

Original operating manual:

Photoelectric proximity switch IRS/IRN/IRD-\*\*-OFX/OVA(-OP)

IRD-\*\*-OFX/OVA-OP

IECEX BVS 14.0108X



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



IECEX markings  
Ex d [op is Ga] IIC T6 Gb  
Ex tb [op is Da] IIIB T100°C Db IP67

Housing M30

- Also for using with certificated fibre optics
- IRD: ATEX and IECEX certificated
- Types IRD: For use in Ex Zones (0), 1, 2, (20), 21, 22 optical radiation can operate into Ex Zones 0, 20
- Types IRN; For use in Ex Zones (1), 2, (21), 22 optical radiation can operate into Ex Zones 1, 21
- Robust sensor for industrial applications

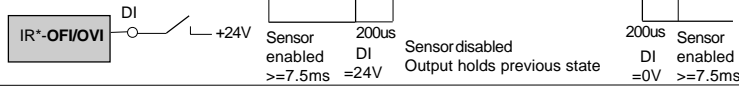
IRN-\*\*-OFX/OVA-OP



ATEX designation:  
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

Type	IRS-**-OFX/OVA	IRN-**-OFX/OVA-OP	IRD-**-OFX/OVA-OP																					
<b>Technical Data</b>	<b>OFX = output function selectable by polarity of the supply voltage</b>																							
Range (on white paper A4, 80g)	**I = Range in dm 021/041/101/151. 0.2m to 1.5m																							
Type of Ex protection, Gas, according to 2014/34/EU	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, according to 2014/34/EU	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																					
For use in Ex Zones	Not for Ex zones	Zones (1), 2, (21), 22	Zones (0), 1, 2, (20), 21, 22																					
Maximum radiant intensity	NOT LIMITED	<=5mW/mm <sup>2</sup>	<=5mW/mm <sup>2</sup>																					
Maximum radiant power	NOT LIMITED	<=35mW	<=15mW																					
Light source	Infrared 870nm																							
Optical angle (at nominal range)	appr. 10°																							
Response time	5ms (1ms, on request)																							
Power up delay time	500ms																							
Supply voltage	24 VDC +10%																							
Absolute maximum supply voltage	Um = 30VDC																							
Current consumption	maximum 60mA																							
Maximum power dissipation	1.68W																							
Output	Push-Pull, 100mA, short circuit protected																							
Input, only types IR**-**I-OFI/OVI(-OP) (Disable Input)	PNP compatible, Ri 10kΩ																							
Housing	M30, yellow brass, type Ms58, nickel plated																							
Enclosure rating, according to EN 60529	IP54	IP67	IP67																					
Working temperature range Tamb	-20°C up to +50°C																							
Storage temperature range	-30°C ... +70°C																							
Shock and vibrating resistance	Vibration: 30g over 20Hz to 2kHz. Shock:50g for each direction (X, Y, Z)																							
Pollution degree, according to EN 60664-1:2007	4																							
Device designation, according to EN 60947-5-2	R3A30AP1																							
Electrical connection cable	3+PE x 0.5mm <sup>2</sup> , shielded, TPU, leads numbering marked, length: 3m																							
Electrical connection cable, types IR**-**I-OVA/OFI(-OP)	4+PE x 0.5mm <sup>2</sup> , shielded, TPU, leads numbering marked, length: 3m																							
Electrical connection cable, types IR**-**I-OVI(-OP)	5+PE x 0.5mm <sup>2</sup> , shielded, TPU, leads numbering marked, length: 3m																							
Socket for types IRS/IRN-**-**I-OP-S099	Socket M12, Lumberg type RSF, 5 terminals																							
Accessories, all types	- 2 nuts M30 (optional 1 clamp on demand)																							
Accessories, types IRN/IRD-**-**I-OP(-S**)	- 1x Spare safety screw with packing ring for potentiometer sealing																							
Accessories, only type IRN-**-**I-OP-S099	- 1x Safety lock device, mount at the cable connection, for locking the connection. (black synthetic device)																							
	- 1x Warning plate "Do not open/close when supply voltage connected", self-sealing, for gluing on the cable connector.																							
	- 1x Protection cap for the sensor socket.																							
Accessories, optional for the types IR**-**(-OP)-S099	- Single ended cordset, types RKTS 5-298/xx or RKWTH 5-298/xx, Lumberg																							
Accessories, not included, only IRS-**-**I-O**-S125	- Spare safety screw with packing ring for potentiometer sealing																							
Options	Up to 100m, on request. Designation: IR**-**I-**-**(-OP)/K:??m																							
- IR**-**I-OVA(-OP):	With additional pollution indication output "VA", only PNP type																							
- IR**-**I-OFI(-OP):	With emitter disable input "DI"																							
- IR**-**I-OVI(-OP):	With additional pollution indication output "VA" and with emitter disable input "DI"																							
- IRD-04I-**-**I-OP-S095:	With additional optic, type AD-4-W 15, cable length: 10m																							
- IRD-04I-**-**I-OP-S097:	Response time: 150us, cable length: 5m																							
- IRS/IRN-**-**I(-OP)-S099:	Socket M12, Lumberg RSF 5, 5 pins																							
- IRS-02I/04I-**-**I-S125:	Potentiometer with dust proof screwing. (IRS-02I-OFX-S125: Range = 180mm+5%)																							
- IR**-**I-**-**(-OP)-S268:	1kHz switching frequency																							
- IR**-02I-**-**(-OP)-S269:	10kHz switching frequency																							
- IRS/IRN-02I-**-**(-OP)-S270:	Socket M12, Lumberg RSF 5, 5 pins, response time: 500us																							
- IR**-02I-**-**(-OP)-S271:	With wide optical angle 22°																							
- IRD-10I-OFX-OP:	Output only PNP, function: Output=ON if sensor detects light																							
<b>Function and LED display</b>																								
<b>Function at standard connection of the supply voltage:</b>	<table border="1"> <tr><td>+24VDC</td><td>Wire No. 1</td><td>Pin-No. 1</td></tr> <tr><td>0V</td><td>2</td><td>3</td></tr> <tr><td>Output</td><td>3</td><td>4</td></tr> <tr><td>Pollution indication output</td><td>4</td><td>2</td></tr> <tr><td>Disable input (only DI types)</td><td>5</td><td>2</td></tr> <tr><td>PE</td><td>yellow-green</td><td>5</td></tr> <tr><td>Cable shield</td><td>white</td><td></td></tr> </table>	+24VDC	Wire No. 1	Pin-No. 1	0V	2	3	Output	3	4	Pollution indication output	4	2	Disable input (only DI types)	5	2	PE	yellow-green	5	Cable shield	white			
+24VDC	Wire No. 1	Pin-No. 1																						
0V	2	3																						
Output	3	4																						
Pollution indication output	4	2																						
Disable input (only DI types)	5	2																						
PE	yellow-green	5																						
Cable shield	white																							
<b>Function on reversed polarity of the supply voltage:</b>	<table border="1"> <tr><td>+24VDC</td><td>Wire No. 2</td><td>Pin-No. 3</td></tr> <tr><td>0V</td><td>1</td><td>1</td></tr> <tr><td>Output</td><td>3</td><td>4</td></tr> <tr><td>Pollution indication output</td><td>4</td><td>2</td></tr> <tr><td>Disable input (only DI types)</td><td>5</td><td>2</td></tr> <tr><td>PE</td><td>yellow-green</td><td>5</td></tr> <tr><td>Cable shield</td><td>white</td><td></td></tr> </table>	+24VDC	Wire No. 2	Pin-No. 3	0V	1	1	Output	3	4	Pollution indication output	4	2	Disable input (only DI types)	5	2	PE	yellow-green	5	Cable shield	white			
+24VDC	Wire No. 2	Pin-No. 3																						
0V	1	1																						
Output	3	4																						
Pollution indication output	4	2																						
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PE	yellow-green	5																						
Cable shield	white																							
<b>Devices with pollution indication output "VA".</b>																								
<b>Types:</b>	IR**-**I-OVA/OVI(-OP).																							
<b>LED indication and output function:</b>																								

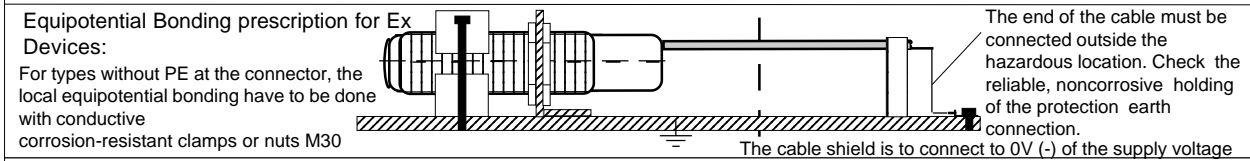
IR\*-\*\*I-OFI/OVI(-OP) (with optional Disable Input)  
 Uin: 18V-28VDC, DI=+24V=Disable  
 Response time: <=200us  
 Hold time: >=7.5ms, DI = 0V=Enable



Dimensions	30, 115, 80	IRN/IRD-**-OFX	IRN/IRD-**-OFI/OVI
Connection layout		+24VDC	1
IRN/IRD-**-***-OP		0V	2
IRS-02I/04I-***-S125:		Output	3
LED		VA	4
Potentiometer		DI	5
with dustproof packing screw		PE	yellow-green

Dimensions	13, 30, 85, 115, 50	IRN/S-**-OFX-S099	IRN/S-**-OFI/OVI-S099
Connection layout		1/brown	+24VDC
IRS/IRN-**-***(-OP)-S099:		2/white	NC
IRN: Dust protection cap		3/blue	0V
for the socket		4/black	Output
LED		5/grey	PE
Potentiometer			
IRN: with dustproof packing screw			

Dimensions	30, 85, 50	IRS-**-OFX	IRS-**-OFI/OVI
Connection layout		+24VDC	1
IRS-**-***:		0V	2
LED		Output	3
Potentiometer		VA	4
		DI	5
		PE	yellow-green



**Ex related markings:**  
 CE 0158  
 Type IRD-\*\*-\*\*\*-OP: II 2(1)G Ex d [op is Ga] IIC T6 Gb  
 Type IRN-\*\*-\*\*\*-OP: II 3(2)G Ex nA [op is Gb] IIB T4 Gc  
 Tamb: -20°C up to +50°C  
 (X designation of the certification number: Fibre optics must only be applied with sensors with certificated limited optical power)

**Operating Manual / EU - Declaration of Conformity:**  
 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 output holds the previous output status from the last enabled time. The DI input is PNP compatible.

**Optical range**  
 The nominal range is defined on white paper A4, 80g. The range will be influenced by the color, kind of surface and shape of the object.  
**Fibre optics**  
 For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas. Fibre optics for Ex zones must only be driven by sensors series IRN and IRD.

**Maintenance**  
 Protect the sensor and the optional fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

**General safety instructions**  
 Series IRN-\*\*-\*\*\*-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 sensor and the fibre optic 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 IRD: Certification number: BVS 14.0108X.  
<http://iecex.iec.ch/iecex/iecexweb.nsf/0FE79714C0BAEF6F5C1257D7E004F6A9?opendocument>  
 ATEX certification, types IRD: II 2(1)G Ex d [op is Ga] IIC T6 Gb, II 2(1)D Ex tb [op is Da] IIB T100°C Db IP67. EC-Certification No. BVS 10 ATEX E 130 X, DEKRA EXAM GmbH, Zertifizierungsstelle, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, Ident number: 0158.

ATEX certification, types IRN: II 3(2)G Ex nA [op is Gb] IIB T4 Gb, II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67. Declaration by manufacturer according to the ATEX directive 2014/34/EU and the test report No. BVS PP 10-2233 EG, for Ex op is. ATEX certification of quality type production of Ex devices at the ATEX 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

IRD-xxI-OFX-OP-IECEX\_e3.2016-12-21/HB

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