Portable process calibrator
Model CPH7000

WIKA data sheet CT 15.51

Applications

- Calibration service companies and service industry
- Measurement and control laboratories
- Quality assurance
- On-site calibration

Special features

- Manual pressure generation of -0.85 … +25 bar (12.3 ... +360 psi)
- Accuracy: 0.025 % FS (incl. calibration certificate)
- Generation/measurement of 0 ... 30 mA and voltage supply DC 24 V
- Data logger with high measuring rate and large memory
- A calibration assistant guides you through the calibration

Portable process calibrator model CPH7000 with optional hand pump

Description

General information
The model CPH7000 process calibrator is a precise, portable calibrator for the calibration and checking of analogue pressure measuring instruments, pressure transmitters and process transmitters. Furthermore, pressure switches can be checked and the switching point determined. With the CPH7000, not only can transmitters be checked, but also simulated and tested.

Design
The CPH7000 optionally features an integrated reference pressure sensor and also a manual pressure generation, with which pressures of -0.85 ... +25 bar (12.3 ... +360 psi) can be generated. It is possible to simultaneously power an external transmitter via the electrical module and to measure (or also simulate) its output signal.

Functions
The calibrator offers the possibility to set calibration routines quickly and easily, but also to run preconfigured calibration routines and automatically save the measured values. Over the WIKA-Wireless interface, the completed calibration processes can be transmitted to a PC. This data can subsequently be evaluated and archived using WIKA-CAL software. Thus a completely paperless transmitter calibration is possible with just the CPH7000.

Accuracy
The CPH7000 is compensated over a wide temperature range of 10 ... 50 °C (50 ... 122 °F) and achieves an accuracy of 0.025 % of span. In order to avoid intricate calculations, the measured values can also be displayed directly in customer-specific units.

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Features

For pressures greater than 25 bar (362.6 psi), there are the model CPT7000 external pressure sensors.
Thus pressure measurement and calibration is possible in further pressure measuring ranges and accuracies.
An optional atmospheric module records and documents the environmental parameters important for a calibration, such as atmospheric pressure, air humidity and ambient temperature.

Complete service case

The process calibrator, developed specifically for maintenance and service operations, is delivered in a portable case system and, depending on requirements, can be equipped with, for example, model CPT7000 external pressure sensors, a Pt100 temperature sensor or a portable system with storage bag.

Software

The calibration software for the CPH7000 is WIKA-CAL. WIKA-CAL, alongside PC-supported calibration and the logger function, also offers the management of the calibration and instrument data in an SQL database. The data transfer is achieved completely wirelessly via WIKA-Wireless.

Certified accuracy

For the model CPH7000 process calibrator, the accuracy is certified in a factory calibration certificate accompanying the instrument. On request, we can provide a DKD/DAkkS calibration certificate.

Specifications

Digital process calibrator model CPH7000	
Display	
Display	Touchscreen colour display
Display resolution	up to 5 digits; selectable
Pressure units	mbar, bar, psi, Pa, kPa, hPa, MPa, mmHg, cmHg, inHg, mmH_2O, mH_2O, inH_2O (4 °C), inH_2O (20 °C), inH_2O (60 °F), inHg (0 °C), inHg (60 °F), kg/cm^2, kp/cm^2, lbf/ft^2, kN/m^2, atm, Torr, micron, g/l (20 °C), kg/m^3 (20 °C) as well as two user-defined units
Settings	
Applications (Apps)	Measure, calibrate, logger, switch test
Measuring rate	50 values/s
Menu languages	English, German, Spanish, French, Italian, Russian, Arabic, Chinese (settable)
Connections	
External pressure sensor [1]	max. 2, compatible with model CPT7000 reference pressure sensors
External ambient module [1]	max. 1 ambient module [2]
External temperature probe [1]	max. 1 temperature probe [2]
Manual pressure generation [1]	-0.85 … +25 bar (-12.3 ... +360 psi)
Voltage supply	
Power supply	internal Lithium-Ion rechargeable battery (typical charging time: < 5 h)
Battery life	typical 8 hours [3]
Permissible ambient conditions	
Operating temperature	-20 ... +50 °C (-4 ... +122 °F)
Storage temperature	-20 ... +60 °C (-4 ... +140 °F)
Relative humidity	0 ... 85 % r. h. (non-condensing)
Shock and vibration	15 g per EN 60068-2-6
Reference conditions per IEC 61298-1	
Atmospheric pressure	860 hPa < P < 1,060 hPa (12.5 psi < P < 15.4 psi)
Ambient temperature	18 °C < T < 28 °C, typ. 23 °C
Relative humidity	35 % r. h. < T < 95 % r. h. , typ. 55 % r. h.
Position	Hand-held lying face-up

[1] Available as an option
[2] Temperature probe and ambient module use the same connection.
     Cannot be used at the same time.
[3] Continuous operation (without backlighting, WIKA-Wireless deactivated and the electrical module gives no voltage/current).

Digital process calibrator model CPH7000

Communication

Interface	WIKA-Wireless [4]

Case

Material	PC + ABS blend
Ingress protection	IP54 category 2
Dimensions	see technical drawing
Weight	approx. 1.9 kg (4.19 lbs.) without internal pump and reference sensor approx. 2.5 kg (5.51 lbs.) incl. internal pump and reference sensor

[4] Requires a PC with Bluetooth® 2.1 interface

Sensor technology

Pressure [5]

Gauge pressure	bar	-1 ... +1	-1 ... 5	-1 ... 10	-1 ... 20	-1 ... 25	
	psi	-14.5 ... +14.5	-14.5 ... +70	-14.5 ... +145	-14.5 ... +300	-14.5 ... +360	
Absolute pressure	bar abs.	0 ... 1	0 ... 1.6	0 ... 6	0 ... 10	0 ... 20	0 ... 25
	psi abs.	0 ... 14.5	0 ... 23	0 ... 87	0 ... 145	0 ... 290	0 ... 360

Overpressure safety	3 times
Accuracy of the measuring chain	0.025 % of span [6]
Resolution	5 digits
Pressure connection	G 1/8 female thread (only with selected pneumatic unit)

Electrical safety:

Resistance to overvoltage	Yes
Short-circuit resistant	Yes
Reverse polarity protection	Yes
Voltage-resistant	Up to 60 V

Input impedance

Current measurement	20 Ω
Voltage measurement	1 MΩ

Current

Measuring range	0 … 30 mA
Supply	0 … 30 mA
Resolution	1 µA
Accuracy	Measure: 0.01 % ±1 µA Supply: 0,01 % ±2 µA [7]

Voltage

Measuring range	DC 0 … 30 V
Supply	DC 24 V
Resolution	1 mV
Accuracy	0.01 % or reading ±1 mV

Barometric reference [1] [8]

Measuring range	850 ... 1,100 mbar (12.3 ... 16 psi)
Accuracy	±1 mbar

[1] Available as an option
[5] The internal reference sensor is only available in combination with a pneumatic unit.
[6] Calibrated at 23 °C (74 °F) and in vertical mounting position.
[7] In the event of interference caused by high-frequency electromagnetic fields in a frequency range of 200 ... 300 MHz, an increased deviation of up to 0.1 % is expected for the current output function.
[8] The barometric reference can be used to switch pressure types, absolute <=> gauge. With gauge pressure sensors, the measuring range of the sensors must begin with -1 bar (-15 psi) in order to carry out a complete absolute pressure emulation.

Power supply unit

Input voltage	AC 100 ... 240 V, 50 ... 60 Hz
Output voltage	DC 12 V
Nominal Output current	2,500 mA
Permissible ambient conditions	
Operating temperature	0 ... 40 °C (32 ... +104 °F); up to 90 % r. h. (non-condensing)
Storage temperature	-40 ... +70 °C (-40 ... +158 °F)
Relative humidity	20 ... 80 % r. h. (non-condensing)

Temperature probe Pt100 [2]

Measuring range	-50 ... +250 °C (-58 ... +482 °F)
Accuracy	1/10 DIN, classe B ±0.1 °C
Probe length	200 mm (7.87 in)
Probe diameter	3 mm (0.12 in)
Cable length	1 m (3.28 ft)
Connection to CPH7000	max. 1 temperature probe [2]
User-defined RTD probe	Input of the coefficients of R0, A, B and C

Ambient module [2]

Measuring range	
Relative humidity	0 ... 100 % r. F.
Temperature	-40 ... +125 °C (-40 ... +257 °F)
Accuracy	
Relative humidity	±1.8 % r. F.
Temperature	±0.2 °C (0.36 °F)
Connection to CPH7000	max. 1 ambient module [2]

WIKA-Wireless [4]

Frequency range	2,400 ... 2,500 MHz
HF output power	max. 2 dBm (+ 2 dBi)
Number of channels	79
Channel spacing	1/2 MHz
Bandwidth	80 MHz
Output power	4 dBm / 10 mW

Reference pressure sensor model CPT7000

Pressure range						
Gauge pressure	bar	-0.25 ... +0.25	-0.4 ... +0.4	-0.6 ... +0.6	-1 ... 0	-1 ... +0.6
		-1 ... +1	-1 ... +1.5	-1 ... +2.5	-1 ... +3	-1 ... +5
		-1 ... +9	-1 ... +10	-1 ... +15	-1 ... +24	-1 ... +25
		-1 ... +39	-1 ... +40			
		0 ... 0.25	0 ... 0.4	0 ... 0.6	0 ... 1	0 ... 1.6
		0 ... 2.5	0 ... 4	0 ... 6	0 ... 10	0 ... 16
		0 ... 25	0 ... 40	0 ... 60	0 ... 100	0 ... 160
		0 ... 250	0 ... 400	0 ... 600	0 ... 700	0 ... 1.000

[2] Temperature probe and ambient module use the same connection.
  Cannot be used at the same time.
[4] Requires a PC with Bluetooth® 2.1 interface

Reference pressure sensor model CPT7000							
Gauge pressure	psi	-4 ... +5	-6 ... +6	-8 ... +8	-14.5 ... 0	-14.5 ... +8
		-14.5 ... +14.5	-14.5 ... +23	-14.5 ... +36	-14.5 ... +44	-14.5 ... +70
		-14.5 ... +130	-14.5 ... +145	-14.5 ... +220	-14.5 ... +350	-14.5 ... +360
		-14.5 ... +565	-14.5 ... +580			
		0 ... 4	0 ... 6	0 ... 8	0 ... 14.5	0 ... 23
		0 ... 36	0 ... 60	0 ... 90	0 ... 145	0 ... 230
		0 ... 360	0 ... 580	0 ... 870	0 ... 1,450	0 ... 2,320
		0 ... 3,630	0 ... 5,800	0 ... 8,700	0 ... 10,150	0 ... 14,500
Absolute pressure	bar abs.	0 ... 0.25	0 ... 0.4	0 ... 0.6	0 ... 1	0 ... 1.6
		0 ... 2.5	0 ... 4	0 ... 6	0 ... 10	0 ... 16
		0 ... 25	0 ... 40			
	psi abs.	0 ... 4	0 ... 6	0 ... 8	0 ... 14.5	0 ... 23
		0 ... 36	0 ... 60	0 ... 90	0 ... 145	0 ... 230
		0 ... 360	0 ... 580			
Overpressure safety	3 times; < 25 bar 2 times; > 25 bar ≤ 600 bar 1.5 times; > 600 bar					

Process connection

Selectable versions	■ G ⅜ B ■ G ¼ B ■ G ¼ female thread ■ G ½ B ■ G ½ male thread to G ¼ female thread ■ G ½ B flush with O-ring from NBR ■ G ½ B flush with O-ring from EPDM ■ G 1 B flush with O-ring from NBR ■ G 1 B flush with O-ring from EPDM
	■ ¼ NPT ■ ½ NPT ■ ½ NPT male thread to ¼ NPT female thread ■ ½ NPT female thread
	■ M16 x 1.5 female with sealing cone ■ M18 x 1.5 male thread to G ¼ female thread ■ M20 x 1.5 ■ M20 x 1.5 female with sealing cone
	■ 9/16-18 UNF female thread F 250-C
	■ R ½ per ISO7 (DIN 2999)

Sensor data

Accuracy per year	0.025 % of span [6]
Resolution	5 digits
Compensated range	10 ... 60 °C (50 ... 140 °F)

Material

Wetted parts	Stainless steel (with measuring ranges ≤ 25 bar (≤ 360 psi) Elgiloy® in addition)
Internal transmission fluid	Synthetic oil (only for measuring ranges up to 25 bar (360 psi))

Permissible ambient conditions

Medium temperature	-20 ... +60 °C (-4 ... +140 °F)
Operating temperature	-20 ... +60 °C (-4 ... +140 °F)
Storage temperature	-20 ... +80 °C (-4 ... +176 °F)
Relative humidity	0 ... 95 % r. h. (non-condensing)
Temperature compensation	10 ... 60 °C (50 ... 140 °F)
Temperature coefficient	Zero point = 0.1 % / 10 K Span = 0.1 % / 10 K

6) Calibrated at 23 °C (74 °F) and in vertical mounting position.

## Reference pressure sensor model CPT7000

Case

Material	Stainless steel
Connection to the CPH7000	Option: External operation via 1 m or 3 m (3.28 ft or 9.84 ft) connection cable (plug-and-play)
Ingress protection	IP65 / IP67 when connected
Dimensions	see technical drawing
Weight	approx. 230 g (0.5 lbs.)

Certificates

Certificate

Calibration	Standard: 3.1 calibration certificate per EN 10204 Option: DKD/DAkkS calibration certificate
Recommended recalibration interval	1 year (dependent on conditions of use)

Approvals and certificates, see website

Dimensions in mm (in)

Digital process calibrator model CPH7000

Reference pressure sensor model CPT7000
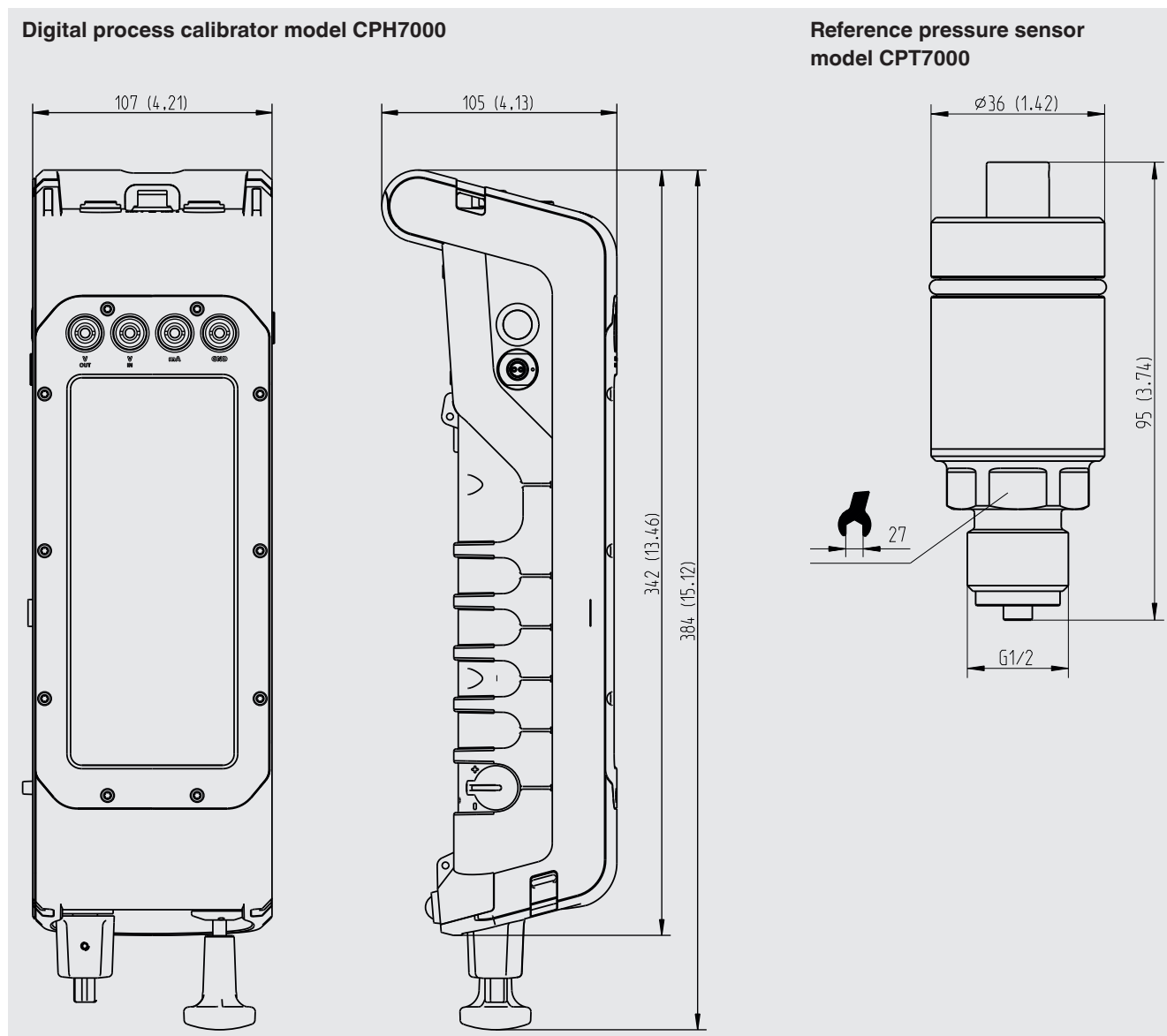
User interface

The home screen is very clearly subdivided into application-oriented apps:

Measure:
Display of 3 different measurements

Logger:
Simultaneous recording of up to 3 signals

Info:
All instrument information available at a glance

Remote:
WIKA-Wireless radio transmission settings

Calibrate:
Setting of calibrations using calibration assistant

Switch test:
Testing of pressure switches (NC or NO)

Settings:
General instrument settings

Service:
All service data at a glance
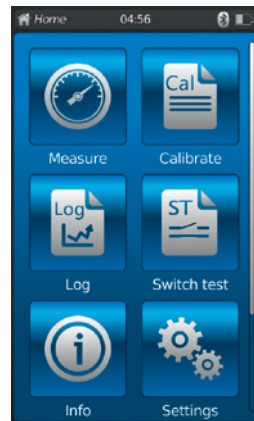
Special operating modes

Operating mode: Measure

Features
- 3 different measurements in one view
- 30 pressure units + 2 programmable units
- Resolution: Up to 4 decimal places
- Graphical display via bargraph
- Optionally settable functions: Min/Max/Tare/Filter/Alarm min/Alarm max/Mean value/Rate/Sensor temperature

Applications
- Measurement of operating/process pressures
- Comparative measurements with test items (power supply and display for the test item through the CPH7000)
- Maximum and Minimum memory (e.g. for leak testing)
- Alarm function for safety testing

For further information see the operating instruction.
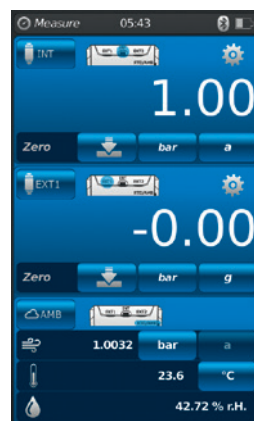
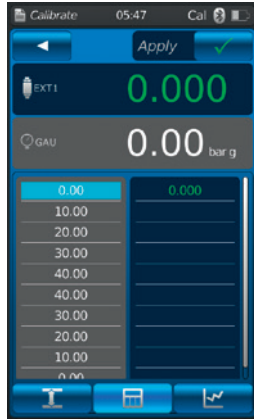Representation of possible measuring channels

Selection of the type of measurement or calibration

Operating mode: Calibrate
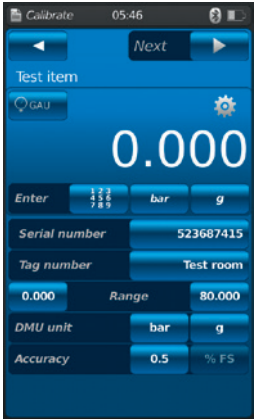
Menu screen of the application „Calibration"

Representation of calibration results as table

Representation of calibration results as graph

Features
- Calibration assistant
- Supply with pressure, current and voltage
- Calibration protocol is automatically saved

Applications
- On-site calibration of pressure sensor and pressure measuring instruments (without PC)
- A calibration assistant guides you easily through the calibration (following DKD/DAkkS). With this, the data sets, including date and time, are recorded within the CPH7000.
- Prior to calibration, the calibration routines can be set directly on the instrument or uploaded via WIKA-CAL software.
- Up to 100 calibrations can be stored
- Re-calibrations possible

PC software available
Communication with WIKA-CAL calibration software via WIKA-Wireless

Operating mode: Switch test

Menu screen of the application „Switch test"

Switch test with external voltage supply

Switch test with voltage supply DC 24 V of the CPH7000
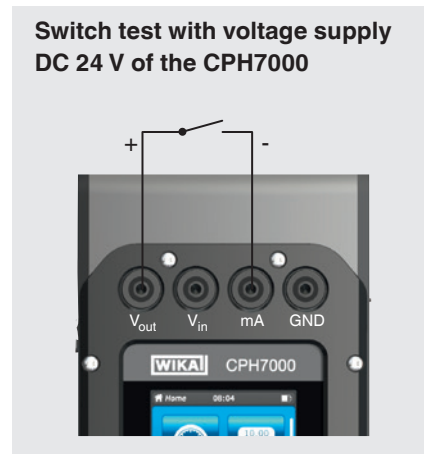
Features
- Pressure display on the closing and opening of the switch
- Automatic calculation of the hysteresis

Applications
- On-site functional check of pressure switches (without PC)
- Determination of the switch point accuracy and repeatability
- Determination of the switch point hysteresis

Operating mode: Logger

Menu screen of the application „Logger"

Representation of logger results as table

Representation of logger results as graph

Features
- Logging of max. 3 signals/measured value at the same time
- Automatic or manual data acquisition
- Direct display as graph or table
- Logger protocols are automatically saved

Applications
- Logging of current, voltage, pressure and temperature
- The logger menu guides one, step by step, through the logger process. The data sets, incl. date and time, are automatically saved in the CPH7000.
- Before logging the data, routines can be set directly on the instrument or uploaded via WIKA-CAL software.
- Re-logging possible

PC software available
Communication with WIKA-CAL calibration software via WIKA-Wireless

Operating mode: Simulation of transmitter signals
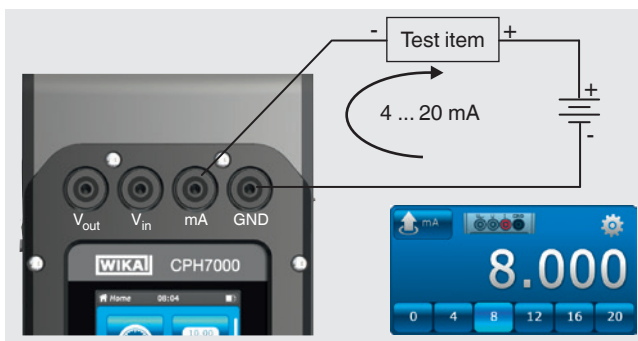
Features
Manual or automatic current source function

Applications
The CPH7000 can be connected in place of a transmitter within a current loop and used as a current source. The transmitter output signals from 0 ... 24 mA can be simulated through manual input or automatically using the ramp and step functions.

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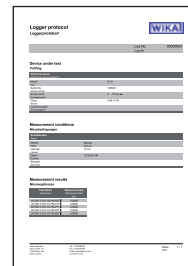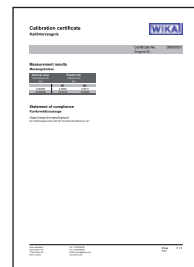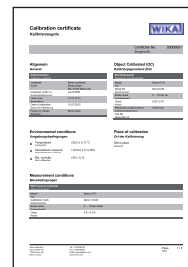
Log Demo
Creation of data logger test reports, limited to 5 measured values.

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

Scope of delivery

■ Process calibrator model CPH7000
■ Power supply unit
■ Operating instructions
■ Service case with 2 connection cables (banana plugs)
■ 3.1 calibration certificate per DIN EN 10204

Options

■ DKD/DAkkS calibration certificate

Accessories

Connection adapters
■ Various pressure adapters

Measuring equipment
■ External pressure sensors model CPT7000
■ Ambient module
■ Barometer
■ Pt100 measuring probe
■ Carrying system
■ Belt pocket for accessories

Software
■ WIKA-CAL calibration software

Process calibrator model CPH7000

Service case with process calibrator and accessories

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