ISO 9001:2015 / ATEX

Original operating manual:

Retroreflective Light Barriers series RLR/ISN/ISD-002/004/006-FXC/XCI(-OP)

ISD-*-***-OP**

CE 1258

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

IECEx BVS 14.0108X

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

Housing M30

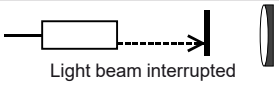
- Long sensing range
- Series ISD: ATEX and IECEx certified
- ISD: For use in Ex zones (0), 1, 2, (20), 21, 22 optical radiation can operate into Ex Zones 0, 20
- ISN: For use in Ex zones 2, 22
- Robust retroreflective light barrier for industrial applications

ISN-*-***-OP**

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

Technical Data / Type	RLR-***-FXC	ISN-***-FXC-OP	ISD-***-FXC-OP
	***** : Sensing range, 002=2m, 004=4m, 006=6m** (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
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
For use in Ex Zones	None	Zones 2, 22	Zones (0), 1, 2, (20), 21, 22
Response time	RLR/ISN/ISD-002/004-FXC(-OP)(-S181): 5ms		
Response time	RLR/ISN/ISD-006-FXC(-OP)(-S181)(-S225): 1ms		
Power up delay time	500ms		
Light source	visible red, 623nm		
Beam pattern (at a distance of 2m)	appr. 12°		
Maximum radiant intensity	NOT LIMITED	<=5mW/mm²	<=5mW/mm²
Maximum radiant power	NOT LIMITED	<35mW	<15mW
Supply voltage	24VDC +-10%		
Absolute maximum input voltage Um	30VDC		
Maximum current consumption	45mA ... 60mA		
Maximum power dissipation	1.4W		
Output, series RLR/ISN/ISD-002/004-FXC(-OP)	1 x PNP, short circuit protected, maximum 100mA		
Output, series RLR/ISN/ISD-002/004-FXC(-OP)-S181	1 x Push-Pull, short circuit protected, maximum 100mA		
Output, series RLR/ISN/ISD-006-FXC(-OP)	1 x Push-Pull, short circuit protected, maximum 100mA		
Output, series RLR/ISN/ISD-006-FXC(-OP)-S225	1 x NPN, short circuit protected, maximum 100mA		
Pollution indication output VA	1 x PNP, short circuit protected, maximum 100mA		
Utilization category, according to EN 60947-5-1	DC-13		
Emitter disable input, only types ***-XCI-***, optional	PNP compatible, Ri=10kΩ		
Housing	M30, brass Ms 58, nickel plated		
Enclosure rating according to EN 60529	IP65	IP67	IP67
Ambient working 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	***-006-FXC: R3A30AS1 / ***-002/4-FXC: R3A30AP1 / ***-006-FXC-S225: R3A30AN1 / ***-***-S099: R3A30A*2		
Connection cable	4 + PE x 0,5mm², TPU, oil resistent, shielded, leads numbering marked, length: 3m		
Connection cable, types ***-XCI-*** (DI)	6 + PE x 0,5mm², PVC, shielded, leads numbering marked, length: 3m		
Socket, types RLR/ISN-***-S099	Socket M12, Lumberg type RSFM 5, 5 terminals		
Accessories included, all types	- 2 nuts M30 (or 1 clamp, on request)		
Accessories included, only ISN-***-*** and ISD-***-***	- 1x Spare safety screw with packing ring for potentiometer sealing		
Accessories, included, only ISN-***-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 RLR/ISN-***-S099	- Cord Set Lumberg RKTS 5-298/xx (straight type), or RKTW/RKWTH 5-298/xx (right angle type)		
Options	-Switching frequency: Up to 2kHz, on request -Cable length: Up to 100m, on request -ISD-002/004-FXC-OP-**S043**: With additional optic -RLR-002/004-FXC-**S109**: Working temperature range -20°C to +100°C -RLR/ISN/ISD-***-***(-OP)-**S147:** Special gluing of the lenses -RLR/ISN/ISD-002/004-***(-OP)-**S181**: With push-pull output -RLR/ISN/ISD-***-**XCI**(-OP) With emitter disable input. (Not for types ***-***(-OP)-S099) -RLR/ISN/ISD-***-***(-OP)-**S225**: With NPN output, function NO		

Function and display

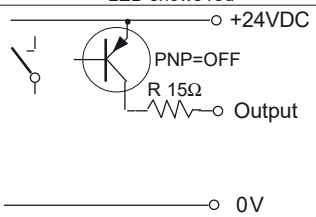


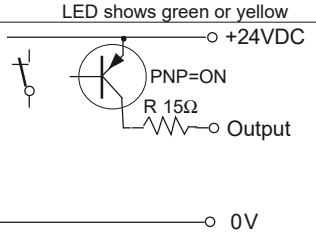
Light beam interrupted
LED shows red

Light beam reflected by the triple mirror
LED shows green or yellow

RLR/ISN/ISD-002/004-FXC(-OP)
Function at standard supply voltage wiring:

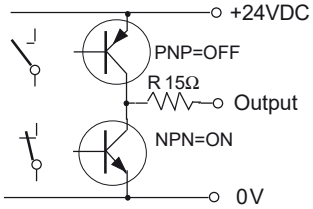
	Cable	Socket
+24VDC	1	1
0V	2	3
Output	3	4
Pollution indicationoutput	4	2
Disable input (only.-DI)	5	--
NC (to connect at 0V)	6	--
PE	yel-grn	5
Cable shield	white	--

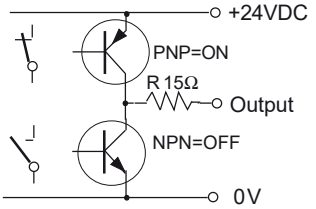




***-006-FXC(-OP) / ***-002/004-FXC(-OP)-S181
Function at standard supply voltage wiring:

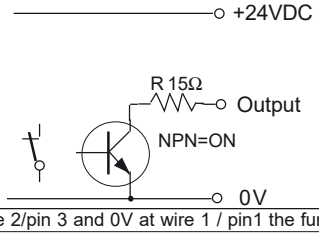
	Cable	Socket
+24VDC	1	1
0V	2	3
Output	3	4
Pollution indicationoutput	4	2
Disable input (only.-DI)	5	--
NC (to connect at 0V)	6	--
PE	yel-grn	5
Cable shield	white	--

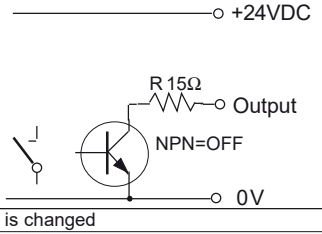




RLR/ISN/ISD-002/004/006-FXC(-OP)-S225
Function at standard supply voltage wiring:

	Cable	Socket
+24VDC	1	1
0V	2	3
Output	3	4
Pollution indicationoutput	4	2
Disable input (only.-DI)	5	--
NC (to connect at 0V)	6	--
PE	yel-grn	5
Cable shield	white	--

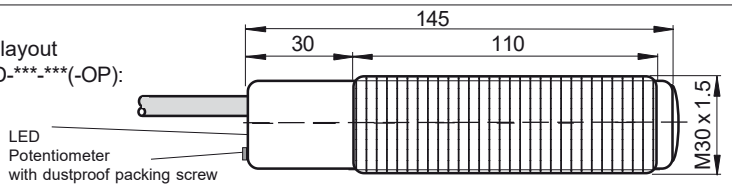




Function at reversed supply voltage wiring: At +24V at wire 2/pin 3 and 0V at wire 1 / pin1 the function is changed

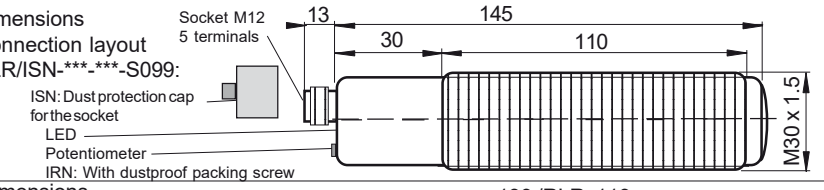
ISD-FXC-OP-IECEX_e5/2022-02-03/MP

Dimensions
Connection layout
RLR/ISN/ISD-***-***(-OP):



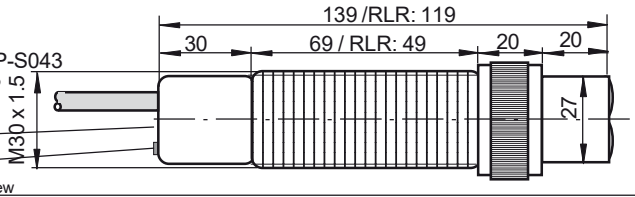
	--FXC wire No	***-***-XCI (DI) wire No
+24VDC	1	1
0V	2	2
Output	3	3
Pollution Out	4	4
DI	--	5
PE	yellow-green	yellow-green

Dimensions
Connection layout
RLR/ISN-***-***-S099:



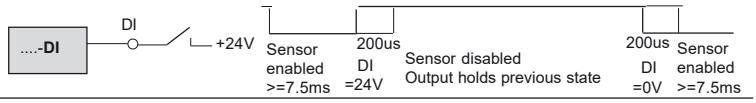
	pin No	color at cable
+24VDC	1	brown
Pollution Out	2	white
0V	3	blue
Output	4	black
PE	5	grey

Dimensions
Connection layout
ISD-002/004-FXC-OP-S043
ISN/ISD-006-FXC-OP
RLR-006-FXC:



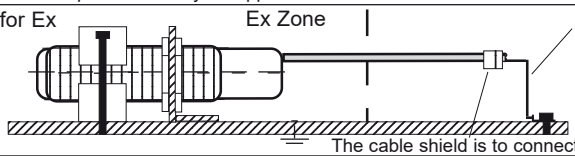
	--FXC wire No	***-***-XCI (DI) wire No
+24VDC	1	1
0V	2	2
Output	3	3
Pollution Out	4	4
DI	--	5
PE	yellow-green	yellow-green

--XCI (with optional disable input)
Uin: 18V-28VDC,DI=+24V=Disable
Response time: <=200us
Hold time: >=7.5ms, DI = 0V=Enable



ATEX/IECEx RELATED MARKINGS CE 1258 T_{amb}: -20°C < T_{amb} < +60°C
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
Type 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 2014/34/EU
Electrical data according to the chart
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 applicated with sensors with certificated limited optical power)

Equipotential Bonding prescription for Ex Devices:



The end of the cable must be connected outside the hazardous location. 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:

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 Um=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-*-FXC/XCI-OP-S***: Applicable in Ex zones 1, 2, 21, 22. The limited optical radiation can operate into hazardous locations 0 or 20.
Type ISN-*-FXC/XCI-OP-S***: Only applicable in Ex zones 2, 22. The limited optical radiation can operate into hazardous locations 1 or 21.
Type ISN-*-FXC/XCI-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 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 the polarity of the supply voltage. If the sensor works under safe conditions the LED shows green. If the sensor detects only poor reflected light, the LED shows yellow and the pollution indication output VA switches to +24VDC. If no reflected light will be recognized, the LED shows red, the outputs switches to 0V and the control-output is switching 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 works without any output delay. If a delayed function of the output / LED is recognized, turn the potentiometer a little more to the right side.
Sensors with disable input, types *-***-XCI (Not for types *-S099):**
If several sensors are installed close to another, it is necessary to use sensors with disable input. By using the disable input DI, each sensor can be controlled in a short reaction time. If only one sensor is activated in the same time, a mutual influence is precluded.
DI= 0V or not connected = emitter enabled
DI= High (24VDC) = emitter disabled
For a correct function the sensor must be enabled for at minimum >= 7.5ms (DI=0V). If the DI input will be disabled, the outputs holds the previous output status from the last enabled time.
The DI input is PNP compatible.
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-***-FXC/XCI-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 60079-1:2014, EN 60079-15:2010, IEC/EN 60079-28:2015, IEC/EN 60079-31:2014, 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 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.
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 manufactuerer in accordance to the ATEX directive 2014/34/EU. ATEX certification of quality type production of Ex devices in accordance to the ATEX 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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