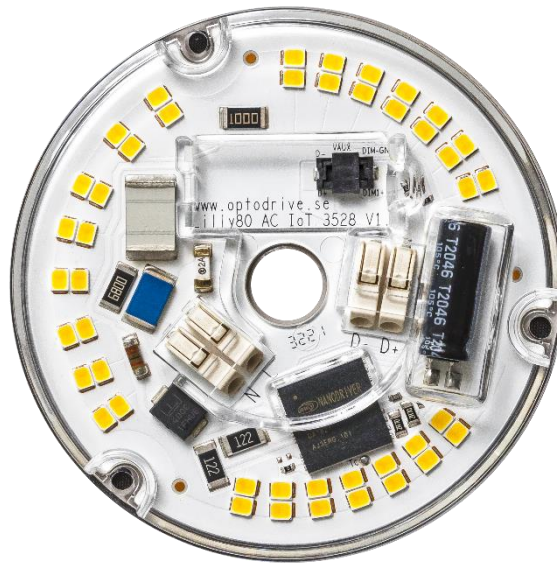




LILLY80 AC IoT

LILLY80 AC IoT

10W | 20W



Compact round LED-light engine for pendants with wireless Casambi and wire DALI technology. By installing a DimIn DALI Memory module on-site, the system supports energy monitoring, diagnostics, and predictive maintenance.

No driver is required!



Key features

Lilly80 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.

6. Energy monitoring, diagnostics, and predictive maintenance

- By installing a DimIn DALI Memory module on-site, the system supports DALI extensions 251–253 for energy monitoring, diagnostics, and predictive maintenance.



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Introduction

The Lilly80 LED module offers 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.

Lilly80 Package

Designed for pendant applications, the Lilly80 is a round LED light engine with a centered hole for easy wire integration. Its plug-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

Lilly80 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 Lilly80 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.

The Lilly80 module is designed to integrate seamlessly with IoT systems, enabling advanced control options such as Casambi, Ingy and DALI. Whether for energy monitoring, detailed device data, or human-centric lighting applications, this module transforms traditional fixtures into intelligent, connected systems.

Smart Lighting with IoT

The world of lighting design is evolving rapidly, and smart LED engines are leading the charge. With IoT technology, designers can now integrate DALI and Casambi directly into their lighting systems, creating dynamic, adaptable environments. From enhancing comfort in workspaces to crafting immersive lighting experiences, smart lighting provides an unparalleled level of control.

Imagine having these capabilities built into your LED module from the start—Optoga makes it possible. The compact, sugar-cube-sized DimIn modules are the key. They seamlessly fit into our IoT interface and can be easily swapped between DALI, Casambi, or even basic dimming controls, making smart lighting accessible to everyone. All that's needed is a mains connection (230VAC) and two wires—either for DALI or for connecting a potentiometer or switch.

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		
ADA60 AC IoT	X	X	X	X	X		
ADA76 AC IoT	X	X	X	(X)			
Sanna158 IoT	X			X	X		
Sanna158 AC IoT HCL				X		X	
Sanna290 IoT				X			X

DimIn Modules for Ultimate Control

- **DALI:** Our DALI-compatible device works seamlessly with DALI-2 systems, offering precise control over lighting with bus-powered simplicity. Integration according to IEC 62386.251, 252, 253 for memory bank, energy reporting, diagnostics and maintenance.
- **Casambi:** Casambi isn't just wireless control—it's a smart, connected lighting system that can respond to changing environments, adjust brightness, and create human-centered lighting that enhances well-being and productivity.
- **Switch:** Use a momentary switch for simple, smooth dimming control in freestanding devices.
- **POT:** The potentiometer option allows easy dimming (up/down) and on/off functionality, perfect for standalone fixtures.

Potentiometer Control

With our easy-to-use potentiometer, users can enjoy intuitive lighting control. The click mechanism provides tactile feedback for on/off, while a smooth clockwise rotation increases light intensity on a logarithmic scale—ideal for precise control over ambiance.



Short form Characteristics

MODULE CHARACTERISTICS	10W	10W	20W	20W
Power	10W +/-10%	10W +/-10%	20W +/-10%	20W +/-10%
Voltage	120 VAC	230 VAC	120 VAC	230 VAC
Number of LEDs	48	48	48	48
CRI	>Ra90			
Colour temperature	2700K, 3000K, 4000K			
Optics	130° Cover			

MECHANICAL				
Module dimension	Round Ø 80mm			
Inner diameter hole	Ø 12mm			
Height	7.5mm			
Weight	TBD			
Assembly holes	3 x 3.5 mm			
Wire connector	Poke in			

ELECTRICAL		
Input voltage range	100-130 V	220-240V
Power factor	0.95	
Total harmonic distortion	<15%	
Peak inrush current	TBD	
Inrush current duration	TBD	
Type of current	AC	
Surge protection	2.0kV on board	
Burst protection	2kV on board	
Over temp. protection	150°C	
Energy class	Se full summery	

PHOTOMETRICAL				
Flux nominal (3000K)	1150 lm	1170 lm	2200 lm	2280 lm
Efficiency EPREL	115 lm/W	117 lm/W	110lm/W	114lm/W
SDCM (Mac Adam)	3			
SVM	0,3			
PstLM	0,3			

ENVIRONMENTAL				
Relative Humidity	10-75%			
Temperature range	-40°C to 85°C (Absolute maximum temp Tc 85°C)			
Ambient air pressure	500-1060 HPa			
Life length L70B10*	>50 000h			



Article number structure

LILLY AC.P.230.48.XYY-NN.ZZ

AC	AC= 230VAC, ED=External Driver required, ID=Internal Driver
P	Power (Watt)
V	Voltage: 120VAC or 230VAC
N	Amount of LEDs
X	9=Ra>90
YY	CCT: 27 =2700K, 30 =3000K, 40 =4000K
NN	130 - with cover, D with Diffused Cover
ZZ	Variance code IOT

Packaging information

Lilly80 – Packaging information

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	30	35,6	22,7	9,6	
Outer Box	180	46,5	37,5	39,6	13,3

DimIn – Packaging information

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	72	35,6	22,7	9,6	
Outer Box	2304	46,5	37,5	39,6	TBD

Potentiometer – Packaging information

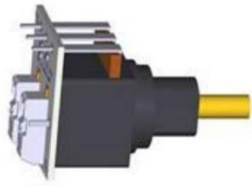
Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	TBD	35,6	22,7	9,6	
Outer Box	TBD	46,5	37,5	39,6	TBD

Article name and versions

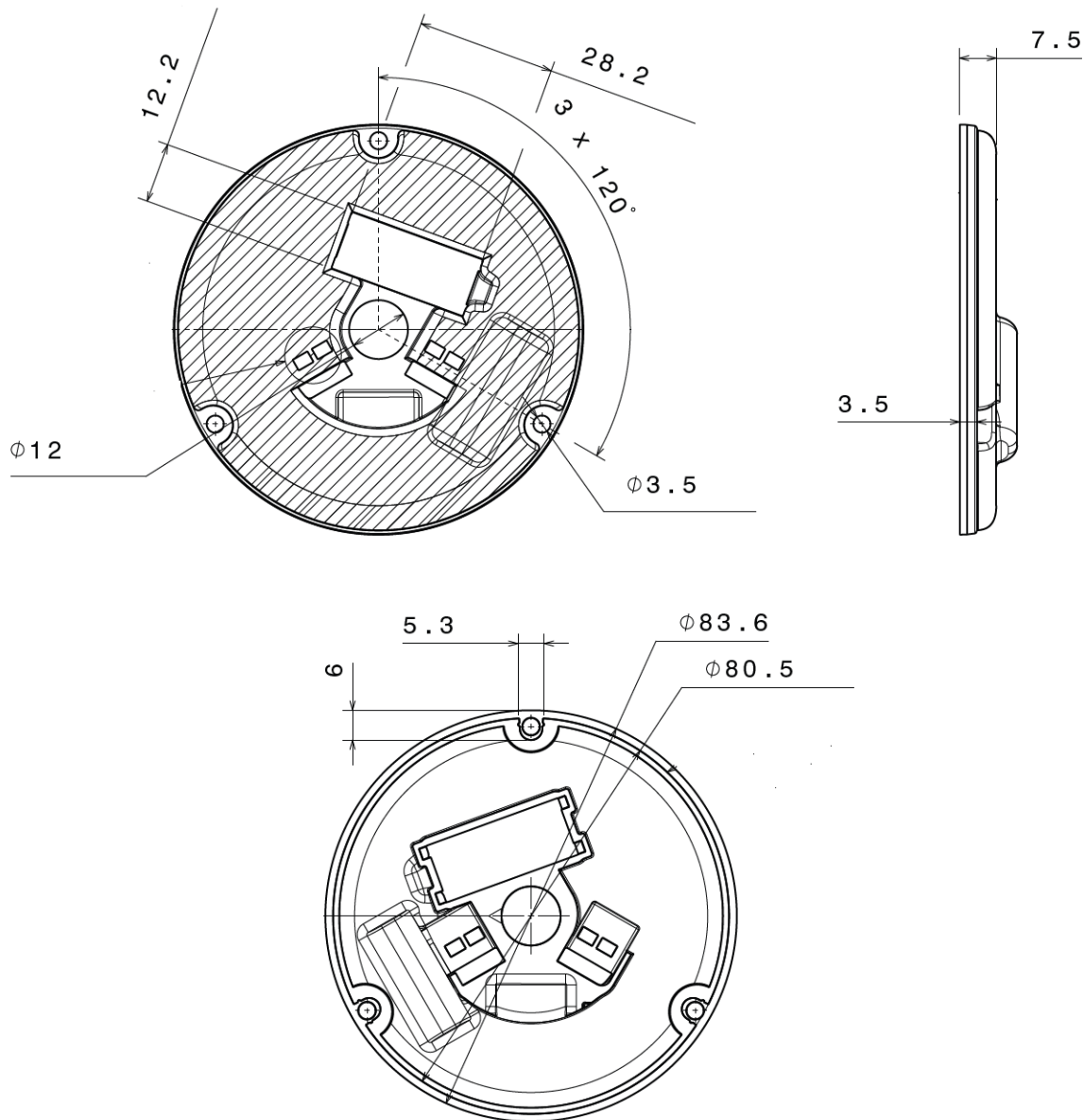
LED Module

ARTICLE NAME	POWER	CURRENT	CRI	CCT	LENS	Lumen		Energy Class
						25°C	65°C	
Lilly80 AC.10.230.48.927-130.IOT.FF	10	230	90	2200	110°	800	720	F
Lilly80 AC.10.230.48.927-130.IOT.FF	10	230	90	2700	110°	1030	920	E
Lilly80 AC.10.230.48.930-130.IOT.FF	10	230	90	3000	110°	1090	1030	D
Lilly80 AC.10.230.48.940-130.IOT.FF	10	230	90	4000	110°	1130	990	D
Lilly80 AC.20.230.48.927-130.IOT.FF	20	230	90	2200	110°	1490	1410	F
Lilly80 AC.20.230.48.927-130.IOT.FF	20	230	90	2700	110°	1940	1860	E
Lilly80 AC.20.230.48.930-130.IOT.FF	20	230	90	3000	110°	2140	2030	D
Lilly80 AC.20.230.48.940-130.IOT.FF	20	230	90	4000	110°	2180	2110	D
Lilly80 AC.10.230.48.927-D.IOT.FF	10	230	90	2200	110°	750	650	F
Lilly80 AC.10.230.48.927-D.IOT.FF	10	230	90	2700	110°	920	830	E
Lilly80 AC.10.230.48.930-D.IOT.FF	10	230	90	3000	110°	970	880	D
Lilly80 AC.10.230.48.940-D.IOT.FF	10	230	90	4000	110°	980	890	D
Lilly80 AC.20.230.48.927-D.IOT.FF	20	230	90	2200	110°	1460	1290	F
Lilly80 AC.20.230.48.927-D.IOT.FF	20	230	90	2700	110°	1840	1650	E
Lilly80 AC.20.230.48.930-D.IOT.FF	20	230	90	3000	110°	1900	1740	D
Lilly80 AC.20.230.48.940-D.IOT.FF	20	230	90	4000	110°	1920	1760	D

DimIn (Function module)

Article code	ARTICLE NAME	DimIn design	DimIn Potentiometer design
105390	DimIn DALI		
105656	DimIn Dali IoT2		
105111	DimIn Casambi		
105652	DimIn Switch		
105040	DimIn PoT		
105148	DimIn Potentiometer		

Dimensions LED Module

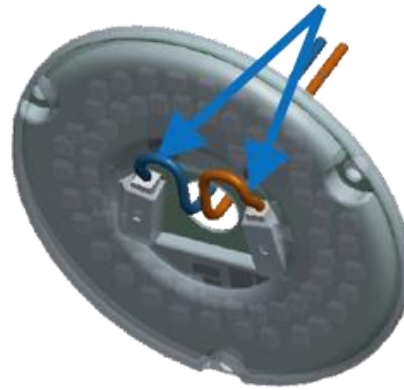


Mounting instructions wires

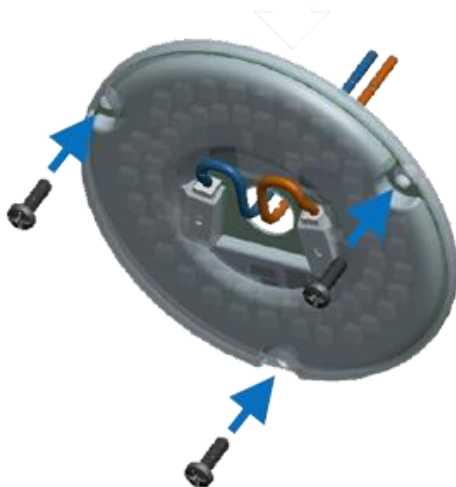
Mounting



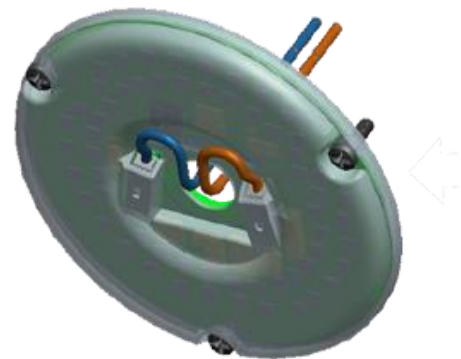
1 Insert the wires into the cover hole.



2 Slot in AC cable into AC connector.



3 Mount the screws to fixate module.



4 Mounted.

Mount the device on heatsink with screws safely



Mounting and Compliance

The IoT version of the LED module includes a dedicated connector (N, L, D+, D–) for easy integration of DimIn function modules such as DALI, Casambi, Switch-Dim, or Potentiometer control.

Modules click securely into the IoT interface without altering the luminaire's appearance, shape, or light quality.

With the high-voltage driver integrated directly into the LED module, no external power supplies are required—connect directly to mains (230 VAC).

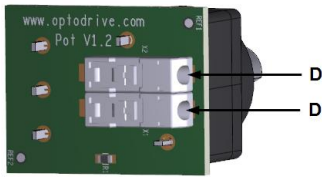
If no function module is installed, the LED module operates in Normal Mode and can be dimmed with a standard dimmer. When a DimIn module is installed, control is handled by the module (DALI, Casambi, etc.), enabling additional functions such as advanced dimming and human-centric lighting.

EPBD 2024/1275 Ready:

By installing a DimIn DALI Memory module on-site, the system supports DALI extensions 251–253 for energy monitoring, diagnostics, and predictive maintenance. This enables BACS compliance under EPBD 2024/1275 and can improve a building's SRI score. See the DimIn datasheet for further details.

The LED module meets all regulatory requirements for electrical connections. All function modules are designed for easy installation by the luminaire manufacturer or even at the end customer's location, allowing flexibility in functionality and upgrades.

Potentiometer card

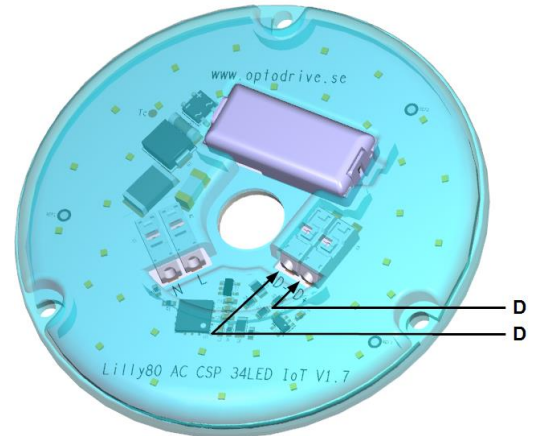


The Pot potentiometer board works with the DimIn Pot functionality module. D+ or D- play a certain role as they change the dimming direction depending on the connection.

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
------	--------------

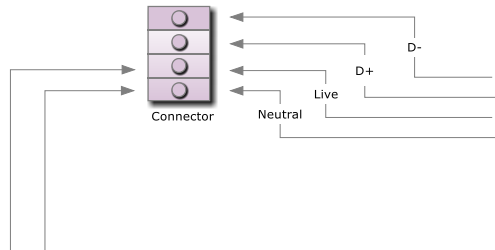
Wire (Recommended)

Type of wire	AWG	mm ²
Stranded	22-20	0.32-0.5mm ²
Solid	24-18	0.51-1.02Ø (0.2-0.8mm ²)
Insulation diameter	Max 2.1 mm	



Wiring for different DimIn versions

Casambi



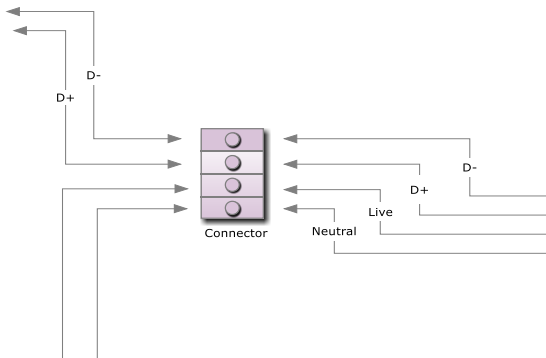
Incoming Wires 110/230VAC

LED Module with IoT (DimIn Casambi)



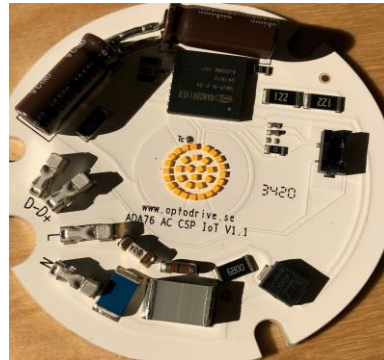
DALI

DALI BUS Incoming



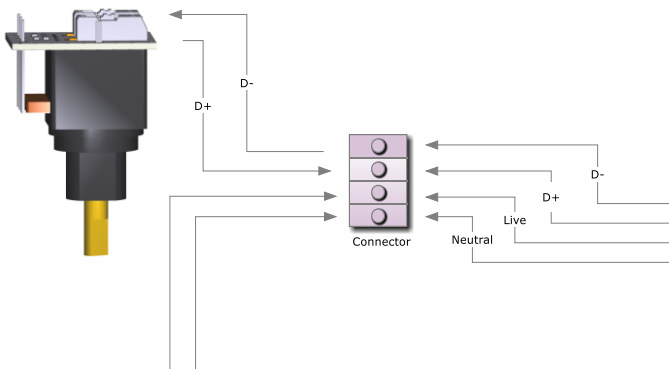
Incoming Wires 110/230VAC

LED Module with IoT (DimIn DALI)



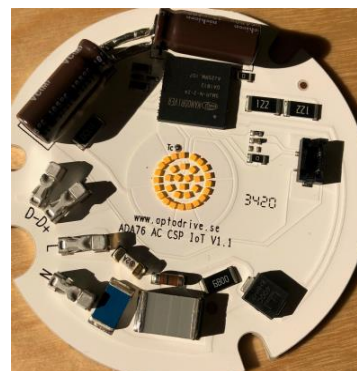
POT / Potentiometer

Potentiometer



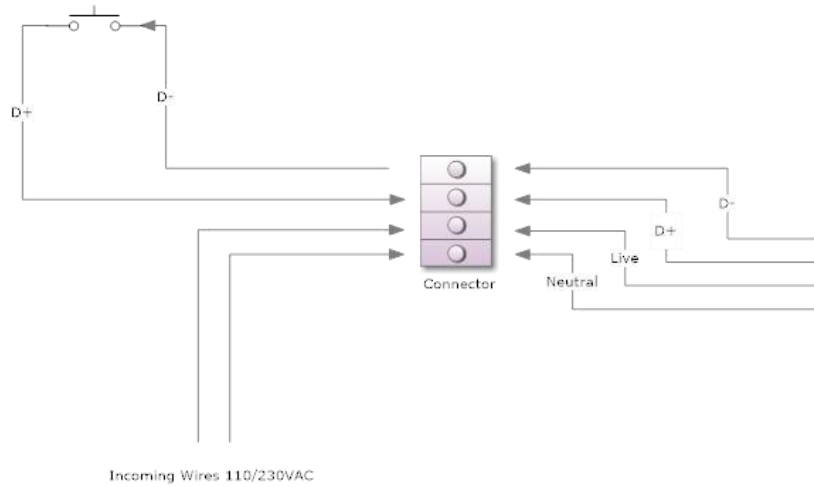
Incoming Wires 110/230VAC

LED Module with IoT (DimIn POT)

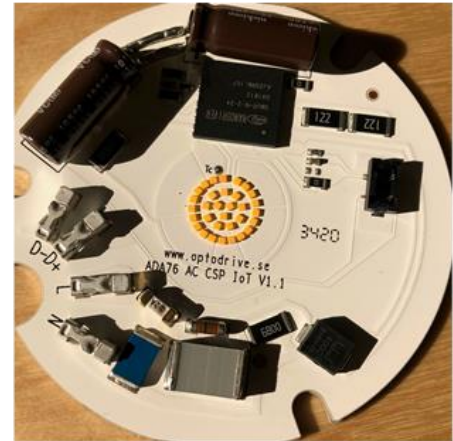


DimIn Switch (Switch-Dim)

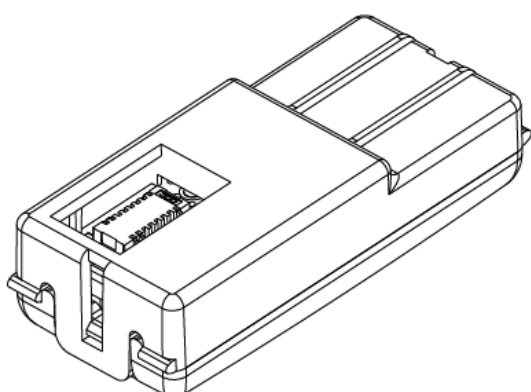
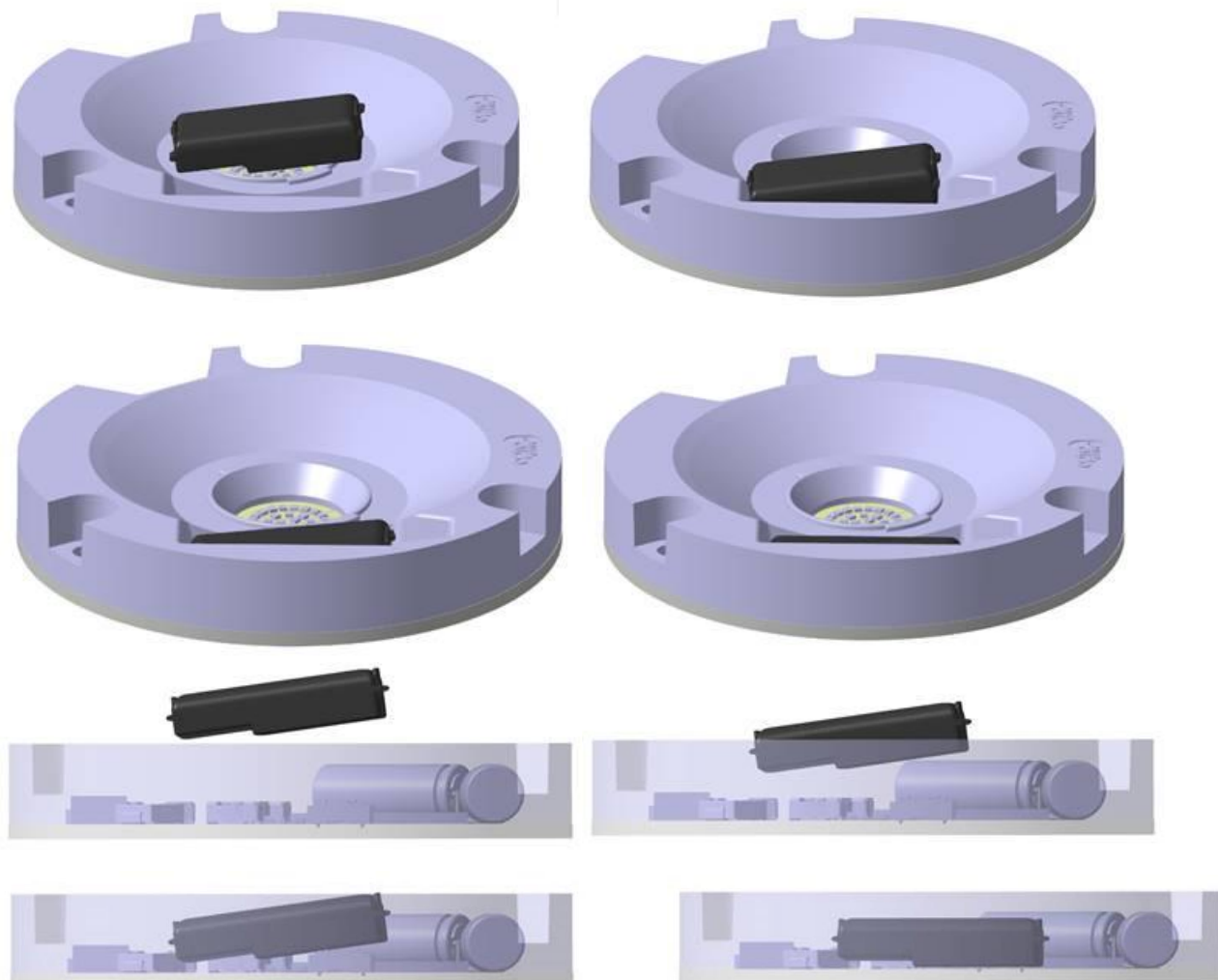
Momentary Switch (Switch DIM)



LED Module with IoT (DimIn Switch)



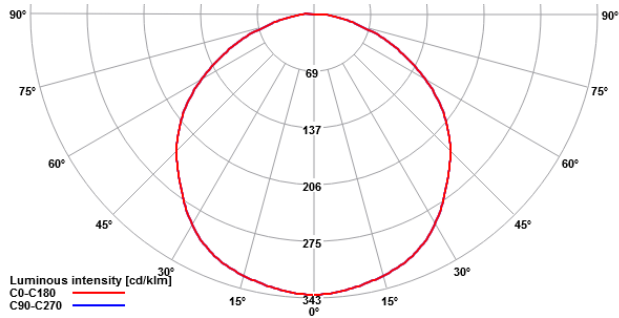
Mounting of DimIn



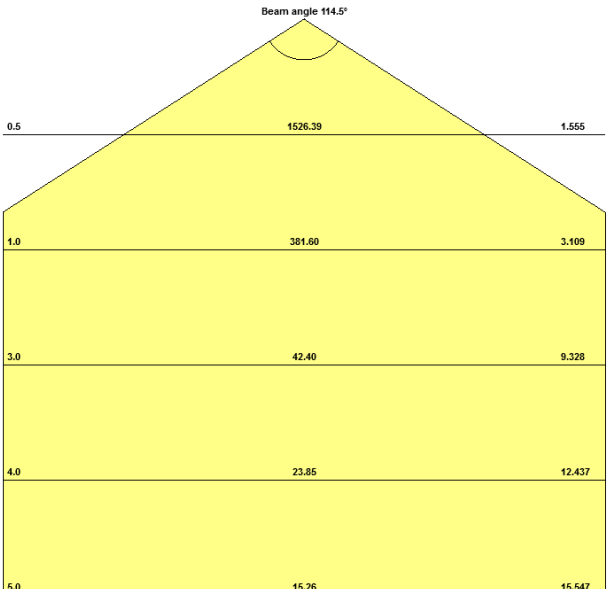
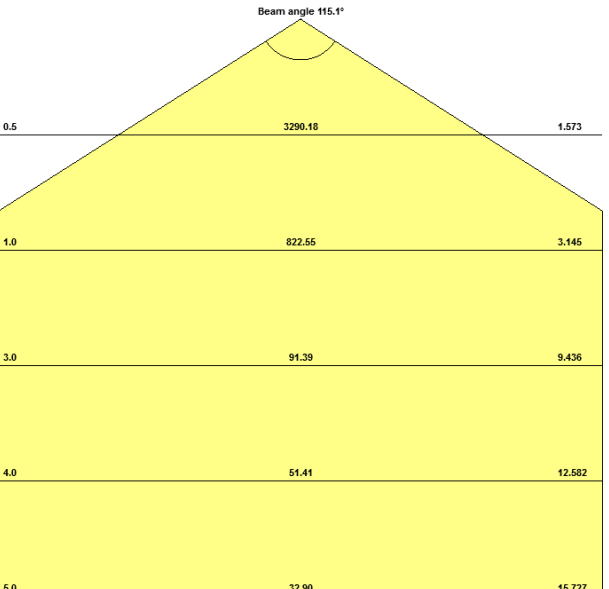
Here on the left, you can see the DimIn unit from below and you can see the connector that is connected to the LED module as well. It is important to insert the front first during assembly, as you can see in the pictures above, then press the rear end and the contact into place. Friction locking between the LED module's safety cover and the DimIn unit's protection locks it in place.

Optical data

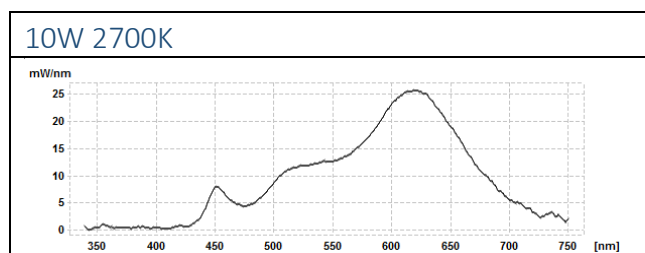
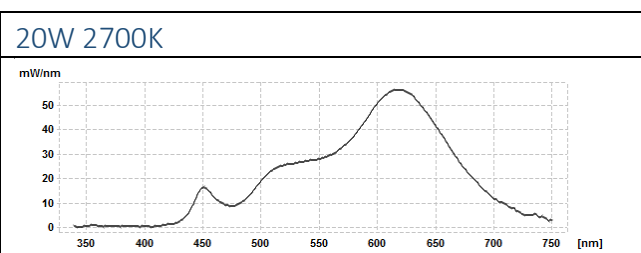
Light intensity distribution 20W version



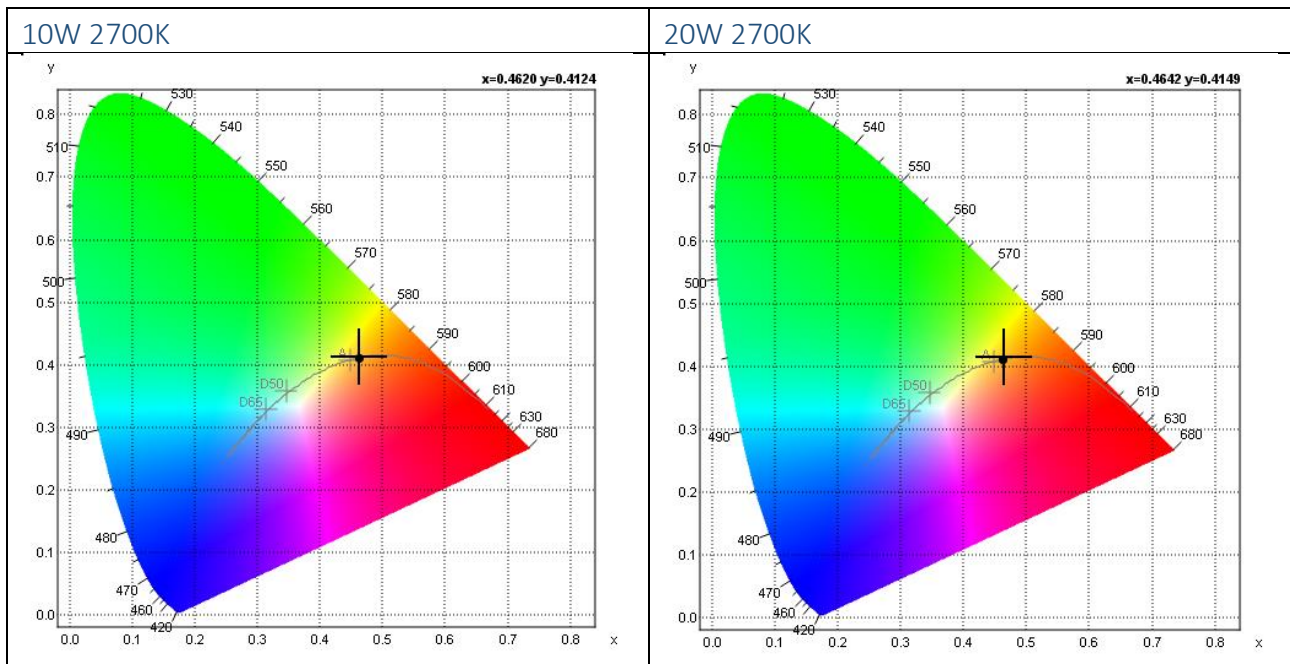
Beam Angle

10W 2700K			20W 2700K		
					
0.5	1526.39	1.555	0.5	3290.18	1.573
1.0	381.60	3.109	1.0	822.55	3.145
3.0	42.40	9.328	3.0	91.39	9.436
4.0	23.85	12.437	4.0	51.41	12.582
5.0	15.26	15.547	5.0	32.90	15.727
Distance [m]	Illuminance [lx]	Diameter [m]	Distance [m]	Illuminance [lx]	Diameter [m]

Spectrum

10W 2700K	20W 2700K
	

CIE1931

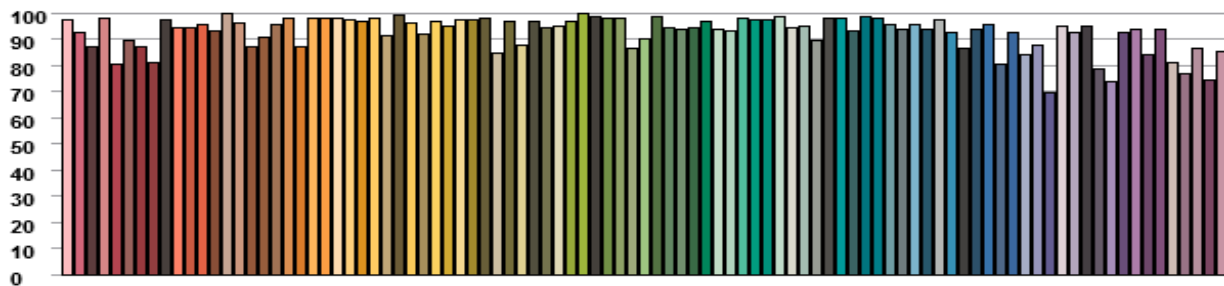


TM-30-15 Calculations

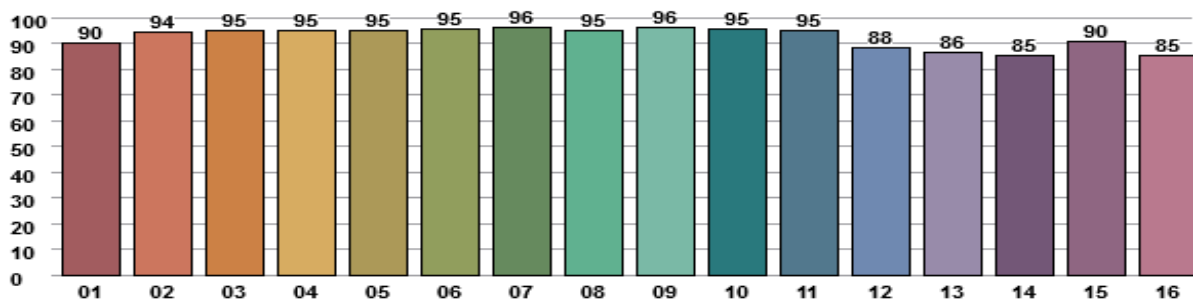
Main parameters

Fi	93
Rg	99
Rfskin	96

Fidelity Index (Rf,j)



Hue Bin Fidelity Index (Rfh,j)





Measurement results including CRI

2700K 10W

CIE 1931 2°observer	
x	0.4620
y	0.4124
u'	0.2631
v'	0.5284
L	100.00
a	28.16
b	69.24
X	1235.23
Y	1102.62
Z	335.53

Other	
CCT	2684
Chromaticity Error	0.001
Color Peak	621.93
Color Peak Value	25.66
Color Dominant	584.1
Radiometric	3.7384
Luminous Efficacy	113.7
Power [W]	9.70
Current [A]	0.047
Voltage [VAC]	230.1
Duv	0.0005

Rendering Indices	
Ra	94.8
R1	97.8
R2	99.6
R3	97.2
R4	99.6
R5	99.0
R6	93.9
R7	90.4
R8	80.5
R9	57.9
R10	99.2
R11	94.1
R12	91.4
R13	99.2
R14	99.0

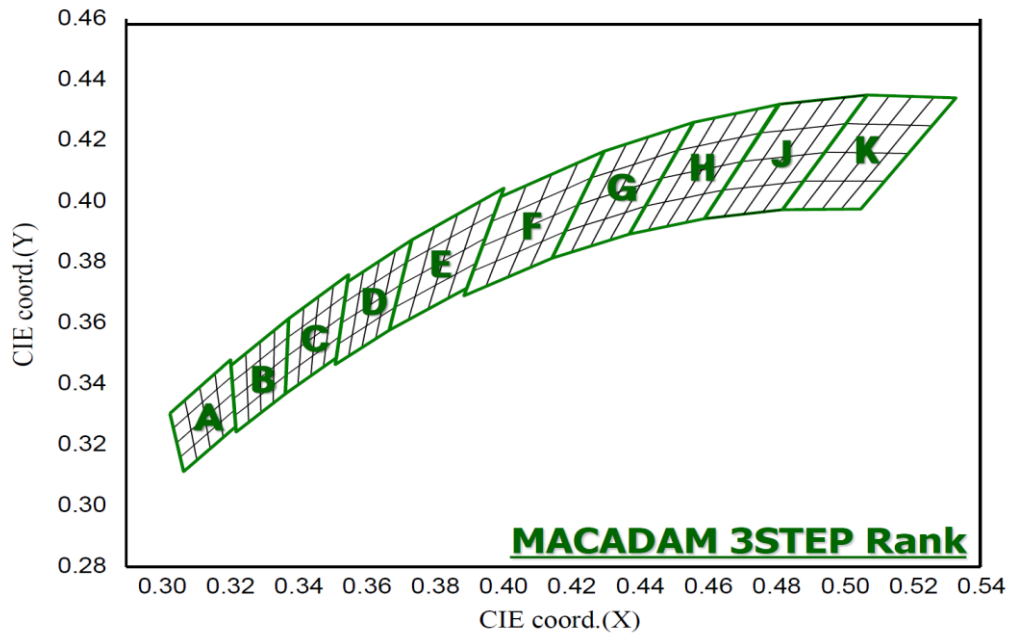
2700K 20W

CIE 1931 2°observer	
x	0.4642
y	0.4149
u'	0.2633
v'	0.5296
L	100.00
a	27.92
b	71.13
X	2707.09
Y	2419.77
Z	704.85

Other	
CCT	2673
Chromaticity Error	0.002
Color Peak	620.26
Color Peak Value	56.19
Color Dominant	584.0
Radiometric	8.0715
Luminous Efficacy	112.9
Power [W]	21.4
Current [A]	0.103
Voltage [VAC]	230.1
Duv	0.0012

Rendering Indices	
Ra	94.6
R1	97.0
R2	99.4
R3	97.9
R4	99.3
R5	98.1
R6	95.2
R7	90.5
R8	79.6
R9	55.2
R10	98.6
R11	94.7
R12	92.6
R13	98.3
R14	99.2

CCT structure graphical representation



Short form in diagram	Colour Code	CCT
K	22	2200K
H	27	2700K
G	30	3000K
E	40	4000K

Colour Rendering Index (CRI)

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

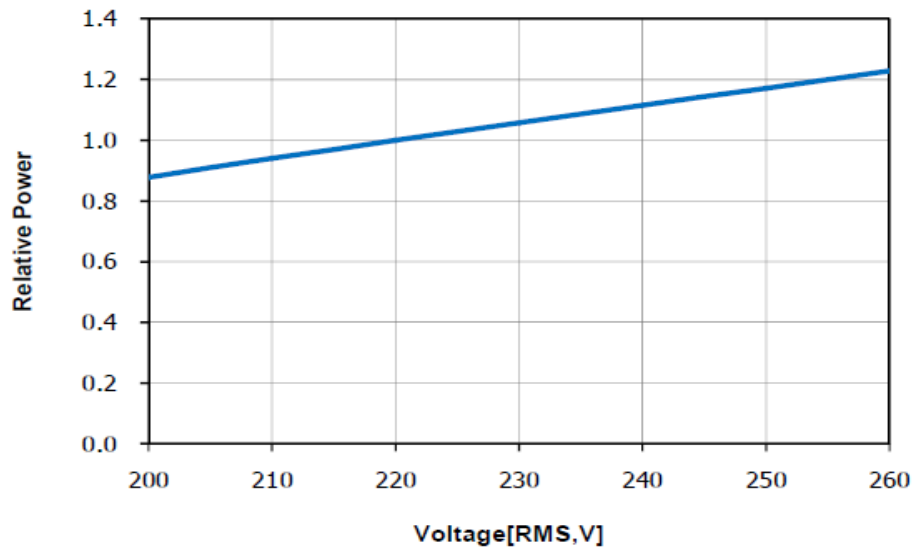
Short form letters for CCT (K)

Colour Code	CCT
22	2200K
27	2700K
30	3000K
40	4000K

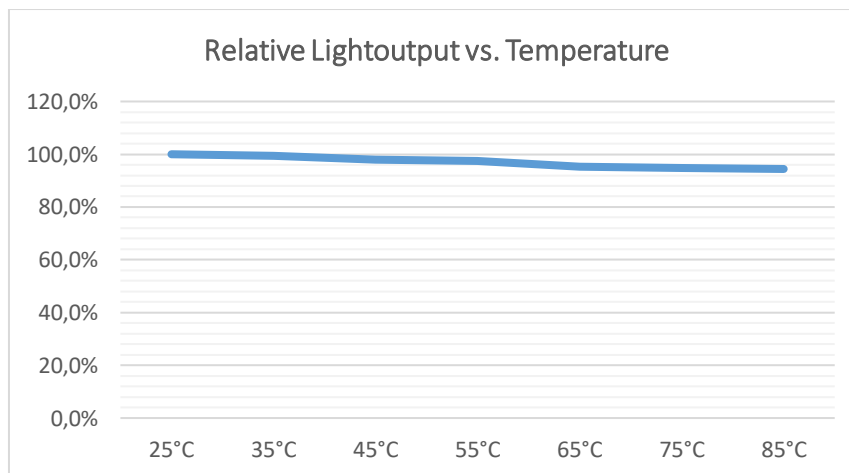
Electro Optical data

Current vs. Voltage

With increasing voltage the light output and the heat increases.



Temperature Characteristics



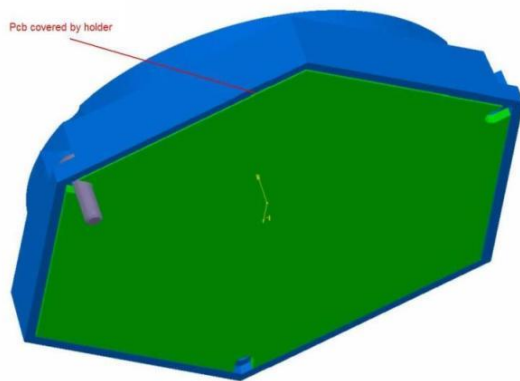
Consider the thermal properties where the LED module is to be mounted. Temperature is an important factor for lifetime longevity as well as for degradation of luminous flux.

Thermal information

The thermal area (green) should be properly connected to an even and fine surface of a heat sink. Without this arrangement the unit will be overheated and will not be able to survive.

Maximum Temperature

Secure the temperature in your application not to exceed 85°C. Read more in the section “Measurement control”.



Measurement Control

The recommended maximum value is 85°C on Tc or measuring point. If this value is exceeded, we cannot guarantee the function and the lifetime of the product. The purpose of the measurement is to control the Junction (Tj) temperature of the LED and also in order to control the performance on the complete setup. By measuring the junction temperature (Tj) the average lifetime of the product is known.

The thermal connection is measured in temperature vs. Power.

Measurement points

When the measurement takes place, you verify that the temperature on the marked measurement points is satisfying. Pending on the result you know what lifetime to expect from the module.



■ Tc

This step will be implemented after the heat sink has been connected properly!



Lifetime (Calculated)

The lifetime is calculated at the maximum temperature recommended at the T_c (measuring point). It is important not to exceed this recommendation; you find more information under the chapter “measurement control”.

Version Lilly80, 10W

Predicted light output based on LED lifetime (LM80) performance <u>ONLY</u>				
	55°C (T_c)	65°C (T_c)	75°C (T_c)	85°C (T_c)
L70	>50 000h	>50 000h	>50 000h	>50 000h
L80	>50 000h	>50 000h	>50 000h	>50 000h
L90	>50 000h	>50 000h	45 000h	37 000h

Version Lilly80, 20W

Predicted light output based on LED lifetime (LM80) performance <u>ONLY</u>				
	55°C (T_c)	65°C (T_c)	75°C (T_c)	85°C (T_c)
L70	>50 000h	>50 000h	>50 000h	>50 000h



Verification of Conformity

The module are tested at Intertek Semco according to IEC 62031.

Radio Disturbance	IEC 55015:2006 + A1:2007 + A2:2009	
SURGE	IEC 61000-4-5	1.5 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	
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 LED Module is in accordance to EU Directive 2002/95/EC (ROHS)

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.

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.



LILLY80 AC IoT 120V/230V

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Object:
Datasheet LILLY80 AC 120 and 230VAC

Author:
SL

Date:
2025-08-11

DIMMERS tested

230VAC

It is important to understand that this is figures tested with standard dimmers and can only be considered as reference information. Please, always perform a test on the application in advance in its actual application. We don't take any blame for the changes, differences and updates towards dimmers and the performance etc. due to this.



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 jewellery) 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 and TSCA Compliant

All our LED modules meet the Restrictions of Hazardous Substances (RoHS III) and Toxic Substances Control Act (TSCA).

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, the Japan Ministry of Trade and Industry (MITI) and US Environmental Protection Agency under TSCA Section 6(h). 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 according to these mentioned directives. We also manage those required by the Toxic Substances Control Act (TSCA), to reduce exposure to certain Persistent, Bioaccumulative and Toxic (PBT) chemicals.

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 (Cr⁶⁺)
- 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 develops 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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