

Pressure controller

Hydraulic high-pressure version

Model CPC8000-H

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 25 ... 2,895 bar
[75 ... 10,000 psi up to 360 ... 42,000 psi]
- Pressure medium: Hydraulic oil or water
- Control stability: up to 0.005 % of FS
- Accuracy: up to 0.008 % IS-33
- Interchangeable reference pressure transducers



**Pressure controller, hydraulic high-pressure version,
model CPC8000-H**

Description

Application

The model CPC8000-H 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. 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 model CPC8000-HC pneumatic pressure controller and the model CPC8000-HM hydraulic module with the reference pressure transducers. 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], a high-pressure version

with a control range of 20 ... 1,600 bar [290 ... 23,000 psi] and an extended pressure version with a control range of 25 ... 2,895 bar [360 ... 42,000 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

Through specialised 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 for reference pressure transducers model CPR8xxx and barometric reference

Reference pressure transducer	
Model CPR8000	
Accuracy ¹⁾	<ul style="list-style-type: none"> ■ 0.008 % FS ■ 0.008 % IS-50 ³⁾ ■ 0.008 % IS-33 ⁴⁾
Pressure ranges	0 ... 100 bar up to 0 ... 414 bar [0 ... 1,500 psi up to 0 ... 6,000 psi]
Precision ²⁾	0.004 % FS
Model CPR8050	
Accuracy ¹⁾	0.008 % FS
Pressure ranges	0 ... 414 bar up to 0 ... 700 bar [0 ... 6,000 psi up to 0 ... 10,000 psi]
Precision ²⁾	0.004 % FS
Model CPR8850	
Accuracy ¹⁾	0.014 % FS
Pressure ranges	<ul style="list-style-type: none"> ■ 0 ... 700.0 bar abs. to 758.4 bar abs. [0 ... 10,000 psi abs. to 0 ... 11,000 psi abs.] ■ 0 ... 827.4 bar to 1,137.6 bar [0 ... 12,000 psi to 0 ... 16,500 psi] ■ 0 ... 1,137.7 bar to 1,517 bar [0 ... 16,500.1 psi to 0 ... 22,000 psi] ■ 0 ... 1,517.1 bar to 2,172 bar [0 ... 22,000.1 psi to 0 ... 31,500 psi] ■ 0 ... 2,207 bar to 2,895 bar [0 ... 32,000 psi to 0 ... 42,000 psi]

- 1) It is defined by the total measurement uncertainty, with the coverage factor ($k = 2$) and includes 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 with recommended zero point adjustment every 30 days.
- 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.
- 3) 0.008 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.008 % of the half full scale and between 50 ... 100 % of the full scale, the accuracy is 0.008 % of reading.
- 4) 0.008 % IS-33 accuracy: Between 0 ... 33 % of the full scale, the accuracy is 0.008 % of the lower third of the full scale and between 33 ... 100 % of the full scale, the accuracy is 0.008 % of reading.

Barometric reference	
Measuring range	<ul style="list-style-type: none"> ■ 552 ... 1,172 mbar abs. ■ 8 ... 17 psi abs. ■ 552 ... 1,172 hPa abs.
Accuracy ¹⁾	0.01 % of reading
Function	The barometric reference can be used to switch pressure types ²⁾ , absolute <=> gauge. With gauge pressure transducers, the measuring range of the transducers must begin with -1 bar [-15 psi] in order to carry out a complete absolute pressure emulation.

- 1) It is defined by the total measurement uncertainty, with the coverage factor ($k = 2$) and includes 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 with recommended zero point adjustment every 30 days.
- 2) For a pressure type emulation a native absolute pressure transducer is recommend, since the zero point drift can be eliminated through a zero point adjustment.

Specifications for hydraulic module model CPC8000-HM

Hydraulic module	Model CPC8000-HM-L	Model CPC8000-HM-M	Model CPC8000-HM-H
Instrument			
Instrument version	<ul style="list-style-type: none"> ■ 19" rack-mounting kit with side panels incl. rack-mounting kit ■ Built into a 19" rack with CPC8000-HC pressure controller 		
Dimensions	See technical drawings		
Weight	Approx. 78 kg [172 lb]	Approx. 87.5 kg [193 lb]	Approx. 120 kg [264 lb]
Permissible pressure			
Drive-Air port (from CPC8000-HC)	0 ... 35 bar [0 ... 507 psi]		0 ... 42 bar [0 ... 609 psi]
Supply port	38.5 bar [558 psi]		46 bar [667 psi]
Measure/Control port	Max. 105 % FS		

Pressure connection	Model CPC8000-HM-L	Model CPC8000-HM-M	Model CPC8000-HM-H
Drive-Air port	6 mm FITOK®/SWAGELOK® tube connection		1/4" tube connection; 6 mm adapter included
Supply port	6 mm FITOK®/SWAGELOK® tube connection		
Measure/Control port	9/16-18 UNF Autoclave® F250C compatible		
Permissible pressure media			
Drive-Air port	<div><div></div> Clean and dry air</div> <div><div></div> Nitrogen (ISO 8573-1:2010 class 5.5.4 or better)</div>		
Supply port	<div><div></div> Clean and dry air</div> <div><div></div> Nitrogen (ISO 8573-1:2010 class 5.5.4 or better)</div>		
Measure/Control port	Non-corrosive liquids <div><div></div> Sebacate</div> <div><div></div> Shell Tellus 22</div> <div><div></div> Distilled water</div> <div><div></div> Others upon request</div>		
Overpressure protection	Safety relief valve on reference transducer		

Control parameter	Model CPC8000-HM-L	Model CPC8000-HM-M	Model CPC8000-HM-H
Control stability ¹⁾	< 0.005 % FS		
Control range	5 ... 700 bar [75 ... 10,000 psi]	20 ... 1,600 bar [290 ... 23,000 psi]	25 ... 2,895 bar [360 ... 42,000 psi]
Control speed	< 60 s		
Primary transducer model	CPR8050/CPR8000	CPR8850/CPR8050	CPR8850
Primary maximum range	700 bar [10,000 psi]	1,600 bar [23,000 psi]	2,895 bar [42,000 psi]
Primary minimum range	400 bar [6,000 psi]	1,000 bar [15,000 psi]	2,000 bar [30,000 psi]
Secondary transducer model	CPR8050/CPR8000	CPR8050/CPR8000	CPR8850/CPR8050
Secondary minimum range	100 bar [1,500 psi]	400 bar [6,000 psi]	414 bar [6,015 psi]
Test volume	10 ... 200 ccm ²⁾		

1) Based on the primary range of the instrument.

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

Operating conditions	
Place of use	Indoor Not for wet locations
Altitude	Up to 3,048 m [10,000 ft] above sea level
Operating temperature	15 ... 40 °C [59 ... 104 °F]
Compensated temperature range	15 ... 40 °C [59 ... 104 °F]
Storage temperature range	5 ... 70 °C [41 ... 158 °F]
Relative humidity, condensation	0 ... 95 % r. h. (non-condensing)
Permissible pressure media	<ul style="list-style-type: none"> ■ Dry, clean air ■ Nitrogen
Mounting position	Horizontal
Test item volume	See graphs below
Permissible pollution degree	Degree 2

Specifications for pneumatic pressure controller model CPC8000-HC

Pressure controller model CPC8000-HC	
Instrument	
Instrument version	<ul style="list-style-type: none"> ■ 19" rack-mounting kit with side panels incl. rack-mounting kit ■ Built into a 19" rack with CPC8000-HM hydraulic module
Dimensions	See technical drawings
Weight	Approx. 16.7 kg [37 lb]
Warm-up time	Approx. 60 minutes
Digital display	
Type of display	10.1" colour TFT with capacitive touchscreen
Display resolution	4 ... 7 digits depending on range and units
Measuring range	5 ... 700 bar to 25 ... 2,895 bar [75 ... 10,000 psi to 360 ... 42,000 psi] Depending on the reference pressure transducer model CPR8xxx
Pressure type	Gauge
Unit	39 and two freely programmable
Permissible pressure	
Drive pressure	38.5 bar [558 psi]
Measure/Control port	Max. 105 % FS

Pressure connection	
Connections	Up to 5 ports with 7/16"- 20 F SAE
Pressure adapters	<ul style="list-style-type: none"> ■ 6 mm FITOK® threaded pipe connection ■ 1/4" tube adapter included ■ Others on request
Filter elements	All pressure ports have 40-micron filters.
Permissible pressure media	<ul style="list-style-type: none"> ■ Dry, clean air ■ Nitrogen (ISO 8573-1:2010 class 5.5.4 or better)
Overpressure protection	Safety relief valve on reference transducer

Communication	
Interface	<ul style="list-style-type: none"> ■ Ethernet ■ IEEE-488.2 ■ USB ■ RS-232
Baud rate	<ul style="list-style-type: none"> ■ 9600 ■ 19200 ■ 38400 ■ 57600 ■ 115200
Command sets	<ul style="list-style-type: none"> ■ Mensor ■ WIKA SCPI ■ Others on request
Response time	< 100 ms

Voltage supply	
Operating voltage	<ul style="list-style-type: none"> ■ AC 100 ... 120 V, 50/60 Hz ■ AC 220 ... 240 V, 50/60 Hz
Power consumption	Max. 160 VA
Supply voltage fluctuation	±10 %
Fuse	1.6 A, 250 V; SLO-BLO 5 x 20 mm

Operating conditions	
Place of use	Indoor Not for wet locations
Altitude	Up to 3,048 m [10,000 ft] above sea level
Operating temperature	15 ... 45 °C [59 ... 113 °F]
Compensated temperature range	15 ... 45 °C [59 ... 113 °F]
Storage temperature range	5 ... 70 °C [41 ... 158 °F]
Relative humidity, condensation	0 ... 95 % r. h. (non-condensing)
Transducers mounting position	Horizontal
Permissible pollution degree	Degree 2
EMC (HF field)	EN 61326-1 emission (group 1, class A) and immunity (industrial application)

Approvals

Logo	Description	Region
CE	EU declaration of conformity	European Union
	EMC directive ¹⁾	
	EN 61326-1 emission (group 1, class A) and immunity (industrial application)	
	Low voltage directive	
	RoHS directive	

1) 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.

Optional approvals

Logo	Description	Region
-	MChS Permission for commissioning	Kazakhstan

Certificates

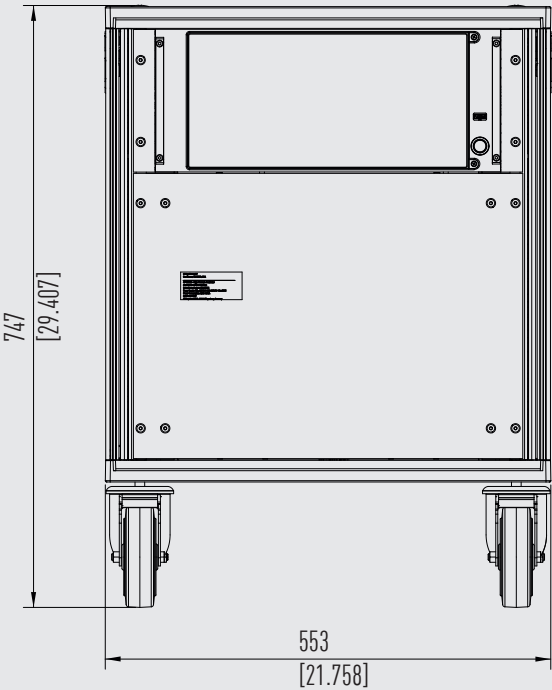
Certificate	
Calibration ¹⁾	
Reference pressure transducer model CPR8000	<ul style="list-style-type: none"> ■ A2LA calibration certificate (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - gauge pressure (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - absolute pressure (traceable and accredited in accordance with ISO/IEC 17025)
Reference pressure transducer model CPR8050	<ul style="list-style-type: none"> ■ A2LA calibration certificate (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - gauge pressure (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - absolute pressure (traceable and accredited in accordance with ISO/IEC 17025)
Reference pressure transducer model CPR8850	<ul style="list-style-type: none"> ■ 3.1 inspection certificate per EN 10204 ■ A2LA calibration certificate (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - gauge pressure (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - absolute pressure (traceable and accredited in accordance with ISO/IEC 17025)
Barometric reference	<ul style="list-style-type: none"> ■ Without ■ 3.1 inspection certificate per EN 10204 ■ A2LA calibration certificate (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate for barometric reference (traceable and accredited in accordance with ISO/IEC 17025)
Recommended calibration interval	1 year (dependent on conditions of use)

1) Calibration in a horizontal position / operating position.

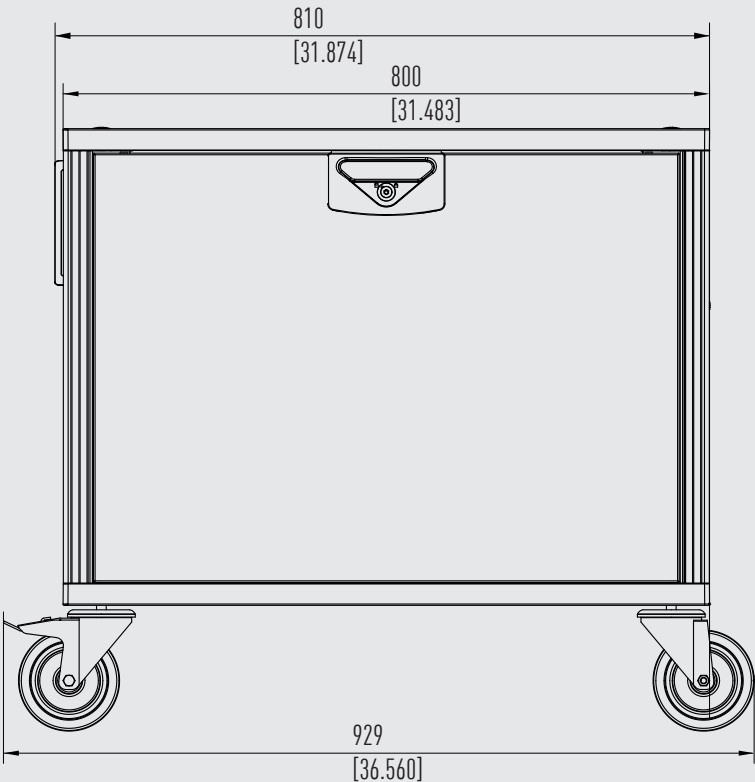
→ Approvals and certificates, see website

Dimensions in mm [in]

View from the front



View from the side (left)



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 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 transducers 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

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 warm-up time (60 minutes).



Pressure controller, hydraulic high-pressure version, model CPC8000-H

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.

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.

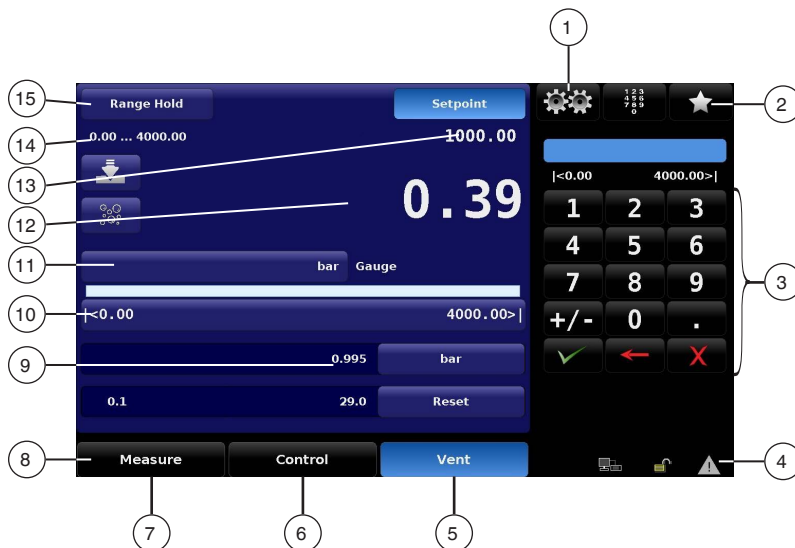
Long-term stability and low maintenance

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 hydraulic 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. / 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 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 Secondary 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 and is available as a demo version for a cost-free download.

To switch from the demo version to a licensed 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
- Maximum degree of automation in connection with our CPC series

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





→ For further information, see data sheet CT 95.10

Three WIKA-Cal licences are available together with one CPC series pressure controller

The WIKA-Cal calibration software is available 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)	Cal-Template (full version)	Log-Template (full version)
Fully automatic calibration	Semi-automatic calibration	Fully automatic calibration	<ul style="list-style-type: none">■ Live measured value recording for a certain period of time with selectable interval, duration and start time■ 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
Limitation to two measuring points	No limitation of the measuring points approached		
<ul style="list-style-type: none">■ Creation of 3.1 inspection certificates per DIN EN 10204■ Calibration data can be exported to Excel® template or XML file■ Calibration of pressure measuring instruments			
Ordering information for a single licence			
Is available for a cost-free download	WIKA-CAL-LZ-Z-Z	WIKA-CAL-CZ-Z-Z	WIKA-CAL-ZZ-L-Z
Ordering information for a pair licence			
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 and spare parts

Description ¹⁾		Order code
		CPX-A-CH
	Barometric reference Measuring range: 552 ... 1,172 mbar abs. Accuracy to 0.01 % of reading	-1-
	Measuring range: 552 ... 1,172 hPa abs. Accuracy to 0.01 % of reading	-2-
	Measuring range: 8 ... 17 psi abs. Accuracy to 0.01 % of reading	-3-
	Calibration adapter For barometric reference, voltage supply and software	-5-
	Calibration adapter For reference pressure transducer, CPR8000 voltage supply and software	-6-
	For reference pressure transducer, CPR8050 and CPR8850 voltage supply and software	-7-
-	Pressure adapter SnoTriK to 9/16 - 18 UNF fitting male F 250-C	-8-
	Operating fluid Oil type - Sebacate In 1-litre plastic bottle	-9-
	Oil type - Shell Tellus S2 MX In 1-litre plastic bottle	-A-
Ordering information for your enquiry:		
		1. Order code: CPX-A-CH 2. Option:
		↓ []

1) The figures are an example and may change depending on the state-of-the-art in design, material composition and representation.

Scope of delivery

- Pressure controller model CPC8000-HC, 19" built-in version
- Hydraulic module
model CPC8000-HM-L (low-pressure version),
model CPC8000-HM-M (high-pressure version) or
model CPC8000-HM-H (extended pressure version)
- Power cord 2 m [6.5 ft]
- Operating instructions
- Calibration certificate

Options

- System built into a 19" rack with rollers
- Additional reference pressure transducers
- External tank
- Protection valve (mandatory for extended pressure version)

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Ordering information

CPC8000-H / Case type / Pressure range basic instrument / Instrument version / Reference pressure transducer 1 / Reference pressure transducer 2 / Barometric reference / Type of certificate for the barometric reference / Medium / Power cord / External tank / Protection valve / Further approvals / Additional order information

CPR8000 / Installed in CPC8000/CPC8000-H/CPC7000 / Pressure unit / Pressure type / Minimum pressure range / Maximum pressure range / Accuracy / Type of certificate / Further approvals / Additional ordering information

CPR8050 / Installed in CPC8000-H/CPC7000 / Pressure unit / Pressure type / Minimum pressure range / Maximum pressure range / Accuracy / Type of certificate / Further approvals / Additional ordering information

CPR8850 / Installed in CPC8000-H / Basis measuring range absolute / Pressure unit / Minimum pressure range / Maximum pressure range / Accuracy / Type of certificate / Further approvals / Additional ordering information

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