WIKA
Standard product portfolio

Pressure | Temperature | Level | Force | Flow | Calibration technology
As a family-run business acting globally, with 10,000 highly qualified employees, the WIKA group of companies is a worldwide leader in pressure and temperature measurement. The company also sets the standard in the measurement of level, force and flow, and in calibration technology.

Founded in 1946, WIKA is today a strong and reliable partner for all the requirements of industrial measurement technology, thanks to a broad portfolio of high-precision instruments and comprehensive services.

With manufacturing locations around the globe, WIKA ensures flexibility and the highest delivery performance. Every year, over 50 million quality products, both standard and customer-specific solutions, are delivered in batches of 1 to over 10,000 units.

With numerous wholly owned subsidiaries and partners, WIKA competently and reliably supports its customers worldwide. Our experienced engineers and sales experts are your competent and dependable contacts locally.
You can find our industry-specific products with a lot of additional information in our segment brochures at www.wika.com.

- Sanitary applications
- Ventilation and air-conditioning
- Innovative SF₆ solutions
- High purity & ultra high purity
Bourdon tube pressure gauges

Copper alloy

These pressure gauges are suitable for liquid and gaseous media, so long as they are not highly viscous or crystallising and do not attack copper alloy parts. The scale ranges cover pressures from 0.6 … 1,000 bar. These instruments are manufactured in accordance with the European standard EN837-1 (except for model 116.15 and 111.12 in NS 27).

For the individual models, various approvals such as EAC, GL and KBA exist. For measuring points with high dynamic loads, such as fast load cycles or vibrations, a liquid-filled design should be used.

<table>
<thead>
<tr>
<th>111.10, 111.12</th>
<th>111.11</th>
<th>111.16, 111.26</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard version</strong></td>
<td><strong>Welding gauge ISO 5171</strong></td>
<td><strong>Panel mounting series</strong></td>
</tr>
<tr>
<td><strong>Nominal size</strong></td>
<td>27, 40, 50, 63, 80, 100, 160 mm</td>
<td>40, 50, 63 mm, model 111.26 also 80 mm</td>
</tr>
<tr>
<td><strong>Scale range</strong></td>
<td>-1 ... 0 to 0 ... 400 bar</td>
<td>-1 ... 0 to 0 ... 400 bar</td>
</tr>
<tr>
<td><strong>Accuracy class</strong></td>
<td>2.5, 1.6 optional NS 27: 4.0</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>PM 01.01, PM 01.17</td>
<td>PM 01.03</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>113.13</th>
<th>214.11</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Plastic case, liquid filling</strong></td>
<td><strong>Edgewise panel design</strong></td>
</tr>
<tr>
<td><strong>Nominal size</strong></td>
<td>40, 50, 63 mm</td>
</tr>
<tr>
<td><strong>Scale range</strong></td>
<td>-1 ... 0 to 0 ... 400 bar</td>
</tr>
<tr>
<td><strong>Accuracy class</strong></td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>PM 01.04</td>
</tr>
</tbody>
</table>
### 212.20
**Stainless steel case**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100, 160 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>0 … 0.6 to 0 … 1,000 bar</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.0</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 02.01</td>
</tr>
</tbody>
</table>

### 213.40
**Heavy-duty version, liquid filling**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>63, 80, 100 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>-1 … 0 to 0 … 1,000 bar</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.0 (NS 100), 1.6 (NS 63 and 80)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 02.06</td>
</tr>
</tbody>
</table>

### 113.53, 213.53
**Stainless steel case, liquid filling**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>113.53: 40, 80 mm, 213.53: 50, 63, 100 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>0 … 0.6 to 0 … 1,000 bar</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>113.53: 1.6 (NS 80), 2.5 (NS 40), 213.53: 1.6 (NS 50, 60)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 01.08, PM 02.12</td>
</tr>
</tbody>
</table>

### Thermomanometers

#### MFT
**With capillaries, for pressure and temperature measurement**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>40, 42, 52 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>Pressure: 0 … 4 bar, Temperature: 0 … 120 °C</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>Pressure: 2.5 (EN 837-1), Temperature: 2.5</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 01.20</td>
</tr>
</tbody>
</table>

#### THM10
**Eco version, for pressure and temperature measurement**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>63, 80 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>Pressure: 0 … 4 to 0 … 10 bar, Temperature: 0 … 120 °C</td>
</tr>
<tr>
<td>Connection location</td>
<td>Lower mount or back mount</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>Pressure: 2.5 (EN 837-1), Temperature: 2.5</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 01.24</td>
</tr>
</tbody>
</table>

#### 100.02
**For pressure and temperature measurement**

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>63, 80 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>Pressure: 0 … 1 to 0 … 16 bar, Temperature: 0 … 100 to 0 … 150 °C</td>
</tr>
<tr>
<td>Connection location</td>
<td>Lower mount or back mount</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>Pressure: 2.5 (EN 837-1), Temperature: ±2.5</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 01.23</td>
</tr>
</tbody>
</table>
Bourdon tube pressure gauges

Stainless steel

The wetted parts of these pressure gauges are manufactured entirely from stainless steel. Thus they are suitable for gaseous and liquid aggressive media that are not highly viscous or crystallising, also in aggressive environments. They are suitable for scale ranges from 0 ... 0.6 to 0 ... 7,000 bar.

Dependant upon the pressure range and the instrument model, overload safety of up to a maximum of 5 x full scale value is possible. To this point, the measurement accuracy is maintained. Liquid filling the case ensures a precise instrument display, even with high dynamic pressure loads and vibrations.

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**131.11 Compact version**

- Nominal size: 40, 50, 63 mm
- Scale range:
  - NS 40, 50: 0 ... 1 to 0 ... 600 bar
  - NS 63: 0 ... 1 to 0 ... 1,000 bar
- Accuracy class: 2.5
- Ingress protection: IP65
- Data sheet: PM 01.05

**232.50, 233.50 For the process industry, standard version**

- Nominal size: 63, 100, 160 mm
- Scale range:
  - NS 63: 0 ... 1 to 0 ... 1,000 bar
  - NS 100: 0 ... 0.6 to 0 ... 1,000 bar
  - NS 160: 0 ... 0.6 to 0 ... 1,600 bar
- Accuracy class: 1.0 (NS 100, 160), 1.6 (NS 63)
- Ingress protection: IP65
- Data sheet: PM 02.02

**232.30, 233.30 For the process industry, safety version**

- Nominal size: 63, 100, 160 mm
- Scale range:
  - NS 63: 0 ... 1 to 0 ... 1,000 bar
  - NS 100: 0 ... 0.6 to 0 ... 1,000 bar
  - NS 160: 0 ... 0.6 to 0 ... 1,600 bar
- Accuracy class: 1.0 (NS 100, 160), 1.6 (NS 63)
- Ingress protection: IP65
- Data sheet: PM 02.04

**232.36, 233.36 High overload safety up to the 4-fold full scale value, safety version**

- Nominal size: 100, 160 mm
- Scale range: 0 ... 0.6 to 0 ... 40 bar
- Overload safety: Up to 4 times the measuring range
- Accuracy class: 1.0
- Ingress protection: IP65
- Data sheet: PM 02.15

**232.34, 233.34 Process Gauge, safety version per ASME B40.100**

- Nominal size: 4 ½”
- Scale range: 0 ... 0.6 bar to 0 ... 1,000 bar
- Accuracy class: Grade 2A
- Ingress protection: IP54 with liquid filling IP65
- Data sheet: PM 02.10
Test gauges

For highest accuracy

Depending upon the instrument model, accuracies of 0.1, 0.25 or 0.6 % of full scale value can be measured.

The pressure ranges cover from 0 … 6 mbar to 0 … max. 1,600 bar and are suitable for calibration tasks. For each of the pressure gauges specified here, a DKD/DAkkS certificate can be provided.

### 312.20
Copper alloy, class 0.6

- **Nominal size**: 160 mm
- **Scale range**: 0 … 0.6 to 0 … 600 bar
- **Accuracy class**: 0.6
- **Ingress protection**: IP54
- **Data sheet**: PM 03.01

### 332.50, 333.50
Stainless steel, standard version, class 0.6

- **Nominal size**: 160 mm
- **Scale range**: 0 … 0.6 to 0 … 1,600 bar
- **Accuracy class**: 0.6
- **Ingress protection**: IP65
- **Data sheet**: PM 03.06

### 332.30, 333.30
Stainless steel, safety version, class 0.6

- **Nominal size**: 160 mm
- **Scale range**: 0 … 0.6 to 0 … 1,600 bar
- **Accuracy class**: 0.6
- **Ingress protection**: IP65
- **Data sheet**: PM 03.05

### 342.11
From class 0.1, with transport case and acceptance test certificate

- **Nominal size**: 250 mm
- **Scale range**: 0 … 1 to 0 … 1,600 bar
- **Accuracy class**: 0.1 for scale ranges < 400 bar, 0.25 for scale ranges ≥ 400 bar
- **Ingress protection**: IP54
- **Data sheet**: PM 03.03

### 610.20, 630.20
For low pressure ranges from 10 mbar, class 0.6

- **Nominal size**: 160 mm
- **Scale range**: 0 … 10 to 0 … 600 mbar
- **Accuracy class**: 0.6
- **Ingress protection**: IP54
- **Data sheet**: PM 06.09
Diaphragm pressure gauges

The application areas for diaphragm pressure gauges are very versatile. They are the specialists in the process industry when it comes to critical measuring tasks such as with highly corrosive or viscous media or when it comes to low pressures and high overload. The scale ranges are from as low as 0 … 16 mbar to typically 0 … 25 to 0 … 40 bar. Dependant upon the pressure range and the instrument model, overload safety of 3 x or 5 x full scale value is possible as standard.

For special designs, an overload safety of up to 400 bar is possible, with the measurement accuracy maintained. Diaphragm pressure gauges are even suitable for highly viscous or contaminated media by using an open connecting flange (per DIN/ASME). For measuring particularly aggressive media, the complete wetted surface can be lined with a large selection of special materials (e.g. PTFE, Hastelloy, tantalum, and many more).

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Nominal Size</th>
<th>Scale Range</th>
<th>Accuracy Class</th>
<th>Ingress Protection</th>
<th>Data Sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>422.12, 423.12</td>
<td>Grey cast iron case</td>
<td>100, 160 mm</td>
<td>0 … 16 mbar to 0 … 40 bar</td>
<td>1.6</td>
<td>IP54, with liquid filling IP65</td>
<td>PM 04.02</td>
</tr>
<tr>
<td>432.50, 433.50</td>
<td>For the process industry, high overload safety up to the 10-fold full scale value, max. 40 bar</td>
<td>100, 160 mm</td>
<td>0 … 16 mbar to 0 … 25 bar</td>
<td>1.6</td>
<td>IP54, with liquid filling IP65</td>
<td>PM 04.03</td>
</tr>
<tr>
<td>432.36, 432.56</td>
<td>For the process industry, high overload safety to 40, 100 or 400 bar</td>
<td>100, 160 mm</td>
<td>0 … 16 mbar to 0 … 40 bar</td>
<td>1.6</td>
<td>IP54, with liquid filling IP65</td>
<td>PM 04.07</td>
</tr>
</tbody>
</table>
Capsule pressure gauges

For very low pressures

These measuring instruments are particularly suited to gaseous media. The scale ranges are between 0 ... 2.5 mbar and 0 ... 1,000 mbar in accuracy classes from 0.1 to 2.5. Capsule pressure gauges consist of two circular, corrugated diaphragms, joined together around the edge with a pressure-tight seal. Overload protection is possible in certain cases.

611.10
Standard version

- Nominal size: 50, 63 mm
- Scale range: 0 ... 25 to 0 ... 600 mbar
- Accuracy class: 1.6
- Ingress protection: IP54
- Data sheet: PM 06.01

611.13
Plastic case

- Nominal size: 50, 63 mm
- Scale range: 0 ... 60 to 0 ... 600 mbar
- Accuracy class: 2.5
- Ingress protection: IP53
- Data sheet: PM 06.12

612.20
Stainless steel case

- Nominal size: 63, 100, 160 mm
- Scale range: 0 ... 6 to 0 ... 600 mbar
- Accuracy class: 1.6
- Ingress protection: IP54
- Data sheet: PM 06.02

614.11, 634.11
Edgewise panel design

- Nominal size: 72 x 72, 96 x 96, 144 x 144, 144 x 72 mm
- Scale range:
  - NS 72 x 72: 0 ... 25 to 0 ... 600 mbar
  - NS 96 x 96: 0 ... 10 to 0 ... 600 mbar
  - NS 144 x 144: 0 ... 6 to 0 ... 600 mbar
  - NS 144 x 72: 0 ... 4 to 0 ... 600 mbar
- Accuracy class: 1.6
- Data sheet: PM 06.05

632.50
For the process industry

- Nominal size: 63, 100, 160 mm
- Scale range:
  - NS 63: 0 ... 40 to 0 ... 600 mbar
  - NS 100: 0 ... 16 to 0 ... 600 mbar
  - NS 160: 0 ... 2.5 to 0 ... 600 mbar
- Accuracy class: 1.6
- Ingress protection: IP54, with liquid filling IP65
- Data sheet: PM 06.03

632.51
For the process industry, high overload safety

- Nominal size: 100, 160 mm
- Scale range:
  - NS 100: 0 ... 2.5 mbar to 0 ... 100 mbar
- Accuracy class: 1.6
- Ingress protection: IP54
- Data sheet: PM 06.06
Differential pressure gauges work with a wide range of pressure elements. With this variety, measuring ranges from 0 ... 0.5 mbar to 0 ... 1,000 bar and static overlay pressures up to 400 bar are possible.

These measuring instruments monitor:
- the pollution degree in filter systems
- the level in closed vessels
- the overpressure in clean rooms
- the flow of gaseous and liquid media
- and they control pumping plants

### 700.01, 700.02
With magnetic piston or with magnetic piston and separating diaphragm

<table>
<thead>
<tr>
<th>Specification</th>
<th>700.01</th>
<th>700.02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>80 mm</td>
<td></td>
</tr>
<tr>
<td>Scale range</td>
<td>700.01: 0 ... 400 mbar to 0 ... 10 bar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>700.02: 0 ... 160 mbar to 0 ... 2.5 bar</td>
<td></td>
</tr>
<tr>
<td>Accuracy class</td>
<td>±3 %</td>
<td>±5 %</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP54</td>
<td></td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 07.14</td>
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</table>

### 711.12, 731.12
With parallel entry, copper alloy or stainless steel

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<th>Specification</th>
<th>711.12</th>
<th>731.12</th>
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</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100, 160 mm</td>
<td></td>
</tr>
<tr>
<td>Scale range</td>
<td>0 ... 0.6 to 0 ... 1,000 bar</td>
<td></td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP33</td>
<td></td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 07.02</td>
<td></td>
</tr>
</tbody>
</table>

### DPG40
With integrated working pressure indication (DELTA-plus)

<table>
<thead>
<tr>
<th>Specification</th>
<th>DPG40</th>
</tr>
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<tbody>
<tr>
<td>Nominal size</td>
<td>100 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>0 ... 0.16 to 0 ... 10 bar</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>2.5</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP65</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 07.20</td>
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</tbody>
</table>

### 716.11, 736.11
For very low differential pressures from 2.5 mbar, copper alloy or stainless steel

<table>
<thead>
<tr>
<th>Specification</th>
<th>716.11</th>
<th>736.11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100, 160 mm</td>
<td></td>
</tr>
<tr>
<td>Scale range</td>
<td>716.01: 0 ... 10 to 0 ... 250 mbar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>716.02: 0 ... 2.5 to 0 ... 250 mbar</td>
<td></td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP66</td>
<td></td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 07.07</td>
<td></td>
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</tbody>
</table>

### 732.51
For the process industry, all-metal media chamber

<table>
<thead>
<tr>
<th>Specification</th>
<th>732.51</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100, 160 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>0 ... 16 mbar to 0 ... 25 bar</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.6</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP66, with liquid filling IP65</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 07.05</td>
</tr>
</tbody>
</table>

### 732.14
For the process industry, high overload safety to 40, 100, 250 or 400 bar

<table>
<thead>
<tr>
<th>Specification</th>
<th>732.14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100, 160 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>732.01: 0 ... 60 to 0 ... 250 mbar (measuring cell DN 140)</td>
</tr>
<tr>
<td></td>
<td>732.02: 0 ... 0.25 to 0 ... 40 bar (measuring cell DN 82)</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.6</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP54, with liquid filling IP65</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 07.13</td>
</tr>
</tbody>
</table>
Absolute pressure gauges

Absolute pressure gauges are used when measured pressures are independent of the natural fluctuations in atmospheric pressure. The pressure of the measured media is determined against a reference pressure, which corresponds to the absolute pressure zero point. For this, the reference chamber is completely evacuated, so that there is a near-perfect vacuum in it.

Applications for these high-precision measuring instruments are, for example, monitoring of vacuum pumps and vacuum packing machines. They are also used in laboratories, in order to monitor condensation pressures or to determine the vapour pressure of liquids.

### 532.52, 532.53, 532.54

**High overload safety**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>100, 150 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>0 ... 25 mbar to 0 ... 25 bar abs. high overload safety</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.0 or 1.6 or 2.5</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP54, with liquid filling IP65</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 05.02</td>
</tr>
</tbody>
</table>

| Symbol | "EAC" |

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Pressure | Display
Digital pressure gauges

**DG-10**
Digital pressure gauge for general industrial applications

- **Measuring range**
  - 0 ... 5 to 0 ... 600 bar
  - -1 ... +5 to -1 ... +10 bar
- **Accuracy**
  - (% of span) ≤ 0.5 % FS ± 1 digit
- **Special feature**
  - Robust stainless steel case, nominal size 80 mm
  - Battery operation (2 x 1.5 V AA cell)
  - Option: Rotatable instrument head, backlighting
- **Data sheet** PE 81.66

**CPG500**
Digital pressure gauge

- **Measuring range**
  - 0 ... 60 to 0 ... 1,000 bar
  - -1 ... +20 to -1 ... +40 bar
- **Accuracy**
  - (% of span) 0.25 ±1 digit
- **Special feature**
  - Robust case with protective rubber cap
  - Simple operation using four buttons
- **Data sheet** CT 09.01

**CPG1500**
Precision digital pressure gauge

- **Measuring range**
  - -1 ... 10,000 bar
- **Accuracy**
  - (% of span) 0.025 % FS
- **Special feature**
  - Integrated data logger
  - WIKA-Cal compatible
  - Data transfer via WIKA-Wireless
  - Robust case IP65
- **Data sheet** CT 10.51
## Process transmitters

### UPT-20

**Universal process transmitter with standard connection, Ex intrinsically safe**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-linearity</td>
<td>≤ 0.1</td>
</tr>
<tr>
<td>Output signal</td>
<td>4 ... 20 mA, HART®^®</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0 ... 0.4 to 0 ... 4,000 bar</td>
</tr>
<tr>
<td></td>
<td>0 ... 1.6 to 0 ... 40 bar abs.</td>
</tr>
<tr>
<td></td>
<td>-0.2 ... +0.2 to -1 ... +40 bar</td>
</tr>
<tr>
<td>Special feature</td>
<td>Multi-functional display</td>
</tr>
<tr>
<td></td>
<td>Freely scalable measuring range</td>
</tr>
<tr>
<td></td>
<td>Simple menu navigation</td>
</tr>
<tr>
<td></td>
<td>Conductive plastic case or stainless steel case</td>
</tr>
<tr>
<td></td>
<td>Large LC display, rotatable</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PE 86.05</td>
</tr>
</tbody>
</table>

### UPT-21

**Universal process transmitter with flush process connection**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-linearity</td>
<td>≤ 0.1</td>
</tr>
<tr>
<td>Output signal</td>
<td>4 ... 20 mA, HART®^®</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0 ... 0.4 to 0 ... 600 bar</td>
</tr>
<tr>
<td></td>
<td>0 ... 1.6 to 0 ... 40 bar abs.</td>
</tr>
<tr>
<td></td>
<td>-0.2 ... +0.2 to -1 ... +40 bar</td>
</tr>
<tr>
<td>Special feature</td>
<td>Hygienic process connections in different designs from ½&quot; to 2&quot;</td>
</tr>
<tr>
<td></td>
<td>Electropolished stainless steel case for hygienic applications</td>
</tr>
<tr>
<td></td>
<td>Freely scalable measuring range</td>
</tr>
<tr>
<td></td>
<td>Conductive plastic case or stainless steel case</td>
</tr>
<tr>
<td></td>
<td>Large LC display, rotatable</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PE 86.05</td>
</tr>
</tbody>
</table>

### IPT-20, IPT-21

**Process pressure transmitter with welded metal measuring cell**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-linearity</td>
<td>≤ 0.075 ... 0.1</td>
</tr>
<tr>
<td>Output signal</td>
<td>4 ... 20 mA, HART® protocol (optional), PROFIBUS® PA FOUNDATION™ Fieldbus</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0 ... 0.1 to 0 ... 4,000 bar</td>
</tr>
<tr>
<td></td>
<td>0 ... 0.1 to 0 ... 40 bar abs.</td>
</tr>
<tr>
<td></td>
<td>-1 ... 0 to -1 ... +40 bar</td>
</tr>
<tr>
<td>Special feature</td>
<td>Freely scalable measuring ranges</td>
</tr>
<tr>
<td></td>
<td>Case from plastic, aluminium or stainless steel</td>
</tr>
<tr>
<td></td>
<td>With integrated display and instrument mounting bracket for wall/pipe mounting (optional)</td>
</tr>
<tr>
<td></td>
<td>Process temperature ranges to 200 °C</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PE 86.06</td>
</tr>
</tbody>
</table>

### CPT-20, CPT-21

**Process pressure transmitter with capacitive ceramic measuring cell**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-linearity</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Output signal</td>
<td>4 ... 20 mA, HART® protocol (optional), PROFIBUS® PA FOUNDATION™ Fieldbus</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0 ... 0.025 to 0 ... 100 bar</td>
</tr>
<tr>
<td></td>
<td>-1 ... 0 to -1 ... +100 bar</td>
</tr>
<tr>
<td>Special feature</td>
<td>Particularly robust, ceramic measuring cell</td>
</tr>
<tr>
<td></td>
<td>Dry ceramic measuring cell with variable sealing concept</td>
</tr>
<tr>
<td></td>
<td>Freely scalable measuring ranges</td>
</tr>
<tr>
<td></td>
<td>Case from plastic, aluminium or stainless steel</td>
</tr>
<tr>
<td></td>
<td>Flush process connection (optional)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PE 86.07</td>
</tr>
</tbody>
</table>

### DPT-10

**Differential pressure transmitter, intrinsically safe or with flame-proof enclosure**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-linearity</td>
<td>≤ 0.075 ... 0.15</td>
</tr>
<tr>
<td>Output signal</td>
<td>4 ... 20 mA, HART® protocol (optional), PROFIBUS® PA</td>
</tr>
<tr>
<td>Measuring range</td>
<td>0 ... 10 mbar to 0 ... 40 bar</td>
</tr>
<tr>
<td>Special feature</td>
<td>Freely scalable measuring ranges</td>
</tr>
<tr>
<td></td>
<td>Static load 160 bar, optionally 420 bar</td>
</tr>
<tr>
<td></td>
<td>Case from plastic, aluminium or stainless steel</td>
</tr>
<tr>
<td></td>
<td>With integrated display and instrument mounting bracket for wall/pipe mounting (optional)</td>
</tr>
<tr>
<td></td>
<td>3- or 5-way valve optional</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PE 86.21</td>
</tr>
</tbody>
</table>
### Pressure sensors

#### A-10
For industrial applications

- **Non-linearity**: (± % of span) ≤ 0.25 or 0.5 BFSL
- **Measuring range**:
  - 0 ... 0.05 to 0 ... 1,000 bar
  - 0 ... 0.1 to 0 ... 25 bar abs.
  - -0.025 to +0.025 to -1 ... +24 bar
- **Special feature**:
  - Compact design
  - Free test report
  - 2 million possible variants
- **Data sheet**: PE 81.60

#### S-20
For superior industrial applications

- **Non-linearity**: (± % of span) ≤ 0.125, 0.25 or 0.5 BFSL
- **Measuring range**:
  - 0 ... 0.4 to 0 ... 1,600 bar
  - 0 ... 0.4 to 0 ... 40 bar abs.
  - -1 ... 0 to -1 ... +59 bar
- **Special feature**:
  - Extreme operating conditions
  - Customer-specific variants
  - Free test report
- **Data sheet**: PE 81.61

#### S-11
Flush diaphragm

- **Non-linearity**: (± % of span) ≤ 0.2 BFSL
- **Measuring range**:
  - 0 ... 0.1 to 0 ... 600 bar
  - 0 ... 0.25 to 0 ... 16 bar abs.
  - -1 ... 0 to -1 ... +24 bar
- **Special feature**:
  - Flush process connection
  - Medium temperature to 150 °C
  - Comprehensive stocks
- **Data sheet**: PE 81.02

#### IS-3
Intrinsic safety Ex i

- **Accuracy**: (± % of span) ≤ 0.5
- **Measuring range**:
  - 0 ... 0.1 to 0 ... 6,000 bar
  - 0 ... 0.25 to 0 ... 25 bar abs.
  - -1 ... 0 to -1 ... +24 bar
- **Special feature**:
  - Further worldwide Ex approvals
  - High-pressure version (optional)
  - Flush process connection (optional)
  - Suitable for SIL 2 per IEC 61508/IEC 61511
- **Data sheet**: PE 81.58

#### E-10, E-11
Flameproof enclosure Ex d

- **Accuracy**: (± % of span) ≤ 0.5
- **Measuring range**:
  - 0 ... 0.4 to 0 ... 1,000 bar
  - 0 ... 0.4 to 0 ... 16 bar abs.
  - -1 ... 0 to -1 ... +25 bar
- **Special feature**:
  - Low-power version
  - For sour gas applications (NACE)
  - Flush process connection (optional)
  - Worldwide Ex approvals
- **Data sheet**: PE 81.27
# Pressure | Transmit

## HP-2
**For highest pressure applications to 15,000 bar**

<table>
<thead>
<tr>
<th>Accuracy (± % of span)</th>
<th>≤ 0.25 or 0.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>0 ... 1,600 to 0 ... 15,000 bar</td>
</tr>
<tr>
<td>Special feature</td>
<td>Very high long-term stability, Excellent load cycle stability, Cavitation protection (optional)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PE 81.53</td>
</tr>
</tbody>
</table>

## M-10, M-11
**Spanner width 19**

<table>
<thead>
<tr>
<th>Non-linearity (± % of span)</th>
<th>≤ 0.2 BFSL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>0 ... 6 to 0 ... 1,000 bar</td>
</tr>
<tr>
<td>Special feature</td>
<td>Small spanner width 19 mm, Flush connection G ¼ available</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PE 81.25</td>
</tr>
</tbody>
</table>

## P-30, P-31
**For precision measurements**

<table>
<thead>
<tr>
<th>Accuracy (± % of span)</th>
<th>≤ 0.1 or 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>0 ... 0.25 to 0 ... 1,000 bar</td>
</tr>
<tr>
<td>Special feature</td>
<td>No additional temperature error in the range 10 ... 60 °C, Flush process connection (optional), Analogue, CANopen® or USB</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PE 81.54</td>
</tr>
</tbody>
</table>

## MHC-1
**For mobile working machines, CANopen® or J1939**

<table>
<thead>
<tr>
<th>Accuracy (± % of span)</th>
<th>≤ 1 or 0.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>0 ... 60 to 0 ... 1,000 bar</td>
</tr>
<tr>
<td>Special feature</td>
<td>Tested for harsh environmental conditions, Robust instrument design, Version with integrated Y-connector</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PE 81.49</td>
</tr>
</tbody>
</table>
## OEM pressure sensors

<table>
<thead>
<tr>
<th>Model</th>
<th>Application</th>
<th>Accuracy (± % of span)</th>
<th>Measuring range</th>
<th>Special feature</th>
<th>Data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>O-10</strong></td>
<td>For industrial applications</td>
<td>≤ 0.5 BFSL</td>
<td>0 ... 6 to 0 ... 600 bar, -1 ... +5 to -1 ... +59 bar</td>
<td>For OEM quantities, Customer-specific variants, Special version for applications with water as medium</td>
<td>PE 81.65</td>
</tr>
<tr>
<td><strong>MH-3</strong></td>
<td>For mobile working machines</td>
<td>≤ 1</td>
<td>0 ... 6 to 0 ... 600 bar</td>
<td>For extreme operating conditions, Compact and robust design, Diagnostic function (optional), Signal clamping (optional), Customer-specific adaptations possible</td>
<td>PE 81.59</td>
</tr>
<tr>
<td><strong>R-1</strong></td>
<td>For refrigeration and air-conditioning applications</td>
<td>≤ 2</td>
<td>0 ... 6 to 0 ... 160 bar, -1 ... +7 to -1 ... +45 bar</td>
<td>Special case design for the best possible condensation tightness, Resistant to all common refrigerants</td>
<td>PE 81.45</td>
</tr>
<tr>
<td><strong>C-2</strong></td>
<td>For air compressors</td>
<td>≤ 1 or 2</td>
<td>0 ... 6 to 0 ... 60 bar, -1 ... +10 to -1 ... +45 bar</td>
<td>Robust design, Compact design, Long service life and high reliability</td>
<td>PE 81.47</td>
</tr>
<tr>
<td><strong>MG-1</strong></td>
<td>For medical gases</td>
<td>≤ 2</td>
<td>0 ... 6 to 0 ... 400 bar, -1 ... +6 bar</td>
<td>Cleaned, packed and labelled for oxygen per international standards</td>
<td>PE 81.44</td>
</tr>
</tbody>
</table>
## Sensor assemblies and modules

### Customer-specific electronic pressure measurement solutions

We see ourselves not only as a provider of top quality measurement technology, but also as a highly competent partner that is able to create individually designed solutions together with you. We are ready to develop products for you that are tailor made to cater for your individual needs. Create your perfect pressure sensor solution together with us. Here, the experience from a multitude of completed projects is incorporated - thus we can refer back to numerous proven solutions and components. As required, we will adapt our systems to your individual application or develop new ones.

Talk to us – we are happy to provide you with advice!

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Non-linearity (± % of span)</th>
<th>Measuring range</th>
<th>Special feature</th>
<th>Signal</th>
<th>Data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTF-1</td>
<td>Metal thin-film sensor assembly</td>
<td>≤ 0.12 … 0.5</td>
<td>0 … 10 to 0 … 1,000 bar</td>
<td></td>
<td>mV/V</td>
<td>PE 81.16</td>
</tr>
<tr>
<td>SCT-1</td>
<td>Ceramic sensor assembly</td>
<td>≤ 0.25 … 0.5</td>
<td>0 … 2 to 0 … 100 bar</td>
<td>Excellent resistance to media</td>
<td>mV/V</td>
<td>PE 81.40</td>
</tr>
<tr>
<td>SPR-2, TPR-2</td>
<td>Piezo sensor element and sensor assembly</td>
<td>≤ 0.3</td>
<td>0 … 0.4 to 0 … 25 bar</td>
<td>Gauge and absolute pressure measurement</td>
<td>mV/V</td>
<td>PE 81.62</td>
</tr>
<tr>
<td>TI-1</td>
<td>Piezo or metal thin-film sensor module</td>
<td>≤ 0.25</td>
<td>0 … 0.4 to 0 … 1,000 bar</td>
<td>Processed signal</td>
<td>Analogue and digital</td>
<td>PE 81.57</td>
</tr>
<tr>
<td>MPR-1</td>
<td>Sensor module</td>
<td>≤ 0.125 … 0.25</td>
<td>0 … 0.4 to 0 … 25 bar</td>
<td>19 mm spanner width for limited mounting space</td>
<td>Analogue and digital (ºC)</td>
<td>PE 81.64</td>
</tr>
</tbody>
</table>
Pressure gauges with output signal

The multi-functional intelliGAUGEs present a cost-effective and, at the same time, reliable solution for nearly all pressure measurement applications. They combine the analogue indication of a mechanical pressure gauge, needing no external power, with the electrical output signal of a pressure sensor. These hybrid instruments are available with all commonly used electrical signals. The sensor works in a non-contact way, without any influence on the measuring signal. Many of the instruments can be delivered in accordance with ATEX Ex ia.

Depending on the pressure gauge, the following electrical output signals are possible:

- 0.5 … 4.5 V ratiometric
- 4 … 20 mA, 2-wire
- 4 … 20 mA, 2-wire with Ex approvals
- 0 … 20 mA, 3-wire
- 0 … 10 V, 3-wire

For pressure gauges with nominal sizes 100 and 160 mm, the electrical output signals can also be combined with switch contacts.

**PGT21**
Bourdon tube, stainless steel case

Nominal size 50, 63 mm
Scale range 0 … 1.6 to 0 … 400 bar
Accuracy class 2.5
Ingress protection IP65, IP67 optional
Data sheet PV 11.03

**PGT23.063**
Bourdon tube, for the process industry, safety version

Nominal size 63 mm
Scale range 0 … 1 to 0 … 1,000 bar
Accuracy class 1.6
Ingress protection IP54, filled IP65
Data sheet PV 12.03

**PGT23.100, PGT23.160**
Bourdon tube, for the process industry, standard or safety version

Nominal size 100, 160 mm
Scale range 0 … 0.6 to 0 … 1,600 bar
Accuracy class 1.0
Ingress protection IP54, filled IP65
Data sheet PV 12.04

**PGT43**
Diaphragm element, for the process industry, high overload safety up to the 10-fold full scale value, max. 40 bar

Nominal size 100, 160 mm
Scale range 0 … 16 mbar to 0 … 25 bar
Accuracy class 1.6
Ingress protection IP54, with liquid filling IP65
Data sheet PV 14.03

**PGT43HP**
Diaphragm element, for the process industry, high overload safety to 40, 100 or 400 bar

Nominal size 100, 160 mm
Scale range 0 … 16 mbar to 0 … 40 bar
Accuracy class 1.6
Ingress protection IP54, with liquid filling IP65
Data sheet PV 14.07

**PGT63HP**
Capsule element, for the process industry, high overload safety

Nominal size 100, 160 mm
Scale range 2.5 … 100 mbar
Accuracy class 1.6
Ingress protection IP54
Data sheet PV 16.06
<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Nominal size</th>
<th>Scale range</th>
<th>Accuracy class</th>
<th>Ingress protection</th>
<th>Data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPGT43</td>
<td>Differential pressure, for the process industry, all-metal media chamber</td>
<td>100, 160 mm</td>
<td>0 … 16 mbar to 0 … 25 bar</td>
<td>1.6</td>
<td>IP54, filled IP65</td>
<td>PV 17.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPGT43HP</td>
<td>Differential pressure, for the process industry, high overload safety to 40, 100, 250 or 400 bar</td>
<td>100, 160 mm</td>
<td>0 … 60 mbar to 0 … 40 bar</td>
<td>1.6</td>
<td>IP54, filled IP65</td>
<td>PV 17.13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DPGT40</td>
<td>Differential pressure, with integrated working pressure indication (DELTA-trans)</td>
<td>100 mm</td>
<td>0 … 0.16 to 0 … 10 bar</td>
<td>2.5 (1.6 optional)</td>
<td>IP65</td>
<td>PV 17.19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>APGT43</td>
<td>Absolute pressure, for the process industry</td>
<td>100, 160 mm</td>
<td>0 … 25 mbar to 0 … 25 bar abs.</td>
<td>2.5</td>
<td>IP54, with liquid filling IP65</td>
<td>PV 15.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Control systems are gaining more and more importance in industrial applications. Consequently, mere pressure indication on the measuring instrument itself is no longer sufficient, rather the measured value must be transferred to the control system via an electrical signal, e.g. by closing or opening of a circuit. WIKA is focusing on its contact pressure gauges in order to satisfy this trend.

All instruments with inductive contacts are certified in accordance with ATEX Ex ia.

Depending on the model the following contacts are built-in:

- Magnetic snap-action contact, e.g. model 821, for general applications
- Inductive contact model 831, for hazardous areas
- Electronic contact model 830 E, for PLC
- Reed contact model 851, for general applications and PLC
- Micro switch model 850
- Transistor output NPN or PNP

### Contact pressure gauges

PGS21

<table>
<thead>
<tr>
<th>Bourdon tube, stainless steel case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size: 40, 50, 63 mm</td>
</tr>
<tr>
<td>Scale range: 0 ... 2.5 to 0 ... 400 bar</td>
</tr>
<tr>
<td>Accuracy class: 2.5</td>
</tr>
<tr>
<td>Ingress protection: IP65</td>
</tr>
<tr>
<td>Special feature: NS 50; Version with VdS or LPCB approval possible</td>
</tr>
<tr>
<td>Data sheet: P21.02</td>
</tr>
</tbody>
</table>

PGS25

<table>
<thead>
<tr>
<th>Bourdon tube, with electronic pressure switch, stainless steel case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size: 50, 63 mm</td>
</tr>
<tr>
<td>Scale range: 0 ... 1.6 to 0 ... 400 bar</td>
</tr>
<tr>
<td>Accuracy class: 2.5</td>
</tr>
<tr>
<td>Ingress protection: IP65</td>
</tr>
<tr>
<td>Data sheet: P21.04</td>
</tr>
</tbody>
</table>

PGS21.100, PGS21.160

<table>
<thead>
<tr>
<th>Bourdon tube, stainless steel case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size: 100, 160 mm</td>
</tr>
<tr>
<td>Scale range: 0 ... 0.6 to 0 ... 600 bar</td>
</tr>
<tr>
<td>Accuracy class: 1.0</td>
</tr>
<tr>
<td>Ingress protection: IP54</td>
</tr>
<tr>
<td>Data sheet: P22.01</td>
</tr>
</tbody>
</table>

PGS23.100, PGS23.160

<table>
<thead>
<tr>
<th>Bourdon tube, for the process industry, standard or safety version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size: 100, 160 mm</td>
</tr>
<tr>
<td>Scale range: 0 ... 0.6 to 0 ... 1,600 bar</td>
</tr>
<tr>
<td>Accuracy class: 1.0</td>
</tr>
<tr>
<td>Ingress protection: IP65 or IP66</td>
</tr>
<tr>
<td>Data sheet: P22.02</td>
</tr>
</tbody>
</table>

PGS23.063

<table>
<thead>
<tr>
<th>Bourdon tube, for the process industry, safety version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size: 63 mm</td>
</tr>
<tr>
<td>Scale range: 0 ... 4 to 0 ... 400 bar</td>
</tr>
<tr>
<td>Accuracy class: 1.6</td>
</tr>
<tr>
<td>Ingress protection: IP54</td>
</tr>
<tr>
<td>Data sheet: P22.03</td>
</tr>
</tbody>
</table>

PGS43.100, PGS43.160

<table>
<thead>
<tr>
<th>Diaphragm element, for the process industry, high overload safety up to the 10-fold full scale value, max. 40 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size: 100, 160 mm</td>
</tr>
<tr>
<td>Scale range: 0 ... 25 mbar to 0 ... 25 bar</td>
</tr>
<tr>
<td>Accuracy class: 1.6</td>
</tr>
<tr>
<td>Ingress protection: IP54, with liquid filling IP65</td>
</tr>
<tr>
<td>Data sheet: P24.03</td>
</tr>
</tbody>
</table>
### 432.36, 432.56 with 8xx
Diaphragm element, for the process industry, high overload safety to 100 or 400 bar

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100, 160 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>0 … 25 mbar to 0 … 40 bar</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.6</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP54, with liquid filling IP65</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PV 24.07</td>
</tr>
</tbody>
</table>

### 532.53 with 8xx
Absolute pressure, for the process industry, high overload safety

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100, 160 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>0 … 25 mbar to 0 … 25 bar abs.</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.6</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP54, with liquid filling IP65</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PV 25.02</td>
</tr>
</tbody>
</table>

### 632.51 with 8xx
Capsule element, for the process industry, high overload safety

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100, 160 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>0 … 2.5 to 0 … 10 bar</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.6</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP54</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PV 26.06</td>
</tr>
</tbody>
</table>

### DPGS40
Differential pressure, with micro switches, with integrated working pressure indication (DELTA-comb)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>0 … 0.25 to 0 … 10 bar</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>2.5 (1.6 optional)</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP65</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PV 27.20</td>
</tr>
</tbody>
</table>

### DPGS43
Differential pressure, for the process industry, all-metal media chamber

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100, 160 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>0 … 16 mbar to 0 … 25 bar</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.6</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP54, filled IP65</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PV 27.05</td>
</tr>
</tbody>
</table>

### DPGS43HP
Differential pressure, for the process industry, high overload safety to 400 bar

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal size</td>
<td>100, 160 mm</td>
</tr>
<tr>
<td>Scale range</td>
<td>0 … 60 mbar to 0 … 40 bar</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.6</td>
</tr>
<tr>
<td>Ingress protection</td>
<td>IP54, filled IP65</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PV 27.13</td>
</tr>
</tbody>
</table>
# Pressure switches

## Electronic pressure switches

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Setting range</th>
<th>Switching function</th>
<th>Material</th>
<th>Switching power</th>
<th>Data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSD-4</td>
<td>Electronic pressure switch with display</td>
<td>≤ 0.5</td>
<td>≤ 0.5</td>
<td>Stainless steel, zinc-nickel coating</td>
<td>2 A, AC 48 V</td>
<td>PV 34.81</td>
</tr>
</tbody>
</table>

## Mechanical pressure switches for industrial applications

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Setting range</th>
<th>Switching function</th>
<th>Material</th>
<th>Switching power</th>
<th>Data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSM01</td>
<td>Compact pressure switch, standard version</td>
<td>0.85 … 0.15 bar</td>
<td>Change-over contact (SPDT)</td>
<td>Stainless steel, zinc-nickel coating</td>
<td>2 A, AC 48 V</td>
<td>PV 34.82</td>
</tr>
<tr>
<td>PSM02</td>
<td>Compact pressure switch, with settable hysteresis</td>
<td>0.85 … 0.15 bar</td>
<td>Change-over contact (SPDT)</td>
<td>Stainless steel, zinc-nickel coating</td>
<td>2 A or 4 A, AC 250 V</td>
<td>PV 34.82</td>
</tr>
<tr>
<td>PSM-520</td>
<td>Pressure switch, adjustable switch differential</td>
<td>-0.4 … +7 bar</td>
<td>Change-over contact (SPDT)</td>
<td>Copper alloy CuSn6 per EN 1652</td>
<td>10 A / 6 A, AC 230 V</td>
<td>PV 35.01</td>
</tr>
<tr>
<td>PSM-550</td>
<td>Pressure switch, for superior industrial applications</td>
<td>-1 … 0 and -0.8 … +5 bar</td>
<td>Change-over contact (SPDT)</td>
<td>Copper alloy CuSn6 per EN 1652 or stainless steel 1.4401</td>
<td>4 A or 10 A, AC 230 V</td>
<td>PV 35.03</td>
</tr>
</tbody>
</table>
Due to the use of high-quality micro switches, the mechanical pressure switches are notable for their high precision and long-term stability. Furthermore, the direct switching of electrical loads up to AC 250 V/20 A is enabled, while simultaneously ensuring a high switch point reproducibility.

The instruments come with a SIL certificate and are thus particularly suited for safety-critical applications. In addition, with their ‘intrinsically safe’ and ‘flameproof enclosure’ ignition protection types the pressure switches are ideally suited for permanent use in hazardous environments. All mechanical pressure switches for the process industry are available with EAC certificate and technical passport.

### Mechanical pressure switches for the process industry

<table>
<thead>
<tr>
<th><strong>MW, MA</strong></th>
<th><strong>Diaphragm pressure switch</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Setting range</strong></td>
<td>0 … 16 mbar to 30 … 600 bar</td>
</tr>
<tr>
<td><strong>Ignition protection type</strong></td>
<td>Ex ia or Ex d</td>
</tr>
<tr>
<td><strong>Switch</strong></td>
<td>1 x SPDT or DPDT</td>
</tr>
<tr>
<td><strong>Switching power</strong></td>
<td>AC 250 V/15 A, DC 24 V/2 A</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>PV 31.10, PV 31.11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PXS, PXA</strong></th>
<th><strong>Mini pressure switch</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Setting range</strong></td>
<td>1 … 2.5 to 200 … 1,000 bar</td>
</tr>
<tr>
<td><strong>Ignition protection type</strong></td>
<td>Ex ia or Ex d</td>
</tr>
<tr>
<td><strong>Switch</strong></td>
<td>1 x SPDT or DPDT</td>
</tr>
<tr>
<td><strong>Switching power</strong></td>
<td>AC 250 V/5 A, DC 24 V/2 A</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>PV 34.36, PV 34.38</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PCS, PCA</strong></th>
<th><strong>Compact pressure switch</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Setting range</strong></td>
<td>-1 … -0.2 to 200 … 1,000 bar</td>
</tr>
<tr>
<td><strong>Ignition protection type</strong></td>
<td>Ex ia or Ex d</td>
</tr>
<tr>
<td><strong>Switch</strong></td>
<td>1 x SPDT or DPDT</td>
</tr>
<tr>
<td><strong>Switching power</strong></td>
<td>AC 250 V/15 A, DC 24 V/2 A</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>PV 33.30, PV 33.31</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>BWX, BA</strong></th>
<th><strong>Bourdon tube pressure switch</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Setting range</strong></td>
<td>0 … 2.5 to 0 … 1,000 bar</td>
</tr>
<tr>
<td><strong>Ignition protection type</strong></td>
<td>Ex ia or Ex d</td>
</tr>
<tr>
<td><strong>Switch</strong></td>
<td>1 or 2 x SPDT or 1 x DPDT</td>
</tr>
<tr>
<td><strong>Switching power</strong></td>
<td>AC 250 V/20 A, DC 24 V/2 A</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>PV 32.20, PV 32.22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>DW, DA</strong></th>
<th><strong>Differential pressure switch</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Setting range</strong></td>
<td>0 … 16 mbar to 0 … 40 bar, static pressure to 160 bar</td>
</tr>
<tr>
<td><strong>Ignition protection type</strong></td>
<td>Ex ia or Ex d</td>
</tr>
<tr>
<td><strong>Switch</strong></td>
<td>1 or 2 x SPDT or 1 x DPDT</td>
</tr>
<tr>
<td><strong>Switching power</strong></td>
<td>AC 250 V/20 A, DC 24 V/2 A</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>PV 35.42, PV 35.43, PV 35.50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>APW, APA</strong></th>
<th><strong>Absolute pressure switch</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Setting range</strong></td>
<td>0 … 25 mbar to 0 … 1.5 bar abs.</td>
</tr>
<tr>
<td><strong>Proof pressure</strong></td>
<td>11 bar abs.</td>
</tr>
<tr>
<td><strong>Ignition protection type</strong></td>
<td>Ex ia or Ex d</td>
</tr>
<tr>
<td><strong>Switch</strong></td>
<td>1 or 2 x SPDT or 1 x DPDT</td>
</tr>
<tr>
<td><strong>Switching power</strong></td>
<td>AC 250 V/20 A, DC 24 V/2 A</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>PV 35.49, PV 35.48</td>
</tr>
</tbody>
</table>
Diaphragm seal systems

These combinations of diaphragm seals and pressure gauges or pressure sensors feature fast availability. They are particularly suitable for demanding measuring tasks in the pharmaceutical and biotechnology industries, food and beverage industries, and through to the oil & gas, chemical, petrochemical and semiconductor industries.

The diaphragm seal systems can be used for processes with gases, compressed air or vapour, with liquid, paste-like, powdery and crystallising media and also with aggressive, adhesive, corrosive, highly viscous, environmentally hazardous or toxic media.

**With flange connection**

**DSS26M**
With pressure gauge per EN 837-1, internal diaphragm

- Applications with small flange process connections in the process industry
- PN max: 40 bar
- System fill fluid: KN2
- Data sheet: DS 95.09

**DSS26T**
With high-quality pressure sensor, internal diaphragm

- Applications with small flange process connections in the process industry
- PN max: 40 bar
- System fill fluid: KN2
- Data sheet: DS 95.10

**DSS27M**
With pressure gauge per EN 837-1, flush diaphragm

- Applications with high requirements in the process industry, in machine building and in plant construction
- PN max: 40 bar
- System fill fluid: KN2
- Data sheet: DS 95.12

**DSS27T**
With high-quality pressure sensor, flush diaphragm

- Applications with high requirements in the process industry, in machine building and in plant construction
- PN max: 40 bar
- System fill fluid: KN2
- Data sheet: DS 95.13

The diaphragm seal is directly welded to the pressure gauge or pressure sensor. The diaphragm made of stainless steel provides for the separation from the medium. The pressure is transmitted to the measuring instrument via the system fill fluid which is inside the diaphragm seal system.
## Pressure | Diaphragm seal systems

### With threaded connection

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Application</th>
<th>PN max</th>
<th>System fill fluid</th>
<th>Data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSS10M</td>
<td>With pressure gauge per EN 837-1, threaded design</td>
<td>General applications in the process industry</td>
<td>60 bar</td>
<td>KN2 for general applications</td>
<td>DS 95.01</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSS10T</td>
<td>With high-quality pressure sensor, threaded design</td>
<td>General applications in the process industry</td>
<td>60 bar</td>
<td>KN2 for general applications</td>
<td>DS 95.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSS34M</td>
<td>With pressure gauge per EN 837-1, welded design</td>
<td>Applications with high requirements in the chemical, petrochemical and water treatment industries</td>
<td>60 bar</td>
<td>KN2 for general applications</td>
<td>DS 95.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSS34T</td>
<td>With high-quality pressure sensor, welded design</td>
<td>Applications with high requirements in the chemical, petrochemical and water treatment industries</td>
<td>60 bar</td>
<td>KN2 for general applications</td>
<td>DS 95.16</td>
</tr>
</tbody>
</table>
Wika diaphragm seals can be connected to almost all pressure gauges, process transmitters, pressure switches or pressure sensors. Mounting may be made via a direct connection, a cooling element or a corresponding capillary. The combined systems can therefore withstand a pressure of 10 mbar up to 3,600 bar at extreme temperatures (-130 … +400 °C) and with a wide variety of media, thus enabling accurate pressure measurements under extreme conditions. The optimal diaphragm seal designs, materials, system fill fluids and accessories are available for each application. The diaphragm seals can be supplied with test certificates and approvals for special applications.

Accessories

- Flushing rings
- Block and saddle flanges
- Plug screws
- Valves
- Instrument mounting brackets and adapters
- Union nuts
- Transition pieces
- Connection adapters, e.g. VARIVENT®, clamp, aseptic, welding sleeves, weld stubs

Extensive information can be found in our brochure “Diaphragm seals – combinations and accessories” at www.wika.de.
Electrical accessories

A-Al-1, A-IAI-1

LCD attachable indicator, 50 x 50 mm

- Input: 4 ... 20 mA, 2-wire
- Power supply: From the 4 ... 20 mA current loop
- Special feature: Model A-Al-1 intrinsically safe per ATEX
- Data sheet: AC 80.07

M12 x 1 cable

Cable assemblies M12 x 1

- Circular connector M12 x 1, 4- and 5-pin
- Straight and angled version
- 2, 5 or 10 m cable
- Ingress protection IP67

IS Barrier

Intrinsically safe repeater power supply

- 1-channel input 0/4 ... 20 mA
- Intrinsically safe [Ex ia], supplying and non-supplying
- Galvanic isolation
- Bidirectional HART® signal transmission
- Suitable for SIL 2 per IEC 61508/IEC 61511
- Data sheet AC 80.14

905

Contact protection relay for model 821 switch contacts

- Application: For optimal contact protection and highest switching reliability
- Data sheet: AC 08.01

904

Control unit for inductive contacts model 831

- Application: For operating measuring instruments with inductive switch contacts
- Data sheet: AC 08.01
# Valves and protective devices

## Valves

### 910.10, 910.11

**Stopcock and DIN shut-off valve**

- **Application**: For shutting off pressure measuring instruments with threaded connection
- **Version**: Per DIN 16270, DIN 16271, DIN 16272
- **Material**: Brass, steel, stainless steel
- **Nominal pressure**: 910.10: to 25 bar, 910.11: to 400 bar
- **Data sheet**: AC 09.01, AC 09.02

### IV10, IV11

**Needle valve and multiport valve**

- **Application**: For shutting off pressure measuring instruments with threaded connection
- **Version**: Needle valve and multiport valve
- **Material**: Stainless steel
- **Nominal pressure**: To PN 420 (6,000 psi), Option: To PN 680 (10,000 psi)
- **Data sheet**: AC 09.22

### IV20, IV21

**Block-and-bleed valve, square or flat form**

- **Application**: For shutting off and venting pressure measuring instruments with threaded connection
- **Version**: Block-and-bleed valve
- **Material**: Stainless steel
- **Nominal pressure**: To PN 420 (6,000 psi), Option: To PN 680 (10,000 psi)
- **Data sheet**: AC 09.19

### IV30, IV31, IV50, IV51

**Valve manifold for differential pressure measuring instruments**

- **Application**: For shutting off, pressure compensating as well as purging and venting differential pressure measuring instruments
- **Version**: Three-way and five-way valves
- **Material**: Stainless steel
- **Nominal pressure**: To PN 420 (6,000 psi), Option: To PN 680 (10,000 psi)
- **Data sheet**: AC 09.23

### 910.80

**Monoflanges**

- **Application**: For shutting off and venting pressure measuring instruments with flange connection
- **Version**: Flange connection per ASMI or EN
- **Material**: Stainless steel
- **Nominal pressure**: To PN 420 (6,000 psi)
- **Data sheet**: AC 09.17
**Protective devices**

### 910.12, 910.13
**Snubbers and overpressure protectors**

- **Application**: For the protection of pressure measuring instruments from pressure surges and pulsations or overpressures
- **Version**: 910.13: Version with LH-RH union or fixed bushing
- **Material**: Brass, steel, stainless steel
- **Nominal pressure**: 910.12: to 400 bar, 910.13: To 600 bar (overload safety to 1,000 bar)
- **Data sheet**: AC 09.03, AC 09.04

### 910.15
**Syphons**

- **Application**: For the protection of pressure measuring instruments from excessive pulsation and heat
- **Version**: U-form, trumpet form, compact form, standard
- **Material**: Steel, stainless steel
- **Nominal pressure**: To 160 bar
- **Data sheet**: AC 09.06

### Mounting accessories

### 910.14, 910.16, 910.17
**Adapters, instrument mounting brackets and sealings**

- **Application**: For mounting and sealing pressure gauges
- **Data sheet**: AC 09.05, AC 09.07, AC 09.08
Dial thermometers

Our dial thermometers work on the bimetal, expansion or gas actuation principle. This enables scale ranges of -200 ... +700 °C in different class accuracies, response times and resilience to environmental influences. Diverse connection designs, stem diameters and individual stem lengths enable a flexible measuring point design.

Dial thermometers with capillaries are particularly versatile. All thermometers are suited for operation in a thermowell if necessary.

### Bimetal thermometers

<table>
<thead>
<tr>
<th>A43</th>
<th>Heating technology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal size</strong></td>
<td>63, 80, 100 mm</td>
</tr>
<tr>
<td><strong>Scale range</strong></td>
<td>-30 ... +120 °C</td>
</tr>
<tr>
<td><strong>Permissible operating pressure at thermowell/stem</strong></td>
<td>Max. 6 bar</td>
</tr>
<tr>
<td><strong>Wetted parts</strong></td>
<td>Copper alloy</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>TM 43.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A48</th>
<th>Refrigeration and air-conditioning technology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal size</strong></td>
<td>63, 80, 100, 160 mm</td>
</tr>
<tr>
<td><strong>Scale range</strong></td>
<td>-30 ... +120 °C</td>
</tr>
<tr>
<td><strong>Wetted parts</strong></td>
<td>Copper alloy</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>TM 48.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A50</th>
<th>Standard version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal size</strong></td>
<td>63, 80, 100, 160 mm</td>
</tr>
<tr>
<td><strong>Scale range</strong></td>
<td>-30 ... +200 °C</td>
</tr>
<tr>
<td><strong>Connection</strong></td>
<td>Removable thermowell with retainer screw</td>
</tr>
<tr>
<td><strong>Wetted parts</strong></td>
<td>Copper alloy</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>TM 50.03</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A52, R52</th>
<th>Industrial series, axial and radial</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal size</strong></td>
<td>25, 33, 40, 50, 63, 80, 100, 160 mm</td>
</tr>
<tr>
<td><strong>Scale range</strong></td>
<td>-30 ... +50 to 0 ... +500 °C</td>
</tr>
<tr>
<td><strong>Permissible operating pressure at thermowell/stem</strong></td>
<td>Max. 25 bar</td>
</tr>
<tr>
<td><strong>Wetted parts</strong></td>
<td>Stainless steel</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>TM 52.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TG53</th>
<th>Process version per ASME B40.200</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal size</strong></td>
<td>3, 4, 5, 6”</td>
</tr>
<tr>
<td><strong>Scale range</strong></td>
<td>-70 ... +70 to 0 ... +600 °C</td>
</tr>
<tr>
<td><strong>Wetted parts</strong></td>
<td>Stainless steel</td>
</tr>
<tr>
<td><strong>Option</strong></td>
<td>Liquid damping to max. 250 °C (case and probe)</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>TM 53.02</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TG54</th>
<th>Process version per EN 13190</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Nominal size</strong></td>
<td>63, 80, 100, 160 mm</td>
</tr>
<tr>
<td><strong>Scale range</strong></td>
<td>-70 ... +70 to 0 ... +600 °C</td>
</tr>
<tr>
<td><strong>Wetted parts</strong></td>
<td>Stainless steel</td>
</tr>
<tr>
<td><strong>Option</strong></td>
<td>Liquid damping to max. 250 °C (case and probe)</td>
</tr>
<tr>
<td><strong>Data sheet</strong></td>
<td>TM 54.02</td>
</tr>
</tbody>
</table>
### Bimetal thermometer

#### 55

**High-quality process version to EN 13190**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>63, 100, 160 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>-70 ... +70 to 0 ... 600 °C</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Option</td>
<td>Liquid damping to max. 250 °C (case and probe)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TM 55.01</td>
</tr>
</tbody>
</table>

### Machine glass thermometer

#### 32

**V shape**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>110, 150, 200 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>-30 ... +200 °C</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Copper alloy</td>
</tr>
<tr>
<td>Option</td>
<td>Dual scale °F/°C, 3 variants straight, 90° and 135°</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TM 32.02</td>
</tr>
</tbody>
</table>

### Expansion thermometers

#### TF58, TF59

**With capillary, edgewise panel design**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>58 x 25 mm, 62 x 11 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>-50 ... 250 °C</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Copper alloy</td>
</tr>
<tr>
<td>Option</td>
<td>Vertical arrangement, Special scales</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TM 80.02</td>
</tr>
</tbody>
</table>

#### 70

**With capillary, stainless steel version**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>63, 100, 160 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>-60 ... +400 °C</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Option</td>
<td>Liquid damping (case), Indication accuracy class 1</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TM 81.01</td>
</tr>
</tbody>
</table>

#### IFC

**With capillary, standard version**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>52, 60, 80, 100 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>-100 ... +400 °C</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Copper alloy</td>
</tr>
<tr>
<td>Option</td>
<td>Square case version, Other case materials</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TM 80.01</td>
</tr>
</tbody>
</table>
Dial thermometers

### Gas-actuated thermometers

#### R73, S73, A73
**Axial and radial, adjustable stem and dial**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>100, 160 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>-200 ... +100 to 0 ... +700 °C</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Option</td>
<td>- Liquid damping (case)</td>
</tr>
<tr>
<td></td>
<td>- Contact bulb</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TM 73.01</td>
</tr>
</tbody>
</table>

#### F73
**With capillary**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>100, 160 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>-200 ... +100 to 0 ... +700 °C</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Option</td>
<td>- Armoured or coated capillary (PVC coating)</td>
</tr>
<tr>
<td></td>
<td>- Liquid damping (case)</td>
</tr>
<tr>
<td></td>
<td>- Contact bulb</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TM 73.01</td>
</tr>
</tbody>
</table>

#### 75
**Highly vibration resistant**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>100 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>0 ... +700 or -50 ... +650 °C</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Option</td>
<td>Various neck tube and insertion lengths</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TM 75.01</td>
</tr>
</tbody>
</table>

### Thermomanometers

#### MFT
**With capillaries, for pressure and temperature measurement**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>40, 42, 52 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>- Pressure 0 ... 4 bar</td>
</tr>
<tr>
<td></td>
<td>- Temperature 0 ... 120 °C</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>- Pressure 2.5 (EN 837-1)</td>
</tr>
<tr>
<td></td>
<td>- Temperature 2.5</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 01.20</td>
</tr>
</tbody>
</table>

#### THM10
**Eco version, for pressure and temperature measurement**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>63, 80 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>- Pressure 0 ... 4 to 0 ... 10 bar</td>
</tr>
<tr>
<td></td>
<td>- Temperature 0 ... 120 °C</td>
</tr>
<tr>
<td>Connection location</td>
<td>Lower mount or back mount</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>- Pressure 2.5 (EN 837-1)</td>
</tr>
<tr>
<td></td>
<td>- Temperature 2.5 (EN 13190)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 01.24</td>
</tr>
</tbody>
</table>

#### 100.02
**For pressure and temperature measurement**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>63, 80 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>- Pressure 0 ... 1 to 0 ... 16 bar</td>
</tr>
<tr>
<td></td>
<td>- Temperature 0 ... 100 to 0 ... 150 °C</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>- Pressure 2.5 (EN 837-1)</td>
</tr>
<tr>
<td></td>
<td>- Temperature 2.5 °C</td>
</tr>
<tr>
<td>Data sheet</td>
<td>PM 01.23</td>
</tr>
</tbody>
</table>
## Dial thermometers with output signal

### TGT70

**Expansion thermometer with output signal**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>63, 100 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>-40 … +60 to 0 … 250 °C</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Option</td>
<td>Capillary</td>
</tr>
<tr>
<td></td>
<td>Output signals 4 … 20 mA or 0.5 … 4.5 V</td>
</tr>
<tr>
<td></td>
<td>Other connection designs</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TV 18.01</td>
</tr>
</tbody>
</table>

### TGT73

**Gas-actuated thermometer with output signal**

<table>
<thead>
<tr>
<th>Nominal size</th>
<th>100, 160 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale range</td>
<td>-200 … +100 to 0 … 700 °C</td>
</tr>
<tr>
<td>Wetted parts</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Option</td>
<td>Capillary</td>
</tr>
<tr>
<td></td>
<td>Liquid damping (case)</td>
</tr>
<tr>
<td></td>
<td>Output signal 4 … 20 mA or 0 … 10 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TV 17.10</td>
</tr>
</tbody>
</table>
## Digital indicators

### DI10

For panel mounting, current loop display, 96 x 48 mm

<table>
<thead>
<tr>
<th>Input</th>
<th>4 ... 20 mA, 2-wire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm output</td>
<td>2 electronic contacts (optional)</td>
</tr>
<tr>
<td>Special feature</td>
<td>Wall-mounting case (optional)</td>
</tr>
<tr>
<td>Power supply</td>
<td>From the 4 ... 20 mA current loop</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 80.06</td>
</tr>
</tbody>
</table>

### DI25

For panel mounting, 96 x 48 mm

<table>
<thead>
<tr>
<th>Input</th>
<th>Multi-function input for resistance thermometers, thermocouples and standard signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm output</td>
<td>3 relays</td>
</tr>
<tr>
<td>Special feature</td>
<td>2 relays for instruments with integrated transmitter power supply DC 24 V</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 100 ... 240 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 80.02</td>
</tr>
</tbody>
</table>

### DI30

For panel mounting, 96 x 96 mm

<table>
<thead>
<tr>
<th>Input</th>
<th>Standard signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm output</td>
<td>2 relays</td>
</tr>
<tr>
<td>Special feature</td>
<td>Integrated transmitter power supply</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 230 V or AC 115 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 80.05</td>
</tr>
</tbody>
</table>

### DI32-1

For panel mounting, 48 x 24 mm

<table>
<thead>
<tr>
<th>Input</th>
<th>Multi-function input for resistance thermometers, thermocouples and standard signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm output</td>
<td>2 electronic contacts</td>
</tr>
<tr>
<td>Power supply</td>
<td>DC 9 ... 28 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 80.13</td>
</tr>
</tbody>
</table>

### DI35

For panel mounting, 96 x 48 mm

<table>
<thead>
<tr>
<th>Input</th>
<th>Multi-function input for resistance thermometers, thermocouples and standard signals</th>
<th>Alternatively double input for standard signals with calculation function (+ x x) for two transmitters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm output</td>
<td>2 or 4 relays (optional)</td>
<td></td>
</tr>
<tr>
<td>Special feature</td>
<td>Integrated transmitter power supply</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>AC/DC 100 ... 240 V</td>
<td></td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 80.03</td>
<td></td>
</tr>
</tbody>
</table>

### DI30

For panel mounting, 96 x 96 mm

<table>
<thead>
<tr>
<th>Input</th>
<th>Standard signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm output</td>
<td>2 relays</td>
</tr>
<tr>
<td>Special feature</td>
<td>Integrated transmitter power supply</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 230 V or AC 115 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 80.05</td>
</tr>
</tbody>
</table>
### DIH10
**Connection head with digital indicator**

<table>
<thead>
<tr>
<th>Input</th>
<th>4 ... 20 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply</td>
<td>from the 4 ... 20 mA current loop</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 80.11</td>
</tr>
</tbody>
</table>

### DIH50, DIH52
**For current loops with HART® communication**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>150 x 127 x 127 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case</td>
<td>Aluminium, stainless steel</td>
</tr>
</tbody>
</table>
| Special feature | - Adjustment of indication range and unit via HART® communication 
                 - Model DIH52 additionally suitable for multidrop operation and with local master function |
| Approval   | - Intrinsically safe per ATEX 
             - Flameproof enclosure |
| Data sheet | AC 80.10 |

### TF-LCD
**Longlife digital thermometer**

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>-40 ... +120 °C</th>
</tr>
</thead>
</table>
| Special feature | - Dust and waterproof case, IP68 
                 - Battery or solar powered 
                 - Extremely long service life |
| Data sheet      | TE 85.01 |
Thermocouples

Thermocouples generate a voltage directly dependent on temperature. They are particularly suitable for high temperatures to 1,700 °C (3,092 °F) and for very high oscillating stresses. For thermocouples, the accuracy classes 1 and 2 apply (ASTM: Standard and special). They are available with a tolerance value in accordance with IEC 60584-1/ASTM E230.

In our range of products you will find all market-standard instrument versions. If required, a temperature transmitter can be installed in the connection head.

<table>
<thead>
<tr>
<th>TC10-A</th>
<th>TC10-B</th>
<th>TC10-C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Measuring insert</strong></td>
<td><strong>For additional thermowell</strong></td>
<td><strong>Threaded, with fabricated thermowell</strong></td>
</tr>
<tr>
<td>Sensor element</td>
<td>Types K, J, E, N or T</td>
<td>Sensor element</td>
</tr>
<tr>
<td>Measuring range</td>
<td>-40 ... +1,200 °C, -40 ... +2,192 °F</td>
<td>Measuring range</td>
</tr>
<tr>
<td>Measuring point</td>
<td>Ungrounded or grounded</td>
<td>Measuring point</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 65.01</td>
<td>Data sheet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TC10-D</th>
<th>TC10-F</th>
<th>TC10-H</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Threaded, miniature design</strong></td>
<td><strong>Flanged thermocouple, with fabricated thermowell</strong></td>
<td><strong>Without thermowell</strong></td>
</tr>
<tr>
<td>Sensor element</td>
<td>Types K, J, E, N or T</td>
<td>Sensor element</td>
</tr>
<tr>
<td>Measuring range</td>
<td>-40 ... +600 °C, -40 ... +1,112 °F</td>
<td>Measuring range</td>
</tr>
<tr>
<td>Measuring point</td>
<td>Ungrounded or grounded</td>
<td>Measuring point</td>
</tr>
<tr>
<td>Process connection</td>
<td>Mounting thread</td>
<td>Process connection</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 65.04</td>
<td>Data sheet</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Thermocouples generate a voltage directly dependent on temperature. They are particularly suitable for high temperatures to 1,700 °C (3,092 °F) and for very high oscillating stresses. For thermocouples, the accuracy classes 1 and 2 apply (ASTM: Standard and special). They are available with a tolerance value in accordance with IEC 60584-1/ASTM E230.

In our range of products you will find all market-standard instrument versions. If required, a temperature transmitter can be installed in the connection head.
Temperature | Transmit + Record

**TC10-K**
Measuring insert, for installation in TC10-L

- **Sensor element**: Types K, J, E, N or T
- **Measuring range**: -40 ... +1,200 °C, -40 ... +2,192 °F
- **Measuring point**: Ungrounded or grounded
- **Data sheet**: TE 65.11

**TC10-L**
Flameproof enclosure, for additional thermowell

- **Sensor element**: Types K, J, E, N or T
- **Measuring range**: -40 ... +1,200 °C, -40 ... +2,192 °F
- **Measuring point**: Ungrounded or grounded
- **Data sheet**: TE 65.12

**TC12-A**
Measuring insert for process thermocouple

- **Sensor element**: Types K, J, N or T
- **Measuring range**: -40 ... +1,200 °C, -40 ... +2,192 °F
- **Measuring point**: Ungrounded or grounded
- **Data sheet**: TE 65.16

**TC12-B**
Process thermocouple, for additional thermowell

- **Sensor element**: Types K, J, E, N or T
- **Measuring range**: -40 ... +1,200 °C, -40 ... +2,192 °F
- **Measuring point**: Ungrounded or grounded
- **Option**: Ex i, Ex d
- **Data sheet**: TE 65.17

**TC12-M**
Process thermocouple, basic module

- **Sensor element**: Types K, J, E, N or T
- **Measuring range**: -40 ... +1,200 °C, -40 ... +2,192 °F
- **Measuring point**: Ungrounded or grounded
- **Option**: Ex i, Ex d
- **Data sheet**: TE 65.17
Thermocouples

**TC40**
Cable thermocouple
- **Sensor element**: Types K, J, E, N or T
- **Measuring range**: -40 ... +1,200 °C, -40 ... +2,192 °F
- **Measuring point**: Ungrounded or grounded
- **Cable**: Silicone, PTFE, fiberglass, PVC
- **Data sheet**: TE 65.40

**TC46**
Hot runner thermocouple
- **Sensor element**: Type J or K
- **Measuring range**: -25 ... +400 °C, -13 ... +752 °F
- **Measuring point**: Ungrounded or grounded
- **Special feature**:■ Probe diameter 0.5 ... 3.0 mm
■ Plastic-moulded transition
- **Data sheet**: TE 66.46

**TC47**
Thermocouple for plastics machinery
- **Sensor element**: Types J or K
- **Measuring range**: -25 ... +400 °C, -13 ... +752 °F
- **Measuring point**: Ungrounded or grounded
- **Special feature**:■ Various process connections
■ Connection lead fiberglass with stainless steel braid
- **Data sheet**: TE 67.20

**TC50**
Surface thermocouple
- **Sensor element**: Types K, J, E, N or T
- **Measuring range**: -40 ... +1,200 °C, -40 ... +2,192 °F
- **Measuring point**: Ungrounded or grounded
- **Process connection**: Surface mounting
- **Data sheet**: TE 65.50

**TC53**
Bayonet thermocouple
- **Sensor element**: Types K, J, E, N or T
- **Measuring range**: -40 ... +1,200 °C, -40 ... +2,192 °F
- **Measuring point**: Ungrounded or grounded
- **Special feature**:■ Single and dual thermocouple
■ Explosion-protected versions
- **Data sheet**: TE 65.53

**TC59**
Tubeskin thermocouple
- **Sensor element**: Type K or N
- **Measuring range**: 0 ... 1,200 °C, 32 ... 2,192 °F
- **Measuring point**: Welded or exchangeable
- **Process connection**: Surface mounting
- **Data sheet**: TE 65.56 ... TE 65.59
TC80
High-temperature thermocouple
Sensor element: Types S, R, B, K, N or J
Measuring range: 0 … 1,700 °C, 32 … 3,092 °F
Process connection: Stop flange, threaded bushing
Data sheet: TE 65.80

TC81
For flue gas temperature measurements
Sensor element: Types K, N or J
Measuring range: 0 … 1,200 °C, 32 … 2,192 °F
Process connection: Stop flange, threaded bushing
Data sheet: TE 65.81

TC82
High-temperature thermocouple
Sensor element: Types K, J, E, N, S, R or B
Thermowell: C610, C799
Data sheet: TE 65.82

TC83
Sapphire-design thermocouple
Sensor element: Types K, N, S, R or B
Thermowell: Sapphire (monocrystalline)
Data sheet: TE 65.83

TC84
Sapphire-design thermocouple
Sensor element: Types S, R, B
Thermowell: Sapphire (monocrystalline)
Case: Highest safety thanks to 2-chamber system
Data sheet: TE 65.84

TC90
High-pressure thermocouple
Sensor element: Types K, J, E or N or T
Measuring range: 0 … 350 °C, 32 … 662 °F
Tip: Ungrounded or grounded
Process connection: Various high-pressure connections
Data sheet: TE 65.90

TC95
Multipoint thermocouple in band design
Sensor element: Types K, J, E, N or T
Measuring range: 0 … 1,200 °C, 32 … 2,192 °F
Process connection: Various process connections
Data sheet: TE 70.01

TC96-R
Flexible multipoint thermometer
Sensor element: Types K, J, E or N
Measuring range: 0 … 1,200 °C, 32 … 2,192 °F
Process connection: Various process connections
Data sheet: TE 70.10
Resistance thermometers are equipped with platinum sensor elements which change their electrical resistance as a function of temperature. In our range of products you will find resistance thermometers with connected cable as well as versions with connection head. A temperature transmitter can be installed directly in the connection head.

Resistance thermometers are suitable for applications between -196 … +600 °C, -320 … +1,112 °F (dependent on instrument model, sensor element, accuracy class and materials coming into contact with the medium).

Resistance thermometers are available in classes AA, A and B in accordance with IEC 60751.

TR10-A
Measuring insert, MI cable

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 2 x Pt100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-196 ... +600 °C, -320 ... +1,112 °F</td>
</tr>
<tr>
<td>Connection method</td>
<td>2-, 3- and 4-wire</td>
</tr>
<tr>
<td>Measuring insert</td>
<td>MI cable</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.01</td>
</tr>
</tbody>
</table>

TR10-B
For additional thermowell

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 2 x Pt100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-196 ... +600 °C, -320 ... +1,112 °F</td>
</tr>
<tr>
<td>Connection method</td>
<td>2-, 3- and 4-wire</td>
</tr>
<tr>
<td>Measuring insert</td>
<td>MI cable</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.02</td>
</tr>
</tbody>
</table>

TR10-C
Threaded, with fabricated thermowell

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 2 x Pt100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-196 ... +600 °C, -320 ... +1,112 °F</td>
</tr>
<tr>
<td>Connection method</td>
<td>2-, 3- and 4-wire</td>
</tr>
<tr>
<td>Measuring insert</td>
<td>MI cable</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.03</td>
</tr>
</tbody>
</table>

TR10-D
Threaded, miniature design

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 2 x Pt100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-196 ... +500 °C, -320 ... +932 °F</td>
</tr>
<tr>
<td>Connection method</td>
<td>2-, 3- and 4-wire</td>
</tr>
<tr>
<td>Process connection</td>
<td>Mounting thread</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.04</td>
</tr>
</tbody>
</table>

TR10-F
Flanged resistance thermometer, with fabricated thermowell

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 2 x Pt100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-196 ... +600 °C, -320 ... +1,112 °F</td>
</tr>
<tr>
<td>Connection method</td>
<td>2-, 3- and 4-wire</td>
</tr>
<tr>
<td>Process connection</td>
<td>Flange</td>
</tr>
<tr>
<td>Measuring insert</td>
<td>MI cable</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.06</td>
</tr>
</tbody>
</table>

TR10-H
Without thermowell

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 2 x Pt100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-196 ... +600 °C, -320 ... +1,112 °F</td>
</tr>
<tr>
<td>Connection method</td>
<td>2-, 3- and 4-wire</td>
</tr>
<tr>
<td>Process connection</td>
<td>Mounting thread</td>
</tr>
<tr>
<td>Measuring insert</td>
<td>MI cable</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.08</td>
</tr>
</tbody>
</table>
### TR10-J
**Threaded, with perforated thermowell**

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -196 ... +600 °C, -320 ... +1,112 °F
- **Connection method**: 2-, 3- and 4-wire
- **Measuring insert**: MI cable
- **Process connection**: Mounting thread
- **Data sheet**: TE 60.10

### TR11-A
**Measuring insert, tubular design**

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -50 ... +250 °C, -58 ... +482 °F
- **Connection method**: 2-, 3- and 4-wire
- **Measuring insert**: Tubular design
- **Data sheet**: TE 60.13

### TR10-K
**Measuring insert, for installation in TR10-L**

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -196 ... +600 °C, -320 ... +1,112 °F
- **Connection method**: 2-, 3- and 4-wire
- **Measuring insert**: MI cable
- **Data sheet**: TE 60.11

### TR10-L
**Flameproof enclosure, for additional thermowell**

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -196 ... +600 °C, -320 ... +1,112 °F
- **Connection method**: 2-, 3- and 4-wire
- **Measuring insert**: MI cable
- **Data sheet**: TE 60.12

### TR12-A
**Measuring insert for process resistance thermometer TR12-B**

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -196 ... +600 °C, -320 ... +1,112 °F
- **Connection method**: 2-, 3- and 4-wire
- **Measuring insert**: MI cable
- **Data sheet**: TE 60.16

### TR12-B
**Process resistance thermometer, for additional thermowell**

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -196 ... +600 °C, -320 ... +1,112 °F
- **Connection method**: 2-, 3- and 4-wire
- **Measuring insert**: MI cable
- **Option**: Ex i, Ex d
- **Data sheet**: TE 60.17

### TR12-M
**Process resistance thermometer, basic module**

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -196 ... +600 °C, -320 ... +1,112 °F
- **Connection method**: 2-, 3- and 4-wire
- **Measuring insert**: MI cable
- **Option**: Ex i, Ex d
- **Data sheet**: TE 60.17
Resistance thermometers

TFT35
Threaded thermometer with integrated transmitter

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>-50 ... +200 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special feature</td>
<td>■ Output signal 4 ... 20 mA, 0 ... 10 V, 0.5 ... 4.5 V</td>
</tr>
<tr>
<td></td>
<td>■ Factory configured</td>
</tr>
<tr>
<td></td>
<td>■ Measuring insert exchangeable</td>
</tr>
<tr>
<td></td>
<td>■ Electric connection via plug connection</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 78.18</td>
</tr>
</tbody>
</table>

TR30
Compact version

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-50 ... +250 °C, -58 ... +482 °F</td>
</tr>
<tr>
<td>Output</td>
<td>Pt100, 4 ... 20 mA</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.30</td>
</tr>
</tbody>
</table>

TR31
OEM miniature design

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 1 x Pt1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-50 ... +250 °C, -58 ... +482 °F</td>
</tr>
<tr>
<td>Output</td>
<td>Pt100, Pt1000, 4 ... 20 mA</td>
</tr>
<tr>
<td>CSA</td>
<td>Ordinary and hazardous locations</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.31</td>
</tr>
</tbody>
</table>

TR33
Miniature design, standard version

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 1 x Pt1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-50 ... +250 °C, -58 ... +482 °F</td>
</tr>
<tr>
<td>Output</td>
<td>Pt100, Pt1000, 4 ... 20 mA</td>
</tr>
<tr>
<td>CSA</td>
<td>Ordinary locations</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.33</td>
</tr>
</tbody>
</table>

TR34
Miniature design, explosion-protected

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 1 x Pt1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-50 ... +250 °C, -58 ... +482 °F</td>
</tr>
<tr>
<td>Output</td>
<td>Pt100, Pt1000, 4 ... 20 mA</td>
</tr>
<tr>
<td>CSA</td>
<td>Hazardous locations</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.34</td>
</tr>
</tbody>
</table>

TR40
Cable resistance thermometer

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 2 x Pt100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-196 ... +600 °C, -320 ... +1,112 °F</td>
</tr>
<tr>
<td>Connection method</td>
<td>2-, 3- and 4-wire</td>
</tr>
<tr>
<td>Cable</td>
<td>Silicone, PTFE, PVC</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.40</td>
</tr>
</tbody>
</table>

TR50
Surface resistance thermometer

<table>
<thead>
<tr>
<th>Sensor element</th>
<th>1 x Pt100, 2 x Pt100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>-196 ... +600 °C, -320 ... +1,112 °F</td>
</tr>
<tr>
<td>Connection method</td>
<td>2-, 3- and 4-wire</td>
</tr>
<tr>
<td>Process connection</td>
<td>Surface mounting</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TE 60.50</td>
</tr>
</tbody>
</table>
**Temperature | Transmit + Record**

**TR53**
Bayonet resistance thermometer

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -196 ... +400 °C, -320 ... +752 °F
- **Connection method**: 2-, 3- and 4-wire
- **Process connection**: Bayonet
- **Data sheet**: TE 60.53

---

**TR55**
With spring-loaded tip

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -196 ... +500 °C, -320 ... +932 °F
- **Connection method**: 2-, 3- and 4-wire
- **Process connection**: Compression fitting
- **Data sheet**: TE 60.55

---

**TR57-M**
Pipe surface resistance thermometer, for clamping

- **Sensor element**: 1 x Pt100
- **Measuring range**: -20 ... +150 °C, -4 ... +302 °F
- **Connection method**: Pt100 3-wire, 4 ... 20 mA
- **Data sheet**: TE 60.57

---

**TR60**
Indoor and outdoor resistance thermometer

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -40 ... +80 °C, -40 ... +176 °F
- **Connection method**: 2-, 3- and 4-wire
- **Process connection**: Wall mounting
- **Data sheet**: TE 60.60

---

**TR75**
DiwiTherm® with digital indicator

- **Measuring range**: -40.0 ... +199.9 °C, +200 ... +450 °C
  with automatic measuring range changeover (autorange)
- **Power supply**: Battery operation
- **Data sheet**: TE 60.75

---

**TR81**
For flue gas temperature measurements

- **Sensor element**: 1 x Pt100, 2 x Pt100
- **Measuring range**: -196 ... +600 °C, -320 ... +1,112 °F
- **Connection method**: 2-, 3- and 4-wire
- **Thermowell**: Metal
- **Data sheet**: TE 60.81

---

**TR95**
Multipoint resistance thermometer in band design

- **Sensor**: Pt100
- **Measuring range**: -196 ... +600 °C, -320 ... +1,112 °F
- **Connection method**: 2-, 3- and 4-wire
- **Process connection**: Various process connections
- **Data sheet**: TE 70.01

---

43
Resistance thermometers

TF35
OEM threaded thermometer, with plug connection

TF37
Threaded thermometer with connection lead

TF40
Duct thermometer

TF41
Outdoor thermometer

TF43
OEM insertion thermometer for refrigeration technology

TF44
Strap-on thermometer with connection lead

TF45
OEM insertion thermometer with connection lead
Temperature transmitters

**T15**
Digital temperature transmitter for resistance sensors

- **Input**: Resistance thermometers, potentiometers
- **Accuracy**: < 0.1 %
- **Output**: 4 ... 20 mA
- **Special feature**: The fastest and simplest configuration on the market
- **Data sheet**: TE 15.01

**T16**
Digital temperature transmitter for thermocouples

- **Input**: All commercially available thermocouples
- **Accuracy**: Typical < 2 K
- **Output**: 4 ... 20 mA
- **Special feature**: The fastest and simplest configuration on the market
- **Data sheet**: TE 16.01

**T32**
HART® temperature transmitter

- **Input**: Resistance thermometers, thermocouples, potentiometers
- **Accuracy**: < 0.1 %
- **Output**: 4 ... 20 mA, HART® protocol
- **Special feature**: TÜV certified SIL version (full assessment)
- **Data sheet**: TE 32.04

**T53**
FOUNDATION™ Fieldbus and PROFIBUS® PA transmitter

- **Input**: Resistance thermometers, thermocouples, potentiometers
- **Accuracy**: < 0.1 %
- **Special feature**: PC configurable
- **Data sheet**: TE 53.01

**T91**
Analogue temperature transmitter 3-wire, 0 ... 10 V

- **Input**: Resistance thermometers, thermocouples
- **Accuracy**: < 0.5 or < 1 %
- **Output**: 0 ... 10 V, 0 ... 5 V
- **Special feature**: Fixed measuring range
- **Data sheet**: TE 91.01, TE 91.02

**TIF50, TIF52**
HART® field temperature transmitter

- **Input**: Resistance thermometers, thermocouples, potentiometers
- **Accuracy**: < 0.1 %
- **Output**: 4 ... 20 mA, HART® protocol
- **Special feature**: PC configurable
- **Data sheet**: TE 62.01
## Temperature switches

### Temperature switches for industrial applications

<table>
<thead>
<tr>
<th><strong>Model</strong></th>
<th><strong>Description</strong></th>
<th><strong>Measuring range</strong></th>
<th><strong>Output</strong></th>
<th><strong>Switching temperature</strong></th>
<th><strong>Special feature</strong></th>
<th><strong>Data sheet</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TSD-30</strong></td>
<td>Electronic temperature switch with display</td>
<td>-20 ... +80 °C, -20 ... +120 °C, 0 ... 150 °C</td>
<td>- Switching outputs PNP or NPN</td>
<td>50 ... 200 °C, fixed</td>
<td>- Switching voltage to AC 48 V, DC 24 V</td>
<td>TE 67.16</td>
</tr>
<tr>
<td><strong>TFS35</strong></td>
<td>Bimetal temperature switch</td>
<td>-20 ... +80 °C</td>
<td>- 4 ... 20 mA</td>
<td>50 ... 200 °C, fixed</td>
<td>- Switching voltage to AC 48 V, DC 24 V</td>
<td>TV 35.01</td>
</tr>
<tr>
<td><strong>TFS135</strong></td>
<td>Bimetal temperature switch for voltages to AC 250 V</td>
<td>-20 ... +120 °C</td>
<td>- 0 ... 10 V</td>
<td>50 ... 130 °C, fixed</td>
<td>- Switching voltages up to AC 250 V</td>
<td>TV 35.02</td>
</tr>
</tbody>
</table>

### Temperature switches for the process industry

<table>
<thead>
<tr>
<th><strong>Model</strong></th>
<th><strong>Description</strong></th>
<th><strong>Setting range</strong></th>
<th><strong>Ignition protection type</strong></th>
<th><strong>Switching power</strong></th>
<th><strong>Switching temperature</strong></th>
<th><strong>Special feature</strong></th>
<th><strong>Data sheet</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TXS, TXA</strong></td>
<td>Mini temperature switches</td>
<td>-15 ... +20 to 180 ... 250 °C</td>
<td>Ex ia or Ex d</td>
<td>AC 220 V/5 A</td>
<td>50 ... 200 °C</td>
<td>- Switching voltage to AC 48 V, DC 24 V</td>
<td>TV 31.70, TV 31.72 (Ex)</td>
</tr>
<tr>
<td><strong>TCS, TCA</strong></td>
<td>Compact temperature switches</td>
<td>-30 ... +10 to 160 ... 250 °C</td>
<td>Ex ia or Ex d</td>
<td>AC 250 V/15 A</td>
<td>50 ... 200 °C</td>
<td>- Switching voltage to AC 48 V, DC 24 V</td>
<td>TV 31.64, TV 31.65 (Ex)</td>
</tr>
<tr>
<td><strong>TWG, TAG</strong></td>
<td>Heavy-duty version</td>
<td>-30 ... +70 to 0 ... 600 °C</td>
<td>Ex ia or Ex d</td>
<td>AC 250 V/20 A</td>
<td>50 ... 200 °C</td>
<td>- Switching voltages up to AC 250 V</td>
<td>TV 31.60, TV 31.61</td>
</tr>
</tbody>
</table>
## Thermometers with switch contacts

### SC15
**Expansion thermometer with micro switch, indicating temperature controller**

- **Nominal size:** 60, 80, 100 mm
- **Scale range:** -100...+400°C
- **Wetted parts:** Copper alloy
- **Option:** Sheet steel version
- **Data sheet:** TV 28.02

### SW15
**Expansion thermometer with micro switch, safety temperature controller**

- **Nominal size:** 60, 80, 100 mm
- **Scale range:** 0...400°C
- **Wetted parts:** Copper alloy
- **Option:** Sheet steel version
- **Data sheet:** TV 28.04

### SB15
**Expansion thermometer with micro switch, safety temperature limiter**

- **Nominal size:** 60, 80, 100 mm
- **Scale range:** 0...400°C
- **Wetted parts:** Copper alloy
- **Option:** Sheet steel version
- **Type examination certificate per pressure equipment directive, EN 14597**
- **Data sheet:** TV 28.03

### 55 with 8xx
**Bimetal thermometer, stainless steel version**

- **Nominal size:** 100, 160 mm
- **Scale range:** -70...+30 to 0...600°C
- **Wetted parts:** Stainless steel
- **Option:** Liquid damping to max. 250°C (case and probe)
- **Data sheet:** TV 25.01

### 70 with 8xx
**Expansion thermometer with micro switch**

- **Nominal size:** 100 mm
- **Scale range:** -60...+40 to 0...250°C
- **Wetted parts:** Stainless steel
- **Option:** Various contact versions
- **Data sheet:** TV 28.01

### 73 with 8xx
**Gas-actuated thermometer, stainless steel version**

- **Nominal size:** 100, 160, 144 x 144 mm
- **Scale range:** -80...+60 to 0...700°C
- **Wetted parts:** Stainless steel
- **Option:** Capillary
- **Liquid damping (case)**
- **Data sheet:** TV 27.01
Temperature controllers

CS4M
For panel mounting, 48 x 24 mm

<table>
<thead>
<tr>
<th>Input</th>
<th>Multi-function input for resistance thermometers, thermocouples and standard signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control mode</td>
<td>PID, PI, PD, P, ON/OFF (configurable)</td>
</tr>
<tr>
<td>Monitoring output</td>
<td>Relay or logic level DC 0/12 V for 3-point control to control an electronic switch relay (SSR) or analogue current signal 4 … 20 mA</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 100 ... 240 V, AC/DC 24 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 85.06</td>
</tr>
</tbody>
</table>

CS4R
For rail mounting, 22.5 x 75 mm

<table>
<thead>
<tr>
<th>Input</th>
<th>Multi-function input for resistance thermometers, thermocouples and standard signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control mode</td>
<td>PID, PI, PD, P, ON/OFF (configurable)</td>
</tr>
<tr>
<td>Monitoring output</td>
<td>Relay or logic level DC 0/12 V to control an electronic switch relay (SSR) or analogue current signal 4 … 20 mA</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 100 ... 240 V, AC/DC 24 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 85.05</td>
</tr>
</tbody>
</table>

CS6S, CS6H, CS6L
For panel mounting, 48 x 48, 48 x 96, 96 x 96 mm

<table>
<thead>
<tr>
<th>Input</th>
<th>Multi-function input for resistance thermometers, thermocouples and standard signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control mode</td>
<td>PID, PI, PD, P, ON/OFF (configurable)</td>
</tr>
<tr>
<td>Monitoring output</td>
<td>Relay (AC 250 V, 3A, (R) or 1A (L)) or logic level DC 0/12 V for 3-point control to control an electronic switch relay (SSR) or analogue current signal 4 … 20 mA</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 100 ... 240 V, AC/DC 24 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 85.08</td>
</tr>
</tbody>
</table>

SC58
For panel mounting, 62 x 28 mm

<table>
<thead>
<tr>
<th>Input</th>
<th>Pt100 or PTC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control mode</td>
<td>Simple 2-point controller</td>
</tr>
<tr>
<td>Monitoring output</td>
<td>Relay switching output 12 A, 250 V</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 230 V, AC 12 ... 24 V or DC 16 ... 32 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 85.24</td>
</tr>
</tbody>
</table>

SC64
For panel mounting, 64 mm, round

<table>
<thead>
<tr>
<th>Input</th>
<th>Pt100 or PTC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control mode</td>
<td>Simple 2-point controller</td>
</tr>
<tr>
<td>Monitoring output</td>
<td>Relay switching output 16 A, 250 V</td>
</tr>
<tr>
<td>Power supply</td>
<td>AC 230 V, AC 12 ... 24 V or DC 16 ... 32 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 85.25</td>
</tr>
</tbody>
</table>
Thermowells

Whether in aggressive or abrasive process media, whether in high- or low-temperature ranges: For electrical or mechanical thermometers, to prevent direct exposure of their temperature probes to the medium, thermowells that suit each application are available. Thermowells can be machined from solid-body material or assembled from tube sections and can either be screw-, weld- or flange-fitted.

They are offered in standard and special materials such as stainless steel 1.4571, 316L, Hastelloy® or titanium. Each version, depending on its construction type and its mounting to the process, has certain advantages and drawbacks with respect to its load limits and the special materials that can be used.

In order to manufacture thermowells for flange mounting at low cost from special materials, the designs used differ from standard thermowells in accordance with DIN 43772. Thus, only the wetted parts of the thermowell are manufactured from special materials, whereas the non-wetted flange is made of stainless steel and is welded to the special material.

This design is used both for fabricated and solid-machined thermowells. With tantalum as special material a removable jacket is used, which is slid over the supporting thermowell from stainless steel.

<table>
<thead>
<tr>
<th>TW10</th>
<th>Solid-machined with flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermowell form</td>
<td>Tapered, straight or stepped</td>
</tr>
<tr>
<td>Nominal width</td>
<td>ASME 1 ... 4 inch</td>
</tr>
<tr>
<td></td>
<td>DIN/EN DN 25 ... 100</td>
</tr>
<tr>
<td>Pressure rating</td>
<td>ASME to 2,500 lbs (DIN/EN to PN 100)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TW 95.10, TW 95.11, TW 95.12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TW15</th>
<th>Threaded (solid-machined)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermowell form</td>
<td>Tapered, straight or stepped</td>
</tr>
<tr>
<td>Head version</td>
<td>Hexagon, round with hexagon, or</td>
</tr>
<tr>
<td></td>
<td>round with spanner flats</td>
</tr>
<tr>
<td>Process connection</td>
<td>¾, ¾ or 1 NPT</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TW 95.15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TW20</th>
<th>Socket weld (solid-machined)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermowell form</td>
<td>Tapered, straight or stepped</td>
</tr>
<tr>
<td>Welding diameter</td>
<td>1.050, 1.315 or 1.900 inch</td>
</tr>
<tr>
<td></td>
<td>(26.7, 33.4 or 48.3 mm)</td>
</tr>
<tr>
<td>Pressure rating</td>
<td>3,000 or 6,000 psi</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TW 95.20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TW25</th>
<th>Weld-in (solid-machined)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermowell form</td>
<td>Tapered, straight or stepped</td>
</tr>
<tr>
<td>Head diameter</td>
<td>Up to 2 inch (50.8 mm)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TW 95.25</td>
</tr>
</tbody>
</table>
Thermowells

**TW30**
Vanstone (solid-machined) for lap flanges

<table>
<thead>
<tr>
<th>Thermowell form</th>
<th>Tapered, straight or stepped</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal width</td>
<td>ASME 1, 1½ or 2 inch</td>
</tr>
<tr>
<td>Pressure rating</td>
<td>ASME up to 2,500 lbs</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TW 95.30</td>
</tr>
</tbody>
</table>

**TW35**
Threaded (fabricated) (DIN 43772 form 2, 2G, 3, 3G)

<table>
<thead>
<tr>
<th>Thermowell form</th>
<th>Form 2, 2G, 3 or 3G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Connection to thermometer</td>
<td>M24 x 1.5 rotatable</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TW 95.35</td>
</tr>
</tbody>
</table>

**TW40**
Fabricated with flange (DIN 43772 form 2F, 3F)

<table>
<thead>
<tr>
<th>Thermowell form</th>
<th>Form 2F or 3F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal width</td>
<td>DIN/EN DN 25 … 50</td>
</tr>
<tr>
<td></td>
<td>ASME 1 … 2 inch</td>
</tr>
<tr>
<td>Pressure rating</td>
<td>DIN/EN up to PN 100</td>
</tr>
<tr>
<td></td>
<td>(ASME up to 1,500 psig)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TW 95.40</td>
</tr>
</tbody>
</table>

**TW45**
Threaded (fabricated, DIN 43772 form 5, 8)

<table>
<thead>
<tr>
<th>Thermowell form</th>
<th>Form 5 or 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Stainless steel or copper alloy</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TW 95.45</td>
</tr>
</tbody>
</table>

**TW50**
Threaded (solid-machined, DIN 43772 form 6, 7, 9)

<table>
<thead>
<tr>
<th>Thermowell form</th>
<th>Form 6, 7 or 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Stainless steel or copper alloy</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TW 95.50</td>
</tr>
</tbody>
</table>

**TW55**
Solid-machined for weld-in or with flange (DIN 43772 form 4, 4F)

<table>
<thead>
<tr>
<th>Thermowell form</th>
<th>Form 4 or 4F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal width</td>
<td>DIN/EN DN 25 … 50</td>
</tr>
<tr>
<td></td>
<td>ASME 1 … 2 inch</td>
</tr>
<tr>
<td>Pressure rating</td>
<td>DIN/EN up to PN 100</td>
</tr>
<tr>
<td></td>
<td>(ASME up to 2,500 psig)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>TW 95.55</td>
</tr>
</tbody>
</table>

**STW52G**
Thermowell for model 52 and model 73

- Suitable for thermometers with smooth connection (without thread), collar Ø 18 mm, stem 8 and 13 mm
- Thermowell material: Copper alloy, St35 ☰ or stainless steel
- Process connection: G ½ B thread
- Max. process temperature, process pressure:
  - 160 °C with copper alloy as thermowell material (6 bar stat.)
  - 500 °C with St35 stainless steel thermowell material (25 bar stat.)
- Data sheet: TW 90.11

- ☰ Thermowell stem material: Stainless steel
## Accessories

### PU-548

**Programming unit for temperature transmitters**

- LED status display
- Compact design
- No further voltage supply needed, neither for the programming unit nor for the transmitter
- Due to the magWIK quick connector, fast connection to the transmitter possible
- Data sheet AC 80.18

### magWIK

**Magnetic quick connector**

- For accelerated connection for all configuration and calibration processes
- Connection of 2-mm plug contacts or 4-mm plug contacts with adapter
- Data sheet AC 80.15

### 905

**Contact protection relay for model 821 switch contacts**

- Application: For optimal contact protection and highest switching reliability
- Data sheet: AC 08.01

### 904

**Control unit for inductive contacts**

- Application: For operating measuring instruments with inductive contacts
- Data sheet: AC 08.01

---

### Coupler connector

### Fittings

### Wires & cables
Bypass level indicators

Continuous level measurement via visual indication of the level without power supply

Applications
- Continuous level indication without power supply
- Indication of the level proportional to height
- Individual design and corrosion-resistant materials make the products suitable for a broad range of applications
- Chemical industry, petrochemical industry, oil and natural gas extraction (on- and offshore), shipbuilding, machine building, power generating equipment, power plants
- Process water and drinking water treatment, food and beverage industry, pharmaceutical industry

Special features
- Process- and procedure-specific production
- Operating limits:
  - Operating temperature: $T = -196 \ldots +450 \, ^\circ C$
  - Operating pressure: $P = \text{vacuum to } 400 \, \text{bar} \, ^1$
  - Limit density: $\rho \geq 340 \, \text{kg/m}^3$
- Wide variety of different process connections and materials
- Mounting of level sensors and magnetic switches possible as an option
- Explosion-protected versions

^1 Individual limit values. For application limits, the joint consideration of temperature and pressure is required.

---

BNA-S
Standard version

<table>
<thead>
<tr>
<th>Chamber</th>
<th>Ø 60.3 x 2 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Stainless steel 1.4571/316TI</td>
</tr>
<tr>
<td>process connection</td>
<td>Flange DIN, ANSI, EN</td>
</tr>
<tr>
<td>Pressure</td>
<td>Max. 64 bar</td>
</tr>
<tr>
<td>Temperature</td>
<td>-196 ... +450 °C</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 10.01</td>
</tr>
</tbody>
</table>

BNA-P
Plastic version

<table>
<thead>
<tr>
<th>Chamber</th>
<th>Ø 60.3 x 3 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>PVDF</td>
</tr>
<tr>
<td>process connection</td>
<td>Flange DIN, ANSI, EN</td>
</tr>
<tr>
<td>Pressure</td>
<td>Max. 6 bar</td>
</tr>
<tr>
<td>Temperature</td>
<td>-10 ... +100 °C</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 10.01</td>
</tr>
</tbody>
</table>
### BNA-X
**Special materials**

<table>
<thead>
<tr>
<th>Chamber</th>
<th>Ø 60.3 x 2 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ø 60.3 x 2.77 mm</td>
</tr>
<tr>
<td></td>
<td>Ø 60.3 x 3.91 mm</td>
</tr>
<tr>
<td></td>
<td>Ø 60.3 x 5.54 mm</td>
</tr>
<tr>
<td>Material</td>
<td>Titanium 3.7035</td>
</tr>
<tr>
<td></td>
<td>Hastelloy C276</td>
</tr>
<tr>
<td></td>
<td>6Mo 14547</td>
</tr>
<tr>
<td></td>
<td>Monel</td>
</tr>
<tr>
<td></td>
<td>Inconel</td>
</tr>
<tr>
<td>Process connection</td>
<td>Flange DIN, ANSI, EN</td>
</tr>
<tr>
<td></td>
<td>Thread</td>
</tr>
<tr>
<td></td>
<td>Weld stub</td>
</tr>
<tr>
<td>Pressure</td>
<td>Max. 250 bar</td>
</tr>
<tr>
<td>Temperature</td>
<td>-196 ... +450 °C</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 10.01</td>
</tr>
</tbody>
</table>

### BNA-SD, BNA-HD DUplus
**Standard/high-pressure version**

<table>
<thead>
<tr>
<th>Chamber</th>
<th>BNA-SD: Ø 60.3 x 2 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BNA-HD: Ø 60.3 x 2.77 mm</td>
</tr>
<tr>
<td>Material</td>
<td>1.4571/316TI</td>
</tr>
<tr>
<td></td>
<td>1.4404/316L</td>
</tr>
<tr>
<td>Process connection</td>
<td>Flange DIN, ANSI, EN</td>
</tr>
<tr>
<td></td>
<td>Thread</td>
</tr>
<tr>
<td></td>
<td>Weld stub</td>
</tr>
<tr>
<td>Pressure</td>
<td>BNA-SD: max. 64 bar</td>
</tr>
<tr>
<td>Temperature</td>
<td>-196 ... +450 °C</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 10.01</td>
</tr>
</tbody>
</table>

### BNA-L
**Liquid/KOplus version**

<table>
<thead>
<tr>
<th>Chamber</th>
<th>Ø 88.9 x 2 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ø 88.9 x 2.9 mm</td>
</tr>
<tr>
<td>Material</td>
<td>Stainless steel 1.4404/316L</td>
</tr>
<tr>
<td>Process connection</td>
<td>Flange DIN, ANSI, EN</td>
</tr>
<tr>
<td></td>
<td>Thread</td>
</tr>
<tr>
<td></td>
<td>Weld stub</td>
</tr>
<tr>
<td>Pressure</td>
<td>Max. 64 bar</td>
</tr>
<tr>
<td>Temperature</td>
<td>-196 ... +300 °C</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 10.01</td>
</tr>
</tbody>
</table>

### BNA-L
**Liquid/KOplus version**

<table>
<thead>
<tr>
<th>Chamber</th>
<th>Ø 88.9 x 2 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ø 88.9 x 2.9 mm</td>
</tr>
<tr>
<td>Material</td>
<td>Stainless steel 1.4404/316L</td>
</tr>
<tr>
<td>Process connection</td>
<td>Flange DIN, ANSI, EN</td>
</tr>
<tr>
<td></td>
<td>Thread</td>
</tr>
<tr>
<td></td>
<td>Weld stub</td>
</tr>
<tr>
<td>Pressure</td>
<td>Max. 64 bar</td>
</tr>
<tr>
<td>Temperature</td>
<td>-196 ... +300 °C</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 10.01</td>
</tr>
</tbody>
</table>
Sight glass level indicators

Direct level indication without power supply

Applications
- Continuous level indication without power supply
- Direct indication of the level
- Individual design and corrosion-resistant materials make the products suitable for a broad range of applications
- Chemical, petrochemical industry, oil and natural gas extraction (on- and offshore), shipbuilding, machine building, power generating equipment, power plants
- Oil and gas, heat transfer and refrigeration systems, plants for cryogenics

Special features
- Process- and procedure-specific production
- Operating limits: □ Operating temperature: T = -196 … +374 °C ¹)
  □ Operating pressure: Vacuum to 250 bar ¹)
- Wide variety of different process connections and materials
- Illumination optional
- Heating and/or insulation optional

¹) Individual limit values. For application limits, the joint consideration of temperature and pressure is required.

LGG-E
Compact version

Display type          Reflex
Material              ■ Steel 1.0460
                      ■ A105, 1.0570
Process connection    Flange DIN, ANSI, EN
Pressure              Max. 40 bar
Temperature           -10 … +243 °C (steam)
Glass size            2 … 11
Number of segments    1 … 3
Data sheet            LM 33.01

LGG-RP, LGG-TP
Carbon-Line version

Display type          Reflex/transparent
Material              Steel A350 LF2
Process connection    ■ Flange DIN, ANSI, EN
                      ■ Male thread ½" NPT, ¾" NPT
                      ■ Weld stub ½", ¾"
Pressure              Max. 100 bar
Temperature           ■ -40 … +243 °C (steam)
                      ■ -40 … +300 °C
Glass size            4 … 9
Number of segments    1 … 5
Data sheet            LM 33.01

LGG-RE, LGG-TE
Standard version

Display type          Reflex/transparent
Material              ■ Steel 1.0570, A350 LF2
                      ■ Stainless steel 1.4404/316L
Process connection    ■ Flange DIN, ANSI, EN
                      ■ Male thread ½" NPT, ¾" NPT
                      ■ Weld stub ½", ¾"
Pressure              Max. 160 bar
Temperature           ■ -196 … +243 °C (steam)
                      ■ -196 … +300 °C
Glass size            2 … 11
Number of segments    1 … 5 (others on request)
Data sheet            LM 33.01

Direct level indication without power supply

Applications
- Continuous level indication without power supply
- Direct indication of the level
- Individual design and corrosion-resistant materials make the products suitable for a broad range of applications
- Chemical, petrochemical industry, oil and natural gas extraction (on- and offshore), shipbuilding, machine building, power generating equipment, power plants
- Oil and gas, heat transfer and refrigeration systems, plants for cryogenics

Special features
- Process- and procedure-specific production
- Operating limits: □ Operating temperature: T = -196 … +374 °C ¹)
  □ Operating pressure: Vacuum to 250 bar ¹)
- Wide variety of different process connections and materials
- Illumination optional
- Heating and/or insulation optional

¹) Individual limit values. For application limits, the joint consideration of temperature and pressure is required.

LGG-E
Compact version

Display type          Reflex
Material              ■ Steel 1.0460
                      ■ A105, 1.0570
Process connection    Flange DIN, ANSI, EN
Pressure              Max. 40 bar
Temperature           -10 … +243 °C (steam)
Glass size            2 … 11
Number of segments    1 … 3
Data sheet            LM 33.01

LGG-RP, LGG-TP
Carbon-Line version

Display type          Reflex/transparent
Material              Steel A350 LF2
Process connection    ■ Flange DIN, ANSI, EN
                      ■ Male thread ½" NPT, ¾" NPT
                      ■ Weld stub ½", ¾"
Pressure              Max. 100 bar
Temperature           ■ -40 … +243 °C (steam)
                      ■ -40 … +300 °C
Glass size            4 … 9
Number of segments    1 … 5
Data sheet            LM 33.01

LGG-RE, LGG-TE
Standard version

Display type          Reflex/transparent
Material              ■ Steel 1.0570, A350 LF2
                      ■ Stainless steel 1.4404/316L
Process connection    ■ Flange DIN, ANSI, EN
                      ■ Male thread ½" NPT, ¾" NPT
                      ■ Weld stub ½", ¾"
Pressure              Max. 160 bar
Temperature           ■ -196 … +243 °C (steam)
                      ■ -196 … +300 °C
Glass size            2 … 11
Number of segments    1 … 5 (others on request)
Data sheet            LM 33.01
### LGG-RI, LGG-TI

**High-pressure version**

<table>
<thead>
<tr>
<th>Display type</th>
<th>Reflex/transparent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Steel 1.5415</td>
</tr>
<tr>
<td></td>
<td>Stainless steel 1.4404/316L</td>
</tr>
<tr>
<td>Process connection</td>
<td>Flange DIN, ANSI, EN</td>
</tr>
<tr>
<td></td>
<td>Male thread ½” NPT, ¾” NPT</td>
</tr>
<tr>
<td></td>
<td>Weld stub ½”, ¾”</td>
</tr>
<tr>
<td>Pressure</td>
<td>Max. 250 bar</td>
</tr>
<tr>
<td>Temperature</td>
<td>-196 ... +100 °C</td>
</tr>
<tr>
<td>Glass size</td>
<td>2 ... 9</td>
</tr>
<tr>
<td>Number of segments</td>
<td>1 ... 5</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 33.01</td>
</tr>
</tbody>
</table>

### LGG-M

**Refraction version**

<table>
<thead>
<tr>
<th>Display type</th>
<th>Refraction</th>
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</thead>
<tbody>
<tr>
<td>Material</td>
<td>Steel 1.5415</td>
</tr>
<tr>
<td>Process connection</td>
<td>Flange DIN, ANSI, EN</td>
</tr>
<tr>
<td></td>
<td>Male thread G ½, G ¾, ½” NPT, ¾” NPT</td>
</tr>
<tr>
<td></td>
<td>Weld stub ½”, ¾”</td>
</tr>
<tr>
<td>Pressure</td>
<td>Max. 250 bar</td>
</tr>
<tr>
<td>Temperature</td>
<td>-10 ... +374 °C</td>
</tr>
<tr>
<td>Glass size</td>
<td>2 ... 11</td>
</tr>
<tr>
<td>Number of segments</td>
<td>1 ... 9</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 33.01</td>
</tr>
</tbody>
</table>
Submersible pressure sensors

Hydrostatic level measurement

Applications
- Level measurement in rivers and lakes
- Control of sewage lift and pumping stations
- Monitoring of sewage, settling and rainwater retention basins
- Level measurement in vessel and storage systems for oils and fuels

Special features
- Slimline and hermetically sealed design up to 300 m water column
- Highly resistant versions available
- Explosion protection per ATEX, IECEx, FM and CSA
- Drinking water conformity per KTW and ACS
- Temperature output, HART® and low-power output signal for battery operation

<table>
<thead>
<tr>
<th>Model</th>
<th>For superior applications</th>
<th>Standard version</th>
<th>High-performance</th>
</tr>
</thead>
</table>
| LF-1  | Accuracy (± % of span) ≤ 0.5 or ≤ 1 | Measuring range 0 ... 0.1 to 0 ... 6 bar | Output signal
|       |                          | 4 ... 20 mA (2-wire) | 4 ... 20 mA + HART® (2-wire) | DC 0.1 ... 2.5 V (3-wire) |
|       | Special feature Suitable for measurements in contaminated and aggressive media | An optimised discharge behaviour and a large pressure port prevent the instrument from clogging and ensure a minimum maintenance effort | Can be used in explosion-protected areas | Developed for wireless applications |
|       | Data sheet LM 40.04 | | |
| LS-1  | Accuracy (± % of span) ≤ 0.5 | Measuring range 0 ... 0.25 to 0 ... 10 bar | Output signal 4 ... 20 mA (2-wire) |
|       | Special feature Suitable for measurements in contaminated and aggressive media | An optimised discharge behaviour and a large pressure port prevent the instrument from clogging and ensure a minimum maintenance effort | Can be used in explosion-protected areas | Developed for wireless applications |
|       | Data sheet PE 81.55 | | |
| LH-20 | Accuracy (± % of span) ≤ 0.2 or 0.1 | Measuring range 0 ... 0.1 to 0 ... 25 bar | Output signal 4 ... 20 mA (2-wire) |
|       | Special feature Suitable for measurements in contaminated and aggressive media | An optimised discharge behaviour and a large pressure port prevent the instrument from clogging and ensure a minimum maintenance effort | Can be used in explosion-protected areas | Developed for wireless applications |
|       | Data sheet PE 81.56 | | |
Continuous measurement with float for industrial applications

With reed measuring chain

Applications
- Level measurement of liquids in machine building
- Control and monitoring tasks for hydraulic power packs, compressors and cooling systems

Special features
- Media compatibility: Oil, water, diesel, refrigerants and other liquids
- Permissible medium temperature: -30 ... +120 °C
- Output signals for level and temperature (optional) as resistance output signal or 4 ... 20 mA current output
- Measurement principle: Reed-chain technology
- Accuracy, resolution: 24, 12, 10, 6 or 3 mm

RLT-1000
Stainless steel version

Accuracy | 24, 12, 10, 6 or 3 mm
Output signal | Resistance signal or 4 ... 20 mA
Temperature | -30 ... +80 °C
( +120 °C optional)
Guide tube length | 150 ... 1,500 mm
Data sheet | LM 50.02

RLT-2000
Plastic version

Accuracy | 24, 12, 10, 6 or 3 mm
Output signal | Resistance signal or 4 ... 20 mA
Temperature | -10 ... +80 °C
( -30 ... +120 °C optional)
Guide tube length | 150 ... 1,500 mm
Data sheet | LM 50.01

RLT-3000
Stainless steel version with temperature output signal

Accuracy | 24, 12, 10, 6 or 3 mm
Level output signal | 4 ... 20 mA
Output signal | 4 ... 20 mA, Pt100 or Pt1000
Temperature | -30 ... +100 °C
Guide tube length | 150 ... 1,500 mm
Data sheet | LM 50.05
Continuous measurement with float for the process industry

**Magnetostrictive**

**Applications**
- High-accuracy level measurement for almost all liquid media
- Chemical, petrochemical industry, natural gas, offshore, shipbuilding, machine building, power generating equipment, power plants
- Process water and drinking water treatment, food and beverage industry, pharmaceutical industry

**Special features**
- Process- and system-specific solutions possible
- Operating limits:  □ Operating temperature: T = -90 … +400 °C
  □ Operating pressure: P = vacuum to 100 bar
  □ Limit density: ρ ≥ 400 kg/m³
- Resolution < 0.1 mm
- Wide variety of different electrical connections, process connections and materials
- Explosion-protected versions

**FLM-S**
**Stainless steel version**
- Process connection: Mounting thread, Flange DIN, ANSI
- Guide tube length: Max. 6,000 mm
- Pressure: 0 … 200 bar
- Temperature: -90 … +450 °C
- Density: ≥ 400 kg/m³
- Data sheet: LM 20.01

**FLM-SP**
**Plastic version**
- Process connection: Mounting thread, Flange DIN, ANSI
- Guide tube length: Max. 5,000 mm
- Pressure: 0 … 16 bar
- Temperature: -10 … +100 °C
- Density: ≥ 800 kg/m³
- Data sheet: LM 20.01

**FLM-H**
**Hygienic version, for sanitary applications**
- Process connection: Clamp ISO 2852, Clamp DIN 32767, Aseptic thread DIN 11864-1, Aseptic liner DIN 11864-1, Aseptic flange DIN 11864-2, Aseptic clamp DIN 11864-3, VARIVENT®, BioConnect®
- Material: 1.4435 (316L) or 1.4404 (316L)
- Guide tube length: Max. 6,000 mm
- Pressure: 10 bar
- Temperature: -40 … +250 °C
- Density: ≥ 770 kg/m³
- Data sheet: LM 20.01

VARIVENT® is a registered trademark of the company GEA Tuchenhagen
BioConnect® is a registered trademark of the company NEUMO
With reed measuring chain

Applications
- Level detection for almost all liquid media
- Chemical, petrochemical industry, natural gas, offshore, shipbuilding, machine building, power generating equipment, power plants
- Process water and drinking water treatment, food and beverage industry, pharmaceutical industry

Special features
- Process- and system-specific solutions possible
- Operating limits: □ Operating temperature: T = -80 … +200 °C
□ Operating pressure: P = vacuum to 80 bar
□ Limit density: ρ ≥ 400 kg/m³
- Wide variety of different electrical connections, process connections and materials
- Optionally with programmable and configurable head-mounted transmitter for 4 … 20 mA field signals, HART®, PROFIBUS® PA and FOUNDATION™ Fieldbus
- Explosion-protected versions

FLR-SA, FLR-SB
Stainless steel version

<table>
<thead>
<tr>
<th>Process connection</th>
<th>Mounting thread</th>
<th>Flange DIN, ANSI, EN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide tube length</td>
<td>Max. 6,000 mm</td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td>0 ... 100 bar</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>-80 ... +200 °C</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>≥ 400 kg/m³</td>
<td></td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 20.02</td>
<td></td>
</tr>
</tbody>
</table>

FLR-PA, FLR-PB
Plastic version, PP, PVDF, PP

<table>
<thead>
<tr>
<th>Process connection</th>
<th>Mounting thread</th>
<th>Flange DIN, ANSI, EN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide tube length</td>
<td>Max. 5,000 mm</td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td>0 ... 3 bar</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>-10 ... +100 °C</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>≥ 800 kg/m³</td>
<td></td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 20.02</td>
<td></td>
</tr>
</tbody>
</table>

FLR-HA3
Hygienic version, for sanitary applications

<table>
<thead>
<tr>
<th>Process connection</th>
<th>Clamp ISO 2852</th>
<th>Clamp DIN 32767</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aseptic thread DIN 11864-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aseptic liner DIN 11864-1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aseptic flange DIN 11864-2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aseptic clamp DIN 11864-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>VARIVENT®</td>
<td>BioConnect®</td>
</tr>
<tr>
<td>Material</td>
<td>1.4435 (316L) or 1.4404 (316L)</td>
<td></td>
</tr>
<tr>
<td>Guide tube length</td>
<td>Max. 6,000 mm</td>
<td></td>
</tr>
<tr>
<td>Pressure</td>
<td>10 bar</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>-40 ... +250 °C</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>≥ 770 kg/m³</td>
<td></td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 20.02</td>
<td></td>
</tr>
</tbody>
</table>

VARIVENT® is a registered trademark of the company GEA Tuchenhagen
BioConnect® is a registered trademark of the company NEUMO
### Float switches for industrial applications

**Applications**
- Level measurement of liquids in machine building
- Control and monitoring tasks for hydraulic power packs, compressors and cooling systems

**Special features**
- Media compatibility: Oil, water, diesel, refrigerants and other liquids
- Permissible medium temperature range: -30 ... +150 °C
- Up to 4 switching outputs freely definable as normally open, normally closed or change-over contact
- Optional temperature output signal, selectable as preconfigured bimetal switch or either Pt100 or Pt1000

### RLS-1000
**Stainless steel version**

<table>
<thead>
<tr>
<th>Switch points</th>
<th>Up to 4 (normally closed, normally open, change-over contact)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium temperature</td>
<td>-30 ... +80 °C, -30 ... +150 °C optional</td>
</tr>
<tr>
<td>Guide tube length</td>
<td>60 ... 1,500 mm</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 50.03</td>
</tr>
</tbody>
</table>

### RLS-2000
**Plastic version**

<table>
<thead>
<tr>
<th>Switch points</th>
<th>Up to 4 (normally closed, normally open, change-over contact)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium temperature</td>
<td>-10 ... +80 °C, -30 ... +120 °C optional</td>
</tr>
<tr>
<td>Guide tube length</td>
<td>100 ... 1,500 mm</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 50.04</td>
</tr>
</tbody>
</table>

### RLS-3000
**Stainless steel version, with temperature output signal**

<table>
<thead>
<tr>
<th>Switch points</th>
<th>Up to 3 (normally closed, normally open, change-over contact)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature output</td>
<td>Normally closed, normally open, Pt100, Pt1000</td>
</tr>
<tr>
<td>Medium temperature</td>
<td>-30 ... +80 °C, (-30 ... +150 °C optional)</td>
</tr>
<tr>
<td>Guide tube length</td>
<td>60 ... 1,500 mm</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 50.06</td>
</tr>
<tr>
<td>Switch points</td>
<td>Up to 4 (normally closed, normally open, change-over contact)</td>
</tr>
<tr>
<td>---------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Temperature output (optional)</td>
<td>Normally closed, normally open, Pt100, Pt1000</td>
</tr>
<tr>
<td>Medium temperature</td>
<td>-30 … +80 °C (-30 … +150 °C optional)</td>
</tr>
<tr>
<td>Guide tube length</td>
<td>60 … 1,500 mm</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 50.07</td>
</tr>
</tbody>
</table>

**Material**
- Stainless steel 1.4571

**Switching output**
- Normally closed, normally open, change-over contact

**Medium temperature**
- -40 ... +80 °C

**Electrical output**
- Marine cable, IP68 (8 m)

**Test device**
- Optional

**Data sheet**
- LM 50.08

---

**Densities**
- ≥ 1,000 kg/m³

**Temperature**
- -30 … +80 °C (-30 … +150 °C optional)

**Guide tube length**
- 60 … 1,500 mm

---

**LSD-30**

**Electronic level switch, with display**

- Measuring range: Probes length 250, 370, 410, 520, 730 mm (others upon request)
- Density: ≥ 0.88 g/cm³ (stainless steel float)
- Output signal:
  - 1 or 2 switching outputs (PNP or NPN)
  - Analogue output (optional)
- Process connection: G ½, A, % NPT (others upon request)
- Data sheet: LM 40.01

---

**GLS-1000**

**PNP or NPN switching outputs**

- Switch points: Up to 4 (normally closed, normally open)
- Temperature output: Pt100, Pt1000
- Medium temperature:
  - -40 ... +80 °C
  - (-40 ... +110 °C optional)
- Guide tube length: 60 ... 1,000 mm
- Accuracy: < 1 mm
- Data sheet: LM 50.10

---

**RLS-4000**

**Intrinsic safety Ex i**

- **Switch points**: Up to 4 (normally closed, normally open, change-over contact)
- **Temperature output (optional)**: Normally closed, normally open, Pt100, Pt1000
- **Medium temperature**: -30 … +80 °C (-30 … +150 °C optional)
- **Guide tube length**: 60 … 1,500 mm
- **Data sheet**: LM 50.07

---

**RLS-5000**

**For the shipbuilding industry (bilge water tanks)**

- **Material**: Stainless steel 1.4571
- **Switching output**: Normally closed, normally open, change-over contact
- **Medium temperature**: -40 ... +80 °C
- **Electrical output**: Marine cable, IP68 (8 m)
- **Test device**: Optional
- **Data sheet**: LM 50.08

---

**RLS-6000**

**For water and wastewater**

- **Switching output**: Normally closed, normally open, change-over contact
- **Density**: ≥ 1,000 kg/m³
- **Temperature**: -10 … +60 °C
- **Guide tube length**: 150 … 1,000 mm
- **Data sheet**: LM 50.09
Float switches for the process industry

Robust switches for liquid media

Applications
- Level measurement for almost all liquid media
- Pump and level control and monitoring of distinct filling levels
- Chemical, petrochemical industry, natural gas, offshore, shipbuilding, machine building, power generating equipment, power plants
- Process water and drinking water treatment, food and beverage industry

Special features
- Large range of application due to the simple, proven functional principle
- For harsh operating conditions, long service life
- Operating limits:
  - Operating temperature: \( T = -196 \ldots +350 \, ^\circ C \)
  - Operating pressure: \( P = \) vacuum to 40 bar
  - Limit density: \( \rho \geq 300 \, kg/m^3 \)
- Wide variety of different electrical connections, process connections and materials
- Explosion-protected versions

FLS-SA, FLS-SB
Stainless steel version, for vertical installation

Switch points: Max. 8 switch points
Process connection: Mounting thread, Flange DIN, ANSI, EN
Guide tube length: Max. 6,000 mm
Pressure: 0 … 100 bar
Temperature: -196 … +300 °C
Density: \( \geq 390 \, kg/m^3 \)
Data sheet: LM 30.01

FLS-PA, FLS-PB
Plastic version, for vertical installation

Switch points: Max. 8 switch points
Process connection: Mounting thread, Flange DIN, ANSI, EN
Guide tube length: Max. 5,000 mm
Pressure: 0 … 3 bar
Temperature: -10 … +100 °C
Density: \( \geq 400 \, kg/m^3 \)
Data sheet: LM 30.01

FLR-HA3
Hygienic version, for sanitary applications


Material: 1.4435 (316L) or 1.4404 (316L)
Guide tube length: Max. 6,000 mm
Pressure: 10 bar
Temperature: -40 … +250 °C
Density: \( \geq 770 \, kg/m^3 \)
Data sheet: LM 20.02

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BioConnect® is a registered trademark of the company NEUMO
**ELS-S**

For lateral mounting with external chamber

- **External chamber**: Stainless steel
- **Process connection**: Threaded pipe connection GE10-LR galvanised steel
- **Pressure**: Up to 6 bar
- **Temperature**: -30 ... +300 °C
- **Data sheet**: LM 30.03

---

**ELS-A**

For lateral mounting with external chamber

- **External chamber**: Aluminium
- **Process connection**: Threaded pipe connection GE10-LR galvanised steel
- **Pressure**: Max. 1 bar
- **Temperature**: -30 ... +150 °C
- **Data sheet**: LM 30.03

---

**HLS-M1, HLS-M2**

Plastic or stainless steel version, with cable outlet

- **Process connection**: ½” NPT (installation in the tank from outside)
- **Pressure**: HLS-M1: 1 bar
- **Temperature**: HLS-M1: -10 ... +80 °C
- **Material**: HLS-M1: PP
- **Electrical connection**: HLS-M1: Cable
- **Data sheet**: LM 30.06

---

**HLS-S**

Stainless steel version, for horizontal installation

- **Process connection**: Flange DIN, ANSI, EN
- **Pressure**: 0 ... 232 bar
- **Temperature**: -196 ... +350 °C
- **Density**: ≥ 600 kg/m³
- **Material**: Stainless steel, titanium
- **Data sheet**: LM 30.02

---

**HLS-P**

Plastic version, for horizontal installation

- **Process connection**: Flange DIN, ANSI, EN
- **Pressure**: 0 ... 3 bar
- **Temperature**: -10 ... +80 °C
- **Density**: ≥ 750 kg/m³
- **Material**: PP
- **Data sheet**: LM 30.02

---

**HLS-S Ex i**

Intrinsically safe stainless steel version for horizontal installation

- **Process connection**: Mounting flange: DIN DIN 50 ... DIN 100, PN 6 ... 160 EN 1092 DIN 50 ... DIN 100, PN 6 ... PN 160 ANSI 2” ... 4”, class 150 ... 900
- **Square flange**: DN 80 and DN 92 (other flanges on request)
- **Pressure**: Max. 6 bar
- **Temperature class**: T2 T3 T4 T5 T6
- **Process temperature**: 180 °C 190 °C 108 °C 80 °C 65 °C
- **Ambient temperature at case**: 80 °C
- **Density**: 600 kg/m³
- **Material**: Stainless steel 1.4571
- **Data sheet**: LM 30.02
Optoelectronic switches for the process industry

For applications with limited mounting space

Applications
- Chemical, petrochemical, natural gas, offshore industries
- Shipbuilding, machine building, refrigerator units
- Power generating equipment, power plants
- Process water and drinking water treatment
- Wastewater and environmental engineering

Special features
- Temperature ranges from -269 … +400 °C
- Versions for pressure ranges from vacuum to 500 bar
- Special versions: High pressure, interface measurement
- Explosion-protected versions
- Signal processing is made using a separate model OSA-S switching amplifier

OLS-S, OLS-H
Standard and high-pressure version

Material: Stainless steel, Hastelloy, KM-glass, quartz glass, sapphire, graphite
Process connection: G ½ A, ½ NPT
Pressure: 0 … 500 bar
Temperature: -269 … +400 °C
Approval: Ex i
Data sheet: LM 31.01

OSA-S
Switching amplifier, for models OLS-S, OLS-H

Output: 1 signal relay, 1 failure relay
Function: High or low alarm
Time delay: Up to 8 s
Voltage supply: AC 24/115/120/230 V, DC 24 V
Approval: Ex i
Data sheet: LM 31.01

OLS-C20
Compact design, high-pressure version

Material: Stainless steel, quartz glass
Process connection: M16 x 1.5, G ½ A, ½ NPT
Insertion length: 24 mm
Pressure: 0 … 50 bar
Temperature: -30 … +135 °C
Data sheet: LM 31.02
Optoelectronic switches for industrial applications

**Applications**
- Limit detection of liquids
- Machine tools
- Hydraulics
- Machine building
- Water technology

**Optoelectronic limit level switches – for general applications in machine building**

**OLS-C01**
- Level switch, standard version
- **Material**: Stainless steel, borosilicate glass
- **Process connection**: G ¼", G ½" or M12 x 1
- **Pressure**: Max. 25 bar
- **Temperature**: -30 °C ... +100 °C
- **Switching output**: 1 x PNP
- **Data sheet**: LM 31.31

**OLS-C02**
- Level switch, with selectable switch length
- **Material**: Stainless steel, borosilicate glass
- **Process connection**: G ½"
- **Pressure**: Max. 25 bar
- **Temperature**: -30 °C ... +100 °C
- **Switch length**: 65 ... 1,500 mm
- **Switching output**: 1 x PNP
- **Data sheet**: LM 31.32

**OLS-C05**
- Level switch, high-temperature version
- **Material**: Stainless steel, borosilicate glass
- **Process connection**: G ½"
- **Pressure**: Max. 25 bar
- **Temperature**: -40 °C ... +170 °C
- **Switching output**: 1 x PNP
- **Data sheet**: LM 31.33

**Optoelectronic limit level switches – application specialists**

**OLS-C51**
- Intrinsic safety Ex i
- **Material**: Stainless steel, borosilicate glass
- **Process connection**: G ½"
- **Pressure**: Max. 40 bar
- **Temperature**: -30 °C ... +135 °C
- **Approval**: Ex i
- **Output signal**: 4 ... 20 mA low/high
- **Data sheet**: LM 31.04

**OLS-C04**
- For refrigeration technology
- **Material**: Steel, nickel-plated; glass
- **Process connection**: G ½", ½" NPT
- **Pressure**: Max. 40 bar
- **Temperature**: -40 °C ... +130 °C
- **Switching output**: 1 x PNP
- **Vibration resistance**: 10 ... 5,000 Hz, 0 ... 60 g
- **Data sheet**: LM 31.34

**OLS-5200**
- For the shipbuilding industry
- **Material**: Stainless steel, borosilicate glass
- **Process connection**: Male thread G ½" or M18 x 1.5
- **Pressure**: Max. 25 bar
- **Temperature**: -40 °C ... +130 °C
- **Switching output**: 1 x PNP
- **Data sheet**: LM 31.06
Accessories for bypass

Combines the tried-andtrusted bypass with further independent measurement principles

<table>
<thead>
<tr>
<th>BLM-S</th>
<th>BLM-SF-FM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>Guide tube length</td>
<td>Max. 5,800 mm</td>
</tr>
<tr>
<td>Temperature</td>
<td>-60 ... +185 °C</td>
</tr>
<tr>
<td>Output signal</td>
<td>4 ... 20 mA, HART®</td>
</tr>
<tr>
<td>Data sheet</td>
<td>LM 10.05</td>
</tr>
</tbody>
</table>

Material: Stainless steel 1.4404
Guid tube length: Max. 5,800 mm
Temperature: -60 ... +185 °C
Output signal: 4 ... 20 mA, HART®
Data sheet: LM 10.05
The comprehensive accessory programme includes a wide variety of electronic equipment required for the evaluation and indication of our sensors.

### Accessories

**904**

**Control unit for inductive contacts**

<table>
<thead>
<tr>
<th>Application</th>
<th>For operating measuring instruments with inductive contacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data sheet</td>
<td>AC 08.01</td>
</tr>
</tbody>
</table>

**IS Barrier**

**Intrinsically safe repeater power supply**

- 1-channel input 0/4 ... 20 mA
- Intrinsically safe [Ex ia], supplying and non-supplying
- Galvanic isolation
- Bidirectional HART® signal transmission
- Suitable for SIL 2 per IEC 61508/IEC 61511
- Data sheet AC 80.14

**DI32-1**

**Digital indicator for panel mounting, 48 x 24 mm**

<table>
<thead>
<tr>
<th>Input</th>
<th>Multi-function input for resistance thermometers, thermocouples and standard signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm output</td>
<td>2 or 4 relays (optional)</td>
</tr>
<tr>
<td>Special feature</td>
<td>Integrated transmitter power supply, Analogue output signal</td>
</tr>
<tr>
<td>Power supply</td>
<td>DC 9 ... 28 V</td>
</tr>
<tr>
<td>Data sheet</td>
<td>AC 80.13</td>
</tr>
</tbody>
</table>

**DI35**

**For panel mounting, 96 x 48 mm**

- Multi-function input for resistance thermometers, thermocouples and standard signals
- Alternatively double input for standard signals with calculation function (+ - x /) for two transmitters
- 2 or 4 relays (optional)
- Integrated transmitter power supply, Analogue output signal
- Power supply: DC 10 ... 40 V, AC 18 ... 30 V
- Data sheet AC 80.03

**DI32-1**

- Multi-function input for resistance thermometers, thermocouples and standard signals
- 2 electronic contacts
- Power supply: DC 9 ... 28 V
- Data sheet AC 80.13

---

**Level | Accessories**

**904**

**Control unit for inductive contacts**

**IS Barrier**

**Intrinsically safe repeater power supply**

**DI32-1**

**Digital indicator for panel mounting, 48 x 24 mm**

**DI35**

**For panel mounting, 96 x 48 mm**
Force transducers from WIKA can be delivered with affixed strain gauges or thin-film sensors. The span of the measuring ranges that can be delivered stretches from 0.5 N to over 10,000 kN. The strain gauge technology offers a large geometrical variety and high accuracy, and it is well suited for detecting even the smallest forces. Force transducers with thin-film sensors are very cost-effective for customer-specific solutions or OEM applications and also for safety-related use. They are particularly characterised by their long-term and temperature behaviour.

**F1211**

Compression force transducer to 1,000 kN

- Rated force $F_{\text{nom}}$: 0 ... 1 to 0 ... 1,000 kN
- Relative linearity error: $\leq \pm 0.2 \% F_{\text{nom}}$
- Output signal: 2 mV/V
- Ingress protection: IP67
- Data sheet: FO 51.10

**F1222**

Miniature compression force transducer from 0.5 N

- Rated force $F_{\text{nom}}$: 0 ... 0.5 to 0 ... 5.000 N
- Relative linearity error: $\leq 1 \% F_{\text{nom}}$
- Output signal: 1 ... 10 mV/V/N
- Ingress protection: IP65
- Data sheet: FO 51.11

**F1224**

Miniature compression force transducer from 1 kN

- Rated force $F_{\text{nom}}$: 0 ... 1 to 0 ... 500 kN
- Relative linearity error: $\leq 0.5 \% F_{\text{nom}}$
- Output signal: 1.5 mV/V
- Ingress protection: IP65
- Data sheet: FO 51.12

**F2210**

Tension/compression force transducer, flat bar to 2,000 kN

- Rated force $F_{\text{nom}}$: 0 ... 0.5 to 0 ... 2,000 kN
- Relative linearity error: $\leq \pm 0.15 \% F_{\text{nom}}$ tension or pressure, $\leq \pm 0.30 \% F_{\text{nom}}$ tension and pressure
- Output signal: 2 mV/V
- Ingress protection: IP67
- Data sheet: FO 51.14

**F2211**

Tension/compression force transducer, S-type to 50 kN

- Rated force $F_{\text{nom}}$: 0 ... 0.02 to 0 ... 50 kN
- Relative linearity error: $\leq \pm 0.2 \% F_{\text{nom}}$
- Output signal: 2 mV/V (1 mV/V at 0.02 kN)
- Ingress protection: IP65, to 1 kN IP66
- Data sheet: FO 51.15

**F2220**

Miniature tension/compression force transducer, from 1.5 N

- Rated force $F_{\text{nom}}$: 0 ... 1.5 to 0 ... 5,000 N
- Relative linearity error: $\leq \pm 0.5 \% F_{\text{nom}}$
- Output signal: 2 mV/V (to 5 N 15 mV/V)
- Ingress protection: IP65
- Data sheet: FO 51.16

**F2221**

Tension/compression force transducer from 0.01 kN

- Rated force $F_{\text{nom}}$: 0 ... 0.01 to 0 ... 50 kN
- Relative linearity error: $\leq \pm 0.2 \% F_{\text{nom}}$
- Output signal: 2 mV/V
- Ingress protection: IP65
- Data sheet: FO 51.26
F2301, F23C1, F23S1

Tension/compression force transducer with thin-film technology to 500 kN

- Rated force $F_{\text{nom}}$: $0 \ldots 1$ to $0 \ldots 500$ kN
- Relative linearity error: $\leq 0.2 \% F_{\text{nom}}$
- Output signal:
  - 4 ... 20 mA, 2-wire/3-wire
  - 0 ... 10 V, 3-wire
  - 0 ... 10 V redundant
- Ingress protection: IP67 (IP69K optional)
- Data sheet: FO 51.17

F6215

Ring force transducer to 1,500 kN

- Rated force $F_{\text{nom}}$: $0 \ldots 15$ to $0 \ldots 1,500$ kN
- Relative linearity error:
  - $\leq 1 \% F_{\text{nom}}$ for compression force measurement
  - $3 \% F_{\text{nom}}$ for preload force measurement
- Output signal: 0.8 ... 1.2 mV/V
- Ingress protection: IP65
- Data sheet: FO 51.28

F2301, F23C1, F23S1

Load pin with thin-film technology to 70 kN

- Rated force $F_{\text{nom}}$: $0 \ldots 10$ to $0 \ldots 70$ kN
- Relative linearity error:
  - $\leq 1 \% F_{\text{nom}}$
  - $\leq 1.5 \% F_{\text{nom}}$
  - $\leq 2 \% F_{\text{nom}}$
- Output signal:
  - 4 ... 20 mA, 2-wire/3-wire, CANopen®
  - 2 x 4 ... 20 mA redundant, CANopen®
  - 0 ... 10 V, 3-wire, CANopen®
  - 2 x 0 ... 10 V redundant, CANopen®
- Ingress protection: IP67, IP69K (optional)
- Data sheet: FO 51.18

F6212

Ring force transducer to 100 kN

- Rated force $F_{\text{nom}}$: $0 \ldots 2$ to $0 \ldots 100$ kN
- Relative linearity error: $\leq 0.2 \% F_{\text{nom}}$
- Output signal: 0.8 ... 1.2 mV/V
- Ingress protection: IP65
- Data sheet: FO 51.27

F3831

Shear beam to 10 t

- Rated load $F_{\text{nom}}$: $0 \ldots 500$ to $0 \ldots 10,000$ kg
- Relative linearity error: 0.03 \% $F_{\text{nom}}$
- Output signal:
  - 2.0 ±1 % mV/V
  - 3.0 ±1 % mV/V (optional)
- Ingress protection: IP65 (500 kg), IP67 (500 kg)
- Data sheet: FO 51.21

F3833

Bending beam to 500 kg

- Rated load $F_{\text{nom}}$: $0 \ldots 20$ to $0 \ldots 500$ kg
- Relative linearity error: 0.02 \% $F_{\text{nom}}$
- Output signal: 2.0 ±1 % mV/V
- Ingress protection: IP68
- Data sheet: FO 51.22
**Force transducers**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Rated force $F_{\text{nom}}$</th>
<th>Relative linearity error</th>
<th>Output signal</th>
<th>Ingress protection</th>
<th>Data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F2233</strong></td>
<td>Tension/compression force transducer, heavy-duty version, to 200,000 lbs</td>
<td>0 ... 100 lbs to 0 ... 200,000 lbs</td>
<td>±0.3 % $F_{\text{nom}}$</td>
<td>mV/V ± 0.25 %</td>
<td>IP65</td>
<td>FO 51.67</td>
</tr>
<tr>
<td><strong>F2808</strong></td>
<td>Tension/compression force transducer from 0.01 kN</td>
<td>0 ... 0.01 to 0 ... 50 kN</td>
<td>±0.15 % $F_{\text{nom}}$</td>
<td>2.0 ± 10 % mV/V</td>
<td>IP66</td>
<td>FO 51.68</td>
</tr>
<tr>
<td><strong>F9302</strong></td>
<td>Strain transducer to 1,000 με</td>
<td>0 ... ±20, 0 ... ±500, 0 ... ±1,000 με</td>
<td>±0.5 % $F_{\text{nom}}$</td>
<td>Analogue or digital display</td>
<td>IP67</td>
<td>FO 54.10</td>
</tr>
<tr>
<td><strong>F2222</strong></td>
<td>Tension/compression force transducer to 200,000 lbs</td>
<td>5 lbs ... 500 kbs (22 N ... 2,200 kN)</td>
<td>±0.1 % $F_{\text{nom}}$</td>
<td>≤ 25 lbs: 2 mV/V, &gt; 50 lbs: 3 mV/V</td>
<td>IP65</td>
<td>FO 51.29</td>
</tr>
<tr>
<td><strong>F9204</strong></td>
<td>Wire rope force transducer to 40 t</td>
<td>0 ... 1 to 0 ... 15 t</td>
<td>±3 % $F_{\text{nom}}$</td>
<td>4 ... 20 mA, 2-wire</td>
<td>IP66</td>
<td>FO 51.25</td>
</tr>
<tr>
<td><strong>F1119, F1136</strong></td>
<td>Hydraulic compression force transducer to 500 kN</td>
<td>0 ... 300 N to 0 ... 500 kN</td>
<td>Analogue ≤ ±1.6 % $F_{\text{nom}}$</td>
<td>Analogue or digital display</td>
<td>IP65 analogue display, IP65 digital display</td>
<td>FO 52.10</td>
</tr>
<tr>
<td><strong>FRKPS</strong></td>
<td>Chain hoist test set for checking friction clutches</td>
<td>40 ... 3,500 kg</td>
<td>0.5 % $F_{\text{nom}}$</td>
<td>4 ... 20 mA</td>
<td>Force transducer IP67, Display instrument IP40</td>
<td>FO 51.69</td>
</tr>
</tbody>
</table>
Load cells are designed as a special form of force transducers for use in weighing equipment. They enable very high measurement accuracies between 0.01 % and 0.05 % $F_{\text{nom}}$. Typical and widely used load cell geometries are single-point load cells, bending and shear beam load cells, S-type load cells, pendulum load cells and compression force load cells. In addition, there are corresponding mounting kits and complete weighing modules available.

### F4801
**Single-point load cell to 250 kg**
- Rated load $F_{\text{nom}}$: 0 ... 3 to 0 ... 250 kg
- Relative linearity error: 0.02 % $F_{\text{nom}}$
- Output signal: 2.0 ±10 % mV/V
- Ingress protection: IP65
- Data sheet: FO 53.10

### F4812
**Single-point load cell to 650 kg**
- Rated load $F_{\text{nom}}$: 0 ... 50 to 0 ... 650 kg
- Relative linearity error: 0.02 % $F_{\text{nom}}$
- Output signal: 2.0 ±10 % mV/V
- Ingress protection: IP65
- Data sheet: FO 53.11

### F4817
**Single-point load cell to 2,000 kg**
- Rated load $F_{\text{nom}}$: 0 ... 100 to 0 ... 2,000 kg
- Relative linearity error: 0.02 % $F_{\text{nom}}$
- Output signal: 2.0 ±10 % mV/V
- Ingress protection: IP65
- Data sheet: FO 53.12
Primary flow elements
The most common way to measure flow is differential-pressure flow measurement. This measurement principle has proven itself over many years and is applicable for all common types of media.

Our portfolio of primary flow elements includes orifice plates, orifice assemblies, meter runs, flow nozzles, Venturi tubes and averaging pitot tubes.

Restriction orifices
When the process requires a pressure drop, a restriction orifice can be installed in the line. The design must take into consideration the flow conditions, and the differential pressure required to avoid issues (cavitation, choking and noise).

Single- or multi-step restriction orifice solutions are selected depending on the differential pressure and medium. Single-bore or multi-bore options must be selected to ensure an acceptable noise level.

Pressure drop
When using a differential pressure flow meter a permanent pressure drop is always generated. The graph shows a comparison between the different types of differential-pressure flow measurement instruments. Pressure loss is shown as a percentage of the measured differential pressure.

The graph can assist in the selection of the best instrument for your application.

Example:
Orifice plate
Differential pressure at full scale 1,000 mbar
β = d/D = 0.65
% of permanent pressure loss = 58 %
Permanent pressure loss = 580 mbar
Medium characteristics

Not all instruments can be used in all applications. The type of medium (gas, liquid or steam) and its conditions must be taken into account when selecting the right instrument for your medium condition.

The following selection chart will assist in choosing the right instrument:

<table>
<thead>
<tr>
<th>Orifice plate and related assemblies</th>
<th>Flow nozzle</th>
<th>Venturi tube</th>
<th>Averaging pilot tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square edge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quarter circle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conical entrance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eccentric</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Segmental</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Orifice plate and related assemblies (Orifice flange / Meter run / Annular chambers)</th>
<th>Gas</th>
<th>Liquid</th>
<th>Steam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td>Dirty</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Viscous</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Corrosive</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

| Reynolds number |

It is difficult to evaluate the many variables affecting the velocity profile for all flow meters and for all pipeline conditions. To combine medium properties (density and viscosity), flow rate and geometrical aspects the Reynolds number is used.

The table shows you the smallest possible Reynolds number that can be used with each instrument.
Orifice plates represent the most common primary flow elements in the world due to their proven technology and ease of installation and maintenance.

**Main characteristics**
- Maximum operating temperature up to 800 °C
- Maximum operating pressure up to 400 bar
- Suitable for liquid, gas and steam flow measurement
- Accuracy: Uncalibrated ±0.5 … 2.5 %
- Repeatability of measurement 0.1 %

**FLC-OP**

**Orifice plate**

**Standards**
- ISO 5167-2
- ASME MFC3M

**Pipe size**
- ≥ 2”
- ≥ 50 mm

**Accuracy**
- Depending on version
- Uncalibrated ±0.5 … 2.5 %

**Data sheet**
- FL 10.01

**FLC-CO**

**Compact orifice plate for the direct mounting of differential pressure transmitters**

**Standards**
- ISO 5167-2
- ANSI/ASME B16.5

**Pipe size**
- 2” … 14”
- DN 50 … 350

**Accuracy**
- Depending on version
- ±0.5 %

**Data sheet**
- FL 10.10

**Versions**

- **Square edge orifice plates** (standard version)
  This design is intended for general applications in clean liquids and gases.

- **Quarter circle and conical entrance orifice plates**
  The best choice for measurement of liquids with low Reynolds number.

- **Segmental orifice plates**
  For measurements with two-phase, dirty and particle-laden media.

- **Eccentric orifice plates**
  The application areas are similar to the segmental version. However, an eccentric orifice plate is the better solution for smaller pipe diameters.

© The actual measuring deviation is specified during the engineering phase
Orifice flanges are intended for use instead of standard pipe flanges when an orifice plate or flow nozzle must be installed. Pairs of pressure tappings are machined into the orifice flange, making separate orifice carriers or tappings in the pipe wall unnecessary.

Main characteristics
- Wide range of materials available
- The number and type of pressure tapping (flange tap or corner tap) can be manufactured to customer requirements
- Special assemblies can be designed on request

Annular chambers are designed to be mounted between standard pipe flanges. Versions are available to suit all common flange standards, including DIN and ANSI B16.5.

FLC-FL
Orifice flanges

<table>
<thead>
<tr>
<th>Standards</th>
<th>ISO 5167-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe size</td>
<td>≥ 2&quot;</td>
</tr>
<tr>
<td></td>
<td>≥ 50 mm</td>
</tr>
<tr>
<td>β</td>
<td>Depending on version</td>
</tr>
<tr>
<td>Accuracy 1</td>
<td>Uncalibrated ±0.5 ... 2.5 %</td>
</tr>
<tr>
<td>Data sheet</td>
<td>FL 10.01</td>
</tr>
</tbody>
</table>

Main characteristics
- Standard material is 316/316L stainless steel, but a wide range of alternative materials is available
- Gaskets are included in the scope of delivery (as standard, 4.4 mm thick spiral-wound gasket 316/graphite filler, unless requested otherwise)
To ensure high accuracy in the flow measurement of liquids, gases and steam the primary flow element is supplied as an assembly incorporating the upstream and downstream pipe sections required by ISO 5167-1:2003. This assembly is known as a “meter run”.

**Main characteristics**
- Nominal width < 1 ½"
- Nominal pressure rating 300 … 2,500 depending on model/version
- Wide range of materials available

A calibration of the instrument can be performed if higher accuracy is required.

An integral orifice plate is normally selected when the pipe diameter is 1 ½” or smaller and the medium is clean. An extremely compact installation can be ensured as the pressure sensor can be mounted directly onto the meter run. Without a calibration, an accuracy of ±1 … 2 % can be expected, the actual values will be confirmed during the engineering phase.

---

**Special assemblies**

**FLC-HHR-PP**
ProPak flow meter for oil and gas

<table>
<thead>
<tr>
<th>Pipe size</th>
<th>2&quot;, 3&quot;, 4&quot;, 6&quot; or 8&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>β and pipe length</td>
<td>0.75 or 0.40</td>
</tr>
<tr>
<td>Special feature</td>
<td>No need for straight upstream and downstream pipes</td>
</tr>
<tr>
<td>Data sheet</td>
<td>FL 10.07</td>
</tr>
</tbody>
</table>

**FLC-HHR-FP**
FlowPak flow meter

<table>
<thead>
<tr>
<th>Pipe size</th>
<th>3 ... 24&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>β and pipe length</td>
<td>0.75 or 0.40</td>
</tr>
<tr>
<td>Special feature</td>
<td>No need for straight upstream and downstream pipes</td>
</tr>
<tr>
<td>Data sheet</td>
<td>FL 10.09</td>
</tr>
</tbody>
</table>

**FLC-WG**
Wedge flow meter for slurries and highly viscous media

<table>
<thead>
<tr>
<th>Pipe size</th>
<th>½&quot; ... 24&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>H/D ratios</td>
<td>0.2/0.3/0.4/0.5</td>
</tr>
<tr>
<td>Special feature</td>
<td>Low maintenance through robust design</td>
</tr>
<tr>
<td></td>
<td>For very high and very low Reynolds numbers</td>
</tr>
<tr>
<td></td>
<td>Bidirectional measurement possible</td>
</tr>
<tr>
<td>Data sheet</td>
<td>FL 10.08</td>
</tr>
</tbody>
</table>

---

**FLC-MR**
Meter run

<table>
<thead>
<tr>
<th>Standards</th>
<th>ISO 5167-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe size</td>
<td>½ … 1½ in</td>
</tr>
<tr>
<td></td>
<td>12 … 40 mm</td>
</tr>
<tr>
<td>β</td>
<td>0.2 … 0.75</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Uncalibrated ±1 … 2 %</td>
</tr>
<tr>
<td>Data sheet</td>
<td>FL 10.02</td>
</tr>
</tbody>
</table>
Flow nozzles

A flow nozzle consists of a convergent section with a rounded profile and a cylindrical throat. This design is generally selected for steam flow measurement at high velocity.

To reduce pressure loss an axisymmetric solution, called a Venturi nozzle, can be offered. It combines the standard features of a flow nozzle with a divergent section.

Main characteristics
- Suitable for liquid, gas and steam flow measurement
- Optimum solution for measuring the flow of steam
- Accuracy: Uncalibrated ±0.8 … 2 %
- Repeatability of measurement 0.1 %
- Ensure a lower pressure loss compared to orifice plate family.

**Flow nozzle for in-pipe installation**

<table>
<thead>
<tr>
<th>FLC-FN-PIP</th>
<th>Flow nozzle for in-pipe installation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe size</td>
<td>≥ 2 in&lt;br&gt;≥ 50 mm</td>
</tr>
<tr>
<td>β</td>
<td>0.2 … 0.8</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Uncalibrated ±2 %</td>
</tr>
<tr>
<td>Data sheet</td>
<td>FL 10.03</td>
</tr>
</tbody>
</table>

**Flow nozzle for flange assembly**

<table>
<thead>
<tr>
<th>FLC-FN-FLN</th>
<th>Flow nozzle for flange assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe size</td>
<td>≥ 2 in&lt;br&gt;≥ 50 mm</td>
</tr>
<tr>
<td>β</td>
<td>0.3 … 0.8</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Uncalibrated ±0.8 %</td>
</tr>
<tr>
<td>Data sheet</td>
<td>FL 10.03</td>
</tr>
</tbody>
</table>

**Venturi nozzle**

<table>
<thead>
<tr>
<th>FLC-VN</th>
<th>Venturi nozzle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe size</td>
<td>≥ 2 in&lt;br&gt;≥ 50 mm</td>
</tr>
<tr>
<td>β</td>
<td>0.2 … 0.8</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Uncalibrated ±1 %</td>
</tr>
<tr>
<td>Data sheet</td>
<td>FL 10.03</td>
</tr>
</tbody>
</table>

1) The actual measuring deviation is specified during the engineering phase.
A Venturi tube is a reliable and easily-managed and maintained instrument that can measure a wide range of clean liquids and gases.

The main advantage of a Venturi tube over other differential pressure flow measuring instruments is the higher pressure recovery and the lower upstream and downstream straight tube length requirements.

**Main characteristics**

- In accordance with ISO 5167-4 & ASME MFC-3M standards
- Fabricated from plate or machined from bar/forgings
- Flanged or weld-in construction
- Wide range of materials available
- Pipe sizes from 50 ... 1,200 mm
- Wide variety of pressure tappings available
- Calibration possible on request
- Accuracy: Uncalibrated ±1 ... 1.5 %

### FLC-VT-BAR
**Venturi tube, bar body**

<table>
<thead>
<tr>
<th>Pipe size</th>
<th>2 ... 32 in</th>
<th>50 ... 250 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0.4 ... 0.75</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>Uncalibrated ±1.25 %</td>
<td></td>
</tr>
<tr>
<td>Data sheet</td>
<td>FL 10.04</td>
<td></td>
</tr>
</tbody>
</table>

### FLC-VT-WS
**Venturi tube, welded sheet**

<table>
<thead>
<tr>
<th>Pipe size</th>
<th>≥ 14 in</th>
<th>200 ... 1,200 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0.4 ... 0.7</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>Uncalibrated ±1.5 %</td>
<td></td>
</tr>
<tr>
<td>Data sheet</td>
<td>FL 10.04</td>
<td></td>
</tr>
</tbody>
</table>

© The actual measuring deviation is specified during the engineering phase
FloTec (averaging pitot tubes)

FloTec (a multi-port, averaging pitot tube) measures the difference between the static pressure and the dynamic pressure of the media in the pipe. The volumetric flow is calculated from that difference using Bernoulli’s principle and taking into account the pipe inner diameter. Using four dynamic ports this instrument is able to evaluate a better velocity profile inside the pipe. This ensures a higher accuracy in the flow measurement.

**Main characteristics**
- Low installation costs
- Long-term accuracy
- Minimal permanent pressure loss
- Fixed and extractable versions available

**Vortex shedding frequency**
Depending on the inner diameter, the medium characteristics and the Reynolds number, a vortex will be generated around the pitot tube. A support mounted on the opposite side of the pipe can be supplied should the natural frequency of the pitot coincide with the vortex shedding frequency. The necessity test is performed during the design phase.
When a reduction of pressure or a limitation of the flow rate is required, a restriction orifice must be inserted into the pipeline. Our technical department will produce the correct design for the restriction orifice, depending on customer requirements and flow conditions.

If high differential pressures, a change in phase or sonic issues can occur, a more-complex design will be required. The solution in these cases is to decrease the differential pressure in several steps, avoiding all the issues created by these factors. This solution is called multi-step restriction orifice.

**Main characteristics**
- Multi-step restriction orifices to reduce the pressure by more than 50% of the inlet value
- Multi-bore designs to reduce the noise level

---

**FLC-RO-ST**

*Single-step restriction orifice*

- Nominal size: ½ … 24”
- Special feature: Suitable for liquids, gases and steam, Single-step version
- Data sheet: FL 10.06

**FLC-RO-MS**

*Multi-step restriction orifice*

- Nominal size: ½ … 24”
- Special feature: Suitable for liquids, gases and steam, Single-step version
- Data sheet: FL 10.06
Flow switches are used for the display and monitoring of the flow of liquid and gaseous media. The instruments feature a high switching accuracy and functional safety, low switch hysteresis and continuous switch point setting by the operator.

The wide selection of WIKA flow switches also includes viscosity-compensated models and ATEX-certified instruments for use in hazardous environments.

For each flow monitoring the right flow switch

Flow switches

Material: Stainless steel, brass
Process connection: G ¼ ... G 1½
Flow range:
- 0.005 ... 250 l/min (water)
- 0.2 ... 1,450 NL/min (air)
Output: Optionally pointer, sight glass, reed contact
Data sheet: LM 31.31

FWS

For liquid and gaseous media

FSD-3

For liquid media

Measuring range:
- Water: 5 ... 150 cm/s
- Oil: 3 ... 300 cm/s
Output signal: For flow and temperature
- PNP or NPN
- Analogue output (optional)
Process connection:
- G ¼ A, G ½ A
- ¼ NPT, ½ NPT
- M18 x 1.5
Data sheet: FL 80.01
Digital pressure gauges

High-quality digital pressure gauges from WIKA

Precision digital pressure gauges are suitable for stationary and also mobile measurement and display of pressures. In addition, a digital pressure gauge can be used as a pressure reference and enables the easy testing, adjustment and calibration of other pressure measuring equipment directly on site. Through efficient measuring cells with electronic linearisation of the characteristic curve, a high accuracy is achieved.

### DG-10
Digital pressure gauge for general industrial applications

- **Measuring range**: 0 … 5 to 0 … 600 bar
- **Accuracy (% of span)**: ≤ 0.5 % FS ± 1 digit
- **Special feature**:
  - Robust stainless steel case, nominal size 80 mm
  - Battery operation (2 x 1.5 V AA cell)
  - Option: Rotatable instrument head, backlighting
- **Data sheet**: PE 81.86

### CPG500
Digital pressure gauge

- **Measuring range**: -1 … +16 to 0 … 1,000 bar
- **Accuracy**: 0.25 %
- **Special feature**:
  - Simple operation using 4 buttons
  - Robust case with protective rubber cap, IP67
- **Data sheet**: CT 08.01

### CPG1500
Precision digital pressure gauge

- **Measuring range**: -1 … 10,000 bar
- **Accuracy**: to 0.025 % FS
- **Special feature**:
  - Integrated data logger
  - WIKA-Cal compatible
  - Data transfer via WIKA-Wireless
  - Password protection possible
  - Robust case IP65
- **Data sheet**: CT 10.51

### CPG-KITH
Hydraulic service kit

- Simple testing and adjustment of pressure measuring instruments
- Kit consists of a CPG1500 reference instrument and a CPP700-H hand pump (hydraulic, Pmax 700 bar) or CPP1000-H (hydraulic, Pmax 1,000 bar)

### CPG-KITP
Pneumatic service kit

- Simple testing and adjustment of pressure measuring instruments
- Kit consists of a CPG1500 reference instrument and a CPP30 hand pump (pneumatic, Pmax 30 bar)

### WIKA-Cal
Calibration software, accessories for digital pressure gauges

- Creation of calibration certificates for mechanical and electronic pressure measuring instruments
- Fully automatic calibration with pressure controllers
- For the recording of certificate-relevant data in combination with the CalibratorUnits of the CPU6000 series
- Determination of the required mass loads for pressure balances
- Calibration of gauge pressure measuring instruments with absolute pressure references and vice versa
- Data sheet: CT 95.10
Hand-helds, calibrators

Hand-helds are portable calibration instruments for mobile use for the accurate measurement and recording of pressure profiles. There are interchangeable pressure sensors with measuring ranges of up to 10,000 bar available for the instruments. Through this, hand-helds are particularly suitable as test instruments for a large variety of applications in the widest range of industries. Data recorded in the hand-held can be evaluated via PC software, some instruments document calibrations in the internal memory, which can later be read on a PC. Optionally, a calibration certificate can be generated with our calibration software WIKA-Cal.

### CPH6200, CPH6210
Hand-held pressure indicator

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>0 ... 0.025 to 0 ... 1,000 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.2 %, 0.1 % (optional)</td>
</tr>
<tr>
<td>Special feature</td>
<td>Integrated data logger</td>
</tr>
<tr>
<td></td>
<td>Differential pressure measurement (optional)</td>
</tr>
<tr>
<td></td>
<td>Ex version: Model CPH6210 (optional)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 11.01, CT 11.02</td>
</tr>
</tbody>
</table>

### CPH6300
Hand-held pressure indicator

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>0 ... 0.025 to 0 ... 1,000 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.2 %, 0.1 % (optional)</td>
</tr>
<tr>
<td>Special feature</td>
<td>Robust and waterproof case with IP65, IP67</td>
</tr>
<tr>
<td></td>
<td>Integrated data logger</td>
</tr>
<tr>
<td></td>
<td>Differential pressure measurement (optional)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 12.01</td>
</tr>
</tbody>
</table>

### CPH6400
Precision hand-held pressure indicator

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>0 ... 0.25 to 0 ... 6,000 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.025 %</td>
</tr>
<tr>
<td>Special feature</td>
<td>Integrated data logger</td>
</tr>
<tr>
<td></td>
<td>Temperature measurement (optional)</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 14.01</td>
</tr>
</tbody>
</table>

### CPH6000
ProcessCalibrator

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>0 ... 0.25 to 0 ... 6,000 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.025 %</td>
</tr>
<tr>
<td>Special feature</td>
<td>Calibration function</td>
</tr>
<tr>
<td></td>
<td>Pressure switch test</td>
</tr>
<tr>
<td></td>
<td>Transmitter supply</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 15.01</td>
</tr>
</tbody>
</table>

### Complete test and service cases

These cases can be assembled exactly to your requirements. Thus you will be fully equipped on site!
**Hand-holds, calibrators**

### CPH7000
**Portable process calibrator**

- **Measuring range**: -1 … 25 bar (-1 … 10,000 bar with CPT7000)
- **Accuracy**: 0.025 % FS
- **Special feature**
  - Integrated pressure generation
  - Measurement of pressure, temperature, current, voltage, ambient conditions
  - Supply of pressure, current and voltage
  - Calibration function/data logger/switch test
- **Data sheet**: CT 15.51

### Pascal ET
**Hand-held multi-function calibrator**

- **Measuring range**
  - 0 … 100 mA, 0 … 80 V, 5 … 10,000 Ω
  - 0 … 50 kHz
  - -190 … +1,200 °C (type J)
  - -200 … +850 °C (Pt100)
- **Accuracy**: 0.025 % FS
- **Special feature**
  - Large display with touchscreen
  - Integrated data logger and calibration function
  - Measurement and simulation of temperature, current, voltage, resistance, frequency, pressure
  - HART® communication
- **Data sheet**: CT 18.02

### Pascal100
**Hand-held multi-function calibrator**

- **Measuring range**: -1 … 100 bar
- **Accuracy**: 0.025 % FS
- **Special feature**
  - Large display with touchscreen
  - Internal pressure/vacuum generation
  - Integrated data logger and calibration function
  - Measurement and simulation of pressure, current, voltage, resistance, frequency, temperature and pulses
  - HART® communication
- **Data sheet**: CT 18.01

### CPH7650
**Portable pressure calibrator**

- **Measuring range**: -1 … 6,000 bar with CPT6000
  - Supply elec. pump: -0.85 … +20 bar
- **Accuracy**: 0.025 % FS
- **Special feature**
  - Calibration function
  - Generation/measurement of 4 … 20 mA and DC 24 V voltage supply for transmitters
  - Interchangeable reference sensors CPT6000
  - High-performance electric pump
- **Data sheet**: CT 17.02

### WIKA-Cal
**Calibration software, accessories for hand-holds/calibrators**

- **Creation of calibration certificates for mechanical and electronic pressure measuring instruments**
- **Fully automatic calibration with pressure controllers**
- **For the recording of certificate-relevant data in combination with the CalibratorUnits of the CPU6000 series**
- **Determination of the required mass loads for pressure balances**
- **Calibration of gauge pressure measuring instruments with absolute pressure references and vice versa**
- **Data sheet**: CT 95.10
Precision pressure measuring instruments

Precision pressure measuring instruments are electrical measuring systems which convert pressure into an electrical signal and optionally visualise it. Precise pressure transmitters and process transmitters are used for the monitoring and control of particularly sensitive processes. Due to the low, DKD/DAkkS certified measurement uncertainty of down to 0.008 % of the entire measuring chain, the particularly accurate instruments find their primary applications as a factory/working standard for testing and/or calibrating a variety of pressure measuring instruments.

**CPT2500**
USB pressure transmitter

- Measuring range: 0 ... 0.025 to 0 ... 1,000 bar
- Accuracy: 0.2 %, 0.1 % (optional)
- Special feature:
  - Recording interval adjustable from 1 ms ... 10 s
  - No external voltage supply required
  - Data storage and evaluation directly via PC
- Data sheet: CT 05.01

**CPT6020**
Precision pressure sensor, basic version

- Measuring range: 0 ... 0.025 to 0 ... 1,000 bar
- Accuracy: 0.02 %
- Special feature:
  - Comp. temperature range -20 ... +75 °C
  - RS-232 or RS-485
  - Measuring rate 20 ms
  - Resolution 6 digits
  - Barometric measuring range: 552 ... 1,172 mbar abs., 0.02 % of reading
- Data sheet: CT 25.13

**CPT61x0**
Precision pressure sensor, standard version

- Measuring range: 0 ... 0.025 to 0 ... 400 bar
- Accuracy: 0.01 %
- Special feature:
  - RS-232 or RS-485 connection
  - Analogue output (optional)
  - Barometric measuring range: 552 ... 1,172 mbar abs., 0.01 % of reading
  - Optional measuring rate of 4 ms
- Data sheet: CT 25.10, CT 25.11

**CPT9000**
Precision pressure sensor, premium version

- Measuring range: 0 ... 0.025 to 0 ... 1,000 bar
- Accuracy: 0.008 %
- Special feature:
  - Comp. temperature range -20 ... +75 °C
  - RS-232 or RS-485
  - Measuring rate 20 ms
  - Barometric measuring range: 552 ... 1,172 mbar abs., 0.008 % of reading
  - Resolution 7 digits
- Data sheet: CT 25.12

**CPG2500**
Precision pressure indicator

- Measuring range: 0 ... 0.025 to 0 ... 2,890 bar
- Accuracy: 0.01 %, 0.008 %
- Medium:
  - Non-corrosive gases > 1 bar liquids
- Special feature:
  - Up to 2 exchangeable, internal sensors
  - 1 external sensor
  - Barometric reference (optional)
- Data sheet: CT 25.02

**CPA2501**
Precision air data test indicator

- Measuring range:
  - Altitudes to 100,000 ft
  - Speeds to 1,150 knots
- Accuracy: 0.01 %
- Special feature:
  - RVSM-compliant
  - Configurations height (Ps), speed (Qc), Ps/Pt, Ps/Qc
- Data sheet: CT 29.02
Pressure controllers

Pressure controllers are electronic controllers which quickly and automatically provide a pressure based on a supply pressure. Due to the high accuracy and control stability, pressure controllers are especially suitable as references for production lines and laboratories, in order to carry out automatic testing and/or calibration of all types of sensors.

### WIKA pressure controllers: Always the right calibration solution

CPC2000
- **Low-pressure version**
- Measuring range: 0 ... 1 to 0 ... 1,000 mbar
- Accuracy: 0.1/0.3 % (for 0 ... 1 mbar)
- Medium: Ambient air
- Special feature: Integrated pressure generation, Integrated rechargeable battery
- Data sheet: CT 27.51

CPC4000
- **Industrial series**
- Measuring range: 0 ... 0.35 to 0 ... 210 bar
- Accuracy: 0.02 %
- Medium: Dry, clean air or nitrogen
- Special feature: Up to 2 sensors, Fast control speed, Leak test function, Automatic contamination protection (optional)
- Data sheet: CT 27.40

CPC6050
- **Modular version**
- Measuring range: 0 ... 0.025 to 0 ... 210 bar
- Accuracy: 0.01 %
- Medium: Dry, clean air or nitrogen
- Special feature: Up to 2 control/measuring channels with 2 sensors each, Sensors exchangeable, Switch test function, Auto-channel for both controllers, Automatic contamination protection (optional)
- Data sheet: CT 27.62
Pneumatic pressure controllers

**CPC7000**

**High-pressure version**

- Measuring range: 0 ... 100 bar to 0 ... 700 bar
- Accuracy: 0.01 %
- Medium: Nitrogen
- Special feature:
  - Robust and low-wear valve technology with long-term stability
  - Up to three interchangeable sensors
  - Control performance can be matched to application
- Data sheet: CT 27.63

**CPC8000**

**Premium version**

- Measuring range: 0 ... 0.035 to 0 ... 400 bar
- Accuracy: 0.01 %
- Medium: Dry, clean air or nitrogen
- Special feature:
  - Excellent control stability and pressure control without overshooting
  - Up to three interchangeable sensors
  - Control performance can be matched to application
- Data sheet: CT 28.01

**CPC8000-H**

**High-pressure version**

- Measuring range: 0 ... 100 to 0 ... 1,600 bar
- Accuracy: 0.014 % ... 0.01 %
- Medium: Hydraulic oil or water
- Special feature:
  - High stability, also for large volumes
  - Up to two interchangeable reference sensors
  - Automatic flooding
  - Hydraulic liquids available, e.g. Sebacate, Shell Tellus 22, Krytox, FC77
- Data sheet: CT 28.05

**For aviation**

**CPA8001**

**Air data test set**

- Measuring range: Altitudes to 100,000 ft
  - Speeds to 1,150 knots
- Accuracy: 0.01 % ... 0.009 %
- Medium: Dry, clean air or nitrogen
- Special feature:
  - Excellent control stability, even with rate control
  - Overshoot-free control
  - RVSM compatible
  - Configurations Ps/Pt, Ps/Qc
- Data sheet: CT 29.01

**Calibration software, accessories for pressure controllers (WIKAD-CaL)**

- Creation of calibration certificates for mechanical and electronic pressure measuring instruments
- Fully automatic calibration with pressure controllers
- For the recording of certificate-relevant data in combination with the CalibratorUnits of the CPU6000 series
- Determination of the required mass loads for pressure balances
- Calibration of gauge pressure measuring instruments with absolute pressure references and vice versa
- Data sheet: CT 95.10

**Hydraulic pressure controller**

An air data test set is an electronic controller which, based on a supply pressure, provides a pressure at a variable and adjustable rate.

Air data test sets are specifically developed to convert the pressure to be controlled into a height or rate of climb and velocity. As a result of the high accuracy, control stability and ability to simulate altitude and velocity, an air data test set is particularly suitable as a reference for aircraft workshops and also for instrument manufacturers and calibration laboratories in the aviation industry, in order to make calibrations on sensors and displays.
Pressure balances

**Industrial series**

Compact and competitively priced dead-weight testers for use on site or for maintenance and service

The compact dimensions and low weight are key features of these dead-weight testers for their daily use in service and maintenance. With their integrated pressure generation and purely mechanical measurement principle, they are also specifically suited to on-site applications.

<table>
<thead>
<tr>
<th>CPB3500</th>
<th>CPB3800</th>
<th>CPB3800HP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pneumatic compact version</strong></td>
<td><strong>Hydraulic compact version</strong></td>
<td><strong>Compact, high-pressure version with dual-range piston-cylinder system</strong></td>
</tr>
<tr>
<td>Measuring range</td>
<td>0.015 ... 1 to 1 ... 120 bar</td>
<td>1 ... 120 to 10 ... 1,200 bar</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0.015 ... 0.006 %</td>
<td>0.05 ... 0.025 %</td>
</tr>
<tr>
<td>Medium</td>
<td>Non-corrosive gases</td>
<td>Special oil</td>
</tr>
<tr>
<td>Special feature</td>
<td>Compact dimensions and low weight</td>
<td>Compact dimensions and low weight</td>
</tr>
<tr>
<td>Special feature</td>
<td>1 bar piston can be used for positive and negative overpressure</td>
<td>Instrument base can now also be combined with the CPB5800 piston-cylinder systems</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 31.22</td>
<td>CT 31.06</td>
</tr>
</tbody>
</table>
High-performance primary standards with excellent running characteristics for use in calibration laboratories

Through modern instrument design with excellent equipment features, the highest demands of operator convenience and performance are fulfilled. The selection of dual-range piston-cylinder systems with automated changing between ranges can ensure this measurement uncertainty over a large pressure range, even with a single measuring system.

## CPB5000
**Pneumatic version**

<table>
<thead>
<tr>
<th>Measurement Range</th>
<th>-0.03 … -0.1 to 0.4 … 100 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.015 … 0.008 %</td>
</tr>
<tr>
<td>Medium</td>
<td>Non-corrosive gases</td>
</tr>
<tr>
<td>Special Feature</td>
<td>Patented system for fast piston-cylinder exchange</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 31.01</td>
</tr>
</tbody>
</table>

## CPB5000HP
**High-pressure version**

<table>
<thead>
<tr>
<th>Measurement Range</th>
<th>25 … 2,500 to 25 … 6,000 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.025 … 0.02 %</td>
</tr>
<tr>
<td>Medium</td>
<td>Special oil</td>
</tr>
<tr>
<td>Special Feature</td>
<td>Robust instrument base with integrated high-pressure generation</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 31.51</td>
</tr>
</tbody>
</table>

## CPB5800
**Hydraulic version with dual-range piston-cylinder systems**

<table>
<thead>
<tr>
<th>Measurement Range</th>
<th>1 … 120 to 1 … 1,400 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.015 … 0.006 %</td>
</tr>
<tr>
<td>Medium</td>
<td>Special oil or others on request</td>
</tr>
<tr>
<td>Special Feature</td>
<td>Dual-range piston-cylinder systems with fully automated changing between ranges</td>
</tr>
<tr>
<td>Special Feature</td>
<td>Instrument base can now also be combined with the CPB5000 piston-cylinder systems</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 31.11</td>
</tr>
</tbody>
</table>

## CPB5600DP
**Differential pressure version**

<table>
<thead>
<tr>
<th>Measurement Range</th>
<th>0.03 … 2 to 25 … 1,800 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.015 … 0.008 %</td>
</tr>
<tr>
<td>Medium</td>
<td>Non-corrosive gases or special oil</td>
</tr>
<tr>
<td>Special Feature</td>
<td>Two complete pressure balances within one case for real differential pressure measurements under static pressure</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 31.56</td>
</tr>
</tbody>
</table>

## CPS5000
**Hydraulic single-range piston-cylinder systems**

| Special Feature   | For the highest demands on accuracy and performance |
| Special Feature   | Can be combined with the CPB5800 instrument base |
| Data sheet        | CT 31.01                           |

## CPU6000 series
**CalibratorUnit**

- Determination of the required mass loads or the reference pressure for calibration with pressure balances
- Recording of certificate-relevant data
- Calibration of gauge pressure measuring instruments with absolute pressure references and vice versa
- Easy calibration of pressure transmitters through the voltage supply and multimeter function

Data sheet: CT 35.02
Pressure balances

High-end version

High-accuracy and high-performance primary standards with excellent operating characteristics, based on the physical principle of Pressure = Force/Area

The direct measurement of the pressure (p = F/A), as well as the use of high-quality materials enable this small measurement uncertainty, in conjunction with an excellent long-term stability (recommended recalibration interval of five years in accordance with the German Calibration Service DKD/DAkkS). Furthermore, an automatic mass handling system and pressure generation ensure fully automated calibration. The pressure balance has therefore been used for years in factory and calibration laboratories in industry, national institutes and research laboratories, and also in production by sensor and transmitter manufacturers.

### CPB6000

**Highest-accuracy primary standard**

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>4 ... 5,000 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.0035 ... 0.0015 %</td>
</tr>
<tr>
<td>Medium</td>
<td>Dry, clean air, nitrogen or special oil</td>
</tr>
<tr>
<td>Special feature</td>
<td>Different instrument variants for the highest demands</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 32.01</td>
</tr>
</tbody>
</table>

### CPB6000DP

**Primary standard for differential pressure**

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>30 ... 800 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.005 ... 0.002 %</td>
</tr>
<tr>
<td>Medium</td>
<td>Non-corrosive gases</td>
</tr>
<tr>
<td>Special feature</td>
<td>For differential pressure measurements from 10 Pa to 800 bar</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 32.02</td>
</tr>
</tbody>
</table>

### CPD8500

**Digital pressure balance**

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>1 ... 500 bar (abs. and rel.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>0.005 % ... 0.0035 %</td>
</tr>
<tr>
<td>Medium</td>
<td>Non-corrosive, dry gases</td>
</tr>
<tr>
<td>Special feature</td>
<td>■ Unique principle of operation based on Si units</td>
</tr>
<tr>
<td></td>
<td>■ Intuitive operator interface</td>
</tr>
<tr>
<td></td>
<td>■ Automatic calibrations, no mass handling needed</td>
</tr>
<tr>
<td></td>
<td>■ Automatic compensation of the environmental conditions</td>
</tr>
<tr>
<td>Data sheet</td>
<td>CT 32.05</td>
</tr>
</tbody>
</table>
Calibration software

Easy and fast creation of a high-quality calibration certificate

The WIKA-Cal calibration software is used for generating calibration certificates or logger protocols for pressure measuring instruments and is available as a demo version for a cost-free download on the website. A template helps the user and guides him through the creation process of a document. Calibration certificates can be created with the Cal-Template and logger protocols can be created with the Log-Template.

In order to switch from the demo version to a full version of the respective template, a USB key with a licence upgrade has to be purchased. The pre-installed demo version automatically changes to the selected full version when the USB key is inserted and is available as long as the USB key is connected to the computer.

- **Cal Demo**
  Generation of calibration certificates limited to 2 measuring points, with automatic initiation of pressures via a pressure controller.

- **Cal Light**
  Generation of calibration certificates with no limitations on measuring points, without automatic initiation of pressures via a pressure controller.

- **Cal**
  Generation of calibration certificates with no limitations on measuring points, with automatic initiation of pressures via a pressure controller.

- **Log Demo**
  Creation of data logger test reports, limited to 5 measured values.

- **Log**
  Creation of data logger test reports without limiting the measured values.

**Multicalibration**

The additionally charged “Multicalibration” licence can be ordered in addition to Cal Light or Cal. With this, it is possible to calibrate, incl. documentation, up to 16 test items simultaneously. The prerequisite is that the test items are of the same instrument model, measuring range and accuracy. During the parallel calibration, the measuring window for each test item can be viewed via a table view.

For pressure sensors, it is possible to use either several multimeters (such as model CPU6000-M, for example) or a multiplexer to which all multimeters will be connected. As multiplexers, Agilent 34970A and Netscanner 9816 are supported. The correct cabling is the responsibility of the operator.
Pressure generation

Portable pressure generation

Hand test pumps serve as pressure generators for the testing, adjustment and calibration of mechanical and electronic pressure measuring instruments through comparative measurements. These pressure tests can take place in the laboratory or workshop, or on site at the measuring point.

### CPP7-H
- **Pneumatic hand test pump**
- Measuring range: -850 mbar ... +7 bar
- Medium: Ambient air
- Special feature: Pressure and vacuum generation switchable, Low weight, Compact dimensions
- Data sheet: CT 91.04

### CPP30
- **Pneumatic hand test pump**
- Measuring range: -950 mbar ... +35 bar
- Medium: Ambient air
- Special feature: Pressure and vacuum generation switchable, Compact dimensions
- Data sheet: CT 91.06

### CPP700-H, CPP1000-H
- **Hydraulic hand test pump**
- Measuring range: 0 ... 700 or 0 ... 1,000 bar
- Medium: Oil or water
- Special feature: Integrated medium reservoir, Ergonomic handling
- Data sheet: CT 91.07

### CPP1000-M, CPP1000-L
- **Hydraulic hand spindle pump**
- Measuring range: 0 ... 1,000 bar
- Medium: Oil or water
- Special feature: Smooth-running internal precision spindle, Compact dimensions
- Data sheet: CT 91.05
Comparison test pumps serve as pressure generators or controllers for the testing, adjustment and calibration of mechanical and electronic pressure measuring instruments. Due to their stable case, these test pumps are particularly suitable for stationary use in laboratories or workshops.

### Laboratory version

**CPP120-X**
- **Pneumatic comparison test pump**
- Measuring range: 0 ... 120 bar
- Medium: Clean, dry, non-corrosive gases
- Special feature:
  - Accurate pressure setting
  - Robust industrial series
- Data sheet: CT 91.03

**CPP1200-X**
- **Hydraulic comparison test pump**
- Measuring range: 0 ... 1,200 bar
- Medium: Oil or water
- Special feature:
  - Integrated tank
  - Dual-area spindle pump
  - Robust industrial series
- Data sheet: CT 91.08

**CPP4000-X**
- **Hydraulic comparison test pump**
- Measuring range: 0 ... 1,200 bar
- Medium: Oil or water
- Special feature:
  - Integrated tank
  - Dual-area spindle pump
  - Robust industrial series
- Data sheet: CT 91.09

**CPP1000-X, CPP1600-X**
- **Hydraulic comparison test pump**
- Measuring range: 0 ... 1,000 to 0 ... 1,600 bar
- Medium: Oil or water
- Special feature:
  - Integrated tank
  - Robust laboratory version with priming pump
  - Compact industrial series with priming pump
- Data sheet: CT 91.12

**CPP7000-X**
- **Hydraulic comparison test pump**
- Measuring range: 0 ... 7,000 bar
- Medium: Sebacate oil
- Special feature:
  - Integrated tank
  - Robust laboratory version with priming pump
- Data sheet: CT 91.13
Reference thermometers

Highly accurate temperature measurement with reference thermometers

Reference thermometers (standard thermometers) are, due to their excellent stability and their geometrical adaptations, ideally suited for applications in industrial laboratories. They enable easy comparative calibration in baths, in tube furnaces and in dry-well calibrators. The advantage of reference thermometers is the wide temperature range, and with this, their flexible operation. Furthermore, with their low drift, a long service life is ensured.

**CTP2000**

Platinum resistance thermometer

- Measuring range: -200 ... +450 °C
- Stability: < 50 mK after 100 h at 450 °C
- Dimensions: Ø 4 mm, l = 500 mm
- Special feature: 4-wire connection, Ends with 4 mm banana plugs
- Data sheet: CT 61.10

**CTP5000**

Reference thermometer

- Measuring range: -196 ... +660 °C
- Probe type: Pt100, Pt25
- Dimensions: Depending on version
- Special feature: Flying leads, DIN or SMART connector
- Data sheet: CT 61.20

**CTP5000-T25**

Reference thermometer

- Measuring range: -189 ... +660 °C
- Probe type: Pt25
- Dimensions: d = 7 mm, l = 480 mm
- Special feature: Flying leads, DIN or SMART connector
- Data sheet: CT 61.25

**CTP9000**

Thermocouple

- Measuring range: 0 ... 1,300 °C
- Thermocouple: Type S per IEC 584, class 1
- Dimensions: Ø 7 mm, l = 620 mm
- Special feature: Cold junction optional, 2,000 mm cable
- Data sheet: CT 61.10
Hand-helds

Hand-helds are portable calibration instruments for mobile use for the accurate measurement and recording of temperature profiles. For the instruments there are various designs of thermometers available. Through this, hand-helds are particularly suitable as test instruments for a large variety of applications in the widest range of industries. Data recorded in the hand-held can be evaluated via PC software, some instruments document calibrations in the internal memory, which can later be read on a PC. Optionally, a calibration certificate can be generated with our calibration software WIKA-Cal.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Measuring range</th>
<th>Accuracy</th>
<th>Probe type</th>
<th>Special feature</th>
<th>Data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTR1000</td>
<td>Infrared hand-held thermometer</td>
<td>-60 ... +1,000 °C</td>
<td>2 K or 2 % of reading</td>
<td>Pt100</td>
<td>Thermocouple connection (optional)</td>
<td>CT 55.21</td>
</tr>
<tr>
<td>CTH6200</td>
<td>Hand-held thermometer</td>
<td>-50 ... +250 °C</td>
<td>&lt; 0.2</td>
<td>Pt100</td>
<td>Integrated data logger</td>
<td>CT 51.01</td>
</tr>
<tr>
<td>CTH6300, CTH63I0</td>
<td>Hand-held thermometer</td>
<td>-200 ... +1,500 °C</td>
<td>0.1 ... 1 K</td>
<td>Pt100, TC</td>
<td>Integrated data logger</td>
<td>CT 51.05</td>
</tr>
<tr>
<td>CTH6500, CTH65I0</td>
<td>Hand-held thermometer</td>
<td>-200 ... +1,500 °C</td>
<td>0.03 ... 0.2 K</td>
<td>Pt100, TC</td>
<td>Integrated data logger</td>
<td>CT 55.10</td>
</tr>
<tr>
<td>CTH7000</td>
<td>Hand-held thermometer</td>
<td>-200 ... +962 °C</td>
<td>0.015 K</td>
<td>Pt100, Pt25 and NTC</td>
<td>Integrated data logger</td>
<td>CT 55.50</td>
</tr>
</tbody>
</table>

CTH7000

Measuring range: -200 ... +962 °C
Accuracy: 0.015 K
Probe type: Pt100, Pt25 and NTC
Special feature: Integrated data logger
Data sheet: CT 55.50
Calibration baths

Calibration baths are electronic controllers which automatically, quickly and with the help of a liquid supply a temperature. Due to the high reliability, accuracy and exceptional homogeneity in the measuring chamber, calibration baths are particularly suitable as a factory/working standard for the automatic testing and/or calibration of the widest range of temperature probes - independent of diameter. A special micro calibration bath design enables on-site applications.

### CTB9100
**Micro calibration bath**

- **Measuring range**: -35 ... +255 °C
- **Accuracy**: ±0.2 ... 0.3 K
- **Stability**: ±0.05 K
- **Special feature**: Short heating and cooling times, Easy to use
- **Data sheet**: CT 46.30

### CTM9100-150
**Multi-function calibrator**

- **Measuring range**: -35 ... +165 °C depending on the application
- **Accuracy**: ±0.3 K ... 1 K depending on the application
- **Immersion depth**: 150 mm
- **Special feature**: Use as a dry-well calibrator, micro calibration bath, infrared calibrator and surface calibrator
- **Data sheet**: CT 41.40

### CTB9400
**Calibration bath, medium measuring range**

- **Measuring range**: 28 ... 300 °C
- **Stability**: ±0.02 K
- **Immersion depth**: 200 mm
- **Medium**: Water, oil or similar media
- **Data sheet**: CT 46.20

### CTB9500
**Calibration bath, low measuring range**

- **Measuring range**: -45 ... +200 °C
- **Stability**: ±0.02 K
- **Immersion depth**: 200 mm
- **Medium**: Water, oil or similar media
- **Data sheet**: CT 46.20
Portable temperature calibrators (dry-well calibrators) are electronic controllers which automatically, quickly and dryly supply a temperature. Due to the high reliability, accuracy and simple operation, portable temperature calibrators are particularly suitable as a factory/working standard for the automatic testing and/or calibration of temperature measuring instruments of all types.

### CTD9100
**Temperature dry-well calibrator**

- **Measuring range**: -55 … +650 °C
- **Accuracy**: ±0.15 … 0.8 K
- **Stability**: ±0.01 … 0.05 K
- **Immersion depth**: 150 mm
- **Data sheet**: CT 41.28

### CTD9100-1100
**High-temperature dry-well calibrator**

- **Measuring range**: 200 … 1,100 °C
- **Accuracy**: ±0.3 K
- **Stability**: ±0.01 … 0.1 K
- **Immersion depth**: 220 mm, bore depth 155 mm
- **Data sheet**: CT 41.29

### CTD9300
**Temperature dry-well calibrator**

- **Measuring range**: -55 … +650 °C
- **Accuracy**: ±0.15 … 0.8 K
- **Stability**: ±0.01 … 0.05 K
- **Immersion depth**: 150 mm
- **Data sheet**: CT 41.28

### CTD9100-375
**Compact temperature dry-well calibrator**

- **Measuring range**: -35 … 375 °C
- **Accuracy**: ±0.5 … 0.8 K
- **Stability**: ±0.05 K
- **Immersion depth**: 100 mm
- **Data sheet**: CT 41.32

### CTI5000
**Infrared calibrator**

- **Measuring range**: 50 … 500 °C
- **Accuracy**: ±0.1 … 0.4 K
- **Stability**: ±0.01 K
- **Special feature**: Large diameter of measuring surface
- **Data sheet**: CT 41.42

### CTM9100-150
**Multi-function calibrator**

- **Measuring range**: -35 … +165 °C depending on the application
- **Accuracy**: ±0.3 K … 1 K depending on the application
- **Stability**: ±0.01 K
- **Immersion depth**: 150 mm
- **Special feature**: Use as a dry-well calibrator, micro calibration bath, infrared calibrator and surface calibrator
- **Data sheet**: CT 41.40
Resistance thermometry bridges

By using built-in or external standard resistors, resistance thermometry bridges measure resistance ratios with high accuracy, which are indicative of the temperature, among other things. These instruments are not only used in the field of temperature measurement, but – due to their high accuracy – also in electrical laboratories.

**CTR2000**
Precision thermometer

- Measuring range: 200 ... +850 °C
- Probe type: Pt100, Pt25

**CTR3000**
Multi-functional precision thermometer

- Measuring range: -210 ... +1,820 °C
- Probe type: Pt100, Pt25, thermocouples
- Special feature: Versatile applications by measuring thermocouples and resistance thermometers
- Data sheet: CT 60.15

**CTR5000**
Precision thermometer

- Measuring range: 200 ... +962 °C
- Probe type: Pt100, Pt25

**CTR6000**
DC resistance thermometry bridge

- Measuring range: 200 ... +962 °C
- Probe type: PRT, thermistors or fixed resistors
- Special feature: Expandable to up to 60 channels (optional)
- Data sheet: CT 60.30

**CTR6500**
AC resistance thermometry bridge

- Measuring range: 200 ... +962 °C
- Probe type: SPRT, PRT or fixed resistors
- Special feature: Expandable to up to 60 channels (optional)
- Data sheet: CT 60.40

**CTR9000**
Primary-standard resistance thermometry bridge

- Measuring range: 0 ... 260 Ω
- Probe type: SPRT, PRT or fixed resistors
- Special feature: Expandable to up to 60 channels (optional)
- Data sheet: CT 60.80
Standard reference resistors, AC/DC

Electrical comparison standard

Reference resistors with high-accuracy, fixed resistance values, which are used in connection with resistance thermometry bridges. They are also used as standards in accredited electrical laboratories.

<table>
<thead>
<tr>
<th>CER6000-RR</th>
<th>CER6000-RW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference resistor</td>
<td>Standard reference resistor</td>
</tr>
</tbody>
</table>

- **Resistance value**: 1, 10, 25, 100, 300, 400, 500, 1,000 and 10,000 Ω
- **Long-term stability**: ≤ ±5 ppm per year
- **Special feature**: - Low temperature coefficient
  - Rugged stainless steel construction
- **Data sheet**: CT 70.30

- **Resistance value**: 1, 10, 25, 100, 300, 400, 500, 1,000 and 10,000 Ω
- **Long-term stability**: ±2 ppm per year
  - (HS version 0.5 ppm per year)
- **Special feature**: - Low temperature coefficient
  - Rugged stainless steel construction
- **Data sheet**: CT 70.30

Connections of the reference resistor, model CER6000-RR

Model CER6000-RR reference resistor with 100 Ω

Reference resistor, model CER6000-RR with different resistance range
Accessories

From individual components ... to complete turnkey kits

The following accessory components are the ideal complement to the individual calibration instruments. Thus a complete solution is not only quickly and easily configured, but can also be installed in the same manner. The various packages complete the product programme for calibration technology and can be used in many different applications.

Customer-specific drilled inserts, silicone oil suited for calibration in micro calibration baths and interface cables complete the product portfolio for temperature.

You can find a detailed description in our catalogue “Accessories for calibration technology”.

<table>
<thead>
<tr>
<th>Pressure supply case</th>
<th>Pressure and vacuum supply packages</th>
<th>Connection components</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Pressure supply case" /></td>
<td><img src="image2.png" alt="Pressure and vacuum supply packages" /></td>
<td><img src="image3.png" alt="Connection components" /></td>
</tr>
</tbody>
</table>
Pressure control

Calibration and adjustment tools

Temperature accessories
Test and calibration systems for workshops and laboratories

Turnkey customer-specific systems for adjustment and calibration of pressure and temperature measuring instruments

Precise calibration instruments are the starting point for resolving your test requirements, even though they are only one component of a high-performance calibration system. From our extensive product range, we can design you a complete and individual solution with adaptability for test items, pressure and vacuum supply, components for pressure control and fine adjustment, through to voltage supply and multimeters for the calibration of electrical test items.

Whether built-in to test benches, mobile test carts or 19" racks and supplemented with user-friendly calibration software, you will get a complete system, tailored to your requirements with the desired level of automation. The use of high-quality proven components, ergonomic usability and a cost-effective overall concept with high customer benefit are made a priority. Take advantage of our experience and the proven operation of such systems in WIKA’s own accredited laboratories and manufacturing facilities.

<table>
<thead>
<tr>
<th>Adjustment and calibration benches</th>
<th>Mobile calibration benches</th>
<th>Test systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>Measuring range</td>
<td>Measuring range</td>
</tr>
<tr>
<td>1 … 400 bar pneumatic</td>
<td>Customer-specific</td>
<td>Customer-specific</td>
</tr>
<tr>
<td>10 … 1,600 bar hydraulic</td>
<td>Accuracy</td>
<td>Accuracy</td>
</tr>
<tr>
<td>Depending on the measuring devices used</td>
<td>Down to 0.008 %</td>
<td>Down to 0.008 %</td>
</tr>
<tr>
<td>Medium</td>
<td>Compressed air, nitrogen, oil or water</td>
<td>Compressed air, nitrogen, oil or water</td>
</tr>
<tr>
<td>Special feature</td>
<td>Provision of pressure in workshops and laboratories</td>
<td>Self-contained, mobile calibration system for workshops and on-site service</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Measurement parameters pressure, temperature and electrical measurands</td>
</tr>
</tbody>
</table>

Automated pressure calibration systems

Measuring range: Customer-specific
Accuracy: Down to 0.008 %
Medium: Compressed air, nitrogen, oil or water
Special feature: Complete turnkey system

Automated temperature calibration systems

Measuring range: Customer-specific
Stability: Up to 0.001 K
Medium: Water, alcohol, silicone oil or salt
Special feature: Complete turnkey system

Complete setup of laboratories

Measuring range: Customer-specific
Accuracy: Measurand pressure up to 0.008 %, Measurand temperature up to 0.001 K
Special feature: Complete solutions from one source from factory calibration laboratories through calibration vehicles up to national laboratories

Engineered solutions
Test stands and calibration systems for production

From consultation through design to implementation - all from one source.
Our particular strength lies in the project planning, development and the building of complete, individual, application-specific systems - from simple manual work stations through to fully automated test systems in production lines - for the following applications:

Calibration and adjustment of
- Pressure sensors
- Pressure transmitters
- Process transmitters

The precise interaction of measurement technology, test system mechanics and control components is a top priority here. The complete solutions are available in the widest variety of build stages incl. tempering units, workpiece transport systems, workpiece fixtures and electrical and pressure-side contacting. Furthermore, there is also the possibility of integrating mounting or labelling operations on the test components into the overall concept. You can be assured of our capabilities.

<table>
<thead>
<tr>
<th><strong>19” test and calibration racks for pressure sensors</strong></th>
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<tbody>
<tr>
<td><strong>Measuring range</strong></td>
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<tr>
<td>- Up to 400 bar pneumatic</td>
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<tr>
<td><strong>Special feature</strong></td>
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<table>
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<tr>
<th><strong>Batch testing systems for pressure sensors</strong></th>
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<tbody>
<tr>
<td><strong>Measuring range</strong></td>
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<tr>
<td>- Up to 1,050 bar pneumatic</td>
</tr>
<tr>
<td>- Up to 6,000 bar hydraulic</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
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<tr>
<td><strong>Temperature range</strong></td>
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<td><strong>Special feature</strong></td>
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<tr>
<th><strong>Inline calibration systems for pressure sensors</strong></th>
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Calibration service

Our calibration laboratories have been calibrated for pressure and temperature for over 30 years. Since 2014, our calibration laboratory has also been accredited for the electrical measurands DC current, DC voltage and DC resistance. Recently, factory calibration for force and length measuring instruments has been expanding our portfolio.

Manufacturer-independent calibration - fast and precise for ...

Pressure

-1 bar ... +8,000 bar (to +9,500 bar possible with factory calibration)
- Calibration using working standards (precise electrical pressure measuring instruments) or high-accuracy reference standards (pressure balances)
- With an accuracy of 0.003 % ... 0.01 % of reading
- In accordance with the directives DIN EN 837, DAkkS-DKD-R 6-1 or EURAMET cg-3

Temperature

-196 °C ... +1,200 °C
- Comparative calibration in calibration baths and tube furnaces with an accuracy of down to 1.5 mK
- Calibration at fixed points of ITS90 with the smallest possible measurement uncertainties
  - Triple point of mercury (-38.8344 °C)
  - Triple point of water (0.01 °C)
  - Melting point of gallium (29.7646 °C)
  - Solidification point of tin (231.928 °C)
  - Solidification point of zinc (419.527 °C)
  - Solidification point of aluminium (660.323 °C)
- In accordance with the appropriate DKD/DAkkS directives

- ISO 9001 certified
- DKD/DAkkS accredited (in accordance with DIN EN ISO/IEC 17025)
- Cooperation in the DKD/DAkkS working groups
- Over 60 years of experience in pressure and temperature measurement
- Highly qualified, individually trained personnel
- Latest reference instruments with the highest accuracy

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### Current, voltage, resistance
- DC current from 0 mA ... 100 mA
- DC voltage from 0 V ... 100 V
- DC resistance from 0 Ω ... 10 kΩ
- In accordance with the directives VDI/VDE/DGQ/DKD 2622

### Length
- Factory calibration
- Replacement of the measuring device if required
- Calibration of special-purpose gauges in accordance with customer drawings
  - Calibratable measuring devices
    - Caliper gauges to 800 mm
    - Testing pins to 100 mm
    - Ring gauges and plug gauges to 150 mm
    - Tapered thread gauges to 150 mm
    - Gauge blocks to 170 mm
    (also possible as a set)
- others on request

### Force
- 2.5 N ... 6 MN
- Factory calibration
- With a system accuracy of up to 0.01 % with pressure loading or 0.02 % with tensile loads
- In accordance with the directive DIN EN 10204

### On site (pressure and temperature)
In order to have the least possible impact on the production process, we offer you a time-saving, on-site DAkkS calibration throughout Germany.
- In our calibration van or on your workbench
- With a DAkkS accreditation for pressure
  - from -1 bar ... +8,000 bar
  - with accuracies between 0.025 % and 0.1 % of full scale for the standard used
- With a DAkkS accreditation for temperature from -55 °C ... +1,100 °C
Service for diaphragm seal systems

Diaphragm seal systems are used for demanding measuring requirements with extreme medium temperatures of -90 °C up to +400 °C in the process industry. The diaphragm seal assemblies protect the measuring instrument from aggressive, corrosive, heterogeneous, abrasive, highly viscous or toxic media.

With this service, the total costs of the diaphragm seal system can be clearly lowered. In this way, the service life of the measuring instrument can be fully utilised and only the diaphragm seal assembly needs replacement or repair, preventatively or after failure.

With a preventative repair, scheduled in line with planned shut-downs to your plant, you can reduce downtimes.

Options
- Replacement service for diaphragm seal systems with process transmitters or mechanical measuring instruments
- Repair of the defective parts
- Optimisation of the existing diaphragm seal system

Your benefits
- Cost and time saving
- Functional test of a process transmitter
- Current material certificate
- New calibration of the entire system
In our segment brochures, you will find the entire product families for the areas of “ventilation and air-conditioning”, “sanitary applications”, “SF₆ lifecycle solutions” and “high purity & ultra high purity” and also their technical distinctions.

**Ventilation and air-conditioning**

**SF₆ solutions**

**Sanitary applications**

**High purity & ultra high purity**