

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
- Pressure type: positive and negative gauge pressure, absolute pressure
- Up to three integrated, interchangeable reference sensors
- Control stability 0.002 % of the span
- Accuracy down to 0.008 % IS (IntelliScale)



High-end pressure controller, model CPC8000

Description

Application

The CPC8000 high-end pressure controller provides always an appropriate calibration solution on account of its accuracy class (see specifications). Its outstanding control performance is particularly impressive, thanks to special, patented valve technology and the specific pressure sensor 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.

Design

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

Functionality

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

Complete test and calibration systems

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.

Specifications

Reference pressure sensors

Model CPR8000	Standard	Optional
Accuracy ¹⁾	0.01 % FS	0.01 % IS-50 ³⁾
Gauge pressure	0 ... 0.07 up to 0 ... 400 bar 0 ... 1 up to 0 ... 6,000 psi	0 ... 1 up to 0 ... 400 bar 0 ... 15 up to 0 ... 6,000 psi
Bi-directional	-0.035 ... +0.035 up to -1 ... 400 bar -0.5 ... +0.5 up to -15 ... 6,000 psi	-1 ... 10 up to -1 ... 400 bar -15 ... 150 up to -15 ... 6,000 psi
Absolute pressure	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.
Precision ²⁾	0.005 % FS	0.005 % IS-50

Model CPR8800

Accuracy ¹⁾	0.008 % IS-33 ⁴⁾	0.008 % IS-50 ⁵⁾
Absolute pressure	0 ... 1 to 0 ... ≤ 35 bar abs. 0 ... 15 up to 0 ... ≤ 500 psi abs.	0 ... 35 to 0 ... 401 bar abs. 0 ... 500 up to 0 ... 6,015 psi abs.
Precision ²⁾	0.004 % IS-33	0.004 % IS-50

Optional barometric reference

Function	The barometric reference can be used to switch pressure types ⁶⁾ (absolute <=> gauge). With gauge pressure sensors, the measuring range of the sensors 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 ¹⁾	0.01 % of reading
Pressure units	38 and 2 freely programmable

- 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) It is defined as the maximum deviation between two measurements at one point under laboratory conditions which includes linearity, hysteresis and repeatability of the measuring instrument.
- 3) 0.01 % IS-50 accuracy: Between 0 ... 50 % of the measuring span, the accuracy is 0.01 % of half the measuring span and between 50 ... 100 % of the measuring span, the accuracy is 0.01 % of reading.
- 4) 0.008 % IS-33 accuracy: Between 0 ... 33 % of the measuring span, the accuracy is 0.008 % of the lower third of the measuring span and between 33 ... 100 % of the measuring span, the accuracy is 0.008 % of reading.
- 5) 0.008 % IS-50 accuracy: Between 0 ... 50 % of the measuring span, the accuracy is 0.008 % of half the measuring span and between 50 ... 100 % of the measuring span, the accuracy is 0.008 % of reading.
- 6) For a pressure type emulation, we recommend a native absolute pressure sensor, 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.

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 SWAGELOK® threaded pipe connection; others on request
Filter elements	all pressure ports have 20-micron filters
Permissible pressure media	dry, clean air or nitrogen
Overpressure protection	Safety relief valve fixed to reference pressure sensor and adjusted to customised measuring range

Base instrument

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	< 25 s
Control range	0.5 ... 100 % FS ⁷⁾
Rate control	0.1 ... 5 % FS/s
Stability of the rate control	±2 % of the set rate
Test volume	10 ... 1,000 ccm

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

7) Control within the given specifications

CE conformity, certificates

CE conformity

EMC directive ⁸⁾	2004/108/EC, EN 61326-1 emission (group 1, class A) and interference immunity (industrial application)
Low voltage directive	2006/95/EC, EN 61010-1

Certificate

Calibration ⁹⁾	Standard: 3.1 calibration certificate per EN 10204 Option: DKD/DAkkS calibration certificate
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8) **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.

9) Calibration in a horizontal position.

Approvals and certificates, see website

Modular design of the CPC8000

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

Up to three precision pressure sensors possible

The controller offers at least one precision pressure sensor (optional are two or three), whose calibration data is stored in the sensor (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 sensors are possible. With two or three available reference sensors, 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 sensors in a controller is 1:10. Each larger sensor must include the measuring range of the next smaller sensor.

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 sensors of different pressure ranges can be exchanged in just five minutes (plug-and-play).



Modular parts of the hardware
Up to three reference sensors 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

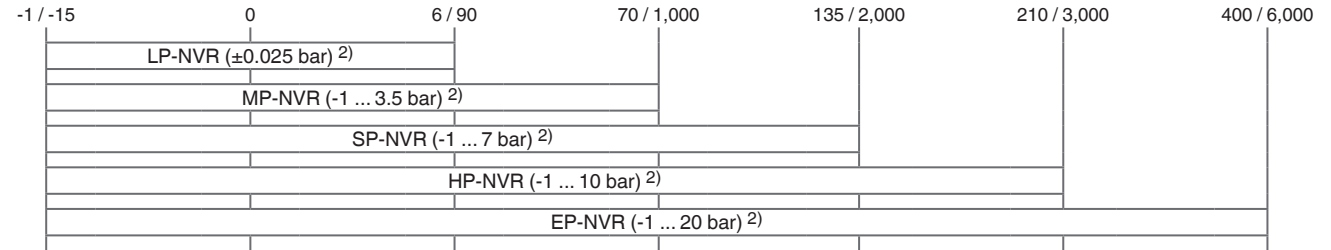
The lean and unambiguous menu structure ensures a particularly high user-friendliness.

Long-term stability and low maintenance

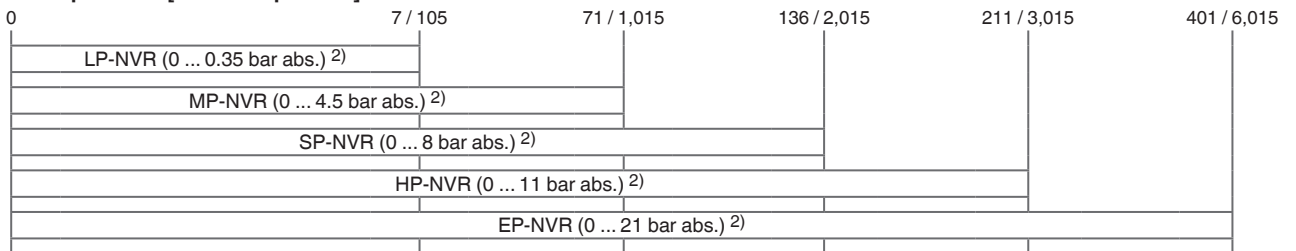
As a result of the high-quality precision pressure sensor technology, the instrument offers an excellent measuring accuracy and long-term stability. Furthermore, special patented needle valve technology ensures a low-noise and low-wear control of pressure.

Working range of the basic controller

Bi-directional or gauge pressure [bar / psi] ¹⁾



Absolute pressure [bar abs. / psi abs.] ¹⁾



- 1) Mixing of absolute pressure and gauge pressure sensors in a module is not possible
 2) Smallest recommendable sensor 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

Annotations for the screenshot:

- Selection of the active sensor or auto-range: Range Hold
- Pressure range of the sensors: 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: Settings gear icon
- Selection: Numeric keypad, settings and favourites: Numeric keypad and 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 and status icons

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).

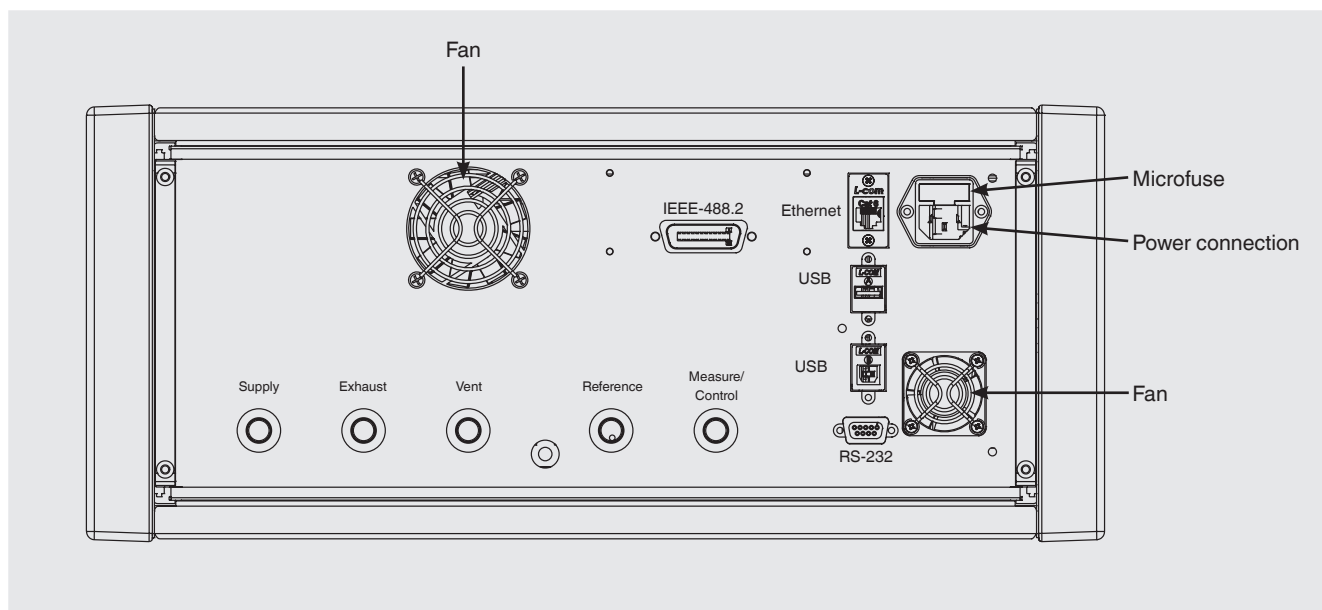
CONTROL

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.

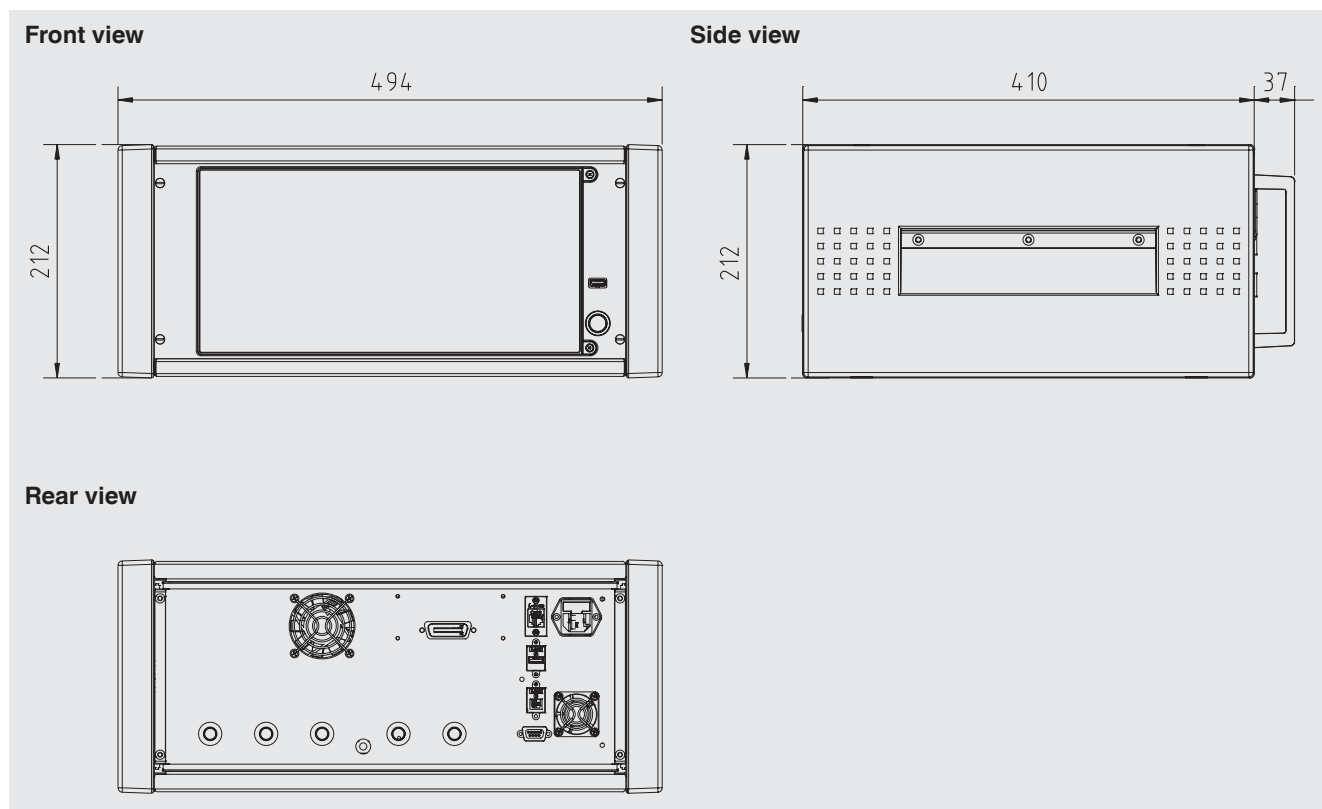
VENT

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

Electrical and pressure connections - rear



Dimensions in mm



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 key with the template has to be purchased.

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



- Creation of calibration certificates for mechanical and electronic pressure measuring instruments
- Fully automatic calibration with pressure controllers
- Calibration of relative 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.



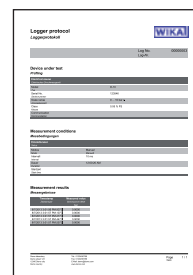
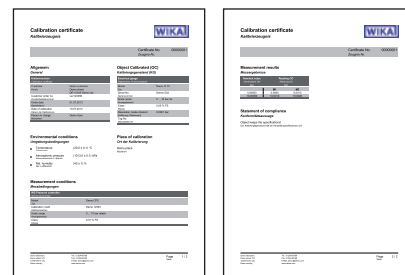
Log Demo

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



Log

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



Scope of delivery

- High-end pressure controller model CPC8000
- 2 m / 6.5 ft power cord
- Operating instructions
- 3.1 calibration certificate per DIN EN 10204

Accessories

- Calibration sled
- Pressure adapters
- Interface cable

Options

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

Ordering information

Model / Housing type / Instrument version / Reference pressure sensor 1 / Reference pressure sensor 2 / Reference pressure sensor 3 / Barometric reference / Calibration certificate for the barometric reference / Power cord / Pressure connection adapter / Additional order information

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