OEM pressure transducer
With signal processing
Model TI-1

Applications
- Integration into data loggers, pressure controllers and hand-holds
- Basis for pressure transmitters

Special features
- Digital or analogue output signals
- Non-linearity of up to 0.125 % of span
- Measuring range: 0 ... 6 psi to 0 ... 14,500 psi (0 ... 0.4 to 0 ... 1,000 bar)
- Common international process connections

Description

Optimal basis
The model TI-1 pressure transducer serves as the core for the widest variety of products such as pressure transmitters, data loggers, pressure controllers or as components in hand-held measuring instruments.

WIKA uses the TI-1 as the basis of pressure measuring instruments for the highest industrial requirements. This guarantees a security of supply over many years.

As a customer, you profit from our long experience in the field of sensor manufacturing and compensation.

State-of-the-art manufacturing
The pressure transducer is manufactured on state-of-the-art production equipment, enabling the greatest flexibility and fast lead times. The manufacturing concept offers continuous traceability for each produced unit, down to an individual component level.

Individual designs
A wide range of designs in the area of process connections and mechanical connections to the case are already available.

On request, further customizations can be developed in order to meet customer demands to the full extent.

Technical aspects
As output signals, digital signals such as UART, I²C and SPI or an analogue voltage signal are available.

Via the digital interface, the sensor unit can provide a wide range of information, e.g. the sensor temperature.

Following assembly, a zero adjustment and span correction can be carried out.

Examples of the model TI-1 OEM pressure transducer
### Measuring ranges

#### Gauge pressure

<table>
<thead>
<tr>
<th>bar</th>
<th>0 ... 0.4</th>
<th>0 ... 0.6</th>
<th>0 ... 1</th>
<th>0 ... 1.6</th>
<th>0 ... 2.5</th>
<th>0 ... 4</th>
<th>0 ... 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi</td>
<td>0 ... 10</td>
<td>0 ... 15</td>
<td>0 ... 25</td>
<td>0 ... 30</td>
<td>0 ... 50</td>
<td>0 ... 60</td>
<td>0 ... 100</td>
</tr>
</tbody>
</table>

#### Absolute pressure

<table>
<thead>
<tr>
<th>bar</th>
<th>0 ... 0.4</th>
<th>0 ... 0.6</th>
<th>0 ... 1</th>
<th>0 ... 1.6</th>
<th>0 ... 2.5</th>
<th>0 ... 4</th>
<th>0 ... 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi</td>
<td>0 ... 10</td>
<td>0 ... 15</td>
<td>0 ... 25</td>
<td>0 ... 30</td>
<td>0 ... 50</td>
<td>0 ... 60</td>
<td>0 ... 100</td>
</tr>
</tbody>
</table>

#### Vacuum and +/- measuring ranges

<table>
<thead>
<tr>
<th>bar</th>
<th>-0.4 ... 0</th>
<th>-0.6 ... 0</th>
<th>-1 ... 0</th>
<th>-1 ... +0.6</th>
<th>-1 ... 1.5</th>
<th>-1 ... +3</th>
<th>-1 ... +5</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi</td>
<td>-30 inHg ... 0</td>
<td>-30 inHg ... +15</td>
<td>-30 inHg ... +30</td>
<td>-30 inHg ... +45</td>
<td>-30 inHg ... +60</td>
<td>-30 inHg ... +100</td>
<td>-30 inHg ... +160</td>
</tr>
</tbody>
</table>

#### Other measuring ranges on request.

### Overpressure limit

The overpressure limit is based on the sensor element used. Depending on the selected process connection and sealing, restrictions in overpressure safety can result. A higher overpressure limit will result in a higher temperature error.

#### Selectable versions

<table>
<thead>
<tr>
<th>Measuring range &lt; 150 psi (10 bar)</th>
<th>≥ 150 psi (10 bar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>3 times</td>
</tr>
<tr>
<td>Option</td>
<td>5 times</td>
</tr>
<tr>
<td>Option</td>
<td>3 times</td>
</tr>
</tbody>
</table>

1) Restriction: max. 60 bar (870 psi) with absolute pressure.
2) Only possible for gauge pressure measuring ranges ≤ 400 bar (5,800 psi).
3) Only possible for absolute pressure measuring ranges < 16 bar (220 psi).

### Output signals

#### Selectable versions

<table>
<thead>
<tr>
<th>Digital</th>
<th>I²C</th>
<th>SPI</th>
<th>UART</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analogue</th>
<th>DC 0.3 ... 2.7 V</th>
</tr>
</thead>
</table>

### Vacuum tightness

Yes
Voltage supply

Power supply

<table>
<thead>
<tr>
<th>Selectable versions</th>
<th>Standard</th>
<th>DC 3 V ±1 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option</td>
<td>DC 2.7…3.6 V (has influence on the overall accuracy)</td>
<td></td>
</tr>
</tbody>
</table>

Current supply
- SPI: 2.7 mA (typ.), 3.7 mA (max.)
- I²C: 2.7 mA (typ.), 3.7 mA (max.)
- UART: 2.1 mA (typ.), 3 mA (max.)
- Voltage/switching signal: 2.8 mA (typ.), 3.7 mA (max.)

Accuracy specifications
The values given are only valid for the listed measuring ranges.

Non-linearity (per IEC 61298-2)
- ≤ ±0.125 % of span (BFSL)
- ≤ ±0.25 % of span (terminal method)

Accuracy at reference conditions
- ≤ ±0.25 % of span

Long-term drift (per IEC 61298-2)
- ≤ 0.1 % of span
- ≤ 0.2 % of span (measuring ranges < 1 bar)

Zero adjustment and span correction
- Zero point: ±0 ... 20 %
- Span: ±0 ... 20 %

Temperature measurement
Measuring error between -22 ... 212 °F (-30 ... +100 °C)
- 4 K (typ.), 12 K (max.)

Temperature error
For measuring ranges < 1 bar, special measuring ranges and instruments with an increased overpressure limit the respective temperature error increases by 0.5 % of span

Reference conditions (per IEC 61298-1)

Temperature
- 59 ... 77 °F (15 ... 25 °C)

Atmospheric pressure
- 12.47 ... 15.37 psi (860 ... 1,060 mbar)

Humidity
- 45 ... 75 % r. h.

Power supply
- DC 3 V

Mounting position
Calibrated in vertical mounting position with pressure connection facing downwards.
Operating conditions

Permissible ambient temperature
-40 ... +125 °C

Depending on the sealing on the process connection and the electrical connection, there may be limitations in the medium and ambient temperatures.

Process connections

Various process connections on request

Electrical connection

Electrical connection
ERNI - Microstac 0.8 mm Mezzanine connector system
Others on request

Pin assignment

<table>
<thead>
<tr>
<th>Pin</th>
<th>Description</th>
<th>UART</th>
<th>SPI</th>
<th>I²C</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1.1</td>
<td>Chip-select</td>
<td>-</td>
<td>CS</td>
<td>-</td>
</tr>
<tr>
<td>X1.2</td>
<td>Serial clock</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>X1.3</td>
<td>Master out slave in</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>X1.4</td>
<td>Master in slave out</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>X1.5</td>
<td>Serial clock</td>
<td>-</td>
<td>SCLK</td>
<td>SCL</td>
</tr>
<tr>
<td>X1.6</td>
<td>Serial data</td>
<td>-</td>
<td>MOSI</td>
<td>SDA</td>
</tr>
<tr>
<td>X2.1</td>
<td>Analogue supply voltage</td>
<td>AVDD</td>
<td>AVDD</td>
<td>AVDD</td>
</tr>
<tr>
<td>X2.2</td>
<td>Analogue/digital ground</td>
<td>GND</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>X2.3</td>
<td>Digital supply voltage</td>
<td>DVDD</td>
<td>DVDD</td>
<td>DVDD</td>
</tr>
<tr>
<td>X2.4</td>
<td>GPIO/DAC</td>
<td>Voltage or switching signal ¹</td>
<td>MISO</td>
<td>-</td>
</tr>
<tr>
<td>X2.5</td>
<td>Serial UART transmit</td>
<td>TxD</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>X2.6</td>
<td>Serial UART receive</td>
<td>RxD</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

¹ Optional

Manufacturer's declaration

RoHS
2011/65/EU

Ordering information

Measuring range / Overpressure limit / Power supply / Output signal / Process connection

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