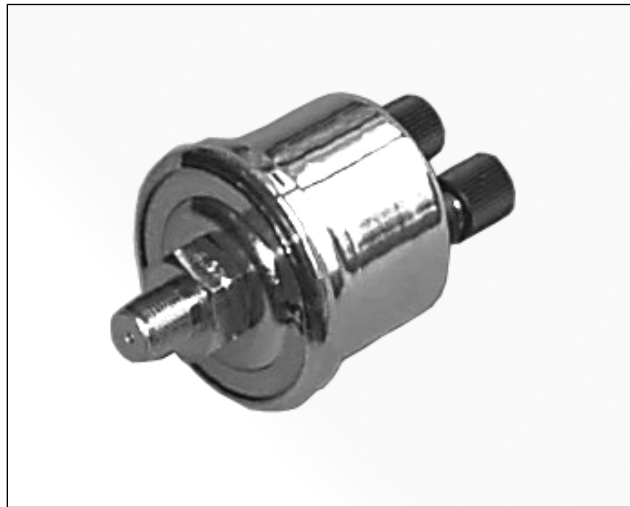


Engine & Chassis Sensors

Electromechanical Pressure Sensors (EMPS)



Application

Pressure measurement of gaseous and liquid media.

General description

The VDO pressure sensor is based on the following electromechanical principle:

The applied pressure acts against a radially elastic diaphragm.

A lifter transfers the deflection of the diaphragm to a movable carrier plate. This carrier plate contains screws for gain and offset calibration and holds the electrical wiper contact. The position of the wiper on a resistance wire coil directly depends on the applied pressure and leads to a corresponding electrical output signal.

The protection cap includes an electrical socket and the customer specific connector.

The pressure sensor is distinguished by the following features:

- Media: Engine oil, air
- Modular assembly
- Pressure ranges: 0 ... 2 bar up to 0 ... 25 bar, gauge
- Output signal: 10 Ohm ... 184 Ohm
- Electrical switch (pressure warning) optional
- Customized pressure ports and electrical connectors

Technical data

Operating pressure	0 ... 2bar, 0...3 bar, 0... 5 bar, 0... 10 bar, 0... 16 bar, 25 bar gauge
Max. Proof pressure (2 sec.)	Version 10 bar: 30 bar Version 16 bar: 40 bar Version 25 bar: 50 bar
Operating temperature	-25°C ... + 100°C (+120°C, 1 h)
Storage temperature	-30°C ... + 100°C (+120°C, 1 h)
Vibration*: Pressure port M12x1.5 Pressure port M14x1.5 Pressure port M18x1.5	5g 5g Frequency: 10 ... 500 Hz, 48 h per axis 15g Frequency: 60 ... 2000 Hz: 96 h per axis 10 ... 60 Hz: 1mm amplitude
* Test in each 3 axes according DIN IEC68-2-6	
Pressure cycles (Fig. 2)	> 500.000 (operating pressure ≤ 10 bar) > 200.000 (operating pressure > 10 bar)
Degree of protection	IP 64 A
Supply voltage	6 Volt ... 24 Volt
Min. supply current	20 mA
Max. power dissipation	250 mW
Output characteristic (Fig. 1)	10 ... 184 Ohm
Characteristic curve temperature dependency	< 0.04 bar (per 10 K) relating to ambient temperature
Warning contact (optional)	8% to 50% at full scale
Tolerance switch point:	± 3% at full scale
Switching load (non-inductive)	≤ 5 Watt

Output characteristic (10 bar Sensor)

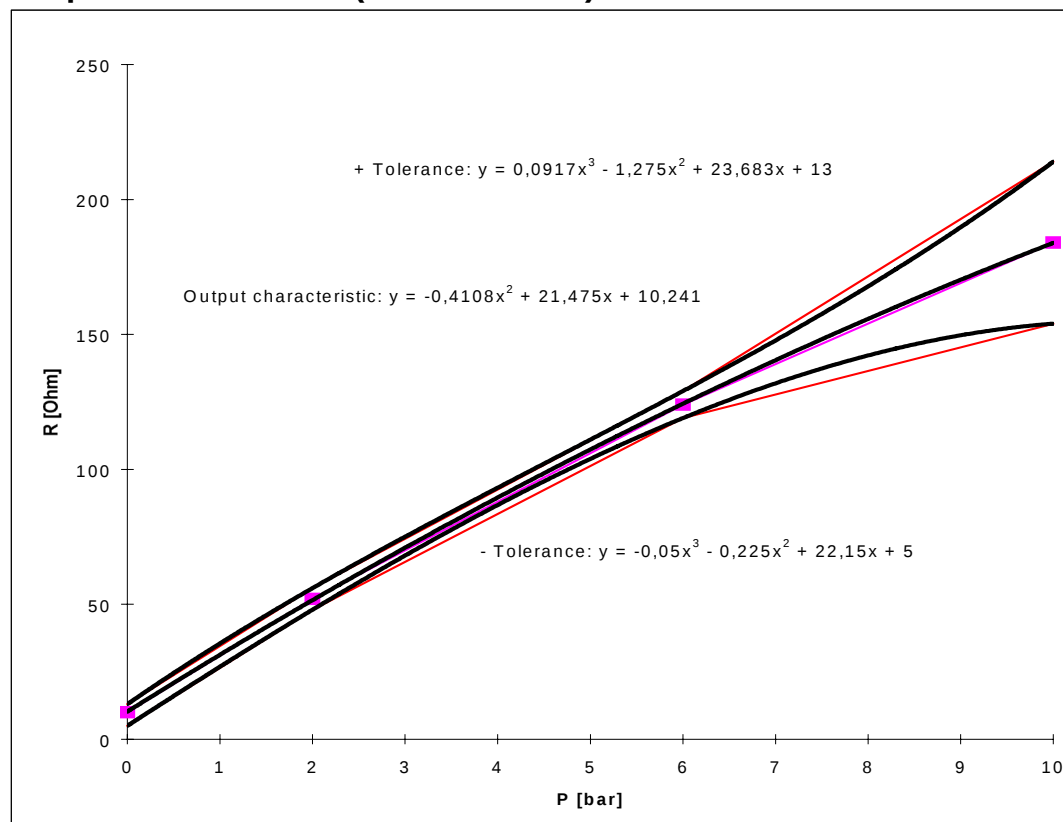
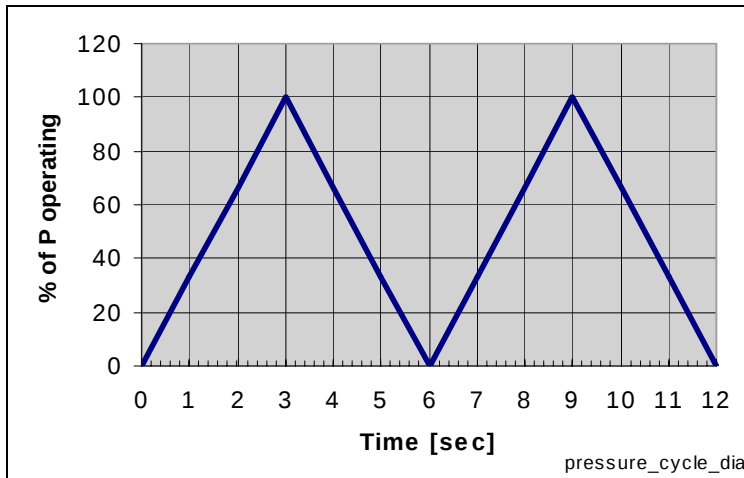


Fig. 1: Output characteristic

Pressure cycles diagram



Test conditions:

- Temperature + 100 °C
- Electrical load, test-current min. 20 mA.
- Warning contact with maximum switching load

Fig. 2: Pressure cycles diagram

Important mounting recommendations:

The pressure sensor should be mounted in locations which meet the parameters defined in section technical data. The sensor itself can be installed in any orientation (port facing up or down).

To avoid damage of internal components the sensor design and mounting position should be chosen according to the following principles:

- **Locations with strong pressure pulsation**
Close to an oil pump (filter flange) strong oil pressure pulsation is often present. In this case, vibration of the wiper can damage the resistance wire. If no location without strong pulsation is available, a damping element (low-pass-filter) should be used.
- **Locations with high vibration levels**
The allowed vibration levels are defined in section technical data. Please note the differences based on the specific mounting thread used!
Strong vibrations at certain positions on an engine can be avoided by mounting the sensor on the vehicle chassis. The connection to the sensor can be made using a flexible tube.
Important note: Threads with less than M12 should not be used due to reduced vibration performance!
- **High pressure steam-jet**
In order to avoid penetrating water or humidity, the sensor may not directly exposed to a high pressure steam-jet.
- **Locations near components with high temperature radiation**
Mounting the component close to or above components with high temperatures, e.g. near the turbocharger or exhaust gas system, may exceed the temperature limit of the pressure sensor.
To avoid high temperature influences, select a mounting position with good air cooling conditions and low radiative heating effects.

Customer Drawing 360-081-030-030, 10 bar version

