ISO 9001:2008 / ATEX

Original Operating Manual:

Retroreflective Light Barriers series ISS/ISN/ISD-L15-OFN/OFP(-OP)-S290/S291

ISD-L15-***-OP-S290 — Housing M30 — ISN-L15-***-OP-S290

CE 0158

Ex

IECEx BVS 14.0108X

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

ATEX-Designation:
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

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

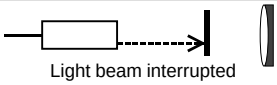
CE

Ex

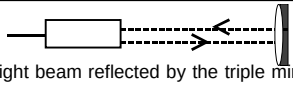
II 3G Ex nA op is IIB T4 Gc
II 3D Ex tc op is IIIA T135°C Dc IP67

Technical Data / Type	ISS-L15-***-S290	ISN-L15-***-OP-S290	ISD-L15-***-OP-S290
	*** : Output function, OFN (n-type), OFP (p-type), types with emitter disable input: ONI (n-type), OPI (p-type)		
Operating range (on reflector D = 83mm)	0.3m ... 15m		
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
Applicable in Ex Zones	None	Zones (1), 2, (21), 22	Zones (0), 1, 2, (20), 21, 22
Response time	5ms		
Power up delay time	500ms		
Light source	Laser, visible red, 650nm, class 2, Po <1mW		
Beam divergence (at a distance of 2m)	< 0.2°		
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	60mA (maximum 100mA at Ta < -10°C)		
Maximum power dissipation	1.6W (maximum 2.7W at Ta < -10°C)		
Output, series ISS/ISN/ISD-L15-***(-OP)-S290	1 x Push-Pull, short circuit protected, maximum 100mA		
Utilization category, at EN 60947-5-1	DC-13		
Emitter disable input, only types ISS/ISN/ISD-L15-ONI/OPI(-OP)-S290	PNP compatible, Ri=10kΩ, optional,		
Housing	M30, brass Ms 58, nickel plated		
Enclosure rating, according to EN 60529	IP 65	IP 67	IP67
Ambient working temperature range Tamb	-45°C < Tamb < +40°C		
Storage temperature range	-45°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	***-L15-OFN/OFP: R3A30CS1 / ***-L15-OFN/OFP-S225: R3A30CN1 / ***-L15-OFN/OFP-S099: R3A30CS2		
Connection cable	3 + PE x 0,5mm², TPU, oil resistent, shielded, leads numbering marked, length: 3m		
Connection cable, types ISS/ISN/ISD-L15-**OPI/ONI**(-OP)-S290	4 + PE x 0,5mm², TPU, oil resistent, shielded, leads numbering marked, length: 3m		
Socket, types ISS/ISN-L15-***(-OP)-S291	Socket M12, Lumberg type RSFM 5, 5 terminals		
Accessories included, all types	- 2 nuts M30 (or 1 clamp, on request)		
Accessories, included, only ISN-L15-***-OP-S291	- 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 ISS/ISN-L15-***(-OP)-S291	- Cord Set Lumberg RKTS 5-298/xx (straight type), or RKTW/RKWTH 5-298/xx (right angle type)		
Options	-Switching frequency: Up to 1kHz, on request -Cable length: Up to 100m, on request -ISS/ISN/ISD-L15-**OPI**(-OP) With emitter disable input, output function "P" -ISS/ISN/ISD-L15-**ONI**(-OP) With emitter disable input, output function "N" -ISS/ISN-L15-***(-OP)-**S291**: With socket M12, type RSFM5, 5 pins		

Function and display



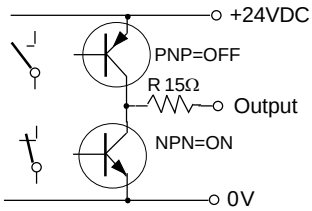
Light beam interrupted
LED = OFF

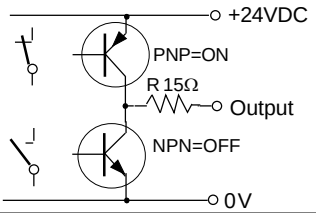


Light beam reflected by the triple mirror
LED = ON

Function: ***-L15-OFP(-OP)-S290

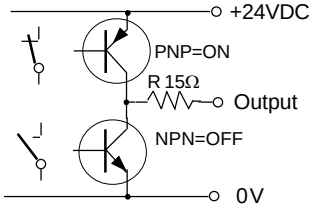
	Cable	Socket
+24VDC	1	1
0V	2	3
Output	3	4
Disable input (only.-DI)	4	2
PE	yel-grn	5
Cable shield	white	--

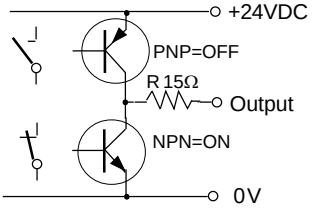




Function: ***-L15-OFN(-OP)-S290

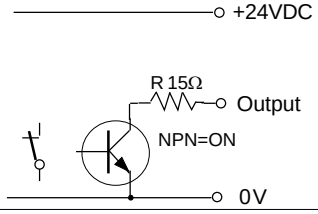
	Cable	Socket
+24VDC	1	1
0V	2	3
Output	3	4
Disable input (only *-L15-ONI/OPI-*	4	2
PE	yel-grn	5
Cable shield	white	--

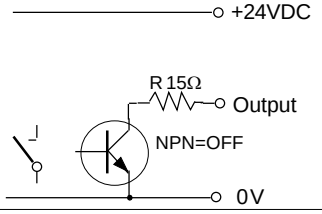




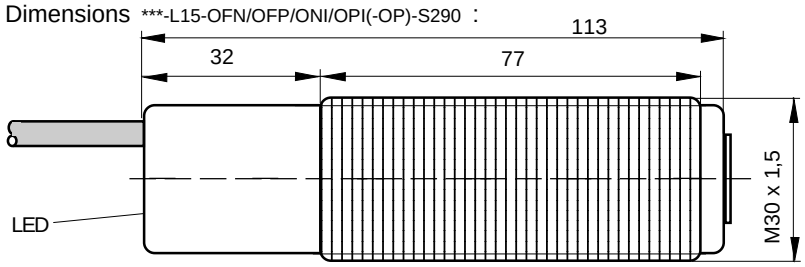
Function: ***-L15-OFP(-OP)-S291

	Cable	Socket
+24VDC	1	1
0V	2	3
Output	3	4
Disable input (only *-L15-ONI/OPI-*	4	2
PE	yel-grn	5
Cable shield	white	--





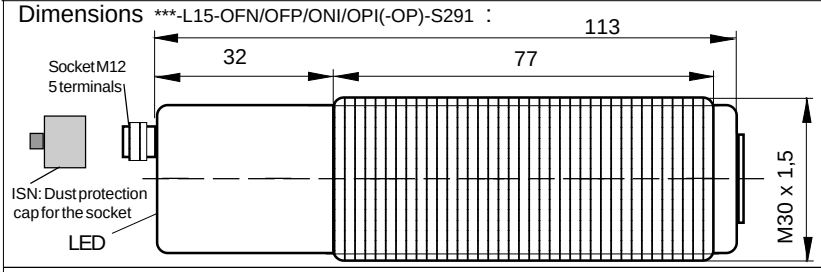
Dimensions ***-L15-OFN/OFP/ONI/OPI(-OP)-S290 :



Wiring:

	-L15- Wire No	***-L15-OPI/ONI Wire No
+24VDC	1	1
0V	2	2
Output	3	3
Disable Input	--	4
PE	yellow-green	yellow-green

Dimensions ***-L15-OFN/OFP/ONI/OPI(-OP)-S291 :

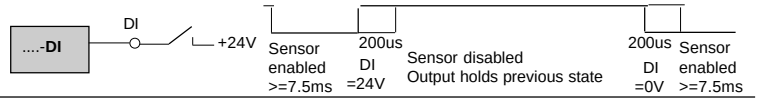


Wiring:

	-L15--S291 Pin No	***-L15-OPI/ONI-S291 Pin No
+24VDC	1	1
0V	3	3
Output	4	4
Disable Input	--	2
PE	yellow-green	yellow-green

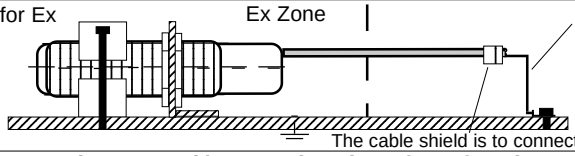
-L15-OPI/OPN-S (with optional disable input)

Uin: 24VDC +-10% ,DI=+24V=Disable
Response time: <=200us
Hold time: >=7.5ms, DI = 0V=Enable



ATEX/IECEx RELATED MARKINGS CE 0158 T_{amb}: -45°C < T_{amb} < +40°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 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/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 / 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-L15-OFP/OFN/OPI/ONI-OP-S***: Applicable in Ex zones 1, 2, 21, 22. The limited optical radiation can operate into hazardous locations 0 or 20.

Type ISN-L15-OFP/OFN/OPI/ONI-OP-S***: Only applicable in Ex zones 2, 22.

Type ISN-L15-OFP/OFN/OPI/ONI-OP-S291: Only applicable in Ex zones 2, 22. 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. Since the angle of beam spread is relatively small, the sensor has to be mounted stable and vibration-free.

Function basics

The sensor can only be used with a retroreflector (triple mirror). The sensor works basically as light barrier on reflective mirrors.

Function *-L15-OFP/OPI(-OP)(-S***)**

If the sensor detects reflected light, the output switches to +24VDC and the LED lights up. If no reflected light will be recognized, the LED turns off and the output switches to 0V.

Function *-L15-OFN/ONI(-OP)(-S***)**

If the sensor detects reflected light, the output switches to 0V and the LED turns off. If no reflected light will be recognized, the LED lights on and the output switches to +24VDC.

Sensors with disable input, types *-L15-OPI/ONI(-OP)(-S***):**

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.

Sensors with disable input, types *-L15-OPI/ONI(-OP)(-S***):**

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.

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

Safety considerations for Class 2 laser devices

The relevant standard is EN 60825-1 „Safety of laser products“, see paragraphs 12.5.1 and 12.6.1. It is only necessary to take precautions to avoid a direct and prolongued staring into the beam. A direct look into the beam is not considered hazardous if the normal eye reflex limits it to a short duration (max. 0.25 s). The laser beam path should be blocked at the end of its useful path when this is reasonably practicable. Additionally, the laser should not be directed at people.

General safety instructions

Series ISN-***-OFP/OFN/OPI/OPI/ONI-OP-S291: "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 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 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, Ident No. CE 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 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

Tippkemper - Matrix GmbH
Meegener Str. 43 D-51491 Overath
Tel.:+49 2206 9566-0 Fax -19
info@tippkemper-matrix.com

Matrix Elektronik AG (Manufacturer)
Kirchweg 24 CH-542O Ehrendingen
Tel.:+41 56 20400-20 Fax -29
info@matrix-elektronik.com