model AGIL XL except the size, LED driver and LED number.

Model AVENUE M was similar to model AVENUE XL except the size, LED driver and LED number.

Model ESKADE, ESKADE-1, ESKADE UP and CORBA were similar to model BEL except the appearance.

Model MILAN S and MILAN M were similar to MILAN XL except the size and LED number.

See below table for details:

Model	Ratings	Power	Size (mm)	Maximum projected area	LED driver	LED number
AGIL XL	100 V – 240 V; 50 Hz / 60 Hz; IP66; t <sub>a</sub> : 35 °C	150 W	825*360*150	0,24 m <sup>2</sup>	HLG-150H-48A	98
AGIL		80 W	620*295*150	0,14 m <sup>2</sup>	HLG-80H-42A	48
AGIL S	100 V – 240 V; 50 Hz / 60 Hz; IP66; t <sub>a</sub> : 45 °C	40 W	525*250*102	0,1 m <sup>2</sup>	HLG-40H-54A	24
AVENUE M	200 V – 240 V; 50 Hz / 60 Hz; IP66; t <sub>a</sub> : 35 °C	60 W	628*250*80	0,13 m <sup>2</sup>	EBC-042S105DV- xxxxy	24
AVENUE XL	100 V – 240 V; 50 Hz / 60 Hz; IP66; t <sub>a</sub> : 35 °C	100 W	780*280*105	0,18 m <sup>2</sup>	HLG-100H-42A	48
ESKADE	100 V – 240 V; 50 Hz / 60 Hz; IP66; t <sub>a</sub> : 45 °C	80 W	763*560*220	0,25 m <sup>2</sup>	HLG-80H-42A	48
ESKADE-1		80 W	562*660*220	0,25 m <sup>2</sup>		48
ESKADE UP		80 W	562*562*255	0,25 m <sup>2</sup>		48
CORBA		80 W	733*530*158	0,22 m <sup>2</sup>		48
BEL		80 W	733*530*228	0,22 m <sup>2</sup>		48
MILAN S	100 V – 240 V; 50 Hz / 60 Hz; IP66; t <sub>a</sub> : 45 °C	60 W	525 x 255 x 105	0,106 m <sup>2</sup>	HLG-60H-42A	24
MILAN M		100 W	625 x 290 x 105	0,143 m <sup>2</sup>	HLG-100H-42A	48
MILAN XL		150 W	780 x 325 x 105	0,2055 m <sup>2</sup>	HLG-150H-54A	64

After review, all tests were performed on the model AGIL XL, AVENUE XL, BEL and MILAN XL according to EN 60598-2-3: 2003 + A1: 2011 and EN 60598-1: 2015.

Clause 3.7 (11), 3.12 (12.4) and construction check were performed on the model AGIL S according to EN 60598-2-3: 2003 + A1: 2011 and EN 60598-1: 2015.

Clause 3.7 (11), 3.12 (12.4 only t<sub>c</sub> point of LED driver) and construction check were performed on the model AVENUE M according to EN 60598-2-3: 2003 + A1: 2011 and EN 60598-1: 2015.

Clause 3.6.3.1 and construction check were performed on model ESKADE according to EN 60598-2-3: 2003 + A1: 2011 and EN 60598-1: 2015.

Clause 3.6.3.1, 3.6 (4.14.1) and construction check were performed on model ESKADE UP according to EN 60598-2-3: 2003 + A1: 2011 and EN 60598-1: 2015.

Construction check was checked other models.

All the tests according to EN 62031: 2008 + A1: 2013 + A2: 2015 were performed on the LED module of model AGIL XL and MILAN XL.

The standard IEC TR 62778 was also considered necessary at SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. (588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China). Model AGIL XL and MILAN XL were classified as RG1 at 200 mm according to IEC TR 62778.



The submitted appliance was found to be in compliance with the standard EN 62493: 2015 according to the clause 4.2.2.

Factory Location: Same as applicant

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

3.2 (0)	GENERAL TEST REQUIREMENTS		—
3.2 (0.1)	Information for luminaire design considered .....	Standard IEC / EN 62031 Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
3.2 (0.3)	More sections applicable .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

3.4 (2)	CLASSIFICATION		—
3.4 (2.2)	Type of protection .....	Class I	—
3.4 (2.3)	Degree of protection .....	IP66	—
3.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
3.4 (2.5)	Luminaire for normal use .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
3.4 (-)	Modes of installation of road or street lighting		—
	a) on a pipe	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	b) on a mast arm	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	c) on a post top	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	d) on span or suspension wires	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	e) on a wall	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

3.5 (3)	MARKING		—
3.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
3.5 (3.3)	Additional information		P
	Language of instructions	English	P
3.5 (3.3.1)	Combination luminaires		N/A
3.5 (3.3.2)	Nominal frequency in Hz	50 Hz / 60 Hz	P
3.5 (3.3.3)	Operating temperature		P
3.5 (3.3.4)	Symbol or warning notice		N/A
3.5 (3.3.5)	Wiring diagram		P
3.5 (3.3.6)	Special conditions		N/A
3.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
3.5 (3.3.8)	Limitation for semi-luminaires		N/A
3.5 (3.3.9)	Power factor and supply current		P

<b>IEC 60598-2-3</b>			
Clause	Requirement + Test	Result - Remark	Verdict
3.5 (3.3.10)	Suitability for use indoors		N/A
3.5 (3.3.11)	Luminaires with remote control		N/A
3.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
3.5 (3.3.13)	Specifications of protective shields		N/A
3.5 (3.3.14)	Symbol for nature of supply	~	P
3.5 (3.3.15)	Rated current of socket outlet		N/A
3.5 (3.3.16)	Rough service luminaire		N/A
3.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments		N/A
3.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A
3.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
3.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
3.5 (3.3.21)	Non-replaceable and non-user replaceable light sources information provided		P
	Cautionary symbol		P
3.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
3.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
3.5 (-)	Additional information in instruction leaflet		P
	a) Design attitude		P
	b) Weight		P
	c) Overall dimensions		P
	d) Maximum projected area if applicable		P
	e) Cross-sectional area of wires if applicable		P
	f) Suitability for indoors use		N/A
	g) Dimensions of the compartment		N/A
	h) Torque setting to be applied to bolts or screws		P
	i) Maximum mounting height		P
<b>3.6 (4)</b>	<b>CONSTRUCTION</b>		—
3.6 (4.2)	Components replaceable without difficulty		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.3)	Wireways smooth and free from sharp edges		P
<b>3.6 (4.4)</b>	<b>Lampholders</b>		N/A
3.6 (4.4.1)	Integral lampholder		N/A
3.6 (4.4.2)	Wiring connection		N/A
3.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
3.6 (4.4.4)	Positioning		N/A
	- pressure test (N) .....		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....		—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A
3.6 (4.4.5)	Peak pulse voltage		N/A
3.6 (4.4.6)	Centre contact		N/A
3.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
3.6 (4.4.8)	Lamp connectors		N/A
3.6 (4.4.9)	Caps and bases correctly used		N/A
3.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
<b>3.6 (4.5)</b>	<b>Starter holders</b>		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
<b>3.6 (4.6)</b>	<b>Terminal blocks</b>		N/A
	Tails		N/A
	Unsecured blocks		N/A
<b>3.6 (4.7)</b>	<b>Terminals and supply connections</b>		P
3.6 (4.7.1)	Contact to metal parts		P
3.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P
3.6 (4.7.3)	Terminals for supply conductors		P
3.6 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A

<b>IEC 60598-2-3</b>			
Clause	Requirement + Test	Result - Remark	Verdict
	- Type Z attachment		N/A
	- mechanical test according to 15.8.2		N/A
	- electrical test according to 15.9		N/A
	- heat test according to 15.9.2.3 and 15.9.2.4		N/A
3.6 (4.7.4)	Terminals other than supply connection		P
3.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
3.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
<b>3.6 (4.8)</b>	<b>Switches</b>		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A
	- compliance with IEC 61058-1 for electronic switches		N/A
<b>3.6 (4.9)</b>	<b>Insulating lining and sleeves</b>		N/A
3.6 (4.9.1)	Retainment		N/A
	Method of fixing ..... :		—
3.6 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C)..... :		N/A
<b>3.6 (4.10)</b>	<b>Double or reinforced insulation</b>		P
3.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
3.6 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
3.6 (4.10.3)	Retainment of insulation:		P
	- fixed		P
	- unable to be replaced; luminaire inoperative		P
	- sleeves retained in position		N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- lining in lampholder		N/A
<b>3.6 (4.11)</b>	<b>Electrical connections and current-carrying parts</b>		P
3.6 (4.11.1)	Contact pressure		P
3.6 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
3.6 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N/A
3.6 (4.11.4)	Material of current-carrying parts		P
3.6 (4.11.5)	No contact to wood or mounting surface		P
3.6 (4.11.6)	Electro-mechanical contact systems		N/A
<b>3.6 (4.12)</b>	<b>Screws and connections (mechanical) and glands</b>		P
3.6 (4.12.1)	Screws not made of soft metal		P
	Screws of insulating material		N/A
	Torque test: torque (Nm); part..... :	AGIL XL: mounting part fixed screw: 17,0 Nm; BEL: Screw for fixing LED driver: 2,0 Nm; MILAN XL: Screw for fixing glass cover: 2,5 Nm	P
	Torque test: torque (Nm); part..... :	AGIL XL, AVENUE XL: Earthing screw: 1,2 Nm; BEL: Earthing screw: 1,2 Nm; MILAN XL: Earthing screw: 1,2 Nm, Screw for fixing LED driver: 1,2 Nm	P
	Torque test: torque (Nm); part..... :	AVENUE XL: front cover fixed screw: 1,2 Nm; BEL, MILAN XL: Screw for fixing the pillar: 17,0 Nm	P
3.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
3.6 (4.12.4)	Locked connections:		N/A
	- fixed arms; torque (Nm) .....	2,5 Nm	P
	- lampholder; torque (Nm) .....		N/A
	- push-button switches; torque 0,8 Nm .....		N/A
3.6 (4.12.5)	Screwed glands; force (Nm)..... :	AGIL XL, AVENUE XL: 3,25 Nm; BEL: 2,5 Nm; MILAN XL: 5 Nm	P
<b>3.6 (4.13)</b>	<b>Mechanical strength</b>		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm) .....	The glass cover: 0,5 Nm	P
	- other parts; energy (Nm).....	The plastic enclosure: 0,7 Nm, The metal enclosure: 0,7 Nm	P
	1) live parts		P
	2) linings		P
	3) protection		P
	4) covers		P
3.6 (4.13.3)	Straight test finger		P
3.6 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A
3.6 (4.13.6)	Tumbling barrel		N/A
<b>3.6 (4.14)</b>	<b>Suspensions, fixings and means of adjusting</b>		P
3.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm).....		N/A
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) .....		N/A
	Metal rod. diameter (mm) .....		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
3.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) .....		—
	Stress in conductors (N/mm <sup>2</sup> ) .....		N/A
	Mass (kg) of semi-luminaire .....		—
	Bending moment (Nm) of semi-luminaire .....		N/A
3.6 (4.14.3)	Adjusting devices:		P
	- flexing test; number of cycles.....	45	P
	- strands broken .....		P

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- electric strength test afterwards		P
3.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
3.6 (4.14.5)	Guide pulleys		N/A
3.6 (4.14.6)	Strain on socket-outlets		N/A
<b>3.6 (4.15)</b>	<b>Flammable materials</b>		P
	- glow-wire test 650°C .....	See Test Table 3.15 (13.3.2)	P
	- spacing $\geq 30$ mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
3.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A
	b) temperature sensing control		N/A
	c) surface temperature		N/A
<b>3.6 (4.16)</b>	<b>Luminaires for mounting on normally flammable surfaces</b>		P
	No lamp control gear .....	(compliance with Section 12)	N/A
3.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
3.6 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
3.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
<b>3.6 (4.17)</b>	<b>Drain holes</b>		N/A
	Clearance at least 5 mm		N/A
<b>3.6 (4.18)</b>	<b>Resistance to corrosion</b>		P
3.6 (4.18.1)	- rust-resistance		P
3.6 (4.18.2)	- season cracking in copper		N/A
3.6 (4.18.3)	- corrosion of aluminium		P
3.6 (4.19)	Igniters compatible with ballast		N/A



IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict
3.6 (4.20)	Rough service vibration		N/A
<b>3.6 (4.21)</b>	<b>Protective shield</b>		N/A
3.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
3.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
3.6 (4.21.3)	No direct path		N/A
3.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment..... :	See Test Table 3.15 (13.3.2)	N/A
3.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
3.6 (4.23)	Semi-luminaires comply Class II		N/A
<b>3.6 (4.24)</b>	<b>Photobiological hazards</b>		P
3.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A
3.6 (4.24.2)	Retinal blue light hazard		P
	Luminaires with $E_{thr}$ :		P
	a) Fixed luminaires		P
	- distance x m, borderline between RG1 and RG2 ... :		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
<b>3.6 (4.25)</b>	<b>Mechanical hazard</b>		P
	No sharp point or edges		P
<b>3.6 (4.26)</b>	<b>Short-circuit protection</b>		N/A
3.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
3.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
<b>3.6 (4.27)</b>	<b>Terminal blocks with integrated screwless earthing contacts</b>		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	After test, resistance < 0,05 Ω		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 Ω		N/A
	Voltage drop test, resistance < 0,05 Ω		N/A
<b>3.6 (4.28)</b>	<b>Fixing of thermal sensing control</b>		N/A
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		N/A
	Max. temperature on adhesive material (°C) ..... :		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
<b>3.6 (4.29)</b>	<b>Luminaires with non-replaceable light source</b>		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
<b>3.6 (4.30)</b>	<b>Luminaires with non-user replaceable light source</b>		P
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P
	Minimum two fixing means		P
<b>3.6 (4.31)</b>	<b>Insulation between circuits</b>		P
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		P
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
<b>3.6 (4.31.1)</b>	<b>SELV circuits</b>		P
	Used SELV source		P
	Voltage ≤ ELV		P
	Insulating of SELV circuits from LV supply		P
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	SELV circuits insulated from accessible parts according Table X.1		P
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage $\leq$ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
3.6 (4.31.3)	Other circuits		N/A
	Other circuits insulated from accessible parts according Table X.1		N/A
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3 of above		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
<b>3.6 (4.32)</b>	<b>Overvoltage protective devices</b>		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
3.6.1 (-)	At least IP X3 or X5 respectively. IP .....	IP66	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Column-integrated luminaires:		N/A
	- parts below 2,5 m. IP .....		N/A
	- parts above 2,5 m. IP .....		N/A
3.6.2 (-)	Suspension on span wires		N/A
3.6.3 (-)	Means for attaching the luminaire or external parts to its support appropriate to the weight		N/A
3.6.3.1 (-)	Static load test		P
	- drag coefficient.....	1,2	P
	- loaded area (m <sup>2</sup> ).....	AGIL XL: 0,24 m <sup>2</sup> ; AVENUE XL: 0,18 m <sup>2</sup> ; BEL: 0,22 m <sup>2</sup> ; MILAN XL: 0,2055 m <sup>2</sup> ; ESKADE: 0,25 m <sup>2</sup> ; ESKADE UP: 0,25 m <sup>2</sup>	P
	- used load (N).....	AGIL XL: 360 N; AVENUE XL: 270 N; BEL: 330 N; MILAN XL: 308,25 N; ESKADE: 375 N; ESKADE UP: 375 N;	P
	- measured deformation (cm/m) .....	AGIL XL: 0 cm/m; AVENUE XL: 0 cm/m; BEL: 0 cm/m; MILAN XL: 1,2 cm/m; ESKADE: 0 cm/m; ESKADE UP: 0 cm/m	P
	- no rotation		P
3.6.4 (-)	Adjustable lampholders		N/A
3.6.5 (-)	Luminaires installed above 5 m, glass covers shall be:		P
	a) glass that fractures into small pieces (test according to 3.6.5.1), or		P
	b) glass having a high impact shock resistance (test according to 3.6.5.2), or		N/A
	c) protected by any means to retain glass fragments		N/A
	For tunnel luminaires 3.6.5.1 apply		N/A
	Method of protection declared by the manufacturer		N/A
3.6.5.1 (-)	Protection by the use of glass that fractures into small pieces		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- number of particles is more than 40.....:	AGIL XL: > 60; AVENUE XL: > 60; BEL: 96; MILAN XL: 45	P
3.6.5.2 (-)	Protection by the use of high impact resistant glass		N/A
3.6.5.2.1 (-)	Glass covers have high mechanical strength		N/A
	Test according IEC 62262 with test apparatus according IEC 60068-2-75 with impact energy of 5J on preconditioned sample		N/A
3.6.5.2.2 (-)	Glass covers not break into large pieces		N/A
	- test according 3.6.5.1, number of particles is more than 20 .....		N/A
3.6.6 (-)	Connection compartment of column-integrated luminaire		N/A
	- provides adequate space		N/A
	- means for attachment		N/A
	- means for attachment of metal corrosion-resistant		N/A
3.6.7 (-)	Compliance with ISO standard or other .....		N/A
3.6.8 (-)	Doors of column-integrated luminaires:		N/A
	- corrosion-resistant		N/A
	- opening only possible for an authorized person		N/A
	- impact test 5 Nm		N/A
	- sample show no damage		N/A
3.6.9 (-)	Column-integrated luminaire:		N/A
	- dimension of the cable entry slot (mm).....:		N/A
	- cable path from the slot to the connection compartment (mm) .....		N/A
	- cable path free from obstruction that might cause abrasion of the cable		N/A
<b>3.7 (11) .....</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		—
3.7 (11.2)	Creepage distances and clearances..... :	See Table 3.7 (11.2)	P
	Impulse withstand category (Normal category II) (Category III Annex U, Table U.1)	Category II <input type="checkbox"/> Category III <input type="checkbox"/>	—
<b>3.8 (7)</b>	<b>PROVISION FOR EARTHING</b>		—
3.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		P
	Resistance < 0,5 Ω..... :	Max. 32,5 mΩ	P

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Clause	Requirement + Test	Result - Remark	Verdict

	Self-tapping screws used		P
	Thread-forming screws		N/A
	Thread-forming screw used in a groove		N/A
	Earth makes contact first		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A
3.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		N/A
3.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
3.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
3.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
3.8 (7.2.7)	Electrolytic corrosion of the earth terminal		P
3.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
3.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
3.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P
3.8.1 (-)	Attachment prevented from rotation		N/A

<b>3.9 (14)</b>	<b>SCREW TERMINALS</b>		—
	Separately approved; component list..... :	(see Annex 1)	P
	Part of the luminaire .....	(see Annex 3)	N/A

<b>3.9 (15)</b>	<b>SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS</b>		—
	Separately approved; component list..... :	(see Annex 1)	N/A
	Part of the luminaire .....	(see Annex 4)	N/A

<b>3.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		—
<b>3.10 (5.2)</b>	<b>Supply connection and external wiring</b>		P
3.10 (5.2.1)	Means of connection .....	Terminal block	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV ≤ 25 V a.c./60 V d.c. or protected from outdoor environment		N/A
3.10 (5.2.2)	Type of cable .....		N/A
	Nominal cross-sectional area (mm <sup>2</sup> ) .....		N/A
	Cables equal to IEC 60227 or IEC 60245		N/A
3.10 (5.2.3)	Type of attachment, X, Y or Z		N/A
3.10 (5.2.5)	Type Z not connected to screws		N/A
3.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
3.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
3.10 (5.2.8)	Insulating bushings:		N/A
	- suitably fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- tubes or guards made of insulating material		N/A
3.10 (5.2.9)	Locking of screwed bushings		N/A
3.10 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
3.10 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		N/A
3.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) ..... :	80 N	P
	- torque test: torque (Nm)..... :	0,35 Nm	P
	- displacement ≤ 2 mm	Max.: 1,2 mm;	P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
3.10 (5.2.11)	External wiring passing into luminaire		N/A
3.10 (5.2.12)	Looping-in terminals		N/A
3.10 (5.2.13)	Wire ends not tinned		P
	Wire ends tinned: no cold flow		N/A
3.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
3.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
3.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
3.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
<b>3.10 (5.3)</b>	<b>Internal wiring</b>		P
3.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	- socket outlet loaded (A) .....		N/A
	- temperatures .....	(see Annex 2)	N/A
	Green-yellow for earth only		P
3.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm <sup>2</sup> ).....	(see Annex 1)	P
	Insulation thickness		P
	Extra insulation added where necessary		N/A
3.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		N/A
	Adequate cross-sectional area and insulation thickness		N/A
3.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A
3.10 (5.3.1.4)	Conductors without insulation		N/A
3.10 (5.3.1.5)	SELV current-carrying parts		N/A
3.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
3.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		N/A
	Joints, raising/lowering devices		P
	Telescopic tubes etc.		N/A
	No twisting over 360°		P
3.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
3.10 (5.3.4)	Joints and junctions effectively insulated		N/A
3.10 (5.3.5)	Strain on internal wiring		N/A
3.10 (5.3.6)	Wire carriers		N/A
3.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
3.10.1 (-)	Cord anchorage if applicable		P
	- pull test: 25 times; pull (N) .....	60 N	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- torque test: torque (Nm).....:	0,25 Nm	P

3.11 (8)	PROTECTION AGAINST ELECTRIC SHOCK		—
3.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		P
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		N/A
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		N/A
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		P
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
3.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
3.11 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
3.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
3.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- touch current .....		N/A
	- no-load voltage.....:		N/A
	Other than ordinary luminaire:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- nominal voltage .....		N/A
3.11 (8.2.4)	Portable luminaire have protection independent of supporting surface		N/A
3.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
3.11 (8.2.6)	Covers reliably secured		P
3.11 (8.2.7)	Discharging of capacitors $\geq 0,5 \mu\text{F}$		P
	Portable plug connected luminaire with capacitor		N/A
	Other plug connected luminaire with capacitor		N/A
	Discharge device on or within capacitor		N/A
	Discharge device mounted separately		N/A

<b>3.12 (12)</b>	<b>ENDURANCE TEST AND THERMAL TEST</b>		—
3.12.2 (-)	If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 3.13		—
3.12 (12.3)	Endurance test:		P
	- mounting-position.....	On the pillar	—
	- test temperature (°C) .....	BEL, MILAN XL: 55 °C; AGIL XL, AVENUE XL: 45 °C	—
	- total duration (h) .....	240 h	—
	- supply voltage: Un factor; calculated voltage (V)...	240 x 1,1= 264 V	—
	- lamp used.....	LED lamp	—
3.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
3.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
3.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	P
3.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
3.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		—
	- case of abnormal conditions .....		—
	- electronic lamp control gear		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured mounting surface temperature (°C) at 1,1 Un ..... :		N/A
	- calculated mounting surface temperature (°C) ..... :		N/A
	- track-mounted luminaires		N/A
3.12 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions ..... :		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C) ..... :		N/A
	- track-mounted luminaires		N/A
3.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
3.12 (12.7.1)	Luminaire without temperature sensing control		N/A
3.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W ..... :		—
	Test according to 12.7.1.1:		N/A
	- case of abnormal conditions ..... :		—
	- Ballast failure at supply voltage (V) ..... :		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un ..... :		—
	- calculated temperature of fixing point/exposed part (°C) ..... :		—
	Ball-pressure test ..... :	See Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions ..... :		—
	- measured winding temperature (°C): at 1,1 Un ..... :		—

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Clause	Requirement + Test	Result - Remark	Verdict
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test .....	See Table 3.15 (13.2.1)	N/A
3.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
3.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- manual reset cut-out .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- auto reset cut-out .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- case of abnormal conditions .....		—
	- highest measured temperature of fixing point/ exposed part (°C): .....		—
	Ball-pressure test: .....	See Table 3.15 (13.2.1)	N/A
3.12.1 (-)	Temperature reduction if for outdoor use only		N/A
3.12.2 (-)	(See above)		—
3.12.3 (-)	Glass covers used within the thermal limits declared by the glass manufacturer		P

<b>3.13 (9)</b>	<b>RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE</b>		—
3.13.1 (-)	If IP > IP 20 the order of tests as specified in clause 3.12		P
3.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		—
	- classification according to IP .....	IP66	—
	- mounting position during test .....	On the pillar	—
	- fixing screws tightened; torque (Nm) .....	Two-thirds of that specified in the clause 3.6 (4.12.1)	—
	- tests according to clauses .....	9.2.2 and 9.2.7	—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) i) For luminaires without drain holes – no water entry		P
	d) ii) For luminaires with drain holes – no hazardous water entry		N/A
	e) no water in watertight luminaire		N/A
	f) no contact with live parts (IP 2X)		N/A
	f) no entry into enclosure (IP 3X and IP 4X)		N/A
	f) no contact with live parts (IP3X and IP4X)		N/A
	g) no trace of water on part of lamp requiring protection from splashing water		N/A
	h) no damage of protective shield or glass envelope		P
3.13 (9.3)	Humidity test 48 h		P

3.14 (10)	INSULATION RESISTANCE AND ELECTRIC STRENGTH		—
3.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....		—
	Insulation resistance (MΩ) .....	See below	—
	SELV		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface .....	>99 MΩ	P
	- between current-carrying parts and metal parts of the luminaire .....	>99 MΩ	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....	>99 MΩ	P
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV		P
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....	>99 MΩ	P
	- between live parts and metal parts .....	>99 MΩ	P
	- between live parts of different polarity through action of a switch .....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....	>99 MΩ	P
	- Insulation bushings as described in Section 5 .....		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
3.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V) .....	See below	P
	SELV		P
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface .....	500 V	P
	- between current-carrying parts and metal parts of the luminaire .....	500 V	P
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....	500 V	P
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV		P
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....	1480 V	P
	- between live parts and metal parts .....	Between live part and earthed metal part: 1480 V; Between live part and unearthed metal part and glass cover: 2960 V	P
	- between live parts of different polarity through action of a switch .....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....	1480 V	P
	- Insulation bushings as described in Section 5 .....		N/A
3.14 (10.3)	Touch current or protective conductor current (mA) :	Max. 0,2 mA	P

<b>3.15 (13)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		—
3.15 (13.2.1)	Ball-pressure test .....	See Test Table 3.15 (13.2.1)	P
3.15 (13.3.1)	Needle-flame test (10 s) .....	See Test Table 3.15 (13.3.1)	P
3.15 (13.3.2)	Glow-wire test (650°C) .....	See Test Table 3.15 (13.3.2)	P
3.15 (13.4)	Proof tracking test (IEC 60112) .....	See Test Table 3.15 (13.4)	P

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Clause	Requirement + Test	Result - Remark	Verdict

<b>3.7 (11.2)</b>	<b>TABLE: Creepage distances and clearances</b>						—
	<b>Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages</b>						P
	<b>Applicable part of IEC 60598-1 Table 11.1* and 11.2*</b>						P
	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:	B	1)	1,5	11.1 & 11.2	1)	2,5	11.1 & 11.2
Working voltage (V) .....					240 V		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....					2,5		—
Supplementary information:							
1) Basic insulation:							
AGIL XL:							
Between L and N: Cr.= 2,6 mm, Cl.= 2,6 mm;							
Between live part and earthed metal part: Cr.= Cl.= 2,6 mm;							
Between cable clamped and accessible metal parts: Cr.= Cl.= 2,6 mm;							
AVENUE M:							
Between L and N: Cr.= 2,6 mm, Cl.= 2,6 mm;							
Between live part and earthed metal part: Cr.= Cl.= 2,6 mm;							
Between cable clamped and accessible metal parts: Cr.= Cl.= 2,6 mm;							
The work voltage of LED driver output was Max. 69 V d.c.							
Between current-carrying part and accessible metal part: Cr.= Cl.= 1,4 mm; (limit. Cr.: 1,4mm, Cl.: 0,4 mm)							
Between different polarity of current-carrying part: Cr.= Cl.= 1,4 mm; (limit. Cr.: 1,4mm, Cl.: 0,4 mm)							
AVENUE XL:							
Between L and N: Cr.= 2,6 mm, Cl.= 2,6 mm;							
Between live part and earthed metal part: Cr.= Cl.= 2,6 mm;							
Between cable clamped and accessible metal parts: Cr.= Cl.= 2,6 mm;							
BEL:							
Between L and N: Cr.= 2,6 mm, Cl.= 2,6 mm;							
Between live part and earthed metal part: Cr.= Cl.= 2,6 mm;							
Between cable clamped and accessible metal parts: Cr.= Cl.= 2,6 mm;							
MILAN XL:							
Between L and N: Cr.= 2,6 mm, Cl.= 2,6 mm;							
Between live part and earthed metal part: Cr.= Cl.= 2,6 mm;							
Between cable clamped and accessible metal parts: Cr.= Cl.= 2,6 mm							
Distance 2:	S	2)	1,5	11.1 & 11.2	2)	2,5	11.1 & 11.2
Working voltage (V) .....					240 V		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....					2,5		—



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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information: 2) Supplementary insulation: AGIL XL: Between internal wire and unearthed metal part and glass cover: Cr.= Cl.= 2,6 mm AVENUE M: Between internal wire and unearthed metal part and glass cover: Cr.= Cl.= 2,6 mm AVENUE XL: Between internal wire and unearthed metal part and glass cover: Cr.= Cl.= 2,6 mm BEL: Between internal wire and unearthed metal part and glass cover: Cr.= Cl.= 2,6 mm MILAN XL: Between internal wire and unearthed metal part and glass cover: Cr.= Cl.= 2,6 mm							
Distance 3:	R	3)	3,0	11.1 & 11.2	3)	5,0	11.1 & 11.2
Working voltage (V) .....					240 V		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....					2,5		—
Supplementary information: 3) Reinforced insulation: AGIL XL: Between live part and unearthed metal part and glass cover: Cr.= Cl.= 5,1 mm; AVENUE M: Between live part and unearthed metal part and glass cover: Cr.= Cl.= 5,1 mm; AVENUE XL: Between live part and unearthed metal part and glass cover: Cr.= Cl.= 5,1 mm; BEL: Between live part and unearthed metal part and glass cover: Cr.= Cl.= 5,1 mm; MILAN XL: Between live part and unearthed metal part and glass cover: Cr.= Cl.= 5,1 mm;							

\*\* Insulation type: B – Basic; S – Supplementary; R – Reinforced. See also IEC 60598-1 Annex M.

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Clause	Requirement + Test	Result - Remark	Verdict

3.15 (13.2.1)	<b>TABLE: Ball Pressure Test of Thermoplastics</b>			<b>P</b>
<b>Allowed impression diameter (mm) .....</b>		2 mm		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
The plastic gland	See Annex 1	75	1,2	
LED Lens	See Annex 1	138	1,0	
DC Connector	See Annex 1	125	0,9	
Supplementary information: N/A				

3.15 (13.3.1)	<b>TABLE: Needle-flame test (IEC 60695-11-5)</b>				<b>P</b>
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
DC Connector	See Annex 1	10	No	0	P
Wire connector	See Annex 1	10	No	0	P
Supplementary information: N/A					

3.15 (13.3.2)	<b>TABLE: Glow-wire test (IEC 60695-2-11)</b>				<b>P</b>
<b>Glow wire temperature .....</b>		650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
The plastic gland	See Annex 1	30	No	0	P
LED Lens	See Annex 1	30	No	0	P
Insulation tape	See Annex 1	30	No	0	P
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/ No) .....					Yes
Supplementary information: N/A					

3.15 (13.4)	<b>TABLE: Proof tracking test (IEC 60112)</b>				<b>P</b>
<b>Test voltage PTI .....</b>		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
DC Connector	See Annex 1	No breakdown	No breakdown	No breakdown	P

IEC 60598-2-3					
Clause	Requirement + Test	Result - Remark			Verdict
Wire connector	See Annex 1	No breakdown	No breakdown	No breakdown	P
Supplementary information: N/A					

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1		TABLE: Critical components information					P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
Connector (for all model except AGIL S)	B	Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.	CD-100/3	250 V, 16 A, 85°C	EN 61984	TUV (R 50280145)	
Terminal block (for all model except AGIL S)	B	Ninghai Chengguan Fangzheng Rubber & Plastic Hardware Factory	KP-10A	450 V~, 0,75...1,5mm <sup>2</sup> , 32 A, T110	DIN VDE 0613-1 DIN VDE 0613-2-1 EN 60998-2-1 EN 60998-1	VDE (40019217)	
(Alternative) (for all model except AGIL S)	D	Ningbo Kimbetter Electrical Co., Ltd.	PA10	450 V~, T110, 24 A	DIN VDE 0613-1 DIN VDE 0613-2-1 EN 60998-2-1 EN 60998-1	VDE (40025212)	
Insulation paper (for model ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL)	B	Jintan City Hongwei Electricity Insulating Material Factory Co., Ltd.	6520-23	Min Thickness: 0,15 mm	IEC/EN 60598-2-3 IEC/EN 60598-1	Tested with appliance	
Connector (for model MILAN S, MILAN M, MILAN XL, AGIL S, AGIL, AGIL XL)	B	Ningbo King-Bridge Lighting Technology Co., Ltd	Q-02 (K)	250 V, 6 A, T100	EN 61995-1	TUV (R 50336340)	
Independent controlgear (for model AGIL XL)	B	Mean Well Enterprises Co., Ltd.	HLG-150H-48A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 48 V d.c., 3,2 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 90 °C, IP65, SELV	IEC/EN 61347-2-13 IEC/EN 61347-1	TUV CB (DE 2-017562)	
Independent controlgear (for model AGIL)	B	Mean Well Enterprises Co., Ltd.	HLG-80H-42A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 42 V d.c., 1,95 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 80 °C, IP65, SELV	IEC/EN 61347-2-13 IEC/EN 61347-1	TUV CB (DE 2-017562)	

IEC 60598-2-3						
Clause	Requirement + Test			Result - Remark		Verdict
Independent controlgear (for model AGIL S)	B	Mean Well Enterprises Co., Ltd.	HLG-40H-54A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 54 V d.c., 0,75 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 80 °C, IP65, SELV	IEC/EN 61347-2-13 IEC/EN 61347-1	TUV CB (DE 2-020427-A2)
Independent controlgear (for model AVENUE M)	B	INVENTRONICS (HANGZHOU), INC	EBC-042S105DV-xxxy	Input: 200 V – 240 V, 50 Hz / 60 Hz, Output: 25-60 V d.c., 1050 mA, Vomax: 69 V d.c., t <sub>a</sub> : 70 °C, t <sub>c</sub> : 90 °C, IP67, SELV	IEC/EN 61347-2-13 IEC/EN 61347-1	TUV SUD CB (SG-LE 01200)
Independent controlgear (for model AVENUE XL)	B	Mean Well Enterprises Co., Ltd.	HLG-100H-42A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 42 V d.c., 2,28 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 80 °C, IP65, SELV	IEC/EN 61347-2-13 IEC/EN 61347-1	TUV CB (DE 2-017562)
Independent controlgear (for model ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL)	B	Mean Well Enterprises Co., Ltd.	HLG-80H-42A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 42 V d.c., 1,95 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 80 °C, IP65, SELV	IEC/EN 61347-2-13 IEC/EN 61347-1	TUV (R 50202561)
Independent controlgear (for model MILAN S)	B	Mean Well Enterprises Co., Ltd.	HLG-60H-42A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 42 V d.c., 1,45 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 80 °C, IP65, SELV	IEC/EN 61347-2-13 IEC/EN 61347-1	TUV (DE 2-020427-A1)
Independent controlgear (for MILAN M)	B	Mean Well Enterprises Co., Ltd.	HLG-100H-42A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 42 V d.c., 2,28 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 90 °C, IP65, SELV	IEC/EN 61347-2-13 IEC/EN 61347-1	TUV (R 50213993)
Independent controlgear (for MILAN XL)	B	Mean Well Enterprises Co., Ltd.	HLG-150H-54A	Input: 100 V – 240 V, 50 Hz / 60 Hz, Output: 54 V d.c., 2,8 A, t <sub>a</sub> : 60 °C, t <sub>c</sub> : 90 °C, IP65, SELV	IEC/EN 61347-2-13 IEC/EN 61347-1	TUV (DE 2-017562-M2)

IEC 60598-2-3						
Clause	Requirement + Test			Result - Remark		Verdict
Wire connector (for all model)	C	Heavy Power Co., Ltd.	CE2	105 °C	IEC/EN 60598-2-3 IEC/EN 60598-1 UL 486	UL (E113650) + tested with appliance
Internal wire (connect LED module) (for model ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL)	B	Yuyao Donghai Special Wire Factory	1007	80°C;300 VAC;0,3 mm <sup>2</sup>	EN 60998-1 EN 60998-2-1	UL (E212811) + tested with appliance
Alternative (for model ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL)	D	Dongguan Cheng Xing Electronic Co., Ltd.	1007	80°C;300 VAC;0,3 mm <sup>2</sup>	EN 60998-1 EN 60998-2-1	UL (E249743) + tested with appliance
Internal wiring (lead to LED) (for all model)	B	Ningbo Xuanhua Electric Co. Ltd.	H05RN-F 60245 IEC 57	2 x 1,0 mm <sup>2</sup>	DIN EN 50525-2-21 IEC 60245-4	VDE (40036306)
DC Connector (for all model)	C	Ningbo Ecomomic & Technical Development Zone Hengda Electrical Co., LTD.	TB-L02	160 VDC, T105	EN 60998-1 EN 60998-2-2 EN 60598-1	TUV (R 50288437)
LED	C	CREE	XTER5	2,85 V - 3,4 V, Max. 1500 mA	IEC / TR 62778	Tested with appliance
PCB of LED module	C	Ningbo KJPCB Electronic Technology Co., Ltd.	Metal-based CCL	Min. thickness: 1,5 mm	IEC/EN 60598-2-3 IEC/EN 60598-1	Tested with appliance
Plastic gland	C	Beisit Electric (Hangzhou) Co., Ltd.	M2012	GWT 650 °C	IEC/EN 60598-2-3 IEC/EN 60598-1 UL514B	UL (E360400) + tested with appliance
Earthing wire	B	Jiangyin Haocheng Electrical Appliances Wire & Cable Co., Ltd.	H05SJ-K	1 x 0,75 mm <sup>2</sup>	DIN EN 50525-2-41	VDE (40017754)
Glass	C	Ningbo Cixi Eastglass Co.,Ltd.	Toughened glass	Thinckness: 4mm; Min. - 100°C, Max. 280°C	IEC/EN 60598-2-3 IEC/EN 60598-1	Tested with appliance
LED lens	C	OSYS	PC	GWT 650°C	IEC/EN 60598-2-3 IEC/EN 60598-1	Tested with appliance

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

<p>Supplementary information:</p> <p><sup>1)</sup> Provided evidence ensures the agreed level of compliance. See OD-CB2039.</p> <p>The codes above have the following meaning:</p> <p>A - The component is replaceable with another one, also certified, with equivalent characteristics</p> <p>B - The component is replaceable if authorised by the test house</p> <p>C - Integrated component tested together with the appliance</p> <p>D - Alternative component</p>			
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IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12			P			
	Type reference .....	BEL		—			
	Lamp used.....	LED lamp		—			
	Lamp control gear used.....	HLG-80H-42A		—			
	Mounting position of luminaire .....	On the pillar		—			
	Supply wattage (W).....	54,1 W		—			
	Supply current (A) .....	0,20 A		—			
	Calculated power factor.....	0,88		—			
	Table: measured temperatures corrected for $t_a = 45\text{ }^\circ\text{C}$ :			—			
	- abnormal operating mode .....	1. Output of LED driver was short-circuited the circuit was protected 2. 10 % LEDs were shorted		—			
	- test 1: rated voltage.....	240 V		—			
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage .....	$1,06 \times 240 = 254,4\text{ V}$		—			
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A		—			
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage .....	$1,1 \times 240 = 264\text{ V}$		—			
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A		—			
Temperature measurements, ( $^\circ\text{C}$ )							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Terminal block	--	--	59,4	--	110	--	--
Supply cord	--	--	58,8	--	90	--	--
$t_c$ of LED driver	--	69,6	--	--	80	--	--
Internal wire (unstressed)	--	--	60,2	--	80	--	--
Lamp Lens	--	--	54,5	--	For reference	--	--
Mounting surface	--	--	48,5	--	90	47,2	130
Internal wire(stressed)	--	--	52,6	--	75	--	--
Enclosure	--	--	51,4	--	Ref.	--	--
Supplementary information: N/A							



IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		P
	Type reference .....	AGIL XL	—
	Lamp used.....	LED lamp	—
	Lamp control gear used.....	HLG-150H-48A	—
	Mounting position of luminaire .....	On the pillar	—
	Supply wattage (W).....	150,1 W	—
	Supply current (A) .....	0,624 A	—
	Calculated power factor.....	0,9545	—
	Table: measured temperatures corrected for $t_a = 35\text{ }^\circ\text{C}$ :		—
	- abnormal operating mode .....	1. Output of LED driver was short-circuited the circuit was protected 2. 10 % LEDs were shorted	—
	- test 1: rated voltage.....	240 V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage .....	$1,06 \times 240 = 254,4\text{ V}$	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage .....	$1,1 \times 240 = 264\text{ V}$	—
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A	—

Temperature measurements, ( $^\circ\text{C}$ )							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Connector	--	--	50,4	--	85	--	--
Earth wire	--	--	59,2	--	90	--	--
Input wire of LED driver	--	--	50,1	--	For reference	--	--
$t_c$ of LED driver	--	62,4	--	--	90	--	--
Wire connector	--	--	49,7	--	105	--	--
Input wire of LED board	--	--	61,3	--	80	--	--
LED board	--	--	70,5	--	For reference	--	--
LED lens	--	--	73,7	--	For reference	--	--
Mounting surface	--	--	37,6	--	90	45,4	130

Supplementary information: N/A

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12			P			
	Type reference .....	AVENUE XL		—			
	Lamp used.....	LED lamp		—			
	Lamp control gear used.....	HLG-100H-42A		—			
	Mounting position of luminaire .....	On the pillar		—			
	Supply wattage (W).....	92,4 W		—			
	Supply current (A) .....	0,381 A		—			
	Calculated power factor.....	0,953		—			
	Table: measured temperatures corrected for ta = 35 °C:			—			
	- abnormal operating mode .....	1. Output of LED driver was short-circuited, the circuit was protected 2. 10 % LEDs were shorted		—			
	- test 1: rated voltage.....	240 V		—			
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage .....	1,06 x 240 = 254,4 V		—			
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A		—			
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage .....	1,1 x 240 = 264 V		—			
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A		—			
Temperature measurements, (°C)							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Ambient of terminal block	--	--	44,9	--	110	--	--
Internal wire	--	--	50,4	--	80	--	--
Tc point of LED driver	--	51,3	--	--	80	--	--
LED module	--	--	54,3	--	For reference	--	--
Connector	--	--	46,5	--	85	--	--
Mounting surface	--	--	51,7	--	90	52,2	130
LED lens	--	--	79,4	--	For reference	--	--
Lighted object	--	--	47,3	--	90	45,8	175
Supplementary information: N/A							

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12					P	
	Type reference .....	AVENUE M			—		
	Lamp used.....	LED lamp			—		
	Lamp control gear used.....	EBC-042S105DV-xxxxy			—		
	Mounting position of luminaire .....	On the pillar			—		
	Supply wattage (W).....	29,0 W			—		
	Supply current (A) .....	0,130 A			—		
	Calculated power factor.....	0,929			—		
	Table: measured temperatures corrected for ta = 35 °C:				—		
	- abnormal operating mode .....	N/A			—		
	- test 1: rated voltage.....	240 V			—		
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage .....	N/A			—		
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A			—		
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage .....	N/A			—		
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A			—		
Temperature measurements, (°C)							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Tc point of LED driver	--	51,5	--	--	90	--	--
Supplementary information: N/A							

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12		P
	Type reference .....	MILAN XL	—
	Lamp used.....	LED lamp	—
	Lamp control gear used.....	HLG-150H-54A	—
	Mounting position of luminaire .....	On the pillar	—
	Supply wattage (W).....	151,0 W	—
	Supply current (A) .....	0,65 A	—
	Calculated power factor.....	0,9155	—
	Table: measured temperatures corrected for $t_a = 45\text{ }^\circ\text{C}$ :		—
	- abnormal operating mode .....	1. Output of LED driver was short-circuited, the circuit was protected 2. 10 % LEDs were shorted	—
	- test 1: rated voltage.....	240 V	—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage .....	$1,06 \times 240 = 254,4\text{ V}$	—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A	—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage .....	$1,1 \times 240 = 264\text{ V}$	—
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A	—

Temperature measurements, ( $^\circ\text{C}$ )							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Test piece	--	--	62,0	--	75	--	--
Connector	--	--	61,5	--	85	--	--
Internal wire (lead to LED)	--	--	74,6	--	80	--	--
$t_c$ of LED driver	--	73,8	--	--	90	--	--
DC Connector	--	--	81,2	--	105	--	--
Mounting surface	--	--	59,0	--	90	54,0	130
Seal ring	--	--	72,3	--	230	--	--
Glass	--	--	86,0	--	For reference	--	--
LED lens	--	--	112,9	--	For reference	--	--
Object surface	--	--	55,1	--	90	57,4	175

IEC 60598-2-3							
Clause	Requirement + Test			Result - Remark			Verdict
PCB of LED module	--	--	87,6	--	For reference	--	--
Supplementary information: N/A							

IEC 60598-2-3			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ANNEX 3</b>	<b>Screw terminals (part of the luminaire)</b>		N/A
	<b>No such screw terminals</b>		N/A

<b>ANNEX 4</b>	<b>Screwless terminals (part of the luminaire)</b>		N/A
	<b>No such screwless terminals</b>		N/A

— End of test report —

Attachment A

IEC60598_2_3K - ATTACHMENT			
Clause	Requirement – Test	Result - Remark	Verdict

<b>ATTACHMENT TO TEST REPORT IEC 60598-2-3</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> <b>LUMINAIRES</b> <b>PART 2: PARTICULAR REQUIREMENTS</b> <b>SECTION 3: LUMINAIRES FOR ROAD AND STREET LIGHTING</b>			
<b>Differences according to</b> .....: EN 60598-2-3:2003 + A1:2011 used in conjunction with EN 60598-1:2015			
<b>Annex Form No.</b> ..... : EU_GD_IEC60598_2_3K			
<b>Annex Form Originator</b> ..... : IMQ S.p.A.			
<b>Master Annex Form</b> ..... : 2016-12			
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	<b>CENELEC COMMON MODIFICATIONS (EN)</b>		—
--	--	--	---

<b>3.5 (3)</b>	<b>MARKING</b>		—
3.5 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		N/A

<b>3.6 (4)</b>	<b>CONSTRUCTION</b>		—
3.6 (4.11.6)	Electro-mechanical contact systems		N/A

<b>3.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		—
3.10 (5.2.1)	Connecting leads		N/A
	- without a means for connection to the supply		N/A
	- terminal block specified		N/A
	- relevant information provided		N/A
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N/A
3.10 (5.2.2)	Cables equal to EN 50525		N/A
	Replace table 5.1 – Supply cord		N/A

<b>3.12 (12)</b>	<b>ENDURANCE TESTS AND THERMAL TESTS</b>		—
3.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		N/A

<b>ZB</b>	<b>ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>		—
(3.3)	DK: power supply cords of class I luminaires with label		N/A

Attachment A

IEC60598_2_3K - ATTACHMENT			
Clause	Requirement – Test	Result - Remark	Verdict

(4.5.1)	DK: socket-outlets		N/A
(5.2.1)	CY, DK, FI, GB: type of plug		N/A

ZC	ANNEX ZC, NATIONAL DEVIATIONS (EN)		—
(4 & 5)	FR: Shuttered socket-outlets 10/16A		
	FR: Safety requirements for high buildings  (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage)  Glow-wire test for outer parts of luminaires:		N/A
	- 850°C for luminaires in stairways and horizontal travel paths		N/A
	- 650°C for indoor luminaires		N/A
	GB: Requirements according to United Kingdom Building Regulation		N/A

— End of Attachment A —



EN 62031: 2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>GENERAL REQUIREMENTS</b>		—
4.4	Integral modules tested assembled in the luminaire		P
4.5	Independent modules complies with requirements in IEC 60598-1		N/A
<b>5</b>	<b>GENERAL TEST REQUIREMENTS</b>		—
5.5	SELV-operated LED modules comply with Annex I of IEC 61347-2-13	Approved LED driver approved	N/A
	General conditions for tests in Annex A	(see Annex A)	P
<b>6</b>	<b>CLASSIFICATION</b>		—
	Built-in module .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	Independent module.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	Integral module .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—
<b>7</b>	<b>MARKING</b>		N/A
	Integral module		N/A
<b>8</b>	<b>TERMINALS</b>		N/A
	No such terminals		N/A
<b>9 (9)</b>	<b>PROVISION FOR PROTECTIVE EARTHING</b>		N/A
	Refer to main report		—
<b>10 (10)</b>	<b>PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS</b>		—
- (10.1)	Controlgear protected against accidental contact with live parts		P
- (A2)	The current flowing between the part concerned and earth is measured and does not exceed 0,7 mA (peak) or 2 mA d.c. ....:		N/A
- (A2)	For frequencies above 1 kHz, the current does not exceed 0,7 mA (peak) multiplied by the value of the frequency in kilohertz or 70 mA (peak) .....		N/A
- (A3)	The voltage between the part concerned and any accessible part is measured and does not exceed 34 V (peak).....:		N/A
- (10.1)	Lacquer or enamel not used for protection or insulation		P
	Adequate mechanical strength on parts providing protection		P

EN 62031: 2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict
- (10.2)	Capacitors > 0,5 µF: voltage after 1 min (V): < 50 V .....:		N/A
- (10.3)	Controlgear providing SELV		N/A
	Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear		N/A
	No connection between output circuit and the body or protective earthing circuit		N/A
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		N/A
	SELV outputs separated by at least basic insulation		N/A
	ELV conductive parts insulated as live parts		N/A
	Tests according Annex L of IEC 61347-1		N/A
- (10.4)	Accessible conductive parts in SELV circuits		N/A
	Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c.		N/A
	If output voltage > 25 V r.m.s. or > 60 V d.c.; No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. ....:		N/A
	One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
<b>11 (11)</b>	<b>MOISTURE RESISTANCE AND INSULATION</b>		<b>P</b>
	Refer to main report		—
<b>12 (12)</b>	<b>ELECTRIC STRENGTH</b>		<b>P</b>
	Refer to main report		—
<b>13 (14)</b>	<b>FAULT CONDITIONS</b>		<b>—</b>
- (14)	When operated under fault conditions the controlgear:		<b>P</b>
	- does not emit flames or molten material		<b>P</b>
	- does not produce flammable gases		<b>P</b>
	- protection against accidental contact not impaired		<b>P</b>

EN 62031: 2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict
	Thermally protected controlgear does not exceed the marked temperature value		N/A
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)	(see appended table)	N/A
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N/A
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	N/A
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance $\geq 1 \text{ M}\Omega$ .....		P
	No flammable gases		P
	No accessible parts have become live		P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite		P
- (14.6)	Relevant fault condition tests with high-power supply		P
<b>13.2</b>	<b>Overpower condition</b>		P
	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		N/A
	No fire, smoke or flammable gas is produced		P
	Molten material does not ignite tissue paper, spread below the module		P
<b>15</b>	<b>CONSTRUCTION</b>		—
	Wood, cotton, silk, paper and similar fibrous material not used as insulation		P
<b>16 (16)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		P
	Refer to main report		—
<b>17 (17)</b>	<b>SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS</b>		P
	Refer to main report		—

EN 62031: 2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict
<b>18 (18)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		P
	Refer to main report		—
<b>19 (19)</b>	<b>RESISTANCE TO CORROSION</b>		P
	Refer to main report		—
<b>20</b>	<b>INFORMATION FOR LUMINAIRE DESIGN</b>		P
	Information in Annex D (informative)		—
<b>21</b>	<b>HEAT MANAGEMENT</b>		N/A
	No such parts		—
<b>22</b>	<b>PHOTOBIOLOGICAL SAFETY</b>		—
<b>22.1</b>	<b>UV radiation</b>		N/A
	Luminous radiation not exceed 2mW/klm		N/A
<b>22.2</b>	<b>Blue light hazard</b>		P
	Assessed according to IEC TR 62778		P
<b>22.3</b>	<b>Infrared radiation</b>		N/A
	Requirements for infrared radiation when required		N/A
<b>A</b>	<b>ANNEX A - TESTS</b>		—
	All tests performed in accordance with the advice given in Annex H of IEC 61347-1, if applicable		P
<b>13 (14)</b>	<b>TABLE: tests of fault conditions</b>		P
<b>Part</b>	<b>Simulated fault</b>		<b>Hazard</b>
LED of model AGIL XL	SC, not work and no hazard		No
LED of model MILAN XL	SC, not work and no hazard		No

EN 62031: 2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ANNEX 1</b>	<b>SELV-operated LED modules</b>	N/A
	No such parts	—

<b>ANNEX 2</b>	<b>TABLE: Critical components information</b>					P
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>
Refer to main report for details						
Supplementary information: <sup>1)</sup> Provided evidence ensures the agreed level of compliance. See OD-CB2039. The codes above have the following meaning: A - The component is replaceable with another one, also certified, with equivalent characteristics B - The component is replaceable if authorised by the test house C - Integrated component tested together with the appliance D - Alternative component						

EN 62031: 2008 + A1: 2013 + A2: 2015			
Clause	Requirement + Test	Result - Remark	Verdict

	<b>ANNEX 3: screw terminals (part of the luminaire)</b>		N/A
	No such parts		N/A
	<b>ANNEX 4: screwless terminals (part of the luminaire)</b>		N/A
	No such parts		N/A

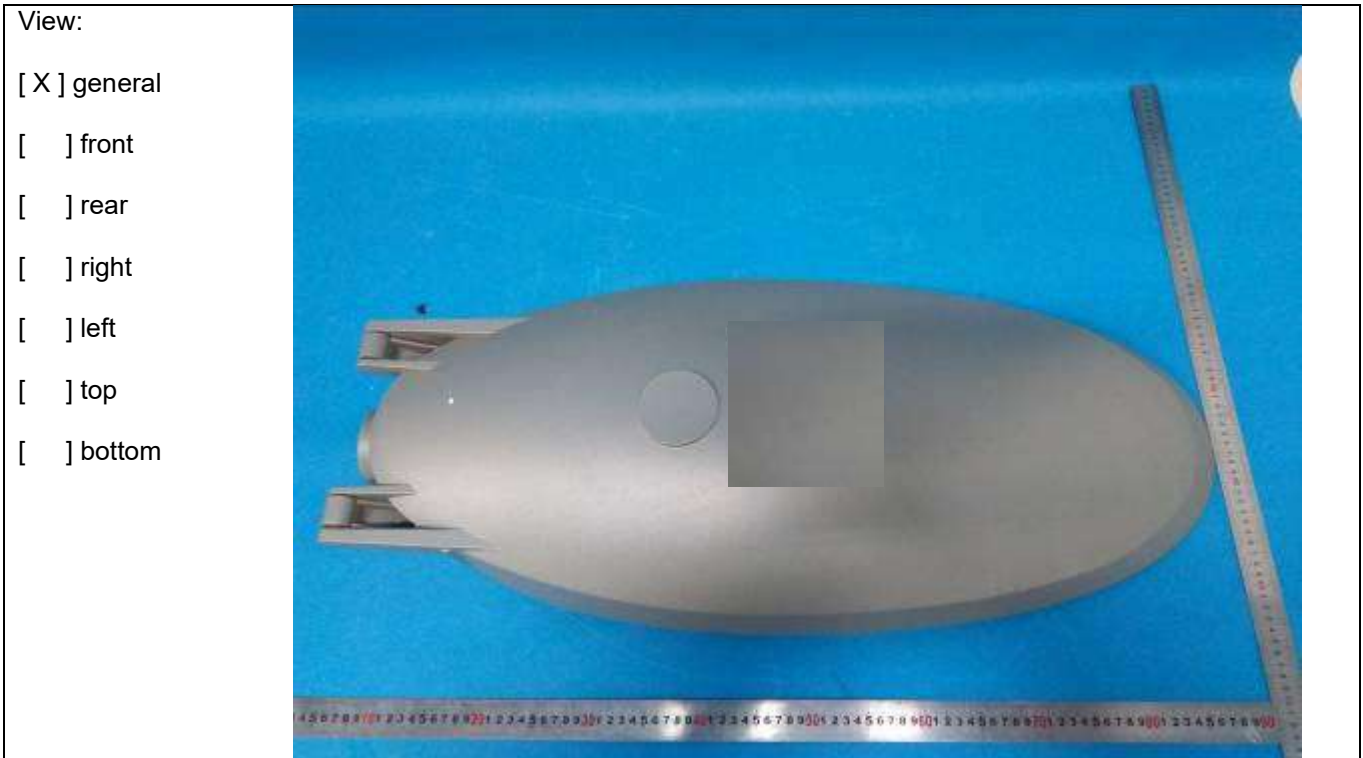
—End of Attachment B —

Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AGIL XL



Detail of: AGIL XL



Attachment C  
Photo documentation

Report No.: NBES170901575201

LED Street Lighting (LED lamp)

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S,  
MILAN M, MILAN XL

Detail of: AGIL XL



Detail of: AGIL XL





Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AGIL XL



Detail of: AGIL XL



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

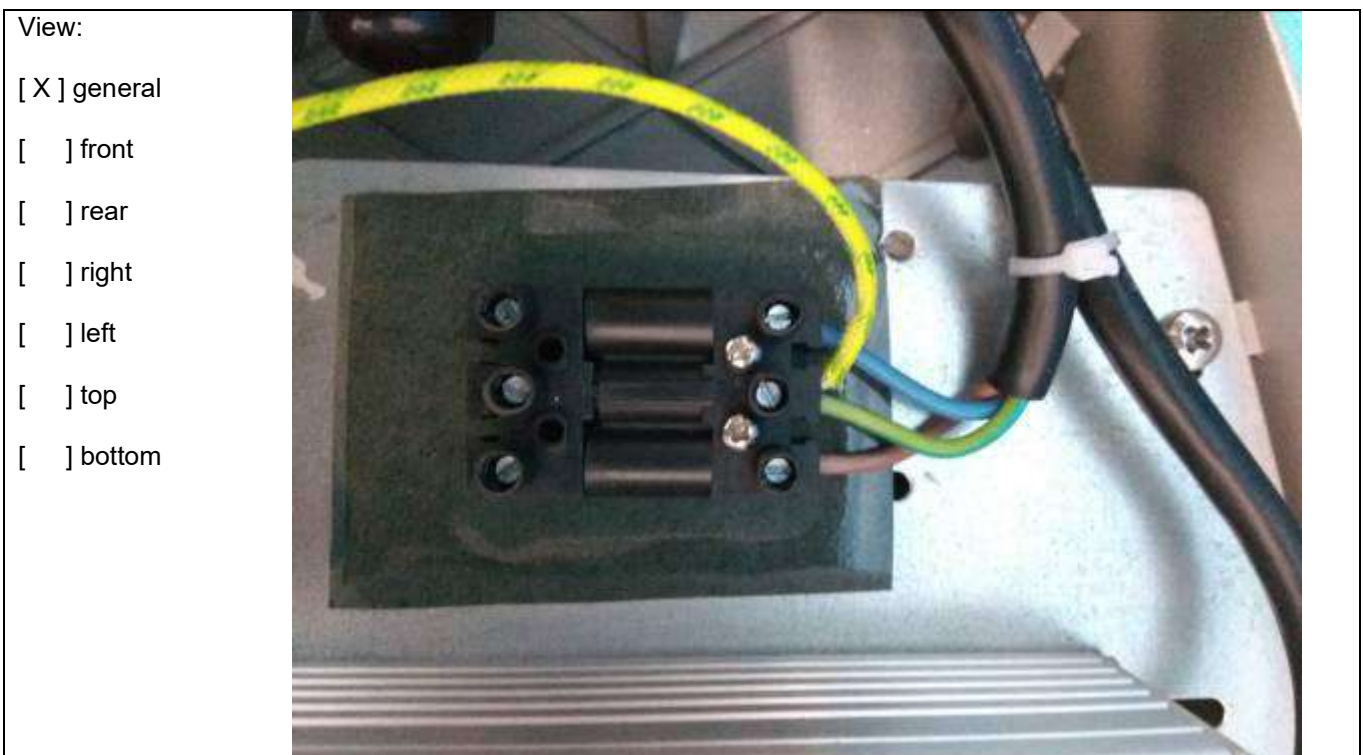
Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

**Detail of:** Gland for model AGIL XL



**Detail of:** Terminal block for model AGIL S, AGIL, AGIL XL, AVENUE M, AVENUE XL



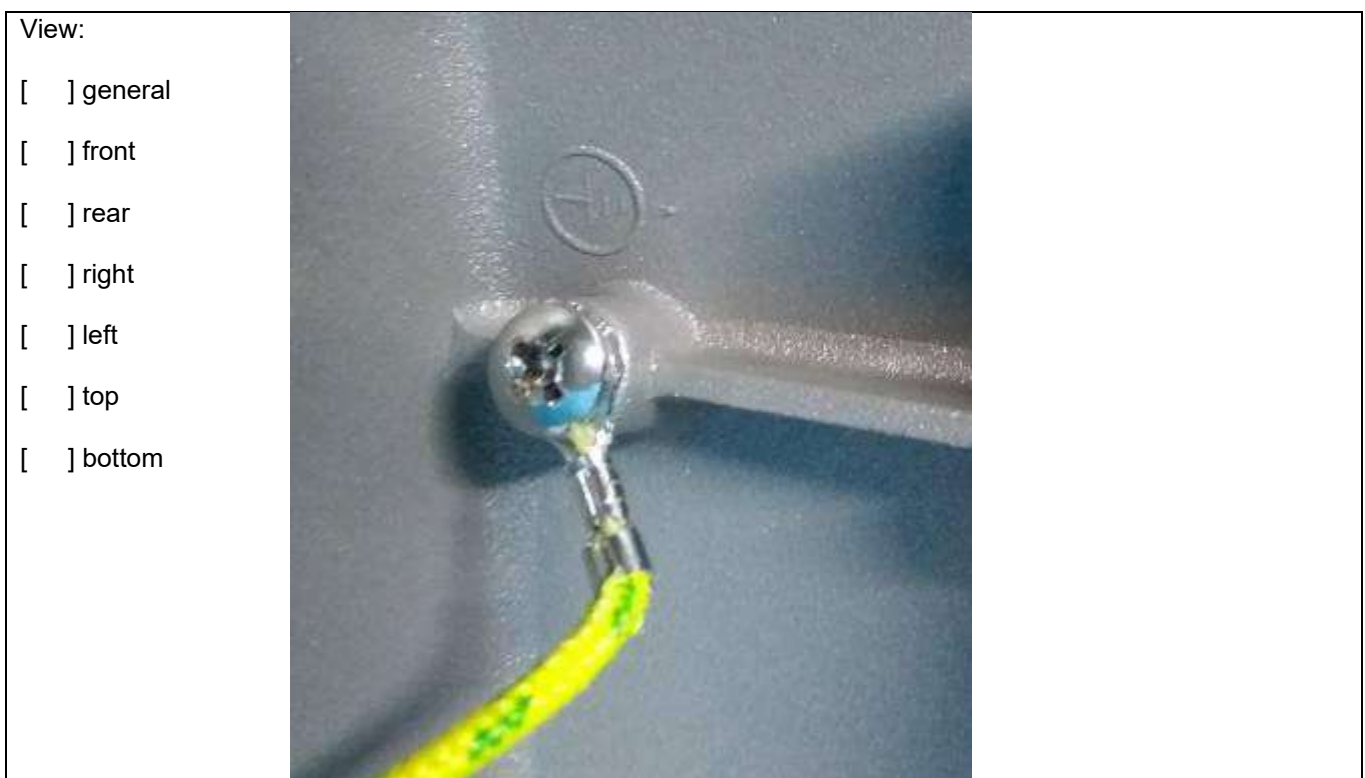
Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)  
 AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S,  
 MILAN M, MILAN XL

Report No.: NBES170901575201

**Detail of:** Independent controlgear for model AGIL XL



**Detail of:** Earth screw for all models



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

**Detail of:** LED module for model AGIL XL

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**Detail of:** AGIL

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Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AGIL S



Detail of: AGIL S



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S,  
MILAN M, MILAN XL

Detail of: AGIL S



Detail of: AGIL S

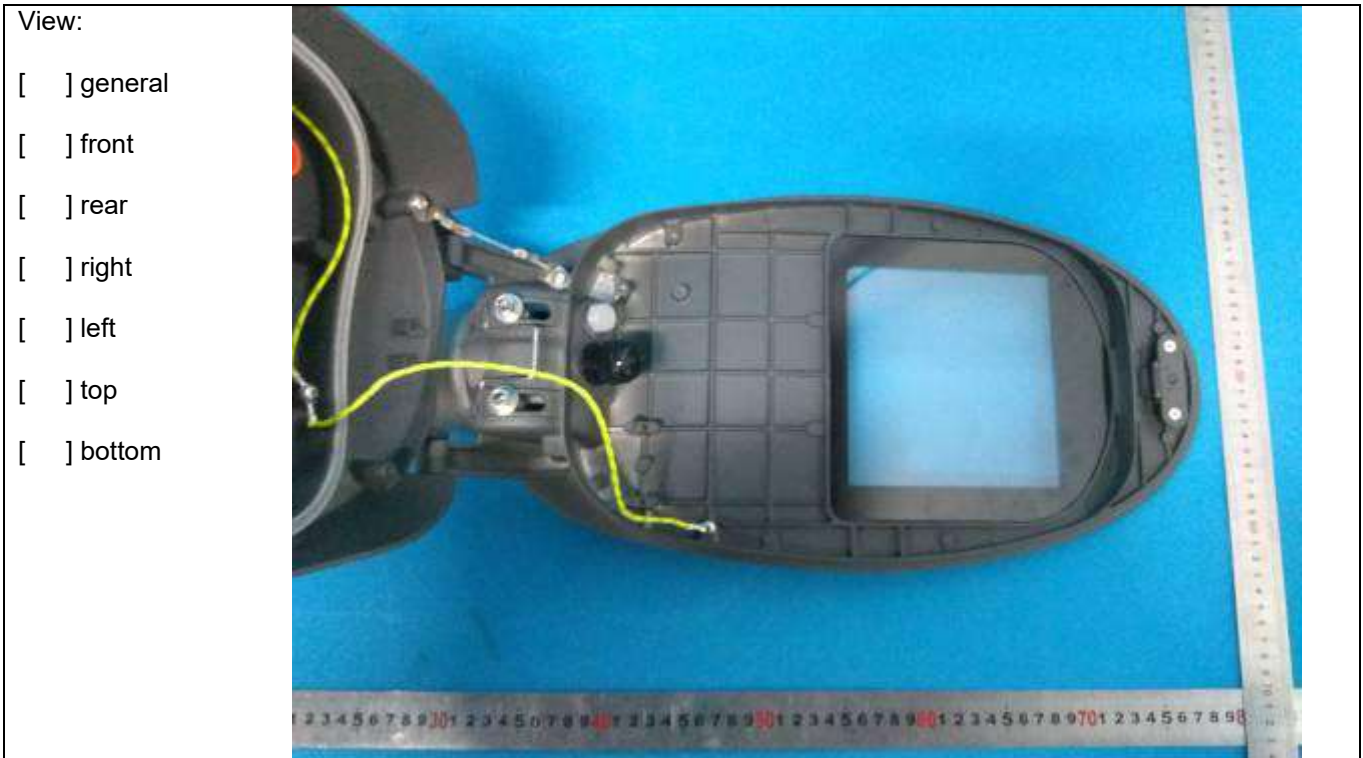


Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

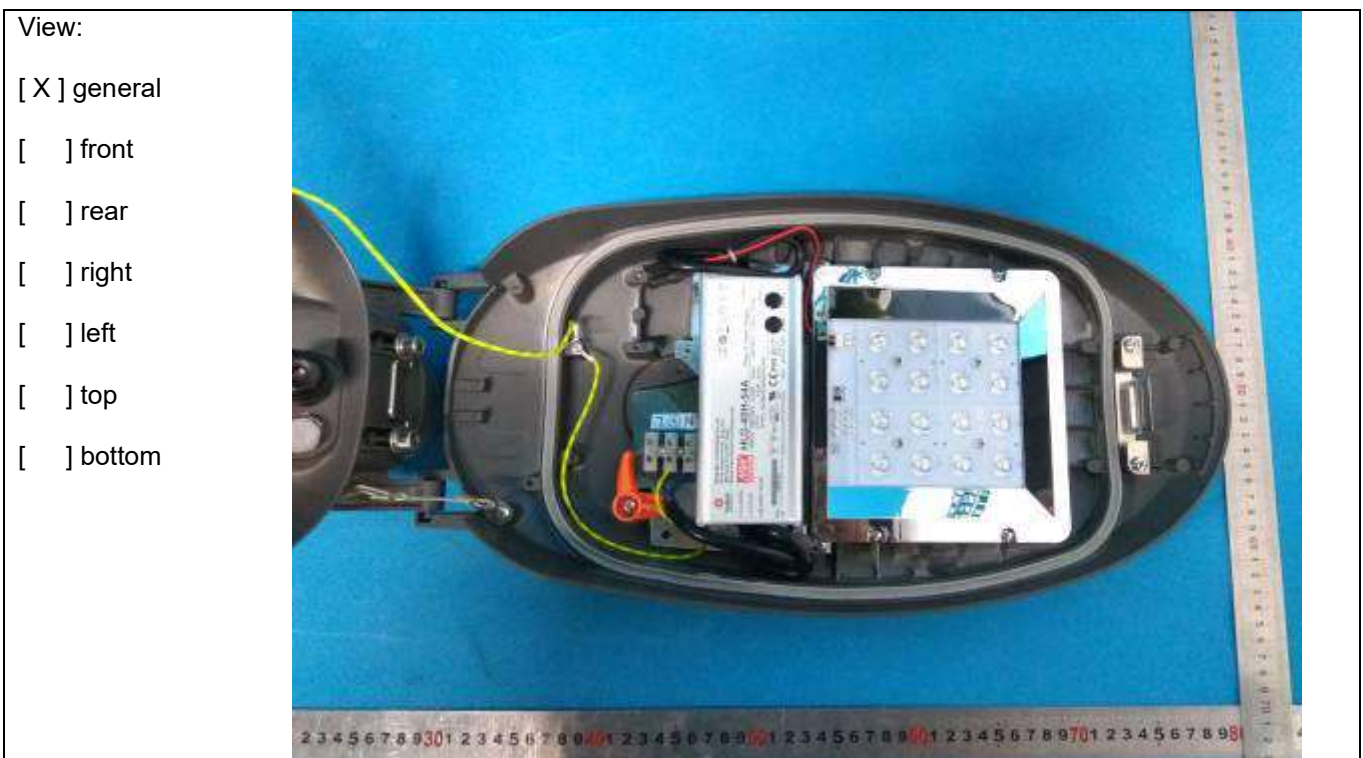
Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AGIL S



Detail of: AGIL S

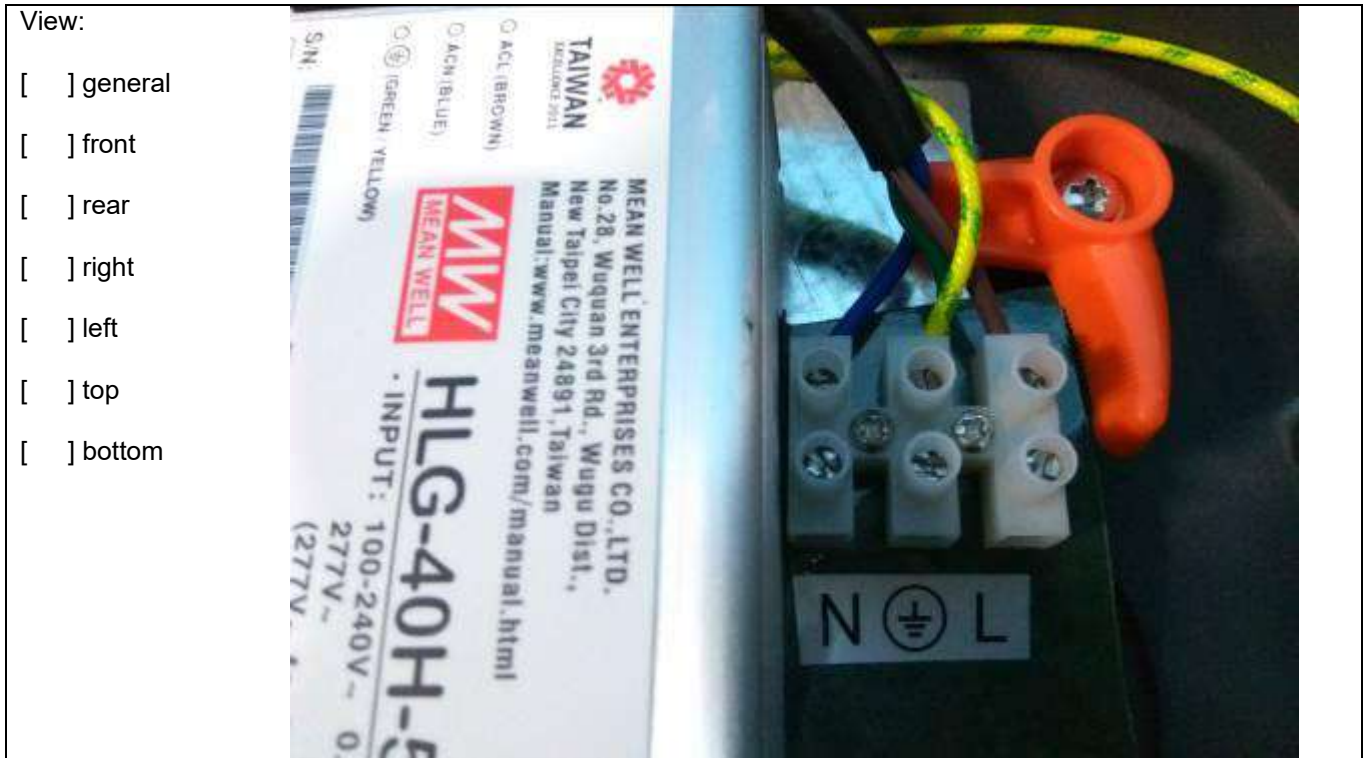


Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

**Detail of:** Terminal block for model AGIL S



**Detail of:** Independent controlgear for model AGIL S



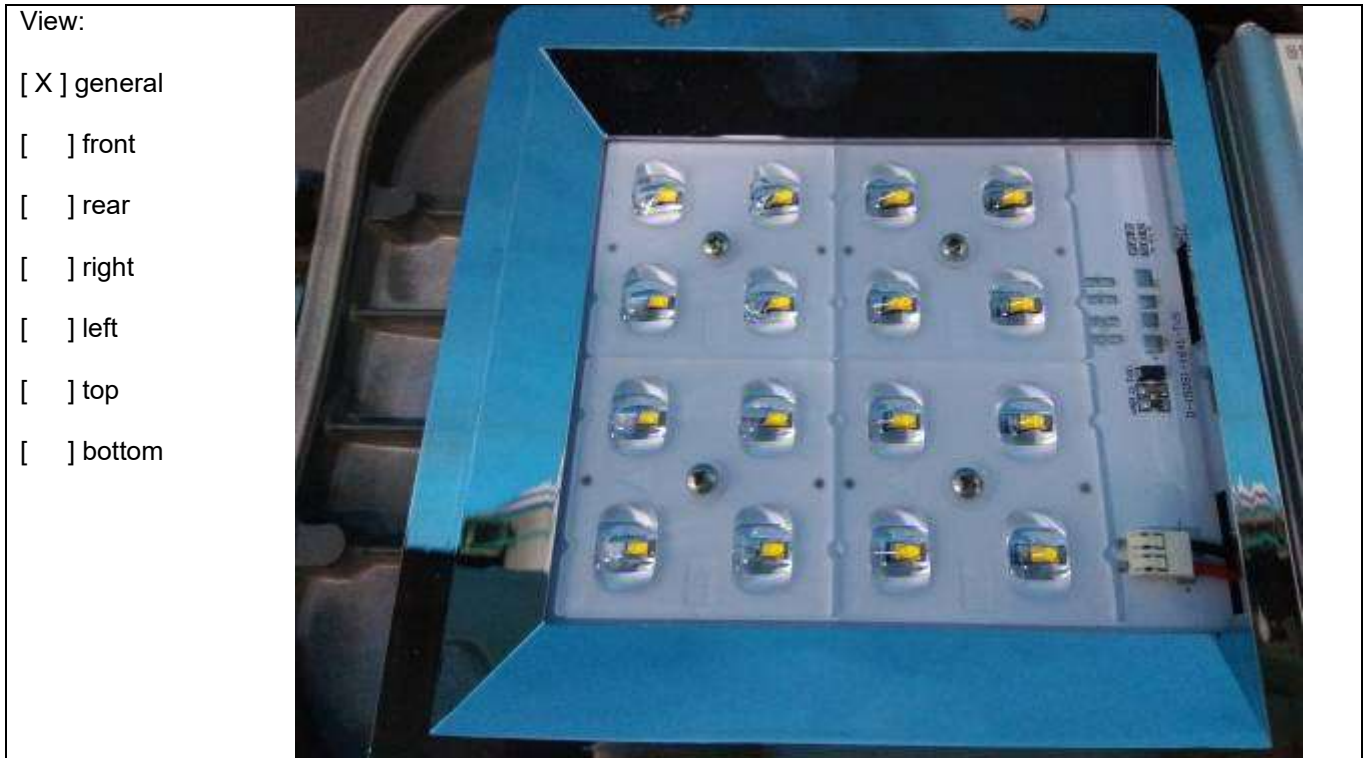


Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AGIL S



Detail of: AVENUE M



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AVENUE M



Detail of: AVENUE M



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AVENUE M



Detail of: Earth screw for model AVENUE M

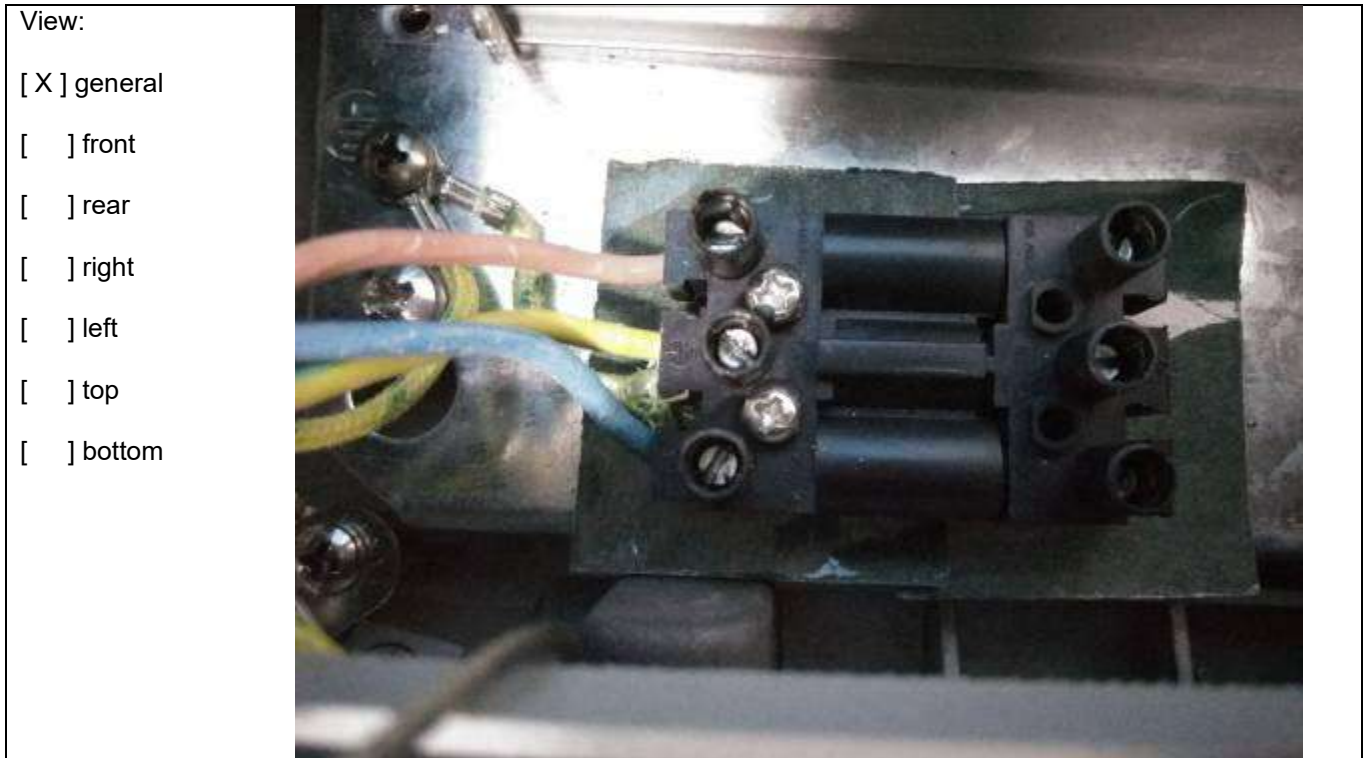


Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

**Detail of:** Terminal block for model AVENUE M



**Detail of:** Independent controlgear for model AVENUE M



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AVENUE M



Detail of: AVENUE M



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: LED module for model AVENUE M



Detail of: AVENUE XL



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AVENUE XL



Detail of: AVENUE XL

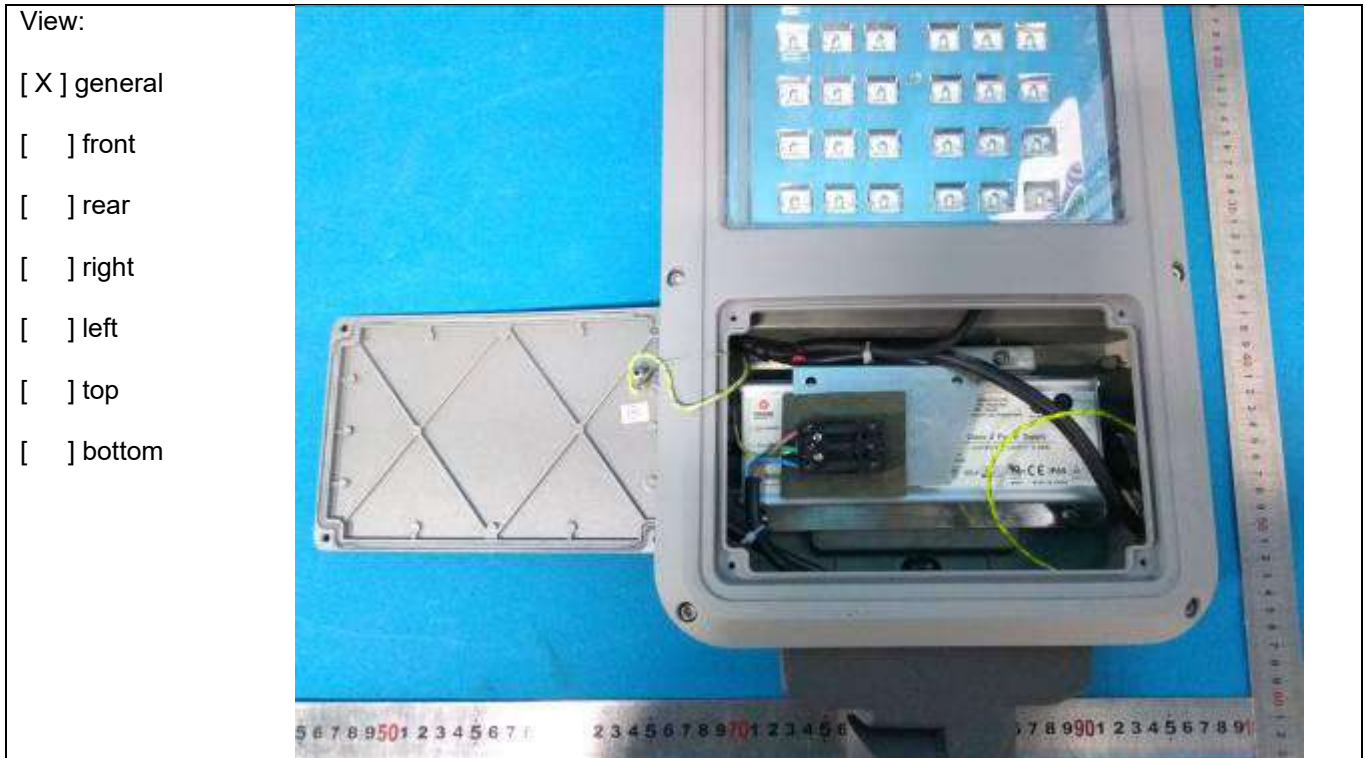


Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)

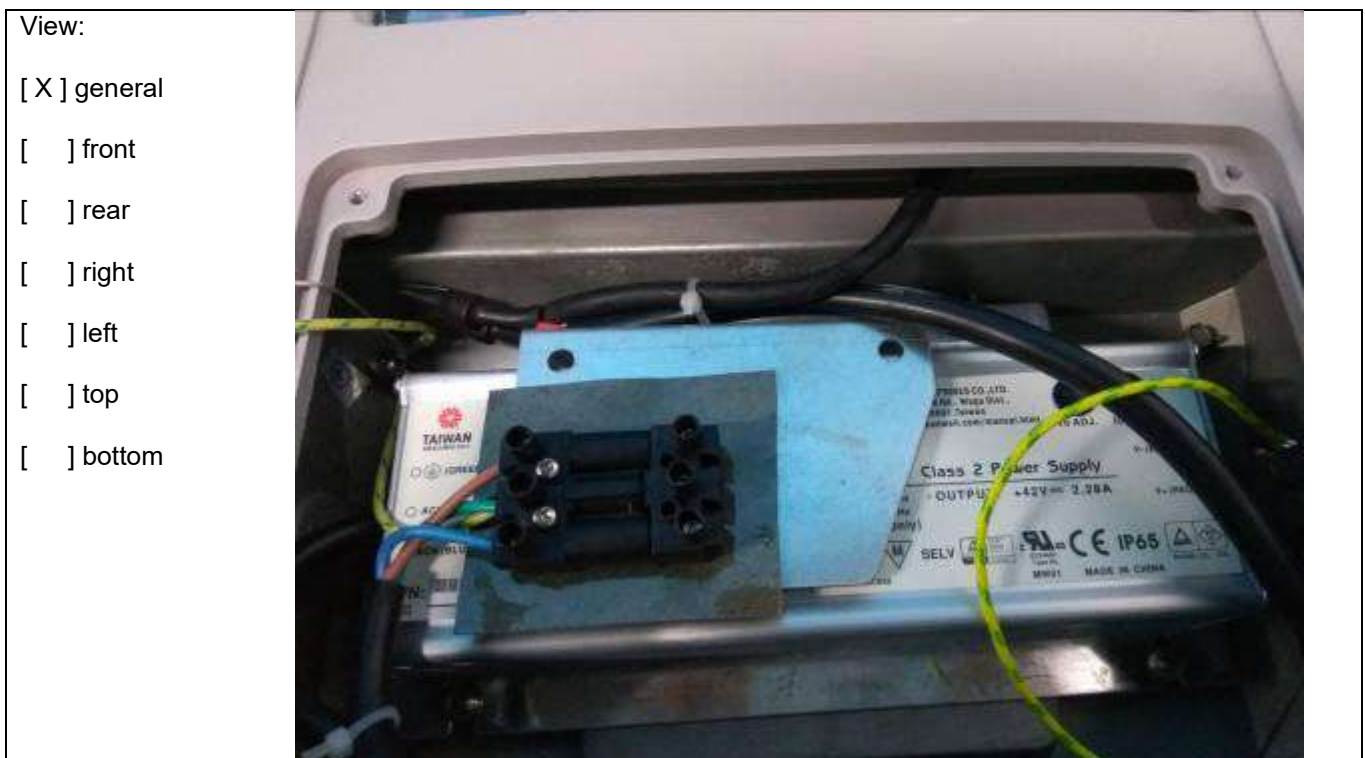
Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AVENUE XL



Detail of: AVENUE XL





Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: AVENUE XL



Detail of: Earth screw for model AVENUE XL



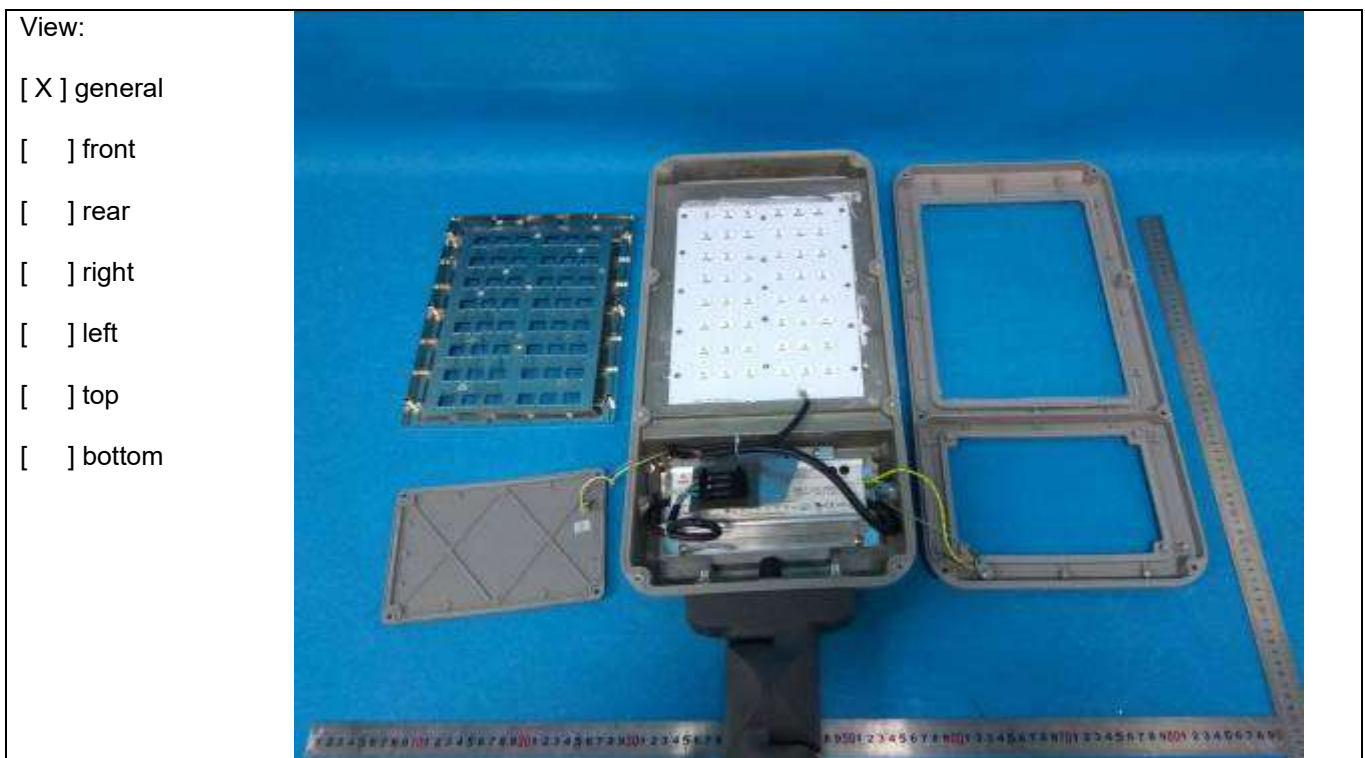
Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)  
 AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S,  
 MILAN M, MILAN XL

Report No.: NBES170901575201

Detail of: AVENUE XL



Detail of: AVENUE XL



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

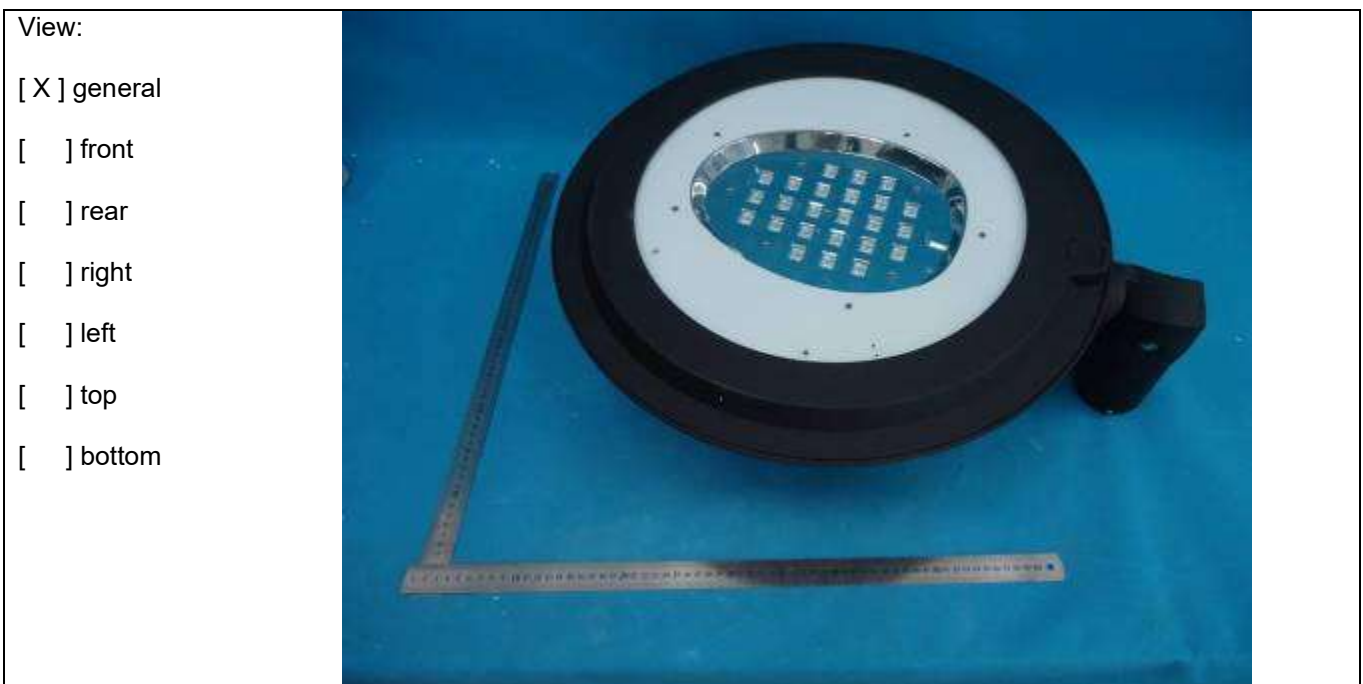
Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: LED module for model AVENUE XL



Detail of: ESKADE



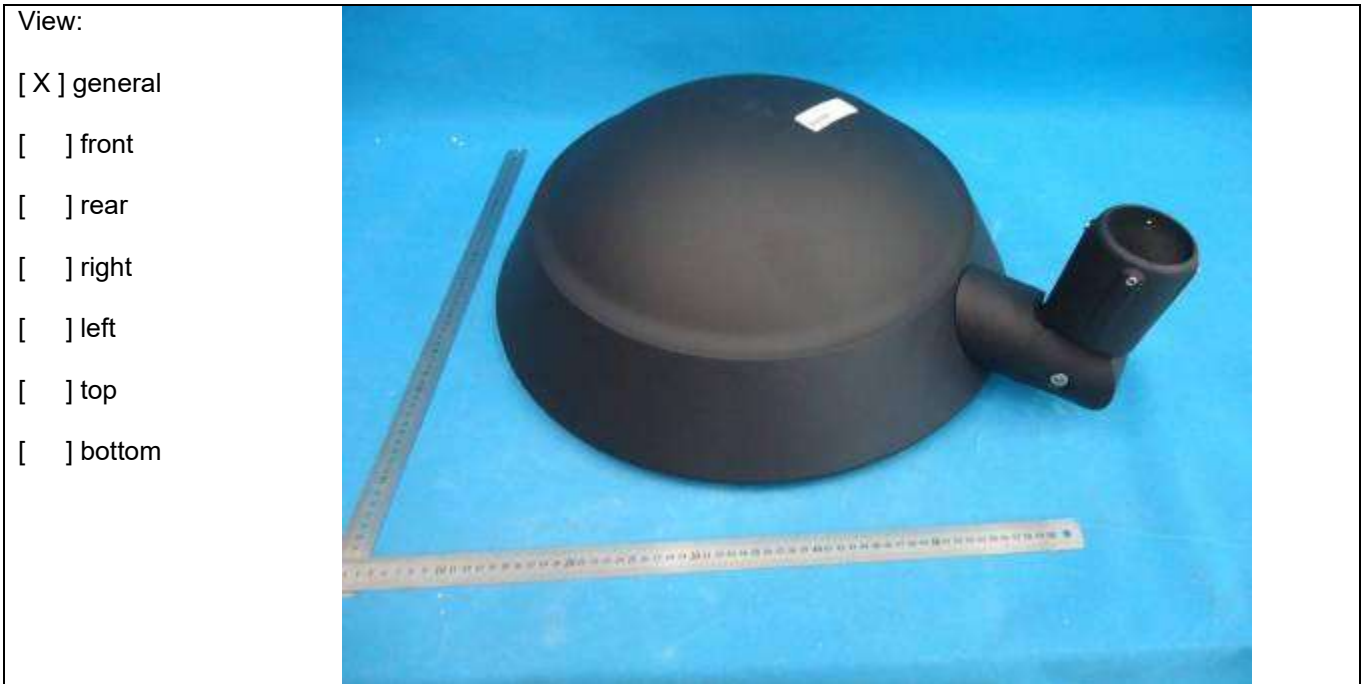
Attachment C  
Photo documentation

Report No.: NBES170901575201

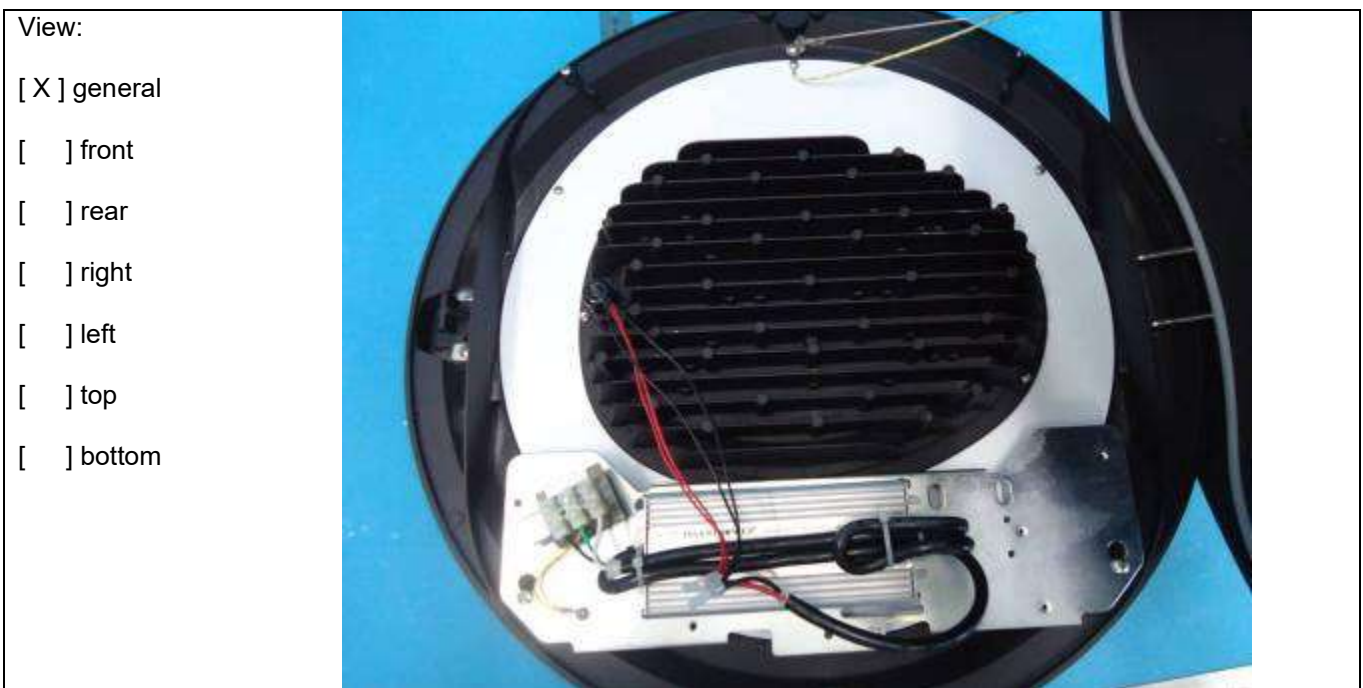
LED Street Lighting (LED lamp)

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S,  
MILAN M, MILAN XL

Detail of: ESKADE



Detail of: ESKADE



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)


Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: ESKADE

View:	
<input checked="" type="checkbox"/> general	
<input type="checkbox"/> front	
<input type="checkbox"/> rear	
<input type="checkbox"/> right	
<input type="checkbox"/> left	
<input type="checkbox"/> top	
<input type="checkbox"/> bottom	

Detail of: Cord entry for model ESKADE

View:	
<input checked="" type="checkbox"/> general	
<input type="checkbox"/> front	
<input type="checkbox"/> rear	
<input type="checkbox"/> right	
<input type="checkbox"/> left	
<input type="checkbox"/> top	
<input type="checkbox"/> bottom	

Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

**Detail of:** Cord Anchorage in cable entry for model ESKADE

View:

- [ X ] general
- [ ] front
- [ ] rear
- [ ] right
- [ ] left
- [ ] top
- [ ] bottom



**Detail of:** Independent controlgear for model ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL

View:

- [ X ] general
- [ ] front
- [ ] rear
- [ ] right
- [ ] left
- [ ] top
- [ ] bottom



TAIWAN  
 MW MEAN WELL  
**HLG-80H-42A** Class 2 Power Supply  
 - INPUT: 100-240VAC 0.85A 50-60Hz  
 277VAC 0.40A 50-60Hz  
 (277VAC for North America only)  
 - OUTPUT: +42VDC 1.95A  
 IP65  
 I<sub>c</sub>: 80°C  
 I<sub>s</sub>: 60°C  
 V+ (RED) ○  
 V- (BLACK) ○  
 I<sub>o</sub> ADJ. ○  
 V<sub>o</sub> ADJ. ○  
 S/N: 4852 751862  
 Suitable for use in Dry, Damp and Wet Locations  
 CE, ENEC, TUV, SELV, MADE IN CHINA

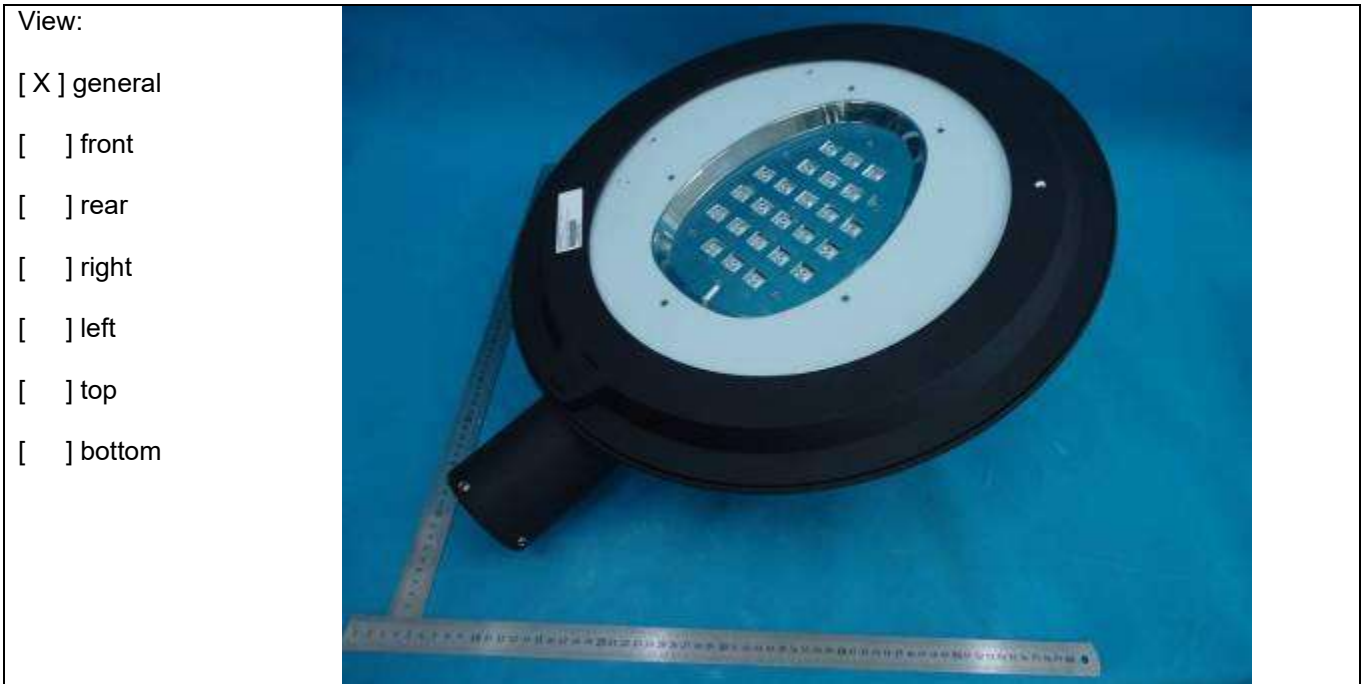
Attachment C  
Photo documentation

Report No.: NBES170901575201

LED Street Lighting (LED lamp)

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: ESKADE-1



Detail of: ESKADE UP



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of:   CORBA  



Details of:   BEL  



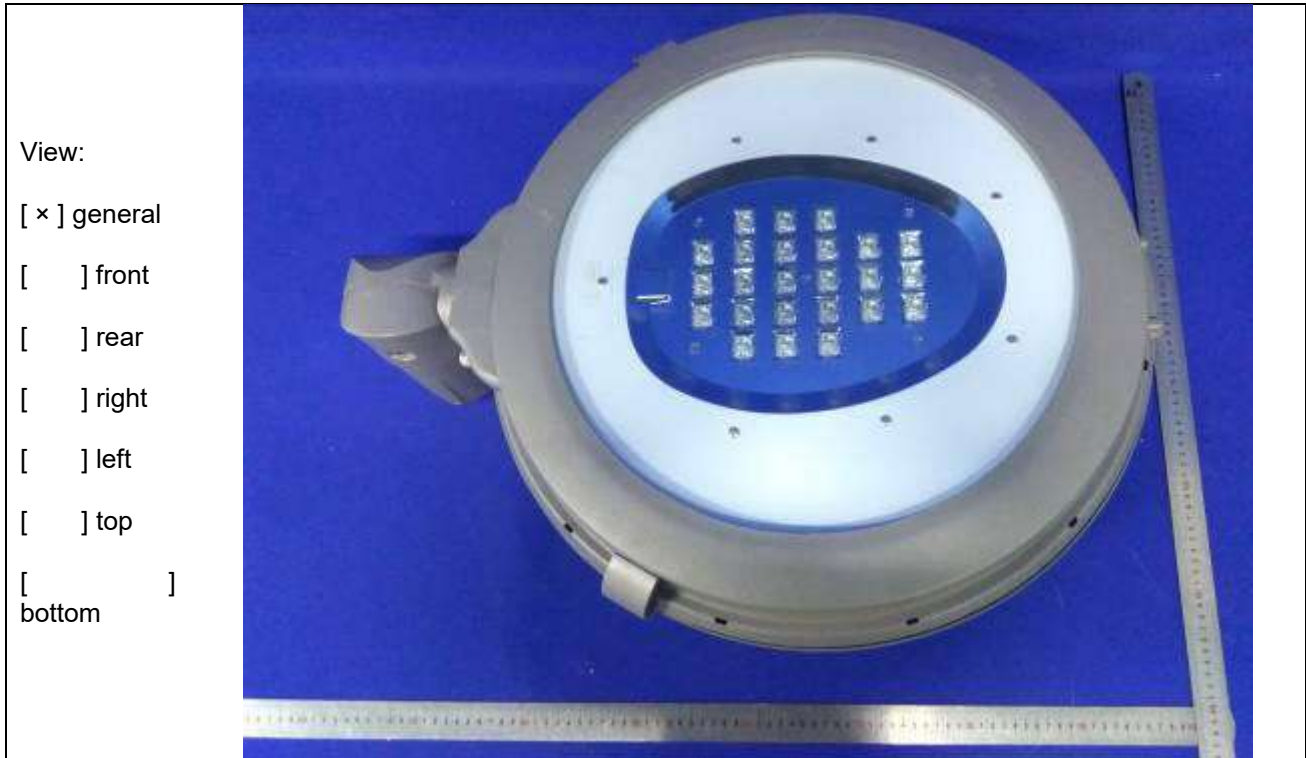
Details of:   BEL



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL



Details of: BEL



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

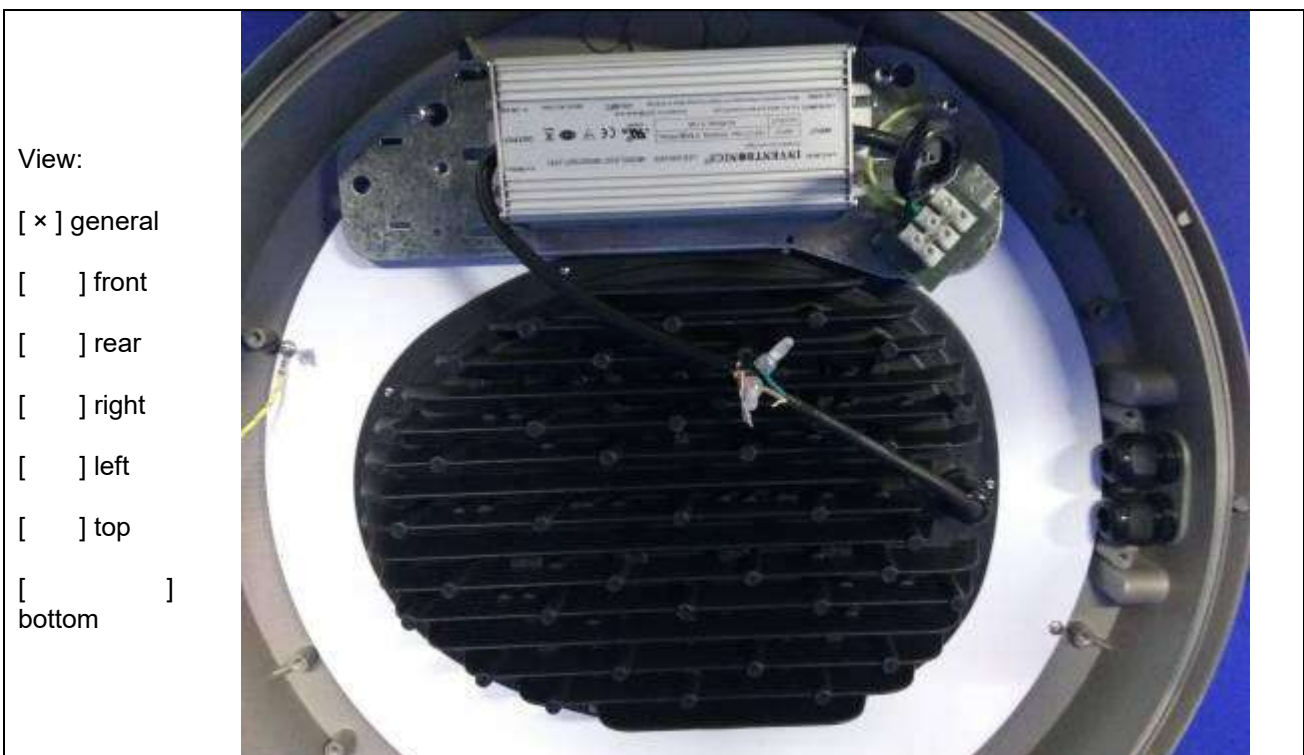
Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Details of:   BEL  



Details of:   Internal construction for model BEL and CORBA  



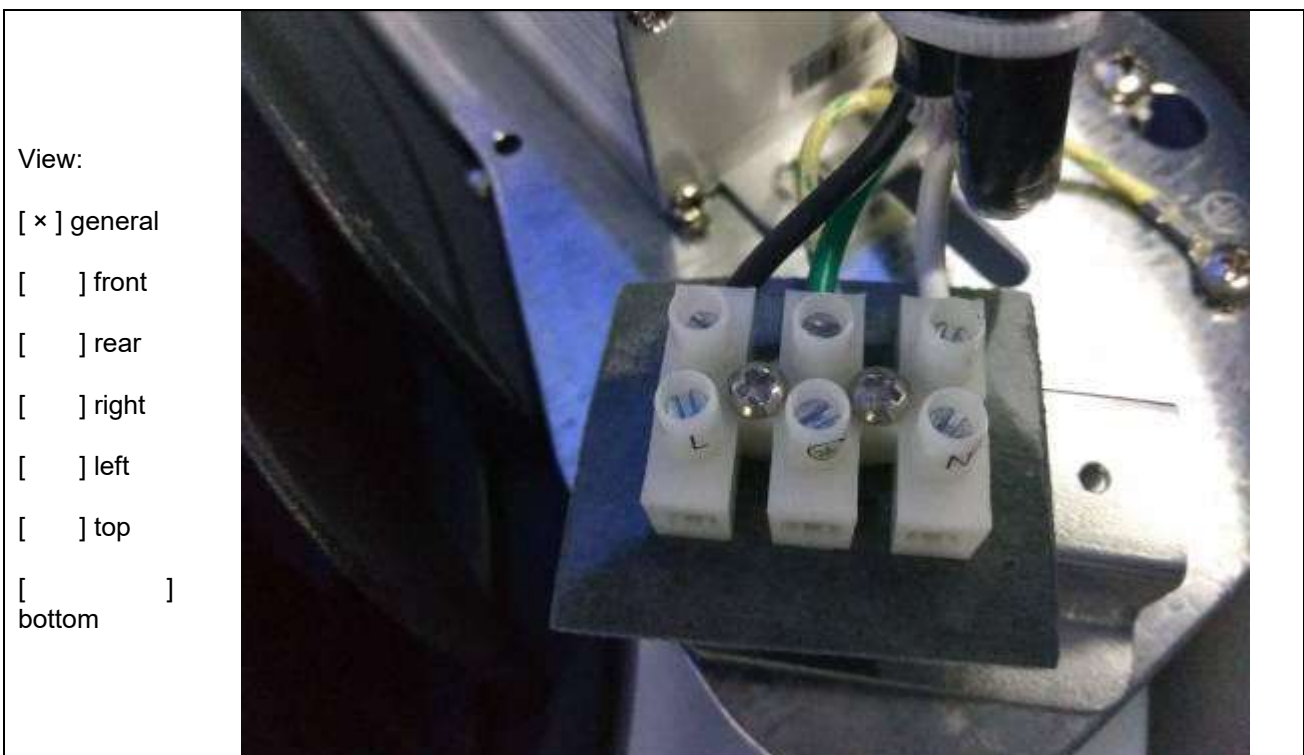
Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)  
AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S,  
MILAN M, MILAN XL

Report No.: NBES170901575201

Details of: Gland for model BEL and CORBA



Details of: Terminal block for model BEL and CORBA



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Details of: Earth screw for BEL and CORBA



Details of: Gland for model BEL and CORBA

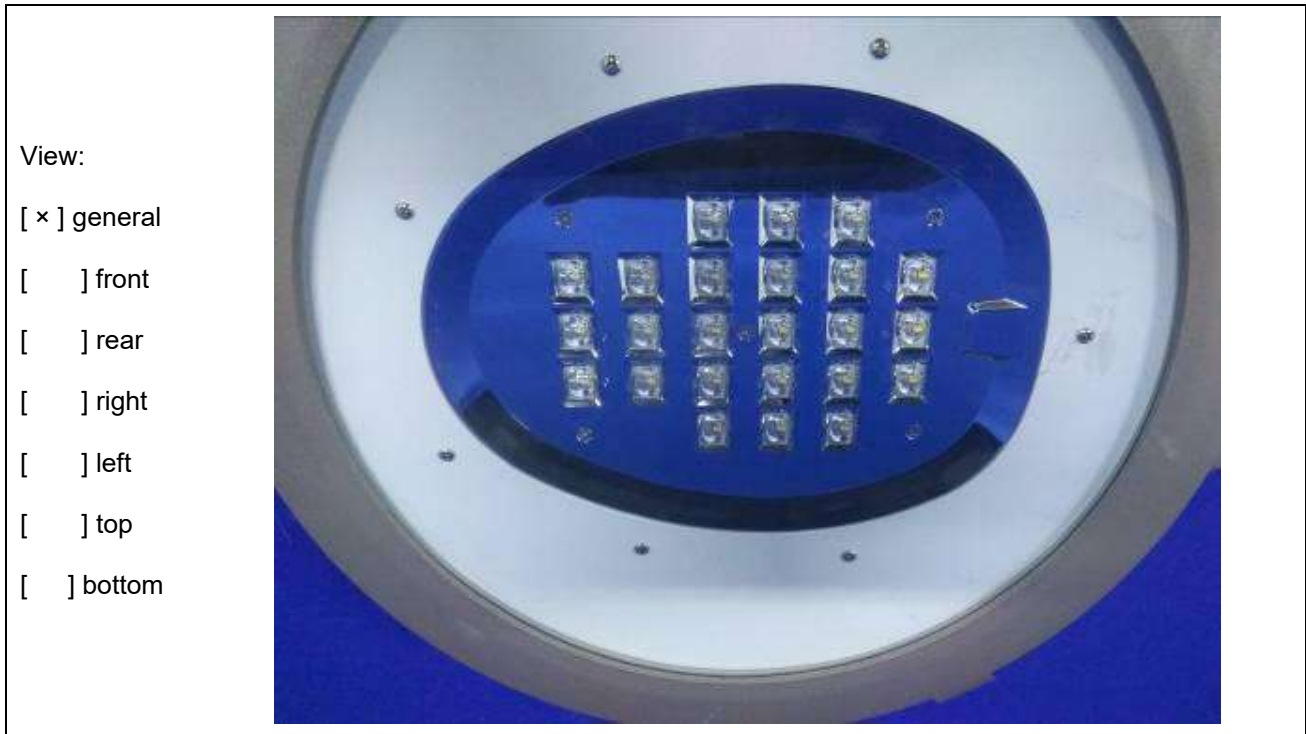


Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Details of: LED module for model BEL and CORBA



Detail of: MILAN XL



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

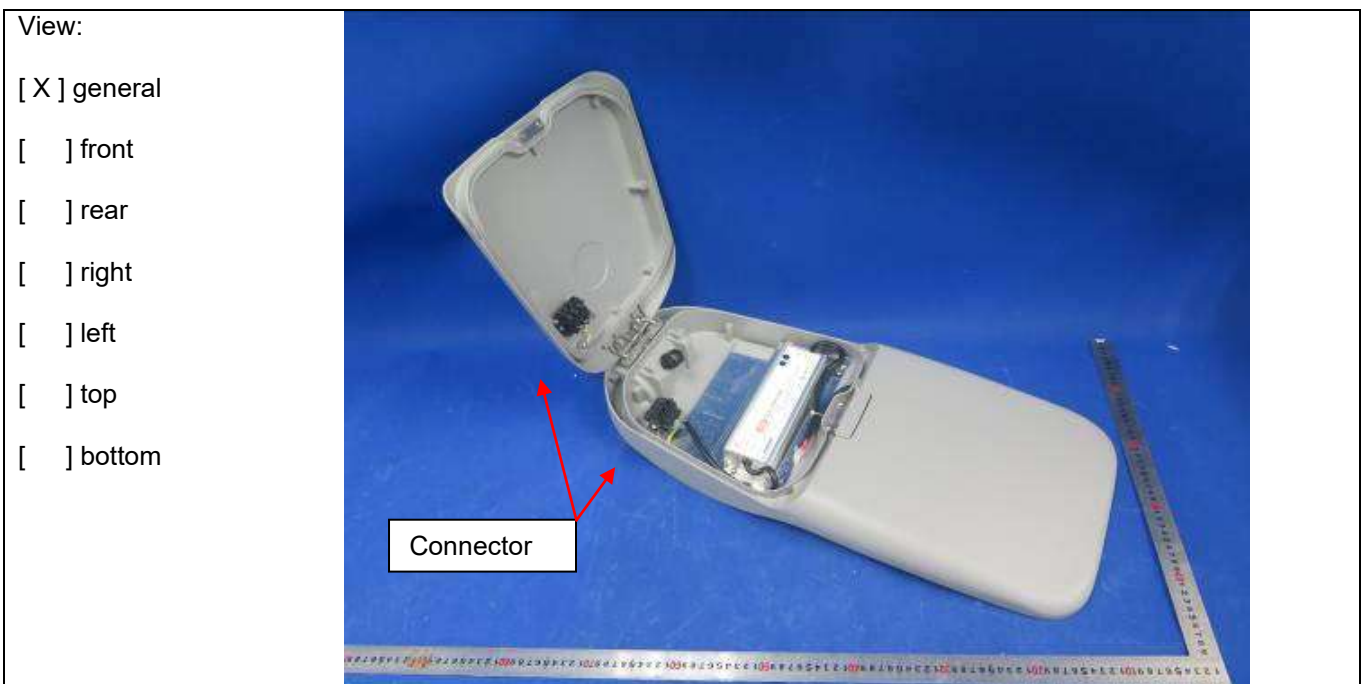
Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: MILAN XL



Detail of: MILAN XL



Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: MILAN XL

View:

- [ X ] general
- [ ] front
- [ ] rear
- [ ] right
- [ ] left
- [ ] top
- [ ] bottom



Detail of: Independent controlgear for MILAN XL

View:

- [ X ] general
- [ ] front
- [ ] rear
- [ ] right
- [ ] left
- [ ] top
- [ ] bottom



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

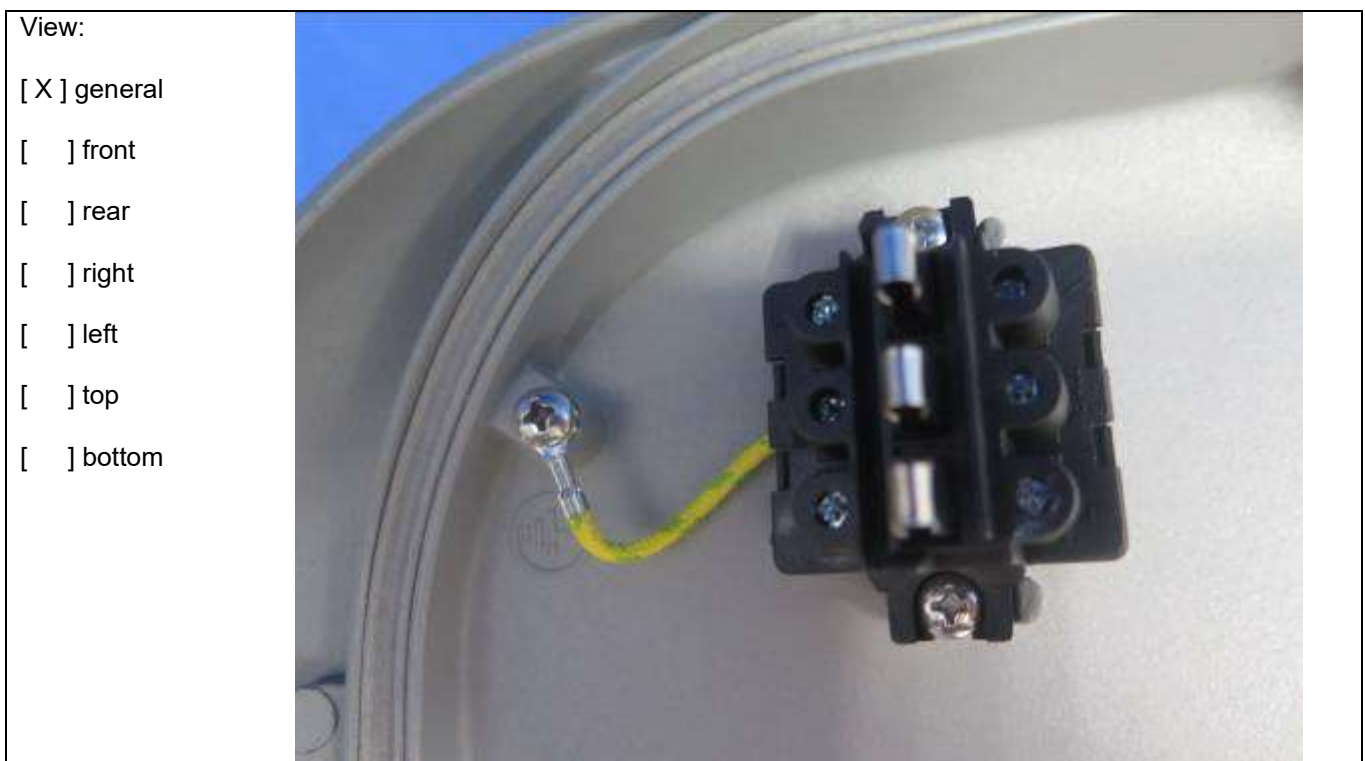
Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

**Detail of:** Connector for all model except AGIL S



**Detail of:** Connector for all model except AGIL S





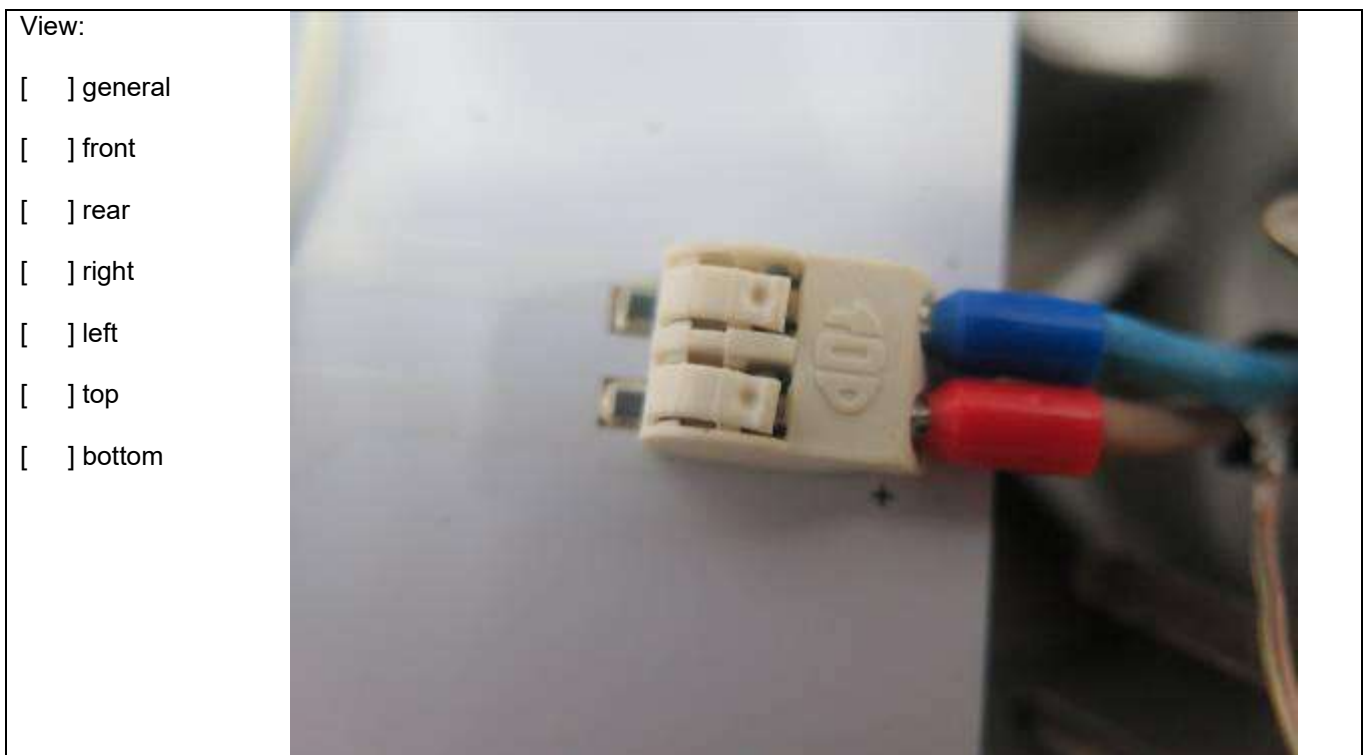
Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)  
AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S,  
MILAN M, MILAN XL

Report No.: NBES170901575201

**Detail of:** LED module for model MILAN XL



**Detail of:** DC Connector for all models



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: LED for model MILAN S, MILAN M, MILAN XL



Detail of: MILAN S



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: MILAN S



Detail of: MILAN S



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

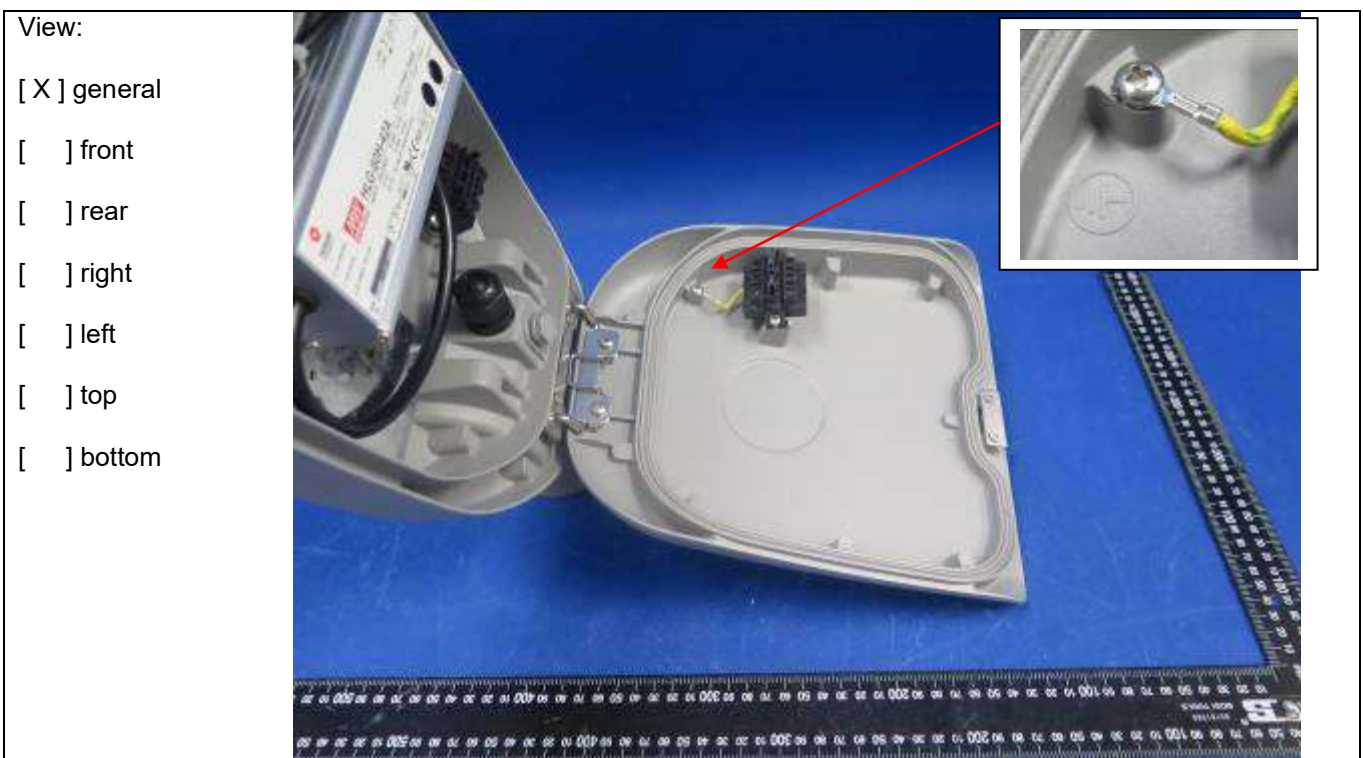
Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S,  
MILAN M, MILAN XL

Detail of: MILAN S



Detail of: MILAN S



Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)

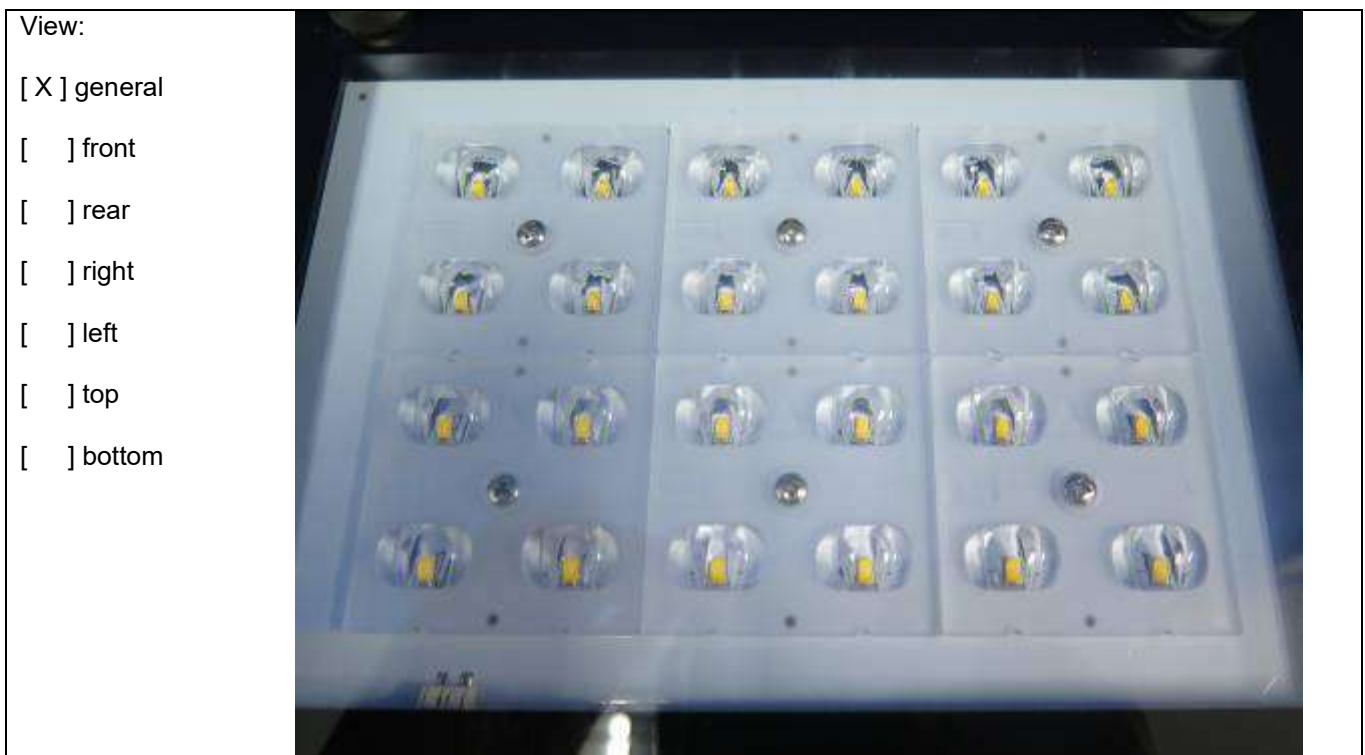
Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

**Detail of:** Independent controlgear for model MILAN S



**Detail of:** LED module for model MILAN S



Attachment C  
Photo documentation  
LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: MILAN M



Detail of: MILAN M



Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

Detail of: MILAN M



Detail of: MILAN M



Attachment C  
 Photo documentation  
 LED Street Lighting (LED lamp)

Report No.: NBES170901575201

AGIL XL, AGIL, AGIL S, AVENUE M, AVENUE XL, ESKADE, ESKADE-1, ESKADE UP, CORBA, BEL, MILAN S, MILAN M, MILAN XL

**Detail of:** Independent controlgear for MILAN M



**Detail of:** LED module for model MILAN M



- End of Attachment C -


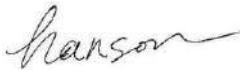




Test Report issued under the responsibility of:



<b>TEST REPORT</b> <b>IEC TR 62778</b> <b>Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires</b>	
<b>Report Number</b> .....	3194758.51P
<b>Date of issue</b> .....	2016-08-30
<b>Total number of pages</b> .....	16
<b>Name of Testing Laboratory preparing the Report</b> .....	DEKRA Testing and Certification (Shanghai) Ltd. 3/F, #250, Jiangchangsan Road building 16 Headquarter Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436
<b>Applicant's name</b> .....	Lumileds Commercial (Shanghai) Co., Ltd
<b>Address</b> .....	No. 9, Lane 888, Tianlin Road, Shanghai, China
<b>Test specification:</b>	
<b>Standard</b> .....	IEC TR 62778:2014 (Second Edition)
<b>Test procedure</b> .....	CB Scheme
<b>Non-standard test method</b> .....	N/A
<b>Test Report Form No.</b> .....	IEC62778A
<b>Test Report Form(s) Originator</b> ....	TÜV SÜD Product Service GmbH
<b>Master TRF</b> .....	Dated 2016-02
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<b>General disclaimer:</b>	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.	

<b>Test item description</b> .....	LUXEON 5050	
<b>Trade Mark</b> .....	LUMILEDS	
<b>Manufacturer</b> .....	Lumileds Commercial (Shanghai) Co., Ltd No. 9, Lane 888, Tianlin Road, Shanghai, China	
<b>Model/Type reference</b> .....	LUXEON 5050 series Detailed lists refer to Appendix 2: Model List	
<b>Ratings</b> .....	Max voltage: 27 Vdc, Max current: 240 mA Detailed information please refer to Appendix 2: Model List.	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/> <b>CB Testing Laboratory:</b>	DEKRA Testing and Certification (Shanghai) Ltd.	
<b>Testing location/ address</b> .....	3/F, #250, Jiangchangsan Road building 16 Headquater Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436	
<input type="checkbox"/> <b>Associated CB Testing Laboratory:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....	Zhijun Wang	
<b>Approved by (name, function, signature)</b> ...	Hanson Zhang	
<b>Testing procedure: CTF Stage 1:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> .....		
<b>Testing procedure: CTF Stage 2:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name + signature)</b> .....		
<b>Witnessed by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> .....		
<b>Testing procedure: CTF Stage 3:</b>		
<b>Testing procedure: CTF Stage 4:</b>		
<b>Testing location/ address</b> .....		

Tested by (name, function, signature) .....		
Witnessed by (name, function, signature) .....		
Approved by (name, function, signature) .....		
Supervised by (name, function, signature) .....		

<p><b>List of Attachments (including a total number of pages in each attachment):</b></p> <ul style="list-style-type: none"> <li>● Appendix 1: Photo Documentation</li> <li>● Appendix 2: Model List</li> <li>● Appendix 3: Relative Spectrum Of Tested Sample(s)</li> <li>● Appendix 4: Table 6.1 Based On IEC 62471:2006</li> <li>● Appendix 5: Table 6.1 Based On EN62471:2008, Attachment To IEC 62471 European Group Differences And National Differences</li> </ul>	
<p><b>Summary of testing:</b></p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>These tests fulfil the requirements of standard ISO/IEC 17025. When determining the test conclusion, the Measurement Uncertainty of test has been considered.</p> <p>The tested sample of L150-44705024SCP00 from LUXEON 5050 series list at appendix 2 Have been tested according to the IEC 62471 (first edition, 2006-07) <b>at 200mm</b> and been classified as <b>RG 2</b>. Have been tested according to the EN 62471:2008 <b>at 200mm</b> and been classified as <b>RG 2</b>. Have been tested according to the IEC/TR62778:2014 and been classified as <b>RG 2 for blue light hazard</b></p>	<p><b>Testing location:</b></p> <p>DEKRA Testing and Certification (Shanghai) Ltd. 3/F, #250, Jiangchangsan Road building 16 Headquater Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436</p>
<p><b>Summary of compliance with National Differences (List of countries addressed): EN Standards</b></p> <p>EN 62471:2008</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements</b></p>	

**Copy of marking plate:**

**The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.**

N/A

<b>Test item particulars.....: See below</b>	
<b>Product evaluated.....:</b>	<input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire
<b>Rated voltage (V) .....</b>	Max: 27 Vdc
<b>Rated current (mA) .....</b>	Max:240 mA
<b>Rated CCT (K).....</b>	2600K / 3340K // 4000K / 4360K Details information please refer to Appendix 2: Model List.
<b>Rated Luminance (Mcd/m<sup>2</sup>) .....</b>	--
<b>Component report data used .....</b>	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp Report number: --
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object..... : N/A	
- test object does meet the requirement..... : P (Pass)	
- test object does not meet the requirement..... : F (Fail)	
<b>Testing..... : --</b>	
<b>Date of receipt of test item .....</b>	2016-08-25
<b>Date (s) of performance of tests .....</b>	2016-08-25 to 2016-08-30
<b>General remarks:</b>	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.  <b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b>  The product complied with the following standards: <input checked="" type="checkbox"/> IEC 62471:2006 <input checked="" type="checkbox"/> EN 62471:2008 <input type="checkbox"/> IEC/TR 62471-2:2009 <input checked="" type="checkbox"/> IEC/TR 62778:2014	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC 62471-2:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable

**When differences exist; they shall be identified in the General product information section.**

**Name and address of factory (ies) .....** : Lumileds Commercial (Shanghai) Co., Ltd  
No. 9, Lane 888, Tianlin Road, Shanghai, China

**General product information:**

L150-44705024SCP00, with ANSI bin 4360K, is part of the LUXEON 5050 product family. The sample measured, L150-44705024SCP00 has the highest typical flux density (lumens per mm<sup>2</sup> of light emitting surface (LES) area), highest typical device luminance level and highest CCT within the listed LUXEON 5050 product family. The present classification is thus valid (worst case) for all LUXEON 5050 with part number L 1 5 0 - A A B 5 0 2 4 C C 0 0 where AA represents nominal ANSI CCT bins could be equal to 4360K or lower, BB represents CRI could be from 68 to 90 (see TR IEC62778). See the appendix below for an explanation of the type designation.

The products considered as worst case which should be evaluated at 200mm.

The sample of L150-44705024SCP00 was tested at 200mm from the light source. CCT of spectral irradiance was found at 4544 K.

Base on the Model list which listed on the appendix 2, The tested sample can be considered as  
 typical product  worst product

Which the results can be reference used for the other models.

Type test was performed according to IEC 62471:2006 procedure.

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict
<b>7</b>	<b>MEASUREMENT INFORMATION FLOW</b>		<b>P</b>
<b>7.1</b>	<b>Basic flow</b>		<b>P</b>
	'Law of conservation of luminance' applied		N/A
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		N/A
	In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution		N/A
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		<b>P</b>
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
<b>7.3</b>	<b>Special cases (I): Replacement by a lamp or LED module of another type</b>		<b>N/A</b>
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
<b>7.4</b>	<b>Special cases (II): Arrays and clusters of primary light sources</b>		<b>N/A</b>
	LED package is evaluated as ..... : <input type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited		N/A
	$E_{thr}$ of LED package applies to array		N/A
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		<b>P</b>
	Risk group achieved:		P
	- ..Risk Group 0 unlimited		N/A
	- ..Risk Group 1 unlimited		N/A
	- $E_{thr}$ ..... (lx) : - Distance to reach RG1..... (mm) ::	Refer to the Supplementary information of <b>TABLE:Spectroradiometric measurement</b> as following	P



IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE:Spectroradiometric measurement				
Measurement performed on:		<input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire		
Model number.....		L150-44705024SCP00		
Test voltage (V) .....		27 Vdc		—
Test current (mA) .....		240 mA		—
Test frequency (Hz).....		--		—
Ambient, t(°C) .....		25°C		—
Measurement distance.....		<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		—
Source size .....		<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small :		—
Field of view .....		<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		—
Item	Symb ol	Units	Result	Remark
Correlated colour temperature	CCT	K	4544	
x/y colour coordinates			0,3669/ 0,4076	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	1,70E+04	@11mrad
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	--	
Luminance	L	cd/m <sup>2</sup>	2,82E+07	@11mrad
Illuminance	E	lx	8,23E+03	
Supplementary information: Per IEC/TR 62778:2014 E <sub>thr</sub> =1655 lx D <sub>min</sub> = 446 mm				

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

	<b>TABLE: Angular light distribution</b>	<b>N/A</b>

**List of test equipment used:**

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to CTF stage 1 or CTF stage 2 procedure has been used.

Note: This page may be removed when CTF stage 1 CTF stage 2 are not used. See also clause 4.8 in OD 2020 for more details.

Clause	Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Last Calibration date	Calibration due date
7	Irradiance measurements Radiance measurements	IDR 300 Monochromator (SH 344)	200-3000nm	/	/
7	Radiance measurements	S009 Telescope (SH 345)	300-1400nm	/	/
7	Radiance measurements	SRS 12 Radiance Standard (SH 348)	300-1400nm	2016/3/22	2017/3/22
7	Irradiance measurements	CL6 Spectral irradiance standard (SH 350)	300-3000nm	2016/3/22	2017/3/22
7	Irradiance measurements	CL7 Spectral irradiance standard (SH 351)	200-400nm	2016/3/22	2017/3/22
7	Irradiance measurements	Photometric detector head (SH 359)	380nm-800nm	2016/3/22	2017/3/22
7	Irradiance measurements Radiance measurements	Wattmeter (SH070)	500V,40A	2015/10/16	2016/10/16

Appendix 1: Photo Documentation



Overview (tested)

Appendix 2: Model List:

L150-44705024SCP00, with ANSI bin 4360K, is part of the LUXEON 5050 product family. The sample measured, L150-44705024SCP00 has the highest typical flux density (lumens per mm<sup>2</sup> of light emitting surface (LES) area), highest typical device luminance level and highest CCT within the listed LUXEON 5050 product family. The present classification is thus valid (worst case) for all LUXEON 5050 with part number L 1 5 0 - A A B B 5 0 2 4 C C C 0 0 where AA represents nominal ANSI CCT bins could be equal to 4360K or lower, BB represents CRI could be from 68 to 90 (see TR IEC62778). See the appendix below for an explanation of the type designation.

L 1 5 0 - **A A B B** 5 0 2 4 **C C C** 0 0

Where:

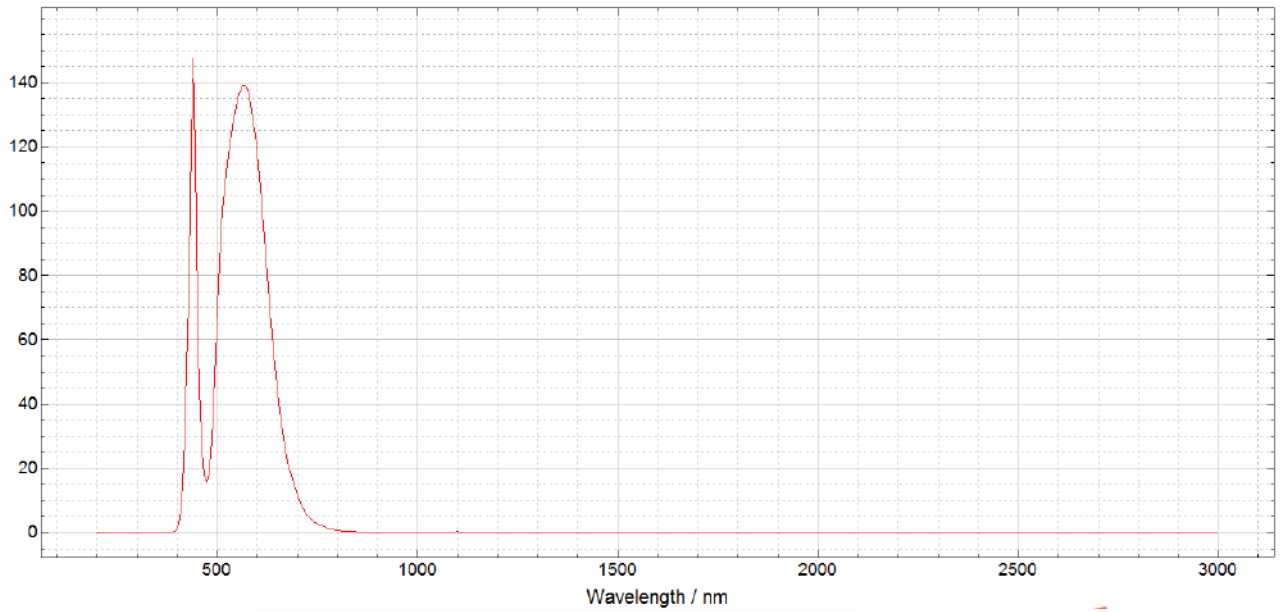
**AA** - designates nominal ANSI CCT

**BB** - designates minimum CRI

**CCC** - designates standard color point or customized one

Part number	CRI	CCT	typical flux (lm)	LES (mm <sup>2</sup> )	flux density	Max voltage	max current
L150-26705024SCP00	≥68	2600K	590	16.3	36	27	240
L150-33705024SCP00	≥68	3340K	625	16.3	38	27	240
L150-40705024SCP00	≥68	4000K	655	16.3	40	27	240
L150-44705024SCP00	≥68	4360K	655	16.3	40	27	240

Appendix 3: Relative Spectrum Of Tested Sample(s)



Appendix 4: Table 6.1 Based On IEC 62471:2006

DUT: L150-44705024SCP00, Evaluation Distance: 200mm, Test current: 240mA, Angular subtense of the apparent source  $\alpha$ : 25mrad

IEC 62471									
Clause	Requirement + Test				Result – Remark				Verdict
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps								P
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	0,0000	0,003		0,03	
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	0,0000	33		100	
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	5,08E+02	10000	1,70E+04	4000000	1,80E+04
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	--	1,0		400	
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ $\alpha$	2,23E+05	28000/ $\alpha$		71000/ $\alpha$	
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	6000/ $\alpha$	--	6000/ $\alpha$		6000/ $\alpha$	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0,04	570		3200	
* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian.									
** Involves evaluation of non-GLS source									

Appendix 5: Table 6.1 Based On EN62471:2008, Attachment To IEC 62471 European Group Differences And National Differences

DUT: L150-44705024SCP00, Evaluation Distance: 200mm, Test current: 240mA, Angular subtense of the apparent source  $\alpha$ : 25mrad

EN 62471										
Clause	Requirement + Test			Result – Remark				Verdict		
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)								P	
Risk	Action spectrum	Symbol	Units	Emission Measurement						
				Exempt		Low risk		Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	0,0000	--	--	--	--	
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	0,0000	--	--	--	--	
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	5,08E+02	10000	1,70E+04	4000000	1,80E+04	
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	--	1,0		400		
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ $\alpha$	2,23E+05	28000/ $\alpha$		71000/ $\alpha$		
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 0,0017 $\leq \alpha \leq$ 0,011	--					
				6000/ $\alpha$ 0,011 $\leq \alpha \leq$ 0,1	--					
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0,04	570		3200		
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2  The applicable aperture diameters: see 4.2.1  The limitations for the angular subtenses: see 4.2.2  The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p>										





Report No.: SHES170800829571  
Date of issue: 2017-08-28

## TEST REPORT

Product .....: LED ROAD LIGHTING

Product/Item No.....: MILAN XL, MILAN M, MILAN S, CORBA, AVENUE M, AVENUE XL, ESKADE, AGIL XL, AGIL, AGIL S

Applicant.....: NOVATILU, S.L.U

Address .....: Via Ausetania, 11-13 08560 Manlleu Barcelona Spain

Manufacturer's Name .....: Same as applicant

Address .....: Same as applicant

Factory's Name .....: Same as applicant

Address .....: Same as applicant

Testing Laboratory.....: SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Address .....: 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Number of Samples received ...: 10

Date of samples reception.....: 2017-03-01

Date Test Conducted.....: 2017-03-01 to 2017-03-09

Test Requested .....: IK10

Test Method (standards) .....: IEC 62262:2002

Test result.....: PASS

**CONCLUSION** .....: The submitted sample **complied** with IK10 Test



Tested by:

Lisa Li  
Lisa Li

Reviewed by:

Henry HU  
Henry HU

## TEST RESULTS

**Standards used** Clause 5 of IEC 62262:2002

<u>Sample</u>	<u>Requirement + Test</u>	<u>Result – Remark</u>	<u>Verdict</u>
MILAN XL	<b>IK10 Test</b>	--	<b>Pass</b>
MILAN M	<b>IK10 Test</b>	--	<b>Pass</b>
MILAN S	<b>IK10 Test</b>	--	<b>Pass</b>
CORBA	<b>IK10 Test</b>	--	<b>Pass</b>
AVENUE M	<b>IK10 Test</b>	--	<b>Pass</b>
AVENUE XL	<b>IK10 Test</b>	--	<b>Pass</b>
ESKADE	<b>IK10 Test</b>	--	<b>Pass</b>
AGIL XL	<b>IK10 Test</b>	--	<b>Pass</b>
AGIL	<b>IK10 Test</b>	--	<b>Pass</b>
AGIL S	<b>IK10 Test</b>	--	<b>Pass</b>

### TEST PREPARATION:

There are 10 models covered in this report.

The sample shall be mounted on a rigid support.

### TEST CONDITION:

1. Impact energy 20 J
2. The number of impacts shall be five on each exposed face.

### OBSERVATIONS:

There was no obvious damage on the enclosure.

**Overview of the sample**  
Model MILAN XL



Model MILAN XL



Model MILAN M



Model MILAN M



Model MILAN S



Model MILAN S



Model CORBA



Model CORBA



Model AVENUE M



Model AVENUE M



Model AVENUE XL



Model AVENUE XL

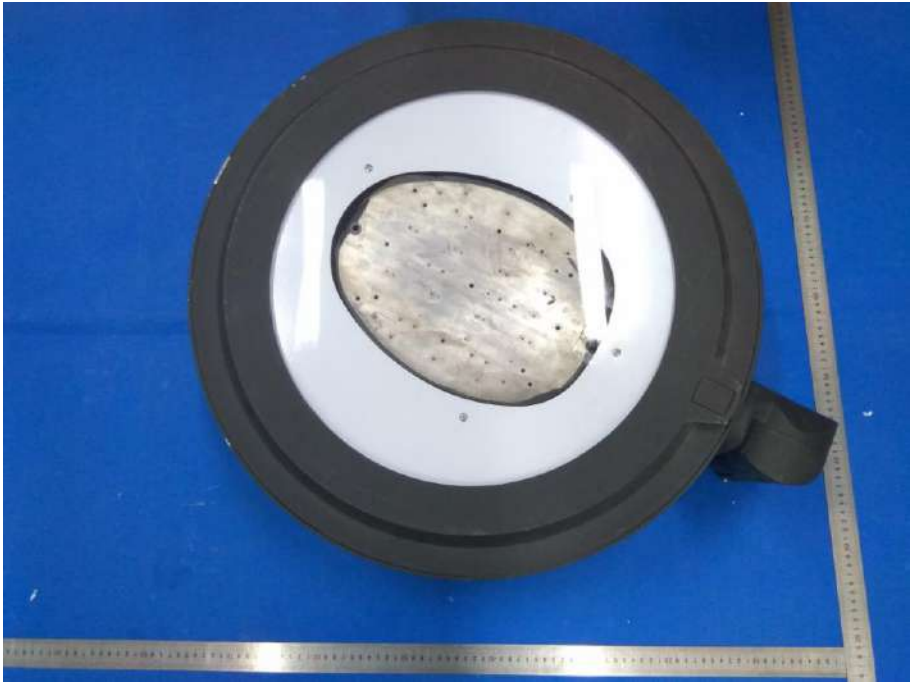


This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product.

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Model ESKADE



Model ESKADE



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product.

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Model AGIL XL



Model AGIL XL



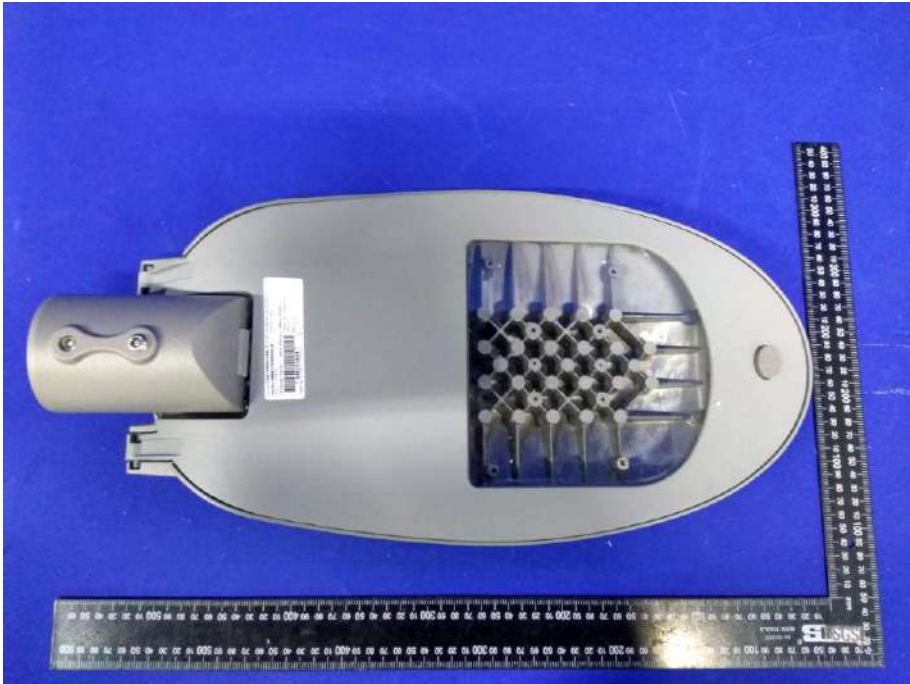
Model AGIL



Model AGIL



Model AGIL S



Model AGIL S



— End of Report —

### 2.3 Compatibilidad Electromagnética

- UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2 Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16 A por fase)
- UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.
- UNE-EN 61547. Equipos para alumbrado

## ***VERIFICATION OF COMPLIANCE***

Verification No.: SHEM210200145801LMC  
Applicant: NOVATILU,S.L.  
Address of Applicant: Schlüterstr. Via Ausetania, 11-13 08560 MANLLEU Barcelona Spain  
Product Description: LED STREET LIGHTING  
Model No.: ALMXXLL350D, ALMXXLL300D, ALMXXLL240D, ALMXXLL240D1, ALMXXLL200D, ALMXXLL350, ALMXXLL300, ALMXXLL240, ALMXXLL240A, ALMXXLL200, ALFUL240, ALFUL200, ALFUL200-72, ALFUL150, ALFUM150, ALFUM120, ALFUM100, ALFUM80, ALFUS60, ALFUS40, ALFUS25, ALFUS2530, ALFUS5030, ALQXL240, ALQL200, ALQL150, ALQM100, ALQM80, ALQS60, ALJM40, ALJM60, ALJM80, ALJM100, ALJM8030, ALJS40, ALJS60, ALJS80, ALMSL60, ALMSL40, ALMSL30, ALHM720, ALHM660, ALHM600

Sufficient samples of the product have been tested and found to be in conformity with

Test Standards: EN IEC 55015:2019  
EN IEC 61000-3-2:2019  
EN 61000-3-3:2013+A1:2019  
EN 61547:2009

As shown in the

Test Report Number(s): SHEM210200145801

This verification of EMC Compliance has been granted to the applicant based on the results of the tests, performed by laboratory of SGS-CSTC Standards Technical Services Co., Ltd. on the sample of the above-mentioned product in accordance with the provisions of the relevant specific standards under Directive 2014/30/EU. The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.

*Parlam Zhan*

Parlam Zhan  
E&E Section Manager



Date: 2021-02-25

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# TEST REPORT

**Application No.:** SHEM2102001458LM  
**Applicant:** NOVATILU,S.L.  
**Address of Applicant:** Schlüterstr. Via Ausetania, 11-13 08560 MANLLEU Barcelona Spain  
**Manufacturer:** Ningbo King-Bridge Lighting Technology Co., Ltd.  
**Address of Manufacturer:** 8, Xingfu Road, Xinqiao Industry Zone, Yangming Street, Yuyao, 315400 Zhejiang Province, China  
**Factory:** Ningbo King-Bridge Lighting Technology Co., Ltd.  
**Address of Factory:** 8, Xingfu Road, Xinqiao Industry Zone, Yangming Street, Yuyao, 315400 Zhejiang Province, China

**Equipment Under Test (EUT):**

**EUT Name:** LED STREET LIGHTING

**Model No.:** ALMXXLL350D, ALMXXLL300D, ALMXXLL240D, ALMXXLL240D1, ALMXXLL200D, ALMXXLL350, ALMXXLL300, ALMXXLL240, ALMXXLL240A, ALMXXLL200, ALFUL240, ALFUL200, ALFUL200-72, ALFUL150, ALFUM150, ALFUM120, ALFUM100, ALFUM80, ALFUS60, ALFUS40, ALFUS25, ALFUS2530, ALFUS5030, ALQXL240, ALQL200, ALQL150, ALQM100, ALQM80, ALQS60, ALJM40, ALJM60, ALJM80, ALJM100, ALJM8030, ALJS40, ALJS60, ALJS80, ALMSL60, ALMSL40, ALMSL30, ALHM720, ALHM660, ALHM600

☐ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

**Trade Mark:** **BENITO NOVATILU**

**Standard(s) :** EN IEC 55015:2019, EN IEC 61000-3-2:2019  
EN 61000-3-3:2013+A1:2019, EN 61547:2009

**Date of Receipt:** 2020-10-22

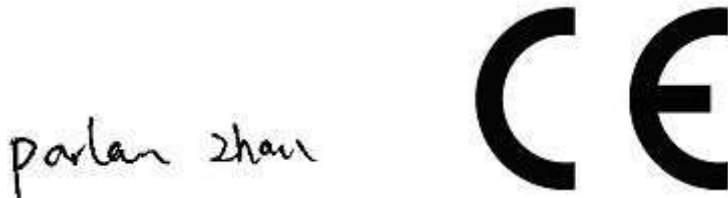
**Date of Test:** 2020-10-28

**Date of Issue:** 2021-02-25

<b>Test Result:</b>	<b>Pass*</b>
---------------------	--------------

\* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.



Parlan Zhan  
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

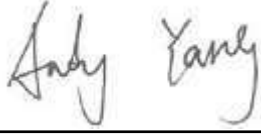



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Revision Record			
Version	Description	Date	Remark
00	Co-license	2021-02-25	Base on SHEM201000886501

Authorized for issue by:			
			
		<b>Andy Yang /Project Engineer</b>	
			
		<b>Bruce Tang /Reviewer</b>	



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## 2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (9kHz-30MHz)	EN IEC 55015:2019	EN IEC 55015:2019	N/A	Pass
Radiated Emissions (30MHz-1000MHz)	EN IEC 55015:2019	CISPR 32:2015	N/A	Pass
Radiated Emissions (Magnetic field Induced Current) (9kHz-30MHz)	EN IEC 55015:2019	EN IEC 55015:2019	N/A	Pass
Harmonic Current Emission	EN IEC 61000-3-2:2019	EN IEC 61000-3-2:2019	Class C	Pass
Voltage Fluctuations and Flicker	EN 61000-3-3:2013+A1:2019	EN 61000-3-3:2013+A1:2019	Clause 5 of EN 61000-3-3	Pass

N/A: Not applicable

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN 61547:2009	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Radiated Immunity (80MHz-1GHz)	EN 61547:2009	EN 61000-4-3:2006 +A1:2008+A2:2010	3V/m, 80%, 1kHz Amp. Mod.	Pass
Electrical Fast Transients/Burst at Power Port	EN 61547:2009	EN 61000-4-4:2012	1kV 5/50ns Tr/Td 5kHz Repetition Frequency	Pass
Surge at Power Port	EN 61547:2009	EN 61000-4-5:2014 +A1:2017	1kV Line to Line 2kV Line to Ground	Pass
Conducted Immunity at Power Port (150kHz-80MHz)	EN 61547:2009	EN 61000-4-6:2014	3Vrms (emf),80%,1kHz Amp. Mod.	Pass
Voltage Dips and Interruptions	EN 61547:2009	EN 61000-4-11:2004 +A1:2017	0 % UT for 0.5per 70 % UT for 10per UT is Supply Voltage	Pass

N/A: Not applicable



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**Note1: Declaration of EUT Family Grouping:**

There are series models mentioned in this report and they are the similar in electrical and electronic characters. Only the model ALQXL240 was tested since their differences are model number, trade mark and appearance.

Note2: This report was an additional report copied from the report SHEM201000886501, just changing the model name, applicant and trade mark. Since the electrical circuit design, layout, components used and internal wiring for the model ALMXXLL350D, ALMXXLL300D, ALMXXLL240D, ALMXXLL240D1, ALMXXLL200D, ALMXXLL350, ALMXXLL300, ALMXXLL240, ALMXXLL240A, ALMXXLL200, ALFUL240, ALFUL200, ALFUL200-72, ALFUL150, ALFUM150, ALFUM120, ALFUM100, ALFUM80, ALFUS60, ALFUS40, ALFUS25, ALFUS2530, ALFUS5030, ALQXL240, ALQL200, ALQL150, ALQM100, ALQM80, ALQS60, ALJM40, ALJM60, ALJM80, ALJM100, ALJM8030, ALJS40, ALJS60, ALJS80, ALMSL60, ALMSL40, ALMSL30, ALHM720, ALHM660, ALHM600 in this report was exactly the same as the model D-211LED240-4MD in the report SHEM201000886501.



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## 4 General Information

### 4.1 Details of E.U.T.

Power supply: AC 220-240V, 50/60 Hz  
 Test Voltage: AC 230V, 50Hz  
 Cable: AC cable 1.5m

### 4.2 Description of Support Units

The EUT has been tested as an independent unit.

### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Emission at mains port using AMN	2.6dB (9kHz to 150kHz)
		2.4dB (150kHz to 30MHz)
2	Conducted Emission at mains port using VP	1.8dB (9kHz to 30MHz)
3	Conducted Emission at telecommunication port using AAN	4.2dB (150kHz to 30MHz)
4	Radiated Power	3.2dB
5	Radiated emission	4.5dB (30MHz-1GHz)
		5.1dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)
6	Radiated disturbance (disturbance current in a LLAS)	2.4dB (9kHz to 30MHz)

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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#### 4.4 Test Location

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

Sub-contracted at:

Ningbo Joysun Product Testing Service Co., Ltd.

No. 66, Qingyi Road, Hi-Tech Distric, Ningbo, Zhejiang, China

#### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **NVLAP (LAB CODE: 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

- **FCC (Designation Number: CN5033)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None

#### 4.8 Monitoring of EUT for All Immunity Test

Visual: Monitor the lamp lighting.



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## 5 Equipment List

### CE

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
EMI receiver	ESCI	100708	R&S	2021/2/23
Artificial mains network	ENV216	101022	R&S	2021/2/23
Artificial mains network	ESH2-Z5	100198	R&S	2021/2/23
Pulse Limiter	ESH3-Z2	100847	R&S	2021/2/23
Control Room2	(11.2*5.2*3.3)	N/A	Albatross	2021/3/2

### RE

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
EMI receiver	ESU26	100224	R&S	2021/2/23
Combined antenna	VULB 9163	9163-563	SCHWARZBECK	2021/2/23
Horn antenna	HF907	100147	R&S	2021/2/23
Preamplifier	SCU18	10042	R&S	2021/2/23
Semi -Anechoic Chamber	3M (9.1*5.8*5.7)	N/A	Albatross	2021/10/8
EMI receiver	ESR 7	101203	R&S	2021/2/23
Combined antenna	VULB 9163	9163-560	SCHWARZBECK	2021/2/23
Semi -Anechoic Chamber	5M (12.1*7.3*6)	N/A	Albatross	2021/3/2

### RE Loop

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
EMI receiver	ESCI	101213	R&S	2021/2/23
Three ring antenna	SWB-HXYZ9170	175	SCHWARZBECK	2021/2/23
Shielding Room1	(10*6.1*3.3)	N/A	Albatross	2021/3/2

### Harmonic & Voltage Fluctuations and Flicker

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Harmonic and flicker test system	DPA500	V0746103124	EM TEST	2021/2/23
AC Power Source	500lix-400-413	58311	CI	2021/2/23
Shielding Room1	(10*6.1*3.3)	N/A	Albatross	2021/3/2
Harmonic and flicker test system(3phase)	DPA503	V0828104013	EM TEST	2021/2/23
AC Power Source	61705	617050000124	Chroma	2021/2/23
Shielding Room2	(10*4.9*3.0)	N/A	Albatross	2021/3/2

### ESD

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
ESD gun	ditto	DITO B07040	EM TEST	2021/2/23

### EFT

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Surge, Burst and Dip test	UCS500-M6B	V0746103125	EM TEST	2021/2/23



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system				
booster	MV2616	V0746103126	EM TEST	2021/2/23
Coupling clamp	HFK	0108-27	EM TEST	2021/2/23
Shielding Room2	(10*4.9*3.0)	N/A	Albatross	2021/3/2

Surge

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Surge, Burst and Dip test system	UCS500-M6B	V0746103125	EM TEST	2021/2/23
booster	MV2616	V0746103126	EM TEST	2021/2/23
Shielding Room2	(10*4.9*3.0)	N/A	Albatross	2021/3/2

CI

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Attenuator	75-A-FFN-06	141733	BIRD	2021/2/23
CDN for Two/There Supply Main Line	FCC-801-M2/M3-16A	7079	FISCHER	2021/2/23
CDN for Two/There Supply Main Line	CDN-M2+3	A2210412/2016	Frankonia	2021/2/23
Coupling/Decoupling Network	DC2600M2	327429	AR	2021/2/23
Decoupling network	F-203I-23MM-DCN	8225	FISCHER	2021/2/23
EM injection clamp	F-203I-23MM	8562	FISCHER	2021/2/23
POWER AMPLIFIER	75A250A	327549	AR	2021/2/23
Integrated measurement system	IMS	100012	R&S	2021/2/23
Smart sensor technology	NRP-Z91	100520	R&S	2021/2/23
Control Room1	(11.2*5.2*3.3)	N/A	Albatross	2021/3/2
Conduct Immunity Test System	CIT-10-75	126B1413/2016	Frankonia	2021/2/23
Shielding Room2	(10*4.9*3.0)	N/A	Albatross	2021/3/2

Dips

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Surge, Burst and Dip test system	UCS500-M6B	V0746103125	EM TEST	2021/2/23
booster	MV2616	V0746103126	EM TEST	2021/2/23
Shielding Room2	(10*4.9*3.0)	N/A	Albatross	2021/3/2



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RI

Equipment	Model No	Inventory No	Manufacturer	Cal Due Date
Semi -Anechoic Chamber	3M (9.1*5.8*5.7)	N/A	Albatross	2021/10/8
LOGPERIODIC ANTENNA	AT1080	325189	AR	2021/2/23
Horn antenna	AT4002A	328236	AR	2021/2/23
Coupling/Decoupling Network	DC6180M1	328058	AR	2021/2/23
Coupling/Decoupling Network	DC7144M1	327100	AR	2021/2/23
POWER AMPLIFIER	250W1000A	327579	AR	2021/2/23
POWER AMPLIFIER	80S1G3	327495	AR	2021/2/23
Integrated measurement system	IMS	100012	R&S	2021/2/23
Smart sensor technology	NRP-Z91	100520	R&S	2021/2/23



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## 6 Emission Test Results

### 6.1 Conducted Emissions at Mains Terminals (9kHz-30MHz)

Test Requirement:	EN IEC 55015:2019
Test Method:	EN IEC 55015:2019
Frequency Range:	9kHz to 30MHz
Limit:	
0.009MHz – 0.05MHz	110dB(μV) quasi-peak
0.05MHz – 0.15MHz	90dB(μV)-80dB(μV) quasi-peak
0.15MHz – 0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5MHz – 5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5MHz – 30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (200Hz resolution bandwidth) 0.009M to 0.15MHz Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

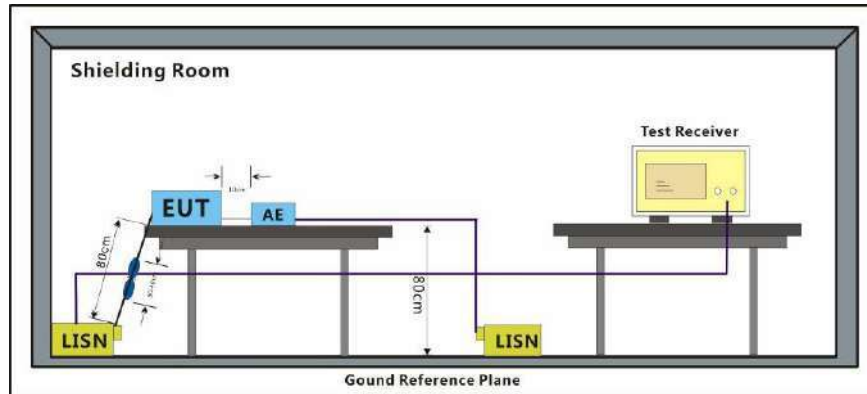
#### 6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a: Lighting mode: Keep EUT lighting continuously.

#### 6.1.2 Test Setup Diagram



#### 6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

Notes: Emission Level=Read Level + LISN Factor + Cable Loss



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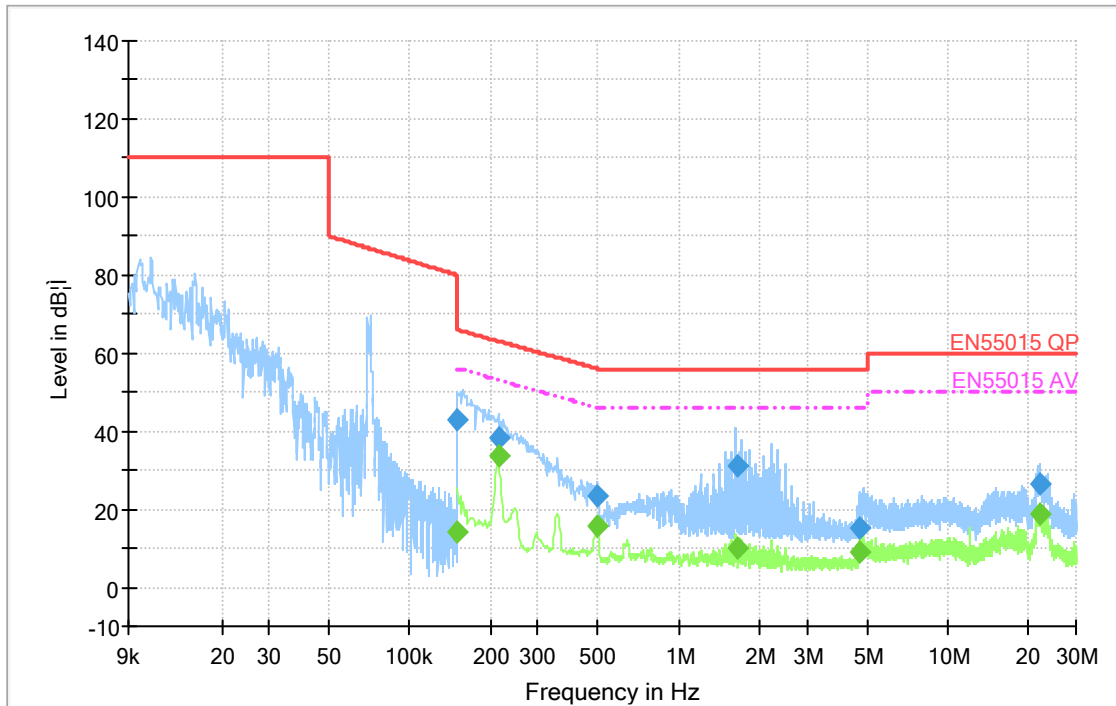
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Mode:a; Line:Live Line

9K-30M-Voltage with 2-Line-LISN-sgs1



### Final Result 1

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.150000	43.0	1000.0	9.000	Off	L1	10.8	22.9	65.9	
0.214000	38.4	1000.0	9.000	Off	L1	10.8	24.6	63.0	
0.494000	23.3	1000.0	9.000	Off	L1	10.8	32.8	56.1	
1.648000	30.9	1000.0	9.000	Off	L1	10.7	25.1	56.0	
4.714000	15.2	1000.0	9.000	Off	L1	10.8	40.8	56.0	
22.000000	26.3	1000.0	9.000	Off	L1	10.9	33.7	60.0	

### Final Result 2

Frequency (MHz)	CAverage (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)	Comment
0.150000	14.1	1000.0	9.000	Off	L1	10.8	41.9	56.0	
0.214000	33.9	1000.0	9.000	Off	L1	10.8	19.1	53.0	
0.494000	15.9	1000.0	9.000	Off	L1	10.8	30.1	46.1	
1.648000	9.9	1000.0	9.000	Off	L1	10.7	36.1	46.0	
4.714000	9.1	1000.0	9.000	Off	L1	10.8	36.9	46.0	
22.000000	18.6	1000.0	9.000	Off	L1	10.9	31.4	50.0	



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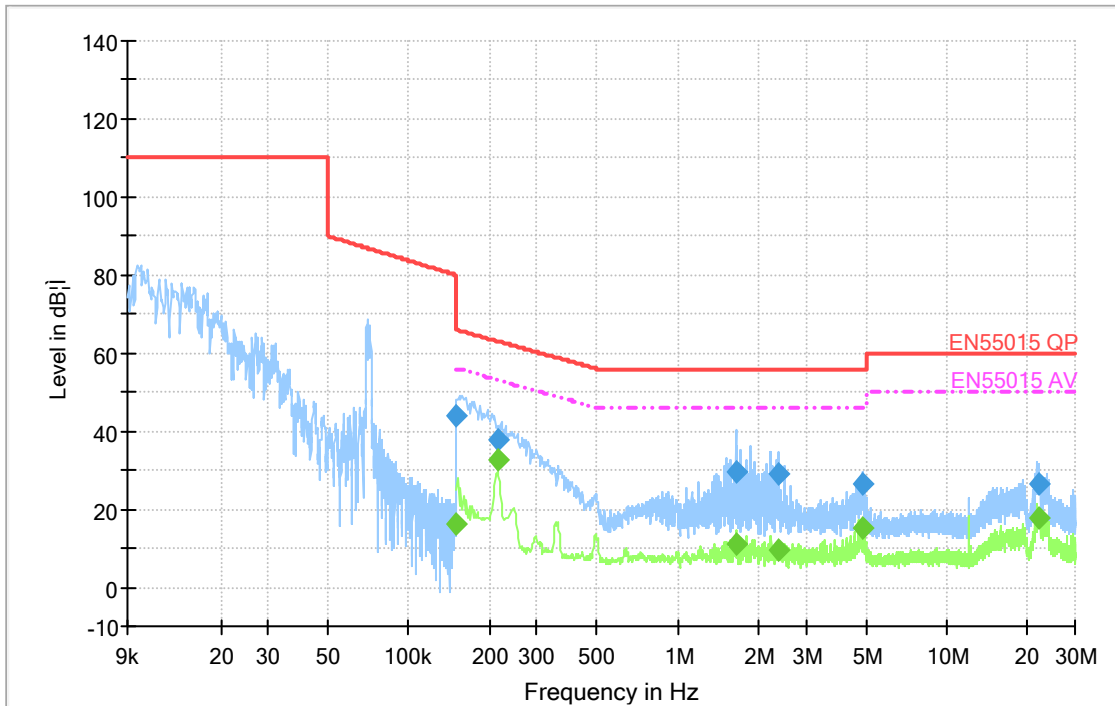
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Mode:a; Line:Neutral Line

9K-30M-Voltage with 2-Line-LISN-sgs1



### Final Result 1

Frequency (MHz)	QuasiPeak (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.150000	44.0	1000.0	9.000	Off	N	10.7	21.9	65.9	
0.214000	37.6	1000.0	9.000	Off	N	10.7	26.3	63.9	
1.655000	29.4	1000.0	9.000	Off	N	10.7	26.6	56.0	
2.360000	29.0	1000.0	9.000	Off	N	10.8	27.0	56.0	
4.854000	26.3	1000.0	9.000	Off	N	10.8	29.7	56.0	
21.940000	26.3	1000.0	9.000	Off	N	11.1	33.7	60.0	

### Final Result 2

Frequency (MHz)	CAverage (dB µ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)	Comment
0.150000	16.3	1000.0	9.000	Off	N	10.8	39.7	56.0	
0.214000	32.6	1000.0	9.000	Off	N	10.8	20.4	53.0	
1.655000	11.0	1000.0	9.000	Off	N	10.7	35.0	46.0	
2.360000	9.7	1000.0	9.000	Off	N	10.8	36.3	46.0	
4.854000	15.0	1000.0	9.000	Off	N	10.8	31.0	46.0	
21.940000	17.7	1000.0	9.000	Off	N	11.1	32.3	50.0	



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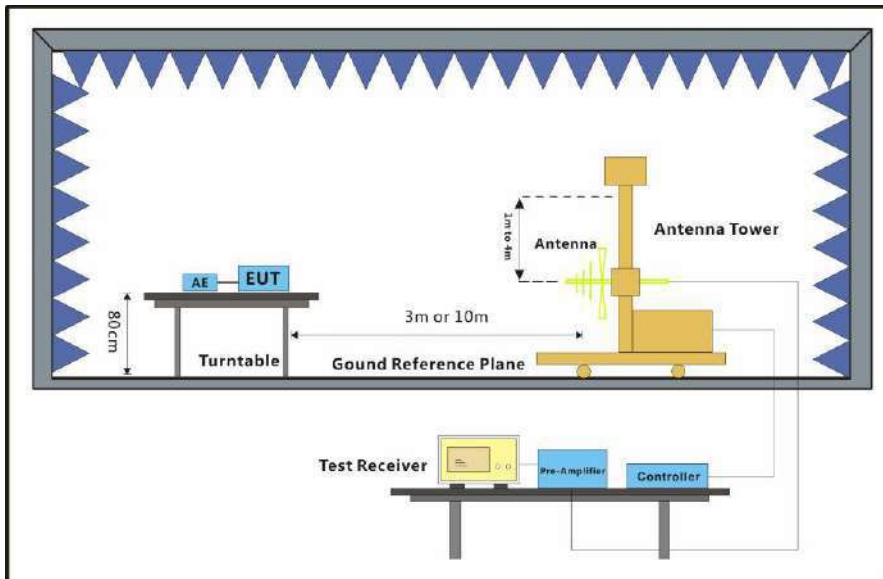
## 6.2 Radiated Emissions (30MHz-1000MHz)

Test Requirement: EN IEC 55015:2019  
 Test Method: CISPR 32:2015  
 Frequency Range: 30MHz to 1000MHz  
 Measurement Distance: 3m  
 Limit:  
 30MHz-230MHz 40dB(μV/m) quasi-peak  
 230MHz-1000MHz 47dB(μV/m) quasi-peak  
 Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

### 6.2.1 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode a: Lighting mode: Keep EUT lighting continuously.

### 6.2.2 Test Setup Diagram



### 6.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Notes: Emission Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor



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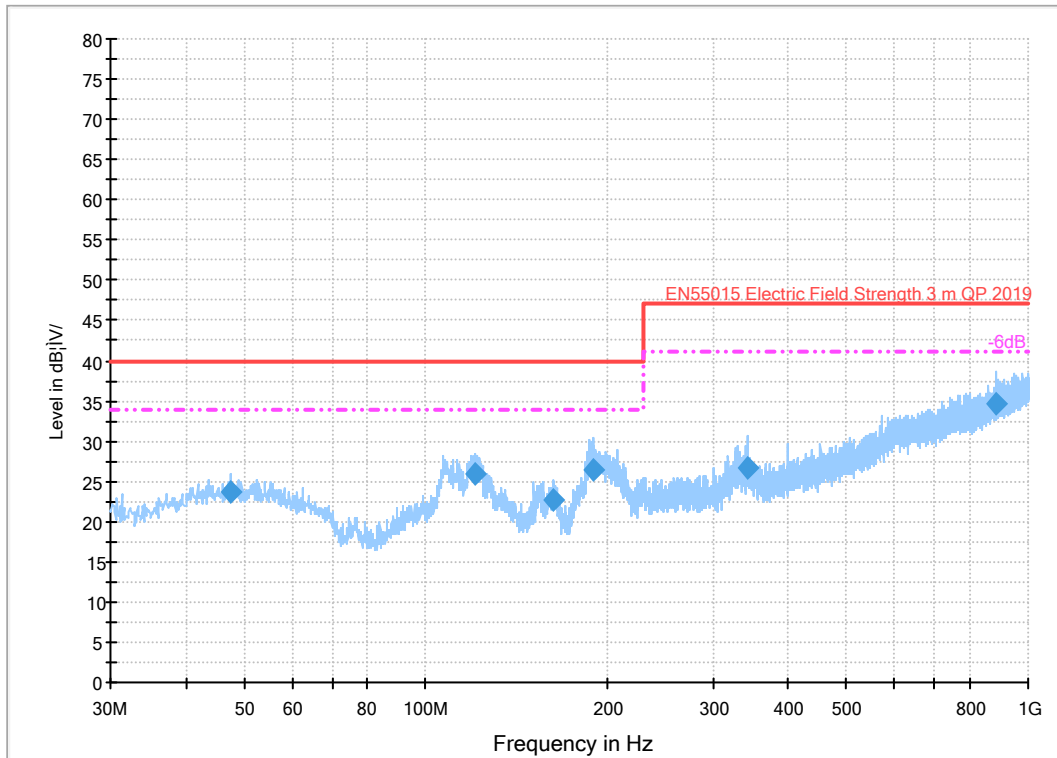
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Mode:a; Polarization:Horizontal

Radiated EMI Auto Test (30-1000MHz)-SGS-1



### Final Result 1

Frequency (MHz)	QuasiPeak (dB μV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)
47.557000	23.7	1000.0	120.000	175	H	195.0	15.5	16.3
121.180000	25.8	1000.0	120.000	142	H	146.0	11.6	14.2
163.472000	22.7	1000.0	120.000	173	H	133.0	10.6	17.3
189.371000	26.4	1000.0	120.000	131	H	0.0	12.3	13.6
342.340000	26.6	1000.0	120.000	117	H	146.0	16.7	20.4
884.958000	34.7	1000.0	120.000	184	H	255.0	25.0	12.3

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dB μ)	Comment
47.557000	40.0	
121.180000	40.0	
163.472000	40.0	
189.371000	40.0	
342.340000	47.0	
884.958000	47.0	



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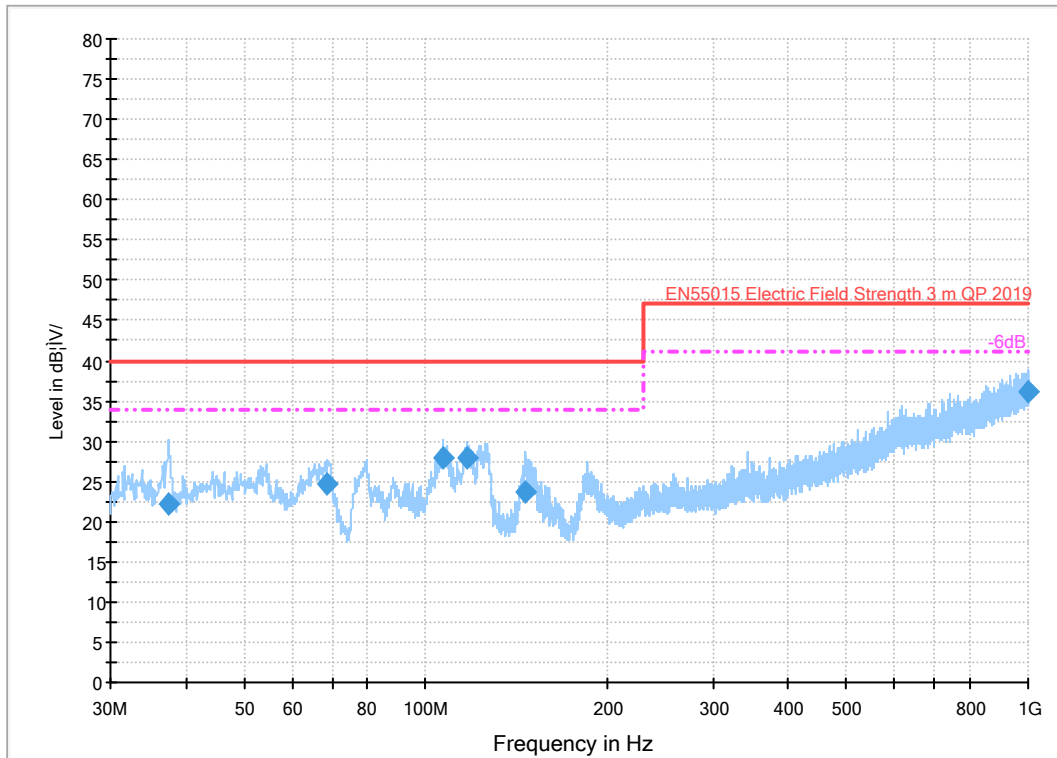
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Mode:a; Polarization:Vertical

Radiated EMI Auto Test (30-1000MHz)-SGS-1



### Final Result 1

Frequency (MHz)	QuasiPeak (dB μV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)
37.469000	22.1	1000.0	120.000	135	V	187.0	13.8	17.9
68.800000	24.7	1000.0	120.000	148	V	158.0	11.8	15.3
106.824000	27.9	1000.0	120.000	147	V	72.0	13.7	12.1
117.397000	27.8	1000.0	120.000	177	V	84.0	12.3	12.2
146.497000	23.7	1000.0	120.000	139	V	72.0	9.9	16.3
998.448000	36.1	1000.0	120.000	199	V	199.0	26.0	10.9

(continuation of the "Final Result 1" table from column 9 ...)

Frequency (MHz)	Limit (dB μ)	Comment
37.469000	40.0	
68.800000	40.0	
106.824000	40.0	
117.397000	40.0	
146.497000	40.0	
998.448000	47.0	



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### 6.3 Radiated Emissions (Magnetic field Induced Current) (9kHz-30MHz)

Test Requirement:	EN IEC 55015:2019
Test Method:	EN IEC 55015:2019
Frequency Range:	9kHz to 30MHz
Limit:	
0.009MHz-0.07MHz	88dB(μA) quasi-peak
0.07MHz-0.15MHz	88dB(μA)-58dB(μA) quasi-peak
0.15MHz-3MHz	58dB(μA)-22dB(μA) quasi-peak
3MHz-30MHz	22dB(μA) quasi-peak
Detector:	Peak for pre-scan (200Hz resolution bandwidth) 0.009M to 0.15MHz
	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

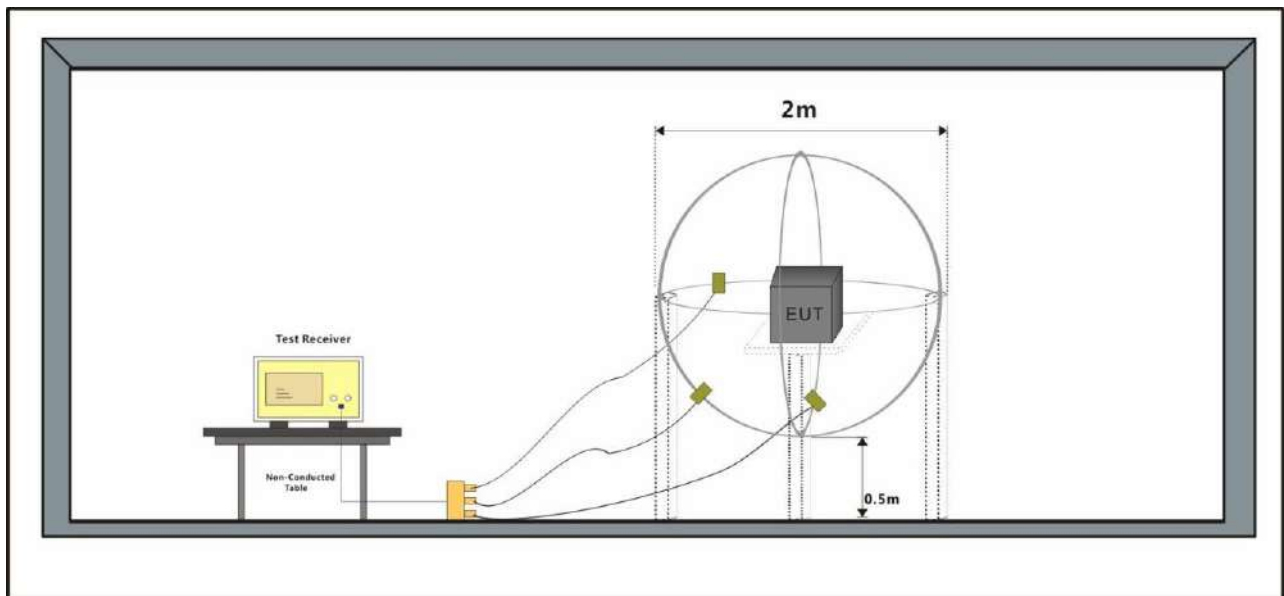
#### 6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

Test mode a: Lighting mode: Keep EUT lighting continuously.

#### 6.3.2 Test Setup Diagram



#### 6.3.3 Measurement Data

An initial pre-scan was performed in the 2m loop antenna using the spectrum analyser in peak detection mode. The EUT was measured for X(A), Y(B), Z(C) polarities.

Notes: Emission Level=Read Level + Cable Loss



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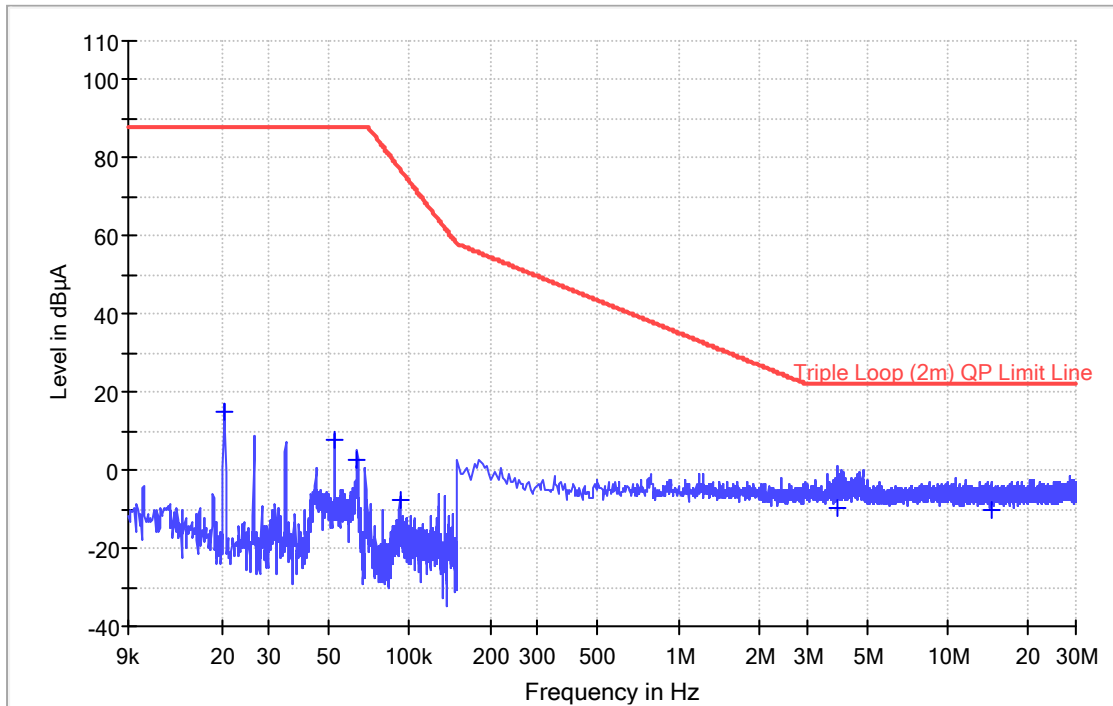
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Mode:a; Axial:X

Triple Loop pre-enc



### Limit and Margin-X

Frequency (MHz)	QuasiPeak (dB 礎)	Meas. Time (ms)	Bandwidth (kHz)	Triple Loop frame	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB 礎)	Comment
0.020520	14.8	1000.0	0.200	X	0.0	73.2	88.0	
0.052840	7.5	1000.0	0.200	X	0.0	80.5	88.0	
0.064120	2.8	1000.0	0.200	X	0.0	85.2	88.0	
0.092040	-7.5	1000.0	0.200	X	0.0	84.7	77.2	
3.930000	-9.7	1000.0	9.000	X	0.1	31.7	22.0	
14.494000	-10.4	1000.0	9.000	X	0.3	32.4	22.0	



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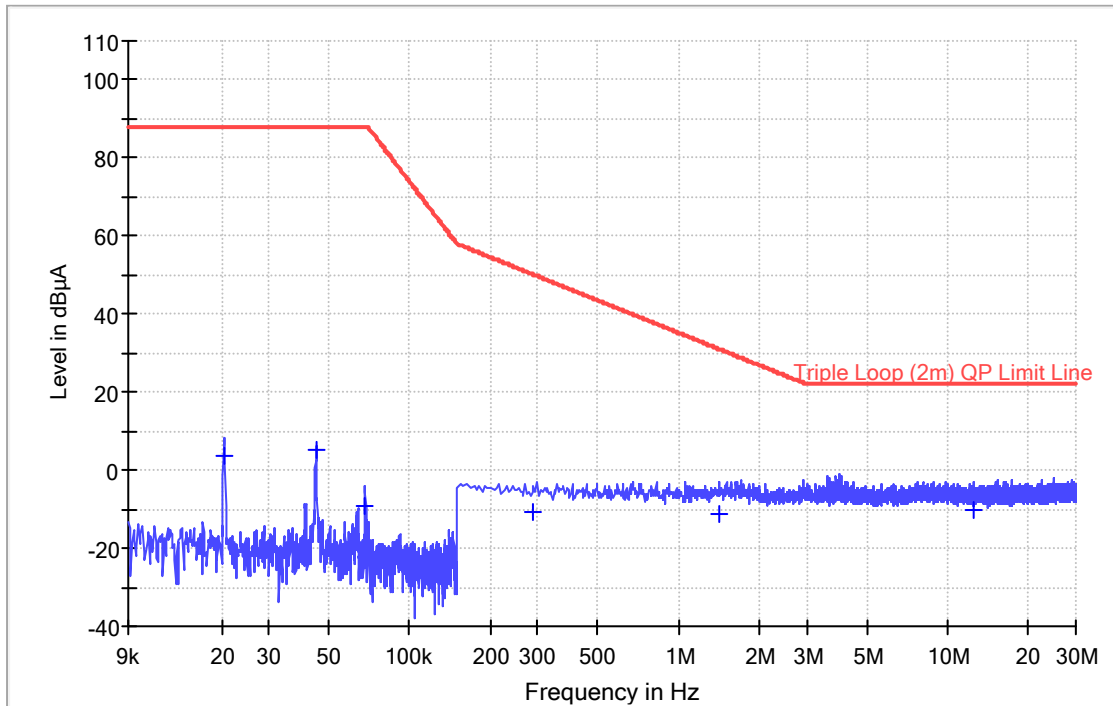
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Mode:a; Axial:Y

Triple Loop pre-enc



### Limit and Margin-Y

Frequency (MHz)	QuasiPeak (dB 礎)	Meas. Time (ms)	Bandwidth (kHz)	Triple Loop frame	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dB 礎)	Comment
0.020520	3.8	1000.0	0.200	Y	0.0	84.2	88.0	
0.045000	5.2	1000.0	0.200	Y	0.0	82.8	88.0	
0.068600	-9.0	1000.0	0.200	Y	0.0	97.0	88.0	
0.290000	-10.7	1000.0	9.000	Y	0.0	60.8	50.1	
1.410000	-11.3	1000.0	9.000	Y	0.1	42.3	31.1	
12.478000	-10.2	1000.0	9.000	Y	0.2	32.2	22.0	



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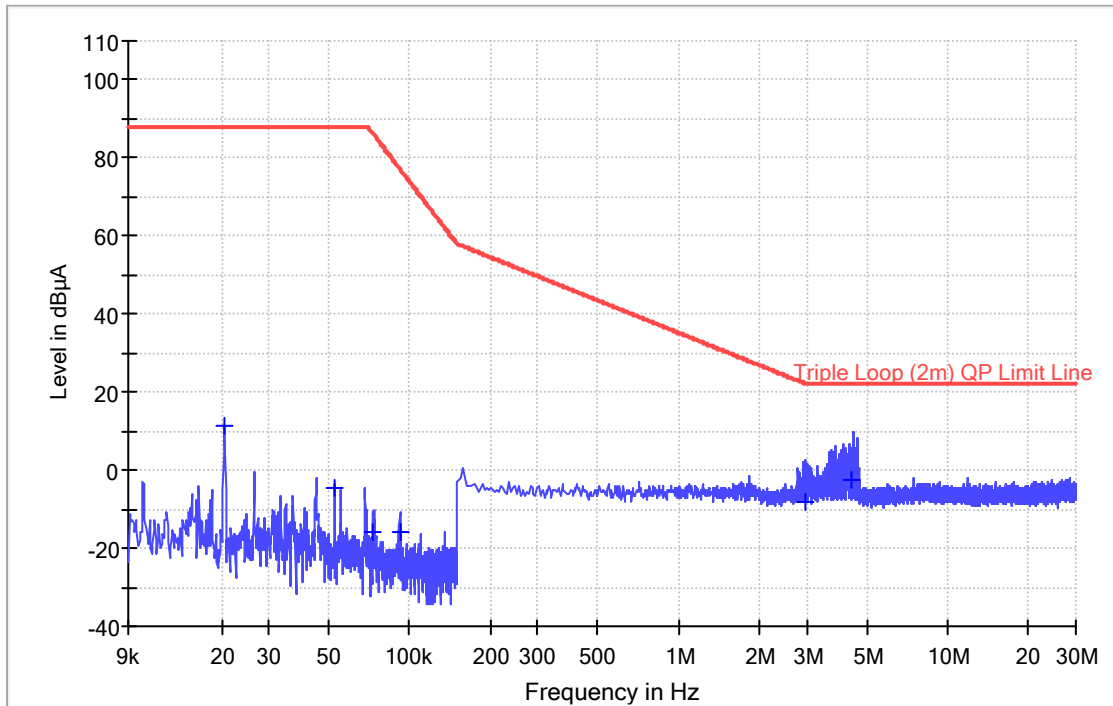
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Mode:a; Axial:Z

Triple Loop pre-emc



**Limit and Margin-Z**

Frequency (MHz)	QuasiPeak (dBµ)	Meas. Time (ms)	Bandwidth (kHz)	Triple Loop frame	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµ)	Comment
0.020520	11.5	1000.0	0.200	Z	0.0	76.5	88.0	
0.052840	-4.8	1000.0	0.200	Z	0.0	92.8	88.0	
0.073480	-15.7	1000.0	0.200	Z	0.0	101.8	86.1	
0.092040	-15.8	1000.0	0.200	Z	0.0	93.0	77.2	
2.982000	-8.2	1000.0	9.000	Z	0.1	30.3	22.1	
4.414000	-2.6	1000.0	9.000	Z	0.1	24.6	22.0	



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## 6.4 Harmonic Current Emission

Test Requirement: EN IEC 61000-3-2:2019  
 Test Method: EN IEC 61000-3-2:2019  
 Frequency Range: 100Hz to 2kHz

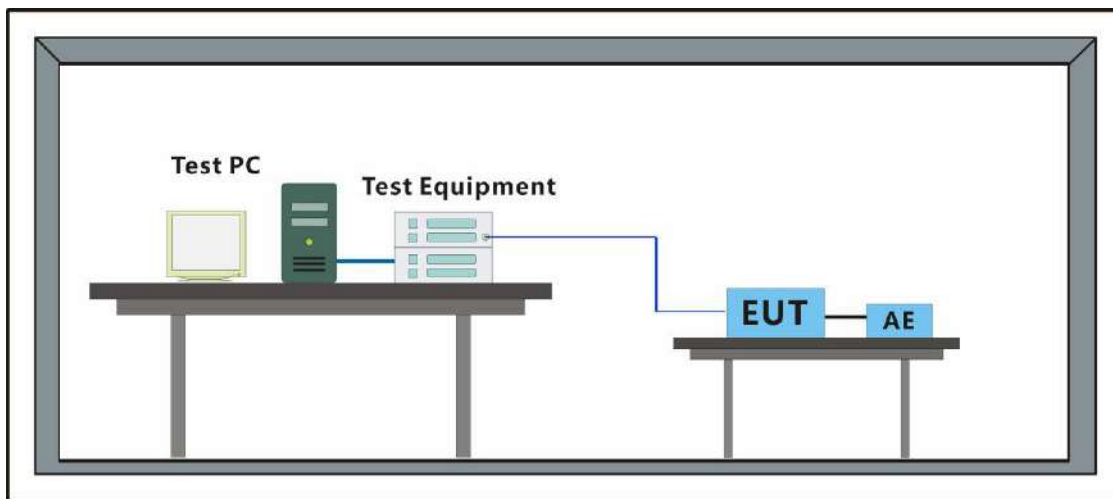
### 6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

Test mode: a: Lighting mode: Keep EUT lighting continuously.

### 6.4.2 Test Setup



### 6.4.3 Measurement Data



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Mode a

**Average harmonic current results**

Hn	I <sub>eff</sub> [A]	I <sub>eff</sub> [%]	Limit [%]	Result
1	1.072	99.961		
2	882.859E-6	0.082	2.00	PASS
3	35.143E-3	3.277	29.53	PASS
4	1.497E-3	0.140		PASS
5	30.699E-3	2.863	10.00	PASS
6	903.207E-6	0.084		PASS
7	18.735E-3	1.747	7.00	PASS
8	873.091E-6	0.081		PASS
9	15.608E-3	1.455	5.00	PASS
10	906.748E-6	0.085		PASS
11	13.467E-3	1.256	3.00	PASS
12	823.750E-6	0.077		PASS
13	11.262E-3	1.050	3.00	PASS
14	1.436E-3	0.134		PASS
15	10.014E-3	0.934	3.00	PASS
16	826.262E-6	0.077		PASS
17	9.220E-3	0.860	3.00	PASS
18	1.491E-3	0.139		PASS
19	8.378E-3	0.781	3.00	PASS
20	815.502E-6	0.076		PASS
21	7.237E-3	0.675	3.00	PASS
22	807.352E-6	0.075		PASS
23	6.988E-3	0.652	3.00	PASS
24	854.306E-6	0.080		PASS
25	5.991E-3	0.559	3.00	PASS
26	879.228E-6	0.082		PASS
27	6.067E-3	0.566	3.00	PASS
28	1.333E-3	0.124		PASS
29	5.486E-3	0.512	3.00	PASS
30	846.723E-6	0.079		PASS
31	5.334E-3	0.497	3.00	PASS
32	1.299E-3	0.121		PASS
33	5.470E-3	0.510	3.00	PASS
34	828.915E-6	0.077		PASS
35	4.444E-3	0.414	3.00	PASS
36	832.779E-6	0.078		PASS
37	5.443E-3	0.508	3.00	PASS
38	839.068E-6	0.078		PASS
39	4.096E-3	0.382	3.00	PASS
40	839.746E-6	0.078		PASS



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**Maximum harmonic current results**

Hn	I <sub>eff</sub> [A]	I <sub>eff</sub> [%]	Limit [%]	Result
1	1.072	100.000		
2	984.530E-6	0.092	3.00	PASS
3	35.861E-3	3.344	44.30	PASS
4	1.712E-3	0.160		PASS
5	31.220E-3	2.911	15.00	PASS
6	992.655E-6	0.093		PASS
7	19.006E-3	1.772	10.50	PASS
8	979.984E-6	0.091		PASS
9	15.806E-3	1.474	7.50	PASS
10	1.033E-3	0.096		PASS
11	13.615E-3	1.270	4.50	PASS
12	968.591E-6	0.090		PASS
13	11.436E-3	1.066	4.50	PASS
14	1.552E-3	0.145		PASS
15	10.189E-3	0.950	4.50	PASS
16	912.006E-6	0.085		PASS
17	9.387E-3	0.875	4.50	PASS
18	1.618E-3	0.151		PASS
19	8.479E-3	0.791	4.50	PASS
20	953.785E-6	0.089		PASS
21	7.400E-3	0.690	4.50	PASS
22	899.239E-6	0.084		PASS
23	7.566E-3	0.706	4.50	PASS
24	991.010E-6	0.092		PASS
25	6.114E-3	0.570	4.50	PASS
26	989.447E-6	0.092		PASS
27	6.243E-3	0.582	4.50	PASS
28	1.483E-3	0.138		PASS
29	5.629E-3	0.525	4.50	PASS
30	939.981E-6	0.088		PASS
31	5.543E-3	0.517	4.50	PASS
32	1.429E-3	0.133		PASS
33	5.659E-3	0.528	4.50	PASS
34	932.938E-6	0.087		PASS
35	4.605E-3	0.429	4.50	PASS
36	913.639E-6	0.085		PASS
37	5.635E-3	0.525	4.50	PASS
38	927.748E-6	0.087		PASS
39	4.382E-3	0.409	4.50	PASS
40	962.523E-6	0.090		PASS



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**Maximum harmonic voltage results**

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	230.56	100.242		
2	78.48E-3	0.034	0.2	PASS
3	490.93E-3	0.213	0.9	PASS
4	51.31E-3	0.022	0.2	PASS
5	42.41E-3	0.018	0.4	PASS
6	44.67E-3	0.019	0.2	PASS
7	19.08E-3	0.008	0.3	PASS
8	14.67E-3	0.006	0.2	PASS
9	30.74E-3	0.013	0.2	PASS
10	12.35E-3	0.005	0.2	PASS
11	10.25E-3	0.004	0.1	PASS
12	16.09E-3	0.007	0.1	PASS
13	14.49E-3	0.006	0.1	PASS
14	9.49E-3	0.004	0.1	PASS
15	10.39E-3	0.005	0.1	PASS
16	11.41E-3	0.005	0.1	PASS
17	9.35E-3	0.004	0.1	PASS
18	13.13E-3	0.006	0.1	PASS
19	14.29E-3	0.006	0.1	PASS
20	11.96E-3	0.005	0.1	PASS
21	9.44E-3	0.004	0.1	PASS
22	7.10E-3	0.003	0.1	PASS
23	12.54E-3	0.005	0.1	PASS
24	9.75E-3	0.004	0.1	PASS
25	10.69E-3	0.005	0.1	PASS
26	8.42E-3	0.004	0.1	PASS
27	10.94E-3	0.005	0.1	PASS
28	9.27E-3	0.004	0.1	PASS
29	9.74E-3	0.004	0.1	PASS
30	7.42E-3	0.003	0.1	PASS
31	11.97E-3	0.005	0.1	PASS
32	7.72E-3	0.003	0.1	PASS
33	11.97E-3	0.005	0.1	PASS
34	7.43E-3	0.003	0.1	PASS
35	12.18E-3	0.005	0.1	PASS
36	6.89E-3	0.003	0.1	PASS
37	14.03E-3	0.006	0.1	PASS
38	7.53E-3	0.003	0.1	PASS
39	14.44E-3	0.006	0.1	PASS
40	8.57E-3	0.004	0.1	PASS



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**Power and THD results - DS: 8**

True power P:	243.8W	Apparent power S:	247.6VA
Reactiv power Q:	43.62var	Power factor:	0.984
THD (U):	0.002	THD (I):	0.057
Crest Factor (U):	1.413	Crest Factor (I):	1.394



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### 6.5 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3:2013+A1:2019

Test Method: EN 61000-3-3:2013+A1:2019

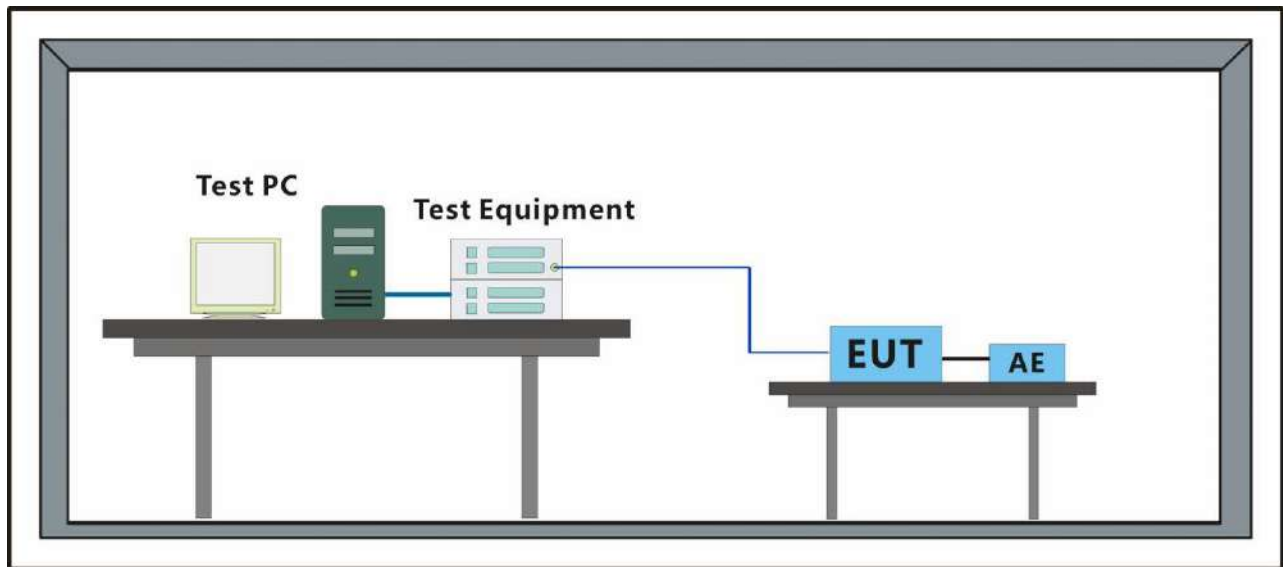
#### 6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode a: Lighting mode: Keep EUT lighting continuously.

#### 6.5.2 Test Setup Diagram



#### 6.5.3 Measurement Data

Mode:a

### Maximum Flicker results

	EUT values	Limit	Result
Pst	0.037	1.00	PASS
dc [%]	0.004	3.30	PASS
dmax [%]	0.313	4.00	PASS
Tmax [s]	0.000	0.50	PASS



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## 7 Immunity Test Results

### 7.1 Performance Criteria Description in EN 61547:2009

- Criterion A** During the test no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.
- Criterion B** During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min.  
Regulating controls need not function during the test, but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.
- Criterion C** During and after the test any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control.



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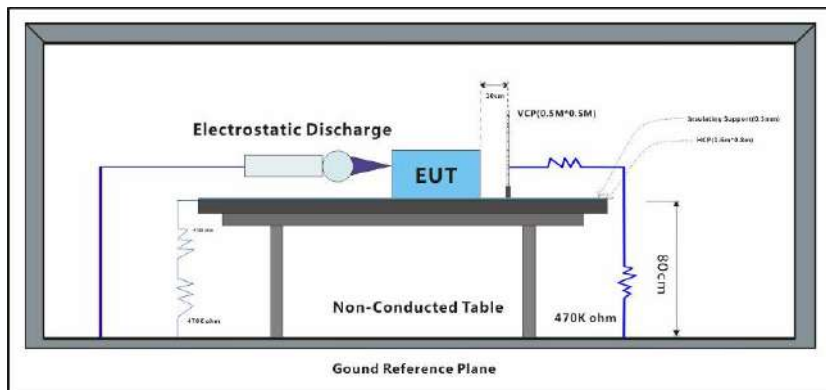
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## 7.2 Electrostatic Discharge

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-2:2009  
 Performance Criterion: B  
 Discharge Impedance: 330Ω/150pF  
 Number of Discharge: Minimum 10 times at each test point  
 Discharge Mode: Single Discharge  
 Discharge Period: 1 second minimum

### 7.2.1 Test Setup Diagram



### 7.2.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Lighting mode: Keep EUT lighting continuously.

### 7.2.3 Test Results:

Observations: Test Point:  
 1. All insulated enclosure and seams.  
 2. All accessible metal parts of the enclosure.  
 3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	8	+	1	A
Air Discharge	8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

### Results:

A: No degradation in the performance of the EUT was observed.



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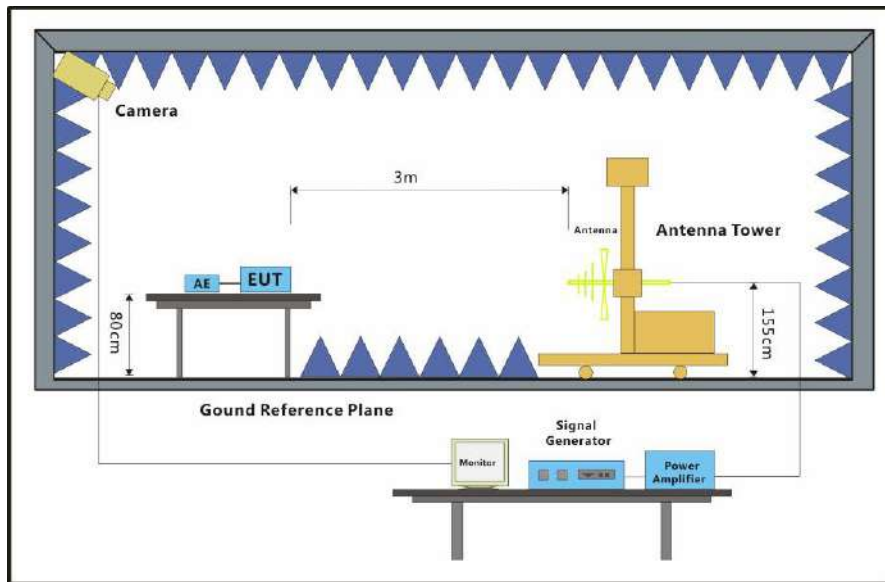
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### 7.3 Radiated Immunity (80MHz-1GHz)

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010  
 Performance Criterion: A  
 Frequency Range: 80MHz to 1GHz  
 Antenna Polarisation: Vertical and Horizontal  
 Modulation: 1kHz,80% Amp. Mod,1% increment

#### 7.3.1 Test Setup Diagram



#### 7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: Lighting mode: Keep EUT lighting continuously.

#### 7.3.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	3s	A
80MHz-1GHz	3	Back	3s	A
80MHz-1GHz	3	Left	3s	A
80MHz-1GHz	3	Right	3s	A
80MHz-1GHz	3	Top	3s	A
80MHz-1GHz	3	Underside	3s	A

#### Results:

A: No degradation in the performance of the EUT was observed.



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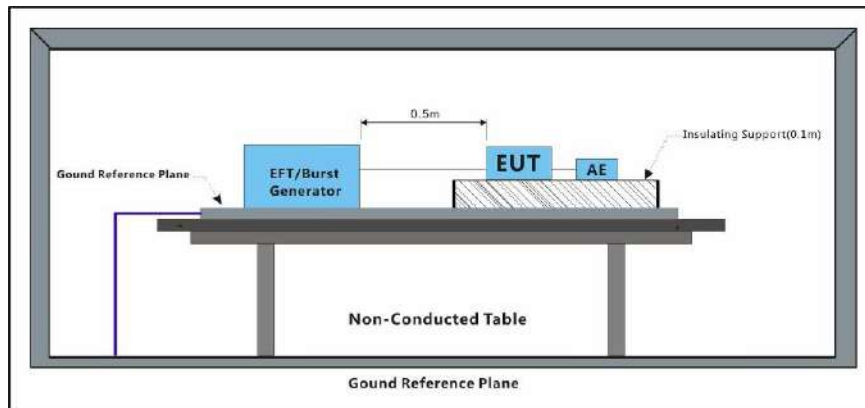
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### 7.4 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-4:2012  
 Performance Criterion: B  
 Repetition Frequency: 5kHz  
 Burst Period: 300ms  
 Test Duration: 2 minute per level & polarity

#### 7.4.1 Test Setup Diagram



#### 7.4.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Lighting mode: Keep EUT lighting continuously.

#### 7.4.3 Test Results:

Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A

#### Results:

A: No degradation in the performance of the EUT was observed.



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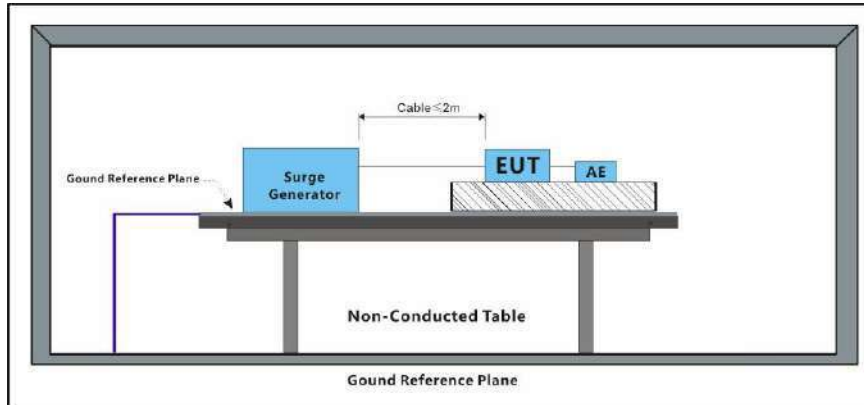
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### 7.5 Surge at Power Port

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-5:2014 +A1:2017  
 Performance Criterion: C  
 No. of surges: 5 positive at 90°, 5 negative at 270°.

#### 7.5.1 Test Setup Diagram



#### 7.5.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Lighting mode: Keep EUT lighting continuously.

#### 7.5.3 Test Results:

Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1	+	90°	A
L-N	1	-	270°	A
L-PE	2	+	90°	A
L-PE	2	-	270°	A
N-PE	2	+	90°	A
N-PE	2	-	270°	A

#### Results:

A: No degradation in the performance of the EUT was observed.



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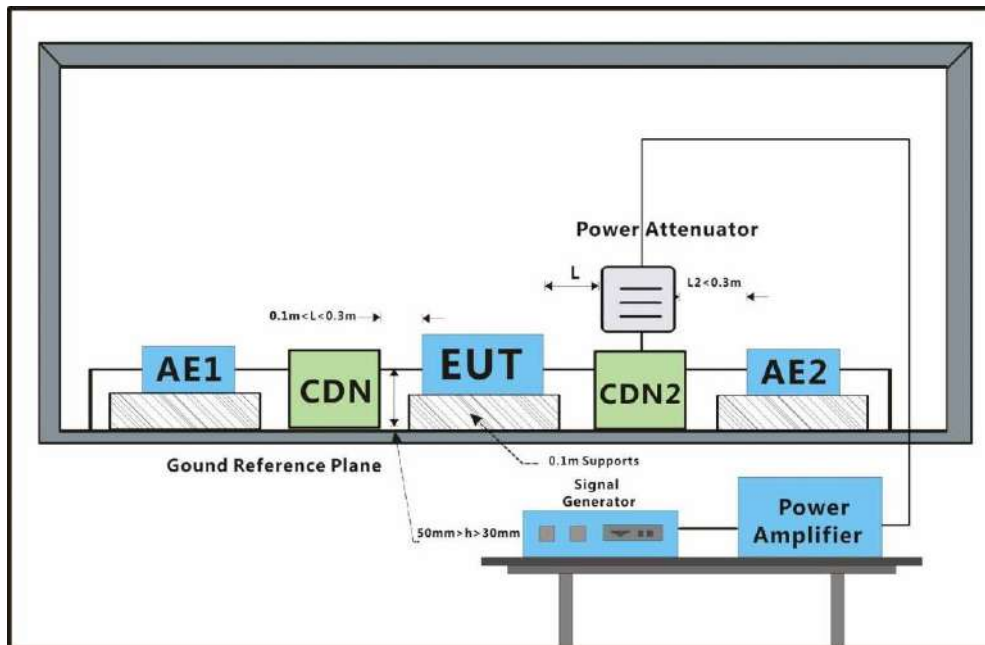
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### 7.6 Conducted Immunity at Power Port (150kHz-80MHz)

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-6:2014  
 Performance Criterion: A  
 Frequency Range: 0.15MHz to 80MHz  
 Modulation: 80%, 1kHz Amplitude Modulation  
 Step Size: 1%

#### 7.6.1 Test Setup Diagram



#### 7.6.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar  
 Test mode: a: Lighting mode: Keep EUT lighting continuously.

#### 7.6.3 Test Results:

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	3	CDN	3s	A

#### Results:

A: No degradation in the performance of the EUT was observed.



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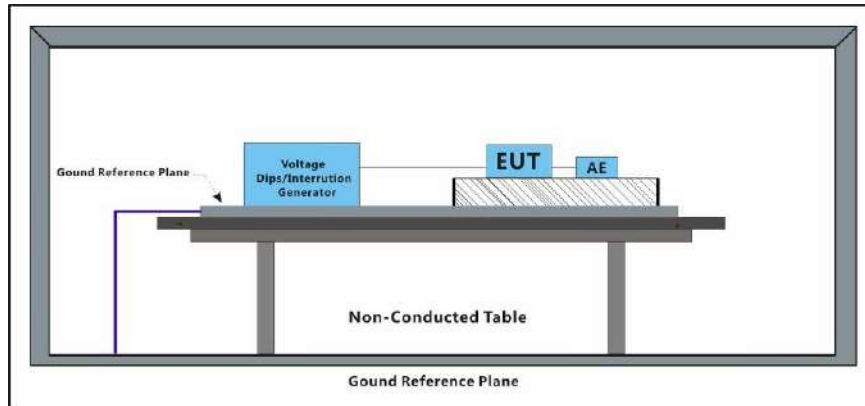
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### 7.7 Voltage Dips and Interruptions

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-11:2004 +A1:2017  
 Performance Criterion: 0% of UT (Supply Voltage) for 0.5 Periods:B;  
 70 % of UT for 10 Periods:C  
 No. of Dips / Interruptions: 3 per Level  
 Time between dropout 10s

#### 7.7.1 Test Setup Diagram



#### 7.7.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: Lighting mode: Keep EUT lighting continuously.

#### 7.7.3 Test Results:

Level % UT	Phase (deg)	Duration	No. of Dips / Interruptions	Result / Observations
0	0°	0.5 Cycles	3	A
0	180°	0.5 Cycles	3	A
70	0°	10 Cycles	3	A
70	180°	10 Cycles	3	A

#### Results:

A: No degradation in the performance of the EUT was observed.



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## 8 Photographs

### 8.1 Conducted Emissions at Mains Terminals (9kHz-30MHz) Test Setup



### 8.2 Radiated Emissions (30MHz-1000MHz) Test Setup



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### 8.3 Radiated Emissions (Magnetic field Induced Current) (9kHz-30MHz) Test Setup



### 8.4 Harmonic & Voltage Fluctuations and Flicker Test Setup



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### 8.5 Electrostatic Discharge Test Setup



### 8.6 Radiated Immunity (80MHz-1GHz) Test Setup



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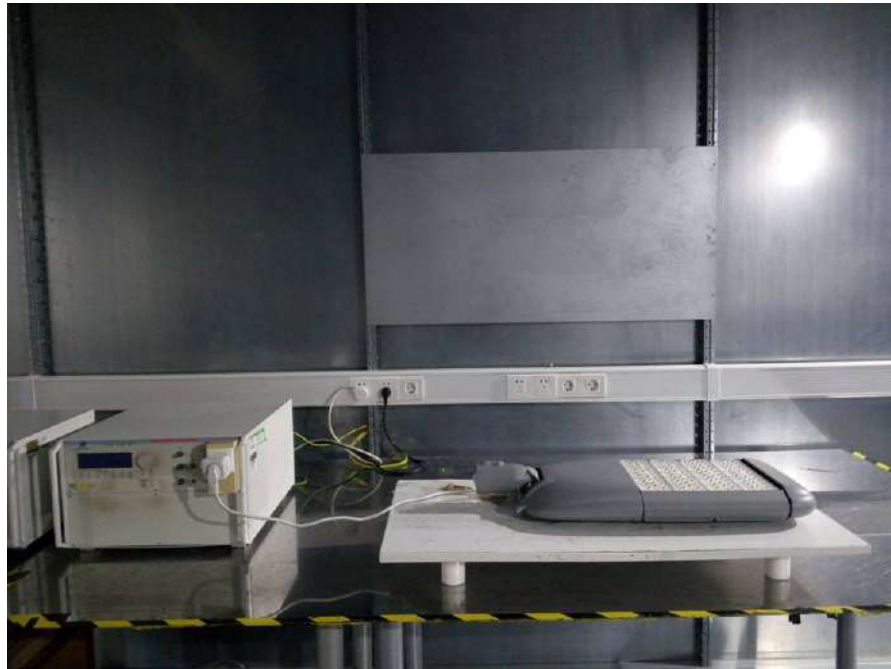
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### 8.7 Electrical Fast Transients/Burst at Power Port Test Setup



### 8.8 Surge at Power Port Test Setup



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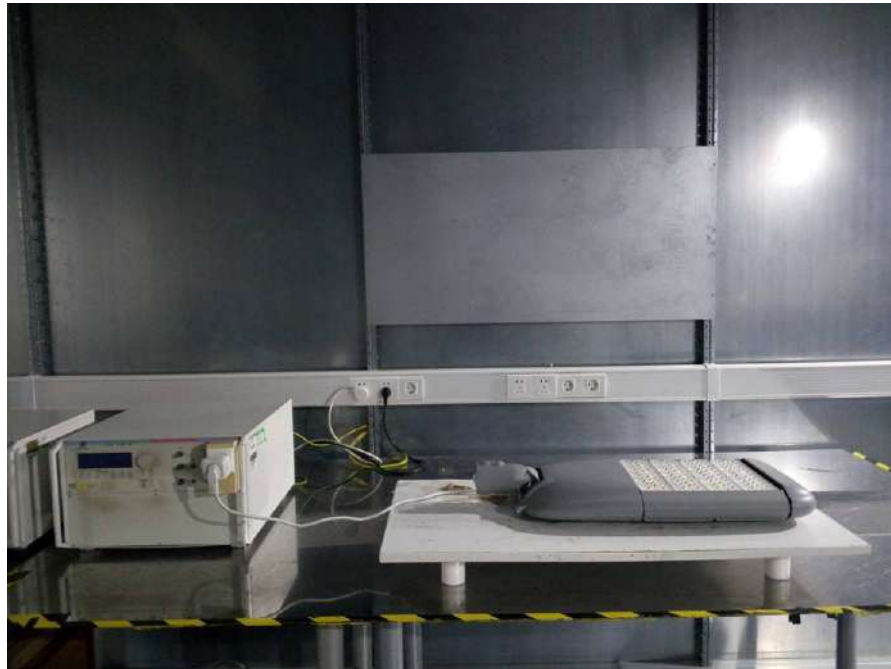
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### 8.9 Conducted Immunity at Power Port (150kHz-80MHz) Test Setup



### 8.10 Voltage Dips and Interruptions Test Setup



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8.11 EUT Constructional Details (EUT Photos)



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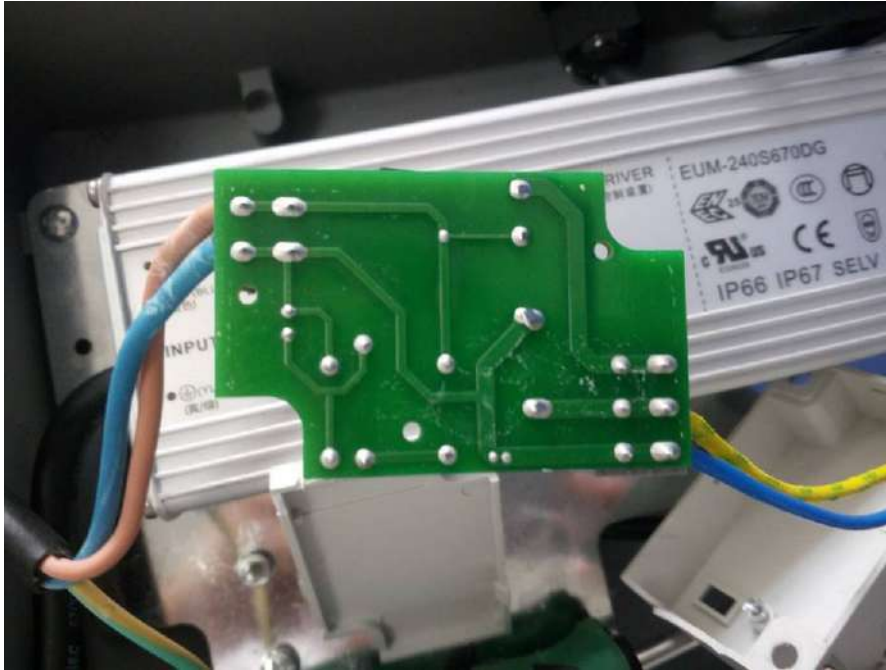


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## 2.4 Componentes de las Luminarias

- UNE-EN 62031. Módulos LED para alumbrado general.  
Requisitos de seguridad. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.)
- UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13:  
Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.
- UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED.
- Requisitos de funcionamiento.



Product Service

# Attestation of Compliance

No. N5A 17 11 02897 001

**Holder of Certificate: NOVATILU, S.L.U**Via Ausetania 11  
08560 Manlleu  
SPAIN**Product: LED Module**

This Attestation of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of Low Voltage Directive 2014/35/EU. The essential requirements are fulfilled accordingly based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for testing and certification. See also notes overleaf.

Test report no.: 701281718401-00



Date, 2017-11-16

  
( Binwen Zhang )

Other relevant European directives have to be observed. If they require CE marking, it may be affixed on the product after preparation of the necessary technical documentation as well as the EU declaration of conformity.

Page 1 of 3



Product Service

## Attestation of Compliance

No. N5A 17 11 02897 001

**Model(s):** AML079XXX,AML0612XXX,AML0616XXX,  
AML0624XXX,AML0632XXX,ANL16LXXX,  
ANL32LXXX,AML0412XXX,AML0315XXX,  
AML0248XXX,AML0236XXX,AML0224XXX,  
AML0130XXX

**Brand:** NOVATILU

**Parameters:**

Rated voltage:	See attachment
Protection Class:	Class III
Rated power:	See attachment
Degree of protection:	IP66
tc:	85°C
ta:	45°C

**Tested according to:** EN 62031:2008/A2:2015  
EN 62493:2015  
EN 62471:2008

Page 2 of 3

**Attestation of Compliance**  
**No. N5A 17 11 02897 001**



Product Service

Model type	Max. Wattage(W)	Voltage (dc.V)	Quantity of LEDs
AML079XXX	30	21,6~36	9
AML0612XXX	30	25,2~42	12
AML0616XXX	40	32,4~54	16
AML0624XXX	60	25,2~42	24
AML0632XXX	80	32,4~54	32
ANL16LXXX	40	32,4~54	16
ANL32LXXX	80	32,4~54	32
AML0412XXX	80	25,2~42	12
AML0315XXX	40	32,4~54	15
AML0248XXX	100	25,2~42	48
AML0236XXX	80	25,2~42	36
AML0224XXX	60	25,2~42	24
AML0130XXX	60	21,6~36	30

Note: XXX can be 001-100, represents the rated power of product, e.g. 005=5W



APL

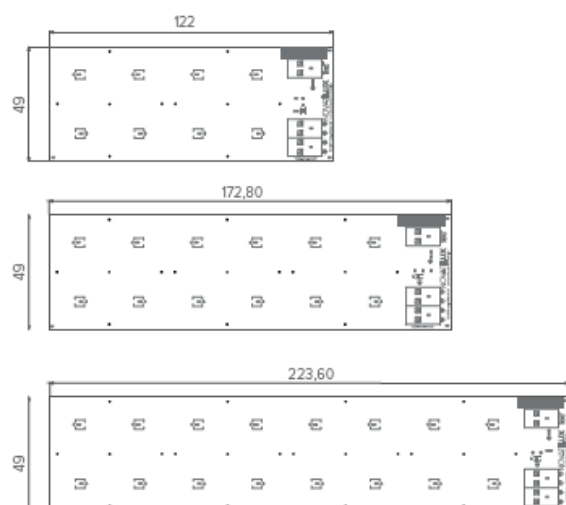
# PCB



El módulo de LED del Grupo Benito Novatilu mediante su tecnología propia ofrece un alto rendimiento lumínico con las máximas garantía de seguridad y una óptima calidad fotométrica, gracias al principio de adiciones donde cada LED dispone de su lente específica.

- MCPCB de Aluminio de Alta Transferencia Térmica en formatos (8, 12 y 16 LEDs) según Estándar Zhaga Book 15.
- Tecnología LED de Alta Eficiencia en formato 5050 con rendimiento >172lm/W.
- Control del flujo lumínico mediante lentes PMMA 2x2 de alta transparencia. Disponibilidad >18 distribuciones lumínicas diferentes.
- Doble Protección de sobretensiones Transitorias.
- Incluye sensor NTC de Temperatura para la protección Térmica del LED.
- Disponible en Diferentes Temperaturas de Color (de PC Ambar a 5000K) y distintos índices de reproducción cromática IRC (>70 o >80).

PLANO:

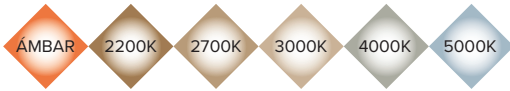


CONFIGURACIONES:

- APL16ZH - 48Vdc
- APL12ZH - 36Vdc
- APL8ZH - 24Vdc

El Grupo BENITO NOVATILU se reserva el derecho de realizar modificaciones a sus productos sin previo aviso

## RANGO DE TEMPERATURA DE COLOR



## LAS VERSIONES DE PCB BENITO NOVATILU

REF.	Nº LEDs	I <sub>max</sub> (mA)	W <sub>max</sub> (W)	Flujo lumínico Real (T) (=85°C)	Eficiencia lm/W	Flujo lumínico Real (T) (=25°C)	Eficiencia lm/W
<APL8ZH	8	1050	25,2	3881	154	4208	167
<APL12ZH	12	1050	37,8	5821	154	6313	167
<APL16ZH	16	1050	50,4	7762	154	8417	167

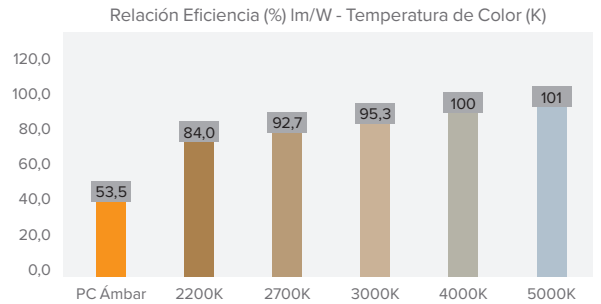
L90B10 >100.000h según TM21 (Certificado por Laboratorio ENAC).

Temperatura de Funcionamiento -35°C - + 60°C.

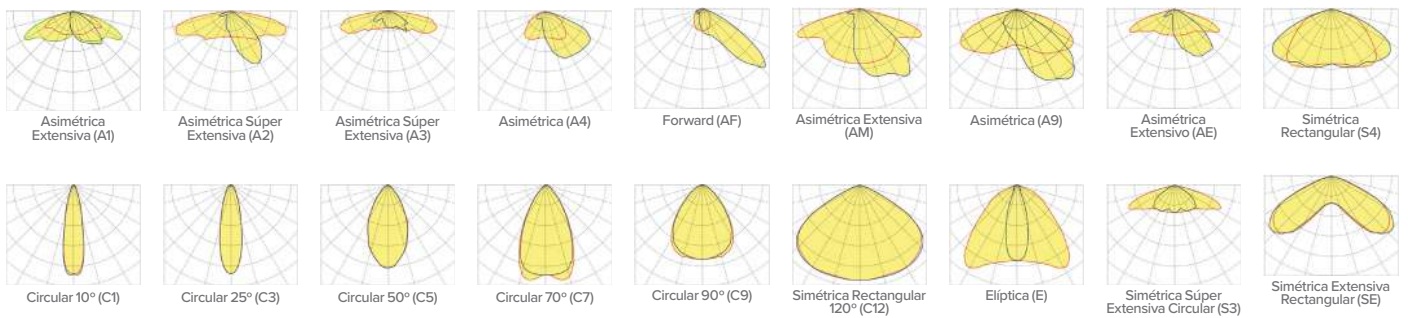
Corriente del LED = Corriente Driver /2 (I<sub>max</sub> - 525mA).

Tolerancia del flujo lumínico < +/-3%.

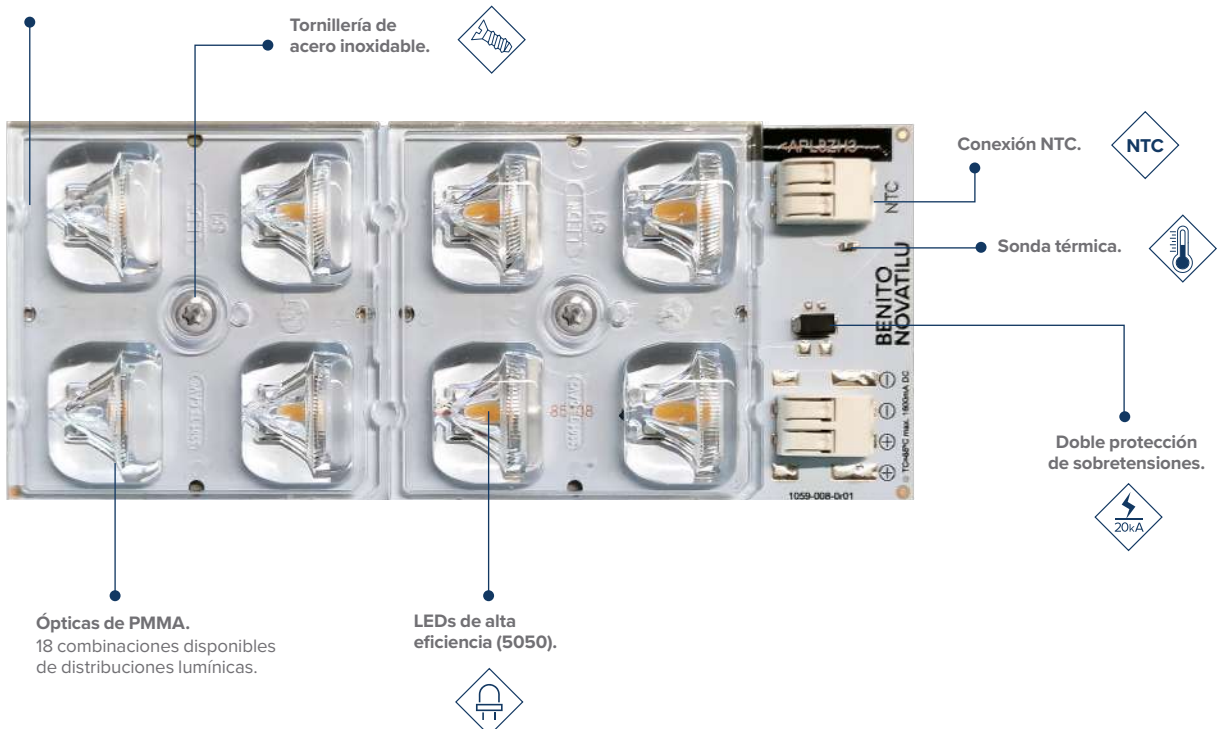
Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.



## DISTRIBUCIONES LUMÍNICAS DISPONIBLES



PCB BENITO NOVATILU de aluminio de alta transferencia térmica en 3 formatos standard Zhaga (Book15) (8, 12 y 16 LED). Consultar temperaturas de color y distribuciones lumínicas.

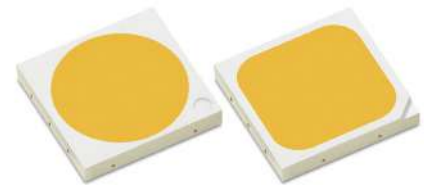


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# LUXEON 5050

High efficacy and superior robustness in a multi-die, high power package, enabling cost-effective system design

LUXEON 5050 is a multi-die, high power package that provides high luminance from a super robust package to enable cost effective, single optic and directional fixture designs. LUXEON 5050 uses an industry standard 5050 surface mount package with a small Light Emitting Surface (LES). LUXEON 5050 comes in 70CRI, 80CRI and 90CRI with a wide range of CCTs, and offers hot-color targeting to ensure that the LEDs are within color target at application conditions of 85°C.



## FEATURES AND BENEFITS

- Superior lm/W enables outstanding efficacy in end application
- Extremely reliable package design affirms long lifetime in harsh environments <sup>[1]</sup>
- Two voltage configurations are compatible with low cost high efficacy drivers
- Low  $R_{th}$  enables effective thermal dissipation design for higher efficiency
- Hot-color targeting ensures color is within ANSI bin at 85°C
- 3-step and 5-step MacAdam ellipse binning structure ensures excellent color uniformity

1. Refer to reliability datasheet for more details.

## PRIMARY APPLICATIONS

- High Bay
- Low Bay
- Floodlights
- Wall Pack
- [More...](#)

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# General Product Information

## Product Test Conditions

LUXEON 5050 LEDs are tested with a 20ms monopulse specified below at a junction temperature,  $T_j$ , of 25°C. Forward voltage and luminous flux are binned at a  $T_j$  of 25°C, while color is hot-targeted at a  $T_j$  of 85°C.

- 160mA - LUXEON 5050 (Round LES) – 24V and LUXEON 5050 (Square LES) – 30V
- 640mA - LUXEON 5050 (Round LES) – 6V
- 800mA - LUXEON 5050 (Square LES) – 6V

## Part Number Nomenclature

Part numbers for LUXEON 5050 follow the convention below:

L 1 5 0 – **A A B B** 5 0 **C C** 0 0 0 **D** 0

Where:

- A A** - designates nominal ANSI CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K 40=4000K, 50=5000K, 57=5700K, 65=6500K)
- B B** - designates minimum CRI (70=70CRI, 80=80CRI, 90=90CRI)
- C C** - designates voltage (06=6V, 24=24V, 30=30V)
- D** - designates product type (0=Round LES, S=Square LES)

Therefore, the following part number is used for a LUXEON 5050 Square LES, 3000K 80CRI, 30V:

L 1 5 0 – **3 0 8 0** 5 0 **3 0** 0 0 0 **S** 0

## Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

## Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON 5050 is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

# Performance Characteristics

## Product Selection Guide

Table 1. Product performance of LUXEON 5050 at specified test current,  $T_j=25^\circ\text{C}$ .

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Round LES) 24V	2200K	70	515	550	140	160	L150-2270502400000
	2700K	70	535	605	154	160	L150-2770502400000
	3000K	70	553	625	159	160	L150-3070502400000
	3500K	70	600	635	162	160	L150-3570502400000
	4000K	70	580	675	172	160	L150-4070502400000
	5000K	70	580	672	171	160	L150-5070502400000
	5700K	70	570	661	169	160	L150-5770502400000
	6500K	70	570	655	167	160	L150-6570502400000
	2200K	80	440	475	121	160	L150-2280502400000
	2700K	80	500	550	140	160	L150-2780502400000
	3000K	80	516	590	151	160	L150-3080502400000
	3500K	80	527	595	152	160	L150-3580502400000
	4000K	80	539	615	157	160	L150-4080502400000
	5000K	80	539	615	157	160	L150-5080502400000
	5700K	80	539	615	157	160	L150-5780502400000
	6500K	80	539	615	157	160	L150-6580502400000
	2700K	90	414	475	121	160	L150-2790502400000
	3000K	90	428	490	125	160	L150-3090502400000
	3500K	90	445	510	130	160	L150-3590502400000
	4000K	90	456	530	135	160	L150-4090502400000
	5000K	90	456	530	135	160	L150-5090502400000
5700K	90	456	530	135	160	L150-5790502400000	
LUXEON 5050 (Round LES) 6V	2200K	70	515	550	140	640	L150-2270500600000
	2700K	70	535	605	154	640	L150-2770500600000
	3000K	70	553	625	159	640	L150-3070500600000
	3500K	70	600	635	162	640	L150-3570500600000
	4000K	70	580	675	172	640	L150-4070500600000
	5000K	70	580	672	171	640	L150-5070500600000
	5700K	70	570	661	169	640	L150-5770500600000
	6500K	70	570	655	167	640	L150-6570500600000
	2200K	80	440	475	121	640	L150-2280500600000
	2700K	80	500	550	140	640	L150-2780500600000
	3000K	80	516	590	151	640	L150-3080500600000
	3500K	80	527	595	152	640	L150-3580500600000
	4000K	80	539	615	157	640	L150-4080500600000
	5000K	80	539	615	157	640	L150-5080500600000
	5700K	80	539	615	157	640	L150-5780500600000
	6500K	80	539	615	157	640	L150-6580500600000
	2700K	90	414	475	121	640	L150-2790500600000
	3000K	90	428	490	125	640	L150-3090500600000
	3500K	90	445	510	130	640	L150-3590500600000
	4000K	90	456	530	135	640	L150-4090500600000
	5000K	90	456	530	135	640	L150-5090500600000
5700K	90	456	530	135	640	L150-5790500600000	

Table 1 continued on next page:

1. Correlated color temperature is not targeted at  $T_j=85^\circ\text{C}$ .
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at  $T_j=25^\circ\text{C}$ . Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of  $\pm 2$  on CRI and  $\pm 7\%$  on luminous flux measurements.

Table 1. Product performance of LUXEON 5050 at specified test current, T<sub>j</sub>=25°C, Continued.

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER	
			MINIMUM	TYPICAL				
LUXEON 5050 (Square LES) 30V	2200K	70	621	690	141	160	L150-22705030000S0	
	2700K	70	693	770	158	160	L150-27705030000S0	
	3000K	70	720	800	164	160	L150-30705030000S0	
	3500K	70	729	810	166	160	L150-35705030000S0	
	4000K	70	743	825	169	160	L150-40705030000S0	
	5000K	70	743	825	169	160	L150-50705030000S0	
	5700K	70	738	820	168	160	L150-57705030000S0	
	6500K	70	720	800	164	160	L150-65705030000S0	
	2200K	80	586	630	129	160	L150-22805030000S0	
	2700K	80	650	695	142	160	L150-27805030000S0	
	3000K	80	665	715	147	160	L150-30805030000S0	
	3500K	80	679	730	150	160	L150-35805030000S0	
	4000K	80	700	750	154	160	L150-40805030000S0	
	5000K	80	702	755	155	160	L150-50805030000S0	
	5700K	80	700	750	154	160	L150-57805030000S0	
	6500K	80	688	740	152	160	L150-65805030000S0	
	2700K	90	558	600	123	160	L150-27905030000S0	
	3000K	90	586	630	129	160	L150-30905030000S0	
	3500K	90	600	640	131	160	L150-35905030000S0	
	4000K	90	609	655	134	160	L150-40905030000S0	
	5000K	90	618	665	136	160	L150-50905030000S0	
	5700K	90	605	650	133	160	L150-57905030000S0	
	LUXEON 5050 (Square LES) 6V	2200K	70	621	690	141	800	L150-22705006000S0
		2700K	70	693	770	158	800	L150-27705006000S0
		3000K	70	720	800	164	800	L150-30705006000S0
		3500K	70	729	810	166	800	L150-35705006000S0
		4000K	70	743	825	169	800	L150-40705006000S0
		5000K	70	743	825	169	800	L150-50705006000S0
5700K		70	738	820	168	800	L150-57705006000S0	
6500K		70	720	800	164	800	L150-65705006000S0	
2200K		80	586	630	129	800	L150-22805006000S0	
2700K		80	650	695	142	800	L150-27805006000S0	
3000K		80	665	715	147	800	L150-30805006000S0	
3500K		80	679	730	150	800	L150-35805006000S0	
4000K		80	700	750	154	800	L150-40805006000S0	
5000K		80	702	755	155	800	L150-50805006000S0	
5700K		80	700	750	154	800	L150-57805006000S0	
6500K		80	688	740	152	800	L150-65805006000S0	
2700K		90	558	600	123	800	L150-27905006000S0	
3000K		90	586	630	129	800	L150-30905006000S0	
3500K		90	600	640	131	800	L150-35905006000S0	
4000K		90	609	655	134	800	L150-40905006000S0	
5000K		90	618	665	136	800	L150-50905006000S0	
5700K		90	605	650	133	800	L150-57905006000S0	

Notes for Table 1:

1. Correlated color temperature is not targeted at T<sub>j</sub>=85°C.
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at T<sub>j</sub>=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7% on luminous flux measurements.

# Optical Characteristics

Table 2. Optical characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE <sup>[1]</sup>	TYPICAL VIEWING ANGLE <sup>[2]</sup>
L150-xxxx50xx000x0	138°	116°

**Notes for Table 2:**

- Total angle at which 90% of total luminous flux is captured.
- Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.

# Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	FORWARD VOLTAGE <sup>[1]</sup> ( $V_f$ )			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE <sup>[2]</sup> (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L150-xxxx502400000	23.5	24.4	26.5	-12	2.4
L150-xxxx500600000	5.8	6.1	6.6	-3	2.4
L150-xxxx5030000S0	29.0	30.5	32.0	-15	1.4
L150-xxxx5006000S0	5.8	6.1	6.6	-3	1.4

**Notes for Table 3:**

- Lumileds maintains a tolerance of ±1% on forward voltage measurements.
- Measured between 25°C and 85°C.

# Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON 5050.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current <sup>[1,2]</sup>	240mA for L150-xxxx502400000 800mA for L150-xxxx500600000 240mA for L150-xxxx5030000S0 1000mA for L150-xxxx5006000S0
Peak Pulsed Forward Current <sup>[1,3]</sup>	300mA for L150-xxxx502400000 1000mA for L150-xxxx500600000 300mA for L150-xxxx5030000S0 1250mA for L150-xxxx5006000S0
LED Junction Temperature <sup>[1]</sup> (DC & Pulse)	125°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 2
Operating Case Temperature <sup>[1]</sup>	105°C
LED Storage Temperature	-40°C to 105°C
Allowable Reflow Cycles	3
Reverse Voltage ( $V_{reverse}$ )	LUXEON LEDs are not designed to be driven in reverse bias

**Notes for Table 4:**

- Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
- Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," are acceptable if the following conditions are met:
  - The frequency of the ripple current is 100Hz or higher
  - The average current for each cycle does not exceed the maximum allowable DC forward current
  - The maximum amplitude of the ripple does not exceed the maximum peak pulsed forward current
- At 10% duty cycle with pulse width of 10ms.

# Characteristic Curves

## Spectral Power Distribution Characteristics

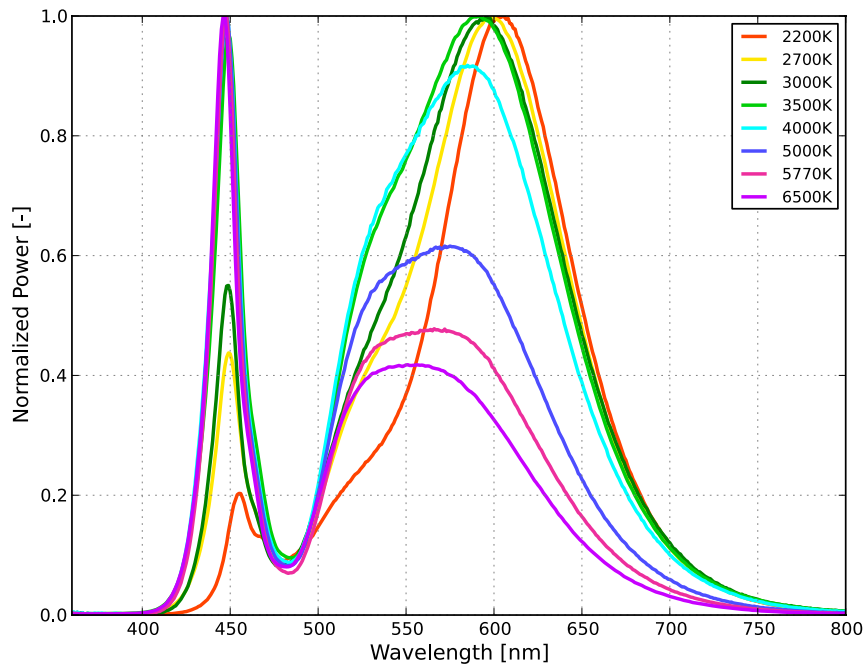


Figure 1a. Typical normalized power vs. wavelength for L150-xx7050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

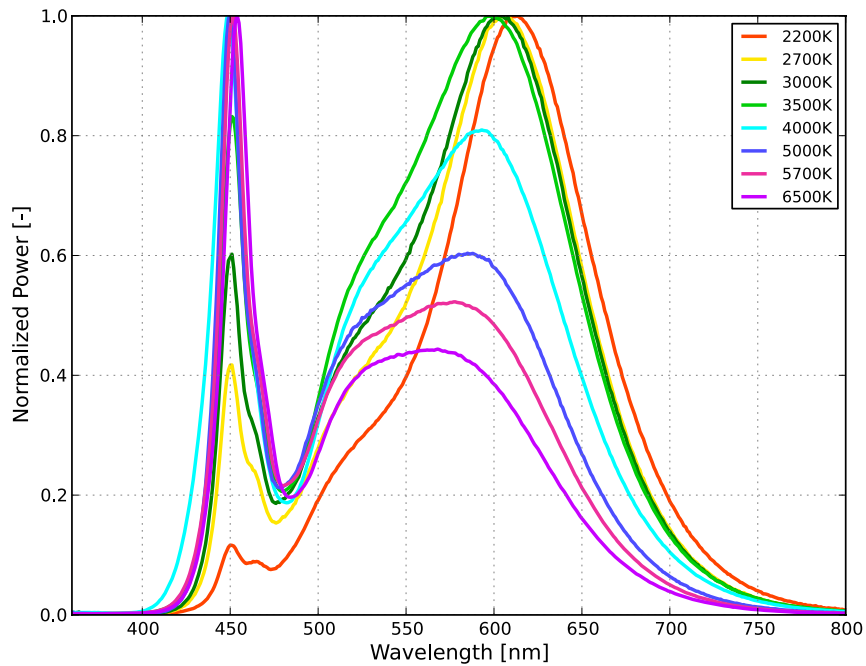


Figure 1b. Typical normalized power vs. wavelength for L150-xx8050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

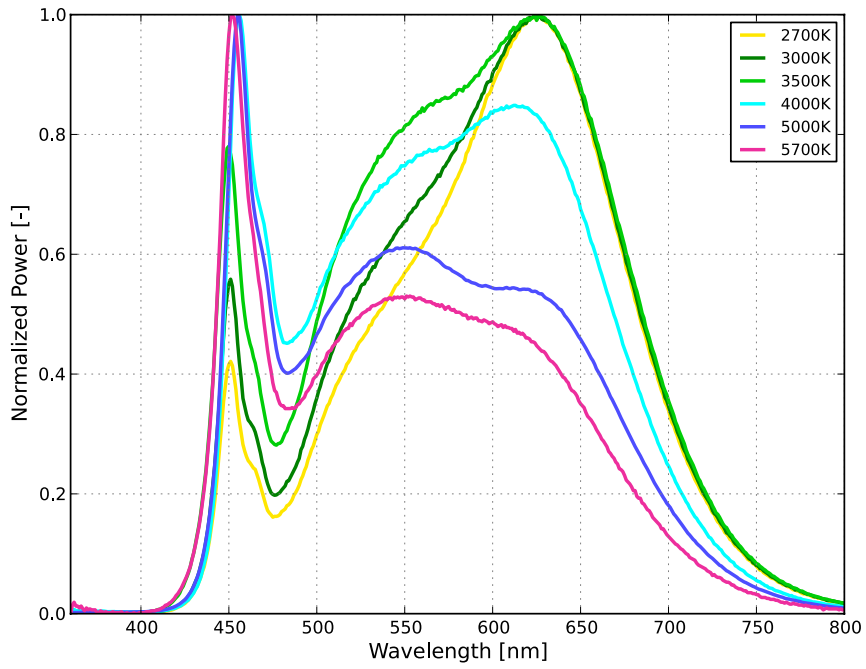


Figure 1c. Typical normalized power vs. wavelength for L150-xx9050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

## Light Output Characteristics

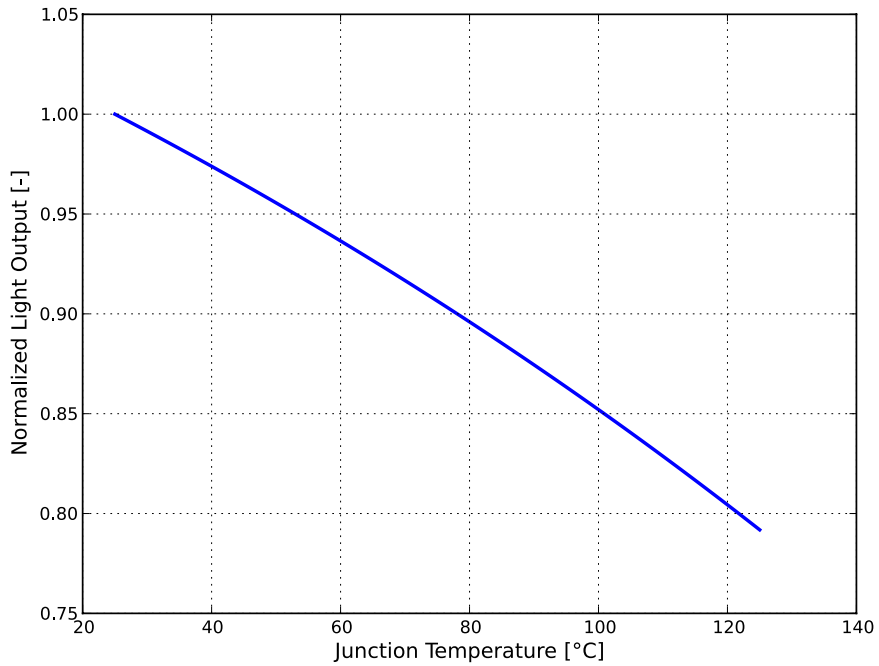


Figure 2. Typical normalized light output vs. junction temperature for L150-xxx50xx000x0 at specified test current.

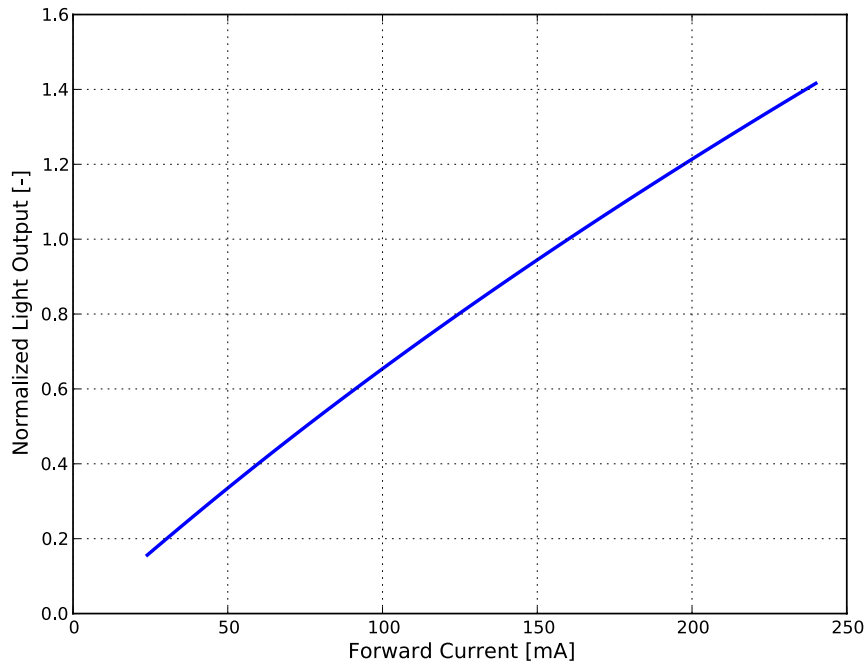


Figure 3a. Typical normalized light output vs. forward current for L150-xxxx50xx000x0,  $T_j=25^\circ\text{C}$ .

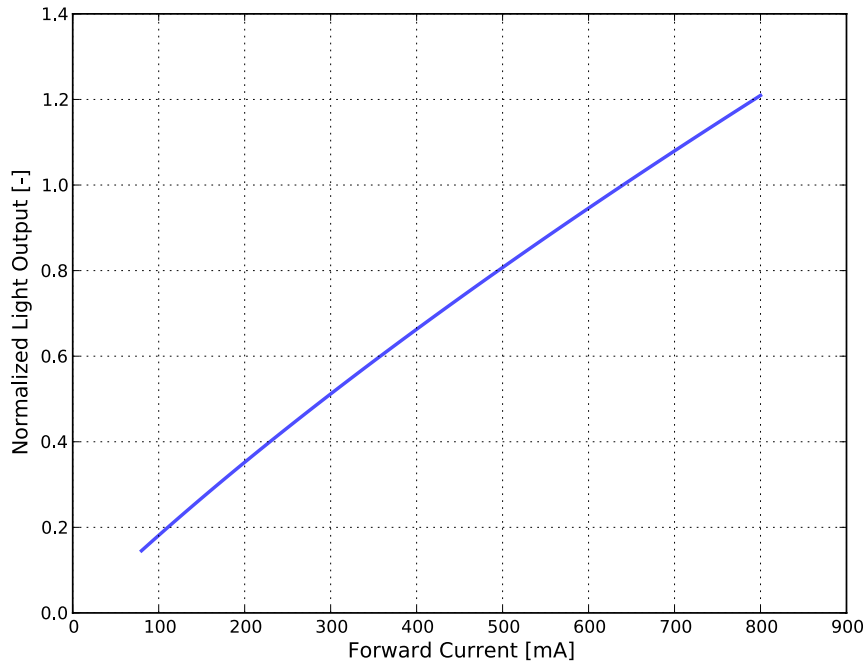


Figure 3b. Typical normalized light output vs. forward current for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

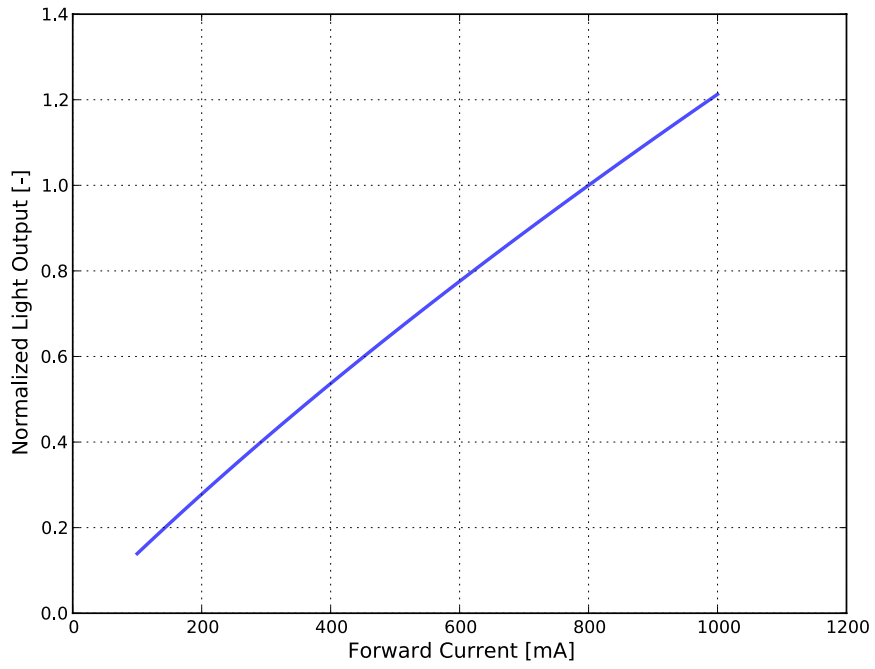


Figure 3c. Typical normalized light output vs. forward current for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Forward Current Characteristics

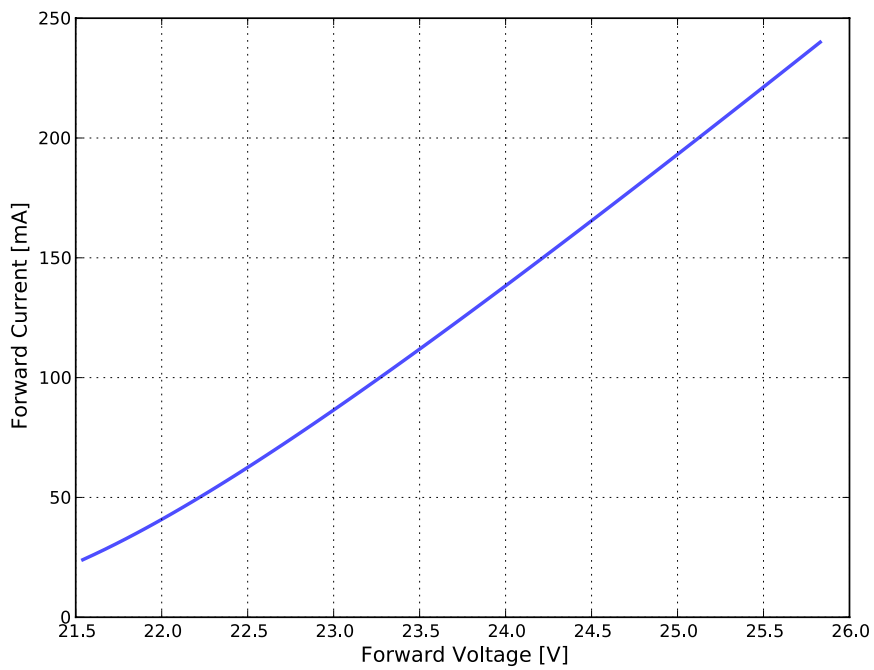


Figure 4a. Typical forward current vs. forward voltage for L150-xxxx502400000,  $T_j=25^\circ\text{C}$ .



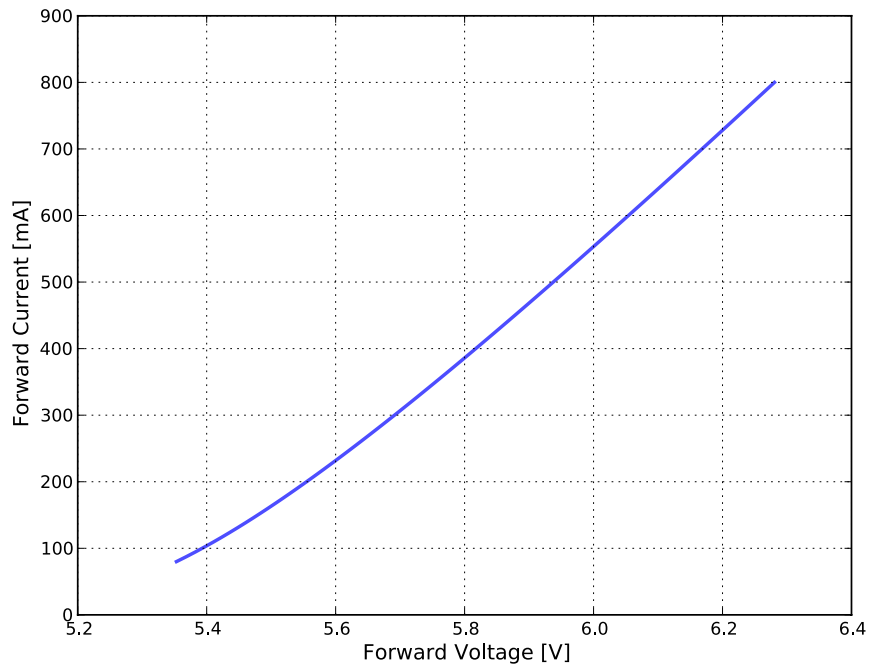


Figure 4b. Typical forward current vs. forward voltage for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

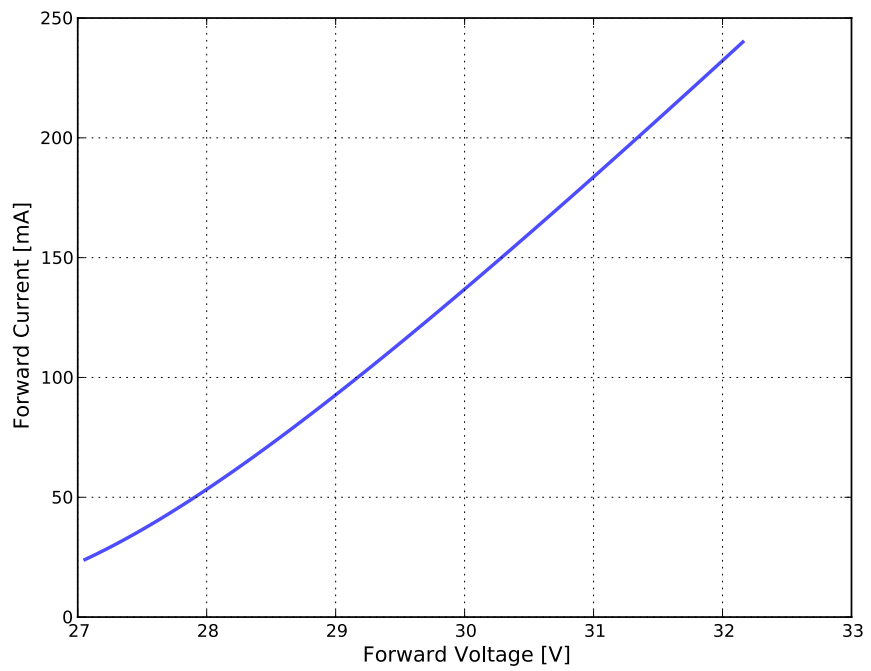


Figure 4c. Typical forward current vs. forward voltage for L150-xxxx503000050,  $T_j=25^\circ\text{C}$ .

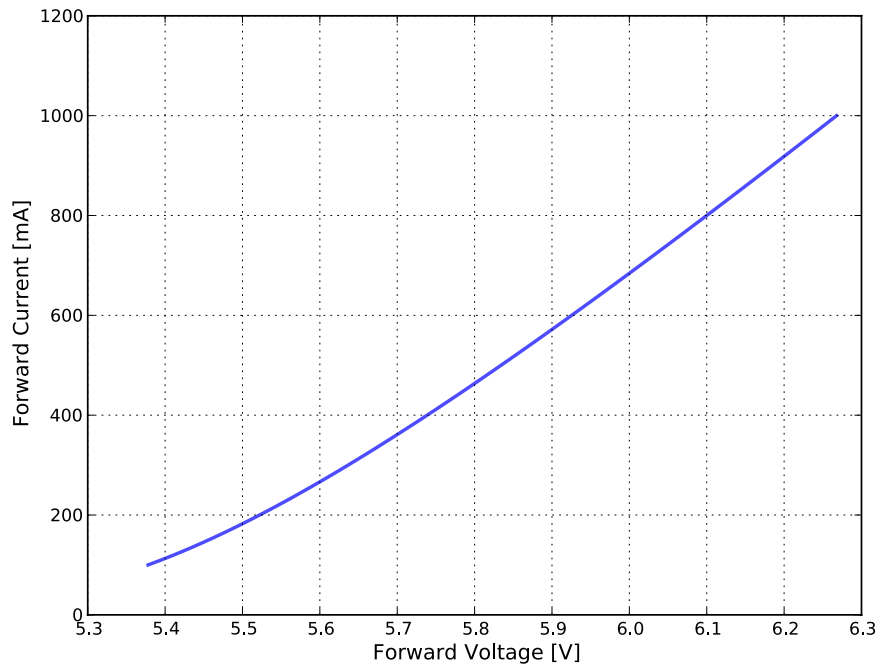


Figure 4d. Typical forward current vs. forward voltage for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Radiation Pattern Characteristics

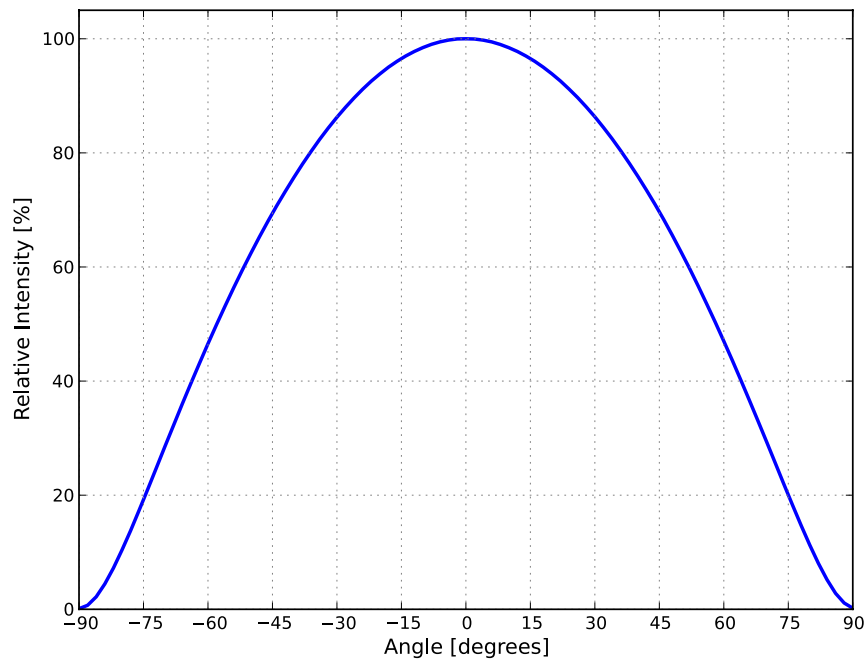


Figure 5. Typical radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

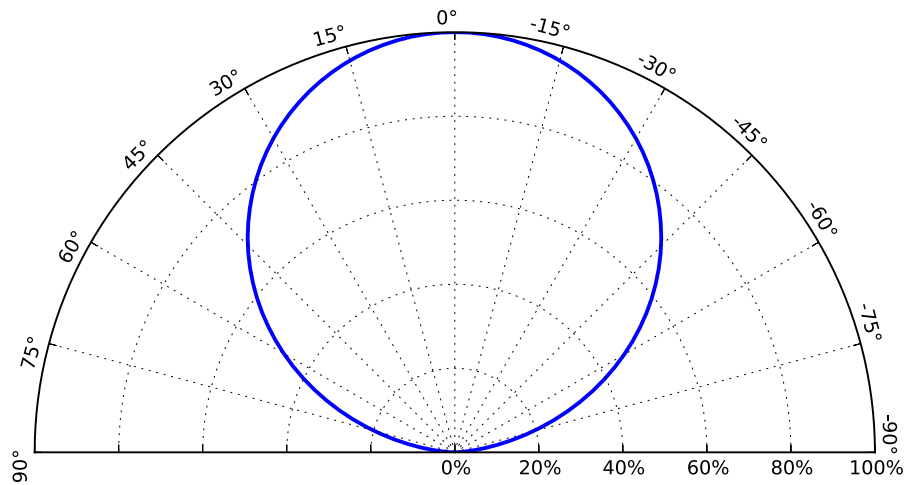


Figure 6. Typical polar radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

## Product Bin and Labeling Definitions

### Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON 5050 (Round LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B C C**

Where:

- A** - designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B** - designates color bin (example: 3=3 SDCM, 5=5 SDCM parts)
- C C** - designates forward voltage bin (example: A1, A2, B1, B2)

Therefore, a LUXEON 5050 (Round LES) with a lumen range of 600 to 650 lm, color bin of 3 and forward voltage range of 23.5 to 24.2V has the following CAT code:

**L 3 A 1**

LUXEON 5050 (Square LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B B C**

Where:

- A** – designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B B** – designates color bin: (example: 83=2700K and 3 SDCM, 35=5000K and 5 SDCM)
- C** – designates forward voltage bin (example: A, B, C, D)

Therefore, a LUXEON 5050 (Square LES) with a lumen range of 600 to 650 lm, color bin of 83 and forward voltage range of 29.0 to 30.0V has the following CAT code:

**L 8 3 A**

## Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON 5050 LEDs. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

**Table 5. Luminous flux bin definitions for LUXEON 5050, T<sub>j</sub>=25°C.**

BIN	LUMINOUS FLUX <sup>(1)</sup> (lm)	
	MINIMUM	MAXIMUM
G	400	450
H	450	500
J	500	550
K	550	600
L	600	650
M	650	700
N	700	750
P	750	800
Q	800	850
R	850	900
S	900	950
T	950	1000

**Notes for Table 5:**

1. Lumileds maintains a tolerance of ±7% on luminous flux measurements.

## Color Bin Definitions

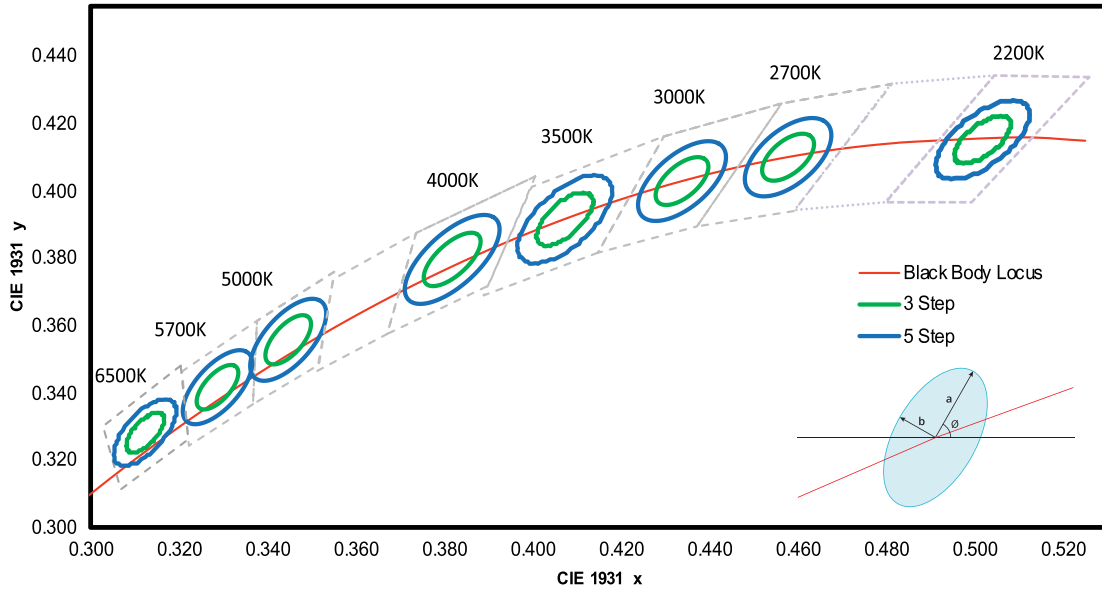


Figure 7. 3- and 5-step MacAdam ellipse illustration for hot-color targeting expected at 85°C.

Table 6. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 5050 at test current, hot-color targeted at  $T_j=85^\circ\text{C}$ .

NOMINAL CCT	COLOR SPACE	CENTER POINT <sup>(1)</sup> (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, $\theta$	LUXEON 5050 (ROUND LES) COLOR BIN CODE	LUXEON 5050 (SQUARE LES) COLOR BIN CODE
2200K	Single 3-step MacAdam ellipse	(0.5018, 0.4153)	0.00863	0.00398	49.27°	3	A3
2700K	Single 3-step MacAdam ellipse	(0.4578, 0.4101)	0.00810	0.00420	53.70°	3	83
3000K	Single 3-step MacAdam ellipse	(0.4338, 0.4030)	0.00834	0.00408	53.22°	3	73
3500K	Single 3-step MacAdam ellipse	(0.4073, 0.3917)	0.00927	0.00414	54.00°	3	63
4000K	Single 3-step MacAdam ellipse	(0.3818, 0.3797)	0.00939	0.00402	53.72°	3	53
5000K	Single 3-step MacAdam ellipse	(0.3447, 0.3553)	0.00822	0.00354	59.62°	3	33
5700K	Single 3-step MacAdam ellipse	(0.3287, 0.3417)	0.00745	0.00320	59.09°	3	23
6500K	Single 3-step MacAdam ellipse	(0.3123, 0.3282)	0.00669	0.00285	58.57°	3	13
2200K	Single 5-step MacAdam ellipse	(0.5018, 0.4153)	0.01438	0.00663	49.27°	5	A5
2700K	Single 5-step MacAdam ellipse	(0.4578, 0.4101)	0.01350	0.00700	53.70°	5	85
3000K	Single 5-step MacAdam ellipse	(0.4338, 0.4030)	0.01390	0.00680	53.22°	5	75
3500K	Single 5-step MacAdam ellipse	(0.4073, 0.3917)	0.01545	0.00690	54.00°	5	65
4000K	Single 5-step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°	5	55
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°	5	35
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°	5	25
6500K	Single 5-step MacAdam ellipse	(0.3123, 0.3282)	0.01115	0.00475	58.57°	5	15

**Notes for Table 6:**

1. Lumileds maintains a tolerance of  $\pm 0.005$  on x and y coordinates in the CIE 1931 color space.

## Forward Voltage Bins

Table 7. Forward voltage bin definitions for LUXEON 5050,  $T_j=25^\circ\text{C}$ .

PART NUMBER	BIN	FORWARD VOLTAGE <sup>(1)</sup> (V <sub>f</sub> )	
		MINIMUM	MAXIMUM
L150-xxxx502400000	A1	23.5	24.2
	A2	24.2	25.0
	B1	25.0	25.8
	B2	25.8	26.5
L150-xxxx500600000	A1	5.8	6.0
	A2	6.0	6.2
	B1	6.2	6.4
	B2	6.4	6.6
L150-xxxx5030000S0	A	29.0	30.0
	B	30.0	31.0
	C	31.0	32.0
L150-xxxx5006000S0	A	5.8	6.0
	B	6.0	6.2
	C	6.2	6.4
	D	6.4	6.6

**Notes for Table 7:**

1. Lumileds maintains a tolerance of  $\pm 0.1\text{V}$  on forward voltage measurements.

# Mechanical Dimensions

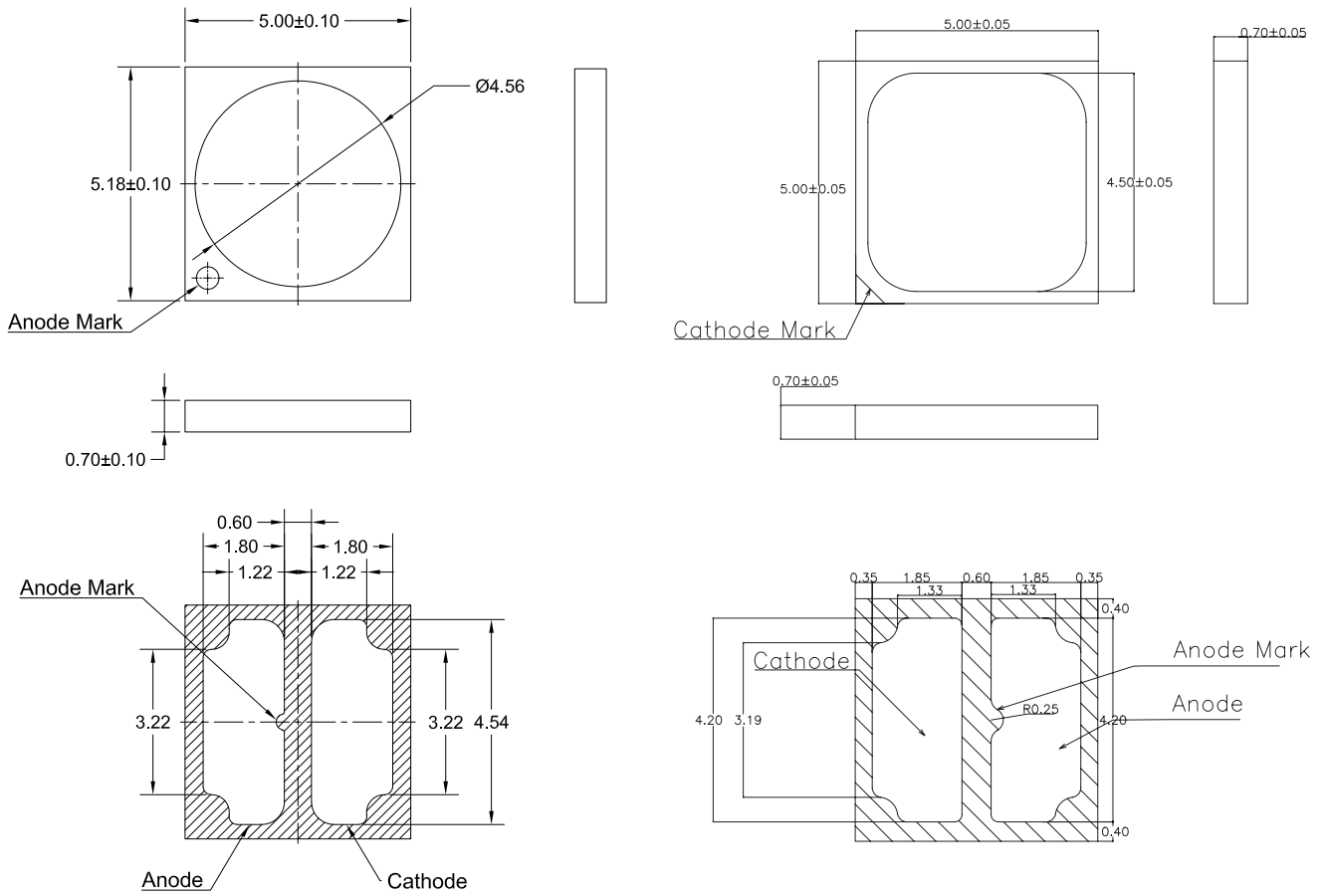


Figure 8. Mechanical dimensions for LUXEON 5050 (Round LES), left, and LUXEON 5050 (Square LES), right.

**Notes for Figure 8:**

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Reflow Soldering Guidelines

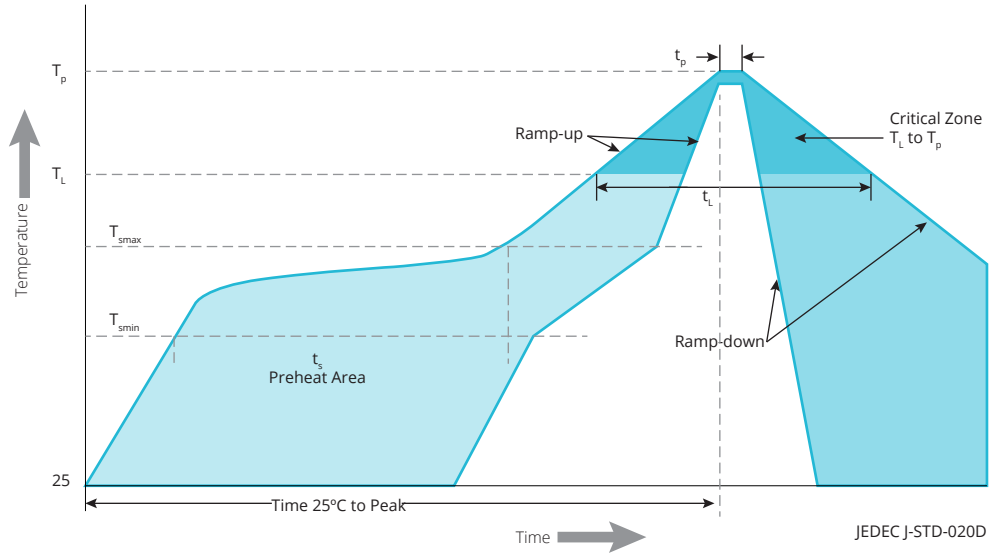


Figure 9. Visualization of the acceptable reflow temperature profile as specified in Table 8.

Table 8. Reflow profile characteristics for LUXEON 5050.

PROFILE FEATURE	LEAD-FREE ASSEMBLY
Preheat Minimum Temperature ( $T_{smin}$ )	150°C
Preheat Maximum Temperature ( $T_{smax}$ )	200°C
Preheat Time ( $t_{smin}$ to $t_{smax}$ )	60 to 180 seconds
Ramp-Up Rate ( $T_L$ to $T_p$ )	3°C / second maximum
Liquidous Temperature ( $T_L$ )	217°C
Time Maintained Above Temperature $T_L$ ( $t_t$ )	60 to 150 seconds
Peak / Classification Temperature ( $T_p$ )	260°C
Time Within 5°C of Actual Peak Temperature ( $t_p$ )	20 to 40 seconds
Ramp-Down Rate ( $T_p$ to $T_L$ )	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

## JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON 5050.

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
3	168 Hours	≤30°C / 60% RH	192 Hours +5 / -0	30°C / 60% RH



## Solder Pad Design

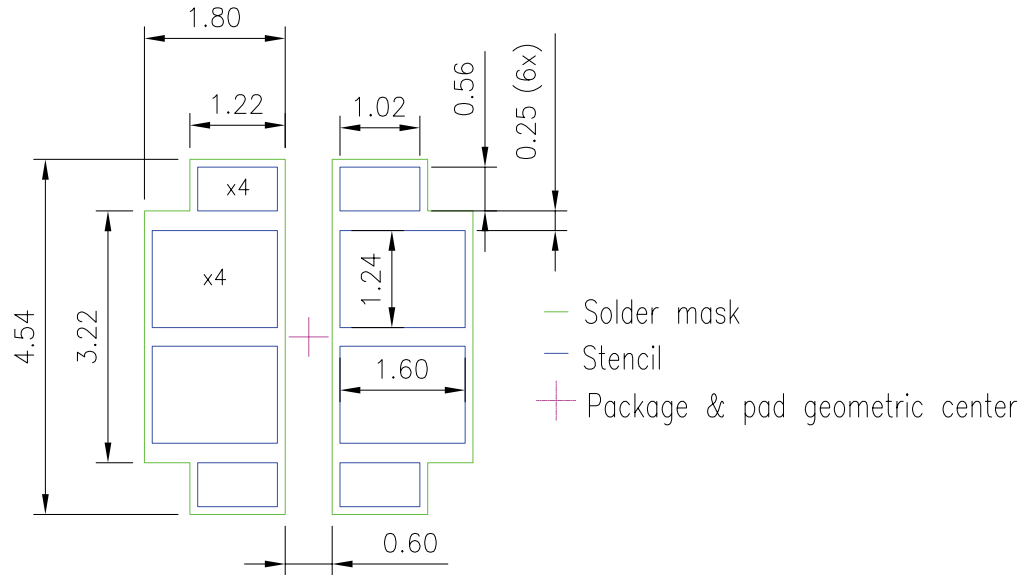


Figure 10. Recommended PCB solder pad layout for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

### Notes for Figure 10:

1. Drawings are not to scale.
2. All dimensions are in millimeters.
3. Refer to application brief [AB174](#) for additional details regarding recommended PCB layout design.

## Packaging Information

### Pocket Tape Dimensions

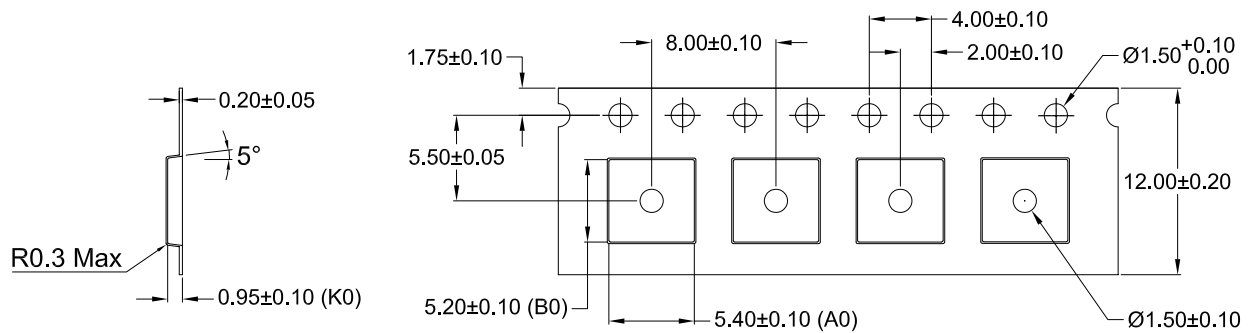
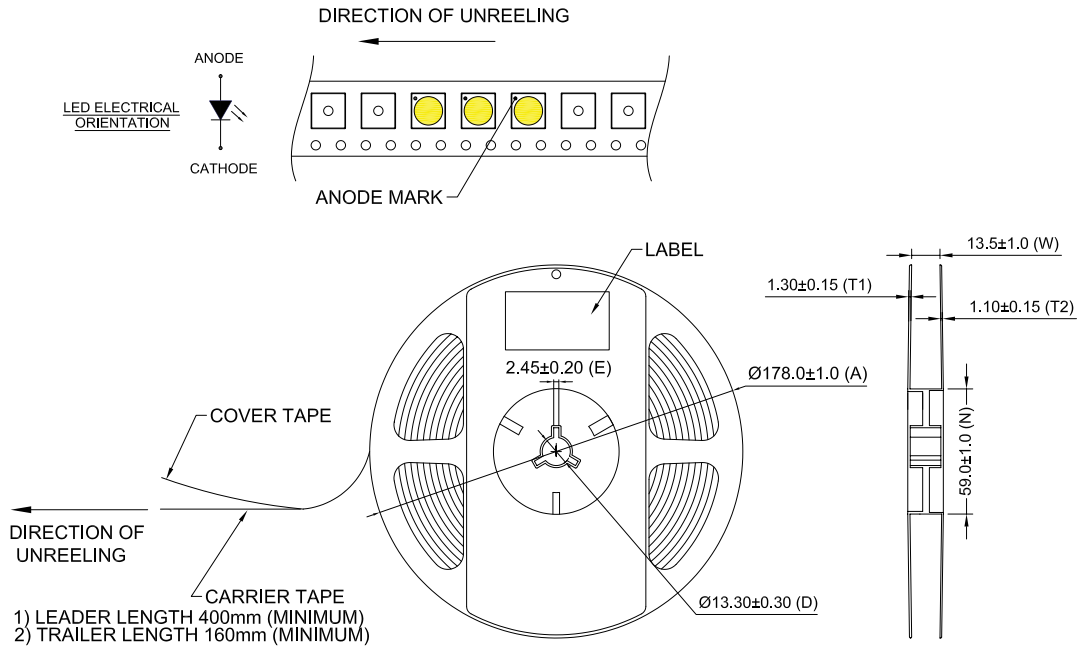


Figure 11. Pocket tape dimensions for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

### Notes for Figure 11:

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Reel Dimensions



12a. Reel dimensions for LUXEON 5050 (Round LES).

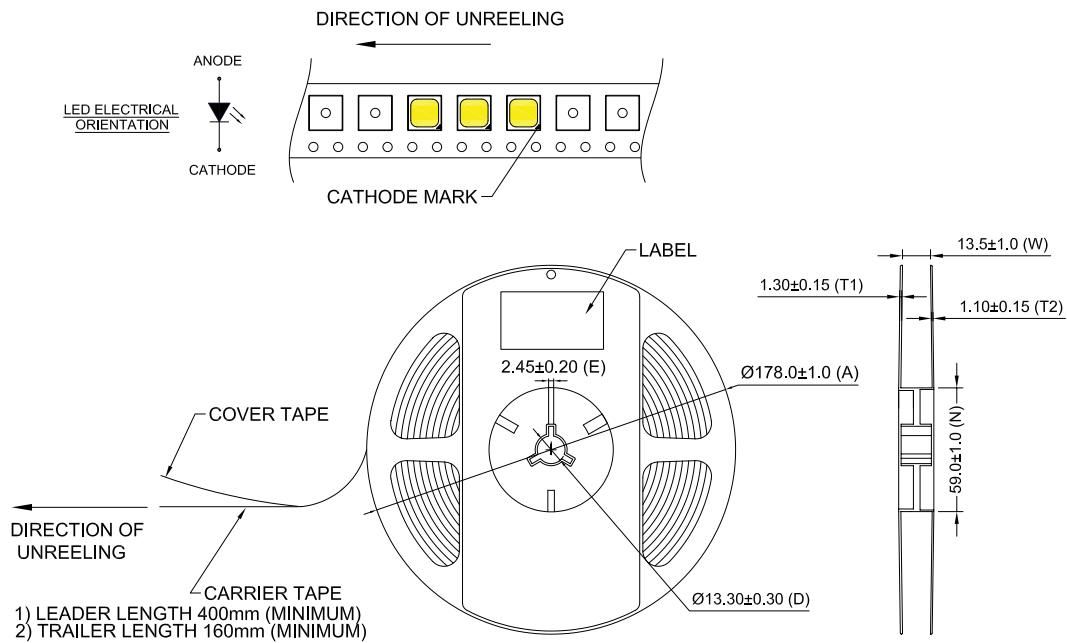


Figure 12b. Reel dimensions for LUXEON 5050 (Square LES).

Notes for Figures 12a and 12b:  
1. Drawings are not to scale.  
2. All dimensions are in millimeters.

## About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit [lumileds.com](http://lumileds.com).



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# CERTIFICATE

Issued to:  
Applicant:  
**Philips Lighting B.V.**  
High Tech Campus 45  
5656 AE Eindhoven, The Netherlands

Manufacturer/Licensee:  
**Philips Lighting B.V.**  
High Tech Campus 45  
5656 AE Eindhoven, The Netherlands

Product : LED driver  
Trade name(s) : PHILIPS  
Type(s)/model(s) : Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt,  
Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt and  
Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt

The product and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

DEKRA hereby declares that the above-mentioned product has been certified on the basis of:

- a type test according to the standard EN 61347-2-13:2014, EN 61347-1:2015, EN 62384:2006 and EN 62384:2006/A1:2009
- an inspection of the production location according to CENELEC Operational Document CIG 021
- a certification agreement with the number 947556

DEKRA hereby grants the right to use the ENEC certification mark.

The ENEC certification mark may be applied to the product as specified in this certificate for the duration of the ENEC certification agreement and under the conditions of the ENEC certification agreement.

This certificate is issued on 5 September 2017 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 31-101322

DEKRA Certification B.V.



drs. G.J. Zoetbrood  
Managing Director



Kreny Lin  
Certification Manager

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ACCREDITED BY THE  
DUTCH ACCREDITATION  
COUNCIL



**SPECIFICATION OF THE CERTIFIED PRODUCT****Product data**

Product	: LED driver
Trade name(s)	: PHILIPS
Type(s)/model(s)	: Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt, Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt and Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt
Rated voltage	: 220-240 Vac or 186-250 Vdc
Nature of supply	: AC or DC
Rated frequency	: 50/60 Hz at AC
Power factor	: 0,95
Rated input current	: 0,4-0,34 Aac or 0,48 Adc
Rated input power	: 84W
Output power	: 75 W
Max. case temperature (tc)	: 80 °C
Ambient temperature (ta)	: -40 °C...+55 °C
Temperature declared thermally protection	: 130 °C
Description	: Built-in with double/reinforced insulation

**Product data – type Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt**

Output current	: 200-700 mA
Output voltage	: 50-150 Vdc; 220 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt**

Output current	: 300-1050 mA
Output voltage	: 35-108 Vdc; 150 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt**

Output current	: 500-1500 mA
Output voltage	: 25-71 Vdc; 120 Vdc MAX (open-circuit); SELV

**TESTS****Test requirements**

EN 61347-2-13:2014  
EN 61347-1:2015  
EN 62384:2006  
EN 62384:2006/A1:2009

**Test result**

The test results are laid down in DEKRA test file 601602100.

**Additional Information**

constant current type with screwless terminal block  
LED driver is completely potted with asphalt

**Remarks**

For component list refers to annex 1 of test reports 6016021.50.

The tests were performed by the manufacturer under the conditions of the agreement concerning the manufacturer's right to conduct type tests for the KEMA-KEUR / ENEC certification system under supervision of DEKRA (CTF Stage 3).

**Conclusion**

The examination proved that all requirements were met.

**Factory location**

Philips Lighting Electronics Poland  
ul Przemysłowa 29  
64-920 Pila, Poland



## EU Declaration of Conformity

### We, Philips Lighting

I.B.R.S./C.C.R.I./Numéro 10461

5600 VB Eindhoven, The Netherlands

Internal Ref. Nr.: 2017A0064

Year in which CE Mark was first affixed: 2017

### Declare under our responsibility for the products:

Product Range:	NAME:	#1	Xi FP 75W 0.2-0.7A SNLDAE	#2	Xi FP 75W 0.3-1.0A SNLDAE	#3	Xi FP 75W 0.5-1.5A SNLDAE
	DESCRIPTION:		230V C133 sXt LED Electronic Driver		230V C133 sXt LED Electronic Driver		230V C133 sXt LED Electronic Driver
Product Code:	12NC:		9290 014 08406		9290 014 08506		9290 014 08606

### The designated products are in conformity with the essential requirements of the following European Directives and harmonized standards:

#### Low Voltage Directive (LVD), 2014/35/EU

- EN 61347-2-13:2014

#### Electromagnetic compatibility Directive (EMC), 2014/30/EU

- EN 55015:2013+A1:2015
- EN 61000-3-2:2014
- EN 61000-3-3:2013
- EN 61547:2009

#### EcoDesign requirements for energy-related products Directive (ErP), 2009/125/EC and applicable Implementing Measures

- Implementing Measure EC/1194/2012

#### Restriction of the use of certain Hazardous Substances in electrical and electronic equipment Directive (RoHS), 2011/65/EU

- EN 50581:2012

and are produced under a quality scheme at least in conformity with ISO 9001 or CENELEC permanent documents.

2017-08-31, Eindhoven

**Ms. C. Sweegers**  
Regulatory Affairs Manager LED Electronics  
High Tech Campus 45  
5656 AE Eindhoven, The Netherlands



# PHILIPS

## Xitanium

### LED driver



## Datasheet

# Xitanium FULL Prog LED Xtreme drivers

Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt

### Xitanium FULL Prog LED Xtreme drivers

Philips Xitanium Full Programmable LED drivers are specifically designed to deliver the highest performance, protection and configurability. The portfolio offers both central and standalone dimming protocols further increasing the energy savings and CO<sub>2</sub> reductions achieved with LED lighting. The Xtreme technology ensures maximum robustness and protection combined with a very long lifetime.

In this product family Philips introduces new drivers in a compact form factor with state-of-the-art features, which offer high value for both OEM customers and end-users. The products can replace the existing programmable outdoor LED drivers and will bring significant improvement in programming, assembly into a luminaire and electrical performance.

#### Benefits

- Ultimate robustness, offering peace of mind and lower maintenance costs
- Fully programmable LED-drivers designed for the new digital and connected lighting world
- Extended diagnostics via MultiOne
- Easy to design-in, configure and install for insulation Class I and Class II applications
- Energy savings through high efficiency and via multiple dimming options

#### Features

- High surge immunity (CM/DM)
- Long lifetime and robust protection against moisture, vibration and temperature
- Configurable operating windows (AOC)
- Multiple control interfaces: DALI, AmpDim, 1-step and 3-step LineSwitch
- Autonomous dimming via integrated DynaDimmer
- Adjustable thermal protection for driver (DTL, on select models) and LED module (MTP)
- Constant Light Output (CLO)
- Adjustable Start-up Time (AST)
- Adjustable Light Output (ALO)
- End-Of-Life indicator (EOL)

#### Application

- Road and street lighting
- Area lighting
- Tunnel lighting
- Industrial lighting



## Electrical input data

Specification item	Value	Unit	Condition
Rated input voltage range	202...254	V <sub>ac</sub>	Performance range
Rated input voltage	230	V <sub>ac</sub>	
Rated input frequency range	47...63	Hz	Performance range
Rated input current	0.34	A	@ rated output power @ rated input voltage
Max. input current	0.4	A	@ rated output power @ minimum performance input voltage
Rated input power	84	W	@ rated output power @ rated input voltage
Power factor	0.99		@ rated output power @ rated input voltage
Total harmonic distortion	8	%	@ rated output power @ rated input voltage
Efficiency	92.5	%	@ rated output power @ rated input voltage
Rated input voltage DC range	186...250	V <sub>dc</sub>	Performance range
Rated input current DC range	≤ 0.48	A <sub>dc</sub>	Performance range
Input voltage AC range	80...264	V <sub>ac</sub>	Safety operational range
Input frequency AC range	45...66	Hz	Safety operational range
Input voltage DC range	168...275	V <sub>dc</sub>	Safety operational range
Standby Power	0.45	W	
Isolation input to output	Double		

## Electrical output data

Specification item	Value	Unit	Condition
Regulation method	Constant Current		
Output voltage	35...108	V <sub>dc</sub>	
Output voltage max.	150	V	Maximum voltage at open load
Output current	0.07...1.05	A	
Output current min programmable	300	mA	
Output current min dimming	70	mA	
Output current tolerance	± 3	%	
Output current ripple LF	≤ 4	%	Ripple = peak / average @ < 1kHz
Output current ripple HF	≤ 4	%	
Output power	2.5...75	W	

## Electrical data controls input

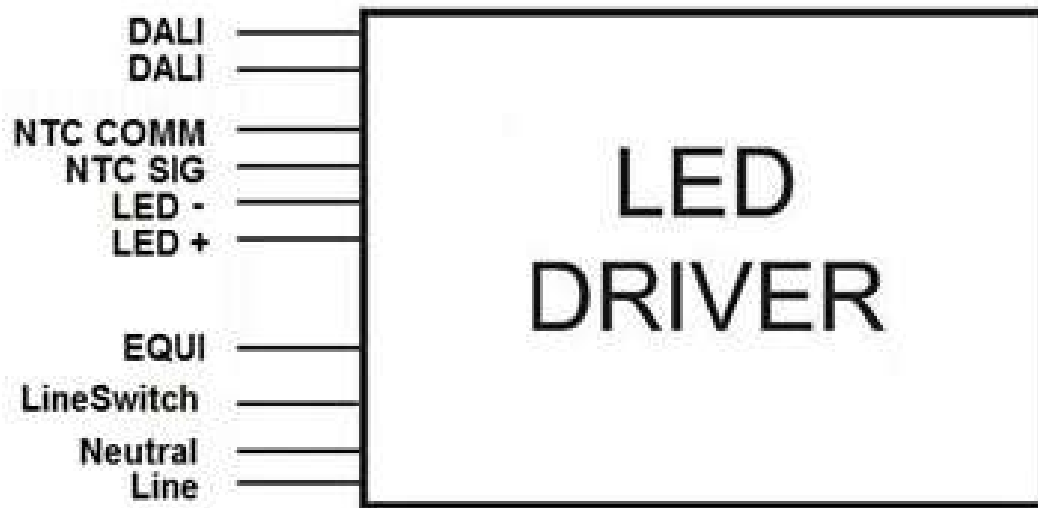
Specification item	Value	Unit	Condition
Control method	AmpDim, DALI, Dynadimmer, LineSwitch 3-step, LineSwitch single-step		Output current amplitude dimming
Dimming range	10...100	%	DALI acc. IEC62386-101, -102 Ed. 2.0; LineSwitch: Vlow: < 160Vac Vhigh: 170 ... 264Vac
Galvanic Isolation	Double		

## Logistical data

Specification item	Value
Product name	Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt
Order code	871869675569300
Logistic code 12NC	9290 014 08506
Pieces per box	12

## Wiring & Connections

Specification item	Value	Unit	Condition
Input wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Input wire strip length	8.5...9.5	mm	
Output wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Output wire strip length	8.5...9.5	mm	
Dimming wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Dimming wire strip length	8.5...9.5	mm	
Maximum cable length	600	mm	Total length of wiring including LED module, one way
Maximum NTC output cable length	0.6	m	

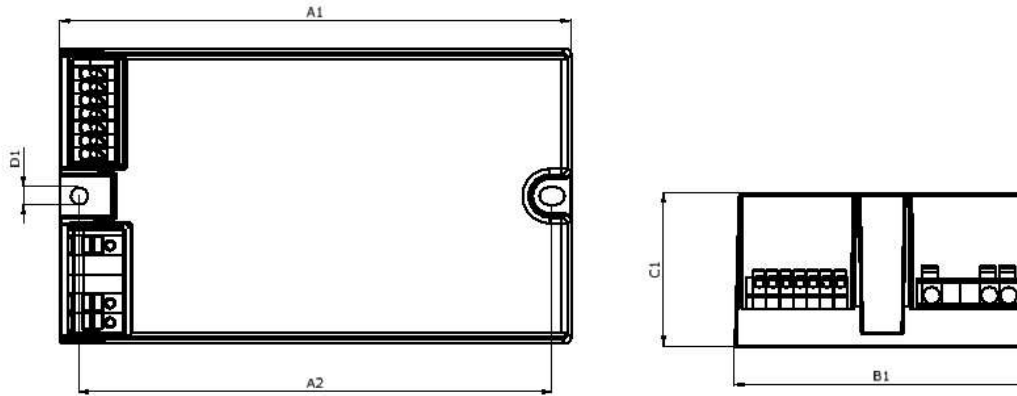


## Insulation

Insulation	Mains	EQUI	LED + NTC	LineSwitch	DALI
Mains		Double	Double	NA	Basic
EQUI	Double		Basic	Double	Double
LED + NTC	Double	Basic		Double	Double
LineSwitch	NA	Double	Double		Basic
DALI	Basic	Double	Double	Basic	

## Dimensions and weight

Specification item	Value	Unit	Condition
Length (A1)	133	mm	
Width (B1)	77	mm	
Height (C1)	40	mm	
Fixing hole diameter (D1)	4.2	mm	
Fixing hole distance (A2)	122	mm	
Weight	550	gram	



## Operational temperatures and humidity

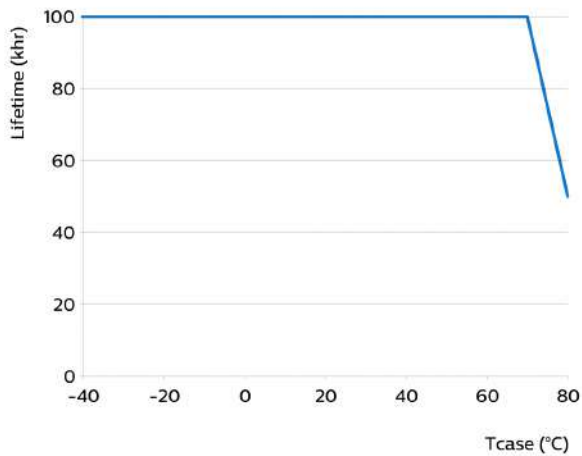
Specification item	Value	Unit	Condition
Ambient temperature	-40...+55	°C	Higher ambient temperature allowed as long as Tcase-max is not exceeded.
Tcase-max	80	°C	Maximum temperature measured at T <sub>case</sub> -point
Tcase-life	70	°C	Measured at T <sub>case</sub> -point
Maximum housing temperature	130	°C	In case of a failure
Relative humidity	10...90	%	Non-condensing

## Storage temperature and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-40...+80	°C	
Relative humidity	5...95	%	Non-condensing

## Lifetime

Specification item	Value	Unit	Condition
Driver lifetime	100,000	hours	Measured temperature at $T_{case}$ -point is $T_{case}$ -life. Maximum failures = 10%



## Programmable features

Specification item	Value	Remark	Condition
Set output current (AOC)	Programmable, SimpleSet	See Design-in guide.	Default output current: = 700 mA
LED module temperature derating (MTP)	Yes		
Driver Temperature Limit (DTL)	Yes		
Constant Lumen Over Lifetime (CLO)	Yes		
DC emergency dimming (DCemDIM)	Yes		Default: AOC = 15%. EOfx = 10 ... 60%. No external DC rated fuse required
Diagnostics	Yes		
Adjustable Light Output (ALO)	Yes		
Ampdim	Yes		
LineSwitch single-step	Yes		
LineSwitch 3-step	Yes		
Adjustable Start-up Time (AST)	Yes		
Integrated Dynadimmer	Yes		5-step, light turn-off possible
End Of Life indicator	Yes		

## Features

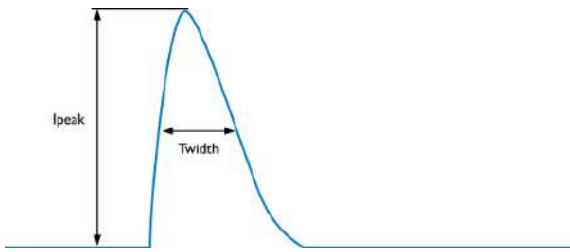
Specification item	Value	Remark	Condition
Open load protection	Yes		Automatic recovering
Short circuit protection	Yes		Automatic recovering
Over power protection	Yes		Automatic recovering
Hot wiring	No		
Suitable for fixtures with protection class	I and II		per IEC60598
Over temperature protection driver	Yes		Automatic recovering
Overheating protection	Yes		Automatic recovering

## Certificates and standards

Specification item	Value
Approval marks	CB / CCC / CE / EL / ENEC
Ingress Protection classification (IP)	20

## Inrush current

Specification item	Value	Unit	Condition
Inrush current $I_{peak}$	43	A	Input voltage 230V
Inrush current $T_{width}$	260	$\mu$ s	Input voltage 230V, measured at 50% $I_{peak}$
Drivers / MCB 16A type B	$\leq 10$	pcs	Indicative value



MCB	Rating	Relative number of LED drivers
B	4A	25%
B	6A	40%
B	10A	63%
B	13A	81%
B	16A	100% (stated in datasheet)
B	20A	125%
B	25A	156%
B	32A	200%
B	40A	250%
C	4A	42%
C	6A	63%
C	10A	104%
C	13A	135%
C	16A	170%
C	20A	208%
C	25A	260%
C	32A	340%
C	40A	415%

## Driver touch current / protective conductor current

Specification item	Value	Unit	Condition
Typical touch current (ins. Class II)	0.28	mA peak	Acc. IEC61347-1. LED module contribution not included
Typical protective conductor current (ins. Class I)	0.2	mA rms	Acc. IEC61347-1. LED module contribution not included

## Surge immunity

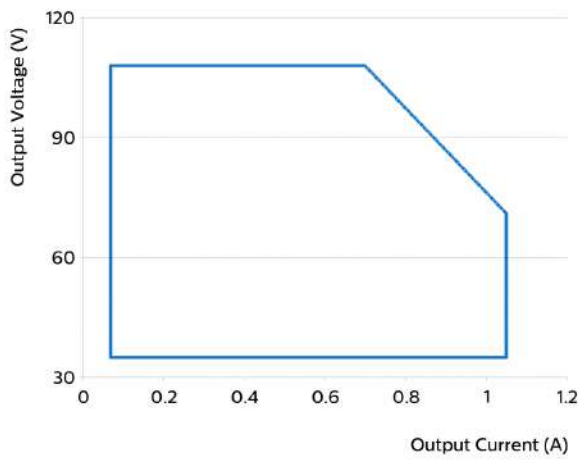
Specification item	Value	Unit	Condition
Mains surge immunity (diff. mode)	6	kV	L-N, Ls-L, Ls-N, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Mains surge immunity (comm. mode)	10	kV	L/N/Ls - EQUI 10kV acc. EN61547; 8kV acc. IEC61000-4-5, 12 Ohm 1.2/50us,8/20us
Control surge immunity (diff. mode)	0.9	kV	DALI, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Control surge immunity (comm. mode)	6	kV	DALI - EQUI acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us
DALI surge immunity (comm. mode)	6	kV	DALI - L/N/Ls acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us

### Additional information

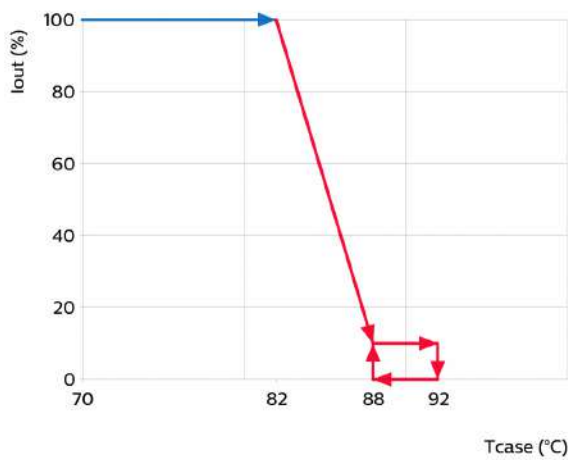
Specification item	Default setting	Remark	Condition
AOC	700	mA	
LineSwitch	ON		
CLO	OFF		
MTP	OFF		
Dynadimmer	OFF		
EOL	OFF		

### Graphs

#### Operating window

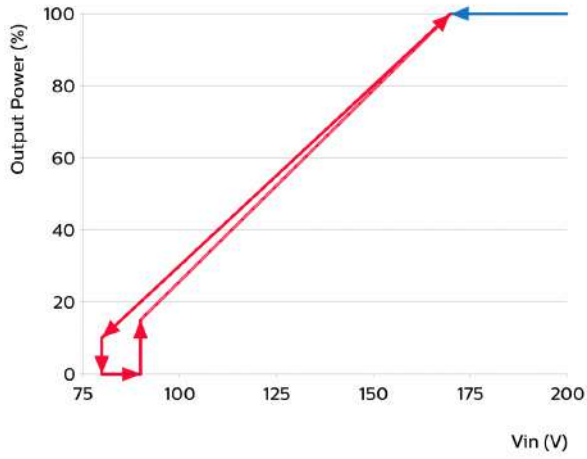


#### Thermal Guard



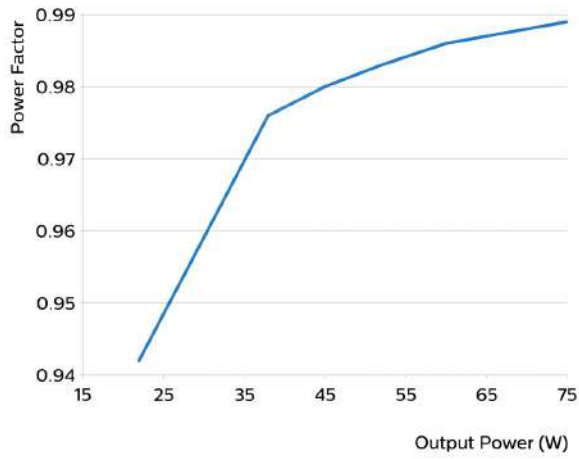
## Mains Guard

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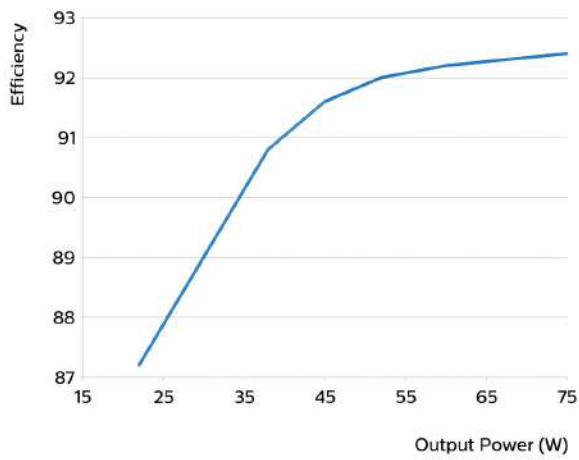
## Power factor versus output power

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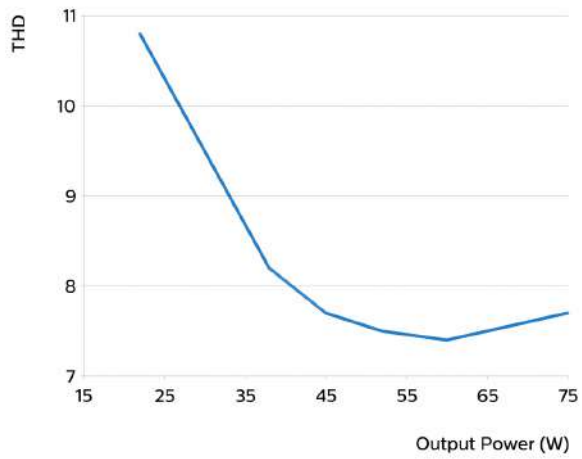
## Efficiency versus output power

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## THD versus output power

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Date of release: June 25, 2019 v4


[www.philips.com/oem](http://www.philips.com/oem)



## **2.5 Materiales de las luminarias**

Informe de ensayo en relación con el material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda.

### **a. Luminaria modelo funcional**

 Relva, 27 A - Torneiros 36410 PORRIÑO - Pontevedra Tel. +34 986 344 000 Fax. +34 986 337 302 e-mail: aimen@aimen.es www.aimen.es C.I.F. G - 36.606.291	Nº Informe Report No.	1142147.2.3	Página Page	1 de 1 1 of 1
	Cliente Customer	IMQ TECNOCREA SL C/ Sèquia de Benàger, P.I.Alquería de Moret 23 - 46210 PICANYA - Valencia (España)		

<b>Datos de la muestra</b> Sample data		Fecha de recepción Receipt date	23.12.2020	Fecha de pedido Receipt date of order	17.12.2020
Descripción Description		Carcasa de aluminio Aluminium housing		Pedido Order	ACEPTACIÓN OFERTA
Id. AIMEN Id. AIMEN		†Referencia del Cliente †Customer's reference			
1142147-B		Luminaria Milan. Luminaria Grupo Benito/Novatilu			

<b>Ensayo de Tracción</b> Tensile Test		Condiciones de ensayo Test conditions		UNE-EN ISO 6892-1:2020 A224				Fecha de ensayo Date of test		11.01.2021	
Id.	Probeta / Specimen			R <sub>p0.2</sub> (MPa)	R <sub>p1</sub> (MPa)	R <sub>eH</sub> (MPa)	R <sub>m</sub> (MPa)	A (%)	Z (%)		
	Orientación Orientation	Tipo Type	Dimensiones Size (mm)								
1142147-B	TRANSVERSAL A LA MUESTRA TRANSVERSE TO THE SAMPLE	P	12,458 x 2,252	185	---	---	242	*1,1	---		
Incertidumbre k=2 Uncertainty				0,053·R <sub>p0.2</sub>	0,053·R <sub>p1</sub>	0,053·R <sub>eH</sub>	0,030·R <sub>m</sub>	0,13·A	0,095·Z		
Observaciones Remarks		*La elongación porcentual tras la rotura se obtiene mediante el extensómetro MTS 50mm N <sup>o</sup> HMEDEX_007 (31030/7-08) *The percentage elongation after breakage is obtained by means of the MTS 50mm extensometer N <sup>o</sup> HMEDEX_007 (31030/7-08)									
Leyenda Legend		R <sub>p0.2</sub> : Limite elástico a 0,2% de deformación / 0,2% offset yieldstrength. R <sub>p1</sub> : Limite elástico a 1% de deformación / 1% Offset yieldstrength. R <sub>eH</sub> : Limite superior de cedencia / Upperyieldstrength.			R <sub>m</sub> : Resistencia a tracción / Tensilestrength. A: Alargamiento tras la fractura / Elongationafter fracture. Z: Coeficiente de estricción / Reduction of area.		Orientación / Orientation: L: Longitudinal. T: Transversal. Z: Perpendicular al espesor / Through thickness. A: All Weld.		Probeta tipo / Specimentype: P: Prismática / Flat. C: Cilíndrica / Round. T: Tubocompleto / Tube complete. B: Banda de pared de tubo / Strip of tubewall.		

<b>Análisis químico</b> Chemical Analysis										Fecha de ensayo Date of test		14.01.2021	
Muestra Sample		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Pb#	Sn#	Al
B	% peso wt %	11,10	0,947	0,703	0,334	0,507	<0,028	<0,04	0,777	<0,02	0,036	0,015	Matriz Matrix
	Incert. Uncert.	0,36	0,031	0,030	0,017	0,028	----	----	0,075	----	----	----	----
Método de ensayo Test method		B	B	B	B	B	B	B	B	B	B	B	----
<b>Técnicas de análisis</b> Analysis techniques													
<p>A) Absorción infrarroja tras combustión en horno de inducción: Procedimiento A/PE/AFM.Q/09. / Infrared absorption after induction furnace combustion: Procedure A/PE/AFM.Q/09.</p> <p>B) Espectrometría de emisión por chispa en aleación de aluminio: Procedimiento A/PE/AFM.Q/08 / Spark Emission Spectrometry in aluminium alloy: Procedure A/PE/AFM.Q/08</p> <p>C) Conductividad térmica tras fusión en corriente de gas inerte: Procedimiento A/PE/AFM.Q/11. Thermal conductivity after melting in an inert gas stream: Procedure A/PE/AFM.Q/11.</p> <p>D) ICP-OES: Procedimiento A/PE/AFM.Q/03 / ICP-OES: Procedure A/PE/AFM.Q/03</p>													
Observaciones Remarks		<p>*La composición química de la muestra analizada es característica de una aleación de aluminio EN 1706 EN AC-47100, pero las concentraciones de magnesio (Mg) Y cinc (Zn) están por encima de las indicadas en la norma. *Chemical composition of the sample analyzed is similar to an EN 1706 EN AC-47100 aluminum alloy, but the elements: magnesium (Mg) and zinc (Zn) don't fulfill the values indicate in the standard.</p> <p>La declaración de conformidad está basada en el criterio de aceptación simple según la guía ILAC G8, con una probabilidad de aceptación o rechazo falsos inferior al 50% The statement of conformity is based on the simple acceptance criterion according to the ILAC G8 guide, with a false acceptance or rejection probability of less than 50%".</p>											

Porriño, 16 de febrero de 2021  
Porriño, 16<sup>th</sup> February 2021


Jorge Delgado Guirao  
Coordinador de Análisis Metalográfico y Químico  
Head of Metallography and Chemical Analysis

Agustín Paz Gestoso  
Responsable de Ensayos y Análisis  
Testing and analysis manager

Mauricio Ruibal Acuña  
Coordinador de Ensayos Mecánicos y END  
Mechanical Testing and NDT Coordinator

**Este informe anula y sustituye a nuestro informe nº 1142147.2.2 de fecha 8 de febrero de 2021**  
**This report supersedes our report no. 1142147.2.2 dated 8th February, 2021**

Descripción de los cambios / Description of changes.  
Modificación para incluir la clasificación de la aleación por solicitud del cliente. / Modification to include alloy classification as requested by the customer.

 Las actividades marcadas con # no están amparadas por la acreditación de ENAC Activities marked with # are not included in the scope of accreditation	Los resultados reflejados en este informe se refieren únicamente a la(s) muestra(s) reseñada(s). La información acompañada del superíndice † ha sido facilitada por el cliente, por lo tanto AIMEN no puede asumir responsabilidades sobre su veracidad. Este informe no podrá ser reproducido parcialmente sin la autorización escrita de AIMEN. The information market with the superscript † has been provided by the client, therefore AIMEN cannot assume responsibility for its veracity. This report may not be reproduced except in full without the written authorisation of AIMEN. The English version is a translation. In case of doubt, the Spanish text of this report is valid.

## DECLARACIÓN DE CONFORMIDAD Equipos Alumbrado Público BENITO NOVATILU

**BENITO URBAN SLU**, como fabricante de luminarias, de módulos LED, de protectores de sobretensión, y suministrador de fuentes de alimentación y sistemas de control y regulación, con domicilio social en c/ Lleida, 10 de 08500 VIC (Barcelona – España), con CIF B 59.987.529 y miembro del grupo BENITO NOVATILU.

DECLARA:

Que todas las luminarias del grupo BENITO NOVATILU están fabricadas en aluminio de alta pureza y cumplen con los requerimientos de una aleación de aluminio EN AC-44100 según Norma Europea EN 1706.

Y para que así conste, se expide este documento.

Vic, 4 de febrero de 2022.



**BENITO URBAN S.L.U**  
C.I.F. E3 859 987 529

**Lighting Department**  
Albert de Ramos Pons

### 3 Informe de Pruebas o Certificados de la Luminaria.

#### 3.1 Tabla Verificación (Anexo 4) CEI – IDAE

Informe de Pruebas o Certificados emitidos por el fabricante de la luminaria o entidad OEC acreditada	
1	Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes. (Propio de la empresa)
2	Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4.
3	Ensayo colorimétrico de la luminaria según la Norma UNE EN 13032-4.
4	Ensayo de medidas eléctricas: tensión, corriente de alimentación, potencia nominal leds y potencia total consumida por luminaria con todos sus elementos integrantes y factor de potencia. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.



**FABRICANTE:** **BENITO URBAN, SLU**  
**MANUFACTURER:** C/ Lleida 10 08500 Vic (Barcelona) – Spain  
Tel.: (+34) 93 852 1000

Certificamos y declaramos bajo nuestra responsabilidad que el siguiente producto:  
*We certify and declare under our responsibility that the following product:*

**Marca:** **BENITO**  
**Brand:** **NOVATILU**

**Modelo:** Luminaria Vial **MILAN XS – MILAN S – MILAN M – MILAN XL – MILAN XXL**  
**Model:** Functional Lighting **ALMSXL – ALMSL – ALML – ALMXLL – ALMXXLL**

Está conforme a las siguientes directivas y normativas:  
*It is according to the following directives and norms:*

UNE-EN-61000-3-2:2006+A1:2010+A2:2010  
UNE-EN-61000-3-3:2009  
UNE-EN-61547:2011  
UNE-EN-55015:2007+A1:2008+A2:2009

Compatibilidad electromagnética (CEM).  
- Límites emisiones corrientes armónicas  
- Limitación variación tensión y flicker en redes públicas  
- Requisitos de Inmunidad  
- Límites perturbación radioeléctrica  
*Electromagnetic compatibility (EMC).*  
*-Limits harmonic current emissions*  
*-Limiting voltage variation and flicker in electrical networks*  
*-Immunity requirements*  
*-Limits radio electrical disturbance*

UNE-EN-60598-2-3:2003+A1:2011  
UNE-EN-60598-1:2015  
UNE-EN-62262  
UNE-EN-62471  
UNE-EN-62031:2009  
IEC 62722-1:2014  
IEC 62722-2-1:2014  
IEC 62717:2014

Luminarias Alumbrado Público  
- Requisitos generales y ensayos  
- Grado protección contra impactos (IK)  
- Seguridad Fotobiológica  
- Módulos LED. Requisitos de seguridad  
- Características de funcionamiento de luminarias. Requisitos generales.  
- Requisitos particulares para luminarias LED.  
- Módulos LED para iluminación general. Requisitos de funcionamiento.  
*Street Lighting Luminaires*  
*- General requirements and tests*  
*- Degrees of protection mechanical impacts (IK)*  
*- Photobiological safety*  
*- LED Modules. Safety requirement*  
*- Characteristics of operation of accessories. General requirements*  
*- Specific requirements for LED lighting.*  
*- LED modules for general lighting. Operating requirements.*

**Fecha de emisión:** Enero 2021  
**Issued on:** *January 2021*

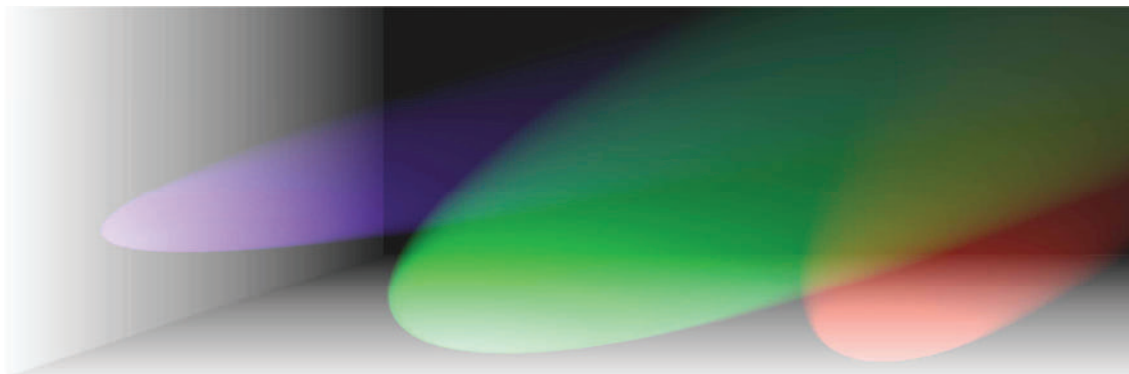
**Firmado:**  
**Signed:**



**Jordi Puig Rovira**  
Ingeniero Técnico Telecomunicación (col. 903055)  
Design & Engineering - Lighting Department

Los ensayos marcados con \* no están amparados por la acreditación ENAC

# INFORME DE ENSAYO



## **Asselum luminotècnics, SL**

Polígono Industrial Can Roqueta  
C/ Ca n'Alzina 76 08202 Barcelona

Tel - Fax: 93.725.98.10

[www.asselum.com](http://www.asselum.com)

**Cliente:** Novatilu, S.L.U.

**Dirección:** Via Ausetània, 11, 08560 Manlleu,

**Provincia:** Barcelona

**País:** España

**Teléfono:** 961 40 10 00

**Nombre muestra<sup>1</sup>:** MILAN S

**Código muestra<sup>1</sup>:** ALMS40AE3

**Nº muestra:** RM19121801

**Fecha del ensayo:** 18/12/2019

**Código de ensayo:** CL043A19D004VP

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

Informe revisado:



**Marc Ballbè**

**Director técnico**

Los resultados obtenidos en el presente informe se refieren únicamente a la muestra ensayada conforme en el apartado 1.1.No se podrá reproducir total o parcialmente el informe sin el consentimiento de **ASELUM assessorsluminotècnics, S.L.** La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa.

Cualquier impresión del presente informe será considerada como una copia del mismo.  
**Assessors luminotècnics, SL Pol. Ind. Can Roqueta C/. Ca n'Alzina, 76 - 08202 Sabadell Barcelona 225**  
Tel. 93 725 98 10 [www.asselum.com](http://www.asselum.com)

## ÍNDICE DEL INFORME

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## 1. Descripción de la muestra y del ensayo

### 1.1. Ficha técnica del producto

Tipo	Luminária
Código Producto <sup>1</sup>	ALMS40AE3
Nombre <sup>1</sup>	MILAN S
Dimensiones [mm]	450 x 250 x 80
Área luminosa [mm]	95 x 95 x 0
Tipo fuente de luz	LED
Flujo luminoso[Im]	5641
Potencia del conjunto[W]	41
Eficacia luminosa[Im/W]	137,6

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

#### 1.1.1. Imagen de la muestra

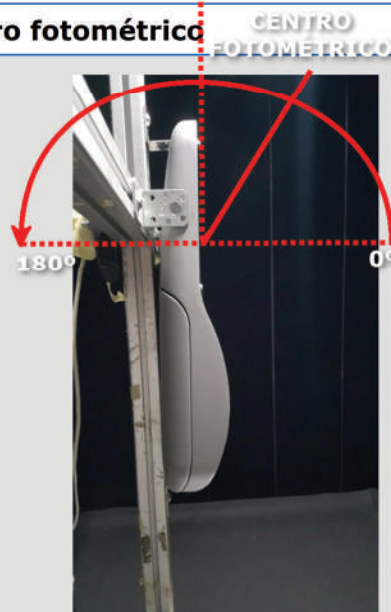
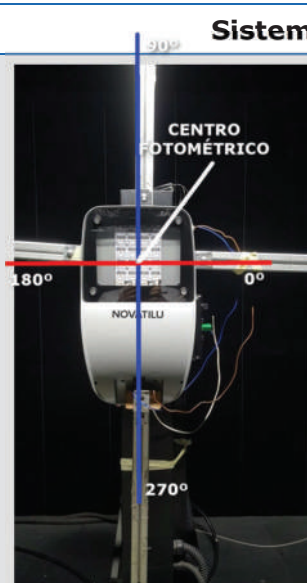




## 1.2. Ficha del ensayo

Normas de referencia	UNE-EN 13032-4:2016 EN 13032-4: 2015 CIE S 025: 2015 CIE 34:1977 CIE 52:1982 CIE 117:1995 IES TM-15:07
Sistema de medición	C- $\gamma$ , $C = \Delta 15^\circ, G = \Delta 2,5^\circ$

### Sistema de referencia y centro fotométrico



## 1.3. Parámetros del test eléctrico

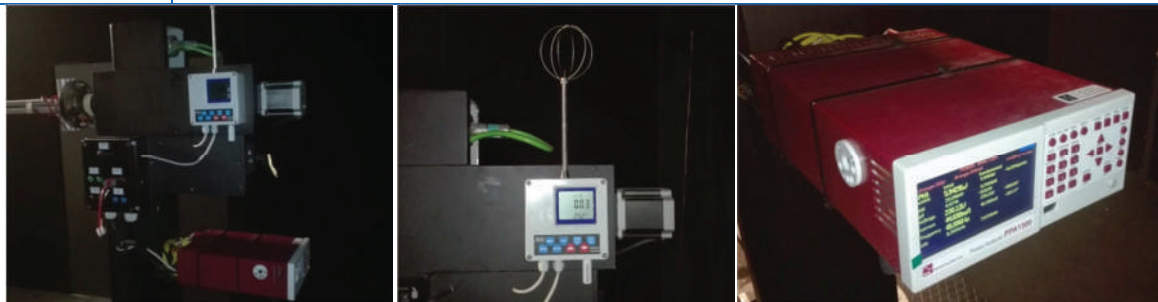
Tipo de alimentación	Fuente estabilizada
Alimentación eléctrica	230V AC $\pm$ 0,2%
Distorsión armónica	< 0,5%
Frecuencia	50 Hz $\pm$ 0.1%

## 1.4. Condiciones ambientales

Temperatura del laboratorio [°C]	25°C $\pm$ 1°C
Humedad relativa	<60%
Movimiento del aire	< 0,25 m/s

## 1.5. Instrumentos utilizados

Goniofotómetro	<p>Goniofotómetro T2 de rotación de la luminaria acuerdo con las normas y recomendaciones:</p> <ul style="list-style-type: none"> <li>❖ EN 13032-1 2005 cap. 6.1.1.1 – tipo de goniofotómetro 1.1, 1.2 y 1.3</li> <li>❖ Recomendación CIE 121 Cap.5 Tipo 1 y 2</li> </ul> <p>Nº identificativo: E-001 Distancia de medición: 6,44 m</p>
Posición de ensayo de la muestra	El ensayo se realiza con la muestra en posición en horizontal y se aplica un factor de corrección entregando el resultado en función de la posición de diseño.
Fuente de alimentación	Fuente de alimentación AC ET-System modelo EAC-S-1000 Nº identificativo: E-019
Multímetro	MULTIMETRO NEWTON 4TH. MODELO PPA 1510 Nº identificativo: E-020
Luxómetro	Luxómetro CZIULA&GRUNDMANN Nº identificativo: E-003
Anemómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Termómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Espectroradiómetro	JETI SPECOS 1201 Nº identificativo: E-007
Termómetro	TERMOMETRO DIGITAL PCE-T 390 Nº identificativo: E-018



## 2. Parámetros eléctricos medidos

### 2.1. Medición del conjunto

Tensión de alimentación [V]	230,2
Intensidad [A]	0,180
Potencia [W]	41
Factor de potencia	0,98
Intensidad Modulo Led [mA]	796

### 3. Observaciones

- Queda prohibida la reproducción parcial de este documento.
- Este Informe no puede presentar enmiendas o raspaduras, en caso contrario será considerado nulo.
- La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa, en la instrucción técnica IT10 de ASSELUM.

### 4. Resultados del ensayo de fotometría

## 4.1. Resumen

### Luminaria

Código ALMS40AE3  
Nombre MILAN S

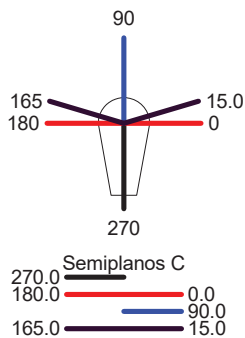
### Ensayo

Código CL043A19D004VP  
Nombre MILAN S

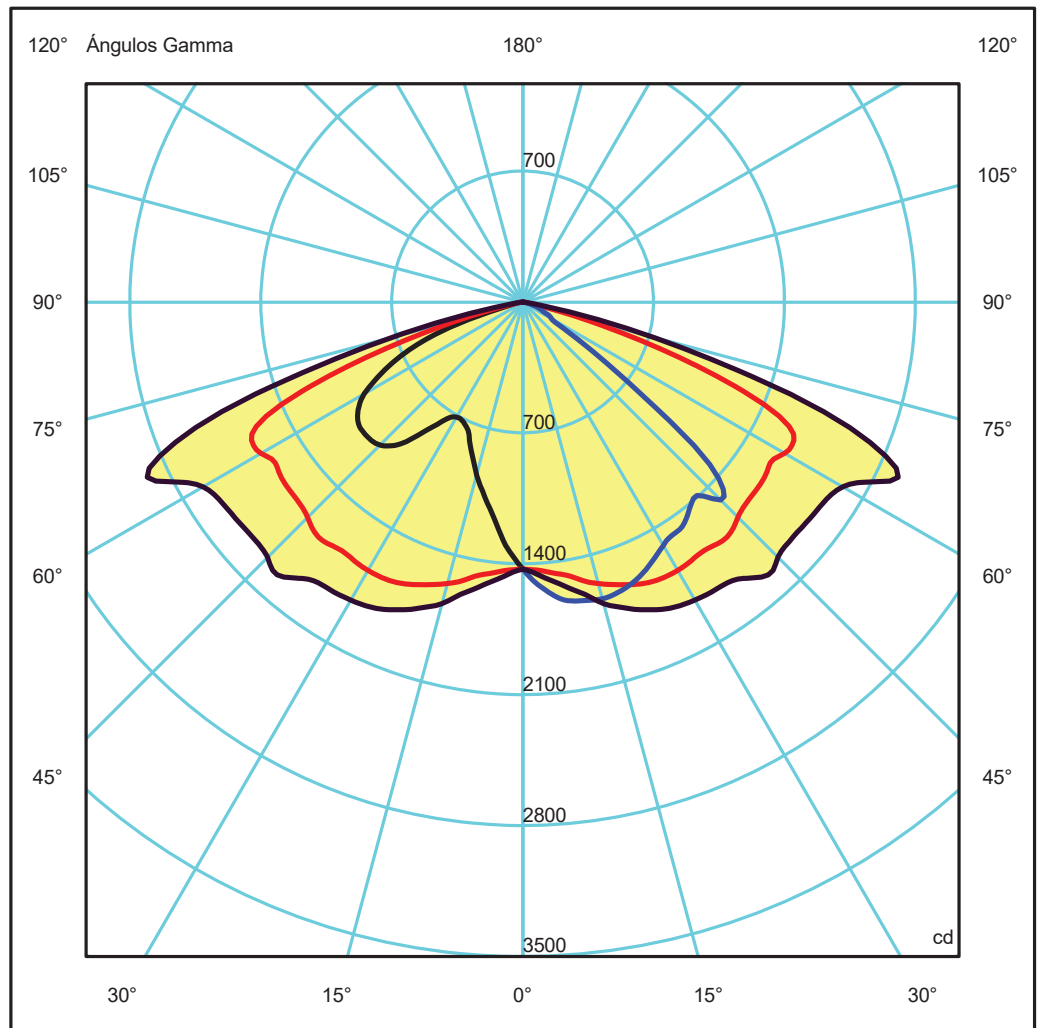
Flujo Luminaria	5343.62 lm	Potencia luminaria	41.00 W	Eficacia	130.33 lm/W	Eficiencia	100.00%
Flujo Fuentes	5343.62 lm	Valor Máximo	2215.78 cd	Posición	C=15.00 G=65.00	CG Sim. en los planos 270-90	
Luminaria Rectangular		Longit.	450 mm	Anchura	250 mm	Altura	80 mm
Área Luminosa Rectangular		Longit.	95 mm	Anchura	95 mm	Altura	0 mm
Área Luminosa Horizontal	0.009025 m2			Área Emisión sobre Pl. 180°	0.000000 m2		
Área Emisión sobre Pl. 0°	0.000000 m2			Área Emisión sobre Pl. 270°	0.000000 m2		
Área Emisión sobre Pl. 90°	0.000000 m2			Área de deslumbramiento a 76°	0.002183 m2		
Sist. de Coorden.		CG viales			Tipo de Simetría	Sim. en los planos 270-90	
Fecha		18-12-2019			Máximo Ángulo Gamma	180	
Distancia de Ensayo		6.44			Flujo de Ensayo	5343.62 lm	
Operador		Asselum T2			Tensión Nominal	230.20 V	
Temperatura		25.20 °C			Corriente Nominal	0.18 A	
Humedad		38.10 %			Fotocélula	Prc	
Notas		RM19121801					

### Lámparas de la Luminaria

Familia	Código	Nombre	Flujo [lm]	Pot. [W]	Cant.
	5050	Lumiled	5343.62	41.00	1
C.I.E.	41 79 98 100 100		D DIN 5040	A30	



ULOR 0.08 %  
DLOR 99.92 %  
RN 0.08 %



## 4.2. Matriz de intensidades (Cd)

**Luminaria**  
 Código ALMS40AE3  
 Nombre MILAN S  
**Ensayo**  
 Código CL043A19D004VP  
 Nombre MILAN S

Flujo Luminaria	5343.62 lm	Potencia luminaria	41.00 W	Eficacia	130.33 lm/W	Eficiencia	100.00%
Flujo Fuentes	5343.62 lm	Valor Máximo	2215.78 cd	Posición	C=15.00 G=65.00	CG	Sim. en los planos 270-90

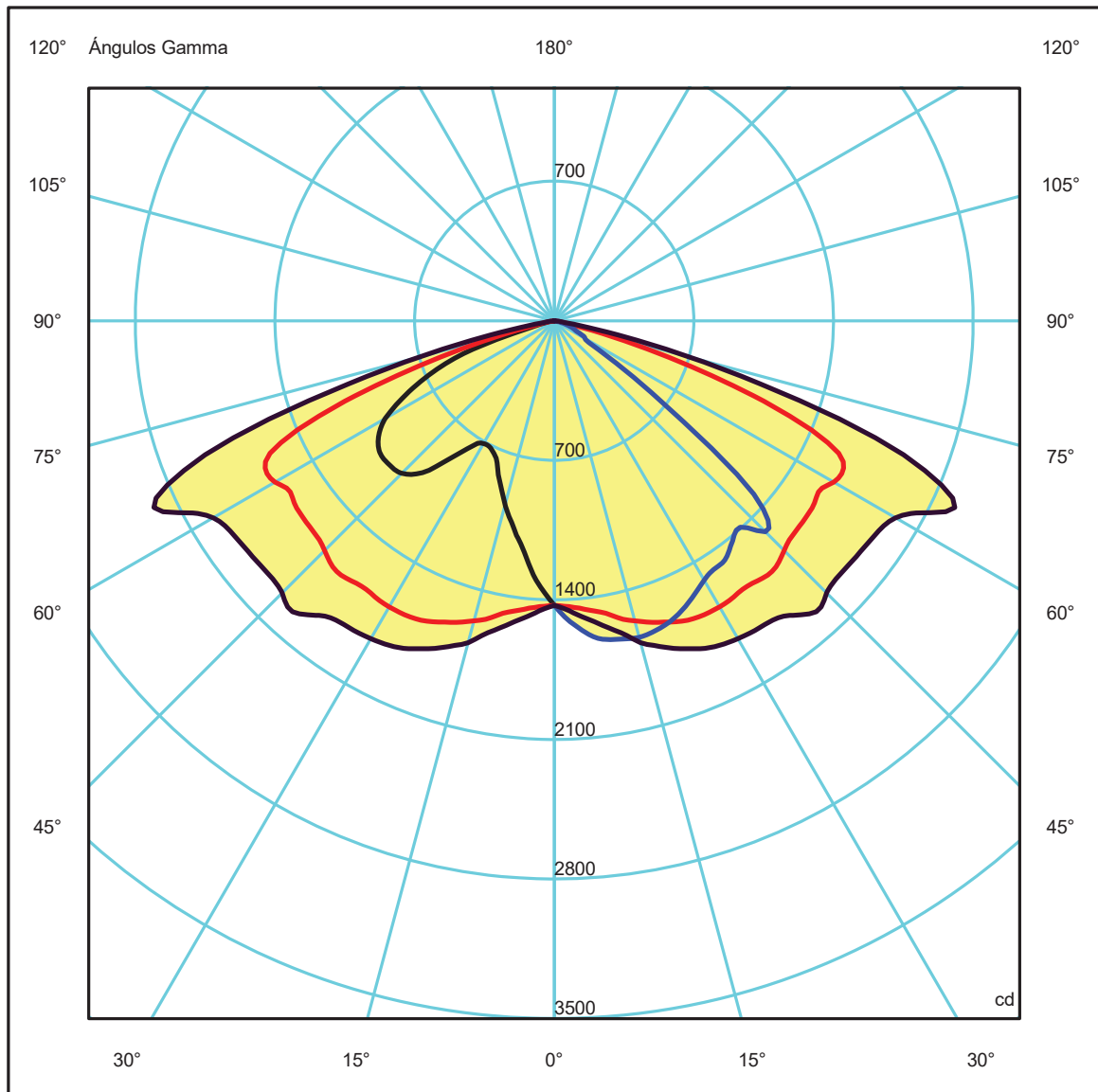
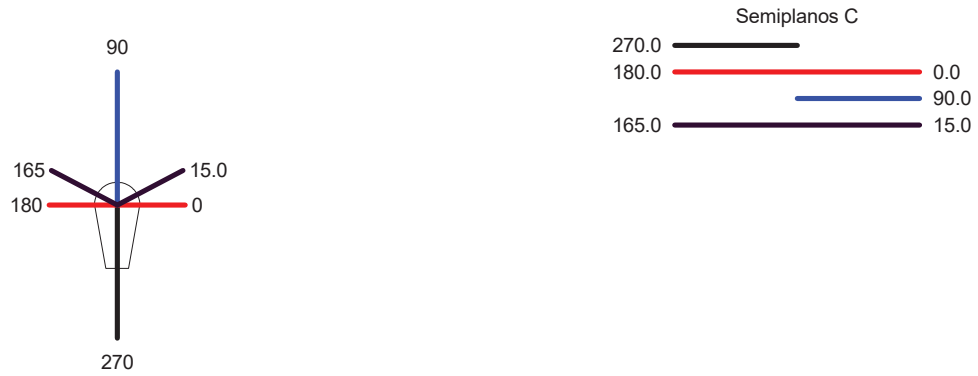
Tabla de Intensidad Luminosa cd Tabla 1/1

	C 270.00	C 285.00	C 300.00	C 315.00	C 330.00	C 345.00	C 0.00	C 15.00	C 30.00	C 45.00	C 60.00	C 75.00	C 90.00
G 0.0	1427	1427	1427	1427	1427	1427	1427	1427	1427	1427	1427	1427	1427
G 2.5	1352	1346	1358	1362	1388	1409	1434	1450	1474	1493	1505	1500	1499
G 5.0	1267	1261	1288	1311	1355	1400	1446	1486	1527	1547	1561	1565	1555
G 7.5	1166	1167	1224	1265	1326	1399	1466	1521	1575	1599	1605	1629	1603
G 10.0	1092	1099	1152	1227	1300	1406	1490	1563	1625	1646	1636	1662	1623
G 12.5	1020	1028	1089	1182	1285	1417	1529	1609	1674	1699	1664	1682	1634
G 15.0	956	963	1024	1128	1272	1424	1558	1670	1717	1734	1689	1694	1643
G 17.5	881	885	960	1074	1257	1433	1585	1710	1761	1766	1709	1705	1637
G 20.0	821	821	900	1019	1236	1443	1608	1749	1795	1795	1723	1705	1624
G 22.5	756	766	833	953	1209	1449	1632	1780	1824	1827	1736	1701	1602
G 25.0	726	744	761	869	1173	1449	1648	1810	1856	1854	1749	1687	1571
G 27.5	709	735	743	819	1124	1437	1655	1829	1885	1882	1757	1674	1536
G 30.0	710	741	725	784	1051	1418	1656	1840	1905	1912	1760	1654	1502
G 32.5	732	762	721	746	983	1376	1653	1849	1919	1935	1763	1646	1480
G 35.0	799	820	731	713	898	1339	1644	1854	1934	1943	1770	1655	1476
G 37.5	878	907	770	691	835	1306	1651	1871	1965	1946	1794	1669	1444
G 40.0	977	991	815	679	764	1278	1664	1925	2019	1962	1797	1638	1403
G 42.5	1043	1045	865	673	704	1217	1656	1965	2045	1993	1781	1586	1402
G 45.0	1081	1075	916	673	632	1159	1628	1930	2017	1995	1780	1570	1496
G 47.5	1096	1083	933	674	547	1102	1608	1916	2002	1969	1817	1646	1441
G 50.0	1099	1080	926	670	470	1039	1604	1916	1984	1974	1911	1661	1195
G 52.5	1099	1065	905	657	407	974	1600	1921	1982	1991	1918	1442	736
G 55.0	1078	1035	873	633	372	868	1592	1927	2011	2045	1769	1065	445
G 57.5	1040	994	830	594	343	795	1579	1940	2058	2117	1472	655	226
G 60.0	979	919	789	566	314	746	1617	1976	2120	2092	854	301	177
G 62.5	876	825	737	537	285	640	1630	2083	2148	1920	291	188	161
G 65.0	766	719	687	504	254	358	1572	2216	2186	1659	171	170	124
G 67.5	640	563	613	447	232	180	1339	2058	1953	1057	152	142	106
G 70.0	496	407	519	372	203	120	968	1713	1476	387	131	104	86
G 72.5	260	208	390	281	167	85	581	1184	553	156	96	85	65
G 75.0	104	101	230	171	111	59	283	705	240	113	70	67	42
G 77.5	66	50	133	68	70	40	100	337	83	82	45	47	27
G 80.0	28	14	58	20	42	27	44	99	35	50	26	30	16
G 82.5	6	1	18	8	25	15	21	31	15	23	9	15	7
G 85.0	0	0	1	2	12	6	9	15	4	9	2	6	2
G 87.5	0	0	0	1	3	1	2	3	1	2	1	2	1
G 90.0	0	0	0	0	1	0	1	0	0	1	1	1	1
G 92.5	0	0	0	0	0	0	0	0	0	0	0	1	0
G 95.0	0	0	0	0	0	1	0	0	0	0	0	0	0
G 97.5	0	0	0	0	1	1	0	0	0	0	0	0	0
G100.0	0	0	0	1	1	1	0	0	0	0	0	0	0
G102.5	0	0	0	1	1	1	1	0	0	0	0	0	0
G105.0	0	0	0	1	1	1	1	0	0	0	0	0	0
G107.5	0	0	1	1	1	1	1	0	0	0	0	0	0
G110.0	0	1	1	1	1	1	1	0	0	0	0	0	0
G112.5	0	1	1	1	1	1	1	1	0	0	0	1	1
G115.0	1	1	1	1	1	1	1	1	0	0	1	1	1
G117.5	1	1	1	1	1	1	1	1	0	0	1	1	1
G120.0	1	1	1	1	1	1	1	1	0	0	1	1	1
G122.5	1	1	1	1	1	1	1	1	1	0	1	1	0
G125.0	1	1	1	1	1	1	1	1	1	0	1	1	1
G127.5	1	1	1	1	1	1	1	1	1	0	1	1	1
G130.0	1	1	1	1	1	1	1	1	1	0	1	1	1
G132.5	1	1	1	1	1	1	1	1	1	1	1	1	1
G135.0	1	1	1	1	1	1	1	1	1	1	1	1	1
G137.5	1	1	1	1	1	1	1	1	1	1	1	1	1
G140.0	1	1	1	1	1	1	1	1	1	1	1	1	1
G142.5	1	1	1	1	1	1	1	1	1	1	1	1	1
G145.0	1	1	1	1	1	1	1	1	1	1	1	1	1
G147.5	1	1	1	1	1	1	1	1	1	1	1	1	1
G150.0	1	1	1	1	1	1	1	1	1	1	1	1	1
G152.5	1	1	1	1	1	1	1	1	1	1	1	1	1
G155.0	1	1	1	1	1	1	1	1	1	1	1	1	1
G157.5	1	1	1	1	1	1	1	1	1	1	1	1	1
G160.0	1	1	1	1	1	1	1	1	1	1	1	1	1
G162.5	1	1	1	1	1	1	1	1	1	1	1	1	1
G165.0	1	1	1	1	1	1	1	1	1	1	1	1	1
G167.5	1	1	1	1	1	1	1	1	1	1	1	1	1
G170.0	1	1	1	1	1	1	1	1	1	1	1	1	1
G172.5	1	1	1	1	1	1	1	1	1	1	1	1	1
G175.0	1	1	1	1	1	1	1	1	1	1	1	1	1
G177.5	1	1	1	1	1	1	1	1	1	1	1	1	1
G180.0	1	1	1	1	1	1	1	1	1	1	1	1	1

### 4.3. Distribución polar de intensidades (Cd)

**Luminaria**  
 Código ALMS40AE3  
 Nombre MILAN S  
**Ensayo**  
 Código CL043A19D004VP  
 Nombre MILAN S

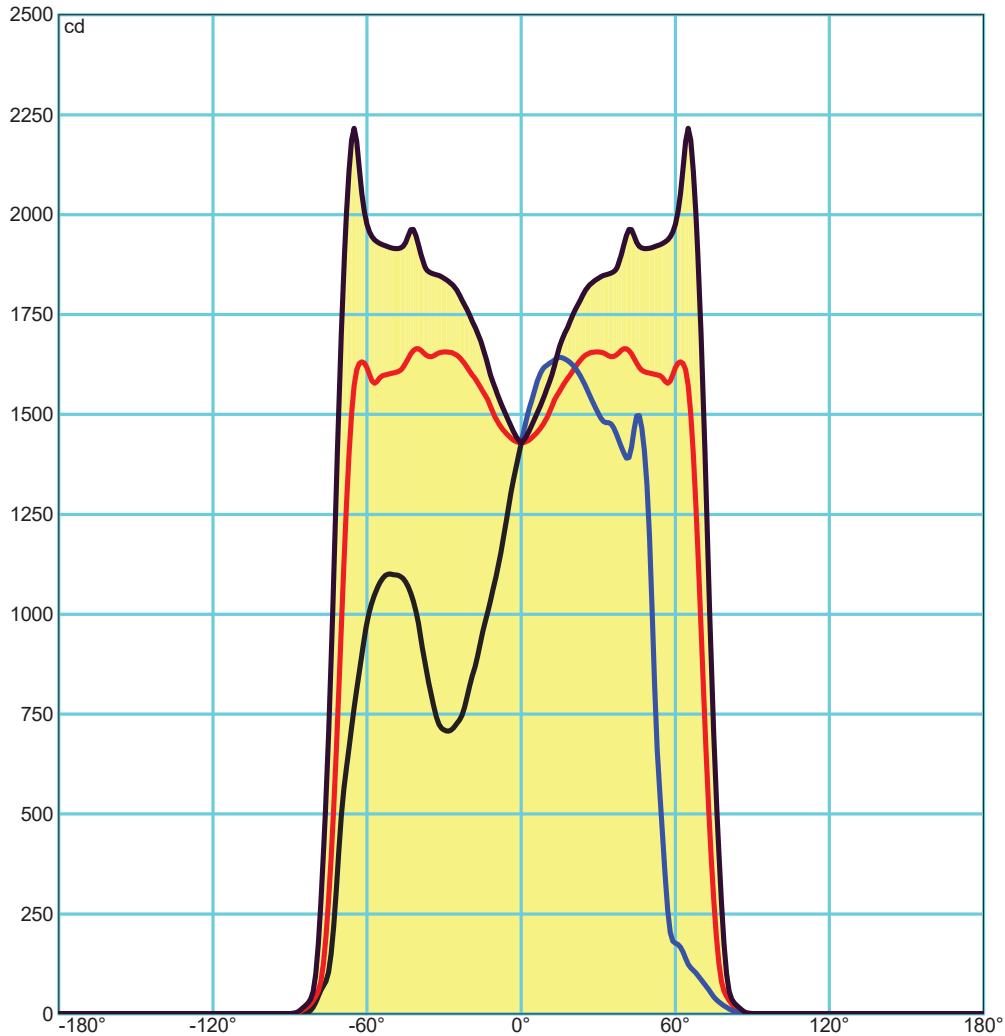
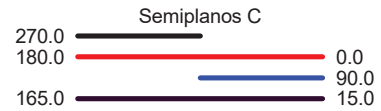
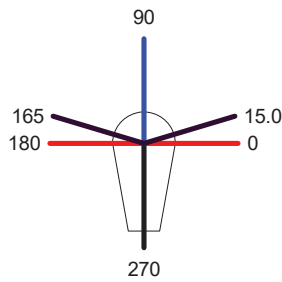
Flujo Luminaria	5343.62 lm	Potencia luminaria	41.00 W	Eficacia	130.33 lm/W	Eficiencia	100.00%
Flujo Fuentes	5343.62 lm	Valor Máximo	2215.78 cd	Posición	C=15.00 G=65.00	CG	Sim. en los planos 270-90



### 4.4. Distribución cartesiana de intensidades (Cd)

**Luminaria**  
 Código ALMS40AE3  
 Nombre MILAN S  
**Ensayo**  
 Código CL043A19D004VP  
 Nombre MILAN S

Flujo Luminaria	5343.62 lm	Potencia luminaria	41.00 W	Eficacia	130.33 lm/W	Eficiencia	100.00%
Flujo Fuentes	5343.62 lm	Valor Máximo	2215.78 cd	Posición	C=15.00 G=65.00	CG	Sim. en los planos 270-90



## 4.5. Flujo zonal

### Luminaria

Código ALMS40AE3

Nombre MILAN S

### Ensayo

Código CL043A19D004VP

Nombre MILAN S

Flujo Luminaria	5343.62 lm	Potencia luminaria	41.00 W	Eficacia	130.33 lm/W	Eficiencia	100.00%
Flujo Fuentes	5343.62 lm	Valor Máximo	2215.78 cd	Posición	C=15.00 G=65.00	CG Sim. en los planos	270-90

Flujo Total=5343.62 Flujo Luminaria=5343.62

RI	0.60	0.80	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	10.00	20.00
DRR	0.25	0.35	0.43	0.51	0.57	0.67	0.73	0.78	0.83	0.87	0.93	0.97
RC	6	6	6	5	5	5	5	5	5	4	4	4

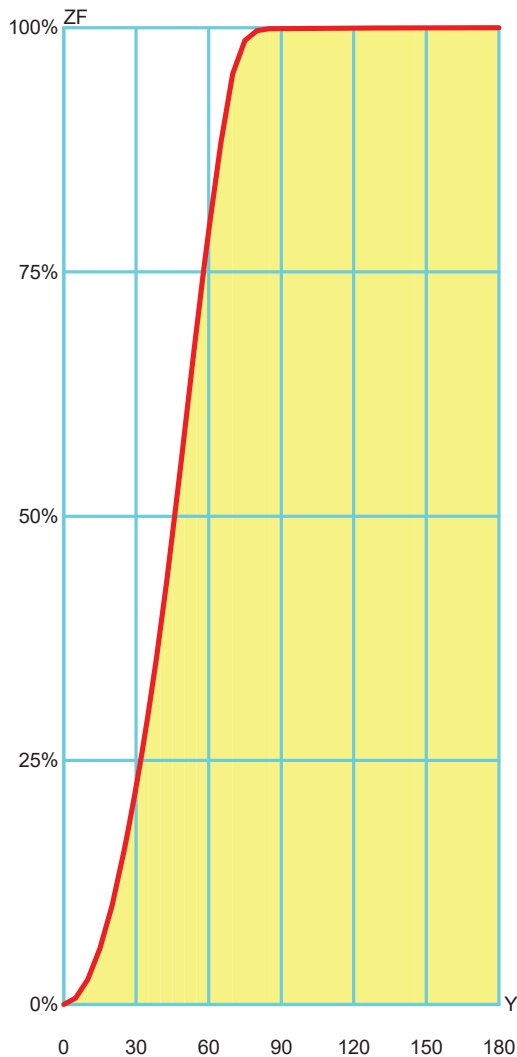
Flujo Zonal por 1000 Lúmenes

Y°	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
ZF(Y)	26	101	222	384	585	792	953	997	999	999	999	1000	1000	1000	1000	1000	1000	1000

Códigos de Flujo C.I.E.

41 79 98 100 100

C.I.E.	6/6/6/5/5/5/5/5/4/4/4	LOR	100.00000 %
D DIN 5040	A30	ULOR	0.07684 %
F UTE	1.00 E	DLOR	99.92316 %
B NBN	BZ 5 / 2.5 / BZ 4	UFF	0.07684 %
RN	0.07684 %	DFF	99.92316 %
BLF	1.0	FFR	0.07690 %



Flujo Zonal				
Gamma °	Flujo	Suma lm	Flujo [%]	Suma [%]
0°	0.00	0.00	0.00%	0.00 %
5°	6.39	6.39	0.64 %	0.64 %
10°	19.15	25.54	1.91 %	2.55 %
15°	31.78	57.32	3.18 %	5.73 %
20°	43.94	101.27	4.39 %	10.13 %
25°	55.22	156.49	5.52 %	15.65 %
30°	65.74	222.23	6.57 %	22.22 %
35°	75.67	297.90	7.57 %	29.79 %
40°	86.25	384.15	8.62 %	38.42 %
45°	96.57	480.72	9.66 %	48.07 %
50°	104.26	584.98	10.43 %	58.50 %
55°	106.58	691.57	10.66 %	69.16 %
60°	100.59	792.16	10.06 %	79.22 %
65°	89.84	882.00	8.98 %	88.20 %
70°	70.69	952.69	7.07 %	95.27 %
75°	34.20	986.90	3.42 %	98.69 %
80°	10.19	997.09	1.02 %	99.71 %
85°	1.92	999.01	0.19 %	99.90 %
90°	0.23	999.23	0.02 %	99.92 %
95°	0.04	999.27	0.00 %	99.93 %
100°	0.04	999.31	0.00 %	99.93 %
105°	0.05	999.36	0.00 %	99.94 %
110°	0.05	999.41	0.01 %	99.94 %
115°	0.06	999.47	0.01 %	99.95 %
120°	0.06	999.53	0.01 %	99.95 %
125°	0.06	999.60	0.01 %	99.96 %
130°	0.06	999.66	0.01 %	99.97 %
135°	0.06	999.72	0.01 %	99.97 %
140°	0.06	999.78	0.01 %	99.98 %
145°	0.05	999.83	0.01 %	99.98 %
150°	0.04	999.87	0.00 %	99.99 %
155°	0.04	999.91	0.00 %	99.99 %
160°	0.03	999.94	0.00 %	99.99 %
165°	0.03	999.97	0.00 %	100.00 %
170°	0.02	999.98	0.00 %	100.00 %
175°	0.01	1000.00	0.00 %	100.00 %
180°	0.00	1000.00	0.00 %	100.00 %



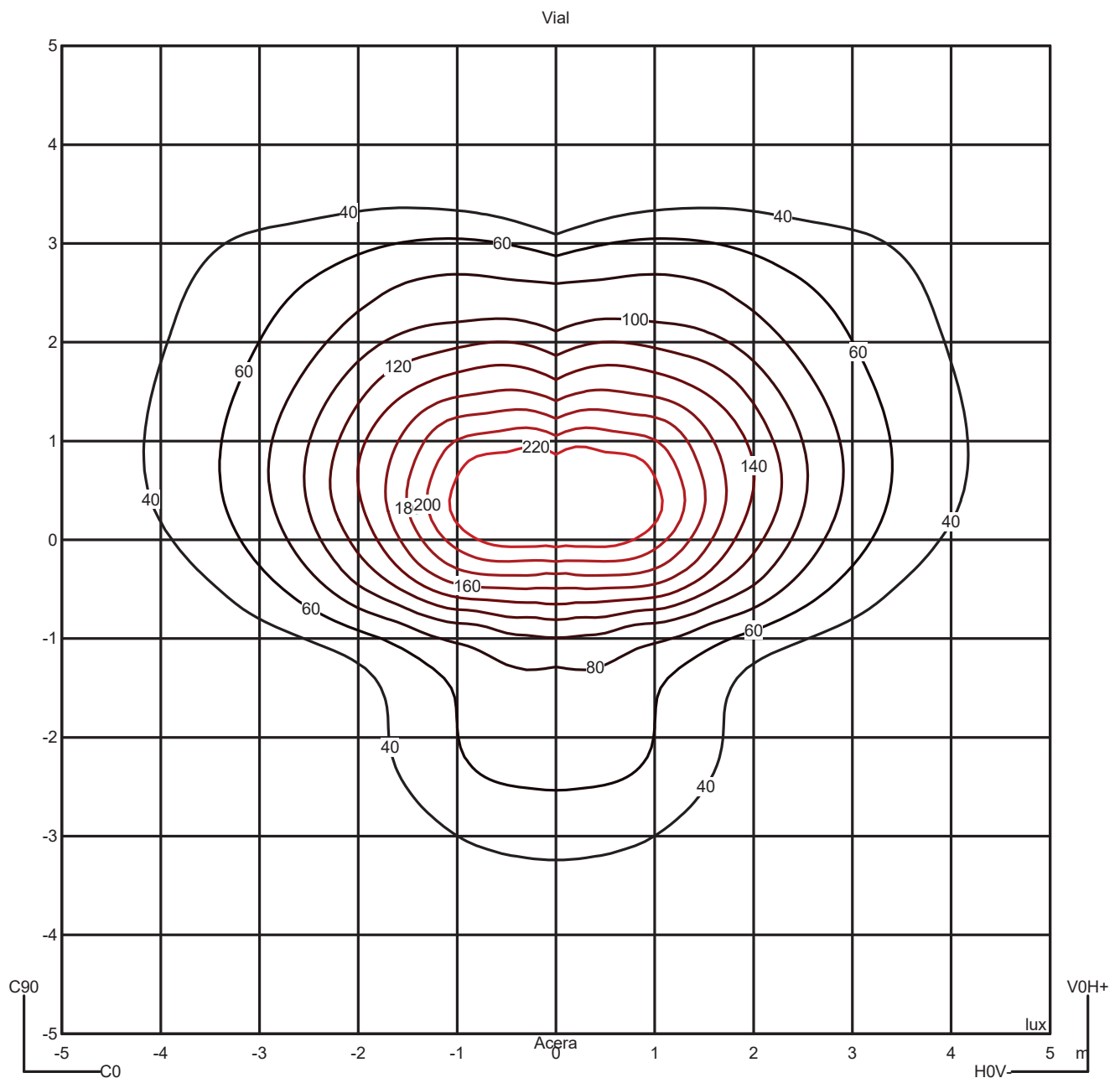
## 4.6. Diagrama Isolux

**Luminaria**  
 Código ALMS40AE3  
 Nombre MILAN S  
**Ensayo**  
 Código CL043A19D004VP  
 Nombre MILAN S

Flujo Luminaria	5343.62 lm	Potencia luminaria	41.00 W	Eficacia	130.33 lm/W	Eficiencia	100.00%
Flujo Fuentes	5343.62 lm	Valor Máximo	2215.78 cd	Posición	C=15.00 G=65.00	CG	Sim. en los planos 270-90

Isolux (Suelo)

Posición Luminaria X=0.00m Y=0.00m Z=2.50m



## 4.7. Factor de utilización

**Luminaria**

Código ALMS40AE3  
Nombre MILAN S

**Ensayo**

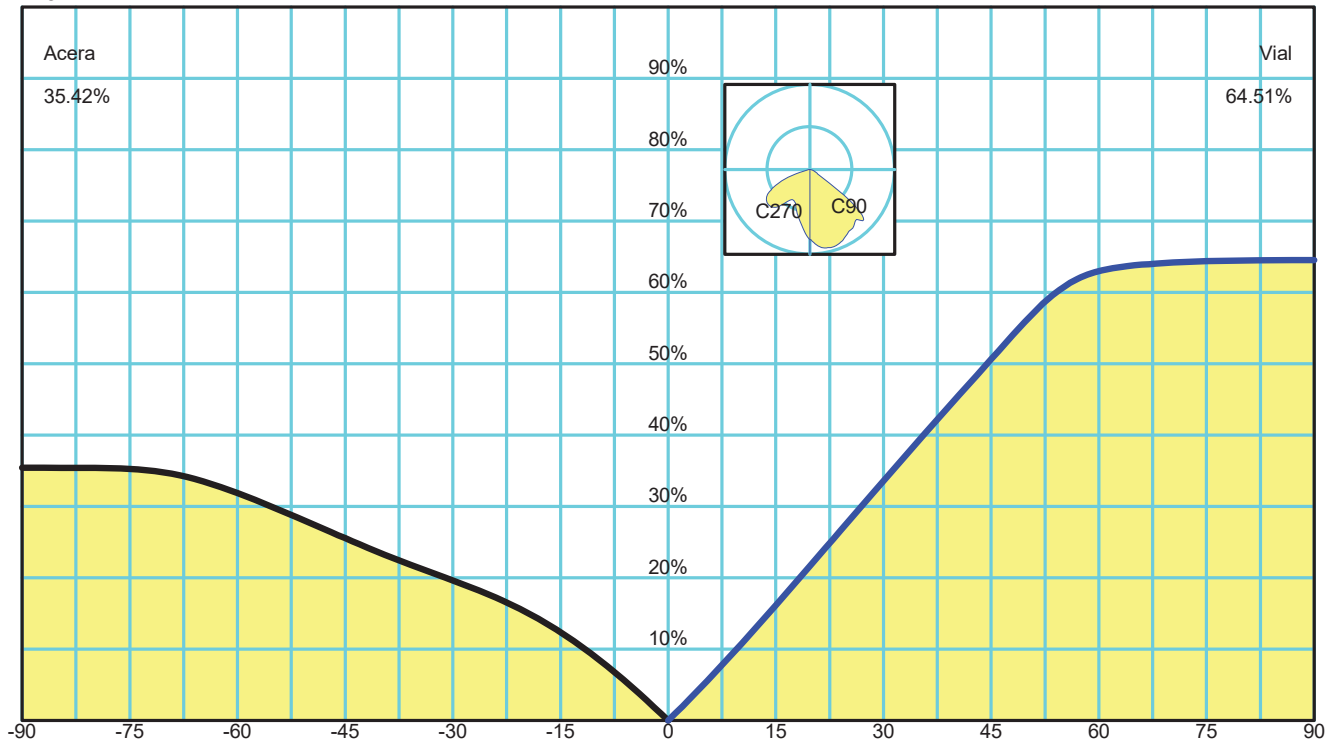
Código CL043A19D004VP  
Nombre MILAN S

Flujo Luminaria	5343.62 lm	Potencia luminaria	41.00 W	Eficacia	130.33 lm/W	Eficiencia	100.00%
Flujo Fuentes	5343.62 lm	Valor Máximo	2215.78 cd	Posición	C=15.00 G=65.00	CG	Sim. en los planos 270-90

Acera			Vial		
Ángulo	0	0.00%	Ángulo	0	0.00%
Ángulo	-5	4.66%	Ángulo	5	5.09%
Ángulo	-10	8.81%	Ángulo	10	10.53%
Ángulo	-15	12.39%	Ángulo	15	16.17%
Ángulo	-20	15.31%	Ángulo	20	21.95%
Ángulo	-25	17.65%	Ángulo	25	27.78%
Ángulo	-30	19.64%	Ángulo	30	33.58%
Ángulo	-35	21.49%	Ángulo	35	39.34%
Ángulo	-40	23.44%	Ángulo	40	45.03%
Ángulo	-45	25.56%	Ángulo	45	50.63%
Ángulo	-50	27.73%	Ángulo	50	56.21%
Ángulo	-55	29.88%	Ángulo	55	60.69%
Ángulo	-60	31.88%	Ángulo	60	62.97%
Ángulo	-65	33.57%	Ángulo	65	63.79%
Ángulo	-70	34.75%	Ángulo	70	64.16%
Ángulo	-75	35.26%	Ángulo	75	64.37%
Ángulo	-80	35.40%	Ángulo	80	64.47%
Ángulo	-85	35.42%	Ángulo	85	64.50%
Ángulo	-90	35.42%	Ángulo	90	64.51%

Ángulo de Inclinación = 0.0

DLOR = 99.92%



Spread	53.9° Medio	DLOR	99.92316 %
Throw	64.3° Intermedio	ULOR	0.07684 %
SLI	6.4 Concentrado	Eficiencia	100.00000 %
Cutoff CIE	Cutoff - Max: C=15.0° Gamma=65.0°	RN	0.07684 %
Cutoff lesna	Cutoff	Clase de Intensidad Luminosa	G*6
DIN5044	KB1	Índice de Deslumbramiento	D5

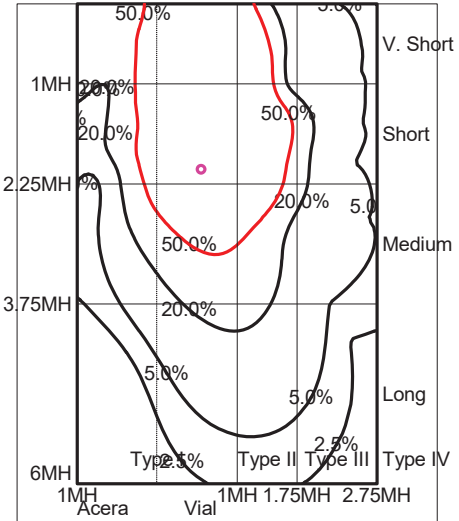
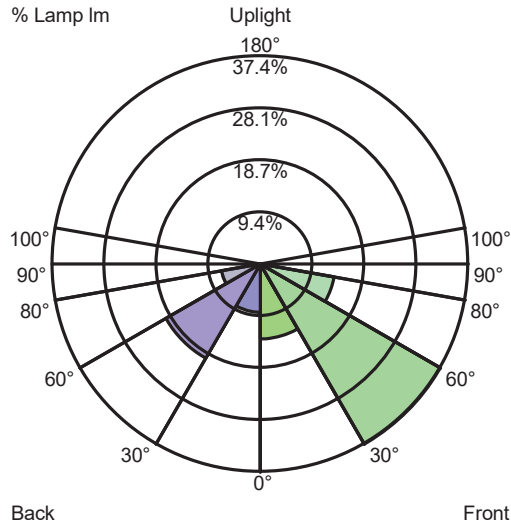
IESNA Type II Short Asymmetrical

### 4.8. Clasificación vial según IES TM-15

**Luminaria**  
 Código ALMS40AE3  
 Nombre MILAN S  
**Ensayo**  
 Código CL043A19D004VP  
 Nombre MILAN S

Flujo Luminaria	5343.62 lm	Potencia luminaria	41.00 W	Eficacia	130.33 lm/W	Eficiencia	100.00%
Flujo Fuentes	5343.62 lm	Valor Máximo	2215.78 cd	Posición	C=15.00 G=65.00	CG	Sim. en los planos 270-90

US ROAD STANDARDS



Luminaire Classification System (LCS)				
LCS Zone		Lumens	%Lamp	%Lum
FL	0° -- 30°	720.8 lm	13.5 %	13.5 %
FM	30° -- 60°	1999.2 lm	37.4 %	37.4 %
FH	60° -- 80°	720.6 lm	13.5 %	13.5 %
FVH	80° -- 90°	6.4 lm	0.1 %	0.1 %
BL	0° -- 30°	464.6 lm	8.7 %	8.7 %
BM	30° -- 60°	1046.9 lm	19.6 %	19.6 %
BH	60° -- 80°	376.7 lm	7.0 %	7.0 %
BVH	80° -- 90°	4.4 lm	0.1 %	0.1 %
UL	90° -- 100°	0.4 lm	0.0 %	0.0 %
UH	100° -- 180°	3.7 lm	0.1 %	0.1 %
TOTALS		5343.6 lm	100.0 %	100.0 %
BUG B2 U1 G1 Type II Short Asymmetrical				

## 5. Resultados del ensayo de color

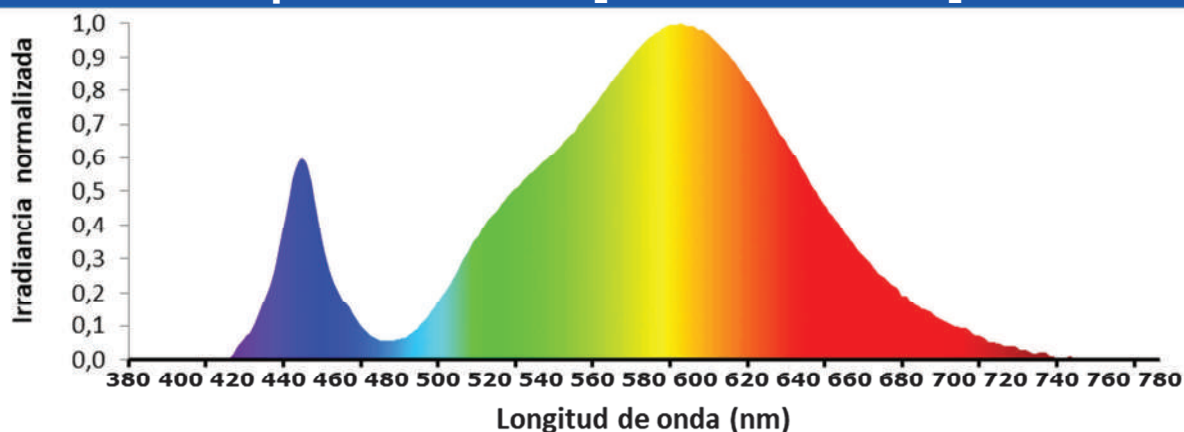
### Ensayo de colorimetría

Metodo de ensayo	Medición en el punto C = 0 y G = 0
Norma utilizada	UNE-EN 13032-4:2016 EN 13032-4: 2015 CIE S 025:2015 CIE 63:1984 CIE 15:2004 CIE 13.3:1995
Nº de mediciones	1
Instrumento utilizado	Gonio-espectroradiometro

### Mediciones y cálculos de color

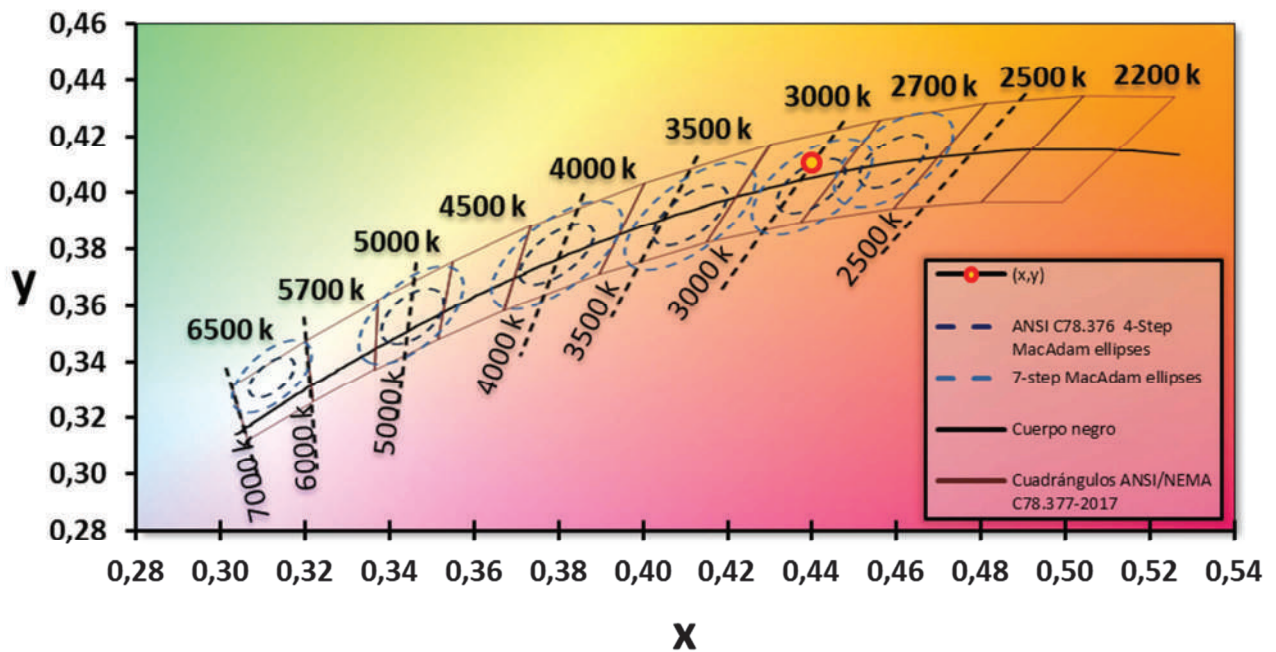
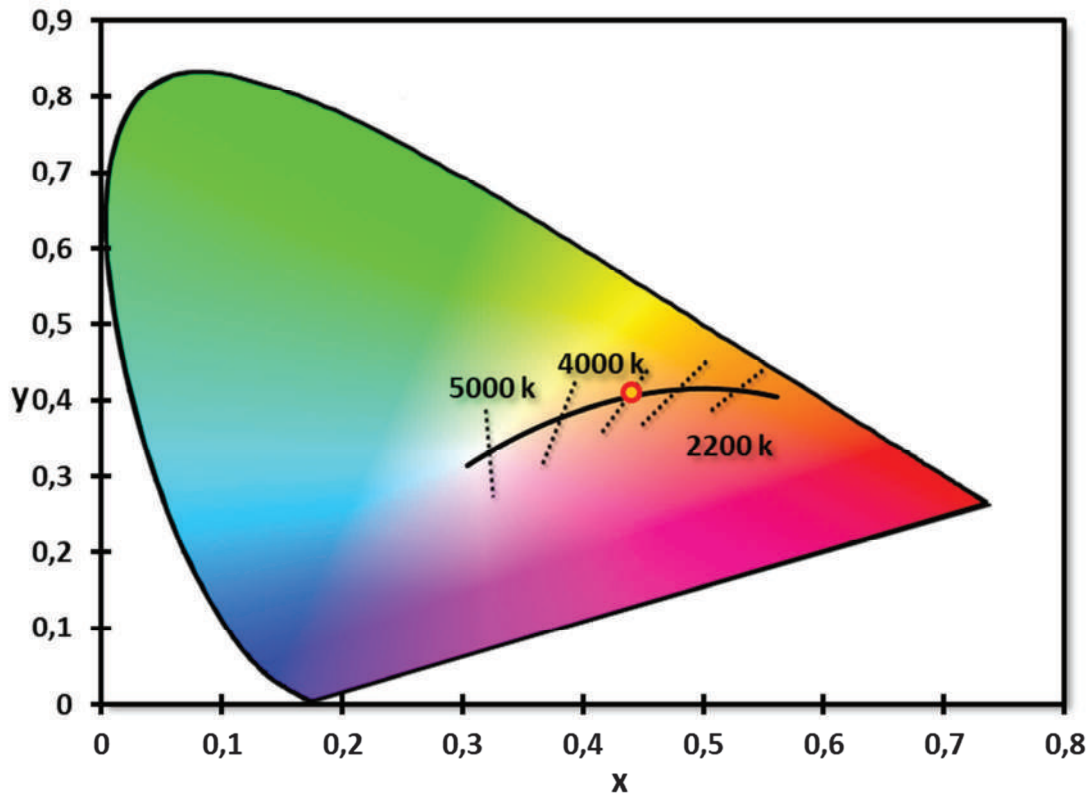
Temperatura de color correlacionada (CCT)	3005 K	
Índice de rendimiento de color (Ra)	70	
*Rf IES TM-30-15	70	
*Rg IES TM-30-15	95	
*Rf CIE 2017 Color Fidelity Index	73	
*S/P Ratio	1,16	
Coordenadas cromáticas	<b>x</b>	0,440
	<b>y</b>	0,411
	<b>u</b>	0,250
	<b>v</b>	0,350
	<b>u'</b>	0,250
	<b>v'</b>	0,524
Duv	-0,0022	

### Espectro relativo [380nm - 780nm]



### Diagrama CIE 1931

Coordenada x	0,440	Coordenada y	0,411
--------------	-------	--------------	-------



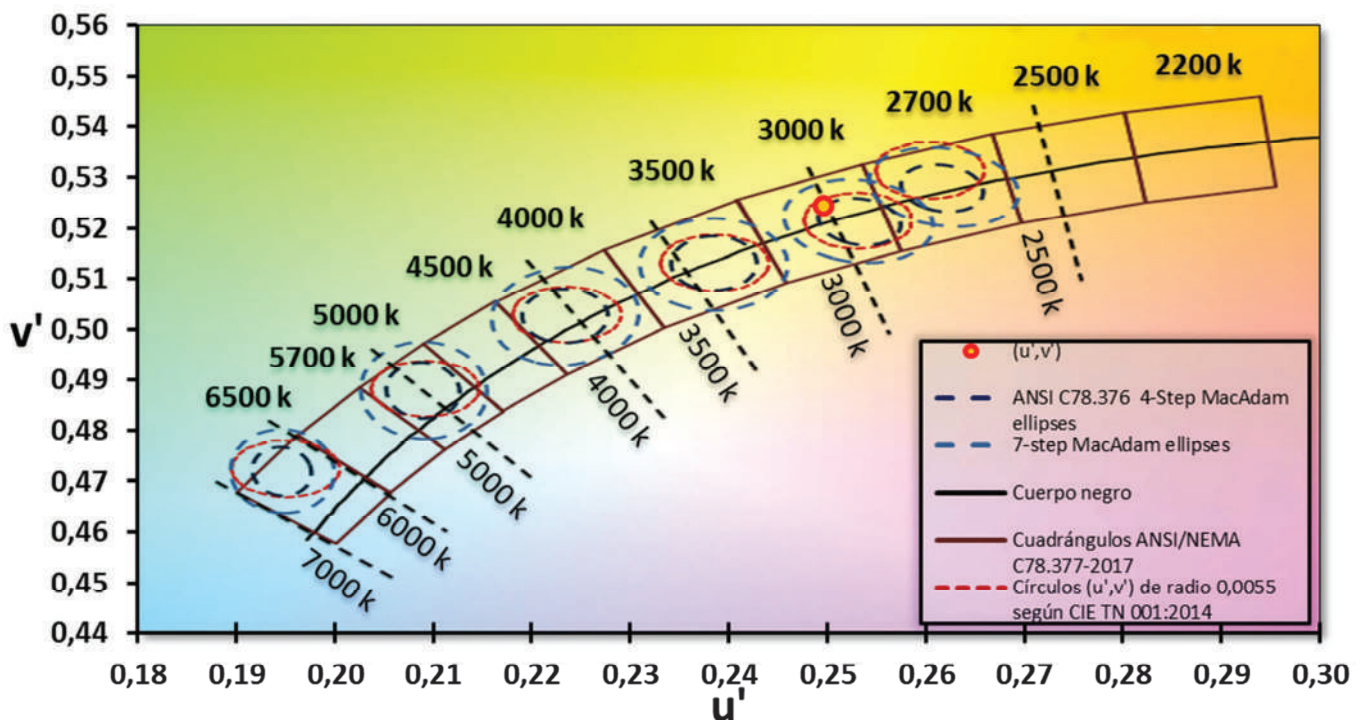
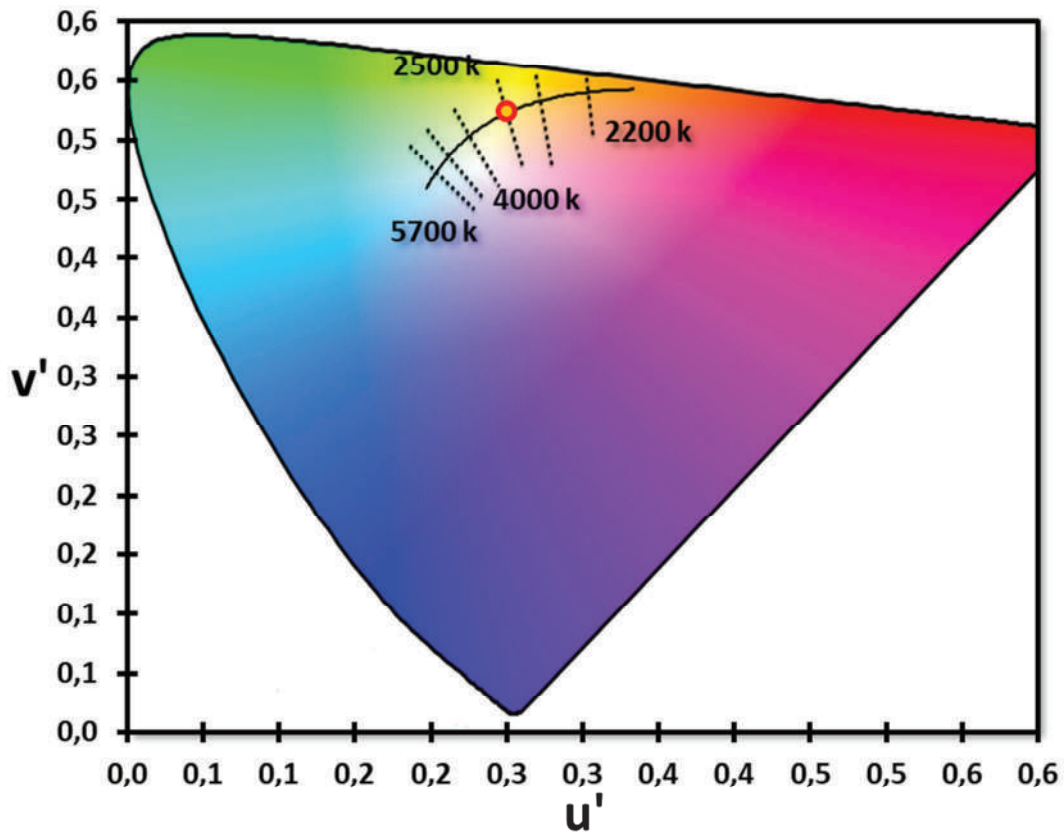
### Diagrama CIE 1976

Coordenada  $u'$

0,250

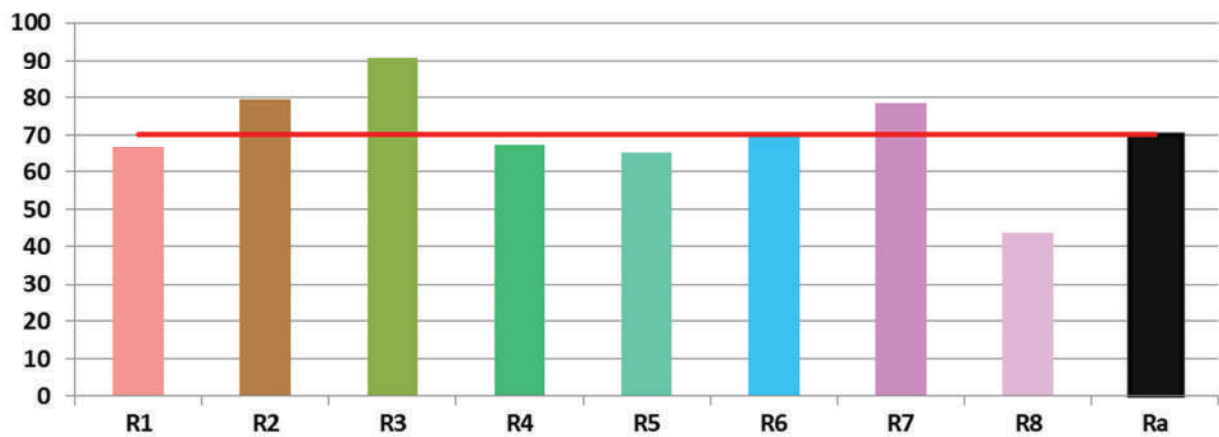
Coordenada  $u'$

0,524



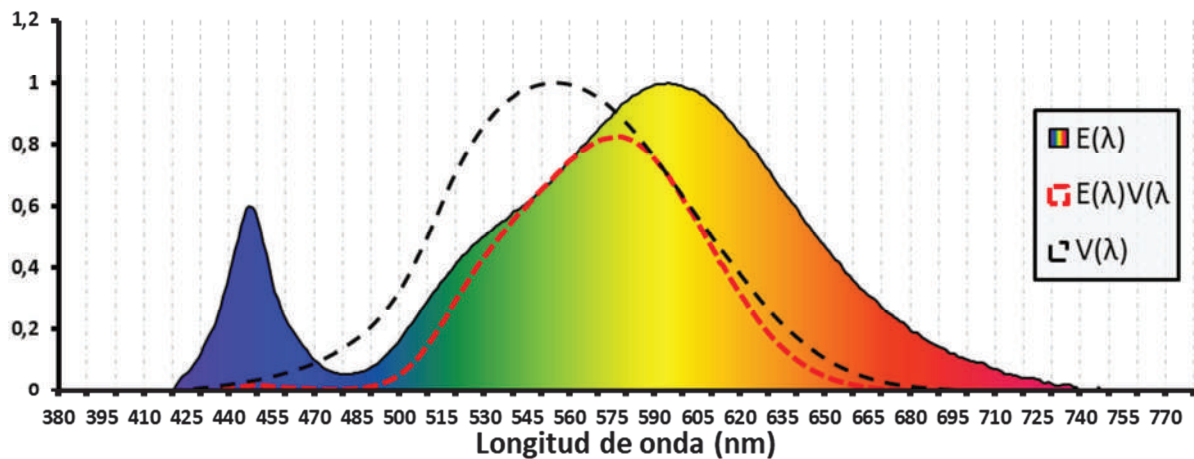
## Índice de reproducción cromática

R1	67
R2	79
R3	91
R4	67
R5	65
R6	71
R7	78
R8	44
<b>Ra</b>	<b>70</b>



**\*Distribución de potencia espectral (SPD) y contaminación lumínica**

Temperatura de color correlacionada (CCT)	3005 K
Longitud de onda pico (nm)	595
Longitud de onda dominante (nm)	582,1
Porcentaje de potencia espectral por debajo de 500nm	12,11%
Porcentaje de potencia espectral por debajo de 440nm	3,79%
<b>Índice espectral G</b>	<b>1,6</b>
<b>Zona lumínica según índice espectral G</b>	<b>E3</b>

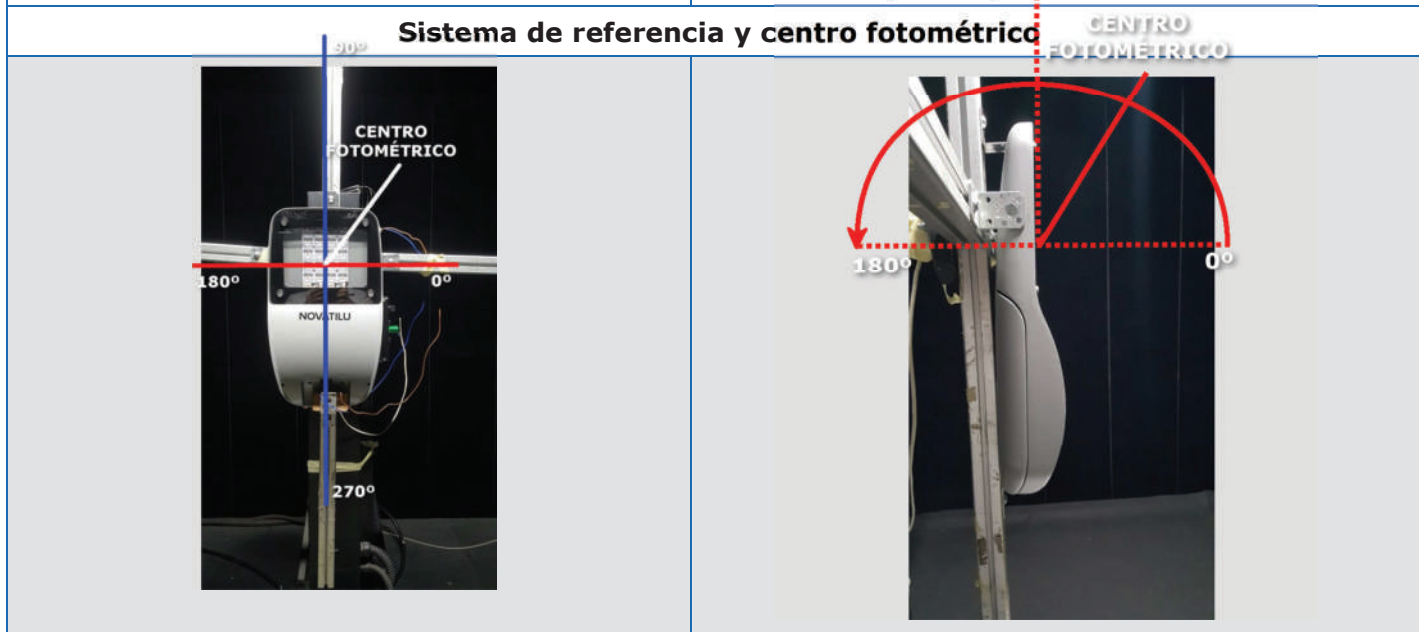




## 1.2. Ficha del ensayo

Normas de referencia	UNE-EN 13032-4:2016 EN 13032-4: 2015 CIE S 025: 2015 CIE 34:1977 CIE 52:1982 CIE 117:1995 IES TM-15:07
Sistema de medición	$C-\gamma, C = \Delta 15^\circ, G = \Delta 2,5^\circ$

### Sistema de referencia y centro fotométrico



## 1.3. Parámetros del test eléctrico

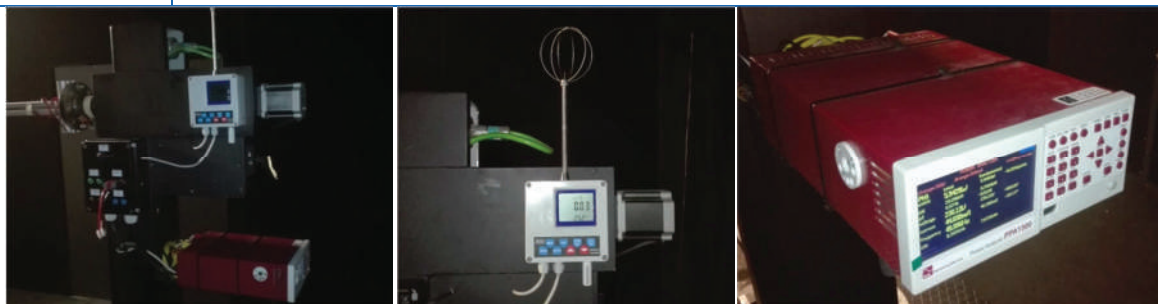
Tipo de alimentación	Fuente estabilizada
Alimentación eléctrica	230V AC $\pm$ 0,2%
Distorsión armónica	< 0,5%
Frecuencia	50 Hz $\pm$ 0.1%

## 1.4. Condiciones ambientales

Temperatura del laboratorio [°C]	25°C $\pm$ 1°C
Humedad relativa	<60%
Movimiento del aire	< 0,25 m/s

## 1.5. Instrumentos utilizados

Goniofotómetro	<p>Goniofotómetro T2 de rotación de la luminaria acuerdo con las normas y recomendaciones:</p> <ul style="list-style-type: none"> <li>❖ EN 13032-1 2005 cap. 6.1.1.1 – tipo de goniofotómetro 1.1, 1.2 y 1.3</li> <li>❖ Recomendación CIE 121 Cap.5 Tipo 1 y 2</li> </ul> <p>Nº identificativo: E-001          Distancia de medición: 6,44 m</p>
Posición de ensayo de la muestra	El ensayo se realiza con la muestra en posición en horizontal y se aplica un factor de corrección entregando el resultado en función de la posición de diseño.
Fuente de alimentación	Fuente de alimentación AC ET-System modelo EAC-S-1000 Nº identificativo: E-019
Multímetro	MULTIMETRO NEWTON 4TH. MODELO PPA 1510 Nº identificativo: E-020
Luxómetro	Luxómetro CZIULA&GRUNDMANN Nº identificativo: E-003
Anemómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Termómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Espectroradiómetro	JETI SPECOS 1201 Nº identificativo: E-007
Termómetro	TERMOMETRO DIGITAL PCE-T 390 Nº identificativo: E-018



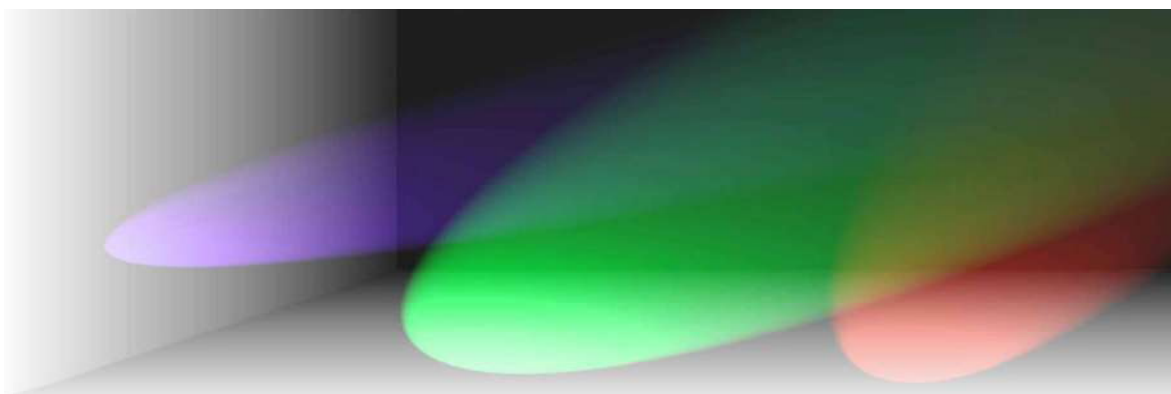
## 2. Parámetros eléctricos medidos

### 2.1. Medición del conjunto

Tensión de alimentación [V]	230,2
Intensidad [A]	0,180
Potencia [W]	41
Factor de potencia	0,98
Intensidad Modulo Led [mA]	796

Los ensayos marcados con \* no están amparados por la acreditación ENAC

# ENSAYO DE TEMPERATURA Y TM21



## Asselumluminotècnics, SL

Polígono Industrial Can Roqueta  
C/ Ca n'Alzina 76 08202 Barcelona

Tel - Fax: 93.725.98.10

[www.asselum.com](http://www.asselum.com)

**Cliente:** BENITO – NOVATILU

**Dirección:** C/Lleida 10, 08500, Vic

**Provincia:** Barcelona

**País:** España

**Teléfono:** 938521000

**Nombre muestra<sup>1</sup>:** Milan S60 60W 4K

**Código muestra<sup>1</sup>:** ALMS60

**Nº muestra:** RM22021004

**Fecha del ensayo:** 24/03/2022

**Código de ensayo:** CL237A22T010

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

Informe revisado:

43564191Y  
MARC BALLBE  
(R: B62741152)

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MARC BALLBE (R: B62741152)  
DN: cn=55654191Y.MARC.BALLBE,  
(R: B62741152) gn=MARC c=ES  
o=ASSELUM LUMINOTÈCNICS SL  
Motivo: He revisado este documento  
liberado.  
Fecha: 2022.06.09 17:26:02.00

**Marc Ballbè**  
**Responsable**  
**laboratorio**

Los resultados obtenidos en el presente informe se refieren únicamente a la muestra ensayada conforme en el apartado 1.1. No se podrá reproducir total o parcialmente el informe sin el consentimiento de **ASSELUM assessorsluminotècnics, S.L.**  
La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa.  
Cualquier impresión del presente informe será considerada como una copia del mismo.

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## Ensayo de temperatura y TM21

### Ficha técnica del producto

Tipo	Luminaria
Código Producto <sup>1</sup>	APMS
Nombre <sup>1</sup>	Milan S60 60W 4K
Tipo fuente de luz	LED

### Imagen muestra



## 1.2. Ficha del ensayo

Normas de referencia	ES TM21	EN 62722-2-1
	LM80	UNE-EN 62722-2-1
	UNE-EN 62717	IEC 62717
	IEC 62722-1	EN 62717
	EN 62722-1	
	UNE-EN 62722-1	
	IEC 62722-2-1	

## 1.3. Parámetros del test eléctrico

Tipo de fuente	Fuente de alimentación AC
Alimentación [ <b>V</b> ]	230± 0.4%
Distorsión armónica	< 0,5%
Frecuencia	50 Hz ± 0.1%

## 1.4. Condiciones ambientales

Temperatura del laboratorio [ <b>°C</b> ]	25°C ± 1°C
Humedad relativa	60%
Movimiento del aire	< 0,25 m/s

## 1.5. Instrumentos utilizados

Termómetro data logger	TERMOMETRO DIGITAL PCE-T 390 N° identificativo: E-018
Sonda termopar	Termopar de 2m tipo K +250°C

## Observaciones

- Queda prohibida la reproducción parcial de este documento.
- Este informe no puede presentar enmiendas o raspaduras, en caso contrario será considerado nulo.
- La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa, en la instrucción técnica IT14 V02 de ASSELUM

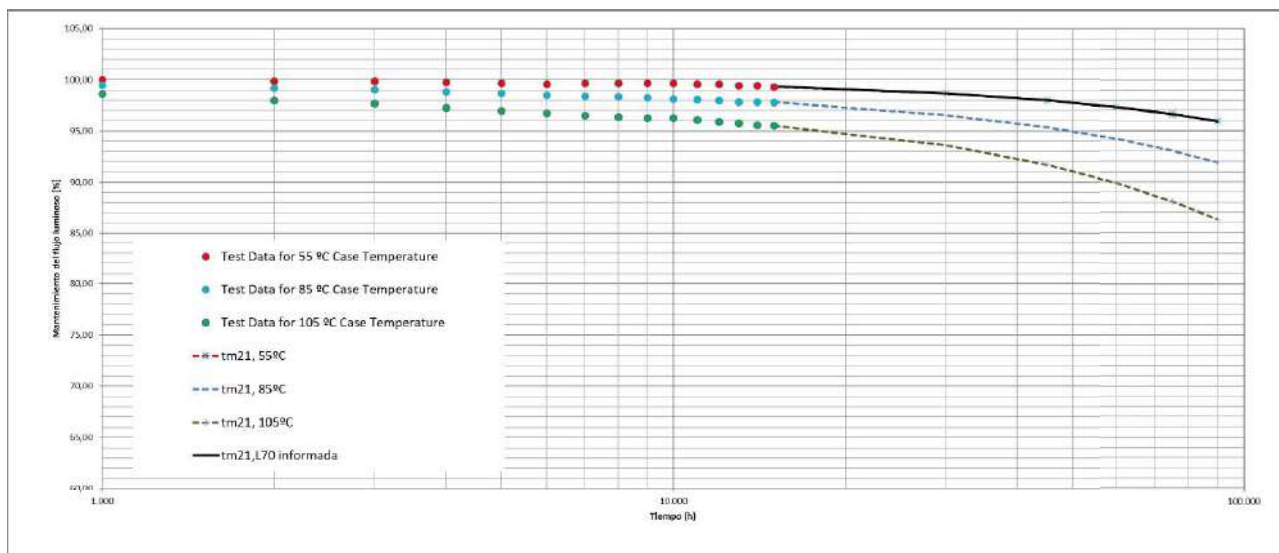
## Resultados del ensayo de temperatura y TM 21

### Ensayo de temperatura ISTMT

Tiempo de ensayo (h)	8
Temperatura ambiente (°C)	25,0
Temperatura LED $T_{s,l}$ (°C)	
Temperatura Tc Driver (°C)	52,7
Alimentación de cada LED <sup>1</sup> (mA)	350

### <sup>2</sup>Extrapolación del mantenimiento del flujo según TM 21

<b>L90(15K) B50 proyectado</b>	<b>&gt; 90000 h</b>	*L90(15K) B50 informado	225.217 h
<b>L90(15K) B10 proyectado</b>	<b>&gt; 90000 h</b>	*L90(15K) B10 informado	210.076 h
<b>L80(15K) B50 proyectado</b>	<b>&gt; 90000 h</b>	*L80(15K) B50 informado	474.610 h
<b>L80(15K) B10 proyectado</b>	<b>&gt; 90000 h</b>	*L80(15K) B10 informado	445.711 h
<b>L70(15K) B50 proyectado</b>	<b>&gt; 90000 h</b>	*L70(15K) B50 informado	757.349 h
<b>L70(15K) B10 proyectado</b>	<b>&gt; 90000 h</b>	*L70(15K) B10 informado	712.852 h



<sup>2</sup> Según el método TM21, el mantenimiento del flujo luminoso solo se puede extrapolar 6 veces el tiempo medido en el ensayo lm80. Todo valor fuera del alcance antes mencionado queda excluido del procedimiento TM21.

## Información del ensayo según LM 80<sup>1</sup>

Informe realizado por:	CSA Group Seattle		
Fecha finalización ensayo:	27/01/2021		
Fabricante:	LUMILEDS		
Modelo LED:	LUXEON 5050		
Número de muestras ensayadas:	25		
Corriente de alimentación del LED:	400 mA		
Nº de caso	1	2	3
Temperatura	55 °C	85 °C	105 °C
Mantenimiento del flujo a las 15.000 h	99,3 %	97,8%	95,5 %

## Lm 80 Inputs

### LM-80 Test Inputs

Description of LED Light Source Tested (manufacturer, model, catalog number)	Test Data for 55°C Case Temperature		Test Data for 85°C Case Temperature		Test Data for 105°C Case Temperature	
	Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)	Time (hours)	Lumen Maintenance (%)
	1.000	100,00%	1.000	99,50%	1.000	98,65%
	2.000	99,90%	2.000	99,20%	2.000	98,00%
	3.000	99,90%	3.000	99,10%	3.000	97,70%
	4.000	99,80%	4.000	98,85%	4.000	97,30%
	5.000	99,70%	5.000	98,70%	5.000	97,00%
	6.000	99,60%	6.000	98,50%	6.000	96,75%
	7.000	99,70%	7.000	98,40%	7.000	96,50%
	8.000	99,70%	8.000	98,35%	8.000	96,40%
	9.000	99,70%	9.000	98,25%	9.000	96,30%
	10.000	99,70%	10.000	98,15%	10.000	96,30%
	11.000	99,60%	11.000	98,10%	11.000	96,10%
	12.000	99,60%	12.000	98,00%	12.000	95,90%
	13.000	99,47%	13.000	97,85%	13.000	95,77%
	14.000	99,44%	14.000	97,85%	14.000	95,60%
	15.000	99,33%	15.000	97,80%	15.000	95,52%
-	-	-	-	-	-	
-	-	-	-	-	-	
-	-	-	-	-	-	
-	-	-	-	-	-	
-	-	-	-	-	-	

LM-80 Testing Details	
Total number of units tested per case temperature:	24
Number of failures:	0
Number of units measured:	24
Test duration (hours):	15000
Tested drive current (mA):	500
Tested case temperature 1 (T <sub>c</sub> , °C):	55
Tested case temperature 2 (T <sub>c</sub> , °C):	85
Tested case temperature 3 (T <sub>c</sub> , °C):	105



## TM 21 Inputs

Table 1: Report at each LM-80 Test Condition					
Description of LED Light Source Tested (manufacturer, model, catalog number)					
Test Condition 1 - 55 Case Temp		Test Condition 2 - 85 Case Temp		Test Condition 3 - 105°C Case Temp	
Sample size	24	Sample size	24	Sample size	24
Number of failures	0	Number of failures	0	Number of failures	0
DUT drive current used in the test (mA)	500	DUT drive current used in the test (mA)	500	DUT drive current used in the test (mA)	500
Test duration (hours)	15.000	Test duration (hours)	15.000	Test duration (hours)	15.000
Test duration used for projection (hour to hour)	7000,0 - 15000,0	Test duration used for projection (hour to hour)	7000,0 - 15000,0	Test duration used for projection (hour to hour)	7000,0 - 15000,0
Tested case temperature (°C)	55	Tested case temperature (°C)	85	Tested case temperature (°C)	105
$\alpha$	4,723E-07	$\alpha$	8,241E-07	$\alpha$	1,352E-06
B	1,001	B	0,990	B	0,975
Reported L70(15k) (hours)	>90000	Reported L70(15k) (hours)	>90000	Reported L70(15k) (hours)	>90000

Table 2: Interpolation Report (projection based on <i>in-situ</i> temperature entered)	
$T_{s,1}$ (°C)	55,00
$T_{s,1}$ (K)	328,15
$\alpha_1$	4,723E-07
$B_1$	1,001
$T_{s,2}$ (°C)	-
$T_{s,2}$ (K)	-
$\alpha_2$	-
$B_2$	-
$E_s/k_b$	-
A	-
$B_0$	1,001
$T_{s,j}$ (°C)	52,70
$T_{s,j}$ (K)	325,85
$\alpha_i$	4,723E-07
Reported L70(15k) at 52,7°C (hours)	>90000

## Imagen ensayo temperatura



# MÓDULO 16

Documentación técnica IDAE



**BENITO  
NOVATILU**

EXPERTOS  
EN ILUMINACIÓN  
EFICIENTE

+34 961 401 000 / info@[novatilu.com](http://novatilu.com)

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*UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas.*

*Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.*

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*Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16A)*

*UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.*

*UNE-EN 61547. Equipos para alumbrado*

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*UNE-EN 62031. Módulos LED para alumbrado general.*

*Requisitos de seguridad. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.)*

*UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13:*

*Requisitos particulares para dispositivos de control electrónicos.*

*UNE-EN 62384. Dispositivos de control electrónicos. Requisitos de funcionamiento.*

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*Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes.*

*Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4.*

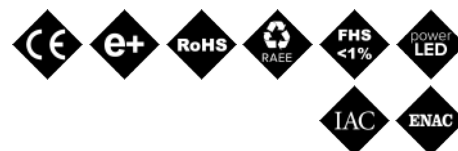
*Ensayo colorimétrico de la luminaria según la norma UNE EN 13032-4.*

*Ensayo de medidas eléctricas*



AR-80

# RETROFIT AR-80



Retrofit con 16 o 32 LEDs. Con el disipador de alta eficiencia de aluminio de extrusión anodizado se obtiene un gran rango de potencias, de 20W hasta 120W sin perjuicio de la vida de los LEDs. Es una pieza indispensable para la actualización tecnológica de las luminarias de descarga. En combinación con una placa de montaje, los retrofits se adaptan a cualquier luminaria.

## VENTAJAS:

- Alta eficiencia. Hasta 145 lm/W reales
- 2 Medidas distintas. De 20W hasta 120W
- 18 Distribuciones lumínicas distintas
- Estándar Zhaga (Book 15)
- Vidrio templado de 4mm con junta de estanqueidad de silicona para conseguir una IP66

## APLICACIONES:

- Retrofit para luminarias clásicas y de descarga.
- Complemento para las luminarias Tomsk, Gas, Vialia, Camprodon, Neovilla, Realia e Isabelina.

[Catálogo](#) | [Imagen HD](#)

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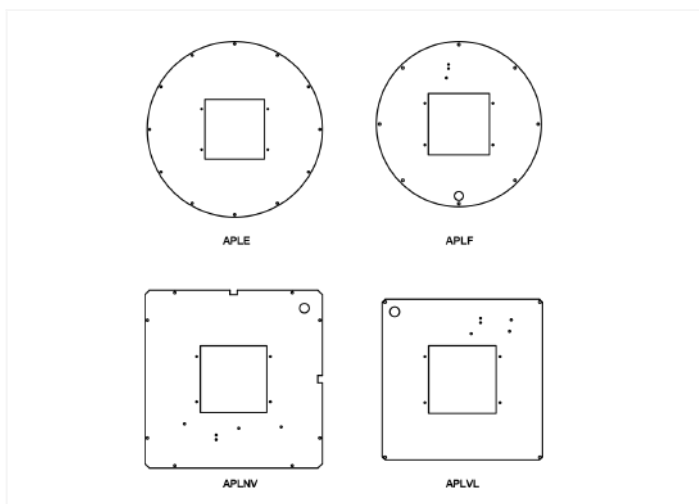
info@benito.com

tel. +34 93 852 1000 / +34 961 401 000

## CARACTERÍSTICAS:

Material cuerpo:	Cuerpo principal de extrusión de aluminio de alta pureza, tapas laterales de fundición de aluminio inyectado a presión del tipo EN AC-43000, EN AC-43100, EN AC-43400, EN AC-44100, EN AC-47100 según la norma UNE EN 1706.
Difusor (cerramiento cavidad óptica):	Vidrio Templado de 4 mm. Filtra los UV.
Tornillería:	Acero Inoxidable 18/8 - AISI 304
Cuerpo:	Opcional, placa de montaje de aluminio para completar los Retrofits
Juntas de estanqueidad:	Silicona (extrusión)
Índice de protección IP de la luminaria:	
Índice de protección IP del Grupo Óptico:	20-66
Índice de protección IK:	IK10
Disipación térmica de los LEDs:	Disipador de alta eficiencia con gran superficie de disipación, gracias al radiador de aletas onduladas de aluminio anodizado. Disipación pasiva por convección y asegurando el contacto térmico de los módulos de LEDs a través de material de transferencia térmica de alta conductividad.
Válvula anti condensación:	Válvula de compensación de presiones que asegura la evacuación de la humedad, evitando la condensación, manteniendo el grado de estanqueidad IP del módulo.
Pintura:	Cuerpo principal o disipador Anodizado negro. Tapas laterales con recubrimiento de pintura en polvo de poliéster, pulverizado electrostáticamente i sublimado al horno. Resistente a la corrosión.
Color:	Negro mate y otros colores bajo pedido
Fijación:	Fijación frontal mediante tornillería autoroscante.
Orientable:	La orientación del módulo depende de la propia luminaria
Mantenimiento:	Módulos reemplazables: LEDs, Drivers, SPD.
Altura de montaje recomendada:	4 - 6m
Driver:	Driver regulable y programable de corriente constante. Incorporado dentro de la luminaria, precableado sobre placa de acero galvanizada.
Regulación driver:	Driver Regulable 0-10V, programable en 5 niveles y con opción DALI 2. Con las características de Wireless, AOC, MTP, DTL.
Opciones de reducción de flujo:	<ul style="list-style-type: none"> <li>- Multinivel Temporizado o Media Noche Virtual</li> <li>- Ready4IoT</li> <li>- Reducción de flujo en Cabecera</li> <li>- Doble Nivel con Línea de Mando</li> </ul>
Protector de sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.

## PLANO:





## CUADRO TÉCNICO:

REF.	Nº LEDs	Potencia W	I Driver mA	Flujo Lumínico Real (T) =85°C)		Flujo Lumínico Inicial (T) =25°C)	
				Flujo lm	Eficiencia lm/W	Flujo lm	Eficiencia lm/W
Módulo Benito Novatilu ARLC16	16	20	375	2842	142	3240	162
	16	30	563	4260	142	4856	162
	16	40	750	5642	141	6432	161
	16	60	1125	8460	141	9644	161

LEDs: 5050

Eficiencia Nominal del LED: 172 lm/W.

Corriente máxima LED: 1000 mA.

Corriente LED = Corriente Driver/2.

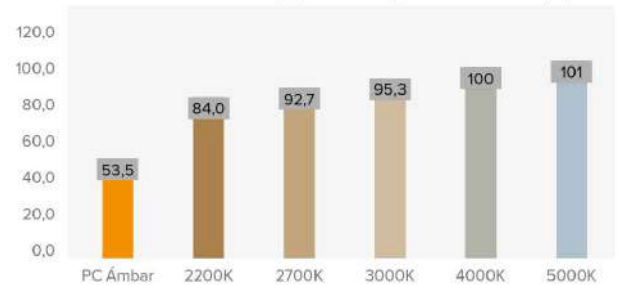
Vida Media L90B10: >100,000 horas.

Flujos Lumínicos y Eficiencias a 4000°K y CRI>70.

Tolerancia del flujo lumínico <+/-3%.

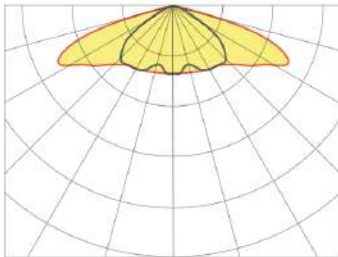
Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.

Relación Eficiencia (%) lm/W - Temperatura de Color (K)

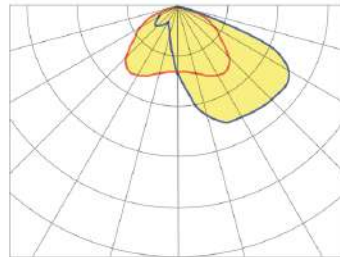


## FOTOMETRÍAS:

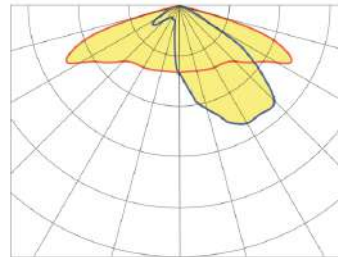
Simétrico Extensivo Rectangular (S3)



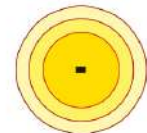
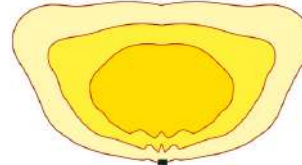
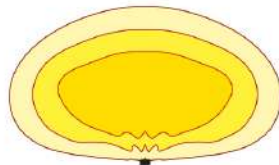
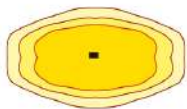
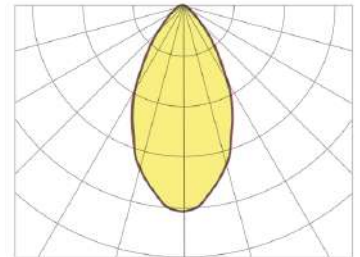
Asimétrico (A4)



Asimétrico Super-Extensivo (AE)



Circular 50° (C5)



\*Consultar otras distribuciones lumínicas

El Grupo BENITO NOVATILU se reserva el derecho de realizar modificaciones a sus productos sin previo aviso.

## MÓDULO LED'S:

Módulo de LEDs:	BENITO-NOVATILU Formato Zhaga de 8, 12 y 16 LEDs. Consultar Temperaturas de Color, CRI y Distribuciones Lumínicas	
Módulo sustituible:	Si	
LED:	5050	
Nº de LED's:	16	
Formato PCBs:	2 Zhaga (Book 15) 2x4	
Eficiencia nominal del LED:	172	
Temperatura de Color:	PC Ámbar, 2K2, 2K7, 3K, 4K, 5K	
Rendimiento Cromático CRI:	>70 (opcional >80)	
Vida Media de los LED - L90B10:	L90B10 >100.000 horas	

## ESPECIFICACIONES ÓPTICAS:

Sistema Óptico:	Lentes de PMMA 2x2	
Distribución Lumínica:	18 Distribuciones Lumínicas disponibles	
Flujo Hemisferio Superior (FHS) ULOR:	0%	
Flujo Hemisferio Inferior DLOR:	100%	
Índice de Deslumbramiento:	Entre D5 y D6 (depende de la distribución lumínica)	
Categoría Intensidad Luminosa:	Entre G*4 y G*6 (depende de la distribución lumínica)	
Flujo Luminoso CIE n°3:	>95%	
Seguridad Fotobiológica:	RG0 (exento de riesgo)	
Flujo lumínico Inicial Tj=25°C (hasta):	lm	9644
Eficiencia Lumínica Inicial Tj=25°C (hasta):	lm/W	162
Flujo lumínico Real Tj=85°C (UNE EN 13032-4) (hasta):	lm	8460
Eficiencia Lumínica Real Tj=85°C (UNE EN 13032-4) (hasta):	lm/W	142

## ESPECIFICACIONES ELÉCTRICAS:

Potencia máxima nominal (LED's):	W	54
Potencia máxima consumida (Luminaria):	W	60
Rango de Potencias:	W	20 - 60 W
Corriente máxima del LED:	mA	<500 (<50% I <sub>max</sub> )
Clase de Protección Eléctrica IEC:	Clase I y II	
Protector de Sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.	
Nivel de protección de tensión modo común y diferencial (SPD) Udc:	kV	10 y NTC opcional
Corriente máxima de descarga (8/20) (SPD):	kA	20
Desconexión Térmica de la Fase (SPD):	Si	
Tensión de Entrada:	Vac	220-240
Tensión de Entrada (rango máximo):	Vac	198-264
Frecuencia de Entrada:	Hz	47-63
Corriente de arranque:	A	<65
Duración del pico de arranque:	ms	<0,3
Eficiencia del Driver:	>90%	
Factor de potencia 100% consumo:	>0,98	
Factor de potencia 50% consumo:	>0,95	
Distorsión Harmónica Total (THD):	<10	
Consumo de Energía en reposo:	W	<0,4
Clasificación Energética:	A++ IPEA>1,15	

## CONDICIONES DE TRABAJO:

Vida Media de los LED - L90B10:	horas	>100.000
Vida Media del Driver a Tp<70°C:	horas	100.000
Vida Media de la Luminaria L80B10 (TM-21):	horas	
Temperatura ambiente de trabajo:	°C	de -35°C a +50°C
Superficie al viento:	m <sup>2</sup>	
Test anti vibraciones (15Hz en 3 ejes):		
Test fuerza del viento:	m/s	
Período de Garantía:	años	5 años (opcional hasta 10)

## DIMENSIONES EMBALAJE:

Peso neto	kg	1,1
Peso Bruto	kg	
Dimensiones Luminaria (LxAxH)	mm	168x175x65
Dimensiones Embalaje (LxAxH)	mm	
Unidades por Embalaje		1
Cantidad por contenedor de 20"		
Cantidad por contenedor de 40"		

## CERTIFICACIONES:

Certificaciones Seguridad:	Certificaciones EMC:	Otras Certificaciones:
EN 62031 / EN 62493 / EN 62471 / IEC 62778 / EN 61247-2-13	EN 55015 / EN 61547 / EN 61000-3-2 / EN 61000-3-3 / EN 61347-2-13 / EN 61347-1 / EN 62384	IEC 62262 / EN 13032-4 / EN 62717 / EN 6272-1 / EN 6272-2-1 / EN 61643-11

## 1.2 Tabla (Anexo 2) CEI – IDAE Requerimientos Técnicos Luminaria

DATOS Y DOCUMENTACIÓN TÉCNICA TIPO FAROL																							
1	Marca y Modelo	BENITO - Módulo 16																					
2	Ficha Técnica	Si – AR40																					
3	Marcado CE	Si																					
4	Material de Fabricación conforme el apartado 5.	Si																					
5	Sustitución independiente de los sistemas integrantes compartimento óptico (módulo y lente) y equipos auxiliares	Si																					
6	Grado de estanqueidad en la luminaria IP 66	IP 66																					
7	Grado de protección ante impactos en la luminaria mínimo IK 08	IK 10																					
8	Rango de temperatura de funcionamiento -10°C a 35°C	Si, - 20°C A +50°C																					
9	Número de distribuciones fotométricas, al menos 3	3																					
10	Curvas Fotométricas y de utilización de la luminaria, al menos 5	Si																					
11	FHSINST , máximo permitido 3%	<1%																					
12	Temperatura de color en K de la luz emitida por la luminaria, máxima permitida (4000K)	Si																					
Eficacia de salida de la luminaria (lm/W)																							
13	<table border="1"> <thead> <tr> <th>TIPO DE LED</th> <th>lm/W min</th> </tr> </thead> <tbody> <tr> <td>LED NEUTRO 4000°K</td> <td>110</td> </tr> <tr> <td>LED CÁLIDO 3000°K</td> <td>100</td> </tr> <tr> <td>LED CÁLIDO 2700°K</td> <td>90</td> </tr> <tr> <td>LED CÁLIDO 2200°K</td> <td>85</td> </tr> <tr> <td>LED ÁMBAR (Phosphor-Converted)*</td> <td>70</td> </tr> <tr> <td>LED ÁMBAR PURO (monocromático)*</td> <td>40</td> </tr> </tbody> </table>	TIPO DE LED	lm/W min	LED NEUTRO 4000°K	110	LED CÁLIDO 3000°K	100	LED CÁLIDO 2700°K	90	LED CÁLIDO 2200°K	85	LED ÁMBAR (Phosphor-Converted)*	70	LED ÁMBAR PURO (monocromático)*	40	<table border="1"> <thead> <tr> <th>lm/W</th> </tr> </thead> <tbody> <tr> <td>&gt;120</td> </tr> <tr> <td>&gt;110</td> </tr> <tr> <td>&gt;100</td> </tr> <tr> <td>&gt;90</td> </tr> <tr> <td>&gt;75</td> </tr> <tr> <td>-</td> </tr> </tbody> </table>	lm/W	>120	>110	>100	>90	>75	-
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>100																							
>90																							
>75																							
-																							
14	Clase Eléctrica	I y II																					
15	Medidas Eléctricas: Tensión, corriente, potencia total consumida y Factor de potencia (>0.9)	Tensión 230V / Potencia 40W / FP >0,98																					
16	Vida útil estimada de la luminaria (Se considerará como máximo 100.000h)	L90B10 >100 000 horas																					
17	Ficha Técnica del LED utilizado en la luminaria y marcado CE	Si																					
18	Número de LEDs y Corriente de Alimentación	16 Led / 375mA																					
19	Ficha Técnica Driver y marcado CE	Si																					
20	Ficha Técnica de otros dispositivos (SPD, OLC,...etc) y marcado CE, que se estimen oportunos	Si																					



## 2 Informes de Pruebas y Certificados de la Luminaria por OEC

### 2.1 Tabla de Verificación (Anexo 3) CEI – IDAE

Informes de Pruebas y Certificados emitidos por OEC acreditada sobre La luminaria y sus elementos integrantes	
1	Documento del alcance de la acreditación del certificador/es de estos informes o certificados.
2	UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.
3	UNE EN 60598-2-3 o 60598-2-5 Luminarias. Requisitos particulares. Luminarias de Alumbrado público o proyectores.
4	UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan Lámparas, o según IEC/TR 62778 que es su norma de aplicación.
5	Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.
6	El Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria)
7	UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2: Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16A por fase)
8	UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.
9	UNE-EN 61547. Equipos para alumbrado de uso general. Requisitos de inmunidad CEM.
10	UNE-EN 62031. Módulos LED para alumbrado general. Requisitos de seguridad. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.
11	UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.
12	UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED. Requisitos de funcionamiento.
13	Informe de ensayo en relación al material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda. A – Luminaria modelo funcional

## 2.2 Requisitos de Seguridad

- UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.
- UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.
- UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas.
- Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.
- Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262.



Product Service

# Attestation of Compliance

No. N5A 17 11 02897 001

**Holder of Certificate: NOVATILU, S.L.U**Via Ausetania 11  
08560 Manlleu  
SPAIN**Product: LED Module**

This Attestation of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of Low Voltage Directive 2014/35/EU. The essential requirements are fulfilled accordingly based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for testing and certification. See also notes overleaf.

**Test report no.:** 701281718401-00**Date,** 2017-11-16  
( Binwen Zhang )

Other relevant European directives have to be observed. If they require CE marking, it may be affixed on the product after preparation of the necessary technical documentation as well as the EU declaration of conformity.

Page 1 of 3



Product Service

## Attestation of Compliance

No. N5A 17 11 02897 001

**Model(s):** AML079XXX, AML0612XXX, AML0616XXX,  
AML0624XXX, AML0632XXX, ANL16LXXX,  
ANL32LXXX, AML0412XXX, AML0315XXX,  
AML0248XXX, AML0236XXX, AML0224XXX,  
AML0130XXX

**Brand:** NOVATILU

**Parameters:**

Rated voltage:	See attachment
Protection Class:	Class III
Rated power:	See attachment
Degree of protection:	IP66
tc:	85°C
ta:	45°C

**Tested according to:** EN 62031:2008/A2:2015  
EN 62493:2015  
EN 62471:2008

**Attestation of Compliance**  
**No. N5A 17 11 02897 001**



Product Service

Model type	Max. Wattage(W)	Voltage (dc.V)	Quantity of LEDs
AML079XXX	30	21,6~36	9
AML0612XXX	30	25,2~42	12
AML0616XXX	40	32,4~54	16
AML0624XXX	60	25,2~42	24
AML0632XXX	80	32,4~54	32
ANL16LXXX	40	32,4~54	16
ANL32LXXX	80	32,4~54	32
AML0412XXX	80	25,2~42	12
AML0315XXX	40	32,4~54	15
AML0248XXX	100	25,2~42	48
AML0236XXX	80	25,2~42	36
AML0224XXX	60	25,2~42	24
AML0130XXX	60	21,6~36	30


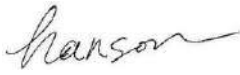
Note: XXX can be 001-100, represents the rated power of product, e.g. 005=5W



Test Report issued under the responsibility of:



<b>TEST REPORT</b> <b>IEC TR 62778</b> <b>Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires</b>	
<b>Report Number</b> .....	3194758.51P
<b>Date of issue</b> .....	2016-08-30
<b>Total number of pages</b> .....	16
<b>Name of Testing Laboratory preparing the Report</b> .....	DEKRA Testing and Certification (Shanghai) Ltd. 3/F, #250, Jiangchangsan Road building 16 Headquarter Economy Park Shibeil Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436
<b>Applicant's name</b> .....	Lumileds Commercial (Shanghai) Co., Ltd
<b>Address</b> .....	No. 9, Lane 888, Tianlin Road, Shanghai, China
<b>Test specification:</b>	
<b>Standard</b> .....	IEC TR 62778:2014 (Second Edition)
<b>Test procedure</b> .....	CB Scheme
<b>Non-standard test method</b> .....	N/A
<b>Test Report Form No.</b> .....	IEC62778A
<b>Test Report Form(s) Originator</b> ....	TÜV SÜD Product Service GmbH
<b>Master TRF</b> .....	Dated 2016-02
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<b>General disclaimer:</b>	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.	

<b>Test item description</b> .....	LUXEON 5050	
<b>Trade Mark</b> .....	LUMILEDS	
<b>Manufacturer</b> .....	Lumileds Commercial (Shanghai) Co., Ltd No. 9, Lane 888, Tianlin Road, Shanghai, China	
<b>Model/Type reference</b> .....	LUXEON 5050 series Detailed lists refer to Appendix 2: Model List	
<b>Ratings</b> .....	Max voltage: 27 Vdc, Max current: 240 mA Detailed information please refer to Appendix 2: Model List.	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/> <b>CB Testing Laboratory:</b>	DEKRA Testing and Certification (Shanghai) Ltd.	
<b>Testing location/ address</b> .....	3/F, #250, Jiangchangsan Road building 16 Headquater Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436	
<input type="checkbox"/> <b>Associated CB Testing Laboratory:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....	Zhijun Wang	
<b>Approved by (name, function, signature)</b> .....	Hanson Zhang	
<b>Testing procedure: CTF Stage 1:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> .....		
<b>Testing procedure: CTF Stage 2:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name + signature)</b> .....		
<b>Witnessed by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> .....		
<b>Testing procedure: CTF Stage 3:</b>		
<b>Testing procedure: CTF Stage 4:</b>		
<b>Testing location/ address</b> .....		

Tested by (name, function, signature) .....		
Witnessed by (name, function, signature) .....		
Approved by (name, function, signature) .....		
Supervised by (name, function, signature) .....		



<p><b>List of Attachments (including a total number of pages in each attachment):</b></p> <ul style="list-style-type: none"> <li>● Appendix 1: Photo Documentation</li> <li>● Appendix 2: Model List</li> <li>● Appendix 3: Relative Spectrum Of Tested Sample(s)</li> <li>● Appendix 4: Table 6.1 Based On IEC 62471:2006</li> <li>● Appendix 5: Table 6.1 Based On EN62471:2008, Attachment To IEC 62471 European Group Differences And National Differences</li> </ul>	
<p><b>Summary of testing:</b></p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>These tests fulfil the requirements of standard ISO/IEC 17025. When determining the test conclusion, the Measurement Uncertainty of test has been considered.</p> <p>The tested sample of L150-44705024SCP00 from LUXEON 5050 series list at appendix 2 Have been tested according to the IEC 62471 (first edition, 2006-07) <b>at 200mm</b> and been classified as <b>RG 2</b>. Have been tested according to the EN 62471:2008 <b>at 200mm</b> and been classified as <b>RG 2</b>. Have been tested according to the IEC/TR62778:2014 and been classified as <b>RG 2 for blue light hazard</b></p>	<p><b>Testing location:</b></p> <p>DEKRA Testing and Certification (Shanghai) Ltd. 3/F, #250, Jiangchangsan Road building 16 Headquater Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436</p>
<p><b>Summary of compliance with National Differences (List of countries addressed): EN Standards</b></p> <p>EN 62471:2008</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements</b></p>	

**Copy of marking plate:**

**The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.**

N/A

<b>Test item particulars.....: See below</b>	
<b>Product evaluated.....:</b> <input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire	
<b>Rated voltage (V) .....:</b> Max: 27 Vdc	
<b>Rated current (mA) .....:</b> Max:240 mA	
<b>Rated CCT (K).....:</b> 2600K / 3340K // 4000K / 4360K Details information please refer to Appendix 2: Model List.	
<b>Rated Luminance (Mcd/m<sup>2</sup>) .....:</b> --	
<b>Component report data used .....:</b> <input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp Report number: --	
<b>Possible test case verdicts:</b> - test case does not apply to the test object..... : N/A - test object does meet the requirement..... : P (Pass) - test object does not meet the requirement..... : F (Fail)	
<b>Testing.....:</b> --	
<b>Date of receipt of test item .....:</b> 2016-08-25	
<b>Date (s) of performance of tests .....:</b> 2016-08-25 to 2016-08-30	
<b>General remarks:</b> "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. <b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b> The product complied with the following standards: <input checked="" type="checkbox"/> IEC 62471:2006 <input checked="" type="checkbox"/> EN 62471:2008 <input type="checkbox"/> IEC/TR 62471-2:2009 <input checked="" type="checkbox"/> IEC/TR 62778:2014	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC60730-2:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable

**When differences exist; they shall be identified in the General product information section.**

**Name and address of factory (ies) .....** : Lumileds Commercial (Shanghai) Co., Ltd  
No. 9, Lane 888, Tianlin Road, Shanghai, China

**General product information:**

L150-44705024SCP00, with ANSI bin 4360K, is part of the LUXEON 5050 product family. The sample measured, L150-44705024SCP00 has the highest typical flux density (lumens per mm<sup>2</sup> of light emitting surface (LES) area), highest typical device luminance level and highest CCT within the listed LUXEON 5050 product family. The present classification is thus valid (worst case) for all LUXEON 5050 with part number L 1 5 0 - A A B 5 0 2 4 C C 0 0 where AA represents nominal ANSI CCT bins could be equal to 4360K or lower, BB represents CRI could be from 68 to 90 (see TR IEC62778). See the appendix below for an explanation of the type designation.

The products considered as worst case which should be evaluated at 200mm.

The sample of L150-44705024SCP00 was tested at 200mm from the light source. CCT of spectral irradiance was found at 4544 K.

Base on the Model list which listed on the appendix 2, The tested sample can be considered as  
 typical product  worst product

Which the results can be reference used for the other models.

Type test was performed according to IEC 62471:2006 procedure.

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict
<b>7</b>	<b>MEASUREMENT INFORMATION FLOW</b>		<b>P</b>
<b>7.1</b>	<b>Basic flow</b>		<b>P</b>
	'Law of conservation of luminance' applied		N/A
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		N/A
	In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution		N/A
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		<b>P</b>
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
<b>7.3</b>	<b>Special cases (I): Replacement by a lamp or LED module of another type</b>		<b>N/A</b>
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
<b>7.4</b>	<b>Special cases (II): Arrays and clusters of primary light sources</b>		<b>N/A</b>
	LED package is evaluated as ..... : <input type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited		N/A
	$E_{thr}$ of LED package applies to array		N/A
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		<b>P</b>
	Risk group achieved:		P
	- ..Risk Group 0 unlimited		N/A
	- ..Risk Group 1 unlimited		N/A
	- $E_{thr}$ ..... (lx) : - Distance to reach RG1..... (mm) ::	Refer to the Supplementary information of <b>TABLE:Spectroradiometric measurement</b> as following	P

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE:Spectroradiometric measurement				
Measurement performed on:		<input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire		
Model number.....		L150-44705024SCP00		
Test voltage (V) .....		27 Vdc		—
Test current (mA) .....		240 mA		—
Test frequency (Hz).....		--		—
Ambient, t(°C) .....		25°C		—
Measurement distance.....		<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		—
Source size .....		<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small :		—
Field of view .....		<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		—
Item	Symb ol	Units	Result	Remark
Correlated colour temperature	CCT	K	4544	
x/y colour coordinates			0,3669/ 0,4076	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	1,70E+04	@11mrad
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	--	
Luminance	L	cd/m <sup>2</sup>	2,82E+07	@11mrad
Illuminance	E	lx	8,23E+03	
Supplementary information: Per IEC/TR 62778:2014 E <sub>thr</sub> =1655 lx D <sub>min</sub> = 446 mm				

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

	<b>TABLE: Angular light distribution</b>	<b>N/A</b>

**List of test equipment used:**

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to CTF stage 1 or CTF stage 2 procedure has been used.

Note: This page may be removed when CTF stage 1 CTF stage 2 are not used. See also clause 4.8 in OD 2020 for more details.

Clause	Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Last Calibration date	Calibration due date
7	Irradiance measurements Radiance measurements	IDR 300 Monochromator (SH 344)	200-3000nm	/	/
7	Radiance measurements	S009 Telescope (SH 345)	300-1400nm	/	/
7	Radiance measurements	SRS 12 Radiance Standard (SH 348)	300-1400nm	2016/3/22	2017/3/22
7	Irradiance measurements	CL6 Spectral irradiance standard (SH 350)	300-3000nm	2016/3/22	2017/3/22
7	Irradiance measurements	CL7 Spectral irradiance standard (SH 351)	200-400nm	2016/3/22	2017/3/22
7	Irradiance measurements	Photometric detector head (SH 359)	380nm-800nm	2016/3/22	2017/3/22
7	Irradiance measurements Radiance measurements	Wattmeter (SH070)	500V,40A	2015/10/16	2016/10/16



Appendix 1: Photo Documentation



Overview (tested)

Appendix 2: Model List:

L150-44705024SCP00, with ANSI bin 4360K, is part of the LUXEON 5050 product family. The sample measured, L150-44705024SCP00 has the highest typical flux density (lumens per mm<sup>2</sup> of light emitting surface (LES) area), highest typical device luminance level and highest CCT within the listed LUXEON 5050 product family. The present classification is thus valid (worst case) for all LUXEON 5050 with part number L 1 5 0 - A A B B 5 0 2 4 C C C 0 0 where AA represents nominal ANSI CCT bins could be equal to 4360K or lower, BB represents CRI could be from 68 to 90 (see TR IEC62778). See the appendix below for an explanation of the type designation.

L 1 5 0 - **A A B B** 5 0 2 4 C C C 0 0

Where:

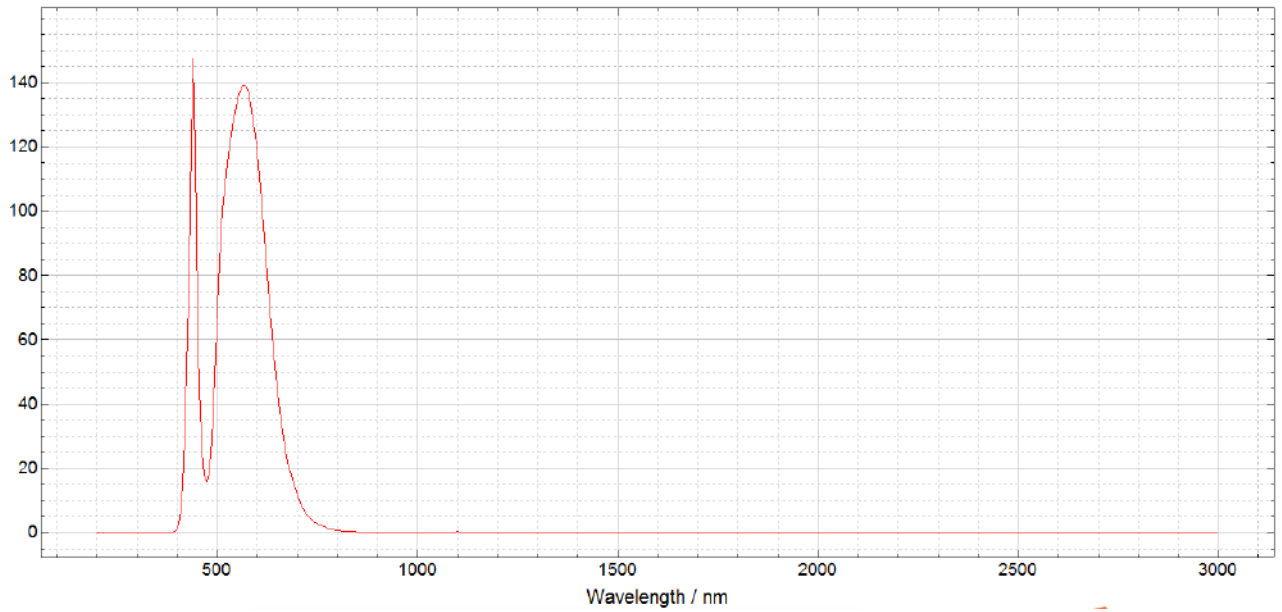
**AA** - designates nominal ANSI CCT

**BB** - designates minimum CRI

**CCC** - designates standard color point or customized one

Part number	CRI	CCT	typical flux (lm)	LES (mm <sup>2</sup> )	flux density	Max voltage	max current
L150-26705024SCP00	≥68	2600K	590	16.3	36	27	240
L150-33705024SCP00	≥68	3340K	625	16.3	38	27	240
L150-40705024SCP00	≥68	4000K	655	16.3	40	27	240
L150-44705024SCP00	≥68	4360K	655	16.3	40	27	240

Appendix 3: Relative Spectrum Of Tested Sample(s)



Appendix 4: Table 6.1 Based On IEC 62471:2006

DUT: L150-44705024SCP00, Evaluation Distance: 200mm, Test current: 240mA, Angular subtense of the apparent source  $\alpha$ : 25mrad

IEC 62471									
Clause	Requirement + Test				Result – Remark				Verdict
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps								P
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	0,0000	0,003		0,03	
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	0,0000	33		100	
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	5,08E+02	10000	1,70E+04	4000000	1,80E+04
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	--	1,0		400	
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ $\alpha$	2,23E+05	28000/ $\alpha$		71000/ $\alpha$	
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	6000/ $\alpha$	--	6000/ $\alpha$		6000/ $\alpha$	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0,04	570		3200	
* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian.									
** Involves evaluation of non-GLS source									

Appendix 5: Table 6.1 Based On EN62471:2008, Attachment To IEC 62471 European Group Differences And National Differences

DUT: L150-44705024SCP00, Evaluation Distance: 200mm, Test current: 240mA, Angular subtense of the apparent source  $\alpha$ : 25mrad

EN 62471										
Clause	Requirement + Test			Result – Remark				Verdict		
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)								P	
Risk	Action spectrum	Symbol	Units	Emission Measurement						
				Exempt		Low risk		Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	0,0000	--	--	--	--	
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	0,0000	--	--	--	--	
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	5,08E+02	10000	1,70E+04	4000000	1,80E+04	
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	--	1,0		400		
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ $\alpha$	2,23E+05	28000/ $\alpha$		71000/ $\alpha$		
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 0,0017 $\leq \alpha \leq$ 0,011	--					
				6000/ $\alpha$ 0,011 $\leq \alpha \leq$ 0,1	--					
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0,04	570		3200		
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2  The applicable aperture diameters: see 4.2.1  The limitations for the angular subtenses: see 4.2.2  The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p>										

## 2.3 Compatibilidad Electromagnética

- UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2 Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16 A por fase)
- UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.
- UNE-EN 61547. Equipos para alumbrado

## 4 General Information

### 4.1 Client Information

Applicant: NOVATILU, S.L.U  
 Address of Applicant: Via Ausetania, 11-13 08560 MANLLEU Barcelona Spain  
 Manufacturer: NOVATILU, S.L.U  
 Address of Manufacturer: Via Ausetania, 11-13 08560 MANLLEU Barcelona Spain

### 4.2 Details of E.U.T.

Power supply: AC 100-240V 50/60Hz  
 For model D-120S1NLED: 40W  
 For model D-170MLED: 150W  
 Cable: 0.8m for AC cable.

### 4.3 E.U.T Operation Mode

Detail description of the Test mode

- a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.
- b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

### 4.4 Description of Support Units

The EUT has been tested as an independent unit.

### 4.5 Standards Applicable for Testing

**Table 1 : Tests Carried Out Under EN 55015:2013+A1:2015**

Method	Item	Status
EN 55015:2013+A1:2015	Conducted Disturbance at Mains Terminals(9KHz-30MHz)	√
EN 55015:2013+A1:2015	Conducted Disturbance at Load Terminals(150KHz-30MHz)	×
CISPR 32:2015	Radiated Disturbance(30MHz-300MHz)	√
EN 55015:2013+A1:2015	Radiated Disturbance (Magnetic field Induced Current)(9KHz-30MHz)	√
EN 55015:2013+A1:2015	Insertion Loss	×
EN 55015:2013+A1:2015	Conducted Disturbance at Control Terminals(150KHz-30MHz)	×
EN 55015:2013+A1:2015	Conducted RF Emission Test for CDN method	×



**Table 2 : Tests Carried Out Under EN 61547:2009**

Method	Item	Status
EN 61000-4-2:2009	Electrostatic Discharge	√
EN 61000-4-3:2006+A1:2008+A2:2010	Radiated Immunity(80MHz-1GHz)	√
EN 61000-4-4:2012	Electrical Fast Transients/Burst at Power Port	√
EN 61000-4-4:2012	Electrical Fast Transients/Burst at Signal Port	×
EN 61000-4-5:2014	Surge at Power Port	√
EN 61000-4-6:2014	Conducted Immunity at Power Port(150kHz-80MHz)	√
EN 61000-4-6:2014	Conducted Immunity at Signal Port(150kHz-80MHz)	×
EN 61000-4-11:2004	Voltage Dips and Interruptions	√
EN 61000-4-4:2012	Electrical Fast Transients/Burst at DC port	×
EN 61000-4-6:2014	Conducted Immunity at DC Port(150kHz-80MHz)	×

**Table 3 : Tests Carried Out Under EN 61000-3-2:2014**

Method	Item	Status
EN 61000-3-2:2014	Harmonic Current Emission	√

**Table 4 : Tests Carried Out Under EN 61000-3-3:2013**

Method	Item	Status
EN 61000-3-3:2013	Voltage Fluctuations and Flicker	√

- × Indicates that the test is not applicable  
√ Indicates that the test is applicable



## 6 Emission Test Results

### 6.1 CE M(9k-30M)

Test Requirement:	EN 55015:2013+A1:2015
Test Method:	EN 55015:2013+A1:2015
Frequency Range:	9kHz to 30MHz
Limit:	
0.009MHz – 0.05MHz	110dB(μV) quasi-peak
0.05MHz – 0.15MHz	90dB(μV)-80dB(μV) quasi-peak
0.15MHz – 0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5MHz – 5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5MHz – 30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (200Hz resolution bandwidth) 0.009M to 0.15MHz Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

#### 6.1.1 E.U.T. Operation

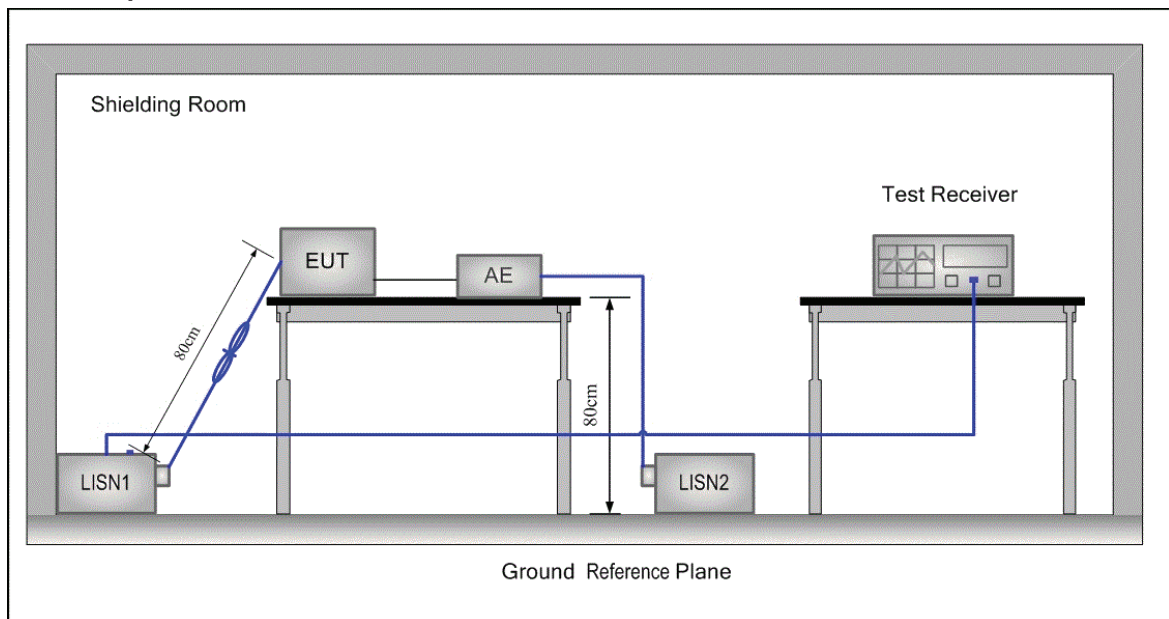
Operating Environment:

Temperature: 22 °C Humidity:48 % RH Atmospheric Pressure: 1010 mbar

Pretest these a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.  
mode to find the b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.  
worst case:

The worst case for a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.  
final test b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

#### 6.1.2 Test Setup

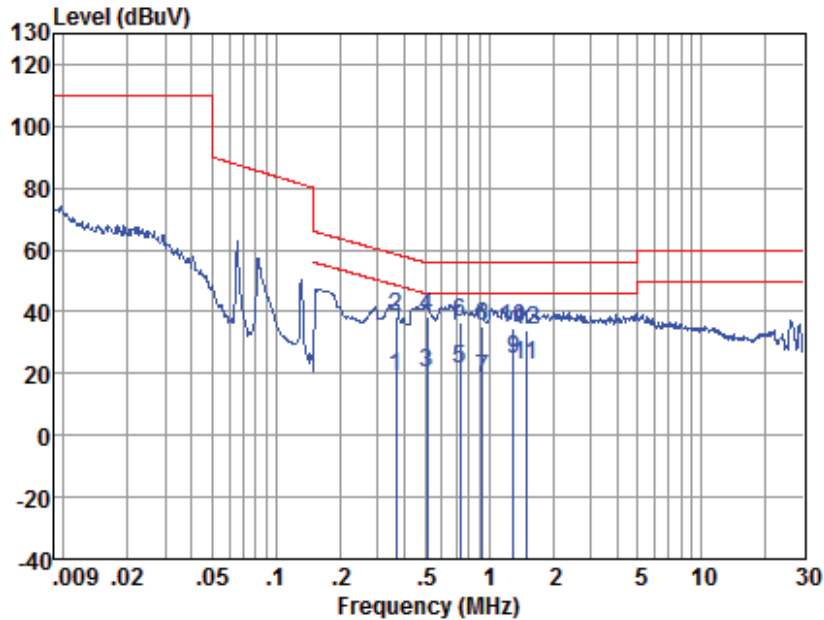


#### 6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.



Mode:a;Line:Live Line

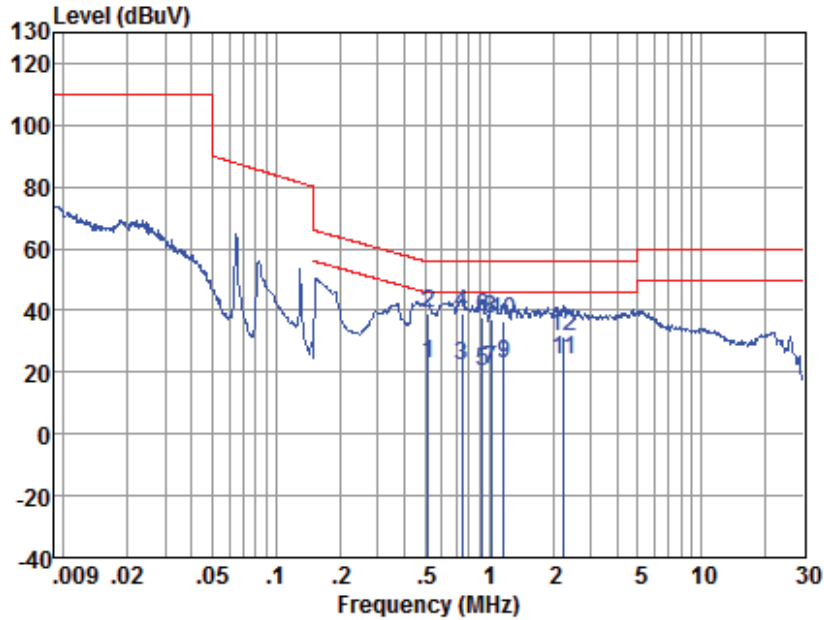


Site : chamber  
Condition : 55015-CE-QP LISN-L-2016  
EUT/Project No: 3742LM  
Test mode : a

	Read Freq	LISN Level	Cable Factor	Cable Loss	Limit Level	Over Line	Remark
	MHz	dBuV	dB	dB	dBuV	dB	
1	0.366	8.69	0.09	10.01	18.79	48.60	-29.81 Average
2	0.366	28.45	0.09	10.01	38.55	58.60	-20.05 QP
3	0.511	9.83	0.10	10.02	19.95	46.00	-26.05 Average
4	0.511	28.15	0.10	10.02	38.27	56.00	-17.73 QP
5	0.730	11.07	0.10	10.02	21.19	46.00	-24.81 Average
6	0.730	26.49	0.10	10.02	36.61	56.00	-19.39 QP
7	0.934	8.42	0.08	10.02	18.52	46.00	-27.48 Average
8	0.934	25.26	0.08	10.02	35.36	56.00	-20.64 QP
9	1.306	14.59	0.08	10.03	24.70	46.00	-21.30 Average
10	1.306	24.57	0.08	10.03	34.68	56.00	-21.32 QP
11	1.489	12.75	0.08	10.04	22.87	46.00	-23.13 Average
12	1.489	23.79	0.08	10.04	33.91	56.00	-22.09 QP



Mode:a;Line:Neutral Line

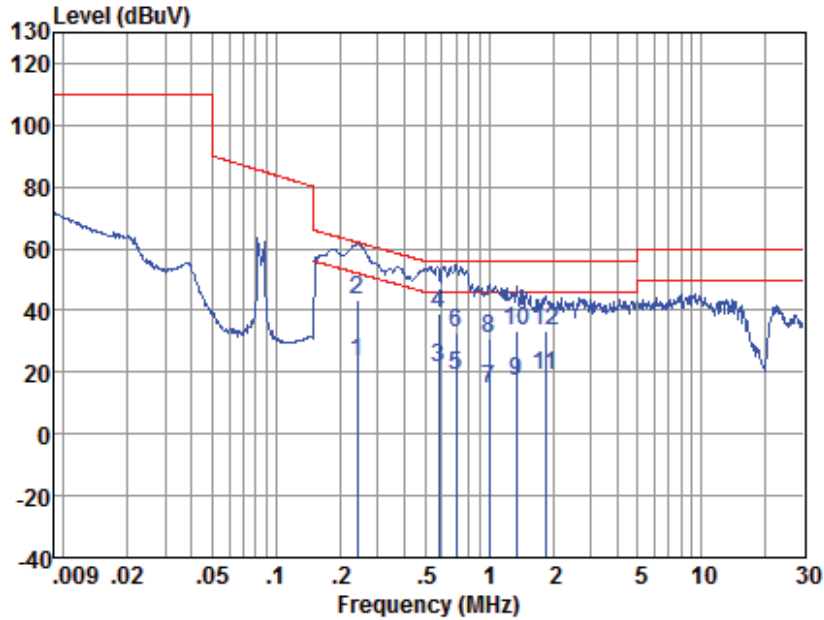


Site : chamber  
Condition : 55015-CE-QP LISN-N-2016  
EUT/Project No: 3742LM  
Test mode : a

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.516	12.84	0.04	10.02	22.90	46.00	-23.10	Average
2	0.516	28.67	0.04	10.02	38.73	56.00	-17.27	QP
3	0.746	11.95	0.05	10.02	22.02	46.00	-23.98	Average
4	0.746	28.96	0.05	10.02	39.03	56.00	-16.97	QP
5	0.931	10.24	0.05	10.02	20.31	46.00	-25.69	Average
6	0.931	27.54	0.05	10.02	37.61	56.00	-18.39	QP
7	1.019	10.73	0.05	10.03	20.81	46.00	-25.19	Average
8	1.019	27.01	0.05	10.03	37.09	56.00	-18.91	QP
9	1.169	12.60	0.05	10.03	22.68	46.00	-23.32	Average
10	1.169	26.31	0.05	10.03	36.39	56.00	-19.61	QP
11	2.260	13.93	0.08	10.04	24.05	46.00	-21.95	Average
12	2.260	21.66	0.08	10.04	31.78	56.00	-24.22	QP



Mode:b;Line:Live Line

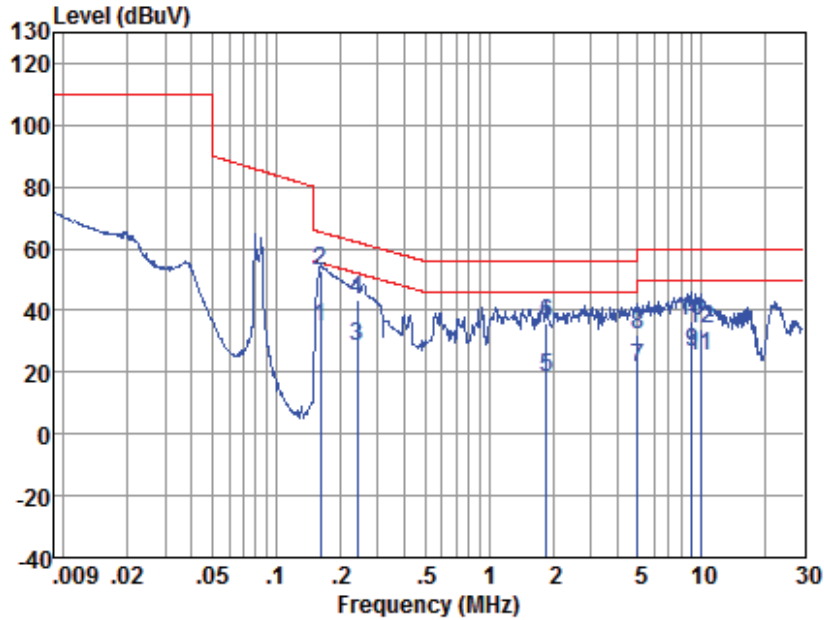


Site : chamber  
Condition : 55015-CE-QP LISN-L-2016  
EUT/Project No: 3742LM  
Test mode : b

	Read Freq	LISN Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.240	13.20	0.09	10.01	23.30	52.09	-28.79	Average
2	0.240	33.52	0.09	10.01	43.62	62.09	-18.47	QP
3	0.581	11.25	0.10	10.02	21.37	46.00	-24.63	Average
4	0.581	29.03	0.10	10.02	39.15	56.00	-16.85	QP
5	0.702	8.81	0.10	10.02	18.93	46.00	-27.07	Average
6	0.702	22.81	0.10	10.02	32.93	56.00	-23.07	QP
7	1.002	4.63	0.08	10.02	14.73	46.00	-31.27	Average
8	1.002	20.67	0.08	10.02	30.77	56.00	-25.23	QP
9	1.346	7.10	0.08	10.03	17.21	46.00	-28.79	Average
10	1.346	22.99	0.08	10.03	33.10	56.00	-22.90	QP
11	1.832	9.08	0.08	10.04	19.20	46.00	-26.80	Average
12	1.832	23.38	0.08	10.04	33.50	56.00	-22.50	QP



Mode:b;Line:Neutral Line



Site : chamber  
Condition : 55015-CE-QP LISN-N-2016  
EUT/Project No: 3742LM  
Test mode : b

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.162	24.90	0.05	10.00	34.95	55.38	-20.43	Average
2	0.162	42.79	0.05	10.00	52.84	65.38	-12.54	QP
3	0.241	18.42	0.05	10.01	28.48	52.07	-23.59	Average
4	0.241	33.21	0.05	10.01	43.27	62.07	-18.80	QP
5	1.863	8.13	0.06	10.04	18.23	46.00	-27.77	Average
6	1.863	25.87	0.06	10.04	35.97	56.00	-20.03	QP
7	4.973	10.95	0.18	10.08	21.21	46.00	-24.79	Average
8	4.973	21.69	0.18	10.08	31.95	56.00	-24.05	QP
9	9.022	16.26	0.20	10.10	26.56	50.00	-23.44	Average
10	9.022	25.92	0.20	10.10	36.22	60.00	-23.78	QP
11	9.911	14.98	0.21	10.10	25.29	50.00	-24.71	Average
12	9.911	23.47	0.21	10.10	33.78	60.00	-26.22	QP

## 6.2 RE(30M-300M)

Test Requirement:	EN 55015:2013+A1:2015
Test Method:	CISPR 32:2015
Frequency Range:	30MHz to 300MHz
Limit:	
30MHz-230MHz	40dB( $\mu$ V/m) quasi-peak
230MHz-300MHz	47dB( $\mu$ V/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 300MHz

### 6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 51 % RH Atmospheric Pressure: 1001 mbar

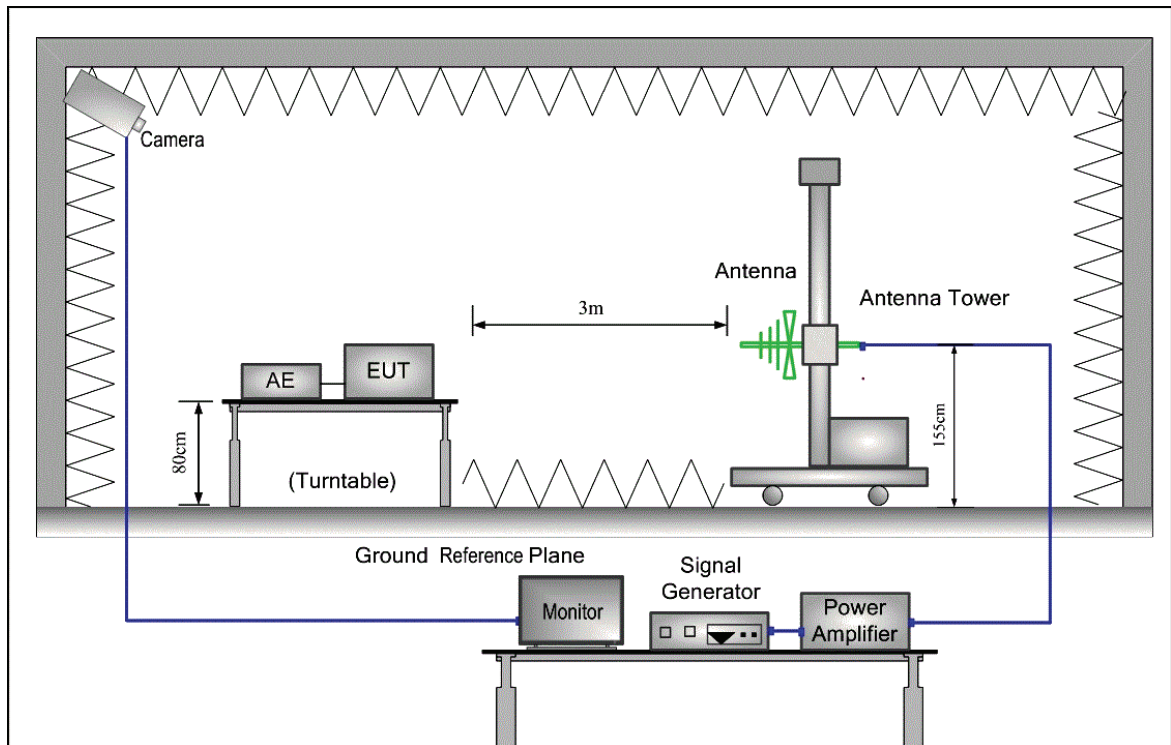
Pretest these mode to find the worst case:

- a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.
- b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

The worst case for final test

- a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.
- b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

### 6.2.2 Test Setup

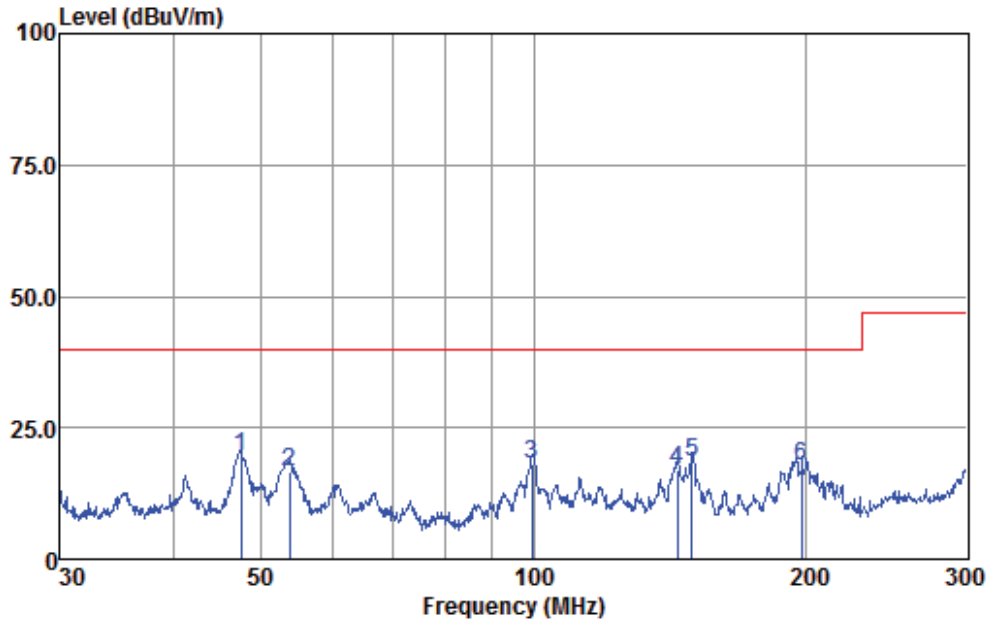


### 6.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



Mode:a;Polarization:Horizontal

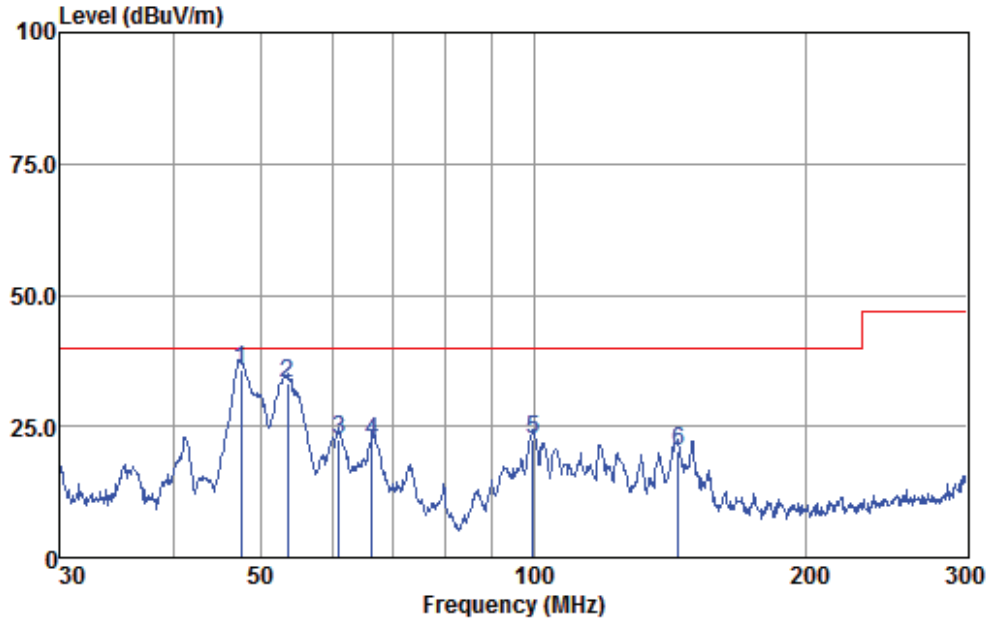


Condition : HORIZONTAL  
EUT/Project: 3742LM  
Test Mode : a

	ReadAntenna	Cable	Preamp	Limit	Over				
Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Remark	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1 q	47.55	38.52	13.72	0.68	33.53	19.39	40.00	-20.61 QP	
2	53.72	36.01	13.36	0.73	33.44	16.66	40.00	-23.34 QP	
3	99.57	40.96	9.19	1.10	33.30	17.95	40.00	-22.05 QP	
4	143.92	36.25	12.50	1.34	33.28	16.81	40.00	-23.19 QP	
5	149.32	37.54	12.78	1.37	33.26	18.43	40.00	-21.57 QP	
6	197.75	38.09	10.86	1.58	32.93	17.60	40.00	-22.40 QP	



Mode:a;Polarization:Vertical



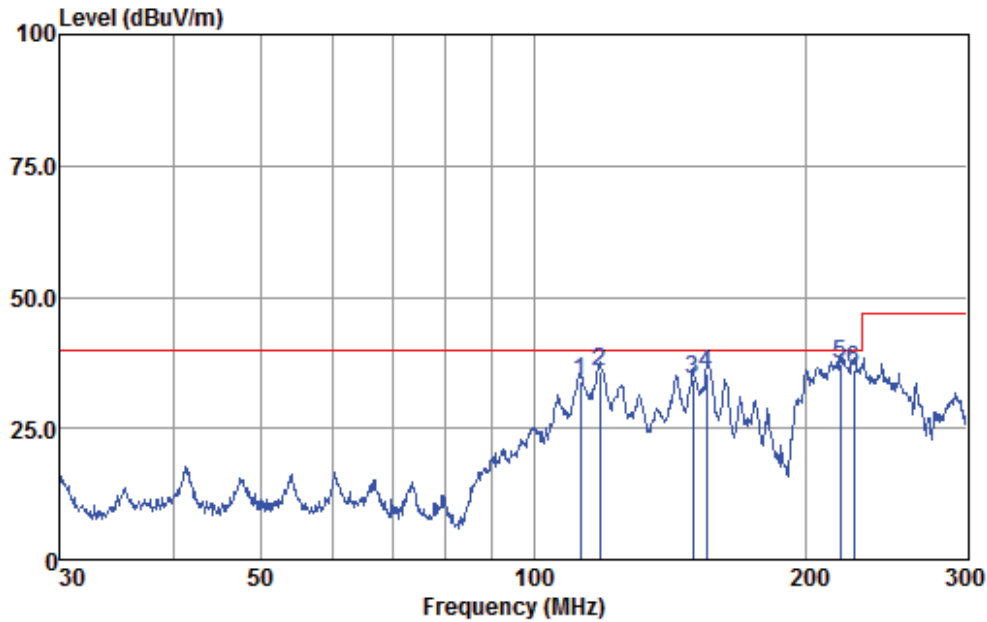
Condition : VERTICAL  
EUT/Project: 3742LM  
Test Mode : a

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 q	47.55	54.85	13.72	0.68	33.53	35.72	40.00	-4.28	QP
2	53.47	52.37	13.38	0.73	33.40	33.08	40.00	-6.92	QP
3	60.97	43.14	12.21	0.79	33.52	22.62	40.00	-17.38	QP
4	66.24	42.31	12.40	0.83	33.36	22.18	40.00	-17.82	QP
5	99.80	45.47	9.20	1.10	33.29	22.48	40.00	-17.52	QP
6	144.58	39.82	12.53	1.34	33.27	20.42	40.00	-19.58	QP





Mode:b;Polarization:Horizontal

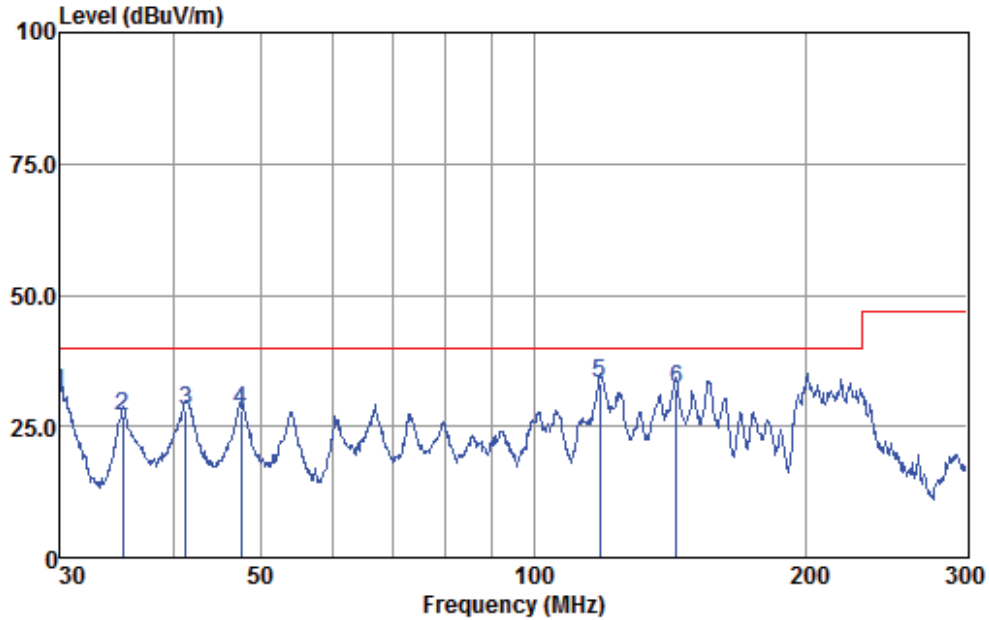


Condition : HORIZONTAL  
EUT/Project: 3742LM  
Test Mode : b

	Freq	ReadAntenna	Cable	Preamp	Level	Limit	Over	Remark
	MHz	Level	Factor	Loss	Factor	Line	Limit	
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	112.49	55.03	11.12	1.16	33.48	33.83	40.00	-6.17 QP
2	118.34	56.32	11.65	1.21	33.42	35.76	40.00	-4.24 QP
3	150.01	53.58	12.80	1.37	33.25	34.50	40.00	-5.50 QP
4	155.28	55.06	12.41	1.39	33.33	35.53	40.00	-4.47 QP
5 q	217.83	57.98	10.12	1.72	32.62	37.20	40.00	-2.80 QP
6	225.49	57.30	10.05	1.75	32.82	36.28	40.00	-3.72 QP



Mode:b;Polarization:Vertical



Condition : VERTICAL  
EUT/Project: 3742LM  
Test Mode : b

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	30.00	51.52	12.50	0.60	33.18	31.44	40.00	-8.56	QP
2	35.17	47.21	12.52	0.57	33.40	26.90	40.00	-13.10	QP
3	41.32	47.15	13.76	0.61	33.60	27.92	40.00	-12.08	QP
4	47.55	47.00	13.72	0.68	33.53	27.87	40.00	-12.13	QP
5 q	118.34	53.71	11.65	1.21	33.42	33.15	40.00	-6.85	QP
6	143.59	51.60	12.50	1.34	33.28	32.16	40.00	-7.84	QP

### 6.3 RE Loop(9K-30M)

Test Requirement:	EN 55015:2013+A1:2015
Test Method:	EN 55015:2013+A1:2015
Frequency Range:	9kHz to 30MHz
Limit:	
0.009MHz-0.07MHz	88dB(μA) quasi-peak
0.07MHz-0.15MHz	88dB(μA)-58dB(μA) quasi-peak
0.15MHz-3MHz	58dB(μA)-22dB(μA) quasi-peak
3MHz-30MHz	22dB(μA) quasi-peak
Detector:	Peak for pre-scan (200Hz resolution bandwidth) 0.009M to 0.15MHz Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

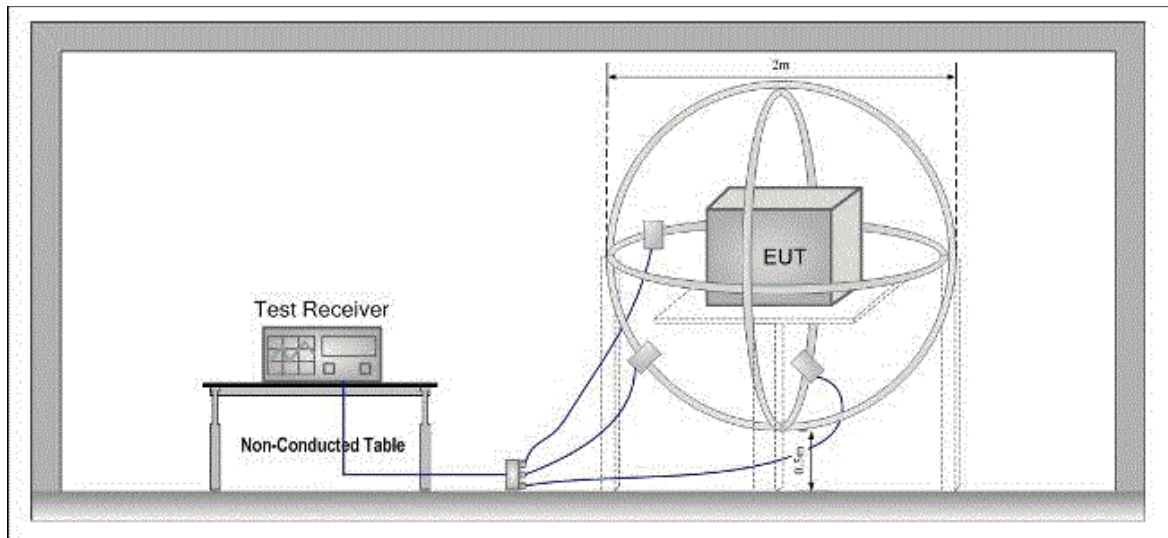
#### 6.3.1 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity:48 % RH Atmospheric Pressure: 1010 mbar

Pretest these mode to find the worst case:  
 a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.  
 b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

The worst case for final test  
 a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.  
 b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

#### 6.3.2 Test Setup

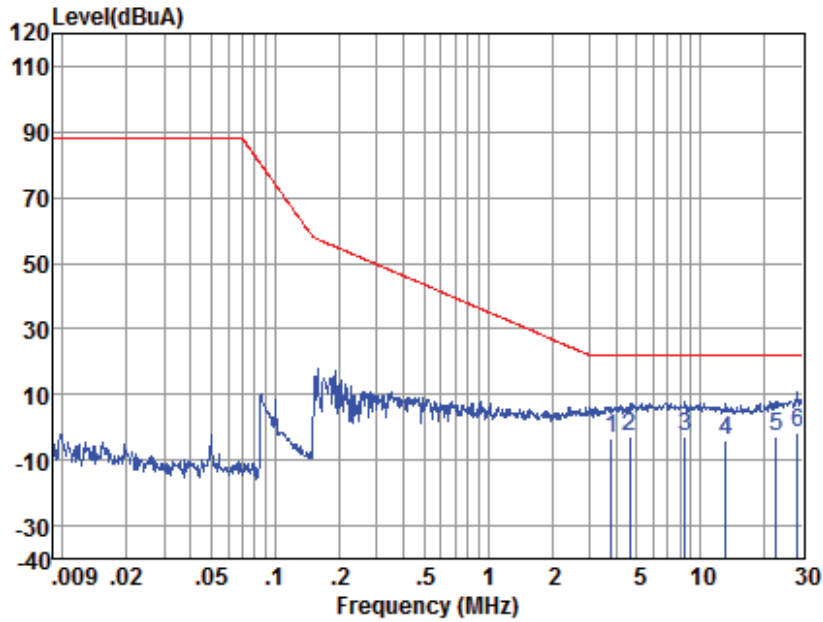


#### 6.3.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



Mode:a;Axial:X

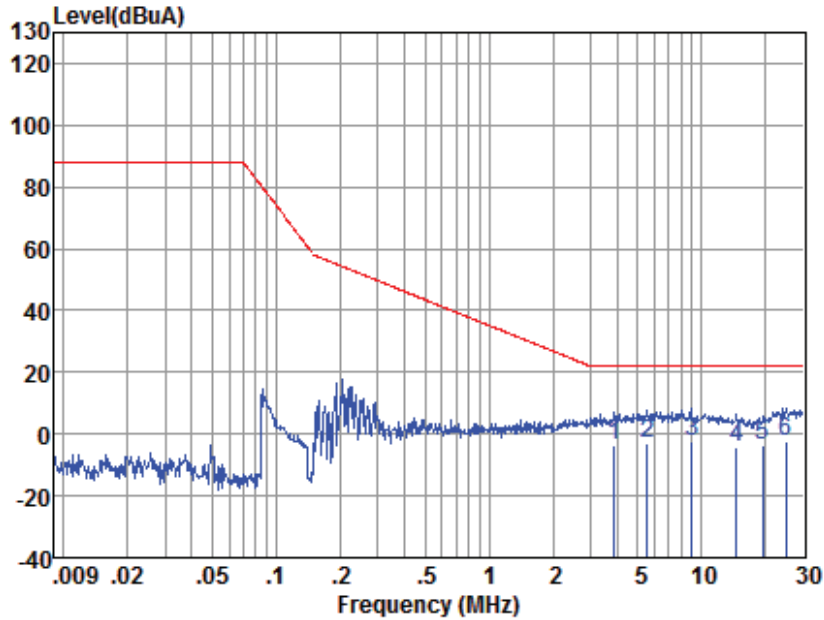


Site : chamber  
Condition : 55015\_LOOP  
EUT/Project No: 3742LM  
Test mode : a  
: x

	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuA	dB	dBuA	dBuA	dB	
1	3.799	-3.97	0.37	-3.60	22.00	-25.60	QP
2	4.647	-3.45	0.39	-3.06	22.00	-25.06	QP
3	8.456	-3.51	0.50	-3.01	22.00	-25.01	QP
4	13.057	-4.53	0.50	-4.03	22.00	-26.03	QP
5	22.775	-3.50	0.71	-2.79	22.00	-24.79	QP
6	28.452	-2.65	0.80	-1.85	22.00	-23.85	QP



Mode:a;Axial:Y

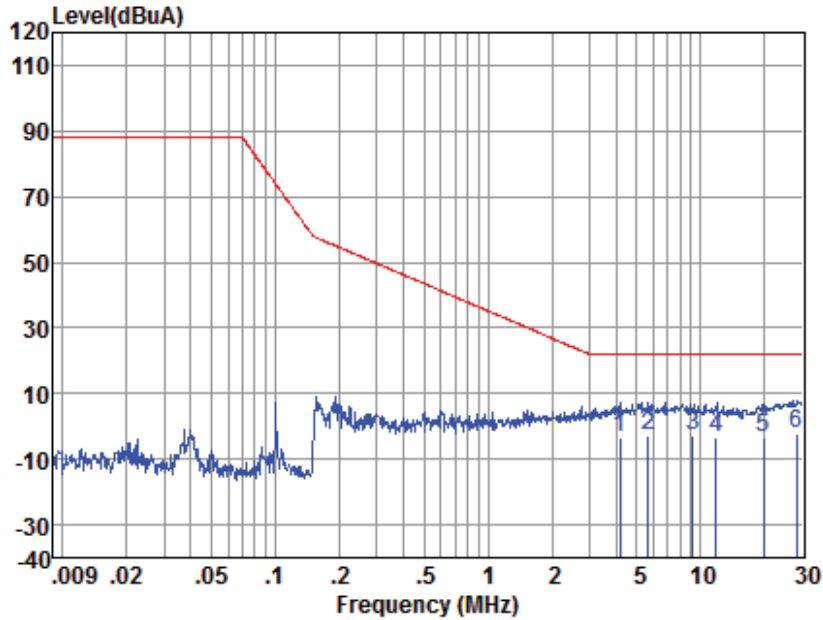


Site : chamber  
Condition : 55015\_LOOP  
EUT/Project No: 3742LM  
Test mode : a  
: y

	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuA	dB	dBuA	dBuA	dB	
1	3.881	-3.91	0.37	-3.54	22.00	-25.54	QP
2	5.535	-3.25	0.43	-2.82	22.00	-24.82	QP
3	8.964	-3.16	0.50	-2.66	22.00	-24.66	QP
4	14.594	-4.87	0.50	-4.37	22.00	-26.37	QP
5	19.428	-4.34	0.59	-3.75	22.00	-25.75	QP
6	24.790	-3.22	0.79	-2.43	22.00	-24.43	QP



Mode:a;Axial:Z

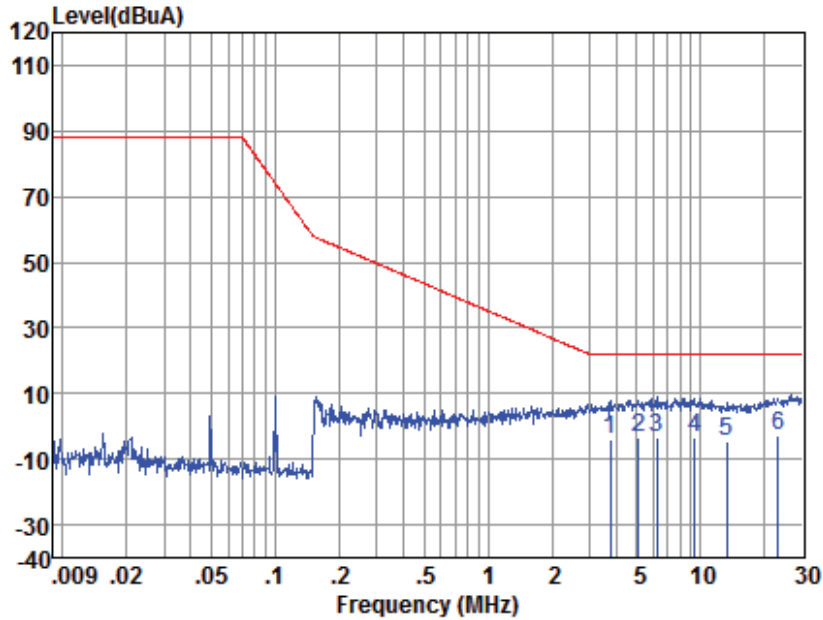


Site : chamber  
Condition : 55015\_LOOP  
Test mode : 3742LM  
EUT/Project No: a  
: z

	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuA	dB	dBuA	dBuA	dB	
1	4.158	-3.87	0.38	-3.49	22.00	-25.49	QP
2	5.683	-3.42	0.44	-2.98	22.00	-24.98	QP
3	9.204	-3.46	0.50	-2.96	22.00	-24.96	QP
4	11.870	-4.19	0.50	-3.69	22.00	-25.69	QP
5	19.740	-4.14	0.59	-3.55	22.00	-25.55	QP
6	28.302	-2.78	0.80	-1.98	22.00	-23.98	QP



Mode:b;Axial:X

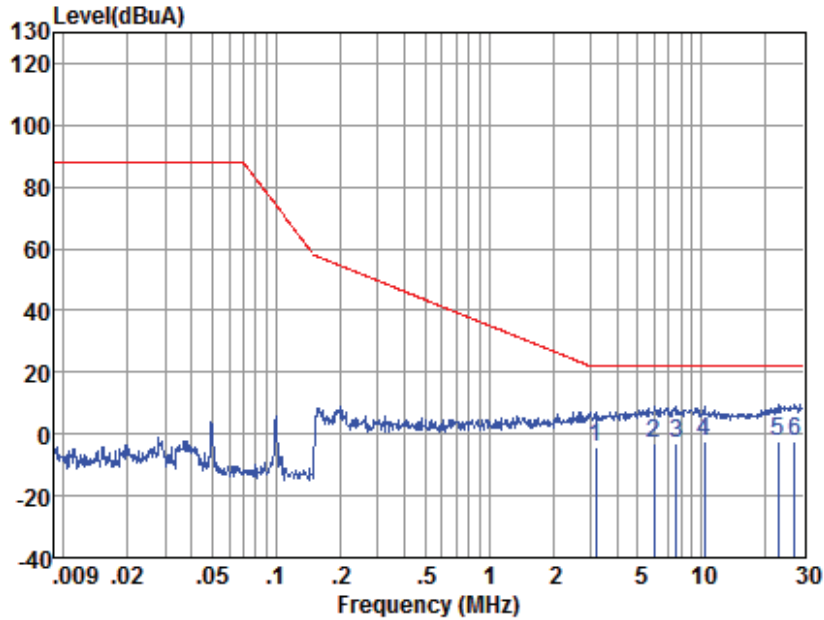


Site : chamber  
Condition : 55015\_LOOP  
EUT/Project No: 3742LM  
Test mode : b  
: x

	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuA	dB	dBuA	dBuA	dB	
1	3.759	-4.33	0.37	-3.96	22.00	-25.96	QP
2	5.112	-3.98	0.41	-3.57	22.00	-25.57	QP
3	6.219	-3.88	0.46	-3.42	22.00	-25.42	QP
4	9.352	-4.09	0.50	-3.59	22.00	-25.59	QP
5	13.267	-5.23	0.50	-4.73	22.00	-26.73	QP
6	23.018	-3.82	0.72	-3.10	22.00	-25.10	QP



Mode:b;Axial:Y



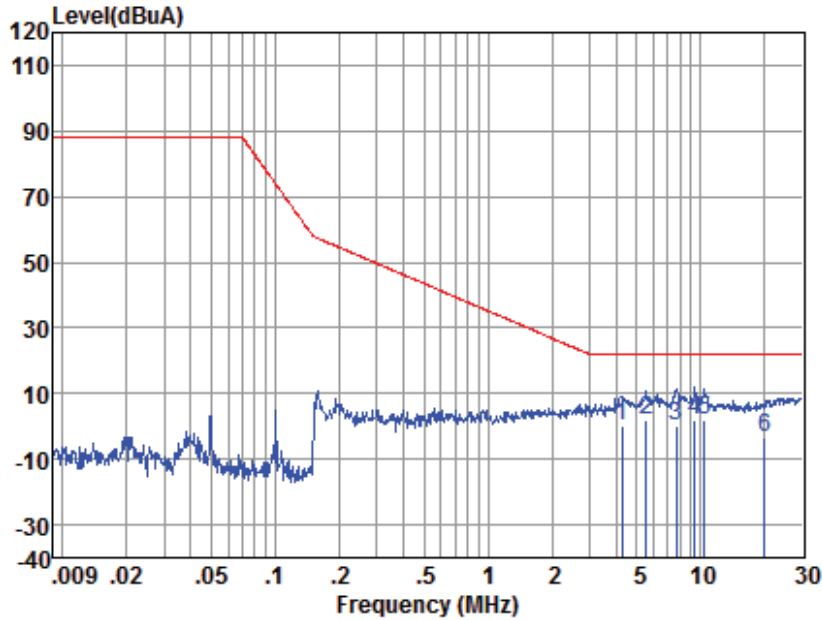
Site : chamber  
Condition : 55015\_LOOP  
EUT/Project No: 3742LM  
Test mode : b  
: y

	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuA	dB	dBuA	dBuA	dB	
1	3.173	-4.62	0.35	-4.27	22.00	-26.27	QP
2	5.993	-3.29	0.45	-2.84	22.00	-24.84	QP
3	7.606	-3.23	0.50	-2.73	22.00	-24.73	QP
4	10.342	-3.12	0.50	-2.62	22.00	-24.62	QP
5	22.896	-3.22	0.72	-2.50	22.00	-24.50	QP
6	27.416	-3.14	0.80	-2.34	22.00	-24.34	QP





Mode:b;Axial:Z



Site : chamber  
Condition : 55015\_LOOP  
EUT/Project No: 3742LM  
Test mode : b  
: z

	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuA	dB	dBuA	dBuA	dB	
1	4.247	0.01	0.38	0.39	22.00	-21.61	QP
2	5.535	1.78	0.43	2.21	22.00	-19.79	QP
3	7.687	-0.47	0.50	0.03	22.00	-21.97	QP
4	9.401	1.53	0.50	2.03	22.00	-19.97	QP
5	10.452	1.62	0.50	2.12	22.00	-19.88	QP
6	20.056	-4.22	0.60	-3.62	22.00	-25.62	QP

## **7 Immunity Test Results**

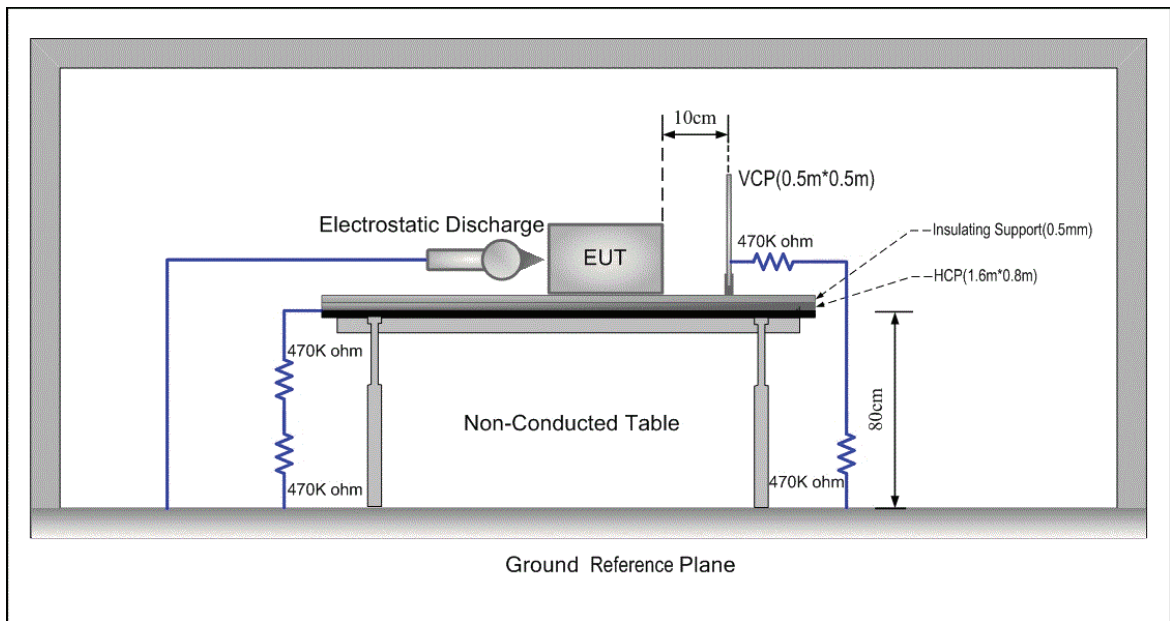
### **7.1 Performance Criteria Description in EN 61547:2009**

- Criterion A** During the test no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.
- Criterion B** During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min.  
Regulating controls need not function during the test, but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.
- Criterion C** During and after the test any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control.

## 7.2 ESD

Test Requirement:	EN 61547:2009
Test Method:	EN 61000-4-2:2009
Performance Criterion:	B
Discharge Impedance:	330Ω/150pF
Number of Discharge:	Minimum 10 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

### 7.2.1 Test Setup:



### 7.2.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 49 % RH Atmospheric Pressure: 1004 mbar

Test mode: a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.

b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

### 7.2.3 Test Results:

Observations: Test Point:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A



Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

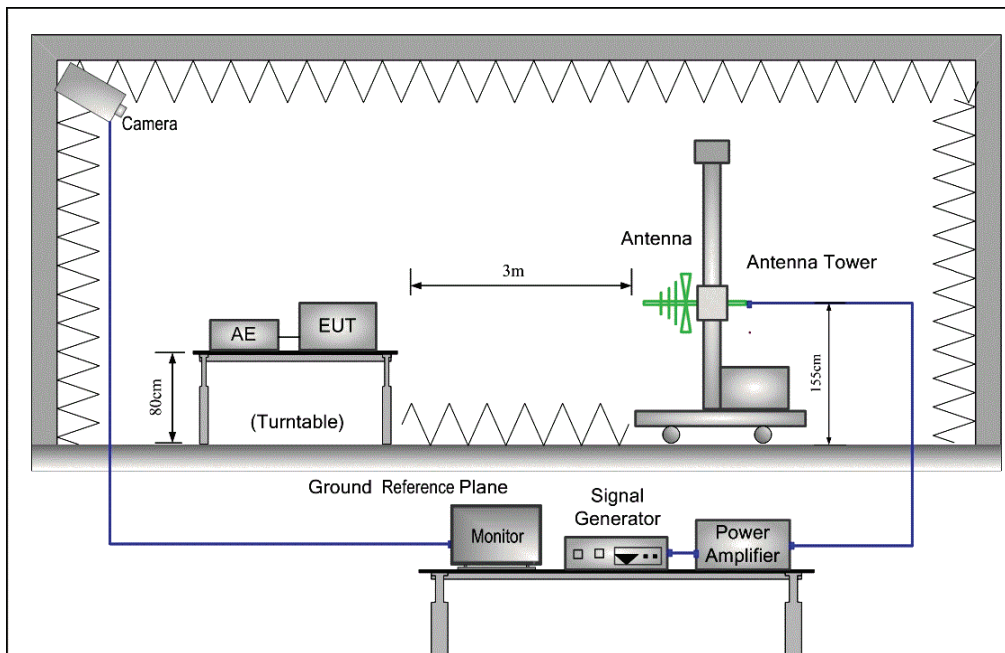
**Results:**

A: No degradation in the performance of the EUT was observed.

### 7.3 RI(80M-1G)

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-3:2006+A1:2008+A2:2010  
 Performance Criterion: A  
 Frequency Range: 80MHz to 1GHz  
 Antenna Polarisation: Vertical and Horizontal  
 Modulation: 1kHz,80% Amp. Mod,1% increment

#### 7.3.1 Test Setup:



#### 7.3.2 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity:51 % RH Atmospheric Pressure: 1001 mbar

Test mode: a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.  
 b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

#### 7.3.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	3s	A
80MHz-1GHz	3	Back	3s	A
80MHz-1GHz	3	Left	3s	A
80MHz-1GHz	3	Right	3s	A
80MHz-1GHz	3	Top	3s	A
80MHz-1GHz	3	Underside	3s	A

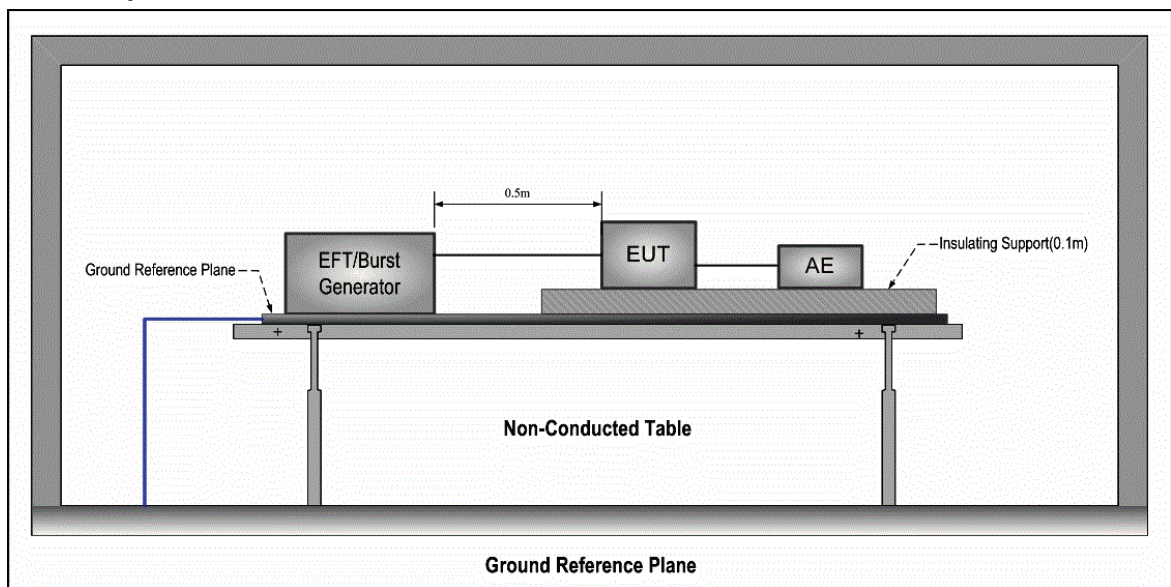
#### Results:

A: No degradation in the performance of the EUT was observed.

### 7.4 EFT(Mains)

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-4:2012  
 Performance Criterion: B  
 Repetition Frequency: 5kHz  
 Burst Period: 300ms  
 Test Duration: 2 minute per level & polarity

#### 7.4.1 Test Setup:



#### 7.4.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 49 % RH Atmospheric Pressure: 1006 mbar

Test mode: a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.

b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

#### 7.4.3 Test Results:

Test Line	Level (kV)	Polarity	Direct/Coupling	Result / Observations
AC power port	1	+	Direct	A
AC power port	1	-	Direct	A

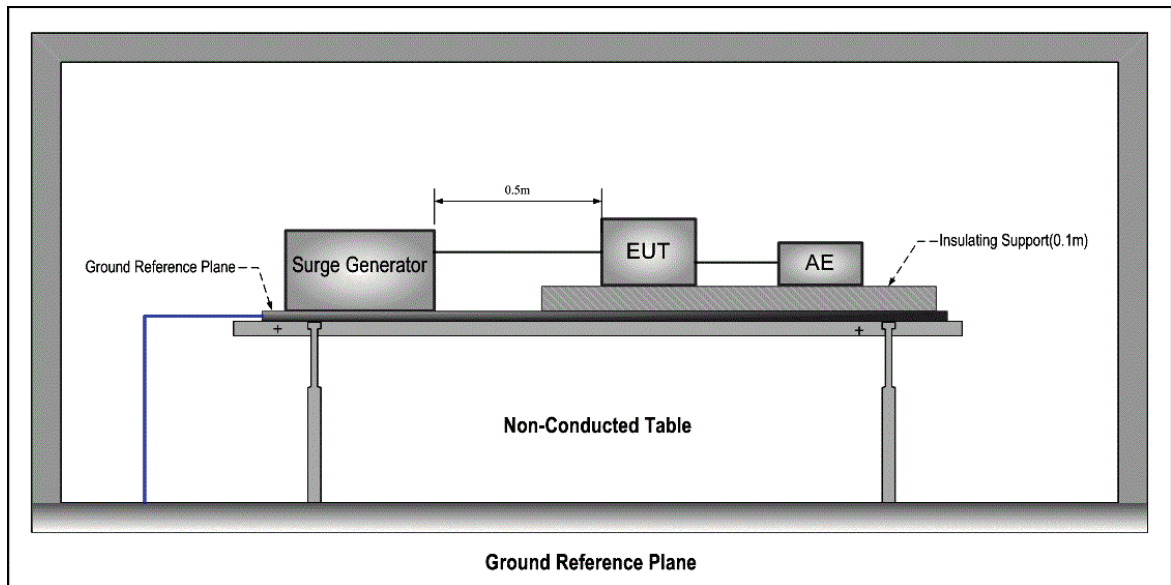
#### Results:

A: No degradation in the performance of the EUT was observed.

### 7.5 Surge(Mains)

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-5:2014  
 Performance Criterion: C  
 No. of surges: 5 positive, 5 negative at 0°, 90°, 180°, 270°.

#### 7.5.1 Test Setup:



#### 7.5.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 49 % RH Atmospheric Pressure: 1005 mbar  
 Test mode:  
 a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.  
 b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

#### 7.5.3 Test Results:

Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1	+	90°	A
L-N	1	-	270°	A
L-PE	2	+	90°	A
L-PE	2	-	270°	A
N-PE	2	+	90°	A
N-PE	2	-	270°	A

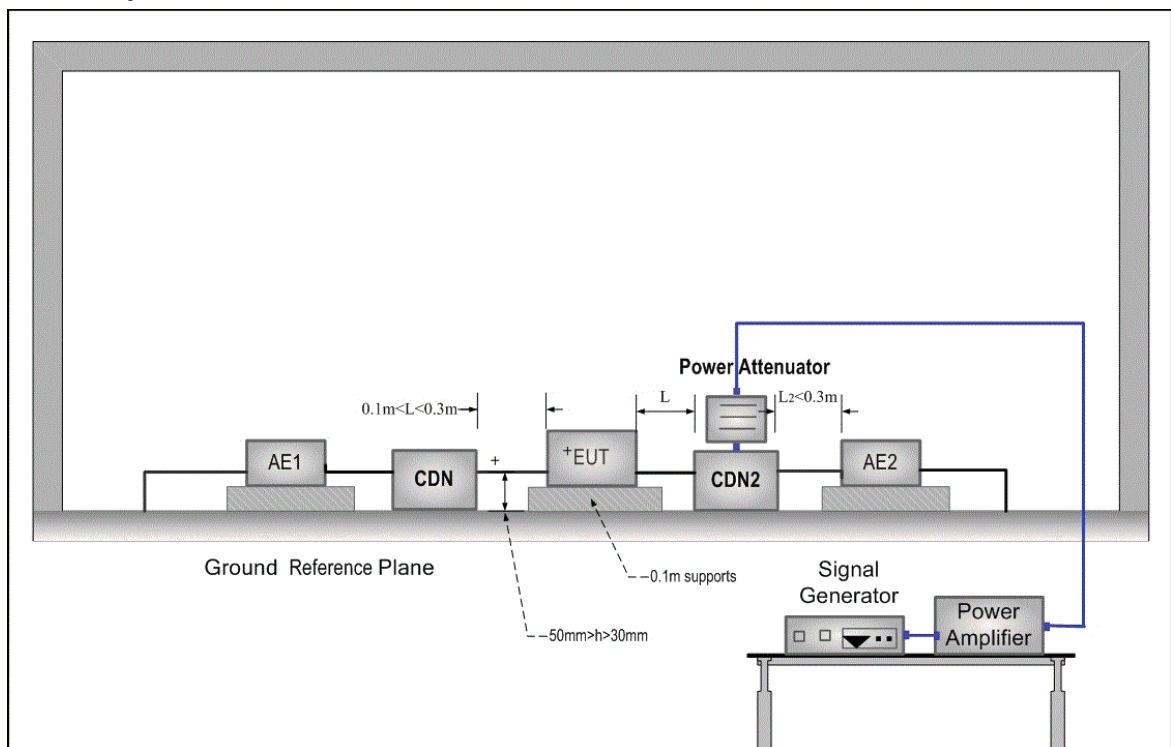
#### Results:

A: No degradation in the performance of the EUT was observed.

### 7.6 CI M(150K-80M)

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-6:2014  
 Performance Criterion: A  
 Frequency Range: 0.15MHz to 80MHz  
 Modulation: 80%, 1kHz Amplitude Modulation  
 Step Size: 1%

#### 7.6.1 Test Setup:



#### 7.6.2 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 51 % RH Atmospheric Pressure: 1001 mbar  
 Test mode: a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.  
 b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

#### 7.6.3 Test Results:

Cable port	Level (Vrms)	Direct/Coupling	Dwell time	Result / Observations
AC power port	3	Direct	3s	A

#### Results:

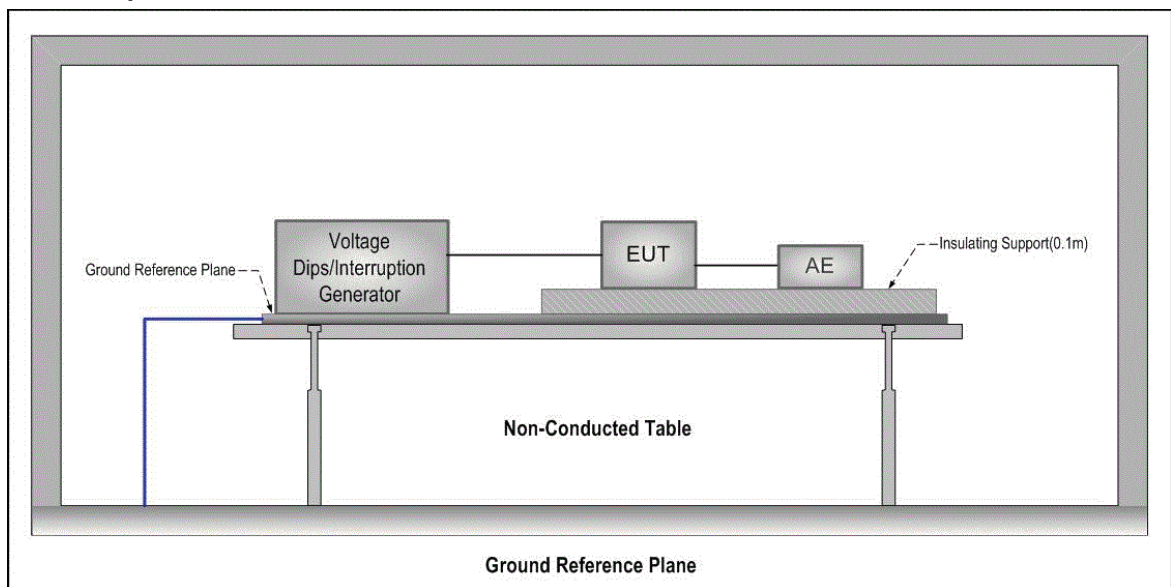
A: No degradation in the performance of the EUT was observed.



### 7.7 V-Dips

Test Requirement: EN 61547:2009  
 Test Method: EN 61000-4-11:2004  
 Performance Criterion: 0% of UT (Supply Voltage) for 0.5 Periods:B; 70 % of UT for 10 Periods:C  
 No. of Dips / Interruptions: 3 per Level  
 Time between dropout 10s

#### 7.7.1 Test Setup:



#### 7.7.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity:49 % RH Atmospheric Pressure: 1004 mbar  
 Test mode:  
 a: Lighting mode: Keep the lamp lighting continuously for model D-120S1NLED.  
 b: Lighting mode: Keep the lamp lighting continuously for model D-170MLED.

#### 7.7.3 Test Results:

Level % UT	Phase (deg)	Duration	No. of Dips / Interruptions	Result / Observations
0	0°	0.5 Periods	3	A
0	180°	0.5 Periods	3	A
70	0°	10 Periods	3	B
70	180°	10 Periods	3	B

#### Results:

A: No degradation in the performance of the EUT was observed.  
 B: during the test, the EUT goes flicker.

## 2.4 Componentes de las Luminarias

- UNE-EN 62031. Módulos LED para alumbrado general.  
Requisitos de seguridad. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.)
- UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13:  
Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.
- UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED.
- Requisitos de funcionamiento.



Product Service

# Attestation of Compliance

No. N5A 17 11 02897 001

**Holder of Certificate: NOVATILU, S.L.U**Via Ausetania 11  
08560 Manlleu  
SPAIN**Product: LED Module**

This Attestation of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of Low Voltage Directive 2014/35/EU. The essential requirements are fulfilled accordingly based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for testing and certification. See also notes overleaf.

**Test report no.:** 701281718401-00**Date,** 2017-11-16  
( Binwen Zhang )

Other relevant European directives have to be observed. If they require CE marking, it may be affixed on the product after preparation of the necessary technical documentation as well as the EU declaration of conformity.

Page 1 of 3



Product Service

## Attestation of Compliance

No. N5A 17 11 02897 001

### Model(s):

AML079XXX,AML0612XXX,AML0616XXX,  
AML0624XXX,AML0632XXX,ANL16LXXX,  
ANL32LXXX,AML0412XXX,AML0315XXX,  
AML0248XXX,AML0236XXX,AML0224XXX,  
AML0130XXX

### Brand:

NOVATILU

### Parameters:

Rated voltage:	See attachment
Protection Class:	Class III
Rated power:	See attachment
Degree of protection:	IP66
tc:	85°C
ta:	45°C

### Tested according to:

EN 62031:2008/A2:2015  
EN 62493:2015  
EN 62471:2008

**Attestation of Compliance**  
**No. N5A 17 11 02897 001**



Product Service

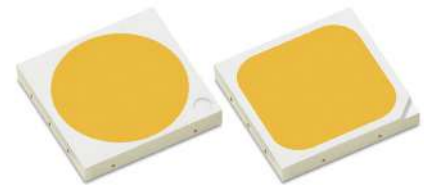
Model type	Max. Wattage(W)	Voltage (dc.V)	Quantity of LEDs
AML079XXX	30	21,6~36	9
AML0612XXX	30	25,2~42	12
AML0616XXX	40	32,4~54	16
AML0624XXX	60	25,2~42	24
AML0632XXX	80	32,4~54	32
ANL16LXXX	40	32,4~54	16
ANL32LXXX	80	32,4~54	32
AML0412XXX	80	25,2~42	12
AML0315XXX	40	32,4~54	15
AML0248XXX	100	25,2~42	48
AML0236XXX	80	25,2~42	36
AML0224XXX	60	25,2~42	24
AML0130XXX	60	21,6~36	30

Note: XXX can be 001-100, represents the rated power of product, e.g. 005=5W

# LUXEON 5050

High efficacy and superior robustness in a multi-die, high power package, enabling cost-effective system design

LUXEON 5050 is a multi-die, high power package that provides high luminance from a super robust package to enable cost effective, single optic and directional fixture designs. LUXEON 5050 uses an industry standard 5050 surface mount package with a small Light Emitting Surface (LES). LUXEON 5050 comes in 70CRI, 80CRI and 90CRI with a wide range of CCTs, and offers hot-color targeting to ensure that the LEDs are within color target at application conditions of 85°C.



## FEATURES AND BENEFITS

- Superior lm/W enables outstanding efficacy in end application
- Extremely reliable package design affirms long lifetime in harsh environments <sup>[1]</sup>
- Two voltage configurations are compatible with low cost high efficacy drivers
- Low  $R_{th}$  enables effective thermal dissipation design for higher efficiency
- Hot-color targeting ensures color is within ANSI bin at 85°C
- 3-step and 5-step MacAdam ellipse binning structure ensures excellent color uniformity

1. Refer to reliability datasheet for more details.

## PRIMARY APPLICATIONS

- High Bay
- Low Bay
- Floodlights
- Wall Pack
- [More...](#)

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# General Product Information

## Product Test Conditions

LUXEON 5050 LEDs are tested with a 20ms monopulse specified below at a junction temperature,  $T_j$ , of 25°C. Forward voltage and luminous flux are binned at a  $T_j$  of 25°C, while color is hot-targeted at a  $T_j$  of 85°C.

- 160mA - LUXEON 5050 (Round LES) – 24V and LUXEON 5050 (Square LES) – 30V
- 640mA - LUXEON 5050 (Round LES) – 6V
- 800mA - LUXEON 5050 (Square LES) – 6V

## Part Number Nomenclature

Part numbers for LUXEON 5050 follow the convention below:

L 1 5 0 – **A A B B** 5 0 **C C** 0 0 0 **D** 0

Where:

- A A** - designates nominal ANSI CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K 40=4000K, 50=5000K, 57=5700K, 65=6500K)
- B B** - designates minimum CRI (70=70CRI, 80=80CRI, 90=90CRI)
- C C** - designates voltage (06=6V, 24=24V, 30=30V)
- D** - designates product type (0=Round LES, S=Square LES)

Therefore, the following part number is used for a LUXEON 5050 Square LES, 3000K 80CRI, 30V:

L 1 5 0 – **3 0 8 0** 5 0 **3 0** 0 0 0 **S** 0

## Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

## Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON 5050 is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).



# Performance Characteristics

## Product Selection Guide

Table 1. Product performance of LUXEON 5050 at specified test current,  $T_j=25^\circ\text{C}$ .

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Round LES) 24V	2200K	70	515	550	140	160	L150-2270502400000
	2700K	70	535	605	154	160	L150-2770502400000
	3000K	70	553	625	159	160	L150-3070502400000
	3500K	70	600	635	162	160	L150-3570502400000
	4000K	70	580	675	172	160	L150-4070502400000
	5000K	70	580	672	171	160	L150-5070502400000
	5700K	70	570	661	169	160	L150-5770502400000
	6500K	70	570	655	167	160	L150-6570502400000
	2200K	80	440	475	121	160	L150-2280502400000
	2700K	80	500	550	140	160	L150-2780502400000
	3000K	80	516	590	151	160	L150-3080502400000
	3500K	80	527	595	152	160	L150-3580502400000
	4000K	80	539	615	157	160	L150-4080502400000
	5000K	80	539	615	157	160	L150-5080502400000
	5700K	80	539	615	157	160	L150-5780502400000
	6500K	80	539	615	157	160	L150-6580502400000
	2700K	90	414	475	121	160	L150-2790502400000
	3000K	90	428	490	125	160	L150-3090502400000
	3500K	90	445	510	130	160	L150-3590502400000
	4000K	90	456	530	135	160	L150-4090502400000
	5000K	90	456	530	135	160	L150-5090502400000
5700K	90	456	530	135	160	L150-5790502400000	
LUXEON 5050 (Round LES) 6V	2200K	70	515	550	140	640	L150-2270500600000
	2700K	70	535	605	154	640	L150-2770500600000
	3000K	70	553	625	159	640	L150-3070500600000
	3500K	70	600	635	162	640	L150-3570500600000
	4000K	70	580	675	172	640	L150-4070500600000
	5000K	70	580	672	171	640	L150-5070500600000
	5700K	70	570	661	169	640	L150-5770500600000
	6500K	70	570	655	167	640	L150-6570500600000
	2200K	80	440	475	121	640	L150-2280500600000
	2700K	80	500	550	140	640	L150-2780500600000
	3000K	80	516	590	151	640	L150-3080500600000
	3500K	80	527	595	152	640	L150-3580500600000
	4000K	80	539	615	157	640	L150-4080500600000
	5000K	80	539	615	157	640	L150-5080500600000
	5700K	80	539	615	157	640	L150-5780500600000
	6500K	80	539	615	157	640	L150-6580500600000
	2700K	90	414	475	121	640	L150-2790500600000
	3000K	90	428	490	125	640	L150-3090500600000
	3500K	90	445	510	130	640	L150-3590500600000
	4000K	90	456	530	135	640	L150-4090500600000
	5000K	90	456	530	135	640	L150-5090500600000
5700K	90	456	530	135	640	L150-5790500600000	

Table 1 continued on next page:

1. Correlated color temperature is not targeted at  $T_j=85^\circ\text{C}$ .
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at  $T_j=25^\circ\text{C}$ . Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of  $\pm 2$  on CRI and  $\pm 7\%$  on luminous flux measurements.

Table 1. Product performance of LUXEON 5050 at specified test current, T<sub>j</sub>=25°C, Continued.

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Square LES) 30V	2200K	70	621	690	141	160	L150-22705030000S0
	2700K	70	693	770	158	160	L150-27705030000S0
	3000K	70	720	800	164	160	L150-30705030000S0
	3500K	70	729	810	166	160	L150-35705030000S0
	4000K	70	743	825	169	160	L150-40705030000S0
	5000K	70	743	825	169	160	L150-50705030000S0
	5700K	70	738	820	168	160	L150-57705030000S0
	6500K	70	720	800	164	160	L150-65705030000S0
	2200K	80	586	630	129	160	L150-22805030000S0
	2700K	80	650	695	142	160	L150-27805030000S0
	3000K	80	665	715	147	160	L150-30805030000S0
	3500K	80	679	730	150	160	L150-35805030000S0
	4000K	80	700	750	154	160	L150-40805030000S0
	5000K	80	702	755	155	160	L150-50805030000S0
	5700K	80	700	750	154	160	L150-57805030000S0
	6500K	80	688	740	152	160	L150-65805030000S0
	2700K	90	558	600	123	160	L150-27905030000S0
	3000K	90	586	630	129	160	L150-30905030000S0
	3500K	90	600	640	131	160	L150-35905030000S0
	4000K	90	609	655	134	160	L150-40905030000S0
	5000K	90	618	665	136	160	L150-50905030000S0
5700K	90	605	650	133	160	L150-57905030000S0	
LUXEON 5050 (Square LES) 6V	2200K	70	621	690	141	800	L150-22705006000S0
	2700K	70	693	770	158	800	L150-27705006000S0
	3000K	70	720	800	164	800	L150-30705006000S0
	3500K	70	729	810	166	800	L150-35705006000S0
	4000K	70	743	825	169	800	L150-40705006000S0
	5000K	70	743	825	169	800	L150-50705006000S0
	5700K	70	738	820	168	800	L150-57705006000S0
	6500K	70	720	800	164	800	L150-65705006000S0
	2200K	80	586	630	129	800	L150-22805006000S0
	2700K	80	650	695	142	800	L150-27805006000S0
	3000K	80	665	715	147	800	L150-30805006000S0
	3500K	80	679	730	150	800	L150-35805006000S0
	4000K	80	700	750	154	800	L150-40805006000S0
	5000K	80	702	755	155	800	L150-50805006000S0
	5700K	80	700	750	154	800	L150-57805006000S0
	6500K	80	688	740	152	800	L150-65805006000S0
	2700K	90	558	600	123	800	L150-27905006000S0
	3000K	90	586	630	129	800	L150-30905006000S0
	3500K	90	600	640	131	800	L150-35905006000S0
	4000K	90	609	655	134	800	L150-40905006000S0
	5000K	90	618	665	136	800	L150-50905006000S0
5700K	90	605	650	133	800	L150-57905006000S0	

Notes for Table 1:

1. Correlated color temperature is not targeted at T<sub>j</sub>=85°C.
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at T<sub>j</sub>=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7% on luminous flux measurements.

# Optical Characteristics

Table 2. Optical characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE <sup>[1]</sup>	TYPICAL VIEWING ANGLE <sup>[2]</sup>
L150-xxxx50xx000x0	138°	116°

**Notes for Table 2:**

- Total angle at which 90% of total luminous flux is captured.
- Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.

# Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	FORWARD VOLTAGE <sup>[1]</sup> ( $V_f$ )			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE <sup>[2]</sup> (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L150-xxxx502400000	23.5	24.4	26.5	-12	2.4
L150-xxxx500600000	5.8	6.1	6.6	-3	2.4
L150-xxxx5030000S0	29.0	30.5	32.0	-15	1.4
L150-xxxx5006000S0	5.8	6.1	6.6	-3	1.4

**Notes for Table 3:**

- Lumileds maintains a tolerance of ±1% on forward voltage measurements.
- Measured between 25°C and 85°C.

# Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON 5050.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current <sup>[1,2]</sup>	240mA for L150-xxxx502400000 800mA for L150-xxxx500600000 240mA for L150-xxxx5030000S0 1000mA for L150-xxxx5006000S0
Peak Pulsed Forward Current <sup>[1,3]</sup>	300mA for L150-xxxx502400000 1000mA for L150-xxxx500600000 300mA for L150-xxxx5030000S0 1250mA for L150-xxxx5006000S0
LED Junction Temperature <sup>[1]</sup> (DC & Pulse)	125°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 2
Operating Case Temperature <sup>[1]</sup>	105°C
LED Storage Temperature	-40°C to 105°C
Allowable Reflow Cycles	3
Reverse Voltage ( $V_{reverse}$ )	LUXEON LEDs are not designed to be driven in reverse bias

**Notes for Table 4:**

- Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
- Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," are acceptable if the following conditions are met:
  - The frequency of the ripple current is 100Hz or higher
  - The average current for each cycle does not exceed the maximum allowable DC forward current
  - The maximum amplitude of the ripple does not exceed the maximum peak pulsed forward current
- At 10% duty cycle with pulse width of 10ms.

# Characteristic Curves

## Spectral Power Distribution Characteristics

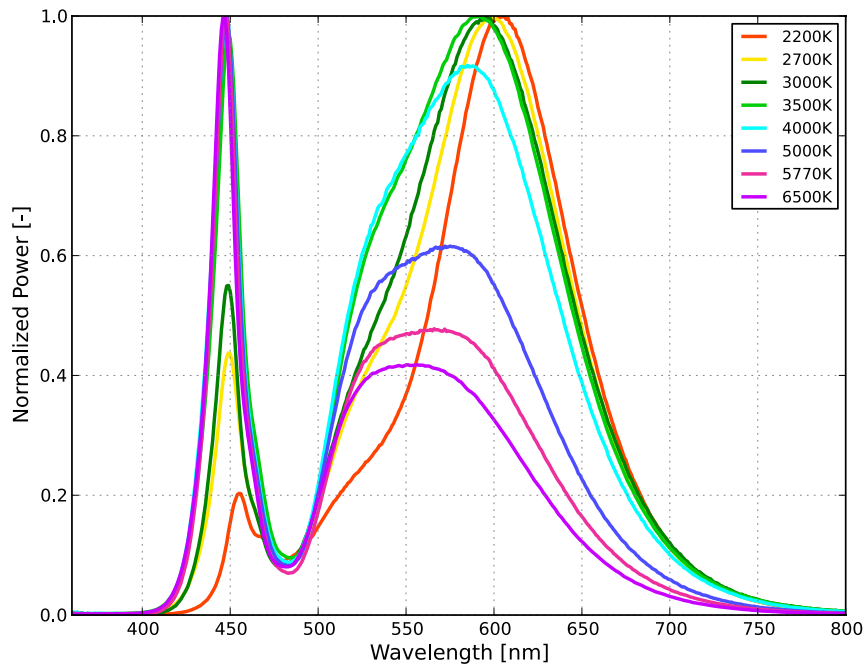


Figure 1a. Typical normalized power vs. wavelength for L150-xx7050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

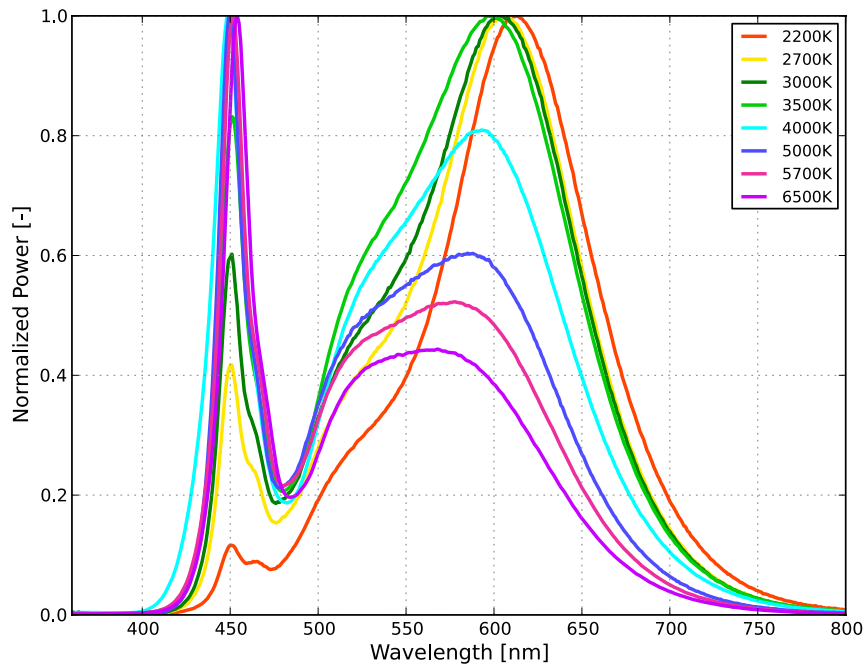


Figure 1b. Typical normalized power vs. wavelength for L150-xx8050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

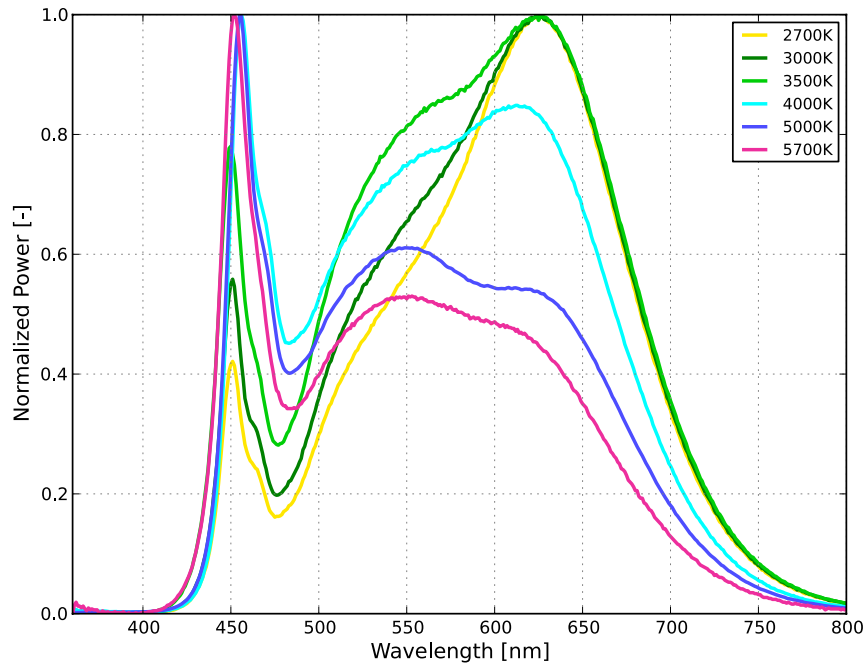


Figure 1c. Typical normalized power vs. wavelength for L150-xx9050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

## Light Output Characteristics

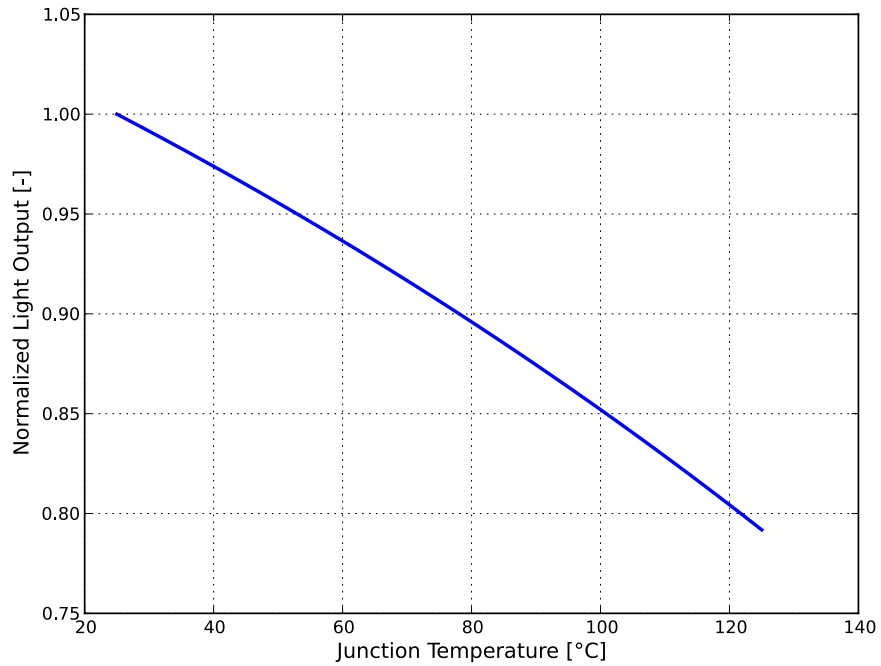


Figure 2. Typical normalized light output vs. junction temperature for L150-xxx50xx000x0 at specified test current.

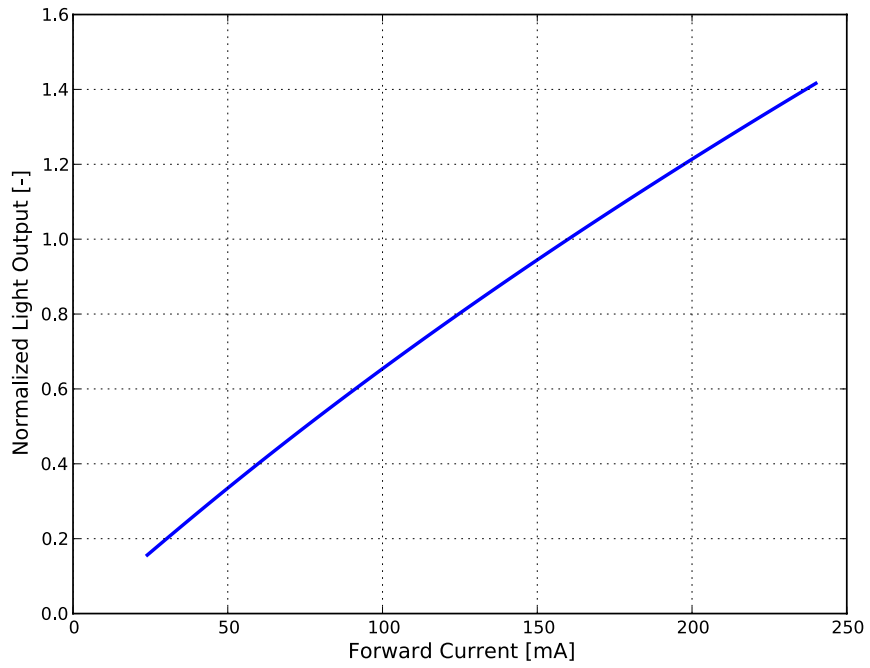


Figure 3a. Typical normalized light output vs. forward current for L150-xxxx50xx000x0,  $T_j=25^\circ\text{C}$ .

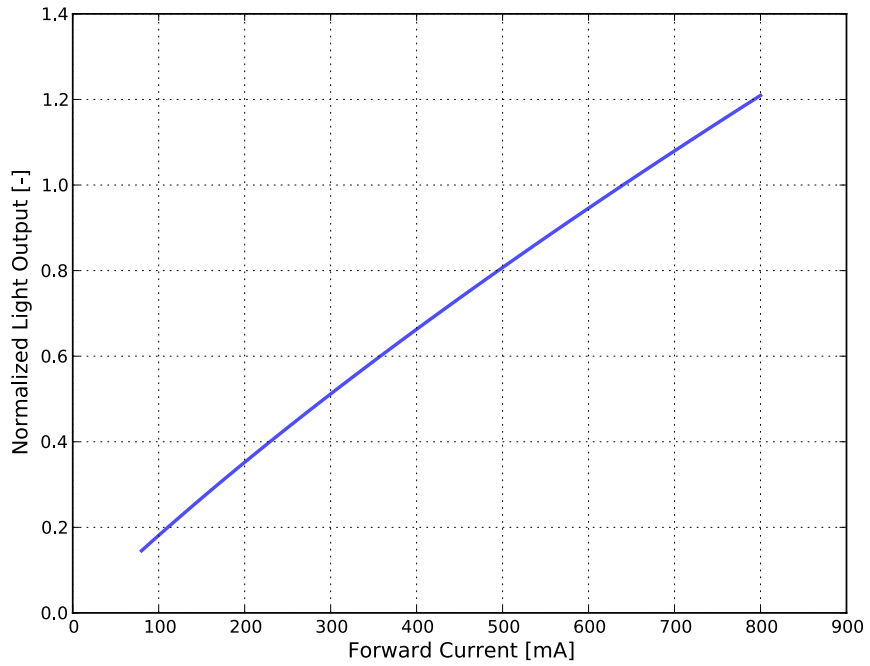


Figure 3b. Typical normalized light output vs. forward current for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

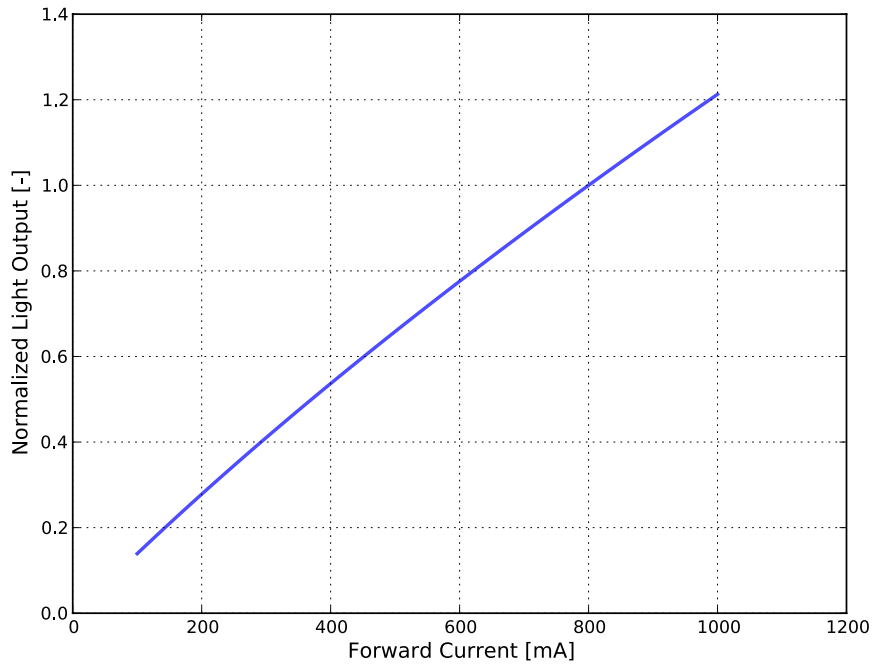


Figure 3c. Typical normalized light output vs. forward current for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Forward Current Characteristics

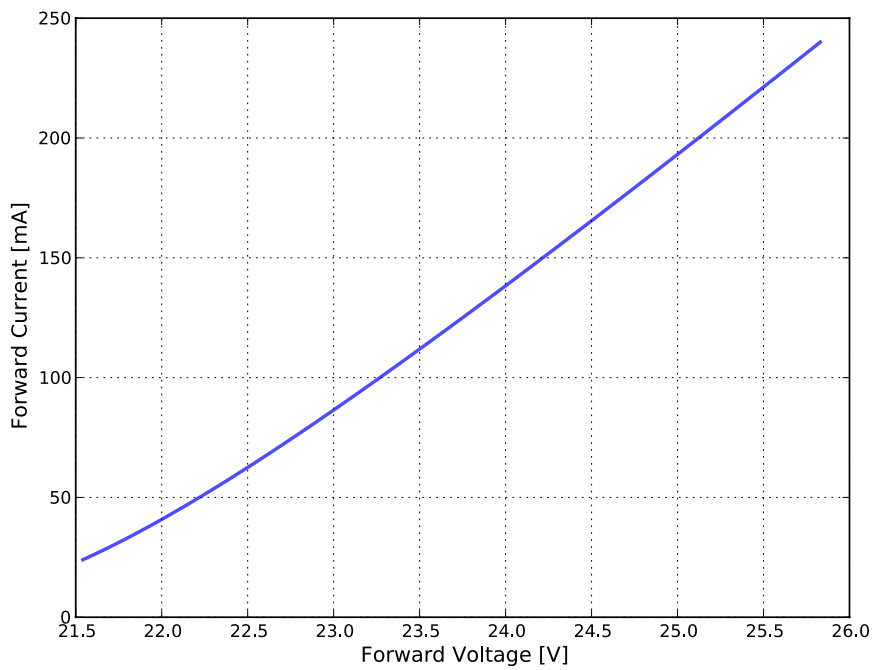


Figure 4a. Typical forward current vs. forward voltage for L150-xxxx502400000,  $T_j=25^\circ\text{C}$ .

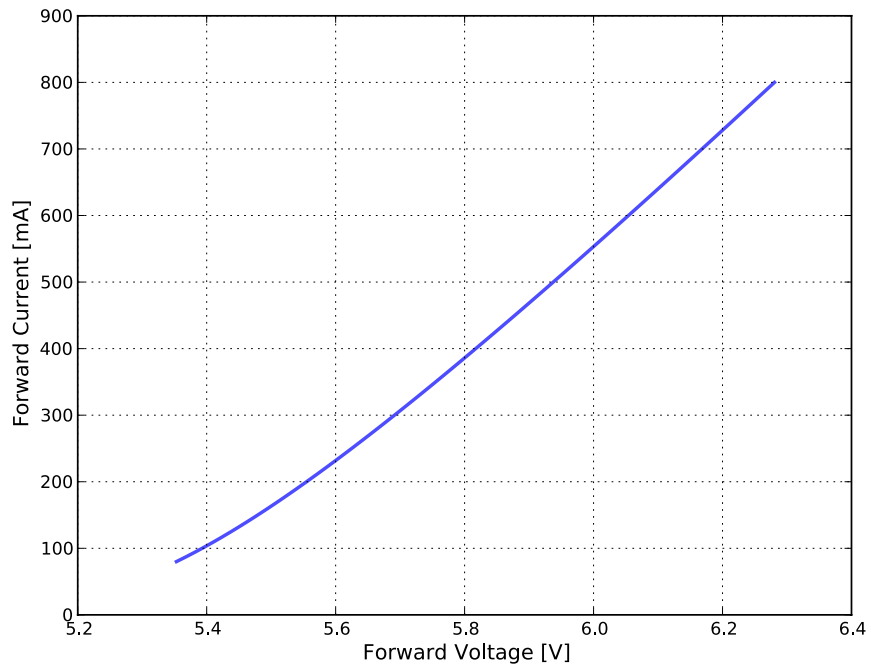


Figure 4b. Typical forward current vs. forward voltage for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

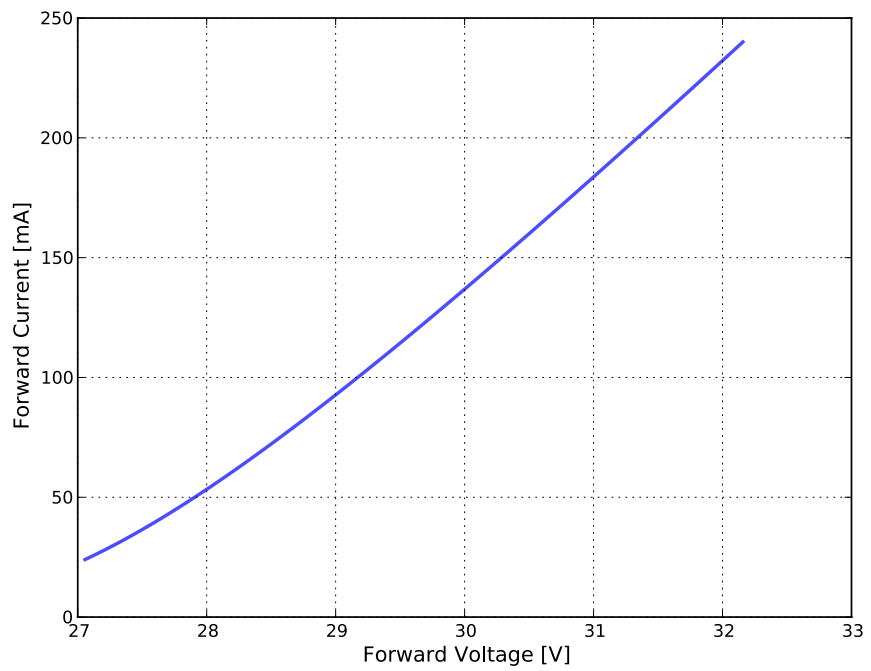


Figure 4c. Typical forward current vs. forward voltage for L150-xxxx503000050,  $T_j=25^\circ\text{C}$ .



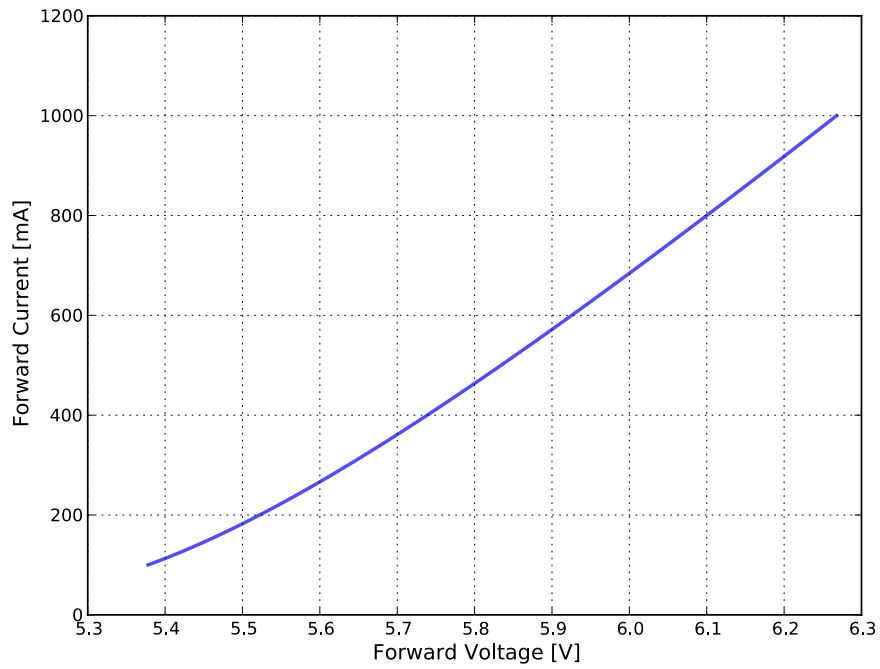


Figure 4d. Typical forward current vs. forward voltage for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Radiation Pattern Characteristics

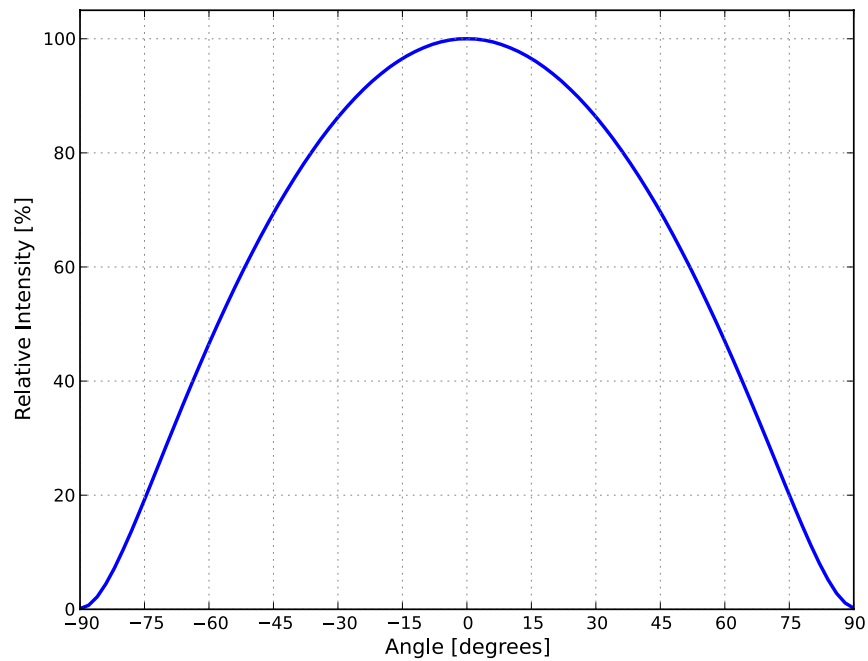


Figure 5. Typical radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

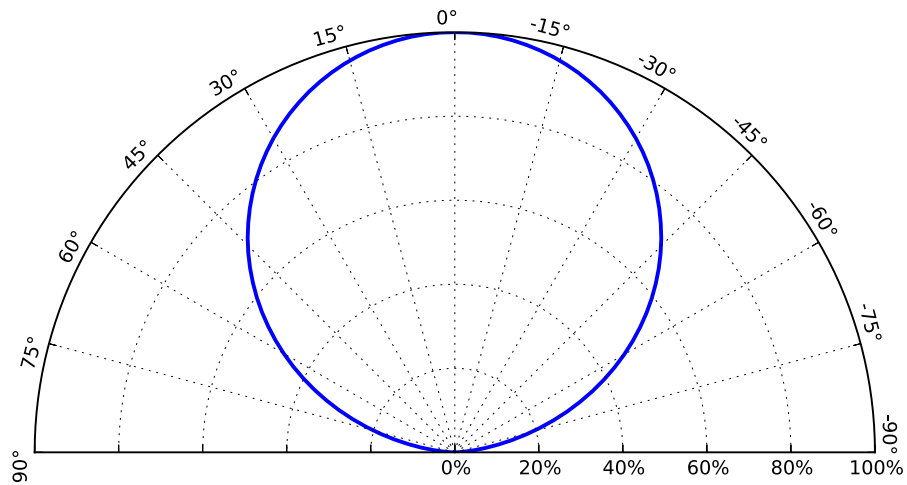


Figure 6. Typical polar radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

## Product Bin and Labeling Definitions

### Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON 5050 (Round LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B C C**

Where:

- A** – designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B** – designates color bin (example: 3=3 SDCM, 5=5 SDCM parts)
- C C** – designates forward voltage bin (example: A1, A2, B1, B2)

Therefore, a LUXEON 5050 (Round LES) with a lumen range of 600 to 650 lm, color bin of 3 and forward voltage range of 23.5 to 24.2V has the following CAT code:

**L 3 A 1**

LUXEON 5050 (Square LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B B C**

Where:

- A** – designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B B** – designates color bin: (example: 83=2700K and 3 SDCM, 35=5000K and 5 SDCM)
- C** – designates forward voltage bin (example: A, B, C, D)

Therefore, a LUXEON 5050 (Square LES) with a lumen range of 600 to 650 lm, color bin of 83 and forward voltage range of 29.0 to 30.0V has the following CAT code:

**L 8 3 A**

## Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON 5050 LEDs. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

**Table 5. Luminous flux bin definitions for LUXEON 5050, T<sub>j</sub>=25°C.**

BIN	LUMINOUS FLUX <sup>(1)</sup> (lm)	
	MINIMUM	MAXIMUM
G	400	450
H	450	500
J	500	550
K	550	600
L	600	650
M	650	700
N	700	750
P	750	800
Q	800	850
R	850	900
S	900	950
T	950	1000

**Notes for Table 5:**

1. Lumileds maintains a tolerance of ±7% on luminous flux measurements.

## Color Bin Definitions

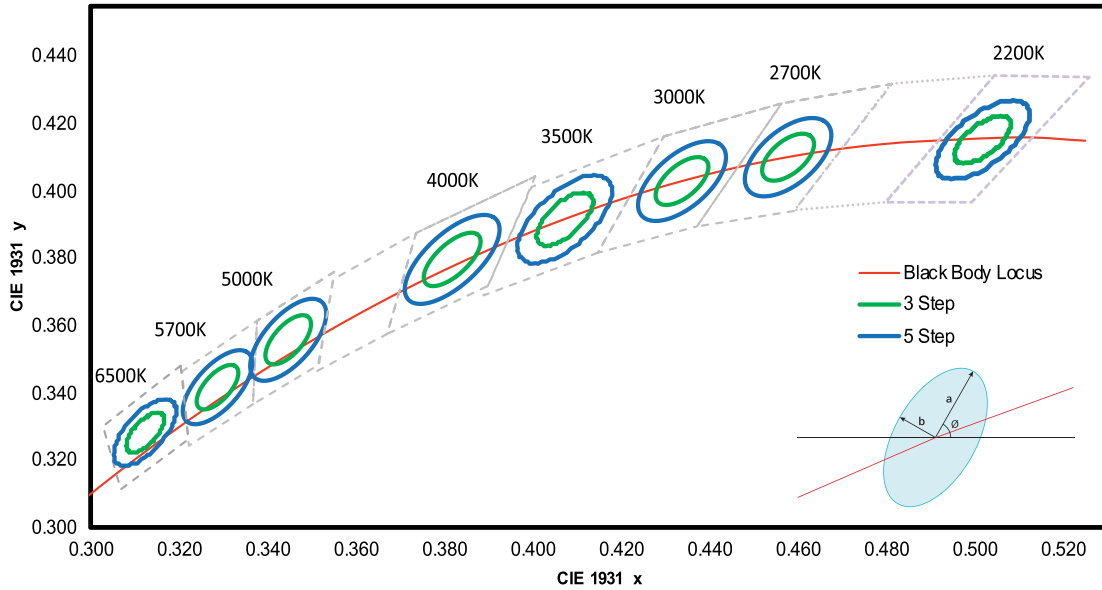


Figure 7. 3- and 5-step MacAdam ellipse illustration for hot-color targeting expected at 85°C.

Table 6. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 5050 at test current, hot-color targeted at  $T_j=85^\circ\text{C}$ .

NOMINAL CCT	COLOR SPACE	CENTER POINT <sup>(1)</sup> (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, $\theta$	LUXEON 5050 (ROUND LES) COLOR BIN CODE	LUXEON 5050 (SQUARE LES) COLOR BIN CODE
2200K	Single 3-step MacAdam ellipse	(0.5018, 0.4153)	0.00863	0.00398	49.27°	3	A3
2700K	Single 3-step MacAdam ellipse	(0.4578, 0.4101)	0.00810	0.00420	53.70°	3	83
3000K	Single 3-step MacAdam ellipse	(0.4338, 0.4030)	0.00834	0.00408	53.22°	3	73
3500K	Single 3-step MacAdam ellipse	(0.4073, 0.3917)	0.00927	0.00414	54.00°	3	63
4000K	Single 3-step MacAdam ellipse	(0.3818, 0.3797)	0.00939	0.00402	53.72°	3	53
5000K	Single 3-step MacAdam ellipse	(0.3447, 0.3553)	0.00822	0.00354	59.62°	3	33
5700K	Single 3-step MacAdam ellipse	(0.3287, 0.3417)	0.00745	0.00320	59.09°	3	23
6500K	Single 3-step MacAdam ellipse	(0.3123, 0.3282)	0.00669	0.00285	58.57°	3	13
2200K	Single 5-step MacAdam ellipse	(0.5018, 0.4153)	0.01438	0.00663	49.27°	5	A5
2700K	Single 5-step MacAdam ellipse	(0.4578, 0.4101)	0.01350	0.00700	53.70°	5	85
3000K	Single 5-step MacAdam ellipse	(0.4338, 0.4030)	0.01390	0.00680	53.22°	5	75
3500K	Single 5-step MacAdam ellipse	(0.4073, 0.3917)	0.01545	0.00690	54.00°	5	65
4000K	Single 5-step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°	5	55
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°	5	35
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°	5	25
6500K	Single 5-step MacAdam ellipse	(0.3123, 0.3282)	0.01115	0.00475	58.57°	5	15

**Notes for Table 6:**

1. Lumileds maintains a tolerance of  $\pm 0.005$  on x and y coordinates in the CIE 1931 color space.

## Forward Voltage Bins

Table 7. Forward voltage bin definitions for LUXEON 5050,  $T_j=25^\circ\text{C}$ .

PART NUMBER	BIN	FORWARD VOLTAGE <sup>(1)</sup> (V <sub>f</sub> )	
		MINIMUM	MAXIMUM
L150-xxxx502400000	A1	23.5	24.2
	A2	24.2	25.0
	B1	25.0	25.8
	B2	25.8	26.5
L150-xxxx500600000	A1	5.8	6.0
	A2	6.0	6.2
	B1	6.2	6.4
	B2	6.4	6.6
L150-xxxx5030000S0	A	29.0	30.0
	B	30.0	31.0
	C	31.0	32.0
L150-xxxx5006000S0	A	5.8	6.0
	B	6.0	6.2
	C	6.2	6.4
	D	6.4	6.6

**Notes for Table 7:**

1. Lumileds maintains a tolerance of  $\pm 0.1\text{V}$  on forward voltage measurements.

# Mechanical Dimensions

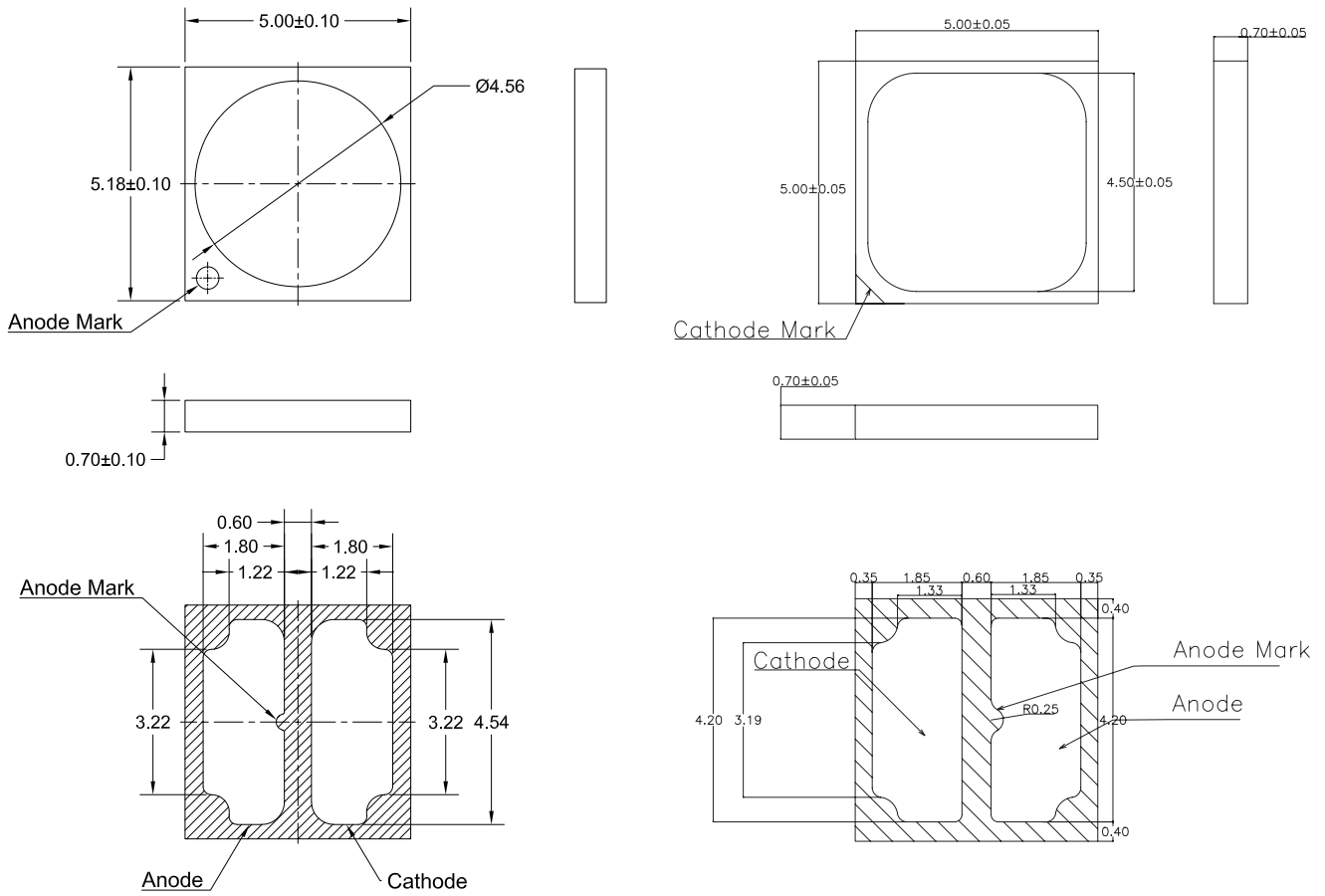


Figure 8. Mechanical dimensions for LUXEON 5050 (Round LES), left, and LUXEON 5050 (Square LES), right.

**Notes for Figure 8:**

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Reflow Soldering Guidelines

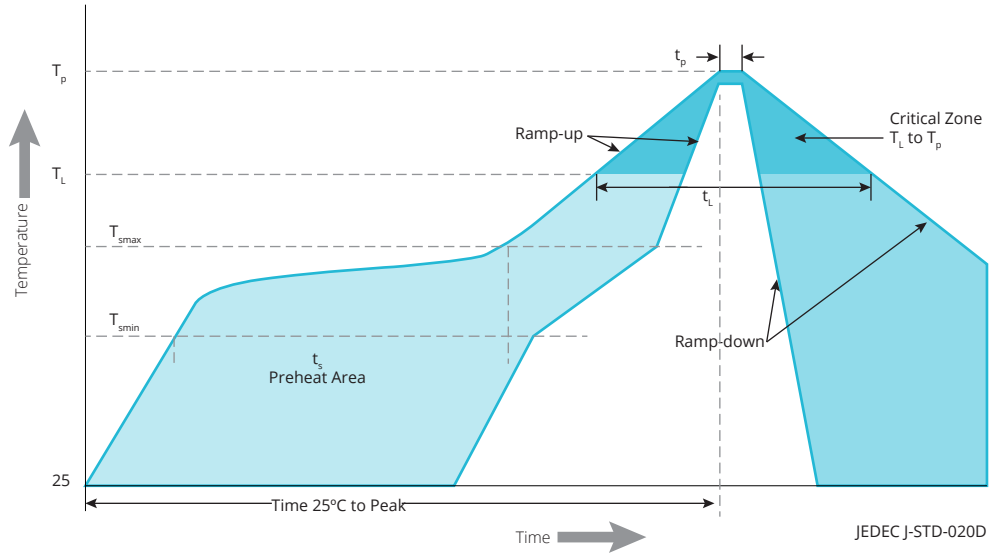


Figure 9. Visualization of the acceptable reflow temperature profile as specified in Table 8.

Table 8. Reflow profile characteristics for LUXEON 5050.

PROFILE FEATURE	LEAD-FREE ASSEMBLY
Preheat Minimum Temperature ( $T_{smin}$ )	150°C
Preheat Maximum Temperature ( $T_{smax}$ )	200°C
Preheat Time ( $t_{smin}$ to $t_{smax}$ )	60 to 180 seconds
Ramp-Up Rate ( $T_L$ to $T_p$ )	3°C / second maximum
Liquidous Temperature ( $T_L$ )	217°C
Time Maintained Above Temperature $T_L$ ( $t_t$ )	60 to 150 seconds
Peak / Classification Temperature ( $T_p$ )	260°C
Time Within 5°C of Actual Peak Temperature ( $t_p$ )	20 to 40 seconds
Ramp-Down Rate ( $T_p$ to $T_L$ )	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

## JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON 5050.

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
3	168 Hours	≤30°C / 60% RH	192 Hours +5 / -0	30°C / 60% RH

# Solder Pad Design

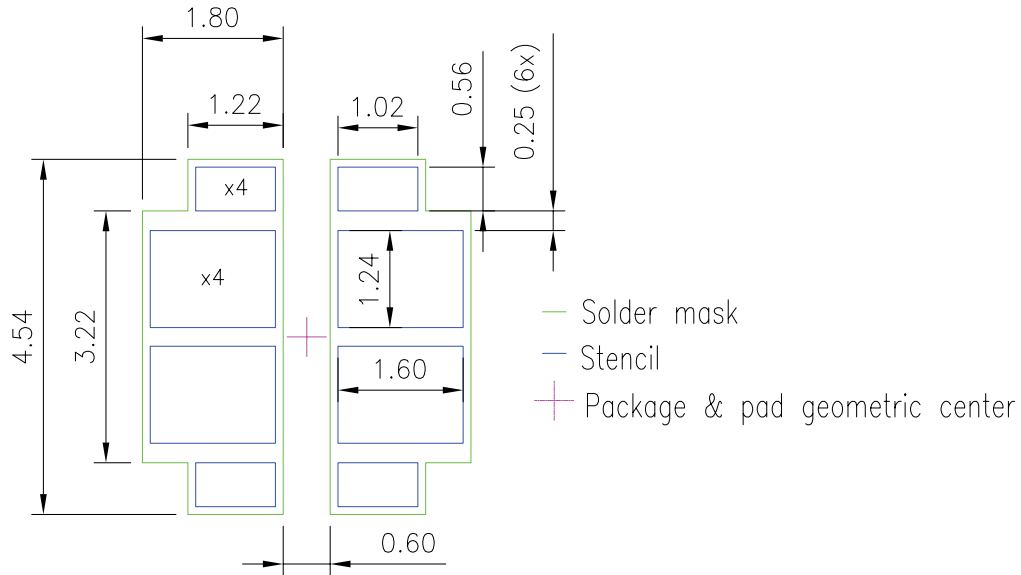


Figure 10. Recommended PCB solder pad layout for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

## Notes for Figure 10:

1. Drawings are not to scale.
2. All dimensions are in millimeters.
3. Refer to application brief [AB174](#) for additional details regarding recommended PCB layout design.

# Packaging Information

## Pocket Tape Dimensions

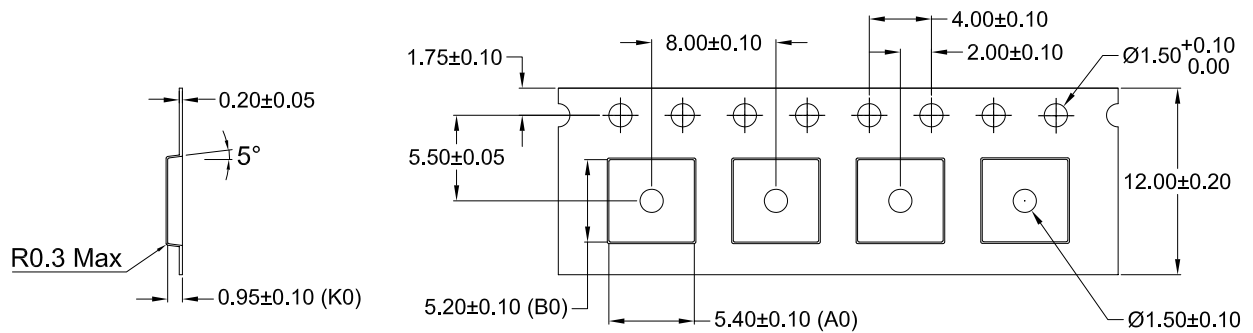


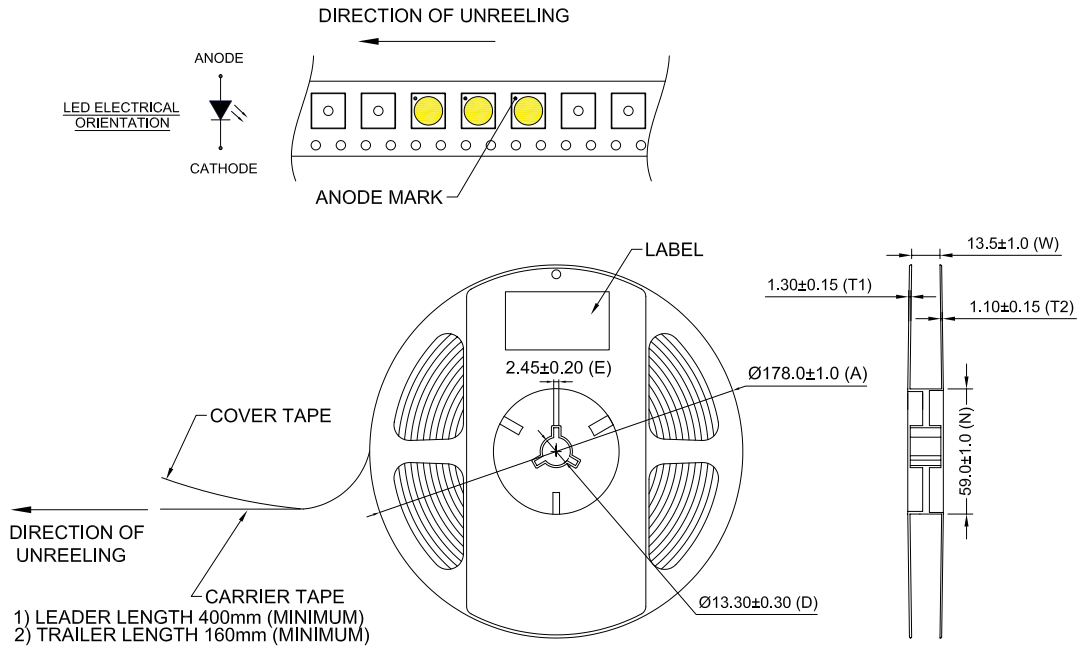
Figure 11. Pocket tape dimensions for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

## Notes for Figure 11:

1. Drawings are not to scale.
2. All dimensions are in millimeters.



# Reel Dimensions



12a. Reel dimensions for LUXEON 5050 (Round LES).

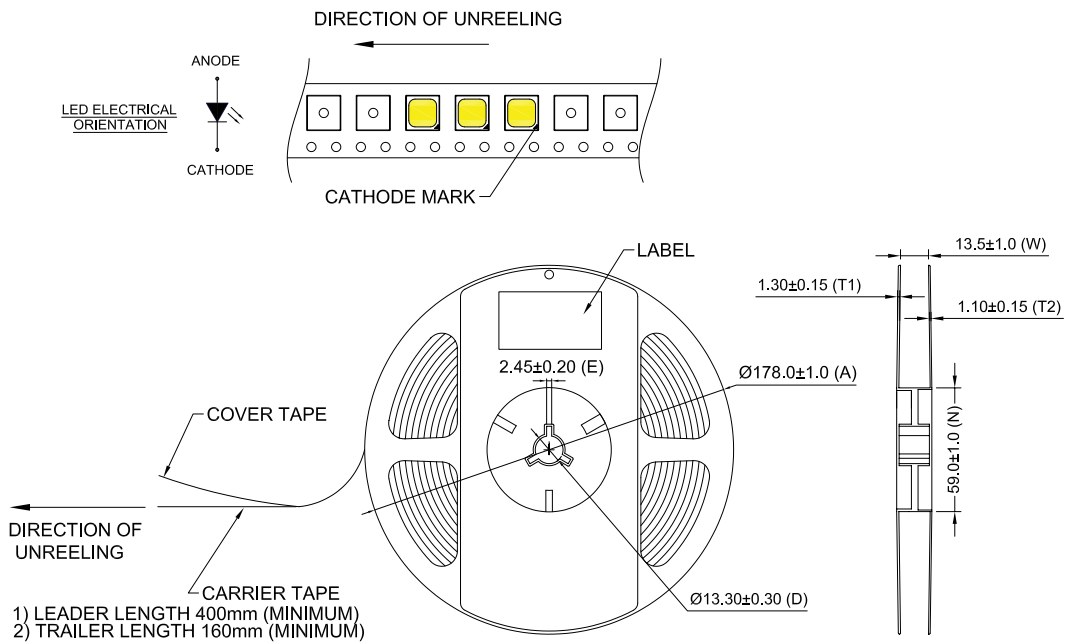


Figure 12b. Reel dimensions for LUXEON 5050 (Square LES).

Notes for Figures 12a and 12b:  
1. Drawings are not to scale.  
2. All dimensions are in millimeters.

## About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit [lumileds.com](http://lumileds.com).



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# CERTIFICATE

Issued to:  
Applicant:  
**Philips Lighting B.V.**  
High Tech Campus 45  
5656 AE Eindhoven, The Netherlands

Manufacturer/Licensee:  
**Philips Lighting B.V.**  
High Tech Campus 45  
5656 AE Eindhoven, The Netherlands

Product : LED driver  
Trade name(s) : PHILIPS  
Type(s)/model(s) : Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt,  
Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt and  
Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt

The product and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

DEKRA hereby declares that the above-mentioned product has been certified on the basis of:

- a type test according to the standard EN 61347-2-13:2014, EN 61347-1:2015, EN 62384:2006 and EN 62384:2006/A1:2009
- an inspection of the production location according to CENELEC Operational Document CIG 021
- a certification agreement with the number 947556

DEKRA hereby grants the right to use the ENEC certification mark.

The ENEC certification mark may be applied to the product as specified in this certificate for the duration of the ENEC certification agreement and under the conditions of the ENEC certification agreement.

This certificate is issued on 5 September 2017 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 31-101322

DEKRA Certification B.V.



drs. G.J. Zoetbrood  
Managing Director



Kreny Lin  
Certification Manager

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ACCREDITED BY THE  
DUTCH ACCREDITATION  
COUNCIL



**SPECIFICATION OF THE CERTIFIED PRODUCT****Product data**

Product	: LED driver
Trade name(s)	: PHILIPS
Type(s)/model(s)	: Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt, Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt and Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt
Rated voltage	: 220-240 Vac or 186-250 Vdc
Nature of supply	: AC or DC
Rated frequency	: 50/60 Hz at AC
Power factor	: 0,95
Rated input current	: 0,4-0,34 Aac or 0,48 Adc
Rated input power	: 84W
Output power	: 75 W
Max. case temperature (tc)	: 80 °C
Ambient temperature (ta)	: -40 °C...+55 °C
Temperature declared thermally protection	: 130 °C
Description	: Built-in with double/reinforced insulation

**Product data – type Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt**

Output current	: 200-700 mA
Output voltage	: 50-150 Vdc; 220 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt**

Output current	: 300-1050 mA
Output voltage	: 35-108 Vdc; 150 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt**

Output current	: 500-1500 mA
Output voltage	: 25-71 Vdc; 120 Vdc MAX (open-circuit); SELV

**TESTS****Test requirements**

EN 61347-2-13:2014  
EN 61347-1:2015  
EN 62384:2006  
EN 62384:2006/A1:2009

**Test result**

The test results are laid down in DEKRA test file 601602100.

**Additional Information**

constant current type with screwless terminal block  
LED driver is completely potted with asphalt

**Remarks**

For component list refers to annex 1 of test reports 6016021.50.

The tests were performed by the manufacturer under the conditions of the agreement concerning the manufacturer's right to conduct type tests for the KEMA-KEUR / ENEC certification system under supervision of DEKRA (CTF Stage 3).

**Conclusion**

The examination proved that all requirements were met.

**Factory location**

Philips Lighting Electronics Poland  
ul Przemysłowa 29  
64-920 Pila, Poland

## Philips Lighting



### EU Declaration of Conformity

Document No.: 2017A0126

Year in which CE Mark was first affixed: 2017

**Manufacturer: Philips Lighting**

I.B.R.S./C.C.R.I. /Numéro 10461

5600 VB Eindhoven, The Netherlands

**This declaration of conformity is issued under the sole responsibility of the manufacturer.**

Product:	NAME:	Xi FP 22W 0.2-0.7A SNLDAE 230V S175 sXt Led Electronic Driver	Xi FP 22W 0.3-1.0A SNLDAE 230V S175 sXt Led Electronic Driver
Product Code:	12NC	9290 016 17806	9290 009 91206
Product:	NAME:	Xi FP 40W 0.2-0.7A SNLDAE 230V S175 sXt Led Electronic Driver	Xi FP 40W 0.3-1.0A SNLDAE 230V S175 sXt Led Electronic Driver
Product Code:	12NC	9290 009 89206	9290 009 89306

**The designated products are in conformity with the following Union harmonization legislation and with the applicable requirements of the following harmonized standards:**

#### Low Voltage Directive (LVD), 2014/35/EU

- EN 61347-2-13:2014+A1:2017

#### Electromagnetic compatibility Directive (EMC), 2014/30/EU

- EN 55015:2013+A1:2015
- EN 61000-3-2:2014
- EN 61000-3-3:2013
- EN 61547:2009

#### EcoDesign requirements for energy-related products Directive (ErP), 2009/125/EC and applicable Implementing Measures

- Implementing Measure EC/1194/2012

#### Restriction of the use of certain Hazardous Substances in electrical and electronic equipment Directive (RoHS), 2011/65/EU

- EN 50581:2012

**and are produced under a quality scheme at least in conformity with ISO 9001 or CENELEC permanent documents.**

2017-12-08, Eindhoven

**Ms. C. Sweegers**

Regulatory Affairs Manager

High tech campus 45

5656 AE Eindhoven, The Netherlands

# PHILIPS

## Xitanium

### LED driver



## Datasheet

# Xitanium FULL Prog LED Xtreme drivers

Xi FP 40W 0.3-1.0A SNLDAE 230V C123 sXt

### Xitanium FULL Prog LED Xtreme drivers

Philips Xitanium Full Programmable LED drivers are specifically designed to deliver the highest performance, protection and configurability. The portfolio offers both central and standalone dimming protocols further increasing the energy savings and CO<sub>2</sub> reductions achieved with LED lighting. The Xtreme technology ensures maximum robustness and protection combined with a very long lifetime.

In this product family Philips introduces new drivers in a compact form factor with state-of-the-art features, which offer high value for both OEM customers and end-users. The products can replace the existing programmable outdoor LED drivers and will bring significant improvement in programming, assembly into a luminaire and electrical performance.

#### Benefits

- Ultimate robustness, offering peace of mind and lower maintenance costs
- Fully programmable LED-drivers designed for the new digital and connected lighting world
- Extended diagnostics via MultiOne
- Easy to design-in, configure and install for insulation Class I and Class II applications
- Energy savings through high efficiency and via multiple dimming options

#### Features

- High surge immunity (CM/DM)
- Long lifetime and robust protection against moisture, vibration and temperature
- Configurable operating windows (AOC)
- Multiple control interfaces: DALI, AmpDim, 1-step and 3-step LineSwitch
- Autonomous dimming via integrated DynaDimmer
- Adjustable thermal protection for driver (DTL, on select models) and LED module (MTP)
- Constant Light Output (CLO)
- Adjustable Start-up Time (AST)
- Adjustable Light Output (ALO)
- End-Of-Life indicator (EOL)

#### Application

- Road and street lighting
- Area lighting
- Tunnel lighting
- Industrial lighting

## Electrical input data

Specification item	Value	Unit	Condition
Rated input voltage range	202...254	V <sub>ac</sub>	Performance range
Rated input voltage	230	V <sub>ac</sub>	
Rated input frequency range	47...63	Hz	Performance range
Rated input current	0.2	A	@ rated output power @ rated input voltage
Max. input current	0.21	A	@ rated output power @ minimum performance input voltage
Rated input power	46	W	@ rated output power @ rated input voltage
Power factor	≥ 0.99		@ rated output power @ rated input voltage
Total harmonic distortion	≤ 7	%	@ rated output power @ rated input voltage
Efficiency	≤ 89	%	@ rated output power @ rated input voltage
Rated input voltage DC range	186...250	V <sub>dc</sub>	Performance range
Rated input current DC range	≤ 0.15	A <sub>dc</sub>	Performance range
Input voltage AC range	80...264	V <sub>ac</sub>	Safety operational range; see MainsGuard graph
Input frequency AC range	45...66	Hz	Safety operational range
Input voltage DC range	168...275	V <sub>dc</sub>	Safety operational range
Standby Power (TD)	0.5	W	
Isolation input to output	SELV		

## Electrical output data

Specification item	Value	Unit	Condition
Regulation method	Constant Current		
Output voltage	20...54	V <sub>dc</sub>	
Output voltage max.	60	V	Maximum voltage at open load
Output current	0.07...1.05	A	
Output current min programmable	300	mA	
Output current min dimming	70	mA	
Output current tolerance	± 3	%	
Output current ripple LF	≤ 4	%	Ripple = peak / average @ < 1kHz
Output current ripple HF	≤ 4	%	
Output power	1.4...40	W	

## Electrical data controls input

Specification item	Value	Unit	Condition
Control method	AmpDim, DALI, Dynadimmer, LineSwitch 3-step, LineSwitch single-step		Output current amplitude dimming
Dimming range	10...100	%	DALI acc. IEC62386-101, -102 Ed. 2.0; LineSwitch: Vlow: < 160Vac Vhigh: 170 ... 264Vac
Galvanic Isolation	Double		

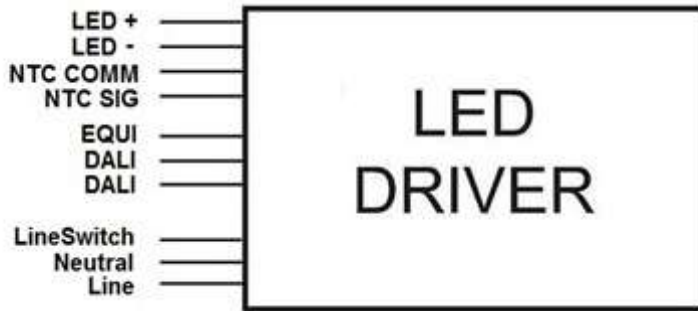
## Logistical data

Specification item	Value
Product name	Xi FP 40W 0.3-1.0A SNLDAE 230V C123 sXt
Order code	871869659257100
Logistic code 12NC	9290 015 18706
Pieces per box	20



## Wiring & Connections

Specification item	Value	Unit	Condition
Input wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Input wire strip length	8.5...9.5	mm	
Output wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Output wire strip length	8.5...9.5	mm	
Dimming wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Dimming wire strip length	8.5...9.5	mm	
Maximum cable length	600	mm	Total length of wiring including LED module, one way
Maximum NTC output cable length	0.6	m	

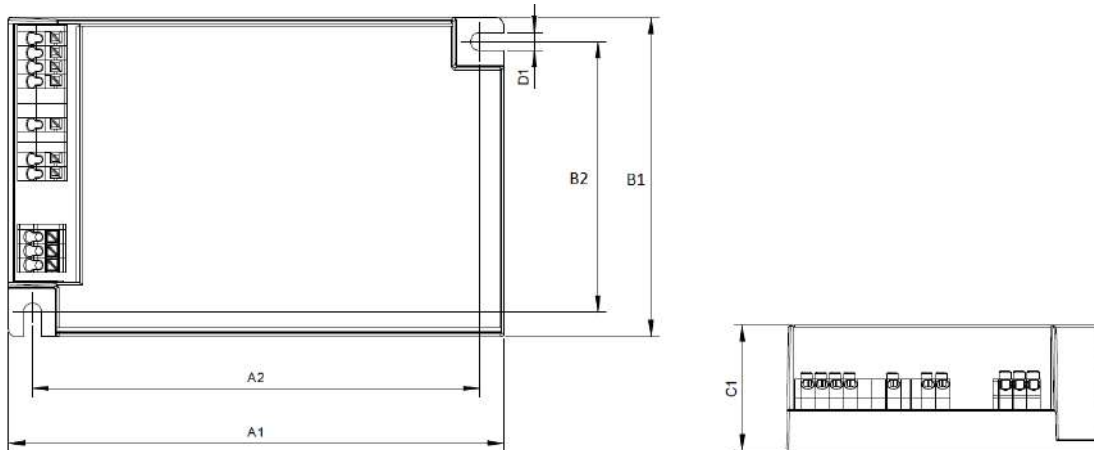


## Insulation

Insulation	Mains	EQUI	LED + NTC	LineSwitch	DALI
Mains		Double	SELV	NA	Basic
EQUI	Double		Basic	Double	Double
LED + NTC	SELV	Basic		SELV	Double
LineSwitch	NA	Double	SELV		Basic
DALI	Basic	Double	Double	Basic	

## Dimensions and weight

Specification item	Value	Unit	Condition
Length (A1)	123	mm	
Width (B1)	79	mm	
Width (B2)	67	mm	
Height (C1)	31	mm	
Fixing hole diameter (D1)	4.5	mm	
Fixing hole distance (A2)	111	mm	
Weight	190	gram	



## Operational temperatures and humidity

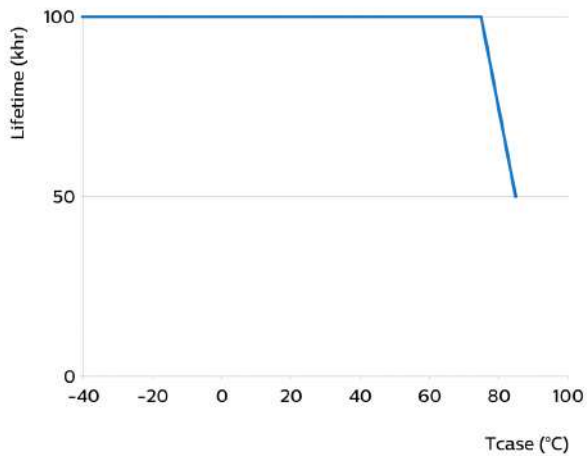
Specification item	Value	Unit	Condition
Ambient temperature	-40...+55	°C	Higher ambient temperature allowed as long as T <sub>case-max</sub> is not exceeded.
T <sub>case-max</sub>	85	°C	Maximum temperature measured at T <sub>case</sub> -point
T <sub>case-life</sub>	75	°C	Measured at T <sub>case</sub> -point
Maximum housing temperature	120	°C	In case of a failure
Relative humidity	10...90	%	Non-condensing

## Storage temperature and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-40...+85	°C	
Relative humidity	5...95	%	Non-condensing

## Lifetime

Specification item	Value	Unit	Condition
Driver lifetime	100,000	hours	Measured temperature at $T_{case}$ -point is $T_{case}$ -life. Maximum failures = 10%



## Programmable features

Specification item	Value	Remark	Condition
Set output current (AOC)	Programmable, SimpleSet	See Design-in guide.	Default output current: = 700 mA
LED module temperature derating (MTP)	Yes		
Constant Lumen Over Lifetime (CLO)	Yes		
DC emergency dimming (DCemDIM)	Yes		Default: AOC = 15%. EOFx = 10 ... 60%. No external DC rated fuse required
Diagnostics	Yes		
Adjustable Light Output (ALO)	Yes		
Ampdim	Yes		
LineSwitch single-step	Yes		
LineSwitch 3-step	Yes		
Adjustable Start-up Time (AST)	Yes		
End of life EOL	Yes		
Integrated Dynadimmer	Yes		5-step, light turn-off possible
End Of Life indicator	Yes		

## Features

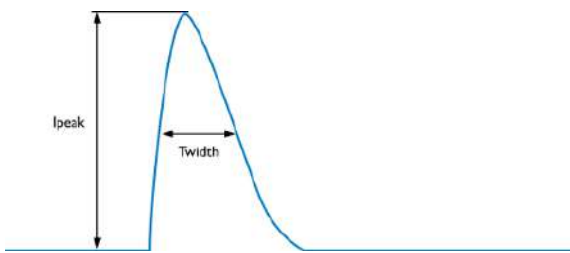
Specification item	Value	Remark	Condition
Open load protection	Yes		Automatic recovering
Short circuit protection	Yes		Automatic recovering
Over power protection	Yes		Automatic recovering
Hot wiring	No		
Suitable for fixtures with protection class	I and II		per IEC60598
Over temperature protection driver	Yes		Automatic recovering
Overheating protection	Yes		Automatic recovering

## Certificates and standards

Specification item	Value
Approval marks	CB / CCC / CE / ENEC / SELV / VDE-EMV / VDE-S
Ingress Protection classification (IP)	20

## Inrush current

Specification item	Value	Unit	Condition
Inrush current $I_{peak}$	21	A	Input voltage 230V
Inrush current $T_{width}$	300	$\mu$ s	Input voltage 230V, measured at 50% $I_{peak}$
Drivers / MCB 16A type B	$\leq 21$	pcs	



MCB	Rating	Relative number of LED drivers
B	10A	63%
B	13A	81%
B	16A	100% (stated in datasheet)
B	20A	125%
B	25A	156%
C	10A	104%
C	13A	135%
C	16A	170%
C	20A	208%
C	25A	260%

## Driver touch current / protective conductor current

Specification item	Value	Unit	Condition
Typical touch current (ins. Class II)	< 0.24	mA peak	Acc. IEC61347-1. LED module contribution not included
Typical protective conductor current (ins. Class I)	< 0.17	mA rms	Acc. IEC61347-1. LED module contribution not included

## Surge immunity

Specification item	Value	Unit	Condition
Mains surge immunity (diff. mode)	6	kV	L-N, Ls-L, Ls-N, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Mains surge immunity (comm. mode)	10	kV	L/N/Ls - EQUI 10kV acc. EN61547; 8kV acc. IEC61000-4-5, 12 Ohm 1.2/50us,8/20us
Control surge immunity (diff. mode)	0.9	kV	DALI - DALI, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Control surge immunity (comm. mode)	4	kV	DALI - EQUI, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
DALI surge immunity (comm. mode)	8	kV	DALI - L/N/Ls acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us

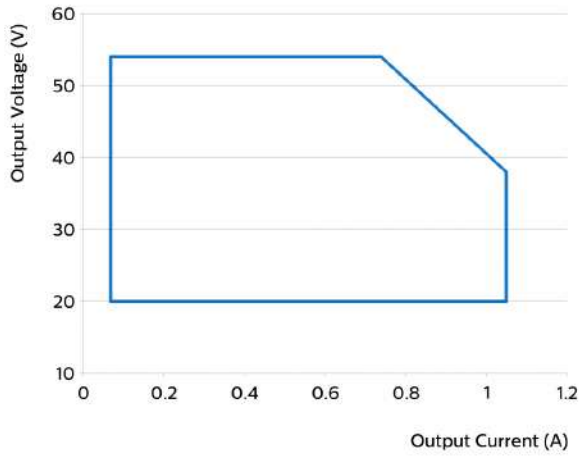
## Additional information

Specification item	Default setting	Remark	Condition
AOC	700	mA	
LineSwitch	ON		
CLO	OFF		
MTP	OFF		
Dynadimmer	OFF		
EOL	OFF		

## Graphs

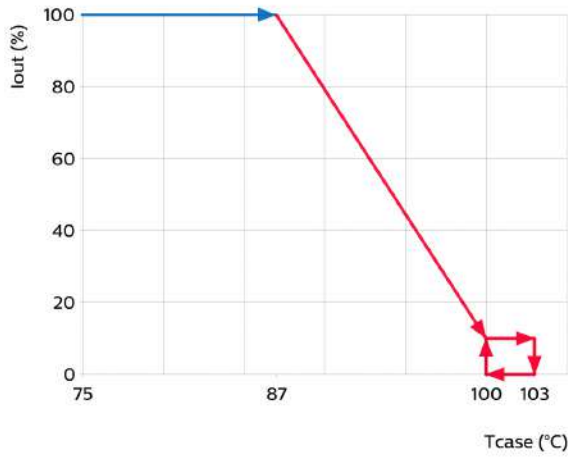
### Operating window

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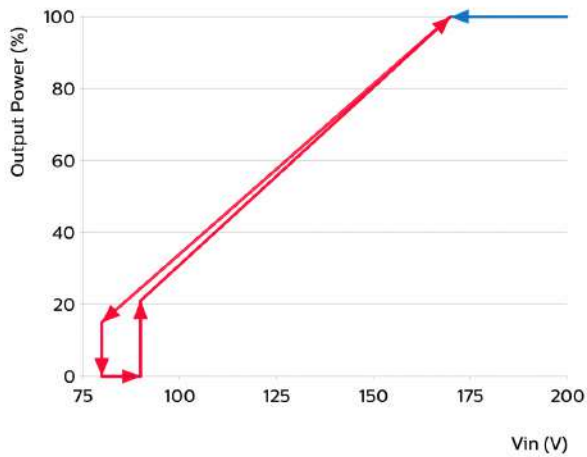
### Thermal Guard

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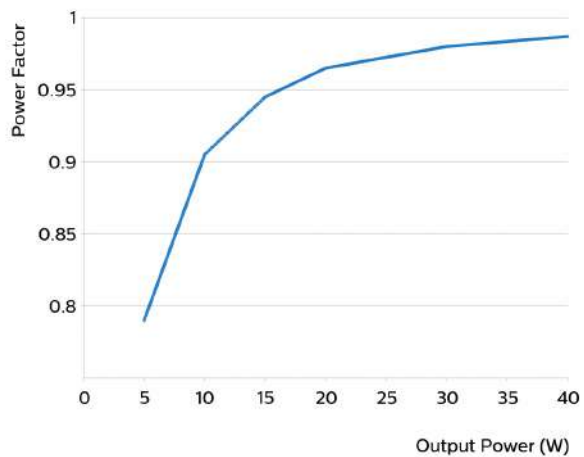
### Mains Guard

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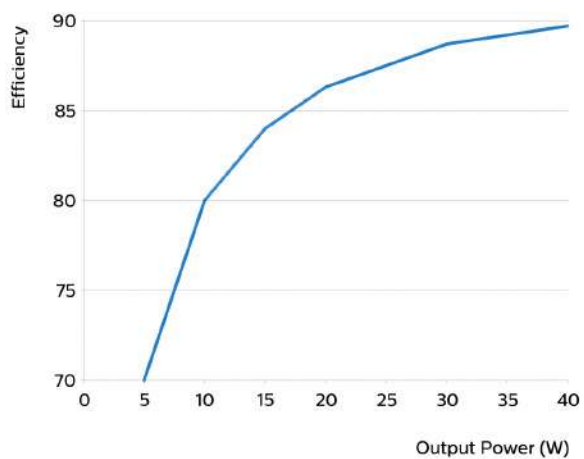
### Power factor versus output power

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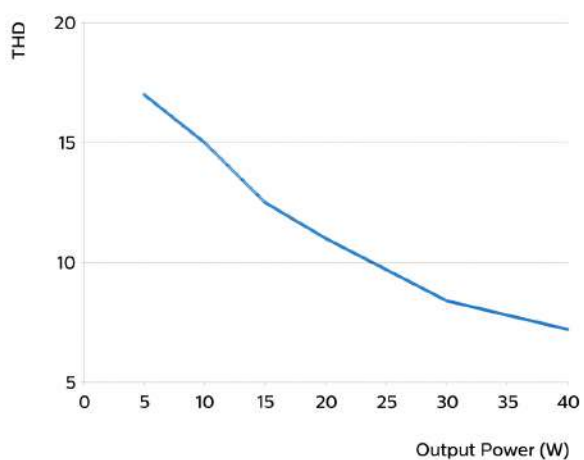
### Efficiency versus output power

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### THD versus output power

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Date of release: December 15, 2017 v2


[www.philips.com/technology](http://www.philips.com/technology)

## **2.5 Materiales de las luminarias**

Informe de ensayo en relación con el material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda.

### **a. Luminaria modelo funcional**



 Relva, 27 A - Torneiros 36410 PORRIÑO - Pontevedra Tel. +34 986 344 000 Fax. +34 986 337 302 e-mail: aimen@aimen.es www.aimen.es C.I.F. G - 36.606.291	Nº Informe Report No.	1142147.2.3	Página Page	1 de 1 1 of 1
	Cliente Customer	IMQ TECNOCREA SL C/ Sèquia de Benàger, P.I.Alquería de Moret 23 - 46210 PICANYA - Valencia (España)		

<b>Datos de la muestra</b> Sample data		Fecha de recepción Receipt date	23.12.2020	Fecha de pedido Receipt date of order	17.12.2020
Descripción Description		Carcasa de aluminio Aluminium housing		Pedido Order	ACEPTACIÓN OFERTA
Id. AIMEN Id. AIMEN		†Referencia del Cliente †Customer's reference			
1142147-B		Luminaria Milan. Luminaria Grupo Benito/Novatilu			

<b>Ensayo de Tracción</b> Tensile Test		Condiciones de ensayo Test conditions		UNE-EN ISO 6892-1:2020 A224				Fecha de ensayo Date of test	11.01.2021	
Id.	Probeta / Specimen			R <sub>p0.2</sub> (MPa)	R <sub>p1</sub> (MPa)	R <sub>eH</sub> (MPa)	R <sub>m</sub> (MPa)	A (%)	Z (%)	
	Orientación Orientation	Tipo Type	Dimensiones Size (mm)							
1142147-B	TRANSVERSAL A LA MUESTRA TRANSVERSE TO THE SAMPLE	P	12,458 x 2,252	185	---	---	242	*1,1	---	
Incertidumbre k=2 Uncertainty				0,053·R <sub>p0.2</sub>	0,053·R <sub>p1</sub>	0,053·R <sub>eH</sub>	0,030·R <sub>m</sub>	0,13·A	0,095·Z	
Observaciones Remarks		*La elongación porcentual tras la rotura se obtiene mediante el extensómetro MTS 50mm N°HMEDEX_007 (31030/7-08) *The percentage elongation after breakage is obtained by means of the MTS 50mm extensometer N°HMEDEX_007 (31030/7-08)								
Leyenda Legend		R <sub>p0.2</sub> : Limite elástico a 0,2% de deformación / 0,2% offset yieldstrength. R <sub>p1</sub> : Limite elástico a 1% de deformación / 1% Offset yieldstrength. R <sub>eH</sub> : Limite superior de cedencia / Upperyieldstrength.		R <sub>m</sub> : Resistencia a tracción / Tensilestrength. A: Alargamiento tras la fractura / Elongationafter fracture. Z: Coeficiente de estricción / Reduction of area.		Orientación / Orientation: L: Longitudinal. T: Transversal. Z: Perpendicular al espesor / Through thickness. A: All Weld.		Probeta tipo / Specimentype: P: Prismática / Flat. C: Cilíndrica / Round. T: Tubocompleto / Tube complete. B: Banda de pared de tubo / Strip of tubewall.		

<b>Análisis químico</b> Chemical Analysis										Fecha de ensayo Date of test		14.01.2021	
Muestra Sample		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Pb#	Sn#	Al
B	% peso wt %	11,10	0,947	0,703	0,334	0,507	<0,028	<0,04	0,777	<0,02	0,036	0,015	Matriz Matrix
	Incert. Uncert.	0,36	0,031	0,030	0,017	0,028	----	----	0,075	----	----	----	----
Método de ensayo Test method		B	B	B	B	B	B	B	B	B	B	B	----
<b>Técnicas de análisis</b> Analysis techniques													
<p>A) Absorción infrarroja tras combustión en horno de inducción: Procedimiento A/PE/AFM.Q/09. / Infrared absorption after induction furnace combustion: Procedure A/PE/AFM.Q/09.</p> <p>B) Espectrometría de emisión por chispa en aleación de aluminio: Procedimiento A/PE/AFM.Q/08 / Spark Emission Spectrometry in aluminium alloy: Procedure A/PE/AFM.Q/08</p> <p>C) Conductividad térmica tras fusión en corriente de gas inerte: Procedimiento A/PE/AFM.Q/11. Thermal conductivity after melting in an inert gas stream: Procedure A/PE/AFM.Q/11.</p> <p>D) ICP-OES: Procedimiento A/PE/AFM.Q/03 / ICP-OES: Procedure A/PE/AFM.Q/03</p>													
Observaciones Remarks		<p>*La composición química de la muestra analizada es característica de una aleación de aluminio EN 1706 EN AC-47100, pero las concentraciones de magnesio (Mg) Y cinc (Zn) están por encima de las indicadas en la norma. *Chemical composition of the sample analyzed is similar to an EN 1706 EN AC-47100 aluminum alloy, but the elements: magnesium (Mg) and zinc (Zn) don't fulfill the values indicate in the standard.</p> <p>La declaración de conformidad está basada en el criterio de aceptación simple según la guía ILAC G8, con una probabilidad de aceptación o rechazo falsos inferior al 50% The statement of conformity is based on the simple acceptance criterion according to the ILAC G8 guide, with a false acceptance or rejection probability of less than 50%".</p>											

Porriño, 16 de febrero de 2021  
Porriño, 16<sup>th</sup> February 2021

Jorge Delgado Guirao  
Coordinador de Análisis Metalográfico y Químico  
Head of Metallography and Chemical Analysis

Agustín Paz Gestoso  
Responsable de Ensayos y Análisis  
Testing and analysis manager

Mauricio Ruibal Acuña  
Coordinador de Ensayos Mecánicos y END  
Mechanical Testing and NDT Coordinator

**Este informe anula y sustituye a nuestro informe nº 1142147.2.2 de fecha 8 de febrero de 2021**  
**This report supersedes our report no. 1142147.2.2 dated 8th February, 2021**

Descripción de los cambios / Description of changes.  
Modificación para incluir la clasificación de la aleación por solicitud del cliente. / Modification to include alloy classification as requested by the customer.







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Activities marked with # are not included in the scope of accreditation

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### 3 Informe de Pruebas o Certificados de la Luminaria.

#### 3.1 Tabla Verificación (Anexo 4) CEI – IDAE

Informe de Pruebas o Certificados emitidos por el fabricante de la luminaria o entidad OEC acreditada	
1	Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes. (Propio de la empresa) 
2	Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4. 
3	Ensayo colorimétrico de la luminaria según la Norma UNE EN 13032-4. 
4	Ensayo de medidas eléctricas: tensión, corriente de alimentación, potencia nominal leds y potencia total consumida por luminaria con todos sus elementos integrantes y factor de potencia. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria. 



**FABRICANTE:** NOVATILU, SLU  
**MANUFACTURER:** C/ Via Ausetània, 11-13  
08560 Manlleu (Barcelona) – Spain  
Tel.: (+34) 961 401 000

Certificamos y declaramos bajo nuestra responsabilidad que el siguiente producto:  
*Certify and declare under our responsibility that the following product:*

**Marca:** Benito Novatilu  
**Brand:** Benito Novatilu  
**Modelo:** Luminarias: AGIL / AVENUE / COSMO-LED / ESKADE-LED / VILLA LUXE-LED / VILLA  
**Model:** IG-LED / FERNANDINA-LED / INNOVA / SIENA / FORMA / CIRCULAR / UFO / MILAN /  
P. MILAN / APOLO / VOLGA / STARK / CORBA / CORBA LIRA / PLANET / GARDEN /  
TOMSK / Módulos NOVATILUX

Está conforme a las siguientes directivas y normativas:  
*It is according to the following directives and norms:*

UNE-EN-61000-3-2:2006+A1:2010+A2:2010  
UNE-EN-61000-3-3:2009  
UNE-EN-61547:2011  
UNE-EN-55015:2007+A1:2008+A2:2009

UNE-EN-60598-2-3:1997  
UNE-EN-60598:2009+A11:2  
UNE-EN-62031:2009

Compatibilidad electromagnética (CEM).  
- Límites emisiones corrientes armónicas  
- Limitación variación tensión y flicker en redes públicas  
- Requisitos de Inmunidad  
- Límites perturbación radioeléctrica  
*Electromagnetic compatibility (EMC).*  
*-Limits harmonic current emissions*  
*-Limiting voltage variation and flicker in electrical networks*  
*-Immunity requirements*  
*-Limits radio electrical disturbance*

Luminarias Alumbrado Público  
- Requisitos generales y ensayos  
- Módulos LED. Requisitos de seguridad  
*Street Lighting Luminaires*  
*- General requirements and tests*  
*- LED Modules. Safety requirement*

**Fecha de emisión:** Mayo de 2015  
*Issued on:*

**Firmado:**  
*Signed:*



Jordi Puig Rovira  
Ingeniero Técnico Telecomunicación (col. 903055)  
**Design & Engineering**  
**Lighting Department**

EXPEDIENTE NÚMERO **18/31703702**  
Nº de Página 1/12



## INFORME DE ENSAYO

### Estudio fotométrico

#### Referencia del peticionario: NOVATILU, S.L.

Dirección cliente: Via Ausetània, 11-13  
08560 Manlleu (Barcelona)

#### Equipo ensayado: MÓDULO LED NOVATILUX 30W 4000K

Marca:	NOVATILU	Modelo:	NOVATILUX 16
Referencia:	<ANL16AA4	N. ident. interna:	6326/1

#### Ensayos solicitados:

Determinación de la distribución fotométrica de la luminaria, curva polar, diagrama isolux, gráfica de clasificación zonal de flujo, diagrama de apertura del haz de iluminancias, tabla UGR, temperatura de color\* y CRI\* en el eje de referencia y promediado espacialmente, corriente consumida, potencia activa, reactiva y aparente, factor de potencia, %THDi\* y relación eficiencia lm/W.

Ver especificaciones aplicadas en la página 4

#### Normas aplicadas:

**UNE-EN 13032-1:2006+A1:2014:** "Luz y alumbrado. Medición y presentación de datos fotométricos de lámparas y luminarias. Parte 1: Medición y formato de fichero"

**\*UNE-EN 13032-4:2016:** "Luz y alumbrado. Medición y presentación de datos fotométricos de lámparas y luminarias. Parte 4: Lámparas LED, módulos y luminarias"

**CIE nº121:1996:** "The photometry and goniophotometry of luminaires"

**Procedimiento interno C5401547:** "Método para la medida de la potencia consumida y factor de potencia durante los ensayos fotométricos"

**Los ensayos/inspecciones marcados con \* no están amparados por la acreditación de ENAC**

**Fecha de emisión:** Bellaterra, 04 de mayo de 2018

Albert Marginet Morales  
Responsable Técnico  
Electrical and Electronics  
LGAI Technological Center S.A.

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## 1. CONFIGURACIÓN GENERAL DEL ENSAYO

### 1.1. DATOS GENERALES

<b>Expediente número:</b>	<b>18/31703702</b>
Fecha de recepción:	25/04/2018
Fecha de inicio de los ensayos:	04/05/2018
Fecha de final de los ensayos:	04/05/2018
Laboratorio de ensayos:	LGAI Technological Center, S.A.
Dirección:	Campus de la UAB. Ronda de la Font del Carme, s/n. 08193 Bellaterra (Barcelona – España)

### 1.2. DESCRIPCIÓN DEL MATERIAL RECIBIDO

Equipo:	<b>MÓDULO LED NOVATILUX 30W 4000K</b>
Fabricante:	NOVATILU, S.L.
Marca:	NOVATILU
Modelo:	NOVATILUX 16
Referencia:	<ANL16AA4
N. de identificación interna:	6326/1

### 1.3. CARACTERÍSTICAS NOMINALES

Tensión de alimentación (V):	230
Potencia declarada (W):	30
Intensidad (A):	---
Frecuencia (Hz):	50
Otras características:	Módulo alimentado por fuente de alimentación marca MEAN WELL, modelo HLG-40H-54B, input:100-240V 0,43A 50/60Hz / output:54V 0.75A (ver foto en Anexo)

### 1.4. CONDICIONES AMBIENTALES DURANTE LA REALIZACIÓN DE LOS ENSAYOS

Temperatura (°C):	24,2-24,7
Humedad relativa (%):	43-44

### 1.5. OBSERVACIONES / COMENTARIOS DE INTERÉS

Especificaciones aplicadas:

- UNE-EN 13032-1:2006+A1:2014: "Luz y alumbrado. Medición y presentación de datos fotométricos de lámparas y luminarias. Parte 1: Medición y formato de fichero"
- \*UNE-EN 13032-4:2016: "Luz y alumbrado. Medición y presentación de datos fotométricos de lámparas y luminarias. Parte 4: Lámparas LED, módulos y luminarias" (capítulo 7)
- CIE nº121:1996: "The photometry and goniophotometry of luminaires"
- Procedimiento interno C5401547: "Método para la medida de la potencia consumida y factor de potencia durante los ensayos fotométricos"

### 1.6. INCERTIDUMBRES EN LAS MEDIDAS

Las incertidumbres de medida han sido calculadas y están a disposición del cliente bajo petición.

### 1.7. MÉTODO DE ENSAYO

La medición ha sido realizada de manera que:

- Las medidas se han efectuado para un  $\Delta\gamma = 5^\circ$  y para un  $\Delta C = 15^\circ$ , mediante un goniofotómetro de cabeza móvil operando según las recomendaciones de la publicación CIE nº 121:1996.
- Las medidas de flujo luminoso y potencia se han realizado alimentando la luminaria a una tensión de 230V 50Hz.
- Posición inicial de la luminaria paralela al eje C90-C270 (ver fotos en Anexo).
- Medidas de parámetros eléctricos realizadas con analizador de potencia Voltech PM3000A en el rango de banda de medida DC-25kHz y %THDi, tasa de distorsión armónica en corriente medida hasta armónico 99.
- Las medidas colorimétricas se han obtenido mediante un espectroradiómetro Instrument Systems MAS-40 (cálculos según CIE 13.3 y CIE 15), en combinación con un goniofotómetro, por integración de las medidas según los pasos  $\Delta C=90^\circ$  y  $\Delta\gamma=10^\circ$  (UNE-EN 13032-4 apdo. 7.1, método 2).

### Garantía de Calidad de Servicio

**Applus+**, garantiza que este trabajo se ha realizado dentro de lo exigido por nuestro Sistema de Calidad y Sostenibilidad, habiéndose cumplido las condiciones contractuales y la normativa legal.

En el marco de nuestro programa de mejora les agradecemos nos transmitan cualquier comentario que consideren oportuno, dirigiéndose al responsable que firma este escrito, o bien, al Director de Calidad de Applus+, en la dirección: [satisfaccion.cliente@applus.com](mailto:satisfaccion.cliente@applus.com)

## 2. RESULTADOS

Con esta disposición, la medición del flujo absoluto de la luminaria descrita en el apartado 1.2 "DESCRIPCIÓN DEL MATERIAL RECIBIDO" resulta ser:

<b>FLUJO TOTAL DE LA LUMINARIA</b>	<b>3540,6</b>	<b>lm</b>
<b>% EMISIÓN HACIA EL HEMISFERIO SUPERIOR</b>	<b>0,0</b>	<b>%</b>
<b>% EMISIÓN HACIA EL HEMISFERIO INFERIOR</b>	<b>100,0</b>	<b>%</b>

### 2.1. PARÁMETROS FOTOMÉTRICOS Y COLORIMÉTRICOS DE LA LUMINARIA

FLUJO LUMINOSO (lm)	EFICACIA (lm/W)	TEMPERATURA DE COLOR* (K)		CRI*	
		Eje de referencia	Promediado espacialmente	Eje de referencia	Promediado espacialmente
3540,6	117,6	4244	4052	74,5	73,9

### 2.2. PARÁMETROS ELÉCTRICOS MEDIDOS DE LA LUMINARIA

TENSIÓN (V)	CORRIENTE (A)	POTENCIA ACTIVA (W)	POTENCIA REACTIVA (VAR)	POTENCIA APARENTE (VA)	FACTOR DE POTENCIA (PF)	THDi* (%)
230,0	0,134	30,1	6,3	30,8	0,978	18,2

Se anexan tablas y curvas fotométricas de la luminaria.



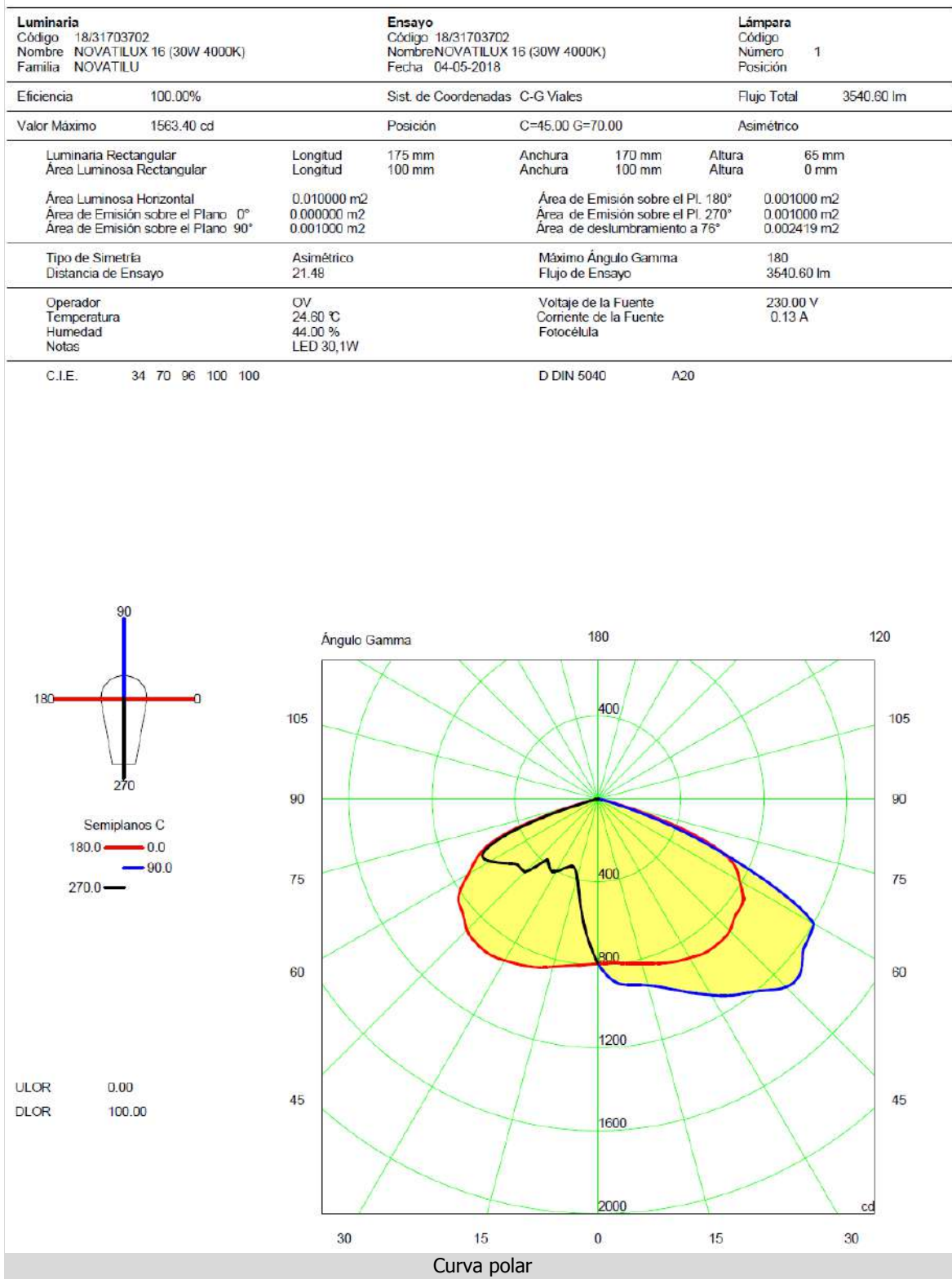
### 3. TABLAS Y CURVAS FOTOMÉTRICAS DE LA LUMINARIA

#### 3.1. TABLA DE DISTRIBUCIÓN DE INTENSIDAD LUMINOSA

Luminaria		Ensayo		Lámpara									
Código	18/31703702	Código	18/31703702	Código									
Nombre	NOVATILUX 16 (30W 4000K)	Nombre	NOVATILUX 16 (30W 4000K)	Número	1								
Familia	NOVATILU	Fecha	04-05-2018	Posición									
Eficiencia	100.00%	Sist. de Coordenadas	C-G Viales	Flujo Total	3540.60 lm								
<b>Tabla de Intensidad Luminosa cd      Tabla 1/2</b>													
	C 270.00	C 285.00	C 300.00	C 315.00	C 330.00	C 345.00	C 0.00	C 15.00	C 30.00	C 45.00	C 60.00	C 75.00	C 90.00
G 0.0	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99
G 5.0	650.00	654.10	669.20	694.00	724.80	759.90	793.30	823.40	844.80	862.10	873.70	879.60	882.00
G 10.0	500.00	509.10	538.70	588.50	655.80	732.60	804.20	857.00	889.30	904.10	911.20	911.40	909.30
G 15.0	389.80	397.90	426.60	486.30	582.00	706.10	820.10	889.60	923.60	935.60	935.30	931.40	929.40
G 20.0	347.20	350.00	358.60	400.30	507.70	677.80	842.40	925.60	959.40	970.60	973.30	971.00	970.40
G 25.0	365.00	370.50	362.20	352.00	438.20	647.00	866.20	956.10	989.90	1011.40	1027.70	1027.70	1027.10
G 30.0	402.00	417.40	412.40	370.50	381.90	617.20	884.10	980.90	1011.10	1047.90	1086.70	1091.50	1090.00
G 35.0	405.90	441.90	472.50	424.80	346.60	590.00	903.60	997.80	1023.20	1083.70	1142.70	1153.60	1152.60
G 40.0	380.00	417.10	498.40	481.90	340.30	553.90	906.10	995.50	1024.20	1118.50	1199.70	1207.10	1206.60
G 45.0	498.40	492.90	485.90	519.70	347.80	517.00	898.10	967.70	1009.50	1163.70	1276.20	1293.20	1282.00
G 50.0	500.50	501.30	516.70	505.30	354.60	477.30	867.90	931.50	998.40	1228.60	1365.80	1311.10	1279.90
G 55.0	539.60	515.50	471.10	487.30	344.60	440.80	854.60	947.50	1044.00	1306.50	1361.90	1269.10	1222.70
G 60.0	599.10	547.40	457.80	441.70	301.70	431.70	788.80	850.10	1069.30	1404.50	1346.60	1217.50	1203.20
G 65.0	609.40	568.10	458.90	407.30	238.50	349.10	711.40	798.80	1074.70	1466.50	1369.10	954.20	806.70
G 70.0	398.30	444.10	414.90	327.70	120.60	188.50	472.80	727.10	1015.60	1563.40	826.70	486.10	371.20
G 75.0	56.00	143.70	176.70	144.90	65.90	127.30	117.80	515.30	1248.10	765.20	306.90	94.10	63.00
G 80.0	16.90	21.30	31.00	25.80	38.30	54.30	15.20	62.60	313.20	220.20	38.70	29.90	18.00
G 85.0	1.00	1.20	1.40	2.30	2.80	1.70	1.10	1.90	5.30	3.00	0.60	0.70	0.70
G 90.0	0.10	0.10	0.10	0.10	0.10	0.10	0.20	0.10	0.10	0.10	0.10	0.10	0.10
G 95.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G100.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G105.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G120.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G135.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G150.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G165.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G180.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Tabla de Intensidad Luminosa cd      Tabla 2/2</b>													
	C 105.00	C 120.00	C 135.00	C 150.00	C 165.00	C 180.00	C 195.00	C 210.00	C 225.00	C 240.00	C 255.00		
G 0.0	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99	792.99	
G 5.0	879.80	875.60	864.80	848.50	830.20	801.50	769.20	734.80	701.70	674.80	656.50		
G 10.0	909.80	910.40	905.90	892.00	864.60	815.60	747.50	669.30	597.70	542.70	510.60		
G 15.0	929.30	932.00	935.30	926.60	898.90	836.70	726.00	598.90	493.40	429.10	398.50		
G 20.0	967.30	968.30	967.40	958.40	934.40	862.90	703.50	526.50	405.90	359.50	350.30		
G 25.0	1024.60	1020.80	1002.60	986.50	961.40	881.30	676.90	458.10	356.00	360.80	369.60		
G 30.0	1088.20	1079.80	1037.80	1001.00	979.70	898.60	649.50	398.50	370.50	412.40	415.60		
G 35.0	1151.80	1134.50	1072.10	1008.30	989.70	913.60	623.10	358.50	422.40	474.60	440.30		
G 40.0	1207.40	1197.00	1104.50	1003.50	976.80	909.60	583.40	340.20	476.10	501.90	417.40		
G 45.0	1295.40	1275.50	1150.00	985.40	942.70	893.70	541.40	337.10	509.70	489.80	490.70		
G 50.0	1304.30	1354.30	1215.60	971.40	901.40	851.90	493.40	335.90	498.30	515.60	497.70		
G 55.0	1264.90	1357.20	1295.30	1027.40	907.70	821.40	449.90	320.70	479.00	465.30	509.60		
G 60.0	1229.00	1347.00	1389.20	1042.10	789.60	721.00	431.40	282.30	434.50	446.10	541.00		
G 65.0	938.70	1360.90	1464.30	1061.70	745.70	630.30	368.80	218.70	390.50	439.50	557.40		
G 70.0	482.30	823.00	1543.40	983.20	714.40	446.30	206.90	113.30	302.60	383.60	434.10		
G 75.0	95.20	302.00	743.70	1236.80	501.60	98.10	135.00	68.40	116.10	147.60	137.90		
G 80.0	30.20	41.90	221.00	354.10	57.80	13.30	42.50	31.80	22.10	25.40	20.90		
G 85.0	0.80	0.50	1.40	2.90	1.20	0.70	1.30	1.20	1.70	1.20	1.10		
G 90.0	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10		
G 95.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
G100.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
G105.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
G120.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
G135.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
G150.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
G165.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
G180.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

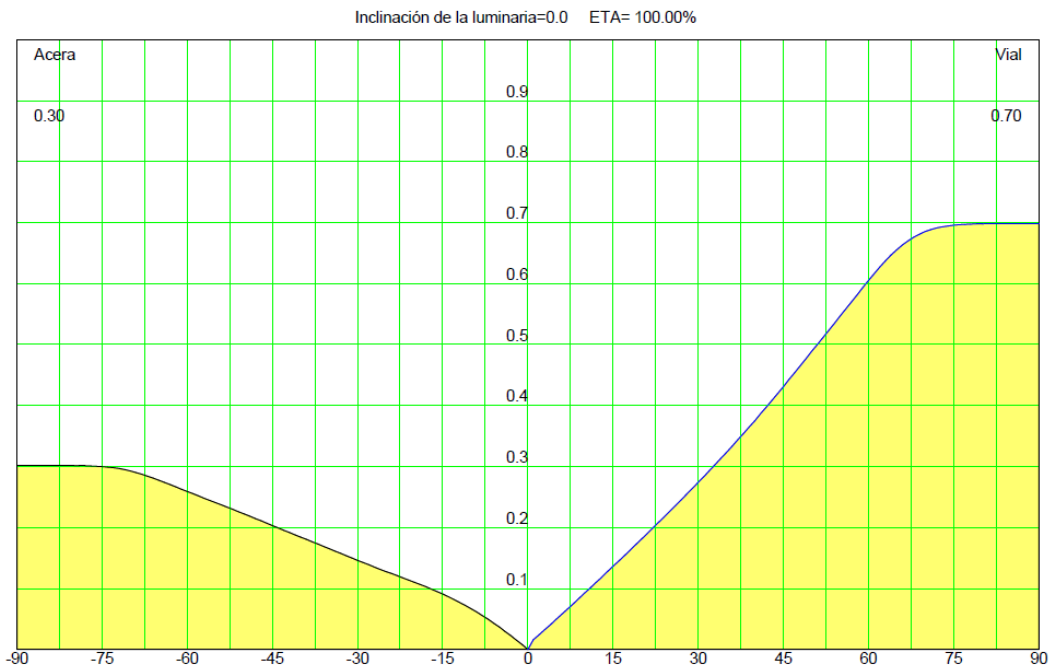
Tabla de distribución de intensidad luminosa (cd)

### 3.2. CURVA POLAR



### 3.3. CLASIFICACIÓN ZONAL DEL FLUJO

<b>Luminaria</b> Código 18/31703702 Nombre NOVATILUX 16 (30W 4000K) Familia NOVATILUX		<b>Ensayo</b> Código 18/31703702 Nombre NOVATILUX 16 (30W 4000K) Fecha 04-05-2018		<b>Lámpara</b> Código Número 1 Posición	
Eficiencia	100.00%	Sist. de Coordenadas	C-G Viales	Flujo Total	3540.60 lm
Valor Máximo	1563.40 cd	Posición	C=45.00 G=70.00	Asimétrico	



Throw: 65.9° Intermedio

RN: 0.00072 %

SLI (deslumbramiento) 8.0 Concentrado

ULOR: 0.00001

Clasificación CIE: Semi Cutoff - Max: C=45.0° Gam ma=70.0°

DLOR: 0.99996

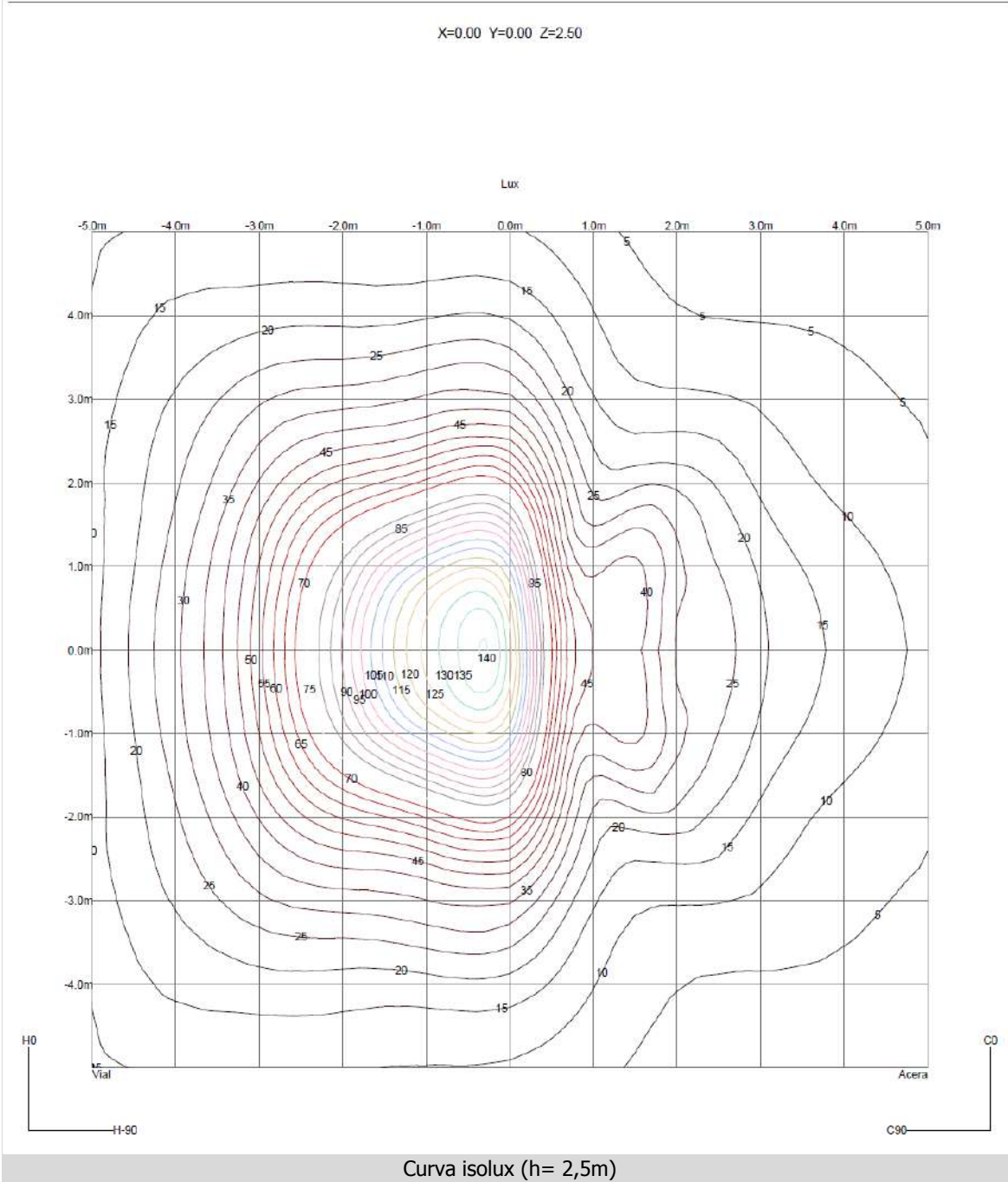
Clasificación IES: Semi Cutoff

Eficiencia: 100.00%

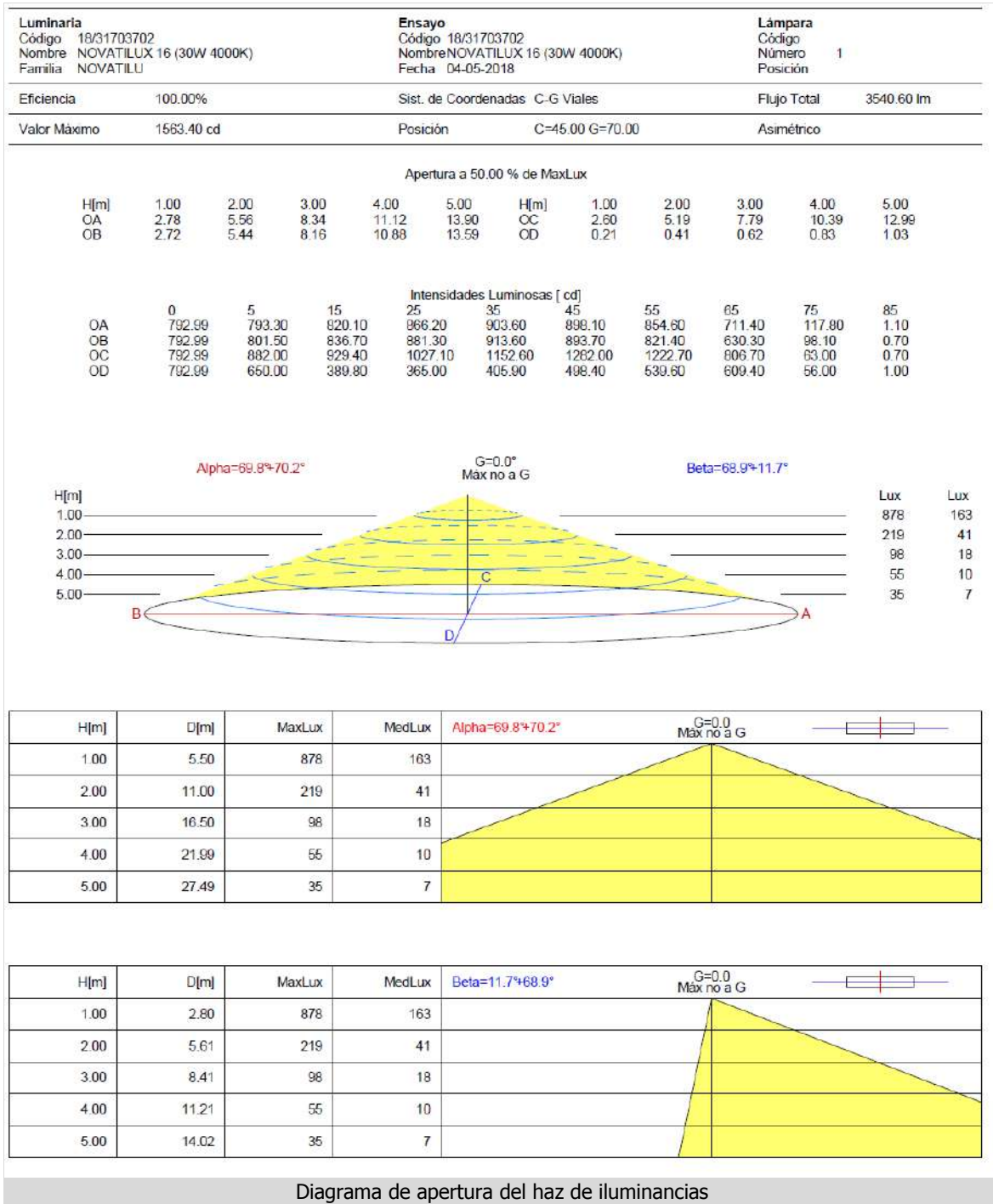
Clasificación zonal del flujo

### 3.4. CURVA ISOLUX

<b>Luminaria</b>		<b>Ensayo</b>		<b>Lámpara</b>	
Código	18/31703702	Código	18/31703702	Código	
Nombre	NOVATILUX 16 (30W 4000K)	Nombre	NOVATILUX 16 (30W 4000K)	Número	1
Familia	NOVATILU	Fecha	04-06-2018	Posición	
Eficiencia	100.00%	Sist. de Coordenadas	C-G Viales	Flujo Total	3540.60 lm
Valor Máximo	1563.40 cd	Posición	C=45.00 G=70.00	Asimétrico	



**3.5. DIAGRAMA DE APERTURA DEL HAZ DE ILUMINANCIAS**

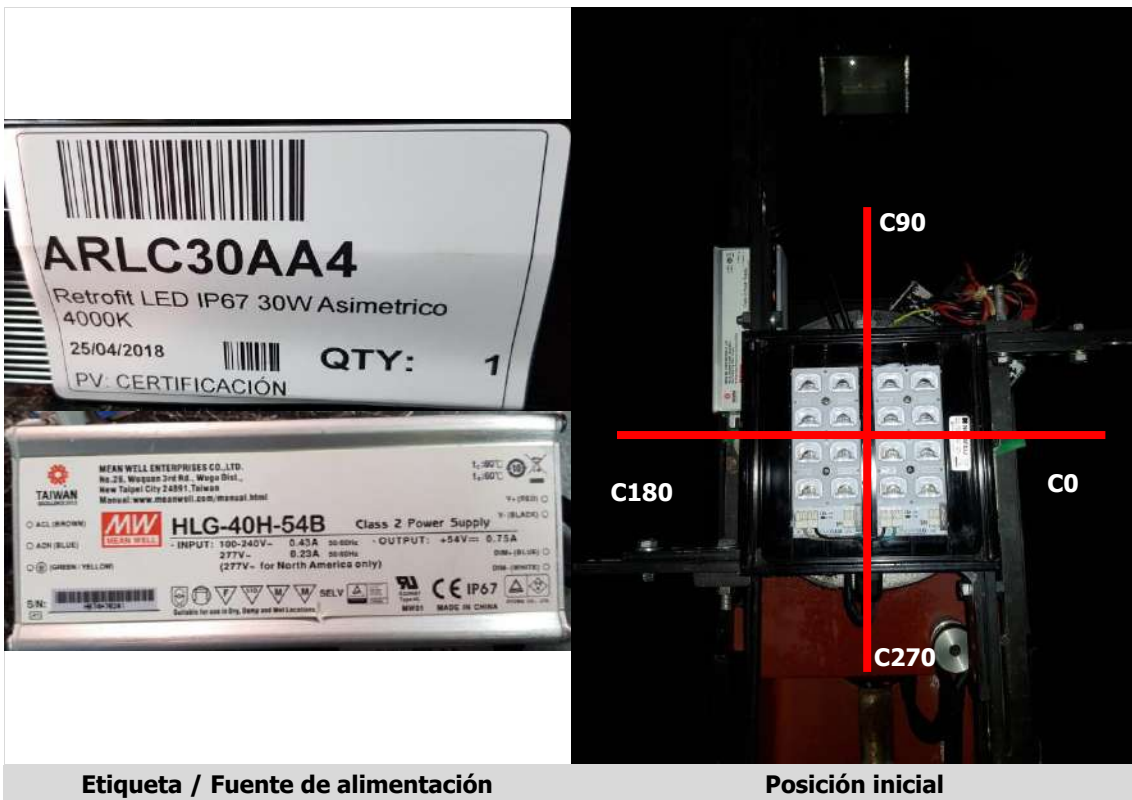
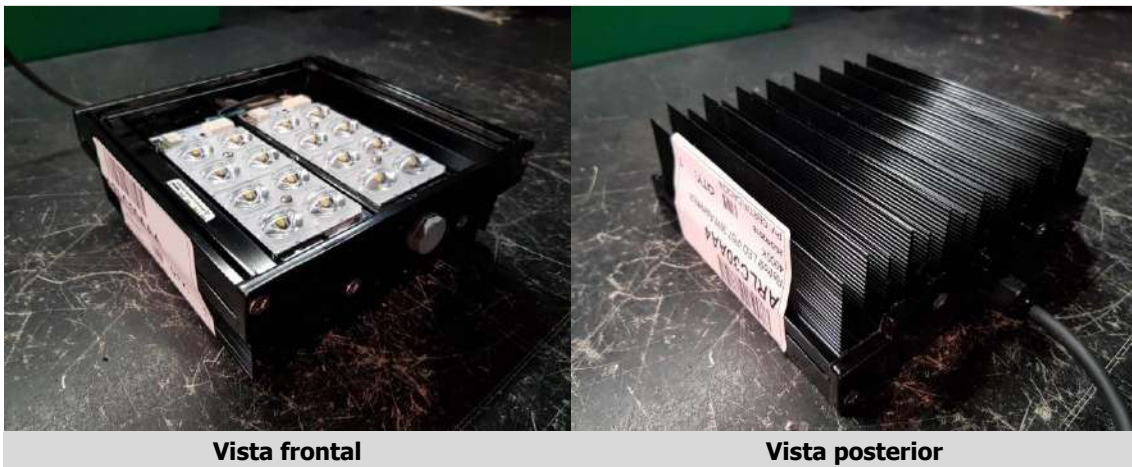


### 3.6. TABLA UGR

Luminaria		Ensayo		Lámpara						
Código	18/31703702	Código	18/31703702	Código						
Nombre	NOVATILUX 16 (30W 4000K)	Nombre	NOVATILUX 16 (30W 4000K)	Número	1					
Familia	NOVATILU	Fecha	04-05-2018	Posición						
Eficiencia	100.00%	Sist. de Coordenadas	C-G Viales	Flujo Total	3540.60 lm					
Valor Máximo	1563.40 cd	Posición	C=45.00 G=70.00	Asimétrico						
<b>UGR</b>										
Reflectancias										
Techo/Cavidad	0.7	0.7	0.5	0.5	0.3					
Paredes	0.5	0.3	0.5	0.3	0.3					
PDT	0.2	0.2	0.2	0.2	0.2					
Dimensiones del Local										
	Vista Lateral					Vista Longitudinal				
x=2H y=2H	29.4	31.0	29.8	31.2	35.3	33.3	34.8	33.6	35.0	35.3
x=2H y=3H	31.5	32.9	31.9	33.2	36.2	34.3	35.7	34.6	36.0	36.2
x=2H y=4H	31.9	33.2	32.3	33.5	36.2	34.3	35.6	34.6	35.9	36.2
x=2H y=6H	31.9	33.1	32.2	33.4	36.0	34.2	35.4	34.6	35.7	36.0
x=2H y=8H	31.8	33.0	32.2	33.3	36.0	34.2	35.3	34.5	35.6	36.0
x=2H y=12H	31.8	32.9	32.2	33.2	35.9	34.1	35.2	34.5	35.6	35.9
x=4H y=2H	31.7	33.0	32.0	33.3	36.8	34.9	36.2	35.2	36.5	36.8
x=4H y=3H	34.0	35.1	34.3	35.4	37.9	36.1	37.3	36.5	37.6	37.9
x=4H y=4H	34.8	35.8	35.3	36.2	37.9	36.2	37.1	36.6	37.5	37.9
x=4H y=6H	34.9	35.8	35.4	36.2	37.7	36.1	37.0	36.5	37.4	37.7
x=4H y=8H	34.9	35.7	35.3	36.1	37.7	36.1	36.9	36.5	37.2	37.7
x=4H y=12H	34.9	35.6	35.3	36.0	37.6	36.0	36.7	36.5	37.2	37.6
x=8H y=4H	35.5	36.3	36.0	36.7	38.6	37.0	37.8	37.4	38.2	38.6
x=8H y=6H	35.8	36.4	36.2	36.8	38.5	37.0	37.6	37.4	38.0	38.5
x=8H y=8H	35.8	36.3	36.2	36.7	38.4	36.9	37.5	37.4	37.9	38.4
x=8H y=12H	35.7	36.2	36.2	36.7	38.3	36.9	37.4	37.4	37.8	38.3
x=12H y=4H	35.5	36.2	35.9	36.6	38.6	37.0	37.7	37.5	38.2	38.6
x=12H y=6H	35.8	36.3	36.2	36.8	38.5	37.0	37.6	37.5	38.0	38.5
x=12H y=8H	35.7	36.2	36.2	36.7	38.4	37.0	37.4	37.5	37.9	38.4

Tabla UGR

#### 4. ANEXOS



# NEOVILLA ALU

Documentación técnica IDAE



**BENITO  
NOVATILU**

EXPERTOS EN  
ILUMINACIÓN EFICIENTE

+34 93 852 1000 / info@[benito.com](http://benito.com)



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*UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.*

*UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas.*

*Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.*

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*UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.*

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*Ficha técnica PCB*

*Ficha técnica LED*

*UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos.*

*UNE-EN 62384. Dispositivos de control electrónicos. Requisitos de funcionamiento.*

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*Ensayo colorimétrico de la luminaria según la norma UNE EN 13032-4.*

*Ensayo de medidas eléctricas y de seguridad*

ILNA

Luminaria

# NEOVILLA-ALU



La Luminaria Clásica por excelencia, la Neovilla- ALU de tipología Ornamental incorpora todos los detalles técnicos necesarios para la tecnología LED. Con una extraordinaria personalidad ideal para espacios históricos y entornos urbanos así como calles residenciales y urbanas estrechas y plazas sobre soportes entre 3 y 7m de altura. Una luminaria de perfil clásico pero preparada para cualquier sistema de telegestión.

## VENTAJAS:

- Alta eficiencia. Hasta 134 lm/W reales
- De 20W hasta 80W
- 18 Distribuciones lumínicas distintas
- Estándar Zhaga (Book 15)
- Vidrio templado con junta de estanqueidad de silicona para conseguir una IP66.
- Apertura Sin Herramientas

## APLICACIONES:

- Calles Residenciales
- Centros Históricos
- Áreas Verdes
- Paseos Peatonales y Ramblas

[Ficha de proyecto](#) | [CAD](#) | [Catálogo](#) | [BIM](#) | [Imagen HD](#)

**BENITO  
NOVATILU**

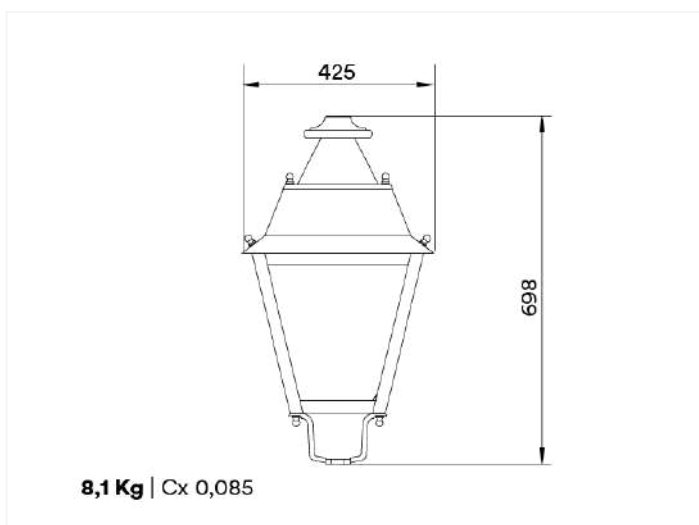
info@benito.com

tel. +34 93 852 1000 / +34 961 401 000

## CARACTERÍSTICAS:

Material cuerpo:	Cuerpo en inyección de aluminio de alta resistencia. del tipo EN AC-43000, EN AC-43100, EN AC-43400, EN AC-44100, EN AC-47100 según la norma UNE EN 1706.
Difusor (cerramiento cavidad óptica):	Vidrio Templado de 4 mm Filtra los UV. Posibilidad de difusores laterales bajo demanda.
Tornillería:	Acero Inoxidable 18/8 - AISI 304
Cuerpo:	Se compone de tres piezas: El cuerpo superior, donde se aloja el módulo de LEDs BENITO - NOVATILU, el Driver y la electrónica de control. El bloque central trapezoidal. La araña de sujeción.
Juntas de estanqueidad:	Silicona (extrusión)
Índice de protección IP de la luminaria:	IP66
Índice de protección IP del Grupo Óptico:	IP66
Índice de protección IK:	IK10
Disipación térmica de los LEDs:	Disipador de alta eficiencia con gran superficie de disipación, gracias al radiador de aletas onduladas de aluminio anodizado. Disipación pasiva por convección y asegurando el contacto térmico de los módulos de LEDs a través de material de transferencia térmica de alta conductividad.
Válvula anti condensación:	Válvula de compensación de presiones que asegura la evacuación de la humedad, evitando la condensación, manteniendo el grado de estanqueidad IP del módulo.
Pintura:	Recubrimiento de pintura en polvo de poliéster, pulverizado electrostáticamente y sublimado al horno. Resistente a la corrosión.
Color:	Negro micro textura do. Otros Colores y acabados opcionalmente bajo demanda.
Fijación:	Fijación Top mediante rácor de 3/4" GAS. Opcionalmente Ø60mm o Suspendida 3xM10 120°, accesorio no suministrado.
Orientable:	Luminaria no orientable
Mantenimiento:	Apertura Manual sin necesidad de Herramientas, mediante bellota roscada; Módulos reemplazables: LEDs, Drivers, SPD.
Altura de montaje recomendada:	3 - 7 m
Driver:	Driver regulable y programable de corriente constante. Incorporado dentro de la luminaria, precableado sobre placa de acero galvanizada.
Regulación driver:	Driver Regulable 0-10V, programable en 5 niveles y con opción DALI 2. Con los característiques de Wireless, AOC, MTP, DTL.
Opciones de reducción de flujo:	<ul style="list-style-type: none"> <li>- Multinivel Temporizado o Media Noche Virtual</li> <li>- Ready4IoT</li> <li>- Reducción de flujo en Cabecera</li> <li>- Doble Nivel con Línea de Mando</li> </ul>
Protector de sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.

## PLANO:





## CUADRO TÉCNICO:

REF.	Nº LEDs	Potencia W	I Driver mA	Flujo Lumínico Real (T) =85°C)		Flujo Lumínico Inicial (T) =25°C)	
				Flujo lm	Eficiencia lm/W	Flujo lm	Eficiencia lm/W
Neovilla Alu ILNA	16	20	375	2600	130	2964	148
	16	30	563	3900	130	4446	148
	16	40	750	5160	129	5882	147
	16	60	1125	7680	128	8755	146
	32	80	750	10400	130	11856	148
	32	100	938	12900	129	14706	147

LEDs: 5050

Eficiencia Nominal del LED: 172 lm/W.

Corriente máxima LED: 1000 mA.

Corriente LED = Corriente Driver/2.

Vida Media L90B10: >100,000 horas.

Flujos Lumínicos y Eficiencias a 4000°K y CRI>70.

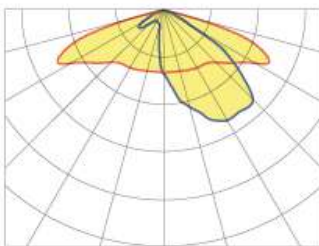
Tolerancia del flujo lumínico < +/-3%.

Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.

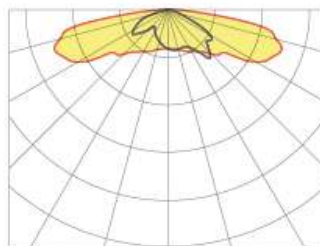


## FOTOMETRÍAS:

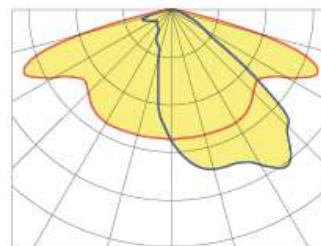
Asimétrico Super-Extensivo (AE)



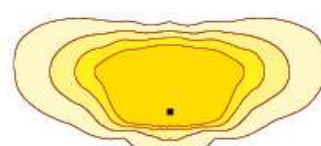
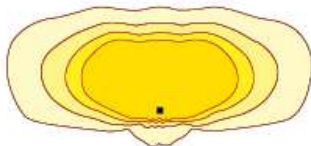
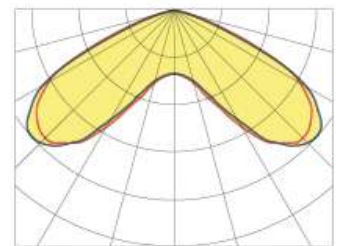
Asimétrico Extensivo (A3)



Asimétrico Extensivo (AM)



Asimétrico Super-Extensivo (S3)



\*Consultar otras distribuciones lumínicas

## MÓDULO LED'S:

Módulo de LEDs:	BENITO-NOVATILU Formato Zhaga de 16, 32 LEDs. Consultar Temperaturas de Color, CRI y Distribuciones Lumínicas	
Módulo sustituible:	Si	
LED:	5050	
Nº de LED's:	16 /32	
Formato PCBs:	2x Zhaga (Book 15) 2x4 o 2x Zhaga (Book 15) 2x8	
Eficiencia nominal del LED:	172 lm/W	
Temperatura de Color:	PC Ámbar, 2K2, 2K7, 3K, 4K, 5K	
Rendimiento Cromático CRI:	>70 (opcional >80)	
Vida Media de los LED - L90B10:	L90B10 >100.000 horas	

## ESPECIFICACIONES ÓPTICAS:

Sistema Óptico:	Lentes de PMMA 2x2	
Distribución Lumínica:	18 Distribuciones Lumínicas disponibles	
Flujo Hemisferio Superior (FHS) ULOR:	0%	
Flujo Hemisferio Inferior DLOR:	100%	
Índice de Deslumbramiento:	Entre D5 y D6 (depende de la distribución lumínica)	
Categoría Intensidad Luminosa:	Entre G*4 y G*6 (depende de la distribución lumínica)	
Flujo Luminoso CIE n°3:	>95%	
Seguridad Fotobiológica:	RG0 (exento de riesgo)	
Flujo lumínico Inicial Tj=25°C (hasta):	lm	14706
Eficiencia Luminaria Inicial Tj=25°C (hasta):	lm/W	148
Flujo lumínico Real Tj=85°C (UNE EN 13032-4) (hasta):	lm	12900
Eficiencia Luminaria Real Tj=85°C (UNE EN 13032-4) (hasta):	lm/W	130 (Rendimiento = 76.5 % lm/W (Real 85°C) ÷ lm/W (Nominal Led))

## ESPECIFICACIONES ELÉCTRICAS:

Potencia máxima nominal (LED's):	W	73
Potencia máxima consumida (Luminaria):	W	80
Rango de Potencias:	W	20 - 80W
Corriente máxima del LED:	mA	<500 (<50% Imax)
Clase de Protección Eléctrica IEC:	Clase I y II	
Protector de Sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.	
Nivel de protección de tensión modo común y diferencial (SPD) Udc:	kV	10 y NTC opcional
Corriente máxima de descarga (8/20) (SPD):	kA	20
Desconexión Térmica de la Fase (SPD):	Si	
Tensión de Entrada:	Vac	220-240
Tensión de Entrada (rango máximo):	Vac	198-264
Frecuencia de Entrada:	Hz	47-63
Corriente de arranque:	A	<65
Duración del pico de arranque:	ms	<0,3
Eficiencia del Driver:	>90%	
Factor de potencia 100% consumo:	>0,98	
Factor de potencia 50% consumo:	>0,95	
Distorsión Harmónica Total (THD):	<10	
Consumo de Energía en reposo:	W	<0,4
Clasificación Energética:	A++ IPEA>1,15	

## CONDICIONES DE TRABAJO:

Vida Media de los LED - L90B10:	horas	>100.000
Vida Media del Driver a Tp<70°C:	horas	100.000
Vida Media de la Luminaria L80B10 (TM-21):	horas	
Temperatura ambiente de trabajo:	°C	de -35°C a +50°C
Superficie al viento:	m2	0,085
Test anti vibraciones (15Hz en 3 ejes):		
Test fuerza del viento:	m/s	
Período de Garantía:	Años	5 años (opcional hasta 10)

## DIMENSIONES EMBALAJE:

Peso neto	kg	8,1
Peso Bruto	kg	
Dimensiones Luminaria (LxAxH)	mm	425x425x698
Dimensiones Embalaje (LxAxH)	mm	
Unidades por Embalaje		1
Cantidad por contenedor de 20"		
Cantidad por contenedor de 40"		

## CERTIFICACIONES:

Certificaciones Seguridad:	Certificaciones EMC:	Otras Certificaciones:
EN 40 / EN 62031 / EN 62493 / EN 62471 / IEC 62778 / EN 55015 / EN 61547 / EN 61000-3-2 / EN 61000-3-3 / IEC 62262 / EN 13032-4 / EN 62717 / EN 6272-1 / EN 61247-2-14	EN 61347-2-13 / EN 61347-1 / EN 62384	6272-2-1 / EN 61643-12

## 1.2 Tabla (Anexo 1): Datos Generales de la Empresa

DATOS GENERALES DE LA EMPRESA FABRICANTE DE LA LUMINARIA LED		
1	Nombre de la empresa	BENITO URBAN, S.L.U.
2	Actividad social de la empresa	Fabricación, Comercialización y Distribución de Alumbrado Público
3	Código Identificación Fiscal	B59987529
4	Dirección postal	Calle Lleida, 10, 08500 Vic. Barcelona.
5	Dirección correo electrónico	mhoms@benito.com
6	Página/s web	www.benito.com
7	Nº Teléfono y Fax	T. 938 521 000 y F. 938 521 001
8	Persona de contacto	Mateu Homs
9	Certificado UNE-EN ISO 9001	OCA GLOBAL ENAC 34/5200/19/8038
10	Certificado UNE-EN ISO 14001	OCA GLOBAL ENAC 34/5400/19/8039
11	Catálogo Digital Publicado de Producto	<a href="https://www.benito.com/es/descargas-alumbrado-publico/catalogo-light.html">https://www.benito.com/es/descargas-alumbrado-publico/catalogo-light.html</a>
12	Certificado de la empresa de adhesión a un sistema integrado de gestión de residuos (SIG)	SI

Para más información consultar pack IDAE Empresa



**Barcelona T +34 938 521 000 Madrid T+34 916 436 964 info@benito.com www.benito.com**

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 AMERICA: USA +1 617 778 29 47 Argentina +54 1 159 844 113 Chile +56 2 938 20 35 Mexico +52 5 546 319 722 Brazil +55 1 139 570 340 Peru +51 1707 1369  
 ASIA China +86 1 063 705 530

1.2 Tabla (Anexo 2) CEI – IDAE Requerimientos Técnicos Luminaria

DATOS Y DOCUMENTACIÓN TÉCNICA TIPO FAROL																							
1	Marca y Modelo	BENITO - NEOVILLA ALU																					
2	Ficha Técnica	Si – ILNA																					
3	Marcado CE	Si																					
4	Material de Fabricación conforme el apartado 5.	Si																					
5	Sustitución independiente de los sistemas integrantes compartimento óptico (módulo y lente) y equipos auxiliares	Si																					
6	Grado de estanqueidad en la luminaria IP 66	IP 66																					
7	Grado de protección ante impactos en la luminaria mínimo IK 08	IK 10																					
8	Rango de temperatura de funcionamiento -10°C a 35°C	Si, -35°C A +50°C																					
9	Número de distribuciones fotométricas, al menos 3	18																					
10	Curvas Fotométricas y de utilización de la luminaria, al menos 5	Si																					
11	FHSINST , máximo permitido 3%	<1%																					
12	Temperatura de color en K de la luz emitida por la luminaria, máxima permitida (4000K)	PC-Ámbar, 2200K, 2700K, 3000K, 4000K, 5000K (estadios deportivos)																					
Eficacia de salida de la luminaria (lm/W)																							
13	<table border="1"> <thead> <tr> <th>TIPO DE LED</th> <th>lm/W min</th> </tr> </thead> <tbody> <tr> <td>LED NEUTRO 4000°K</td> <td>80</td> </tr> <tr> <td>LED CÁLIDO 3000°K</td> <td>70</td> </tr> <tr> <td>LED CÁLIDO 2700°K</td> <td>65</td> </tr> <tr> <td>LED CÁLIDO 2200°K</td> <td>60</td> </tr> <tr> <td>LED ÁMBAR (Phosphor-Converted)*</td> <td>55</td> </tr> <tr> <td>LED ÁMBAR PURO (monocromático)*</td> <td>35</td> </tr> </tbody> </table>	TIPO DE LED	lm/W min	LED NEUTRO 4000°K	80	LED CÁLIDO 3000°K	70	LED CÁLIDO 2700°K	65	LED CÁLIDO 2200°K	60	LED ÁMBAR (Phosphor-Converted)*	55	LED ÁMBAR PURO (monocromático)*	35	<table border="1"> <thead> <tr> <th>lm/W</th> </tr> </thead> <tbody> <tr> <td>&gt;100</td> </tr> <tr> <td>&gt;95</td> </tr> <tr> <td>&gt;92</td> </tr> <tr> <td>&gt;84</td> </tr> <tr> <td>&gt;55</td> </tr> <tr> <td>-</td> </tr> </tbody> </table>	lm/W	>100	>95	>92	>84	>55	-
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lm/W																							
>100																							
>95																							
>92																							
>84																							
>55																							
-																							
14	Clase Eléctrica	I y II																					
15	Medidas Eléctricas: Tensión, corriente, potencia total consumida y Factor de potencia (>0.9)	Tensión 230V / Potencia 20W / FP >0,98																					
16	Vida útil estimada de la luminaria (Se considerará como máximo 100.000h)	L90B10 >100.000 horas																					
17	Ficha Técnica del LED utilizado en la luminaria y marcado CE	Si																					
18	Número de LEDs y Corriente de Alimentación	16-32 led / 375mA																					
19	Ficha Técnica Driver y marcado CE	Si																					
20	Ficha Técnica de otros dispositivos (SPD, OLC,...etc) y marcado CE, que se estimen oportunos	Si																					



## 2 Informes de Pruebas y Certificados de la Luminaria por OEC

### 2.1 Tabla de Verificación (Anexo 3) CEI – IDAE

Informes de Pruebas y Certificados emitidos por OEC acreditada sobre La luminaria y sus elementos integrantes	
1	Documento del alcance de la acreditación del certificador/es de estos informes o certificados.
2	UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.
3	UNE EN 60598-2-3 o 60598-2-5 Luminarias. Requisitos particulares. Luminarias de Alumbrado público o proyectores.
4	UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan Lámparas, o según IEC/TR 62778 que es su norma de aplicación.
5	Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.
6	El Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria)
7	UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2: Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16A por fase)
8	UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.
9	UNE-EN 61547. Equipos para alumbrado de uso general. Requisitos de inmunidad CEM.
10	UNE-EN 62031. Módulos LED para alumbrado general. Requisitos de seguridad. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.
11	UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.
12	UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED. Requisitos de funcionamiento.
13	Informe de ensayo en relación al material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda. A – Luminaria modelo funcional



## 2.2 Requisitos de Seguridad

- UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.
- UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.
- UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas.
- Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.
- Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262.

CERTIFICADO DE ENSAYO PARA EQUIPOS  
ELÉCTRICOS

TEST CERTIFICATES FOR ELECTRICAL  
EQUIPMENT

**CERTIFICADO DE ENSAYO**

**TEST CERTIFICATE**

Producto  
Product

Luminaria para alumbrado público  
Luminaire for road and street lighting

Nombre y dirección del solicitante  
Name and address of the applicant

BENITO URBAN, S.L.U.  
C/ Llevant, 17  
08503 Sant Bartomeu del Grau - Barcelona  
(España/Spain)

Nombre y dirección del fabricante  
Name and address of the manufacturer

Igual que el solicitante  
Same as applicant

Nombre y dirección de la fábrica  
Name and address of the factory

Igual que el solicitante  
Same as applicant

Nota: Cuando haya más de una fábrica, por favor indicarlo en la página 2  
Note: When more than one factory, please report on page 2

Valores y características principales  
Ratings and principal characteristics

Ver página 2  
See page 2

Marca (si existe)  
Trademark (if any)

BENITO

Modelo / Ref. de tipo  
Model / Type Ref.

Ver página 2  
See page 2

Información adicional (si es necesaria puede ser  
indicada en la página 2)  
Additional information (if necessary may also be  
reported on page 2)

Una muestra del producto se ha ensayado y se  
considera conforme con  
A sample of the product was tested and found to be in  
conformity with

EN 60598-1:2015 + AC:2015 + AC:2016  
EN 60598-2-3:2003 + AC:2005 + A1:2011  
EN 62471:2008  
*Harmonized standards under Directive 2014/35/EU – LVD*

EN 55015:2013  
EN 61000-3-2:2014  
EN 61000-3-3:2013  
EN 61547:2009  
*Harmonized standards under Directive 2014/30/EU – EMC*

EN 62493:2010  
EN 62262:2002  
EN 50102:1995 + A1:1998

Como se muestra en el Informe de Ensayo No. el cual  
forma parte de este certificado  
As shown in the Test Report Ref. No. which forms part  
of this Certificate

SAFEENIT170102.00; SAFEENIT160301.00;  
EMCOENIT150102.00; EMCOENIT160302.00.



TECNOCREA ADVANCED TESTS & INTERNATIONAL  
CERTIFICATION AGREEMENTS  
C/ Colón, 41. 46210 Picanya  
Valencia – España (Spain)

Firma/Signature: David Latorre

(Documento firmado mediante firma electrónica)  
(Document signed by means of electronic signature)

Fecha/Date: 01/07/2019

Página/Page 1 de/of 3

Este certificado modifica y anula el certificado Ref. No. BENIT170102.00

This Certificate modifies and annuls the certificate Ref. No. BENIT170102.00

Detalles modelos:

Model details

Valores y características principales:

Ratings and principal characteristics:

220-240V~ 50/60Hz. Clase I. LED. Convertidor. IP23 (luminaria) / IP67 (grupo óptico).  
IK10. ta +35°C.

220-240V~ 50/60Hz. Class I. LED. Converter. IP23 (luminaire) / IP67 (optical group). IK10. ta +35°C.

Modelo/Ref. de tipo: NEOVILLA / ver características

Model/Type ref: NEOVILLA / see characteristics

ILNV uuuvwxyz

Pueden ser valores entre / May be values between: **0-2**

Regulación / Dimming: **0** Sin regulación / No dimming

Clase / Class: **1** Clase I / Class I

**2** T2

**4** T4

Lentes / Lens: **5** T5

**3** 3000K

Temperatura de color / Colour temperature: **4** 4000K

**012** 12 [27W]

Número de LED / Number of LED: **016** 16 [35W]

Continúa en la página siguiente  
Continues on next page

Información adicional (si es necesaria)  
Additional information (if necessary)



Firma/Signature: David Latorre

(Documento firmado mediante firma electrónica)  
(Document signed by means of electronic signature)

Fecha/Date: 01/07/2019

Página/Page 2 de/of 3

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Detalles modelos:

Model details

Valores y características principales:

Ratings and principal characteristics

220-240V~ 50/60Hz. Clase I. LED. Convertidor. IP23 (luminaria) / IP67 (grupo óptico).  
IK09. ta +35°C.

220-240V~ 50/60Hz. Class I. LED. Converter. IP23 (luminaria) / IP67 (optical group). IK09. ta +35°C.

Modelo/Ref. de tipo: NEOVILLA/ ver características

Model/Type ref: NEOVILLA / see characteristics

ILNV uuuvwxyz

Pueden ser valores entre / May be values between: **0-2**

Regulación / Dimming: **0** Sin regulación / No dimming

Clase / Class: **1** Clase I / Class I

**2** T2

**4** T4

Lentes / Lens: **5** T5

**3** 3000K

Temperatura de color / Colour temperature: **4** 4000K

**024** 24 [53W]

Número de LED / Number of LED: **032** 32 [71W]

Información adicional (si es necesaria)

Additional information (if necessary)



Firma/Signature: David Latorre

(Documento firmado mediante firma electrónica)

(Document signed by means of electronic signature)

Fecha/Date: 23/03/2018

Página/Page 3 de/of 3

Este certificado modifica y anula el certificado Ref. No. BENIT170102.00

This Certificate modifies and annuls the certificate Ref. No. BENIT170102.00

**INFORME DE ENSAYO**  
**IEC 60598-2-3 y/o EN 60598-2-3**  
**Luminarias**  
**Parte 2: Requisitos particulares:**  
**Sección Tres – Luminarias para alumbrado público**

**Número de informe** .....: SAFEENIT140402.00

**Ensayado por (nombre + firma)** .....: Carlos Royo  
Técnico Especialista de Laboratorio

**Aprobado por (nombre + firma)**.....: Jorge Hernández  
Director Técnico de Laboratorio  
(Documento firmado mediante firma electrónica)

**Fecha emisión** .....: 31-03-2015

**Número total páginas** .....: 29



**Solicitante** .....: BENITO URBAN, SLU

**Dirección**.....: C/ Llevant, 17  
08503, Sant Bartomeu del Grau (Barcelona – España)

**Laboratorio de ensayos**.....: TECNOCREA, S.L.

**Dirección**.....: C/ Colón, 41  
46210 Picaña (Valencia – España)

**Especificaciones ensayo:**

**Norma**.....:  IEC 60598-2-3:2002 + A1:2011 usada en conjunto con la IEC 60598-1:2008  
 EN 60598-2-3:2003 + A1:2011 + AC:2005 usada en conjunto con la EN 60598-1:2008 + A11:2009

\* Los ensayos marcados no están amparados por la acreditación ENAC.

**Procedimiento ensayo**.....: CE SAFE

**Método ensayo no normalizado** .....: N/A

**Formato Informe de Ensayo Nº**.....: 01IECEN60598\_2\_3&2\_6\_04

**Creador Formato Informe de ensayo** ....: Tecnocert

**Patrón Formato Informe de Ensayo** .....: Fechado 05-2014

Los resultados reflejados son propiedad del solicitante y sin su autorización previa no se comunicarán a un tercero.

El laboratorio de ensayos no asume ninguna responsabilidad por daños resultantes del uso o la interpretación incorrecta de la información contenida en este documento.

**Descripción muestra ensayo** .....: Luminaria de alumbrado público

**Marca**.....: BENITO URBAN

**Fabricante**.....: BENITO URBAN, S.L.U.

**Modelo/Referencia tipo** .....: ILNA03242120 / NEOVILLA

**Características**.....: 230V~50Hz. Clase I. IP66. LED. 71W. Convertidor electrónico. IK07.

**Resumen de ensayos:** La luminaria BENITO URBAN referencia ILNA03242120 **cumple** las secciones ensayadas en este informe.

**Ensayos realizados (nombre y cláusula de ensayo):**

- EN 60598-1:2008 + A11:2009, EN 60598-2-3:2003 + A1:2011 + AC:2005
  - 3.6 (4) construcción
  - 3.8 (7) disposiciones para la puesta tierra
  - 3.11 (8) protección contra los choques eléctricos
  - 3.13 (9) resistencia al polvo, cuerpos sólidos y humedad
  - 3.14 (10) resistencia de aislamiento y rigidez dieléctrica
  - 3.12 (12) ensayos de durabilidad y calentamiento
- EN 60598-2-6:1994 + A1:1997, adjunto N° 1
  - 6.6 (4) construcción
  - 6.8 (7) disposiciones para la puesta a tierra
  - 6.11 (8) protección contra los choques eléctricos
  - 6.12 (12) ensayos de durabilidad y calentamiento
  - 6.13 (9) resistencia al polvo, cuerpos sólidos y humedad
  - 6.14 (10) resistencia de aislamiento y rigidez dieléctrica
- EN 50102:1995 + A1:1998 + A1:1998/CORR:2002 + CORR:2002, adjunto N° 2

**Ubicación de Laboratorios:**

TECNOCREA, S.L.  
C/ Colón, 41  
46210 Picaña (Valencia – España)

**Resumen del cumplimiento con las diferencias nacionales:**

**Copia del marcado de la etiqueta**



<b>Datos de la muestra de ensayo:</b>	
Clasificación de la instalación y uso.....	: Apta para superficies inflamable, uso exterior
Conexión a red .....	: Clema de conexión
.....	: Tipo Y
.....	: N/A
<b>Posibles casos de veredicto del ensayo:</b>	
- el ensayo no aplica a la muestra.....	: N/A
- la muestra de ensayo cumple los requisitos .....	: P (Pasa)
- la muestra de ensayo no cumple los requisitos .....	: F (Falla)
<b>Ensayos:</b>	
Fecha de recepción de la muestra de ensayo .....	: 08-01-2015
Fecha (s) de inicio/fin de los ensayos .....	: 09-02-2015 / 30-03-2015
<b>Condiciones ambientales:</b>	
Temperatura (mín. / máx.).....	: 21°C / 25°C
Humedad relativa (mín. / máx.).....	: 42% / 49%

<b>Comentarios generales:</b>
ENAC es firmante del Acuerdo Multilateral de la EA (European co-operation for Accreditation) en materia de ensayos.
Los resultados de los ensayos presentados en este informe se refieren solo a la muestra ensayada.
El presente documento no puede ser reproducido, excepto completamente, sin la aprobación por escrito del laboratorio de ensayos emisor.
Las incertidumbres de las medidas están calculadas y a disposición del cliente.
"(Ver celda #)" se refiere a información adicional anexa al informe.
"(Ver tabla adjunta)" se refiere a una tabla anexa en el informe.
<b>Nota: las diferencias de las normas EN junto con las diferencias nacionales y las condiciones nacionales especiales, si existen, están en el Anexo del cuerpo principal de este informe de ensayo.</b>
En todo el informe una coma se usa como separador decimal.
Los números de cláusula entre paréntesis se refieren a las cláusulas en la IEC 60598-1.
Adjunto N° 1: EN 60598-2-6:1994 + A1:1997, páginas totales 2.
Adjunto N° 2: EN 50102:1995 + A1:1998 + A1:1998/CORR:2002 + CORR:2002, páginas totales 2.
<b>Información general del producto:</b>
- Componente LED cumple EN 62471 clasificación de grupo de riesgo: <input type="checkbox"/> RG0 <input checked="" type="checkbox"/> RG1 <input type="checkbox"/> RG2 <input type="checkbox"/> RG3 (Esta información de la EN 62471 está basada en el certificado N° F150031).

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto

<b>3.2 (0)</b>	<b>REQUISITOS GENERALES DE ENSAYO</b>		—
3.2 (0.1)	Información considerada para el diseño de la luminaria	Norma Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
3.2 (0.3)	Mas secciones aplicables .....	Si <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

<b>3.4 (2)</b>	<b>CLASIFICACIÓN</b>		—
3.4 (2.2)	Tipo de protección .....	Clase I	—
3.4 (2.3)	Grado de protección .....	IP66	—
3.4 (2.4)	Luminaria prevista para el montaje directo en superficies normalmente inflamables .....	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaria no prevista para el montaje directo en superficies normalmente inflamables .....	Si <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
3.4 (2.5)	Luminaria para uso normal .....	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaria para condiciones severas de empleo ..	Si <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
3.4 (-)	Modos de instalación de las luminarias de alumbrado público		—
	- sobre un tubo	Si <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- sobre un brazo de columna o poste	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	- sobre la parte alta de un poste	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	- por cables fiadores o cables de suspensión	Si <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- sobre un muro o pared	Si <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

<b>3.6 (4)</b>	<b>CONSTRUCCIÓN</b>		<b>P</b>
3.6 (4.2)	Componentes reemplazables sin dificultad		P
3.6 (4.3)	Pasos de cable lisos y libres de aristas vivas		P
3.6 (4.4)	Portalámparas		N/A
3.6 (4.4.1)	Portalámparas integrados		N/A
3.6 (4.4.2)	Conexiones de cableado		N/A
3.6 (4.4.3)	Luminarias para montar en línea		N/A
3.6 (4.4.4)	Posicionamiento		N/A
	- Ensayo de presión (N) .....		N/A
	Después del ensayo los portalámparas cumplen con las partes relevantes de la norma y no presentan daños		N/A



IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
	Después del ensayo sobre portalámparas de un solo casquillo los portalámparas no tienen que haber cambiado de posición y no deben presentar deformaciones		N/A
	- Ensayo de flexión (N) .....		N/A
	Después del ensayo los portalámparas no debe haber cambiado de posición ni presentar deformaciones permanentes		N/A
3.6 (4.4.5)	Tensión de cresta		N/A
3.6 (4.4.6)	Contacto central		N/A
3.6 (4.4.7)	Partes aislantes de la luminarias severas de empleo resistentes a la formación de caminos conductores		N/A
3.6 (4.4.8)	Conectores de la lámpara		N/A
3.6 (4.4.9)	Casquillos y bases usados correctamente		N/A
3.6 (4.5)	Portacebadores		N/A
	Portacebadores en luminarias que no sean de clase II		N/A
	Portacebadores construidos para clase II		N/A
3.6 (4.6)	Bloques de conexión		N/A
	Salidas		N/A
	Bloques no fijados		N/A
3.6 (4.7)	Bornes y conexiones a la red de alimentación		P
3.6 (4.7.1)	Contacto con partes metálicas		P
3.6 (4.7.2)	Ensayo 8 mm del conductor activo		P
	Ensayo 8 mm del conductor de tierra		P
3.6 (4.7.3)	Bornes para cables de alimentación		P
3.6 (4.7.3.1)	Conexiones soldadas:		N/A
	- conductores flexibles o rígidos		N/A
	- soldaduras por punto		N/A
	- soldadura entre cables		N/A
	- conexiones tipo Z		N/A
	- ensayo mecánico conforme al 15.8.2		N/A
	- ensayo eléctrico conforme al 15.9		N/A
	- ensayo térmico conforme al 15.9.2.3 y 15.9.2.4		N/A
3.6 (4.7.4)	Otros bornes de conexión a red		P

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
3.6 (4.7.5)	Cableado/manguitos resistente a las temperaturas		N/A
3.6 (4.7.6)	Clavija multipolar		N/A
	- ensayo a 30 N		N/A
3.6 (4.8)	Interruptores:		N/A
	- dimensión eléctrica adecuada		N/A
	- fijación adecuada		N/A
	- fuente polarizada		N/A
	- conformidad con IEC 61058-1 para interruptores electrónicos		N/A
3.6 (4.9)	Revestimientos y manguitos aislantes		N/A
3.6 (4.9.1)	Revestimientos		N/A
	Método de fijación..... :		N/A
3.6 (4.9.2)	Revestimientos aislantes y manguitos		N/A
	Resisten a una temperatura > 20 °C a la medida en el cable		N/A
	a) y c) Resistencia de aislamiento y rigidez dieléctrica		N/A
	b) Ensayo estufa. Temperatura (°C)..... :		N/A
3.6 (4.10)	Aislamiento para luminarias de clase II		N/A
3.6 (4.10.1)	No contacto, superficie de montaje – partes metálicas accesibles – cableado con aislamiento principal		N/A
	Instalación segura en luminarias fijas		N/A
	Condensadores e interruptores		N/A
	Condensadores de supresión de interferencias conforme a IEC 60384-14		N/A
3.6 (4.10.2)	Ranuras de montaje:		N/A
	- no coincidencia		N/A
	- no acceso a ranuras con la sonda de ensayo		N/A
3.6 (4.10.3)	Aislamiento suplementario y reforzado:		N/A
	- fijadas		N/A
	- sustitución incorrecta; luminaria no operativa		N/A
	- manguitos fijados en su posición		N/A
	- revestimiento en portalámparas		N/A
3.6 (4.11)	Conexiones eléctricas		P

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
3.6 (4.11.1)	Presión de contacto		P
3.6 (4.11.2)	Tornillos:		P
	- tornillos autoterrajantes		N/A
	- tornillos autorroscantes		P
3.6 (4.11.3)	Tornillos de bloqueo:		P
	- arandelas elásticas		N/A
	- remaches		N/A
3.6 (4.11.4)	Material de las partes conductoras de corriente	Cobre	P
3.6 (4.11.5)	No contacto directo con la madera o la superficie de montaje		P
3.6 (4.11.6)	Sistemas de contacto electromecánico		N/A
3.6 (4.12)	Conexiones mecánicas y prensaestopas		P
3.6 (4.12.1)	Tornillos no fabricados de un material blando		P
	Tornillos de material aislante		N/A
	Ensayo de torsión: torsión (Nm); parte..... :	2,00; fijación disipador	P
	Ensayo de torsión: torsión (Nm); parte..... :	1,20; fijación convertidor	P
	Ensayo de torsión: torsión (Nm); parte..... :	0,50; Módulo LED	P
	Ensayo de torsión: torsión (Nm); parte..... :	2,00; fijación envolvente	P
3.6 (4.12.2)	Tornillos con un diámetro < 3 mm atornillados en metal		N/A
3.6 (4.12.4)	Uniones bloqueadas:		P
	- brazos fijos; torsión (Nm)..... :		N/A
	- portalámparas; torsión (Nm)..... :		N/A
	- interruptores tipo pulsador; torsión 0,8 Nm ..... :		N/A
3.6 (4.12.5)	Prensaestopas roscados; fuerza (Nm)..... :	3,25	P
3.6 (4.13)	Resistencia mecánica		P
3.6 (4.13.1)	Test de impacto:		P
	- partes frágiles; energía (Nm)..... :	Difusor externo; 0,5	P
	- otras partes; energía (Nm) ..... :	Envolvente; 0,7	P
	1) partes activas		P
	2) revestimientos		P
	3) protección		P
	4) cubiertas		P
3.6 (4.13.3)	Dedo de ensayo recto		P

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
3.6 (4.13.4)*	Luminarias para condiciones severas de empleo		N/A
	- IP54 o superior		N/A
	a) fijadas		N/A
	b) portátiles de mano		N/A
	c) suministradas con un soporte		N/A
	d) para instalaciones provisionales y adecuadas para montaje en soporte		N/A
3.6 (4.13.6)*	Tambor giratorio		N/A
3.6 (4.14)	Suspensiones y dispositivos de regulación		N/A
3.6 (4.14.1)	Carga mecánica:		N/A
	A) cuatro veces su peso		N/A
	B) torsión 2,5 Nm		N/A
	C) brazos; momento de flexión (Nm)..... :		N/A
	D) carga para luminarias de carril		N/A
	E) luminarias de pinza/clip, estantería de vidrio. Espesor (mm) .....		N/A
	Barra de metal. Diámetro (mm) .....		N/A
	Luminarias fijas o dispositivos de control de lámparas independientes sin dispositivos de fijación		N/A
3.6 (4.14.2)	Carga de los cables flexibles		N/A
	Masa (kg) .....		N/A
	Tensión en conductores (N/mm <sup>2</sup> ) .....		N/A
	Masa (kg) de semi-luminarias .....		N/A
	Momento de flexión (Nm) de semi-luminarias .....		N/A
3.6 (4.14.3)	Dispositivos de regulación:		N/A
	- ensayo de flexión; numero de ciclos .....		N/A
	- hilos rotos		N/A
	- rigidez dieléctrica después del ensayo		N/A
3.6 (4.14.4)	Tubos telescópicos: cordones no fijados al tubo; evitar esfuerzos sobre los conductores		N/A
3.6 (4.14.5)	Poleas de guiado		N/A
3.6 (4.14.6)	Esfuerzo sobre las bases de toma de corriente		N/A
3.6 (4.15)	Materiales inflamables:		P
	- ensayo del hilo incandescente 650 °C		P

<b>IEC/EN 60598-2-3</b>			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
	- distancia $\geq$ 30 mm		N/A
	- pantalla soporta el ensayo 13.3.1		N/A
	- dimensiones pantalla		N/A
	- no deben emplearse materiales que arden violentamente		P
	- protección térmica		N/A
	- circuitos electrónicos exentos		N/A
3.6 (4.15.2)	Luminarias de material termoplástico con dispositivo de control de lámpara		N/A
	a) construcción		N/A
	b) dispositivos sensibles a la temperatura		N/A
	c) temperatura superficie		N/A
3.6 (4.16)	Luminarias para el montaje en superficies normalmente inflamables		P
	No existe dispositivo de control de lámpara	(conforme con Sección 12)	P
3.6 (4.16.1)	Distancia del dispositivo de control de lámpara:		N/A
	- distancia 35 mm		N/A
	- distancia 10 mm		N/A
3.6 (4.16.2)	Protección térmica:		N/A
	- dentro del dispositivo de control de lámpara		N/A
	- externo		N/A
	- posición fija		N/A
	- temperatura marcada en el dispositivo de control de lámpara		N/A
3.6 (4.16.3)	Diseñado para satisfacer el ensayo 12.6	(ver 12.6)	N/A
3.6 (4.17)	Agujeros de drenaje		N/A
	Espacio de al menos 5 mm		N/A
3.6 (4.18)	Resistencia a la corrosión:		P
3.6 (4.18.1)	- resistencia a la oxidación		P
3.6 (4.18.2)	- no fisuras en cobre por envejecimiento		P
3.6 (4.18.3)	- corrosión del aluminio		N/A
3.6 (4.19)	Arrancadores compatibles con balastos		N/A
3.6 (4.20)*	Vibraciones en condiciones severas de empleo		N/A
3.6 (4.21)	Pantalla de protección:		N/A
3.6 (4.21.1)	Equipado con pantalla de protección		N/A
	Pantalla de cristal para lámparas halógenas de wolframio		N/A

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
3.6 (4.21.2)	Partículas de la explosión de la lámpara no afectan a la seguridad		N/A
3.6 (4.21.3)	No trayectoria directa		N/A
3.6 (4.21.4)	Ensayo de choque en pantalla		N/A
	Ensayo de resistencia a la llama sobre los elementos del compartimento de lámpara		N/A
3.6 (4.22)	Accesorios fijados a las lámparas		N/A
3.6 (4.23)	Semiluminarias cumplen Clase II		N/A
3.6 (4.24)*	Radiación UV para lámparas halógenas de wolframio y lámparas de halogenuros metálicos (Anexo P)	EN 62471	P
3.6 (4.25)	No existen puntos o bordes afilados		P
3.6 (4.26)	Protección contra cortocircuito:		N/A
3.6 (4.26.1)	Partes accesibles no aisladas a MBTS		N/A
3.6 (4.26.2)	Ensayo de cortocircuito		N/A
3.6 (4.26.3)	Cadena de ensayo conforme a Figura 29		N/A
3.6 (4.27)	Bloque de conexión con contacto de tierra integrado sin tornillo Anexo V		N/A
	Ensayo tracción de fijación del borne (20 N)		N/A
	Después del ensayo, resistencia < 0,05 $\Omega$		N/A
	Ensayo tracción de la conexión mecánica (50 N)		N/A
	Después del ensayo, resistencia < 0,05 $\Omega$		N/A
	Ensayo de caída de tensión, resistencia < 0,05 $\Omega$		N/A
3.6.1 (-)	Como mínimo IP X3 ó X5 respectivamente	IP66	P
	Luminarias integradas en una columna:		N/A
	- partes por debajo de 2,5 m	IP	N/A
	- partes por encima de 2,5 m	IP	N/A
3.6.2 (-)	Suspensión de cables fijadores		N/A
3.6.3 (-)	Medios de fijación de la luminaria o de la parte externa a su soporte apropiados a su peso		P
3.6.3.1 (-)	Ensayo de carga estática		P
	- coeficiente de resistencia aerodinámica .....	1,2	P
	- área a cargar (m <sup>2</sup> ) .....	0,1	P
	- carga utilizada (N) .....	145	P
	- deformación medida .....	No existe deformación	P
	- no existe rotación		P

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
3.6.4 (-)	Portalámparas ajustables		N/A
3.6.5 (-)	Luminarias instaladas por encima de 5 m, las cubiertas de cristal deben estar:		P
	a) compuestas por un cristal que rompa en pequeños fragmentos (ensayo de acuerdo al apartado 3.6.5.1), o		P
	b) compuestas por un cristal de gran resistencia ante el impacto (ensayo de acuerdo al apartado 3.6.5.2), o		N/A
	c) protegidas por algún medio de retención para los fragmentos de cristal		N/A
	Para luminarias en túneles aplica el apartado 3.6.5.1		N/A
	Método de protección utilizado declarado por el fabricante	Rompa pequeños fragmentos	P
3.6.5.1 (-)	Cubiertas de cristal que rompa en pequeños fragmentos		P
	- número de partículas es mayor a 40..... :	62	P
3.6.5.2 (-)	Cubiertas de cristal protegidas mediante la utilización de un cristal con alta resistencia al impacto		N/A
3.6.5.2.1 (-)	Protección del cristal tiene una alta robustez mecánica		N/A
	Ensayo de acuerdo con la IEC 62262 con el dispositivo utilizado de acuerdo con la IEC 60068-2-75 con una energía de impacto de 5 J		N/A
3.6.5.2.2 (-)	Protección del cristal no se rompe en grandes pedazos		N/A
	- ensayo de acuerdo al apartado 3.6.5.1, número de partículas es mayor a 20..... :		N/A
3.6.6 (-)	Compartimento de conexión de las luminarias integradas en columna		N/A
	- proporciona un adecuado espacio		N/A
	- medios de fijación		N/A
3.6.7 (-)	Conforme con..... :		N/A
3.6.8 (-)	Puerta de acceso de luminarias integradas en columna:		N/A
	- resistencia a la corrosión		N/A
	- sólo puede abrirse por personal autorizado		N/A
	- ensayo de impacto		N/A
3.6.9 (-)	Luminarias integradas en columna:		N/A
	- dimensiones de la ranura de entrada (mm)..... :		N/A
	- trayectoria del cable desde la ranura de entrada hasta la caja de conexión..... :		N/A

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
	- trayectoria del cable libre de obstrucciones que puedan provocar la abrasión de los cables		N/A

3.8 (7)	DISPOSICIONES PARA LA PUESTA A TIERRA		P
3.8 (7.2.1 + 7.2.3)	Partes metálicas accesibles		P
	Partes metálicas en contacto con la superficie de montaje		P
	Resistencia < 0,5 $\Omega$ .....	0,07	P
	Tornillos autorroscantes		P
	Tornillos autoterrajantes		N/A
	Tornillos autoterrajantes por deformación del material usados en una ranura		N/A
	Tierra hace contacto primero		N/A
	Bloques de conexión con contacto de tierra integrado sin tornillo ensayado conforme Anexo V		N/A
3.8 (7.2.2 + 7.2.3)	Continuidad de puesta a tierra en uniones, etc.		P
3.8 (7.2.4)	Protegida contra aflojamientos accidentales		P
	Conformidad con 4.7.3		P
	Bloques de conexión con contacto de tierra integrado sin tornillo ensayado conforme Anexo V		N/A
3.8 (7.2.5)	Contacto de puesta a tierra forma parte integrante de toma móvil		N/A
3.8 (7.2.6)	Borne de toma tierra adyacente a los bornes de red		P
3.8 (7.2.7)	Corrosión electrolítica del borne de tierra		P
3.8 (7.2.8)	Material del borne de tierra		P
	Superficies de contacto de metal desnudo		P
3.8 (7.2.10)	Luminaria de clase II para alimentación pasante		N/A
	Aislamiento doble o reforzado en tierra funcional		N/A
3.8 (7.2.11)	Conductor de puesta a tierra de color verde-amarillo		N/A
	Longitud del conductor de tierra		N/A
3.8.1 (-)	Fijación evita su rotación		P



<b>IEC/EN 60598-2-3</b>			
<b>Cláusula</b>	<b>Requisito + Ensayo</b>	<b>Resultado - Observación</b>	<b>Veredicto</b>
<b>3.11 (8)</b>	<b>PROTECCIÓN CONTRA LOS CHOQUES ELÉCTRICOS</b>		<b>P</b>
3.11 (8.2.1)	Partes activas no accesibles		P
	Partes con aislamiento principal no usadas en la superficie exterior sin una protección adecuada		P
	Partes con aislamiento principal no accesibles con el dedo de prueba normalizado en luminarias portátiles y regulables		N/A
	Partes con aislamiento principal no accesibles con la sonda de Ø 50 mm desde el exterior, en el volumen de accesibilidad, para luminarias de montaje en pared		N/A
	Portalámparas y portacebadores en luminarias portátiles y ajustables cumplen con los requisitos de aislamiento doble o reforzado		N/A
	Aislamiento principal solamente puede ser accesible durante el cambio de la lámpara o cebador		N/A
	Protección en cualquier posición		P
	Lámparas de filamento de wolframio de doble casquillo		N/A
	Barnices no aseguran aislamiento		N/A
	Lámparas de descarga de alta presión con doble casquillo		N/A
	Advertencia de acuerdo con lo indicado en el apartado 3.2.18 colocada en la luminaria		N/A
3.11 (8.2.2)	Luminaria portátil ajustada en la posición más desfavorable		N/A
3.11 (8.2.3.a)	Luminarias de Clase II:		N/A
	- partes metálicas con aislamiento principal no accesibles durante el reemplazamiento del cebador o lámpara		N/A
	- otras partes con aislamiento principal no accesibles durante el reemplazamiento del cebador o lámpara		N/A
	- pantallas de protección de vidrio no sirven como aislamiento suplementario		N/A
3.11 (8.2.3.b)	Portalámparas metálico para casquillo de bayoneta en luminarias de clase I puesto a tierra		N/A
3.11 (8.2.3.c)	Luminarias de clase III con partes MBTS accesibles:		N/A
	Luminaria ordinaria:		N/A
	- corriente de contacto .....		N/A

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
	- tensión en vacío .....		N/A
	Luminarias diferentes a las ordinarias:		N/A
	- tensión nominal .....		N/A
3.11 (8.2.4)	Luminarias portátiles tienen una protección independiente de la superficie de apoyo		N/A
3.11 (8.2.5)	Conformidad con el dedo de ensayo normalizado o la correspondiente sonda		P
3.11 (8.2.6)	Cubiertas fijadas de manera segura		N/A
3.11 (8.2.7)	Descarga de condensadores $\geq 0,5 \mu\text{F}$		N/A
	Luminarias portátiles conectadas mediante clavija con condensador		N/A
	Otras luminarias conectadas mediante clavija con condensador		N/A
	Dispositivos de descarga con o sin condensador		N/A
	Dispositivo de descarga montado separadamente		N/A

<b>3.12 (12)</b>	<b>ENSAYOS DE ENDURANCIA Y CALENTAMIENTO</b>		<b>P</b>
3.12 (12.3)	Ensayo durancia:		P
	- posición-montaje .....	(conforme Instrucciones)	—
	- temperatura de ensayo ( $^{\circ}\text{C}$ ) .....	$35^{\circ}\text{C} + 10^{\circ}\text{C} = 45^{\circ}\text{C}$	—
	- duración total (h).....	168 h	—
	- tensión alimentación: Sin factor de potencia; tensión calculada (V) .....	$230 \text{ V} \times 1,10 = 253 \text{ V}$	—
	- lámpara usada.....	(ver Anexo 1)	—
3.12 (12.3.2)	Después del ensayo de durancia:		P
	- no hay partes fuera de servicio		P
	- luminaria no insegura		P
	- no hay daño en sistema de carril		N/A
	- marcado legible		P
	- no hay roturas, deformaciones etc.		P
3.12 (12.4)	Calentamiento (funcionamiento normal)	(ver Anexo 2)	P
3.12 (12.5)	Calentamiento (funcionamiento anormal)	(ver Anexo 2)	P
3.12 (12.6)	Calentamiento (condición de fallo del dispositivo de control de lámpara):		N/A
3.12 (12.6.1)	Corriente de carga a través del cableado o alimentación pasante (A) .....		—
	- caso de condiciones anormales .....		—

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
	- dispositivo de control de lámpara electrónico		N/A
	- temperatura medida bobinado (°C): a 1,1 Un ... :		—
	- temperatura medida de la superficie de montaje (°C) a 1,1 Un..... :		N/A
	- temperatura de la superficie de montaje calculada (°C) ..... :		N/A
	- Luminarias montadas sobre carril		N/A
3.12 (12.6.2)	Protección térmica		N/A
	- caso de condiciones anormales ..... :		—
	- protector térmico		N/A
	- cortocircuito de rearme manual		N/A
	- cortocircuito de rearme automático		N/A
	- temperatura medida en la superficie de montaje (°C)..... :		N/A
	- Luminarias montadas sobre carril		N/A
3.12 (12.7)	Calentamiento (fallo de control de lámpara en luminarias termoplásticas):		N/A
3.12 (12.7.1)	Luminaria sin dispositivo de control sensibles a la temperatura		N/A
3.12 (12.7.1.1)	Luminaria con lámpara fluorescente ≤ 70W		N/A
	Método de ensayo 12.7.1.1 o Anexo W ..... :		—
	Ensayo conforme 12.7.1.1:		N/A
	- casos de condiciones anormales		—
	- Fallo de balasto a tensión de red (V) ..... :		—
	- Los componentes se mantienen en posición después del ensayo		N/A
	- Ensayo con dedo normalizado de ensayo después del ensayo		N/A
	Ensayo conforme a anexo W:		N/A
	- caso de condición anormal		—
	- temperatura medida bobinado (°C): at 1,1 Un ... :		—
	- temperatura medida de puntos fijos/partes expuestas (°C): a 1,1 Un ..... :		—
	- temperatura calcula de puntos fijos/partes expuestas (°C) ..... :		—
	Ensayo bola de presión:		N/A
	- parte ensayada; temperatura (°C)..... :		N/A

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
	- parte ensayada; temperatura (°C)..... :		N/A
3.12 (12.7.1.2)	Luminarias con lámpara de descarga, lámpara fluorescente > 70 W, transformador > 10 VA		N/A
	- caso de condiciones anormales		—
	- temperatura medida bobinado (°C): a 1,1 Un .... :		—
	- temperatura medida de puntos fijos/partes expuestas (°C): a 1,1 Un ..... :		—
	- temperatura calculada de puntos fijos/partes expuestas (°C) ..... :		—
	Ensayo bola de presión:		N/A
	- parte ensayada; temperatura (°C)..... :		N/A
	- parte ensayada; temperatura (°C)..... :		N/A
3.12 (12.7.1.3)	Luminarias con transformadores resistentes a los cortocircuitos ≤ 10 VA		N/A
	- caso de condiciones anormal		—
	- Los componentes se mantienen en posición después del ensayo		N/A
	- Ensayo con dedo normalizado de ensayo después del ensayo		N/A
3.12 (12.7.2)	Luminarias con dispositivos de control sensibles a la temperatura		N/A
	- fusible térmico	Si <input type="checkbox"/> No <input type="checkbox"/>	—
	- cortocircuito de rearme manual	Si <input type="checkbox"/> No <input type="checkbox"/>	—
	- cortocircuito de rearme automático	Si <input type="checkbox"/> No <input type="checkbox"/>	—
	- caso de condiciones anormales		—
	- temperatura mas alta medida de puntos fijos/partes expuestas (°C): ..... :		—
	Ensayo bola de presión:		N/A
	- parte ensayada; temperatura (°C)..... :		N/A
	- parte ensayada; temperatura (°C)..... :		N/A
3.12.1 (-)	Reducción temperatura si solamente es para uso en el exterior		N/A
3.12.2 (-)	Si IP > IP 20 ensayos pertinentes del (12.4), (12.5) y (12.6) después del (9.2) pero antes del (9.3) especificado en el apartado 3.13		—
3.12.3 (-)	Protecciones de cristal utilizados dentro de los límites de temperatura declarados por el fabricante del cristal		N/A

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
<b>3.13 (9)</b>	<b>RESISTENCIA AL POLVO, CUERPOS SÓLIDOS Y HUMEDAD</b>		<b>P</b>
3.13 (9.2)	Ensayos para la penetración de polvo, cuerpos sólidos y humedad:		P
	- clasificación conforme a IP .....	IP66	—
	- posición de montaje durante el ensayo.....	(conforme Instrucciones)	—
	- tornillos de fijación apretados; torsión (Nm).....	1,20 Nm	—
	- ensayo conforme a cláusulas.....	9.2.2 & 9.2.7	—
	- rigidez dieléctrica después del ensayo		P
	a) ningún deposito de polvo en luminarias contra la penetración de polvo		P
	b) no hay polvo en las luminarias estancas al polvo		P
	c) no entra agua en partes conductoras de corriente o partes MBTS o donde pueda resultar peligroso		P
	d) i) Para luminarias sin agujeros de drenaje – no hay entrada de agua		P
	d) ii) Para luminarias con agujeros de drenaje – no hay entrada de agua peligrosa		N/A
3.13 (9.2.8 + 9.2.9)*	e) no hay agua en luminarias estancas a la inmersión		N/A
	f) no contacto con partes activas (IP2X)		N/A
	f) no entra dentro de la envolvente (IP3X y IP4X)		N/A
	f) no contacto con partes activas (IP3X y IP4X)		N/A
	g) no entra agua en partes de la lámpara que requieran protección contra salpicaduras		P
	h) no hay daños en pantalla de protección o envoltentes de cristal		N/A
3.13 (9.3)	Ensayo de humedad 48h	24°C / 93%	P
3.13.1 (-)	Si IP > IP 20 el orden del ensayo especificado en el apartado 3.12		—

<b>3.14 (10)</b>	<b>RESISTENCIA DE AISLAMIENTO Y RIGIDEZ DIELECTRICA</b>		<b>P</b>
3.14 (10.2.1)	Ensayo de resistencia aislamiento		P
	Cable o cordón cubierto por hoja de aluminio o reemplazar por barra de metal de mm Ø .....	12mm	—
	Resistencia de aislamiento (MΩ)		—
	MBTS:		P
	- entre partes conductoras de corriente de diferente polaridad .....	>1 MΩ	P

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
	- entre partes conductoras de corriente y superficie de montaje..... :	>1 MΩ	P
	- entre partes conductoras de corriente y partes metálicas de la luminaria ..... :	>1 MΩ	P
	- entre superficie exterior de un cordón o cable flexible cuando esta sujeto a un dispositivo de anclaje y las partes metálicas accesibles..... :		N/A
	- Aislamiento de pasamuros descritos en la sección 5 ..... :		N/A
	A parte de MBTS:		P
	- entre partes activas de polaridad diferente ..... :	>2 MΩ	P
	- entre partes activas y superficie de montaje ..... :	>2 MΩ	P
	- entre partes metálicas y partes activas ..... :	>2 MΩ	P
	- entre partes activas de polaridad diferente mediante la acción de un interruptor ..... :		N/A
	- entre superficie exterior de un cordón o cable flexible cuando esta sujeto a un dispositivo de anclaje y las partes metálicas accesibles..... :	>2 MΩ	P
	- Aislamiento de pasamuros descritos en la sección 5 ..... :		N/A
3.14 (10.2.2)	Ensayo rigidez dieléctrica		P
	Lámpara ficticia		N/A
	Luminarias con arrancadores después de 24h de ensayo		N/A
	Luminarias con arrancadores manuales		N/A
	Tensión de ensayo (V):		N/A
	MBTS:		P
	- entre partes conductoras de corriente de diferente polaridad ..... :	500 V	P
	- entre partes conductoras de corriente y superficie de montaje..... :	500 V	P
	- entre partes conductoras de corriente y partes metálicas de la luminaria ..... :	500 V	P
	- entre superficie exterior de un cordón o cable flexible cuando esta sujeto a un dispositivo de anclaje y las partes metálicas accesibles..... :		N/A
	- Aislamiento de pasamuros descritos en la sección 5 ..... :		N/A
	A parte de MBTS:		P

<b>IEC/EN 60598-2-3</b>			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
	- entre partes activas de polaridad diferente .....	1460 V	P
	- entre partes activas y superficie de montaje .....	1460 V	P
	- entre partes metálicas y partes activas .....	1460 V	P
	- entre partes activas de polaridad diferente mediante la acción de un interruptor .....		N/A
	- entre superficie exterior de un cordón o cable flexible cuando está sujeto a un dispositivo de anclaje y las partes metálicas accesibles.....	1460 V	P
	- Aislamiento de pasamuros descritos en la sección 5 .....		N/A
3.14 (10.3)	Corriente de contacto o corriente del conductor de protección (mA) .....	0,20mA	P

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto

	<b>ANEXO 1: componentes</b>		—
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objeto/parte No.	código	fabricante/ marca	tipo/modelo	información técnica	norma	marca(s) de conformidad
Convertidor	A	Philips	Xitanium Full Prog 70W 1000 NLI C150 Xt	220-240V. 50/60Hz. 79W. Iout100- 1000mA. tc 90°C. PF 0.95.	EN 61347-1 EN 61374-2-13	ENEC 05
Cableado	A	Omerin	CSV	Silicona con fibra. 0,75mm <sup>2</sup> -60° ...+200°C. 300/500V.	HD 22.1	CE
Cableado	A	Omerin	CSV	Silicona. 0,75mm <sup>2</sup> -60° ...+200°C. 300/500V.	HD 22.1	CE
Módulo LED	A	Benito	ILLED12K4	1A. 36VCC. 36W. tc 75°C.	EN 62471 EN 62031	CE
Prensaestopas	A	Jacob	M20x1.5	IP68. PA6 V-2.	EN 50262	VDE
Clema conexión	A	Tekox	1100	450V. 15A. 2,5mm <sup>2</sup> . 110°C.	EN 60998	ENEC 10

Los códigos de arriba tienen el siguiente significado:

- A - El componente es reemplazable con otro, también certificado, con equivalentes características
- B - El componente es reemplazable si se autorizo por el laboratorio
- C - Componentes integrados ensayados junto con la muestra
- D - Componente alternativo



IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto

	<b>ANEXO 2: medida de temperaturas, calentamiento de la Sección 12</b>		—
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	Tipo referencia .....	ILNA03242120	—
	Lámpara usada .....	(ver Anexo 1)	—
	Dispositivo de control de lámpara usado .....	(ver Anexo 1)	—
	Posición de montaje de la luminaria .....	(según Instrucciones)	—
	Potencia alimentación (W) .....	73 W	—
	Corriente alimentación (A) .....	0,32 A	—
	Factor de potencia calculado .....	0,98 FP	—
	Tabla: temperaturas medidas corregidas para $t_a = 35\text{ °C}$ :		P
	- modo del funcionamiento anormal.....	Cortocircuito convertidor	—
	- ensayo 1: tensión nominal .....	230 V x 1,00 = 230 V	—
	- ensayo 2: 1,06 veces tensión nominal o 1,05 veces potencia nominal.....	230 V x 1,06 = 243 V	—
	- ensayo 3: Carga en el cable para tomas de corriente, 1,06 veces tensión o 1,05 veces potencia.....	-	—
	- ensayo 4: 1,1 veces tensión nominal o 1,05 veces potencia nominal.....	230 V x 1,10 = 253 V	—
	corriente (A) de carga a través del cableado o alimentación pasante durante el ensayo (A) .....	-	—

temperatura (°C) de parte	Cláusula 12.4 – normal				Cláusula 12.5 – anormal	
	ensayo 1	ensayo 2	ensayo 3	limite	ensayo 4	limite
Módulo LED 1 (tc)	70,0	-	-	75	-	-
Módulo LED 2 (tc)	76,2 <sup>*1</sup>	-	-	75	-	-
Convertidor (tc)	-	64,0	-	90	40,2	90
Cable toma tierra	-	38,8	-	180	-	-
Cable red	-	39,4	-	90	-	-
Cable módulo LED	-	46,1	-	180	-	-
Cable convertidor	-	48,1	-	180	-	-
Clema conexión	-	38,8	-	110	-	-
Aislante clema conexión	-	37,0	-	75	-	-
Superficie de apoyo	-	35,5	-	90	34,0	130
Prensaestopas	-	33,9	-	100	-	-

<b>IEC/EN 60598-2-3</b>						
Cláusula	Requisito + Ensayo			Resultado - Observación		Veredicto
Cristal	-	70,5	-	250	-	-
Conector PCB	-	50,5	-	130	-	-
Distancia objeto iluminado (10cm)	-	38,4	-	90	-	-
* <sup>1</sup> Tolerancia 5°C permitida según punto 12.4.2						

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto

	<b>ANEXO 3: diferencias nacionales para (nombre del país) o diferencias de grupo</b>		—
--	--	--	---

	<b>CENELEC MODIFICACIONES COMUNES (EN)</b>		—
<b>3.5 (3)</b>	<b>MARCADO</b>		—
3.5 (3.3.101)	Advertencia adecuada en el embalaje		—
<b>3.10 (5)</b>	<b>CABLEADO EXTERNO E INTERNO</b>		—
3.10 (5.2.1)	Conductores de conexión		—
	- sin medios de conexión a red		—
	- bloque de conexión especificado		—
	- información correspondiente suministrada		—
	- conformidad con los capítulos y apartados 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 y 13.2 de la parte 1		—
3.10 (5.2.2)	Cables iguales a HD21 S2 ó HD22 S2		—

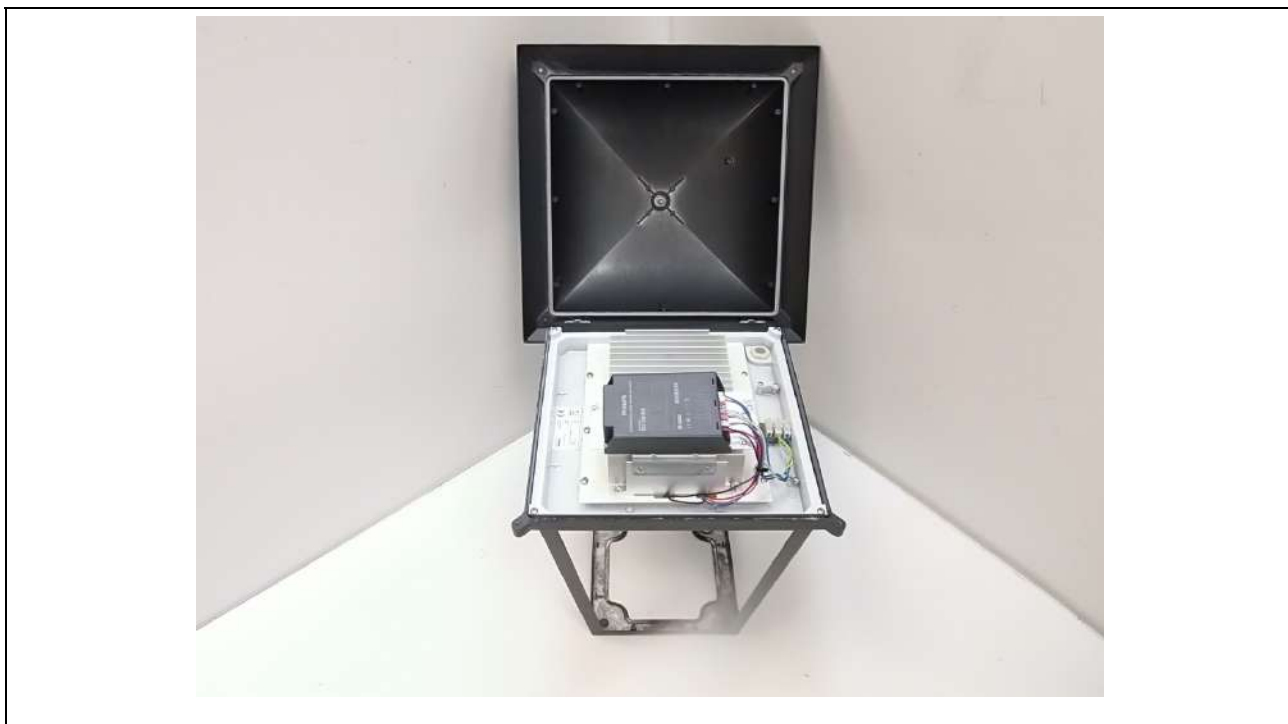
<b>ZB</b>	<b>ANEXO ZB, CONDICIONES NACIONALES ESPECIALES (EN)</b>		<b>N/A</b>
(3.3)	DK: cables de alimentación con una etiqueta		N/A
	IT: etiqueta de advertencia en luminarias de Clase 0		N/A
(4.5.1)	DK: bases de toma de corriente		N/A
(5.2.1)	CY, DK, FI, SE, GB: tipo de clavija		N/A

<b>ZC</b>	<b>ANEXO ZC, DESVIACIONES NACIONALES (EN)</b>		<b>N/A</b>
(4 & 5)	FR: Bases de corriente 10/16A con obturador		N/A
(13.3)	GB: Requisitos de acuerdo con el United Kingdom Building Regulation		N/A
(13.3.2)	FR: Ensayo de hilo incandescente a 850 °C alt. 750 °C para luminarias en locales abiertos al público ó 960 °C para luminarias en salidas de emergencia		N/A

IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
<b>ANEXO 4: fotografías</b>			—



IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
<b>ANEXO 4: fotografías</b>			—



IEC/EN 60598-2-3			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
	<b>ANEXO 4: fotografías</b>		—



Adjunto N° 1

<b>IEC/EN 60598-2-6</b>			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto
<b>6.1 (0)</b>	<b>OBJETO Y CAMPO DE APLICACIÓN</b>		<b>P</b>
6.1 (0.1)	Mas secciones aplicables .....	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
<b>6.4 (2)</b>	<b>CLASIFICACIÓN</b>		<b>P</b>
<b>6.6 (4)</b>	<b>CONSTRUCCIÓN</b>		<b>P</b>
6.6 1-3 (-)	Seguridad eléctrica del circuito de secundario		P
P			
<b>6.8 (7)</b>	<b>DISPOSICIONES PARA LA PUESTA A TIERRA</b>		<b>P</b>
6.8.1 (-)	Faldón metálico del portalámparas		N/A
6.8.2 (-)	Puesta a tierra del circuito secundario		N/A
6.8.3 (-)	Paso de la corriente durante el funcionamiento		P
<b>6.11 (8)</b>	<b>PROTECCIÓN CONTRA LOS CHOQUES ELÉCTRICOS</b>		<b>P</b>
<b>6.12 (12)</b>	<b>ENSAYOS DE ENDURANCIA Y CALENTAMIENTO</b>		<b>P</b>
6.12a (-)	- tensión de ensayo 1,1 U <sub>n</sub> (V) .....	253 V	—
6.12b (-)	- tensión de ensayo 1,06 U <sub>n</sub> (V) .....	243 V	—
<b>6.14 (10)</b>	<b>RESISTENCIA DE AISLAMIENTO Y RIGIDEZ DIELECTRICA</b>		<b>P</b>
	<b>CENELEC MODIFICACIONES COMUNES (EN)</b>		<b>N/A</b>
<b>ZB</b>	<b>ANEXO ZB, CONDICIONES NACIONALES ESPECIALES (EN)</b>		<b>N/A</b>
<b>ZC</b>	<b>ANEXO ZC, DESVIACIONES NACIONALES (EN)</b>		<b>N/A</b>

Adjunto N° 2

EN 50102			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto

4	DESIGNACIONES		P
4.1	Disposición del código IK .....	IK07	P
4.2	Correspondencia entre código IK y energía de impacto:		—
	IK00	No protegido	N/A
	IK01	Energía 0,14 J	N/A
	IK02	Energía 0,2 J	N/A
	IK03	Energía 0,35 J	N/A
	IK04	Energía 0,5 J	N/A
	IK05	Energía 0,7 J	N/A
	IK06	Energía 1 J	N/A
	IK07	Energía 2 J	P
	IK08	Energía 5 J	N/A
	IK09	Energía 10 J	N/A
	IK10	Energía 20 J	N/A
4.3	Aplicación del código IK		P
	Grado de protección aplicado a la envolvente en su totalidad	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Envolvente con diferentes grados de protección	Si <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

5	CONDICIONES GENERALES		P
5.1	Condiciones atmosféricas para los ensayos	Tª 24°C HR 45%	P
5.2	Envolventes sometidas a ensayo		P
	Limpia	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Nueva	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
5.3	Especificaciones de la norma particular de producto		P
	Medio de ensayo	Martillo pendular	P
	Número de muestras a ensayar .....	1	P
	Condiciones de la muestra	Fijada a superficie	P
	Montaje		P
	Conexión		P
	Posición		N/A
	Preacondicionamiento, si aplica	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Ensayo con tensión	Si <input type="checkbox"/> No <input checked="" type="checkbox"/>	—



Adjunto N° 2

EN 50102			
Cláusula	Requisito + Ensayo	Resultado - Observación	Veredicto

	Ensayo con partes móviles en movimiento	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Número de impactos .....	Envolvente luminaria; 5 impactos. Cristal: 5 impactos	P
	Punto de aplicación	Uniformemente distribuidos sobre la envolvente de la luminaria y grupo óptico	P

<b>7</b>	<b>APARATOS DE ENSAYO</b>		—
	Martillo pendular según EN 60068-2-75:1997	Si <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Martillo de resorte según EN 60068-2-75:1997	Si <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Martillo vertical según EN 60068-2-75:1997	Si <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

### TIPO DE ENSAYO

Clasificación grupo de riesgo según norma UNE-EN 62471:2009. Seguridad fotobiológica de lámparas y de los aparatos que utilizan lámparas.

Cálculo de  $E_{thr}$  y  $d_{thr}$  según el Informe Técnico IEC/TR 62778.

### DATOS SOLICITANTE

Nombre: BENITO URBAN S.L.U.

Dirección: C/ Lleida 10 (modulo 3). Vic (Barcelona)

Teléfono: (+34) 938 521 000

Fechas de ensayo: 12/03/2019

Elaborado por:



Francisco Faus Talavera  
Técnico Laboratorio  
13/03/2019

Revisado por:

Elena Sanjuán Sánchez  
Responsable Laboratorio  
13/03/2019

Los resultados de este informe sólo conciernen a las muestras cuya descripción aparece en el informe. Este informe no será válido si presenta tachaduras o enmiendas.

Queda prohibida la reproducción total o parcial de este informe en cualquier medio o por cualquier medio sin el consentimiento expreso de candelTEC y del solicitante.

## 1. DESCRIPCIÓN DE LA MUESTRA

### DESCRIPCIÓN DE LA MUESTRA: EE190058-1, EE190058-2

Placa LED sin lentes.

Ensayo realizado sobre un LED (D12)

Información aportada por el solicitante:

*Dimensiones placa LED: 25 cm largo x 7.5 cm ancho x 6.5 cm alto*

*Dimensiones LED: 5.0 mm largo x 5.2 mm ancho x 1 mm alto*

*Referencia: PCB LED B-Flex GEN3 16 LEDs 4000K*

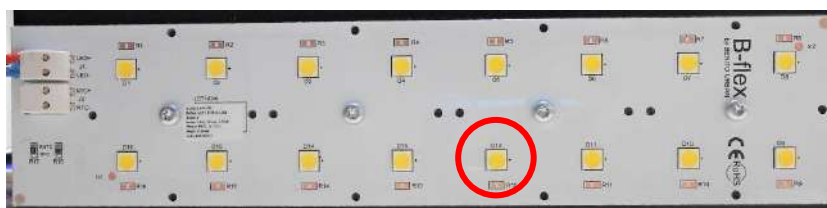
*LED: LUXEON 5050 -- 4070 (4000K CRI>70)*

*Consumo LED: 350 mA x 6 V (DC)*

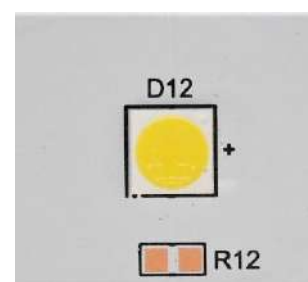
EE190058-1: PCB de 16 LEDs sin óptica montada sobre disipador.



PCB LED



LED seleccionado para el ensayo (D12)

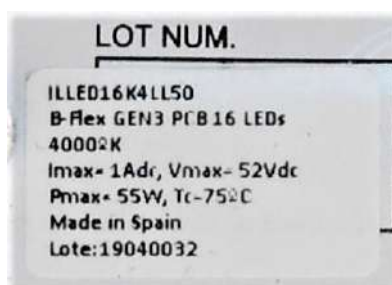


LED sin óptica

EE190058-2: Driver PHILIPS XiLP 40W 0.2-0.7A S1230V S175 sXt, 9290009307, S/N: 8675851942



Marcas identificativas: Marcas en placa LED



Fecha de recepción: 08/03/2019

Suministrador de la muestra: El solicitante.

## 2. CLASIFICACIÓN SEGÚN NORMA UNE-EN 62471:2009

### **Método de ensayo**

Ensayo realizado según el procedimiento técnico PT09\_Evaluación del riesgo fotobiológico de la luz azul en luminarias y fuentes luminosas LED. Clasificación del Grupo de Riesgo.

### **Equipos de medida utilizados**

- Telémetro (E0016)
- Goniómetro (E0037)
- Espectrorradiómetro (E0081)
- Pie de rey (E0050)
- Cámara luminancia (E0055)
- Termohigrómetro digital (E0020)
- Fuente de alimentación (E0030)

### **Condiciones ambientales registradas durante el ensayo:**

Temperatura:  $(24.57 \pm 0.30)$  °C

Humedad:  $(31.4 \pm 2.6)$  % Hr

### **Alimentación eléctrica durante el ensayo**

La muestra se alimenta con una tensión estabilizada de 230 V (50 Hz).

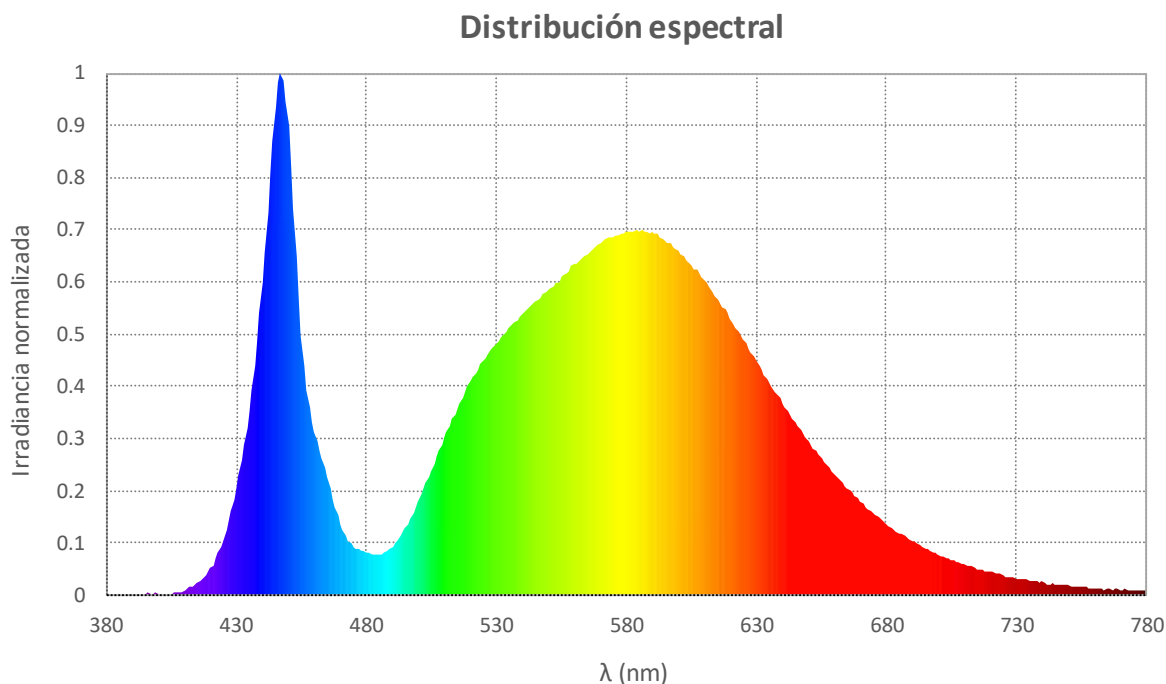
<b>PARÁMETROS ELÉCTRICOS MEDIDOS EN PLACA LED (DC)</b>		
Corriente (mA)	Tensión (V)	Potencia (W)
$694.49 \pm 0.14$	$45.7056 \pm 0.0069$	$31.7419 \pm 0.0079$

**Distancia de medida:**  $(200.2 \pm 4.0)$  mm

El ensayo se realiza considerando al LED como un producto No-GLS (200 mm)

**RESULTADOS**

**ESPECTRO DE EMISIÓN (11 mrad FOV)**



**Temperatura de color (11 mrad FOV):** (4023 ± 30) K

**CLASIFICACIÓN LÁMPARA SEGÚN NORMA UNE-EN 62471:2009**

Riesgo	Espectro de acción	Símbolo	Unidades	FOV (mrad)	Límite emisión	Resultado e Incertidumbre <sup>i</sup>	Grupo de riesgo
Luz azul	B(λ)	L <sub>B</sub>	W·m <sup>2</sup> ·sr <sup>-1</sup>	100	100 (RG0)	198.0 ± 7.0	<b>Grupo 1</b>
				11	10000 (RG1)	5419 ± 178	
				1.7	4000000 (RG2)	19885 ± 1928	
Luz azul, fuente pequeña*	B(λ)	E <sub>B</sub>	W·m <sup>2</sup>	--	1.0*		--

\* Fuente pequeña subtende α < 0.011 rad. El campo de visión en que se promedia es 0.1 rad para 10000 s

**CLASIFICACIÓN: GRUPO DE BAJO RIESGO (GRUPO 1)**

### 3. CÁLCULO DE $E_{thr}$ Y $d_{thr}$ SEGÚN IEC/TR 62778

El LED evaluado tiene una temperatura de color nominal de 4000 K y está alimentado a 350 mA.

Siguiendo las indicaciones del IEC/TR 62778:2012, cualquier producto final que incorpore LEDs cuya temperatura de color sea igual o inferior 4000K y su corriente de alimentación no supere los 350 mA, será clasificada como máximo como grupo 1 (grupo de bajo riesgo).

---

<sup>i</sup> Todas las incertidumbres expandidas que aparecen en este informe han sido calculadas siendo  $k = 2$  (factor de cobertura, que para una distribución normal corresponde a una probabilidad de cobertura de aproximadamente el 95 %)

## DECLARACIÓN CERTIFICACIÓN LUMINARIA CAMPRODON Equipos Alumbrado Público BENITO-NOVATILU

La luminaria VILLA LUXE y NEOVILLA ALU son idénticas y provienen de nuestra fábrica del Grup Benito-Novatilu K-LED (Ningbo King-Bridge Lighting Technology Co. Ltd.)

Las Certificaciones presentadas han sido realizadas a nombre de ambas luminarias teniendo validez para la luminaria NEOVILLA ALU

Las equivalencias en las referencias son las siguientes:

**BENITO reference**  
NEOVILLA ALU (ILNA)

**NOVATILU reference**  
VILLA LUXE (ALVLL)

Vic, septiembre de 2022.

**Responsable de Calidad de BENITO URBAN, SLU**



**Jordi Puig i Rovira (Ingeniero Técnico Telecomunicación, col.903055)**  
**Design & Engineering Lighting Department**





Report No.: SHES170800829671  
Date of issue: 2017-08-28

## TEST REPORT

Product .....: LED GARDEN LIGHTING  
Product/Item No.....: VILLA LUXE, CORBA, ESKADE, VOLGA, SIENA  
Applicant.....: NOVATILU, S.L.U  
Address .....: Via Ausetania, 11-13 08560 Manlleu Barcelona Spain  
Manufacturer's Name .....: Same as applicant  
Address .....: Same as applicant  
Factory's Name .....: Same as applicant  
Address .....: Same as applicant  
Testing Laboratory.....: SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.  
Address .....: 588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China  
Number of Samples received ....: 5  
Date of samples reception.....: 2017-03-01  
Date Test Conducted.....: 2017-03-01 to 2017-03-09  
Test Requested .....: IK10  
Test Method (standards) .....: IEC 62262:2002  
Test result.....: PASS  
**CONCLUSION** .....: The submitted sample **complied** with IK10 Test



Tested by:

Lisa Li  
Lisa Li

Reviewed by:

Henry HU  
Henry HU



## TEST RESULTS

**Standards used** Clause 5 of IEC 62262:2002

<u>Sample</u>	<u>Requirement + Test</u>	<u>Result – Remark</u>	<u>Verdict</u>
VILLA LUXE	<b>IK10 Test</b>	--	<b>Pass</b>
CORBA	<b>IK10 Test</b>	--	<b>Pass</b>
ESKADE	<b>IK10 Test</b>	--	<b>Pass</b>
VOLGA	<b>IK10 Test</b>	--	<b>Pass</b>
SIENA	<b>IK10 Test</b>	--	<b>Pass</b>

### TEST PREPARATION:

There are 5 models covered in this report.

The sample shall be mounted on a rigid support.

### TEST CONDITION:

1. Impact energy 20 J
2. The number of impacts shall be five on each exposed face.

### OBSERVATIONS:

There was no obvious damage on the enclosure.

**Overview of the sample**  
Model VILLA LUXE



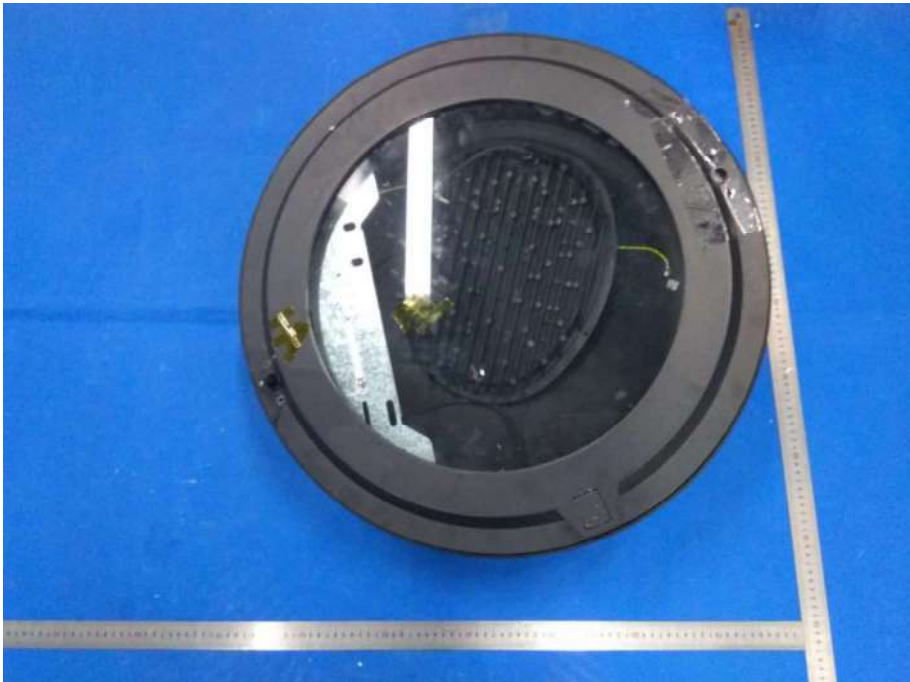
Model CORBA



Model CORBA



Model ESKADE



Model ESKADE



Model VOLGA



Model VOLGA



Model SIENA



Model SIENA



— End of Report —

## 2.3 Compatibilidad Electromagnética

- UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2 Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16 A por fase)
- UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.
- UNE-EN 61547. Equipos para alumbrado



Bellaterra: 28 de marzo de 2014

Expediente número: **14/31700721**

Referencia del peticionario: **BENITO URBAN S.L.U.**

C.\Vía Ausetania, 11  
08560, MANLLEU  
BARCELONA - ESPAÑA

En representación suya:  
Sr.: Jordi Serradell



### **INFORME DE ENSAYO**

#### **ASUNTO SOLICITADO**

Compatibilidad electromagnética

Ensayo de conformidad según normas:

**UNE-EN 55015:2013** Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.

**UNE-EN 61000-3-3:2013** Compatibilidad electromagnética (CEM). Parte 3-3: Límites. Limitación de las variaciones de tensión, fluctuaciones de tensión y flicker en las redes públicas de suministro de baja tensión para equipos con corriente asignada  $\leq 16$  A por fase y no sujetos a una conexión condicional.

**UNE-EN 61000-3-2:2006+A1:2010+A2:2010** Compatibilidad electromagnética (CEM). Parte 3-2: Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada  $\leq 16$  A por fase)

**UNE 61547:2011** Equipos para iluminación para uso general. Requisitos relativos a la inmunidad CEM.

#### **INDICE**

1. MATERIAL RECIBIDO Y ENSAYADO
  - 1.1. Configuración de ensayo
  - 1.2. Equipo de control y auxiliar
  - 1.3. Cables de Entrada-Salida
  - 1.4. Modificaciones realizadas
2. MÉTODO DE ENSAYO
  - 2.1. Criterios de aceptación para las pruebas de inmunidad
  - 2.2. Procedimientos de ensayo
  - 2.3. Incertidumbre en la medida
  - 2.4. Condiciones ambientales
3. RESULTADOS
4. ANEXOS
  - 4.1. Fotografías identificativas
  - 4.2. Detalles de resultados

La reproducción del presente documento, sólo está autorizada si se hace en su totalidad.  
Esta es la primera página del documento el cual consta de 23 páginas de las cuales 18 son anexos.

**1. MATERIAL RECIBIDO Y ENSAYADO**

Equipo: Lámpara de exterior, marca: BENITO URBAN, modelo: NEOVILLA LED 35 2.0, s/n: ---; Id: 001

Fecha recepción de las muestras: 14-03-2014  
 Fecha inicio de pruebas: 14-03-2014  
 Fecha finalización de las pruebas: 24-03-2014

**1.1. Configuración de ensayo**

Alimentación: AC 230V 50Hz.  
 Disposición normal de Sobremesa.  
 Configuración de ensayo: Funcionamiento continuo con precalentamiento según norma.  
 Tamaño del equipo: 650x430x430 mm.

**1.2. Equipo de control y auxiliar**

El equipo bajo prueba no dispone de equipos de control ni auxiliares.

**1.3. Cables de Entrada-Salida**

El equipo no dispone de cables de entrada-salida.

**2. MÉTODO DE ENSAYO**

<b>NORMA APLICABLES PARA ENSAYOS DE EMISIONES</b>	
<b>Norma: UNE-EN 55015:2013 basada en las normas:</b>	
<b>Norma Básica:</b> UNE-EN 55022:2011/AC:2012	
<input checked="" type="checkbox"/> Emisiones radiadas de radiofrecuencia (30 -300MHz)	Clase: B
<b>Norma Básica:</b> UNE-EN 55015:2013	
<input checked="" type="checkbox"/> Emisiones conducidas continuas (0,009-30MHz)	
<input checked="" type="checkbox"/> Emisiones radiadas de campo magnético	
<b>Norma Básica:</b> UNE-EN 61000-3-3:2013	
<input checked="" type="checkbox"/> Emisiones de fluctuaciones de tensión	
<b>Norma Básica:</b> UNE-EN 61000-3-2:2006/A1:2010/A2:2010	
<input checked="" type="checkbox"/> Emisiones de armónicos de corriente	Clase: C

<b>NORMAS APLICABLES A LOS ENSAYOS DE INMUNIDAD</b>	
<b>Norma: UNE 61547:2011 basada en las normas:</b>	
<b>Norma Básica:</b> UNE-EN 61000-4-2:2010	
<input checked="" type="checkbox"/> Inmunidad a las descargas electroestáticas	Nivel Ac: 8 kV Nivel DC: 4 kV
<b>Norma Básica:</b> UNE-EN 61000-4-3:2007/A1:2008/A2:2011	
<input checked="" type="checkbox"/> Inmunidad a los campos electromagnéticos	Rango de frecuencias: 80MHz-1GHz Severidad: 3 V/m Modulación: 80% AM 1 Hz
Equipo categoría II, con frecuencia de oscilador interno superior a 15MHz.	
<b>Norma Básica:</b> UNE-EN 61000-4-4:2005/A1:2010/CORR:2010	
<input checked="" type="checkbox"/> Inmunidad a los transitorios rápido en ráfagas	
<input type="checkbox"/> Nivel de severidad a los terminales de señal y control y por el borne de tierra	Severidad: 0.5 kV
<input checked="" type="checkbox"/> Nivel de severidad en los terminales I/O de alimentación AC	Severidad: 1 kV
<input type="checkbox"/> Nivel de severidad en los terminales I/O de alimentación DC	Severidad: 0.5 kV
<b>Norma Básica:</b> UNE-WN 61000-4-5:2005/CORR:2010	
NOTA: Potencia de luminaria >25 W	
<input checked="" type="checkbox"/> Inmunidad a las ondas de choque	
<input checked="" type="checkbox"/> Terminales de alimentación AC	Modo diferencial severidad: 0.5 Kv Modo común severidad: 2 kV
<b>Norma Básica:</b> UNE-EN 61000-4-6:2009	
<input checked="" type="checkbox"/> Inmunidad a las perturbaciones conducidas 150 KHz - 80 MHz	
<input type="checkbox"/> Terminales de líneas y/o control	Severidad: 3 V rms
<input checked="" type="checkbox"/> Alimentación AC/DC y acceso por el borne de tierra	Severidad: 3 V rms
<b>Norma básica:</b> UNE-EN 61000-4-11:2005	
<input checked="" type="checkbox"/> Inmunidad a los Huecos de tensión, interrupciones breves y variaciones de tensión	
<input checked="" type="checkbox"/> Huecos e interrupciones	
<input type="checkbox"/> Variaciones de tensión	
<b>Norma básica:</b> EN 61000-4-8:2011	
<input type="checkbox"/> Inmunidad a los campos magnéticos a frecuencia industrial	Intensidad: 3 A/m
Nota: Ensayo no aplicable. Aplicable sólo a equipos que contienen dispositivos susceptibles a campos magnéticos.	

### **2.1. Criterios de aceptación para las pruebas de inmunidad**

Según norma UNE 61547:2011 apartado 6.3.

**2.2. Procedimientos de ensayo**

Emisiones radiadas de radiofrecuencia: C5400277.

Emisiones conducidas continuas: C5400276.

Emisiones de armónicos de corriente: C5400281.

Emisiones de fluctuaciones de tensión: C5400281.

Inmunidad a las descargas electrostática: C5400282.

Inmunidad a los campos electromagnéticos: C5400285.

Inmunidad a los transitorios rápidos en ráfagas: C5400283.

Inmunidad a las ondas de choque: C5400284.

Inmunidad a las perturbaciones conducidas: C5400286.

Inmunidad a los Huecos de tensión, interrupciones breves y variaciones de tensión: C5400288.

Inmunidad a los campos magnéticos a frecuencia industrial: C5400287.

**2.3. Incertidumbre en la medida**

Emisiones radiadas de radiofrecuencia:  $\pm 4,3$  dB.

Emisiones conducidas continuas:  $\pm 2,1$  dB.

Emisiones de fluctuaciones de tensión:  $\pm 0,8$  dB.

Emisiones de armónicos de corriente:  $\pm 0,8$  dB.

Inmunidad a las descargas electrostáticas:  $\pm 1,65$  dB.

Inmunidad a los campos electromagnéticos:  $\pm 2,45$  dB.

Inmunidad a los transitorios rápidos en ráfaga:  $\pm 1,3$  dB.

Inmunidad a las ondas de choque:  $\pm 1,3$  dB.

Inmunidad a las perturbaciones conducidas:  $\pm 1,7$  dB.

Inmunidad a los Huecos de tensión, interrupciones breves y variaciones de tensión:  $\pm 0,8$  dB.

Inmunidad a los campos magnéticos a frecuencia industrial:  $\pm 1,01$  dB.

La incertidumbre expandida de medida se ha obtenido multiplicando la incertidumbre típica de medida por un factor de cobertura  $k = 2$  que, para una distribución de probabilidad normal, corresponde a un nivel de confianza del 95%. La incertidumbre típica de medida se ha determinado conforme al documento EA-4/02.

**2.4. Condiciones ambientales**

Ver hojas de Resultado

### 3.RESULTADOS

PRODUCTO		
Equipo: Lámpara de exterior, marca: BENITO URBAN, modelo: NEOVILLA LED 35 2.0, nº de serie: ---; Id: 001		
ENSAYOS DE EMISIÓN	RESULTADO	
Emisiones radiadas de radiofrecuencia (30 -1000MHz).	Pasa	4
Emisiones conducidas continuas (0,009-30MHz).	Pasa	4
Emisiones radiadas de campo magnético.	Pasa	4
Emisiones de fluctuaciones de tensión.	Pasa	4
Emisiones de armónicos de corriente.	Pasa	4
<p><b>1:</b> Los Resultados están por debajo del límite especificado, pero dentro del margen de incertidumbre. De esta manera, no es posible establecer la conformidad basada en el 95% del nivel de confianza. No obstante el Resultado indica que la conformidad es más probable que la no conformidad.</p> <p><b>2:</b> Los Resultados están por encima del límite especificado, pero dentro del margen de incertidumbre. De esta manera, no es posible establecer la no conformidad basada en el 95% del nivel de confianza. No obstante el Resultado indica que la no conformidad es más probable que la conformidad.</p> <p><b>3:</b> Los Resultados están por encima del límite superior, incluso teniendo en cuenta la mitad del intervalo de incertidumbre.</p> <p><b>4:</b> Los Resultados están dentro del límite, incluyendo el intervalo de incertidumbre.</p>		
ENSAYOS DE INMUNIDAD	RESULTADO	
Inmunidad a las descargas electroestáticas.	A	Criterio: B
Inmunidad a los campos electromagnéticos.	A	Criterio: A
Inmunidad a los transitorios rápido en ráfagas.	A	Criterio: B
Inmunidad a las ondas de choque.	B	Criterio: C
Inmunidad a las perturbaciones conducidas 150 kHz - 230 MHz	A	Criterio: A
Inmunidad a los huecos de tensión, interrupciones breves y variaciones de tensión.	A	Ver normas
Criterio de funcionamiento según la norma		

José Manuel Suárez Román  
 Responsable técnico  
 Electrical and Electronics  
 LGAI Technological Center S.A.

Los Resultados se refieren, exclusivamente, a la muestra, producto o material librado al Laboratorio, tal como se informa en el apartado de material recibido, y ensayado en las condiciones indicadas en la/s norma/s citada/s en este documento.

#### Garantía de Calidad de Servicio

**Applus+**, garantiza que este trabajo se ha realizado dentro de lo exigido por nuestro Sistema de Calidad y Sostenibilidad, habiéndose cumplido las condiciones contractuales y la normativa legal.

En el marco de nuestro programa de mejora les agradecemos nos transmitan cualquier comentario que consideren oportuno, dirigiéndose al responsable que firma este escrito, o bien, al Director de Calidad de Applus+, en la dirección: [satisfaccion.cliente@applus.com](mailto:satisfaccion.cliente@applus.com)

#### **4.ANEXOS**

##### **4.1.Fotografías identificativas**

###### **Vista general**



Vista lateral I.



Vista lateral II.



Detalle electrónica.



Vista interior.



Leds.

**Configuración de ensayos**



Emisiones radiadas de radiofrecuencia.



Emisiones conducidas continuas.



Emisiones radiadas de campo magnético.



Emisiones de fluctuaciones de tensión y emisiones de corriente.



Inmunidad a las descargas electrostática.



Inmunidad a los campos electromagnéticos.



Inmunidad a los transitorios rápidos en ráfaga.



Inmunidad a las perturbaciones conducidas.



Inmunidad a las ondas de choque.



Inmunidad a los huecos de tensión,  
interrupciones breves y variaciones de tensión.

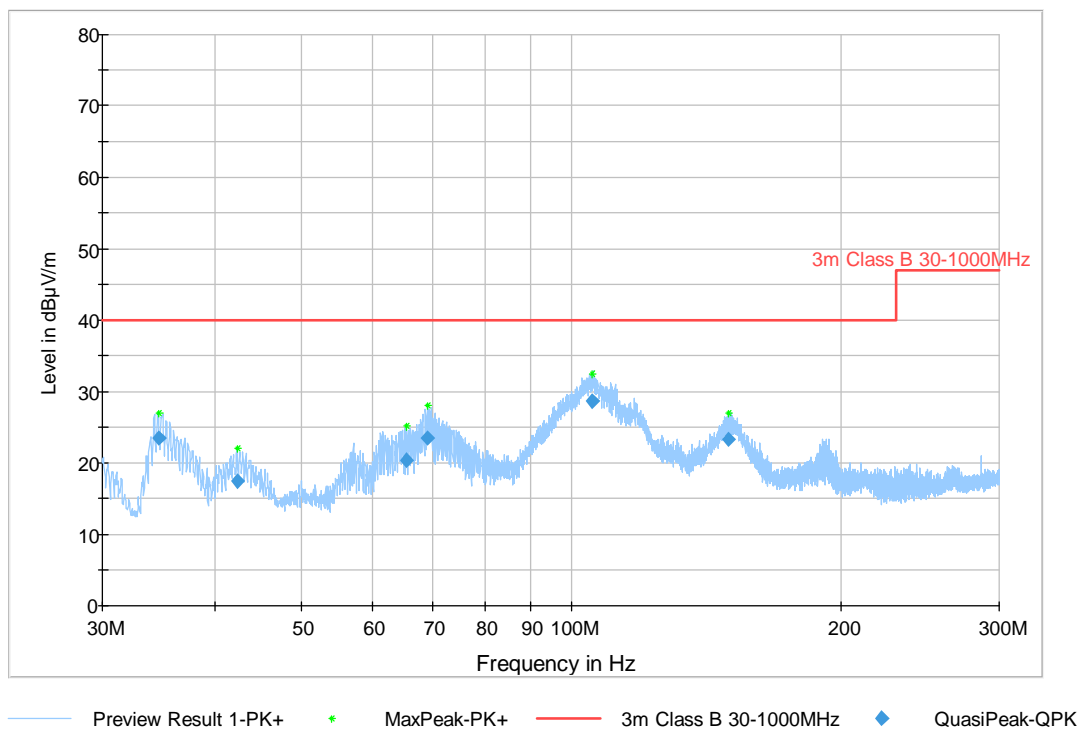


**4.2. Detalles de resultados**

<b>EMISIONES RADIADAS DE RADIOFRECUENCIA</b>					
<b>Peticionario:</b> BENITO URBAN S.L.U			<b>Equipo bajo prueba:</b> Lámpara de exterior		
<b>Nº Expediente:</b> 14/31700721			<b>Marca:</b> BENITO URBAN		
<b>Procedimiento:</b> C5400277			<b>Modelo:</b> NEOVILLA LED 35 2.0		
<b>Norma básica:</b> UNE-EN 55022:2011/AC:2012			<b>Número de serie:</b> ---; Id: 001		
			<b>Fecha de recepción:</b> 14-03-2014		
<b>Criterio func. según norma:</b> UNE-EN 55015:2013			<b>Tipo de ensayo:</b> Conformidad	<b>Temperatura:</b> 21,4 °C	
<b>Técnico:</b> Luis Piñol				<b>Humedad:</b> 32,5 %	
<b>Supervisado:</b>			<b>Presión Atm.:</b> 1009 hPa		
<b>Fecha de ensayo:</b> 21-02-2014			<b>Tamaño del EBP:</b> 650x430x430 mm.		
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.			<b>Rango de frecuencias:</b> 30MHz-300MHz		
<b>Cables de entrada/salida:</b> El equipo no dispone de cables de entrada-salida.			<b>Ejercicio de ensayo:</b> Funcionamiento continuo con precalentamiento según norma.		
			<b>Alimentación:</b> AC 230V 50Hz.		
<b>Disposición EBP:</b>	<b>Clase</b>	<b>Área Test</b>	<b>Distancia</b>	<b>PreScan</b>	<b>Evaluación</b>
Sobremesa.	B	SAC 2	3 m	8 caras	Individual
<b>RESULTADO:</b> PASA					
<b>Identificación</b>		<b>Emisiones</b>		<b>Fuentes de emisión principal y tipo</b>	
EBP: Equipo Bajo Prueba AUX : Dispositivos auxiliares SYS : EBP + AUX BA : Banda Ancha BE : Banda Estrecha Qp: Casi-pico		QP < Limit - I  I=Incertidumbre		EBP, BB	
<b>Comentarios:</b>					

EMISIONES RADIADAS DE RADIOFRECUENCIA II	
<b>Peticionario:</b> BENITO URBAN S.L.U	<b>Equipo bajo prueba:</b> Lámpara de exterior
<b>Nº Expediente:</b> 14/31700721	<b>Marca:</b> BENITO URBAN
<b>Procedimiento:</b> C5400277	<b>Modelo:</b> NEOVILLA LED 35 2.0
<b>Norma básica:</b> UNE-EN 55022:2011/AC:2012	<b>Número de serie:</b> ---; Id: 001
	<b>Fecha de recepción:</b> 14-03-2014

### GRÁFICOS



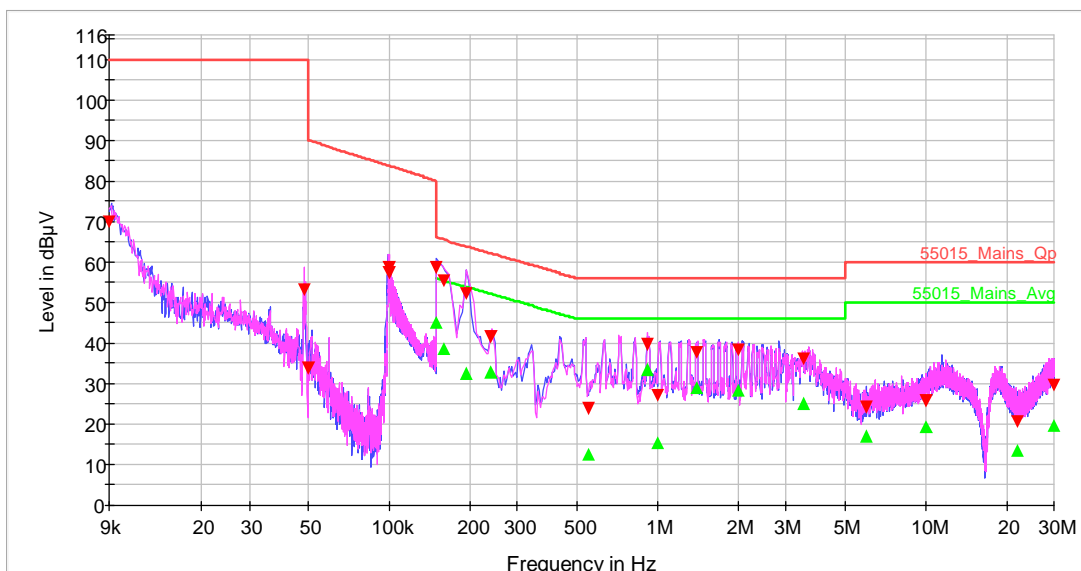
### MEDIDAS FINALES

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (m)	Pol	Azimuth (deg)	Corr. (dB)
34.640000	23.48	40.00	16.52	20000.0	120.000	1.44	V	317.0	-23.6
42.360000	17.50	40.00	22.50	20000.0	120.000	1.25	V	10.0	-23.0
65.480000	20.37	40.00	19.63	20000.0	120.000	1.32	V	25.0	-24.1
69.040000	23.51	40.00	16.49	20000.0	120.000	1.25	V	0.0	-24.3
105.320000	28.66	40.00	11.34	20000.0	120.000	1.20	V	90.0	-22.7
149.600000	23.34	40.00	16.66	20000.0	120.000	1.40	V	267.0	-20.5

<b>EMISIONES CONDUCCIDAS CONTINUAS</b>							
<b>Peticionario:</b> BENITO URBAN S.L.U	<b>Equipo Bajo Prueba:</b> Lámpara de exterior						
<b>Nº Expediente:</b> 14/31700721	<b>Marca:</b> BENITO URBAN						
<b>Procedimiento:</b> C5400276	<b>Modelo:</b> NEOVILLA LED 35 2.0						
<b>Norma básica:</b> UNE-EN 55015:2013	<b>Número de serie:</b> ---; Id: 001						
	<b>Fecha de recepción:</b> 14-03-2014						
<b>Criterio func. según norma:</b> UNE-EN 55015:2013	<table border="1" style="width: 100%;"> <tr> <td><b>Tipo de ensayo:</b> Conformidad</td> <td><b>Temperatura:</b> 26.4 °C</td> </tr> <tr> <td></td> <td><b>Humedad:</b> 32.1 %</td> </tr> <tr> <td></td> <td><b>Presión Atm.:</b> 1006 hPa</td> </tr> </table>	<b>Tipo de ensayo:</b> Conformidad	<b>Temperatura:</b> 26.4 °C		<b>Humedad:</b> 32.1 %		<b>Presión Atm.:</b> 1006 hPa
<b>Tipo de ensayo:</b> Conformidad		<b>Temperatura:</b> 26.4 °C					
	<b>Humedad:</b> 32.1 %						
	<b>Presión Atm.:</b> 1006 hPa						
<b>Técnico:</b> Juan Carlos Parrilla							
<b>Supervisado:</b>	<b>Ejercicio de ensayo:</b>						
<b>Fecha de ensayo:</b> 18-03-2014	Funcionamiento continuo con precalentamiento según norma.						
<b>Equipo:</b> LISN RS ESH3-Z5 Receptor EMI RS ESCS30	<b>Alimentación:</b> AC 230V 50Hz.						
	<b>Área de Ensayo:</b> Cámara de Faraday, FAC-1						
	<b>Disposición test:</b> Sobremesa.						
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.	<b>Cables de entrada/salida:</b> El equipo no dispone de cables de entrada-salida.						
<b>EMISIONES CONDUCCIDAS CONTINUAS</b>							
<b>Alimentación</b>							
<b>Alimentación principal</b>							
T. in bornes de alimentación (dBµV)	PASA Vgp < lim QP ; Vavg < lim AVG						
<b>Procedencia y tipo de las emisiones más importantes</b>							
<b>Fuente:</b> Equipo bajo prueba	<b>Tipo:</b> Banda ancha						
<b>RESULTADO:</b> PASA							
<b>Comentarios:</b>							

EMISIONES CONDUCCIDAS CONTINUAS II	
<b>Peticionario:</b> BENITO URBAN S.L.U	<b>Equipo Bajo Prueba:</b> Lámpara de exterior
<b>Nº Expediente:</b> 14/31700721	<b>Marca:</b> BENITO URBAN
<b>Procedimiento:</b> C5400276	<b>Modelo:</b> NEOVILLA LED 35 2.0
<b>Norma básica:</b> UNE-EN 55015:2013	<b>Número de serie:</b> ---; Id: 001
	<b>Fecha de recepción:</b> 14-03-2014

PRESCAN



— neutro MaxPeak-ClearWrite    — 55015\_Mains\_Qp    — 55015\_Mains\_Avg  
— linea MaxPeak-ClearWrite    ▼ QuasiPeak-QPK (Single)    ▲ Average-AVG (Single)

MEDIDAS FINALES

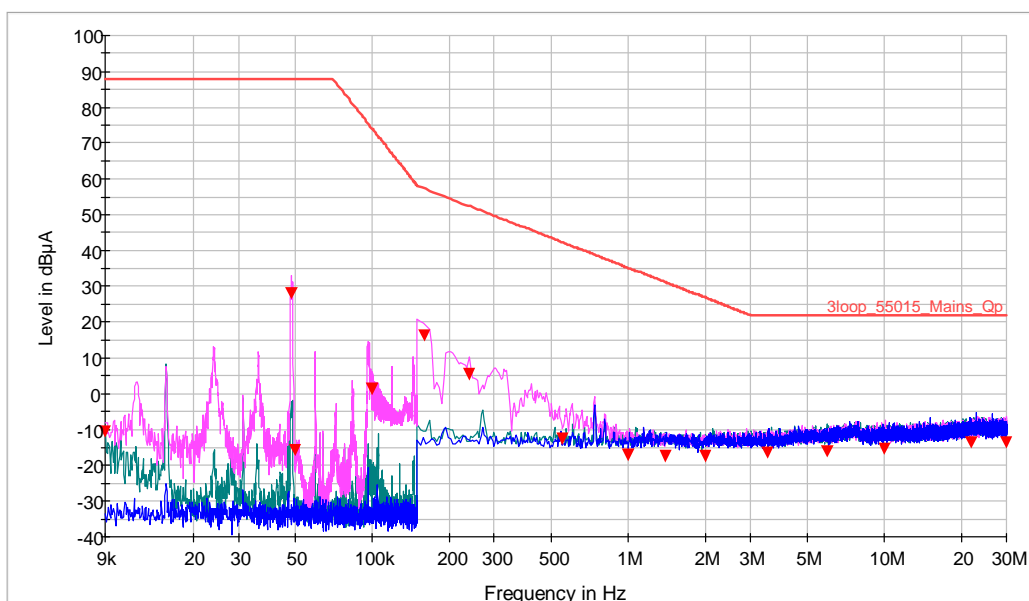
Frequency (MHz)	QuasiPeak (dBµV)	Limit - QPK (dBµV)	Margin - QPK (dB)	Average (dBµV)	Limit - AVG (dBµV)	Margin - AVG (dB)	Line	Corr. (dB)	Comment
0.009000	69.9	110.0	40.2	---	---	---	L1	11.5	BB
0.048120	53.1	110.0	56.9	---	---	---	L1	10.4	BB
0.050000	34.0	90.0	56.0	---	---	---	L1	10.4	BB
0.099320	58.6	83.8	25.1	---	---	---	L1	10.3	BB
0.100000	57.5	83.7	26.2	---	---	---	L1	10.3	BB
0.150000	58.6	66.0	7.4	45.0	56.0	11.0	L1	10.3	BB
0.160000	55.4	65.5	10.1	38.7	55.5	16.8	N	10.3	BB
0.194000	52.2	63.9	11.7	32.7	53.9	21.2	L1	10.3	BB
0.240000	41.5	62.1	20.6	32.9	52.1	19.2	L1	10.3	BB
0.550000	24.0	56.0	32.0	12.5	46.0	33.5	L1	10.3	BB
0.914000	39.7	56.0	16.3	33.6	46.0	12.4	L1	10.4	BB
1.000000	27.0	56.0	29.0	15.5	46.0	30.5	L1	10.4	BB
1.400000	37.7	56.0	18.3	28.9	46.0	17.1	L1	10.4	BB
2.000000	38.2	56.0	17.8	28.3	46.0	17.7	L1	10.4	BB
3.500000	36.0	56.0	20.0	25.3	46.0	20.7	L1	10.6	BB
6.000000	24.0	60.0	36.0	17.0	50.0	33.0	L1	10.8	BB
10.000000	25.8	60.0	34.2	19.2	50.0	30.8	L1	11.1	BB
22.000000	20.7	60.0	39.3	13.4	50.0	36.6	L1	12.6	BB
29.990000	29.7	60.0	30.3	19.8	50.0	30.2	L1	14.0	BB

<b>EMISIONES RADIADAS DE CAMPO MAGNÉTICO</b>	
<b>Peticionario:</b> BENITO URBAN S.L.U	<b>Equipo bajo prueba:</b> Lámpara de exterior
<b>Nº Expediente:</b> 14/31700721	<b>Marca:</b> BENITO URBAN
<b>Procedimiento:</b> C5400278	<b>Modelo:</b> NEOVILLA LED 35 2.0
<b>Norma básica:</b> UNE-EN 55015:2013	<b>Número de serie:</b> ---; Id: 001
	<b>Fecha de recepción:</b> 14-03-2014
<b>Criterio func. según norma:</b> UNE-EN 55015:2013	<b>Tipo de ensayo:</b> Conformidad
	<b>Temperatura:</b> 21.3 °C <b>Humedad:</b> 45.1 % <b>Presión Atm.:</b> 1006 hPa
<b>Técnico:</b> Juan Carlos Parrilla	
<b>Supervisado:</b>	<b>Ejercicio de ensayo:</b>
<b>Fecha de ensayo:</b> 21-03-2014	Funcionamiento continuo con precalentamiento según norma. <b>Alimentación:</b> AC 230V 50Hz.
<b>Equipo:</b> Receptor EMI RS ESCS30 Antena de triple lazo RS HMO_20_Z1	<b>Área de Ensayo:</b> Cámara de Faraday, FAC-1
	<b>Disposición de test:</b> Sobremesa.
	<b>Cables de entrada/salida:</b> El equipo no dispone de cables de entrada-salida.
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.	
<b>CORRIENTE INDUCIDA POR EL CAMPO MAGNÉTICO</b>	
Medida antena X: PASA	
Medida antena Y: PASA	
Medida antena Z: PASA	
<b>RESULTADO:</b> PASA	
<b>Comentario:</b>	
Peor resultado en el eje Y	

EMISIONES RADIADAS DE CAMPO MAGNÉTICO II	
<b>Peticionario:</b> BENITO URBAN S.L.U	<b>Equipo Bajo prueba:</b> Lámpara de exterior
<b>Nº Expediente:</b> 14/31700721	<b>Marca:</b> BENITO URBAN
<b>Procedimiento:</b> C5400279	<b>Modelo:</b> NEOVILLA LED 35 2.0
<b>Norma básica:</b> UNE-EN 55015:2013	<b>Número de serie:</b> ---; Id: 001
	<b>Fecha de recepción:</b> 14-03-2014

**CORRIENTE INDUCIDA POR EL CAMPO MAGNÉTICO**

**PRESCAN**

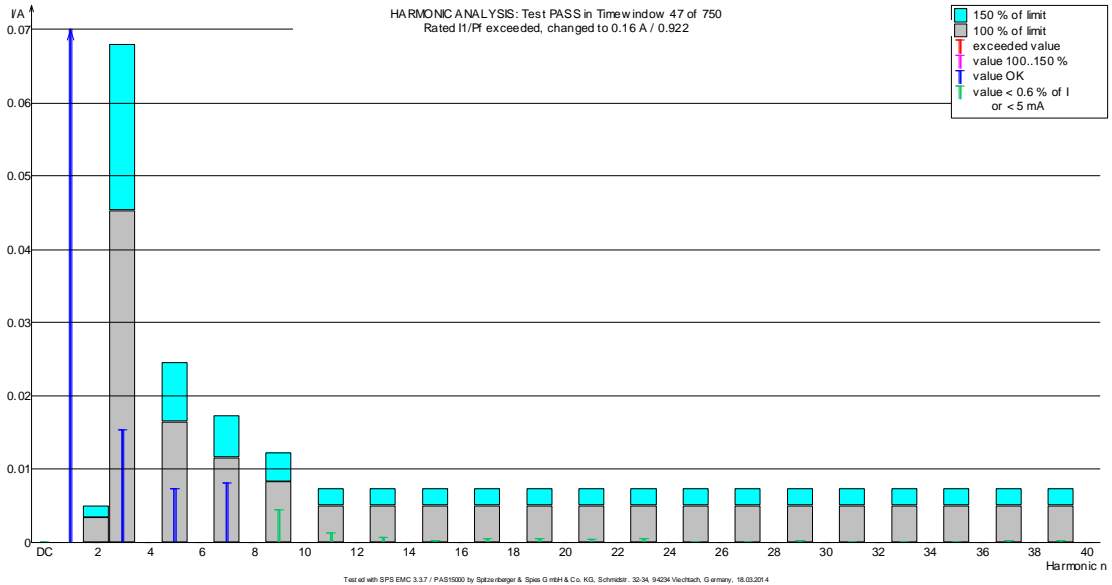


— Eje z MaxPeak      — 3loop\_55015\_Mains\_Qp      — Eje y MaxPeak  
— Eje x MaxPeak      ▼ QuasiPeak-QPK (Single)

**MEDIDAS FINALES**

Frequency (MHz)	QuasiPeak (dBµA)	Meas. Time (ms)	Bandwidth (kHz)	Triple Loop frame	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµA)
0.009000	-10.5	15000.0	0.200	Y	0.0	98.5	88.0
0.048040	28.2	15000.0	0.200	Y	0.1	59.8	88.0
0.050000	-15.7	15000.0	0.200	Y	0.1	103.7	88.0
0.100000	1.5	15000.0	0.200	Y	0.1	72.5	74.0
0.160000	16.3	15000.0	9.000	Y	0.1	41.0	57.2
0.240000	5.4	15000.0	9.000	Y	0.1	46.9	52.4
0.550000	-12.4	15000.0	9.000	Y	0.1	54.8	42.4
1.000000	-17.1	15000.0	9.000	Y	0.1	52.3	35.2
1.400000	-17.4	15000.0	9.000	Y	0.1	48.5	31.2
2.000000	-17.6	15000.0	9.000	Y	0.1	44.4	26.9
3.500000	-16.4	15000.0	9.000	Y	0.2	38.4	22.0
6.000000	-15.9	15000.0	9.000	Y	0.2	37.9	22.0
10.000000	-15.4	15000.0	9.000	Y	0.4	37.4	22.0
22.000000	-13.7	15000.0	9.000	Y	1.0	35.7	22.0
29.990000	-13.7	15000.0	9.000	Y	1.0	35.7	22.0

<b>EMISIONES DE FLUCTUACIONES DE TENSIÓN</b>																																																																																				
<b>Peticionario:</b> BENITO URBAN S.L.U		<b>Equipo Bajo Prueba:</b> Lámpara de exterior																																																																																		
<b>Nº Expediente:</b> 14/31700721		<b>Marca:</b> BENITO URBAN																																																																																		
<b>Procedimiento:</b> C5400281		<b>Modelo:</b> NEOVILLA LED 35 2.0																																																																																		
<b>Norma básica:</b> UNE-EN 61000-3-3:2013		<b>Número de serie:</b> ---; Id: 001																																																																																		
		<b>Fecha de recepción:</b> 14-03-2014																																																																																		
<b>Criterio func. según la norma:</b> UNE-EN 61000-3-3:2013		<b>Tipo de ensayo:</b> Conformidad	<b>Temperatura:</b> 21.4 °C <b>Humedad:</b> 41.9 % <b>Presión Atm.:</b> 1006 hPa																																																																																	
<b>Criterio:</b> Pasa																																																																																				
<b>Técnico:</b> Juan Carlos Parrilla		<b>Ejercicio de ensayo:</b> Funcionamiento continuo con precalentamiento según norma.																																																																																		
<b>Supervisado:</b>		<b>Alimentación:</b> AC 230V 50Hz.																																																																																		
<b>Fecha de ensayo:</b> 19-02-2014																																																																																				
<b>Equipo:</b> Spitzenberger+Spies EMV E 10000/PAS																																																																																				
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.		<b>Disposición test:</b> Sobremesa.																																																																																		
		<b>Cables entrada/salida:</b> El equipo no dispone de cables de entrada-salida.																																																																																		
<b>RESULTADO: PASA</b>																																																																																				
<p>Test conditions: EN 61000-3-3:2008 / 230 V / 50 Hz / Phase L1 / Obs 1 x 10 min / Ztest (0.400+j0.250) Ohm</p> <p>FLICKER: Test PASS!</p> <table border="1"> <thead> <tr> <th>Time</th> <th>Pmax</th> <th>Pst</th> <th>Sliding Plt</th> <th>d(t)&gt;3.30% [s]</th> <th>dmax [%]</th> <th>dc [%]</th> <th>PA SS</th> <th>FA IL</th> </tr> </thead> <tbody> <tr> <td>13:29:15</td> <td>0.003</td> <td>0.0360</td> <td>- . . . . .</td> <td>0.000</td> <td>0.063</td> <td>- . . . . .</td> <td>X</td> <td></td> </tr> <tr> <td colspan="2"><b>Limits:</b></td> <td>1.000</td> <td>0.650</td> <td>0.500</td> <td>4.000</td> <td>3.300</td> <td></td> <td></td> </tr> <tr> <td colspan="7">Pt: 0.015724 (calculated over 12 periods)</td> <td>X</td> <td></td> </tr> <tr> <td colspan="9">Evaluated: PST, PLT, Sliding PLT, dc, dmax, d(t)</td> </tr> </tbody> </table> <p>FLICKER: Source test PASS!</p> <table border="1"> <thead> <tr> <th>Time</th> <th>Pmax</th> <th>Pst</th> <th>Sliding Plt</th> <th>d(t)&gt;3.30% [s]</th> <th>dmax [%]</th> <th>dc [%]</th> <th>PA SS</th> <th>FA IL</th> </tr> </thead> <tbody> <tr> <td>13:29:15</td> <td>0.002</td> <td>0.0290</td> <td>- . . . . .</td> <td>0.000</td> <td>0.041</td> <td>- . . . . .</td> <td>X</td> <td></td> </tr> <tr> <td colspan="7">Pt: 0.012667 (calculated over 12 periods)</td> <td></td> <td></td> </tr> <tr> <td colspan="9">Evaluated: PST &lt;= 0.4 dmax &lt; 20 % dmax1</td> </tr> </tbody> </table> <p style="font-size: small; text-align: center;">Tested with SPS EMC 3.3.7 / PAS15000 by Spitzenberger &amp; Spies GmbH &amp; Co. KG, Schmidstr. 32-34, 94234 Viechtach, Germany, 18.03.2014</p>				Time	Pmax	Pst	Sliding Plt	d(t)>3.30% [s]	dmax [%]	dc [%]	PA SS	FA IL	13:29:15	0.003	0.0360	- . . . . .	0.000	0.063	- . . . . .	X		<b>Limits:</b>		1.000	0.650	0.500	4.000	3.300			Pt: 0.015724 (calculated over 12 periods)							X		Evaluated: PST, PLT, Sliding PLT, dc, dmax, d(t)									Time	Pmax	Pst	Sliding Plt	d(t)>3.30% [s]	dmax [%]	dc [%]	PA SS	FA IL	13:29:15	0.002	0.0290	- . . . . .	0.000	0.041	- . . . . .	X		Pt: 0.012667 (calculated over 12 periods)									Evaluated: PST <= 0.4 dmax < 20 % dmax1								
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<b>EMISIONES DE ARMÓNICOS DE CORRIENTE</b>		
<b>Peticionario:</b> BENITO URBAN S.L.U	<b>Equipo Bajo Prueba:</b> Lámpara de exterior	
<b>Nº Expediente:</b> 14/31700721	<b>Marca:</b> BENITO URBAN	
<b>Procedimiento:</b> C5400281	<b>Modelo:</b> NEOVILLA LED 35 2.0	
<b>Norma básica:</b> UNE-EN 61000-3-2:2006/A1:2010/A2:2010 +A1:2010+A2:2010	<b>Número de serie:</b> ---; Id: 001	
	<b>Fecha de recepción:</b> 14-03-2014	
<b>Criterio func. según la norma:</b> UNE-EN 61000-3-2:2006/A1:2010/A2:2010 +A1:2010+A2:2010	<b>Tipo de ensayo:</b> Conformidad	<b>Temperatura:</b> 21.4 °C
		<b>Humedad:</b> 41.9 %
<b>Criterio:</b> Pasa		<b>Presión Atm.:</b> 1006 hPa
<b>Técnico:</b> Juan Carlos Parrilla	<b>Ejercicio de ensayo:</b> Funcionamiento continuo con precalentamiento según norma.	
<b>Supervisado:</b>	<b>Alimentación:</b> AC 230V 50Hz.	
<b>Fecha de ensayo:</b> 18-03-2014		
<b>Equipo:</b> Spitzenberger+Spies EMV E 10000/PAS		
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.	<b>Disposición test:</b> Sobremesa.	
	<b>Cables entrada/salida:</b> El equipo no dispone de cables de entrada-salida.	
<b>RESULTADO:</b> Clase Ca >25W		
<p style="text-align: center;">Spectrum Time window 47 of 750 - EN61000-3-2 Class C a)</p> <p style="text-align: center;">HARMONIC ANALYSIS: Test PASS in Time window 47 of 750 Rated I1/P1 exceeded, changed to 0.16 A / 0.922</p>  <p style="text-align: center;"><small>Tested with SPS EMC 3.3.7 / PAS10000 by Spitzenberger &amp; Spies GmbH Co. KG, Schindler, 33-34, 94254 Vöcklabach, Germany, 18.03.2014</small></p>		
<b>Comentarios:</b>		



EMISIONES DE ARMÓNICOS DE CORRIENTE II	
<b>Peticionario:</b> BENITO URBAN S.L.U	<b>Equipo Bajo prueba:</b> Lámpara de exterior
<b>Nº Expediente:</b> 14/31700721	<b>Marca:</b> BENITO URBAN
<b>Procedimiento:</b> C5400279	<b>Modelo:</b> NEOVILLA LED 35 2.0
<b>Norma básica:</b> UNE-EN 61000-3-2:2006/A1:2010/A2:2010+A1:2010+A2:2010	<b>Número de serie:</b> ---; Id: 001
	<b>Fecha de recepción:</b> 14-03-2014

Maximum RMS current and corresponding values in timewindow 47:

Voltage: 230.32 Vrms THD=0.00 % THV=0.009 V POHV=0.004 V PWHD=0.01 %  
 Current: 0.165 Arms THD=12.06 % THC=0.020 A POHC=0.001 A PWHD=4.66 %  
 Power: 36.7 W P1=36.7 W 38.0 VA  
 Power factor: 0.965 CosPhi1 : 0.972

Test conditions: EN 61000-3-2:2006 + A1:2009 + A2:2009, f=50 Hz, Phase=L1, Range=0.80 A  
 Time window =10/12 (200ms), Grouping=on, Rated I1=1.3 A, Rated pf=0.922

No Ztest selected

harmonic cur. < 0.6 % of I or < 5 mA are NOT DISREGARD for calc. of THD, THC, POHC, PWHD

HARMONIC ANALYSIS: Test PASS

Tobs = entire measurement; POHC: avg=0.00 A, limits=0.02 A

lavg=0.165 Arms; Rated I1/Pf exceeded, changed to 0.16 A/0.922

Ha	Entire measurement (2.5 min = 750 time window s)					Worst 2.5 min		Average		P A S S	F A I L
	Maximum	Window	EN61000-3-2 Class C a)	Margin in MaxWin	100 to 150%	Ex- ceeded	100 to 150%	Ex- ceeded	Value		
DC	-0.0002 A	4	-- -- --	-- -- --	0	0	n.e.	n.e.	-0.0001 A	0	X
1	0.1639 A	47	-- -- --	-- -- --	0	0	n.e.	n.e.	0.1637 A	0	X
2	0.0002 A	92	0.0033 A	-95.1 %	0	0	n.e.	n.e.	0.0001 A	0	X
3	0.0156 A	135	0.0453 A	-65.7 %	0	0	n.e.	n.e.	0.0155 A	0	X
4	0.0001 A	88	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
5	0.0075 A	678	0.0164 A	-54.2 %	0	0	n.e.	n.e.	0.0075 A	0	X
6	0.0001 A	123	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
7	0.0082 A	35	0.0115 A	-28.1 %	0	0	n.e.	n.e.	0.0082 A	0	X
8	0.0001 A	1	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
9	0.0045 A	1	0.0082 A	-45.2 %	0	0	n.e.	n.e.	0.0045 A	0	X
10	0.0001 A	85	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
11	0.0015 A	651	0.0049 A	-70.4 %	0	0	n.e.	n.e.	0.0014 A	0	X
12	0.0001 A	654	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0000 A	0	X
13	0.0008 A	413	0.0049 A	-83.6 %	0	0	n.e.	n.e.	0.0008 A	0	X
14	0.0001 A	560	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
15	0.0004 A	692	0.0049 A	-92.6 %	0	0	n.e.	n.e.	0.0004 A	0	X
16	0.0001 A	2	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
17	0.0007 A	1	0.0049 A	-86.3 %	0	0	n.e.	n.e.	0.0007 A	0	X
18	0.0001 A	120	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0000 A	0	X
19	0.0006 A	1	0.0049 A	-86.9 %	0	0	n.e.	n.e.	0.0006 A	0	X
20	0.0001 A	219	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
21	0.0005 A	721	0.0049 A	-89.2 %	0	0	n.e.	n.e.	0.0005 A	0	X
22	0.0001 A	525	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
23	0.0007 A	155	0.0049 A	-85.7 %	0	0	n.e.	n.e.	0.0007 A	0	X
24	0.0001 A	479	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
25	0.0003 A	66	0.0049 A	-93.9 %	0	0	n.e.	n.e.	0.0003 A	0	X
26	0.0001 A	624	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
27	0.0003 A	74	0.0049 A	-94.7 %	0	0	n.e.	n.e.	0.0002 A	0	X
28	0.0001 A	638	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
29	0.0004 A	725	0.0049 A	-91.1 %	0	0	n.e.	n.e.	0.0004 A	0	X
30	0.0001 A	1	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
31	0.0002 A	106	0.0049 A	-95.5 %	0	0	n.e.	n.e.	0.0002 A	0	X
32	0.0001 A	121	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
33	0.0002 A	615	0.0049 A	-95.6 %	0	0	n.e.	n.e.	0.0002 A	0	X
34	0.0001 A	22	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
35	0.0003 A	656	0.0049 A	-94.7 %	0	0	n.e.	n.e.	0.0003 A	0	X
36	0.0001 A	675	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
37	0.0003 A	71	0.0049 A	-93.6 %	0	0	n.e.	n.e.	0.0003 A	0	X
38	0.0001 A	472	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X
39	0.0004 A	3	0.0049 A	-91.4 %	0	0	n.e.	n.e.	0.0004 A	0	X
40	0.0001 A	540	-- -- --	-- -- --	0	0	n.e.	n.e.	0.0001 A	0	X

average value < 0.6 % of lavg or < 5 mA n.e. = not eval

INMUNIDAD A LAS DESCARGAS ELECTROESTÁTICAS							
<b>Peticionario:</b> BENITO URBAN S.L.U				<b>Equipo Bajo Prueba:</b> Lámpara de exterior			
<b>Nº Expediente:</b> 14/31700721				<b>Marca:</b> BENITO URBAN			
<b>Procedimiento:</b> C5400281				<b>Modelo:</b> NEOVILLA LED 35 2.0			
<b>Norma básica:</b> UNE-EN 61000-4-2:2010				<b>Número de serie:</b> ---; Id: 001			
<b>Criterio func. según la norma:</b> UNE 61547:2011				<b>Tipo de ensayo:</b> Conformidad		<b>Temperatura:</b> 23.2 °C	
<b>Criterio:</b> B						<b>Humedad:</b> 40.5 %	
<b>Técnico:</b> Juan Carlos Parrilla						<b>Presión Atm.:</b> 1006 hPa	
<b>Supervisado:</b>				<b>Ejercicio de ensayo:</b> Funcionamiento continuo con precalentamiento según norma.			
<b>Fecha de ensayo:</b> 19-02-2014				<b>Alimentación:</b> AC 230V 50Hz.			
<b>Equipo:</b> Schaffner NSG 438				<b>Disposición test:</b> Sobremesa.			
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.				<b>Cables entrada/salida:</b> El equipo no dispone de cables de entrada-salida.			
<b>DC-</b> Contacto Directo, punta de prueba CÓNICA				<b>IH-</b> Contacto indirecto en plano horizontal, punta de prueba CÓNICA			
<b>AC-</b> Contacto por Aire, punta de prueba REDONDA.				<b>IV-</b> Contacto indirecto en plano vertical, punta de prueba CÓNICA.			
Prueba nivel	Nivel	Descargas		Pol +/-	Punto de aplicación	Resultado	Comentarios
		Nº	Tipo				
1	4 kV	10	IV	+ -	0°	A	
2	4 kV	10	IV	+ -	90°	A	
3	4 kV	10	IV	+ -	180°	A	
4	4 kV	10	IV	+ -	270°	A	
5	4 kV	10	IH	+ -	0°	A	
6	4 kV	10	IH	+ -	90°	A	
7	4 kV	10	IH	+ -	180°	A	
8	4 kV	10	IH	+ -	270°	A	
9	4 kV	10	DC	+ -	CHASIS METÁLICO	A	
10	4 kV	10	DC	+ -	TORNILLOS	A	
11	2, 4, 8 kV	10	AC	+ -	CABLE ALIMENTACION	A	No descarga
12	2, 4, 8 kV	10	AC	+ -	CRISTAL PROTECTOR	A	No descarga
<b>Comentarios:</b>							

<b>INMUNIDAD A LOS CAMPOS ELECTROMAGNÉTICOS</b>				
<b>Peticionario:</b> BENITO URBAN S.L.U		<b>Equipo Bajo Prueba:</b> Lámpara de exterior		
<b>Nº Expediente:</b> 14/31700721		<b>Marca:</b> BENITO URBAN		
<b>Procedimiento:</b> C5400285		<b>Modelo:</b> NEOVILLA LED 35 2.0		
<b>Norma básica:</b> UNE-EN 61000-4-3:2007/A1:2008/A2:2011		<b>Número de serie:</b> ---; Id: 001		
<b>Criterio func. según la norma:</b> UNE 61547:2011		<b>Fecha de recepción:</b> 14-03-2014		
<b>Criterio:</b> A		<b>Tipo de ensayo:</b> Conformidad	<b>Temperatura:</b> 22,4 °C	<b>Humedad:</b> 35,3 %
<b>Técnico:</b> Andreu Tey			<b>Presión Atm.:</b> 1011 hPa	
<b>Supervisado:</b>		<b>Ejercicio de ensayo:</b> Funcionamiento continuo con precalentamiento según norma.		
<b>Fecha de ensayo:</b> 14-03-2014		<b>Alimentación:</b> AC 230V 50Hz.		
<b>Área de ensayo:</b> Cámara semianecoica, SAC-1		<b>Disposición test:</b> Sobremesa.		
<b>Tamaño EBP:</b> 650x430x430 mm.		<b>Cables entrada/salida:</b> El equipo no dispone de cables de entrada-salida.		
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.		Comprobación del campo: <input checked="" type="checkbox"/> Puntos para calibración de campo: L=0,5m: 16 (80MHz – 1GHz)		
<b>Rango de frecuencia</b>	<b>80MHz – 1GHz</b>			
Severidad	3 V/m			
Tipo de Antena	Logoperiódica			
Paso de frecuencia	1%		<input checked="" type="checkbox"/> 0,3	<input checked="" type="checkbox"/> 1,3
Tiempo de permanencia	3s		<input checked="" type="checkbox"/> 2,3	<input checked="" type="checkbox"/> 3,3
Modulación	80% AM 1 KHz		<input checked="" type="checkbox"/> 0,2	<input checked="" type="checkbox"/> 1,2
Dist. ESE/antena	3m		<input checked="" type="checkbox"/> 2,2	<input checked="" type="checkbox"/> 3,2
Polarización	Horizontal	Vertical	<input checked="" type="checkbox"/> 0,1	<input checked="" type="checkbox"/> 1,1
CARA	FRONTAL 0°	A	<input checked="" type="checkbox"/> 2,1	<input checked="" type="checkbox"/> 3,1
	IZQUIERDA 90 °	A	<input checked="" type="checkbox"/> 0,0	<input checked="" type="checkbox"/> 1,0
	POSTERIOR 180 °	A	<input checked="" type="checkbox"/> 2,0	<input checked="" type="checkbox"/> 3,0
	DERECHA 270°	A	Comprobación del campo: <input checked="" type="checkbox"/>	
<b>RESULTADO:</b> PASA				
<b>Comentarios:</b>				

INMUNIDAD A LOS TRANSITORIOS RÁPIDO EN RÁFAGAS					
<b>Peticionario:</b> BENITO URBAN S.L.U			<b>Equipo Bajo Prueba:</b> Lámpara de exterior		
<b>Nº Expediente:</b> 14/31700721			<b>Marca:</b> BENITO URBAN		
<b>Procedimiento:</b> C5400283			<b>Modelo:</b> NEOVILLA LED 35 2.0		
<b>Norma básica:</b> UNE-EN 61000-4-4:2005/A1:2010/CORR:2010			<b>Número de serie:</b> ---; Id: 001		
<b>Criterio func. según la norma:</b> UNE 61547:2011			<b>Fecha de recepción:</b> 14-03-2014		
<b>Criterio:</b> B			<b>Tipo de ensayo:</b> Conformidad	<b>Temperatura:</b> 27.0 °C	<b>Humedad:</b> 33.4 %
<b>Técnico:</b> Juan Carlos Parrilla			<b>Presión Atm.:</b> 1006 hPa		
<b>Supervisado:</b>			<b>Ejercicio de ensayo:</b> Funcionamiento continuo con precalentamiento según norma.		
<b>Fecha de ensayo:</b> 18-03-2014			<b>Alimentación:</b> AC 230V 50Hz.		
<b>Equipos:</b> Generador Schaffner NSG 2025-8			<b>Disposición test:</b> Sobremesa.		
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.			<b>Cables entrada/salida:</b> El equipo no dispone de cables de entrada-salida.		
Puerto de ensayo	Aplicación	Severidad (kV)	Duración	Resultado	Comentarios
Alimentación AC	L1+N+GND	+1	2 min	A	
		-1	2 min	A	
<b>Comentarios:</b>					

INMUNIDAD A LAS ONDAS DE CHOQUE (1,2/50)								
<b>Peticionario:</b> BENITO URBAN S.L.U				<b>Equipo Bajo Prueba:</b> Lámpara de exterior				
<b>Nº Expediente:</b> 14/31700721				<b>Marca:</b> BENITO URBAN				
<b>Procedimiento:</b> C5400281				<b>Modelo:</b> NEOVILLA LED 35 2.0				
<b>Norma básica:</b> <b>iError! No se encuentra el origen de la referencia.</b>				<b>Número de serie:</b> ---; Id: 001				
<b>Criterio func. según la norma:</b> UNE 61547:2011				<b>Tipo de ensayo:</b> Conformidad		<b>Temperatura:</b> 24,3 °C		
<b>Criterio:</b> C						<b>Humedad:</b> 35,3 %		
<b>Técnico:</b> Pedro Moreno						<b>Presión Atm.:</b> 1003 hPa		
<b>Supervisado:</b>				<b>Ejercicio de ensayo:</b>				
<b>Fecha de ensayo:</b> 24-03-2014				Funcionamiento continuo con precalentamiento según norma.				
<b>Equipo:</b> HAEFELY PSURGE8000 HAEFELY PCD130				<b>Alimentación:</b> AC 230V 50Hz.				
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.				<b>Disposición test:</b> Sobremesa.				
				<b>Cables entrada/salida:</b> El equipo no dispone de cables de entrada-salida.				
Aplicación	Zo	Línea	Fase	Severidad (kV)	nº Pulsos		Resultado	Comentarios
					+	-		
ALIMENTACIÓN								
Diferencial	2	L1 / N	90	0,5	5	-	A	
			270	0,5	-	5	A	
Común	12	L1 / E	90	2	5	-	B	Nota 1
			270	2	-	5	A	
Común	12	N / E	90	2	5	-	B	Nota 1
			270	2	-	5	A	
<b>Comentarios:</b>								
<b>Nota 1:</b> Durante la perturbación la lámpara se apaga. Se recupera sola.								

IMNUNIDAD A PERTURBACIONES CONDUCTIDAS				
<b>Peticionario:</b> BENITO URBAN S.L.U		<b>Equipo bajo prueba:</b> Lámpara de exterior		
<b>Nº Expediente:</b> 14/31700721		<b>Marca:</b> BENITO URBAN		
<b>Procedimiento:</b> C5400284		<b>Modelo:</b> NEOVILLA LED 35 2.0		
<b>Norma básica:</b> UNE-EN 61000-4-6:2009		<b>Número de serie:</b> ---; Id: 001		
		<b>Fecha de recepción:</b> 14-03-2014		
<b>Criterio func. según norma:</b> UNE 61547:2011		<b>Tipo de test</b> Conformidad	<b>Temperatura:</b> 26.9 °C	
<b>Criterio:</b> A			<b>Humedad:</b> 33.4 %	
			<b>Presión Atm.:</b> 1006 hPa	
<b>Técnico:</b> Juan Carlos Parrilla		<b>Ejercicio de ensayo:</b> Funcionamiento continuo con precalentamiento según norma.		
<b>Supervisado:</b>		<b>Alimentación:</b> AC 230V 50Hz.		
<b>Fecha de ensayo:</b> 18-03-2014		<b>Disposición de test:</b> Sobremesa.		
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.		<b>Cables de entrada/salida:</b> El equipo no dispone de cables de entrada-salida.		
<b>Tamaño EBP:</b> 650x430x430 mm.		<b>¿Parte de un sistema?:</b> Si		
<b>Nivel de Severidad:</b> 3 V rms		<b>Tiempo de permanencia:</b> 3 s.		
<b>Margen de frecuencias:</b> 150 KHz - 80 MHz		<b>Incremento:</b> 1%		
<b>Modulación:</b> 80% AM 1 kHz				
Acoplamiento	Severidad (V)	Punto aplicación	Resultado	Comentarios
M2	3	Alimentación AC	A	
<b>Comentarios:</b>				

INMUNIDAD A LOS HUECOS DE TENSIÓN, INTERRUPCIONES BREVES Y VARIACIONES DE TENSIÓN					
<b>Peticionario:</b> BENITO URBAN S.L.U			<b>Equipo bajo prueba:</b> Lámpara de exterior		
<b>Nº Expediente:</b> 14/31700721			<b>Marca:</b> BENITO URBAN		
<b>Procedimiento:</b> C5400288			<b>Modelo:</b> NEOVILLA LED 35 2.0		
<b>Norma básica:</b> UNE-EN 61000-4-11:2005			<b>Número de serie:</b> ---; Id: 001		
<b>Criterio func. según la norma</b> UNE 61547:2011			<b>Fecha de recepción:</b> 14-03-2014		
<b>Criterio:</b> C/B			<b>Tipo de ensayo:</b> Conformidad	<b>Temperatura:</b> 21.4 °C	<b>Humedad:</b> 41.9 %
<b>Técnico:</b> Juan Carlos Parrilla			<b>Presión Atm.:</b> 1006 hPa		
<b>Supervisado:</b>			<b>Ejercicio de ensayo:</b> Funcionamiento continuo con precalentamiento según norma.		
<b>Fecha de ensayo:</b> 18-03-2014			<b>Alimentación:</b> AC 230V 50Hz.		
<b>Equipo auxiliar:</b> El equipo bajo prueba no dispone de equipos de control ni auxiliares.			<b>Disposición del test:</b> Sobremesa.		
			<b>Cables de entrada/salida:</b> El equipo no dispone de cables de entrada-salida.		
HUECOS DE TENSIÓN					
Tensión Nominal	Nivel U Aplicada %	Duración en milisegundos	Resultado	Criterio	Comentarios
230 V / 50 Hz	70	200	A	C	
INTERRUPCIONES BREVES					
Tensión Nominal	Nivel U Aplicada %	Duración en milisegundos	Resultado	Criterio	Comentarios
230 V / 50 Hz	0	10	A	B	
Comentarios:					

## 2.4 Componentes de las Luminarias

- UNE-EN 62031. Módulos LED para alumbrado general.  
Requisitos de seguridad. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.)
- UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13:  
Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.
- UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED.
- Requisitos de funcionamiento.





Product Service

# Attestation of Compliance

No. N5A 17 11 02897 001

**Holder of Certificate: NOVATILU, S.L.U**Via Ausetania 11  
08560 Manlleu  
SPAIN**Product: LED Module**

This Attestation of Compliance is issued on a voluntary basis for electrical equipment below the voltage limits of Low Voltage Directive 2014/35/EU. The essential requirements are fulfilled accordingly based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for testing and certification. See also notes overleaf.

**Test report no.:** 701281718401-00**Date,** 2017-11-16  
( Binwen Zhang )

Other relevant European directives have to be observed. If they require CE marking, it may be affixed on the product after preparation of the necessary technical documentation as well as the EU declaration of conformity.

Page 1 of 3



Product Service

**Attestation of Compliance**  
**No. N5A 17 11 02897 001**

**Model(s):** AML079XXX,AML0612XXX,AML0616XXX,  
AML0624XXX,AML0632XXX,ANL16LXXX,  
ANL32LXXX,AML0412XXX,AML0315XXX,  
AML0248XXX,AML0236XXX,AML0224XXX,  
AML0130XXX

**Brand:** NOVATILU

**Parameters:**

Rated voltage:	See attachment
Protection Class:	Class III
Rated power:	See attachment
Degree of protection:	IP66
tc:	85°C
ta:	45°C

**Tested according to:** EN 62031:2008/A2:2015  
EN 62493:2015  
EN 62471:2008

**Attestation of Compliance**  
**No. N5A 17 11 02897 001**



Product Service

Model type	Max. Wattage(W)	Voltage (dc.V)	Quantity of LEDs
AML079XXX	30	21,6~36	9
AML0612XXX	30	25,2~42	12
AML0616XXX	40	32,4~54	16
AML0624XXX	60	25,2~42	24
AML0632XXX	80	32,4~54	32
ANL16LXXX	40	32,4~54	16
ANL32LXXX	80	32,4~54	32
AML0412XXX	80	25,2~42	12
AML0315XXX	40	32,4~54	15
AML0248XXX	100	25,2~42	48
AML0236XXX	80	25,2~42	36
AML0224XXX	60	25,2~42	24
AML0130XXX	60	21,6~36	30

Note: XXX can be 001-100, represents the rated power of product, e.g. 005=5W



APL

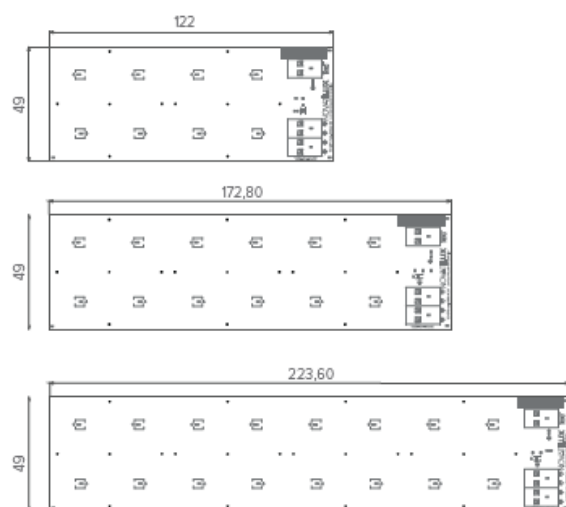
# PCB



El módulo de LED del Grupo Benito Novatilu mediante su tecnología propia ofrece un alto rendimiento lumínico con las máximas garantía de seguridad y una óptima calidad fotométrica, gracias al principio de adiciones donde cada LED dispone de su lente específica.

- MCPCB de Aluminio de Alta Transferencia Térmica en formatos (8, 12 y 16 LEDs) según Estándar Zhaga Book 15.
- Tecnología LED de Alta Eficiencia en formato 5050 con rendimiento >172lm/W.
- Control del flujo lumínico mediante lentes PMMA 2x2 de alta transparencia. Disponibilidad >18 distribuciones lumínicas diferentes.
- Doble Protección de sobretensiones Transitorias.
- Incluye sensor NTC de Temperatura para la protección Térmica del LED.
- Disponible en Diferentes Temperaturas de Color (de PC Ambar a 5000K) y distintos índices de reproducción cromática IRC (>70 o >80).

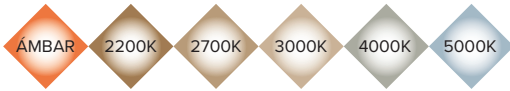
PLANO:



CONFIGURACIONES:

- APL16ZH - 48Vdc
- APL12ZH - 36Vdc
- APL8ZH - 24Vdc

## RANGO DE TEMPERATURA DE COLOR



## LAS VERSIONES DE PCB BENITO NOVATILU

REF.	Nº LEDs	I <sub>max</sub> (mA)	W <sub>max</sub> (W)	Flujo luminoso Real (T) (=85°C)	Eficiencia lm/W	Flujo luminoso Real (T) (=25°C)	Eficiencia lm/W
<APL8ZH	8	1050	25,2	3881	154	4208	167
<APL12ZH	12	1050	37,8	5821	154	6313	167
<APL16ZH	16	1050	50,4	7762	154	8417	167

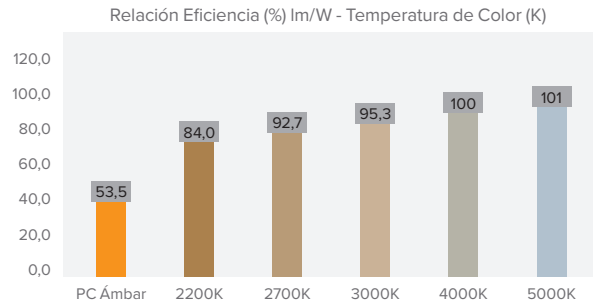
L90B10 >100.000h según TM21 (Certificado por Laboratorio ENAC).

Temperatura de Funcionamiento -35°C - + 60°C.

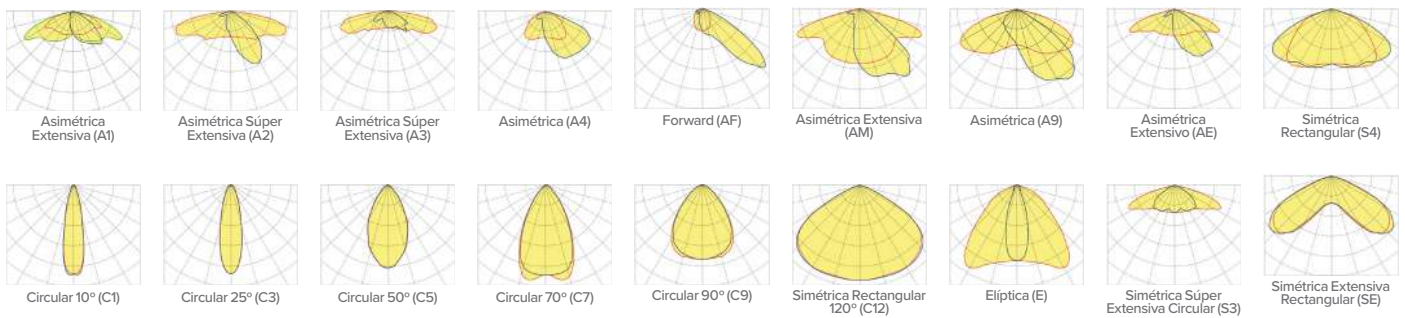
Corriente del LED = Corriente Driver /2 (I<sub>max</sub> - 525mA).

Tolerancia del flujo luminoso < +/-3%.

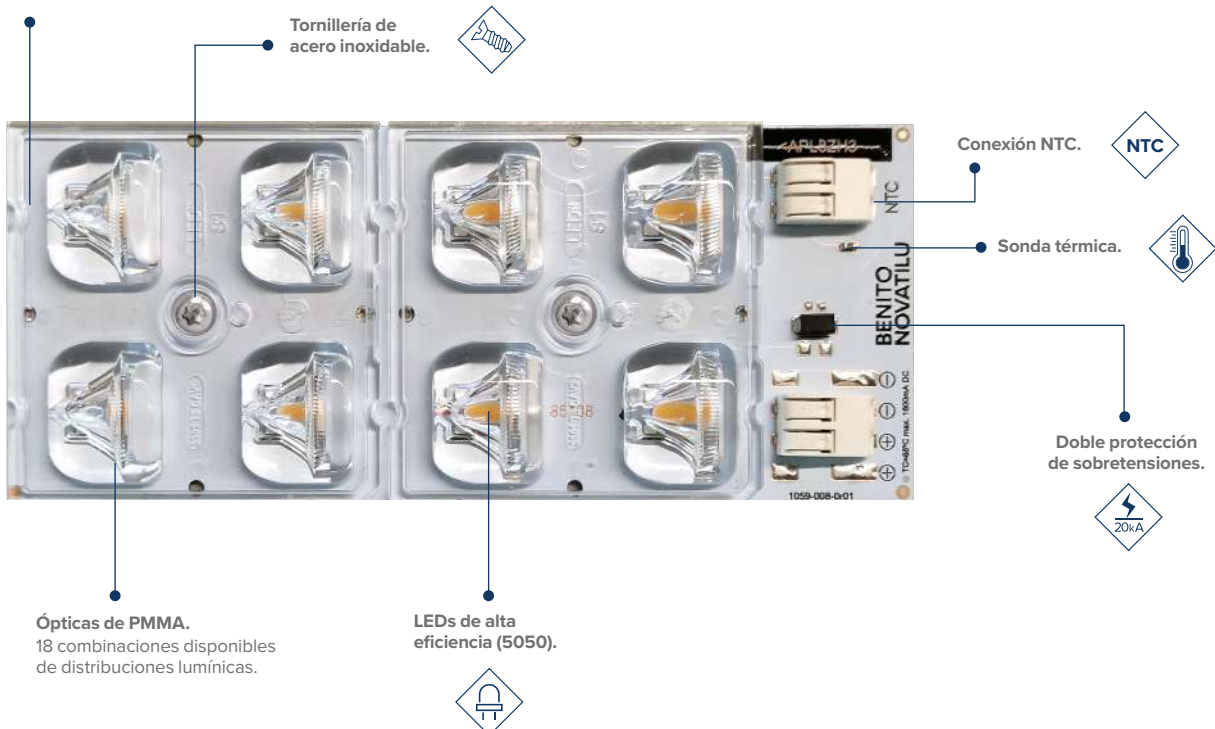
Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.



## DISTRIBUCIONES LUMÍNICAS DISPONIBLES



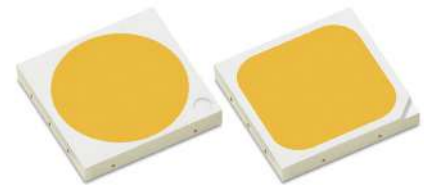
PCB BENITO NOVATILU de aluminio de alta transferencia térmica en 3 formatos standard Zhaga (Book15) (8, 12 y 16 LED). Consultar temperaturas de color y distribuciones lumínicas.



# LUXEON 5050

High efficacy and superior robustness in a multi-die, high power package, enabling cost-effective system design

LUXEON 5050 is a multi-die, high power package that provides high luminance from a super robust package to enable cost effective, single optic and directional fixture designs. LUXEON 5050 uses an industry standard 5050 surface mount package with a small Light Emitting Surface (LES). LUXEON 5050 comes in 70CRI, 80CRI and 90CRI with a wide range of CCTs, and offers hot-color targeting to ensure that the LEDs are within color target at application conditions of 85°C.



## FEATURES AND BENEFITS

- Superior lm/W enables outstanding efficacy in end application
- Extremely reliable package design affirms long lifetime in harsh environments <sup>[1]</sup>
- Two voltage configurations are compatible with low cost high efficacy drivers
- Low  $R_{th}$  enables effective thermal dissipation design for higher efficiency
- Hot-color targeting ensures color is within ANSI bin at 85°C
- 3-step and 5-step MacAdam ellipse binning structure ensures excellent color uniformity

1. Refer to reliability datasheet for more details.

## PRIMARY APPLICATIONS

- High Bay
- Low Bay
- Floodlights
- Wall Pack
- [More...](#)

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# General Product Information

## Product Test Conditions

LUXEON 5050 LEDs are tested with a 20ms monopulse specified below at a junction temperature,  $T_j$ , of 25°C. Forward voltage and luminous flux are binned at a  $T_j$  of 25°C, while color is hot-targeted at a  $T_j$  of 85°C.

- 160mA - LUXEON 5050 (Round LES) – 24V and LUXEON 5050 (Square LES) – 30V
- 640mA - LUXEON 5050 (Round LES) – 6V
- 800mA - LUXEON 5050 (Square LES) – 6V

## Part Number Nomenclature

Part numbers for LUXEON 5050 follow the convention below:

L 1 5 0 – **A A B B** 5 0 **C C** 0 0 0 **D** 0

Where:

- A A** - designates nominal ANSI CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K 40=4000K, 50=5000K, 57=5700K, 65=6500K)
- B B** - designates minimum CRI (70=70CRI, 80=80CRI, 90=90CRI)
- C C** - designates voltage (06=6V, 24=24V, 30=30V)
- D** - designates product type (0=Round LES, S=Square LES)

Therefore, the following part number is used for a LUXEON 5050 Square LES, 3000K 80CRI, 30V:

L 1 5 0 – **3 0 8 0** 5 0 **3 0** 0 0 0 **S** 0

## Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

## Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON 5050 is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).



# Performance Characteristics

## Product Selection Guide

Table 1. Product performance of LUXEON 5050 at specified test current,  $T_j=25^\circ\text{C}$ .

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Round LES) 24V	2200K	70	515	550	140	160	L150-2270502400000
	2700K	70	535	605	154	160	L150-2770502400000
	3000K	70	553	625	159	160	L150-3070502400000
	3500K	70	600	635	162	160	L150-3570502400000
	4000K	70	580	675	172	160	L150-4070502400000
	5000K	70	580	672	171	160	L150-5070502400000
	5700K	70	570	661	169	160	L150-5770502400000
	6500K	70	570	655	167	160	L150-6570502400000
	2200K	80	440	475	121	160	L150-2280502400000
	2700K	80	500	550	140	160	L150-2780502400000
	3000K	80	516	590	151	160	L150-3080502400000
	3500K	80	527	595	152	160	L150-3580502400000
	4000K	80	539	615	157	160	L150-4080502400000
	5000K	80	539	615	157	160	L150-5080502400000
	5700K	80	539	615	157	160	L150-5780502400000
	6500K	80	539	615	157	160	L150-6580502400000
	2700K	90	414	475	121	160	L150-2790502400000
	3000K	90	428	490	125	160	L150-3090502400000
	3500K	90	445	510	130	160	L150-3590502400000
	4000K	90	456	530	135	160	L150-4090502400000
	5000K	90	456	530	135	160	L150-5090502400000
5700K	90	456	530	135	160	L150-5790502400000	
LUXEON 5050 (Round LES) 6V	2200K	70	515	550	140	640	L150-2270500600000
	2700K	70	535	605	154	640	L150-2770500600000
	3000K	70	553	625	159	640	L150-3070500600000
	3500K	70	600	635	162	640	L150-3570500600000
	4000K	70	580	675	172	640	L150-4070500600000
	5000K	70	580	672	171	640	L150-5070500600000
	5700K	70	570	661	169	640	L150-5770500600000
	6500K	70	570	655	167	640	L150-6570500600000
	2200K	80	440	475	121	640	L150-2280500600000
	2700K	80	500	550	140	640	L150-2780500600000
	3000K	80	516	590	151	640	L150-3080500600000
	3500K	80	527	595	152	640	L150-3580500600000
	4000K	80	539	615	157	640	L150-4080500600000
	5000K	80	539	615	157	640	L150-5080500600000
	5700K	80	539	615	157	640	L150-5780500600000
	6500K	80	539	615	157	640	L150-6580500600000
	2700K	90	414	475	121	640	L150-2790500600000
	3000K	90	428	490	125	640	L150-3090500600000
	3500K	90	445	510	130	640	L150-3590500600000
	4000K	90	456	530	135	640	L150-4090500600000
	5000K	90	456	530	135	640	L150-5090500600000
5700K	90	456	530	135	640	L150-5790500600000	

Table 1 continued on next page:

1. Correlated color temperature is not targeted at  $T_j=85^\circ\text{C}$ .
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at  $T_j=25^\circ\text{C}$ . Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of  $\pm 2$  on CRI and  $\pm 7\%$  on luminous flux measurements.

Table 1. Product performance of LUXEON 5050 at specified test current, T<sub>j</sub>=25°C, Continued.

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Square LES) 30V	2200K	70	621	690	141	160	L150-22705030000S0
	2700K	70	693	770	158	160	L150-27705030000S0
	3000K	70	720	800	164	160	L150-30705030000S0
	3500K	70	729	810	166	160	L150-35705030000S0
	4000K	70	743	825	169	160	L150-40705030000S0
	5000K	70	743	825	169	160	L150-50705030000S0
	5700K	70	738	820	168	160	L150-57705030000S0
	6500K	70	720	800	164	160	L150-65705030000S0
	2200K	80	586	630	129	160	L150-22805030000S0
	2700K	80	650	695	142	160	L150-27805030000S0
	3000K	80	665	715	147	160	L150-30805030000S0
	3500K	80	679	730	150	160	L150-35805030000S0
	4000K	80	700	750	154	160	L150-40805030000S0
	5000K	80	702	755	155	160	L150-50805030000S0
	5700K	80	700	750	154	160	L150-57805030000S0
	6500K	80	688	740	152	160	L150-65805030000S0
	2700K	90	558	600	123	160	L150-27905030000S0
	3000K	90	586	630	129	160	L150-30905030000S0
	3500K	90	600	640	131	160	L150-35905030000S0
	4000K	90	609	655	134	160	L150-40905030000S0
	5000K	90	618	665	136	160	L150-50905030000S0
5700K	90	605	650	133	160	L150-57905030000S0	
LUXEON 5050 (Square LES) 6V	2200K	70	621	690	141	800	L150-22705006000S0
	2700K	70	693	770	158	800	L150-27705006000S0
	3000K	70	720	800	164	800	L150-30705006000S0
	3500K	70	729	810	166	800	L150-35705006000S0
	4000K	70	743	825	169	800	L150-40705006000S0
	5000K	70	743	825	169	800	L150-50705006000S0
	5700K	70	738	820	168	800	L150-57705006000S0
	6500K	70	720	800	164	800	L150-65705006000S0
	2200K	80	586	630	129	800	L150-22805006000S0
	2700K	80	650	695	142	800	L150-27805006000S0
	3000K	80	665	715	147	800	L150-30805006000S0
	3500K	80	679	730	150	800	L150-35805006000S0
	4000K	80	700	750	154	800	L150-40805006000S0
	5000K	80	702	755	155	800	L150-50805006000S0
	5700K	80	700	750	154	800	L150-57805006000S0
	6500K	80	688	740	152	800	L150-65805006000S0
	2700K	90	558	600	123	800	L150-27905006000S0
	3000K	90	586	630	129	800	L150-30905006000S0
	3500K	90	600	640	131	800	L150-35905006000S0
	4000K	90	609	655	134	800	L150-40905006000S0
	5000K	90	618	665	136	800	L150-50905006000S0
5700K	90	605	650	133	800	L150-57905006000S0	

Notes for Table 1:

1. Correlated color temperature is not targeted at T<sub>j</sub>=85°C.
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at T<sub>j</sub>=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7% on luminous flux measurements.

# Optical Characteristics

Table 2. Optical characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE <sup>[1]</sup>	TYPICAL VIEWING ANGLE <sup>[2]</sup>
L150-xxxx50xx000x0	138°	116°

Notes for Table 2:

- Total angle at which 90% of total luminous flux is captured.
- Viewing angle is the off axis angle from the LED centerline where the luminous intensity is 1/2 of the peak value.

# Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	FORWARD VOLTAGE <sup>[1]</sup> ( $V_f$ )			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE <sup>[2]</sup> (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L150-xxxx502400000	23.5	24.4	26.5	-12	2.4
L150-xxxx500600000	5.8	6.1	6.6	-3	2.4
L150-xxxx5030000S0	29.0	30.5	32.0	-15	1.4
L150-xxxx5006000S0	5.8	6.1	6.6	-3	1.4

Notes for Table 3:

- Lumileds maintains a tolerance of ±1% on forward voltage measurements.
- Measured between 25°C and 85°C.

# Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON 5050.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current <sup>[1,2]</sup>	240mA for L150-xxxx502400000 800mA for L150-xxxx500600000 240mA for L150-xxxx5030000S0 1000mA for L150-xxxx5006000S0
Peak Pulsed Forward Current <sup>[1,3]</sup>	300mA for L150-xxxx502400000 1000mA for L150-xxxx500600000 300mA for L150-xxxx5030000S0 1250mA for L150-xxxx5006000S0
LED Junction Temperature <sup>[1]</sup> (DC & Pulse)	125°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 2
Operating Case Temperature <sup>[1]</sup>	105°C
LED Storage Temperature	-40°C to 105°C
Allowable Reflow Cycles	3
Reverse Voltage ( $V_{reverse}$ )	LUXEON LEDs are not designed to be driven in reverse bias

Notes for Table 4:

- Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
- Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," are acceptable if the following conditions are met:
  - The frequency of the ripple current is 100Hz or higher
  - The average current for each cycle does not exceed the maximum allowable DC forward current
  - The maximum amplitude of the ripple does not exceed the maximum peak pulsed forward current
- At 10% duty cycle with pulse width of 10ms.

# Characteristic Curves

## Spectral Power Distribution Characteristics

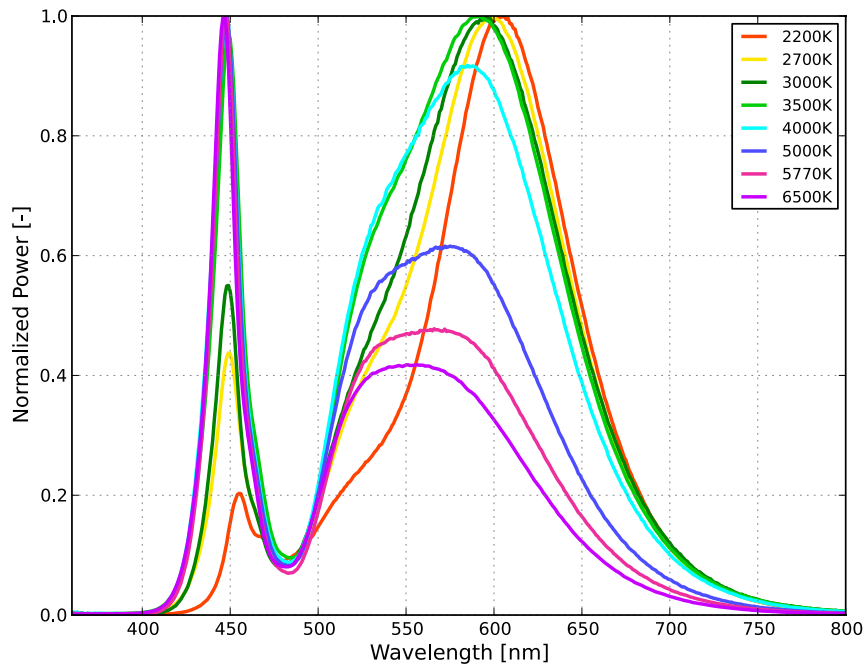


Figure 1a. Typical normalized power vs. wavelength for L150-xx7050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

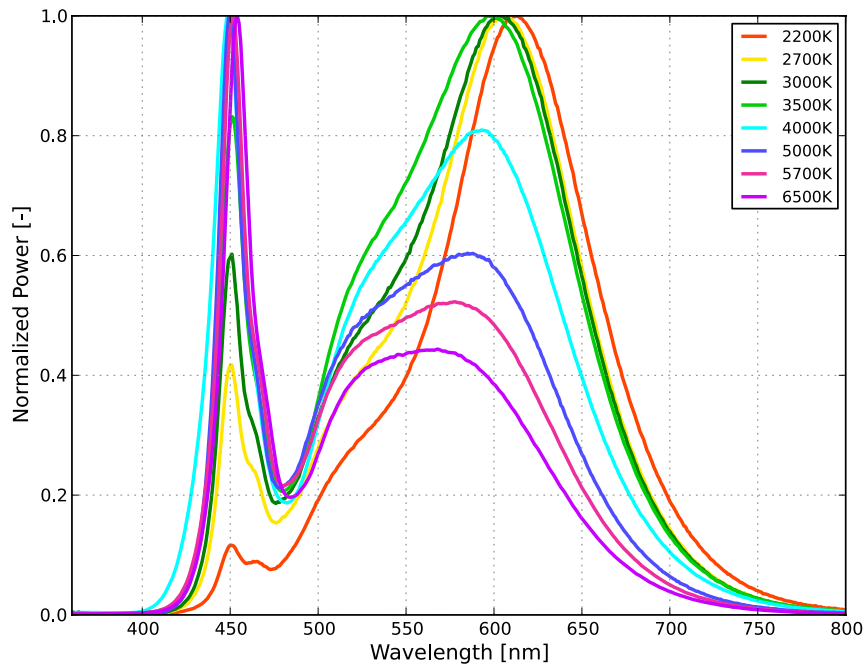


Figure 1b. Typical normalized power vs. wavelength for L150-xx8050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

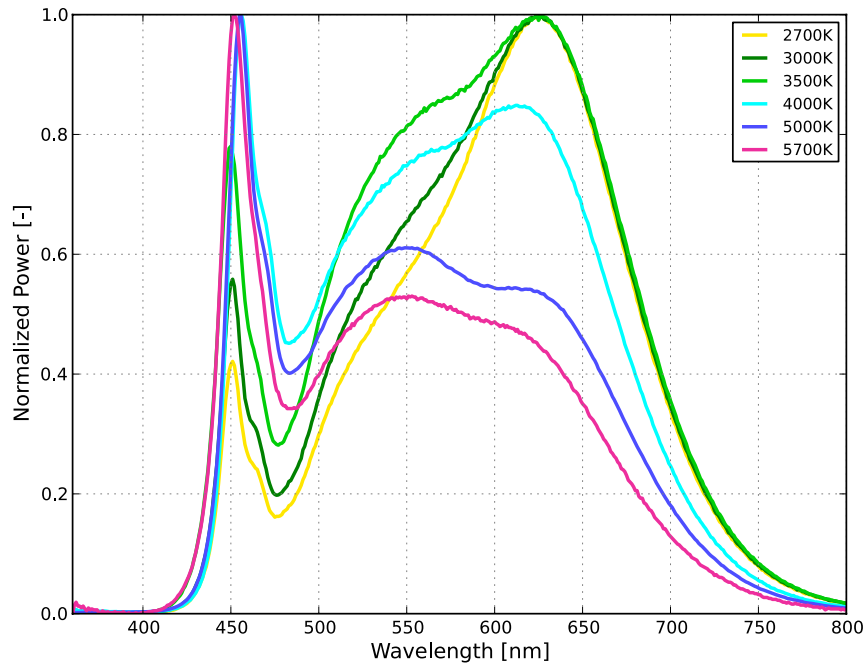


Figure 1c. Typical normalized power vs. wavelength for L150-xx9050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

## Light Output Characteristics

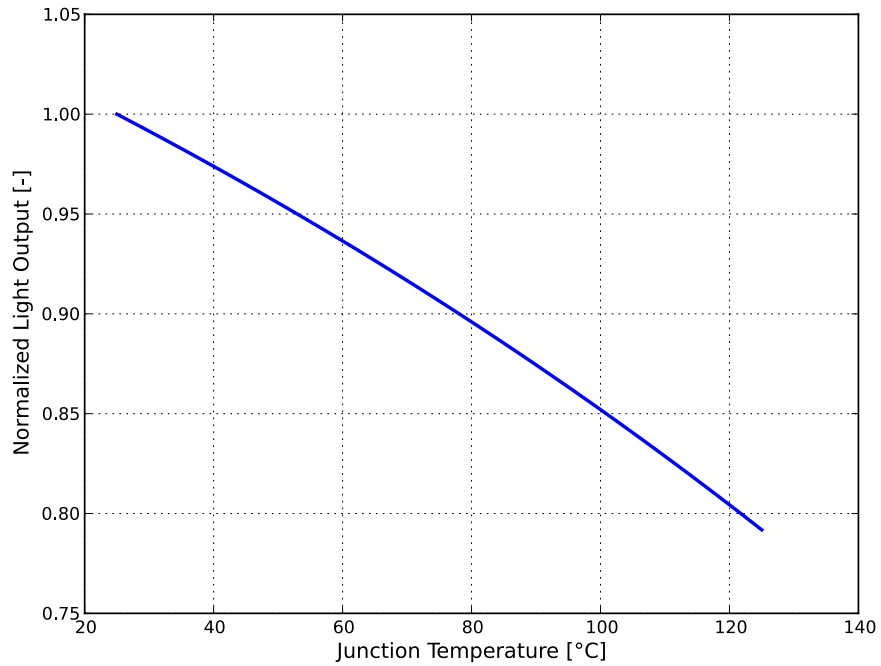


Figure 2. Typical normalized light output vs. junction temperature for L150-xxx50xx000x0 at specified test current.

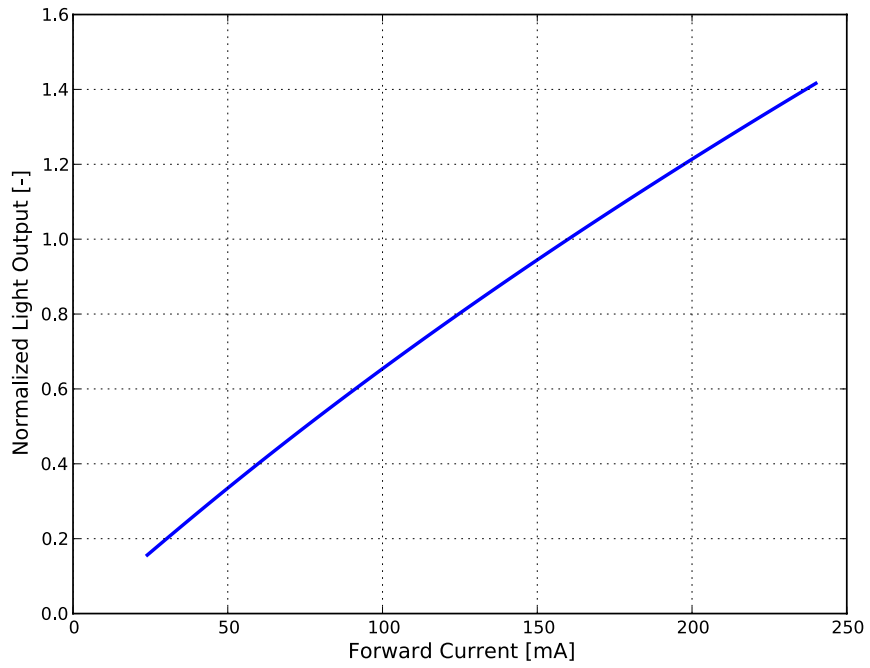


Figure 3a. Typical normalized light output vs. forward current for L150-xxxx50xx000x0,  $T_j=25^\circ\text{C}$ .

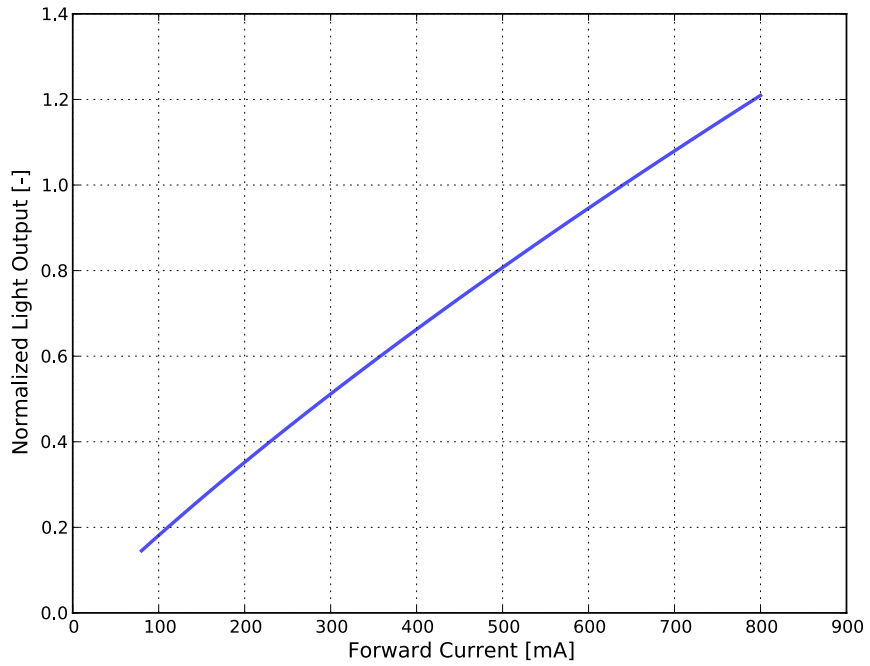


Figure 3b. Typical normalized light output vs. forward current for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

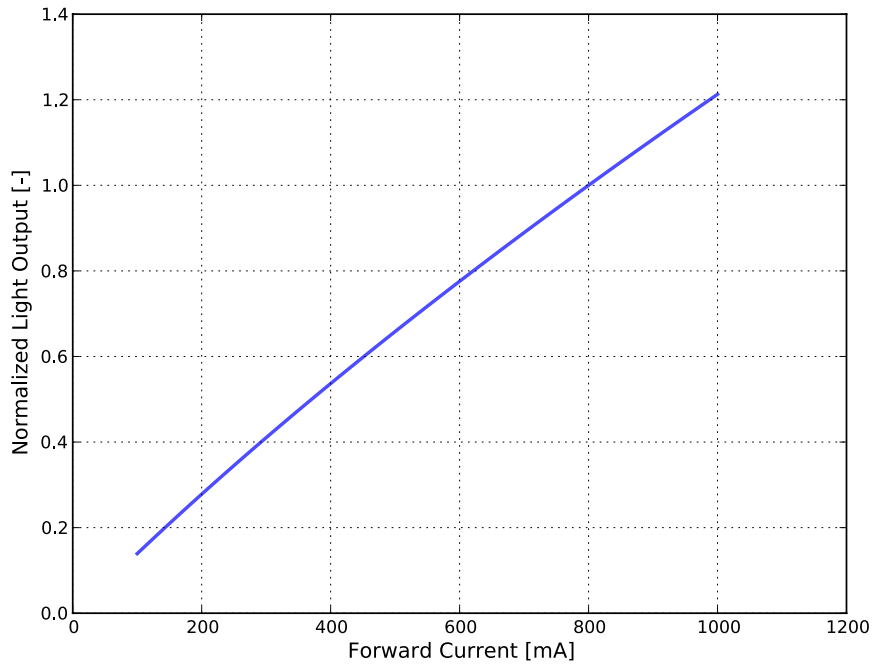


Figure 3c. Typical normalized light output vs. forward current for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Forward Current Characteristics

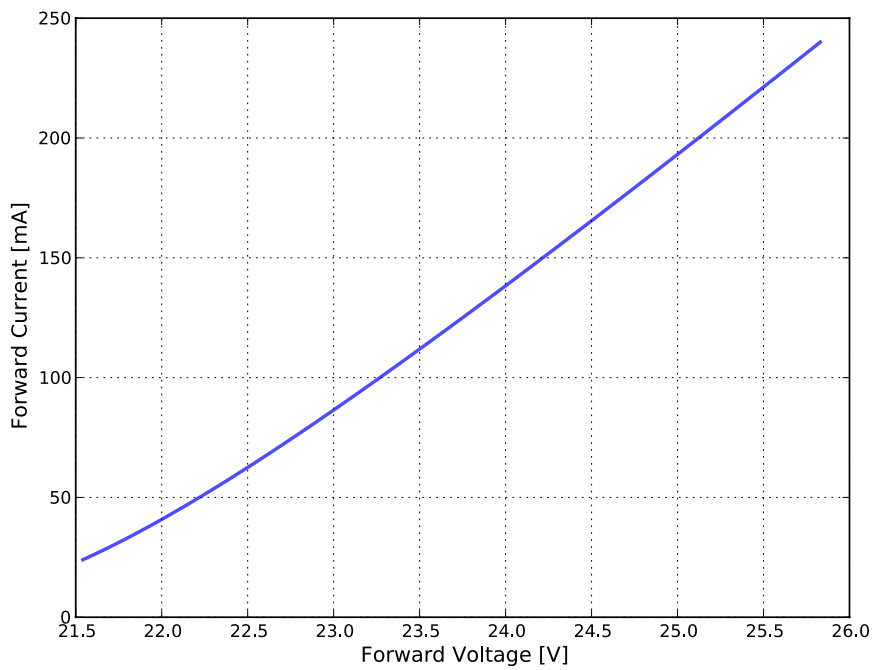


Figure 4a. Typical forward current vs. forward voltage for L150-xxxx502400000,  $T_j=25^\circ\text{C}$ .

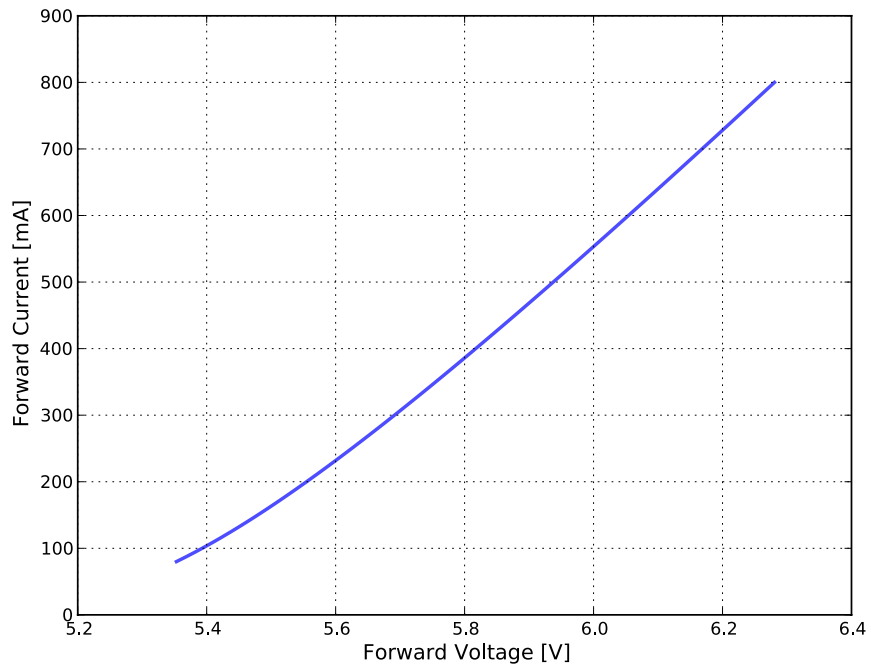


Figure 4b. Typical forward current vs. forward voltage for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

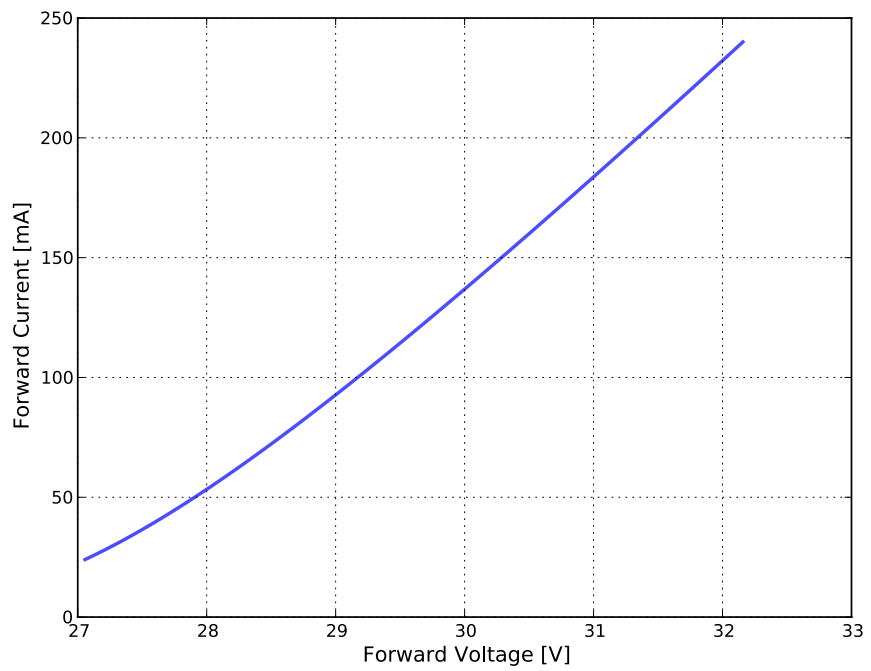


Figure 4c. Typical forward current vs. forward voltage for L150-xxxx503000050,  $T_j=25^\circ\text{C}$ .



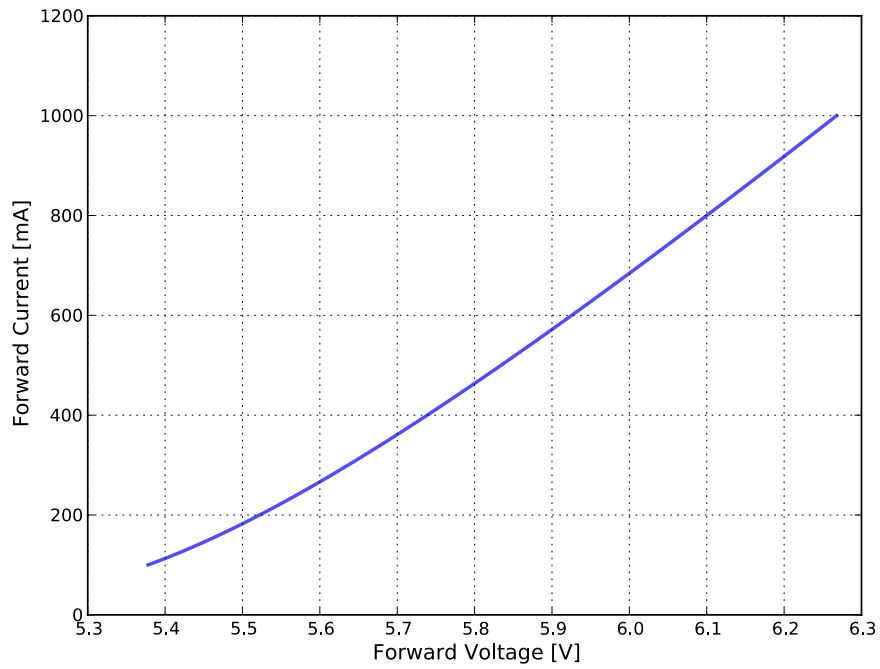


Figure 4d. Typical forward current vs. forward voltage for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Radiation Pattern Characteristics

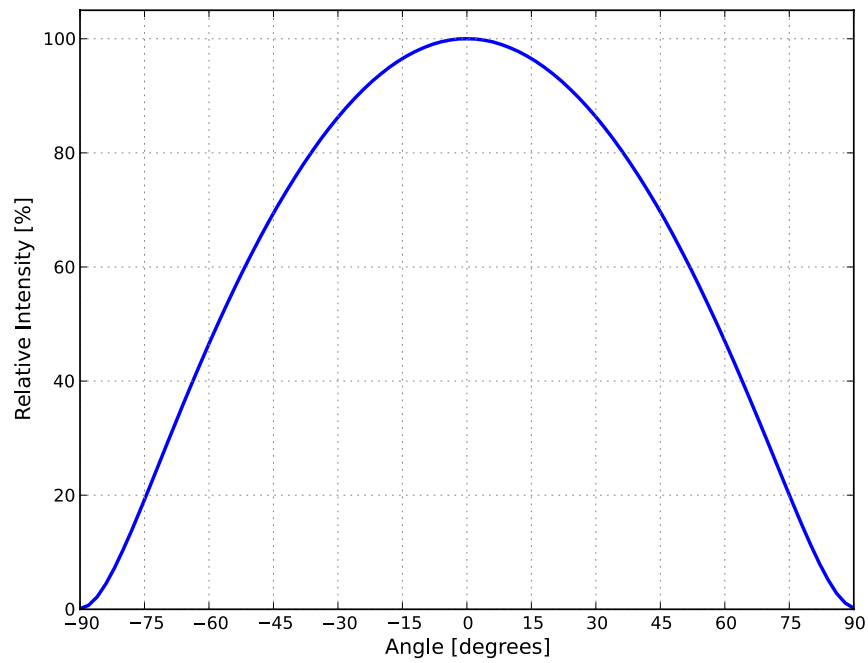


Figure 5. Typical radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

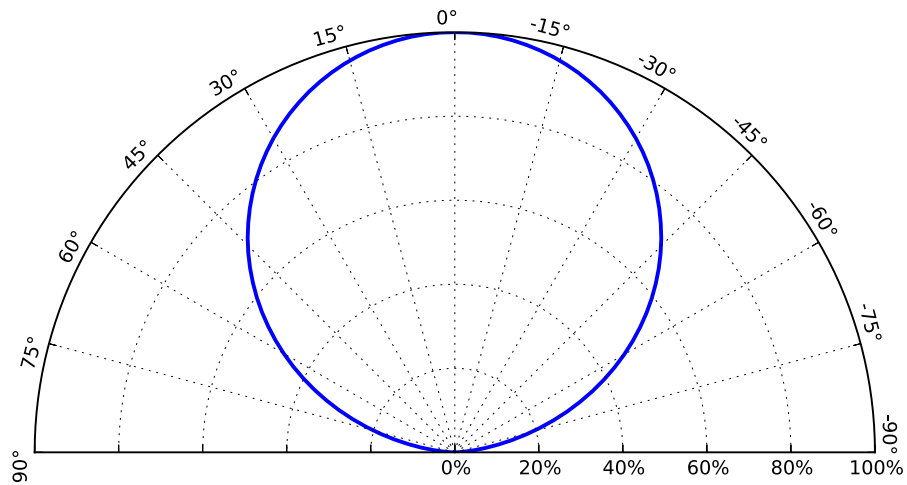


Figure 6. Typical polar radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

## Product Bin and Labeling Definitions

### Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON 5050 (Round LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B C C**

Where:

- A** - designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B** - designates color bin (example: 3=3 SDCM, 5=5 SDCM parts)
- C C** - designates forward voltage bin (example: A1, A2, B1, B2)

Therefore, a LUXEON 5050 (Round LES) with a lumen range of 600 to 650 lm, color bin of 3 and forward voltage range of 23.5 to 24.2V has the following CAT code:

**L 3 A 1**

LUXEON 5050 (Square LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B B C**

Where:

- A** – designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B B** – designates color bin: (example: 83=2700K and 3 SDCM, 35=5000K and 5 SDCM)
- C** – designates forward voltage bin (example: A, B, C, D)

Therefore, a LUXEON 5050 (Square LES) with a lumen range of 600 to 650 lm, color bin of 83 and forward voltage range of 29.0 to 30.0V has the following CAT code:

**L 8 3 A**

## Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON 5050 LEDs. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

**Table 5. Luminous flux bin definitions for LUXEON 5050, T<sub>j</sub>=25°C.**

BIN	LUMINOUS FLUX <sup>(1)</sup> (lm)	
	MINIMUM	MAXIMUM
G	400	450
H	450	500
J	500	550
K	550	600
L	600	650
M	650	700
N	700	750
P	750	800
Q	800	850
R	850	900
S	900	950
T	950	1000

**Notes for Table 5:**

1. Lumileds maintains a tolerance of ±7% on luminous flux measurements.

## Color Bin Definitions

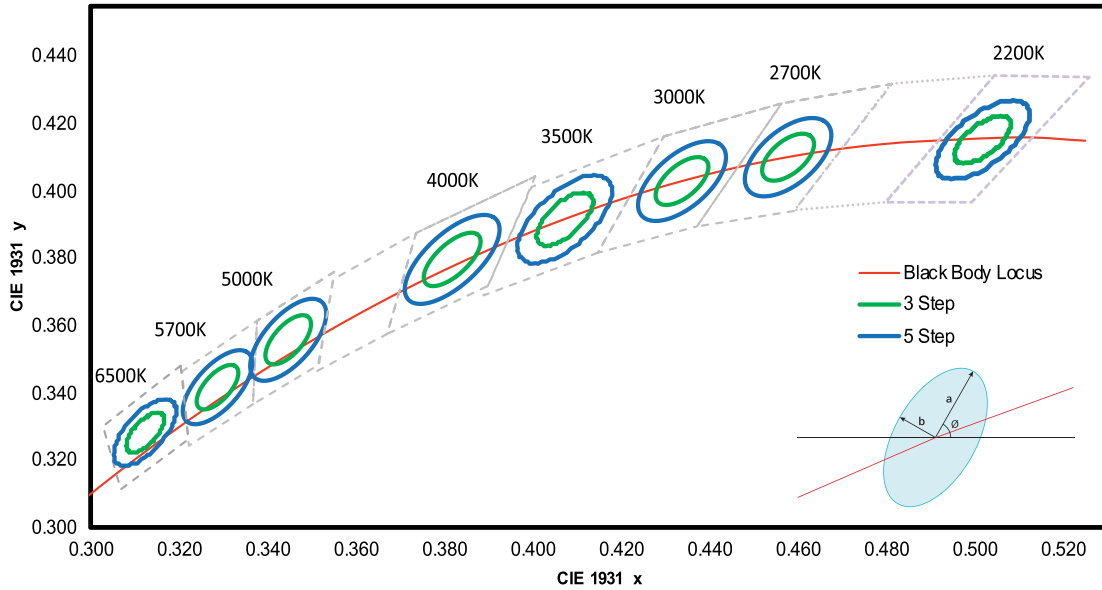


Figure 7. 3- and 5-step MacAdam ellipse illustration for hot-color targeting expected at 85°C.

Table 6. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 5050 at test current, hot-color targeted at  $T_j=85^\circ\text{C}$ .

NOMINAL CCT	COLOR SPACE	CENTER POINT <sup>(1)</sup> (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, $\theta$	LUXEON 5050 (ROUND LES) COLOR BIN CODE	LUXEON 5050 (SQUARE LES) COLOR BIN CODE
2200K	Single 3-step MacAdam ellipse	(0.5018, 0.4153)	0.00863	0.00398	49.27°	3	A3
2700K	Single 3-step MacAdam ellipse	(0.4578, 0.4101)	0.00810	0.00420	53.70°	3	83
3000K	Single 3-step MacAdam ellipse	(0.4338, 0.4030)	0.00834	0.00408	53.22°	3	73
3500K	Single 3-step MacAdam ellipse	(0.4073, 0.3917)	0.00927	0.00414	54.00°	3	63
4000K	Single 3-step MacAdam ellipse	(0.3818, 0.3797)	0.00939	0.00402	53.72°	3	53
5000K	Single 3-step MacAdam ellipse	(0.3447, 0.3553)	0.00822	0.00354	59.62°	3	33
5700K	Single 3-step MacAdam ellipse	(0.3287, 0.3417)	0.00745	0.00320	59.09°	3	23
6500K	Single 3-step MacAdam ellipse	(0.3123, 0.3282)	0.00669	0.00285	58.57°	3	13
2200K	Single 5-step MacAdam ellipse	(0.5018, 0.4153)	0.01438	0.00663	49.27°	5	A5
2700K	Single 5-step MacAdam ellipse	(0.4578, 0.4101)	0.01350	0.00700	53.70°	5	85
3000K	Single 5-step MacAdam ellipse	(0.4338, 0.4030)	0.01390	0.00680	53.22°	5	75
3500K	Single 5-step MacAdam ellipse	(0.4073, 0.3917)	0.01545	0.00690	54.00°	5	65
4000K	Single 5-step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°	5	55
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°	5	35
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°	5	25
6500K	Single 5-step MacAdam ellipse	(0.3123, 0.3282)	0.01115	0.00475	58.57°	5	15

**Notes for Table 6:**

1. Lumileds maintains a tolerance of  $\pm 0.005$  on x and y coordinates in the CIE 1931 color space.

## Forward Voltage Bins

Table 7. Forward voltage bin definitions for LUXEON 5050,  $T_j=25^\circ\text{C}$ .

PART NUMBER	BIN	FORWARD VOLTAGE <sup>(1)</sup> (V <sub>f</sub> )	
		MINIMUM	MAXIMUM
L150-xxxx502400000	A1	23.5	24.2
	A2	24.2	25.0
	B1	25.0	25.8
	B2	25.8	26.5
L150-xxxx500600000	A1	5.8	6.0
	A2	6.0	6.2
	B1	6.2	6.4
	B2	6.4	6.6
L150-xxxx5030000S0	A	29.0	30.0
	B	30.0	31.0
	C	31.0	32.0
L150-xxxx5006000S0	A	5.8	6.0
	B	6.0	6.2
	C	6.2	6.4
	D	6.4	6.6

**Notes for Table 7:**

1. Lumileds maintains a tolerance of  $\pm 0.1\text{V}$  on forward voltage measurements.

# Mechanical Dimensions

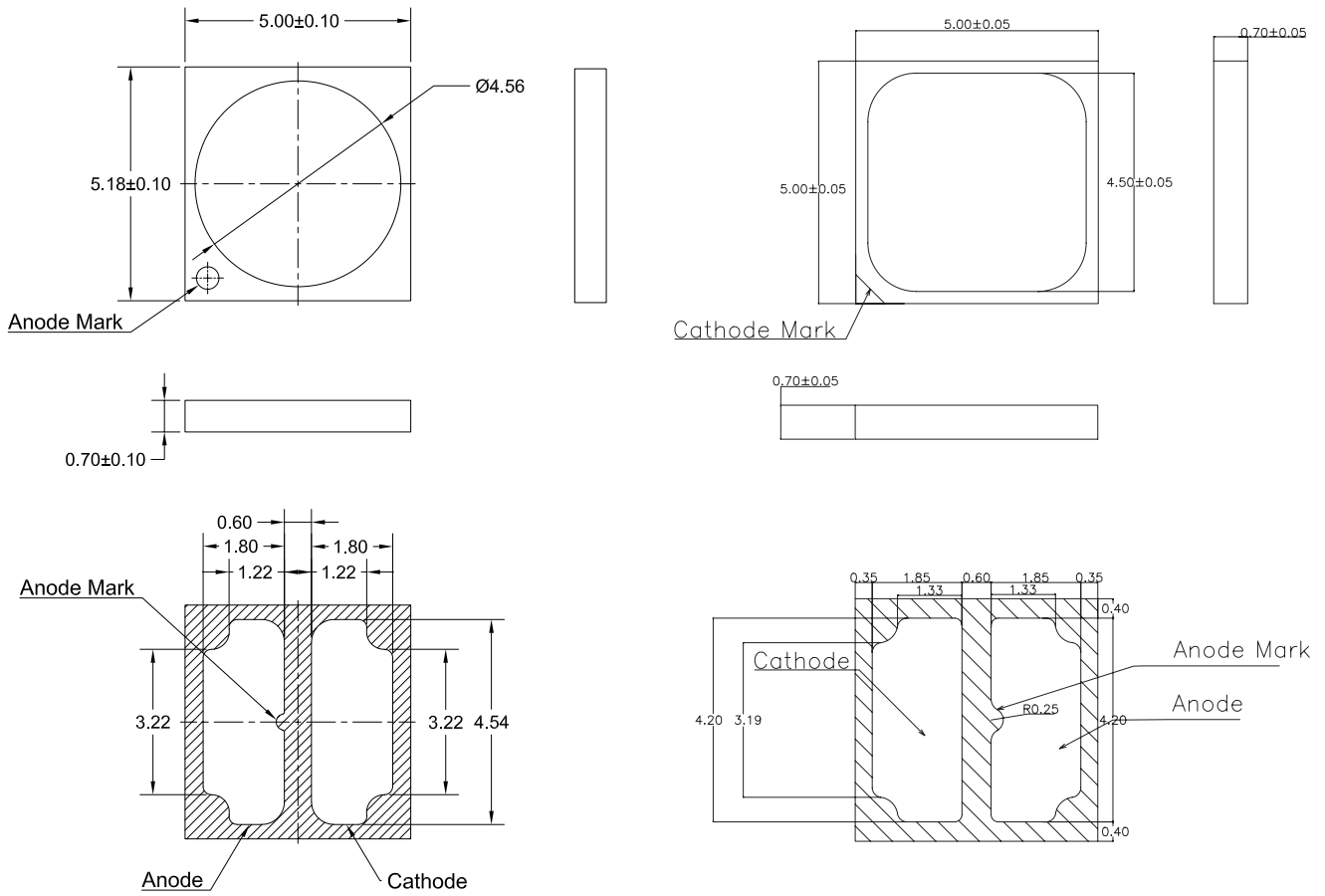


Figure 8. Mechanical dimensions for LUXEON 5050 (Round LES), left, and LUXEON 5050 (Square LES), right.

**Notes for Figure 8:**

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Reflow Soldering Guidelines

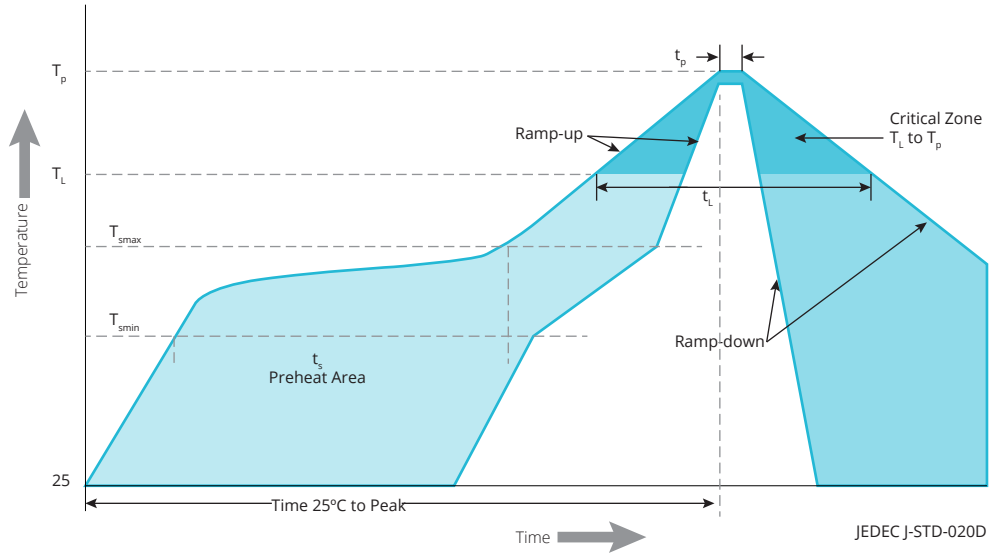


Figure 9. Visualization of the acceptable reflow temperature profile as specified in Table 8.

Table 8. Reflow profile characteristics for LUXEON 5050.

PROFILE FEATURE	LEAD-FREE ASSEMBLY
Preheat Minimum Temperature ( $T_{smin}$ )	150°C
Preheat Maximum Temperature ( $T_{smax}$ )	200°C
Preheat Time ( $t_{smin}$ to $t_{smax}$ )	60 to 180 seconds
Ramp-Up Rate ( $T_L$ to $T_p$ )	3°C / second maximum
Liquidous Temperature ( $T_L$ )	217°C
Time Maintained Above Temperature $T_L$ ( $t_t$ )	60 to 150 seconds
Peak / Classification Temperature ( $T_p$ )	260°C
Time Within 5°C of Actual Peak Temperature ( $t_p$ )	20 to 40 seconds
Ramp-Down Rate ( $T_p$ to $T_L$ )	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

## JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON 5050.

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
3	168 Hours	≤30°C / 60% RH	192 Hours +5 / -0	30°C / 60% RH

# Solder Pad Design

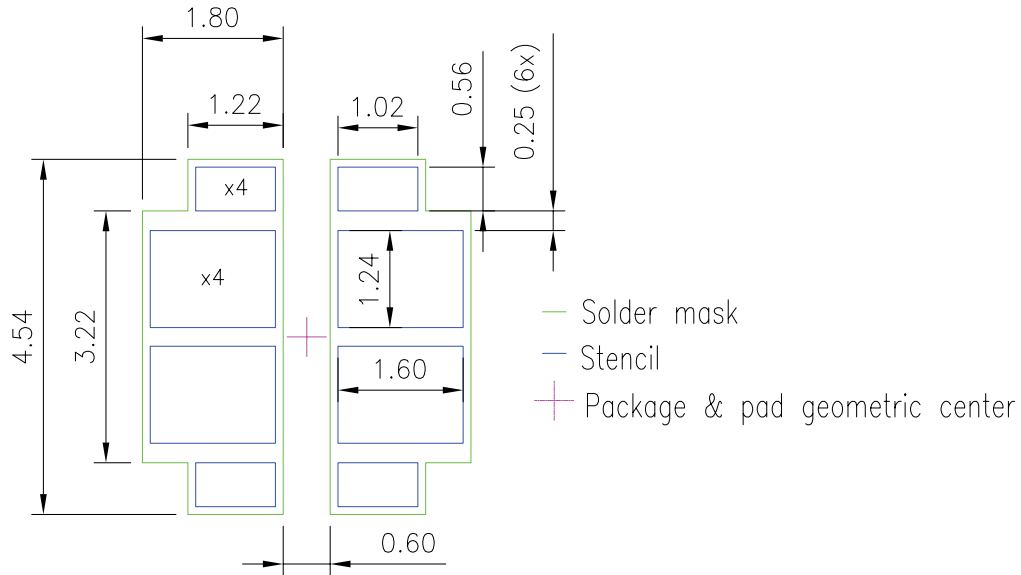


Figure 10. Recommended PCB solder pad layout for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

- Notes for Figure 10:
- 1. Drawings are not to scale.
  - 2. All dimensions are in millimeters.
  - 3. Refer to application brief AB174 for additional details regarding recommended PCB layout design.

# Packaging Information

## Pocket Tape Dimensions

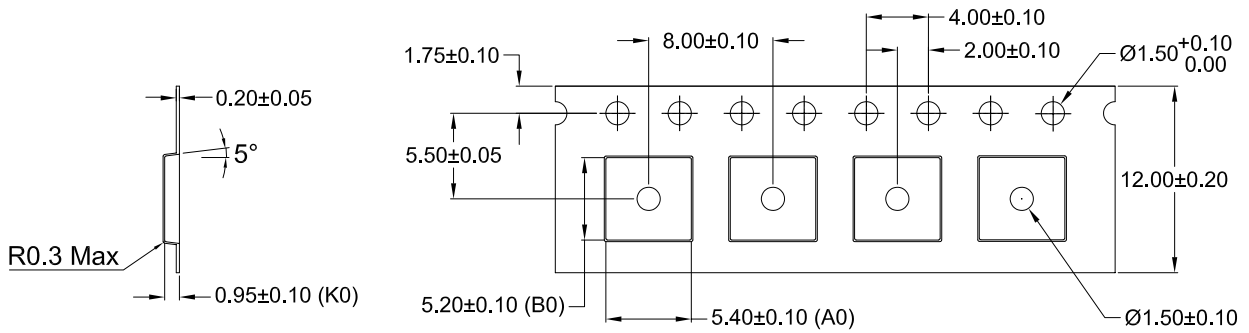
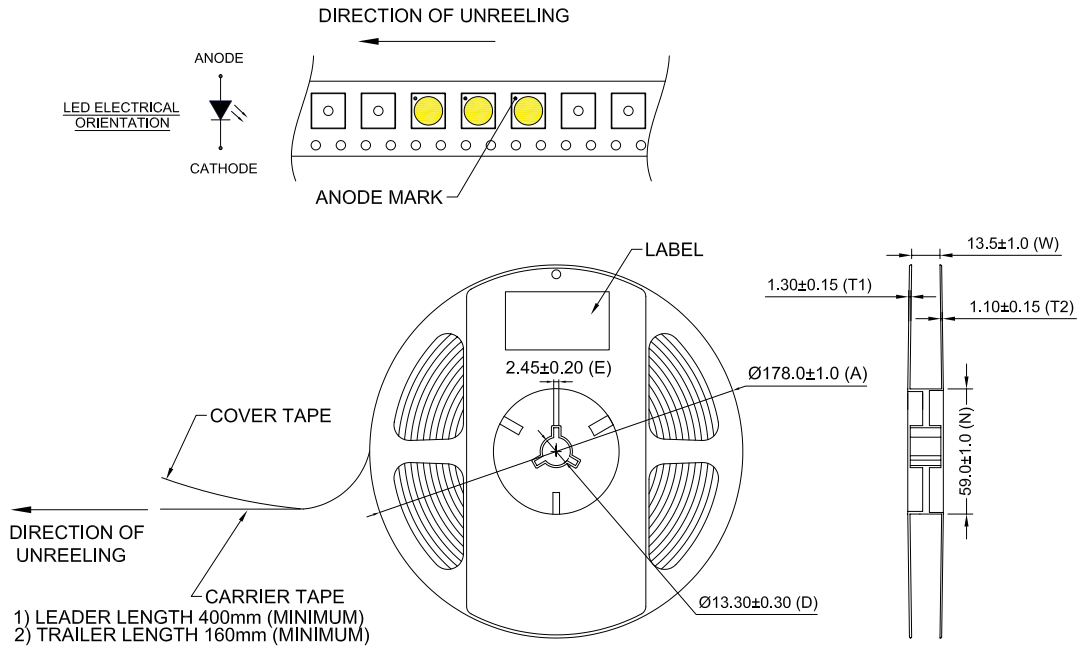


Figure 11. Pocket tape dimensions for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

- Notes for Figure 11:
- 1. Drawings are not to scale.
  - 2. All dimensions are in millimeters.



# Reel Dimensions



12a. Reel dimensions for LUXEON 5050 (Round LES).

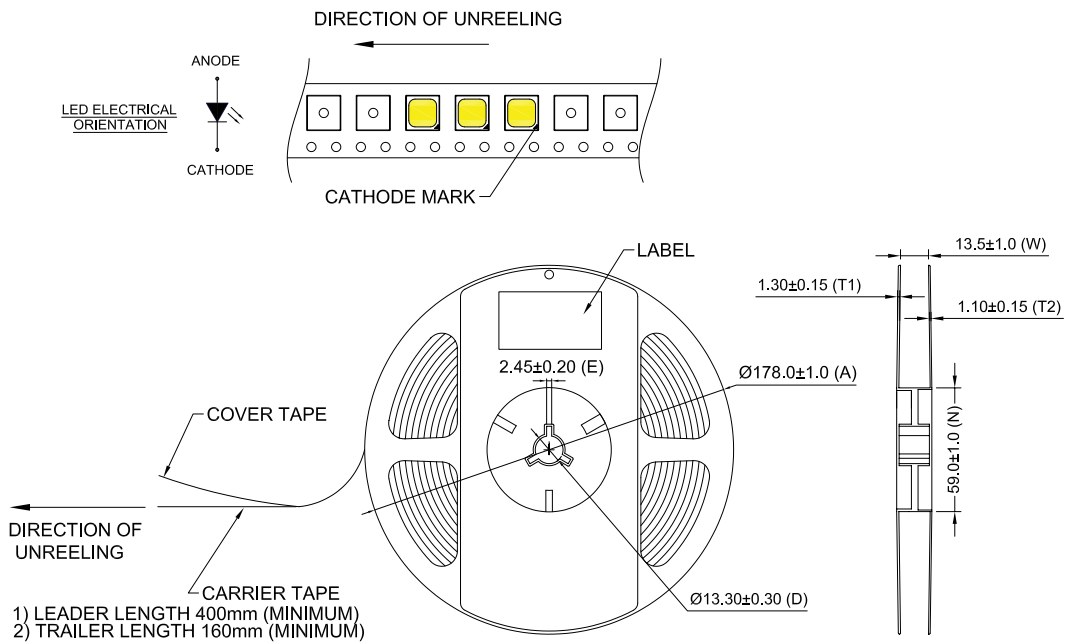


Figure 12b. Reel dimensions for LUXEON 5050 (Square LES).

Notes for Figures 12a and 12b:  
1. Drawings are not to scale.  
2. All dimensions are in millimeters.

## About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit [lumileds.com](http://lumileds.com).



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## EU Declaration of Conformity

### We, Philips Lighting

I.B.R.S./C.C.R.I. /Numéro 10461  
5600 VB Eindhoven, The Netherlands

Internal Ref. Nr.: 2017A0064

Year in which CE Mark was first affixed: 2017

### Declare under our responsibility for the products:

Product Range:	NAME:	#1	Xi FP 75W 0.2-0.7A SNLDAE	#2	Xi FP 75W 0.3-1.0A SNLDAE	#3	Xi FP 75W 0.5-1.5A SNLDAE
	DESCRIPTION:		230V C133 sXt LED Electronic Driver		230V C133 sXt LED Electronic Driver		230V C133 sXt LED Electronic Driver
Product Code:	12NC:		9290 014 08406		9290 014 08506		9290 014 08606

### The designated products are in conformity with the essential requirements of the following European Directives and harmonized standards:

#### Low Voltage Directive (LVD), 2014/35/EU

- EN 61347-2-13:2014

#### Electromagnetic compatibility Directive (EMC), 2014/30/EU

- EN 55015:2013+A1:2015
- EN 61000-3-2:2014
- EN 61000-3-3:2013
- EN 61547:2009

#### EcoDesign requirements for energy-related products Directive (ErP), 2009/125/EC and applicable Implementing Measures

- Implementing Measure EC/1194/2012

#### Restriction of the use of certain Hazardous Substances in electrical and electronic equipment Directive (RoHS), 2011/65/EU

- EN 50581:2012

and are produced under a quality scheme at least in conformity with ISO 9001 or CENELEC permanent documents.

2017-08-31, Eindhoven

Ms. C. Sweegers  
Regulatory Affairs Manager LED Electronics  
High Tech Campus 45  
5656 AE Eindhoven, The Netherlands



# CERTIFICATE

Issued to:  
Applicant:  
**Philips Lighting B.V.**  
High Tech Campus 45  
5656 AE Eindhoven, The Netherlands

Manufacturer/Licensee:  
**Philips Lighting B.V.**  
High Tech Campus 45  
5656 AE Eindhoven, The Netherlands

Product : LED driver  
Trade name(s) : PHILIPS  
Type(s)/model(s) : Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt,  
Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt and  
Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt

The product and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

DEKRA hereby declares that the above-mentioned product has been certified on the basis of:

- a type test according to the standard EN 61347-2-13:2014, EN 61347-1:2015, EN 62384:2006 and EN 62384:2006/A1:2009
- an inspection of the production location according to CENELEC Operational Document CIG 021
- a certification agreement with the number 947556

DEKRA hereby grants the right to use the ENEC certification mark.

The ENEC certification mark may be applied to the product as specified in this certificate for the duration of the ENEC certification agreement and under the conditions of the ENEC certification agreement.

This certificate is issued on 5 September 2017 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 31-101322

DEKRA Certification B.V.



drs. G.J. Zoetbrood  
Managing Director



Kreny Lin  
Certification Manager

© Integral publication of this certificate is allowed

ACCREDITED BY THE  
DUTCH ACCREDITATION  
COUNCIL



**SPECIFICATION OF THE CERTIFIED PRODUCT****Product data**

Product	: LED driver
Trade name(s)	: PHILIPS
Type(s)/model(s)	: Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt, Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt and Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt
Rated voltage	: 220-240 Vac or 186-250 Vdc
Nature of supply	: AC or DC
Rated frequency	: 50/60 Hz at AC
Power factor	: 0,95
Rated input current	: 0,4-0,34 Aac or 0,48 Adc
Rated input power	: 84W
Output power	: 75 W
Max. case temperature (tc)	: 80 °C
Ambient temperature (ta)	: -40 °C...+55 °C
Temperature declared thermally protection	: 130 °C
Description	: Built-in with double/reinforced insulation

**Product data – type Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt**

Output current	: 200-700 mA
Output voltage	: 50-150 Vdc; 220 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt**

Output current	: 300-1050 mA
Output voltage	: 35-108 Vdc; 150 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt**

Output current	: 500-1500 mA
Output voltage	: 25-71 Vdc; 120 Vdc MAX (open-circuit); SELV

**TESTS****Test requirements**

EN 61347-2-13:2014  
EN 61347-1:2015  
EN 62384:2006  
EN 62384:2006/A1:2009

**Test result**

The test results are laid down in DEKRA test file 601602100.

**Additional Information**

constant current type with screwless terminal block  
LED driver is completely potted with asphalt

**Remarks**

For component list refers to annex 1 of test reports 6016021.50.

The tests were performed by the manufacturer under the conditions of the agreement concerning the manufacturer's right to conduct type tests for the KEMA-KEUR / ENEC certification system under supervision of DEKRA (CTF Stage 3).

**Conclusion**

The examination proved that all requirements were met.

**Factory location**

Philips Lighting Electronics Poland  
ul Przemysłowa 29  
64-920 Pila, Poland

# PHILIPS

## Xitanium

### LED driver



## Datasheet

# Xitanium FULL Prog LED Xtreme drivers

Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt

### Xitanium FULL Prog LED Xtreme drivers

Philips Xitanium Full Programmable LED drivers are specifically designed to deliver the highest performance, protection and configurability. The portfolio offers both central and standalone dimming protocols further increasing the energy savings and CO<sub>2</sub> reductions achieved with LED lighting. The Xtreme technology ensures maximum robustness and protection combined with a very long lifetime.

In this product family Philips introduces new drivers in a compact form factor with state-of-the-art features, which offer high value for both OEM customers and end-users. The products can replace the existing programmable outdoor LED drivers and will bring significant improvement in programming, assembly into a luminaire and electrical performance.

#### Benefits

- Ultimate robustness, offering peace of mind and lower maintenance costs
- Fully programmable LED-drivers designed for the new digital and connected lighting world
- Extended diagnostics via MultiOne
- Easy to design-in, configure and install for insulation Class I and Class II applications
- Energy savings through high efficiency and via multiple dimming options

#### Features

- High surge immunity (CM/DM)
- Long lifetime and robust protection against moisture, vibration and temperature
- Configurable operating windows (AOC)
- Multiple control interfaces: DALI, AmpDim, 1-step and 3-step LineSwitch
- Autonomous dimming via integrated DynaDimmer
- Adjustable thermal protection for driver (DTL, on select models) and LED module (MTP)
- Constant Light Output (CLO)
- Adjustable Start-up Time (AST)
- Adjustable Light Output (ALO)
- End-Of-Life indicator (EOL)

#### Application

- Road and street lighting
- Area lighting
- Tunnel lighting
- Industrial lighting

## Electrical input data

Specification item	Value	Unit	Condition
Rated input voltage range	202...254	V <sub>ac</sub>	Performance range
Rated input voltage	230	V <sub>ac</sub>	
Rated input frequency range	47...63	Hz	Performance range
Rated input current	0.34	A	@ rated output power @ rated input voltage
Max. input current	0.4	A	@ rated output power @ minimum performance input voltage
Rated input power	84	W	@ rated output power @ rated input voltage
Power factor	0.99		@ rated output power @ rated input voltage
Total harmonic distortion	8	%	@ rated output power @ rated input voltage
Efficiency	92.5	%	@ rated output power @ rated input voltage
Rated input voltage DC range	186...250	V <sub>dc</sub>	Performance range
Rated input current DC range	≤ 0.48	A <sub>dc</sub>	Performance range
Input voltage AC range	80...264	V <sub>ac</sub>	Safety operational range
Input frequency AC range	45...66	Hz	Safety operational range
Input voltage DC range	168...275	V <sub>dc</sub>	Safety operational range
Standby Power	0.45	W	
Isolation input to output	Double		

## Electrical output data

Specification item	Value	Unit	Condition
Regulation method	Constant Current		
Output voltage	35...108	V <sub>dc</sub>	
Output voltage max.	150	V	Maximum voltage at open load
Output current	0.07...1.05	A	
Output current min programmable	300	mA	
Output current min dimming	70	mA	
Output current tolerance	± 3	%	
Output current ripple LF	≤ 4	%	Ripple = peak / average @ < 1kHz
Output current ripple HF	≤ 4	%	
Output power	2.5...75	W	

## Electrical data controls input

Specification item	Value	Unit	Condition
Control method	AmpDim, DALI, Dynadimmer, LineSwitch 3-step, LineSwitch single-step		Output current amplitude dimming
Dimming range	10...100	%	DALI acc. IEC62386-101, -102 Ed. 2.0; LineSwitch: Vlow: < 160Vac Vhigh: 170 ... 264Vac
Galvanic Isolation	Double		

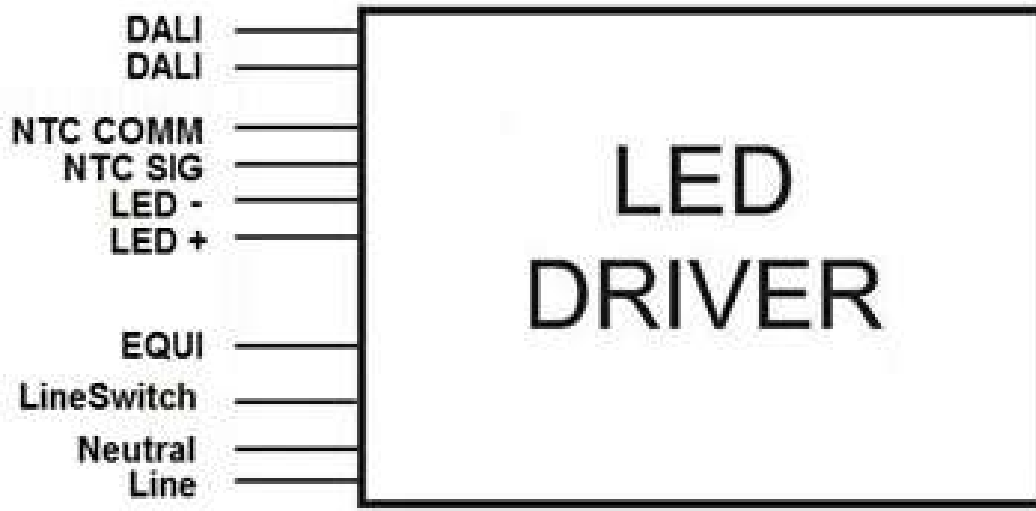
## Logistical data

Specification item	Value
Product name	Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt
Order code	871869675569300
Logistic code 12NC	9290 014 08506
Pieces per box	12



## Wiring & Connections

Specification item	Value	Unit	Condition
Input wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Input wire strip length	8.5...9.5	mm	
Output wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Output wire strip length	8.5...9.5	mm	
Dimming wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Dimming wire strip length	8.5...9.5	mm	
Maximum cable length	600	mm	Total length of wiring including LED module, one way
Maximum NTC output cable length	0.6	m	

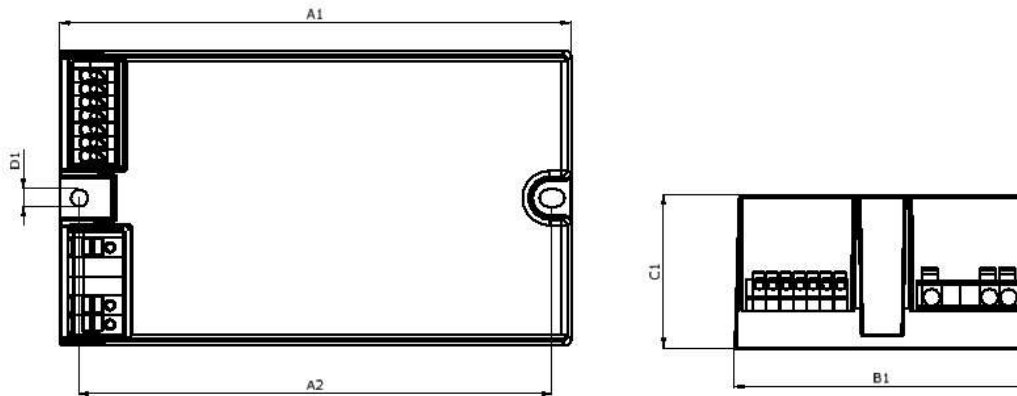


## Insulation

Insulation	Mains	EQUI	LED + NTC	LineSwitch	DALI
Mains		Double	Double	NA	Basic
EQUI	Double		Basic	Double	Double
LED + NTC	Double	Basic		Double	Double
LineSwitch	NA	Double	Double		Basic
DALI	Basic	Double	Double	Basic	

## Dimensions and weight

Specification item	Value	Unit	Condition
Length (A1)	133	mm	
Width (B1)	77	mm	
Height (C1)	40	mm	
Fixing hole diameter (D1)	4.2	mm	
Fixing hole distance (A2)	122	mm	
Weight	550	gram	



## Operational temperatures and humidity

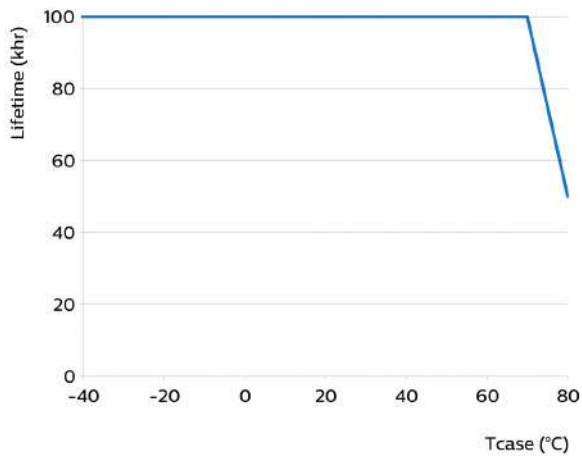
Specification item	Value	Unit	Condition
Ambient temperature	-40...+55	°C	Higher ambient temperature allowed as long as T <sub>case-max</sub> is not exceeded.
T <sub>case-max</sub>	80	°C	Maximum temperature measured at T <sub>case-point</sub>
T <sub>case-life</sub>	70	°C	Measured at T <sub>case-point</sub>
Maximum housing temperature	130	°C	In case of a failure
Relative humidity	10...90	%	Non-condensing

## Storage temperature and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-40...+80	°C	
Relative humidity	5...95	%	Non-condensing

## Lifetime

Specification item	Value	Unit	Condition
Driver lifetime	100,000	hours	Measured temperature at $T_{case}$ -point is $T_{case}$ -life. Maximum failures = 10%



## Programmable features

Specification item	Value	Remark	Condition
Set output current (AOC)	Programmable, SimpleSet	See Design-in guide.	Default output current: = 700 mA
LED module temperature derating (MTP)	Yes		
Driver Temperature Limit (DTL)	Yes		
Constant Lumen Over Lifetime (CLO)	Yes		
DC emergency dimming (DCemDIM)	Yes		Default: AOC = 15%. EOFx = 10 ... 60%. No external DC rated fuse required
Diagnostics	Yes		
Adjustable Light Output (ALO)	Yes		
Ampdim	Yes		
LineSwitch single-step	Yes		
LineSwitch 3-step	Yes		
Adjustable Start-up Time (AST)	Yes		
Integrated Dynadimmer	Yes		5-step, light turn-off possible
End Of Life indicator	Yes		

## Features

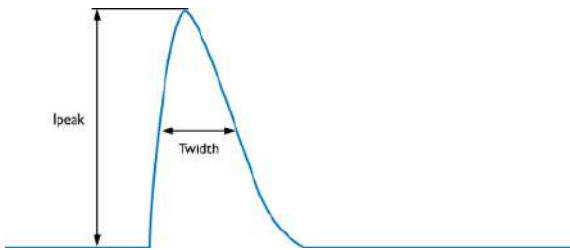
Specification item	Value	Remark	Condition
Open load protection	Yes		Automatic recovering
Short circuit protection	Yes		Automatic recovering
Over power protection	Yes		Automatic recovering
Hot wiring	No		
Suitable for fixtures with protection class	I and II		per IEC60598
Over temperature protection driver	Yes		Automatic recovering
Overheating protection	Yes		Automatic recovering

## Certificates and standards

Specification item	Value
Approval marks	CB / CCC / CE / EL / ENEC
Ingress Protection classification (IP)	20

## Inrush current

Specification item	Value	Unit	Condition
Inrush current $I_{peak}$	43	A	Input voltage 230V
Inrush current $T_{width}$	260	$\mu$ s	Input voltage 230V, measured at 50% $I_{peak}$
Drivers / MCB 16A type B	$\leq 10$	pcs	Indicative value



MCB	Rating	Relative number of LED drivers
B	4A	25%
B	6A	40%
B	10A	63%
B	13A	81%
B	16A	100% (stated in datasheet)
B	20A	125%
B	25A	156%
B	32A	200%
B	40A	250%
C	4A	42%
C	6A	63%
C	10A	104%
C	13A	135%
C	16A	170%
C	20A	208%
C	25A	260%
C	32A	340%
C	40A	415%

## Driver touch current / protective conductor current

Specification item	Value	Unit	Condition
Typical touch current (ins. Class II)	0.28	mA peak	Acc. IEC61347-1. LED module contribution not included
Typical protective conductor current (ins. Class I)	0.2	mA rms	Acc. IEC61347-1. LED module contribution not included

## Surge immunity

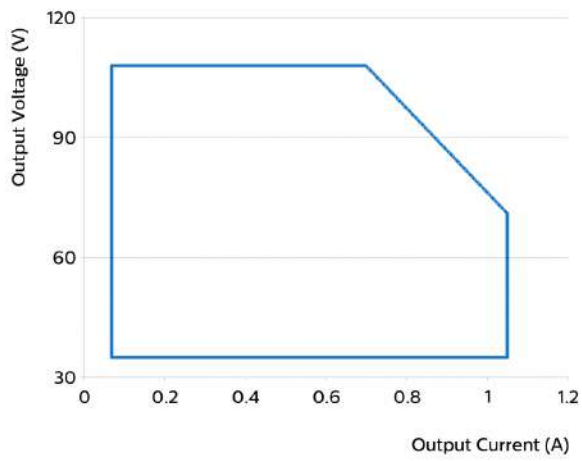
Specification item	Value	Unit	Condition
Mains surge immunity (diff. mode)	6	kV	L-N, Ls-L, Ls-N, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Mains surge immunity (comm. mode)	10	kV	L/N/Ls - EQUI 10kV acc. EN61547; 8kV acc. IEC61000-4-5, 12 Ohm 1.2/50us,8/20us
Control surge immunity (diff. mode)	0.9	kV	DALI, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Control surge immunity (comm. mode)	6	kV	DALI - EQUI acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us
DALI surge immunity (comm. mode)	6	kV	DALI - L/N/Ls acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us

## Additional information

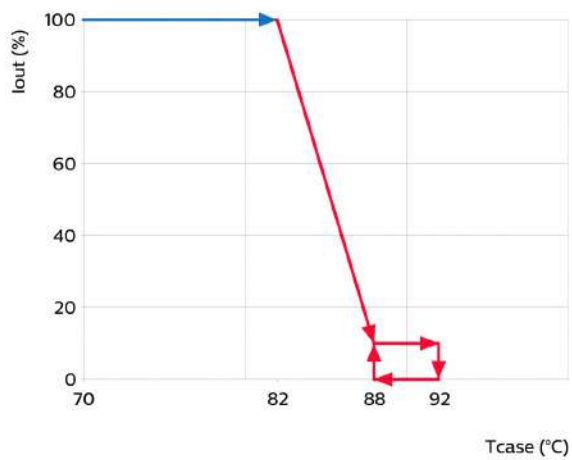
Specification item	Default setting	Remark	Condition
AOC	700	mA	
LineSwitch	ON		
CLO	OFF		
MTP	OFF		
Dynadimmer	OFF		
EOL	OFF		

## Graphs

### Operating window

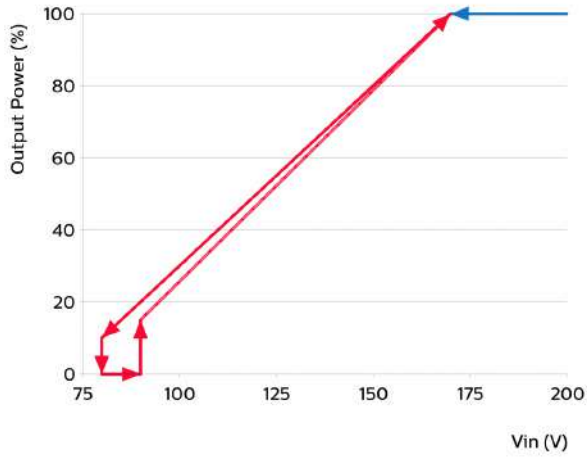


### Thermal Guard



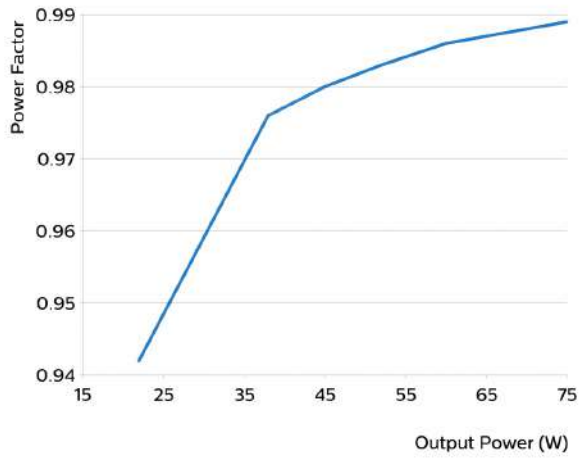
## Mains Guard

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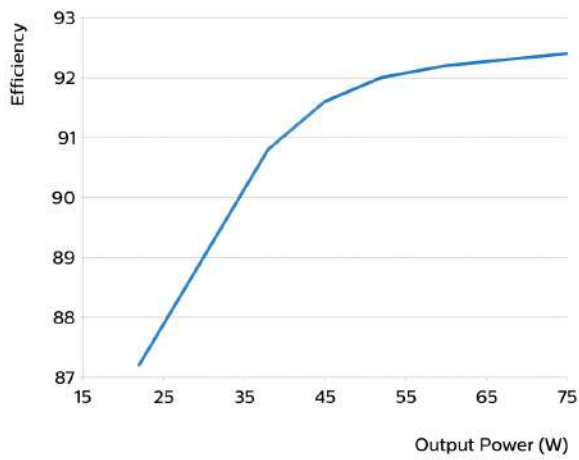
## Power factor versus output power

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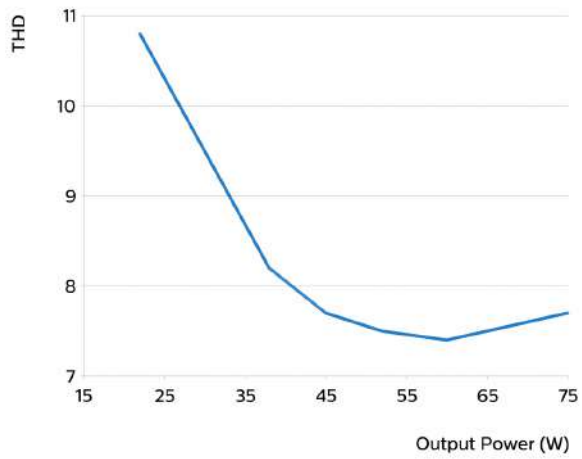
## Efficiency versus output power

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## THD versus output power

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Date of release: June 25, 2019 v4


[www.philips.com/oem](http://www.philips.com/oem)

## **2.5 Materiales de las luminarias**

Informe de ensayo en relación con el material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda.

### **c. Luminaria modelo farol**



 <p>Relva, 27 A - Torneiros 36410 PORRIÑO - Pontevedra Tel. +34 986 344 000 Fax. +34 986 337 302 e-mail: aimen@aimen.es www.aimen.es C.I.F. G - 36.606.291</p>	Nº Informe <i>Report No.</i>	1142147.1.2	Página <i>Page</i>	1 de 1 <i>1 of 1</i>
	Cliente <i>Customer</i>	IMQ TECNOCREA SL C/ Sèquia de Benàger, P.I.Alquería de Moret 23 - 46210 PICANYA - Valencia (España)		


<b>Datos de la muestra</b> <i>Sample data</i>		Fecha de recepción <i>Receipt date</i>	23.12.2020	Fecha de pedido <i>Receipt date of order</i>	17.12.2020
Descripción <i>Description</i>		Carcasa de aluminio <i>Aluminium housing</i>		Pedido <i>Order</i>	ACEPTACIÓN OFERTA
Id. AIMEN <i>Id. AIMEN</i>		†Referencia del Cliente <i>†Customer's reference</i>			
1142147-A		Luminarias Grupo Benito/Novatilu			

<b>Ensayo de Tracción</b> <i>Tensile Test</i>		Condiciones de ensayo <i>Test conditions</i>		UNE-EN ISO 6892-1:2020 A224				Fecha de ensayo <i>Date of test</i>		11.01.2021
Id.	Probeta / <i>Specimen</i>			R <sub>p0.2</sub> (MPa)	R <sub>p1</sub> (MPa)	R <sub>eH</sub> (MPa)	R <sub>m</sub> (MPa)	A (%)	Z (%)	
	Orientación <i>Orientation</i>	Tipo <i>Type</i>	Dimensiones <i>Size (mm)</i>							
1142147-A	LONGITUDINAL A LA MUESTRA <i>LONGITUDINAL TO THE SAMPLE</i>	P	12,517 x 3,464	148	---	---	174	*0,7	---	
Incertidumbre k=2 <i>Uncertainty</i>				0,053·R <sub>p0.2</sub>	0,053·R <sub>p1</sub>	0,053·R <sub>eH</sub>	0,030·R <sub>m</sub>	0,13·A	0,095·Z	
Observaciones <i>Remarks</i>		*La elongacion porcentual tras la rotura se obtiene mediante el extensometro MTS 50mm N°HMEDEX_007 (31030/7-08) <i>*The percentage elongation after breakage is obtained by means of the MTS 50mm extensometer N°HMEDEX_007 (31030/7-08)</i>								
Leyenda <i>Legend</i>		R <sub>p0.2</sub> : Limite elástico a 0,2% de deformación / 0,2% offset yieldstrength. R <sub>p1</sub> : Limite elástico a 1% de deformación / 1% Offset yieldstrength. R <sub>eH</sub> : Limite superior de cedencia / Upper yieldstrength.		R <sub>m</sub> : Resistencia a tracción / <i>Tensile strength</i> . A: Alargamiento tras la fractura / <i>Elongation after fracture</i> . Z: Coeficiente de estricción / <i>Reduction of area</i> .		Orientación / <i>Orientation</i> : L: Longitudinal. T: Transversal. Z: Perpendicular al espesor / <i>Through thickness</i> . A: All Weld.		Probeta tipo / <i>Specimentype</i> : P: Prismática / <i>Flat</i> . C: Cilíndrica / <i>Round</i> . T: Tubocompleto / <i>Tube complete</i> . B: Banda de pared de tubo / <i>Strip of tubewall</i> .		

<b>Análisis químico</b> <i>Chemical Analysis</i>										Fecha de ensayo <i>Date of test</i>		14.01.2021	
Muestra <i>Sample</i>		Si#	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Pb#	Sn#	Al
A	% peso <i>wt %</i>	12,52	0,567	<0,04	0,396	0,096	<0,028	<0,04	<0,017	0,041	0,011	<0,010	Matriz <i>Matrix</i>
	Incert. <i>Uncert.</i>	0,40	0,036	----	0,018	0,016	----	----	----	0,007	----	----	----
Método de ensayo <i>Test method</i>		B	B	B	B	B	B	B	B	B	B	B	----
<b>Técnicas de análisis</b> <i>Analysis techniques</i>													
<p>A) Absorción infrarroja tras combustión en horno de inducción: Procedimiento A/PE/AFM.Q/09. / Infrared absorption after induction furnace combustion: Procedure A/PE/AFM.Q/09.</p> <p>B) Espectrometría de emisión por chispa en aleación de aluminio: Procedimiento A/PE/AFM.Q/08 / Spark Emission Spectrometry in aluminium alloy: Procedure A/PE/AFM.Q/08</p> <p>C) Conductividad térmica tras fusión en corriente de gas inerte: Procedimiento A/PE/AFM.Q/11. Thermal conductivity after melting in an inert gas stream: Procedure A/PE/AFM.Q/11.</p> <p>D) ICP-OES: Procedimiento A/PE/AFM.Q/03 / ICP-OES: Procedure A/PE/AFM.Q/03</p>													
Observaciones <i>Remarks</i>		<p>La composición química de la muestra analizada cumple los requerimientos de una aleación de aluminio EN 1706 EN AC-44100. <i>Chemical composition of the sample analyzed fulfills the requirements of an EN 1706 EN AC-44100 aluminum alloy.</i></p> <p>La declaración de conformidad está basada en el criterio de aceptación simple según la guía ILAC G8, con una probabilidad de aceptación o rechazo falsos inferior al 50% <i>The statement of conformity is based on the simple acceptance criterion according to the ILAC G8 guide, with a false acceptance or rejection probability of less than 50%.</i></p>											

<p>Porriño, 8 de Febrero de 2021 <i>Porriño, 8<sup>th</sup> Febrero 2021</i></p>		
<p>Jorge Delgado Guirao Coordinador de Análisis Metalográfico y Químico <i>Head of Metallography and Chemical Analysis</i></p>	<p>Agustín Paz Gestoso Responsable de Ensayos y Análisis <i>Testing and analysis manager</i></p>	<p>Mauricio Ruibal Acuña Coordinador de Ensayos Mecánicos y END <i>Mechanical Testing and NDT Coordinator</i></p>

<p><b>Este informe anula y sustituye a nuestro informe nº 1142147.1.1 de fecha 21 de Enero de 2021</b> <i>This report supersedes our report no. 1142147.1.1 dated 21st January, 2021</i></p> <p>Descripción de los cambios / <i>Description of changes.</i> Modificación de la referencia del cliente por solicitud de este. / <i>Modification of the client's reference by request of the client.</i></p>		
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 <p>Las actividades marcadas con # no están amparadas por la acreditación de ENAC <i>Activities marked with # are not included in the scope of accreditation</i></p>	<p>Los resultados reflejados en este informe se refieren únicamente a la(s) muestra(s) reseñada(s). La información acompañada del superíndice † ha sido facilitada por el cliente, por lo tanto AIMEN no puede asumir responsabilidades sobre su veracidad. Este informe no podrá ser reproducido parcialmente sin la autorización escrita de AIMEN. <i>The results in this report refer only to the reported sample(s).</i> <i>The information market with the superscript † has been provided by the client, therefore AIMEN cannot assume responsibility for its veracity.</i> This report may not be reproduced except in full without the written authorisation of AIMEN. <i>The English version is a translation. In case of doubt, the Spanish text of this report is valid.</i></p>
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## DECLARACIÓN DE CONFORMIDAD Equipos Alumbrado Público BENITO NOVATILU

**BENITO URBAN SLU**, como fabricante de luminarias, de módulos LED, de protectores de sobretensión, y suministrador de fuentes de alimentación y sistemas de control y regulación, con domicilio social en c/ Lleida, 10 de 08500 VIC (Barcelona – España), con CIF B 59.987.529 y miembro del grupo BENITO NOVATILU.

DECLARA:

Que todas las luminarias del grupo BENITO NOVATILU están fabricadas en aluminio de alta pureza y cumplen con los requerimientos de una aleación de aluminio EN AC-44100 según Norma Europea EN 1706.

Y para que así conste, se expide este documento.

Vic, 4 de febrero de 2022.



**BENITO URBAN S.L.U**  
C.I.F. E3 859 987 529

**Lighting Department**  
Albert de Ramos Pons

### 3 Informe de Pruebas o Certificados de la Luminaria.

#### 3.1 Tabla Verificación (Anexo 4) CEI – IDAE

Informe de Pruebas o Certificados emitidos por el fabricante de la luminaria o entidad OEC acreditada	
1	Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes. (Propio de la empresa)
2	Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4.
3	Ensayo colorimétrico de la luminaria según la Norma UNE EN 13032-4.
4	Ensayo de medidas eléctricas: tensión, corriente de alimentación, potencia nominal leds y potencia total consumida por luminaria con todos sus elementos integrantes y factor de potencia. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.



**FABRICANTE:** BENITO URBAN, SLU  
**MANUFACTURER:** C/ Lleida 10 08500 Vic (Barcelona) – Spain  
Tel.: (+34) 93 852 1000

Certificamos y declaramos bajo nuestra responsabilidad que el siguiente producto:  
*We certify and declare under our responsibility that the following product:*

**Marca:** BENITO  
**Brand:** NOVATILU

**Modelo:** Luminaria Ornamental **NEOVILLA – NEOVILLA ALU – REALIA – ISABELINA**  
**Model:** Classical Lighting **ILNV – ILNA – ILRE – ILIS**

Está conforme a las siguientes directivas y normativas:  
*It is according to the following directives and norms:*

UNE-EN-61000-3-2:2006+A1:2010+A2:2010  
UNE-EN-61000-3-3:2009  
UNE-EN-61547:2011  
UNE-EN-55015:2007+A1:2008+A2:2009

Compatibilidad electromagnética (CEM).  
- Límites emisiones corrientes armónicas  
- Limitación variación tensión y flicker en redes públicas  
- Requisitos de Inmunidad  
- Límites perturbación radioeléctrica  
*Electromagnetic compatibility (EMC).*  
*-Limits harmonic current emissions*  
*-Limiting voltage variation and flicker in electrical networks*  
*-Immunity requirements*  
*-Limits radio electrical disturbance*

UNE-EN-60598-2-3:2003+A1:2011  
UNE-EN-60598-1:2015  
UNE-EN-62262  
UNE-EN-62471  
UNE-EN-62031:2009  
IEC 62722-1:2014  
IEC 62722-2-1:2014  
IEC 62717:2014

Luminarias Alumbrado Público  
- Requisitos generales y ensayos  
- Grado protección contra impactos (IK)  
- Seguridad Fotobiológica  
- Módulos LED. Requisitos de seguridad  
- Características de funcionamiento de luminarias. Requisitos generales.  
- Requisitos particulares para luminarias LED.  
- Módulos LED para iluminación general. Requisitos de funcionamiento.  
*Street Lighting Luminaires*  
*- General requirements and tests*  
*- Degrees of protection mechanical impacts (IK)*  
*- Photobiological safety*  
*- LED Modules. Safety requirement*  
*- Characteristics of operation of accessories. General requirements*  
*- Specific requirements for LED lighting.*  
*- LED modules for general lighting. Operating requirements.*

**Fecha de emisión:** Enero 2021  
**Issued on:** January 2021

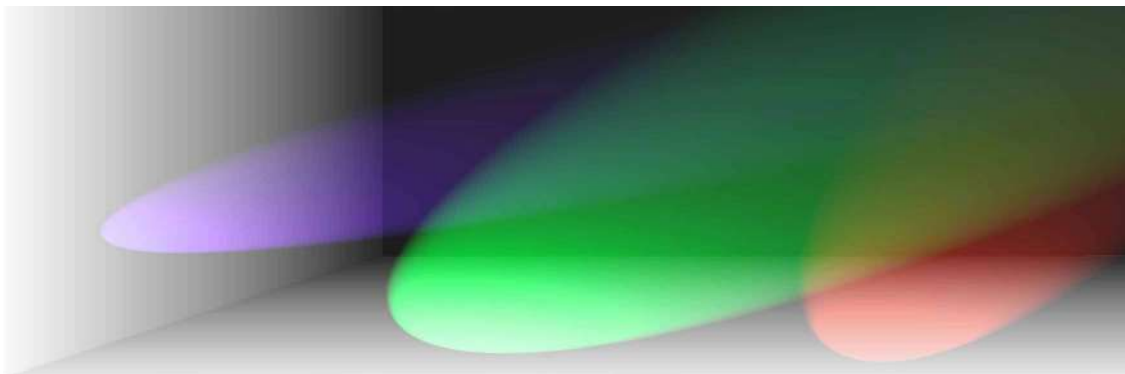
**Firmado:**  
**Signed:**



**Jordi Puig Rovira**  
Ingeniero Técnico Telecomunicación (col. 903055)  
Design & Engineering - Lighting Department

Los ensayos marcados con \* no están amparados por la acreditación ENAC

# INFORME DE ENSAYO



## Asselum luminotècnics, SL

Polígono Industrial Can Roqueta  
C/ Ca n'Alzina 76 08202 Barcelona

Tel - Fax: 93.725.98.10

[www.asselum.com](http://www.asselum.com)

**Cliente:** BENITO – NOVATILU

**Dirección:** C/Lleida 10, 08500, Vic

**Provincia:** Barcelona

**País:** España

**Teléfono:** 938521000

**Nombre muestra<sup>1</sup>:** Neovilla 80W 4K

**Código muestra<sup>1</sup>:** ILNV - ILNA

**Nº muestra:** RM21072804.15

**Fecha del ensayo:** 15/03/2022

**Código de ensayo:** CL237A22F009V

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

Informe revisado:

43564191Y  
MARC  
BALLBE (R:  
B62741152)

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por 43564191Y MARC BALLBE  
(R: B62741152)  
DN: cn=43564191Y MARC  
BALLBE (R: B62741152),  
gn=MARC CHES @ASSELUM  
LUMINOTÈCNICS SL  
Motivo: Soy el autor de este  
documento  
Ubicación:  
Fecha: 2022-03-17 11:07:01.00

**Marc Ballbè**  
**Director técnico**

Los resultados obtenidos en el presente informe se refieren únicamente a la muestra ensayada conforme en el apartado 1.1. No se podrá reproducir total o parcialmente el informe sin el consentimiento de **ASSELUM assessorsluminotècnics, S.L.** La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa.

Cualquier impresión del presente informe será considerada como una copia del mismo.  
**Assessors luminotècnics, SL Pol. Ind. Can Roqueta C/. Ca n'Alzina, 76 - 08202 Sabadell Barcelona**  
**Tel. 93 725 98 10 [www.asselum.com](http://www.asselum.com)**

## **ÍNDICE DEL INFORME**

### **1. Descripción de la muestra y del ensayo**

- 1.1. Ficha técnica del producto
  - 1.1.1. Imagen de la muestra
- 1.2. Ficha del ensayo
- 1.3. Parámetros del test eléctrico
- 1.4. Condiciones ambientales
- 1.5. Instrumentos utilizados

### **2. Parámetros eléctricos medidos**

- 2.1. Medición del conjunto

### **3. Observaciones**

### **4. Resultados del ensayo de fotometría**

## 1. Descripción de la muestra y del ensayo

### 1.1. Ficha técnica del producto

Tipo	Luminária
Código Producto <sup>1</sup>	ILNV - ILNA
Nombre <sup>1</sup>	Neovilla 80W 4K
Dimensiones [mm]	455 x 455 x 300
Área luminosa [mm]	200 x 100 x 0
Tipo fuente de luz	LED
Flujo luminoso[Im]	8573
Potencia del conjunto[W]	82,4
Eficacia luminosa[Im/W]	104,0

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

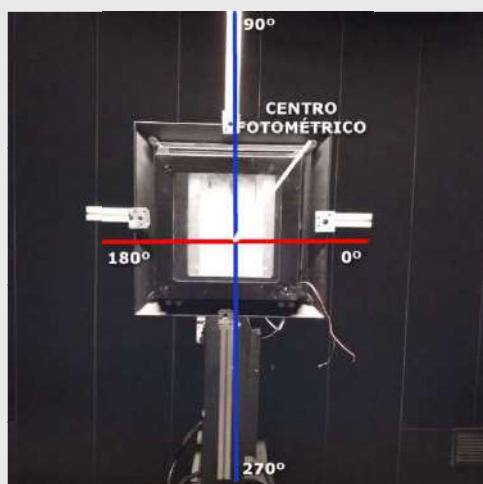
#### 1.1.1. Imagen de la muestra



## 1.2. Ficha del ensayo

Normas de referencia	UNE-EN 13032-4:2016 EN 13032-4: 2015 CIE S 025: 2015 CIE 34:1977 CIE 52:1982 CIE 117:1995 IES TM-15:07
Sistema de medición	C- $\gamma$ , $C = \Delta 15^\circ$ , $G = \Delta 2,5^\circ$

### Sistema de referencia y centro fotométrico



## 1.3. Parámetros del test eléctrico


Tipo de alimentación	Fuente estabilizada
Alimentación eléctrica	230V AC $\pm$ 0,4%
Distorsión armónica	< 0,5%
Frecuencia	50 Hz $\pm$ 0.1%

## 1.4. Condiciones ambientales

Temperatura del laboratorio [°C]	25°C $\pm$ 1,2°C
Humedad relativa	<60%
Movimiento del aire	< 0,25 m/s



## 1.5. Instrumentos utilizados

Goniofotómetro	<p>Goniofotómetro T2 de rotación de la luminaria acuerdo con las normas y recomendaciones:</p> <ul style="list-style-type: none"> <li>❖ EN 13032-1 2005 cap. 6.1.1.1 – tipo de goniofotómetro 1.1, 1.2 y 1.3</li> <li>❖ Recomendación CIE 121 Cap.5 Tipo 1 y 2</li> </ul> <p>Nº identificativo: E-001 Distancia de medición: 6,44 m</p>
Posición de ensayo de la muestra	El ensayo se realiza con la muestra en posición en horizontal y se aplica un factor de corrección entregando el resultado en función de la posición de diseño.
Fuente de alimentación	Fuente de alimentación AC ET-System modelo EAC-S-1000 Nº identificativo: E-019
Multímetro	MULTIMETRO NEWTON 4TH. MODELO PPA 1510 Nº identificativo: E-020
Luxómetro	Luxómetro CZIULA&GRUNDMANN Nº identificativo: E-003
Anemómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Termómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Espectroradiómetro	JETI SPECOS 1211 Nº identificativo: E-036
Termómetro	TERMOMETRO DIGITAL PCE-T 390 Nº identificativo: E-018
	

## 2. Parámetros eléctricos medidos

### 2.1. Medición del conjunto

Tensión de alimentación <b>[V]</b>	230,1
Intensidad <b>[A]</b>	0,359
Potencia <b>[W]</b>	82,5
Factor de potencia	0,98

### 3. Observaciones

- Queda prohibida la reproducción parcial de este documento.
- Este Informe no puede presentar enmiendas o raspaduras, en caso contrario será considerado nulo.
- La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa, en la instrucción técnica IT10 de ASSELUM.

### 4. Resultados del ensayo de fotometría

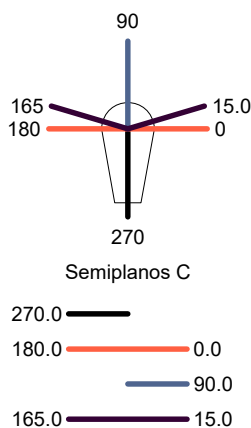
## 4.1. Resumen

### Luminaria

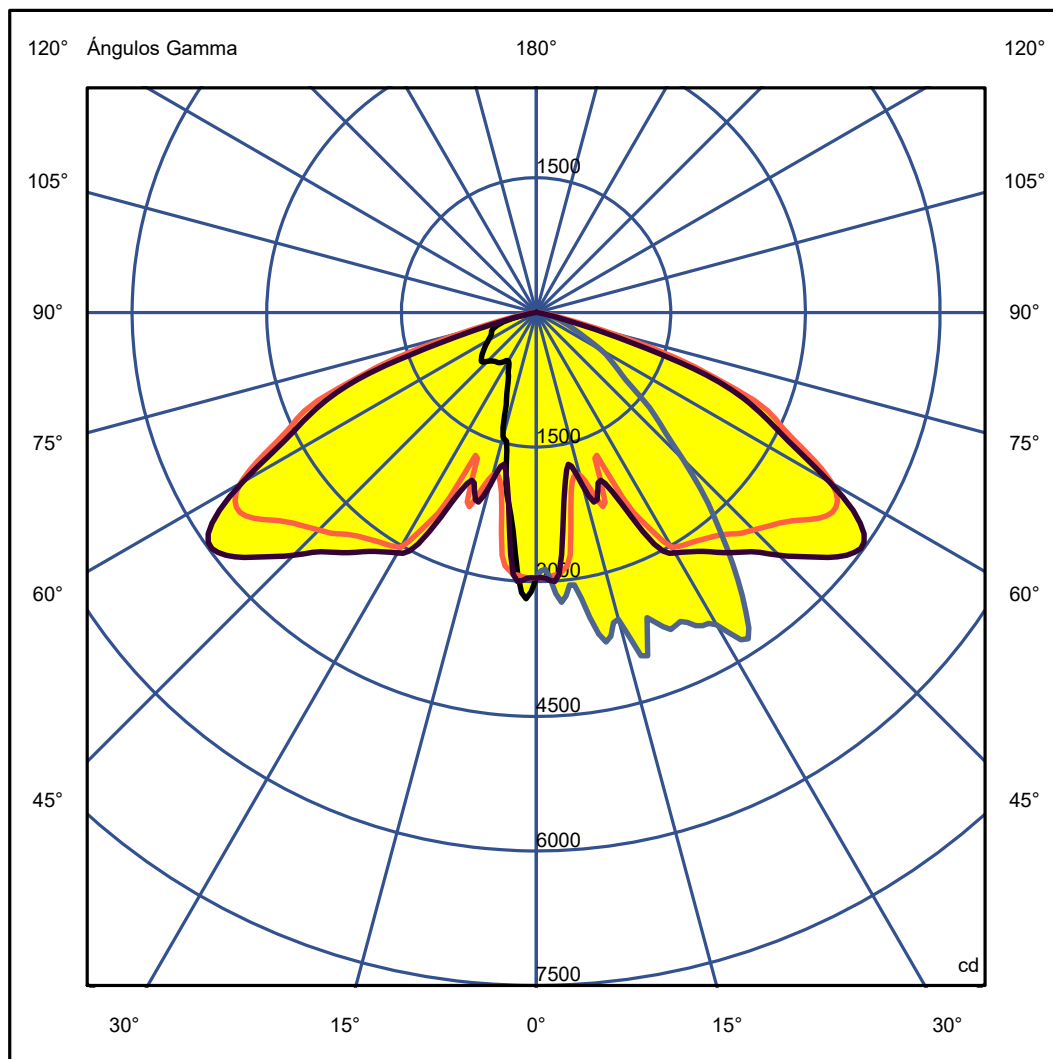
Código ILNV - ILNA  
 Nombre Neovilla 80W 4K  
**Ensayo**  
 Código CL237A22F009V  
 Nombre Neovilla 80W 4K

Flujo Luminaria	8572.72 lm	Potencia Luminaria	82.45 W	Eficacia	103.97 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	8572.72 lm	Valor Máximo	4460.98 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90
Luminaria Rectangular	Longit. 455 mm	Anchura	455 mm	Altura	300 mm		
Área Luminosa Rectangular	Longit. 200 mm	Anchura	100 mm	Altura	0 mm		
Área Luminosa Horizontal	0.020000 m2	Área Emisión sobre Pl. 180°	0.000000 m2	Área Emisión sobre Pl. 270°	0.000000 m2	Área de deslumbramiento a 76°	0.004838 m2
Área Emisión sobre Pl. 0°	0.000000 m2						
Área Emisión sobre Pl. 90°	0.000000 m2						
Sist. de Coord.	CG viales	Tipo de Simetría		Sim. en los planos 270-90			
Fecha	15-03-2022	Máximo Ángulo Gamma		180			
Distancia de Ensayo	6.44	Flujo de Ensayo		8572.72 lm			
Operador	Asselum T2	Tensión Nominal		230.12 V			
Temperatura	25.20 °C	Corriente Nominal		0.36 A			
Humedad	40.10 %	Fotocélula		Prc			
Notas	RM21072804.15						

Fuentes de luz de la Luminaria					
Familia	Código	Nombre	Flujo [lm]	Pot. [W]	Cant.
	5050	Lumiled 5050	8572.72	82.45	1
C.I.E.	42 79 98 100 100	D DIN 5040	A30		



ULOR 0.27 %  
 DLOR 99.73 %  
 RN 0.27 %



## 4.2. Matriz de intensidades (Cd)

**Luminaria**

Código ILNV - ILNA  
 Nombre Neovilla 80W 4K  
**Ensayo**  
 Código CL237A22F009V  
 Nombre Neovilla 80W 4K

Flujo Luminaria	8572.72 lm	Potencia Luminaria	82.45 W	Eficacia	103.97 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	8572.72 lm	Valor Máximo	4460.98 cd	Posición	C=15.00 G=55.00	CG Sim. en los planos	270-90

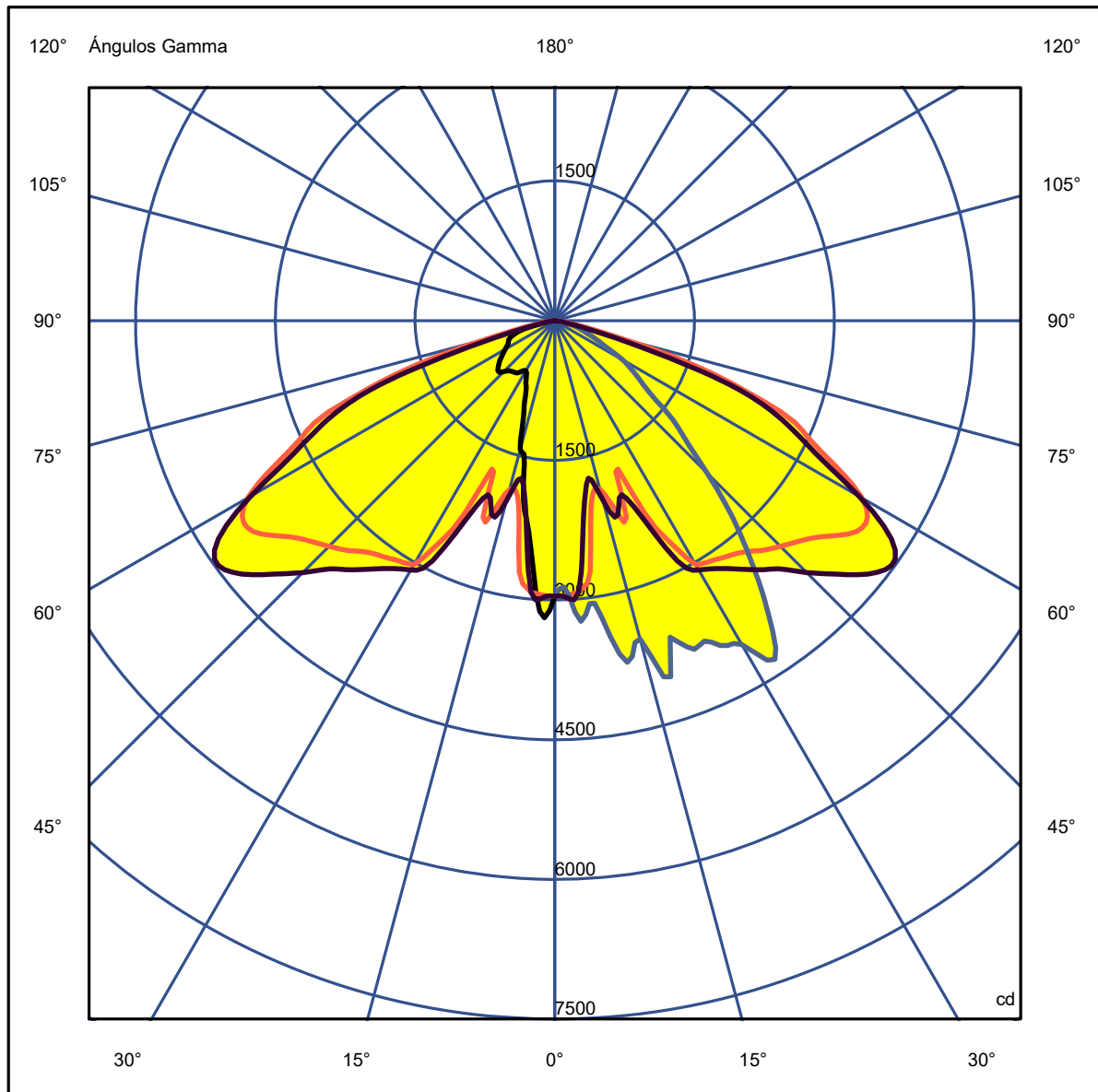
Tabla de Intensidad Luminosa cd      Tabla 1/1

	C 270.00	C 285.00	C 300.00	C 315.00	C 330.00	C 345.00	C 0.00	C 15.00	C 30.00	C 45.00	C 60.00	C 75.00	C 90.00
G 0.0	2958.54	2958.54	2958.54	2958.54	2958.54	2958.54	2958.54	2958.54	2958.54	2958.54	2958.54	2958.54	2958.54
G 2.5	3179.01	2937.95	3114.66	2865.49	3006.71	2921.33	2952.70	2973.71	3023.64	2708.78	2994.73	3254.14	2896.09
G 5.0	2675.30	3124.15	2726.30	2991.83	3131.60	2906.25	2927.62	2928.01	2932.98	3151.86	3048.31	3059.39	3240.04
G 7.5	2220.83	2595.09	2444.52	2862.50	2826.58	2979.95	2820.93	2305.02	2749.67	2908.76	3295.97	3602.70	3037.93
G 10.0	1945.74	2341.49	1944.26	2453.23	2267.01	2902.09	2217.77	1886.20	2850.74	3043.95	3489.52	3280.48	3448.19
G 12.5	1506.67	1940.92	1907.31	1993.23	1870.91	2396.83	1894.43	1731.85	2493.06	2693.06	3245.97	3841.17	3746.12
G 15.0	1432.08	1531.16	1315.07	1618.64	1397.06	1883.81	1875.47	1997.82	2002.89	2443.46	3552.24	3768.78	3538.22
G 17.5	1135.51	1370.04	1265.62	1412.78	1312.84	1826.71	2108.45	2213.09	2471.54	2720.42	3203.74	3571.57	4050.77
G 20.0	956.81	1118.49	912.96	1115.27	1548.07	1803.15	2248.02	2021.20	2563.60	2815.06	3513.80	3937.96	3616.60
G 22.5	805.74	955.64	756.21	981.23	1158.36	1745.37	1698.14	2104.33	2386.68	3041.54	3194.60	3831.49	3813.35
G 25.0	736.09	849.19	746.52	877.46	1242.53	1740.16	2271.34	2513.81	2347.97	3045.36	3152.30	3608.85	3796.59
G 27.5	656.94	720.94	661.48	865.01	1111.00	1758.25	2685.45	2961.49	2751.45	2969.91	3484.84	4000.48	3939.17
G 30.0	622.73	647.72	619.80	749.70	1213.54	2128.90	3024.13	3090.90	3019.44	3101.67	3386.23	4156.67	4014.39
G 32.5	636.55	621.46	587.38	715.89	1202.54	2326.27	3072.40	3161.63	3458.76	3239.57	3544.87	4094.74	4336.77
G 35.0	681.61	610.56	577.05	668.57	1145.65	2326.96	3111.88	3249.08	3545.80	3306.75	3576.51	3866.72	4077.08
G 37.5	701.38	626.98	572.67	668.38	1086.28	2328.72	3160.60	3368.73	3653.52	3263.41	3525.07	3551.23	3647.74
G 40.0	711.33	663.17	573.97	624.13	1020.26	2318.05	3232.44	3488.97	3741.79	3169.15	3362.09	3154.52	3200.25
G 42.5	731.54	685.22	571.80	590.21	948.67	2315.98	3339.51	3617.19	3829.43	3052.23	3171.74	2722.33	2774.79
G 45.0	771.82	698.62	573.56	543.64	890.93	2323.59	3424.99	3823.90	3896.66	2937.43	2916.07	2171.43	2310.53
G 47.5	815.91	732.86	591.73	521.54	836.10	2347.53	3518.27	4025.54	3953.01	2798.42	2708.02	1848.05	1918.21
G 50.0	795.42	771.76	600.04	504.75	787.60	2378.23	3626.90	4242.42	3977.18	2629.97	2465.29	1580.41	1650.72
G 52.5	756.42	777.91	586.23	493.38	743.44	2416.15	3790.69	4417.29	3939.21	2431.56	2055.76	1364.71	1300.83
G 55.0	708.05	731.58	555.58	485.47	729.02	2474.13	3950.32	4460.98	3819.99	2191.45	1679.25	1175.26	1121.49
G 57.5	659.26	681.96	519.81	470.08	729.11	2530.81	3972.80	4239.80	3631.73	1977.67	1417.78	990.90	978.32
G 60.0	614.91	633.78	466.97	439.79	712.43	2561.33	3804.61	3773.68	3387.92	1766.87	1200.47	810.35	842.46
G 62.5	573.60	594.40	433.60	412.45	662.99	2467.42	3411.63	3233.41	3100.61	1510.74	1029.28	642.95	643.54
G 65.0	549.90	558.75	392.14	382.96	610.70	2193.66	3019.26	2860.75	2626.13	1158.86	880.61	495.92	519.49
G 67.5	535.04	522.71	356.21	348.72	566.45	1938.81	2724.42	2500.81	2064.32	790.80	666.82	400.07	408.22
G 70.0	493.97	478.75	317.62	307.00	511.39	1739.60	2115.88	1965.94	1706.56	449.77	520.94	281.21	327.72
G 72.5	429.90	436.67	270.33	254.70	367.38	1324.08	1506.25	1121.15	1300.56	284.44	409.99	201.10	265.42
G 75.0	333.97	383.44	190.37	201.56	232.72	889.14	750.64	481.80	725.27	174.56	294.25	122.63	209.43
G 77.5	166.13	312.84	138.70	158.29	144.76	493.18	361.56	197.90	329.23	103.08	196.94	80.20	91.37
G 80.0	96.37	219.91	87.62	114.83	84.10	260.18	164.51	99.90	163.18	54.18	126.04	41.56	63.79
G 82.5	44.98	126.17	46.33	72.56	46.58	131.84	93.31	39.73	80.59	26.18	49.75	19.28	38.63
G 85.0	18.53	46.66	22.39	41.63	23.33	76.44	37.52	12.73	42.34	4.21	23.18	6.79	21.20
G 87.5	6.02	22.96	9.03	12.46	7.75	39.50	8.58	6.45	15.76	1.30	8.28	2.09	9.50
G 90.0	2.76	10.11	5.99	4.11	4.77	14.89	3.23	5.93	5.62	1.29	2.25	2.01	1.38
G 92.5	3.42	6.67	5.78	1.69	4.61	5.69	3.46	5.62	4.19	1.35	1.77	2.00	1.39
G 95.0	3.86	6.54	5.45	1.68	4.48	5.20	3.67	5.10	4.00	1.46	1.76	1.96	1.48
G 97.5	4.21	6.21	5.02	1.80	4.26	5.06	3.71	4.17	3.81	1.56	1.76	1.91	1.65
G100.0	4.23	5.58	4.53	1.90	3.99	4.84	3.65	3.65	3.56	1.65	1.74	1.89	1.74
G102.5	4.14	5.04	4.04	2.05	3.82	4.56	3.63	3.34	3.24	1.70	1.75	1.87	1.79
G105.0	4.10	4.57	3.86	2.15	3.72	4.29	3.67	3.15	2.94	1.82	1.79	1.89	1.87
G107.5	4.07	4.29	3.76	2.26	3.69	4.10	3.69	3.10	2.82	1.95	1.84	1.95	1.92
G110.0	4.08	4.06	3.70	2.46	3.76	4.01	3.76	3.13	2.76	2.19	1.94	2.07	2.01
G112.5	4.18	3.89	3.75	2.68	3.90	4.00	3.87	3.28	2.78	2.44	2.10	2.25	2.14
G115.0	4.22	3.88	3.95	2.96	4.15	4.10	4.04	3.44	2.92	2.72	2.29	2.44	2.27
G117.5	4.43	3.93	4.21	3.28	4.37	4.24	4.27	3.66	3.14	2.90	2.52	2.69	2.41
G120.0	4.74	4.09	4.48	3.51	4.67	4.46	4.56	3.86	3.44	3.16	2.78	2.93	2.81
G122.5	4.96	4.31	4.76	3.75	4.94	4.78	4.88	4.07	3.70	3.45	3.09	3.37	3.12
G125.0	5.07	4.54	5.07	4.02	5.22	5.05	5.19	4.26	3.95	3.75	3.45	3.62	3.43
G127.5	5.45	5.00	4.92	4.28	5.20	5.31	5.52	4.16	4.17	4.22	3.66	3.74	3.79
G130.0	5.59	5.22	4.47	4.49	4.89	5.52	5.71	3.65	4.30	4.58	3.89	3.88	4.07
G132.5	3.67	4.21	4.49	4.70	5.06	5.59	5.16	3.64	4.60	4.89	4.22	4.16	4.01
G135.0	3.58	3.19	4.60	4.85	5.20	4.94	4.98	3.81	4.72	5.30	4.57	4.60	4.28
G137.5	3.58	3.13	4.32	5.02	5.33	4.99	5.19	3.94	4.68	5.64	4.93	4.98	4.64
G140.0	3.53	3.14	3.72	5.17	5.35	5.17	5.40	4.26	4.61	6.01	5.26	5.29	4.99
G142.5	3.52	3.22	3.26	5.31	5.31	5.34	5.65	4.48	4.37	5.80	5.31	5.21	5.36
G145.0	3.42	3.18	3.11	5.47	5.28	5.51	5.76	4.69	4.07	4.87	5.25	5.03	5.63
G147.5	3.29	3.15	3.07	5.13	5.21	5.63	5.80	4.71	4.07	2.82	5.29	5.23	5.90
G150.0	3.13	3.13	2.77	3.90	4.57	5.57	5.78	4.48	4.03	1.51	4.85	4.62	5.95
G152.5	2.73	3.15	2.19	2.53	3.13	5.06	4.99	3.52	3.36	1.11	3.20	2.78	5.84
G155.0	2.19	2.66	1.76	1.79	1.95	3.88	3.74	1.51	2.07	1.06	2.08	1.98	3.80
G157.5	1.84	1.96	1.61	1.61	1.61	2.87	1.90	1.24	1.26	1.06	1.26	1.09	2.86
G160.0	1.51	1.72	1.54	1.55	1.50	1.85	1.37	1.20	1.13	1.06	1.07	1.05	1.72
G162.5	1.45	1.51	1.51	1.52	1.48	1.47	1.29	1.24	1.14	1.06	1.07	1.05	1.03
G165.0	1.43	1.50	1.49	1.49	1.45	1.37	1.27	1.24	1.14	1.09	1.07	1.09	1.07
G167.5	1.40	1.45	1.43	1.45	1.43	1.37	1.28	1.25	1.15	1.12	1.09	1.13	1.07
G170.0	1.39	1.42	1.39	1.41	1.36	1.37	1.27	1.28	1.20	1.17	1.12	1.19	1.12
G172.5	1.36	1.39	1.34	1.35	1.32	1.35	1.25	1.27	1.24	1.20	1.19	1.23	1.19
G175.0	1.34	1.34	1.30	1.30	1.28	1.29	1.22	1.27	1.25	1.24	1.23	1.25	1.21
G177.5	1.34	1.33	1.30	1.28	1.30	1.26	1.21	1.28	1.27	1.25	1.27	1.30	1.29
G180.0	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29

### 4.3. Distribución polar de intensidades (Cd)

**Luminaria**  
 Código ILNV - ILNA  
 Nombre Neovilla 80W 4K  
**Ensayo**  
 Código CL237A22F009V  
 Nombre Neovilla 80W 4K

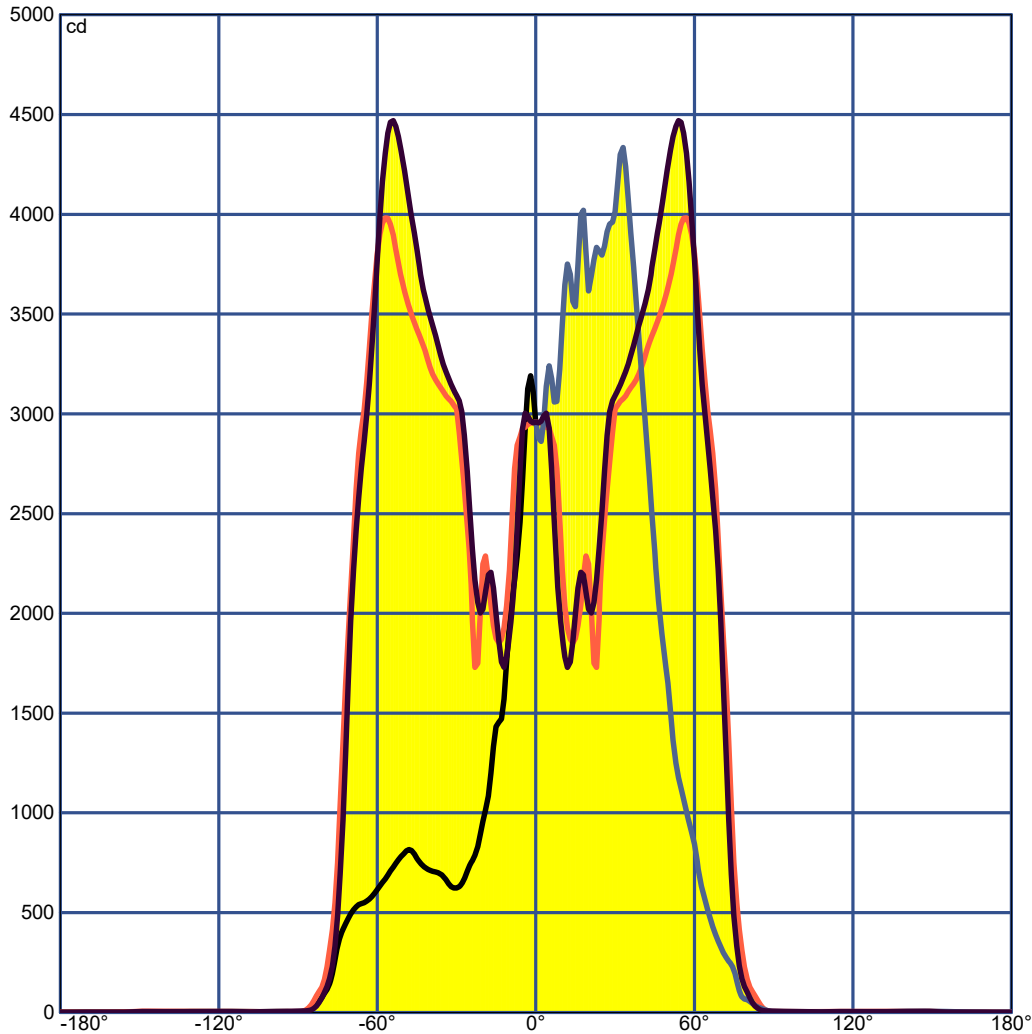
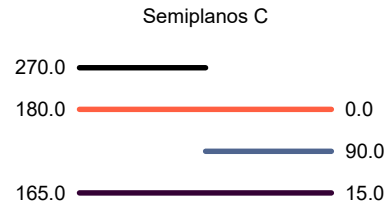
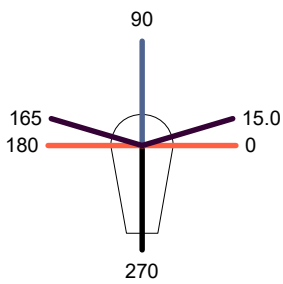
Flujo Luminaria	8572.72 lm	Potencia Luminaria	82.45 W	Eficacia	103.97 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	8572.72 lm	Valor Máximo	4460.98 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90



### 4.4. Distribución cartesiana de intensidades (Cd)

**Luminaria**  
 Código ILNV - ILNA  
 Nombre Neovilla 80W 4K  
**Ensayo**  
 Código CL237A22F009V  
 Nombre Neovilla 80W 4K

Flujo Luminaria	8572.72 lm	Potencia Luminaria	82.45 W	Eficacia	103.97 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	8572.72 lm	Valor Máximo	4460.98 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90



## 4.5. Flujo zonal

**Luminaria**  
 Código ILNV - ILNA  
 Nombre Neovilla 80W 4K  
**Ensayo**  
 Código CL237A22F009V  
 Nombre Neovilla 80W 4K

Flujo Luminaria	8572.72 lm	Potencia Luminaria	82.45 W	Eficacia	103.97 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	8572.72 lm	Valor Máximo	4460.98 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

Flujo Total=8572.72 Flujo Luminaria=8572.72

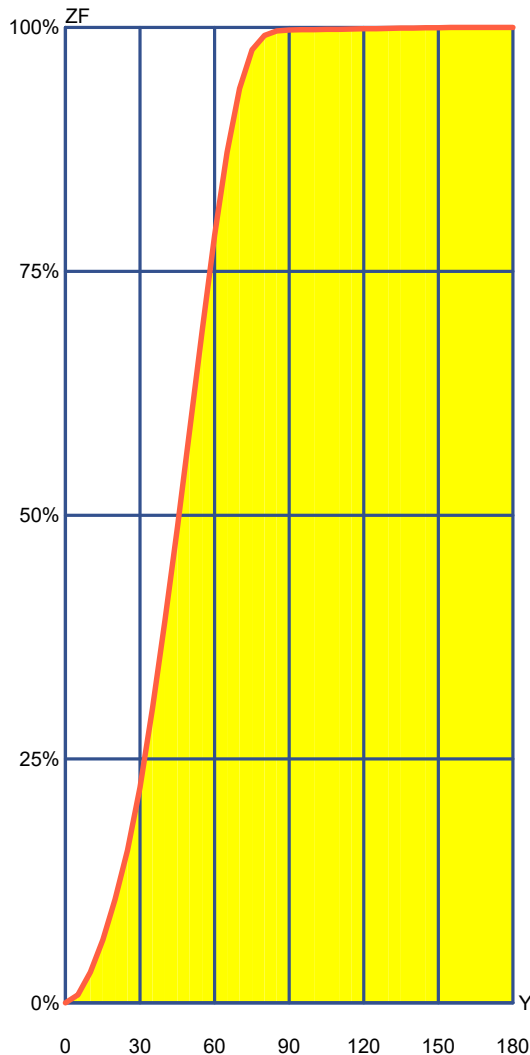
RI	0.60	0.80	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	10.00	20.00
DRR	0.26	0.35	0.43	0.51	0.58	0.67	0.73	0.78	0.83	0.86	0.93	0.97
RC	6	6	6	5	5	5	5	5	5	5	4	4

Flujo Zonal por 1000 Lúmenes

Y°	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
ZF(Y)	32	106	221	392	587	787	937	992	997	998	998	999	999	999	1000	1000	1000	1000

Códigos de Flujo C.I.E.  
 42 79 98 100 100

C.I.E.	6/6/6/5/5/5/5/5/4/4	LOR	100.00000 %
D DIN 5040	A30	ULOR	0.26655 %
F UTE	1.00 E	DLOR	99.73345 %
B NBN	BZ 5 / 3 / BZ 4	UFF	0.26655 %
RN	0.26655 %	DFF	99.73345 %
BLF	1.0	FFR	0.26726 %



Gamma °	Flujo	Suma lm	Flujo [%]	Suma [%]
0°	0.00	0.00	0.00%	0.00 %
5°	8.32	8.32	0.83 %	0.83 %
10°	23.40	31.71	2.34 %	3.17 %
15°	32.86	64.57	3.29 %	6.46 %
20°	41.62	106.19	4.16 %	10.62 %
25°	50.37	156.56	5.04 %	15.66 %
30°	64.44	221.00	6.44 %	22.10 %
35°	80.79	301.79	8.08 %	30.18 %
40°	90.50	392.29	9.05 %	39.23 %
45°	95.58	487.87	9.56 %	48.79 %
50°	99.20	587.07	9.92 %	58.71 %
55°	101.47	688.54	10.15 %	68.85 %
60°	98.16	786.71	9.82 %	78.67 %
65°	85.27	871.97	8.53 %	87.20 %
70°	65.45	937.42	6.54 %	93.74 %
75°	39.55	976.97	3.95 %	97.70 %
80°	14.94	991.91	1.49 %	99.19 %
85°	4.49	996.40	0.45 %	99.64 %
90°	0.94	997.33	0.09 %	99.73 %
95°	0.26	997.60	0.03 %	99.76 %
100°	0.22	997.82	0.02 %	99.78 %
105°	0.20	998.02	0.02 %	99.80 %
110°	0.19	998.20	0.02 %	99.82 %
115°	0.19	998.39	0.02 %	99.84 %
120°	0.20	998.59	0.02 %	99.86 %
125°	0.22	998.81	0.02 %	99.88 %
130°	0.23	999.04	0.02 %	99.90 %
135°	0.22	999.26	0.02 %	99.93 %
140°	0.20	999.46	0.02 %	99.95 %
145°	0.19	999.65	0.02 %	99.96 %
150°	0.15	999.80	0.02 %	99.98 %
155°	0.10	999.90	0.01 %	99.99 %
160°	0.04	999.94	0.00 %	99.99 %
165°	0.03	999.97	0.00 %	100.00 %
170°	0.02	999.99	0.00 %	100.00 %
175°	0.01	1000.00	0.00 %	100.00 %
180°	0.00	1000.00	0.00 %	100.00 %

## 4.6. Diagrama Isolux

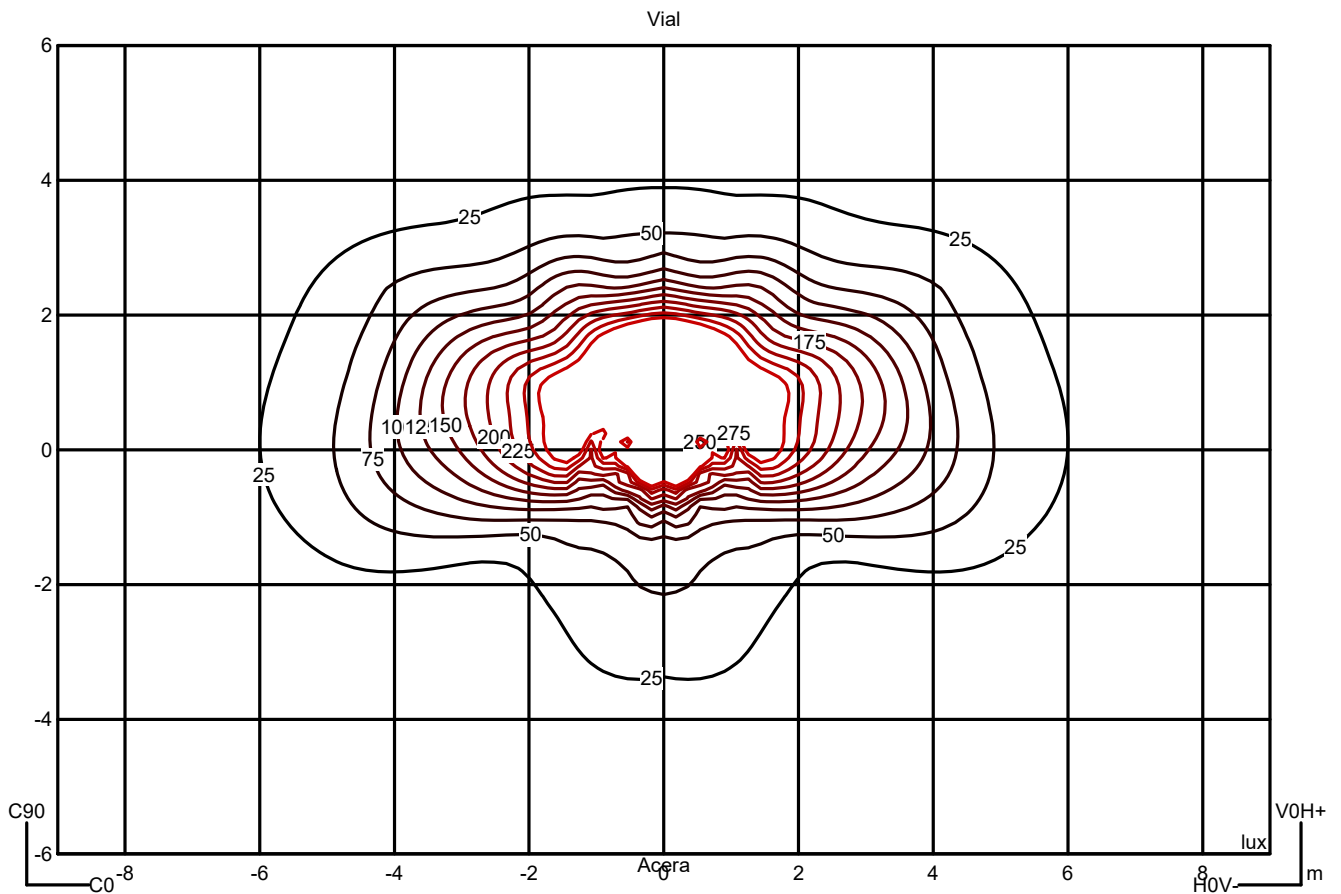
**Luminaria**

Código ILNV - ILNA  
 Nombre Neovilla 80W 4K  
**Ensayo**  
 Código CL237A22F009V  
 Nombre Neovilla 80W 4K

Flujo Luminaria	8572.72 lm	Potencia Luminaria	82.45 W	Eficacia	103.97 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	8572.72 lm	Valor Máximo	4460.98 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

Isolux (Suelo)

Posición Luminaria X=0.00m Y=0.00m Z=2.50m





### 4.7. Factor de utilización

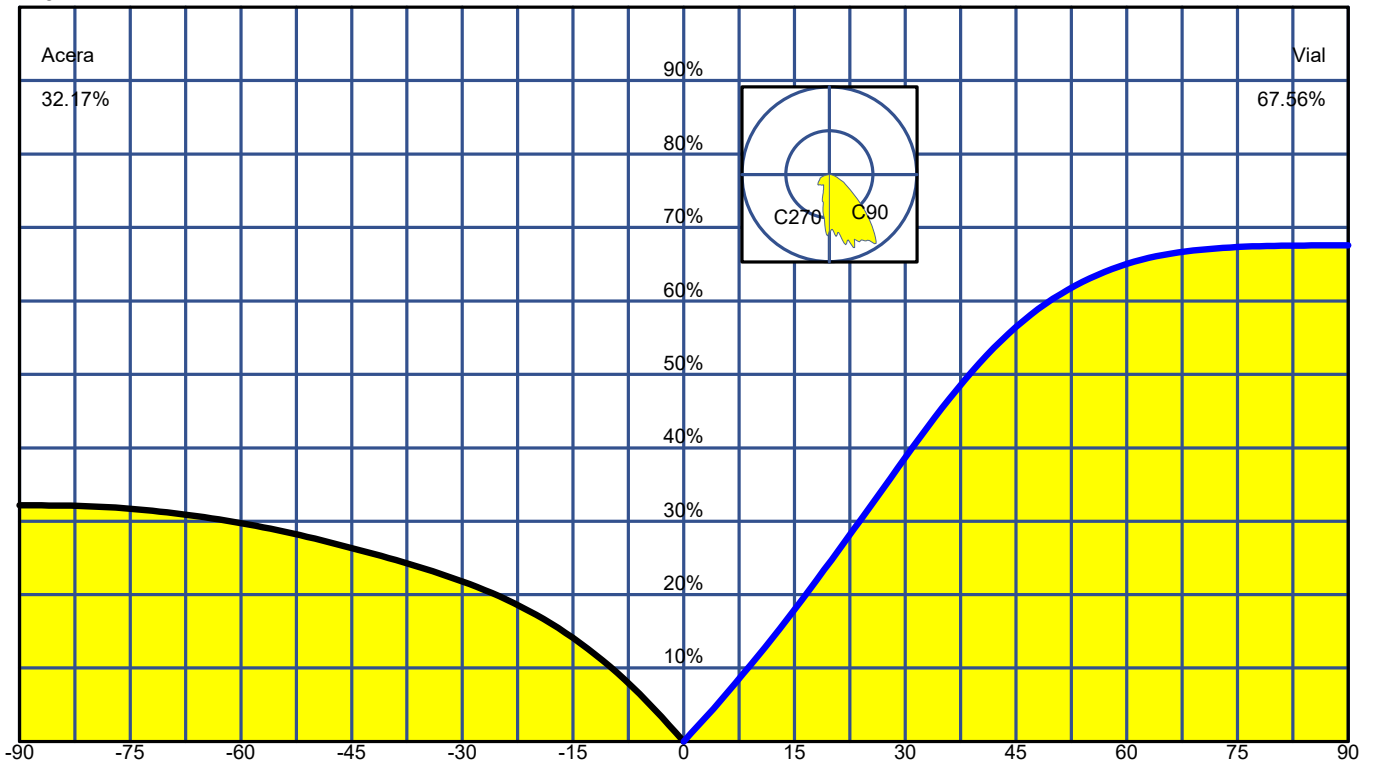
**Luminaria**  
 Código ILNV - ILNA  
 Nombre Neovilla 80W 4K  
**Ensayo**  
 Código CL237A22F009V  
 Nombre Neovilla 80W 4K

Flujo Luminaria	8572.72 lm	Potencia Luminaria	82.45 W	Eficacia	103.97 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	8572.72 lm	Valor Máximo	4460.98 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

Acera			Vial		
Ángulo	0	0.00%	Ángulo	0	0.00%
Ángulo	-5	5.46%	Ángulo	5	5.61%
Ángulo	-10	10.18%	Ángulo	10	11.60%
Ángulo	-15	14.11%	Ángulo	15	17.97%
Ángulo	-20	17.26%	Ángulo	20	24.74%
Ángulo	-25	19.78%	Ángulo	25	31.66%
Ángulo	-30	21.81%	Ángulo	30	38.66%
Ángulo	-35	23.50%	Ángulo	35	45.44%
Ángulo	-40	24.99%	Ángulo	40	51.47%
Ángulo	-45	26.35%	Ángulo	45	56.45%
Ángulo	-50	27.63%	Ángulo	50	60.28%
Ángulo	-55	28.78%	Ángulo	55	63.08%
Ángulo	-60	29.74%	Ángulo	60	65.03%
Ángulo	-65	30.54%	Ángulo	65	66.26%
Ángulo	-70	31.21%	Ángulo	70	66.97%
Ángulo	-75	31.71%	Ángulo	75	67.34%
Ángulo	-80	32.02%	Ángulo	80	67.50%
Ángulo	-85	32.15%	Ángulo	85	67.55%
Ángulo	-90	32.17%	Ángulo	90	67.56%

Ángulo de Inclinación = 0.0

DLOR = 99.73%



Spread	35.4° Estrecho	DLOR	99.73345 %
Throw	53.1° Corto	ULOR	0.26655 %
SLI	5.0 Concentrado	Eficiencia	100.00000 %
Cutoff CIE	Cutoff - Max: C=15.0° Gamma=55.0°	RN	0.26655 %
Cutoff lesna	Cutoff	Clase de Intensidad Luminosa	G*5
DIN5044	KB1	Índice de Deslumbramiento	D4

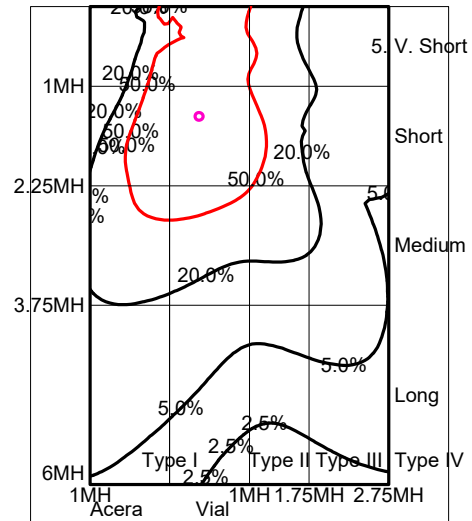
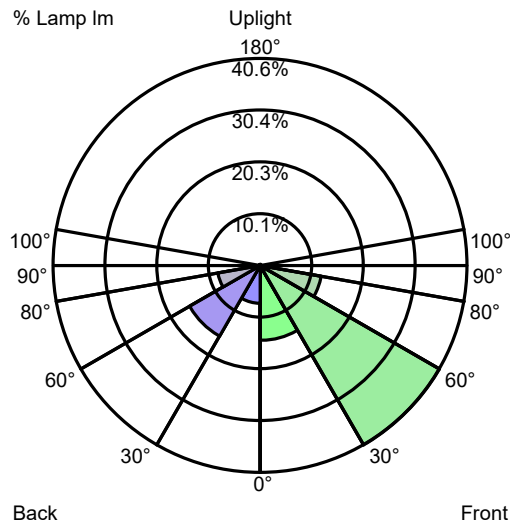
IESNA Type II Short Asymmetrical

### 4.8. Clasificación vial según IES TM-15

**Luminaria**  
 Código ILNV - ILNA  
 Nombre Neovilla 80W 4K  
**Ensayo**  
 Código CL237A22F009V  
 Nombre Neovilla 80W 4K

Flujo Luminaria	8572.72 lm	Potencia Luminaria	82.45 W	Eficacia	103.97 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	8572.72 lm	Valor Máximo	4460.98 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

US ROAD STANDARDS



Luminaire Classification System (LCS)			
LCS Zone		Lumens	%Lamp
FL	0° -- 30°	1257.8 lm	14.7 %
FM	30° -- 60°	3477.5 lm	40.6 %
FH	60° -- 80°	1040.6 lm	12.1 %
FVH	80° -- 90°	15.8 lm	0.2 %
BL	0° -- 30°	634.2 lm	7.4 %
BM	30° -- 60°	1371.8 lm	16.0 %
BH	60° -- 80°	722.4 lm	8.4 %
BVH	80° -- 90°	29.7 lm	0.3 %
UL	90° -- 100°	4.2 lm	0.0 %
UH	100° -- 180°	18.7 lm	0.2 %
TOTALS		8572.7 lm	100.0 %
BUG B2 U2 G2 Type II Short Asymmetrical			

# P MILAN M

Documentación técnica IDAE



**BENITO  
NOVATILU**

EXPERTOS EN  
ILUMINACIÓN EFICIENTE

+34 93 852 1000 / info@[benito.com](http://benito.com)

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*UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.*  
*UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas. Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.*  
*Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE- EN 62262.*

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*UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2 Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16A)*  
*UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.*  
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*UNE-EN 62031. Módulos LED para alumbrado general. Requisitos de seguridad. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.)*  
*Ficha técnica PCB*  
*Ficha técnica LED*  
*UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos.*  
*UNE-EN 62384. Dispositivos de control electrónicos. Requisitos de funcionamiento.*  
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## 3 Informes de Pruebas o Certificados de la Luminaria

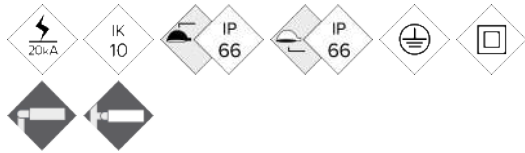
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*Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes.*  
*Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4.*  
*Ensayo colorimétrico de la luminaria según la norma UNE EN 13032-4.*  
*Ensayo de medidas eléctricas y de seguridad*



APM

# Proyector MILAN M



Proyector de perfil plano, con baja resistencia al viento. Familia con cuatro medidas distintas y un amplio rango de potencias, entre 40W y 460W. Está disponible con múltiples distribuciones lumínicas para adaptarse a cada proyecto. Su anclaje mediante lira permite orientaciones en cualquier ángulo de inclinación. Preparada para cualquier sistema de control de regulación.

## VENTAJAS:

- Alta eficiencia. Hasta 140 lm/W reales.
- 4 Medidas distintas. De 40W hasta 460W.
- Doble cavidad, Driver y Grupo Óptico.
- 18 Distribuciones lumínicas distintas.
- Estándar Zhaga (Book 15).
- Ready 4IoT. Preparada para la conectividad.
- Gran robusteza a vibraciones 5G.

## APLICACIONES:

- Instalaciones deportivas (Pabellones, pistas, estadios...)
- Túneles y Grandes Infraestructuras
- Zonas industriales
- Parkings y Grandes Áreas
- Arquitectural (Edificios y monumentos)

## DETALLES:



Lira sujeción vibración 5G.



Doble Cavidad.



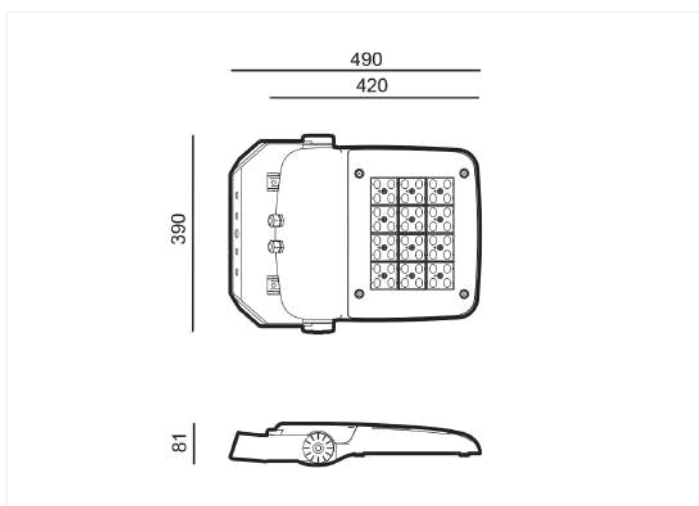
Opcional en versión RGBW.

[Ficha de proyecto](#) | [Catálogo](#) | [Imagen HD](#)

## CARACTERÍSTICAS:

Material cuerpo:	Fundición de aluminio inyectado a presión del tipo EN AC-43000, EN AC-43100, EN AC-43400, EN AC-44100, EN AC-47100 según la norma UNE EN 1706.
Difusor (cerramiento cavidad óptica):	Vidrio Templado de 5 mm. Filtra los UV.
Tornillería:	Acero Inoxidable 18/8 - AISI 304
Cuerpo:	Doble Cavidad: Driver / Módulo LEDs
Juntas de estanqueidad:	Espuma de Silicona
Índice de protección IP de la luminaria:	IP66
Índice de protección IP del Grupo Óptico:	IP66
Índice de protección IK:	IK10
Disipación térmica de los LEDs:	Disipación térmica a través del cuerpo de la luminaria, sin aletas externas ni fluidos conductores. Disipación pasiva por convección y asegurando el contacto térmico de los módulos de LEDs a través de material de transferencia térmica de alta conductividad.
Válvula anti condensación:	Válvula de compensación de presiones que asegura la evacuación de la humedad, evitando la condensación, manteniendo el grado de estanqueidad IP de la luminaria.
Pintura:	Recubrimiento de pintura en polvo de poliéster, pulverizado electrostáticamente y sublimado al horno. Resistente a la corrosión.
Color:	Color RAL 9022 y otros colores bajo pedido
Fijación:	Lira de acero
Orientable:	Proyector orientable de -120° a 120° de inclinación.
Mantenimiento:	De apertura superior para una fácil manipulación. Módulos reemplazables: LEDs, Drivers, SPD.
Altura de montaje recomendada:	6-8 m
Driver:	Driver regulable y programable de corriente constante. Incorporado dentro de la luminaria, precableado sobre placa de acero galvanizada.
Regulación driver:	Driver Regulable 0-10V, programable en 5 niveles y con opción DALI 2. Con las características de Wireless, AOC, MTP, DTL.
Opciones de reducción de flujo:	<ul style="list-style-type: none"> <li>- Multinivel Temporizado o Media Noche Virtual</li> <li>- Ready4IoT</li> <li>- Reducción de flujo en Cabecera</li> <li>- Doble Nivel con Línea de Mando</li> </ul>
Protector de sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.

## PLANO:



## INSTALACIÓN:

### TELECONTROL SYSTEM



## CUADRO TÉCNICO:

REF.	Nº LEDs	Potencia W	I Driver mA	Flujo Lumínico Real (T) =85°C)		Flujo Lumínico Inicial (T) =25°C)	
				Flujo lm	Eficiencia lm/W	Flujo lm	Eficiencia lm/W
P Milan M	APM140	48	100	625	13900	15846	158
		48	120	750	16440	18742	156
		48	140	875	19040	21706	155

LEDs: 5050

Eficiencia Nominal del LED: 172 lm/W.

Corriente máxima LED: 1000 mA.

Corriente LED = Corriente Driver/2.

Vida Media L90B10: >100,000 horas.

Flujos Lumínicos y Eficiencias a 4000°K y CRI>70.

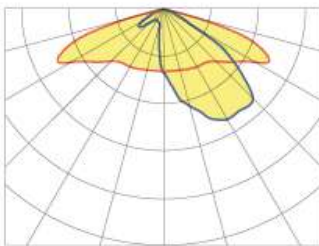
Tolerancia del flujo lumínico < +/-3%.

Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.

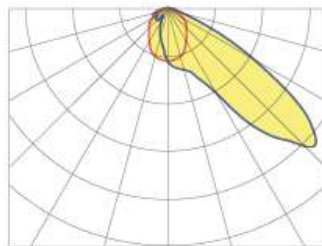


## FOTOMETRÍAS:

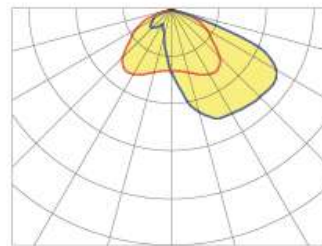
Asimétrico Super-Extensivo (AE)



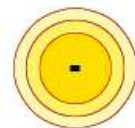
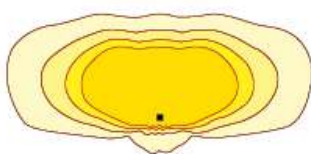
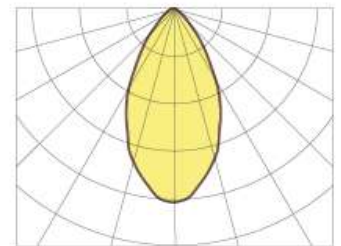
Forward ( AF)



Asimétrico (A4)



Circular 50° (C5)



\*Consultar otras distribuciones lumínicas

El Grupo BENITO NOVATILU se reserva el derecho de realizar modificaciones a sus productos sin previo aviso.

## MÓDULO LED'S:

Módulo de LEDs:	BENITO-NOVATILU Formato Zhaga de 8, 12 y 16 LEDs. Consultar Temperaturas de Color, CRI y Distribuciones Lumínicas.	
Módulo sustituible:	Si	
LED:	5050	
Nº de LED's:	48	
Formato PCBs:	3 Zhaga (Book 15) 2x8	
Eficiencia nominal del LED:	172	
Temperatura de Color:	PC Ámbar, 2K2, 2K7, 3K, 4K, 5K	
Rendimiento Cromático CRI:	>70 (opcional >80)	
Vida Media de los LED - L90B10:	L90B10 >100.000 horas	

## ESPECIFICACIONES ÓPTICAS:

Sistema Óptico:	Lentes de PMMA 2x2	
Distribución Lumínica:	18 Distribuciones Lumínicas disponibles	
Flujo Hemisferio Superior (FHS) ULOR:	0%	
Flujo Hemisferio Inferior DLOR:	100%	
Índice de Deslumbramiento:	Entre D5 y D6 (depende de la distribución lumínica)	
Categoría Intensidad Luminosa:	Entre G*4 y G*6 (depende de la distribución lumínica)	
Flujo Luminoso CIE n°3:	>95%	
Seguridad Fotobiológica:	RG0 (exento de riesgo)	
Flujo lumínico Inicial Tj=25°C (hasta):	lm	21706
Eficiencia Lumínica Inicial Tj=25°C (hasta):	lm/W	158
Flujo lumínico Real Tj=85°C (UNE EN 13032-4) (hasta):	lm	19040
Eficiencia Lumínica Real Tj=85°C (UNE EN 13032-4) (hasta):	lm/W	139

## ESPECIFICACIONES ELÉCTRICAS:

Potencia máxima nominal (LED's):	W	126
Potencia máxima consumida (Luminaria):	W	140
Rango de Potencias:	W	80W - 140W
Corriente máxima del LED:	mA	<400 (<50% I <sub>max</sub> )
Clase de Protección Eléctrica IEC:	Clase I y II	
Protector de Sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.	
Nivel de protección de tensión modo común y diferencial (SPD) Udc:	kV	10 y NTC opcional
Corriente máxima de descarga (8/20) (SPD):	kA	20
Desconexión Térmica de la Fase (SPD):	SI	
Tensión de Entrada:	Vac	220-240
Tensión de Entrada (rango máximo):	Vac	198-264
Frecuencia de Entrada:	Hz	47-63
Corriente de arranque:	A	<65
Duración del pico de arranque:	ms	<0,3
Eficiencia del Driver:	>90%	
Factor de potencia 100% consumo:	>0,98	
Factor de potencia 50% consumo:	>0,95	
Distorsión Harmónica Total (THD):	<10	
Consumo de Energía en reposo:	W	<0,4
Clasificación Energética:	A++ IPEA>1,15	

## CONDICIONES DE TRABAJO:

Vida Media de los LED - L90B10:	horas	>100.000
Vida Media del Driver a Tp<70°C:	horas	100.000
Vida Media de la Luminaria L80B10 (TM-21):	horas	72.167
Temperatura ambiente de trabajo:	°C	de -35°C a +50°C
Superficie al viento:	m <sup>2</sup>	0,039
Test anti vibraciones (15Hz en 3 ejes):		
Test fuerza del viento:	m/s	5G
Período de Garantía:	años	5 años (opcional hasta 10)

## DIMENSIONES EMBALAJE:

Peso neto	kg	8,2
Peso Bruto	kg	9,2
Dimensiones Luminaria (LxAxH)	mm	490x390x81
Dimensiones Embalaje (LxAxH)	mm	500x395x110
Unidades por Embalaje	1	
Cantidad por contenedor de 20"	1344	
Cantidad por contenedor de 40"	2898	

## CERTIFICACIONES:

Certificaciones Seguridad:

EN 60598-1 / EN 60598-2-5 / EN 62493 / IEC 62471

Certificaciones EMC:

EN 55015 / EN 61547 / EN 61000-3-2 / EN 61000-3-3 / EN 61347-2-13 / EN 61347-1 / EN 62384

Otras Certificaciones:

IEC 62262 / EN 13032-4 / EN 62717 / EN 6272-1 / EN 6272-2-1 / EN 61643-11



## 1.2 Tabla (Anexo 1): Datos Generales de la Empresa

DATOS GENERALES DE LA EMPRESA FABRICANTE DE LA LUMINARIA LED		
1	Nombre de la empresa	BENITO URBAN, S.L.U.
2	Actividad social de la empresa	Fabricación, Comercialización y Distribución de Alumbrado Público
3	Código Identificación Fiscal	B59987529
4	Dirección postal	Calle Lleida, 10, 08500 Vic. Barcelona.
5	Dirección correo electrónico	mhoms@benito.com
6	Página/s web	www.benito.com
7	Nº Teléfono y Fax	T. 938 521 000 y F. 938 521 001
8	Persona de contacto	Mateu Homs
9	Certificado UNE-EN ISO 9001	OCA GLOBAL ENAC 34/5200/19/8038
10	Certificado UNE-EN ISO 14001	OCA GLOBAL ENAC 34/5400/19/8039
11	Catálogo Digital Publicado de Producto	<a href="https://www.benito.com/es/descargas-alumbrado-publico/catalogo-light.html">https://www.benito.com/es/descargas-alumbrado-publico/catalogo-light.html</a>
12	Certificado de la empresa de adhesión a un sistema integrado de gestión de residuos (SIG)	SI

Para más información consultar pack IDAE Empresa

1.2 Tabla (Anexo 2) CEI – IDAE Requerimientos Técnicos Luminaria

DATOS Y DOCUMENTACIÓN TÉCNICA DE LA LUMINARIA TIPO FUNCIONAL																							
1	Marca y Modelo	NOVATILU - PROYECTOR MILAN M																					
2	Ficha Técnica	Si - APM																					
3	Marcado CE	Si																					
4	Material de Fabricación conforme el apartado 5.	Si																					
5	Sustitución independiente de los sistemas integrantes compartimento óptico (módulo y lente) y equipos auxiliares	Si																					
6	Grado de estanqueidad en la luminaria IP 66	IP 66																					
7	Grado de protección ante impactos en la luminaria mínimo IK 08	IK 09																					
8	Rango de temperatura de funcionamiento -10°C a 35°C	Si, -30°C a 50°C																					
9	Número de distribuciones fotométricas, al menos 5	18																					
10	Curvas Fotométricas y de utilización de la luminaria, al menos 5	Si																					
11	FHSINST , máximo permitido 3%	<1%																					
12	Temperatura de color en K de la luz emitida por la luminaria, máxima permitida (4000K)	PC-Ámbar, 2200K, 2700K, 3000K, 4000K, 5000K (estadios deportivos)																					
Eficacia de salida de la luminaria (lm/W)																							
13	<table border="1"> <thead> <tr> <th>TIPO DE LED</th> <th>lm/W min</th> </tr> </thead> <tbody> <tr> <td>LED NEUTRO 4000°K</td> <td>110</td> </tr> <tr> <td>LED CÁLIDO 3000°K</td> <td>100</td> </tr> <tr> <td>LED CÁLIDO 2700°K</td> <td>90</td> </tr> <tr> <td>LED CÁLIDO 2200°K</td> <td>85</td> </tr> <tr> <td>LED ÁMBAR (Phosphor-Converted)*</td> <td>70</td> </tr> <tr> <td>LED ÁMBAR PURO (monocromático)*</td> <td>40</td> </tr> </tbody> </table>	TIPO DE LED	lm/W min	LED NEUTRO 4000°K	110	LED CÁLIDO 3000°K	100	LED CÁLIDO 2700°K	90	LED CÁLIDO 2200°K	85	LED ÁMBAR (Phosphor-Converted)*	70	LED ÁMBAR PURO (monocromático)*	40	<table border="1"> <thead> <tr> <th>lm/W</th> </tr> </thead> <tbody> <tr> <td>&gt;120</td> </tr> <tr> <td>&gt;110</td> </tr> <tr> <td>&gt;100</td> </tr> <tr> <td>&gt;90</td> </tr> <tr> <td>&gt;75</td> </tr> <tr> <td>-</td> </tr> </tbody> </table>	lm/W	>120	>110	>100	>90	>75	-
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>75																							
-																							
14	Clase Eléctrica	I y II																					
15	Medidas Eléctricas: Tensión, corriente, potencia total consumida y Factor de potencia (>0.9)	Tensión 230V / Potencia 100W / FP >0,98																					
16	Vida útil estimada de la luminaria (Se considerará como máximo 100.000h)	L90B10 >100.000 horas																					
17	Ficha Técnica del LED utilizado en la luminaria y marcado CE	Si																					
18	Número de LEDs y Corriente de Alimentación	48 led / 312mA																					
19	Ficha Técnica Driver y marcado CE	Si																					
20	Ficha Técnica de otros dispositivos (SPD, OLC,...etc) y marcado CE, que se estimen oportunos	Si																					



## 2 Informes de Pruebas y Certificados de la Luminaria por OEC

### 2.1 Tabla de Verificación (Anexo 3) CEI – IDAE

Informes de Pruebas y Certificados emitidos por OEC acreditada sobre La luminaria y sus elementos integrantes		
1	Documento del alcance de la acreditación del certificador/es de estos informes o certificados.	✓
2	UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.	✓
3	UNE EN 60598-2-3 o 60598-2-5 Luminarias. Requisitos particulares. Luminarias de Alumbrado público o proyectores.	✓
4	UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan Lámparas, o según IEC/TR 62778 que es su norma de aplicación.	✓
5	Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.	✓
6	El Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria)	✓
7	UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2: Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16A por fase)	✓
8	UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.	✓
9	UNE-EN 61547. Equipos para alumbrado de uso general. Requisitos de inmunidad CEM.	✓
10	UNE-EN 62031. Módulos LED para alumbrado general. Requisitos de seguridad. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.	✓
11	UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.	✓
12	UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED. Requisitos de funcionamiento.	✓
13	Informe de ensayo en relación al material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda. A – Luminaria modelo funcional	✓

## 2.2 Requisitos de Seguridad

- UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.
- UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.
- UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas.
- Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.
- Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262.

## VERIFICATION OF COMPLIANCE

No.: LVD SHES210300359501LMC  
Applicant: NOVATILU,S.L.  
Via Ausetania,11-13 08560 MANLLEU Barcelona Spain  
Manufacturer: Same as applicant  
Product Name: LED Flood Luminaire  
Product Description: Floodlights  
Model No.: See page 2  
Trade Mark: **BENITO  
NOVATILU**  
Rating: 220 V – 240 V; 50 Hz - 60 Hz; ta: 45 °C; Max. 1800 W  
Protection against Electric Shock: Class I  
Degree of Protection: IP66  
Additional Information: None  
Sufficient samples of the product have been tested and found to be in conformity with  
Test Standard: EN 60598-2-5: 2015  
EN 60598-1: 2015 + A1: 2018  
EN 62493: 2015  
as shown in the  
Test Report Number(s): SHES210300359501

This Verification of Compliance has been granted to the applicant based on the results of tests, performed by Laboratory of SGS-CSTC Standards Technical Services Co., Ltd. on sample of the above-mentioned product in accordance with the provisions of the relevant harmonized standards under the Low Voltage Directive 2014/35/EU. The CE marking as shown below can be affixed, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The affixing of the CE marking presumes in addition that the conditions in annexes III and IV of the Directive are fulfilled.



Andrew Zhai  
Laboratory Technical Manager  
SGS-CSTC



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Member of SGS Group (Société Générale de Surveillance)

No.:

LVD SHES210300359501LMC

Other information added:

Rating:

Model	Rated power (W)
APAXLL1800	1800
APAXLL1500	1500
APALL1200, APAXLL1200	1200
APALL1000	1000
APALL800	800
APAML600	600
APAML500	500
APAML400, APMXXLL400	400
APMXXLL480	480
APMXXLL300, APMXLL300	300
APMXLL240	240
APMXLL200, APML200	200
APUXLL180	180
APML150, APUXLL150	150
APML120, APUXLL120	120
APMSL100, APUXLL100	100
APMSL60	60
APMSL40	40

Andrew Zhai

Laboratory Technical Manager  
SGS-CSTC




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Member of SGS Group (Société Générale de Surveillance)

## DECLARACIÓN CERTIFICACIÓN UNE-EN Equipos Alumbrado Público **BENITO-NOVATILU**

Todas las luminarias BENITO-NOVATILU incorporan los módulos de LEDs BENITO-NOVATILU PCB APL.

Las Luminarias, Proyectoros y Módulos NOVATILU están certificados a nombre de nuestra fábrica de Yuyao, Ningbo King-Bridge Lighting Technology Co., Ltd. (KLED), que forma parte del Grupo BENITO-NOVATILU.

Una vez pasada la certificación (adjuntamos documentación original), se hace la convalidación a nombre de BENITO-NOVATILU. El proceso está finalizado, pero estamos a la espera de los documentos convalidados.

Las equivalencias en las referencias son las siguientes:

<b>KLED reference</b>	<b>BENITO-NOVATILU reference</b>
TG-163SLED	APOLO M 500W – APAML500
TG-163LLED	APOLO L 1000W – APALL1000
TG-161LLED	P MILAN XXL - APMXXLL
TG-161MLED	P MILAN XL - APMXLL
TG-161SLED	P MILAN M - APML
TG-161S1LED	P MILAN S - APMSL

Vic, 14 de septiembre de 2022.

**Responsable de Calidad de BENITO URBAN, SLU**



**Jordi Puig i Rovira (Ingeniero Técnico Telecomunicación, col.903055)**  
**Design & Engineering Lighting Department**



Product Service

# Attestation of Conformity

No. N8A 18 01 01704 002

**Holder of Certificate:** Ningbo King-Bridge Lighting Technology Co.,Ltd.No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street,  
315400 Yuyao, Zhejiang Province  
PEOPLE'S REPUBLIC OF CHINA**Product:** Flood lights  
LED Floodlight**Model(s):** TG-163SLED; TG-163LLED; TG-161LLED;  
TG-161MLED; TG-161SLED; TG-161S1LED**Parameters:**  
Rated voltage: 100-240V~  
Rated frequency: 50-60Hz  
Protection Class: Class I  
Rated power:  
TG-163SLED: 600W; TG-163LLED: 1200W;  
TG-161LLED: 480W; TG-161MLED: 300W;  
TG-161SLED: 200W; TG-161S1LED: 100W  
Degree of protection: IP66  
ta: 45°C**Tested according to:**  
EN 60598-1:2015  
EN 60598-2-5:2015  
EN 62471:2008  
EN 62493:2015

This Attestation of Conformity is issued on a voluntary basis according to the Low Voltage Directive 2014/35/EU relating to electrical equipment designed for use within certain voltage limits. It confirms that the listed equipment complies with the principal protection requirements of the directive and is based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for testing and certification. See also notes overleaf.

**Test report no.:** 704021712536-00**Date,** 2018-01-30

(Na Zhang)

**CE** After preparation of the necessary technical documentation as well as the EU declaration of conformity the required CE marking can be affixed on the product. The declaration of conformity is issued under the sole responsibility of the manufacturer. Other relevant EU-directives have to be observed.

Page 1 of 1



# Aufbauübersicht für Elektrogeräte und Maschinen

## Data form for electrical equipment and machinery



Seite von  
Page 1 of 3

**Auftraggeber / Applicant:** Ningbo King-Bridge Lighting Technology Co.,Ltd.  
No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400,  
Yuyao, Zhejiang Province, People's Republic of China

**Fertigungsstätte / Production facility:** Ningbo King-Bridge Lighting Technology Co.,Ltd.  
No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400,  
Yuyao, Zhejiang Province, People's Republic of China

**Geräteart / Type of equipment:** LED Floodlight

**Typenbezeichnung / Type,model:** TG-163SLED; TG-163LLED; TG-161LLED; TG-161MLED; TG-161SLED;  
TG-161S1LED

**Seriennr. / Serial no.:** N/A

**Nennspannung/Frequenz / Rated voltage,frequency:** 50-60Hz

**Nennaufnahme/Nennstrom / Rated input power,current:** TG-163SLED: 600W; TG-163LLED: 1200W; TG-161LLED: 480W; TG-  
161MLED: 300W; TG-161SLED: 200W; TG-161S1LED: 100W

**Anschlußdaten-Hydraulik / Connection to hydraulic power:** N/A

**Anschlußdaten-Pneumatik / Connection to pneumatic power:** N/A

**Anschlußdaten-Wasser / Connection to waterinstallation:** N/A

**Gewicht / weight:** 44.65Kg

**Lärmemission / noise emission (dB A):** N/A

**Ausführung/Construction:**

Ortsfest	Stationary	<input checked="" type="checkbox"/>
Orsveränderlich	Portable	<input type="checkbox"/>
Handgerät	Hand-held	<input type="checkbox"/>
Einbaugerät	Open-frame	<input type="checkbox"/>

**Schutzklasse/Protection class:**

Schutzklasse I:	Schutzleiteranschluß	PE-connection	<input checked="" type="checkbox"/>
Schutzklasse II:	Schutzisoliert	Double insulation	<input type="checkbox"/>
SchutzklasseIII:	Schutzkleinspannung/ interne Stromversorgung	SELV/internally powered	<input type="checkbox"/>

**Schutzart/Degree of protection against liquids:** IP 66

**Anschlußart/Supply connection:**

Feste Anschlußleitung	Non detachable cord	<input checked="" type="checkbox"/>
Fester Anschluß	Permanent connection	<input type="checkbox"/>
Gerätesteckvorrichtung	Appliance inlet	<input type="checkbox"/>

**Netzbetriebsart/Rated operation:**

Dauerbetrieb	Continuous operation	<input checked="" type="checkbox"/>
Aussetzbetrieb	Intermittent operation	<input type="checkbox"/>
Kurzzeitbetrieb	Short time operation	<input type="checkbox"/>

**Material:** a)Gehäuse/Enclosure: N/A  
b) Leiterplatten/p.c.b.: N/A

TEC\_GCN\_F\_09.30E - Rev. 0  
2010-11-26

Prüfbericht Nr. , Test Report No.: 704021712536700

Projektleiter , Project Engineer: Xiáng GAO

Ort, place: Yuyao Zhejiang

Datum , date: 2018-01-29

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# Aufbauübersicht für Elektrogeräte und Maschinen

## Data form for electrical equipment and machinery



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Sicherheitsrelevante Bauteile: (Schalter, Temperaturregler, Heizkörper, Stecker, Fassungen, Leitungen, Kondensatoren, Motoren und sonstige Wicklungen z.B. Transformatoren, Magnetspulen)  
(Not-Aus Geräte, 2-Handsteuerungen, Verriegelungsschalter, Sicherheits-Lichtschranken, Sicherheitsventile, Programmierbare Steuerungen-SPS, hydraulische Steuerungen, pneumatische Steuerungen .....)  
Safety relevant components: (switch, temperature regulator, heating element, plug, socket, wiring, capacitor, motors and other components with windings e.g. transformers, coils)  
(emergency off devices, 2-hand-control-devices, interlock switches, safety light barriers, safety valves, programmable electronic controllers -PLC, hydraulic controllers, pneumatic controllers .....)

Bauteil, Kind of component	Hersteller, Manufacturer	Angaben über Typ, Stromstärke, Leistung, Transformatorspezifikationsnummer, Isolationsklasse, Information about type, current, power, transformer specification number, insulating class	Prüfzeichen von Test mark from (TÜV, VDE, BSI, UL etc.)
LED	Cree Inc.	XPG 2,85 V - 3,4 V, Max. 1500 mA	Test with appliance
	PHILIPS Luxeon	5050 23.5-26.5V,Max.300mA	
PCB(LED module)	Yuyao Lianda Electronic Co Ltd	LD0008 130 °C, V-0	UL (E356059)
	Ningbo Kjpcb Electronic Technology Co Ltd	KJ-01 100 °C, V-0	UL (E474795)
Electro-mechanical contact systems (For except TG- 161S1LED)	Yuyao Sineyi Electronic Technology CO.,LTD	M29-3 16A/450V	B 15 09 92724 002
	Ningbo King-Bridge Lighting Technology Co.,Ltd.	Q-02 250V 6A	TUV R AN 50336430
Terminal block(for TG- 161S1LED)	Ninghai chengguan Fangzheng Rubber & Plastic Hardware Factory	KP-10A 450ACV, T110, 32 A	VDE 40019217
	Jiangxi Kimbetter Electrical Co., Ltd.	PA10 450 V~, T110, 24 A	VDE* (40025212)
Screwless terminal Terminal block (for TG-161S1LED)	Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.	CD-100/3 250 V, 16 A, 85°C	TUV (R 50280145)
Screwless terminal (for all model)	Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.	CD-100/2 250 V, 16 A, 85°C	TUV (R 50280145)
	Wago-Kontakttechnik GmbH Co.,KG	221-412 450V 32A 0.2-4mm2 85°C	ENEC
Screwless terminal(PCB)	Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.	TB-L02 160 VDC, T105	TUV (R 50288437)
	Degson Electronics Co.,Ltd.	DG2.5T AC 450 V,100 A, 075-2.5 mm2	VDE (40026193)
	Wago-Kontakttechnik GmbH Co.,KG	2060-452/998-404 105°C 0.2-0.75mm2 320V 9A	NTR-NL-7534
Surge protector SPD	Ningbo King-Bridge Lighting Technology Co.,Ltd.	Q-01B AC230V TYPE 2 SPD	ITS 161101683SHA- V1
LED driver for item TG- 163LLED with cree XPG and PHILIPS 5050 LED)	MEANWELL	HLG-320H-C1050A Input: 90 V – 305 V, 50 Hz / 60 Hz, Output: 152-305V d.c., 1050A, tc: 85 °C, IP67	ENEC NO3983
LED driver ( for item TG- 161LLED with cree XPG)	MEANWELL	HLG-480H-36A Input: 90 V – 305 V, 50 Hz / 60 Hz, Output: 18-36V d.c., 13.3A, tc: 90 °C, IP67, SELV	ENEC NO4029
LED driver for item TG- 163LLED with PHILIPS 5050 LED)	MEANWELL	HLG-480H-48A Input: 100 V – 305 V, 50 Hz / 60 Hz, Output: 24-48V d.c., 10A, tc: 90 C, IP67, SELV	ENEC NO4029
LED driver for item TG- 161MLED with cree XPG and PHILIPS 5050 LED)	MEANWELL	HLG-320H-48A Input: 100 V – 305 V, 50 Hz / 60 Hz, Output: 24-48V d.c., 6.7A, tc: 90 °C,	TUV R 50210986

Prüfbericht Nr., Test Report No.: 704021712536-00

Ort, place: Yuyao Zhejiang

Datum, date: 2018-01-29

Projektleiter, Project Engineer: Xiang GAO

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Seal and signature



# Aufbauübersicht für Elektrogeräte und Maschinen

## Data form for electrical equipment and machinery



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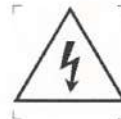
Sicherheitsrelevante Bauteile: (Schalter, Temperaturregler, Heizkörper, Stecker, Fassungen, Leitungen, Kondensatoren, Motoren und sonstige Wicklungen z.B. Transformatoren, Magnetspulen) (Not-Aus Geräte, 2-Handsteuerungen, Verriegelungsschalter, Sicherheits-Lichtschranken, Sicherheitsventile, Programmierbare Steuerungen-SPS, hydraulische Steuerungen, pneumatische Steuerungen .....)

Safety relevant components: (switch, temperature regulator, heating element, plug, socket, wiring, capacitor, motors and other components with windings e.g. transformers, coils)

(emergency off devices, 2-hand-control-devices, interlock switches, safety light barriers, safety valves, programmable electronic controllers -PLC, hydraulic controllers, pneumatic controllers .....)

Bauteil, Kind of component	Hersteller, Manufacturer	Angaben über Typ, Stromstärke, Leistung, Transformatorspezifikationsnummer, Isolationsklasse, Information about type, current, power, transformer specification number, insulating class	Prüfzeichen von Test mark from (TÜV, VDE, BSI, UL etc.)
LED driver ( for item TG-161SLED with cree XPG)	MEANWELL	IP67, SELV ELG-200-36A Input: 100 V – 305 V, 50 Hz / 60 Hz, Output: 18-36V d.c., 5.55A, tc: 90 °C, IP67, SELV	ENEC (HN 69255160)
LED driver for item TG-161SLED with PHILIPS 5050 LED)	MEANWELL	ELG-200-48A Input: 100 V – 305V, 50 Hz / 60 Hz, Output: 24-48V d.c.,4.16A tc: 90 °C, IP65, SELV	ENEC (HN 69255160)
LED driver ( for item TG-161S1LED with cree XPG)	MEANWELL	ELG-100-36A Input: 100 V – 305 V, 50 Hz / 60 Hz, Output: 18-36V d.c., 2.66A, tc: 90 °C, IP67, SELV	ENEC DEKRA 2195617.01
LED driver for item TG-1611SLED with PHILIPS 5050 LED)	MEANWELL	ELG-100-48A Input: 100 V – 305 V, 50 Hz / 60 Hz, Output: 24-48V d.c., 2A, tc: 90 °C, IP67, SELV	ENEC DEKRA 2195617.01
Internal wire	Jiangyin Haocheng Electrical Appliances Wire & Cable Co., Ltd.	(N)6YAF , 1 x 0,75 mm <sup>2</sup> 300 / 500 V	VDE (40027987)
Earthing wire	Jiangyin Haocheng Electrical Appliances Wire & Cable Co., Ltd.	H05SJ-K 1 x 0,75 mm <sup>2</sup> , 180 °C	VDE (40017754)
	Cixi Shuanghong Wire Co.,LTD	H05SJ-K 1 x 0,75 mm <sup>2</sup> , 180 °C	VDE (40017324)
Power Cord	Ningbo Xuanhua Electric Co. Ltd.	H05RN-F 2 x 0.75 mm <sup>2</sup>	VDE (40036306)
	Shangyu Jintao Electron Co., Ltd.	H05RN-F 2 x 0.75 mm <sup>2</sup>	VDE (40018106)

LED Floodlight
TG-163LLED
 
100-240VAC 50-60Hz 1200W t <sub>a</sub> 45°C IP66
Ningbo King-Bridge Lighting Technology Co.,Ltd. No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400, Yuyao, Zhejiang Province, People's Republic of China Authorized representative in EU: XXXX+XXXX Series No: XXXX



Caution, risk of electric shock

Note 1: Height of letter and numeral not less than 2mm, graphical symbol not less than 5mm, WEEE not less than 7mm.

Note 2: Labels for other models are the same except model number and wattage.

Note 3: Warning label must be observed when users try to replace the LED model.

Prüfbericht Nr. , Test Report No.: 704021712536-00

Ort, place: Yuyao Zhejiang

Datum , date: 2018-01-29

Projektleiter , Project Engineer: Xiang GAO

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Seal and signature





**TEST REPORT**  
**IEC 60598-2-5**  
**Luminaires**  
**Part 2: Particular requirements**  
**Section 5: Floodlights**

**Report Number**.....: 704021712536-00

**Date of issue** .....: 2018-01-29

**Total number of pages**..... 47

**Name of Testing Laboratory preparing the Report**.....: TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

**Applicant's name** .....: Ningbo King-Bridge Lighting Technology Co.,Ltd.

**Address** .....: No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400, Yuyao, Zhejiang Province, People's Republic of China

**Test specification:**

**Standard** .....: IEC 60598-2-5:2015 (Third Edition) used in conjunction with IEC 60598-1:2014 (Eighth Edition)

**Test procedure**.....: EU-Directive

**Non-standard test method**.....: N/A

**Test Report Form No**.....: IEC60598\_2\_5E

**Test Report Form(s) Originator**....: Intertek Semko AB

**Master TRF** .....: 2016-02

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**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**General disclaimer:**

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

<b>Test item description</b> ..... :	LED Floodlight	
<b>Trade Mark</b> ..... :	N/A	
<b>Manufacturer</b> ..... :	Ningbo King-Bridge Lighting Technology Co.,Ltd.	
<b>Model/Type reference</b> ..... :	TG-163SLED; TG-163LLED; TG-161LLED; TG-161MLED; TG-161SLED; TG-161S1LED	
<b>Ratings</b> ..... :	100-240V~; 50-60Hz; IP66; Class I; ta45 °C TG-163SLED: 600W; TG-163LLED: 1200W; TG-161LLED: 480W; TG-161MLED: 300W; TG-161SLED: 200W; TG-161S1LED: 100W	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch/No.151 Heng Tong Road. Shanghai 200070 P.R. China
	<b>Testing location/ address</b> .....:	No. 1999, Duhui Road, Shanghai, 201108, P. R. China
<input type="checkbox"/>	<b>Associated CB Testing Laboratory:</b>	N/A
	<b>Testing location/ address</b> .....:	N/A
	<b>Tested by (name, function, signature)</b> .....:	Xiaohui YANG
	<b>Approved by (name, function, signature)</b> ...:	Xiang GAO
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 1:</b>	N/A
	<b>Testing location/ address</b> .....:	N/A
	<b>Tested by (name, function, signature)</b> .....:	N/A
	<b>Approved by (name, function, signature)</b> ...:	N/A
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 2:</b>	N/A
	<b>Testing location/ address</b> .....:	N/A
	<b>Tested by (name + signature) .....</b>	N/A
	<b>Witnessed by (name, function, signature)...</b>	N/A
	<b>Approved by (name, function, signature)</b> ...:	N/A
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>	N/A
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>	N/A
	<b>Testing location/ address</b> .....:	N/A
	<b>Tested by (name, function, signature)</b> .....:	N/A
	<b>Witnessed by (name, function, signature)...</b>	N/A
	<b>Approved by (name, function, signature)</b> ...:	N/A
	<b>Supervised by (name, function, signature) :</b>	N/A



<p><b>List of Attachments (including a total number of pages in each attachment):</b> N/A</p>	
<p><b>Summary of testing:</b></p> <p>Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods. Representative sample covered by this report has been tested and complies with the applicable requirements of this standard. All applicable hazards are covered by the harmonized standard.</p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>Complete tests were performed for TG-163LLED, TG-161SLED. Construction checks are performed for all models. All of the models comply with the safety requirement. EMF requirements of EN 62493 have been evaluated and no test required.</p>	<p><b>Testing location:</b></p> <p>TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch</p> <p>No. 1999, Duhui Road, Shanghai, 201108, P. R. China</p>
<p><b>Summary of compliance with National Differences:</b></p> <p>The deviation between EN 60598-2-5:2015 used in conjunction with EN 60598-1:2015 and IEC 60598-2-5:2015 (Third Edition) used in conjunction with IEC 60598-1:2014 (Eighth Edition) is taken into account at the end of the report, please refer to appendix 1 of this report.</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements of EN 60598-2-5:2015 used in conjunction with EN 60598-1:2015</b></p>	

<p><b>Copy of marking plate:</b></p> <p>See Construction Data form for electrical equipment and machinery.</p>
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<b>Test item particulars</b> .....	LED Floodlight
<b>Classification of installation and use</b> .....	Normal use
<b>Supply Connection</b> .....	Non-detachable flexible cable or cord
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object.....	: N/A
- test object does meet the requirement.....	: P (Pass)
- test object does not meet the requirement.....	: F (Fail)
<b>Testing</b> .....	
<b>Date of receipt of test item</b> .....	: 2017-11-16
<b>Date (s) of performance of tests</b> .....	: 2017-11-16 to 2018-01-29
<b>General remarks:</b>	
<p>"(See Enclosure #)" refers to additional information appended to the report.          "(See appended table)" refers to a table appended to the report.  <b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b>          Clause numbers between brackets refer to clauses in IEC 60598-1</p> <p><b>Remark 1:</b>          The following contents are included and as appendix of this test report:          1) Test report IEC 60598-2-5:1998 used in conjunction with IEC 60598-1:2014.          2) Appendix 1 comprising: Deviation of EN 60598-2-5:2015 used in conjunction with EN 60598-1:2015 to IEC 60598-2-5:2015 used in conjunction with IEC 60598-1:2014.          3) Appendix 2: Requirements of IEC 62031:2008/A1:2012+A2:2014.          4) Appendix 3: EMF requirements of IEC 62493:2015.          5) Appendix 4: Requirements of IEC/TR 62778:2014.          6) Appendix 5: Photographs.</p>	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60598-1:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>Not applicable</b>
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies)</b> .....	Ningbo King-Bridge Lighting Technology Co.,Ltd. No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400, Yuyao, Zhejiang Province, People's Republic of China
<b>General product information:</b>	
The products are LED floodlight, protection against moisture is IP66, protection class is Class I, rang of mounting height is up to 40m.	

IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
<b>5.4 (0+2)</b>	<b>CLASSIFICATION OF LUMINAIRES</b>		P
5.4 (0.1)	Information for luminaire design considered .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
5.4 (0.3)	More sections applicable .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
5.4 (2.2)	Type of protection .....	Class I	P
5.4 (2.3)	Degree of protection .....	IP66	P
5.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
5.4 (2.5)	Luminaire for normal use .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

<b>5.5 (3)</b>	<b>MARKING</b>		P
5.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
5.5 (3.3)	Additional information		P
	Language of instructions		P
5.5 (3.3.1)	Combination luminaires		N/A
5.5 (3.3.2)	Nominal frequency in Hz	50-60Hz	P
5.5 (3.3.3)	Operating temperature		P
5.5 (3.3.4)	Symbol or warning notice		N/A
5.5 (3.3.5)	Wiring diagram		N/A
5.5 (3.3.6)	Special conditions		N/A
5.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
5.5 (3.3.8)	Limitation for semi-luminaires		N/A
5.5 (3.3.9)	Power factor and supply current		P
5.5 (3.3.10)	Suitability for use indoors		N/A
5.5 (3.3.11)	Luminaires with remote control		N/A
5.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
5.5 (3.3.13)	Specifications of protective shields		N/A
5.5 (3.3.14)	Symbol for nature of supply	~	P
5.5 (3.3.15)	Rated current of socket outlet		N/A
5.5 (3.3.16)	Rough service luminaire		N/A
5.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y	P
5.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A



IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
5.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
5.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
5.5 (3.3.21)	Non replaceable and non-user replaceable light sources information provided		P
	Cautionary symbol		P
5.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
5.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
5.5 (-)	Additional information if applicable		P
	a) Operation position		N/A
	b) Weight and dimensions		P
	c) Maximum protected area		P
	d) Limitation of use indoors and/or outdoor		P
	e) Maximum mounting height if $\leq 5$ m		N/A

<b>5.6 (4)</b>	<b>CONSTRUCTION</b>		P
5.6 (4.2)	Components replaceable without difficulty		P
5.6 (4.3)	Wireways smooth and free from sharp edges		P
<b>5.6 (4.4)</b>	<b>Lampholders</b>		N/A
5.6 (4.4.1)	Integral lampholder		N/A
5.6 (4.4.2)	Wiring connection		N/A
5.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
5.6 (4.4.4)	Positioning		N/A
	- pressure test (N) .....		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....		—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A

IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
5.6 (4.4.5)	Peak pulse voltage		N/A
5.6 (4.4.6)	Centre contact		N/A
5.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
5.6 (4.4.8)	Lamp connectors		N/A
5.6 (4.4.9)	Caps and bases correctly used		N/A
5.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
<b>5.6 (4.5)</b>	<b>Starter holders</b>		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
<b>5.6 (4.6)</b>	<b>Terminal blocks</b>		N/A
	Tails		N/A
	Unsecured blocks		N/A
<b>5.6 (4.7)</b>	<b>Terminals and supply connections</b>		<b>P</b>
5.6 (4.7.1)	Contact to metal parts		P
5.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P
5.6 (4.7.3)	Terminals for supply conductors		N/A
5.6 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.2.3 and 15.6.2.4		N/A
5.6 (4.7.4)	Terminals other than supply connection		P
5.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
5.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
<b>5.6 (4.8)</b>	<b>Switches</b>		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A

IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
	- compliance with IEC 61058-1 for electronic switches		N/A
<b>5.6 (4.9)</b>	<b>Insulating lining and sleeves</b>		N/A
5.6 (4.9.1)	Retainment		N/A
	Method of fixing .....		N/A
5.6 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) .....		N/A
<b>5.6 (4.10)</b>	<b>Double or reinforced insulation</b>		N/A
5.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
5.6 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
5.6 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
5.6 (4.10.4)	Protective impedance device		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
<b>5.6 (4.11)</b>	<b>Electrical connections and current-carrying parts</b>		<b>P</b>
5.6 (4.11.1)	Contact pressure		P
5.6 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A

IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
5.6 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N/A
5.6 (4.11.4)	Material of current-carrying parts		P
5.6 (4.11.5)	No contact to wood or mounting surface		P
5.6 (4.11.6)	Electro-mechanical contact systems		P
<b>5.6 (4.12)</b>	<b>Screws and connections (mechanical) and glands</b>		<b>N/A</b>
5.6 (4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
5.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
5.6 (4.12.4)	Locked connections:		P
	- fixed arms; torque (Nm).....:	2,5	P
	- lampholder; torque (Nm).....:		N/A
	- push-button switches; torque 0,8 Nm.....:		N/A
5.6 (4.12.5)	Screwed glands; force (Nm).....:	6,25	P
<b>5.6 (4.13)</b>	<b>Mechanical strength</b>		<b>P</b>
5.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....:		N/A
	- other parts; energy (Nm).....:	Glass cover /Enclosure; 0,7	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
5.6 (4.13.3)	Straight test finger		P
5.6 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6 (4.13.6)	Tumbling barrel		N/A
<b>5.6 (4.14)</b>	<b>Suspensions, fixings and means of adjusting</b>		<b>P</b>
5.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm) .....	7,2	P
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) .....		N/A
	Metal rod. diameter (mm) .....		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
5.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) .....		—
	Stress in conductors (N/mm <sup>2</sup> ) .....		N/A
	Mass (kg) of semi-luminaire .....		N/A
	Bending moment (Nm) of semi-luminaire .....		N/A
5.6 (4.14.3)	Adjusting devices:		P
	- flexing test; number of cycles.....	45	P
	- strands broken .....	0	P
	- electric strength test afterwards		P
5.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
5.6 (4.14.5)	Guide pulleys		N/A
5.6 (4.14.6)	Strain on socket-outlets		N/A
<b>5.6 (4.15)</b>	<b>Flammable materials</b>		<b>P</b>
	- glow-wire test 650°C.....	See Test Table 5.15 (13.3.2)	N/A
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
5.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A

IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
	b) temperature sensing control		N/A
	c) surface temperature		N/A
<b>5.6 (4.16)</b>	<b>Luminaires for mounting on normally flammable surfaces</b>		N/A
	No lamp control gear .....	(compliance with Section 12)	N/A
5.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
5.6 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
5.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
<b>5.6 (4.17)</b>	<b>Drain holes</b>		N/A
	Clearance at least 5 mm		N/A
<b>5.6 (4.18)</b>	<b>Resistance to corrosion</b>		P
5.6 (4.18.1)	- rust-resistance		P
5.6 (4.18.2)	- season cracking in copper		N/A
5.6 (4.18.3)	- corrosion of aluminium		P
5.6 (4.19)	Igniters compatible with ballast		N/A
5.6 (4.20)	Rough service vibration		N/A
<b>5.6 (4.21)</b>	<b>Protective shield</b>		<b>N/A</b>
5.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
5.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
5.6 (4.21.3)	No direct path		N/A
5.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment .....	See Test Table 5.15 (13.3.2)	N/A
5.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
5.6 (4.23)	Semi-luminaires comply Class II		N/A
<b>5.6 (4.24)</b>	<b>Photobiological hazards</b>		<b>P</b>
5.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A

IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
5.6 (4.24.2)	Retinal blue light hazard	Classified as RG1	P
	Class of risk group assessed according to IEC/TR 62778 .....		—
	Luminaires with $E_{thr}$ :		N/A
	a) Fixed luminaires		N/A
	- distance x m, borderline between RG1 and RG2....:		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
<b>5.6 (4.25)</b>	<b>Mechanical hazard</b>		<b>P</b>
	No sharp point or edges		P
<b>5.6 (4.26)</b>	<b>Short-circuit protection</b>		N/A
5.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
5.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
<b>5.6 (4.27)</b>	<b>Terminal blocks with integrated screwless earthing contacts</b>		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Voltage drop test, resistance < 0,05 $\Omega$		N/A
<b>5.6 (4.28)</b>	<b>Fixing of thermal sensing control</b>		N/A
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		N/A

IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
	Max. temperature on adhesive material (°C) .....		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
<b>5.6 (4.29)</b>	<b>Luminaires with non-replaceable light source</b>		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
<b>5.6 (4.30)</b>	<b>Luminaires with non-user replaceable light source</b>		<b>P</b>
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P
	Minimum two fixing means		P
<b>5.6 (4.31)</b>	<b>Insulation between circuits</b>		P
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
5.6 (4.31.1)	SELV circuits		N/A
	Used SELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of SELV circuits from LV supply		N/A
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
5.6 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A



IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
5.6 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		P
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
<b>5.6 (4.32)</b>	<b>Overvoltage protective devices</b>		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
5.6.1 (-)	At least IPX3 if for outdoor use		P
5.6.2 (-)	Lampholder brackets and lamp supports		N/A
5.6.3 (-)	Adjusting means		P
5.6.4 (-)	Controlling components		N/A
5.6.5 (-)	Fixing device		P
	Wind force test		P
5.6.6 (-)	Locking of angular adjustment		P
5.6.7 (-)	Vibration resistance		P
5.6.8 (-)	Requirement on glass cover if mounting height > 5 m		P
	Method of protection ..... :	IK08	—

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Clause	Requirement + Test	Result - Remark	Verdict
<b>5.7 (11)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		P
5.7 (11.2)	Creepage distances and clearances .....	See Table 5.7 (11.2)	P
	Impulse withstand category (Normal category II) (Category III Annex U, Table U.1)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—
<b>5.8 (7)</b>	<b>PROVISION FOR EARTHING</b>		P
5.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		N/A
	Resistance < 0,5 $\Omega$ .....	0,066	P
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a groove		N/A
	Earth makes contact first		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A
5.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		P
5.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
5.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
5.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
5.8 (7.2.7)	Electrolytic corrosion of the earth terminal		P
5.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
5.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
5.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P

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Clause	Requirement + Test	Result - Remark	Verdict
<b>5.9 (14)</b>	<b>SCREW TERMINALS</b>		P
	Separately approved; component list	(see Annex 1)	P
	Part of the luminaire	(see Annex 3)	N/A
<b>5.9 (15)</b>	<b>SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS</b>		P
	Separately approved; component list .....	(see Annex 1)	P
	Part of the luminaire .....	(see Annex 4)	N/A
<b>5.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		P
<b>5.10 (5.2)</b>	<b>Supply connection and external wiring</b>		P
5.10 (5.2.1)	Means of connection.....	Non-detachable flexible cable or cord	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV $\leq 25$ V a.c./60 V d.c. or protected from outdoor environment		N/A
5.10 (5.2.2)	Type of cable.....	H05RN-F	P
	Nominal cross-sectional area (mm <sup>2</sup> ).....	3x1,0mm <sup>2</sup>	P
	Cables equal to IEC 60227 or IEC 60245		P
5.10 (5.2.3)	Type of attachment, X, Y or Z		P
5.10 (5.2.5)	Type Z not connected to screws		N/A
5.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
5.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
5.10 (5.2.8)	Insulating bushings:		P
	- suitably fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- tubes or guards made of insulating material		P
5.10 (5.2.9)	Locking of screwed bushings		N/A
5.10 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
5.10 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
5.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
5.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) .....: 60		P
	- torque test: torque (Nm).....: 0,25		P
	- displacement $\leq 2$ mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
5.10 (5.2.11)	External wiring passing into luminaire		P
5.10 (5.2.12)	Looping-in terminals		N/A
5.10 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
5.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
5.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
5.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
5.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
<b>5.10 (5.3)</b>	<b>Internal wiring</b>		<b>P</b>
5.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A).....:		N/A
	- temperatures.....: (see Annex 2)		N/A
	Green-yellow for earth only		P
5.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm <sup>2</sup> ).....: 1,0		P
	Insulation thickness		P
	Extra insulation added where necessary		N/A
5.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
5.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A
5.10 (5.3.1.4)	Conductors without insulation		N/A
5.10 (5.3.1.5)	SELV current-carrying parts		N/A
5.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
5.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		P
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No twisting over 360°		P
5.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
5.10 (5.3.4)	Joints and junctions effectively insulated		N/A
5.10 (5.3.5)	Strain on internal wiring		N/A
5.10 (5.3.6)	Wire carriers		N/A
5.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
<b>5.11 (8)</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		P
5.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		N/A
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		P
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		N/A
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
5.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
5.11 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
5.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
5.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load (V) .....		N/A
	- no-load voltage (V) .....		N/A
	- touch current if applicable (mA) .....		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage (V) .....		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
5.11 (8.2.4)	Portable luminaire has protection independent of supporting surface		N/A
5.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
5.11 (8.2.6)	Covers reliably secured		P
5.11 (8.2.7)	Luminaire other than below with capacitor > 0,5 $\mu$ F not exceed 50 V 1 min after disconnection		N/A
	Portable luminaire with capacitor > 0,1 $\mu$ F (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 $\mu$ F (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

<b>5.12 (12)</b>	<b>ENDURANCE TEST AND THERMAL TEST</b>		P
	If IP > IP 20 relevant test of (12.4), (12.5), (12.6) and 12.7 after (9.2) before (9.3) specified in 5.13		P
5.12 (12.3)	Endurance test:		P
	- mounting-position .....	Normal	—
	- test temperature (°C) .....	55	—
	- total duration (h) .....	240	—

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Clause	Requirement + Test	Result - Remark	Verdict
	- supply voltage: Un factor; calculated voltage (V)....:	240: 1,1; 264	—
	- lamp used .....	LED module	—
5.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
5.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
5.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N/A
5.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
5.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		—
	- case of abnormal conditions .....		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured mounting surface temperature (°C) at 1,1 Un .....		N/A
	- calculated mounting surface temperature (°C) .....		N/A
	- track-mounted luminaires		N/A
5.12 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions .....		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C).....:		N/A
	- track-mounted luminaires		N/A
5.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
5.12 (12.7.1)	Luminaire without temperature sensing control		N/A
5.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....		—
	Test according to 12.7.1.1:		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	- case of abnormal conditions .....		—
	- Ballast failure at supply voltage (V) .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions .....		—
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test.....	See Table 5.15 (13.2.1)	N/A
5.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions .....		—
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test.....	See Table 5.15 (13.2.1)	N/A
5.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
5.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- case of abnormal conditions .....		—
	- highest measured temperature of fixing point/ exposed part (°C): .....		—
	Ball-pressure test.....	See Table 5.15 (13.2.1)	N/A
5.12.1 (-)	Reduction 10 °C of measured temperatures if for outdoor use		—

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Clause	Requirement + Test	Result - Remark	Verdict
5.12.2 (-)	Glass covers used within the thermal limits		N/A
<b>5.13 (9)</b>	<b>RESISTANCE TO DUST AND MOISTURE</b>		P
5.13 (-)	If IP > IP 20 the order of tests as specified in clause 5.12		P
5.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....: IP 66		—
	- mounting position during test.....: Normal use		—
	- fixing screws tightened; torque (Nm).....: 2/3 torque		—
	- tests according to clauses .....: 9.2.2; 9.2.7		—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c.1) For luminaires without drain holes – no water entry		P
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		P
5.13 (9.3)	Humidity test 48 h		P
<b>5.14 (10)</b>	<b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>		P
5.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....	Covered by metal foil	—
	Insulation resistance (MΩ).....: 100		—
	SELV		N/A
	- between current-carrying parts of different polarity:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts and mounting surface .....		N/A
	- between current-carrying parts and metal parts of the luminaire.....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV		P
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....	100MΩ	P
	- between live parts and metal parts.....	100MΩ	P
	- between live parts of different polarity through action of a switch .....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
5.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V) .....	1480	P
	SELV		N/A
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface .....		N/A
	- between current-carrying parts and metal parts of the luminaire.....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV		P
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....	1480 V	P
	- between live parts and metal parts.....	1480 V	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts of different polarity through action of a switch .....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
5.14 (10.3)	Touch current or protective conductor current (mA):	0,07	P

<b>5.15 (13)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		P
5.15 (13.2.1)	Ball-pressure test.....	See Test Table 5.15 (13.2.1)	P
5.15 (13.3.1)	Needle-flame test (10 s) .....	See Test Table 5.15 (13.3.1)	P
5.15 (13.3.2)	Glow-wire test (650°C).....	See Test Table 5.15 (13.3.2)	N/A
5.15 (13.4)	Proof tracking test (IEC 60112).....	See Test Table 5.15 (13.4)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

5.7 (11.2)	TABLE: Creepage distances and clearances						P
	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						P
	Applicable part of IEC 60598-1 Table 11.1* and 11.2*						P
	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:	B	2,4	2,0	11.1	3,1	3,0	11.1
	B	3,1	2,0	11.1	3,1	3,0	11.1
Working voltage (V) .....					Uout 311V		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....							—
Supplementary information: L to N(PCB); L/N to enclosure(PCB)							
Distance 2:	R	6,5	3	11.1	6,5	5	11.1
Working voltage (V) .....					220-240		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....							—
Supplementary information:							
Distance 3:							
Working voltage (V) .....							—
PTI .....					< 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....							—
Supplementary information:							

\*\* Insulation type: B – Basic; S – Supplementary; R – Reinforced. See also IEC 60598-1 Annex M.

5.15 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) .....		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Screwless terminal	See CDF	125	1,3	
Supplementary information:				

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Clause	Requirement + Test	Result - Remark			Verdict
<b>5.15 (13.3.1)</b>	<b>TABLE: Needle-flame test (IEC 60695-11-5)</b>				<b>P</b>
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Screwless terminal	See CDF	10	No	0	P
Supplementary information:					

<b>5.15 (13.3.2)</b>	<b>TABLE: Glow-wire test (IEC 60695-2-11)</b>				<b>N/A</b>
<b>Glow wire temperature .....</b>		650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No).....:					
Supplementary information:					

<b>5.15 (13.4)</b>	<b>TABLE: Proof tracking test (IEC 60112)</b>				<b>N/A</b>
<b>Test voltage PTI .....</b>		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Supplementary information:					

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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1	TABLE: Critical components information						
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
See Construction Data form for electrical equipment and machinery.							
Supplementary information:							
<sup>1)</sup> Provided evidence ensures the agreed level of compliance. See OD-CB2039. The codes above have the following meaning: A - The component is replaceable with another one, also certified, with equivalent characteristics B - The component is replaceable if authorised by the test house C - Integrated component tested together with the appliance D - Alternative component							

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12						P
	Type reference .....	TG-163LLED				—	
	Lamp used.....	LED module				—	
	Lamp control gear used .....	LED driver				—	
	Mounting position of luminaire.....	Normal position				—	
	Supply wattage (W) .....	1162,2				—	
	Supply current (A).....	4,676				—	
	Calculated power factor .....	0,978				—	
	Table: measured temperatures corrected for ta = 45 °C:						
	- abnormal operating mode .....	N/A				—	
	- test 1: rated voltage .....	240V~				—	
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....	254V~				—	
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A				—	
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....	N/A				—	
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A				—	
Temperature measurements, (°C)							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
linternal wire	45,0	-	68,2	-	180	-	-

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Clause	Requirement + Test				Result - Remark		Verdict
PCB	45,0	-	81,0	-	130	-	-
terminal	45,0	-	65,1	-	110	-	-
Driver tc	45,0	71,5	-	-	90	-	-
Enclosure(metal )	45,0	-	69,9	-	65+10	-	-
Power cord	45,0	-	56,9	-	180	-	-
Mounting surface	45,0	-	52,1	-	85	-	-
Surge protector	45,0	-	71,0	-	90	-	-
Screwless terminal	45,0	-	60,7	-	90	-	-
Supplementary information:							

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12						P
	Type reference .....	TG-161SLED					—
	Lamp used.....	LED module					—
	Lamp control gear used .....	LED driver					—
	Mounting position of luminaire.....	Normal position					—
	Supply wattage (W) .....	512,1					—
	Supply current (A).....	2,048					—
	Calculated power factor .....	0,984					—
	Table: measured temperatures corrected for ta = 45 °C:						
	- abnormal operating mode .....	N/A					—
	- test 1: rated voltage .....	240V~					—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....	254V~					—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A					—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....	N/A					—
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A					—
<b>Temperature measurements, (°C)</b>							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit



IEC 60598-2-5							
Clause	Requirement + Test				Result - Remark		Verdict
Internal wire	45,0	-	84,6	-	180	-	-
PCB	45,0	-	97,5	-	130	-	-
terminal	45,0	-	62,8	-	110	-	-
Driver tc	45,0	82,7	-	-	90	-	-
Enclosure(metal )	45,0	-	74,5	-	65+10	-	-
Power cord	45,0	-	56,6	-	180	-	-
Mounting surface	45,0	-	52,5	-	85	-	-
Screwless terminal	45,0	-	75,4	-	90	-	-
Electro-mechanical contact systems	45,0	-	61,8	-	90	-	-
Supplementary information:							

<b>ANNEX 3</b>	<b>Screw terminals (part of the luminaire)</b>		N/A
<b>(14)</b>	<b>SCREW TERMINALS</b>		N/A
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm <sup>2</sup> ) .....		—
(14.3.3)	Conductor space (mm) .....		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) .....		N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm).....:		N/A
	Torque (Nm).....:		N/A

IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N).....:		N/A
(14.4.8)	Without undue damage		N/A
<b>ANNEX 4</b>	<b>Screwless terminals (part of the luminaire)</b>		N/A
<b>(15)</b>	<b>SCREWLESS TERMINALS</b>		N/A
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples).....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples).....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A

IEC 60598-2-5											
Clause	Requirement + Test									Result - Remark	Verdict
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:										N/A
(15.6)	Terminals external wiring										N/A
	Terminal size and rating										N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....										N/A
	Pull test pin or tab terminals (4 samples); pull (N) .....										N/A
<b>(15.6.3.1)</b> <b>(15.6.3.2)</b>	<b>TABLE: Contact resistance test / Heating tests</b>										N/A
	Voltage drop (mV) after 1 h										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop of two inseparable joints										N/A
	Voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Supplementary information:											

Appendix 1: National difference			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ATTACHMENT TO TEST REPORT IEC 60598-2-5</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> <b>Luminaires</b> <b>Part 2: Particular requirements</b> <b>Section 5: Floodlights</b>			
<b>Differences according to</b> ..... : EN 60598-2-5:2015 used in conjunction with EN 60598-1:2015			
<b>Annex Form No.</b> .... : EU_GD_IEC60598_2_5E			
<b>Annex Form Originator</b> ..... : IMQ S.p.A.			
<b>Master Annex Form</b> ..... : 2016-08			
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	<b>CENELEC COMMON MODIFICATIONS (EN)</b>		<b>P</b>
--	--	--	----------

<b>5.5 (3)</b>	<b>MARKING</b>		<b>N/A</b>
5.5 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		N/A

<b>5.6 (4)</b>	<b>CONSTRUCTION</b>		<b>N/A</b>
5.6 (4.11.6)	Electro-mechanical contact systems		N/A

<b>5.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		<b>N/A</b>
5.10 (5.2.1)	Connecting leads		N/A
	- without a means for connection to the supply		N/A
	- terminal block specified		N/A
	- relevant information provided		N/A
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N/A
5.10 (5.2.2)	Cables equal to EN 50525		N/A
	Replace table 5.1 – Supply cord		N/A

<b>5.12 (12)</b>	<b>ENDURANCE TESTS AND THERMAL TESTS</b>		<b>P</b>
5.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		P

<b>Appendix 1: National difference</b>			
Clause	Requirement + Test	Result - Remark	Verdict
<b>ZB</b>	<b>ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>		N/A
(3.3)	DK: power supply cords of class I luminaires with label		N/A
(4.5.1)	DK: socket-outlets		N/A
(5.2.1)	CY, DK, FI, GB: type of plug		N/A
<b>ZC</b>	<b>ANNEX ZC, NATIONAL DEVIATIONS (EN)</b>		N/A
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings  (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage)  Glow-wire test for outer parts of luminaires:		N/A
	- 850°C for luminaires in stairways and horizontal travel paths		N/A
	- 650°C for indoor luminaires		N/A
	GB: Requirements according to United Kingdom Building Regulation		N/A

Appendix 2: requirements of IEC 62031:2008/A1:2012+A2:2014			
Clause	Requirement + Test	Result - Remark	Verdict

6	CLASSIFICATION		P
	Built-in module .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Independent module.....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Integral module .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—

13 (14)	FAULT CONDITIONS		P
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		P
	During the tests, tissue paper, spread below module, does not ignite		P

Appendix 3: requirements of IEC 62493:2015			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>LIMITS</b>		P
<b>4.1</b>	<b>General</b>		P
	Comply with Van der Hoofden test limit in 4.2.3 or inherently compliant in 4.2.2 and pass assessment procedure for intentional radiators in 4.3		
<b>4.2</b>	<b>Unintentional radiating part of lighting equipment</b>		P
4.2.2	Lighting equipment deemed to comply with the Van der Hoofden test without testing		P
	1) electronic controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	2) incandescent-lamp technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	3) LED-light-source technology	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	4) OLED-light-source technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	5) high-pressure discharge lamp LED-light-source technologies	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	6) low-pressure discharge lamp technologies with exposure distance $\geq 50$ cm	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	7) independent auxiliary	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Not fulfil any of 1-7 above subject to 4.2.3		—
4.2.3	Applications of limits		N/A
	Not fulfil any of 1-7 in 4.2.2 but the compliance factor $F$ is $\leq 1$		N/A
<b>4.3</b>	<b>Intentional radiating part of lighting equipment</b>		N/A
	Comply with one of methods in Clause 7 if intentional radiator		N/A

Appendix 4: requirements of IEC/TR 62778: 2014			
Clause	Requirement + Test	Result - Remark	Verdict
<b>7</b>	<b>MEASUREMENT INFORMATION FLOW</b>		<b>P</b>
<b>7.1</b>	<b>Basic flow</b>		<b>P</b>
	'Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution		N/A
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		<b>P</b>
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		P
<b>7.3</b>	<b>Special cases (I): Replacement by a lamp or LED module of another type</b>		<b>N/A</b>
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
<b>7.4</b>	<b>Special cases (II): Arrays and clusters of primary light sources</b>		<b>N/A</b>
	LED package is evaluated as .....	<input type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited	N/A
	$E_{thr}$ of LED package applies to array		N/A
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		<b>P</b>
	Risk group achieved:		P
	-...Risk Group 0 unlimited		N/A
	-...Risk Group 1 unlimited		P
	- $E_{thr}$ ..... (lx) : Distance to reach RG1 ..... (m) :		N/A



Appendix 4: requirements of IEC/TR 62778: 2014				
Clause	Requirement + Test		Result - Remark	Verdict
	<b>TABLE: Spectroradiometric measurement</b>			<b>P</b>
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
	Model number.....:	TG-161SLED		
	Test voltage (V).....:	240		—
	Test current (mA).....:	204,8		—
	Test frequency (Hz) .....	50		—
	Ambient, t (°C) .....	25		—
	Measurement distance .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		—
	Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small: .... mm		—
	Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		—
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	6257	
x/y colour coordinates			/	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	48	
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	2,462	
Luminance	L	cd/m <sup>2</sup>	6,511 x10 <sup>4</sup>	
Illuminance	E	lx	5922	
Supplementary information:				

Appendix 4: requirements of IEC/TR 62778: 2014			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE: Spectroradiometric measurement (5050)			P	
	Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
	Model number .....	TG-161SLED		
	Test voltage (V) .....	240	—	
	Test current (mA) .....	204,8	—	
	Test frequency (Hz) .....	50	—	
	Ambient, t (°C) .....	25	—	
	Measurement distance .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm	—	
	Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small: .... mm	—	
	Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)	—	
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	6896	
x/y colour coordinates			/	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	3,286 x 10 <sup>3</sup>	
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	6,642	
Luminance	L	cd/m <sup>2</sup>	3,339 x 10 <sup>6</sup>	
Illuminance	E	lx	6749	
Supplementary information:				

Appendix 5 Photograph



TG-161SLED



TG-161S1LED

Appendix 5 Photograph

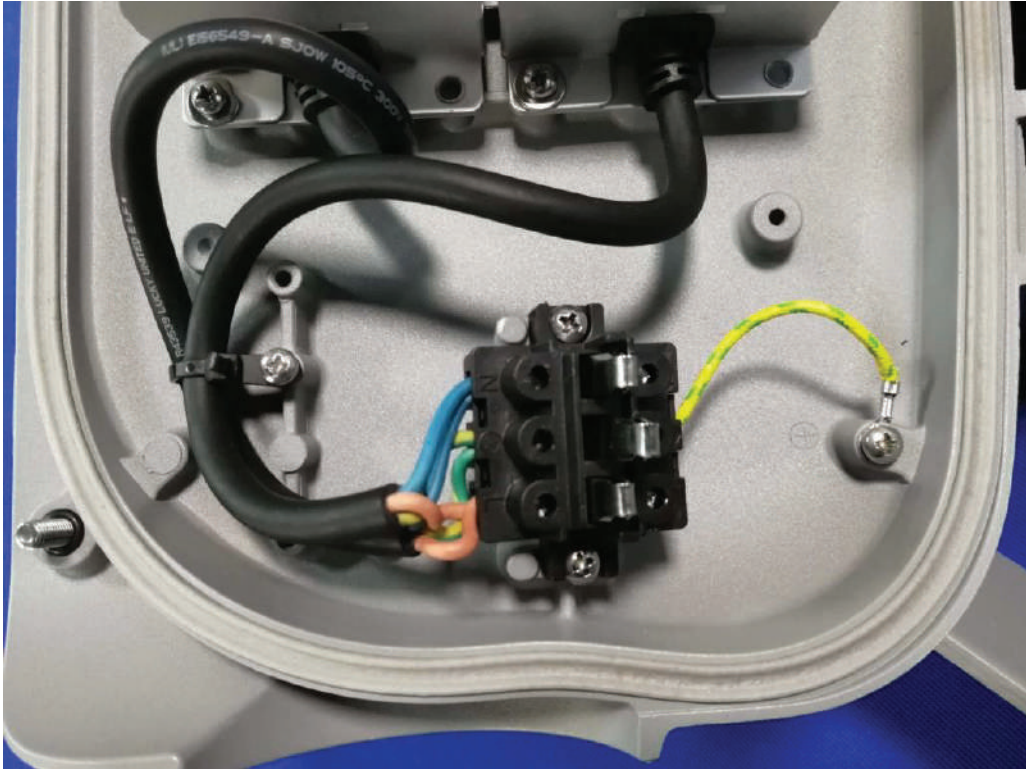


TG-161LLED



Internal construction

Appendix 5 Photograph



Electro-mechanical contact systems




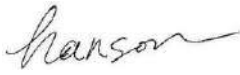
LED driver



Test Report issued under the responsibility of:



<b>TEST REPORT</b> <b>IEC TR 62778</b> <b>Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires</b>	
<b>Report Number</b> ..... :	3194758.51P
<b>Date of issue</b> .....	2016-08-30
<b>Total number of pages</b> .....	16
<b>Name of Testing Laboratory preparing the Report</b> .....	DEKRA Testing and Certification (Shanghai) Ltd. 3/F, #250, Jiangchangsan Road building 16 Headquarter Economy Park Shibeil Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436
<b>Applicant's name</b> .....	Lumileds Commercial (Shanghai) Co., Ltd
<b>Address</b> .....	No. 9, Lane 888, Tianlin Road, Shanghai, China
<b>Test specification:</b>	
<b>Standard</b> .....	IEC TR 62778:2014 (Second Edition)
<b>Test procedure</b> .....	CB Scheme
<b>Non-standard test method</b> .....	N/A
<b>Test Report Form No.</b> .....	IEC62778A
<b>Test Report Form(s) Originator</b> ....	TÜV SÜD Product Service GmbH
<b>Master TRF</b> .....	Dated 2016-02
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<b>General disclaimer:</b>	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.	

<b>Test item description</b> .....	LUXEON 5050	
<b>Trade Mark</b> .....	LUMILEDS	
<b>Manufacturer</b> .....	Lumileds Commercial (Shanghai) Co., Ltd No. 9, Lane 888, Tianlin Road, Shanghai, China	
<b>Model/Type reference</b> .....	LUXEON 5050 series Detailed lists refer to Appendix 2: Model List	
<b>Ratings</b> .....	Max voltage: 27 Vdc, Max current: 240 mA Detailed information please refer to Appendix 2: Model List.	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/> <b>CB Testing Laboratory:</b>	DEKRA Testing and Certification (Shanghai) Ltd.	
<b>Testing location/ address</b> .....	3/F, #250, Jiangchangsan Road building 16 Headquater Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436	
<input type="checkbox"/> <b>Associated CB Testing Laboratory:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....	Zhijun Wang	
<b>Approved by (name, function, signature)</b> .....	Hanson Zhang	
<b>Testing procedure: CTF Stage 1:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> .....		
<b>Testing procedure: CTF Stage 2:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name + signature)</b> .....		
<b>Witnessed by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> .....		
<b>Testing procedure: CTF Stage 3:</b>		
<b>Testing procedure: CTF Stage 4:</b>		
<b>Testing location/ address</b> .....		

Tested by (name, function, signature) .....		
Witnessed by (name, function, signature) .....		
Approved by (name, function, signature) .....		
Supervised by (name, function, signature) .....		



<p><b>List of Attachments (including a total number of pages in each attachment):</b></p> <ul style="list-style-type: none"> <li>● Appendix 1: Photo Documentation</li> <li>● Appendix 2: Model List</li> <li>● Appendix 3: Relative Spectrum Of Tested Sample(s)</li> <li>● Appendix 4: Table 6.1 Based On IEC 62471:2006</li> <li>● Appendix 5: Table 6.1 Based On EN62471:2008, Attachment To IEC 62471 European Group Differences And National Differences</li> </ul>	
<p><b>Summary of testing:</b></p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>These tests fulfil the requirements of standard ISO/IEC 17025. When determining the test conclusion, the Measurement Uncertainty of test has been considered.</p> <p>The tested sample of L150-44705024SCP00 from LUXEON 5050 series list at appendix 2 Have been tested according to the IEC 62471 (first edition, 2006-07) <b>at 200mm</b> and been classified as <b>RG 2</b>. Have been tested according to the EN 62471:2008 <b>at 200mm</b> and been classified as <b>RG 2</b>. Have been tested according to the IEC/TR62778:2014 and been classified as <b>RG 2 for blue light hazard</b></p>	<p><b>Testing location:</b></p> <p>DEKRA Testing and Certification (Shanghai) Ltd. 3/F, #250, Jiangchangsan Road building 16 Headquater Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436</p>
<p><b>Summary of compliance with National Differences (List of countries addressed): EN Standards</b></p> <p>EN 62471:2008</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements</b></p>	

**Copy of marking plate:**

**The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.**

N/A

<b>Test item particulars.....: See below</b>	
<b>Product evaluated.....:</b> <input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire	
<b>Rated voltage (V) .....:</b> Max: 27 Vdc	
<b>Rated current (mA) .....:</b> Max:240 mA	
<b>Rated CCT (K).....:</b> 2600K / 3340K // 4000K / 4360K Details information please refer to Appendix 2: Model List.	
<b>Rated Luminance (Mcd/m<sup>2</sup>) .....:</b> --	
<b>Component report data used .....:</b> <input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp Report number: --	
<b>Possible test case verdicts:</b> - test case does not apply to the test object..... : N/A - test object does meet the requirement..... : P (Pass) - test object does not meet the requirement..... : F (Fail)	
<b>Testing.....:</b> --	
<b>Date of receipt of test item .....:</b> 2016-08-25	
<b>Date (s) of performance of tests .....:</b> 2016-08-25 to 2016-08-30	
<b>General remarks:</b> "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. <b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b> The product complied with the following standards: <input checked="" type="checkbox"/> IEC 62471:2006 <input checked="" type="checkbox"/> EN 62471:2008 <input type="checkbox"/> IEC/TR 62471-2:2009 <input checked="" type="checkbox"/> IEC/TR 62778:2014	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC 62471-2:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable

**When differences exist; they shall be identified in the General product information section.**

**Name and address of factory (ies) .....** : Lumileds Commercial (Shanghai) Co., Ltd  
No. 9, Lane 888, Tianlin Road, Shanghai, China

**General product information:**

L150-44705024SCP00, with ANSI bin 4360K, is part of the LUXEON 5050 product family. The sample measured, L150-44705024SCP00 has the highest typical flux density (lumens per mm<sup>2</sup> of light emitting surface (LES) area), highest typical device luminance level and highest CCT within the listed LUXEON 5050 product family. The present classification is thus valid (worst case) for all LUXEON 5050 with part number L 1 5 0 - A A B 5 0 2 4 C C 0 0 where AA represents nominal ANSI CCT bins could be equal to 4360K or lower, BB represents CRI could be from 68 to 90 (see TR IEC62778). See the appendix below for an explanation of the type designation.

The products considered as worst case which should be evaluated at 200mm.

The sample of L150-44705024SCP00 was tested at 200mm from the light source. CCT of spectral irradiance was found at 4544 K.

Base on the Model list which listed on the appendix 2, The tested sample can be considered as  
 typical product  worst product

Which the results can be reference used for the other models.

Type test was performed according to IEC 62471:2006 procedure.

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict
<b>7</b>	<b>MEASUREMENT INFORMATION FLOW</b>		<b>P</b>
<b>7.1</b>	<b>Basic flow</b>		<b>P</b>
	'Law of conservation of luminance' applied		N/A
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		N/A
	In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution		N/A
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		<b>P</b>
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
<b>7.3</b>	<b>Special cases (I): Replacement by a lamp or LED module of another type</b>		<b>N/A</b>
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
<b>7.4</b>	<b>Special cases (II): Arrays and clusters of primary light sources</b>		<b>N/A</b>
	LED package is evaluated as ..... : <input type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited		N/A
	$E_{thr}$ of LED package applies to array		N/A
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		<b>P</b>
	Risk group achieved:		P
	- ..Risk Group 0 unlimited		N/A
	- ..Risk Group 1 unlimited		N/A
	- $E_{thr}$ ..... (lx) : - Distance to reach RG1..... (mm) ::	Refer to the Supplementary information of <b>TABLE:Spectroradiometric measurement</b> as following	P

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE:Spectroradiometric measurement				
Measurement performed on:		<input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire		
Model number.....		L150-44705024SCP00		
Test voltage (V) .....		27 Vdc		—
Test current (mA) .....		240 mA		—
Test frequency (Hz).....		--		—
Ambient, t(°C) .....		25°C		—
Measurement distance.....		<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		—
Source size .....		<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small :		—
Field of view .....		<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		—
Item	Symb ol	Units	Result	Remark
Correlated colour temperature	CCT	K	4544	
x/y colour coordinates			0,3669/ 0,4076	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	1,70E+04	@11mrad
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	--	
Luminance	L	cd/m <sup>2</sup>	2,82E+07	@11mrad
Illuminance	E	lx	8,23E+03	
Supplementary information: Per IEC/TR 62778:2014 E <sub>thr</sub> =1655 lx D <sub>min</sub> = 446 mm				

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

	<b>TABLE: Angular light distribution</b>	<b>N/A</b>

**List of test equipment used:**

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to CTF stage 1 or CTF stage 2 procedure has been used.

Note: This page may be removed when CTF stage 1 CTF stage 2 are not used. See also clause 4.8 in OD 2020 for more details.

Clause	Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Last Calibration date	Calibration due date
7	Irradiance measurements Radiance measurements	IDR 300 Monochromator (SH 344)	200-3000nm	/	/
7	Radiance measurements	S009 Telescope (SH 345)	300-1400nm	/	/
7	Radiance measurements	SRS 12 Radiance Standard (SH 348)	300-1400nm	2016/3/22	2017/3/22
7	Irradiance measurements	CL6 Spectral irradiance standard (SH 350)	300-3000nm	2016/3/22	2017/3/22
7	Irradiance measurements	CL7 Spectral irradiance standard (SH 351)	200-400nm	2016/3/22	2017/3/22
7	Irradiance measurements	Photometric detector head (SH 359)	380nm-800nm	2016/3/22	2017/3/22
7	Irradiance measurements Radiance measurements	Wattmeter (SH070)	500V,40A	2015/10/16	2016/10/16



Appendix 1: Photo Documentation



Overview (tested)

Appendix 2: Model List:

L150-44705024SCP00, with ANSI bin 4360K, is part of the LUXEON 5050 product family. The sample measured, L150-44705024SCP00 has the highest typical flux density (lumens per mm<sup>2</sup> of light emitting surface (LES) area), highest typical device luminance level and highest CCT within the listed LUXEON 5050 product family. The present classification is thus valid (worst case) for all LUXEON 5050 with part number L 1 5 0 - A A B B 5 0 2 4 C C C 0 0 where AA represents nominal ANSI CCT bins could be equal to 4360K or lower, BB represents CRI could be from 68 to 90 (see TR IEC62778). See the appendix below for an explanation of the type designation.

L 1 5 0 - **A A B B** 5 0 2 4 C C C 0 0

Where:

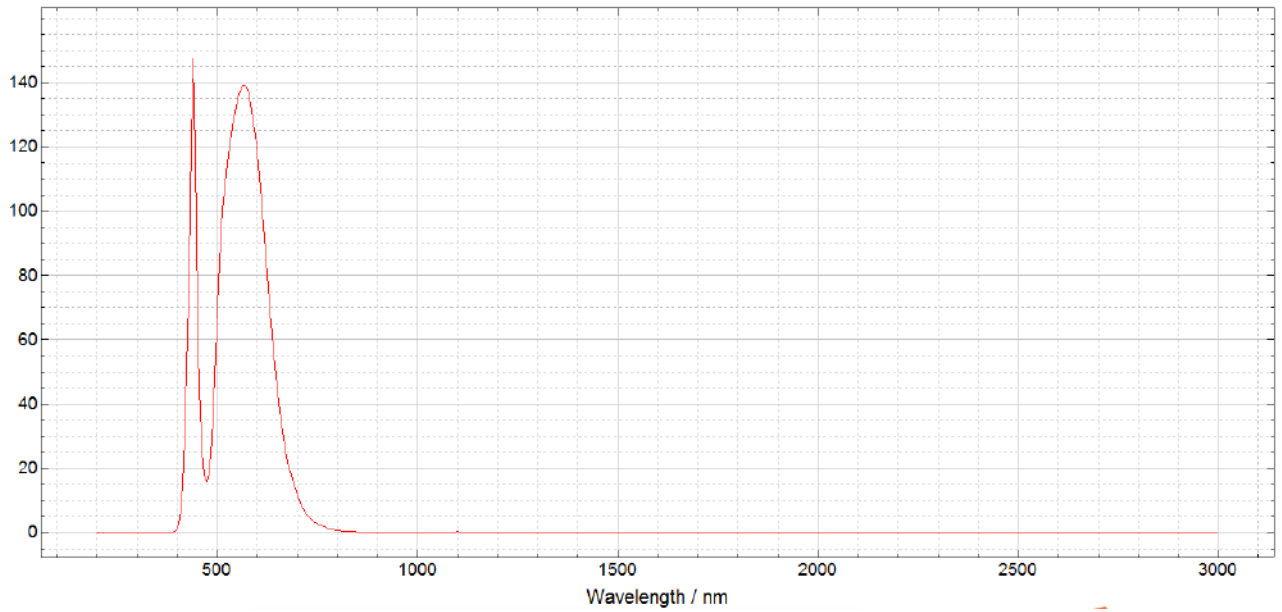
**AA** - designates nominal ANSI CCT

**BB** - designates minimum CRI

**CCC** - designates standard color point or customized one

Part number	CRI	CCT	typical flux (lm)	LES (mm <sup>2</sup> )	flux density	Max voltage	max current
L150-26705024SCP00	≥68	2600K	590	16.3	36	27	240
L150-33705024SCP00	≥68	3340K	625	16.3	38	27	240
L150-40705024SCP00	≥68	4000K	655	16.3	40	27	240
L150-44705024SCP00	≥68	4360K	655	16.3	40	27	240

Appendix 3: Relative Spectrum Of Tested Sample(s)



Appendix 4: Table 6.1 Based On IEC 62471:2006

DUT: L150-44705024SCP00, Evaluation Distance: 200mm, Test current: 240mA, Angular subtense of the apparent source  $\alpha$ : 25mrad

IEC 62471									
Clause	Requirement + Test				Result – Remark				Verdict
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps								P
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	0,0000	0,003		0,03	
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	0,0000	33		100	
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	5,08E+02	10000	1,70E+04	4000000	1,80E+04
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	--	1,0		400	
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ $\alpha$	2,23E+05	28000/ $\alpha$		71000/ $\alpha$	
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	6000/ $\alpha$	--	6000/ $\alpha$		6000/ $\alpha$	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0,04	570		3200	
* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian.									
** Involves evaluation of non-GLS source									

Appendix 5: Table 6.1 Based On EN62471:2008, Attachment To IEC 62471 European Group Differences And National Differences

DUT: L150-44705024SCP00, Evaluation Distance: 200mm, Test current: 240mA, Angular subtense of the apparent source  $\alpha$ : 25mrad

EN 62471										
Clause	Requirement + Test			Result – Remark				Verdict		
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)								P	
Risk	Action spectrum	Symbol	Units	Emission Measurement						
				Exempt		Low risk		Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	0,0000	--	--	--	--	
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	0,0000	--	--	--	--	
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	5,08E+02	10000	1,70E+04	4000000	1,80E+04	
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	--	1,0		400		
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ $\alpha$	2,23E+05	28000/ $\alpha$		71000/ $\alpha$		
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 0,0017 $\leq \alpha \leq$ 0,011	--					
				6000/ $\alpha$ 0,011 $\leq \alpha \leq$ 0,1	--					
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0,04	570		3200		
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2  The applicable aperture diameters: see 4.2.1  The limitations for the angular subtenses: see 4.2.2  The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p>										



Choose certainty.  
Add value.

**Technical Report No. 704021712536-00**

**Rev. 00**

**Dated 2018-02-08**

Client: Ningbo King-Bridge Lighting Technology Co.,Ltd.  
No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400,  
Yuyao, Zhejiang Province, People's Republic of China

Manufacturing place: Ningbo King-Bridge Lighting Technology Co.,Ltd.  
No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400,  
Yuyao, Zhejiang Province, People's Republic of China

Test subject: Product: LED Floodlight  
Type: TG-163SLED; TG-163LLED; TG-161LLED; TG-161MLED; TG-  
161SLED; TG-161S1LED

Test specification: IEC 60598-2-3:2002 + A1:2011 & IEC 60598-1:2014

Purpose of examination: 

- According to client's requirement for above mentioned model
  - IK09 test
  - IP66 test

Test result: **PASS**



## 1 Description of the test subject

### 1.1 Technical Data

Rated voltage: 100-240V~

Rated frequency: 50/60Hz

Rated power: TG-163SLED: 600W; TG-163LLED: 1200W; TG-161LLED: 480W; TG-161MLED: 300W; TG-161SLED: 200W; TG-161S1LED: 100W

Protection Class: Class I

Degree of protection: IP66

## 2 Order

### 2.1 Date of Purchase Order, Customer's Reference

2017-11-16

#### Receipt of Test Sample, Location

2017-11-16

TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

No. 1999, Duhui Road, Shanghai, 201108, P. R. China

### 2.2 Date of Testing

2017-11-16 to 2018-02-05

### 2.3 Location of Testing

TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch



## 2.4 Points of Non-compliance or Exceptions of the Test Procedure

None

## 3 Test specification

Test methods: According to IEC 60598-2-3:2002 + A1:2011 & IEC 60598-1:2014.

We pick up the TG-163LLED with highest wattage and largest dimension as typical test sample.

### 1. Impact energy was shown as blow:

IK code	IK00	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10
Impact energy, J	*	0,14	0,2	0,35	0,5	0,7	1	2	5	10	20
* Not protected according to this standard.											
NOTE 1 When higher impact energy is required, the value of 50 J is recommended.											
NOTE 2 A characteristic group numeral of two figures has been chosen to avoid confusion with some national standards which used a single numeral for a specific impact energy.											

### 2. Requirement of IP test:

IP Level 1st Digit	IP Level 2nd Digit De
<b>0</b> Not protected	<b>0</b> Not protected
<b>1</b> Protected against solid foreign objects of 50 mm diameter and greater	<b>1</b> Protected against vertically falling water drops
<b>2</b> Protected against solid foreign objects of 12,5 mm diameter and greater	<b>2</b> Protected against vertically falling water drops when enclosure is tilted up to 15 °
<b>3</b> Protected against solid foreign objects of 2,5 mm diameter and greater	<b>3</b> Protected against water sprayed at an angle up to 60 ° on either side of the vertical
<b>4</b> Protected against solid foreign objects of 1,0 mm diameter and greater	<b>4</b> Protected against water splashed against the component from any direction
<b>5</b> Protected from the amount of dust that would interfere with normal operation	<b>5</b> Protected against water projected in jets from any direction
<b>6</b> Dust tight	<b>6</b> Protected against water projected in powerful jets from any direction
	<b>7</b> Protected against temporary immersion in water
	<b>8</b> Protected against continuous immersion in water, or as specified by the user



**4 Deviations**

N/A

**5 Instruction manual**

N/A

**6 Photograph**





TÜV SÜD Certification and Testing (China)Co.,Ltd. Shanghai Branch  
TÜV SÜD Group

Engineer:   
Xiaohui YANG  
Project Handler

Technical Report checked:   
Xiang GAO  
Designated Reviewer

### 2.3 Compatibilidad Electromagnética

- UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2 Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16 A por fase)
- UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.
- UNE-EN 61547. Equipos para alumbrado



Product Service

# Attestation of Conformity

No. E8A 001704 0004 Rev. 01

**Holder of Certificate:** **Ningbo King-Bridge Lighting Technology Co.,Ltd.**

No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street,  
315400 Yuyao, Zhejiang Province  
PEOPLE'S REPUBLIC OF CHINA

**Name of Object:** **Flood lights**  
**LED Floodlight**

This Attestation of Conformity is issued on a voluntary basis according to the Directive 2014/30/EU relating to electromagnetic compatibility. It confirms that the listed apparatus complies with all essential requirements of the directive and is based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for testing and certification. For details see: [www.tuvsud.com/ps-cert](http://www.tuvsud.com/ps-cert)

**Test report no.:** 708881712536-01

**Date,** 2020-10-29

( Hui Tong )

Page 1 of 2

After preparation of the necessary technical documentation as well as the EU Declaration of conformity the required CE marking can be affixed on the product. That Declaration of conformity is issued under the sole responsibility of the manufacturer. Other relevant EU-directives have to be observed.



Product Service

# Attestation of Conformity

No. E8A 001704 0004 Rev. 01

**Model(s):** TG-163SLED, TG-163LLED, TG-161LLED,  
TG-161MLED, TG-161SLED, TG-161S1LED,  
TG-163XLLED, TG-201LED, TG-162LED

## Description of Object:

Rated voltage: see model list

Rated frequency: 50-60Hz

Rated power: see model list

Protection class: I

Model	Rated voltage	Rated frequency	Rated power
TG-163LLED	100-240V~	50-60Hz	1200W
TG-163SLED	100-240V~	50-60Hz	600W
TG-161LLED	100-240V~	50-60Hz	480W
TG-161MLED	100-240V~	50-60Hz	300W
TG-161SLED	100-240V~	50-60Hz	200W
TG-162LED	100-240V~	50-60Hz	180W
TG-161S1LED	100-240V~	50-60Hz	100W
TG-163XLLED	200-240V~	50-60Hz	1800W
TG-201LED	200-240V~	50-60Hz	720W

**Tested according to:** EN 55015:2013/A1:2015  
EN 61547:2009  
EN 61000-3-2:2014  
EN 61000-3-3:2013

# EMC Test Report

Product: LED Floodlight

Model: TG-163SLED, TG-163LLED,  
TG-161LLED, TG-161MLED, TG-161SLED,  
TG-161S1LED, TG-163XLLED, TG-201LED,  
TG-162LED

Applicant: Ningbo King-Bridge Lighting  
Technology Co., Ltd.



No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street,  
315400 Yuyao, Zhejiang Province, PEOPLE'S REPUBLIC OF CHINA



In accordance with EN 55015, EN 61547,  
EN 61000-3-2 and EN 61000-3-3

## COMMERCIAL-IN-CONFIDENCE

Issue Date: October 22,2020  
Report Number: 708881712536-01

RESPONSIBLE FOR	NAME	SIGNATURE	DATE
Approved By	Keping ZANG		Oct. 22. 2020
Prepared By	Liping XUE		Oct.22,2020

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service control rules.

### EXECUTIVE SUMMARY

Two samples of this product were tested and found to be compliance with EN 55015:2013/A1:2015, EN 61547:2009, EN 61000-3-2:2014 and EN 61000-3-3:2013.

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This non-binding report has been prepared by TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch with all reasonable skill and care. The reports apply only to the specific samples tested under stated test conditions. The document is confidential to the potential Client and TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch. No part of this document may be reproduced without the prior written approval of TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch.

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ID Number: EMC\_SHA\_F\_B\_02.23E  
Revision:20.00  
Effective:12/06/2019



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## 1 Report Summary

### 1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	10/22/2020

### 1.2 Introduction

The information contained in this report is intended to show verification of the EMC Qualification Approval Testing of the requirements of the standards for the tests listed in Section 1.3.

Applicant	Ningbo King-Bridge Lighting Technology Co., Ltd.
Address	No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400 Yuyao, Zhejiang Province, People's Republic of CHINA
Manufacturer	Ningbo King-Bridge Lighting Technology Co., Ltd.
Address	No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400 Yuyao, Zhejiang Province, P. R. China
Factory	Ningbo King-Bridge Lighting Technology Co., Ltd.
Address	No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400 Yuyao, Zhejiang Province, P. R. China
Trade Name	KLED
Model Number(s)	TG-163SLED, TG-163LLED, TG-161LLED, TG-161MLED, TG-161SLED, TG-161S1LED, TG-163XLLED, TG-201LED, TG-162LED
Rated Input Voltage/Frequency	Refer to model list
Rated Power	Refer to model list
Protection Class	Class I
Sample Number(s)	SHA-525505-1(TG-201LED), SHA-525505-2(TG-163XLLED)
Number of Samples Tested	2
Test Specification	EN 55015:2013/A1:2015, EN 61547:2009, EN 61000-3-2:2014 and EN 61000-3-3:2013
Date of Receipt of EUT	10/16/2020
Start of Test	10/19/2020
Finish of Test	10/20/2020
Name of Engineer(s)	Liping XUE



### 1.3 Brief Summary of Results

The sample's mentioned in this report is/are submitted/ supplied/ manufactured by client. The laboratory therefore assumes no responsibility for accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.

A brief summary of the tests carried out in accordance with EN 55015, EN 61000-3-2, EN 61000-3-3 and EN 61547 is shown below.

Section	Specification	Clause	Test Description	Result	Comments/Base Standard
AC Powered Light on					
2.1	EN 55015:2013/A1:2015	4.3.1	Conducted Disturbance at Mains Terminals	Pass (Minimum limit margin: 1.1dB)	
2.2	EN 55015:2013/A1:2015	4.4.1	Radiated Disturbance (9KHz to 30MHz)	Pass (Minimum limit margin: >6dB)	
2.3	EN 55015:2013/A1:2015	4.4.2	Radiated Disturbance (30MHz to 300MHz)	Pass (Minimum limit margin: >6dB)	
2.4	EN 61000-3-2:2014	7	Harmonic Current Emissions	Pass	
2.5	EN 61000-3-3:2013	5	Flicker	Pass	
2.6	EN 61547:2009	5.2	Electrostatic discharge immunity test	Pass	IEC 61000-4-2:2008
2.7	EN 61547:2009	5.3	Radiated, radio-frequency, electromagnetic field immunity test	Pass	IEC 61000-4-3:2006/A1:2007
2.8	EN 61547:2009	5.5	Electrical fast transient /burst immunity test	Pass	IEC 61000-4-4:2004
2.9	EN 61547:2009	5.6	Immunity to conducted disturbances, induced by radio-frequency fields	Pass	IEC 61000-4-6:2008
2.10	EN 61547:2009	5.7	Surge immunity test	Pass	IEC 61000-4-5:2005
2.11	EN 61547:2009	5.8	Voltage dips, short interruptions and voltage variations immunity test	Pass	IEC 61000-4-11:2004

## 1.4 Product Information

### 1.4.1 Technical Description

The Equipment Under Test (EUT) was a LED Floodlight.

According to the client's request, three new models TG-162LED, TG-163XLED and TG-201LED are added on the E8A attestation. The client declared that model TG-162LED use the same LED driver as model TG-161SLED except for the different rated power and enclosure. New models TG-163XLED and TG-201LED are equipped with new LED drivers.

Detailed model differences are as below:

Model list

Model	Rated voltage	Rated frequency	Rated power	LED driver
TG-163LLED	100-240V~	50-60Hz	1200W	4*HLG-320H
TG-163SLED	100-240V~	50-60Hz	600W	2*HLG-320H
TG-161LLED	100-240V~	50-60Hz	480W	2*ELG-240
TG-161MLED	100-240V~	50-60Hz	300W	HLG-320H
TG-161SLED	100-240V~	50-60Hz	200W	ELG-200
<b>TG-162LED</b>	<b>100-240V~</b>	<b>50-60Hz</b>	<b>180W</b>	<b>ELG-200</b>
TG-161S1LED	100-240V~	50-60Hz	100W	ELG-100
<b>TG-163XLED</b>	<b>200-240V~</b>	<b>50-60Hz</b>	<b>1800W</b>	<b>6*HLG-320H-C1050A</b>
<b>TG-201LED</b>	<b>200-240V~</b>	<b>50-60Hz</b>	<b>720W</b>	<b>4*LCO 200/200-1050/355 O4a NF C EXC3</b>

So model TG-201LED and TG-163XLED were chosen to perform all the tests.

After pre-scanning under 200-240V~50-60Hz, the worst test results were recorded.

### 1.4.2 EUT Port/Cable Identification

Port	Max Cable Length specified	Usage	Type	Screened
AC Powered Light on				
AC Power port	N/A	AC power for the EUT	3 core	No

### 1.4.3 Test Configuration

Configuration	Description
AC Powered	AC 200-240/50-60Hz

### 1.4.4 Modes of Operation

Mode	Description
Light on	The EUT was powered on.

#### 1.4.5 Monitoring of Performance

The luminous intensity does not deviate by more than 15%.

#### 1.4.6 Performance Criteria

Performance criterion A: During the test, no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.

Performance criterion B: During the test, the luminous intensity may change to any value. After the test, the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test, but after the test, the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.

Performance criterion C: During and after the test, any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal, if necessary by temporary interruption of the mains supply and/or operating the regulating control.

Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended.

#### 1.5 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

#### 1.6 Test Location

TÜV SÜD Product Service conducted the following tests at TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai branch.

Address:  
No.16, Lane 1951,  
Du Hui Road  
Shanghai 201108,  
P.R.China

Test Name	Name of Engineer(s)
Conducted Disturbance at Mains Terminals	Chengjie GUO
Radiated Disturbance (9kHz to 30MHz)	Chengjie GUO
Radiated Disturbance (30MHz to 300MHz)	Chengjie GUO
Harmonic Current Emissions	Chengjie GUO
Flicker	Chengjie GUO
Electrostatic discharge immunity test	Chengjie GUO
Radiated, radio-frequency, electromagnetic field immunity test	Chengjie GUO
Electrical fast transient /burst immunity test	Chengjie GUO
Immunity to conducted disturbances, induced by radio-frequency fields	Chengjie GUO
Surge immunity test	Chengjie GUO
Voltage dips, short interruptions and voltage variations immunity test	Chengjie GUO

## 2 Test Details

### 2.1 Conducted Disturbance at Mains Terminals

#### 2.1.1 Specification Reference

EN 55015:2013/A1:2015, Clause 4.3.1

#### 2.1.2 Equipment Under Test

TG-201LED and TG-163XLLED

#### 2.1.3 Date of Test

10/19/2020-10/20/2020

#### 2.1.4 Test Method

The disturbance voltage shall be measured at the main terminals of the lighting equipment by means of the arrangement described in Figure 5 to Figure 11 of EN 55015:2013/A1:2015 for the relevant type of equipment.

The output terminals of the artificial mains network (V-network) and the terminals a-b shall be positioned  $0,8\text{m} \pm 0.05\text{m}$  apart and shall be connected by the two power conductors of a flexible three-core cable of  $0,8\text{m}$  length.

#### 2.1.5 Environmental Conditions

Ambient Temperature 20-25°C  
Relative Humidity 40-60%  
Atmospheric Pressure 1010-1060mbar

#### 2.1.6 Specification Limits

Disturbance voltage limits at the mains terminals		
Frequency range	Limits dB( $\mu\text{V}$ )	
	Quasi-peak	Average
9kHz to 50kHz	110	--
50kHz to 150kHz	90 to 80	--
150kHz to 0.5MHz	66 to 56	56 to 46
0.5MHz to 5.0MHz	56	46
5.0MHz to 30MHz	60	50

#### 2.1.7 Test Results

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

# 9K-30MHz Conducted Disturbance Test

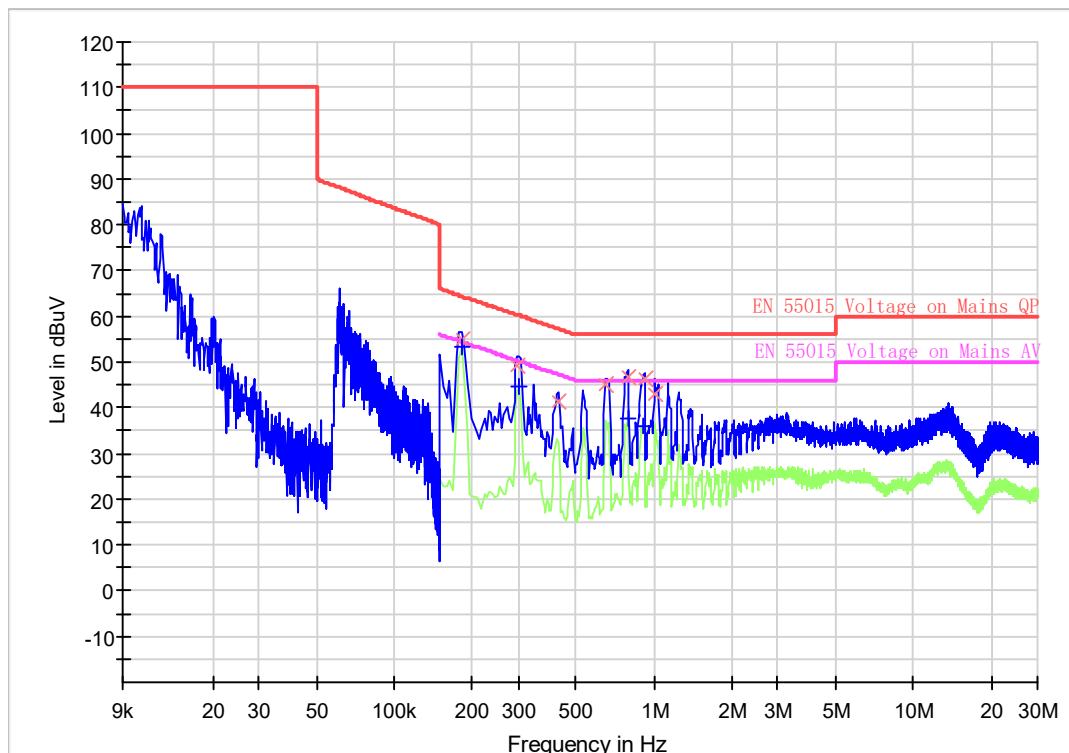
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op Cond: Light on, AC 230V/50Hz, T21.5, H52.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Standard: EN 55015  
 Comment: Phase L  
 Sample No.: SHA-525505-1

## Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup: Voltage with 2-Line-LISN  
 Receiver: [ESR 3]  
 Level Unit: dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB





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## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.181500	---	53.32	54.42	1.10	1000.0	9.000	L1	19.5
0.181500	55.14	---	64.42	9.28	1000.0	9.000	L1	19.5
0.298500	49.13	---	60.28	11.15	1000.0	9.000	L1	19.5
0.303000	---	44.47	50.16	5.69	1000.0	9.000	L1	19.5
0.429000	41.54	---	57.27	15.73	1000.0	9.000	L1	19.5
0.654000	44.97	---	56.00	11.03	1000.0	9.000	L1	19.5
0.793500	---	37.84	46.00	8.16	1000.0	9.000	L1	19.5
0.793500	46.61	---	56.00	9.39	1000.0	9.000	L1	19.5
0.915000	---	35.86	46.00	10.14	1000.0	9.000	L1	19.5
0.919500	46.35	---	56.00	9.65	1000.0	9.000	L1	19.5
1.005000	43.09	---	56.00	12.91	1000.0	9.000	L1	19.5

# 9K-30MHz Conducted Disturbance Test

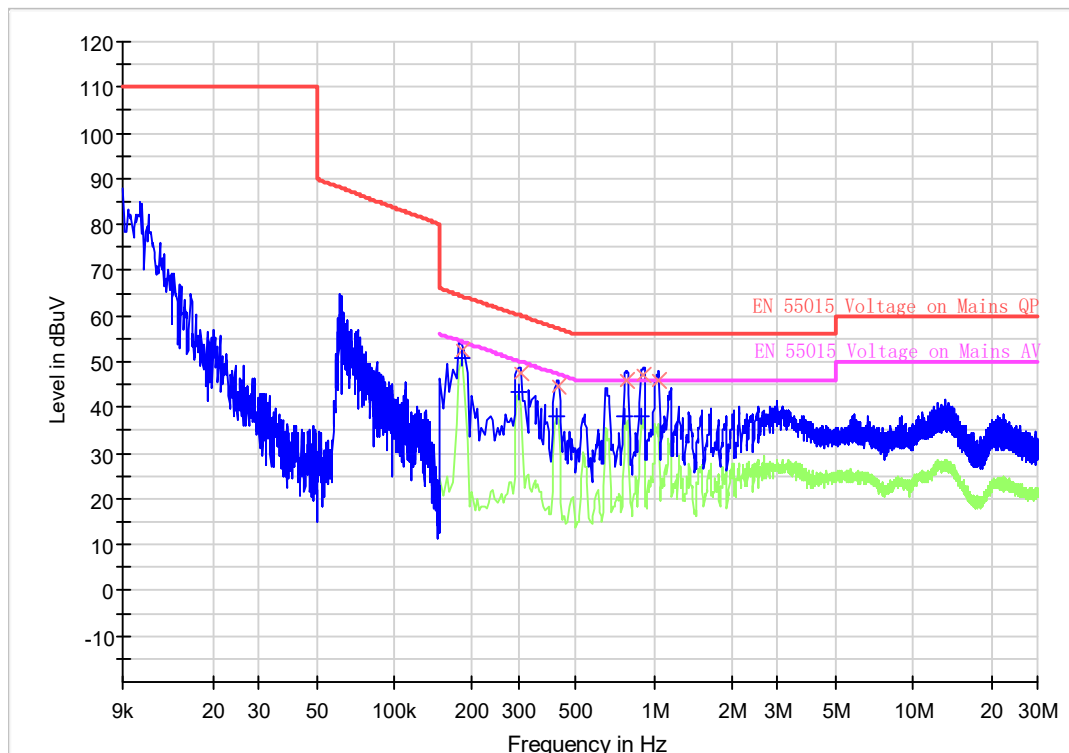
## EUT Information

EUT Name:	LED Floodlight
Model:	TG-201LED
Client:	Ningbo King-Bridge Technology Co., Ltd.
Op Cond:	Light on, AC 230V/50Hz, T21.5, H52.3%, P103.1kPa
Operator:	Guo Chengjie
Standard:	EN 55015
Comment:	Phase N
Sample No.:	SHA-525505-1

## Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup:	Voltage with 2-Line-LISN
Receiver:	[ESR 3]
Level Unit:	dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB





## Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.181500	---	50.96	54.42	3.46	1000.0	9.000	N	19.5
0.181500	52.49	---	64.42	11.93	1000.0	9.000	N	19.5
0.303000	---	43.21	50.16	6.95	1000.0	9.000	N	19.5
0.307500	47.39	---	60.04	12.65	1000.0	9.000	N	19.5
0.420000	---	38.09	47.45	9.36	1000.0	9.000	N	19.5
0.429000	44.65	---	57.27	12.62	1000.0	9.000	N	19.5
0.775500	---	37.92	46.00	8.08	1000.0	9.000	N	19.5
0.789000	46.07	---	56.00	9.93	1000.0	9.000	N	19.5
0.892500	---	38.24	46.00	7.76	1000.0	9.000	N	19.5
0.915000	46.97	---	56.00	9.03	1000.0	9.000	N	19.5
1.036500	45.70	---	56.00	10.30	1000.0	9.000	N	19.5



# 9K-30MHz Conducted Disturbance Test

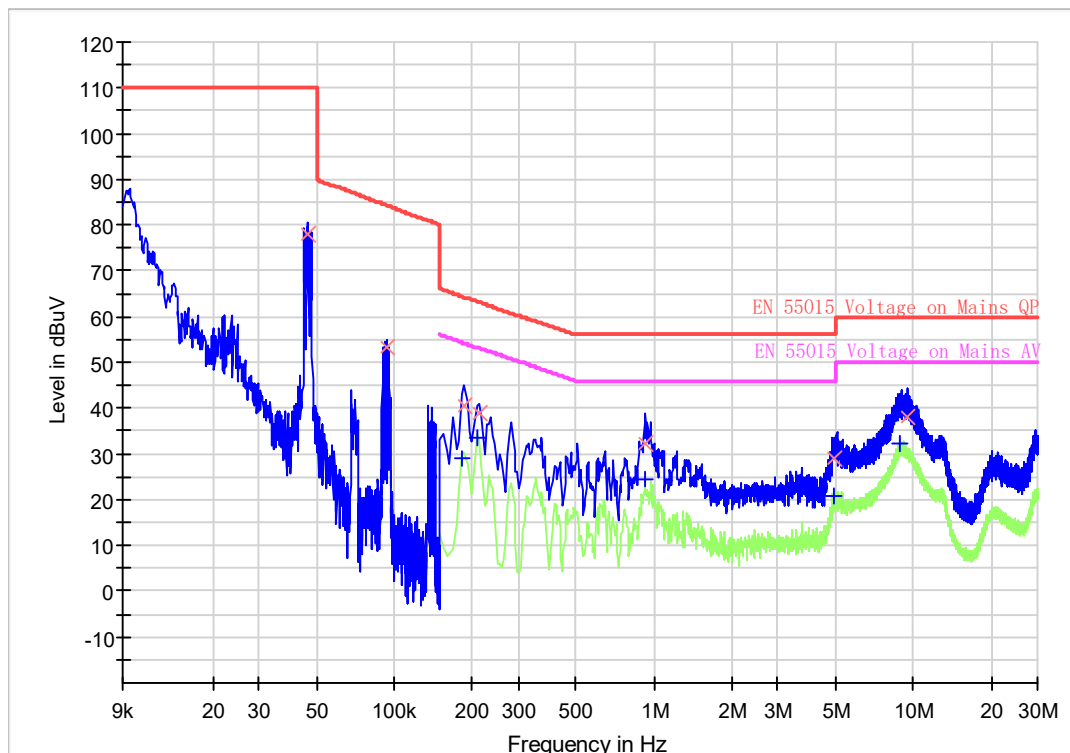
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op Cond: Light on, AC 230V/50Hz, T21.5, H52.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Standard: EN 55015  
 Comment: Phase L  
 Sample No.: SHA-525505-2

## Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup: Voltage with 2-Line-LISN  
 Receiver: [ESR 3]  
 Level Unit: dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB





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## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.046400	77.93	---	110.00	32.07	1000.0	0.200	N	19.6
0.092800	53.11	---	84.37	31.26	1000.0	0.200	N	19.5
0.181500	---	29.14	54.42	25.28	1000.0	9.000	N	19.5
0.186000	40.50	---	64.21	23.71	1000.0	9.000	N	19.5
0.208500	---	33.67	53.26	19.59	1000.0	9.000	N	19.5
0.213000	38.74	---	63.09	24.35	1000.0	9.000	N	19.5
0.924000	---	24.46	46.00	21.54	1000.0	9.000	N	19.5
0.933000	32.38	---	56.00	23.62	1000.0	9.000	N	19.5
4.965000	---	20.73	46.00	25.27	1000.0	9.000	N	19.6
4.965000	29.11	---	56.00	26.89	1000.0	9.000	N	19.6
8.920500	---	32.13	50.00	17.87	1000.0	9.000	N	19.8
9.420000	38.22	---	60.00	21.78	1000.0	9.000	N	19.8

# 9K-30MHz Conducted Disturbance Test

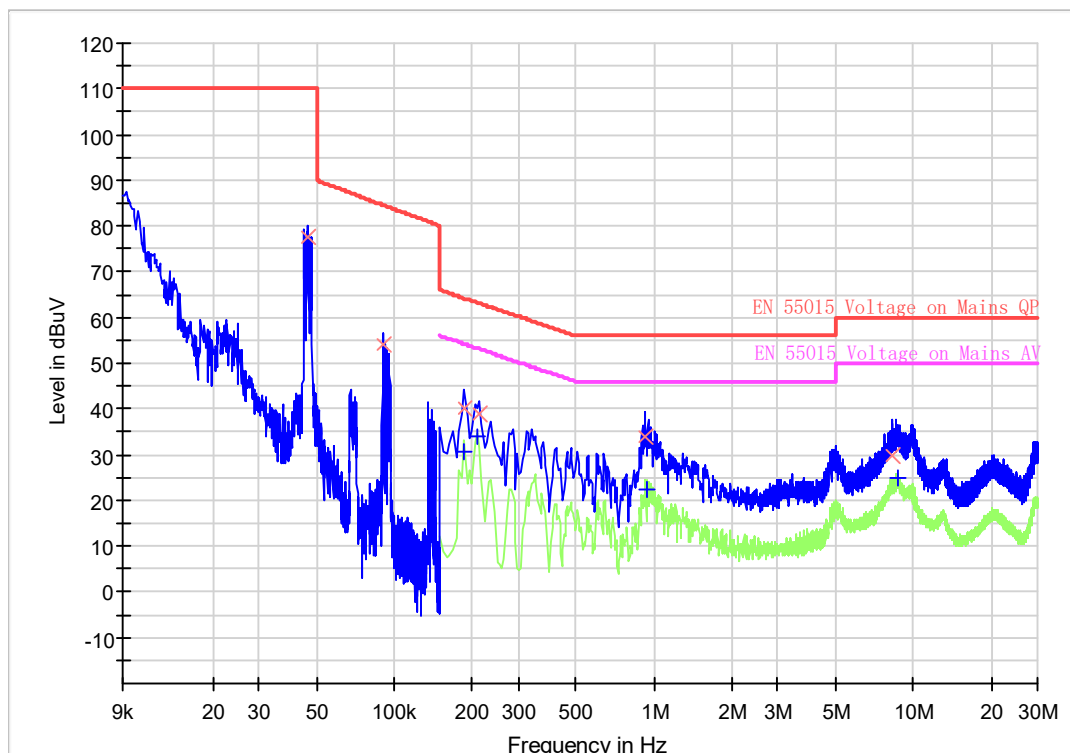
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op Cond: Light on, AC 230V/50Hz, T21.5, H52.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Standard: EN 55015  
 Comment: Phase N  
 Sample No.: SHA-525505-2

## Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup: Voltage with 2-Line-LISN  
 Receiver: [ESR 3]  
 Level Unit: dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB



## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.046400	77.66	---	110.00	32.34	1000.0	0.200	L1	19.5
0.090000	54.18	---	84.65	30.47	1000.0	0.200	L1	19.5
0.186000	---	30.47	54.21	23.74	1000.0	9.000	L1	19.5
0.186000	40.32	---	64.21	23.89	1000.0	9.000	L1	19.5
0.208500	---	34.14	53.26	19.12	1000.0	9.000	L1	19.5
0.213000	38.87	---	63.09	24.22	1000.0	9.000	L1	19.5
0.928500	33.96	---	56.00	22.04	1000.0	9.000	L1	19.5
0.946500	---	22.47	46.00	23.53	1000.0	9.000	L1	19.5
8.272500	29.83	---	60.00	30.17	1000.0	9.000	L1	19.7
8.736000	---	24.68	50.00	25.32	1000.0	9.000	L1	19.7



Test Setup

### 2.1.8 Test Location

This test was carried out in shielded room Z119.



**2.2 Radiated Disturbance (9KHz to 30MHz)**

**2.2.1 Specification Reference**

EN 55015:2013/A1:2015, Clause 4.4.1

**2.2.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.2.3 Date of Test**

10/19/2020

**2.2.4 Test Method**

The magnetic component shall be measured by means of a loop antenna. The lighting equipment shall be placed in the center of the antenna.  
 The induced current in the loop antenna is measured by means of a current probe and the CISPR measuring receiver. By means of a coaxial switch, the three field directions can be measured in sequence.

**2.2.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.2.6 Specification Limits**

Radiated disturbance limits in the frequency range 9kHz to 30MHz			
Frequency range	Limits dB(μA) for loop diameter		
	2 m	3 m	4 m
9kHz to 70kHz	88	81	75
70kHz to 150kHz	88 to 58	81 to 51	75 to 45
150kHz to 3.0MHz	58 to 22	51 to 15	45 to 9
3.0MHz to 30MHz	22	15 to 16	9 to 12

**2.2.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.  
 Performance assessment of the EUT made during this test: Pass.  
 Detailed results are shown below.

# 9K-30MHz Radiated Disturbance Test

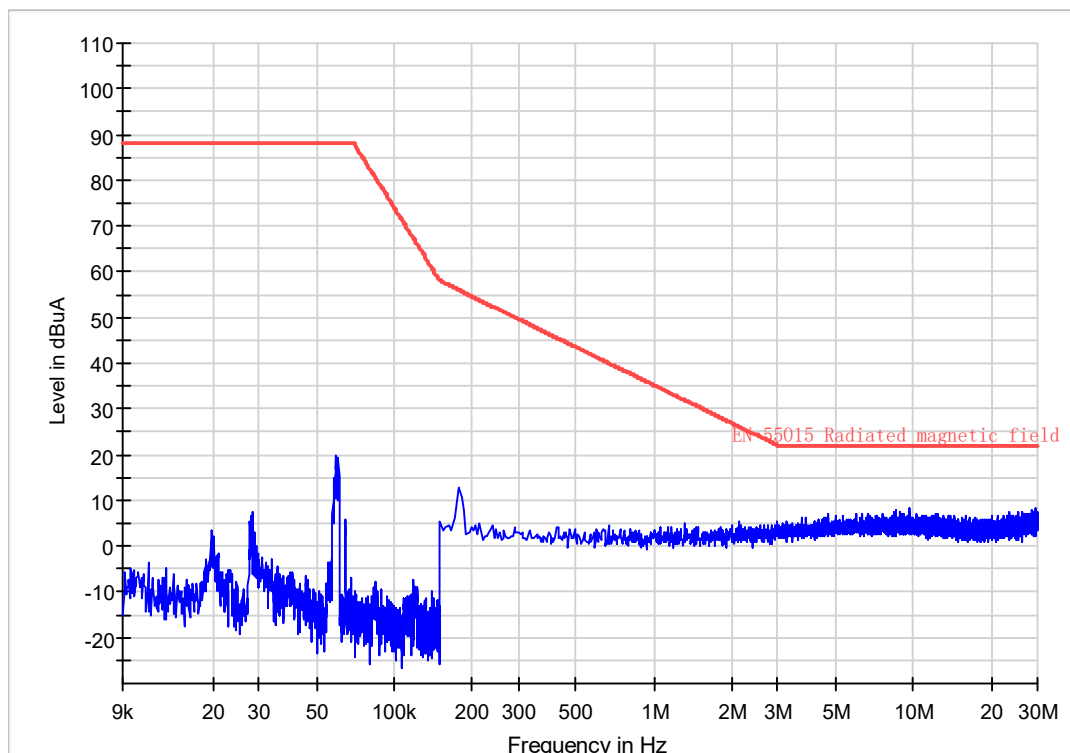
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: X  
 Sample No.: SHA-525505-1

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB



# 9K-30MHz Radiated Disturbance Test

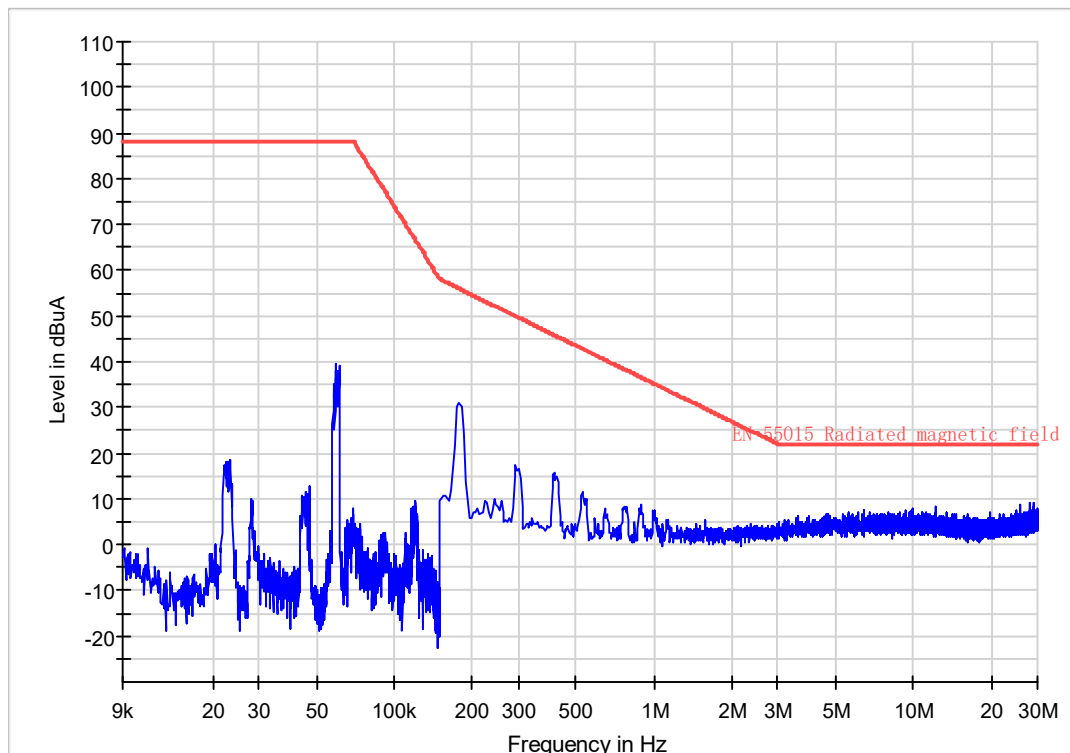
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Y  
 Sample No.: SHA-525505-1

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB



# 9K-30MHz Radiated Disturbance Test

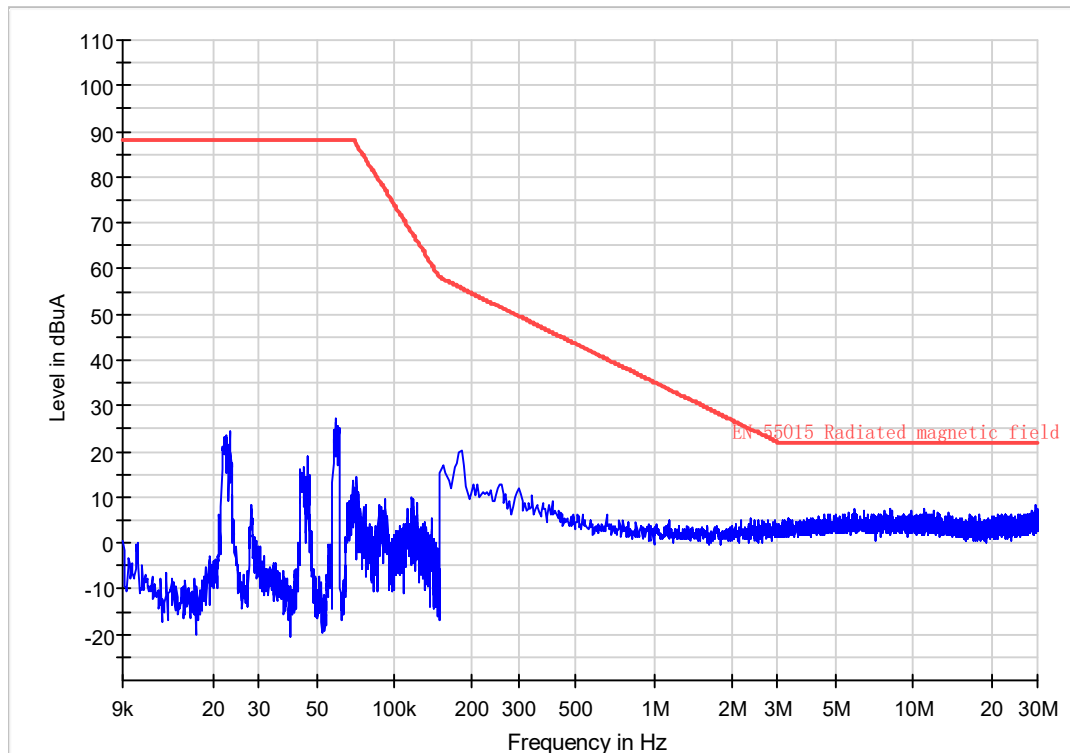
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Z  
 Sample No.: SHA-525505-1

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB





# 9K-30MHz Radiated Disturbance Test

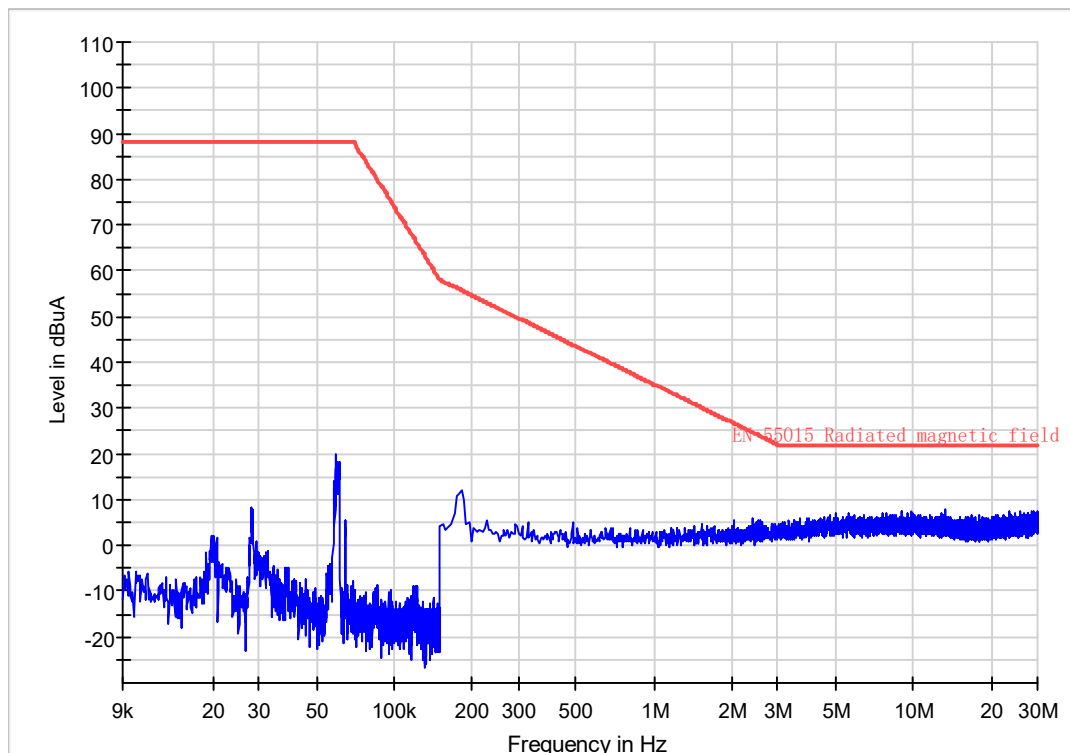
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: X  
 Sample No.: SHA-525505-2

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB





# 9K-30MHz Radiated Disturbance Test

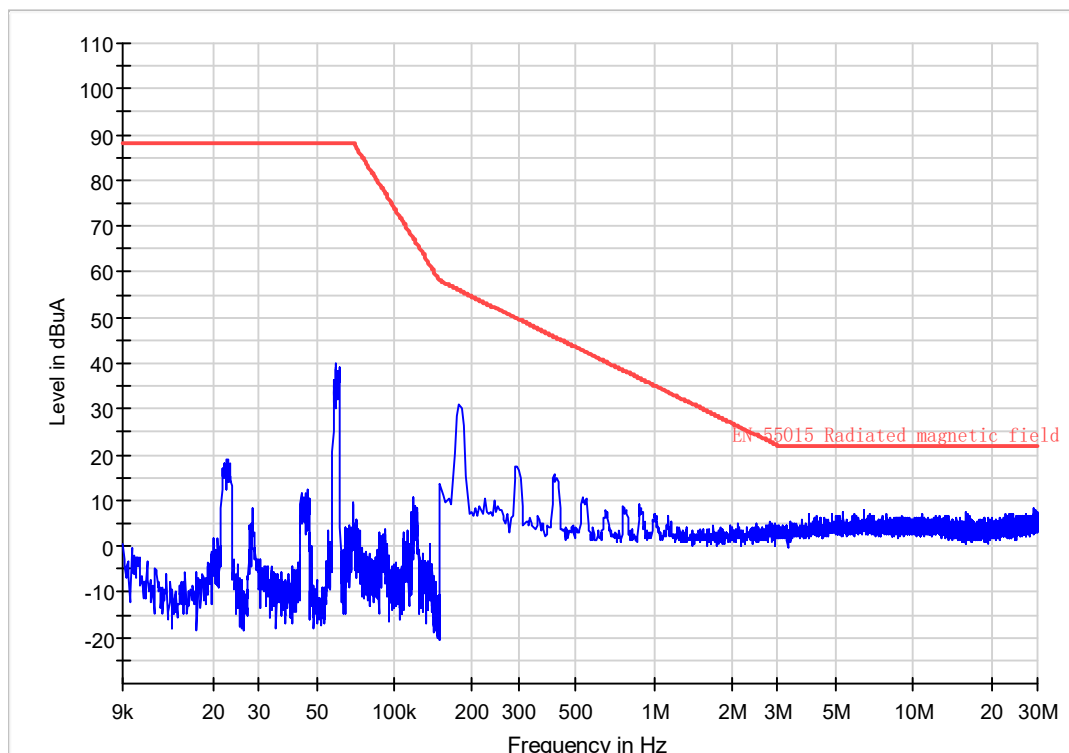
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Y  
 Sample No.: SHA-525505-2

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB



# 9K-30MHz Radiated Disturbance Test

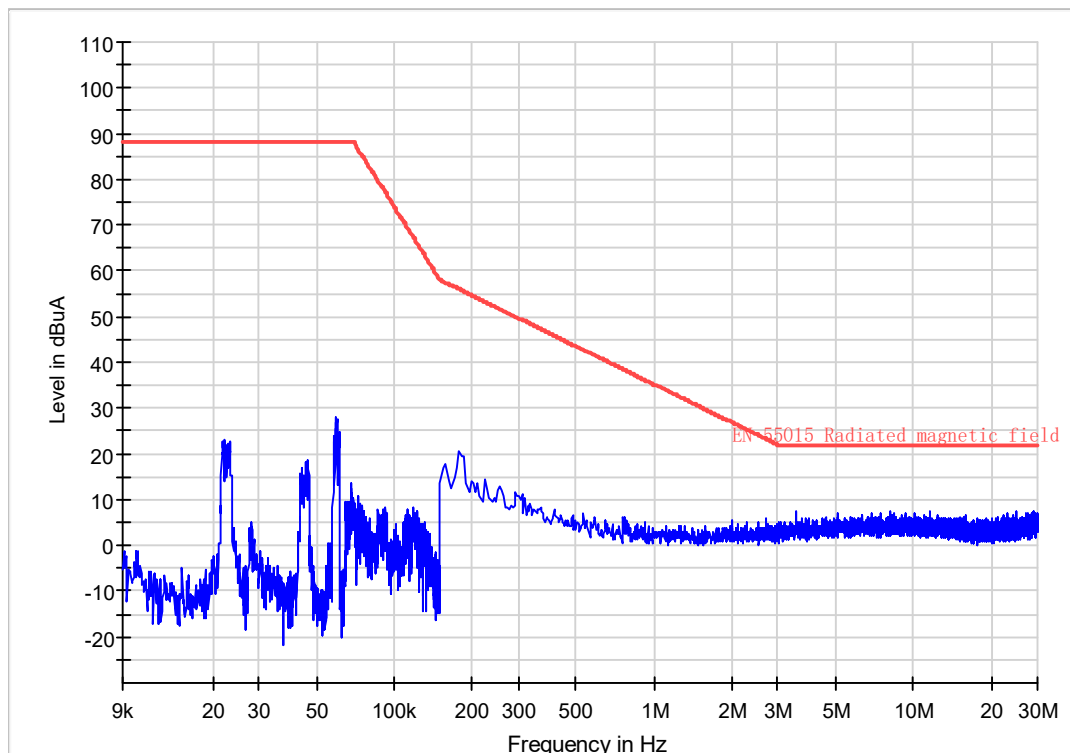
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Z  
 Sample No.: SHA-525505-2

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB





**Test Setup**

**2.2.8 Test Location**

This test was carried out in shielded room Z120.



**2.3 Radiated Disturbance (30MHz to 300MHz)**

**2.3.1 Specification Reference**

EN 55015:2013/A1:2015, Clause 4.4.2

**2.3.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.3.3 Date of Test**

10/19/2020-10/20/202

**2.3.4 Test Method**

The EUT was set up in a semi-anechoic chamber on a remotely controlled turntable and placed on a non-conductive. Guidance on how to arrange the luminaire during the measurements can be found in Annex C of EN 55015:2013/A1:2015.

A prescan of the EUT emissions profile was made while varying the antenna-to-EUT azimuth and antenna-to-EUT polarization using a peak detector; measurements were taken at a 3m distance. Using the prescan list of the highest emissions detected, their bearing and associated antenna polarization, the EUT was then formally measured using a Quasi-Peak detector. The readings were maximized by adjusting the antenna height, polarization and turntable azimuth, in accordance with the specification.

**2.3.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060 mbar

**2.3.6 Specification Limits**

Radiated disturbance limits in the frequency range 30MHz to 300MHz at a measuring distance of 3 m	
Frequency range MHz	Quasi-peak limits dB(µV/m)
30 to 230	40
230 to 300	47

**2.3.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Frequency Range of Test: 30 MHz to 300MHz



# 30-300MHz Radiated Disturbance Test

## EUT Information

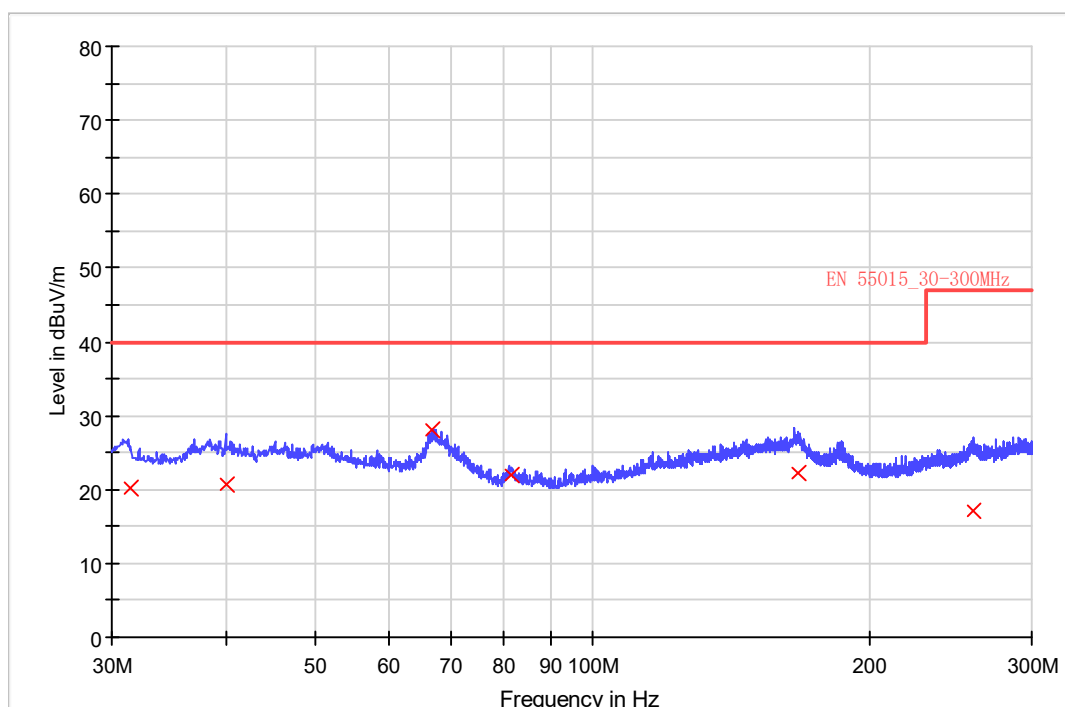
EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Lighting Technology Co., Ltd.  
 Op Cond: light on, AC230V 50Hz, 22.3, H51.5%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Horizontal  
 Sample No: SHA-525505-1

## Sweep Setup: RE\_VULB9168\_pre\_Cont\_30\_300 [EMI radiated]

Hardware Setup: RE\_VULB9168  
 Receiver: [ESR 3]  
 Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 300 MHz	50 kHz	PK+	120 kHz	0.005 s	20 dB

RE\_VULB9168\_pre\_Cont\_30\_300





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### Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
66.960000	28.2	1000.0	120.000	100.0	H	1.0	12.3	11.8	40.0
31.440000	20.1	1000.0	120.000	100.0	H	264.0	13.9	19.9	40.0
167.160000	22.3	1000.0	120.000	100.0	H	264.0	15.0	17.7	40.0
258.960000	17.1	1000.0	120.000	100.0	H	359.0	13.8	22.9	40.0
39.960000	20.6	1000.0	120.000	100.0	H	359.0	14.8	19.4	40.0
81.640000	22.1	1000.0	120.000	100.0	H	359.0	10.3	17.9	40.0

# 30-300MHz Radiated Disturbance Test

## EUT Information

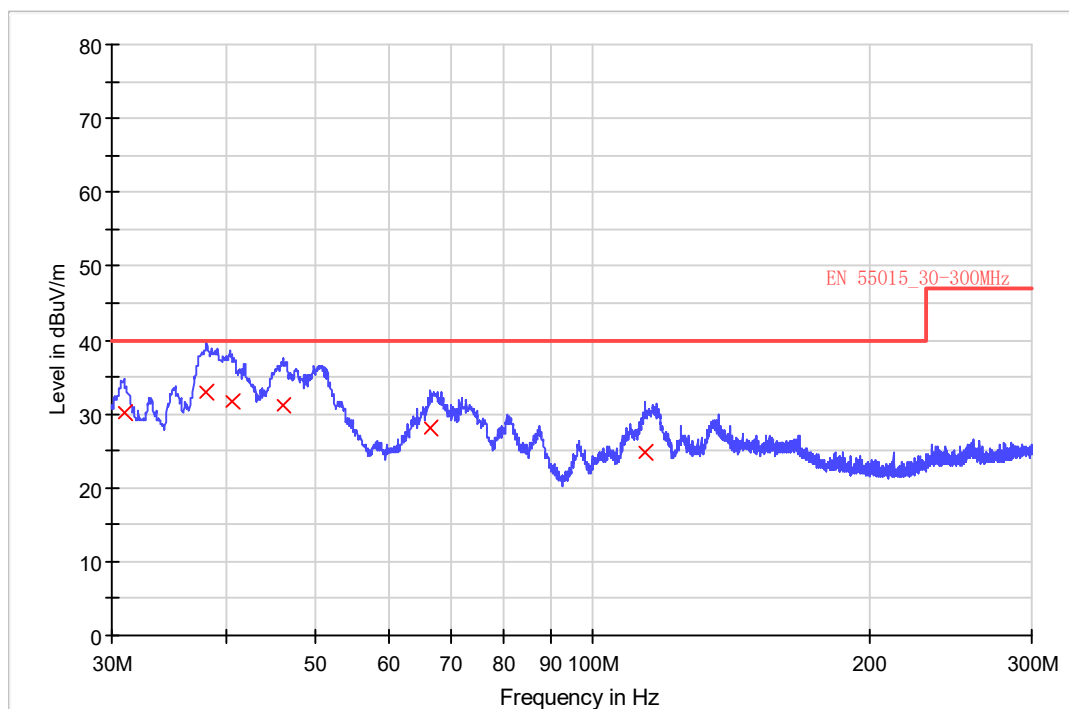
EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Lighting Technology Co., Ltd.  
 Op Cond: light on, AC230V 50Hz, 22.3, H51.5%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Vertical  
 Sample No: SHA-525505-1

## Sweep Setup: RE\_VULB9168\_pre\_Cont\_30\_300 [EMI radiated]

Hardware Setup: RE\_VULB9168  
 Receiver: [ESR 3]  
 Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamplifier
30 MHz - 300 MHz	50 kHz	PK+	120 kHz	0.005 s	20 dB

RE\_VULB9168\_pre\_Cont\_30\_300







China

### Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
30.960000	30.3	1000.0	120.000	100.0	V	1.0	13.9	9.7	40.0
38.000000	33.0	1000.0	120.000	100.3	V	359.0	14.5	7.0	40.0
40.560000	31.7	1000.0	120.000	199.8	V	52.0	14.7	8.3	40.0
46.000000	31.1	1000.0	120.000	100.3	V	1.0	14.4	8.9	40.0
66.680000	28.0	1000.0	120.000	100.0	V	61.0	12.4	12.0	40.0
114.160000	24.9	1000.0	120.000	100.0	V	359.0	12.9	15.1	40.0

# 30-300MHz Radiated Disturbance Test

## EUT Information

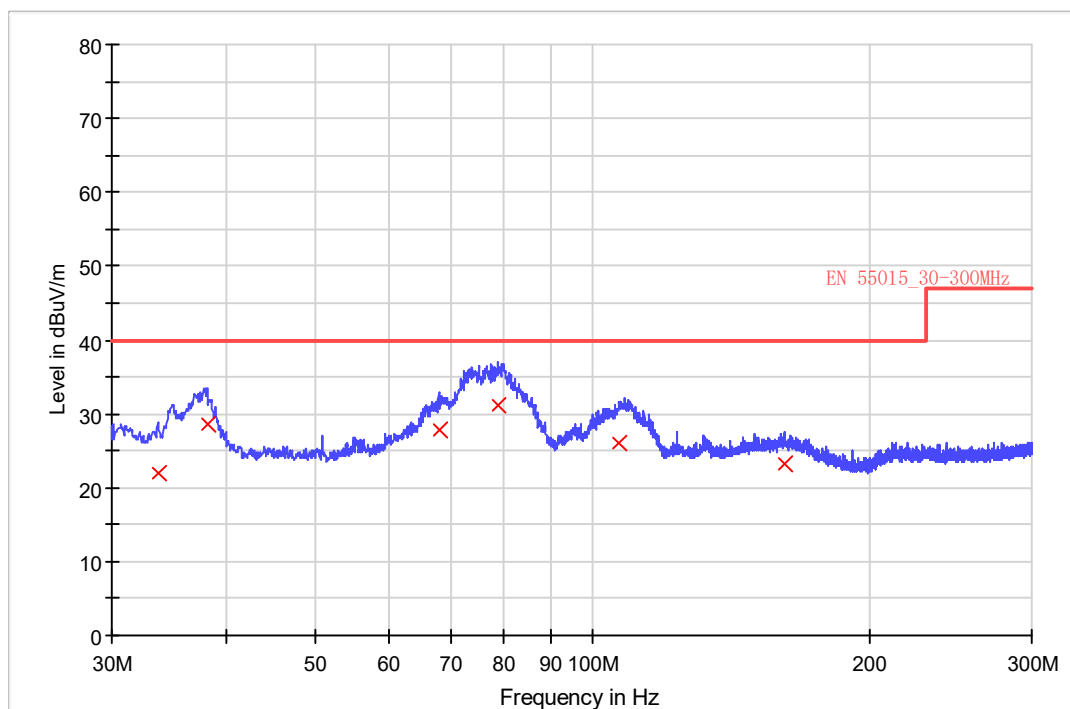
EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Lighting Technology Co., Ltd.  
 Op Cond: light on, AC230V 50Hz, 22.3, H51.5%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Horizontal  
 Sample No: SHA-525505-2

## Sweep Setup: RE\_VULB9168\_pre\_Cont\_30\_300 [EMI radiated]

Hardware Setup: RE\_VULB9168  
 Receiver: [ESR 3]  
 Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamplifier
30 MHz - 300 MHz	50 kHz	PK+	120 kHz	0.005 s	20 dB

RE\_VULB9168\_pre\_Cont\_30\_300





## Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
33.680000	22.1	1000.0	120.000	100.1	V	147.0	14.0	17.9	40.0
38.080000	28.6	1000.0	120.000	100.1	V	1.0	14.5	11.4	40.0
68.040000	27.8	1000.0	120.000	100.1	V	126.0	12.1	12.2	40.0
78.840000	31.3	1000.0	120.000	100.1	V	255.0	10.5	8.7	40.0
106.880000	26.0	1000.0	120.000	100.1	V	0.0	12.0	14.0	40.0
161.640000	23.2	1000.0	120.000	100.1	V	177.0	15.5	16.8	40.0

# 30-300MHz Radiated Disturbance Test

## EUT Information

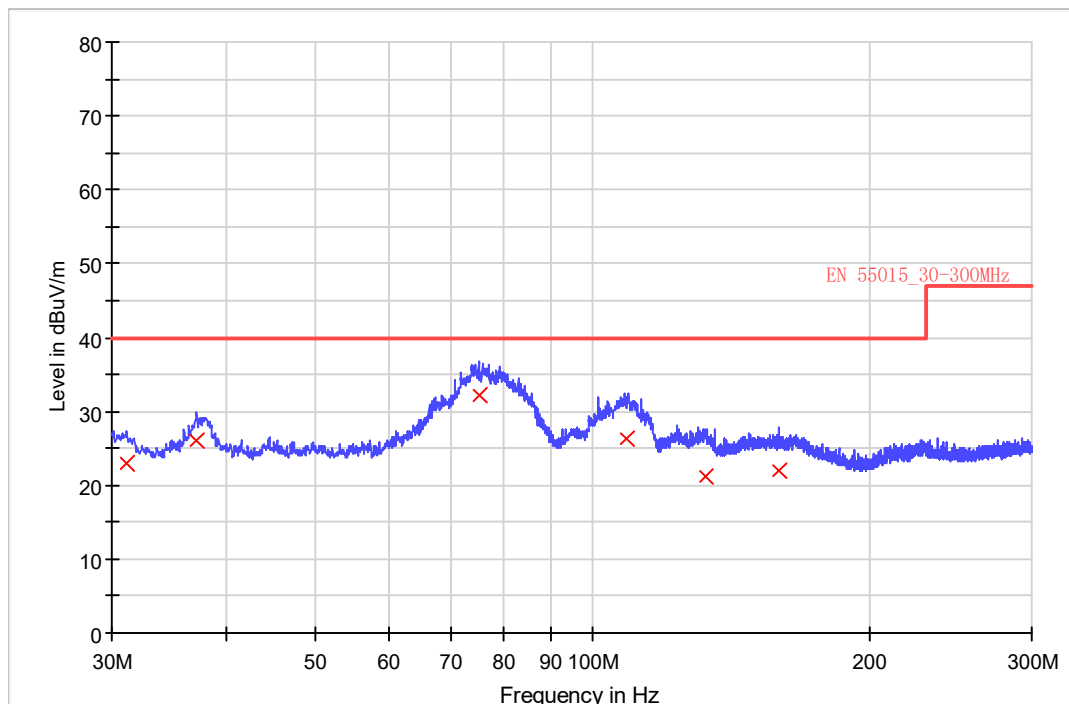
EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Lighting Technology Co., Ltd.  
 Op Cond: light on, AC230V 50Hz, 22.3, H51.5%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Vertical  
 Sample No: SHA-525505-2

## Sweep Setup: RE\_VULB9168\_pre\_Cont\_30\_300 [EMI radiated]

Hardware Setup: RE\_VULB9168  
 Receiver: [ESR 3]  
 Level Unit: dBuV/m

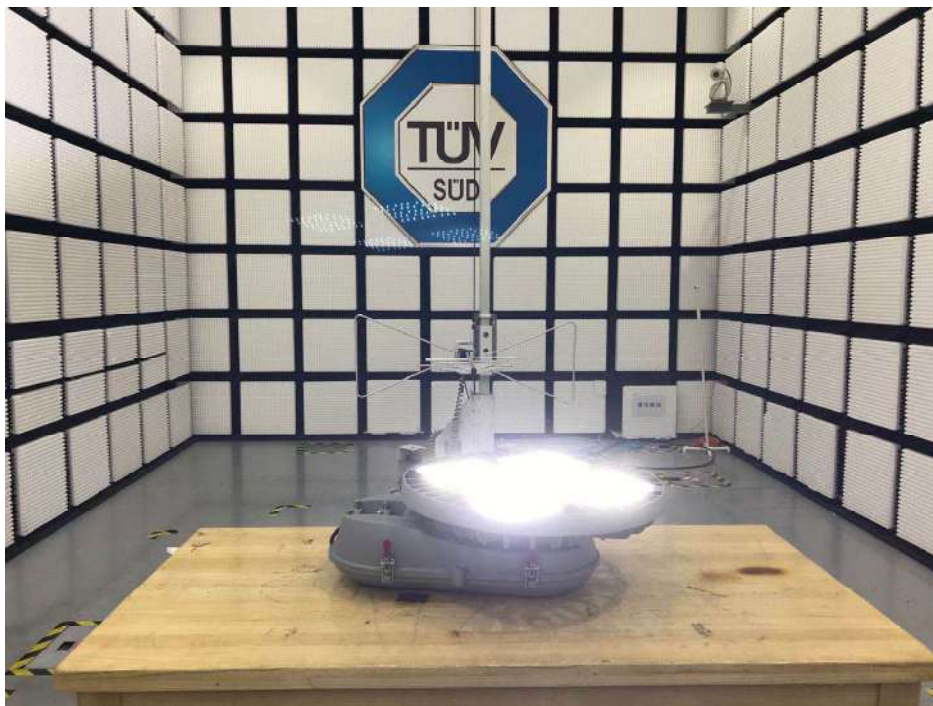
Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 300 MHz	50 kHz	PK+	120 kHz	0.005 s	20 dB

RE\_VULB9168\_pre\_Cont\_30\_300



## Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
31.160000	23.1	1000.0	120.000	100.1	V	139.0	13.9	16.9	40.0
37.160000	26.0	1000.0	120.000	100.1	V	0.0	14.4	14.0	40.0
75.160000	32.3	1000.0	120.000	100.1	V	359.0	11.0	7.7	40.0
108.680000	26.4	1000.0	120.000	100.1	V	359.0	12.2	13.6	40.0
132.640000	21.3	1000.0	120.000	100.1	V	359.0	14.4	18.7	40.0
159.080000	22.1	1000.0	120.000	100.1	V	359.0	15.7	17.9	40.0



Test Setup

### 2.3.8 Test Location

This test was carried out in 3-meter semi-anechoic chamber.

**2.4 Harmonic Current Emissions**

**2.4.1 Specification Reference**

EN 61000-3-2:2014, Clause 7

**2.4.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.4.3 Date of Test**

10/19/2020

**2.4.4 Test Method**

The EUT was placed on a non-conductive table 0.1 m above a reference ground plane. All power was connected to the EUT through a software controller AC power amplifier. The amplitude of the AC mains harmonic components was then measured.

**2.4.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.4.6 Specification Limits**

Limits for class C Equipment active input power > 25W	
Harmonic order n	Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency %
2	2
3	30λ
5	10
7	7
9	5
11 ≤ n ≤ 39 (odd harmonic only)	3
λ is the circuit power factor	

**2.4.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: *Pass*.

Detailed results are shown below.

Line Under Test: power line



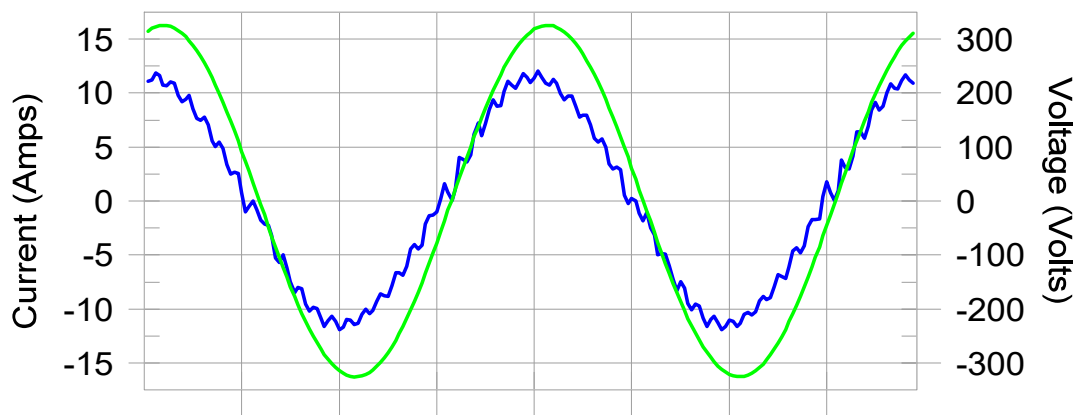
**Harmonics – Class-C per Ed. 4.0 (2014)(Run time) incl. inter-harmonics**

EUT: LED Floodlight  
 Test category: Class-C per Ed. 4.0 (2014) (European limits)  
 Test date: 10/19/2020  
 Test duration (min): 2.5  
 Comment: Light on, TG-201LED T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Lighting Technology Co., Ltd.

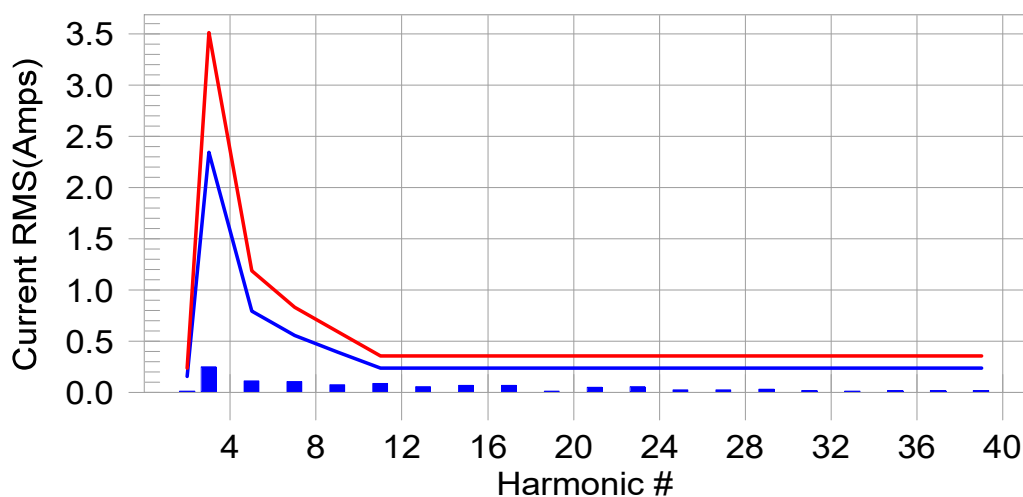
Tested by: guochengjie  
 Test Margin: 100  
 End time: 1:24:02 PM  
 Data file name: H-000240.cts\_data

Test Result: Pass      Source qualification: Normal

Current & voltage waveforms



Harmonics and Class C limit line      European Limits



**Test result: Pass      Worst harmonics H11-25.4% of 150% limit, H11-37.8% of 100% limit.**



### Current Test Result Summary (Run time)

EUT: LED Floodlight Tested by: guochengjie  
 Test category: Class-C per Ed. 4.0 (2014) (European limits) Test Margin: 100  
 Test date: 10/19/2020 Start time: 1:21:11 PM End time: 1:24:02 PM  
 Test duration (min): 2.5 Data file name: H-000240.cts\_data  
 Comment: Light on,TG-201LED T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Lighting Technology Co., Ltd.

Test Result: Pass Source qualification: Normal  
 THC(A): 0.355 I-THD(%): 4.5 POHC(A): 0.077 POHC Limit(A): 0.754

Highest parameter values during test:

V_RMS (Volts): 230.24	Frequency(Hz): 50.00
I_Peak (Amps): 12.330	I_RMS (Amps): 7.973
I_Fund (Amps): 7.949	Crest Factor: 1.547
Power (Watts): 1802.2	Power Factor: 0.982

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.017	0.159	N/A	0.023	0.238	N/A	Pass
3	0.253	2.342	10.8	0.258	3.513	7.3	Pass
4	0.005	0.000	N/A	0.007	0.000	N/A	Pass
5	0.113	0.795	14.2	0.114	1.192	9.6	Pass
6	0.003	0.000	N/A	0.004	0.000	N/A	Pass
7	0.106	0.556	19.1	0.108	0.835	12.9	Pass
8	0.003	0.000	N/A	0.004	0.000	N/A	Pass
9	0.076	0.397	19.2	0.078	0.596	13.0	Pass
10	0.002	0.000	N/A	0.003	0.000	N/A	Pass
11	0.090	0.238	37.8	0.091	0.358	25.4	Pass
12	0.003	0.000	N/A	0.004	0.000	N/A	Pass
13	0.057	0.238	23.8	0.058	0.358	16.1	Pass
14	0.003	0.000	N/A	0.004	0.000	N/A	Pass
15	0.069	0.238	29.1	0.070	0.358	19.6	Pass
16	0.004	0.000	N/A	0.004	0.000	N/A	Pass
17	0.069	0.238	29.1	0.070	0.358	19.6	Pass
18	0.003	0.000	N/A	0.004	0.000	N/A	Pass
19	0.012	0.238	N/A	0.013	0.358	N/A	Pass
20	0.004	0.000	N/A	0.004	0.000	N/A	Pass
21	0.049	0.238	20.8	0.050	0.358	14.1	Pass
22	0.004	0.000	N/A	0.004	0.000	N/A	Pass
23	0.058	0.238	24.5	0.059	0.358	16.5	Pass
24	0.004	0.000	N/A	0.004	0.000	N/A	Pass
25	0.027	0.238	N/A	0.028	0.358	N/A	Pass
26	0.004	0.000	N/A	0.004	0.000	N/A	Pass
27	0.030	0.238	N/A	0.031	0.358	N/A	Pass
28	0.003	0.000	N/A	0.004	0.000	N/A	Pass
29	0.032	0.238	N/A	0.033	0.358	N/A	Pass
30	0.004	0.000	N/A	0.004	0.000	N/A	Pass
31	0.023	0.238	N/A	0.024	0.358	N/A	Pass
32	0.003	0.000	N/A	0.004	0.000	N/A	Pass
33	0.016	0.238	N/A	0.018	0.358	N/A	Pass
34	0.003	0.000	N/A	0.004	0.000	N/A	Pass
35	0.020	0.238	N/A	0.020	0.358	N/A	Pass
36	0.003	0.000	N/A	0.003	0.000	N/A	Pass
37	0.023	0.238	N/A	0.024	0.358	N/A	Pass
38	0.003	0.000	N/A	0.004	0.000	N/A	Pass
39	0.020	0.238	N/A	0.021	0.358	N/A	Pass
40	0.003	0.000	N/A	0.004	0.000	N/A	Pass

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.



### Voltage Source Verification Data (Run time)

EUT: LED Floodlight      Tested by: guochengjie  
 Test category: Class-C per Ed. 4.0 (2014) (European limits)      Test Margin: 100  
 Test date: 10/19/2020      Start time: 1:21:11 PM      End time: 1:24:02 PM  
 Test duration (min): 2.5      Data file name: H-000240.cts\_data  
 Comment: Light on, TG-201LED T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Lighting Technology Co.,Ltd.

Test Result: Pass      Source qualification: Normal

#### Highest parameter values during test:

Voltage (Vrms):	230.24	Frequency(Hz):	50.00
I_Peak (Amps):	12.330	I_RMS (Amps):	7.973
I_Fund (Amps):	7.949	Crest Factor:	1.547
Power (Watts):	1802.2	Power Factor:	0.982

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.083	0.460	18.06	OK
3	0.377	2.072	18.21	OK
4	0.057	0.460	12.43	OK
5	0.082	0.921	8.92	OK
6	0.038	0.460	8.32	OK
7	0.053	0.691	7.63	OK
8	0.031	0.460	6.73	OK
9	0.030	0.460	6.44	OK
10	0.026	0.460	5.63	OK
11	0.031	0.230	13.47	OK
12	0.031	0.230	13.67	OK
13	0.033	0.230	14.21	OK
14	0.017	0.230	7.47	OK
15	0.043	0.230	18.89	OK
16	0.016	0.230	6.75	OK
17	0.050	0.230	21.65	OK
18	0.013	0.230	5.63	OK
19	0.011	0.230	4.89	OK
20	0.016	0.230	6.98	OK
21	0.039	0.230	17.14	OK
22	0.008	0.230	3.36	OK
23	0.052	0.230	22.71	OK
24	0.010	0.230	4.13	OK
25	0.027	0.230	11.60	OK
26	0.007	0.230	3.12	OK
27	0.027	0.230	11.60	OK
28	0.005	0.230	2.29	OK
29	0.035	0.230	15.23	OK
30	0.006	0.230	2.81	OK
31	0.031	0.230	13.30	OK
32	0.007	0.230	2.97	OK
33	0.021	0.230	9.12	OK
34	0.007	0.230	2.98	OK
35	0.028	0.230	12.26	OK
36	0.004	0.230	1.92	OK
37	0.030	0.230	13.20	OK
38	0.004	0.230	1.94	OK
39	0.027	0.230	11.73	OK
40	0.008	0.230	3.67	OK



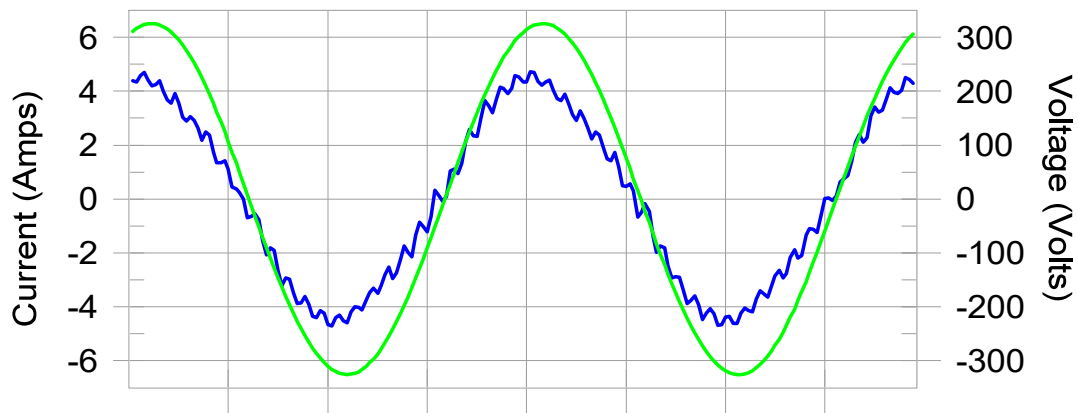
### Harmonics – Class-C per Ed. 4.0 (2014)(Run time) incl. inter-harmonics

EUT: LED Floodlight  
Test category: Class-C per Ed. 4.0 (2014) (European limits)  
Test date: 10/19/2020  
Test duration (min): 2.5  
Comment: Light on, TG-163XLLED, T23.5, H50.1%, P103.1kPa  
Customer: Ningbo King-Bridge Technology Co., Ltd.

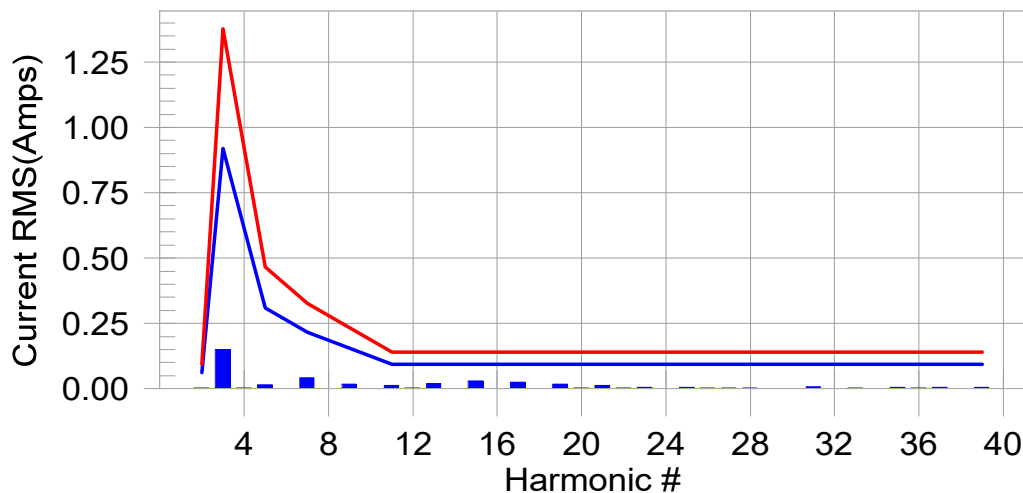
Tested by: guochengjie  
Test Margin: 100  
End time: 1:52:44 PM  
Data file name: H-000242.cts\_data

Test Result: Pass      Source qualification: Normal

#### Current & voltage waveforms



#### Harmonics and Class C limit line      European Limits



Test result: Pass      Worst harmonics H15-21.7% of 150% limit, H15-32.2% of 100% limit.



**Current Test Result Summary (Run time)**

EUT: LED Floodlight Tested by: guochengjie  
 Test category: Class-C per Ed. 4.0 (2014) (European limits) Test Margin: 100  
 Test date: 10/19/2020 Start time: 1:49:53 PM End time: 1:52:44 PM  
 Test duration (min): 2.5 Data file name: H-000242.cts\_data  
 Comment: Light on, TG-163XLLED, T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Technology Co., Ltd.

Test Result: Pass Source qualification: Normal  
 THC(A): 0.168 I-THD(%): 5.4 POHC(A): 0.000 POHC Limit(A): 0.294

Highest parameter values during test:

V_RMS (Volts): 230.27	Frequency(Hz): 50.00
I_Peak (Amps): 4.835	I_RMS (Amps): 3.117
I_Fund (Amps): 3.104	Crest Factor: 1.555
Power (Watts): 707.5	Power Factor: 0.986

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	0.062	N/A	0.003	0.093	N/A	Pass
3	0.151	0.918	16.5	0.153	1.377	11.1	Pass
4	0.002	0.000	N/A	0.003	0.000	N/A	Pass
5	0.017	0.310	N/A	0.018	0.466	N/A	Pass
6	0.002	0.000	N/A	0.002	0.000	N/A	Pass
7	0.043	0.217	19.9	0.044	0.326	13.5	Pass
8	0.002	0.000	N/A	0.002	0.000	N/A	Pass
9	0.017	0.155	N/A	0.018	0.233	N/A	Pass
10	0.002	0.000	N/A	0.002	0.000	N/A	Pass
11	0.013	0.093	N/A	0.013	0.140	N/A	Pass
12	0.002	0.000	N/A	0.002	0.000	N/A	Pass
13	0.019	0.093	20.5	0.019	0.140	13.9	Pass
14	0.002	0.000	N/A	0.002	0.000	N/A	Pass
15	0.030	0.093	32.2	0.030	0.140	21.7	Pass
16	0.002	0.000	N/A	0.002	0.000	N/A	Pass
17	0.025	0.093	26.5	0.025	0.140	18.0	Pass
18	0.002	0.000	N/A	0.002	0.000	N/A	Pass
19	0.019	0.093	20.1	0.019	0.140	13.6	Pass
20	0.002	0.000	N/A	0.002	0.000	N/A	Pass
21	0.013	0.093	N/A	0.013	0.140	N/A	Pass
22	0.002	0.000	N/A	0.002	0.000	N/A	Pass
23	0.005	0.093	N/A	0.006	0.140	N/A	Pass
24	0.002	0.000	N/A	0.002	0.000	N/A	Pass
25	0.006	0.093	N/A	0.007	0.140	N/A	Pass
26	0.002	0.000	N/A	0.003	0.000	N/A	Pass
27	0.003	0.093	N/A	0.004	0.140	N/A	Pass
28	0.002	0.000	N/A	0.002	0.000	N/A	Pass
29	0.002	0.093	N/A	0.002	0.140	N/A	Pass
30	0.002	0.000	N/A	0.002	0.000	N/A	Pass
31	0.008	0.093	N/A	0.009	0.140	N/A	Pass
32	0.002	0.000	N/A	0.002	0.000	N/A	Pass
33	0.003	0.093	N/A	0.004	0.140	N/A	Pass
34	0.002	0.000	N/A	0.002	0.000	N/A	Pass
35	0.007	0.093	N/A	0.007	0.140	N/A	Pass
36	0.002	0.000	N/A	0.003	0.000	N/A	Pass
37	0.006	0.093	N/A	0.007	0.140	N/A	Pass
38	0.002	0.000	N/A	0.002	0.000	N/A	Pass
39	0.005	0.093	N/A	0.005	0.140	N/A	Pass
40	0.002	0.000	N/A	0.002	0.000	N/A	Pass

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

### Voltage Source Verification Data (Run time)

**EUT: LED Floodlight** Tested by: guochengjie  
**Test category: Class-C per Ed. 4.0 (2014) (European limits)** Test Margin: 100  
**Test date: 10/19/2020** Start time: 1:49:53 PM End time: 1:52:44 PM  
**Test duration (min): 2.5** Data file name: H-000242.cts\_data  
**Comment: Light on, TG-163XLLED, T23.5, H50.1%, P103.1kPa**  
**Customer: Ningbo King-Bridge Technology Co., Ltd.**

Test Result: Pass Source qualification: Normal

#### Highest parameter values during test:

Voltage (Vrms):	230.27	Frequency(Hz):	50.00
I_Peak (Amps):	4.835	I_RMS (Amps):	3.117
I_Fund (Amps):	3.104	Crest Factor:	1.555
Power (Watts):	707.5	Power Factor:	0.986

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.086	0.460	18.63	OK
3	0.425	2.072	20.52	OK
4	0.055	0.461	11.84	OK
5	0.052	0.921	5.65	OK
6	0.022	0.460	4.88	OK
7	0.030	0.691	4.40	OK
8	0.022	0.461	4.75	OK
9	0.018	0.460	3.87	OK
10	0.019	0.460	4.03	OK
11	0.015	0.230	6.64	OK
12	0.015	0.230	6.58	OK
13	0.017	0.230	7.38	OK
14	0.010	0.230	4.23	OK
15	0.019	0.230	8.37	OK
16	0.011	0.230	4.69	OK
17	0.019	0.230	8.13	OK
18	0.008	0.230	3.52	OK
19	0.016	0.230	7.08	OK
20	0.012	0.230	5.26	OK
21	0.014	0.230	6.27	OK
22	0.005	0.230	2.17	OK
23	0.012	0.230	5.25	OK
24	0.005	0.230	2.31	OK
25	0.010	0.230	4.40	OK
26	0.004	0.230	1.86	OK
27	0.008	0.230	3.53	OK
28	0.005	0.230	2.11	OK
29	0.008	0.230	3.41	OK
30	0.005	0.230	1.97	OK
31	0.013	0.230	5.74	OK
32	0.005	0.230	2.22	OK
33	0.007	0.230	3.13	OK
34	0.005	0.230	1.98	OK
35	0.009	0.230	3.90	OK
36	0.005	0.230	2.03	OK
37	0.011	0.230	4.83	OK
38	0.004	0.230	1.64	OK
39	0.010	0.230	4.32	OK
40	0.006	0.230	2.71	OK



**Test Setup**

#### **2.4.8 Test Location**

This test was carried out in harmonic current emission and flicker test area.

## 2.5 Flicker

### 2.5.1 Specification Reference

EN 61000-3-3:2013, Clause 6

### 2.5.2 Equipment Under Test

TG-201LED and TG-163XLLED

### 2.5.3 Date of Test

10/19/2020

### 2.5.4 Test Method

For equipment not mentioned in annex A of EN 6100-3-3:2013, controls or automatic programs should be set to produce the most unfavourable sequence of voltage change, using only those combinations of controls and programmes which are mentioned by the manufacturer in the instruction manual, or are otherwise likely to be used

### 2.5.5 Environmental Conditions

Ambient Temperature	20-25°C
Relative Humidity	40-60%
Atmospheric Pressure	1010-1060mbar

### 2.5.6 Specification Limits

The value of Pst shall not be greater than 1.0

The value of Plt shall not be greater than 0.65

Tmax, the accumulated time value of d(t) with a deviation exceeding 3.3% during a single voltage change at the EUT terminals, shall not exceed 500ms

The maximum relative steady-state voltage change, dc, shall not exceed 3.3%

The maximum relative voltage change dmax, shall not exceed

- a) 4% without additional conditions
- b) 6% for equipment which is:
  - Switched manually, or
  - Switched automatically more frequently than twice per day, and also has either a delayed start, or manual restart, after a power supply interruption
- c) 7% for equipment which is:
  - Attended whilst in use, or
  - Switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart or manual restart, after a power supply interruption

### 2.5.7 Test Results

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: *Pass*.

Detailed results are shown below.



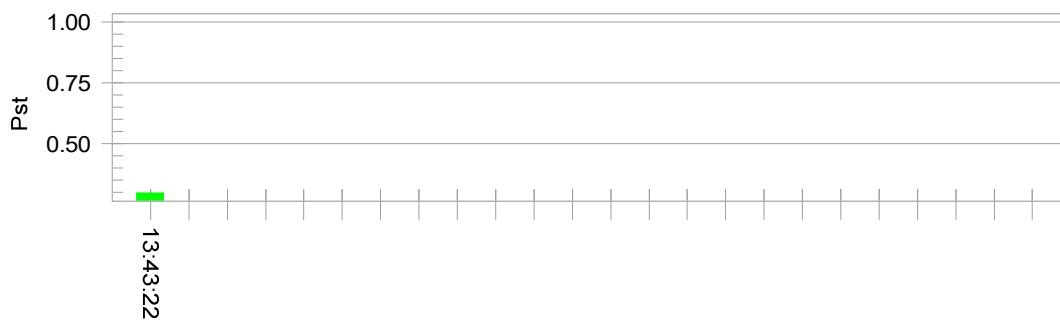
**Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)**

EUT: LED Floodlight  
 Test category: dt,dmax,dc and Pst (European limits)  
 Test date: 10/19/2020 Start time: 1:32:52 PM  
 Test duration (min): 10 Data file name: F-000241.cts\_data  
 Comment: Light on, TG-201LED, T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Technology Co., Ltd.

Tested by: guochengjie  
 Test Margin: 100  
 End time: 1:43:23 PM

Test Result: Pass Status: Test Completed

**Pst and limit line European Limits**



**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	227.25		
Highest dt (%):	-0.94	Test limit (%):	N/A N/A
T-max (mS):	0	Test limit (mS):	500.0 Pass
Highest dc (%):	-1.28	Test limit (%):	3.30 Pass
Highest dmax (%):	1.33	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.299	Test limit:	1.000 Pass



**Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)**

EUT: LED Floodlight  
 Test category: dt,dmax,dc and Pst (European limits)  
 Test date: 10/19/2020 Start time: 1:57:50 PM  
 Test duration (min): 10 Data file name: F-000243.cts\_data  
 Comment: Light on, TG-201LED, T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Technology Co., Ltd.

Tested by: guochengjie  
 Test Margin: 100  
 End time: 2:08:21 PM

Test Result: Pass Status: Test Completed

**Pst<sub>t</sub> and limit line European Limits**



**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	228.96		
Highest dt (%):	0.56	Test limit (%):	N/A N/A
T-max (mS):	0	Test limit (mS):	500.0 Pass
Highest dc (%):	-0.51	Test limit (%):	3.30 Pass
Highest dmax (%):	0.55	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.220	Test limit:	1.000 Pass





**Test setup**

### **2.5.8 Test Location**

This test was carried out in harmonic current emission and flicker test area.



**2.6 Electrostatic discharge immunity test**

**2.6.1 Specification Reference**

EN 61547:2009, Clause 5.2

**2.6.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.6.3 Date of Test**

10/20/2020

**2.6.4 Test Method**

The equipment under test including associated cabling was configured on but insulated from, using a 0.5mm isolator, a horizontal coupling plane fitted to the top of a 0.8m non-conductive table for table-top equipment; and on a 0.1m insulated support for floor standing equipment; above a ground reference plane all within a test laboratory.

Using the air discharge method for non-metallic parts, contact discharge method for metallic parts with both vertical and horizontal couple plane discharge methods for the sides of the equipment under test, the required electrostatic discharge voltage levels in both voltage polarities were applied at the detailed pulse repartition rate.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.6.5 Environmental Conditions**

Ambient Temperature 21.6°C  
 Relative Humidity 41.7%  
 Atmospheric Pressure 1027.0mbar

**2.6.6 Specification Limits**

Required Test Levels				Performance Criteria
Discharge type	Discharge Level (kV)		Number of discharges per location (each polarity)	
	Positive	Negative		
Air – Direct	2, 4 and 8	2, 4 and 8	<10>	B
Contact – Direct	2 and 4	2 and 4	<10>	B
Contact – Indirect	2 and 4	2 and 4	<10>	B

**2.6.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

ID	Test Point	Discharge	Results									
			2kV		4kV		6kV		8kV		15kV	
			+	-	+	-	+	-	+	-	+	-
A	Vertical coupling plane	Contact	✓	✓	✓	✓						
B	Horizontal coupling plane	Contact	✓	✓	✓	✓						
C	screw	Contact	✓	✓	✓	✓						
D	Metallic enclosure	Contact	✓	✓	✓	✓						
E	Gap	Air	✓	✓	✓	✓			✓	✓		

**Note:**

✓	The EUTs performance was not impacted when the ESD pulse was applied.
✓*	No discharge occurred at this point when the ESD pulse was applied.
Ox	Observation number A, B, ...etc.



**Test Setup**

**2.6.8 Test Location**

This test was carried out in shielded room Z118.



**2.7 Radiated, radio-frequency, electromagnetic field immunity test**

**2.7.1 Specification Reference**

EN 61547:2009, Clause 5.3

**2.7.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.7.3 Date of Test**

10/20/2020

**2.7.4 Test Method**

The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment; with a pre-calibrated semi anechoic chamber.

All four side of the equipment under test were subjected to the required RF field strength, modulated as described, swept over the frequency range of test with the antenna positioned in both horizontal and vertical polarizations.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.7.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.7.6 Specification Limits**

Required Test Levels					Performance Criteria
Frequency Range (MHz)	Level (V/m)	Modulation	Step Size (%)	Dwell (s)	
80 to 1000	3	AM (80 %, 1 kHz, sine wave)	1	3	A
Note 1. EUT powered at one of the Nominal input voltages and frequencies					

**2.7.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Test Results for RF Electromagnetic Field 80 - 1000 MHz				
Side of the equipment under test	Antenna polarization	Test Level	Dwell Time	Result
Front	Horizontal	3 V/m	3 s	Pass PC A
Front	Vertical	3 V/m	3 s	Pass PC A
Right	Horizontal	3 V/m	3 s	Pass PC A
Right	Vertical	3 V/m	3 s	Pass PC A
Rear	Horizontal	3 V/m	3 s	Pass PC A
Rear	Vertical	3 V/m	3 s	Pass PC A
Left	Horizontal	3 V/m	3 s	Pass PC A
Left	Vertical	3 V/m	3 s	Pass PC A
Remark:				



**Test Setup**

**2.7.8 Test Location**

This test was carried out in 3m anechoic chamber.



**2.8 Electrical fast transient /burst immunity test**

**2.8.1 Specification Reference**

EN 61547:2009, Clause 5.5

**2.8.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.8.3 Date of Test**

10/20/2020

**2.8.4 Test Method**

The equipment under test including associated cabling was configured on but insulated from, using a 0.1 m isolator, a horizontal coupling plane fitted to the top of a 0.8 m non-conductive table for table-top equipment; and on a 0.1 m insulated support for floor standing equipment; above a ground reference plane all within a test laboratory.

Using a CDN for power ports, capacitive coupling clamp for signal and control ports and a 33nF coupling capacitor for earth ports, the required fast transient burst voltage levels in both voltage polarities were applied at the detailed pulse repartition rate and duration of test.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.8.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.8.6 Specification Limits**

Required Test Levels at input and output a.c. power port					Performance Criteria
Line Under Test	Level (kV)	Repetition Rate (kHz)	Test Duration	Coupling Method	
AC Power Port	± 1	5 kHz	2 min per polarity	CDN	B
Note 1. EUT powered at one of the Nominal input voltages and frequencies					

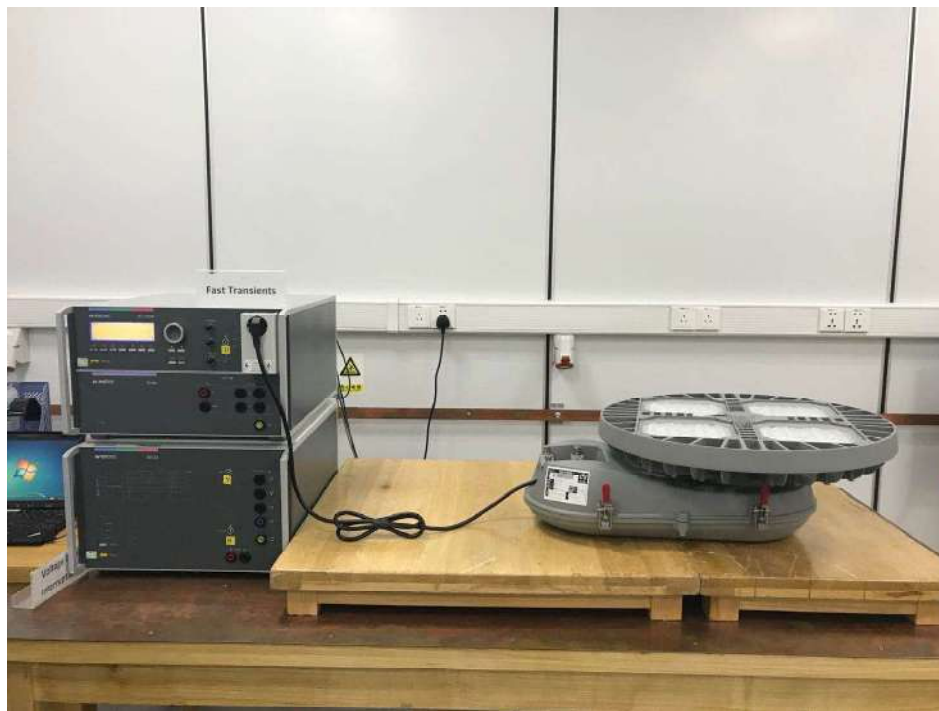
**2.8.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Test Results for Fast Transient Burst Immunity					
Line under test	Test Level (kV)	Repetition Rate	Test Duration	Coupling Method	Result
power line	± 1.0	5 kHz	2 min	CDN	Pass PC A
Remark:					



**Test Setup**

### 2.8.8 Test Location

This test was carried out in shielded room Z118.



**2.9 Immunity to conducted disturbances, induced by radio-frequency fields**

**2.9.1 Specification Reference**

EN 61547:2009, Clause 5.6

**2.9.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.9.3 Date of Test**

10/20/2020

**2.9.4 Test Method**

The equipment under test was placed on an insulating support 0,1 m above the reference ground plane.

All associated cabling was configured, on but insulated from, using a 50 mm isolator, the same horizontal coupling plane as the equipment under test.

Using CDNs, EM Clamps or current clamps as appropriate, the power ports and applicable signal and control ports were subjected to the required, pre calibrated RF injected signal strength, modulated as described, swept over the frequency range of test.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.9.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.9.6 Specification Limits**

Required Test Levels at input and output a.c. power ports						Performance Criteria
Line Under Test	Frequency Range (MHz)	Level (V)	Modulation	Step Size (%)	Dwell (s)	
AC power ports	0.15 to 80	3	AM (80 %, 1 kHz, sine wave)	1	3	A
Note Only applicable to ports interfacing with cables whose total length, according to the manufacturer's specification, may exceed 3m						

**2.9.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Test Results for Injected current						
Line under test	Test Level	Step	Dwell Time	Coupling Method	Modulation	Result
power line	3V	1%	3S	CDN	1KHZ 80%	Pass PC A
Remark:						





**Test Setup**

### **2.9.8 Test Location**

This test was carried out in shielded room Z118.



**2.10 Surge immunity test**

**2.10.1 Specification Reference**

EN 61547:2009, Clause 5.7

**2.10.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.10.3 Date of Test**

10/20/2020

**2.10.4 Test Method**

The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment above a ground reference plane all within a test laboratory.

Using CDNs for power ports and appropriate coupling methods for applicable signal and control ports, the required number of surges was applied for each surge voltage level using both positive and negative surge voltage polarities. Surges were applied at the power line frequency phase angles and repartition rates detailed.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.10.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.10.6 Specification Limits**

Characteristics	Test Levels			Performance Criteria
	Device			
	Self-ballasted lamps And semi-luminaires	Luminaires and independent auxiliaries		
		Input power		
	≤25W	>25W		
Wave- shape data	1.2/50 μs	1.2/50 μs	1.2/50 μs	C
Test levels line to line	± 0.5 kV	± 0.5 kV	± 1.0 kV	
line to ground	±1.0 kV	±1.0 kV	±2.0 kV	
Note In addition to the specified test level, all lower levels as detailed in IEC 61000-4-5 should also be satisfied.				

**2.10.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Test Results for Surge Immunity (Power Ports)							
Line Name	Coupling	Level	Polarity	Phase Angle	No of Pulses	Repetition Rate	Result
power line	Live to Neutral	-1kV	NEGATIVE	270 deg	5	60 sec	Pass PC A
power line	Live to Neutral	+1kV	POSITIVE	90 deg	5	60 sec	Pass PC A
power line	Live to Ground	-2kV	NEGATIVE	270 deg	5	60 sec	Pass PC A
power line	Live to Ground	+2kV	POSITIVE	90 deg	5	60 sec	Pass PC A
power line	Neutral to Ground	-2kV	NEGATIVE	270 deg	5	60 sec	Pass PC A
power line	Neutral to Ground	+2kV	POSITIVE	90 deg	5	60 sec	Pass PC A
Remark:							



**Test Setup**

**2.10.8 Test Location**

This test was carried out in shielded room Z118.



**2.11 Voltage dips, short interruptions and voltage variations immunity test**

**2.11.1 Specification Reference**

EN 61547:2009, Clause 5.8

**2.11.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.11.3 Date of Test**

10/20/2020

**2.11.4 Test Method**

The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment above a ground reference plane all within a test laboratory.

Using a programmable power supply the equipment under test was subjected to the detailed supply voltage dips and interruptions. The required supply phase synchronization and test repetition rate, detailed, was controlled by the programmable power supply.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.11.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.11.6 Specification Limits**

Required Test Levels			Performance Criteria
Test	Test Level	Duration	
Voltage short interruptions	0 % of Vnom	½ cycle	B
Voltage dips	70 % of Vnom	10 cycles	C
Note EUT powered at one of the Nominal input voltages and frequencies			

**2.11.7 Test Results**

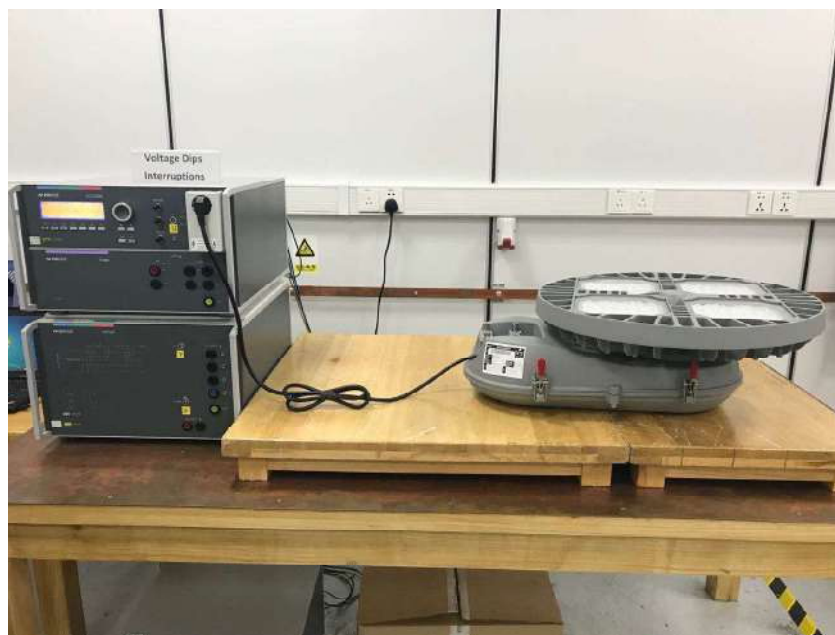
Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Test Results for Voltage Dip and Short Interruption					
Line under test	Vnom	Operating Frequency	Test Level	Duration	Result
power line	230 Vac	50/60 Hz	0% of Vnom	½ cycle	Pass PC A
power line	230 Vac	50/60 Hz	70% of Vnom	10 cycles	Pass PC B

Remark: During the test of voltage dips, the lamp flashed. After removing the interference, it can restore its original mode by itself automatically.



**Test Setup**

**2.11.8 Test Location**

This test was carried out in shielded room Z118.



### 3 Test Equipment Information

#### 3.1 General Test Equipment Used

Instrument	Manufacturer	Type No	TE No	Calibration Date	Calibration Due
Conducted Emission					
EMI test receiver	R & S	ESR3	S1503001-YQ-EMC	2020.8.4	2021.8.3
2-Line V-network	R & S	ENV216	S1503103-YQ-EMC	2020.8.4	2021.8.3
Radiated Disturbance (9kHz to 30MHz)					
EMI test receiver	R & S	ESR3	S1503101-YQ-EMC	2020.8.4	2021.8.3
Triple loop antenna	R & S	HM020	S1503115-YQ-EMC	2020.7.10	2021.7.9
Radiated Disturbance (30MHz to 300MHz)					
EMI test receiver	R & S	ESR3	S1503109-YQ-EMC	2020.8.4	2021.8.3
Trilog super broadband test antenna	SCHWARZBECK	VULB 9168	S1808296-YQ-EMC	2019.3.16	2022.3.15
3 meter semi-anechoic chamber	TDK	3m	S1503231-YQ-EMC	2018.5.11	2021.5.10
Harmonic current emission and Flicker					
Harmonic-flicker test system	California Instruments	15003IX-CTS-400-413-LF-411	S1503193-YQ-EMC	2020.7.10	2021.7.9



Instrument	Manufacturer	Type No	TE No	Calibration Date	Calibration Due
Electrostatic discharge immunity test					
ESD Simulator	HAEFELY	ONYX 16	S1905298-YQ-EMC	2020.7.10	2021.7.9
T/H record	Shanghai meteorological instrument	ZJ1-2A	S1503201-YQ-EMC	2020.8.13	2021.8.12
Horizontal Coupling Plane	TÜV Product Service	---	---	---	---
Vertical Coupling Plane	TÜV Product Service	---	---	---	---
Radiated, radio-frequency, electromagnetic field immunity test					
Signal generator	R & S	SMB 100A	S1503055-YQ-EMC	2020.8.4	2021.8.3
Amplifier	A R	1000W1000EM1	S1503076-YQ-EMC	2020.8.4	2021.8.3
Power meter	R & S	NRP2	S1503062-YQ-EMC	2020.8.4	2021.8.3
Dual directional coupler	AR	DC6280AM1	S1503077-YQ-EMC	2020.8.4	2021.8.3
High gain log-periodic antenna	R & S	HL046E	S1503083-SB-EMC	--	--
Wideband power sensor	R & S	NRP-Z91	S1503068-YQ-EMC	2020.8.4	2021.8.3
Wideband power sensor	R & S	NRP-Z91	S1503069-YQ-EMC	2020.8.4	2021.8.3
Electrical fast transient/burst immunity test					
Ultra compact simulator	EM test	UCS 500N5T	S1503171-YQ-EMC	2020.8.4	2021.8.3
Immunity to conducted disturbances, induced by radio-frequency field					
Continuous wave generator	EM test	CWS 500N2.2	S1503159-YQ-EMC	2020.8.4	2021.8.3
6dB attenuator	EM test	ATT 6/80	S1503180-SB-EMC	--	--
Coupling and decoupling network	EM test	CDN M2/M3	S1503186-YQ-EMC	2020.8.4	2021.8.3
Surge immunity test					
Ultra compact simulator	EM test	UCS 500N5T	S1503171-YQ-EMC	2020.8.4	2021.8.3
Voltage dips, short interruptions and voltage variations immunity test					
Ultra compact simulator	EM test	UCS 500N5T	S1503171-YQ-EMC	2020.8.4	2021.8.3
Motor driven AC source	EM test	MV 2616	S1503175-YQ-EMC	2020.8.4	2021.8.3



## 4 Measurement Uncertainty

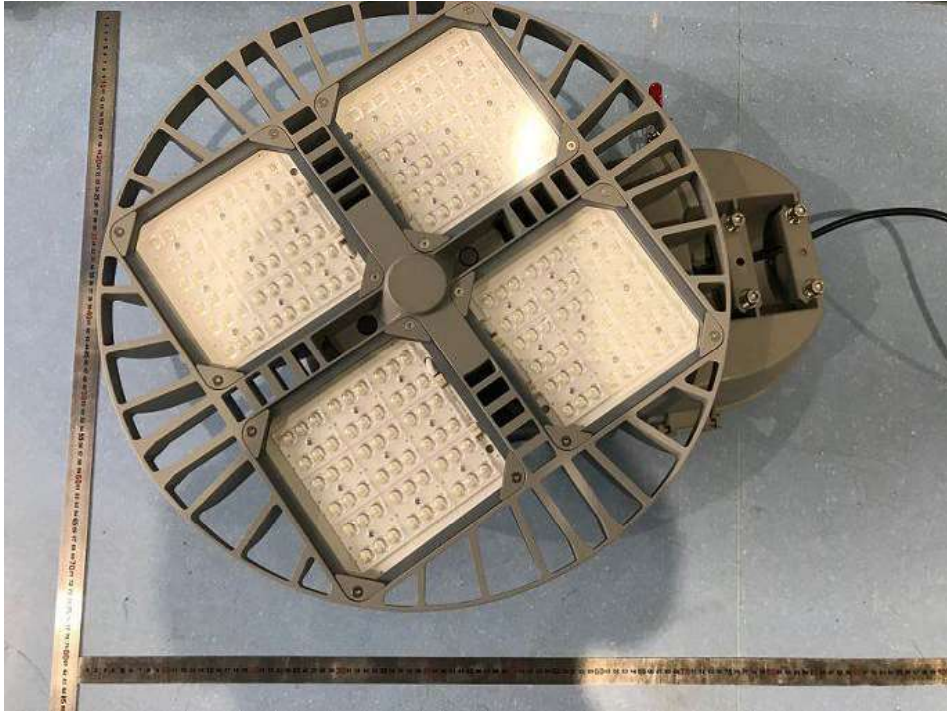
For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Conducted Disturbance at Mains Terminals	9kHz to 30MHz, $\pm 3.16$ dB
Radiated Disturbance	9kHz to 30MHz, $\pm 2.78$ dB
Radiated Disturbance	30MHz to 1GHz, $\pm 5.03$ dB (Horizontal) $\pm 5.12$ dB (Vertical)



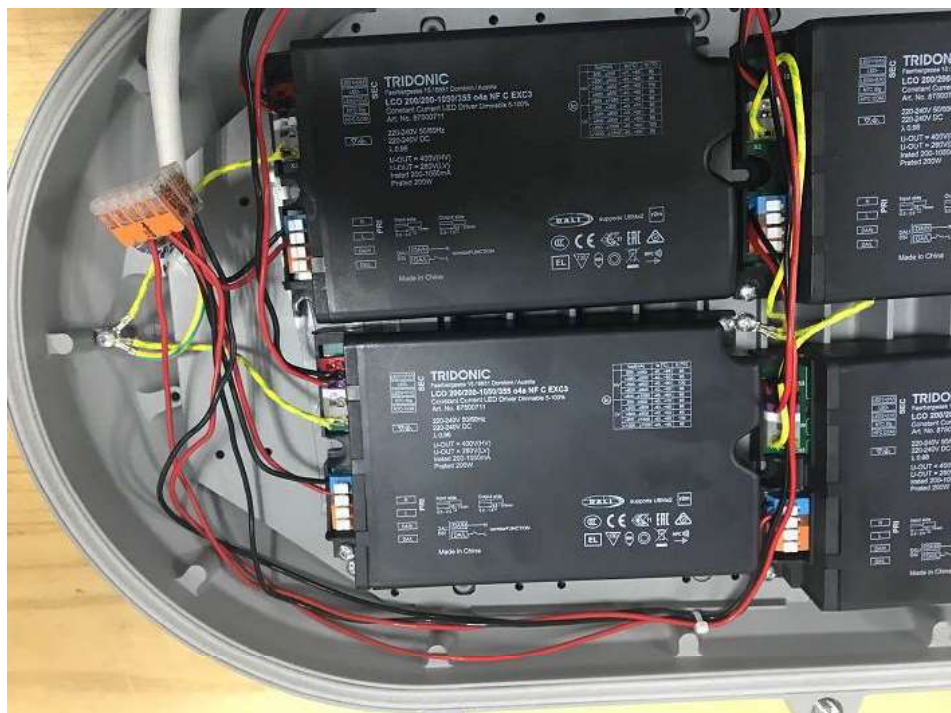
## 5 Photographs

TG-201LED



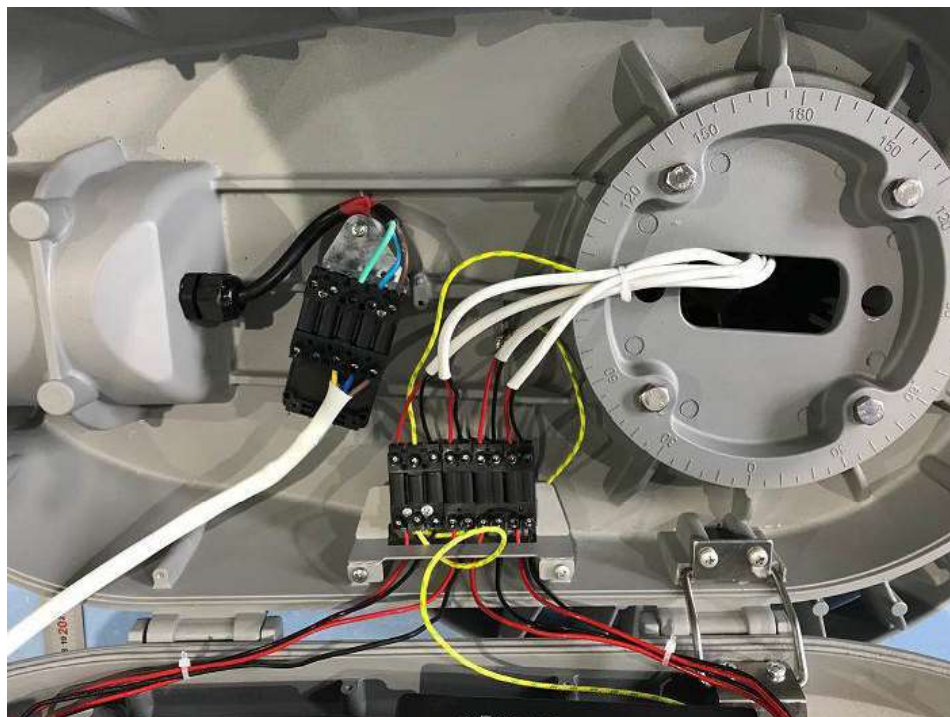






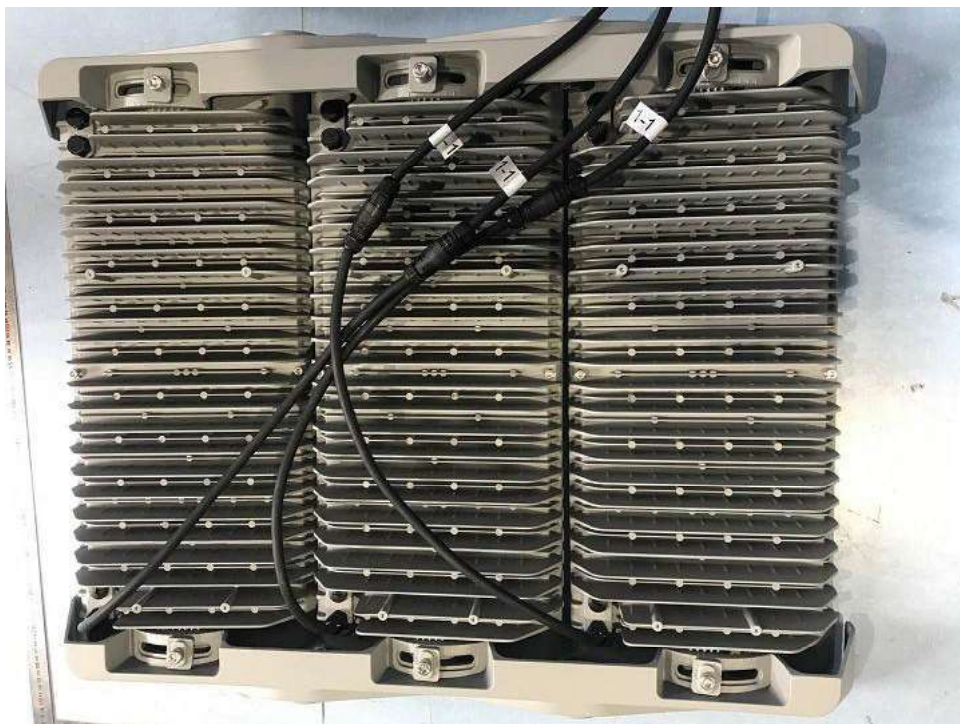


China



TG-163XLLED





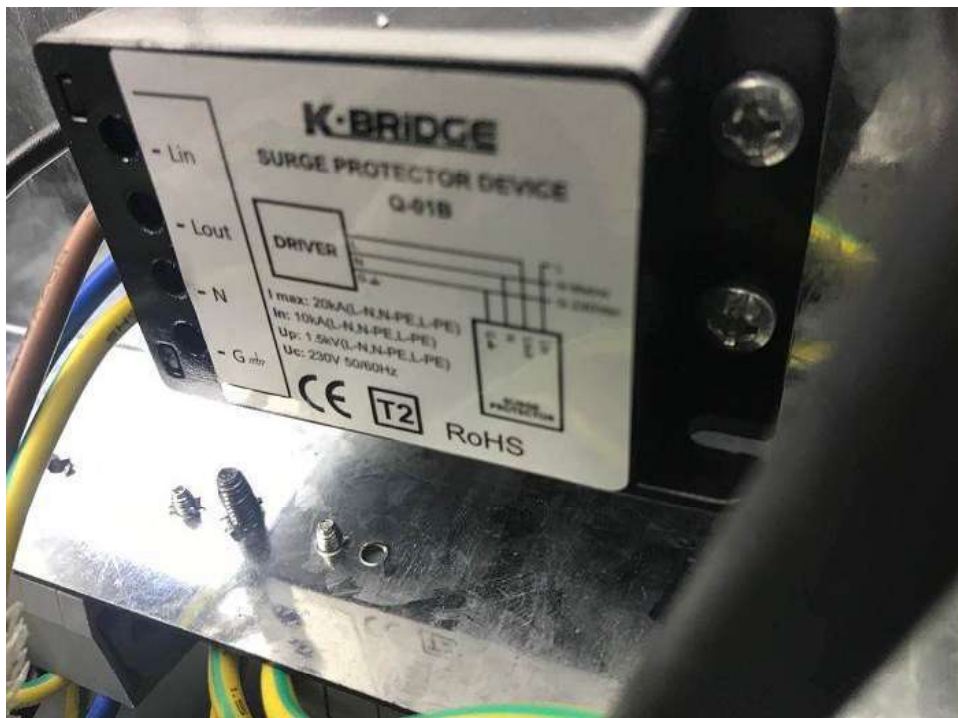






China







## 2.4 Componentes de las Luminarias

- UNE-EN 62031. Módulos LED para alumbrado general.  
Requisitos de seguridad. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.)
- UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13:  
Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.
- UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED.
- Requisitos de funcionamiento.



APL

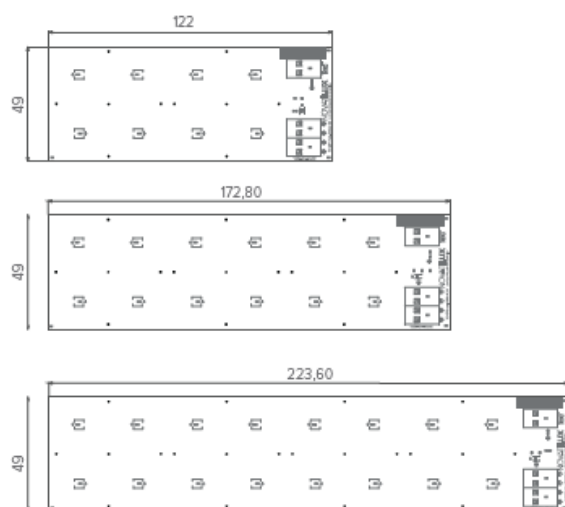
# PCB



El módulo de LED del Grupo Benito Novatilu mediante su tecnología propia ofrece un alto rendimiento lumínico con las máximas garantía de seguridad y una óptima calidad fotométrica, gracias al principio de adiciones donde cada LED dispone de su lente específica.

- MCPCB de Aluminio de Alta Transferencia Térmica en formatos (8, 12 y 16 LEDs) según Estándar Zhaga Book 15.
- Tecnología LED de Alta Eficiencia en formato 5050 con rendimiento  $>172\text{lm/W}$ .
- Control del flujo lumínico mediante lentes PMMA 2x2 de alta transparencia. Disponibilidad  $>18$  distribuciones lumínicas diferentes.
- Doble Protección de sobretensiones Transitorias.
- Incluye sensor NTC de Temperatura para la protección Térmica del LED.
- Disponible en Diferentes Temperaturas de Color (de PC Ambar a 5000K) y distintos índices de reproducción cromática IRC ( $>70$  o  $>80$ ).

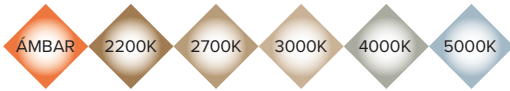
PLANO:



CONFIGURACIONES:

- APL16ZH - 48Vdc
- APL12ZH - 36Vdc
- APL8ZH - 24Vdc

## RANGO DE TEMPERATURA DE COLOR



## LAS VERSIONES DE PCB BENITO NOVATILU

REF.	Nº LEDs	I <sub>max</sub> (mA)	W <sub>max</sub> (W)	Flujo luminoso Real (T) (=85°C)	Eficiencia lm/W	Flujo luminoso Real (T) (=25°C)	Eficiencia lm/W
<APL8ZH	8	1050	25,2	3881	154	4208	167
<APL12ZH	12	1050	37,8	5821	154	6313	167
<APL16ZH	16	1050	50,4	7762	154	8417	167

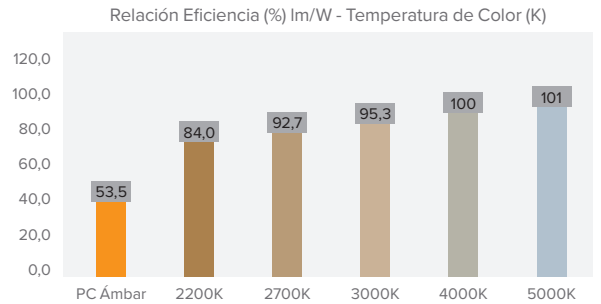
L90B10 >100.000h según TM21 (Certificado por Laboratorio ENAC).

Temperatura de Funcionamiento -35°C - + 60°C.

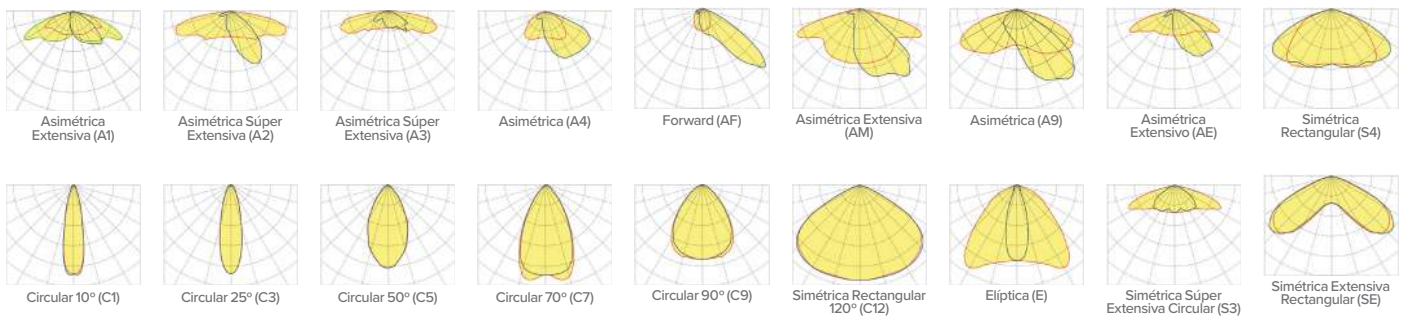
Corriente del LED = Corriente Driver /2 (I<sub>max</sub> - 525mA).

Tolerancia del flujo luminoso < +/-3%.

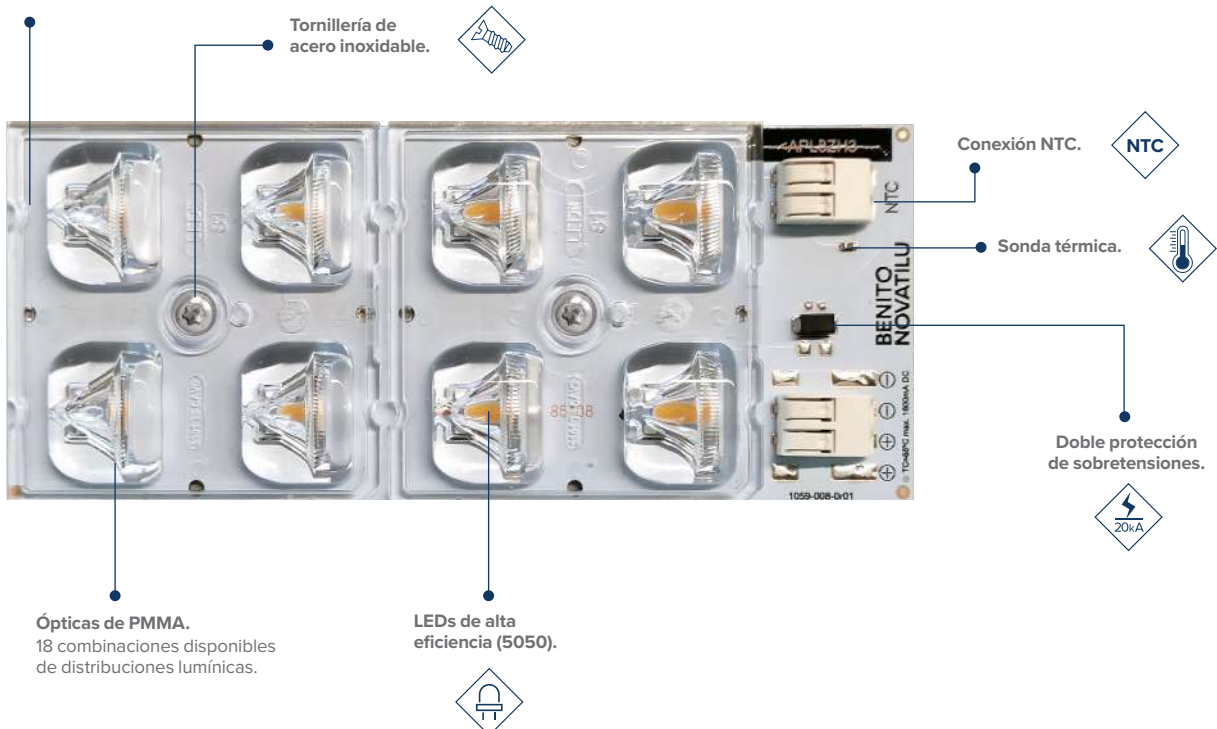
Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.



## DISTRIBUCIONES LUMÍNICAS DISPONIBLES



PCB BENITO NOVATILU de aluminio de alta transferencia térmica en 3 formatos standard Zhaga (Book15) (8, 12 y 16 LED). Consultar temperaturas de color y distribuciones lumínicas.

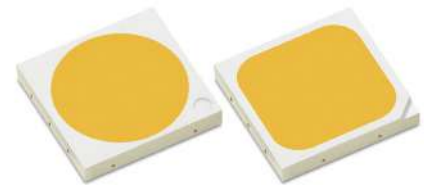


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# LUXEON 5050

High efficacy and superior robustness in a multi-die, high power package, enabling cost-effective system design

LUXEON 5050 is a multi-die, high power package that provides high luminance from a super robust package to enable cost effective, single optic and directional fixture designs. LUXEON 5050 uses an industry standard 5050 surface mount package with a small Light Emitting Surface (LES). LUXEON 5050 comes in 70CRI, 80CRI and 90CRI with a wide range of CCTs, and offers hot-color targeting to ensure that the LEDs are within color target at application conditions of 85°C.



## FEATURES AND BENEFITS

- Superior lm/W enables outstanding efficacy in end application
- Extremely reliable package design affirms long lifetime in harsh environments <sup>[1]</sup>
- Two voltage configurations are compatible with low cost high efficacy drivers
- Low  $R_{th}$  enables effective thermal dissipation design for higher efficiency
- Hot-color targeting ensures color is within ANSI bin at 85°C
- 3-step and 5-step MacAdam ellipse binning structure ensures excellent color uniformity

1. Refer to reliability datasheet for more details.

## PRIMARY APPLICATIONS

- High Bay
- Low Bay
- Floodlights
- Wall Pack
- [More...](#)

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# General Product Information

## Product Test Conditions

LUXEON 5050 LEDs are tested with a 20ms monopulse specified below at a junction temperature,  $T_j$ , of 25°C. Forward voltage and luminous flux are binned at a  $T_j$  of 25°C, while color is hot-targeted at a  $T_j$  of 85°C.

- 160mA - LUXEON 5050 (Round LES) – 24V and LUXEON 5050 (Square LES) – 30V
- 640mA - LUXEON 5050 (Round LES) – 6V
- 800mA - LUXEON 5050 (Square LES) – 6V

## Part Number Nomenclature

Part numbers for LUXEON 5050 follow the convention below:

L 1 5 0 – **A A B B** 5 0 **C C** 0 0 0 **D** 0

Where:

- A A** - designates nominal ANSI CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K 40=4000K, 50=5000K, 57=5700K, 65=6500K)
- B B** - designates minimum CRI (70=70CRI, 80=80CRI, 90=90CRI)
- C C** - designates voltage (06=6V, 24=24V, 30=30V)
- D** - designates product type (0=Round LES, S=Square LES)

Therefore, the following part number is used for a LUXEON 5050 Square LES, 3000K 80CRI, 30V:

L 1 5 0 – **3 0 8 0** 5 0 **3 0** 0 0 0 **S** 0

## Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

## Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON 5050 is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

# Performance Characteristics

## Product Selection Guide

Table 1. Product performance of LUXEON 5050 at specified test current,  $T_j=25^\circ\text{C}$ .

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Round LES) 24V	2200K	70	515	550	140	160	L150-2270502400000
	2700K	70	535	605	154	160	L150-2770502400000
	3000K	70	553	625	159	160	L150-3070502400000
	3500K	70	600	635	162	160	L150-3570502400000
	4000K	70	580	675	172	160	L150-4070502400000
	5000K	70	580	672	171	160	L150-5070502400000
	5700K	70	570	661	169	160	L150-5770502400000
	6500K	70	570	655	167	160	L150-6570502400000
	2200K	80	440	475	121	160	L150-2280502400000
	2700K	80	500	550	140	160	L150-2780502400000
	3000K	80	516	590	151	160	L150-3080502400000
	3500K	80	527	595	152	160	L150-3580502400000
	4000K	80	539	615	157	160	L150-4080502400000
	5000K	80	539	615	157	160	L150-5080502400000
	5700K	80	539	615	157	160	L150-5780502400000
	6500K	80	539	615	157	160	L150-6580502400000
	2700K	90	414	475	121	160	L150-2790502400000
	3000K	90	428	490	125	160	L150-3090502400000
	3500K	90	445	510	130	160	L150-3590502400000
	4000K	90	456	530	135	160	L150-4090502400000
	5000K	90	456	530	135	160	L150-5090502400000
5700K	90	456	530	135	160	L150-5790502400000	
LUXEON 5050 (Round LES) 6V	2200K	70	515	550	140	640	L150-2270500600000
	2700K	70	535	605	154	640	L150-2770500600000
	3000K	70	553	625	159	640	L150-3070500600000
	3500K	70	600	635	162	640	L150-3570500600000
	4000K	70	580	675	172	640	L150-4070500600000
	5000K	70	580	672	171	640	L150-5070500600000
	5700K	70	570	661	169	640	L150-5770500600000
	6500K	70	570	655	167	640	L150-6570500600000
	2200K	80	440	475	121	640	L150-2280500600000
	2700K	80	500	550	140	640	L150-2780500600000
	3000K	80	516	590	151	640	L150-3080500600000
	3500K	80	527	595	152	640	L150-3580500600000
	4000K	80	539	615	157	640	L150-4080500600000
	5000K	80	539	615	157	640	L150-5080500600000
	5700K	80	539	615	157	640	L150-5780500600000
	6500K	80	539	615	157	640	L150-6580500600000
	2700K	90	414	475	121	640	L150-2790500600000
	3000K	90	428	490	125	640	L150-3090500600000
	3500K	90	445	510	130	640	L150-3590500600000
	4000K	90	456	530	135	640	L150-4090500600000
	5000K	90	456	530	135	640	L150-5090500600000
5700K	90	456	530	135	640	L150-5790500600000	

Table 1 continued on next page:

1. Correlated color temperature is not targeted at  $T_j=85^\circ\text{C}$ .
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at  $T_j=25^\circ\text{C}$ . Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of  $\pm 2$  on CRI and  $\pm 7\%$  on luminous flux measurements.

Table 1. Product performance of LUXEON 5050 at specified test current, T<sub>j</sub>=25°C, Continued.

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Square LES) 30V	2200K	70	621	690	141	160	L150-22705030000S0
	2700K	70	693	770	158	160	L150-27705030000S0
	3000K	70	720	800	164	160	L150-30705030000S0
	3500K	70	729	810	166	160	L150-35705030000S0
	4000K	70	743	825	169	160	L150-40705030000S0
	5000K	70	743	825	169	160	L150-50705030000S0
	5700K	70	738	820	168	160	L150-57705030000S0
	6500K	70	720	800	164	160	L150-65705030000S0
	2200K	80	586	630	129	160	L150-22805030000S0
	2700K	80	650	695	142	160	L150-27805030000S0
	3000K	80	665	715	147	160	L150-30805030000S0
	3500K	80	679	730	150	160	L150-35805030000S0
	4000K	80	700	750	154	160	L150-40805030000S0
	5000K	80	702	755	155	160	L150-50805030000S0
	5700K	80	700	750	154	160	L150-57805030000S0
	6500K	80	688	740	152	160	L150-65805030000S0
	2700K	90	558	600	123	160	L150-27905030000S0
	3000K	90	586	630	129	160	L150-30905030000S0
	3500K	90	600	640	131	160	L150-35905030000S0
	4000K	90	609	655	134	160	L150-40905030000S0
	5000K	90	618	665	136	160	L150-50905030000S0
5700K	90	605	650	133	160	L150-57905030000S0	
LUXEON 5050 (Square LES) 6V	2200K	70	621	690	141	800	L150-22705006000S0
	2700K	70	693	770	158	800	L150-27705006000S0
	3000K	70	720	800	164	800	L150-30705006000S0
	3500K	70	729	810	166	800	L150-35705006000S0
	4000K	70	743	825	169	800	L150-40705006000S0
	5000K	70	743	825	169	800	L150-50705006000S0
	5700K	70	738	820	168	800	L150-57705006000S0
	6500K	70	720	800	164	800	L150-65705006000S0
	2200K	80	586	630	129	800	L150-22805006000S0
	2700K	80	650	695	142	800	L150-27805006000S0
	3000K	80	665	715	147	800	L150-30805006000S0
	3500K	80	679	730	150	800	L150-35805006000S0
	4000K	80	700	750	154	800	L150-40805006000S0
	5000K	80	702	755	155	800	L150-50805006000S0
	5700K	80	700	750	154	800	L150-57805006000S0
	6500K	80	688	740	152	800	L150-65805006000S0
	2700K	90	558	600	123	800	L150-27905006000S0
	3000K	90	586	630	129	800	L150-30905006000S0
	3500K	90	600	640	131	800	L150-35905006000S0
	4000K	90	609	655	134	800	L150-40905006000S0
	5000K	90	618	665	136	800	L150-50905006000S0
5700K	90	605	650	133	800	L150-57905006000S0	

Notes for Table 1:

1. Correlated color temperature is not targeted at T<sub>j</sub>=85°C.
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at T<sub>j</sub>=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7% on luminous flux measurements.

# Optical Characteristics

Table 2. Optical characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE <sup>[1]</sup>	TYPICAL VIEWING ANGLE <sup>[2]</sup>
L150-xxxx50xx000x0	138°	116°

**Notes for Table 2:**

1. Total angle at which 90% of total luminous flux is captured.
2. Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.

# Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	FORWARD VOLTAGE <sup>[1]</sup> ( $V_f$ )			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE <sup>[2]</sup> (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L150-xxxx502400000	23.5	24.4	26.5	-12	2.4
L150-xxxx500600000	5.8	6.1	6.6	-3	2.4
L150-xxxx5030000S0	29.0	30.5	32.0	-15	1.4
L150-xxxx5006000S0	5.8	6.1	6.6	-3	1.4

**Notes for Table 3:**

1. Lumileds maintains a tolerance of ±1% on forward voltage measurements.
2. Measured between 25°C and 85°C.

# Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON 5050.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current <sup>[1,2]</sup>	240mA for L150-xxxx502400000 800mA for L150-xxxx500600000 240mA for L150-xxxx5030000S0 1000mA for L150-xxxx5006000S0
Peak Pulsed Forward Current <sup>[1,3]</sup>	300mA for L150-xxxx502400000 1000mA for L150-xxxx500600000 300mA for L150-xxxx5030000S0 1250mA for L150-xxxx5006000S0
LED Junction Temperature <sup>[1]</sup> (DC & Pulse)	125°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 2
Operating Case Temperature <sup>[1]</sup>	105°C
LED Storage Temperature	-40°C to 105°C
Allowable Reflow Cycles	3
Reverse Voltage ( $V_{reverse}$ )	LUXEON LEDs are not designed to be driven in reverse bias

**Notes for Table 4:**

1. Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
2. Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," are acceptable if the following conditions are met:
  - The frequency of the ripple current is 100Hz or higher
  - The average current for each cycle does not exceed the maximum allowable DC forward current
  - The maximum amplitude of the ripple does not exceed the maximum peak pulsed forward current
3. At 10% duty cycle with pulse width of 10ms.

# Characteristic Curves

## Spectral Power Distribution Characteristics

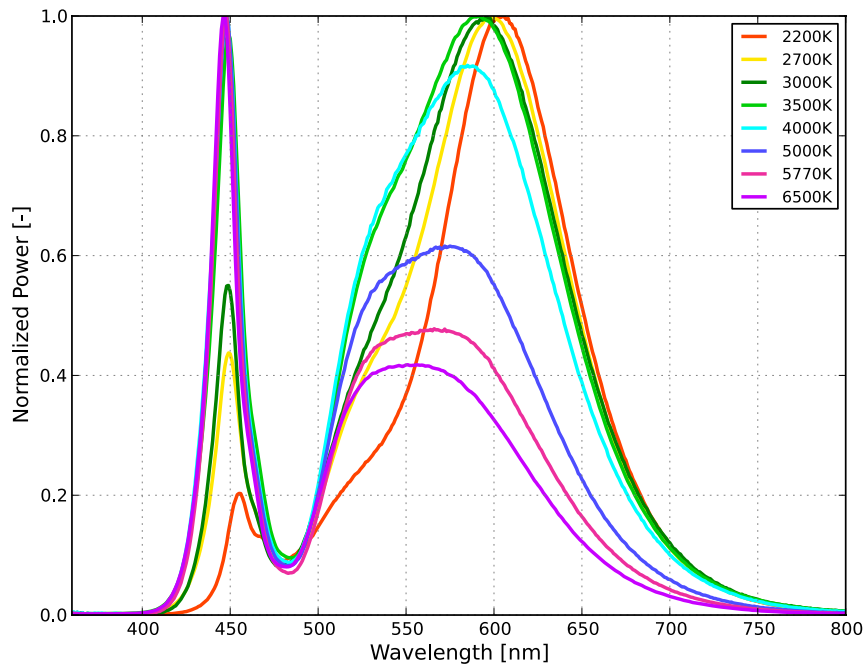


Figure 1a. Typical normalized power vs. wavelength for L150-xx7050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

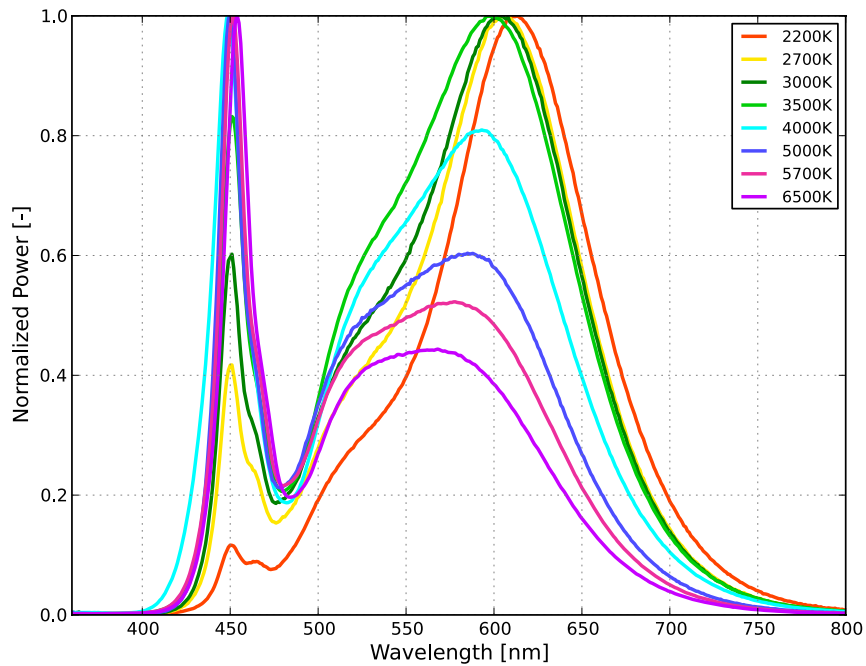


Figure 1b. Typical normalized power vs. wavelength for L150-xx8050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

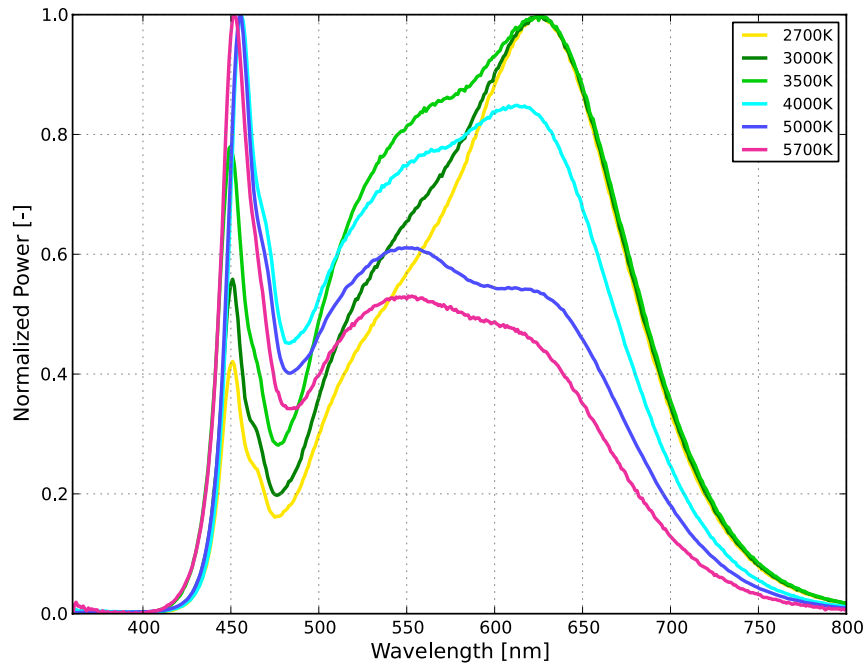


Figure 1c. Typical normalized power vs. wavelength for L150-xx9050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

## Light Output Characteristics

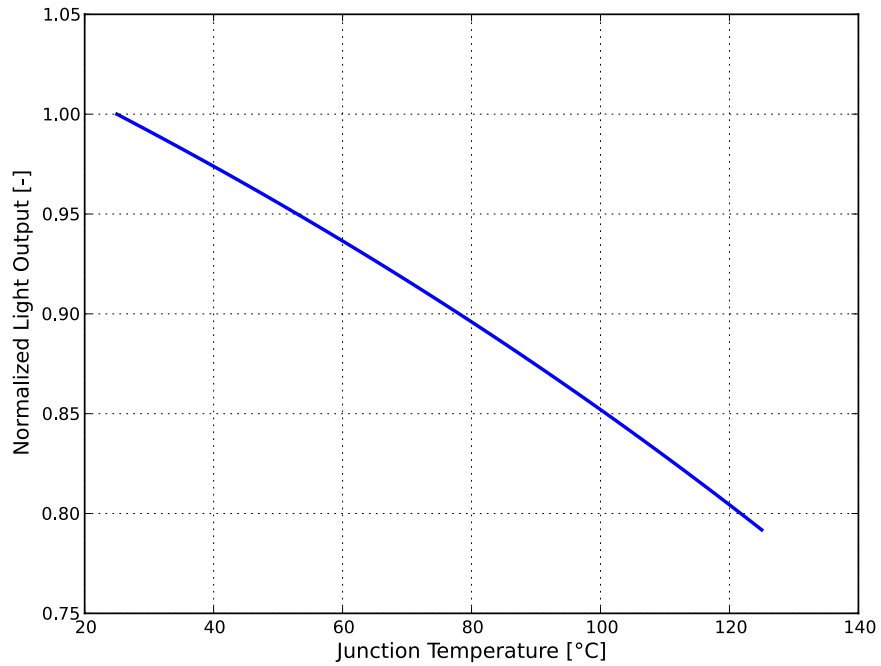


Figure 2. Typical normalized light output vs. junction temperature for L150-xxx50xx000x0 at specified test current.

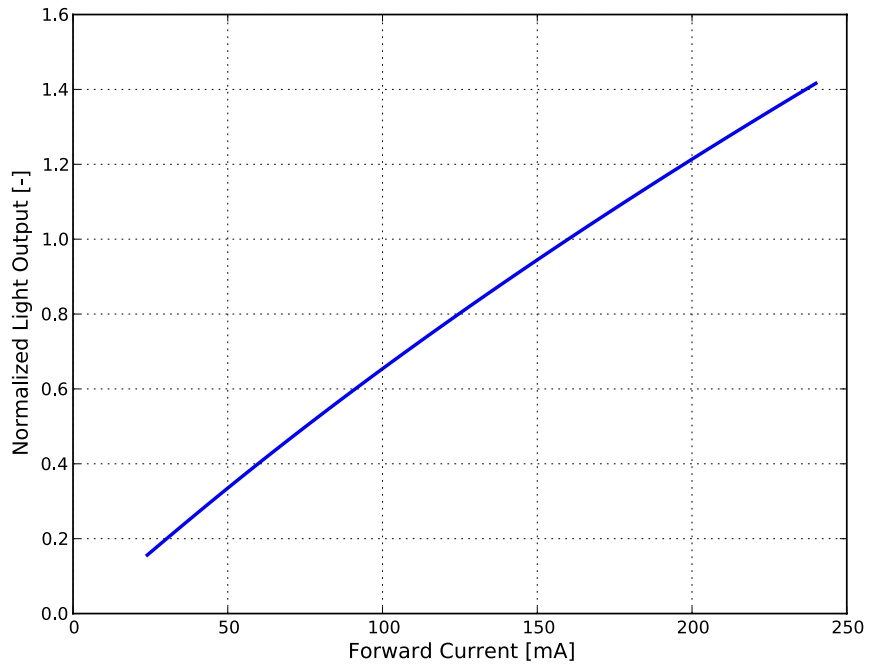


Figure 3a. Typical normalized light output vs. forward current for L150-xxxx50xx000x0,  $T_j=25^\circ\text{C}$ .

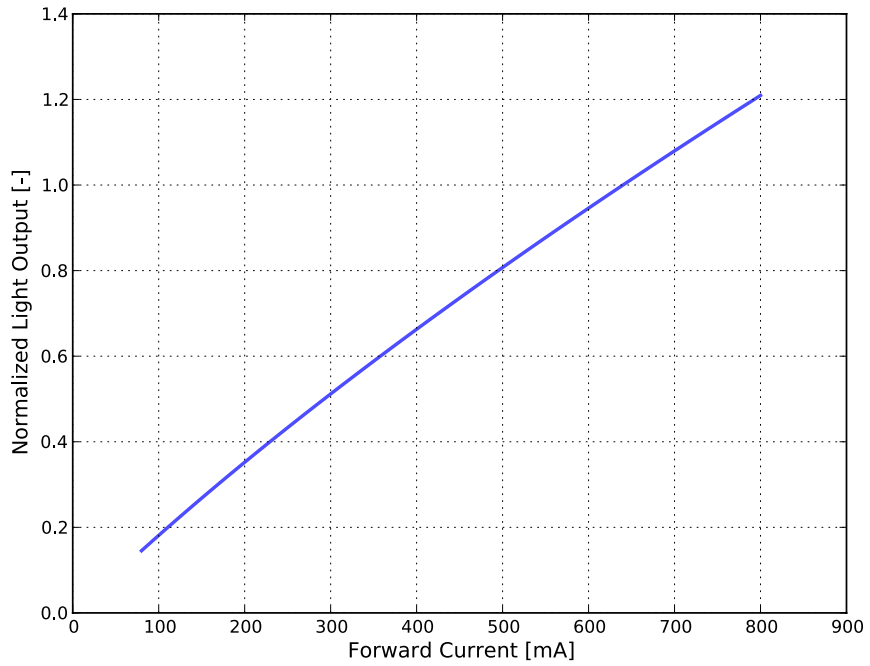


Figure 3b. Typical normalized light output vs. forward current for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

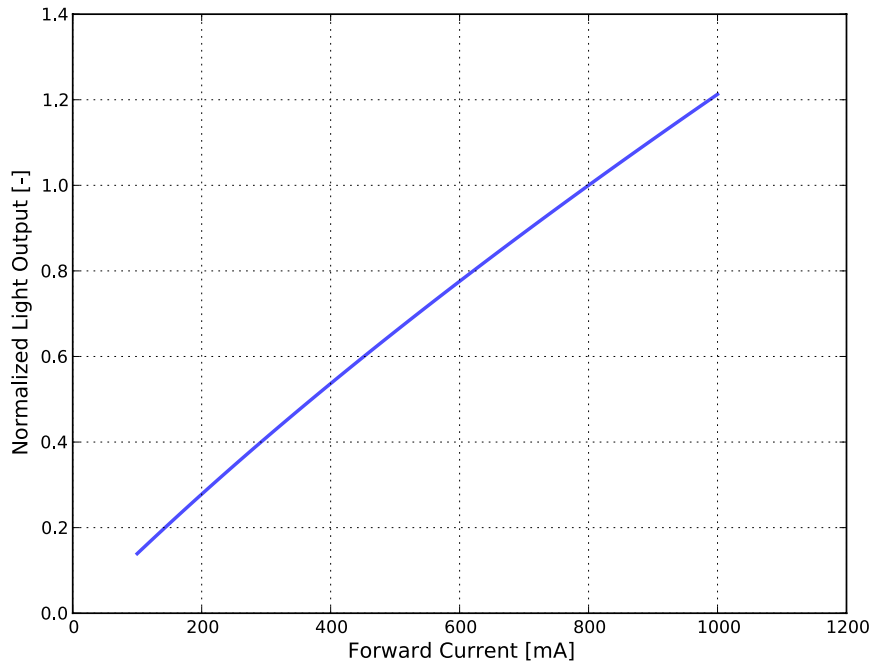


Figure 3c. Typical normalized light output vs. forward current for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Forward Current Characteristics

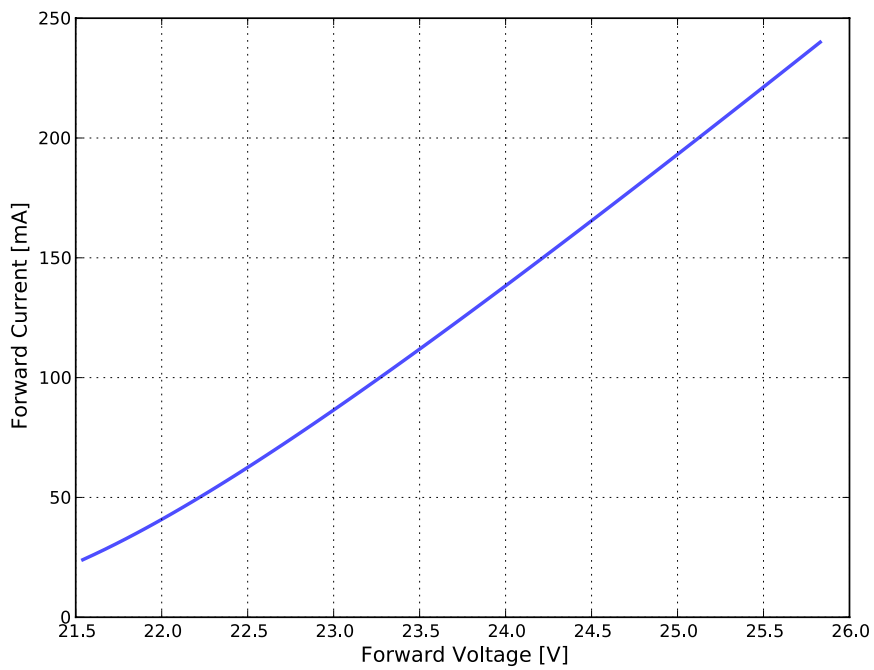


Figure 4a. Typical forward current vs. forward voltage for L150-xxxx502400000,  $T_j=25^\circ\text{C}$ .



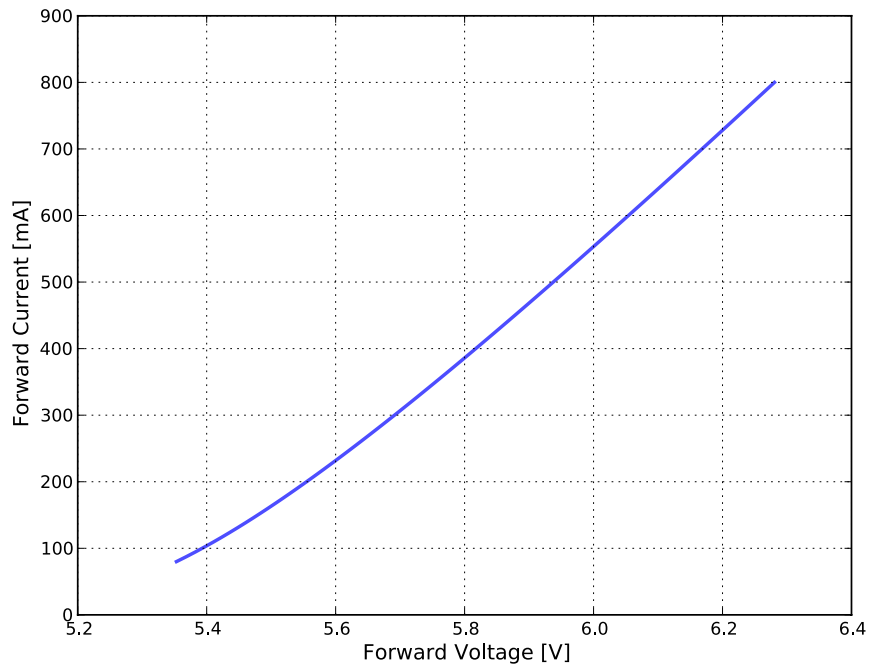


Figure 4b. Typical forward current vs. forward voltage for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

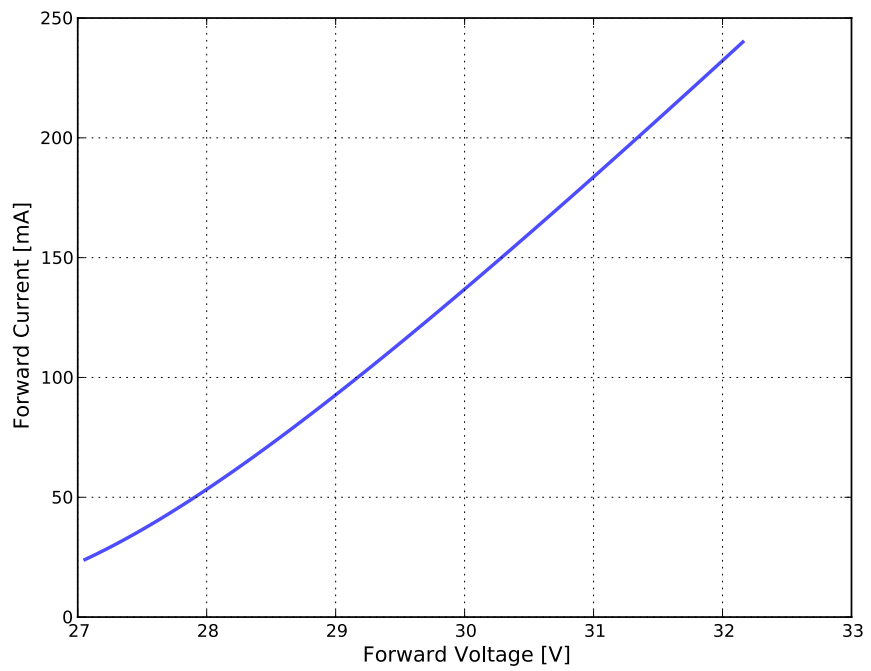


Figure 4c. Typical forward current vs. forward voltage for L150-xxxx503000050,  $T_j=25^\circ\text{C}$ .

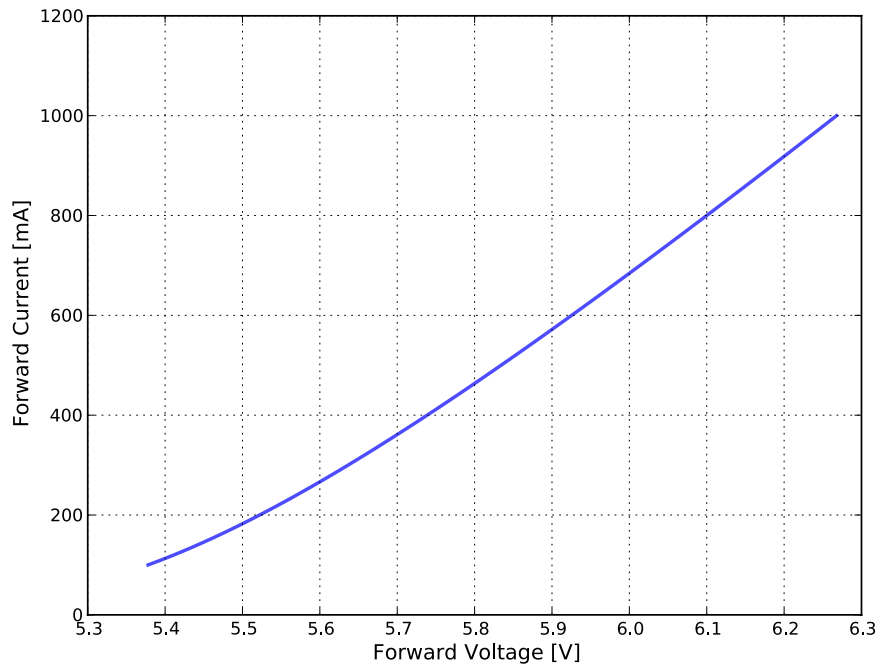


Figure 4d. Typical forward current vs. forward voltage for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Radiation Pattern Characteristics

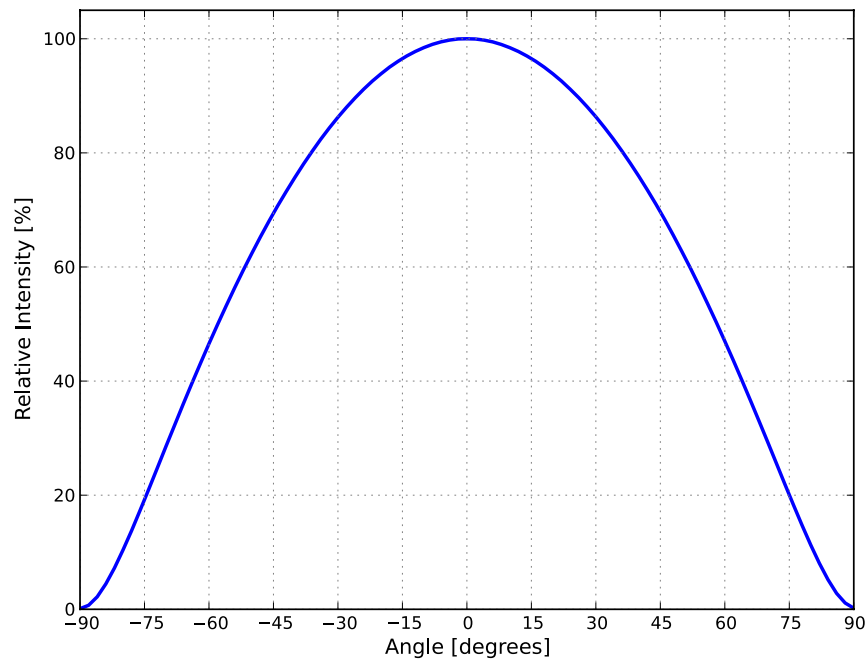


Figure 5. Typical radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

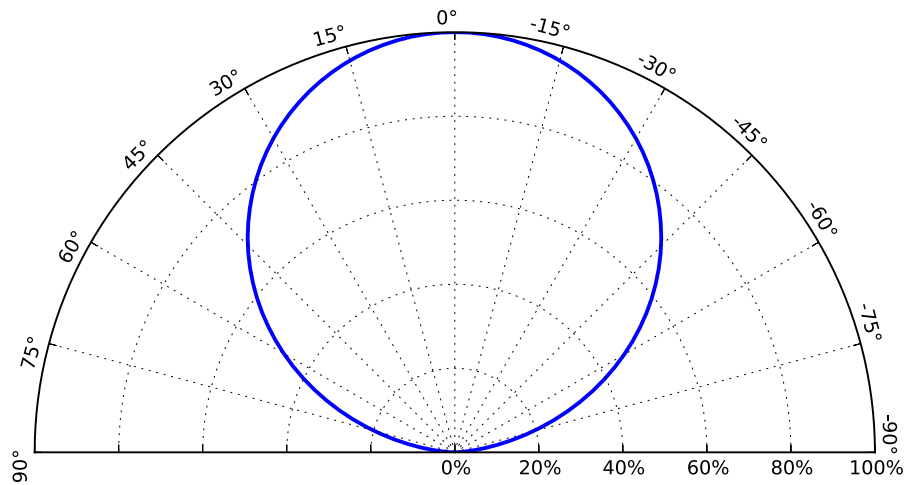


Figure 6. Typical polar radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

## Product Bin and Labeling Definitions

### Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON 5050 (Round LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B C C**

Where:

- A** - designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B** - designates color bin (example: 3=3 SDCM, 5=5 SDCM parts)
- C C** - designates forward voltage bin (example: A1, A2, B1, B2)

Therefore, a LUXEON 5050 (Round LES) with a lumen range of 600 to 650 lm, color bin of 3 and forward voltage range of 23.5 to 24.2V has the following CAT code:

**L 3 A 1**

LUXEON 5050 (Square LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B B C**

Where:

- A** – designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B B** – designates color bin: (example: 83=2700K and 3 SDCM, 35=5000K and 5 SDCM)
- C** – designates forward voltage bin (example: A, B, C, D)

Therefore, a LUXEON 5050 (Square LES) with a lumen range of 600 to 650 lm, color bin of 83 and forward voltage range of 29.0 to 30.0V has the following CAT code:

**L 8 3 A**

## Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON 5050 LEDs. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

**Table 5. Luminous flux bin definitions for LUXEON 5050, T<sub>j</sub>=25°C.**

BIN	LUMINOUS FLUX <sup>(1)</sup> (lm)	
	MINIMUM	MAXIMUM
G	400	450
H	450	500
J	500	550
K	550	600
L	600	650
M	650	700
N	700	750
P	750	800
Q	800	850
R	850	900
S	900	950
T	950	1000

**Notes for Table 5:**

1. Lumileds maintains a tolerance of ±7% on luminous flux measurements.

## Color Bin Definitions

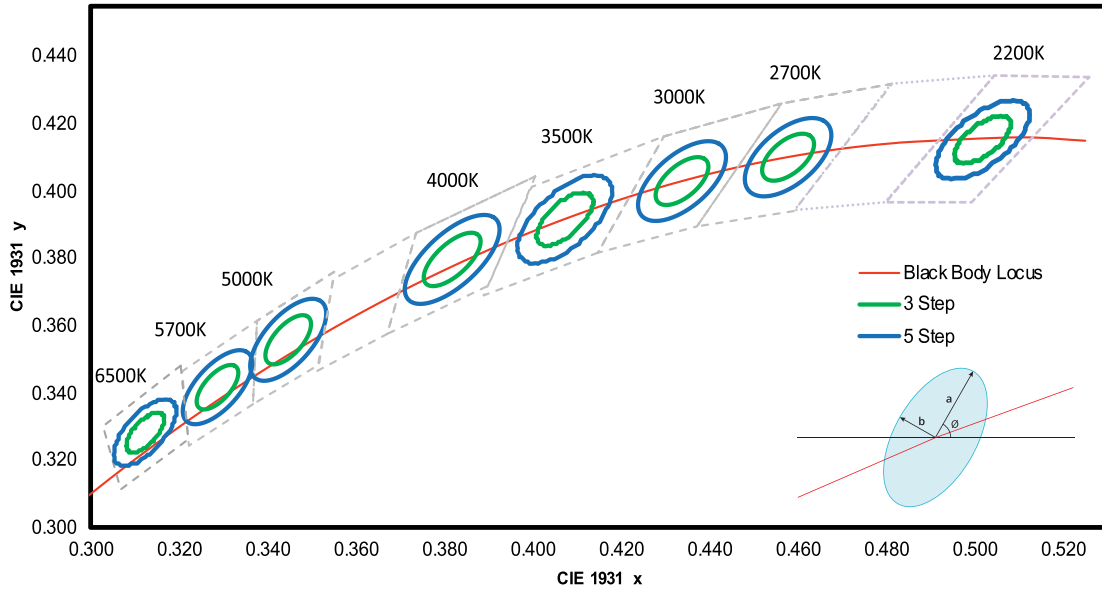


Figure 7. 3- and 5-step MacAdam ellipse illustration for hot-color targeting expected at 85°C.

Table 6. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 5050 at test current, hot-color targeted at  $T_j=85^\circ\text{C}$ .

NOMINAL CCT	COLOR SPACE	CENTER POINT <sup>(1)</sup> (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, $\theta$	LUXEON 5050 (ROUND LES) COLOR BIN CODE	LUXEON 5050 (SQUARE LES) COLOR BIN CODE
2200K	Single 3-step MacAdam ellipse	(0.5018, 0.4153)	0.00863	0.00398	49.27°	3	A3
2700K	Single 3-step MacAdam ellipse	(0.4578, 0.4101)	0.00810	0.00420	53.70°	3	83
3000K	Single 3-step MacAdam ellipse	(0.4338, 0.4030)	0.00834	0.00408	53.22°	3	73
3500K	Single 3-step MacAdam ellipse	(0.4073, 0.3917)	0.00927	0.00414	54.00°	3	63
4000K	Single 3-step MacAdam ellipse	(0.3818, 0.3797)	0.00939	0.00402	53.72°	3	53
5000K	Single 3-step MacAdam ellipse	(0.3447, 0.3553)	0.00822	0.00354	59.62°	3	33
5700K	Single 3-step MacAdam ellipse	(0.3287, 0.3417)	0.00745	0.00320	59.09°	3	23
6500K	Single 3-step MacAdam ellipse	(0.3123, 0.3282)	0.00669	0.00285	58.57°	3	13
2200K	Single 5-step MacAdam ellipse	(0.5018, 0.4153)	0.01438	0.00663	49.27°	5	A5
2700K	Single 5-step MacAdam ellipse	(0.4578, 0.4101)	0.01350	0.00700	53.70°	5	85
3000K	Single 5-step MacAdam ellipse	(0.4338, 0.4030)	0.01390	0.00680	53.22°	5	75
3500K	Single 5-step MacAdam ellipse	(0.4073, 0.3917)	0.01545	0.00690	54.00°	5	65
4000K	Single 5-step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°	5	55
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°	5	35
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°	5	25
6500K	Single 5-step MacAdam ellipse	(0.3123, 0.3282)	0.01115	0.00475	58.57°	5	15

**Notes for Table 6:**

1. Lumileds maintains a tolerance of  $\pm 0.005$  on x and y coordinates in the CIE 1931 color space.

## Forward Voltage Bins

Table 7. Forward voltage bin definitions for LUXEON 5050,  $T_j=25^\circ\text{C}$ .

PART NUMBER	BIN	FORWARD VOLTAGE <sup>(1)</sup> (V <sub>f</sub> )	
		MINIMUM	MAXIMUM
L150-xxxx502400000	A1	23.5	24.2
	A2	24.2	25.0
	B1	25.0	25.8
	B2	25.8	26.5
L150-xxxx500600000	A1	5.8	6.0
	A2	6.0	6.2
	B1	6.2	6.4
	B2	6.4	6.6
L150-xxxx5030000S0	A	29.0	30.0
	B	30.0	31.0
	C	31.0	32.0
L150-xxxx5006000S0	A	5.8	6.0
	B	6.0	6.2
	C	6.2	6.4
	D	6.4	6.6

**Notes for Table 7:**

1. Lumileds maintains a tolerance of  $\pm 0.1\text{V}$  on forward voltage measurements.

# Mechanical Dimensions

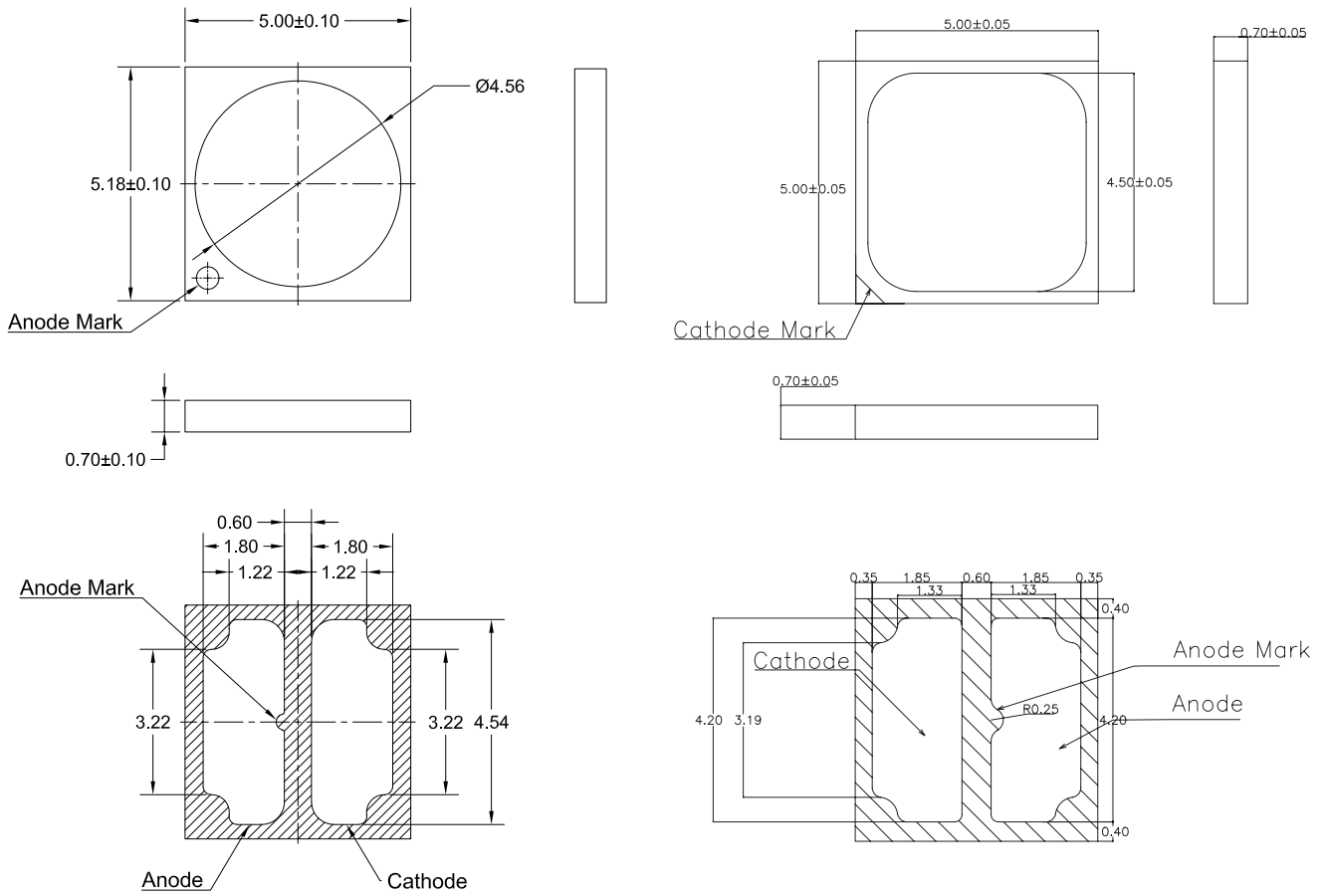


Figure 8. Mechanical dimensions for LUXEON 5050 (Round LES), left, and LUXEON 5050 (Square LES), right.

**Notes for Figure 8:**

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Reflow Soldering Guidelines

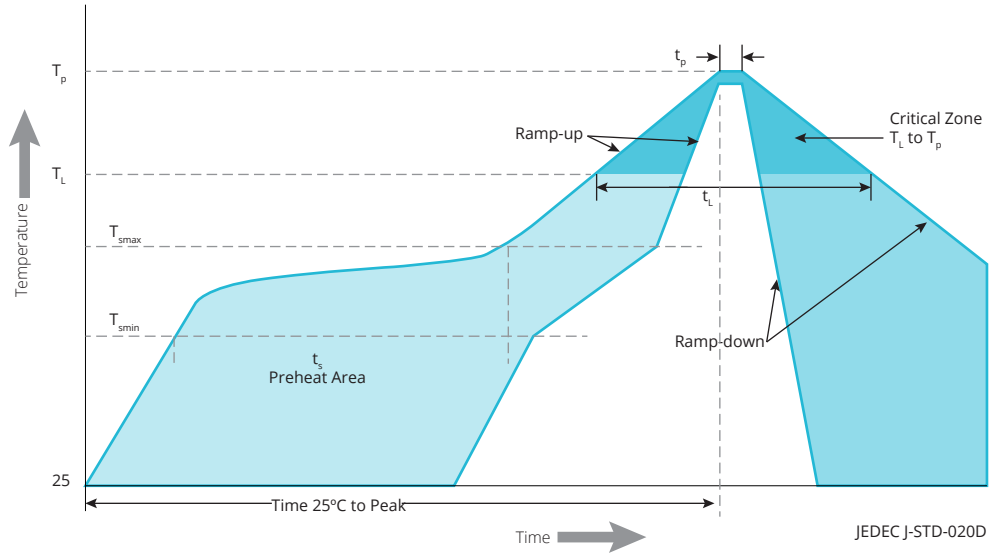


Figure 9. Visualization of the acceptable reflow temperature profile as specified in Table 8.

Table 8. Reflow profile characteristics for LUXEON 5050.

PROFILE FEATURE	LEAD-FREE ASSEMBLY
Preheat Minimum Temperature ( $T_{smin}$ )	150°C
Preheat Maximum Temperature ( $T_{smax}$ )	200°C
Preheat Time ( $t_{smin}$ to $t_{smax}$ )	60 to 180 seconds
Ramp-Up Rate ( $T_L$ to $T_p$ )	3°C / second maximum
Liquidous Temperature ( $T_L$ )	217°C
Time Maintained Above Temperature $T_L$ ( $t_t$ )	60 to 150 seconds
Peak / Classification Temperature ( $T_p$ )	260°C
Time Within 5°C of Actual Peak Temperature ( $t_p$ )	20 to 40 seconds
Ramp-Down Rate ( $T_p$ to $T_L$ )	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

## JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON 5050.

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
3	168 Hours	≤30°C / 60% RH	192 Hours +5 / -0	30°C / 60% RH



# Solder Pad Design

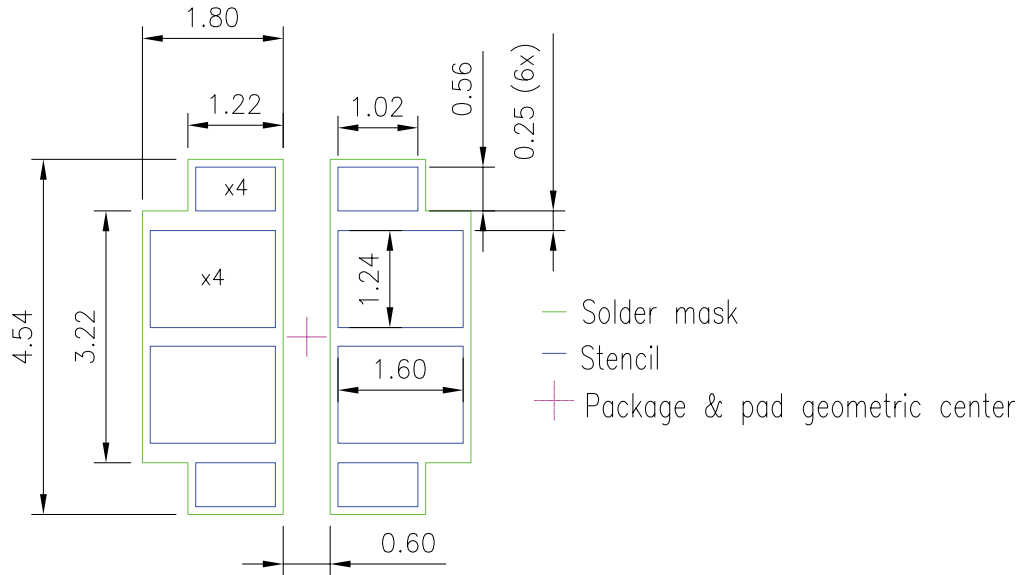


Figure 10. Recommended PCB solder pad layout for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

## Notes for Figure 10:

1. Drawings are not to scale.
2. All dimensions are in millimeters.
3. Refer to application brief [AB174](#) for additional details regarding recommended PCB layout design.

# Packaging Information

## Pocket Tape Dimensions

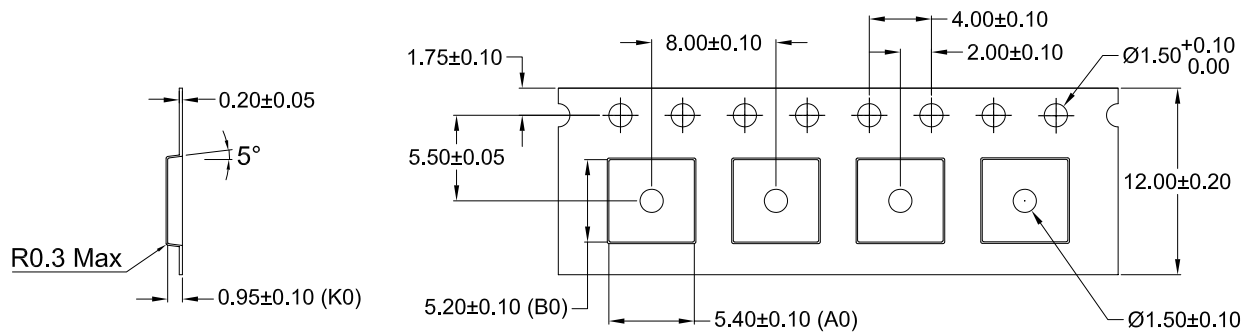
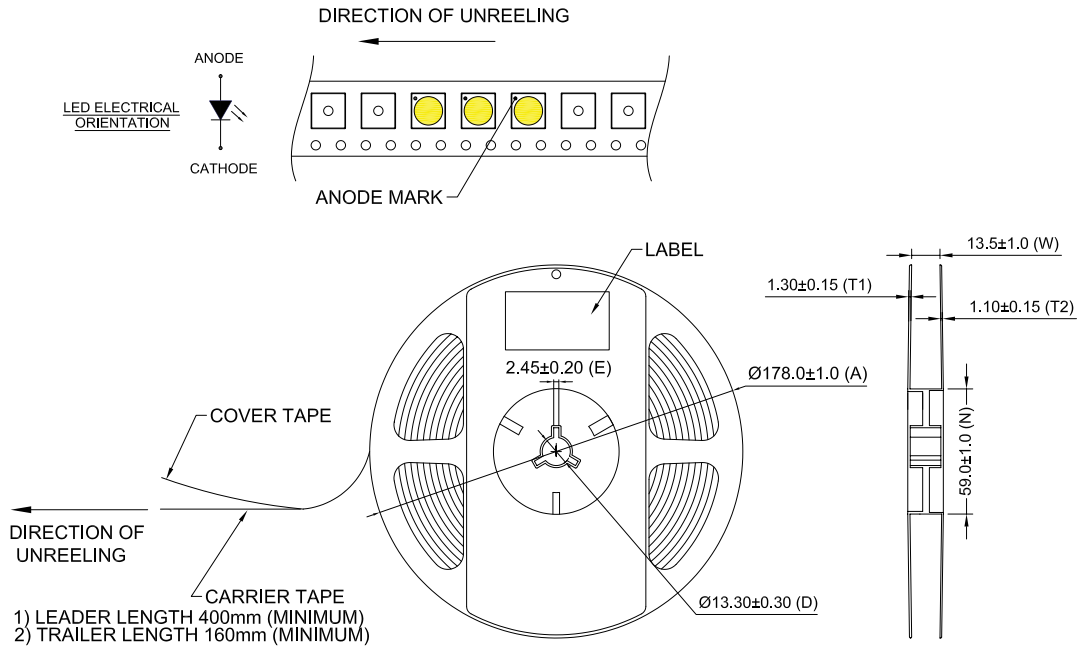


Figure 11. Pocket tape dimensions for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

## Notes for Figure 11:

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Reel Dimensions



12a. Reel dimensions for LUXEON 5050 (Round LES).

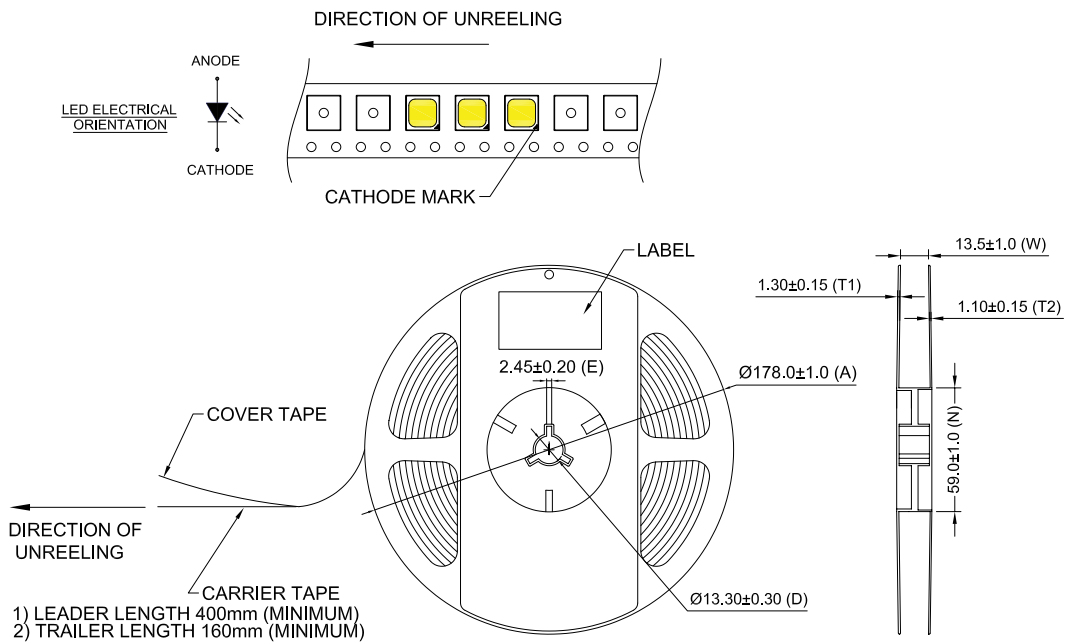


Figure 12b. Reel dimensions for LUXEON 5050 (Square LES).

Notes for Figures 12a and 12b:  
 1. Drawings are not to scale.  
 2. All dimensions are in millimeters.

## About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit [lumileds.com](http://lumileds.com).



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# CERTIFICATE

Issued to:  
Applicant:  
**Signify Netherlands B.V.**  
**High Tech Campus 48**  
**5656 AE Eindhoven, The Netherlands**

Licensee:  
**Signify Netherlands B.V.**  
**High Tech Campus 48**  
**5656 AE Eindhoven, The Netherlands**

Product : LED driver  
Trade name(s) : PHILIPS  
Type(s)/model(s) : Xi FP 150W 0.2-0.7A SNLDAE 230V S240 sXt,  
Xi FP 150W 0.3-1.0A SNLDAE 230V S240 sXt,  
Xi FP 75W 0.2-0.7A SNLDAE 230V S240 sXt and  
Xi FP 75W 0.3-1.0A SNLDAE 230V S240 sXt

The product and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

DEKRA hereby declares that the above-mentioned product has been certified on the basis of:

- a type test according to the standard EN 61347-1:2015, EN 61347-2-13:2014, EN 61347-2-13:2014/A1:2017, EN 62384:2006 and EN 62384:2006/A1:2009
- an inspection of the production location according to CENELEC Operational Document CIG 021
- a certification agreement with the number 947556

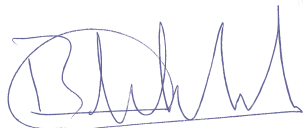
DEKRA hereby grants the right to use the ENEC certification mark.

The ENEC certification mark may be applied to the product as specified in this certificate for the duration of the ENEC certification agreement and under the conditions of the ENEC certification agreement.

This certificate is issued on 9 January 2020 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 31-112173

DEKRA Certification B.V.



B.T.M. Holtus  
Managing Director



K Xu  
Certification Manager

© Integral publication of this certificate is allowed

ACCREDITED BY THE  
DUTCH ACCREDITATION  
COUNCIL



**SPECIFICATION OF THE CERTIFIED PRODUCT****Product data**

Product	: LED driver
Trade name(s)	: PHILIPS
Type(s)/model(s)	: Xi FP 150W 0.2-0.7A SNLDAE 230V S240 sXt, Xi FP 150W 0.3-1.0A SNLDAE 230V S240 sXt, Xi FP 75W 0.2-0.7A SNLDAE 230V S240 sXt and Xi FP 75W 0.3-1.0A SNLDAE 230V S240 sXt
Rated voltage	: 220-240 Vac or 186-250 Vdc
Rated frequency	: 50/60 Hz at AC
Power factor	: 0,95
Ambient temperature (ta)	: -40 °C...+55 °C
Temperature declared thermally protection	: 130 °C
Description	: Built-in with double/reinforced insulation

**Product data – type Xi FP 150W 0.2-0.7A SNLDAE 230V S240 sXt**

Rated input current	: 0,80-0,70 Aac or 0,6 Adc max.
Rated input power	: 163 W
Output current	: 200-700 mA
Output voltage	: 90-283 Vdc; 340 Vdc max (open-circuit)
Output power	: 150 W
Max. case temperature (tc)	: 90 °C

**Product data – type Xi FP 150W 0.3-1.0A SNLDAE 230V S240 sXt**

Rated input current	: 0,80-0,70 Aac or 0,6 Adc max.
Rated input power	: 163 W
Output current	: 300-1050 mA
Output voltage	: 70-214 Vdc; 260 Vdc max (open-circuit)
Output power	: 150 W
Max. case temperature (tc)	: 90 °C

**Product data – type Xi FP 75W 0.2-0.7A SNLDAE 230V S240 sXt**

Rated input current	: 0,43-0,35 Aac or 0,3 Adc max.
Rated input power	: 82 W
Output current	: 200-700 mA
Output voltage	: 50-150 Vdc; 190 Vdc max (open-circuit)
Output power	: 75 W
Max. case temperature (tc)	: 85 °C

**Product data – type Xi FP 75W 0.3-1.0A SNLDAE 230V S240 sXt**

Rated input current	: 0,43-0,36 Aac or 0,3 Adc max.
Rated input power	: 82 W
Output current	: 300-1050 mA
Output voltage	: 35-108 Vdc; 140 Vdc max (open-circuit)
Output power	: 75 W
Max. case temperature (tc)	: 85 °C

**TESTS****Test requirements**

EN 61347-1:2015  
EN 61347-2-13:2014

EN 61347-2-13:2014/A1:2017  
EN 62384:2006  
EN 62384:2006/A1:2009

**Test result**

The test results are laid down in DEKRA test file 606676200.

**Additional information**

constant current type with screwless terminal block  
LED driver is completely potted with asphalt  
Double/reinforced insulation between PRI and SEC

For component list refers to annex 1 of test reports 6066762.50.

The tests were performed by the manufacturer under the conditions of the agreement concerning the manufacturer's right to conduct type tests for the KEMA-KEUR / ENEC certification system under supervision of DEKRA (CTF Stage 3).

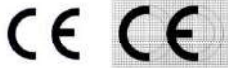
This certificate replaces certificate No. 31-109925 which we herewith declare invalid.

**Conclusion**

The examination proved that all requirements were met.

**Factory locations**

The factory locations are registered with the numbers 674666, 306303 and 326285.



## EU Declaration of Conformity

Document No.: 2020E0024

Year in which CE Mark was first affixed: 2018

### 1. Product Range / Model:

Product Range / Model:	NAME: Xitanium Led Driver
------------------------	---------------------------

### 2. Manufacturer Name & Address:

**Signify**

I.B.R.S./C.C.R.I. /Numéro 10461

5600 VB Eindhoven, The Netherlands

### 3. This declaration of conformity is issued under the sole responsibility of the manufacturer.

### 4. Object of the declaration:

Product Code:	Product Name: Xitanium Led Driver 75W & 150W SNLDAE S240 sXt
	Product ID: family of Ids (4 members)
	See for Unique product ID number of all products under the family described above the Annex: Specification of the products

**5&6. The object of the declaration described above is in conformity with the following relevant Union harmonization legislation and with the applicable requirements of the following harmonized standards and technical specifications:**

#### Low Voltage Directive (LVD), 2014/35/EU

- EN 61347-1:2015
- EN 61347-2-13:2014 + A1:2017

#### Electromagnetic compatibility Directive (EMC), 2014/30/EU

- EN 55015:2013 + A1:2015
- EN 61547:2009
- EN 61000-3-2:2014
- EN 61000-3-3:2013

#### EcoDesign requirements for energy-related products Directive (ErP), 2009/125/EC and applicable Implementing Measures

- Commission Regulation (EU) 1194/2012
- Commission Regulation (EU) 2019/2020 Article 7

#### Restriction of the use of certain Hazardous Substances in electrical and electronic equipment Directive (RoHS), 2011/65/EU

- EN 50581:2012

**7. Additional information: The product(s) in this declaration is/are produced under a quality scheme at least in conformity with ISO 9001 or CENELEC permanent documents.**

Signed for and on behalf of:

**21-04-2020**

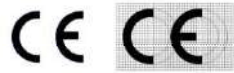
High Tech Campus 48

5656 AE Eindhoven, The Netherlands

Ms C Sweegers

Regulatory Affairs Manager LED Electronics





## EU Declaration of Conformity

Document No.: 2020E0024

### Specification of the products:

10NC	12NC	Product Description	Brand	Remarks
9290021284	929002128406	Xi FP 75W 0.2-0.7A SNLDAE 230V S240 sXt	Philips	
9290021285	929002128506	Xi FP 75W 0.3-1.0A SNLDAE 230V S240 sXt	Philips	
9290021286	929002128606	Xi FP 150W 0.2-0.7A SNLDAE 230V S240 sXt	Philips	
9290021287	929002128706	Xi FP 150W 0.3-1.0A SNLDAE 230V S240 sXt	Philips	



# PHILIPS

## Xitanium

### LED driver



## Datasheet

### Xitanium FULL Prog LED Xtreme drivers

Xi FP 150W 0.3-1.0A SNLDAE 230V S240 sXt

9290 021 28706

#### Xitanium FULL Prog LED Xtreme drivers

Philips Xitanium Full Programmable LED drivers are specifically designed to deliver the highest performance, protection and configurability. The portfolio offers both central and standalone dimming protocols further increasing the energy savings and CO<sub>2</sub> reductions achieved with LED lighting. The Xtreme technology ensures maximum robustness and protection combined with a very long lifetime.

In this product family Philips introduces new drivers in a compact form factor with state-of-the-art features, which offer high value for both OEM customers and end-users. The products can replace the existing programmable outdoor LED drivers and will bring significant improvement in programming, assembly into a luminaire and electrical performance.

#### Benefits

- Ultimate robustness, offering peace of mind and lower maintenance costs
- Fully programmable LED-drivers designed for the new digital and connected lighting world
- Extended diagnostics via MultiOne
- Easy to design-in, configure and install for Class I and Class II applications
- Energy savings through high efficiency and via multiple dimming options

#### Features

- High surge protection (CM/DM)
- Long lifetime and robust protection against moisture, vibration and temperature
- Configurable operating windows (AOC)
- Multiple control interfaces: DALI, AmpDim, 1-step and 3-step LineSwitch
- Autonomous dimming via integrated DynaDimmer
- Adjustable thermal protection for driver (DTL) and LED module (MTP)
- Constant Light Output (CLO)
- Adjustable Start-up Time (AST)
- Adjustable Light Output (ALO)
- End-Of-Life indicator (EOL)
- Communication through mains via coded commands
- Compliant per DALI Part 251/252/253 (select models)

#### Application

- Road and street lighting
- Area lighting
- Tunnel lighting
- Industrial lighting

## Electrical input data

Specification item	Value	Unit	Condition
Rated input voltage range	202...254	V <sub>ac</sub>	Performance range
Rated input voltage	230	V <sub>ac</sub>	
Rated input frequency range	47...63	Hz	Performance range
Rated input current	0.7	A	@ rated output power @ rated input voltage
Max. input current	0.8	A	@ rated output power @ minimum performance input voltage
Rated input power	163	W	@ rated output power @ rated input voltage
Power factor	0.99		@ rated output power @ rated input voltage
Total harmonic distortion	7	%	@ rated output power @ rated input voltage
Efficiency	92.5	%	@ rated output power @ rated input voltage @ max. U <sub>out</sub>
Rated input voltage DC range	186...250	V <sub>dc</sub>	Performance range, no external DC-rated fuse required
Rated input current DC range	0.6	A <sub>dc</sub>	Performance range
Input voltage AC range	80...264	V <sub>ac</sub>	Safety operational range, see MainsGuard graph
Input frequency AC range	45...66	Hz	Safety operational range
Input voltage DC range	168...275	V <sub>dc</sub>	Safety operational range
Standby Power	0.45	W	
Isolation input to output	Double		

## Electrical output data

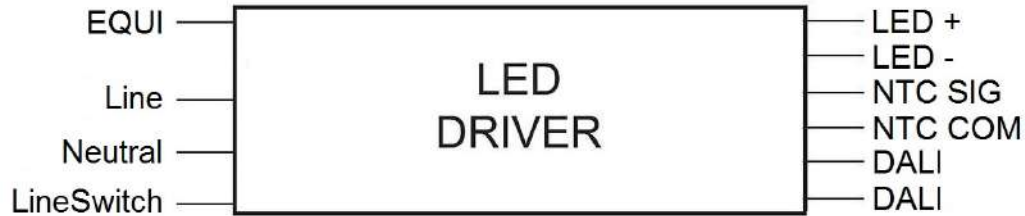
Specification item	Value	Unit	Condition
Regulation method	Constant Current		
Output voltage	70...214	V <sub>dc</sub>	
Output voltage max.	260	V	Maximum voltage at open load
Output current	0.07...1.05	A	
Output current min programmable	300	mA	
Output current min dimming	70	mA	
Output current tolerance ±	3	%	
Output current ripple LF	≤ 4	%	Ripple = peak / average @ < 3kHz
Output current ripple HF	≤ 4	%	
Output P <sub>st</sub> <sup>LM</sup>	≤ 0.23		In entire operating window
Output SVM	≤ 0.07		In entire operating window
Output power	4.5...150	W	

## Electrical data controls input

Specification item	Value	Unit	Condition
Control method	AmpDim, Coded Mains, DALI, Dynadimmer, LineSwitch 3-step, LineSwitch single-step		Output current amplitude dimming. Please refer to design-in guide at <a href="http://www.philips.com/oem">www.philips.com/oem</a> for more controllability details.
Dimming range	10...100	%	For latest DALI certification status please visit <a href="http://www.digitalilluminationinterface.org/products">www.digitalilluminationinterface.org/products</a> ; LineSwitch: Vlow: < 160Vac Vhigh: 170 ... 264Vac
Isolation controls input to output	Double		acc. IEC61347-1

## Wiring and Connections

Specification item	Value	Unit	Type
Input wire cross-section	0.5...1.5 / 20...16	mm <sup>2</sup> / AWG	solid / stranded wire
Input wire strip length	8.5...9.5	mm	
Output wire cross-section	0.5...1.5 / 20...16	mm <sup>2</sup> / AWG	solid / stranded wire
Output wire strip length	8.5...9.5	mm	
Control wire cross-section	0.5...1.5 / 20...16	mm <sup>2</sup> / AWG	solid / stranded wire
Control wire strip length	8.5...9.5	mm	
Maximum cable length	2.5	m	CISPR15: between driver and LED module
Maximum NTC output cable length	0.6	m	

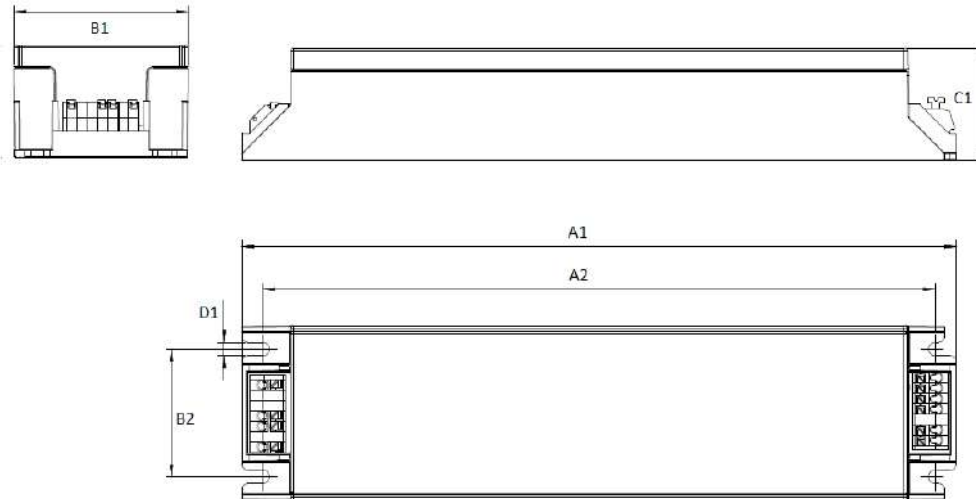


## Insulation

Insulation per IEC61347-1	Mains + LineSwitch	EQUI	LED + NTC	DALI
Mains + LineSwitch		Double	Double	Basic
EQUI	Double		Basic	Double
LED + NTC	Double	Basic		Double
DALI	Basic	Double	Double	

## Dimensions and weight

Specification item	Value	Unit	Tolerance (mm)
Length (A1)	240.5	mm	
Mounting hole distance (A2)	226.2	mm	
Width (B1)	58.6	mm	
Width (B2)	42.9	mm	
Height (C1)	37.8	mm	
Mounting hole diameter (D1)	4.5	mm	
Weight	700	gram	



## Logistical data

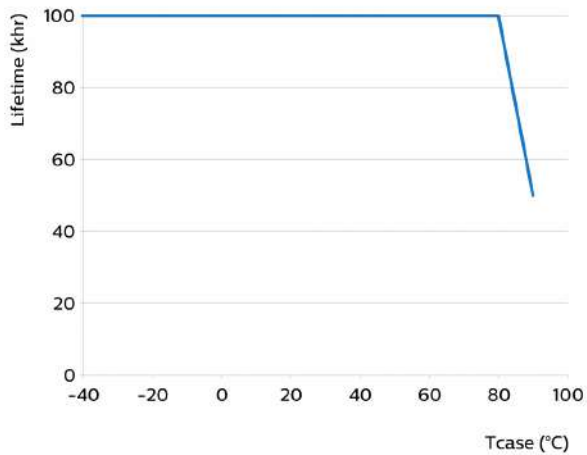
Specification item	Value
Product name	Xi FP 150W 0.3-1.0A SNLDAE 230V S240 sXt
EOC	871869970577000
Logistic code 12NC	9290 021 28706
EAN1 (GTIN)	8718699705770
EAN3 (box)	8718699705787
Pieces per box	10

## Operational temperatures and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-40...+55	°C	Higher ambient temperature allowed as long as T <sub>case-max</sub> is not exceeded
T <sub>case-max</sub>	90	°C	Maximum temperature measured at T <sub>case-point</sub>
T <sub>case-life</sub>	80	°C	Measured at T <sub>case-point</sub>
Maximum housing temperature	130	°C	In case of a failure, inherent by design
Relative humidity	10...90	%	Non-condensing

## Lifetime

Specification item	Value	Unit	Condition
Driver lifetime	100,000	hours	Measured temperature at Tcase-point is Tcase-life. Maximum failures = 10%



## Storage temperature and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-40...+85	°C	
Relative humidity	5...95	%	Non-condensing

## Programmable features

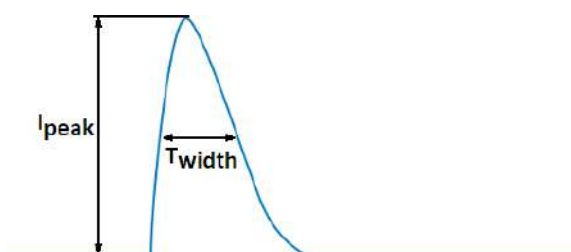
Specification item	Available	Default setting	Condition
Set Adjustable Output Current (AOC)	Programmable, SimpleSet	700 mA	
LED Module Temperature Protection (MTP)	Yes	OFF	
Driver Temperature Limit (DTL)	Yes	ON	
Adjustable Light Output (ALO)	Yes	OFF	
Constant Light Output (CLO)	Yes	OFF	
Adjustable Start-up Time (AST)	Yes	1 s	
Integrated Dynadimmer	Yes	OFF	5-step, light turn-off possible
LineSwitch single-step	Yes	ON	
LineSwitch 3-step	Yes	OFF	
AmpDim	Yes	OFF	
Min Dim Level	Yes	10 %	
DC emergency (DCemDim)	Yes	ON	Default: AOC = 15%. EOFx = 10 ... 60%. No external DC rated fuse required. Internal fuse rating: T6.3A 250VAC/DC.
End Of Life indicator (EOL)	Yes	OFF	
Coded Mains	Yes	OFF	
OEM Write Protection (OWP)	Yes	OFF	

## Features

Specification item	Value	Condition
Open load protection	Yes	Automatic recovering
Short circuit protection	Yes	Automatic recovering
Over power protection	Yes	Automatic recovering
Hot wiring	No	
Suitable for fixtures with protection class	I and II	per IEC60598
Overtemperature protection	Yes	Automatic recovering
Diagnostics	Yes	

## Inrush current

Specification item	Value	Unit	Condition
Inrush current	53/300	A/ $\mu$ s	Input voltage 230V
Drivers / MCB 16A type B	$\leq 8$	pcs	Indicative value



Please refer to the driver design in guide if you use other MCB-types.

## Driver touch current / protective conductor current

Specification item	Value	Unit	Condition
Typical Touch Current (ins. Class II)	0.3	mA peak	Acc. IEC61347-1. LED module contribution not included
Typical Protective Conductor Current (ins. Class I)	0.18	mA rms	Acc. IEC60598-1. LED module contribution not included

## Surge immunity

Specification item	Value	Unit	Condition
Mains surge immunity (diff. mode)	6	kV	L-N, Ls-L, Ls-N, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Mains surge immunity (comm. mode)	10	kV	L/N/Ls - EQUI 10kV acc. EN61547; 8kV acc. IEC61000-4-5, 12 Ohm 1.2/50us,8/20us
Control surge immunity (diff. mode)	0.9	kV	DALI - DALI, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Control surge immunity (comm. mode)	6	kV	DALI - EQUI acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us
Control surge immunity (comm. mode)	8	kV	DALI - L/N/Ls acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us

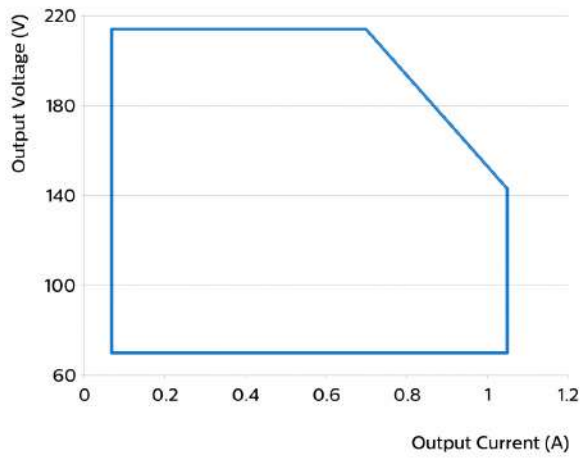
## Application Info

Specification item	Value
Approval marks	CCC / CE / DALI 2 / Double-insulated Built-In / EAC / EL / ENEC / RCM / TISI / UA / WEEE
Ingress Protection classification (IP)	20
Application	Outdoor
Mounting Type	Built-in

## Graphs

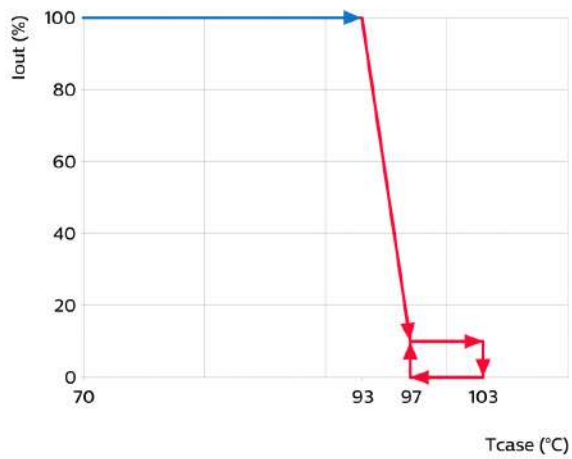
### Operating window

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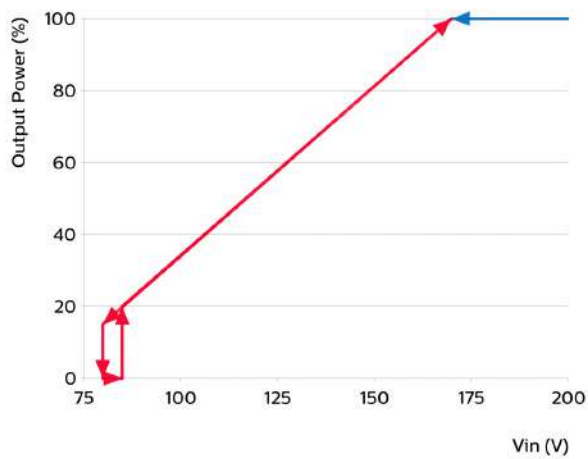
### Thermal Guard

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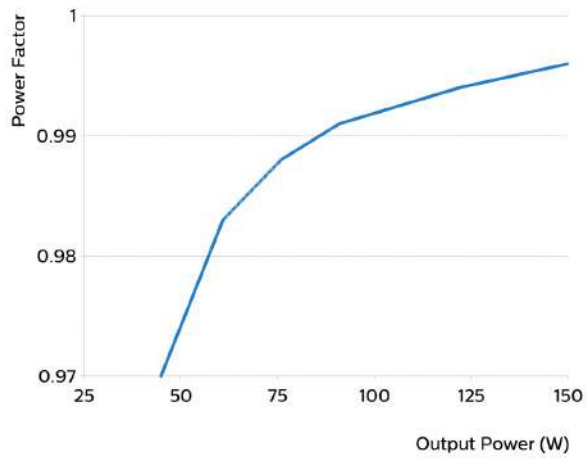
### Mains Guard

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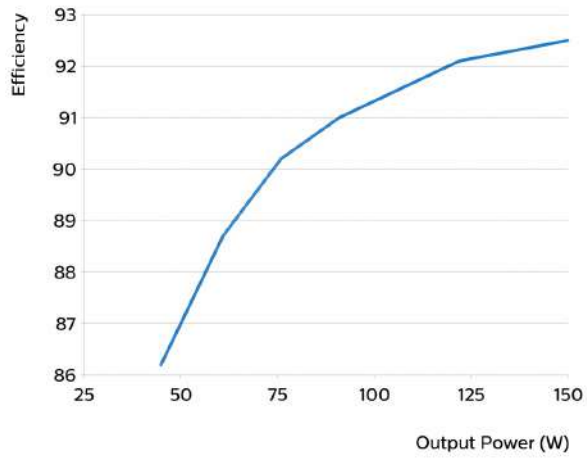
### Power factor versus output power

---



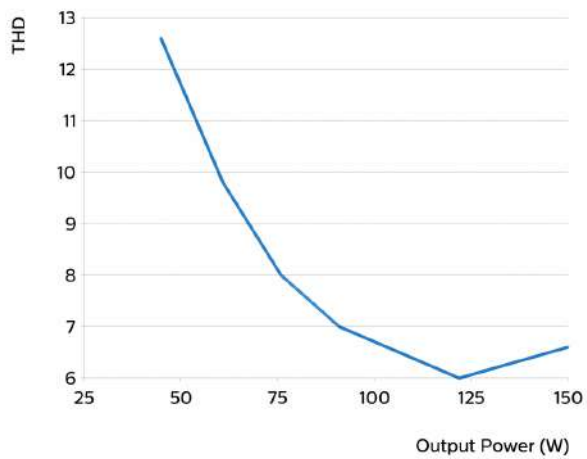
### Efficiency versus output power

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### THD versus output power

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Date of release: June 17, 2021 v3

[www.philips.com/oem](http://www.philips.com/oem)

## **2.5 Materiales de las luminarias**

Informe de ensayo en relación con el material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda.

### **D. Luminaria modelo proyector**

 Relva, 27 A - Torneiros 36410 PORRIÑO - Pontevedra Tel. +34 986 344 000 Fax. +34 986 337 302 e-mail: aimen@aimen.es www.aimen.es C.I.F. G - 36.606.291	Nº Informe Report No.	1142147.2.3	Página Page	1 de 1 1 of 1
	Cliente Customer	IMQ TECNOCREA SL C/ Sèquia de Benàger, P.I.Alquería de Moret 23 - 46210 PICANYA - Valencia (España)		

<b>Datos de la muestra</b> Sample data		Fecha de recepción Receipt date	23.12.2020	Fecha de pedido Receipt date of order	17.12.2020
Descripción Description		Carcasa de aluminio Aluminium housing		Pedido Order	ACEPTACIÓN OFERTA
Id. AIMEN Id. AIMEN		†Referencia del Cliente †Customer's reference			
1142147-B		Luminaria Milan. Luminaria Grupo Benito/Novatilu			

<b>Ensayo de Tracción</b> Tensile Test		Condiciones de ensayo Test conditions		UNE-EN ISO 6892-1:2020 A224				Fecha de ensayo Date of test	11.01.2021	
Id.	Probeta / Specimen			R <sub>p0.2</sub> (MPa)	R <sub>p1</sub> (MPa)	R <sub>eH</sub> (MPa)	R <sub>m</sub> (MPa)	A (%)	Z (%)	
	Orientación Orientation	Tipo Type	Dimensiones Size (mm)							
1142147-B	TRANSVERSAL A LA MUESTRA TRANSVERSE TO THE SAMPLE	P	12,458 x 2,252	185	---	---	242	*1,1	---	
Incertidumbre k=2 Uncertainty				0,053·R <sub>p0.2</sub>	0,053·R <sub>p1</sub>	0,053·R <sub>eH</sub>	0,030·R <sub>m</sub>	0,13·A	0,095·Z	
Observaciones Remarks		*La elongación porcentual tras la rotura se obtiene mediante el extensómetro MTS 50mm N <sup>o</sup> HMEDEX_007 (31030/7-08) *The percentage elongation after breakage is obtained by means of the MTS 50mm extensometer N <sup>o</sup> HMEDEX_007 (31030/7-08)								
Leyenda Legend		R <sub>p0.2</sub> : Limite elástico a 0,2% de deformación / 0,2% offset yield strength. R <sub>p1</sub> : Limite elástico a 1% de deformación / 1% Offset yield strength. R <sub>eH</sub> : Limite superior de cedencia / Upper yield strength.		R <sub>m</sub> : Resistencia a tracción / Tensile strength. A: Alargamiento tras la fractura / Elongation after fracture. Z: Coeficiente de estricción / Reduction of area.		Orientación / Orientation: L: Longitudinal. T: Transversal. Z: Perpendicular al espesor / Through thickness. A: All Weld.		Probeta tipo / Specimentype: P: Prismática / Flat. C: Cilíndrica / Round. T: Tubocompleto / Tube complete. B: Banda de pared de tubo / Strip of tubewall.		

<b>Análisis químico</b> Chemical Analysis										Fecha de ensayo Date of test		14.01.2021	
Muestra Sample		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Pb <sup>#</sup>	Sn <sup>#</sup>	Al
B	% peso wt %	11,10	0,947	0,703	0,334	0,507	<0,028	<0,04	0,777	<0,02	0,036	0,015	Matriz Matrix
	Incert. Uncert.	0,36	0,031	0,030	0,017	0,028	----	----	0,075	----	----	----	----
Método de ensayo Test method		B	B	B	B	B	B	B	B	B	B	B	----
<b>Técnicas de análisis</b> Analysis techniques													
<p>A) Absorción infrarroja tras combustión en horno de inducción: Procedimiento A/PE/AFM.Q/09. / Infrared absorption after induction furnace combustion: Procedure A/PE/AFM.Q/09.</p> <p>B) Espectrometría de emisión por chispa en aleación de aluminio: Procedimiento A/PE/AFM.Q/08 / Spark Emission Spectrometry in aluminium alloy: Procedure A/PE/AFM.Q/08</p> <p>C) Conductividad térmica tras fusión en corriente de gas inerte: Procedimiento A/PE/AFM.Q/11. Thermal conductivity after melting in an inert gas stream: Procedure A/PE/AFM.Q/11.</p> <p>D) ICP-OES: Procedimiento A/PE/AFM.Q/03 / ICP-OES: Procedure A/PE/AFM.Q/03</p>													
Observaciones Remarks		<p>*La composición química de la muestra analizada es característica de una aleación de aluminio EN 1706 EN AC-47100, pero las concentraciones de magnesio (Mg) Y cinc (Zn) están por encima de las indicadas en la norma. *Chemical composition of the sample analyzed is similar to an EN 1706 EN AC-47100 aluminum alloy, but the elements: magnesium (Mg) and zinc (Zn) don't fulfill the values indicate in the standard.</p> <p>La declaración de conformidad está basada en el criterio de aceptación simple según la guía ILAC G8, con una probabilidad de aceptación o rechazo falsos inferior al 50% The statement of conformity is based on the simple acceptance criterion according to the ILAC G8 guide, with a false acceptance or rejection probability of less than 50%".</p>											

Porriño, 16 de febrero de 2021  
Porriño, 16<sup>th</sup> February 2021

Jorge Delgado Guirao  
Coordinador de Análisis Metalográfico y Químico  
Head of Metallography and Chemical Analysis

Agustín Paz Gestoso  
Responsable de Ensayos y Análisis  
Testing and analysis manager

Mauricio Ruibal Acuña  
Coordinador de Ensayos Mecánicos y END  
Mechanical Testing and NDT Coordinator

**Este informe anula y sustituye a nuestro informe nº 1142147.2.2 de fecha 8 de febrero de 2021**  
**This report supersedes our report no. 1142147.2.2 dated 8th February, 2021**

Descripción de los cambios / Description of changes.  
Modificación para incluir la clasificación de la aleación por solicitud del cliente. / Modification to include alloy classification as requested by the customer.



Las actividades marcadas con # no están amparadas por la acreditación de ENAC  
Activities marked with # are not included in the scope of accreditation

Los resultados reflejados en este informe se refieren únicamente a la(s) muestra(s) reseñada(s).  
La información acompañada del superíndice † ha sido facilitada por el cliente, por lo tanto AIMEN no puede asumir responsabilidades sobre su veracidad.  
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The English version is a translation. In case of doubt, the Spanish text of this report is valid.

## DECLARACIÓN DE CONFORMIDAD

### Equipos Alumbrado Público BENITO NOVATILU

**BENITO URBAN SLU**, como fabricante de luminarias, de módulos LED, de protectores de sobretensión, y suministrador de fuentes de alimentación y sistemas de control y regulación, con domicilio social en c/ Lleida, 10 de 08500 VIC (Barcelona – España), con CIF B 59.987.529 y miembro del grupo BENITO NOVATILU.

DECLARA:

Que todas las luminarias del grupo BENITO NOVATILU están fabricadas en aluminio de alta pureza y cumplen con los requerimientos de una aleación de aluminio EN AC-44100 según Norma Europea EN 1706.

Y para que así conste, se expide este documento.

Vic, 4 de febrero de 2022.



**BENITO URBAN S.L.U**  
C.I.F. E3 859 987 529

**Lighting Department**  
Albert de Ramos Pons

### 3 Informe de Pruebas o Certificados de la Luminaria.

#### 3.1 Tabla Verificación (Anexo 4) CEI – IDAE

##### Informe de Pruebas o Certificados emitidos por el fabricante de la luminaria o entidad OEC acreditada

- |   |  |   |
|---|--|---|
| 1 | Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes. (Propio de la empresa)  | ✓ |
| 2 | Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4.  | ✓ |
| 3 | Ensayo colorimétrico de la luminaria según la Norma UNE EN 13032-4.  | ✓ |
| 4 | Ensayo de medidas eléctricas: tensión, corriente de alimentación, potencia nominal leds y potencia total consumida por luminaria con todos sus elementos integrantes y factor de potencia. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria. | ✓ |



**FABRICANTE:** BENITO URBAN, SLU  
**MANUFACTURER:** C/ Lleida 10 08500 Vic (Barcelona) – Spain  
Tel.: (+34) 93 852 1000

Certificamos y declaramos bajo nuestra responsabilidad que el siguiente producto:

*We certify and declare under our responsibility that the following product:*

**Marca:** **BENITO**  
**Brand:** **NOVATILU**

**Modelo:** Proyector **P-MILAN S – P-MILAN M – P-MILAN XL – P-MILAN XXL**  
**Model:** Projectors **APMSL – APML – APMXL – APMXXL**

Está conforme a las siguientes directivas y normativas:

*It is according to the following directives and norms:*

UNE-EN-61000-3-2:2006+A1:2010+A2:2010  
UNE-EN-61000-3-3:2009  
UNE-EN-61547:2011  
UNE-EN-55015:2007+A1:2008+A2:2009

Compatibilidad electromagnética (CEM).  
- Límites emisiones corrientes armónicas  
- Limitación variación tensión y flicker en redes públicas  
- Requisitos de Inmunidad  
- Límites perturbación radioeléctrica  
*Electromagnetic compatibility (EMC).*  
*-Limits harmonic current emissions*  
*-Limiting voltage variation and flicker in electrical networks*  
*-Immunity requirements*  
*-Limits radio electrical disturbance*

UNE-EN-60598-2-5:2015  
UNE-EN-60598-1:2015+A1:2018  
UNE-EN-62262  
UNE-EN-62471  
UNE-EN-62493:2015  
UNE-EN-62031:2009  
IEC 62722-1:2014  
IEC 62722-2-1:2014  
IEC 62717:2014

Luminarias Alumbrado Público  
- Requisitos generales y ensayos  
- Grado protección contra impactos (IK)  
- Seguridad Fotobiológica  
- Módulos LED. Requisitos de seguridad  
- Evaluación de los equipos de alumbrado en relación a la exposición humana a los campos electromagnéticos.  
-Características de funcionamiento de luminarias. Requisitos generales.  
-Requisitos particulares para luminarias LED.  
-Módulos LED para iluminación general. Requisitos de funcionamiento.  
*Street Lighting Luminaires*  
*- General requirements and tests*  
*- Degrees of protection mechanical impacts (IK)*  
*- Photobiological safety*  
*- LED Modules. Safety requirement*  
*-Assessment of lighting equipment related to human exposure to electromagnetic fields*  
*-Characteristics of operation of accessories. General requirements*  
*- Specific requirements for LED lighting.*  
*-LED modules for general lighting. Operating requirements.*

IEC 62321

Determinación de ciertas sustancias en productos electrotécnicos. Es equivalente a la UNE EN 63000  
*Determination of certain substances in electrotechnical products. It is equivalent to the UNE EN 63000*

**Fecha de emisión:** Enero 2021  
**Issued on:** *January 2021*

**Firmado:**  
**Signed:**



**Jordi Puig Rovira**

Ingeniero Técnico Telecomunicación (col. 903055)  
Design & Engineering - Lighting Department

Los ensayos marcados con \* no están amparados por la acreditación ENAC

# INFORME DE ENSAYO



## **Asselum luminotècnics, SL**

Polígono Industrial Can Roqueta  
C/ Ca n'Alzina 76 08202 Barcelona  
Tel - Fax: 93.725.98.10  
[www.asselum.com](http://www.asselum.com)

**Cliente:** BENITO – NOVATILU

**Dirección:** C/Lleida 10, 08500, Vic

**Provincia:** Barcelona

**País:** España

**Teléfono:** 938521000

**Nombre muestra<sup>1</sup>:** P.Milan M 140W 4K

**Código muestra<sup>1</sup>:** APM

**Nº muestra:** RM21072804.12

**Fecha del ensayo:** 22/11/2021

**Código de ensayo:** CL237A21F017V

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

Informe revisado:



**Marc Ballbè**  
Director técnico

Los resultados obtenidos en el presente informe se refieren únicamente a la muestra ensayada conforme en el apartado 1.1.No se podrá reproducir total o parcialmente el informe sin el consentimiento de **ASELUM assessorsluminotècnics, S.L.**  
La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa.

*Cualquier impresión del presente informe será considerada como una copia del mismo.*  
**Assessors luminotècnics, SL Pol. Ind. Can Roqueta C/. Ca n'Alzina, 76 - 08202 Sabadell Barcelona**  
**Tel. 93 725 98 10 [www.asselum.com](http://www.asselum.com)**

## **ÍNDICE DEL INFORME**

### **1. Descripción de la muestra y del ensayo**

1.1. Ficha técnica del producto

1.1.1. Imagen de la muestra

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1.3. Parámetros del test eléctrico

1.4. Condiciones ambientales

1.5. Instrumentos utilizados

### **2. Parámetros eléctricos medidos**

2.1. Medición del conjunto

### **3. Observaciones**

### **4. Resultados del ensayo de fotometría**



## 1. Descripción de la muestra y del ensayo

### 1.1. Ficha técnica del producto

Tipo	Luminária
Código Producto <sup>1</sup>	APM
Nombre <sup>1</sup>	P.Milan M 140W 4K
Dimensiones [mm]	390 x 340 x 80
Área luminosa [mm]	150 x 200 x 0
Tipo fuente de luz	LED
Flujo luminoso[ <b>lm</b> ]	17389
Potencia del conjunto[ <b>W</b> ]	136,2
Eficacia luminosa[ <b>lm/W</b> ]	127,6

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

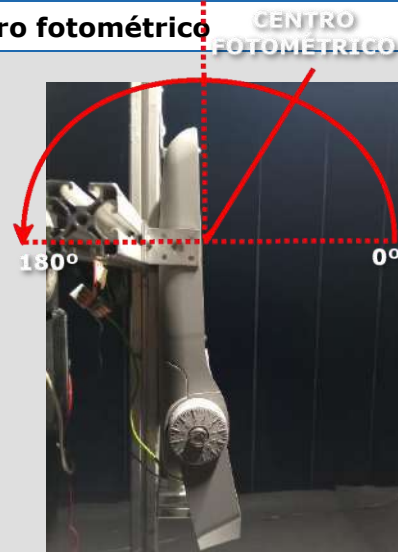
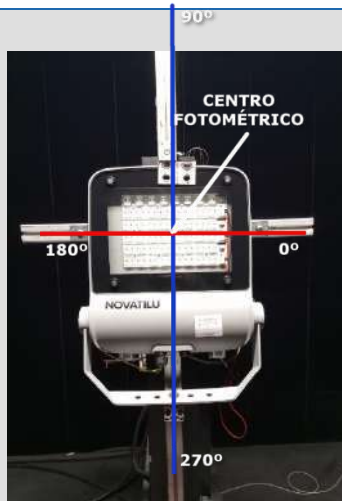
#### 1.1.1. Imagen de la muestra



## 1.2. Ficha del ensayo

Normas de referencia	UNE-EN 13032-4:2016 EN 13032-4: 2015 CIE S 025: 2015 CIE 34:1977 CIE 52:1982 CIE 117:1995 IES TM-15:07
Sistema de medición	$C-\gamma, C = \Delta 15^\circ, G = \Delta 2,5^\circ$

### Sistema de referencia y centro fotométrico




## 1.3. Parámetros del test eléctrico

Tipo de alimentación	Fuente estabilizada
Alimentación eléctrica	230V AC $\pm$ 0,4%
Distorsión armónica	< 0,5%
Frecuencia	50 Hz $\pm$ 0.1%

## 1.4. Condiciones ambientales

Temperatura del laboratorio [°C]	25°C $\pm$ 1,2°C
Humedad relativa	< 60%
Movimiento del aire	< 0,25 m/s

## 1.5. Instrumentos utilizados

Goniofotómetro	<p>Goniofotómetro T2 de rotación de la luminaria acuerdo con las normas y recomendaciones:</p> <ul style="list-style-type: none"> <li>❖ EN 13032-1 2005 cap. 6.1.1.1 – tipo de goniofotómetro 1.1, 1.2 y 1.3</li> <li>❖ Recomendación CIE 121 Cap.5 Tipo 1 y 2</li> </ul> <p>Nº identificativo: E-001          Distancia de medición: 6,44 m</p>
Posición de ensayo de la muestra	El ensayo se realiza con la muestra en posición en horizontal y se aplica un factor de corrección entregando el resultado en función de la posición de diseño.
Fuente de alimentación	Fuente de alimentación AC ET-System modelo EAC-S-1000 Nº identificativo: E-019
Multímetro	MULTIMETRO NEWTON 4TH. MODELO PPA 1510 Nº identificativo: E-020
Luxómetro	Luxómetro CZIULA&GRUNDMANN Nº identificativo: E-003
Anemómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Termómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Termómetro	TERMOMETRO DIGITAL PCE-T 390 Nº identificativo: E-018
	

## 2. Parámetros eléctricos medidos

### 2.1. Medición del conjunto

Tensión de alimentación [V]	230,0
Intensidad [A]	0,595
Potencia [W]	136,2
Factor de potencia	0,99

### 3. Observaciones

- Queda prohibida la reproducción parcial de este documento.
- Este Informe no puede presentar enmiendas o raspaduras, en caso contrario será considerado nulo.
- La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa, en la instrucción técnica IT10 de ASSELUM.

### 4. Resultados del ensayo de fotometría

## 4.1. Resumen

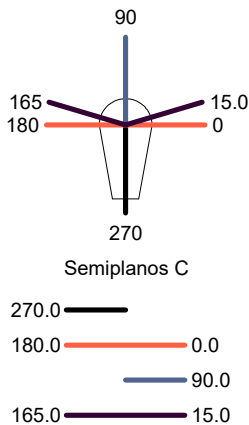
### Luminaria

Código APM  
 Nombre P.Milan M 140W 4K  
**Ensayo**  
 Código CL237A21F017V  
 Nombre P.Milan M 140W 4K

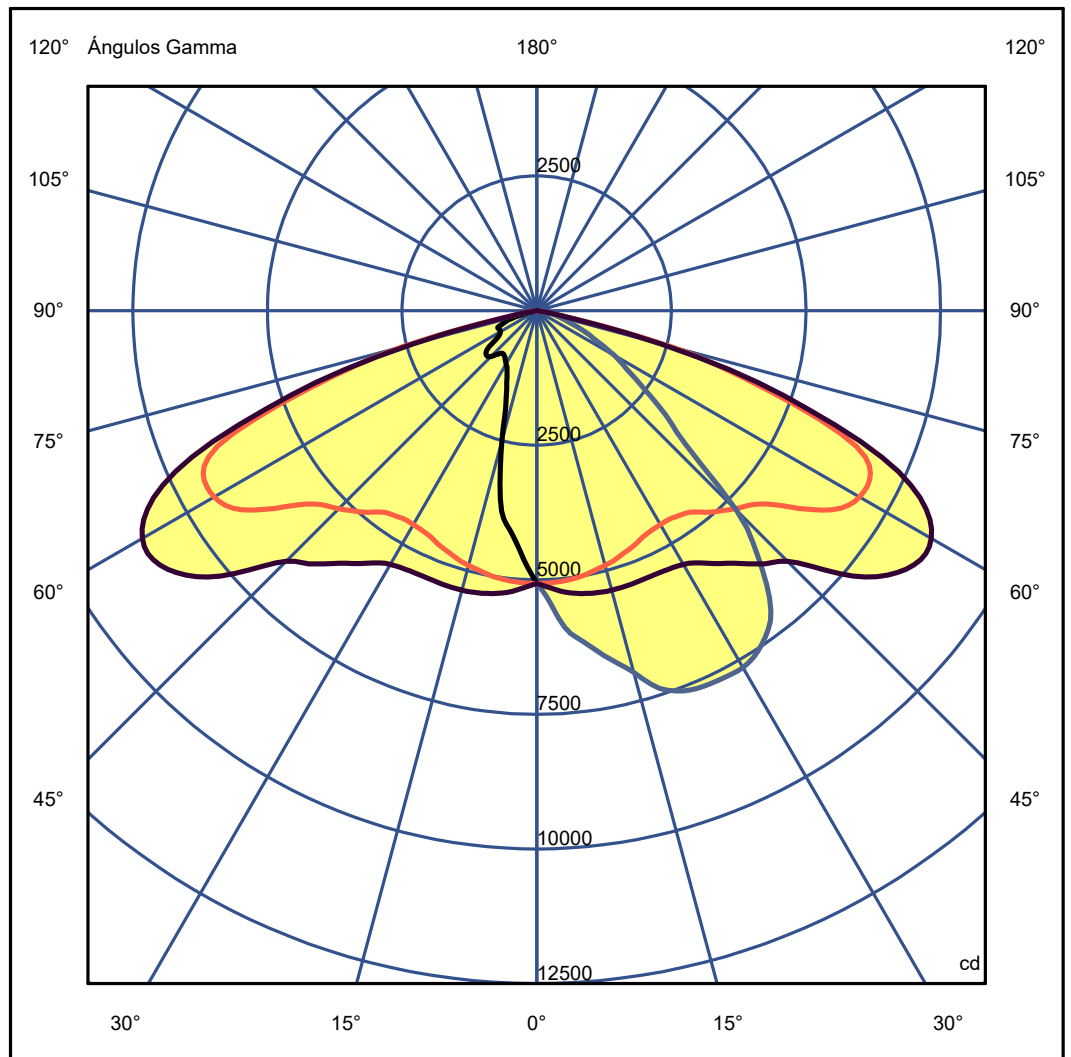
Flujo Luminaria	17388.77 lm	Potencia Luminaria	136.22 W	Eficacia	127.65 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	17388.77 lm	Valor Máximo	8510.49 cd	Posición	C=15.00 G=57.50	CG	Sim. en los planos 270-90
Luminaria Rectangular	Longit. 390 mm	Anchura	340 mm	Altura	80 mm		
Área Luminosa Rectangular	Longit. 150 mm	Anchura	200 mm	Altura	0 mm		
Área Luminosa Horizontal	0.030000 m2	Área Emisión sobre Pl. 180°	0.000000 m2	Área de deslumbramiento a 76°	0.007258 m2		
Área Emisión sobre Pl. 0°	0.000000 m2	Área Emisión sobre Pl. 270°	0.000000 m2				
Área Emisión sobre Pl. 90°	0.000000 m2						
Sist. de Coorden.	CG viales	Tipo de Simetría	Sim. en los planos 270-90				
Fecha	22-11-2021	Máximo Ángulo Gamma	180				
Distancia de Ensayo	6.44	Flujo de Ensayo	17388.77 lm				
Operador	Asselum T2	Tensión Nominal	230.01 V				
Temperatura	25.70 °C	Corriente Nominal	0.60 A				
Humedad	33.80 %	Fotocélula	Prc				
Notas	RM21072804.12						

### Fuentes de luz de la Luminaria

Familia	Código	Nombre	Flujo [lm]	Pot. [W]	Cant.
	5050	Lumiled 5050	17388.77	136.22	1
C.I.E.	40 75 97 100 100	D DIN 5040	A20		



ULOR 0.07 %  
 DLOR 99.93 %  
 RN 0.07 %



## 4.2. Matriz de intensidades (Cd)

**Luminaria**  
 Código APM  
 Nombre P.Milan M 140W 4K  
**Ensayo**  
 Código CL237A21F017V  
 Nombre P.Milan M 140W 4K

Flujo Luminaria	17388.77 lm	Potencia Luminaria	136.22 W	Eficacia	127.65 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	17388.77 lm	Valor Máximo	8510.49 cd	Posición	C=15.00 G=57.50	CG	Sim. en los planos 270-90

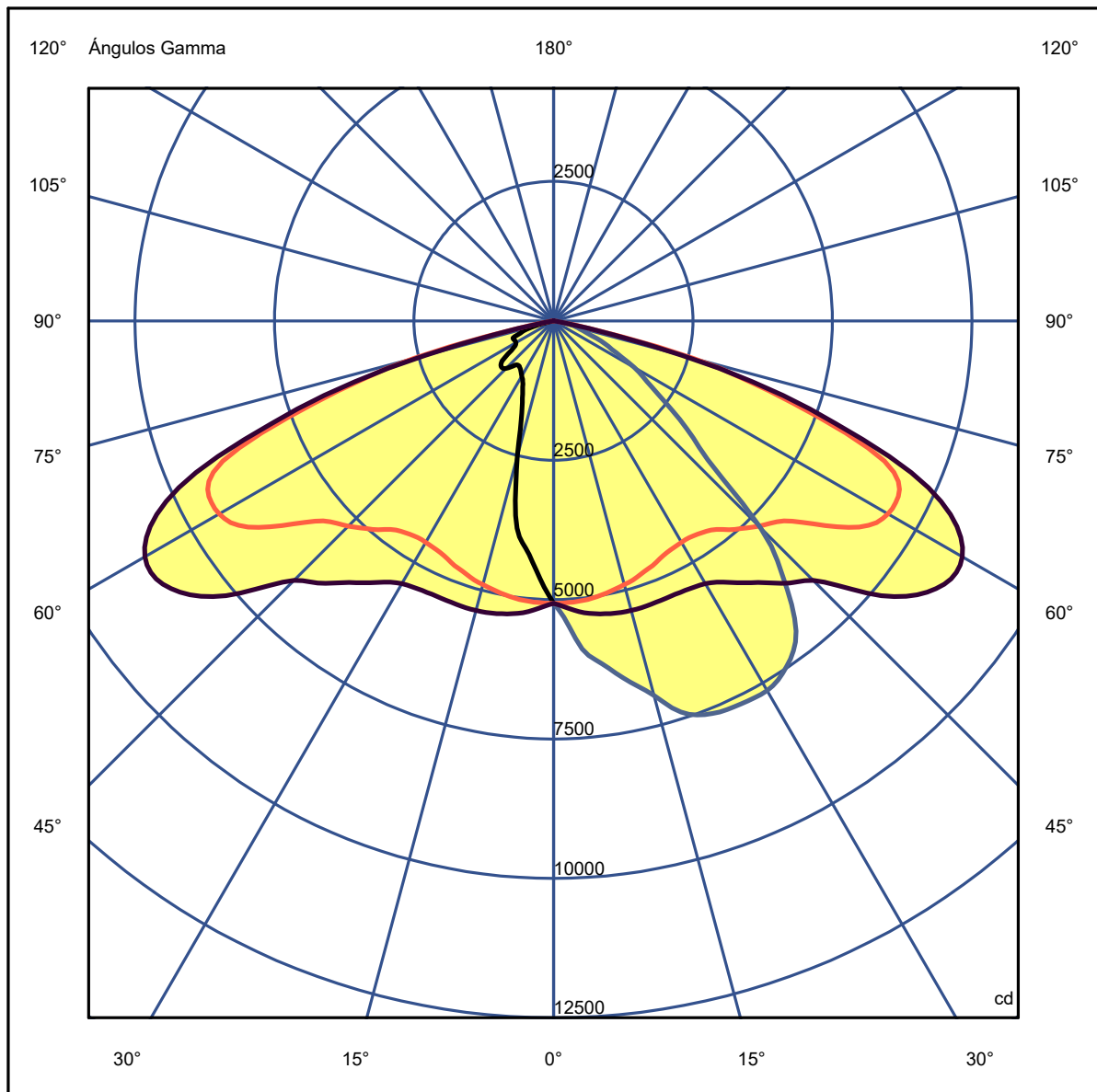
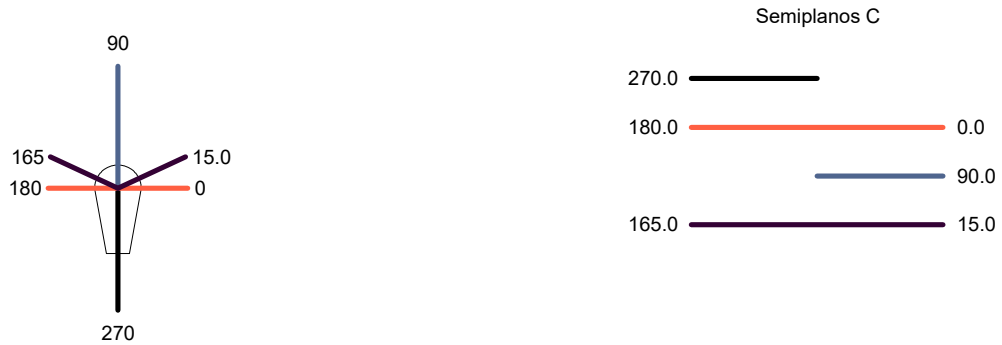
**Tabla de Intensidad Luminosa cd Tabla 1/1**

	C 270.00	C 285.00	C 300.00	C 315.00	C 330.00	C 345.00	C 0.00	C 15.00	C 30.00	C 45.00	C 60.00	C 75.00	C 90.00
G 0.0	5064.44	5064.44	5064.44	5064.44	5064.44	5064.44	5064.44	5064.44	5064.44	5064.44	5064.44	5064.44	5064.44
G 2.5	4702.18	4760.42	4754.92	4799.70	4863.40	4979.36	5060.25	5142.81	5241.01	5363.16	5380.88	5400.45	5400.45
G 5.0	4335.50	4391.71	4431.48	4551.36	4681.24	4892.90	5048.49	5234.09	5459.30	5567.70	5757.03	5636.75	5904.59
G 7.5	4057.65	3967.22	4154.73	4300.70	4482.09	4789.36	5027.53	5294.10	5598.83	5730.53	6010.75	5874.73	6161.73
G 10.0	3777.34	3721.29	3869.55	4069.87	4253.24	4667.66	4989.22	5333.02	5717.70	5872.65	6226.01	6213.77	6412.40
G 12.5	3451.06	3451.55	3505.93	3873.32	4081.97	4507.52	4941.72	5361.40	5811.83	6005.97	6423.13	6458.01	6676.51
G 15.0	2500.92	3093.30	3092.68	3586.56	3883.04	4391.12	4896.50	5375.23	5907.71	6206.29	6640.39	6689.74	6956.30
G 17.5	1951.64	2544.69	2553.24	3332.99	3728.92	4268.62	4846.35	5376.25	5977.96	6347.49	6861.06	6878.34	7321.76
G 20.0	1652.14	1946.05	2062.02	3041.04	3565.65	4150.60	4776.23	5369.55	6052.84	6458.39	7111.49	7009.93	7517.64
G 22.5	1458.22	1532.71	1749.81	2649.16	3382.16	4036.75	4720.24	5364.25	6102.05	6543.36	7246.18	7065.63	7608.00
G 25.0	1308.04	1365.32	1480.43	2261.90	3115.22	3881.84	4645.15	5371.62	6157.51	6610.34	7306.83	7070.34	7639.65
G 27.5	1198.86	1223.17	1345.27	1922.81	2880.78	3762.18	4605.29	5393.68	6222.55	6659.62	7309.38	7043.55	7654.22
G 30.0	1141.80	1142.51	1239.98	1636.93	2566.77	3661.35	4584.78	5441.21	6323.53	6691.00	7276.17	6991.57	7655.10
G 32.5	1086.90	1090.11	1176.53	1504.08	2328.96	3576.52	4587.31	5550.26	6422.58	6728.03	7236.11	6898.90	7566.64
G 35.0	1042.06	1015.22	1113.48	1378.63	2096.88	3509.84	4637.02	5732.52	6543.68	6778.50	7197.13	6754.33	7398.86
G 37.5	1017.64	970.87	1060.33	1239.36	1897.99	3458.98	4715.20	5914.17	6684.04	6849.70	7170.40	6351.03	7138.40
G 40.0	1029.03	941.22	998.80	1112.10	1665.31	3423.30	4886.23	6136.36	6848.63	6898.11	7130.97	5862.40	6639.69
G 42.5	1103.90	939.92	986.17	996.48	1485.59	3432.68	5043.61	6364.19	7025.54	6898.94	7025.19	5292.55	6002.14
G 45.0	1203.54	977.99	1005.29	907.09	1345.27	3477.73	5203.93	6580.85	7270.17	6856.38	6821.54	4560.04	5245.52
G 47.5	1248.65	1061.20	1050.83	852.67	1247.88	3545.37	5349.22	7071.19	7479.89	6816.34	6503.68	3794.28	3906.48
G 50.0	1235.54	1123.37	1066.82	813.27	1177.64	3619.55	5585.53	7662.76	7800.71	6799.48	5818.76	3204.97	3266.40
G 52.5	1138.84	1086.23	1022.89	785.55	1121.65	3702.93	6005.89	8093.19	8145.53	6670.73	5131.17	2573.49	2761.86
G 55.0	923.29	986.10	894.53	754.20	1090.40	3879.47	6455.78	8370.54	8294.24	6270.43	4356.81	2095.72	2284.11
G 57.5	814.52	850.77	776.61	711.64	1136.76	4159.71	6782.04	8510.49	8315.80	5567.78	3601.89	1811.46	1937.37
G 60.0	782.79	743.37	679.52	669.95	1163.46	4454.08	6921.17	8456.12	7972.54	4862.17	3002.05	1565.36	1672.62
G 62.5	775.08	675.05	592.83	618.97	1133.92	4593.73	6941.68	8198.14	7527.56	4226.24	2330.70	1327.32	1317.59
G 65.0	786.01	637.45	542.29	566.40	1129.61	4468.28	6816.10	7663.36	7341.00	3541.59	1964.90	1118.98	1087.22
G 67.5	775.32	612.69	493.44	502.81	1143.82	4321.45	6277.25	6738.68	7110.96	2800.85	1658.24	838.52	878.33
G 70.0	630.27	585.94	439.92	438.24	1136.71	4144.24	5082.54	5385.14	6493.24	2088.67	1355.86	620.96	646.71
G 72.5	536.55	536.47	362.60	373.47	833.99	3369.95	3820.30	4038.27	5034.60	1384.40	1075.85	450.98	523.17
G 75.0	309.22	431.67	260.75	309.65	376.38	2327.43	2589.17	2385.16	3416.45	736.20	776.98	308.75	408.18
G 77.5	129.00	291.33	135.35	234.19	182.47	1461.82	973.21	848.22	1523.26	457.75	536.89	142.16	331.70
G 80.0	22.71	135.63	32.06	158.30	99.11	560.26	210.57	183.86	674.71	186.38	364.66	80.67	155.01
G 82.5	1.05	28.49	3.08	65.35	29.59	138.88	81.08	61.94	255.21	75.75	207.34	39.20	84.67
G 85.0	0.55	1.49	0.97	14.16	7.35	53.11	31.90	14.35	98.70	20.13	99.39	14.09	32.91
G 87.5	0.55	0.52	0.66	3.22	1.94	18.70	9.65	2.66	20.56	3.80	31.46	3.85	12.55
G 90.0	0.56	0.53	0.64	1.12	1.02	5.40	1.74	1.25	4.34	0.74	4.49	0.78	4.87
G 92.5	0.59	0.55	0.71	0.77	1.22	1.14	1.43	1.40	1.01	0.68	0.91	0.68	1.33
G 95.0	0.64	0.57	0.78	0.85	1.42	1.24	1.67	1.62	0.92	0.72	0.72	0.68	0.79
G 97.5	0.71	0.62	0.86	1.04	1.77	1.54	1.96	1.87	1.03	0.79	0.71	0.73	0.73
G100.0	0.74	0.66	0.98	1.24	2.01	1.80	2.26	2.10	1.14	0.83	0.75	0.77	0.77
G102.5	0.84	0.74	1.12	1.43	2.29	2.11	2.55	2.30	1.27	0.89	0.80	0.82	0.86
G105.0	0.93	0.85	1.32	1.60	2.52	2.40	2.91	2.43	1.40	0.96	0.84	0.86	0.91
G107.5	0.99	0.90	1.50	1.80	2.71	2.65	3.09	2.50	1.49	1.01	0.89	0.87	0.91
G110.0	1.10	1.01	1.68	1.95	2.90	2.92	3.19	2.56	1.58	1.05	0.93	0.89	0.96
G112.5	1.32	1.12	1.88	2.19	3.09	3.11	3.21	2.59	1.63	1.09	0.94	0.93	0.99
G115.0	1.48	1.26	2.07	2.43	3.20	3.22	3.25	2.61	1.70	1.12	0.97	0.94	1.00
G117.5	1.63	1.42	2.27	2.57	3.28	3.32	3.25	2.56	1.74	1.16	1.00	0.96	1.00
G120.0	1.81	1.67	2.48	2.74	3.33	3.37	3.19	2.54	1.76	1.19	1.02	0.98	1.05
G122.5	1.99	1.83	2.60	2.84	3.37	3.37	3.04	2.51	1.79	1.24	1.04	0.99	1.05
G125.0	2.17	2.01	2.73	2.94	3.40	3.36	2.98	2.49	1.82	1.30	1.07	1.02	1.09
G127.5	2.46	2.15	2.85	3.05	3.42	3.32	2.91	2.47	1.85	1.35	1.09	1.02	1.09
G130.0	2.64	2.31	2.96	3.14	3.47	3.31	2.85	2.45	1.88	1.38	1.12	1.05	1.09
G132.5	2.80	2.53	3.07	3.18	3.49	3.32	2.79	2.45	1.90	1.45	1.16	1.08	1.13
G135.0	2.93	2.67	3.16	3.23	3.55	3.32	2.79	2.45	1.92	1.50	1.25	1.11	1.14
G137.5	3.08	2.78	3.25	3.26	3.56	3.32	2.77	2.45	1.96	1.58	1.30	1.16	1.17
G140.0	3.19	2.89	3.31	3.32	3.56	3.34	2.77	2.48	2.03	1.64	1.38	1.24	1.22
G142.5	3.25	2.97	3.38	3.35	3.56	3.34	2.74	2.50	2.04	1.72	1.44	1.33	1.32
G145.0	3.32	3.04	3.40	3.40	3.56	3.36	2.74	2.51	2.10	1.79	1.52	1.44	1.41
G147.5	3.37	3.12	3.49	3.43	3.56	3.33	2.72	2.55	2.14	1.88	1.67	1.55	1.50
G150.0	3.41	3.18	3.54	3.45	3.54	3.32	2.72	2.59	2.19	1.95	1.77	1.69	1.59
G152.5	3.49	3.23	3.56	3.46	3.52	3.28	2.73	2.65	2.29	2.11	1.91	1.81	1.73
G155.0	3.56	3.27	3.60	3.47	3.49	3.28	2.76	2.70	2.37	2.20	2.03	1.96	1.86
G157.5	3.66	3.34	3.66	3.49	3.49	3.25	2.78	2.75	2.45	2.30	2.12	2.09	2.09
G160.0	3.73	3.40	3.65	3.48	3.47	3.23	2.79	2.81	2.53	2.42	2.28	2.25	2.23
G162.5	3.81	3.46	3.71	3.49	3.47	3.23	2.83	2.91	2.61	2.54	2.43	2.45	2.36
G165.0	3.82	3.51	3.69	3.47	3.47	3.24	2.90	2.98	2.73	2.68	2.60	2.59	2.55
G167.5	3.82	3.51	3.69	3.49	3.45	3.25	2.93	3.04	2.87	2.82	2.76	2.72	2.73
G170.0	3.79	3.53	3.68	3.48	3.43	3.25	2.95	3.12	2.99	2.96	2.89	2.87	2.92
G172.5	3.77	3.52	3.67	3.46	3.45	3.26	2.99	3.16	3.09	3.06	3.04	2.99	3.06
G175.0	3.73	3.49	3.62	3.45	3.45	3.30	3.01	3.22	3.19	3.13	3.21	3.13	3.26
G177.5	3.64	3.43	3.55	3.41	3.43	3.31	3.04	3.25	3.29	3.25	3.37	3.26	3.43
G180.0	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36

### 4.3. Distribución polar de intensidades (Cd)

**Luminaria**  
 Código APM  
 Nombre P.Milan M 140W 4K  
**Ensayo**  
 Código CL237A21F017V  
 Nombre P.Milan M 140W 4K

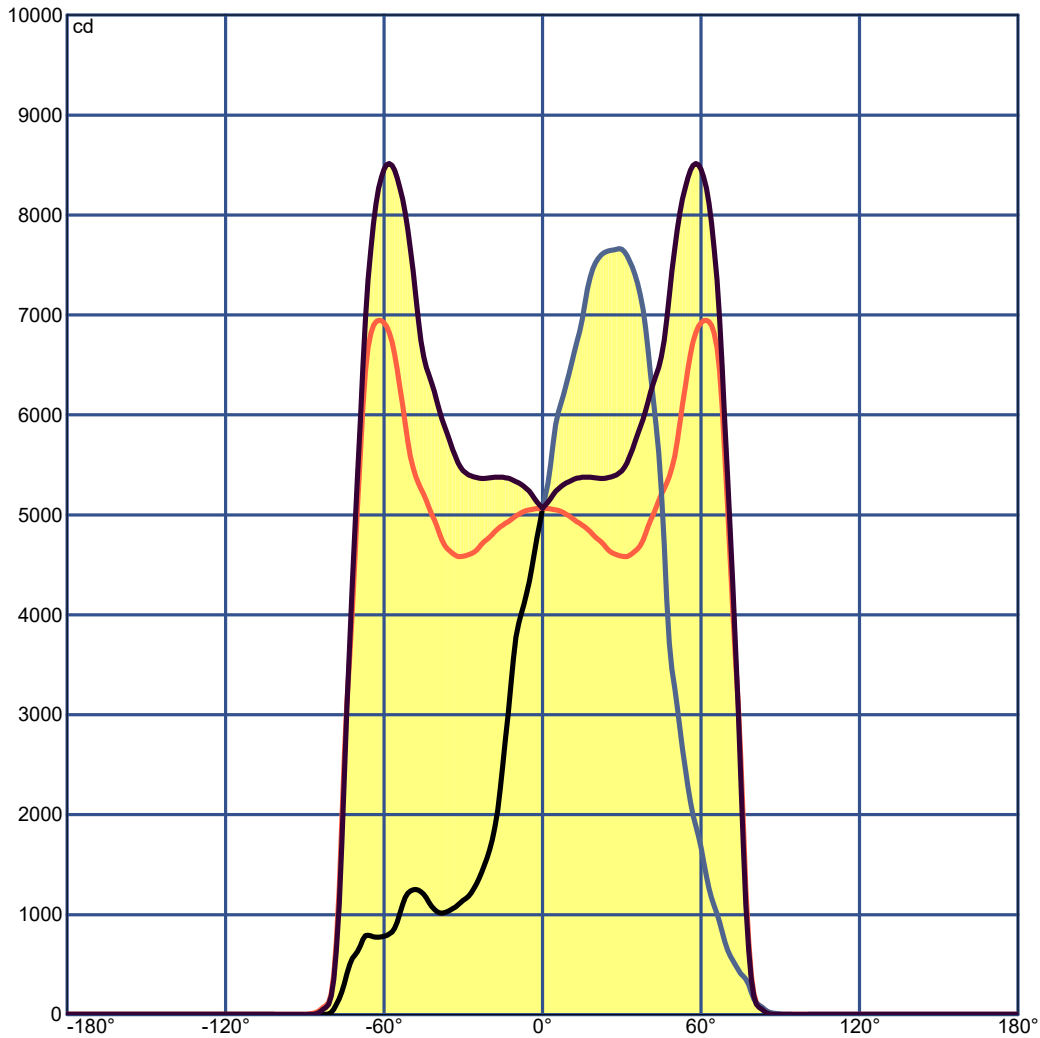
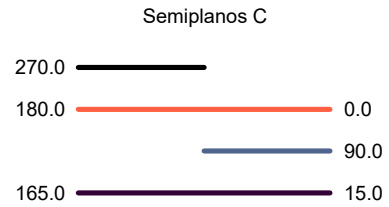
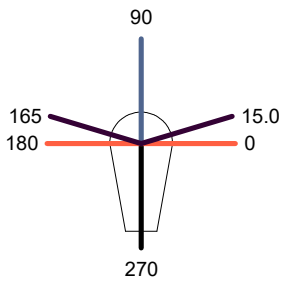
Flujo Luminaria	17388.77 lm	Potencia Luminaria	136.22 W	Eficacia	127.65 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	17388.77 lm	Valor Máximo	8510.49 cd	Posición	C=15.00 G=57.50	CG	Sim. en los planos 270-90



### 4.4. Distribución cartesiana de intensidades (Cd)

**Luminaria**  
 Código APM  
 Nombre P.Milan M 140W 4K  
**Ensayo**  
 Código CL237A21F017V  
 Nombre P.Milan M 140W 4K

Flujo Luminaria	17388.77 lm	Potencia Luminaria	136.22 W	Eficacia	127.65 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	17388.77 lm	Valor Máximo	8510.49 cd	Posición	C=15.00 G=57.50	CG	Sim. en los planos 270-90





## 4.5. Flujo zonal

### Luminaria

Código APM  
 Nombre P.Milan M 140W 4K  
**Ensayo**  
 Código CL237A21F017V  
 Nombre P.Milan M 140W 4K

Flujo Luminaria	17388.77 lm	Potencia Luminaria	136.22 W	Eficacia	127.65 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	17388.77 lm	Valor Máximo	8510.49 cd	Posición	C=15.00 G=57.50	CG Sim. en los planos	270-90

Flujo Total=17388.77 Flujo Luminaria=17388.77

RI	0.60	0.80	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	10.00	20.00
DRR	0.26	0.34	0.42	0.50	0.56	0.65	0.72	0.76	0.82	0.86	0.93	0.97
RC	6	6	6	6	6	6	5	5	5	5	4	3

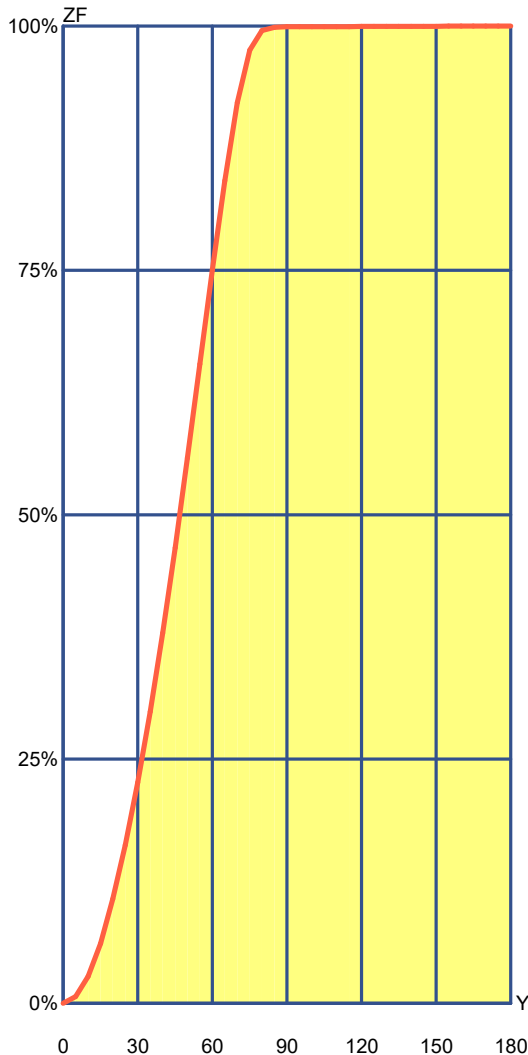
Flujo Zonal por 1000 Lúmenes

Y°	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
ZF(Y)	28	107	226	379	558	750	922	995	999	999	999	1000	1000	1000	1000	1000	1000	1000

Códigos de Flujo C.I.E.  
 40 75 97 100 100

C.I.E. 6/6/6/6/6/6/5/5/5/4/3  
 D DIN 5040 A20  
 F UTE 1.00 E  
 B NBN BZ 5  
 RN 0.07420 %  
 BLF 1.0

LOR 100.00000 %  
 ULOR 0.07420 %  
 DLOR 99.92580 %  
 UFF 0.07420 %  
 DFF 99.92580 %  
 FFR 0.07426 %



Flujo Zonal				
Gamma °	Flujo	Suma lm	Flujo [%]	Suma [%]
0°	0.00	0.00	0.00%	0.00 %
5°	6.96	6.96	0.70 %	0.70 %
10°	20.69	27.65	2.07 %	2.77 %
15°	33.69	61.34	3.37 %	6.13 %
20°	45.25	106.60	4.53 %	10.66 %
25°	55.19	161.79	5.52 %	16.18 %
30°	64.05	225.83	6.40 %	22.58 %
35°	72.60	298.43	7.26 %	29.84 %
40°	80.54	378.97	8.05 %	37.90 %
45°	86.97	465.94	8.70 %	46.59 %
50°	91.91	557.86	9.19 %	55.79 %
55°	96.14	653.99	9.61 %	65.40 %
60°	96.33	750.33	9.63 %	75.03 %
65°	91.35	841.67	9.13 %	84.17 %
70°	79.91	921.59	7.99 %	92.16 %
75°	54.00	975.58	5.40 %	97.56 %
80°	19.90	995.48	1.99 %	99.55 %
85°	3.38	998.86	0.34 %	99.89 %
90°	0.40	999.26	0.04 %	99.93 %
95°	0.04	999.30	0.00 %	99.93 %
100°	0.04	999.33	0.00 %	99.93 %
105°	0.04	999.38	0.00 %	99.94 %
110°	0.05	999.43	0.01 %	99.94 %
115°	0.06	999.48	0.01 %	99.95 %
120°	0.06	999.54	0.01 %	99.95 %
125°	0.06	999.60	0.01 %	99.96 %
130°	0.06	999.66	0.01 %	99.97 %
135°	0.05	999.71	0.01 %	99.97 %
140°	0.05	999.76	0.01 %	99.98 %
145°	0.05	999.81	0.00 %	99.98 %
150°	0.04	999.86	0.00 %	99.99 %
155°	0.04	999.90	0.00 %	99.99 %
160°	0.03	999.93	0.00 %	99.99 %
165°	0.03	999.96	0.00 %	100.00 %
170°	0.02	999.98	0.00 %	100.00 %
175°	0.01	1000.00	0.00 %	100.00 %
180°	0.00	1000.00	0.00 %	100.00 %

## 4.6. Diagrama Isolux

**Luminaria**

Código APM  
Nombre P.Milan M 140W 4K

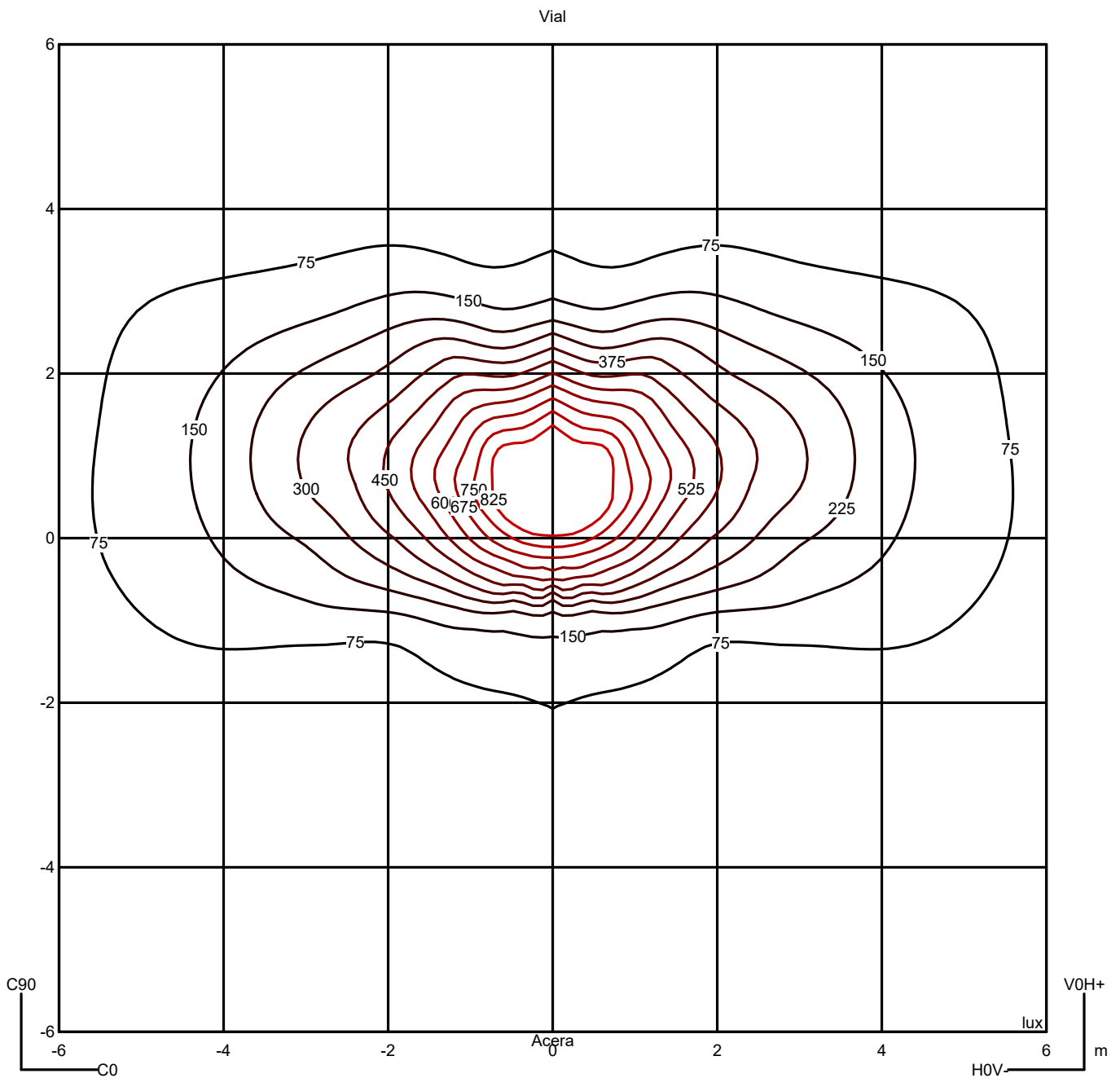
**Ensayo**

Código CL237A21F017V  
Nombre P.Milan M 140W 4K

Flujo Luminaria	17388.77 lm	Potencia Luminaria	136.22 W	Eficacia	127.65 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	17388.77 lm	Valor Máximo	8510.49 cd	Posición	C=15.00 G=57.50	CG	Sim. en los planos 270-90

Isolux (Suelo)

Posición Luminaria X=0.00m Y=0.00m Z=2.50m



### 4.7. Factor de utilización

**Luminaria**

Código APM  
Nombre P.Milan M 140W 4K

**Ensayo**

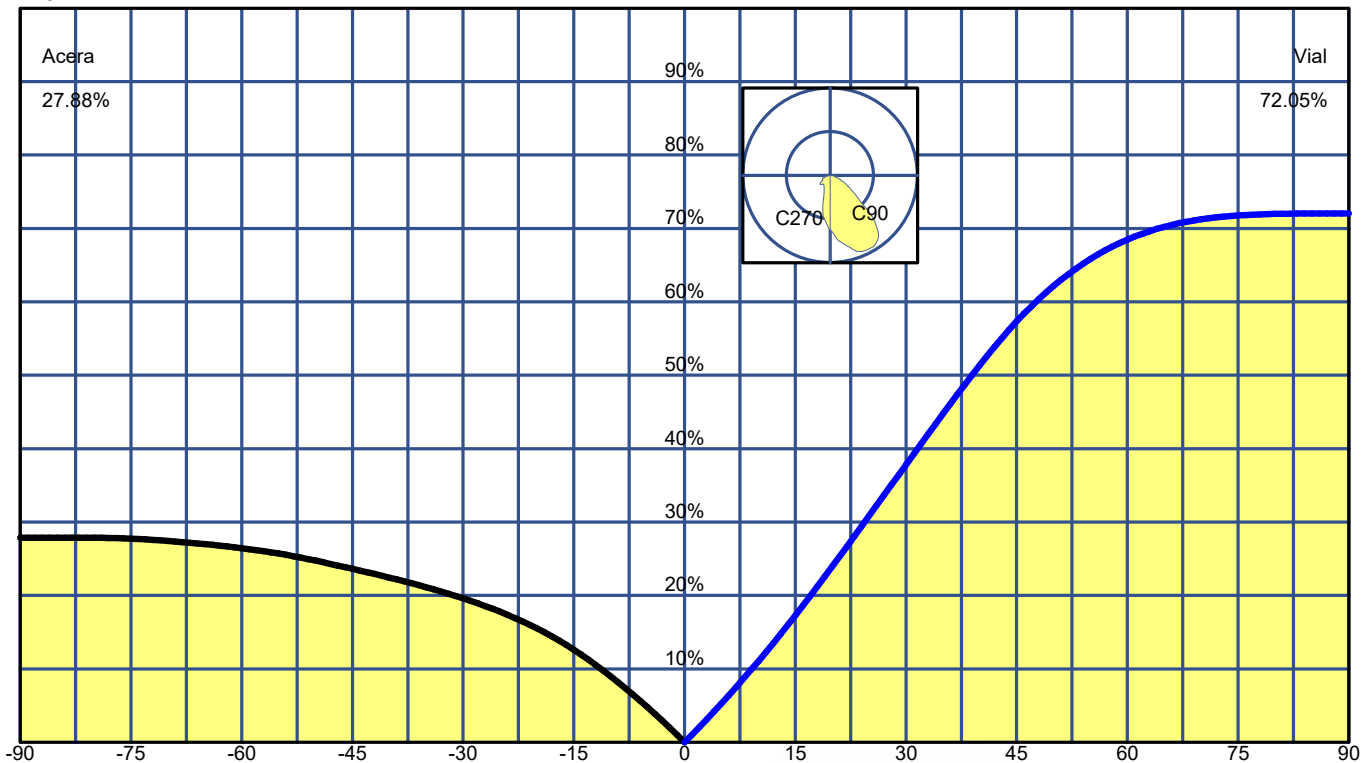
Código CL237A21F017V  
Nombre P.Milan M 140W 4K

Flujo Luminaria	17388.77 lm	Potencia Luminaria	136.22 W	Eficacia	127.65 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	17388.77 lm	Valor Máximo	8510.49 cd	Posición	C=15.00 G=57.50	CG	Sim. en los planos 270-90

Acera			Vial		
Ángulo	0	0.00%	Ángulo	0	0.00%
Ángulo	-5	4.75%	Ángulo	5	5.26%
Ángulo	-10	8.96%	Ángulo	10	11.03%
Ángulo	-15	12.61%	Ángulo	15	17.27%
Ángulo	-20	15.52%	Ángulo	20	23.92%
Ángulo	-25	17.77%	Ángulo	25	30.82%
Ángulo	-30	19.60%	Ángulo	30	37.80%
Ángulo	-35	21.12%	Ángulo	35	44.73%
Ángulo	-40	22.43%	Ángulo	40	51.35%
Ángulo	-45	23.62%	Ángulo	45	57.32%
Ángulo	-50	24.74%	Ángulo	50	62.17%
Ángulo	-55	25.71%	Ángulo	55	65.83%
Ángulo	-60	26.43%	Ángulo	60	68.46%
Ángulo	-65	26.98%	Ángulo	65	70.21%
Ángulo	-70	27.42%	Ángulo	70	71.24%
Ángulo	-75	27.73%	Ángulo	75	71.76%
Ángulo	-80	27.86%	Ángulo	80	71.97%
Ángulo	-85	27.87%	Ángulo	85	72.04%
Ángulo	-90	27.88%	Ángulo	90	72.05%

Ángulo de Inclinación = 0.0

DLOR = 99.93%



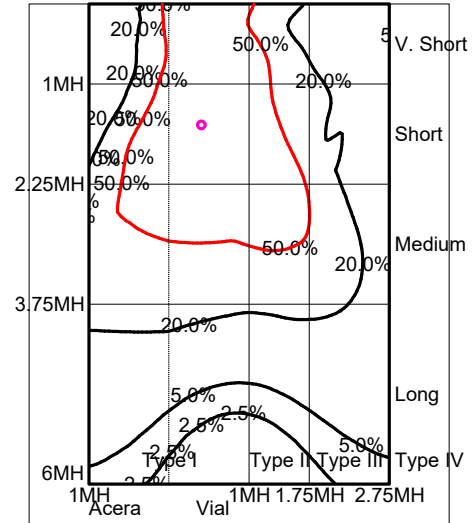
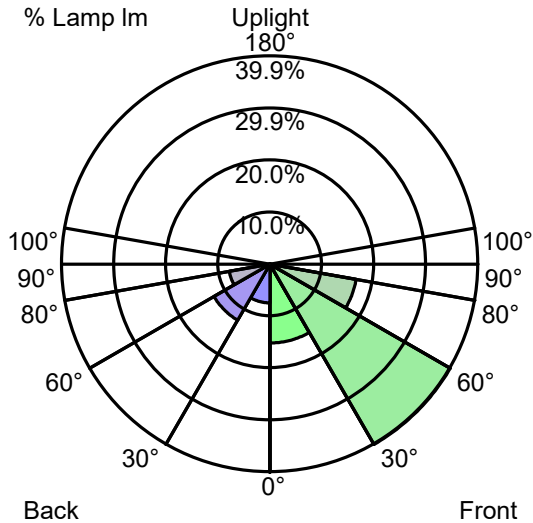
Spread	44.8° Estrecho	DLOR	99.92580 %
Throw	57.5° Corto	ULOR	0.07420 %
Cutoff CIE	Cutoff - Max: C=15.0° Gamma=57.5°	Eficiencia	100.00000 %
Cutoff Iesna	Cutoff	RN	0.07420 %
DIN5044	KB1	Clase de Intensidad Luminosa	G*4
	IESNA Type II Short Asymmetrical	Índice de Deslumbramiento	D4

### 4.8. Clasificación vial según IES TM-15

**Luminaria**  
 Código APM  
 Nombre P.Milan M 140W 4K  
**Ensayo**  
 Código CL237A21F017V  
 Nombre P.Milan M 140W 4K

Flujo Luminaria	17388.77 lm	Potencia Luminaria	136.22 W	Eficacia	127.65 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	17388.77 lm	Valor Máximo	8510.49 cd	Posición	C=15.00 G=57.50	CG	Sim. en los planos 270-90

US ROAD STANDARDS



Luminaire Classification System (LCS)			
LCS Zone		Lumens	%Lamp
FL	0° -- 30°	2630.0 lm	15.1 %
FM	30° -- 60°	6940.3 lm	39.9 %
FH	60° -- 80°	2918.7 lm	16.8 %
FVH	80° -- 90°	39.6 lm	0.2 %
BL	0° -- 30°	1293.8 lm	7.4 %
BM	30° -- 60°	2154.4 lm	12.4 %
BH	60° -- 80°	1378.0 lm	7.9 %
BVH	80° -- 90°	21.1 lm	0.1 %
UL	90° -- 100°	1.3 lm	0.0 %
UH	100° -- 180°	11.6 lm	0.1 %
<b>TOTALS</b>		<b>17388.8 lm</b>	<b>100.0 %</b>
BUG B3 U2 G3 Type II Short Asymmetrical			

# P MILAN S

Documentación técnica IDAE



**BENITO  
NOVATILU**

EXPERTOS EN  
ILUMINACIÓN EFICIENTE

+34 93 852 1000 / info@[benito.com](http://benito.com)

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*UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.*  
*UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas. Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.*  
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*Ficha técnica LED*  
*UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos.*  
*UNE-EN 62384. Dispositivos de control electrónicos. Requisitos de funcionamiento.*  
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## 3 Informes de Pruebas o Certificados de la Luminaria

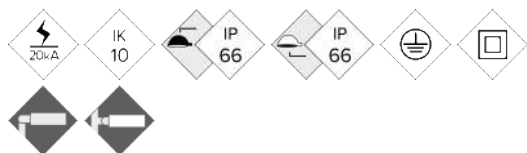
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*Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes.*  
*Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4.*  
*Ensayo colorimétrico de la luminaria según la norma UNE EN 13032-4.*  
*Ensayo de medidas eléctricas y de seguridad*



APMS

# Proyector MILAN S



Proyector de perfil plano, con baja resistencia al viento. Familia con cuatro medidas distintas y un amplio rango de potencias, entre 40W y 460W. Está disponible con múltiples distribuciones lumínicas para adaptarse a cada proyecto. Su anclaje mediante lira permite orientaciones en cualquier ángulo de inclinación. Preparada para cualquier sistema de control de regulación.

## VENTAJAS:

- Alta eficiencia. Hasta 140 lm/W reales.
- 4 Medidas distintas. De 40W hasta 460W.
- Doble cavidad, Driver y Grupo Óptico.
- 18 Distribuciones lumínicas distintas.
- Estándar Zhaga (Book 15).
- Ready 4IoT. Preparada para la conectividad.
- Gran robustez a vibraciones 5G.

## APLICACIONES:

- Instalaciones deportivas (Pabellones, pistas, estadios...)
- Túneles y Grandes Infraestructuras
- Zonas industriales
- Parkings y Grandes Áreas
- Arquitectural (Edificios y monumentos)

## DETALLES:



Lira sujeción vibración 5G.



Doble Cavidad.



Opcional en versión RGBW.

[Ficha de proyecto](#) | [CAD](#) | [Catálogo](#) | [Instrucciones montaje](#) | [Imagen HD](#)

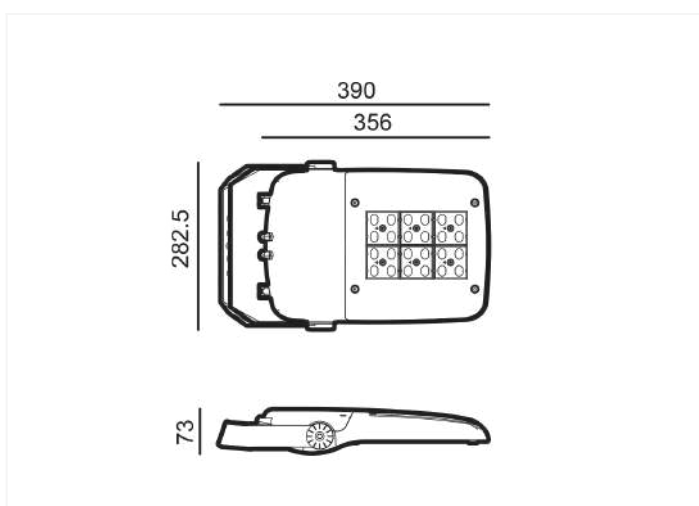
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NOVATILU**

info@benito.com  
tel. +34 93 852 1000 / +34 961 401 000

## CARACTERÍSTICAS:

Material cuerpo:	Fundición de aluminio inyectado a presión del tipo EN AC-43000, EN AC-43100, EN AC-43400, EN AC-44100, EN AC-47100 según la norma UNE EN 1706.
Difusor (cerramiento cavidad óptica):	Vidrio Templado de 5 mm. Filtra los UV.
Tornillería:	Acero Inoxidable 18/8 - AISI 304
Cuerpo:	Doble Cavidad: Driver / Módulo LEDs
Juntas de estanqueidad:	Espuma de Silicona
Índice de protección IP de la luminaria:	IP66
Índice de protección IP del Grupo Óptico:	IP66
Índice de protección IK:	IK10
Disipación térmica de los LEDs:	Disipación térmica a través del cuerpo de la luminaria, sin aletas externas ni fluidos conductores. Disipación pasiva por convección y asegurando el contacto térmico de los módulos de LEDs a través de material de transferencia térmica de alta conductividad.
Válvula anti condensación:	Válvula de compensación de presiones que asegura la evacuación de la humedad, evitando la condensación, manteniendo el grado de estanqueidad IP de la luminaria.
Pintura:	Recubrimiento de pintura en polvo de poliéster, pulverizado electrostáticamente y sublimado al horno. Resistente a la corrosión.
Color:	Color RAL 9022 y otros colores bajo pedido
Fijación:	Lira de acero
Orientable:	Proyector orientable de -120° a 120° de inclinación.
Mantenimiento:	De apertura superior para una fácil manipulación. Módulos reemplazables: LEDs, Drivers, SPD.
Altura de montaje recomendada:	4 - 6m
Driver:	Driver regulable y programable de corriente constante. Incorporado dentro de la luminaria, precableado sobre placa de acero galvanizada.
Regulación driver:	Driver Regulable 0-10V, programable en 5 niveles y con opción DALI 2. Con las características de Wireless, AOC, MTP, DTL.
Opciones de reducción de flujo:	- Multinivel Temporizado o Media Noche Virtual - Ready4IoT - Reducción de flujo en Cabecera - Doble Nivel con Línea de Mando
Protector de sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.

## PLANO:



## INSTALACIÓN:

### TELECONTROL SYSTEM





## CUADRO TÉCNICO:

REF.	Nº LEDs	Potencia W	I Driver mA	Flujo Lumínico Real (T) =85°C)		Flujo Lumínico Inicial (T) =25°C)		
				Flujo lm	Eficiencia lm/W	Flujo lm	Eficiencia lm/W	
P Milan S	APMS80	24	40	500	5600	140	6384	160
		24	60	750	8220	137	9371	156
		24	80	1000	10800	135	12312	154

LEDs: 5050

Eficiencia Nominal del LED: 172 lm/W.

Corriente máxima LED: 1000 mA.

Corriente LED = Corriente Driver/2.

Vida Media L90B10: >100,000 horas.

Flujos Lumínicos y Eficiencias a 4000°K y CRI>70.

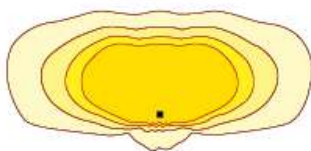
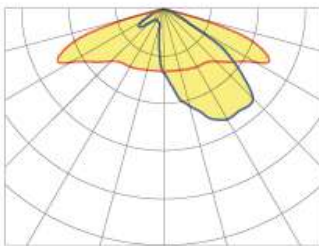
Tolerancia del flujo lumínico < +/-3%.

Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.

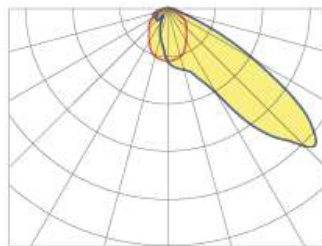


## FOTOMETRÍAS:

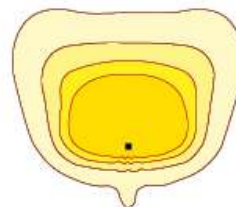
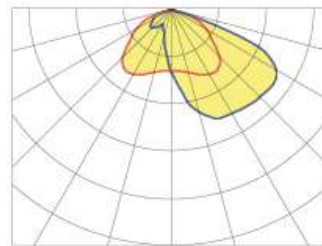
Asimétrico Super-Extensivo (AE)



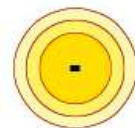
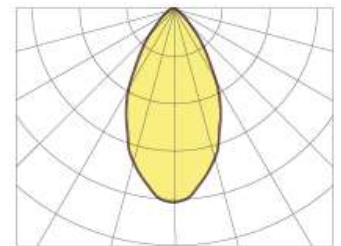
Forward ( AF)



Asimétrico (A4)



Circular 50° (C5)



\*Consultar otras distribuciones lumínicas

El Grupo BENITO NOVATILU se reserva el derecho de realizar modificaciones a sus productos sin previo aviso.

## MÓDULO LED'S:

Módulo de LEDs:	BENITO-NOVATILU Formato Zhaga de 8, 12 y 16 LEDs. Consultar Temperaturas de Color, CRI y Distribuciones Lumínicas.	
Módulo sustituible:	Si	
LED:	5050	
Nº de LED's:	24-36	
Formato PCBs:	2 Zhaga (Book 15) 2x6	
Eficiencia nominal del LED:	172	
Temperatura de Color:	PC Ámbar, 2K2, 2K7, 3K, 4K, 5K	
Rendimiento Cromático CRI:	>70 (opcional >80)	
Vida Media de los LED - L90B10:	L90B10 >100.000 horas	

## ESPECIFICACIONES ÓPTICAS:

Sistema Óptico:	Lentes de PMMA 2x2	
Distribución Lumínica:	18 Distribuciones Lumínicas disponibles	
Flujo Hemisferio Superior (FHS) ULOR:	0%	
Flujo Hemisferio Inferior DLOR:	100%	
Índice de Deslumbramiento:	Entre D5 y D6 (depende de la distribución lumínica)	
Categoría Intensidad Luminosa:	Entre G*4 y G*6 (depende de la distribución lumínica)	
Flujo Luminoso CIE n°3:	>95%	
Seguridad Fotobiológica:	RG0 (exento de riesgo)	
Flujo lumínico Inicial Tj=25°C (hasta):	lm	12312
Eficiencia Luminaria Inicial Tj=25°C (hasta):	lm/W	160
Flujo lumínico Real Tj=85°C (UNE EN 13032-4) (hasta):	lm	10800
Eficiencia Luminaria Real Tj=85°C (UNE EN 13032-4) (hasta):	lm/W	140

## ESPECIFICACIONES ELÉCTRICAS:

Potencia máxima nominal (LED's):	W	72
Potencia máxima consumida (Luminaria):	W	80
Rango de Potencias:	W	40W - 80W
Corriente máxima del LED:	mA	<400 (<50% I <sub>max</sub> )
Clase de Protección Eléctrica IEC:	Clase I y II	
Protector de Sobretensiones (SPD):	Protector de Sobretensiones Transitorias (SPD) de 10kV y 20kA Tipo 2. Conexión serie con termofusible de desconexión para una protección más efectiva al final de la vida del SPD.	
Nivel de protección de tensión modo común y diferencial (SPD) Udc:	kV	10 y NTC opcional
Corriente máxima de descarga (8/20) (SPD):	kA	20
Desconexión Térmica de la Fase (SPD):	SI	
Tensión de Entrada:	Vac	220-240
Tensión de Entrada (rango máximo):	Vac	198-264
Frecuencia de Entrada:	Hz	47-63
Corriente de arranque:	A	<65
Duración del pico de arranque:	ms	<0,3
Eficiencia del Driver:	>90%	
Factor de potencia 100% consumo:	>0,98	
Factor de potencia 50% consumo:	>0,95	
Distorsión Harmónica Total (THD):	<10	
Consumo de Energía en reposo:	W	<0,4
Clasificación Energética:	A++ IPEA>1,15	

## CONDICIONES DE TRABAJO:

Vida Media de los LED - L90B10:	horas	>100.000
Vida Media del Driver a Tp<70°C:	horas	100.000
Vida Media de la Luminaria L80B10 (TM-21):	horas	72.167
Temperatura ambiente de trabajo:	°C	de -35°C a +50°C
Superficie al viento:	m2	0,028
Test anti vibraciones (15Hz en 3 ejes):		
Test fuerza del viento:	m/s	5G
Período de Garantía:	años	5 años (opcional hasta 10)

## DIMENSIONES EMBALAJE:

Peso neto	kg	4,2
Peso Bruto	kg	4,6
Dimensiones Luminaria (LxAxH)	mm	390x282,5x73
Dimensiones Embalaje (LxAxH)	mm	400x295x106
Unidades por Embalaje	1	
Cantidad por contenedor de 20"	2420	
Cantidad por contenedor de 40"	5038	

## CERTIFICACIONES:

Certificaciones Seguridad:

EN 60598-1 / EN 60598-2-5 / EN 62493 / IEC 62471

Certificaciones EMC:

EN 55015 / EN 61547 / EN 61000-3-2 / EN 61000-3-3 / EN 61347-2-13 / EN 61347-1 / EN 62384

Otras Certificaciones:

IEC 62262 / EN 13032-4 / EN 62717 / EN 6272-1 / EN 6272-2-1 / EN 61643-11

## 1.2 Tabla (Anexo 1): Datos Generales de la Empresa

DATOS GENERALES DE LA EMPRESA FABRICANTE DE LA LUMINARIA LED		
1	Nombre de la empresa	BENITO URBAN, S.L.U.
2	Actividad social de la empresa	Fabricación, Comercialización y Distribución de Alumbrado Público
3	Código Identificación Fiscal	B59987529
4	Dirección postal	Calle Lleida, 10, 08500 Vic. Barcelona.
5	Dirección correo electrónico	mhoms@benito.com
6	Página/s web	www.benito.com
7	Nº Teléfono y Fax	T. 938 521 000 y F. 938 521 001
8	Persona de contacto	Mateu Homs
9	Certificado UNE-EN ISO 9001	OCA GLOBAL ENAC 34/5200/19/8038
10	Certificado UNE-EN ISO 14001	OCA GLOBAL ENAC 34/5400/19/8039
11	Catálogo Digital Publicado de Producto	<a href="https://www.benito.com/es/descargas-alumbrado-publico/catalogo-light.html">https://www.benito.com/es/descargas-alumbrado-publico/catalogo-light.html</a>
12	Certificado de la empresa de adhesión a un sistema integrado de gestión de residuos (SIG)	SI

Para más información consultar pack IDAE Empresa



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 AMERICA: USA +1 617 778 29 47 Argentina +54 1 159 844 113 Chile +56 2 938 20 35 Mexico +52 5 546 319 722 Brazil +55 1 139 570 340 Peru +51 1707 1369  
 ASIA China +86 1 063 705 530

### 1.3 Tabla (Anexo 2) CEI – IDAE Requerimientos Técnicos Luminaria

DATOS Y DOCUMENTACIÓN TÉCNICA DE LA LUMINARIA TIPO PROYECTOR																						
1	Marca y Modelo <span style="float: right;">NOVATILU - PROYECTOR MILAN S</span>																					
2	Ficha Técnica <span style="float: right;">Si - APMS</span>																					
3	Marcado CE <span style="float: right;">Si</span>																					
4	Material de Fabricación conforme el apartado 5. <span style="float: right;">Si</span>																					
5	Sustitución independiente de los sistemas integrantes compartimento óptico (módulo y lente) y equipos auxiliares <span style="float: right;">Si</span>																					
6	Grado de estanqueidad en la luminaria IP 66 <span style="float: right;">IP 66</span>																					
7	Grado de protección ante impactos en la luminaria mínimo IK 08 <span style="float: right;">IK 10</span>																					
8	Rango de temperatura de funcionamiento -10°C a 35°C <span style="float: right;">Si, -35°C a 50°C</span>																					
9	Número de distribuciones fotométricas, al menos 3 (1 asimétrica) <span style="float: right;">Si, 18</span>																					
10	Curvas Fotométricas y de utilización de la luminaria, al menos 3 (1 asimétrica) <span style="float: right;">Si</span>																					
11	FHSINST , máximo permitido 1% <span style="float: right;">&lt;1%</span>																					
12	Temperatura de color en K de la luz emitida por la luminaria, máxima permitida (4000K) <span style="float: right;">Si</span>																					
Eficacia de salida de la luminaria (lm/W)																						
13	<table border="1" style="width: 100%;"> <thead> <tr> <th>TIPO DE LED</th> <th>lm/W min</th> <th>lm/W</th> </tr> </thead> <tbody> <tr> <td>LED NEUTRO 4000°K</td> <td>110</td> <td>&gt;120</td> </tr> <tr> <td>LED CÁLIDO 3000°K</td> <td>100</td> <td>&gt;110</td> </tr> <tr> <td>LED CÁLIDO 2700°K</td> <td>90</td> <td>&gt;100</td> </tr> <tr> <td>LED CÁLIDO 2200°K</td> <td>85</td> <td>&gt;90</td> </tr> <tr> <td>LED ÁMBAR (Phosphor-Converted)*</td> <td>70</td> <td>&gt;75</td> </tr> <tr> <td>LED ÁMBAR PURO (monocromático)*</td> <td>40</td> <td>-</td> </tr> </tbody> </table>	TIPO DE LED	lm/W min	lm/W	LED NEUTRO 4000°K	110	>120	LED CÁLIDO 3000°K	100	>110	LED CÁLIDO 2700°K	90	>100	LED CÁLIDO 2200°K	85	>90	LED ÁMBAR (Phosphor-Converted)*	70	>75	LED ÁMBAR PURO (monocromático)*	40	-
	TIPO DE LED	lm/W min	lm/W																			
	LED NEUTRO 4000°K	110	>120																			
	LED CÁLIDO 3000°K	100	>110																			
	LED CÁLIDO 2700°K	90	>100																			
	LED CÁLIDO 2200°K	85	>90																			
	LED ÁMBAR (Phosphor-Converted)*	70	>75																			
LED ÁMBAR PURO (monocromático)*	40	-																				
14	Clase Eléctrica <span style="float: right;">I y II</span>																					
15	Medidas Eléctricas: Tensión, corriente, potencia total consumida y Factor de potencia (>0.9) <span style="float: right;">Tensión 230V / Potencia 80W / FP &gt;0,98</span>																					
16	Vida útil estimada de la luminaria (Se considerará como máximo 100.000h) <span style="float: right;">L90B10 &gt;100.000 horas</span>																					
17	Ficha Técnica del LED utilizado en la luminaria y marcado CE <span style="float: right;">Si</span>																					
18	Número de LEDs y Corriente de Alimentación <span style="float: right;">24 led / 500mA</span>																					
19	Ficha Técnica Driver y marcado CE <span style="float: right;">Si</span>																					
20	Ficha Técnica de otros dispositivos (SPD, OLC,...etc) y marcado CE, que se estimen oportunos <span style="float: right;">Si</span>																					

## 2 Informes de Pruebas y Certificados de la Luminaria por OEC

### 2.1 Tabla de Verificación (Anexo 3) CEI – IDAE

Informes de Pruebas y Certificados emitidos por OEC acreditada sobre La luminaria y sus elementos integrantes		
1	Documento del alcance de la acreditación del certificador/es de estos informes o certificados.	✓
2	UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.	✓
3	UNE EN 60598-2-3 o 60598-2-5 Luminarias. Requisitos particulares. Luminarias de Alumbrado público o proyectores.	✓
4	UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan Lámparas, o según IEC/TR 62778 que es su norma de aplicación.	✓
5	Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.	✓
6	El Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria)	✓
7	UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2: Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16A por fase)	✓
8	UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.	✓
9	UNE-EN 61547. Equipos para alumbrado de uso general. Requisitos de inmunidad CEM.	✓
10	UNE-EN 62031. Módulos LED para alumbrado general. Requisitos de seguridad. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.	✓
11	UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13: Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.	✓
12	UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED. Requisitos de funcionamiento.	✓
13	Informe de ensayo en relación al material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda. D – Luminaria modelo proyector	✓



## 2.2 Requisitos de Seguridad

- UNE EN 60598-1 Luminarias. Requisitos generales y ensayos.
- UNE EN 60598-2-3 o UNE EN 60598-2-5 Luminarias. Requisitos particulares. Luminarias de alumbrado público o proyectores.
- UNE EN 62471 Seguridad fotobiológica de lámparas y aparatos que utilizan lámparas.
- Certificado sobre el grado de hermeticidad de la luminaria: conjunto óptico y general, según norma UNE-EN 60598.
- Ensayo de grado de protección contra los impactos mecánicos externos según norma UNE-EN 62262.

## VERIFICATION OF COMPLIANCE

No.: LVD SHES210300359501LMC  
Applicant: NOVATILU, S.L.  
Via Ausetania, 11-13 08560 MANLLEU Barcelona Spain  
Manufacturer: Same as applicant  
Product Name: LED Flood Luminaire  
Product Description: Floodlights  
Model No.: See page 2  
Trade Mark:

Rating: 220 V – 240 V; 50 Hz - 60 Hz; ta: 45 °C; Max. 1800 W  
Protection against Electric Shock: Class I  
Degree of Protection: IP66  
Additional Information: None

Sufficient samples of the product have been tested and found to be in conformity with

Test Standard: EN 60598-2-5: 2015  
EN 60598-1: 2015 + A1: 2018  
EN 62493: 2015

as shown in the

Test Report Number(s): SHES210300359501

This Verification of Compliance has been granted to the applicant based on the results of tests, performed by Laboratory of SGS-CSTC Standards Technical Services Co., Ltd. on sample of the above-mentioned product in accordance with the provisions of the relevant harmonized standards under the Low Voltage Directive 2014/35/EU. The CE marking as shown below can be affixed, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The affixing of the CE marking presumes in addition that the conditions in annexes III and IV of the Directive are fulfilled.



Andrew Zhai  
Laboratory Technical Manager  
SGS-CSTC



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Member of SGS Group (Société Générale de Surveillance)

No.:

LVD SHES210300359501LMC

Other information added:

Rating:

Model	Rated power (W)
APAXLL1800	1800
APAXLL1500	1500
APALL1200, APAXLL1200	1200
APALL1000	1000
APALL800	800
APAML600	600
APAML500	500
APAML400, APMXXLL400	400
APMXXLL480	480
APMXXLL300, APMXLL300	300
APMXLL240	240
APMXLL200, APML200	200
APUXLL180	180
APML150, APUXLL150	150
APML120, APUXLL120	120
APMSL100, APUXLL100	100
APMSL60	60
APMSL40	40

Andrew Zhai

Laboratory Technical Manager  
SGS-CSTC




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## DECLARACIÓN CERTIFICACIÓN UNE-EN Equipos Alumbrado Público **BENITO-NOVATILU**

Todas las luminarias BENITO-NOVATILU incorporan los módulos de LEDs BENITO-NOVATILU PCB APL.

Las Luminarias, Proyectoros y Módulos NOVATILU están certificados a nombre de nuestra fábrica de Yuyao, Ningbo King-Bridge Lighting Technology Co., Ltd. (KLED), que forma parte del Grupo BENITO-NOVATILU.

Una vez pasada la certificación (adjuntamos documentación original), se hace la convalidación a nombre de BENITO-NOVATILU. El proceso está finalizado, pero estamos a la espera de los documentos convalidados.

Las equivalencias en las referencias son las siguientes:

<b>KLED reference</b>	<b>BENITO-NOVATILU reference</b>
TG-163SLED	APOLO M 500W – APAML500
TG-163LLED	APOLO L 1000W – APALL1000
TG-161LLED	P MILAN XXL - APMXXLL
TG-161MLED	P MILAN XL - APMXLL
TG-161SLED	P MILAN M - APML
TG-161S1LED	P MILAN S - APMSL

Vic, 14 de septiembre de 2022.

**Responsable de Calidad de BENITO URBAN, SLU**



**Jordi Puig i Rovira (Ingeniero Técnico Telecomunicación, col.903055)**  
**Design & Engineering Lighting Department**



Product Service

# Attestation of Conformity

No. N8A 18 01 01704 002

**Holder of Certificate:** Ningbo King-Bridge Lighting Technology Co.,Ltd.No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street,  
315400 Yuyao, Zhejiang Province  
PEOPLE'S REPUBLIC OF CHINA**Product:** Flood lights  
LED Floodlight**Model(s):** TG-163SLED; TG-163LLED; TG-161LLED;  
TG-161MLED; TG-161SLED; TG-161S1LED**Parameters:**  
Rated voltage: 100-240V~  
Rated frequency: 50-60Hz  
Protection Class: Class I  
Rated power:  
TG-163SLED: 600W; TG-163LLED: 1200W;  
TG-161LLED: 480W; TG-161MLED: 300W;  
TG-161SLED: 200W; TG-161S1LED: 100W  
Degree of protection: IP66  
ta: 45°C**Tested according to:**  
EN 60598-1:2015  
EN 60598-2-5:2015  
EN 62471:2008  
EN 62493:2015

This Attestation of Conformity is issued on a voluntary basis according to the Low Voltage Directive 2014/35/EU relating to electrical equipment designed for use within certain voltage limits. It confirms that the listed equipment complies with the principal protection requirements of the directive and is based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for testing and certification. See also notes overleaf.

**Test report no.:** 704021712536-00**Date,** 2018-01-30

(Na Zhang)

**CE** After preparation of the necessary technical documentation as well as the EU declaration of conformity the required CE marking can be affixed on the product. The declaration of conformity is issued under the sole responsibility of the manufacturer. Other relevant EU-directives have to be observed.

Page 1 of 1

# Aufbauübersicht für Elektrogeräte und Maschinen

## Data form for electrical equipment and machinery



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Page 1 of 3

**Auftraggeber / Applicant:** Ningbo King-Bridge Lighting Technology Co.,Ltd.  
No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400,  
Yuyao, Zhejiang Province, People's Republic of China

**Fertigungsstätte / Production facility:** Ningbo King-Bridge Lighting Technology Co.,Ltd.  
No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400,  
Yuyao, Zhejiang Province, People's Republic of China

**Geräteart / Type of equipment:** LED Floodlight

**Typenbezeichnung / Type,model:** TG-163SLED; TG-163LLED; TG-161LLED; TG-161MLED; TG-161SLED;  
TG-161S1LED

**Seriennr. / Serial no.:** N/A

**Nennspannung/Frequenz / Rated voltage,frequency:** 50-60Hz

**Nennaufnahme/Nennstrom / Rated input power,current:** TG-163SLED: 600W; TG-163LLED: 1200W; TG-161LLED: 480W; TG-161MLED: 300W; TG-161SLED: 200W; TG-161S1LED: 100W

**Anschlußdaten-Hydraulik / Connection to hydraulic power:** N/A

**Anschlußdaten-Pneumatik / Connection to pneumatic power:** N/A

**Anschlußdaten-Wasser / Connection to waterinstallation:** N/A

**Gewicht / weight:** 44.65Kg

**Lärmemission / noise emission (dB A):** N/A

**Ausführung/Construction:**

Ortsfest	Stationary	<input checked="" type="checkbox"/>
Orsveränderlich	Portable	<input type="checkbox"/>
Handgerät	Hand-held	<input type="checkbox"/>
Einbaugerät	Open-frame	<input type="checkbox"/>

**Schutzklasse/Protection class:**

Schutzklasse I:	Schutzleiteranschluß	PE-connection	<input checked="" type="checkbox"/>
Schutzklasse II:	Schutzisoliert	Double insulation	<input type="checkbox"/>
SchutzklasseIII:	Schutzkleinspannung/ interne Stromversorgung	SELV/internally powered	<input type="checkbox"/>

**Schutzart/Degree of protection against liquids:** IP 66

**Anschlußart/Supply connection:**

Feste Anschlußleitung	Non detachable cord	<input checked="" type="checkbox"/>
Fester Anschluß	Permanent connection	<input type="checkbox"/>
Gerätesteckvorrichtung	Appliance inlet	<input type="checkbox"/>

**Netzbetriebsart/Rated operation:**

Dauerbetrieb	Continuous operation	<input checked="" type="checkbox"/>
Aussetzbetrieb	Intermittent operation	<input type="checkbox"/>
Kurzzeitbetrieb	Short time operation	<input type="checkbox"/>

**Material:** a)Gehäuse/Enclosure: N/A  
b) Leiterplatten/p.c.b.: N/A

TEC\_GCN\_F\_09.30E - Rev. 0 2010-11-26



Prüfbericht Nr. , Test Report No.: 704021712536700

Projektleiter , Project Engineer: Xiang GAO

Ort, place: Yuyao Zhejiang

Datum , date: 2018-01-29

Stempel und Unterschrift ,  
Seal and signature

# Aufbauübersicht für Elektrogeräte und Maschinen

## Data form for electrical equipment and machinery



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Sicherheitsrelevante Bauteile: (Schalter, Temperaturregler, Heizkörper, Stecker, Fassungen, Leitungen, Kondensatoren, Motoren und sonstige Wicklungen z.B. Transformatoren, Magnetspulen)  
(Not-Aus Geräte, 2-Handsteuerungen, Verriegelungsschalter, Sicherheits-Lichtschranken, Sicherheitsventile, Programmierbare Steuerungen-SPS, hydraulische Steuerungen, pneumatische Steuerungen .....)  
Safety relevant components: (switch, temperature regulator, heating element, plug, socket, wiring, capacitor, motors and other components with windings e.g. transformers, coils)  
(emergency off devices, 2-hand-control-devices, interlock switches, safety light barriers, safety valves, programmable electronic controllers -PLC, hydraulic controllers, pneumatic controllers .....)

Bauteil, Kind of component	Hersteller, Manufacturer	Angaben über Typ, Stromstärke, Leistung, Transformatorspezifikationsnummer, Isolationsklasse, Information about type, current, power, transformer specification number, insulating class	Prüfzeichen von Test mark from (TUV, VDE, BSI, UL etc.)
LED	Cree Inc.	XPG 2,85 V - 3,4 V, Max. 1500 mA	Test with appliance
	PHILIPS Luxeon	5050 23.5-26.5V,Max.300mA	
PCB(LED module)	Yuyao Lianda Electronic Co Ltd	LD0008 130 °C, V-0	UL (E356059)
	Ningbo Kjpgb Electronic Technology Co Ltd	KJ-01 100 °C, V-0	UL (E474795)
Electro-mechanical contact systems (For except TG- 161S1LED)	Yuyao Sineyi Electronic Technology CO.,LTD	M29-3 16A/450V	B 15 09 92724 002
	Ningbo King-Bridge Lighting Technology Co.,Ltd.	Q-02 250V 6A	TUV R AN 50336430
Terminal block(for TG- 161S1LED)	Ninghai chengguan Fangzheng Rubber & Plastic Hardware Factory	KP-10A 450ACV, T110, 32 A	VDE 40019217
	Jiangxi Kimbetter Electrical Co., Ltd.	PA10 450 V~, T110, 24 A	VDE* (40025212)
Screwless terminal Terminal block (for TG-161S1LED)	Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.	CD-100/3 250 V, 16 A, 85°C	TUV (R 50280145)
Screwless terminal (for all model)	Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.	CD-100/2 250 V, 16 A, 85°C	TUV (R 50280145)
	Wago-Kontakttechnik GmbH Co.,KG	221-412 450V 32A 0.2-4mm2 85°C	ENEC
Screwless terminal(PCB)	Ningbo Economic & Technical Development Zone Hengda Electrical Co., Ltd.	TB-L02 160 VDC, T105	TUV (R 50288437)
	Degson Electronics Co.,Ltd.	DG2.5T AC 450 V,100 A, 075-2.5 mm2	VDE (40026193)
	Wago-Kontakttechnik GmbH Co.,KG	2060-452/998-404 105°C 0.2-0.75mm2 320V 9A	NTR-NL-7534
Surge protector SPD	Ningbo King-Bridge Lighting Technology Co.,Ltd.	Q-01B AC230V TYPE 2 SPD	ITS 161101683SHA- V1
LED driver for item TG- 163LLED with cree XPG and PHILIPS 5050 LED)	MEANWELL	HLG-320H-C1050A Input: 90 V – 305 V, 50 Hz / 60 Hz, Output: 152-305V d.c., 1050A, tc: 85 °C, IP67	ENEC NO3983
LED driver ( for item TG- 161LLED with cree XPG)	MEANWELL	HLG-480H-36A Input: 90 V – 305 V, 50 Hz / 60 Hz, Output: 18-36V d.c., 13.3A, tc: 90 °C, IP67, SELV	ENEC NO4029
LED driver for item TG- 163LLED with PHILIPS 5050 LED)	MEANWELL	HLG-480H-48A Input: 100 V – 305 V, 50 Hz / 60 Hz, Output: 24-48V d.c., 10A, tc: 90 C, IP67, SELV	ENEC NO4029
LED driver for item TG- 161MLED with cree XPG and PHILIPS 5050 LED)	MEANWELL	HLG-320H-48A Input: 100 V – 305 V, 50 Hz / 60 Hz, Output: 24-48V d.c., 6.7A, tc: 90 °C,	TUV R 50210986

Prüfbericht Nr. , Test Report No.: 704021712536-00

Ort, place: Yuyao Zhejiang

Datum , date: 2018-01-29

Projektleiter , Project Engineer: Xiang GAO

Stempel und Unterschrift ,  
Seal and signature



# Aufbauübersicht für Elektrogeräte und Maschinen

## Data form for electrical equipment and machinery



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Page 3 of 3

Sicherheitsrelevante Bauteile: (Schalter, Temperaturregler, Heizkörper, Stecker, Fassungen, Leitungen, Kondensatoren, Motoren und sonstige Wicklungen z.B. Transformatoren, Magnetspulen) (Not-Aus Geräte, 2-Handsteuerungen, Verriegelungsschalter, Sicherheits-Lichtschranken, Sicherheitsventile, Programmierbare Steuerungen-SPS, hydraulische Steuerungen, pneumatische Steuerungen .....)

Safety relevant components: (switch, temperature regulator, heating element, plug, socket, wiring, capacitor, motors and other components with windings e.g. transformers, coils)

(emergency off devices, 2-hand-control-devices, interlock switches, safety light barriers, safety valves, programmable electronic controllers -PLC, hydraulic controllers, pneumatic controllers .....)

Bauteil, Kind of component	Hersteller, Manufacturer	Angaben über Typ, Stromstärke, Leistung, Transformatorspezifikationsnummer, Isolationsklasse, Information about type, current, power, transformer specification number, insulating class	Prüfzeichen von Test mark from (TÜV, VDE, BSI, UL etc.)
LED driver ( for item TG-161SLED with cree XPG)	MEANWELL	IP67, SELV ELG-200-36A Input: 100 V – 305 V, 50 Hz / 60 Hz, Output: 18-36V d.c., 5.55A, tc: 90 °C, IP67, SELV	ENEC (HN 69255160)
LED driver for item TG-161SLED with PHILIPS 5050 LED)	MEANWELL	ELG-200-48A Input: 100 V – 305V, 50 Hz / 60 Hz, Output: 24-48V d.c.,4.16A tc: 90 °C, IP65, SELV	ENEC (HN 69255160)
LED driver ( for item TG-161S1LED with cree XPG)	MEANWELL	ELG-100-36A Input: 100 V – 305 V, 50 Hz / 60 Hz, Output: 18-36V d.c., 2.66A, tc: 90 °C, IP67, SELV	ENEC DEKRA 2195617.01
LED driver for item TG-1611SLED with PHILIPS 5050 LED)	MEANWELL	ELG-100-48A Input: 100 V – 305 V, 50 Hz / 60 Hz, Output: 24-48V d.c., 2A, tc: 90 °C, IP67, SELV	ENEC DEKRA 2195617.01
Internal wire	Jiangyin Haocheng Electrical Appliances Wire & Cable Co., Ltd.	(N)6YAF , 1 x 0,75 mm <sup>2</sup> 300 / 500 V	VDE (40027987)
Earthing wire	Jiangyin Haocheng Electrical Appliances Wire & Cable Co., Ltd.	H05SJ-K 1 x 0,75 mm <sup>2</sup> , 180 °C	VDE (40017754)
	Cixi Shuanghong Wire Co.,LTD	H05SJ-K 1 x 0,75 mm <sup>2</sup> , 180 °C	VDE (40017324)
Power Cord	Ningbo Xuanhua Electric Co. Ltd.	H05RN-F 2 x 0.75 mm <sup>2</sup>	VDE (40036306)
	Shangyu Jintao Electron Co., Ltd.	H05RN-F 2 x 0.75 mm <sup>2</sup>	VDE (40018106)

LED Floodlight

**TG-163LLED**

**100-240VAC 50-60Hz 1200W t<sub>a</sub> 45°C IP66**

Ningbo King-Bridge Lighting Technology Co.,Ltd.  
No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street,  
315400, Yuyao, Zhejiang Province, People's Republic of China  
Authorized representative in EU: XXXX+XXXX  
Series No: XXXX



Caution, risk of electric shock

Note 1: Height of letter and numeral not less than 2mm, graphical symbol not less than 5mm, WEEE not less than 7mm.

Note 2: Labels for other models are the same except model number and wattage.

Note 3: Warning label must be observed when users try to replace the LED model.

Prüfbericht Nr. , Test Report No.: 704021712536-00

Ort, place: Yuyao Zhejiang

Datum , date: 2018-01-29

Projektleiter , Project Engineer: Xiang GAO

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**TEST REPORT**  
**IEC 60598-2-5**  
**Luminaires**  
**Part 2: Particular requirements**  
**Section 5: Floodlights**

**Report Number**.....: 704021712536-00

**Date of issue** .....: 2018-01-29

**Total number of pages**..... 47

**Name of Testing Laboratory preparing the Report**.....: TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

**Applicant's name** .....: Ningbo King-Bridge Lighting Technology Co.,Ltd.

**Address** .....: No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400, Yuyao, Zhejiang Province, People's Republic of China

**Test specification:**

**Standard** .....: IEC 60598-2-5:2015 (Third Edition) used in conjunction with IEC 60598-1:2014 (Eighth Edition)

**Test procedure**.....: EU-Directive

**Non-standard test method**.....: N/A

**Test Report Form No**.....: IEC60598\_2\_5E

**Test Report Form(s) Originator**....: Intertek Semko AB

**Master TRF** .....: 2016-02

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**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**General disclaimer:**

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

<b>Test item description</b> ..... :	LED Floodlight	
<b>Trade Mark</b> ..... :	N/A	
<b>Manufacturer</b> ..... :	Ningbo King-Bridge Lighting Technology Co.,Ltd.	
<b>Model/Type reference</b> ..... :	TG-163SLED; TG-163LLED; TG-161LLED; TG-161MLED; TG-161SLED; TG-161S1LED	
<b>Ratings</b> ..... :	100-240V~; 50-60Hz; IP66; Class I; ta45 °C TG-163SLED: 600W; TG-163LLED: 1200W; TG-161LLED: 480W; TG-161MLED: 300W; TG-161SLED: 200W; TG-161S1LED: 100W	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/>	<b>CB Testing Laboratory:</b>	TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch/No.151 Heng Tong Road. Shanghai 200070 P.R. China
	<b>Testing location/ address</b> .....:	No. 1999, Duhui Road, Shanghai, 201108, P. R. China
<input type="checkbox"/>	<b>Associated CB Testing Laboratory:</b>	N/A
	<b>Testing location/ address</b> .....:	N/A
	<b>Tested by (name, function, signature)</b> .....:	Xiaohui YANG
	<b>Approved by (name, function, signature)</b> ...:	Xiang GAO
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 1:</b>	N/A
	<b>Testing location/ address</b> .....:	N/A
	<b>Tested by (name, function, signature)</b> .....:	N/A
	<b>Approved by (name, function, signature)</b> ...:	N/A
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 2:</b>	N/A
	<b>Testing location/ address</b> .....:	N/A
	<b>Tested by (name + signature) .....</b>	N/A
	<b>Witnessed by (name, function, signature)...</b>	N/A
	<b>Approved by (name, function, signature)</b> ...:	N/A
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 3:</b>	N/A
<input type="checkbox"/>	<b>Testing procedure: CTF Stage 4:</b>	N/A
	<b>Testing location/ address</b> .....:	N/A
	<b>Tested by (name, function, signature)</b> .....:	N/A
	<b>Witnessed by (name, function, signature)...</b>	N/A
	<b>Approved by (name, function, signature)</b> ...:	N/A
	<b>Supervised by (name, function, signature) :</b>	N/A



<p><b>List of Attachments (including a total number of pages in each attachment):</b> N/A</p>	
<p><b>Summary of testing:</b></p> <p>Determination of the test result includes consideration of measurement uncertainty from the test equipment and methods. Representative sample covered by this report has been tested and complies with the applicable requirements of this standard. All applicable hazards are covered by the harmonized standard.</p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>Complete tests were performed for TG-163LLED, TG-161SLED. Construction checks are performed for all models. All of the models comply with the safety requirement. EMF requirements of EN 62493 have been evaluated and no test required.</p>	<p><b>Testing location:</b></p> <p>TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch</p> <p>No. 1999, Duhui Road, Shanghai, 201108, P. R. China</p>
<p><b>Summary of compliance with National Differences:</b></p> <p>The deviation between EN 60598-2-5:2015 used in conjunction with EN 60598-1:2015 and IEC 60598-2-5:2015 (Third Edition) used in conjunction with IEC 60598-1:2014 (Eighth Edition) is taken into account at the end of the report, please refer to appendix 1 of this report.</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements of EN 60598-2-5:2015 used in conjunction with EN 60598-1:2015</b></p>	

<p><b>Copy of marking plate:</b></p> <p>See Construction Data form for electrical equipment and machinery.</p>
--



<b>Test item particulars</b> .....	LED Floodlight
<b>Classification of installation and use</b> .....	Normal use
<b>Supply Connection</b> .....	Non-detachable flexible cable or cord
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object.....	: N/A
- test object does meet the requirement.....	: P (Pass)
- test object does not meet the requirement.....	: F (Fail)
<b>Testing</b> .....	
<b>Date of receipt of test item</b> .....	: 2017-11-16
<b>Date (s) of performance of tests</b> .....	: 2017-11-16 to 2018-01-29
<b>General remarks:</b>	
<p>"(See Enclosure #)" refers to additional information appended to the report.          "(See appended table)" refers to a table appended to the report.  <b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b>          Clause numbers between brackets refer to clauses in IEC 60598-1</p> <p><b>Remark 1:</b>          The following contents are included and as appendix of this test report:          1) Test report IEC 60598-2-5:1998 used in conjunction with IEC 60598-1:2014.          2) Appendix 1 comprising: Deviation of EN 60598-2-5:2015 used in conjunction with EN 60598-1:2015 to IEC 60598-2-5:2015 used in conjunction with IEC 60598-1:2014.          3) Appendix 2: Requirements of IEC 62031:2008/A1:2012+A2:2014.          4) Appendix 3: EMF requirements of IEC 62493:2015.          5) Appendix 4: Requirements of IEC/TR 62778:2014.          6) Appendix 5: Photographs.</p>	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60598-1:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....	<input type="checkbox"/> <b>Yes</b> <input checked="" type="checkbox"/> <b>Not applicable</b>
<b>When differences exist; they shall be identified in the General product information section.</b>	
<b>Name and address of factory (ies)</b> .....	Ningbo King-Bridge Lighting Technology Co.,Ltd. No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400, Yuyao, Zhejiang Province, People's Republic of China
<b>General product information:</b>	
The products are LED floodlight, protection against moisture is IP66, protection class is Class I, rang of mounting height is up to 40m.	

IEC 60598-2-5			
Clause	Requirement + Test	Result - Remark	Verdict
<b>5.4 (0+2)</b>	<b>CLASSIFICATION OF LUMINAIRES</b>		P
5.4 (0.1)	Information for luminaire design considered.....:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
5.4 (0.3)	More sections applicable.....:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
5.4 (2.2)	Type of protection.....:	Class I	P
5.4 (2.3)	Degree of protection.....:	IP66	P
5.4 (2.4)	Luminaire suitable for direct mounting on normally flammable surfaces.....:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
5.4 (2.5)	Luminaire for normal use.....:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Luminaire for rough service.....:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

<b>5.5 (3)</b>	<b>MARKING</b>		P
5.5 (3.2)	Mandatory markings		P
	Position of the marking		P
	Format of symbols/text		P
5.5 (3.3)	Additional information		P
	Language of instructions		P
5.5 (3.3.1)	Combination luminaires		N/A
5.5 (3.3.2)	Nominal frequency in Hz	50-60Hz	P
5.5 (3.3.3)	Operating temperature		P
5.5 (3.3.4)	Symbol or warning notice		N/A
5.5 (3.3.5)	Wiring diagram		N/A
5.5 (3.3.6)	Special conditions		N/A
5.5 (3.3.7)	Metal halide lamp luminaire – warning		N/A
5.5 (3.3.8)	Limitation for semi-luminaires		N/A
5.5 (3.3.9)	Power factor and supply current		P
5.5 (3.3.10)	Suitability for use indoors		N/A
5.5 (3.3.11)	Luminaires with remote control		N/A
5.5 (3.3.12)	Clip-mounted luminaire – warning		N/A
5.5 (3.3.13)	Specifications of protective shields		N/A
5.5 (3.3.14)	Symbol for nature of supply	~	P
5.5 (3.3.15)	Rated current of socket outlet		N/A
5.5 (3.3.16)	Rough service luminaire		N/A
5.5 (3.3.17)	Mounting instruction for type Y, type Z and some type X attachments	Type Y	P
5.5 (3.3.18)	Non-ordinary luminaires with PVC cable		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.5 (3.3.19)	Protective conductor current in instruction if applicable		N/A
5.5 (3.3.20)	Provided with information if not intended to be mounted within arm's reach		N/A
5.5 (3.3.21)	Non replaceable and non-user replaceable light sources information provided		P
	Cautionary symbol		P
5.5 (3.3.22)	Controllable luminaires, classification of insulation provided		N/A
5.5 (3.4)	Test with water		P
	Test with hexane		P
	Legible after test		P
	Label attached		P
5.5 (-)	Additional information if applicable		P
	a) Operation position		N/A
	b) Weight and dimensions		P
	c) Maximum protected area		P
	d) Limitation of use indoors and/or outdoor		P
	e) Maximum mounting height if $\leq 5$ m		N/A

<b>5.6 (4)</b>	<b>CONSTRUCTION</b>		P
5.6 (4.2)	Components replaceable without difficulty		P
5.6 (4.3)	Wireways smooth and free from sharp edges		P
<b>5.6 (4.4)</b>	<b>Lampholders</b>		N/A
5.6 (4.4.1)	Integral lampholder		N/A
5.6 (4.4.2)	Wiring connection		N/A
5.6 (4.4.3)	Lampholder for end-to-end mounting		N/A
5.6 (4.4.4)	Positioning		N/A
	- pressure test (N) .....		—
	After test the lampholder comply with relevant standard sheets and show no damage		N/A
	After test on single-capped lampholder the lampholder have not moved from its position and show no permanent deformation		N/A
	- bending test (N) .....		—
	After test the lampholder have not moved from its position and show no permanent deformation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6 (4.4.5)	Peak pulse voltage		N/A
5.6 (4.4.6)	Centre contact		N/A
5.6 (4.4.7)	Parts in rough service luminaires resistant to tracking		N/A
5.6 (4.4.8)	Lamp connectors		N/A
5.6 (4.4.9)	Caps and bases correctly used		N/A
5.6 (4.4.10)	Light source for lampholder or connection according IEC 60061 not connected another way		N/A
<b>5.6 (4.5)</b>	<b>Starter holders</b>		N/A
	Starter holder in luminaires other than class II		N/A
	Starter holder class II construction		N/A
<b>5.6 (4.6)</b>	<b>Terminal blocks</b>		N/A
	Tails		N/A
	Unsecured blocks		N/A
<b>5.6 (4.7)</b>	<b>Terminals and supply connections</b>		<b>P</b>
5.6 (4.7.1)	Contact to metal parts		P
5.6 (4.7.2)	Test 8 mm live conductor		P
	Test 8 mm earth conductor		P
5.6 (4.7.3)	Terminals for supply conductors		N/A
5.6 (4.7.3.1)	Welded method and material		N/A
	- stranded or solid conductor		N/A
	- spot welding		N/A
	- welding between wires		N/A
	- Type Z attachment		N/A
	- mechanical test according to 15.6.2		N/A
	- electrical test according to 15.6.3		N/A
	- heat test according to 15.6.2.3 and 15.6.2.4		N/A
5.6 (4.7.4)	Terminals other than supply connection		P
5.6 (4.7.5)	Heat-resistant wiring/sleeves		N/A
5.6 (4.7.6)	Multi-pole plug		N/A
	- test at 30 N		N/A
<b>5.6 (4.8)</b>	<b>Switches</b>		N/A
	- adequate rating		N/A
	- adequate fixing		N/A
	- polarized supply		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- compliance with IEC 61058-1 for electronic switches		N/A
<b>5.6 (4.9)</b>	<b>Insulating lining and sleeves</b>		N/A
5.6 (4.9.1)	Retainment		N/A
	Method of fixing .....		N/A
5.6 (4.9.2)	Insulated linings and sleeves:		N/A
	Resistant to a temperature > 20 °C to the wire temperature or		N/A
	a) & c) Insulation resistance and electric strength		N/A
	b) Ageing test. Temperature (°C) .....		N/A
<b>5.6 (4.10)</b>	<b>Double or reinforced insulation</b>		N/A
5.6 (4.10.1)	No contact, mounting surface – accessible metal parts – wiring of basic insulation		N/A
	Safe installation fixed luminaires		N/A
	Capacitors and switches		N/A
	Interference suppression capacitors according to IEC 60384-14		N/A
5.6 (4.10.2)	Assembly gaps:		N/A
	- not coincidental		N/A
	- no straight access with test probe		N/A
5.6 (4.10.3)	Retainment of insulation:		N/A
	- fixed		N/A
	- unable to be replaced; luminaire inoperative		N/A
	- sleeves retained in position		N/A
	- lining in lampholder		N/A
5.6 (4.10.4)	Protective impedance device		N/A
	Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor		N/A
	Y1 or Y2 capacitors comply with IEC 60384-14		N/A
	Resistors comply with test (a) in 14.1 of IEC 60065		N/A
<b>5.6 (4.11)</b>	<b>Electrical connections and current-carrying parts</b>		<b>P</b>
5.6 (4.11.1)	Contact pressure		P
5.6 (4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6 (4.11.3)	Screw locking:		P
	- spring washer		P
	- rivets		N/A
5.6 (4.11.4)	Material of current-carrying parts		P
5.6 (4.11.5)	No contact to wood or mounting surface		P
5.6 (4.11.6)	Electro-mechanical contact systems		P
<b>5.6 (4.12)</b>	<b>Screws and connections (mechanical) and glands</b>		<b>N/A</b>
5.6 (4.12.1)	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
	Torque test: torque (Nm); part.....:		N/A
5.6 (4.12.2)	Screws with diameter < 3 mm screwed into metal		N/A
5.6 (4.12.4)	Locked connections:		P
	- fixed arms; torque (Nm).....:	2,5	P
	- lampholder; torque (Nm).....:		N/A
	- push-button switches; torque 0,8 Nm.....:		N/A
5.6 (4.12.5)	Screwed glands; force (Nm).....:	6,25	P
<b>5.6 (4.13)</b>	<b>Mechanical strength</b>		<b>P</b>
5.6 (4.13.1)	Impact tests:		P
	- fragile parts; energy (Nm).....:		N/A
	- other parts; energy (Nm).....:	Glass cover /Enclosure; 0,7	P
	1) live parts		P
	2) linings		N/A
	3) protection		P
	4) covers		P
5.6 (4.13.3)	Straight test finger		P
5.6 (4.13.4)	Rough service luminaires		N/A
	- IP54 or higher		N/A
	a) fixed		N/A
	b) hand-held		N/A
	c) delivered with a stand		N/A
	d) for temporary installations and suitable for mounting on a stand		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
5.6 (4.13.6)	Tumbling barrel		N/A
<b>5.6 (4.14)</b>	<b>Suspensions, fixings and means of adjusting</b>		<b>P</b>
5.6 (4.14.1)	Mechanical load:		P
	A) four times the weight		P
	B) torque 2,5 Nm		N/A
	C) bracket arm; bending moment (Nm) .....	7,2	P
	D) load track-mounted luminaires		N/A
	E) clip-mounted luminaires, glass-shelve. Thickness (mm) .....		N/A
	Metal rod. diameter (mm) .....		N/A
	Fixed luminaire or independent control gear without fixing devices		N/A
5.6 (4.14.2)	Load to flexible cables		N/A
	Mass (kg) .....		—
	Stress in conductors (N/mm <sup>2</sup> ) .....		N/A
	Mass (kg) of semi-luminaire .....		N/A
	Bending moment (Nm) of semi-luminaire .....		N/A
5.6 (4.14.3)	Adjusting devices:		P
	- flexing test; number of cycles.....	45	P
	- strands broken .....	0	P
	- electric strength test afterwards		P
5.6 (4.14.4)	Telescopic tubes: cords not fixed to tube; no strain on conductors		N/A
5.6 (4.14.5)	Guide pulleys		N/A
5.6 (4.14.6)	Strain on socket-outlets		N/A
<b>5.6 (4.15)</b>	<b>Flammable materials</b>		<b>P</b>
	- glow-wire test 650°C.....	See Test Table 5.15 (13.3.2)	N/A
	- spacing ≥30 mm		N/A
	- screen withstanding test of 13.3.1		N/A
	- screen dimensions		N/A
	- no fiercely burning material		P
	- thermal protection		N/A
	- electronic circuits exempted		N/A
5.6 (4.15.2)	Luminaires made of thermoplastic material with lamp control gear		N/A
	a) construction		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) temperature sensing control		N/A
	c) surface temperature		N/A
<b>5.6 (4.16)</b>	<b>Luminaires for mounting on normally flammable surfaces</b>		N/A
	No lamp control gear .....	(compliance with Section 12)	N/A
5.6 (4.16.1)	Lamp control gear spacing:		N/A
	- spacing 35 mm		N/A
	- spacing 10 mm		N/A
5.6 (4.16.2)	Thermal protection:		N/A
	- in lamp control gear		N/A
	- external		N/A
	- fixed position		N/A
	- temperature marked lamp control gear		N/A
5.6 (4.16.3)	Design to satisfy the test of 12.6	(see clause 12.6)	N/A
<b>5.6 (4.17)</b>	<b>Drain holes</b>		N/A
	Clearance at least 5 mm		N/A
<b>5.6 (4.18)</b>	<b>Resistance to corrosion</b>		P
5.6 (4.18.1)	- rust-resistance		P
5.6 (4.18.2)	- season cracking in copper		N/A
5.6 (4.18.3)	- corrosion of aluminium		P
5.6 (4.19)	Igniters compatible with ballast		N/A
5.6 (4.20)	Rough service vibration		N/A
<b>5.6 (4.21)</b>	<b>Protective shield</b>		<b>N/A</b>
5.6 (4.21.1)	Shield fitted if tungsten halogen lamps or metal halide lamps		N/A
	Shield of glass if tungsten halogen lamps		N/A
5.6 (4.21.2)	Particles from a shattering lamp not impair safety		N/A
5.6 (4.21.3)	No direct path		N/A
5.6 (4.21.4)	Impact test on shield		N/A
	Glow-wire test on lamp compartment .....	See Test Table 5.15 (13.3.2)	N/A
5.6 (4.22)	Attachments to lamps not cause overheating or damage		N/A
5.6 (4.23)	Semi-luminaires comply Class II		N/A
<b>5.6 (4.24)</b>	<b>Photobiological hazards</b>		<b>P</b>
5.6 (4.24.1)	No excessive UV radiation if tungsten halogen lamps and metal halide lamps (Annex P)		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
5.6 (4.24.2)	Retinal blue light hazard	Classified as RG1	P
	Class of risk group assessed according to IEC/TR 62778 .....		—
	Luminaires with $E_{thr}$ :		N/A
	a) Fixed luminaires		N/A
	- distance x m, borderline between RG1 and RG2....:		N/A
	- marking and instruction according 3.2.23		N/A
	b) Portable and handheld luminaires		N/A
	- marking according 3.2.23 if RG1 exceeded at 200 mm according to IEC/TR 62778		N/A
	Portable luminaires for children IEC 60598-2-10 and Mains socket outlet nightlights IEC 60598-2-12 not exceed RG1 at 200 mm according to IEC/62778		N/A
<b>5.6 (4.25)</b>	<b>Mechanical hazard</b>		<b>P</b>
	No sharp point or edges		P
<b>5.6 (4.26)</b>	<b>Short-circuit protection</b>		N/A
5.6 (4.26.1)	Adequate means of uninsulated accessible SELV parts		N/A
5.6 (4.26.2)	Short-circuit test with test chain according 4.26.3		N/A
	Test chain not melt through		N/A
	Test sample not exceed values of Table 12.1 and 12.2		N/A
<b>5.6 (4.27)</b>	<b>Terminal blocks with integrated screwless earthing contacts</b>		N/A
	Test according Annex V		N/A
	Pull test of terminal fixing (20 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Pull test of mechanical connection (50 N)		N/A
	After test, resistance < 0,05 $\Omega$		N/A
	Voltage drop test, resistance < 0,05 $\Omega$		N/A
<b>5.6 (4.28)</b>	<b>Fixing of thermal sensing control</b>		N/A
	Not plug-in or easily replaceable type		N/A
	Reliably kept in position		N/A
	No adhesive fixing if UV radiations from a lamp can degrade the fixing		N/A
	Not outside the luminaire enclosure		N/A
	Test of adhesive fixing:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Max. temperature on adhesive material (°C) .....		—
	100 cycles between t min and t max		N/A
	Temperature sensing control still in position		N/A
<b>5.6 (4.29)</b>	<b>Luminaires with non-replaceable light source</b>		N/A
	Not possible to replace light source		N/A
	Live part not accessible after parts have been opened by hand or tools		N/A
<b>5.6 (4.30)</b>	<b>Luminaires with non-user replaceable light source</b>		<b>P</b>
	If protective cover provide protection against electric shock and marked with “caution, electric shock risk” symbol:		P
	Minimum two fixing means		P
<b>5.6 (4.31)</b>	<b>Insulation between circuits</b>		P
	Circuits insulated from LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
	Controllable luminaires requiring same level of insulation for all components, the insulation between control terminals and LV supply fulfil requirements according 4.31.1 – 4.31.3		N/A
5.6 (4.31.1)	SELV circuits		N/A
	Used SELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of SELV circuits from LV supply		N/A
	Insulating of SELV circuits from other non SELV circuits		N/A
	Insulating of SELV circuits from FELV		N/A
	Insulating of SELV circuits from other SELV circuits		N/A
	SELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Plugs and socket-outlets does not have protective conductor contact		N/A
5.6 (4.31.2)	FELV circuits		N/A
	Used FELV source		N/A
	Voltage ≤ ELV		N/A
	Insulating of FELV circuits from LV supply		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	FELV circuits insulated from accessible parts according Table X.1		N/A
	Plugs not able to enter socket-outlets of other voltage systems		N/A
	Socket outlets does not admit plugs of other voltage systems		N/A
	Socket-outlets does not have protective conductor contact		N/A
5.6 (4.31.3)	Other circuits		P
	Other circuits insulated from accessible parts according Table X.1		P
	Class II construction with equipotential bonding for protection against indirect contacts with live parts:		N/A
	- conductive parts are connected together		N/A
	- test according 7.2.3		N/A
	- conductive part not cause an electric shock in case of an insulation fault		N/A
	- equipotential bonding in master/slave applications		N/A
	- master luminaire provided with terminal for accessible conductive parts of slave luminaires		N/A
	- slave luminaire constructed as class I		N/A
<b>5.6 (4.32)</b>	<b>Overvoltage protective devices</b>		N/A
	Comply with IEC 61643-11		N/A
	External to controlgear and connected to earth:		N/A
	- only in fixed luminaires		N/A
	- only connected to protective earth		N/A
5.6.1 (-)	At least IPX3 if for outdoor use		P
5.6.2 (-)	Lampholder brackets and lamp supports		N/A
5.6.3 (-)	Adjusting means		P
5.6.4 (-)	Controlling components		N/A
5.6.5 (-)	Fixing device		P
	Wind force test		P
5.6.6 (-)	Locking of angular adjustment		P
5.6.7 (-)	Vibration resistance		P
5.6.8 (-)	Requirement on glass cover if mounting height > 5 m		P
	Method of protection ..... :	IK08	—

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Clause	Requirement + Test	Result - Remark	Verdict
<b>5.7 (11)</b>	<b>CREEPAGE DISTANCES AND CLEARANCES</b>		P
5.7 (11.2)	Creepage distances and clearances .....	See Table 5.7 (11.2)	P
	Impulse withstand category (Normal category II) (Category III Annex U, Table U.1)	Category II <input checked="" type="checkbox"/> Category III <input type="checkbox"/>	—
<b>5.8 (7)</b>	<b>PROVISION FOR EARTHING</b>		P
5.8 (7.2.1 + 7.2.3)	Accessible metal parts		P
	Metal parts in contact with supporting surface		N/A
	Resistance < 0,5 $\Omega$ .....	0,066	P
	Self-tapping screws used		N/A
	Thread-forming screws		N/A
	Thread-forming screw used in a groove		N/A
	Earth makes contact first		P
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
	Protective earthing of the luminaire not via built-in control gear		N/A
5.8 (7.2.2 + 7.2.3)	Earth continuity in joints, etc.		P
5.8 (7.2.4)	Locking of clamping means		P
	Compliance with 4.7.3		N/A
	Terminal blocks with integrated screwless earthing contacts tested according Annex V		N/A
5.8 (7.2.5)	Earth terminal integral part of connector socket		N/A
5.8 (7.2.6)	Earth terminal adjacent to mains terminals		P
5.8 (7.2.7)	Electrolytic corrosion of the earth terminal		P
5.8 (7.2.8)	Material of earth terminal		P
	Contact surface bare metal		P
5.8 (7.2.10)	Class II luminaire for looping-in		N/A
	Double or reinforced insulation to functional earth		N/A
5.8 (7.2.11)	Earthing core coloured green-yellow		P
	Length of earth conductor		P

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Clause	Requirement + Test	Result - Remark	Verdict
<b>5.9 (14)</b>	<b>SCREW TERMINALS</b>		P
	Separately approved; component list	(see Annex 1)	P
	Part of the luminaire	(see Annex 3)	N/A
<b>5.9 (15)</b>	<b>SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS</b>		P
	Separately approved; component list .....	(see Annex 1)	P
	Part of the luminaire .....	(see Annex 4)	N/A
<b>5.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		P
<b>5.10 (5.2)</b>	<b>Supply connection and external wiring</b>		P
5.10 (5.2.1)	Means of connection.....	Non-detachable flexible cable or cord	P
	Outdoor luminaire has not PVC insulated external wiring if not class III or SELV $\leq 25$ V a.c./60 V d.c. or protected from outdoor environment		N/A
5.10 (5.2.2)	Type of cable.....	H05RN-F	P
	Nominal cross-sectional area (mm <sup>2</sup> ).....	3x1,0mm <sup>2</sup>	P
	Cables equal to IEC 60227 or IEC 60245		P
5.10 (5.2.3)	Type of attachment, X, Y or Z		P
5.10 (5.2.5)	Type Z not connected to screws		N/A
5.10 (5.2.6)	Cable entries:		P
	- suitable for introduction		P
	- adequate degree of protection		P
5.10 (5.2.7)	Cable entries through rigid material have rounded edges		P
5.10 (5.2.8)	Insulating bushings:		P
	- suitably fixed		P
	- material in bushings		P
	- material not likely to deteriorate		P
	- tubes or guards made of insulating material		P
5.10 (5.2.9)	Locking of screwed bushings		N/A
5.10 (5.2.10)	Cord anchorage:		P
	- covering protected from abrasion		P
	- clear how to be effective		P
	- no mechanical or thermal stress		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- no tying of cables into knots etc.		P
	- insulating material or lining		P
5.10 (5.2.10.1)	Cord anchorage for type X attachment:		N/A
	a) at least one part fixed		N/A
	b) types of cable		N/A
	c) no damaging of the cable		N/A
	d) whole cable can be mounted		N/A
	e) no touching of clamping screws		N/A
	f) metal screw not directly on cable		N/A
	g) replacement without special tool		N/A
	Glands not used as anchorage		N/A
	Labyrinth type anchorages		N/A
5.10 (5.2.10.2)	Adequate cord anchorage for type Y and type Z attachment		P
5.10 (5.2.10.3)	Tests:		P
	- impossible to push cable; unsafe		P
	- pull test: 25 times; pull (N) .....: 60		P
	- torque test: torque (Nm).....: 0,25		P
	- displacement $\leq 2$ mm		P
	- no movement of conductors		P
	- no damage of cable or cord		P
	- function independent of electrical connection		P
5.10 (5.2.11)	External wiring passing into luminaire		P
5.10 (5.2.12)	Looping-in terminals		N/A
5.10 (5.2.13)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
5.10 (5.2.14)	Mains plug same protection		N/A
	Class III luminaire plug		N/A
	No unsafe compatibility		N/A
5.10 (5.2.16)	Appliance inlets (IEC 60320)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Installation couplers (IEC 61535)		N/A
	Other appliance inlet or connector according relevant IEC standard		N/A
5.10 (5.2.17)	No standardized interconnecting cables properly assembled		N/A
5.10 (5.2.18)	Used plug in accordance with		N/A
	- IEC 60083		N/A
	- other standard		N/A
<b>5.10 (5.3)</b>	<b>Internal wiring</b>		<b>P</b>
5.10 (5.3.1)	Internal wiring of suitable size and type		P
	Through wiring		N/A
	- not delivered/ mounting instruction		N/A
	- factory assembled		N/A
	- socket outlet loaded (A).....:		N/A
	- temperatures.....: (see Annex 2)		N/A
	Green-yellow for earth only		P
5.10 (5.3.1.1)	Internal wiring connected directly to fixed wiring		P
	Cross-sectional area (mm <sup>2</sup> ).....: 1,0		P
	Insulation thickness		P
	Extra insulation added where necessary		N/A
5.10 (5.3.1.2)	Internal wiring connected to fixed wiring via internal current-limiting device		P
	Adequate cross-sectional area and insulation thickness		P
5.10 (5.3.1.3)	Double or reinforced insulation for class II		N/A
5.10 (5.3.1.4)	Conductors without insulation		N/A
5.10 (5.3.1.5)	SELV current-carrying parts		N/A
5.10 (5.3.1.6)	Insulation thickness other than PVC or rubber		N/A
5.10 (5.3.2)	Sharp edges etc.		P
	No moving parts of switches etc.		P
	Joints, raising/lowering devices		N/A
	Telescopic tubes etc.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No twisting over 360°		P
5.10 (5.3.3)	Insulating bushings:		N/A
	- suitable fixed		N/A
	- material in bushings		N/A
	- material not likely to deteriorate		N/A
	- cables with protective sheath		N/A
5.10 (5.3.4)	Joints and junctions effectively insulated		N/A
5.10 (5.3.5)	Strain on internal wiring		N/A
5.10 (5.3.6)	Wire carriers		N/A
5.10 (5.3.7)	Wire ends not tinned		N/A
	Wire ends tinned: no cold flow		P
<b>5.11 (8)</b>	<b>PROTECTION AGAINST ELECTRIC SHOCK</b>		P
5.11 (8.2.1)	Live parts not accessible		P
	Basic insulated parts not used on the outer surface without appropriate protection		N/A
	Basic insulated parts not accessible with standard test finger on portable, settable and adjustable luminaires		P
	Basic insulated parts not accessible with Ø 50 mm probe from outside, other types of luminaires		N/A
	Lamp and starterholders in portable and adjustable luminaires comply with double or reinforced insulation requirements		N/A
	Basic insulation only accessible under lamp or starter replacement		N/A
	Protection in any position		P
	Double-ended tungsten filament lamp		N/A
	Insulation lacquer not reliable		N/A
	Double-ended high pressure discharge lamp		N/A
	Relevant warning according to 3.2.18 fitted to the luminaire		N/A
5.11 (8.2.2)	Portable luminaire adjusted in most unfavourable position		N/A
5.11 (8.2.3.a)	Class II luminaire:		N/A
	- basic insulated metal parts not accessible during starter or lamp replacement		N/A



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Clause	Requirement + Test	Result - Remark	Verdict
	- basic insulation not accessible other than during starter or lamp replacement		N/A
	- glass protective shields not used as supplementary insulation		N/A
5.11 (8.2.3.b)	BC lampholder of metal in class I luminaires shall be earthed		N/A
5.11 (8.2.3.c)	SELV circuits with exposed current carrying parts:		N/A
	Ordinary luminaire:		N/A
	- voltage under load (V) .....		N/A
	- no-load voltage (V) .....		N/A
	- touch current if applicable (mA) .....		N/A
	One conductive part insulated if required		N/A
	Other than ordinary luminaire:		N/A
	- nominal voltage (V) .....		N/A
	Class III luminaire only for connection to SELV		N/A
	Class III luminaire not provided with means for protective earthing		N/A
5.11 (8.2.4)	Portable luminaire has protection independent of supporting surface		N/A
5.11 (8.2.5)	Compliance with the standard test finger or relevant probe		P
5.11 (8.2.6)	Covers reliably secured		P
5.11 (8.2.7)	Luminaire other than below with capacitor > 0,5 $\mu$ F not exceed 50 V 1 min after disconnection		N/A
	Portable luminaire with capacitor > 0,1 $\mu$ F (0.25) not exceed 34 V 1 s after disconnection		N/A
	Other luminaires with capacitor > 0,1 $\mu$ F (0.25) with plug and track adaptors not exceed 60 V 5 s after disconnection		N/A

<b>5.12 (12)</b>	<b>ENDURANCE TEST AND THERMAL TEST</b>		P
	If IP > IP 20 relevant test of (12.4), (12.5), (12.6) and 12.7 after (9.2) before (9.3) specified in 5.13		P
5.12 (12.3)	Endurance test:		P
	- mounting-position .....	Normal	—
	- test temperature (°C) .....	55	—
	- total duration (h) .....	240	—

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Clause	Requirement + Test	Result - Remark	Verdict
	- supply voltage: Un factor; calculated voltage (V)....:	240: 1,1; 264	—
	- lamp used .....	LED module	—
5.12 (12.3.2)	After endurance test:		P
	- no part unserviceable		P
	- luminaire not unsafe		P
	- no damage to track system		N/A
	- marking legible		P
	- no cracks, deformation etc.		P
5.12 (12.4)	Thermal test (normal operation)	(see Annex 2)	P
5.12 (12.5)	Thermal test (abnormal operation)	(see Annex 2)	N/A
5.12 (12.6)	Thermal test (failed lamp control gear condition):		N/A
5.12 (12.6.1)	Through wiring or looping-in wiring loaded by a current of (A) .....		—
	- case of abnormal conditions .....		—
	- electronic lamp control gear		N/A
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured mounting surface temperature (°C) at 1,1 Un .....		N/A
	- calculated mounting surface temperature (°C) .....		N/A
	- track-mounted luminaires		N/A
5.12 (12.6.2)	Temperature sensing control		N/A
	- case of abnormal conditions .....		—
	- thermal link		N/A
	- manual reset cut-out		N/A
	- auto reset cut-out		N/A
	- measured mounting surface temperature (°C).....:		N/A
	- track-mounted luminaires		N/A
5.12 (12.7)	Thermal test (failed lamp control gear in plastic luminaires):		N/A
5.12 (12.7.1)	Luminaire without temperature sensing control		N/A
5.12 (12.7.1.1)	Luminaire with fluorescent lamp ≤ 70W		N/A
	Test method 12.7.1.1 or Annex W .....		—
	Test according to 12.7.1.1:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- case of abnormal conditions .....		—
	- Ballast failure at supply voltage (V) .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
	Test according to Annex W:		N/A
	- case of abnormal conditions .....		—
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test.....	See Table 5.15 (13.2.1)	N/A
5.12 (12.7.1.2)	Luminaire with discharge lamp, fluorescent lamp > 70W, transformer > 10 VA		N/A
	- case of abnormal conditions .....		—
	- measured winding temperature (°C): at 1,1 Un .....		—
	- measured temperature of fixing point/exposed part (°C): at 1,1 Un .....		—
	- calculated temperature of fixing point/exposed part (°C) .....		—
	Ball-pressure test.....	See Table 5.15 (13.2.1)	N/A
5.12 (12.7.1.3)	Luminaire with short circuit proof transformers ≤ 10 VA		N/A
	- case of abnormal conditions .....		—
	- Components retained in place after the test		N/A
	- Test with standard test finger after the test		N/A
5.12 (12.7.2)	Luminaire with temperature sensing control		N/A
	- thermal link.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- manual reset cut-out.....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- auto reset cut-out .....	Yes <input type="checkbox"/> No <input type="checkbox"/>	—
	- case of abnormal conditions .....		—
	- highest measured temperature of fixing point/ exposed part (°C): .....		—
	Ball-pressure test.....	See Table 5.15 (13.2.1)	N/A
5.12.1 (-)	Reduction 10 °C of measured temperatures if for outdoor use		—

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Clause	Requirement + Test	Result - Remark	Verdict
5.12.2 (-)	Glass covers used within the thermal limits		N/A
<b>5.13 (9)</b>	<b>RESISTANCE TO DUST AND MOISTURE</b>		P
5.13 (-)	If IP > IP 20 the order of tests as specified in clause 5.12		P
5.13 (9.2)	Tests for ingress of dust, solid objects and moisture:		P
	- classification according to IP.....: IP 66		—
	- mounting position during test.....: Normal use		—
	- fixing screws tightened; torque (Nm).....: 2/3 torque		—
	- tests according to clauses .....: 9.2.2; 9.2.7		—
	- electric strength test afterwards		P
	a) no deposit in dust-proof luminaire		N/A
	b) no talcum in dust-tight luminaire		P
	c) no trace of water on current-carrying parts or on insulation where it could become a hazard		P
	c.1) For luminaires without drain holes – no water entry		P
	c.2) For luminaires with drain holes – no hazardous water entry		N/A
	d) no water in watertight or pressure watertight luminaire		N/A
	e) no contact with live parts (IP 2X)		N/A
	e) no entry into enclosure (IP 3X and IP 4X)		N/A
	e) no contact with live parts through drain holes and ventilation slots (IP3X and IP4X)		N/A
	f) no trace of water on part of lamp requiring protection from splashing water		N/A
	g) no damage of protective shield or glass envelope		P
5.13 (9.3)	Humidity test 48 h		P
<b>5.14 (10)</b>	<b>INSULATION RESISTANCE AND ELECTRIC STRENGTH</b>		P
5.14 (10.2.1)	Insulation resistance test		P
	Cable or cord covered by metal foil or replaced by a metal rod of mm Ø .....	Covered by metal foil	—
	Insulation resistance (MΩ).....: 100		—
	SELV		N/A
	- between current-carrying parts of different polarity:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- between current-carrying parts and mounting surface .....		N/A
	- between current-carrying parts and metal parts of the luminaire.....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV		P
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....	100MΩ	P
	- between live parts and metal parts.....	100MΩ	P
	- between live parts of different polarity through action of a switch .....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
5.14 (10.2.2)	Electric strength test		P
	Dummy lamp		N/A
	Luminaires with ignitors after 24 h test		N/A
	Luminaires with manual ignitors		N/A
	Test voltage (V) .....	1480	P
	SELV		N/A
	- between current-carrying parts of different polarity :		N/A
	- between current-carrying parts and mounting surface .....		N/A
	- between current-carrying parts and metal parts of the luminaire.....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
	Other than SELV		P
	- between live parts of different polarity .....		N/A
	- between live parts and mounting surface .....	1480 V	P
	- between live parts and metal parts.....	1480 V	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- between live parts of different polarity through action of a switch .....		N/A
	- between the outer surface of a flexible cord or cable where it is clamped in a cord anchorage and accessible metal parts .....		N/A
	- Insulation bushings as described in Section 5 .....		N/A
5.14 (10.3)	Touch current or protective conductor current (mA):	0,07	P

<b>5.15 (13)</b>	<b>RESISTANCE TO HEAT, FIRE AND TRACKING</b>		P
5.15 (13.2.1)	Ball-pressure test.....	See Test Table 5.15 (13.2.1)	P
5.15 (13.3.1)	Needle-flame test (10 s) .....	See Test Table 5.15 (13.3.1)	P
5.15 (13.3.2)	Glow-wire test (650°C).....	See Test Table 5.15 (13.3.2)	N/A
5.15 (13.4)	Proof tracking test (IEC 60112).....	See Test Table 5.15 (13.4)	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

5.7 (11.2)	TABLE: Creepage distances and clearances						P
	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages						P
	Applicable part of IEC 60598-1 Table 11.1* and 11.2*						P
	Insulation type **	Measured clearance	Required		Measured creepage	Required	
			clearance	*Table		creepage	*Table
Distance 1:	B	2,4	2,0	11.1	3,1	3,0	11.1
	B	3,1	2,0	11.1	3,1	3,0	11.1
Working voltage (V) .....					Uout 311V		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....							—
Supplementary information: L to N(PCB); L/N to enclosure(PCB)							
Distance 2:	R	6,5	3	11.1	6,5	5	11.1
Working voltage (V) .....					220-240		—
PTI .....					< 600 <input checked="" type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....							—
Supplementary information:							
Distance 3:							
Working voltage (V) .....							—
PTI .....					< 600 <input type="checkbox"/> ≥ 600 <input type="checkbox"/>		—
Pulse voltage if applicable (kV) .....							—
Supplementary information:							

\*\* Insulation type: B – Basic; S – Supplementary; R – Reinforced. See also IEC 60598-1 Annex M.

5.15 (13.2.1)	TABLE: Ball Pressure Test of Thermoplastics			P
Allowed impression diameter (mm) .....		2		—
Object/ Part No./ Material	Manufacturer/ trademark	Test temperature (°C)	Impression diameter (mm)	
Screwless terminal	See CDF	125	1,3	
Supplementary information:				

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Clause	Requirement + Test	Result - Remark			Verdict
<b>5.15 (13.3.1)</b>	<b>TABLE: Needle-flame test (IEC 60695-11-5)</b>				<b>P</b>
Object/ Part No./ Material	Manufacturer/ trademark	Duration of application of test flame (ta); (s)	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict
Screwless terminal	See CDF	10	No	0	P
Supplementary information:					

<b>5.15 (13.3.2)</b>	<b>TABLE: Glow-wire test (IEC 60695-2-11)</b>				<b>N/A</b>
<b>Glow wire temperature .....</b>		650°C			—
Object/ Part No./ Material	Manufacturer/ trademark	Ignition of specified layer Yes/No	Duration of burning (tb) (s)	Verdict	
Any flame or glowing of the sample extinguished within 30 s of withdrawing the glow-wire, and any burning or molten drop did not ignite the underlying parts (Yes/No).....:					
Supplementary information:					

<b>5.15 (13.4)</b>	<b>TABLE: Proof tracking test (IEC 60112)</b>				<b>N/A</b>
<b>Test voltage PTI .....</b>		175 V			—
Object/ Part No./ Material	Manufacturer/ trademark	Withstand 50 drops without failure on three places or on three specimens			Verdict
Supplementary information:					



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Clause	Requirement + Test	Result - Remark	Verdict

ANNEX 1		TABLE: Critical components information					
Object / part No.	Code	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity <sup>1)</sup>	
See Construction Data form for electrical equipment and machinery.							
Supplementary information:							
<sup>1)</sup> Provided evidence ensures the agreed level of compliance. See OD-CB2039. The codes above have the following meaning: A - The component is replaceable with another one, also certified, with equivalent characteristics B - The component is replaceable if authorised by the test house C - Integrated component tested together with the appliance D - Alternative component							

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12			P			
	Type reference .....	TG-163LLED		—			
	Lamp used.....	LED module		—			
	Lamp control gear used .....	LED driver		—			
	Mounting position of luminaire.....	Normal position		—			
	Supply wattage (W) .....	1162,2		—			
	Supply current (A).....	4,676		—			
	Calculated power factor .....	0,978		—			
	Table: measured temperatures corrected for ta = 45 °C:						
	- abnormal operating mode .....	N/A		—			
	- test 1: rated voltage .....	240V~		—			
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....	254V~		—			
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A		—			
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....	N/A		—			
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A		—			
Temperature measurements, (°C)							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit
Internal wire	45,0	-	68,2	-	180	-	-

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Clause	Requirement + Test				Result - Remark		Verdict
PCB	45,0	-	81,0	-	130	-	-
terminal	45,0	-	65,1	-	110	-	-
Driver tc	45,0	71,5	-	-	90	-	-
Enclosure(metal )	45,0	-	69,9	-	65+10	-	-
Power cord	45,0	-	56,9	-	180	-	-
Mounting surface	45,0	-	52,1	-	85	-	-
Surge protector	45,0	-	71,0	-	90	-	-
Screwless terminal	45,0	-	60,7	-	90	-	-
Supplementary information:							

ANNEX 2	TABLE: Temperature measurements, thermal tests of Section 12						P
	Type reference .....	TG-161SLED					—
	Lamp used.....	LED module					—
	Lamp control gear used .....	LED driver					—
	Mounting position of luminaire.....	Normal position					—
	Supply wattage (W) .....	512,1					—
	Supply current (A).....	2,048					—
	Calculated power factor .....	0,984					—
	Table: measured temperatures corrected for $t_a = 45\text{ }^\circ\text{C}$ :						
	- abnormal operating mode .....	N/A					—
	- test 1: rated voltage .....	240V~					—
	- test 2: 1,06 times rated voltage or 1,05 times rated wattage.....	254V~					—
	- test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage .....	N/A					—
	- test 4: 1,1 times rated voltage or 1,05 times rated wattage.....	N/A					—
	Through wiring or looping-in wiring loaded by a current of A during the test .....	N/A					—
<b>Temperature measurements, (<math>^\circ\text{C}</math>)</b>							
Part	Ambient	Clause 12.4 – normal				Clause 12.5 – abnormal	
		test 1	test 2	test 3	limit	test 4	limit

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Clause	Requirement + Test				Result - Remark		Verdict
Internal wire	45,0	-	84,6	-	180	-	-
PCB	45,0	-	97,5	-	130	-	-
terminal	45,0	-	62,8	-	110	-	-
Driver tc	45,0	82,7	-	-	90	-	-
Enclosure(metal )	45,0	-	74,5	-	65+10	-	-
Power cord	45,0	-	56,6	-	180	-	-
Mounting surface	45,0	-	52,5	-	85	-	-
Screwless terminal	45,0	-	75,4	-	90	-	-
Electro-mechanical contact systems	45,0	-	61,8	-	90	-	-
Supplementary information:							

ANNEX 3	Screw terminals (part of the luminaire)		N/A
<b>(14)</b>	<b>SCREW TERMINALS</b>		N/A
(14.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(14.3.2.1)	One or more conductors		N/A
(14.3.2.2)	Special preparation		N/A
(14.3.2.3)	Terminal size		N/A
	Cross-sectional area (mm <sup>2</sup> ) .....		—
(14.3.3)	Conductor space (mm) .....		N/A
(14.4)	Mechanical tests		N/A
(14.4.1)	Minimum distance		N/A
(14.4.2)	Cannot slip out		N/A
(14.4.3)	Special preparation		N/A
(14.4.4)	Nominal diameter of thread (metric ISO thread) .....		N/A
	External wiring		N/A
	No soft metal		N/A
(14.4.5)	Corrosion		N/A
(14.4.6)	Nominal diameter of thread (mm).....:		N/A
	Torque (Nm).....:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
(14.4.7)	Between metal surfaces		N/A
	Lug terminal		N/A
	Mantle terminal		N/A
	Pull test; pull (N).....:		N/A
(14.4.8)	Without undue damage		N/A
<b>ANNEX 4</b>	<b>Screwless terminals (part of the luminaire)</b>		N/A
<b>(15)</b>	<b>SCREWLESS TERMINALS</b>		N/A
(15.2)	Type of terminal.....:		—
	Rated current (A).....:		—
(15.3.1)	Material		N/A
(15.3.2)	Clamping		N/A
(15.3.3)	Stop		N/A
(15.3.4)	Unprepared conductors		N/A
(15.3.5)	Pressure on insulating material		N/A
(15.3.6)	Clear connection method		N/A
(15.3.7)	Clamping independently		N/A
(15.3.8)	Fixed in position		N/A
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples).....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.1.2)	Permanent connections: pull-off test (20 N)		N/A
(15.5.2)	Electrical tests		N/A
	Voltage drop (mV) after 1 h (4 samples).....:		N/A
	Voltage drop of two inseparable joints		N/A
	Number of cycles:		—
	Voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A
	Voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:		N/A
	After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples).....:		N/A

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Clause	Requirement + Test									Result - Remark	Verdict
	After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples).....:										N/A
(15.6)	Terminals external wiring										N/A
	Terminal size and rating										N/A
(15.6.2.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N) .....										N/A
	Pull test pin or tab terminals (4 samples); pull (N) .....										N/A
<b>(15.6.3.1)</b> <b>(15.6.3.2)</b>	<b>TABLE: Contact resistance test / Heating tests</b>										N/A
	Voltage drop (mV) after 1 h										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop of two inseparable joints										N/A
	Voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 10th alt. 25th cycle										N/A
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
	Continued ageing: voltage drop after 50th alt. 100th cycle										N/A
	Max. allowed voltage drop (mV).....:										—
terminal	1	2	3	4	5	6	7	8	9	10	
voltage drop (mV)											
Supplementary information:											

Appendix 1: National difference			
Clause	Requirement + Test	Result - Remark	Verdict

<b>ATTACHMENT TO TEST REPORT IEC 60598-2-5</b> <b>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES</b> <b>Luminaires</b> <b>Part 2: Particular requirements</b> <b>Section 5: Floodlights</b>			
<b>Differences according to</b> ..... : EN 60598-2-5:2015 used in conjunction with EN 60598-1:2015			
<b>Annex Form No.</b> .... : EU_GD_IEC60598_2_5E			
<b>Annex Form Originator</b> ..... : IMQ S.p.A.			
<b>Master Annex Form</b> ..... : 2016-08			
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	<b>CENELEC COMMON MODIFICATIONS (EN)</b>		<b>P</b>
--	--	--	----------

<b>5.5 (3)</b>	<b>MARKING</b>		<b>N/A</b>
5.5 (3.3.101)	For luminaires not supplied with terminal block: Adequate warning on the package		N/A

<b>5.6 (4)</b>	<b>CONSTRUCTION</b>		<b>N/A</b>
5.6 (4.11.6)	Electro-mechanical contact systems		N/A

<b>5.10 (5)</b>	<b>EXTERNAL AND INTERNAL WIRING</b>		<b>N/A</b>
5.10 (5.2.1)	Connecting leads		N/A
	- without a means for connection to the supply		N/A
	- terminal block specified		N/A
	- relevant information provided		N/A
	- compliance with 4.6, 4.7.1, 4.7.2, 4.10.1, 11.2, 12 and 13.2 of Part 1		N/A
5.10 (5.2.2)	Cables equal to EN 50525		N/A
	Replace table 5.1 – Supply cord		N/A

<b>5.12 (12)</b>	<b>ENDURANCE TESTS AND THERMAL TESTS</b>		<b>P</b>
5.12 (12.4.2c)	Thermal test (normal operation) see footnote c to table 12.2 relating to unsleeved fixed wiring		P

<b>Appendix 1: National difference</b>			
Clause	Requirement + Test	Result - Remark	Verdict
<b>ZB</b>	<b>ANNEX ZB, SPECIAL NATIONAL CONDITIONS (EN)</b>		N/A
(3.3)	DK: power supply cords of class I luminaires with label		N/A
(4.5.1)	DK: socket-outlets		N/A
(5.2.1)	CY, DK, FI, GB: type of plug		N/A
<b>ZC</b>	<b>ANNEX ZC, NATIONAL DEVIATIONS (EN)</b>		N/A
(4 & 5)	FR: Shuttered socket-outlets 10/16A		N/A
	FR: Safety requirements for high buildings  (Arrêté du 30 décembre 2011 portant règlement de sécurité pour la construction des immeubles de grande hauteur et leur protection contre les risques d'incendie et de panique; Section VIII; Article GH 48, Eclairage)  Glow-wire test for outer parts of luminaires:		N/A
	- 850°C for luminaires in stairways and horizontal travel paths		N/A
	- 650°C for indoor luminaires		N/A
	GB: Requirements according to United Kingdom Building Regulation		N/A

Appendix 2: requirements of IEC 62031:2008/A1:2012+A2:2014			
Clause	Requirement + Test	Result - Remark	Verdict

6	CLASSIFICATION		P
	Built-in module .....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Independent module.....	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Integral module .....	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	For Integral module; Note to 1.2.1 in IEC 60598-1 applies.		—

13 (14)	FAULT CONDITIONS		P
13.2	Module withstands overpower condition >15 min.		P
	Module with automatic protective device or power limiter, test performed 15 min. at limit.		P
	During the tests, tissue paper, spread below module, does not ignite		P



Appendix 3: requirements of IEC 62493:2015			
Clause	Requirement + Test	Result - Remark	Verdict
<b>4</b>	<b>LIMITS</b>		P
<b>4.1</b>	<b>General</b>		P
	Comply with Van der Hoofden test limit in 4.2.3 or inherently compliant in 4.2.2 and pass assessment procedure for intentional radiators in 4.3		
<b>4.2</b>	<b>Unintentional radiating part of lighting equipment</b>		P
4.2.2	Lighting equipment deemed to comply with the Van der Hoofden test without testing		P
	1) electronic controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	2) incandescent-lamp technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	3) LED-light-source technology	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	4) OLED-light-source technology	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	5) high-pressure discharge lamp LED-light-source technologies	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	6) low-pressure discharge lamp technologies with exposure distance $\geq 50$ cm	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	7) independent auxiliary	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Not fulfil any of 1-7 above subject to 4.2.3		—
4.2.3	Applications of limits		N/A
	Not fulfil any of 1-7 in 4.2.2 but the compliance factor $F$ is $\leq 1$		N/A
<b>4.3</b>	<b>Intentional radiating part of lighting equipment</b>		N/A
	Comply with one of methods in Clause 7 if intentional radiator		N/A

Appendix 4: requirements of IEC/TR 62778: 2014			
Clause	Requirement + Test	Result - Remark	Verdict
<b>7</b>	<b>MEASUREMENT INFORMATION FLOW</b>		<b>P</b>
<b>7.1</b>	<b>Basic flow</b>		<b>P</b>
	'Law of conservation of luminance' applied		P
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		P
	In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution		N/A
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		<b>P</b>
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		P
<b>7.3</b>	<b>Special cases (I): Replacement by a lamp or LED module of another type</b>		<b>N/A</b>
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
<b>7.4</b>	<b>Special cases (II): Arrays and clusters of primary light sources</b>		<b>N/A</b>
	LED package is evaluated as .....	<input type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited	N/A
	$E_{thr}$ of LED package applies to array		N/A
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		<b>P</b>
	Risk group achieved:		P
	-...Risk Group 0 unlimited		N/A
	-...Risk Group 1 unlimited		P
	- $E_{thr}$ ..... (lx) : Distance to reach RG1 ..... (m) :		N/A

Appendix 4: requirements of IEC/TR 62778: 2014				
Clause	Requirement + Test		Result - Remark	Verdict
	<b>TABLE: Spectroradiometric measurement</b>			<b>P</b>
	<b>Measurement performed on:</b>	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire		
	<b>Model number</b> .....:	TG-161SLED		
	<b>Test voltage (V)</b> .....:	240		—
	<b>Test current (mA)</b> .....:	204,8		—
	<b>Test frequency (Hz)</b> .....	50		—
	<b>Ambient, t (°C)</b> .....	25		—
	<b>Measurement distance</b> .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		—
	<b>Source size</b> .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small: .... mm		—
	<b>Field of view</b> .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		—
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	6257	
x/y colour coordinates			/	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	48	
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	2,462	
Luminance	L	cd/m <sup>2</sup>	6,511 x10 <sup>4</sup>	
Illuminance	E	lx	5922	
Supplementary information:				

Appendix 4: requirements of IEC/TR 62778: 2014			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE: Spectroradiometric measurement (5050)			P	
Measurement performed on:	<input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input checked="" type="checkbox"/> Luminaire			
Model number .....	TG-161SLED			
Test voltage (V) .....	240		—	
Test current (mA) .....	204,8		—	
Test frequency (Hz) .....	50		—	
Ambient, t (°C) .....	25		—	
Measurement distance .....	<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		—	
Source size .....	<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small: .... mm		—	
Field of view .....	<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		—	
Item	Symbol	Units	Result	Remark
Correlated colour temperature	CCT	K	6896	
x/y colour coordinates			/	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	3,286 x 10 <sup>3</sup>	
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	6,642	
Luminance	L	cd/m <sup>2</sup>	3,339 x 10 <sup>6</sup>	
Illuminance	E	lx	6749	
Supplementary information:				

Appendix 5 Photograph



TG-161SLED

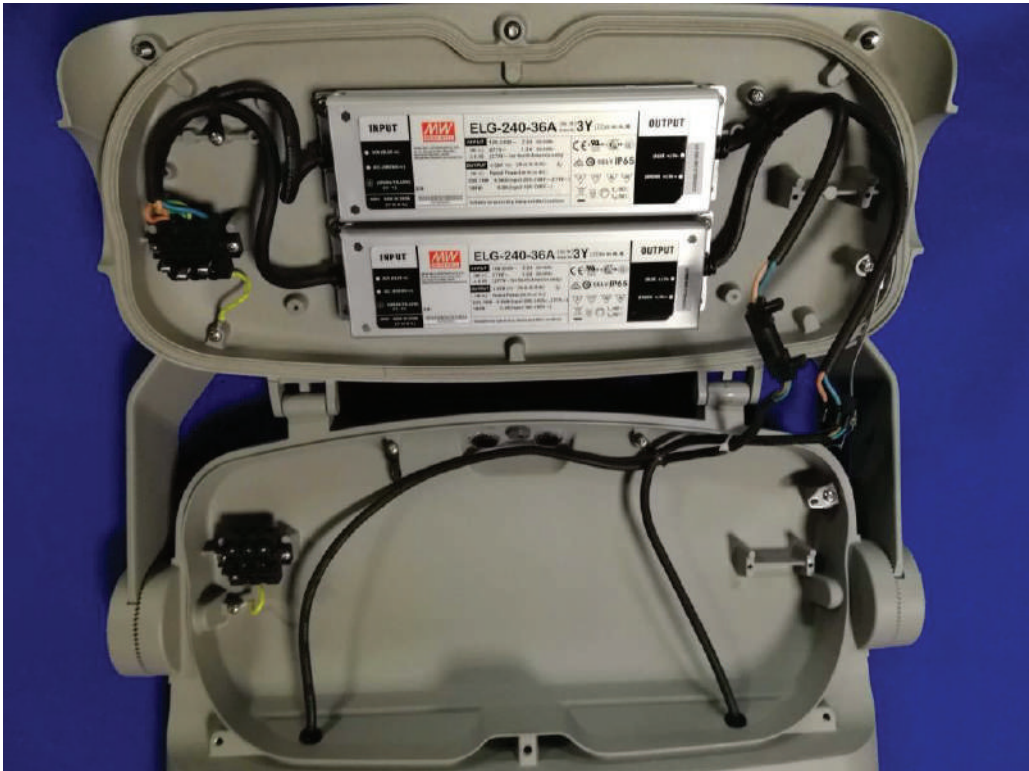


TG-161S1LED

Appendix 5 Photograph

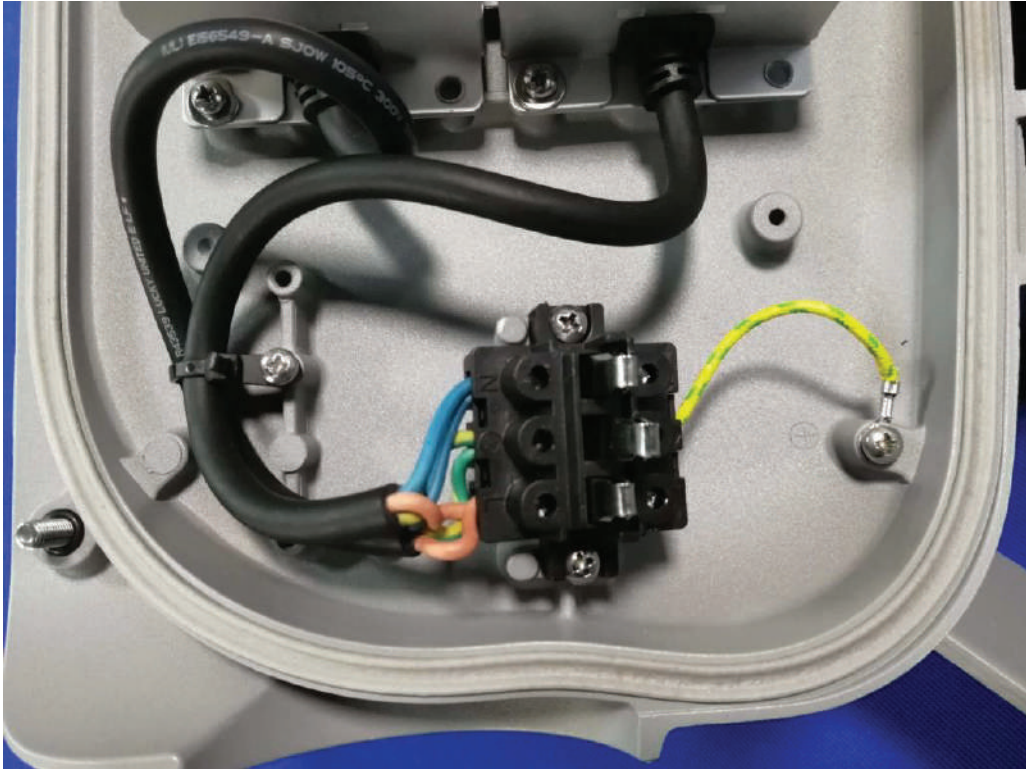


TG-161LLED



Internal construction

Appendix 5 Photograph



Electro-mechanical contact systems



LED driver


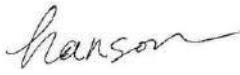


Test Report issued under the responsibility of:



<b>TEST REPORT</b> <b>IEC TR 62778</b> <b>Application of IEC 62471 for the assessment of blue light hazard to light sources and luminaires</b>	
Report Number.....	3194758.51P
Date of issue .....	2016-08-30
Total number of pages .....	16
Name of Testing Laboratory preparing the Report .....	DEKRA Testing and Certification (Shanghai) Ltd. 3/F, #250, Jiangchangsan Road building 16 Headquarter Economy Park Shibeil Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436
Applicant's name .....	Lumileds Commercial (Shanghai) Co., Ltd
Address.....	No. 9, Lane 888, Tianlin Road, Shanghai, China
<b>Test specification:</b>	
Standard .....	IEC TR 62778:2014 (Second Edition)
Test procedure .....	CB Scheme
Non-standard test method .....	N/A
Test Report Form No. ....	IEC62778A
Test Report Form(s) Originator ....	TÜV SÜD Product Service GmbH
Master TRF .....	Dated 2016-02
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<b>General disclaimer:</b>	
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<b>Test item description</b> .....	LUXEON 5050	
<b>Trade Mark</b> .....	LUMILEDS	
<b>Manufacturer</b> .....	Lumileds Commercial (Shanghai) Co., Ltd No. 9, Lane 888, Tianlin Road, Shanghai, China	
<b>Model/Type reference</b> .....	LUXEON 5050 series Detailed lists refer to Appendix 2: Model List	
<b>Ratings</b> .....	Max voltage: 27 Vdc, Max current: 240 mA Detailed information please refer to Appendix 2: Model List.	
<b>Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):</b>		
<input checked="" type="checkbox"/> <b>CB Testing Laboratory:</b>	DEKRA Testing and Certification (Shanghai) Ltd.	
<b>Testing location/ address</b> .....	3/F, #250, Jiangchangsan Road building 16 Headquater Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436	
<input type="checkbox"/> <b>Associated CB Testing Laboratory:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....	Zhijun Wang	
<b>Approved by (name, function, signature)</b> .....	Hanson Zhang	
<b>Testing procedure: CTF Stage 1:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> .....		
<b>Testing procedure: CTF Stage 2:</b>		
<b>Testing location/ address</b> .....		
<b>Tested by (name + signature)</b> .....		
<b>Witnessed by (name, function, signature)</b> .....		
<b>Approved by (name, function, signature)</b> .....		
<b>Testing procedure: CTF Stage 3:</b>		
<b>Testing procedure: CTF Stage 4:</b>		
<b>Testing location/ address</b> .....		

Tested by (name, function, signature) .....		
Witnessed by (name, function, signature) .....		
Approved by (name, function, signature) .....		
Supervised by (name, function, signature) .....		

<p><b>List of Attachments (including a total number of pages in each attachment):</b></p> <ul style="list-style-type: none"> <li>● Appendix 1: Photo Documentation</li> <li>● Appendix 2: Model List</li> <li>● Appendix 3: Relative Spectrum Of Tested Sample(s)</li> <li>● Appendix 4: Table 6.1 Based On IEC 62471:2006</li> <li>● Appendix 5: Table 6.1 Based On EN62471:2008, Attachment To IEC 62471 European Group Differences And National Differences</li> </ul>	
<p><b>Summary of testing:</b></p>	
<p><b>Tests performed (name of test and test clause):</b></p> <p>These tests fulfil the requirements of standard ISO/IEC 17025. When determining the test conclusion, the Measurement Uncertainty of test has been considered.</p> <p>The tested sample of L150-44705024SCP00 from LUXEON 5050 series list at appendix 2 Have been tested according to the IEC 62471 (first edition, 2006-07) <b>at 200mm</b> and been classified as <b>RG 2</b>. Have been tested according to the EN 62471:2008 <b>at 200mm</b> and been classified as <b>RG 2</b>. Have been tested according to the IEC/TR62778:2014 and been classified as <b>RG 2 for blue light hazard</b></p>	<p><b>Testing location:</b></p> <p>DEKRA Testing and Certification (Shanghai) Ltd. 3/F, #250, Jiangchangsan Road building 16 Headquater Economy Park Shibe Hi-Tech Park, Zhabei District, Shanghai, P.R.C 200436</p>
<p><b>Summary of compliance with National Differences (List of countries addressed): EN Standards</b></p> <p>EN 62471:2008</p> <p><input checked="" type="checkbox"/> <b>The product fulfils the requirements</b></p>	

**Copy of marking plate:**

**The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.**

N/A

<b>Test item particulars.....: See below</b>	
<b>Product evaluated.....:</b>	<input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire
<b>Rated voltage (V) .....</b>	Max: 27 Vdc
<b>Rated current (mA) .....</b>	Max:240 mA
<b>Rated CCT (K).....</b>	2600K / 3340K // 4000K / 4360K Details information please refer to Appendix 2: Model List.
<b>Rated Luminance (Mcd/m<sup>2</sup>) .....</b>	--
<b>Component report data used .....</b>	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp Report number: --
<b>Possible test case verdicts:</b>	
- test case does not apply to the test object..... : N/A	
- test object does meet the requirement..... : P (Pass)	
- test object does not meet the requirement..... : F (Fail)	
<b>Testing..... : --</b>	
<b>Date of receipt of test item .....</b>	2016-08-25
<b>Date (s) of performance of tests .....</b>	2016-08-25 to 2016-08-30
<b>General remarks:</b>	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.  <b>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</b>  The product complied with the following standards: <input checked="" type="checkbox"/> IEC 62471:2006 <input checked="" type="checkbox"/> EN 62471:2008 <input type="checkbox"/> IEC/TR 62471-2:2009 <input checked="" type="checkbox"/> IEC/TR 62778:2014	
<b>Manufacturer's Declaration per sub-clause 4.2.5 of IEC62778:</b>	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided ..... :	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable

**When differences exist; they shall be identified in the General product information section.**

**Name and address of factory (ies) .....** : Lumileds Commercial (Shanghai) Co., Ltd  
No. 9, Lane 888, Tianlin Road, Shanghai, China

**General product information:**

L150-44705024SCP00, with ANSI bin 4360K, is part of the LUXEON 5050 product family. The sample measured, L150-44705024SCP00 has the highest typical flux density (lumens per mm<sup>2</sup> of light emitting surface (LES) area), highest typical device luminance level and highest CCT within the listed LUXEON 5050 product family. The present classification is thus valid (worst case) for all LUXEON 5050 with part number L 1 5 0 - A A B 5 0 2 4 C C 0 0 where AA represents nominal ANSI CCT bins could be equal to 4360K or lower, BB represents CRI could be from 68 to 90 (see TR IEC62778). See the appendix below for an explanation of the type designation.

The products considered as worst case which should be evaluated at 200mm.

The sample of L150-44705024SCP00 was tested at 200mm from the light source. CCT of spectral irradiance was found at 4544 K.

Base on the Model list which listed on the appendix 2, The tested sample can be considered as  
 typical product  worst product

Which the results can be reference used for the other models.

Type test was performed according to IEC 62471:2006 procedure.

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict
<b>7</b>	<b>MEASUREMENT INFORMATION FLOW</b>		<b>P</b>
<b>7.1</b>	<b>Basic flow</b>		<b>P</b>
	'Law of conservation of luminance' applied		N/A
	Use of only true luminance/radiance values		P
	In case of luminaire: The light source is operated in the luminaire under similar conditions as when tested as a component		N/A
	In case $E_{thr}$ value for RG2 was established the peak value was derived from angular light distribution		N/A
<b>7.2</b>	<b>Conditions for the radiance measurement</b>		<b>P</b>
	Standard condition applied (200mm distance, 0,011rad field of view)		P
	Non-standard condition applied		N/A
<b>7.3</b>	<b>Special cases (I): Replacement by a lamp or LED module of another type</b>		<b>N/A</b>
	Light source is a white light source		N/A
	Evaluation done based on highest luminance		N/A
	Evaluation done based on CCT value		N/A
<b>7.4</b>	<b>Special cases (II): Arrays and clusters of primary light sources</b>		<b>N/A</b>
	LED package is evaluated as ..... : <input type="checkbox"/> RG0 unlimited <input type="checkbox"/> RG1 unlimited		N/A
	$E_{thr}$ of LED package applies to array		N/A
<b>8</b>	<b>RISK GROUP CLASSIFICATION</b>		<b>P</b>
	Risk group achieved:		P
	- ..Risk Group 0 unlimited		N/A
	- ..Risk Group 1 unlimited		N/A
	- $E_{thr}$ ..... (lx) : - Distance to reach RG1..... (mm) ::	Refer to the Supplementary information of <b>TABLE:Spectroradiometric measurement</b> as following	P

IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE:Spectroradiometric measurement				
Measurement performed on:		<input checked="" type="checkbox"/> LED package <input type="checkbox"/> LED module <input type="checkbox"/> Lamp <input type="checkbox"/> Luminaire		
Model number.....		L150-44705024SCP00		
Test voltage (V) .....		27 Vdc		—
Test current (mA) .....		240 mA		—
Test frequency (Hz).....		--		—
Ambient, t(°C) .....		25°C		—
Measurement distance.....		<input checked="" type="checkbox"/> 20 cm <input type="checkbox"/> ... cm		—
Source size .....		<input checked="" type="checkbox"/> Non-small <input type="checkbox"/> Small :		—
Field of view .....		<input type="checkbox"/> 100 mrad <input checked="" type="checkbox"/> 11 mrad <input type="checkbox"/> 1,7 mrad (for small sources)		—
Item	Symb ol	Units	Result	Remark
Correlated colour temperature	CCT	K	4544	
x/y colour coordinates			0,3669/ 0,4076	
Blue light hazard radiance	L <sub>B</sub>	W/(m <sup>2</sup> •sr <sup>1</sup> )	1,70E+04	@11mrad
Blue light hazard irradiance	E <sub>B</sub>	W/m <sup>2</sup>	--	
Luminance	L	cd/m <sup>2</sup>	2,82E+07	@11mrad
Illuminance	E	lx	8,23E+03	
Supplementary information: Per IEC/TR 62778:2014 E <sub>thr</sub> =1655 lx D <sub>min</sub> = 446 mm				



IEC TR 62778			
Clause	Requirement + Test	Result - Remark	Verdict

	<b>TABLE: Angular light distribution</b>	<b>N/A</b>

**List of test equipment used:**

A completed list of used test equipment shall be provided in the Test Reports when a Manufacturer Testing Laboratory according to CTF stage 1 or CTF stage 2 procedure has been used.

Note: This page may be removed when CTF stage 1 CTF stage 2 are not used. See also clause 4.8 in OD 2020 for more details.

Clause	Measurement / testing	Testing / measuring equipment / material used, (Equipment ID)	Range used	Last Calibration date	Calibration due date
7	Irradiance measurements Radiance measurements	IDR 300 Monochromator (SH 344)	200-3000nm	/	/
7	Radiance measurements	S009 Telescope (SH 345)	300-1400nm	/	/
7	Radiance measurements	SRS 12 Radiance Standard (SH 348)	300-1400nm	2016/3/22	2017/3/22
7	Irradiance measurements	CL6 Spectral irradiance standard (SH 350)	300-3000nm	2016/3/22	2017/3/22
7	Irradiance measurements	CL7 Spectral irradiance standard (SH 351)	200-400nm	2016/3/22	2017/3/22
7	Irradiance measurements	Photometric detector head (SH 359)	380nm-800nm	2016/3/22	2017/3/22
7	Irradiance measurements Radiance measurements	Wattmeter (SH070)	500V,40A	2015/10/16	2016/10/16

Appendix 1: Photo Documentation



Overview (tested)

Appendix 2: Model List:

L150-44705024SCP00, with ANSI bin 4360K, is part of the LUXEON 5050 product family. The sample measured, L150-44705024SCP00 has the highest typical flux density (lumens per mm<sup>2</sup> of light emitting surface (LES) area), highest typical device luminance level and highest CCT within the listed LUXEON 5050 product family. The present classification is thus valid (worst case) for all LUXEON 5050 with part number L 1 5 0 - A A B B 5 0 2 4 C C C 0 0 where AA represents nominal ANSI CCT bins could be equal to 4360K or lower, BB represents CRI could be from 68 to 90 (see TR IEC62778). See the appendix below for an explanation of the type designation.

L 1 5 0 - **A A B B** 5 0 2 4 C C C 0 0

Where:

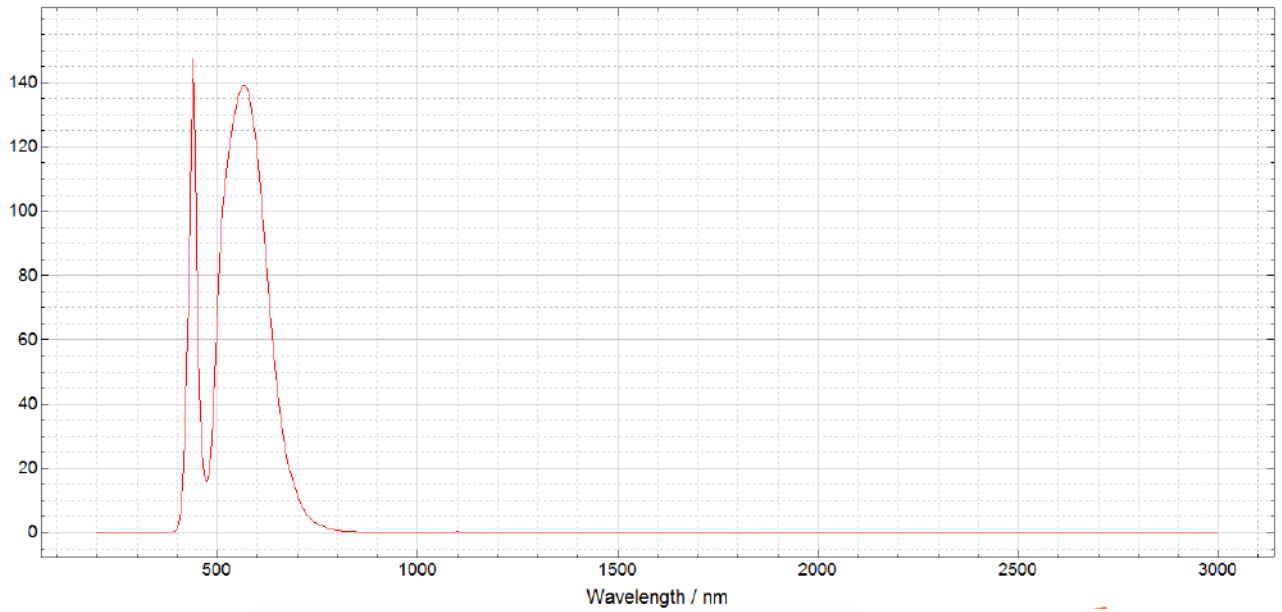
**AA** - designates nominal ANSI CCT

**BB** - designates minimum CRI

**CCC** - designates standard color point or customized one

Part number	CRI	CCT	typical flux (lm)	LES (mm <sup>2</sup> )	flux density	Max voltage	max current
L150-26705024SCP00	≥68	2600K	590	16.3	36	27	240
L150-33705024SCP00	≥68	3340K	625	16.3	38	27	240
L150-40705024SCP00	≥68	4000K	655	16.3	40	27	240
L150-44705024SCP00	≥68	4360K	655	16.3	40	27	240

Appendix 3: Relative Spectrum Of Tested Sample(s)



Appendix 4: Table 6.1 Based On IEC 62471:2006

DUT: L150-44705024SCP00, Evaluation Distance: 200mm, Test current: 240mA, Angular subtense of the apparent source  $\alpha$ : 25mrad

IEC 62471									
Clause	Requirement + Test				Result – Remark				Verdict
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps								P
Risk	Action spectrum	Symbol	Units	Emission Measurement					
				Exempt		Low risk		Mod risk	
				Limit	Result	Limit	Result	Limit	Result
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	0,0000	0,003		0,03	
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	10	0,0000	33		100	
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	5,08E+02	10000	1,70E+04	4000000	1,80E+04
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	1,0*	--	1,0		400	
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ $\alpha$	2,23E+05	28000/ $\alpha$		71000/ $\alpha$	
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	6000/ $\alpha$	--	6000/ $\alpha$		6000/ $\alpha$	
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0,04	570		3200	
* Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian.									
** Involves evaluation of non-GLS source									

Appendix 5: Table 6.1 Based On EN62471:2008, Attachment To IEC 62471 European Group Differences And National Differences

DUT: L150-44705024SCP00, Evaluation Distance: 200mm, Test current: 240mA, Angular subtense of the apparent source  $\alpha$ : 25mrad

EN 62471										
Clause	Requirement + Test			Result – Remark				Verdict		
<b>Table 6.1</b>	Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC)								P	
Risk	Action spectrum	Symbol	Units	Emission Measurement						
				Exempt		Low risk		Mod risk		
				Limit	Result	Limit	Result	Limit	Result	
Actinic UV	$S_{UV}(\lambda)$	$E_s$	$W \cdot m^{-2}$	0,001	0,0000	--	--	--	--	
Near UV		$E_{UVA}$	$W \cdot m^{-2}$	0,33	0,0000	--	--	--	--	
Blue light	$B(\lambda)$	$L_B$	$W \cdot m^{-2} \cdot sr^{-1}$	100	5,08E+02	10000	1,70E+04	4000000	1,80E+04	
Blue light, small source	$B(\lambda)$	$E_B$	$W \cdot m^{-2}$	0,01*	--	1,0		400		
Retinal thermal	$R(\lambda)$	$L_R$	$W \cdot m^{-2} \cdot sr^{-1}$	28000/ $\alpha$	2,23E+05	28000/ $\alpha$		71000/ $\alpha$		
Retinal thermal, weak visual stimulus**	$R(\lambda)$	$L_{IR}$	$W \cdot m^{-2} \cdot sr^{-1}$	545000 0,0017 $\leq \alpha \leq$ 0,011	--					
				6000/ $\alpha$ 0,011 $\leq \alpha \leq$ 0,1	--					
IR radiation, eye		$E_{IR}$	$W \cdot m^{-2}$	100	0,04	570		3200		
<p>* Small source defined as one with <math>\alpha &lt; 0,011</math> radian. Averaging field of view at 10000 s is 0,1 radian.</p> <p>** Involves evaluation of non-GLS source</p> <p>NOTE The action functions: see Table 4.1 and Table 4.2  The applicable aperture diameters: see 4.2.1  The limitations for the angular subtenses: see 4.2.2  The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.</p>										



Choose certainty.  
Add value.

**Technical Report No. 704021712536-00**

**Rev. 00**

**Dated 2018-02-08**

Client: Ningbo King-Bridge Lighting Technology Co.,Ltd.  
No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400,  
Yuyao, Zhejiang Province, People's Republic of China

Manufacturing place: Ningbo King-Bridge Lighting Technology Co.,Ltd.  
No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400,  
Yuyao, Zhejiang Province, People's Republic of China

Test subject: Product: LED Floodlight  
Type: TG-163SLED; TG-163LLED; TG-161LLED; TG-161MLED; TG-  
161SLED; TG-161S1LED

Test specification: IEC 60598-2-3:2002 + A1:2011 & IEC 60598-1:2014

Purpose of examination: 

- According to client's requirement for above mentioned model
  - IK09 test
  - IP66 test

Test result: **PASS**





## 1 Description of the test subject

### 1.1 Technical Data

Rated voltage: 100-240V~

Rated frequency: 50/60Hz

Rated power: TG-163SLED: 600W; TG-163LLED: 1200W; TG-161LLED: 480W; TG-161MLED: 300W; TG-161SLED: 200W; TG-161S1LED: 100W

Protection Class: Class I

Degree of protection: IP66

## 2 Order

### 2.1 Date of Purchase Order, Customer's Reference

2017-11-16

#### Receipt of Test Sample, Location

2017-11-16

TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch

No. 1999, Duhui Road, Shanghai, 201108, P. R. China

### 2.2 Date of Testing

2017-11-16 to 2018-02-05

### 2.3 Location of Testing

TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch



## 2.4 Points of Non-compliance or Exceptions of the Test Procedure

None

## 3 Test specification

Test methods: According to IEC 60598-2-3:2002 + A1:2011 & IEC 60598-1:2014.

We pick up the TG-163LLED with highest wattage and largest dimension as typical test sample.

### 1. Impact energy was shown as blow:

IK code	IK00	IK01	IK02	IK03	IK04	IK05	IK06	IK07	IK08	IK09	IK10
Impact energy, J	*	0,14	0,2	0,35	0,5	0,7	1	2	5	10	20
* Not protected according to this standard.											
NOTE 1 When higher impact energy is required, the value of 50 J is recommended.											
NOTE 2 A characteristic group numeral of two figures has been chosen to avoid confusion with some national standards which used a single numeral for a specific impact energy.											

### 2. Requirement of IP test:

IP Level 1st Digit	IP Level 2nd Digit De
<b>0</b> Not protected	<b>0</b> Not protected
<b>1</b> Protected against solid foreign objects of 50 mm diameter and greater	<b>1</b> Protected against vertically falling water drops
<b>2</b> Protected against solid foreign objects of 12,5 mm diameter and greater	<b>2</b> Protected against vertically falling water drops when enclosure is tilted up to 15 °
<b>3</b> Protected against solid foreign objects of 2,5 mm diameter and greater	<b>3</b> Protected against water sprayed at an angle up to 60 ° on either side of the vertical
<b>4</b> Protected against solid foreign objects of 1,0 mm diameter and greater	<b>4</b> Protected against water splashed against the component from any direction
<b>5</b> Protected from the amount of dust that would interfere with normal operation	<b>5</b> Protected against water projected in jets from any direction
<b>6</b> Dust tight	<b>6</b> Protected against water projected in powerful jets from any direction
	<b>7</b> Protected against temporary immersion in water
	<b>8</b> Protected against continuous immersion in water, or as specified by the user

#### 4 Deviations

N/A

#### 5 Instruction manual

N/A


#### 6 Photograph





TÜV SÜD Certification and Testing (China)Co.,Ltd. Shanghai Branch  
TÜV SÜD Group

Engineer:   
Xiaohui YANG  
Project Handler

Technical Report checked:   
Xiang GAO  
Designated Reviewer

### **2.3 Compatibilidad Electromagnética**

- UNE-EN 61000-3-2. Compatibilidad electromagnética (CEM). Parte 3-2 Límites. Límites para las emisiones de corriente armónica (equipos con corriente de entrada 16 A por fase)
- UNE-EN 55015. Límites y métodos de medida de las características relativas a la perturbación radioeléctrica de los equipos de iluminación y similares.
- UNE-EN 61547. Equipos para alumbrado



Product Service

# Attestation of Conformity

No. E8A 001704 0004 Rev. 01

**Holder of Certificate:** **Ningbo King-Bridge Lighting Technology Co.,Ltd.**

No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street,  
315400 Yuyao, Zhejiang Province  
PEOPLE'S REPUBLIC OF CHINA

**Name of Object:** **Flood lights**  
**LED Floodlight**

This Attestation of Conformity is issued on a voluntary basis according to the Directive 2014/30/EU relating to electromagnetic compatibility. It confirms that the listed apparatus complies with all essential requirements of the directive and is based on the technical specifications applicable at the time of issuance. It refers only to the particular sample submitted for testing and certification. For details see: [www.tuvsud.com/ps-cert](http://www.tuvsud.com/ps-cert)

**Test report no.:** 708881712536-01

**Date,** 2020-10-29

( Hui Tong )

Page 1 of 2

After preparation of the necessary technical documentation as well as the EU Declaration of conformity the required CE marking can be affixed on the product. That Declaration of conformity is issued under the sole responsibility of the manufacturer. Other relevant EU-directives have to be observed.



Product Service

# Attestation of Conformity

No. E8A 001704 0004 Rev. 01

**Model(s):** TG-163SLED, TG-163LLED, TG-161LLED,  
TG-161MLED, TG-161SLED, TG-161S1LED,  
TG-163XLLED, TG-201LED, TG-162LED

## Description of Object:

Rated voltage: see model list

Rated frequency: 50-60Hz

Rated power: see model list

Protection class: I

Model	Rated voltage	Rated frequency	Rated power
TG-163LLED	100-240V~	50-60Hz	1200W
TG-163SLED	100-240V~	50-60Hz	600W
TG-161LLED	100-240V~	50-60Hz	480W
TG-161MLED	100-240V~	50-60Hz	300W
TG-161SLED	100-240V~	50-60Hz	200W
TG-162LED	100-240V~	50-60Hz	180W
TG-161S1LED	100-240V~	50-60Hz	100W
TG-163XLLED	200-240V~	50-60Hz	1800W
TG-201LED	200-240V~	50-60Hz	720W

**Tested according to:** EN 55015:2013/A1:2015  
EN 61547:2009  
EN 61000-3-2:2014  
EN 61000-3-3:2013

# EMC Test Report

Product: LED Floodlight

Model: TG-163SLED, TG-163LLED,  
TG-161LLED, TG-161MLED, TG-161SLED,  
TG-161S1LED, TG-163XLLED, TG-201LED,  
TG-162LED

Applicant: Ningbo King-Bridge Lighting  
Technology Co., Ltd.



No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street,  
315400 Yuyao, Zhejiang Province, PEOPLE'S REPUBLIC OF CHINA



In accordance with EN 55015, EN 61547,  
EN 61000-3-2 and EN 61000-3-3

## COMMERCIAL-IN-CONFIDENCE

Issue Date: October 22,2020  
Report Number: 708881712536-01

RESPONSIBLE FOR	NAME	SIGNATURE	DATE
Approved By	Keping ZANG		Oct. 22. 2020
Prepared By	Liping XUE		Oct.22,2020

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service control rules.

### EXECUTIVE SUMMARY

Two samples of this product were tested and found to be compliance with EN 55015:2013/A1:2015, EN 61547:2009, EN 61000-3-2:2014 and EN 61000-3-3:2013.

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ID Number: EMC\_SHA\_F\_B\_02.23E  
Revision:20.00  
Effective:12/06/2019





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## 1 Report Summary

### 1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	10/22/2020

### 1.2 Introduction

The information contained in this report is intended to show verification of the EMC Qualification Approval Testing of the requirements of the standards for the tests listed in Section 1.3.

Applicant	Ningbo King-Bridge Lighting Technology Co., Ltd.
Address	No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400 Yuyao, Zhejiang Province, People's Republic of CHINA
Manufacturer	Ningbo King-Bridge Lighting Technology Co., Ltd.
Address	No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400 Yuyao, Zhejiang Province, P. R. China
Factory	Ningbo King-Bridge Lighting Technology Co., Ltd.
Address	No.8 Xingfu Road, Xinqiao Industry Zone, Yangming Street, 315400 Yuyao, Zhejiang Province, P. R. China
Trade Name	KLED
Model Number(s)	TG-163SLED, TG-163LLED, TG-161LLED, TG-161MLED, TG-161SLED, TG-161S1LED, TG-163XLLED, TG-201LED, TG-162LED
Rated Input Voltage/Frequency	Refer to model list
Rated Power	Refer to model list
Protection Class	Class I
Sample Number(s)	SHA-525505-1(TG-201LED), SHA-525505-2(TG-163XLLED)
Number of Samples Tested	2
Test Specification	EN 55015:2013/A1:2015, EN 61547:2009, EN 61000-3-2:2014 and EN 61000-3-3:2013
Date of Receipt of EUT	10/16/2020
Start of Test	10/19/2020
Finish of Test	10/20/2020
Name of Engineer(s)	Liping XUE

### 1.3 Brief Summary of Results

The sample's mentioned in this report is/are submitted/ supplied/ manufactured by client. The laboratory therefore assumes no responsibility for accuracy of information on the brand name, model number, origin of manufacture, consignment or any information supplied.

A brief summary of the tests carried out in accordance with EN 55015, EN 61000-3-2, EN 61000-3-3 and EN 61547 is shown below.

Section	Specification	Clause	Test Description	Result	Comments/Base Standard
AC Powered Light on					
2.1	EN 55015:2013/A1:2015	4.3.1	Conducted Disturbance at Mains Terminals	Pass (Minimum limit margin: 1.1dB)	
2.2	EN 55015:2013/A1:2015	4.4.1	Radiated Disturbance (9KHz to 30MHz)	Pass (Minimum limit margin: >6dB)	
2.3	EN 55015:2013/A1:2015	4.4.2	Radiated Disturbance (30MHz to 300MHz)	Pass (Minimum limit margin: >6dB)	
2.4	EN 61000-3-2:2014	7	Harmonic Current Emissions	Pass	
2.5	EN 61000-3-3:2013	5	Flicker	Pass	
2.6	EN 61547:2009	5.2	Electrostatic discharge immunity test	Pass	IEC 61000-4-2:2008
2.7	EN 61547:2009	5.3	Radiated, radio-frequency, electromagnetic field immunity test	Pass	IEC 61000-4-3:2006/A1:2007
2.8	EN 61547:2009	5.5	Electrical fast transient /burst immunity test	Pass	IEC 61000-4-4:2004
2.9	EN 61547:2009	5.6	Immunity to conducted disturbances, induced by radio-frequency fields	Pass	IEC 61000-4-6:2008
2.10	EN 61547:2009	5.7	Surge immunity test	Pass	IEC 61000-4-5:2005
2.11	EN 61547:2009	5.8	Voltage dips, short interruptions and voltage variations immunity test	Pass	IEC 61000-4-11:2004

## 1.4 Product Information

### 1.4.1 Technical Description

The Equipment Under Test (EUT) was a LED Floodlight.

According to the client's request, three new models TG-162LED, TG-163XLLED and TG-201LED are added on the E8A attestation. The client declared that model TG-162LED use the same LED driver as model TG-161SLED except for the different rated power and enclosure. New models TG-163XLLED and TG-201LED are equipped with new LED drivers.

Detailed model differences are as below:

Model list

Model	Rated voltage	Rated frequency	Rated power	LED driver
TG-163LLED	100-240V~	50-60Hz	1200W	4*HLG-320H
TG-163SLED	100-240V~	50-60Hz	600W	2*HLG-320H
TG-161LLED	100-240V~	50-60Hz	480W	2*ELG-240
TG-161MLED	100-240V~	50-60Hz	300W	HLG-320H
TG-161SLED	100-240V~	50-60Hz	200W	ELG-200
<b>TG-162LED</b>	<b>100-240V~</b>	<b>50-60Hz</b>	<b>180W</b>	<b>ELG-200</b>
TG-161S1LED	100-240V~	50-60Hz	100W	ELG-100
<b>TG-163XLLED</b>	<b>200-240V~</b>	<b>50-60Hz</b>	<b>1800W</b>	<b>6*HLG-320H-C1050A</b>
<b>TG-201LED</b>	<b>200-240V~</b>	<b>50-60Hz</b>	<b>720W</b>	<b>4*LCO 200/200-1050/355 O4a NF C EXC3</b>

So model TG-201LED and TG-163XLLED were chosen to perform all the tests.

After pre-scanning under 200-240V~50-60Hz, the worst test results were recorded.

### 1.4.2 EUT Port/Cable Identification

Port	Max Cable Length specified	Usage	Type	Screened
AC Powered Light on				
AC Power port	N/A	AC power for the EUT	3 core	No

### 1.4.3 Test Configuration

Configuration	Description
AC Powered	AC 200-240/50-60Hz

### 1.4.4 Modes of Operation

Mode	Description
Light on	The EUT was powered on.

#### 1.4.5 Monitoring of Performance

The luminous intensity does not deviate by more than 15%.

#### 1.4.6 Performance Criteria

Performance criterion A: During the test, no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.

Performance criterion B: During the test, the luminous intensity may change to any value. After the test, the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test, but after the test, the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.

Performance criterion C: During and after the test, any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal, if necessary by temporary interruption of the mains supply and/or operating the regulating control.

Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour, it is switched on again. The lighting equipment shall start and operate as intended.

#### 1.5 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

#### 1.6 Test Location

TÜV SÜD Product Service conducted the following tests at TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai branch.

Address:  
No.16, Lane 1951,  
Du Hui Road  
Shanghai 201108,  
P.R.China

Test Name	Name of Engineer(s)
Conducted Disturbance at Mains Terminals	Chengjie GUO
Radiated Disturbance (9kHz to 30MHz)	Chengjie GUO
Radiated Disturbance (30MHz to 300MHz)	Chengjie GUO
Harmonic Current Emissions	Chengjie GUO
Flicker	Chengjie GUO
Electrostatic discharge immunity test	Chengjie GUO
Radiated, radio-frequency, electromagnetic field immunity test	Chengjie GUO
Electrical fast transient /burst immunity test	Chengjie GUO
Immunity to conducted disturbances, induced by radio-frequency fields	Chengjie GUO
Surge immunity test	Chengjie GUO
Voltage dips, short interruptions and voltage variations immunity test	Chengjie GUO

## 2 Test Details

### 2.1 Conducted Disturbance at Mains Terminals

#### 2.1.1 Specification Reference

EN 55015:2013/A1:2015, Clause 4.3.1

#### 2.1.2 Equipment Under Test

TG-201LED and TG-163XLLED

#### 2.1.3 Date of Test

10/19/2020-10/20/2020

#### 2.1.4 Test Method

The disturbance voltage shall be measured at the main terminals of the lighting equipment by means of the arrangement described in Figure 5 to Figure 11 of EN 55015:2013/A1:2015 for the relevant type of equipment.

The output terminals of the artificial mains network (V-network) and the terminals a-b shall be positioned  $0,8\text{m} \pm 0.05\text{m}$  apart and shall be connected by the two power conductors of a flexible three-core cable of  $0,8\text{m}$  length.

#### 2.1.5 Environmental Conditions

Ambient Temperature 20-25°C  
Relative Humidity 40-60%  
Atmospheric Pressure 1010-1060mbar

#### 2.1.6 Specification Limits

Disturbance voltage limits at the mains terminals		
Frequency range	Limits dB( $\mu\text{V}$ )	
	Quasi-peak	Average
9kHz to 50kHz	110	--
50kHz to 150kHz	90 to 80	--
150kHz to 0.5MHz	66 to 56	56 to 46
0.5MHz to 5.0MHz	56	46
5.0MHz to 30MHz	60	50

#### 2.1.7 Test Results

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

# 9K-30MHz Conducted Disturbance Test

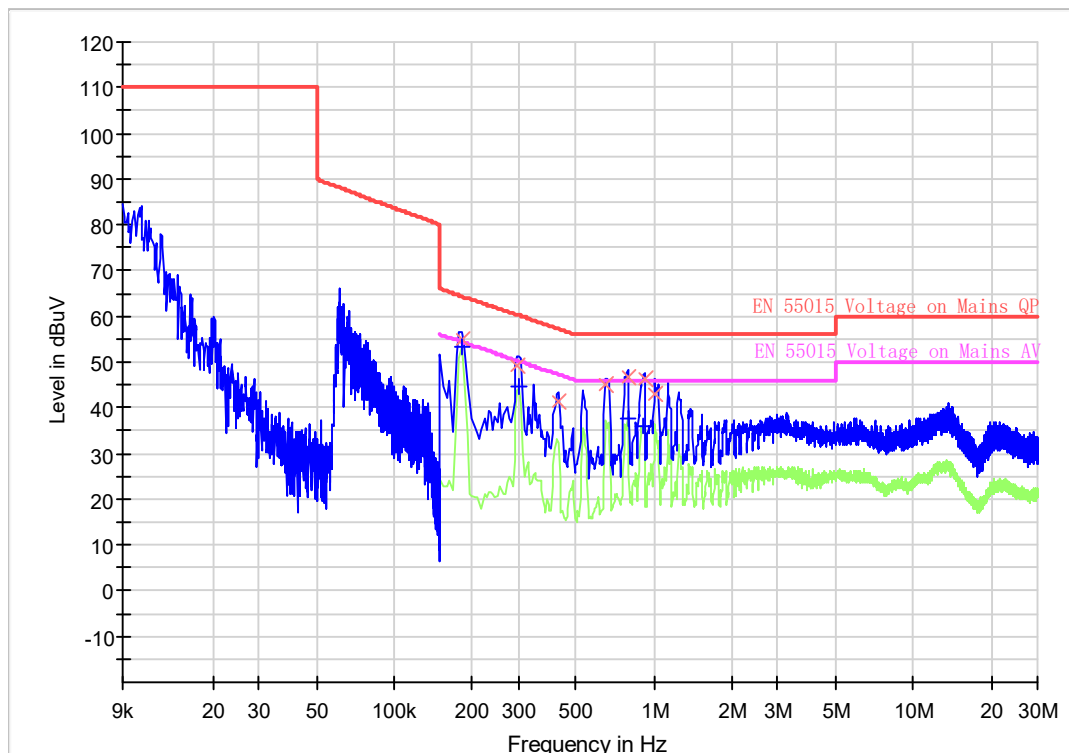
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op Cond: Light on, AC 230V/50Hz, T21.5, H52.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Standard: EN 55015  
 Comment: Phase L  
 Sample No.: SHA-525505-1

## Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup: Voltage with 2-Line-LISN  
 Receiver: [ESR 3]  
 Level Unit: dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB





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## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.181500	---	53.32	54.42	1.10	1000.0	9.000	L1	19.5
0.181500	55.14	---	64.42	9.28	1000.0	9.000	L1	19.5
0.298500	49.13	---	60.28	11.15	1000.0	9.000	L1	19.5
0.303000	---	44.47	50.16	5.69	1000.0	9.000	L1	19.5
0.429000	41.54	---	57.27	15.73	1000.0	9.000	L1	19.5
0.654000	44.97	---	56.00	11.03	1000.0	9.000	L1	19.5
0.793500	---	37.84	46.00	8.16	1000.0	9.000	L1	19.5
0.793500	46.61	---	56.00	9.39	1000.0	9.000	L1	19.5
0.915000	---	35.86	46.00	10.14	1000.0	9.000	L1	19.5
0.919500	46.35	---	56.00	9.65	1000.0	9.000	L1	19.5
1.005000	43.09	---	56.00	12.91	1000.0	9.000	L1	19.5



# 9K-30MHz Conducted Disturbance Test

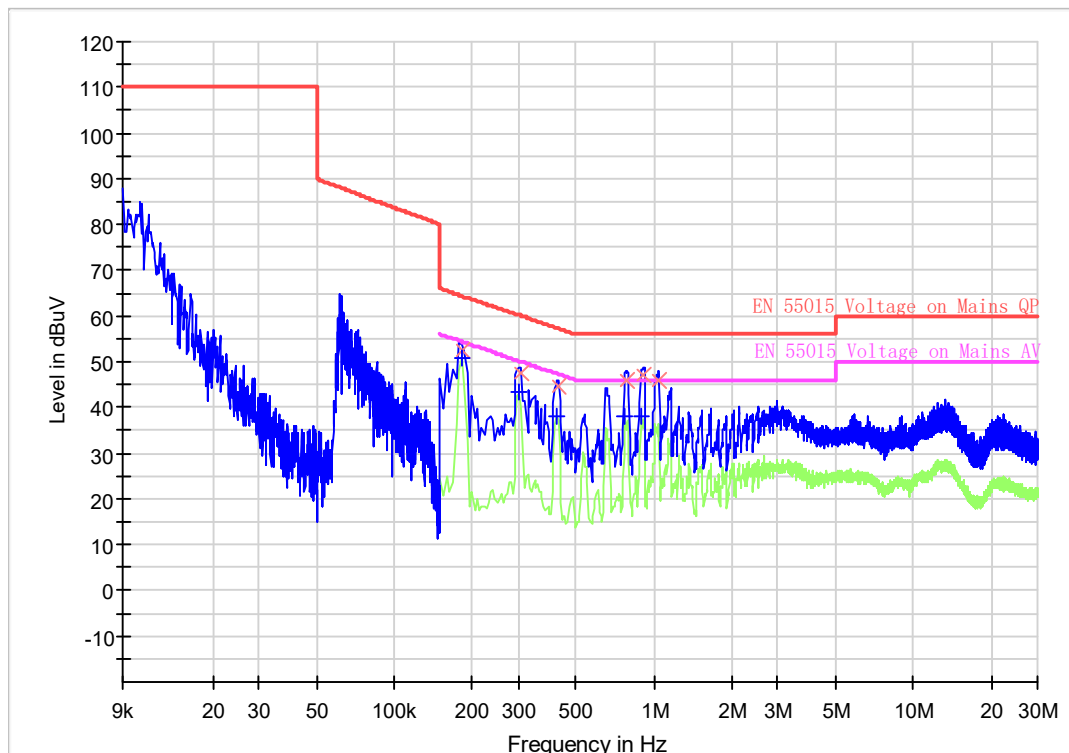
## EUT Information

EUT Name:	LED Floodlight
Model:	TG-201LED
Client:	Ningbo King-Bridge Technology Co., Ltd.
Op Cond:	Light on, AC 230V/50Hz, T21.5, H52.3%, P103.1kPa
Operator:	Guo Chengjie
Standard:	EN 55015
Comment:	Phase N
Sample No.:	SHA-525505-1

## Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup:	Voltage with 2-Line-LISN
Receiver:	[ESR 3]
Level Unit:	dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB





## Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.181500	---	50.96	54.42	3.46	1000.0	9.000	N	19.5
0.181500	52.49	---	64.42	11.93	1000.0	9.000	N	19.5
0.303000	---	43.21	50.16	6.95	1000.0	9.000	N	19.5
0.307500	47.39	---	60.04	12.65	1000.0	9.000	N	19.5
0.420000	---	38.09	47.45	9.36	1000.0	9.000	N	19.5
0.429000	44.65	---	57.27	12.62	1000.0	9.000	N	19.5
0.775500	---	37.92	46.00	8.08	1000.0	9.000	N	19.5
0.789000	46.07	---	56.00	9.93	1000.0	9.000	N	19.5
0.892500	---	38.24	46.00	7.76	1000.0	9.000	N	19.5
0.915000	46.97	---	56.00	9.03	1000.0	9.000	N	19.5
1.036500	45.70	---	56.00	10.30	1000.0	9.000	N	19.5

# 9K-30MHz Conducted Disturbance Test

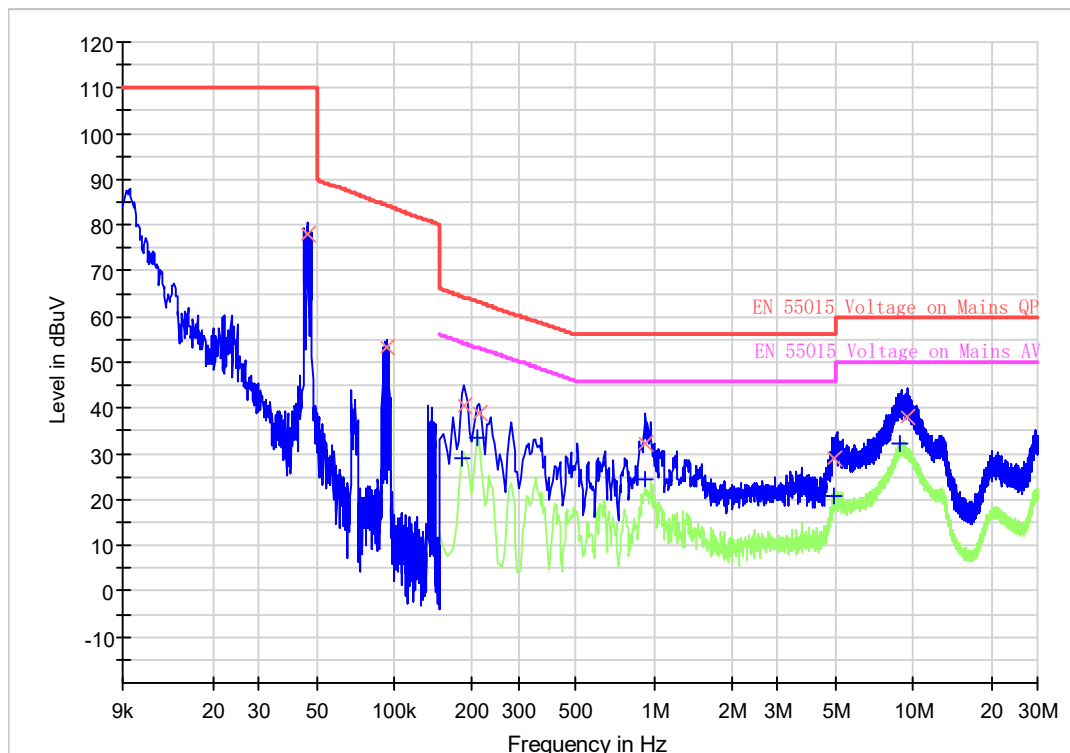
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op Cond: Light on, AC 230V/50Hz, T21.5, H52.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Standard: EN 55015  
 Comment: Phase L  
 Sample No.: SHA-525505-2

## Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup: Voltage with 2-Line-LISN  
 Receiver: [ESR 3]  
 Level Unit: dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB





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## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.046400	77.93	---	110.00	32.07	1000.0	0.200	N	19.6
0.092800	53.11	---	84.37	31.26	1000.0	0.200	N	19.5
0.181500	---	29.14	54.42	25.28	1000.0	9.000	N	19.5
0.186000	40.50	---	64.21	23.71	1000.0	9.000	N	19.5
0.208500	---	33.67	53.26	19.59	1000.0	9.000	N	19.5
0.213000	38.74	---	63.09	24.35	1000.0	9.000	N	19.5
0.924000	---	24.46	46.00	21.54	1000.0	9.000	N	19.5
0.933000	32.38	---	56.00	23.62	1000.0	9.000	N	19.5
4.965000	---	20.73	46.00	25.27	1000.0	9.000	N	19.6
4.965000	29.11	---	56.00	26.89	1000.0	9.000	N	19.6
8.920500	---	32.13	50.00	17.87	1000.0	9.000	N	19.8
9.420000	38.22	---	60.00	21.78	1000.0	9.000	N	19.8

# 9K-30MHz Conducted Disturbance Test

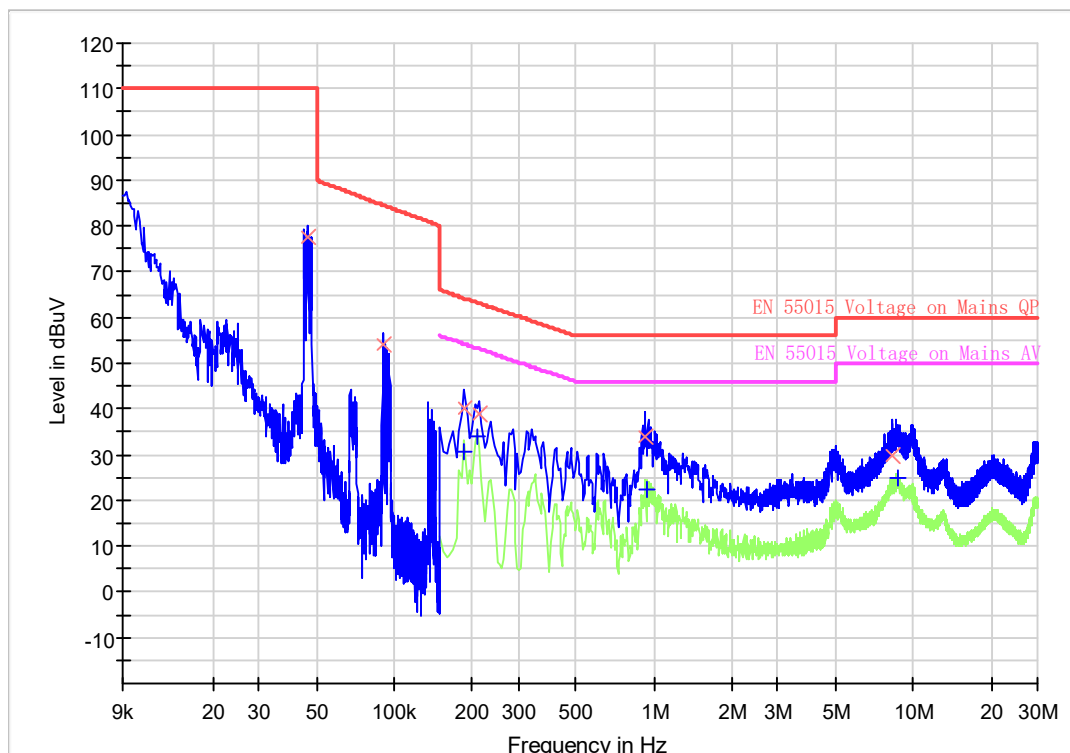
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op Cond: Light on, AC 230V/50Hz, T21.5, H52.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Standard: EN 55015  
 Comment: Phase N  
 Sample No.: SHA-525505-2

## Scan Setup: Voltage with 2-Line-LISN pre [EMI conducted]

Hardware Setup: Voltage with 2-Line-LISN  
 Receiver: [ESR 3]  
 Level Unit: dBuV

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	100 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4.5 kHz	PK+; AVG	9 kHz	0.01 s	0 dB



## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.046400	77.66	---	110.00	32.34	1000.0	0.200	L1	19.5
0.090000	54.18	---	84.65	30.47	1000.0	0.200	L1	19.5
0.186000	---	30.47	54.21	23.74	1000.0	9.000	L1	19.5
0.186000	40.32	---	64.21	23.89	1000.0	9.000	L1	19.5
0.208500	---	34.14	53.26	19.12	1000.0	9.000	L1	19.5
0.213000	38.87	---	63.09	24.22	1000.0	9.000	L1	19.5
0.928500	33.96	---	56.00	22.04	1000.0	9.000	L1	19.5
0.946500	---	22.47	46.00	23.53	1000.0	9.000	L1	19.5
8.272500	29.83	---	60.00	30.17	1000.0	9.000	L1	19.7
8.736000	---	24.68	50.00	25.32	1000.0	9.000	L1	19.7



Test Setup

### 2.1.8 Test Location

This test was carried out in shielded room Z119.

**2.2 Radiated Disturbance (9KHz to 30MHz)**

**2.2.1 Specification Reference**

EN 55015:2013/A1:2015, Clause 4.4.1

**2.2.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.2.3 Date of Test**

10/19/2020

**2.2.4 Test Method**

The magnetic component shall be measured by means of a loop antenna. The lighting equipment shall be placed in the center of the antenna.  
The induced current in the loop antenna is measured by means of a current probe and the CISPR measuring receiver. By means of a coaxial switch, the three field directions can be measured in sequence.

**2.2.5 Environmental Conditions**

Ambient Temperature 20-25°C  
Relative Humidity 40-60%  
Atmospheric Pressure 1010-1060mbar

**2.2.6 Specification Limits**

Radiated disturbance limits in the frequency range 9kHz to 30MHz			
Frequency range	Limits dB(μA) for loop diameter		
	2 m	3 m	4 m
9kHz to 70kHz	88	81	75
70kHz to 150kHz	88 to 58	81 to 51	75 to 45
150kHz to 3.0MHz	58 to 22	51 to 15	45 to 9
3.0MHz to 30MHz	22	15 to 16	9 to 12

**2.2.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

# 9K-30MHz Radiated Disturbance Test

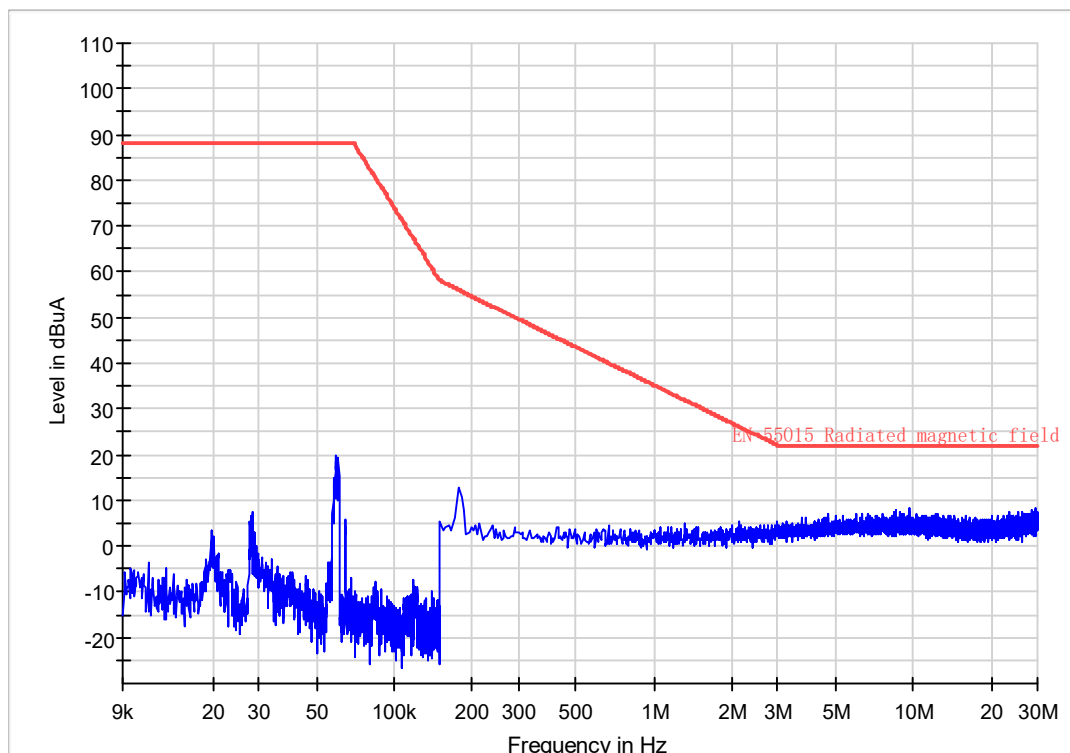
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: X  
 Sample No.: SHA-525505-1

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB





# 9K-30MHz Radiated Disturbance Test

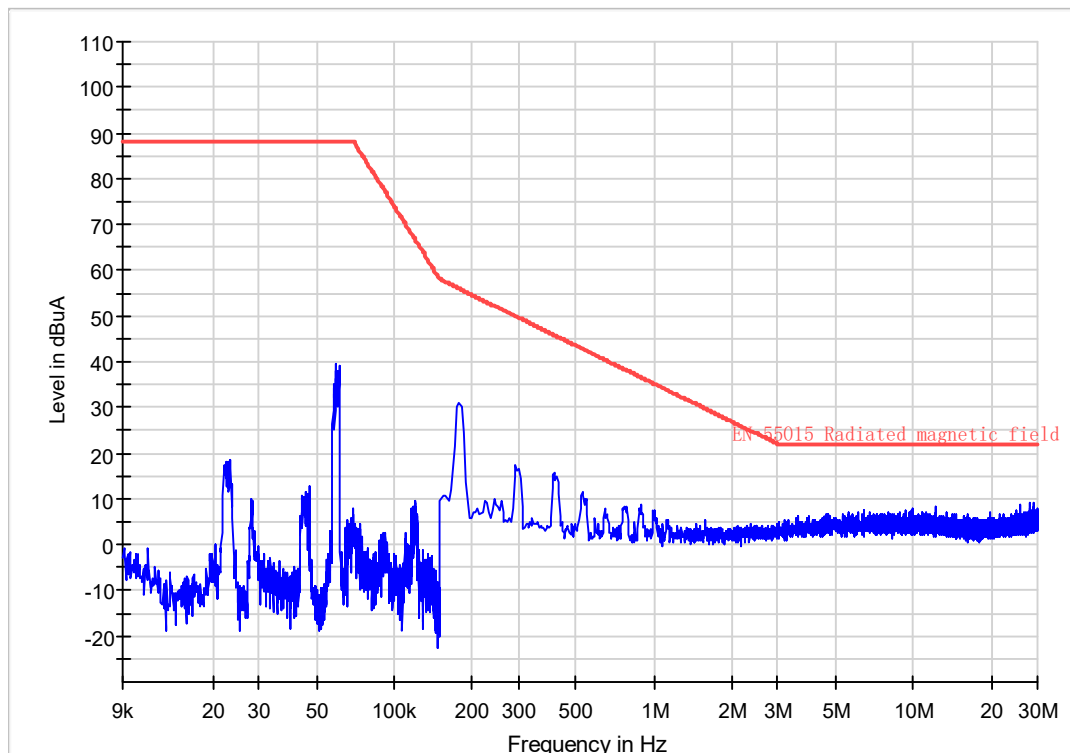
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Y  
 Sample No.: SHA-525505-1

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB



# 9K-30MHz Radiated Disturbance Test

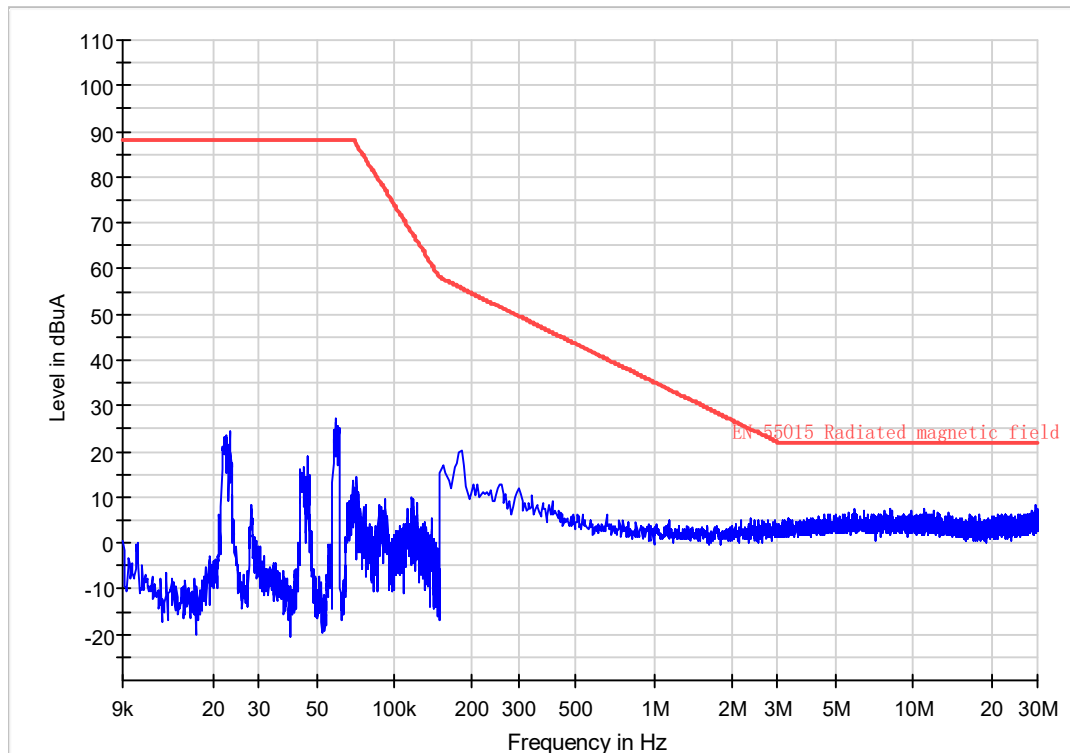
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Z  
 Sample No.: SHA-525505-1

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB



# 9K-30MHz Radiated Disturbance Test

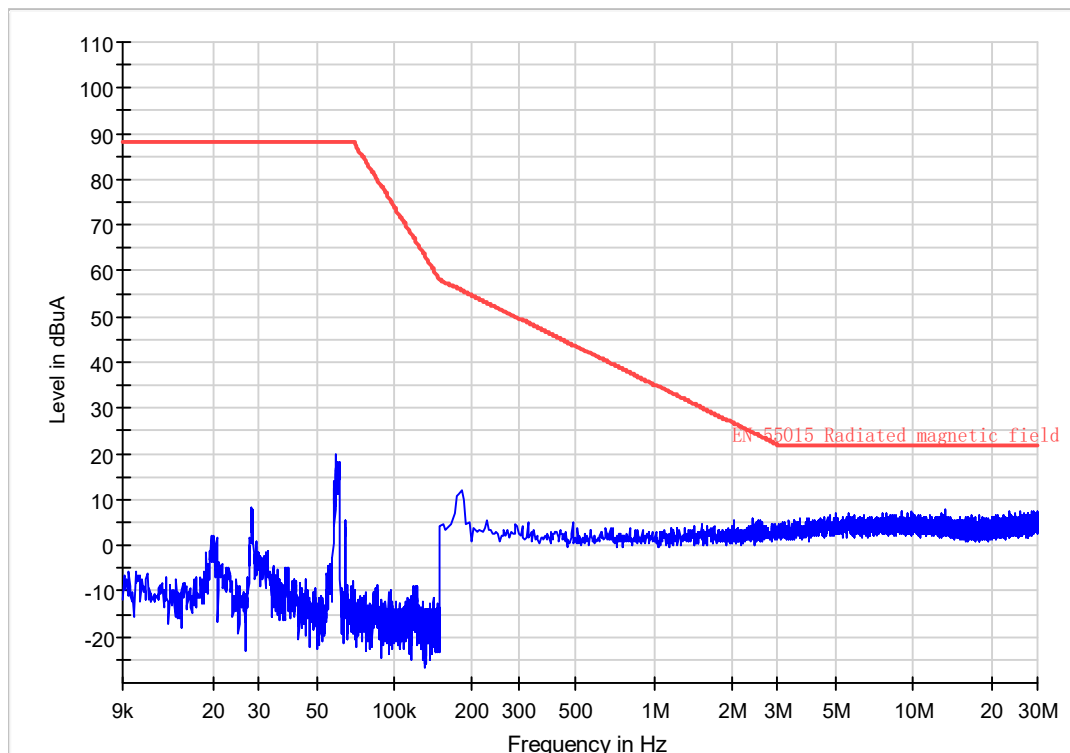
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: X  
 Sample No.: SHA-525505-2

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB





# 9K-30MHz Radiated Disturbance Test

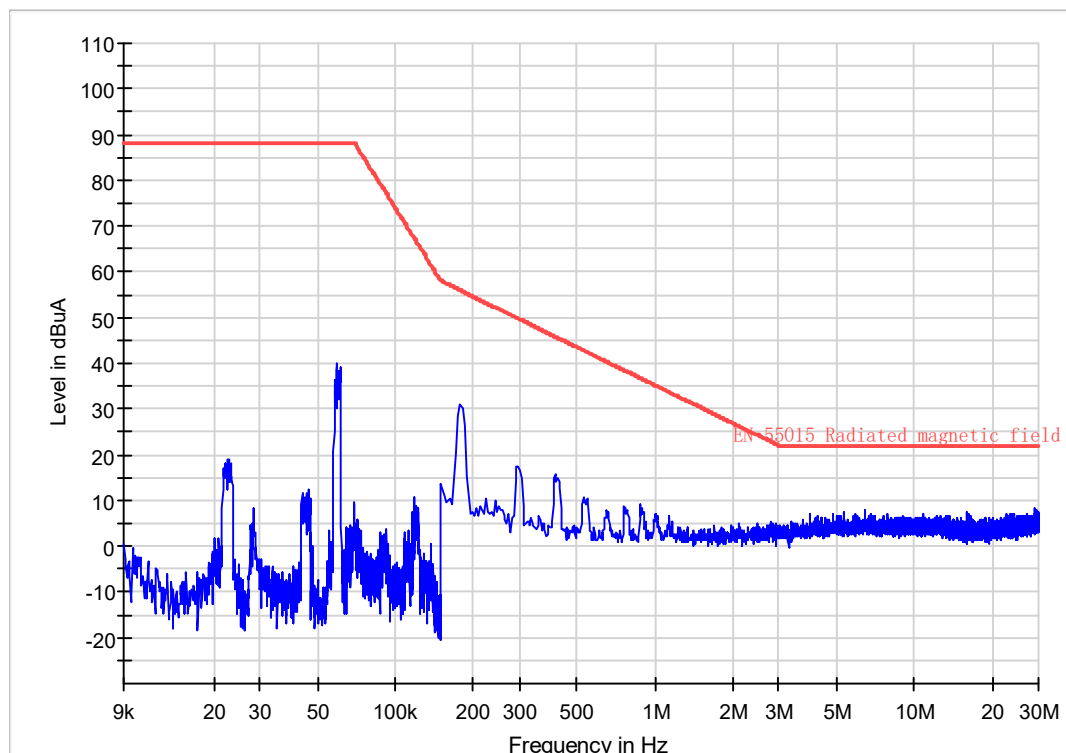
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Y  
 Sample No.: SHA-525505-2

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB



# 9K-30MHz Radiated Disturbance Test

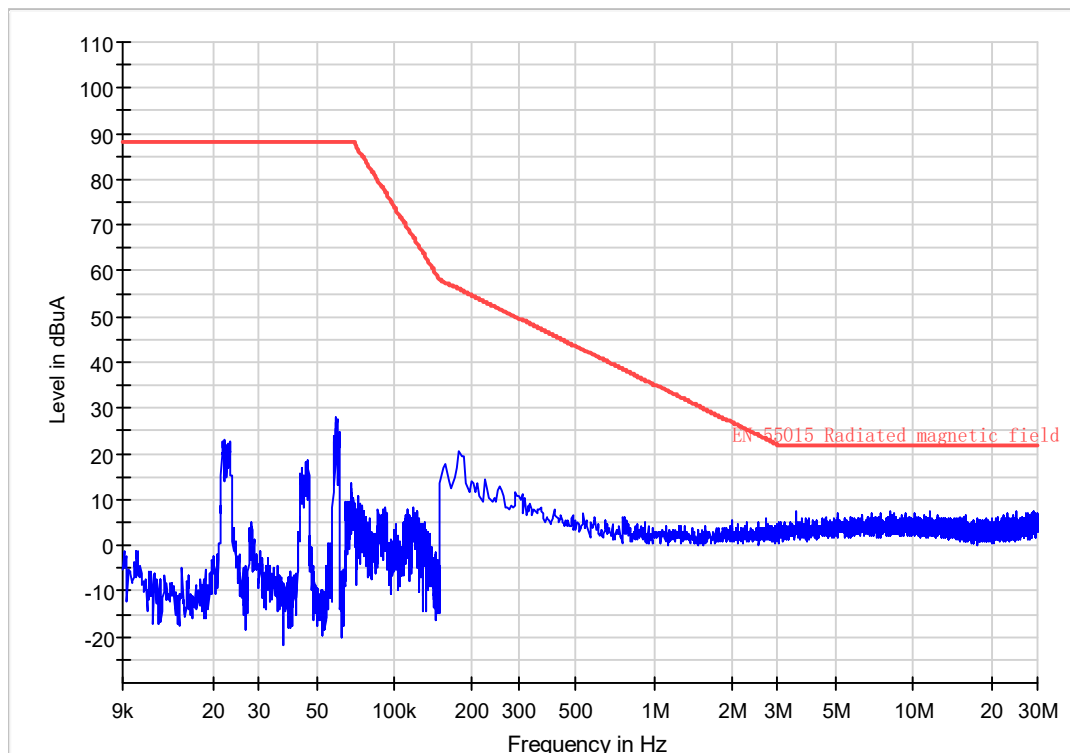
## EUT Information

EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Technology Co., Ltd.  
 Op cond: Light on, AC 230V/50Hz, T22.0, H50.3%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Z  
 Sample No.: SHA-525505-2

## Scan Setup: TripleLoop max [EMI radiated]

Hardware Setup: TripleLoop  
 Receiver: [ESR 3]  
 Level Unit: dBuA

Subrange	Step Size	Detectors	IF BW	Meas. Time	Preamp
9 kHz - 150 kHz	80 Hz	PK+	200 Hz	0.01 s	0 dB
150 kHz - 30 MHz	4 kHz	PK+	9 kHz	0.01 s	0 dB





Test Setup

### 2.2.8 Test Location

This test was carried out in shielded room Z120.



**2.3 Radiated Disturbance (30MHz to 300MHz)**

**2.3.1 Specification Reference**

EN 55015:2013/A1:2015, Clause 4.4.2

**2.3.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.3.3 Date of Test**

10/19/2020-10/20/202

**2.3.4 Test Method**

The EUT was set up in a semi-anechoic chamber on a remotely controlled turntable and placed on a non-conductive. Guidance on how to arrange the luminaire during the measurements can be found in Annex C of EN 55015:2013/A1:2015.

A prescan of the EUT emissions profile was made while varying the antenna-to-EUT azimuth and antenna-to-EUT polarization using a peak detector; measurements were taken at a 3m distance. Using the prescan list of the highest emissions detected, their bearing and associated antenna polarization, the EUT was then formally measured using a Quasi-Peak detector. The readings were maximized by adjusting the antenna height, polarization and turntable azimuth, in accordance with the specification.

**2.3.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060 mbar

**2.3.6 Specification Limits**

Radiated disturbance limits in the frequency range 30MHz to 300MHz at a measuring distance of 3 m	
Frequency range MHz	Quasi-peak limits dB(µV/m)
30 to 230	40
230 to 300	47

**2.3.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Frequency Range of Test: 30 MHz to 300MHz



# 30-300MHz Radiated Disturbance Test

## EUT Information

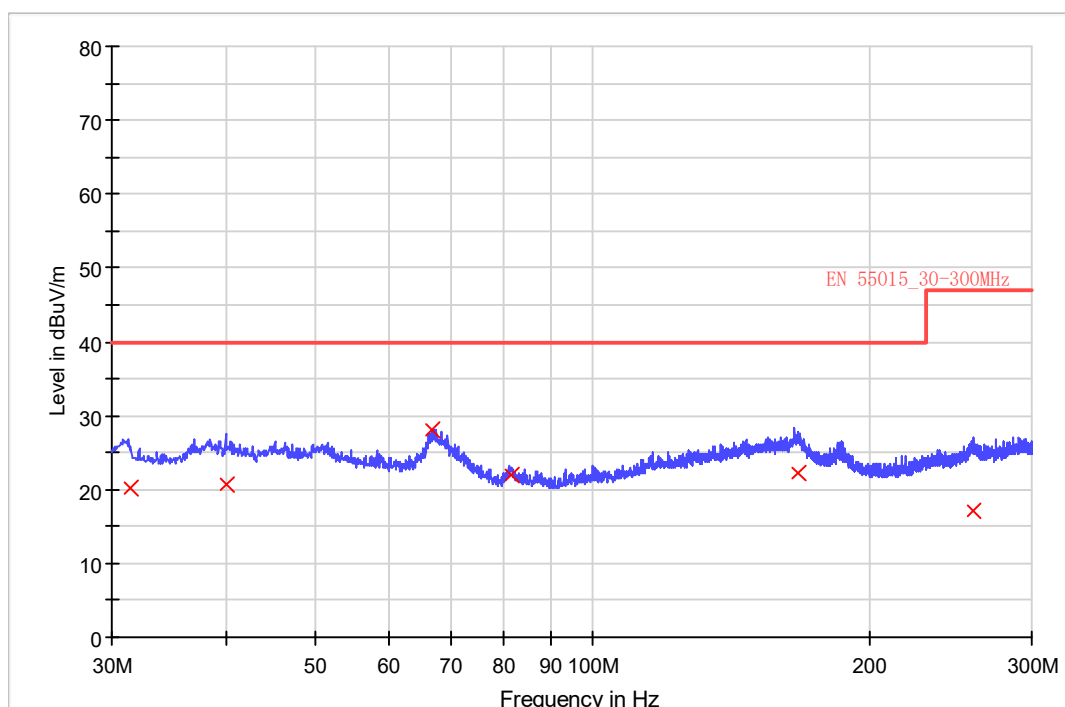
EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Lighting Technology Co., Ltd.  
 Op Cond: light on, AC230V 50Hz, 22.3, H51.5%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Horizontal  
 Sample No: SHA-525505-1

## Sweep Setup: RE\_VULB9168\_pre\_Cont\_30\_300 [EMI radiated]

Hardware Setup: RE\_VULB9168  
 Receiver: [ESR 3]  
 Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 300 MHz	50 kHz	PK+	120 kHz	0.005 s	20 dB

RE\_VULB9168\_pre\_Cont\_30\_300







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## Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
66.960000	28.2	1000.0	120.000	100.0	H	1.0	12.3	11.8	40.0
31.440000	20.1	1000.0	120.000	100.0	H	264.0	13.9	19.9	40.0
167.160000	22.3	1000.0	120.000	100.0	H	264.0	15.0	17.7	40.0
258.960000	17.1	1000.0	120.000	100.0	H	359.0	13.8	22.9	40.0
39.960000	20.6	1000.0	120.000	100.0	H	359.0	14.8	19.4	40.0
81.640000	22.1	1000.0	120.000	100.0	H	359.0	10.3	17.9	40.0



# 30-300MHz Radiated Disturbance Test

## EUT Information

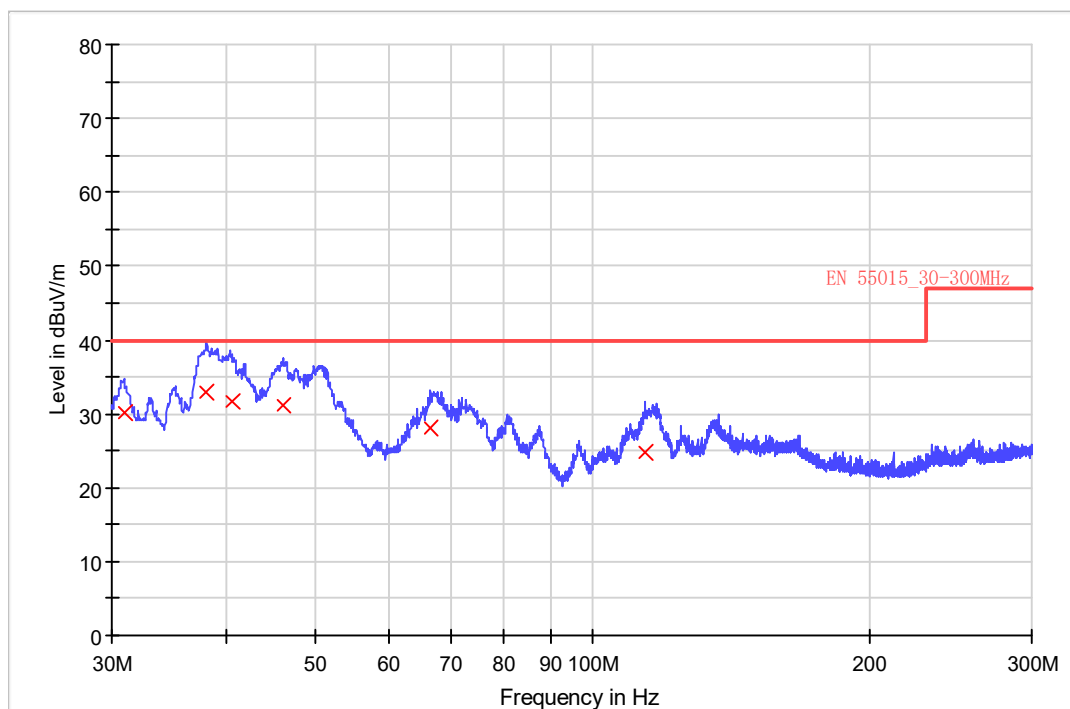
EUT Name: LED Floodlight  
 Model: TG-201LED  
 Client: Ningbo King-Bridge Lighting Technology Co., Ltd.  
 Op Cond: light on, AC230V 50Hz, 22.3, H51.5%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Vertical  
 Sample No: SHA-525505-1

## Sweep Setup: RE\_VULB9168\_pre\_Cont\_30\_300 [EMI radiated]

Hardware Setup: RE\_VULB9168  
 Receiver: [ESR 3]  
 Level Unit: dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 300 MHz	50 kHz	PK+	120 kHz	0.005 s	20 dB

RE\_VULB9168\_pre\_Cont\_30\_300





China

### Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
30.960000	30.3	1000.0	120.000	100.0	V	1.0	13.9	9.7	40.0
38.000000	33.0	1000.0	120.000	100.3	V	359.0	14.5	7.0	40.0
40.560000	31.7	1000.0	120.000	199.8	V	52.0	14.7	8.3	40.0
46.000000	31.1	1000.0	120.000	100.3	V	1.0	14.4	8.9	40.0
66.680000	28.0	1000.0	120.000	100.0	V	61.0	12.4	12.0	40.0
114.160000	24.9	1000.0	120.000	100.0	V	359.0	12.9	15.1	40.0

## 30-300MHz Radiated Disturbance Test

### EUT Information

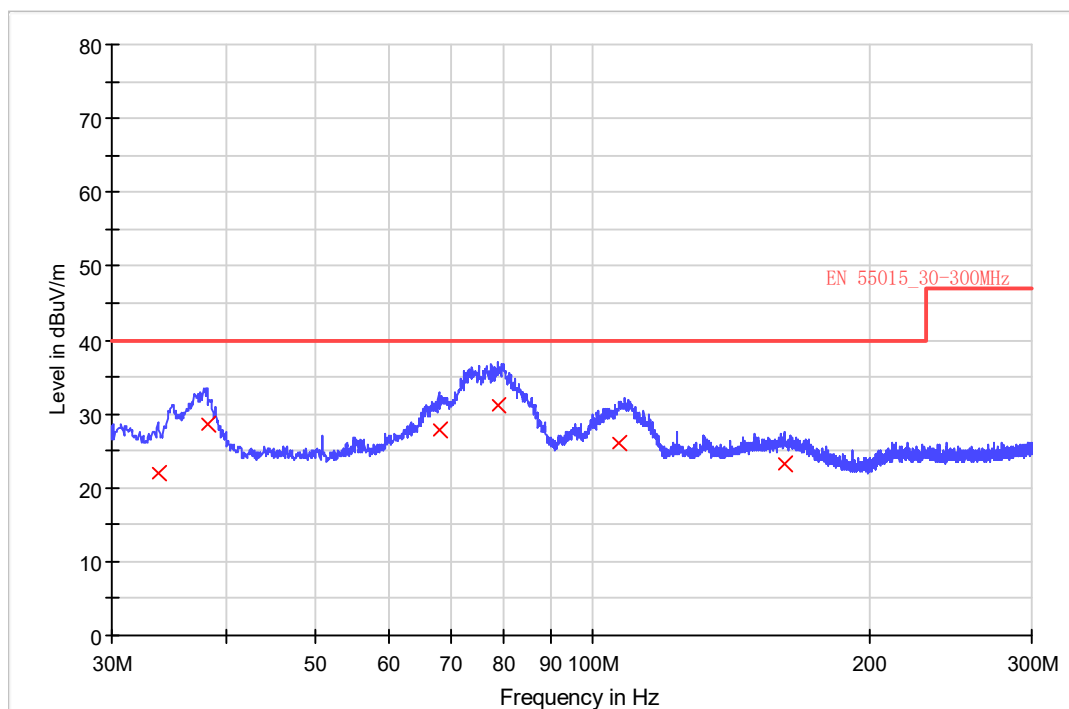
EUT Name:	LED Floodlight
Model:	TG-163XLLED
Client:	Ningbo King-Bridge Lighting Technology Co., Ltd.
Op Cond:	light on, AC230V 50Hz, 22.3, H51.5%, P103.1kPa
Operator:	Guo Chengjie
Test Spec:	EN 55015
Comment:	Horizontal
Sample No:	SHA-525505-2

### Sweep Setup: RE\_VULB9168\_pre\_Cont\_30\_300 [EMI radiated]

Hardware Setup:	RE_VULB9168
Receiver:	[ESR 3]
Level Unit:	dBuV/m

Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 300 MHz	50 kHz	PK+	120 kHz	0.005 s	20 dB

RE\_VULB9168\_pre\_Cont\_30\_300





## Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
33.680000	22.1	1000.0	120.000	100.1	V	147.0	14.0	17.9	40.0
38.080000	28.6	1000.0	120.000	100.1	V	1.0	14.5	11.4	40.0
68.040000	27.8	1000.0	120.000	100.1	V	126.0	12.1	12.2	40.0
78.840000	31.3	1000.0	120.000	100.1	V	255.0	10.5	8.7	40.0
106.880000	26.0	1000.0	120.000	100.1	V	0.0	12.0	14.0	40.0
161.640000	23.2	1000.0	120.000	100.1	V	177.0	15.5	16.8	40.0

## 30-300MHz Radiated Disturbance Test

### EUT Information

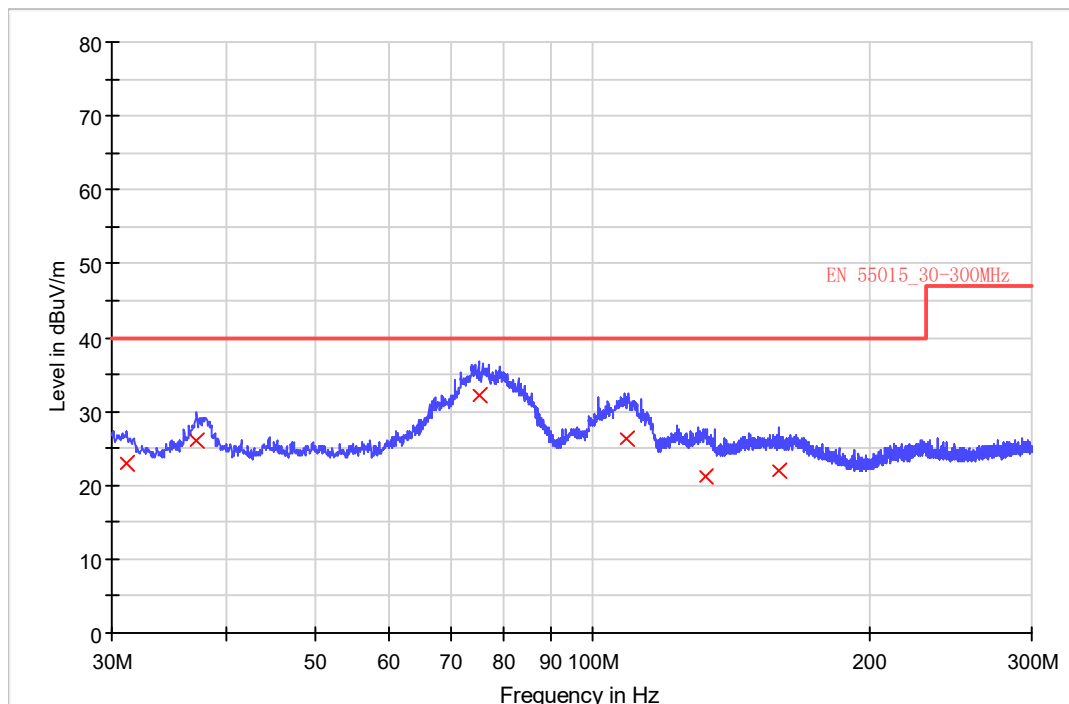
EUT Name: LED Floodlight  
 Model: TG-163XLLED  
 Client: Ningbo King-Bridge Lighting Technology Co., Ltd.  
 Op Cond: light on, AC230V 50Hz, 22.3, H51.5%, P103.1kPa  
 Operator: Guo Chengjie  
 Test Spec: EN 55015  
 Comment: Vertical  
 Sample No: SHA-525505-2

### Sweep Setup: RE\_VULB9168\_pre\_Cont\_30\_300 [EMI radiated]

Hardware Setup: RE\_VULB9168  
 Receiver: [ESR 3]  
 Level Unit: dBuV/m

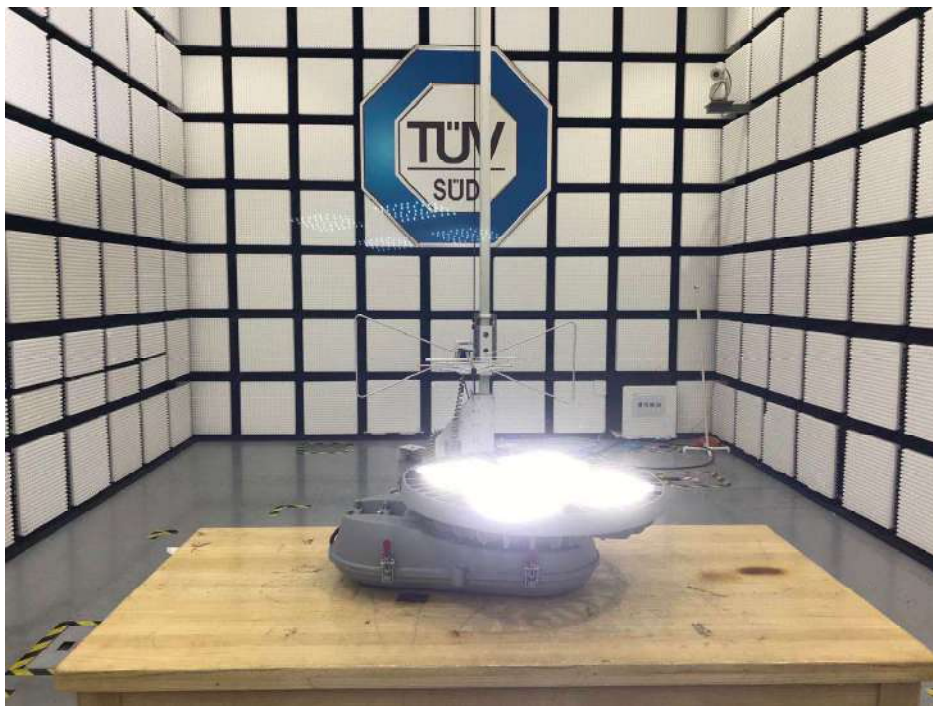
Subrange	Step Size	Detectors	Bandwidth	Sweep Time	Preamp
30 MHz - 300 MHz	50 kHz	PK+	120 kHz	0.005 s	20 dB

RE\_VULB9168\_pre\_Cont\_30\_300



## Limit and Margin

Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
31.160000	23.1	1000.0	120.000	100.1	V	139.0	13.9	16.9	40.0
37.160000	26.0	1000.0	120.000	100.1	V	0.0	14.4	14.0	40.0
75.160000	32.3	1000.0	120.000	100.1	V	359.0	11.0	7.7	40.0
108.680000	26.4	1000.0	120.000	100.1	V	359.0	12.2	13.6	40.0
132.640000	21.3	1000.0	120.000	100.1	V	359.0	14.4	18.7	40.0
159.080000	22.1	1000.0	120.000	100.1	V	359.0	15.7	17.9	40.0



Test Setup

### 2.3.8 Test Location

This test was carried out in 3-meter semi-anechoic chamber.

**2.4 Harmonic Current Emissions**

**2.4.1 Specification Reference**

EN 61000-3-2:2014, Clause 7

**2.4.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.4.3 Date of Test**

10/19/2020

**2.4.4 Test Method**

The EUT was placed on a non-conductive table 0.1 m above a reference ground plane. All power was connected to the EUT through a software controller AC power amplifier. The amplitude of the AC mains harmonic components was then measured.

**2.4.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.4.6 Specification Limits**

Limits for class C Equipment active input power > 25W	
Harmonic order n	Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency %
2	2
3	30λ
5	10
7	7
9	5
11 ≤ n ≤ 39 (odd harmonic only)	3
λ is the circuit power factor	

**2.4.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: *Pass*.

Detailed results are shown below.

Line Under Test: power line





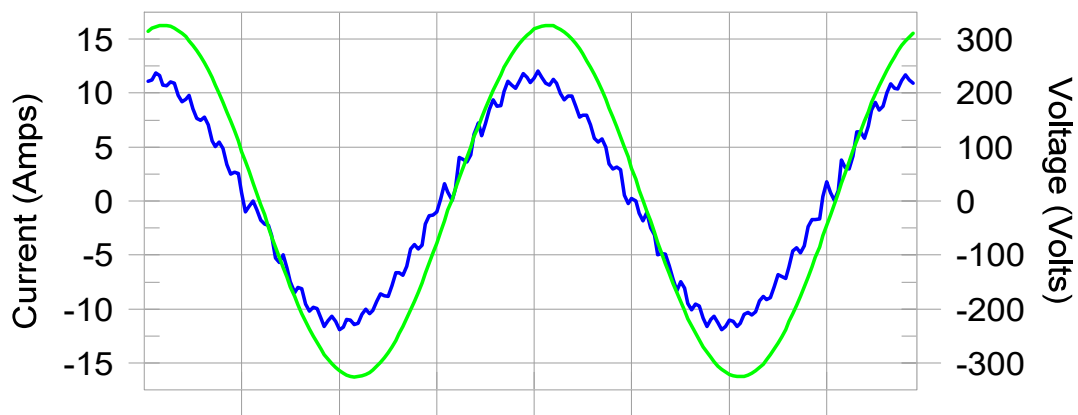
**Harmonics – Class-C per Ed. 4.0 (2014)(Run time) incl. inter-harmonics**

EUT: LED Floodlight  
 Test category: Class-C per Ed. 4.0 (2014) (European limits)  
 Test date: 10/19/2020  
 Test duration (min): 2.5  
 Comment: Light on, TG-201LED T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Lighting Technology Co., Ltd.

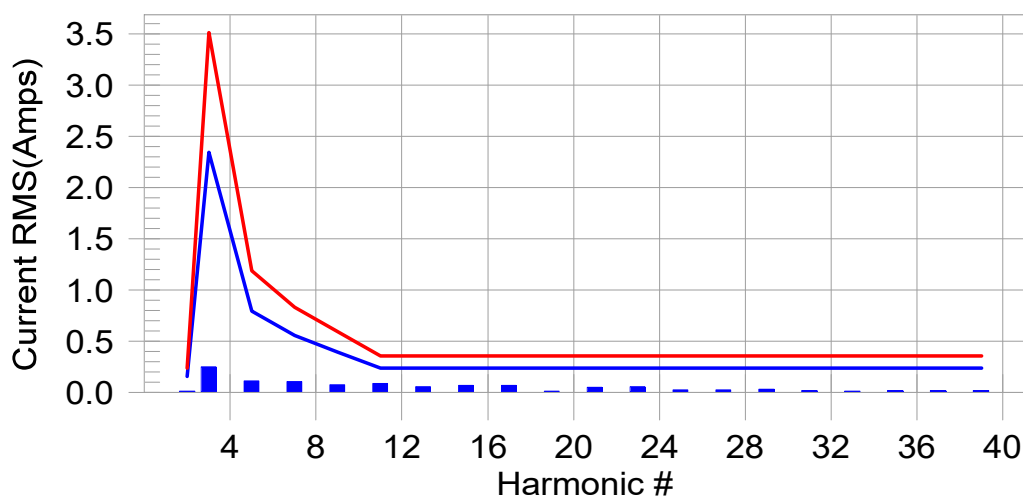
Tested by: guochengjie  
 Test Margin: 100  
 End time: 1:24:02 PM  
 Data file name: H-000240.cts\_data

Test Result: Pass      Source qualification: Normal

Current & voltage waveforms



Harmonics and Class C limit line      European Limits



**Test result: Pass      Worst harmonics H11-25.4% of 150% limit, H11-37.8% of 100% limit.**



### Current Test Result Summary (Run time)

EUT: LED Floodlight Tested by: guochengjie  
 Test category: Class-C per Ed. 4.0 (2014) (European limits) Test Margin: 100  
 Test date: 10/19/2020 Start time: 1:21:11 PM End time: 1:24:02 PM  
 Test duration (min): 2.5 Data file name: H-000240.cts\_data  
 Comment: Light on,TG-201LED T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Lighting Technology Co., Ltd.

Test Result: Pass Source qualification: Normal  
 THC(A): 0.355 I-THD(%): 4.5 POHC(A): 0.077 POHC Limit(A): 0.754

Highest parameter values during test:

V_RMS (Volts): 230.24	Frequency(Hz): 50.00
I_Peak (Amps): 12.330	I_RMS (Amps): 7.973
I_Fund (Amps): 7.949	Crest Factor: 1.547
Power (Watts): 1802.2	Power Factor: 0.982

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.017	0.159	N/A	0.023	0.238	N/A	Pass
3	0.253	2.342	10.8	0.258	3.513	7.3	Pass
4	0.005	0.000	N/A	0.007	0.000	N/A	Pass
5	0.113	0.795	14.2	0.114	1.192	9.6	Pass
6	0.003	0.000	N/A	0.004	0.000	N/A	Pass
7	0.106	0.556	19.1	0.108	0.835	12.9	Pass
8	0.003	0.000	N/A	0.004	0.000	N/A	Pass
9	0.076	0.397	19.2	0.078	0.596	13.0	Pass
10	0.002	0.000	N/A	0.003	0.000	N/A	Pass
11	0.090	0.238	37.8	0.091	0.358	25.4	Pass
12	0.003	0.000	N/A	0.004	0.000	N/A	Pass
13	0.057	0.238	23.8	0.058	0.358	16.1	Pass
14	0.003	0.000	N/A	0.004	0.000	N/A	Pass
15	0.069	0.238	29.1	0.070	0.358	19.6	Pass
16	0.004	0.000	N/A	0.004	0.000	N/A	Pass
17	0.069	0.238	29.1	0.070	0.358	19.6	Pass
18	0.003	0.000	N/A	0.004	0.000	N/A	Pass
19	0.012	0.238	N/A	0.013	0.358	N/A	Pass
20	0.004	0.000	N/A	0.004	0.000	N/A	Pass
21	0.049	0.238	20.8	0.050	0.358	14.1	Pass
22	0.004	0.000	N/A	0.004	0.000	N/A	Pass
23	0.058	0.238	24.5	0.059	0.358	16.5	Pass
24	0.004	0.000	N/A	0.004	0.000	N/A	Pass
25	0.027	0.238	N/A	0.028	0.358	N/A	Pass
26	0.004	0.000	N/A	0.004	0.000	N/A	Pass
27	0.030	0.238	N/A	0.031	0.358	N/A	Pass
28	0.003	0.000	N/A	0.004	0.000	N/A	Pass
29	0.032	0.238	N/A	0.033	0.358	N/A	Pass
30	0.004	0.000	N/A	0.004	0.000	N/A	Pass
31	0.023	0.238	N/A	0.024	0.358	N/A	Pass
32	0.003	0.000	N/A	0.004	0.000	N/A	Pass
33	0.016	0.238	N/A	0.018	0.358	N/A	Pass
34	0.003	0.000	N/A	0.004	0.000	N/A	Pass
35	0.020	0.238	N/A	0.020	0.358	N/A	Pass
36	0.003	0.000	N/A	0.003	0.000	N/A	Pass
37	0.023	0.238	N/A	0.024	0.358	N/A	Pass
38	0.003	0.000	N/A	0.004	0.000	N/A	Pass
39	0.020	0.238	N/A	0.021	0.358	N/A	Pass
40	0.003	0.000	N/A	0.004	0.000	N/A	Pass

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

### Voltage Source Verification Data (Run time)

**EUT: LED Floodlight** Tested by: guochengjie  
**Test category: Class-C per Ed. 4.0 (2014) (European limits)** Test Margin: 100  
**Test date: 10/19/2020** Start time: 1:21:11 PM End time: 1:24:02 PM  
**Test duration (min): 2.5** Data file name: H-000240.cts\_data  
**Comment: Light on, TG-201LED T23.5, H50.1%, P103.1kPa**  
**Customer: Ningbo King-Bridge Lighting Technology Co.,Ltd.**

Test Result: Pass Source qualification: Normal

#### Highest parameter values during test:

Voltage (Vrms):	230.24	Frequency(Hz):	50.00
I_Peak (Amps):	12.330	I_RMS (Amps):	7.973
I_Fund (Amps):	7.949	Crest Factor:	1.547
Power (Watts):	1802.2	Power Factor:	0.982

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.083	0.460	18.06	OK
3	0.377	2.072	18.21	OK
4	0.057	0.460	12.43	OK
5	0.082	0.921	8.92	OK
6	0.038	0.460	8.32	OK
7	0.053	0.691	7.63	OK
8	0.031	0.460	6.73	OK
9	0.030	0.460	6.44	OK
10	0.026	0.460	5.63	OK
11	0.031	0.230	13.47	OK
12	0.031	0.230	13.67	OK
13	0.033	0.230	14.21	OK
14	0.017	0.230	7.47	OK
15	0.043	0.230	18.89	OK
16	0.016	0.230	6.75	OK
17	0.050	0.230	21.65	OK
18	0.013	0.230	5.63	OK
19	0.011	0.230	4.89	OK
20	0.016	0.230	6.98	OK
21	0.039	0.230	17.14	OK
22	0.008	0.230	3.36	OK
23	0.052	0.230	22.71	OK
24	0.010	0.230	4.13	OK
25	0.027	0.230	11.60	OK
26	0.007	0.230	3.12	OK
27	0.027	0.230	11.60	OK
28	0.005	0.230	2.29	OK
29	0.035	0.230	15.23	OK
30	0.006	0.230	2.81	OK
31	0.031	0.230	13.30	OK
32	0.007	0.230	2.97	OK
33	0.021	0.230	9.12	OK
34	0.007	0.230	2.98	OK
35	0.028	0.230	12.26	OK
36	0.004	0.230	1.92	OK
37	0.030	0.230	13.20	OK
38	0.004	0.230	1.94	OK
39	0.027	0.230	11.73	OK
40	0.008	0.230	3.67	OK



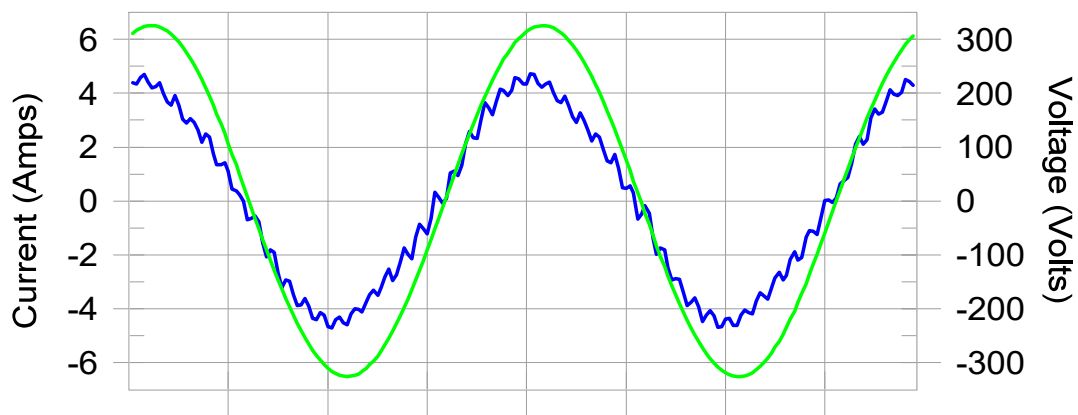
### Harmonics – Class-C per Ed. 4.0 (2014)(Run time) incl. inter-harmonics

EUT: LED Floodlight  
Test category: Class-C per Ed. 4.0 (2014) (European limits)  
Test date: 10/19/2020  
Test duration (min): 2.5  
Comment: Light on, TG-163XLLED, T23.5, H50.1%, P103.1kPa  
Customer: Ningbo King-Bridge Technology Co., Ltd.

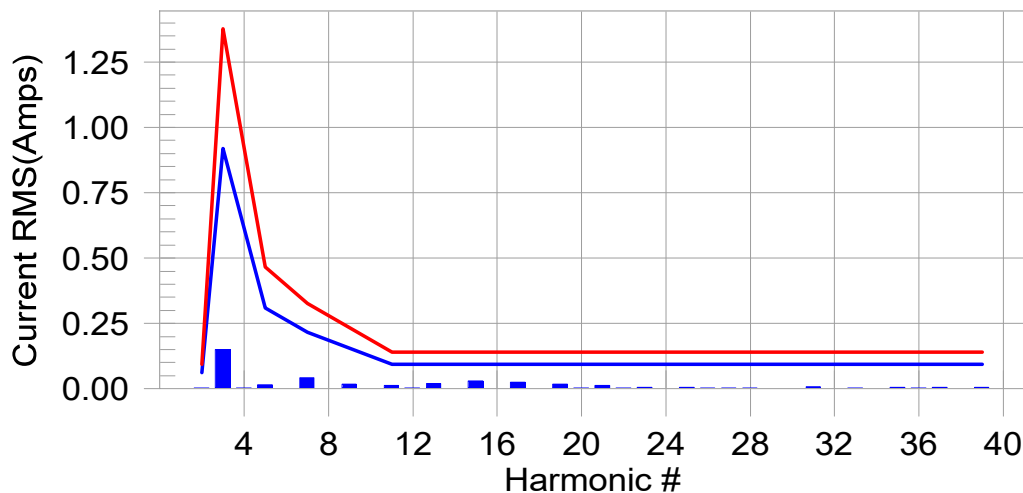
Tested by: guochengjie  
Test Margin: 100  
End time: 1:52:44 PM  
Data file name: H-000242.cts\_data

Test Result: Pass      Source qualification: Normal

#### Current & voltage waveforms



#### Harmonics and Class C limit line      European Limits



Test result: Pass      Worst harmonics H15-21.7% of 150% limit, H15-32.2% of 100% limit.



### Current Test Result Summary (Run time)

EUT: LED Floodlight Tested by: guochengjie  
 Test category: Class-C per Ed. 4.0 (2014) (European limits) Test Margin: 100  
 Test date: 10/19/2020 Start time: 1:49:53 PM End time: 1:52:44 PM  
 Test duration (min): 2.5 Data file name: H-000242.cts\_data  
 Comment: Light on, TG-163XLLED, T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Technology Co., Ltd.

Test Result: Pass Source qualification: Normal  
 THC(A): 0.168 I-THD(%): 5.4 POHC(A): 0.000 POHC Limit(A): 0.294

Highest parameter values during test:

V_RMS (Volts): 230.27	Frequency(Hz): 50.00
I_Peak (Amps): 4.835	I_RMS (Amps): 3.117
I_Fund (Amps): 3.104	Crest Factor: 1.555
Power (Watts): 707.5	Power Factor: 0.986

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	0.062	N/A	0.003	0.093	N/A	Pass
3	0.151	0.918	16.5	0.153	1.377	11.1	Pass
4	0.002	0.000	N/A	0.003	0.000	N/A	Pass
5	0.017	0.310	N/A	0.018	0.466	N/A	Pass
6	0.002	0.000	N/A	0.002	0.000	N/A	Pass
7	0.043	0.217	19.9	0.044	0.326	13.5	Pass
8	0.002	0.000	N/A	0.002	0.000	N/A	Pass
9	0.017	0.155	N/A	0.018	0.233	N/A	Pass
10	0.002	0.000	N/A	0.002	0.000	N/A	Pass
11	0.013	0.093	N/A	0.013	0.140	N/A	Pass
12	0.002	0.000	N/A	0.002	0.000	N/A	Pass
13	0.019	0.093	20.5	0.019	0.140	13.9	Pass
14	0.002	0.000	N/A	0.002	0.000	N/A	Pass
15	0.030	0.093	32.2	0.030	0.140	21.7	Pass
16	0.002	0.000	N/A	0.002	0.000	N/A	Pass
17	0.025	0.093	26.5	0.025	0.140	18.0	Pass
18	0.002	0.000	N/A	0.002	0.000	N/A	Pass
19	0.019	0.093	20.1	0.019	0.140	13.6	Pass
20	0.002	0.000	N/A	0.002	0.000	N/A	Pass
21	0.013	0.093	N/A	0.013	0.140	N/A	Pass
22	0.002	0.000	N/A	0.002	0.000	N/A	Pass
23	0.005	0.093	N/A	0.006	0.140	N/A	Pass
24	0.002	0.000	N/A	0.002	0.000	N/A	Pass
25	0.006	0.093	N/A	0.007	0.140	N/A	Pass
26	0.002	0.000	N/A	0.003	0.000	N/A	Pass
27	0.003	0.093	N/A	0.004	0.140	N/A	Pass
28	0.002	0.000	N/A	0.002	0.000	N/A	Pass
29	0.002	0.093	N/A	0.002	0.140	N/A	Pass
30	0.002	0.000	N/A	0.002	0.000	N/A	Pass
31	0.008	0.093	N/A	0.009	0.140	N/A	Pass
32	0.002	0.000	N/A	0.002	0.000	N/A	Pass
33	0.003	0.093	N/A	0.004	0.140	N/A	Pass
34	0.002	0.000	N/A	0.002	0.000	N/A	Pass
35	0.007	0.093	N/A	0.007	0.140	N/A	Pass
36	0.002	0.000	N/A	0.003	0.000	N/A	Pass
37	0.006	0.093	N/A	0.007	0.140	N/A	Pass
38	0.002	0.000	N/A	0.002	0.000	N/A	Pass
39	0.005	0.093	N/A	0.005	0.140	N/A	Pass
40	0.002	0.000	N/A	0.002	0.000	N/A	Pass

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

### Voltage Source Verification Data (Run time)

EUT: LED Floodlight      Tested by: guochengjie  
 Test category: Class-C per Ed. 4.0 (2014) (European limits)      Test Margin: 100  
 Test date: 10/19/2020      Start time: 1:49:53 PM      End time: 1:52:44 PM  
 Test duration (min): 2.5      Data file name: H-000242.cts\_data  
 Comment: Light on, TG-163XLLED, T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Technology Co., Ltd.

Test Result: Pass      Source qualification: Normal

#### Highest parameter values during test:

Voltage (Vrms):	230.27	Frequency(Hz):	50.00
I_Peak (Amps):	4.835	I_RMS (Amps):	3.117
I_Fund (Amps):	3.104	Crest Factor:	1.555
Power (Watts):	707.5	Power Factor:	0.986

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.086	0.460	18.63	OK
3	0.425	2.072	20.52	OK
4	0.055	0.461	11.84	OK
5	0.052	0.921	5.65	OK
6	0.022	0.460	4.88	OK
7	0.030	0.691	4.40	OK
8	0.022	0.461	4.75	OK
9	0.018	0.460	3.87	OK
10	0.019	0.460	4.03	OK
11	0.015	0.230	6.64	OK
12	0.015	0.230	6.58	OK
13	0.017	0.230	7.38	OK
14	0.010	0.230	4.23	OK
15	0.019	0.230	8.37	OK
16	0.011	0.230	4.69	OK
17	0.019	0.230	8.13	OK
18	0.008	0.230	3.52	OK
19	0.016	0.230	7.08	OK
20	0.012	0.230	5.26	OK
21	0.014	0.230	6.27	OK
22	0.005	0.230	2.17	OK
23	0.012	0.230	5.25	OK
24	0.005	0.230	2.31	OK
25	0.010	0.230	4.40	OK
26	0.004	0.230	1.86	OK
27	0.008	0.230	3.53	OK
28	0.005	0.230	2.11	OK
29	0.008	0.230	3.41	OK
30	0.005	0.230	1.97	OK
31	0.013	0.230	5.74	OK
32	0.005	0.230	2.22	OK
33	0.007	0.230	3.13	OK
34	0.005	0.230	1.98	OK
35	0.009	0.230	3.90	OK
36	0.005	0.230	2.03	OK
37	0.011	0.230	4.83	OK
38	0.004	0.230	1.64	OK
39	0.010	0.230	4.32	OK
40	0.006	0.230	2.71	OK



**Test Setup**

#### **2.4.8 Test Location**

This test was carried out in harmonic current emission and flicker test area.

## 2.5 Flicker

### 2.5.1 Specification Reference

EN 61000-3-3:2013, Clause 6

### 2.5.2 Equipment Under Test

TG-201LED and TG-163XLLED

### 2.5.3 Date of Test

10/19/2020

### 2.5.4 Test Method

For equipment not mentioned in annex A of EN 6100-3-3:2013, controls or automatic programs should be set to produce the most unfavourable sequence of voltage change, using only those combinations of controls and programmes which are mentioned by the manufacturer in the instruction manual, or are otherwise likely to be used

### 2.5.5 Environmental Conditions

Ambient Temperature	20-25°C
Relative Humidity	40-60%
Atmospheric Pressure	1010-1060mbar

### 2.5.6 Specification Limits

The value of Pst shall not be greater than 1.0

The value of Plt shall not be greater than 0.65

Tmax, the accumulated time value of d(t) with a deviation exceeding 3.3% during a single voltage change at the EUT terminals, shall not exceed 500ms

The maximum relative steady-state voltage change, dc, shall not exceed 3.3%

The maximum relative voltage change dmax, shall not exceed

a) 4% without additional conditions

b) 6% for equipment which is:

- Switched manually, or
- Switched automatically more frequently than twice per day, and also has either a delayed start, or manual restart, after a power supply interruption

c) 7% for equipment which is:

- Attended whilst in use, or
- Switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart or manual restart, after a power supply interruption

### 2.5.7 Test Results

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: *Pass*.

Detailed results are shown below.





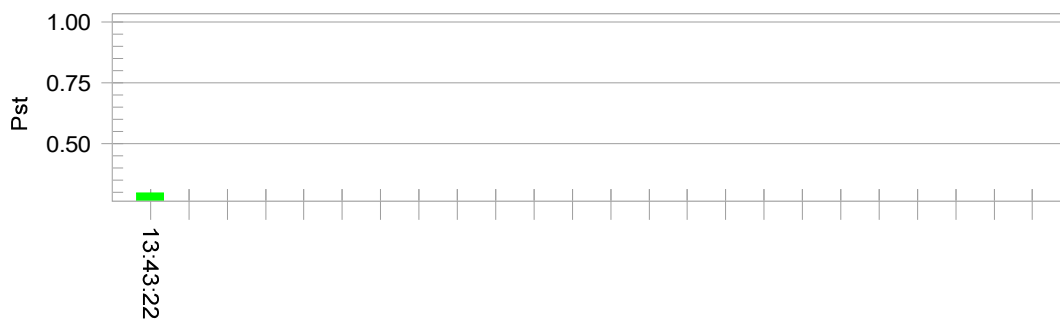
**Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)**

EUT: LED Floodlight  
 Test category: dt,dmax,dc and Pst (European limits)  
 Test date: 10/19/2020      Start time: 1:32:52 PM  
 Test duration (min): 10      Data file name: F-000241.cts\_data  
 Comment: Light on, TG-201LED, T23.5, H50.1%, P103.1kPa  
 Customer: Ningbo King-Bridge Technology Co., Ltd.

Tested by: guochengjie  
 Test Margin: 100  
 End time: 1:43:23 PM

Test Result: Pass      Status: Test Completed

**Pst and limit line      European Limits**



**Parameter values recorded during the test:**

Vrms at the end of test (Volt):	227.25	Test limit (%):	N/A	N/A
Highest dt (%):	-0.94	Test limit (mS):	500.0	Pass
T-max (mS):	0	Test limit (%):	3.30	Pass
Highest dc (%):	-1.28	Test limit (%):	4.00	Pass
Highest dmax (%):	1.33	Test limit:	1.000	Pass
Highest Pst (10 min. period):	0.299			

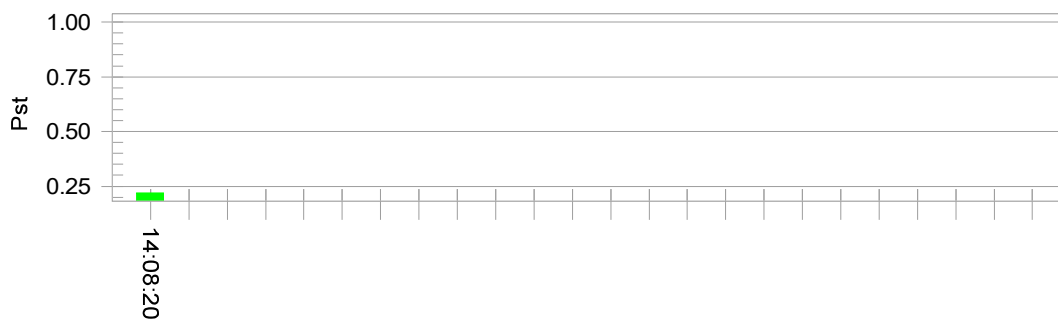


### Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

**EUT: LED Floodlight** Tested by: guochengjie  
**Test category: dt,dmax,dc and Pst (European limits)** Test Margin: 100  
**Test date: 10/19/2020** Start time: 1:57:50 PM End time: 2:08:21 PM  
**Test duration (min): 10** Data file name: F-000243.cts\_data  
**Comment: Light on, TG-201LED, T23.5, H50.1%, P103.1kPa**  
**Customer: Ningbo King-Bridge Technology Co., Ltd.**

**Test Result: Pass** **Status: Test Completed**

**Pst<sub>t</sub> and limit line** **European Limits**



**Parameter values recorded during the test:**

<b>Vrms at the end of test (Volt):</b>	<b>228.96</b>		
<b>Highest dt (%):</b>	<b>0.56</b>	<b>Test limit (%):</b>	<b>N/A</b> <span style="margin-left: 20px;"><b>N/A</b></span>
<b>T-max (mS):</b>	<b>0</b>	<b>Test limit (mS):</b>	<b>500.0</b> <span style="margin-left: 20px;"><b>Pass</b></span>
<b>Highest dc (%):</b>	<b>-0.51</b>	<b>Test limit (%):</b>	<b>3.30</b> <span style="margin-left: 20px;"><b>Pass</b></span>
<b>Highest dmax (%):</b>	<b>0.55</b>	<b>Test limit (%):</b>	<b>4.00</b> <span style="margin-left: 20px;"><b>Pass</b></span>
<b>Highest Pst (10 min. period):</b>	<b>0.220</b>	<b>Test limit:</b>	<b>1.000</b> <span style="margin-left: 20px;"><b>Pass</b></span>



**Test setup**

### **2.5.8 Test Location**

This test was carried out in harmonic current emission and flicker test area.



**2.6 Electrostatic discharge immunity test**

**2.6.1 Specification Reference**

EN 61547:2009, Clause 5.2

**2.6.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.6.3 Date of Test**

10/20/2020

**2.6.4 Test Method**

The equipment under test including associated cabling was configured on but insulated from, using a 0.5mm isolator, a horizontal coupling plane fitted to the top of a 0.8m non-conductive table for table-top equipment; and on a 0.1m insulated support for floor standing equipment; above a ground reference plane all within a test laboratory.

Using the air discharge method for non-metallic parts, contact discharge method for metallic parts with both vertical and horizontal couple plane discharge methods for the sides of the equipment under test, the required electrostatic discharge voltage levels in both voltage polarities were applied at the detailed pulse repartition rate.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.6.5 Environmental Conditions**

Ambient Temperature 21.6°C  
 Relative Humidity 41.7%  
 Atmospheric Pressure 1027.0mbar

**2.6.6 Specification Limits**

Required Test Levels				Performance Criteria
Discharge type	Discharge Level (kV)		Number of discharges per location (each polarity)	
	Positive	Negative		
Air – Direct	2, 4 and 8	2, 4 and 8	<10>	B
Contact – Direct	2 and 4	2 and 4	<10>	B
Contact – Indirect	2 and 4	2 and 4	<10>	B

**2.6.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

ID	Test Point	Discharge	Results									
			2kV		4kV		6kV		8kV		15kV	
			+	-	+	-	+	-	+	-	+	-
A	Vertical coupling plane	Contact	✓	✓	✓	✓						
B	Horizontal coupling plane	Contact	✓	✓	✓	✓						
C	screw	Contact	✓	✓	✓	✓						
D	Metallic enclosure	Contact	✓	✓	✓	✓						
E	Gap	Air	✓	✓	✓	✓			✓	✓		

**Note:**

✓	The EUTs performance was not impacted when the ESD pulse was applied.
✓*	No discharge occurred at this point when the ESD pulse was applied.
Ox	Observation number A, B, ...etc.



**Test Setup**

**2.6.8 Test Location**

This test was carried out in shielded room Z118.



**2.7 Radiated, radio-frequency, electromagnetic field immunity test**

**2.7.1 Specification Reference**

EN 61547:2009, Clause 5.3

**2.7.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.7.3 Date of Test**

10/20/2020

**2.7.4 Test Method**

The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment; with a pre-calibrated semi anechoic chamber.

All four side of the equipment under test were subjected to the required RF field strength, modulated as described, swept over the frequency range of test with the antenna positioned in both horizontal and vertical polarizations.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.7.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.7.6 Specification Limits**

Required Test Levels					Performance Criteria
Frequency Range (MHz)	Level (V/m)	Modulation	Step Size (%)	Dwell (s)	
80 to 1000	3	AM (80 %, 1 kHz, sine wave)	1	3	A
Note 1. EUT powered at one of the Nominal input voltages and frequencies					

**2.7.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Test Results for RF Electromagnetic Field 80 - 1000 MHz				
Side of the equipment under test	Antenna polarization	Test Level	Dwell Time	Result
Front	Horizontal	3 V/m	3 s	Pass PC A
Front	Vertical	3 V/m	3 s	Pass PC A
Right	Horizontal	3 V/m	3 s	Pass PC A
Right	Vertical	3 V/m	3 s	Pass PC A
Rear	Horizontal	3 V/m	3 s	Pass PC A
Rear	Vertical	3 V/m	3 s	Pass PC A
Left	Horizontal	3 V/m	3 s	Pass PC A
Left	Vertical	3 V/m	3 s	Pass PC A
Remark:				



**Test Setup**

**2.7.8 Test Location**

This test was carried out in 3m anechoic chamber.



**2.8 Electrical fast transient /burst immunity test**

**2.8.1 Specification Reference**

EN 61547:2009, Clause 5.5

**2.8.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.8.3 Date of Test**

10/20/2020

**2.8.4 Test Method**

The equipment under test including associated cabling was configured on but insulated from, using a 0.1 m isolator, a horizontal coupling plane fitted to the top of a 0.8 m non-conductive table for table-top equipment; and on a 0.1 m insulated support for floor standing equipment; above a ground reference plane all within a test laboratory.

Using a CDN for power ports, capacitive coupling clamp for signal and control ports and a 33nF coupling capacitor for earth ports, the required fast transient burst voltage levels in both voltage polarities were applied at the detailed pulse repartition rate and duration of test.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.8.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.8.6 Specification Limits**

Required Test Levels at input and output a.c. power port					Performance Criteria
Line Under Test	Level (kV)	Repetition Rate (kHz)	Test Duration	Coupling Method	
AC Power Port	± 1	5 kHz	2 min per polarity	CDN	B
Note 1. EUT powered at one of the Nominal input voltages and frequencies					

**2.8.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.



Test Results for Fast Transient Burst Immunity					
Line under test	Test Level (kV)	Repetition Rate	Test Duration	Coupling Method	Result
power line	± 1.0	5 kHz	2 min	CDN	Pass PC A
Remark:					



**Test Setup**

### 2.8.8 Test Location

This test was carried out in shielded room Z118.



**2.9 Immunity to conducted disturbances, induced by radio-frequency fields**

**2.9.1 Specification Reference**

EN 61547:2009, Clause 5.6

**2.9.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.9.3 Date of Test**

10/20/2020

**2.9.4 Test Method**

The equipment under test was placed on an insulating support 0,1 m above the reference ground plane.

All associated cabling was configured, on but insulated from, using a 50 mm isolator, the same horizontal coupling plane as the equipment under test.

Using CDNs, EM Clamps or current clamps as appropriate, the power ports and applicable signal and control ports were subjected to the required, pre calibrated RF injected signal strength, modulated as described, swept over the frequency range of test.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.9.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.9.6 Specification Limits**

Required Test Levels at input and output a.c. power ports						Performance Criteria
Line Under Test	Frequency Range (MHz)	Level (V)	Modulation	Step Size (%)	Dwell (s)	
AC power ports	0.15 to 80	3	AM (80 %, 1 kHz, sine wave)	1	3	A
Note Only applicable to ports interfacing with cables whose total length, according to the manufacturer's specification, may exceed 3m						

**2.9.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Test Results for Injected current						
Line under test	Test Level	Step	Dwell Time	Coupling Method	Modulation	Result
power line	3V	1%	3S	CDN	1KHZ 80%	Pass PC A
Remark:						



**Test Setup**

**2.9.8 Test Location**

This test was carried out in shielded room Z118.



**2.10 Surge immunity test**

**2.10.1 Specification Reference**

EN 61547:2009, Clause 5.7

**2.10.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.10.3 Date of Test**

10/20/2020

**2.10.4 Test Method**

The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment above a ground reference plane all within a test laboratory.

Using CDNs for power ports and appropriate coupling methods for applicable signal and control ports, the required number of surges was applied for each surge voltage level using both positive and negative surge voltage polarities. Surges were applied at the power line frequency phase angles and repartition rates detailed.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.10.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.10.6 Specification Limits**

Characteristics	Test Levels			Performance Criteria
	Device			
	Self-ballasted lamps And semi-luminaires	Luminaires and independent auxiliaries		
		Input power		
	≤25W	>25W		
Wave- shape data	1.2/50 μs	1.2/50 μs	1.2/50 μs	C
Test levels line to line	± 0.5 kV	± 0.5 kV	± 1.0 kV	
line to ground	±1.0 kV	±1.0 kV	±2.0 kV	
Note In addition to the specified test level, all lower levels as detailed in IEC 61000-4-5 should also be satisfied.				

**2.10.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Test Results for Surge Immunity (Power Ports)							
Line Name	Coupling	Level	Polarity	Phase Angle	No of Pulses	Repetition Rate	Result
power line	Live to Neutral	-1kV	NEGATIVE	270 deg	5	60 sec	Pass PC A
power line	Live to Neutral	+1kV	POSITIVE	90 deg	5	60 sec	Pass PC A
power line	Live to Ground	-2kV	NEGATIVE	270 deg	5	60 sec	Pass PC A
power line	Live to Ground	+2kV	POSITIVE	90 deg	5	60 sec	Pass PC A
power line	Neutral to Ground	-2kV	NEGATIVE	270 deg	5	60 sec	Pass PC A
power line	Neutral to Ground	+2kV	POSITIVE	90 deg	5	60 sec	Pass PC A
Remark:							



**Test Setup**

### 2.10.8 Test Location

This test was carried out in shielded room Z118.



**2.11 Voltage dips, short interruptions and voltage variations immunity test**

**2.11.1 Specification Reference**

EN 61547:2009, Clause 5.8

**2.11.2 Equipment Under Test**

TG-201LED and TG-163XLLED

**2.11.3 Date of Test**

10/20/2020

**2.11.4 Test Method**

The equipment under test including associated cabling was configured, on a 0.8 m non-conductive table for table-top equipment and on a 0.1 m insulated support for floor standing equipment above a ground reference plane all within a test laboratory.

Using a programmable power supply the equipment under test was subjected to the detailed supply voltage dips and interruptions. The required supply phase synchronization and test repetition rate, detailed, was controlled by the programmable power supply.

During this testing any anomalies in the equipment under tests performance was recorded.

**2.11.5 Environmental Conditions**

Ambient Temperature 20-25°C  
 Relative Humidity 40-60%  
 Atmospheric Pressure 1010-1060mbar

**2.11.6 Specification Limits**

Required Test Levels			Performance Criteria
Test	Test Level	Duration	
Voltage short interruptions	0 % of Vnom	½ cycle	B
Voltage dips	70 % of Vnom	10 cycles	C

Note EUT powered at one of the Nominal input voltages and frequencies

**2.11.7 Test Results**

Results for Configuration and Mode: AC Powered/Light on.

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Test Results for Voltage Dip and Short Interruption					
Line under test	Vnom	Operating Frequency	Test Level	Duration	Result
power line	230 Vac	50/60 Hz	0% of Vnom	½ cycle	Pass PC A
power line	230 Vac	50/60 Hz	70% of Vnom	10 cycles	Pass PC B

Remark: During the test of voltage dips, the lamp flashed. After removing the interference, it can restore its original mode by itself automatically.



**Test Setup**

**2.11.8 Test Location**

This test was carried out in shielded room Z118.



### 3 Test Equipment Information

#### 3.1 General Test Equipment Used

Instrument	Manufacturer	Type No	TE No	Calibration Date	Calibration Due
Conducted Emission					
EMI test receiver	R & S	ESR3	S1503001-YQ-EMC	2020.8.4	2021.8.3
2-Line V-network	R & S	ENV216	S1503103-YQ-EMC	2020.8.4	2021.8.3
Radiated Disturbance (9kHz to 30MHz)					
EMI test receiver	R & S	ESR3	S1503101-YQ-EMC	2020.8.4	2021.8.3
Triple loop antenna	R & S	HM020	S1503115-YQ-EMC	2020.7.10	2021.7.9
Radiated Disturbance (30MHz to 300MHz)					
EMI test receiver	R & S	ESR3	S1503109-YQ-EMC	2020.8.4	2021.8.3
Trilog super broadband test antenna	SCHWARZBECK	VULB 9168	S1808296-YQ-EMC	2019.3.16	2022.3.15
3 meter semi-anechoic chamber	TDK	3m	S1503231-YQ-EMC	2018.5.11	2021.5.10
Harmonic current emission and Flicker					
Harmonic-flicker test system	California Instruments	15003IX-CTS-400-413-LF-411	S1503193-YQ-EMC	2020.7.10	2021.7.9





Instrument	Manufacturer	Type No	TE No	Calibration Date	Calibration Due
Electrostatic discharge immunity test					
ESD Simulator	HAEFELY	ONYX 16	S1905298-YQ-EMC	2020.7.10	2021.7.9
T/H record	Shanghai meteorological instrument	ZJ1-2A	S1503201-YQ-EMC	2020.8.13	2021.8.12
Horizontal Coupling Plane	TÜV Product Service	---	---	---	---
Vertical Coupling Plane	TÜV Product Service	---	---	---	---
Radiated, radio-frequency, electromagnetic field immunity test					
Signal generator	R & S	SMB 100A	S1503055-YQ-EMC	2020.8.4	2021.8.3
Amplifier	A R	1000W1000EM1	S1503076-YQ-EMC	2020.8.4	2021.8.3
Power meter	R & S	NRP2	S1503062-YQ-EMC	2020.8.4	2021.8.3
Dual directional coupler	AR	DC6280AM1	S1503077-YQ-EMC	2020.8.4	2021.8.3
High gain log-periodic antenna	R & S	HL046E	S1503083-SB-EMC	--	--
Wideband power sensor	R & S	NRP-Z91	S1503068-YQ-EMC	2020.8.4	2021.8.3
Wideband power sensor	R & S	NRP-Z91	S1503069-YQ-EMC	2020.8.4	2021.8.3
Electrical fast transient/burst immunity test					
Ultra compact simulator	EM test	UCS 500N5T	S1503171-YQ-EMC	2020.8.4	2021.8.3
Immunity to conducted disturbances, induced by radio-frequency field					
Continuous wave generator	EM test	CWS 500N2.2	S1503159-YQ-EMC	2020.8.4	2021.8.3
6dB attenuator	EM test	ATT 6/80	S1503180-SB-EMC	--	--
Coupling and decoupling network	EM test	CDN M2/M3	S1503186-YQ-EMC	2020.8.4	2021.8.3
Surge immunity test					
Ultra compact simulator	EM test	UCS 500N5T	S1503171-YQ-EMC	2020.8.4	2021.8.3
Voltage dips, short interruptions and voltage variations immunity test					
Ultra compact simulator	EM test	UCS 500N5T	S1503171-YQ-EMC	2020.8.4	2021.8.3
Motor driven AC source	EM test	MV 2616	S1503175-YQ-EMC	2020.8.4	2021.8.3



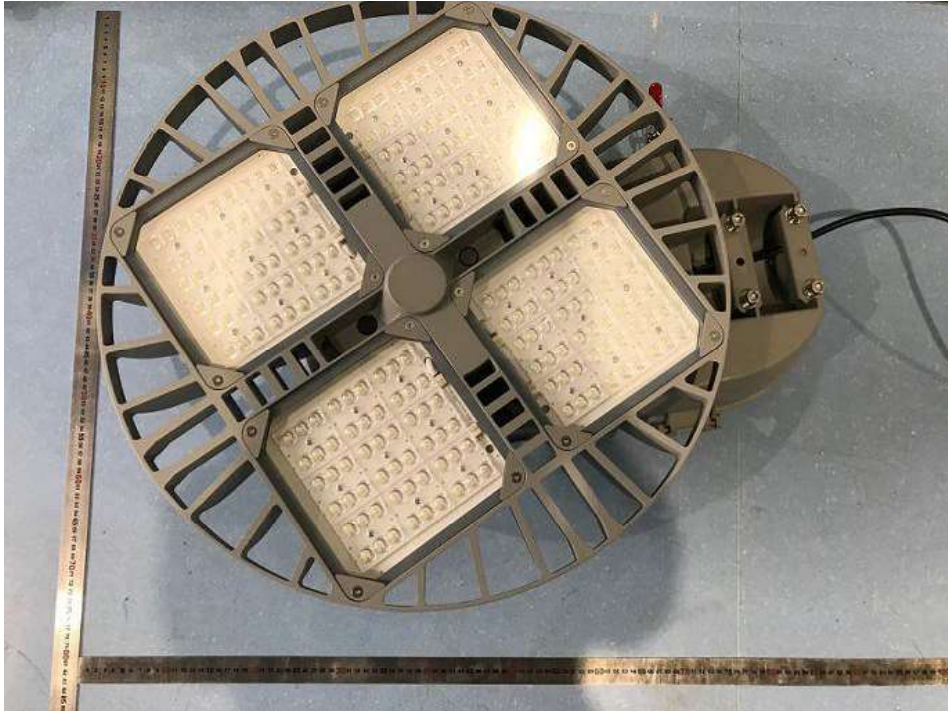
## 4 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Conducted Disturbance at Mains Terminals	9kHz to 30MHz, $\pm 3.16$ dB
Radiated Disturbance	9kHz to 30MHz, $\pm 2.78$ dB
Radiated Disturbance	30MHz to 1GHz, $\pm 5.03$ dB (Horizontal) $\pm 5.12$ dB (Vertical)

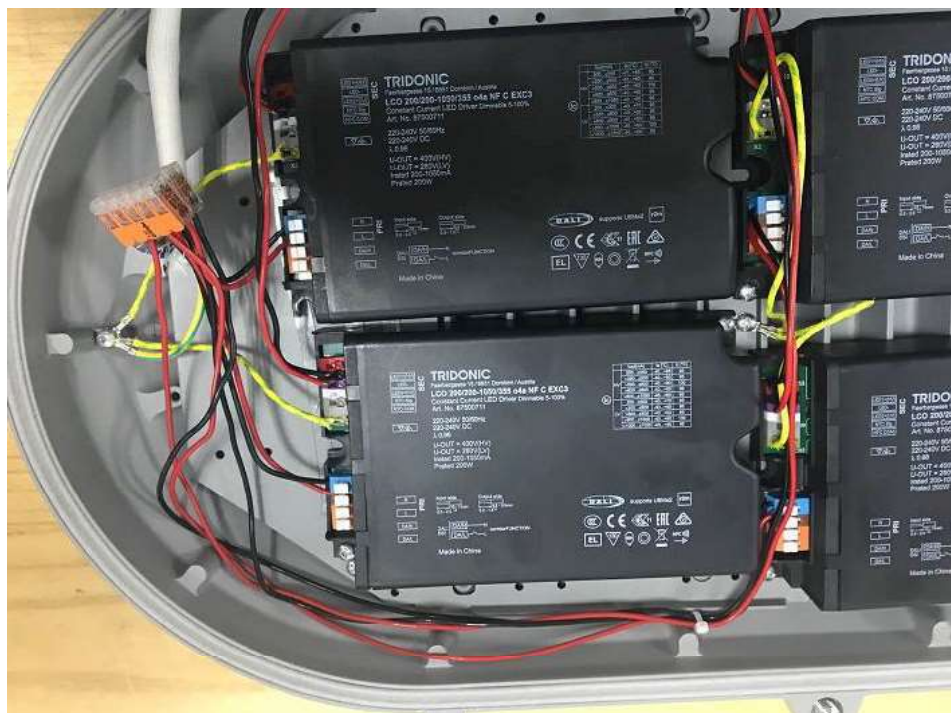
## 5 Photographs

TG-201LED



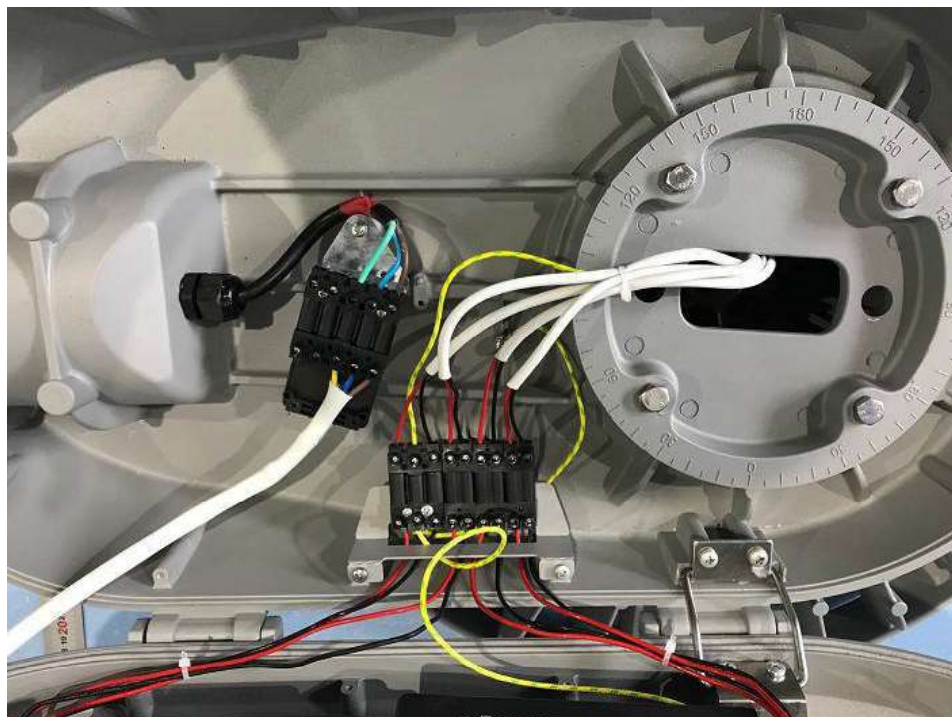








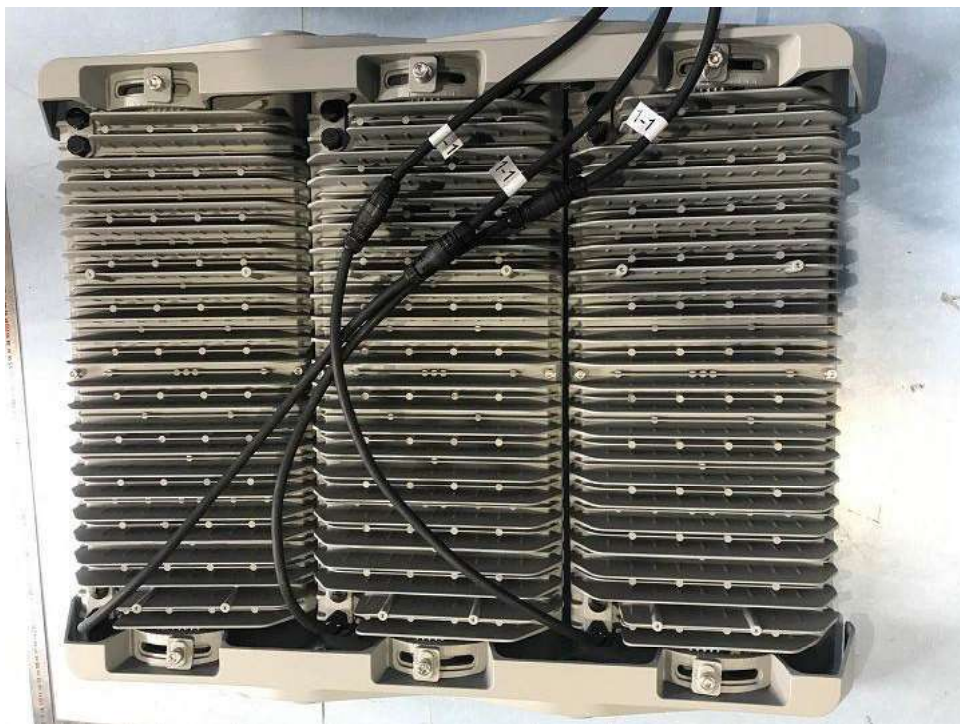
China



TG-163XLLED

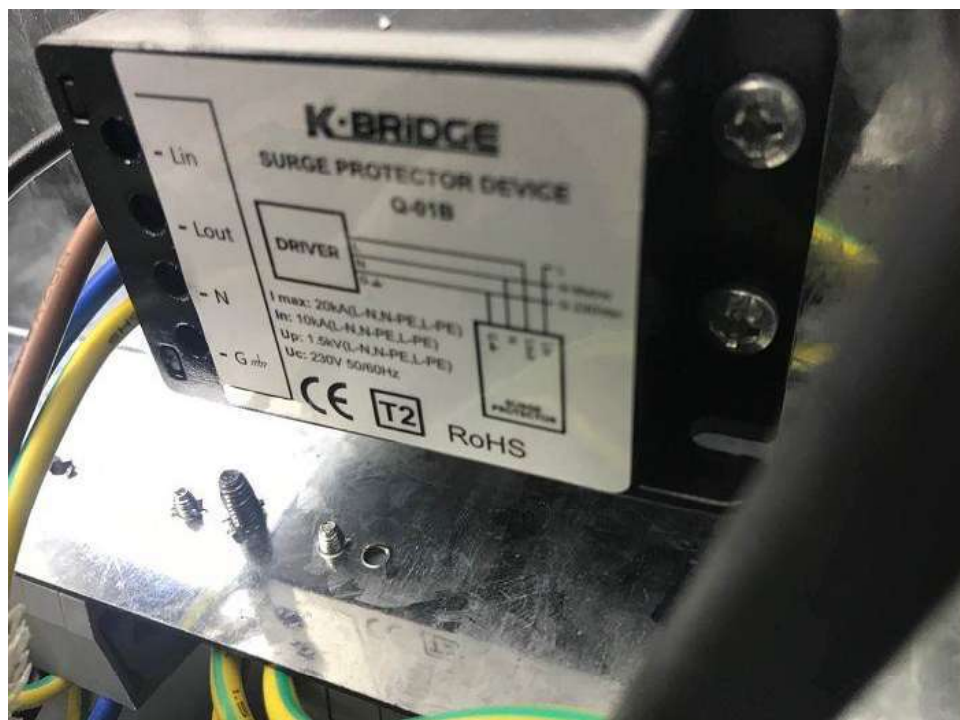














## 2.4 Componentes de las Luminarias

- UNE-EN 62031. Módulos LED para alumbrado general.  
Requisitos de seguridad. (Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria.)
- UNE-EN 61347-2-13. Dispositivos de control de lámpara. Parte 2-13:  
Requisitos particulares para dispositivos de control electrónicos alimentados con corriente continua o corriente alterna para módulos LED.
- UNE-EN 62384. Dispositivos de control electrónicos alimentados en corriente continua o corriente alterna para módulos LED.
- Requisitos de funcionamiento.



APL

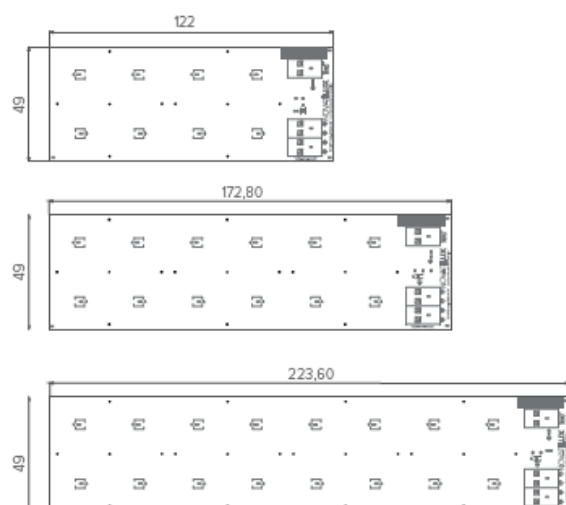
# PCB



El módulo de LED del Grupo Benito Novatilu mediante su tecnología propia ofrece un alto rendimiento lumínico con las máximas garantía de seguridad y una óptima calidad fotométrica, gracias al principio de adiciones donde cada LED dispone de su lente específica.

- MCPCB de Aluminio de Alta Transferencia Térmica en formatos (8, 12 y 16 LEDs) según Estándar Zhaga Book 15.
- Tecnología LED de Alta Eficiencia en formato 5050 con rendimiento >172lm/W.
- Control del flujo lumínico mediante lentes PMMA 2x2 de alta transparencia. Disponibilidad >18 distribuciones lumínicas diferentes.
- Doble Protección de sobretensiones Transitorias.
- Incluye sensor NTC de Temperatura para la protección Térmica del LED.
- Disponible en Diferentes Temperaturas de Color (de PC Ambar a 5000K) y distintos índices de reproducción cromática IRC (>70 o >80).

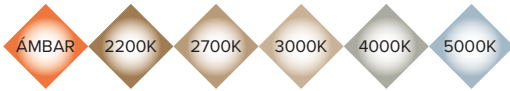
PLANO:



CONFIGURACIONES:

- APL16ZH - 48Vdc
- APL12ZH - 36Vdc
- APL8ZH - 24Vdc

## RANGO DE TEMPERATURA DE COLOR



## LAS VERSIONES DE PCB BENITO NOVATILU

REF.	Nº LEDs	I <sub>max</sub> (mA)	W <sub>max</sub> (W)	Flujo luminoso Real (T) (=85°C)	Eficiencia lm/W	Flujo luminoso Real (T) (=25°C)	Eficiencia lm/W
<APL8ZH	8	1050	25,2	3881	154	4208	167
<APL12ZH	12	1050	37,8	5821	154	6313	167
<APL16ZH	16	1050	50,4	7762	154	8417	167

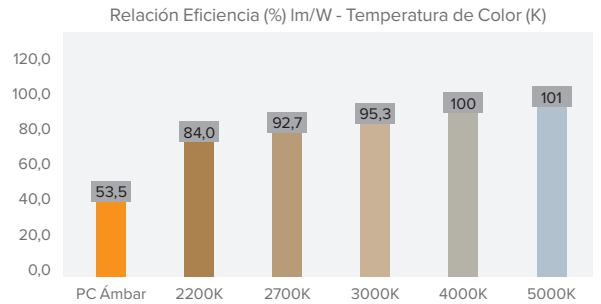
L90B10 >100.000h según TM21 (Certificado por Laboratorio ENAC).

Temperatura de Funcionamiento -35°C - + 60°C.

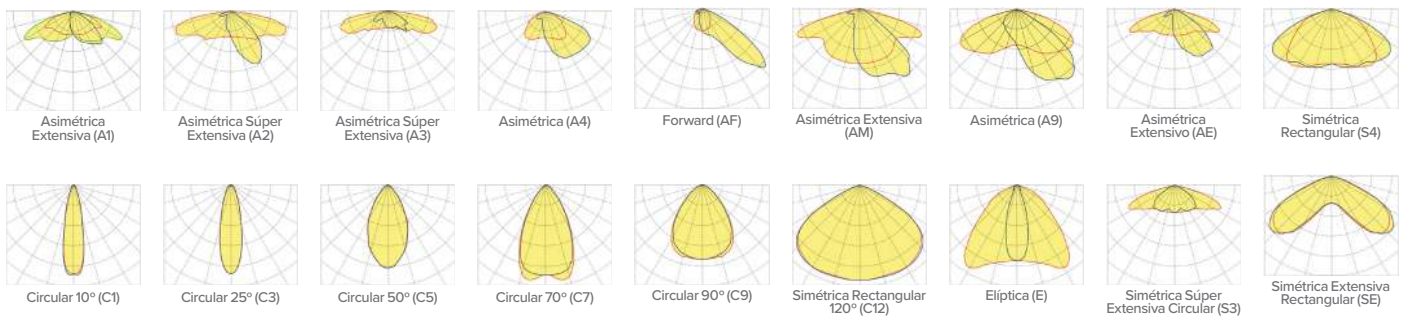
Corriente del LED = Corriente Driver /2 (I<sub>max</sub> - 525mA).

Tolerancia del flujo luminoso < +/-3%.

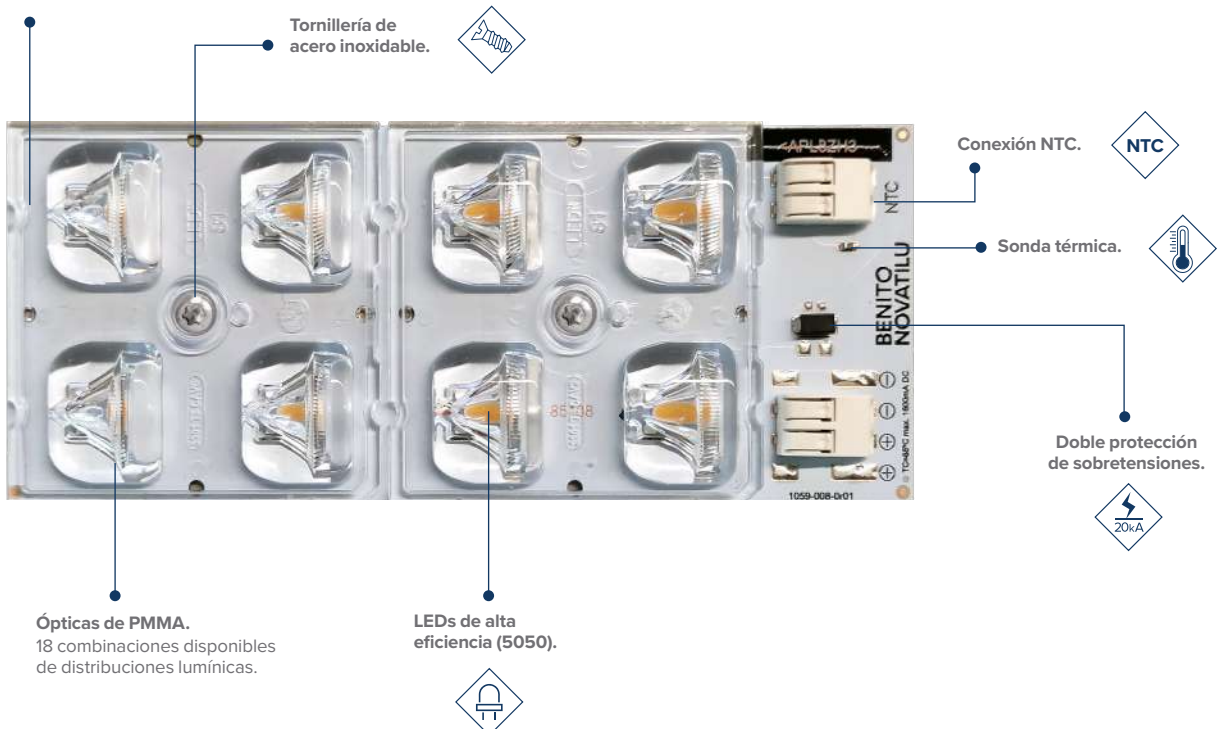
Valores sujetos a cambios sin previo aviso en función del Binning de los LEDs.



## DISTRIBUCIONES LUMÍNICAS DISPONIBLES



PCB BENITO NOVATILU de aluminio de alta transferencia térmica en 3 formatos standard Zhaga (Book15) (8, 12 y 16 LED). Consultar temperaturas de color y distribuciones lumínicas.



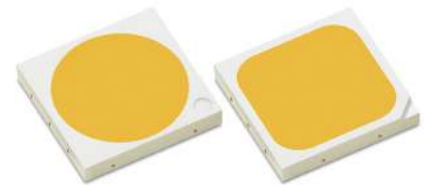
El Grupo BENITO NOVATILU se reserva el derecho de realizar modificaciones a sus productos sin previo aviso



# LUXEON 5050

High efficacy and superior robustness in a multi-die, high power package, enabling cost-effective system design

LUXEON 5050 is a multi-die, high power package that provides high luminance from a super robust package to enable cost effective, single optic and directional fixture designs. LUXEON 5050 uses an industry standard 5050 surface mount package with a small Light Emitting Surface (LES). LUXEON 5050 comes in 70CRI, 80CRI and 90CRI with a wide range of CCTs, and offers hot-color targeting to ensure that the LEDs are within color target at application conditions of 85°C.



## FEATURES AND BENEFITS

- Superior lm/W enables outstanding efficacy in end application
- Extremely reliable package design affirms long lifetime in harsh environments <sup>[1]</sup>
- Two voltage configurations are compatible with low cost high efficacy drivers
- Low  $R_{th}$  enables effective thermal dissipation design for higher efficiency
- Hot-color targeting ensures color is within ANSI bin at 85°C
- 3-step and 5-step MacAdam ellipse binning structure ensures excellent color uniformity

1. Refer to reliability datasheet for more details.

## PRIMARY APPLICATIONS

- High Bay
- Low Bay
- Floodlights
- Wall Pack
- [More...](#)

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# General Product Information

## Product Test Conditions

LUXEON 5050 LEDs are tested with a 20ms monopulse specified below at a junction temperature,  $T_j$ , of 25°C. Forward voltage and luminous flux are binned at a  $T_j$  of 25°C, while color is hot-targeted at a  $T_j$  of 85°C.

- 160mA - LUXEON 5050 (Round LES) – 24V and LUXEON 5050 (Square LES) – 30V
- 640mA - LUXEON 5050 (Round LES) – 6V
- 800mA - LUXEON 5050 (Square LES) – 6V

## Part Number Nomenclature

Part numbers for LUXEON 5050 follow the convention below:

L 1 5 0 – **A A B B** 5 0 **C C** 0 0 0 **D** 0

Where:

- A A** - designates nominal ANSI CCT (22=2200K, 27=2700K, 30=3000K, 35=3500K 40=4000K, 50=5000K, 57=5700K, 65=6500K)
- B B** - designates minimum CRI (70=70CRI, 80=80CRI, 90=90CRI)
- C C** - designates voltage (06=6V, 24=24V, 30=30V)
- D** - designates product type (0=Round LES, S=Square LES)

Therefore, the following part number is used for a LUXEON 5050 Square LES, 3000K 80CRI, 30V:

L 1 5 0 – **3 0 8 0** 5 0 **3 0** 0 0 0 **S** 0

## Lumen Maintenance

Please contact your local Sales Representative or Lumileds Technical Solutions Manager for more information about the long-term performance of this product.

## Environmental Compliance

Lumileds LLC is committed to providing environmentally friendly products to the solid-state lighting market. LUXEON 5050 is compliant to the European Union directives on the restriction of hazardous substances in electronic equipment, namely the RoHS Directive 2011/65/EU and REACH Regulation (EC) 1907/2006. Lumileds LLC will not intentionally add the following restricted materials to its products: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

# Performance Characteristics

## Product Selection Guide

Table 1. Product performance of LUXEON 5050 at specified test current,  $T_j=25^\circ\text{C}$ .

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER
			MINIMUM	TYPICAL			
LUXEON 5050 (Round LES) 24V	2200K	70	515	550	140	160	L150-2270502400000
	2700K	70	535	605	154	160	L150-2770502400000
	3000K	70	553	625	159	160	L150-3070502400000
	3500K	70	600	635	162	160	L150-3570502400000
	4000K	70	580	675	172	160	L150-4070502400000
	5000K	70	580	672	171	160	L150-5070502400000
	5700K	70	570	661	169	160	L150-5770502400000
	6500K	70	570	655	167	160	L150-6570502400000
	2200K	80	440	475	121	160	L150-2280502400000
	2700K	80	500	550	140	160	L150-2780502400000
	3000K	80	516	590	151	160	L150-3080502400000
	3500K	80	527	595	152	160	L150-3580502400000
	4000K	80	539	615	157	160	L150-4080502400000
	5000K	80	539	615	157	160	L150-5080502400000
	5700K	80	539	615	157	160	L150-5780502400000
	6500K	80	539	615	157	160	L150-6580502400000
	2700K	90	414	475	121	160	L150-2790502400000
	3000K	90	428	490	125	160	L150-3090502400000
	3500K	90	445	510	130	160	L150-3590502400000
	4000K	90	456	530	135	160	L150-4090502400000
	5000K	90	456	530	135	160	L150-5090502400000
5700K	90	456	530	135	160	L150-5790502400000	
LUXEON 5050 (Round LES) 6V	2200K	70	515	550	140	640	L150-2270500600000
	2700K	70	535	605	154	640	L150-2770500600000
	3000K	70	553	625	159	640	L150-3070500600000
	3500K	70	600	635	162	640	L150-3570500600000
	4000K	70	580	675	172	640	L150-4070500600000
	5000K	70	580	672	171	640	L150-5070500600000
	5700K	70	570	661	169	640	L150-5770500600000
	6500K	70	570	655	167	640	L150-6570500600000
	2200K	80	440	475	121	640	L150-2280500600000
	2700K	80	500	550	140	640	L150-2780500600000
	3000K	80	516	590	151	640	L150-3080500600000
	3500K	80	527	595	152	640	L150-3580500600000
	4000K	80	539	615	157	640	L150-4080500600000
	5000K	80	539	615	157	640	L150-5080500600000
	5700K	80	539	615	157	640	L150-5780500600000
	6500K	80	539	615	157	640	L150-6580500600000
	2700K	90	414	475	121	640	L150-2790500600000
	3000K	90	428	490	125	640	L150-3090500600000
	3500K	90	445	510	130	640	L150-3590500600000
	4000K	90	456	530	135	640	L150-4090500600000
	5000K	90	456	530	135	640	L150-5090500600000
5700K	90	456	530	135	640	L150-5790500600000	

Table 1 continued on next page:

1. Correlated color temperature is not targeted at  $T_j=85^\circ\text{C}$ .
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at  $T_j=25^\circ\text{C}$ . Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of  $\pm 2$  on CRI and  $\pm 7\%$  on luminous flux measurements.

Table 1. Product performance of LUXEON 5050 at specified test current, T<sub>j</sub>=25°C, Continued.

PRODUCT	NOMINAL CCT <sup>[1]</sup>	MINIMUM CRI <sup>[2, 3]</sup>	LUMINOUS FLUX <sup>[2, 3]</sup> (lm)		TYPICAL LUMINOUS EFFICACY (lm/W)	TEST CURRENT (mA)	PART NUMBER	
			MINIMUM	TYPICAL				
LUXEON 5050 (Square LES) 30V	2200K	70	621	690	141	160	L150-22705030000S0	
	2700K	70	693	770	158	160	L150-27705030000S0	
	3000K	70	720	800	164	160	L150-30705030000S0	
	3500K	70	729	810	166	160	L150-35705030000S0	
	4000K	70	743	825	169	160	L150-40705030000S0	
	5000K	70	743	825	169	160	L150-50705030000S0	
	5700K	70	738	820	168	160	L150-57705030000S0	
	6500K	70	720	800	164	160	L150-65705030000S0	
	2200K	80	586	630	129	160	L150-22805030000S0	
	2700K	80	650	695	142	160	L150-27805030000S0	
	3000K	80	665	715	147	160	L150-30805030000S0	
	3500K	80	679	730	150	160	L150-35805030000S0	
	4000K	80	700	750	154	160	L150-40805030000S0	
	5000K	80	702	755	155	160	L150-50805030000S0	
	5700K	80	700	750	154	160	L150-57805030000S0	
	6500K	80	688	740	152	160	L150-65805030000S0	
	2700K	90	558	600	123	160	L150-27905030000S0	
	3000K	90	586	630	129	160	L150-30905030000S0	
	3500K	90	600	640	131	160	L150-35905030000S0	
	4000K	90	609	655	134	160	L150-40905030000S0	
	5000K	90	618	665	136	160	L150-50905030000S0	
	5700K	90	605	650	133	160	L150-57905030000S0	
	LUXEON 5050 (Square LES) 6V	2200K	70	621	690	141	800	L150-22705006000S0
		2700K	70	693	770	158	800	L150-27705006000S0
		3000K	70	720	800	164	800	L150-30705006000S0
		3500K	70	729	810	166	800	L150-35705006000S0
		4000K	70	743	825	169	800	L150-40705006000S0
		5000K	70	743	825	169	800	L150-50705006000S0
5700K		70	738	820	168	800	L150-57705006000S0	
6500K		70	720	800	164	800	L150-65705006000S0	
2200K		80	586	630	129	800	L150-22805006000S0	
2700K		80	650	695	142	800	L150-27805006000S0	
3000K		80	665	715	147	800	L150-30805006000S0	
3500K		80	679	730	150	800	L150-35805006000S0	
4000K		80	700	750	154	800	L150-40805006000S0	
5000K		80	702	755	155	800	L150-50805006000S0	
5700K		80	700	750	154	800	L150-57805006000S0	
6500K		80	688	740	152	800	L150-65805006000S0	
2700K		90	558	600	123	800	L150-27905006000S0	
3000K		90	586	630	129	800	L150-30905006000S0	
3500K		90	600	640	131	800	L150-35905006000S0	
4000K		90	609	655	134	800	L150-40905006000S0	
5000K		90	618	665	136	800	L150-50905006000S0	
5700K		90	605	650	133	800	L150-57905006000S0	

Notes for Table 1:

1. Correlated color temperature is not targeted at T<sub>j</sub>=85°C.
2. Luminous flux and CRI are based upon mounted package on highly reflective surface at T<sub>j</sub>=25°C. Typical CRI is approximately 2 points higher than the minimum CRI specified, but this is not guaranteed.
3. Lumileds maintains a tolerance of ±2 on CRI and ±7% on luminous flux measurements.

# Optical Characteristics

Table 2. Optical characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	TYPICAL TOTAL INCLUDED ANGLE <sup>[1]</sup>	TYPICAL VIEWING ANGLE <sup>[2]</sup>
L150-xxxx50xx000x0	138°	116°

Notes for Table 2:

- Total angle at which 90% of total luminous flux is captured.
- Viewing angle is the off axis angle from the LED centerline where the luminous intensity is ½ of the peak value.

# Electrical and Thermal Characteristics

Table 3. Electrical and thermal characteristics for LUXEON 5050 at test current,  $T_j=25^\circ\text{C}$ .

PART NUMBER	FORWARD VOLTAGE <sup>[1]</sup> ( $V_f$ )			TYPICAL TEMPERATURE COEFFICIENT OF FORWARD VOLTAGE <sup>[2]</sup> (mV/°C)	TYPICAL THERMAL RESISTANCE—JUNCTION TO SOLDER PAD (°C/W)
	MINIMUM	TYPICAL	MAXIMUM		
L150-xxxx502400000	23.5	24.4	26.5	-12	2.4
L150-xxxx500600000	5.8	6.1	6.6	-3	2.4
L150-xxxx5030000S0	29.0	30.5	32.0	-15	1.4
L150-xxxx5006000S0	5.8	6.1	6.6	-3	1.4

Notes for Table 3:

- Lumileds maintains a tolerance of  $\pm 1\%$  on forward voltage measurements.
- Measured between 25°C and 85°C.

# Absolute Maximum Ratings

Table 4. Absolute maximum ratings for LUXEON 5050.

PARAMETER	MAXIMUM PERFORMANCE
DC Forward Current <sup>[1,2]</sup>	240mA for L150-xxxx502400000 800mA for L150-xxxx500600000 240mA for L150-xxxx5030000S0 1000mA for L150-xxxx5006000S0
Peak Pulsed Forward Current <sup>[1,3]</sup>	300mA for L150-xxxx502400000 1000mA for L150-xxxx500600000 300mA for L150-xxxx5030000S0 1250mA for L150-xxxx5006000S0
LED Junction Temperature <sup>[1]</sup> (DC & Pulse)	125°C
ESD Sensitivity (ANSI/ESDA/JEDEC JS-001-2012)	Class 2
Operating Case Temperature <sup>[1]</sup>	105°C
LED Storage Temperature	-40°C to 105°C
Allowable Reflow Cycles	3
Reverse Voltage ( $V_{reverse}$ )	LUXEON LEDs are not designed to be driven in reverse bias

Notes for Table 4:

- Proper current derating must be observed to maintain the junction temperature below the maximum allowable junction temperature.
- Residual periodic variations due to power conversion from alternating current (AC) to direct current (DC), also called "ripple," are acceptable if the following conditions are met:
  - The frequency of the ripple current is 100Hz or higher
  - The average current for each cycle does not exceed the maximum allowable DC forward current
  - The maximum amplitude of the ripple does not exceed the maximum peak pulsed forward current
- At 10% duty cycle with pulse width of 10ms.

# Characteristic Curves

## Spectral Power Distribution Characteristics

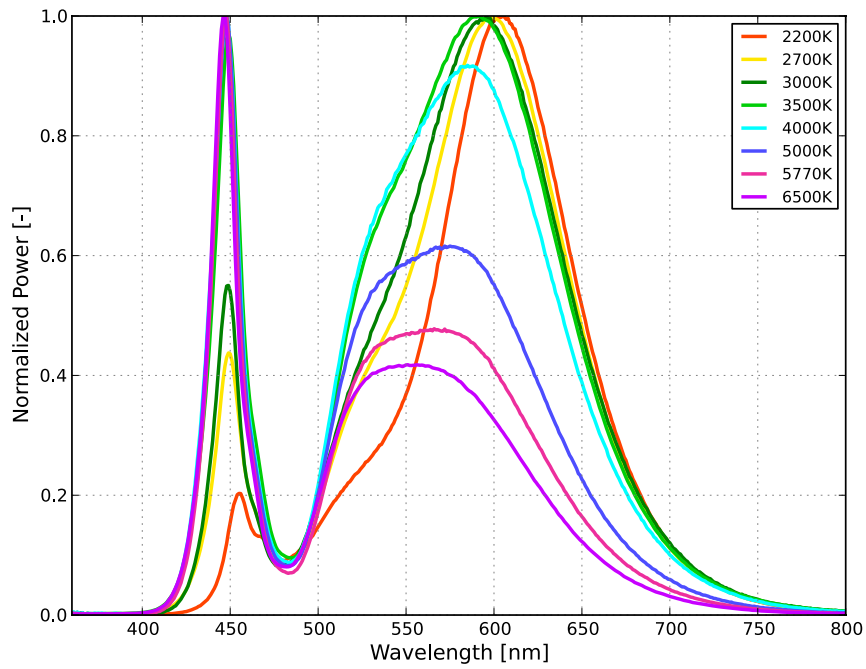


Figure 1a. Typical normalized power vs. wavelength for L150-xx7050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

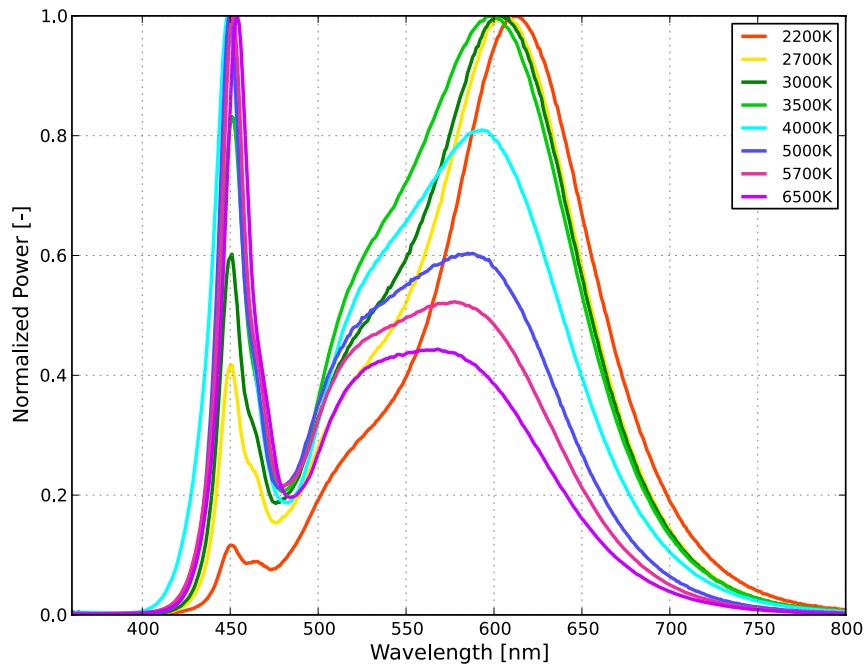


Figure 1b. Typical normalized power vs. wavelength for L150-xx8050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

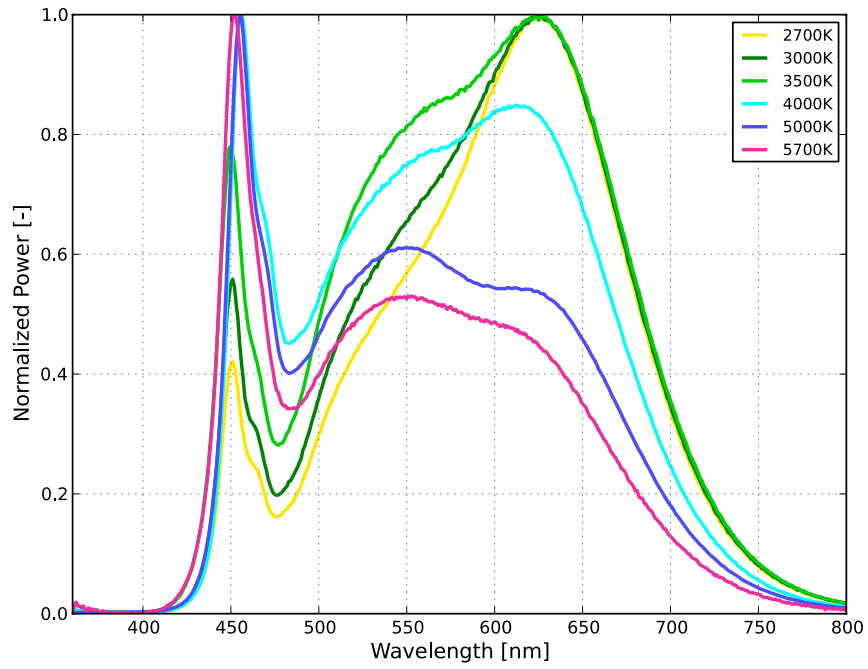


Figure 1c. Typical normalized power vs. wavelength for L150-xx9050xx000x0 at test current,  $T_j=25^\circ\text{C}$ .

## Light Output Characteristics

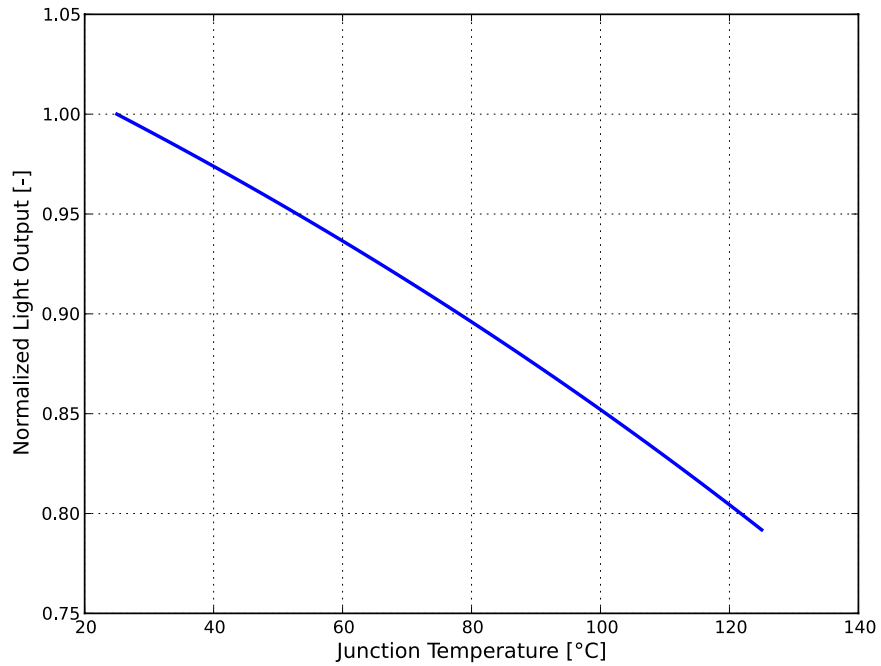


Figure 2. Typical normalized light output vs. junction temperature for L150-xxx50xx000x0 at specified test current.



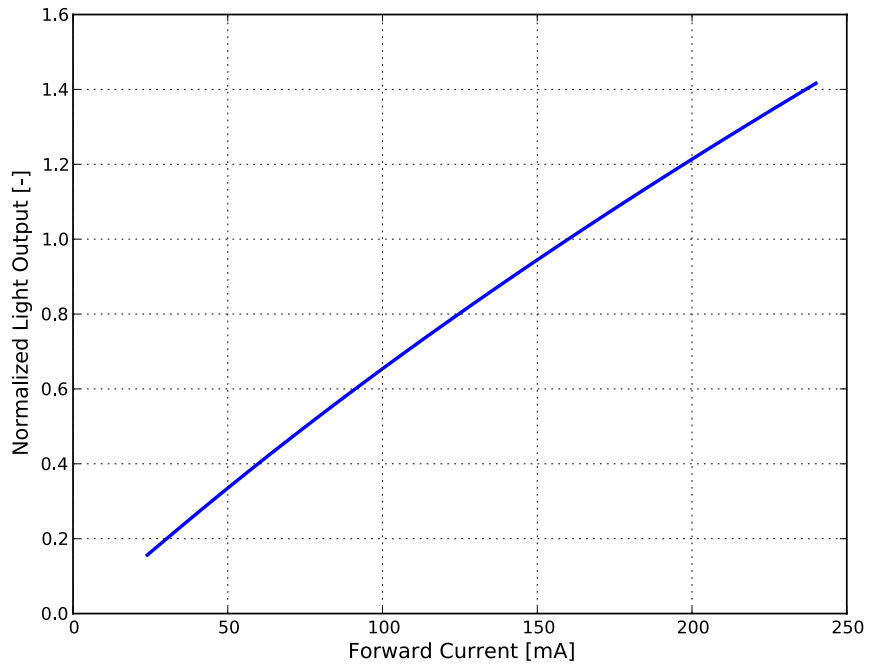


Figure 3a. Typical normalized light output vs. forward current for L150-xxxx50xx000x0,  $T_j=25^\circ\text{C}$ .

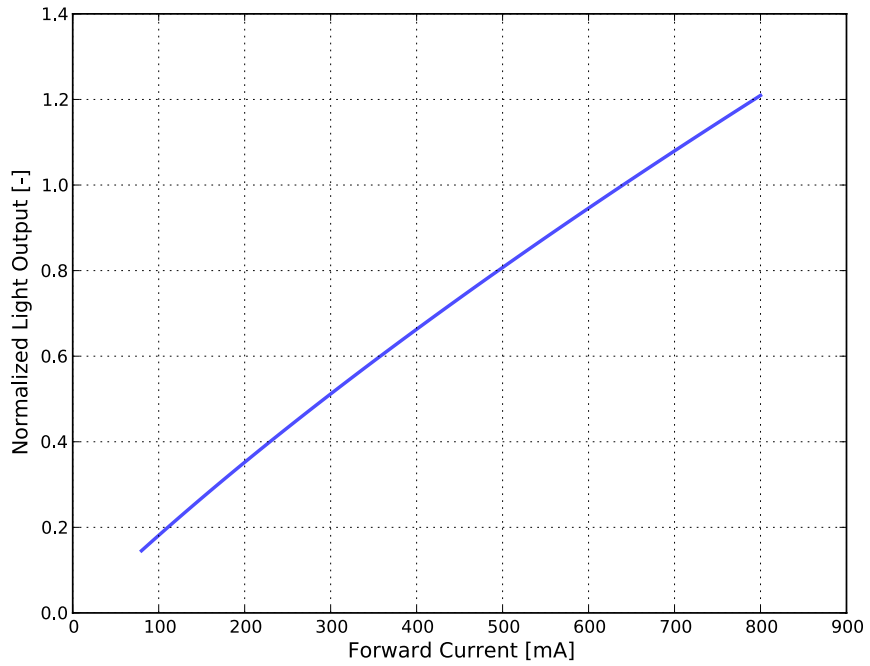


Figure 3b. Typical normalized light output vs. forward current for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

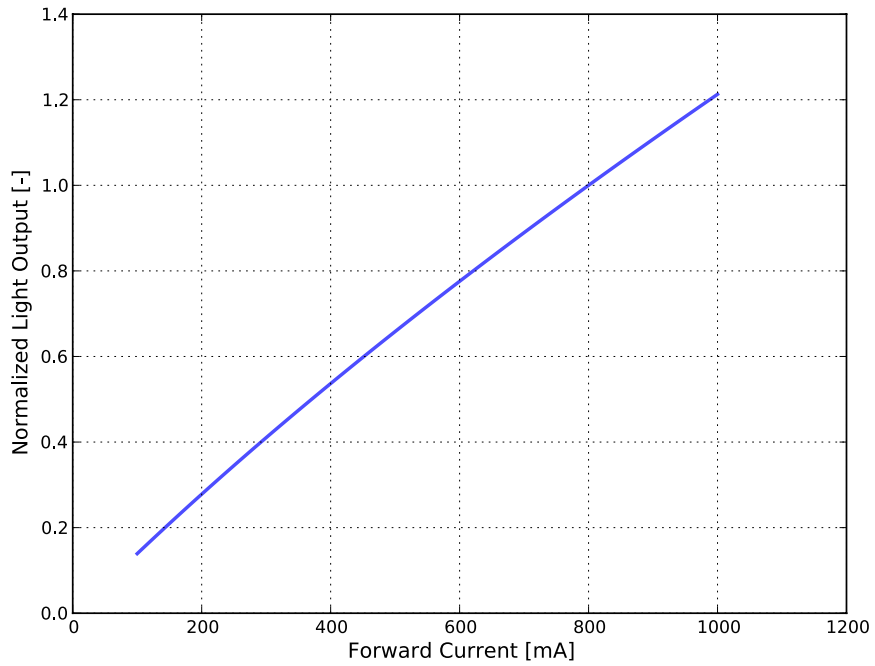


Figure 3c. Typical normalized light output vs. forward current for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Forward Current Characteristics

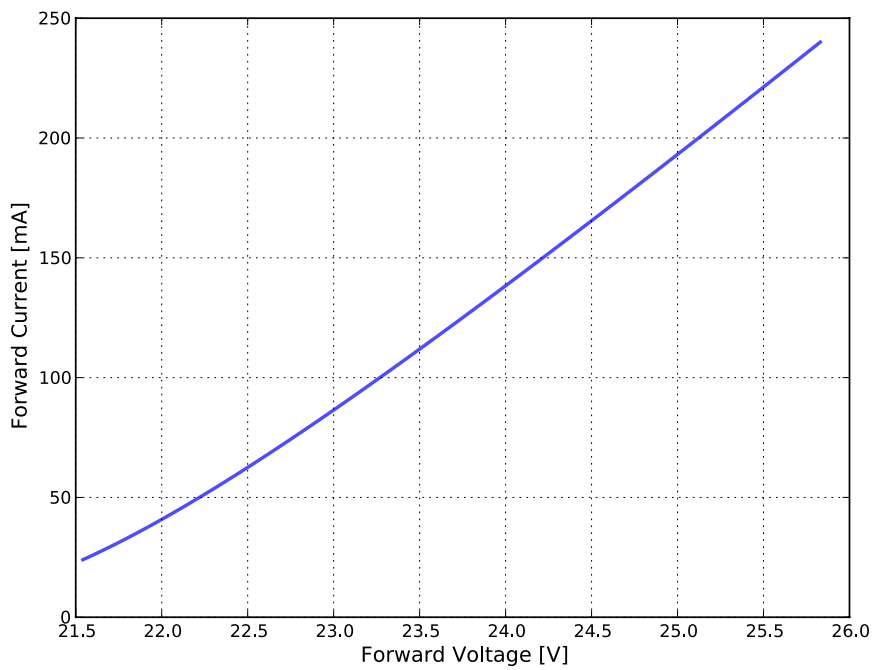


Figure 4a. Typical forward current vs. forward voltage for L150-xxxx502400000,  $T_j=25^\circ\text{C}$ .

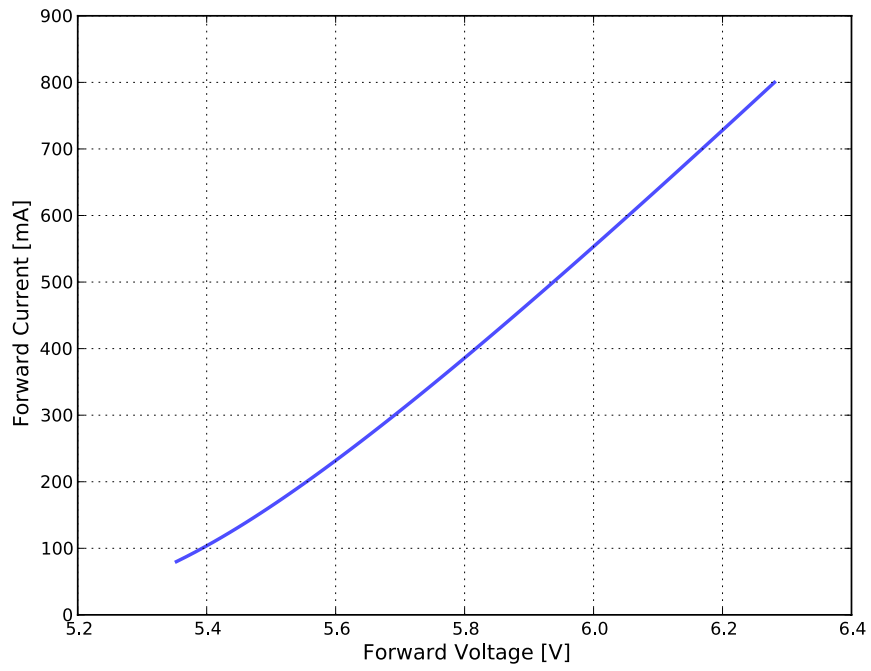


Figure 4b. Typical forward current vs. forward voltage for L150-xxxx500600000,  $T_j=25^\circ\text{C}$ .

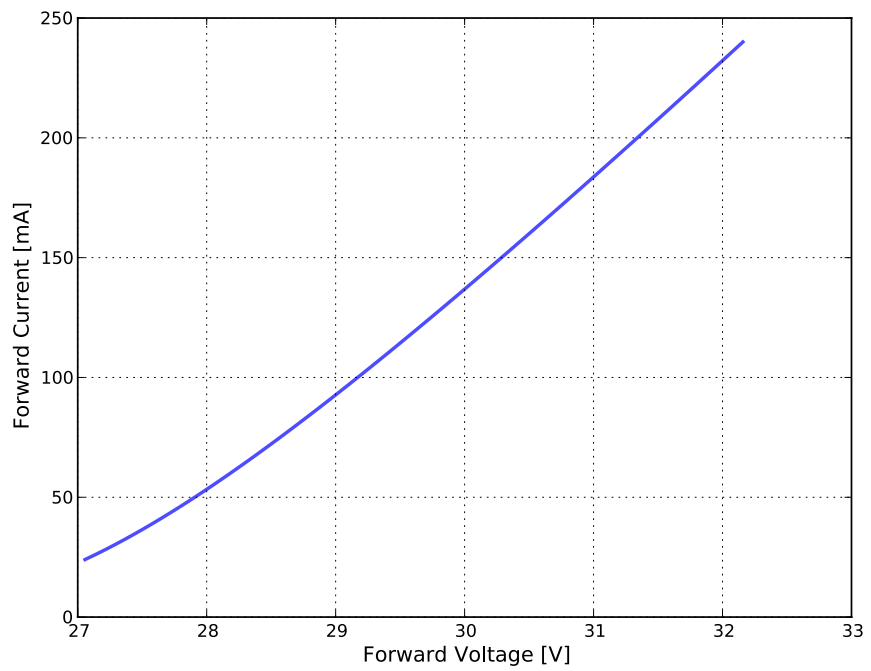


Figure 4c. Typical forward current vs. forward voltage for L150-xxxx503000050,  $T_j=25^\circ\text{C}$ .

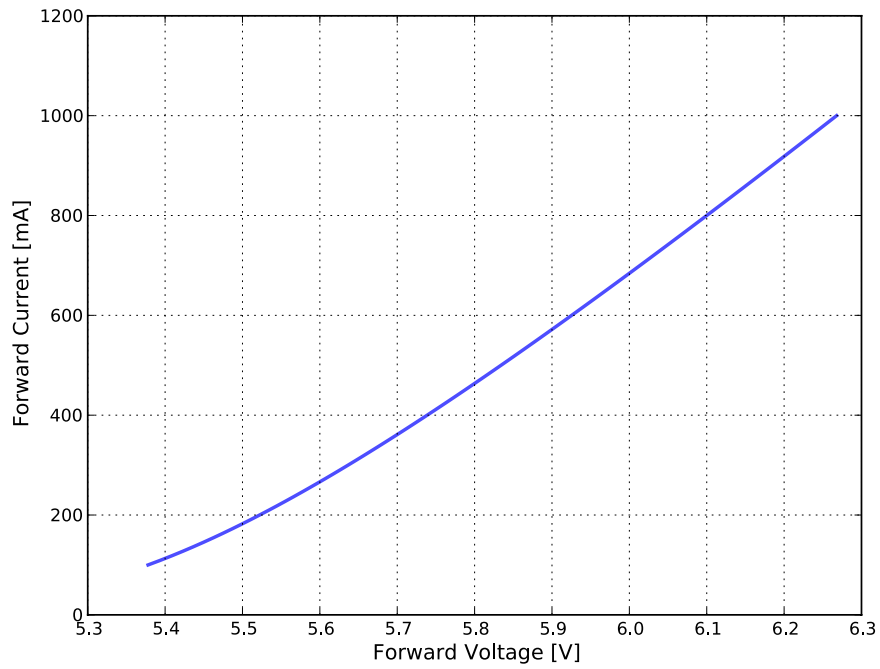


Figure 4d. Typical forward current vs. forward voltage for L150-xxxx5006000S0,  $T_j=25^\circ\text{C}$ .

## Radiation Pattern Characteristics

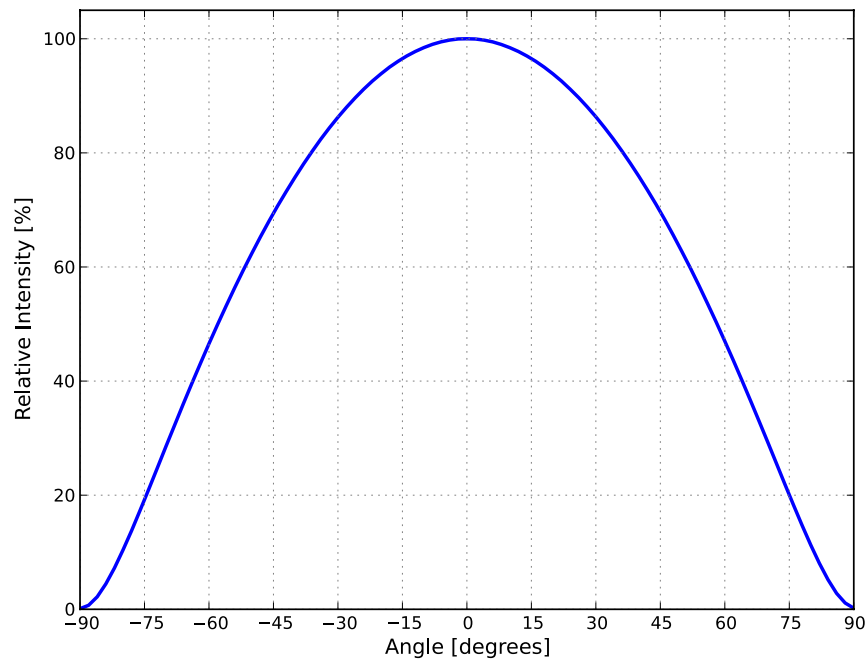


Figure 5. Typical radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

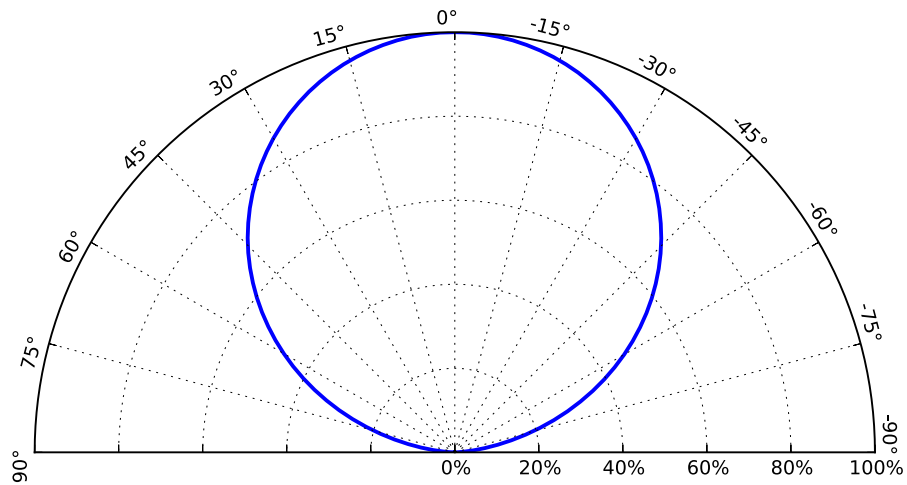


Figure 6. Typical polar radiation pattern for L150-xxxx50xx000x0 at specified test current,  $T_j=25^\circ\text{C}$ .

## Product Bin and Labeling Definitions

### Decoding Product Bin Labeling

In the manufacturing of semiconductor products, there are variations in performance around the average values given in the technical datasheet. For this reason, Lumileds bins LED components for luminous flux or radiometric power, color point, peak or dominant wavelength and forward voltage.

LUXEON 5050 (Round LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B C C**

Where:

- A** - designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B** - designates color bin (example: 3=3 SDCM, 5=5 SDCM parts)
- C C** - designates forward voltage bin (example: A1, A2, B1, B2)

Therefore, a LUXEON 5050 (Round LES) with a lumen range of 600 to 650 lm, color bin of 3 and forward voltage range of 23.5 to 24.2V has the following CAT code:

**L 3 A 1**

LUXEON 5050 (Square LES) LEDs are labeled using a 4-digit alphanumeric CAT code following the format below:

**A B B C**

Where:

- A** – designates luminous flux bin (example: L=600 to 650 lm, M=650 to 700 lm)
- B B** – designates color bin: (example: 83=2700K and 3 SDCM, 35=5000K and 5 SDCM)
- C** – designates forward voltage bin (example: A, B, C, D)

Therefore, a LUXEON 5050 (Square LES) with a lumen range of 600 to 650 lm, color bin of 83 and forward voltage range of 29.0 to 30.0V has the following CAT code:

**L 8 3 A**

## Luminous Flux Bins

Table 5 lists the standard luminous flux bins for LUXEON 5050 LEDs. Although several bins are outlined, product availability in a particular bin varies by production run and by product performance. Not all bins are available in all CCTs.

**Table 5. Luminous flux bin definitions for LUXEON 5050, T<sub>j</sub>=25°C.**

BIN	LUMINOUS FLUX <sup>(1)</sup> (lm)	
	MINIMUM	MAXIMUM
G	400	450
H	450	500
J	500	550
K	550	600
L	600	650
M	650	700
N	700	750
P	750	800
Q	800	850
R	850	900
S	900	950
T	950	1000

**Notes for Table 5:**

1. Lumileds maintains a tolerance of ±7% on luminous flux measurements.

## Color Bin Definitions

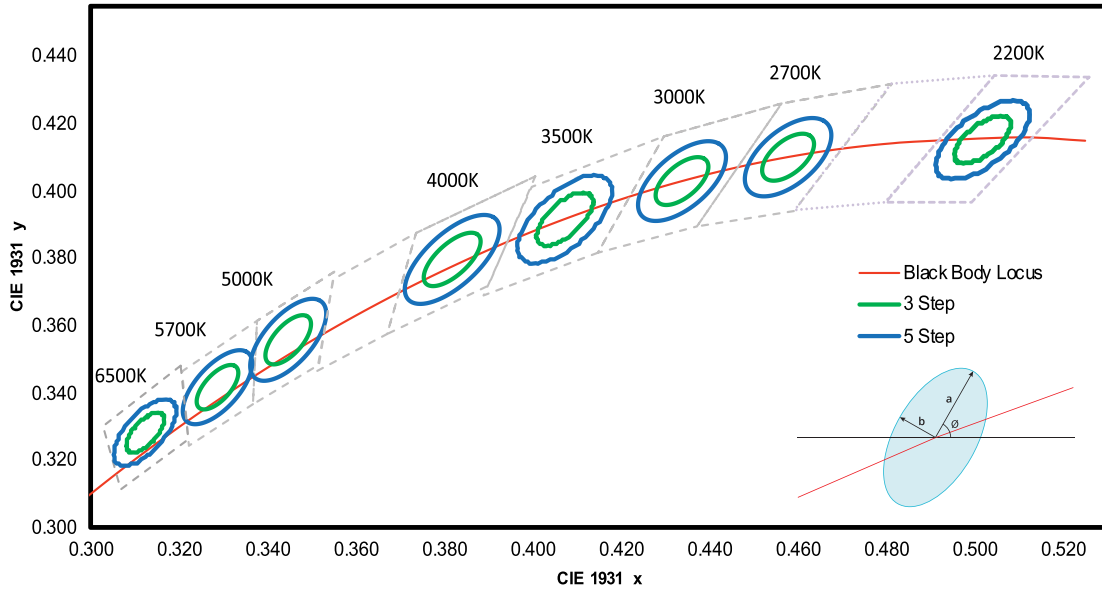


Figure 7. 3- and 5-step MacAdam ellipse illustration for hot-color targeting expected at 85°C.

Table 6. 3- and 5-step MacAdam ellipse color bin definitions for LUXEON 5050 at test current, hot-color targeted at  $T_j=85^\circ\text{C}$ .

NOMINAL CCT	COLOR SPACE	CENTER POINT <sup>(1)</sup> (cx, cy)	MAJOR AXIS, a	MINOR AXIS, b	ELLIPSE ROTATION ANGLE, $\theta$	LUXEON 5050 (ROUND LES) COLOR BIN CODE	LUXEON 5050 (SQUARE LES) COLOR BIN CODE
2200K	Single 3-step MacAdam ellipse	(0.5018, 0.4153)	0.00863	0.00398	49.27°	3	A3
2700K	Single 3-step MacAdam ellipse	(0.4578, 0.4101)	0.00810	0.00420	53.70°	3	83
3000K	Single 3-step MacAdam ellipse	(0.4338, 0.4030)	0.00834	0.00408	53.22°	3	73
3500K	Single 3-step MacAdam ellipse	(0.4073, 0.3917)	0.00927	0.00414	54.00°	3	63
4000K	Single 3-step MacAdam ellipse	(0.3818, 0.3797)	0.00939	0.00402	53.72°	3	53
5000K	Single 3-step MacAdam ellipse	(0.3447, 0.3553)	0.00822	0.00354	59.62°	3	33
5700K	Single 3-step MacAdam ellipse	(0.3287, 0.3417)	0.00745	0.00320	59.09°	3	23
6500K	Single 3-step MacAdam ellipse	(0.3123, 0.3282)	0.00669	0.00285	58.57°	3	13
2200K	Single 5-step MacAdam ellipse	(0.5018, 0.4153)	0.01438	0.00663	49.27°	5	A5
2700K	Single 5-step MacAdam ellipse	(0.4578, 0.4101)	0.01350	0.00700	53.70°	5	85
3000K	Single 5-step MacAdam ellipse	(0.4338, 0.4030)	0.01390	0.00680	53.22°	5	75
3500K	Single 5-step MacAdam ellipse	(0.4073, 0.3917)	0.01545	0.00690	54.00°	5	65
4000K	Single 5-step MacAdam ellipse	(0.3818, 0.3797)	0.01565	0.00670	53.72°	5	55
5000K	Single 5-step MacAdam ellipse	(0.3447, 0.3553)	0.01370	0.00590	59.62°	5	35
5700K	Single 5-step MacAdam ellipse	(0.3287, 0.3417)	0.01243	0.00533	59.09°	5	25
6500K	Single 5-step MacAdam ellipse	(0.3123, 0.3282)	0.01115	0.00475	58.57°	5	15

**Notes for Table 6:**

1. Lumileds maintains a tolerance of  $\pm 0.005$  on x and y coordinates in the CIE 1931 color space.

## Forward Voltage Bins

Table 7. Forward voltage bin definitions for LUXEON 5050,  $T_j=25^\circ\text{C}$ .

PART NUMBER	BIN	FORWARD VOLTAGE <sup>[1]</sup> (V <sub>f</sub> )	
		MINIMUM	MAXIMUM
L150-xxxx502400000	A1	23.5	24.2
	A2	24.2	25.0
	B1	25.0	25.8
	B2	25.8	26.5
L150-xxxx500600000	A1	5.8	6.0
	A2	6.0	6.2
	B1	6.2	6.4
	B2	6.4	6.6
L150-xxxx5030000S0	A	29.0	30.0
	B	30.0	31.0
	C	31.0	32.0
L150-xxxx5006000S0	A	5.8	6.0
	B	6.0	6.2
	C	6.2	6.4
	D	6.4	6.6

**Notes for Table 7:**

1. Lumileds maintains a tolerance of  $\pm 0.1\text{V}$  on forward voltage measurements.



# Mechanical Dimensions

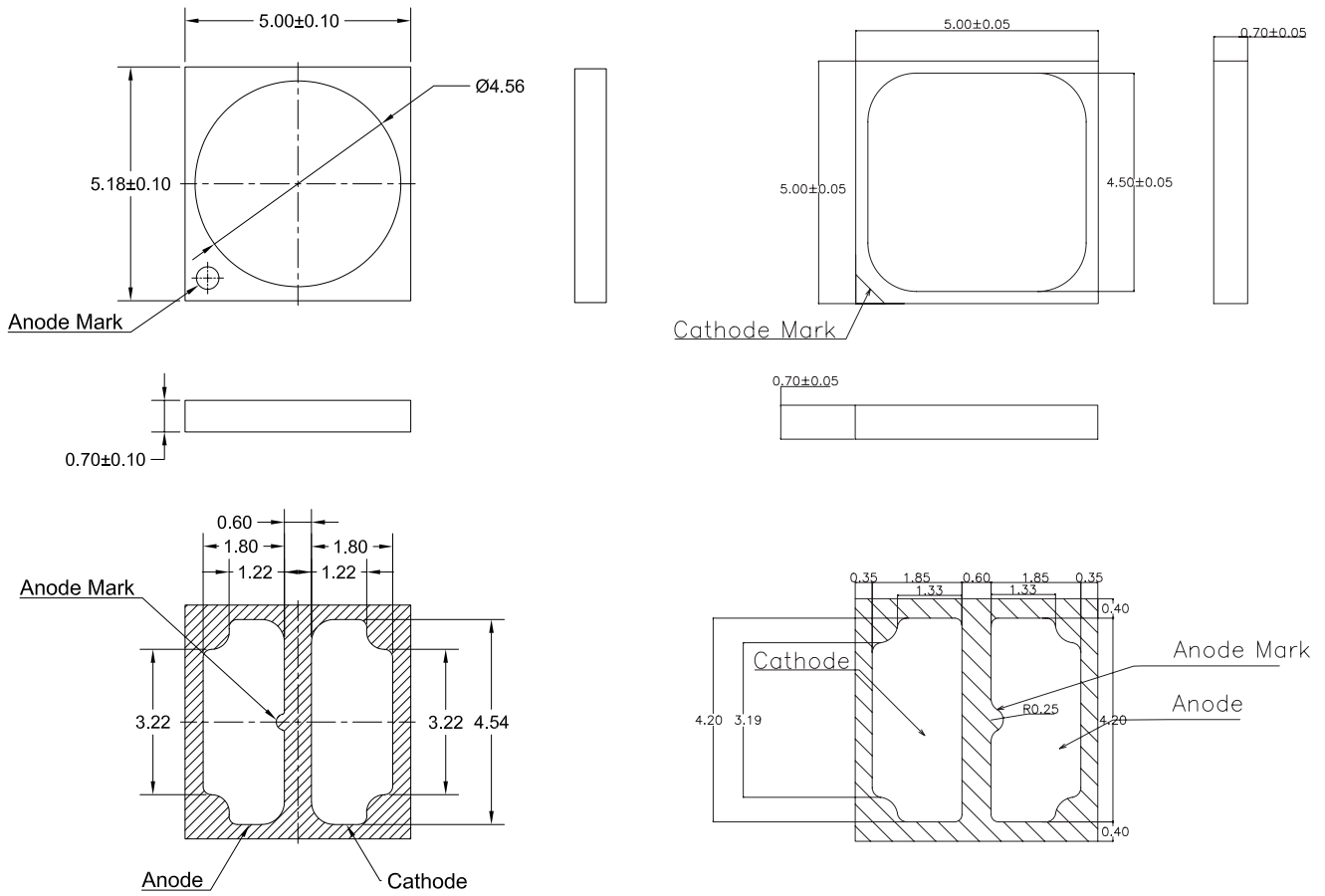


Figure 8. Mechanical dimensions for LUXEON 5050 (Round LES), left, and LUXEON 5050 (Square LES), right.

**Notes for Figure 8:**

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Reflow Soldering Guidelines

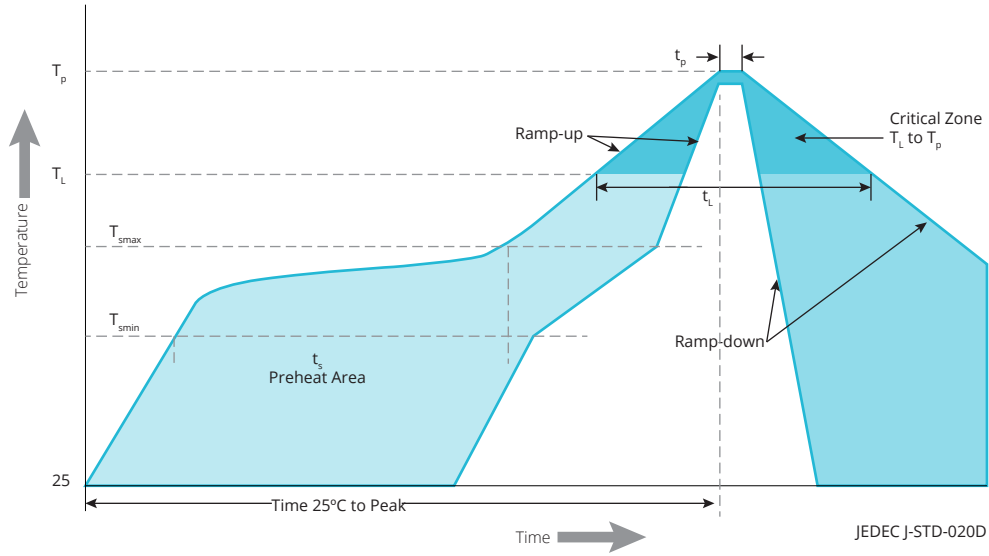


Figure 9. Visualization of the acceptable reflow temperature profile as specified in Table 8.

Table 8. Reflow profile characteristics for LUXEON 5050.

PROFILE FEATURE	LEAD-FREE ASSEMBLY
Preheat Minimum Temperature ( $T_{smin}$ )	150°C
Preheat Maximum Temperature ( $T_{smax}$ )	200°C
Preheat Time ( $t_{smin}$ to $t_{smax}$ )	60 to 180 seconds
Ramp-Up Rate ( $T_L$ to $T_p$ )	3°C / second maximum
Liquidous Temperature ( $T_L$ )	217°C
Time Maintained Above Temperature $T_L$ ( $t_t$ )	60 to 150 seconds
Peak / Classification Temperature ( $T_p$ )	260°C
Time Within 5°C of Actual Peak Temperature ( $t_p$ )	20 to 40 seconds
Ramp-Down Rate ( $T_p$ to $T_L$ )	6°C / second maximum
Time 25°C to Peak Temperature	8 minutes maximum

## JEDEC Moisture Sensitivity

Table 9. Moisture sensitivity levels for LUXEON 5050.

LEVEL	FLOOR LIFE		SOAK REQUIREMENTS STANDARD	
	TIME	CONDITIONS	TIME	CONDITIONS
3	168 Hours	≤30°C / 60% RH	192 Hours +5 / -0	30°C / 60% RH

# Solder Pad Design

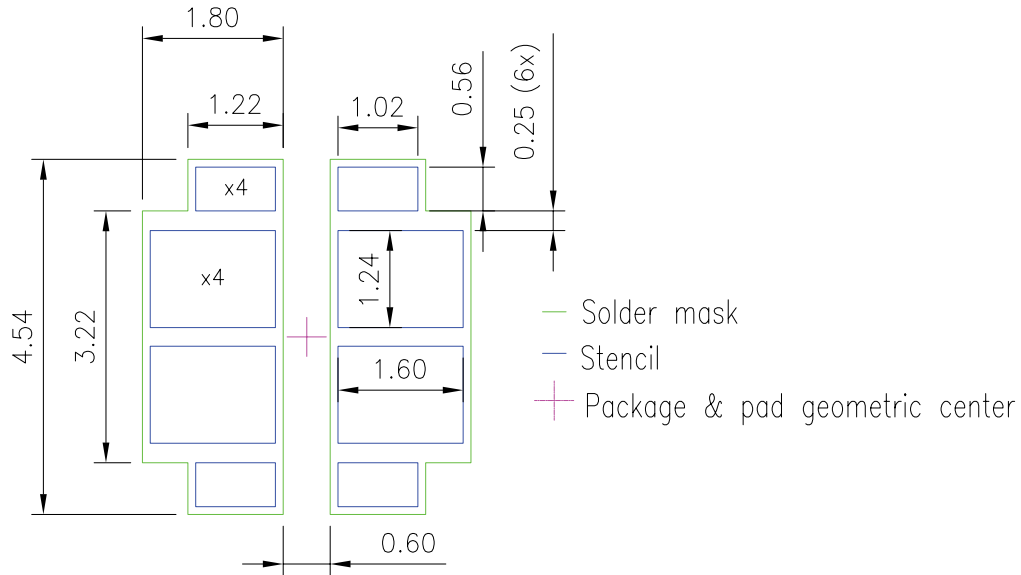


Figure 10. Recommended PCB solder pad layout for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

## Notes for Figure 10:

1. Drawings are not to scale.
2. All dimensions are in millimeters.
3. Refer to application brief [AB174](#) for additional details regarding recommended PCB layout design.

# Packaging Information

## Pocket Tape Dimensions

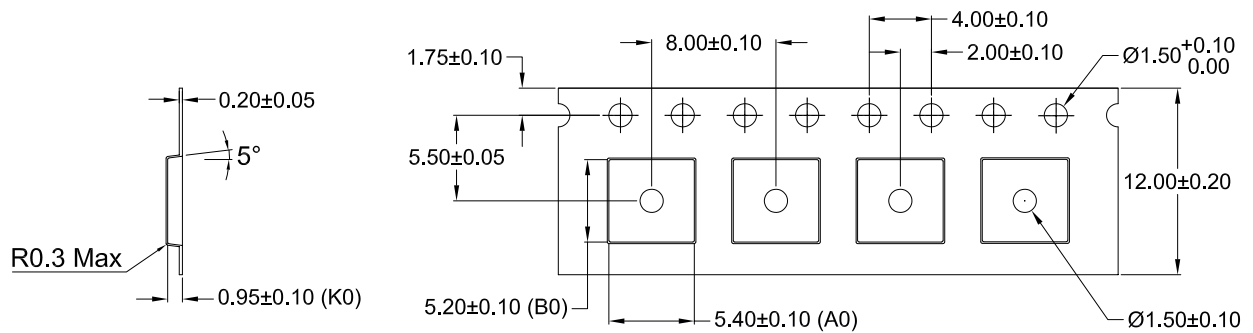
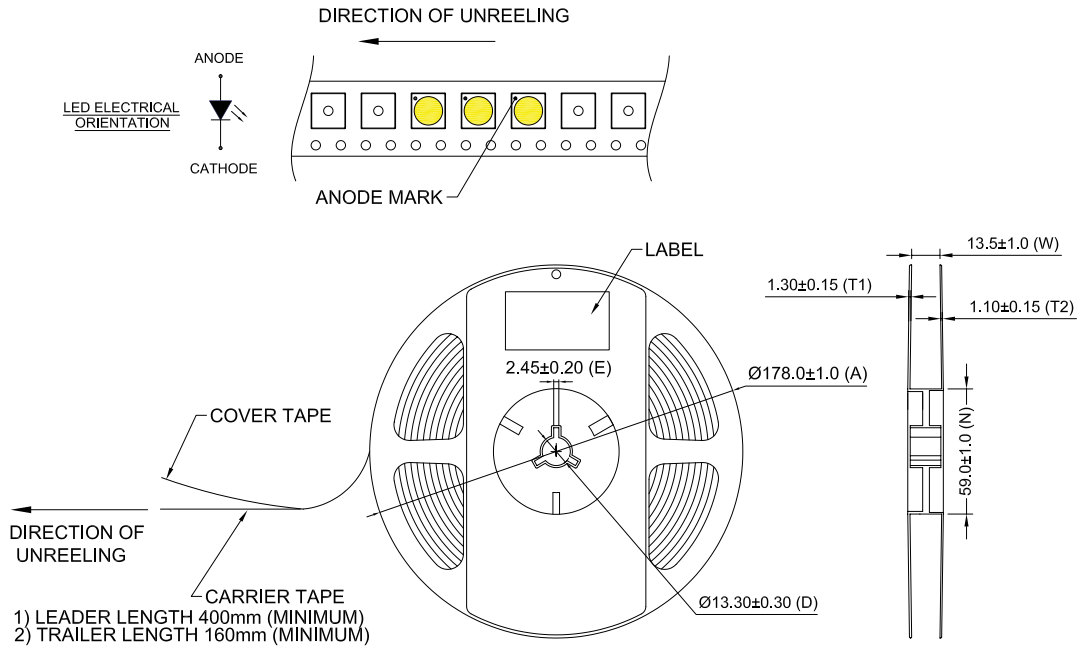


Figure 11. Pocket tape dimensions for LUXEON 5050 (Round LES) and LUXEON 5050 (Square LES).

## Notes for Figure 11:

1. Drawings are not to scale.
2. All dimensions are in millimeters.

# Reel Dimensions



12a. Reel dimensions for LUXEON 5050 (Round LES).

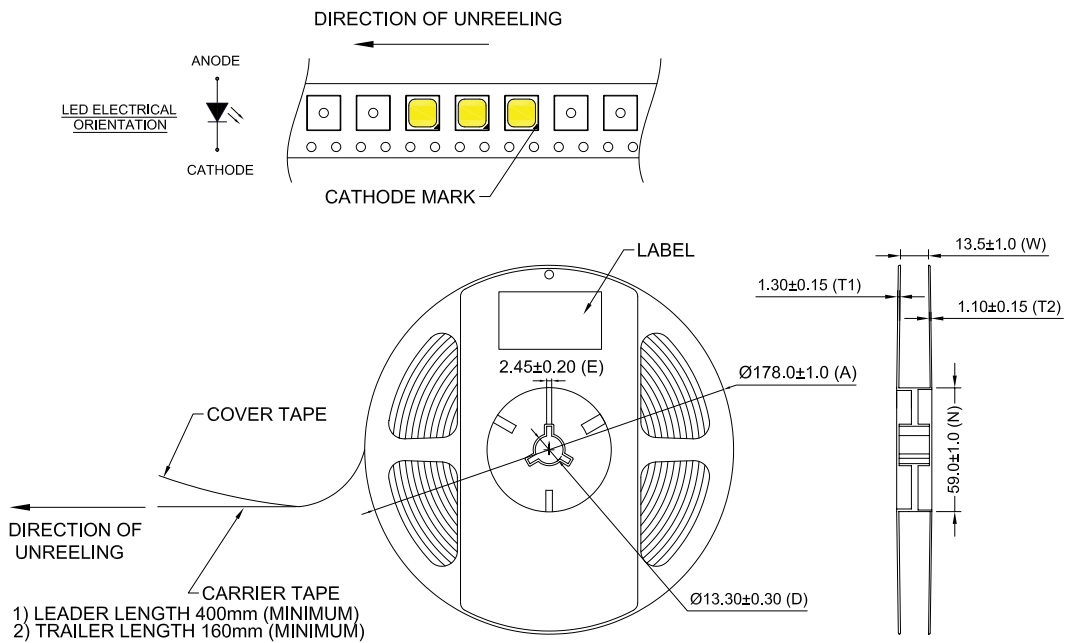


Figure 12b. Reel dimensions for LUXEON 5050 (Square LES).

Notes for Figures 12a and 12b:  
 1. Drawings are not to scale.  
 2. All dimensions are in millimeters.

## About Lumileds

Companies developing automotive, mobile, IoT and illumination lighting applications need a partner who can collaborate with them to push the boundaries of light. With over 100 years of inventions and industry firsts, Lumileds is a global lighting solutions company that helps customers around the world deliver differentiated solutions to gain and maintain a competitive edge. As the inventor of Xenon technology, a pioneer in halogen lighting and the leader in high performance LEDs, Lumileds builds innovation, quality and reliability into its technology, products and every customer engagement. Together with its customers, Lumileds is making the world better, safer, more beautiful—with light.

To learn more about our lighting solutions, visit [lumileds.com](http://lumileds.com).



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# CERTIFICATE

Issued to:  
Applicant:  
**Philips Lighting B.V.**  
**High Tech Campus 45**  
**5656 AE Eindhoven, The Netherlands**

Manufacturer/Licensee:  
**Philips Lighting B.V.**  
**High Tech Campus 45**  
**5656 AE Eindhoven, The Netherlands**

Product : LED driver  
Trade name(s) : PHILIPS  
Type(s)/model(s) : Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt,  
Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt and  
Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt

The product and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

DEKRA hereby declares that the above-mentioned product has been certified on the basis of:

- a type test according to the standard EN 61347-2-13:2014, EN 61347-1:2015, EN 62384:2006 and EN 62384:2006/A1:2009
- an inspection of the production location according to CENELEC Operational Document CIG 021
- a certification agreement with the number 947556

DEKRA hereby grants the right to use the ENEC certification mark.

The ENEC certification mark may be applied to the product as specified in this certificate for the duration of the ENEC certification agreement and under the conditions of the ENEC certification agreement.

This certificate is issued on 5 September 2017 and expires upon withdrawal of one of the above mentioned standards.

Certificate number: 31-101322

DEKRA Certification B.V.



drs. G.J. Zoetbrood  
Managing Director



Kreny Lin  
Certification Manager

© Integral publication of this certificate is allowed

ACCREDITED BY THE  
DUTCH ACCREDITATION  
COUNCIL



**SPECIFICATION OF THE CERTIFIED PRODUCT****Product data**

Product	: LED driver
Trade name(s)	: PHILIPS
Type(s)/model(s)	: Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt, Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt and Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt
Rated voltage	: 220-240 Vac or 186-250 Vdc
Nature of supply	: AC or DC
Rated frequency	: 50/60 Hz at AC
Power factor	: 0,95
Rated input current	: 0,4-0,34 Aac or 0,48 Adc
Rated input power	: 84W
Output power	: 75 W
Max. case temperature (tc)	: 80 °C
Ambient temperature (ta)	: -40 °C...+55 °C
Temperature declared thermally protection	: 130 °C
Description	: Built-in with double/reinforced insulation

**Product data – type Xi FP 75W 0.2-0.7A SNLDAE 230V C133 sXt**

Output current	: 200-700 mA
Output voltage	: 50-150 Vdc; 220 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt**

Output current	: 300-1050 mA
Output voltage	: 35-108 Vdc; 150 Vdc MAX (open-circuit)

**Product data – type Xi FP 75W 0.5-1.5A SNLDAE 230V C133 sXt**

Output current	: 500-1500 mA
Output voltage	: 25-71 Vdc; 120 Vdc MAX (open-circuit); SELV

**TESTS****Test requirements**

EN 61347-2-13:2014  
EN 61347-1:2015  
EN 62384:2006  
EN 62384:2006/A1:2009

**Test result**

The test results are laid down in DEKRA test file 601602100.

**Additional Information**

constant current type with screwless terminal block  
LED driver is completely potted with asphalt

**Remarks**

For component list refers to annex 1 of test reports 6016021.50.

The tests were performed by the manufacturer under the conditions of the agreement concerning the manufacturer's right to conduct type tests for the KEMA-KEUR / ENEC certification system under supervision of DEKRA (CTF Stage 3).

**Conclusion**

The examination proved that all requirements were met.

**Factory location**

Philips Lighting Electronics Poland  
ul Przemysłowa 29  
64-920 Pila, Poland





## EU Declaration of Conformity

### We, Philips Lighting

I.B.R.S./C.C.R.I. /Numéro 10461  
5600 VB Eindhoven, The Netherlands

Internal Ref. Nr.: 2017A0064

Year in which CE Mark was first affixed: 2017

### Declare under our responsibility for the products:

Product Range:	NAME:	#1	Xi FP 75W 0.2-0.7A SNLDAE	#2	Xi FP 75W 0.3-1.0A SNLDAE	#3	Xi FP 75W 0.5-1.5A SNLDAE
	DESCRIPTION:		230V C133 sXt LED Electronic Driver		230V C133 sXt LED Electronic Driver		230V C133 sXt LED Electronic Driver
Product Code:	12NC:		9290 014 08406		9290 014 08506		9290 014 08606

### The designated products are in conformity with the essential requirements of the following European Directives and harmonized standards:

#### Low Voltage Directive (LVD), 2014/35/EU

- EN 61347-2-13:2014

#### Electromagnetic compatibility Directive (EMC), 2014/30/EU

- EN 55015:2013+A1:2015
- EN 61000-3-2:2014
- EN 61000-3-3:2013
- EN 61547:2009

#### EcoDesign requirements for energy-related products Directive (ErP), 2009/125/EC and applicable Implementing Measures

- Implementing Measure EC/1194/2012

#### Restriction of the use of certain Hazardous Substances in electrical and electronic equipment Directive (RoHS), 2011/65/EU

- EN 50581:2012

and are produced under a quality scheme at least in conformity with ISO 9001 or CENELEC permanent documents.

2017-08-31, Eindhoven

Ms. C. Sweegers  
Regulatory Affairs Manager LED Electronics  
High Tech Campus 45  
5656 AE Eindhoven, The Netherlands



# PHILIPS

## Xitanium

### LED driver



## Datasheet

# Xitanium FULL Prog LED Xtreme drivers

Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt

### Xitanium FULL Prog LED Xtreme drivers

Philips Xitanium Full Programmable LED drivers are specifically designed to deliver the highest performance, protection and configurability. The portfolio offers both central and standalone dimming protocols further increasing the energy savings and CO<sub>2</sub> reductions achieved with LED lighting. The Xtreme technology ensures maximum robustness and protection combined with a very long lifetime.

In this product family Philips introduces new drivers in a compact form factor with state-of-the-art features, which offer high value for both OEM customers and end-users. The products can replace the existing programmable outdoor LED drivers and will bring significant improvement in programming, assembly into a luminaire and electrical performance.

#### Benefits

- Ultimate robustness, offering peace of mind and lower maintenance costs
- Fully programmable LED-drivers designed for the new digital and connected lighting world
- Extended diagnostics via MultiOne
- Easy to design-in, configure and install for insulation Class I and Class II applications
- Energy savings through high efficiency and via multiple dimming options

#### Features

- High surge immunity (CM/DM)
- Long lifetime and robust protection against moisture, vibration and temperature
- Configurable operating windows (AOC)
- Multiple control interfaces: DALI, AmpDim, 1-step and 3-step LineSwitch
- Autonomous dimming via integrated DynaDimmer
- Adjustable thermal protection for driver (DTL, on select models) and LED module (MTP)
- Constant Light Output (CLO)
- Adjustable Start-up Time (AST)
- Adjustable Light Output (ALO)
- End-Of-Life indicator (EOL)

#### Application

- Road and street lighting
- Area lighting
- Tunnel lighting
- Industrial lighting

## Electrical input data

Specification item	Value	Unit	Condition
Rated input voltage range	202...254	V <sub>ac</sub>	Performance range
Rated input voltage	230	V <sub>ac</sub>	
Rated input frequency range	47...63	Hz	Performance range
Rated input current	0.34	A	@ rated output power @ rated input voltage
Max. input current	0.4	A	@ rated output power @ minimum performance input voltage
Rated input power	84	W	@ rated output power @ rated input voltage
Power factor	0.99		@ rated output power @ rated input voltage
Total harmonic distortion	8	%	@ rated output power @ rated input voltage
Efficiency	92.5	%	@ rated output power @ rated input voltage
Rated input voltage DC range	186...250	V <sub>dc</sub>	Performance range
Rated input current DC range	≤ 0.48	A <sub>dc</sub>	Performance range
Input voltage AC range	80...264	V <sub>ac</sub>	Safety operational range
Input frequency AC range	45...66	Hz	Safety operational range
Input voltage DC range	168...275	V <sub>dc</sub>	Safety operational range
Standby Power	0.45	W	
Isolation input to output	Double		

## Electrical output data

Specification item	Value	Unit	Condition
Regulation method	Constant Current		
Output voltage	35...108	V <sub>dc</sub>	
Output voltage max.	150	V	Maximum voltage at open load
Output current	0.07...1.05	A	
Output current min programmable	300	mA	
Output current min dimming	70	mA	
Output current tolerance	± 3	%	
Output current ripple LF	≤ 4	%	Ripple = peak / average @ < 1kHz
Output current ripple HF	≤ 4	%	
Output power	2.5...75	W	

## Electrical data controls input

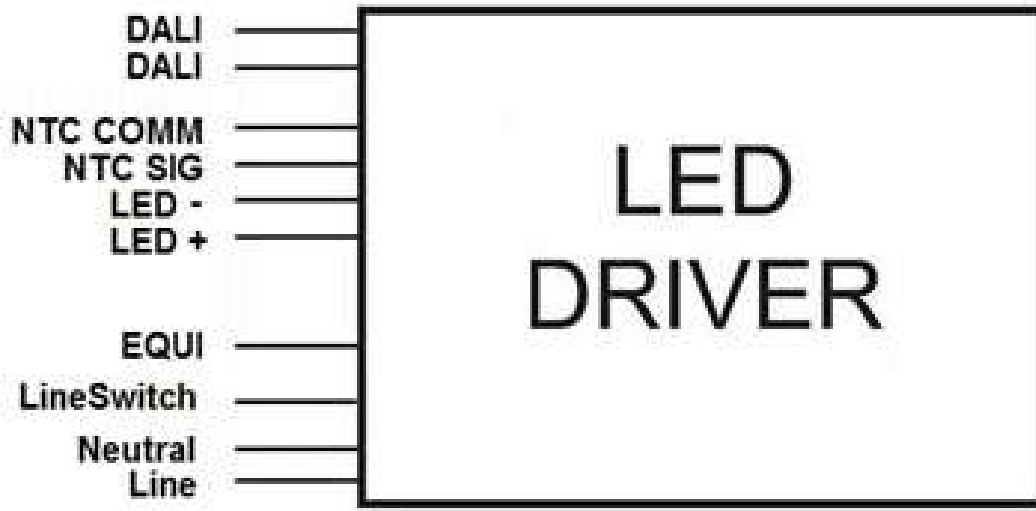
Specification item	Value	Unit	Condition
Control method	AmpDim, DALI, Dynadimmer, LineSwitch 3-step, LineSwitch single-step		Output current amplitude dimming
Dimming range	10...100	%	DALI acc. IEC62386-101, -102 Ed. 2.0; LineSwitch: Vlow: < 160Vac Vhigh: 170 ... 264Vac
Galvanic Isolation	Double		

## Logistical data

Specification item	Value
Product name	Xi FP 75W 0.3-1.0A SNLDAE 230V C133 sXt
Order code	871869675569300
Logistic code 12NC	9290 014 08506
Pieces per box	12

## Wiring & Connections

Specification item	Value	Unit	Condition
Input wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Input wire strip length	8.5...9.5	mm	
Output wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Output wire strip length	8.5...9.5	mm	
Dimming wire cross-section	0.2...1.5	mm <sup>2</sup>	WAGO250 (3.5 mm), solid / stranded wire
	16...24	AWG	WAGO250 (3.5 mm), solid / stranded wire
Dimming wire strip length	8.5...9.5	mm	
Maximum cable length	600	mm	Total length of wiring including LED module, one way
Maximum NTC output cable length	0.6	m	

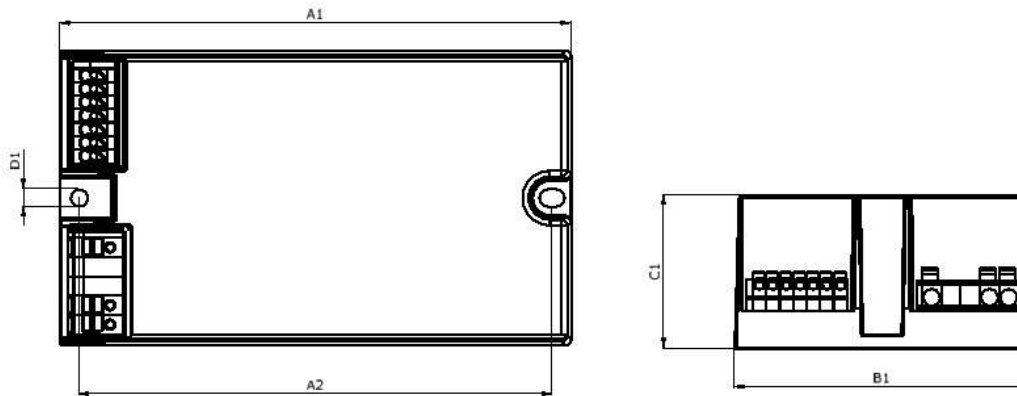


## Insulation

Insulation	Mains	EQUI	LED + NTC	LineSwitch	DALI
Mains		Double	Double	NA	Basic
EQUI	Double		Basic	Double	Double
LED + NTC	Double	Basic		Double	Double
LineSwitch	NA	Double	Double		Basic
DALI	Basic	Double	Double	Basic	

## Dimensions and weight

Specification item	Value	Unit	Condition
Length (A1)	133	mm	
Width (B1)	77	mm	
Height (C1)	40	mm	
Fixing hole diameter (D1)	4.2	mm	
Fixing hole distance (A2)	122	mm	
Weight	550	gram	



## Operational temperatures and humidity

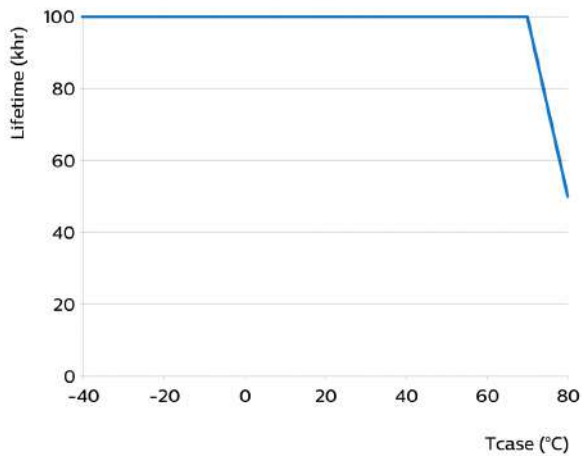
Specification item	Value	Unit	Condition
Ambient temperature	-40...+55	°C	Higher ambient temperature allowed as long as T <sub>case-max</sub> is not exceeded.
T <sub>case-max</sub>	80	°C	Maximum temperature measured at T <sub>case-point</sub>
T <sub>case-life</sub>	70	°C	Measured at T <sub>case-point</sub>
Maximum housing temperature	130	°C	In case of a failure
Relative humidity	10...90	%	Non-condensing

## Storage temperature and humidity

Specification item	Value	Unit	Condition
Ambient temperature	-40...+80	°C	
Relative humidity	5...95	%	Non-condensing

## Lifetime

Specification item	Value	Unit	Condition
Driver lifetime	100,000	hours	Measured temperature at $T_{case}$ -point is $T_{case}$ -life. Maximum failures = 10%



## Programmable features

Specification item	Value	Remark	Condition
Set output current (AOC)	Programmable, SimpleSet	See Design-in guide.	Default output current: = 700 mA
LED module temperature derating (MTP)	Yes		
Driver Temperature Limit (DTL)	Yes		
Constant Lumen Over Lifetime (CLO)	Yes		
DC emergency dimming (DCemDIM)	Yes		Default: AOC = 15%. EOFx = 10 ... 60%. No external DC rated fuse required
Diagnostics	Yes		
Adjustable Light Output (ALO)	Yes		
Ampdim	Yes		
LineSwitch single-step	Yes		
LineSwitch 3-step	Yes		
Adjustable Start-up Time (AST)	Yes		
Integrated Dynadimmer	Yes		5-step, light turn-off possible
End Of Life indicator	Yes		

## Features

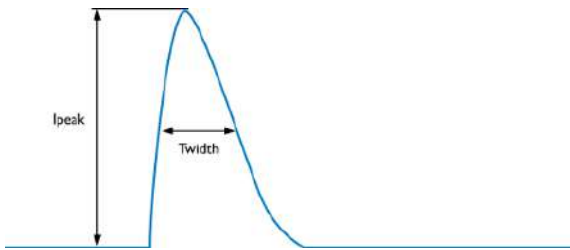
Specification item	Value	Remark	Condition
Open load protection	Yes		Automatic recovering
Short circuit protection	Yes		Automatic recovering
Over power protection	Yes		Automatic recovering
Hot wiring	No		
Suitable for fixtures with protection class	I and II		per IEC60598
Over temperature protection driver	Yes		Automatic recovering
Overheating protection	Yes		Automatic recovering

## Certificates and standards

Specification item	Value
Approval marks	CB / CCC / CE / EL / ENEC
Ingress Protection classification (IP)	20

## Inrush current

Specification item	Value	Unit	Condition
Inrush current $I_{peak}$	43	A	Input voltage 230V
Inrush current $T_{width}$	260	$\mu$ s	Input voltage 230V, measured at 50% $I_{peak}$
Drivers / MCB 16A type B	$\leq 10$	pcs	Indicative value



MCB	Rating	Relative number of LED drivers
B	4A	25%
B	6A	40%
B	10A	63%
B	13A	81%
B	16A	100% (stated in datasheet)
B	20A	125%
B	25A	156%
B	32A	200%
B	40A	250%
C	4A	42%
C	6A	63%
C	10A	104%
C	13A	135%
C	16A	170%
C	20A	208%
C	25A	260%
C	32A	340%
C	40A	415%

## Driver touch current / protective conductor current

Specification item	Value	Unit	Condition
Typical touch current (ins. Class II)	0.28	mA peak	Acc. IEC61347-1. LED module contribution not included
Typical protective conductor current (ins. Class I)	0.2	mA rms	Acc. IEC61347-1. LED module contribution not included

## Surge immunity

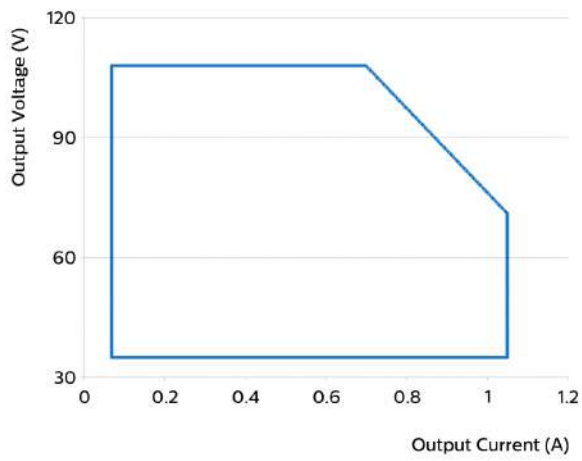
Specification item	Value	Unit	Condition
Mains surge immunity (diff. mode)	6	kV	L-N, Ls-L, Ls-N, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Mains surge immunity (comm. mode)	10	kV	L/N/Ls - EQUI 10kV acc. EN61547; 8kV acc. IEC61000-4-5, 12 Ohm 1.2/50us,8/20us
Control surge immunity (diff. mode)	0.9	kV	DALI, acc. IEC61000-4-5. 2 Ohm, 1.2/50us, 8/20us
Control surge immunity (comm. mode)	6	kV	DALI - EQUI acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us
DALI surge immunity (comm. mode)	6	kV	DALI - L/N/Ls acc. IEC61000-4-5. 12 Ohm, 1.2/50us, 8/20us

## Additional information

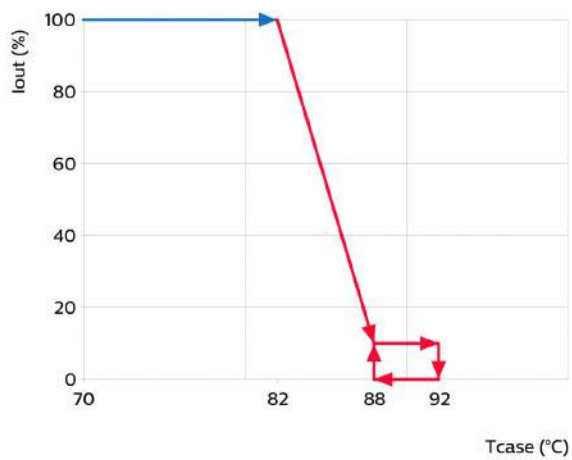
Specification item	Default setting	Remark	Condition
AOC	700	mA	
LineSwitch	ON		
CLO	OFF		
MTP	OFF		
Dynadimmer	OFF		
EOL	OFF		

## Graphs

### Operating window



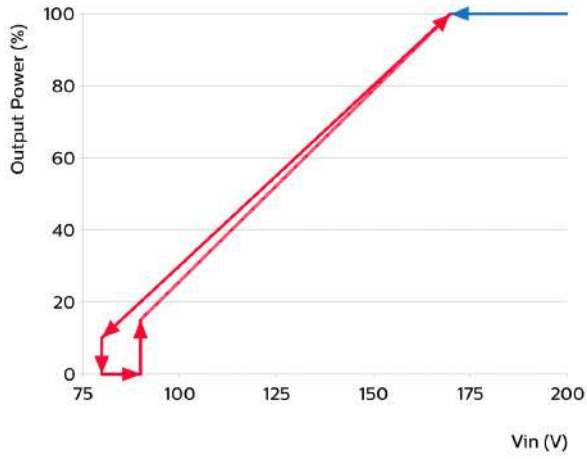
### Thermal Guard





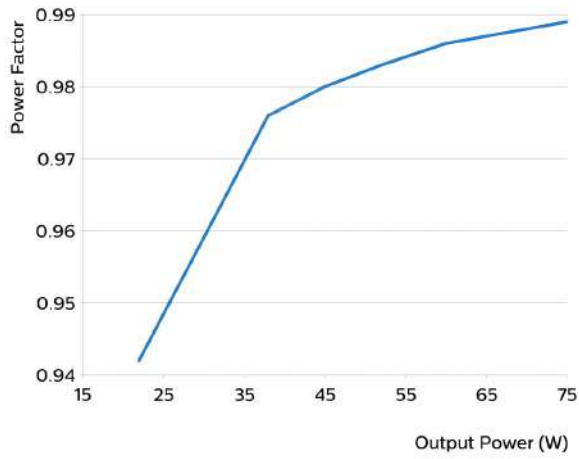
## Mains Guard

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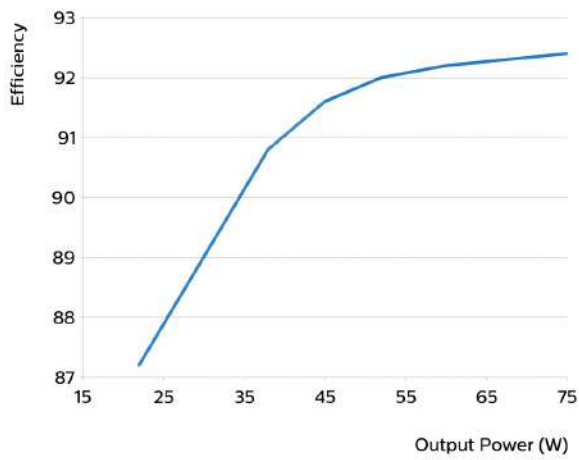
## Power factor versus output power

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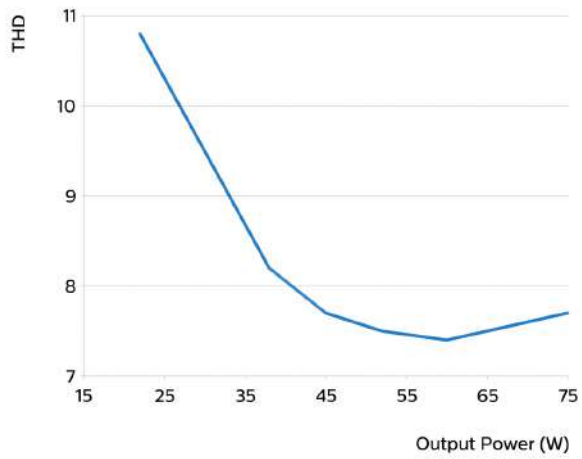
## Efficiency versus output power

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## THD versus output power

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Date of release: June 25, 2019 v4

[www.philips.com/oem](http://www.philips.com/oem)

## **2.5 Materiales de las luminarias**

Informe de ensayo en relación con el material que compone el cuerpo y la fijación de las luminarias conforme al punto 5.1 en el apartado que corresponda.

### **a. Luminaria modelo funcional**

 <p>Relva, 27 A - Torneiros 36410 PORRIÑO - Pontevedra Tel. +34 986 344 000 Fax. +34 986 337 302 e-mail: aimen@aimen.es www.aimen.es C.I.F. G - 36.606.291</p>	Nº Informe <i>Report No.</i>	1142147.2.3	Página <i>Page</i>	1 de 1 <i>1 of 1</i>
	Cliente <i>Customer</i>	IMQ TECNOCREA SL C/ Sèquia de Benàger, P.I.Alquería de Moret 23 - 46210 PICANYA - Valencia (España)		

<b>Datos de la muestra</b> <i>Sample data</i>		Fecha de recepción <i>Receipt date</i>	23.12.2020	Fecha de pedido <i>Receipt date of order</i>	17.12.2020
Descripción <i>Description</i>		Carcasa de aluminio <i>Aluminium housing</i>		Pedido <i>Order</i>	ACEPTACIÓN OFERTA
Id. AIMEN <i>Id. AIMEN</i>		†Referencia del Cliente <i>†Customer's reference</i>			
1142147-B		Luminaria Milan. Luminaria Grupo Benito/Novatilu			

<b>Ensayo de Tracción</b> <i>Tensile Test</i>		Condiciones de ensayo <i>Test conditions</i>		UNE-EN ISO 6892-1:2020 A224				Fecha de ensayo <i>Date of test</i>	11.01.2021	
Id.	Probeta / <i>Specimen</i>			R <sub>p0.2</sub> (MPa)	R <sub>p1</sub> (MPa)	R <sub>eH</sub> (MPa)	R <sub>m</sub> (MPa)	A (%)	Z (%)	
	Orientación <i>Orientation</i>	Tipo <i>Type</i>	Dimensiones <i>Size (mm)</i>							
1142147-B	TRANSVERSAL A LA MUESTRA <i>TRANSVERSE TO THE SAMPLE</i>	P	12,458 x 2,252	185	---	---	242	*1,1	---	
Incertidumbre k=2 <i>Uncertainty</i>				0,053·R <sub>p0.2</sub>	0,053·R <sub>p1</sub>	0,053·R <sub>eH</sub>	0,030·R <sub>m</sub>	0,13·A	0,095·Z	
Observaciones <i>Remarks</i>		*La elongación porcentual tras la rotura se obtiene mediante el extensómetro MTS 50mm N°HMEDEX_007 (31030/7-08) <i>*The percentage elongation after breakage is obtained by means of the MTS 50mm extensometer N°HMEDEX_007 (31030/7-08)</i>								
Leyenda <i>Legend</i>		R <sub>p0.2</sub> : Limite elástico a 0,2% de deformación / 0,2% offset yieldstrength. R <sub>p1</sub> : Limite elástico a 1% de deformación / 1% Offset yieldstrength. R <sub>eH</sub> : Limite superior de cedencia / Upper yieldstrength.		R <sub>m</sub> : Resistencia a tracción / <i>Tensile strength</i> . A: Alargamiento tras la fractura / <i>Elongation after fracture</i> . Z: Coeficiente de estricción / <i>Reduction of area</i> .		Orientación / <i>Orientation</i> : L: Longitudinal. T: Transversal. Z: Perpendicular al espesor / <i>Through thickness</i> . A: All Weld.		Probeta tipo / <i>Specimentype</i> : P: Prismática / <i>Flat</i> . C: Cilíndrica / <i>Round</i> . T: Tubocompleto / <i>Tube complete</i> . B: Banda de pared de tubo / <i>Strip of tubewall</i> .		

<b>Análisis químico</b> <i>Chemical Analysis</i>										Fecha de ensayo <i>Date of test</i>		14.01.2021	
Muestra <i>Sample</i>		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Pb#	Sn#	Al
B	% peso <i>wt %</i>	11,10	0,947	0,703	0,334	0,507	<0,028	<0,04	0,777	<0,02	0,036	0,015	Matriz <i>Matrix</i>
	Incert. <i>Uncert.</i>	0,36	0,031	0,030	0,017	0,028	----	----	0,075	----	----	----	----
Método de ensayo <i>Test method</i>		B	B	B	B	B	B	B	B	B	B	B	----
<b>Técnicas de análisis</b> <i>Analysis techniques</i>													
<p>A) Absorción infrarroja tras combustión en horno de inducción: Procedimiento A/PE/AFM.Q/09. / Infrared absorption after induction furnace combustion: Procedure A/PE/AFM.Q/09.</p> <p>B) Espectrometría de emisión por chispa en aleación de aluminio: Procedimiento A/PE/AFM.Q/08 / Spark Emission Spectrometry in aluminium alloy: Procedure A/PE/AFM.Q/08</p> <p>C) Conductividad térmica tras fusión en corriente de gas inerte: Procedimiento A/PE/AFM.Q/11. Thermal conductivity after melting in an inert gas stream: Procedure A/PE/AFM.Q/11.</p> <p>D) ICP-OES: Procedimiento A/PE/AFM.Q/03 / ICP-OES: Procedure A/PE/AFM.Q/03</p>													
Observaciones <i>Remarks</i>		<p>*La composición química de la muestra analizada es característica de una aleación de aluminio EN 1706 EN AC-47100, pero las concentraciones de magnesio (Mg) Y cinc (Zn) están por encima de las indicadas en la norma. <i>*Chemical composition of the sample analyzed is similar to an EN 1706 EN AC-47100 aluminum alloy, but the elements: magnesium (Mg) and zinc (Zn) don't fulfill the values indicate in the standard.</i></p> <p>La declaración de conformidad está basada en el criterio de aceptación simple según la guía ILAC G8, con una probabilidad de aceptación o rechazo falsos inferior al 50% <i>The statement of conformity is based on the simple acceptance criterion according to the ILAC G8 guide, with a false acceptance or rejection probability of less than 50%.</i></p>											

Porriño, 16 de febrero de 2021  
*Porriño, 16<sup>th</sup> February 2021*

Jorge Delgado Guirao  
Coordinador de Análisis Metalográfico y Químico  
*Head of Metallography and Chemical Analysis*

Agustín Paz Gestoso  
Responsable de Ensayos y Análisis  
*Testing and analysis manager*

Mauricio Ruibal Acuña  
Coordinador de Ensayos Mecánicos y END  
*Mechanical Testing and NDT Coordinator*

**Este informe anula y sustituye a nuestro informe nº 1142147.2.2 de fecha 8 de febrero de 2021**  
***This report supersedes our report no. 1142147.2.2 dated 8th February, 2021***

Descripción de los cambios / *Description of changes.*  
Modificación para incluir la clasificación de la aleación por solicitud del cliente. / *Modification to include alloy classification as requested by the customer.*



Las actividades marcadas con # no están amparadas por la acreditación de ENAC  
*Activities marked with # are not included in the scope of accreditation*

Los resultados reflejados en este informe se refieren únicamente a la(s) muestra(s) reseñada(s).  
La información acompañada del superíndice † ha sido facilitada por el cliente, por lo tanto AIMEN no puede asumir responsabilidades sobre su veracidad.  
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*The English version is a translation. In case of doubt, the Spanish text of this report is valid.*

## DECLARACIÓN DE CONFORMIDAD Equipos Alumbrado Público BENITO NOVATILU

**BENITO URBAN SLU**, como fabricante de luminarias, de módulos LED, de protectores de sobretensión, y suministrador de fuentes de alimentación y sistemas de control y regulación, con domicilio social en c/ Lleida, 10 de 08500 VIC (Barcelona – España), con CIF B 59.987.529 y miembro del grupo BENITO NOVATILU.

DECLARA:

Que todas las luminarias del grupo BENITO NOVATILU están fabricadas en aluminio de alta pureza y cumplen con los requerimientos de una aleación de aluminio EN AC-44100 según Norma Europea EN 1706.

Y para que así conste, se expide este documento.

Vic, 4 de febrero de 2022.



**BENITO URBAN S.L.U**  
C.I.F. E3 859 987 529

**Lighting Department**  
Albert de Ramos Pons

### 3 Informe de Pruebas o Certificados de la Luminaria.

#### 3.1 Tabla Verificación (Anexo 4) CEI – IDAE

##### Informe de Pruebas o Certificados emitidos por el fabricante de la luminaria o entidad OEC acreditada

- |   |  |   |
|---|--|---|
| 1 | Marcado CE: Declaración de conformidad, tanto de la luminaria como de sus elementos integrantes. (Propio de la empresa)  | ✓ |
| 2 | Ensayo fotométrico de la luminaria según la Norma UNE EN 13032-4.  | ✓ |
| 3 | Ensayo colorimétrico de la luminaria según la Norma UNE EN 13032-4.  | ✓ |
| 4 | Ensayo de medidas eléctricas: tensión, corriente de alimentación, potencia nominal leds y potencia total consumida por luminaria con todos sus elementos integrantes y factor de potencia. Este ensayo puede incluirse también en los requisitos de seguridad de la luminaria. | ✓ |



**FABRICANTE:** BENITO URBAN, SLU  
**MANUFACTURER:** C/ Lleida 10 08500 Vic (Barcelona) – Spain  
Tel.: (+34) 93 852 1000

Certificamos y declaramos bajo nuestra responsabilidad que el siguiente producto:

*We certify and declare under our responsibility that the following product:*

**Marca:** **BENITO**  
**Brand:** **NOVATILU**

**Modelo:** Proyector **P-MILAN S – P-MILAN M – P-MILAN XL – P-MILAN XXL**  
**Model:** Projectors **APMSL – APML – APMXL – APMXXL**

Está conforme a las siguientes directivas y normativas:

*It is according to the following directives and norms:*

UNE-EN-61000-3-2:2006+A1:2010+A2:2010  
UNE-EN-61000-3-3:2009  
UNE-EN-61547:2011  
UNE-EN-55015:2007+A1:2008+A2:2009

Compatibilidad electromagnética (CEM).  
- Límites emisiones corrientes armónicas  
- Limitación variación tensión y flicker en redes públicas  
- Requisitos de Inmunidad  
- Límites perturbación radioeléctrica  
*Electromagnetic compatibility (EMC).*  
*-Limits harmonic current emissions*  
*-Limiting voltage variation and flicker in electrical networks*  
*-Immunity requirements*  
*-Limits radio electrical disturbance*

UNE-EN-60598-2-5:2015  
UNE-EN-60598-1:2015+A1:2018  
UNE-EN-62262  
UNE-EN-62471  
UNE-EN-62493:2015  
UNE-EN-62031:2009  
IEC 62722-1:2014  
IEC 62722-2-1:2014  
IEC 62717:2014

Luminarias Alumbrado Público  
- Requisitos generales y ensayos  
- Grado protección contra impactos (IK)  
- Seguridad Fotobiológica  
- Módulos LED. Requisitos de seguridad  
- Evaluación de los equipos de alumbrado en relación a la exposición humana a los campos electromagnéticos.  
-Características de funcionamiento de luminarias. Requisitos generales.  
-Requisitos particulares para luminarias LED.  
-Módulos LED para iluminación general. Requisitos de funcionamiento.  
*Street Lighting Luminaires*  
*- General requirements and tests*  
*- Degrees of protection mechanical impacts (IK)*  
*- Photobiological safety*  
*- LED Modules. Safety requirement*  
*-Assessment of lighting equipment related to human exposure to electromagnetic fields*  
*-Characteristics of operation of accessories. General requirements*  
*- Specific requirements for LED lighting.*  
*-LED modules for general lighting. Operating requirements.*

IEC 62321

Determinación de ciertas sustancias en productos electrotécnicos. Es equivalente a la UNE EN 63000  
*Determination of certain substances in electrotechnical products. It is equivalent to the UNE EN 63000*

**Fecha de emisión:** Enero 2021  
**Issued on:** *January 2021*

**Firmado:**  
**Signed:**

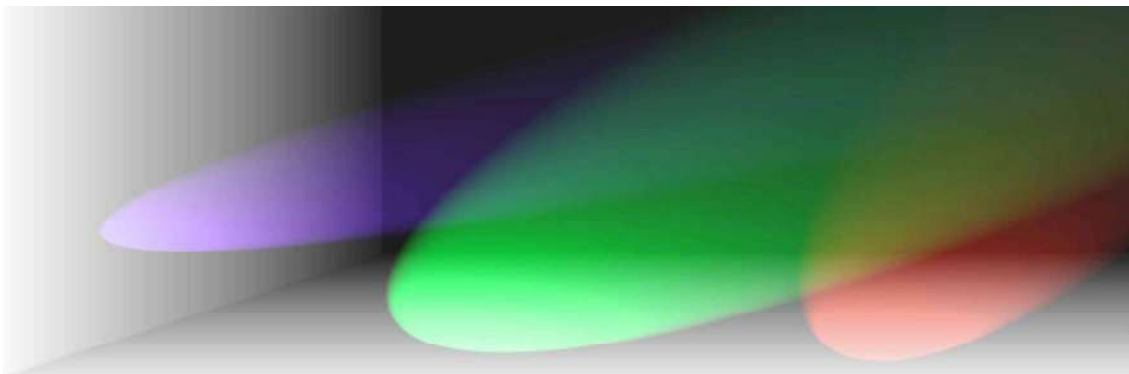


**Jordi Puig Rovira**

Ingeniero Técnico Telecomunicación (col. 903055)  
Design & Engineering - Lighting Department

Los ensayos marcados con \* no están amparados por la acreditación ENAC

# INFORME DE ENSAYO



## Asselum luminotècnics, SL

Polígono Industrial Can Roqueta  
C/ Ca n'Alzina 76 08202 Barcelona

Tel - Fax: 93.725.98.10

[www.asselum.com](http://www.asselum.com)

**Cliente:** BENITO – NOVATILU

**Dirección:** C/Lleida 10, 08500, Vic

**Provincia:** Barcelona

**País:** España

**Teléfono:** 938521000

**Nombre muestra<sup>1</sup>:** P.Milan S 80W 4k

**Código muestra<sup>1</sup>:** APMS

**Nº muestra:** RM21072804.10 // RM20100701.2

**Fecha del ensayo:** 14/12/2021

**Código de ensayo:** CL237A21F019V

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

### Informe revisado:

43564191Y  
MARC  
BALLBE (R:  
B62741152)

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BALLBE (R: B62741152)  
DN: cn=43564191Y MARC  
BALLBE (R: B62741152)  
gn=MARC c=ES  
o=ASSELUM  
LUMINOTECNICS SL  
Motivo: He revisado este  
documento  
Ubicación:  
Fecha: 2021.12.15  
19:31+01:00

**Marc Ballbè**  
**Director técnico**

Los resultados obtenidos en el presente informe se refieren únicamente a la muestra ensayada conforme en el apartado 1.1. No se podrá reproducir total o parcialmente el informe sin el consentimiento de **ASSELUM assessorsluminotècnics, S.L.**  
La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa.

Cualquier impresión del presente informe será considerada como una copia del mismo.  
**Assessors luminotècnics, SL Pol. Ind. Can Roqueta C/. Ca n'Alzina, 76 - 08202 Sabadell Barcelona**  
**Tel. 93 725 98 10 [www.asselum.com](http://www.asselum.com)**



## ÍNDICE DEL INFORME

### **1. Descripción de la muestra y del ensayo**

- 1.1. Ficha técnica del producto
  - 1.1.1. Imagen de la muestra
- 1.2. Ficha del ensayo
- 1.3. Parámetros del test eléctrico
- 1.4. Condiciones ambientales
- 1.5. Instrumentos utilizados

### **2. Parámetros eléctricos medidos**

- 2.1. Medición del conjunto

### **3. Observaciones**

### **4. Resultados del ensayo de fotometría**

## 1. Descripción de la muestra y del ensayo

### 1.1. Ficha técnica del producto

Tipo	Módulo
Código Producto <sup>1</sup>	APMS
Nombre <sup>1</sup>	P.Milan S 80W 4k
Dimensiones [mm]	350 x 250 x 80
Área luminosa [mm]	150 x 150 x 0
Tipo fuente de luz	LED
Flujo luminoso[Im]	10738
Potencia del conjunto[W]	83,0
Eficacia luminosa[Im/W]	129,4

<sup>1</sup> Información suministrada por el solicitante del ensayo Asselum no se hace responsable de esta información, ni de las marcas identificativas que incorpora la muestra.

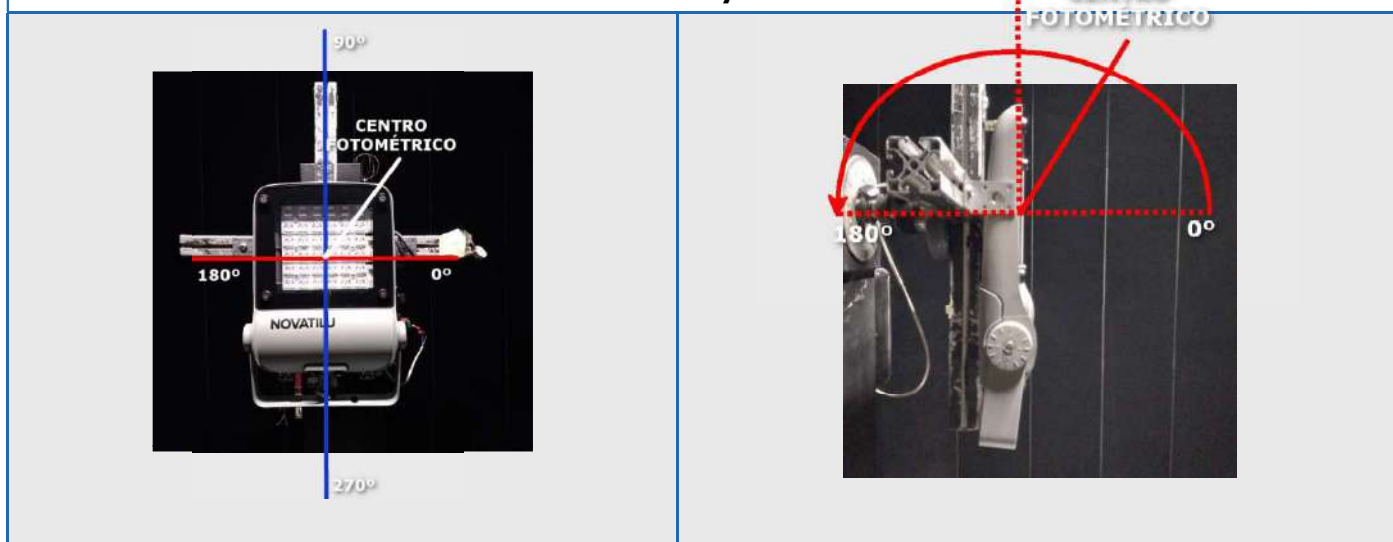
#### 1.1.1. Imagen de la muestra



## 1.2. Ficha del ensayo

Normas de referencia	UNE-EN 13032-4:2016 EN 13032-4: 2015 CIE S 025: 2015 CIE 34:1977 CIE 52:1982 CIE 117:1995 IES TM-15:07
Sistema de medición	$C-\gamma, C = \Delta 15^\circ, G = \Delta 2,5^\circ$

### Sistema de referencia y centro fotométrico




## 1.3. Parámetros del test eléctrico

Tipo de alimentación	Fuente estabilizada
Alimentación eléctrica	230V AC $\pm$ 0,4%
Distorsión armónica	< 0,5%
Frecuencia	50 Hz $\pm$ 0.1%

## 1.4. Condiciones ambientales

Temperatura del laboratorio [°C]	25°C $\pm$ 1,2°C
Humedad relativa	< 60%
Movimiento del aire	< 0,25 m/s

## 1.5. Instrumentos utilizados

Goniofotómetro	<p>Goniofotómetro T2 de rotación de la luminaria acuerdo con las normas y recomendaciones:</p> <ul style="list-style-type: none"> <li>❖ EN 13032-1 2005 cap. 6.1.1.1 – tipo de goniofotómetro 1.1, 1.2 y 1.3</li> <li>❖ Recomendación CIE 121 Cap.5 Tipo 1 y 2</li> </ul> <p>Nº identificativo: E-001 Distancia de medición: 6,44 m</p>
Posición de ensayo de la muestra	El ensayo se realiza con la muestra en posición en horizontal y se aplica un factor de corrección entregando el resultado en función de la posición de diseño.
Fuente de alimentación	Fuente de alimentación AC ET-System modelo EAC-S-1000 Nº identificativo: E-019
Multímetro	MULTIMETRO NEWTON 4TH. MODELO PPA 1510 Nº identificativo: E-020
Luxómetro	Luxómetro CZIULA&GRUNDMANN Nº identificativo: E-003
Anemómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Termómetro	Delta Ohm-HD2001.2 Nº identificativo: E-015
Termómetro	TERMOMETRO DIGITAL PCE-T 390 Nº identificativo: E-018
	

## 2. Parámetros eléctricos medidos

### 2.1. Medición del conjunto

Tensión de alimentación [V]	230,1
Intensidad [A]	0,364
Potencia [W]	83
Factor de potencia	0,99

### 3. Observaciones

- Queda prohibida la reproducción parcial de este documento.
- Este Informe no puede presentar enmiendas o raspaduras, en caso contrario será considerado nulo.
- La incertidumbre de las medidas incluidas en el presente informe están disponibles, bajo petición expresa, en la instrucción técnica IT10 de ASSELUM.

### 4. Resultados del ensayo de fotometría

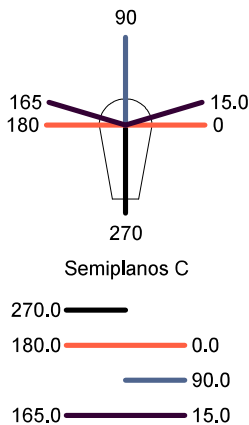
## 4.1. Resumen

### Luminaria

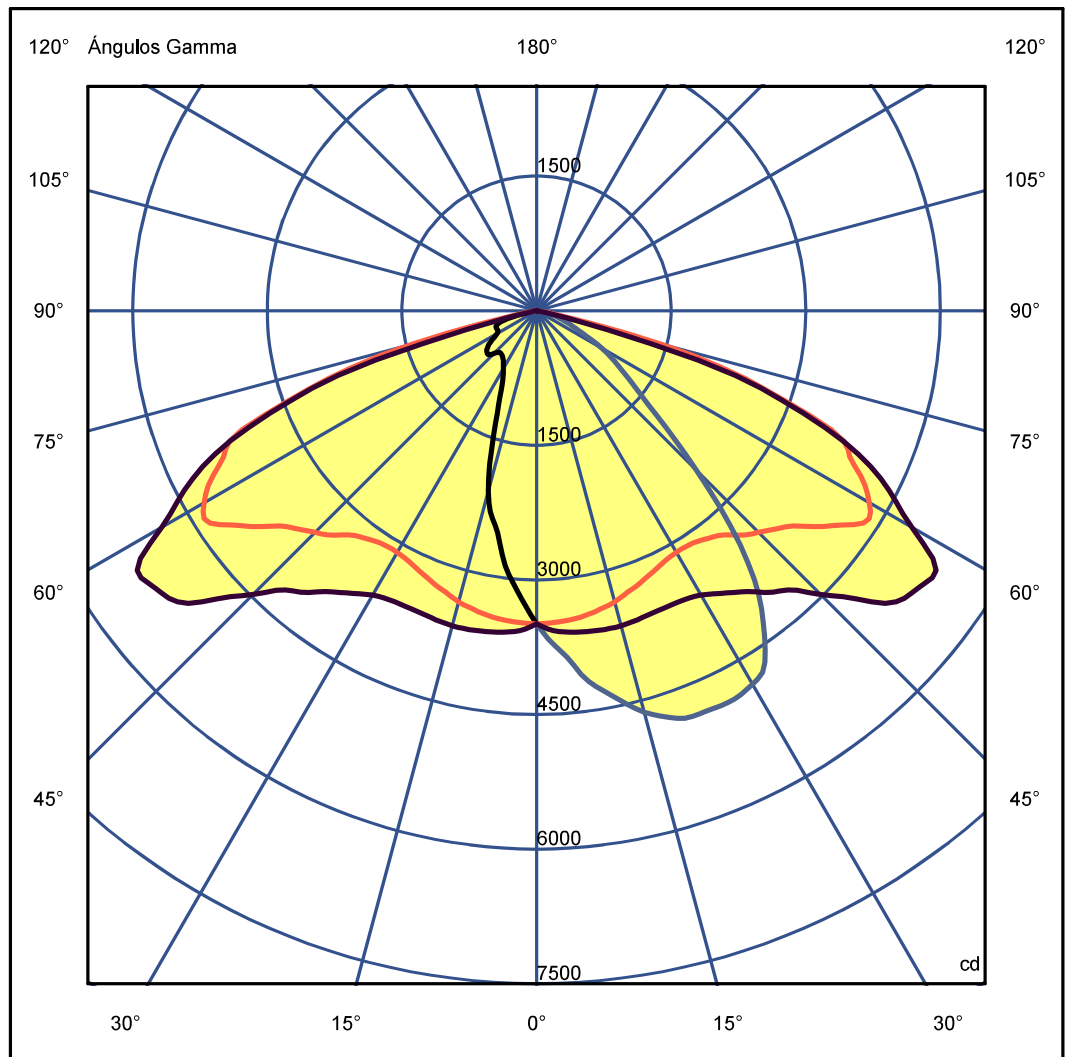
Código APMS  
 Nombre P.Milan S 80W 4k  
**Ensayo**  
 Código CL237A21F019V  
 Nombre P.Milan S 80W 4k

Flujo Luminaria	10738.02 lm	Potencia Luminaria	82.96 W	Eficacia	129.43 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	10738.02 lm	Valor Máximo	5285.67 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90
Luminaria Rectangular	Longit. 350 mm	Longit.	150 mm	Anchura	250 mm	Altura	80 mm
Área Luminosa Rectangular	Longit.	Longit.	150 mm	Anchura	150 mm	Altura	0 mm
Área Luminosa Horizontal	0.022500 m2			Área Emisión sobre Pl. 180°		0.000000 m2	
Área Emisión sobre Pl. 0°	0.000000 m2			Área Emisión sobre Pl. 270°		0.000000 m2	
Área Emisión sobre Pl. 90°	0.000000 m2			Área de deslumbramiento a 76°		0.005443 m2	
Sist. de Coord.	CG viales			Tipo de Simetría		Sim. en los planos 270-90	
Fecha	14-12-2021			Máximo Ángulo Gamma		180	
Distancia de Ensayo	6.44			Flujo de Ensayo		10738.02 lm	
Operador	Asselum T2			Tensión Nominal		230.12 V	
Temperatura	25.20 °C			Corriente Nominal		0.36 A	
Humedad	28.30 %			Fotocélula		Prc	
Notas	RM21072804.10 // RM20100701.2						

Fuentes de luz de la Luminaria						
Familia	Código	Nombre	Flujo [lm]	Pot. [W]	Cant.	
	5050	Lumiled 5050	10738.02	82.96	1	
C.I.E.	44 78 98 100 100	D DIN 5040	A30			



ULOR 0.09 %  
 DLOR 99.91 %  
 RN 0.09 %



## 4.2. Matriz de intensidades (Cd)

**Luminaria**  
 Código APMS  
 Nombre P.Milan S 80W 4k  
**Ensayo**  
 Código CL237A21F019V  
 Nombre P.Milan S 80W 4k

Flujo Luminaria	10738.02 lm	Potencia Luminaria	82.96 W	Eficacia	129.43 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	10738.02 lm	Valor Máximo	5285.67 cd	Posición	C=15.00 G=55.00	CG Sim. en los planos	270-90

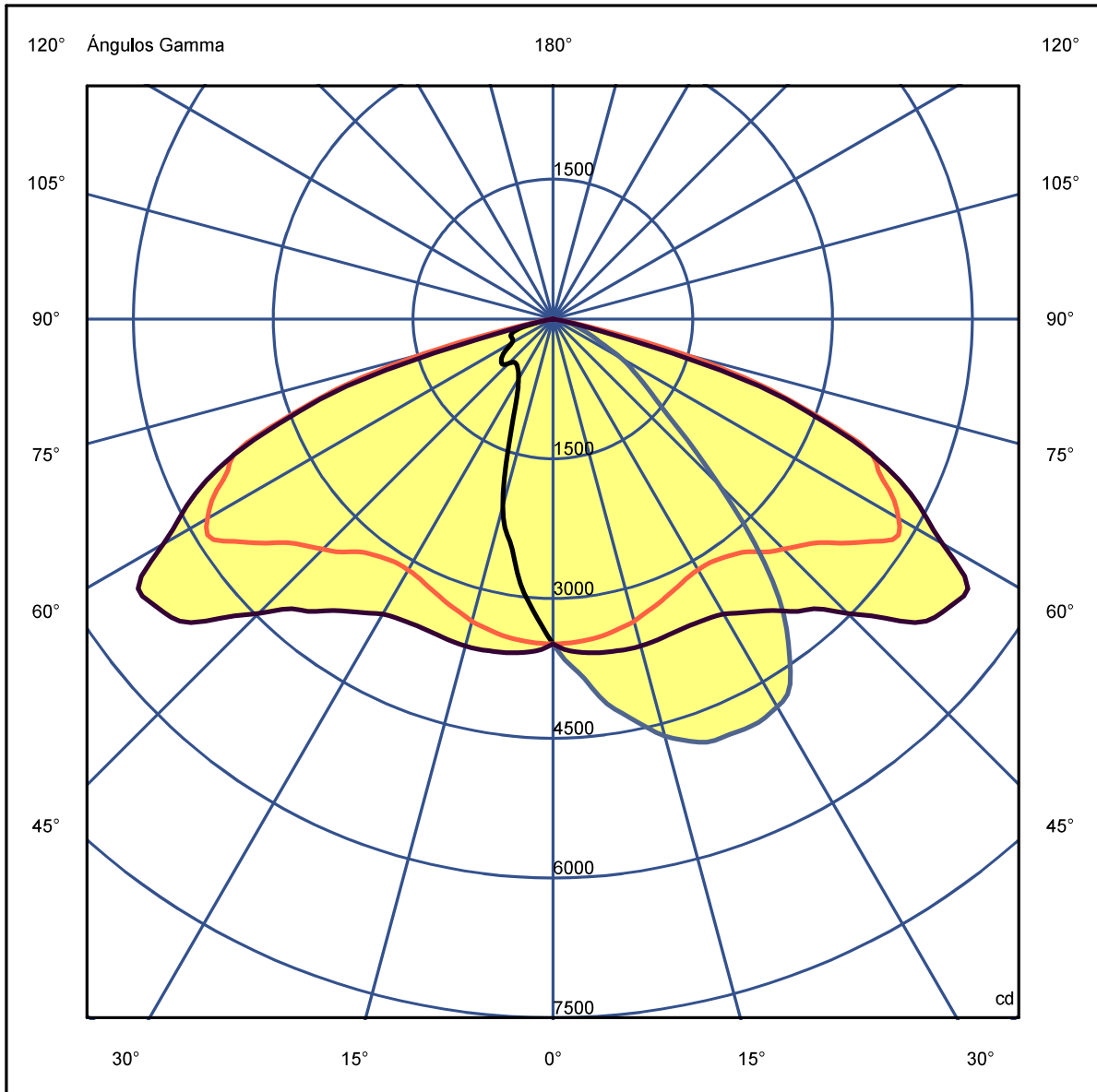
Tabla de Intensidad Luminosa cd Tabla 1/1

	C 270.00	C 285.00	C 300.00	C 315.00	C 330.00	C 345.00	C 0.00	C 15.00	C 30.00	C 45.00	C 60.00	C 75.00	C 90.00
G 0.0	3486.92	3486.92	3486.92	3486.92	3486.92	3486.92	3486.92	3486.92	3486.92	3486.92	3486.92	3486.92	3486.92
G 2.5	3259.43	3237.90	3286.52	3343.95	3366.99	3436.11	3481.39	3558.94	3620.61	3610.49	3765.97	3693.85	3695.23
G 5.0	3039.34	3038.27	3094.97	3148.04	3249.78	3372.89	3470.26	3590.42	3726.06	3717.29	3910.22	3837.99	3875.31
G 7.5	2810.13	2834.85	2892.80	2965.01	3132.13	3308.75	3453.28	3611.61	3799.71	3814.85	4047.77	3996.36	4128.86
G 10.0	2511.37	2627.04	2704.34	2804.35	3008.72	3239.40	3427.75	3622.88	3860.62	3951.49	4190.84	4153.71	4298.92
G 12.5	2334.55	2428.39	2522.25	2642.72	2853.49	3165.55	3392.60	3631.93	3913.79	4051.05	4328.88	4294.30	4467.24
G 15.0	2084.97	2249.37	2290.62	2498.64	2690.72	3043.81	3358.35	3633.08	3972.07	4133.16	4496.37	4443.01	4631.54
G 17.5	1712.33	1968.09	2048.92	2372.34	2570.96	2965.24	3303.31	3623.97	4034.47	4200.30	4628.35	4524.26	4743.43
G 20.0	1342.46	1635.55	1736.17	2164.56	2466.15	2883.05	3260.60	3609.52	4069.15	4250.17	4699.71	4543.86	4831.32
G 22.5	1086.95	1291.03	1406.17	2013.92	2359.43	2800.96	3211.16	3602.34	4095.86	4279.91	4728.89	4543.75	4843.68
G 25.0	914.21	1044.51	1165.47	1792.71	2253.19	2717.43	3168.81	3604.49	4121.01	4287.24	4725.46	4529.27	4856.41
G 27.5	808.11	904.20	1003.27	1562.99	2120.23	2630.36	3127.76	3619.80	4152.19	4281.85	4696.70	4487.85	4852.25
G 30.0	743.38	798.53	870.35	1335.33	1949.79	2517.82	3108.72	3655.90	4193.01	4284.02	4647.33	4389.28	4806.45
G 32.5	687.87	703.13	789.08	1164.78	1812.09	2456.78	3108.45	3738.44	4262.19	4304.56	4620.03	4262.70	4716.46
G 35.0	655.08	669.84	731.64	979.67	1665.46	2406.99	3135.60	3829.76	4322.95	4342.88	4582.77	4063.78	4425.01
G 37.5	632.06	635.81	683.64	894.58	1519.63	2371.85	3185.41	3945.17	4400.42	4381.01	4532.49	3760.49	4096.91
G 40.0	621.10	606.19	641.71	796.50	1381.57	2352.02	3258.10	4093.54	4488.75	4373.42	4447.51	3391.35	3663.55
G 42.5	626.89	586.52	619.53	689.38	1201.56	2361.50	3391.74	4217.78	4580.19	4331.48	4314.51	2824.15	3114.85
G 45.0	672.57	580.52	608.51	614.96	1079.62	2400.14	3491.98	4469.63	4705.66	4240.11	3981.28	2156.12	2525.80
G 47.5	723.16	606.70	618.07	554.91	993.59	2447.49	3600.44	4729.57	4874.45	4161.84	3633.84	1818.66	2025.21
G 50.0	723.31	648.21	633.88	509.44	922.14	2497.21	3730.31	5069.23	5089.43	4049.29	3161.36	1570.49	1614.26
G 52.5	697.92	667.91	627.06	479.78	873.76	2553.14	3949.67	5216.61	5232.20	3702.17	2662.06	1342.91	1363.22
G 55.0	648.45	641.50	575.09	457.72	842.51	2616.49	4162.89	5285.67	5262.01	3202.01	2262.54	1156.45	1168.39
G 57.5	576.57	601.15	504.56	429.13	845.26	2814.17	4365.76	5273.11	5163.20	2842.75	1939.19	975.59	1006.69
G 60.0	510.31	526.06	449.52	400.73	877.31	2958.72	4280.33	4825.53	4632.65	2425.27	1511.45	772.21	852.52
G 62.5	486.28	457.16	402.51	371.19	851.26	2991.87	4101.29	4474.42	4301.22	1975.52	1268.22	595.59	655.84
G 65.0	484.53	424.09	364.92	341.88	784.89	2803.14	3850.32	4104.35	3921.10	1518.65	1028.77	469.84	512.35
G 67.5	488.94	402.48	326.86	309.77	753.55	2568.47	3649.37	3592.44	3448.15	962.92	782.25	371.56	416.64
G 70.0	476.91	388.01	296.71	268.33	727.96	2474.39	2968.02	2900.10	2925.36	616.90	610.24	276.12	330.21
G 72.5	433.64	370.68	238.61	224.79	622.63	2115.25	2305.49	2126.00	2126.86	409.71	466.16	200.27	256.34
G 75.0	334.01	321.31	192.32	194.52	427.05	1521.21	1432.29	828.81	1152.04	261.05	344.15	101.15	201.11
G 77.5	180.49	281.09	145.71	161.05	135.62	952.21	506.90	267.31	569.72	129.76	232.74	49.56	69.22
G 80.0	79.47	195.69	85.18	118.45	61.53	348.97	128.56	58.96	215.44	48.97	135.81	19.53	42.22
G 82.5	14.30	91.18	18.13	73.15	25.89	97.12	30.51	11.37	78.10	12.44	60.87	6.21	21.63
G 85.0	1.16	25.01	1.88	19.44	7.02	30.80	10.49	2.89	18.03	2.23	13.88	2.09	8.86
G 87.5	0.50	1.92	0.64	3.38	1.63	10.11	3.40	0.91	3.55	0.71	2.37	0.78	2.93
G 90.0	0.53	0.49	0.55	0.98	0.78	3.07	1.09	0.91	1.07	0.59	0.79	0.60	1.08
G 92.5	0.54	0.49	0.58	0.59	0.84	1.03	0.95	0.96	0.71	0.56	0.63	0.56	0.59
G 95.0	0.54	0.49	0.59	0.63	0.95	0.94	1.09	1.12	0.75	0.58	0.59	0.60	0.56
G 97.5	0.57	0.51	0.66	0.69	1.08	1.05	1.29	1.28	0.81	0.63	0.60	0.64	0.60
G100.0	0.62	0.53	0.71	0.79	1.26	1.20	1.47	1.43	0.88	0.67	0.64	0.64	0.63
G102.5	0.66	0.58	0.81	0.93	1.44	1.40	1.67	1.58	0.94	0.71	0.68	0.68	0.68
G105.0	0.71	0.62	0.90	1.04	1.61	1.58	1.86	1.69	1.02	0.75	0.68	0.69	0.72
G107.5	0.77	0.68	1.02	1.17	1.84	1.76	2.05	1.76	1.13	0.78	0.71	0.72	0.72
G110.0	0.81	0.74	1.11	1.32	2.00	2.04	2.23	1.83	1.20	0.82	0.73	0.73	0.72
G112.5	0.90	0.81	1.30	1.51	2.13	2.16	2.32	1.85	1.27	0.86	0.75	0.73	0.75
G115.0	0.98	0.88	1.41	1.66	2.26	2.31	2.37	1.85	1.31	0.88	0.77	0.75	0.77
G117.5	1.11	1.01	1.57	1.80	2.36	2.40	2.39	1.85	1.33	0.91	0.77	0.75	0.77
G120.0	1.26	1.13	1.68	1.90	2.42	2.49	2.37	1.87	1.36	0.95	0.82	0.77	0.77
G122.5	1.38	1.24	1.80	2.01	2.47	2.53	2.33	1.87	1.40	0.97	0.82	0.77	0.77
G125.0	1.52	1.37	1.93	2.09	2.50	2.54	2.28	1.85	1.42	1.01	0.82	0.79	0.77
G127.5	1.65	1.48	2.01	2.16	2.50	2.54	2.24	1.85	1.43	1.04	0.87	0.81	0.81
G130.0	1.80	1.61	2.16	2.24	2.52	2.50	2.19	1.82	1.47	1.06	0.89	0.82	0.81
G132.5	1.97	1.77	2.20	2.27	2.52	2.50	2.17	1.83	1.47	1.10	0.91	0.84	0.81
G135.0	2.12	1.88	2.27	2.31	2.53	2.48	2.12	1.83	1.49	1.19	0.96	0.88	0.86
G137.5	2.21	1.99	2.32	2.32	2.54	2.46	2.10	1.85	1.53	1.23	1.00	0.92	0.86
G140.0	2.30	2.07	2.39	2.35	2.56	2.45	2.08	1.85	1.56	1.27	1.05	0.97	0.90
G142.5	2.34	2.14	2.44	2.39	2.53	2.43	2.08	1.86	1.56	1.32	1.14	1.03	0.95
G145.0	2.39	2.22	2.48	2.42	2.55	2.43	2.08	1.87	1.61	1.36	1.19	1.10	1.02
G147.5	2.44	2.28	2.53	2.44	2.56	2.41	2.08	1.92	1.63	1.42	1.26	1.18	1.07
G150.0	2.48	2.29	2.55	2.46	2.53	2.41	2.08	1.94	1.67	1.49	1.33	1.28	1.19
G152.5	2.52	2.33	2.57	2.47	2.51	2.38	2.10	1.98	1.74	1.56	1.42	1.36	1.28
G155.0	2.53	2.35	2.60	2.46	2.51	2.38	2.10	2.01	1.79	1.62	1.49	1.46	1.38
G157.5	2.58	2.38	2.60	2.46	2.49	2.36	2.10	2.05	1.83	1.69	1.60	1.55	1.46
G160.0	2.62	2.41	2.60	2.46	2.49	2.36	2.12	2.08	1.89	1.75	1.67	1.64	1.56
G162.5	2.67	2.45	2.64	2.44	2.49	2.36	2.16	2.15	1.93	1.85	1.76	1.75	1.66
G165.0	2.71	2.50	2.65	2.48	2.51	2.38	2.19	2.21	2.06	1.95	1.88	1.89	1.83
G167.5	2.71	2.50	2.64	2.48	2.51	2.42	2.23	2.28	2.16	2.06	1.97	1.98	1.92
G170.0	2.71	2.50	2.62	2.46	2.51	2.43	2.26	2.32	2.20	2.15	2.11	2.07	2.01
G172.5	2.70	2.50	2.60	2.46	2.53	2.43	2.30	2.38	2.30	2.21	2.22	2.18	2.14
G175.0	2.66	2.48	2.58	2.44	2.53	2.43	2.32	2.41	2.38	2.27	2.34	2.27	2.29
G177.5	2.57	2.43	2.55	2.44	2.50	2.46	2.35	2.44	2.47	2.36	2.43	2.34	2.42
G180.0	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45	2.45

### 4.3. Distribución polar de intensidades (Cd)

**Luminaria**  
 Código APMS  
 Nombre P.Milan S 80W 4k  
**Ensayo**  
 Código CL237A21F019V  
 Nombre P.Milan S 80W 4k

Flujo Luminaria	10738.02 lm	Potencia Luminaria	82.96 W	Eficacia	129.43 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	10738.02 lm	Valor Máximo	5285.67 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

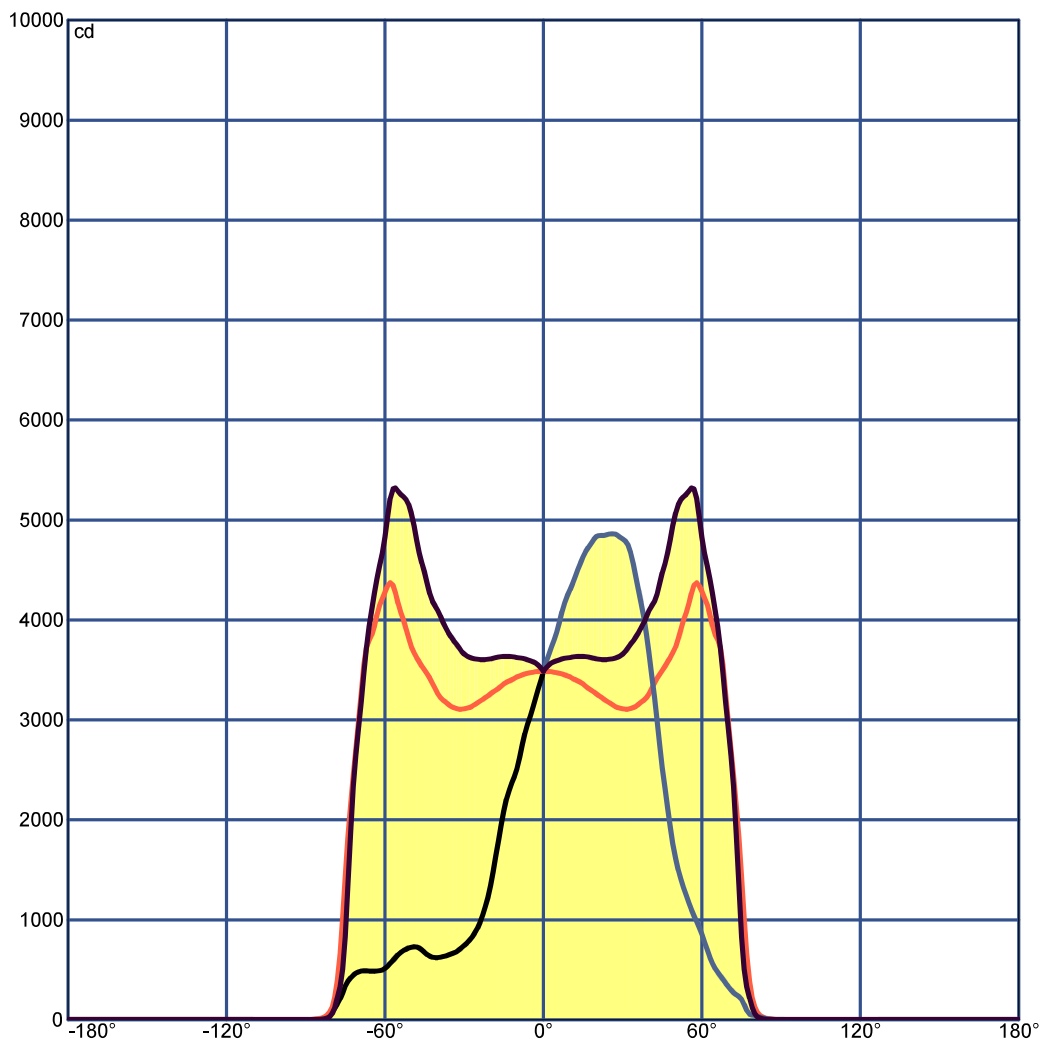




### 4.4. Distribución cartesiana de intensidades (Cd)

**Luminaria**  
 Código APMS  
 Nombre P.Milan S 80W 4k  
**Ensayo**  
 Código CL237A21F019V  
 Nombre P.Milan S 80W 4k

Flujo Luminaria	10738.02 lm	Potencia Luminaria	82.96 W	Eficacia	129.43 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	10738.02 lm	Valor Máximo	5285.67 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90



## 4.5. Flujo zonal

**Luminaria**  
 Código APMS  
 Nombre P.Milan S 80W 4k  
**Ensayo**  
 Código CL237A21F019V  
 Nombre P.Milan S 80W 4k

Flujo Luminaria	10738.02 lm	Potencia Luminaria	82.96 W	Eficacia	129.43 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	10738.02 lm	Valor Máximo	5285.67 cd	Posición	C=15.00 G=55.00	CG Sim. en los planos	270-90

Flujo Total=10738.02 Flujo Luminaria=10738.02

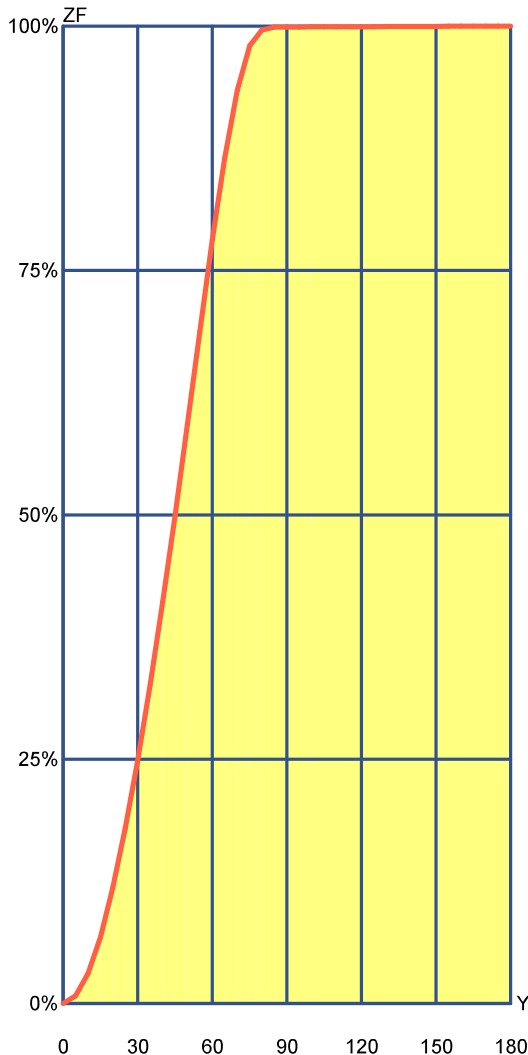
RI	0.60	0.80	1.00	1.25	1.50	2.00	2.50	3.00	4.00	5.00	10.00	20.00
DRR	0.28	0.37	0.44	0.52	0.58	0.67	0.74	0.78	0.83	0.87	0.94	0.97
RC	6	5	5	5	5	5	5	5	4	4	4	3

Flujo Zonal por 1000 Lúmenes

Y°	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
ZF(Y)	31	118	249	411	592	781	934	996	999	999	999	999	1000	1000	1000	1000	1000	1000

Códigos de Flujo C.I.E.  
 44 78 98 100 100

C.I.E.	6/5/5/5/5/5/5/4/4/4/3	LOR	100.00000 %
D DIN 5040	A30	ULOR	0.08688 %
F UTE	1.00 E	DLOR	99.91312 %
B NBN	BZ 5 / 2 / BZ 4	UFF	0.08688 %
RN	0.08688 %	DFF	99.91312 %
BLF	1.0	FFR	0.08695 %



Flujo Zonal				
Gamma °	Flujo	Suma lm	Flujo [%]	Suma [%]
0°	0.00	0.00	0.00%	0.00%
5°	7.75	7.75	0.78%	0.78%
10°	22.93	30.68	2.29%	3.07%
15°	37.37	68.04	3.74%	6.80%
20°	50.33	118.37	5.03%	11.84%
25°	60.71	179.09	6.07%	17.91%
30°	69.52	248.61	6.95%	24.86%
35°	77.48	326.10	7.75%	32.61%
40°	84.52	410.62	8.45%	41.06%
45°	88.97	499.59	8.90%	49.96%
50°	92.35	591.94	9.24%	59.19%
55°	95.40	687.34	9.54%	68.73%
60°	93.96	781.30	9.40%	78.13%
65°	84.07	865.38	8.41%	86.54%
70°	68.93	934.31	6.89%	93.43%
75°	45.59	979.90	4.56%	97.99%
80°	16.20	996.10	1.62%	99.61%
85°	2.80	998.91	0.28%	99.89%
90°	0.23	999.13	0.02%	99.91%
95°	0.04	999.17	0.00%	99.92%
100°	0.04	999.21	0.00%	99.92%
105°	0.05	999.26	0.01%	99.93%
110°	0.06	999.32	0.01%	99.93%
115°	0.06	999.39	0.01%	99.94%
120°	0.07	999.45	0.01%	99.95%
125°	0.07	999.52	0.01%	99.95%
130°	0.07	999.59	0.01%	99.96%
135°	0.07	999.66	0.01%	99.97%
140°	0.06	999.72	0.01%	99.97%
145°	0.06	999.78	0.01%	99.98%
150°	0.05	999.83	0.01%	99.98%
155°	0.05	999.88	0.00%	99.99%
160°	0.04	999.92	0.00%	99.99%
165°	0.03	999.95	0.00%	100.00%
170°	0.03	999.98	0.00%	100.00%
175°	0.02	999.99	0.00%	100.00%
180°	0.01	1000.00	0.00%	100.00%

## 4.6. Diagrama Isolux

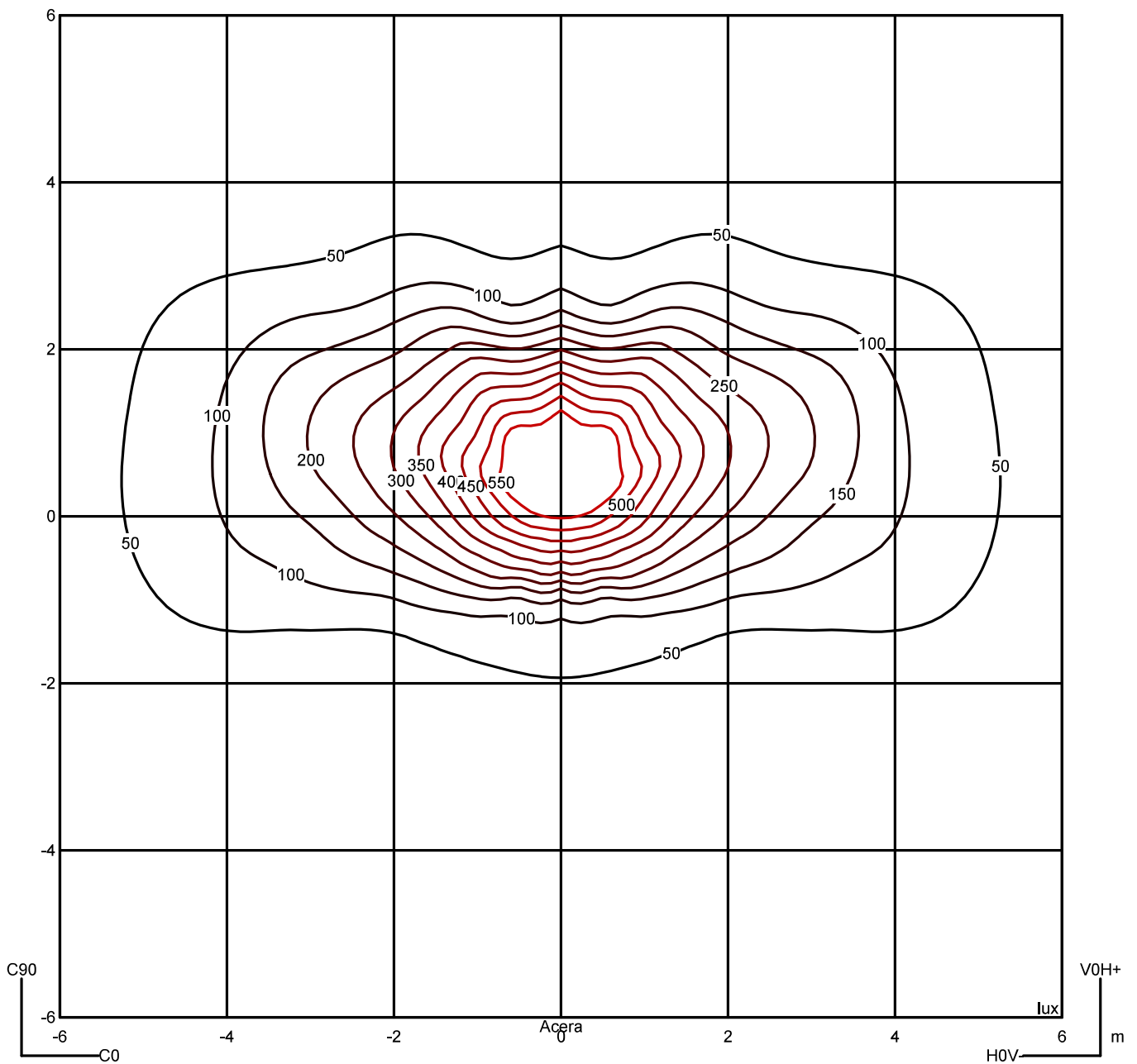
**Luminaria**  
 Código APMS  
 Nombre P.Milan S 80W 4k  
**Ensayo**  
 Código CL237A21F019V  
 Nombre P.Milan S 80W 4k

Flujo Luminaria	10738.02 lm	Potencia Luminaria	82.96 W	Eficacia	129.43 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	10738.02 lm	Valor Máximo	5285.67 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

Isolux (Suelo)

Posición Luminaria X=0.00m Y=0.00m Z=2.50m

Vial



### 4.7. Factor de utilización

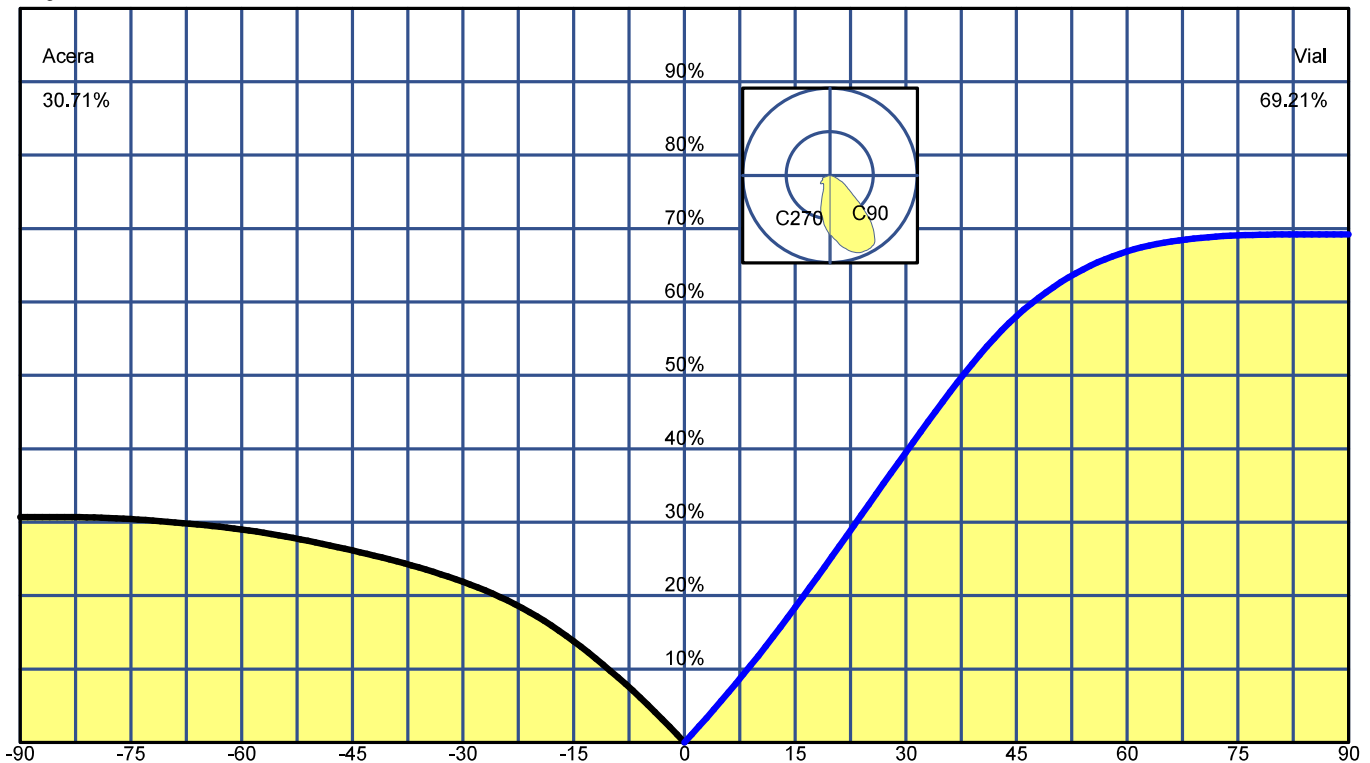
**Luminaria**  
 Código APMS  
 Nombre P.Milan S 80W 4k  
**Ensayo**  
 Código CL237A21F019V  
 Nombre P.Milan S 80W 4k

Flujo Luminaria	10738.02 lm	Potencia Luminaria	82.96 W	Eficacia	129.43 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	10738.02 lm	Valor Máximo	5285.67 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

Acera			Vial		
Ángulo	0	0.00%	Ángulo	0	0.00%
Ángulo	-5	5.14%	Ángulo	5	5.64%
Ángulo	-10	9.73%	Ángulo	10	11.78%
Ángulo	-15	13.78%	Ángulo	15	18.38%
Ángulo	-20	17.17%	Ángulo	20	25.32%
Ángulo	-25	19.81%	Ángulo	25	32.41%
Ángulo	-30	21.87%	Ángulo	30	39.50%
Ángulo	-35	23.53%	Ángulo	35	46.40%
Ángulo	-40	24.93%	Ángulo	40	52.76%
Ángulo	-45	26.15%	Ángulo	45	58.05%
Ángulo	-50	27.25%	Ángulo	50	62.02%
Ángulo	-55	28.22%	Ángulo	55	64.93%
Ángulo	-60	29.00%	Ángulo	60	66.88%
Ángulo	-65	29.59%	Ángulo	65	68.07%
Ángulo	-70	30.05%	Ángulo	70	68.73%
Ángulo	-75	30.42%	Ángulo	75	69.06%
Ángulo	-80	30.64%	Ángulo	80	69.18%
Ángulo	-85	30.70%	Ángulo	85	69.20%
Ángulo	-90	30.71%	Ángulo	90	69.21%

Ángulo de Inclinación = 0.0

DLOR = 99.91%



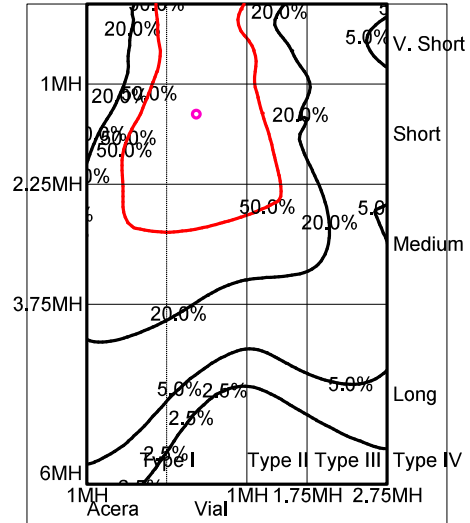
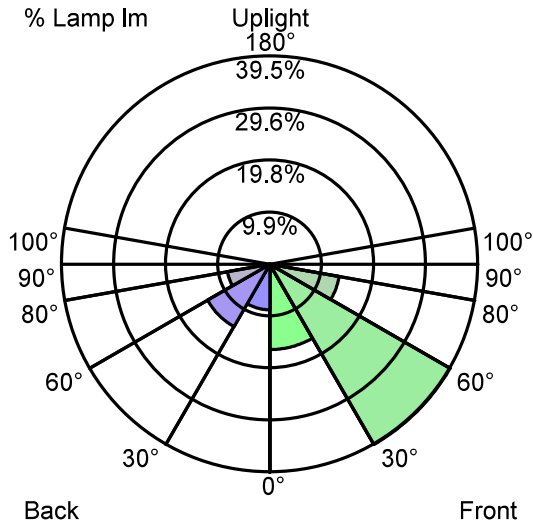
Spread	40.8° Estrecho	DLOR	99.91312 %
Throw	54.1° Corto	ULOR	0.08688 %
Cutoff CIE	Cutoff - Max: C=15.0° Gamma=55.0°	Eficiencia	100.00000 %
Cutoff lesna	Cutoff	RN	0.08688 %
DIN5044	KB1	Clase de Intensidad Luminosa	G*6
	IESNA Type II Short Asymmetrical	Índice de Deslumbramiento	D5

### 4.8. Clasificación vial según IES TM-15

**Luminaria**  
 Código APMS  
 Nombre P.Milan S 80W 4k  
**Ensayo**  
 Código CL237A21F019V  
 Nombre P.Milan S 80W 4k

Flujo Luminaria	10738.02 lm	Potencia Luminaria	82.96 W	Eficacia	129.43 lm/W	Eficiencia	100.00%
Flujo Fuentes de luz	10738.02 lm	Valor Máximo	5285.67 cd	Posición	C=15.00 G=55.00	CG	Sim. en los planos 270-90

US ROAD STANDARDS



Luminaire Classification System (LCS)			
LCS Zone		Lumens	%Lamp %Lum
FL	0° -- 30°	1741.0 lm	16.2 % 16.2 %
FM	30° -- 60°	4244.4 lm	39.5 % 39.5 %
FH	60° -- 80°	1435.5 lm	13.4 % 13.4 %
FVH	80° -- 90°	10.6 lm	0.1 % 0.1 %
BL	0° -- 30°	930.3 lm	8.7 % 8.7 %
BM	30° -- 60°	1468.6 lm	13.7 % 13.7 %
BH	60° -- 80°	878.5 lm	8.2 % 8.2 %
BVH	80° -- 90°	19.8 lm	0.2 % 0.2 %
UL	90° -- 100°	0.9 lm	0.0 % 0.0 %
UH	100° -- 180°	8.5 lm	0.1 % 0.1 %
TOTALS		10738.0 lm	100.0 % 100.0 %
BUG B2 U1 G2 Type II Short Asymmetrical			



**ANNEX N°3: Pla d'obra**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**  
**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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**ANNEX N°3: PLA D'OBRA**

**1.- INTRODUCCIÓ:**

S'ha elaborat un PLA D'OBRA, amb caràcter merament indicatiu, corresponent a la possible execucio de les obres considerades en el projecte, d'acord amb lo establert en l'article 124 del text refós e la llei de Contractes de les Administracions Publiques. --

**2.- DESCRIPCIO DEL PLA D'OBRA. DIAGRAMA DE BARRES:**

S'ha realitzat un Diagrama de Barres representatiu de les obres, amb indicació del termini total estimat per a l'acabament de les mateixes. -----

El diagrama s'ha elaborat tenint en compte les activitats corresponents a les unitats d'obra més importants, exposant les indicacions dels terminis parcials i les diferents parts de l'obra. -----

S'ha volgut tenir en compte el rendiment dels equips que figuren en a l'annex de Quadre de Preus n°2 i el volum d'obra a construir. Amb aquest últim, s'ha calculat la durada aproximada en dies de cada part de les obres, i posteriorment s'ha aplicat un coeficient corrector per compensar les pèrdues per condicions de simultaneïtat d'usos.

Totes aquestes dades serveixen per plantejar el quadre adjunt, en el que no figuren mes que les unitats o grups d'unitats determinants de la durada dels treballs.-----



PLA D'OBRES					
ACTIV	MESOS				
	1-2 MES		3-4 MES		5-6 MES
OBRA CIVIL					
CONTROL DE QUALITAT					
BAIXA TENSÍO					
VARIS					

Es contempla l'entrega de totes les lluminàries al magatzem del ajuntament i s'agafa una al atzar o dues que es portaran assajar, sent el plaç d'entrega de resultats de tres / 4 setmanes, mentrestant estaran custodiades al magatzem.

El termini de les obres es de 6 mesos

La Palma de Cervelló, a novembre del 2022  
L'enginyer Industrial

Josep Ibañez Gassiot





**ANNEX N°4: Programa de control de qualitat**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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## PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----

**PROMOTOR:** AJUNTAMENT DE LA PALMA DE CERVELLÓ  
**EQUIP REDACTOR:** Sr. JOSEP IBAÑEZ GASSIOT

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### ANNEX N° 4: PROGRAMA DE CONTROL DE QUALITAT

#### **1.1.- Implantació de serveis.**

- 1.1.1.- Assaigs de qualitat dels materials de rebliment de rases.
- 1.1.2.- Assaigs de compactació de rases.
- 1.1.3.- Control de recepció de materials per instal·lacions i serveis
- 1.1.4.- Control d'acceptació de les xarxes i instal·lacions elèctriques.

#### **1.2.- Obra Civil**

- 1.2.1.- Execució formigó a fonaments.
- 1.2.2.- Acceptació d'acer per armat.

#### **1.3.- Control de llumeneres**

- 1.3.1.- Control previ.
- 1.3.2.- Control instal·lat.

#### **1.4.- Normes d'execució d'assaigs**

- 1.4.1.- Normes oficials.
- 1.4.2.- Relació de normatives per activitat.



### **1.1.- Implantació de serveis**

#### **1.1.1.- Assaigs de qualitat dels materials de rebliment de rases**

- 1 Assaig Pròctor Modificat cada 400 m<sup>3</sup> de rasa compactada o canvi de material.
- 1 Assaig granulomètric cada 1.000 m<sup>3</sup> de rasa compactada o canvi de material.
- 1 Assaig de Límits d'Atterberg cada 1.000 m<sup>3</sup> de rasa compactada o canvi de material.
- 1 Assaig Índex CBR cada 1.000 m<sup>3</sup> de rasa compactada o canvi de material.
- 1 Assaig de determinació de matèria orgànica cada 1.000 m<sup>3</sup> de rasa compactada o canvi de material.

#### **1.1.2.- Assaigs de compactació de rases**

- 5 Assaigs de Densitat in situ cada 50 ml. de rasa compactada.
- 5 Assaigs d'Humitat in situ cada 50 ml. de rasa compactada.

#### **1.1.3.- Control de recepció de materials per instal·lacions i serveis**

- 1 Control comprovació característiques tècniques (mides, gruixos, etc.).
- 1 Control de certificat i catàlegs.
- 1 Control de compliment de les especificacions de la normativa oficial i certificat de prova en fàbrica per cada diàmetre i 500 ml. de conducte elèctric instal·lat.

#### **1.1.4.- Control d'acceptació de les xarxes i instal·lacions elèctriques**

##### **1.1.4.1.- Enllumenat públic**

- 1 Comprovació de caiguda de tensió menor al 3 % per cada punt de llum col·locat.
- 1 Comprovació d'aïllament dels conductors i neutre, de cadascun d'ells i la línia de terra per cada línia instal·lada.
- 1 Comprovació d'intensitat normal dels diferents fusibles per cada 20 punts de llum instal·lats.
- 1 Mesura de línia de terres per cada línia instal·lada.
- 1 Mesura d'intensitat a cadascuna de les fases per línia instal·lada.
- 1 Identificació de fases en quadres de comandament.
- 1 Comprovació de valors d'il·luminació amb luxòmetre per cada 10 punts de llum instal·lats.

### **1.2.- OBRA CIVIL**

#### **1.2.1.- Execució formigó**

- 1 Assaig consistència con d'Abrams cada 100 m<sup>3</sup>.
- 1 Assaig resistència compressió, 6 provetes, cada 100 m<sup>3</sup>.



### **1.2.2.- Acceptació d'acer per armat**

Per cada decímetre de barres emprat:

2 Verificacions de la secció equivalent.

2 Assaigs de doblegament a 180° i desdobleament a 90°.

2 Verificacions característiques geomètriques dels resalts.

Dos cops al llarg de l'obra:

1 Assaig límit elàstic.

1 Assaig de càrrega de trencament i allargament en trencament.

### **1.3.- Control de llumeneres**

#### **1.3.1.- Control previ**

S'entregarà les fitxes de cada lluminària a instal·lar conjuntament amb l'assaig de homologació del producte, referent a la seguretat elèctrica (EN 60598-1:2015 + A1:2018, EN 60598-2-3:2002 +A1:2011), IP i IK.

S'entregarà l'assaig de cada lluminària en funció de la EN 13032-4:2016.

#### **1.3.2.- Control obra executada**

Per validar la traçabilitat de que els assajos entregats s'ajusten a les lluminàries instal·lades, s'agafaran tres lluminàries al atzar definides per D.F. o la propietat i es portaran a assajar a una laboratori acreditat, realitzant-se els següents assajos parcials de les llumeneres:

- **SEGURETAT ELÈCTRICA (EN 60598-1: 2015 + A1: 2018 + A 60598- 2-3: 2002 + A1: 2011)**

Inspecció visual de punts crítics + verificació de marcat i instruccions Assaigs de parciales endurància segons apartat 12.3 i verificació de Tc segons apartat 12.4

Assaigs d'estanqueïtat grau IP (segona xifra) segons apartat 9.2.

Assaigs de rigidesa dielèctrica segons apartat 10.2.2

Verificació de resistència a impactes grau IK

- **Fotometria (ASSAIG Reduïda A 13.032-4: 2016)**

Rendiment del llum en lm / W

Verificació de l'índex de reproducció cromàtica CRI

Verificació de temperatura de color



#### **1.4.- NORMES D'EXECUCIÓ D'ASSAIGS**

##### **1.4.1.- Normes oficials**

Les Normes d'execució d'assaigs es concreten bàsicament en:

- Normes UNE declarades d'acompliment obligatori per ordres ministerials de 5 juliol de 1967 i d'11 de maig de 1971.
- Normes NLT del Laboratori del Transport i de Mecànica del Sòl.
- Normes A.S.T.M. i Normes D.I.N. (Normes d'altres països a les quals es pot fer referència).

##### **1.4.2.- Relació de normatives per activitat**

Resistència a compressió .....	UNE 7240-7242
Consistència.....	UNE 7103
Resistència a compressió prèvia extracció de testimoni.....	UNE 7241
Resistència al desgast .....	UNE 7015
Contingut de Sulfats .....	UNE 7245
Contingut de Terrossos d'Argila .....	UNE 7133
Resistència a flexo-tracció .....	UNE 7240-7395
Acceptació dels àrids .....	UNE 7133-7135 i UNE 7244-7245
Granulomètrica .....	NLT-104
Límits d'Atterberg .....	NLT-105 i 106/72
Pròctor Modificat .....	NLT-108
Índex CBR .....	NLT-111
Contingut de matèria orgànica (únicament en cas de dubte).....	NLT-117
De densitat in situ d'humitat in situ .....	NLT-109
Equivalent de sorra .....	NLT-113/72
Qualitat de "Los Angeles" .....	NLT-149/72
Resistència a compressió en provetes fabricades amb el motlle i compactació de l'assaig .....	NLT-108/72
Pròctor Modificat .....	NLT-150
Coeficient de poliment accelerat (únicament a capa de trànsit de vies ràpides) .....	NLT-174
Forma dels àrids	
Adhesivitat .....	NLT-355
Marshall .....	NLT-159
Granulometria dels àrids del polsim de pedrera (filler) .....	NLT-150 i NLT-151
Granulomètric de la mescla fabricada després d'extret el lligant .....	NLT-165



**Ajuntament de  
la Palma de Cervelló**

PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA  
DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ

Marshall determinacions de buit .....	NLT-162
Contingut de lligant .....	NLT-164
Prova de flexió transversal (resistència a aixafament) .....	TMM-73

Les normes esmentades regulen l'execució d'assaigs normalitzats relatius a les diferents activitats de les obres d'urbanització.

El programa de control ha de fer referència a les normes que defineixen l'assaig més adient per a cada unitat d'obra.

La Palma de Cervelló, a novembre del 2022

L'enginyer Industrial

Josep Ibañez Gassiot



**ANNEX 5.** Pla de protecció del arbrat

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. ....**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**  
**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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**ANNEX N°5: PLA DE PROTECCIÓ DE L'ARBRAT VIARI**

**1.- INTRODUCCIÓ:**

S'ha elaborat un pla de treball d'acord amb lo establert en el Pla director de l'arbrat viari del Ajuntament de Mataró.-----

**2.- DESCRIPCIÓ DEL PLA DE TREBALL:**

La protecció de la vegetació ha de realitzar-se amb anterioritat a l'inici de les obres i molt especialment, abans de l'entrada de qualsevol maquinària. -----

Per evitar tant danys directes (cops, ferides) com indirectes (compactació del sòl), abans d'iniciar les obres s'ha d'instal·lar un tancament de fusta que limiti l'accés de la maquinària. -----

Si això no fos possible, abans de l'inici de les obres es realitzarà la senyalització d'una via de pas restringit a maquinària, mitjançant la localització de balises de 3 m. davant de cada arbre, així com de cintes de senyalització per indicar el gàlib. -----

En cas de que per necessitats de l'obra, la maquinària hagi de transitar per una zona externa a la via de pas, serà necessari procedir prèviament a la senyalització d'una nova via, sota la tutela de la Direcció facultativa. -----

És necessari preveure la presència de personal qualificat a l'obra durant l'execució dels treballs d'obertura de rases, per poder actuar correctament en el tractament de les arrels. -----

El perímetre del tronc dels arbres si es de 60 cm a 99 cm d'amplada, el radi de la base de les arrels es de 2 metres.-----





La zona de seguretat es igual o superior al 20% del radi de la base dels arbres. Sent en aquest cas 2,40 metres. -----

La protecció individuals dels arbres contra els cops consistirà en realitzar tancats de fusta de 2 metres d'alçada com a mínim, i es protegirà amb material d'encoixinat (bandes de jute), la part del tronc en contacte amb el tancat de fusta, les zones de contacte dels lligams amb l'escorça, i la zona del coll de l'arrel si fos necessari. -----

#### Protecció durant l'obertura de rases.

Durant l'obertura de rases i/o altres excavacions, es tindran en compte les següents indicacions:

- Els treballs d'excavació a una distància mínima de 50 cm. o en la zona de Seguretat i fins a 150 cm. de fondària, es realitzaran manualment. -----
- Quan en el procés d'excavació, apareguin arrels de més de 3 cm. de diàmetre, el personal qualificat procedirà immediatament a la poda correcta de l'arrel afectada. ----
- Si es tracta d'arrels de més de 10 cm. de diàmetre, es respectaran sempre que sigui possible i es protegiran contra la dessecació amb un embolcall de jute o amb una manta orgànica. -----
- En acabar l'excavació de la rasa, es protegirà la paret més propera a l'arbre amb una manta orgànica que es mantindrà humida fins al recobriment de la rasa. -----
- Les arrels no han d'estar descobertes més de dos dies i serà necessari garantir el manteniment de les condicions d'humitat necessàries. -----
- Es realitzarà un manteniment de la zona d'arrelament mentre dura l'obra. -----

#### Protecció durant el canvi de paviments.

En les operacions derivades dels canvis de paviments, es tindran en compte les següents indicacions:

- A la base de les arrels i a les zones de major concentració, l'excavació es realitzarà manualment. -----
- A qualsevol altre zona que a l'excavar amb la maquinaria surtin arrels de més de 3 cm. de diàmetre, es continuaran els treballs manualment. -----
- A totes les zones on es detecti presència significativa d'arrels es substituiran els primers 10 cm. de terra per sorra de riu rentada, abans de compactar i recobrir. -----
- S'adoptarà la màxima precaució en els treballs d'anivellació del terreny. A la Zona de Seguretat, es realitzaran de forma manual. -----
- La compactació prèvia al recobriment es reduirà al mínim per garantir l'estabilitat del nou paviment i a la Zona de Seguretat, es realitzarà de forma manual. -----



Restauració.

S'exigirà als responsables de l'obra que una vegada conclosa aquesta i en el termini prèviament establert, restitueixin l'estat de l'espai verd tal i com es trobava abans de l'inici de les obres, reposant si convé, els elements temporalment suprimits i reparant els danys que s'hagin pogut originar. -----

En determinades circumstàncies, podrà obligar-se a realitzar restauracions parcials en el transcurs de l'obra. -----

La Palma de Cervelló, a novembre del 2022

L'enginyer Industrial

Josep Ibañez Gassiot



## **DOCUMENT Nº 2 PLÀNOLS**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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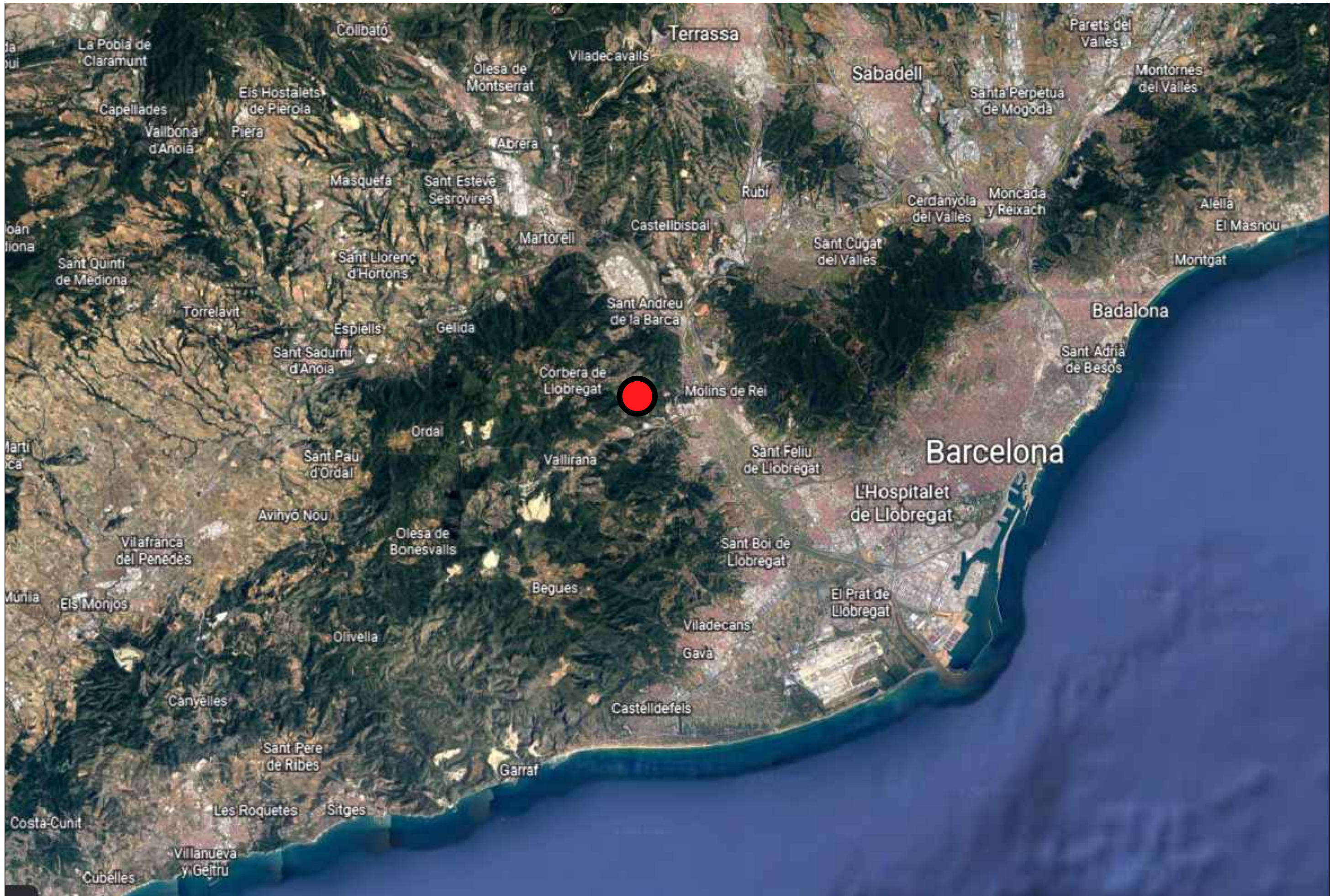
**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**  
**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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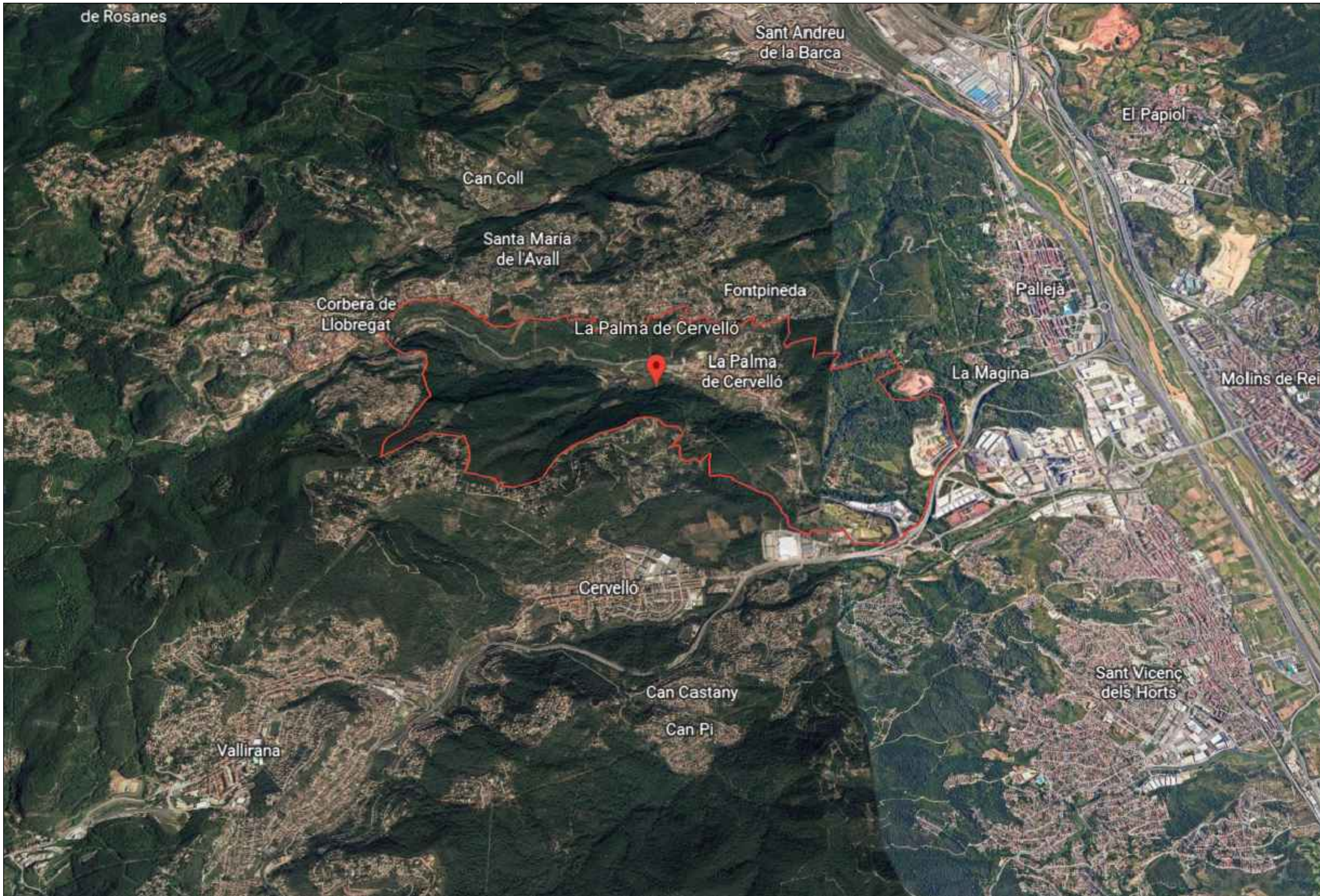
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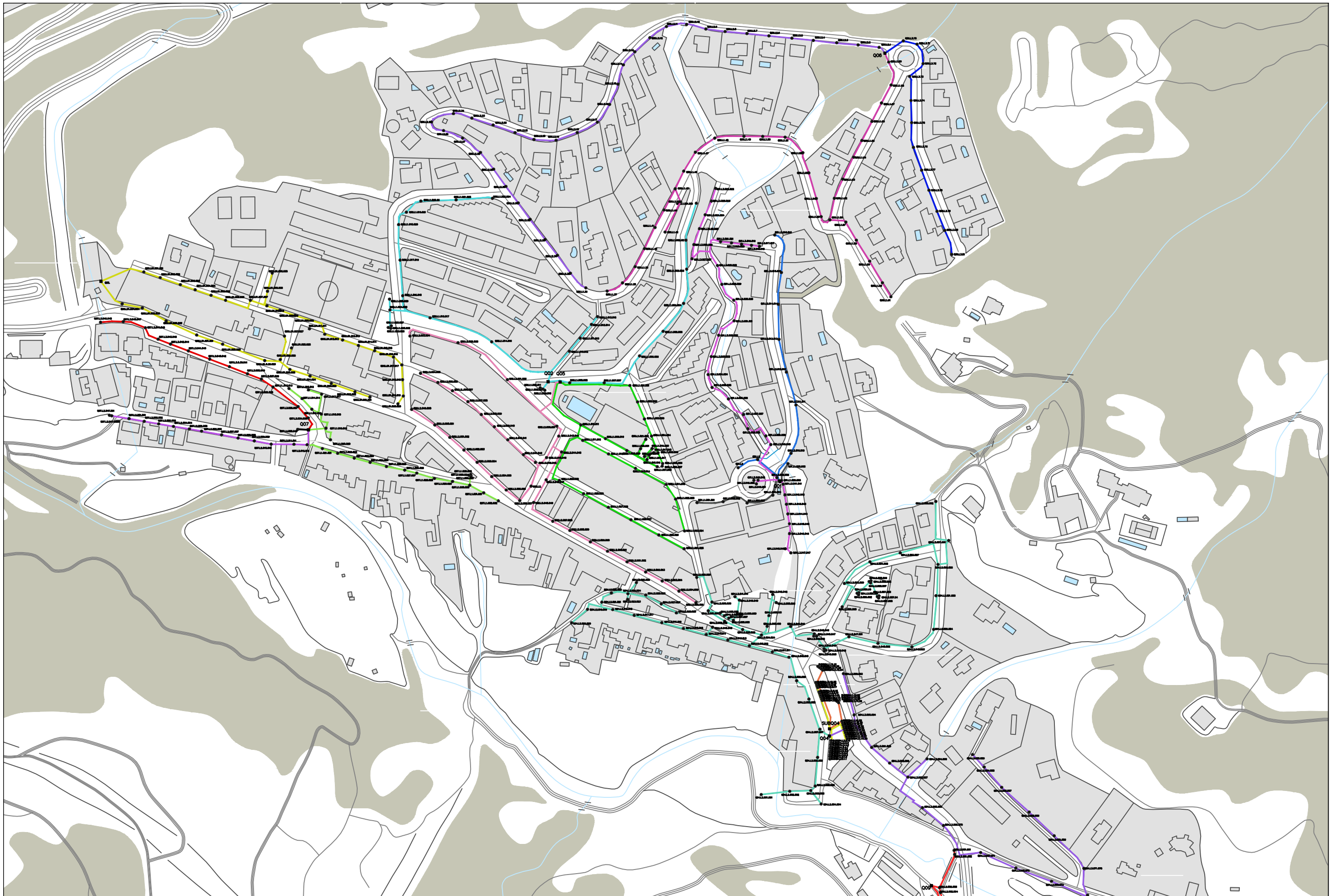

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 PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ

**PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ**

PLANOL N°	REF. : 22
<b>01</b>	DATA: NOV-2022
	ESCALA: 1/--



 Carrer Josep Domenech n°23 08349-Cabrera de Mar (Barcelona)	E-mail: info@engivert.com Tel. 606 522 900						TITOL PLANOL: <b>EMPLAÇAMENT</b>	TITOL PROJECTE: PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ	PLANOL N° <b>02</b>	REF. : 22
		REV. N	DIB.	DATA	COMP.	OBSERVACIONS		PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ	ESCALA: 1/--	

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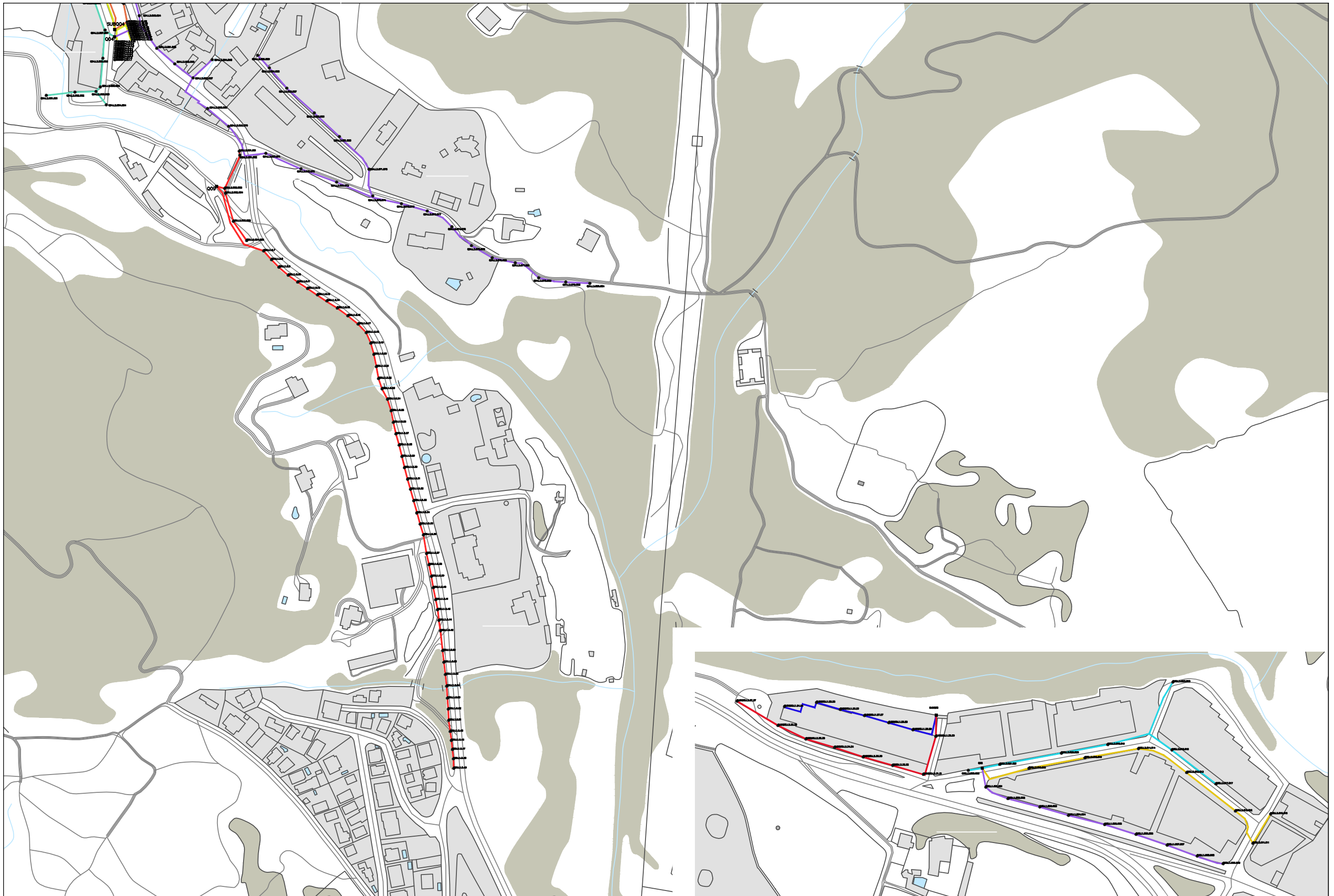
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**SITUACIÓ GENERAL**

**TITOL PROJECTE:**  
 PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ

**PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**PLANOL N°**  
03

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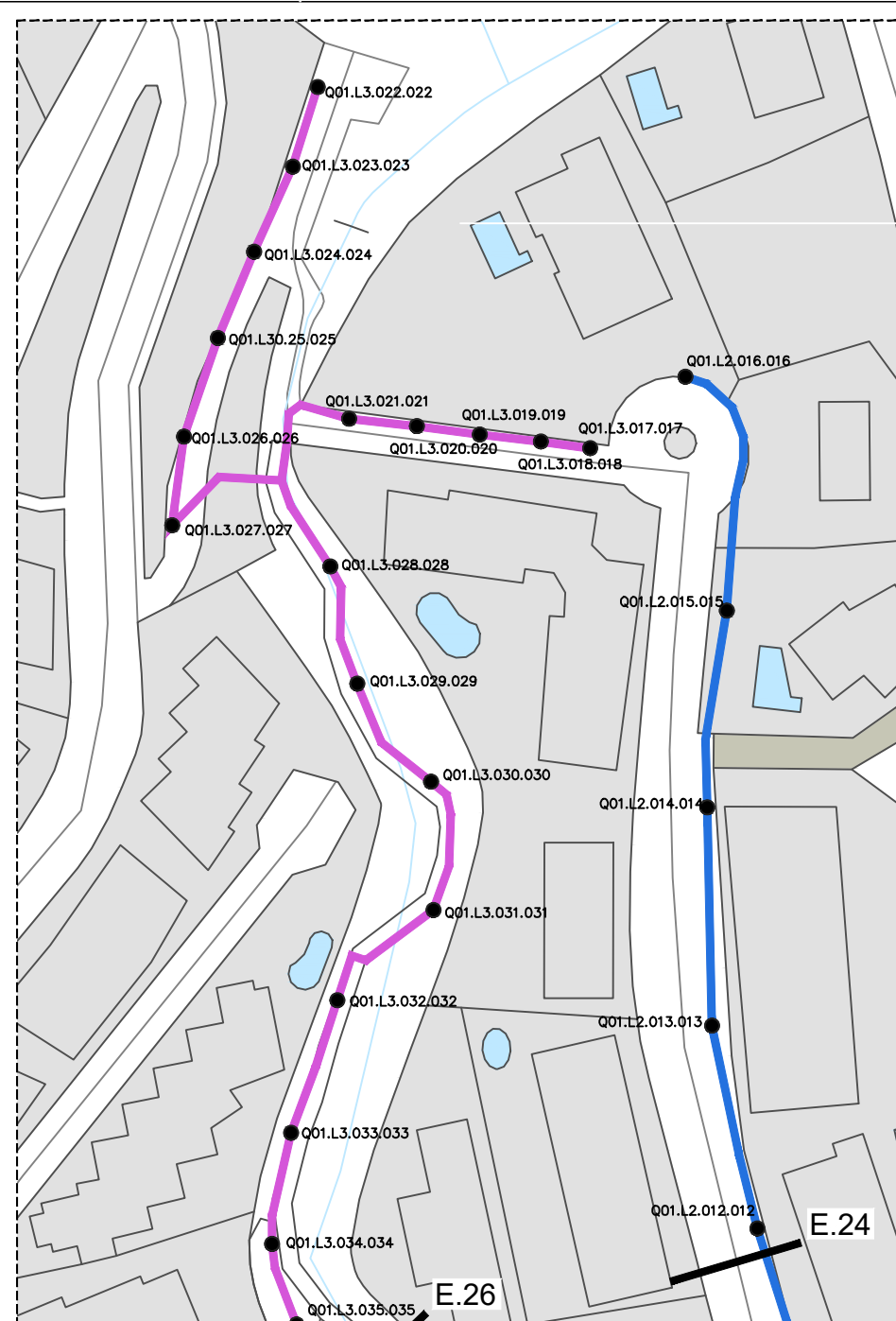
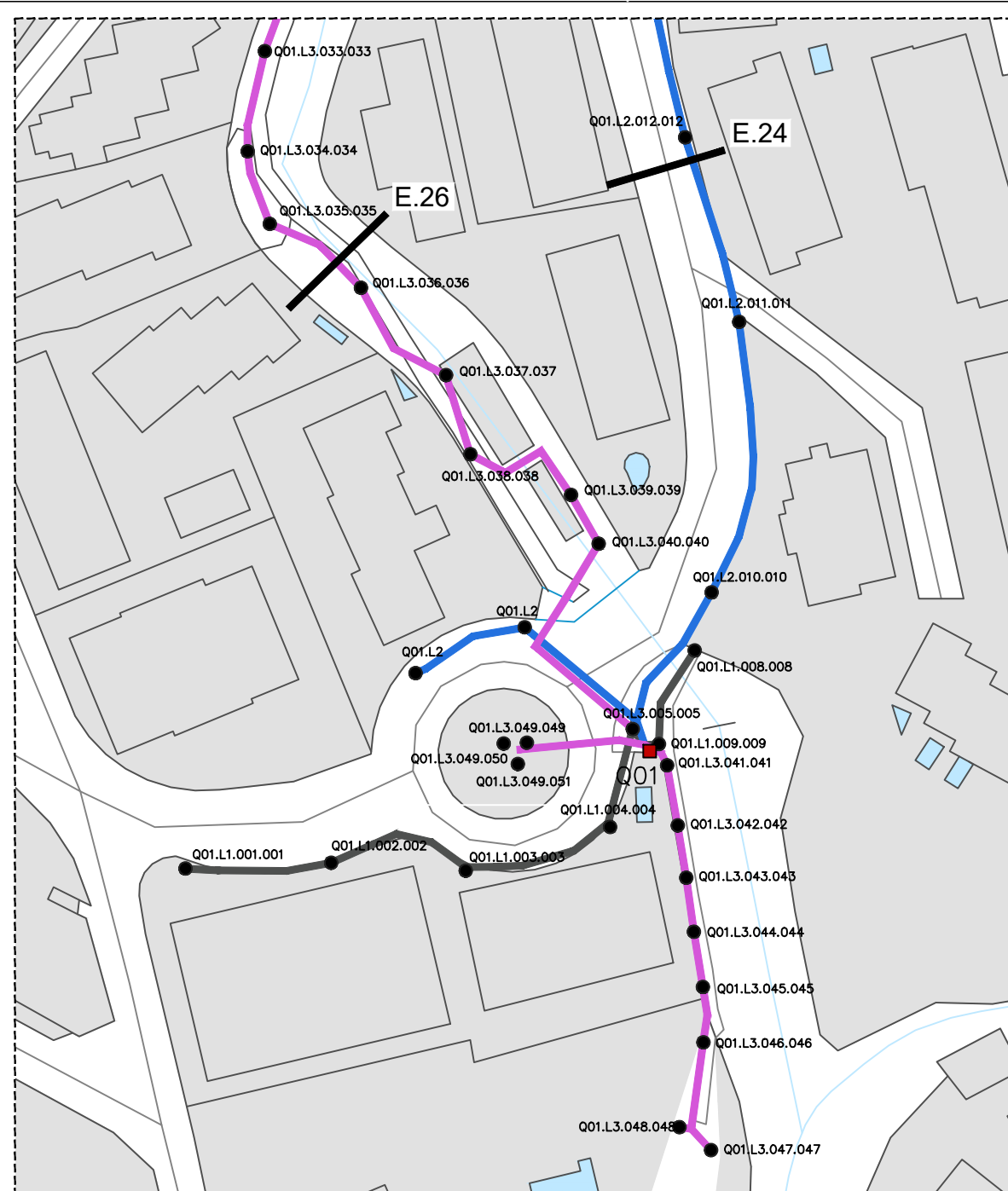
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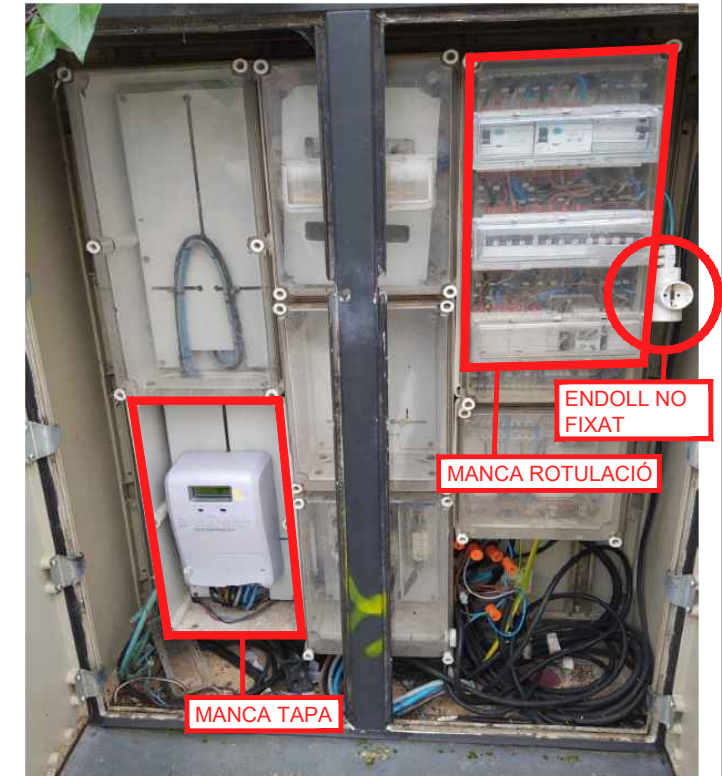
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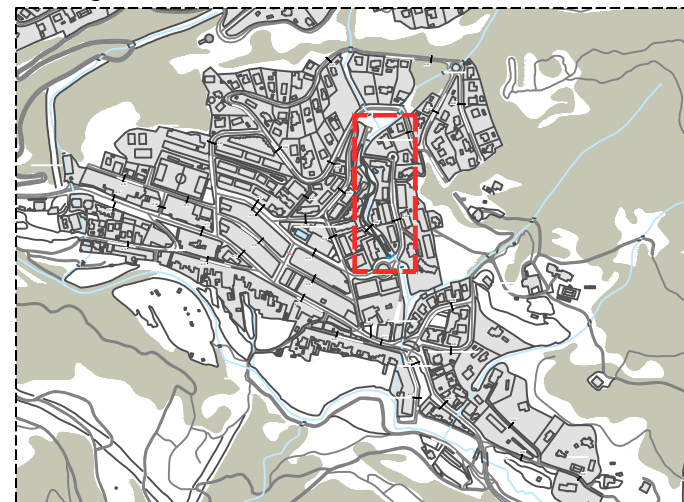




FOTOGRAFIES QUADRE N°1



**Plànol guia**



**DEFECTES QUADRE N°1**

- MANCA TAPA AL MÒDUL DE DOBLE AÏLLAMENT DEL COMPTADOR
- CONNEXIONS DE LA LÍNIA L3 FORA DEL MÒDUL DE BORNES DE SORTIDA
- NO EXISTEIX ESQUEMA DE LA INSTAL·LACIÓ AL QUADRE
- ENDOLL NO FIXAT A CARRIL DIN
- VALORS DE RESISTÈNCIA D'AÏLLAMENT MOLT INFERIORS A 0,5 MOHMS A L2 I L3
- NO EXISTEIX D'INTERRUPTOR GENERAL AUTOMÀTIC NI DE PROTECTOR CONTRA SOBRETENSIONS PERMANENTS I TRANSITÒRIES
- NO EXISTEIX ROTULACIÓ ADEQUADA DELS ELEMENTS DE PROTECCIÓ DEL QUADRE
- MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT

**Simbologia**

- Luminaria.
- Quadre electric
- E.nº | Secció d'estudi luminc.



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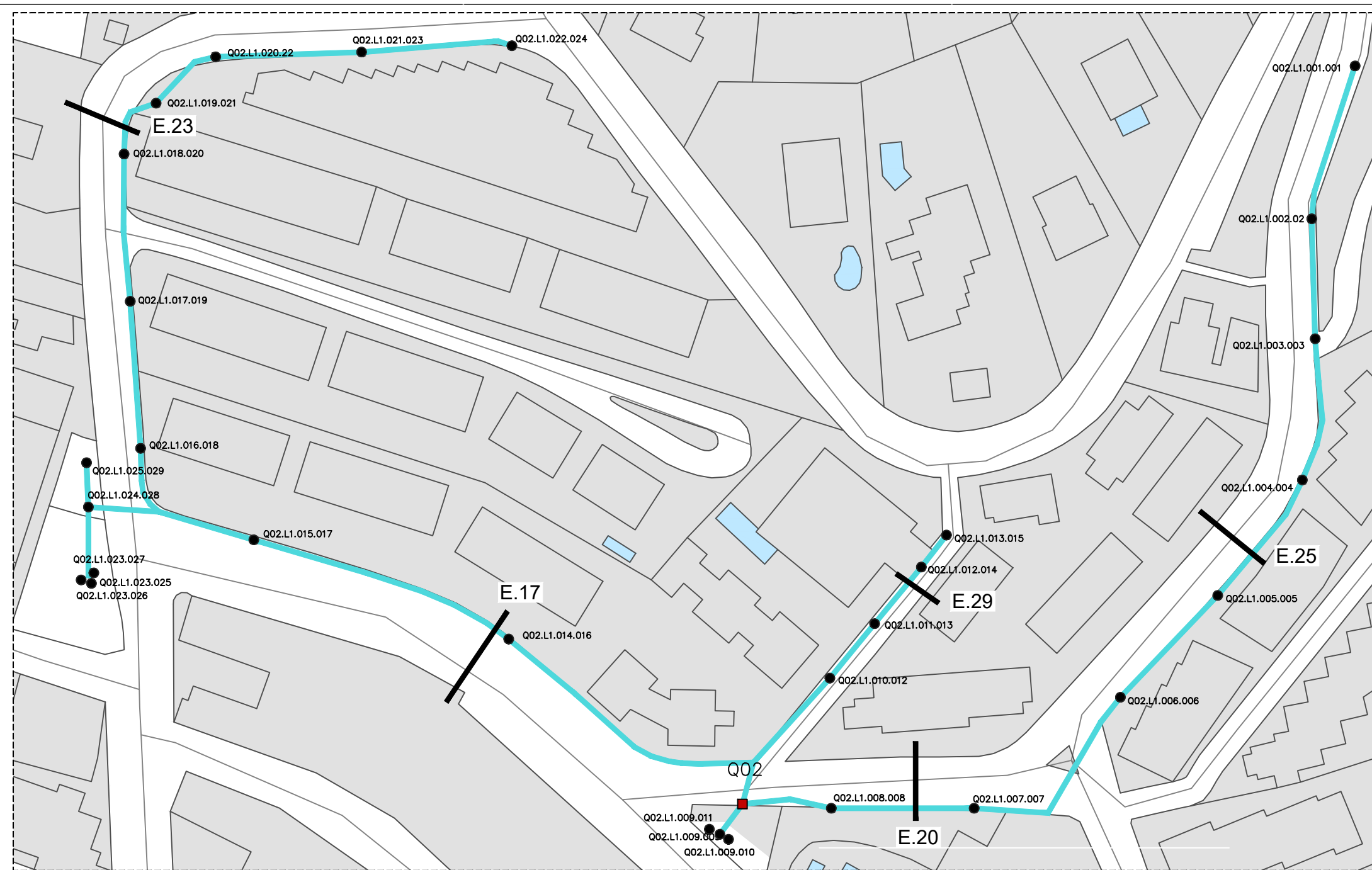
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**ESTAT ACTUAL  
QUADRE N° 1**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ

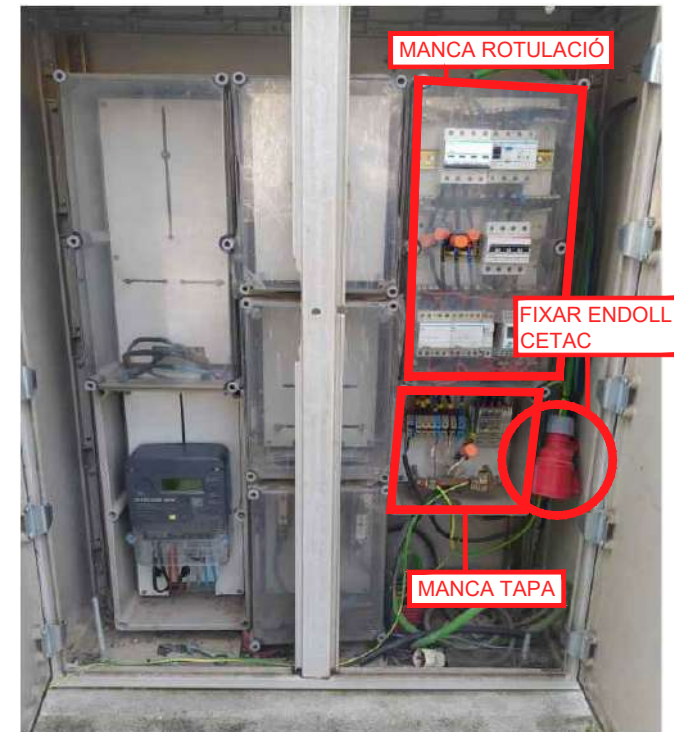
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PLANOL N°  
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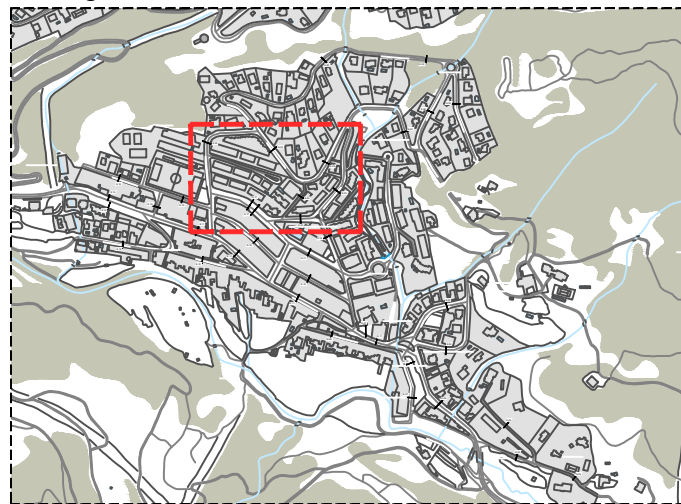
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DATA: NOV-2022  
ESCALA: 1/1000



FOTOGRAFIES QUADRE N°2



Plànol guia



DEFECTES QUADRE N°2

- FALTA TAPA AL MÒDUL DE DOBLE AÏLLAMENT AL BORNES DE SORTIDA I AL COMPTADOR
- NO EXISTEIX D'INTERRUPTOR GENERAL AUTOMÀTIC NI DE PROTECTOR CONTRA SOBRETENSIONS
- PERMANENTS I TRANSITÒRIES
- PANY DE LA PORTA DEL QUADRE ELÈCTRIC TRENCAT
- SURTEN DOS CABLES D'UN MATEIX BORNE DE SORTIDA (ALIMENTACIÓ PROJECTORS)
- ENDOLL CETAC NO FIXAT CORRECTAMENT
- NO EXISTEIX DIFERENCIAL A LA LÍNIA 2 (BASE CETAC)
- MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT
- VALORS DE RESISTÈNCIA D'AÏLLAMENT MOLT INFERIORS A 0,5 MOHMS A L1
- NO EXISTEIX ESQUEMA DE LA INSTAL·LACIÓ AL QUADRE
- NO EXISTEIX ROTULACIÓ ADEQUADA DELS ELEMENTS DE PROTECCIÓ DEL QUADRE
- CABLEJAT D'ALIMENTACIÓ DELS PROJECTORS DE LA PLAÇA, UBICADA DAVANT DARRERA DEL QUADRE, INFERIOR A 4mm 2

Simbologia

- Luminària.
  - Quadre electric
- E.n° | Secció d'estudi luminc.



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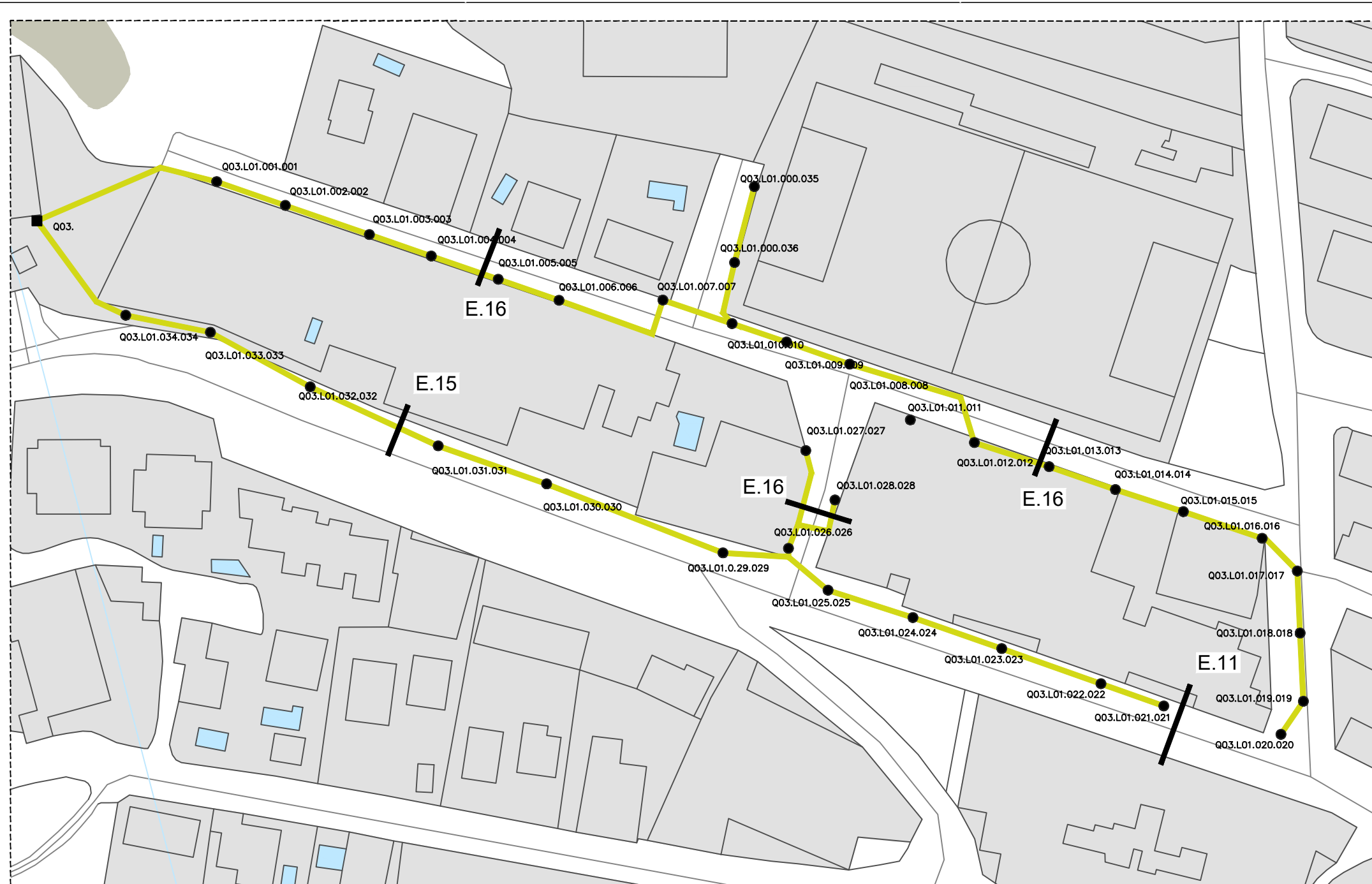
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TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

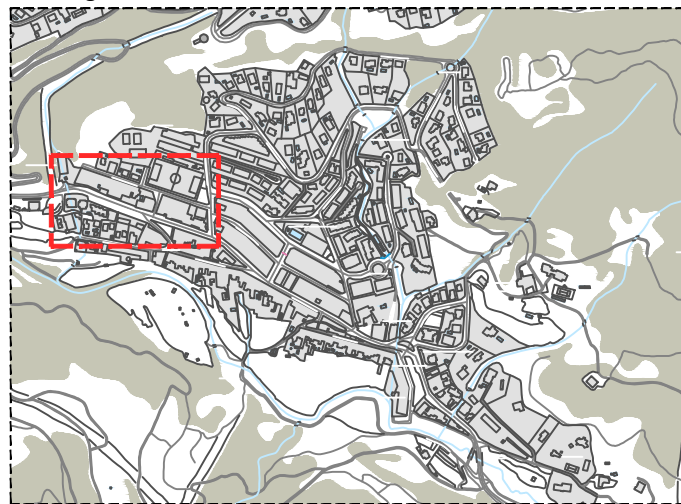
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<b>06</b>	DATA: NOV-2022
	ESCALA: 1/1000



FOTOGRAFIES QUADRE N°3



Plànol guia



DEFECTES QUADRE N°3

- NO EXISTEIX ESQUEMA DE LA INSTAL·LACIÓ AL QUADRE
- NO EXISTEIX POSTA A TERRA DE LA INSTAL·LACIÓ
- NO EXISTEIX D'INTERRUPTOR GENERAL AUTOMÀTIC NI DE PROTECTOR CONTRA SOBRETENSIONS PERMANENTS I TRANSITÒRIES
- MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT
- NO EXISTEIX ROTULACIÓ ADEQUADA DELS ELEMENTS DE PROTECCIÓ DEL QUADRE
- NO EXISTEIX PROTECCIÓ DIFERENCIAL A LA LÍNIA D'ENLLUMENAT
- FALTA TAPA AL MÒDUL DE DOBLE AÏLLAMENT AL COMPTADOR

Simbologia

- Luminaria.
- Quadre electric
- E.n° | Secció d'estudi luminc.



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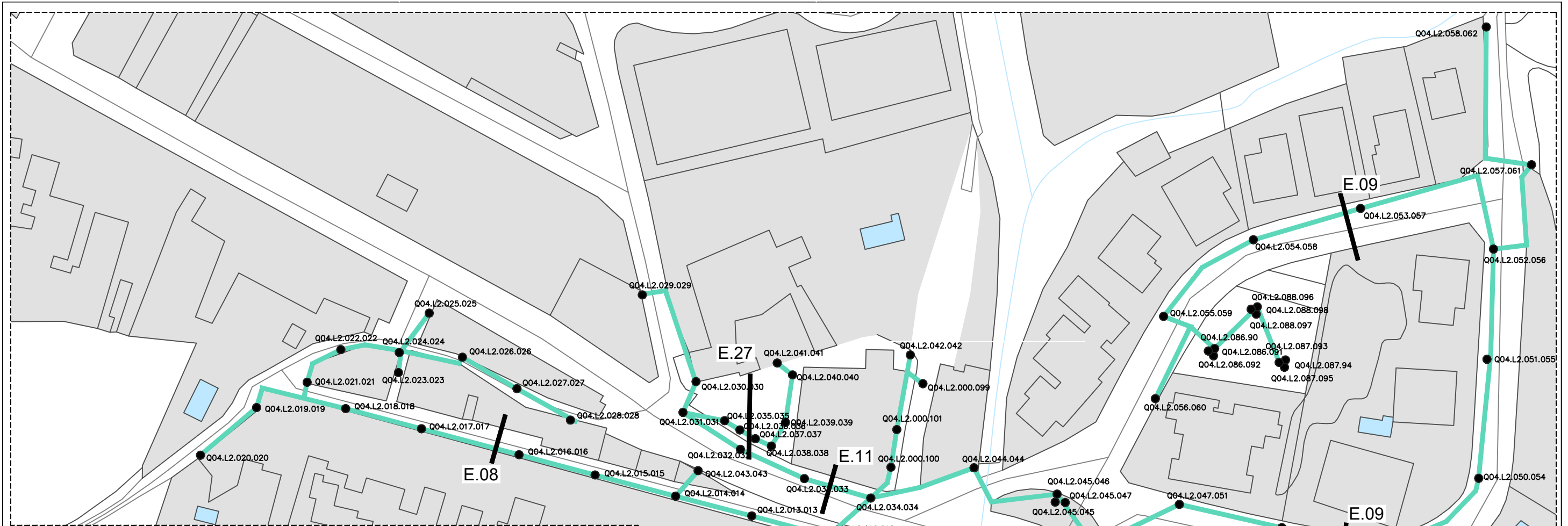
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QUADRE N° 3**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

PLANOL N°  
**07**

REF. : 07  
DATA: NOV-2022  
ESCALA: 1/1000



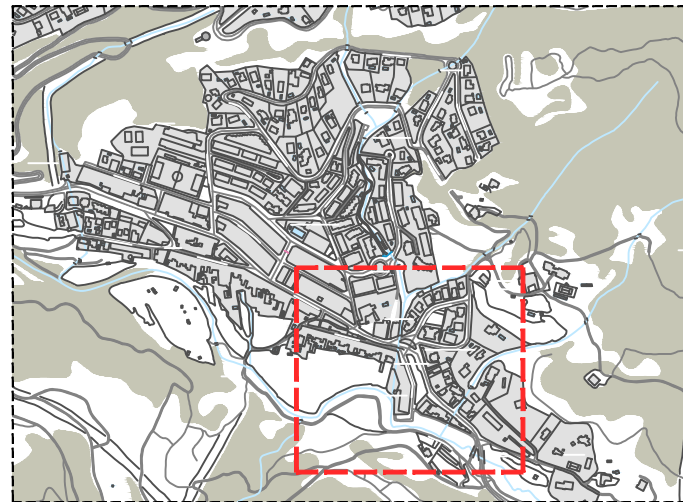
**DEFECTES QUADRE N°4**

- NO EXISTEIX ESQUEMA DE LA INSTAL·LACIÓ AL QUADRE
- MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT
- NO EXISTEIX D'INTERRUPTOR GENERAL AUTOMÀTIC NI DE PROTECTOR CONTRA SOBRTENSIONS PERMANENTS I TRANSITÒRIES
- NO EXISTEIX ROTULACIÓ ADEQUADA DELS ELEMENTS DE PROTECCIÓ DEL QUADRE
- NO EXISTEIX DIFERENCIAL A LA LÍNIA 2
- VALORS DE RESISTÈNCIA D'AÏLLAMENT INFERIORS A 0,5 MOHMS A L2 I A L3

**DEFECTES SUB QUADRE N°4**

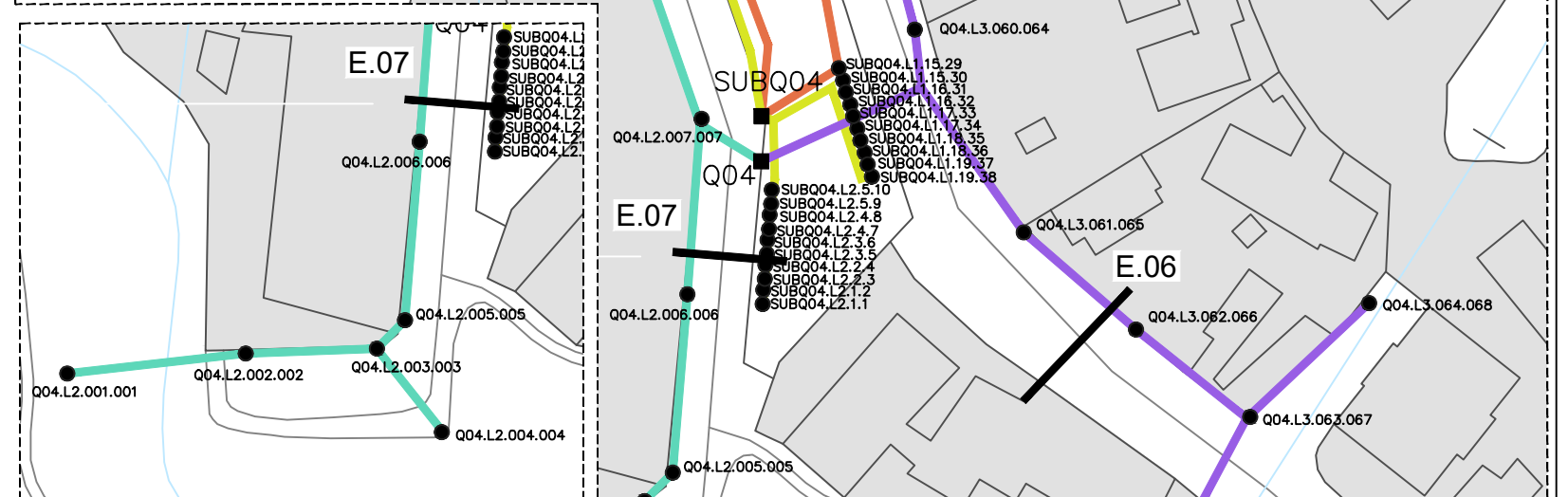
- NO EXISTEIX ESQUEMA DE LA INSTAL·LACIÓ AL QUADRE
- MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT
- VALOR DE POSTA A TERRA DEL QUADRE ELÈCTRIC ELEVADA (+ DE 30 OHMS)

**Plànol guia**



**Simbologia**

- Luminaria.
- Quadre electric
- E.n° Secció d'estudi luminc.



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REV.	N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT ACTUAL**  
**QUADRE N° 4**  
**QUADRE SUB N° 4**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

PLANOL N°

**08**

REF. : 08

DATA: NOV-2022

ESCALA: 1/1000

FOTOGRAFIES QUADRE N°4



FOTOGRAFIES SUB QUADRE N°4



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 Tel. 606 522 900

REV. N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT ACTUAL**  
**QUADRE N° 4**  
**SUB QUADRE N° 4**

TITOL PROJECTE:  
 PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
 DE LA PALMA DE CERVELLÓ  
**PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ**

PLANOL N°  
**09**  
 REF. : 09  
 DATA: NOV-2022  
 ESCALA: 1/1000

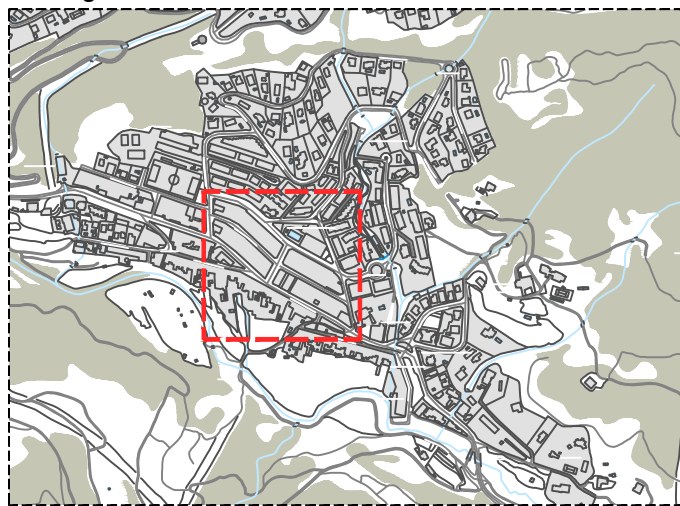
FOTOGRAFIES QUADRE N°5



DEFECTES QUADRE N°5

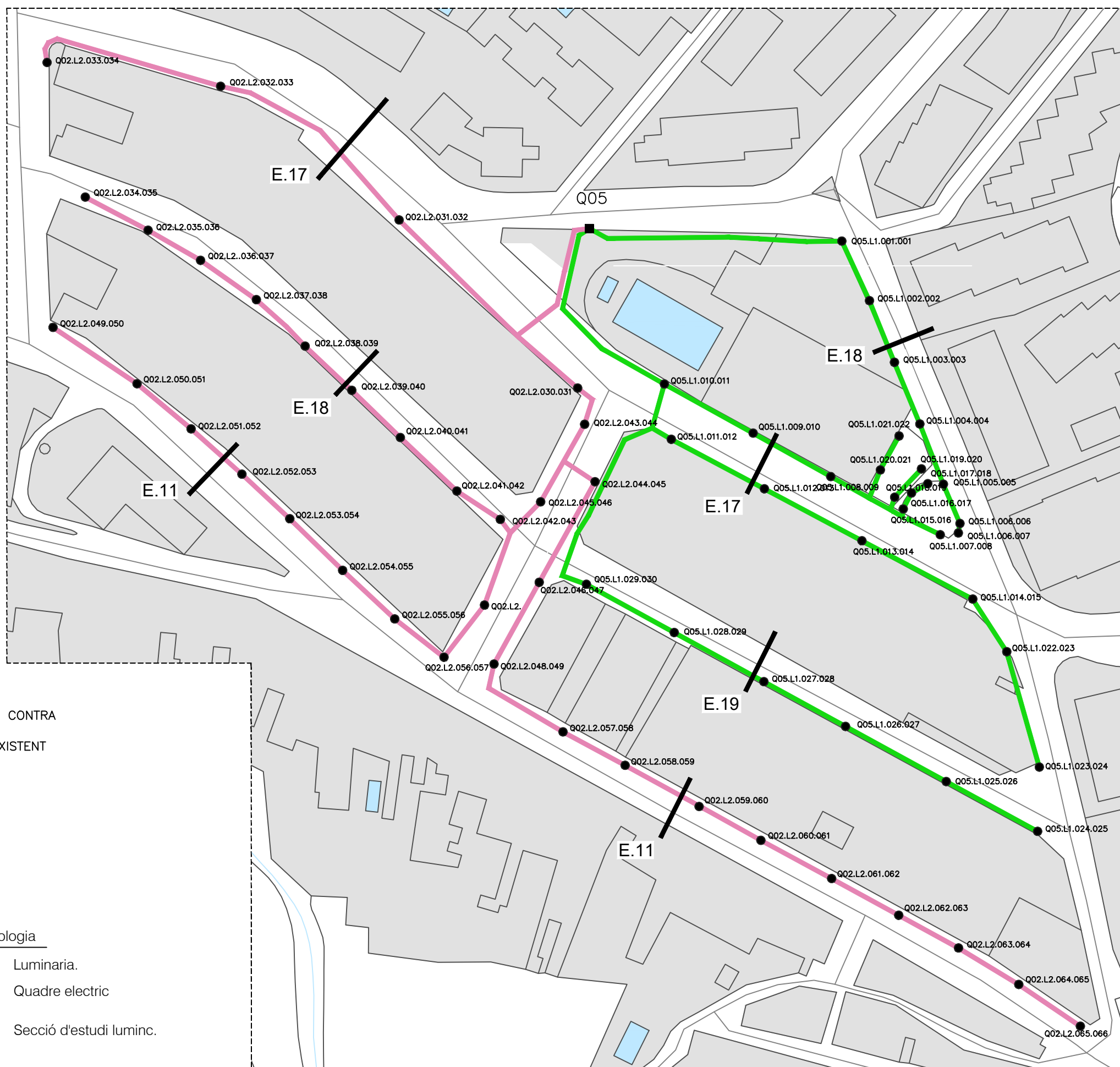
- NO EXISTEIX PROTECCIÓ DIFERENCIAL A LA LÍNIA L2
- NO EXISTEIX D'INTERRUPTOR GENERAL AUTOMÀTIC NI DE PROTECTOR CONTRA SOBRETENSIONS PERMANENTS I TRANSITÒRIES
- MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT
- NO EXISTEIX ESQUEMA DE LA INSTAL·LACIÓ AL QUADRE

Plànol guia

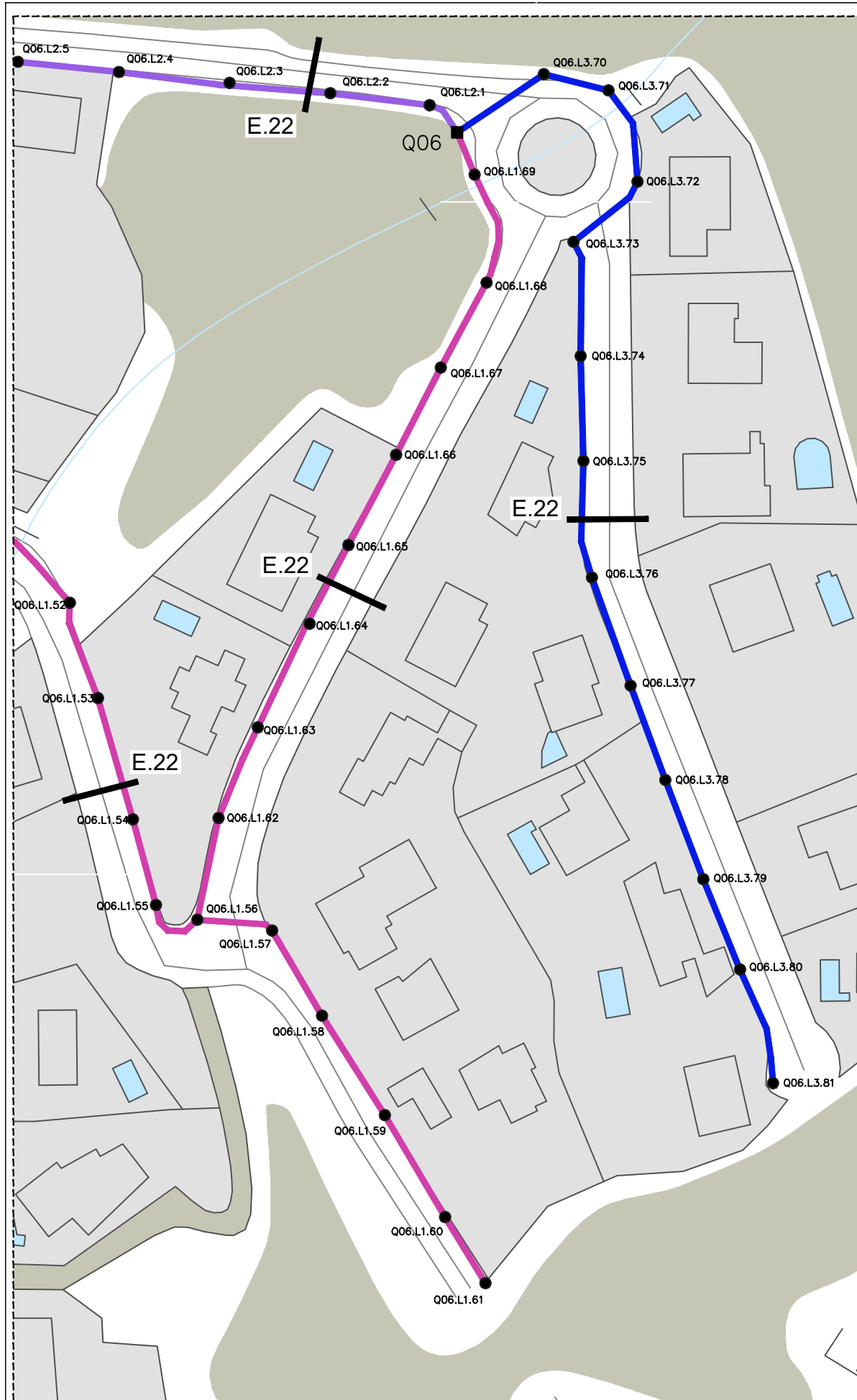


Simbologia

- Luminaria.
- Quadre electric
- E.n° | Secció d'estudi luminc.



REV. N	DIB.	DATA	COMP.	OBSERVACIONS



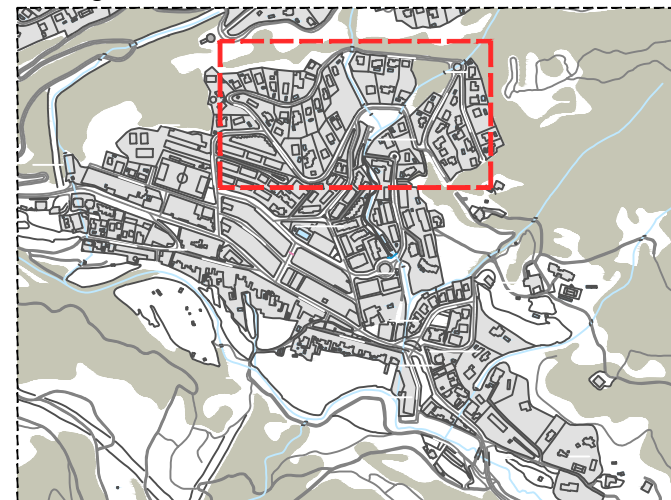
FOTOGRAFIES QUADRE N°6



DEFECTES QUADRE N°6

- EL RELLOTGE DEL QUADRE VA CONNECTAT A L'ENDOLL IMPEDINT QUE ES PUGUI COL·LOCAR LA TAPA DEL MÒDUL DE DOBLE AÏLLAMENT
- MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT
- VALORS DE RESISTÈNCIA D'AÏLLAMENT INFERIORS A 0,5 MOHMS A L1 I A L2
- A LES LÍNIES L1 I L2 ES FA SERVIR CABLEJAT DE TERRA (GROC I VERD) COM A NEUTRE

Plànol guia



Simbologia

- Luminaria.
- Quadre electric
- E.n° | Secció d'estudi luminc.



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REV. N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT ACTUAL  
QUADRE N° 6**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

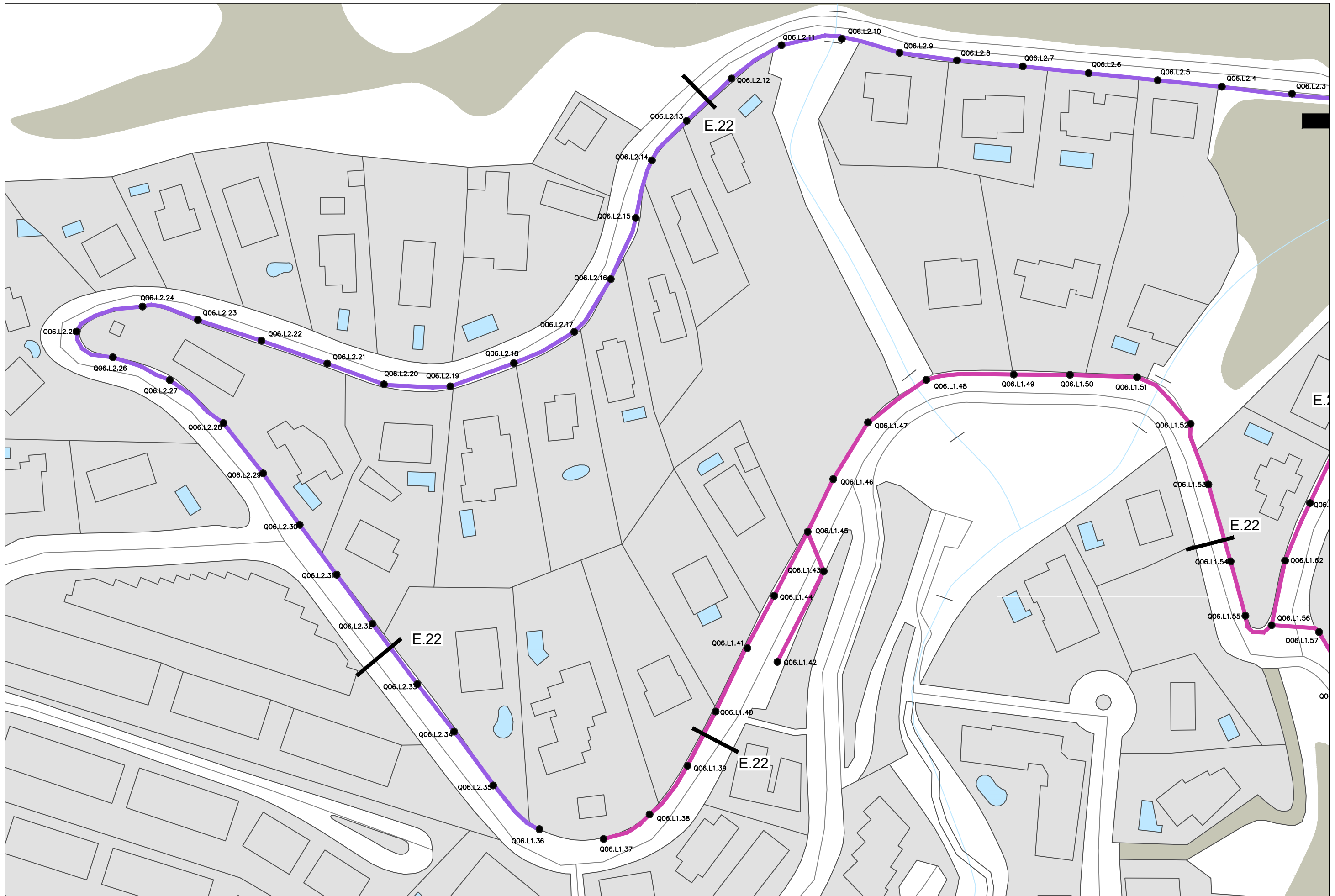
PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

PLANOL N° REF. : 11

**11**

DATA: NOV-2022

ESCALA: 1/1000



REV. N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT ACTUAL**  
**QUADRE Nº 6**

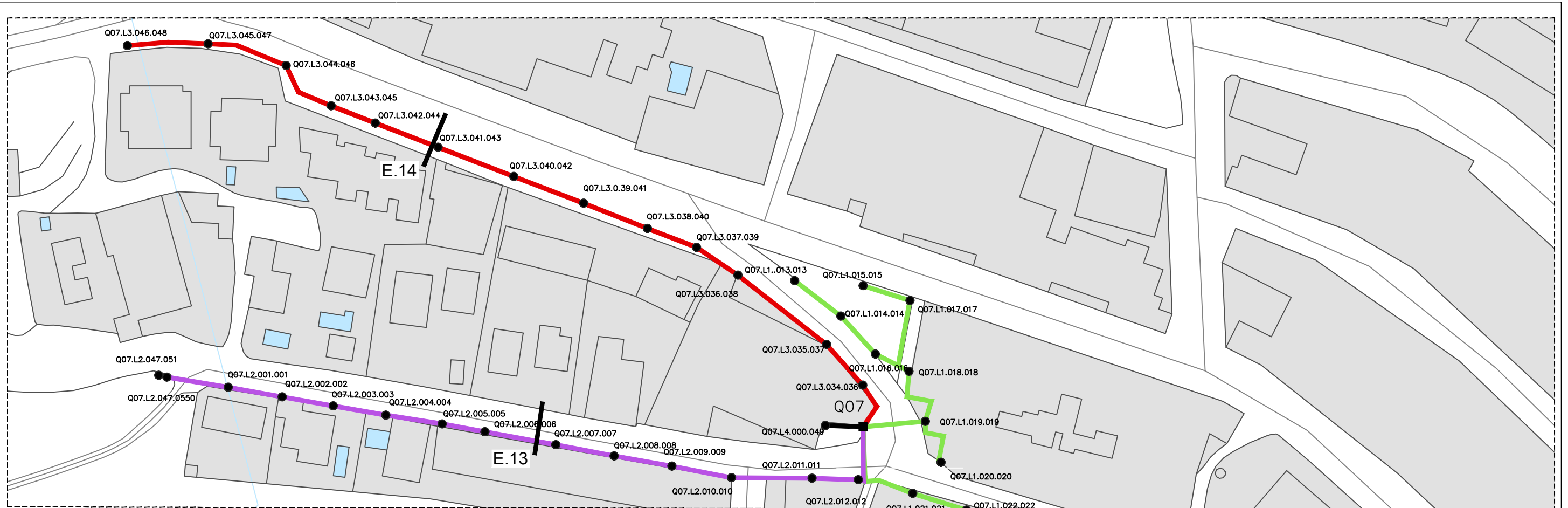
TITOL PROJECTE:  
 PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
 DE LA PALMA DE CERVELLÓ

**PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ**

PLANOL N°  
**12**

REF. : 11  
 DATA: NOV-2022  
 ESCALA: 1/1000

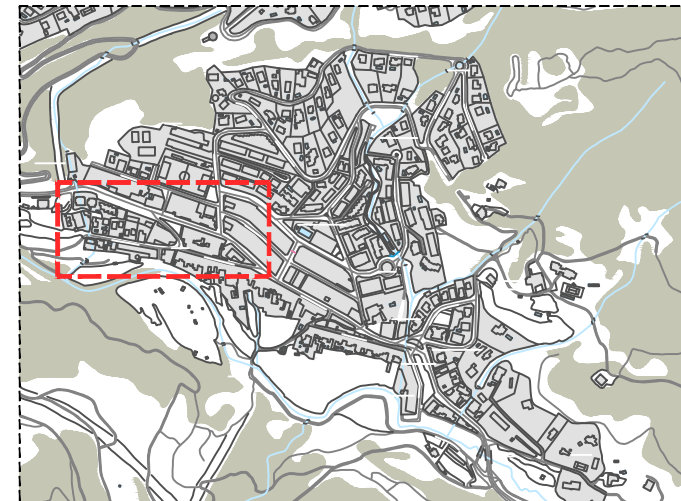




FOTOGRAFIES QUADRE N°7



Plànol guia



Simbologia

- Luminaria.
- Quadre electric
- E.n° | Secció d'estudi luminc.

DEFECTES QUADRE N°7

- SECCIÓ DE LA LÍNIA 4 ÉS INFERIOR A 6mm<sup>2</sup>
- MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT
- VALOR DE POSTA A TERRA DEL QUADRE ELÈCTRIC ELEVADA (+ DE 30 OHMS)
- ALIMENTACIÓ DE CAIXA D'ENDOLLS (UBICADA FORA DEL QUADRE) DES DELS FUSIBLES D'ENTRADA
- SENSE PASSAR PEL COMPTADOR



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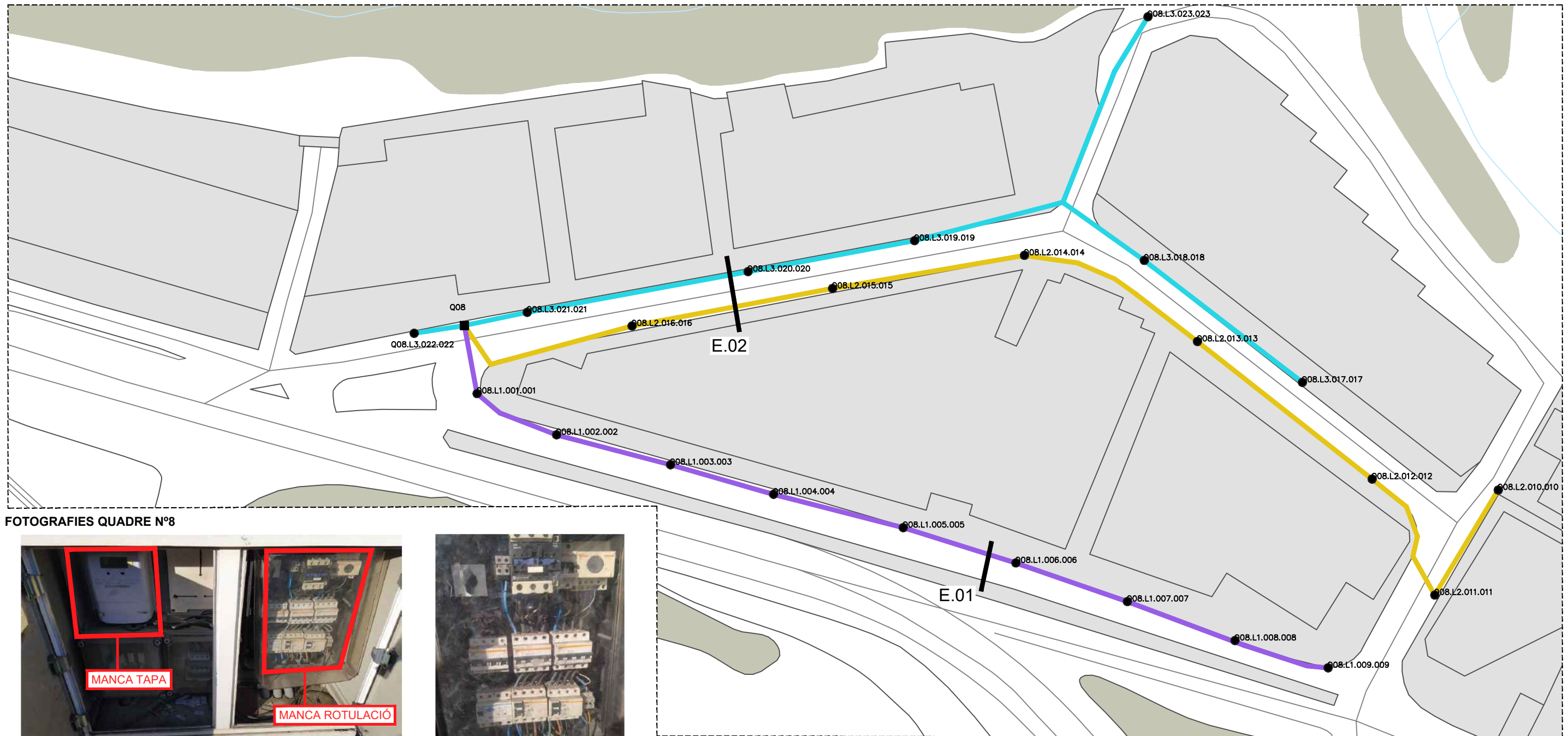
REV. N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT ACTUAL  
QUADRE N° 7**

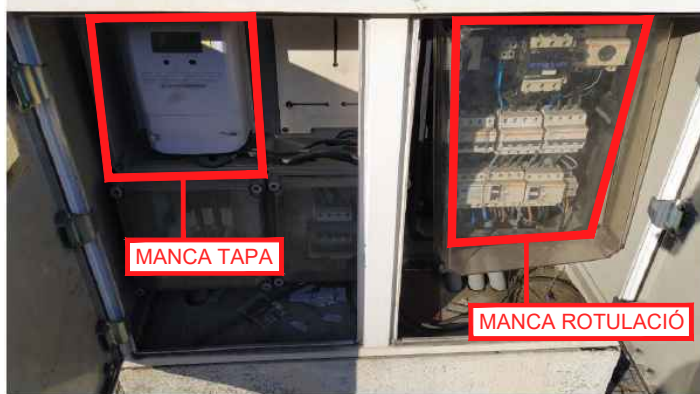
TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

PLANOL N°	REF. : 22
<b>13</b>	DATA: NOV-2022
	ESCALA: 1/1000



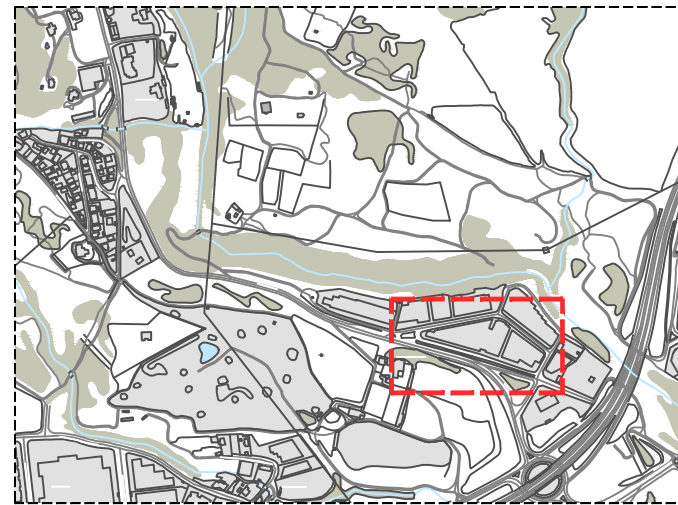
FOTOGRAFIES QUADRE N°8



DEFECTES QUADRE N°8

- NO EXISTEIX ROTULACIÓ ADEQUADA DELS ELEMENTS DE PROTECCIÓ DEL QUADRE
- MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT
- NO EXISTEIX ESQUEMA DE LA INSTAL·LACIÓ AL QUADRE
- FALTA TAPA TRANSPARENT AL MÒDUL DE DOBLE AÏLLAMENT DEL COMPTADOR
- NO EXISTEIX D'INTERRUPTOR GENERAL AUTOMÀTIC NI DE PROTECTOR CONTRA SOBRETENSIONS
- PERMANENTS I TRANSITÒRIES

Plànol guia



Simbologia

- Luminaria.
- Quadre electric
- E.nº | Secció d'estudi luminc.



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REV. N	DIB.	DATA	COMP.	OBSERVACIONS

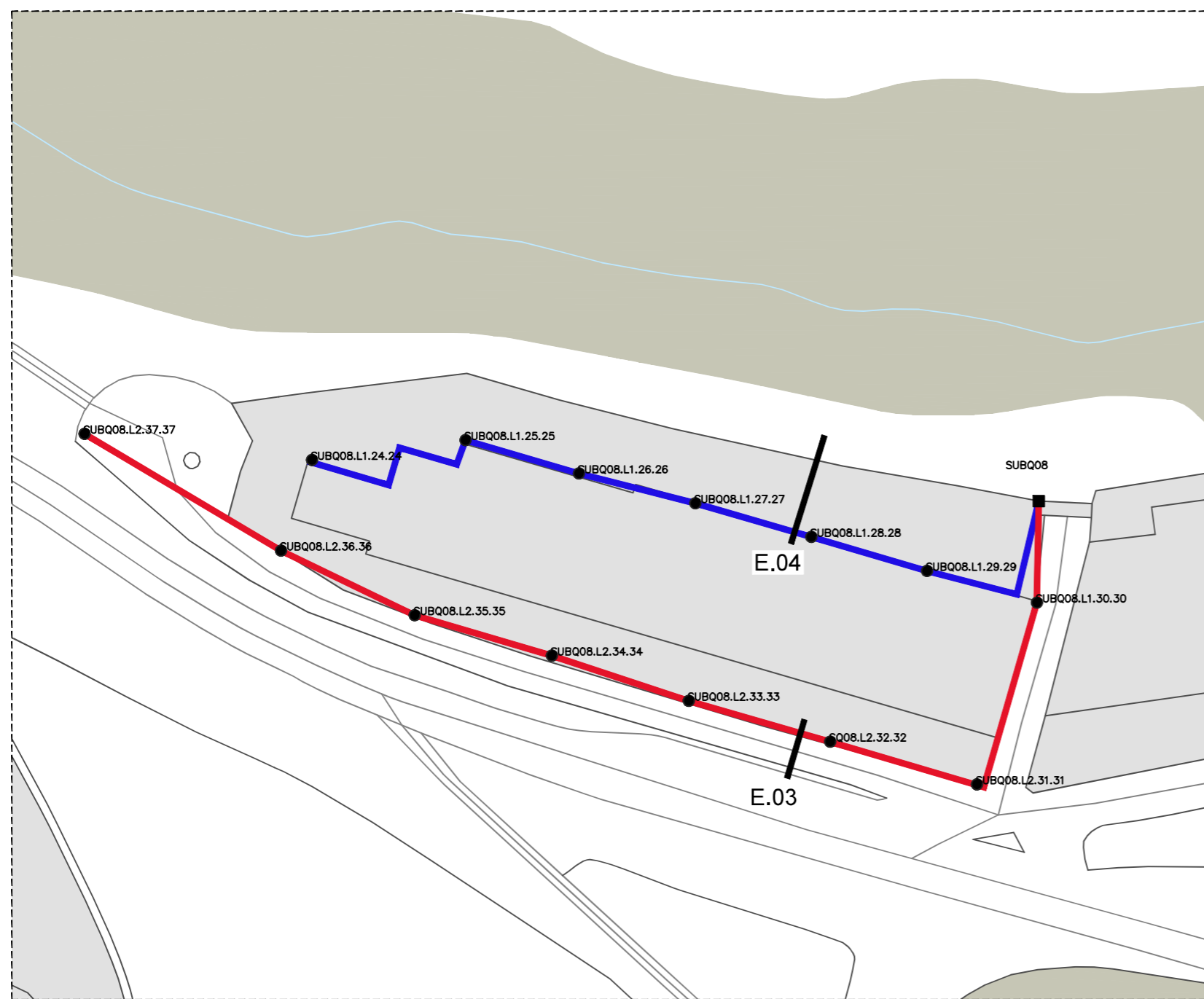
TITOL PLANOL:  
**ESTAT ACTUAL  
QUADRE N° 8**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ

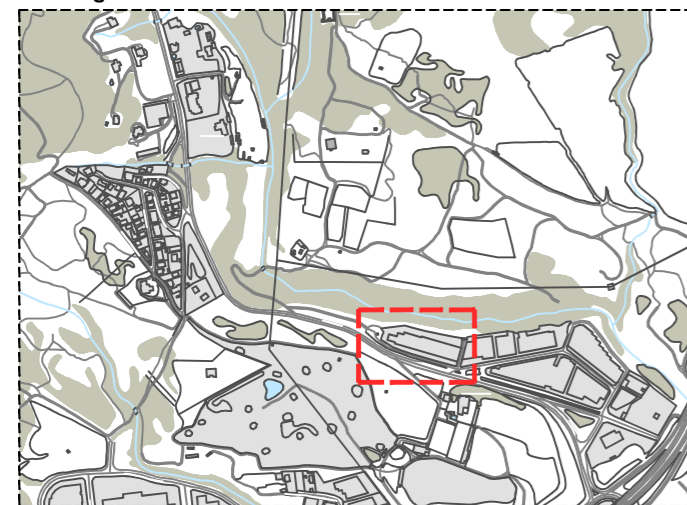
PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

PLANOL N°  
**14**

REF. : 14  
DATA: NOV-2022  
ESCALA: 1/1000



Plànol guia



**DEFECTES SUB QUADE Nº 8**

- NO EXISTEIX ROTULACIÓ ADEQUADA DELS ELEMENTS DE PROTECCIÓ DEL QUADE
- MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT
- NO EXISTEIX ESQUEMA DE LA INSTAL·LACIÓ AL QUADE
- ES FA SERVIR CABLEJAT DE TERRA (GROC VERD) COM A NEUTRE

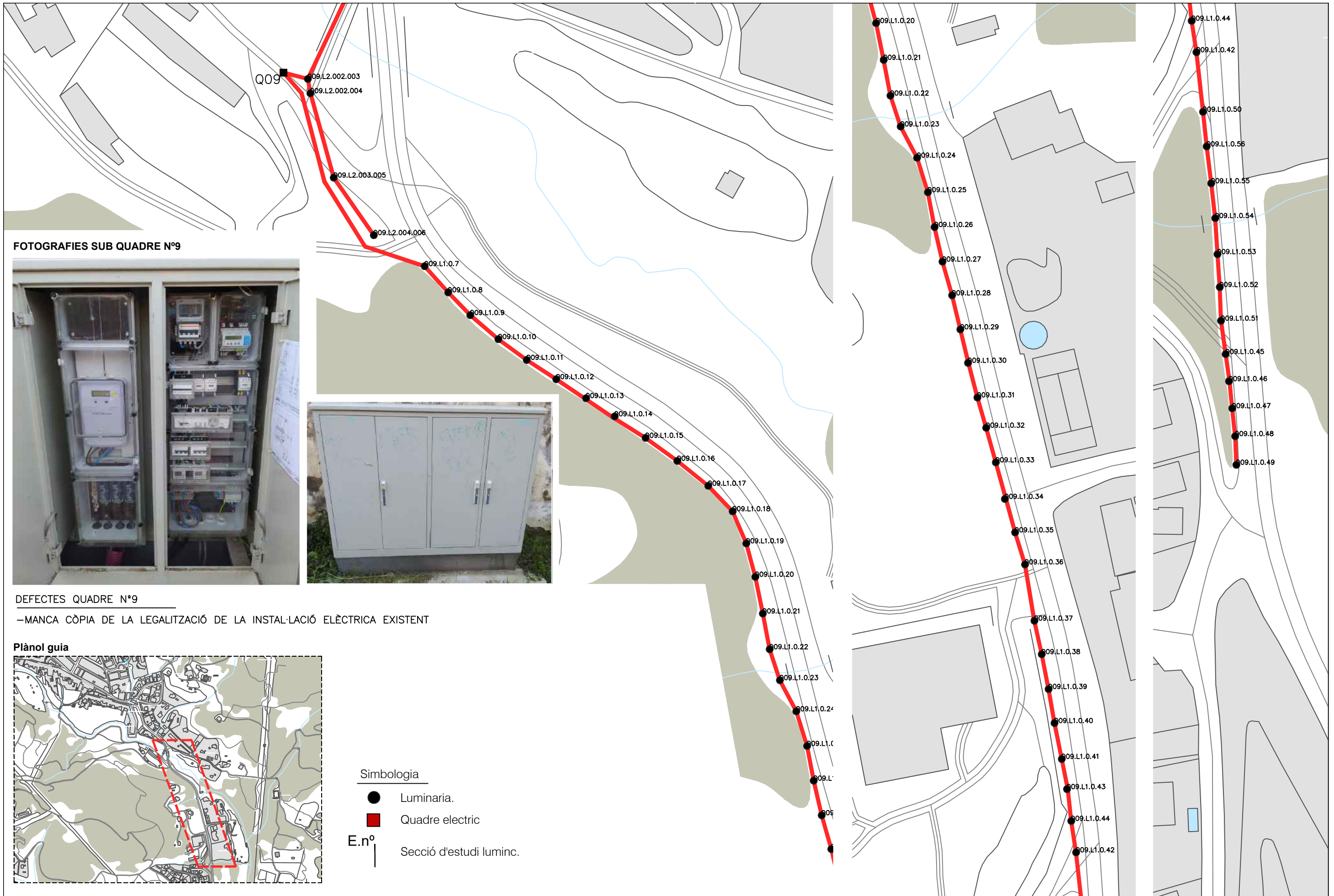
**FOTOGRAFIES SUB QUADE Nº 8**



**Simbologia**

- Luminaria.
- Quadre electric
- E.nº | Secció d'estudi luminc.

REV. N	DIB.	DATA	COMP.	OBSERVACIONS



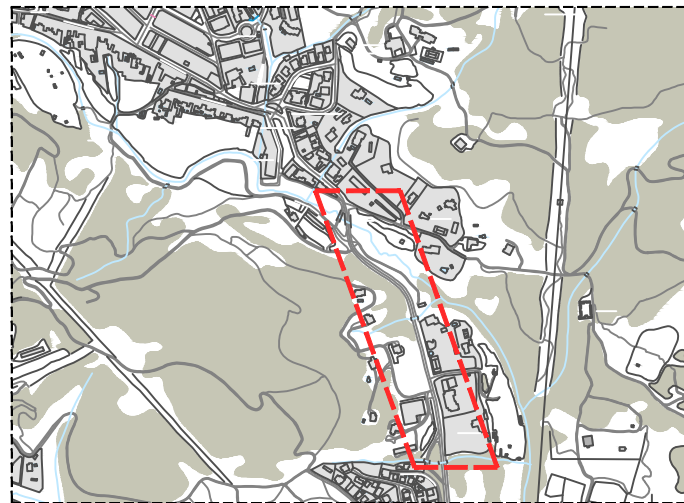
FOTOGRAFIES SUB QUADRE N°9



DEFECTES QUADRE N°9

-MANCA CÒPIA DE LA LEGALITZACIÓ DE LA INSTAL·LACIÓ ELÈCTRICA EXISTENT

Plànol guia

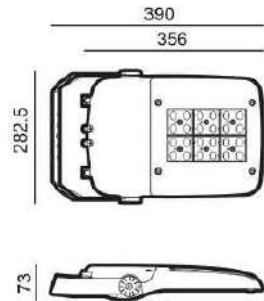


Simbologia

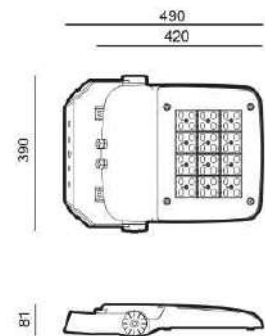
- Luminaria.
- Quadre electric
- E.nº | Secció d'estudi luminc.

REV. N	DIB.	DATA	COMP.	OBSERVACIONS

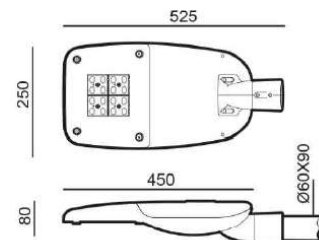
**P MILAN S**



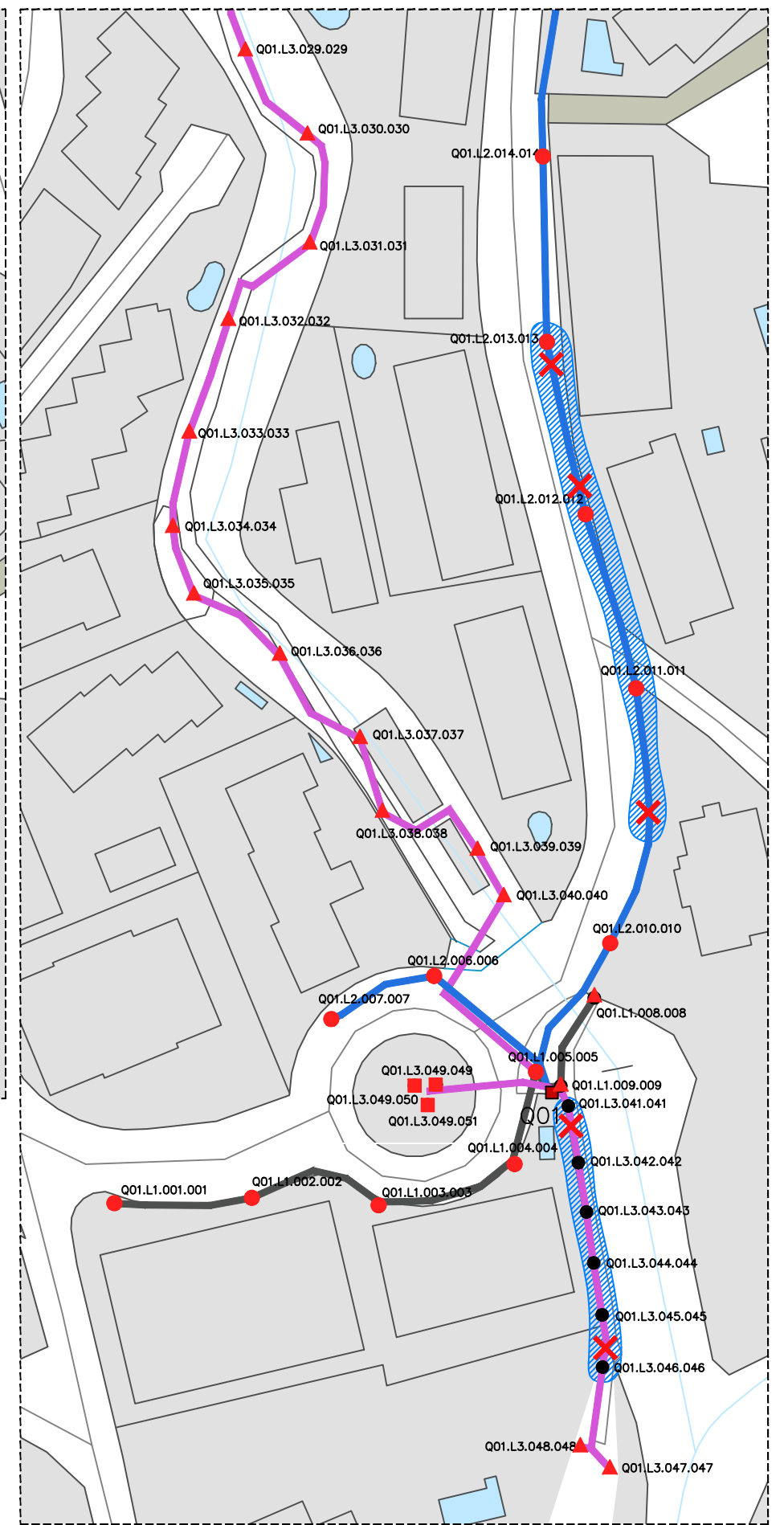
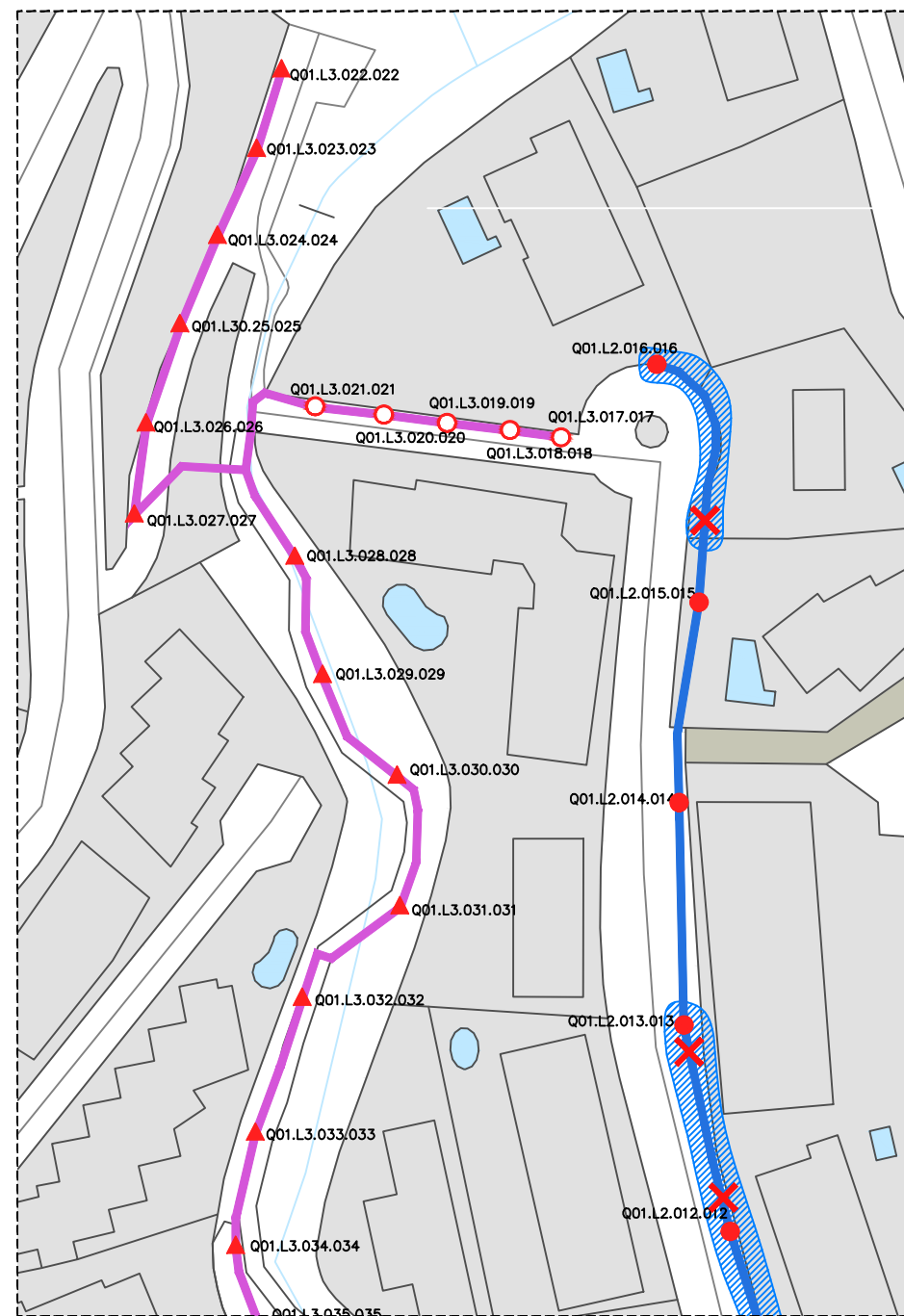
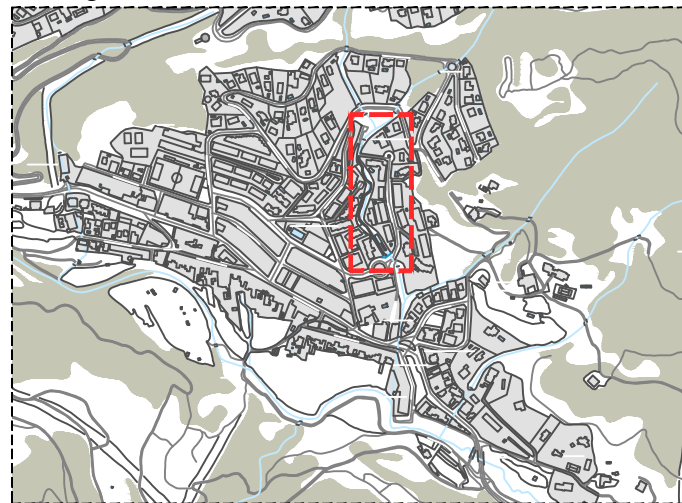
**P MILAN M**



**MILAN S 60**



**Plànol guia**



**Simbologia**

- Luminària a mantenir.
- Nova lluminària model Milan S
- ▲ Nova lluminària model Projector-Milan S
- Nova lluminària model Projector-Milan M
- ★ Nova lluminària model Innova B
- ⊕ Nova lluminària model Retrofeet
- ✕ Nova lluminària model Neovilla ALU
- Canvia bombeta baix consum
- ✕ Cata
- Linya amb problemes d'aïllament elèctric.
- Formació de rassa amb estesa de línia subterrània



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REV.	N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT PROJECTAT  
QUADRE N° 1**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

PLANOL N°

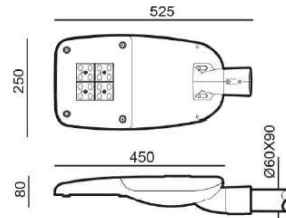
**17**

REF. : 05

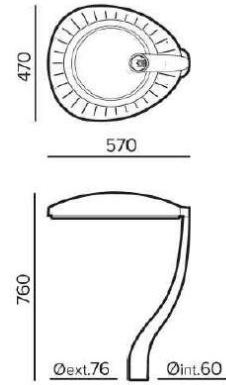
DATA: NOV-2022

ESCALA: 1/1000

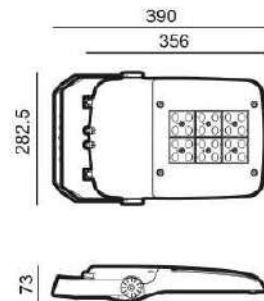
**MILAN S 60**



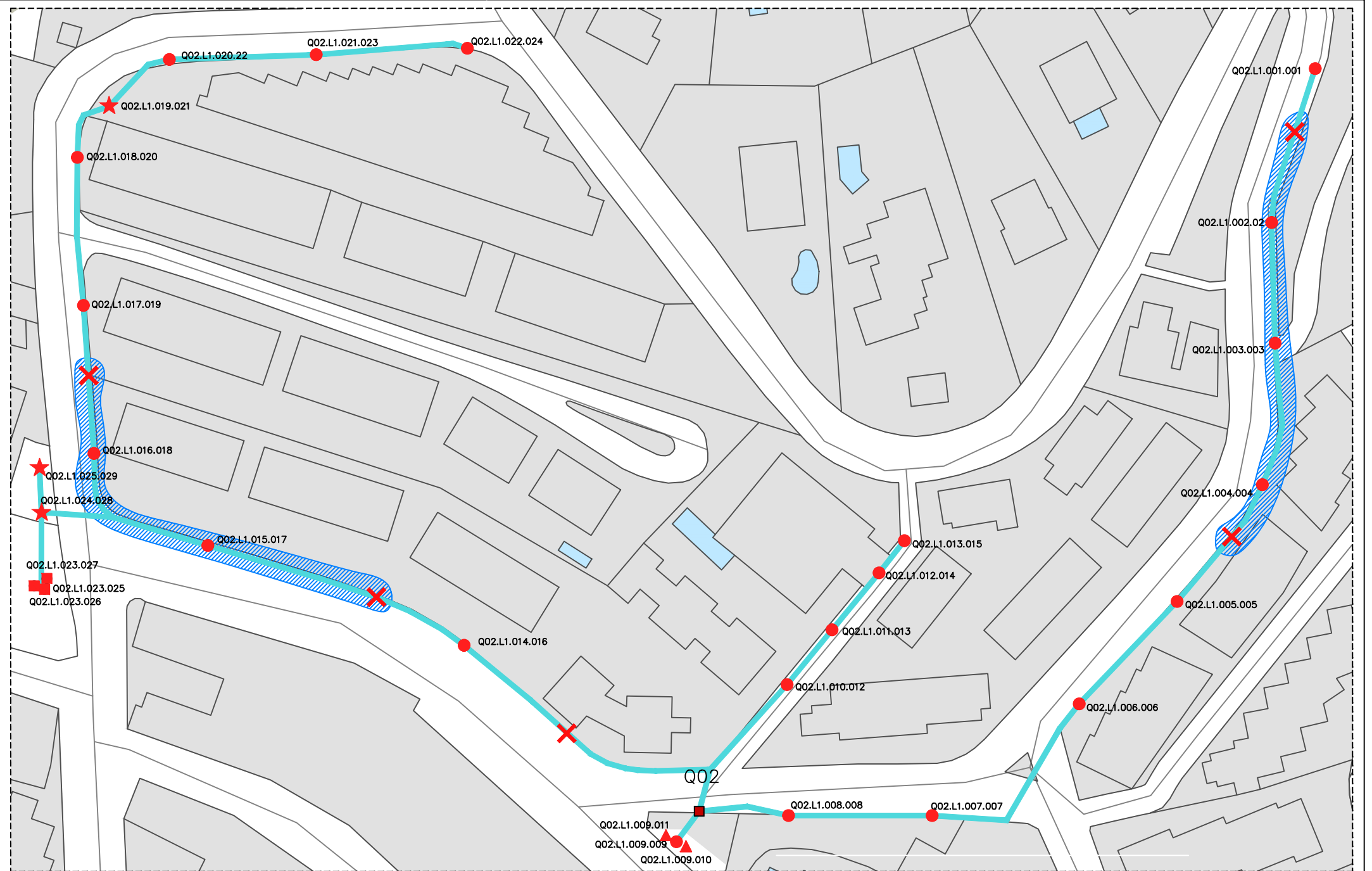
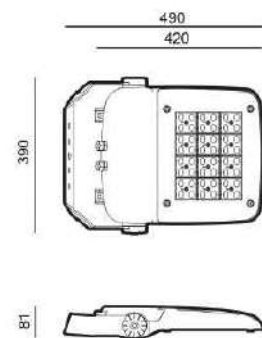
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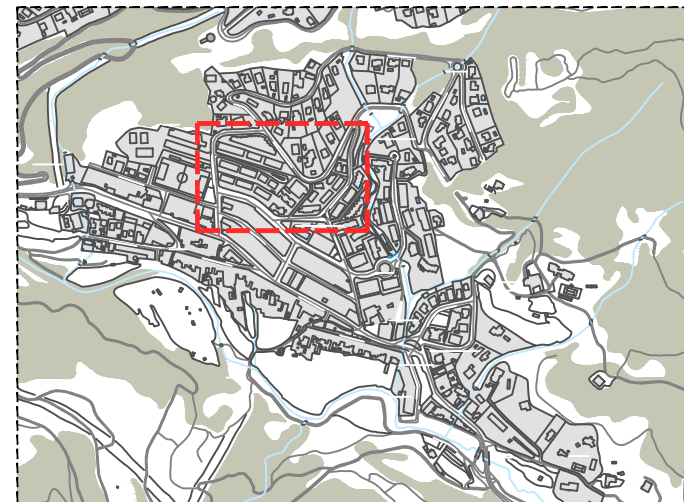
**P MILAN S**



**P MILAN M**



**Plànol guia**



**Simbologia**

- Luminària a mantenir.
- Nova lluminària model Milan S
- ▲ Nova lluminària model Projector-Milan S
- Nova lluminària model Projector-Milan M
- ★ Nova lluminària model Innova B
- ⊕ Nova lluminària model Retrofeet
- ⊗ Nova lluminària model Neovilla ALU
- Canvia bombeta baix consum
- ✕ Cata
- ▨ Línia amb problemes d'aïllament elèctric.
- Formació de rassa amb estesa de línia subterrània



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REV.	N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT PROJECTAT  
QUADRE N° 2**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

**PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ**

PLANOL N°

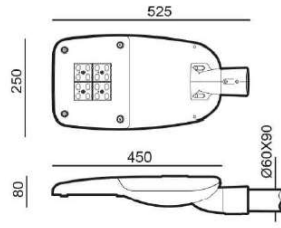
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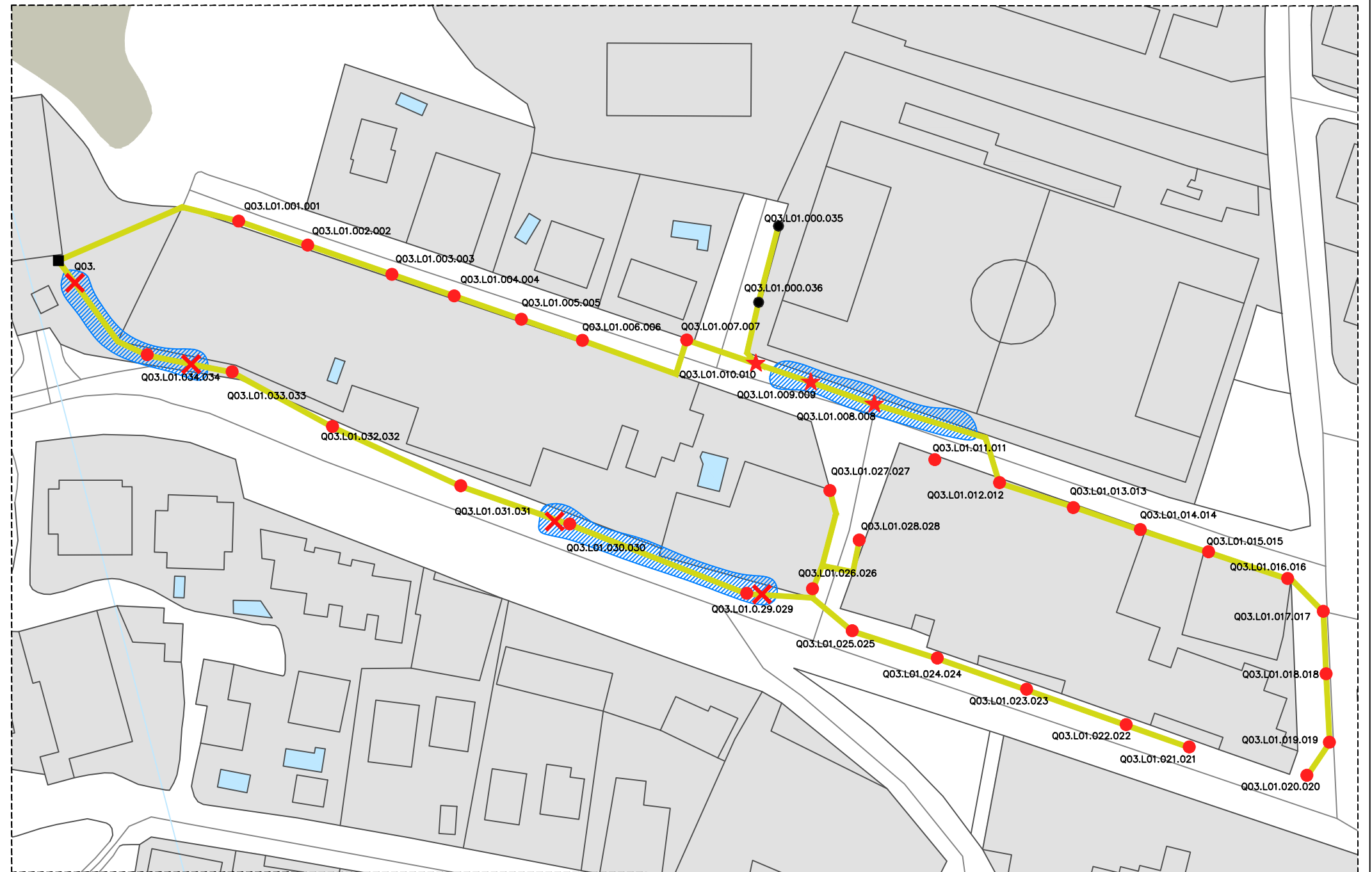
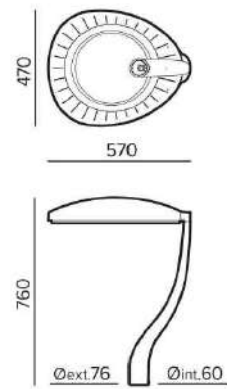
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ESCALA: 1/1000

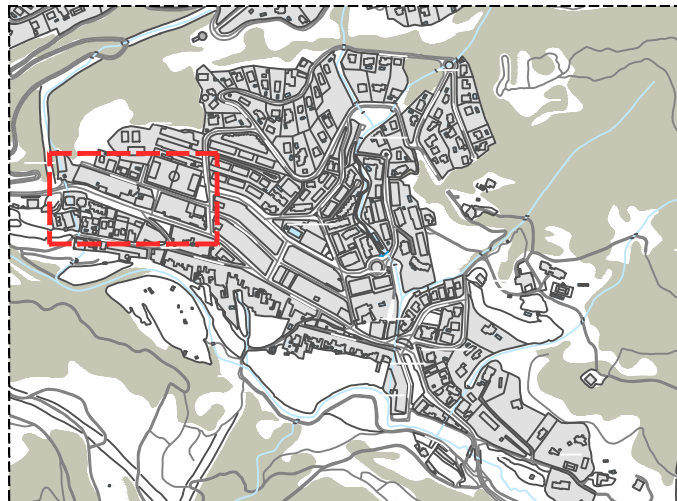
**MILAN S 60**



**INNOVA**



**Plànol guia**



**Simbologia**

- Luminària a mantenir.
- Nova lluminària model Milan S
- ▲ Nova lluminària model Projector-Milan S
- Nova lluminària model Projector-Milan M
- ★ Nova lluminària model Innova B
- ⊕ Nova lluminària model Retrofeet
- ⊗ Nova lluminària model Neovilla ALU
- Canvia bombeta baix consum
- ✕ Cata
- ▨ Línia amb problemes d'aïllament elèctric.
- Formació de rassa amb estesa de línia subterrània



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REV. N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT PROJECTAT  
QUADRE N° 3**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

PLANOL N°

**19**

REF. : 07

DATA: NOV-2022

ESCALA: 1/1000

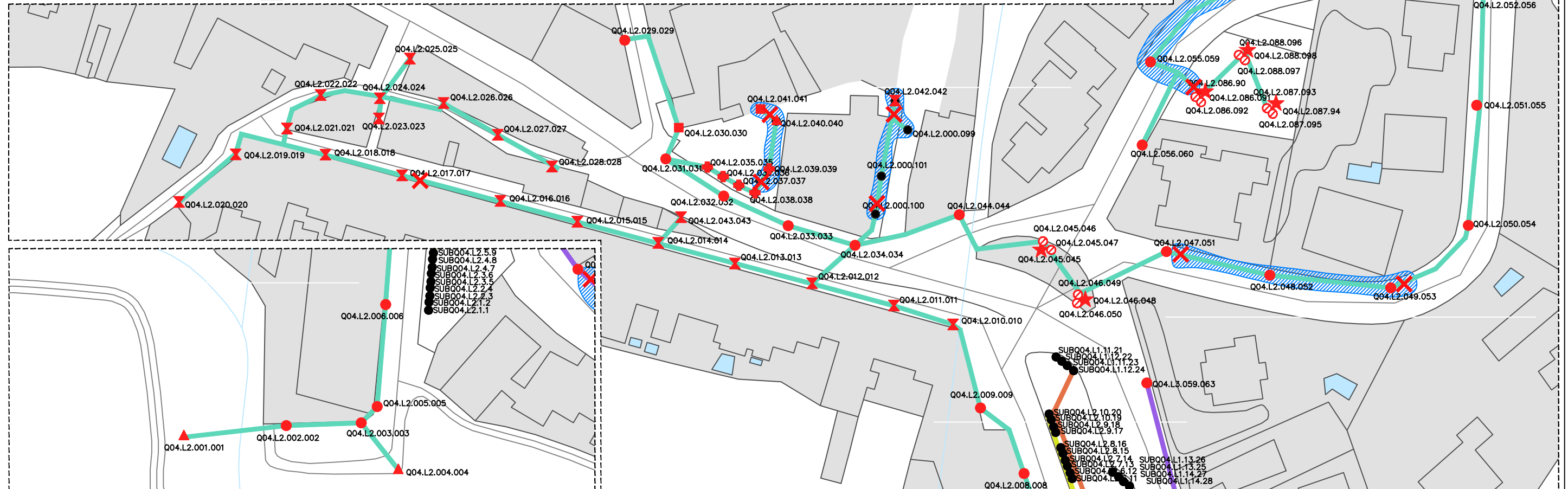
NOVELLA

INNOVA

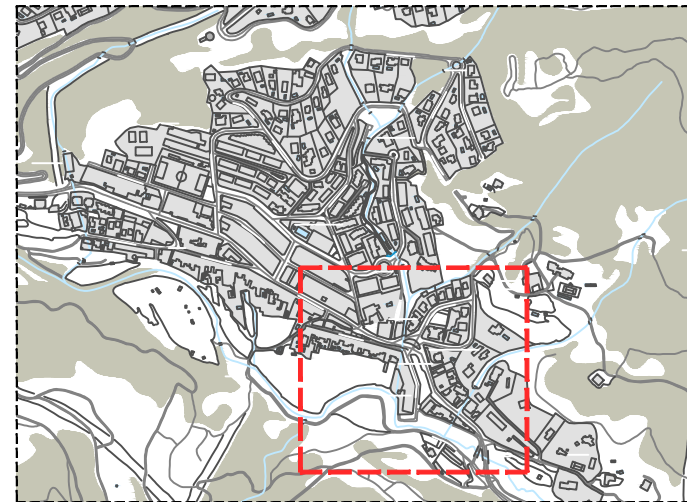
MILAN S 60

P MILAN M

P MILAN S



Plànol guia



Simbologia

- Luminària a mantenir.
- Nova Il·luminària model Milan S
- ▲ Nova Il·luminària model Projector-Milan S
- Nova Il·luminària model Projector-Milan M
- ★ Nova Il·luminària model Innova B
- ⊕ Nova Il·luminària model Retrofeet
- ⊗ Nova Il·luminària model Neovilla ALU
- Canvia bombeta baix consum
- ⊘ Eliminació de punt
- ✕ Cata
- ⬭ Línia amb problemes d'aïllament elèctric.
- Formació de rassa amb estesa de línia subterrània



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REV. N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT PROJECTAT**  
**QUADRE N° 4**  
**QUADRE SUB N° 4**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

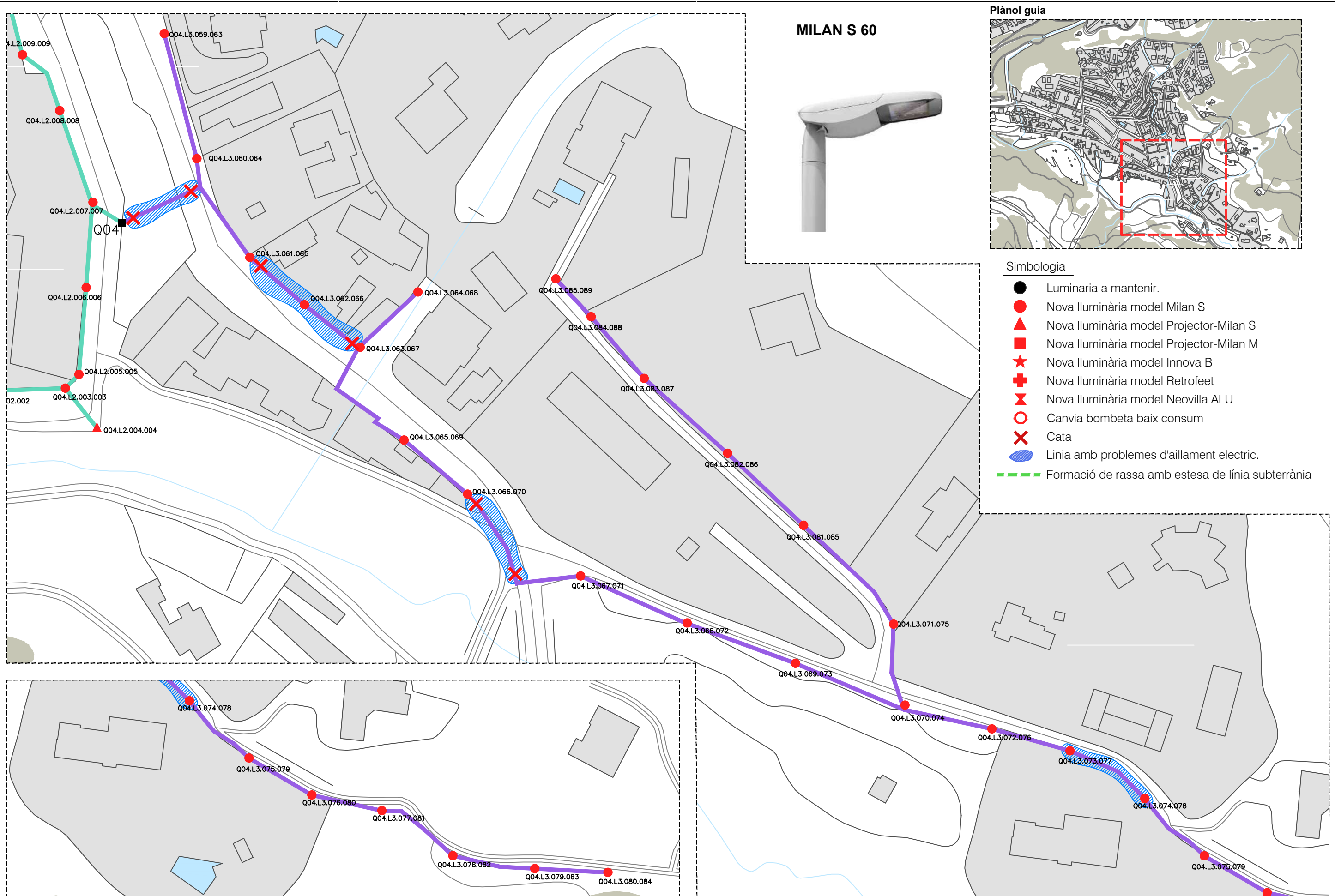
PLANOL N°  
**20**

REF. : 08

DATA: NOV-2022

ESCALA: 1/1000

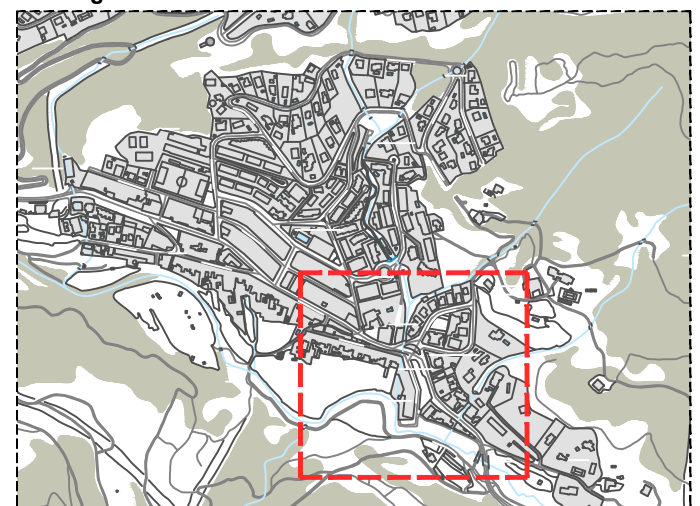




MILAN S 60



Plànol guia



Simbologia

- Luminària a mantenir.
- Nova lluminària model Milan S
- ▲ Nova lluminària model Projector-Milan S
- Nova lluminària model Projector-Milan M
- ★ Nova lluminària model Innova B
- ⊕ Nova lluminària model Retrofeet
- ⊗ Nova lluminària model Neovilla ALU
- Canvia bombeta baix consum
- ✕ Cata
- Linia amb problemes d'aïllament electric.
- Formació de rassa amb estesa de línia subterrània

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Tel. 606 522 900

REV. N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT PROJECTAT  
 QUADRE N° 4  
 SUB QUADRE N° 4**

TITOL PROJECTE:  
 PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
 DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

PLANOL N°

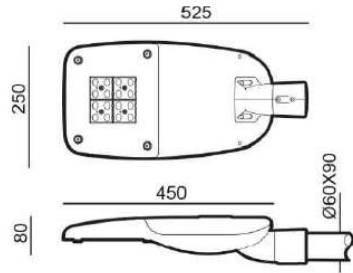
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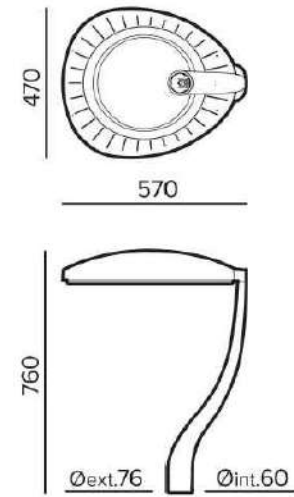
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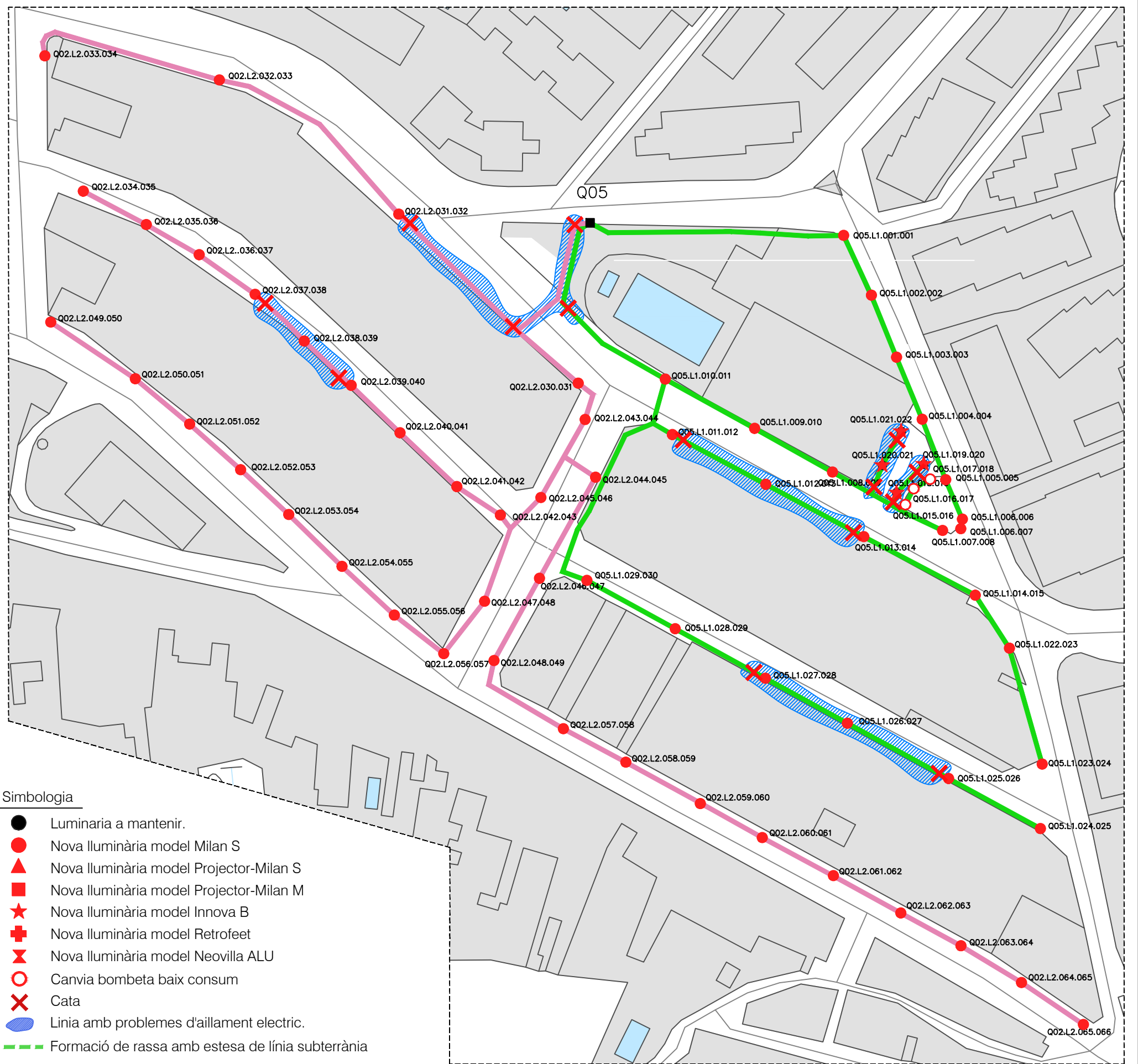
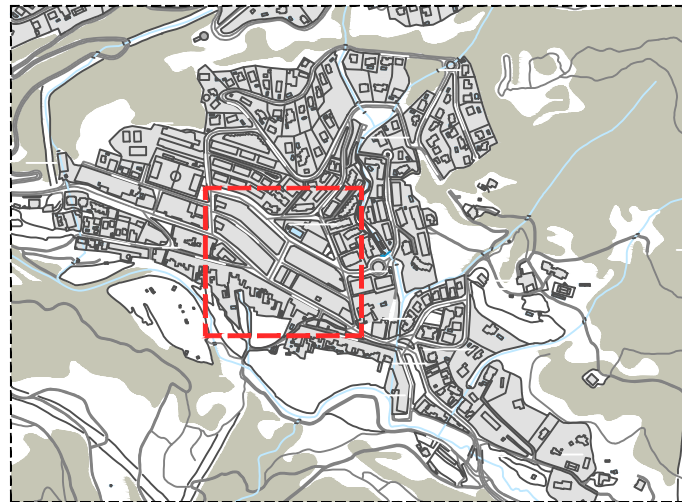
### MILAN S 60



### INNOVA



### Plànol guia



### Simbologia

- Luminària a mantenir.
- Nova lluminària model Milan S
- ▲ Nova lluminària model Projector-Milan S
- Nova lluminària model Projector-Milan M
- ★ Nova lluminària model Innova B
- ⊕ Nova lluminària model Retrofeet
- ⊗ Nova lluminària model Neovilla ALU
- Canvia bombeta baix consum
- ✕ Cata
- ▭ Línia amb problemes d'aïllament elèctric.
- Formació de rassa amb estesa de línia subterrània



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TITOL PLANOL:  
**ESTAT PROJECTAT  
QUADRE N° 5**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

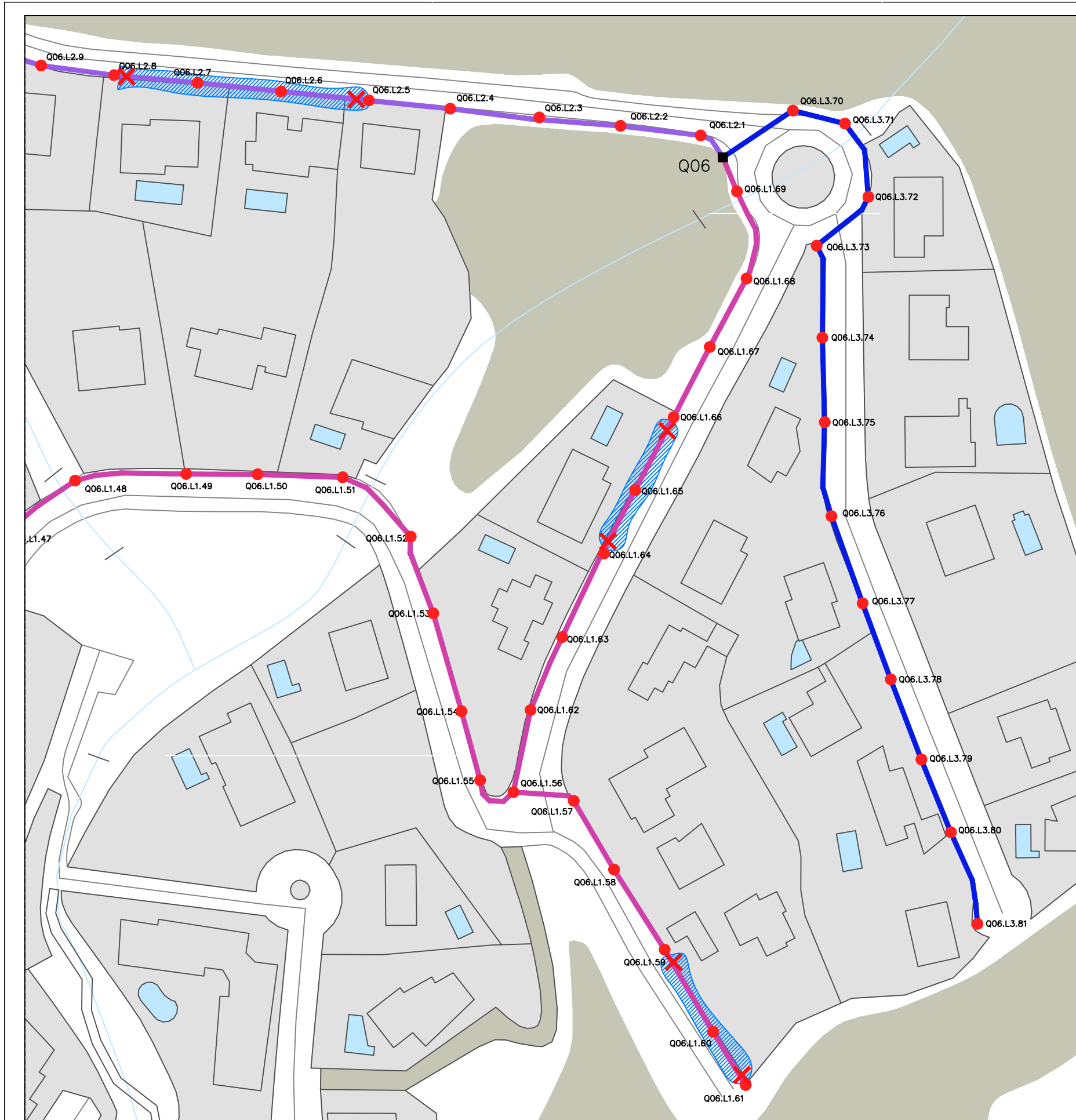
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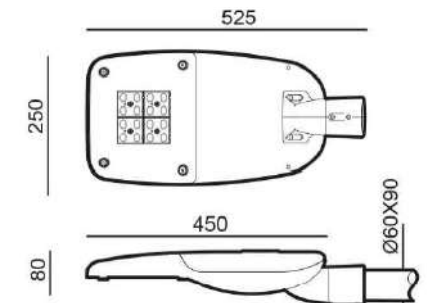
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**MILAN S 60**



**Simbologia**

- Luminària a mantenir.
- Nova lluminària model Milan S
- ▲ Nova lluminària model Projector-Milan S
- Nova lluminària model Projector-Milan M
- ★ Nova lluminària model Innova B
- ⊕ Nova lluminària model Retrofeet
- ⊗ Nova lluminària model Neovilla ALU
- Canvia bombeta baix consum
- ✕ Cata
- ▨ Línies amb problemes d'aïllament elèctric.
- Formació de rassa amb estesa de línia subterrània

**Plànol guia**



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TITOL PLANOL:  
**ESTAT PROJECTAT  
QUADRE Nº 6**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

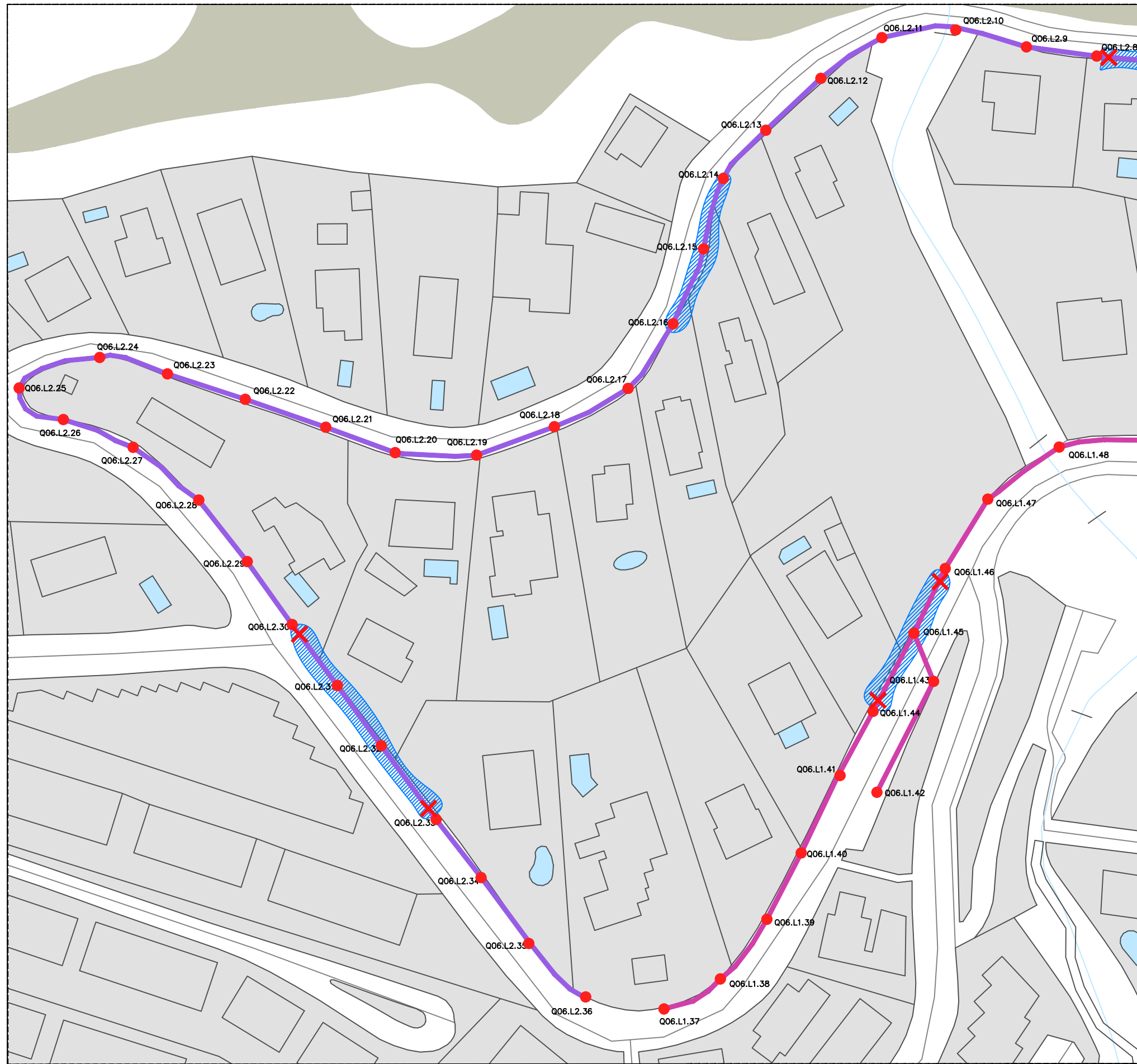
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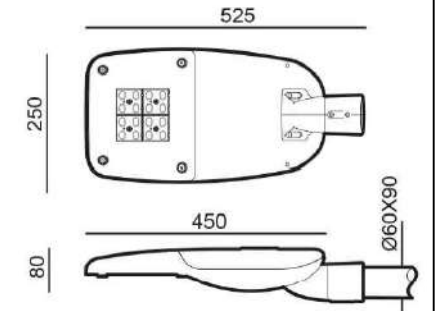
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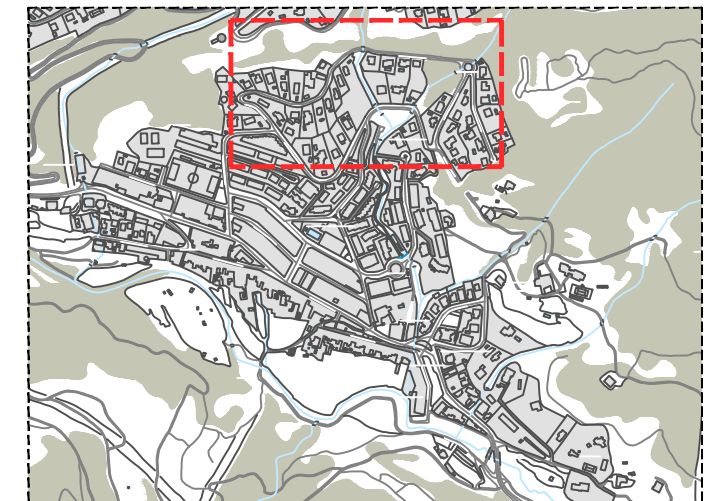
**MILAN S 60**



**Simbologia**

- Luminaria a mantenir.
- Nova lluminària model Milan S
- ▲ Nova lluminària model Projector-Milan S
- Nova lluminària model Projector-Milan M
- ★ Nova lluminària model Innova B
- ⊕ Nova lluminària model Retrofeet
- ⊗ Nova lluminària model Neovilla ALU
- Canvia bombeta baix consum
- ✕ Cata
- ▨ Linia amb problemes d'aïllament electric.
- Formació de rassa amb estesa de línia subterrània

**Plànol guia**



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TITOL PLANOL:  
**ESTAT PROJECTAT  
QUADRE N° 6**

TITOL PROJECTE:  
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DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

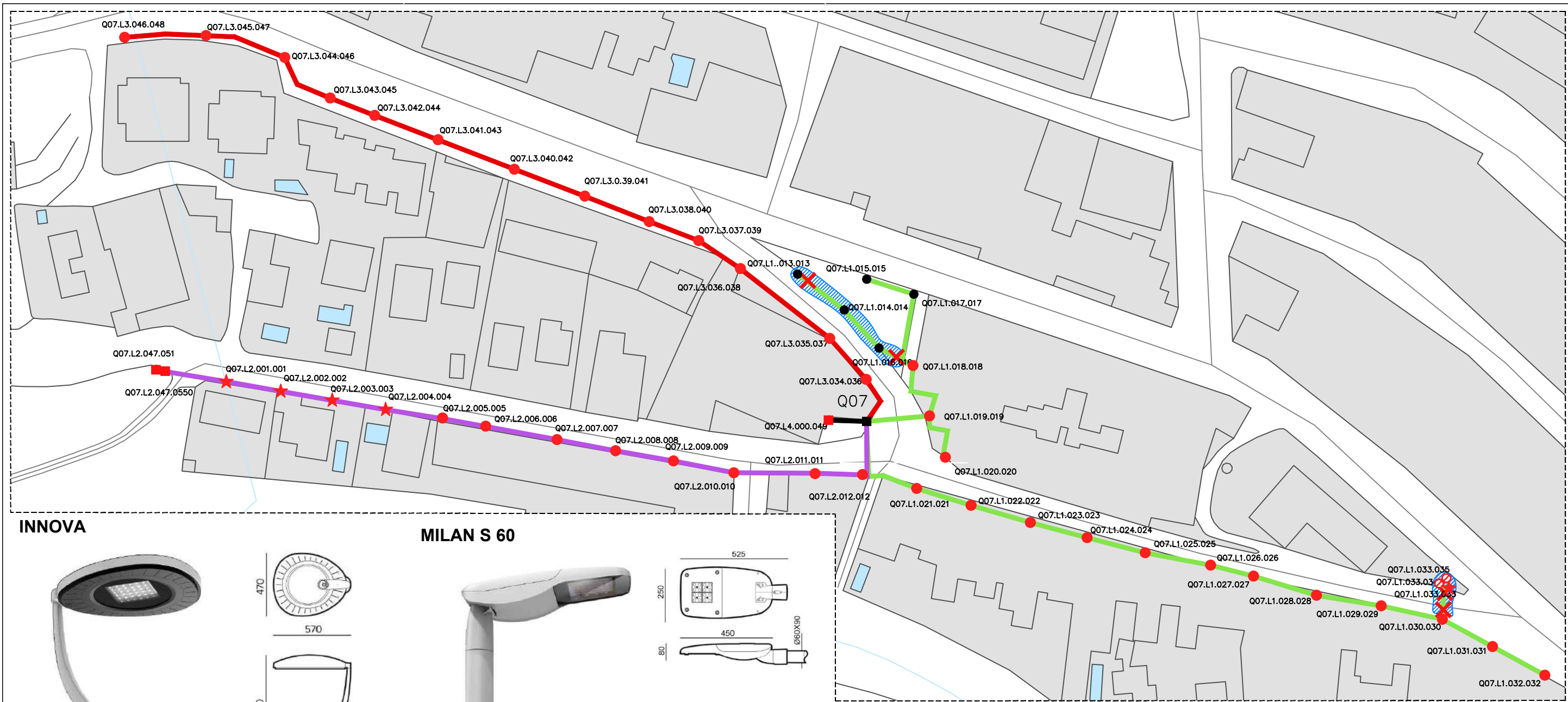
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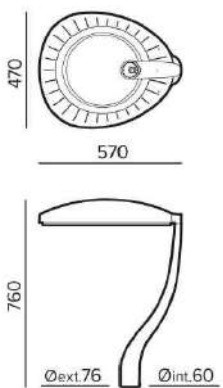
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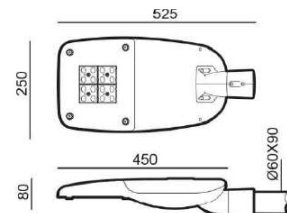
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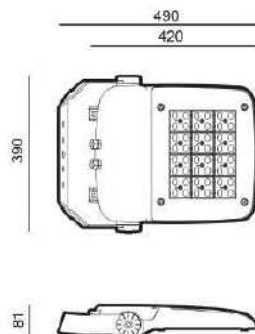
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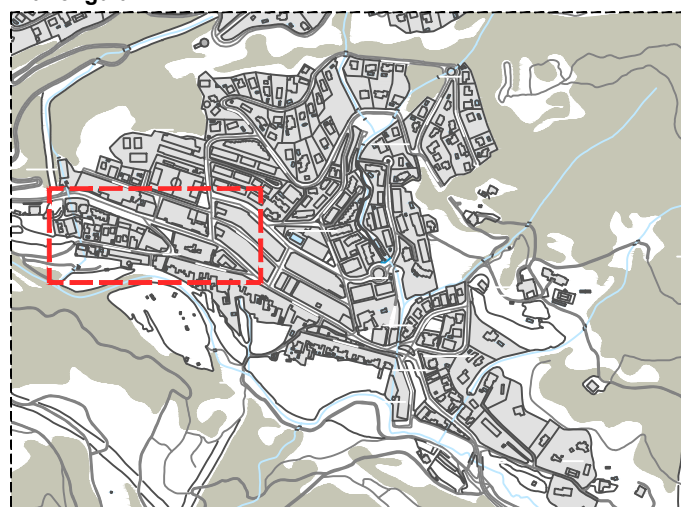
**MILAN S 60**



**P MILAN M**



**Plànol guia**



**Simbologia**

- Luminària a mantenir.
- Nova lluminària model Milan S
- ▲ Nova lluminària model Projector-Milan S
- Nova lluminària model Projector-Milan M
- ★ Nova lluminària model Innova B
- ✚ Nova lluminària model Retrofeet
- ✖ Nova lluminària model Neovilla ALU
- Canvia bombeta baix consum
- ⊘ Eliminació de punt
- ✕ Cata
- ▨ Línia amb problemes d'aïllament elèctric.
- Formació de rassa amb estesa de línia subterrània



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TITOL PLANOL:  
**ESTAT PROJECTAT  
QUADRE Nº 7**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

**PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ**

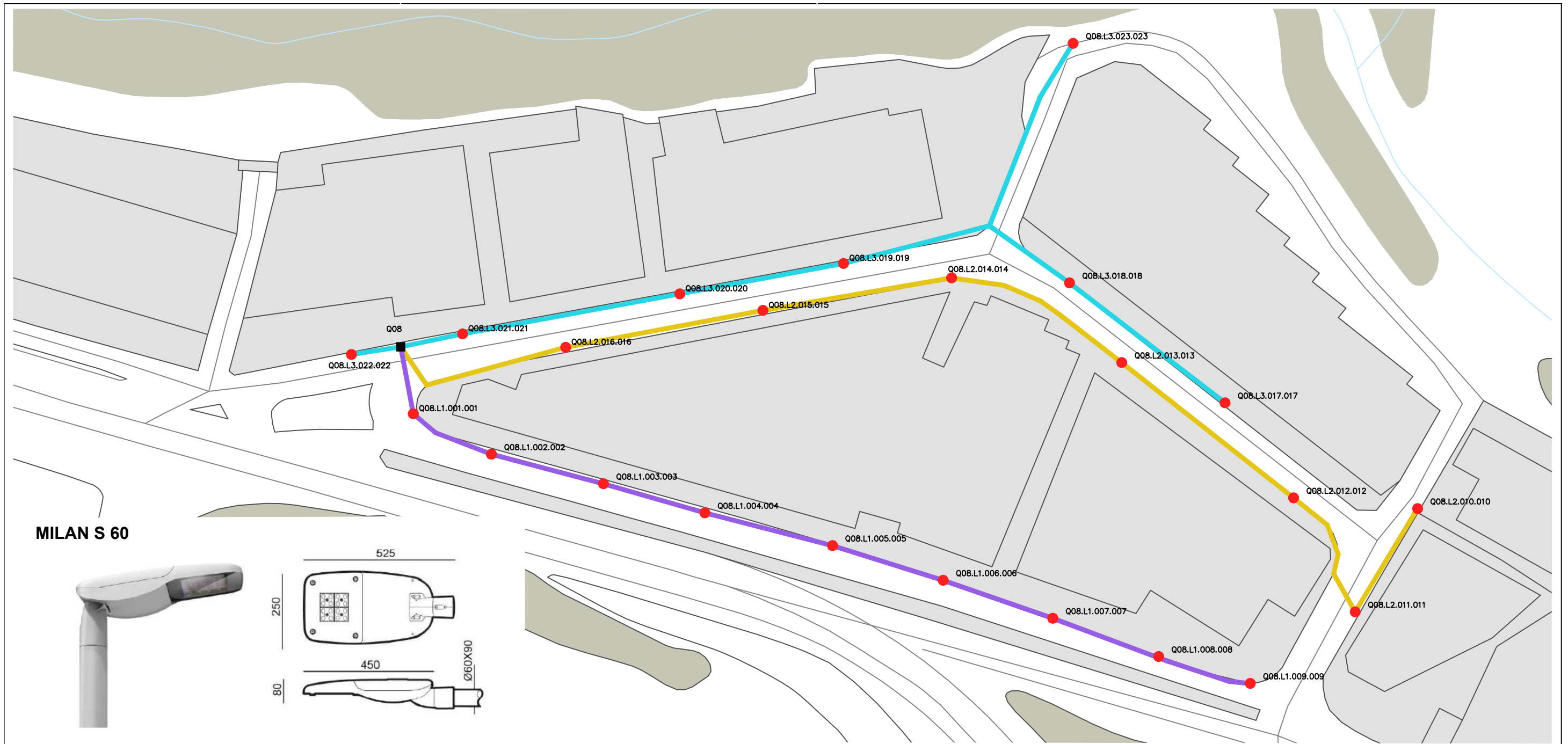
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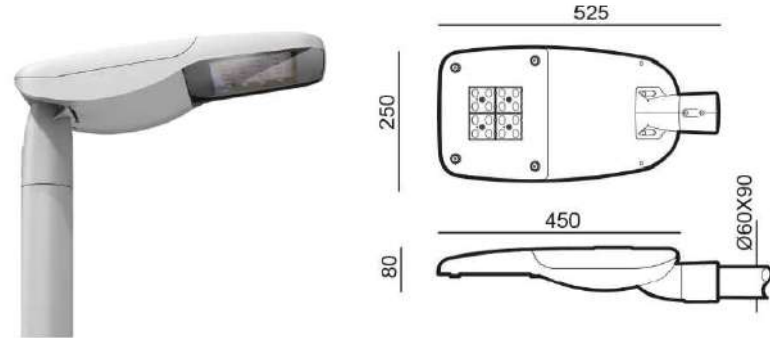
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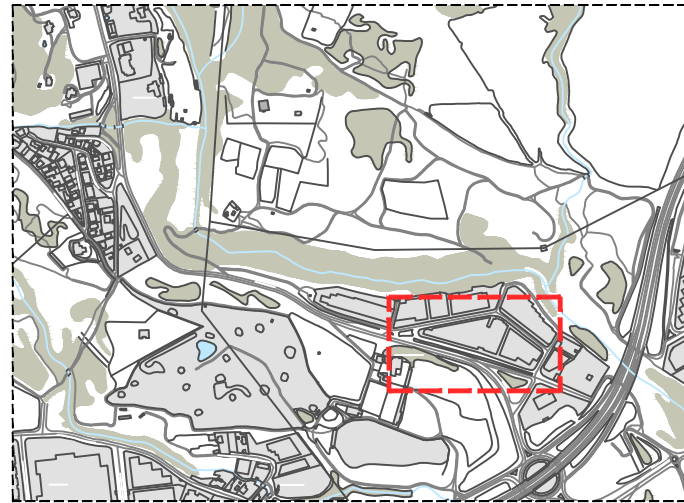
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MILAN S 60



Plànol guia



Simbologia

- Luminària a mantenir.
- Nova lluminària model Milan S
- ▲ Nova lluminària model Projector-Milan S
- Nova lluminària model Projector-Milan M
- ★ Nova lluminària model Innova B
- ✚ Nova lluminària model Retrofeet
- ✖ Nova lluminària model Neovilla ALU
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- ✗ Cata
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- - - Formació de rassa amb estesa de línia subterrània



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TITOL PLANOL:  
ESTAT PROJECTAT  
QUADRE Nº 8

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

PLANOL N°

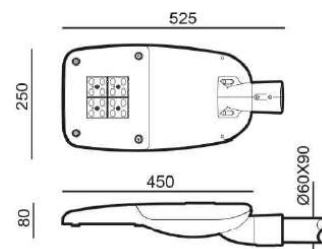
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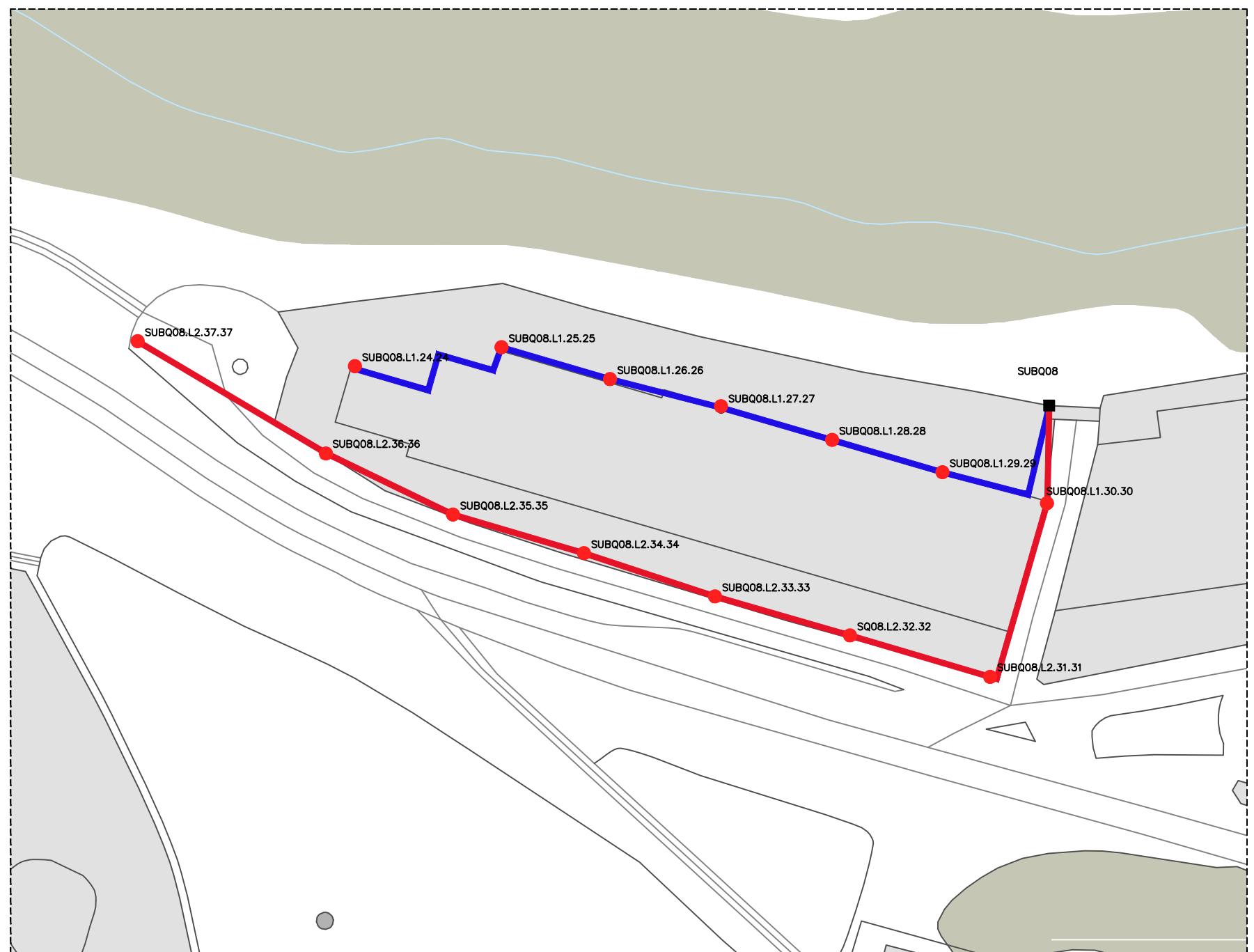
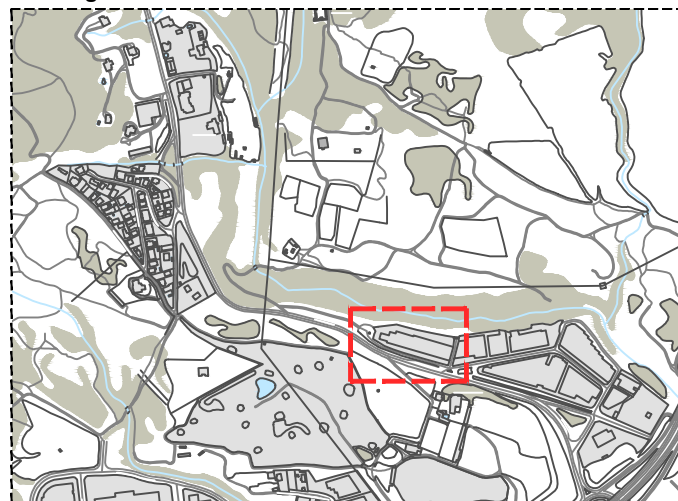
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### MILAN S 60



### Plànol guia



### Simbologia

- Luminària a mantenir.
- Nova Il·luminària model Milan S
- ▲ Nova Il·luminària model Projector-Milan S
- Nova Il·luminària model Projector-Milan M
- ★ Nova Il·luminària model Innova B
- ⊕ Nova Il·luminària model Retrofeet
- ⊗ Nova Il·luminària model Neovilla ALU
- Canvia bombeta baix consum
- ✕ Cata
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TITOL PLANOL:  
**ESTAT PROJECTAT  
QUADRE SUB N° 8**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

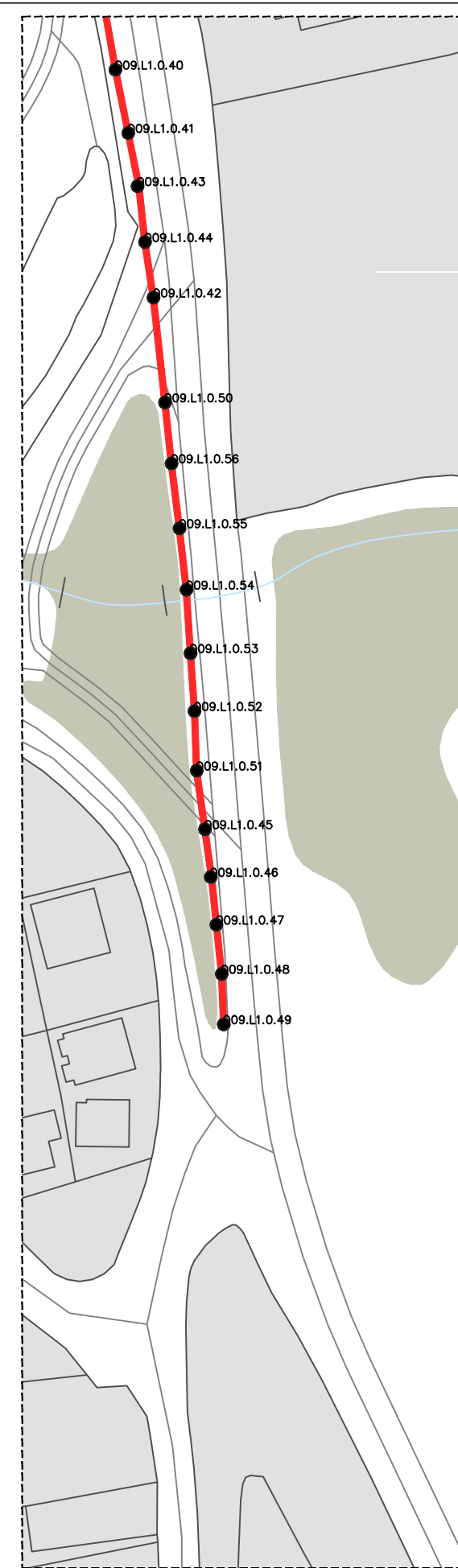
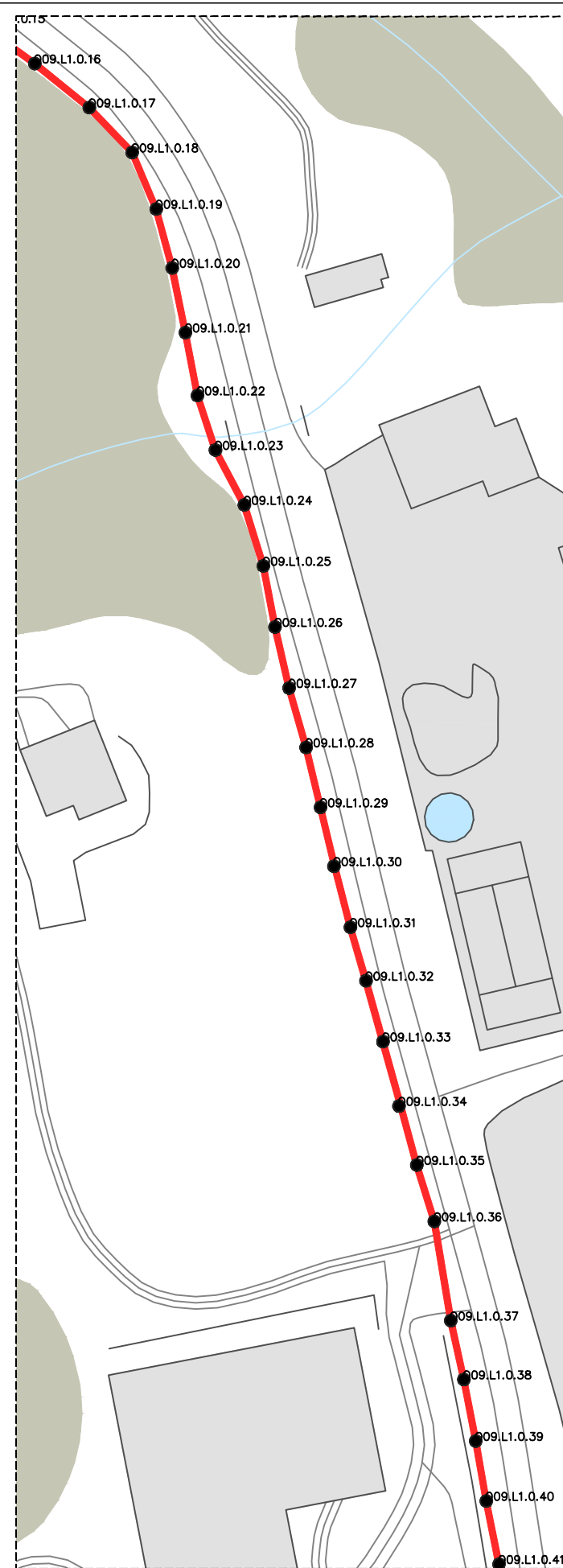
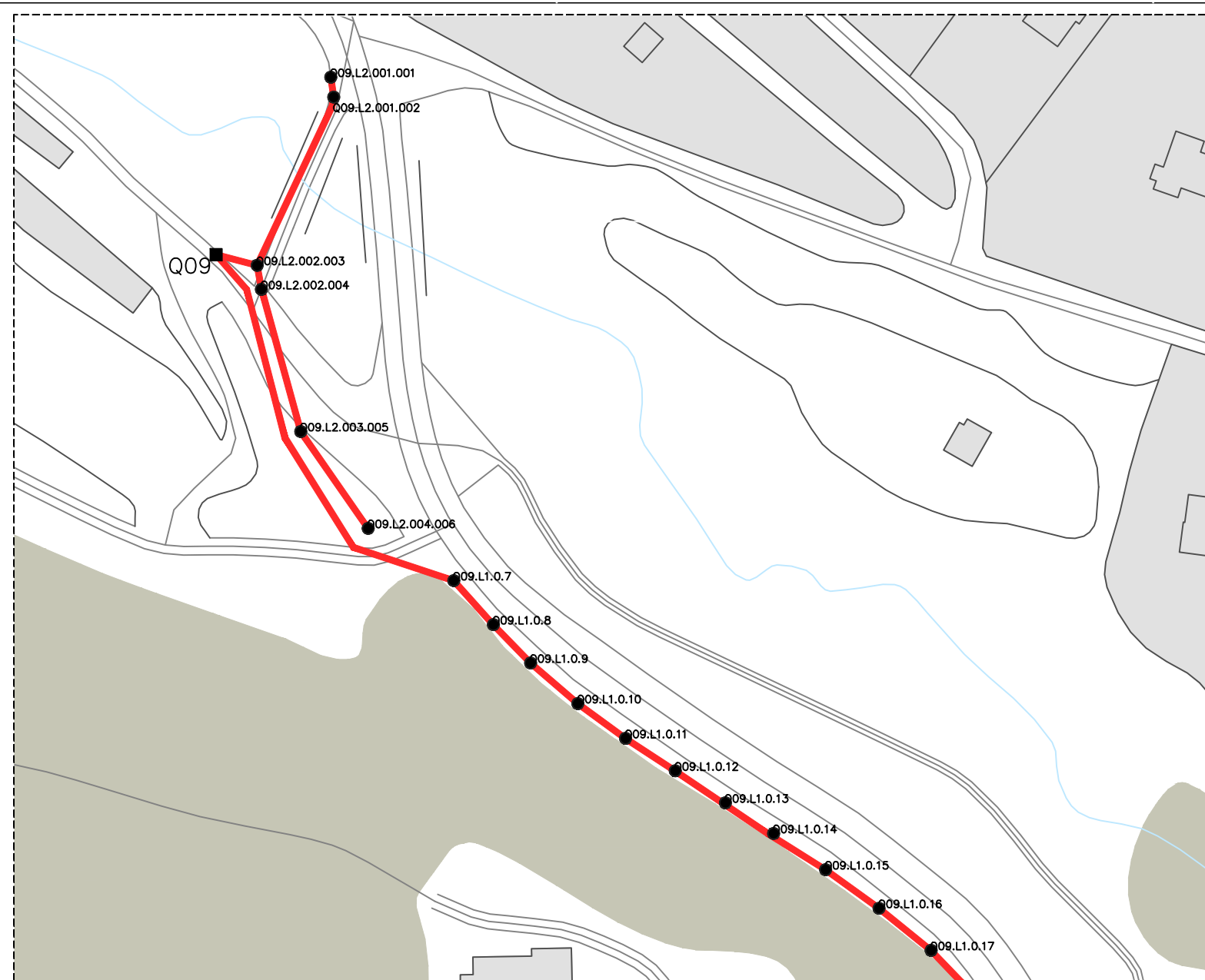
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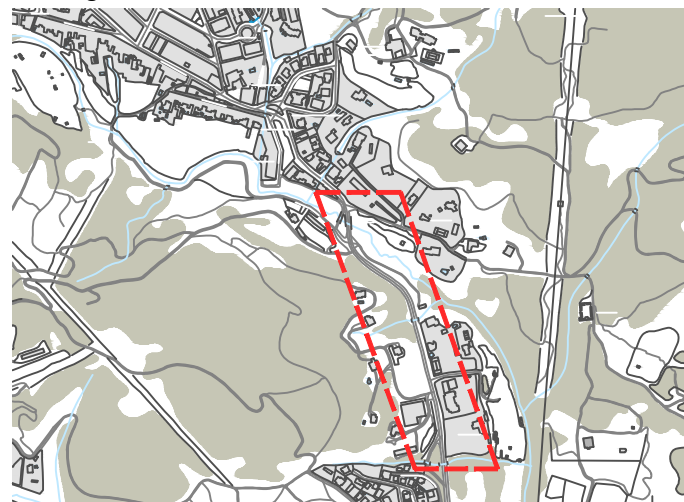
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ESCALA: 1/1000



**Plànol guia**



**Simbologia**

- Luminària a mantenir.
- Nova lluminària model Milan S
- ▲ Nova lluminària model Projector-Milan S
- Nova lluminària model Projector-Milan M
- ★ Nova lluminària model Innova B
- ⊕ Nova lluminària model Retrofeet
- ⊗ Nova lluminària model Neovilla ALU
- Canvia bombeta baix consum
- ✕ Cata
- Línia amb problemes d'aïllament elèctric.
- Formació de rassa amb estesa de línia subterrània



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REV. N	DIB.	DATA	COMP.	OBSERVACIONS

TITOL PLANOL:  
**ESTAT PROJECTAT  
QUADRE N° 9**

TITOL PROJECTE:  
PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC  
DE LA PALMA DE CERVELLÓ

PROMOTOR : AJUNTAMENT DE LA PALMA DE CERVELLÓ

PLANOL N°

**28**

REF. : 14

DATA: NOV-2022

ESCALA: 1/1000





**DOCUMENT N°3  
PLEC DE CONDICIONS TÈCNIQUES GENERALS**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ  
EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

---



Segons figura en el "Real Decreto 314/2006. Código Técnico de la Edificación (CTE)", el projecte definirà les obres projectades amb el detall adequat a les seves característiques, de manera que pugui comprovar-se que les solucions proposades compleixen les exigències bàsiques del CTE i altra normativa aplicable. Aquesta definició inclourà, almenys, la següent informació continguda en el Plec de Condicions:

- Les característiques tècniques mínimes que han de reunir els productes, equips i sistemes que s'incorporin de forma permanent a l'edifici projectat, així com les seves condicions de subministrament, les garanties de qualitat i el control de recepció que hagi de realitzar-se. Aquesta informació es troba en l'apartat corresponent a les Prescripcions sobre els materials, del present Plec de Condicions.
- Les característiques tècniques de cada unitat d'obra, amb indicació de les condicions per a la seva execució i les verificacions i controls a realitzar per a comprovar la seva conformitat amb l'indicat en el projecte. Es precisaran les mesures a adoptar durant l'execució de les obres i en l'ús i manteniment de l'edifici, per a assegurar la compatibilitat entre els diferents productes, elements i sistemes constructius. Aquesta informació es troba en l'apartat corresponent a les Prescripcions quant a l'execució per unitats d'obra del present Plec de Condicions.
- Les verificacions i les proves de servei que, si s'escau, han de realitzar-se per a comprovar les prestacions finals de l'edifici. Aquesta informació es troba en l'apartat corresponent a les Prescripcions sobre verificacions en l'edifici acabat, del present Plec de Condicions.



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## 1.- PLEC DE CLÀUSULES ADMINISTRATIVES

### 1.1.- Disposicions Generals

Les disposicions de caràcter general, les relatives a treballs i materials, així com les recepcions d'edificis i obres annexes, es regiran per l'exposat en el Plec de Clàusules Particulars per a contractes amb l'Administració Pública corresponent, segons el que es disposa en la Llei 3/2011, de Contractes del Sector Públic (LCSP).

### 1.2.- Disposicions Facultatives

#### 1.2.1.- Definició, atribucions i obligacions dels agents de l'edificació

Les atribucions dels diferents agents intervinents en l'edificació són les regulades per la "Ley 38/1999. Ley de Ordenación de la Edificación".

Es defineixen agents de l'edificació totes les persones, físiques o jurídiques, que intervenen en el procés de l'edificació. Les seves obligacions queden determinades pel disposat en la "Ley 38/1999. Ley de Ordenación de la Edificación" i altres disposicions que siguin d'aplicació i pel contracte que origina la seva intervenció.

Les definicions i funcions dels agents que intervenen en l'edificació queden recollides en el capítol III "Agents de l'edificació", considerant-se:

#### 1.2.1.1.- El promotor

És la persona física o jurídica, pública o privada, que individual o col·lectivament decideix, impulsa, programa i finança amb recursos propis o aliens, les obres d'edificació per a si o per a la seva posterior alienació, lliurament o cessió a tercers sota qualsevol títol.

Assumeix la iniciativa de tot el procés de l'edificació, impulsant la gestió necessària per a portar a terme l'obra inicialment projectada, i es fa càrrec de tots els costos necessaris.

Segons la legislació vigent, a la figura del promotor s'equiparen també les de gestor de societats cooperatives, comunitats de propietaris, o altres anàlogues que assumeixen la gestió econòmica de l'edificació.

Quan les Administracions públiques i els organismes subjectes a la legislació de contractes de les Administracions públiques actuïn com promotors, es regiran per la legislació de contractes de les Administracions públiques i, en el que no està contemplat en la mateixa, per les disposicions de la "Ley 38/1999. Ley de Ordenación de la Edificación".

#### 1.2.1.2.- El projectista

És l'agent que, per encàrrec del promotor i amb subjecció a la normativa tècnica i urbanística corresponent, redacta el projecte.

Podran redactar projectes parcials del projecte, o parts que ho complementin altres tècnics, de forma coordinada amb l'autor d'aquest.

Quan el projecte es desenvolupi o completi mitjançant projectes parcials o altres documents tècnics segons el previst en la "Ley 38/1999. Ley de Ordenación de la Edificación", cada projectista assumirà la titularitat del seu projecte.

#### 1.2.1.3.- El constructor o contractista

És l'agent que assumeix, contractualment davant el promotor, el compromís d'executar amb mitjans humans i materials, propis o aliens, les obres o part de les mateixes amb subjecció al Projecte i al Contracte d'obra.

S'HA D'EFECTUAR ESPECIAL MENCIO QUE LA LLEI ASSENYALA COM RESPONSABLE EXPLÍCIT DELS VICIS O DEFECTES CONSTRUCTIUS AL CONTRACTISTA GENERAL DE L'OBRA, SENSE PERJUDICI DEL DRET DE REPETICIO D'AQUEST CAP ALS SUBCONTRACTISTES.



#### **1.2.1.4.- El director d'obra**

És l'agent que, formant part de la direcció facultativa, dirigeix el desenvolupament de l'obra en els aspectes tècnics, estètics, urbanístics i mediambientals, de conformitat amb el projecte que la defineix, la llicència d'edificació i altres autoritzacions preceptives, i les condicions del contracte, amb l'objecte d'assegurar la seva adequació per fi proposat.

Podran dirigir les obres dels projectes parcials altres tècnics, sota la coordinació del director d'obra.

#### **1.2.1.5.- El director de l'execució de l'obra**

És l'agent que, formant part de la Direcció facultativa, assumeix la funció tècnica de dirigir l'Execució Material de l'Obra i de controlar qualitativa i quantitativament la construcció i qualitat de l'edificat. Per a això és requisit indispensable l'estudi i anàlisi prèvia del projecte d'execució una vegada redactat pel director d'obra, procedint a sol·licitar-li, amb antelació a l'inici de les obres, totes aquells aclariments, reparacions o documents complementaris que, dintre de la seva competència i atribucions legals, estimés necessaris per a poder dirigir de manera solvent l'execució de les mateixes.

#### **1.2.1.6.- Les entitats i els laboratoris de control de qualitat de l'edificació**

Són entitats de control de qualitat de l'edificació aquelles capacitades per a atorgar assistència tècnica en la verificació de la qualitat del projecte, dels materials i de l'execució de l'obra i les seves instal·lacions d'acord amb el projecte i la normativa aplicable.

Són laboratoris d'assajos per al control de qualitat de l'edificació els capacitats per a atorgar assistència tècnica, mitjançant la realització d'assajos o proves de servei dels materials, sistemes o instal·lacions d'una obra d'edificació.

#### **1.2.1.7.- Els subministradors de productes**

Es consideren subministradors de productes els fabricants, encarregats de magatzems, importadors o venedors de productes de construcció.

S'entén per producte de construcció aquell que es fabrica per a la seva incorporació permanent en una obra, incloent materials, elements semielaborats, components i obres o part de les mateixes, tant acabades com en procés d'execució.

#### **1.2.2.- Agents que intervenen en l'obra**

La relació d'agents intervinents es troba en la memòria descriptiva del projecte.

#### **1.2.3.- Agents en matèria de seguretat i salut**

La relació d'agents intervinents en matèria de seguretat i salut es troba en la memòria descriptiva del projecte.

#### **1.2.4.- Agents en matèria de gestió de residus**

La relació d'agents intervinents en matèria de gestió de residus, es troba en l'Estudi de Gestió de Residus de Construcció i Demolició.

#### **1.2.5.- La Direcció Facultativa**

La Direcció facultativa està composta per la direcció d'Obra i la direcció d'Execució de l'Obra. A la Direcció facultativa s'integrarà el Coordinador en matèria de Seguretat i Salut en fase d'execució de l'obra, en el cas que s'hagi adjudicat aquesta missió a facultatiu distint dels anteriors.

Representa tècnicament els interessos del promotor durant l'execució de l'obra dirigint el procés de construcció en funció de les atribucions professionals de cada tècnic participant.

#### **1.2.6.- Visites facultatives**

Són les realitzades a l'obra de manera conjunta o individual per qualsevol dels membres que componen la Direcció facultativa. La intensitat i nombre de visites dependrà de les comeses que a



cada agent li són pròpies, podent variar en funció dels requeriments específics i de la major o menor exigència presencial requerida al tècnic a aquest efecte en cada cas i segons cadascuna de les fases de l'obra. Hauran d'adaptar-se al procés lògic de construcció, podent els agents ésser o no coincidents en l'obra en funció de la fase concreta que s'estigui desenvolupant a cada moment i de la comesa exigible a cadascú.

### **1.2.7.- Obligacions dels agents intervinents**

Les obligacions dels agents que intervenen en l'edificació són les contingudes a la "Ley 38/1999. Ley de Ordenación de la Edificación" i altra legislació aplicable.

#### **1.2.7.1.- El promotor**

Ostentar sobre el solar la titularitat d'un dret que li faculti per a construir en ell.

Facilitar la documentació i informació prèvia necessària per a la redacció del projecte, així com autoritzar al director d'obra, al director de l'execució de l'obra i al contractista posteriors modificacions del mateix que fossin imprescindibles per a dur a bon terme el projectat.

Triar i contractar als diferents agents, amb la titulació i capacitat professional necessària, que garanteixin el compliment de les condicions legalment exigibles per a realitzar en la seva globalitat i dur a bon terme l'objecte del promogut, en els terminis estipulats i en les condicions de qualitat exigibles mitjançant el compliment dels requisits bàsics estipulats per als edificis.

Gestionar i fer-se càrrec de les preceptives llicències i altres autoritzacions administratives procedents que, de conformitat amb la normativa aplicable, comporta la construcció d'edificis, la urbanització que procedís en el seu entorn immediat, la realització d'obres que en ells s'executin i la seva ocupació.

Garantir els danys materials que l'edifici pugui sofrir, per a l'adequada protecció dels interessos dels usuaris finals, en les condicions legalment establertes, assumint la responsabilitat civil de forma personal i individualitzada, tant per a actes propis com per a actes d'altres agents pels que, conforme a la legislació vigent, s'ha de respondre.

La subscripció obligatòria d'una assegurança, d'acord a les normes concretes fixades a aquest efecte, que cobreixi els danys materials que ocasionin en l'edifici l'incompliment de les condicions d'habitabilitat en tres anys o que afectin a la seguretat estructural en el termini de deu anys, amb especial esment als habitatges individuals en règim de autopromoció, que es regiran per tot allò especialment legislat a aquest efecte.

Contractar als tècnics redactors del preceptiu Estudi de Seguretat i Salut o Estudi Bàsic, si escau, igual que als tècnics coordinadors en la matèria en la fase que correspongui, tot això segons l'establert en el "Real Decreto 1627/1997. Disposiciones mínimas de seguridad y de salud en las obras de construcción".

Subscriure l'acta de recepció final de les obres, una vegada acabades aquestes, fent constar l'acceptació de les obres, que podrà efectuar-se amb o sense reserves i que haurà d'abastar la totalitat de les obres o fases completes. En el cas de fer esment exprés a reserves per a la recepció, haurien d'esmentar-se de manera detallada les deficiències i s'haurà de fer constar el termini que haurien de quedar resolts els defectes observats.

Lliurar al comprador i usuari inicial, si escau, el denominat Llibre de l'Edifici que conté el manual d'ús i manteniment del mateix i altra documentació d'obra executada, o qualsevol altre document exigible per les Administracions competents.

#### **1.2.7.2.- El projectista**

Redactar el projecte per encàrrec del promotor, amb subjecció a la normativa urbanística i tècnica en vigor i contenint la documentació necessària per a tramitar tant la llicència d'obres i altres permisos administratius -projecte bàsic- com per a ser interpretada i poder executar totalment l'obra, lliurant al promotor les còpies autoritzades corresponents, degudament visades pel seu col·legi professional.



Definir el concepte global del projecte d'execució amb el nivell de detall gràfic i escrit suficient i calcular els elements fonamentals de l'edifici, especialment la fonamentació i l'estructura. Concretar en el Projecte l'emplaçament de cambres de màquines, de comptadors, fornícules, espais assignats per a pujada de conductes, reserves de buits de ventilació, allotjament de sistemes de telecomunicació i, en general, d'aquells elements necessaris en l'edifici per a facilitar les determinacions concretes i especificacions detallades que són comeses dels projectes parcials, havent aquests d'adaptar-se al Projecte d'Execució, no podent contravenir-ho de cap manera. Haurà de lliurar-se necessàriament un exemplar del projecte complementari al director d'obra abans de l'inici de les obres o instal·lacions corresponents.

Acordar amb el promotor la contractació de col·laboracions parcials d'altres tècnics professionals. Facilitar la col·laboració necessària perquè es produeixi l'adequada coordinació amb els projectes parcials exigibles per la legislació o la normativa vigent i que sigui necessari incloure per al desenvolupament adequat del procés constructiu, que haurien de ser redactats per tècnics competents, sota la seva responsabilitat i subscrits per persona física. Els projectes parcials seran aquells redactats per altres tècnics la competència dels quals pot ser distinta i incompatible amb les competències del director d'obra i, per tant, d'exclusiva responsabilitat d'aquests.

Elaborar aquells projectes parcials o estudis complementaris exigits per la legislació vigent en els quals és legalment competent per a la seva redacció, excepte declinació expressa del director d'obra i previ acord amb el promotor, podent exigir la compensació econòmica en concepte de cessió de drets d'autor i de la propietat intel·lectual si s'hagués de lliurar a altres tècnics, igualment competents per a realitzar el treball, documents o plans del projecte per ell redactat, en suport paper o informàtic.

Ostentar la propietat intel·lectual del seu treball, tant de la documentació escrita com dels càlculs de qualsevol tipus, així com dels plànols continguts en la totalitat del projecte i qualsevol dels seus documents complementaris.

### **1.2.7.3.- El constructor o contractista**

Tenir la capacitat professional o titulació que habilita per al compliment de les condicions legalment exigibles per a actuar com constructor.

Organitzar els treballs de construcció per a complir amb els terminis previstos, d'acord al corresponent Pla d'Obra, efectuant les instal·lacions provisionals i disposant dels mitjans auxiliars necessaris.

Elaborar, i exigir de cada subcontractista, un pla de seguretat i salut en el treball en el qual s'analitzin, estudiïn, desenvolupin i complementin les previsions contingudes en l'estudi o estudi bàsic, en funció del seu propi sistema d'execució de l'obra. En aquests plans s'inclouran, si escau, les propostes de mesures alternatives de prevenció proposades, amb la corresponent justificació tècnica, que no podran implicar disminució dels nivells de protecció previstos en l'estudi o estudi bàsic.

Comunicar a l'autoritat laboral competent l'obertura del centre de treball en la qual inclourà el Pla de Seguretat i Salut al que es refereix la "Real Decreto 1627/1997. Disposiciones mínimas de seguridad y de salud en las obras de construcción".

Adoptar totes les mesures preventives que compleixin els preceptes en matèria de Prevenció de Riscos laborals i Seguretat i Salut que estableix la legislació vigent, redactant el corresponent Pla de Seguretat i ajustant-se al compliment estricte i permanent de l'establert en l'Estudi de Seguretat i Salut, disposant de tots els mitjans necessaris i dotant al personal de l'equipament de seguretat exigibles, així com complir les ordres efectuades pel coordinador en matèria de Seguretat i Salut en la fase d'Execució de l'obra.

Supervisar de manera continuada el compliment de les normes de seguretat, tutelant les activitats dels treballadors al seu càrrec i, si escau, rellevant del seu lloc a tots aquells que poguessin menyscarbar les condicions bàsiques de seguretat personals o generals, per no estar en les condicions adequades.





Examinar la documentació aportada pels tècnics redactors corresponents, tant del Projecte d'Execució com dels projectes complementaris, així com de l'Estudi de Seguretat i Salut, verificant que li resulta suficient per a la comprensió de la totalitat de l'obra contractada o, en cas contrari, sol·licitant els aclariments pertinents.

Facilitar la tasca de la Direcció facultativa, subscriuint l'Acta de Replanteig executant les obres amb subjecció al Projecte d'Execució que haurà d'haver examinat prèviament, a la legislació aplicable, a les Instruccions del director d'obra i del director de l'execució material de l'obra, a fi d'arribar a la qualitat exigida en el projecte.

Efectuar les obres seguint els criteris a l'ús que són propis de la correcta construcció, que té l'obligació de conèixer i posar en pràctica, així com de les lleis generals dels materials o lex artis, encara quan aquests criteris no estiguessin específicament ressenyats en la seva totalitat en la documentació de projecte. A aquest efecte, ostenta la prefectura de tot el personal que intervingui en l'obra i coordina les tasques dels subcontractistes.

Disposar dels mitjans materials i humans que la naturalesa i entitat de l'obra imposin, disposant del nombre adequat d'oficials, suboficials i peons que l'obra requereixi a cada moment, bé per personal propi o mitjançant subcontractistes a aquest efecte, procedint a encavalcar aquells oficis en l'obra que siguin compatibles entre si i que permetin escometre diferents treballs alhora sense provocar interferències, contribuint amb això a la agilització i finalització de l'obra dintre dels terminis previstos.

Ordenar i disposar a cada moment de personal suficient al seu càrrec perquè efectui les actuacions pertinents per a executar les obres amb solvència, diligentment i sense interrupció, programant-les de manera coordinada amb el director d'execució material de l'obra.

Supervisar personalment i de manera continuada i completa la marxa de les obres, que haurien de transcórrer sense dilació i amb adequat ordre i concert, així com respondre directament dels treballs efectuats pels seus treballadors subordinats, exigint-los el continu autocontrol dels treballs que efectuïn, i ordenant la modificació de totes aquelles tasques que es presentin malament efectuades. Assegurar la idoneïtat de tots i cadascun dels materials utilitzats i elements constructius, comprovant els preparats en obra i rebutjant, per iniciativa pròpia o per prescripció facultativa del director de l'execució de l'obra els subministraments de material o prefabricats que no contin amb les garanties, documentació mínima exigible o documents d'idoneïtat requerits per les normes d'aplicació, havent de recaptar de la Direcció facultativa la informació que necessiti per a complir adequadament la seva comesa.

Dotar de material, maquinària i utilitatges adequats als operaris que intervinguin en l'obra, per a efectuar adequadament les instal·lacions necessàries i no menyscabar amb la posada en obra les característiques i naturalesa dels elements constructius que componen l'edifici una vegada finalitzat.

Posar a la disposició del director d'execució material de l'obra els mitjans auxiliars i personal necessari per a efectuar les proves pertinents per al Control de Qualitat, recaptant la dita tècnica el pla a seguir quant a les preses de mostres, trasllats, assajos i altres actuacions necessàries.

Cuidar que el personal de l'obra guardi el degut respecte a la Direcció facultativa.

Auxiliar al Director de l'Execució de l'Obra en els actes de replanteig i signar posteriorment i una vegada finalitzat aquest, l'acta corresponent d'inici d'obra, així com la de recepció final.

Facilitar als directors d'obra les dades necessàries per a l'elaboració de la documentació final d'obra executada.

Subscriure les garanties d'obra que s'assenyalen en la "Ley 38/1999. Ley de Ordenación de la Edificación" i que, en funció de la seva naturalesa, arriben a períodes de 1 any (danys per defectes de terminació o acabat de les obres), 3 anys (danys per defectes o vicis d'elements constructius o d'instal·lacions que afectin a l'habitabilitat) o 10 anys (danys en fonamentació o estructura que comprometin directament la resistència mecànica i l'estabilitat de l'edifici).



#### 1.2.7.4.- El director d'obra

Dirigir l'obra coordinant-la amb el Projecte d'Execució, facilitant la seva interpretació tècnica, econòmica i estètica als agents que intervenen en el procés constructiu.

Detenir l'obra per causa greu i justificada, que s'haurà de fer constar necessàriament en el Llibre d'Ordres i Assistències, donant explicacions immediates al promotor.

Redactar les modificacions, ajustaments, rectificacions o plànols complementaris que es precisin per a l'adequat desenvolupament de les obres. És facultat expressa i única la redacció d'aquelles modificacions o aclariments directament relacionats amb l'adequació de la fonamentació i de l'estructura projectades a les característiques geotècniques del terreny; el càlcul o recàlcul del dimensionament i armat de tots i cadascun dels elements principals i complementaris de la fonamentació i de l'estructura vertical i horitzontal; els quals afectin substancialment a la distribució d'espais i les solucions de façana i coberta i dimensionament i composició de buits, així com la modificació dels materials previstos.

Assessorar al director de l'execució de l'obra en aquells aclariments i dubtes que poguessin esdevenir per al correcte desenvolupament de la mateixa, pel que fa a les interpretacions de les especificacions de projecte.

Assistir a les obres a fi de resoldre les contingències que es produeixin per a assegurar la correcta interpretació i execució del projecte, així com impartir les solucions aclaridores que fossin necessàries, consignant en el Llibre d'Ordres i Assistències les instruccions precises que s'estimessin oportunes ressenyar per a la correcta interpretació de tot el que està projectat, sense perjudici d'efectuar tots els aclariments i ordres verbals que s'estimés oportú.

Signar l'Acta de replanteig o de començament d'obra i el Certificat Final d'Obra així com signar el vistiplau de les certificacions parcials referides al percentatge d'obra efectuada i, si escau i a instàncies del promotor, la supervisió de la documentació que se li presenti relativa a les unitats d'obra realment executades prèvia a la seva liquidació final, tot això amb els visats que si escau fossin preceptius.

Informar puntualment al promotor d'aquelles modificacions substancials que, per raons tècniques o normatives, comporten una variació del construït pel que fa al projecte bàsic i d'execució i que afectin o puguin afectar al contracte subscrit entre el promotor i els destinataris finals dels habitatges.

Redactar la documentació final d'obra, pel que fa a la documentació gràfica i escrita del projecte executat, incorporant les modificacions efectuades. Per a això, els tècnics redactors de projectes i/o estudis complementaris hauran obligatòriament lliurar-li la documentació final en la que es faci constar l'estat final de les obres i/o instal·lacions per ells redactades, supervisades i realment executades, sent responsabilitat dels signants la veracitat i exactitud dels documents presentats.

Al Projecte Final d'Obra s'annexarà l'Acta de Recepció Final; la relació identificativa dels agents que han intervingut en el procés d'edificació, inclosos tots els subcontractistes i oficis intervinents; les instruccions d'Ús i Manteniment de l'Edifici i de les seves instal·lacions, de conformitat amb la normativa que li sigui d'aplicació.

La documentació a la qual es fa referència en els dos apartats anteriors és part constituent del Llibre de l'Edifici i el promotor haurà de lliurar una còpia completa als usuaris finals del mateix que, en el cas d'edificis d'habitatges plurifamiliars, es materialitza en un exemplar que haurà de ser custodiat pel president de la Comunitat de Propietaris o per l'Administrador, sent aquests els responsables de divulgar a la resta de propietaris el seu contingut i de fer complir els requisits de manteniment que consten en la citada documentació.

A més de totes les facultats que corresponen al director d'obra, expressades en els articles precedents, és missió específica seva la direcció mediata, denominada alta direcció en el que al compliment de les directrius generals del projecte es refereix, i a l'adequació del construït a aquest. S'ha d'assenyalar expressament que la resistència al compliment de les ordres dels directors d'obra en la seva tasca d'alta direcció es considerarà com falta greu i, en cas que, al seu parer, d'incompliment de l'ordenat posés en perill l'obra o les persones que en ella treballen, podrà recusar



al contractista i/o acudir a les autoritats judicials, sent responsable el contractista de les conseqüències legals i econòmiques.

#### **1.2.7.5.- El director de l'execució de l'obra**

Correspon al director d'execució material de l'obra, segons s'estableix en la "Ley 38/1999. Ley de Ordenación de la Edificación" i altra legislació vigent a aquest efecte, les atribucions competencials i obligacions que s'assenyalen a continuació

La direcció immediata de l'Obra.

Verificar personalment la recepció a peu d'obra, previ al seu aplec o col·locació definitiva, de tots els productes i materials subministrats necessaris per a l'execució de l'obra, comprovant que s'ajusten amb precisió a les determinacions del projecte i a les normes exigibles de qualitat, amb la plena potestat d'acceptació o rebuig dels mateixos en cas que ho considerés oportú i per causa justificada, ordenant la realització de proves i assajos que fossin necessaris.

Dirigir l'execució material de l'obra d'acord amb les especificacions de la memòria i dels plànols del Projecte, així com, si escau, amb les instruccions complementàries necessàries que recaptés del director d'obra.

Anticipar-se amb l'antelació suficient a les diferents fases de la posada en obra, requerint els aclariments al director d'obra o directors d'obra que fossin necessàries i planificant de manera anticipada i continuada amb el contractista principal i els subcontractistes els treballs a efectuar.

Comprovar els replanteigs, els materials, formigons i altres productes subministrats, exigint la presentació dels oportuns certificats de idoneïtat dels mateixos.

Verificar la correcta execució i disposició dels elements constructius i de les instal·lacions, estenent-se aquesta comesa a tots els elements de fonamentació i estructura horitzontal i vertical, amb comprovació de les seves especificacions concretes de dimensionat d'elements, tipus de biguetes i adequació a fitxa tècnica homologada, diàmetres nominals, longituds d'ancoratge i encavallaments adequats i doblegat de barres.

Observança dels temps d'encofrat i desencofrat de bigues, pilars i forjats assenyalats per la Instrucció del Formigó vigent i d'aplicació.

Comprovació del correcte dimensionament de rampes i escales i del seu adequat traçat i replanteig amb acord als pendents, desnivells projectats i al compliment de totes les normatives que són d'aplicació; a dimensions parcials i totals d'elements, a la seva forma i geometria específica, així com a les distàncies que han de guardar-se entre ells, tant en horitzontal com en vertical.

Verificació de l'adequada posada en obra de fàbriques i tancaments, al seu correcte i complet entrellaçament i, en general, al que pertoca a l'execució material de la totalitat de l'obra i sense excepció alguna, d'acord als criteris i lleis dels materials i de la correcta construcció (lex artis) i a les normatives d'aplicació.

Assistir a l'obra amb la freqüència, dedicació i diligència necessàries per a complir eficaçment la deguda supervisió de l'execució de la mateixa en totes les seves fases, des del replanteig inicial fins a la total finalització de l'edifici, donant les ordres precises d'execució al contractista i, si escau, als subcontractistes.

Consignar en el Llibre d'Ordres i Assistències les instruccions precises que considerés oportú ressenyar per a la correcta execució material de les obres.

Supervisar posteriorment el correcte compliment de les ordres prèviament efectuades i l'adequació del realment executat a l'ordenat prèviament.

Verificar l'adequat traçat d'instal·lacions, conductes, escomeses, xarxes d'evacuació i el seu dimensionament, comprovant la seva idoneïtat i ajustament tant a l'especificacions del projecte d'execució com dels projectes parcials, coordinant aquestes actuacions amb els tècnics redactors corresponents.

Detenir l'Obra si, al seu judici, existís causa greu i justificada, que s'haurà de fer constar necessàriament en el Llibre d'Ordres i Assistències, donant compte immediata als directors d'obra que haurien de necessàriament corroborar-la per a la seva plena efectivitat, i al promotor.



Supervisar les proves pertinents per al Control de Qualitat, respecte a l'especificat per la normativa vigent, en la comesa de la qual i obligacions té legalment competència exclusiva, programant sota la seva responsabilitat i degudament coordinat i auxiliat pel contractista, les preses de mostres, trasllats, assajos i altres actuacions necessàries d'elements estructurals, així com les proves d'estanquitat de façanes i dels seus elements, de cobertes i les seves impermeabilitzacions, comprovant l'eficàcia de les solucions.

Informar amb promptitud als directors d'obra dels resultats dels Assajos de Control conforme es vagi tenint coneixement dels mateixos, proposant-li la realització de proves complementàries en cas de resultats adversos.

Després de l'oportuna comprovació, emetre les certificacions parcials o totals relatives a les unitats d'obra realment executades, amb els visats que si escau fossin preceptius.

Col·laborar activa i positivament amb els restants agents intervinents, servint de nexa d'unió entre aquests, el contractista, els subcontractistes i el personal de l'obra.

Elaborar i subscriure responsablement la documentació final d'obra relativa als resultats del Control de Qualitat i, en concret, a aquells assajos i verificacions d'execució d'obra realitzats sota la seva supervisió relatius als elements de la fonamentació, murs i estructura, a les proves d'estanquitat i vessament de cobertes i de façanes, a les verificacions del funcionament de les instal·lacions de sanejament i desguassos de pluvials i altres aspectes assenyalats en la normativa de Control de Qualitat.

Subscriure conjuntament el Certificat Final d'Obra, acreditant amb això la seva conformitat a la correcta execució de les obres i a la comprovació i verificació positiva dels assajos i proves realitzades.

Si es fes cas omís de les ordres efectuades pel director d'execució material de l'obra, es considerés com falta greu i, en cas que, al seu judici, l'incompliment de l'ordenat posés en perill l'obra o les persones que en ella treballen, podrà acudir a les autoritats judicials, sent responsable el contractista de les conseqüències legals i econòmiques.

#### **1.2.7.6.- Les entitats i els laboratoris de control de qualitat de l'edificació**

Prestar assistència tècnica i lliurar els resultats de la seva activitat a l'agent autor de l'encàrrec i, en tot cas, al director de l'execució de l'obra.

Justificar la capacitat suficient de mitjans materials i humans necessaris per a realitzar adequadament els treballs contractats, si escau, a través de la corresponent acreditació oficial atorgada per les Comunitats Autònomes amb competència en la matèria.

#### **1.2.7.7.- Els subministradors de productes**

Realitzar els lliuraments dels productes d'acord amb les especificacions de la comanda, responnent del seu origen, identitat i qualitat, així com del compliment de les exigències que, si escau, estableixi la normativa tècnica aplicable.

Facilitar, quan escaigui, les instruccions d'ús i manteniment dels productes subministrats, així com les garanties de qualitat corresponents, per a la seva inclusió en la documentació de l'obra executada.

#### **1.2.7.8.- Els propietaris i els usuaris**

Són obligacions dels propietaris conservar en bon estat l'edificació mitjançant un adequat ús i manteniment, així com rebre, conservar i transmetre la documentació de l'obra executada i les assegurances i garanties amb que aquesta conti.

Són obligacions dels usuaris siguin o no propietaris, la utilització adequada dels edificis o de part dels mateixos de conformitat amb les instruccions d'ús i manteniment contingudes en la documentació de l'obra executada.



### **1.2.8.- Documentació final d'obra: Llibre de l'Edifici**

D'acord a la "Ley 38/1999. Ley de Ordenación de la Edificación", una vegada finalitzada l'obra, el projecte amb la incorporació, si escau, de les modificacions degudament aprovades, serà facilitat al promotor pel director d'obra per a la formalització dels corresponents tràmits administratius.

A aquesta documentació s'adjuntarà, almenys, l'acta de recepció, la relació identificativa dels agents que han intervingut durant el procés d'edificació així com la relativa a les instruccions d'ús i manteniment de l'edifici i les seves instal·lacions, de conformitat amb la normativa que li sigui d'aplicació.

Tota la documentació que fan referència els apartats anteriors, que constituirà el Llibre de l'Edifici, serà lliurada als usuaris finals de l'edifici.

#### **1.2.8.1.- Els propietaris i els usuaris**

Són obligacions dels propietaris conservar en bon estat l'edificació mitjançant un adequat ús i manteniment, així com rebre, conservar i transmetre la documentació de l'obra executada i les assegurances i garanties amb que aquesta conti.

Són obligacions dels usuaris siguin o no propietaris, la utilització adequada dels edificis o de part dels mateixos de conformitat amb les instruccions d'ús i manteniment contingudes en la documentació de l'obra executada.

### **1.3.- Disposicions Econòmiques**

Es regiran per l'exposat en el Plec de Clàusules Administratives Particulars per a contractes amb l'Administració Pública corresponent, segons el que es disposa en la Llei 3/2011, de Contractes del Sector Públic (LCSP).



## 2.- PLEC DE CONDICIONS TÈCNiques PARTICULARS

### 2.1.- Prescripcions sobre els materials

Per a facilitar la labor a realitzar, per part del director de l'execució de l'obra per al control de recepció en obra dels productes, equips i sistemes que se subministren a l'obra d'acord amb l'especificat en la "Real Decreto 314/2006. Código Técnico de la Edificación (CTE)", en el present projecte s'especifiquen les característiques tècniques que haurien de complir els productes, equips i sistemes subministrats.

Els productes, equips i sistemes subministrats haurien de complir les condicions que sobre ells s'especifiquen en els diferents documents que componen el Projecte. Així mateix, les seves qualitats seran acords amb les diferents normes que sobre ells estiguin publicades i que tindran un caràcter de complementarietat a aquest apartat del Plec. Tindran preferència en quant a la seva acceptabilitat aquells materials que estiguin en possessió de Document d'Idoneïtat Tècnica que avaluï les seves qualitats, emès per Organismes Tècnics reconeguts.

Aquest control de recepció en obra de productes, equips i sistemes comprendrà:

- El control de la documentació dels subministraments.
- El control mitjançant distintius de qualitat o avaluacions tècniques d'ideïtat.
- El control mitjançant assajos.

Per part del constructor o contractista ha d'existir obligació de comunicar als subministradors de productes les qualitats que s'exigeixen per als distints materials, aconsellant-se que prèviament a l'ocupació dels mateixos se sol·liciti l'aprovació del director d'execució de l'obra i de les entitats i laboratoris encarregats del control de qualitat de l'obra.

El contractista serà responsable que els materials empleats compleixin amb les condicions exigides, independentment del nivell de control de qualitat que s'estableixi per a l'acceptació dels mateixos.

El contractista notificarà al director d'execució de l'obra, amb suficient antelació, la procedència dels materials que es proposi utilitzar, aportant, quan així ho sol·liciti el director d'execució de l'obra, les mostres i dades necessàries per a decidir sobre la seva acceptació.

Aquests materials seran reconeguts pel director d'execució de l'obra abans de la seva ocupació en obra, sense l'aprovació de la qual no podran ser apilats en obra ni es podrà procedir a la seva col·locació. Així mateix, encara després de col·locats en obra, aquells materials que presentin defectes no percebuts en el primer reconeixement, sempre que vagi en perjudici del bon acabat de l'obra, seran retirats de l'obra. Totes les despeses que això ocasionés seran a càrrec del contractista.

El fet que el contractista subcontracti qualsevol partida d'obra no li eximeix de la seva responsabilitat.

La simple inspecció o examen per part dels Tècnics no suposa la recepció absoluta dels mateixos, sent els oportuns assajos els quals determinin la seva idoneïtat, no extingint-se la responsabilitat contractual del contractista a aquests efectes fins a la recepció definitiva de l'obra.

#### 2.1.1.- Garanties de qualitat (Marcat CE)

El terme producte de construcció queda definit com qualsevol producte fabricat per la seva incorporació, amb caràcter permanent, a les obres d'edificació i enginyeria civil que tinguin incidència sobre els següents requisits essencials:

- Resistència mecànica i estabilitat.
- Seguretat en cas d'incendi.



- Higiene, salut i medi ambient.
- Seguretat d'utilització.
- Protecció contra el soroll.
- Estalvi d'energia i aïllament tèrmic.

El marcat CE d'un producte de construcció indica:

- Que aquest compleixi amb unes determinades especificacions tècniques relacionades amb los requisits essencials continguts en les Normes Armonitzades (EN) i en les GuíasDITE (Guies pel Document d'Idoneïtat Tècnica Europeu).
- Que s'ha complert el sistema d'avaluació i verificació de la constància de les prestacions indicat en els mandats relatius a les normes harmonitzades i en les especificacions tècniques harmonitzades.

Sent el fabricant el responsable de la seva fixació i l'Administració competent en matèria d'indústria la que s'asseguri de la correcta utilització del marcat CE.

És obligació del director de l'execució de l'obra verificar si els productes que entren en l'obra estan afectats pel compliment del sistema del marcat CE i, en cas de ser així, si es compleixen les condicions establertes en el "Real Decreto 1630/1992. Disposiciones para la libre circulación de productos de construcción, en aplicación de la Directiva 89/106/CEE".

El marcat CE es materialitza mitjançant el símbol "CE" acompanyat d'una informació complementària.

El fabricant ha de cuidar que el marcat CE figuri, per ordre de preferència:

- En el producte propiament dit.
- En una etiqueta adherida al mateix.
- En el seu envàs o embalatge.
- En la documentació comercial que l'acompanya.

Les lletres del símbol CE han de tenir una dimensió vertical no inferior a 5 mm.

A més del símbol CE han d'estar situades en una de les quatre possibles localitzacions una sèrie d'inscripcions complementàries, el contingut específic de les quals es determina en les normes armonitzades i Guías DITE per cada família de productes, entre les que s'inclouen:

- el nombre d'identificació de l'organisme notificat (quan procedeixi)
- el nom comercial o la marca distintiva del fabricant
- la direcció del fabricant
- el nom comercial o la marca distintiva de la fàbrica
- les dues últimes xifres de l'any en el qual s'ha estampat el marcat en el producte
- el nombre del certificat CE de conformitat (quan procedeixi)



- el nombre de la norma armonitzada i en cas de veure's afectada per diverses els nombres de totes elles
- la designació del producte, el seu ús previst i la seva designació normalitzada
- informació addicional que permeti identificar les característiques del producte atenent les seves especificacions tècniques

Les inscripcions complementàries del marcat CE no tenen perquè tenir un format, tipus de lletra, color o composició especial, havent de complir únicament les característiques remarcades anteriorment pel símbol.

Dins de les característiques del producte podem trobar que alguna d'elles presenti l'esment "Prestació no determinada" (PND).

L'opció PND és una classe que pot ser considerada si almenys un estat membre no té requisits legals per a una determinada característica i el fabricant no desitja facilitar el valor d'aquesta característica.

## **2.1.2.- Formigons**

### **2.1.2.1.- Formigó estructural**

#### **2.1.2.1.1.- Condicions de subministre**

El formigó s'ha de transportar utilitzant procediments adequats per a aconseguir que les masses arribin al lloc de lliurament en les condicions estipulades, sense experimentar variació sensible en les característiques que posseïen acabades de pastar.

Quan el formigó es pasta completament en central i es transporta en pastadores mòbils, el volum de formigó transportat no haurà d'excedir del 80% del volum total del tambor. Quan el formigó es pasta, o s'acaba de pastar, en pastadora mòbil, el volum no excedirà dels dos terços del volum total del tambor.

Els equips de transport haurien d'estar exempts de residus de formigó o morter endurit, per a això es netejaran curosament abans de procedir a la càrrega d'una nova massa fresca de formigó. Així mateix, no haurien de presentar desperfectes o desgastos en les paletes o en la seva superfície interior que puguin afectar a l'homogeneïtat del formigó.

El transport es podrà realitzar en pastadores mòbils, a la velocitat d'agitació o en equips amb o sense agitadors, sempre que tals equips tinguin superfícies llises i arrodonides i siguin capaces de mantenir l'homogeneïtat del formigó durant el transport i la descàrrega.

#### **2.1.2.1.2.- Recepció i control**

Documentació dels subministraments:

Els subministradors lliuraran al Constructor, qui els facilitarà a la Direcció Facultativa, qualsevol document d'identificació del producte exigint per la reglamentació aplicable o, si escau, pel projecte o per la Direcció facultativa. Es facilitaràn els següents documents:

Abans del subministrament:

Els documents de conformitat o autoritzacions administratives exigides reglamentàriament.





Es lliuraran els certificats d'assaig que garanteixin el compliment de l'establert en la Instrucció de Formigó Estructural (EHE-08).

Durant el subministrament:

Cada càrrega de formigó fabricat en central, tant si aquesta pertany o no a les instal·lacions d'obra, anirà acompanyada d'una fulla de subministrament que estarà en tot moment a la disposició de la Direcció d'Obra, i en la qual haurien de figurar, com a mínim, les següents dades:

Nom de la central de fabricació de formigó.

Nombre de sèrie del full de subministrament.

Data d'entrega.

Nom del peticionari i del responsable de la recepció.

Especificació del formigó.

En cas que el formigó es designi per propietats:

Designació.

Contingut de ciment en quilos per metre cúbic ( $\text{kg}/\text{m}^3$ ) de formigó, amb una tolerància de  $\pm 15$  kg.

Relació aigua/ciment del formigó, amb una tolerància de  $\pm 0,02$ .

En cas que el formigó es designi per dosificació:

Contingut de ciment per metre cúbic de formigó.

Relació aigua/ciment del formigó, amb una tolerància de  $\pm 0,02$ .

Tipus d'ambient.

Tipus, classe i marca del ciment.

Consistència.

Grandària màxima de l'àrid.

Tipus d'additiu, si ho hagués, i en cas contrari indicació expressa que no conté.

Procedència i quantitat d'addició (cendres volants o fum de silici) si l'hagués i, en cas contrari, indicació expressa que no conté.

Designació específica del lloc del subministrament (nom i lloc).

Quantitat de formigó que compon la càrrega, expressada en metres cúbics de formigó fresc.

Identificació del camió formigonera (o equip de transport) i de la persona que procedeixi a la descàrrega.

Hora límit d'ús per al formigó.

Després del subministrament:

El certificat de garantia del producte subministrat, signat per persona física amb poder de representació suficient.

Distintius de qualitat i avaluacions d'idoneïtat tècnica:

Assajos:

La comprovació de les propietats o característiques exigibles a aquest material es realitza segons la Instrucció de Formigó Estructural (EHE-08).

#### **2.1.2.1.3.- Conservació, emmagatzematge i manipulació**

En l'abocament i col·locació de les masses, fins i tot quan aquestes operacions es realitzin d'una manera contínua mitjançant conduccions apropiades, s'adoptaran les degudes precaucions per a evitar la disgregació de la barreja.

#### **2.1.2.1.4.- Recomenacions per a el seu ús en obra**



El temps transcorregut entre l'addició d'aigua de pastat al ciment i als àrids i la col·locació del formigó, no ha de ser major d'hora i mitja. En temps calorós, o sota condicions que contribueixin a un ràpid enduriment del formigó, el temps límit haurà de ser inferior, tret que s'adoptin mesures especials que, sense perjudicar la qualitat del formigó, augmentin el temps d'enduriment.

Formigonat en temps fred:

La temperatura de la massa de formigó, en el moment d'abocar-la en el motlle o encofrat, no serà inferior a 5°C.

Es prohibeix abocar el formigó sobre elements (armadures, motlles, etc.) la temperatura de les quals sigui inferior a zero graus centígrads.

En general, se suspendrà el formigonat sempre que es previngui que, dintre de les quaranta-vuit hores següents, pugui descendir la temperatura ambient per sota de zero graus centígrads.

En els casos que, per absoluta necessitat, s'hagi de formigonar en temps de gelades, s'adoptaran les mesures necessàries per a garantir que, durant l'adormiment i primer enduriment del formigó, no es produiran deterioracions locals en els elements corresponents, ni minvaments permanents apreciables de les característiques resistents del material.

Formigonat en temps calorós:

Si la temperatura ambient és superior a 40°C o hi ha un vent excessiu, se suspendrà el formigonat, tret que, prèvia autorització expressa de la Direcció d'Obra, s'adoptin mesures especials.

## **2.1.3.- Morters**

### **2.1.3.1.- Morters fets en obra**

#### **2.1.3.1.1.- Condicions de subministre**

El conglomerant (calç o ciment) s'ha de subministrar:

En sacs de paper o plàstic, adequats perquè el seu contingut no pateixi alteració.

O a granel, mitjançant instal·lacions especials de transport i emmagatzematge que garanteixin la seva perfecta conservació.

La sorra s'ha de subministrar a granel, mitjançant instal·lacions especials de transport i emmagatzematge que garanteixin la seva perfecta conservació.

L'aigua s'ha de subministrar des de la xarxa d'aigua potable.

#### **2.1.3.1.2.- Recepció i control**

Documentació dels subministraments:

Si certs tipus de morter necessiten equipaments, procediments o temps de pastat especificats per al pastat en obra, s'han d'especificar pel fabricant. El temps de pastat s'amida a partir del moment en el qual tots els components s'han addicionat.

Distintius de qualitat i avaluacions d'idoneïtat tècnica:

Assajos:



La comprovació de les propietats o característiques exigibles a aquest material es realitza segons la normativa vigent.

#### **2.1.3.1.3.- Conservació, emmagatzematge i manipulació**

Els morters han d'estar perfectament protegits de l'aigua i del vent, ja que, si es troben exposats a l'acció d'aquest últim, la barreja veurà reduït el nombre de fins que la componen, deteriorant les seves característiques inicials i, per tant, no podrà ser utilitzat. És aconsellable emmagatzemar els morters secs en sitges.

#### **2.1.3.1.4.- Recomenacions per a el seu ús en obra**

Per a triar el tipus de morter apropiat es tindrà en compte determinades propietats, com la resistència al gel i el contingut de sals solubles en les condicions de servei en funció del grau d'exposició i del risc de saturació d'aigua.

En condicions climatològiques adverses, com pluja, gelada o excessiva calor, es prendran les mesures oportunes de protecció.

El pastat dels morters es realitzarà preferentment amb mitjans mecànics. La barreja ha de ser batuda fins a aconseguir la seva uniformitat, amb un temps mínim d'1 minut. Quan el pastat es realitzi a mà, es farà sobre una plataforma impermeable i neta, realitzant com a mínim tres batudes.

El morter s'utilitzarà en les dues hores posteriors al seu pastat. Si és necessari, durant aquest temps se li podrà agregar aigua per a compensar la seva pèrdua. Passades les dues hores, el morter que no s'hagi emprat es rebutjarà.

#### **2.1.4.- Conglomerants**

##### **2.1.4.1.- Ciment**

##### **2.1.4.1.1.- Condicions de subministre**

El ciment es subministra a granel o envasat.

El ciment a granel s'ha de transportar en vehicles, bótes o sistemes similars adequats, amb l'hermetisme, seguretat i emmagatzematge tals que garanteixin la perfecta conservació del ciment, de manera que el seu contingut no pateixi alteracions, i que no alterin el medi ambient.

El ciment envasat s'ha de transportar mitjançant palets o plataformes similars, per facilitar tant la seva càrrega i descàrrega com la seva manipulació, i així permetre millor tracte dels envasos.

El ciment no arribarà a l'obra o altres instal·lacions d'ús excessivament calent. Es recomana que, si la seva manipulació es realitzarà per mitjans mecànics, la seva temperatura no excedeixi de 70°C, i si es realitza a mà, no excedeixi de 40°C.

Quan es previngui que pot presentar-se el fenomen de fals enduriment, s'haurà de comprovar, amb anterioritat a l'ocupació del ciment, que aquest no presenta tendència a experimentar aquest fenomen.



#### 2.1.4.1.2.- Recepció i control

Documentació dels subministraments:

Aquest material ha d'estar proveït del marcat CE, que és una indicació que compleix els requisits essencials i ha estat objecte d'un procediment d'avaluació de la conformitat.

Al lliurament del ciment, ja sigui el ciment expedit a granel o envasat, el subministrador aportarà un albarà que inclourà, almenys, les següents dades:

1. Nombre de referència de la comanda.
2. Nom i adreça del comprador i punt de destinació del ciment.
3. Identificació del fabricant i de l'empresa subministradora.
4. Designació normalitzada del ciment subministrat.
5. Quantitat que es subministra.
6. En el seu cas, referència a les dades de l'etiquetatge corresponent al marcatge CE.
7. Data de subministrament.
8. Identificació del vehicle que el transporta (matrícula).

Distintius de qualitat i avaluacions d'idoneïtat tècnica:

Assajos:

La comprovació de les propietats o característiques exigibles a aquest material es realitza segons la Instrucció per a la recepció de ciments (RC-08).

#### 2.1.4.1.3.- Conservació, emmagatzematge i manipulació

Els ciments a granel s'emmagatzemaran en sitges estanques i s'evitarà, en particular, la seva contaminació amb altres ciments de tipus o classe de resistència diferent. Les sitges han d'estar protegides de la humitat i tenir un sistema o mecanisme d'obertura per a la càrrega en condicions adequades des dels vehicles de transport, sense risc d'alteració del ciment.

En ciments envasats, l'emmagatzematge haurà de realitzar-se sobre palets o plataforma similar, en locals coberts, ventilats i protegits de les pluges i de l'exposició directa del sol. S'evitaran especialment les ubicacions en les quals els envasos puguin estar exposats a la humitat, així com les manipulacions durant el seu emmagatzematge que puguin malmetre l'envàs o la qualitat del ciment.

Les instal·lacions d'emmagatzematge, càrrega i descàrrega del ciment disposaran dels dispositius adequats per a minimitzar les emissions de pols a l'atmosfera.

Encara en el cas que les condicions de conservació siguin bones, l'emmagatzematge del ciment no ha de ser molt perllongat, ja que pot meteoritzar-se. L'emmagatzematge màxim aconsellable és de tres mesos, dos mesos i un mes, respectivament, per a les classes resistents 32,5, 42,5 i 52,5. Si el període d'emmagatzematge és superior, es comprovarà que les característiques del ciment continuïn sent adequades. Per a això, dintre dels vint dies anteriors a la seva ocupació, es realitzaran els assajos de determinació de principi i fi d'enduriment i resistència mecànica inicial a 7 dies (si la classe és 32,5) o 2 dies (per a totes les altres classes) sobre una mostra representativa del ciment emmagatzemat, sense excloure els terrossos que hagin pogut formar-se.



#### **2.1.4.1.4.- Recomenacions per a el seu ús en obra**

L'elecció dels diferents tipus de ciment es realitzarà en funció de l'aplicació o ús al que es destinin, les condicions de posta en obra i la classe d'exposició ambiental del formigó o morter fabricat amb ells.

Les aplicacions considerades són la fabricació de formigons i els morters convencionals, quedant exclosos els morters especials i els monocapa.

El comportament dels ciments pot ser afectat per les condicions de posta en obra dels productes que els contenen, entre les quals cap destacar:

Els factors climàtics: temperatura, humitat relativa de l'aire i velocitat del vent.

Els procediments d'execució del formigó o morter: col·locat en obra, prefabricat, projectat, etc.

Les classes d'exposició ambiental.

Els ciments que es vagin a utilitzar en presència de sulfats, haurien de tenir la característica addicional de resistència a sulfats.

Els ciments haurien de tenir la característica addicional de resistència a l'aigua de mar quan es vagin a emprar en els ambients marí submergit o de zona de carrera de mareas.

En els casos en els quals s'hagi d'emprar àrids susceptibles de produir reaccions àlcali-àrid, s'utilitzaran els ciments amb un contingut d'alcalins inferior a 0,60% en massa de ciment.

Quan es requereixi l'exigència de blancor, s'utilitzaran els ciments blancs.

Per a fabricar un formigó es recomana utilitzar el ciment de la menor classe de resistència que sigui possible i compatible amb la resistència mecànica del formigó desitjada.

#### **2.1.5.- Materials ceràmics**

##### **2.1.5.1.- Llambordes d'argila cuita**

###### **2.1.5.1.1.- Condicions de subministre**

Les llambordes s'han de subministrar protegides, de manera que no s'alterin les seves característiques.

###### **2.1.5.1.2.- Recepció i control**

Documentació dels subministraments:

Aquest material ha d'estar proveït del marcat CE, que és una indicació que compleix els requisits essencials i ha estat objecte d'un procediment d'avaluació de la conformitat.

Distintius de qualitat i avaluacions d'idoneïtat tècnica:



Assajos:

La comprovació de les propietats o característiques exigibles a aquest material es realitza segons la normativa vigent.

#### **2.1.5.1.3.- Conservació, emmagatzematge i manipulació**

L'emmagatzematge es realitzarà en llocs protegits d'impactes.

#### **2.1.5.1.4.- Recomenacions per a el seu ús en obra**

La temperatura ambient durant l'execució no afecta al paviment amb llamborda ceràmica, el que evita esperes innecessàries durant la seva execució.

És recomanable agafar llambordes de diversos palets simultàniament, i per capes verticals i no horitzontals. D'aquesta manera, el paviment presentarà una barreja de tons agradable i de gran efecte estètic.

#### **2.1.6.- Prefabricats de ciment**

##### **2.1.6.1.- Voreres de formigó**

###### **2.1.6.1.1.- Condicions de subministre**

Les voreres s'han de subministrar protegides, de manera que no s'alterin les seves característiques, i havent transcorregut com a mínim set dies des de la seva data de fabricació.

###### **2.1.6.1.2.- Recepció i control**

Documentació dels subministraments:

Aquest material ha d'estar proveït del marcat CE, que és una indicació que compleix els requisits essencials i ha estat objecte d'un procediment d'avaluació de la conformitat.

Distintius de qualitat i avaluacions d'idoneïtat tècnica:

Assajos:

La comprovació de les propietats o característiques exigibles a aquest material es realitza segons la normativa vigent.

###### **2.1.6.1.3.- Conservació, emmagatzematge i manipulació**

L'emmagatzematge es realitzarà en llocs protegits d'impactes.

#### **2.1.7.- Instal·lacions**

##### **2.1.7.1.- Tubs de plàstic (PP, PE-X, PB, PVC)**



#### **2.1.7.1.1.- Condicions de subministre**

Els tubs s'han de subministrar a peu d'obra en camions amb sòl pla, sense paletitzar, i els accessoris en caixes adequades per a ells.

Els tubs s'han de col·locar sobre els camions de forma que no se produeixin deformacions per contacte amb arestes vives, cadenes, etc., i de forma que no quedin trams sortints innecessaris.

Els tubs i accessoris s'han de carregar de manera que no es produeixi cap deterioració durant el transport. Els tubs s'han d'apilar a una altura màxima d'1,5 m.

S'ha d'evitar la col·locació de pes excessiu damunt dels tubs, col·locant les caixes d'accessoris en la base del camió.

Quan els tubs se subministrin en rotllos, s'han de col·locar de forma horitzontal en la base del camió, o damunt dels tubs subministrats en barres si els hagués, cuidant d'evitar que s'aixafin.

Els rotllos de gran diàmetre que, per les seves dimensions, la plataforma del vehicle no admeti en posició horitzontal, han de col·locar-se verticalment, tenint la precaució que romanguin el menor temps possible en aquesta posició.

Els tubs i accessoris s'han de carregar i descarregar cuidadosament.

#### **2.1.7.1.2.- Recepció i control**

Documentació dels subministraments:

Els tubs han d'estar marcats a intervals màxims d'1 m i almenys una vegada per accessori, amb:

Els caràcters corresponents a la designació normalitzada.

La traçabilitat del tub (informació facilitada pel fabricant que indiqui la data de fabricació, en xifres o en codi, i un nombre o codi indicatiu de la factoria de fabricació en cas d'existir més d'una).

Els caràcters de marcat han d'estar impresos o gravats directament sobre el tub o accessori de manera que siguin llegibles després del seu emmagatzematge, exposició a la intempèrie, instal·lació i posada en obra

El marcat no ha de produir fissures o altre tipus de defecte que influeixi desfavorablement en el comportament funcional del tub o accessori.

Si s'utilitza el sistema d'impressió, el color de la informació ha de ser diferent al color base del tub o accessori.

La grandària del marcat ha de ser fàcilment llegible sense augment.

Els tubs i accessoris certificats per una tercera part poden estar marcats en conseqüència.

Distintius de qualitat i avaluacions d'idoneïtat tècnica:

Assajos:

La comprovació de les propietats o característiques exigibles a aquest material es realitza segons la normativa vigent.

#### **2.1.7.1.3.- Conservació, emmagatzematge i manipulació**



S'han d'evitar el dany en les superfícies i en els extrems dels tubs i accessoris. S'han d'utilitzar, si fos possible, els embalatges d'origen.

S'ha d'evitar l'emmagatzematge a la llum directa del sol durant llargs períodes de temps.

S'ha de disposar d'una zona d'emmagatzematge que tingui el sòl llis i anivellat o un jaç pla d'estructura de fusta, amb la finalitat d'evitar qualsevol corbatura o deterioració dels tubs.

Els tubs amb embocadura i amb accessoris muntats prèviament s'han de disposar de manera que estiguin protegits contra la deterioració i els extrems quedin lliures de càrregues, per exemple, alternant els extrems amb embocadura i els extrems sense embocadura o en capes adjacents.

Els tubs en rotllos s'han d'emmagatzemar en pisos apilats un sobre un altre o verticalment en suports o prestatgeries especialment dissenyades per a aquest fi.

El desenrotllat dels tubs ha de fer-se tangencialment al rotllo, rodant-lo sobre si mateix. No s'ha de fer mai en espiral.

Ha d'evitar-se tot risc de deteriorament portant els tubs i accessoris sense arrossegar fins el lloc de treball, i evitant deixar-los caure sobre una superfície dura.

Quan s'utilitzin mitjants mecànics de manipulació, les tècniques utilitzades han d'assegurar que no produeixen danys en els tubs. Les eslingues de metall, ganxos i cadenes emprades en la manipulació no han d'entrar en contacte amb el tub.

S'ha d'evitar qualsevol índex de brutícia en els accessoris i en les boques dels tubs, doncs pot donar lloc, si no es neteja, a instal·lacions defectuoses. Els extrems dels tubs s'han de cobrir o protegir amb el fi d'evitar l'entrada de brutícia en aquests. La neteja del tub i dels accessoris s'ha de realitzar seguint les instruccions del fabricant.

El tub s'ha de tallar amb el seu corresponent tallatubs.

## **2.2.- Prescripcions quant a l'Execució per Unitat d'Obra**

Les prescripcions per a l'execució de cadascuna de les diferents unitats d'obra s'organitzen en els següents apartats:

**MESURES PER A ASSEGURAR LA COMPATIBILITAT ENTRE ELS DIFERENTS PRODUCTES, ELEMENTS I SISTEMES CONSTRUCTIUS QUE COMPONEN LA UNITAT D'OBRA.**

S'especifiquen, en el cas que existeixin, les possibles incompatibilitats, tant físiques com a químiques, entre els diversos components que componen la unitat de obra, o entre el suport i els components.

**CARACTERÍSTIQUES TÈCNIQUES**

Es descriu la unitat d'obra, detallant de manera detallada els elements que la componen, amb la nomenclatura específica correcta de cadascun d'ells, d'acord als criteris que marca la pròpia normativa.

**NORMATIVA D'APLICACIÓ**

S'especifiquen les normes que afecten a la realització de la unitat d'obra.





#### CRITERI D'AMIDAMENT EN PROJECTE

Indica com s'ha amidat la unitat d'obra en la fase de redacció del projecte, amidament que després serà comprovat en obra.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

Abans d'iniciar-se els treballs d'execució de cada una de les unitats d'obra, el director de l'execució de l'obra haurà rebut els materials i els certificats acreditatius exigibles, en base a l'establert en la documentació pertinent pel tècnic redactor del projecte. Serà preceptiva l'acceptació prèvia per part del director de l'execució de l'obra de tots els materials que constitueixen la unitat d'obra.

Així mateix, es realitzaran una sèrie de comprovacions prèvies sobre les condicions del suport, les condicions ambientals de l'entorn, i la qualificació de la mà d'obra, en el seu cas.

#### DEL SUPORT

S'estableixen una sèrie de requisits previs sobre l'estat de les unitats d'obra realitzades prèviament, que poden servir de suport a la nova unitat d'obra.

#### AMBIENTALS

En determinades condicions climàtiques (vent, pluja, humitat, etc.) no es podran iniciar els treballs d'execució de la unitat d'obra, s'hauran d'interrompre o serà necessari adoptar una sèrie de mesures protectores.

#### DEL CONTRACTISTA

En alguns casos, serà necessària la presentació al director de l'execució de l'obra d'una sèrie de documents per part del contractista, que acreditin la seva qualificació, o la de l'empresa per ell subcontractada, per realitzar cert tipus de treballs. Per exemple la posada en obra de sistemes constructius en possessió d'un Document d'Idoneïtat Tècnica (DIT), hauran de ser realitzats per la mateixa empresa propietària del DIT, o per empreses especialitzades i qualificades, reconegudes per aquesta i sota el seu control tècnic.

#### PROCÉS D'EXECUCIÓ

En aquest apartat es desenvolupa el procés d'execució de cada unitat d'obra, assegurant a cada moment les condicions que permetin aconseguir el nivell de qualitat previst per a cada element constructiu en particular.

#### FASES D'EXECUCIÓ

S'enumeren, per ordre d'execució, les fases de les quals consta el procés d'execució de la unitat d'obra.

#### CONDICIONS DE TERMINACIÓ

En algunes unitats d'obra es fa referència a les condicions en les que s'ha de finalitzar una determinada unitat d'obra, perquè no interfereixi negativament en el procés d'execució de la resta d'unitats.

Una vegada acabats els treballs corresponents a l'execució de cada unitat d'obra, el contractista retirarà els mitjans auxiliars i procedirà a la neteja de l'element realitzat i de les zones de treball, recollint les restes de materials i altres residus originats per les operacions realitzades per a executar l'unitat d'obra, sent tots ells classificats, carregats i transportats a centre de reciclatge, abocador específic o centre d'acollida o transferència.

#### PROVES DE SERVEI

En aquelles unitats d'obra que sigui necessari, s'indiquen les proves de servei a realitzar pel propi contractista o empresa instal·ladora, el cost de les quals es troba inclòs en el propi preu de la unitat d'obra.

Aquelles altres proves de servei o assaigs que no estan inclosos en el preu de la unitat d'obra, i que és obligatòria la seva realització per mitjà de laboratoris acreditats es troben detallades i pressupostades, en el corresponent capítol X de Control de Qualitat i Assaigs, del Pressupost d'Execució Material (PEM).

Per exemple, això és el que passa a la unitat d'obra ADP010, on s'indica que no està inclòs en el preu de la unitat d'obra el cost de l'assaig de densitat i humitat "in situ".



## CONSERVACIÓ I MANTENIMENT

En algunes unitats d'obra s'estableixen les condicions que han de protegir-se per a la correcta conservació i manteniment en obra, fins a la seva recepció final.

## CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Indica com es comprovaran en obra els amidaments de Projecte, una vegada superats tots els controls de qualitat i obtinguda l'acceptació final per part del director d'execució de l'obra.

L'amidament del nombre d'unitats d'obra que ha d'abonar-se es realitzarà, si escau, d'acord amb les normes que estableix aquest capítol, tindrà lloc en presència i amb intervenció del contractista, entenent que aquest renúncia a tal dret si, avisat oportunament, no comparegués a temps. En tal cas, serà vàlid el resultat que el director d'execució de l'obra consigni.

Totes les unitats d'obra s'abonaran als preus establerts en el Pressupost. Els mencionats preus s'abonaran per les unitats acabades i executades d'acord amb el present Plec de Condicions Tècniques Particulars i Prescripcions pel que fa a l'Execució per Unitat d'Obra.

Aquestes unitats comprenen el subministrament, cànon, transport, manipulació i ocupació dels materials, maquinària, mitjans auxiliars, mà d'obra necessària per a la seva execució i costos indirectes derivats d'aquests conceptes, així com quantes necessitats circumstancials es requereixin per a l'execució de l'obra, tals com indemnitzacions per danys a tercers o ocupacions temporals i costos d'obtenció dels permisos necessaris, així com de les operacions necessàries per a la reposició de servituds i serveis públics o privats afectats tant pel procés d'execució de les obres com per les instal·lacions auxiliars.

Igualment, aquells conceptes que s'especifiquen en la definició de cada unitat d'obra, les operacions descrites en el procés d'execució, els assajos i proves de servei i posada en funcionament, inspeccions, permisos, butlletins, llicències, taxes o similars.

No s'abonarà al contractista major volum de qualsevol tipus d'obra que el definit en els plànols o en les modificacions autoritzades per la Direcció facultativa. Tampoc li serà abonat, si escau, el cost de la restitució de l'obra a les seves dimensions correctes, ni l'obra que hagués hagut de realitzar per ordre de la Direcció facultativa per a resoldre qualsevol defecte d'execució.

## TERMINOLOGIA APLICADA EN EL CRITERI DE MESURAMENT.

A continuació, es detalla el significat d'alguns dels termes utilitzats en els diferents capítols d'obra.

### ACONDICIONAMENT DEL TERRENY

Volum de terres en perfil esponjat. L'amidament es referirà a l'estat de les terres una vegada extretes. Per a això, la forma d'obtenir el volum de terres a transportar, serà la que resulti d'aplicar el percentatge d'esponjament mig que procedeixi, en funció de les característiques del terreny.

Volum de reble en perfil compactat. L'amidament es referirà a l'estat del reble una vegada finalitzat el procés de compactació.

Volum teòric executat. Serà el volum que resulti de considerar les dimensions de les seccions teòriques especificades en els plànols de Projecte, independentment que les seccions excavades haguessin quedat amb majors dimensions.

### FONAMENTACIONS

Superfície teòrica executada. Serà la superfície que resulti de considerar les dimensions de les seccions teòriques especificades en els plànols de Projecte, independentment que la superfície ocupada pel formigó hagués quedat amb majors dimensions.

Volum teòric executat. Serà el volum que resulti de considerar les dimensions de les seccions teòriques especificades en els plànols de Projecte, independentment que les seccions de formigó haguessin quedat amb majors dimensions.

### ESTRUCTURES

Volum teòric executat. Serà el volum que resulti de considerar les dimensions de les seccions teòriques especificades en els plànols de Projecte, independentment que les seccions dels elements estructurals haguessin quedat amb majors dimensions.



## ESTRUCTURES METÀL·LIQUES

Pes nominal amidat. Seran els kg que resultin d'aplicar als elements estructurals metàl·lics els pesos nominals que, segons dimensions i tipus d'acer figurin en taules.

### ESTRUCTURES (FORJATS)

Deduint els buits de superfície major de  $X \text{ m}^2$ . Es mesurarà la superfície dels forjats de cara exterior a cara exterior dels cercles que delimiten el perímetre de la seva superfície, descomptant únicament els buits o passos de forjats que tinguin una superfície major de  $X \text{ m}^2$ .

En els casos de dos draps formats per forjats diferents, objecte de preus unitaris distints, que donin suport o encastin en una jàssera o mur de càrrega comuna a ambdós draps, cadascuna de les unitats d'obra de forjat s'amidarà des de fora a cara exterior dels elements delimitadors a l'eix de la jàssera o mur de càrrega comuna.

En els casos de forjats inclinats es prendrà en veritable magnitud la superfície de la cara inferior del forjat, amb el mateix criteri anteriorment assenyalat per a la deducció de buits.

### ESTRUCTURES (MURS)

Deduint els buits de superfície major de  $X \text{ m}^2$ . S'aplicarà el mateix criteri que per a façanes i particions.

### FAÇANES I PARTICIONS

Deduint els buits de superfície major de  $X \text{ m}^2$ . S'amidaran els paraments verticals de façanes i particions descomptant únicament aquells buits la superfície dels quals sigui major de  $X \text{ m}^2$ , el que significa que:

Quan els buits siguin més petits de  $X \text{ m}^2$  es mesuraran a cinta correguda com si no hi hagués buits. Al no deduir cap buit, en compensació de mesurar buit per massís, no es mesuraran els treballs de formació de queixals en brancals i llindes.

Quan els buits siguin més grans de  $X \text{ m}^2$ , es deduirà la superfície d'aquests buits, però es sumarà al mesurament la superfície de la part interior del buit, corresponent al desenvolupament dels queixals.

Deduint tots els buits. Es mesuraran els paraments verticals de façanes i particions descomptant la superfície de tots els buits, però s'inclou l'execució de tots els treballs precisos per a la resolució del buit, així com els materials que formen llindes, brancals i escopidors.

Als efectes anteriors, s'entendrà com buit, qualsevol obertura que tingui queixals i llinda per a porta o finestra. En cas de tractar-se d'un buit en la fàbrica sense llinda, ampit ni fusteria, es deduirà sempre el mateix a l'amidar la fàbrica, sigui com sigui la seva superfície.

En el supòsit de tancaments de façana on les fulles, en lloc de donar suport directament en el forjat, recolzin en una o dues filades de regularització que abastin tot l'espessor del tancament, a l'efectuar l'amidament de les unitats d'obra es mesurarà la seva alçada des del forjat i, en compensació, no es mesurarà les filades de regularització.

### INSTAL·LACIONS

Longitud realment executada. Amidament segons desenvolupament longitudinal resultant, considerant, si escau, els trams ocupats per peces especials.

### REVESTIMENTS (GUIXOS I ESQUERDEJATS DE CIMENT)

Deduint, en els buits de superfície major de  $X \text{ m}^2$ , l'excés sobre els  $X \text{ m}^2$ . Els paraments verticals i horitzontals s'amidaran a cinta correguda, sense descomptar buits de superfície menor a  $X \text{ m}^2$ . Per a buits de major superfície, es descomptarà únicament l'excés sobre aquesta superfície. En ambdós casos es considerarà inclosa l'execució de queixals, fons de llindes i arestes. Els paraments que tinguin armaris de paret no seran objecte de descompte, sigui com sigui la seva dimensió.

#### 2.2.1.- Demolicions



Unitat d'obra DIE030: Desmuntatge de línia general d'alimentació fix en superfície, amb mitjans manuals, i càrrega manual sobre camió o contenidor.

#### CARACTERÍSTIQUES TÈCNIQUES

Desmuntatge de línia general d'alimentació fix en superfície, amb mitjans manuals, i càrrega manual sobre camió o contenidor.

#### CRITERI D'AMIDAMENT EN PROJECTE

Longitud mesurada segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

#### DEL SUPORT

Es comprovarà que la xarxa d'alimentació elèctrica està desconnectada i fora de servei.

#### PROCÉS D'EXECUCIÓ

#### FASES D'EXECUCIÓ

Desmuntatge de l'element. Retirada i apilament del material desmuntat. Neteja de les restes de l'obra. Càrrega manual del material desmuntat i restes de l'obra sobre camió o contenidor.

#### CONDICIONS DE TERMINACIÓ

Els cables de connexió que no es retirin haurien de quedar degudament protegits.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà la longitud realment desmuntada segons especificacions de Projecte.

Unitat d'obra DIE101: Desmuntatge de cablejat elèctric vist fixe en superfície situat a façana d'edifici, amb mitjans manuals, i càrrega manual sobre camió o contenidor.

#### CARACTERÍSTIQUES TÈCNIQUES

Desmuntatge de cablejat elèctric vist fixe en superfície situat a façana d'edifici, amb mitjans manuals, i càrrega manual sobre camió o contenidor.

#### CRITERI D'AMIDAMENT EN PROJECTE

Longitud mesurada segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

#### DEL SUPORT

Es comprovarà que s'ha efectuat l'anul·lació i neutralització de l'escomesa elèctrica de l'edifici per part de la companyia subministradora i aquesta ha quedat fora de servei.

#### AMBIENTALS

Se suspendran els treballs quan ploqui, neu o la velocitat del vent sigui superior a 50 km/h.

#### PROCÉS D'EXECUCIÓ

#### FASES D'EXECUCIÓ

Desmuntatge de l'element. Retirada i apilament del material desmuntat. Neteja de les restes de l'obra. Càrrega manual del material desmuntat i restes de l'obra sobre camió o contenidor.

#### CONDICIONS DE TERMINACIÓ

Els cables de connexió que no es retirin haurien de quedar degudament protegits.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà la longitud realment desmuntada segons especificacions de Projecte.



Unitat d'obra DIE103: Desmuntatge de tub protector rígid fixat superficialment en parament interior per a allotjament del cablejat elèctric en el seu interior, amb mitjans manuals, i càrrega manual sobre camió o contenidor.

#### CARACTERÍSTIQUES TÈCNIQUES

Desmuntatge de tub protector rígid fixat superficialment en parament interior per a allotjament del cablejat elèctric en el seu interior, amb mitjans manuals, i càrrega manual sobre camió o contenidor.

#### CRITERI D'AMIDAMENT EN PROJECTE

Longitud mesurada segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

#### DEL SUPORT

Es comprovarà que s'ha eliminat el cablejat elèctric que discorria per l'interior del tub protector a desmuntar.

#### FASES D'EXECUCIÓ

Desmuntatge de l'element. Retirada i apilament del material desmuntat. Neteja de les restes de l'obra. Càrrega manual del material desmuntat i restes de l'obra sobre camió o contenidor.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà la longitud realment desmuntada segons especificacions de Projecte.

#### CRITERI DE VALORACIÓ ECONÒMICA

El preu inclou el desmuntatge dels mecanismes i dels accessoris.

Unitat d'obra DII001: Desmuntatge de llum situada a menys de 3 m d'altura, amb mitjans manuals i càrrega manual sobre camió o contenidor.

#### CARACTERÍSTIQUES TÈCNIQUES

Desmuntatge de llum situada a menys de 3 m d'altura, amb mitjans manuals i càrrega manual sobre camió o contenidor.

#### CRITERI D'AMIDAMENT EN PROJECTE

Nombre d'unitats previstes, segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

#### DEL SUPORT

Es comprovarà que la xarxa d'alimentació elèctrica està desconnectada i fora de servei.

#### FASES D'EXECUCIÓ

Desmuntatge de l'element. Retirada i apilament del material desmuntat. Neteja de les restes de l'obra. Càrrega manual del material desmuntat i restes de l'obra sobre camió o contenidor.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà el nombre d'unitats realment desmuntades segons especificacions de Projecte.

Unitat d'obra DII010: Desmuntatge de lluminària exterior situada a menys de 3 m d'altura, suspesa amb mitjans manuals, sense deteriorar els elements constructius als quals pugui estar subjecte, i càrrega manual sobre camió o contenidor.

#### CARACTERÍSTIQUES TÈCNIQUES

Desmuntatge de lluminària exterior situada a menys de 3 m d'altura, suspesa amb mitjans manuals, sense deteriorar els elements constructius als quals pugui estar subjecte, i càrrega manual sobre camió o contenidor.

#### CRITERI D'AMIDAMENT EN PROJECTE

Nombre d'unitats previstes, segons documentació gràfica de Projecte.



## CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

### DEL SUPORT

Es comprovarà que la xarxa d'alimentació elèctrica està desconnectada i fora de servei.

### AMBIENTALS

Se suspendran els treballs quan ploqui, neu o la velocitat del vent sigui superior a 50 km/h.

### PROCÉS D'EXECUCIÓ

### FASES D'EXECUCIÓ

Desmuntatge de l'element. Retirada i apilament del material desmuntat. Neteja de les restes de l'obra. Càrrega manual del material desmuntat i restes de l'obra sobre camió o contenidor.

### CONDICIONS DE TERMINACIÓ

Els cables de connexió que no es retirin haurien de quedar degudament protegits.

### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà el nombre d'unitats realment desmuntades segons especificacions de Projecte.

Unitat d'obra DMX010: Demolició de paviment exterior de llambordins i capa de sorra, amb martell pneumàtic, i càrrega manual sobre camió o contenidor.

### CARACTERÍSTIQUES TÈCNIQUES

Demolició de paviment exterior de llambordins i capa de sorra, amb martell pneumàtic, i càrrega manual sobre camió o contenidor.

### NORMATIVA D'APLICACIÓ

Execució: PG-3. Pliego de prescripciones técnicas generales para obras de carreteras y puentes de la Dirección General de Carreteras.

### CRITERI D'AMIDAMENT EN PROJECTE

Superfície mesurada segons documentació gràfica de Projecte.

### PROCÉS D'EXECUCIÓ

### FASES D'EXECUCIÓ

Demolició de l'element. Fragmentació dels enderrocs en peces manejables. Retirada i arreplegat de enderrocs. Neteja de les restes de l'obra. Càrrega manual d'enderrocs sobre camió o contenidor.

### CONDICIONS DE TERMINACIÓ

Una vegada conclusos els treballs, la base suport quedarà neta de restes del material.

### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà la superfície realment enderrocada segons especificacions de Projecte.

### CRITERI DE VALORACIÓ ECONÒMICA

El preu no inclou la demolició de la base suport.

Unitat d'obra DMX020: Demolició de paviment exterior de formigó en massa, mitjançant retroexcavadora amb martell picador, i càrrega mecànica sobre camió o contenidor.

### CARACTERÍSTIQUES TÈCNIQUES

Demolició de paviment exterior de formigó en massa, mitjançant retroexcavadora amb martell picador, i càrrega mecànica sobre camió o contenidor.

### NORMATIVA D'APLICACIÓ

Execució: PG-3. Pliego de prescripciones técnicas generales para obras de carreteras y puentes de la Dirección General de Carreteras.

### CRITERI D'AMIDAMENT EN PROJECTE

Superfície mesurada segons documentació gràfica de Projecte.



## PROCÉS D'EXECUCIÓ

### FASES D'EXECUCIÓ

Demolició de l'element. Fragmentació dels enderroc en peces manejables. Retirada i arreplegat de enderroc. Neteja de les restes de l'obra. Càrrega mecànica d'enderroc sobre camió o contenidor.

### CONDICIONS DE TERMINACIÓ

Una vegada conclusos els treballs, la base suport quedarà neta de restes del material.

### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà la superfície realment enderrocada segons especificacions de Projecte.

### CRITERI DE VALORACIÓ ECONÒMICA

El preu no inclou la demolició de la base suport.

Unitat d'obra DMX030: Demolició de paviment d'aglomerat asfàltic en calçada, amb martell pneumàtic, i càrrega manual sobre camió o contenidor.

### CARACTERÍSTIQUES TÈCNIQUES

Demolició de paviment d'aglomerat asfàltic en calçada, amb martell pneumàtic, i càrrega manual sobre camió o contenidor.

### NORMATIVA D'APLICACIÓ

Execució: PG-3. Pliego de prescripciones técnicas generales para obras de carreteras y puentes de la Dirección General de Carreteras.

### CRITERI D'AMIDAMENT EN PROJECTE

Superfície mesurada segons documentació gràfica de Projecte.

## PROCÉS D'EXECUCIÓ

### FASES D'EXECUCIÓ

Tall previ del contorn de la zona a demolir. Demolició de l'element. Fragmentació dels enderroc en peces manejables. Retirada i arreplegat de enderroc. Neteja de les restes de l'obra. Càrrega manual d'enderroc sobre camió o contenidor.

### CONDICIONS DE TERMINACIÓ

Una vegada conclusos els treballs, la base suport quedarà neta de restes del material.

### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà la superfície realment enderrocada segons especificacions de Projecte.

### CRITERI DE VALORACIÓ ECONÒMICA

El preu inclou el tall previ del contorn del paviment, però no inclou la demolició de la base suport.

Unitat d'obra DMX050: Demolició de paviment exterior de rajoles i/o llosetes de formigó amb martell pneumàtic, i càrrega manual sobre camió o contenidor.

### CARACTERÍSTIQUES TÈCNIQUES

Demolició de paviment exterior de rajoles i/o llosetes de formigó amb martell pneumàtic, i càrrega manual sobre camió o contenidor.

### NORMATIVA D'APLICACIÓ

Execució: PG-3. Pliego de prescripciones técnicas generales para obras de carreteras y puentes de la Dirección General de Carreteras.

### CRITERI D'AMIDAMENT EN PROJECTE

Superfície mesurada segons documentació gràfica de Projecte.

## PROCÉS D'EXECUCIÓ

### FASES D'EXECUCIÓ

Demolició de l'element. Fragmentació dels enderroc en peces manejables. Retirada i arreplegat de enderroc. Neteja de les restes de l'obra. Càrrega manual d'enderroc sobre camió o contenidor.

### CONDICIONS DE TERMINACIÓ

Una vegada conclusos els treballs, la base suport quedarà neta de restes del material.



#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà la superfície realment enderrocada segons especificacions de Projecte.

#### CRITERI DE VALORACIÓ ECONÒMICA

El preu inclou el picat del material d'unió, però no inclou la demolició de la base suport.

Unitat d'obra DMX090: Aixecat de vorada sobre base de formigó, amb mitjans manuals i recuperació del 80% del material per a la seva posterior reutilització, sense deteriorar els elements constructius contigus, i càrrega manual sobre camió o contenidor.

#### CARACTERÍSTIQUES TÈCNIQUES

Aixecat de vorada sobre base de formigó, amb mitjans manuals i recuperació del 80% del material per a la seva posterior reutilització, sense deteriorar els elements constructius contigus, i càrrega manual sobre camió o contenidor.

#### CRITERI D'AMIDAMENT EN PROJECTE

Longitud mesurada segons documentació gràfica de Projecte.

#### PROCÉS D'EXECUCIÓ

#### FASES D'EXECUCIÓ

Aixecat de l'element. Classificació i etiquetatge. Neteja del revers de les rajoles. Aplec dels materials a reutilitzar. Càrrega manual del material a reutilitzar sobre camió. Retirada i aplec de les restes d'obra. Neteja de les restes de l'obra. Càrrega manual d'enderrocs sobre camió o contenidor.

#### CONDICIONS DE TERMINACIÓ

Una vegada conclusos els treballs, la base suport quedarà neta de restes del material.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà la longitud realment enderrocada segons especificacions de Projecte.

#### CRITERI DE VALORACIÓ ECONÒMICA

El preu inclou el picat del material d'unió adherit a la seva superfície i al suport.

Unitat d'obra DMX091: Demolició de rigola sobre base de formigó amb mitjans manuals, sense deteriorar els elements constructius contigus, i càrrega manual sobre camió o contenidor.

#### CARACTERÍSTIQUES TÈCNIQUES

Demolició de rigola sobre base de formigó amb mitjans manuals, sense deteriorar els elements constructius contigus, i càrrega manual sobre camió o contenidor.

#### CRITERI D'AMIDAMENT EN PROJECTE

Longitud mesurada segons documentació gràfica de Projecte.

#### PROCÉS D'EXECUCIÓ

#### FASES D'EXECUCIÓ

Demolició de l'element. Fragmentació dels enderrocs en peces manejables. Retirada i arreplegat de enderrocs. Neteja de les restes de l'obra. Càrrega manual d'enderrocs sobre camió o contenidor.

#### CONDICIONS DE TERMINACIÓ

Una vegada conclusos els treballs, la base suport quedarà neta de restes del material.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

S'amidarà la longitud realment enderrocada segons especificacions de Projecte.

#### CRITERI DE VALORACIÓ ECONÒMICA

El preu inclou el picat del material d'unió.

### **2.2.2.- Acondicionament del terreny**





Unitat d'obra ADE010: Excavació en rases per instal·lacions en terra d'argila semidura, amb mitjans mecànics, retirada dels materials excavats i càrrega a camió.

#### CARACTERÍSTIQUES TÈCNIQUES

Excavació de terres a cel obert per a formació de rases per instal·lacions fins a una profunditat de 2 m, en terra d'argila semidura, amb mitjans mecànics, fins a aconseguir la cota de profunditat indicada en el Projecte. Inclús transport de la maquinària, refinat de paraments i fons d'excavació, extracció de terres fora de l'excavació, retirada dels materials excavats i càrrega a camió.

#### NORMATIVA D'APLICACIÓ

Execució:

- CTE. DB-HS Salubridad.
- NTE-ADZ. Acondicionamiento del terreno. Desmontes: Zanjas y pozos.

#### CRITERI D'AMIDAMENT EN PROJECTE

Volum mesurat sobre les seccions teòriques de l'excavació, segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

##### DEL SUPORT

Es comprovarà la possible existència de servituds, elements soterrats, reds de servei o qualsevol tipus d'instal·lacions que poden resultar afectades per les obres a iniciar.

Es disposarà de la informació topogràfica i geotècnica necessària, recollida en el corresponent estudi geotècnic del terreny realitzat per un laboratori acreditat a l'àrea tècnica corresponent, i que inclourà, entre d'altres dades: tipus, humitat i compacitat o consistència del terreny.

Es disposaran punts fixes de referència en llocs que puguin veure's afectats per la excavació, als quals es referiràn totes les lectures de cotes de nivell i desplazamientos horitzontals i verticals dels punts del terreny.

Es comprovarà l'estat de conservació dels edificis mitgers i de les construccions pròximes que poden veure's afectades per les excavacions.

##### DEL CONTRACTISTA

Si existissin instal·lacions en servei que poguessin veure's afectades pels treballs a realitzar, sol·licitarà de les corresponents companyies subministradores la seva situació i, si escau, la solució a adoptar, així com les distàncies de seguretat a esteses aèries de conducció d'energia elèctrica.

Notificarà al director de l'execució de l'obra, amb l'antelació suficient, l'inici de les excavacions.

En cas de realitzar-se qualsevol tipus d'entibació del terreny, presentarà al director de l'execució de l'obra, per a la seva aprovació, els càlculs justificatius de la solució a adoptar.

#### PROCÉS D'EXECUCIÓ

##### FASES D'EXECUCIÓ

Replanteig general i fixació dels punts i nivells de referència. Col·locació de les lliteres en els cantons i extrems de les alineacions. Excavació en successives rases horitzontals i extracció de terres. Refinat de fons amb extracció de les terres. Càrrega a camió de les terres excavades.

##### CONDICIONS DE TERMINACIÓ

El fons de l'excavació quedarà anivellat, net i lleugerament piconat.

##### CONSERVACIÓ I MANTENIMENT

Les excavacions quedaran protegides enfront de filtracions i accions d'erosió o ensorrada per part de les aigües de vessament. Es prendran les mesures oportunes per a assegurar que les seves característiques geomètriques romanen inamovibles. Mentre s'efectuï la consolidació definitiva de les parets i fons de les excavacions es conservaran les entibacions realitzades, que només es podran treure, total o parcialment, prèvia comprovació del director de l'execució de l'obra, i en la forma i terminis que aquest dictami. Es prendran les mesures necessàries per impedir la degradació del fons de l'excavació en front a l'acció de les pluges o altres agents meteorològics, en



l'interval de temps que es mesuri entre l'excavació i la finalització dels treballs de col·locació d'instal·lacions i posterior replè de les rases.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà el volum teòric executat segons especificacions de Projecte, sense incloure els increments per excessos d'excavació no autoritzats, ni el reblert necessari per a reconstruir la secció teòrica per defectes imputables al Contractista. Es mesurarà l'excavació una vegada realitzada i abans que sobre ella s'efectuï cap tipus de reblert. Si el Contractista tanqués l'excavació abans de conformar l'amidament, s'entendrà que s'avé al que unilateralment determini el director de l'execució de l'obra.

Unitat d'obra ADR010: Rebliments de rases per instal·lacions, amb sorra 0/5 mm, i compactació al 95% del Proctor Modificat amb safata vibrant de guiat manual.

#### CARACTERÍSTIQUES TÈCNiques

Formació de rebliments de rases per instal·lacions, amb sorra de 0 a 5 mm de diàmetre i compactació en tongades successives de 20 cm d'espessor màxim amb safata vibrant de guiat manual, fins a assolir una densitat seca no inferior al 95% de la màxima obtinguda en l'assaig Proctor Modificat, realitzat segons UNE 103501 (assaig no inclòs en aquest preu). Fins i tot cinta o distintiu indicador de la instal·lació, càrrega, transport i descàrrega a peu de tall dels àrids a utilitzar en els treballs de reblert i humectació dels mateixos.

#### NORMATIVA D'APLICACIÓ

Execució:

- CTE. DB-SE-C Seguridad estructural: Cimientos.
- CTE. DB-HS Salubridad.
- NTE-ADZ. Acondicionamiento del terreno. Desmontes: Zanjas y pozos.

#### CRITERI D'AMIDAMENT EN PROJECTE

Volum mesurat sobre les seccions teòriques de l'excavació, segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

#### AMBIENTALS

Es comprovarà que la temperatura ambient no sigui inferior a 2°C a l'ombra.

#### PROCÉS D'EXECUCIÓ

#### FASES D'EXECUCIÓ

Estesa del material de reblert en tongades d'espessor uniforme. Humectació o dessecació de cada tongada. Col·locació de cinta o distintiu indicador de la instal·lació. Compactació.

#### CONDICIONS DE TERMINACIÓ

Les terres o àrids de farciment hauran arribat a el grau de compactació adequat.

#### CONSERVACIÓ I MANTENIMENT

Les terres o àrids utilitzats com material de farciment quedaran protegits de la possible contaminació per materials estranys o per aigua de pluja, així com del pas de vehicles.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà, en perfil compactat, el volum realment executat segons especificacions de Projecte, sense incloure els increments per excessos d'excavació no autoritzats.

### 2.2.3.- Fonamentacions



Unitat d'obra CSZ015: Sabata de fonamentació de formigó en massa, realitzada amb formigó HM-20/B/20/I fabricat en central i abocament des de camió, sense incloure encofrat.

MESURES PER A ASSEGURAR LA COMPATIBILITAT ENTRE ELS DIFERENTS PRODUCTES, ELEMENTS I SISTEMES CONSTRUCTIUS QUE COMPONEN LA UNITAT D'OBRA.

Depenent de l'agressivitat del terreny o la presència d'aigua amb substàncies agressives, es triarà el ciment adequat per a la fabricació del formigó, així com el seu dosatge i permeabilitat.

**CARACTERÍSTIQUES TÈCNiques**

Formació de sabata de fonamentació de formigó en massa, realitzada amb formigó HM-20/B/20/I fabricat en central i abocament des de camió, sense incloure l'encofrat en aquest preu. Inclús p/p de curació del formigó.

**NORMATIVA D'APLICACIÓ**

Elaboració, transport i posada en obra del formigó:

- Instrucción de Hormigón Estructural (EHE-08).

Execució:

- CTE. DB-SE-C Seguridad estructural: Cimientos.

- NTE-CSZ. Cimentaciones superficiales: Zapatas.

**CRITERI D'AMIDAMENT EN PROJECTE**

Volum teòric, segons documentació gràfica de Projecte.

**CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA**

**DEL SUPORT**

Es comprovarà l'existència de la capa de formigó de neteja, que presentarà un plànol de suport horitzontal i una superfície neta.

**AMBIENTALS**

Se suspendran els treballs de formigonat quan ploqui amb intensitat, neu, existeixi vent excessiu, una temperatura ambient superior a 40°C o es prevegi que dins de les 48 hores següents pugui descendir la temperatura ambient per sota dels 0°C.

**DEL CONTRACTISTA**

Disposarà en obra d'una sèrie de mitjans, en previsió que es produeixin canvis bruscs de les condicions ambientals durant el formigonat o posterior període d'enduriment, no podent començar-se el formigonat dels diferents elements sense l'autorització per escrit del director de l'execució de l'obra.

**PROCÉS D'EXECUCIÓ**

**FASES D'EXECUCIÓ**

Replanteig i traçat de les sabates i dels pilars o altres elements estructurals que es recolzin en les mateixes. Abocament i compactació del formigó. Coronació i enrasament de fonaments. Curat del formigó.

**CONDICIONS DE TERMINACIÓ**

El conjunt serà monolític i transmetrà correctament les càrregues al terreny. La superfície quedarà sense imperfeccions.

**CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT**

Es mesurarà el volum teòric executat segons especificacions de Projecte, sense incloure els increments per excessos d'excavació no autoritzats.

## **2.2.4.- Instal·lacions**



Unitat d'obra IEP021: Presa de terra amb una pica d'acer courat de 2 m de longitud.

#### CARACTERÍSTIQUES TÈCNIQUES

Subministrament i instal·lació de presa de terra composta per pica d'acer courat de 2 m de longitud, clavada en el terreny, connectada a pont per a comprovació, dintre d'una arqueta de registre de polipropilè de 30x30 cm. Fins i tot replanteig, excavació per l'arqueta de registre, clavat de l'elèctrode al terreny, col·locació de l'arqueta de registre, connexió de l'elèctrode amb la línia d'enllaç mitjançant grapa abraçadora, reblert amb terres de la pròpia excavació i additius per a disminuir la resistivitat del terreny i connectat a la xarxa de terra mitjançant pont de comprovació. Totalment muntada, connexionada i provada per l'empresa instal·ladora mitjançant les corresponents proves de servei (incloses en aquest preu).

#### NORMATIVA D'APLICACIÓ

Instal·lació:

- REBT. Reglamento Electrotécnico para Baja Tensión.
- ITC-BT-18 y GUÍA-BT-18. Instalaciones de puesta a tierra.

#### CRITERI D'AMIDAMENT EN PROJECTE

Nombre d'unitats previstes, segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

#### DEL SUPORT

Es comprovarà que la seva situació es correspon amb la de Projecte.

#### DEL CONTRACTISTA

Les instal·lacions elèctriques de baixa tensió s'executaran per instal·ladors autoritzats en baixa tensió, autoritzats per a l'exercici de l'activitat.

#### PROCÉS D'EXECUCIÓ

#### FASES D'EXECUCIÓ

Replanteig. Excavació. Clavat de la pica. Col·locació de l'arqueta de registre. Connexió de l'elèctrode amb la línia d'enllaç. Reblert de la zona excavada. Connexionat a la xarxa de terra. Realització de proves de servei.

#### CONDICIONS DE TERMINACIÓ

Els contactes estaran degudament protegits per a garantir una contínua i correcta connexió.

#### PROVES DE SERVEI

Prova de mesura de la resistència de posada a terra.

Normativa d'aplicació: GUÍA-BT-ANEXO 4. Verificación de las instalaciones eléctricas

#### CONSERVACIÓ I MANTENIMENT

Es protegiran tots els elements enfront de cops, materials agressius, humitats i brutícia.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà el nombre d'unitats realment executades segons especificacions de Projecte.

Unitat d'obra IEP025: Conductor de terra format per cable rígid nu de cobre trenat, de 35 mm<sup>2</sup> de secció.

#### CARACTERÍSTIQUES TÈCNIQUES

Subministrament i instal·lació de conductor de terra format per cable rígid nu de cobre trenat, de 35 mm<sup>2</sup> de secció. També p/p d'unions realitzades amb soldadura aluminotèrmica, grapes i borns d'unió. Completament muntat, amb connexions establertes i provat.

#### NORMATIVA D'APLICACIÓ

Instal·lació:

- REBT. Reglamento Electrotécnico para Baja Tensión.
- ITC-BT-18 y GUÍA-BT-18. Instalaciones de puesta a tierra.



#### CRITERI D'AMIDAMENT EN PROJECTE

Longitud mesurada segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

##### DEL SUPORT

Es comprovarà que la seva situació i recorregut es corresponen amb els de Projecte, i que hi ha espai suficient per a la seva instal·lació.

Es comprovaran les separacions mínimes de les conduccions amb altres instal·lacions.

##### FASES D'EXECUCIÓ

Replanteig del recorregut. Estesa del conductor de terra. Connexionat del conductor de terra mitjançant borns d'unió.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà la longitud realment executada segons especificacions de Projecte.

Unitat d'obra IEO010: Canalització soterrada de tub corbable, subministrat en rotllo, de polietilè de doble paret (interior llisa i exterior corrugada), de color taronja, de 90 mm de diàmetre nominal, resistència a la compressió 450 N.

#### CARACTERÍSTIQUES TÈCNIQUES

Subministrament i instal·lació de canalització soterrada de tub corbable, subministrat en rotllo, de polietilè de doble paret (interior llisa i exterior corrugada), de color taronja, de 90 mm de diàmetre nominal, resistència a la compressió 450 N, col·locat sobre llit de sorra de 5 cm d'espessor, degudament compactada i anivellada amb picó vibrant de guiat manual, reblert lateral compactant fins als ronyons i posterior reblert amb la mateixa sorra fins a 10 cm per sobre de la generatriu superior de la canonada, sense incloure l'excavació ni el posterior reblert principal de les rases. Inclús p/p de cinta de senyalització. Totalment muntada.

#### NORMATIVA D'APLICACIÓ

Instal·lació: REBT. Reglamento Electrotécnico para Baja Tensión.

#### CRITERI D'AMIDAMENT EN PROJECTE

Longitud mesurada segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

##### DEL SUPORT

Es comprovarà que la seva situació i recorregut es corresponen amb els de Projecte, i que hi ha espai suficient per a la seva instal·lació.

##### DEL CONTRACTISTA

Les instal·lacions elèctriques de baixa tensió s'executaran per instal·ladors autoritzats en baixa tensió, autoritzats per a l'exercici de l'activitat.

##### PROCÉS D'EXECUCIÓ

##### FASES D'EXECUCIÓ

Replanteig. Execució del llit de sorra per a seient del tub. Col·locació del tub. Col·locació de la cinta de senyalització. Execució del reblert envoltant de sorra.

##### CONDICIONS DE TERMINACIÓ

La instal·lació podrà revisar-se amb facilitat.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà la longitud realment executada segons especificacions de Projecte.



Unitat d'obra IEO010b: Canalització fix en superfície de de PVC, sèrie B, de 40 mm de diàmetre.

#### CARACTERÍSTIQUES TÈCNIQUES

Subministrament i instal·lació de canalització fix en superfície de de PVC, sèrie B, de 40 mm de diàmetre. Inclús p/p d'accessoris i peces especials. Totalment muntada.

#### NORMATIVA D'APLICACIÓ

Instal·lació: REBT. Reglamento Electrotécnico para Baja Tensión.

#### CRITERI D'AMIDAMENT EN PROJECTE

Longitud mesurada segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

#### DEL SUPORT

Es comprovarà que la seva situació i recorregut es corresponen amb els de Projecte, i que hi ha espai suficient per a la seva instal·lació.

#### DEL CONTRACTISTA

Les instal·lacions elèctriques de baixa tensió s'executaran per instal·ladors autoritzats en baixa tensió, autoritzats per a l'exercici de l'activitat.

#### PROCÉS D'EXECUCIÓ

#### FASES D'EXECUCIÓ

Replanteig. Col·locació i fixació del tub.

#### CONDICIONS DE TERMINACIÓ

La instal·lació podrà revisar-se amb facilitat.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà la longitud realment executada segons especificacions de Projecte.

Unitat d'obra IEL010: Línia general d'alimentació soterrada formada per cables unipolars amb conductors de coure, RZ1-K (AS) Cca-s1b,d1,a1 4G16+1x10 mm<sup>2</sup>, sent la seva tensió assignada de 0,6/1 kV, sota tub protector de polietilè de doble paret, de 75 mm de diàmetre.

#### CARACTERÍSTIQUES TÈCNIQUES

Subministrament i instal·lació de línia general d'alimentació soterrada, que enllaça la caixa general de protecció amb la centralització de comptadors, formada per cables unipolars amb conductors de coure, RZ1-K (AS) Cca-s1b,d1,a1 4G16+1x10 mm<sup>2</sup>, sent la seva tensió assignada de 0,6/1 KV, sota tub protector de polietilè de doble paret, de 75 mm de diàmetre, resistència a compressió major de 250 N, subministrat en rotllo, col·locat sobre llit de sorra de 10 cm d'espessor, degudament compactada i anivellada amb picó vibrant de guiat manual, reblert lateral compactant fins als ronyons i posterior reblert amb la mateixa sorra fins a 10 cm per sobre de la generatriu superior de la canonada, sense incloure l'excavació ni el posterior reblert principal de les rases. Inclús fil guia. Totalment muntada, connexionada i provada.

#### NORMATIVA D'APLICACIÓ

Instal·lació:

- REBT. Reglamento Electrotécnico para Baja Tensión.
- ITC-BT-14 y GUÍA-BT-14. Instalaciones de enlace. Línea general de alimentación.

Instal·lació i col·locació dels tubs:

- UNE 20460-5-523. Instalaciones eléctricas en edificios. Parte 5: Selección e instalación de materiales eléctricos. Capítulo 523: Intensidades admisibles en sistemas de conducción de cables.
- ITC-BT-19 y GUÍA-BT-19. Instalaciones interiores o receptoras. Prescripciones generales..
- ITC-BT-20 y GUÍA-BT-20. Instalaciones interiores o receptoras. Sistemas de instalación.
- ITC-BT-21 y GUÍA-BT-21. Instalaciones interiores o receptoras. Tubos y canales protectoras.

#### CRITERI D'AMIDAMENT EN PROJECTE

Longitud mesurada segons documentació gràfica de Projecte.



## CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

### DEL SUPORT

Es comprovarà que la seva situació i recorregut es corresponen amb els de Projecte, i que hi ha espai suficient per a la seva instal·lació.

### DEL CONTRACTISTA

Les instal·lacions elèctriques de baixa tensió s'executaran per instal·ladors autoritzats en baixa tensió, autoritzats per a l'exercici de l'activitat.

### PROCÉS D'EXECUCIÓ

### FASES D'EXECUCIÓ

Replanteig i traçat de la rasa. Execució del llit de sorra per a seient del tub. Col·locació del tub en la rasa. Estesa de cables. Connexionat. Execució del reblert envoltant.

### CONDICIONS DE TERMINACIÓ

Els registres seran accessibles desde zones comunitàries.

### CONSERVACIÓ I MANTENIMENT

Es protegirà de la humitat i del contacte amb materials agressius.

### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà la longitud realment executada segons especificacions de Projecte.

Unitat d'obra IEL010b: Línia general d'alimentació soterrada formada per cables unipolars amb conductors de coure, RZ1-K (AS) Cca-s1b,d1,a1 5G10 mm<sup>2</sup>, sent la seva tensió assignada de 0,6/1 kV, sota tub protector de polietilè de doble paret, de 75 mm de diàmetre.

### CARACTERÍSTIQUES TÈCNIQUES

Subministrament i instal·lació de línia general d'alimentació soterrada, que enllaça la caixa general de protecció amb la centralització de comptadors, formada per cables unipolars amb conductors de coure, RZ1-K (AS) Cca-s1b,d1,a1 5G10 mm<sup>2</sup>, sent la seva tensió assignada de 0,6/1 kV, sota tub protector de polietilè de doble paret, de 75 mm de diàmetre, resistència a compressió major de 250 N, subministrat en rotllo, col·locat sobre llit de sorra de 10 cm d'espessor, degudament compactada i anivellada amb picó vibrant de guiat manual, reblert lateral compactant fins als ronyons i posterior reblert amb la mateixa sorra fins a 10 cm per sobre de la generatriu superior de la canonada, sense incloure l'excavació ni el posterior reblert principal de les rases. Inclús fil guia. Totalment muntada, connexionada i provada.

### NORMATIVA D'APLICACIÓ

Instal·lació:

- REBT. Reglamento Electrotécnico para Baja Tensión.
- ITC-BT-14 y GUÍA-BT-14. Instalaciones de enlace. Línea general de alimentación.

Instal·lació i col·locació dels tubs:

- UNE 20460-5-523. Instalaciones eléctricas en edificios. Parte 5: Selección e instalación de materiales eléctricos. Capítulo 523: Intensidades admisibles en sistemas de conducción de cables.
- ITC-BT-19 y GUÍA-BT-19. Instalaciones interiores o receptoras. Prescripciones generales..
- ITC-BT-20 y GUÍA-BT-20. Instalaciones interiores o receptoras. Sistemas de instalación.
- ITC-BT-21 y GUÍA-BT-21. Instalaciones interiores o receptoras. Tubos y canales protectoras.

### CRITERI D'AMIDAMENT EN PROJECTE

Longitud mesurada segons documentació gràfica de Projecte.

## CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

### DEL SUPORT

Es comprovarà que la seva situació i recorregut es corresponen amb els de Projecte, i que hi ha espai suficient per a la seva instal·lació.



#### DEL CONTRACTISTA

Les instal·lacions elèctriques de baixa tensió s'executaran per instal·ladors autoritzats en baixa tensió, autoritzats per a l'exercici de l'activitat.

#### PROCÉS D'EXECUCIÓ

#### FASES D'EXECUCIÓ

Replanteig i traçat de la rasa. Execució del llit de sorra per a seient del tub. Col·locació del tub en la rasa. Estesa de cables. Connexionat. Execució del rebert envoltant.

#### CONDICIONS DE TERMINACIÓ

Els registres seran accessibles desde zones comunitàries.

#### CONSERVACIÓ I MANTENIMENT

Es protegirà de la humitat i del contacte amb materials agressius.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà la longitud realment executada segons especificacions de Projecte.

### **2.2.5.- Urbanització interior de la parcel·la**

Unitat d'obra UIP010: Projector per a jardí amb pica per a terra, de 150 mm de diàmetre i 220 mm d'altura, per a 1 làmpada fluorescent compacta TCA-SE de 16 W.

#### CARACTERÍSTIQUES TÈCNIQUES

Subministrament i muntatge de projector per a jardí amb pica per a terra, de 150 mm de diàmetre i 220 mm d'altura, per a 1 làmpada fluorescent compacta TCA-SE de 16 W, amb cos de poliamida reforçada amb fibra de vidre, vidre transparent, balast electrònic, portalàmpades E 27, classe de protecció II, grau de protecció IP 65, aïllament classe F, cable i endoll. Inclús accessoris, elements de ancoratge i connexionat. Totalment instal·lat.

#### CRITERI D'AMIDAMENT EN PROJECTE

Nombre d'unitats previstes, segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

#### DEL SUPORT

Es comprovarà que la seva situació es correspon amb la de Projecte.

#### PROCÉS D'EXECUCIÓ

#### FASES D'EXECUCIÓ

Preparació de la superfície de recolzament. Fixació del projector. Col·locació d'accessoris. Connexionat. Neteja de l'element.

#### CONDICIONS DE TERMINACIÓ

El nivell d'il·luminació serà adequat i uniforme.

#### CONSERVACIÓ I MANTENIMENT

Es protegirà enfront de cops i esquitxades.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà el nombre d'unitats realment executades segons especificacions de Projecte.

Unitat d'obra UIV010: Fanal per a enllumenat viari compost de columna de 3 m d'altura, i lluminària decorativa amb difusor de plàstic i làmpada de vapor de sodi a alta pressió de 150 watts.

#### CARACTERÍSTIQUES TÈCNIQUES

Subministrament i muntatge de fanal per a enllumenat viari compost de columna troncocònica de 3 m de altura, construïda en xapa d'acer galvanitzat de 3 mm de gruix, proveïda de caixa de connexió i protecció, conductor interior per 0,6/1,0 kV, pica de terra, pericó de pas i derivació de 40x40x60 cm, proveïda de marc i tapa de ferro colat, ancoratge mitjançant perns a dau de fonamentació realitzat amb formigó en massa HM-20/P/20/I; i lluminària decorativa amb difusor de plàstic i





làmpada de vapor de sodi a alta pressió de 150 watts de potència, forma troncopiramidal i acoblada al suport. Inclús p/p de fonamentació, accessoris, elements d'ancoratge, equip d'encesa i connexionat. Totalment instal·lada.

#### CRITERI D'AMIDAMENT EN PROJECTE

Nombre d'unitats previstes, segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

##### DEL SUPORT

Es comprovarà que la seva situació es correspon amb la de Projecte.

##### PROCÉS D'EXECUCIÓ

##### FASES D'EXECUCIÓ

Formació de fonamentació de formigó en massa. Preparació de la superfície de recolzament.

Fixació de la columna. Col·locació d'accessoris. Connexionat. Neteja de l'element.

##### CONDICIONS DE TERMINACIÓ

El nivell d'il·luminació serà adequat i uniforme. Tendrà una adequada fixació al suport.

##### CONSERVACIÓ I MANTENIMENT

Es protegirà enfront de cops i esquixades.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà el nombre d'unitats realment executades segons especificacions de Projecte.

Unitat d'obra UIA010: Pericó de connexió elèctrica, prefabricat de formigó, sense fons, registrable, de 60x60x60 cm de mesures interiors, amb marc de xapa galvanitzada i tapa de formigó armat alleugerit, de 69,5x68,5 cm.

#### CARACTERÍSTIQUES TÈCNiques

Subministrament i muntatge de pericó de connexió elèctrica, prefabricat de formigó, sense fons, registrable, de 60x60x60 cm de mesures interiors, amb parets rebaixades per a l'entrada de tubs, capaç de suportar una càrrega de 400 kN, amb marc de xapa galvanitzada i tapa de formigó armat alleugerit, de 69,5x68,5 cm, per a pericó de connexió elèctrica, capaç de suportar una càrrega de 125 kN.

#### CRITERI D'AMIDAMENT EN PROJECTE

Nombre d'unitats previstes, segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

##### DEL SUPORT

Es comprovarà que la ubicació es correspon amb la de Projecte.

##### PROCÉS D'EXECUCIÓ

##### FASES D'EXECUCIÓ

Replanteig. Col·locació de l'arqueta prefabricada. Execució de forats per a connexionat de tubs.

Connexionado dels tubs al pericó. Col·locació de la tapa i els accessoris.

##### CONDICIONS DE TERMINACIÓ

Serà accessible.

##### CONSERVACIÓ I MANTENIMENT

Es protegirà enfront de cops i obturacions. Es tapanaran totes les arquetes per a evitar accidents.

#### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà el nombre d'unitats realment executades segons especificacions de Projecte.

Unitat d'obra UXA010: Secció per a viàries amb tràfic de categoria C4 (àrees de vianants, carrers residencials) i categoria d'explanada E1 ( $5 \leq \text{CBR} < 10$ ), pavimentada amb llamborda ceràmica



clíiquer vermell llis, 200x100x50 mm, aparellat a matajunt per a tipus de col·locació flexible, realitzat sobre ferm compost per base flexible de tot-u natural, de 20 cm d'espessor.

#### CARACTERÍSTIQUES TÈCNIQUES

Formació de paviment mitjançant col·locació flexible, en exteriors, de llambordes ceràmiques clíiquer vermell llis, quines característiques tècniques compleixen la UNE-EN 1344, de 200x100x50 mm, aparellat a matajunt, sobre una capa de sorra de 0,5 a 5 mm de diàmetre, el gruix final del qual, una vegada col·locades les llambordes i vibrat el paviment amb safata vibrant de guiat manual, serà uniforme i estarà comprès entre 3 i 5 cm, deixant entre ells una junta de separació entre 2 i 3 mm, pel seu posterior reblert amb sorra natural, fina, seca i de granulometria compresa entre 0 i 2 mm, realitzat sobre ferm compost per base flexible de tot-u natural, de 20 cm d'espessor, amb estès i compactat al 100% del Proctor Modificat, executada segons pendents del projecte i col·locat sobre explanada formada pel terreny natural adequadament compactat fins arribar a una capacitat portant mínima definida pel seu índex CBR ( $5 \leq \text{CBR} < 10$ ). Inclús p/p de ruptures, talls a realitzar per ajustar-los als cantells del confinament (no inclosos en aquest preu) i a les intrusions existents en el paviment, acabaments i peces especials.

#### CRITERI D'AMIDAMENT EN PROJECTE

Superfície mesurada en projecció horitzontal, segons documentació gràfica de Projecte. No s'han tingut en compte les escapçadures com factor d'influència per incrementar l'amidament, cada vegada que en la descomposició s'ha considerat el tant per cent de ruptures general.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

##### DEL SUPORT

Es comprovarà que s'ha realitzat un estudi de les característiques del sòl natural sobre el que s'actuarà i s'ha procedit a la retirada o desviament de serveis, tals com línies elèctriques i canonades de proveïment d'aigua i de clavegueram.

##### PROCÉS D'EXECUCIÓ

##### FASES D'EXECUCIÓ

Replanteig de mestres i nivells. Preparació de l'explanada. Estès i compactació de la base. Execució de l'encontre amb els cantells de confinament. Estesa i anivellament de la capa de sorra. Col·locació de les llambordes. Reblert de juntes amb sorra i vibrat del paviment. Neteja.

##### CONDICIONS DE TERMINACIÓ

Tindrà planitud. L'evacuació d'aigües serà correcta. Tindrà bon aspecte.

##### CONSERVACIÓ I MANTENIMENT

Es protegirà enfront del trànsit, pluges, gelades i temperatures elevades.

##### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà, en projecció horitzontal, la superfície realment executada segons especificacions de Projecte.

Unitat d'obra UXF010: Paviment de 5 cm de gruix, realitzat amb barreja bituminosa contínua en calent AC16 surf D, per a capa de rodolament, de composició densa.

#### CARACTERÍSTIQUES TÈCNIQUES

Formació de paviment de 5 cm de gruix, realitzat amb barreja bituminosa contínua en calent AC16 surf D, per a capa de rodolament, de composició densa, amb àrid granític de 16 mm de grandària màxima i betum asfàltic de penetració. Inclús p/p de comprovació de l'anivellament de la superfície suport, replanteig del gruix del paviment i neteja final. Sense incloure la preparació de la capa base existent.

#### NORMATIVA D'APLICACIÓ

Execució:

- Norma 6.1-IC. Secciones de firme de la Instrucción de Carreteras.



- PG-3. Pliego de prescripciones técnicas generales para obras de carreteras y puentes de la Dirección General de Carreteras.

#### CRITERI D'AMIDAMENT EN PROJECTE

Superfície mesurada en projecció horitzontal, segons documentació gràfica de Projecte.

#### CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA

##### DEL SUPORT

Es comprovarà que la superfície suport reuneix les condicions de qualitat i forma previstes.

##### AMBIENTALS

Se suspendran els treballs quan la temperatura sigui inferior a 8°C, plougui o neu.

##### PROCÉS D'EXECUCIÓ

##### FASES D'EXECUCIÓ

Transport de la barreja bituminosa. Extensió de la barreja bituminosa. Compactació de la capa de barreja bituminosa. Execució de juntes transversals i longitudinals en la capa de barreja bituminosa.

##### CONDICIONS DE TERMINACIÓ

La superfície quedarà plana, llisa, amb textura uniforme i sense segregacions.

##### CONSERVACIÓ I MANTENIMENT

Es protegirà enfront del tràfic fins que la barreja estigui piconada, a la temperatura ambient i amb la densitat adequada.

##### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà, en projecció horitzontal, la superfície realment executada segons especificacions de Projecte.

Unitat d'obra UXH010: Enrajolat de rajola de formigó per exteriors, acabat baix relleu sense polir, resistència a flexió T, càrrega de ruptura 4, resistència al desgast H, 30x30x4 cm, gris, per ús privat en exteriors en zona de parcs i jardins, col·locada picat de pitxell amb morter; tot allò realitzat sobre solera de formigó no estructural (HNE-20/P/20), de 10 cm d'espessor, abocament des de camió amb estès i vibrat manual amb regla vibrant de 3 m, amb acabat reglejat.

##### CARACTERÍSTIQUES TÈCNIQUES

Subministrament i col·locació de paviment per a ús privat en zona de parcs i jardins, de rajola de formigó per exteriors, acabat superficial de la cara vista: baix relleu sense polir, classe resistent a flexió T, classe resistent segons la càrrega de ruptura 4, classe de desgast per abrasió H, format nominal 30x30x4 cm, color gris, segons UNE-EN 1339, col·locades picat de pitxell amb morter de ciment M-5 de 3 cm de gruix, deixant entre elles una junta de separació de entre 1,5 i 3 mm. Tot això realitzat sobre ferm compost per solera de formigó no estructural (HNE-20/P/20), de 10 cm d'espessor, abocament des de camió amb estès i vibrat manual amb regla vibrant de 3 m, amb acabat reglejat executada segons pendents del projecte i col·locat sobre explanada amb índex CBR > 5 (California Bearing Ratio), no inclosa en aquest preu. Inclús p/p de juntes estructurals i de dilatació, talls a realitzar per ajustar-les als cantells del confinament o a les intrusions existents en el paviment i reblert de juntes amb sorra silícia de mida 0/2 mm i/o producte recomanat pel fabricant, seguint les instruccions d'aquest.

##### NORMATIVA D'APLICACIÓ

Elaboració, transport i posada en obra del formigó:

- Instrucción de Hormigón Estructural (EHE-08).

Execució:

- CTE. DB-SUA Seguridad de utilización y accesibilidad.

- NTE-RSR. Revestimientos de suelos: Piezas rígidas.

##### CRITERI D'AMIDAMENT EN PROJECTE

Superfície mesurada en projecció horitzontal, segons documentació gràfica de Projecte, deduint els buits de superfície major de 1,5 m<sup>2</sup>. No s'han tingut en compte les escapçadures com factor



d'influència per incrementar l'amidament, cada vegada que en la descomposició s'ha considerat el tant per cent de ruptures general.

**CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA**

**DEL SUPORT**

Es comprovarà que s'ha realitzat un estudi sobre les característiques de la seva base de suport.

**PROCÉS D'EXECUCIÓ**

**FASES D'EXECUCIÓ**

Replanteig de mestres i nivells. Abocament i compactació de la solera de formigó. Estesa de la capa de morter. Humectació de les peces a col·locar. Col·locació individual, a pic de maceta, de les peces. Formació de juntes i trobades. Neteja del paviment i les juntes. Reblert dels junts amb sorra seca, mitjançant raspallat. Eliminació del material sobrant de la superfície, mitjançant escombrat.

**CONDICIONS DE TERMINACIÓ**

Formarà una superfície plana i uniforme i s'ajustarà a les alineacions i rasants previstes. Tindrà bon aspecte.

**CONSERVACIÓ I MANTENIMENT**

Després de finalitzar els treballs de pavimentació, es protegirà enfront del trànsit durant el temps indicat pel director de l'execució de l'obra.

**CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT**

Es mesurarà, en projecció horitzontal, la superfície realment executada segons especificacions de Projecte, deduint els buits de superfície major de 1,5 m<sup>2</sup>.

Unitat d'obra UXB020: Vorera - Recta - MC - A1 (20x14) - B- H - S(R-3,5) - UNE-EN 1340, col·locat sobre base de formigó no estructural (HNE-20/P/20) de 20 cm d'espessor i rejuntat amb morter de ciment, industrial, M-5.

**CARACTERÍSTIQUES TÈCNIQUES**

Subministrament i col·locació de peces de vorada recta de formigó, monocapa, amb secció normalitzada de vianants A1 (20x14) cm, classe climàtica B (absorció ≤6%), classe resistent a l'abració H (petjada ≤23 mm) i classe resistent a flexió S (R-3,5 N/mm<sup>2</sup>), de 50 cm de longitud, segons UNE-EN 1340 i UNE 127340, col·locades sobre base de formigó no estructural (HNE-20/P/20) de gruix uniforme de 20 cm i 10 cm d'amplada a cada costat del vorera, abocament des de camió, estès i vibrat amb acabat reglejat, segons pendents del projecte i col·locat sobre explanada amb índex CBR > 5 (California Bearing Ratio), no inclosa en aquest preu; posterior ajuntant d'amplada màxima 5 mm amb morter de ciment, industrial, M-5. Inclús p/p de topalls o contraforts de 1/3 i 2/3 de l'altura de la vorera, del costat de la calçada i al revers respectivament, amb un mínim de 10 cm, excepte en el cas de paviments flexibles.

**NORMATIVA D'APLICACIÓ**

Elaboració, transport i posada en obra del formigó: Instrucció de Hormigón Estructural (EHE-08).

**CRITERI D'AMIDAMENT EN PROJECTE**

Longitud mesurada segons documentació gràfica de Projecte.

**CONDICIONS PRÈVIES QUE S'HAN DE COMPLIR ABANS DE LA EXECUCIÓ DE LES UNITATS D'OBRA**

**DEL SUPORT**

Es comprovarà que s'ha realitzat un estudi sobre les característiques de la seva base de suport.

**PROCÉS D'EXECUCIÓ**

**FASES D'EXECUCIÓ**

Replanteig d'alineacions i nivells. Abocament i estès de formigó en llit de suport. Col·locació, rebut i anivellació de les peces, incloent-hi topalls o contraforts. Reomplert de junts amb morter de ciment.



### CONDICIONS DE TERMINACIÓ

El conjunt serà monolític i quedarà alineat.

### CONSERVACIÓ I MANTENIMENT

Es protegirà enfront del trànsit, pluges, gelades i temperatures elevades.

### CRITERI D'AMIDAMENT EN OBRA I CONDICIONS D'ABONAMENT

Es mesurarà la longitud realment executada segons especificacions de Projecte.

### 2.3.- Prescripcions sobre verificacions en l'edifici acabat

D'acord amb el "Real Decreto 314/2006. Código Técnico de la Edificación (CTE)", a l'obra acabada, bé sobre l'edifici en el seu conjunt, o bé sobre les seves diferents parts i les seves instal·lacions, totalment acabades, han de realitzar-se, a més de les que puguin establir-se amb caràcter voluntari, les comprovacions i proves de servei previstes en el present plec, per part del constructor, i al seu càrrec, independentment de les ordenades per la Direcció Facultativa i les exigides per la legislació aplicable, que seran realitzades per laboratori acreditat i el cost de les quals s'especifica detalladament en el capítol de Control de Qualitat i Assaigs, del Pressupost d'Execució material (PEM) del projecte.

### C FONAMENTACIONS

Segons el "Real Decreto 314/2006. Código Técnico de la Edificación (CTE)", abans de la posada en servei de l'edifici s'ha de comprovar que:

- La fonamentació es comporta en la forma prevista en el projecte.
- No s'aprecia que s'estiguin superant les càrregues admissibles.
- Els assentaments s'ajusten al previst, si, en casos especials, així ho exigeix el projecte o el director d'obra.
- No s'han plantat arbres les arrels dels quals puguin originar canvis d'humitat en el terreny de fonamentació, o creat zones verdes el drenatge de les quals no estigui previst en el projecte, sobretot en terrenys expansius.

Així mateix, és recomanable controlar els moviments del terreny per a qualsevol tipus de construcció, per part de l'empresa constructora, i obligatori en el cas d'edificis del tipus C-3 (construccions entre 11 i 20 plantes) i C-4 (conjunts monumentals o singulars i edificis de més de 20 plantes), mitjançant l'establiment per part d'una organització amb experiència en aquest tipus de treballs, dirigida per un tècnic competent, d'un sistema d'anivellació per controlar l'assentament a les zones més característiques de l'obra, en les següents condicions:

- El punt de referència ha d'estar protegit de qualsevol eventual pertorbació, de manera que pugui considerar-se com a immòbil durant tot el període d'observació.
- El nombre de pilars a anivellar no serà inferior al 10% del total de l'edificació. En el cas que la superestructura es recolzi sobre murs, es preveurà un punt d'observació cada 20 m de longitud, com a mínim. En qualsevol cas, el nombre mínim de referències d'anivellació serà de 4. La precisió de l'anivellació serà de 0,1 mm.
- La cadència de lectures serà l'adequada per advertir qualsevol anomalia en el comportament de la fonamentació. És recomanable efectuar-les en completar-se el 50% de l'estructura, al final de la mateixa, i en acabar els envans de cada dues plantes.
- El resultat final de les observacions s'incorporarà a la documentació de l'obra.



## I INSTAL·LACIONS

Les proves finals de la instal·lació s'efectuaran, un cop estigui l'edifici acabat, per l'empresa instal·ladora, que disposarà dels mitjans materials i humans necessaris per a la seva realització.

Totes les proves s'efectuaran en presència de l'instal·lador autoritzat o del director d'Execució de l'Obra, que ha de donar la seva conformitat tant al procediment seguit com als resultats obtinguts.

Els resultats de les diferents proves realitzades a cadascun dels equips, aparells o subsistemes, passaran a formar part de la documentació final de la instal·lació. S'indicaran marca i model i es mostraran, per a cada equip, les dades de funcionament segons projecte i les dades mesurades en obra durant la posada en marxa.

Quan per estendre el certificat de la instal·lació sigui necessari disposar d'energia per realitzar proves, es sol·licitarà a l'empresa subministradora d'energia un subministrament provisional per a proves, per l'instal·lador autoritzat o pel director de la instal·lació, i sota la seva responsabilitat.

Seràn a càrrec de l'empresa instal·ladora totes les despeses ocasionades per la realització d'aquestes proves finals, així com les despeses ocasionades per l'incompliment de les mateixes.

### **2.4.- Prescripcions en relació amb l'emmagatzematge, maneig, separació i altres operacions de gestió dels residus de construcció i demolició**

El corresponent Estudi de Gestió dels Residus de Construcció i Demolició, contindrà les següents prescripcions en relació amb l'emmagatzematge, maneig, separació i altres operacions de gestió dels residus de l'obra:

El dipòsit temporal de la runa es realitzarà en contenidors metàl·lics amb la ubicació i condicions establertes en les ordenances municipals, o bé en sacs industrials amb un volum inferior a un metre cúbic, quedant degudament senyalitzats i segregats de la resta de residus.

Aquells residus valoritzables, com fustes, plàstics, ferralla, etc., Es dipositaran en contenidors degudament senyalitzats i segregats de la resta de residus, per tal de facilitar la seva gestió.

Els contenidors hauran d'estar pintats amb colors vius, que siguin visibles durant la nit, i han de comptar amb una banda de material reflectant de, almenys, 15 centímetres al llarg de tot el seu perímetre, figurant de forma clara i llegible la següent informació:

- Raó social.
- Codi d'Identificació Fiscal (C.I.F.).
- Número de telèfon del titular del contenidor / envàs.
- Número d'inscripció en el Registre de Transportistes de Residus del titular del contenidor.

Aquesta informació haurà de quedar també reflectida a través d'adhesius o plaques, en els envasos industrials o altres elements de contenció.

El responsable de l'obra a la qual dona servei el contenidor d'adoptar les mesures pertinents per evitar que es dipositin residus aliens a la mateixa. Els contenidors romandran tancats o coberts fora de l'horari de treball, amb tal d'evitar el dipòsit de restes aliens a l'obra i el vessament de dels residus.

A l'equip d'obra s'hauran d'establir els mitjans humans, tècnics i procediments de separació que es dedicaran a cada tipus de RCE.



S'hauran de complir les prescripcions establertes en les ordenances municipals, els requisits i condicions de la llicència d'obra, especialment si obliguen a la separació en origen de determinades matèries objecte de reciclatge o deposició, i el constructor o el cap d'obra realitzar una avaluació econòmica de les condicions en què és viable aquesta operació, considerant les possibilitats reals de fer-la, és a dir, que l'obra o construcció ho permeti i que es disposi de plantes de reciclatge o gestors adequats.

El constructor haurà d'efectuar un estricte control documental, de manera que els transportistes i gestors de RCE presentin els vals de cada retirada i lliurament a destinació final. En el cas que els residus es reutilitzin en altres obres o projectes de restauració, s'haurà d'aportar evidència documental de la destinació final.

Les restes derivades del rentat de les canaletes de les cubes de subministrament de formigó prefabricat seran considerats com a residus i gestionats com li correspon (LER 17 01 01).

S'ha d'evitar la contaminació mitjançant productes tòxics o perillosos dels materials plàstics, restes de fusta, abassegaments o contenidors de runes, amb la finalitat de procedir a la seva adequada segregació.

Les terres superficials que es puguin destinar a jardineria o la recuperació de sòls degradats, seran acuradament retirades i emmagatzemades durant el menor temps possible, disposades en cavallons d'alçada no superior a 2 metres, evitant la humitat excessiva, la seva manipulació i la seva contaminació.



## **DOCUMENT N°4: PRESSUPOST**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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**DOCUMENT N°4: PRESSUPOST  
CAPÍTOL N°1: AMIDAMENTS**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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Pressupost parcial nº 1 Renovació Enllumenat Palma de Cervello

Nº	U	Descripció					Amidament	
<b>1.1.- DEMOLICIÓ</b>								
1.1.1	M2	DEMOLICIO DE PAVIMENT DE PANOTS COL-LOCATS SOBRE FORMIGO PREVI TALL AMB DISC DE 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MARTELL PICADOR AMB MITJANS MECANICS I CARREGA SOBRE CAMIO						
						Total M2 .....	0,100	
1.1.2	M2	DEMOLICIO DE PAVIMENT DE LLAMBORDES , AMB MITJANS MECANICS I CÀRREGA I TRANSPORT A L'ABOCADOR INCLOS CANON ADICIONAL						
						Total M2 .....	0,100	
1.1.3	M2	DEMOLICIO DE PAVIMENT DE MESCLA BITUMINOSA, PREVI TALL AMB DISC, DE FINS A 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MITJANS MECANICS I CARREGA SOBRE CAMIO						
						Total M2 .....	0,100	
1.1.4	M2	DEMOLICIO DE PAVIMENT DE PECES DE FORMIGO COL-LOCANES SOBRE FORMIGO PREVI TALL AMB DISC, DE FINS A 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MITJANS MECANICS I CARREGA SOBRE CAMIO						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Rassa	1	15,000	0,400		6,000	
		Fonaments punt de llum 8	2	0,800	0,800		1,280	
		Fonaments punts de llum 4	6	0,600	0,600		2,160	
		Arquetes	6	1,000	1,000		6,000	
						15,440	15,440	
						Total M2 .....	15,440	
1.1.5	M2	DEMOLICIO DE PAVIMENT DE FORMIGO PREVI TALL AMB DISC, DE FINS A 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MITJANS MECANICS I CARREGA SOBRE CAMIO						
						Total M2 .....	0,100	
1.1.6	Ut	DESMUNTATGE DELS PUNTS DE LLUMS EXISTENTS I RETIRAR TOTS ELS SEUS COMPONENTS, TALS COM LLUMINARIS, CABLEJAT, MECANISMES BACULS, BRAÇOS I POSTES I LINIES D'ALIMENTACIO I DISTRIBUCIO ACTUALS, AMB REPOSICIO DE FAÇANES AMB MATERIAL ADIENT, AMB CARREGA I TRANSPORT DE RUNES AL ABOCADOR AUTORITZAT INCLOS LES TAXES D'ABOCAMENT. EL DESMUNTATGE DEL ENLLUMENAT S'EXECUTARA UN COP FINALITZADA I EN FUNCIONAMENT LA INSTAL·LACIO PROJECTADA AL SER CIRCUIT TANCAT.						
						Total UT .....	474,000	
1.1.7	Ut	DESMUNTATGE DE QUADRE ELECTRIC ACTUAL.						
						Total UT .....	0,010	
<b>1.2.- OBRA CIVIL</b>								
1.2.1	M3	EXCAVACIO DE RASSA PER A PAS D'INSTAL·LACIONS FINS A 1 METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MANUALS I AMB LES TERRES DEIXADES A LA VORA						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Rassa	1	15,000	0,400	0,500	3,000	
		Fonaments punt de llum 8	2	0,800	0,800	0,800	1,024	
		Fonaments punts de llum 4	6	0,600	0,600	0,600	1,296	
		Arquetes	6	1,000	1,000	1,000	6,000	
						0,800	11,320	9,056
						Total M3 .....	9,056	
1.2.2	M3	EXCAVACIO DE RASA PER A PAS D'INSTAL·LACIONS FINS A 1,-METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MECANICS I AMB LES TERRES DEIXADES A LA VORA.						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Rassa	1	15,000	0,400	0,500	3,000	
		Fonaments punt de llum 8	2	0,800	0,800	0,800	1,024	
		Fonaments punts de llum 4	6	0,600	0,600	0,600	1,296	
		Arquetes	6	1,000	1,000	1,000	6,000	
						0,200	11,320	2,264
						Total M3 .....	2,264	

**Pressupost parcial nº 1 Renovació Enllumenat Palma de Cervello**

<b>Nº</b>	<b>U</b>	<b>Descripció</b>					<b>Amidament</b>	
<b>1.2.3</b>	<b>M3</b>	<b>REBLIMENT I PICONATGE DE RASA D'AMPLARIA FINS A 60 CM, AMB MATERIAL SELECCIONAT DE L'OBRA, EN TONGADES DE GRUIX DE FINS A 25 CM, UTILITZANT PICO VIBRANT, AMB COMPACTACIO DEL 95% P.M.</b>						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
	Rassa		1	15,000	0,400	0,300	1,800	
							1,800	1,800
							<b>Total M3 .....</b>	<b>1,800</b>
<b>1.2.4</b>	<b>M3</b>	<b>TRANSPORT DE RUNES A L'ABOCADOR AMB CONECTOR, CARREGAT AMB MITJANS MECANICS I MANUALS AMB UN RECORREGUT DE FINS A 10,-KM INCLOS ELS DRETS D'ABOCAMENT</b>						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
	Rassa		1	15,000	0,400	0,200	1,200	
	Fonaments punt de llum 8		2	0,800	0,800	0,800	1,024	
	Fonaments punts de llum 4		6	0,600	0,600	0,600	1,296	
	Arquetes		6	1,000	1,000	1,000	6,000	
						1,300	9,520	12,376
							<b>Total M3 .....</b>	<b>12,376</b>
<b>1.2.5</b>	<b>M2</b>	<b>PAVIMENT DE PANOT PER A VORERA GRIS DE 20x20x4 CM, CLASSE 1A TIPUS 2, COL-LOCAT A L'ESTESSA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PÒRTLAND I BEURADA DE CIMENT PORLAND</b>						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
	Rassa		1	15,000	0,400		6,000	
	Fonaments punt de llum 8		2	0,800	0,800		1,280	
	Fonaments punts de llum 4		6	0,600	0,600		2,160	
	Arquetes		6	1,000	1,000		6,000	
							15,440	15,440
							<b>Total M2 .....</b>	<b>15,440</b>
<b>1.2.6</b>	<b>M2</b>	<b>PAVIMENT DE PECES DE FORMIGO PER A VORERA DE 30x30x4 CM, IGUALS A LES EXISTENTS, COL-LOCAT A L'ESTESSA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PÒRTLAND I BEURADA DE CIMENT PORLAND</b>						
								<b>Total M2 .....</b>
								<b>0,100</b>
<b>1.2.7</b>	<b>M2</b>	<b>PAVIMENT DE MICROAGLOMERAT ASFALTIC EN CALENT, COLOR SAULO DE 4 CM DE GRUIX IGUAL AL EXISTENT.</b>						
								<b>Total M2 .....</b>
								<b>0,100</b>
<b>1.2.8</b>	<b>M3</b>	<b>PAVIMENT DE FORMIGO SENSE ADDITIUS HM-30/B/20/I+E DE CONSISTENCIA TOVA GRANDARIA MAXIMA DEL GRANULAT 20 MM, ESCAMPAT DES DE CAMIO, ESTESA I VIBRATGE MECANIC I ACABAT REGLEJAT</b>						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
	Rassa		1	15,000	0,400	0,200	1,200	
	Fonaments punt de llum 8		2	0,800	0,800	0,800	1,024	
	Fonaments punts de llum 4		6	0,600	0,600	0,600	1,296	
							3,520	3,520
							<b>Total M3 .....</b>	<b>3,520</b>
<b>1.2.9</b>	<b>M2</b>	<b>PAVIMENT DE MESCLA BITUMINOSA EN CALENT DE COMPOSICIO Densa D-12 AMB GRANULAT GRANÍTIC I BETUM ASFALTIC DE PENETRACIO, ESTESA I COMPACTADA AL 98 % DE L'ASSAIG MARSHALL.</b>						
								<b>Total M2 .....</b>
								<b>0,100</b>
<b>1.2.10</b>	<b>Ut</b>	<b>PERICO DE 38x38x55 CM, AMB PARETS DE 15 CM DE GRUIX DE FORMIGO HM-20/P/20 I I SOLERA DE MAÓ CALAT, SOBRE LLIT DE SORRA.</b>						
								<b>Total UT .....</b>
								<b>6,000</b>
<b>1.2.11</b>	<b>Ut</b>	<b>BASTIMENT I TAPA PER A PERICO DE SERVEIS DE FOSA GRISA DE 420x420x40 MM I DE 25 KG DE PES , COL-LOCAT AMB MORTER MIXT 1:05:04, ELABORAT A L'OBRA AMB FORMIGONERA DE 165 LITRES</b>						
								<b>Total UT .....</b>
								<b>6,000</b>
<b>1.2.12</b>	<b>MI</b>	<b>TUB RIGID DE PVC DE 110 MM DE DIAMTRE NOMINAL I 1,70 MM DE GRUIX, AMB GRAU DE RESISTENCIA AL XOC 7, ENDOLLAT I MUNTAT COM A CANALITZACIO SOTERRADA.</b>						

**Pressupost parcial nº 1 Renovacio Enllumenat Palma de Cervello**

Nº	U	Descripció					Amidament	
						<b>Total ML .....</b>	<b>0,100</b>	
1.2.13	MI	TUB RIGID D'ACER ELECTRO GALVANITZAT, DE DIAMETRE NOMINAL REFERENCIA 36, ROSCAT I MUNTAT SUPERFICIALMENT.					<b>Total ML .....</b>	<b>0,100</b>
1.2.14	MI	TUB FLEXIBLE CORRUGAT DE 80 MM DE DIAMETRE NOMINAL I 4,25 MM DE GRUIX AMB GRAU DE RESISTENCIA AL XOC 7 I MUNTAT COM A CANALITZACIO SOTERRADA.	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Rassa	1	15,000			15,000	
		Fonaments punt de llum 8	2	2,000			4,000	
		Fonaments punts de llum 4	6	2,000			12,000	
		Arquetes	6	1,000			6,000	
						<b>37,000</b>	<b>37,000</b>	
						<b>Total ML .....</b>	<b>37,000</b>	
1.2.15	MI	TUB FLEXIBLE CORRUGAT DE PVC DE DIAMETRE NOMINAL REFERENCIA 21 AMB GRAU DE RESISTENCIA AL XOC 5 I ENCASTAT.					<b>Total ML .....</b>	<b>1,000</b>
1.2.16	MI	CINTA DE PVC PER A SENYALITZACIO D'INSTAL·LACIONS SOTERRADES. INSTAL·LADA A 25 CM PER DAMUNT DEL TUB	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Rassa	1	15,000			15,000	
		Fonaments punt de llum 8	2	2,000			4,000	
		Fonaments punts de llum 4	6	2,000			12,000	
		Arquetes	6	1,000			6,000	
						<b>37,000</b>	<b>37,000</b>	
						<b>Total ML .....</b>	<b>37,000</b>	
1.2.17	Ut	PARTIDA DE COBRAMENT INTEGRER PER L'OBRA CIVIL PER CREAR UN SORTIDA EN PUNT DE LLUM EXISTENT					<b>Total UT .....</b>	<b>6,000</b>
1.2.18	Ut	PARTIDA DE COBRAMENT INTEGRER PER L'OBRA CIVIL PER EL CALAT DE MUR DE FORMIGO A LA ZONA VERDA.					<b>Total UT .....</b>	<b>1,000</b>
1.2.19	Ut	PARTIDA COMPLETA I EN FUNCIONAMENT DE PROTECCIÓ INDIVIDUALS DELS ARBRES DE PERÍMETRE DEL TRONC DE FINS A 149 CM DE PERÍMETRE CONTRA ELS COPS, CONSISTENT EN TANCATS DE FUSTA DE PI, DE 22 MM DE GRUIX, PER A 5 USOS DE 2 METRES D'ALÇADA COM A MÍNIM, I ES PROTEGIRÀ AMB MATERIAL D'ENCOIXINAT (BANDES DE JUTE), LA PART DEL TRONC EN CONTACTE AMB EL TANCAT DE FUSTA, LES ZONES DE CONTACTE DELS LLIGAMS AMB L'ESCORÇA, I LA ZONA DEL COLL DE L'ARREL SI FOS NECESSARI.(INCLÒS LA COL·LOCACIÓ I EL DESMUNTATGE.).					<b>Total UT .....</b>	<b>4,000</b>
<b>1.3.- INSTAL·LACIONS</b>								
1.3.1	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE NU, UNIPOLAR 1x35 MM2 MUNTAT EN FONS DE RASA	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Canalitzacio nous punts de llum	7	3,000			21,000	
		Subquadre	1	3,000			3,000	
						<b>24,000</b>	<b>24,000</b>	
						<b>Total ML .....</b>	<b>24,000</b>	

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Nº	U	Descripció					Amidament	
1.3.2	U	<p>Subministrament i instal·lació de presa de terra composta per un pou de 2 m de profunditat en l'interior de la qual s'instal·la una placa de coure electrolític pur de 500x500x1,5 mm unida a la barra conductora de coure estanyat de 30x2 mm, connectada a pont per a comprovació, dintre d'una arqueta de registre de polipropilè de 30x30 cm. Fins i tot replanteig, excavació del pou, col·locació de la placa en el seu interior, connexió entre la placa i el conductor de terra mitjançant platina conductora, col·locació de l'arqueta de registre, connexió de la platina conductora amb la línia d'enllaç mitjançant born d'unió, reblert amb terres de la pròpia excavació i additius per a disminuir la resistivitat del terreny i connectat a la xarxa de terra mitjançant pont de comprovació. Totalment muntada, connexionada i provada per l'empresa instal·ladora mitjançant les corresponents proves de servei (incloses en aquest preu).                      Inclou: Replanteig. Excavació del pou. Col·locació de la placa. Connexió de la placa amb la platina conductora. Col·locació de l'arqueta de registre. Connexió de la platina conductora amb la línia d'enllaç. Reblert de la zona excavada. Connexionat a la xarxa de terra. Realització de proves de servei.                      Criteri d'amidament de projecte: Nombre d'unitats previstes, segons documentació gràfica de Projecte.                      Criteri de mesura d'obra: Es mesurarà el nombre d'unitats realment executades segons especificacions de Projecte.</p>						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Terra subquadre 4	1				1,000	
							1,000	1,000
							<b>Total U .....</b>	<b>1,000</b>
1.3.3	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 1x16,00 MM2 , COL·LOCAT EN TUB						
							<b>Total ML .....</b>	<b>40,000</b>
1.3.4	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X6 MM2 COL·LOCATS EN TUB.						
							<b>Total ML .....</b>	<b>40,000</b>
1.3.5	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X6 MM2 COL·LOCATS EN TUB.						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Projectors darreera quadre 2		25,000			25,000	
							25,000	25,000
							<b>Total ML .....</b>	<b>25,000</b>
1.3.6	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X10 MM2 COL·LOCAT EN TUB.						
							<b>Total ML .....</b>	<b>0,010</b>
1.3.7	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X10 MM2 COL·LOCAT EN TUB.						
							<b>Total ML .....</b>	<b>0,010</b>
1.3.8	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X16 MM2 COL·LOCAT EN TUB.						
							<b>Total ML .....</b>	<b>0,010</b>
1.3.9	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X16 MM2 COL·LOCAT EN TUB.						
							<b>Total ML .....</b>	<b>0,010</b>
1.3.10	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 4X6 MM2 MUNTAT SUPERFICIALMENT TRENAT.						
							<b>Total ML .....</b>	<b>0,010</b>
1.3.11	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X6 MM2 MUNTAT TRENAT SUPERFICIALMENT.						
							<b>Total ML .....</b>	<b>0,010</b>
1.3.12	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 4X10 MM2 MUNTAT SUPERFICIALMENT.						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal

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Nº	U	Descripció	Amidament	
		Quadre nº7, línia 4	50,000	50,000
				50,000
			<b>Total ML .....</b>	<b>50,000</b>
1.3.13	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X10 MM2 MUNTAT SUPERFICIALMENT.		
			<b>Total ML .....</b>	<b>0,010</b>
1.3.14	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 1X16 MM2 MUNTAT SUPERFICIALMENT.		
			<b>Total ML .....</b>	<b>0,010</b>
1.3.15	MI	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X16 MM2 MUNTAT SUPERFICIALMENT.		
			<b>Total ML .....</b>	<b>0,010</b>

1.4.- LLUMENERES I BACULS

1.4.1	Ut	<p>SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL MILAN S O EQUIVALENT, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i tres mides diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED – DRIVER)</li> <li>- Ròtula: Fixació tant lateral, com a top diàmetre 60mm, amb possibilitat d'orientació i inclinació de -15 a + 15º amb la mateixa peça</li> <li>- Tancament a pressió sense cargols ni necessitat de ferramentes.</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes IK10</li> <li>- Mides: 525x250x80mm - 625x290x95mm - 775x320x95mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona, i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S40 fins a 40W, S60 fins a 60W, M fins a 100W, XL fins a 150W, i XXL fins a 300W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Ideal per a alçades de 4 metres fins a 14 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> <li>- Incorpora seccionador de corrent (desconnexió automàtica) o connector segur de tres pols.</li> </ul>						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Canvi massiu	331				331,000	
		Punts de llum carretera	2				2,000	
							333,000	333,000
							<b>Total UT .....</b>	<b>333,000</b>

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Nº U Descripció Amidament

1.4.2 Ut SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL INNOVA B O EQUIVALENT D'ALÇADA FINS A 760 MM, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.

La llumenera te les següents característiques:

- Forma aerodinàmica amb tres formes de subjecció: Ròtula, Braç i Suspesa
  - Doble cavitat aïllades tèrmicament (LED – DRIVER
  - Ròtula: Fixació tant lateral, com a top diàmetre 60mm, amb possibilitat d'orientació i inclinació de 0 – 15º amb la mateixa peça
  - Braç: Fixació top diàmetre 60mm.
  - Suspesa: Fixació mitjançant adaptador a catenària oa rosca GAS
  - Tancament a pressió sense cargols ni necessitat de ferramentes.
  - Difusor en vidre temperat pla amb màxima protecció a impactes IK09
  - Mides: 569x468x105mm
  - Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9007 i Negre Mate
  - Tots els cargols exteriors i interiors en acer inoxidable.
  - Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.
  - Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària. Les aletes del dissipador tèrmic estan protegides per una tapa superior que evita l'acumulació de brutícia, mantenint aquesta part vital en perfecte estat de funcionament.
  - Diverses versions de 15W fins a 100W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament deficiència energètica.
- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85ºC
- Lents de PMMA, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.
  - Driver primera marca Philips Xitanium Full Prog regulable en potència
  - Driver dimmable 1-10V, opcionalment PLC, DALI, Programable.
  - Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe II
  - Inclou protector individual contra sobretensions de 20KA (tipus 2)
  - Incorpora seccionador de corrent (desconnexió automàtica) o connector segur de tres pols.
  - Compleix amb totes les certificacions corresponents al CE, homologada per IAC i amb marcatge ENEC.

	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
Innova B	14				14,000	
iNNOBA B+Columnna	6				6,000	
					20,000	20,000
<b>Total UT .....</b>						<b>20,000</b>

1.4.3 Ut SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL NEOVILLA O EQUIVALENT D'ALÇADA FINS A 750 MM, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS

**Total UT .....** 21,000

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Nº	U	Descripció	Amidament
1.4.4	Ut	<p>SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL PROJECTOR M MILAN S APM140 O EQUIVALENT D'ALÇADA , AMB POTENCIA NOMINAL DE FINS A 140W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i quatre mesures diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED – DRIVER)</li> <li>- Fixació mitjançant lira, amb possibilitat d'orientació i inclinació de -120 ° a + 120 °</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes fins a IK10</li> <li>- Mides (lira inclosa): 390x282,5x73mm – 490x390x81mm – 595x460x95mm – 727x558x107mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S fins a 80W, M fins a 140W, XL fins a 240W i XXL fins a 460W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Versió especial del Projector MILAN XL-RGBW: Tres colors primaris més blanc. Controlable externament amb 4 canals de DMX-512.</li> <li>- Ideal per a alçades de 4 metres fins a 18 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> </ul>	
<b>Total UT .....</b>			<b>11,000</b>
1.4.5	Ut	<p>SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE fluorescent leed EN LLUMENERA EXISTENT , AMB POTENCIA NOMINAL DE FINS A 15W, AMB TEMPERATURA DE COLOR 3000 °K, , AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p>	
<b>Total ut .....</b>			<b>48,000</b>



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Nº	U	Descripció					Amidament	
1.4.6	Ut	<p>SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL PROJECTOR P MILAN S APMS O EQUIVALENT , AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i quatre mesures diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED – DRIVER)</li> <li>- Fixació mitjançant lira, amb possibilitat d'orientació i inclinació de -120 ° a + 120 °</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes fins a IK10</li> <li>- Mides (lira inclosa): 390x282,5x73mm – 490x390x81mm – 595x460x95mm – 727x558x107mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S fins a 80W, M fins a 140W, XL fins a 240W i XXL fins a 460W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Versió especial del Projector MILAN XL-RGBW: Tres colors primaris més blanc. Controlable externament amb 4 canals de DMX-512.</li> <li>- Ideal per a alçades de 4 metres fins a 18 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> </ul>					Total ut .....	28,000
1.4.7	Ut	<p>SUBMINISTRAMENT, MUNTATGE I INSTAL·LACIÓ DE BRAÇ DE 1,50 METRE DE DIAMETRE 42 MM. INCLÒS TOT EL NECESSARI PER LA SEVA CORRECTE FIXACIÓ SEGONS LO ESTABLERT PER D.F.</p>					Total UT .....	46,000
1.4.8	Ut	<p>SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE COLUMNA TRONCOCONICA DE 8,00 METRES D'ALÇADA , AMB BASE , PLATINA I PORTA,,AMB CARTELA I ARO DE REFORÇ COL·LOCADA SOBRE DAU DE FORMIGO. INCLOU PERNS D'ANCORATGE, COFRED DE CONNEXIONS I CONDUCTOR DE COURE DESIGNACIO UNE RV 0,6/1KV DE 5X2,50 MM2</p> <p>LES NOVES COLUMNES O BÀCULS HAURAN DEVENIR:</p> <ul style="list-style-type: none"> <li>- CARTELES I AROS DE REFORÇ FINS A250MM.</li> <li>- GALVANITZADES EN CALENT EN ISO1461.</li> <li>- PORTELLA RASANT AMB REFORÇ INTERIOR.</li> <li>- ELS PUNTS DE LLUM COMPLIRAN L'APARTAT 6.1 DE LA ITC-BT-09 DEL REBT AMB ELS ACLARIMENT DE LA GUIA TÈCNICA I DISPOSARAN DEL MARCATGE DE LACE.</li> <li>- LES COLUMNES I BÀCULS D'ACER GALVANITZAT TINDRAN UN RECOBRIMENT PROTECTOR AMB POLIAMIDA TERMOPLÀSTICA EN POLS DE TIPUS RILSAN O EQUIVALENT APLICADA PER IMMERSIÓ. AQUEST PROCÉS S'APLICARÀ DES DE LA BASE DE COLUMNA FINS A L'ALÇADA DE LA PORTELLA PER LA PART INTERIOR COM L'EXTERIOR TENINT CURA QUE LA PRÉSA DE TERRA NO QUEDI RECOBERTA PER AQUEST TRACTAMENT. AQUEST PROCÉS S'APLICARÀ DESPRÈS D'UN DECAPAT I GRANALLAT SOBRE LA SUPERFÍCIE A TRACTAR.</li> <li>- LA GARANTIA DEL SUPORTS DEL FABRICANT SERÀ COM A MÍNIM DE 20 ANYS I DE LA PART TRACTADA AMB TRACTAMENT D'ANTICORROSIU SERÀ DE 10ANYS.</li> </ul>	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
cARRETERA		2				2,000		
						2,000	2,000	
						Total UT .....	2,000	

Pressupost parcial nº 1 Renovacio Enllumenat Palma de Cervello

Nº	U	Descripció					Amidament	
1.4.9	Ut	<p>SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE COLUMNA TIPUS NICOLSON DE 4,00 METRES D'ALÇADA , AMB BASE , PLATINA I PORTA,,AMB CARTELA I ARO DE REFORÇ COL·LOCADA SOBRE DAU DE FORMIGO. INCLOU PERNS D'ANCORATGE, COFRED DE CONNEXIONS I CONDUCTOR DE COURE DESIGNACIO UNE RV 0,6/1KV DE 5X2,50 MM2</p> <p>LES NOVES COLUMNS O BÀCULS HAURAN DEVENIR:</p> <ul style="list-style-type: none"> <li>- CARTELES I AROS DE REFORÇ FINS A250MM.</li> <li>- GALVANITZADES EN CALENT EN ISO1461.</li> <li>- PORTELLA RASANT AMB REFORÇ INTERIOR.</li> <li>- ELS PUNTS DE LLUM COMPLIRAN L'APARTAT 6.1 DE LA ITC-BT-09 DEL REBT AMB ELS ACLARIMENT DE LA GUIA TÈCNICA I DISPOSARAN DEL MARCATGE DE LACE.</li> <li>- LES COLUMNS I BÀCULS D'ACER GALVANITZAT TINDRAN UN RECOBRIMENT PROTECTOR AMB POLIAMIDA TERMOPLÀSTICA EN POLS DE TIPUS RILSAN O EQUIVALENT APLICADA PER IMMERSIÓ. AQUEST PROCÉS S'APLICARÀ DES DE LA BASE DE COLUMNA FINS A L'ALÇADA DE LA PORTELLA PER LA PART INTERIOR COM L'EXTERIOR TENINT CURA QUE LA PRESA DE TERRA NO QUEDI RECOBERTA PER AQUEST TRACTAMENT. AQUEST PROCÉS S'APLICARÀ DESPRÈS D'UN DECAPAT I GRANALLAT SOBRE LA SUPERFÍCIE A TRACTAR.</li> <li>- LA GARANTIA DEL SUPORTS DEL FABRICANT SERÀ COM A MÍNIM DE 20 ANYS I DE LA PART TRACTADA AMB TRACTAMENT D'ANTICORROSIU SERÀ DE 10ANYS.</li> </ul>	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Columnes parques		6,000			6,000	
						6,000	6,000	
						<b>Total UT .....</b>	<b>6,000</b>	
1.4.10	Ut	<p>SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE RETROFEET EN LLUMENERA EXISTENT , AMB POTENCIA NOMINAL DE FINS A 60W, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p>						
						<b>Total ut .....</b>	<b>5,000</b>	
1.4.11	Ut	<p>Subministrament i col·locació de làmpada de tecnologia LED Bulb per a substitució de l'existent, amb una potència de consum de 5W. Garantia de 1 any, mitjana de vida 15.000 hores, temperatura de color 3000-4000K. S'inclou el desmuntatge i retirada de l'antiga làmpada, la neteja de la llumenera exterior i interiorment, el muntatge i connexió del nou, així com la maquinària, i la mà d'obra necessària per portar a terme aquestes actuacions, la gestió de residus, amb el transport del material i el cànon d'abocador corresponent, i la part proporcional de seguretat i salut. S'inclou la instal·lació a qualsevol alçada.</p>	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Canvi bombeta baix consum	8				8,000	
						8,000	8,000	
						<b>Total ut .....</b>	<b>8,000</b>	
1.4.12	MI	<p>CONDICIONAMENT DE QUADRES, INCLOU EL SANEJAMENT I RETIRADA DE TOTS ELS ELEMENTS OBSOLETS, CONDENSADORS, REGULADORS DE FLUX. ESTA INCLÒS EL TRASLLATS, GESTIO I DESPESES D'ABOCADOR</p>						
						<b>Total ML .....</b>	<b>11,000</b>	

Nº	U	Descripció	Amidament
1.4.13	MI	<p>SUBMINISTRE I INSTAL·LACIÓ DE SISTEMA DE TELEGESTIÓ CLEVER MASTER O SIMILAR, CONFIGURACIÓ, POSADA EN SERVEI. ESTA INCLOS CLEVER MASTER CSD / 5G, ANTENA MASTER AMB QUANY, CONMUTADOR CM3 POS 2 INV, 9 BORNES DOBLES PIS RKD 2,50 MM P/GUIA AR 35, 2 FINAL DE GUIA AR35 ES35 I UN CABLE CLEVER WAT</p> <p>MANTENIMENT.</p> <p>CARACTERSTIQUES TELECONTROL D'ENCESA, SISTEMA DE TELECONTROL NarrowBandNB IoT/ LoRaWAN, AMB ASTRONÒMIC INCORPORAT CLEVER-MASTER O EQUIVALENT</p> <ul style="list-style-type: none"> <li>• Rebre informació en temps real i actuar sobre la xarxa d'enllumenat exterior des d'un lloc de telecontrol o altres ordinadors, 3 telèfons mòbils prèviament autoritzats i 1 telèfon mòbil sistema tall cablejat (Policia), també podem comunicar localment mitjançant ordinador portàtil.</li> <li>• Ajust precís de l'encesa i apagat de les instal·lacions per mitjà d'un microprocessador amb càlcul astronòmic diari del l'orto i l'ocàs, i possibilitat d'encès mitjançant telecomandament per quadre o grup de quadres.</li> <li>• Estalvi energètic de les instal·lacions en reduir el flux lluminós en hores de poca utilització de l'enllumenat mitjançant reductor-estabilitzador en capçalera.</li> <li>• Millora de la qualitat del servei en detectar les avaries en temps real i poder actuar immediatament.</li> <li>• Màxima eficiència en l'explotació i manteniment de les instal·lacions gràcies al flux d'informació rebuda via SMS text personalitzat 150 caràcters o Mail via smartphone.</li> <li>• Integren comunicació bidireccional NarrowBand NB IoT capaç de realitzar comunicacions en temps real amb telèfons mòbils autoritzats via SMS i amb el centre de control mitjançant entorn IP dinàmiques o trucada CSD.</li> <li>• Disposa de rellotge astronòmic programable via NarrowBand NB IoT mitjançant connexió RS232 cable PC.</li> <li>• Rellotge intern de temps real (RTC) amb bateria de liti pròpia, substituïble als 5 anys.</li> <li>• Desviació del rellotge astronòmic +/-1 minut any.</li> <li>• Memòria EEPROM interna de 4 Mbits guardant valors eficaços per fase en períodes de 30 minuts dels últims 30 dies, adquirits del tarifador gestió energètica.</li> <li>• Possibilitat de valors durant 24 hores en períodes d'1 minut. Programacions d'estalvi, astronòmic i texts personalitzats identificats d'entrades auxiliars...</li> <li>• Permet comunicació mostrant valors eficaços de funcionament d'instal·lació amb auditoria energètica a temps real.</li> <li>• LoRaWAN comunicació global del Municipi i sensorització.</li> <li>• GPRS intern en el propi equip per comunicació de suport.</li> <li>• Possibilitat de connexió mitjançant IP dinàmiques gràcies a la versatilitat del programari. Reduint costos i temps d'explotació en instal·lacions de més de 150 escomeses.</li> <li>• Antena GSM/GPRS interna en el propi equip amb possibilitat de connexió d'una altra externa per a major guany.</li> <li>• Bateria recarregable de liti interna, permet que l'equip envii un SMS quan s'interromp el subministrament elèctric del centre de comandament.</li> <li>• Funcionament amb targetes de telefonia mòbil, amb tots els operadors nacionals.</li> <li>• Permet actualitzacions de firmware de forma remota (Local per cable, NarrowBand NB IoT)</li> <li>• Sistema de seguretat per a connexió a través de codi PIN en la targeta de telefonia.</li> <li>• Protegit contra descàrregues atmosfèriques conduïdes.</li> <li>• Protegit contra sobretensions permanents.</li> <li>• Els equips estan degudament patentats i fabricats a la Unió Europea, amb els seus corresponents certificats i documents que acrediten els drets d'explotació, compleixen la normativa vigent de seguretat per a equips elèctrics UNE -EN 61010-1.</li> <li>• Compleix amb normativa ROHS.</li> <li>• 8 Ports. Permeten comunicar i programar fins a 8 sortides domòtiques magneto tèrmic i diferencial iDPR (Diferencial Progressiu amb Reconnexió).</li> <li>• 1 Port. Permet connexió directa amb PC.</li> <li>• 1 Port. Permet unitats d'expansió per a presa de dades elèctriques en quadres amb altres reguladors de mercat.</li> <li>• 1 Port. Permet una connexió transparent amb el tarifador per la presa de tancaments amb protocol companyia.</li> <li>• 1 Rellotge astronòmic ajustable + - l'orto / + - l'ocàs amb relé funció commutat.</li> <li>• 3 Circuits auxiliars, programació individual i funció astronòmica amb funció de rellotge, hores fixes set dies setmanals</li> <li>• 1 Sortida 1-10V control de balastres electrònics.</li> <li>• 32 Entrades lliures de potencial per a esdeveniments personalitzats amb 150 caràcters via SMS,.</li> </ul> <p>(Obertura de portes, caiguda de diferencials,...). 3 d'elles es poden combinar amb els 3 relés de sortida per engegar un dispositiu en produir-se un esdeveniment (connectar una sirena si s'obre una porta, encendre una bomba de buidatge si una bolla detecta un nivell d'aigua molt alt...)</p>	
Total ML .....			9,000

Pressupost parcial nº 1 Renovació Enllumenat Palma de Cervello

Nº	U	Descripció						Amidament
<b>1.5.- VARIS</b>								
1.5.1	Ut	DRETS D'ESCOMESA DE LA CIA. SUBMINISTRADORA DE FLUID ELÈCTRIC, PER A UNA AMPLIACIO DE POTÈNCIA NOMINAL NECESSARIA (A JUSTIFICAR)						
							Total UT .....:	1,000
1.5.2	Ut	LEGALITZACIO DE LA INSTAL-LACIO.DOCUMENTACIO TECNICA PER PASSA LA INTRUCCIO TECNIA 1/2015. INCLOS ELS DRETS DE VISAT DEL PROJECTE AMB CERTIFICAT FINAL AL COL·LEGI PROFESSIONAT, MEMORIA TECNICA DE DISSENY I TAXES DE L'ENTITAT D'INSPECCIO I CONTROL, AMB ACTA FAVORABLE DE LA INSTAL-LACIO I DOCUMENT D'INSCRIPCIO.						
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
Escomeses i quadres			9				9,000	
							9,000	9,000
							Total UT .....:	9,000
1.5.3	Ut	IMPREVISTOS A JUSTIFICAR						
							Total UT .....:	1,000
1.5.4	Ut	Per validar la traçabilitat de que els assajos entregats s'ajusten a les lluminàries instal·lades, s'agafaran tres lluminàries al atzar definides per D.F. o la propietat i es portaran a assajar a una laboratori acreditat, realitzant-se els següents assajos parcials de les llumeneres: - SEGURETAT ELÈCTRICA (EN 60598-1: 2015 + A1: 2018 + A 60598- 2-3: 2002 + A1: 2011) Inspecció visual de punts crítics + verificació de marcat i instruccions Assaigs de parciales endurància segons apartat 12.3 i verificació de Tc segons apartat 12.4 Assaigs d'estanqueïtat grau IP (segona xifra) segons apartat 9.2. Assaigs de rigidesa dielèctrica segons apartat 10.2.2 Verificació de resistència a impactes grau IK - Fotometria (ASSAIG Reduïda A 13.032-4: 2016) Rendiment del llum en lm / W Verificació de l'índex de reproducció cromàtica CRI Verificació de temperatura de color						
							Total UT .....:	1,000

**Pressupost parcial nº 2 Arranjament defectes de Baixa tensio**

Nº	U	Descripció					Amidament	
2.1	Ut	Identificar com cal el conjunt de les línies que conformen el quadre general de distribució. Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies. Rotulació de manera indeleble els circuits. Inclou compensació de fases i realització d'informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal. Eliminar condensadors, equips de regulació de flux en capçalera.	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Quadres		11,000			11,000	
						11,000	11,000	
								<b>11,000</b>
						<b>Total ut .....</b>	<b>11,000</b>	
2.2	Ut	Partida de verificació, comprovació i localització dels trams afectats per defectes d'aïllament d'una línia del quadre d'enllumenat. Inclòs tots el necessari per a determinar i localitzar entre quines caixes de fusibles es localitzà els defectes. Inclou la feina d'anàlisi de l'averia seccionant la línia fins a determinar el focus del problema. Realització d'estudi de les línies i una vegada detectat el problema redacció d'informe. Informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal, l'informe te que esta signat per un instal·lador autoritzat.	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Quadre nº1: L1 i L2	2				2,000	
		Quadre nº2	1				1,000	
		Quadre nº3	1				1,000	
		Quadre nº4	2				2,000	
		Quadre nº5	2				2,000	
		Quadre nº6	2				2,000	
		Quadre nº7	1				1,000	
							11,000	11,000
								<b>11,000</b>
							<b>Total UT .....</b>	<b>11,000</b>
2.3	Ut	Creació de cata de serveis, que inclou les següents etapes constructives: 1. Senyalització amb 10 dies d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació. Inclou gestió amb Tubgsal pel desviament d'autobusos si escau. 2. Picar cata en terreny existent, fins un màxim de 100x100cm i 1 metre de fondària amb mitjans manuals, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament. 3. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica al'existent.						
								<b>150,000</b>
2.4	MI	Substitució i renovació de les línies aèries o entubades igual a les existent, com a mínim la secció sera de 6 mm2 de Cu 0,6/1kV, que inclou les següent partides a executar: 1. Senyalització amb 10 dies d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació. Inclou gestió amb Tubgsal pel desviament d'autobusos si escau. 2. Desmuntatge de les existent existents i esteses de guies o passa cables, amb carrega i transport de runes al abocador autoritzat inclòs les taxes d'abocament. 3. Subministrament, instal·lació i muntatge de conductor de coure designació UNE VV 0,6/1kV de armant de la mateixa secció que el retirat col·locat en tub o grapat afaçana, fins a 16 mm de secció	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Quadre nº1: L1 i L2	0,3	294,000			88,200	
		Quadre nº2	0,3	583,000			174,900	
		Quadre nº3	0,3	609,000			182,700	
		Quadre nº4	0,3	996,000			298,800	
		Quadre nº5	0,3	1.132,000			339,600	
		Quadre nº6	0,3	1.200,000			360,000	
		Quadre nº7	0,3	200,000			60,000	
							1,100	1.504,200
								<b>1.654,620</b>
							<b>Total mi .....</b>	<b>1.654,620</b>
2.5	M2	DEMOLICIO DE PAVIMENT DE PANOTS COL·LOCATS SOBRE FORMIGO PREVI TALL AMB DISC DE 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MARTELL PICADOR AMB MITJANS MECANICS I CARREGA SOBRE CAMIO	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Rassa	2	120,000	0,400		96,000	
							96,000	96,000

Pressupost parcial nº 2 Arranjament defectes de Baixa tensio

Nº	U	Descripció	Amidament						
			<b>Total M2 .....</b>				<b>96,000</b>		
2.6	M3	EXCAVACIO DE RASSA PER A PAS D'INSTAL•LACIONS FINS A 1 METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MANUALS I AMB LES TERRES DEIXADES A LA VORA	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal	
	Rassa			120,000	0,400	0,500	24,000		
			<b>Total M3 .....</b>				<b>24,000</b>		
2.7	M3	EXCAVACIO DE RASA PER A PAS D'INSTAL-LACIONS FINS A 1,-METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MECANICS I AMB LES TERRES DEIXADES A LA VORA.	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal	
	Rassa			120,000	0,400	0,500	24,000		
			<b>Total M3 .....</b>				<b>24,000</b>		
2.8	M3	REBLIMENT I PICONATGE DE RASA D'AMPLARIA FINS A 60 CM, AMB MATERIAL SELECCIONAT DE L'OBRA, EN TONGADES DE GRUIX DE FINS A 25 CM, UTILITZANT PICO VIBRANT, AMB COMPACTACIO DEL 95% P.M.	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal	
	Rassa		2	120,000	0,400	0,400	38,400		
			<b>Total M3 .....</b>				<b>38,400</b>		
2.9	M3	TRANSPORT DE RUNES A L'ABOCADOR AMB CONECTOR, CARREGAT AMB MITJANS MECANICS I MANUALS AMB UN RECORREGUT DE FINS A 10,-KM INCLOS ELS DRETS D'ABOCAMENT	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal	
	Rassa		2	120,000	0,400	0,100	9,600		
			<b>Total M3 .....</b>				<b>12,480</b>		
2.10	M2	PAVIMENT DE PANOT PER A VORERA GRIS DE 20x20x4 CM, CLASSE 1A TIPUS 2, COL-LOCAT A L'ESTESSA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PÒRTLAND I BEURADA DE CIMENT PORLAND	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal	
	Rassa		2	120,000	0,400		96,000		
			<b>Total M2 .....</b>				<b>96,000</b>		
2.11	M3	PAVIMENT DE FORMIGO SENSE ADDITIUS HM-30/B/20/I+E DE CONSISTENCIA TOVA GRANDARIA MAXIMA DEL GRANULAT 20 MM, ESCAMPAT DES DE CAMIO, ESTESA I VIBRATGE MECANIC I ACABAT REGLEJAT	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal	
	Rassa			120,000	0,400	0,100	4,800		
			<b>Total M3 .....</b>				<b>4,800</b>		
2.12	Ut	PERICO DE 38x38x55 CM, AMB PARETS DE 15 CM DE GRUIX DE FORMIGO HM-20/P/20 I I SOLERA DE MAÓ CALAT, SOBRE LLIT DE SORRA.						<b>Total UT .....</b>	<b>2,000</b>
2.13	Ut	BASTIMENT I TAPA PER A PERICO DE SERVEIS DE FOSA GRISA DE 420x420x40 MM I DE 25 KG DE PES , COL-LOCAT AMB MORTER MIXT 1:05:04, ELABORAT A L'OBRA AMB FORMIGONERA DE 165 LITRES						<b>Total UT .....</b>	<b>2,000</b>
2.14	MI	TUB FLEXIBLE CORRUGAT DE 80 MM DE DIAMETRE NOMINAL I 4,25 MM DE GRUIX AMB GRAU DE RESISTENCIA AL XOC 7 I MUNTAT COM A CANALITZACIO SOTERRADA.						<b>Total ML .....</b>	<b>200,000</b>
2.15	MI	CINTA DE PVC PER A SENYALITZACIO D'INSTAL-LACIONS SOTERRADES. INSTAL-LADA A 25 CM PER DAMUNT DEL TUB							

Pressupost parcial nº 2 Arranjament defectes de Baixa tensio

Nº	U	Descripció						Amidament	
							Total ML .....	200,000	
2.16	Ut	PARTIDA DE COBRAMENT INTEGRÉ PER L'OBRA CIVIL PER CREAR UN SORTIDA EN PUNT DE LLUM EXISTENT						Total UT .....	18,000
2.17	Ut	Canvi de ICPM a potencia normalitzada de 13,856kW, col·locacio de protector per sobre tensions en capçalera Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Efectuar comprovacions de terra i de resistències d'aïllament de les línies. Rotulacio de manera indeleble els circuits. Canvi ICPM existent per al corresponent per vademècum de CIA a potencia normalitzada de 13,586 kW i ajustant a la tensió de treball del quadre. Si el increment de proteccions no cap al quadre elèctric existent, esta inclòs el canvia proteccions per DPN per generar espai. Inclou compensació de fases i realització d'informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal	
		Quadre nº01	1				1,000		
		Quadre nº2	1				1,000		
		Quadre nº3	1				1,000		
		Quadre nº4	1				1,000		
		Quadre nº5	1				1,000		
		Quadre nº8	1				1,000		
							6,000	6,000	
							Total ut .....	6,000	
2.18	Ut	Conexionat del element de la instal·lacio a la xarxa de terra del quadre d'enllumenat public: Instal·lació i muntatge de conductor de coure nu, unipolar 1x35 mm2 muntat en fons de rasa Subministrament, instal·lació i muntatge de piqueta de connexió a terra d'acer i recobrimet de coure de 2,- metres de longitud, i 14,6 mm de diàmetre, estàndard i clavada al terra. Connexionat del element a la xarxa de distribució del terra. Canalització i estesa de cable fins a 5 metres de llargària, unclou trencament i reposició vorera panot. Verificació del terra de la instal·lació una vegada connectat l'element determinat. Realització d'informe de recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema GIS municipal.	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal	
		Quadre nº3	1				1,000		
		Quadre nº4	1				1,000		
		quadre nº7	1				1,000		
							3,000	3,000	
							Total ut .....	3,000	
2.19	Ut	Passa acta d'inspecció periòdica fins assolir acta d'inspecció neta per part d'una entitat de control del quadre d'enllumenat públic. Esta inclòs tràmits, despeses i acompanyament al tècnic de entitat de control.						Total UT .....	9,000
2.20	Ut	Manca de protecció contra contactes indirectes(interruptor/s diferencial/s) a algun dels circuits del quadre general de distribució. Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Subministrament , instal·lació i muntatge de diferencial trifasic en la linia de sortida que no actua inclòs la retirada del existent. Inclou equilibrat de fases i informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal	Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal	
		Quadre nº2	1				1,000		
		Quadre nº3	1				1,000		
		Quadre nº4	1				1,000		
		Quadre nº5	1				1,000		
							4,000	4,000	
							Total ut .....	4,000	
2.21	MI	SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 180X270X180 MM.						Total ML .....	0,100
2.22	MI	SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270X270X180 MM.							

**Pressupost parcial nº 2 Arranjament defectes de Baixa tensio**

Nº	U	Descripció					Amidament	
			Uts.	Llargada	Amplada	Alçada	Parcial	Subtotal
		Quadre nº8	1				1,000	
							1,000	1,000
							<b>Total ML .....</b>	<b>1,000</b>
<b>2.23</b>	<b>MI</b>	<b>SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270x360X180 MM.</b>						
							<b>Total ML .....</b>	<b>0,100</b>
<b>2.24</b>	<b>MI</b>	<b>SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270X540X180 MM.</b>						
							<b>Total ML .....</b>	<b>0,100</b>
<b>2.25</b>	<b>MI</b>	<b>SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 360X540X180 MM.</b>						
		Quadre nº1	1				1,000	
		Quadre nº2	1				1,000	
							2,000	2,000
							<b>Total ML .....</b>	<b>2,000</b>
<b>2.26</b>	<b>MI</b>	<b>SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 540X540X180 MM.</b>						
		Quadre nº3	1				1,000	
							1,000	1,000
							<b>Total ML .....</b>	<b>1,000</b>
<b>2.27</b>	<b>Ut</b>	<b>Endoll no fixat al carril DIN Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Subministrament , instal·lació i muntatge d'endoll fixat al carril DIN, fotografies i alta al sistema gis municipal</b>						
		Quadre nº1	1				1,000	
							1,000	1,000
							<b>Total ut .....</b>	<b>1,000</b>
<b>2.28</b>	<b>Ut</b>	<b>Feines de serralleria per la reparació del pany del armari, inclou adaptació de porta al nou bombi amb pany GIS, i feines de pintura.</b>						
		Quadre nº2	1				1,000	
							1,000	1,000
							<b>Total UT .....</b>	<b>1,000</b>



Pressupost parcial nº 3 Pintura de columnes

Nº	U	Descripció	Amidament
3.1	Ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 10 i &lt;12 metres (diferents models cilíndrica, nikolson, tronconica o baculs i de 4 mm de gruix de xapa), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:             <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>	1,000
Total ut .....			1,000

Pressupost parcial nº 3 Pintura de columnes

Nº	U	Descripció	Amidament
3.2	Ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 12 i &lt;15 metres (diferents models cilíndrica, nikolson, tronconica, o baculs i de 4 mm de gruix de xapa no inclou la columna tipus PRIM), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:             <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>	2,000
Total ut .....			2,000

Pressupost parcial nº 3 Pintura de columnes

Nº	U	Descripció	Amidament
3.3	Ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 9 i &lt;10 metres (diferents models cilíndrica, nikolson, tronconica o baculs i de 4 mm de gruix de xapa), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:             <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>	4,000
Total ut .....			4,000

Pressupost parcial nº 3 Pintura de columnes

Nº	U	Descripció	Amidament
3.4	Ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 8 i &lt;9 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:             <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>	<p>Total ut .....: <b>4,000</b></p>

Pressupost parcial nº 3 Pintura de columnes

Nº	U	Descripció	Amidament
3.5	Ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 7 i &lt;8 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:             <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>	<p>Total ut .....: 1,000</p>

Pressupost parcial nº 3 Pintura de columnes

Nº	U	Descripció	Amidament
3.6	Ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 6 i &lt;7 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:             <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>	1,000
Total ut .....			1,000

Pressupost parcial nº 3 Pintura de columnes

Nº	U	Descripció	Amidament
3.7	Ut	<p>Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 5 i &lt;6 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:             <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>	1,000
Total ut .....			1,000

Pressupost parcial nº 3 Pintura de columnes

Nº	U	Descripció	Amidament
3.8	Ut	<p>Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 4 i &lt;5 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:             <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>	<p>Total ut .....: 1,000</p>



Pressupost parcial nº 3 Pintura de columnes

Nº	U	Descripció	Amidament
3.9	Ut	<p>Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 3 i &lt;4 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:             <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>	Total ut .....: 1,000
3.10	Ut	Subministrament, instal·lació i muntatge de portella de protecció a farola d'acer galvanitzat	Total ut .....: 34,000



**DOCUMENT N°4: PRESSUPOST  
CAPÍTOL N°2: QUADRE DE PREUS N°1**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ  
EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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## Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
	<b>1 Renovació Enllumenat Palma de Cervello</b>		
	<b>1.1 DEMOLICIÓ</b>		
1.1.1	M2 DEMOLICIO DE PAVIMENT DE PANOTS COL·LOCATS SOBRE FORMIGO PREVI TALL AMB DISC DE 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MARTELL PICADOR AMB MITJANS MECANICS I CARREGA SOBRE CAMIO	11,59	ONZE EUROS AMB CINQUANTA-NOU CÈNTIMS
1.1.2	M2 DEMOLICIO DE PAVIMENT DE LLAMBORDES , AMB MITJANS MECANICS I CÀRREGA I TRANSPORT A L'ABOCADOR INCLOS CANON ADICIONAL	5,47	CINC EUROS AMB QUARANTA-SET CÈNTIMS
1.1.3	M2 DEMOLICIO DE PAVIMENT DE MESCLA BITUMINOSA, PREVI TALL AMB DISC, DE FINS A 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MITJANS MECANICS I CARREGA SOBRE CAMIO	5,47	CINC EUROS AMB QUARANTA-SET CÈNTIMS
1.1.4	M2 DEMOLICIO DE PAVIMENT DE PECES DE FORMIGO COL·LOCADES SOBRE FORMIGO PREVI TALL AMB DISC, DE FINS A 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MITJANS MECANICS I CARREGA SOBRE CAMIO	11,67	ONZE EUROS AMB SEIXANTA-SET CÈNTIMS
1.1.5	M2 DEMOLICIO DE PAVIMENT DE FORMIGO PREVI TALL AMB DISC, DE FINS A 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MITJANS MECANICS I CARREGA SOBRE CAMIO	11,67	ONZE EUROS AMB SEIXANTA-SET CÈNTIMS
1.1.6	UT DESMUNTATGE DELS PUNTS DE LLUMS EXISTENTS I RETIRAR TOTS ELS SEUS COMPONENTS, TALS COM LLUMINARIES, CABLEJAT, MECANISMES BACULS, BRAÇOS I POSTES I LINIES D'ALIMENTACIO I DISTRIBUCIO ACTUALS, AMB REPOSICIO DE FAÇANES AMB MATERIAL ADIENT, AMB CARREGA I TRANSPORT DE RUNES AL ABOCADOR AUTORITZAT INCLOS LES TAXES D'ABOCAMENT. EL DESMUNTATGE DEL ENLLUMENAT S'EXECUTARA UN COP FINALITZADA I EN FUNCIONAMENT LA INSTAL·LACIO PROJECTADA AL SER CIRCUIT TANCAT.	10,20	DEU EUROS AMB VINT CÈNTIMS
1.1.7	UT DESMUNTATGE DE QUADRE ELECTRIC ACTUAL.	212,52	DOS-CENTS DOTZE EUROS AMB CINQUANTA-DOS CÈNTIMS
	<b>1.2 OBRA CIVIL</b>		
1.2.1	M3 EXCAVACIO DE RASSA PER A PAS D'INSTAL·LACIONS FINS A 1 METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MANUALS I AMB LES TERRES DEIXADES A LA VORA	36,59	TRENTA-SIS EUROS AMB CINQUANTA-NOU CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.2.2	M3 EXCAVACIO DE RASA PER A PAS D'INSTAL·LACIONS FINS A 1,-METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MECANICS I AMB LES TERRES DEIXADES A LA VORA.	6,67	SIS EUROS AMB SEIXANTA-SET CÈNTIMS
1.2.3	M3 REBLIMENT I PICONATGE DE RASA D'AMPLARIA FINS A 60 CM, AMB MATERIAL SELECCIONAT DE L'OBRA, EN TONGADES DE GRUIX DE FINS A 25 CM, UTILITZANT PICO VIBRANT, AMB COMPACTACIO DEL 95% P.M.	16,26	SETZE EUROS AMB VINT-I-SIS CÈNTIMS
1.2.4	M3 TRANSPORT DE RUNES A L'ABOCADOR AMB CONECTOR, CARREGAT AMB MITJANS MECANICS I MANUALS AMB UN RECORREGUT DE FINS A 10,-KM INCLOS ELS DRETS D'ABOCAMENT	13,04	TRETZE EUROS AMB QUATRE CÈNTIMS
1.2.5	M2 PAVIMENT DE PANOT PER A VORERA GRIS DE 20x20x4 CM, CLASSE 1A TIPUS 2, COL·LOCAT A L'ESTESEA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PÒRTLAND I BEURADA DE CIMENT PORLAND	26,24	VINT-I-SIS EUROS AMB VINT-I-QUATRE CÈNTIMS
1.2.6	M2 PAVIMENT DE PECES DE FORMIGO PER A VORERA DE 30x30x4 CM, IGUALS A LES EXISTENTS, COL·LOCAT A L'ESTESEA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PÒRTLAND I BEURADA DE CIMENT PORLAND	28,96	VINT-I-VUIT EUROS AMB NORANTA-SIS CÈNTIMS
1.2.7	M2 PAVIMENT DE MICROAGLOMERAT ASFALTIC EN CALENT, COLOR SAULO DE 4 CM DE GRUIX IGUAL AL EXISTENT.	32,67	TRENTA-DOS EUROS AMB SEIXANTA-SET CÈNTIMS
1.2.8	M3 PAVIMENT DE FORMIGO SENSE ADDITIUS HM-30/B/20/I+E DE CONSISTENCIA TOVA GRANDARIA MAXIMA DEL GRANULAT 20 MM, ESCAMPAT DES DE CAMIO, ESTESA I VIBRATGE MECANIC I ACABAT REGLEJAT	61,97	SEIXANTA-U EUROS AMB NORANTA-SET CÈNTIMS
1.2.9	M2 PAVIMENT DE MESCLA BITUMINOSA EN CALENT DE COMPOSICIO Densa D-12 AMB GRANULAT GRANÍTIC I BETUM ASFALTIC DE PENETRACIO, ESTESA I COMPACTADA AL 98 % DE L'ASSAIG MARSHALL.	27,77	VINT-I-SET EUROS AMB SETANTA-SET CÈNTIMS
1.2.10	UT PERICO DE 38x38x55 CM, AMB PARETS DE 15 CM DE GRUIX DE FORMIGO HM-20/P/20 I SOLERA DE MAÓ CALAT, SOBRE LLIT DE SORRA.	65,21	SEIXANTA-CINC EUROS AMB VINT-I-U CÈNTIMS
1.2.11	UT BASTIMENT I TAPA PER A PERICO DE SERVEIS DE FOSA GRISA DE 420x420x40 MM I DE 25 KG DE PES , COL·LOCAT AMB MORTER MIXT 1:05:04, ELABORAT A L'OBRA AMB FORMIGONERA DE 165 LITRES	28,92	VINT-I-VUIT EUROS AMB NORANTA-DOS CÈNTIMS
1.2.12	ML TUB RIGID DE PVC DE 110 MM DE DIAMTRE NOMINAL I 1,70 MM DE GRUIX, AMB GRAU DE RESISTENCIA AL XOC 7, ENDOLLAT I MUNTAT COM A CANALITZACIO SOTERRADA.	3,37	TRES EUROS AMB TRENTA-SET CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.2.13	ML TUB RIGID D'ACER ELECTRO GALVANITZAT, DE DIAMETRE NOMINAL REFERENCIA 36, ROSCAT I MUNTAT SUPERFICIALMENT.	22,01	VINT-I-DOS EUROS AMB U CÈNTIM
1.2.14	ML TUB FLEXIBLE CORRUGAT DE 80 MM DE DIAMETRE NOMINAL I 4,25 MM DE GRUIX AMB GRAU DE RESISTENCIA AL XOC 7 I MUNTAT COM A CANALITZACIO SOTERRADA.	1,90	U EURO AMB NORANTA CÈNTIMS
1.2.15	ML TUB FLEXIBLE CORRUGAT DE PVC DE DIAMETRE NOMINAL REFERENCIA 21 AMB GRAU DE RESISTENCIA AL XOC 5 I ENCASTAT.	1,11	U EURO AMB ONZE CÈNTIMS
1.2.16	ML CINTA DE PVC PER A SENYALITZACIO D'INSTAL·LACIONS SOTERRADES. INSTAL·LADA A 25 CM PER DAMUNT DEL TUB	0,19	DINOU CÈNTIMS
1.2.17	UT PARTIDA DE COBRAMENT INTEGRER PER L'OBRA CIVIL PER CREAR UN SORTIDA EN PUNT DE LLUM EXISTENT	23,17	VINT-I-TRES EUROS AMB DISSET CÈNTIMS
1.2.18	UT PARTIDA DE COBRAMENT INTEGRER PER L'OBRA CIVIL PER EL CALAT DE MUR DE FORMIGO A LA ZONA VERDA.	204,01	DOS-CENTS QUATRE EUROS AMB U CÈNTIM
1.2.19	UT PARTIDA COMPLETA I EN FUNCIONAMENT DE PROTECCIÓ INDIVIDUALS DELS ARBRES DE PERÍMETRE DEL TRONC DE FINS A 149 CM DE PERÍMETRE CONTRA ELS COPS, CONSISTENT EN TANCATS DE FUSTA DE PI, DE 22 MM DE GRUIX, PER A 5 USOS DE 2 METRES D'ALÇADA COM A MÍNIM, I ES PROTEGIRÀ AMB MATERIAL D'ENCOIXINAT (BANDES DE JUTE), LA PART DEL TRONC EN CONTACTE AMB EL TANCAT DE FUSTA, LES ZONES DE CONTACTE DELS LLIGAMS AMB L'ESCORÇA, I LA ZONA DEL COLL DE L'ARREL SI FOS NECESSARI.(INCLÒS LA COL·LOCACIÓ I EL DESMUNTATGE.).	22,11	VINT-I-DOS EUROS AMB ONZE CÈNTIMS
1.3.1	<b>1.3 INSTAL·LACIONS</b> ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE NU, UNIPOLAR 1x35 MM2 MUNTAT EN FONDS DE RASA	1,90	U EURO AMB NORANTA CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.3.2	<p>U Subministrament i instal·lació de presa de terra composta per un pou de 2 m de profunditat en l'interior de la qual s'instal·la una placa de coure electrolític pur de 500x500x1,5 mm unida a la barra conductora de coure estanyat de 30x2 mm, connectada a pont per a comprovació, dintre d'una arqueta de registre de polipropilè de 30x30 cm. Fins i tot replanteig, excavació del pou, col·locació de la placa en el seu interior, connexió entre la placa i el conductor de terra mitjançant platina conductora, col·locació de l'arqueta de registre, connexió de la platina conductora amb la línia d'enllaç mitjançant born d'unió, reblert amb terres de la pròpia excavació i additius per a disminuir la resistivitat del terreny i connectat a la xarxa de terra mitjançant pont de comprovació. Totalment muntada, connexionada i provada per l'empresa instal·ladora mitjançant les corresponents proves de servei (incloses en aquest preu).                      Inclou: Replanteig. Excavació del pou. Col·locació de la placa. Connexió de la placa amb la platina conductora. Col·locació de l'arqueta de registre. Connexió de la platina conductora amb la línia d'enllaç. Reblert de la zona excavada. Connexionat a la xarxa de terra. Realització de proves de servei. Criteri d'amidament de projecte: Nombre d'unitats previstes, segons documentació gràfica de Projecte.                      Criteri de mesura d'obra: Es mesurarà el nombre d'unitats realment executades segons especificacions de Projecte.</p>	51,79	CINQUANTA-U EUROS AMB SETANTA-NOU CÈNTIMS
1.3.3	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 1x16,00 MM2 , COL·LOCAT EN TUB	7,98	SET EUROS AMB NORANTA-VUIT CÈNTIMS
1.3.4	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X6 MM2 COL·LOCATS EN TUB.	7,25	SET EUROS AMB VINT-I-CINC CÈNTIMS
1.3.5	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X6 MM2 COL·LOCATS EN TUB.	7,39	SET EUROS AMB TRENTA-NOU CÈNTIMS
1.3.6	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X10 MM2 COL·LOCAT EN TUB.	8,11	VUIT EUROS AMB ONZE CÈNTIMS
1.3.7	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X10 MM2 COL·LOCAT EN TUB.	8,28	VUIT EUROS AMB VINT-I-VUIT CÈNTIMS
1.3.8	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X16 MM2 COL·LOCAT EN TUB.	12,67	DOTZE EUROS AMB SEIXANTA-SET CÈNTIMS
1.3.9	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X16 MM2 COL·LOCAT EN TUB.	8,55	VUIT EUROS AMB CINQUANTA-CINC CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.3.10	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 4X6 MM2 MUNTAT SUPERFICIALMENT TRENAT.	8,94	VUIT EUROS AMB NORANTA-QUATRE CÈNTIMS
1.3.11	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X6 MM2 MUNTAT TRENAT SUPERFICIALMENT.	8,98	VUIT EUROS AMB NORANTA-VUIT CÈNTIMS
1.3.12	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 4X10 MM2 MUNTAT SUPERFICIALMENT.	9,85	NOU EUROS AMB VUITANTA-CINC CÈNTIMS
1.3.13	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X10 MM2 MUNTAT SUPERFICIALMENT.	9,90	NOU EUROS AMB NORANTA CÈNTIMS
1.3.14	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 1X16 MM2 MUNTAT SUPERFICIALMENT.	10,08	DEU EUROS AMB VUIT CÈNTIMS
1.3.15	ML SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X16 MM2 MUNTAT SUPERFICIALMENT.	10,19	DEU EUROS AMB DINOU CÈNTIMS
	<b>1.4 LLUMENERES I BACULS</b>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.4.1	<p>UT SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL MILANS O EQUIVALENT, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINCSGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i tres mides diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED – DRIVER)</li> <li>- Ròtula: Fixació tant lateral, com a top diàmetre 60mm, amb possibilitat d'orientació i inclinació de -15 a + 15° amb la mateixa peça</li> <li>- Tancament a pressió sense cargols ni necessitat de ferramentes.</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes IK10</li> <li>- Mides: 525x250x80mm - 625x290x95mm - 775x320x95mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona, i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S40 fins a 40W, S60 fins a 60W, M fins a 100W, XL fins a 150W, i XXL fins a 300W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Ideal per a alçades de 4 metres fins a 14 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> <li>- Incorpora seccionador de corrent (desconnexió automàtica) o connector segur de tres pols.</li> </ul>	195,62	CENT NORANTA-CINC EUROS AMB SEIXANTA-DOS CÈNTIMS



Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.4.2	<p>UT SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL INNOVA B O EQUIVALENT D'ALÇADA FINS A 760 MM, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica amb tres formes de subjecció: Ròtula, Braç i Suspesa</li> <li>- Doble cavitat aïllades tèrmicament (LED – DRIVER</li> <li>- Ròtula: Fixació tant lateral, com a top diàmetre 60mm, amb possibilitat d'orientació i inclinació de 0 – 15º amb la mateixa peça</li> <li>- Braç: Fixació top diàmetre 60mm.</li> <li>- Suspesa: Fixació mitjançant adaptador a catenària oa rosca GAS</li> <li>- Tancament a pressió sense cargols ni necessitat de ferramentes.</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes IK09</li> <li>- Mides: 569x468x105mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9007 i Negre Mate</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la luminària. Les aletes del dissipador tèrmic estan protegides per una tapa superior que evita l'acumulació de brutícia, mantenint aquesta part vital en perfecte estat de funcionament.</li> <li>- Diverses versions de 15W fins a 100W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament deficiència energètica.</li> </ul> <p>Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</p> <ul style="list-style-type: none"> <li>- Lents de PMMA, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca Philips Xitanium Full Prog regulable en potència</li> <li>- Driver dimmable 1-10V, opcionalment PLC, DALI, Programable.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> <li>- Incorpora seccionador de corrent (desconnexió automàtica) o connector segur de tres pols.</li> <li>- Compleix amb totes les certificacions</li> </ul>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.4.3	<p>corresponents al CE, homologada per IAC i amb marcatge ENEC.</p> <p>UT SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL NEOVILLA O EQUIVALENT D'ALÇADA FINS A 750 MM, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS</p>	219,96	DOS-CENTS DINOU EUROS AMB NORANTA-SIS CÈNTIMS
		254,19	DOS-CENTS CINQUANTA-QUATRE EUROS AMB DINOU CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.4.4	<p>UT SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL PROJECTOR M MILAN S APM140 O EQUIVALENT D'ALÇADA , AMB POTENCIA NOMINAL DE FINS A 140W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i quatre mesures diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED – DRIVER)</li> <li>- Fixació mitjançant lira, amb possibilitat d'orientació i inclinació de -120 ° a + 120 °</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes fins a IK10</li> <li>- Mides (lira inclosa): 390x282,5x73mm – 490x390x81mm – 595x460x95mm – 727x558x107mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S fins a 80W, M fins a 140W, XL fins a 240W i XXL fins a 460W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Versió especial del Projector MILAN XL-RGBW: Tres colors primaris més blanc. Controlable externament amb 4 canals de DMX-512.</li> <li>- Ideal per a alçades de 4 metres fins a 18 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> </ul>	247,33	DOS-CENTS QUARANTA-SET EUROS AMB TRENTA-TRES CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.4.5	ut SUBMINISTRAMENT, INSTAL•LACIÓ I MUNTATGE DE fluorescent leed EN LLUMENERA EXISTENT , AMB POTENCIA NOMINAL DE FINS A 15W, AMB TEMPERATURA DE COLOR 3000 °K, , AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINC ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.	25,57	VINT-I-CINC EUROS AMB CINQUANTA-SET CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.4.6	<p>ut SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL PROJECTOR P MILAN S APMS O EQUIVALENT , AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i quatre mesures diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED – DRIVER)</li> <li>- Fixació mitjançant lira, amb possibilitat d'orientació i inclinació de -120 ° a + 120 °</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes fins a IK10</li> <li>- Mides (lira inclosa): 390x282,5x73mm – 490x390x81mm – 595x460x95mm – 727x558x107mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S fins a 80W, M fins a 140W, XL fins a 240W i XXL fins a 460W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Versió especial del Projector MILAN XL-RGBW: Tres colors primaris més blanc. Controlable externament amb 4 canals de DMX-512.</li> <li>- Ideal per a alçades de 4 metres fins a 18 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> </ul>	218,17	DOS-CENTS DIVUIT EUROS AMB DISSET CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.4.7	UT SUBMINISTRAMENT, MUNTATGE I INSTAL·LACIÓ DE BRAÇ DE 1,50 METRE DE DIAMETRE 42 MM. INCLÓS TOT EL NECESSARI PER LA SEVA CORRECTE FIXACIÓ SEGONS LO ESTABLERT PER D.F.	102,99	CENT DOS EUROS AMB NORANTA-NOU CÈNTIMS
1.4.8	UT SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE COLUMNA TRONCOCONICA DE 8,00 METRES D'ALÇADA , AMB BASE , PLATINA I PORTA,,AMB CARTELA I ARO DE REFORÇ COL·LOCADA SOBRE DAU DE FORMIGO. INCLOU PERNES D'ANCORATGE, COFRED DE CONNEXIONS I CONDUCTOR DE COURE DESIGNACIO UNE RV 0,6/1KV DE 5X2,50 MM2 LES NOVES COLUMNES O BÀCULS HAURAN DEVENIR: - CARTELES I AROS DE REFORÇ FINS A250MM. - GALVANITZADES EN CALENT EN ISO1461. - PORTELLA RASANT AMB REFORÇ INTERIOR. - ELS PUNTS DE LLUM COMPLIRAN L'APARTAT 6.1 DE LA ITC-BT-09 DEL REBT AMB ELS ACLARIMENT DE LA GUIA TÈCNICA I DISPOSARAN DEL MARCATGE DE LACE. - LES COLUMNES I BÀCULS D'ACER GALVANITZAT TINDRAN UN RECOBRIMENT PROTECTOR AMB POLIAMIDA TERMOPLÀSTICA EN POLS DE TIPUS RILSAN O EQUIVALENT APLICADA PER IMMERSIÓ. AQUEST PROCÉS S'APLICARÀ DES DE LA BASE DE COLUMNA FINS A L'ALÇADA DE LA PORTELLA PER LA PART INTERIOR COM L'EXTERIOR TENINT CURA QUE LA PRESA DE TERRA NO QUEDI RECOBERTA PER AQUEST TRACTAMENT. AQUEST PROCÉS S'APLICARÀ DESPRÈS D'UN DECAPAT I GRANALLAT SOBRE LA SUPERFÍCIE A TRACTAR. - LA GARANTIA DEL SUPORTS DEL FABRICANT SERÀ COM A MÍNIM DE 20 ANYS I DE LA PART TRACTADA AMB TRACTAMENT D'ANTICORROSIU SERÀ DE 10ANYS.	344,79	TRES-CENTS QUARANTA-QUATRE EUROS AMB SETANTA-NOU CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.4.9	<p>UT SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE COLUMNA TIPUS NICOLSON DE 4,00 METRES D'ALÇADA , AMB BASE , PLATINA I PORTA, AMB CARTELA I ARO DE REFORÇ COL·LOCADA SOBRE DAU DE FORMIGO. INCLOU PERNS D'ANCORATGE, COFRED DE CONNEXIONS I CONDUCTOR DE COURE DESIGNACIO UNE RV 0,6/1KV DE 5X2,50 MM2 LES NOVES COLUMNES O BÀCULS HAURAN DEVENIR:</p> <ul style="list-style-type: none"> <li>-□CARTELES I AROS DE REFORÇ FINS A250MM.</li> <li>-□GALVANITZADES EN CALENT EN ISO1461.</li> <li>-□PORTELLA RASANT AMB REFORÇ INTERIOR.</li> <li>-□ELS PUNTS DE LLUM COMPLIRAN L'APARTAT 6.1 DE LA ITC-BT-09 DEL REBT AMB ELS ACLARIMENT DE LA GUIA TÈCNICA I DISPOSARAN DEL MARCATGE DE LACE.</li> <li>-□LES COLUMNES I BÀCULS D'ACER GALVANITZAT TINDRAN UN RECOBRIMENT PROTECTOR AMB POLIAMIDA TERMOPLÀSTICA EN POLS DE TIPUS RILSAN O EQUIVALENT APLICADA PER IMMERSIÓ. AQUEST PROCÉS S'APLICARÀ DES DE LA BASE DE COLUMNA FINS A L'ALÇADA DE LA PORTELLA PER LA PART INTERIOR COM L'EXTERIOR TENINT CURA QUE LA PRESA DE TERRA NO QUEDI RECOBERTA PER AQUEST TRACTAMENT. AQUEST PROCÉS S'APLICARÀ DESPRÈS D'UN DECAPAT I GRANALLAT SOBRE LA SUPERFÍCIE A TRACTAR.</li> <li>-□LA GARANTIA DEL SUPORTS DEL FABRICANT SERÀ COM A MÍNIM DE 20 ANYS I DE LA PART TRACTADA AMB TRACTAMENT D'ANTICORROSIU SERÀ DE 10 ANYS.</li> </ul>	221,69	DOS-CENTS VINT-I-U EUROS AMB SEIXANTA-NOU CÈNTIMS
1.4.10	<p>ut SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE RETROFEET EN LLUMENERA EXISTENT , AMB POTENCIA NOMINAL DE FINS A 60W, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%, AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p>	154,74	CENT CINQUANTA-QUATRE EUROS AMB SETANTA-QUATRE CÈNTIMS
1.4.11	<p>ut Subministrament i col·locació de làmpada de tecnologia LED Bulb per a substitució de l'existent, amb una potència de consum de 5W. Garantia de 1 any, mitjana de vida 15.000 hores, temperatura de color 3000-4000K. S'inclou el desmuntatge i retirada de l'antiga làmpada, la neteja de la llumenera exterior i interiorment, el muntatge i connexió del nou, així com la maquinària, i la mà d'obra necessària per portar a terme aquestes actuacions, la gestió de residus, amb el transport del material i el cànon d'abocador corresponent, i la part proporcional de seguretat i salut. S'inclou la instal·lació a qualsevol alçada.</p>	118,42	CENT DIVUIT EUROS AMB QUARANTA-DOS CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.4.12	ML CONDICIONAMENT DE QUADRES, INCLOU EL SANEJAMENT I RETIRADA DE TOTS ELS ELEMENTS OBSOLETS, CONDENSADORS, REGULADORS DE FLUX. ESTA INCLÒS EL TRASLLATS, GESTIO I DESPESES D'ABOCADOR	213,15	DOS-CENTS TRETZE EUROS AMB QUINZE CÈNTIMS



Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.4.13	<p>ML SUBMINISTRE I INSTAL·LACIÓ DE SISTEMA DE TELEGESTIÓ CLEVER MASTER O SIMILAR, CONFIGURACIÓ, POSADA EN SERVEI. ESTÀ INCLOS CLEVER MASTER CSD / 5G, ANTENA MASTER AMB QUANY, CONMUTADOR CM3 POS 2 INV, 9 BORNES DOBLES PIS RKD 2,50 MM P/GUIA AR 35, 2 FINAL DE GUIA AR35 ES35 I UN CABLE CLEVER WAT</p> <p>MANTENIMENT.</p> <p>CARACTERSTIQUES TELECONTROL D'ENCESA, SISTEMA DE TELECONTROL NarrowBandNB IoT/ LoRaWAN, AMB ASTRONÒMIC INCORPORAT CLEVER-MASTER O EQUIVALENT</p> <ul style="list-style-type: none"> <li>• Rebre informació en temps real i actuar sobre la xarxa d'enllumenat exterior des d'un lloc de telecontrol o altres ordinadors, 3 telèfons mòbils prèviament autoritzats i 1 telèfon mòbil sistema tall cablejat (Policia), també podem comunicar localment mitjançant ordinador portàtil.</li> <li>• Ajust precís de l'encesa i apagat de les instal·lacions per mitjà d'un microprocessador amb càlcul astronòmic diari del l'orto i l'ocàs, i possibilitat d'encès mitjançant telecomandament per quadre o grup de quadres.</li> <li>• Estalvi energètic de les instal·lacions en reduir el flux lluminós en hores de poca utilització de l'enllumenat mitjançant reductor-estabilitzador en capçalera.</li> <li>• Millora de la qualitat del servei en detectar les avaries en temps real i poder actuar immediatament.</li> <li>• Màxima eficiència en l'explotació i manteniment de les instal·lacions gràcies al flux d'informació rebuda via SMS text personalitzat 150 caràcters o Mail via smartphone.</li> <li>• Integren comunicació bidireccional NarrowBand NB IoTcapaç de realitzar comunicacions en temps real amb telèfons mòbils autoritzats via SMS i amb el centre de control mitjançant entorn IP dinàmiques o trucada CSD.</li> <li>• Disposa de rellotge astronòmic programable via NarrowBand NB IoT mitjançant connexió RS232 cable PC.</li> <li>• Rellotge intern de temps real (RTC) amb bateria de liti pròpia, substituïble als 5 anys.</li> <li>• Desviació del rellotge astronòmic +/-1 minut any.</li> <li>• Memòria EEPROM interna de 4 Mbits guardant valors eficaços per fase en períodes de 30 minuts dels últims 30 dies, adquirits del tarifador gestió energètica.</li> <li>• Possibilitat de valors durant 24 hores en períodes d'1 minut. Programacions d'estalvi, astronòmic i texts personalitzats identificats d'entrades auxiliars...</li> <li>• Permet comunicació mostrant valors eficaços de funcionament d'instal·lació amb auditoria energètica a temps real.</li> <li>• LoRaWAN comunicació global del Municipi i sensorització.</li> <li>• GPRS intern en el propi equip per comunicació de suport.</li> <li>• Possibilitat de connexió mitjançant IP dinàmiques gràcies a la versatilitat del programari. Reduint costos i temps d'explotació en instal·lacions de més de 150 escomeses.</li> <li>• Antena GSM/GPRS interna en el propi equip amb possibilitat de connexió d'una altra externa per a</li> </ul>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
	<p>major guany.</p> <ul style="list-style-type: none"> <li>• Bateria recarregable de liti interna, permet que l'equip enviï un SMS quan s'interromp el subministrament elèctric del centre de comandament.</li> <li>• Funcionament amb targetes de telefonia mòbil, amb tots els operadors nacionals.</li> <li>• Permet actualitzacions de firmware de forma remota (Local per cable, NarrowBand NB IoT)</li> <li>• Sistema de seguretat per a connexió a través de codi PIN en la targeta de telefonia.</li> <li>• Protegit contra descàrregues atmosfèriques conduïdes.</li> <li>• Protegit contra sobretensions permanents.</li> <li>• Els equips estan degudament patentats i fabricats a la Unió Europea, amb els seus corresponents certificats i documents que acrediten els drets d'explotació, compleixen la normativa vigent de seguretat per a equips elèctrics UNE -EN 61010-1.</li> <li>• Compleix amb normativa ROHS.</li> <li>• 8 Ports. Permeten comunicar i programar fins a 8 sortides domòtiques magneto tèrmic i diferencial iDPR (Diferencial Progressiu amb Reconnexió).</li> <li>• 1 Port. Permet connexió directa amb PC.</li> <li>• 1 Port. Permet unitats d'expansió per a presa de dades elèctriques en quadres amb altres reguladors de mercat.</li> <li>• 1 Port. Permet una connexió transparent amb el tarifador per la pressa de tancaments amb protocol companyia.</li> <li>• 1 Relotge astronòmic ajustable + - l'orto / + - l'ocàs amb relé funció commutat.</li> <li>• 3 Circuits auxiliars, programació individual i funció astronòmica amb funció de relotge, hores fixes set dies setmanals</li> <li>• 1 Sortida 1-10V control de balastres electrònics.</li> <li>• 32 Entrades lliures de potencial per a esdeveniments personalitzats amb 150 caràcters via SMS,.</li> </ul> <p>(Obertura de portes, caiguda de diferencials,...). 3 d'elles es poden combinar amb els 3 relés de sortida per engegar un dispositiu en produir-se un esdeveniment (connectar una sirena si s'obre una porta, encendre una bomba de buidatge si una bolla detecta un nivell d'aigua molt alt...)</p>		
	1.5 VARIS		
1.5.1	UT DRETS D'ESCOMESA DE LA CIA. SUBMINISTRADORA DE FLUID ELÈCTRIC, PER A UNA AMPLIACIÓ DE POTÈNCIA NOMINAL NECESSARIA (A JUSTIFICAR)	1.601,86	MIL SIS-CENTS U EUROS AMB VUITANTA-SIS CÈNTIMS
1.5.2	UT LEGALITZACIÓ DE LA INSTAL·LACIÓ.DOCUMENTACIÓ TECNICA PER PASSA LA INTRUCCIÓ TECNIA 1/2015. INCLOS ELS DRETS DE VISAT DEL PROJECTE AMB CERTIFICAT FINAL AL COL·LEGI PROFESSIONAT, MEMORIA TECNICA DE DISSENY I TAXES DE L'ENTITAT D'INSPECCIÓ I CONTROL, AMB ACTA FAVORABLE DE LA INSTAL·LACIÓ I DOCUMENT D'INSCRIPCIÓ.	425,01	QUATRE-CENTS VINT-I-CINC EUROS AMB U CÈNTIM
1.5.3	UT IMPREVISTOS A JUSTIFICAR	1.410,25	MIL QUATRE-CENTS DEU EUROS AMB VINT-I-CINC CÈNTIMS
		3.223,42	TRES MIL DOS-CENTS VINT-I-TRES EUROS AMB QUARANTA-DOS CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
1.5.4	<p>UT Per validar la traçabilitat de que els assajos entregats s'ajusten a les lluminàries instal·lades, s'agafaran tres lluminàries al atzar definides per D.F. o la propietat i es portaran a assajar a una laboratori acreditat, realitzant-se els següents assajos parcials de les llumeneres:</p> <p>-□SEGURETAT ELÈCTRICA (EN 60598-1: 2015 + A1: 2018 + A 60598- 2-3: 2002 + A1: 2011)</p> <p>Inspecció visual de punts crítics + verificació de marcat i instruccions Assaigs de parciales endurància segons apartat 12.3 i verificació de Tc segons apartat 12.4</p> <p>Assaigs d'estanqueïtat grau IP (segona xifra) segons apartat 9.2.</p> <p>Assaigs de rigidesa dielèctrica segons apartat 10.2.2</p> <p>Verificació de resistència a impactes grau IK</p> <p>-□Fotometria (ASSAIG Reduïda A 13.032-4: 2016)</p> <p>Rendiment del llum en lm / W</p> <p>Verificació de l'índex de reproducció cromàtica CRI</p> <p>Verificació de temperatura de color</p>	503,66	CINC-CENTS TRES EUROS AMB SEIXANTA-SIS CÈNTIMS
2.1	<p><b>2 Arranjament defectes de Baixa tensio</b></p> <p>ut Identificar com cal el conjunt de les línees que conformen el quadre general de distribució.</p> <p>Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies. Rotulació de manera indeleble els circuits. Inclou compensació de fases i realització d'informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal. Eliminar condensadors, equips de regulació de flux en capçalera.</p>	97,92	NORANTA-SET EUROS AMB NORANTA-DOS CÈNTIMS
2.2	<p>UT Partida de verificació, comprovació i localització dels trams afectats per defectes d'aïllament d'una línia del quadre d'enllumenat. Inclòs tots el necessari per a determinar i localitzar entre quines caixes de fusibles es localitzà els defectes. Inclou la feina d'anàlisi de l'averia seccionant la línia fins a determinar el focus del problema. Realització d'estudi de les línies i una vegada detectat el problema redacció d'informe. Informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal, l'informe te que esta signat per un instal·lador autoritzat.</p>	583,85	CINC-CENTS VUITANTA-TRES EUROS AMB VUITANTA-CINC CÈNTIMS
2.3	<p>ut Creació de cata de serveis, que inclou les següents etapes constructives:</p> <p>1.□Senyalització amb 10 dies d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació. Inclou gestió amb Tubgsal pel desviament d'autobusos si escau.</p> <p>2.□Picar cata en terreny existent, fins un màxim de 100x100cm i 1 metre de fondària amb mitjans manuals, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</p> <p>3.□Reposició del ferm, amb independència del tipus de superfície, inclouent-hi pavimentació idèntica a l'existent.</p>	85,89	VUITANTA-CINC EUROS AMB VUITANTA-NOU CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
2.4	ml Substitució i renovació de les línies aèries o entubades igual a les existent, com a mínim la secció serà de 6 mm <sup>2</sup> de Cu 0,6/1kV, que inclou les següent partides a executar: 1. □ Senyalització amb 10 dies d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació. Inclou gestió amb Tubgsal pel desviament d'autobusos si escau. 2. □ Desmuntatge de les existents i esteses de guies o passa cables, amb carrega i transport de runes al abocador autoritzat inclòs les taxes d'abocament. 3. □ Subministrament, instal·lació i muntatge de conductor de coure designació UNE VV 0,6/1kv de armant de la mateixa secció que el retirat col·locat en tub o gratat afaçana, fins a 16 mm de secció	11,40	ONZE EUROS AMB QUARANTA CÈNTIMS
2.5	M2 DEMOLICIO DE PAVIMENT DE PANOTS COL·LOCATS SOBRE FORMIGO PREVI TALL AMB DISC DE 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MARTELL PICADOR AMB MITJANS MECANICS I CARREGA SOBRE CAMIO	11,59	ONZE EUROS AMB CINQUANTA-NOU CÈNTIMS
2.6	M3 EXCAVACIO DE RASSA PER A PAS D'INSTAL·LACIONS FINS A 1 METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MANUALS I AMB LES TERRES DEIXADES A LA VORA	36,59	TRENTA-SIS EUROS AMB CINQUANTA-NOU CÈNTIMS
2.7	M3 EXCAVACIO DE RASA PER A PAS D'INSTAL·LACIONS FINS A 1,-METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MECANICS I AMB LES TERRES DEIXADES A LA VORA.	6,67	SIS EUROS AMB SEIXANTA-SET CÈNTIMS
2.8	M3 REBLIMENT I PICONATGE DE RASA D'AMPLARIA FINS A 60 CM, AMB MATERIAL SELECCIONAT DE L'OBRA, EN TONGADES DE GRUIX DE FINS A 25 CM, UTILITZANT PICO VIBRANT, AMB COMPACTACIO DEL 95% P.M.	16,26	SETZE EUROS AMB VINT-I-SIS CÈNTIMS
2.9	M3 TRANSPORT DE RUNES A L'ABOCADOR AMB CONECTOR, CARREGAT AMB MITJANS MECANICS I MANUALS AMB UN RECORREGUT DE FINS A 10,-KM INCLOS ELS DRETS D'ABOCAMENT	13,04	TRETZE EUROS AMB QUATRE CÈNTIMS
2.10	M2 PAVIMENT DE PANOT PER A VORERA GRIS DE 20x20x4 CM, CLASSE 1A TIPUS 2, COL·LOCAT A L'ESTESEA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PORTLAND I BEURADA DE CIMENT PORLAND	26,24	VINT-I-SIS EUROS AMB VINT-I-QUATRE CÈNTIMS
2.11	M3 PAVIMENT DE FORMIGO SENSE ADDITIUS HM-30/B/20/1+E DE CONSISTENCIA TOVA GRANDARIA MAXIMA DEL GRANULAT 20 MM, ESCAMPAT DES DE CAMIO, ESTESA I VIBRATGE MECANIC I ACABAT REGLEJAT	61,97	SEIXANTA-U EUROS AMB NORANTA-SET CÈNTIMS
2.12	UT PERICO DE 38x38x55 CM, AMB PARETS DE 15 CM DE GRUIX DE FORMIGO HM-20/P/20 I SOLERA DE MAÓ CALAT, SOBRE LLIT DE SORRA.	65,21	SEIXANTA-CINC EUROS AMB VINT-I-U CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
2.13	UT BASTIMENT I TAPA PER A PERICO DE SERVEIS DE FOSA GRISA DE 420x420x40 MM I DE 25 KG DE PES , COL-LOCAT AMB MORTER MIXT 1:05:04, ELABORAT A L'OBRA AMB FORMIGONERA DE 165 LITRES	28,92	VINT-I-VUIT EUROS AMB NORANTA-DOS CÈNTIMS
2.14	ML TUB FLEXIBLE CORRUGAT DE 80 MM DE DIAMETRE NOMINAL I 4,25 MM DE GRUIX AMB GRAU DE RESISTENCIA AL XOC 7 I MUNTAT COM A CANALITZACIO SOTERRADA.	1,90	U EURO AMB NORANTA CÈNTIMS
2.15	ML CINTA DE PVC PER A SENYALITZACIO D'INSTAL·LACIONS SOTERRADES. INSTAL·LADA A 25 CM PER DAMUNT DEL TUB	0,19	DINOU CÈNTIMS
2.16	UT PARTIDA DE COBRAMENT INTEGRER PER L'OBRA CIVIL PER CREAR UN SORTIDA EN PUNT DE LLUM EXISTENT	23,17	VINT-I-TRES EUROS AMB DISSET CÈNTIMS
2.17	ut Canvi de ICPM a potencia normalitzada de 13,856kW, col·locacio de protector per sobre tensions en capçalera Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Efectuar comprovacions de terra i de resistències d'aïllament de les línies. Rotulacio de manera indeleble els circuits. Canvi ICPM existent per al corresponent per vademècum de CIA a potencia normalitzada de 13,586 kW i ajustant a la tensió de treball del quadre. Si el increment de proteccions no cap al quadre elèctric existent, esta inclòs el canvia proteccions per DPN per generar espai. Inclou compensació de fases i realització d'informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal	375,41	TRES-CENTS SETANTA-CINC EUROS AMB QUARANTA-U CÈNTIMS
2.18	ut Connexionat del element de la instal·lacio a la xarxa de terra del quadre d'enllumenat public: Instal·lació i muntatge de conductor de coure nu, unipolar 1x35 mm2 muntat en fons de rasa Subministrament, instal·lació i muntatge de piqueta de connexió a terra d'acer i recobriments de coure de 2,- metres de longitud, i 14,6 mm de diàmetre, estàndard i clavada al terra. Connexionat del element a la xarxa de distribució del terra. Canalització i estesa de cable fins a 5 metres de llargària, unclou trencament i reposició vorera panot. Verificació del terra de la instal·lació una vegada connectat l'element determinat. Realització d'informe de recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema GIS municipal.	127,33	CENT VINT-I-SET EUROS AMB TRENTA-TRES CÈNTIMS
2.19	UT Passa acta d'inspecció periòdica fins assolir acta d'inspecció neta per part d'una entitat de control del quadre d'enllumenat públic. Esta inclòs tràmits, despeses i acompanyament al tècnic de entitat de control.	141,48	CENT QUARANTA-U EUROS AMB QUARANTA-VUIT CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
2.20	ut Manca de protecció contra contactes indirectes(interruptor/s diferencial/s) a algun dels circuits del quadre general de distribució. Desmuntatge d'instal·lacions obsoletes del quadre general,reordenar entrades i sortides de les línies segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Subministrament , instal·lació i muntatge de diferencial trifasic en la línia de sortida que no actua inclòs la retirada del existent.Inclou equilibrat de fases i informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal	396,97	TRES-CENTS NORANTA-SIS EUROS AMB NORANTA-SET CÈNTIMS
2.21	ML SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 180X270X180 MM.	25,40	VINT-I-CINC EUROS AMB QUARANTA CÈNTIMS
2.22	ML SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270X270X180 MM.	28,21	VINT-I-VUIT EUROS AMB VINT-I-U CÈNTIMS
2.23	ML SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270x360X180 MM.	29,58	VINT-I-NOU EUROS AMB CINQUANTA-VUIT CÈNTIMS
2.24	ML SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270X540X180 MM.	37,25	TRENTA-SET EUROS AMB VINT-I-CINC CÈNTIMS
2.25	ML SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 360X540X180 MM.	44,21	QUARANTA-QUATRE EUROS AMB VINT-I-U CÈNTIMS
2.26	ML SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 540X540X180 MM.	60,90	SEIXANTA EUROS AMB NORANTA CÈNTIMS
2.27	ut Endoll no fixat al carril DIN Desmuntatge d'instal·lacions obsoletes del quadre general,reordenar entrades i sortides de les línies segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Subministrament , instal·lació i muntatge d'endoll fixat al carril DIN, fotografies i alta al sistema gis municipal	84,62	VUITANTA-QUATRE EUROS AMB SEIXANTA-DOS CÈNTIMS
2.28	UT Feines de serralleria per la reparacio del pany del armari, inclou adaptacio de porta al nou bombi amb pany GIS, i feines de pintura.  3 Pintura de columnes	41,98	QUARANTA-U EUROS AMB NORANTA-VUIT CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
3.1	<p>ut Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 10 i &lt;12 metres (diferents models cilíndrica, nikolson, tronconica o baculs i de 4 mm de gruix de xapa), que inclou les següents etapes constructives:</p> <p>1. <input type="checkbox"/> Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</p> <p>2. <input type="checkbox"/> Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</p> <p>3. <input type="checkbox"/> Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</p> <p>4. <input type="checkbox"/> Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</p> <p>5. <input type="checkbox"/> Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</p> <p>6. <input type="checkbox"/> Retirada de punt de llum existent i del morter pobre.</p> <p>7. <input type="checkbox"/> Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</p> <p>8. <input type="checkbox"/> Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</p> <p>9. <input type="checkbox"/> Neteja de la zona de treball i transport a deixalleria de fanal retirat.</p> <p>10. <input type="checkbox"/> Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:</p> <p>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</p> <p>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</p> <p>11. <input type="checkbox"/> Les noves columnes o bàculs hauran de venir:</p> <p>a. Carteles i aros de reforç fins a 250mm.</p> <p>b. Galvanitzades en calent EN ISO 1461.</p> <p>c. Portella rasant amb reforç interior.</p> <p>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</p> <p>12. <input type="checkbox"/> Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</p> <p>13. <input type="checkbox"/> Col·locació i anivellat de columna o bacul.</p> <p>14. <input type="checkbox"/> Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</p> <p>15. <input type="checkbox"/> Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</p>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
	16. <input type="checkbox"/> Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent. 17. <input type="checkbox"/> Repas de pintura antioxidant fins a alçada de portella. 18. <input type="checkbox"/> Numeració de suport existent, segons inventar. 19. <input type="checkbox"/> Neteja de la zona de treball i eliminació de sobrants a deixalleria.	569,19	CINC-CENTS SEIXANTA-NOU EUROS AMB DINOU CÈNTIMS



Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
3.2	<p>ut Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 12 i &lt;15 metres (diferents models cilíndrica, nikolson, tronconica, o baculs i de 4 mm de gruix de xapa no inclou la columna tipus PRIM), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. <input type="checkbox"/> Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. <input type="checkbox"/> Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. <input type="checkbox"/> Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. <input type="checkbox"/> Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. <input type="checkbox"/> Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. <input type="checkbox"/> Retirada de punt de llum existent i del morter pobre.</li> <li>7. <input type="checkbox"/> Custodia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. <input type="checkbox"/> Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. <input type="checkbox"/> Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. <input type="checkbox"/> Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions: <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. <input type="checkbox"/> Les noves columnes o baculs hauran de venir: <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. <input type="checkbox"/> Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. <input type="checkbox"/> Col·locació i anivellat de columna o bacul.</li> <li>14. <input type="checkbox"/> Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existent a la columna.</li> <li>15. <input type="checkbox"/> Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i</li> </ol>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
	continuïtat de línies). 16. <input type="checkbox"/> Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent. 17. <input type="checkbox"/> Repas de pintura antioxidant fins a alçada de portella. 18. <input type="checkbox"/> Numeració de suport existent, segons inventari. 19. <input type="checkbox"/> Neteja de la zona de treball i eliminació de sobrants a deixalleria.	615,85	SIS-CENTS QUINZE EUROS AMB VUITANTA-CINC CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
3.3	<p>ut Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 9 i &lt;10 metres (diferents models cilíndrica, nikolson, tronconica o baculs i de 4 mm de gruix de xapa), que inclou les següents etapes constructives:</p> <p>1. <input type="checkbox"/> Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</p> <p>2. <input type="checkbox"/> Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</p> <p>3. <input type="checkbox"/> Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</p> <p>4. <input type="checkbox"/> Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</p> <p>5. <input type="checkbox"/> Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</p> <p>6. <input type="checkbox"/> Retirada de punt de llum existent i del morter pobre.</p> <p>7. <input type="checkbox"/> Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</p> <p>8. <input type="checkbox"/> Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</p> <p>9. <input type="checkbox"/> Neteja de la zona de treball i transport a deixalleria de fanal retirat.</p> <p>10. <input type="checkbox"/> Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:</p> <p>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</p> <p>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</p> <p>11. <input type="checkbox"/> Les noves columnes o bàculs hauran de venir:</p> <p>a. Carteles i aros de reforç fins a 250mm.</p> <p>b. Galvanitzades en calent EN ISO 1461.</p> <p>c. Portella rasant amb reforç interior.</p> <p>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</p> <p>12. <input type="checkbox"/> Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</p> <p>13. <input type="checkbox"/> Col·locació i anivellat de columna o bacul.</p> <p>14. <input type="checkbox"/> Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</p> <p>15. <input type="checkbox"/> Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</p>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
	16. <input type="checkbox"/> Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent. 17. <input type="checkbox"/> Repas de pintura antioxidant fins a alçada de portella. 18. <input type="checkbox"/> Numeració de suport existent, segons inventar. 19. <input type="checkbox"/> Neteja de la zona de treball i eliminació de sobrants a deixalleria.	519,70	CINC-CENTS DINOU EUROS AMB SETANTA CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
3.4	<p>ut Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 8 i &lt;9 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <p>1. <input type="checkbox"/> Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</p> <p>2. <input type="checkbox"/> Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</p> <p>3. <input type="checkbox"/> Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</p> <p>4. <input type="checkbox"/> Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</p> <p>5. <input type="checkbox"/> Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</p> <p>6. <input type="checkbox"/> Retirada de punt de llum existent i del morter pobre.</p> <p>7. <input type="checkbox"/> Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</p> <p>8. <input type="checkbox"/> Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</p> <p>9. <input type="checkbox"/> Neteja de la zona de treball i transport a deixalleria de fanal retirat.</p> <p>10. <input type="checkbox"/> Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:</p> <p>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</p> <p>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</p> <p>11. <input type="checkbox"/> Les noves columnes o bàculs hauran de venir:</p> <p>a. Carteles i aros de reforç fins a 250mm.</p> <p>b. Galvanitzades en calent EN ISO 1461.</p> <p>c. Portella rasant amb reforç interior.</p> <p>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</p> <p>12. <input type="checkbox"/> Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</p> <p>13. <input type="checkbox"/> Col·locació i anivellat de columna o bacul.</p> <p>14. <input type="checkbox"/> Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</p> <p>15. <input type="checkbox"/> Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</p>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
	16. <input type="checkbox"/> Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent. 17. <input type="checkbox"/> Repas de pintura antioxidant fins a alçada de portella. 18. <input type="checkbox"/> Numeració de suport existent, segons inventar. 19. <input type="checkbox"/> Neteja de la zona de treball i eliminació de sobrants a deixalleria.	461,88	QUATRE-CENTS SEIXANTA-U EUROS AMB VUITANTA-VUIT CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
3.5	<p>ut Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 7 i &lt;8 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <p>1. <input type="checkbox"/> Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</p> <p>2. <input type="checkbox"/> Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</p> <p>3. <input type="checkbox"/> Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</p> <p>4. <input type="checkbox"/> Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</p> <p>5. <input type="checkbox"/> Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</p> <p>6. <input type="checkbox"/> Retirada de punt de llum existent i del morter pobre.</p> <p>7. <input type="checkbox"/> Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</p> <p>8. <input type="checkbox"/> Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</p> <p>9. <input type="checkbox"/> Neteja de la zona de treball i transport a deixalleria de fanal retirat.</p> <p>10. <input type="checkbox"/> Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:</p> <p>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</p> <p>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</p> <p>11. <input type="checkbox"/> Les noves columnes o bàculs hauran de venir:</p> <p>a. Carteles i aros de reforç fins a 250mm.</p> <p>b. Galvanitzades en calent EN ISO 1461.</p> <p>c. Portella rasant amb reforç interior.</p> <p>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</p> <p>12. <input type="checkbox"/> Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</p> <p>13. <input type="checkbox"/> Col·locació i anivellat de columna o bacul.</p> <p>14. <input type="checkbox"/> Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</p> <p>15. <input type="checkbox"/> Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</p>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
	16. <input type="checkbox"/> Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent. 17. <input type="checkbox"/> Repas de pintura antioxidant fins a alçada de portella. 18. <input type="checkbox"/> Numeració de suport existent, segons inventar. 19. <input type="checkbox"/> Neteja de la zona de treball i eliminació de sobrants a deixalleria.	438,54	QUATRE-CENTS TRENTA-VUIT EUROS AMB CINQUANTA-QUATRE CÈNTIMS



Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
3.6	<p>ut Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 6 i &lt;7 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <p>1. <input type="checkbox"/> Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</p> <p>2. <input type="checkbox"/> Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</p> <p>3. <input type="checkbox"/> Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</p> <p>4. <input type="checkbox"/> Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</p> <p>5. <input type="checkbox"/> Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</p> <p>6. <input type="checkbox"/> Retirada de punt de llum existent i del morter pobre.</p> <p>7. <input type="checkbox"/> Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</p> <p>8. <input type="checkbox"/> Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</p> <p>9. <input type="checkbox"/> Neteja de la zona de treball i transport a deixalleria de fanal retirat.</p> <p>10. <input type="checkbox"/> Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:</p> <p>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</p> <p>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</p> <p>11. <input type="checkbox"/> Les noves columnes o bàculs hauran de venir:</p> <p>a. Carteles i aros de reforç fins a 250mm.</p> <p>b. Galvanitzades en calent EN ISO 1461.</p> <p>c. Portella rasant amb reforç interior.</p> <p>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</p> <p>12. <input type="checkbox"/> Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</p> <p>13. <input type="checkbox"/> Col·locació i anivellat de columna o bacul.</p> <p>14. <input type="checkbox"/> Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</p> <p>15. <input type="checkbox"/> Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</p>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
	16. <input type="checkbox"/> Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent. 17. <input type="checkbox"/> Repas de pintura antioxidant fins a alçada de portella. 18. <input type="checkbox"/> Numeració de suport existent, segons inventar. 19. <input type="checkbox"/> Neteja de la zona de treball i eliminació de sobrants a deixalleria.	365,77	TRES-CENTS SEIXANTA-CINC EUROS AMB SETANTA-SET CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
3.7	<p>ut Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 5 i &lt;6 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <p>1. <input type="checkbox"/> Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</p> <p>2. <input type="checkbox"/> Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</p> <p>3. <input type="checkbox"/> Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</p> <p>4. <input type="checkbox"/> Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</p> <p>5. <input type="checkbox"/> Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</p> <p>6. <input type="checkbox"/> Retirada de punt de llum existent i del morter pobre.</p> <p>7. <input type="checkbox"/> Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</p> <p>8. <input type="checkbox"/> Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</p> <p>9. <input type="checkbox"/> Neteja de la zona de treball i transport a deixalleria de fanal retirat.</p> <p>10. <input type="checkbox"/> Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:</p> <p>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</p> <p>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</p> <p>11. <input type="checkbox"/> Les noves columnes o bàculs hauran de venir:</p> <p>a. Carteles i aros de reforç fins a 250mm.</p> <p>b. Galvanitzades en calent EN ISO 1461.</p> <p>c. Portella rasant amb reforç interior.</p> <p>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</p> <p>12. <input type="checkbox"/> Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</p> <p>13. <input type="checkbox"/> Col·locació i anivellat de columna o bacul.</p> <p>14. <input type="checkbox"/> Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</p> <p>15. <input type="checkbox"/> Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</p>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
	16. <input type="checkbox"/> Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent. 17. <input type="checkbox"/> Repas de pintura antioxidant fins a alçada de portella. 18. <input type="checkbox"/> Numeració de suport existent, segons inventar. 19. <input type="checkbox"/> Neteja de la zona de treball i eliminació de sobrants a deixalleria.	355,30	TRES-CENTS CINQUANTA-CINC EUROS AMB TRENTA CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
3.8	<p>ut Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 4 i &lt;5 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <p>1. <input type="checkbox"/> Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</p> <p>2. <input type="checkbox"/> Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</p> <p>3. <input type="checkbox"/> Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</p> <p>4. <input type="checkbox"/> Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</p> <p>5. <input type="checkbox"/> Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</p> <p>6. <input type="checkbox"/> Retirada de punt de llum existent i del morter pobre.</p> <p>7. <input type="checkbox"/> Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</p> <p>8. <input type="checkbox"/> Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</p> <p>9. <input type="checkbox"/> Neteja de la zona de treball i transport a deixalleria de fanal retirat.</p> <p>10. <input type="checkbox"/> Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:</p> <p>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</p> <p>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</p> <p>11. <input type="checkbox"/> Les noves columnes o bàculs hauran de venir:</p> <p>a. Carteles i aros de reforç fins a 250mm.</p> <p>b. Galvanitzades en calent EN ISO 1461.</p> <p>c. Portella rasant amb reforç interior.</p> <p>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</p> <p>12. <input type="checkbox"/> Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</p> <p>13. <input type="checkbox"/> Col·locació i anivellat de columna o bacul.</p> <p>14. <input type="checkbox"/> Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</p> <p>15. <input type="checkbox"/> Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</p>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
	16. <input type="checkbox"/> Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent. 17. <input type="checkbox"/> Repas de pintura antioxidant fins a alçada de portella. 18. <input type="checkbox"/> Numeració de suport existent, segons inventar. 19. <input type="checkbox"/> Neteja de la zona de treball i eliminació de sobrants a deixalleria.	328,45	TRES-CENTS VINT-I-VUIT EUROS AMB QUARANTA-CINC CÈNTIMS

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
3.9	<p>ut Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 3 i &lt;4 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <p>1. <input type="checkbox"/> Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</p> <p>2. <input type="checkbox"/> Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</p> <p>3. <input type="checkbox"/> Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</p> <p>4. <input type="checkbox"/> Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</p> <p>5. <input type="checkbox"/> Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</p> <p>6. <input type="checkbox"/> Retirada de punt de llum existent i del morter pobre.</p> <p>7. <input type="checkbox"/> Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</p> <p>8. <input type="checkbox"/> Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</p> <p>9. <input type="checkbox"/> Neteja de la zona de treball i transport a deixalleria de fanal retirat.</p> <p>10. <input type="checkbox"/> Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:</p> <p>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</p> <p>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</p> <p>11. <input type="checkbox"/> Les noves columnes o bàculs hauran de venir:</p> <p>a. Carteles i aros de reforç fins a 250mm.</p> <p>b. Galvanitzades en calent EN ISO 1461.</p> <p>c. Portella rasant amb reforç interior.</p> <p>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</p> <p>12. <input type="checkbox"/> Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</p> <p>13. <input type="checkbox"/> Col·locació i anivellat de columna o bacul.</p> <p>14. <input type="checkbox"/> Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</p> <p>15. <input type="checkbox"/> Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</p>		

Quadre de preus nº 1

Nº	Designació	Import	
		En xifra (Euros)	En lletra (Euros)
3.10	16. <input type="checkbox"/> Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.	312,24	TRES-CENTS DOTZE EUROS AMB VINT-I-QUATRE CÈNTIMS
	17. <input type="checkbox"/> Repas de pintura antioxidant fins a alçada de portella.		
3.10	18. <input type="checkbox"/> Numeració de suport existent, segons inventari.	51,73	CINQUANTA-U EUROS AMB SETANTA-TRES CÈNTIMS
	19. <input type="checkbox"/> Neteja de la zona de treball i eliminació de sobrants a deixalleria.		
	ut Subministrament, instal·lació i muntatge de portella de protecció a farola d'acer galvanitzat		





**DOCUMENT N°4: PRESSUPOST  
CAPÍTOL N°3: QUADRE DE PREUS N°2**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ  
EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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## Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
1	<p>UT de Partida de verificació, comprovació i localització dels trams afectats per defectes d'aïllament d'una línia del quadre d'enllumenat. Inclòs tots el necessari per a determinar i localitzar entre quines caixes de fusibles es localitzà els defectes. Inclou la feina d'anàlisi de l'averia seccionant la línia fins a determinar el focus del problema. Realització d'estudi de les línies i una vegada detectat el problema redacció d'informe. Informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal, l'informe te que esta signat per un instal·lador autoritzat.</p> <p style="margin-left: 20px;">Mà d'obra 5 % Costos indirectes</p>	<p>556,05 27,80</p>	583,85
2	<p>ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE NU, UNIPOLAR 1x35 MM2 MUNTAT EN FONDS DE RASA</p> <p style="margin-left: 20px;">Mà d'obra Materials 5 % Costos indirectes</p>	<p>0,09 1,72 0,09</p>	1,90
3	<p>ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIO UNE VV 0,6/1KV DE 1x16,00 MM2 , COL·LOCAT EN TUB</p> <p style="margin-left: 20px;">Mà d'obra Materials 5 % Costos indirectes</p>	<p>6,01 1,59 0,38</p>	7,98
4	<p>UT de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE COLUMNA TIPUS NICOLSON DE 4,00 METRES D'ALÇADA , AMB BASE , PLATINA I PORTA, ,AMB CARTELA I ARO DE REFORÇ COL·LOCADA SOBRE DAU DE FORMIGO. INCLOU PERNS D'ANCORATGE, COFRED DE CONNEXIONS I CONDUCTOR DE COURE DESIGNACIO UNE RV 0,6/1KV DE 5X2,50 MM2</p> <p>LES NOVES COLUMNES O BÀCULS HAURAN DEVENIR:</p> <ul style="list-style-type: none"> <li>- CARTELES I AROS DE REFORÇ FINS A250MM.</li> <li>- GALVANITZADES EN CALENT EN ISO1461.</li> <li>- PORTELLA RASANT AMB REFORÇ INTERIOR.</li> <li>- ELS PUNTS DE LLUM COMPLIRAN L'APARTAT 6.1 DE LA ITC-BT-09 DEL REBT AMB ELS ACLARIMENT DE LA GUIA TÈCNICA I DISPOSARAN DEL MARCATGE DE LACE.</li> <li>- LES COLUMNES I BÀCULS D'ACER GALVANITZAT TINDRAN UN RECOBRIMENT PROTECTOR AMB POLIAMIDA TERMOPLÀSTICA EN POLS DE TIPUS RILSAN O EQUIVALENT APLICADA PER IMMERSIÓ. AQUEST PROCÉS S'APLICARÀ DES DE LA BASE DE COLUMNA FINS A L'ALÇADA DE LA PORTELLA PER LA PART INTERIOR COM L'EXTERIOR TENINT CURA QUE LA PRESA DE TERRA NO QUEDI RECOBERTA PER AQUEST TRACTAMENT. AQUEST PROCÉS S'APLICARÀ DESPRÈS D'UN DECAPAT I GRANALLAT SOBRE LA SUPERFÍCIE A TRACTAR.</li> <li>- LA GARANTIA DEL SUPORTS DEL FABRICANT SERÀ COM A MÍNIM DE 20 ANYS I DE LA PART TRACTADA AMB TRACTAMENT D'ANTICORROSIU SERÀ DE 10ANYS.</li> </ul> <p style="margin-left: 20px;">Mà d'obra Maquinària Materials 5 % Costos indirectes</p>	<p>16,84 12,70 181,59 10,56</p>	221,69

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
5	<p>UT de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE COLUMNA TRONCOCONICA DE 8,00 METRES D'ALÇADA , AMB BASE , PLATINA I PORTA,,AMB CARTELA I ARO DE REFORÇ COL·LOCADA SOBRE DAU DE FORMIGO. INCLOU PERNS D'ANCORATGE, COFRED DE CONNEXIONS I CONDUCTOR DE COURE DESIGNACIO UNE RV 0,6/1KV DE 5X2,50 MM2</p> <p>LES NOVES COLUMNES O BÀCULS HAURAN DEVENIR:</p> <ul style="list-style-type: none"> <li>- CARTELES I AROS DE REFORÇ FINS A250MM.</li> <li>- GALVANITZADES EN CALENT EN ISO1461.</li> <li>- PORTELLA RASANT AMB REFORÇ INTERIOR.</li> <li>- ELS PUNTS DE LLUM COMPLIRAN L'APARTAT 6.1 DE LA ITC-BT-09 DEL REBT AMB ELS ACLARIMENT DE LA GUIA TÈCNICA I DISPOSARAN DEL MARCATGE DE LACE.</li> <li>- LES COLUMNES I BÀCULS D'ACER GALVANITZAT TINDRAN UN RECOBRIMENT PROTECTOR AMB POLIAMIDA TERMOPLÀSTICA EN POLS DE TIPUS RILSAN O EQUIVALENT APLICADA PER IMMERSIÓ. AQUEST PROCÉS S'APLICARÀ DES DE LA BASE DE COLUMNA FINS A L'ALÇADA DE LA PORTELLA PER LA PART INTERIOR COM L'EXTERIOR TENINT CURA QUE LA PRESA DE TERRA NO QUEDI RECOBERTA PER AQUEST TRACTAMENT. AQUEST PROCÉS S'APLICARÀ DESPRÈS D'UN DECAPAT I GRANALLAT SOBRE LA SUPERFÍCIE A TRACTAR.</li> <li>- LA GARANTIA DEL SUPORTS DEL FABRICANT SERÀ COM A MÍNIM DE 20 ANYS I DE LA PART TRACTADA AMB TRACTAMENT D'ANTICORROSIU SERÀ DE 10ANYS.</li> </ul> <p>Mà d'obra 46,32 Materials 282,05 5 % Costos indirectes 16,42</p>		344,79
6	<p>ut de Creació de cata de serveis, que inclou les següents etapesconstructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 10 dies d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació. Inclou gestió amb Tubgsal pel desviament d'autobusos si escau.</li> <li>2. Picar cata en terreny existent, fins un màxim de 100x100cm i 1 metre de fondària amb mitjans manuals, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els dretsd'abocament.</li> <li>3. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica al'existent.</li> </ol> <p>Mà d'obra 59,46 Maquinària 4,51 Materials 17,83 5 % Costos indirectes 4,09</p>		85,89
7	<p>ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X6 MM2 COL·LOCATS EN TUB.</p> <p>Mà d'obra 3,08 Materials 3,82 5 % Costos indirectes 0,35</p>		7,25
8	<p>ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X6 MM2 COL·LOCATS EN TUB.</p> <p>Mà d'obra 3,25 Materials 3,79 5 % Costos indirectes 0,35</p>		7,39
9	<p>ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 4X6 MM2 MUNTAT SUPERFICIALMENT TRENAT.</p> <p>Mà d'obra 4,69 Materials 3,82 5 % Costos indirectes 0,43</p>		8,94
10	<p>ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X6 MM2 MUNTAT TRENAT SUPERFICIALMENT.</p> <p>Mà d'obra 4,76 Materials 3,79 5 % Costos indirectes 0,43</p>		8,98

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
11	ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X10 MM2 COL·LOCAT EN TUB. Mà d'obra Materials 5 % Costos indirectes	3,08 4,64 0,39	8,11
12	ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X10 MM2 COL·LOCAT EN TUB. Mà d'obra Materials 5 % Costos indirectes	3,25 4,64 0,39	8,28
13	ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 4X10 MM2 MUNTAT SUPERFICIALMENT. Mà d'obra Materials 5 % Costos indirectes	4,74 4,64 0,47	9,85
14	ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X10 MM2 MUNTAT SUPERFICIALMENT. Mà d'obra Materials 5 % Costos indirectes	4,79 4,64 0,47	9,90
15	ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X16 MM2 COL·LOCAT EN TUB. Mà d'obra Materials 5 % Costos indirectes	3,23 8,84 0,60	12,67
16	ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X16 MM2 COL·LOCAT EN TUB. Mà d'obra Materials 5 % Costos indirectes	3,23 4,91 0,41	8,55
17	ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 1X16 MM2 MUNTAT SUPERFICIALMENT. Mà d'obra Materials 5 % Costos indirectes	4,69 4,91 0,48	10,08
18	ML de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X16 MM2 MUNTAT SUPERFICIALMENT. Mà d'obra Materials 5 % Costos indirectes	4,79 4,91 0,49	10,19

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
19	<p>ML de SUBMINISTRE I INSTAL·LACIÓ DE SISTEMA DE TELEGESTIÓ CLEVER MASTER O SIMILAR, CONFIGURACIÓ, POSADA EN SERVEI. ESTA INCLOS CLEVER MASTER CSD / 5G, ANTENA MASTER AMB QUANY, CONMUTADOR CM3 POS 2 INV, 9 BORNES DOBLES PIS RKD 2,50 MM P/GUIA AR 35, 2 FINAL DE GUIA AR35 ES35 I UN CABLE CLEVER WAT</p> <p>MANTENIMENT.</p> <p>CARACTERSTIQUES TELECONTROL D'ENCESA, SISTEMA DE TELECONTROL NarrowBandNB IoT/ LoRaWAN, AMB ASTRONÒMIC INCORPORAT CLEVER-MASTER O EQUIVALENT</p> <ul style="list-style-type: none"> <li>• Rebre informació en temps real i actuar sobre la xarxa d'enllumenat exterior des d'un lloc de telecontrol o altres ordinadors, 3 telèfons mòbils prèviament autoritzats i 1 telèfon mòbils sistema tall cablejat (Policia), també podem comunicar localment mitjançant ordinador portàtil.</li> <li>• Ajust precís de l'encesa i apagat de les instal·lacions per mitjà d'un microprocessador amb càlcul astronòmic diari del l'orto i l'ocàs, i possibilitat d'encès mitjançant telecomandament per quadre o grup de quadres.</li> <li>• Estalvi energètic de les instal·lacions en reduir el flux lluminós en hores de poca utilització de l'enllumenat mitjançant reductor-estabilitzador en capçalera.</li> <li>• Millora de la qualitat del servei en detectar les avaries en temps real i poder actuar immediatament.</li> <li>• Màxima eficiència en l'explotació i manteniment de les instal·lacions gràcies al flux d'informació rebuda via SMS text personalitzat 150 caràcters o Mail via smartphone.</li> <li>• Integren comunicació bidireccional NarrowBand NB IoTcapaç de realitzar comunicacions en temps real amb telèfons mòbils autoritzats via SMS i amb el centre de control mitjançant entorn IP dinàmiques o trucada CSD.</li> <li>• Disposa de rellotge astronòmic programable via NarrowBand NB IoT mitjançant connexió RS232 cable PC.</li> <li>• Rellotge intern de temps real (RTC) amb bateria de liti pròpia, substituïble als 5 anys.</li> <li>• Desviació del rellotge astronòmic +/-1 minut any.</li> <li>• Memòria EEPROM interna de 4 Mbits guardant valors eficaços per fase en períodes de 30 minuts dels últims 30 dies, adquirits del tarifador gestió energètica.</li> <li>• Possibilitat de valors durant 24 hores en períodes d'1 minut. Programacions d'estalvi, astronòmic i texts personalitzats identificats d'entrades auxiliars...</li> <li>• Permet comunicació mostrant valors eficaços de funcionament d'instal·lació amb auditoria energètica a temps real.</li> <li>• LoRaWAN comunicació global del Municipi i sensorització.</li> <li>• GPRS intern en el propi equip per comunicació de suport.</li> <li>• Possibilitat de connexió mitjançant IP dinàmiques gràcies a la versatilitat del programari. Reduint costos i temps d'explotació en instal·lacions de més de 150 escames.</li> <li>• Antena GSM/GPRS interna en el propi equip amb possibilitat de connexió d'una altra externa per a major guany.</li> <li>• Bateria recarregable de liti interna, permet que l'equip enviï un SMS quan s'interromp el subministrament elèctric del centre de comandament.</li> <li>• Funcionament amb targetes de telefonia mòbil, amb tots els operadors nacionals.</li> <li>• Permet actualitzacions de firmware de forma remota (Local per cable, NarrowBand NB IoT)</li> <li>• Sistema de seguretat per a connexió a través de codi PIN en la targeta de telefonia.</li> <li>• Protegit contra descàrregues atmosfèriques conduïdes.</li> <li>• Protegit contra sobretensions permanents.</li> <li>• Els equips estan degudament patentats i fabricats a la Unió Europea, amb els seus corresponents certificats i documents que acrediten els drets d'explotació, compleixen la normativa vigent de seguretat per a equips elèctrics UNE -EN 61010-1.</li> <li>• Compleix amb normativa ROHS.</li> <li>• 8 Ports. Permeten comunicar i programar fins a 8 sortides domòtiques magneto tèrmic i diferencial iDPR (Diferencial Progressiu amb Reconexió).</li> <li>• 1 Port. Permet connexió directa amb PC.</li> <li>• 1 Port. Permet unitats d'expansió per a presa de dades elèctriques en quadres amb altres reguladors de mercat.</li> </ul>		

## Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
	<ul style="list-style-type: none"> <li>• 1 Port. Permet una connexió transparent amb el tarifador per la pressa de tancaments amb protocol companyia.</li> <li>• 1 Relloatge astronòmic ajustable + - l'orto / + - l'ocàs amb relé funció commutat.</li> <li>• 3 Circuits auxiliars, programació individual i funció astronòmica amb funció de relloatge, hores fixes set dies setmanals</li> <li>• 1 Sortida 1-10V control de balastres electrònics.</li> <li>• 32 Entrades lliures de potencial per a esdeveniments personalitzats amb 150 caràcters via SMS,.</li> </ul> <p>(Obertura de portes, caiguda de diferencials,...). 3 d'elles es poden combinar amb els 3 relés de sortida per engegar un dispositiu en produir-se un esdeveniment (connectar una sirena si s'obre una porta, encendre una bomba de buidatge si una bolla detecta un nivell d'aigua molt alt...)</p>		
	<p style="padding-left: 40px;">Mà d'obra</p> <p style="padding-left: 40px;">Materials</p> <p style="padding-left: 40px;">5 % Costos indirectes</p>	<p>202,98</p> <p>1.322,60</p> <p>76,28</p>	1.601,86
20	<p>ML de SUBMINISTRE I INSTAL•LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 180X270X180 MM.</p> <p style="padding-left: 40px;">Mà d'obra</p> <p style="padding-left: 40px;">Materials</p> <p style="padding-left: 40px;">5 % Costos indirectes</p>	<p>10,16</p> <p>14,03</p> <p>1,21</p>	25,40
21	<p>ML de SUBMINISTRE I INSTAL•LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270X270X180 MM.</p> <p style="padding-left: 40px;">Mà d'obra</p> <p style="padding-left: 40px;">Materials</p> <p style="padding-left: 40px;">5 % Costos indirectes</p>	<p>10,16</p> <p>16,71</p> <p>1,34</p>	28,21
22	<p>ML de SUBMINISTRE I INSTAL•LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270x360X180 MM.</p> <p style="padding-left: 40px;">Mà d'obra</p> <p style="padding-left: 40px;">Materials</p> <p style="padding-left: 40px;">5 % Costos indirectes</p>	<p>10,16</p> <p>18,01</p> <p>1,41</p>	29,58
23	<p>ML de SUBMINISTRE I INSTAL•LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270X540X180 MM.</p> <p style="padding-left: 40px;">Mà d'obra</p> <p style="padding-left: 40px;">Materials</p> <p style="padding-left: 40px;">5 % Costos indirectes</p>	<p>10,19</p> <p>25,29</p> <p>1,77</p>	37,25
24	<p>ML de SUBMINISTRE I INSTAL•LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 360X540X180 MM.</p> <p style="padding-left: 40px;">Mà d'obra</p> <p style="padding-left: 40px;">Materials</p> <p style="padding-left: 40px;">5 % Costos indirectes</p>	<p>10,16</p> <p>31,94</p> <p>2,11</p>	44,21
25	<p>ML de SUBMINISTRE I INSTAL•LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 540X540X180 MM.</p> <p style="padding-left: 40px;">Mà d'obra</p> <p style="padding-left: 40px;">Materials</p> <p style="padding-left: 40px;">5 % Costos indirectes</p>	<p>10,16</p> <p>47,84</p> <p>2,90</p>	60,90
26	<p>ML de CONDICIONAMENT DE QUADRES, INCLOU EL SANEJAMENT I RETIRADA DE TOTS ELS ELEMENTS OBSOLETS, CONDENSADORS, REGULADORS DE FLUX. ESTA INCLÒS EL TRASLLATS, GESTIO I DESPESES D'ABOCADOR</p> <p style="padding-left: 40px;">Mà d'obra</p> <p style="padding-left: 40px;">5 % Costos indirectes</p>	<p>203,00</p> <p>10,15</p>	213,15

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
27	<p>m1 de Substitució i renovació de les línies aèries o entubades igual a les existent, com a mínim la secció sera de 6 mm2 de Cu 0,6/1kV, que inclou les següent partides aexecutar:</p> <p>1. Senyalització amb 10 dies d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.Inclou gestió amb Tubgsal pel desviament d'autobusos si escau.</p> <p>2. Desmuntatge de les existent existents i esteses de guies o passa cables, amb carrega i transport de runes al abocador autoritzat inclòs les taxes d'abocament.</p> <p>3. Subministrament, instal·lació i muntatge de conductor de coure designació UNE VV 0,6/1kv de armant de la mateixa secció que el retirat col·locat en tub o grapat afaçana, fins a 16 mm de secció</p> <p>Mà d'obra Maquinària Materials 5 % Costos indirectes</p>	<p>2,48 2,03 6,35 0,54</p>	11,40
28	<p>M2 de DEMOLICIO DE PAVIMENT DE LLAMBORDES , AMB MITJANS MECANICS I CÀRREGA I TRANSPORT A L'ABOCADOR INCLOS CANON ADICIONAL</p> <p>Mà d'obra Maquinària Resta d'Obra 5 % Costos indirectes</p>	<p>2,16 2,48 0,57 0,26</p>	5,47
29	<p>M3 de EXCAVACIO DE RASSA PER A PAS D'INSTAL·LACIONS FINS A 1 METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MANUALS I AMB LES TERRES DEIXADES A LA VORA</p> <p>Mà d'obra 5 % Costos indirectes</p>	<p>34,85 1,74</p>	36,59
30	<p>M3 de EXCAVACIO DE RASA PER A PAS D'INSTAL·LACIONS FINS A 1,-METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MECANICS I AMB LES TERRES DEIXADES A LA VORA.</p> <p>Mà d'obra Maquinària 5 % Costos indirectes</p>	<p>3,33 3,02 0,32</p>	6,67
31	<p>M2 de DEMOLICIO DE PAVIMENT DE PANOTS COL·LOCATS SOBRE FORMIGO PREVI TALL AMB DISC DE 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MARTELL PICADOR AMB MITJANS MECANICS I CARREGA SOBRE CAMIO</p> <p>Mà d'obra Maquinària 5 % Costos indirectes</p>	<p>7,30 3,74 0,55</p>	11,59
32	<p>M2 de DEMOLICIO DE PAVIMENT DE MESCLA BITUMINOSA, PREVI TALL AMB DISC, DE FINS A 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MITJANS MECANICS I CARREGA SOBRE CAMIO</p> <p>Mà d'obra Maquinària 5 % Costos indirectes</p>	<p>3,36 1,85 0,26</p>	5,47
33	<p>M2 de DEMOLICIO DE PAVIMENT DE PECES DE FORMIGO COL·LOCADES SOBRE FORMIGO PREVI TALL AMB DISC, DE FINS A 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MITJANS MECANICS I CARREGA SOBRE CAMIO</p> <p>Mà d'obra Maquinària 5 % Costos indirectes</p>	<p>7,37 3,74 0,56</p>	11,67

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
34	M2 de DEMOLICIO DE PAVIMENT DE FORMIGO PREVI TALL AMB DISC, DE FINS A 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MITJANS MECANICS I CARREGA SOBRE CAMIO Mà d'obra Maquinària 5 % Costos indirectes	7,37 3,74 0,56	11,67
35	M3 de REBLIMENT I PICONATGE DE RASA D'AMPLARIA FINS A 60 CM, AMB MATERIAL SELECCIONAT DE L'OBRA, EN TONGADES DE GRUIX DE FINS A 25 CM, UTILITZANT PICO VIBRANT, AMB COMPACTACIO DEL 95% P.M. Mà d'obra Maquinària 5 % Costos indirectes	8,97 6,52 0,77	16,26
36	M3 de TRANSPORT DE RUNES A L'ABOCADOR AMB CONECTOR, CARREGAT AMB MITJANS MECANICS I MANUALS AMB UN RECORREGUT DE FINS A 10,-KM INCLOS ELS DRETS D'ABOCAMENT Maquinària Resta d'Obra 5 % Costos indirectes	9,84 2,58 0,62	13,04
37	M2 de PAVIMENT DE PANOT PER A VORERA GRIS DE 20x20x4 CM, CLASSE 1A TIPUS 2, COL·LOCAT A L'ESTESSA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PÒRTLAND I BEURADA DE CIMENT PORTLAND Mà d'obra Materials 5 % Costos indirectes	18,44 6,55 1,25	26,24
38	M2 de PAVIMENT DE PECES DE FORMIGO PER A VORERA DE 30x30x4 CM, IGUALS A LES EXISTENTS, COL·LOCAT A L'ESTESSA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PÒRTLAND I BEURADA DE CIMENT PORTLAND Mà d'obra Materials 5 % Costos indirectes	21,03 6,55 1,38	28,96
39	M2 de PAVIMENT DE MICROAGLOMERAT ASFALTIC EN CALENT, COLOR SAULO DE 4 CM DE GRUIX IGUAL AL EXISTENT. Mà d'obra Materials 5 % Costos indirectes	19,21 11,90 1,56	32,67
40	M3 de PAVIMENT DE FORMIGO SENSE ADDITIUS HM-30/B/20/I+E DE CONSISTENCIA TOVA GRANDARIA MAXIMA DEL GRANULAT 20 MM, ESCAMPAT DES DE CAMIO, ESTESA I VIBRATGE MECANIC I ACABAT REGLEJAT Mà d'obra Maquinària Materials 5 % Costos indirectes	13,55 0,73 44,74 2,95	61,97
41	M2 de PAVIMENT DE MESCLA BITUMINOSA EN CALENT DE COMPOSICIO Densa D-12 AMB GRANULAT GRANÍTIC I BETUM ASFALTIC DE PENETRACIO, ESTESA I COMPACTADA AL 98 % DE L'ASSAIG MARSHALL. Mà d'obra Materials Resta d'Obra 5 % Costos indirectes	14,41 3,49 8,55 1,32	27,77
42	UT de PERICO DE 38x38x55 CM, AMB PARETS DE 15 CM DE GRUIX DE FORMIGO HM-20/P/20 l I SOLERA DE MAÓ CALAT, SOBRE LLIT DE SORRA. Mà d'obra Materials 5 % Costos indirectes	47,98 14,12 3,11	65,21



Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
43	UT de BASTIMENT I TAPA PER A PERICO DE SERVEIS DE FOSA GRISA DE 420x420x40 MM I DE 25 KG DE PES , COL·LOCAT AMB MORTER MIXT 1:05:04, ELABORAT A L'OBRA AMB FORMIGONERA DE 165 LITRES Mà d'obra Materials 5 % Costos indirectes	13,38 14,16 1,38	28,92
44	ML de TUB RIGID DE PVC DE 110 MM DE DIAMTRE NOMINAL I 1,70 MM DE GRUIX, AMB GRAU DE RESISTENCIA AL XOC 7, ENDOLLAT I MUNTAT COM A CANALITZACIO SOTERRADA. Mà d'obra Materials 5 % Costos indirectes	1,75 1,46 0,16	3,37
45	ML de TUB RIGID D'ACER ELECTRO GALVANITZAT, DE DIAMETRE NOMINAL REFERENCIA 36, ROSCAT I MUNTAT SUPERFICIALMENT. Mà d'obra Materials 5 % Costos indirectes	9,73 11,23 1,05	22,01
46	ML de TUB FLEXIBLE CORRUGAT DE 80 MM DE DIAMETRE NOMINAL I 4,25 MM DE GRUIX AMB GRAU DE RESISTENCIA AL XOC 7 I MUNTAT COM A CANALITZACIO SOTERRADA. Mà d'obra Materials 5 % Costos indirectes	1,03 0,78 0,09	1,90
47	ML de TUB FLEXIBLE CORRUGAT DE PVC DE DIAMETRE NOMINAL REFERENCIA 21 AMB GRAU DE RESISTENCIA AL XOC 5 I ENCASTAT. Mà d'obra Materials 5 % Costos indirectes	0,95 0,11 0,05	1,11
48	UT de DESMUNTATGE DELS PUNTS DE LLUMS EXISTENTS I RETIRAR TOTS ELS SEUS COMPONENTS, TALS COM LLUMINARIES, CABLEJAT, MECANISMES BACULS, BRAÇOS I POSTES I LINIES D'ALIMENTACIO I DISTRIBUCIO ACTUALS, AMB REPOSICIO DE FAÇANES AMB MATERIAL ADIENT, AMB CARREGA I TRANSPORT DE RUNES AL ABOCADOR AUTORITZAT INCLOS LES TAXES D'ABOCAMENT. EL DESMUNTATGE DEL ENLLUMENAT S'EXECUTARA UN COP FINALITZADA I EN FUNCIONAMENT LA INSTAL·LACIO PROJECTADA AL SER CIRCUIT TANCAT. Sense descomposició 5 % Costos indirectes	9,72 0,48	10,20
49	ML de CINTA DE PVC PER A SENYALITZACIO D'INSTAL·LACIONS SOTERRADES. INSTAL·LADA A 25 CM PER DAMUNT DEL TUB Mà d'obra Materials 5 % Costos indirectes	0,09 0,09 0,01	0,19
50	UT de DESMUNTATGE DE QUADRE ELECTRIC ACTUAL. Sense descomposició 5 % Costos indirectes	202,40 10,12	212,52
51	UT de PARTIDA DE COBRAMENT INTEGREGRE PER L'OBRA CIVIL PER CREAR UN SORTIDA EN PUNT DE LLUM EXISTENT Sense descomposició 5 % Costos indirectes	22,07 1,10	23,17

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
52	<p>UT de PARTIDA DE COBRAMENT INTEGRÉ PER L'OBRA CIVIL PER EL CALAT DE MUR DE FORMIGO A LA ZONA VERDA.</p> <p>Sense descomposició 5 % Costos indirectes</p>	<p>194,29 9,72</p>	204,01
53	<p>ut de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE fluorescent leed EN LLUMENERA EXISTENT , AMB POTENCIA NOMINAL DE FINS A 15W, AMB TEMPERATURA DE COLOR 3000 °K, , AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>Mà d'obra Materials 5 % Costos indirectes</p>	<p>9,24 15,11 1,22</p>	25,57
54	<p>U de Subministrament i instal·lació de presa de terra composta per un pou de 2 m de profunditat en l'interior de la qual s'instal·la una placa de coure electrolític pur de 500x500x1,5 mm unida a la barra conductora de coure estanyat de 30x2 mm, connectada a pont per a comprovació, dintre d'una arqueta de registre de polipropilè de 30x30 cm. Fins i tot replanteig, excavació del pou, col·locació de la placa en el seu interior, connexió entre la placa i el conductor de terra mitjançant platina conductora, col·locació de l'arqueta de registre, connexió de la platina conductora amb la línia d'enllaç mitjançant born d'unió, reblert amb terres de la pròpia excavació i additius per a disminuir la resistivitat del terreny i connectat a la xarxa de terra mitjançant pont de comprovació. Totalment muntada, connexionada i provada per l'empresa instal·ladora mitjançant les corresponents proves de servei (incloses en aquest preu). Inclou: Replanteig. Excavació del pou. Col·locació de la placa. Connexió de la placa amb la platina conductora. Col·locació de l'arqueta de registre. Connexió de la platina conductora amb la línia d'enllaç. Reblert de la zona excavada. Connexionat a la xarxa de terra. Realització de proves de servei. Criteri d'amidament de projecte: Nombre d'unitats previstes, segons documentació gràfica de Projecte. Criteri de mesura d'obra: Es mesurarà el nombre d'unitats realment executades segons especificacions de Projecte.</p> <p>Mà d'obra Maquinària Materials Mitjans auxiliars 5 % Costos indirectes</p>	<p>8,53 3,96 35,86 0,97 2,47</p>	51,79
55	<p>UT de PARTIDA COMPLETA I EN FUNCIONAMENT DE PROTECCIÓ INDIVIDUALS DELS ARBRES DE PERÍMETRE DEL TRONC DE FINS A 149 CM DE PERÍMETRE CONTRA ELS COPS, CONSISTENT EN TANCATS DE FUSTA DE PI, DE 22 MM DE GRUIX, PER A 5 USOS DE 2 METRES D'ALÇADA COM A MÍNIM, I ES PROTEGIRÀ AMB MATERIAL D'ENCOIXINAT (BANDES DE JUTE), LA PART DEL TRONC EN CONTACTE AMB EL TANCAT DE FUSTA, LES ZONES DE CONTACTE DELS LLIGAMS AMB L'ESCORÇA, I LA ZONA DEL COLL DE L'ARREL SI FOS NECESSARI.(INCLÒS LA COL·LOCACIÓ I EL DESMUNTATGE.).</p> <p>Sense descomposició 5 % Costos indirectes</p>	<p>21,05 1,06</p>	22,11
56	<p>UT de SUBMINISTRAMENT, MUNTATGE I INSTAL·LACIÓ DE BRAÇ DE 1,50 METRE DE DIAMETRE 42 MM. INCLÒS TOT EL NECESSARI PER LA SEVA CORRECTE FIXACIÓ SEGONS LO ESTABLERT PER D.F.</p> <p>Mà d'obra Maquinària Materials 5 % Costos indirectes</p>	<p>15,68 10,16 72,25 4,90</p>	102,99

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
57	UT de LEGALITZACIO DE LA INSTAL·LACIO.DOCUMENTACIO TECNICA PER PASSA LA INTRUCCIO TECNIA 1/2015. INCLOS ELS DRETS DE VISAT DEL PROJECTE AMB CERTIFICAT FINAL AL COL·LEGI PROFESIONAT, MEMORIA TECNICA DE DISSENY I TAXES DE L'ENTITAT D'INSPECCIO I CONTROL, AMB ACTA FAVORABLE DE LA INSTAL·LACIO I DOCUMENT D'INSCRIPCIO. Sense descomposició 5 % Costos indirectes	1.343,09 67,16	1.410,25
58	UT de DRETS D'ESCOMESA DE LA CIA. SUBMINISTRADORA DE FLUID ELÈCTRIC, PER A UNA AMPLIACIO DE POTÈNCIA NOMINAL NECESSARIA (A JUSTIFICAR) Sense descomposició 5 % Costos indirectes	404,78 20,23	425,01
59	UT de IMPREVISTOS A JUSTIFICAR Sense descomposició 5 % Costos indirectes	3.069,92 153,50	3.223,42
60	UT de Passa acta d'inspecció periòdica fins assolir acta d'inspecció neta per part d'una entitat de control del quadre d'enllumenat públic. Esta inclòs tràmits, despeses i acompanyament al tècnic de entitat de control. Sense descomposició 5 % Costos indirectes	134,74 6,74	141,48

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
61	<p>UT de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL MILAN S O EQUIVALENT, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i tres mides diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED - DRIVER)</li> <li>- Ròtula: Fixació tant lateral, com a top diàmetre 60mm, amb possibilitat d'orientació i inclinació de -15 a + 15° amb la mateixa peça</li> <li>- Tancament a pressió sense cargols ni necessitat de ferramentes.</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes IK10</li> <li>- Mides: 525x250x80mm - 625x290x95mm - 775x320x95mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona, i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S40 fins a 40W, S60 fins a 60W, M fins a 100W, XL fins a 150W, i XXL fins a 300W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Ideal per a alçades de 4 metres fins a 14 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> <li>- Incorpora seccionador de corrent (desconnexió automàtica) o connector segur de tres pols.</li> </ul> <p>Mà d'obra Maquinària Materials 5 % Costos indirectes</p>	<p>27,79 42,67 115,84 9,32</p>	<p>195,62</p>

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
62	<p>ut de Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 10 i &lt;12 metres (diferents models cilíndrica, nikolson, tronconica o baculs i de 4 mm de gruix de xapa), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació l ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions: <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir: <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, inclouent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p>Sense descomposició 5 % Costos indirectes</p>	542,09 27,10	569,19

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
63	<p>ut de Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 12 i &lt;15 metres (diferents models cilíndrica, nikolson, tronconica, o baculs i de 4 mm de gruix de xapa no inclou la columna tipus PRIM), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació l ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions: <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir: <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, inclouent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p style="text-align: center;">Sense descomposició 5 % Costos indirectes</p>	586,52 29,33	615,85

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
64	<p>ut de Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 3 i &lt;4 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions: <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir: <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p>Sense descomposició 5 % Costos indirectes</p>	<p>297,37 14,87</p>	<p>312,24</p>

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
65	<p>ut de Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 4 i &lt;5 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:             <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p>Sense descomposició 5 % Costos indirectes</p>	<p>312,81 15,64</p>	<p>328,45</p>



Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
66	<p>ut de Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 5 i &lt;6 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions: <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir: <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p>Sense descomposició 5 % Costos indirectes</p>	<p>338,38 16,92</p>	<p>355,30</p>

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
67	<p>ut de Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 6 i &lt;7 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions: <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir: <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p>Sense descomposició 5 % Costos indirectes</p>	<p>348,35 17,42</p>	<p>365,77</p>

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
68	<p>ut de Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 7 i &lt;8 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions: <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir: <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p>Sense descomposició 5 % Costos indirectes</p>	417,65 20,89	438,54

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
69	<p>ut de Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 8 i &lt;9 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions: <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir: <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p>Sense descomposició 5 % Costos indirectes</p>	<p>439,89 21,99</p>	<p>461,88</p>

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
70	<p>ut de Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 9 i &lt;10 metres (diferents models cilíndrica, nikolson, tronconica o baculs i de 4 mm de gruix de xapa), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació l ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions: <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir: <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p style="text-align: right;">Sense descomposició 5 % Costos indirectes</p>	494,96 24,74	519,70

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
71	<p>UT de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL NEOVILLA O EQUIVALENT D'ALÇADA FINS A 750 MM, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS</p> <p>Mà d'obra Maquinària Materials 5 % Costos indirectes</p>	25,53 15,09 201,47 12,10	254,19
72	<p>ut de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL PROJECTOR P MILAN S APMS O EQUIVALENT , AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i quatre mesures diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED - DRIVER)</li> <li>- Fixació mitjançant lira, amb possibilitat d'orientació i inclinació de -120 ° a + 120 °</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes fins a IK10</li> <li>- Mides (lira inclosa): 390x282,5x73mm - 490x390x81mm - 595x460x95mm - 727x558x107mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S fins a 80W, M fins a 140W, XL fins a 240W i XXL fins a 460W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Versió especial del Projector MILAN XL-RGBW: Tres colors primaris més blanc. Controlable externament amb 4 canals de DMX-512.</li> <li>- Ideal per a alçades de 4 metres fins a 18 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> </ul> <p>Mà d'obra Maquinària Materials 5 % Costos indirectes</p>	41,36 25,39 141,03 10,39	218,17
73	<p>ut de Subministrament, instal·laico i muntatge de portella de proteccio a farola d'acer galvanitzat</p> <p>Sense descomposició 5 % Costos indirectes</p>	49,26 2,47	51,73

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
74	<p>UT de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL PROJECTOR M MILAN S APM140 O EQUIVALENT D'ALÇADA , AMB POTENCIA NOMINAL DE FINS A 140W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i quatre mesures diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED - DRIVER)</li> <li>- Fixació mitjançant lira, amb possibilitat d'orientació i inclinació de -120 ° a + 120 °</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes fins a IK10</li> <li>- Mides (lira inclosa): 390x282,5x73mm - 490x390x81mm - 595x460x95mm - 727x558x107mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S fins a 80W, M fins a 140W, XL fins a 240W i XXL fins a 460W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Versió especial del Projector MILAN XL-RGBW: Tres colors primaris més blanc. Controlable externament amb 4 canals de DMX-512.</li> <li>- Ideal per a alçades de 4 metres fins a 18 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> </ul> <p>Mà d'obra Materials 5 % Costos indirectes</p>	<p>34,08 201,47 11,78</p>	<p>247,33</p>
75	<p>ut de Canvi de ICPM a potencia normalitzada de 13,856kW, col·locacio de protector per sobre tensions en capçalera Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Efectuar comprovacions de terra i de resistències d'aïllament de les línies. Rotulacio de manera indeleble els circuits. Canvi ICPM existent per al corresponent per vademècum de CIA a potencia normalitzada de 13,586 kW i ajustant a la tensió de treball del quadre. Si el increment de proteccions no cap al quadre elèctric existent, esta inclòs el canvia proteccions per DPN per generar espai. Inclou compensació de fases i realització d'informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal</p> <p>Mà d'obra Materials 5 % Costos indirectes</p>	<p>155,39 202,14 17,88</p>	<p>375,41</p>

Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
76	<p>ut de Identificar com cal el conjunt de les línees que conformen el quadre general de distribució. Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línees. Rotulació de manera indeleble els circuits. Inclou compensació de fases i realització d'informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal. Eliminar condensadors, equips de regulació de flux en capçalera.</p> <p>Mà d'obra 5 % Costos indirectes</p>	<p>93,26 4,66</p>	97,92
77	<p>ut de Manca de protecció contra contactes indirectes (interruptor/s diferencial/s) a algun dels circuits del quadre general de distribució. Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línees segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Subministrament, instal·lació i muntatge de diferencial trifàsic en la línia de sortida que no actua inclòs la retirada del existent. Inclou equilibrat de fases i informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal</p> <p>Mà d'obra Materials 5 % Costos indirectes</p>	<p>108,60 269,47 18,90</p>	396,97
78	<p>ut de Endoll no fixat al carril DIN Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línees segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Subministrament, instal·lació i muntatge d'endoll fixat al carril DIN, fotografies i alta al sistema gis municipal</p> <p>Sense descomposició 5 % Costos indirectes</p>	<p>80,59 4,03</p>	84,62
79	<p>UT de Feines de serralleria per la reparació del pany del armari, inclou adaptació de porta al nou bombí amb pany GIS, i feines de pintura.</p> <p>Mà d'obra Materials 5 % Costos indirectes</p>	<p>24,87 15,11 2,00</p>	41,98
80	<p>UT de Per validar la traçabilitat de que els assajos entregats s'ajusten a les lluminàries instal·lades, s'agafaran tres lluminàries al atzar definides per D.F. o la propietat i es portaran a assajar a una laboratori acreditat, realitzant-se els següents assajos parcials de les llumeneres: - SEGURETAT ELÈCTRICA (EN 60598-1: 2015 + A1: 2018 + A 60598- 2-3: 2002 + A1: 2011) Inspecció visual de punts crítics + verificació de marcat i instruccions Assaigs de parciales endurància segons apartat 12.3 i verificació de Tc segons apartat 12.4 Assaigs d'estanqueïtat grau IP (segona xifra) segons apartat 9.2. Assaigs de rigidesa dielèctrica segons apartat 10.2.2 Verificació de resistència a impactes grau IK - Fotometria (ASSAIG Reduïda A 13.032-4: 2016) Rendiment del llum en lm / W Verificació de l'índex de reproducció cromàtica CRI Verificació de temperatura de color</p> <p>Sense descomposició 5 % Costos indirectes</p>	<p>479,67 23,99</p>	503,66



Quadre de preus nº 2

Nº	Designació	Import	
		Parcial (Euros)	Total (Euros)
81	<p>ut de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE RETROFEET EN LLUMENERA EXISTENT , AMB POTENCIA NOMINAL DE FINS A 60W, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>Mà d'obra                      Resta d'Obra                      5 % Costos indirectes</p>	<p>46,60                      100,77                      7,37</p>	<p>154,74</p>
82	<p>ut de Subministrament i col·locació de làmpada de tecnologia LED Bulb per a substitució de l'existent, amb una potència de consum de 5W. Garantia de 1 any, mitjana de vida 15.000 hores, temperatura de color 3000-4000K. S'inclou el desmuntatge i retirada de l'antiga làmpada, la neteja de la llumenera exterior i interiorment, el muntatge i connexió del nou, així com la maquinària, i la mà d'obra necessària per portar a terme aquestes actuacions, la gestió de residus, amb el transport del material i el cànon d'abocador corresponent, i la part proporcional de seguretat i salut. S'inclou la instal·lació a qualsevol alçada.</p> <p>Mà d'obra                      Maquinària                      Materials                      5 % Costos indirectes</p>	<p>41,01                      26,42                      45,35                      5,64</p>	<p>118,42</p>

Quadre de preus nº 2

Nº	Designació	Import		
		Parcial (Euros)	Total (Euros)	
83	<p>UT de SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL INNOVA B O EQUIVALENT D'ALÇADA FINS A 760 MM, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINC ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica amb tres formes de subjecció: Ròtula, Braç i Suspesa</li> <li>- Doble cavitat aïllades tèrmicament (LED - DRIVER</li> <li>- Ròtula: Fixació tant lateral, com a top diàmetre 60mm, amb possibilitat d'orientació i inclinació de 0 - 15° amb la mateixa peça</li> <li>- Braç: Fixació top diàmetre 60mm.</li> <li>- Suspesa: Fixació mitjançant adaptador a catenària oa rosca GAS</li> <li>- Tancament a pressió sense cargols ni necessitat de ferramentes.</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes IK09</li> <li>- Mides: 569x468x105mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9007 i Negre Mate</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària. Les aletes del dissipador tèrmic estan protegides per una tapa superior que evita l'acumulació de brutícia, mantenint aquesta part vital en perfecte estat de funcionament.</li> <li>- Diverses versions de 15W fins a 100W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament deficiència energètica.</li> <li>Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca Philips Xitanium Full Prog regulable en potència</li> <li>- Driver dimmable 1-10V, opcionalment PLC, DALI, Programable.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> <li>- Incorpora seccionador de corrent (desconnexió automàtica) o connector segur de tres pols.</li> <li>- Compleix amb totes les certificacions corresponents al CE, homologada per IAC i amb marcatge ENEC.</li> </ul> <p>Mà d'obra 40,95                      Maquinària 37,59                      Materials 130,95                      5 % Costos indirectes 10,47</p>			219,96
84	<p>ut de Conexionat del element de la instal·lacio a la xarxa de terra del quadre d'enllumenat public:</p> <p>Instal·lació i muntatge de conductor de coure nu, unipolar 1x35 mm2 muntat en fons de rasa</p> <p>Subministrament, instal·lació i muntatge de piqueta de connexió a terra d'acer i recobrimet de coure de 2,- metres de longitud, i 14,6 mm de diàmetre, estàndard i clavada al terra.</p> <p>Connexionat del element a la xarxa de distribució del terra.</p> <p>Canalització i estesa de cable fins a 5 metres de llargària, unclou trencament i reposició vorera panot.</p> <p>Verificació del terra de la instal·lació una vegada connectat l'element determinat. Realització d'informe de recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema GIS municipal.</p> <p>Sense descomposició 121,26                      5 % Costos indirectes 6,07</p>			127,33



**DOCUMENT N°4: PRESSUPOST  
CAPÍTOL N°4: PRESSUPOSTOS PARCIAIS**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ  
EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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Codi	U	Denominació	Amidament	Preu	Total
<b>1.2.2 D006</b>	<b>M3</b>	<b>EXCAVACIO DE RASA PER A PAS D'INSTAL·LACIONS FINA A 1,-METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MECANICS I AMB LES TERRES DEIXADES A LA VORA.</b>			
	<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>
Rassa	1	15,000	0,400	0,500	3,000
Fonaments punt de llum 8	2	0,800	0,800	0,800	1,024
Fonaments punts de llum 4	6	0,600	0,600	0,600	1,296
Arquetes	6	1,000	1,000	1,000	6,000
				0,200	11,320
				2,264	
		Total M3 .....		2,264	6,67
					15,10
<b>1.2.3 D07</b>	<b>M3</b>	<b>REBLIMENT I PICONATGE DE RASA D'AMPLARIA FINA A 60 CM, AMB MATERIAL SELECCIONAT DE L'OBRA, EN TONGADES DE GRUIX DE FINA A 25 CM, UTILITZANT PICO VIBRANT, AMB COMPACTACIO DEL 95% P.M.</b>			
	<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>
Rassa	1	15,000	0,400	0,300	1,800
					1,800
		Total M3 .....		1,800	16,26
					29,27
<b>1.2.4 D08</b>	<b>M3</b>	<b>TRANSPORT DE RUNES A L'ABOCADOR AMB CONECTOR, CARREGAT AMB MITJANS MECANICS I MANUALS AMB UN RECORREGUT DE FINA A 10,-KM INCLOS ELS DRETS D'ABOCAMENT</b>			
	<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>
Rassa	1	15,000	0,400	0,200	1,200
Fonaments punt de llum 8	2	0,800	0,800	0,800	1,024
Fonaments punts de llum 4	6	0,600	0,600	0,600	1,296
Arquetes	6	1,000	1,000	1,000	6,000
				1,300	9,520
		Total M3 .....		12,376	12,376
				13,04	161,38
<b>1.2.5 D09</b>	<b>M2</b>	<b>PAVIMENT DE PANOT PER A VORERA GRIS DE 20x20x4 CM, CLASSE 1A TIPUS 2, COL·LOCAT A L'ESTESSA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PÒRTLAND I BEURADA DE CIMENT PÒRTLAND</b>			
	<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>
Rassa	1	15,000	0,400		6,000
Fonaments punt de llum 8	2	0,800	0,800		1,280
Fonaments punts de llum 4	6	0,600	0,600		2,160
Arquetes	6	1,000	1,000		6,000
		Total M2 .....			15,440
				26,24	405,15
<b>1.2.6 D10</b>	<b>M2</b>	<b>PAVIMENT DE PECES DE FORMIGO PER A VORERA DE 30x30x4 CM, IGUALS A LES EXISTENTS, COL·LOCAT A L'ESTESSA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PÒRTLAND I BEURADA DE CIMENT PÒRTLAND</b>			
		Total M2 .....		0,100	28,96
					2,90
<b>1.2.7 D11</b>	<b>M2</b>	<b>PAVIMENT DE MICROAGLOMERAT ASFALTIC EN CALENT, COLOR SAULO DE 4 CM DE GRUIX IGUAL AL EXISTENT.</b>			
		Total M2 .....		0,100	32,67
					3,27
<b>1.2.8 D12</b>	<b>M3</b>	<b>PAVIMENT DE FORMIGO SENSE ADDITIUS HM-30/B/20/I+E DE CONSISTENCIA TOVA GRANDARIA MAXIMA DEL GRANULAT 20 MM, ESCAMPAT DES DE CAMIO, ESTESA I VIBRATGE MECANIC I ACABAT REGLEJAT</b>			
	<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>
Rassa	1	15,000	0,400	0,200	1,200
Fonaments punt de llum 8	2	0,800	0,800	0,800	1,024
Fonaments punts de llum 4	6	0,600	0,600	0,600	1,296
		Total M3 .....			3,520
				61,97	218,13

Codi	U	Denominació	Amidament	Preu	Total
1.2.9 D13	M2	PAVIMENT DE MESCLA BITUMINOSA EN CALENT DE COMPOSICIO Densa D-12 AMB GRANULAT GRANÍTIC I BETUM ASFALTIC DE PENETRACIO, ESTESA I COMPACTADA AL 98 % DE L'ASSAIG MARSHALL.			
		Total M2 .....	0,100	27,77	2,78
1.2.10 D14	UT	PERICO DE 38x38x55 CM, AMB PARETS DE 15 CM DE GRUIX DE FORMIGO HM-20/P/20 I I SOLERA DE MAÓ CALAT, SOBRE LLIT DE SORRA.			
		Total UT .....	6,000	65,21	391,26
1.2.11 D15	UT	BASTIMENT I TAPA PER A PERICO DE SERVEIS DE FOSA GRISA DE 420x420x40 MM I DE 25 KG DE PES , COL·LOCAT AMB MORTER MIXT 1:05:04, ELABORAT A L'OBRA AMB FORMIGONERA DE 165 LITRES			
		Total UT .....	6,000	28,92	173,52
1.2.12 D16	ML	TUB RIGID DE PVC DE 110 MM DE DIAMTRE NOMINAL I 1,70 MM DE GRUIX, AMB GRAU DE RESISTENCIA AL XOC 7, ENDOLLAT I MUNTAT COM A CANALITZACIO SOTERRADA.			
		Total ML .....	0,100	3,37	0,34
1.2.13 D17	ML	TUB RIGID D'ACER ELECTRO GALVANITZAT, DE DIAMETRE NOMINAL REFERENCIA 36, ROSCAT I MUNTAT SUPERFICIALMENT.			
		Total ML .....	0,100	22,01	2,20
1.2.14 D18	ML	TUB FLEXIBLE CORRUGAT DE 80 MM DE DIAMETRE NOMINAL I 4,25 MM DE GRUIX AMB GRAU DE RESISTENCIA AL XOC 7 I MUNTAT COM A CANALITZACIO SOTERRADA.			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Rassa	1	15,000			15,000
Fonaments punt de llum 8	2	2,000			4,000
Fonaments punts de llum 4	6	2,000			12,000
Arquetes	6	1,000			6,000
		Total ML .....			37,000
				1,90	70,30
1.2.15 D19	ML	TUB FLEXIBLE CORRUGAT DE PVC DE DIAMETRE NOMINAL REFERENCIA 21 AMB GRAU DE RESISTENCIA AL XOC 5 I ENCASTAT.			
		Total ML .....	1,000	1,11	1,11
1.2.16 D21	ML	CINTA DE PVC PER A SENYALITZACIO D'INSTAL·LACIONS SOTERRADES. INSTAL·LADA A 25 CM PER DAMUNT DEL TUB			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Rassa	1	15,000			15,000
Fonaments punt de llum 8	2	2,000			4,000
Fonaments punts de llum 4	6	2,000			12,000
Arquetes	6	1,000			6,000
		Total ML .....			37,000
				0,19	7,03
1.2.17 D25	UT	PARTIDA DE COBRAMENT INTEGRE PER L'OBRA CIVIL PER CREAR UN SORTIDA EN PUNT DE LLUM EXISTENT			
		Total UT .....	6,000	23,17	139,02
1.2.18 D26	UT	PARTIDA DE COBRAMENT INTEGRE PER L'OBRA CIVIL PER EL CALAT DE MUR DE FORMIGO A LA ZONA VERDA.			
		Total UT .....	1,000	204,01	204,01
1.2.19 J02	UT	PARTIDA COMPLETA I EN FUNCIONAMENT DE PROTECCIÓ INDIVIDUALS DELS ARBRES DE PERÍMETRE DEL TRONC DE FINS A 149 CM DE PERÍMETRE CONTRA ELS COPS, CONSISTENT EN TANCATS DE FUSTA DE PI, DE 22 MM DE GRUIX, PER A 5 USOS DE 2 METRES D'ALÇADA COM A MÍNIM, I ES PROTEGIRÀ AMB MATERIAL D'ENCOIXINAT (BANDES DE JUTE), LA PART DEL TRONC EN CONTACTE AMB EL TANCAT DE FUSTA, LES ZONES DE CONTACTE DELS L·LIGAMS AMB L'ESCORÇA, I LA ZONA DEL COLL DE L'ARREL SI FOS NECESSARI.(INCLÒS LA COL·LOCACIÓ I EL DESMUNTATGE.).			
		Total UT .....	4,000	22,11	88,44

1.3 INSTAL·LACIONS

Codi	U	Denominació	Amidament	Preu	Total
1.3.1 C001	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE NU, UNIPOLAR 1x35 MM2 MUNTAT EN FONS DE RASA			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Canalització nous punts de llum	7	3,000			21,000
Subquadre	1	3,000			3,000
		Total ML .....			24,000
				1,90	45,60
1.3.2 IEP022	U	Subministrament i instal·lació de presa de terra composta per un pou de 2 m de profunditat en l'interior de la qual s'instal·la una placa de coure electrolític pur de 500x500x1,5 mm unida a la barra conductora de coure estanyat de 30x2 mm, connectada a pont per a comprovació, dintre d'una arqueta de registre de polipropilè de 30x30 cm. Fins i tot replanteig, excavació del pou, col·locació de la placa en el seu interior, connexió entre la placa i el conductor de terra mitjançant platina conductora, col·locació de l'arqueta de registre, connexió de la platina conductora amb la línia d'enllaç mitjançant born d'unió, reblert amb terres de la pròpia excavació i additius per a disminuir la resistivitat del terreny i connectat a la xarxa de terra mitjançant pont de comprovació. Totalment muntada, connexionada i provada per l'empresa instal·ladora mitjançant les corresponents proves de servei (incloses en aquest preu). Inclou: Replanteig. Excavació del pou. Col·locació de la placa. Connexió de la placa amb la platina conductora. Col·locació de l'arqueta de registre. Connexió de la platina conductora amb la línia d'enllaç. Reblert de la zona excavada. Connexionat a la xarxa de terra. Realització de proves de servei. Criteri d'amidament de projecte: Nombre d'unitats previstes, segons documentació gràfica de Projecte. Criteri de mesura d'obra: Es mesurarà el nombre d'unitats realment executades segons especificacions de Projecte.			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Terra subquadre 4	1				1,000
		Total U .....			1,000
				51,79	51,79
1.3.3 C010	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 1x16,00 MM2 , COL·LOCAT EN TUB			
		Total ML .....			40,000
				7,98	319,20
1.3.4 CR01	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X6 MM2 COL·LOCATS EN TUB.			
		Total ML .....			40,000
				7,25	290,00
1.3.5 CR02	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X6 MM2 COL·LOCATS EN TUB.			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Projectors darreera quadre 2		25,000			25,000
		Total ML .....			25,000
				7,39	184,75
1.3.6 CR05	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X10 MM2 COL·LOCAT EN TUB.			
		Total ML .....			0,010
				8,11	0,08
1.3.7 CR06	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X10 MM2 COL·LOCAT EN TUB.			
		Total ML .....			0,010
				8,28	0,08
1.3.8 CR09	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 4X16 MM2 COL·LOCAT EN TUB.			
		Total ML .....			0,010
				12,67	0,13
1.3.9 CR10	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE VV 0,6/1KV DE 5X16 MM2 COL·LOCAT EN TUB.			
		Total ML .....			0,010
				8,55	0,09

Codi	U	Denominació	Amidament	Preu	Total
1.3.10 CR03	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 4X6 MM2 MUNTAT SUPERFICIALMENT TRENAT.			
		Total ML .....	0,010	8,94	0,09
1.3.11 CR04	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X6 MM2 MUNTAT TRENAT SUPERFICIALMENT.			
		Total ML .....	0,010	8,98	0,09
1.3.12 CR07	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 4X10 MM2 MUNTAT SUPERFICIALMENT.			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Quadre nº7, línia 4		50,000			50,000
		Total ML .....			50,000
					9,85
					492,50
1.3.13 CR08	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X10 MM2 MUNTAT SUPERFICIALMENT.			
		Total ML .....	0,010	9,90	0,10
1.3.14 CR11	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 1X16 MM2 MUNTAT SUPERFICIALMENT.			
		Total ML .....	0,010	10,08	0,10
1.3.15 CR12	ML	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE CONDUCTOR DE COURE DESIGNACIÓ UNE RZ 0,6/1KV DE 5X16 MM2 MUNTAT SUPERFICIALMENT.			
		Total ML .....	0,010	10,19	0,10

1.4 LLUMENERES I BACULS

1.4.1 MILAN	UT	<p>SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL MILAN S O EQUIVALENT, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%, AMB DRIVER PROGRAMABLE AMB CINC ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i tres mides diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED - DRIVER)</li> <li>- Ròtula: Fixació tant lateral, com a top diàmetre 60mm, amb possibilitat d'orientació i inclinació de -15 a + 15° amb la mateixa peça</li> <li>- Tancament a pressió sense cargols ni necessitat de ferramentes.</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes IK10</li> <li>- Mides: 525x250x80mm - 625x290x95mm - 775x320x95mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona, i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S40 fins a 40W, S60 fins a 60W, M fins a 100W, XL fins a 150W, i XXL fins a 300W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Ideal per a alçades de 4 metres fins a 14 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica.</li> <li>- A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> <li>- Incorpora seccionador de corrent (desconnexió automàtica) o connector segur de tres pols.</li> </ul>			
	Uts.	Llargada	Amplada	Alçada	Subtotal



Codi	U	Denominació	Amidament	Preu	Total
Canvi massiu Punts de llum carretera	331		331,000		
	2		2,000		
		Total UT .....	333,000	195,62	65.141,46

**1.4.2 SOCELEC7**      **UT**      **SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL INNOVA B O EQUIVALENT D'ALÇADA FINS A 760 MM, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.**

La llumenera te les següents característiques:

- Forma aerodinàmica amb tres formes de subjecció: Ròtula, Braç i Suspesa
- Doble cavitat aïllades tèrmicament (LED - DRIVER
- Ròtula: Fixació tant lateral, com a top diàmetre 60mm, amb possibilitat d'orientació i inclinació de 0 - 15° amb la mateixa peça
- Braç: Fixació top diàmetre 60mm.
- Suspesa: Fixació mitjançant adaptador a catenària oa rosca GAS
- Tancament a pressió sense cargols ni necessitat de ferramentes.
- Difusor en vidre temperat pla amb màxima protecció a impactes IK09
- Mides: 569x468x105mm
- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9007 i Negre Mate
- Tots els cargols exteriors i interiors en acer inoxidable.
- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.
- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària. Les aletes del dissipador tèrmic estan protegides per una tapa superior que evita l'acumulació de brutícia, mantenint aquesta part vital en perfecte estat de funcionament.
- Diverses versions de 15W fins a 100W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament deficiència energètica.

Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C

- Lents de PMMA, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.
- Driver primera marca Philips Xitanium Full Prog regulable en potència
- Driver dimmable 1-10V, opcionalment PLC, DALI, Programable.
- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe II
- Inclou protector individual contra sobretensions de 20KA (tipus 2)
- Incorpora seccionador de corrent (desconnexió automàtica) o connector segur de tres pols.
- Compleix amb totes les certificacions corresponents al CE, homologada per IAC i amb marcatge ENEC.

	Uts.	Llargada	Amplada	Alçada	Subtotal		
Innova B i INNOBA	14				14,000		
B+Columna	6				6,000		
					Total UT .....	20,000	219,96
							4.399,20

**1.4.3 NEOVILLA**      **UT**      **SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL NEOVILLA O EQUIVALENT D'ALÇADA FINS A 750 MM, AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS**

Total UT .....

					21,000	254,19	5.337,99
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Codi	U	Denominació	Amidament	Preu	Total
1.4.4 projec	UT	<p>SUBMINISTRAMENT, INSTAL•LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL PROJECTOR M MILAN S APM140 O EQUIVALENT D'ALÇADA , AMB POTENCIA NOMINAL DE FINS A 140W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p> <p>La llumenera te les següents característiques:</p> <ul style="list-style-type: none"> <li>- Forma aerodinàmica plana amb baixa resistència al vent i quatre mesures diferents per a diversos rangs de potència.</li> <li>- Doble cavitat aïllades tèrmicament (LED - DRIVER)</li> <li>- Fixació mitjançant lira, amb possibilitat d'orientació i inclinació de -120 ° a + 120 °</li> <li>- Difusor en vidre temperat pla amb màxima protecció a impactes fins a IK10</li> <li>- Mides (lira inclosa): 390x282,5x73mm - 490x390x81mm - 595x460x95mm - 727x558x107mm</li> <li>- Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022</li> <li>- Tots els cargols exteriors i interiors en acer inoxidable.</li> <li>- Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació.</li> <li>- Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària.</li> <li>- Diverses versions: S fins a 80W, M fins a 140W, XL fins a 240W i XXL fins a 460W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica.</li> <li>- Versió especial del Projector MILAN XL-RGBW: Tres colors primaris més blanc. Controlable externament amb 4 canals de DMX-512.</li> <li>- Ideal per a alçades de 4 metres fins a 18 metres.</li> <li>- Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C</li> <li>- Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida.</li> <li>- Driver primera marca segons configuració de regulació o telegestió.</li> <li>- Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II</li> <li>- Inclou protector individual contra sobretensions de 20KA (tipus 2)</li> </ul>			
		Total UT .....	11,000	247,33	2.720,63
1.4.5 Fluores01	ut	<p>SUBMINISTRAMENT, INSTAL•LACIÓ I MUNTATGE DE fluorescent leed EN LLUMENERA EXISTENT , AMB POTENCIA NOMINAL DE FINS A 15W, AMB TEMPERATURA DE COLOR 3000 °K, , AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS.</p>			
		Total ut .....	48,000	25,57	1.227,36

Codi	U	Denominació	Amidament	Preu	Total
1.4.6 pmilna	ut	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE LLUMENERA PER A VIALS MARCA NOVATILUM O SIMILAR MODEL PROJECTOR P MILAN S APMS O EQUIVALENT , AMB POTENCIA NOMINAL DE FINS A 60W, INLOS ADAPTADOR PER A BRAÇ O COLUMNA, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINC ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS. La llumenera te les següents característiques: - Forma aerodinàmica plana amb baixa resistència al vent i quatre mesures diferents per a diversos rangs de potència. - Doble cavitat aïllades tèrmicament (LED - DRIVER) - Fixació mitjançant lira, amb possibilitat d'orientació i inclinació de -120 ° a + 120 ° - Difusor en vidre temperat pla amb màxima protecció a impactes fins a IK10 - Mides (lira inclosa): 390x282,5x73mm - 490x390x81mm - 595x460x95mm - 727x558x107mm - Carcassa realitzada en alumini injectat amb tractament anticorrosió, acabada en pintura epoxi en pols al forn. Colors: Gris RAL 9022 - Tots els cargols exteriors i interiors en acer inoxidable. - Doble compartiment IP66: Equip elèctric/electrònic amb junta d'estanqueïtat de silicona; i mòdul LED amb vàlvula anticondensació. - Dissipador tèrmic de màxima dissipació realitzat en alumini injectat formant part de la lluminària. - Diverses versions: S fins a 80W, M fins a 140W, XL fins a 240W i XXL fins a 460W, per tal de poder ajustar exactament la potència necessària per a cada situació, en compliment del reglament d'eficiència energètica. - Versió especial del Projector MILAN XL-RGBW: Tres colors primaris més blanc. Controlable externament amb 4 canals de DMX-512. - Ideal per a alçades de 4 metres fins a 18 metres. - Mòdul NOVATILUX amb placa PCB de 24 LED fins a 168 LED Zhaga. Lumiled 5050 de 172 lm/W d'eficiència nominal a 85°C - Lents de PMMA 2x2, configurables per a qualsevol distribució lumínica. A utilitzar en funció de les interdistàncies existents i l'homogeneïtat requerida. - Driver primera marca segons configuració de regulació o telegestió. - Entrada universal alimentació del Driver 100-277V i freqüència 50/60Hz, Classe I i II - Inclou protector individual contra sobretensions de 20KA (tipus 2)			
		Total ut .....	28,000	218,17	6.108,76
1.4.7 LL03	UT	SUBMINISTRAMENT, MUNTATGE I INSTAL·LACIÓ DE BRAÇ DE 1,50 METRE DE DIAMETRE 42 MM. INCLÒS TOT EL NECESSARI PER LA SEVA CORRECTE FIXACIÓ SEGONS LO ESTABLERT PER D.F.			
		Total UT .....	46,000	102,99	4.737,54
1.4.8 C08	UT	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE COLUMNA TRONCOCONICA DE 8,00 METRES D'ALÇADA , AMB BASE , PLATINA I PORTA,,AMB CARTELA I ARO DE REFORÇ COL·LOCADA SOBRE DAU DE FORMIGO. INCLOU PERNS D'ANCORATGE, COFRED DE CONNEXIONS I CONDUCTOR DE COURE DESIGNACIO UNE RV 0,6/1KV DE 5X2,50 MM2 LES NOVES COLUMNES O BÀCULS HAURAN DEVENIR: - CARTELES I AROS DE REFORÇ FINS A250MM. - GALVANITZADES EN CALENT EN ISO1461. - PORTELLA RASANT AMB REFORÇ INTERIOR. - ELS PUNTS DE LLUM COMPLIRAN L'APARTAT 6.1 DE LA ITC-BT-09 DEL REBT AMB ELS ACLARIMENT DE LA GUIA TÈCNICA I DISPOSARAN DEL MARCATGE DE LACE. - LES COLUMNES I BÀCULS D'ACER GALVANITZAT TINDRAN UN RECOBRIMENT PROTECTOR AMB POLIAMIDA TERMOPLÀSTICA EN POLS DE TIPUS RILSAN O EQUIVALENT APLICADA PER IMMERSIÓ. AQUEST PROCÉS S'APLICARÀ DES DE LA BASE DE COLUMNA FINS A L'ALÇADA DE LA PORTELLA PER LA PART INTERIOR COM L'EXTERIOR TENINT CURA QUE LA PRESA DE TERRA NO QUEDI RECOBERTA PER AQUEST TRACTAMENT. AQUEST PROCÉS S'APLICARÀ DESPRÈS D'UN DECAPAT I GRANALLAT SOBRE LA SUPERFÍCIE A TRACTAR. - LA GARANTIA DEL SUPORTS DEL FABRICANT SERÀ COM A MÍNIM DE 20 ANYS I DE LA PART TRACTADA AMB TRACTAMENT D'ANTICORROSIU SERÀ DE 10ANYS.			
	Uts.	Llargada	Amplada	Alçada	Subtotal
CARRETERA	2				2,000
		Total UT .....			2,000
				344,79	689,58

Codi	U	Denominació	Amidament	Preu	Total	
1.4.9 C03	UT	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE COLUMNA TIPUS NICOLSON DE 4,00 METRES D'ALÇADA , AMB BASE , PLATINA I PORTA,,AMB CARTELA I ARO DE REFORÇ COL·LOCADA SOBRE DAU DE FORMIGO. INCLOU PERNS D'ANCORATGE, COFRED DE CONNEXIONS I CONDUCTOR DE COURE DESIGNACIO UNE RV 0,6/1KV DE 5X2,50 MM2 LES NOVES COLUMNES O BÀCULS HAURAN DEVENIR: - CARTELES I AROS DE REFORÇ FINS A250MM. - GALVANITZADES EN CALENT EN ISO1461. - PORTELLA RASANT AMB REFORÇ INTERIOR. - ELS PUNTS DE LLUM COMPLIRAN L'APARTAT 6.1 DE LA ITC-BT-09 DEL REBT AMB ELS ACLARIMENT DE LA GUIA TÈCNICA I DISPOSARAN DEL MARCATGE DE LACE. - LES COLUMNES I BÀCULS D'ACER GALVANITZAT TINDRAN UN RECOBRIMENT PROTECTOR AMB POLIAMIDA TERMOPLÀSTICA EN POLS DE TIPUS RILSAN O EQUIVALENT APLICADA PER IMMERSIÓ. AQUEST PROCÉS S'APLICARÀ DES DE LA BASE DE COLUMNA FINS A L'ALÇADA DE LA PORTELLA PER LA PART INTERIOR COM L'EXTERIOR TENINT CURA QUE LA PRESA DE TERRA NO QUEDI RECOBERTA PER AQUEST TRACTAMENT. AQUEST PROCÉS S'APLICARÀ DESPRÈS D'UN DECAPAT I GRANALLAT SOBRE LA SUPERFÍCIE A TRACTAR. - LA GARANTIA DEL SUPORTS DEL FABRICANT SERÀ COM A MÍNIM DE 20 ANYS I DE LA PART TRACTADA AMB TRACTAMENT D'ANTICORROSIU SERÀ DE 10ANYS.				
	Uts.	Llargada	Amplada	Alçada	Subtotal	
Columnes parques					0,000	
		6,000			6,000	
		Total UT .....			6,000	221,69
					1.330,14	
1.4.10 ret01	ut	SUBMINISTRAMENT, INSTAL·LACIÓ I MUNTATGE DE RETROFEET EN LLUMENERA EXISTENT , AMB POTENCIA NOMINAL DE FINS A 60W, AMB TEMPERATURA DE COLOR 3000 °K, AMB PROTECCIÓ DEL BLOC ÒPTIC I DE LA ENVOLVENT DE IP66 I IK-10, AMB FLUX DE CONTAMINACIÓ ATMOSFÈRICA INFERIOR AL 1%,AMB DRIVER PROGRAMABLE AMB CINQ ESGLAONS DE REGULACIÓ, AMB PROTECTOR DE SOBRETENSIONS INCLÒS DE CARACTERÍSTIQUES MÍNIMES 10 KV / 10 KA, CLASE 2, COLOR RAL A DEFINIR PER D.F., TANCADA, AMB ALLOTJAMENT PER A EQUIP I ACOBLADA AL SUPORT. INCLOU COFRETS DE CONNEXIONS I CONDUCTOR DE COURE UNE RV 0,6/1KV DE 3X2,50 MM2. GARANTIA DEL MATERIAL 5 ANYS. Total ut .....				
					5,000	
					154,74	
					773,70	
1.4.11 SALVI005	ut	Subministrament i col·locació de làmpada de tecnologia LED Bulb per a substitució de l'existent, amb una potència de consum de 5W. Garantia de 1 any, mitjana de vida 15.000 hores, temperatura de color 3000-4000K. S'inclou el desmuntatge i retirada de l'antiga làmpada, la neteja de la llumenera exterior i interiorment, el muntatge i connexió del nou, així com la maquinària, i la mà d'obra necessària per portar a terme aquestes actuacions, la gestió de residus, amb el transport del material i el cànon d'abocador corresponent, i la part proporcional de seguretat i salut. S'inclou la instal·lació a qualsevol alçada.				
	Uts.	Llargada	Amplada	Alçada	Subtotal	
Canvi bombeta baix consum					8,000	
	8				8,000	
		Total ut .....			8,000	118,42
					947,36	
1.4.12 CR12X35	ML	CONDICIONAMENT DE QUADRES, INCLOU EL SANEJAMENT I RETIRADA DE TOTS ELS ELEMENTS OBSOLETS, CONDENSADORS, REGULADORS DE FLUX. ESTA INCLÒS EL TRASLLATS, GESTIO I DESPESES D'ABOCADOR Total ML .....				
					11,000	
					213,15	
					2.344,65	

Codi	U	Denominació	Amidament	Preu	Total
1.4.13 CR12X17	ML	<p>SUBMINISTRE I INSTAL·LACIÓ DE SISTEMA DE TELEGESTIÓ CLEVER MASTER O SIMILAR, CONFIGURACIÓ, POSADA EN SERVEI. ESTA INCLOS CLEVER MASTER CSD / 5G, ANTENA MASTER AMB QUANY, CONMUTADOR CM3 POS 2 INV, 9 BORNES DOBLES PIS RKD 2,50 MM P/GUIA AR 35, 2 FINAL DE GUIA AR35 ES35 I UN CABLE CLEVER WAT</p> <p>MANTENIMENT.</p> <p>CARACTERSTIQUES TELECONTROL D'ENCESA, SISTEMA DE TELECONTROL NarrowBandNB IoT/ LoRaWAN, AMB ASTRONÒMIC INCORPORAT CLEVER-MASTER O EQUIVALENT</p> <ul style="list-style-type: none"> <li>• Rebre informació en temps real i actuar sobre la xarxa d'enllumenat exterior des d'un lloc de telecontrol o altres ordinadors, 3 telèfons mòbils prèviament autoritzats i 1 telèfon mòbil sistema tall cablejat (Policia), també podem comunicar localment mitjançant ordinador portàtil.</li> <li>• Ajust precís de l'encesa i apagat de les instal·lacions per mitjà d'un microprocessador amb càlcul astronòmic diari del l'orto i l'ocàs, i possibilitat d'encès mitjançant telecomandament per quadre o grup de quadres.</li> <li>• Estalvi energètic de les instal·lacions en reduir el flux lluminós en hores de poca utilització de l'enllumenat mitjançant reductor-estabilitzador en capçalera.</li> <li>• Millora de la qualitat del servei en detectar les avaries en temps real i poder actuar immediatament.</li> <li>• Màxima eficiència en l'explotació i manteniment de les instal·lacions gràcies al flux d'informació rebuda via SMS text personalitzat 150 caràcters o Mail via smartphone.</li> <li>• Integren comunicació bidireccional NarrowBand NB IoTcapaç de realitzar comunicacions en temps real amb telèfons mòbils autoritzats via SMS i amb el centre de control mitjançant entorn IP dinàmiques o trucada CSD.</li> <li>• Disposa de rellotge astronòmic programable via NarrowBand NB IoT mitjançant connexió RS232 cable PC.</li> <li>• Rellotge intern de temps real (RTC) amb bateria de liti pròpia, substituïble als 5 anys.</li> <li>• Desviació del rellotge astronòmic +/-1 minut any.</li> <li>• Memòria EEPROM interna de 4 Mbits guardant valors eficaços per fase en períodes de 30 minuts dels últims 30 dies, adquirits del tarifador gestió energètica.</li> <li>• Possibilitat de valors durant 24 hores en períodes d'1 minut. Programacions d'estalvi, astronòmic i texts personalitzats identificats d'entrades auxiliars...</li> <li>• Permet comunicació mostrant valors eficaços de funcionament d'instal·lació amb auditoria energètica a temps real.</li> <li>• LoRaWAN comunicació global del Municipi i sensorització.</li> <li>• GPRS intern en el propi equip per comunicació de suport.</li> <li>• Possibilitat de connexió mitjançant IP dinàmiques gràcies a la versatilitat del programari. Reduint costos i temps d'explotació en instal·lacions de més de 150 escames.</li> <li>• Antena GSM/GPRS interna en el propi equip amb possibilitat de connexió d'una altra externa per a major guany.</li> <li>• Bateria recarregable de liti interna, permet que l'equip enviï un SMS quan s'interromp el subministrament elèctric del centre de comandament.</li> <li>• Funcionament amb targetes de telefonia mòbil, amb tots els operadors nacionals.</li> <li>• Permet actualitzacions de firmware de forma remota (Local per cable, NarrowBand NB IoT)</li> <li>• Sistema de seguretat per a connexió a través de codi PIN en la targeta de telefonia.</li> <li>• Protegit contra descàrregues atmosfèriques conduïdes.</li> <li>• Protegit contra sobretensions permanents.</li> <li>• Els equips estan degudament patentats i fabricats a la Unió Europea, amb els seus corresponents certificats i documents que acrediten els drets d'explotació, compleixen la normativa vigent de seguretat per a equips elèctrics UNE -EN 61010-1.</li> <li>• Compleix amb normativa ROHS.</li> <li>• 8 Ports. Permeten comunicar i programar fins a 8 sortides domòtiques magneto tèrmic i diferencial iDPR (Diferencial Progressiu amb Reconexió).</li> <li>• 1 Port. Permet connexió directa amb PC.</li> <li>• 1 Port. Permet unitats d'expansió per a presa de dades elèctriques en quadres amb altres reguladors de mercat.</li> <li>• 1 Port. Permet una connexió transparent amb el tarifador per la pressa de tancaments amb protocol companyia.</li> <li>• 1 Rellotge astronòmic ajustable + - l'orto / + - l'ocàs amb relé funció commutat.</li> <li>• 3 Circuits auxiliars, programació individual i funció astronòmica amb funció de rellotge, hores fixes set dies setmanals</li> </ul>			

Codi	U	Denominació	Amidament	Preu	Total
		<ul style="list-style-type: none"> <li>• 1 Sortida 1-10V control de balastres electrònics.</li> <li>• 32 Entrades lliures de potencial per a esdeveniments personalitzats amb 150 caràcters via SMS,.</li> </ul> <p>(Obertura de portes, caiguda de diferencials,...). 3 d'elles es poden combinar amb els 3 relés de sortida per engegar un dispositiu en produir-se un esdeveniment (connectar una sirena si s'obre una porta, encendre una bomba de buidatge si una bolla detecta un nivell d'aigua molt alt...)</p>			
		Total ML .....	9,000	1.601,86	14.416,74
1.5 VARIS					
1.5.1 LL91	UT	DRETS D'ESCOMESA DE LA CIA. SUBMINISTRADORA DE FLUID ELÈCTRIC, PER A UNA AMPLIACIO DE POTÈNCIA NOMINAL NECESSARIA (A JUSTIFICAR)			
		Total UT .....	1,000	425,01	425,01
1.5.2 LL90	UT	LEGALITZACIO DE LA INSTAL·LACIO.DOCUMENTACIO TECNICA PER PASSA LA INTRUCCIO TECNIA 1/2015. INCLOS ELS DRETS DE VISAT DEL PROJECTE AMB CERTIFICAT FINAL AL COL·LEGI PROFESIONAT, MEMORIA TECNICA DE DISSENY I TAXES DE L'ENTITAT D'INSPECCIO I CONTROL, AMB ACTA FAVORABLE DE LA INSTAL·LACIO I DOCUMENT D'INSCRIPCIO.			
		Uts. Llargada Amplada Alçada Subtotal			
		Escomeses i quadres 9		9,000	
		Total UT .....		9,000	1.410,25
1.5.3 LL92	UT	IMPREVISTOS A JUSTIFICAR			
		Total UT .....	1,000	3.223,42	3.223,42
1.5.4 QUA01	UT	Per validar la traçabilitat de que els assajos entregats s'ajusten a les lluminàries instal·lades, s'agafaran tres lluminàries al atzar definides per D.F. o la propietat i es portaran a assajar a una laboratori acreditat, realitzant-se els següents assajos parcials de les llumeneres: - SEGURETAT ELÈCTRICA (EN 60598-1: 2015 + A1: 2018 + A 60598- 2-3: 2002 + A1: 2011) Inspecció visual de punts crítics + verificació de marcat i instruccions Assaigs de parciales endurància segons apartat 12.3 i verificació de Tc segons apartat 12.4 Assaigs d'estanqueïtat grau IP (segona xifra) segons apartat 9.2. Assaigs de rigidesa dielèctrica segons apartat 10.2.2 Verificació de resistència a impactes grau IK - Fotometria (ASSAIG Reduïda A 13.032-4: 2016) Rendiment del llum en lm / W Verificació de l'índex de reproducció cromàtica CRI Verificació de temperatura de color			
		Total UT .....	1,000	503,66	503,66

Codi	U	Denominació	Amidament	Preu	Total				
2.1 Q04A	ut	Identificar com cal el conjunt de les línies que conformen el quadre general de distribució. Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies. Rotulació de manera indeleble els circuits. Inclou compensació de fases i realització d'informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal. Eliminar condensadors, equips de regulació de flux en capçalera.							
			<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>		
		Quadres		11,000			11,000		
		Total ut .....					11,000	97,92	1.077,12
2.2 AILL05	UT	Partida de verificació, comprovació i localització dels trams afectats per defectes d'aïllament d'una línia del quadre d'enllumenat. Inclòs tots el necessari per a determinar i localitzar entre quines caixes de fusibles es localitzà els defectes. Inclou la feina d'anàlisi de l'averia seccionant la línia fins a determinar el focus del problema. Realització d'estudi de les línies i una vegada detectat el problema redacció d'informe. Informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal, l'informe te que esta signat per un instal·lador autoritzat.							
			<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>		
		Quadre nº1: Ll i L2	2				2,000		
		Quadre nº2	1				1,000		
		Quadre nº3	1				1,000		
		Quadre nº4	2				2,000		
		Quadre nº5	2				2,000		
		Quadre nº6	2				2,000		
		Quadre nº7	1				1,000		
							0,000		
		Total UT .....					11,000	583,85	6.422,35
2.3 CA01	ut	Creació de cata de serveis, que inclou les següents etapes constructives: 1. Senyalització amb 10 dies d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació. Inclou gestió amb Tubgsal pel desviament d'autobusos si escau. 2. Picar cata en terreny existent, fins un màxim de 100x100cm i 1 metre de fondària amb mitjans manuals, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament. 3. Reposició del ferm, amb independència del tipus de superfície, inclouent-hi pavimentació idèntica a l'existent.							
		Total ut .....					150,000	85,89	12.883,50
2.4 crc05	ml	Substitució i renovació de les línies aèries o entubades igual a les existent, com a mínim la secció sera de 6 mm2 de Cu 0,6/1kV, que inclou les següent partides a executar: 1. Senyalització amb 10 dies d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació. Inclou gestió amb Tubgsal pel desviament d'autobusos si escau. 2. Desmuntatge de les existent existents i esteses de guies o passa cables, amb carrega i transport de runes al abocador autoritzat inclòs les taxes d'abocament. 3. Subministrament, instal·lació i muntatge de conductor de coure designació UNE VV 0,6/1kv de armant de la mateixa secció que el retirat col·locat en tub o grapat afaçana, fins a 16 mm de secció							
			<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>		
		Quadre nº1: Ll i L2	0,3	294,000			88,200		
		Quadre nº2	0,3	583,000			174,900		
		Quadre nº3	0,3	609,000			182,700		
		Quadre nº4	0,3	996,000			298,800		
		Quadre nº5	0,3	1.132,000			339,600		
		Quadre nº6	0,3	1.200,000			360,000		
		Quadre nº7	0,3	200,000			60,000		
							0,000		
						1,100	1.504,200	1.654,620	
		Total ml .....					1.654,620	11,40	18.862,67

Codi	U	Denominació	Amidament	Preu	Total
2.5 D01	M2	DEMOLICIO DE PAVIMENT DE PANOTS COL·LOCATS SOBRE FORMIGO PREVI TALL AMB DISC DE 15 CM DE GRUIX I FINS A 60 CM D'AMPLARIA, AMB MARTELL PICADOR AMB MITJANS MECANICS I CARREGA SOBRE CAMIO			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Rassa	2	120,000	0,400		96,000
		Total M2 .....			96,000
				11,59	1.112,64
2.6 D005	M3	EXCAVACIO DE RASSA PER A PAS D'INSTAL·LACIONS FINS A 1 METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MANUAIS I AMB LES TERRES DEIXADES A LA VORA			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Rassa		120,000	0,400	0,500	24,000
		Total M3 .....			24,000
				36,59	878,16
2.7 D006	M3	EXCAVACIO DE RASA PER A PAS D'INSTAL·LACIONS FINS A 1,-METRE DE FONDARIA, EN TERRENY COMPACTE, AMB MITJANS MECANICS I AMB LES TERRES DEIXADES A LA VORA.			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Rassa		120,000	0,400	0,500	24,000
		Total M3 .....			24,000
				6,67	160,08
2.8 D07	M3	REBLIMENT I PICONATGE DE RASA D'AMPLARIA FINS A 60 CM, AMB MATERIAL SELECCIONAT DE L'OBRA, EN TONGADES DE GRUIX DE FINS A 25 CM, UTILITZANT PICO VIBRANT, AMB COMPACTACIO DEL 95% P.M.			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Rassa	2	120,000	0,400	0,400	38,400
		Total M3 .....			38,400
				16,26	624,38
2.9 D08	M3	TRANSPORT DE RUNES A L'ABOCADOR AMB CONECTOR, CARREGAT AMB MITJANS MECANICS I MANUAIS AMB UN RECORREGUT DE FINS A 10,-KM INCLOS ELS DRETS D'ABOCAMENT			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Rassa	2	120,000	0,400	0,100	9,600
				1,300	9,600
		Total M3 .....			12,480
				13,04	162,74
2.10 D09	M2	PAVIMENT DE PANOT PER A VORERA GRIS DE 20x20x4 CM, CLASSE 1A TIPUS 2, COL·LOCAT A L'ESTESSA AMB SORRA CIMENT DE 200,-KG/M3 DE CIMENT PÒRTLAND I BEURADA DE CIMENT PORTLAND			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Rassa	2	120,000	0,400		96,000
		Total M2 .....			96,000
				26,24	2.519,04
2.11 D12	M3	PAVIMENT DE FORMIGO SENSE ADDITIUS HM-30/B/20/I+E DE CONSISTENCIA TOVA GRANDARIA MAXIMA DEL GRANULAT 20 MM, ESCAMPAT DES DE CAMIO, ESTESA I VIBRATGE MECANIC I ACABAT REGLEJAT			
	Uts.	Llargada	Amplada	Alçada	Subtotal
Rassa		120,000	0,400	0,100	4,800
		Total M3 .....			4,800
				61,97	297,46
2.12 D14	UT	PERICO DE 38x38x55 CM, AMB PARETS DE 15 CM DE GRUIX DE FORMIGO HM-20/P/20 I I SOLERA DE MAÓ CALAT, SOBRE LLIT DE SORRA.			
		Total UT .....			2,000
				65,21	130,42
2.13 D15	UT	BASTIMENT I TAPA PER A PERICO DE SERVEIS DE FOSA GRISA DE 420x420x40 MM I DE 25 KG DE PES , COL·LOCAT AMB MORTER MIXT 1:05:04, ELABORAT A L'OBRA AMB FORMIGONERA DE 165 LITRES			
		Total UT .....			2,000
				28,92	57,84
2.14 D18	ML	TUB FLEXIBLE CORRUGAT DE 80 MM DE DIAMETRE NOMINAL I 4,25 MM DE GRUIX AMB GRAU DE RESISTENCIA AL XOC 7 I MUNTAT COM A CANALITZACIO SOTERRADA.			
		Total ML .....			200,000
				1,90	380,00
2.15 D21	ML	CINTA DE PVC PER A SENYALITZACIO D'INSTAL·LACIONS SOTERRADES. INSTAL·LADA A 25 CM PER DAMUNT DEL TUB			
		Total ML .....			200,000
				0,19	38,00



Codi	U	Denominació	Amidament	Preu	Total	
2.16 D25	UT	PARTIDA DE COBRAMENT INTEGRAL PER L'OBRA CIVIL PER CREAR UN SORTIDA EN PUNT DE LLUM EXISTENT				
		Total UT .....	18,000	23,17	417,06	
2.17 Q01A	ut	Canvi de ICPM a potencia normalitzada de 13,856kW, col·locació de protector per sobre tensions en capçalera Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Efectuar comprovacions de terra i de resistències d'aïllament de les línies. Rotulació de manera indeleble els circuits. Canvi ICPM existent per al corresponent per vademècum de CIA a potencia normalitzada de 13,586 kW i ajustant a la tensió de treball del quadre. Si el increment de proteccions no cap al quadre elèctric existent, esta inclòs el canvi proteccions per DPN per generar espai. Inclou compensació de fases i realització d'informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal				
		Uts.	Llargada	Amplada	Alçada	Subtotal
		Quadre n°01	1			1,000
		Quadre n°2	1			1,000
		Quadre n°3	1			1,000
		Quadre n°4	1			1,000
		Quadre n°5	1			1,000
		Quadre n°8	1			1,000
		Total ut .....				6,000
						375,41
						2.252,46
2.18 TER123	ut	Connexionat del element de la instal·lació a la xarxa de terra del quadre d'enllumenat públic: Instal·lació i muntatge de conductor de coure nu, unipolar 1x35 mm2 muntat en fons de rasa Subministrament, instal·lació i muntatge de piqueta de connexió a terra d'acer i recobriments de coure de 2,- metres de longitud, i 14,6 mm de diàmetre, estàndard i clavada al terra. Connexionat del element a la xarxa de distribució del terra. Canalització i estesa de cable fins a 5 metres de llargària, unclou trencament i reposició vorera panot. Verificació del terra de la instal·lació una vegada connectat l'element determinat. Realització d'informe de recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema GIS municipal.				
		1	Llargada	Amplada	Alçada	Subtotal
		Quadre n°3	1			1,000
		Quadre n°4	1			1,000
		quadre n°7	1			1,000
		Total ut .....				3,000
						127,33
						381,99
2.19 LL95	UT	Passa acta d'inspecció periòdica fins assolir acta d'inspecció neta per part d'una entitat de control del quadre d'enllumenat públic. Esta inclòs tràmits, despeses i acompanyament al tècnic de entitat de control.				
		Total UT .....				9,000
						141,48
						1.273,32
2.20 Q08A	ut	Manca de protecció contra contactes indirectes(interruptor/s diferencial/s) a algun dels circuits del quadre general de distribució. Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Subministrament , instal·lació i muntatge de diferencial trifasic en la línia de sortida que no actua inclòs la retirada del existent. Inclou equilibrat de fases i informe recepció amb control d'aïllaments, valor de pressa de terra, fotografies i alta al sistema gis municipal				
		Uts.	Llargada	Amplada	Alçada	Subtotal
		Quadre n°2	1			1,000
		Quadre n°3	1			1,000
		Quadre n°4	1			1,000
		Quadre n°5	1			1,000
		Total ut .....				4,000
						396,97
						1.587,88
2.21 CR12X23	ML	SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 180X270X180 MM.				
		Total ML .....				0,100
						25,40
						2,54

Codi	U	Denominació	Amidament	Preu	Total
<b>2.22 CR12X24</b>	<b>ML</b>	<b>SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270X270X180 MM.</b>			
	<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>
Quadre n°8	1				1,000
		Total ML .....			1,000
				28,21	28,21
<b>2.23 CR12X25</b>	<b>ML</b>	<b>SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270x360X180 MM.</b>			
		Total ML .....			0,100
				29,58	2,96
<b>2.24 CR12X26</b>	<b>ML</b>	<b>SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 270X540X180 MM.</b>			
		Total ML .....			0,100
				37,25	3,73
<b>2.25 CR12X27</b>	<b>ML</b>	<b>SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 360X540X180 MM.</b>			
	<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>
Quadre n°1	1				1,000
Quadre n°2	1				1,000
		Total ML .....			2,000
				44,21	88,42
<b>2.26 CR12X28</b>	<b>ML</b>	<b>SUBMINISTRE I INSTAL·LACIÓ DE TAPA DE DOBLE AILLAMENT DE MIDES 540X540X180 MM.</b>			
	<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>
Quadre n°3	1				1,000
		Total ML .....			1,000
				60,90	60,90
<b>2.27 Q08D</b>	<b>ut</b>	<b>Endoll no fixat al carril DIN Desmuntatge d'instal·lacions obsoletes del quadre general, reordenar entrades i sortides de les línies segons codi de colors del vigent reglament electrotècnic de baixa tensió, inclòs reposició de les mateixes. Subministrament , instal·lació i muntatge d'endoll fixat al carril DIN, fotografies i alta al sistema gis municipal</b>			
	<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>
Quadre n°1	1				1,000
		Total ut .....			1,000
				84,62	84,62
<b>2.28 Q09A</b>	<b>UT</b>	<b>Feines de serralleria per la reparacio del pany del armari, inclou adaptacio de porta al nou bombi amb pany GIS, i feines de pintura.</b>			
	<u>Uts.</u>	<u>Llargada</u>	<u>Amplada</u>	<u>Alçada</u>	<u>Subtotal</u>
Quadre n°2	1				1,000
		Total UT .....			1,000
				41,98	41,98

Codi	U	Denominació	Amidament	Preu	Total
3.1 N1de10a11	ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 10 i &lt;12 metres (diferents models cilíndrica, nikolson, tronconica o baculs i de 4 mm de gruix de xapa), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de trànsit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:                         <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> <li>11. Les noves columnes o bàculs hauran de venir:                                 <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> </li></ol>			
		Total ut .....	1,000	569,19	569,19

Codi	U	Denominació	Amidament	Preu	Total
3.2 N1de12a15	ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 12 i &lt;15 metres (diferents models cilíndrica, nikolson, tronconica, o baculs i de 4 mm de gruix de xapa no inclou la columna tipus PRIM), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de trànsit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> <li>11. Les noves columnes o bàculs hauran de venir:                     <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> </li></ol>			
		Total ut .....	2,000	615,85	1.231,70

Codi	U	Denominació	Amidament	Preu	Total
3.3 N1de9a10	ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 9 i &lt;10 metres (diferents models cilíndrica, nikolson, tronconica o baculs i de 4 mm de gruix de xapa), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de trànsit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:             <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> <li>11. Les noves columnes o baculs hauran de venir:                     <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> </li></ol>			
		Total ut .....	4,000	519,70	2.078,80

Codi	U	Denominació	Amidament	Preu	Total
3.4 N1de8a9b	ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 8 i &lt;9 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:                         <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:                         <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p>Total ut .....: 4,000 461,88 1.847,52</p>			

Codi	U	Denominació	Amidament	Preu	Total
3.5 N1de7a8bb	ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 7 i &lt;8 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:                         <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:                         <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, inclouent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>			
		Total ut .....	1,000	438,54	438,54

Codi	U	Denominació	Amidament	Preu	Total
3.6 N1de6a7bbb	ut	<p>Demolició, desmuntatge i renovació del punt de llum de longitud compresa entre 6 i &lt;7 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custodia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:                         <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:                         <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>			
	Total ut .....		1,000	365,77	365,77



Codi	U	Denominació	Amidament	Preu	Total
3.7 N1de5a6bbbb	ut	<p>Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 5 i &lt;6 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador , inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment ( si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:                         <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:                         <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>			
		Total ut .....	1,000	355,30	355,30

Codi	U	Denominació	Amidament	Preu	Total
3.8 N1de4a5bbbb	ut	<p>Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 4 i &lt;5 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:                         <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (incloent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, incloent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:                         <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, incloent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, incloent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol>			
		Total ut .....	1,000	328,45	328,45

Codi	U	Denominació	Amidament	Preu	Total
3.9 N1de3a4	ut	<p>Demolició, desmuntatge i renovació del punt de llum d'alçada compresa entre 3 i &lt;4 metres (diferents models cilíndrica, nikolson, tronconica o baculs), que inclou les següents etapes constructives:</p> <ol style="list-style-type: none"> <li>1. Senyalització amb 24 hores d'antelació de l'espai de la via pública a ocupar. Inclou comunicació al Servei de Mobilitat i gestió del permís d'ocupació.</li> <li>2. Picar terreny existent, fins un màxim de 100x100cm, inclou retirada de sobrants, transport de runes a l'abocador, inclòs els drets d'abocament.</li> <li>3. Neteja del punt de llum i rascat del òxid de la columna, verificant que si ha resultat afectada la secció útil d'acer del suport, certificant que el grau de classificació 1 ha estat l'encertat i s'haurà d'efectuar reportatge fotogràfic de la situació actual i l'estat final. En cas que li correspongui un grau de classificació 0, s'efectuaran les tasques contemplades en el grau de classificació 0.</li> <li>4. Verificació de les mides exactes del punt a retirar i a renovar (diferents models cilíndrica, nikolson, tronconica o baculs), posterior tapat amb morter pobre del paviment (si hi ha risc de caiguda del punt de llum s'haurà de retirar).</li> <li>5. Restablir la continuïtat de línies elèctriques, inclou torpedo d'empalme provisional i comprovació de continuïtat de terres i aïllament de línia existent des de quadre.</li> <li>6. Retirada de punt de llum existent i del morter pobre.</li> <li>7. Custòdia de la lluminària i de tots els elements fixats al punt de llum com senyals de transit, banderoles, o altres elements preexistents a la columna o bàcul retirat.</li> <li>8. Col·locació de planxa de ferro de dimensions adequades i senyalització del forat (inclou senyalització provisional en el cas de senyals de trànsit suportades per la columna).</li> <li>9. Neteja de la zona de treball i transport a deixalleria de fanal retirat.</li> <li>10. Adaptació de fonamentació existent, i en el cas de no poder, s'ha d'incloure sense cap despesa addicional una de les següents accions:                         <ol style="list-style-type: none"> <li>a. Tallar pern actuals, realització de forat de mètrica com l'existent (16 a 24mm), varilles roscades i pasta química.</li> <li>b. Picar fonamentació actual (inclouent-hi retirada de sobrants), realització nova fonamentació de dimensions adequades, inclouent-hi nova pressa de terra i placa base amb pern d'ancoratge.</li> </ol> </li> <li>11. Les noves columnes o bàculs hauran de venir:                         <ol style="list-style-type: none"> <li>a. Carteles i aros de reforç fins a 250mm.</li> <li>b. Galvanitzades en calent EN ISO 1461.</li> <li>c. Portella rasant amb reforç interior.</li> <li>d. Prèviament pintades amb doble capa de pintura antioxidant i antipitxats fins alçada de portella, Pantiorin d'ADO o similar.</li> </ol> </li> <li>12. Transport de nova columna o bàcul fins a punt de llum de l'anterior retirada (no s'acceptarà la ocupació de la via pública amb columnes, fora del moment del muntatge definitiu i sempre amb personal a la zona de treball).</li> <li>13. Col·locació i anivellat de columna o bacul.</li> <li>14. Muntatge de lluminària i instal·lació elèctrica, inclouent-hi orientació com a resta zona. Inclou reposició de suport banderoles, senyals de trànsit o altres elements pre-existents a la columna.</li> <li>15. Connexions i prova de funcionament des de quadre (Inclou comprovació final de terres i continuïtat de línies).</li> <li>16. Reposició del ferm, amb independència del tipus de superfície, inclouent-hi pavimentació idèntica a l'existent.</li> <li>17. Repas de pintura antioxidant fins a alçada de portella.</li> <li>18. Numeració de suport existent, segons inventari.</li> <li>19. Neteja de la zona de treball i eliminació de sobrants a deixalleria.</li> </ol> <p>Total ut .....: 1,000 312,24 312,24</p>			
3.10 POR544	ut	<p>Subministrament, instal·lació i muntatge de portella de protecció a farola d'acer galvanitzat</p> <p>Total ut .....: 34,000 51,73 1.758,82</p>			

Pressupost d'execució material

1. Renovacio Enllumenat Palma de Cervello .....	135.671,26
2. Arranjament defectes de Baixa tensio .....	51.832,47
3. Pintura de columnes .....	9.286,33
Total:	<hr/> 196.790,06

Puja el pressupost d'execució material a l'expressada quantitat de CENT  
NORANTA-SIS MIL SET-CENTS NORANTA EUROS AMB SIS CÈNTIMS.



**DOCUMENT N°4: PRESSUPOST  
CAPÍTOL N°5: PRESSUPOST GENERAL**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ  
EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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Projecte: Projecte renovacio enllumenat Palma de Cervello

<b>Capítol</b>	<b>Import</b>
<b>1 Renovacio Enllumenat Palma de Cervello</b>	
1.1 DEMOLICIÓ .....	5.020,54
1.2 OBRA CIVIL .....	2.246,57
1.3 INSTAL·LACIONS .....	1.384,70
1.4 LLUMENERES I BACULS .....	110.175,11
1.5 VARIS .....	16.844,34
<b>Total 1 Renovacio Enllumenat Palma de Cervello .....</b>	<b>135.671,26</b>
<b>2 Arranjament defectes de Baixa tensio .....</b>	<b>51.832,47</b>
<b>3 Pintura de columnes .....</b>	<b>9.286,33</b>
<b>Pressupost d'execució material</b>	<b>196.790,06</b>
13% de despeses generals	25.582,71
6% de benefici industrial	11.807,40
<b>Suma</b>	<b>234.180,17</b>
21% IVA	49.177,84
<b>Pressupost d'execució per contracta</b>	<b>283.358,01</b>

Puja el pressupost d'execució per contracta a l'expressada quantitat de DOS-CENTS VUITANTA-TRES MIL TRES-CENTS CINQUANTA-VUIT EUROS AMB U CÈNTIM.



**DOCUMENT N°5: ESTUDI BASIC DE SEGURETAT I SALUT  
EN EL TREBALL**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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## PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----

PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ

EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT

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### - ESTUDI BASIC DE SEGURETAT I SALUT EN LES OBRES -

#### MEMÒRIA

##### **1.- OBJECTE**

L'objectiu del present projecte és la descripció de les característiques millora de l'eficeincia energetica i arrenjament dels defectes de baixatensió que presenten els diferents quadres sobre les quals es desenvoluparà de l'enllumenat públic al terme municipal de La Palma de Cervelló.

##### **2.- DADES DE L'OBRA**

###### **2.1.- Promotor**

AJUNTAMENT DE LA PALMA DE CERVELLÓ, amb domicili social al carrer Sant Cristòfol, s/n, de La Palma de Cervelló (08756-Barcelona) i C.I.F. P-5831301-F. -----

###### **2.2.- Emplaçament de l'obra:**

Terme municipal de La palma de Cervelló.

###### **2.3.- Tècnic autor del projecte:**

Josep Ibañez Gassiot, Enginyer Industrial, col·legiat núm. 11.981. -----

###### **2.4.- Tècnic autor del projecte de Seguretat i Salut:**

Josep Ibañez Gassiot, Enginyer Industrial, col·legiat núm. 11.981. -----





### 3.- CARACTERÍSTIQUES DE LES OBRES:

Les obres que comprenen el present projecte, són:

5.0.- Arreglar defectes de la instal·lació elèctrica segons pla director.

5.1.- Comprovar les línies amb problemes d'aïllament i/o valors baixos inferiors a 10 Mega Ohms, renovar els trams afectats i punts de llum existents en els carrers afectats. -----

5.2.- Condicionament i adequació dels quadres d'escomesa actual del sector, que consisteix en l'eliminació de les proteccions que alimenten als punts de llum existents, comprovacions sectorials per trams del aïllament i realitzar la comprovació de la pressa a terra. -----

5.3.- Instal·lació de noves línies de distribució de potència trifàsiques III-400 V o III-230 V. 50Hz+N en traçat soterrat, per alimentar els punts de llums dels passos peatonals, amb línia equipotencial de terra Cu-1x35 m/m<sup>2</sup> despullat, i pressa de terra per lluminària amb pica de DN-14 m/m i L = 2 m. i terminal de Cu-1x16 m/m<sup>2</sup> / 750 v. color verd-groc, inclòs obres civils d'obertura i tapat de rasa i reposició de paviments de calçada i voreres, -----

5.4.- Instal·lació de columnes, braços i llumeneres distribuïdes segons plànols i formades segons fitxes tècniques. -----

La instal·lació elèctrica; Es farà de conformitat amb el vigent "Reglament Electrò tècnic per a instal·lacions de Baixa Tensió " (Decret 842/2002 de 2 d'agost, BOE núm. 224 de 18 de setembre del 2002) i en especial conforme a les instruccions ITC-BT-09. ----

### 4.- INTERFERÈNCIES I SERVEIS AFECTATS

Abans del començament de la neteja i replanteig d'obra, el Contractista coneixerà la situació exacta de les canalitzacions d'aigua, gas, electricitat, telèfon i clavegueram per a estar previngut davant de qualsevol eventualitat.-----

### 5.- UNITATS CONSTRUCTIVES QUE COMPONEN L'OBRA

#### 5.1.- Termini d'execució

Per a l'execució de les obres del present projecte es considera convenient fixar un termini de SIS (6) mesos a partir de la firma de l'acta de Replanteig. -----



## 5.2.- Ma d'obra a emprar

Per a la realització de les obres, es considera un màxim de treballadors actuant a la vegada de: 4 TREBALLADORS.-----

## 6.- SERVEIS I UNITATS CONSTRUCTIVES I ELS SEUS RISCOS

### Serveis provisionals

Els emplaçaments de les obres tenen subministraments d'aigua i electricitat.

### Unitat constructives i els seus riscos

La relació d'unitats constructives que componen les obres son les que és relacionen a continuació:

Instal·lació elèctrica

Riscos:

- Caigudes al mateix nivell
- Caiguda de la retirada de les línies sobre la xarxa de distribució de baixa tensió.
- Talls i cops
- Risc elèctric

Mesures preventives:

- Neteja de les zones de treball i trànsit
- Escales auxiliars adequades
- Execució de les feines amb dos equips de treball equips cada un amb el respectiu mitja d'elevació, desconexió de la línia i retirada de la línia mitjançant una politja des d'un dels extrems.

Proteccions personals:

- Ús de casc
- Ús de guants
- Ús de guants resistents a l'electrocució
- Ús de calçat de protecció

### RISCOS DINS L'ÀREA DE TREBALL

- Caigudes d'alçada
- Caigudes al mateix nivell per l'existència d'obstacles
- Cops i talls
- Risc elèctric

### PREVENCIÓ DE RISCOS LABORALS

Proteccions individuals.



- Cascos; per a tot el personal que participi a l'obra, inclosos els visitants.
- Guants d'ús general
- Calçat de seguretat
- Ulleres contra impactes, antipols i gotes
- Guants dielèctrics per la seva utilització en baixa tensió.

### **Proteccions col·lectives i senyalització**

- Senyals de seguretat.

### **Informació**

Tot el personal, a l'inici de l'obra o quan s'incorpori, ha d'haver rebut de la seva empresa, la informació dels riscos i les mesures correctores que utilitzarà per realitzar les seves tasques.

### **Reconeixement mèdic**

Cada contractista acreditarà que el seu personal d'obra ha passat un reconeixement mèdic, que es farà cada any.

### **PREVENCIÓ DE RISCOS DE DANYS A TERCERS**

Es prohibirà el pas a tota persona aliena a l'obra

### **PLA DE SEGURETAT**

En compliment de l'article 7 del Reial Decret 1627/1997, de 24 d'octubre de 1997, cada contractista elaborarà un pla de seguretat i salut i adaptarà aquest estudi bàsic de seguretat i salut als seu medis i mètodes d'execució.

Cada pla de seguretat i salut ha d'aprovar-se, abans de començar les obres, pel coordinador en matèria de seguretat i salut en execució de l'obra.

Aquest pla de seguretat i salut es farà arribar als interessats, d'acord al R.C, 1627/97, amb la finalitat de que es puguin presentar les al·legacions i alternatives que es considerin oportunes.

El pla de seguretat i salut, juntament amb l'aprovació del coordinador, el farà arribar el contractista als serveis territorials de Treball de la Generalitat, carrer Carrera, 20-24 de Barcelona amb la comunicació d'obertura del centre de treball, com es preceptiu.

Qualsevol modificació que faci el contractista en el pla de seguretat i salut, resultada de les alteracions i incidències que es puguin produir durant l'execució de l'obra o bé per elaborar aquest estudi bàsic de seguretat i salut, necessitarà l'aprovació del coordinador

### **LLIBRE D'INCIDÈNCIES**

A l'obra hi haurà un llibre d'incidències, sota el control del coordinador de seguretat en fase d'execució, i a disposició de la direcció facultativa, l'autoritat laboral o el representant dels treballadors, el quals podran fer les anotacions que considerin oportunes amb la finalitat de control de compliment.



En cas d'anotació, el coordinador enviarà una còpia de l'anotació a la Inspecció de Treball (a Barcelona, Travessera de Gràcia, 303-311) en el termini de 24 hores.

## **PRESCRIPCIONS GENERALS DE SEGURETAT**

En cas d'accident en el que sigui necessària l'assistència facultativa, per lleu que sigui i l'assistència mèdica es redueixi a una primera cura, el responsable de seguretat del contractista farà una investigació tècnica de les causes de tipus humà i de condicions de treball que ha fet possible l'accident.

A més dels tràmits establerts oficialment, l'empresa passarà un informe a la direcció facultativa on ha d'anar especificat el següent:

- Nom de l'accidentat, categoria professional, empresa per a la qual treballa.
- Hora, dia i lloc de l'accident; descripció de l'accident; causes de tipus personal.
- Causes de tipus tècnic; mesures preventives per tal de que no torni a passar.
- Dates límits de realització de les mesures preventives.

Aquest informe es passarà a la direcció facultativa i al coordinador de seguretat en fase d'execució a l'endemà del accident com a més tard.

La direcció facultativa i el coordinador de seguretat podran aprovar l'informe o exigir la presa de mesures complementàries no indicades a l'informe.

El compliment de les prescripcions generals de seguretat no va en detriment de la subjecció a les ordenances i reglaments administratius de dret positiu i rang superiors, ni eximeix de fer-los complir.

Cada contractista portarà el control de les revisions de manteniment preventiu i les de manteniment correctiu (avaries i reparacions) de la maquinària d'obra. En els casos que no hi hagi norma d'homologació oficial, seran de qualitat adequada a les prestacions respectives.

La maquinària de l'obra disposarà de les proteccions i els resguards originals de fàbrica, o bé les adaptacions millorades amb l'aval d'un tècnic responsable que garanteixi l'operativitat funcional preventiva.

## **CONDICIONS DELS MITJANS DE PROTECCIÓ**

Tots els equips de protecció individual (EPI) i sistemes de protecció col·lectiva (SCP) tindran fixat un període de vida útil, rebutjant-se al seu termini.

Quan, per circumstàncies de treball, es produeixi una deterioració més ràpida d'una determinada peça o equip, aquesta es reposarà, independentment de la durada prevista o la data de lliurament.

Qualsevol peça o equip de protecció que hagi sofert un tracte límit, es a dir, el màxim per el qual fou concebut (per exemple per un accident) serà rebutjat i reposat al moment.

Les peces que pel seu ús hagin agafat més amplitud o tolerància de les admeses pel fabricant, seran reposades immediatament.



L'ús d'una peça o equip de protecció no representarà mai un risc per a ell mateix.

## **EQUIPS DE PROTECCIÓ INDIVIDUAL (EPI)**

Cada contractista portarà el control de lliurament dels equips de protecció individual (EPI) de la totalitat del personal que intervé a l'obra.

Es descriu, en aquest apartat, la indumentària per la protecció personal que s'utilitzarà més i amb major freqüència a un centre de treball del ram de la construcció, en funció dels riscos més freqüents a que estan exposats els treballadors d'aquest sector.

**CASC:**

El casc ha de ser d'ús personal i obligatori a les obres de construcció. Ha d'estar homologat d'acord amb la norma tècnica reglamentària MT-1, Resolució de la DG de Treball de 14-12-74 BOE 312 de 30-12-74.

Les característiques principals són:

- Classe N: es pot usar en treballs amb risc elèctrics a tensions inferiors o iguals a 1000 V.

- Pes: no ha de passar de 450 g.

Els que hagin estat sotmesos a impactes violents o que tinguin més de quatre anys, encara que no s'hagin utilitzats han de ser substituïts per uns altres de nous.

En casos extrems, els podran utilitzar diferents treballadors, sempre que es canviïn les peces interiors que estan en contacte amb el cap.

**CALÇAT DE SEGURETAT:**

Considerant que els treballadors del ram de la construcció estan sotmesos al risc obligat l'ús de calçat de seguretat (botes) homologat d'acord amb la Norma tècnica reglamentària MT-5, Resolució de la DG de Trabajo de 31/01/80, BOE 37 de 12-02-800.

Les característiques principals son:

1.2 Classe: calçat amb puntera (la plantilla serà opcional en funció del risc de punció plantar)

1.3 Pes: no ha de passar de 800 grs.

Quan s'hagi de treballar en terrenys humits o que es puguin rebre esquitxades d'aigua o morter, les botes han de ser de goma. Norma tècnica reglamentària MT-27, Resolució de la DG de Trabajo de 3-12-81, BOE 305 de 22-12-81, classe E.

## **GUANTS**

Per tal d'evitar agressions a les mans dels treballadors (dermatosi, talls, esgarrapades, picades, etc.) s'han d'utilitzar guants. Poden ser de diferents materials, com:

1.4 cotó o punt: treballs lleugers

1.5 cuir: manipulació en general

1.6 làtex rugós: manipulació de peces que tallin



### 1.7 lona: manipulació de fustes

Per a la protecció contra els agressius químics, han d'estar homologats segons la Norma tècnica reglamentaria MT-11, Resolució de la DG de Trabajo de 06-05-77, BOE 158 de 04-07-77.

Pels treballs en els que pugui haver risc d'electrocució, s'ha d'utilitzar guants homologats segons la Norma tècnica reglamentaria MT-4, Resolució de la DG de Trabajo de 28-07-75, BOE 211 de 02-11-75.

### **CINTURONS DE SEGURETAT**

Quan es treballa a un lloc alt i existeix perill de caigudes eventuais, es preceptiu l'ús dels cinturons de seguretat homologats segons la Norma tècnica reglamentaria MT-13, Resolució de la DG de Trabajo de 05-06-77, BOE 210 DE 02-09-77.

Les característiques principals són:

Classe A: cinturó de subjecció. S'ha d'utilitzar quan el treballador no s'hagi de desplaçar o quan els desplaçaments siguin limitats. L'element de subjecció ha d'estar sempre tens per evitar la caiguda lliure.

### **PROTECTORS AUDITIUS**

Quan els treballadors estiguin a un lloc o àrea de treball amb un nivell de soroll superior a 80 dBA, es obligat l'ús de protectors auditius, que sempre seran d'ús individual.

Aquests protectors han de ser homologats d'acord amb la Norma tècnica reglamentaria MT-2, Resolució de la DG de Treball de 28-01-75 BOE 209 de 01-09-75.

### **PROTECTORS DE LA VISTA:**

Quan els treballadors estiguin exposats a projeccions de partícules, pols o fum, esquitxades de líquids i radiacions perilloses, hauran de protegir-se la vista amb ulleres de seguretat i/o pantalles.

Les ulleres i oculars de protecció antiimpactes han d'estar homologats d'acord amb la Norma tècnica reglamentaria MT-16, Resolució de la DG de Trabajo de 14-06-78, BOE 196 de 17-08-78, i MT-17, Resolució de la DG de Trabajo de 28-06-78, BOE de 09-09-78.

### **ROBA DE TREBALL**

Els treballadors de la construcció han d'utilitzar roba de treball, preferiblement del tipus rana, facilitada per l'empresa en les condicions fixades en el conveni col·lectiu provincial.

La roba ha de ser de teixit lleuger i flexible, ajustada al cos, sense elements addicionals i fàcil de netejar.

En el cas d'haver de treballar sota la pluja o en condicions d'humitat similars, se'ls donarà roba impermeable.

### **SISTEMES DE PROTECCIONS COL·LECTIVES (SPC)**



Dins d'aquest apartat es descriuen les proteccions de caràcter col·lectiu, que tenen com a funció principal fer de pantalla entre el focus de possible agressió i la persona a protegir.

### **CABLES DE SUBJECCIÓ DE CINTURÓ DE SEGURETAT I ANCORATGES**

Tindran resistència suficient per suportar els esforços a que puguin estar sotmesos d'acord amb la seva funció protectora.

### **PLATAFORMES DE TREBALL**

Tindran com a mínim 60 cm d'amplada i les situades a més de 2 m de terra hauran de tenir baranes de 90 cm d'alçada, llistó intermedi i sòcol.

### **ESCALES DE MÀ**

Hauran d'anar proveïdes de capçals per no relliscar. No s'utilitzaran simultàniament per dues persones. La longitud sobrepassarà 1 m el punt superior del desembarcament.

Tindran un ancoratge perfectament resistent a la seva part superior per evitar moviments.

Tant la pujada com la baixada per l'escala de mà es realitzarà sempre de cara a l'escala.

### **SERVEIS DE PREVENCIÓ**

#### **Servei Tècnic de Seguretat**

Tot contractista disposarà d'assessorament tècnic propi o extern d'acord amb el Reial Decret 39/1997 sobre serveis de prevenció.

#### **Servei Mèdic**

Els contractistes d'aquesta obra disposaran d'un servei mèdic d'empresa, propi o mancomunat. Tot el personal de nou ingrés a la contracta, encara que sigui eventual o autònom, haurà de passar el reconeixement mèdic prelaboral obligat. També son obligades les revisions mèdiques anuals del treballadors ja contractats.

### **COMITÉ DE SEGURETAT I SALUT**

Es constituirà el Comitè de Seguretat i Salut quan sigui necessari, segons la legislació vigent i el que disposi el conveni col·lectiu provincial del sector.

Es nomenarà per escrit socorrista el treballador voluntari que tingui capacitat i coneixements acreditats de primers auxilis, amb l'autorització del servei mèdic. Es interessant que participi en el Comitè de Seguretat i Salut.

El socorrista revisarà mensualment la farmaciola i es reposarà immediatament el que s'hagi consumit.

### **INSTAL·LACIONS DE SALUBRITAT I CONFORT**

Les instal·lacions provisionals d'obra s'adaptaran , en lo referent a elements, dimensions i característiques, a lo previst als articles 44 de l'Ordenança general de



seguretat i higiene, y 335, 336 i 337 de l'Ordenança laboral de la construcció, vidre i ceràmica.

#### CONDICIONS ECONOMIQUES

El control econòmic de les partides que integren el projecte de l'estudi bàsic  
El control econòmic de les partides que integren el projecte de l'estudi bàsic de seguretat i salut que siguin abonables al contractista principal, serà idèntic al que s'apliqui en l'estat d'amidaments del projecte d'execució.

CUMPLIMENT DEL RD 1627/1997 PER PART DEL PROMOTOR:

#### COORDINADOR DE SEGURETAT I AVÍS PREVI.

El promotor ha de designar un coordinador de seguretat a la fase d'execució de les obres per que assumeixi les funcions que es defineixen al RD 1627/97.

El promotor ha d'efectuar un avís als Serveis Territorials de treball de la Generalitat, carrer Carrera 20-24 de Barcelona, abans de l'inici de les obres.

L'avís previ es redactarà d'acord amb el que disposa l'annex III del RD 1627/1997 de data 24-10-97.

### **8.- PRESSUPOST**

El pressupost general de les obres totalitza la quantitat de: **283.358,01 €** (DOS-CENTS VUITANTA-TRES MIL TRES-CENTS CINQUANTA-VUIT EUROS AMB U CÈNTIMS), considerant inclòs en aquest pressupost, a més a més de les partides i detalls indicats, tot allò que sigui necessari per a que l'obra estigui del tot acabada.-----

La Palma de Cervelló, a novembre del 2022  
L'enginyer Industrial

Josep Ibañez Gassiot





**DOCUMENT Nº5: ESTUDI BASIC DE SEGURETAT I SALUT  
EN EL TREBALL, FITXES I PLANOLS**

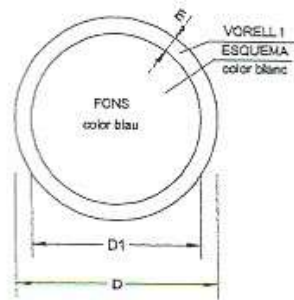
**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ  
EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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## SENYALS D'OBLIGACIÓ



DIMENSIONS EN mm.		
D	D1	m
594	534	30
420	378	21
287	267	15
210	188	11
148	132	8
105	95	5



ÚS MASCARILLA



ÚS CASC



ÚS PROTECTORS  
AUDITUS



ÚS ULLERES



ÚS GUANTS



ÚS GUANTS  
DIELECTRICS



ÚS BOTES



ÚS BOTES  
DIELECTRQUES



ELIMINAR PUNTES



ÚS CINTURÓ  
DE SEGURETAT



ÚS CINTURÓ  
DE SEGURETAT



ÚS CALÇAT  
ANTIESTÀTIC



ÚS D'ULLERES  
O PANTALLES



ÚS DE PANTALLA



OBLIGACIÓ  
RENTAR-SE LES MANS



ÚS DE PROTECTOR  
AJUSTABLE



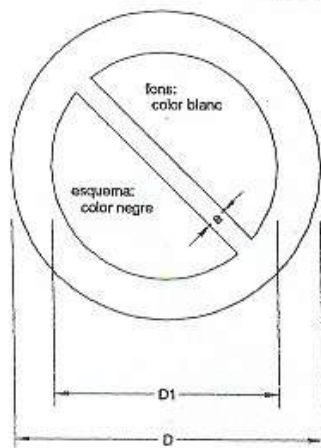
EMPÈNYER



ÚS DE PROTECTOR



### SENYALS DE PROHIBICIÓ

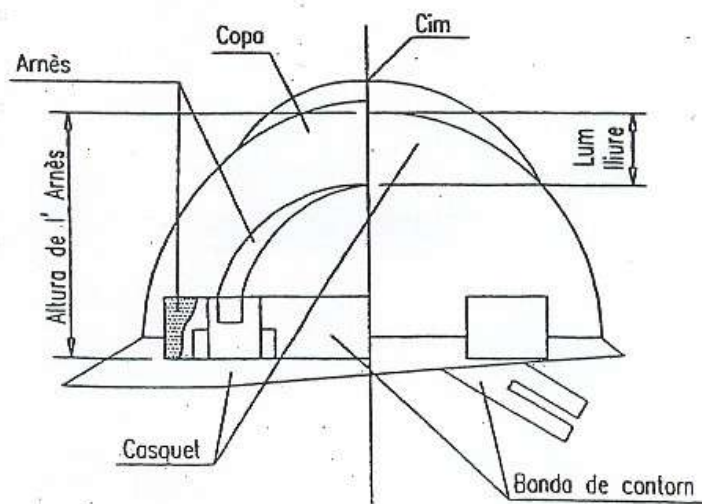
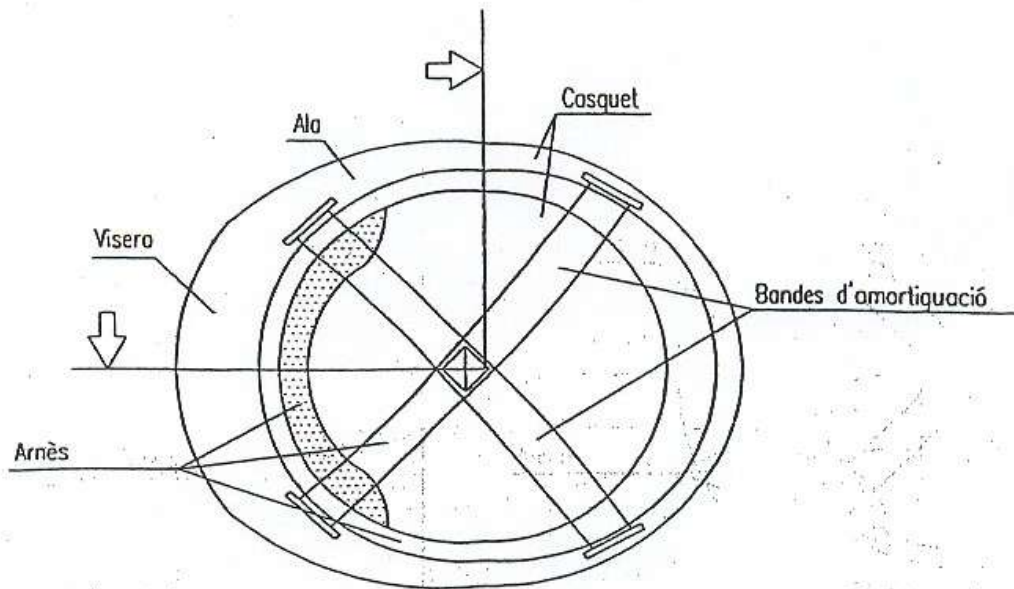


DIMENSIONS EN mm.		
D	D1	a
594	420	44
420	297	31
297	210	17
210	148	16
148	105	11
105	74	8





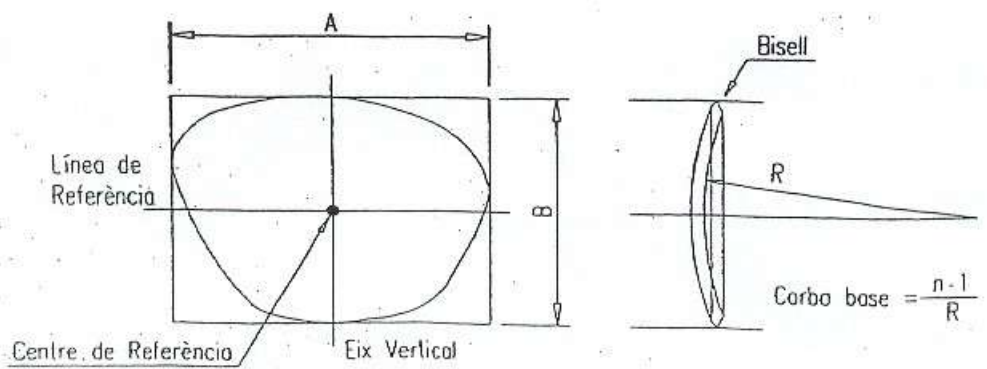
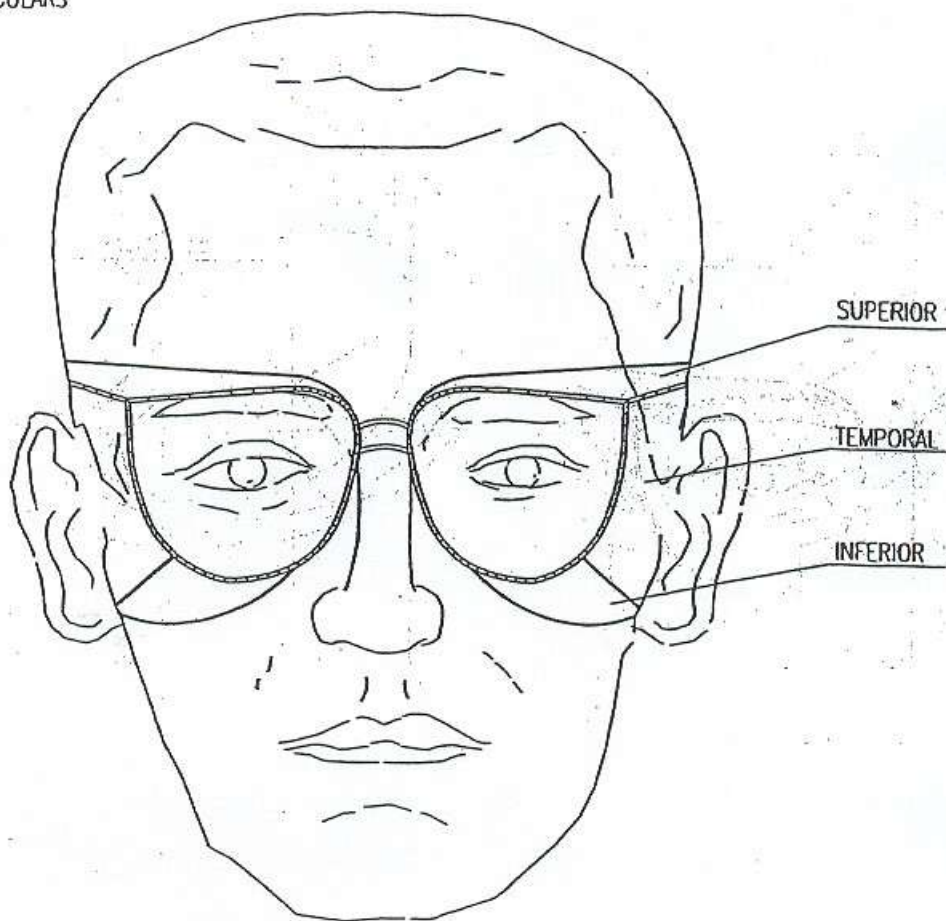
### PROTECCIONS INDIVIDUALS (CASC DE SEGURETAT)





## PROTECCIONS INDIVIDUALS (ULLERES DE SEURETAT II)

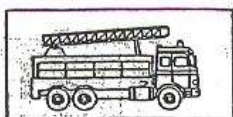
OCULARS





# TELÈFONS D'EMERGÈNCIA

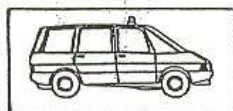
DIRECCIÓ DE L'OBRA



BOMBERS



POLICIA  
NACIONAL



GUÀRDIA  
CIVIL



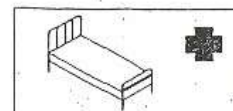
SERVEI MÈDIC  
Dr. \_\_\_\_\_



METGE ASSISTENCIAL  
PER L'OBRA  
Dr. \_\_\_\_\_



AMBULÀNCIES

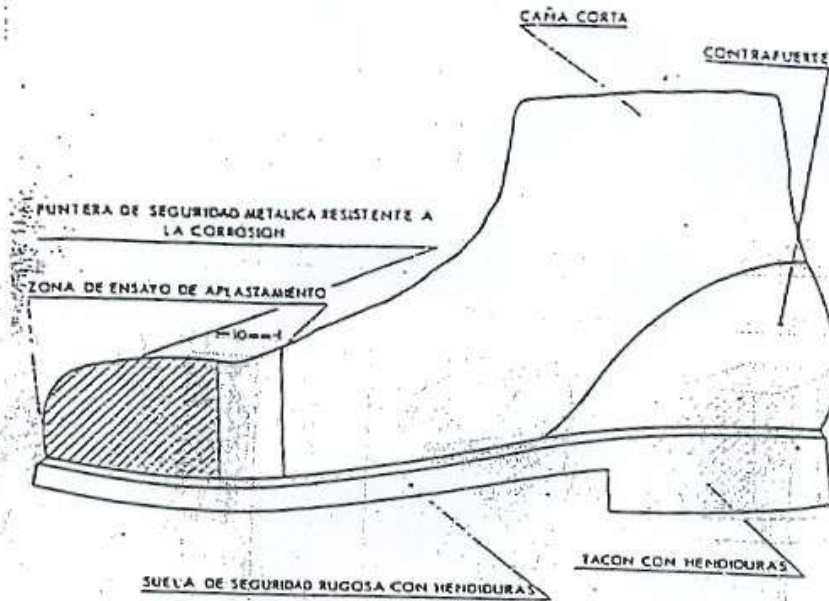


HOSPITALS

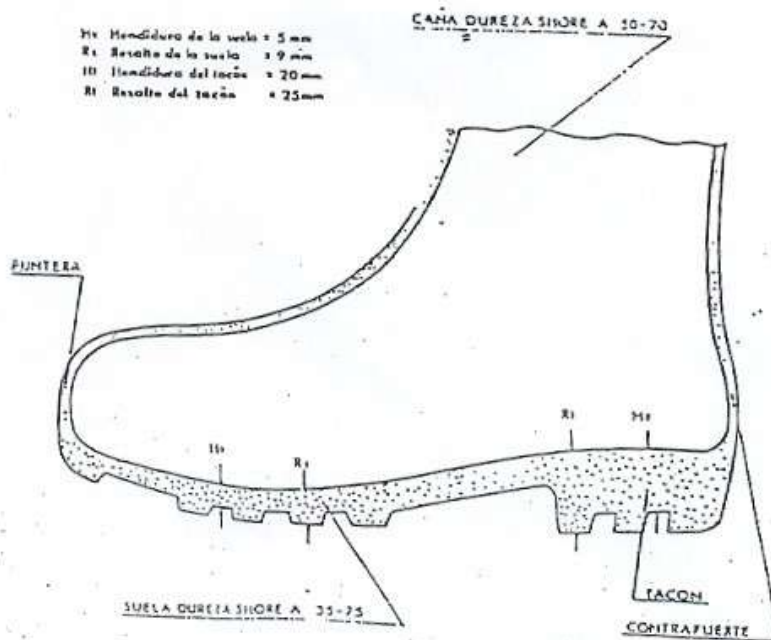




### BOTA DE SEGURIDAD CLASE III





### BOTA IMPERMEABLE AL AGUA Y A LA HUMEDAD









### SEÑALES DE PROHIBICION

Esquema Señal			Colores		Señal Establecida
Significado	Dibujo	Color	Seguridad	Contraste	
PROHIBIDO PASAR A LOS PEATONES		NEGRO	ROJO	BLANCO	

### SEÑALES DE OBLIGACION

Esquema Señal			Colores		Señal Establecida
Significado	Dibujo	Color	Seguridad	Contraste	
USO OBLIGATORIO DE MASCARILLA		BLANCO	AZUL	BLANCO	
USO OBLIGATORIO DE CASCO PROTECTOR		BLANCO	AZUL	BLANCO	





**DOCUMENT N°5: ESTUDI BASIC DE SEGURETAT I SALUT  
EN EL TREBALL, PLEC DE CONDICIONS TÈCNIQUES**

**PROJECTE DE MILLORA DE L'EFICIÈNCIA ENERGÈTICA DE  
L'ENLLUMENAT PÚBLIC DE LA PALMA DE CERVELLÓ. -----**

**PROMOTOR: AJUNTAMENT DE LA PALMA DE CERVELLÓ**

**EQUIP REDACTOR: Sr. JOSEP IBAÑEZ GASSIOT**

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## PLEC DE CONDICIONS PARTICULARS ESTUDI DE SEGURETAT I SALUT. PART I

En la redacció d'aquest estudi s'ha tingut en compte la legislació en matèria de seguretat relacionada en la segona part d'aquest plec, i en especial la Llei 31/1995, de 8 de novembre, de Prevenció de Riscos Laborals, i el Reial Decret 1627/1997, de 24 d'octubre, segons el qual s'estableixen disposicions mínimes de seguretat i de salut en les obres de construcció.

Aquest estudi de seguretat i salut forma part del projecte d'execució d'obra o, en el seu cas, del projecte d'obra, és coherent amb el contingut del mateix i recull les mesures preventives adequades als riscos que comporti la realització de l'obra.

A tals efectes, el pressupost de l'estudi de seguretat i salut ha d'anar incorporat al pressupost general de l'obra com un capítol més del mateix.

No s'inclouen en el pressupost de l'estudi de seguretat i salut els costos exigits per a la correcta execució dels treballs, conforme a les normes reglamentàries en vigor i els criteris tècnics generalment admesos, emanats d'organismes especialitzats.

Els amidaments, qualitats i valoracions recollides en el pressupost de l'estudi de seguretat i salut podran ser modificades o substituïdes per alternatives proposades pel contractista en el pla de seguretat i salut a que es refereix l'article 7 de RD, prèvia justificació tècnica convenientment motivada, sempre que no suposi disminució de l'import total, ni dels nivells de protecció continguts en l'estudi.

Segons el RD, el promotor està obligat a que en la fase de redacció del projecte s'elabori un estudi de seguretat i salut en els projectes d'obres, quan en l'elaboració del projecte d'obra intervinguin diversos projectistes, el promotor designarà un coordinador en matèria de seguretat i de salut durant l'elaboració del projecte d'obra.

La designació dels coordinadors no eximeix al promotor de les seves responsabilitats.

### **Visat de projectes (Art. 17 del RD 1627/97)**

La inclusió en el projecte d'execució d'obra de l'estudi bàsic serà requisit necessari per al visat per part del Col·legi professional, per a l'expedició de la llicència municipal i d'altres autoritzacions i tràmits per part de les Administracions públiques.

En la tramitació per a l'aprovació dels projectes d'obres de les Administracions públiques es farà declaració expressa en l'Oficina de Supervisió de Projectes o òrgan equivalent de la inclusió de l'estudi de seguretat i salut, o en el seu cas, de l'estudi bàsic.

### **Pla de seguretat i salut (art. RD 1627/97)**

En aplicació de l'estudi de seguretat i salut o, en el seu cas, de l'estudi bàsic, cada contractista elaborarà un pla de seguretat i salut en el treball en el que s'analitzen, estudien, desenvolupen i complementen les previsions contingudes en l'estudi o estudi bàsic, en funció del seu propi sistema d'execució de l'obra. En aquest pla s'inclouran les propostes de mesures alternatives de prevenció que el contractista proposi amb la corresponent justificació tècnica, que no podrà implicar disminució dels nivells de protecció previstos en l'estudi o estudi bàsic. En el cas de plans de seguretat i salut elaborats en aplicació de l'estudi de seguretat i salut les propostes de mesures



alternatives de prevenció inclouran la seva valoració econòmica, que no podrà implicar disminució de l'import total, d'acord amb el segon paràgraf de l'apartat 4 de l'article 5 del RD.

Quan en l'execució de l'obra intervingui més d'una empresa, o una empresa i treballadors autònoms, el promotor, abans de l'inici dels treballs o tan aviat com es verifiqui aquesta circumstància, designarà un coordinador en matèria de seguretat i salut durant l'execució de l'obra.

La designació dels coordinadors en matèria de seguretat i salut durant l'elaboració del projecte d'obra i durant l'execució de l'obra podrà recaure en la mateixa persona.

El pla de seguretat i salut haurà de ser aprovat, abans de l'inici de l'obra, pel coordinador en matèria de seguretat i salut durant l'execució de l'obra.

En el cas d'obres de les Administracions públiques, el pla amb el corresponent informe del coordinador en matèria de seguretat i salut durant l'execució de l'obra, s'eleva per a la seva aprovació a l'Administració pública que hagi adjudicat l'obra.

Quan no sigui necessària la designació del coordinador, les funcions que se li atribueixen en els paràgrafs anteriors seran assumides per la direcció facultativa. Així mateix, el pla de seguretat i salut estarà en l'obra a disposició permanent de la direcció facultativa.

Els contractistes i els subcontractistes dels coordinadors, de la direcció facultativa i del promotor no eximiran de les seves responsabilitats als contractistes i als subcontractistes.

#### **Llibre d'incidències (Art. 13 del RD 1627/97)**

- En cada centre de treball existirà, amb finalitats de control i seguiment del pla de seguretat i salut, un llibre d'incidències que constarà de fulles per duplicat, habilitat a tal efecte. Facilitat pel Col·legi Professional al que pertanyi el tècnic que hagi aprovat el Pla de Seguretat i Salut. En les obres de les Administracions públiques ho facilitarà l'oficina de supervisió de projectes o òrgans equivalent.
- 
- El llibre d'incidències haurà d'estar sempre en l'obra, i estarà en poder del coordinador en matèria de seguretat i salut durant l'execució de l'obra o, quan no fos necessària la designació de coordinador, en poder de la direcció facultativa.
- 
- A Aquest llibre hi podran accedir la direcció facultativa de l'obra, els contractistes i subcontractistes i els treballadors autònoms, així com les persones o òrgans amb responsabilitats en matèria de prevenció de les empreses intevintents en l'obra, els representants dels treballadors i els tècnics dels òrgans especialitzats en matèria de seguretat i salut en el treball de les Administracions públiques competents, que podran fer anotacions en ell, relacionades amb les finalitats que al llibre se li reconeixen.
- 
- Efectuada una anotació en el llibre d'incidències, el coordinador en matèria de seguretat i salut durant l'execució de l'obra, o quan no sigui necessària la designació de coordinador, la direcció facultativa, estaran obligats a remetre, en el termini de vint-i-quatre hores, una còpia a la Inspecció de Treball i Seguretat i Social de la província en què es realitza l'obra.
-



- Igualment hauran de notificar les anotacions en el llibre al contractista afectat i als representants dels treballadors d'aquest.

**Avís previ (Art. 18 del RD 1627/97)**

- En les obres incloses en l'àmbit d'aplicació del present Reial Decret, el promotor haurà d'efectuar un avís a l'autoritat laboral competent abans de l'inici dels treballs.
- L'avís previ es redactarà d'acord al que disposa l'annex III del RD; s'haurà d'exposar en l'obra de forma visible, actualitzant-se si fos necessari.

**Obertura del centre de treball (Art.19 del RD 1627/97)**

- L'obertura del centre de treball haurà de comunicar-se a l'autoritat laboral, i haurà d'incloure el pla de seguretat i salut al que es refereix l'article del RD 1627/97.
- 
- El pla de seguretat i salut estarà a disposició permanent de la Inspecció de Treball i Seguretat Social i dels tècnics dels òrgans especialitzats en matèria de seguretat i salut en les Administracions públiques competents.

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**PLEC DE CONDICIONS PARTICULARS  
ESTUDI DE SEGURETAT I SALUT. PART I**

**PRESCRIPCIONS QUE S'HAURAN DE COMPLIR EN RELACIÓ AMB LES  
CARACTERÍSTIQUES, LA UTILITZACIÓ I LA CONSERVACIÓ DE LES MÀQUINES,  
ÚTILS, FERRAMENTES, SISTEMES Y EQUIPS PREVENTIUS:**

**Aspectes generals.**

- REGLAMENT DE SEGURETAT I HIGIENE AL TREBALL.O.M. 31 de gener de 1.940 B.O.E. 3 de febrer de 1.940, en vigor capítol VII.
- DISPOSICIONS MÍNIMES DE SEGURETAT I SALUT EN ELS LLOCS DE TREBALL.R.D. 486/1.997 de 14 d'abril de 1997.
- REGLAMENT DE SEGURETAT I HIGIENE AL TREBALL A LA INDÚSTRIA DE LA CONSTRUCCIÓ.O.M. 20 de Maig de 1.952 B.O.E. 15 de Juny de 1.958.
- PRESCRIPCIONS DE SEGURETAT A LA INDÚSTRIA DE L'EDIFICACIÓ.Conveni O.I.T. 23 de Juny de 1.937, ratificat el 12 de Juny de 1.958.
- ORDENANÇA LABORAL DE LA CONSTRUCCIÓ, VIDRE I CERÀMICA.O.M. 28 d'Agost de 1.970. B.O.E. 5,7,8,9 de Setembre de 1.970, en vigor capítols VI i XVI.
- ORDENANÇA GENERAL DE SEGURETAT I HIGIENE AL TREBALL.O.M. 9 de Març de 1.971. B.O.E. 16 de Març de 1.971, en vigor parts del títol II.
- REGLAMENT D'ACTIVITATS MOLESTES, NOCIVES INSALUBRES I PERILLOSES.D.2414/1.961 de 30 de Novembre B.O.E. 7 de Desembre de 1.961.
- ORDRE APROVACIÓ DE MODEL DE LLIBRE D'INCIDÈNCIES EN LES OBRES DE CONSTRUCCIÓ.O. 12 de Gener de 1998. D.O.G.C. 2565 de 27 de Gener de 1998.
- REGULACIÓ DE LA JORNADA DE TREBALL, JORNADES ESPECIALS I DESCANS.R.D. 2.001/1.983 de 28 de Juliol B.O.E. 3 d'Agost de 1.983.
- ESTABLIMENT DE MODELS DE NOTIFICACIÓ D'ACCIDENTS DE TREBALL.O.M. 16 de Desembre de 1.987 B.O.E. 29 de Desembre de 1.987.
- LLEI DE PREVENCIÓ DE RISCOS LABORALS.L. 31/1995 de Novembre B.O.E. 10 de Novembre de 1995.
- REGLAMENT DELS SERVEIS DE PREVENCIÓ.R.D. 39/1997 de 17 de Gener de 1997 B.O.E. 31 de Gener de 1997
- SENYALITZACIÓ DE SEGURETAT I SALUT AL TREBALL.R.D. 485/1997 de 14 d'abril de 1997 B.O.E. 23 d'Abril de 1997.



- DISPOSICIONS MÍNIMES DE SEGURETAT I SALUT ALS CENTRES DE TREBALL.R.D. 486/1997 de 14 d'Abril de 1997 B.O.E. 23 d'Abril de 1997.
- DISPOSICIONS MÍNIMES DE SEGURETAT I SALUT RELATIVES A LA MANIPULACIÓ MANUAL DE CÀRREGUES QUE IMPLIQUIN RISCOS, EN PARTICULAR DORSOLUMBARS, PELS TREBALLADORS. R.D. 487/1997 de 14 d'Abril de 1997 B.O.E. 23 d'Abril de 1997.
- DISPOSICIONS MÍNIMES DE SEGURETAT I SALUT RELATIVES AL TREBALL QUE INCLOUEN PANTALLES DE VISUALITZACIÓ.R.D. 488/1997 de 14 d'Abril de 1997 B.O.E. de 23 d'Abril de 1997.
- FUNCIONAMENT DE LAS MÚTUES D'ACCIDENTS DE TREBALL I MALALTIES PROFESSIONALS DE LA SEGURETAT SOCIAL I DESENVOLUPAMENT D'ACTIVITATS DE PREVENCIÓ DE RISCOS LABORALS. O. de 22 d'Abril de 1997 B.O.E. de 24 d'Abril de 1997.
- PROTECCIÓ DELS TREBALLADORS CONTRA ELS RISCOS RELACIONATS AMB L'EXPOSICIÓ A AGENTS BIOLÒGICS DURANT EL TREBALL.R.D. 664/1997 de 12 de Maig B.O.E. de 24 de Maig de 1997.
- EXPOSICIÓ A AGENTS CANCERÍGENS DURANT EL TREBALL.R.D. 665/1997 de 12 de Maig B.O.E. de 24 de Maig de 1997.
- DISPOSICIONS MÍNIMES DE SEGURETAT I SALUT RELATIVES A LA UTILITZACIÓ PELS TREBALLADORS D'EQUIPS DE PROTECCIÓ INDIVIDUAL.R.D. 773/1997 de 30 de maig B.O.E. de 12 de Juny de 1997.
- DISPOSICIONS MÍNIMES DE SEGURETAT I SALUT PER LA UTILITZACIÓ PELS TREBALLADORS DELS EQUIPS DE TREBALL.R.D. 1215/1997 de 18 de Juliol B.O.E. de 7 d'Agost de 1997.
- DISPOSICIONS MÍNIMES DESTINADES A PROTEGIR LA SEGURETAT I LA SALUT DELS TREBALLADORS EN LAS ACTIVITATS MINERES.R.D. 1389/1997 de 5 de Setembre B.O.E. de 7 d'Octubre de 1997.
- DISPOSICIONS MÍNIMES DE SEGURETAT I SALUT A LES OBRES DE CONSTRUCCIÓ.R.D. 1627/1997 de 24 d'Octubre B.O.E. de 25 d'Octubre de 1997.
- 
- NORMAS TECNOLOGICAS DE LA EDIFICACION (N.T.E.)

#### **Condicions ambientals.**

- IL·LUMINACIÓ ALS CENTRES DE TREBALL.O.M. 26 d'Agost 1.940 B.O.E. 29 d'Agost de 1.940.
- PROTECCIÓ DELS TREBALLADORS FRONT ALS RISCOS DERIVATS DE L'EXPOSICIÓ AL SOROLL DURANT EL TREBALL.R.D. 1316/1.989, de 27 d'Octubre B.O.E. 2 de Novembre 1.989.

#### **Incendis**

- NORMA BÀSICA EDIFICACIONS NBE - CPI / 96. R.D. 2177/1.996, de 4 d'Octubre B.O.E. 29 d'Octubre de 1.996.
- ORDENANCES MUNICIPALS

#### **Instal·lacions elèctriques.**

- REGLAMENT DE LÍNIES AÈRIES D'ALTA TENSIÓ. D. 3151/1.968 de 28 de Novembre B.O.E. 27 de Desembre de 1.968. Rectificat: B.O.E. 8 de Març de 1.969.
- REGLAMENT ELECTROTÈCNIC PER A BAIXA TENSIÓ. D. 2413/1.973 de 20 de Setembre B.O.E. 9 d'Octubre de 1.973.
- INSTRUCCIONS TÈCNiques COMPLEMENTÀRIES.



### Maquinària.

- REGLAMENT DE RECIPIENTS A PRESSIÓ. D. 16 d'Agost de 1.969 B.O.E. 28 d'Octubre de 1.969. Modificacions: B.O.E. 17 de Febrer de 1.972 i 13 de Març de 1.972.
- EGLAMENT D'APARELLS D'ELEVACIÓ I MANTENIMENT DELS MATEIXOS. R.D. 2291/1.985 de 8 de Novembre B.O.E. 11 de Desembre de 1.985.
- REGLAMENT D'APARELLS ELEVADORS PER A OBRES. O.M. 23 de Maig de 1.977 B.O.E. 14 de Juny de 1.977. Modificacions B.O.E. 7 de Març de 1.981 i 16 de Novembre de 1.981.
- REGLAMENT DE SEGURETAT A LES MÀQUINES. R.D. 1495/1.986 de 26 de Maig B.O.E.21 de Juliol de 1.986. Correccions B.O.E. 4 d'Octubre de 1.986.
- I.T.C.-MIE-AEM1: ASCENSORS ELECTROMECÀNICS. O. 19 de Desembre de 1.985. B.O.E. 14 de Gener de 1.986. Correcció B.O.E. 11 de Juny de 1.986 i 12 de Maig 1.988. Actualització: O. 11 d'Octubre de 1.988 B.O.E. 21 de Novembre de 1.988.
- I.T.C-MIE-AEM2: GRUES TORRE DESMUNTABLES PER A OBRES.O. 28 de Juny de 1.988 B.O.E. 7 de Juliol de 1.988 Modificació O. 16 d'Abril de 1.990 B.O.E. 24 d'Abril de 1.990.
- I.T.C-MIE-AEM3: CARRETES AUTOMOTRIUS DE MANUTENCIÓ. O.26 de Maig de 1.989 B.O.E. 9 de Juny de 1.989.
- I.T.C-MIE-MSG1: MÀQUINES, ELEMENTS DE MÀQUINES O SISTEMES DE PROTECCIÓ FETS SERVIR. O. 8 d'Abril de 1.991 B.O.E. 11 d'Abril de 1.991.

### Equips de protecció individual (EPI)

- COMERCIALITZACIÓ I LLIURE CIRCULACIÓ INTRACOMUNITÀRIA DELS EQUIPS DE PROTECCIÓ INDIVIDUAL.R.D. 1407/1992 de 20 Novembre de 1992 B.O.E. 28 de Desembre de 1992. Modificat per O.M de 16 de Maig de 1994 B.O.E. 1 de Juliol de 1994 y per R.D. 159/1995, de 3 de febrer B.O.E. 8 Març de 1995.
- DISPOSICIONS MÍNIMES DE SEGURETAT Y SALUT RELATIVES A LA UTILITZACIÓ PELS TREBALLADORS D'EQUIPS DE PROTECCIÓ INDIVIDUAL.R.D. 773/1.997 de 30 de maig de 1997

### Senyalitzacions.

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