Calibration Technology
Ability to Meet Any Challenge

The WIKA group of companies is a worldwide leader in pressure and temperature measurement. As a family-run business acting globally, WIKA employs over 7,900 highly qualified employees. The company also sets the standard in the measurement of level 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.

WIKA ensures flexibility and the highest delivery performance with manufacturing locations around the globe. 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 supports its customers worldwide competently and reliably. We have experienced engineers and sales experts in your area.
WIKA Product Lines

The WIKA program covers the following product lines for various fields of application.

**Electronic Pressure Measurement**
WIKA offers a complete range of electronic pressure measuring instruments: pressure sensors, pressure switches, pressure transmitters and process transmitters for the measurement of gauge, absolute and differential pressure. These instruments come supplied with standardized current or voltage output signals (also intrinsically safe per ATEX or with flameproof enclosure), interfaces and protocols for various field uses. WIKA is the leading manufacturer worldwide that develops and produces the full range of today’s leading sensor technologies, whether ceramic thick film, metal thin film or piezo-resistive.

**Mechatronic Pressure Measurement**
With the almost unlimited options for different combinations of mechanical and electrical connections, we have an extraordinary range of instrument variants. Various digital and analog output signals are also available for these measuring instruments. For our measuring instruments, we use the latest sensors, tested in automotive applications millions of times over. They work without any kind of mechanical contact, consequently they are wear-resistant, and there's absolutely no influence on the mechanics.

**Mechanical Pressure Measurement**
Indicating pressure gauges for gauge, absolute and differential pressure with Bourdon tube, diaphragm or capsule pressure elements have been tested millions of times over. These instruments cover scale ranges from 0 … 0.5 mbar to 0 … 7,000 bar and 0 … 0.007 psi to 0 … 100,000 psi, with indication accuracies of up to 0.1 %.

**Diaphragm Seals**
WIKA diaphragm seals, mounted with pressure gauges, pressure transducers, pressure transmitters, etc., are recognized and valued internationally for even the most difficult of measuring tasks. Therefore, the measuring instruments can be used at extreme temperatures (-130 ... +400 °C and -200 ... +750 °F), and with aggressive, corrosive, heterogeneous, abrasive, highly viscous or toxic media. The optimal diaphragm seal designs, materials and filling media are available for each application.

**Electrical Temperature Measurement**
Our range of products includes thermocouples, resistance thermometers (also with local display), temperature switches as well as analog and digital temperature transmitters for all industrial applications, covering measuring ranges from -200 ... +1,600 °C and -300 ... +2,900 °F.

**Mechatronic Temperature Measurement**
We can offer a wide variety of combined instruments because our mechanical temperature measuring instruments have integrated switch contacts and output signals. With switch contacts, the pointer position triggers a change-over. Electrical output signals are realized via an additional, independent sensor circuit (resistance thermometer or thermocouple).

**Mechanical Temperature Measurement**
The mechanical temperature measuring instruments work on the bimetal, expansion or gas actuation principle and cover scale ranges from -200 ... +700 °C and -300 ... +1,300 °F. All thermometers are suited for operation in a thermowell if necessary.

**Level Measurement**
WIKA has a comprehensive range of level measuring instruments available for temperatures up to 450 °C and 842 °F, specific gravity from 400 kg/m³ and pressure ranges up to 420 bar and 6,000 psi. This includes standard instruments and customized products.

**Calibration Technology**
WIKA offers a broad product range of calibration instruments for the physical units of measurement for pressure and temperature and electrical measurands. To ensure unmatched performance from many of our calibration instruments, WIKA owns numerous patents. The range of services covers the calibration of pressure and temperature measuring instruments in our accredited ISO/IEC 17025 calibration laboratories and a mobile service to calibrate your instruments on site.
Wika is the ideal partner for solutions in calibration technology. Whether you require only a single instrument quickly or you need a fully-automated calibration system designed for the laboratory or production, we are able to offer an appropriate solution for each application.

The following product matrix will assist you in finding the appropriate instrument for test and measurement parameters.

**Portable Pressure Generation**
Test pumps serve as pressure generators for testing 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.

**Measuring Components**
High-precision pressure sensors and very stable standard thermometers are ideal as references in industrial laboratories. Due to their analog or digital interfaces they can be connected to existing evaluation instruments.

**Hand-holds, Calibrators**
Our hand-held measuring instruments (process tools) offer simple capability for measurement or simulation of all established measurement parameters on site. They can be operated with a wide variety of pressure sensors or thermometers.
In the past few years, WIKA has successfully integrated three renowned manufacturers of calibration equipment into the Group.

Mensor is known in the market for its outstanding portfolio of pressure controllers and solidifies WIKA’s position as the worldwide market leader in calibration.

DH-Budenberg's product range includes high-end pressure primary standards and transfer standards of the Desgranges & Huot brand, as well as laboratory and industrial standards of the Budenberg brand.

ASL resistance bridges with highly stable thermometers are used specifically in temperature laboratories.

High-accuracy digital precision measuring instruments are ideal for applications as reference standards in industrial laboratories, enabling high-accuracy calibration. They feature exceptionally simple handling and an extensive range of functionality.

These instruments offer exceptional convenience, due to their integrated controller. Typically, a fully automated setting of the required value can be set via the interface.

Fully automated calibration systems are customer-specific, turnkey installations which can be fitted in laboratories as well as in the production environment. With integrated reference instruments and calibration software, calibration certificates can be generated and archived in a simple and reproducible way.
Portable Pressure Generation

Simple Manual Pressure Generation

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.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Measuring Range</th>
<th>Medium</th>
<th>Special Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPP7-H</td>
<td>Pneumatic hand test pump</td>
<td>-12 ... + 100 psi, -800 mbar ... + 7 bar, -80 kPa ... + 7 kPa</td>
<td>Ambient air</td>
<td>Pressure and vacuum generation switchable, Low weight, Compact dimensions</td>
</tr>
<tr>
<td>CPP700-H, CPP1000-H</td>
<td>Hydraulic hand test pump</td>
<td>0 ... 10,000 or 0 ... 14,500 psi, 0 ... 700 or 0 ... 1,000 bar, 0 ... 70 or 0 ... 100 MPa</td>
<td>Oil or water</td>
<td>Integrated medium reservoir, Ergonomic handling</td>
</tr>
<tr>
<td>CPP30</td>
<td>Pneumatic hand test pump</td>
<td>-13 psi ... + 500 psi, -950 mbar ... + 35 bar, -95 kPa ... + 3.5 kPa</td>
<td>Ambient air</td>
<td>Pressure and vacuum generation switchable, Compact dimensions</td>
</tr>
<tr>
<td>CPP120-X</td>
<td>Pneumatic comparison test pump</td>
<td>0 ... 1,700 psi, 0 ... 120 bar</td>
<td>Clean, dry, non-corrosive gases</td>
<td>Accurate pressure setting, Robust industrial series</td>
</tr>
<tr>
<td>CPP1200-X</td>
<td>Hydraulic comparison test pump</td>
<td>0 ... 17,500 psi, 0 ... 1,200 bar, 0 ... 120 MPa</td>
<td>Hydraulic (oil)</td>
<td>Robust instrument base with integrated high-pressure generation</td>
</tr>
<tr>
<td>CPPxx00-X</td>
<td>Hydraulic comparison test pump</td>
<td>0 ... 14,500 to 0 ... 100,000 psi, 0 ... 1,000 to 0 ... 7,000 bar, 0 ... 100,000 to 0 ... 700 MPa</td>
<td>Oil or water</td>
<td>Integrated reservoir and priming pump, Robust laboratory version</td>
</tr>
</tbody>
</table>
Hand-holds, Calibrators

Portable calibration instruments for mobility in the accurate measurement and recording of pressure profiles

For these portable hand-held measuring instruments, exchangeable pressure sensors are available with measuring ranges up to 11,600 psi, 8,000 bar, or 800,000 kPa.

They are particularly suitable as test instruments for process technology, machine building, etc. Data recorded in the instrument can be evaluated via PC software.

### CPT2500
**USB Pressure Transmitter**
- Measuring range:
  - 0 ... 0.4 to 0 ... 14,500 psi
  - 0 ... 0.025 to 0 ... 1,000 bar
  - 0 ... 2.5 to 0 ... 100 MPa
- 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

### CPH6200
**Hand-held Pressure Indicator**
- Measuring range:
  - 0 ... 0.4 to 0 ... 14,500 psi
  - 0 ... 0.025 to 0 ... 1,000 bar
  - 0 ... 2.5 to 0 ... 100 MPa
- Accuracy: 0.2 %, 0.1 % (optional)
- Special feature:
  - Integrated data logger
  - Differential pressure measurement (optional)

### CPH6210
**Hand-held Pressure Indicator, Intrinsically Safe**
- Measuring range:
  - 0 ... 1.5 to 0 ... 14,500 psi
  - 0 ... 0.025 to 0 ... 1,000 bar
  - 0 ... 2.5 to 0 ... 70 MPa
- Accuracy: 0.2 %, 0.1 % (optional)
- Special feature:
  - Intrinsically safe version, II 2G Ex ib IIC T4

### CPH6300
**Hand-held Pressure Indicator**
- Measuring range:
  - 0 ... 0.4 to 0 ... 14,500 psi
  - 0 ... 0.025 to 0 ... 1,000 bar
  - 0 ... 2.5 to 0 ... 100 MPa
- Accuracy: 0.2 %, 0.1 % (optional)
- Special feature:
  - Robust and waterproof case with IP 65, IP 67
  - Integrated data logger
  - Differential pressure measurement (optional)

### CPH6400
**Precision Hand-held Pressure Indicator**
- Measuring range:
  - 0 ... 3.5 to 0 ... 90,000 psi
  - 0 ... 0.25 to 0 ... 6,000 bar
  - 0 ... 25 to 0 ... 600 MPa
- Accuracy: 0.025 %
- Special feature:
  - Integrated data logger
  - Temperature measurement (optional)

### CPH6210
**Hand-held Pressure Indicator, Intrinsically Safe**
- Measuring range:
  - 0 ... 1.5 to 0 ... 14,500 psi
  - 0 ... 0.025 to 0 ... 1,000 bar
  - 0 ... 2.5 to 0 ... 70 MPa
- Accuracy: 0.2 %, 0.1 % (optional)
- Special feature:
  - Intrinsically safe version, II 2G Ex ib IIC T4

These cases can be assembled exactly to your requirements, allowing you to be fully equipped on site!
Hand-helds, Calibrators

Calibrations can be documented directly in the calibrator and later read on a PC. As another option, a calibration certificate can be generated through software.

**CPH6000**
Process calibrator

- Measuring range:
  - 0 ... 4 to 0 ... 116,000 psi
  - 0 ... 0.25 to 0 ... 8,000 bar
  - 0 ... 0.03 to 0 ... 800 MPa
- Accuracy: 0.025 %
- Special feature:
  - Function of calibration
  - Pressure switch test

**CPH7000**
Portable process calibrator

- Measuring range:
  - -15 ... 150,000 psi
  - -1 ... 10,000 bar
- Accuracy: 0.025 %
- Special feature:
  - Integrated pressure generation
  - Measurement of pressure, temperature, current, voltage, ambient conditions
  - Supply of pressure, current and voltage
  - Calibration function, data logger and switch test

**CPH7650**
Portable pressure calibrator

- Measuring range:
  - -14.5 ... +300 psi
  - -1 ... +20 bar
- Accuracy: 0.025 %
- Medium: Clean, dry, non-aggressive gases
- Special feature:
  - Integrated electrical pressure generation
  - Pressure supply via external compressed air line
  - Robust case design, IP 67
- Data sheet: CT 17.0

**Pascal 100**
Hand-held multi-function calibrator

- Measuring range:
  - 0 ... 14,500 psi
  - 0 ... 1,000 bar
  - 0 ... 100 MPa
- Accuracy: 0.025 %
- Medium: Clean, dry, non-corrosive gases
- Special feature:
  - Integrated pressure generation
  - Large display with touchscreen
  - Measurement and simulation of pressure, temperature, current, voltage, resistance, frequency

**CPG2300**
Hand-held pressure loop calibrator

- Measuring range:
  - 0 ... 6,000 psig, 0 ... 6,015 psia
  - 0 ... 400 bar
  - 0 ... 40 MPa
- Accuracy: 0.015 %
- Medium: Clean, dry, non-corrosive gases
- Special feature:
  - Dual transducers
  - Optional mA loop measurement
  - Optional barometric range
# Precision Pressure Measuring Instruments

Electrical measuring systems that convert pressure into an electrical signal and optionally visualize it.

Due to the low ISO/IEC 17025 measurement uncertainty of down to 0.008%, these instruments find their primary application as a factory/working standard for testing and/or calibrating a variety of pressure measuring instruments.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Measuring Range</th>
<th>Accuracy</th>
<th>Special Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPG500</td>
<td>Digital pressure gauges</td>
<td>-15 ... +230 to 0 ... 14,500 psi&lt;br&gt;-1 ... +16 to 0 ... 1,000 bar&lt;br&gt;-100 ... +1600 to 0 ... +100 MPa</td>
<td>0.25 %</td>
<td>Simple operation using 4 buttons, Robust case with protective rubber cap, IP 67</td>
</tr>
<tr>
<td>CPG1500</td>
<td>Precision digital pressure gauge</td>
<td>-15 ... 0 to 0 ... 150,000 psi&lt;br&gt;-1 ... 0 to 0 ... 10,000 bar&lt;br&gt;-100 ... 0 kPa to 0 ... 1,000 MPa</td>
<td>0.1%, 0.05 % (optional)</td>
<td>Integrated data logger, WIKA-CAL compatible, Data transfer via WIKA-Wireless, Robust case IP65</td>
</tr>
<tr>
<td>CPT6010</td>
<td>Digital pressure transducers</td>
<td>0 ... 5 to 0 ... 6,000 psi&lt;br&gt;0 ... 0.35 to 0 ... 400 bar&lt;br&gt;0 ... 2.5 kPa to 41 MPa</td>
<td>0.02 %</td>
<td>RS-232 / RS-485, Robust stainless steel housing</td>
</tr>
<tr>
<td>CPT61X0</td>
<td>Precision pressure sensor</td>
<td>0 ... 0.36 to 0 ... 6,000 psi&lt;br&gt;0 ... 0.025 to 0 ... 400 bar&lt;br&gt;0 ... 2.5 kPa to 0 ... 40 MPa</td>
<td>0.01 %</td>
<td>RS-232 or RS-485 connection, Analog output (optional)</td>
</tr>
<tr>
<td>CPG2400</td>
<td>Pressure indicator, single channel</td>
<td>0 ... 0.36 to 0 ... 6,000 psi&lt;br&gt;0 ... 0.025 to 0 ... 400 bar&lt;br&gt;0 ... 2.5 kPa to 41 MPa</td>
<td>0.03 %</td>
<td>Non-corrosive gases, &gt; 1 bar liquids, Barometer</td>
</tr>
<tr>
<td>CPG2500</td>
<td>Precision pressure indicator, 1 or 2 channel version</td>
<td>0 ... 0.36 to 0 ... 42,000 psi&lt;br&gt;0 ... 0.025 to 0 ... 2,900 bar&lt;br&gt;0 ... 2.5 kPa to 290 MPa</td>
<td>0.01 % ... 0.008%</td>
<td>Non-corrosive gases, &gt; 1 bar liquids, Up to 2 transducers, Barometric reference (optional), External transducers</td>
</tr>
</tbody>
</table>

Further information at www.wika.com
Pressure Controllers

Electronic controllers that quickly and automatically provide a precision pressure output

Due to the high accuracy and control stability, these types of instruments are especially suitable as references for production lines and laboratories to carry out automatic testing and/or calibration of all types of sensors.

### CPC2000
**Low-pressure version**
- Measuring range:
  - 0 ... 0.015 to 0 ... 0.15 psi
  - 0 ... 1 to 0 ... 1,000 mbar
  - 0 ... 0.1 to 0 ... 10 kPa
- Accuracy:
  - 0.1/0.3 % (for 0 ... 1 mbar)
- Medium: Ambient air
- Special feature:
  - Integrated pressure generation
  - Integrated battery

### CPC4000
**Industrial version**
- Measuring range:
  - 0 ... 5 to 0 ... 3,045 psi
  - 0 ... 0.35 to 0 ... 210 bar
  - 0 ... 35 kPa to 0 ... 21 MPa
- Accuracy:
  - 0.02 %
- Medium: Dry clean air or nitrogen
- Special feature:
  - Low cost
  - Automatic contamination prevention system
  - Two transducers

### CPC6050
**Standard version**
- Measuring range:
  - 0 ... 0.36 to 0 ... 3,045 psi
  - 0 ... 0.25 to 0 ... 210 bar
  - 0 ... 2.5 kPa to 0 ... 21 MPa
- Accuracy:
  - 0.0 %
- Medium: Dry clean air or nitrogen
- Special feature:
  - Up to three interchangeable reference transducers

### CPC7000
**Pneumatic high-pressure controller**
- Measuring range:
  - 0 ... 1,500 psi to 0 ... 10,000 psi
  - 0 ... 100 bar to 0 ... 700 bar
  - 0 ... 10 MPa to 0 ... 70 MPa
- Accuracy:
  - 0.01 %
- Medium: Nitrogen
- Special feature:
  - Robust and low-wear valve technology with long-term stability
  - Up to three interchangeable transducers

### CPC8000
**Precision version**
- Measuring range:
  - 0 ... 5 to 0 ... 6,000 psi
  - 0 ... 0.35 to 0 ... 400 bar
  - 0 ... 35 kPa to 0 ... 40 MPa
- Accuracy:
  - 0.01 ... 0.008 %
- Medium: Dry clean air or nitrogen
- Special feature:
  - Excellent control stability and overshoot-free control
  - Up to three interchangeable reference transducers

### CPC8000-H
**High-pressure version**
- Measuring range:
  - 75 ... 10,000 to 300 ... 23,000 psi
  - 5 ... 700 to 20 ... 1,600 bar
  - 0.5 ... 70 MPa to 0.2 ... 160 MPa
- Accuracy:
  - 0.01 %
- Medium: Hydraulic oil or water
- Special feature:
  - High stability, also for large volumes
  - Up to two interchangeable reference transducers
Air Data Instruments

Air Data instruments provide measurement and control of pressure that is equivalent to altitude and airspeed.

An air data test set is an electronic controller which, based on a supply pressure, automatically provides a pressure at a variable and adjustable rate. Air data test sets are specifically developed to convert the pressure to be controlled into an altitude or rate of climb and airspeed.

An air data test set is particularly suitable as a reference for aircraft workshops, instrument manufacturers and calibration laboratories in the aviation industry, to make calibrations on sensors and displays because of the high accuracy, control stability and ability to simulate altitude and airspeed.

Air data indicators measure altitude and airspeed and provide rate of change indication for both.

**CPA8001**  
**Air Data Test Set**

- Measuring range:
  - Up to 50 psi abs.
  - Up to 3.4 bar abs.
  - Up to 340 kPa abs.

- Accuracy: 0.009 % ... 0.01 %

- Medium: Dry, clean air or nitrogen

- Special feature: Excellent control stability, even with rate control, Overshoot-free control

**CPA2501**  
**Precision air data test indicator**

- Measuring range:
  - Altitudes up to 100,000 ft
  - Speeds up to 1,150 knots

- Accuracy: Down to 0.01 % FS

- Special feature: RVSM compliant, Ps, Qc, Ps/Pt or Ps/Qc configuration
Pressure Balances, Industrial Series

Compact and powerful primary standards with excellent operating characteristics, based on the physical principle of Pressure = Force/Area

The direct measurement of pressure (p = F/A), as well as the use of high-quality materials enable low measurement uncertainty, in conjunction with an excellent long-term stability.

The measurement uncertainty can be ensured with the selection of a dual-range piston-cylinder system with automatic measuring range switching, even with a single measuring system, over a large pressure range.

**CPB3500**

Pneumatic compact version

- Measuring range:
  - 0 ... 1,700 psi
  - 0.015 ... -1 to 1 ... 120 bar
- Accuracy: 0.015 ... 0.006 %
- Medium: Non-corrosive gases
- Special feature: Compact dimensions and low weight

**CPB3800**

Compact version

- Measuring range:
  - 15 ... 1,700 to 150 ... 17,000 psi
  - 1 ... 120 to 10 ... 1,200 bar
  - 100 kPa ... 12 MPa to 100 kPa ... 120 MPa
- Accuracy: 0.05 ... 0.025 %
- Medium: Hydraulic (oil)
- Special feature: Compact dimensions and low weight

**CPB5000**

Pneumatic version

- Measuring range:
  - -0.4 ... -15 to 6 ... 1,500 psi
  - -0.03 ... -1 to 0.4 ... 100 bar
  - -3 ... -100 to 40 ... 10 MPa
- Accuracy: 0.015 ... 0.008 %
- Medium: Non-corrosive gases
- Special feature: Patented system for fast piston-cylinder exchange

**CPB5600DP**

Differential pressure version

- Measuring range:
  - 0.5 ... 30 to 360 ... 23,000 psi
  - 0.03 ... 2 to 25 ... 1,600 bar
  - 3 ... 200 kPa to 2.5 ... 160 MPa
- Accuracy: 0.015 ... 0.008 %
- Medium: Non-corrosive gases or special oil
- Special feature: Two complete pressure balances within one case for real differential pressure measurements under static pressure

**CPB5000HP**

High-pressure version

- Measuring range:
  - 25 ... 2,500 to 25 ... 5,000 bar
  - 360 ... 36,000 to 360 ... 72,000 psi
  - 2.5 ... 250 to 2.5 ... 500 MPa
- Accuracy: 0.025 ... 0.02 %
- Medium: Hydraulic (oil)
- Special feature: Robust instrument base with integrated high-pressure generation
Pressure Balances, High-End Version

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

The direct measurement of pressure \( p = F/A \), as well as the use of high-quality materials enable low measurement uncertainty, in conjunction with excellent long-term stability. Furthermore, an automatic mass handling system and pressure generation ensures fully-automated calibration. Therefore, the pressure balance has 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

Measuring range:
- 60 ... 72,000 psi
- 4 ... 5,000 bar
- 400 kPa ... 500 MPa

Accuracy: 0.0035 ... 0.0015 %

Special feature: Different instrument variants for the highest demands

**CPB6000DP**

Primary standard for differential pressure

Measuring range:
- 400 ... 12,000 psi
- 30 ... 800 bar
- 3 MPa ... 80 MPa

Accuracy: 0.005 ... 0.002 %

Special feature: For differential pressure measurements from 10 Pa to 800 bar

**CPB8000**

Automatic primary standard

Measuring range:
- 7200 ... 72,000 psi
- 500 ... 5,000 bar
- 50 MPa ... 500 MPa
- Others on request

Accuracy: 0.005 ... 0.003 %

Medium: Sebacate oil

Special feature: Automated calibration of the highest-accuracy pressure sensors, integrated pressure generation

**CPD8500**

Digital pressure balance

Measuring range:
- 15 ... 7,250 psi
- 1 ... 500 bar
- 100 kPa ... 50 MPa

Accuracy: 0.005 ... 0.0035 %

Medium: Non-corrosive, dry gases

Special feature: unique operating principle, ideal for automatic calibrations, no mass handling needed, one unit for abs. and gauge cal.
Accessories for Pressure Balances

CPU6000 series

Calibrator unit

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

WIKA-CAL

Calibration software

- 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 relative pressure measuring instruments with absolute pressure references and vice versa

Correction of the Environmental Conditions to Achieve the Best Possible Accuracies

WIKA-CAL calibration software
Calibrator Unit CPU6000
iPad app CPB-CAL

Auxiliary device for calibrations of dead weight testers for the highest accuracy

The specified accuracy of pressure balances is valid under reference conditions, i.e. ambient temperature 20 °C, atmospheric pressure 1,013 mbar, relative air humidity 40 % and for a specific installation location with a local gravitational acceleration. For ambient conditions that deviate from these, if required, corrections must be made.

\[
\begin{align*}
pe &= \left[ \frac{m}{A} \left( 1 - \frac{\rho_1}{\rho_m} \right) \cdot \rho_l \cdot \sigma \cdot c + \frac{(\rho_F \cdot \rho_l) \cdot \rho_l \cdot \Delta h}{1 + (\alpha + \beta) \cdot (t - 20) + \lambda} \right] \cdot 10 \cdot 5 \\
\end{align*}
\]

Description

With the demo version of the WIKA-CAL software and a CPB series pressure balance, the mass discs are applied and the corresponding reference pressure can be determined. The pressure balance data can be entered into the database manually or imported automatically via an online XML file. With the CPU6000 series instruments, the accuracy can be further increased. With the CPU6000-W, the ambient conditions can be measured, and with the CPU6000-S, the piston temperature can be measured and these can be taken into account in the calculations. As an additional parameter, the local gravity value can be given for location-independent measurements. If a pressure transmitter is being calibrated, this can automatically be read with the CPU6000-M. Thus the CPU6000-M is used as voltage supply and multimeter. Through the simple and user-friendly operation with the CPB-CAL iPad® app, the mass discs to be applied for a given pressure value can be calculated.
Calibration Software

Easy and fast creation of high-quality calibration certificates

WIIKA-CAL calibration software is used for generating calibration certificates or data logging for pressure measuring instruments. Get a free demo version download from the homepage. The template will guide you through the creation process of a document. Calibration certificates can be created with the Cal-Template and data logging can be created with the Log-Template.

In order to switch from the demo version to a full version of the respective template, you must purchase a USB key with the template. The pre-installed demo version automatically changes to the selected full version when the USB key is inserted and will be 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.
Reference Thermometers

Conventional contact thermometers

Due to the excellent stability and the geometrical conformance, these standard thermometers are ideally suited for applications in industrial laboratories. Simple comparative calibrations can be carried out in baths, in tube furnaces and in dry-well calibrators. The advantage of these reference thermometers is the wide temperature range, which makes them flexible to operate. Furthermore, we can ensure a long service life due to their low drift.

<table>
<thead>
<tr>
<th>CTP2000</th>
<th>CTP5000</th>
<th>CTP9000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Platinum resistance thermometer</strong></td>
<td><strong>Reference thermometer</strong></td>
<td><strong>Thermocouple</strong></td>
</tr>
<tr>
<td>Measuring range:</td>
<td>-196 ... +660 °C</td>
<td>0 ... 1,300 °C</td>
</tr>
<tr>
<td>Stability:</td>
<td>&lt; 50 mK after 100 h at 450 °C</td>
<td>32 ... 2,372 °F</td>
</tr>
<tr>
<td>Dimensions:</td>
<td>Ø 4 mm, l = 500 mm</td>
<td>Ø 7 mm, l = 600 mm (incl. handle)</td>
</tr>
<tr>
<td>Special feature:</td>
<td>4-wire connection</td>
<td>Cold junction optional</td>
</tr>
<tr>
<td>Special feature:</td>
<td>Ends with 4 mm banana plugs</td>
<td>1,500 mm cable</td>
</tr>
</tbody>
</table>

**CTP2000**

- Measuring range: -200 ... +450 °C, -328 ... +842 °F
- 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

**CTP5000**

- Measuring range: -200 ... +450 °C, -328 ... +842 °F
- 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

**CTP9000**

- Measuring range: -200 ... +450 °C, -328 ... +842 °F
- 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
## Hand-Helds

**Portable measuring and calibration instruments for mobile use**

Various designs of portable thermometers are available. They are used as test instruments for a wide variety of fields such as sterile process technology, manufacturing, etc. Depending on the version, functions such as data logging and a serial interface are available, so that immediate on-site measurements can be made and documented, and with this, the data can also be simultaneously acquired.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Measuring Range</th>
<th>Accuracy</th>
<th>Sensor Type</th>
<th>Special Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CTR1000</strong></td>
<td>Infrared hand-held thermometer</td>
<td>-60 ... +1,000 °C</td>
<td>2 K or 2 % of measured value</td>
<td></td>
<td>Thermocouple connection (optional)</td>
</tr>
<tr>
<td><strong>CTH6200</strong></td>
<td>Hand-held thermometer</td>
<td>-50 ... +250°C</td>
<td>&lt; 0.2 K (complete measuring chain)</td>
<td>Pt100</td>
<td>Integrated data logger</td>
</tr>
<tr>
<td><strong>CTH6300</strong></td>
<td>Hand-held thermometer</td>
<td>-200 ... +1,500 °C</td>
<td>0.1 K ... 1 K</td>
<td>Pt100, TC</td>
<td>2 channels (optional)</td>
</tr>
<tr>
<td><strong>CTH6500</strong></td>
<td>Hand-held thermometer</td>
<td>-200 ... +250 °C</td>
<td>0.03 ... 0.2 K</td>
<td>Pt100, TC</td>
<td></td>
</tr>
<tr>
<td><strong>CTH7000</strong></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>
</tr>
</tbody>
</table>
**Portable Temperature Calibrators**

Electronic controllers which automatically supply a dry temperature output

Due to the high reliability, accuracy and ease of use, this type of instrument is appropriate as a factory/working standard for the automatic testing and/or calibration of temperature measuring instruments of all types.

The major advantage of the large sleeve diameters and the fast stable temperature control is that calibration times can be reduced.

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Measuring Range</th>
<th>Accuracy</th>
<th>Stability</th>
<th>Special Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTI5000</td>
<td>50 ... 500 °C 122 ... 932 °F</td>
<td>1 K, usually 0.8 K</td>
<td>0.1 ... 0.4 K</td>
<td>Large diameter of measuring surface</td>
</tr>
<tr>
<td>CTD9100-375</td>
<td>t_{amb} ... 375 °C t_{ref} ... 707 °F</td>
<td>0.5 ... 0.8 K</td>
<td>0.05 K</td>
<td>Immersion depth: 100 mm</td>
</tr>
<tr>
<td>CTD9100</td>
<td>-55 ... +650 °C -67 ... 1,202 °F</td>
<td>0.15 ... 0.8 K</td>
<td>0.01 ... 0.05 K</td>
<td>Immersion depth: 150 mm</td>
</tr>
<tr>
<td>CTM9100-150</td>
<td>-35 ... +165 °C -31 ... +329 °F</td>
<td>0.3 ... 1 K depending on application</td>
<td>0.3 K</td>
<td>Application as dry-well calibrator, micro calibration bath, infrared calibrator and surface calibrator</td>
</tr>
<tr>
<td>CTD9300</td>
<td>-35 ... +650 °C -31 ... +1,202 °F</td>
<td>0.1 ... 0.65 K</td>
<td>0.01 ... 0.1 K</td>
<td>Immersion depth: 150 mm</td>
</tr>
<tr>
<td>CTD9100-1100</td>
<td>200 ... 1,100 °C 392 ... 2,012 °F</td>
<td>3 K</td>
<td>0.3 K</td>
<td>Immersion depth: 220 mm, bore depth 155 m</td>
</tr>
</tbody>
</table>
Calibration Baths

Electronic controllers that automatically and quickly supply a stable temperature within a liquid bath

This type of instrument is particularly suitable as a factory/working standard for the automatic testing and/or calibration of the widest range of temperature sensors - independent of diameter. Its measuring chamber has high reliability, accuracy and exceptional homogeneity. A special micro calibration bath design enables on-site applications.

**CTB9100**

Micro calibration bath

| Measuring range: | -35 ... +255 °C  
|                 | -31 ... +437 °F  
| Accuracy:       | 0.2 ... 0.3 K     
| Stability:      | ±0.05 K           
| Special feature:| Short heating and cooling times  
|                 | Easy to use       

**CTB9400**

Calibration bath, medium measuring range

| Measuring range: | 28 ... 300 °C  
|                 | 82 ... 572 °F  
| Stability:       | 0.02 K         
| Immersion depth: | 200 mm         
| Medium:          | Water, oil or similar media 

**CTB9500**

Calibration bath, low measuring range

| Measuring range: | -45 ... +200 °C  
|                 | -49 ... 392 °F   
| Stability:       | 0.02 K          
| Immersion depth: | 200 mm          
| Medium:          | Water, oil or similar media  

Further information at www.wika.com
Resistance Thermometry Bridges

Electronic thermometry bridges that measure with high accuracy

Resistance thermometry bridges measure resistance ratios with high accuracy by using standard resistors, which are indicative of the temperature, among other things. These instruments are not only used in the field of temperature measurement, but also in electrical laboratories because of their high accuracy.

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Measuring range</th>
<th>Accuracy</th>
<th>Sensor type</th>
<th>Special feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTR2000</td>
<td>Precision thermometer</td>
<td>-200 ... +850 °C</td>
<td>±0.0005 K</td>
<td>Pt100, Pt25</td>
<td>Basic measurement (optional)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-328 ... +1,562 °F</td>
<td></td>
<td></td>
<td>3-wire measurement (optional)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Internal resistors 25 Ω, 10 kΩ, 100 kΩ</td>
</tr>
<tr>
<td>CTR3000</td>
<td>Multi-function precision</td>
<td>PRT: -200 ... +962 °C (-328 ... +1,764 °F)</td>
<td>±0.0005 K</td>
<td>PRT, TC and thermistors</td>
<td>Expandable to up to 44 channels (optional)</td>
</tr>
<tr>
<td></td>
<td>thermometer</td>
<td>TC: -210 ... +2,315 °C (-346 ... +4,199 °F)</td>
<td></td>
<td></td>
<td>Integrated data logger and scanner</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thermistor: 0 ... 500 kΩ</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTR5000</td>
<td>Precision thermometer</td>
<td>-200 ... +962 °C</td>
<td>±0.0005 K</td>
<td>0.01 K, optional 0.001 K</td>
<td>Basic measurement (optional)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-328 ... +1,562 °F</td>
<td></td>
<td></td>
<td>3-wire measurement (optional)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Internal resistors 25 Ω, 10 kΩ, 100 kΩ</td>
</tr>
<tr>
<td>CTR6000</td>
<td>DC resistance thermometry</td>
<td>-200 ... +962 °C</td>
<td>±0.1 ... 1.25 mK</td>
<td>PRT, thermistors or fixed resistors</td>
<td>Expandable to up to 60 channels (optional)</td>
</tr>
<tr>
<td></td>
<td>bridge</td>
<td>-328 ... +1,764 °F</td>
<td>depending on resistance ratio</td>
<td></td>
<td>Internal resistors 25 Ω, 100 Ω</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AC technology</td>
</tr>
<tr>
<td>CTR6500</td>
<td>AC resistance thermometry</td>
<td>-200 ... +962 °C</td>
<td>±0.1 ... 1.25 mK</td>
<td>SPRT, PRT or fixed resistor</td>
<td>Expandable to up to 60 channels (optional)</td>
</tr>
<tr>
<td></td>
<td>bridge</td>
<td>-328 ... +1,764 °F</td>
<td>depending on resistance ratio</td>
<td></td>
<td>Internal resistors 25 Ω, 100 Ω</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AC technology</td>
</tr>
<tr>
<td>CTR9000</td>
<td>Primary-standard resistance</td>
<td>0 ... 260 Ω</td>
<td>0.1 ppm, 20 ppb optional</td>
<td>SPRT, PRT or fixed resistor</td>
<td>Expandable to up to 60 channels (optional)</td>
</tr>
<tr>
<td></td>
<td>thermometry bridge</td>
<td></td>
<td></td>
<td></td>
<td>4 selectable standby currents possible (optional)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>AC technology</td>
</tr>
</tbody>
</table>
Standard Reference Resistors, AC/DC

Electrical comparison standard

These are 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.

---

**CER6000-RR**

Reference resistor

- 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

**CER6000-RW**

Standard reference resistor

- 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

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Connections of the reference resistor, Model CER6000-RR

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Further information at www.wika.com
Hand-Helds, Calibrators

Portable measuring and calibration instruments for mobile use

These instruments are used for calibration in industry (laboratories, production, workshops), in calibration service companies and in quality assurance due to unparalleled performance characteristics and low measurement uncertainties.

**CEP1000**
Hand-held loop calibrator

- Measuring range: 0 ... 24 mA, 0 ... 28 V
- Accuracy: 0.015 %
- Special feature: Simulates, powers and measures 2-wire transmitters

**CEP3000**
Hand-held temperature calibrator

- Measuring range: -10 ... +75 mV, 5 ... 3,200 Ω
- -200 ... +2,000 °C (type J)
- -200 ... +800 °C (Pt100)
- -300 ... +1,500 °F (Pt100)
- Accuracy: 0.4 °C (type J), 0.33 °C (Pt100)
- Special feature: Measurement and simulation of thermocouples and resistance thermometers

**CEP6000**
Hand-held multi-function calibrator

- Measuring range: 0 ... 24 mA, 0 ... 30 V, 5 ... 4,000 Ω
- 2 CPM ... 10 kHz
- -210 ... +1,200 °C (type J)
- -350 ... +2,000 °F (type J)
- -200 ... +800 °C (Pt100)
- -300 ... +1,500 °F (Pt100)
- Accuracy: 0.015 %
- Special feature: Measurement and simulation of thermocouples, resistance thermometers, resistance, current, voltage, frequency, pulse and pressure

**CED7000**
High-precision process calibrator

- Measuring range: 0 ... 100 mA, 0 ... 100 V, 5 ... 4,000 Ω
- -210 ... +1,200 °C (type J)
- -350 ... +2,000 °F (type J)
- -200 ... +850 °C (Pt100)
- -300 ... +1,500 °F (Pt100)
- Accuracy: 0.003 %
- Special feature: High-precision measurement and simulation of thermocouples and resistance thermometers, resistance, current, voltage and pressure

**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)
- -300 ... +2,000 °F (type J)
- -200 ... +850 °C (Pt100)
- -300 ... +1,500 °F (Pt100)
- Accuracy: 0.008 %
- Special feature: Large display with touchscreen
- Integrated data logger and calibration function
- Measurement and simulation of temperature, current, voltage, resistance, frequency, pressure
Complete Solutions

Simple checking or professional calibration

<table>
<thead>
<tr>
<th>CTH6200</th>
<th>Pascal ET</th>
<th>CTD9100-1100</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Online temperature measurement</strong></td>
<td><strong>On-site calibration of a temperature sensor</strong></td>
<td></td>
</tr>
<tr>
<td>![CTH6200 Image]</td>
<td>![Pascal ET Image]</td>
<td>![CTD9100-1100 Image]</td>
</tr>
<tr>
<td>Optional: With data logging and subsequent transfer of the logged data to a PC.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Stable control of temperature with the CTD9100-1100 dry-block calibrator
- Accurate measurement of temperature with the Pascal ET logging, hand-held multi-function calibrator
- Transfer of the calibration data to a PC incl. generation of the calibration certificate
Calibration Systems

**Turnkey, customer-specific systems and installations with corresponding software**

We can design an integrated solution from our extensive product line with the required degree of automation. These systems are well-proven and used in Mensor's own accredited laboratories and manufacturing plants.

A few examples of our custom systems are shown below to showcase our capabilities.

**Rack equipment**
- Custom pressure equipment for production, test, and calibration
- High speed operation with accuracies to 0.01%
- Up to 12 channels per system

**Carts and mobile equipment**
- Custom configurations of mobile racks and carts
- Low profile casters to fully pneumatic wheels
- Standard pressure instruments or special purpose designs
- Accuracies can vary based on equipment included

**Bench or desktop equipment**
- Bench or desktop system designs
- Accuracy, range and auxiliary equipment to meet user needs

**High speed and high volume controller**
- Ranges to 1500 psi
- Absolute, gauge, bi-directional or vacuum
- Uncertainty: 0.01% IntelliScale-50, 0.01%FS, 0.025%FS
- Up to four pressure control channels per instrument
- Compressed air, nitrogen, oil or water
- Complete turnkey system
Calibration Systems

CPH6000, CPP30
Calibration of a process transmitter
- Pressure generation with the pneumatic hand test pump CPP30
- Reading of the electrical signal of the process transmitter via the electrical input of the CPH6000
- Recording of the calibration in the CPH6000 and later evaluation on a PC in conjunction with the EasyCal software

CPH6400, CPP5000-X
High-pressure calibration
- Pressure generation with the hydraulic high-pressure pump CPP5000-X
- Reading of the electrical signal of the calibration item via a digital indicator
- Online acquisition of the calibration data and generation of calibration certificates in conjunction with the WIKA-CAL software

Rack mounted pressure booster
- Boost dry gas
- Model 75RM-boost 300 to 6000 psi with 85 psi shop air
- Model 73RM-boost shop air from 80 to 400 psi

Vacuum/pump compressor set
- 1, 2, or 3 compressors and/or vacuum pumps
- 120 v AC
- Clean, dry pumps
- Pressures to 50 psi
- Vac to 28.5 inHg

Pressure regulating console
- Custom pressure panels
- Can include gauges, regulators, valves, panel meters, alarms, and indicators

Further information at www.wika.com
Operating Principle

**Deadweight Testers**

Mechanical dead weight testers (primary standards) based on the physical principle Pressure = Force/Area

Deadweight testers add a precisely defined force by placing mass pieces on the top of a piston-cylinder system. By producing a certain pressure (counter pressure) inside the pressure balance by using e.g. the integrated hand pump, an equilibrium is achieved. In the state of equilibrium, the pressure is high enough that the mass pieces, incl. the free-running piston of the piston-cylinder system, are floating, which will lead to a very accurate pressure at the test port.

In this case, you'd need a pressure supply, but only for pneumatic applications > 145 psi (10 bar), or a vacuum source for negative pressure versions.

**Advantage:** Large measuring range coverage, long recalibration intervals and stand-alone operation.

**Digital Pressure Balances**

Digital pressure balances require no mass-disc handling.

In contrast to the mechanical dead weight testers, no mass discs are used with digital pressure balances. Instead, with a piston-cylinder unit, the applied pressure, $p$, is converted into a force, $F$, ($F = p \times A$), which is then "weighed" ($m = F/g$), i.e. the cylinder pressure is directed onto a load cell which works on the principle of electromagnetic force compensation.

This unique measuring principle of digital pressure balances in combination with pressure controllers enables a fully-automatic calibration with the highest accuracy. With the integrated measurement module for environmental conditions, the reference value is automatically corrected.
Pressure sensor and pressure sensor with display or pressure indicator

Electrical measuring systems which convert pressure into an electrical signal and optionally visualize it.

Pressure sensors and indicators convert the physical property of pressure into a proportional electrical signal which is accessible via analog or digital interface for further use or processing. Indicators usually offer, in addition to displaying the signal in various pressure units, the ability to use diverse functions such as MIN/MAX memory, etc.

The resource needed in this case is a power supply.

**Advantage:** pressure signal available via electrical interface and, if required, displayed visually.

Pneumatic Pressure Controller

Electronic controllers which quickly and automatically provide a pressure output from a supply pressure.

**Pneumatic:** An entered set point, set via keypad or electrical interface, is quickly and accurately made available at the output (test port), using a precision pressure sensor and a regulator. To control pressure values lower than the ambient air pressure, a vacuum source must also be connected to the device.

**Hydraulic:** Here, a fluid medium (e.g. distilled water) is compressed by the control unit. This is done by a closed-loop control circuit based on a pneumatic primary control circuit (175 ... 435 psi /12 ... 30 bar) and a mechanical pressure multiplier with a hydraulic output (secondary circuit).

The resources needed in this case are, in addition to a power supply, a pressure supply and if needed a vacuum source.

**Advantage:** Fast pressure output and full automation via electrical interface. The Sensor provides continuous feedback to the regulator via the control algorithm to precisely control the output.
Operating Principle

AC Resistance Thermometry Bridges

When a constant current is passed through a thermometer of resistance $R_t$ and a fixed reference resistor of known value $R_s$, the voltage across them will be in direct proportion to their resistance values. The ratio of the two voltages and therefore of the two resistors, can be measured very accurately using high-precision potentiometer techniques employed in the ASL AC bridges. As $R_s$ is known, $R_t$ can be determined from $n = R_t/R_s$, where $n$ is the measured ratio.

The Advantages of the AC Resistance Bridge

ASL's low-frequency AC (alternating current) bridge technology has major advantages over DC (direct current) systems for high-precision measurement of platinum resistance thermometers, two of which are:

- DC generates small voltages in the thermometer, reference resistor and cables, across every junction where different materials are used, for example copper, tin, platinum, palladium, nickel etc. These voltages, which add to or subtract from the measured voltages, are dependent on the various temperature differences at these junctions, hence they are referred to as “Thermal EMFs”. These variable voltages cause measurement errors and the more accurate DC bridge systems switch the polarity of the current to try to solve the problem, taking between 2 and 4 seconds for each reversal. The ASL AC bridges with their AC current perform this reversal automatically 75 times a second, a much more effective solution.

- Active circuits, which are fundamental to the performance of DC systems suffer from ambient temperature changes and the effects of component aging. Fundamental to the ASL AC bridges accuracy is its inductive potentiometer - a passive, precision voltage divider, the performance of which is unaffected by ambient temperature change and by time. DC bridges require very stable and accurate electronics to achieve their performance. Because active circuitry within the AC bridge is secondary to performance, the effects of active component drifts and aging are therefore minimised. This results in an instrument which does not require regular recalibration to remain within specification.
**Dry-well Calibrators**

Electronic controllers which automatically supply a temperature in a dry block.

These instruments produce a controllable temperature within a solid block, to calibrating thermometers in the bores within the block.

A temperature dry-well calibrator consists, at the very least, of a solid block, a temperature control unit for the block and a calibrator thermometer (internal reference) with a display for determining the block temperature.

---

**Calibration Baths**

Electronic controllers which automatically supply a temperature in a liquid bath.

These instruments produce a controllable temperature within a liquid tank, to calibrating thermometers.

A micro calibration bath consists, at the very least, of a liquid tank, a correctly selected liquid for the tank and a calibrator thermometer (internal reference) with a display for determining the tank temperature. The components mentioned above are combined as a compact instrument.
Mensor has established a reputation for world-class service and support by providing customers with skilled technical assistance, quality service and re-calibrations with fast turn-around times.

**Precision Pressure Calibration**

Calibration services are provided for all of Mensor’s product lines as well as a wide range of other pressure instrumentation from manufacturers such as GE, Druck, Fluke, Ruska, DHI, PSI, Rosemount and Heise.

The Mensor calibration laboratory is controlled by a Quality Management System (QMS) that has been certified to ISO 9001:2008 and accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 and also meets the requirements of ANSI/NCSL Z540-1-1994. Accreditation is by the American Association for Laboratory Accreditation (A2LA). Both certificates can be viewed on the Mensor website at www.mensor.com.

Mensor’s calibration laboratory can calibrate pressure ranges from 10 inH2O up to 30,000 psi.

**Documentation Supplied**

Mensor provides a National Institute of Standards and Technology (NIST) traceable A2LA accredited 17025 Calibration Certificate with each calibration. Accredited calibration certificates are provided for all calibrations at no extra charge that are within our A2LA Scope Accreditation.

**Types of calibrations offered:**

- Absolute
- Differential
- Gauge
- Vacuum
- Compound
- Pneumatic media
- Hydraulic media
- Altitude
- Airspeed

Contact Mensor or email tech.support@mensor.com for information on your specific requirements. Fill out and print the Product Return Form on the Mensor website to provide us with instructions needed for calibration services.
Mensor Repair Services

Instrument Repair Service

Mensor's objective is to provide quality customer support whether troubleshooting an instrument over the telephone or servicing a customer-owned instrument at our facility. We will make every attempt to assist you in solving your problem or repairing your instrument at your place of business. Our teams of service technicians have over 75 years of combined instrument repair experience for a wide range of WIKA Calibration Technology products such as:

- Mensor pressure controllers and gauges
- DH-Budenberg Industrial Deadweights
- Desgranges & Hout Primary Deadweight Standards
- ASL Thermometry Bridges
- WIKA Temperature Calibrators

Before returning an instrument for repair, please contact Mensor's Customer Service Dept or email Customer service at tech.support@mensor.com who can provide you with an estimated price and approximate lead time. Fill out the Product Return Form and include the printed confirmation email within the return package and send to the following address:

Instrument Repair Service
Mensor
201 Barnes Drive
San Marcos, TX 78666
Toll Free: (800) 984-4200 (USA & Canada only)
Tel: (512) 396-4200
Fax: (512) 396-1820
Email: tech.support@mensor.com

Firm Price Quotation
After the instrument is received by Mensor, a thorough check is made of the instrument. It is only after this step that we can provide you with a firm price and full description of the service to be performed for your final approval.

Warranty Policy
New products have up to a 2-year warranty on parts and labor. Repair work is covered by a ninety (90) day warranty, which includes parts and labor. Please notify Mensor immediately if you experience a problem or if the instrument is not performing to your expectations.

Global Service Centers (4)

Mensor is committed to providing support within countries and regions where our products are used. We presently have four service centers located outside of the USA and we will be adding more service centers to support other area where Mensor products are used. Our Global Service Centers are presently located in:

Singapore
TIS Instruments
Gwee Cheng Yong
8@Trade Hub 21, #06-16
Boon Lay Way
Singapore 609964
Tel +65 6779 9272
Email: sales@tisinstruments.com

China
WIKA Instrumentation (Suzhou) Co., Ltd
Baggio Lee
81 Ta Yuan Road
SND, Suzhou 215011
Tel +86 512 6878 8000-607
Email: Baggio.Li@wika.com

Germany
DMT GMBH
Londoner Strasse 25
48455 Bad Bentheim - Gildehaus
Tel: +49 5924 783770
Fax: +49 5924 783777
Email: bergfeld@dmt-gmbh.com

Germany
WIKA Alexander Wiegand SE
63911 Klingenberg
Tel: +4909372 132-5049
Email: CTServiceteam@wika.com