

# Data Processing Receiver Type FRN-FO-LWL for ZHM 01/2

## Housing M18

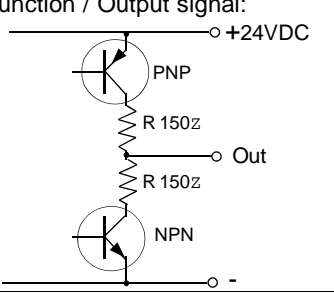
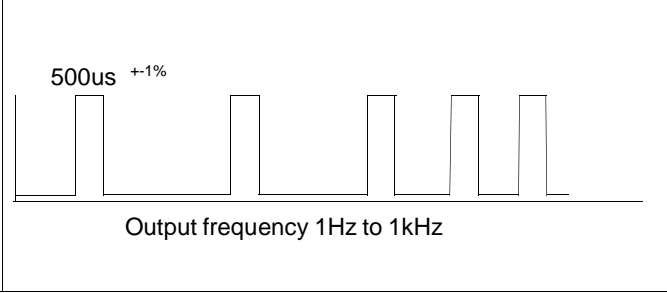
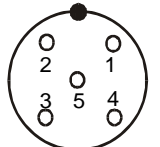


RECOGNIZED BY UNDERWRITER'S LABORATORIES INC. ONLY AS TO NON-SPARKING SAFETY FOR USE IN CL I, DIVISION 2, GR CD, T4A  
File No.E300158

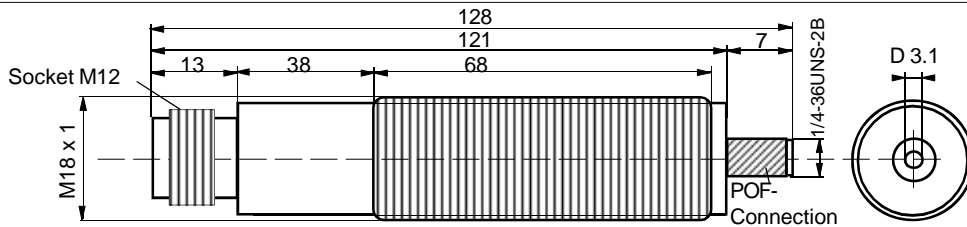
- Applicable as data processing unit at gear pump rate of flow indicators type FOP 60/01-CT-CX
- Simple connection of synthetic fibre optics without special tools
- Applicable in CL. I, Division 2, Groups C and D Hazardous Locations
- Applicable in Ex Zone 2



II 3 G Ex nA IIB T4 Gc

Type	FRN-FO-LWL
<b>Technical Data</b>	
Housing	M18
Number of receivers	1
For data processing at	Flow indicators type FOP 60/01-CT-CX
Applicable in Hazardous Locations	CL I, Division 2, GRP CD
Type of Ex protection Gas, at 94/9/EG	II 3 G Ex nA IIB T4 Gc
Applicable in Ex zones	Zone 2
Frequency range	0.5Hz to 1200Hz
Minimum optical input power	$\geq 0.2\mu\text{W}$ (LWL, L:10m, D:1mm; pulse with $\geq 10\mu\text{s}$ )
Supply voltage	24 VDC ( 20 to 28VDC)
Absolute maximum supply voltage $U_m$	$U_m = 30\text{VDC}$
Current consumption	25mA
Maximum power dissipation	0.7W
Output	Push-Pull, 10mA
Output impedance	max.150 $\Omega$ , RL: 1500 $\Omega$ to 10k $\Omega$
Fault indication outputs	not implemented
Housing, brass Ms 58, nickel plated	M18, 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 $T_{amb}$	$-20^\circ\text{C} < T_{amb} < +50^\circ\text{C}$
Electrical connection	Socket M12, 5 terminals, IP67, type Lumberg RSF 5
POF fitting	POF-connection for PHOENIX Q-FSMA connectors (Phoenix Article-No.: 18 85 99 4)
Applicable POF's	Outside diameter: 2.2mm / Core diameter: 1mm
POF length	1m to 10m
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.
Accessories (not included)	- POF connector PHOENIX Q-FSMA, Article-No.: 18 85 99 4 - Cord set Lumberg 5 terminals RKTS 5-186/5-298/xx (straight type), or RKWTH 5-186/5-298/xx (right angle type)
Function / Output signal: 	
Connection layout: 	1/ brown +24VDC 2/ white NC 3/ blue 0V 4/ black Frequency output 5/ grey PE/PA
ATEX related designations	CE 0158 Device type: FRN-FO-LWL ATEX Declaration by manufacturer at 94/9/EC TA: $-20^\circ < T_{amb} < 50^\circ$ Date of construction: Numerals 5 to 8 of the serial number (Year/Week)
	Manufacturer with address II 3 G Ex nA IIB T4 Gc Electrical data according to the chart

**Dimensions:**



**Control Drawing for Hazardous Areas:**

HAZARDOUS (CLASSIFIED) LOCATIONS  
CLASS I, DIVISION 2, GROUPS C, D, T4A

NON-HAZARDOUS AREA



**Notes:**

1. Nonincendive Circuit Parameters;

Model ORN-G-SO-LWL

$V_{max} = 30VDC$   $V_{oc} = 30VDC$

$I_{max} = 25mA$   $I_{sc} = 25mA$

$C_i = 0$   $C_a = 0$

$L_i = 0$   $L_a = 0$

$P_i = 700mW$

2. Selected Associated Nonincendive Field Wiring Apparatus shall satisfy the following: Class 2 power supply

Associated Nonincendive Field Wiring Apparatus Model ORN-G-SO-LWL

$V_{oc} \leq V_{max}$

$I_{sc} \leq I_{max}$

$C_a \geq C_i + C_{cable}$

$L_a \geq L_i + L_{cable}$

$V_{max} \geq V_{oc}$

$I_{max} \geq I_{sc}$

$C_i + C_{cable} \leq C_a$

$L_i + L_{cable} \leq L_a$

3. If the electrical parameters of the cable are unknown, the following values shall be used:

Capacitance: 60pF / ft, Inductive: 0.70uH / ft

4. Nonincendive Field Wiring must be wise in accordance with 510.4B of the NEC/NFPA70 or as specified in Section 18-152 for installation within Canada and in accordance with the authority having jurisdiction.

**Operating Manual / EC - 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 5-186/xx, RKTS 5-298/..M (Straight type) RKWTH 5-186/xx, 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. 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.

**Additional installation instruction for ATEX applications:**

The data processing receiver Type FRN-FO-LWL is only applicable for the Ex zone 2. It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The maximum rated input voltage  $U_m = 30VDC$  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 should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables.

**Function**

The optical data processing units types FRN-FO-LWL are applicable with gear pump rate of flow indicators type FOP 60/01-CT-CX. The data receiver unit converts the optical input signals to an electrically output signal equivalent to the rate of flow, with a frequency of 1Hz to 1kHz. The output pulse width is constant 500us(+/-1%).

**Mounting the POF**

For mounting the POF a quick connector type Q-FSMA-KT (Phoenix No.: 1885994) will be required. (Not included in the package). POF specifications: Core diameter: 1mm, Cladding diameter: 2.2mm. Fix the connector Q-FSMA-KT at the data processing unit FRN-FO-LWL. Cut the POF with the special cutter carefully and push them

through the quick connector inside the optical receiver set. Rigid fasten the locking nut at the quick connector. Do not use optical fibres longer than 10m. The functional safety of the data receiver is given by the working up of the optical fibres. Specially near the sensor, 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 at the data receiver 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.

**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 NONHAZARDOUS". The data receiver 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, UL 508, UL1604, UL2279 Non-Sparking Safe Apparatus for use in CL I, Division 2, GRP CD, Hazardous (Classified) Locations.

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

UL 2279, UL 1604, UL 508, EN 60079-0:2009, EN 60079-15:2010, EN 60079-31:2010, EN 60529:2000; 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/EC.

**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.

**Declaration of Conformity**

Approval: UL-Recognized, File No. E300158.

ATEX: Declaration of conformity 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 /E118. The conformity of the devices with the UL and 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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