

# High-end pressure controller Model CPC8000



WIKA data sheet CT 28.01



## Applications

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

## Special features

- Pressure ranges: -1 ... 400 bar / -15 ... 6,000 psi
- Up to three integrated, interchangeable reference transducers
- Control stability 0.002 % of the span
- Accuracy down to 0.008 % IS (IntelliScale)
- Two year warranty



High-end pressure controller, model CPC8000

## Description

### Overview

The CPC8000 high-end pressure controller provides an extraordinarily stable and accurate pressure output. On request, complete mobile or stationary test systems can be manufactured. There is an IEEE-488.2, RS-232 or USB and an Ethernet interface for communication with other instruments, and thus the instrument can be integrated into existing systems.

### Application

The CPC8000 high-end pressure controller is a premium accuracy instrument capable of being a calibration solution for various applications. Its outstanding control performance is particularly impressive, thanks to special, patented valve technology and the specific pressure transducer as a measuring unit. With this the controller is suitable as a factory or working standard for the testing or calibration of any type of pressure measuring instrument.

### Functionality

Maximum ease-of-use is achieved through the large touchscreen and the simple and intuitive menu navigation. In addition, its operation 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. 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.

### Design

The CPC8000 is available as a desktop instrument or as a 19" rack-mounted unit. The transducers can be changed via the front, without taking out the complete controller (e.g. out of a calibration rig).

# Specifications

## Reference pressure transducers

Model CPR8000	Standard	Optional	Optional	Optional
Accuracy <sup>1)</sup>	0.01 % FS <sup>2)</sup>	0.008 % FS <sup>2)</sup>	0.01 % or 0.008% IS-50 <sup>3)9)</sup>	0.008 % IS-33 <sup>8)</sup>
Gauge Pressure	0 ... 0.35 up to 0 ... 400 bar 0 ... 5 up to 0 ... 6,000 psi <sup>4)</sup>	0 ... 0.35 up to 0 ... 400 bar 0 ... 5 up to 0 ... 6,000 psi <sup>4)</sup>	0 ... 1 up to 0 ... 400 bar 0 ... 15 up to 0 ... 6,000 psi <sup>4)</sup>	0 ... 1 up to 0 ... 100 bar 0 ... 15 up to 0 ... 1,500 psi
Bi-directional Pressure	-1 ... 1 up to -1 ... 400 bar -15 ... 15 up to -15 ... 6,000 psi	-1 ... 1 up to -1 ... 400 bar -15 ... 15 up to -15 ... 6,000 psi	-1 ... 10 up to -1 ... 400 bar -15 ... 145 up to -15 ... 6,000 psi	-1 ... 10 up to -1 ... 100 bar -15 ... 145 up to -15 ... 1,500 psi
Absolute Pressure <sup>5)</sup>	0 ... 0.5 up to 0 ... 401 bar abs. 0 ... 7.5 up to 0 ... 6,015 psi abs.	0 ... 0.5 up to 0 ... 401 bar abs. 0 ... 7.5 up to 0 ... 6,015 psi abs.	0 ... 1 up to 0 ... 401 bar abs. 0 ... 15 up to 0 ... 6,015 psi abs.	0 ... 1 up to 0 ... 101 bar abs. 0 ... 15 up to 0 ... 1,515 psi abs.
Precision <sup>6)</sup>	0.004 % FS	0.004 % FS	0.004 % FS	0.004 % FS
Calibration Interval	365 days <sup>7)</sup>	365 days <sup>7)</sup>	365 days	365 days

### Model CPR8800

Accuracy <sup>1)</sup>	0.008 % IS-50 <sup>9)</sup>
Absolute Pressure	0 ... 35 to 0 ... 401 bar abs. 0 ... 500 up to 0 ... 6,015 psi abs.
Precision <sup>6)</sup>	0.004 % FS
Calibration Interval	365 days

### Optional barometric reference

Function	The barometric reference can be used to switch pressure types <sup>10)</sup> (absolute <=> gauge). With gauge pressure transducers, the measuring range of the transducers must begin with -1 bar / -15 psi in order to carry out an absolute pressure emulation.
Measuring range	552 ... 1,172 mbar abs. / 8 ... 17 psi abs.
Accuracy <sup>1)</sup>	0.01 % of reading
Pressure units	38 and 2 freely programmable

- 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) FS = full span
- 3) 0.01 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.01% of half of the full scale value and between 50 ... 100 % of the full scale, the accuracy is 0.01 % of reading..
- 4) Ranges from 1500 to 2000 psig will be sealed gauge transducers
- 5) The minimum calibrated range of absolute transducer(s) is 600 mTorr..
- 6) It is defined as the combined effects of linearity, repeatability and hysteresis throughout the stated compensated temperature range.
- 7) 180 days for pressure ranges below 1 bar (15 psi) gauge or absolute, and -1...1 bar (-15 ...14.5 psi) bidirectional. 365 days for the remainder of the specified ranges.
- 8) 0.008 % IS-33 accuracy: Between 0 ... 33 % of the full scale, the accuracy is 0.008% of one third of the full scale value and between 33 ... 100 % of the full scale, the accuracy is 0.008 % of reading.
- 9) 0.008 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.008% of half of the full scale value and between 50 ... 100 % of the full scale, the accuracy is 0.008 % of reading.
- 10) For a pressure type emulation, we recommend a native absolute pressure transducer, since the zero point drift can be eliminated through a zero point adjustment.

## Base instrument

### Instrument

Instrument version	Standard: desktop case Option: 19" rack-mounting with side panels incl. rack-mounting kit
Warm-up time	approx. 25 minutes
Dimensions in mm	see technical drawings
Weight	approx. 22.2 kg / approx. 49 lbs. incl. all internal options

### Display

Screen	9.0" color TFT with capacitive touchscreen
Resolution	4 ... 7 digits

### Connections

Pressure connections	5 ports with 7/16"-20 F SAE and 1 port with 10-32 UNF female
Pressure adapters	6 mm SWAGELOK® threaded pipe connection; others on request
Filter elements	all pressure ports have 40-micron filters
Permissible pressure media	dry, clean air or nitrogen (ISO 8573-1:2010 class 5.5.4 or better)

## Base instrument

Overpressure protection Safety relief valve fixed to reference pressure transducer and adjusted to customised measuring range

### Permissible pressure

Supply Port max. 110 % FS or max. 420 bar / 6,100 psi (whichever is the smaller value)

Measure/Control Port max. 105 % FS

### Voltage supply

Power supply AC 100 ... 120 V / AC 200 ... 240 V, 50 ... 60 Hz

Power consumption max. 130 VA

### Permissible ambient conditions

Storage temperature 0 ... 70 °C / 32 ... 158 °F

Relative humidity 0 ... 95 % r. h. (non-condensing)

Compensated temperature range 15 ... 45 °C / 59 ... 113 °F

Mounting position horizontal or slightly tilted

### Control parameters

Control stability 0.002 % FS

Control speed < 60 s<sup>11)</sup>

Control range 0.5 ... 100 % FS

Rate control 0.1 ... 10 % FS/s

Minimum control pressure 0.0017 bar (0.025 psi) over exhaust pressure or 0.05 % FS, whichever is greater

Test volume 50 ... 300 ccm (Consult factory for volumes exceeding 300 cc)

### Communication

Interface IEEE-488.2, Ethernet, USB, RS-232

Command sets Mensor, WIKA SCPI

Response time < 100 ms

### Digital I/O

Digital Input DC 3.3 V or DC 5 V; current limited by 330 Ω resistor

Digital Output 0.5 A at AC 125 V; 1 A at DC 24 V

11) Regarding a 10% FS pressure increase in a 150 cc volume

## Approvals

### Approvals included in the scope of delivery

Logo	Description	Country
CE	<b>EU declaration of conformity</b>	European Union
	EMC directive <sup>1)</sup> EN 61326-1 emission (group 1, class A) and immunity (industrial application)	
	Low voltage directive EN 61010-1	
	RoHS directive EN 50581	
CE	<b>RoHS directive</b> China RoHS	China

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.

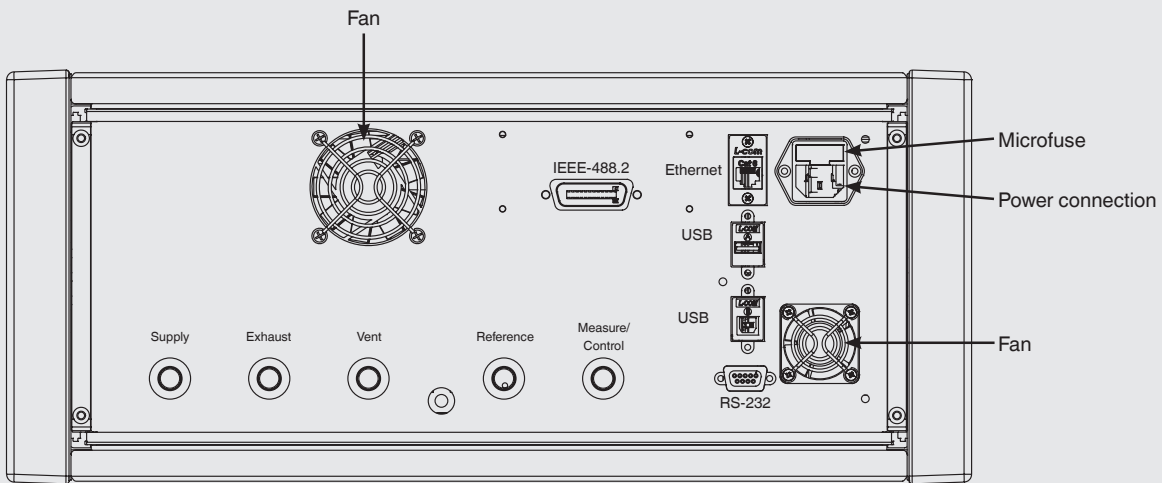
# Certificates

## Certificate

<b>Calibration</b>	<ul style="list-style-type: none"> <li>■ A2LA calibration certificate (standard on factory)</li> <li>■ Optional: DKD/DAkkS calibration certificate for an absolute pressure measuring range</li> <li>■ Optional: DKD/DAkkS calibration certificate for a gauge pressure measuring range</li> </ul>
<b>Recommended recalibration interval</b>	365 days (dependent on conditions of use)

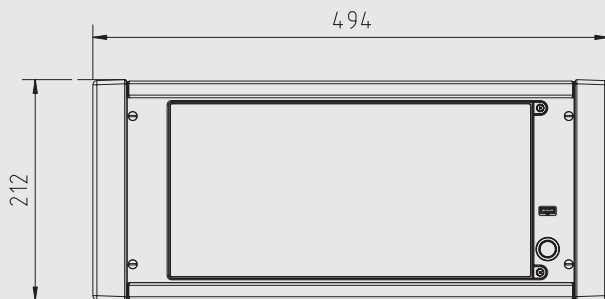
Approvals and certificates, see website

## Electrical and pressure connections - rear

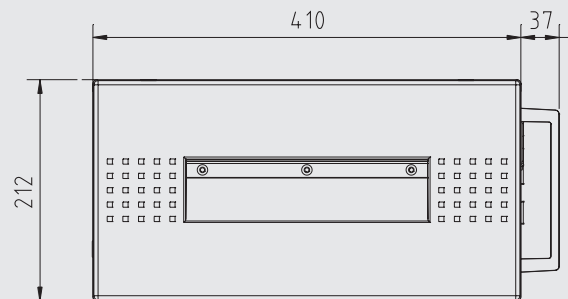


## Dimensions in mm

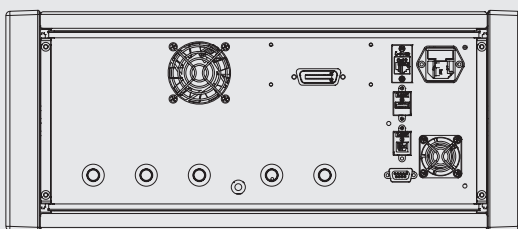
Front view



Side view



Rear view



## Modular design of the CPC8000

Due to the modular transducer design, the large pressure range of up to 400 bar / 6,000 psi and the ability to exchange the transducers through the front, the CPC8000 high-end pressure controller brings a maximum degree of flexibility in terms of hardware design or a subsequent transducer expansion.

### Up to three precision pressure transducers possible

The controller offers at least one precision pressure transducer (optional are two or three), whose calibration data is stored in the transducer (for available ranges, see specifications).

The five basic instruments, which are matched to the respective maximum ranges (see next page), provide an optimal control performance. In one controller, either absolute or gauge pressure transducers are possible. With two or three available reference transducers, the measuring ranges of one controller can either be selected automatically via the auto-range function or via the menu. The maximum ratio of the reference transducers in a controller is 1:10. Each larger transducer must include the measuring range of the next smaller transducer.

Optional a barometric reference allows switching between gauge pressure and absolute pressure.

### Extremely easy to maintain

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



**Modular parts of the hardware**  
Up to three reference transducers per instrument

## Special features of the CPC8000

### Outstanding control performance

The high-end pressure controllers model CPC8000 is notable for its outstanding control performance. The control unit guarantees fast, harmonic and overshoot-free control of pressure values with the highest precision and a very high control stability.

### Particularly adaptable to any application

The controller has a short warm-up time of approx. 25 min. Furthermore it enables an automatic adjustment to the test volume. The CPC8000 high-end pressure controller also offers the possibility of rate control, so that extremely gentle and smooth control processes can also be achieved (e.g. pressure switch tests).

### Simple operation

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

### Long-term stability and low maintenance

As a result of the high-quality precision pressure transducer 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.

## Working range of the basic controller

### Bi-directional or gauge pressure [bar / psi] <sup>1)</sup>

-1 / -15	0	6 / 90	70 / 1,000	135 / 2,000	210 / 3,000	400 / 6,000
LP-NVR 0.35 bar (5 psi) / ±1 bar (± 15 psi) <sup>2)</sup>						
MP-NVR -1 ... 3.5 bar (-15 ... 50 psi) <sup>2)</sup>						
SP-NVR -1 ... 7 bar (-15 ... 100 psi) <sup>2)</sup>						
HP-NVR -1 ... 10 bar (-15 ... 145 psi) <sup>2)</sup>						
EP-NVR -1 ... 20 bar (-15 ... 290 psi) <sup>2)</sup>						

### Absolute pressure [bar abs. / psi abs.] <sup>1)</sup>

0	7 / 105	71 / 1,015	136 / 2,015	211 / 3,015	401 / 6,015
LP-NVR 0 ... 0.5 bar abs. (0 ... 7.5 psi abs.) <sup>2)</sup>					
MP-NVR 0 ... 4.5 bar abs. (0 ... 65 psi abs.) <sup>2)</sup>					
SP-NVR 0 ... 8 bar abs. (0 ... 115 psi abs.) <sup>2)</sup>					
HP-NVR 0 ... 11 bar abs. (0 ... 160 psi abs.) <sup>2)</sup>					
EP-NVR 0 ... 21 bar abs. (0 ... 305 psi abs.) <sup>2)</sup>					

1) Mixing of absolute pressure and gauge pressure transducers in a module is not possible

2) Smallest acceptable transducer range

## Touchscreen and intuitive operator interface

The CPC8000 high-end pressure controller has a high-resolution colour touchscreen with an intuitive menu structure. The instrument offers a precision pressure controller, whose set-up (incl. optional functions) can be easily configured via the touchscreen.

### Standard desktop/main screen

**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).

**CONTROL**  
In control mode the instrument provides a very precise pressure at the test port of the respective channel in accordance with the desired value setting.

**VENT**  
Immediately vents the system, including the test assembly connected to the test port, to atmosphere.

Annotations on the screenshot:  
 - Selection of the active transducer or auto-range: Range Hold  
 - Pressure range of the transducers: 0.00000 ... 4.00000  
 - Entered set point: 0.20000  
 - Current measuring value: 0.00012  
 - Current unit: bar Gauge  
 - Adjustable control limits: |< 0.00000 4.00000 >|  
 - optionally adjustable: slew rate: 500.0000 Rate Setpoint  
 - optionally adjustable: currently measured slew rate: 0.0000 bar/Min  
 - Operating modes: Measure, Control, Vent  
 - Settings: Gear icon  
 - Selection: Numeric keypad, settings and favorites: Star icon  
 - Input menu field (Numeric/STEP Funct./JOG Funct.): Numeric keypad  
 - Display: integrated barometer, serial interface communication status, touchscreen lockout and warnings: Barometric: 1.02513 bar, lockout icon, warning icon

## 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 the user and guides him through the creation process of a document.

To switch from the demo version to a licensed version, a USB dongle with a valid licence 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 licence. Several licences 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 automatic 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

Accessories for CPC8000	Order code
Description	CPX-A-C8
<b>Desktop case</b>	-D-
<b>19" rack mount kit with side panels</b> European Version	-R-
<b>19" rack mount kit with side panels</b> North America Version	-U-
<b>Barometric reference</b> Measuring range: 8 ... 17 psi abs, 0.01% of reading	-3-
<b>Barometric reference</b> Measuring range 552 ... 1172 mbar abs, 0.01% of reading	-K-
<b>Barometric reference</b> Measuring range 552 ... 1172 hPa abs, 0.01% of reading	-L-
<b>Calibration adapter for reference pressure sensors</b> Power supply and software included	-4-
<b>Calibration adapter for barometric reference</b> Power supply and software included	-5-
<b>Carrying case</b>	-6-
<b>Muffler</b>	-7-
<b>RS-232 communication cable</b>	-9-
<b>Adapter set</b> 6mm tube fittings (4 adapters, Pmax 137 bar / 2000 psi)	-M-
<b>Adapter set</b> 6mm tube fittings (4 adapters, Pmax 400 bar / 6000 psi)	-C-
<b>Adapter set</b> 1/4" tube fittings (4 adapters, Pmax 137 bar / 2000 psi)	-I-
<b>Adapter set</b> 1/4" tube fittings (4 adapters, Pmax 400 bar / 6000 psi)	-E-
<b>Adapter set</b> 1/8" BSPG female fittings (4 adapters, Pmax 137 bar / 2000 psi)	-B-
<b>Adapter set</b> 1/4" NPT female fittings (4 adapters, Pmax 137 bar / 2000 psi)	-N-
<b>Adapter set</b> 1/4" NPT female fittings (4 adapters, Pmax 400 bar / 6000 psi)	-A-
<b>Adapter set</b> 1/8" NPT female fittings (4 adapters, Pmax 137 bar / 2000 psi)	-S-
<b>Adapter set</b> 1/8" NPT female fittings (4 adapters, Pmax 400 bar / 6000 psi)	-F-
<b>Ordering information for your enquiry:</b>	
1. Order code: CPX-A-C8 2. Option:	↓ [ ]



## Scope of delivery

- High-end pressure controller model CPC8000
- 2 m / 6.5 ft power cord
- Operating instructions
- A2LA calibration certificate (standard on factory)

## Options

- DKD/DAkkS calibration certificate
- 19" rack mounting with side panels
- Barometric reference
- Additional reference pressure transducers
- Customer-specific system
- 4 pressure port adapters

## Ordering information

Housing / Pressure range basic instrument / Reference pressure sensor 1 / Reference pressure sensor 2 / Reference pressure sensor 3 / Barometric reference / Type of certificate for barometric reference / Pressure port adapter / Power cord / Carrying case / Further approvals / Additional order information

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