

Industrial pressure controller

Model CPC4000

EAC Applications

Oil and gas industry
Industry (laboratory, workshop and production)
Transmitter and pressure gauge manufacturers
Calibration service companies and service industry



Industrial pressure controller, model CPC4000



Special features

Pressure ranges: -1 ... 210 bar (-15 ... 3,045 psi)
Control speed 10 s
Control stability < 0.005 % FS
Accuracy down to 0.02 % IS (IntelliScale)

Description

Design

The model CPC4000 industrial pressure controller offers a broad pressure range from -1 ... 210 bar (-15 ... 3,045 psi). This instrument is available as a desktop or as a 19" rack-mounting kit. It can have up to two reference pressure sensors and an optional barometer for displaying barometric pressure or can be used to emulate gauge or absolute pressure.

Application

Since the controller offers an accuracy of up to 0.02 % IS-50, and controls pressure with a high stability, it is particularly suited as a production tool for transmitter manufacturing, a calibration and maintenance tool for pressure measuring instruments or as a factory/working standard for the calibration of all types of pressure measuring instruments. The optional contamination prevention accessories like the coalescing filter and block and bleed valve make the CPC4000 an ideal solution in oil and gas plants.

Functionality

Maximum ease-of-use is achieved through the touch-screen and the simple and intuitive menu navigation. In addition, the large number of menu languages add to its operability. The instrument can have up to two internal pressure sensors and the ranges for each reference pressure sensor are determined by the customer within the allowable range. Depending on the application, the operator can choose between three set-point methods:

- 1) Direct entry of the pressure value (set point) which will be controlled via touchscreen keypad.
- 2) Define steps to reach the desired pressure value by either defining fixed pressure increments or a percentage of span value.
- 3) User-defined programmable test sequences.

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Software

The WIKA-Cal calibration software enables the convenient calibration of pressure measuring instruments and the generation of test certificates. Additionally, the instrument can also be remotely controlled using the serial command formats, the Mensor standard, SCPI or further optional command sets 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, USB (along with an optional USB-WiFi adapter) and an Ethernet interface for communication with other instruments, and thus the instrument can be integrated into existing systems.

Specifications

Reference pressure sensors

Pressure range	Standard	Optional
Accuracy ¹⁾	0.02 % Full span ²⁾	0.02 % IS-50 ³⁾
Gauge pressure	0 ... 0.35 to 0 ... 210 bar (0 ... 5 to 0 ... 3,045 psi)	0 ... 1 to 0 ... 210 bar (0 ... 15 to 0 ... 3,045 psi)
Bi-directional	-0.17 ... 0.17 to -1 ... 210 bar (-2.5 ... 2.5 to -15 ... 3,045 psi)	-1 ... 10 to -1 ... 210 bar (-15 ... 145 to -15 ... 3,045 psi)
Absolute pressure	0 ... 1 to 0 ... 211 bar abs. (0 ... 15 to 0 ... 3,060 psi abs.)	0 ... 1 to 0 ... 211 bar abs. (0 ... 15 to 0 ... 3,060 psi abs.)
Calibration interval	365 days ⁴⁾	365 days
Optional barometric reference		
Function	The barometric reference can be used to switch pressure types 5), absolute <=> gauge. With gauge pressure sensors, the measuring range of the sensors must begin with -1 bar (-15 psi) in order to carry out a complete absolute pressure emulation.	
Measuring range	552 ... 1,172 mbar abs. (8 ... 17 psi abs.)	
Accuracy ¹⁾	0.02 % of reading	
Pressure units	38 and two 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) Full span = end of measuring range - start of measuring range

3) 0.02 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.02 % of the half full scale and between 50 ... 100 % of the full scale, the accuracy is 0.02 % of reading.

4) 180 days for pressure ranges below 1 bar (15 psi) gauge or absolute and 145 psi bi-directional. 365 days for remaining of the specified ranges.

5) 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 kit
Dimensions	see technical drawings
Weight	approx. 12.7 kg (28 lbs) incl. all internal options
Warm-up time	approx. 15 min
Display	
Screen	7.0" colour LC display with resistive touchscreen
Resolution	4 ... 6 digits depending on range and units

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Connections	
Pressure connections	4 ports with 7/16"- 20 F SAE and 1 port with 1/8" F NPT Optional Barometer: one port with barb fitting.
Filter elements	The instrument has a 40-micron filters on all pressure ports
Pressure port adapters	Standard: without Option: 6 mm tube fitting, 1/4" tube fitting, 1/4" female NPT fittings, 1/8" female NPT fittings or 1/8" female BSP fittings
Permissible pressure media	Dry, clean air or nitrogen (ISO 8573-1:2010 class 5.5.4 or better)
Wetted parts	Aluminium, brass, 316 and 316L stainless steel, Buna N, FKM/ FPM, PCTFE, PEEK, PTFE, PPS, glass-filled epoxy, RTV, ceramic, silicone, silicone grease, Urethane
Overpressure protection	Safety relief valve fixed to reference pressure sensor and adjusted to customised measuring range
Permissible pressure	
Supply port	~ 110 % FS
Measure/Control-Port	max. 105 % FS
Voltage supply	
Power supply	AC 100 ... 110 V / 200 ... 240 V, 50/60 Hz
Power consumption	max. 120 VA
Permissible ambient conditions	
Storage temperature	0 ... 70 °C (32 ... 158 °F)
Humidity	5 ... 95 % r. h. (non-condensing)
Compensated temperature range	15 ... 45 °C (59 ... 113 °F)
Mounting position	horizontal
Control parameter	
Control stability	< 0.005 % FS of the active range
Control mode	slow, normal, fast and variable
Control time	10 s (regarding a 10 % FS pressure increase in a 50 ml test volume)
Control range	0 ... 100 % FS
Min. control pressure	0.0017 bar (0.025 psi) over exhaust pressure or 0.05 % FS whichever is higher
Overshoots	< 0.3 % FS in fast control mode (typical < 0.1 % FS in slow control mode)
Test volume	50 ... 1.000 ccm
Communication	
Interface	Standard: Ethernet, IEEE-488, USB, RS-232. Optional: WiFi (with a USB-WiFi adapter)
Command sets	Mensor, WIKA SCPI, others optional
Response time	approx. 100 ms

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Approvals

Logo	Description	Country
	EU declaration of conformity EMC directive ⁶⁾ EN 61326 emission (group 1, class A) and interference immunity (industrial application) Low voltage directive	European Union
	EAC EMC directive Low voltage directive	Eurasian Economic Community
	KazInMetr Metrology, measurement technology	Kazakhstan

6) 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	
Calibration ⁷⁾	Standard: A2LA calibration certificate (standard on factory) Option: DKD/DAkkS calibration certificate
Recommended recalibration interval	1 year (dependent on conditions of use)

7) Calibration in a horizontal position/operating position.

Approvals and certificates, see website

Working ranges of the controller modules

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

-1 (-15)	0	3,4 (50)	10 (150)	100 (1.500)	210 (3.045)
LPSVR-MODUL $\pm 0,17$ bar ($\pm 2,5$ psi) ²⁾					
MPSVR-MODUL $\pm 0,35$ bar (± 5 psi) ²⁾					
HPSVR-MODUL -1 ... 5,2 bar (-15 ... +75 psi) ²⁾					
EPSVR-MODUL -1 ... 10 bar (-15 ... +150 psi) ²⁾					

Absolute pressure [bar (psi)] ¹⁾

0	4,4 (60)	11 (165)	101 (1.515)	211 (3.060)
LPSVR-MODUL 0 ... 1 bar (0 ... 15 psi) ²⁾				
MPSVR-MODUL 0 ... 1 bar (0 ... 15 psi) ²⁾				
HPSVR-MODUL 0 ... 5,2 bar (0 ... +75 psi) ²⁾				
EPSVR-MODUL 0 ... 11 bar (0 ... 165 psi) ²⁾				

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

2) Smallest recommendable sensor range

For controlling absolute pressure a vacuum pump connected at the supply low port is required.

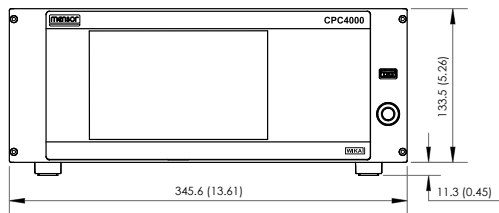
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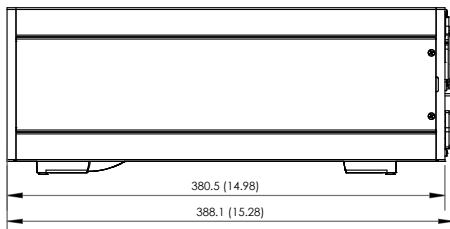
Dimensions in mm (in)

Desktop case

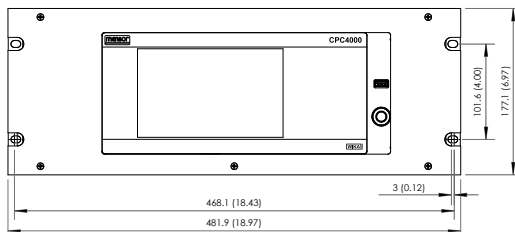
Front view



Side view (left)



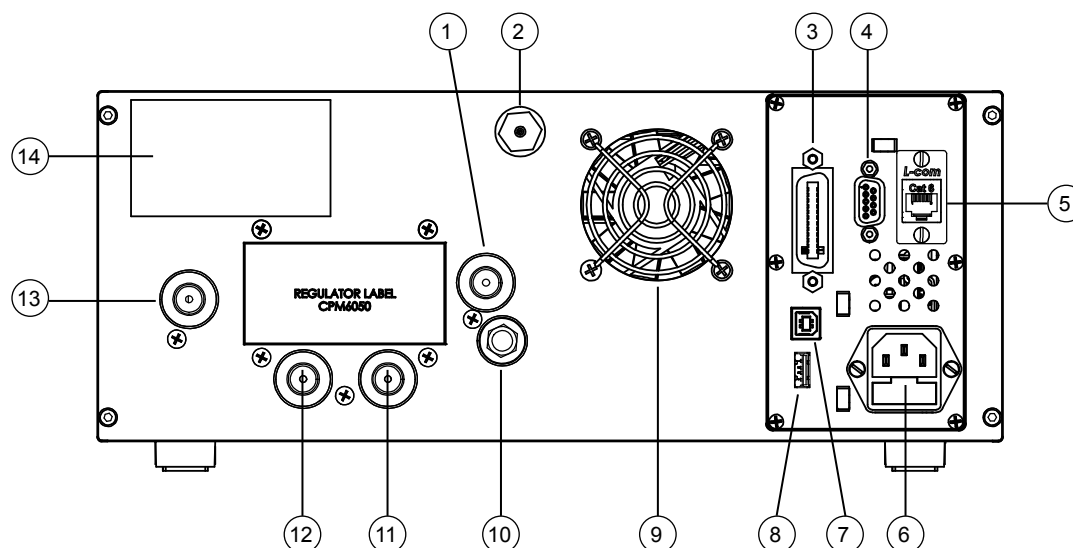
19" rack-mounting kit, front view



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Electrical and pressure connections - rear view



- | | |
|---|--------------------------------------|
| ① Exhaust port (7/16-20 UNF) | ⑧ USB interface (host) for service |
| ② Barometric reference port (10-32 UNF) | ⑨ Fan |
| ③ IEEE-488 interface | ⑩ Vent (ATM) |
| ④ RS-232 interface | ⑪ Reference port (7/16-20 UNF) |
| ⑤ Ethernet port | ⑫ Measure/Control port (7/16-20 UNF) |
| ⑥ Power supply | ⑬ Supply port (7/16-20 UNF) |
| ⑦ USB interface (instrument) for remote communication | ⑭ Instrument label |

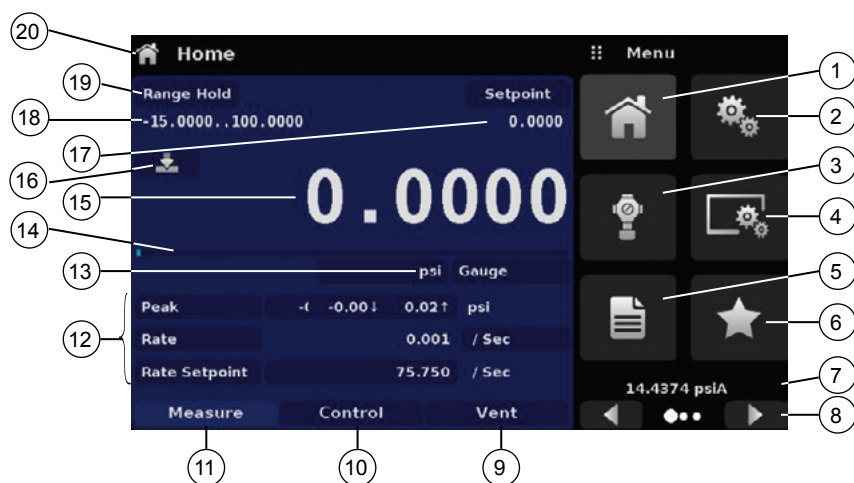
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Touchscreen and intuitive operator interface

Shortly after power-up, the standard main screen (see following picture) is displayed. In this menu screen, one can switch between the operating modes using the buttons MEASURE 11 , CONTROL 10 and VENT 9 . The instrument is a precision pressure controller, whose setup (incl. optional functions) can be easily configured via the touchscreen.

Standard desktop/main screen



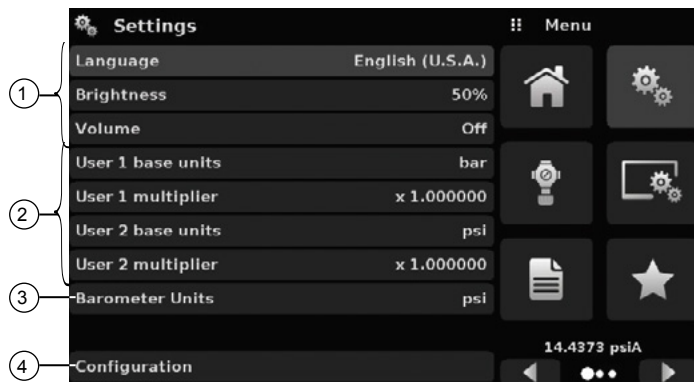
- | | |
|---|---|
| <p>① Home application</p> <p>② General settings</p> <p>③ Control settings</p> <p>④ Display settings</p> <p>⑤ Programs application</p> <p>⑥ Favourites settings</p> <p>⑦ Barometric pressure reading (optional)</p> <p>⑧ Menu scroll features forward / back</p> <p>⑨ VENT
Immediately vents the system, including the test assembly connected to the Measure/Control port, to atmosphere.</p> <p>⑩ CONTROL
In control mode the instrument provides a highly accurate pressure at the Measure/Control port in accordance with the desired set point.</p> <p>⑪ MEASURE
In measure mode, the pressure present at the Measure/Control 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).</p> | <p>⑫ Auxiliary displays either peak, rate or alternate units</p> <p>⑬ Current pressure unit and type</p> <p>⑭ Optional bar graph</p> <p>⑮ Current measuring value</p> <p>⑯ Zero / Tare function</p> <p>⑰ Entered set point</p> <p>⑱ Pressure range of the sensors</p> <p>⑲ Selection of the active sensor or auto-range</p> <p>⑳ Current application name</p> |
|---|---|

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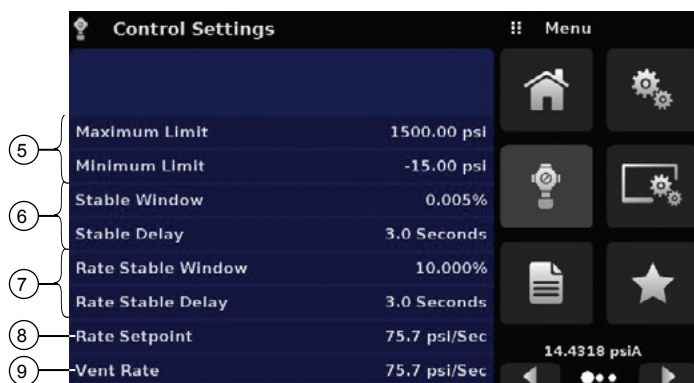
Simple instrument configurations

A) General settings of the instrument



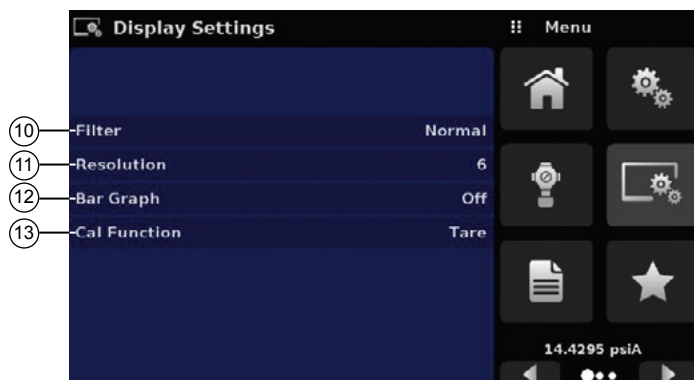
- ① Instrument language, screen brightness and volume settings
- ② User-defined measurement units
- ③ Unit for the optional barometer
- ④ Multiple user-specific configurations created and saved for ease of access

B) Control settings of the instrument



- ⑤ The maximum and minimum limits for the desired control can be set.
- ⑥ The stability of the control can be defined by the user by setting the stable window as "% FS" and by setting the stable delay.
- ⑦ The stability of the stable rate can be defined by the user by setting the stable window as "% FS" and by setting the stable delay.
- ⑧ The control rate can be adjusted by choosing either fast, medium or slow rates or defining a variable rate.
- ⑨ The vent rate lets the user determine the rate at which pressure will vent in vent mode.

C) Sensor settings and auxiliary display settings of the instrument



- ⑩ Electronic filter to smooth the pressure readings
- ⑪ The resolution of the sensor display can be changed
- ⑫ Switching the bargraph on or off
- ⑬ Easy zeroing and tare features

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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 stick 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 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 calibration 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.

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Cal

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



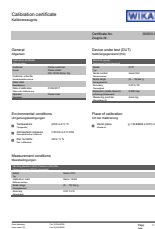
Log Demo

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

- Industrial pressure controller model CPC4000 (desktop case)
- 1.5 m (5 ft) power cord
- Operating instructions
- A2LA calibration certificate (standard on factory)

Options

- DKD/DAkkS calibration certificate
- Second reference pressure sensor model CPR4000
- Barometric reference
- 19" rack-mounting kit
- Customer-specific system
- Adapters and fittings for pressure connections

Accessories

- Pressure adapters
- Interface cable
- Coalescing filter
- Block and bleed valve
- Pressure booster
- WIKA-Cal calibration software

Ordering information

Model / Case / Pressure range base instrument / Pressure unit / Pressure type / Minimum pressure range / Maximum pressure range / Accuracy / Type of calibration certificate / Barometric reference / Type of certificate for barometric reference / Digital interface / Pressure port adapters / Power cord / Additional ordering information