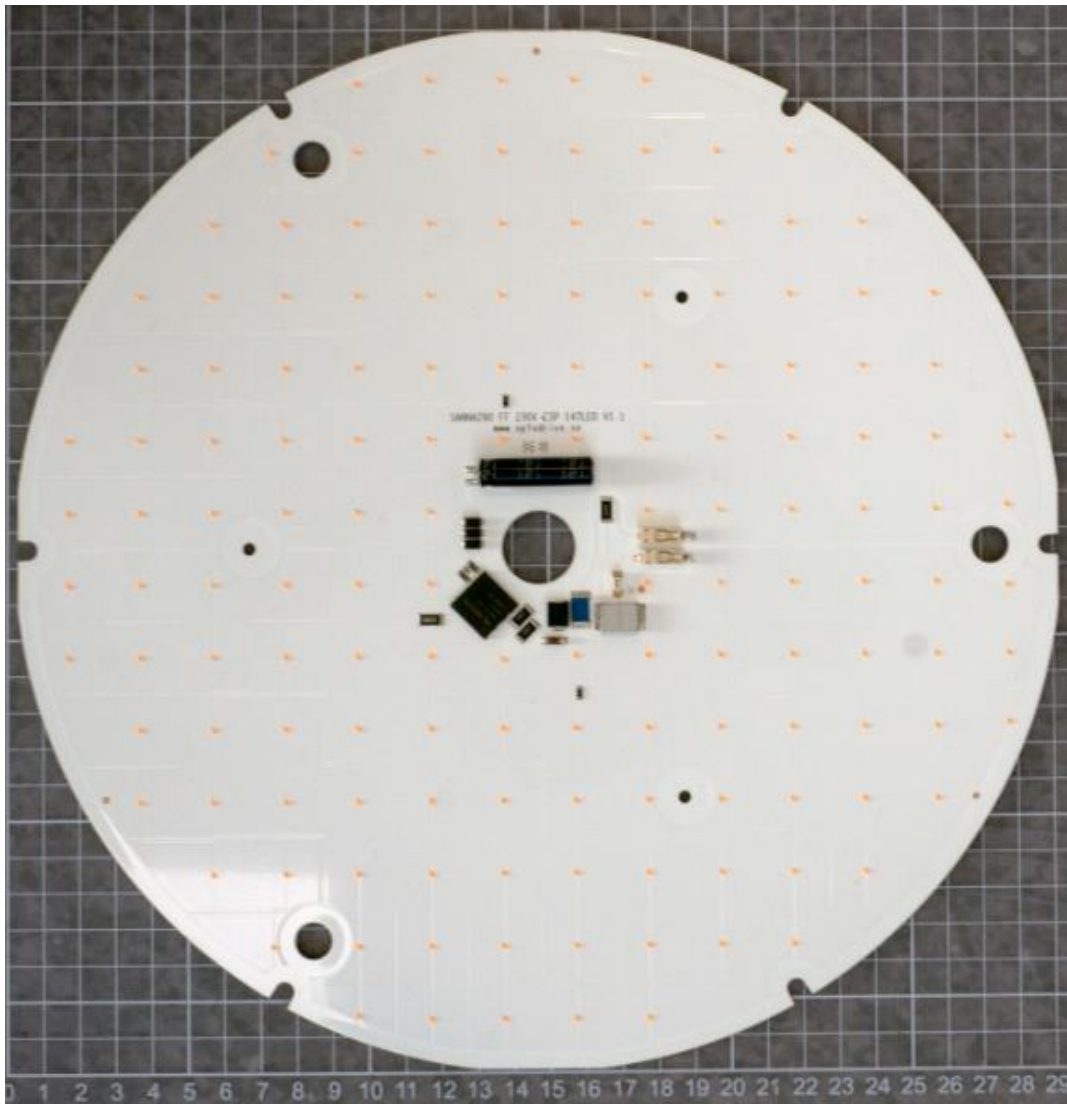




SANNA290 AC FF



SANNA290 AC FLICKERFREE

20W

*Round LED-module for lightings with opalized glass
in professional fixtures*

No driver is required



Key features

The LED module is named SANNA290 and it is designed for big-sized lightings with opalized glass. It can be used for ceiling lamps or wall lamps, as well as bigger pendulums.

Key features

- Made for big-sized lightings with opalized glass.
- Even light distribution
- No need for a driver
- Integrated cover
- Simple integration
- Flickerfree





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Introduction

Sanna290 package

The solution is developed to make it easy for the designers and engineers, with incoming wires and a hole for center mounting it is well equipped for flexible and safe mounting. The size is well suited for bigger light fittings as indoor ceiling light and bulk head lights.

AC design

All driver and dimmer components are built-in.

The advantage with an AC driver that has been built-in is:

- Lifetime – Connected to a heat sink and therefore has a controlled environment
- Dimming – Dimming via standard trailing edge dimmers
- Small – No extra boxes
- Simple – Easily adapted into to the production line

Light output

Colour stability is important to ensure that the installation has a uniform light output. Parameters such as binning, lifetime and thermal control are vital for good results.



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Short form Characteristics

MECHANICAL	20W version
Module dimension with cover	290 mm diameter
Weight	TBD
Assembly holes	6 x M3
Wire connector	Poke in
ELECTRICAL	
Power	20W
Input voltage	230VAC
Input voltage range	220-240VAC
Power factor	0.98
Total harmonic distortion	<15%
Type of current	AC
Surge protection	1500V
Fast transient burst	2000V
Over temp. protection	150°C
Energy class	A+
Inrush Current	
PHOTOMETRICAL	
Flux nominal	2300lm
Efficiency	>115lm/W
Number of LED's	147
Rendering index	>Ra80 >Ra90*
SDCM (Mac Adam)	3
Flicker percent	<10%
Flicker index	0.0206
Spread angle lens	130°
Colour temperatures	2700K, 3000K, 4000K
ENVIRONMENTAL	
Temperature range	-40°C to 65°C (Absolute maximum temp Tc 65°C)
Relative Humidity	10-75%
Ambient air pressure	500-1060 hPa
LIFE LENGHT	
Life length L70B10	>50 000h





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*Specifications are valid for >Ra80.

Article number structure

Sanna290 AC.P.230.147.8yy-NN

AC	AC= 230VAC, ED=External Driver required, ID=Internal Driver
P	Power (Watt)
V	Voltage: 230VAC
N	Amount of LEDs
8	CRI: 8=Ra>80, 9=Ra>90
YY	CCT: 27 =2700K, 30 =3000K, 40 =4000K
NN	Viewing angle code
FF	Flickerfree version

Article name and versions

ARTICLE NAME	PO WE R	CURRENT	LEDS	CRI	CCT	LENS
SANNA290 AC.20.230.90.827-130-FF	20	230	147	80	2700	130°
SANNA290 AC.20.230.90.830-130-FF	20	230	147	80	3000	130°
SANNA290 AC.20.230.90.840-130-FF	20	230	147	80	4000	130°
SANNA290 AC.20.230.99.927-130-FF	20	230	147	90	2700	130°
SANNA290 AC.20.230.90.930-130-FF	20	230	147	90	3000	130°
SANNA290 AC.20.230.90.940-130-FF	20	230	147	90	4000	130°



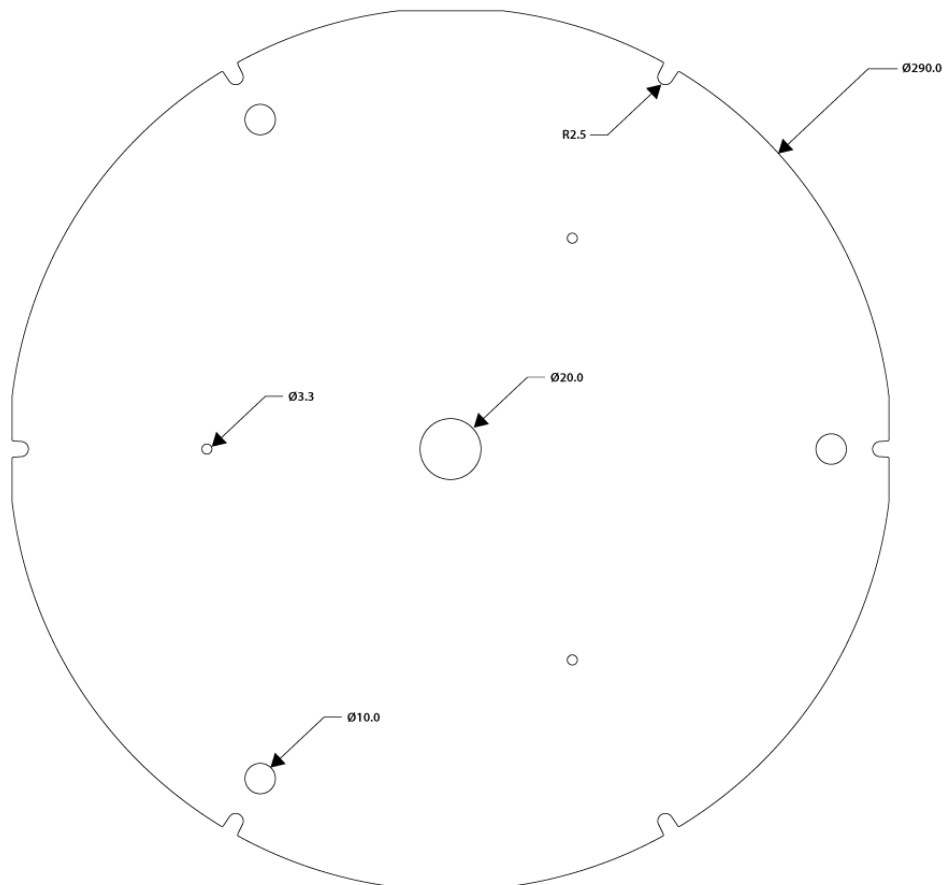
Ordering data

Sanna290 AC – Packaging information

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner box	10	32	32	12	25.6
Outer box	80	64	34	48	35

Dimensions

LED-module



Mounting instructions

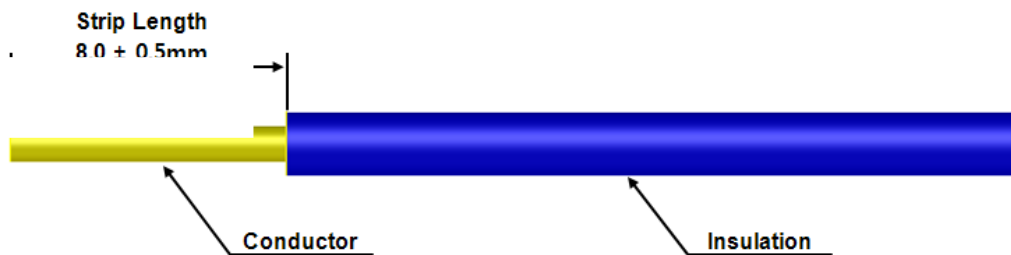
Mounting

The LED module is to be fixated with screws before the wire connection is made.

1. Sanna290 cover
2. Sanna290 PCB

Wiring

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	



Photometrical

Flux

Parameter		Symbol	Value			Unit
			Min	Typ	Max	
Luminous Flux	20W	Φ_v		2300		lm
					lm	
Correlated Colour Temperature	27*(2)	CCT		2700		K
	30*(2)	CCT		3000		K
	40*(2)	CCT		4000		K
CRI		R_a	80		90	-
Power		P_o		20		W
		P_o				W

Electro-Optical characteristics LED module at $I_f = xxmA$, 230VAC, $T_A = 25^\circ C$



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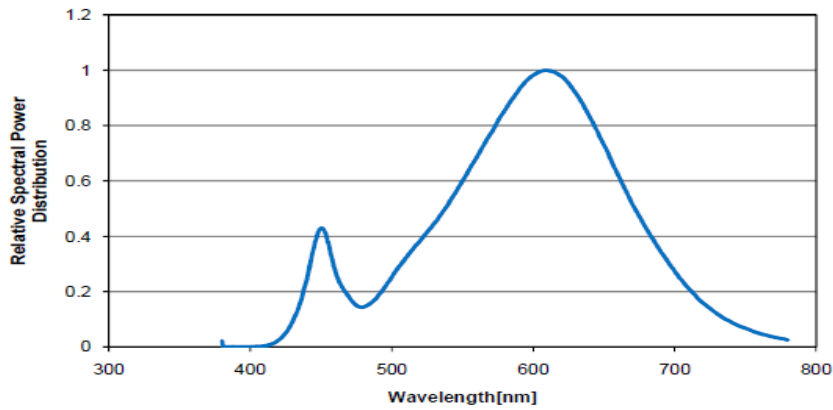
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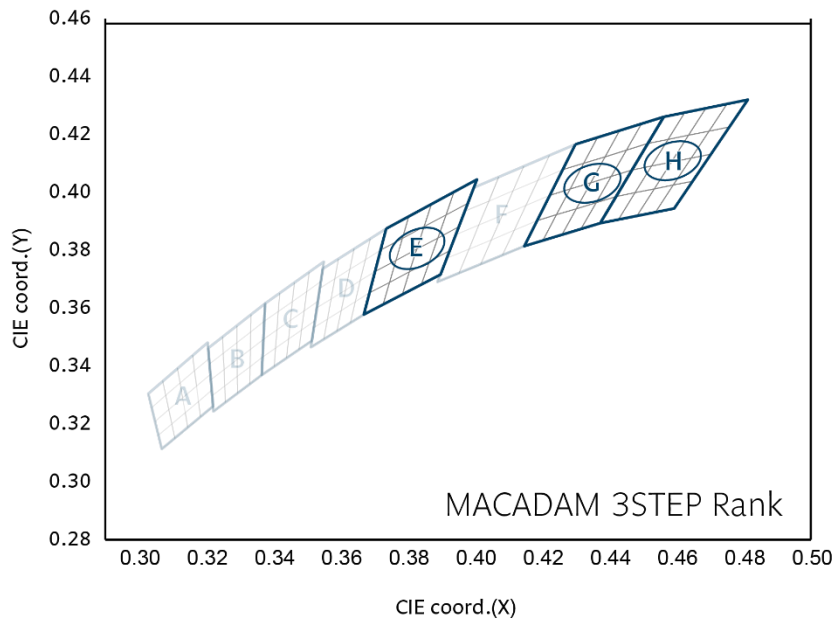
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Colour Spectrum



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)

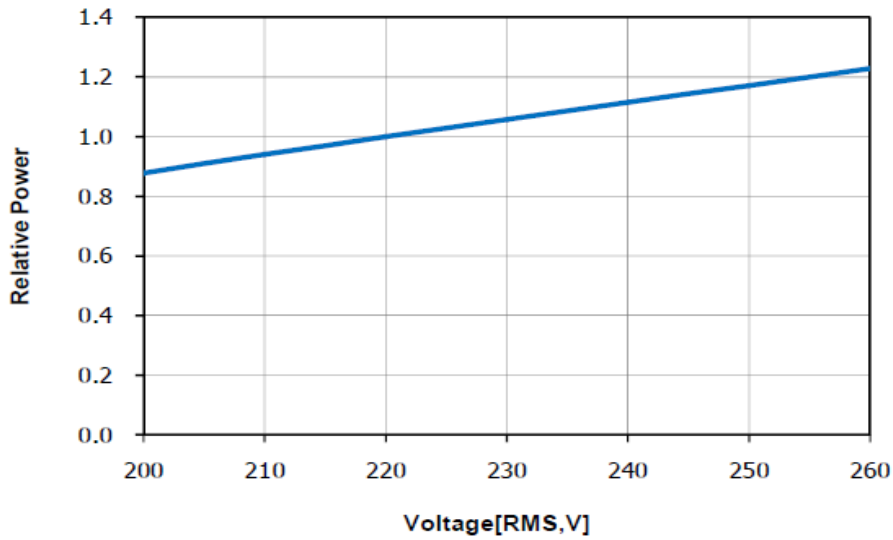
Colour Code	CCT
27	2700K
30	3000K
40	4000K



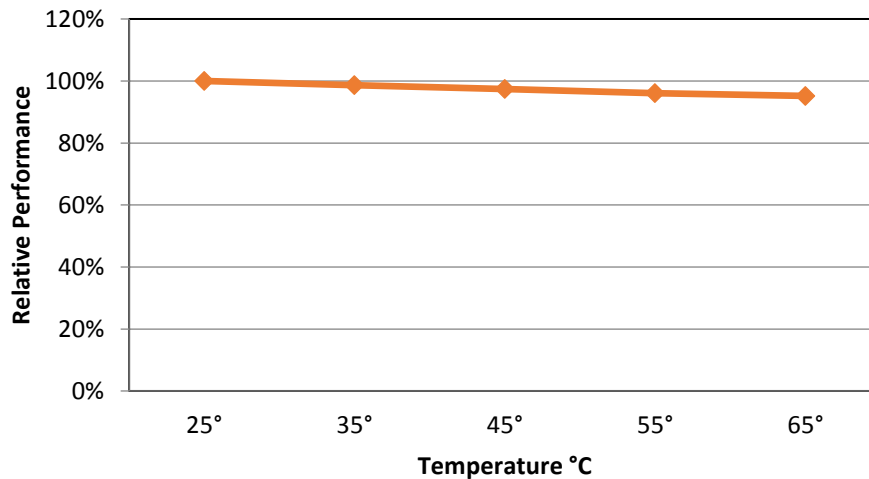
Electrical Optical Data

Current vs. Voltage

With increasing voltage the light output and the heat increases.



Temperature Characteristics



Consider the thermal capabilities of where the LED module is to be fitted. The temperature is an important factor for light output as well as for long time light output degradation.



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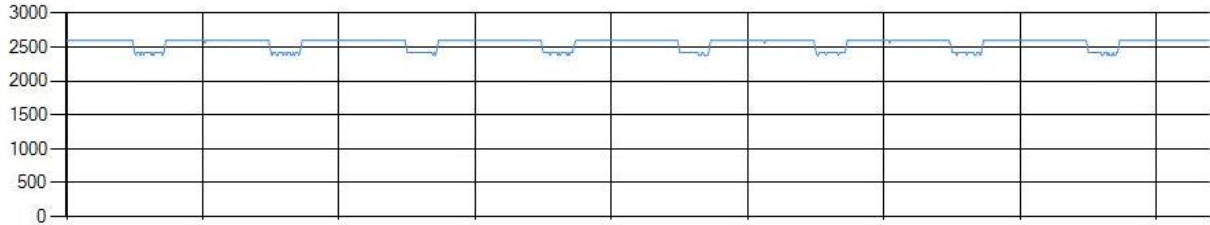
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Flicker



SANNA290 AC Flickerfree version

Flicker index	0.0206
Flicker Percent	7%
Max value	2824
Min value	2511

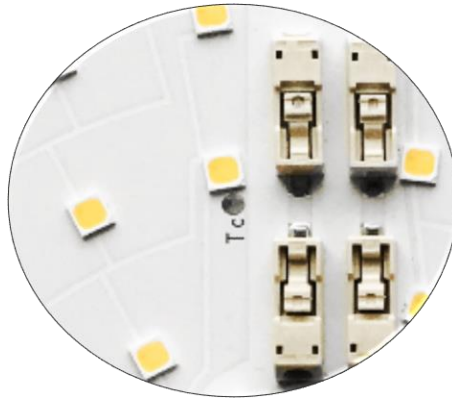
Lifetime (Calculated)

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

The lifetime is calculated at the maximum temperature recommended at the Tc (measuring point). It is important not to exceed this recommendation.

Tc(Surface temperature)	Time for 80% light-output (L80B10)
65°C	>50 000 Hr



Measurement Control

The recommended maximum value is 65°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.

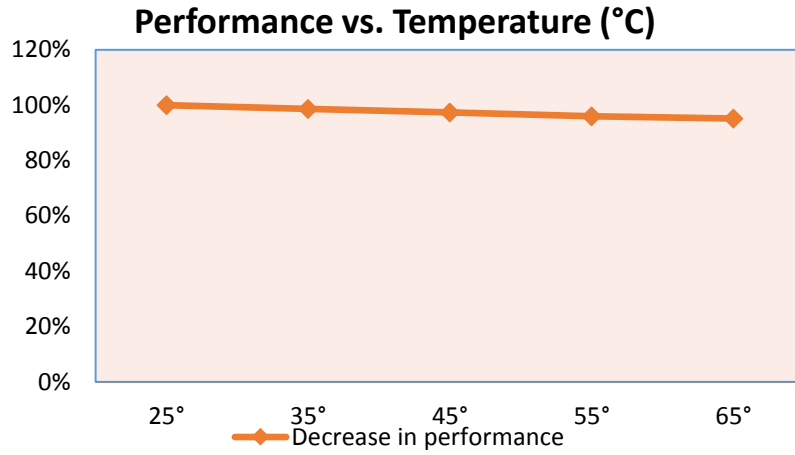
The thermal connection is measured in temperature vs. Power.

Maximum Temperature

Secure the temperature in your application not to exceed 65°C. Read more in the section “Measurement control”.



Temperature Characteristics

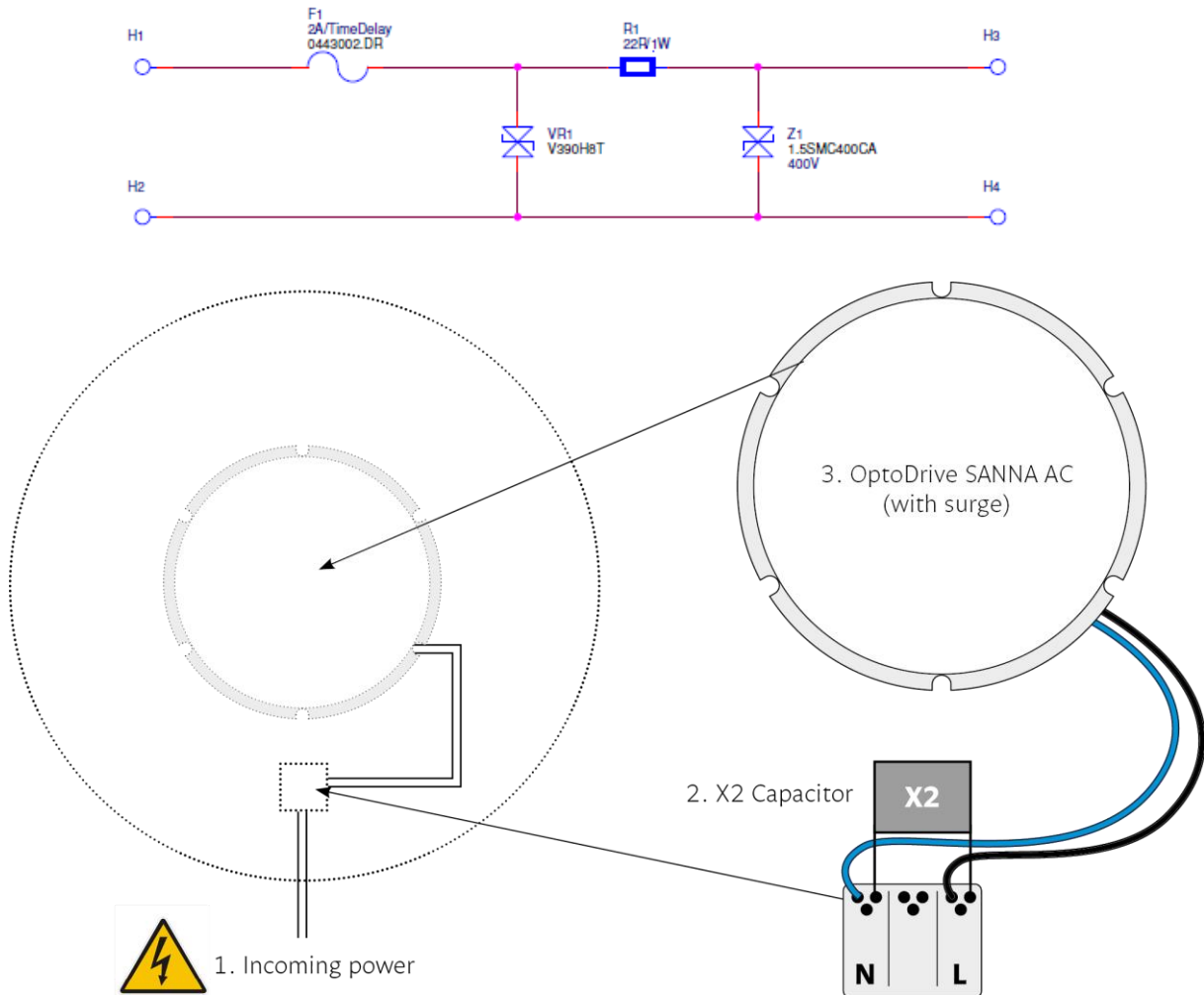


Consider the thermal capabilities of where the LED module is to be fitted. The temperature is an important factor for light output as well as for long time light output degradation.

Surge

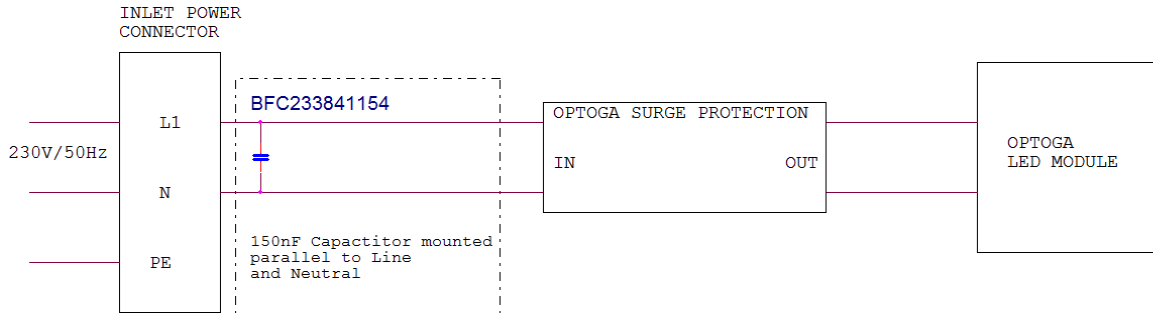
Surge

This document specifies how to connect Optodrive AC modules to achieve long life installation both with Surge, Burst and other problematic installation questions:



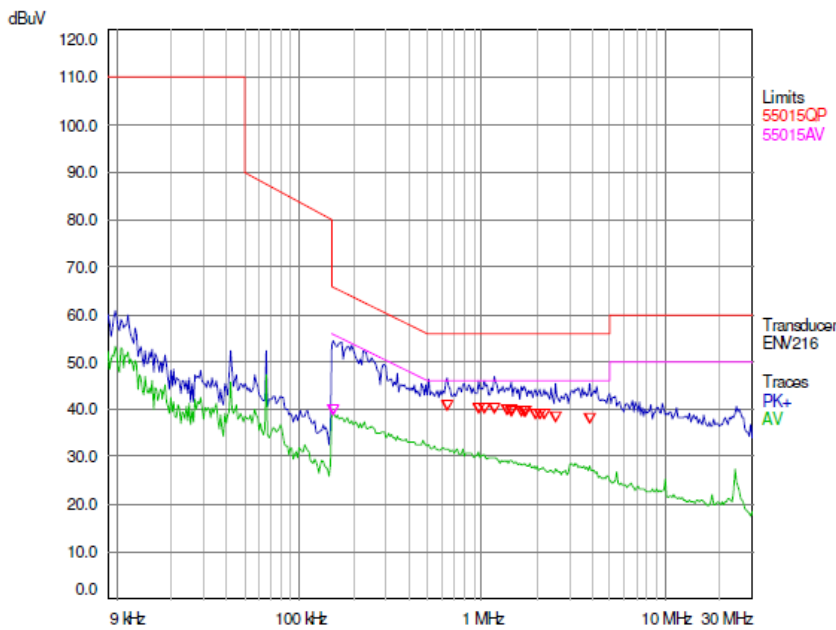
The installation set up requires an X2 Capacitor parallel to L1 and N to handle the fast and high voltage transients generated by the magnetic ballast.

Set-up



EMC

Pre-measurement Graph



Surge protection IEC 61000-4-5
The LED module passed the test at 1250V Surge

Continues Testing

The test is ongoing from Optogas side with a set up that makes on/off 30 times per minute. This is made with magnetic ballast without filtering capacitor to simulate old fluorescent tube installations.



Verification of Conformity

The module are under testing at Intertek Semco according to IEC 62031.

Radio Disturbance	IEC 55015:2006 + A1:2007 + A2:2009	
SURGE	IEC 61000-4-5	1 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 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.



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 II Compliant

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

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 II 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 2011/65/EU (RoHS II) the following substances must not be used in this product

- Lead (Pb) alloys
- Mercury (Hg)
- Cadmium (Cd)
- Chromium (6+) compounds
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ethers (PBDE)

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.



Köpingsvägen 4 • SE-732 31 Arboga • SWEDEN

Tel +46 (0) 589 490 950

info@optoga.com • www.optoga.com

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