ISO 9001:2015 / ATEX

Rotation Speed Control Sensors series IRS/IRN/IRD-LTD-GFO(-OP)

IRD-LTD-GFO-OP — Housing M30 — IRN-LTD-GFO-OP

CE 1258

IECEx BVS 14.0108X

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

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

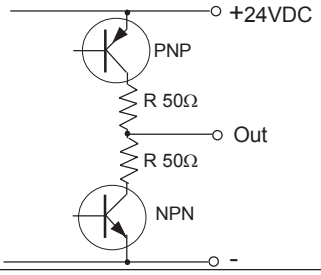
- Well applicable with plastic and glass fibre optics
- Laser-emitter, red light 650nm
- Type IRD: For use in Ex Zones (0),1, 2, (20),21, 22
- Type IRN: For use in Ex Zones (1),2, (21),22
- Type IRO: Optical radiation can operate into Ex Zone (2)
- Speed control up to 100'000 RPM
- Very high reliability (EMC)

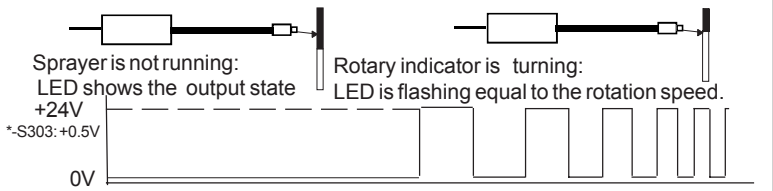
CE

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

Technical Data / Type	IRS-LTD-GFO	IRO-LTD-GFO-OP	IRN-LTD-GFO-OP	IRD-LTD-GFO-OP
Type of Ex protection, Gas, according to 2014/34/EU	NONE	II (3)G [Ex op is IIB T4 Gc]	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	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	(2)	(1), 2, (21), 22	(0), 1, 2, (20), 21, 22
Laser class	Class II, 650nm visible red, Po <= 1mW			
Maximum optical irradiance	NOT LIMITED	<=5mW/mm²	<=5mW/mm²	<=5mW/mm²
Maximum radiated optical power	NOT LIMITED	< 1mW	< 1mW	< 1mW
Switching frequency	0,1kHz - 10kHz[Note1]			
Rise time	<= 2us			
Power up delay time	2sec			
Supply voltage	24VDC +-10%			
Absolute maximum input voltage Um	30VDC			
Current consumption	70mA			
Power dissipation	maximum 1.85W			
Output	1 x Push-Pull, short circuit protected, maximum 10mA			
Output impedance	max.50Ω			
Housing	M30, brass, nickel plated			
Enclosure rating at EN 60529	IP 65	IP 65	IP 67	IP 67
Vibration shock resistance	Vibration: 30g over 20Hz to 2kHz. Shock: 100g for 3ms			
Ambient working temperature range Tamb	0°C up to +50°C			
Storage temperature range	-20°C ... +70°C			
Relative humidity	15% ... 90%, noncondensing			
Pollution degree, at EN 60664-1:2007	4			
Ambient illumination	only for using in enclosed ambients			
Device designation, according to EN 60947-5-2	D3A30CS2		D3A30CS1	
Electrical connection	Cable, 3+PE x 0,5mm², shielded, jacket TPU, length:10m			
Connection, ***-LTD-GFO(-OP)-S099/S253/S303	Socket, M12, 5 terminals			--
Optical fibre connection	Matrix connection, applicable with the series PA and PV			
Accessories, included all types	-2x Nuts M30			
Accessories, type IRN-LTD-GFO-OP-S099/S253/ S303, included	-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. - 1x Protection cap for the sensor connector.			
Accessories, ***-LTD-GFO(-OP)-S099/S253/S303 not included	- Single ended cordset, straight type: RKTS 5-298/xx or right angle type: RKWTH 5-298/xx , Lumberg M12/5P			
Accessories, all types, not included	- Different types of optical fibres, on demand - Fast fixing adapter for POF			
Options	- IRD-LTD-GFO-OP-**S098:** Cable type Ölflex 810CP, L=20m - IRS/IRO/IRN-LTD-GFO(-OP)-**S099**: Socket M12: Lumberg RSF 5 - IRD-LTD-GFO-OP-**S136:** Cable type Ölflex 810CP, L=15m - IRD-LTD-GFO-OP-**S165:** Cable type Ölflex 810CP, Length on request - IRO-LTD-GFO-OP-**S253:** With fail-signal monitoring and socket M12 - IRS/IRO/IRN-LTD-GFO-OP-**S303:** With special output, output signal level 0V to 0.5V, with male connector M12, with fail-signal monitoring.			

Output Function:





Rotary indicator is static:
Output undefined: "L" or "H"

Rotary indicator is turning:
Output generates pulses equal to the rotation speed.

IR*-*-*-OP-S253/S303: Output: Holds "L"

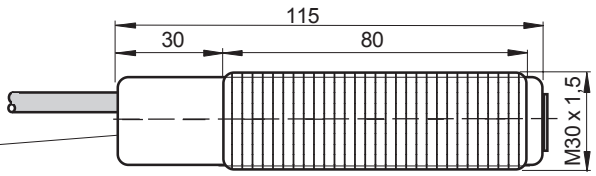
Ex related designations:

CE 1258	Manufacturer with address	Electrical data according to the chart
Type IRD-LTD-GFO-OP:	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	ATEX certification no: BVS 10 ATEX E 130 X & IECEx certification no: IECEx BVS 14.0108X
Type IRN-LTD-GFO-OP:	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	Declaration by manufacturer according to the ATEX directive 2014/34/EU
Type IRO-LTD-GFO-OP:	II (3)G [Ex op is IIB T4 Gc]	Declaration by manufacturer according to 2014/34/EU
T_{amb}: 0°C < T_{amb} < +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 applicated with sensors with certificated limited optical power)

Note 1: The real reachable switching/rotary frequency is dependent on the condition and type of the marking disc (2 or 4 sectioning) and the careful working up of the optical fibres.

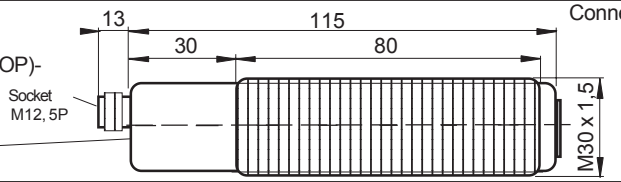
Dimensions and connection layout IRD-LTD-GFO-OP IRN-LTD-GFO-OP:



Connection: IRD/IRN-LTD-GFO-OP

1	+24VDC
2	0V
3	Output
white	Cable shield
yellow-green	PE

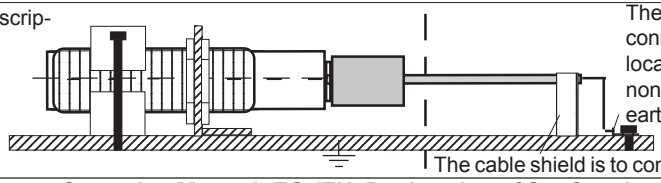
Dimensions and connection layout IRN/IRO/IRS-LTD-(OP)-S099/S253/S303:



Connection: IRN/IRO/IRS-LTD-GFO-OP -S099/S253/S303:

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

Equipotential Bonding prescription:



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-/EU- Declaration of Conformity:

Operating Manual:

Ex protection:

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) terminal is solid connected with the housing. The cable have to be protected against damages. To connect cables inside hazardous locations only use certificated Ex housings. All cable terminals must be connected outside hazardous locations. Use only original manufactured fibre optics and additional optical lenses, other additional optical lenses are not allowed in hazardous locations.

Type IRD-LTD-GFO-OP: For use 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.

Type IRN-LTD-GFO-OP: Only For use in Ex zones 2, 22. The limited optical radiation can operate into hazardous locations 1 or 21 over certificated fibre optics or through a viewing glass.

Type IRN-LTD-GFO-OP-S099/S253/S303: Only For use in Ex zones 2, 22. The limited optical radiation can operate into hazardous locations 1 or 21 over certificated fibre optics or through a viewing glass. 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 socket protection cap must be fitted, when the connection cable is not connected.

Type IRO-LTD-GFO-OP(-S253): The sensor must be installed out of the explosion risk area. The limited optical radiation can operate into hazardous location 2 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.

Function:

The sensor can only be used with connected fibre optics. Light reflection alterations, generated by the turning marking disc of the spraying apparatus, will be amplified and formed.

Type IRO-LTD-GFO-OP-S253: If the generated signals are not plausible, the output will be blocked for 40ms.

Type IRS/IRO/IRN-LTD-GFO-OP-S303: Output signal level from 0V to +0.5V. THIS SPECIAL OUTPUT IS NOT PROTECTED AGAINST SHORT-CIRCUIT. If the generated signals are not plausible, the output will be blocked for 40ms.

Using the fibre optics

The sensor I**-LTD-GFO(-OP)(-S***) must not go into operation without mounted fibre optics. The fibre optics must be handled careful. The functional safety of the sensor is given by the condition of the marking disc and the careful working up of the optical fibres. The fibre optics must not be buckled or laid with a small radius. Buckled or bad laid fibre optics results to a strong decrease of performance. Avoid performance decreasing and failures caused by wear, by a functional mounting of the fibre optics.

Maintenance

Protect the fibre optic adaptor of the sensor and the optical fibres against pollution. If the fibre optic adapter is contaminated, clean with alcohol. Do not use aggressive solvents. Plastic optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

Safety regulations for Laser devices

By the installation, the going into operation and the application, it is necessary to take into consideration the valid rule EN 60825-1/-2 (Parts 12.5.1/12.6.2). Laser Class 2 without connected fibre optics. Do not stare into the beam!

General safety instructions

Series IRN-LTD-GFO-OP-S099/S253/S303: "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, single directive 1999/92/EC.

The sensor and the fibre optic meets the requirements of: 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 60825-1:2006, EN 60825-2:2004, 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.

EC-/EU-Declaration of conformity:

Types IRD: IECEx certification: Ex d [op is Ga] IIC T6 Gb, Ex tb [op is Da] IIIB T100°C Db IP67. Certification No. IECEx BVS 14.0108X.

Types IRD: ATEX certification: 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, Zertifizierungsstelle, Carl-Beyling-Haus, Dinendahlstrasse 9, D-44809 Bochum, Kennnummer: 0158.

Types IRN: ATEX certification: 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. ATEX declaration by manufacturer in accordance to the ATEX directive 2014/34/EU.

Types IRO: ATEX certification: II (3)G [Ex op is IIB T4 Gc]. ATEX declaration by manufacturer in accordance to 2014/34/EU.

ATEX certification of quality type production of Ex devices in accordance to the ATEX 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:

Pablo Ledergerber, Matrix Elektronik AG

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