

Retroreflective Light Barriers RR-1A / RRN-1A-GD / RRD-1A-GD

RRD-1A-GD



II 2G Ex d IIC T6 Gb
II 2D Ex tb IIIB T90°C Db IP67

with analog output

- With analog output, current or voltage
- Type RRD: For using in Ex Zones 1, 2, 21, 22
- Type RRN: For using in Ex Zones 2, 22
- Robust sensor for industrial applications

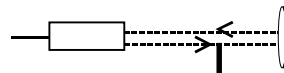
RRN-1A-GD



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

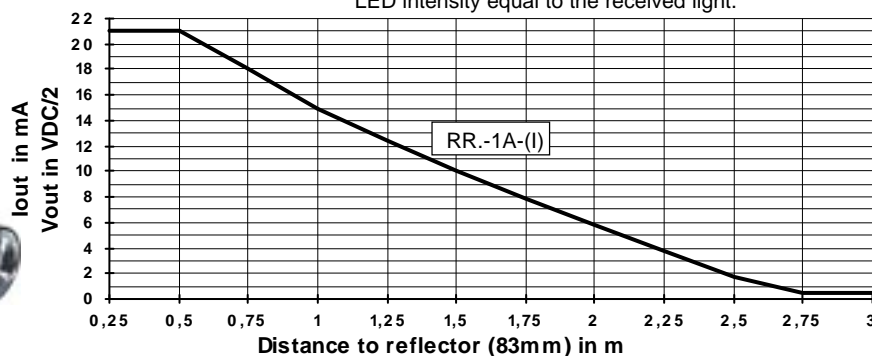
Technical data	Type	RR-1A	RRN-1A-GD	RRD-1A
Type of Ex protection Gas, at 94/9/EG		NONE	II 3G Ex nA IIB T4 Gc	II 2G Ex d IIC T6 Gb
Type of Ex protection Dust, at 94/9/EG		NONE	II 3D Ex tc IIIA T135°C Dc IP67	II 2D Ex tb IIIB T90°C Db IP67
Applicable in Ex Zones		NONE	Zones 2,22	Zones 1,2,21,22
Output range, V-Out: I-Out		0.1VDC - 10.5VDC(Ripple: 40mV) 0.2mA - 21mA (Ripple: 80uA), (4mA - 20mA optional)		
Nominal output level (adjustable)		5V / 10mA, at a distance of 1.5m, with reflector D=83mm		
Light source		Red 630nm		
Optical angle (Distance 2m)		appr.10°		
Maximum radiant intensity		<5mW/mm ²		
Supply voltage		24VDC +-15%		
Current consumption		50mA, without output current		
Response time		8ms		
Maximum power dissipation		max. 1.38W		
Output type, voltage		PNP, impedance appr.25Ω, allowed load: 2kΩ to 1MΩ		
Output type, current		NPN, impedance appr.500Ω, allowed load: 0Ω to 100Ω		
Housing		M30, brass nickel plated		
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)		
Ambient working temperature range T _{amb}		0°C < T _{amb} < +60°C	-10°C < T _{amb} < +50°C	-10°C < T _{amb} < +50°C
Connection cable, leads numbering marked		3+PE x 0,5mm ² , shielded, jacket: TPU, oil resistant		
Connection cable length		3m	3m	5m
Socket, type RR/RRN-1A S99		Socket M12, Lumberg RSF-5,5 pins		--
Accessories, all types		- 2x nuts M30 (or 1 clamp, on request)		
Accessories, only RRN-1A and RRD-1A		- 1x Spare safety screw with packing ring for potentiometer sealing		
Accessories, only RRN-1A-GD S99		- 1x Safety lock device, mount at the cable connection - 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		- Reflector D=83mm, other reflectors on request - Cord set with connector Lumberg M12, RKTS 5-298/xx (straight type), RKWTH 5-298/xx (right angle type)		
Options		- RR.-1A-I4: With current output 4mA to 20mA - RR.-1A S144: Voltage output range: 0.03V to +10.5V - RR/RRN-1A S99: Socket M12: Lumberg RSF 5, 5-pins - RRD-1A-OP: With limited optical output power at EN 60079-28.		
Wiring				

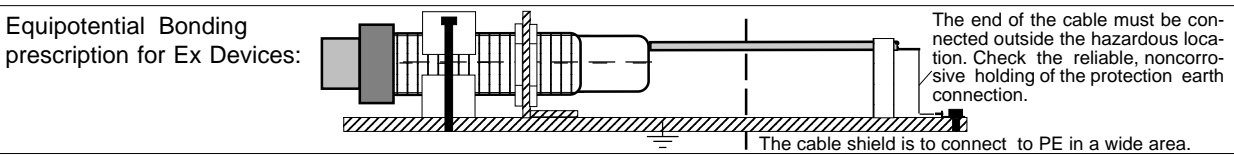
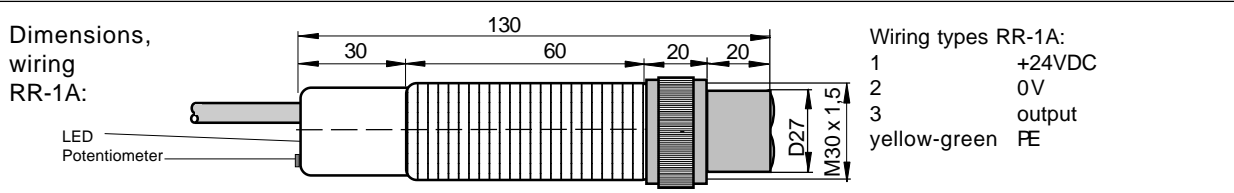
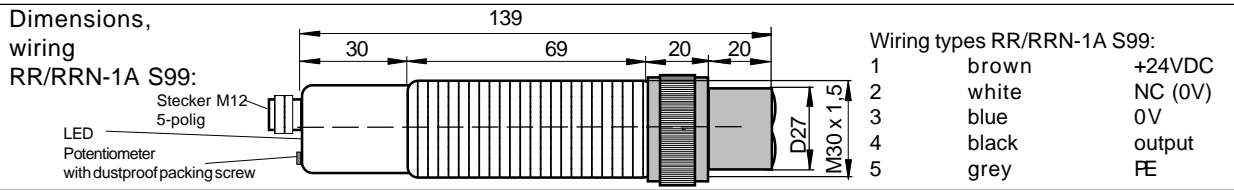
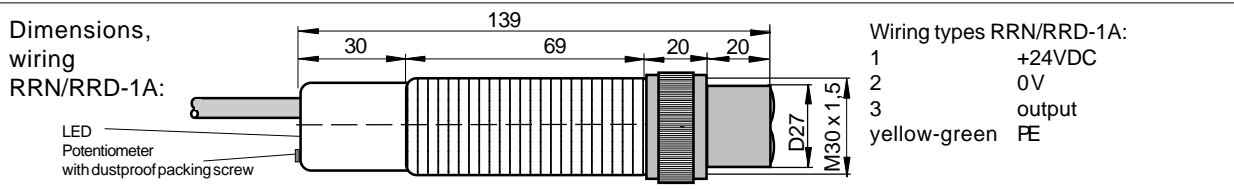
Function output and LED indication



At light beam between sensor and reflector reflected, output signal dependent of the intensity of the reflected light. LED intensity equal to the received light.

Output diagram
(on reflector (triple mirror)
D=83mm)
Potentiometer at maximum





ATEX related designations at the sensor:
CE 0158
Device type: RRD-...: II 2G Ex d IIC T6 Gb, II 2D Ex tb IIIB T90°C Db IP67
Device type: RRN-...: II 3G Ex nA IIB T4 Gc, II 3D Ex tc IIIA T135°C Dc IP67
Tamb: -10°C < Tamb < +50°C
(X designation of the certification number: Fibre optics must only be applied with sensors with certificated limited optical power)

Manufacturer with address
Date of production: Numerals 5 to 8 of the serial number (Year/Week)
ATEX EC-type Certification. No: BVS 10 ATEX E 130 X. DEKRA
ATEX Declaration by manufacturer at 94/9/EC

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 RRD-1A-GD: Applicable only in Ex zones 1, 2, 21, 22.
Type RRN-1A-GD: Applicable only in Ex zones 2, 22.
Type RRN-1A-GD S99: 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 RKT5 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 special reflector (triplex mirror). Only 2 times broken light beams will be detected. The sensor works basically as light barrier on reflective mirrors. The output generates an output signal of 0V to 10V or 0(4)mA to 20mA, equal to the measured light quantity. The brightness of the LED is also equal to the received quantity of reflected light. The optimal working distance or sensitivity is adjustable by the potentiometer.

Adjustment with the potentiometer
- Mount the sensor and the reflector stable and free from vibrations.
- Adjust the potentiometer at an output level of 5V or 10mA.

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

General safety instructions
Model RRN-1A-GDS99: "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:
EN 60079-0:2009, 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 RRD: EC-Certification No. BVS 10 ATEX E 130 X. DEKRA. Notified body: DEKRA EXAM GmbH, Zertifizierungsstelle, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, Kennnummer: 0158.
Model RRN: ATEX declaration by manufacturer at 94/9/EC and EC-Certification No. BVS 10 ATEX E 130 X. 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:

Hans Bracher, Matrix Elektronik AG

RR-1A_e2/2014-05-21/HB

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