ISO 9001:2008 / ATEX

Retroreflective Light Barrier RLR / ISN / ISD - 2/4/6-XC-OP

ISN-2/4/6XC-OP — Housing M30 — ISD-2/4/6XC-OP

- Long range
- Type ISD, applicable in Ex Zones (0),1, 2, (20),21, 22
- Type ISN, applicable in Ex Zones (1),2, (21),22
- Robust sensor for industrial applications

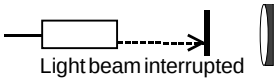
II 3(2)G Ex nA [op is Gb] IIB T4 Gc
II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67

0158

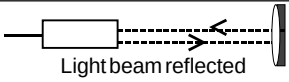
II 2(1)G Ex d [op is Ga] IIC T6 Gb
II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67

Technical Data / Type	RLR-2/4/6XC	ISN-2/4/6XC-OP	ISD-2/4/6XC-OP
Type of Ex protection, Gas, at 94/9/EG	NONE	II 3(2)G Ex nA [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/EG	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
Applicable in Ex Zones	None	Zones (1), 2, (21), 22	Zones (0), 1, 2, (20), 21, 22
Range (adjustable) (on reflector D=83mm)	IS./RLR-**2**XC(-OP) = 2m IS./RLR-**4**XC(-OP) = 4m IS./RLR-**6**XC(-OP) = 6m		
Response time	IS./RLR-**2/4**XC(-OP): 5ms, IS./RLR-**6**XC(-OP): 1ms		
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	1.6W		
Output, series RLR/ISN/ISD-2/4XC(-OP)	1 x PNP, short circuit protected, maximum 100mA		
Output, series RLR/ISN/ISD-6XC(-OP) and S181	1 x Push-Pull, short circuit protected, maximum 100mA		
Output impedance	appr.15Ω		
Pollution indication output VA	1 x PNP, short circuit protected, maximum 100mA		
Emitter disable input, only types ...-.-DI	PNP compatible, Ri=10kΩ		
Housing	M30, yellow brass, nickel plated, 6XC with additional optic		
Enclosure rating, at EN 60529	IP 54	IP67	IP67
Shock and vibrating resistance	Vibration: 30g over 20Hz to 2kHz. Shock:50g for each direction (X, Y, Z)		
Operating temperature range T_{amb}	-20°C < T_{amb} < +60°C		
Connection cable	4 + PE x 0,5mm², TPU, oil resistent, shielded, leads numbering marked, L=3m		
Connection cable, types xxx-.-DI	6 + PE x 0,5mm², PVC, shielded, leads numbering marked, L=3m		
Socket, types RLR/ISN-2/4/6XC S99	Socket M12, Lumberg type RSF 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-2/4/6XC-OP S99	- 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-2/4/6XC(-OP) S99	- 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-2/4XC-OP **S43**: With additional optic -RLR-2/4XC **S109**: Working temperature range -20°C to +100°C -RLR/ISN/ISD-..XC(-OP) **S147:** Special gluing of the lenses -RLR/ISN/ISD-2/4XC(-OP) **S181**: With push-pull output -RLR/IS.-2/4/6XC(-OP)-**DI**: With emitter disable input (not for types S99) -RLR/ISN/ISD-6XC(-OP) **S218**: Low profile lens for use with aeriation tube		

Function
Output and display



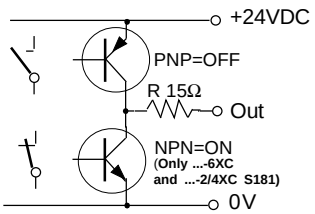
Light beam interrupted
LED shows red

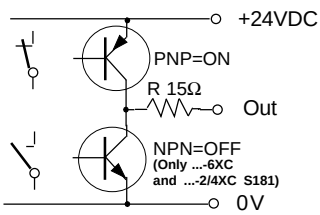


Light beam reflected by the triple mirror
LED shows green or yellow

Function at standard supply voltage wiring:

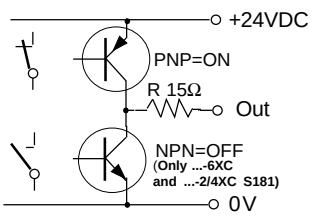
	Cable	Socket
+24VDC	1	1
0V	2	3
Output	3	4
Pollution indicationoutput	4	2
Disable input (only.-DI)	5	--
NC (to connect at 0V)	6	--
PE	yel-grn	5
Cable shield	white	--

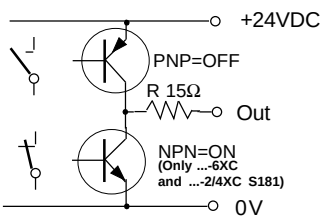




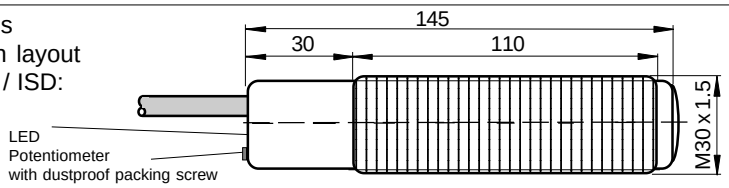
Function at reversed supply voltage wiring:

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



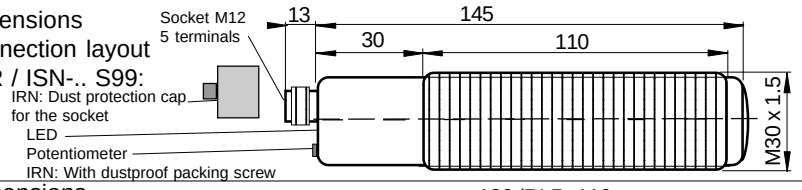


Dimensions
Connection layout
RLR / ISN / ISD:



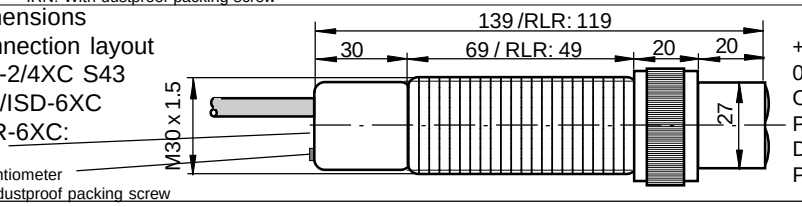
	IS.-2/4XC	IS.-2/4XC-DI
+24VDC	1	1
0V	2	2
Output	3	3
Pollution Out	4	4
DI	--	5
PE	yellow-green	yellow-green

Dimensions
Connection layout
RLR / ISN-.. S99:



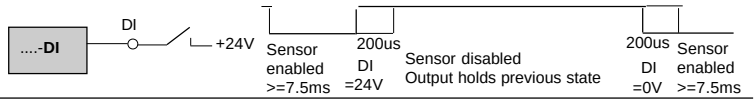
+24VDC	1	brown
Pollution Out	2	white
0V	3	blue
Output	4	black
PE	5	grey

Dimensions
Connection layout
ISD-2/4XC S43
ISN/ISD-6XC
RLR-6XC:



	IS.-2/4/6XC	IS.-2/4/6XC-DI
+24VDC	1	1
0V	2	2
Output	3	3
Pollution Out	4	4
DI	--	5
PE	yellow-green	yellow-green

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

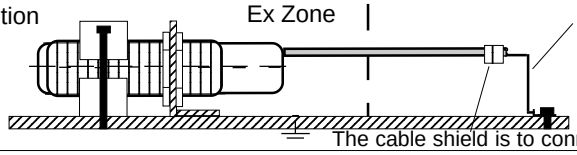


ATEX related designations:

CE 0158	Manufacturer with address	Electrical data according to the chart
Type ISD-..-OP:	II 2(1)G Ex d [op is Ga] IIC T6 Gb	EC certification number: BVS 10 ATEX E 130 X DEKRA
	II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67	EC certification number: BVS 10 ATEX E 130 X DEKRA
Type ISN-..-OP:	II 3(2)G Ex nA [op is Gb] IIB T4 Gc	Declaration by manufacturer at 94/9/EC
	II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67	Declaration by manufacturer at 94/9/EC
T_{amb}: -20°C < T_{amb} < +60°C	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-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-.XC-OP: Applicable in Ex zones 1, 2, 21, 22. The limited optical radiation can operate into hazardous locations 0 or 20.

Type ISN-.XC-OP: Only applicable in Ex zones 2, 22. The limited optical radiation can operate into hazardous locations 1 or 21.

Type ISN-.XC-OP S99: 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. The load on the output must be connected to 0V.

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 ...-..XC-DI (Not for types S99/109):

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-.XC-OP S99: "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 sensor and the fibre optic are conform to the following standards: EN 60079-0:2012 + A11:2013, EN 60079-1:2007, EN 60079-15:2010, EN 60079-28:2007, EN 60079-31:2010, EN 60825-1:2006, EN 60825-2:2004; EN 60529; EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4. ATEX directive: 94/9/EC, Machine 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

Model ISD: EC-Certification No. BVS 10 ATEX E 130 X. DEKRA.
Model ISN: ATEX declaration by manufacturer at 94/9/EC. ATEX certification of quality type production of Ex devices at 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:

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