

**Original operating manual:**
**Retroreflective Light Barriers series RLR/ISN/ISD-002/004-OFF/OFN(-OP)**

ISD-\*\*\*-\*\*\*-OP

IECEx BVS 14.0108X


**Housing M30**

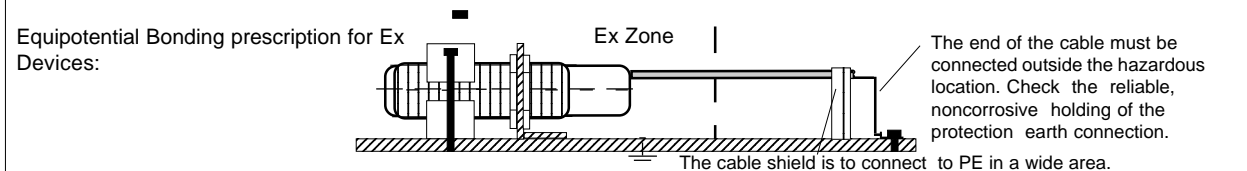
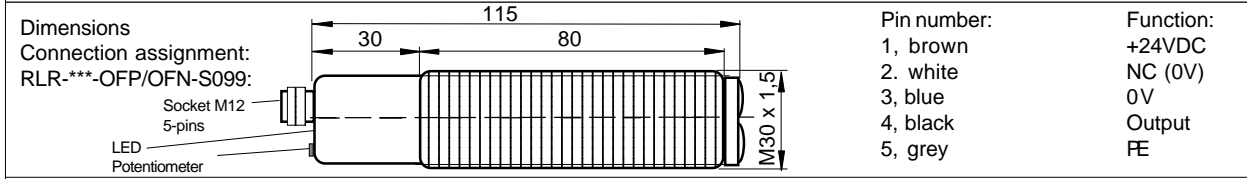
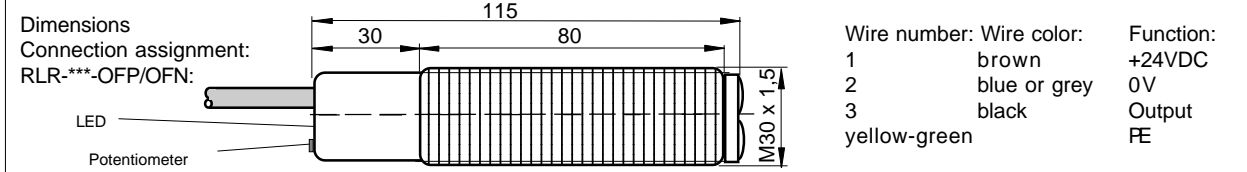
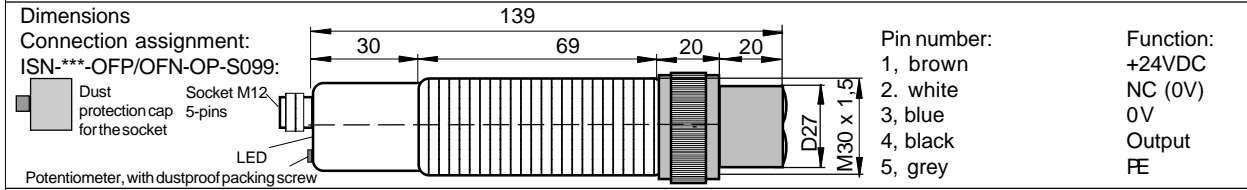
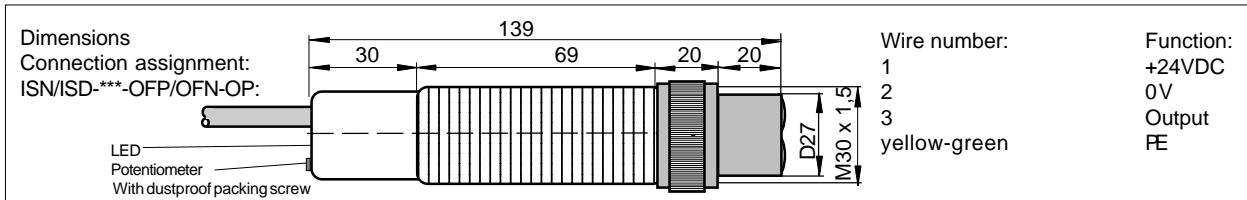
- Long sensing range
- Series ISD: ATEX and IECEx certified
- ISD: For use in Ex zones (0), 1, 2, (20), 21, 22 optical radiation can operate into Ex Zones 0, 20
- ISN: For use in Ex zones 2, 22
- Robust retroreflective light barrier for industrial applications

ISN-\*\*\*-\*\*\*-OP



Technical Data	Type	RLR-***-OFF/OFN	ISN-***-OFF/OFN-OP	ISD-***-OFF/OFN-OP
<b>*** : Sensing range, 002=2m, 004=4m</b> (adjustable by potentiometer, measured on reflector D=83mm)				
Type of Ex protection, Gas, according to 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	II 2(1)G Ex d [op is Ga] IIC T6 Gb
Type of Ex protection, Dust, according to 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	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	Zones (0), 1, 2, (20), 21, 22
Light source		visible red, 623nm		
Optical aperture angle (at a distance of 2m)		appr. 12°		
Maximum optical irradiance	NOT LIMITED	<=5mW/mm²	<=5mW/mm²	<=5mW/mm²
Maximum optical radiant power	NOT LIMITED	<35mW	<35mW	<15mW
Supply voltage		24VDC +10%		
Absolute maximum input voltage Um		30VDC		
Maximum current consumption		45mA...60mA		
Maximum power dissipation		1.6W		
Output type		1 x push-pull, short circuit protected, maximum 100mA		
Output function, types RLR/ISN/ISD-***-OFF(-OP)		Bright switching to +24V		
Output function, types RLR/ISN/ISD-***-OFN(-OP)		Bright switching to 0V		
Response time		5ms		
Power up delay time		500ms		
Utilization category, at EN 60947-5-1		DC-13		
Housing		M30, brass Ms 58, nickel plated		
Enclosure rating, according to EN 60529		IP65	IP67	IP67
Working ambient temperature range Tamb		-20°C < Tamb < +60°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, according to EN 60664-1:2007		4		
Device designation, according to EN 60947-5-2		***-OF(-OP): R3A30AP1 / ***-OF(-OP)-S099: R3A30A*2		
Connection cable		3 + PE x 0,5mm², TPU, oil resistant, shielded, leads numbering marked, halogen free, length: 3m		
Socket, types RLR/ISN-***-OF(-OP)-S099		Socket M12, Lumberg type RSFM 5, 5 pins		
Accessories included, all types		- 2 nuts M30 (or 1 clamp, on request)		
Accessories included, only ISN/ISD-***-OF(-OP)		- 1x Spare safety screw with packing ring for potentiometer sealing		
Accessories included, only ISN-***-OF(-OP)-S099		- 1x Safety lock device, mount at the cable connection, for locking the connection. (black synthetic device)		
		- 1x Warning plate "WARNING - Explosion Hazard - Do Not Disconnect While Circuit Is Live Unless Area Is Known To Be Non-Hazardous", self-sealing, for gluing on the cable connector		
Accessories, not included, only ISN-***-OF(-OP)-S099		- Cord Set Lumberg RKT5-298/xx (straight type), or RKTW/RKWT5-298/xx (right angle type)		
Options		- Cable length: Up to 100m, on request - RLR/ISN-***-OF(-OP)-S099: Male connector M12, 5 pins - RLR/ISN/ISD-004-OFF/OFN(-OP)-S126: Response time 500us, 1kHz - ISN-002-OFF-OP-S115: Working temperature range: -20°C up to +80°C - ISD-002-OFF-OP-S284: Output only type PNP		
Function and display		<p>Light beam reflected by the triple mirror LED lights red</p>		<p>Light beam interrupted LED extinguished</p>
RLR/ISN/ISD-***-OFN(-OP)				
Function:	Cable:	Connector:		
+24VDC	1	1, brown		
0V	2	3, blue		
Output	3	4, black		
NC (to connect at 0V)	--	2, white		
PE	yellow-green	5, grey		
Cable shield	white	--		
RLR/ISN/ISD-***-OFF(-OP)				
Function:	Cable:	Connector:		
+24VDC	1	1, brown		
0V	2	3, blue		
Output	3	4, black		
NC (to connect at 0V)	--	2, white		
PE	yellow-green	5, grey		
Cable shield	white	--		
<b>ATEX/IECEx RELATED MARKINGS</b> CE 0158 Tamb: -20°C < Tamb < +60°C (S115: +80°) Manufacturer with address				
Type ISD: 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		EC-Certification No. BVS 10 ATEX E130 X DEKRA IECEx Certification No. IECEx BVS 14.0108X ATEX declaration by manufacturer, 2014/34/EU		
Type ISN: II 3G Ex nA op is IIB T4 Gc, II 3D Ex tc op is IIIA T135°C Dc IP67		Date of production: Numerals 5 to 8 of the serial number (year / calendar week)		
Electrical data according to the chart (X designation of the certification number: Fibre optics must only be applied with sensors with certificated limited optical power)				

ISD-xxx-OFx-OP-IECEx\_e2/2016-04-28/HB



**Operating Manual / EC-Declaration of Conformity:**

**Mounting prescriptions**

**Ex Protection:**

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) is solid connected with the housing. The cable have to be installed and 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 e housings. All cable terminals must be connected outside hazardous locations. Additional optical lenses are not allowed in hazardous locations. In dust Ex zones, do not operate the sensors without fixed dustproof sealing crew. After adjust the potentiometer, the dustproof sealing crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced.

**Type ISD-\*\*\*-OFF/OFN-OP-S\*\*\*:** Applicable in Ex zones 1, 2, 21, 22. The limited optical radiation can operate into hazardous locations 0 or 20.

**Type ISN-\*\*\*-OFF/OFN-OP-S\*\*\*:** Only applicable in Ex zones 2, 22. The limited optical radiation can operate into hazardous locations 1 or 21.

**Type ISN-\*\*\*-OFF/OFN-OP-S099:** Only applicable in Ex zones 2, 22. The limited optical radiation can operate into hazardous locations 1 or 21. 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 protection cap for the sensor socket must be fitted, when no connection cable is 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.

Do not exceed the maximum ratings.

**Function**

The sensor can only be driven with a reflector (triplex mirror). Only 2 times broken light beams will be detected. The sensor works basically as light barrier on reflective mirrors. If the sensor detects reflected light, the output switches to +24VDC or 0V dependent of type \*\*\*-\*\*\*-OFF or OFN and the LED lights red. If the light beam is interrupted the output switches to +24VDC or 0V dependent of type \*\*\*-\*\*\*-OFF or OFN and the LED goes off.

**Potentiometer adjustment**

For the detection of thin, transparent films, it is necessary the potentiometer by the following procedure:

- Mount the sensor and the mirror.
- Turn the potentiometer left to the sensor is switching off.
- Turn the potentiometer right just to the sensor is switching on.
- Check the safe function of the sensor. The output must work without any output delay. If a delayed function of the output / LED is recognized, turn the potentiometer a little more to the right side.

**Maintenance**

For a high reliability hold the lens and the mirror free from sediment. No special maintenance is required. If the lens or the mirror becomes dirty, they should be cleaned with a non-aggressive cleaning liquid. Equipment must only be repaired by the manufacturer.

**General safety instructions**

Series ISN-\*\*\*-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. The sensors must not be used for Accident-Prevention! In worst case 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 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.

**EU-Declaration of conformity:**

IECEx certification, types ISD: 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/FE79714C0BAEF8F5C1257D7E0044F6A9?opendocument>

ATEX certification, types ISD: 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 ISN: 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 to 2014/34/EU. ATEX certification of quality type production of Ex devices in accordance to the directive 94/9/EC, 2014/34/EU, CE 0158. Certification No: BVS 15 ATEX ZQS / E118, QAR No. DE/BVS/QAR13.0004/01. 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

**Tipkemper - Matrix GmbH**  
Meegerer Str. 43 D-51491 Overath  
Tel.: +49 2206 9566-0 Fax -19  
info@tipkemper-matrix.com

**Matrix Elektronik AG (Manufacturer)**  
Kirchweg 24 CH-5420 Ehrendingen  
Tel.: +41 56 20400-20 Fax -29  
info@matrix-elektronik.com

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