Pressure calibrator
Standard version
Model CPH6000

WIKA data sheet CT 15.01

EAC | (G) | (CT)

for further approvals,
see page 11

Applications

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

Special features

- Digital indicator with easily interchangeable reference pressure sensors model CPT6000 (sensor can also be attached externally)
- Measuring ranges of sensor: from -1 ... 6,000 bar [-14.5 ... 87,000 psi]
- Accuracy: up to 0.025 % (incl. calibration certificate)
- Easy handling for calibration and pressure switch test function with calibration assistant
- Software compatible with WIKA-Cal

Pressure calibrator, model CPH6000
Above: With firmly mounted reference pressure sensor
Below: Reference pressure sensor via sensor connection cable

Description

The model CPH6000 is operated with a calibration assistant that automatically ensures complete documentation of all measuring results. The pressure calibrator enables completely paperless calibration on-site via a pressure sensor. The hand-held recognises the various reference sensors and relieves the user from having to configure them via the menu.

The reference pressure sensor model CPT6000 is available for the respective suitable application solution. The CPT6000 features accuracy down to 0.025 % and measuring ranges up to 6,000 bar [87,000 psi]. It can be replaced on the CPH6000 quickly and without using any tools. In addition to being fixed to the instrument, the CPT6000 can, optionally, be used via an approx. 1.1 m [3.6 ft] long sensor connection cable.

The pressure calibrator can be a complete measuring chain consisting of the various individual components or a complete test and service case (see page 15). The matching test pump is optionally available, depending on the case set.

For the evaluation and documentation of the calibration data stored in the CPH6000, WIKA-Cal calibration software is available. Using this software, the data is automatically transferred into a printable calibration certificate. For data transfer, an RS-232 and a USB interface are available.

WIKA
Part of your business

Functionalities

In the setup menu there are 3 operating modes to choose from:
MEASURING, CALIBRATION and SWITCH TEST. In the CALIBRATION and SWITCH TEST modes, a menu assistant supports the user during each operation and records, for example, the calibration data from several calibrations or automatically calculates the switch hysteresis.

To power the test item and to read its measuring signals, there are electrical inputs and outputs which are protected from adverse conditions in the field by captive protective caps.

Operating mode: MEASURING

Features

- 15 pressure units + 1 programmable unit
- Programmable functions: Min./Max./Tare/Filter/Alarm/Altitude correction
- The display of the test item measured value is also possible as an original electrical signal (mA/V)

Applications

- Measurement of operating/process pressures
- Comparative measurements with test items (power supply and display for the test item through the CPH6000)
- Min. and Max. memory (e.g. for leak testing)
- Alarm function for safety testing

Example: CPH6000 with firmly mounted reference pressure sensor, hand spindle pump and customer-specific test item
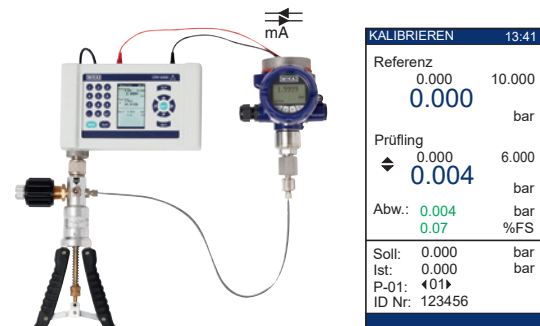
Operating mode: CALIBRATION

Features

- Calibration assistant
- Programmable altitude correction
- Recordable calibration temperature

Applications

- On-site calibration of pressure sensor and pressure measuring instruments (without PC)
- A calibration assistant guides you easily through the calibration (in line with DAkkS). With this, the data sets, including date and time, are recorded within the CPH6000. Prior to calibration, the calibration steps are entered directly on the instrument or downloaded via WIKA-Cal software.

Available PC software

WIKA-Cal calibration software for creating calibration certificates

A) Record calibration data with customer-specific test item
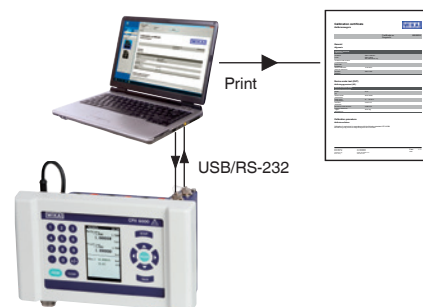
B) Record calibration data on the PC and print the calibration certificate

Operating mode: SWITCH TEST

Features
- Switch test assistant
- Automatic calculation of the hysteresis

Applications
- Convenient checking of pressure switches
- A pressure switch test assistant conveniently guides the user through the checking and automatic calculation of the switch hysteresis.

Example: Switch test assistant with customer-specific test item

Basic information - Complete measuring chain

Complete measuring chain		
Sensor technology	■ 1 reference pressure sensor CPT6000 (interchangeable without tools) ■ External operation via 1.1 m [3.6 ft] sensor connection cable (plug-and-play)	
Version	Up to ten data sets or reference pressure sensors can be programmed per CPH6000.	
Accuracy of the measuring chain [1] [2]		
Gauge pressure	0.025 % FS	≤ 1,000 bar [≤ 14,500 psi]
	0.1 % FS	> 1,000 bar ... ≤ 6,000 bar [> 14,500 psi ... ≤ 87,000 psi]
Absolute pressure	0.025 % FS	≤ 25 bar abs. [≤ 360 psi abs.]
Pressure types		
Gauge pressure	0 ... 6,000 bar [0 ... 87,000 psi]	
Absolute pressure	0 ... 0.25 bar abs. to 0 ... 25 bar abs. [0 ... 4 psi abs. to 0 ... 360 psi abs.]	
Vacuum and +/- measuring range	-600 ... +600 mbar to -1 ... 39 bar [-10 ... +10 psi to -14,5 ... 550 psi]	

1) It is defined by the total measurement uncertainty, which is expressed with the coverage factor (k = 2) and includes the following factors: the intrinsic performance of the instrument, the measurement uncertainty of the reference instrument, long-term stability, influence of ambient conditions, drift and temperature effects over the compensated range during a periodic zero point adjustment.
2) Calibrated at 23 °C [74 °F] and in a vertical mounting position, pressure connection facing downwards.

OBSOLETE

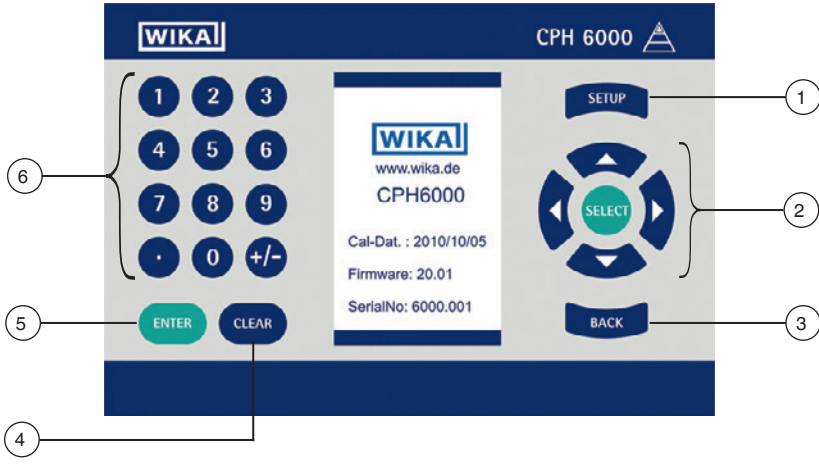## Specifications for digital indicator model CPH6000

Basic information		
Functions		
Operating mode	Measuring, calibration and switch test	
Functions	■ Measuring, calibration and switch test ■ Min./Max. memory ■ Tare ■ Min./Max. alarm (audible/visual) ■ Filter (running averaging) ■ Zero point adjustment ■ PowerSave function	
Measuring rate	2 values/s	
Calibration function		
Memory capacity	Up to 10 test items	
Test points/test item	Up to 32 comparison test points	
Switch test function		
Switch points	Determination of the switch points and automatic calculation of the hysteresis	
Voltage supply		
Supply voltage	Internal lithium-ion rechargeable battery (charging time: < 6 h)	
Battery life	Approx. 20 hours of operation	
Case		
Material	■ Impact-resistant ABS plastic ■ Membrane keyboard ■ Transparent screen	
Ingress protection	IP54 (with protective caps closed)	
Dimensions	See technical drawing	
Weight	Without sensor	approx. 850 g [1.87 lbs.]
	With sensor	approx. 1.080 kg [2.4 lbs.]
Sensor compatibility	Compatible with model CPT6000 reference pressure sensors	

Input signal	
Measuring input, voltage	
Measuring range	■ DC 0 … 1 V ■ DC 0 ... 2 V ■ DC 0 ... 5 V ■ DC 0 ... 10 V
Accuracy	1.0 mV
Measuring input, current	
Measuring range	■ 0 ... 20 mA ■ 4 ... 20 mA
Accuracy	5.0 µA

Digital indicator

Digital display

Indication range	-19999 ... 19999 digits (dependent upon connected reference pressure sensor)
Display resolution	Up to 6 digits; adjustable
Backlighting	Adjustable via menu
Type of display	Large TFT colour screen for the display of reference, test signals and additional information

Menu languages

	Adjustable via menu

- English
- German
- Spanish
- French
- Italian

Units

Pressure units	Adjustable via menu

- mbar
- bar
- psi
- Pa
- hPa
- kPa
- MPa
- mmHg
- cmHg
- inHg
- mmH_2O
- cmH_2O
- mH_2O
- inH_2O
- kg/cm^2
- Customer-specific unit

User interface


1 Setup menu
2 Selection and entry confirmation
3 One step back
4 Clear entry
5 Input confirmation
6 Numeric keypad

Switch on via pressing any button.
Switch off via menu item in main menu.

Output signal

Analogue output

Voltage supply	DC 24 V (can be activated via menu)

Load

	Min. 20 mA
	Max. 50 mA

Communication

Interface	RS-232 USB
Interface cable	■ Without ■ For RS-232 ■ For USB ■ For RS-232 and USB
Configuration software	WIKA-Cal
Baud rate	9600
Measuring rate	2 value/s

Electrical connection	
Connection type	Via banana plugs
Ingress protection	IP65 (with cable connected)
Sensor connection cable	■ Without ■ Length 1.1 m [3.61 ft]

Electrical connections to the digital indicator
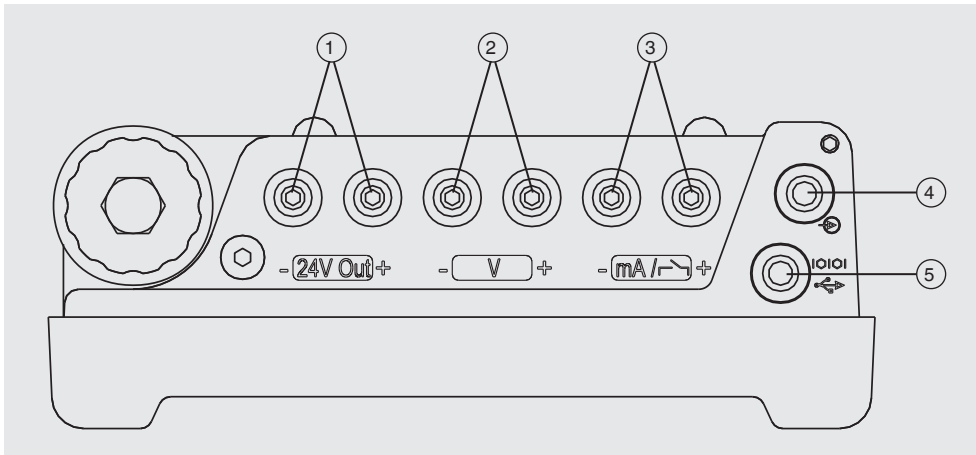

① Voltage supply DC 24 V [1] (can be activated via menu)

② Measuring input [1]; voltage

③ Measuring input [1]; current or switch test

④ Power connection/charging socket (rechargeable battery will be charged automatically)

⑤ USB/RS-232 interface

1) Connections: 4-mm test sockets

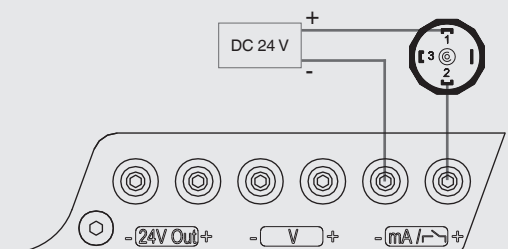## Electrical connection for: CALIBRATION

2-wire test item

Example:
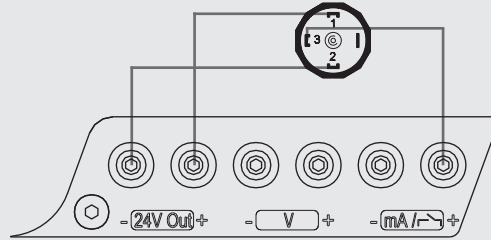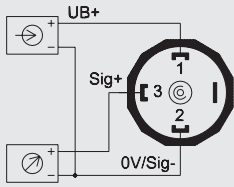**mA signal test item without its own power supply** (24 V must be activated via menu)
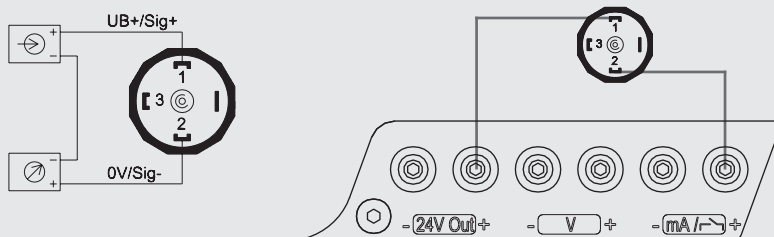
Example:
mA signal test item with its own power supply available

Electrical connection for: CALIBRATION (continued)

3-wire test item

Example:
mA signal test item without its own power supply (24 V must be activated via menu)

Example:
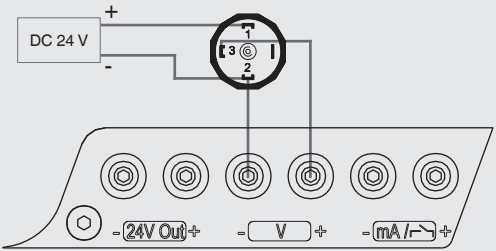**V signal test item with its own power supply available**

Legend

UB+	Positive power supply terminal
0V	Negative power supply terminal
Sig+	Positive analogue output
Sig-	Negative analogue output

Electrical connection for: SWITCH TEST

Potential-free switches

Switching types:

Normally closed / normally open

Low/High window
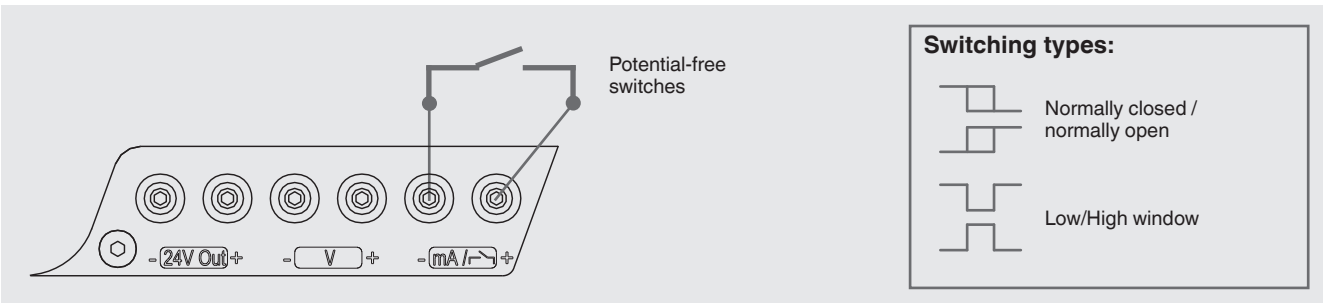
Operating conditions	
Operating temperature	0 ... 50 °C [32 ... 122 °F]
Ambient temperature range	0 ... 50 °C [32 ... 122 °F]
Storage temperature range	-20 ... +70 °C [-4 ... +158 °F]
Relative humidity	0 ... 85 % r. h. (non-condensing)
Ingress protection	■ IP20 ■ IP53 (front), IP54 (rear)

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Specifications for reference pressure sensor model CPT6000

Accuracy specifications	
Accuracy	≤ 0.025 % FS (only in combination with CPH6000)
Compensated range	0 ... 50 °C [32 ... 122 °F]
Reference conditions per IEC 61298-1 [1]	
Ambient temperature	15 ... 25 °C [59 ... 77 °F]
Atmospheric pressure	860 ... 1,060 mbar [12.5 ... 15.4 psig]
Air humidity	45 ... 75 % r. h.
Mounting position	Vertical mounting position, process connection facing downwards.

1) Calibrated at 23 °C [74 °F] and in a vertical mounting position, pressure connection facing downwards.

Pressure ranges, gauge pressure

bar		psi	
0 ... 0.25	0 ... 60	0 ... 4	0 ... 1,450
0 ... 0.4	0 ... 100	0 ... 6	0 ... 2,320
0 ... 0.6	0 ... 160	0 ... 10	0 ... 3,630
0 ... 1	0 ... 250	0 ... 14.5	0 ... 5,800
0 ... 1.6	0 ... 400	0 ... 25	0 ... 8,700
0 ... 2.5	0 ... 600	0 ... 40	0 ... 10,000
0 ... 4	0 ... 700 [1]	0 ... 60	0 ... 14,500
0 ... 6	0 ... 1,000	0 ... 90	0 ... 23,200
0 ... 10	0 ... 1,600	0 ... 145	0 ... 36,200
0 ... 16	0 ... 2,500	0 ... 250	0 ... 58,000
0 ... 20 [1]	0 ... 4,000	0 ... 360	0 ... 72,500
0 ... 25	0 ... 5,000	0 ... 580	0 ... 87,000
0 ... 40	0 ... 6,000	0 ... 870	

1) Also available as oxygen version.

Pressure ranges, absolute pressure

bar abs.		psi abs.	
-0.8 ... 1.2	0 ... 4	-11.6 ... 17.4	0 ... 36
0 ... 0.25	0 ... 6	0 ... 4	0 ... 60
0 ... 0.4	0 ... 10	0 ... 6	0 ... 90
0 ... 0.6	0 ... 16	0 ... 8	0 ... 145
0 ... 1	0 ... 20 [1]	0 ... 14.5	0 ... 230
0 ... 1.6	0 ... 25	0 ... 23	0 ... 360
0 ... 2.5			

1) Also available as oxygen version.

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Pressure ranges, vacuum and +/- measuring range

bar		psi	
-0.25 ... +0.25	-1 ... 5	-4 ... +4	-14.5 ... 44
-0.4 ... +0.4	-1 ... 9	-6 ... +6	-14.5 ... 73
-0.6 ... +0.6	-1 ... 15	-10 ... +10	-14.5 ... 130
-1 ... 0	-1 ... 20 [1]	-14.5 ... 0	-14.5 ... 220
-1 ... 1.5	-1 ... 24	-14.5 ... 22	-14.5 ... 350
-1 ... 2.5	-1 ... 39	-14.5 ... 36	-14.5 ... 565
-1 ... 3			

[1] Also available as oxygen version.

Other measuring ranges on request.

Further details on: Measuring range		
Overpressure limit		
3 times	< 25 bar	< 360 psi
2 times	> 25 ... ≤ 600 bar	> 360 ... ≤ 8,700 psi
1.5 times	> 600 ... ≤ 2,500 bar	> 8,700 ... ≤ 36,260 psi
1.2 times	> 2,500 bar	> 36,260 psi
Vacuum resistance	Yes	

Process connection		
Standard	EN 837	
Size	G ½ B	≤ 1,000 bar [≤ 14,500 psi]
	M16 x 1.5 female, with sealing cone	≥ 1,000 bar [≥ 14,500 psi]
	G 1 B flush	≤ 1.6 bar [≤ 23 psi]
	G ½ B flush	≤ 600 bar [≤ 8,700 psi]
Pressure adapters [1]	■ Without ■ G ½ to ¼ NPT ■ G ½ to ½ NPT	
Sealing	■ NBR ■ EPDM	
Further versions	■ Oil- and grease-free ■ For oxygen, oil- and grease-free	
Material		
Case	Stainless steel	
Wetted parts	Stainless steel	Standard
	Elgiloy®	Additionally for measuring ranges ≥ 25 bar ... ≤ 1,000 bar [≥ 360 ... ≤ 14,500 psi]
Internal pressure transmission medium	Synthetic oil	With measuring ranges up to ≤ 25 bar [≤ 360 psi]
	Halocarbon oil	For oxygen version

[1] Only possible for thread size G ½ B.

→ For drawings of process connections, see page 13

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Output signal	
Signal type	
Current	■ 4 ... 20 mA ■ 0 ... 20 mA
Voltage	■ DC 0 … 1 V ■ DC 0 ... 2 V ■ DC 0 ... 5 V ■ DC 0 ... 10 V
Connection method	■ 2-wire ■ 3-wire

Operating conditions model CPT6000	
Medium temperature range	-20 ... +80 °C [-4 ... +176 °F]
	-20 ... +60 °C [-4 ... +140 °F] only for oxygen version
Ambient temperature range	-20 ... +80 °C [-4 ... +176 °F]
Storage temperature range	-40 ... +85 °C [-40 ... +185 °F]
	-20 ... +60 °C [-4 ... +140 °F] only for oxygen version
Relative humidity	0 ... 95 % r. h. (non-condensing)
Ingress protection	■ IP54 ■ IP65 (with cable connected)

Plug-in charger

Plug-in charger	
Permissible ambient conditions	
Operating temperature range	0 ... 45 °C [32 ... +113 °F]
Storage temperature range	-40 ... +85 °C [-40 ... +185 °F]
Relative humidity	5 ... 95 % r. h. (non-condensing)

Test cables

Test cable set (red and black)		
Scope	■ 2 pairs of measuring lines ■ 2 pairs of clamp connectors ■ 2 pairs of crocodile clips	
Operating temperature	-15 ... +70 °C [-30 ... +158 °F]	
Dimensions	4 x 500 mm [0.16 x 19.69 in] 4 x 300 mm [0.16 x 11.8 in]	
Nominal voltage	■ DC 60 V ■ AC 30 V	
Nominal current	Measuring lines	32 A
	Crocodile clips	5 A

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Approvals

Logo	Description	Region
CE	**EU declaration of conformity for model CPH6000**	European Union
	EMC directive EN 61326 emission (group 1, class B) and immunity (portable measuring equipment)	
	RoHS directive	
CE	**EU declaration of conformity for model CPT6000**	European Union
	EMC directive EN 61326 emission (group 1, class B) and immunity (industrial environments)	
	Pressure equipment directive PS > 200 bar; module A, pressure accessory	
	RoHS directive	

Optional approvals

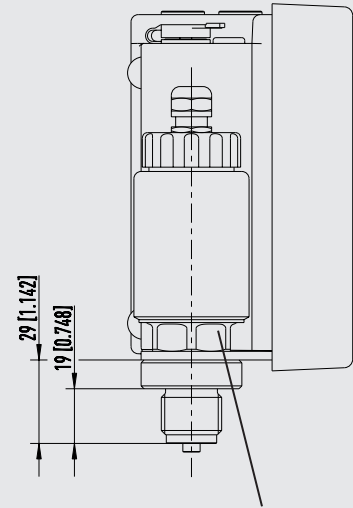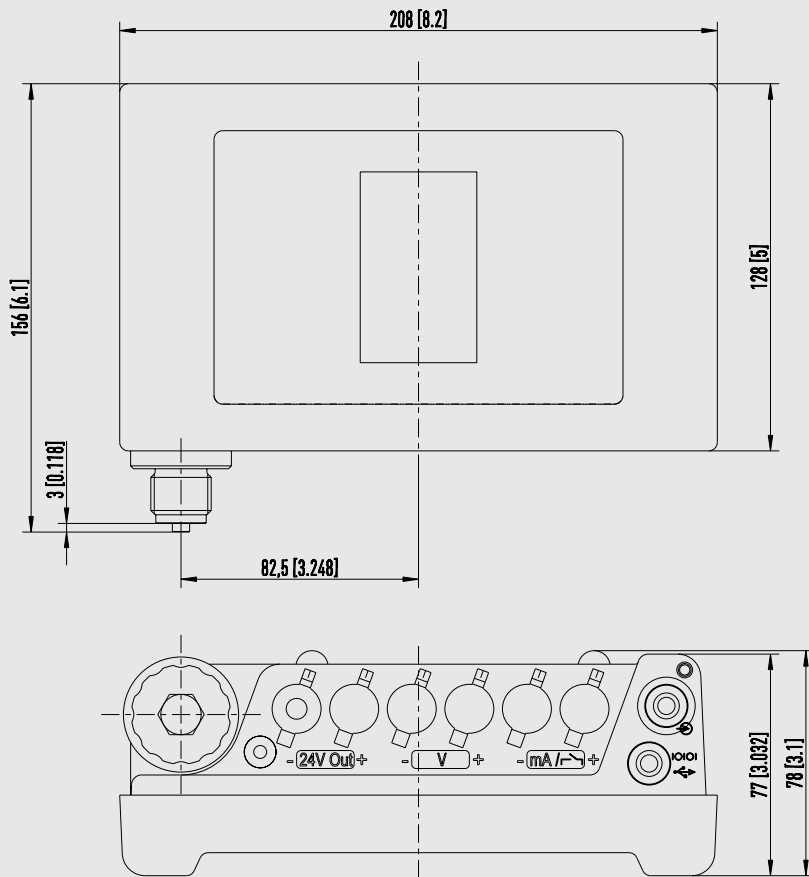| Logo	Description	Region
EAC	**EAC**	Eurasian Economic Community
	EMC directive	
	Pressure equipment directive	
	Low voltage directive	
	PAC Russia Metrology, measurement technology	Russia
-	**MChS** Permission for commissioning	Kazakhstan
	PAC Belarus Metrology, measurement technology	Belarus
-	**PAC China** Metrology, measurement technology	China
-	**CRN** Safety (e.g. electr. safety, overpressure, ...)	Canada

Certificates

Certificates	
Calibration	
CPT6000	■ 3.1 inspection certificate per EN 10204 (factory calibration) ■ DAkkS calibration certificate (traceable and accredited in accordance with ISO/IEC 17025)
CPH6000, electrical module	■ 3.1 inspection certificate per EN 10204 (factory calibration) ■ DAkkS calibration certificate (traceable and accredited in accordance with ISO/IEC 17025)
Recommended calibration interval	1 year (dependent on conditions of use)

Certified accuracy
For each reference pressure sensor, the accuracy is certified by a factory calibration certificate which accompanies the instrument.
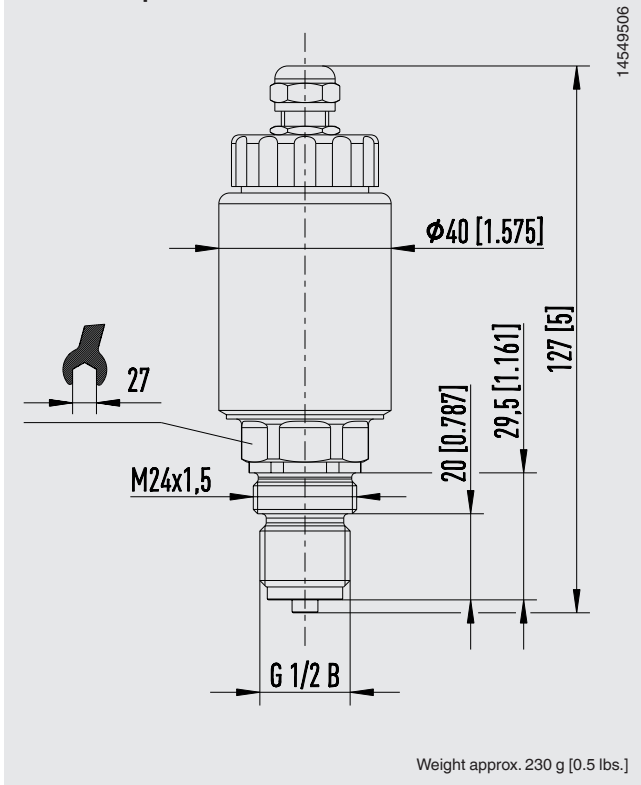
→ For approvals and certificates, see website

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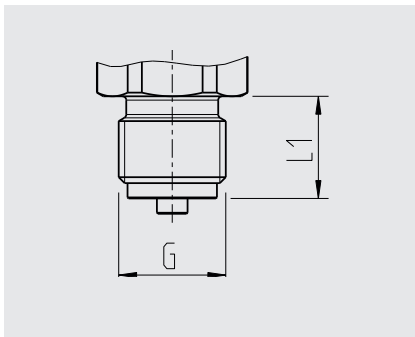## Dimensions in mm [in]
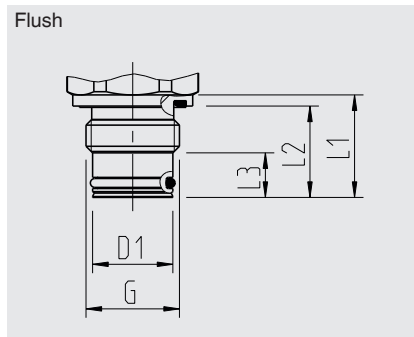
Digital indicator CPH6000

14546225

208 [8.2]

156 [6.1]

128 [5]

3 [0.118]

82,5 [3.248]

29 [1.142]

19 [0.748]

Manual quick-release connector for easy changeover of the sensor.

24V Out   V   mA /

77 [3.032]

78 [3.1]

Reference pressure sensor CPT6000

14549506

Ø40 [1.575]

127 [5]

29.5 [1.161]

20 [0.787]

27

M24x1,5

G 1/2 B

Weight approx. 230 g [0.5 lbs.]

Process connections

L1

G

G	L1
G ½ B	20 [0.79]
M16 x 1.5	20 [0.79]

Flush

L1 L2 L3 D1 G

G	L1	L2	L3	D1
G ½ B	23 [0.9]	20.5 [0.81]	10 [0.39]	18 [0.71]

Flush

Ø41
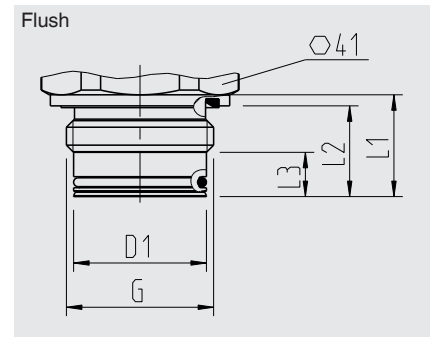
L1 L2 L3 D1 G

G	L1	L2	L3	D1
G 1 B	23 [0.9]	20.5 [0.81]	10 [0.39]	30 [1.18]

→ → For information on tapped holes and welding sockets, see Technical information IN 00.14 at www.wika.com.

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.

To switch from the demo version to a licenced version, a USB dongle with a valid licence must be purchased.

The preinstalled demo version changes automatically to the selected version when plugging in the USB dongle and remains available as long as the USB dongle is connected to the PC.

- The user is guided through the calibration or logger process
- Management of calibration data and instrument data
- Intelligent preselection via SQL database
- Menu languages: German, English, Italian, French, Dutch, Polish, Portuguese, Romanian, Spanish, Swedish, Russian, Greek, Japanese, Chinese
  More languages are due with software updates
- Customer-specific complete solutions possible

The supported instruments are continuously expanded and even customer-specific adaptations are possible.

For further information, see data sheet CT 95.10

Two WIKA-Cal licences are available together with one hand-held

The WIKA-Cal calibration software is available both for reading the logger data stored in the hand-held as well as for online calibrations together with a PC. The scope of software functions depends on the selected licence.

Several licences can be combined on one USB dongle.

Cal-Template (demo version)	Cal-Template (light version)	Log-Template (full version)
Fully automatic calibration	Semi-automatic calibration	■ Live measured value recording for a certain period of time with selectable interval, duration and start time
Limitation to two measuring points	No limitation of the measuring points approached	■ Readout of the integrated data logger of the hand-held
■ Creation of 3.1 inspection certificates per DIN EN 10204 ■ Calibration reports can be exported to Excel® template or XML file ■ Calibration of pressure measuring instruments		■ Creation of logger protocols with graphic and/or tabular representation of the measuring results in PDF format ■ Possibility of exporting measuring results as CSV file
Ordering information for your enquiry:		
Is available for a cost-free download	WIKA-CAL-LZ-Z-Z	WIKA-CAL-ZZ-L-Z
	WIKA-CAL-LZ-L-Z	

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Complete test and service cases

The available test and service cases are individually equipped according to your needs.
A distinction is made between 4 different variants, which differ in the case size and the number or size of the recesses.

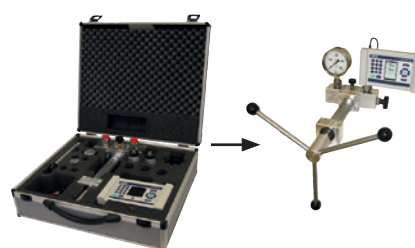| Case variants and existing recesses	1[1]	2	3	4
Recesses for standard components				
Pressure calibrator model CPH6000	x	x	x	x
Number of freely selectable reference pressure sensors, model CPT6000	5	5	5	5
Sensor connection cable 1.1 m [3.3 ft]	x	x	x	x
Sealing set	x	x	x	x
Test cable set with connection terminals	x	x	x	x
Plug-in charger	x	x	x	x
Interface cable	x	x	x	x
USB dongle for WIKA-Cal calibration software	x	x	x	x
Pneumatic hand test pump, either model CPP30 or CPP7-H		x		
Hydraulic hand test pump, either model CPP700-H or CPP1000-H			x	
Hydraulic hand spindle pump model CPP1000-L				x

1) Due to its size, this case model may not provide enough space for all available accessories. We will be happy to help you choose the best equipment for your case set.

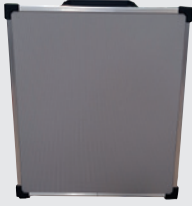**Variant 1: Calibration case with max. 5 pressure sensors**

Variant 2 or 3: Calibration case with max. 5 pressure sensors and incl. hand test pump

Variant 4: Calibration case with max. 5 pressure sensors and incl. hand spindle pump

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Accessories

Description		Order code
		CPH-A-60
	Plug-in charger Meets the requirements of Euro standards, UK standards and US standards	-4-
	Sealing set Consisting of: ■ 4 x G ½ USIT seals ■ 2 x G ¼ USIT seals ■ Plastic box	-D-
	Test cable set (red and black) Consisting of: ■ 2 pairs of measuring lines ■ 2 pairs of clamp connectors ■ 2 pairs of crocodile clips	-T-
	Sensor connection cable For model CPT6000 reference pressure sensor Length 1.1 m [3.61 ft]	-S-
	RS-232 interface cable	-R-
	USB interface cable	-U-
-	**IP54 version (protective caps)** Retrofitting of the caps only at WIKA	-I-
-	**Manual quick-release connector for pressure sensor**	-H-
-	**Carrying system** To hang the CPH6000 around your neck	-C-
	Plastic case **Variant 1** For 1 x hand-held, max. 5 x pressure sensors, accessories Dimensions: 340 x 275 x 83 mm (13.39 x 10.83 x 3.27 in)	-K-

Description		Order code
		CPH-A-60
Transport case from aluminium **Variant 2** For 1 x hand-held, max. 5 x pressure sensors, 1 x pneumatic hand test pump CPP7-H or CPP30, accessories Dimensions: 450 x 360 x 123 mm (17.72 x 13.78 x 4.84 in)		-L-
Variant 3 For 1 x hand-held, max. 5 x pressure sensors, 1 x hydraulic hand test pump CPP700-H/ CPP1000-H, accessories Dimensions: 450 x 360 x 140 mm (17.72 x 13.78 x 5.51 in)		-N-
Variant 4 For 1 x hand-held, max. 5 x pressure sensors, 1 x hydraulic hand spindle pump CPP1000-L, accessories Dimensions: 375 x 425 x 170 mm (14.76 x 16.73 x 6.69 in)		-M-
Ordering information for your enquiry:		
1. Order code: CPH-A-60		⇓
2. Option:		[ ]

Ordering information

CPH6000 / Ingress protection / Additional cable for reference pressure sensor / Software / Interface cable / Test pump / Transport case / Calibration of electrical output module / Further approvals / Additional ordering information

CPT6000 / Unit / Measuring range / Process connection / Special design features / Type of certificate / Pressure adapter / Further approvals / Additional ordering information

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