

# Hand-held pressure calibrator with integrated pump

## Model CPH6600

WIKA data sheet CT 16.01



### Applications

- Calibration service companies and service industry
- Measurement and control laboratories
- Quality assurance

### Special features

- Measurement and electric pressure generation with integrated pump at the touch of a key, from -0.8 ... +20 bar
- Accuracy: 0.025 % (incl. calibration certificate)
- Generation/measurement of 4 ... 20 mA, and 24 V voltage supply to power transmitters
- Accurate temperature measurement with Pt100 resistance thermometer
- Robust and compact design



Hand-held pressure calibrator with integrated pump  
model CPH6600

## Description

### General information

The model CPH6600 hand-held pressure calibrator is a small, lightweight calibrator which can generate pressures of up to 20 bar and vacuum of -0.8 bar through an integrated, high-performance electric pump. The CPH6600 is only slightly larger than the model CPH6400 precision hand-held pressure indicator and weighs less than 1 kg. Due to its compact and ergonomic design the CPH6600 is very lightweight and user-friendly.

### Accuracy

The CPH6600 provides an accuracy of 0.025 % FS for the built-in pressure sensor. The temperature compensation of the built-in sensor safeguards the accuracy for applications in the field. Readings can be displayed in one of 15 standard units.

### Features

A connection for an external pressure module supports all model CPT6600 and CPT6100 WIKA/Mensor pressure modules. Thus a pressure measurement is possible for even wider pressure measuring ranges and better accuracy. In addition, in combination with an external temperature sensor,

simultaneous temperature measurement is also possible with the CPH6600. Additional functions, such as pressure switch tests and the display of the test items deviation in percent, increase the user-friendliness of the CPH6600.

### Software

The WIKA-CAL calibration software is available for online calibration in combination with a PC. Using this software, the data is automatically transferred into a printable calibration certificate. Furthermore, WIKA-CAL also offers, over and above PC-supported calibration, the management of the calibration and instrument data in an SQL database.

### Complete service case

For maintenance and service applications, a fully equipped service case system is available.

### Certified accuracy

For the model CPH6600 hand-held pressure calibrator, the accuracy is certified by a factory calibration certificate which accompanies the instrument. On request, we can provide a DKD/DAkkS calibration certificate for this instrument.

# Specifications

## Model CPH6600

### Measuring ranges

| <b>Pressure</b>          |   |                     |                  |
|--------------------------|---|---------------------|------------------|
| Gauge pressure           | -0.8 ... +2 bar   | -0.8 ... +10 bar    | -0.8 ... +20 bar |
| Overpressure safety      | 4 bar   | 13 bar              | 40 bar           |
| Burst pressure           | 20 bar  | 20 bar              | 135 bar          |
| <b>Absolute pressure</b> |   |                     |                  |
| Absolute pressure        | 0,2 ... 2 bar abs.  | 0,2 ... 10 bar abs. |                  |
| Overpressure safety      | 4 bar abs.  | 13 bar abs.         |                  |
| Burst pressure           | 20 bar abs.   | 20 bar abs.         |                  |
| Accuracy                 | 0.025 % FS  |                     |                  |
| Resolution               | 5-digit   |                     |                  |
| <b>Current</b>           |   |                     |                  |
| Measuring range          | 0 ... 24 mA (max. load 1,000 Ω)   |                     |                  |
| Resolution               | 1 μA  |                     |                  |
| Accuracy                 | 0.015 % of measured value ±2 μA (simulation and measurement)  |                     |                  |
| <b>Voltage</b>           |   |                     |                  |
| Measuring range          | DC 0 ... 30 V   |                     |                  |
| Resolution               | 1 mV  |                     |                  |
| Accuracy                 | 0.015 % of measured value ±2 mV (measurement)   |                     |                  |
| <b>Temperature</b>       |   |                     |                  |
| Measuring range          | -40 ... +150 °C   |                     |                  |
| Resolution               | 0.01 °C   |                     |                  |
| Accuracy                 | 0.015 % of measured value ±20 mΩ, or 0.2 °C for complete measuring chain (Pt100 resistance thermometer and CPH6600) |                     |                  |

### Base instrument

| Pressure connection                   | ½ NPT female   |
|---------------------------------------|--|
| Permissible media                     | clean, dry, non-corrosive gases compatible with silicon, Pyrex, RTV, gold, ceramic, nickel and aluminium   |
| Temperature compensation              | 15 ... 35 °C   |
| Temperature coefficient               | 0.005 % of the span/°C outside of 15 ... 35 °C   |
| Units                                 | psi, bar, mbar, kPa, MPa, kg/cm <sup>2</sup> , mmH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O (20 °C), cmH <sub>2</sub> O (4 °C), cmH <sub>2</sub> O (20 °C), inH <sub>2</sub> O (4 °C), inH <sub>2</sub> O (20 °C), inH <sub>2</sub> O (60 °F), mmHg (0 °C), inHg (0 °C) |
| <b>Output</b>                         |  |
| Voltage supply                        | DC 24 V  |
| <b>Power supply</b>                   |  |
| Batteries                             | DC 12 V, eight AA batteries  |
| Battery life <sup>1)</sup>            | 125 pump cycles to 20 bar<br>300 pump cycles to 10 bar<br>1,000 pump cycles to 2 bar   |
| <b>Permissible ambient conditions</b> |  |
| Operating temperature                 | -10 ... +50 °C   |
| Storage temperature                   | -20 ... +60 °C   |
| Relative humidity                     | 35 ... 85 % r. h. (no condensation)  |
| <b>Communication</b>                  |  |
| Interface                             | RS-232 via special interface cable   |

1) Minimum data for the included batteries.

| Case       |                                |
|------------|--------------------------------|
| Material   | Blend of polycarbonate and ABS |
| Dimensions | 103.3 x 229.0 x 70.7 mm        |
| Weight     | 950 g                          |

| EC conformity, approvals and certificates |  |
|---|--|
| <b>EC conformity</b>                      |  |
| EMC directive                             | 2004/108/EC, EN 61326 emission (group 1, class B) and interference immunity (portable measuring equipment) |
| <b>Approval</b>                           |  |
| GOST                                      | Metrology/measurement technology, Russia   |
| <b>Certificate</b>                        |  |
| Calibration                               | Standard: 3.1 calibration certificate per DIN EN 10204<br>Option: DKD/DAkkS calibration certificate        |
| Recommended calibration interval          | 1 year (dependent on conditions of use)  |

Approvals and certificates, see website

## Available pressure ranges and their resolutions

| Pressure ranges and factors |                     |                 |                  |                  |
|-----------------------------|---------------------|-----------------|------------------|------------------|
|                             | Gauge pressure      | -0.8 ... +2 bar | -0.8 ... +10 bar | -0.8 ... +20 bar |
|                             | Overpressure safety | 4 bar           | 13 bar           | 40 bar           |
|                             | Burst pressure      | 20 bar          | 20 bar           | 135 bar          |
| Unit                        | Conversion factor   |                 |                  |                  |
| psi                         | 1                   | 30.000          | 150.00           | 300.00           |
| bar                         | 0.06894757          | 2.0684          | 10.342           | 20.684           |
| mbar                        | 68.94757            | 2,068.4         | 10,342           | 20,684           |
| kPa                         | 6.894757            | 206.84          | 1,034.2          | 2,068.4          |
| MPa                         | 0.00689476          | 0.2068          | 1.0342           | 2.0684           |
| kg/cm <sup>2</sup>          | 0.07030697          | 2.1092          | 10.546           | 21.092           |
| cmH <sub>2</sub> O (4 °C)   | 70.3089             | 2,109.3         | 10,546           | 21,093           |
| cmH <sub>2</sub> O (20 °C)  | 70.4336             | 2,113.0         | 10,565           | 21,130           |
| mmH <sub>2</sub> O (4 °C)   | 703.089             | 21,093          | -                | -                |
| mmH <sub>2</sub> O (20 °C)  | 704.336             | 21,130          | -                | -                |
| inH <sub>2</sub> O (4 °C)   | 27.68067            | 830.42          | 4,152.1          | 8,304.2          |
| inH <sub>2</sub> O (20 °C)  | 27.72977            | 831.89          | 4,159.5          | 8,318.9          |
| inH <sub>2</sub> O (60 °F)  | 27.70759            | 831.23          | 4,156.1          | 8,312.3          |
| mmHg (0 °C)                 | 51.71508            | 1,551.5         | 7,757.3          | 15,515           |
| inHg (0 °C)                 | 2.03602             | 61.081          | 305.40           | 610.81           |

## Features

### Temperature, current and voltage

A Pt100 resistance thermometer (RTD) is available as an option for measuring temperatures with an accuracy of  $\pm 0.2$  °C. In addition the CPH6600 measures and simulates also a 4 ... 20 mA loop current signal, can measure up to DC 30 V and comes with an internal DC 24 V power supply to power the transmitter being calibrated.

### Display

The CPH6600 displays up to three calibration values simultaneously. This means that the internal pressure sensor, an external pressure sensor, the temperature (from an optional temperature sensor) or electrical values (mA or DC V) can be displayed simultaneously. The instrument has a large graphical LCD display with backlighting

### Pressure ranges

The CPH6600 can be delivered in different ranges of 2 bar, 10 bar and 20 bar relative as well as 2 bar and 10 bar absolute. Each pressure range can be generated with the integrated electric pump at the touch of a key. The fine adjustment will be done with the internal volume slide.

## Functions

The new CPH6600 pressure calibrator has a complete range of useful functions. Switch tests can be performed via the internal or external pressure input. The deviation of the test item is calculated directly from the CPH6600 and indicated on the display.

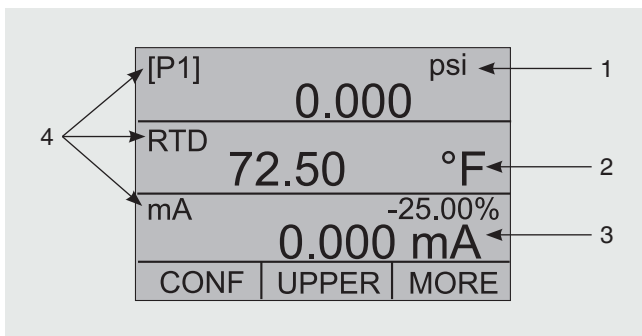
A damping function is available. Up to five frequently used instrument settings can be stored and then retrieved at the touch of a key.

Similarly, high-accuracy model CPT6100 external pressure sensors can be connected via a sensor cable. This allows accuracies of up to 0.01 % to be achieved.

### Compact and robust

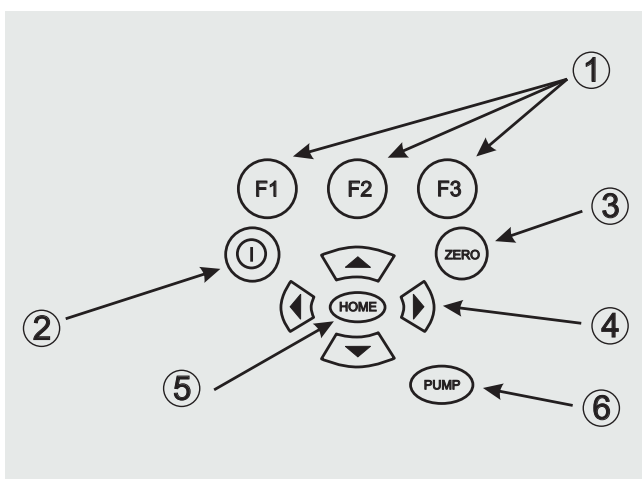
The CPH6600, with its compact and robust design, is powered by eight standard AA batteries. Through the integrated power-save function of the CPH6600, the battery pack has a life of a minimum of 125 pump cycles to 20 bar, 300 pump cycles to 10 bar and 1,000 pump cycles to 2 bar.

## Display layout



- 1) Pressure units**  
Indication of the pressure unit (selectable from 15 pressure units)
- 2) Units**  
Indication of the measuring unit
- 3) Display of the span**  
Indication of the 4 ... 20 mA span (only for the functions mA and mA current loop)
- 4) Primary parameters**  
Indication of the current measured parameters

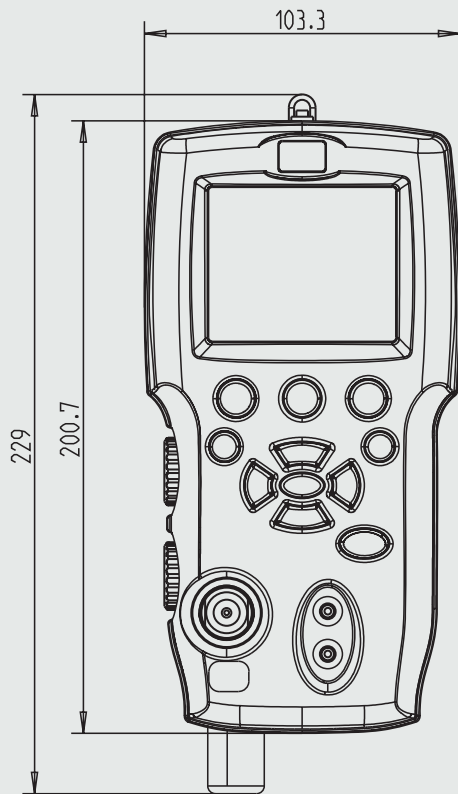
## Keypad



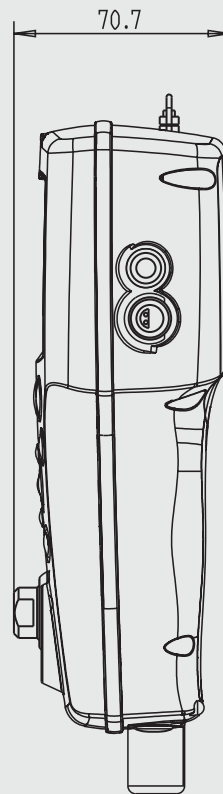
- 1) Function keys**  
Configuration of the calibrator
- 2) ON/OFF key**  
Turning the calibrator on and off
- 3) ZERO key**  
Zeroing of the pressure measurement
- 4) Arrow keys**  
Control of the current source/current simulation and adjustment of the pump limit and the %-error limit
- 5) HOME key**  
Return to main menu
- 6) PUMP key**  
Start-up of the pump operation

## Dimensions in mm

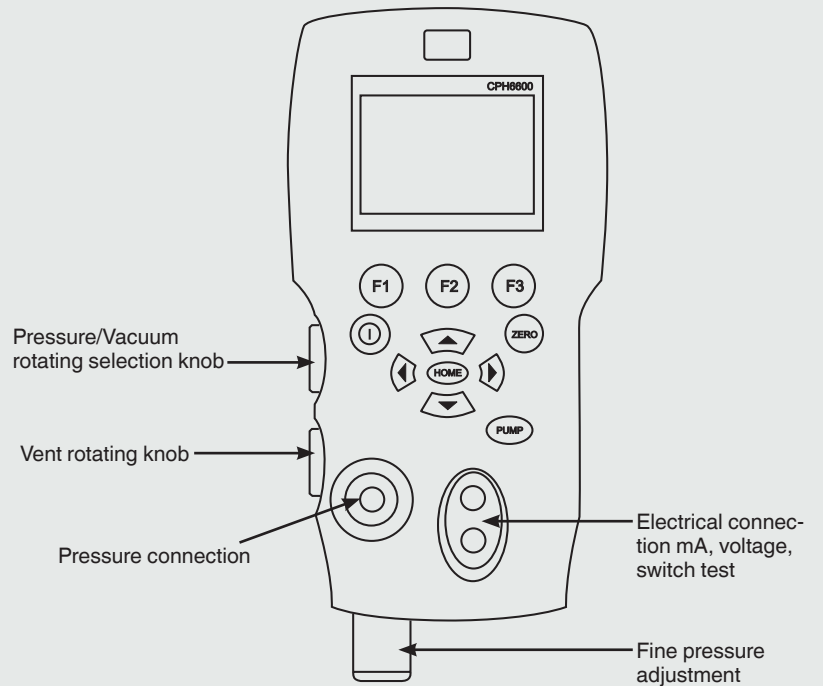
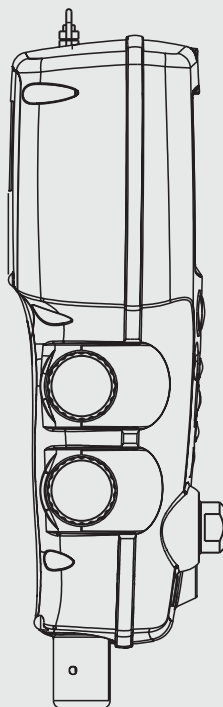
Front view



Side view, right

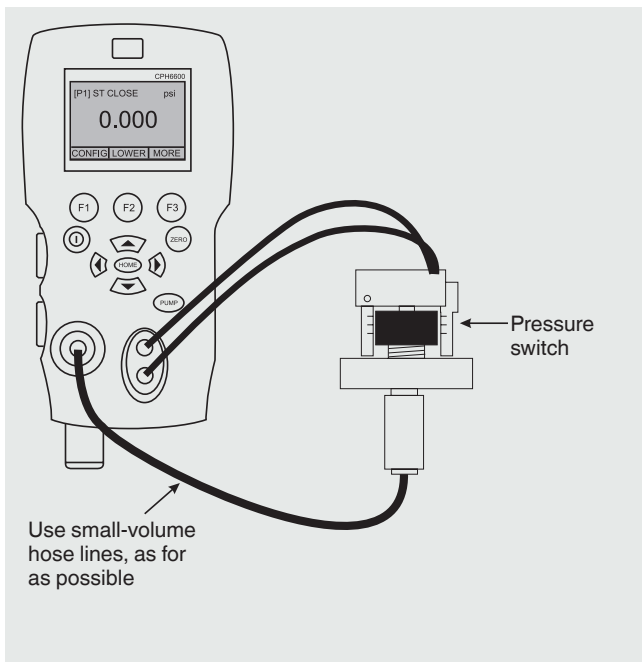


Side view, left



## Special operating modes

### Operating mode: pressure switch test



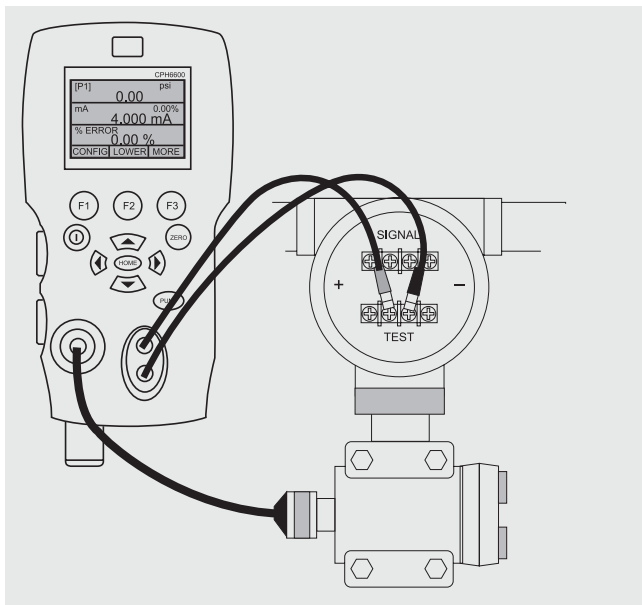
#### Pressure switch test

With the pressure switch function, the CPH6600 can indicate the pressures at which the switch closes or opens. In addition, the hysteresis can be calculated.

In the switch test mode the display update rate is increased to capture changing pressure inputs quickly.

If required, the ambient or medium temperature can be measured with an external Pt100 resistance thermometer simultaneously.

### Operating mode: calibrating transmitters and %-error function



#### Calibrating transmitters

With the mA measuring function, the 4 ... 20 mA output of the instrument which is currently being calibrated can be read. This can be done in two ways.

- 1) **Passively** – the device under test generates 4 ... 20 mA directly. The value is read on the calibrator.
- 2) **Actively** – the calibrator supplies a voltage of DC 24 V to the device under test to power the device while reading the resulting 4 ... 20 mA signal.

The calibrator features a special function which can calculate the error in the pressure value from the mA value as a percentage of the 4 ... 20 mA span. The %-error mode uses all three screens and has a special menu structure. It displays pressure, mA and %-error simultaneously.

#### Example:

A transmitter to be tested has a measuring range of 2 bar and outputs a corresponding 4 ... 20 mA signal. The user can program in a 0 ... 2 bar pressure span into the calibrator and the calibrator will then calculate and display the deviation or error in a percentage value of the 4 ... 20 mA output. This is produced without the need for any manual calculation, which is also an advantage if it is difficult to set an accurate pressure using an external pump.

## Dirt trap

The CPH6600 should only be used with dry and clean test items. Soiling of the integrated pump, for example through contaminated test items, can cause a defect or require the pump to be cleaned.

By using the dirt trap specifically developed for the CPH6600, contamination of the integrated pump can be prevented.

## Using the dirt trap

The dirt trap is attached, hand-tight, to the calibrator's pressure connection. The seal is made by the O-ring incorporated into the dirt trap's  $\frac{1}{8}$  NPT male thread. The maximum working pressure is limited to 35 bar.

The test item is mounted to the upper connection of the dirt trap, using a suitable sealing method. The connection to the test item is usable universally as  $\frac{1}{8}$  NPT female or  $\frac{1}{8}$  BSP female. Use a  $\frac{7}{8}$ " or 23 mm spanner on the hex of the upper pressure port to connect the test item with the dirt trap.

As soon as either moisture or dirt can be seen in the transparent chamber, the dirt trap should be removed and cleaned.

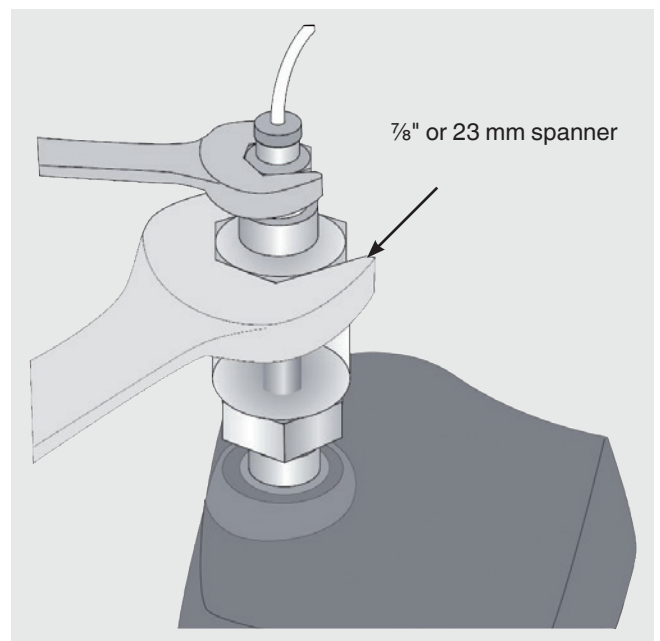
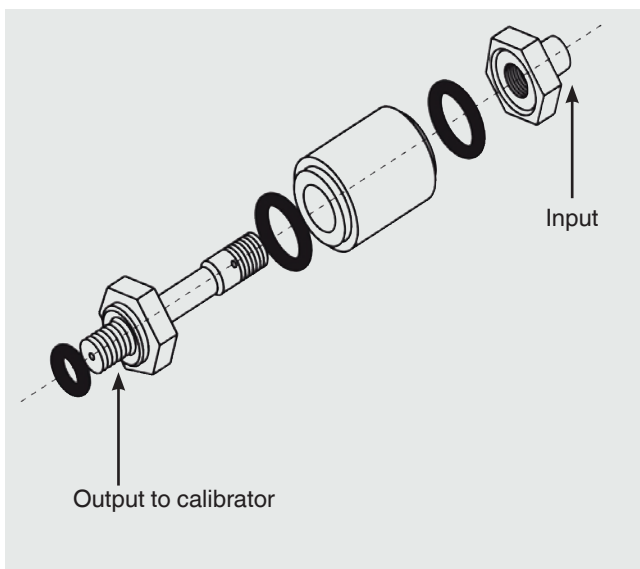
Once the upper dirt trap connection has been unscrewed, the transparent acrylic chamber and the O-rings can be removed and cleaned with a clean cloth.



Hand-held pressure indicator with mounted dirt trap



Dirt trap





# WIKA-CAL 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.

A template helps the user and guides him through the creation process of a document.

In order to switch from the demo version to a full version of the respective template, a USB key with the template 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.



- Creation of calibration certificates for mechanical and electronic pressure measuring instruments
- A calibration assistant guides you through the calibration
- Automatic generation of the calibration steps
- Generation of 3.1 certificates in accordance with DIN EN 10204
- Creation of logger protocols
- User-friendly interface
- Languages: German, English, Italian and more due with software updates

For further information see data sheet CT 95.10

Calibration certificates can be created with the Cal-Template and logger protocols can be created with the Log-Template.



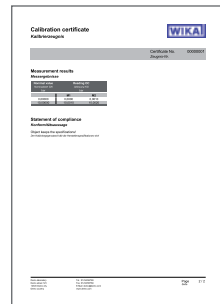
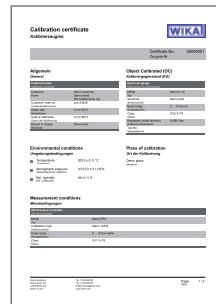
### Cal Demo

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.



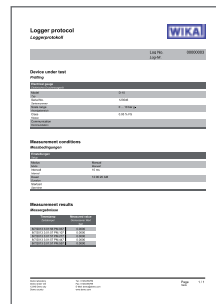
### Log Demo

Creation of data logger test reports, limited to 5 measured values.



### Log

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





## Scope of delivery

- Model CPH6600 hand-held pressure calibrator with integrated pump
- Operating instructions
- Test cables
- Calibration hose with 1/8 NPT male thread connections
- Adapter set consisting of:
  - 1/8 NPT female to 1/4 NPT female
  - 1/8 NPT female to 1/4 BSP female
  - 1/8 NPT female to G 1/2 female
- PTFE thread seal tape
- Eight AA batteries
- 3.1 calibration certificate per DIN EN 10204



Hand-held pressure calibrator with service case

## Option

- DKD/DAkkS certified accuracy

## Accessories

### Connection adapters

- Various pressure adapters

### Dirt trap

- Dirt trap (Order no. 13477103)

### Temperature probe

- Pt100 resistance thermometer (Order no. 13274130)

### Power supply

- Battery set, consisting of four rechargeable AA batteries (Order no. 12981746)
- Battery charger set, consisting of eight rechargeable AA batteries, quick charger, power cord, adapter set (Order no. 14055054)

### Connection cables

- RS-232 interface cable (Order no. 14006096)

### Test cases

- Service case (Order no. 13374657)

### Software

- WIKA-CAL calibration software

## Ordering information

Model / Unit / Pressure range / Type of certificate / Temperature probe / Temperature calibration / Dirt trap / Transport case / Additional ordering information

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