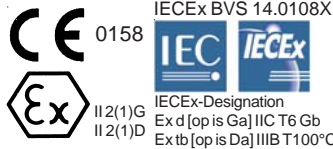
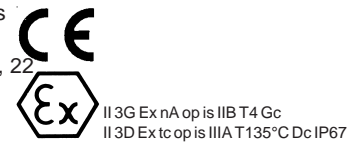


Original Operating Manual:
Speed Control Sensors PSS/PSN/PSD-LTD-OP-S173 / PSD-LTD-OP-S173-V2-DCI
PSD-LTD-OP-S173 / PSD-LTD-OP-S173-V2-DCI Housing M18
PSN-LTD-GD-S173


- Well applicable with plastic and glass fibre optics
- Laser-emitter, red light 650nm
- Type PSD: For use in Ex Zones (0), 1, 2, (20), 21, 22
- Type PSN: For use in Ex Zones 2, 22
- Speed control up to 100'000 RPM
- Wide temperature range: -30°C up to +50°C



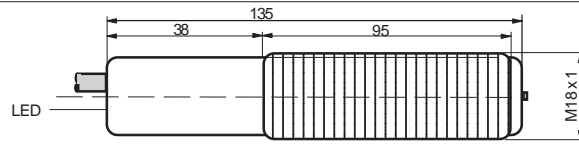
Technical Data	Type	PSS-LTD-S173	PSN-LTD-OP-S173	PSD-LTD-OP-S173
Type of Ex protection Gas, according to 2014/34/EU		None	II 3G Ex nA op is IIB T4 Gc	II 2(1)G Ex d [op is Ga] IIC T6 Gb
Type of Ex protection Dust, according to 2014/34/EU		None	II 3D Extc op is IIIA T135°C Dc IP67	II 2(1)D Extb [op is Da] IIIB T100°C Db IP67
For use in Ex Zones		--	2, 22	(0), 1, 2, (20), 21, 22
Laser class		Class II, 650nm visible red, Po <= 1mW, radiant power stabilized		
Switching frequency		3Hz - 10kHz ^{Note 1}		
Rise/fall time		<= 20us		
Speed measurement accuracy		+0.5%		
Supply voltage		24VDC +-10%		
Absolute maximum input voltage Um		30VDC		
Current consumption		44mA		
Power dissipation		maximum 1.3W		
Power up delay time		10 seconds		
Output		1 x Push-Pull, short circuit protected, maximum 50mA		
Output impedance		max.30Ω		
External potentiometer, only PSD-LTD-OP-S173		nominal 500kΩ (10kΩ to 500kΩ allowed)		
Ambient illumination		only for using in enclosed ambients		
Housing		M18, brass, nickel plated		
Enclosure rating, according to EN 60529		IP 65	IP 67	
Vibration and shock resistance		Vibration: 30g over 20Hz to 2kHz. Shock: 100g for 3ms		
Ambient working temperature range Ta		-10°C < Ta < +50°C	-30°C < Ta < +50°C ^{Note 2}	
PSN/PSD-LTD-OP-S173, connection cable		4 x AWG24 (0.2mm ²), shielded, core insulation: Semi-Rigid-PVC, Jacket: Special-PVC, Length = 3m		
PSD-LTD-OP-S173-V2-DCI, cable		IEEE 802.3 Transceiver Cable, PVC/PP, 4 pairs, 3 x AWG28 + 1 x AWG24, shielded, L=0.4m (0.3m + 0.1m)		
PSS-LTD-S173, connection cable		4 x AWG24 (0.2mm ²), shielded, Jacket: PVC, Length = 3m		
Cable, minimum bending radius		75mm		
Socket, type: PSS-LTD S173/S99		Socket, M12 5 terminals	not available	
Optical fibre connection		M18 connection, system Matrix		
Options		- PSS-LTD-S173/S99: Male connector M12, type Lumberg RSF 5 - PSD-LTD-OP-S173-V2-DCI: With external potentiometer		
Accessories, included all types		- 2x nuts M18		
Accessories, POF's, not included		- POF type: PE-M18-3000-1-T-4.6-2G3D - POF type: PE-M18-3000-1-T-6.1-2G3D		
Accessory POF adapter, not included		- M18 fast fixing adapter for POF Type: POFAD18-2.2-6x8		
Accessories, PSS-LTD-S99 not included		- Single ended cordset, straight type: RKTS 5-298/xx or right angle type: RKWTH 5-298/xx, Lumberg M12/5P		
Output / Function:		<p>Rotary indicator is static: Output: Holds "L"</p>	<p>Rotary indicator is turning: Output generates pulses equal to the rotation speed.</p>	

Note 1: The real reachable switching/rotary frequency is dependent on the condition and the partition of the marking disc and the type, the working condition and the length of the optical fibres.

Note 2: Temperature range: Cable static: -30°C to +50°C. Cable dynamic: -15°C to +50°C

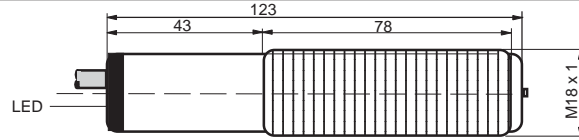
ATEX/IECEx RELATED MARKINGS CE 0158 T_{amb}: -30°C < T_{amb} < +50°C Manufacturer with address
 Type PSD: II 2(1)G Ex d [op is Ga] IIC T6 Gb, II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67 EC-Certification No. BVS 10 ATEX E130 X DEKRA
 Type PSN: II 3G Ex nA op is IIB T4 Gc, II 3D Ex tc op is IIIA T135°C Dc IP67 IECEx Certification No. IECEx BVS 14.0108X
 Electrical data according to the chart 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 applied with sensors with certificated limited optical power)

Dimensions
PSD-LTD-OP-S173
PSN-LTD-OP-S173:



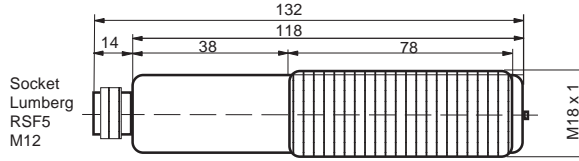
Connection layout:
brown +24VDC
black 0V
red Output
orange PE
white Cable shield

Dimensions
PSS-LTD-S173:



Connection layout:
brown +24VDC
black 0V
red Output
orange PE
white Cable shield

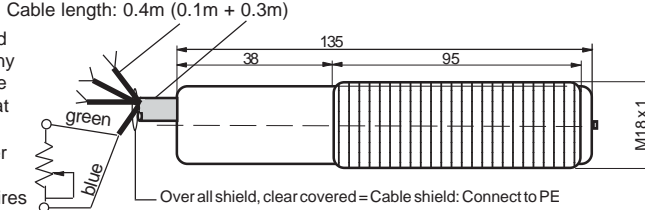
Dimensions
PSS-LTD-S173/S99:



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

Dimensions PSD-LTD-OP-S173-V2-DCI:

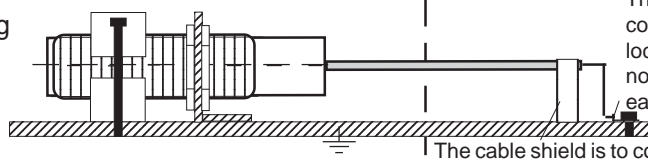
Do not connect the internal shieldings and the tracing wire at any potential! Connect the outside cable shield at PE.
External potentiometer 500kΩ.
Do not connect the wires to other potentials.



Connection layout:
Cable 1:
red +24VDC
black 0V
grey Output
white 0V
yellow PE
orange PE
blank Cable shielding
blue Ext. Pot A
green Ext. Pot B

Do not connect the shield of this pair to any potential

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 / EU-Declaration of Conformity:

Ex Protection:

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The absolute maximum input voltage $U_m=30VDC$ must not be exceeded. The local equipotential bonding have to be done reliable and noncorrosive. The protective earth (PE) is solid connected with the housing. Other than original manufacturer, additional optical components are not allowed in hazardous locations. 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. Inside hazardous locations only use certificated Ex housings. All cable terminals must be connected outside hazardous locations.

Types: PSD-LTD-OP-S173 & PSD-LTD-OP-S173-V2-DCI: For use in Ex zones 1, 2, 21, 22. The limited optical radiation can operate into hazardous locations 0 or 20.

Type: PSN-LTD-OP-S173: Only for use in Ex zones 2 and 22.

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

Potentiometer, only type PSD-LTD-OP-S173-V2-DCI

Use the potentiometer to adjust the sensor at different marking discs, POF and mechanical arrangements. Set the potentiometer as well, that the output signal will be free of failures over the operating range. The potentiometer has a nominal rating of 500kR. (Do not exceed 500kR). The internal cable shieldings and the the tracing wire must NOT be connected at any potential! Connect the outside cable shield at PE.

Potentiometer adjustment, only type PSD-LTD-OP-S173-V2-DCI

Turn the sensor potentiometer clockwise to the end. Set the sprayer rotation speed to 90 RPM. Adjust the potentiometer to an output signal free of failures. Increase to rotation speed of the sprayer to the maximum. The output signal must be free of failures at all times.

Using the fibre optics

The sensor PSS/PSN/PSD-LTD-(OP)-S173(-V2-DCI) must not go into operation without mounted fibre optics. The fibre optics must be handled careful. Do not use optical fibres longer than 10m. 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. If self-conditioned POFs are using, a special cutter or an other professional tool must be used for cutting the POFs.

Maintenance

Protect the fibre optic adaptor of the sensor and the optical fibres against pollution. If the fibre optic or the sensor are 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 class 2

The sensors types PS*-LTD-** must not go into operation without mounted fibre optics. By the installation, the going into operation and the application, it is necessary to take into consideration the valid rule EN 60825 (Parts 12.5.1/12.6.1). Warning! Without mounted fibre optics the optical power reach Laser Class 2. Do not stare into the beam! With mounted fibre optics no safety measures are needed.

Safety Informations

The sensor PSS/PSN/PSD-LTD-(OP)-S173(-V2-DCI) must not be used for fail-safe applications! 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/EG

The sensors 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 PSD: Ex d [op is Ga] IIC T6 Gb, Ex tb [op is Da] IIIB T100°C Db IP67. Certification No. IECEX BVS 14.0108X.

<http://iecec.iec.ch/iececweb.nst0/FE79714C0BAEF6F5C1257D7E0044F6A9?opendocument>

ATEX certification, types PSD: 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, Kennnummer: 0158.

ATEX certification, types PSN: II 3G Ex nA op is IIB T4 Gc, II 3D Ex tc op is IIIA T135°C Dc IP67. 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 0158. Certification No: BVS 15 ATEX ZQS / E118, QAR No. DE/BVS/QAR13.0004/01. 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

PSD-LTD-OP-S173-IECEX_e2/2018-10-03/HB

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