

Pressure controller Industrial series Model CPC4000



WIKA data sheet CT 27.40

Applications

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

Special features

- Pressure ranges: -1 ... 210 bar [-15 ... 3,045 psi]
- Control speed 10 s
- Control stability < 0.005 % FS
- Accuracy to 0.02 % IS (IntelliScale)
- Precision 0.008 % FS



Pressure controller, industrial series, model CPC4000

Description

Design

The industrial series pressure controller, model CPC4000 features a wide pressure range from -1 ... 210 bar [-15 ... 3,045 psi]. This instrument is available as a desktop or as a 19" rack-mounting kit. Up to two reference pressure transducers and one additional barometer can be installed. The barometer can be used to indicate the atmospheric pressure or to emulate gauge or absolute pressure.

Application

Since the controller offers an accuracy of down 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 leak test and burst test special applications allow CPC4000 to be used as a pressure line testing equipment. This automatic contamination prevention system makes the CPC4000 an ideal solution for the oil and gas industry.

Functionality

Maximum ease-of-use is achieved through the touchscreen and the simple and intuitive menu navigation. In addition, the variety of menu languages adds to its user-friendliness. The instrument can be equipped with up to two internal pressure transducers, and the ranges for each pressure transducer are defined by the customer within the permissible range.

Depending on the application, the operator can choose between three set-point entry methods:

- Direct entry of the pressure value to be controlled (set point) via the touchscreen keyboard.
- Definition of steps to achieve the desired pressure value, either by defining fixed pressure increase steps or by defining a percentage of the span value.
- User-defined programmable test sequences.

Software

The WIKA-Cal calibration software enables the convenient calibration of pressure measuring instruments and the generation of test certificates. The instrument can be remotely controlled using either the Mensor standard command sets, SCPI or other command sets.

Complete test and calibration systems

If required, complete mobile or stationary test equipment can also be assembled. For integration into existing systems, an IEEE-488.2, RS-232, USB and Ethernet® interfaces are available for communication with other instruments.

Specifications

Reference pressure transducers model CPR4000		
Pressure range	Standard	Optional
Accuracy ¹⁾	0.02 % FS ²⁾	0.02 % IS-50 ³⁾
Gauge pressure ⁴⁾	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]
Bidirectional ⁴⁾	-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 ⁵⁾	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.]
Pressure unit	■ bar ■ mbar ■ psi ■ MPa ■ kPa ■ inHg at 0 °C ■ inH₂O at 20 °C	
Precision ⁶⁾	0.008 % FS	
Calibration interval	365 days	

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 = End of measuring range - Start of measuring range

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

4) For pressure ranges from $\geq 100 \dots \leq 138$ bar [$\geq 1,500 \dots \leq 2,000$ psi], sealed gauge sensors are used.

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.

Barometric reference	
Optional barometric reference	
Measuring range	■ 552 ... 1,172 mbar abs. ■ 8 ... 17 psi abs. ■ 552 ... 1,172 hPa abs.
Accuracy ¹⁾	0.02 % of reading
Function	The barometric reference can be used to switch pressure types ²⁾ between absolute ↔ gauge. With gauge pressure transducers, the measuring range of the sensor must begin with -1 bar [-15 psi] in order to carry out a complete absolute pressure emulation.

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) For a pressure-type emulation, we recommend a native absolute pressure transducer, since the zero point drift can be eliminated by a zero point adjustment.

Pressure controller CPC4000	
Instrument	
Instrument version	■ Desktop case ■ 19" rack-mounting kit with side panels
Weight	Approx. 12.7 kg [28 lb] incl. all internal components
Warm-up time	Approx. 15 minutes
Digital display	
Type of display	7.0" colour LC display with resistive touchscreen
Display resolution	4 ... 6 digits, depending on range and units
Pressure ranges of the control units	
Modules	■ LPSVR -1 ... 3.4 bar [-15 ... 50 psi] 0 ... 4.4 bar abs. [0 ... 65 psi abs.]
	■ MPSVR -1 ... 10 bar [-15 ... 150 psi] 0 ... 11 bar abs. [0 ... 165 psi abs.]
	■ HPSVR -1 ... 100 bar [-15 ... 1,500 psi] 0 ... 101 bar abs. [0 ... 1,515 psi abs.]
	■ EPSVR -1 ... 210 bar [-15 ... 3,045 psi] 0 ... 211 bar abs. [0 ... 3,060 psi abs.]
Measuring range	Depending on the reference pressure transducer and the accuracy of model CPR4000 0 ... 0.35 bar to 0 ... 210 bar [0 ... 5 psi to 0 ... 3,045 psi] -0.17 ... +0.17 bar to -1 ... 210 bar [-2.5 ... +2.5 psi to -15 ... 3,045 abs.] 0 ... 1 up to 0 ... 211 bar abs. [0 ... 15 up to 0 ... 3,060 psi abs.]
Pressure type	Gauge Absolute Bidirectional
Units	39 and two freely programmable
Permissible pressure	
Supply port	110 % FS 0.69 bar [10 psi] Whichever is greater
Measure/Control port	Max. 105 % FS

Control parameter	
Control stability	< 0.005 % FS of the primary transducer in precision mode
Control mode	Adjustable via menu
	Precise High Speed User-defined
Control time	10 s Corresponds to a pressure increase of 10 % FS above atmosphere in a test volume of 50 ml, in fast control mode
Control range	0 ... 100 % FS
Minimum control pressure	0.0017 bar [0.025 psi] above the exhaust pressure 0.05 % FS Whichever is greater
Overshoots	< 1 % FS in fast control mode (typical < 0.1 % FS in precise control mode)
Test volume	50 ... 1,000 ccm

Pressure connection			
Connections	4 ports with 7/16"-20 SAE female thread 1 port with 1/8" NPT female thread 1 port with 10-32 UNF female thread		
Filter elements	All pressure ports have a 40-micron filter.		
Pressure adapter	■ Without ■ 6 mm tube fitting ■ 1/4" tube fitting ■ 1/4 NPT, female thread ■ 1/8 NPT, female thread ■ 1/8 BSP, female thread		
Barometer port adapters	Barb fitting 6 mm tube fitting 1/4" tube fitting		
Permissible media	Clean, dry air Nitrogen (ISO 8573-1:2010 class 5.5.4 or higher)		
Wetted parts	Aluminium Brass Buna N Urethane FKM/FPM	PCTFE PEEK PTFE PPS RTV	Ceramic Silicone Silicone grease Stainless steel 316 and 316L Glass-filled epoxy resin
Overpressure protection	The relief valve is mounted on the reference pressure transducer and adjusted to the customer-specific measuring range		

Communication	
Interface	RS-232 IEEE-488.2 Ethernet® USB
Command sets	Mensor WIKA SCPI DPI 5XX → SCPI GE on request
Baud rate	9600 (default setting) 19200 38400 57600 115200
USB specification	2.0
Ethernet®	
Communications protocol	10/100Based-T
Response time	Approx. 100 ms
Internal program	Up to 24 sequences with up to 99 steps each
USB input signal	
Max. power	2.5 W

Voltage supply and performance data	
Operating voltage	■ AC 100 ... 120 V, 50/60 Hz ■ AC 220 ... 240 V, 50/60 Hz
Power consumption	Max. 150 VA
Fluctuations in the operating voltage	Max. ±10 % AC 90 ... 132 V AC 180 ... 264 V
Electrical safety	Protection class 1 (PE connected)
Fuse	1.25 A, 250 V; SLO-BLO 5 x 20 mm
Power cord	■ For Europe ■ For USA/Canada ■ For UK ■ For India ■ For China

Operating conditions	
Operating altitude	Up to 2,000 m [6,562 ft] above sea level
Place of use	Indoor Not for wet locations
Operating temperature range	0 ... 50 °C [32 ... 122 °F]
Compensated temperature range	15 ... 45 °C [59 ... 113 °F]
Storage temperature range	-20 ... +70 °C [-4 ... +158 °F]
Humidity	5 ... 95 % relative humidity
Condensation	Non-condensing
Mounting position / Installation	Horizontal
Overvoltage category	II
Pollution degree	2 per IEC 61010-1
EMC (HF field)	EN 61326 emission (group 1, class A) and immunity (industrial application)

Approvals

Logo	Description	Region
	EU declaration of conformity	European Union
	EMC Directive ¹⁾ EN 61326 emission (group 1, class A) and immunity (industrial environments)	
	Low Voltage Directive	
	RoHS directive	
-	IECEE Safety (e.g. electr. safety, overpressure, ...)	International

¹⁾ This is class A equipment for emitted interference and is intended for use in industrial environments. In other environments, e.g. in residential or commercial areas, it can interfere with other equipment under certain circumstances. In such circumstances the operator is expected to take the appropriate measures.

Certificates

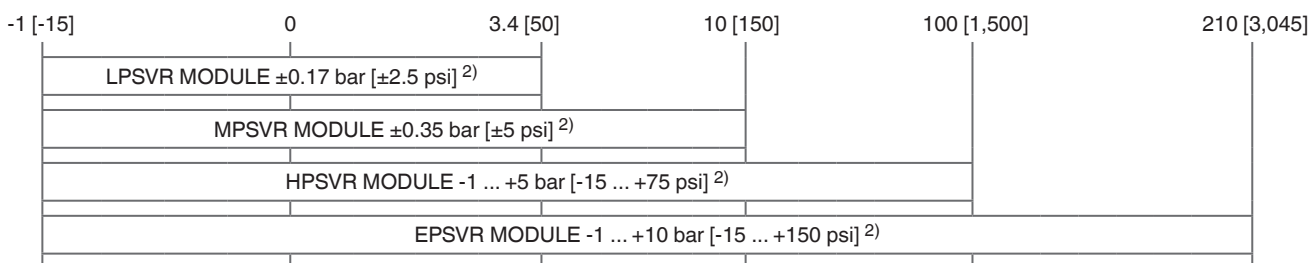
Description	
Calibration ¹⁾	
Reference pressure transducer model CPR4000	■ A2LA calibration certificate (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - gauge pressure (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate - absolute pressure (traceable and accredited in accordance with ISO/IEC 17025)
Barometric reference	■ Without ■ A2LA calibration certificate (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate for barometric reference (traceable and accredited in accordance with ISO/IEC 17025)
Recommended calibration interval	1 year (dependent on conditions of use)

1) Calibration in a horizontal mounting position / operating position.

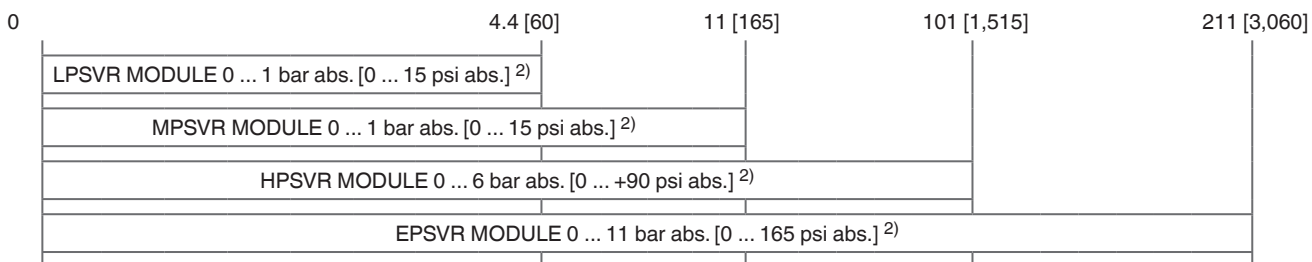
→ For approvals and certificates, see website

Operating ranges of the controller modules

Bidirectional 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.

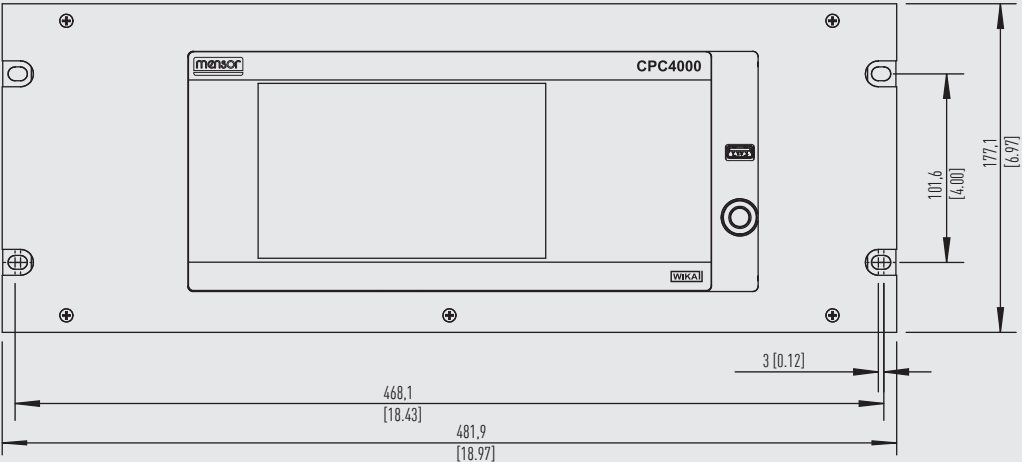
2) Smallest acceptable sensor range

To control absolute pressure, a vacuum pump connected to the exhaust port is required.

Dimensions in mm [in]

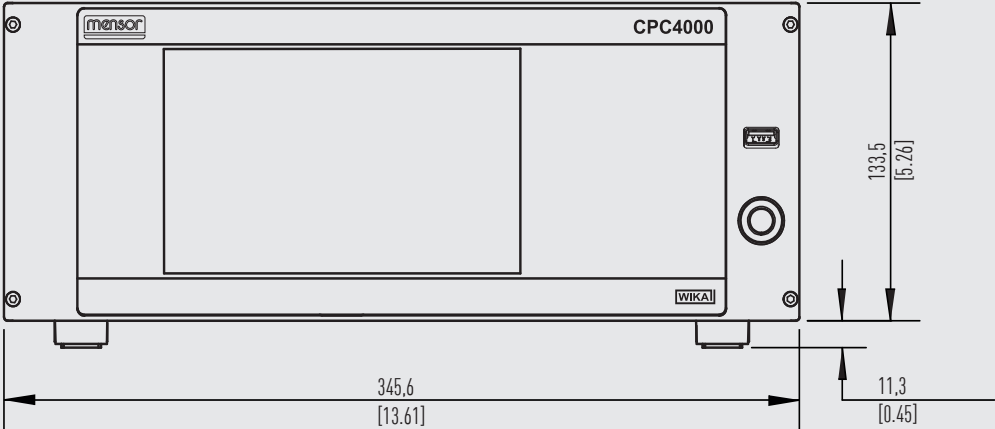
19" rack-mounting kit

View from the front

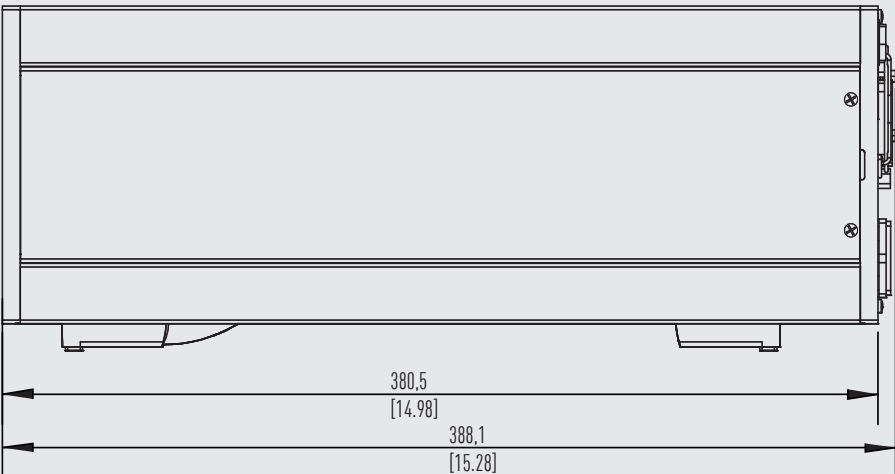


Desktop case

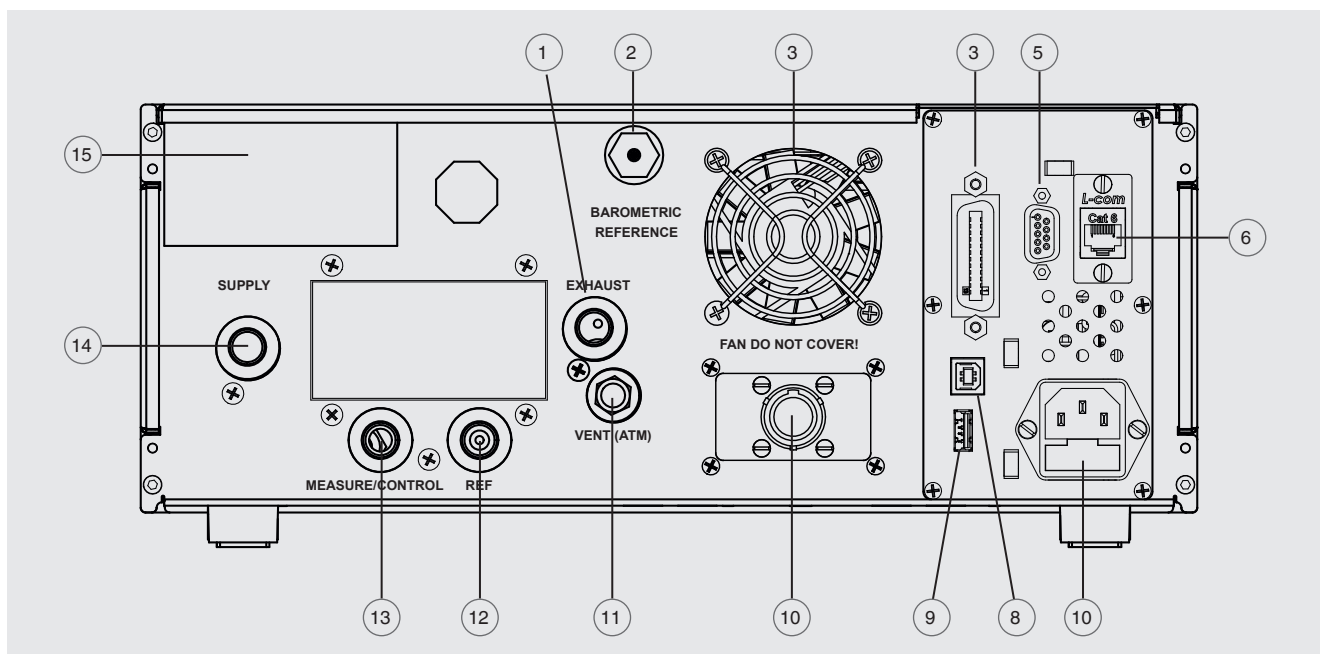
View from the front



View from the left



Electrical and pressure connections - view from the rear

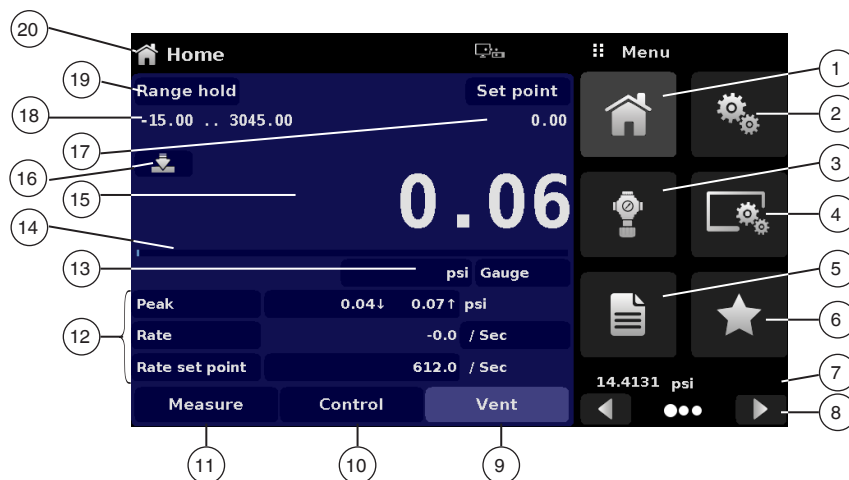


- | | |
|---|--------------------------------------|
| ① Exhaust port (7/16-20 UNF) | ⑨ USB interface (host) for service |
| ② Barometric reference connection (10-32 UNF) | ⑩ Automatic CPC connector |
| ③ Fan | ⑪ Vent connection (ATM) |
| ④ IEEE-488 interface | ⑫ Reference port (7/16-20 UNF) |
| ⑤ RS-232 interface | ⑬ Measure/Control port (7/16-20 UNF) |
| ⑥ Ethernet® port | ⑭ Supply port (7/16-20 UNF) |
| ⑦ Auxiliary power | ⑮ Product label |
| ⑧ USB interface (instrument) for remote communication | |

Touchscreen and intuitive user interface

Shortly after switching on, the standard main screen (see figure) is displayed. In this menu screen, you can switch between the operating modes using the buttons **Measure**, **Control** and **Vent**. The instrument is a precision pressure controller that can be easily configured via the touchscreen.

Standard desktop / Main screen



1 Home application

2 General settings

3 Controller settings

4 Display settings

5 Sequence settings

6 Favourites

7 Barometric pressure reading

8 Navigation within the menu

9 **Vent**

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

10 **Control**

In control mode the instrument provides a highly accurate pressure at the Measure/Control port of the respective channel in accordance with the desired set point.

11 **Measure**

In Measure mode, the pressure at the Measure/Control port is measured with high accuracy (if the mode was changed directly from **Control** to **Measure**, the last controlled pressure in the connected test assembly will be maintained/locked).

12 Auxiliary display either peak value, rate or alternative units

13 Current pressure unit and type

14 Bar graph, optionally adjustable

15 Current measured value

16 Zero point or tare function

17 Entered set point

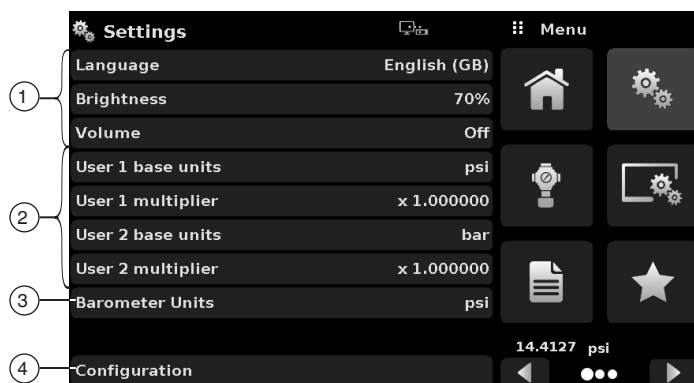
18 Pressure range of the sensors

19 Selection of the active sensor or auto-range

20 Current application name

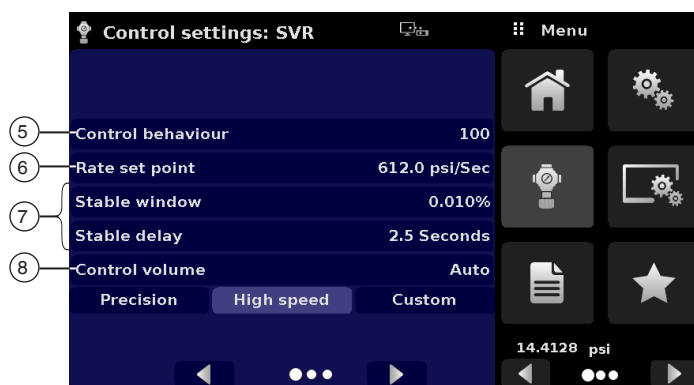
Simple instrument configurations

A) General settings of the instrument



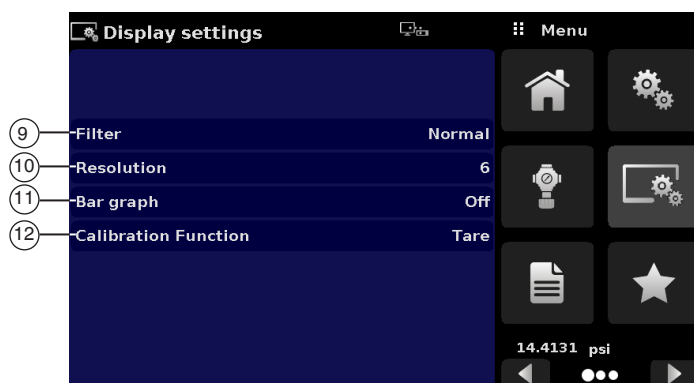
- ① Menu language, screen brightness and volume settings
- ② User-defined measuring units
- ③ Unit for the barometric reference
- ④ Multiple user-specific settings to create and save for ease of access

B) Control settings of the instrument



- ⑤ Control behaviour between low overshoot and high speed
- ⑥ The control rate can be entered by the user as a factor of current units/sec.
- ⑦ The stability of the control can be defined by setting the stable range as “% FS” and by setting the stable delay.
- ⑧ The pressure control volume can be adjusted by the user or set to “Auto” for dynamic automatic detection.

C) Sensor settings and auxiliary display settings of the instrument



- ⑨ Electronic filter to smooth the pressure measurement
- ⑩ The resolution of the sensor display can be changed
- ⑪ Switching the bar graph on or off
- ⑫ Simple zero point adjustment and tare functions

Automatic contamination prevention system (A-CPS)

Active decontamination

The Automatic Contamination Prevention (Automatic Contamination Prevention System, A-CPS) is an accessory for the CPC4000 pressure controller that prevents contamination of the instrument by ingress of particles, water or oil from the test item.

The A-CPS uses a coalescing filter and an automatically actuated vent valve to remove all contaminants and routes them into a transparent collecting bottle, allowing for easy cleaning.

The A-CPS allows hassle-free operation between the test item and the CPC4000 by reducing the additional process of deep cleaning the instrument prior to calibration. The A-CPS does not require an additional power source because it is controlled completely by the pressure controller itself.

In addition, the A-CPS serves as a test bench, making it easier to install and set up the test item. This eliminates the need for additional manifolds and setup procedures.



Automatic contamination prevention system model A-CPS

A-CPS specifications

Operating conditions

Maximum operating pressure	211 bar abs. [3,065 psi abs.]
Maximum operating temperature	80 °C [176 °F]

Voltage supply

Power supply	DC 12 V
Power consumption	13 VA

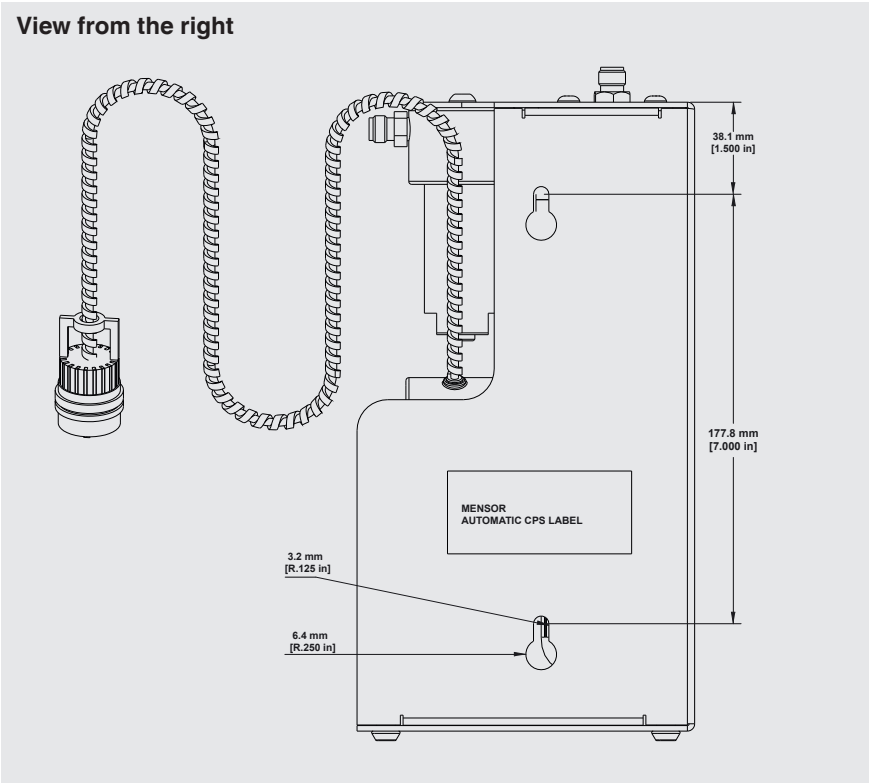
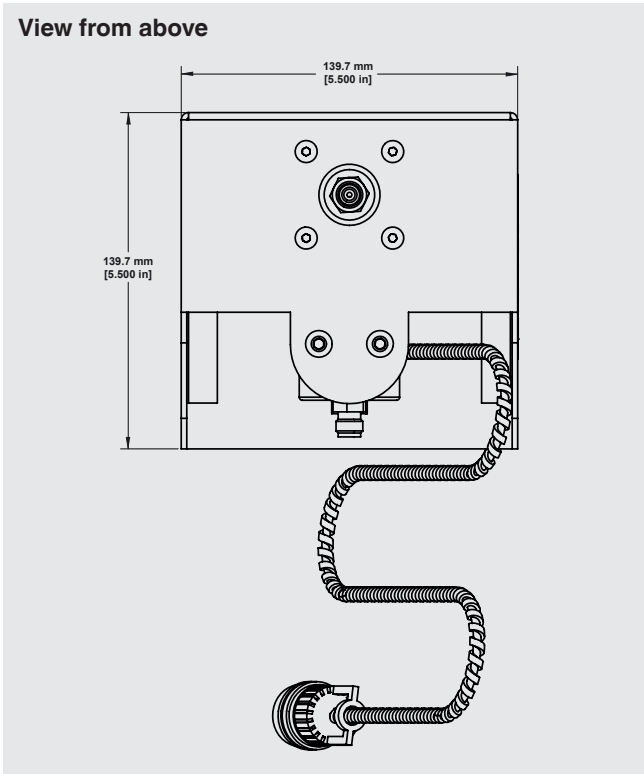
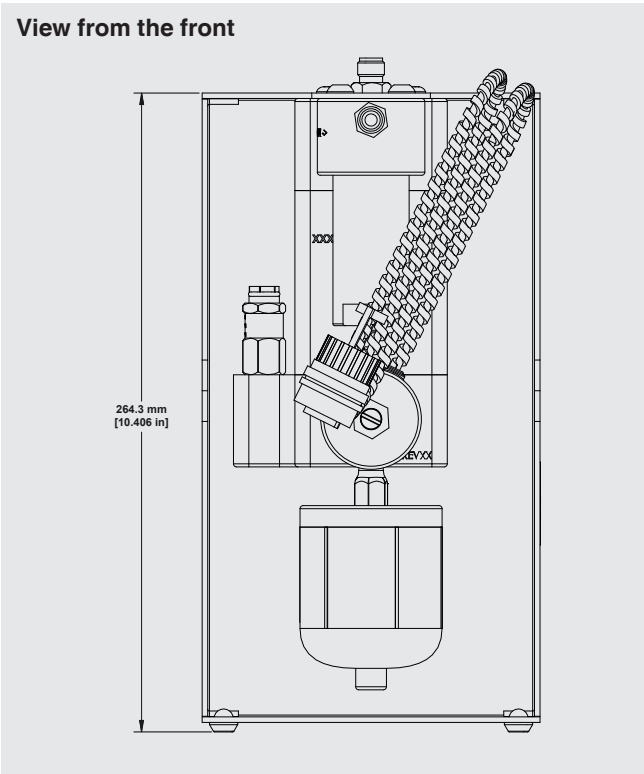
Pressure connection

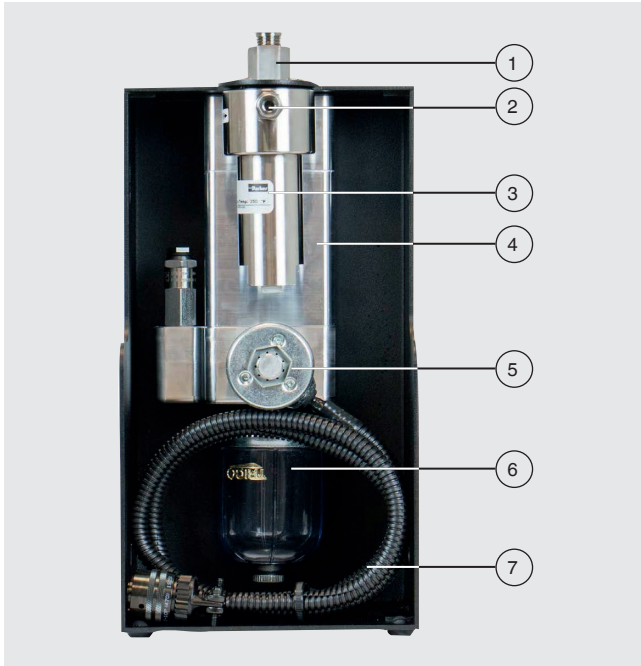
To the Measure/Control port of the CPC4000	1 connection with 1/4" pipe adapter to 7/16"-20 F SAE
To the test item	2 ports ■ 7/16"-20 F SAE ■ 6 mm tube fitting ■ 1/4" tube fitting ■ 1/4 NPT, female thread ■ 1/8 NPT, female thread ■ 1/8 BSP, female thread

Dimensions

Dimensions (W x H x D)	139.7 x 266.7 x 139.7 mm [5.5 x 10.5 x 5.5 in]
Weight	3.9 kg [8.8 lb]

Dimensions in mm [in]





- ① Top mount test connection
- ② Connection to the Measure/Control port of the controller
- ③ Integrated liquid trap
- ④ Integrated coalescing filter
- ⑤ Valve for purging operation
- ⑥ Sump collection bottle
- ⑦ Connection to the A-CPS backplate of the controller

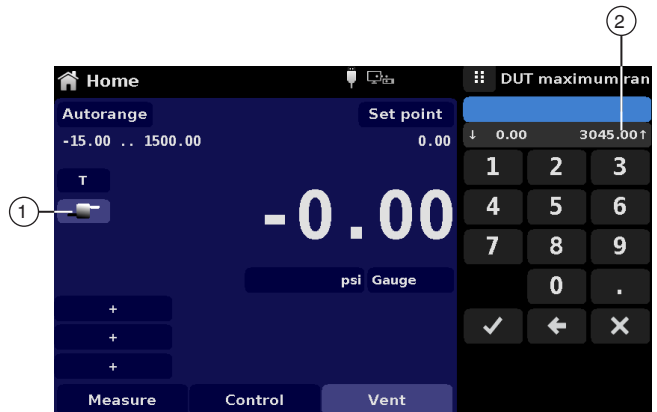
A-CPS operation

Automatic or manual purging with CPC4000

The A-CPS can be operated seamlessly with the CPC4000 in manual or automatic mode.

In automatic mode, the purge sequence is always started when the controller switches from vent to control mode.

The manual mode provides an option for pre-cleansing the system by purging the test item several times. When the A-CPS is enabled, a **[Purge]** button appears on the measuring instrument's start screen. With the **[Purge]** button the desired maximum pressure for cleaning the test item before normal operation can be set on the pressure controller.



- ① Purge button
- ② Max. purge pressure limit

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 free download.

To switch from the demo version to a licenced version, a USB dongle with a valid licence must be purchased.

The preinstalled 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 preselection via SQL database
- Menu languages: German, English, Italian, French, Dutch, Polish, Portuguese, Romanian, Spanish, Swedish, Russian, Greek, Japanese, Chinese
More languages are due with software updates
- Customer-specific complete solutions possible
- Maximum degree of automation in connection with our CPC series / CPx series

The supported instruments are continuously expanded and even customer-specific adaptations are possible.

For further information, see data sheet CT 95.10

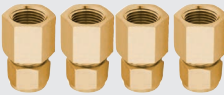
Three WIKA-Cal licences are available together with one CPC series pressure controller to choose from

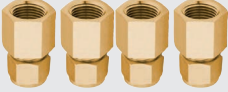
The WIKA-Cal calibration software is available for online calibrations together with a PC. The scope of software functions depends on the selected licence.

Several licences can be combined on one USB dongle.

Cal-Template (demo version)	Cal-Template (light version)	Cal-Template (full version)	Log-Template (full version)
Fully automatic calibration	Semi-automatic calibration	Fully automatic calibration	■ Live measured value recording for a certain period of time with selectable interval, duration and start time ■ Creation of logger protocols with graphic and/or tabular representation of the measuring results in PDF format ■ Possibility of exporting measuring results as CSV file
Limitation to two measuring points	No limitation on the number of measuring points that can be approached		
■ Creation of 3.1 inspection certificates per DIN EN 10204 ■ Calibration data can be exported to Excel® template or XML file ■ Calibration of pressure measuring instruments			
Ordering information for the request for individual licences:			
Is available for a cost-free download	WIKA-CAL-LZ-Z-Z	WIKA-CAL-CZ-Z-Z	WIKA-CAL-ZZ-L-Z
Ordering information for the request for pair licence:			
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 and spare parts

Description ¹⁾		Order code
		CPX-A-C4
-	Digital I/O rear panel	-D-
-	19" rack-mounting kit with side panels	-R-
	Barometric reference Measuring range: 8 ... 17 psi abs. Accuracy to 0.02 % of reading	-6-
	Measuring range: 8 ... 17 psi abs. Accuracy to 0.01 % of reading	-3-
	Measuring range: 552 ... 1,172 mbar abs. Accuracy to 0.02 % of reading	-P-
	Measuring range: 552 ... 1,172 hPa abs. Accuracy to 0.02 % of reading	-Q-
	Measuring range: 552 ... 1,172 mbar abs. Accuracy to 0.01 % of reading	-K-
	Measuring range: 552 ... 1,172 hPa abs. Accuracy to 0.01 % of reading	-L-
	Calibration sled For reference pressure transducers, software and international adapter set for power supply Set consisting of: 1 x power cord and various interchangeable mains plugs 1 x software 1 x interface cable 1 x calibration sled 1 x operating instructions	-4-
	Calibration sled For barometric reference, software and international adapter set for power supply Set consisting of: 1 x power cord and various interchangeable mains plugs 1 x software 1 x interface cable 1 x calibration sled 1 x operating instructions	-5-
	Transport case Dimensions: 38.10 x 60.96 x 66.04 cm [15 x 24 x 26 in] Weight: approx. 13.15 kg [29 lb] Max: Transport weight: 68 kg [150 lb]	-7-
	Adapter set Consisting of: 4 adapters with 1/8 BSPG, female thread Material: brass	-B-
	Adapter set Consisting of: 4 adapters with 1/4" tube fitting Material: brass	-I-
	Adapter set Consisting of: 4 adapters with 6 mm Swagelok® male thread Material: brass	-M-
	Adapter set Consisting of: 4 adapters with 1/4 NPT, female thread Material: brass	-N-

Description ¹⁾		Order code
		CPX-A-C4
	Adapter set Consisting of: 4 adapters with 1/8 NPT, female thread Material: brass	-S-
	Block-and-bleed valve Pressure range: ≤ 400 bar [6,000 psi]	-8-
	Coalescing filter Pressure range: ≤ 240 bar [3,600 psi]	-9-
	Automatic contamination prevention system (A-CPS) Pressure range: ≤ 210 bar [3,045 psi]	-E-
-	Replacement filters for automatic CPS	-2-
Ordering information for the enquiry:		
1. Order code: CPX-A-C4 2. Option:		↓ []

1) The figures are an example and may change in design, material composition and representation depending on the state of the art.

Scope of delivery

- Pressure controller, industrial series, model CPC4000
- Power cord, 1.5 m [5 ft]
- Operating instructions
- Calibration certificate

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Ordering information

CPC4000 / Case type / Pressure range base instrument / Reference pressure transducer 1 / Reference pressure transducer 2 / Barometric reference / Type of certificate for barometric reference / Pressure connection adapter / Rear channel A / Power cord / Transport case / Further approvals / Additional ordering information

CPR4000 / Mounted in CPC4000 / Pressure unit / Pressure type / Start of measuring range / End of measuring range / Accuracy / Type of certificate / Further approvals / Additional ordering information

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We reserve the right to make modifications to the specifications and materials.

