

Data Receiver for pressure sensors with current output 4 - 20mA

FRD-AO-LWL

Housing M30

FRN-AO-LWL

EEx d IIC T6
II 2 G, II 1/2 D IP67 T90°C

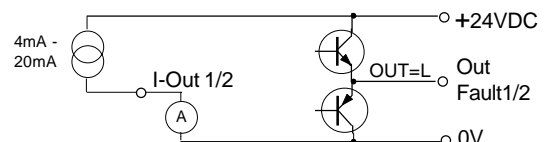
- for data processing with optical inputs for fibre optics
- 2 independent receivers inside
- simple connection of synthetic fibre optics
- short response time and very high sensitivity
- 2 x current outputs 4mA-20mA and
- 2 x fault indication outputs


EEx nA IIC T6
II 3 G

Technical Data	Type	FRS-AO-LWL	FRN-AO-LWL	FRD-AO-LWL
Type of protection		none	EEx nA IIC T6	EEx d IIC T6
Applicable for Ex zones		none	Zone 2	Zones 1 and 20/21
Category / Grouping		--	II 3 G	II 2G + II 1/2 D IP67
Number of receivers			2	
Response time			<= 5.5ms	
minimum pulse width at the inputs			>= 2us	
minimum optical input power			>= 0.2uW (LWL, L:10m, D:1mm; pulse with >=2us)	
Supply voltage			24 VDC (20 to 28VDC)	
Current consumption			70mA	
maximum power dissipation			1.96W	
Analog current outputs		2 x PNP-current outputs, 4mA to 20mA, short circuit protected		
Tolerance current output signal		2.5% at 4mA		
Fault indication outputs		2 x Push-Pull, short circuit protected, max. 20mA		
Inputs		2 x optical for synthetic fibre optics, 2.2mm, core 1mm		
Housing		M30, yellow brass, nickel plated		
Enclosure rating at EN 60529		IP54	IP65	IP67
Ambient operating temperature TA		-20°C < TA < +50°C		
electrical connection		Connector: Amphenol-Tuchel C164-433F-7P 2		Cable: 6+PE x 0,25mm ² + Shield / L=2m
Fibre optics fitting		screwed connection, screw thread: 1/4-36UNS-2B		
maximum length of fibre optics (Core=1mm)		10m		
Accessories included, all types		- 2x nuts M30		
Accessories included, only type FRN-..		- 1x Safety screw for locking the connector housing C164/717. The original screw must be exchanged by safety screw. - 1x Warning plate "Do not separate when supply voltage connected", self-sealing, for gluing on the cable connector		
Accessories optional (not included)		- Connector housing: Amphenol-Tuchel, No.: C164 639F 7S 20 - Connection set for fibre optics		
ATEX related designations		CE 0158 Device type Certification number: TA: -20° < TA < 50° Date of construction: Numeral 4 and 5 of the serial number		

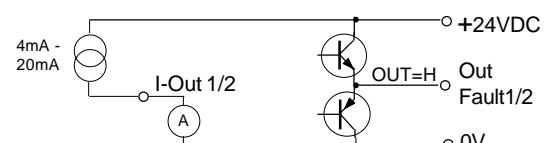
Function:
Pressure 0 - 25 Bar
Battery OK:
- Current out: 4mA to 20mA
- Fault out: Low

Current out 1 or 2 = 4mA-20mA Fault out 1 or 2 = 0V



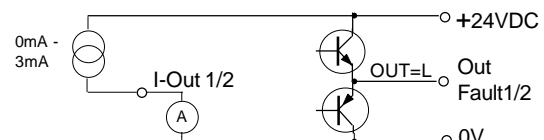
Pressure 0 - 25 Bar
Battery discharged:
- Current out: 4mA to 20mA
- Fault out: High

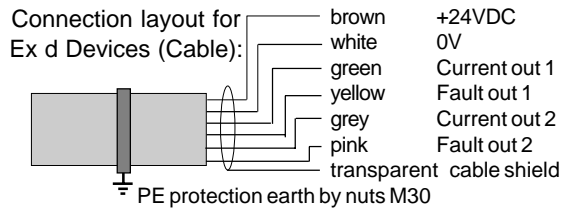
Current out 1 or 2 = 4mA-20mA Fault out 1 or 2 = +24V



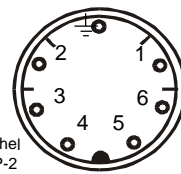
no optical input signal
or no fibre optic connected:
- Current out: < 3mA
- Fault out: Low

Current out 1 or 2 < 3mA Fault out 1 or 2 = 0V





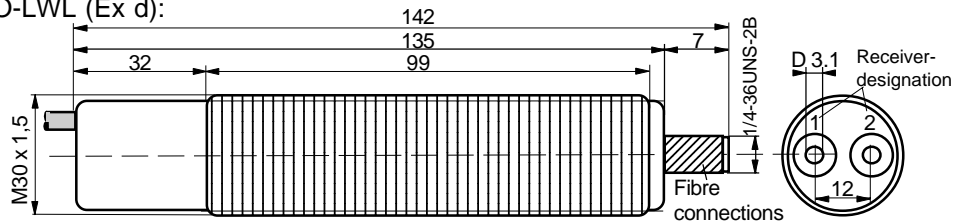
Connection for Ex n devices (Connector):



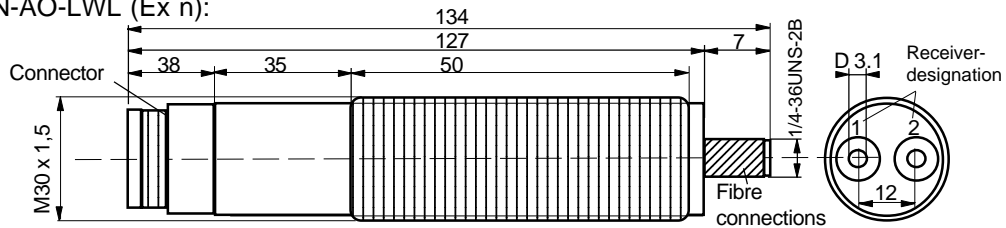
Amphenol-Tuchel
C164-433F-7P-2

- | | |
|---|---------------------|
| 1 | +24VDC |
| 2 | 0V |
| 3 | Current out 1 |
| 4 | Fault out 1 |
| 5 | Current out 2 |
| 6 | Fault out 2 |
| 7 | Protection earth PE |

Dimensions FRD-AO-LWL (Ex d):

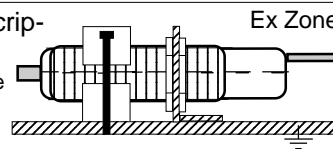


Dimensions FRN-AO-LWL (Ex n):



Equipotential Bonding prescription for Ex Devices:

The local equipotential bonding have to be done with conductive corrosion-resistant clamps or nuts M30



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 0V (-) of the supply voltage

Operating Manual / EC - Declaration of Conformity:

Ex Protection:

It is necessary to take into consideration the valid international and national rules and regulations. The local equipotential bonding have to be done. The protective earth (PE) is solid connected with the housing. The cable have to be installed and protected against damages. To connect cables inside hazardous locations only use certificated Ex e housings. All cable terminals must be connected outside hazardous locations. Additional optical lenses are not allowed in hazardous locations.

Type: FRD-AO-LWL is applicable in Ex Zones 1 and 20/21. For the zones 20/21 only the front part (fibre optics connection) can be mounted inside the zone 20. The rear part with the cable must be in the zone 21.

Type: FRN-AO-LWL is only applicable for the zone 2. Do not separate the connector while energized. For fixing the connector at the sensor, the original screw must be exchanged by the additional safety screw. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Only connectors, Binder series 717 or Amphenol-Tuchel series C164, are allowed. It is necessary to take into consideration the mounting prescription of the connector manufacturer.

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 0V(-) of the supply voltage. Connection cables must not be installed parallel to high voltage cables.

Function

The device has 2 independent data receivers inside. Each receiver has an analog current and a fault indication output.

	Battery	Current Out	Fault Out
Pressure: 0-25 Bar	OK	4-20mA	LOW
Pressure: 0-25 Bar	Low	4-20mA	HIGH
No input signal	--	<3mA	LOW

Using the fibre optics:

The fibre optics must be assembled, mounted and polished careful in accordance with the additional assembly instruc-

tions. The face of optical fibers must be completely even and free of scratches. Do not use optical fibres longer than 10m. The functional safety of the sensor is also given by careful working up of optical fibres. The fibre optics must not be buckled.

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

The Data Receivers must not be used for Accident-Prevention! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations. ATEX 118a, ElexV, TRbF, TRD, UVV, EX-RL, BetrSichV.

Standards met:

- EN 50014, Type FRD: EN 50018, Typ FRN: EN 50021
- EN 50281-1-1; EN 50081-1/-2, EN 50082-1/-2, EN 60529
- Ex Protection: 94/9/EG (ATEX 100A)
- Machine directive: 98/37/EG
- Low voltage directive: 73/23/EWG, 93/68/EWG
- EMC: 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG

General Notes

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.

Approvals, Declaration of Conformity:

DMT 99 ATEX E 056/N1/N2

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 with the ATEX module "Production", declares:

Hans Bracher, Matrix Elektronik AG