

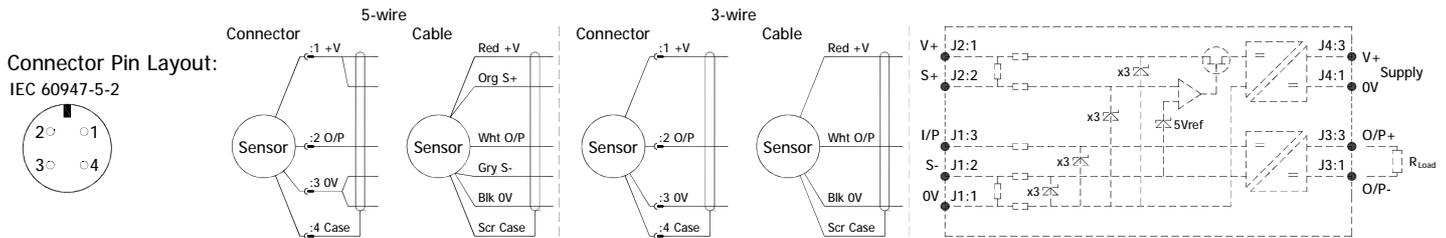
Installation Information

RIPS[®] M502 SMALL ANGLE ROTARY SENSOR

INTRINSICALLY SAFE FOR HAZARDOUS MINING ENVIRONMENTS

For certificate number and safety parameters information for product marked EX04, see next page.

| ATEX /IECEx Qualified to Intrinsic Safety Standard Certificate numbers SIRA 13ATEX2371X IECEx SIR 13.0154X | | Ex I/II M1/1GD Ex ia IIC T4 Ga (Ta = -40°C to +80°C) Ex ia IIIC T135°C Da (Ta = -40°C to +80°C) Ex ia I Ma (Ta = -40 to +80°C) | |
|--|---|---|------------------|
| Electronics Version | Output Description: | Supply Voltage: V _s (tolerance) | Load resistance: |
| EX07 | 0.5 - 4.5V (ratiometric with supply) [Output code 'A'] | +5V (4.5 - 5.5V) | 5kΩ min |



Putting Into Service: The sensor must be used with a galvanic isolation barrier designed to supply the sensor with a nominal 5V and to transmit the sensor output to a safe area. The barrier parameters must not exceed:-

- U_i = 11.4V
- C_i = 1.36μF*
- C_i = 1.16μF
- I_i = 0.20A
- L_i = 860μH*
- L_i = 50μH
- P_i = 0.51W
- (*Lxx', 'LQxx', 'Mxx' or 'MQxx' options) *Figures for 1km cable
- (*J' option)

The sensor is certified to be used with up to 1000m of cable, cable characteristics must not exceed:-

- Capacitance: ≤ 200 pF/m for max. total of: 200 nF
- Inductance: ≤ 810 nH/m for max. total of: 810 μH

Approval only applies to specified ambient temperature range and atmospheric conditions in the range: 0.80 to 1.10 Bar, oxygen ≤ 21%.

The performance of the sensor may be affected by voltage drops associated with long cable lengths; For cable lengths exceeding 10 metres a five wire connection is recommended to eliminate errors introduced by cable resistance and associated temperature coefficients.

N.b. sensors supplied with cable, the free end must be appropriately terminated.

Warning - The M12 IEC 60947 connector may be rotated for purposes of convenient orientation of the connector and cable, however rotating the connector more than one complete revolution is not recommended.

Repeated rotation of the connector will damage the internal wiring!

Special Condition for Safe Use:

The apparatus does not meet the 500 V r.m.s dielectric strength test between circuit and frame, in accordance with clause 6.3.13 of IEC 60079-11:2011. This must be taken into consideration on installation.

When using a Sensor that has an integral cable in a dust application, the free end of the cable shall be appropriately terminated for the zone of use.

Under certain extreme circumstances, the non-metallic and isolated metal parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. This is particularly important if the equipment is installed in a zone 0 location. In addition, the equipment shall only be cleaned with a damp cloth.

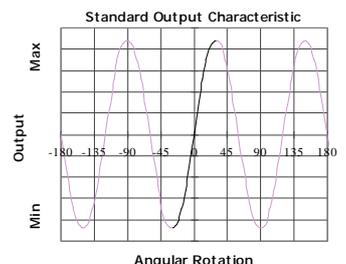
Use: The sensor is designed to measure rotary displacement and provide an analogue output signal.

Assembly and Dismantling: The unit is not to be serviced or dismantled and re-assembled by the user.

Maintenance: No maintenance is required. Any cleaning must be done with a damp cloth.

Mechanical Mounting: Flange mounted or servo mount, with appropriate clips, options. The flange slots are 4.5 mm by 30 degrees wide on a 48 mm pitch. The sensor should be mounted with minimal axial and radial loading on the shaft for optimum life. It is recommended that the shaft is coupled to the drive using a flexible coupling. Tests indicate that life in excess of 16 million cycles can be achieved with 1kg side and end load.

Output Characteristic: The sensor has full rotational freedom and six sectors, 60° apart, over which linear response can be achieved. At the mid point of the calibrated range the output signal will be half full scale deflection, and the flat on the shaft is aligned with the registration mark in the base of the sensor. In the calibrated range the output increases as the shaft is rotated in an anti-clockwise direction viewed from the shaft. The calibrated output is factory set to be between 5° and 15°.



Incorrect Connection Protection levels: Not protected – the sensor is **not** protected against either reverse polarity or over-voltage. The risk of damage should be minimal where the supply current is limited to less than 50mA.

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INTRINSICALLY SAFE FOR HAZARDOUS MINING ENVIRONMENTS

For certificate number and safety parameters information for product marked EX07, see previous page.

| ATEX Qualified to Intrinsic Safety Standard Certificate numbers SIRA 00ATEX2076X | | Ex I/II M1/1GD EEx ia I/IIC T4 (Ta = -40°C to +80°C) Ex ia D 20 T135°C (Ta = -40°C to +80°C) | |
|---|---|--|------------------|
| Electronics Version | Output Description: | Supply Voltage: <i>V_s</i> (tolerance) | Load resistance: |
| EX04 | 0.5 - 4.5V (ratiometric with supply) [Output code 'A'] | +5V (4.5 - 5.5V) | 5kΩ min |

The barrier parameters must not exceed:-

U_i = 11.4V **i_i = 0.20A** **P_i = 0.51W**
C_i = 1.36μF* **L_i = 710μH*** ('Lxx' option) *Figures for 1km cable
C_i = 1.16μF **L_i = 50μH** ('J' option)

The sensor is certified to be used with up to **1000m** of cable, cable characteristics must not exceed:-

Capacitance: ≤ 200 pF/m for max. total of: 200 nF
 Inductance: ≤ 660 nH/m for max. total of: 660 μH

With the exception of the certificate number and safety parameters above, all other notes regarding Putting Into Service, Use, Assembly and Dismantling etc. on previous page apply to sensors marked EX04 or EX07.