

# Precision hydraulic high-pressure controller

## Model CPC8000-H

WIKA data sheet CT 28.05



for further approvals  
see page 4

### Applications

- Transmitter and pressure gauge manufacturers
- Calibration and service companies
- Industry (laboratory, workshop and production)
- Research and development laboratories

### Special features

- Pressure ranges: 5 ... 700 bar up to 20 ... 1,600 bar (75 ... 10,000 psi up to 290 ... 23,000 psi)
- Pressure medium: Hydraulic oil or water
- Control stability: Up to 0.005 % of FS
- Accuracy: Up to 0.008 % of IS-33
- Interchangeable reference pressure sensors

### Description

#### Application:

The model CPC8000-H precision hydraulic high-pressure controller is especially suited as a factory/workshop standard for the automatic testing or calibration of all types of high-pressure measuring instruments, due to its high accuracy and control stability. Autofrettage applications and cyclic pressure-load tests are ideal application areas due to its robust design and reliability.

Clean dry compressed air is required to supply the input of the pneumatic control circuit. Hydraulic oil, water, or other media on request, is used as a pressure medium on the output.

#### Design:

The CPC8000-H consists of two components, the CPC8000-HC pneumatic pressure controller and the CPC8000-HM hydraulic module with the reference pressure sensors. The hydraulic module is available in three versions, as a low pressure version with a control range of 5 ... 700 bar (75 ... 10,000 psi), and a medium pressure version with a control range of 20 ... 1,600 bar (290 ... 23,000 psi).

The complete system is available as a 19" plug-in case or built into a 19" rack. The sensors can be changed via the front of the hydraulic module, without having to dismantle the controller.

#### Functionality:



### Precision hydraulic high-pressure controller, model CPC8000-H

Through specialized technology, the controller regulates the desired pressure value. Maximum simplicity is achieved through the touchscreen and the simple and intuitive menu navigation. In addition, its easy operability is further supported by the availability of numerous menu languages. On the touchscreen, all necessary information such as current measured value and set point can be found. Additionally, the measured values can be displayed in 39 pressure units. The hydraulic pressure controller can be remotely controlled via several different remote interfaces. A wide range of emulation command sets for other pressure controllers are available.

#### Interface:

For communication and data transfer with a PC, the instrument has an IEEE-488.2, RS-232, USB and Ethernet interface. The digital interfaces enable the software-controlled operation of the controller - such as fully-automated calibration processes or running of specific test programs generated from LabVIEW® etc..

#### Complete test and calibration systems:

On request, complete mobile or stationary test systems can be manufactured.

# Specifications

Reference pressure sensors	
<b>Model CPR8000</b>	
Accuracy <sup>1)</sup>	0.008 % FS up to 0.008% IS-33
Pressure ranges	0...100 bar (0...1,500 psi) up to 0...400 bar (0...6,000 psi)
Precision <sup>2)</sup>	0.004 % FS
<b>Model CPR8050</b>	
Accuracy <sup>1)</sup>	0.01 % FS
Pressure ranges	0...400 bar (0...6,000 psi) to 0 ... 700 bar (0 ... 10,000 psi)
Precision <sup>2)</sup>	0.005% FS
<b>Model CPR8850</b> <b>Standard</b>	
Accuracy <sup>1)</sup>	0.014 % FS
Pressure ranges	0 ... 700 bar to 0 ... 1,600 bar (0 ... 10,000 psi to 0 ... 23,000 psi)
Precision <sup>2)</sup>	0.007 % FS

- 1) The accuracy 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 measuring 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) The precision is the maximum deviation between two measurements at one point under laboratory conditions which contains linearity, hysteresis and repeatability of the measuring instrument.

Hydraulic module		
Version	CPC8000-HM-L	CPC8000-HM-M
Instrument version	Standard: 19" rack-mounting with side panels incl. rack-mounting kit Optional: built into a 19" rack with CPC8000-HC pressure controller	
Dimensions in mm	see technical drawings	
Weight	approx. 78 kg (172 lb.)	approx. 87.5 kg (193 lbs.)
<b>Connections</b>		
Pressure connections	Drive-Air port: 6 mm FITOK®/SWAGELOK® tube connection Supply port: 6 mm FITOK®/SWAGELOK® tube connection Measure/Control port: 9/16-18 UNF.	Drive-Air port: 6 mm FITOK®/SWAGELOK® tube connection Supply port: 6 mm FITOK®/SWAGELOK® tube connection Measure/Control port: 9/16-18 UNF .
Permissible pressure media	Drive-Air port: clean and dry air or nitrogen Supply port: clean and dry air or nitrogen Measure/Control port: non-corrosive liquids (sebacate, shell tellus, distilled water, others upon request)	
Primary transducer model	CPR8050	CPR8850
Primary maximum range	700 bar (10,000 psi)	1600 bar (23,000 psi)
Primary minimum range	400 bar (6,000 psi)	1000 bar (15,000 psi)
Secondary transducer model	CPR8050 / CPR8000	CPR8050
Secondary minimum range	100 bar (1,500 psi)	400 bar (6,000 psi)
<b>Permissible pressure</b>		
Drive-Air port (from CPC8000-HC)	0 ... 35 bar (507 psi)	0 ... 35 bar (507 psi)
Supply port	35 (507 psi)	
Measure/Control port	max. 105 % FS	
<b>Control parameters</b>		
Control stability <sup>3)</sup>	< 0.005 % FS	
Control range	5 ... 700 bar (75 ... 10,000 psi)	20 ... 1,600 bar (290 ... 23,000 psi)
<b>Permissible ambient conditions</b>		

## Hydraulic module

Operating temperature	15 ... 40 °C (59 ... 104 °F)
Storage temperature	5 ... 70 °C (41 ... 158 °F)
Relative humidity	0 ... 95 % r.h. (non-condensing)
Compensated temperature range	15 ... 40 °C (59 ... 104 °F)
Mounting position	Horizontal

3) Based on the primary range of the instrument.

## Pressure controller model CPC8000-HC

### Instrument

Instrument version	Standard: 19" rack-mounting with side panels incl. rack-mounting kit Optional: built into a 19" rack with CPC8000-HM hydraulic module
Warm-up time	approx. 60 minutes
Dimensions in mm	see technical drawings
Weight	approx. 16.7 kg (37 lbs.)

### Display

Screen	10.1" color TFT with touchscreen
Resolution	4 ... 7 digits
Input methods	capacitive touchscreen

### Connections

Pressure connections	7/16"-20 F SAE
Pressure adapters	6 mm FITOK® threaded pipe connection; 1/4" tube adapter included
Filter elements	all pressure ports have 40-micron filters
Permissible pressure media	Dry, clean air or nitrogen
Overpressure protection	Safety relief valve on reference transducer

### Permissible pressure

Drive Pressure	38.5 (558 psi)
Measure/Control port	max. 105 % FS

### Voltage supply

Power supply	AC 100 ... 120 V / 200 ... 240 V, 50/60 Hz
Power consumption	160 VA max








### Permissible ambient conditions

Operating temperature	15 ... 45 °C (59 ... 113 °F)
Storage temperature	5 ... 70 °C (41 ... 158 °F)
Relative humidity	0 ... 95 % r. h. (non-condensing)
Compensated temperature range	15 ... 45 °C (59 ... 113 °F)
Sensor Mounting position	Horizontal

### Communication


Interface	IEEE-488.2, Ethernet, USB, RS-232
Command sets	Mensor, WIKA SCPI
Response time	< 100 ms

## Approvals

Logo	Description	Country
	<b>EC declaration of conformity</b> <ul style="list-style-type: none"> <li>■ EMC directive 2014/30/EU <sup>3)</sup>, EN 61326-1 emission (group 1, class A) and immunity (industrial application)</li> <li>■ Low voltage directive 2014/35/EU, EN 61010-1</li> <li>■ RoHS directive 2011/65/EU</li> </ul>	European Community
	<b>EAC</b> <ul style="list-style-type: none"> <li>■ Electromagnetic compatibility</li> <li>■ Low voltage directive</li> </ul>	Eurasian Economic Community
	<b>GOST</b> Metrology/measurement technology	Russia
	<b>KazInMetr</b> Metrology/measurement technology	Kazakhstan
	<b>MTSCHS</b> Commissioning approval	Kazakhstan
	<b>BeIGIM</b> Metrology/measurement technology	Belarus
	<b>UkrSEPRO</b> Metrology/measurement technology	Ukraine
	<b>Uzstandard</b> Metrology/measurement technology	Uzbekistan

3) **Warning!** This is class A equipment for emissions and is intended for use in industrial environments. In other environments, e.g. residential or commercial installations, it can interfere with other equipment under certain conditions. In such circumstances the operator is expected to take the appropriate measures.

## Certificates

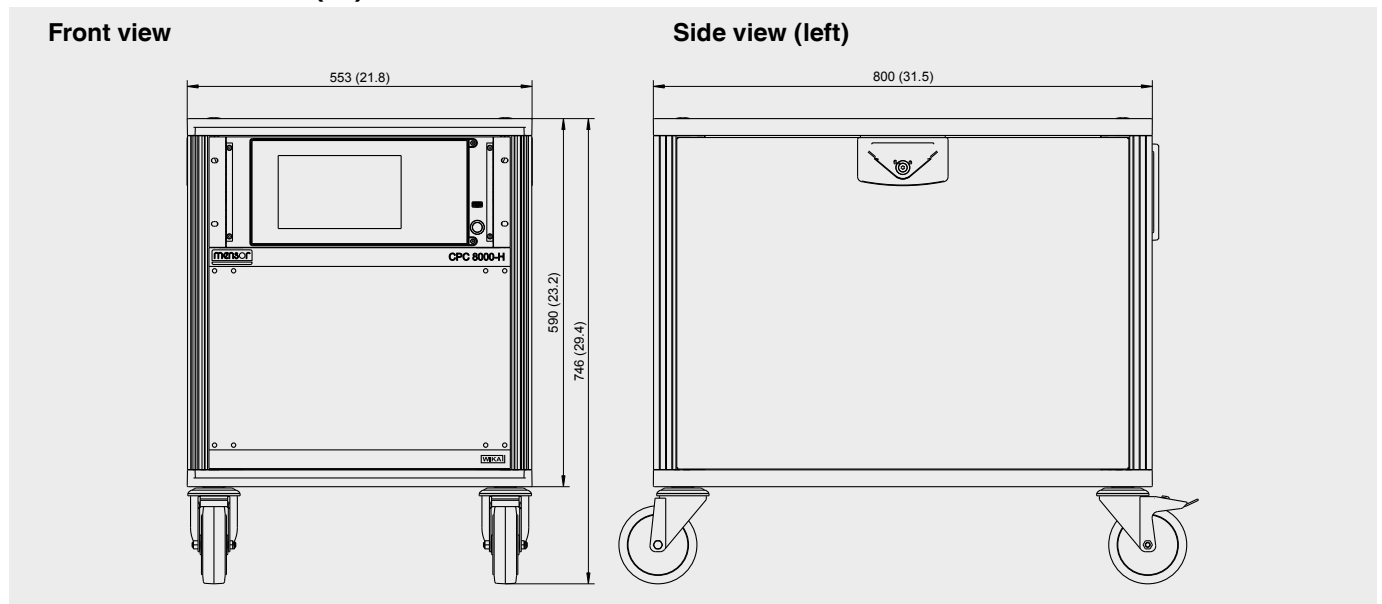
Approvals and Certificates		
Logo	Description	Country
	<b>EU Declaration of Conformity</b> EU Importer: WIKA, 63911 Klingenberg, Germany	European Union
	<b>UKCA Declaration of Conformity</b> Importer: WIKA Instruments Ltd, Unit 6 & 7 Goya Business Park, The Moor Road, Sevenoaks Kent, TN15 5GY	Great Britain
Certificates		
Calibration <sup>11)</sup>	Standard: A2LA accredited calibration certificate (standard on factory) Optional: DKD/DAkkS calibration certificate	

10) **Warning!** This is class A equipment for emissions and is intended for use in industrial environments. In other environments, e.g. residential or commercial installations, it can interfere with other equipment under certain conditions. In such circumstances the operator is expected to take the appropriate measures.

11) Calibration in a horizontal position/operating position.

Approvals and certificates, see website

## Dimensions in mm (in)



### Modular design of the CPC8000-H

Due to the modular sensor design, the large pressure range and the ability to exchange the sensors from the front, the CPC8000-H precision hydraulic high-pressure controller offers a maximum degree of flexibility in terms of hardware design or a subsequent sensor expansion.

#### Up to two precision pressure sensors possible:

The controller contains one (optionally two) precision pressure sensors, whose calibration data is stored in the sensor (for available ranges, see specifications).

#### Extremely easy to maintain:

With its automated capabilities and minimal maintenance, the system is adaptable for a wide range of applications. Different transducer ranges can be exchanged within the hydraulic module in a matter of minutes plus the warmup time (60 minutes).

### Special features of the CPC8000-H

#### Outstanding control performance:

The model CPC8000-H high-pressure controller is especially notable for its outstanding control performance. The control unit guarantees simple control of pressure values with precision and high control stability.

#### Particularly adaptable to any application:

The controller has a short warm-up time of approx. 60 minutes. In addition, it can be used on a variety of test volumes with no need for recharacterization.

#### Simple operation:

The lean and unambiguous menu structure ensures high user-friendliness.



Precision high-pressure controller, model CPC8000-HC

#### Bleed priming function:

The bleed priming function ensures automatic filling of the control circuit, so that larger test volumes also do not present any problem.

#### Long-term stability and low maintenance:

As a result of the high-quality precision pressure sensor technology, the instrument offers an excellent measuring accuracy and long-term stability.

## Touchscreen and intuitive operator interface

The CPC8000-H high-pressure controller has a high-resolution color touchscreen with an intuitive menu structure. The instrument features a precision pressure controller whose interface, including optional functions, can be easily configured via touchscreen.

### Standard desktop/main screen:



① **Settings**

② **Selection:** Settings, numeric keypad, and favorites

③ **Input menu field**  
(Numeric/Step Funct./Jog Funct./Percent step menu)

④ **Display:** integrated optional barometer, head height correction indicator, remote communication status, touchscreen lockout, and warnings.

⑤ **VENT**

The system controls gently to a non-critical value and then vents the system, including the test assembly connected to the test port, to atmosphere.

⑥ **CONTROL**

In control mode the instrument provides a very precise pressure at the test port in accordance with the desired set point parameter.

⑦ **MEASURE**

In Measure mode, the pressure present at the test port is measured with high accuracy (if you switch directly from **CONTROL** to **MEASURE** mode, the last controlled pressure in the connected test assembly will be maintained/locked).

⑧ Operating modes

⑨ Secondary auxiliary display

⑩ Adjustable control limits

⑪ Current unit

⑫ Current measured value

⑬ Entered set point

⑭ Pressure range of the sensor

⑮ Selection of the active sensor

## 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. A demo version is available for free download.

A template helps guide the user through the creation process of a document.

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

The pre-installed 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 pre-selection via SQL database
- Menu languages: German, English, Italian, French, Dutch, Polish, Portuguese, Romanian, Spanish, Swedish, Russian, Greek, Japanese, Chinese  
More languages will be 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

The WIKA-Cal calibration software is available for online calibrations together with a PC. The scope of software functions depends on the selected license. Several licenses can be combined on one USB dongle.

Cal-Template (light version)	Cal-Template (full version)	Log-Template (full version)
<ul style="list-style-type: none"> <li>■ Semi-automated calibration with use of any Mensor controller</li> </ul>	<ul style="list-style-type: none"> <li>■ Fully automated calibration with use of any Mensor controller</li> </ul>	<ul style="list-style-type: none"> <li>■ Live measurement recording for a certain period of time with selectable interval, duration and start time</li> <li>■ Creation of logger protocols with graphic and/or tabular representation of the measurement results in PDF format</li> <li>■ Export of measurement results as CSV file possible</li> </ul>
<ul style="list-style-type: none"> <li>■ Creation of calibration certificates 3.1 per DIN EN 10204</li> <li>■ Export of calibration reports to Excel® template or XML file</li> <li>■ Calibration of gauge pressure measuring instruments with absolute pressure references and vice versa</li> <li>■ Creation of calibration certificates with no limitations on measuring points</li> </ul>		
Ordering information for your enquiry for a single license:		
WIKA-CAL-LZ-Z-Z	WIKA-CAL-CZ-Z-Z	WIKA-CAL-ZZ-L-Z
Ordering information for your enquiry for the pair license:		
Cal-Template (light version) together with Log-Template (full version)		WIKA-CAL-LZ-L-Z
Cal-Template (full version) together with Log-Template (full version)		WIKA-CAL-CZ-L-Z

Accessories for CPC8000-H	Order code
Description	CPX-A-CH
<b>Barometric Reference</b> measuring range 552 ... 1172 mbar abs, 0.01% rdg	-1-
<b>Barometric Reference</b> measuring range 552 ... 1172 hPa abs, 0.01% rdg	-2-
<b>Barometric Reference</b> measuring range 8 ... 17 psi abs, 0.01% rdg	-3-
<b>Calibration Adapter</b> for reference pressure sensors, power supply and software	-4-
<b>Calibration Adapter</b> for reference barometric reference, power supply and software	-5-
<b>Calibration Adapter</b> for reference pressure sensor, CPR8000 with power supply and software	-6-
<b>Calibration Adapter</b> for reference pressure sensors, CPR8050 & CPR8850 with power supply and software	-7-
<b>Pressure adapter</b> SnoTriK to 9/16 - 18 UNF fitting male F 250-C	-8-
<b>Operating fluid</b> Oil type - Sebacate	-9-
<b>Operating fluid</b> Oil type - Shell Tellus S2 MX	-A-
<b>Ordering information for your enquiry:</b>	
1. Order code: CPX-A-CH 2. Option:	↓ [ ]*1

1. For example, a spare barometric reference with mbar units would be configured as CPX-A-CH-1



## Scope of delivery

- Pressure controller model CPC8000-HC, 19" built-in version
- Hydraulic module model CPC8000-HM-L (low pressure version), CPC8000-HM-M (medium pressure version), or CPC8000-HM-H (High pressure version).
- Power cord 2 m (6.5 ft)
- Operating instructions
- A2LA calibration certificate

## Options

- DKD/DAkkS calibration certificate
- System built into a 19" rack with casters
- Additional reference pressure sensors
- External tank
- Protection valve

## Ordering information

Model / Housing / pressure range basic instrument / Instrument version / Reference pressure sensor 1 / Reference pressure sensor 2 / Barometric Reference / Type of certificate for the barometric reference / Medium / Power cord / External tank / Protection Valve / Further approvals / Additional order information

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