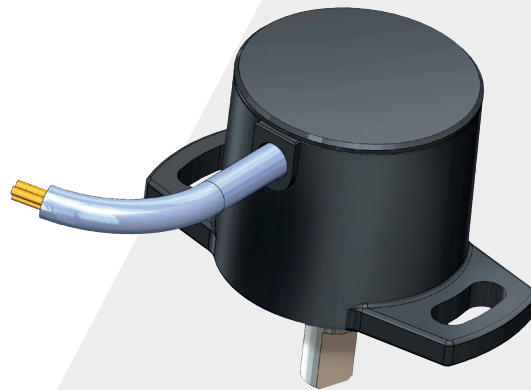


Installation manual

ROTARY SENSORS, FOR ANGULAR MOVEMENTS DETECTION, HALL EFFECT BASED, CONTACTLESS



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1. Introduction

Before placing the sensors in operation, read carefully this documentation and follow the safety instructions. The technical documentation provided below contains information about the mechanical installation and the electrical cabling of the 7R sensors. Such operations must be carried out by qualified personnel and/or by technicians that are familiar with the management of this type of sensors.

Description

The 7R sensors are designed based on the most recent standards of the electronic and mechanical engineering. Therefore they are state-of-the-art products that comply with the EMC requirements for the emission of disturbances and for the immunity of vehicles and mobile machines according to the standards in force. However, an incorrect installation or their inappropriate use may bring danger to the user or third parties, or cause damage to the sensor and to other apparatuses.

The sensors of the 7R family are conceived to measure angular positions in mobile hydraulic applications. The sensors provide an electrical signal and must be connected to adequate evaluation electronics, for ex. a PLC, IPC, ECU or indicator or another type of electronic control capable of interpreting the signal correctly.

As a pre-condition to guarantee the correct operation of the sensor, it is mandatory to carry out its transport, storage, assembly, commissioning and operation according to the instructions of the present manual and the product specifications (datasheet). To ensure this condition and guarantee a correct operation, the installation, connection and maintenance interventions must be performed only by qualified and authorised personnel.

2. Installation and operation

A fault or malfunction of the sensor may bring danger to people or constitute a potential threat for damage to the structures or apparatuses directly or indirectly connected to such sensor. Appropriate additional safety measures must be provided, as plausibility controls, limit switches, stop and emergency systems, protection devices, etc. To prevent the occurrence of dangerous damages in case of malfunction the sensor must be switched off and disconnected from the rest of the apparatuses. Failure to comply with these safety procedures exempts the manufacturer from any liability arising from the inappropriate use of the product.

To guarantee the functioning of the sensor it is indispensable to comply with the following provisions:

- Protect the sensor against mechanical damages during transport, installation and operation.
- Do not open or disassemble the sensor.
- Connect the sensor correctly and make sure that the polarity of the connections, the operation voltage and the supply current comply with the indications in the specification
- The electrical connection must be performed according to the safety instructions for electrical equipment and only carried out by trained personnel.
- Use adequate cables, possibly shielded, directly connected to the sensor, avoiding ring connections
- A checking procedure of the correct operation of the sensor must be carried out periodically (ex. by checking known positions).
- Before placing the apparatuses in operation, make sure that the safety of anyone will not be impaired by the starting of the machines.
- Tests of insulation, welding or painting the machine or parts of the machine with electrostatic spray (cylinder, work machine, etc.) may damage or destroy the sensor. In these cases, all pins of the connector (or Cable) of the sensor must be connected in short circuit to zero

- The connector for connection the transducer must guarantee an adequate protection degree IP (≥ 67) in order to avoid the penetration of any foreign agent
- Avoid the presence of strong electrical or magnetic fields in the proximity of the rotary sensor
- Do not connect or disconnect the sensor when under voltage.
- Do not expose the sensor to shocks or strikes.
- Do not use screws or magnetic pieces in the proximity of the sensor
- Respect the specified temperature range
- The sensor performance, as specified in the catalogue, is guaranteed under the specified environmental conditions

3. Repairs

Repairs on the sensor can only be carried out by OMFB or by an entity expressly authorised by OMFB.

4. Warranty

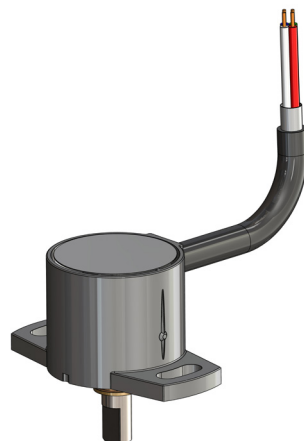
Please refer to the general warranty conditions in the site www.OMFB.com

5. Description and technology of the product

The 7R sensors are designed to be used in mobile hydraulic applications for the accurate measure of an angular position and constitute the ideal replacement for linear contact sensors (potentiometers), offering with respect to these better performance and unlimited service life due to the absence of friction elements. The 7R sensors are resistant to vibration, shocks, dust, atmospheric agents and electromagnetic disturbances and are therefore used successfully in hydraulic units of farming machines, construction machines, earthmoving equipment, steering systems, lifting systems, etc.

Hall Effect

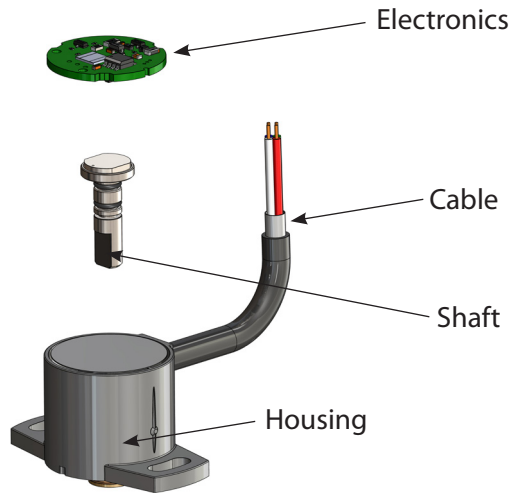
The 7R linear sensors are based on the HALL effect technology: a magnet inside the electronics and coupled to the rotation shaft generates a magnetic field that is "captured" by intelligent electronics capable of determining the angle with respect to a reference calibrated in the factory. This measure is later converted into standard analogical or digital electronic output signals.



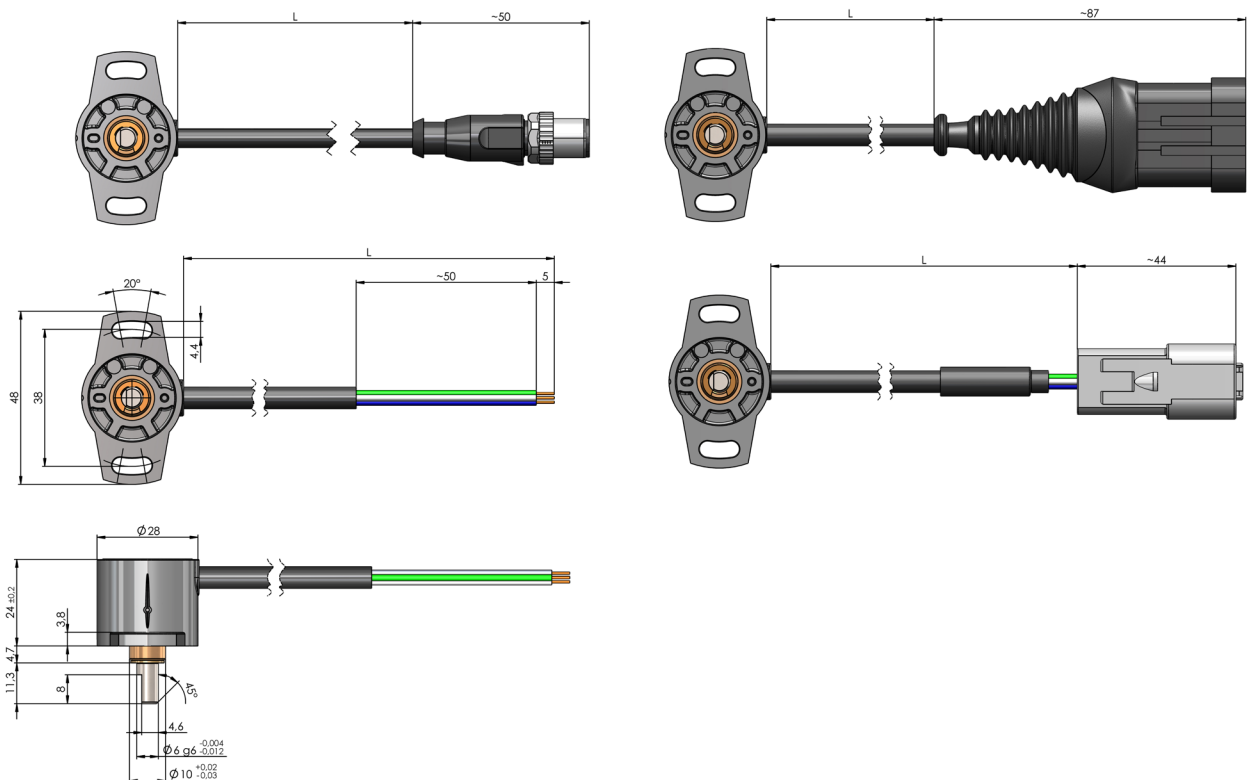
6. Mechanical installation

The sensor is composed by the following principal parts:

- Electronics
- High-performance PPS housing
- Shaft (connected to the system whose angle should be measured)
- Output cable / connector



6.1 Overall dimensions



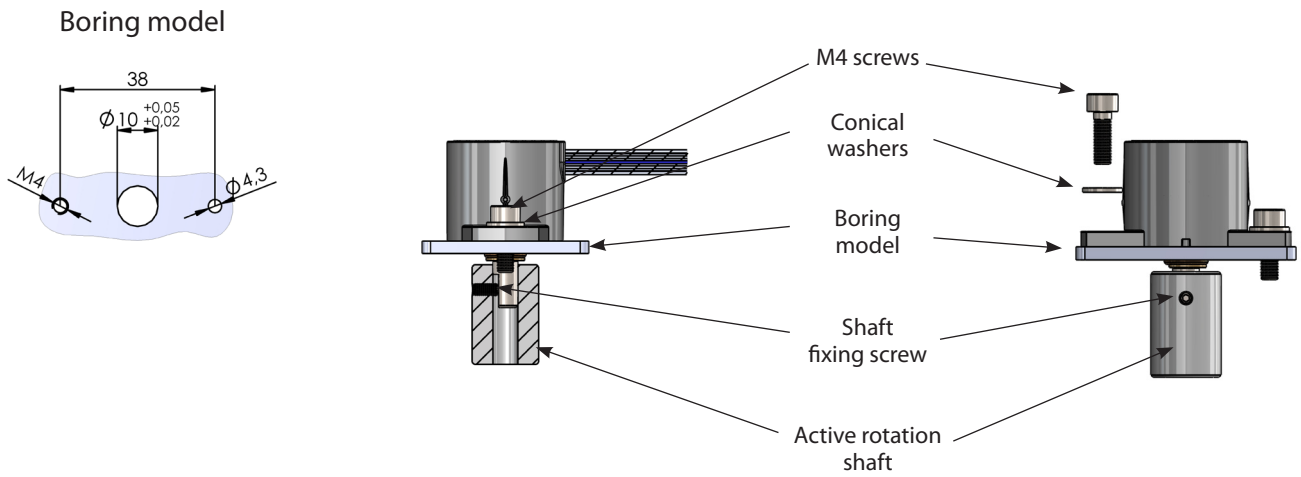
6.2 Sensor installation

The sensor can be fixed with 2 M4 threaded holes or with 2 \varnothing 4.3mm through holes, see "Boring model".

It is recommended to first block the sensor shaft to the rotation shaft, and then tighten the screws.

During the mounting of the M4 fixing screws with DIN6796 conical washers, the maximum torque to be applied is of 180 Ncm.

The minimum curve radius of the cable is 40 mm.

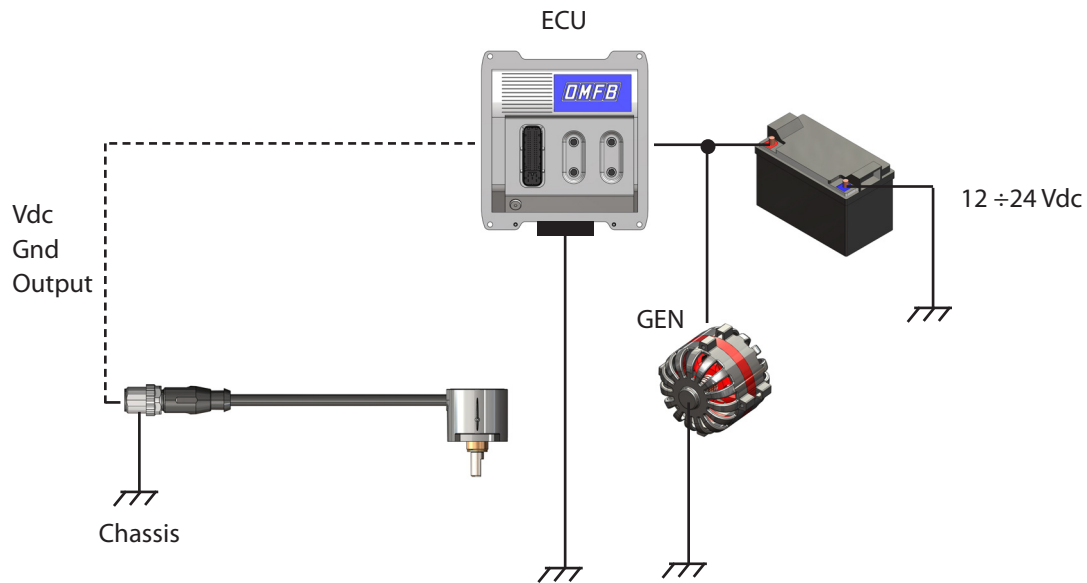


7. Electrical connection

- The cable between the sensor and the electronics must be separated from the network and power supply cables. A minimum distance of 500 mm is necessary.
- A low-pass filter with a cut-off frequency of 5 kHz at the input of the electronics, which acquires the analogical signal of the sensor, is recommended to minimise the effect of possible disturbances
- To prevent potential equalisation currents through the cover, the connection of all components to the equipotential lines is recommended.
- The electric connection cable has a strong influence on the electromagnetic compatibility of the position sensors. Therefore it is recommended to:
 - Use a shielded cable with pairs of twisted for the power supply and outputs.
 - Connect the shielded cables to the wires on the controller side.
 - Avoid installing the sensor cable close to high-voltage power sources, such as high-power motors (use separated and shielded cables for each device).
- If an application includes equipment that emits strong electromagnetic interferences, such as inverters or motors, it is necessary to take the following precautions:
 - Use a shielded cable with twisted wires and insulated pairs.
 - Position the cable inside a metallic conductor that will be connected to the ground

7.1 Connection of the control unit

The connection of the control unit (ECU) must follow the diagram indicated below.



OMFB reserves the right to make functional or aesthetic changes at any time and without notice.



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