Lighting System

LEDSecure SOL

Edition 03/2021

D-A1-B-52226-EN-00

INSTALLATION- AND OPERATING INSTRUCTION

Product philosophy

Thank you for placing your trust in IGEMA and deciding in favour of one of our high-quality products.

For more than 100 years, measuring and control systems have been developed, produced and sold worldwide under the IGEMA brand name.

“Steam is our passion” and we offer you the entire programme for the safe and economic operation of your plants, especially in the steam and condensate sector.

Please read the installation and operating instructions carefully to ensure a safe and reliable operation.

In addition to the information on installation and operation, you will also find important information on maintenance, care, safety and value retention of your measuring and control system.

Table of Contents

Table of Contents (cont.)

1. Important safety instructions

KEEP THESE INSTALLATION AND OPERATING INSTRUCTIONS IN A SAFE PLACE!

Commissioning as well as maintenance and repair work may only be carried out by qualified persons in compliance with the installation instructions given in this operating manual. The correct installation, commissioning, maintenance and operation of the device presupposes that the person in charge is familiar with measurement and control systems and complies with the general installation and safety instructions. In addition, the correct and intended use of tools and the handling of safety devices must be ensured. Unqualified persons must not be assigned the above tasks!

IGEMA GmbH accepts no liability for damage to property or personal injury caused by unqualified persons or by failure to observe these installation and operating instructions. If no sufficiently qualified person can be found, IGEMA GmbH can be commissioned with the installation/maintenance.

1.1 Symbols used in these instructions

In the following installation and operating instructions, safety instructions are marked with the following symbols:

 Danger	This symbol with signal word refers to a potentially hazardous situation which could result in death or serious injuries if ignored.
 Warning	This symbol with signal word indicates a possibly dangerous situation in the hazardous area, which can lead to death or serious injuries.
 Caution electrical voltage	This symbol with signal word indicates live parts with an immediate danger of death from electric shock.
 Caution hot	This symbol with signal word indicates a potentially hazardous situation that can result in severe burns and scalds all over the body.

 Caution	This symbol and signal word refer to a potentially hazardous situation which could result in personal injury, property and environmental damage if ignored.
 Caution	This symbol and signal word refer to a potentially hazardous situation which could result in damage to the equipment if ignored.
 Info	This symbol indicates useful information and recommendations as well as measures that will prolong the value of your measuring and control system.

1.2 Intended use of the device

Use these installation and operating instructions, the identification on the name plate (see chap. 5) and the technical data sheet to check whether the device is suitable for the intended use/application. The device complies with the requirements of the European ATEX Directive 2014/34/EU.

The LEDSecure Slim - illuminating device is used for illumination of the sight glass of the devices of the direct level gauge product range (black-white).

1.3 Safety at work

Danger

Before installation or carrying out maintenance work on the device, safe access must be ensured and a secure working area with sufficient lighting must be defined and marked out. Always use lifting equipment for heavy loads!

Before starting any work, carefully check which liquids or gases are or have been in the pipeline. (flammable substances, irritating substances, substances hazardous to health) When opening or dismantling the device, residues of the medium can escape. Subsequent fumes are also possible in unpressurized and cold systems. Use designated PPE such as safety goggles and respiratory protection!

Special attention must be paid to the condition of the environment around the installation or maintenance site. Be aware of e.g.: potentially explosive atmospheres, lack of oxygen in tanks and pits, dangerous gases/liquids, extreme temperatures, hot surfaces, fire hazard (e.g. during welding) and moving machine and system components. Protect yourself from excessive noise by taking the required protective measures.

For all maintenance work or new installations, on new or existing boilers or vessels, it is imperative to check that the boiler or vessel has been depressurised and that the pressure has been safely reduced to atmospheric pressure. In principle, no system should be regarded as unpressurized even if indicated by pressure measuring devices such as pressure gauges or sensors. When releasing the pressure, make sure that no persons are in the release area. Carefully check whether you and/or other persons in the vicinity need PPE to protect yourself from external influences such as high and low temperatures, radiation, noise, danger to eyes, loose objects that can fall down or chemicals.

There is always a risk of injury when handling large and/or heavy equipment. Observe the load handling regulation as a minimum requirement for working with loads. Avoid handling the device with your own physical force, e.g. by lifting, pulling, carrying, pushing or supporting it, especially to prevent back injuries. Use lifting equipment to move heavy and bulky equipment in accordance with Article 1, Section 2 of the German Load Handling Regulation (LasthandhabV).

Always use PPE including safety goggles!

1.4 Safety instructions for this device

These installation and operating instructions are an integral part of the device and must be forwarded to the responsible departments "Goods inward, Transport, Installation, Commissioning and Maintenance". They must be kept in such a way that the technical staff have access to these documents at all times. If the device is passed on to a third party, these installation and operating instructions must also be included in the national language of the third party.

Avoid shocks and hard contact during transport, as this can lead to damage. During intermediate storage, the device must be kept dry and secured against damage.

When servicing the unit, make sure check for damages. There is a risk of cutting hands and arms!

When returning goods to IGEMA GmbH, the applicable safety and environmental laws according to GGVSEB [German ordinance on the national and international carriage of dangerous goods by road, rail, and inland waterways] must always be observed. If there are any risks to health or the environment due to residues or the device has a mechanical defect this must be indicated when returning the device and the necessary precautionary measures must be taken. If the returned goods are devices that have come into contact with or contain hazardous substances, a safety data sheet must be enclosed, and the goods must be clearly marked. In addition, the hazardous substance must be reported to the logistics service provider.

1.5 Exclusion of liability

IGEMA GmbH Measuring and control systems will assume no liability if the above regulations, instructions and safety precautions are not observed and followed. If they are not expressly listed in the installation and operating instructions, changes to an IGEMA device are carried out at the risk of the user.

2. Contents of packing

1 LEDSecure SOL illuminating device consisting of power supply unit and lighting module(s).

2 Installation and operating instructions

3. Device design

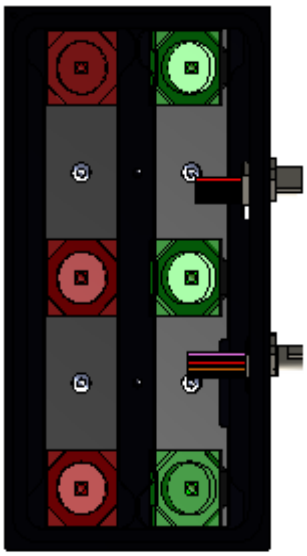
3.1 Design

The LEDSecure SOL consists of 5 components, a mains unit, the connection cable secondary side, the lighting module(s), the interconnecting cables and the dazzling boxes.

3.2 Versions

The mains unit:

- The standard mains unit (LEDSecure SOL mains unit) is provided on the primary side with a 3 metre long connection lead. Other lengths are available upon request. These are calculated in gradations of one metre each.
  The secondary-side connection is made using an M12 A-coded socket on the housing.



The connection cable secondary side (LEDSecure SOL connection cable secondary side) is available in a standard length of 3 metres. Other lengths up to a maximum of 15 metres are available upon request. These are calculated in gradations of one metre each.

The LEDSecure SOL g-r lighting modules are available in 2 versions:

- 3 LED lines (LEDSecure SOL g-r 6 luminaire)
- 4 LED lines (LEDSecure SOL g-r 8 luminaire)

The interconnecting cable (LEDSecure SOL interconnecting cable) is available in a standard length of 45 cm.

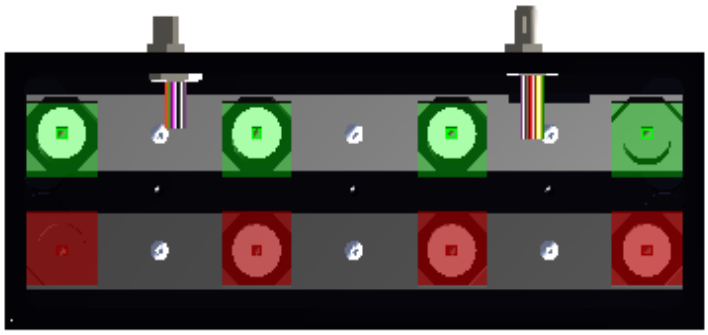
The dazzling boxes are available in several versions

- for the LEDSecure SOL 6 (3 sight openings one-part)
- for the LEDSecure SOL 8 (4 sight openings one-part)
- Special variants (stainless steel, two-part, only bracket + dazzling box front)

4. Area of application

Device groups A1T and A2T

- Bicolour level gauge type CD green-red
- Bicolour level gauge type BU green-red



5. Application and function

The LEDSecure SOL lighting equipment serves for generating the green and red-light phases that are necessary to enable the colour differentiation between liquid and gas on the red-green type bicolour level gauge.
Specially developed for this purpose, it is well suited to the thermal and physical requirements. The strong directional light of the IGEMA LED lighting is optimally focused on the display area of the fill level indicator. This achieves the maximum illumination of the steam and water space, which leads to a clear and unambiguous separation of the two phases on the visible side of the gauge.
IGEMA has continuously developed its light technology over the years – from conventional illuminants such as light bulbs and halogen lamps to extremely economically working LED lighting modules that only require a fraction of the power of traditional illuminants and have at the same time a considerably longer life.
The luminaire consists of 6 or 8 LED elements. The aluminium housing is protected from corrosion by an oxidic protective layer. A glass cover of temperature and media-resistant, thermally tempered borosilicate glass protects the LEDs.
With large sight lengths several LED luminaires are arranged vertically.
Each luminaire has a four-core supply line with separate actuation for red and green LEDs.
Up to five luminaires can be connected with each other via the interconnecting cable to loop through the supply voltage of the first luminaire. In this the various luminaire module can be mixed in any way. The first luminaire is connected with the connection cable as secondary with the mains unit.

It is supplied with power using a switched-mode mains unit with a voltage input range of 100-240VDC. The power supply must be protected with a 6A fuse in the customer's system. If this is not possible, instead of the standard mains unit (LEDSecure SOL mains unit) there are options such as the LEDSecure Sol switch box. This then contains the corresponding fuse. The intensity of the two colours is set separately. It has already been factory preset based on experience and tests. This ensures high efficiency and service life with optimum results. In particular cases subsequent adjustment of the intensity is possible on site by the IGEMA Customer Service.

6. Technical data

6.1 Technical data LEDSecure SOL g-r 6 luminaire

Type designation	LEDSecure SOL g-r 6
Electromagnetic compatibility	EN 61326-1
LED module output	6 W
Operating voltage (red / green)	12 VDC / 18 VDC
Protection type as per DIN EN 60529	IP67
Protection class	3
Housing material	Aluminium
Connection supply line	M12-Stecker A-coded
Ambient temperature	-10°C < T amb. < 70°C
Weight	0,6kg
Order number	40-11126

6.2 Technical data LEDSecure SOL g-r 8 luminaire

Type designation	LEDSecure SOL g-r 8
Electromagnetic compatibility	EN 61326-1
LED module output	6 W
Operating voltage (red / green)	12 VDC / 18 VDC
Protection type as per DIN EN 60529	IP67
Protection class	3
Housing material	Aluminium
Connection supply line	M12-Stecker A-coded
Ambient temperature	-10°C < T amb. < 70°C
Weight	0,8kg
Order number	40-11125

6.3 Technical data LEDSecure SOL power supply unit

Type designation	LEDSecure SOL power supply unit
Electromagnetic compatibility	EN 61326-1
Low voltage	EN 60730-1
Rated output voltage	100 - 240 V AC
max. input voltage range	90 - 265 V AC
Mains frequency	47 - 63 Hz
Input current @ 115 VAC	0,75 A
Input current @ 230 VAC	0,45 A

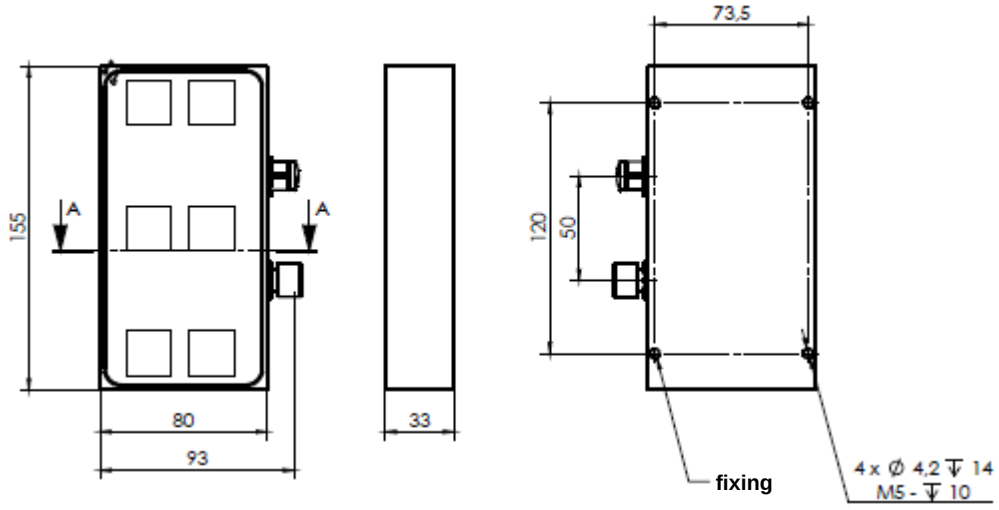
Rated output voltage	10-13 VDC / 15-18 V DC
Maximum number of LED luminaires	5
Rated output current per luminaire per colour	200 mA
Rated output per luminaire	6 W
Max. total output of all LEDs (@ 5 luminaires)	30 W

Insulation voltage I/O-O/P	4000 V AC
Insulation voltage I/O-FG	1500 V AC
Insulation voltage O/O-FG	500 V AC
Insulation resistance (@500 VDC, 25°C, 70% RH)	10^8 Ω

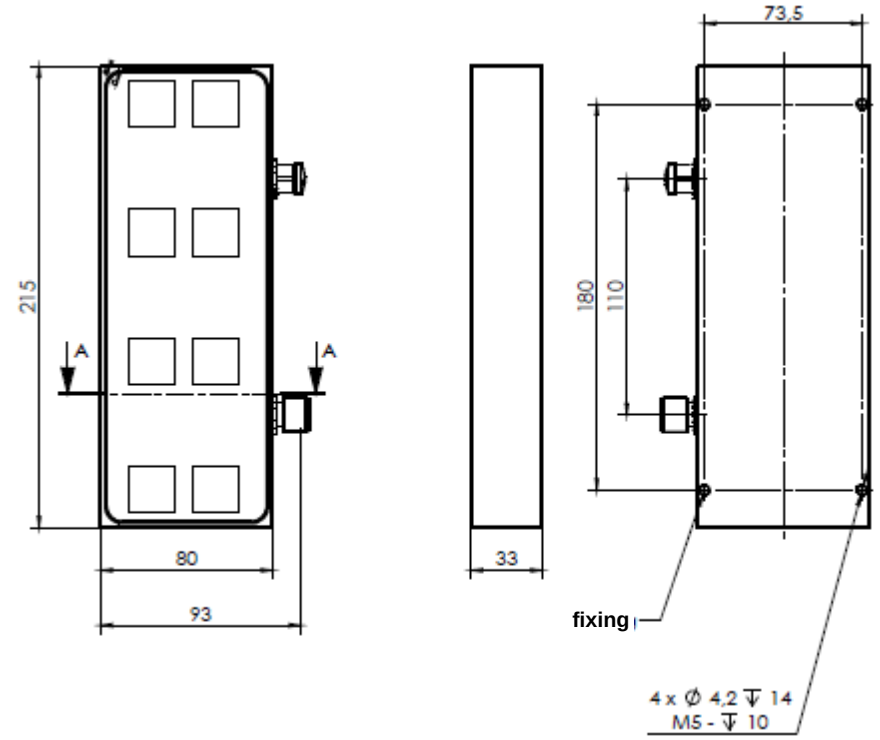
Ambient temperature	0°C < T amb. < 40°C
Protection class according to DIN EN 60529	IP66
Output overcurrent protection	1.6 (foldback to 0.8 A, self-resetting)
Output overvoltage protection	red 16 VDC, green 20 VDC (self-limiting)
Overload protection	150% (Foldback to 80%, self-resetting)
Overtemperature protection	@ 75°C housing (locking, mains reset necessary)
Ambient humidity	20 - 90% RH non-condensing
Dimensions	130 x 170 x 90mm
Connection cable primary	- Cable, 3-core with cable end sleeves - Standard length 3m
Connection secondary	M12 A-coded built-in socket
Order number	25-13000

Input voltage must be protected with a 6A fuse in the customer's system

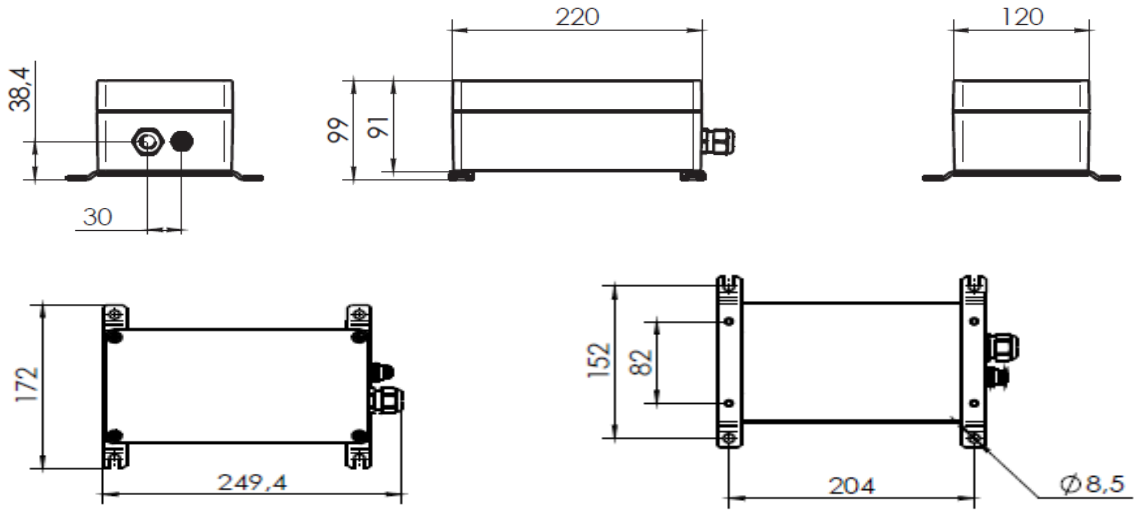
6.4 Dimensions LEDSecure SOL g-r 6 luminaire



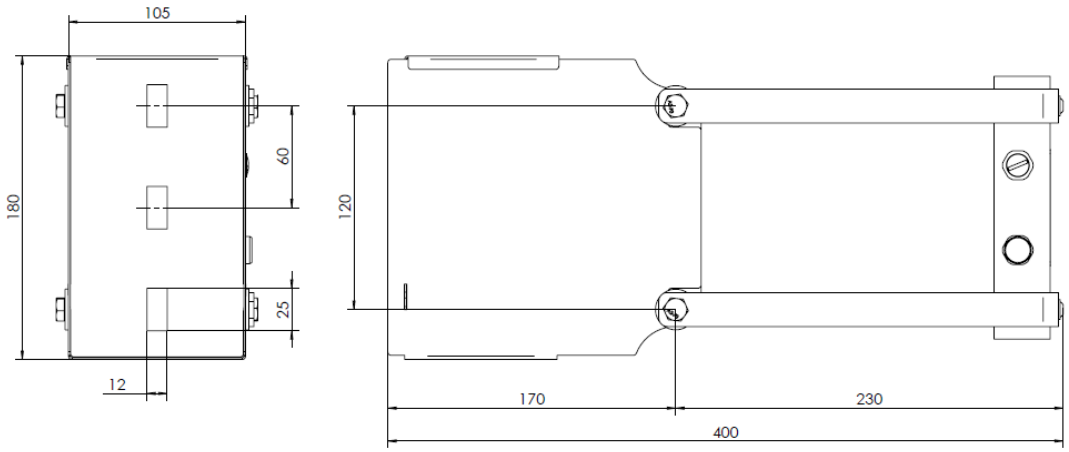
6.5 Dimensions LEDSecure SOL g-r 8 luminaire



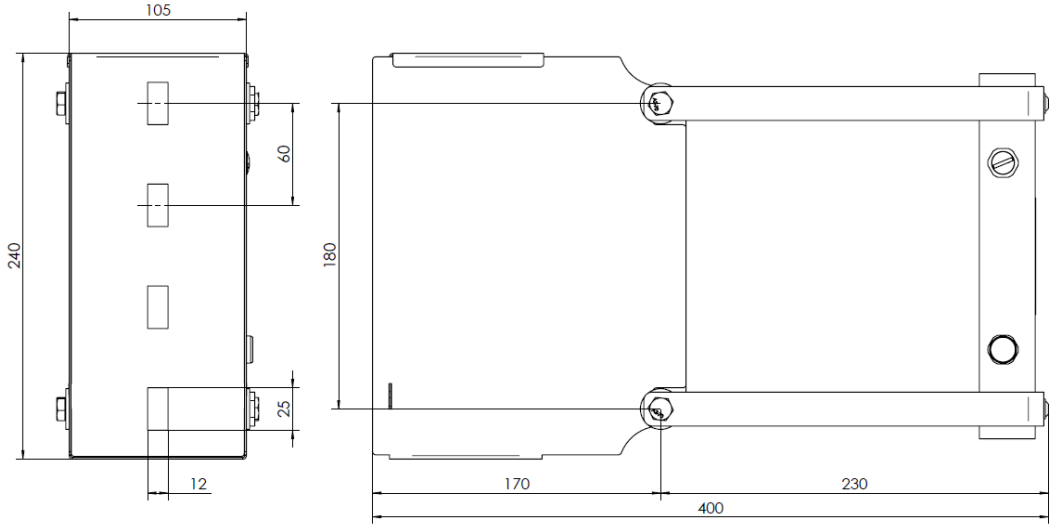
6.6 Dimensions LEDSecure SOL mains unit



6.7 Dimensions LEDSecure SOL 6 dazzling boxes



6.8 Dimensions LEDSecure SOL 8 dazzling boxes



6.9 Dimensions connection cable secondary LEDSecure SOL

The LEDSecure SOL connection cable secondary side (25-13015) is available in a standard length of 3 metres. Other lengths up to a maximum of 15 metres are available upon request. These are calculated in gradations of one metre each.

6.10 Dimensions LEDSecure SOL interconnecting cable

The LEDSecure SOL interconnecting cable (25-13013) between the lighting modules are 45 cm long.

7. Optional

- If individual elements are defective in an old SOL 8 or SOL 6 lighting system, there is also the option of replacing individual components by parts from the new LEDSecure SOL series.
- Optionally the main unit can be fitted into a switch box with upstream 2-pole main switch as well as a 2-pole line circuit breaker.

7.1 Spare parts for old lighting units

The SOL 6 (20-00150) or SOL 8 (20-00151) LED lighting units can be replaced by a new LEDSecure SOL g-r 6 (40-11126) (or LEDSecure SOL g-r 8 (40-11125)). In addition the LEDSecure SOL 6 (25-12772) dazzling box or LEDSecure SOL 8 (25-12774) dazzling box must be replaced. Alternatively two LEDSecure SOL (25-12553) fixing brackets can also be used for the dazzling boxes.

- **For this it is essential that these are actuated with a LEDSecure SOL (25-13000) mains unit. The use of any other mains unit than the one stated on a LEDSecure SOL g-r 6 or 8 leads to irreparable damage to the device.**
- The LEDSecure SOL (25-13015) secondary connection cable is needed for the connection from the mains unit to the first luminaire.
- When several old luminaires are replaced by the new LEDSecure SOL luminaires one interconnecting cable (25-13013) each must be provided between the luminaires.

- **One LEDSecure SOL mains unit can supply a maximum of five luminaires!**

The BU size 3 LED screen (40-04244) can be replaced by a new LEDSecure SOL 6 dazzling boxes (25-12737).

The BU size 4 LED screen (40-04245) can be replaced by a new LEDSecure SOL 8 dazzling boxes (25-12739).

The reinforced LED SOL 6/8 fixing bracket (40-04526) can be replaced by the SOL6 / SOL8 fixing bracket (25-12773).

- **To ensure that the lighting devices are hanging straight, these brackets must be replaced in pairs!**

7.2 Switch box

The clever solution for connecting the Igema LEDSecure SOL lighting equipment.
The switch box is of compact design 200mm long x 200 mm wide x 120 mm high. For safely disconnecting the complete lighting device the switch box is equipped with a 2-pole main switch. This enables the all-pole disconnection of the complete lighting device. The line protection is carried out via a 1-pole +N circuit breaker with a rated current of 6A. The switch box is professionally prewired and the equipment labelled. At the customer's only the supply line has to be connected to the input terminals. An A-coded M12 socket is mounted to the outside of the switch box. The first luminaire can be supplied via the LEDSecure SOL (25-13015) connection cable secondary side with a standard length of 3 metres. Other lengths up to 15 m in 1 m steps are possible according to customer requirements.

The switch box must only be connected and put into operation by qualified electricians. The general safety or construction regulations are to be observed.

7.2.1 Technical data LEDSecure SOL switch box

Type designation	LEDSecure SOL switch box
Protection type as per DIN EN 60529	IP 65
Dimensions	300 x 200 x150mm
Housing material	Stainless steel 1.4301, electropolished
Rated input voltage	100 – 240 V AC
Max. input voltage range	90 – 265V AC
Mains frequency	47 – 63Hz
Electric fuse	1-pole + N 6A tripping characteristic B
Main switch	2-pole switchable, padlockable in 0 position
Rated output voltage	10 – 13 V DC
Maximum number of LED luminaires	5
Max. total output power of all LEDs (@5 luminaires)	30 W
Connection primary	via input terminals
Connection secondary	via M12 A-coded built-in socket
Ambient temperature	0° C < T amb. < 40°C
Fixing	carried out via 4 openings in housing rear wall
Order number	25-13016

Optionally wall holders for mounting the housing can be included in the order.

8. Storage and Transport

The lighting device is to be stored in a dry place in the original packaging.

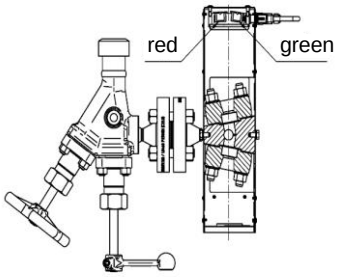
9. Assembly

The user is required to ensure that the parts provided and used by him meet the applicable local specifications and regulations.
Assembly, putting into operation and dismantling must be carried out by appropriately trained staff and in accordance with the locally applicable regulations. Lighting units are to be mounted on the holders provided on the corresponding gauge. Supply lines are to be laid protected mechanically and from temperature and UV.

9.1 Initial assembly

Danger

Respect the instructions of the VDE 0110 (Association for Electrical, Electronic & Information Technologies) and of the local network operators the electrical connection.



Observe the correct posture when mounting the illumination modules (see sketch ⇨).

9.1.1 LEDSecure Sol mains unit

The housing of the mains unit (25-13000) is to be mounted on a suitable place over the fixing brackets of the housing. The mains unit housing must not be opened. Otherwise the guarantee becomes void.
The primary-side connection of the mains unit is carried out via the connecting line pre-assembled on the mains unit.

Achtung

Input voltage must be protected with a 6A fuse in the customer's system.

The secondary-side connection is made using an M12 A-coded socket on the housing.
The first luminaire can now be supplied with power via the secondary-side connection cable.

10. Putting into operation

The LEDSecure SOL lighting equipment must not be put into operation until all devices have been fitted, all connections laid and the construction tested for correctness

11. Service life

The service life of the device depends on the operating conditions. In this connection the technical data (Chap. 5) are to be noted.

Caution

Continuous operation at the limits of the allowable conditions may affect the service life and reliability.

12. Maintenance and servicing

For safe use of the lighting equipment the checks/service tasks listed below must be carried out at regular intervals:

Please note:
The maintenance intervals are to be defined individually depending on the type of use (e.g. degree of contamination).

- Sight check of the housing, plug connectors and wiring for damage and soiling.
- Check that all fastenings are securely fixed.
- Only remove contamination with solvent-free cleaning agent
- All data plates must be present and legible.

13. Disposal

Comply with the national waste disposal regulations.

14. Faults

By using a replacement lighting module or exchanging it with another available lighting module it can be tested whether the module is at fault.
Idling voltage and short circuit current can be measured with the lead disconnected. This can also find a fault in the mains unit.
If both tests show that the lighting module and mains unit are OK, there is a fault in the lead.

This high-quality IGEMA product was designed, manufactured and tested with the application of the QM System guidelines in accordance with DIN EN ISO 9001:2015.
If the device supplied indicates transport damage or gives cause for complaint in spite of our final quality control please contact our SERVICE department on telephone *+49 2501 92424-0*.by return.

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