**PROFILE**

The pressure transmitter PM4 works on the two wire principle and, depending on the measuring range, it features a ceramic or polysilicon measuring element.

Gauge pressures from 1 mbar up to 400 bar, and absolute pressures from 4 mbar onwards are converted into a standardised, pressure proportional 4...20 mA signal.

Microprocessor technology ensures reliable and simple operation.

**DESCRIPTION**

The transmitter PM4 comprises the measuring cell and the electronics housing.

An ASIC in the sensor module stores all the sensor-specific data. Pressure applied is sensed capacitively from the deflection of the ceramic diaphragm, which is in direct contact with the process media.

With polysilicone sensors, the pressure acts onto a metal separating diaphragm, which transmits the pressure to the sensor via a (selectable) filling liquid.

Depending on the application, the process connection has an external (male) or an internal (female =f) tapping. Flush diaphragm is possible for silicone as for ceramic sensors.

An optional LCD indicator with integrated bargraph is very useful for on-site adjustment and display. Span start (zero) and span are adjustable on-site by means of four push buttons. A turn-down ratio of 100 : 1 is possible within the range of each measuring cell.

Microprocessor controlled electronics provides comprehensive monitoring functions. If an internal fault is detected, the self-monitoring function generates an alarm which drives the output signal into a pre-selectable condition (upscale, downscale or no effect).

Electronics and terminals are housed in separate hermetic compartments. This ensures that the electronics is protected from aggressive environments when the terminal compartment is opened.

If the mounting makes access to the terminal compartment difficult, or the display cannot be viewed easily, the entire transmitter can be rotated up to 320 degree.

**TECHNICAL DATA**

**INPUT**

**CERAMIC CELL UP TO 40 BAR**

<table>
<thead>
<tr>
<th>Cell type</th>
<th>measuring limits</th>
<th>smallest span</th>
<th>max. overload</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 bar</td>
<td>-1/+0.1 bar</td>
<td>1 mbar</td>
<td>4 bar</td>
</tr>
<tr>
<td>0.4 bar</td>
<td>-1/+0.4 bar</td>
<td>4 mbar</td>
<td>10 bar</td>
</tr>
<tr>
<td>2 bar</td>
<td>-1/+2 bar</td>
<td>0.02 bar</td>
<td>20 bar</td>
</tr>
<tr>
<td>10 bar</td>
<td>-1/+10 bar</td>
<td>0.1 bar</td>
<td>40 bar</td>
</tr>
<tr>
<td>40 bar</td>
<td>-1/+40 bar</td>
<td>0.4 bar</td>
<td>60 bar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Absolute pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell type</td>
</tr>
<tr>
<td>0.4 bar</td>
</tr>
<tr>
<td>2 bar</td>
</tr>
<tr>
<td>10 bar</td>
</tr>
<tr>
<td>40 bar</td>
</tr>
</tbody>
</table>

**POLYSILICON CELL UP TO 400 BAR**

<table>
<thead>
<tr>
<th>Gauge pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell type</td>
</tr>
<tr>
<td>100 bar</td>
</tr>
<tr>
<td>400 bar</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Absolute pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell type</td>
</tr>
<tr>
<td>100 bar</td>
</tr>
<tr>
<td>400 bar</td>
</tr>
</tbody>
</table>
**Minimum pressure**
(For polysilicone only) 10 mbar absolute

**Process media**
Liquids and gases (aggressive or corrosive with suitable material selection)

**Filling liquid**
Selecting the filling liquid depends from pressure and temperature conditions of the process. Second criteria is immunity of the filling liquid with the process. (For polysilicone only).

**Materials**

- Diaphragm
  - Ceramic
  - Stainless steel 316 L
  - (Hastelloy C on request)

- Process coupling
  - Stainless steel 316 L
  - (Hastelloy C on request)

- Gasket
  - Viton (Ceramic only)

---

**OUTPUT**
Standard signal: 4...20 mA
max. output current: 20,5 mA
Ripple: ≤ 0.25 % fsd
Characteristic: pressure proportional

**Conformity:** ≤ 0,1 %
(zero based to DIN 16 684 of set span with TD 10:1)

**For TD 100:1 Conformity error**

\[
\text{Conformity error} = \pm 0.1 \times \frac{0.1 \times \text{nominal value}}{\text{set} \times \text{span}}
\]

**Load**

\[
R_{\text{Load}} = \frac{U_{\text{Supply}} - U_{\text{Min}} [V]}{0.023[A]} - R_{\text{Load}} [\Omega]
\]

Load effect: ≤ 0.01 % per 100 Ω
Damping: Adjustable 0...16 s
(settling time for 63 % of final value)
Undamped delay for T90: 150 ms

---

**Displacement**
4 digit LCD display of pressure, and LCD bargraph with 28 segments for output signal.

**Power Supply**
Supply voltage
11.5 ... 45 VDC
11.5...30 VDC for intrinsic safety

**Voltage effect**
≤ 0.1 % between 12 and 36 VDC

Ripple
no effect for U_{PP} ≤ 0.5 % at 24 VDC

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**Explosion Protection**
Protection type: EEx ia IIC T4, zone 1
Certificate of conformity
KEMA Nr. Ex 95.C.3881

**Installation**
Transmitter in zone 1 hazarded area

---

**Display**
4 digit LDC display of pressure, and LCD bargraph with 28 segments for output signal.

**Environmental Conditions**
Permissible temperatures
For operation: -40...+85 °C
For storage: -40...+100 °C

**Temperature effects**

<table>
<thead>
<tr>
<th>Temperature Coefficient Tk in % / 10 K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Span start</td>
</tr>
<tr>
<td>±0.02 %</td>
</tr>
<tr>
<td>±0.05 %</td>
</tr>
<tr>
<td>±0.05 %</td>
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Max. process temperature
without temperature isolator: ≤ 130 °C,
limited to heating-up of electronics.
with thermal isolator ≥ 130 °C
for Ex limited to + 70 °C = T4

Relative humidity
100 % no condensation

Climatic category
Class GPC to DIN 40 040

Vibration effect
(For electronics only) No effect from mechanical vibrations with 4 mm stroke at 5...15 Hz, or 2g at 15...150 Hz, or 1 g at 150...2000 Hz

---

**Remarks**
Silicone oil -40 up to 180 °C -40 up to 200 °C standard
Fluorolube -40 up to 80 °C -40 up to 175 °C for oxygen, inert
Voltalef -40 up to 80 °C -40 up to 175 °C for oxygen, inert

---

**Filling media (for Polysilicone only)**

<table>
<thead>
<tr>
<th>Filling media</th>
<th>Medium temperature at 50 mbar</th>
<th>Medium temperature at P_{abs} ≥ 1 bar</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silicone oil</td>
<td>-40 up to 190 °C</td>
<td>-40 up to 200 °C</td>
<td>standard</td>
</tr>
<tr>
<td>Fluorolube</td>
<td>-40 up to 80 °C</td>
<td>-40 up to 175 °C</td>
<td>for oxygen, inert</td>
</tr>
<tr>
<td>Voltalef</td>
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<td>-40 up to 175 °C</td>
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</tr>
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---

**EXPONENTIAL PROTECTION**
Protection type: EEx ia IIC T4, zone 1
Certificate of conformity
KEMA Nr. Ex 95.C.3881

---

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Vibration effect
(For electronics only) No effect from mechanical vibrations with 4 mm stroke at 5...15 Hz, or 2g at 15...150 Hz, or 1 g at 150...2000 Hz
ELECTROMAGNETIC COMPATIBILITY
Meets EN 50 082-2 and EN 50 011. Tests according to IEC 801-1 to 801-6

GENERAL
Electronic housing
Die-cast aluminium AlSi12 with fully chromated surface, epoxy polyester coated

Housing protection type
IP 65 to IEC 529

Electrical connections
Screw terminals for 0.5...2.5 mm² via cable entry gland M12 x 1.5

Mounting position: not critical
Weight: depending from process coupling 1.3 kg respectively 1.7 kg

Accessories: operating instructions 9499-040-43501

Fig. 2 Temperature isolator

Fig. 3 Electrical connections

Fig. 4 Process couplings for ceramical cells

Fig. 5 Process couplings for Polysilicone sensor

ACCESSORY
Mounting bracket, 9404-290-01201

Fig. 6 Mounting bracket

Fig. 7 Wall mounting
ORDERING STRUCTURE

Ranges,
gauge pressure

Process couplings
G ½ A, DIN 16288 0
G ½ A / G ¾ f 1) 1
G ½ A / 11,4 mm f 1) 2
½-14 NPT / ¾-18 f NPT 1) 3
½-14 NPT, 11,4 mm f 1) 4
M20 x 1.5 5
G ½ A flush diaphragm (only polysilicone) 6
G1 ½ A flush diaphragm 1) 7
G2A flush diaphragm 1) 8
Special version, material, gasket 9

Communication, display, EEx
HART protocol
Without display 4
Without display EEx 5
LC display 6
LC display, EEx 7

Ranges, absolute pressure

00 0...100 mbar
01 0...160 mbar
02 0...250 mbar
03 0...0.4 bar
04 0...0.6 bar
05 0...1.0 bar
06 0...1.6 bar
07 0...2.5 bar
08 0...4 bar
09 0...6 bar
10 0...10 bar
11 0...16 bar
12 0...25 bar
13 0...40 bar
14 0...60 bar
15 0...100 bar
16 0...250 bar
17 0...400 bar
23 special range

1) for ceramic cells only

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