ISO 9001:2008 ATEX

Multifunction O/E Converter PSN-TDN-NG1-OP

Housing M18

- Function selectable between dynamic rotation speed detection, with plausibility observation and as static proximity switch for needle detection
- Simple connection of synthetic fibre optics (POF) without special tools
- Rotational speed detection up to 100'000 RPM (At 4 pulses / round)
- Short response time and very high sensitivity as proximity switch
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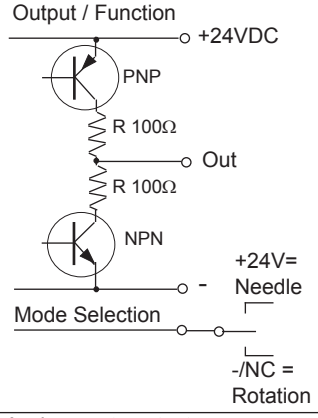
- Applicable in Ex Zones 2 and 22. Optical radiation can operate into hazardous locations 1, 21
- Visible LED, red 660nm

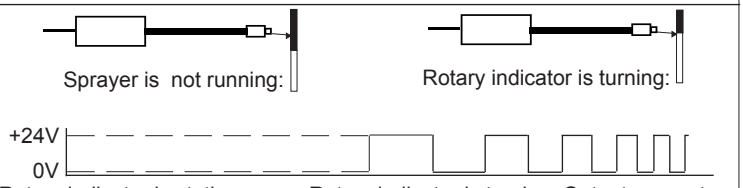
II 3(2)G Ex nA [op is Gb] IIB T4 Gc
II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67

Technical Data / Type	PSN-TDN-NG1-OP / E 3401 0038
ATEX, type of Ex protection Gas, at 2014/34/EU	II 3(2)G Ex nA [op is Gb] IIB T4 Gc
ATEX, type of Ex protection Dust, at 2014/34/EU	II 3(2)D Ex tc [op is Db] IIIA T135°C Dc IP67
Applicable in ATEX Ex Zones	Zones (1), 2 and (21), 22. The limited optical radiation can operate into hazardous locations 1 or 21
LED	660nm red, Pf <= 1mW, current stabilized
Maximum radiant power	<1mW
Maximum radiant intensity	<= 1mW/mm²
Frequency , rotation speed detection	0.01 - 10kHz
Output rise and fall time	<= 1us
Voltage supply	24 VDC +- 10%
Absolute maximum supply voltage Um	Um = 30VDC
Maximum consumption	20mA
Maximum power dissipation at TA=50°C	0.6W
Output	1 x Push-Pull, short circuit protected, maximum 10mA
Output impedance	maximum 150Ω
Input	1 x Mode selection, PNP compatible
Housing	M18, yellow brass, nickel plated
Enclosure rating at EN 60529	IP 67 (with fitted POF and fitted cable connector)
Vibration and shock resistance	Vibration: 30g over 20Hz to 2kHz. Shock: 100g for 3ms
Ambient operating temperature range Tamb	0°C < Tamb < +50°C
Storage temperature range	-30°C ... +80°C
Relative humidity	15% ... 90%, noncondensing
Pollution degree, at EN 60664-1	4
Device designation, at EN 60947-5-2	R3A18CS2
Sensor socket	Lumberg, M12 male receptacle, type RSF 5, 5 contacts
Fibre optics fitting	Screwed connection, without additional parts or special tools
Tightening torque for the fibre optics fixing screw	0.8Nm .. 1.5Nm
Length of fibre optics (Diameter 2.2/1mm)	Dependent on type and fitting of the POF
Accessories included	- 2x nuts M18 - 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 optional	- Single ended cordset, Lumberg M12/5P straight type: RKTS 5-298/..M or right angle type: RKWTH 5-298/..M
ATEX related designation	CE 0158 Manufacturer with address Ex 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 Test report: BVS PP 10-2233 EG(BVS 10 ATEX E130X) Tamb: 0°C < Tamb < +50°C Declaration by manufacturer at 2014/34/EU Device type: PSN-TDN-NG1-OP Electrical data according to the chart Date of production: Numerals 5 to 8 of the serial number (Year/Week)

Output / Function



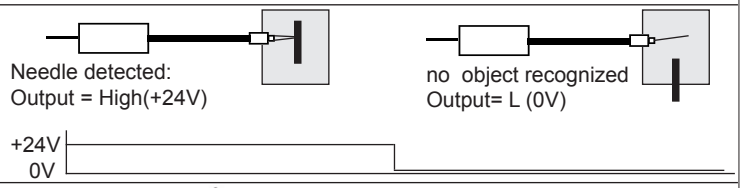
Mode Selection= 0V or not connected



Rotary indicator is static:
Output undefined: „L“ or “H”

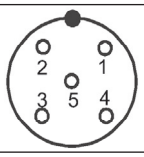
Rotary indicator is turning: Output generates pulses equal to the rotation speed

Mode Selection= +24V



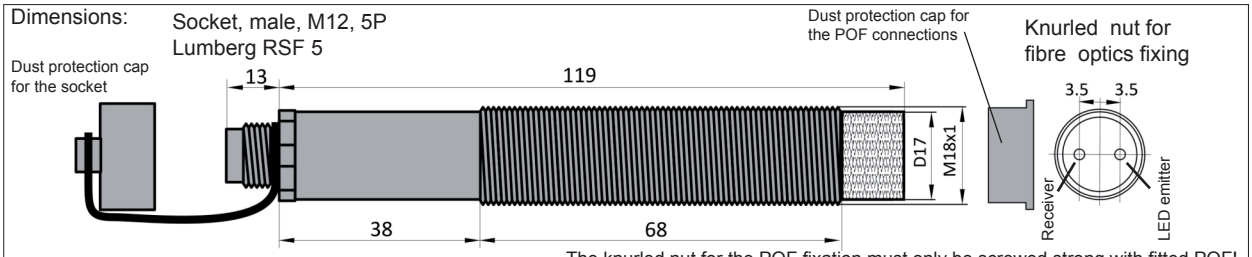
Assignment contacts

Socket M12
Lumberg RSF 5
IP67
5 terminals



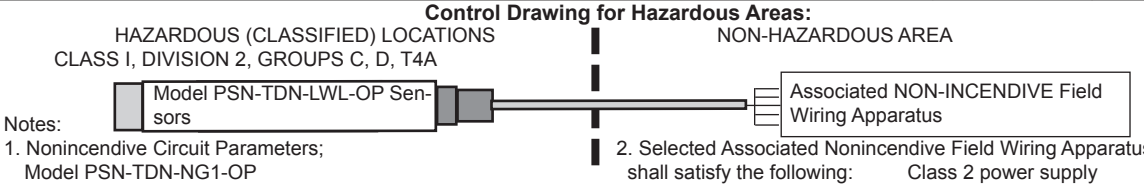
1:	+24VDC
2:	Input Mode Selection
3:	0V
4:	Output
5:	Protection Earth PE

Dimensions:



The knurled nut for the POF fixation must only be screwed strong with fitted POF!

Control Drawing for Hazardous Areas:



Notes:

1. Nonincendive Circuit Parameters;
   Model PSN-TDN-NG1-OP

Vmax	=	30VDC	Voc	=	30VDC
Imax	=	20mA	Isc	=	20mA
Ci	=	0	Ca	=	0
Li	=	0	La	=	0
Pi	=	550mW			

2. Selected Associated Nonincendive Field Wiring Apparatus

shall satisfy the following:		Class 2 power supply
Associated Nonincendive Field Wiring Apparatus		Model PSN-TDN-NG1-OP
Voc	<=	Vmax
Isc	<=	Imax
Ca	>=	Ci + Ccable
La	>=	Li + Lcable
Vmax	>=	Voc
Imax	>=	Isc
Ci + Ccable	<=	Ca
Li + Lcable	<=	La

3. If the electrical parameters of the cable are unknown, the following values shall be used:
   Capacitance: 60pF / ft, Inductive: 0.70uH / ft

4. Power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods - Article 510 - 4(b) of the NEC/NFPA 70or as specified in Section 18-152 for installation within Canada and in accordance with the authority having jurisdiction.

Operating Manual / EU - Declaration of Conformity:

INSTALLATION INSTRUCTIONS FOR HAZARDOUS LOCATIONS:
A. „WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2“
B: „WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCATIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MODULES.“
C. „WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.
Provides nonincendive field circuits when installed per the installation instructions. The local equipotential bonding have to be done. The PE/PA connection (terminal 5 of the cordset) and the cable shield must be connected reliable and noncorrosive to PE. The PE terminal and the socket are solid connected to the housing. ONLY Lumberg cordsets RKTS 5-298/..M (Straight type) or RKWTH 5-298/..M (Right angle type) are allowed. 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. Other then original manufacturer, additional optical components are not allowed in hazardous locations. 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. In dusty locations, the protection cap for the optical connection and for the socket must be fitted, when the connection cable or the POF‘s are NOT connected.

Additional installation instruction only for ATEX applications:
The O/E-Converter Type PSN-TDN-LWL-OP is only applicable in the Ex Zones 2 and 22. The limited optical radiation can operate into hazardous locations 1, 2, 21, 22 over certificated fibre optics. It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The maximum rated input voltage Um = 30VDC must not be exceeded.

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 must be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables. The O/E converters should be mounted stable and thermal conductive.

Function rotation speed detection:
(Mode Selection = 0V)
Light reflection alterations, generated by the turning marking disc of the spraying apparatus, will be amplified and formed.

Function needle detection: (Mode Selection = +24V)
Is the needle positioned in front of the fibre optic, the laser light will be reflected and the output switches to ON (+24V).
If no needle is recognized the output switches to OFF (0V).

Using the fibre optics
WARNING: The knurled nut for the POF fixation must only be screwed strong with fitted POF! The O/E Converter PSN-TDN-LWL-OP 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 knuckled 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°C, the self-heating DT of the sensor can reach 10K. Disconnect the sensor from power supply and let him cooling before touching.
Do not stare into the beam!

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 NON-HAZARDOUS“. 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 are conform to the following standards: EN 60079-0:2009, EN 60079-15:2010, EN 60079-28:2007, EN 60079-31:2010, EN 60825-1:2006, EN 60825-2:2004, EN 61000-6-1/-2, EN 61000-6-3/4, EN 60529:2000, ATEX directive: 2014/34/EU, 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.

EU-Declaration of Conformity
ATEX Declaration of conformity by manufacturer at 2014/34/EU. ATEX Test Report: BVS PP 10-2233 EG, BVS 10 ATEX E 130 X. ATEX certification of quality type production of Ex devices at the directive 2014/34/EU, CE 0158. Certification No: BVS 12 ATEX ZQS / E118, QAR No. DE/BVS/QAR13.0004/01. The conformity of the devices with the EC standards and directives and the observation of the Quality Safety System ISO 9001:2008 with the ATEX module „Production“, declares:

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