Clara AC IP65/67

CLARA AC IP65

4W | 6W | 10W| 16W

A secure and complete solution for outdoor luminaires.

No Driver is required!

Key features

Story

Clara AC IP65 is designed for bollards, park lighting and bulk heads and can be integrated into environments that previously were not possible, since the LED module itself is water and moisture proof.

The idea is that instead of doing the whole luminaire moisture proof, we just do the places that are in need of moisture barriers secure. It's about not closing in moisture, but always get it to be able to evaporate. Do not turn in moisture without opening up the structure so that the moisture can always evaporate.

Key features

- IP65 classed
- Based on Clara AC 24-LED
- No driver required
- No extra encapsulation needed

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Introduction

Clara package

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.

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.

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.

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.

IP65 / 67

Water and moister protect LED Engine solution.

Short form Characteristics

MECHANICAL	4W	6W	10W	16W
Module dimension with cover	48.4 mm (1.90 inch) diameter			
Weight	TBD			
Assembly holes	2 x 3.8 mm (2 x 0.15 inch)			
Wire connector	2-wire Cable (60cm / 23.6 inch)			
ELECTRICAL				
Power	6 W +/-10% ea.	6 W +/-10% ea.	10 W +/-10% ea.	16 W +/-10% ea.
Input voltage	120 or 230VAC			
Input voltage range	100-130 VAC or 220-240VAC			
Power factor	0.98			
Total harmonic distortion	<15%			
Type of current	AC			
Peak inrush current		600mA		
Inrush current duration		< 35µs		
Surge protection	1500V			
Over temp. protection	150°C			
Energy class	A+			
PHOTOMETRICAL				
Flux nominal	430lm	650lm	1050lm	1550lm
Efficiency	TBD			
Number of LED's	24			
Rendering index	>Ra80 (>Ra90 on 2700K and on demand)			
SDCM (Mac Adam)	3			
Flicker percent	100%			
Flicker index	TBD			
Spread angle lens	110° (IP65/IP67)			
Colour temperatures	2700K, 3000K, 4000K			
ENVIRONMENTAL				
Temperature range	-25°C to 85°C (-13°F to 185°F) (Absolute maximum temp Tc 85°C)			
Relative Humidity	10-75%			
Ambient air pressure	500-1060 HPa			
LIFE LENGHT				
Life length L70B10		>50 000h		

Article number structure

Article number: Clara AC.P.230.24.8yy-IP65

CLARA AC.P.230.1.8YY-NN

AC	AC= 230VAC, ED=External Driver required, ID=Internal Driver
P*	Power (Watt)*
V	Voltage: 120VAC or 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/IP class

Article name and versions

ARTICLE NAME	POWER	CURRENT	LEDS	CRI	CCT	LENS
Clara AC.6.230.24.927-IP65	6	230	24	90	2700	IP65
Clara AC.6.230.24.830-IP65	6	230	24	80	3000	IP65
Clara AC.6.230.24.840-IP65	6	230	24	80	4000	IP65
Clara AC.10.230.24.927-IP65	10	230	24	90	2700	IP65
Clara AC.10.230.24.830-IP65	10	230	24	80	3000	IP65
Clara AC.10.230.24.840-IP65	10	230	24	80	4000	IP65
Clara AC.6.120.24.927-IP65	6	120	24	90	2700	IP65
Clara AC.6.120.24.830-IP65	6	120	24	80	3000	IP65
Clara AC.6.120.24.840-IP65	6	120	24	80	4000	IP65
Clara AC.10.120.24.927-IP65	10	120	24	90	2700	IP65
Clara AC.10.120.24.830-IP65	10	120	24	80	3000	IP65
Clara AC.10.120.24.840-IP65	10	120	24	80	4000	IP65

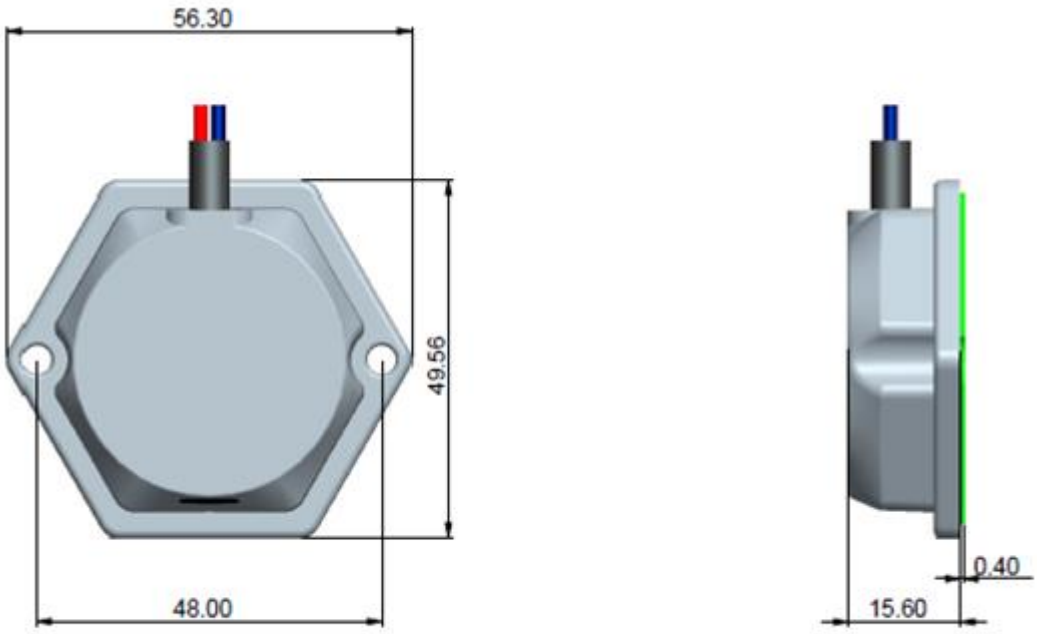
*4W and 16W versions are on demand with minimum volume

Ordering data

Packaging Information Clara AC IP

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	48	66,0	35,0	8,8	
Outer Box	144	68,0	37,0	28,9	11,88

Dimensions LED Module



Dimensions in mm

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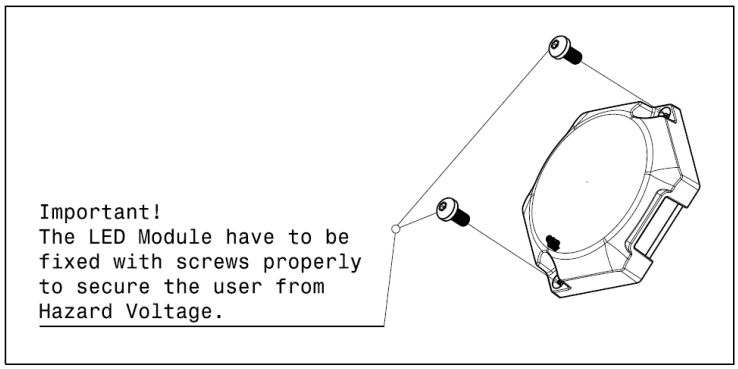
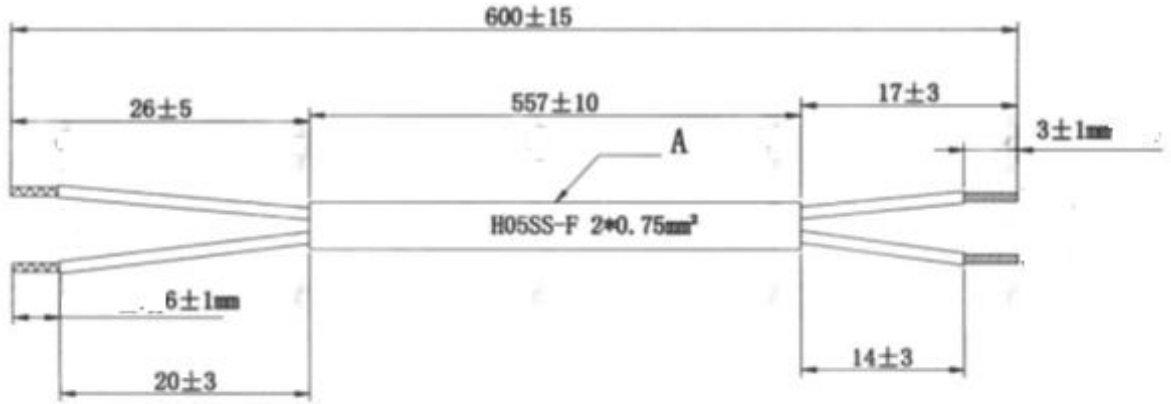
Mounting instructions



Wire

Rubber cable H05SS-F, 60cm (23.6 inches) 0,75mm²



Conductor	Wire	0,75 mm²
	Material	Tinned Copper
Insulation	Material	Silicon Rubber
	Colour outer	Black
	Colour inner	Blue and Brown

Parameters of the Lens System

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

VERSION	VIEWING ANGLE	FWHM ANGLE
CLARA IP65 COVER	110°	±65°

IP65

Test	
Test duration	1 minute per square meter for at least 3 minutes
Water volume	12.5 litres per minute
Pressure	30 kPa at distance of 3 m

Water projected by a nozzle (6.3 mm) against enclosure from any direction shall have no harmful effects.

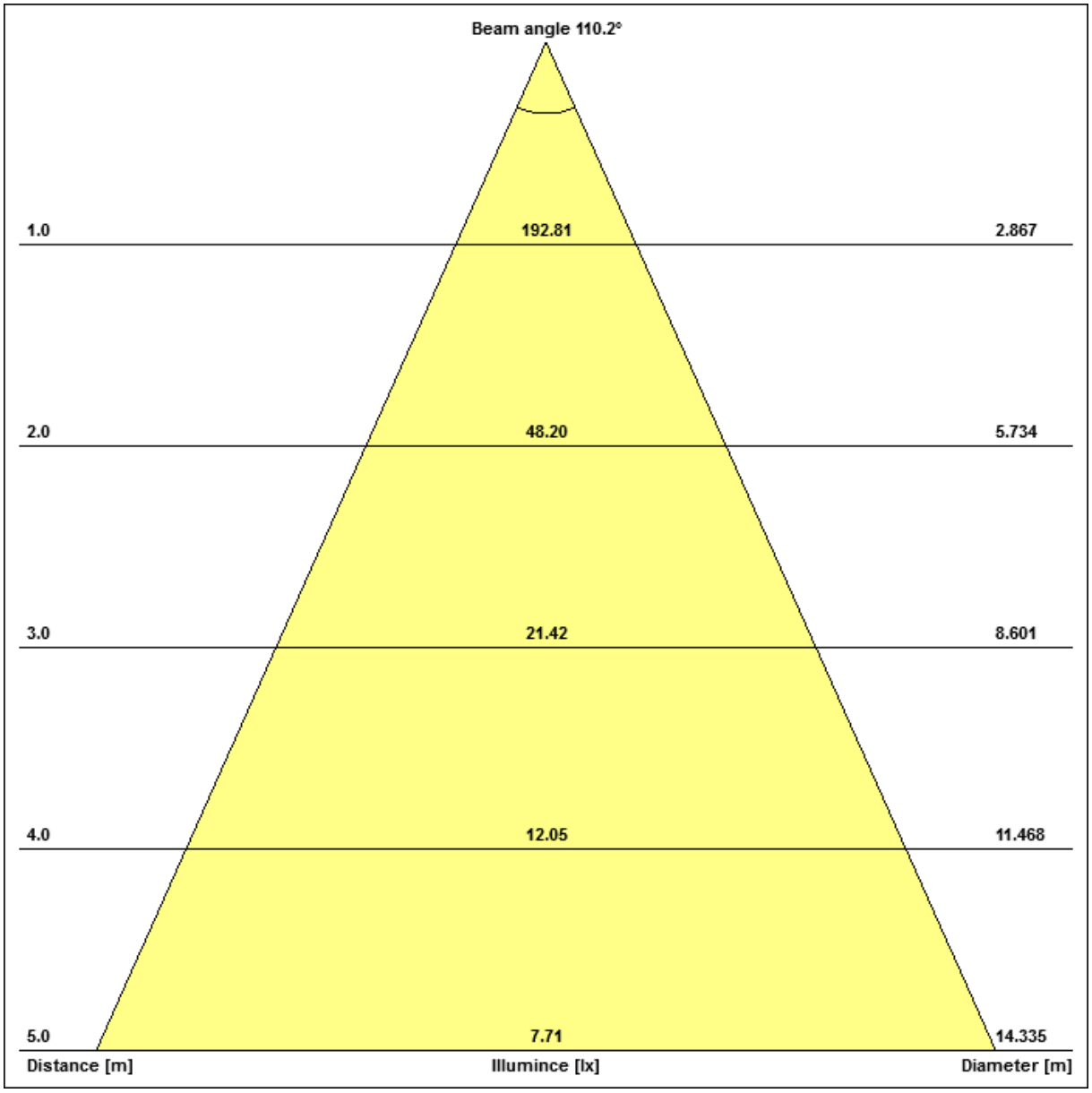
The IP Code, International Protection Marking, IEC standard 60529, sometimes interpreted as Ingress Protection Marking, classifies and rates the degree of protection provided against intrusion (body parts such as hands and fingers), dust, accidental contact, and water by mechanical casings and electrical enclosures.

IK08

Test	IK08
Impact	5 joules
Radius of striking element	25mm
Material of striking element	Steel
Mass of striking element	1.7kg

The European standard EN 62262 — the equivalent of international standard IEC 62262 (2002) — relates to IK ratings. This is an international numeric classification for the degrees of protection provided by enclosures for electrical equipment against external mechanical impacts. It provides a means of specifying the capacity of an enclosure to protect its contents from external impacts

Beam cone


Beam angle 110.2°
1.0
192.81
2.867
2.0
48.20
5.734
3.0
21.42
8.601
4.0
12.05
11.468
5.0
7.71
14.335
Distance [m]
Illumince [lx]
Diameter [m]

Photometrical

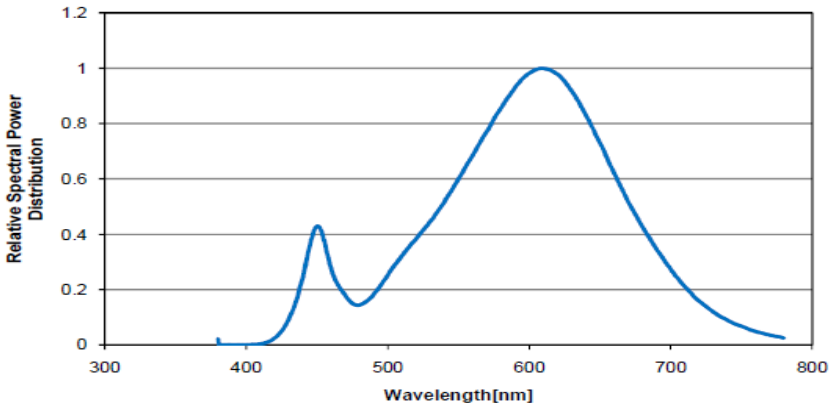
Flux

Parameter		Symbol	Value			Unit
			Min	Typ	Max	
Luminous Flux	4W	Φ_V	400	450		lm
	6W	Φ_V	550	650		lm
	10W	Φ_V	900	1050		lm
	16W	Φ_V	1400	1550		lm
Correlated Colour Temperature	27*(2)	CCT		2700		K
	30*(2)	CCT		3000		K
	40*(2	CCT		4000		K
CRI 3000 and 4000K		R_a	80			-
CRI for 2700K (Min Value CRI90)			90			

Electro-Optical characteristics LED module at I_F=xxmA, 230VAC, T_A=25ºC
Electro-Optical characteristics LED module at I_F=xxmA, 120VAC, T_A=25ºC

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

Colour Spectrum



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 70% light-output
85°C	>50 000 Hr

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.

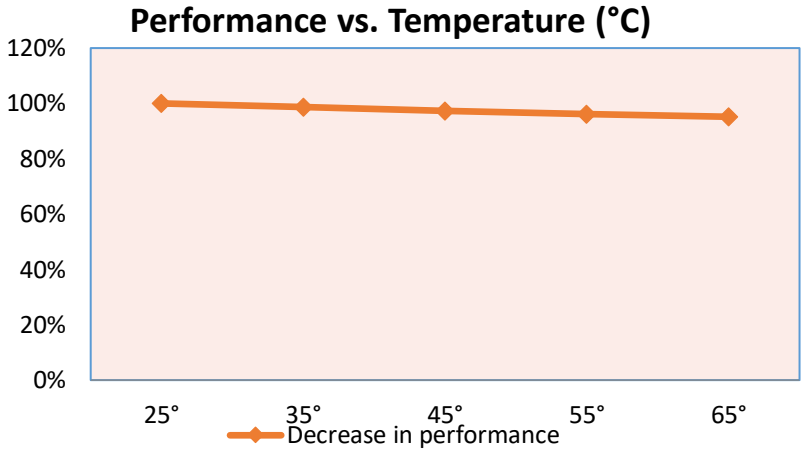
The thermal connection is measured in temperature vs. Power.

Maximum Temperature

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

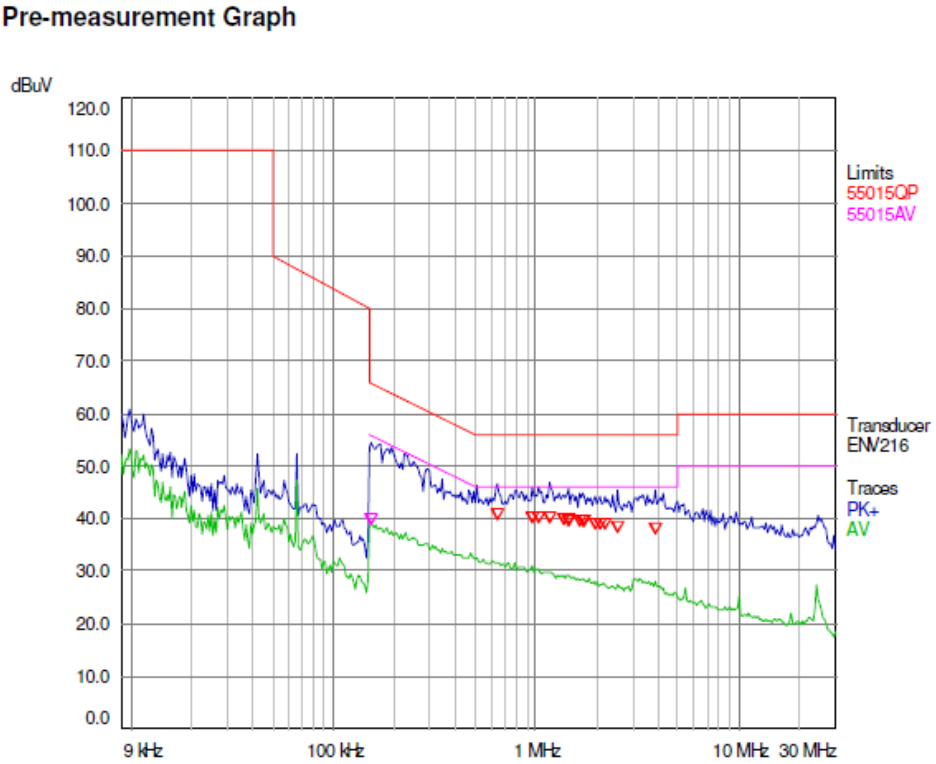
Performance

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.

EMC



Surge protection IEC 61000-4-5

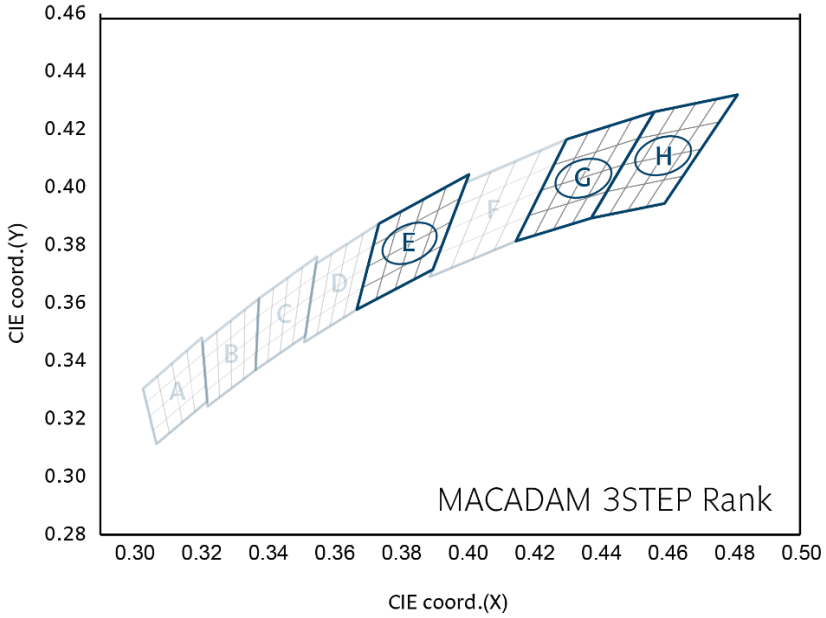
The LED module passed the test at 1500V Surge

Continuous 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.

CCT 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

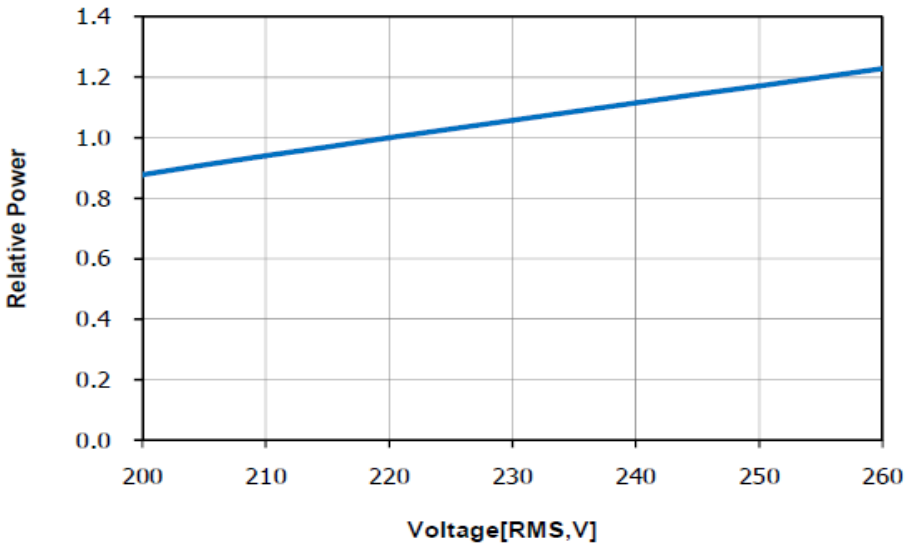
Short form letters for CCT (K)

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

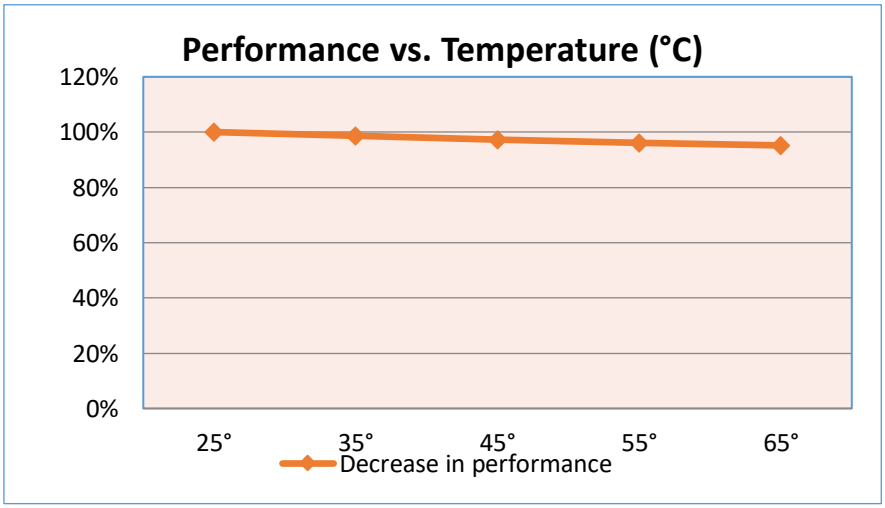
Electro Optical data

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.

Verification of Conformity

The module has been tested at Intertek Semco according to IEC 62031 for Europe and according UL8750 and CSA C22.2 No. 250.13 for USA and Canada.

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	
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
IK class	IEC 62262	IK08
IP class	IEC 60529	IP65 / IP67

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

IEC Protection Classes

The Clara Optodrive module is designed to be built in directly to a Class I fixture.

For Class II fixture use, an electrical insulating pad is needed between the module and the fixture. The pad needs to be minimum 2.5mm wider than the module in all directions; insulating screws such as nylon or plastic must be used when assembling the module to the fixture.

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.

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.
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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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