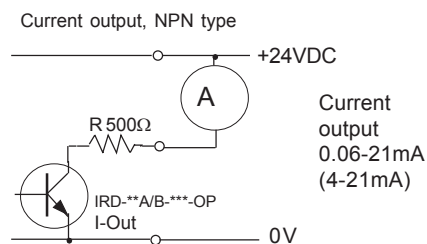
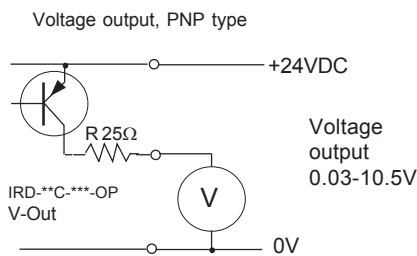
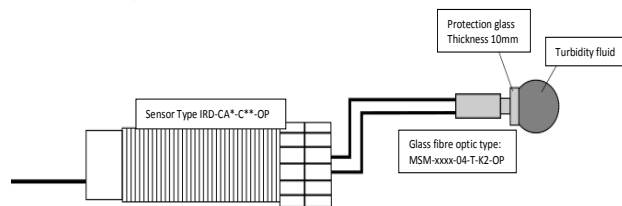
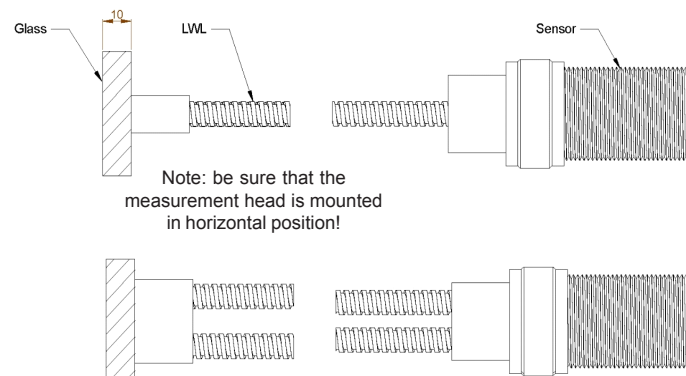


Original Operating Manual:
Photoelectric sensors with analog output: IRD-CA*-C-OP
Housing M30**

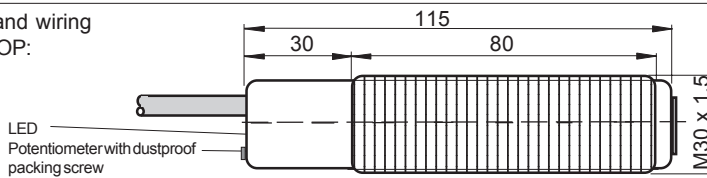

- Only for using with certificated fibre optics MSM-xxxx-04-T-K2-OP1/OP2
- IRD: ATEX and IECEx certificated
- Types IRD: For use in Ex Zones (0),1, 2, (20), 21, 22
- With voltage or current loop output available
- Applicable as turbidimeter 1 NTU to 500 NTU

Technical data	Type	IRD-CA*-C**-OP
		CA*= Type of analog output. CAC: Voltage output 0 ... 10V. CAA: current loop output 0mA ... 20mA. CAB: current loop output 4mA ... 20mA
Type of Ex protection Gas, directive 2014/34/EU		II 2(1)G Ex d [op is Ga] IIC T6 Gb
Type of Ex protection Dust, directive 2014/34/EU		II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67
For use in Ex Zones		Zones (0),1,2 and (20),21,22
Output signal range		0.03VDC - 10.5VDC(Ripple:<20mV) or 0.06mA - 21mA or 4mA - 21mA
Turbidity range,with fibre optic Type:MSM-2000-04-T-K2(-OP*)		NTU 1 to NTU 500, through protection glass, thickness 10mm, accuracy +/-10% from Range
Voltage output, nominal range		0VDC = 1 NTU, 10VDC = 500 NTU, adjustable
Current output, nominal range		0mA / 4mA = 1 NTU, 20mA = 500 NTU, adjustable
Light source		Infrared 870nm
Optical aperture angle		approx.10°
Maximum optical radiant power		<=15mW
Maximum radiant power		<=5mW/mm²
Response time		5ms
Power up delay time		500ms
Supply voltage		24VDC +/-10%, Um = maximum 30VDC
Intrinsic current consumption		max. 60mA
Maximum power dissipation		1.6W
Output type, voltage, IRD-CAC-C**-OP		PNP, output impedance appr. 25Ω, RLoad: 2kΩ to 1MΩ
Output type, current, IRD-CAA/B-C**-OP		NPN, output impedance appr. 500Ω, RLoad: 0Ω to 100Ω
Disable-Input, only types IRD-*A*-C*B-OP		PNP compatible, Ri 10kΩ
Housing		M30, brass Ms 58, nickel plated (optional stainless steel 1.4404)
Enclosure rating, according to EN 60529		IP 67
Ambient working temperature range Tamb		-20°C up to +50°C
Storage temperature range		-20°C ... +70°C
Relative humidity		15% ... 80%
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		R3A30AP1
Connection cable, types IRD-CA*-C*-OP		3+PE x 0,5mm²,TPU, shielded, leads numbering marked, oil resistant cable for trailing, L: 10m
Connection cable, types IRD-CA*-C*-OP		4+PE x 0,5mm²,TPU, shielded, leads numbering marked, oil resistant cable for trailing, L: 10m
Accessories, all devices		- 2x nuts M30 (or 1 clamp on demand)
Accessories, only IRD		- 1x Spare safety screw with packing ring for potentiometer sealing
Required for Turbidity Sensor		- Glas Fiber Optic Type MSM-****-04-T-K2-***
Accessories, not included		--
Accessories, not included, all types		--
Options		- Cable length: Up to maximum 100m. Designation: IRD-***-Z*-OP - IRD-CA*-C*B-OP: With emitter disable input (DI)

Output connection

Measurement arrangement and output connection

Mounting from measurement head at the glass window


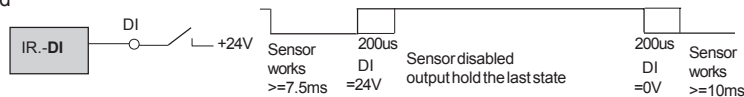
Dimensions and wiring

IRD-CA*-C**-OP:

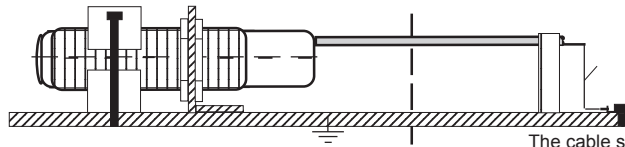


IRD-CA*-CB*-OP	IRD-CA*-CC*-OP
Function: +24VDC	Lead-No: 1
0V	2
Output (DI-Input)	3
FE	4
	yellow-green yellow-green

IRD-CA*-C*B-OP (with optional disable input DI)
 Uin: DI=+24V=disabled / 0V=enabled
 Response time: <=200us
 Hold time: >=10ms



**Equipotential Bonding pre-
 scription 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.

ATEX related markings on the sensors

Device type	CE 1258	Manufacturer with address
IRD-CA*-C**-OP-S***: 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		No. BVS 10 ATEX E130 X DEKRA
IRD-CA*-C**-OP-S***: ATEX-Certification		IECEx 14.0108X
IRD-CA*-C**-OP-S***: IECEx-Certification		Electrical data according to the chart
Tamb: -20°C <= Tamb <= +50°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 used with sensors with certificated limited optical power)

Operating manual / EC-declaration of conformity:

Mounting prescriptions:

General prescriptions for all Ex devices

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 IRD-CA*-C-OP:** Only applicable in Ex zones 1, 2, 21, 22. The limited optical radiation can operate into hazardous locations 0 or 20 over certificated fibre optics or through a viewing glass.

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

Corresponding to the quantity of detected light, the output of the sensor generates an analog output signal. The output generates a voltage signal from 0V to 10.5VDC or a current loop, 0 or 4mA to 21mA. Please check the permissible load for the two different types of outputs. The photoelectric analog sensor can only be operated with fibre optics, function as light barrier or as optical switch.

For turbidity measurement the arrangement should be calibrated with Formazin (recommendation: 250NTU = 12mA) or the own liquid. Just put the LWL in front of a window with a thickness from 10mm. Then you should measure the lower turbidity and adjust the potentiometer until the current output is 4mA (Voltage output should be 0V).

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 >= 10ms (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.

Fibre optics

The photoelectric analog sensor can only be operated with the glass fibre optic MSM-xxxx-04-T-K2-OP* (proximity switch function) or similar Matrix Elektronik AG products.

Maintenance

Protect the sensors 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

"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 sensor 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 137, single directive 1999/92/EC.

The sensors are conform to the following standards:

IEC/EN 60079-0:2012 + A+11:2013, 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

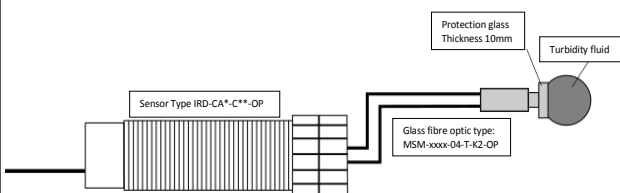
We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

EU-Declaration of conformity:

IECEx certification, types IRD: 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 IRD: 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 number: 0158.

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 1258, Eurofins. Certification No: SEV 21 ATEX 4580, QAR No. CH/SEV/QAR21.0009/00. 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:



IRD-CA*-C*B-OP: Optional emitter disable input "DI"

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 (Response time: 200us). If only one

Pablo Ledergerber, Matrix Elektronik AG

IRD-CA*-C**-OP_e3/2022-08-18/MP

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