ADA60 AC IOT

ADA60 AC IoT

5 and 10W

FlickerFree 2nd Generation

Round LED-module for spotlights and downlights.

No driver is required fully dimmable with DALI, Casambi and INGY

Key features

ADA60 is specifically crafted for light fixture manufacturer and their design of downlights and environments where the focus is on creating a welcoming and comfortable ambiance, whether for social interactions or professional tasks. With integrated drivers, these AC LED light engines simplify installation and offer versatile dimming options. Lilly sets a new benchmark for efficiency, delivering outstanding light output tailored for both aesthetic and functional lighting needs.

1. Integrated Smart Lighting
    - Built-in drivers with possible support for **DALI**, **Casambi**, and other smart control systems, offering seamless dimming options.
2. Effortless Connectivity
    - Direct connection to **230VAC** with no external drivers required, simplifying installation across different environments.
3. Flicker-Free Dimming
    - Provides smooth, flicker-free dimming using either standard dimmers or smart control protocols for consistent, comfortable lighting.
4. IoT-Ready
    - Easy integration into **IoT ecosystems**, enabling smart control and energy efficiency for both personal and commercial applications.
5. Sustainable Design
    - Compliant with the latest **EU circular economy** directives, making it both eco-friendly and future-proof.

Content

Introduction

The ADA60 LED module offers Light Fixture Manufacturers versatile dimming capabilities, working seamlessly with standard dimmers right out of the box. For more advanced, intelligent lighting control, our compact DimIn unit can be integrated, enabling compatibility with DALI, Casambi, or other communication protocols. This opens up new possibilities where the distinction between a single fixture and an interconnected system becomes fluid, allowing for highly personalized and intuitive lighting solutions. The only limit is how you choose to control the light from this LED module.

ADA60 Package

Designed for pendant applications, the ADA60 is a round LED light engine with small dimension for easy integration. Its poke-in connectors allow for quick and straightforward setup. With the option to integrate smart systems like DALI, Casambi, or other IoT-based protocols, this module fits into various lighting ecosystems. Additionally, all IoT LED modules feature an electrically isolated heat pad, ensuring safety and compatibility with Class II fixture installations.

Light Quality

Maintaining color stability is a priority, ensuring consistent and even light output throughout the installation’s lifespan. Key parameters such as precise binning, long lifetime, and efficient thermal management are carefully controlled to deliver superior performance and longevity.

Dimming Capabilities

ADA60 stands out with its impressive dimming capabilities. Whether using traditional phase dimmers or advanced communication protocols like DALI or Casambi, this module minimizes flicker and other unwanted effects, ensuring a smooth and pleasant lighting experience.

Smart Lighting

The ADA60 LED module is IoT-ready, designed to integrate easily with systems like Casambi, DALI, or other communication standards. Our goal is to make smart lighting accessible to small and medium-sized manufacturers, allowing them to incorporate advanced controls without requiring extensive technical expertise. Whether it's straightforward integration or the addition of new smart features, the process is simple, aligning with the latest EU directives on the circular economy for sustainable, future-proof solutions.

Short form Characteristics

MODULE CHARACTERISTICS		5W	10W
Power		5 W +/-10% ea.	10 W +/-10% ea.
Voltage		230VAC	
Number of LED's		32	
Colour Rendering Index		>Ra90	
Colour temperature		2700K, 3000K, 4000	
Optics		25-150°	
MECHANICAL			
Module dimension		Ø 59.5 mm	
Diameter lens		Ø 35mm	
Height		11.6 mm	
Weight			
Assembly holes		2 x 3.5 mm	
Wire connector		Push in	
ELECTRICAL			
Input voltage range		220-240V (max 264VAC)	
Dimmable		Yes (phase cut, DALI, Casambi, INGY etc)	
Power factor		> 0.95	
Total harmonic distortion		< 15%	
Peak inrush current		TBD	
Surge protection		2kV	
Burst protection		2kV	
Over temp. protection		150°C	
Energy class	2700K	G	G
	3000K	G	G
	4000K	G	G
PHOTOMETRICAL			
Flux		410-450 lm	820-900 lm
Efficiency		85lm/W	85lm/W
SDCM (Mac Adam)		3	
Flicker percent		3%	3%
Flicker index		0.0275	0.0275
SVM		0.3	0.3
PstLM		0.3	0.3
ENVIRONMENTAL			
Temperature range		-40°C to 85°C (Absolute maximum temp Tc 85°C)	
Relative Humidity		10-75%	
Ambient air pressure		500-1060 HPa	
LIFETIME			
Life length L70B10*		> 50 000h	

*Specifications are valid for >Ra95.

Article number structure

ADA60 AC.P.230.32.9yy-OH.IOT	
AC	AC= 230VAC, ED=External Driver required, ID=Internal Driver
P	Power (Watt) 5 or 10
V	Voltage: 230VAC
N	Amount of LEDs
8	CRI: 8=Ra>80, 9=Ra>90
YY	CCT: 27 =2700K, 30 =3000K, 40 =4000K
OH	Code: Optical Holder
IoT	IoT interface, Flickerfree (below 10%)

Article name and versions

ADA LED Engine Article description

ARTICLE NAME	POWER	CURRENT	CRI	CCT	LENS
ADA60 AC.5.230.32.927-OH.IOT	5	230	90	2700	Optic Holder
ADA60 AC.5.230.32.930-OH.IOT	5	230	90	3000	Optic Holder
ADA60.AC.5.230.32.840-OH.IOT	5	230	90	4000	Optic Holder
ADA60 AC.10.230.32.927-OH.IOT	10	230	90	2700	Optic Holder
ADA60 AC.10.230.32.930-OH.IOT	10	230	90	3000	Optic Holder
ADA60 AC.10.230.32.940-OH.IOT	10	230	90	4000	Optic Holder

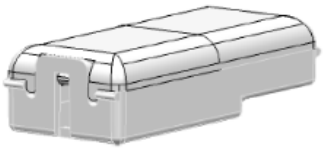
Optics for ADA LED engine

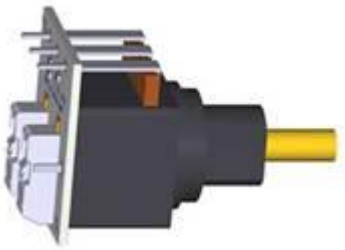
ARTICLE NAME	BEAM ANGLE	LUX Value @ 1 meter (10W)
Lens 35/S	25°	
Lens 35/M	30°	
Lens 35/W	31°	
Lens 35/WW	58°	
Lens Zorya	150°	
Lens 50/S		
Lens 50/M		
Lens 50/W		
Lens 50/WW		

The optics are to be ordered separately

DimIn (IoT Interface)

ARTICLE NAME	Eco System	Information
DimIn DALI DT8	DALI type 2	Wire
DimIn Casambi	Casambi	Wireless
DimIn Switch	Internal dimming	Wire (Together with a regular momentary switch)
DimIn POT	Internal dimming	Wire
- **DimIn Potentiometer**	Internal dimming	Wire together with DimIn POT





See mounting instructions. All of them is mounted as a snap-in solution. As long as the IoT module isn't mounted or with out access to its Eco-System it runs on 100%.

IoT area for Smart Lighting

The integration of DALI and Casambi with our LED modules takes your lighting design to the next level, providing a flexible, immersive, and interactive lighting experience. The small DimIn device functions as a module that fits into our IoT interface and is interchangeable between different devices. The device is connected to the main power supply (230VAC) and two additional wires, which can either be DALI or connected to a potentiometer, switch, or similar.

Platform	Table- or freestanding light 	Downlight 	Spotlight 	Pendent 	Medium size Opaque glass 	Medium size Opaque glass HCL/TW 	Big size Opaque glass 
Lilly80 AC IoT	X	X		X	X		
ADA AC IoT	X	X	X	X			
Sanna158 IoT	X			X	X		
Sanna158 AC IoT HCL				X		X	
Sanna290 IoT				X			X

DALI

The DALI system is bus-powered and operates with the Eco-System DALI-2.

Casambi

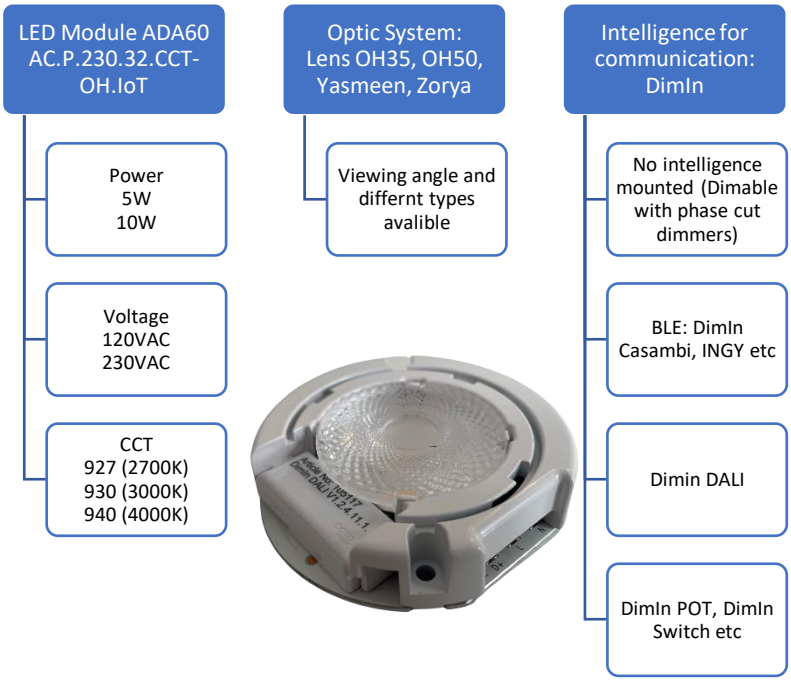
Casambi offers more than just dimming or wireless on/off capabilities. It is a connected and intelligent system that allows for dynamic and responsive lighting, energy savings, and "human-centered lighting" that promotes well-being. Scientific evidence suggests that this type of lighting can increase productivity in workplaces and schools.

POT (Rotary Potentiometer)

The DimIn system also includes a rotary potentiometer for independent units that need local dimming. The potentiometer is easily mounted and can be used for dimming, turning on/off, and adjusting brightness. It is connected to the same output as the DALI wires and is integrated into the LED module. This feature is ideal for freestanding light fixtures, work lighting, or light fixtures that require dimmability.

Ordering and Packaging information

To make it work easily and smoothly, first choose which module to use next, power and which CCT you want. Then choose between different optical solutions such as our hybrid lenses and last but not least which IoT intelligence you need (which we call DimIn) in your application. All parts are ordered separately from each other to be able to be adapted to the end user's needs.



Packaging information

Ada60 AC

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	24	35,6	22,7	9,6	1,5
Outer Box	192	46,5	37,5	36,6	13,0

Lens 35/xx

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	108	30	30	23	TBD
Outer Box	216	62	32	25	TBD

DimIn

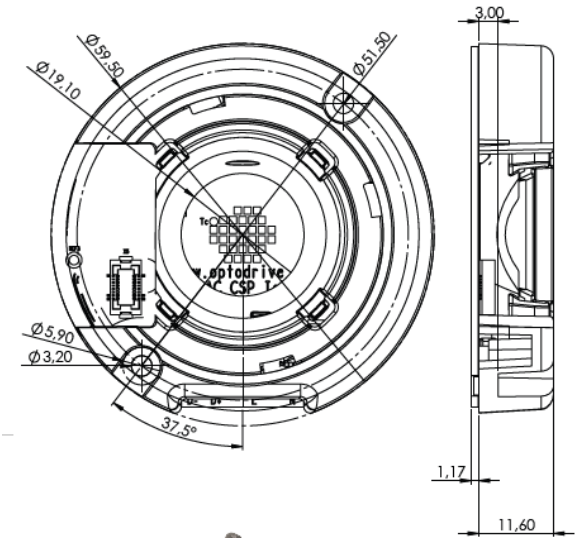
Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	288	35,6	22,7	9,6	
Outer Box	2304	46,5	37,5	39,6	TBD

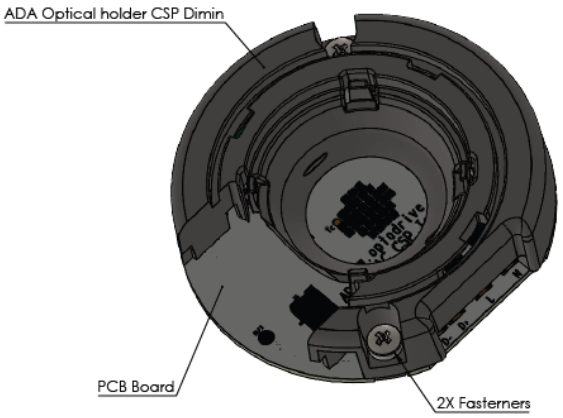
Potentiometer

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	TBD	35,6	22,7	9,6	
Outer Box	TBD	46,5	37,5	39,6	TBD

Dimensions

LED-module





Lens for Optical Holder

Mounting instructions

The DimIn module itself is the small, sugar-cube sized device that provides the IoT functionality for the LED Module. This module allows the LED Module to be connected to different communication systems, such as DALI or Casambi, and provides additional functionality such as dimming and other smart lighting controls. To install the DimIn module, it needs to be mounted in the IoT interface of the LED Module. The terminal blocks on the LED Module are labeled with N for zero, L for phase, D- and D + for the dimming function, and these can be connected to either DALI, a switch, or a potentiometer. The wiring of the LED Module should be performed carefully and in accordance with the electrical code to ensure safe and efficient operation.

Mounting

Mount the device on heatsink with screws safely

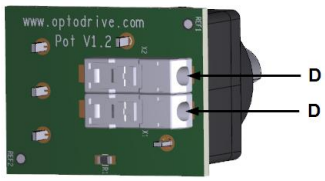
Wiring

The LED module with the nomenclature IoT/DimIn can be expanded with additional functionality, has terminal blocks with the texts N for zero, L for phase, D- and D + for dimming function with either Dali, Switch or a potentiometer.

DimIn

To obtain additional functionality, the LED Module needs to have an additional module mounted in the IoT interface.

Potentiometer card

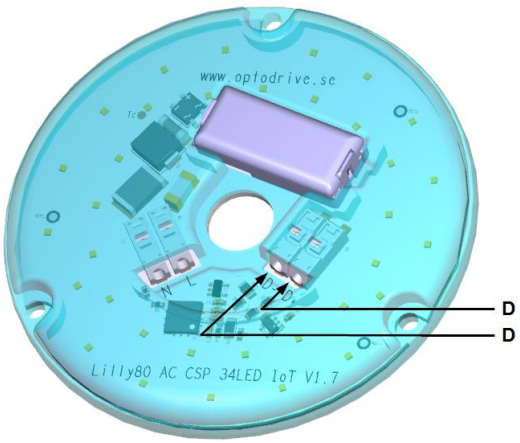


The Pot potentiometer board works with the DimIn Pot functionality module. D + or D- play a certain role as they change the dimming direction depending on the connection.

Wire Connections (DALI or other)

Connect BUS control cables from the DALI control unit or Master unit (standard product that Optoga does not supply) or cables from DimIn Pot to D + and D- on the LED module. This depends on whether there is a DALI or DimIn Pot module mounted on the LED module.

DALI is polarity independent so it does not matter which of D + and D- is connected.

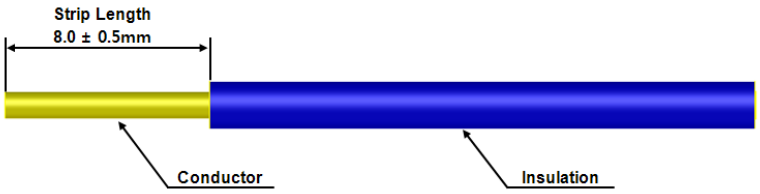


Connector

Type	Push In type

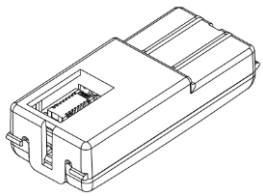
Wire (Recommended)

Type of wire	AWG	mm²
Stranded	22-20	0.32-0.5mm²
Solid	24-18	0.51-1.02Ø (0.2-0.8mm²)
Insulation diameter	Max 2.1 mm	

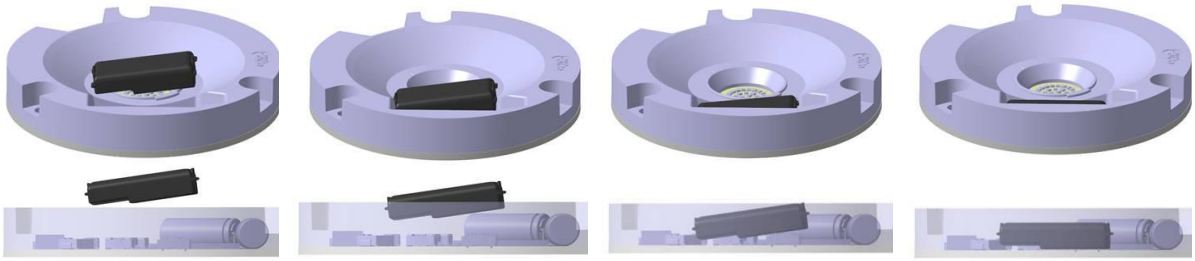


Mounting of DimIn

DimIn is designed for direct plug-in connection to the LED module through a standardized interface – no additional brackets or adapters are required. This ensures:



- No impact on luminaire design, same footprint, no redesign needed
- No loss of light output, full optical performance is maintained



Integrated Power & IoT-Ready

In IoT versions, the AC driver is fully integrated into the LED module.

- **Direct mains connection**, no external driver needed
- **Integrated connector**, easy attachment of DimIn or other functional modules
- **Normal mode fallback**, if no module is attached, the LED module works as a standard dimmable light source

Compliance & Performance

When a DimIn module is installed:

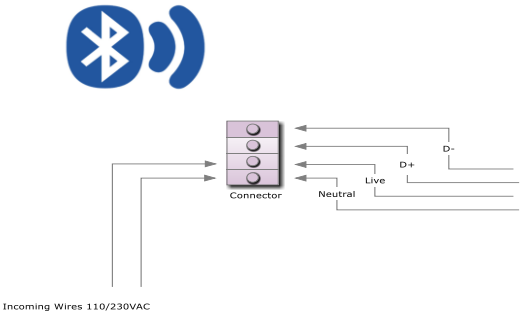
- **Smart control is activated**, enabling DALI, Casambi or other IoT functions
- **Real-time monitoring**, power, temperature and runtime data are reported
- **Eco-Design compliance**, flicker-free dimming across the entire range, meeting EU 2024 (SVM ≤ 0.4) requirements

Flexible Installation

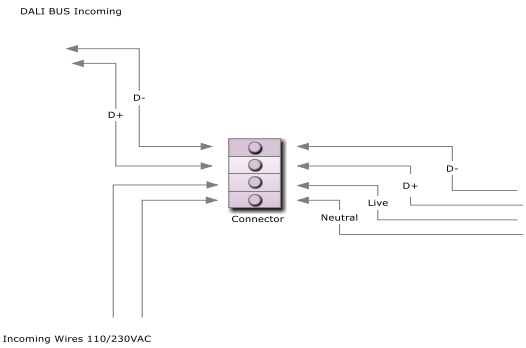
- **At production:** Luminaire manufacturers can pre-install DimIn for ready-to-ship smart luminaires
- **In the field:** Modules can be added later, enabling retrofit upgrades without rewiring

Wiring for different DimIn versions

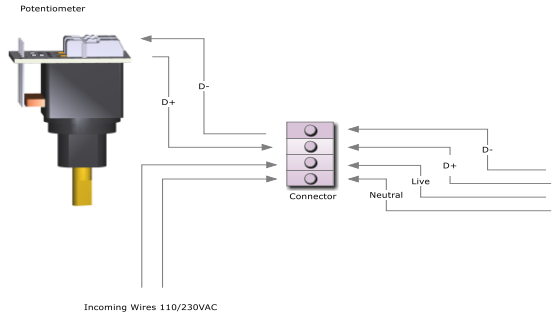
Casambi

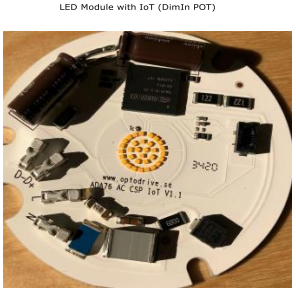


DALI

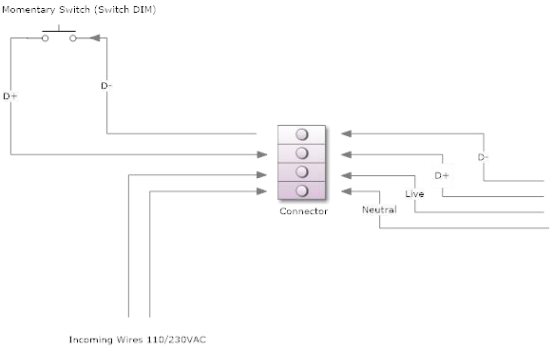


POT / Potentiometer



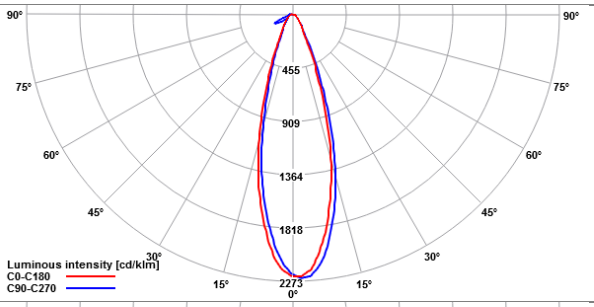
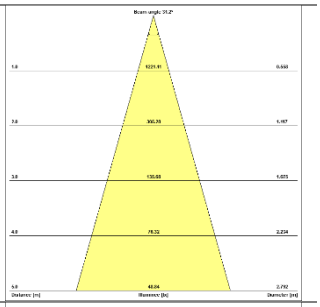
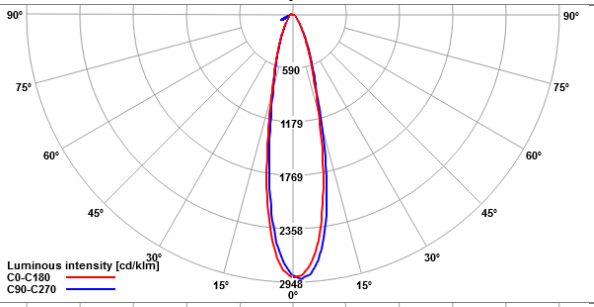
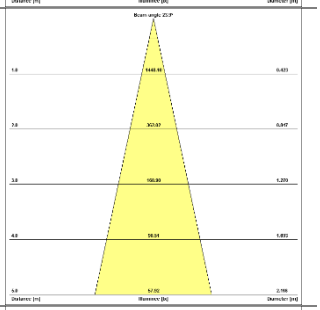
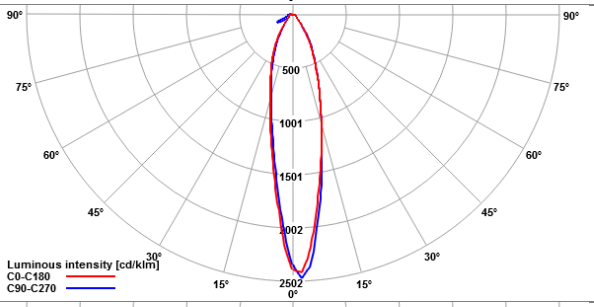
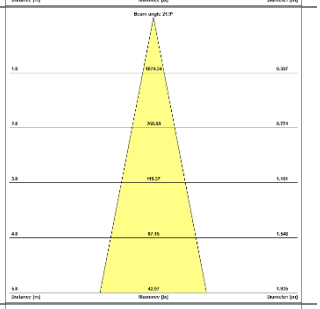
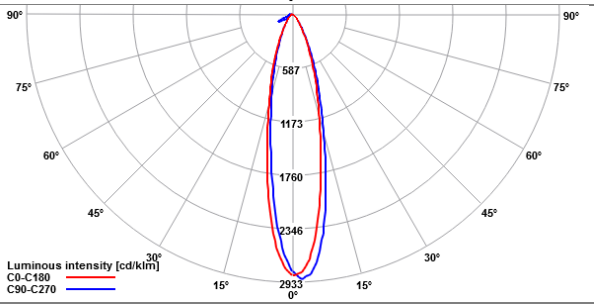
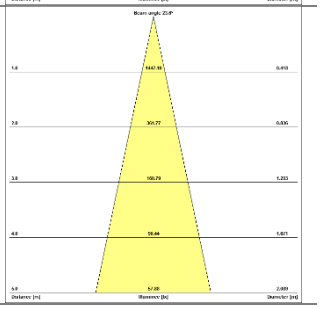


Switch



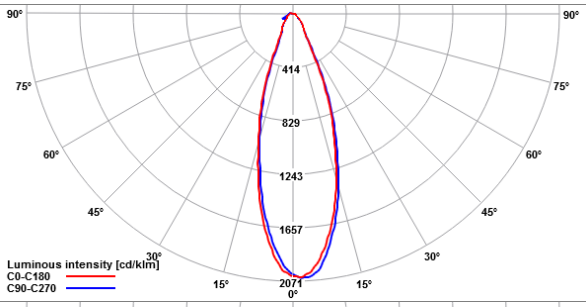
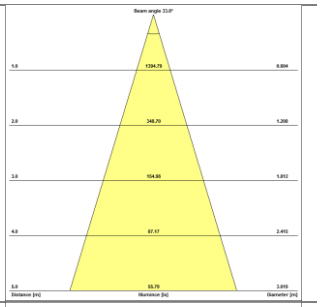
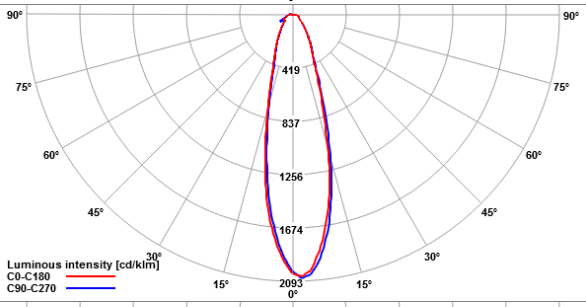
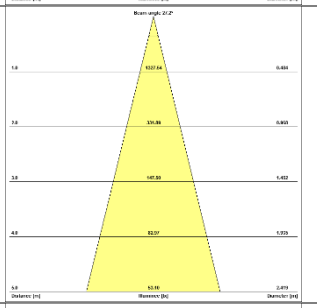
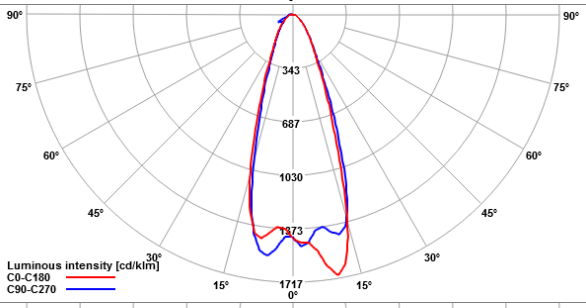
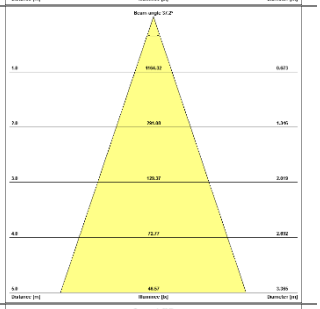
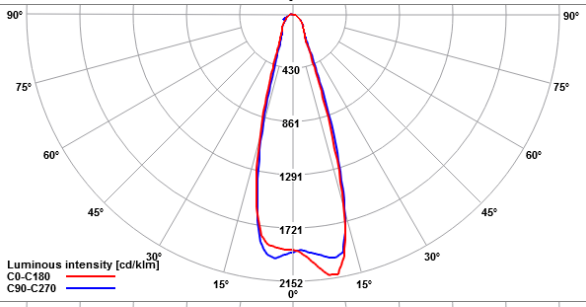
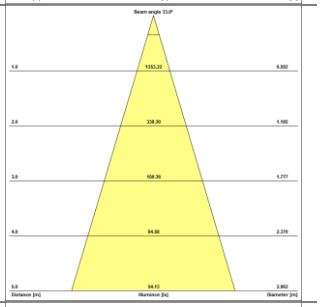
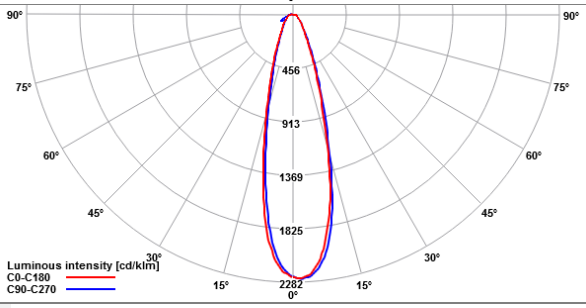
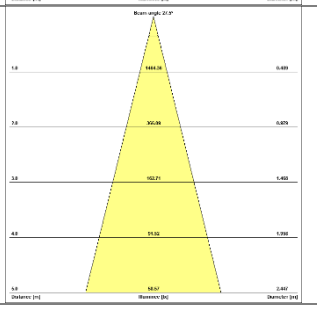
Lens System available

Yasmeen

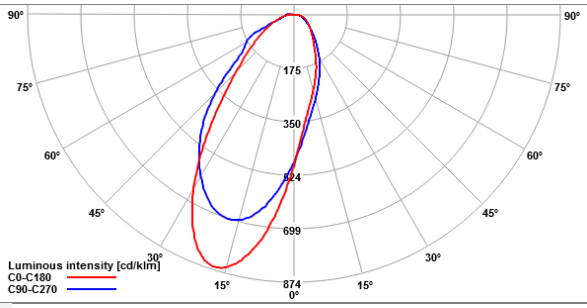
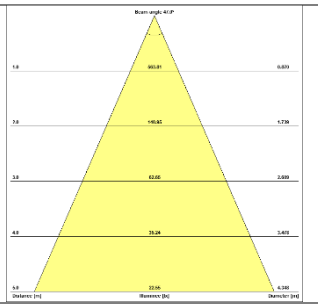
Version xx-C2	Beam Angle	Light intensity distribution	Beam cone
*Yasmeen*_WW 	31,2		
*Yasmeen*_W	23,9		
*Yasmeen*_S	21,9		
*Yasmeen*_M	23,6		

Lens material	PMMA
Lens holder material	PC

AMY50

Version xx-C2	Beam Angle	Light intensity distribution	Beam cone
AMY50_WW 	33,6		
AMY50_W	27,2		
AMY50_S2	37,2		
AMY50_S	33,0		
AMY50_M	27,5		

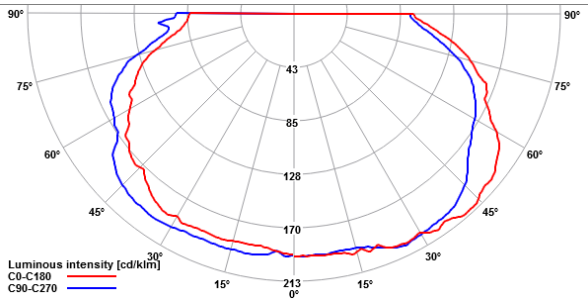
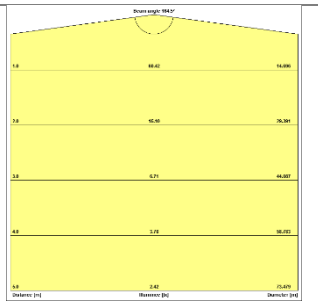
Lens material	PMMA
Lens holder material	PC

Version xx-C2	Beam Angle	Light intensity distribution	Beam cone
AMY50_WAS			

Lens material	PMMA
Lens holder material	PC

Asymmetric beam for wall washing

Zorya

Version xx-C2	Beam Angle	Light intensity distribution	Beam cone
ZORYA-SC-C 105417 	164,5		

Specially designed to be used inside globes etc LED optic made from silicone with around 340-degree light distribution that mimics a traditional light bulb beam pattern.

Lens material	Silicone
Lens holder material	PC

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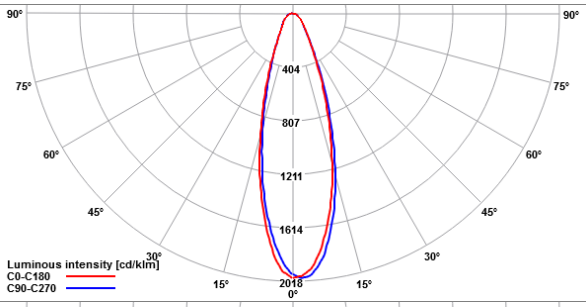
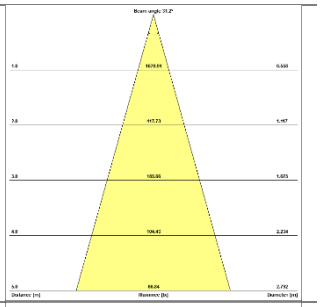
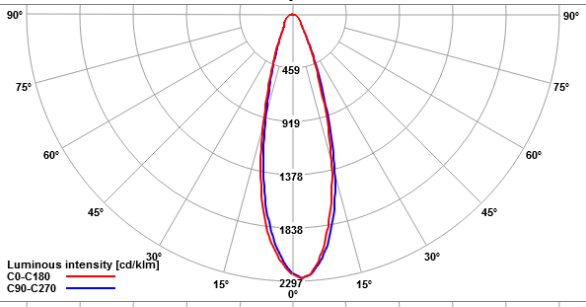
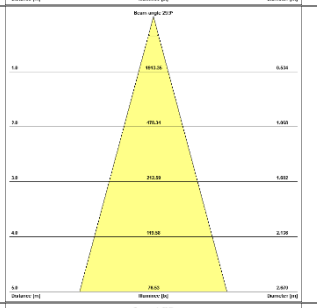
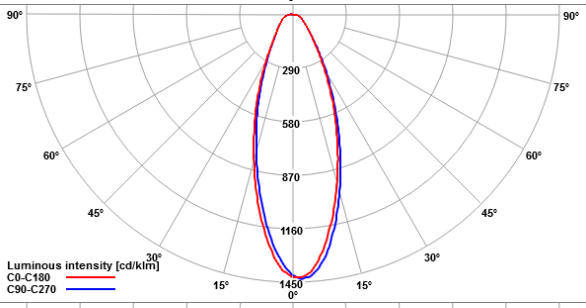
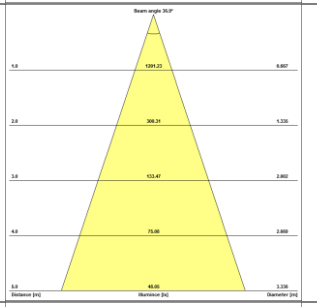
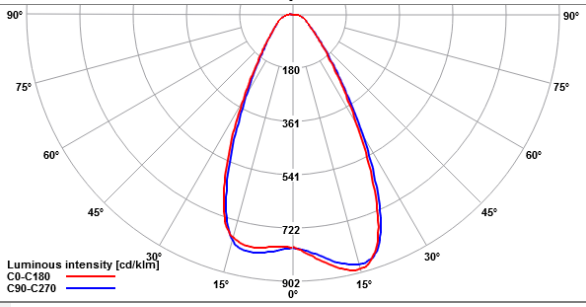
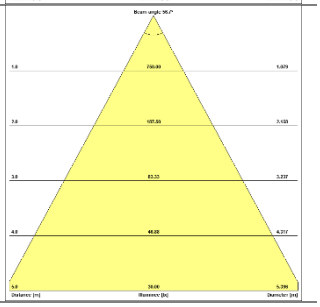
AMY35

Version xx-C2	Beam Angle	Light intensity distribution	Beam cone
AMY35_S 105413 	29,6		
AMY35_M 105414	30,4		
AMY35_W 105415	36,9		
AMY35_WW 105416	57,0		
Lens material	PMMA		

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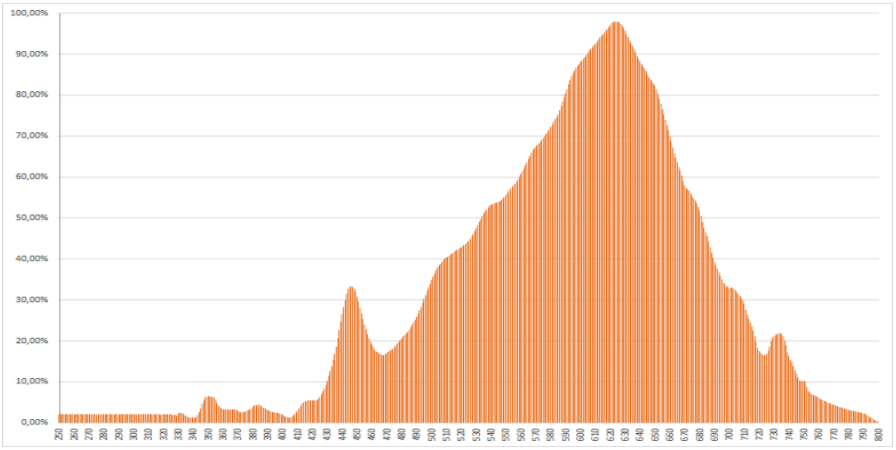
Photometrical

Colour Spectrum 2700K



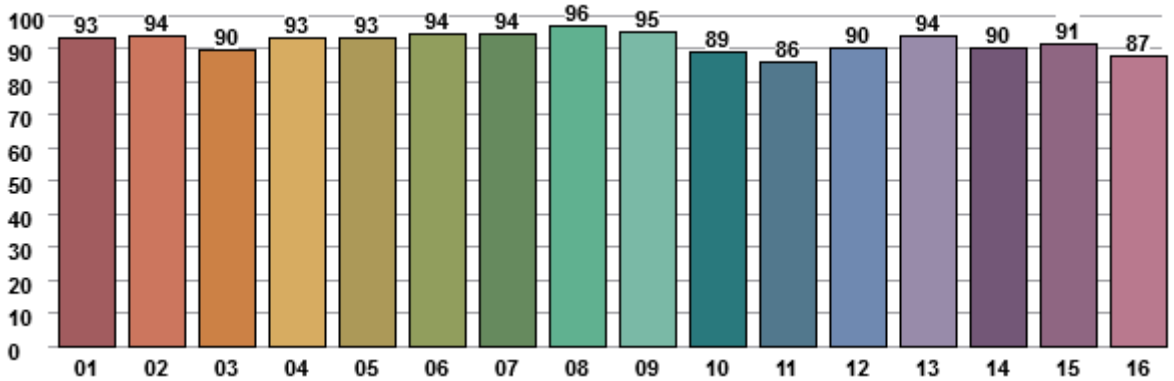
Colour Rendering Index (CRI) 2700K

Ra	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
94.0	95.3	95.4	93.2	94.7	94.2	93.1	95.5	90.6	76.2	87.3	94.4	79.9	95.3	95.3

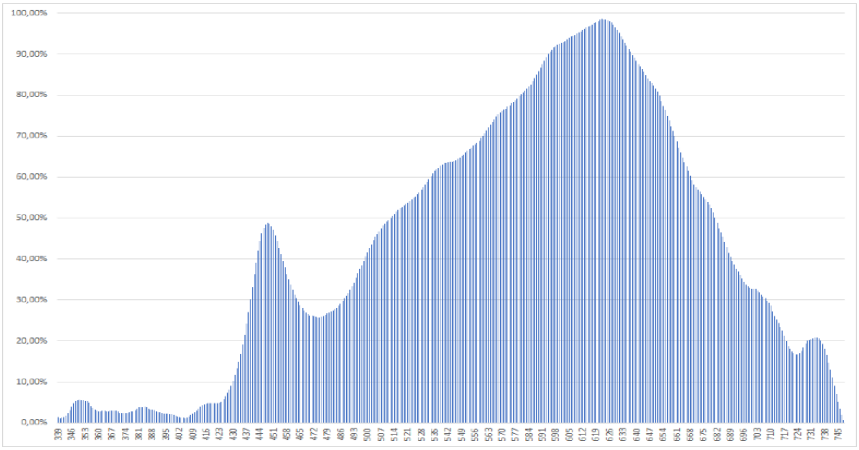
TM-30-15

Main Parameters	
Fi	92
Rg	101
Rfskin	96

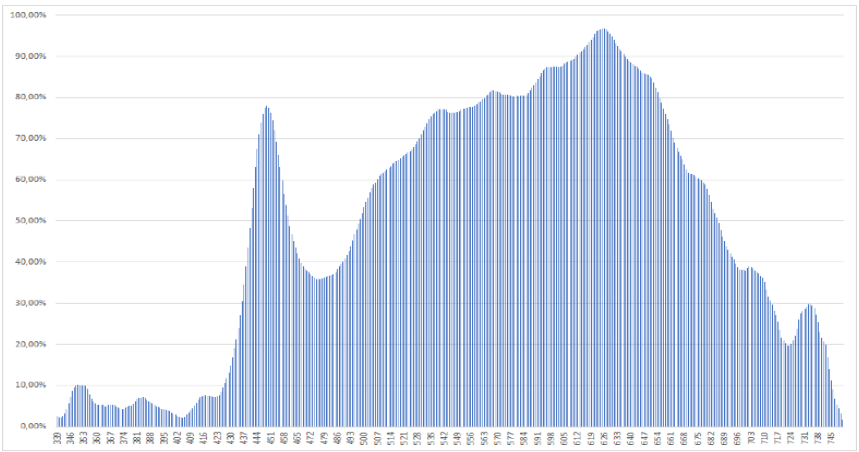
Hue Bin Fidelity Index (Rfh,j)



Colour Spectrum 3000K

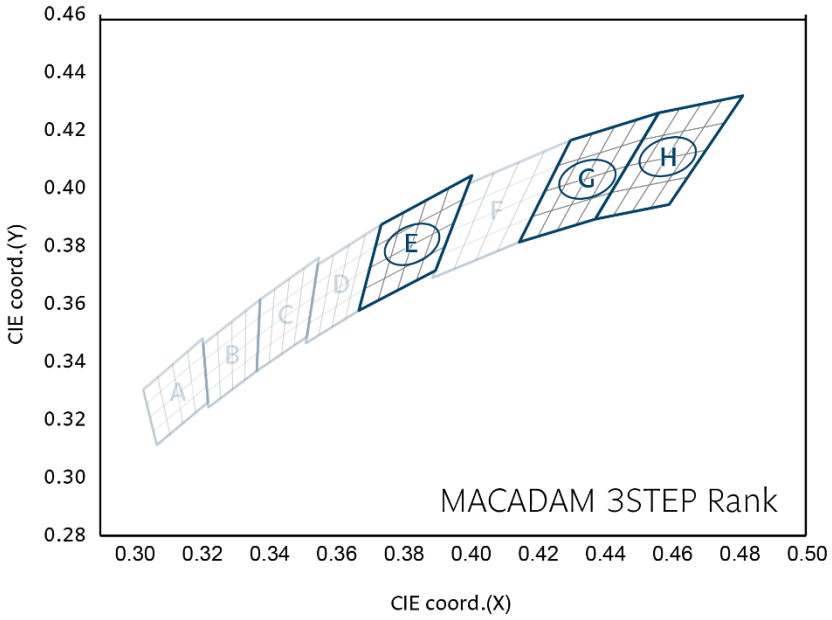


Colour Spectrum 4000K



Binning structure graphical representation

Binning structure graphical representation IEC 1976



* Note that the Blue boxes represent Energy Star Rank

Short form in diagram	Colour Code	CCT
H	27	2700K
G	30	3000K
E	40	4000K

Colour Rendering Index (CRI)

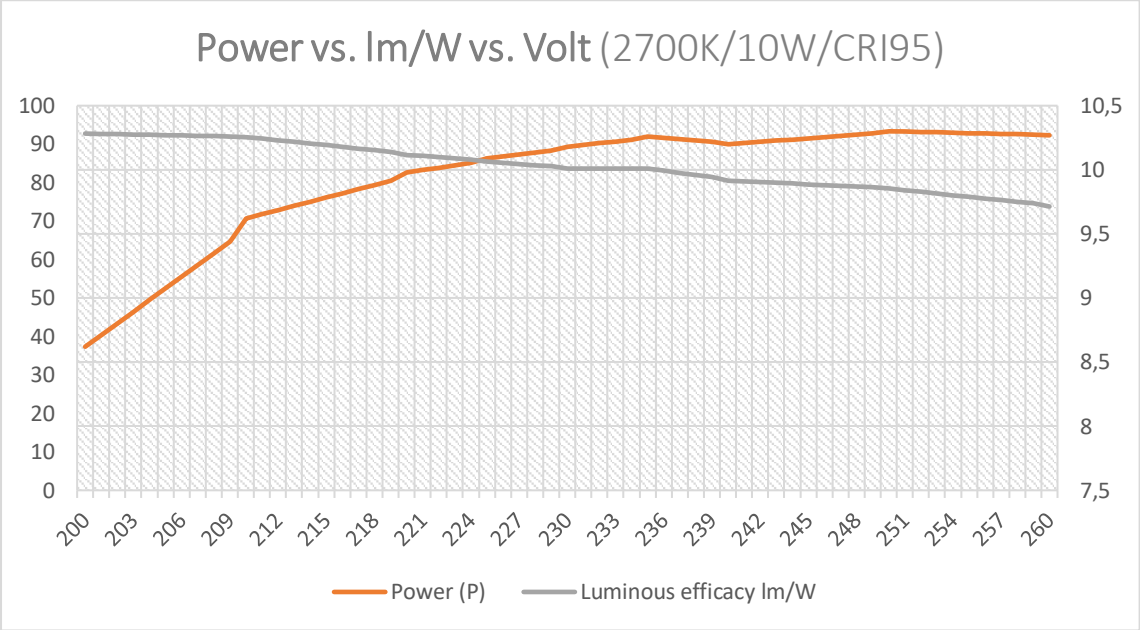
CRI Code	CRI (min) Ra
8	>80
9	>90

Short form letters for CCT (K)

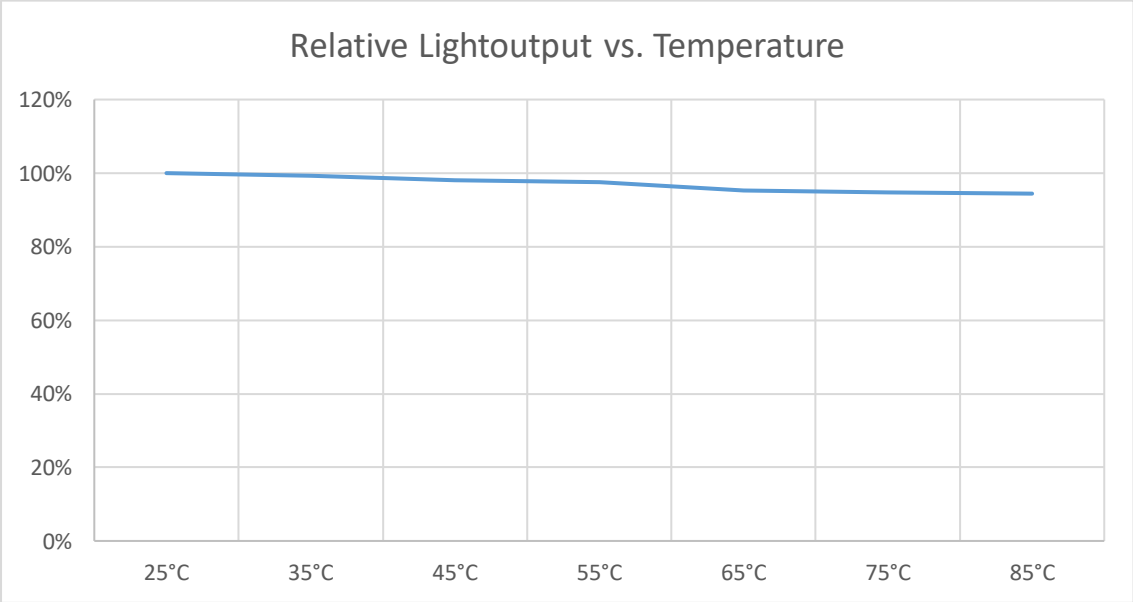
Colour Code	CCT
27	2700K
30	3000K
35	3500K
40	4000K
50	5000K

Electrical Optical Data

Voltage effect on light exchange



Temperature Characteristics

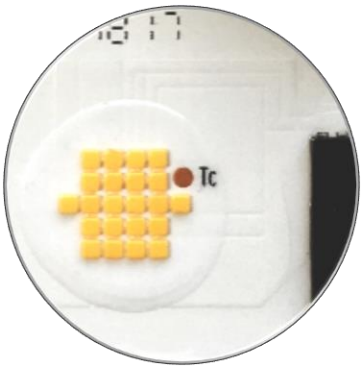


Consider the thermal properties where the LED module is to be mounted. Temperature is an important factor for lifetime longevity as well as for degradation of luminous flux.

Lifetime (Calculated)

Measurement control

At verification, the temperature at the designated Tc measurement points shall be confirmed to remain within the specified limits. Compliance with these limits determines the expected operational lifetime of the module. This verification shall be performed only after proper attachment of the heat sink.



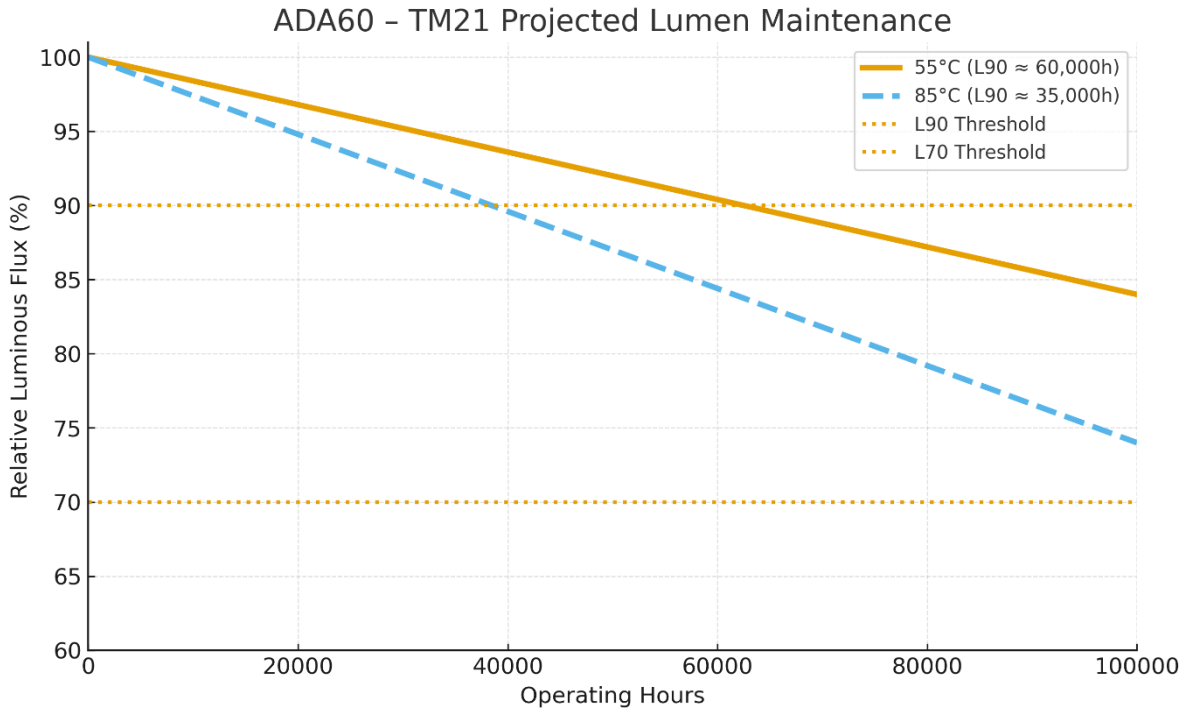
Lifetime Calculation at Tc

The calculated lifetime is based on the maximum recommended temperature at the Tc measurement point. The absolute maximum Tc is 85 °C, and this limit shall not be exceeded. For reliable design margins and extended service life, a recommended Tc of 65 °C should be applied in luminaire design.

Projected lifetime based on TM-21

The applied power load for the LED module is defined in accordance with the lumen maintenance projection. Lifetime projections are based on LM-80 test data from discrete LEDs operated under the specified thermal conditions at a drive current of 30 mA.

Metric	55 °C	65 °C	75 °C	85 °C
L90	62 500 h	54 000 h	46 000 h	38 000 h
L80	>100 000 h	>100 000 h	92 000 h	76 000 h
L70	>100 000 h	>100 000 h	>100 000 h	>100 000 h



Lifetime and Reliability

The projected lifetime values presented are based on TM-21 extrapolation of LM-80 test data for the LEDs used in the module. These figures represent lumen maintenance of the LED packages only.

An LED module, however, consists of several additional components such as PCB substrates, solder joints, driver electronics, optical materials and connectors. The overall service life of the module may therefore be influenced by these elements, depending on the application environment and operating conditions.

Optoga modules are designed and verified to ensure that supporting components are selected and dimensioned to match the LED lifetime at the recommended Tc values. This means that the projected lumen maintenance according to TM-21 is complemented by robust module design, providing customers with reliable long-term performance in real installations.

Verification of Conformity

Radio Disturbance	IEC 55015:2006 + A1:2007 + A2:2009	
SURGE	IEC 61000-4-5	2 kv
Fast transient BURST	IEC 61547	2 kv
SAFETY	IEC 62031:2008	
Photo Biological Safety	IEC 62471:2008	
Radio Disturbance	IEC 55015:2006 + A1:2007 + A2:2009	
EMC	IEC 61000-3-2:2006	
EMC	IEC 61000-3-3:2008	
ESD*	IEC 61000-4-2	8 kv Air discharge 4 kv Contact discharge

** Please consult the document ESD standards on Optodrive ED, ID and AC*

Production Setup

Production in accordance with IPC-6012-B and IPC-A-600G class 2. The bare PCB is isolation tested with 3000VDC/10mA for 10 seconds

PCB Material Setup

In all questions regarding the bare PCB please use “Material Data sheet Optodrive” as a guideline.

Heat-PAD Setup

The heat dissipation PAD is made of silicone rubber, filled with thermally conductive ceramic powder and reinforced with fiberglass. It has good thermal conductivity, excellent insulation and puncture resistance.

Light fitting routine tests

According to EN/IEC 60598-1 should the routine test be performed as a dielectric strength test or insulation test. Only the insulation test of 500Vdc should be performed according to standard, 1s with min 2MΩ.

No dielectric tests are allowed to be performed on OptoDrive LED Modules.

DIMMERS tested

Brand	Model	Max W	Min W	Min %	Flicker (perceived)	Noise
ION	ID350WMKII	11,1	0,3	3%	No	No
ABB/Busch Jaeger	6523URJGL-214-103	9,6	0,7	7%	No	No
Elko	400GLI	9,8	1,2	12%	No	No
Niko	310-0190X	11,5	0,2	2%	No	No
Vadsbo	VD200	8,9	0,2	2%	No	No
Qlight	Monodim 350	10,7	1,9	25%	No	No
Schneider	SBD315RC	10,6	1,6	15%	Yes	No
SG	820320 LEDIM400	10,5	0,2	2%	No	No
Elko	315 GLE	10,4	1,9	18%	Yes	No
Gira	2262 00 / i01	10,1	1,3	13%	No	No
ABB/Busch Jaeger	2247U	10	1,2	12%	No	No
Q-light	Duo touchdim	10,5	3,3	31%	No	No
Q-light	Zerodim 350	10,5	0,8	8%	No	No
Ehmann	T14.03.1	8,2	2,7	33%	No	No
Vadsbo	VD300	10,7	0,5	3%	Yes	No
Gelia	EF700DC	10,3	3,9	3%	No	No
Schnider	SBD200LED	10,5	2,4	3%	No	No
ION	ID350WMKII	11,1	0,3	3%	No	No
Berker	2873	10,1	1,6	3%	No	No
Plejd	Dim-01	11,3	0,3	3%	No	No

It is important to understand that these are numbers tested with standard dimmers in a laboratory environment and can only be considered as reference information. Please always perform a test in its actual application. We take no responsibility for changes, differences and updates to dimmers and performance etc. due to this. In the test some of them had low or high level flicker but no problem changing up or down to make the perceived flicker go away. There is always flicker beyond the ability of the eyes to detect such and to minimize it, we recommend using DALI, Casambi, INGY or the like together with our DimIn system which almost completely removes this flicker.

Precautions for use

- This device should not be used in any type of fluids such as water, oil, organic solvent etc.
- When cleaning is required, use only water together with mild soap on the outside of the lens. Cleaning inside of the LED module is strictly prohibited.
- The appearance and specifications of the product may be modified for improvement without notice.
- Long time exposure of sunlight or occasional UV exposure will cause lens discoloration.
- Opening of the LED module is prohibited due to risk of EMC, dust, grease and other exposures that will damage it.
- The LED Module should always be mounted to a proper heat sink before it's connected with its proper leads.

Handling in regards to static electricity

- The Optodrive products have integrated circuits (IC) on board that may be damaged if exposed to static electricity. Please handle the products only while using equipment that prevents static electricity. Do not handle them without having ESD protection.
- The Optodrive products are not be installed into the end product without proper ESD protection.
- Optodrive LED Modules meet IEC61547:2009 and IEC61000-4-2. We recommend the light fixture manufacturer to take the mentioned standards under consideration.

Storage before use

- Use only properly rated test equipment and tools for the rated voltage and current of the product being tested.
- It is strongly suggested to wear rubber insulated gloves and rubber bottom shoes while handling the product.
- Do not wear any conductive items (such as jewelry) which could accidentally contact electric circuits.
- Faults, lightning, or switching transients can cause voltage surges in excess of the normal ratings.
- Internal component failure can cause excessive voltages.
- Stored or residual electricity in long wire could be hazardous.

ROHS III Compliant

All our LED modules meet the Restrictions of Hazardous Substances (RoHS III)!

There has been a growing consensus that Lead Free Systems should increase for the safety of our environment. It is a very serious problem that lead and other harmful materials are being used in commercial and industrial products, causing more and more environmental problems. This has led to regulations such as RoHS (Restriction of the use of certain Hazardous Substances) from the EU and the Japan Ministry of Trade and Industry (MITI). All LED module makers providing products to these countries should comply with these restrictions. In order to meet the RoHS III regulation, Optoga is strictly implementing a ban on lead and other hazardous materials in its products. This is in compliance with our responsibilities as good corporate citizens.

Design for Environment:

According to the EU-directive (RoHS III) the following substances must not be used in this product

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Chromium VI (Cr^{6+})
- Polybrominated biphenyls PBB
- Polybrominated diphenyl ethers PBDE
- Bis(2-ethylhexyl) phthalate DEPH
- Butyl benzyl phthalate BBP
- Dibutyl phthalate DBP
- Diisobutyl phthalate DIBP

Do you want to know more about benefits of OptoDrive LED?

Read more about OptoDrive at www.optoga.com.
You can contact us via info@optoga.com.
You can also call us on +46 (0)589 490 950.

Optoga AB
Optoga was founded in November 2004 in Arboga, Sweden and has many years of experience in electronics design. The company developes and supplies LEDs and LED-module solutions for the lighting industry, vehicle manufacturers and electronics companies.

With the OptoDrive LED-module, Optoga has taken the initiative to replace strip lights, incandescent and halogen bulbs with LED-based sources.

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