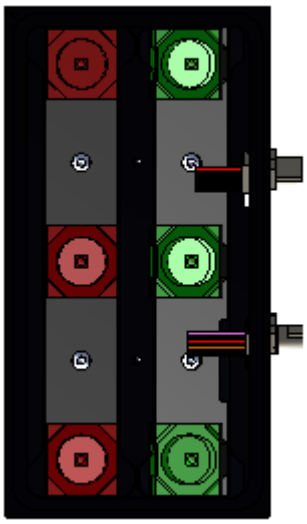
Installation and operating instructions



LEDSecure SOL Lighting System

D-A1-B-30539-En-00
Issued 10/2015

Table of Contents

Safety instructions

1. Risks and safety precautions

1.1 General safety instructions

1. Avoidance of risks to persons and property

- Only use the device supplied in accordance with the intended planning.
- Do not carry out extensions and modifications to the device without the express approval of IGEMA GmbH.
- Observe the general accident prevention regulations and system-specific safety instructions.
- Read and observe fitting and operating instructions.
- The device must only be fitted and put into operation by qualified trained persons.

2. Limitations of use

- The device must only be used in accordance with the details in these operating instructions or for the parameters agreed in the supply contract (see data plate) or the application.
- Approval for this device loses its validity if any changes have been made.
- The safety of the whole boiler system into which this device is used lies in the responsibility of the installer of the system.
- If this device is used for any purposes other than those described in this document, this may result in serious damage to the device. Non-compliance will invalidate the operating licence and all warranty claims against the manufacturer.

3. Avoidance of risks and damage

- Disseminate the installation and operating instructions to the departments responsible for “goods in, transport, assembly, commissioning and maintenance”.
- If this device is passed on to third parties these installation and operating instructions in the relevant language of the country must accompany it.
- Assembly work on the device should only be carried out by trained staff specially commissioned and only with the current disconnected and not in a potentially explosive atmosphere.
- Read and observe the installation and operating instructions carefully and keep them in a safe place.
- When transporting, avoid e.g. knocks and putting down heavily, this can lead to damage.
- For intermediate storage ensure that the storage location is suitable for the device.

- The storage location must be dry and the device secured against damage.
- This device must **not** be used in potentially explosive atmospheres.

4. Symbols

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

means that if they are not observed there is risk to health and / or significant damage to property may occur.

Danger

means that attention is particularly drawn to technical requirements.

Caution

1.2 Exclusion of liability

IGEMA GmbH Mess- und Regelsysteme will assume no liability if the above-mentioned regulations, instructions and safety precautions are not noted and followed.

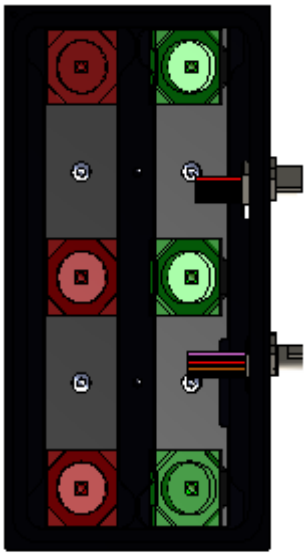
2. Device design

2.1 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.

2.2 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.

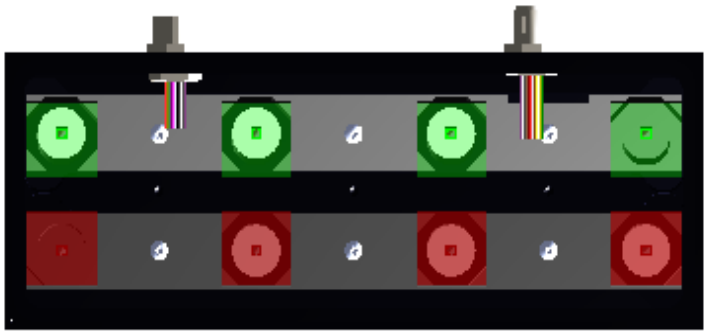
The dazzling boxes are available in several versions

- 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)

3. Area of application

Device groups A1T and A2T

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



4. 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 modules 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.

5. Technical data

5.1 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 plug A-coded
Ambient temperature	-10° C < Tamb. < 70 ° C
Weight	0.6kg
Order number	40-11126

5.2 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 plug A-coded
Ambient temperature	-10° C < Tamb. < 70 ° C
Weight	0.8kg
Order number	40-11125

5.3 Technical data .....LEDSecure SOL mains unit

Type designation	LEDSecure SOL mains unit
Electromagnetic compatibility	EN 61326-1
Low voltage	EN 60730-1
Rated output voltage	100 - 240 VAC
max. input voltage range	90 - 265 VAC
Mains frequency	47 - 63 Hz
Input current @ 115 VAC	0.75 A
Input current @ 230 VAC	0.45 A

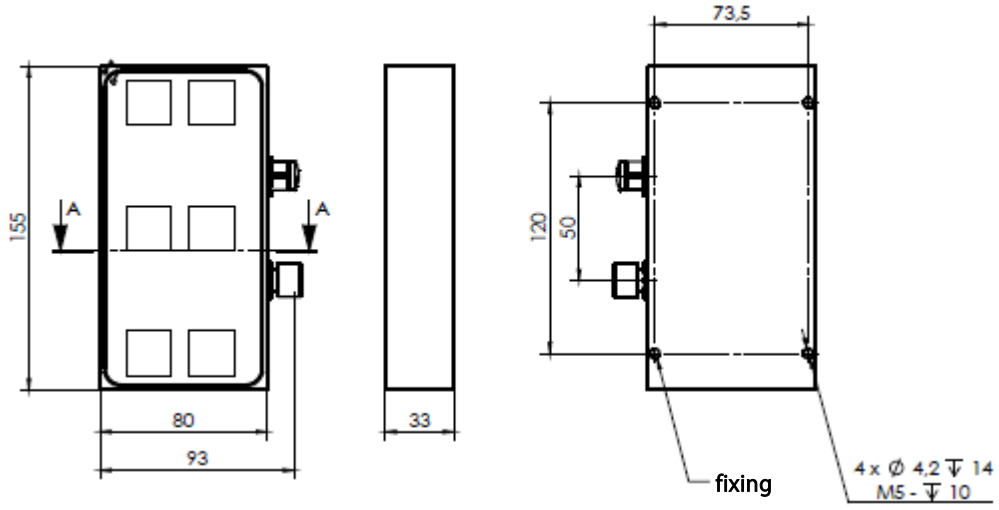
Rated output voltage	10-13 VDC / 15-18 VDC
Maximum number of LED luminaires	5
Rated output current per luminaire per colour	200 mA
Rated output per luminaire	6 W
Max. total output of all LEDs (@ 5 luminaires)	30 W

Insulation voltage I/O-O/P	4000 VAC
Insulation voltage I/O-FG	1500 VAC
Insulation voltage O/O-FG	500 VAC
Insulation resistance (@500 VDC, 25° C, 70% RH)	108 Ω

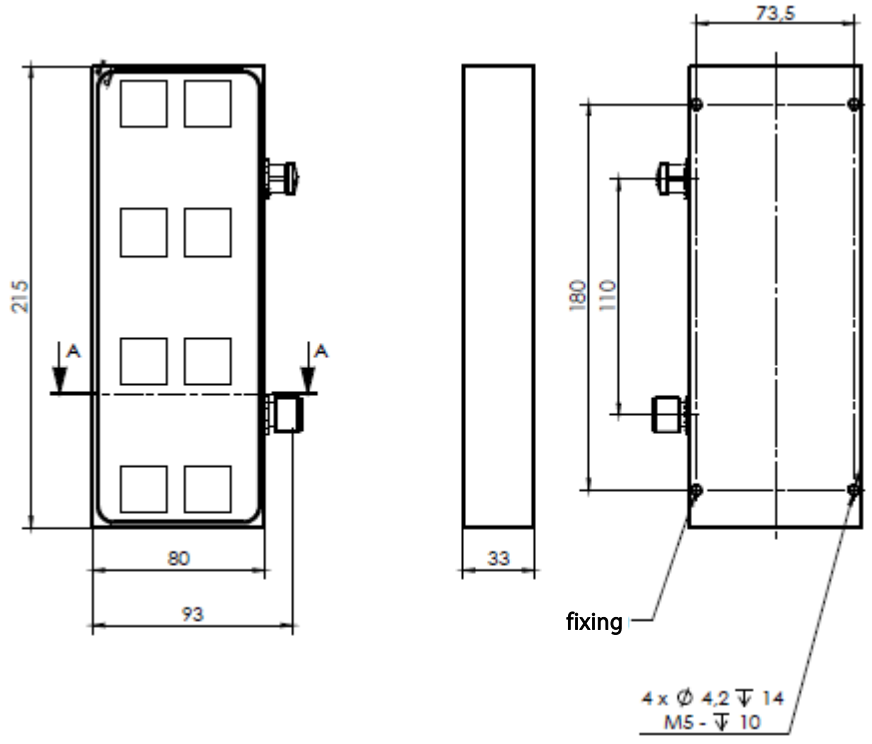
Ambient temperature	0° C < Tamb. < 40° C
Output overcurrent protection	1.6 (foldback to 0.8 A, self-resetting)
Output overvoltage protection	red 16 VDC, green 20 VDC (self-limiting)
Overload protection	150% (Foldback to 80%, self-resetting)
Overtemperature protection	@ 75° C housing (locking, mains reset 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.

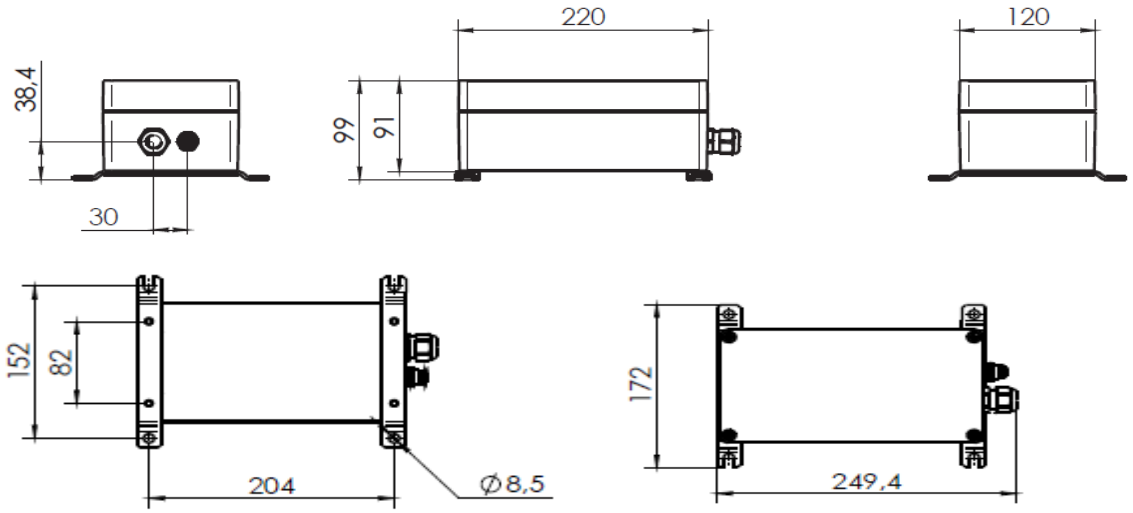
5.4 Dimensions ..... LEDSecure SOL g-r 6 luminaire



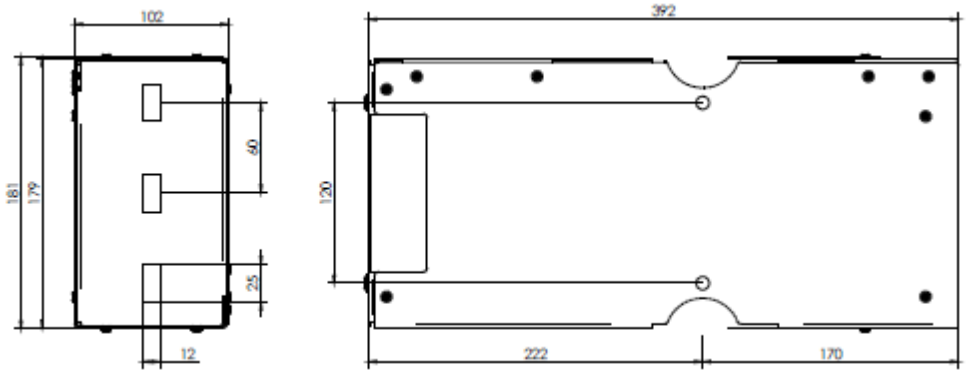
5.5 Dimensions ..... LEDSecure SOL g-r 8 luminaire



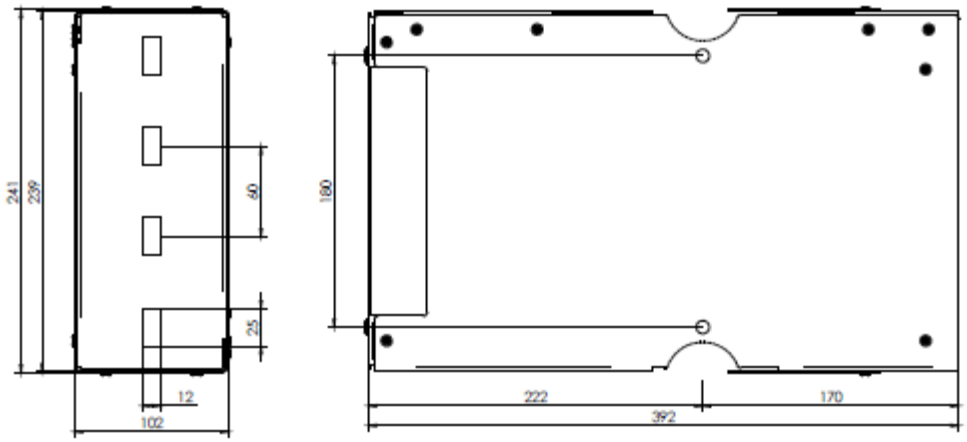
5.6 Dimensions .....LEDSecure SOL mains unit



5.7 Dimensions .....LEDSecure SOL 6 dazzling box



5.8 Dimensions .....LEDSecure SOL 8 dazzling box



5.9 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.

5.10 Dimensions ..... LEDSecure SOL interconnecting cable

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

6. 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.

6.1 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 box (25-12737).

The BU size 4 LED screen (40-04245) can be replaced by a new LEDSecure SOL 8 dazzling box (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!

6.2 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.

6.2.1 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
Operating voltage	230V 50Hz or 110-120V 60Hz
Electric fuse	1-pole + N 6A tripping characteristic B
Main switch	2-pole switchable, padlockable in 0 position
Connection primary	via input terminals

Connection secondary	via M12 A-coded built-in socket
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.

7. Storage and Transport

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

8. 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.

8.1 Initial assembly

Electrical connection complying with VDE 0110 or the country's normal regulations.

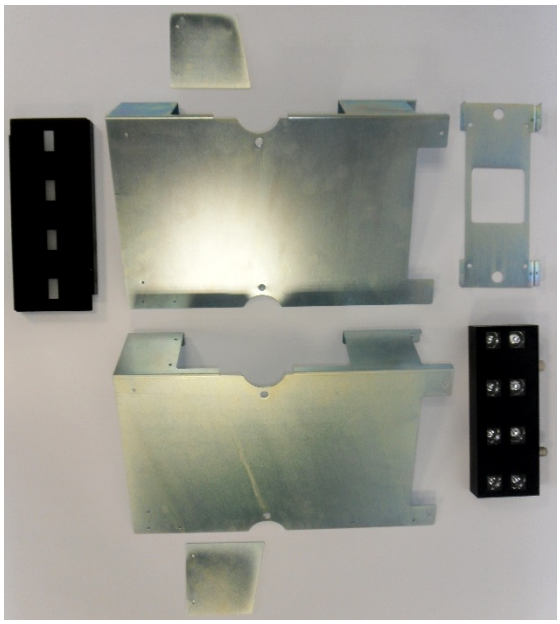
8.1.1 LEDSecure Sol mains unit

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.

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.

8.1.2 LEDSecure SOL lighting module



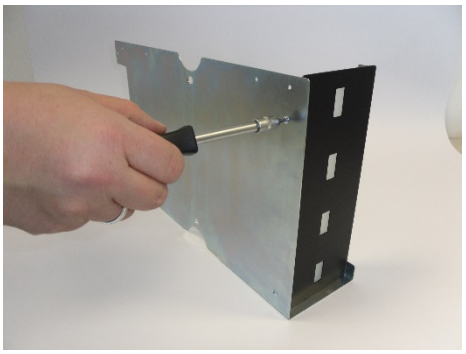
Overview of the individual parts:

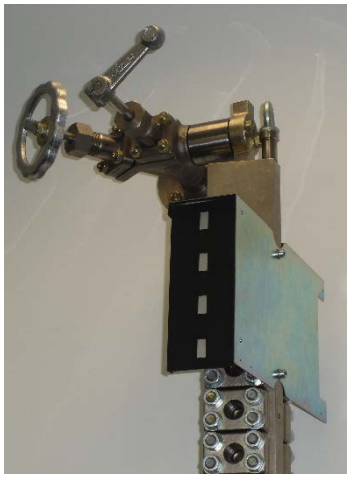
1. Matt screen
2. Body
3. Lamp holder
4. LEDSecure SOL g-r luminaire
5. Cover top/bottom

Not visible on the illustration twenty M3 x 6 TX10, four M5 x 8 TX10 and M8 x 12. Hexagon socket bolts with washers.

1st assembly step

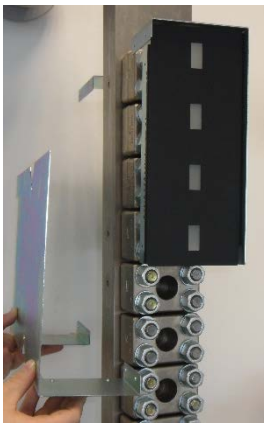
The matt screen is joined with one body part by means of two M3 x 6 TX10 screws.





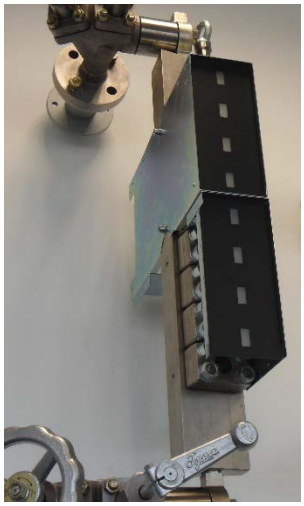
2nd assembly step

The body with the matt screen is mounted to the gauge body with two M8 x 12 hexagon head bolts and washers.



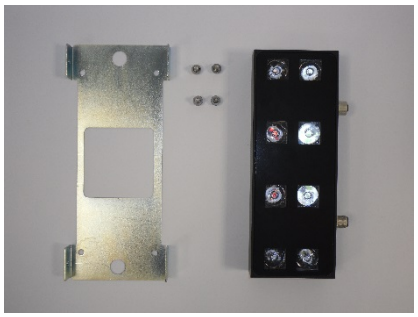
3rd assembly step

The second body part is now in turn mounted to the gauge body by means of two M8 x 12 hexagon head bolts and washers. Then follow the M3 x 6 TX10 screws to screw both body parts with each other. This must be carried out from both sides of the gauge body.



4th assembly step

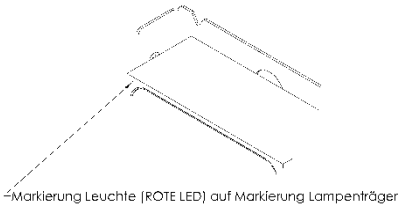
To attach further lighting modules assembly steps 1-3 are repeated.



5th assembly step

The LEDSecure SOL g-r luminaire is mounted to the lamp holder by means of four M5 x 8 TX10 screws.

The marking on the lamp body must correspond to the marking in the lamp holder.



Luminaire marking (RED LED) on lamp holder marking

6th assembly step

Luminaires are now mounted by means of four M3 x 6 TX10 screws to the rear of the body.

The luminaire plugs must be on the wide side of the gauge body.

7th assembly step

Now the covers top and bottom are screwed to the lighting unit by means of four M3 x 6 TX10 screws.

8.1.3 Wiring

Now the individual luminaires are connected with the LEDSecure SOL interconnecting cable. As well as the first lighting module connected with the secondary-side connection cable which is then also connected to the mains unit. The unused plugs on the luminaires must be locked via the blank cover.

If there are more than 5 lights a second mains unit is required.

9. 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.

10. 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.

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

11. 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.

12. Disposal

Comply with the national waste disposal regulations.

13. Fault

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.

14. Warranty

We accord a warranty period of 24 months on our products. A condition for that is appropriate treatment according to these installation and operating instructions. The warranty for wear and spare parts is restricted to material defects and construction faults.

This high-quality IGEMA product was designed, manufactured and tested with the application of the QM System guidelines in accordance with DIN EN ISO 9001:2000.

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 0241- 5687-0 by return.