

## Rotation Speed Control Sensors series RSS/RSN/RSD-LTD

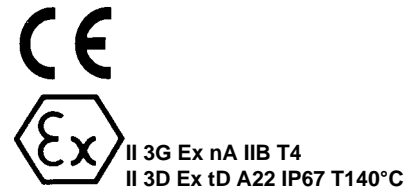
RSD-LTD-GD

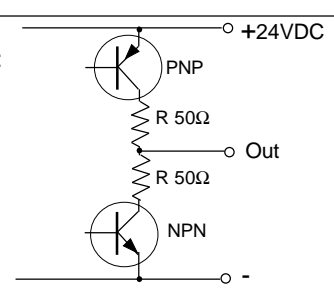
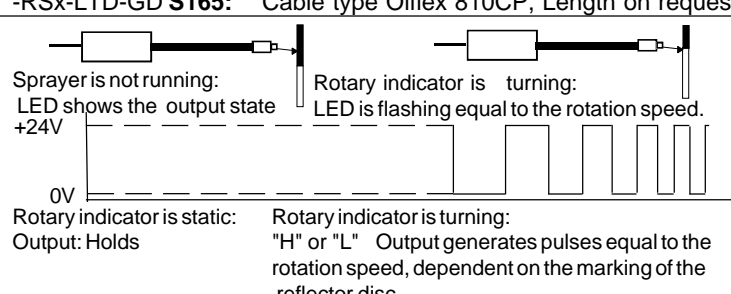
Housing M30

RSN-LTD-GD



- Well applicable with plastic fibre optics (POF)
- Laser-emitter, red light 650nm
- Type RSD: applicable in Ex Zones 1, 2, 20/21, 22
- Type RSN: applicable in Ex Zones 2, 22
- Speed control up to 100'000 RPM
- Very high reliability (EMC)



Technical data	Type	RSS-LTD	RSN-LTD-GD	RSD-LTD-GD
Type of Ex protection, Gas, at 94/9/EG		None	II 3G Ex nA IIB T4	II 2G Ex d IIC T6
Type of Ex protection, Dust, at 94/9/EG		None	II 3D Ex tD A22 IP67 T140°C	II 1/2D Ex tD A20/A21 IP67 T90°C
Applicable in Ex Zones		--	Zones 2 and 22	Zones 1, 2, 20/21, 22
Laser class		Class II, 650nm visible red, Po <= 1mW		
Switching frequency		0,1kHz - 10kHz <sup>Note1</sup>		
Output signal, rise time		<= 2us		
Supply voltage		24VDC (20 to 28VDC)		
Absolute maximum input voltage Um		30VDC		
Current consumption		50mA		
Power dissipation		maximum 1.3W		
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 67	IP 67
Working temperature range T <sub>Amb</sub>		0°C < T <sub>Amb</sub> < +50°C		
Electrical connection, RSD-LTD-GD, cable		4+PE x 0,5mm <sup>2</sup> , PUR, shielded, leads numbering marked, L=10m		
Electrical connection, RSS/RSN-LTD-(GD)		4+PE x 0,5mm <sup>2</sup> , PUR, shielded, leads numbering marked, L=3m		
Socket, RSS/RSN-LTD-(GD) S99		Socket, M12, 5 terminals, Lumberg RSF 5		
POF connection		Matched for POF, Cover: 2.2mm / Core: 1.0mm, without special tools		
Accessories included, all types		- 2x Nuts M30 - 2x Protection caps for the POF connections		
Accessories included, only RSN-LTD-GD S99		- 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, only RSS/ RSN-LTD-(GD S99) not included		- Cord Set Lumberg RKTS 5-298/xx (straight type), or - RKWTH 5-298/xx (right angle type)		
Accessories for all types, not included		- Different types of POF, on request		
Options		-RSx-LTD-GD <b>S158</b> : Current loop output, 4mA to 20mA, PNP type -RSD-LTD-GD <b>S98</b> : Special cable type Ölflex 810CP, L=20m -RSS/RSN-LTD <b>S99</b> : Socket M12: Lumberg RSF 5, 5 terminals -RSD-LTD-GD <b>S136</b> : Special cable type Ölflex 810CP, L=15m -RSx-LTD-GD <b>S150</b> : Reduced sensitivity -RSx-LTD-GD <b>S165</b> : Cable type Ölflex 810CP, Length on request		
Output Function:		 <p>Sprayer is not running: LED shows the output state +24V</p> <p>Rotary indicator is turning: LED is flashing equal to the rotation speed.</p> <p>Rotary indicator is static: Output: Holds</p> <p>Rotary indicator is turning: "H" or "L" Output generates pulses equal to the rotation speed, dependent on the marking of the reflector disc</p>		

RSx-LTD\_DMT99\_e5/2011-09-27/HB

ATEX related designations:

CE 0158

Type RSD-...-GD:



Manufacturer with address  
II 2G Ex d IIC T6, II 1/2D Ex tD A20/A21 IP67 T90°C

Type RSN-...-GD:



II 3G Ex nA IIB T4, II 1/2D Ex tD A22 IP67 T140°C

T<sub>Amb</sub>: 0°C < T<sub>Amb</sub> < +50°C

Date of production: Numerals 5 to 8 of the serial number (Year/Week)

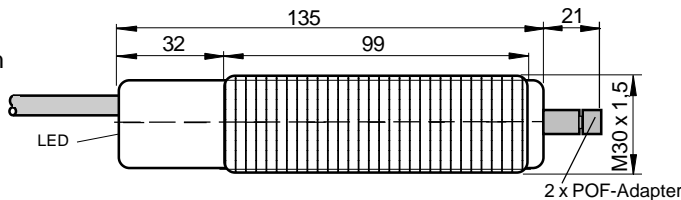
Electrical data according to the chart

EC certification number: DMT 99 ATEX E056 DEKRA

Declaration by manufacturer at 94/9/EC

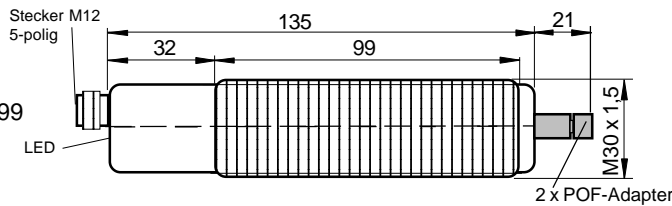
Note 1: The real reachable switching/rotary frequency is dependent on the condition and type of the marking disc (2 or 4 sectioning) and the careful working up of the optical fibres.

Dimensions  
Wiring diagram  
RS.-LTD-GD:



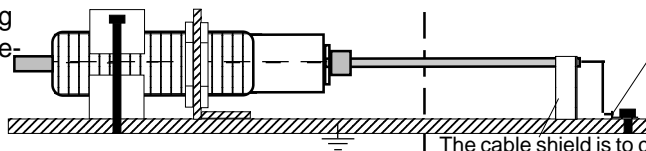
Connection layout: RS.-LTD-GD  
1 +24VDC  
2 0V  
3 Output  
white Cable shield  
yellow-green PE

Dimensions  
Wiring diagram  
RSS-LTD S99:  
RSN-LTD-GD S99



Connection layout:  
RSS/RSN-LTD(-GD) S99:  
1/brown +24VDC  
2/white NC  
3/blue 0V  
4/black Output  
5/grey PE

Equipotential Bonding  
prescription for Ex de-  
vices:



The end of the cable must be connected outside the hazardous location. Check the reliable, noncorrosive holding of the protection earth connection.

### Operating Manual and EC - 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  $U_m=30VDC$  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 EExe 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: RSD-LTD-GD:** Applicable in Ex zones 1, 2 and 20/21, 22. For the zones 20/21 only the front part (optical lens) can be mounted inside the zone 20. The rear part with the cable must be in the zone 21.

**Type: RSN-LTD-GD:** Only applicable in Ex zones 2 and 22.

**Type: RSN-LTD-GD S99:** Only applicable in Ex zones 2 and 22. 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.

#### 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.

#### Using the fibre optics

The sensor RSx-LTD 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. Do not use optical fibres longer than 5m. 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

The sensors types RSx-LTD must not go into operation without mounted fibre optics. Without mounted fibre optics the laser power can increase class 2. By the installation, the going into operation and the application, it is necessary to take into consideration the valid rule EN 60825 (Parts 12.5.1/12.6.2). 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.

#### General safety instructions

Series RSN: "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 FOR 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, ATEX 118a, single directive 1999/92/EC.

The sensor and the fibre optic are conform to the following standards:

EN 60079-0:2004, EN 60079-1:2004, EN 60079-15:2006-05, EN 60241-0:2004, EN 61241-1:2004; EN 60529:2000, EN 60950-1:2006; EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4. Ex protection: 94/9/EC. Machine directive: 2006/42/EC. EMC: 2004/108/EC.

RoHS: 2002/95/EG.

#### 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-Declaration of conformity

Model RSD: EC-Certification No. BVS 10 ATEX E 130 X. DEKRA. Model RSN: ATEX declaration by manufacturer at 94/9/EC ATEX certification of quality type production of Ex devices at the directive 94/9/EC, CE 0158. Certification No: BVS 03 ATEX ZQS / E 118. 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

RSx-LTD\_DMT99\_e5/2011-09-27/HB

Tippekemper - Matrix GmbH  
Meegerer Str. 43 D-51491 Overath  
Tel.: +49 2206 9566-0 Fax -19  
info@tippekemper-matrix.com

Matrix Elektronik AG (Manufacturer)  
Kirchweg 24 CH-5420 Ehrendingen  
Tel.: +41 56 20400-20 Fax -29  
info@matrix-elektronik.com