

# Precision 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
- National institutes and institutions

### Special features

- Pressure ranges: up to 1,600 bar (up to 23,000 psi)
- Pressure medium: Hydraulic oil or water
- Control stability: 0.005 % of FS
- Accuracy: to 0.01 % of FS
- Interchangeable reference pressure sensors



Precision high-pressure controller, model CPC8000-H

## Description

### Application

The model CPC8000-H precision hydraulic high-pressure controller is especially suited as a factory/working standard for the automatic testing or calibration of all types of high-pressure measuring instruments, due to its high accuracy and control stability. However, autofrettage applications or cyclic pressure-load tests are also ideal application areas, thanks to its robustness and reliability. For the supply to the controller, other than the voltage supply, only clean dry compressed air for the pneumatic control circuit is needed. As a pressure medium on the output side, hydraulic oil or water (or other media on request) can be used.

### Design

The CPC8000-H consists of two components, the model CPC8000-HC pressure controller and the model CPC8000-HM hydraulic module with the reference pressure sensors.

The hydraulic module is available in two versions, as low pressure version with a pressure range of 5 ... 700 bar (75 ... 10,000 psi) bar and high pressure version with a pressure range of 20 ... 1,600 bar (290 ... 23,000 psi) with each suitable reference pressure sensors.

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 complete controller.

### Functionality

Through its specialist technology, the desired pressure value from the controller is regulated quickly and simply. Maximum ease-of-use is achieved through the large touchscreen and the simple and intuitive menu navigation. In addition, its easy operability is further supported by the availability of a large number of menu languages.

On the large touchscreen, all necessary information such as current measured value and set point can be found on a single screen. Optionally, the measured values can be displayed in other pressure units additionally. The pressure controller can be remotely controlled via serial interfaces available. Through these, a wide range of emulation command sets for other pressure controllers are available.

controlled operation of the controller - such as fully-automated calibration processes or the 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.

### 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-

## Specifications

Reference pressure sensors		
<b>Model CPR8050</b>		
Accuracy <sup>1)</sup>	0.01 % FS	
Pressure ranges	0 ... 700 bar (0 ... 10,000 psi)	
Precision <sup>2)</sup>	0.005 % FS	
<b>Model CPR8850</b>	<b>Standard</b>	<b>Advanced</b>
Accuracy <sup>1)</sup>	0.01 % FS	0.014 % FS
Pressure ranges	0 ... 480 bar to 0 ... ≤ 1,030 bar (0 ... 7,000 psi to 0 ... ≤ 15,000 psi)	0 ... 1,030 bar to 0 ... 1,600 bar (0 ... 15,000 psi to 0 ... 23,000 psi)
Precision <sup>2)</sup>	0.005 % FS	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.

Model CPC8000-HM hydraulic module		
Version	Low-pressure version CPC8000-HM-L	High-pressure version CPC8000-HM-H
Instrument version	Standard: 19" rack-mounting kit with side panels incl. rack-mounting kit Optional: built into a 19" rack with CPC8000-HC pressure controller	
Dimensions	see technical drawings	
Weight	approx. 78 kg (172 lbs.)	approx. 87.5 kg (193 lbs.)
<b>Pneumatic connections</b>		
Pressure connections	Drive-Air port/Supply: 6 mm threaded pipe connection Measure/Control from CPC8000-HC: 6 mm threaded pipe connection	
Permissible pressure medium	Drive-Air port/Supply: clean and dry air or nitrogen Measure/Control from CPC8000-HC: clean, dry air or nitrogen	
<b>Hydraulic connections</b>		
Pressure connections	Measure/Control port: 1/4"-SNOTRIK® threaded pipe connection	
Permissible pressure medium	Measure/Control port: non-corrosive liquids	
<b>Permissible pressure</b>		
Measure/Control port (from CPC8000-HC)	0.2 ... 35 bar (2.9 ... 510 psi)	0.35 ... 29 bar (5.1 ... 421 psi)
Drive-Air port (from CPC8000-HC)	10 ... 38 bar (145 ... 550 psi)	
Supply port	10 ... 38 bar (145 ... 550 psi)	
Measure/Control port (hydraulic)	max. 105 % FS	

Model CPC8000-HM hydraulic module		
Control parameters	Low-pressure version CPC8000-HM-L	High-pressure version CPC8000-HM-H
Control stability	< 0.005 % max. working range of version	
Control time	< 60 s	
Maximum working range of version	5 ... 700 bar (75 ... 10,000 psi) <sup>3)</sup>	20 ... 1,600 bar (290 ... 23,000 psi) <sup>4)</sup>
Control volume	10 ... 200 ccm <sup>5)</sup>	
Minimum control pressure	5 bar (72.5 psi) 0 bar possible via venting	20 bar (290 psi) 0 bar possible via venting
Maximum controllable pressure	dependent upon the selected pressure sensor, however, not greater than the max. pressure of the operating range	
Permissible ambient conditions		
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	

Pressure controller model CPC8000-HC		
Instrument		
Instrument version	Standard: 19" rack-mounting kit with side panels incl. rack-mounting kit Optional: built into a 19" rack with CPC8000-HM hydraulic module	
Warm-up time	approx. 25 min	
Dimensions	see technical drawings	
Weight	approx. 21 kg (46.3 lbs.)	
Display		
Screen	9.0" colour TFT with touchscreen	
Resolution	4 ... 7 digits	
Input methods	capacitive touchscreen	
Connections		
Pressure connections	7/16"-20 F SAE	
Pressure adapters	6 mm threaded pipe connection others on request	
Filter elements	all pressure ports have 20-micron filters	
Permissible pressure medium	dry, clean air or nitrogen	
Overpressure protection	Safety relief valve	
Permissible pressure		
Supply port <sup>6)</sup>	Low-pressure version CPC8000-HM-L 5.5 ... 38 bar (80 ... 550 psi) Transmission ratio 1:20	High-pressure version CPC8000-HM-H 7.5 ... 32 bar (110 ... 465 psi) Transmission ratio 1:56
Measure/Control port	max. 105 % FS	
Voltage supply		
Power supply	AC 100 ... 120 V / 200 ... 240 V, 50 ... 60 Hz	
Power consumption	130 VA	

3) Smallest recommended sensor range 100 bar (1,500 psi)

4) Smallest recommended sensor range 400 bar (6,000 psi)

5) For a fixed piping system (no flexible elements) without air pockets

6) General:

Calculation of the supply pressure:  
 $P_{max} \text{ (largest sensor)} * \text{transmission ratio} + 10 \%$

E.g. (low-pressure version):  $700 \text{ bar} * 1/20 + 10 \% = 38.5 \text{ bar}$

## Pressure controller model CPC8000-HC







### 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)
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>EU declaration of conformity</b> <ul style="list-style-type: none"><li>■ EMC directive <sup>1)</sup> EN 61326-1 emission (group 1, class A) and interference immunity (industrial application)</li><li>■ Low voltage directive</li><li>■ RoHS directive</li></ul>	European Union
	<b>EAC</b> <ul style="list-style-type: none"><li>■ EMC directive</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>UkrSEPRO</b> Metrology/measurement technology	Ukraine
	<b>Uzstandard</b> Metrology/measurement technology	Uzbekistan

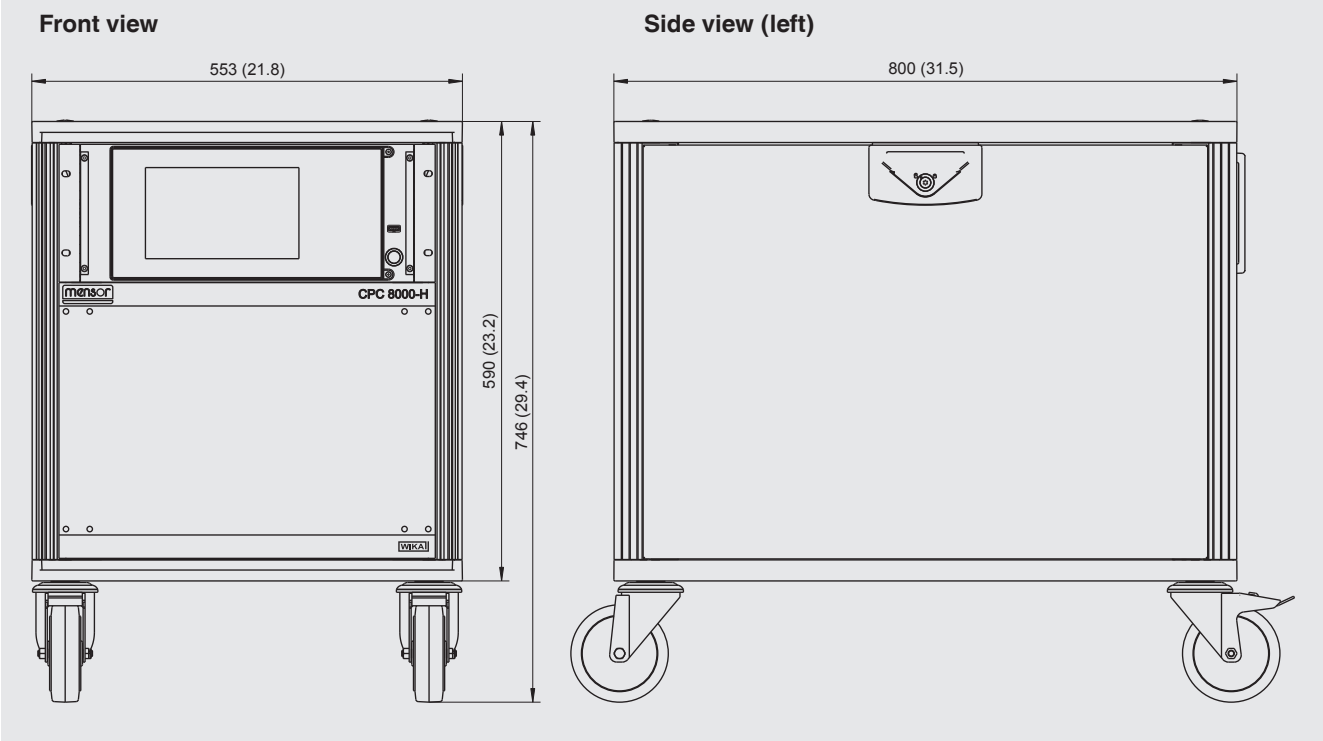
## Certificates

Certificate	
<b>Calibration</b> <sup>2)</sup>	Standard: 3.1 calibration certificate per DIN EN 10204 Option: DKD/DAkkS calibration certificate
<b>Recommended recalibration interval</b>	1 year (dependent on conditions of use)

- 1) **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.
- 2) Calibration in a horizontal 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 precision 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 offers at least one precision pressure sensor (optionally two), whose calibration data is stored in the sensor (for available ranges, see specifications).

### Extremely easy to maintain

The instrument offers the maximum ease-of-service and the highest possible adaptability in the shortest time, since sensors of different pressure ranges can be exchanged in just 15 minutes (plug-and-play).



Precision high-pressure controller,  
model CPC8000-HC

## 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 fast, simple and overshoot-free control of pressure values with the highest precision and a high control stability.

### Particularly adaptable to any application

The controller has a short warm-up time of approx. 25 minutes. In addition, it can be automatically adapted to the test volume.

### Simple operation

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

### Bleed priming function

The bleed priming function ensures automatic filling (10 ... 12 bar (145 ... 174 psi)) 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. Furthermore, special patented needle valve technology ensures a low-noise and low-wear control of pressure.

## Touchscreen and intuitive operator interface

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

### Standard desktop/main screen



- ① Settings
- ② Selection: Numeric keypad, settings and favourites
- ③ Input menu field (Numeric/Step Funct./Jog Funct.)
- ④ Display: integrated barometer, serial interface 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 of the respective channel 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 Optionally settable: second unit
- 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 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 stick with the template has to be purchased.

The pre-installed demo version automatically changes to the selected full version when the USB stick is inserted and is available as long as the USB stick is connected to the computer.



- Creation of calibration certificates for mechanical and electronic pressure measuring instruments
- Fully automatic calibration with pressure controllers
- Calibration of gauge pressure measuring instruments with absolute pressure references and vice versa
- 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.



#### Cal

Generation of calibration certificates with no limitations on measuring points, with automatic initiation of pressures via a pressure controller.



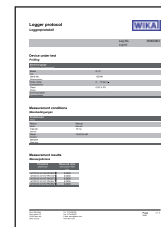
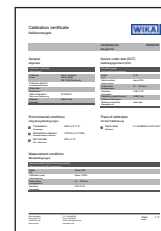
#### Log Demo

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





#### Log

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





Accessories for CPC8000-H		Order code
Description		CPX-A-CH-
	<b>Calibration adapter</b> for reference pressure sensors, voltage supply and software	-4-
	for barometric reference, voltage supply and software	-5-
<b>Ordering information for your enquiry:</b>		
		1. Order code: CPX-A-CH 2. Option:
		↓ [   ]

## Scope of delivery

- Pressure controller model CPC8000-HC, 19" built-in version
- Hydraulic module model CPC8000-HM-L (low pressure version) or model CPC8000-HM-H (high pressure version), 19" mounting version
- Pneumatic hose for connecting the CPC8000-HC with CPC8000-HM, approx. 1 m (3.3 ft)
- Power cord 2 m (6.5 ft)
- Operating instructions
- 3.1 calibration certificate per DIN EN 10204

## Options

- DKD/DAkkS calibration certificate
- System built into a 19" rack with rollers
- Additional reference pressure sensors
- Customer-specific system

## Ordering information

Model / Case type / pressure range basic instrument / Instrument version / Reference pressure sensor 1 / Reference pressure sensor 2 / Type of certificate for the barometric reference / Medium / Additional order information

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