ISO 9001:2008 / ATEX

Original Operating Manual:

Coded Light Barriers series IRL/ILN/ILD-108-ST*/E**(-OP)

ILD-108-ST*/E-OP** | **Housing M30** | **ILN-108-ST*/E**-OP**

IECEx BVS 14.0108X

CE 0158

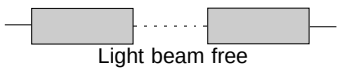
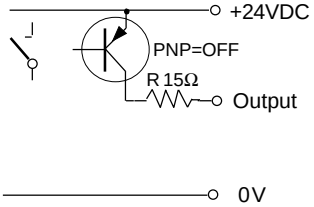
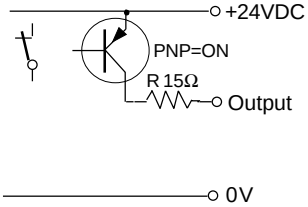
IECEx marking
Ex d [op is Ga] IIC T6 Gb
Ex tb [op is Da] IIIB T100°C Db IP67

II 2(1)G
II 2(1)D

- High penetration capacity in polluted areas.
- Optimal alignment by status visualization trough receiver optic
- Types A to D with 4 different emitter frequencies
- Series ILD: ATEX and IECEx certified
- ILD: For use in Ex zones (0), 1, 2, (20), 21, 22 optical radiation can operate into Ex Zones 0, 20
- ILN: For use in Ex zones 2, 22
- Robust light barrier for industrial applications

CE

II 3G Ex nA op is IIB T4 Gc
II 3D Ex tc op is IIIA T135°C Dc IP67

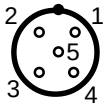
Technical Data	**Type designation emitter**	**IRL-108-ST***	**ILN-108-ST*-OP**	**ILD-108-ST*-OP**
		STA / STB / STC /STD: Emitter with different optical frequencies types A to D		
	Type designation receiver	**IRL-108-E****	**ILN-108-E**-OP**	**ILD-108-E**-OP**
Receivers without pollution indication output VA Receivers with pollution indication output VA		EFA / EFB / EFC / EFD: Receivers with different optical frequencies types A to D EVA / EVB / EVC / EVD: Receivers with different optical frequencies types A to D		
Type of Ex protection Gas, in accordance with 2014/34/EU		NONE	II 3G Ex nA op is IIB T4 Gc	II 2(1)G Ex d [op is Ga] IIC T6 Gb
Type of Ex protection Dust, in accordance with 2014/34/EU		NONE	II 3D Ex tc op is 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 2, 22	Zones (0), 1, 2, (20), 21, 22
Performance Level (PL)		PL b, according to EN 13849-1		
Safety Integrity Level (SIL)		SIL 1, according to EN 61508		
Mean probability of a dangerous failure per hour PFHd		2.56×10^{-6}, at 13849-1 (without PELV power supply)		
Sensing range		80m		
Minimum detectable object size		22mm (avoid mirror effects)		
Light source		Infrared 870nm		
Maximum radiant intensity		NOT LIMITED	<=5mW/m²	<=5mW/m²
Maximum radiant power		NOT LIMITED	< 35mW	< 15mW
Directional angle (at a distance of 10m)		Emitter: appr.8° / Receiver: appr.12°		
Shut-off delay time TOFF		30ms (Switch off time) Note 1		
Turn-on delay time TON		400ms		
Power up delay time		300ms		
Supply voltage		24 VDC +-10% (Power supply type PELV at EN 60204, item 6.4.2)		
Absolute maximum supply voltage Um		30VDC		
Current consumption, emitter		25mA		
Current consumption, receiver		40mA		
Maximum power dissipation		Emitter: max. 0.7W / Receiver: 1.1W		
Output		PNP type, 100mA, short circuit protected		
Permissible line resistance between device and load		10R		
Pollution indication output "VA", optional		PNP type, single guided, 100mA, short circuit protected		
Housing		M30, brass Ms 58, nickel plated		
Enclosure rating, in accordance with EN 60529		IP 65	IP 67	IP67
Ambient working temperature range Tamb		-20°C up to +50°C		
Storage temperature range		-20°C ... +70°C		
Relative humidity		15% ... 90%, noncondensing		
Vibration and shock resistance		Vibration: 30g over 20Hz to 2kHz. Shock: 100g for 3ms		
Pollution degree, in accordance with EN 60664-1:2007		4		
Device designation, in accordance with EN 60947-5-2		IRL/ILN/ILD-108-SIR/EFP(-OP): T3A30BP1 / IRL/ILN-108-SIR/EFP(-OP)-S099: T3A30BP2		
Connection cable		TPU insulation, AWM 20236, 2/3/4+PE x 0.5mm², shielded, leads numbering marked, oil resistant cable for trailing, length: 10m		
Socket M12, only types IRL/ILN-108-***(OP)-S099		Socket , Lumberg RSFM 5, 5 pins		
Accessories, all types, included		- 4x nuts M30 (or optional 2x clamps, on request)		
Accessories, only ILN-108-***-S099, included		- 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, only ILN-108-***-S099, not included		- Single ended cordset, types RKTS 5-298/xx or RKWTH 5-298/xx, Lumberg		
Accessories, not included		- M35 thread adapter with glass disk, locknut included		
Options		- IRL/ILN-108-ST*/E**(-OP)-**S099:** With socket M12, 5 pins - IRL/ILN-108-ST*/EV*(-OP)--**S107:** With pollution indication output and temperature range -20°C up to +80°C - IRL/ILN/ILD-108-E**V***(-OP)**:** Receivers with pollution indication output VA - Cable length: Up to 100m, on request		
LED display and output function		 Light beam interrupted LED's shows red	 Light beam free LED's shows yellow or green	
Output function and wiring diagram (cable): Receiver: 1: = +24VDC 2: = 0V 3: = Output 4: = Pollution indication output "VA", optional Emitter: 1: = +24VDC 2: = 0V (Cable shields, connect to PE) For socket types, see on page 2 of this operating manual				
Function pollution indication output "VA"		Output VA =24V if LED's shows yellow		
Alignment and controlling by LED display (Status visualization trough receiver optic and LED at the rearside of the receiver)		LED red: Light beam interrupted / not aligned LED yellow: Polluted lenses / bad aligned LED green: Light beam free / well aligned		Visible red light source through the emitter lens

Ex related markings Ex CE 0158 Manufacturer with address

Types ILD: Ex d [op is Ga] IIC T6 Gb, Ex tb [op is Da] IIIB T100°C Db IP67, ATEX certification No: BVS 10 ATEX E130 X DEKRA, IECEx certification No. IECEx BVS 14.0108X
Types ILN: II 3G Ex nA op is IIB T4 Gc, II 3D Ex tc op is IIIA T135°C Dc IP67, ATEX declaration by manufacturer in accordance with the ATEX directive 2014/34/EU
Tamb: -20°C < Tamb < +50°C, Electrical data according to the table "Technical data", Date of production: Numerals 5 to 8 of the serial number (Year/Calendar week)
(X designation of the certification number: Fibre optics must only be used with sensors with certificated limited optical power)

Note 1: If a receiver is influenced by other then the same type of emitters, TOFF may increase up to 400ms

Wiring IRL/ILN-108-ST*/E**(-OP)-S099:

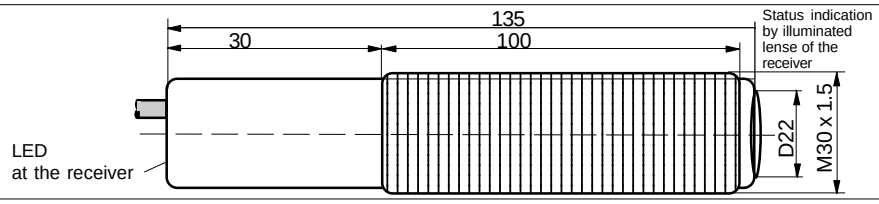


M12
Lumberg RSF 5, male socket

	Receiver:	Emitter:
1/brown	+24VDC	+24VDC
2/white	Pollution indication output	NC
3/blue	0V	0V
4/black	Output	NC
5/grey	PE	PE

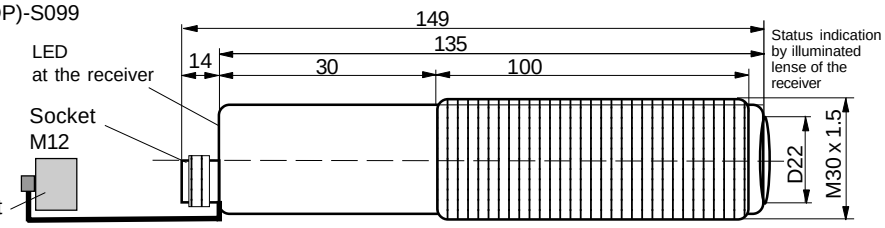
Dimensions
IRL/ILN/ILD-108-ST*(-OP),
IRL/ILN/ILD-108-E**-OP

Same dimensions for emitter and receiver

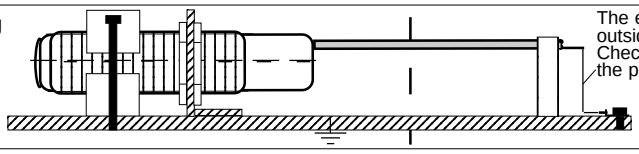


Dimensions IRL/ILN-108-ST*/E**(-OP)-S099

Same dimensions for emitter and receiver



Safe equipotential Bonding for Ex Devices:



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

The cable shield is to connect to PE in a wide area.

Operating Manual, EC-/EU - Declaration of Conformity:

Correct use
The barrier is a non-separating protective device at machinery directive 2006/42/EC. It must not be possible to start the machinery/system as long as personnel are within the hazardous area. The output is only switched ON, when the light beam is not interrupted. The light barriers are composed of an emitter and a receiver device only of the same type or with the emitter types ILD-235-STA-OP / ILD-235-STB-OP. The types must not be mixed. The light barriers must only be operated with post-switched emergency-stop devices or programmable safety devices. All relevant standards and directives for the complete system or machinery, for performance level Pl b, 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 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.

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.

Emitter: ILD-108-ST*-OP, Receiver: ILD-108-E-OP-SIL1:**
Applicable in Ex zones 1, 2, 21, 22. The limited optical radiation can operate into hazardous locations 0 or 20 over certificated fibre optics or through a viewing glass.

Emitter: ILN-108-ST*-OP, Receiver: ILN-108-E-OP-SIL1:**
Applicable only in Ex zones 2, 22.

Emitter: ILN-108-ST*-OP-S099, Receiver: ILN-108-E-OP-SIL1-S099:**
Applicable only in Ex zones 2, 22. WARNING! 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 5-298/xx (Straight type) or RKWTH 5-298/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:
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.

Function:
If the light beam is not interrupted, the output transistor switches to ON (+24V). If the light beam is interrupted or the internal function is disrupted the otput tranistor switches the output OFF. The load must be connected between the output and 0V.

Arrangement of light barriers, types A to D:
If several light barriers are installed close to another, it is necessary to use light barriers with different emitter frequencies (Types A to D). Light barriers with different emitter frequencies have no influence on each other. Precaution: If a receiver is influenced by other emitters of an other type, TOFF may increase up to 400ms. To avoid interfering radiation, mount all emitters on the one and all receivers on the other side.

Optional pollution indication output VA, types EV*:
The VA output will be activated by polluted lenses or a bad alignment. If the lenses are polluted, the LED shows yellow and the VA output switches to ON (+24V). This function gives the possibility to recognize pollutions in a short time.

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:
The 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 light barrier. Please read the operating instructions carefully.Types: ILN-108-ST*-OP-S099, ILN-108-E**-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. In worst case of breakdown, the output can change to any state! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations: EN 60079-14, ATEX 118a, single directive 1999/92/EC. The sensors are conform to the following standards: 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 13849-1:2008, EN 61508-3:2010, EN 61326-3:2008, EN 60204-1:2005, 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, Machine 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.

EC-/EU-Declaration of conformity:
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 ILN: 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 with 2014/34/EU. ATEX certification of quality type production of Ex devices in accordance to the ATEX directive 2014/34/EU, CE 0158. Certification No: BVS 15 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

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