Industrial Pressure Controller Model CPC4000

Applications

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

Special Features

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

Industrial Pressure Controller Model CPC4000

Description

Design

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

Application

Since the controller offers a measurement 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 devices or a factory/working standard for the calibration of all types of pressure measuring devices. The contamination prevention accessories like the coalescing filter and block and bleed valve make the CPC4000 an ideal solution in oil and gas plants.

Functionality

The touchscreen, along with an intuitive user interface, provide maximum ease-of-use. In addition, the large number of menu languages add to its operability. The device can have up to two internal pressure transducers and the ranges for each unit are determined by the customer within the allowable range.

Depending on the application, the operator can choose between three methods of pressure control:

1) Direct numeric entry via keypad for the precise input of the pressure value (set point) which will be controlled.
2) Define steps to reach the desired pressure value by either defining fixed pressure increments or a percentage of span value.
3) Program and store individual test sequences based on users' application.

Software

The WIKA-CAL calibration software enables the convenient calibration of pressure measuring instruments and the generation of test certificates. Additionally the device 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.

Data sheets showing similar products and accessories:
Pneumatic precision pressure controller; model CPC6000; see data sheet CT 27.61 High-end pressure controller; model CPC8000; see data sheet 28.01
WIKA-CAL calibration software; see data sheet CT 95.10

Specifications
CPC4000

Reference Pressure Sensors

Pressure range	Standard	Optional
Accuracy [1]	0.02 % FS	0.02 % IS-50 [2]
Gauge pressure	0 ... 0.35 up to 0 ... 210 bar (0 ... 5 up to 0 ... 3,045 psi)	0 ... 1 up to 0 ... 210 bar (0 ... 15 up to 0 ... 3,045 psi)
Bi-directional	-0.35 ... 0.35 up to -1 ... 210 bar (-5 ... 5 up to -15 ... 3,045 psi)	-1 ... 10 up to -1 ... 210 bar (-15 ... 145 up to -15 ... 3,045 psi)
Absolute pressure	0 ... 1 up to 0 ... 211 bar abs. (0 ... 15 up to 0 ... 3,060 psi abs.)	0 ... 1 up to 0 ... 211 bar abs. (0 ... 15 up to 0 ... 3,060 psi abs.)
Calibration interval	365 days	365 days
Optional barometric reference		
Function	The barometric reference can be used to switch pressure types [3], 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]	0.02 % 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) 0.02 % IS-50 accuracy: 0.02 % of reading in the upper half of the measuring range.
3) 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" mounting with rack-mounting kit
Dimensions in mm	see technical drawings
Weight	approx. 12.7 kg (28 lbs.) with all internal options
Warm-up time	approx.. 15 min
Display	
Screen	7.0" color LCD display
Resolution	4 ... 6 digits depending on range and units
Input methods	Resistive touchscreen
Connections	
Pressure connections	4 ports with 7/16”- 20 F SAE and 1 port with 1/8” F NPT Optional Barometer: 1 port with barb fitting
Filter elements	Filter element (40 micron) included in each pressure port
Pressure port adapters	Standard: without Option: 6 mm tube fitting, 1/4" tube fitting, 1/4" NPT female, 1/8" NPT female or 1/8" BSPG female
Permissible pressure and media	
Permissible pressure media	Dry, clean air or nitrogen (ISO8573-1:2010 Class 5.5.4 or better)
Wetted parts	Aluminum, 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 adjusted to specific customized pressure range
Supply Port	~ 110 % FS
Measure/Control Port	max. 105 % FS

Base Instrument

Power supply	
Power supply	AC 100 ... 240 V, 50 Hz / 60 Hz
Power consumption	max. 120 VA
Permissible ambient conditions	
Storage temperature	0 ... 70 °C (32 ... 158 °F)
Humidity	5 … 95 % r. h. (relative humidity, non-condensing)
Compensated temperature range	15 … 45 °C (59 ... 113 °F)
Mounting position	horizontal
Control parameter	
Control stability	< 0.005 % FS of active range
Control mode	Slow, normal, fast and variable
Control time	10 s (with a 10% pressure increase in a 50cc test volume)
Control range	0.05% FS or 0.0017 bar (0.025 psi) over exhaust pressure to 100% FS
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	100 ms

Approvals and Certificates

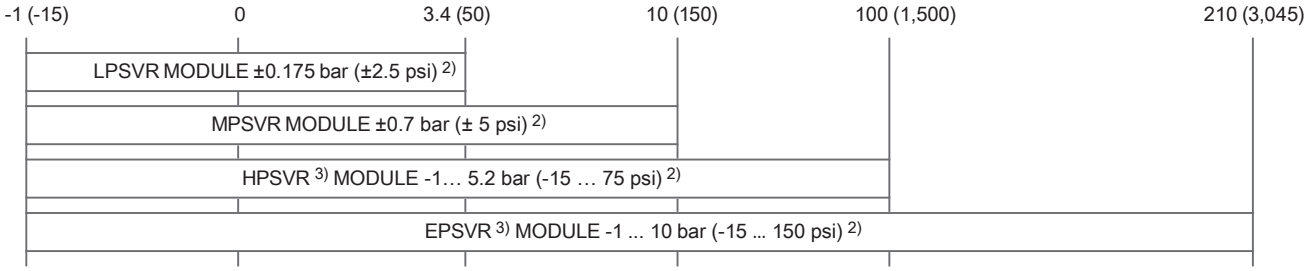
CE conformity	
EMC directive[5)]	2004/108/EC, EN 61326-1: 2013 emission (group 1, class A) and interference immunity (industrial application)
Low voltage directive	2006/95/EC, EN 61010-1:2010
Approvals	
GOST	Metrology/measuring technology, Russia
Certificate	
Calibration [6)]	Standard: A2LA calibration certificate (standard on factory) Option: DKD/DAkkS calibration certificate

4) **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.
5) Calibration in a horizontal position.

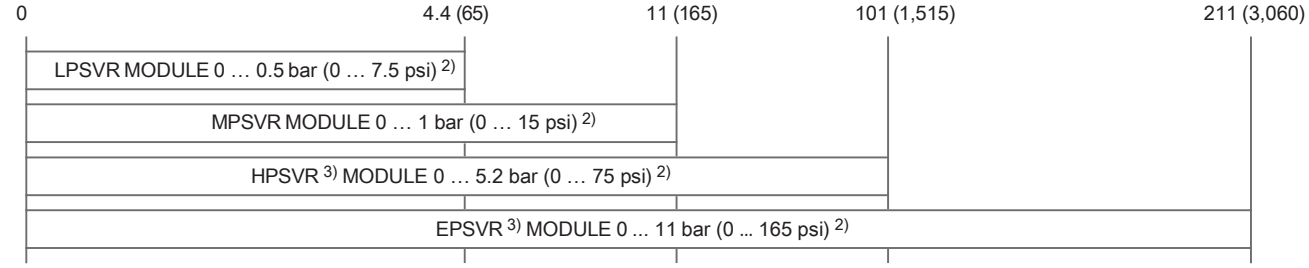
Approvals and certificates, see website

Working Ranges of the Controller Modules

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



Absolute pressure [bar (psi)] 1)



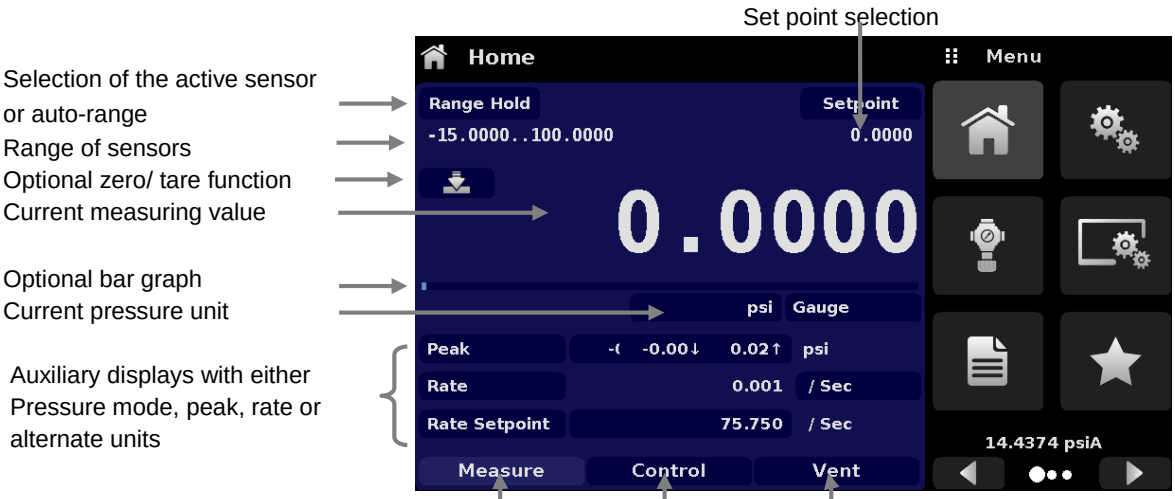
1) Mixing of absolute pressure and gauge pressure sensors in a module is not possible.
2) Smallest recommendable sensor range

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

Easy Operation via Touchscreen

Home Screen

Shortly after power-up, the standard home screen (see following picture) is displayed. In this menu screen, one can switch between the operating modes using the buttons **“MEASURE” / “CONTROL” / “VENT”** at the bottom of the screen.



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).

CONTROL

In control mode, the instrument provides a highly accurate pressure to the Measure/Control port, corresponding to the desired set point.

VENT

Immediately vents the system, incl. the test assembly connected to the Measure/Control port, to atmosphere.

Simple Instrument Configurations

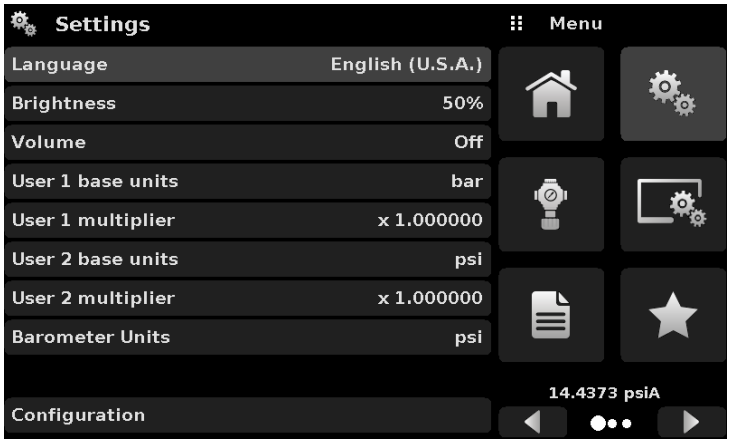
A) General Settings of the Instrument

Instrument language, screen brightness and volume settings

User defined measurement units

Units for the optional barometer

Multiple user specific configurations created and saved for ease of access



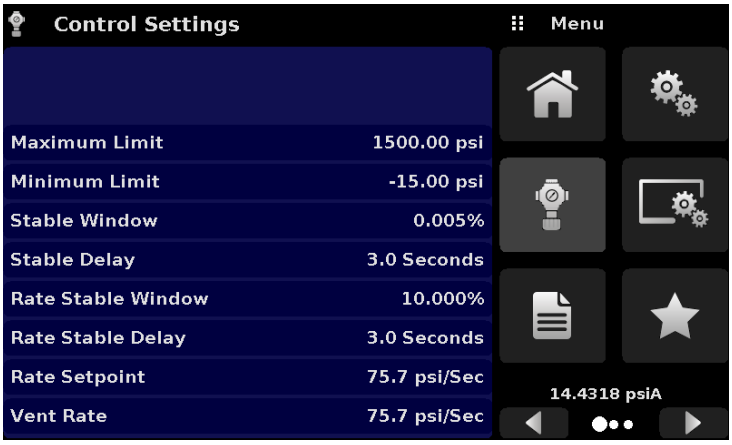
B) Control Settings of the Instrument

The maximum and minimum limits for the desired control can be set

The stability of the control can be defined by the user by setting the Stable Window as “% of set point” and by setting the Stable Delay

The control rate parameters can be adjusted by setting the Rate Stable Window & Delay. The actual rate can be set using the Rate Setpoint.

The vent rate of the instrument can be set



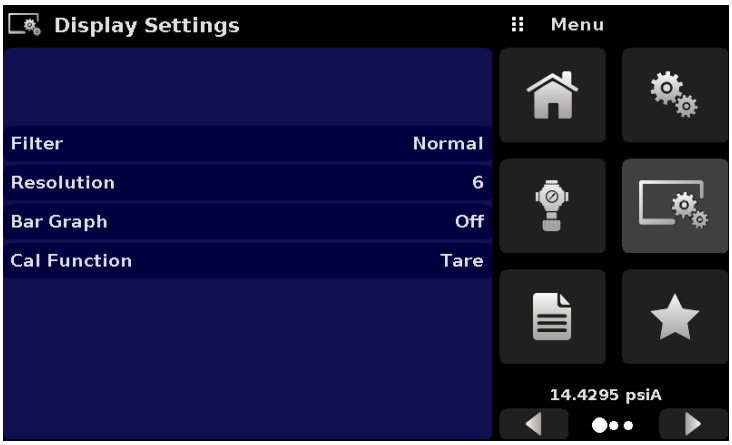
C) Display Settings of the Instrument

Electronic filter to smooth the readings

The resolution of the reading can be changed

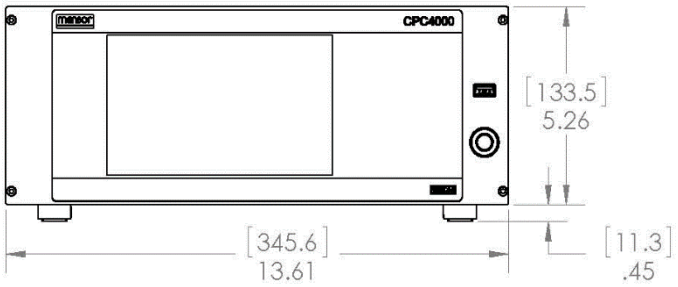
Bar graph can be turned on or off

Easy zeroing and tare features

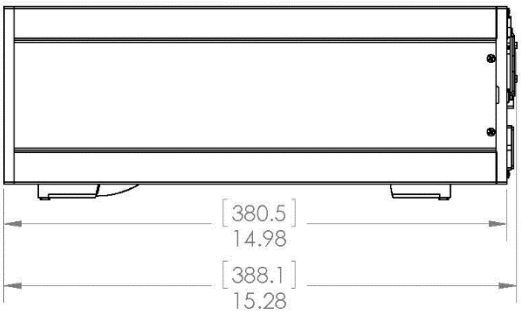


Dimensions in [mm]/ inch

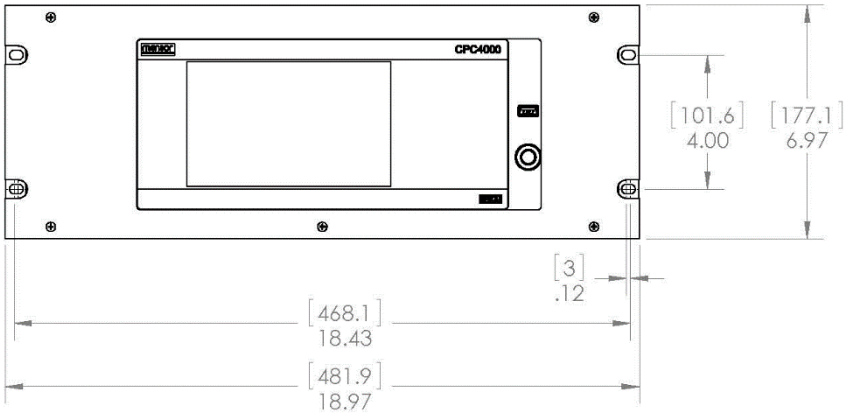
Front view



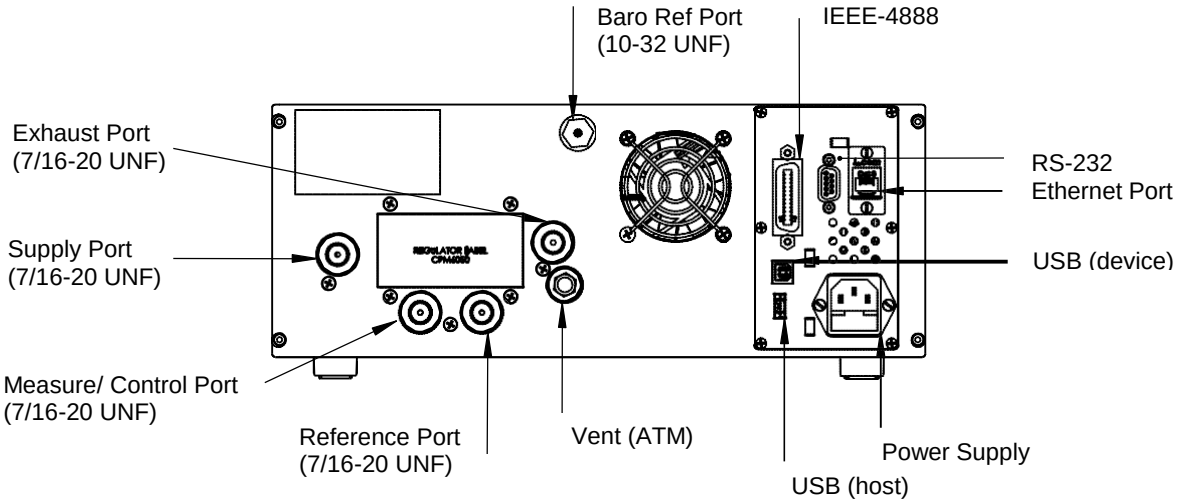
Side view



19” Rack Mount



Electrical and Pressure Connections – Rear



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.

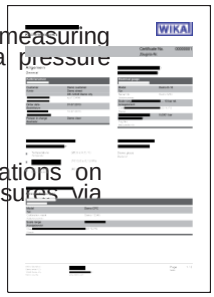
The pre-installed demo version automatically changes to the selected full version when the USB key is inserted and is available as long as the USB key is connected to the computer.

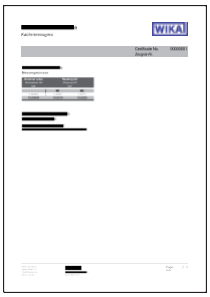
- Creation of calibration certificates for mechanical and electronic pressure measuring instruments
- Fully automatic calibration with pressure controllers
- Calibration of relative pressure measuring instruments with absolute pressure references and vice versa
- A calibration assistant guides you through 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.

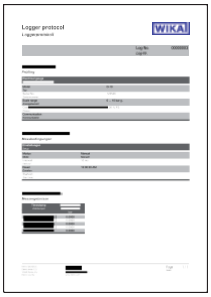




Cal Light
Generation of calibration certificates with no limitations on measuring points, without automatic initiation of pressures via a pressure controller.

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

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

Options

- DKD/DAkkS Calibration certificate
- Barometric reference
- Second reference pressure sensor
- 19" rack mounting kit
- Customer-specific system
- Adapters & fittings for pressure connections

Accessories

- Pressure adapters
- Interface cable
- Coalescing filter
- Block & bleed valve
- Pressure booster
- WIKA-CAL calibration software

Ordering information

Model / Housing / Pressure range transducers / 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 order details

Represented by:

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