Precision pressure sensor
Models CPT6100, CPT6180

Applications
- Testing technology
- Calibration technology
- Laboratories and maintenance shops
- Aviation

Special features
- Accuracy up to 0.01 % IS-50
- Measuring range from -1 ... 400 bar (-15 ... 6,000 psi)
- RS-232 or RS-485 interface
- Compact design

Description
The models CPT6180 and CPT6100 precision pressure sensors are compact, robust sensors with a serial output and a measuring range which is freely selectable between -1 ... 400 bar (-15 ... 6,000 psi). The high accuracy of up to 0.01 % IS-50 for 365 days makes the sensor one of the most accurate transducers in precision measurement technology. The standard output mode provides the pressure values via a query-response process.

Application
These precision pressure sensors are built into OEM instruments, e.g. in pressure, flow or humidity calibrators, or in any instrument where high-accuracy measurement is needed. They are used as reference pressure sensors within the automated manufacturing of pressure measuring instruments or calibration stands. Through a high accuracy, speed of reading and long-term stability, they are particularly suited for applications in wind tunnels or in pressure chambers. These characteristics make it a valuable tool in metrology, hydrology, oceanography, and in the aviation and space industries.

Functions
The models CPT6180 and CPT6100 have an RS-232 or RS-485 interface. The RS-485 interface offers the possibility of a genuine multidrop connection and simple cabling. There are four different baud rates to choose from. The sensors can be configured for gauge and absolute pressure for any measuring range within the specified limits. They have a wide voltage supply range (DC 6 ... 20 V) and low power consumption (< 0.5 W). With a recalibration time of 180 or 365 days and a high resolution of 6 or 7 significant figures, CPT6180 and CPT6100 are flexible enough to be used in a wide variety of applications.

Compact design
The pressure sensors are, due to their robust, compact design, easily integratable in a 19" rack without taking up much space. With the combination of male and female threads, a fast and secure fitting is always possible, negating the need for further sealing.
Specifications

Precision pressure sensor technology

<table>
<thead>
<tr>
<th>Model</th>
<th>CPT6100</th>
<th>CPT6180</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accuracy</strong></td>
<td>0.03 % FS 2)</td>
<td>0.01 % FS 2)</td>
</tr>
<tr>
<td><strong>Measuring ranges</strong></td>
<td></td>
<td></td>
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<tr>
<td>Gauge pressure</td>
<td>0 ... 25 to 0 ... 70 mbar</td>
<td>0 ... 70 mbar to 0 ... 400 bar</td>
</tr>
<tr>
<td></td>
<td>(0 ... 0.36 to 0 ... 1 psi)</td>
<td>(0 ... 1 up to 0 ... 6000 psi)</td>
</tr>
<tr>
<td>Bi-directional</td>
<td>-25 ... -25 to -35 ... 35 mbar</td>
<td>-35 ... 35 mbar to -1 ... 400 bar</td>
</tr>
<tr>
<td></td>
<td>(-0.36 ... 0.36 to -0.5 ... 0.5 psi)</td>
<td>(-0.5 ... 0.5 to -14.5 ... 6000 psi)</td>
</tr>
<tr>
<td>Absolute pressure</td>
<td>0 ... 500 mbar abs. to 0 ... 401 bar abs.</td>
<td>0 ... 7.5 psi abs. to 0 ... 6,015 psi abs.</td>
</tr>
<tr>
<td></td>
<td>(0 ... 7.5 psi abs. to 0 ... 6,015 psi abs.)</td>
<td>(0 ... 15 to 0 ... 6,015 psi abs.)</td>
</tr>
<tr>
<td><strong>Calibration interval</strong></td>
<td>180 days</td>
<td>180 days</td>
</tr>
</tbody>
</table>

CPT6100 as barometric reference

| Measuring range | 552 ... 1,172 mbar abs. (8 ... 17 psi abs.) |
| **Accuracy** 1) | 0.01 % of reading |
| **Calibration interval** | 365 days |

**Pressure units**

- psi, bar, mbar, Pa, kPa, hPa, MPa, tsi, atm, torr, Dynes/cm², g/cm², kg/cm², mSW, oz/in², psf, tsi, mtorr (0 °C)
- mmH₂O (4 °C), cmH₂O (4 °C), inH₂O (4 °C), lnH₂O (20 °C), inH₂O (60 °F), lnH₂O (20 °C), mH₂O (4 °C), fth₂O (20 °C), fth₂O (60 °F), μmHg (0 °C), mmHg (0 °C), cmHg (0 °C), inHg (0 °C), inHg (60 °F), lnSW (0 °C), ftsW (0 °C), mtorr (0 °C)

1) The accuracy is defined by the total measurement uncertainty, which is expressed with the coverage factor (k = 2) and includes the following factors: the intrinsic performance of the instrument, the measurement uncertainty of the reference instrument, long-term stability, influence of ambient conditions, drift and temperature effects over the compensated range during a periodic zero point adjustment.
2) FS: Full Span
3) 0.01 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.01 % of half the full scale and between 50 ... 100 % of the full scale, the accuracy is 0.01 % of reading.

Precision pressure sensor

**Case**

- Mounting position: < 1 bar (< 15 psi) negligible
  - Can be adjusted through zero point adjustment (linear shift of the characteristic curve)
- Dimensions: see technical drawings
- Weight: 505 g (1.11 lbs.)

**Display**

- Resolution: CPT6100: 6 significant figures
  - CPT6180: 7 significant figures
- Filter: Adjustable exponential filter from 0 ... 99 %
  - The filter is only active within a defined range of 0.010 % FS.
- Warm-up time: approx. 15 min up to the specified accuracy

**Connections**

- Pressure connections: Connection 7/16-20 SAE for pressure and reference port
  - The reference port is sealed for absolute pressure sensors
- Overpressure safety: 10 % above the nominal pressure of the sensor
- Material, wetted parts: Aluminium, brass, stainless steel 316, Buna-N, Viton®, silicone grease, silicone rubber, nylon, ceramic, glass, silicon

**Voltage supply**

- Power supply: DC 6 ... 20 V; 45 mA for DC 12 V

**Permissible ambient conditions**

- Storage temperature: -20 ... +70 °C (-4 ... 158 °F)
- Humidity: 0 ... 95 % r. h. (non-condensing)
- Compensated temperature range: 15 ... 45 °C (59 ... 113 °F)

Viton® fluorelastomer is a registered trademark of DuPont Performance Elastomers.
### Precision pressure sensor

**Communication**

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<th>Interface</th>
<th>RS-232 or RS-485</th>
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<tr>
<td>Baud rate</td>
<td>9,600, 19,200, 38,400 or 57,600 baud</td>
</tr>
<tr>
<td>Signal output</td>
<td>Query and response</td>
</tr>
</tbody>
</table>
| Measuring rate  | Standard: 10 values/s  
|                 | Option: 50 values/s |
| Response time   | Standard: 100 ms for a FS pressure pulse  
|                 | Option: 20 ms for a FS pressure pulse |

### Approvals

<table>
<thead>
<tr>
<th>Logo</th>
<th>Description</th>
<th>Country</th>
</tr>
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</table>
| CE   | EU declaration of conformity  
|      | ■ EMC directive  
|      | ■ Pressure equipment Directive; PS > 200 bar; Modul A, pressure accessory | European Community            |
| EAC  | EAC Electromagnetic compatibility                                           | Eurasian Economic Community    |
| MTSCHS | Commissioning approval                                                   | Kazakhstan                      |

### Certificates

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<tr>
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</table>
| Calibration | Standard: A2LA calibration certificate  
|             | Option: DKD/DAkkS calibration certificate                |
| Recommended recalibration interval | 1 year (dependent on conditions of use) |

4) Calibrated in a horizontal position.

Approvals and certificates, see website
Dimensions in mm (in)

Top view

Front view

Bottom view

Isometric view

1. Interface RS-232 or RS-485
2. Reference port (7/16-20 SAE)
3. Pressure port (7/16-20 SAE)
Scope of delivery

- Precision pressure sensor model CPT6180 or model CPT6100
- Operating instructions
- Standard: A2LA calibration certificate

Options

- DKD/DAkkS calibration certificate

Accessories

- Voltage supply over RS-232 or RS-485 interface cable
- External overpressure protection
- Pressure adapters

Ordering information

CPT6100 / Instrument version / Pressure unit / Type of pressure / Start of measuring range / End of measuring range / Accuracy / Type of certificate / Mounting position / Interface / Baud rate / Output mode / Analogue output / Mounting thread / Pressure adapter / Additional order information

CPT6180 / Instrument version / Pressure unit / Type of pressure / Start of measuring range / End of measuring range / Accuracy / Type of certificate / Mounting position / Interface / Baud rate / Output mode / Mounting thread / Pressure adapter / Additional order information