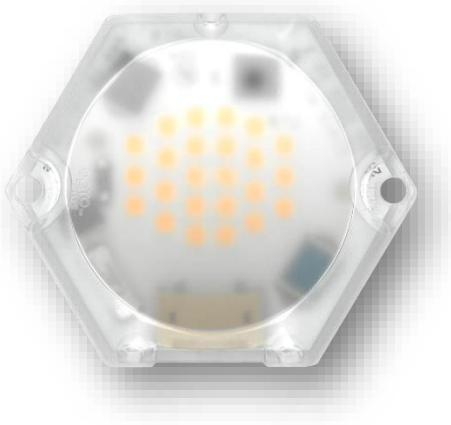
CLARA AC



CLARA AC 24LED

4W | 6W | 8W |10W | 12W

(2nd generation)

A qualified solution to replace and exceed CFL and CDM solutions in Downlights or ambient luminaires.

No Driver is required!

Designed for retail stores, offices, hospitals and other places where the need is to create a good atmosphere for people to dwell in whether they take care of business or socialize.

These LED modules or Light engines for Downlights and ambient luminaires are designed with internal drivers and are therefore very easy to connect into applications with different dimming scenarios. The light output efficiency is the highest available on the market for these types of applications. Our latest design feature TOD (thin optical device) is integrated in the LED module for a bright and consistent light experience.

Pages for reference

Introduction

The LED module and light engine is named Clara and it is a design for light fittings and luminaires aiming for various areas. It has been designed in order to meet the demands on high performance optical solutions in both light emitting and in colour rendering. Mechanically it is constructed with our package design Clara (~50 mm) that has the same footprint as the others in the family both for external drivers as well as built-in drivers for 110/230VAC.

Clara package

The same package is used for Downlight, Spotlight, Tasklight and Medical light fittings etc. The solution is developed to make it easy for the designers and engineers to choose from low to high power, from AC to DC and choose between a variety of lenses in the same luminaire or in similar design. In the design concept there are standard dimmers with the same snap-in connector (that fits the whole Optodrive™ concept) as well as several heat sink designs with worldwide distribution.

AC design

All driver and dimmer components are built-in and operate at 110, 230 or 240 VAC depending on the version with efficiency above 90%. It has a standard plug-in connector that fits all the different AC designs.

Integrated driver

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.

Technical attributes

- Energy saving and a very high lumen output
- High Colour Rendering
- Uniform Colour temperature
- Controlled lifetime
- Simple integration
- High Power Factor
- Low Total Harmonic Distortion

Köpingsvägen 4
SE-732 31 ARBOGA

Ph: +46 (0)589-490 950
Fax: +46 (0)589-490 950

Web: www.optoga.com
E-mail: info@optoga.com

Short form Characteristics

MECHANICAL	4W	6W	8W	10W	12W
BOARD DIMENSIONS:	48.4 mm diameter				
ASSEMBLY HOLES:	2 x 3.8 mm				
WIRE CONNECTOR:	CviLux CP04-03S0 or JST BH				
HEIGHT:					

ELECTRICAL	4W	6W	8W	10W	12W
NUMBER OF LED'S:	24				
INPUT VOLTAGE	230VAC				
POWER:	4W +/-10%ea.	6W +/-10%ea.	8W +/-10%ea.	10W +/-10%ea.	12W +/-10%ea.
INPUT CURRENT:					
MODULE CURRENT:	97				
POWER FACTOR:					
TOTAL HARMONIC DISTORTION:	15				
OVER TEMP PROTECTION:					
SURGE	1000V				
FAST TRANSIENT BURST	2000V				

LIGHT	4W	6W	8W	10W	12W
CCT:	2700K 3000K 4000K				
CRI:	> 80 Ra				
LIGHT OUTPUT:	500lm	600lm	750lm	900lm	1050lm
SDCM (MAC ADAM)	3-4 SDCM				

ENVIRONMENTAL OPERATION CONDITIONS:	
TEMPERATURE RANGE:	-30°C – 65°C
RELATIVE HUMIDITY:	
AMBIENT AIR PRESSURE:	

Dimming

Use the latest dimmers from standard manufacturers for LED and make sure that the dimmer has the capacity to manage the low load of the LEDs power consumption. In some cases the dimmer requires more than one LED module connected in order to work as expected due to the minimum load required for the dimmer to function properly.

Article number structure

Article number: Clara AC.P.230.24.8yy-N

CLARA:	Module name
AC:	No driver required just AC
P:	Power (Watt)
V:	Voltage (230 VAC)
N:	Amount of LEDs
8:	CRI
YY:	CCT 27 =2700K, 30 =3000K, 40 =4000K
N:	Viewing angle code 130 for 130°

Parameters vs. Article no

NAME	P	W	V	LED	RA	K	LENS	ARTICLE NAME
CLARA	AC	4	230	24	80	2700	130°	Clara AC.4.230.24.827-130
CLARA	AC	4	230	24	80	3000	130°	Clara AC.4.230.24.830-130
CLARA	AC	4	230	24	80	4000	130°	Clara AC.4.230.24.840-130

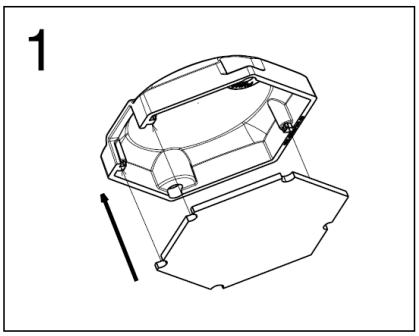
NAME	P	W	V	LED	RA	K	LENS	ARTICLE NAME
CLARA	AC	6	230	24	80	2700	130°	Clara AC.6.230.24.827-130
CLARA	AC	6	230	24	80	3000	130°	Clara AC.6.230.24.830-130
CLARA	AC	6	230	24	80	4000	130°	Clara AC.6.230.24.840-130

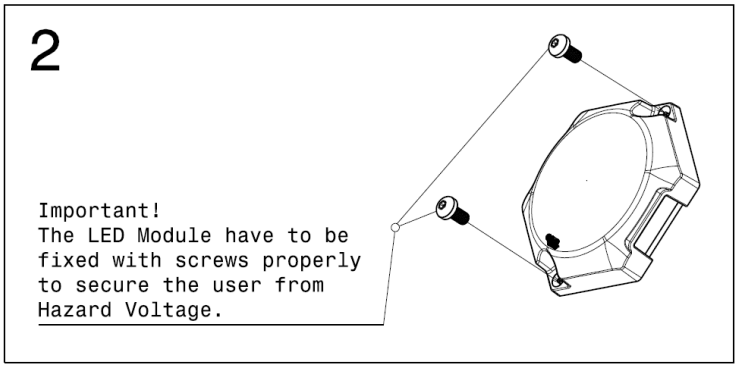
NAME	P	W	V	LED	RA	K	LENS	ARTICLE NAME
CLARA	AC	8	230	24	80	2700	130°	Clara AC.8.230.24.827-130
CLARA	AC	8	230	24	80	3000	130°	Clara AC.8.230.24.830-130
CLARA	AC	8	230	24	80	4000	130°	Clara AC.8.230.24.840-130

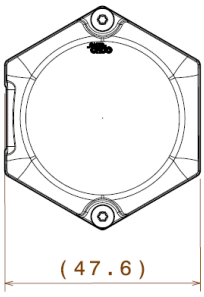
NAME	P	W	V	LED	RA	K	LENS	ARTICLE NAME
CLARA	AC	10	230	24	80	2700	130°	Clara AC.10.230.24.827-130
CLARA	AC	10	230	24	80	3000	130°	Clara AC.10.230.24.830-130
CLARA	AC	10	230	24	80	4000	130°	Clara AC.10.230.24.840-130

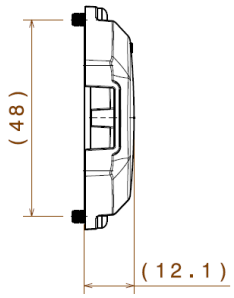
NAME	P	W	V	LED	RA	K	LENS	ARTICLE NAME
CLARA	AC	12	230	24	80	2700	130°	Clara AC.12.230.24.827-130
CLARA	AC	12	230	24	80	3000	130°	Clara AC.12.230.24.830-130
CLARA	AC	12	230	24	80	4000	130°	Clara AC.12.230.24.840-130

Dimensions LED Module









Wiring diagrams

See separate wiring diagram documentation.

ARTICLE NUMBER	ARTICLE NAME	LENGTH
102877	Wire AC 100	100 mm*
103527	Wire AC 220	220 mm*
101913	**Wire AC 450**	**450 mm**
103222	Wire AC 600	600 mm*

*Available on request

Köpingsvägen 4
SE-732 31 ARBOGA

Ph: +46 (0)589-490 950
Fax: +46 (0)589-490 950

Web: www.optoga.com
E-mail: info@optoga.com

Parameters of the Lens System

The lens system is mounted and fixated onto the PCB with a double press-fit. The light parameters are according to the following:

VERSION	VIEWING ANGLE	FWHM ANGLE
CLARA COVER	130°	±65°

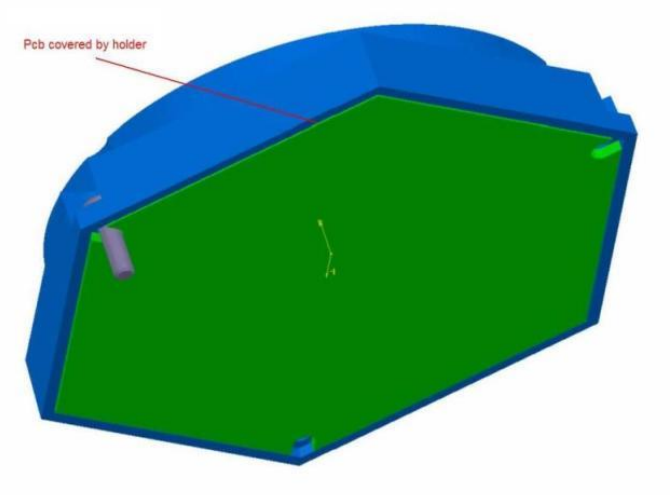
Versions that are under development

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 65°C. Read more in the section "Measurement control".



Parameters of the Light Output

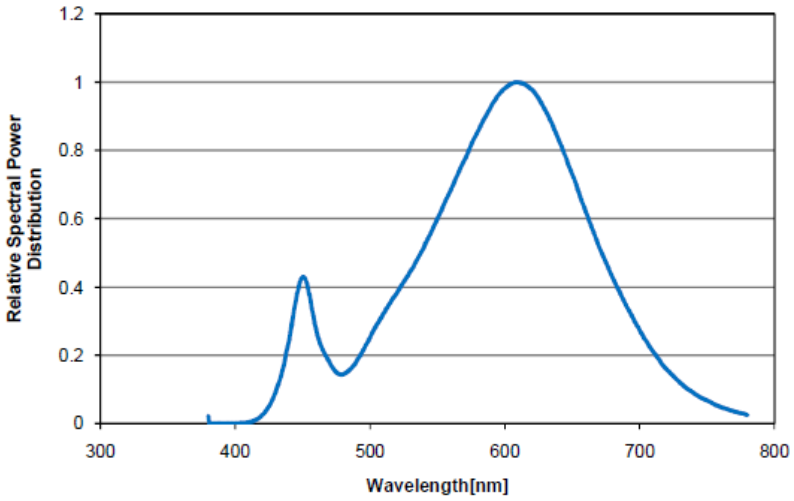
Warm White

Electro-Optical characteristics LED module at I_F=50mA, 230VAC, T_C=25ºC

Parameter		Symbol	Value			Unit
			Min	Typ	Max	
Luminous Flux	4W			500		lm
	6W			600		lm
	8W			750		lm
	10W			900		lm
	12W			1050		lm
Correlated Colour Temperature	27*(2)	CCT		2700		K
	30*(2)	CCT		3000		K
	40*(2	CCT		4000		K
CRI		R_a	80	84	-	-
Power	4W version	Po	3.6	4	4.4	W
	6W version	Po	5.4	6	6.6	W
	8W version	Po	7.2	8	8.8	W
	10W version	Po	9.0	10	11.0	W
	12W version	Po	10.8	12	13.2	W

(2)See detailed information in chapter" Binning structure graphical representation"

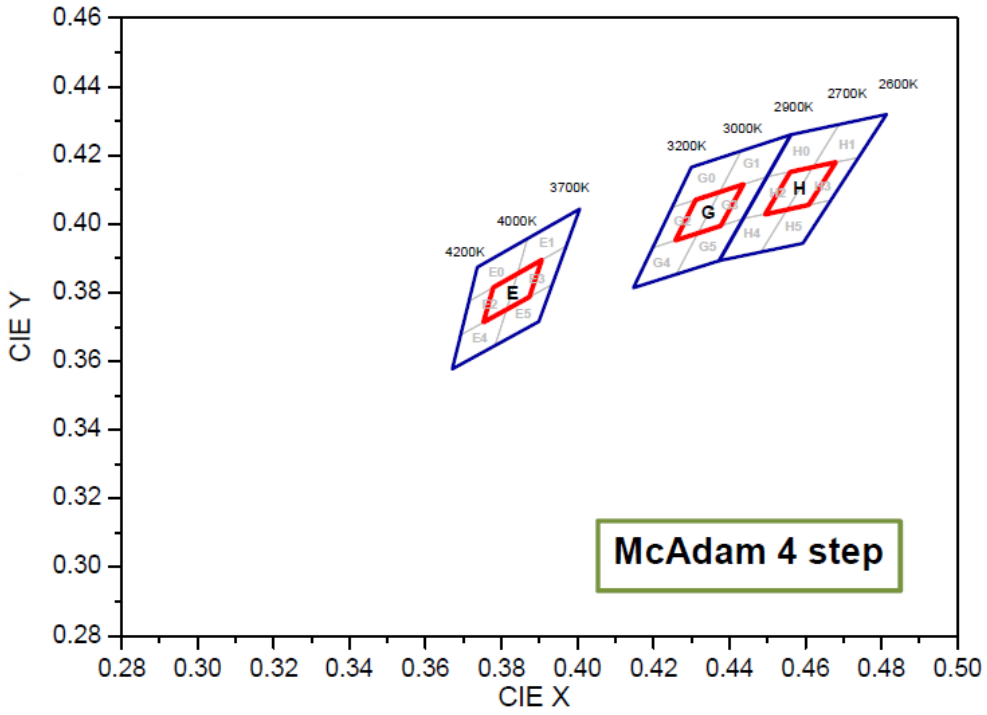
Colour Spectrum Warm White



Binning structure graphical representation

Binning structure graphical representation IEC 1976

Note the availability and representation on the IEC 1976 graph shown below.



* 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

Köpingsvägen 4
SE-732 31 ARBOGA

Ph: +46 (0)589-490 950
Fax: +46 (0)589-490 950

Web: www.optoga.com
E-mail: info@optoga.com

Binning and Labelling

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

Köpingsvägen 4
SE-732 31 ARBOGA

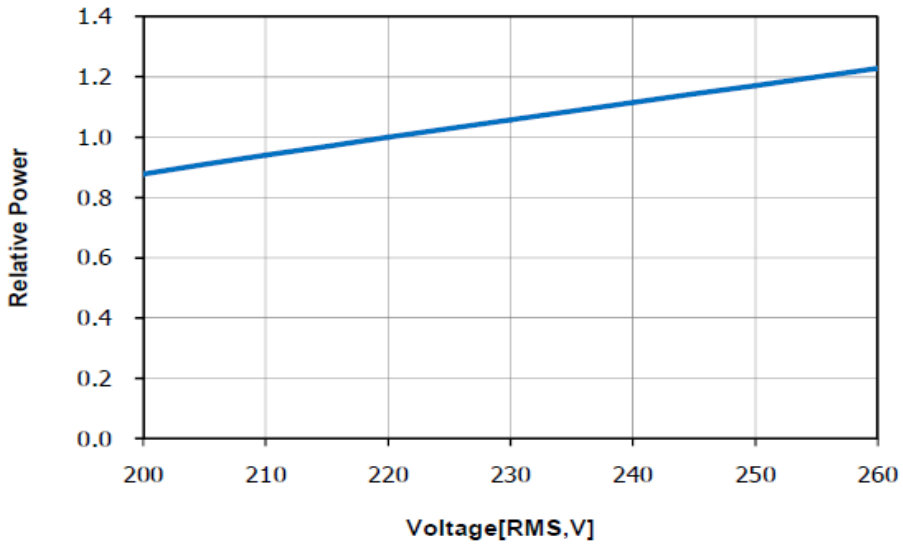
Ph: +46 (0)589-490 950
Fax: +46 (0)589-490 950

Web: www.optoga.com
E-mail: info@optoga.com

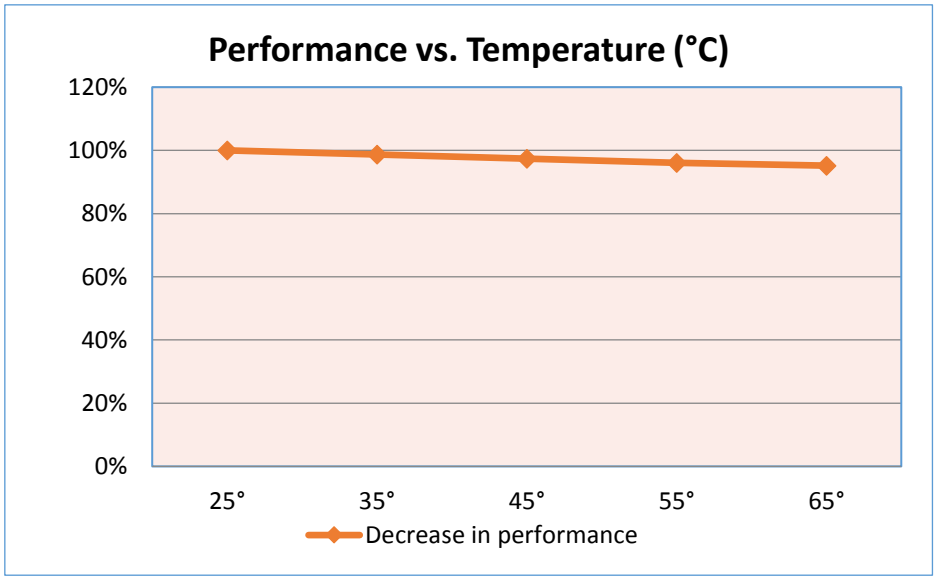
Electro Optical data

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.

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.

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.

Measurement points

- 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 Tc (measuring point). It is important not to exceed this recommendation; you find more information under the chapter “measurement control”.

T_c(SURFACE TEMPERATURE)	TIME FOR 70% LIGHT-OUTPUT
65˚C	50 000 Hr

Köpingsvägen 4
SE-732 31 ARBOGA

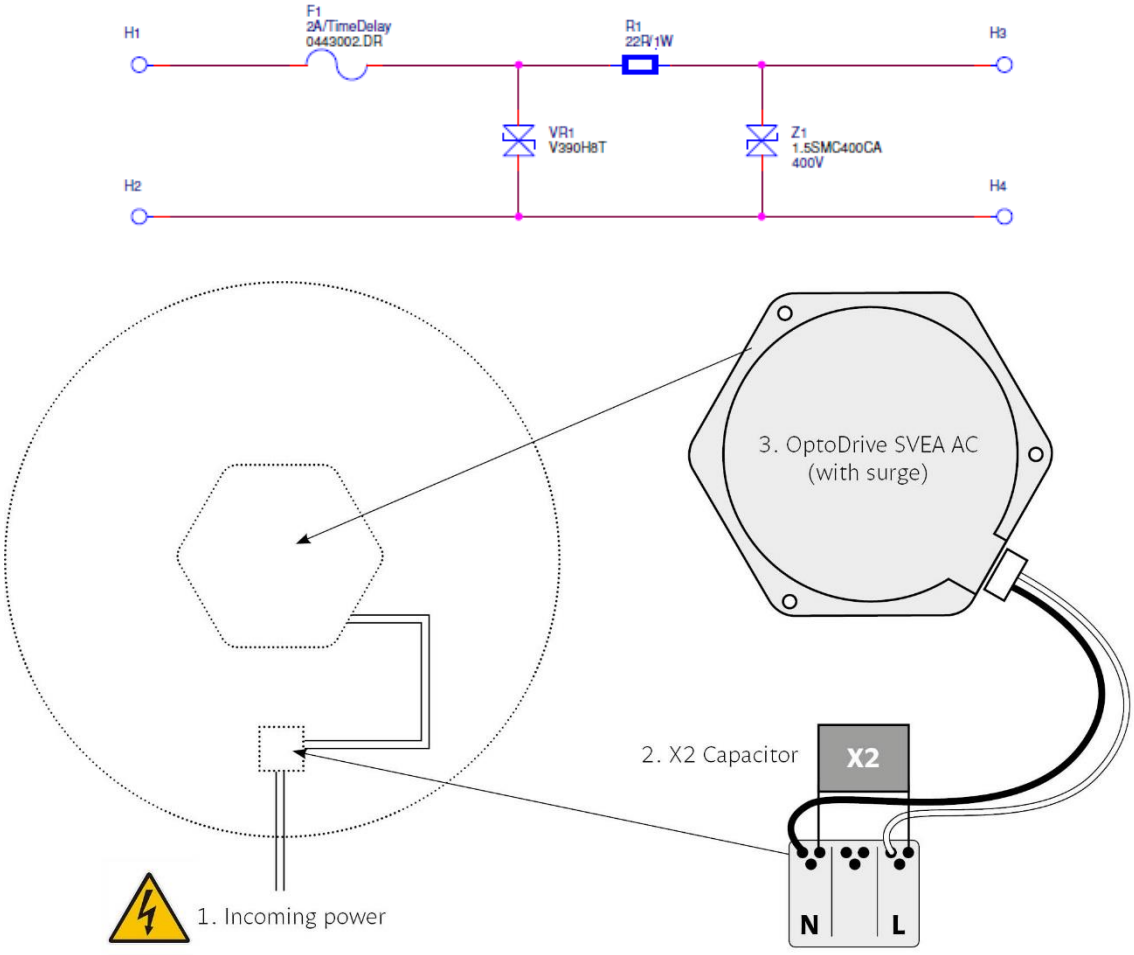
Ph: +46 (0)589-490 950
Fax: +46 (0)589-490 950

Web: www.optoga.com
E-mail: info@optoga.com

Surge

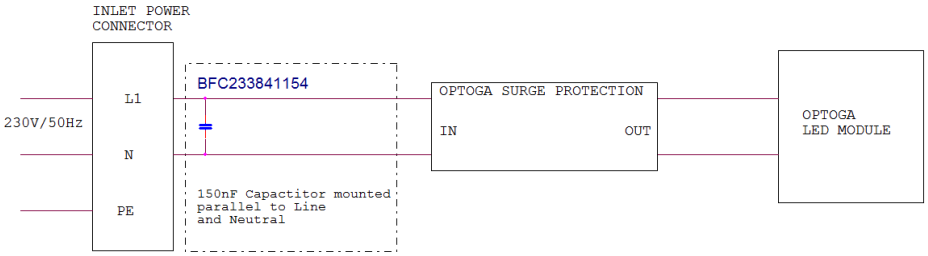
1. Surge

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



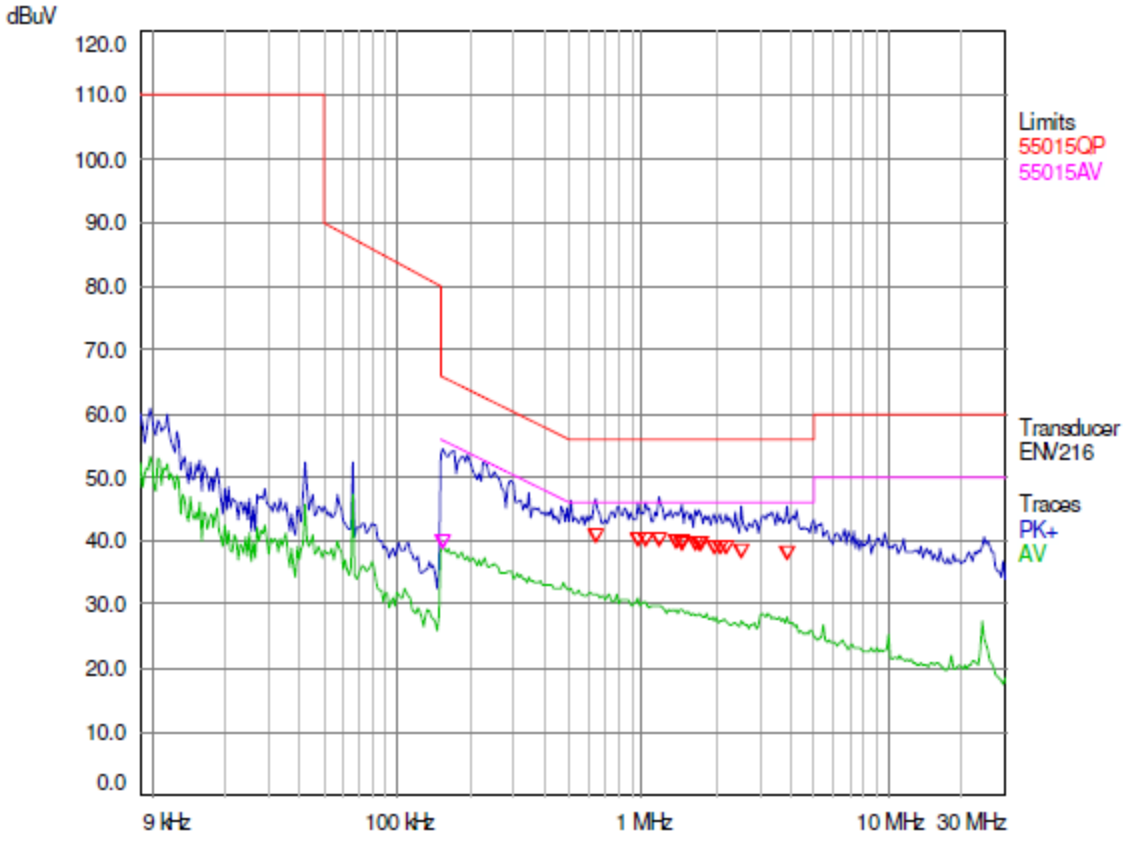
The installation set up requires an X2 Capacitor parallel to L1 and N to handle the fast and high voltage transients generated by the magnetic ballast.

2. Set-up



3. EMC

Pre-measurement Graph



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

4. 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.

EMC	IEC 55015	
SURGE	IEC 61000-4-5	1 kv
Fast transient BURST	IEC 61547	2 kv
SAFETY	IEC 62031:2008	

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.

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 Compliant

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

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 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 2002/95/EC (RoHS) the following substances must not be used in this product

- Lead (Pb) alloys
- Mercury (Hg)
- Cadmium (Cd)
- Chromium (6+) compounds

Köpingsvägen 4
SE-732 31 ARBOGA

Ph: +46 (0)589-490 950
Fax: +46 (0)589-490 950

Web: www.optoga.com
E-mail: info@optoga.com

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

Read more about OptoDrive at www.optodrive.se. You can contact us via info@optoga.com. Obviously, 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.

Köpingsvägen 4 • SE-732 31 Arboga • SWEDEN
Tel +46 (0) 589 490 950 • Fax +46 (0) 589 197 80
info@optoga.com • www.optoga.com