

SIGHTGLASS LED LUMINAIRE SL60



GELEC

INDUSTRIAL ELECTRONICS

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PRECAUTIONS!

There are no serviceable parts inside the **SL60** unit. Not to be opened by any unauthorized person. Any inspection, or spare part replacement must be carried out by the manufacturer, or a qualified service engineer familiar with the product and the application.

Improper handling may result in serious personal injury and considerable material damage. All connection and maintenance work must be carried out by qualified personnel.



RISK OF ELECTRIC SHOCK!

Apply correct voltage. The SL60 is designed for use with specific voltage only. Connection to a different voltage may cause fire, electric shock or other damage.

Do not touch electronic parts and connection cabling with wet hands.

Disconnect power supply from the SL60 before maintenance or configuration, to avoid the risk of electric shock.

Attempting to use a malfunctioning SL60 can be dangerous.

Install the SL60 in accordance to its specifications.

SL60 has an IP65 solid stainless-steel body with cable gland, which makes it appropriate for harsh industrial environment. Though if possible, it is recommended to keep the installation area protected from unnecessary harmful conditions like extremely high/low temperature, steam etc. If there is suspicion of small object or liquids into SL60, unplug it immediately and have it checked by a qualified service engineer before using it again. Any object or liquid inside the device may result to fire, electric shock, or equipment damage.

Be careful when touching the luminaire.

The luminaire body may be significantly hot during operation. Always check before touching with bare hands.

Do not look directly at the light source.

The incorporated LED module emits a very powerful concentrated light beam. Don't look directly at it when powering the luminaire, or during operation.

Inspect the glass disk for defects or cracks before and after installation.

Although the glass disk is reasonably protected by the flange, consider the possibility and risk of dropped broken glass shards at the installation environment, or any relevant process.

I. MANUFACTURER WARRANTY, GENERAL TERMS AND CONDITIONS

Thank you for purchasing this product.

Our products have been manufactured with the latest technology, the highest quality components and have gone through rigorous quality control tests at the factory, before shipment. Make sure that the part number/type indicated on the identification label and package corresponds to the part number/type of your order. After receiving the unit, inspect it in order to ensure that no damage was caused during transportation.

GELEC and GELEC's authorized distributors warrant to the original purchaser that the product shall be free from defect in material and/or workmanship. The warranty period begins on the purchase date (proof of purchase by invoice or delivery note) and is valid for one (1) year.

In the event of malfunction during the warranty period, attributable directly to faulty material and/or faulty construction and functional defects, GELEC and authorized distributors will, at their option, either repair or replace the faulty product with the same or similar model.

GELEC and authorized distributors shall have no obligation under this warranty however, in the following cases:

- ▶ Any defect caused by freight damage, accident, disaster, faulty maintenance or improper handling.
- ▶ Any defect caused by modification, alteration, abuse, misuse or incorrect installation.
- ▶ Any defect of the product caused by improper repair by third party, other than GELEC and GELEC's authorized distributors.
- ▶ Any incompatibility of the products with subsequent technical innovations or regulations.
- ▶ Any defect of the product caused by external equipment.
- ▶ Any defect of the product on which the original manufacturer's labeling has been altered or removed.

In case of complaint please contact our company or send the unit un-dismantled to your local dealer. Any necessary replacement parts and necessary repair work, are totally covered free of charge.

All products are designed and produced by the manufacturer GELEC Co. LP to be in compliance with the EU norms applying to them. GELEC is not responsible for direct or indirect damages, or malfunction caused by improper use or installation of the SL60.

2. DISPOSAL OF OLD ELECTRICAL & ELECTRONIC EQUIPMENT



This symbol, found on your product, indicates that this should not be treated as household waste when you wish to dispose it.

It should be handed over to an applicable collection point for the recycling of electrical and electronic equipment.



By ensuring this product is disposed of correctly, you will prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product.

The recycling of materials will help to preserve natural resources.

3. SIGHTGLASS LED LUMINAIRE SL60

This operator's manual explains the functions and operation of the SL60. It also gives some troubleshooting tips as well as general precautions to be taken when operating the unit. In order to ensure the best performance and effective use of the SL60, we recommend that you read the information in this manual carefully and follow the instructions contained.

This manual is a complete guide to the SL60 with information on unit user maintenance, unit installation and operational instructions. Do not touch parts of the SL60 that are not referred in this manual. Keep this manual for immediate reference. It should help in solving any operational problems you may have.

No part of this manual may be quoted, reproduced, stored in a retrieval system, transmitted, transcribed or translated into any other language in any form or by any means, electronic, mechanical, or otherwise, without prior written permission of "Gelec Co. LP".

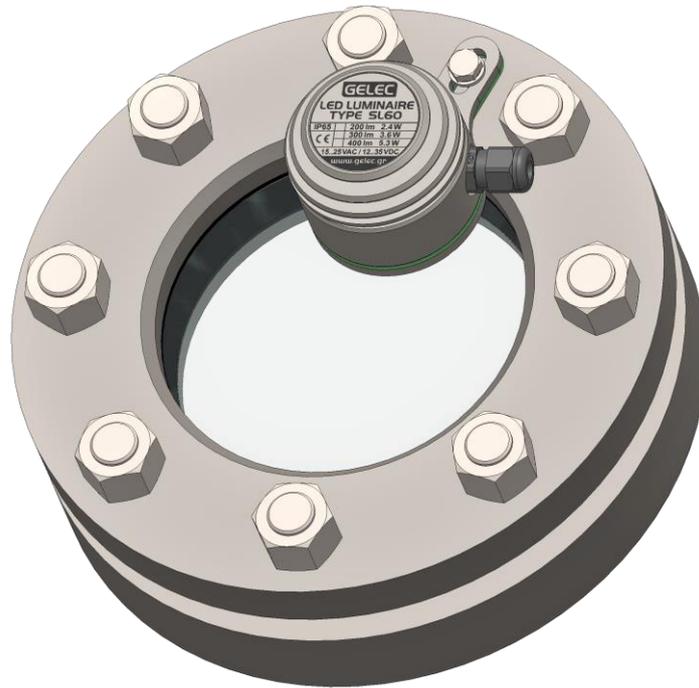
Although every effort has been made to ensure that this manual provides up to date information, please note that the contents in this manual and the unit specifications are subject to change without notice.



Don't forget to mention the exact type and version of your SL60 whenever you contact the manufacturer asking for any further information. You can find this information on the identification label on top of the luminaire. A corresponding mark defines the version of your luminaire (200/300/400 lm).

4. GENERAL DESCRIPTION

The SL60 is a powerful and compact LED luminaire designed for mounting on sightglasses acc. to DIN28120, 28121, 11851, or similar of DN50-200. It is an ideal solution for illuminating the inside of tanks, pipelines, silos, mixers or any closed vessel where visual inspection during process stages is required.



Incorporating a high-performance LED with a 50-degree lens, the SL60 delivers high luminous efficacy (lm/watt), reliability and durability in high-temperature applications. The SL60 comes in three luminous flux versions (200/300/400lm) in order to cover a variety of lighting needs.

The IP65 sandblasted solid stainless-steel body combined with one adapting flange, provides mounting versatility and allows you to integrate the luminaire in your application in the best possible way (mounting position, cable gland direction, customized special adapting flanges etc.). The 'heatsink' design allows the essential heat dissipation.

It can be powered with alternating or direct current (AC/DC) and it's equipped with overcurrent, wrong polarity and overheating protection, which leads in intensity decrement or even in deactivation of the luminaire in cases of excessive temperature conditions. The internal LED module is separately available as a spare part and can be used for a convenient and cost-effective replacement by the customer, if needed.

MAIN FEATURES

- High intensity illumination with low power consumption
- Solid stainless steel AISI 304 - IP65 protection
- Compact design which maximizes space for visual inspection
- Wide range of adapting flanges - Customizations available
- Appropriate for high temperature applications
- Warm white (CCT 3000K) / CRI 80+
- Numerous options for mounting position and cable gland direction
- Independent of vessel's internal pressure/vacuum
- Wrong polarity and overcurrent protection
- Overheating protective function

APPLICATIONS

- Appropriate for combined sight/light glass units, or separate flanged ports in non-hazardous areas.

On sight glasses acc. to DIN28120, DN 50 – DN200

On sight glasses acc. to DIN28121, DN 50 – DN200

On sight glasses acc. to DIN11851, DN 50 – DN125

- Flow indicator sightglasses and rectangular or D-ended sight glasses
- Suitable for pharmaceutical, cosmetic and food processing industries
- Appropriate for general and architectural lighting

COMPLIANCE WITH APPLICABLE STANDARDS

- Low Voltage Directive (LVD) 2014/35/EU
EN 60598-1: 2015
EN 60598-2-1: 1989
- Electromagnetic compatibility Directive (EMC) 2014/30/EU
EN 55015: 2013+A1: 2015 EN 61547: 2009
EN 61000-3-2: 2014
EN 61000-3-3: 2013
- Restriction of the use of certain hazardous substances (RoHS) 2011/65/EU
EN 50581: 2012

5. SL60 VERSIONS AND ORDERING

A complete luminaire consists of the SL60 main body which incorporates the LED module and the adapting flange for the mounting on the sightglass. Three luminous flux versions and a wide range of adapting flanges for different sightglass types are available. **It is necessary to include both luminaire and adapting flange types in your order.**

- SL60 VERSIONS -

	SL60-WW200	SL60-WW300	SL60-WW400
Luminous Flux	200 Lumen	300 Lumen	400 Lumen
Power	2,4 W	3,6 W	5,3 W
LED Module spare part	SL60-WW200SP	SL60-WW300SP	SL60-WW400SP
Operating voltage	15..25 VAC , 12..35 VDC		
LED specifications	Warm White (CCT 3000K)		
Emission angle	50°		

- ADAPTING FLANGES -

Refer to the following tables and the relevant drawings regarding the compatibility between the SL60 Adapting Flanges and each sightglass standard and its nominal diameter.

	DIN28120 sightglasses					
Nominal Diameter (DN)	DN50	DN80	DN100	DN125	DN150	DN200
Adapting Flange Type	A	A / B80	A / B100	A / B125	A / B150	A / B200

	DIN28121 sightglasses					
Nominal Diameter (DN)	DN50	DN80	DN100	DN125	DN150	DN200
Adapting Flange Type	A	A	A	A	A	A

	DIN11851 sightglasses					
Nominal Diameter (DN)	DN50	DN65	DN80	DN100	DN125	DN150
Adapting Flange Type	C50	C65	D	D	D	D

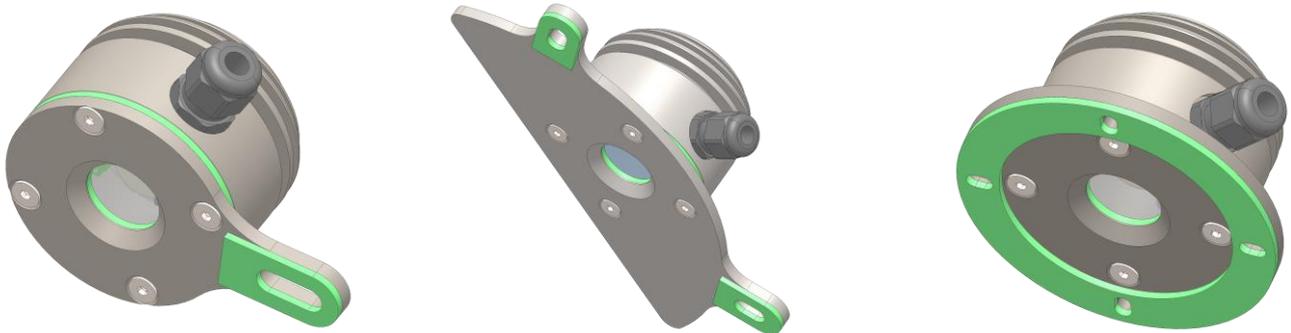
If your application needs are not covered by the standard options, customized solutions can be available upon request. LED color, light emission angle, housing materials, cable gland and adapting flanges can be customized. Contact Gelec providing a detailed description of your application and the requested requirements.

6. ADAPTING FLANGES

A solid sandblasted stainless steel (AISI 304) adapting flange is **the mounting component between the SL60 luminaire body and the sightglass**. There are several types of adapting flanges available, covering a wide range of sightglass DIN standards, or random ports (rectangular, D-ended, flow indicator sightglasses etc.). Customized adapting flanges are also available, upon request. Notice that **the SL60 cannot be installed and used without an adapting flange**.

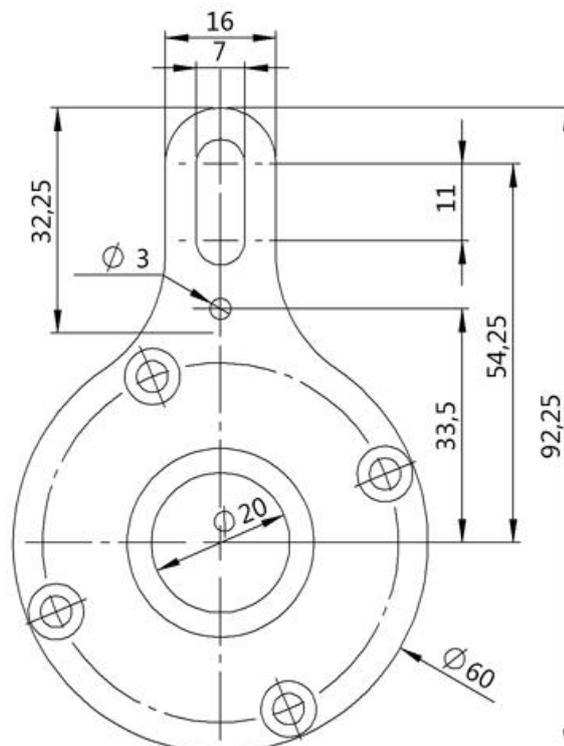


Each flange type has four countersunk holes for the M4 screws that hold the luminaire body on the flange (in any orientation suits your installation) and the hole(s) for the final mounting on the sightglass. The **permanite sealing gaskets** on both sides of the flange waterproof the luminaire and provide thermal insulation from the vessel's temperature, giving the ability to use the SL60 in high temperature applications and harsh industrial environment. The countersink in the middle of the flange allows proper light emission.



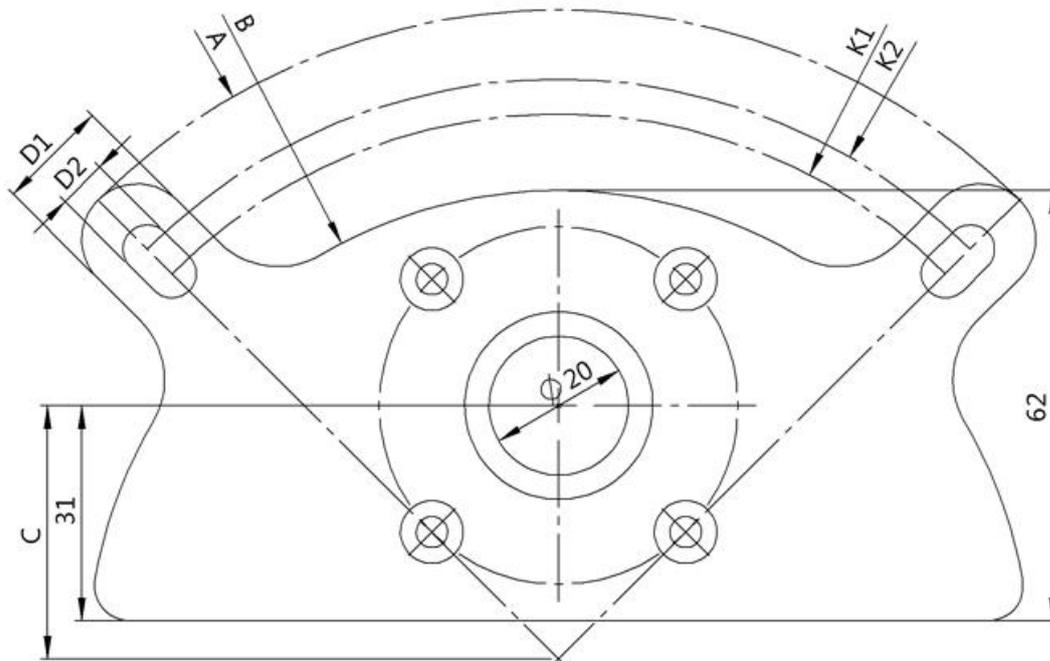
TYPE A - For sightglasses acc. to DIN28120/28121 (DN50-DN200)

Flange with one mounting fin for DIN28120/28121 sightglasses, or any sightglass with adequate mounting space. It maximizes the space for visual inspection, as it covers only 45-60mm of the glass, depending on sightglass geometry and application needs. Use a pin at the 3mm hole in order to firm the mounting in vibrating applications, if needed.



TYPE Bxx* - For sightglasses acc. to DIN28120 (DN80-DN200)

Flange for DIN28120 sightglasses with nominal diameter DN80-DN200. It has a common industrial design with two mounting fins for extra stability in vibrating applications. The extra space around the luminaire body can be used for possible drawings, additional information about the internal of the vessel, or safety precautions that may be needed during visual inspection.



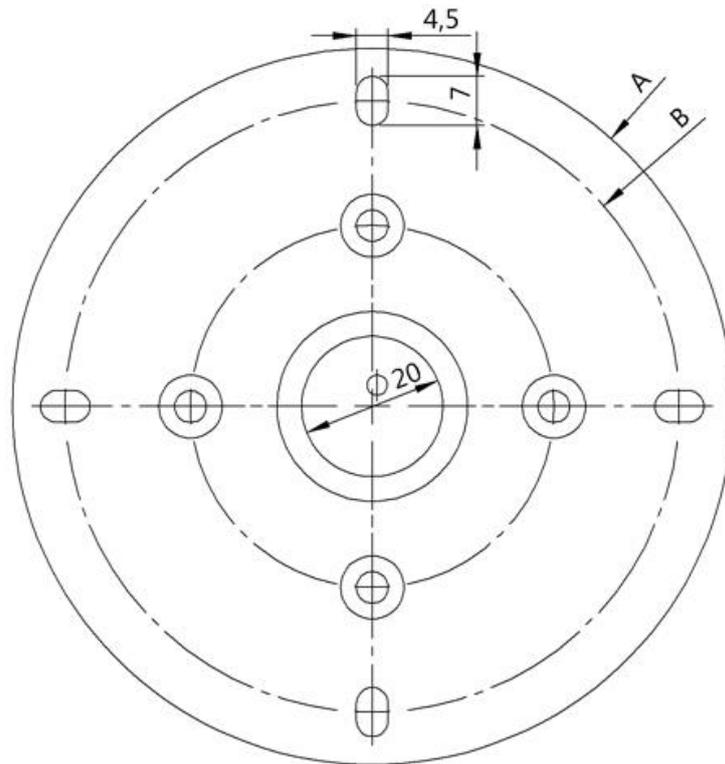
TYPE B flange dimensions (mm)					
	B80	B100	B125	B150	B200
A	158	187	212	245	306
B	110	135	160	185	235
C	24	36.5	49	61.5	86.5
D1	13	16	16	20	20
D2	7	7	7	9	9
K1	128	157	182	210	270
K2	138	167	192	220	280

* **xx** according to your sightglass nominal diameter (DN).

E.g. for a DIN28120/DN150 sightglass, the appropriate flange type is 'B150'.

TYPE Cxx* - For sightglasses acc. to DIN11851 (DN50 & DN65)

Flange for DIN11851 sightglasses with nominal diameter DN50 and DN65. It covers the whole glass, being appropriate for sightglasses used only for lighting.



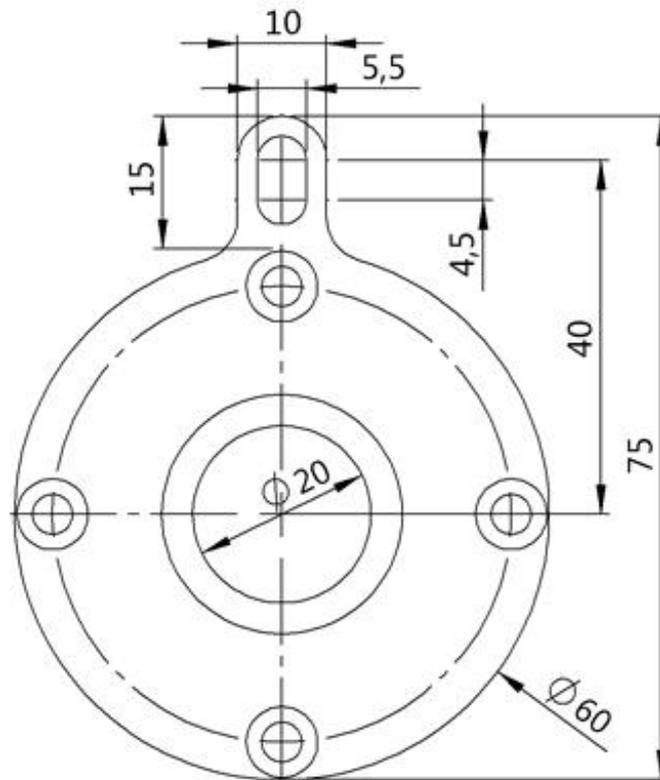
TYPE C flange dimensions (mm)		
	C50	C65
A	84	102
B	72	87

* **xx** according your sightglass nominal diameter (DN).

E.g. for a DIN11851/DN50 sightglass, the appropriate flange type is 'C50'.

TYPE D - For sightglasses acc. to DIN11851 (DN80-DN150)

Flange with one mounting fin for DIN11851 sightglasses, or any sightglass with limited mounting space. It maximizes the space for visual inspection as it covers only 60mm of the glass.

**CUSTOMIZED FLANGE TYPES**

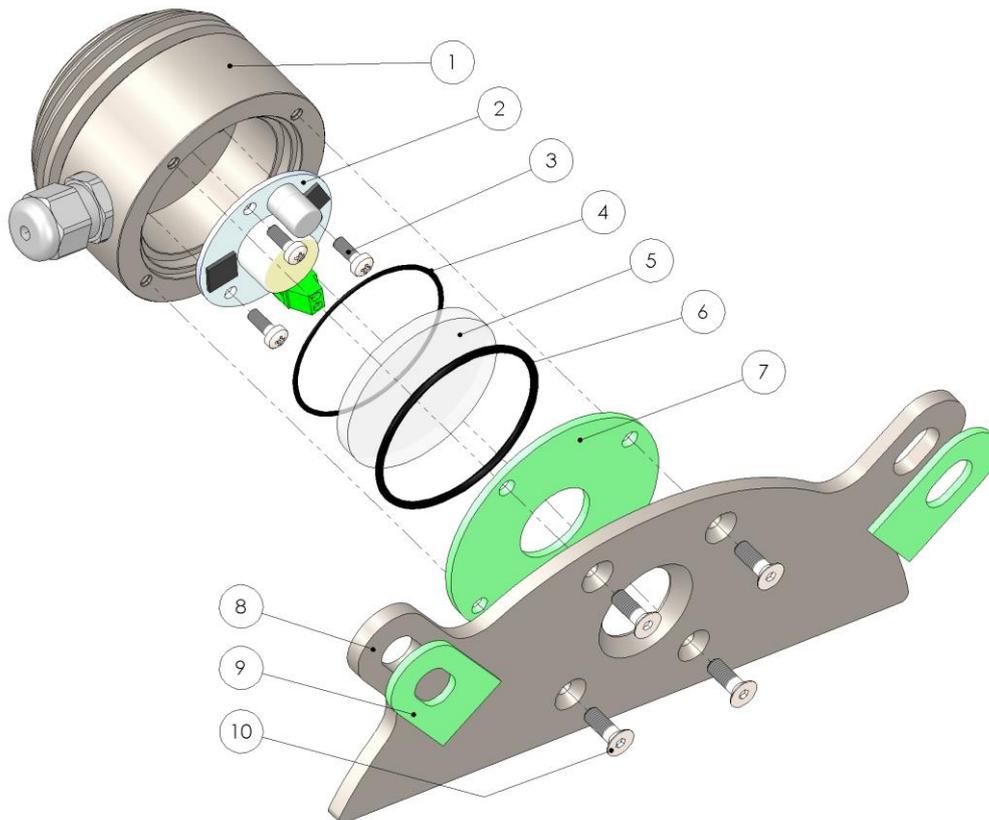
If your application geometry requires a flange design which is not covered by the standard range, a customized solution can be manufactured according to your needs. The variations may refer to dimensions, shape, material etc. Please contact Gelec for more information.

Notice that the **permanite gaskets are necessary for the final assembly**. Even if you choose to manufacture your own custom flange, the relevant gaskets must be provided by Gelec.

7. INSTALLATION & SPARE PART EXCHANGE

The following exploded view shows the main parts of the SL60 LED Luminaire. Notice that all parts **from (1) to (6) are already pre-assembled** when you receive the luminaire. The only thing that has to be done from the user, is the electrical connections.

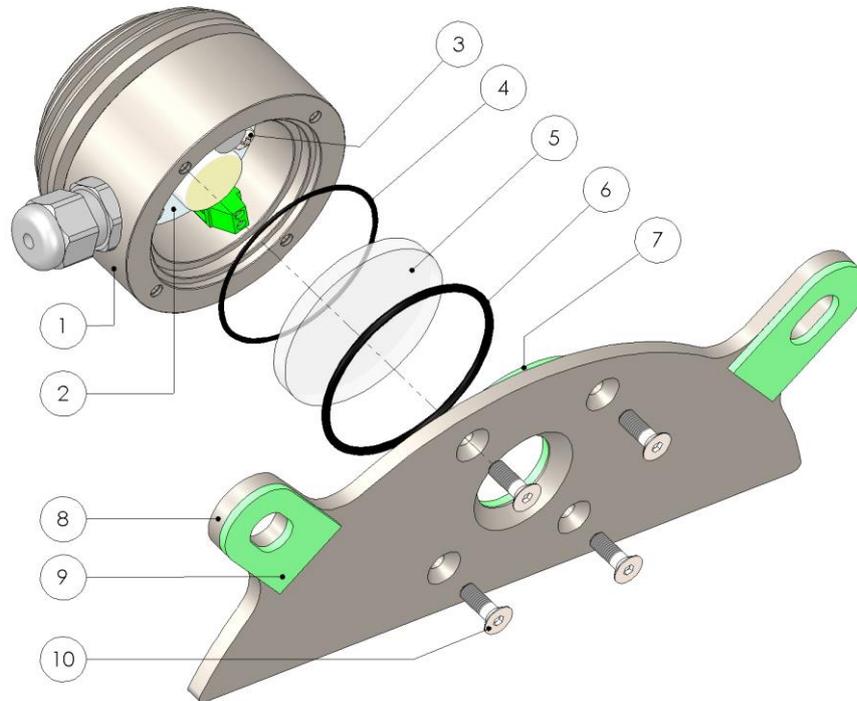
The **permanite gaskets (7) / (9)** are already fitted on the adapting flange (any type) and are **necessary** for a proper waterproof and thermally insulated assembly.



SL60 Exploded view

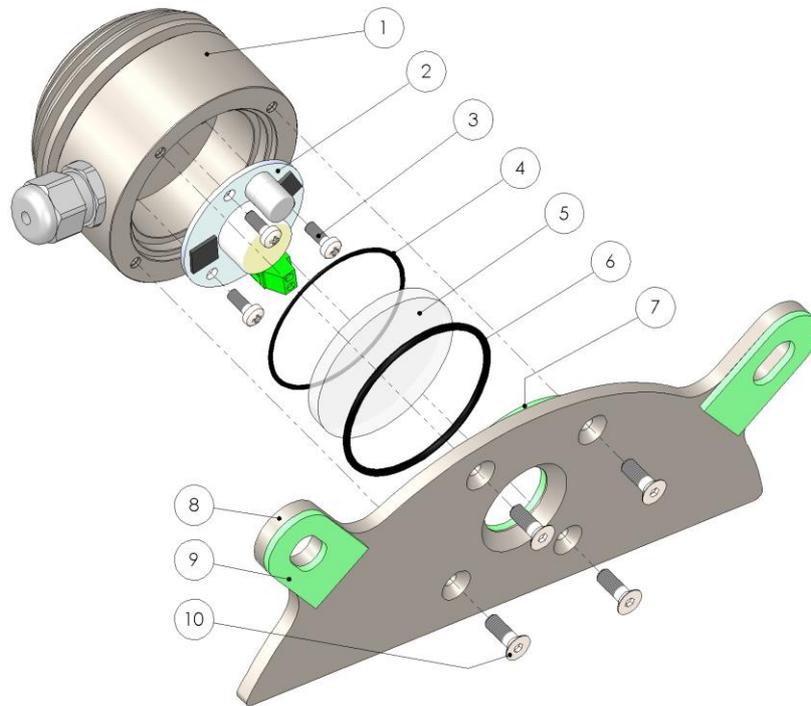
- | | |
|-------------------------------------|------------------------------------|
| (1) Luminaire body with cable gland | (6) Thick o-ring |
| (2) LED module (spare part) | (7) Round permanite sealing gasket |
| (3) Led module screws (M3) | (8) Adapting flange (any type) |
| (4) Thin o-ring | (9) Permanite gaskets |
| (5) Glass disc | (10) Luminaire body screws (M4) |

- Connection and installation of a new SL60 -



- ▶ Carefully extract the **thick o-ring (6)**, the **glass disc (5)** and the **thin o-ring (4)** from the **luminaire body (1)**, in order to get access to the **LED module (2)** and the terminal block for the wire connection.
- ▶ Prepare and feed a proper cable in the *cable gland* and turn the nut until tight. Ensure that the cable is centered, sealed and strain relieved to have a waterproof assembly. Afterwards, screw the wires (1.5mm² max / 16-30 AWG) at the terminal block (**polarity is not important**). Check the '*Electrical section*' for detailed information.
- ▶ Place the **thin o-ring (4)** at the inner circular edge, the **glass disc (5)** above it and evenly wedge the **thick o-ring (6)** in the outer circular edge, between the glass disc and the luminaire body. Ensure that the glass disc is clean.
- ▶ Use the M4 **countersunk screws (10)** to mount the luminaire body on the **adapting flange (8)** with any orientation suits your application.

- Replacement of LED module spare part -



- ▶ Carefully extract the **thick o-ring (6)**, the **glass disc (5)** and the **thin o-ring (4)** from the **luminaire body (1)**, in order to get access to the **old LED module (2)**.
- ▶ Disconnect the wires from the terminal block and unscrew the M3 **Led module screws (3)**. The malfunctioning Led module can now be extracted.
- ▶ Clean the inside of the **luminaire body (1)** and apply a thin layer of paste between the mating surfaces of the new **LED module (2)** and the luminaire body. **Just a small amount of paste behind the LED area is needed.** Apply a small drop in the center of the body socket and press/rotate the Led module on it a few times. Don't let it overflow outside the LED module. This step maximizes heat transfer during operation. Insufficient heat dissipation may affect the luminaire's proper function.
- ▶ Place the **new LED module (2)** inside the luminaire body, screw firmly with the M3 **Led module screws (3)** and screw the wires at the terminal block (**polarity is not important**). Check the '*Electrical section*' for detailed information.
- ▶ Place the **thin o-ring (4)** at the inner circular edge, the **glass disc (5)** above it and evenly wedge the **thick o-ring (6)** in the outer circular edge, between the glass disc and the luminaire body. Ensure that the glass disc is clean.
- ▶ Use the M4 **countersunk screws (10)** to mount the luminaire on the **adapting flange (8)** with any orientation suits your application.

ELECTRICAL SECTION

CABLE GLAND

The SL60 is equipped with a strain relief, liquid tight seal cable gland with **3,5 - 7mm clamping range**. It is resistant to salt water, weak acids/alkalis, gasoline, oils and other common solvents, while it provides permanent vibration protection.

Ensure that you are using **a cable with appropriate material/thermal characteristics and outer diameter within the clamping range**, in order to have a waterproof and durable assembly.

CONNECTION TERMINALS

The incorporated LED module is equipped with a 2-pole M2 terminal block, which is manufactured to provide resistance to stress corrosion cracking, electrolytic corrosion, rusting and screw loosening in case of vibrations. This way, conductor connections are maintained reliable and maintenance-free in harsh industrial environment.

The conductor's cross-section should be up to **1.5mm² / 16-30AWG**, with **6mm maximum stripping length**. The recommended tightening torque is **0,2 Nm**. In order to avoid connector damage, **hold the terminal block while (un)screwing and don't apply excessive torque**.

Clamp all types of copper cables without pre-treatment. Do not solder the conductors, as it affects the connection quality. If necessary, copper ferrules can be used as a protection against splicing when stranded conductors are wired. In general terms, ensure that you are having reliable mechanical connection and electrical contact.

The voltage supply must be **15-25 VAC** or **12-35 VDC (specific polarity not important)**. Connection to lower/higher voltage may cause device damage, fire or electric shock.

Confirm that you have proper connections before operation. Wrong connections may lead to permanent device or external equipment damage. **Don't proceed to any connection modification, while the device is powered.**

MOUNTING ON SIGHTGLASS - TIPS AND PRECAUTIONS

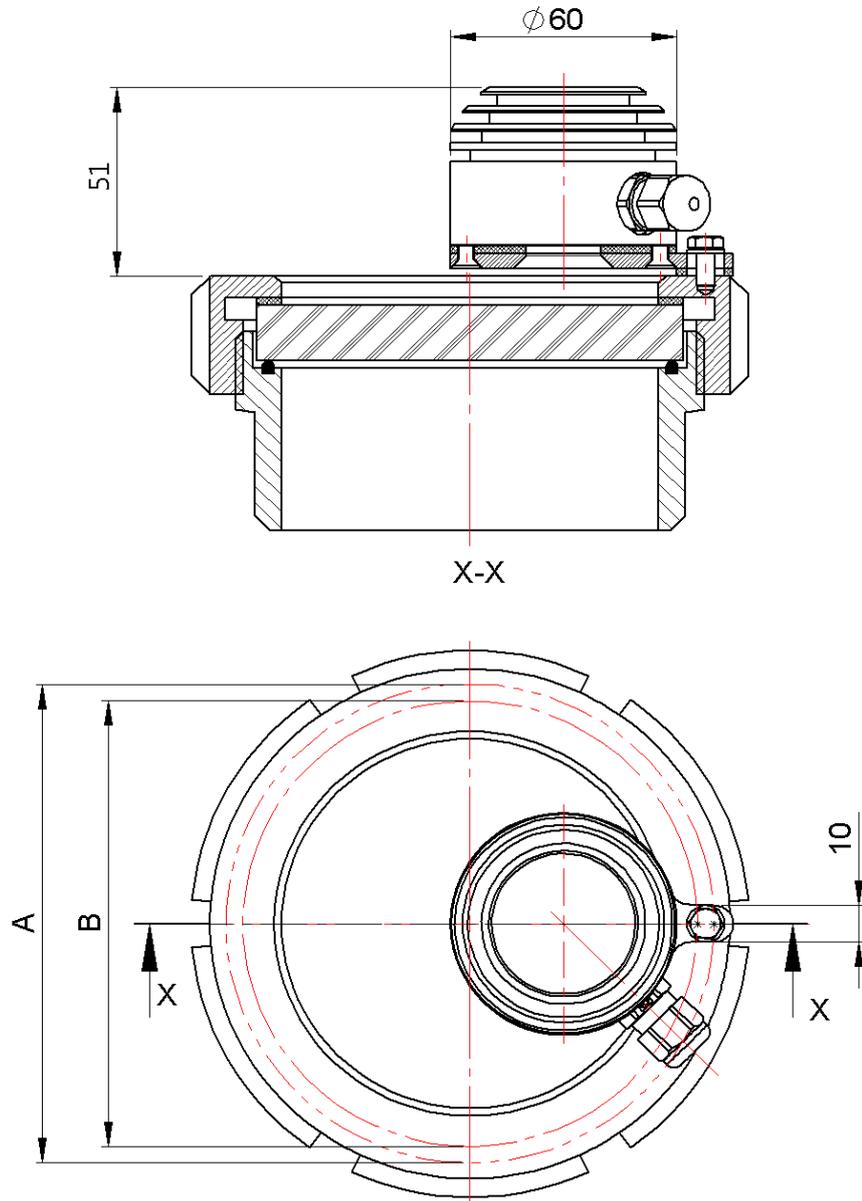
- The sightglass drawings in this manual are designed according to DIN standards, but consider them as **indicative**. There may be differences among different sightglass manufacturers.
- **Always refer to your sightglass drawings and specifications before drilling.** Ensure that any modification on it will not affect its safety and operating standards.
- Although there are many options about the final fitting on the sightglass, it is recommended to **avoid positions that the cable gland faces upwards**, to protect the luminaire from possible liquid insertion.
- Notice that only the **Ø20mm center hole** of the adapting flange is needed for light emission, not its whole surface. You can maximize the visual inspection space by mounting accordingly on the sightglass, though ensure that after mounting, this hole is not partly blocked and you exploit the entire light beam.
- When using adapting flanges with one fin in **excessively vibrating applications**, the use of lock washer on the mounting screw, or a pin at the relevant 3mm hole, may be useful in order to avoid possible fastening loosening and firm the mounting.



If there is suspicion of small object or liquids into SL60, unplug it immediately and have it checked by a qualified service engineer before using it again. Always follow the instructions given by Gelec and use the SL60 in accordance to its specifications.

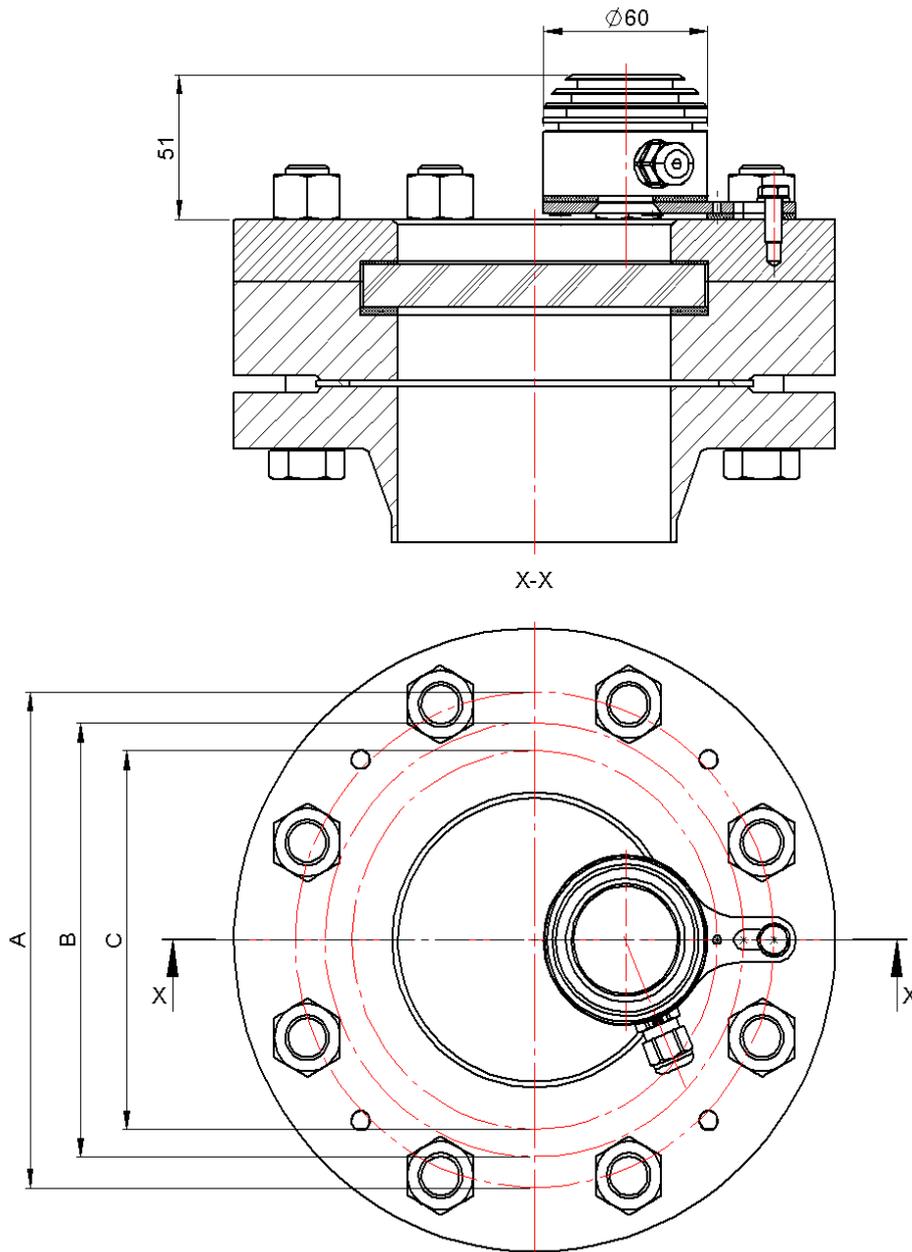
8. SIGHTGLASS FITTINGS

SL60 with TYPE D adapting flange, on sightglass DIN11851



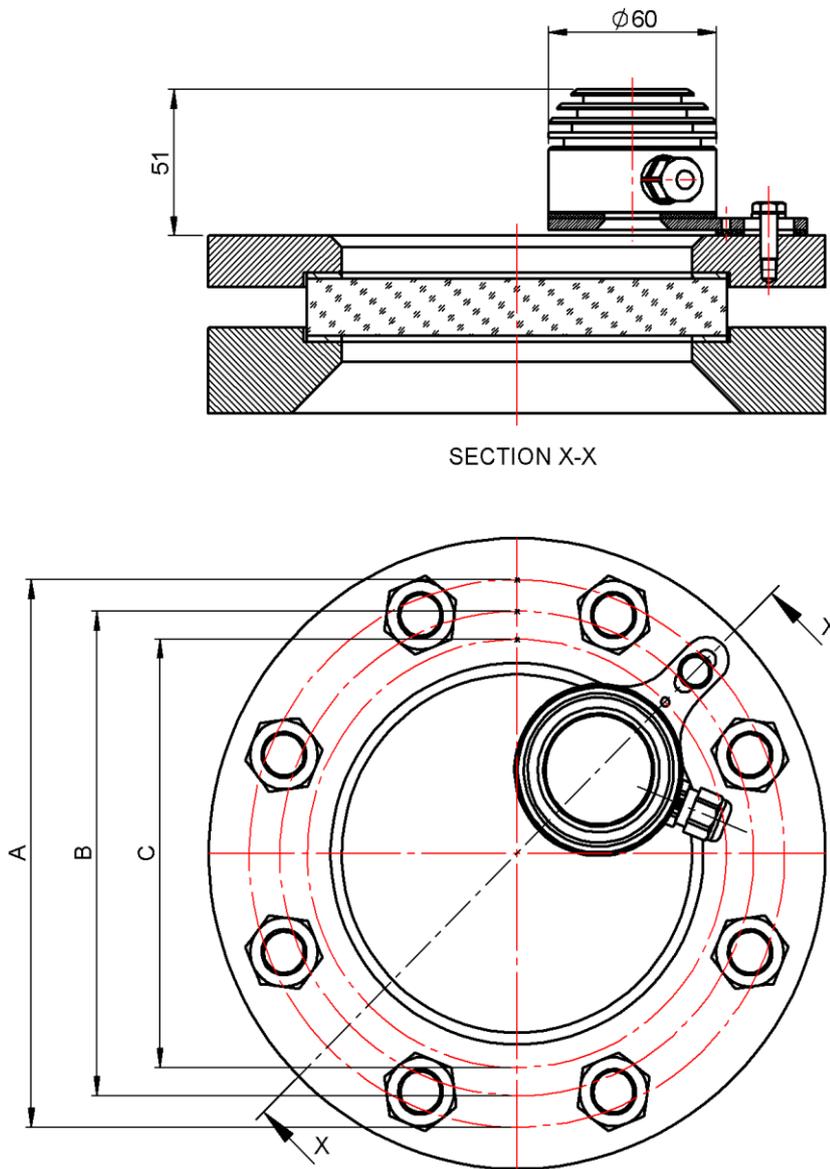
DN	A	B
80	103	94
100	125	116
125	155	146
150	184	175

SL60 with TYPE A adapting flange, on sightglass DIN28121



DN	A	B	C
50	140	118	104
80	152	130	116
100	175	153	139
125	199	177	163
150	200	178	164
200	224	202	188

SL60 with TYPE A adapting flange, on sightglass DIN28120

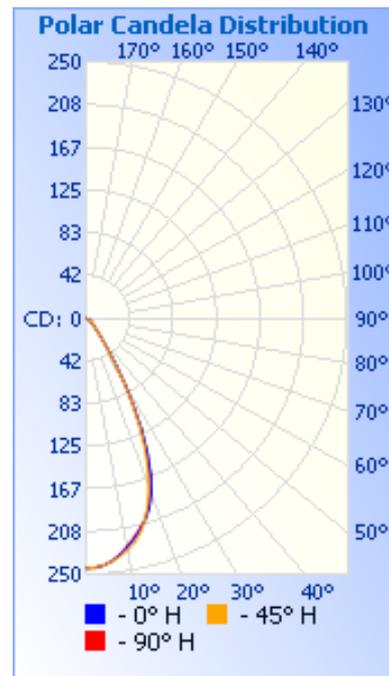
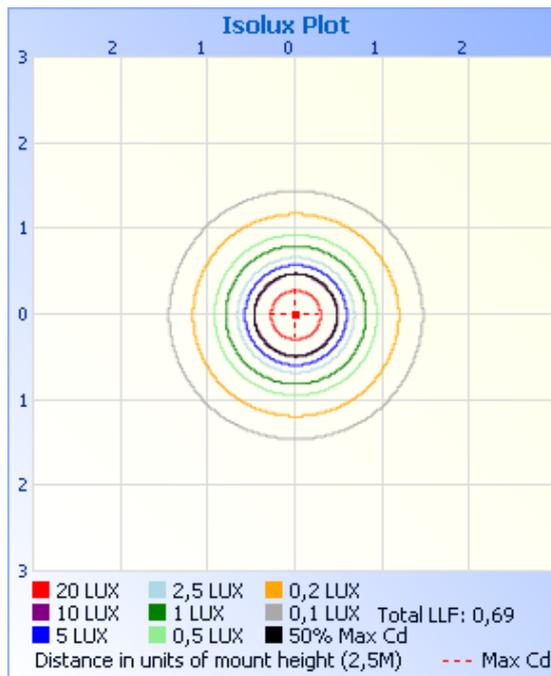


DN	A	B	C
50	149	127	113
80	172	150	136
100	195	173	159
125	219	197	183
150	245	223	209
200	295	273	259

9. PHOTOMETRIC REPORTS

SIGHTGLASS LED LUMINAIRE SL60-WW200

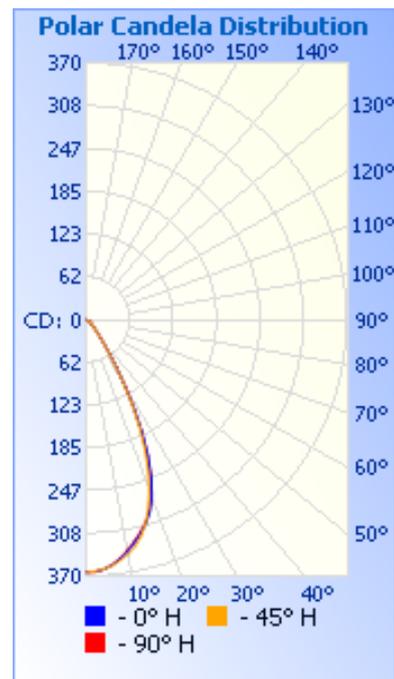
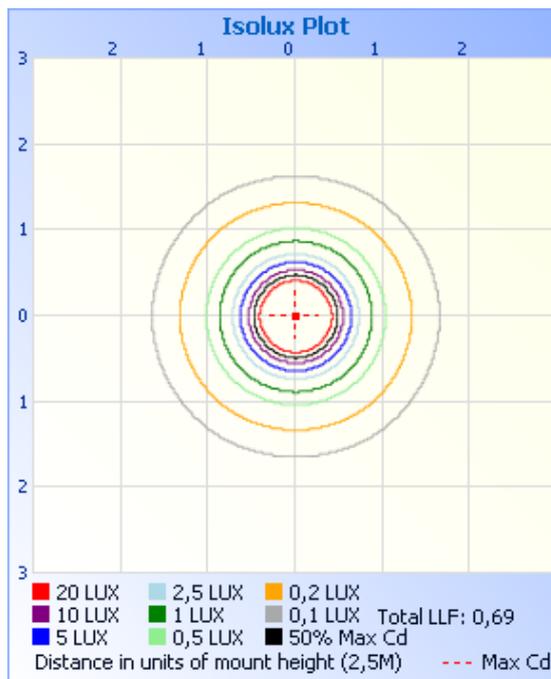
Lamp Color (CCT):	Warm White (3000 K)
Lamp Output:	1 lamp, rated Lumens/lamp: 211
Max Candela	242,8 at Horizontal: 90° , Vertical: 2°
Luminous Opening	Vertical Cylinder (Dia: 0,02M , H: 0,01M)
Photometry:	Type C
CIE Class:	Direct
Cutoff Class:	n/a
Nema Type:	5 x 5



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Reported data calculated from manufacturer's data file, based on IES recommended methods.

SIGHTGLASS LED LUMINAIRE SL60-WW300

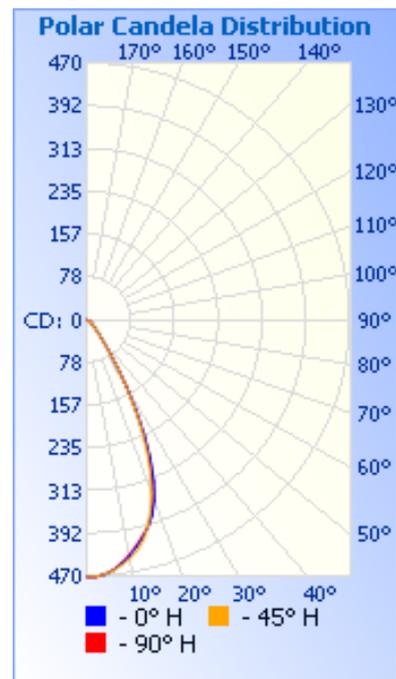
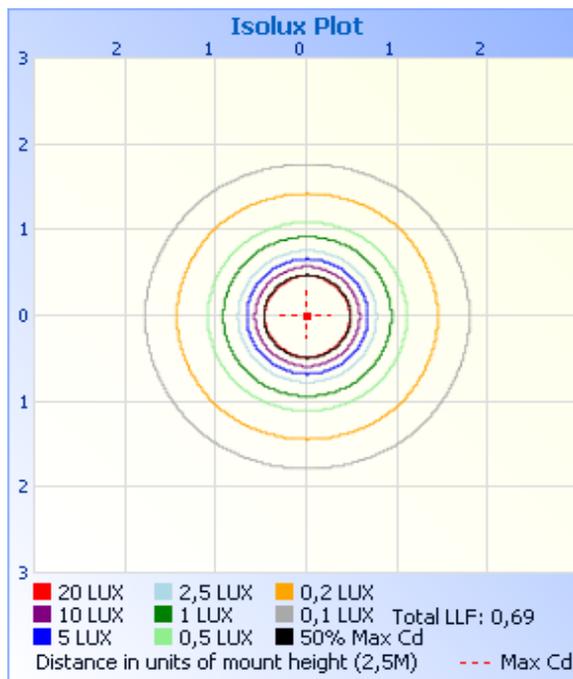
Lamp Color (CCT):	Warm White (3000 K)
Lamp Output:	1 lamp, rated Lumens/lamp: 315
Max Candela	362,4 at Horizontal: 90Â°, Vertical: 2Â°
Luminous Opening	Vertical Cylinder (Dia: 0,02M , H: 0,01M)
Photometry:	Type C
CIE Class:	Direct
Cutoff Class:	n/a
Nema Type:	5 x 5



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 Reported data calculated from manufacturer's data file, based on IES recommended methods.

SIGHTGLASS LED LUMINAIRE SL60-WW400

Lamp Color (CCT):	Warm White (3000 K)
Lamp Output:	1 lamp, rated Lumens/lamp: 408
Max Candela	469,4 at Horizontal: 90° , Vertical: 2°
Luminous Opening	Vertical Cylinder (Dia: 0,02M , H: 0,01M)
Photometry:	Type C
CIE Class:	Direct
Cutoff Class:	n/a
Nema Type:	5 x 5



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 Reported data calculated from manufacturer's data file, based on IES recommended methods.

IO. VISION ADVISORY – EYE SAFETY

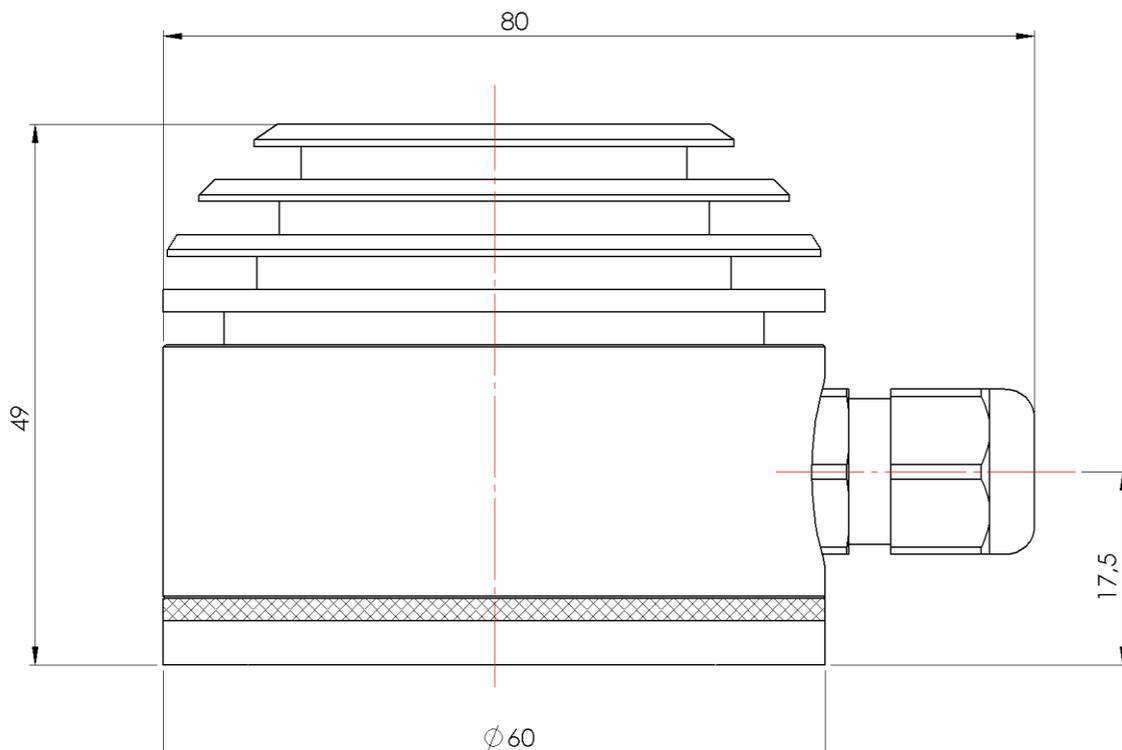
WARNING: Don't look directly at an exposed SL60 in operation. Eye injury can result.

The SL60 incorporated LED is classified as *Risk Group RG-2 (Moderate risk)* acc. to IEC 62471-2006 standard and the ANSI/IESNA RP-27 testing methodology. This means that '**it does not pose a hazard due to aversion response to bright light or thermal discomfort**'.

However, we recommend you to avoid even momentary direct exposure to the light beam of an operating SL60.

In case of maintenance, the possible risks can be minimized by using engineering controls (light-blocking screens/filters), or personal protective equipment (e.g. protective eyewear).

II. DIMENSIONS



12. TECHNICAL SPECIFICATIONS

GENERAL DATA & FEATURES	
Dimensions (LxWxH)	80 x 60 x 49 mm / (3,15 x 2.36 x 1,93 in)
Weight (depending on adapting flange)	690 - 910 gr
Luminous Flux	200 / 300 / 400 Lumen (depending on version)
Light beam emission angle ¹	50°
LED Correlated color temperature (CCT) ¹	3000K (Warm white)
Color Rendering Index (CRI) ¹	80+
Housing Materials ¹	Sandblasted stainless steel (AISI 304) Permanite sealing gaskets , Glass disc Polyamide/CR cable gland , NBR O-rings
Degree of protection	IP65 when correctly mounted
Cooling type	Convection cooling
Ambient temperature	-20 ... + 60 °C (-4 ... +140 °F)
Temperature of mounted surface	-20 ... +135 °C (-4 ... +275 °F)
Storage temperature	-20 ... +100 °C (-4 ... +212 °F)
Protective functions	Overheating protection (intensity decrement or deactivation) Incorrect polarity protection Overcurrent protection

ELECTRICAL DATA & CONNECTION CHARACTERISTICS	
Supply voltage (AC values at 50/60 Hz)	15..25 VAC or 12..35 VDC
Power consumption	2,4 / 3,6 / 5,3 W (depending on version)
Cable gland ¹	M12x1.5mm - Clamping range Ø3,5-7mm
Terminal block	2-pole single deck - 3,5 mm pitch
Terminal block materials	Tin-plated copper alloy , Galvanized steel PA - UL 94 V0
Clamping parts resistance	Electrolytic corrosion , Stress corrosion cracking Rusting
Clamp opening size	1,8 × 2,6 mm
Conductor cross section range	IEC rigid solid / flexible stranded: 1,5 mm ² max AWG: 16 - 30
Conductor stripping length	6 mm max / NOT soldered
Tightening torque	0,2 Nm

CE MARKING - COMPLIANCE WITH APPLICABLE STANDARDS		
In conformity with the following Directives & Regulations / Standards	Low Voltage Directive (LVD) 2014/35/EU	EN 60598-1: 2015 EN 60598-2-1: 1989
	Electromagnetic compatibility Directive (EMC) 2014/30/EU	EN 55015: 2013+A1: 2015 EN 61547: 2009 EN 61000-3-2: 2014 EN 61000-3-3: 2013
	Restriction of the use of certain hazardous substances (RoHS) 2011/65/EU, as amended	EN 50581: 2012

¹ Customization available upon request.

Specifications are subject to change without prior notice.



INDUSTRIAL ELECTRONICS

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