Sensor elements and assemblies, piezo
Model SPR-2, sensor element
Model TPR-2, sensor assembly

Applications
- Applications with limited mounting space
- Design-in solutions

Special features
- Measuring ranges from 0 ... 0.4 to 0 ... 16 bar (gauge and absolute pressure)
- Measuring cell from stainless steel
- High measuring sensitivity
- High stability

Examples for models SPR-2 and TPR-2

Description

Design
The heart of the measuring cell is a silicon chip, which is pressurised via a pressure transmission medium. As pressure transmission medium, a suitable filling liquid for the respective application is used.

A diaphragm and a case from stainless steel make the transducer highly resistant to a wide variety of media.

Individual solutions
The pressure transducers are manufactured on a flexible production line and can be individually adapted to suit customer requirements.

Special features
The pressure transducer can be delivered either with or without linear temperature compensation. Alternatively, a test certificate for the sensor cell can be supplied with it, for active temperature compensation by the customers themselves.

The assembly and connection concept guarantees a very high overload and burst pressure safety. The silicon chip provides a high measuring sensitivity, which enables measurement of even the lowest pressures.
Measuring ranges

<table>
<thead>
<tr>
<th>Gauge pressure and absolute pressure (bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... 0.4</td>
</tr>
<tr>
<td>0 ... 6</td>
</tr>
</tbody>
</table>

Other measuring ranges on request.

Overload safety
3 times

Burst pressure safety
5 times

Vacuum tightness
Yes

Output signals

Without temperature compensation
12 ... 50 mV/V (depending on measuring range)

With temperature compensation
4.5 ... 23.5 mV/V (depending on measuring range)

Voltage supply

Power supply
Max. DC 10 V

Reference conditions (per IEC 61298-1)

Temperature
15 ... 25 °C [59 ... 77 °F]

Atmospheric pressure
860 ... 1,060 mbar [12.5 ... 15.4 psi]

Air humidity
45 ... 75 % r. h.

Power supply
DC 10 V

Mounting position
As required

Time response

Settling time (10 ... 90 %)
< 1 ms

Accuracy specifications

Zero point offset
Without temperature compensation: ≤ ±10 mV/V
With temperature compensation: ≤ ±2 mV/V

Bridge resistance

<table>
<thead>
<tr>
<th>Bridge resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB+/0V</td>
</tr>
<tr>
<td>With temperature compensation</td>
</tr>
<tr>
<td>Without temperature compensation</td>
</tr>
</tbody>
</table>

Legend
UB+ = Positive power supply terminal
0V = Negative power supply terminal
OUT+ = Positive terminal for analogue output
OUT- = Negative terminal for analogue output

Compensated temperature range

<table>
<thead>
<tr>
<th>Compensated temperature range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
</tr>
<tr>
<td>Option</td>
</tr>
</tbody>
</table>

Temperature error

Without temperature compensation

<table>
<thead>
<tr>
<th>Max. temperature coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero point</td>
</tr>
<tr>
<td>Span</td>
</tr>
</tbody>
</table>

With temperature compensation

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>Max. temperature error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero point</td>
<td>0 ... 0.4 bar</td>
</tr>
<tr>
<td></td>
<td>0 ... 1 to 0 ... 2.5 bar</td>
</tr>
<tr>
<td></td>
<td>0 ... 4 to 0 ... 25 bar</td>
</tr>
<tr>
<td>Span</td>
<td>0 ... 0.4 bar</td>
</tr>
<tr>
<td></td>
<td>0 ... 1 to 0 ... 25 bar</td>
</tr>
</tbody>
</table>

Non-linearity (BFSL)
≤ ±0.3 % of span
≤ ±0.4% for 0...0.4 bar version

Hysteresis
≤ ±0.03 % of span

Non-repeatability
≤ ±0.03 % of span

Long-term stability
≤ ±0.2 % of span/year
Operating conditions

Permissible temperature ranges
Medium: -40 ... +125 °C [-40 ... +257 °F]
Ambient: -40 ... +125 °C [-40 ... +257 °F]
Storage: -40 ... +125 °C [-40 ... +257 °F]

Valid for standard filling liquid (synthetic oil). Other filling liquids on request.

Service life
> 100 million load cycles

Process connections

On request

Electrical connections

On request

Electrical protective measures

High-voltage strength
DC 500 V

Insulation resistance
> 1 GΩ

Materials

Wetted parts
Stainless steel
Other materials on request.
Dimensions in mm

Model SPR-2 with temperature compensation

Model TPR-2 with temperature compensation, with O-ring sealing contour
Model SPR-2 without temperature compensation

Model TPR-2 without temperature compensation, with O-ring sealing contour

Legend
UB+ Positive power supply terminal
0V Negative power supply terminal
OUT+ Positive terminal for analogue output
OUT- Negative terminal for analogue output

Pin assignment
1 UB+
2 Sig+
3 0V
4 Sig-
**Installation recommendation for TPR-2 with O-ring sealing contour**

The maximum dimensions and thermal expansion coefficients of the materials used must be observed for the installation. In all operating states, the mounted sensor element must have sufficient play in the axial direction.

### Version with temperature compensation

- 17
- (0.769 x 2.499)

### Version without temperature compensation

- 18.3
- (0.769 x 2.499)

O-ring

Size: D15.6 x 1.78 ISO 3601

Material: Is to be defined by the user, depending on the medium and the temperature. For mounting, adequate sliding properties of the O-ring must be ensured.

* Value must not be less than stated

### Mounting geometry for version with temperature compensation

- 14.5
- (0.571)

### Mounting geometry for version without temperature compensation

- 11.6
- (0.455)

Mounting geometry for version with temperature compensation

Mounting geometry for version without temperature compensation

- Value must not be less than stated

### Ordering information

**Measuring range / Temperature compensation / Process connection / Electrical connection**

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