

**ESPW electro-sensitive protective equipment , series IGS/IGN/IGD-001-LWL(-OP)-S\*\*\***  
 For conception, mounting, installation and working It is necessary to take into consideration

**the complete operating manual!**

**IGD-001-LWL-OP**



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 Pld, at EN 13849-1
- Only for use with special fibre optics, also for high temperature areas
- 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 at the rear side of the light barrier
- With optional pollution indication output "VA" or with integrated restart interlock (WAS)

**IGN-001-LWL-OP**



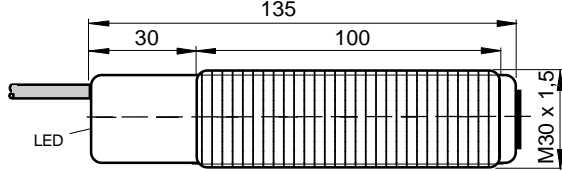
II 3(2)G Ex d [op is Gb] IIB T4 Gc

II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67

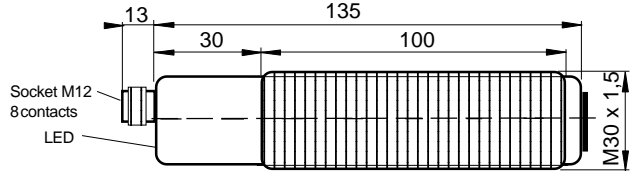
Technical data	Types	IGS-001-LWL	IGN-001-LWL-OP	IGD-001-LWL-OP
Designation		LWL= Only for use with fibre optics series IG*001-LWL(-OP)-S277 = With restart interlock / *-S278 = With pollution indication output		
Type of Ex protection Gas, at 94/9/EC		NONE	II 3(2)G Ex d [op is Gb] IIB T4 Gc	II 2(1)G Ex d [op is Ga] IIC T6 Gb
Type of Ex protection Dust, at 94/9/EC		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 using in Ex Zones		NONE	Zones (1), 2, (21), 22	Zones (0), 1, 2, (20), 21, 22
Type of ESPW		Type 4, at EN 61496-1		
Performance Level (PL)		PL d, in accordance with EN 13849-1		
Safety Category		4, in accordance with EN 13849-1		
Safety Integrity Level (SIL)		SIL 3, in accordance with EN 61508		
Mean probability of a dangerous failure per hour PFHd		2.47 x 10 <sup>-8</sup> , according to 13849-1 (without PELV power supply)		
Range		5cm up to 1m, only with fibre optics MSM/VAM-****-02/05-L-GR(-OP1/-OP2)-S279/S283		
Light source		Infrared 870nm		
Maximum optical radiant power		Not limited	<=5mW/mm <sup>2</sup>	<=5mW/mm <sup>2</sup>
Maximum optical radiant intensity		Not limited	< 35mW	< 15mW
Minimum detectable object size		12mm, only with fibre optics MSM/VAM-****-05-L-GR(-OP1/-OP2)-S279		
Aperture angle, receiving angle		maximum 4°, only with fibre optics MSM/VAM-****-05-L-GR(-OP1/-OP2)-S279		
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		80mA		
Max. power dissipation		2.2W		
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, according to EN 60529		IP65	IP67	
Ambient operating temperature range Tamb		0°C up tp +50°C (Fibre optic: 0°C up to +120°C)		
Storage temperature range		-25°C ... +70°C		
Relative Humidity (noncondensing)		15% ... 80%		
Weight		1.1kg		
Connection cable		TPU insulation, AWM 20236, 4/5+PE x 0.5mm <sup>2</sup> , halogen free, shielded, leads numbering marked, oil resistant cable for trailing, length: 10m		
Socket, types IGS/IGN-001-LWL(-OP)-S099/S280/S281		Socket M12, Lumberg, type RSF8, 8 contacts		
Accessories, included		- 2 nuts M30 or optional 1 clamp		
Accessories not included, but needed		- Fibre optic MSM/VAM-****-05-L-GR(-OP1/-OP2)-S279, lenght: 0.5m, 1m or 2m - Fibre optic MSM/VAM-****-02-L-GR(-OP1/-OP2)-S283, lenght: 0.1m, 0.5m, 1m or 2m		
Accessories included, only IGN-001-LWL-OP-S099/-S280/S281		- 1x Safety lock device, mount at the cable connection, for locking the connection - 1x Warning plate "Do not open/close when supply voltage connected", self-sealing, for gluing on the cable connector. - 1x Protection cap for the sensor socket.		
Accessories included, only IGS/IGN-001-LWL-OP-S099		- Single ended cordset, Lumberg types RKTS 8-299/xx or RKWTH 8-299/xx		
Options		- Cable length: Up to 100m, on request - IGS/IGN-001-LWL(-OP)-S099: Socket M12: Lumberg RSF8, 8 contacts - IGS/IGN/IGD-001-LWL(-OP)-S277: With restart interlock (WAS) - IGS/IGN/IGD-001-LWL(-OP)-S278: With pollution indication output (VA) - IGS/IGN-001-LWL(-OP)-S280: With restart interlock (WAS) and socket M12 - IGS/IGN-001-LWL(-OP)-S281: With pollution indication output (VA), socket M12		
LED indication				
Function OSSDs				
Output signal form				
Alignment and controlling by LED display		LED RED: Light beam interrupted or light barrier very bad aligned LED YELLOW: Lenses polluted or light barrier badly aligned LED GREEN: Light beam free and light barrier well aligned LED RED flashing: Disturbance		

IGD-010-LWL-OP-IECEX\_e2/2016-01-11/HB

Dimensions IGS/IGN/IGD-001-LWL(-OP)-(-S277/S278):



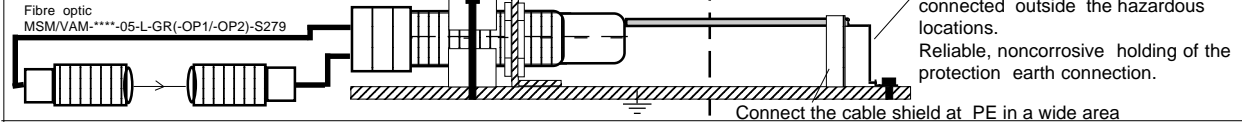
Dimensions IGS/IGN-001-LWL(-OP)-S099(-280/S281):



Assignment:	IGS/IGN/IGD-001-LWL:	IGS/IGN/IGD-001-LWL-S278:	IGS/IGN/IGD-001-LWL-S277:
+24VDC	1	1	1
0V	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
Cable shield	white	white	white

Assignment contacts IG*-001-LWL(-OP)-S099:	Assignment contacts IG*-001-LWL(-OP)-S280:	Assignment contacts IG*-001-LWL(-OP)-S281:
1: white +24VDC	1: white +24VDC	1: white +24VDC
2: brown 0V	2: brown 0V	2: brown 0V
3: green OSSD 1	3: green OSSD 1	3: green OSSD 1
4: yellow OSSD 2	4: yellow OSSD 2	4: yellow OSSD 2
5: grey NC, connect to 0V	5: grey NC, connect to 0V	5: grey VA-output, optional
6: pink NC, connect to 0V	6: pink Input release interlock	6: pink NC, connect to 0V
7: blue Protection Earth PE	7: blue Protection Earth PE	7: blue Protection Earth PE
8: red NC, connect to 0V	8: red NC, connect to 0V	8: red NC, connect to 0V

**Equipotential Bonding for Ex Devices:**



**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 an electro-sensitive protective equipment ESPW, at EN 61496. The safety light barrier series IG\*-001-LWL(-OP)-(-S277/S278/S280/S281) must only be used with connected fibre optics series MSM or VAM-\*\*\*\*-05-L-GR(-OP1/-OP2)-S279, length: 0.5m, 1m or 2m or MSM or VAM-\*\*\*\*-02-L-GR(-OP1/-OP2)-S283, length: 0.2m, 0.5m, 1m or 2m.. 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 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 PLd, 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  $U_m=30VDC$  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-001-LWL-OP-S277/S278: 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-001-LWL-OP-S277/S278: 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-001-LWL-OP-S99/280/S281: 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.

**Working frequencies**

At power up the emitter part choose one of different variable frequency pattern. The receiver part samples the frequency pattern and works only with that pattern.

**Function**

If the light beam between the fibre optic emitter and receiver part is free, both OSSDs are switched ON. If the light beam is interrupted both OSSDs are switched OFF.

**Restart interlock (WAS), only types IG\*-001-LWL(-OP)-S277/S280**

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 by 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\*-001-LWL(-OP)-S278/S281**

The optional pollution indication output VA is activated on polluted lenses of the fibre optic or bad alignment. 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 at the rearside of the controlling unit allows an optimal alignment.

1. The light beam of the fibre optic emitter part must hit the receiver fibre optic.
2. The fibre optic receiver part should be moved, until the LED 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-001-LWL-OP-S099/S280/S281: "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: 94/9/EC, Machinery directive: 2006/42/EC, EMC directive: 2004/108/EC, 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.

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

ESPW, type 4, at EN 61496-1. Declaration by manufacturer according to machinery directive 2006/42/EC.  
IECEx certification, types ILD: Ex d [op is Ga] IIC T6 Gb, Ex tb [op is Da] IIIB T100°C Db IP67. Certification No. IECEx BVS 14.0108X.

<http://iecex.iec.ch/iecex/iecexweb.nsf/0/FE79714C0BAEF6F5C1257D7E0044F6A9?opendocument>

ATEX certification, types ILD: 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 IILN: II 3G Ex d op is IIB T4 Gc, II 3D Ex tc op is IIIA T135°C Dc IP67. ATEX declaration by manufacturer in accordance to 94/9/EC. ATEX certification of quality type production of Ex devices in accordance to the directive 94/9/EC, CE 0158. Certification No: BVS 12 ATEX ZQS / E118. 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 9001:2008 with the ATEX module "Production", declares:

Hans Bracher, Matrix Elektronik AG

IGD-010-LWL-OP-IECEx\_e2/2016-01-11/18

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