


## Original operating manual:

# Dual data processing receiver for flow indicators ZHM 01/2

Housing M18

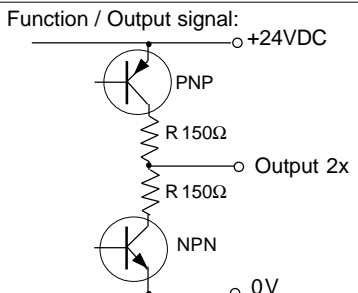
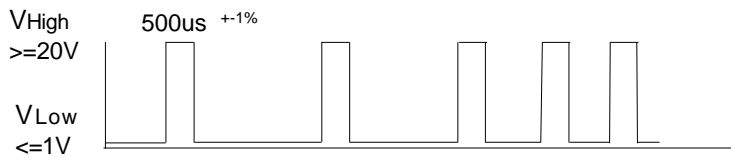
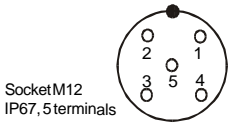

ORN-G-FO-LWL


  
 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

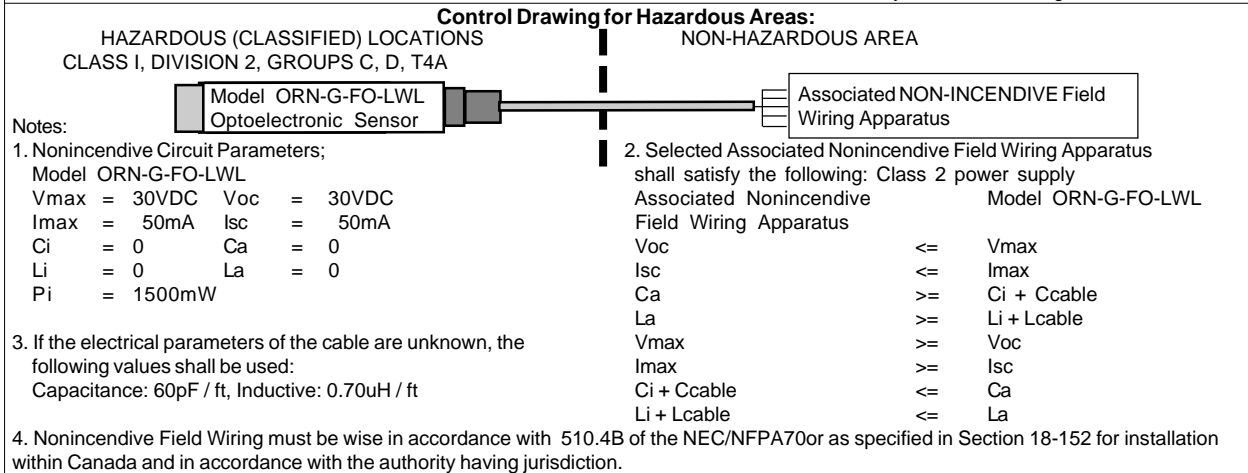
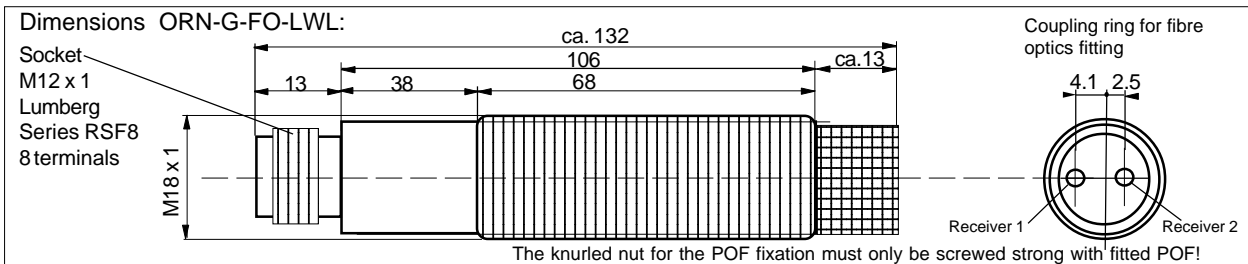
- Applicable as data processing unit at gear pump rate of flow indicators type FOP 60/01-CT-CX
- For data processing with optical inputs for fibre optics
- 2 independent receivers inside
- Simple connection of POF without special tools
- 2 x frequency outputs
- Applicable in CL. I, Division 2, GRP. CD and ATEX Ex Zone 2



II 3G Ex nA IIB T4 Gc

Technical data	Type	ORN-G-FO-LWL/E*****
ATEX, type of Ex protection Gas		II 3G Ex nA IIB T4 Gc, in accordance with 94/9/EC
ATEX, type of Ex protection Dust		none
Applicable in ATEX Ex Zones		Zone 2
Applicable in Hazardous Locations		CL I, Division 2, Groups CD
For data processing for		Flow indicators type FOP 60/01-CT-CX
Number of receivers		2
Input frequency range		0.5Hz up to 1200Hz
Minimum optical input power		$\geq 0.2\mu\text{W}$ (LWL, L:10m, D:1mm; pulse with $\geq 2\mu\text{s}$ )
Supply voltage		24VDC $\pm 10\%$
Absolute maximum supply voltage $U_m$		$U_m = 30\text{VDC}$
Maximum current consumption		50mA
Maximum power dissipation		1.85W
Output		2 x push-pull, short circuit protected, maximum 10mA
Output impedance		maximum 150 $\Omega$
External load resistance		RL: 1500 $\Omega$ to 10k $\Omega$
Inputs		2 x optical for synthetic fibre optics, 2.2mm, core 1mm
Housing		M18, yellow brass, nickel plated
Enclosure rating at EN 60529		IP 67 (with fitted POF and fitted cable connector)
Vibration and shock resistance		300m/s <sup>2</sup> , 10Hz to 55Hz, all directions, in accordance to EN 60947-5-2
Ambient operating temperature range $T_{amb}$		$-20^\circ\text{C} < T_{amb} < +60^\circ\text{C}$
Storage temperature range		$-20^\circ\text{C} \dots +70^\circ\text{C}$
Relative humidity		15% ... 90%, noncondensing
Pollution degree, at EN 60664-1		4
Device designation, at EN 60947-5-2		T3A18CS2
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 (Dia. 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
Function / Output signal: 		 <p>Output frequency 1Hz to 1kHz</p>
Connection layout: 		1 / brown: +24VDC 2 / white: Frequency output 2 3 / blue: 0V 4 / black: Frequency output 1 5 / grey: $\perp$ Protection earth PE/PA
ATEX related designations	CE Device type: ORN-G-FO-LWL ATEX Declaration by manufacturer in accordance with 94/9/EC $T_{amb}: -20^\circ < T_{amb} < 60^\circ$ Date of construction: Numerals 5 to 8 of the serial number (year / calendar week)	Manufacturer with address  II 3G Ex nA IIB T4 Gc Electrical data according to the chart

ORN-G-FO-LWL\_e1/2015-06-25/HB



**Operating Manual / 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 than 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 for ATEX applications:**  
 The data processing receiver Type ORN-G-AO-LWL is only for use in 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<sub>m</sub> = 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.  
**Function**  
 The optical data processing units types ORN-G-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%).  
**Using the fibre optics**  
**WARNING:** The knurled nut for the POF fixation must only be screwed strong with fitted POF! The fibre optics must be handled careful. For cutting the fibre optics, the special cutter or a professional tool is to use. The face of optical fibers must be completely even and free of scratches. After cutting the fibres, push them well set into the adaptor

and fasten the screws. The maximum length of fibre optics is dependent on type and fitting of the POF. 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 of the sensor and the optical fibres against pollution. Please set up the protection cap if no optical fibres are connected. If the fibre optic adaptor 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 warm housing surface**   
 The surface of the sensor can be warm, specially at a ambient temperature >= +50°C. Disconnect the sensor from power supply and let him cooling before touching.

**General Safety Informations**  
 The dismantling of the connector safety lock device while the supply voltage is connected is hazardous! The data receiver ORN-G-FO-LWL must not be used for Accident-Prevention! In worst case of disturbance, the outputs can show any state. When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations. UL 508, UL1604, UL2279 Non-Sparking Safe Apparatus for use in CL I, Division 2, GRP CD, Hazardous (Classified) Locations, EN 60079-14, RL 1999/92/EC.

The sensor and the fibre optic are conform to the following standards: UL 61010-1, ANSI/ISA 12.12.01-2013, UL 2279, UL 1604, UL 508, CAN/CSA C22.2 No. 213-M1987, EN 60079-0:2012 + A1:2013, EN 60079-15:2010, EN 61000-6-1/-2, EN 61000-6-3/4, EN 60529:2014, ATEX directive: 94/9/EC, Machine directive: 2006/42/EC, RoHS directive: 2011/65/EU, EMC directive: 2004/108/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.

**EC-Declaration of Conformity**  
 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 12 ATEX ZQS / E118 QAR No. DE/BVS/QAR13.0004/01. 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:

Hans Bracher, Matrix Elektronik AG

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