

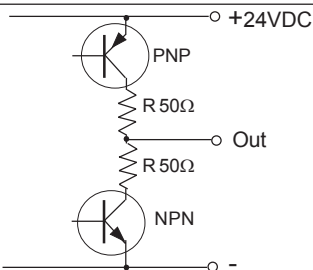
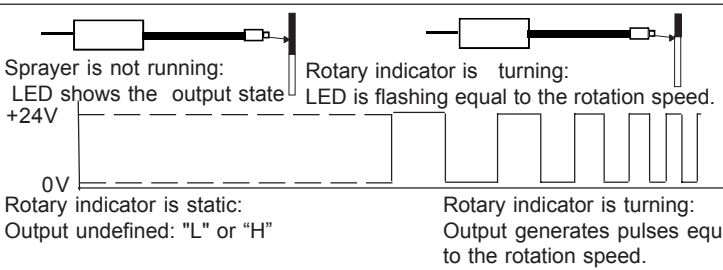

**Original Operating Manual:**
**Rotation Speed Control Sensor type IRD-TDZ-LWL-OP**


IECEx BVS 14.0108X


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

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

- ATEX and IECEx certification
- For use in Ex Zones (0), 1, 2, (20), 21, 22, optical radiation can operate into Ex Zones 0, 20
- Well applicable with plastic fibre optics
- Laser-emitter, red light 650nm
- Speed control up to 100'000 RPM (At 4 pulses / round)
- Robust sensor for industrial applications

Type	IRD-TDZ-LWL-OP
<b>Technical data</b>	
Type of Ex protection Gas, directive 2014/34/EU	II 2(1)G Ex db [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, (20), 21, 22
Maximum optical radiant power	≤15mW
Maximum optical radiant intensity	≤5mW/mm <sup>2</sup>
Light source	Laser class II, 650nm visible red, P <sub>o</sub> ≤ 1mW
Switching frequency	0,01kHz - 10kHz <sup>Note1</sup>
Rise time	≤ 2µs
Power up delay time	2sec
Supply voltage	24VDC ±10%
Absolute maximum input voltage U <sub>m</sub>	30VDC
Current consumption	60mA
Power dissipation	maximum 1.6W
Output	1 x Push-Pull, short circuit protected, maximum 10mA
Output impedance	max.50Ω
Utilization category, EN 60947-5-1	DC13
Housing	M30, brass, nickel plated
Enclosure rating, EN 60529	IP67
Ambient working temperature range T <sub>amb</sub>	0°C up to +50°C
Storage temperature range	-30°C ... +70°C
Relative humidity	15% ... 80%, non-condensing
Vibration and shock resistance	Vibration: 30g over 20Hz to 2kHz. Shock: 100g for 3ms
Pollution degree, EN 60664-1:2007	4
Device designation, EN 60947-5-2	D3A30AP1
Connection cable	3 + PE x 0.5mm <sup>2</sup> , TPU, shielded, halogen free, LABS-free leads numbering marked, for drag chaining, length: 3m
Accessories, included	- 2x nuts M30 (or optional 1 clamp)
Accessories, not included	- Q-FSMA-KT POF- quick connectors (PHOENIX) - POF, Multi- or single fibres; D2.2mm/1mm
Options	- Cable length: Up to 100m, on request
Output Function:	 <p>                     Sprayer is not running: LED shows the output state                      Rotary indicator is turning: LED is flashing equal to the rotation speed.                 </p>  <p>                     Rotary indicator is static: Output undefined: "L" or "H"                      Rotary indicator is turning: Output generates pulses equal to the rotation speed.                 </p>
Wiring:	 <p>                     1 +24VDC                      2 0V                      3 Output                      green-yellow PE/PA                      white Cable shield                 </p>

IRD-TDZ-LWL-OP-IECEX\_e2/2022-04-12/MP

**Ex related designation of the devices**

Type IRD-TDZ-LWL-OP

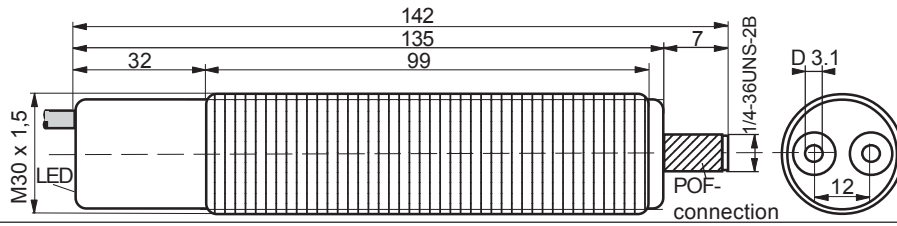
 ATEX EC-type Certification  
 IECEx Certification  
 T<sub>amb</sub>: 0°C up to +50°C  
 Date of production:

 CE 1258 Manufacturer with address  
 II 2(1)G Ex db [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  
 No: IECEx 14.0108X  
 Electrical data according to the chart  
 Numerals 5 to 8 of the serial number (year/calendar week)

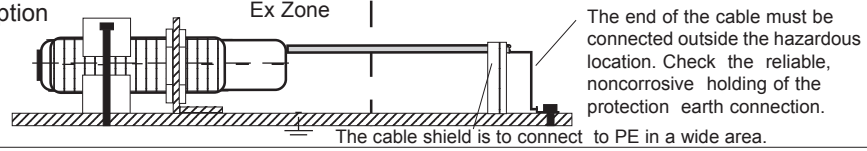
(X designation of the certification number: Fibre optics must only be applied with sensors with certificated limited optical power)

Note 1: The real reachable switching/rotary frequency is dependent on the condition of the marking disc, for 2x4 sections and the careful working up of the optical fibres. At normal conditions approximative 100'000 RPM.

Dimensions:



Equipotential bonding prescription for Ex devices:



Operating Manual, EC-/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  $U_m=30VDC$  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.

Type IRD-TDZ-LWL-OP: Only 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.

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 rotation speed detection

Light reflection alterations, generated by the turning marking disc of the spraying apparatus, will be amplified and formed.

Using the fibre optics

WARNING: The knurled nut for the POF fixation must only be screwed strong with fitted POF! The O/E Converter must not go into operation without mounted fibre optics. The fibre optics must be handled careful. For cutting the fibre optics the special cutter or a professional tool is to use. After cutting the fibres, push them well set into the adaptor and fasten the knurled nut. The maximum length of fibre optics is dependent on type and fitting of the POF. 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. Please set up the protection caps if no optical fibres are connected. 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 informations to hot housing surface



At a ambient temperature of  $+50^{\circ}C$ , the self-heating DT of the sensor can reach 20K. Disconnect the sensor from power supply and let him cooling before touching.

Safety regulations for Laser devices class 2



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

The sensors must not be used for fails-safe applications! In worst case the output can change to any state! Do not turn much too often the potentiometer axis! 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 sensors are conform to the following directives and standards:

IEC/EN 60079-0:2012 + A11:2013, IEC/EN 60079-1:2014, IEC/EN 60079-28:2015, IEC/EN 60079-31:2014, 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

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

ATEX certification: II 2(1)G Ex db [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 certification of quality type production of Ex devices according to the ATEX directive 2014/34/EU, CE 1258, Eurofins. Certification No: SEV 21 ATEX 4580. 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:

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