ISO 9001:2015 / ATEX

# ESPW electro-sensitive protective equipment , series IGS/IGN/IGD-010-***(-OP)

**For conception, mounting, installation and working It is necessary to take into consideration the complete operating manual!**

## IGD-010-SIR/EFP/EVP/EWS-OP — Original short form data sheet — IGN-010-SIR/EFP/EVP/EWS-OP

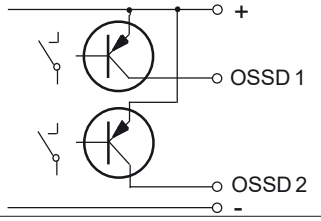
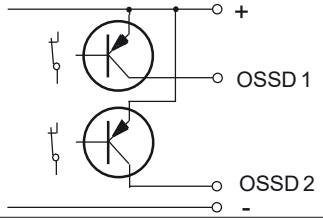
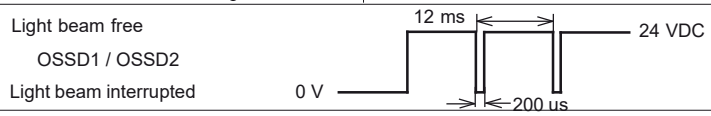
CE 1258 IECEx BVS 14.0108X

IECEx marking:
II 2(1)G Ex d [op is Ga] IIC T6 Gb
II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67

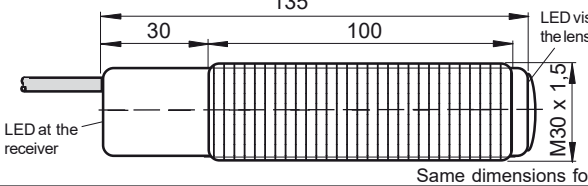
- ESPW type 4, at EN 61496-1
- Performance Level Ple, at EN 13849-1
- IGD: For use in Ex Zones (0), 1, 2, (20), 21, 22, optical radiation can operate into Ex Zones 0, 20
- IGN: For use in Ex Zones (1), 2, (21), 22, optical radiation can operate into Ex Zones 1, 21
- Optimal alignment by visualization by LED through the receiver optic
- With optional pollution indication output "VA" or with integrated restart interlock (WAS)

CE

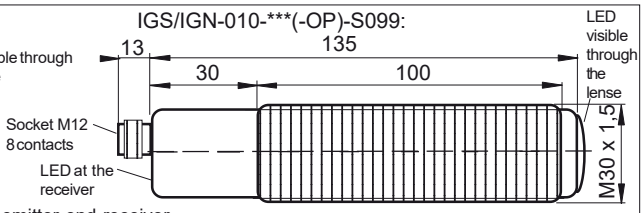
II 3(2)G Ex d [op is Gb] IIB T4 Gc
II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67

| Technical data / Types | IGS-010-SIR/E** | IGN-010-SIR/E**-OP | IGD-010-SIR/E**-OP |
|---|---|---|---|
| Designation | SIR= Emitter<br>E**= Receiver / EFP= Standard /EWS= Restart interlock / EVP= Pollution indication output | | |
| Type of Ex protection Gas, according to 2014/34/EU | NONE | II 3(2)G Ex d [op is Gb] IIB T4 Gc | II 2(1)G Ex d [op is Ga] IIC T6 Gb |
| Type of Ex protection Dust, according to 2014/34/EU | NONE | II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67 | II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67 |
| For use in Ex Zones | NONE | Zones (1), 2, (21), 22 | Zones (0),1, 2, (20), 21, 22 |
| Type of ESPW | Type 4, according to EN 61496-1 | | |
| Performance Level (PL) | PL e, according to EN 13849-1 | | |
| Safety Category | 4, according to EN 13849-1 | | |
| Safety Integrity Level (SIL) | SIL 3, according to EN 61508 | | |
| Mean probability of a dangerous failure per hour PFHd | 2.47 x $10^{-8}$, according to 13849-1 (without PELV power supply) | | |
| Range | 0.1m up to 10m | | |
| Light source | Infrared 870nm | | |
| Maximum optical radiant power | Not limited | <=5mW/mm² | <=5mW/mm² |
| Maximum optical radiant intensity | Not limited | < 35mW | < 15mW |
| Minimum detectable object size | 20mm | | |
| Aperture angle, receiving angle | maximum 4° | | |
| Response time | 25ms (Switch off time) | | |
| Power up delay time | 300ms | | |
| Supply voltage | 24 VDC +-10% (Power supply type PELV according to EN 60204, item 6.4.2) | | |
| Current consumption | Emitter: 55mA / Receiver: 50mA | | |
| Max. power dissipation | Emitter: 1.5W / Receiver: 1.4W | | |
| Safety outputs OSSDs | 2x PNP semiconductor, short-circuit protected, cross-circuit monitored | | |
| OSSDs, maximum switching current | 70mA | | |
| OSSDs, maximum load capacity / inductance | 470nF / 2H | | |
| Permissible line resistance between device and load | 10R | | |
| Pollution indication output "VA", optional | 1x PNP, max. 100mA, short-circuit protected | | |
| Input release restart interlock *WAS", optional | PNP compatible | | |
| Housing | M30, brass, nickel plated | | |
| Enclosure rating, at EN 60529 | IP65 | IP67 | |
| Ambient operating temperature range Tamb | 0°C up tp +50°C (S262: +90°C) | | |
| Storage temperature range | -25°C ... +70°C | | |
| Relative Humidity (noncondensing) | 15% ... 80% | | |
| Weight | 1.9kg | | |
| Connection cable | TPU insulation, AWM 20236, 2/4/5+PE x 0.5mm², halogen free, shielded, leads numbering marked, oil resistant cable for trailing, length: 10m | | |
| Socket, types IGS/IGN-010-***(-OP)-S099 | Socket M12, Lumberg, type RSF8, 8 contacts | | |
| Accessories | 4 nuts M30 or optional 2 clamps | | |
| Accessories included, only IGN-010-***-OP-S099 | - 2x Safety lock device, mount at the cable connection, for locking the connection<br>- 2x Warning plate "Do not open/close when supply voltage connected", self-sealing, for gluing on the cable connector.<br>- 2x Protection cap for the sensor socket. | | |
| Accessories included, only IGS/IGN-010-***-OP-S099 | Single ended cordset, Lumberg types RKTS 8-299/xx or RKWTH 8-299/xx | | |
| Options | -Cable length: Up to 100m, on request<br>-IGS/IGN/IGD-010-**EWS**(-OP) : With restart interlock (WAs)<br>-IGS/IGN/IGD-010-**EVP**(-OP): With pollution indication output (VA)<br>-IGS/IGN-010-***(-OP)-**S099**: Socket M12: Lumberg RSF8, 8 contacts<br>-IGS/IGN/IGD-**030**-***(-OP): Range 30m, ESPW type 2<br>-IGS-010-SIR/EFP(-OP)-**S262**: Temperature range: 0°C up to +90°C | | |
| LED indication | Light beam interrupted<br>LED's shows red | Light beam free<br>LED's shows yellow or green | |
| Function OSSDs |  |  | |
| Output signal form |  | | |
| Alignment and controlling by LED display | LED RED: Light beam interrupted or light barrier very bad aligned<br>LED YELLOW: Lenses polluted or light barrier badly aligned<br>LED GREEN: Light beam free and light barrier well aligned<br>LED RED flushing: Disturbance | | |

Dimensions IGS/IGN/IGD-010-***(-OP):




IGS/IGN-010-***(-OP)-S099:




Same dimensions for emitter end receiver

| Assignment: | IGS/IGN/IGD-010-SIR: | IGS/IGN/IGD-010-EFP: | IGS/IGN/IGD-010-EVP: | IGS/IGN/IGD-010-EWS: |
|---|---|---|---|---|
| +24VDC | 1 | 1 | 1 | 1 |
| 0V | 2 | 2 | 2 | 2 |
| OSSD 1 | -- | 3 | 3 | 3 |
| OSSD 2 | -- | 4 | 4 | 4 |
| Input release restart interlock "WAS" | -- | -- | -- | 5 |
| Pollution indication output "VA" | -- | -- | 5 | -- |
| PE | yellow-green | yellow-green | yellow-green | yellow-green |
| Cable shield | white | white | white | white |

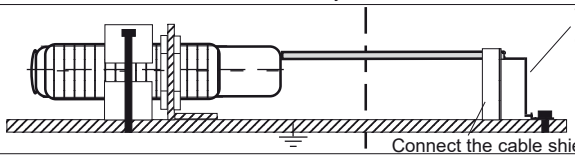
Assignment contacts IGS/IGN-010-SIR(-OP)-S099:

| | | | | |
|---|---|---|---|---|
| 1 white | +24VDC | 5 grey | NC, connect to 0V | |
| 2 brown | 0V | 6 pink | NC, connect to 0V | |
| 3 green | NC, connect to 0V | 7 blue | Protection earth PE | |
| 4 yellow | NC, connect to 0V | 8 red | NC, connect to 0V | |

Assignment contacts IGS/IGN-010-EFP/EVP/EWS(-OP)-S099:

| | | | |
|---|---|---|---|
| 1 white | +24VDC | 5 grey | VA-output, optional |
| 2 brown | 0V | 6 pink | Input release interlock, optional |
| 3 green | OSSD 1 | 7 blue | Protection Earth PE |
| 4 yellow | OSSD 2 | 8 red | NC, connect to 0V |

Equipotential Bonding for Ex Devices:



The end of the cable must be connected outside the hazardous locations.
Reliable, noncorrosive holding of the protection earth connection.

Connect the cable shield at PE in a wide area

## Short form of the operating manual. It is necessary to take into consideration the complete operating manual!

**Correct use**

The safety light barrier Gardix is a non-separating protective device at machinery directive 2006/42/EC, appendix IV and a electro-sensitive protective equipment ESPW, at EN 61496. With 2 or 3 safety light barriers a protective field can be built. The safety light barriers must be installed such that the hazardous area can only be reached through the protective field. It must not be possible to start the machinery/system as long as personnel are within the hazardous area. Both OSSD are only switched ON, when the light beam is not interrupted. The certificated safety light barriers ESPW are composed of an emitter and a receiver device only of the same type. The types must not be mixed, f.e. IG*-010-S** with IG*-030-E**. The safety light barriers ESPW must only be operated with post-switched emergency-stop devices or programmable safety devices.

The single channel safety light barriers ESPW Gardix, type 4 at EN 61496, can only be used as access protection to a hazardous area. All relevant standards and directives for the complete system or machinery, for performance level Ple, category 4 at EN ISO 13849-1, must be observed. The applicant is responsible to realize a restart interlock at the machinery if requisite. This can be realized with a Gardix safety light barrier with integrated restart interlock (WAS) or with an external equipment.

All warranty claims against Matrix Elektronik AG are forfeited in the case of any other use, or alterations being made to the system – even as part of their mounting or installation.

**Installation prescriptions for Ex hazardous locations**

General prescriptions for all Ex devices

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The maximum input voltage Um=30VDC must not be exceeded. The local equipotential bonding have to be done. The protective earth (PE) terminal is solid connected with the housing. The cable have to be protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use certificated Ex housings. All cable terminals must be connected outside hazardous locations. Use only original manufactured fibre optics and additional optical lenses, other additional optical lenses are not allowed in hazardous locations.

Types IGD-010-***-OP: Applicable in Ex zones 1, 2, 21, 22. The limited optical radiation can operate into hazardous locations 0 or 20 through a certificated viewing glass.

Types IGN-010-***-OP: Only applicable in Ex zones 2, 22. The limited optical radiation can operate into hazardous locations 1 or 21 through a certificated viewing glass.

Types IGN-010-***-OP-S099: Only applicable in Ex zones 2, 22. The limited optical radiation can operate into hazardous locations 1 or 21 through a certificated viewing glass. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 8-299/xx (Straight type) or RKWTH 8-299/xx (Right angle type) are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the socket protection cap must be fitted, when the connection cable is not connected.

**General mounting prescriptions:**

Because the safety light barriers have a small optical beam angle, they must be mounted solid and free from vibrations. Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables.

**Power up procedure**

At power up the emitter choose one of different variable frequency pattern. The emitter samples the frequency pattern and works only with that pattern. If only the supply voltage of the emitter will be disconnected and restarted the emitter changes the frequency pattern, and the receiver can not recognize the changed frequency and can not switch ON, or switches periodically OFF. The power supply must always connected to the emitter and the receiver simultaneous.

**Function**

If the light beam is free, both OSSDs are switched ON. If the light beam is interrupted both OSSDs are switched OFF.

**Restart interlock (WAS), only types IG*-010-EWS(-OP)**

At devices with restart interlock WAS, the safety light barrier can only be restarted by activating the RELEASE INTERLOCK WAS input. The input RELEASE INTERLOCK WAS must be wired over an contact NC at +24VDC. The light barrier will be restarted be opening and reclosing this contact. If the indication LEDs flushing fast, the light barrier is locked and both OSSDs are switched OFF.

**Optional pollution indication output VA,only types IG*-010-EVP(-OP)**

The optional pollution indication output VA is activated on polluted lenses or bad alignement. This function gives the possibility to a fast reaction at polluted lenses.

The pollution indication output VA is not combinable with the integrated restart interlock function WAS. PNP type, maximum 100mA.

**Alignment of the Light Barrier:**

The three color indication in the receiver optic allows an optimal alignment.
1. The emitter must be aligned this way, that the emitter lens is fully illuminated (By watching from the receiver at the emitter).
2. The receiver should be moved, until the LED (from the receiver) shows "green". Search the middle of the green range.

**Maintenance:**

No special maintenance is required. If the lenses becomes dirty, they should be cleaned with a non-aggressive solvents. Equipment must only be repaired by the manufacturer.

**General safety instructions**

Only the complete operating manual provide the machine manufacturer's or machine operator's technical personnel instructions on the safe mounting, configuration, electrical installation, commissioning, and on the operation and maintenance of the Gardix safety light barrier. Please read the operating instructions carefully. Series IGN-010-***-OP-S099: "WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES. DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS". The mounting of the sensor in dusty locations without fixed cordset or protection cap results in a high ignition risk. When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations.

Harmonized standards used:

EN 61496-1:2009-03, CLC/TS 61496-2:2008-02; EN 13849-1:2008, EN 61508-3:2010, EN 61326-3:2008, EN 60204-1:2005, IEC/EN 60079-0:2012 + A11:2013, IEC/EN 60079-1:2007, EN 60079-15:2010, IEC/EN 60079-28:2007, IEC/EN 60079-31:2010, EN 60529:2014, EN 60950-1:2006, EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4, ATEX directive: 2014/34/EU, Machinery directive: 2006/42/EC, EMC directive: 2014/30/EU, RoHS directive: 2011/65/EU.

**General Notes, disposal:**

We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

**EU-declaration of conformity, short form**

ESPW, type 4, at EN 61496-1. Declaration by manufacturer at machinery directive 2006/42/EC.

IECEx certification, types IGD: Ex d [op is Ga] IIC T6 Gb, Ex tb [op is Da] IIIB T100°C Db IP67. Certification No. IECEx BVS 14.0108X.

ATEX certification, types IGD: II 2(1)G Ex d [op is Ga] IIC T6 Gb, II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67. Certification No. BVS 10 ATEX E 130 X, DEKRA EXAM GmbH, Zertifizierungsstelle, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, Kennnummer: 0158.

ATEX certification, types IGN: II 3(2)G Ex d [op is Gb] IIB T4 Gc, II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67. ATEX declaration by manufacturer in accordance to 2014/34/EU. ATEX certification of quality type production of Ex devices in accordance to the directive 2014/34/EU, CE 1258, Eurofins. Certification No: SEV 21 ATEX 4580. The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety System ISO 9001:2015 with the ATEX module "Production", declares:

Pablo Ledergerber, Matrix Elektronik AG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