High-end pressure controller
Model CPC8000

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

High-end pressure controller, model CPC8000

Special features

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

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
Accuracy [1]	0.008 % FS [2]	0.008% IS-50 [8]	0.008 % IS-33 [7]
Gauge Pressure	0 ... 0.35 up to 0 ... 400 bar 0 ... 5 up to 0 ... 6,000 psi [3]	0 ... 1 up to 0 ... 400 bar 0 ... 15 up to 0 ... 6,000 psi [3]	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 ... 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 [5]	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 [6]	0.004 % FS	0.004 % FS	0.004 % FS
Calibration Interval	365 days [6]	365 days	365 days
Optional barometric reference			
Function	The barometric reference can be used to switch pressure types [9] (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 [1]	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) Ranges from 1500 to 2000 psig will be sealed gauge tranducers
4) The minimum calibrated range of absolute transducer(s) is 600 mTorr..
5) It is defined as the combined effects of linearity, repeatability and hysteresis throughout the stated compensated temperature range.
6) 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.
7) 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.
8) 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.
9) 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	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	10.1" 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)
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. 6,600 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, 160-155 VA
Power consumption	max. 160 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

Base instrument

Control parameters	
Control stability	0.002 % FS
Control speed	< 60 s [11)]
Control range	0.05 ... 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 to 300 mL's (Consult factory for anything outside of this range)
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

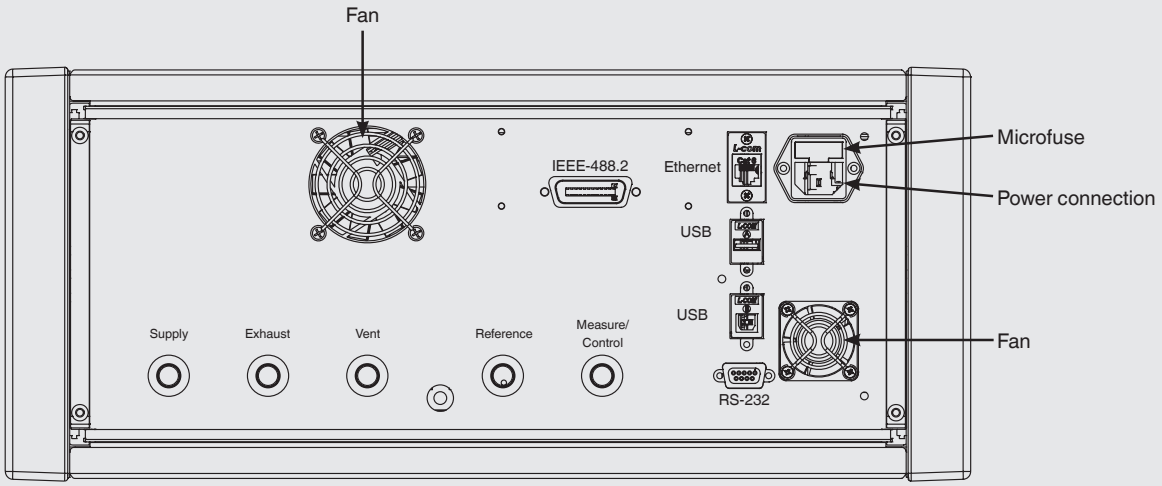
Approvals and Certificates		
Logo	**Description**	**Country**
CE	**EU Declaration of Conformity** EU Importer: WIKA, 63911 Klingenberg, Germany	European Union

Certificates

Certificate	
Calibration	■ A2LA calibration certificate (standard on factory) ■ Optional: DKD/DAkkS calibration certificate for an absolute pressure measuring range ■ Optional: DKD/DAkkS calibration certificate for a gauge pressure measuring range
Recommended recalibration interval	365 days (dependent on conditions of use)

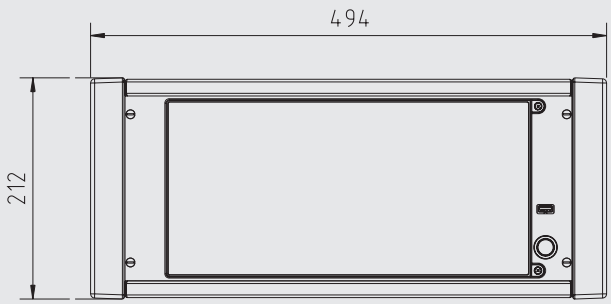
Approvals and certificates, see website

Electrical and pressure connections - rear

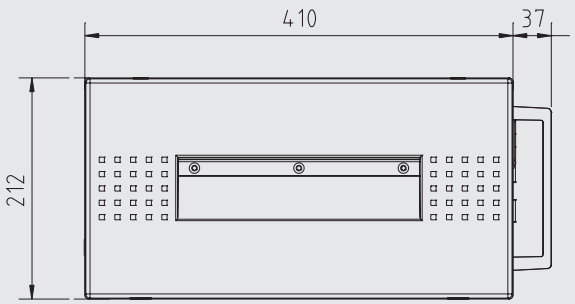


Dimensions in mm

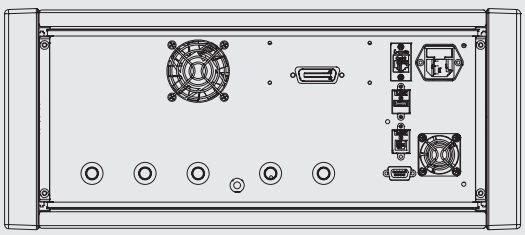
Front view



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.

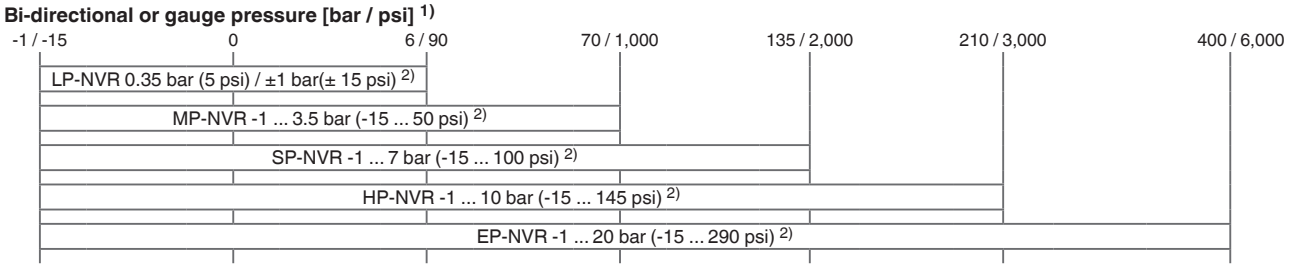
Particularly adaptable to any application
The controller has an short warm-up time of approx. 25 min. Furthermore it enables an automatic adjustment to the test volume. The CPC8000 high-end pressure controller also offers the possibility of rate control, so that extremely gentle and smooth control processes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

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

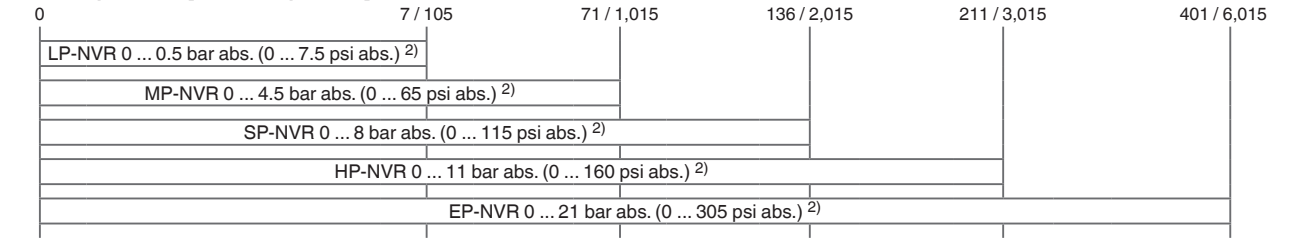
Long-term stability and low maintenance
As a result of the high-quality precision pressure transducer technology, the instrument offers an excellent measuring accuracy and long-term stability. Furthermore, special patented needle valve technology ensures a low-noise and low-wear control of pressure.

Working range of the basic controller

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



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

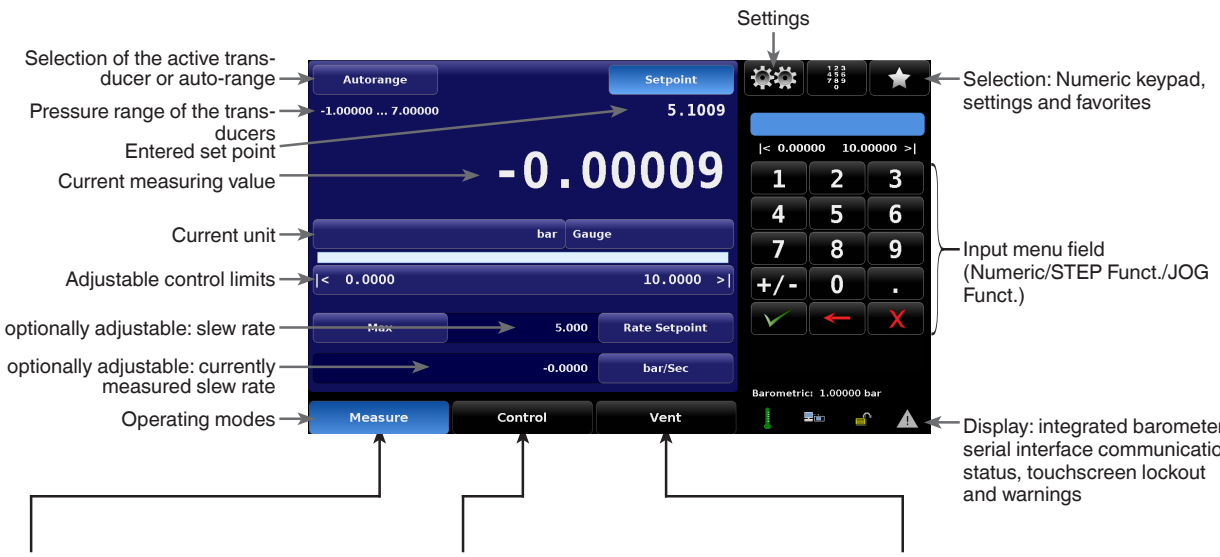


1) Mixing of absolute pressure and gauge pressure transducers in a module is not possible
2) Smallest acceptable transducer range

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.

Scope of delivery

- High-end pressure controller model CPC8000
- 2 m / 6.5 ft power cord
- Operating instructions
- A2LA calibration certificate (standard on factory)
- 19” rack mounting with side panels
- Barometric reference

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

Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing.
Modifications may take place and materials specified may be replaced by others without prior notice.

All standard Mensor products are provided with a calibration certificate traceable to NIST. The calibration program at Mensor is accredited to both ISO/IEC 17025:2017 and Z540-1-1994 by A2LA. Mensor is certified to ISO9001:2015.

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