Pressure controller
High-speed version
Model CPC3050

Applications

- High-speed controlling
- End of line production testing
- Pressure calibration
- Automotive, oil and gas industry

Pressure controller, high-speed version, model CPC3050

Special features

- Pressure ranges: -1 ... 210 bar [-15 ... 3,045 psi]
- Control speed < 4 seconds for 25 % FS steps
- Accuracy: to 0.02 % FS
- PACE emulation

Description

The model CPC3050 high-speed pressure controller is designed with a primary focus on improving throughput in a manufacturing or calibration process. Offering pressure ranges as low as 0 ... 350 mbar [0 ... 5 psi] up to 210 bar [3,045 psi], the CPC3050 can be the solution for multiple applications. This controller can be configured as a desktop or as a 19" rack-mounting version.
Capable of two internal reference sensors and a barometric reference, a single CPC3050 can provide a wide range of pressure control and also emulate both absolute or gauge pressure types. The removable sensors provide more flexibility for customer needs, whether it be spare sensors or various ranges.

Application

The CPC3050 has an accuracy of 0.02 % FS and uses a regulator technology that is designed specifically for high-speed pressure control; ideal for end of line testing of an automated production and manufacturing line.

Along with the high speed, the 0.02 % FS accuracy provides adequate calibration requirements for numerous instruments designed for the automotive and oil/gas industry.

Functionality

The CPC3050 high-speed pressure controller can be operated locally through a simple and intuitive menu that allows users to control and measure pressure.
Additionally, it is capable of remote control with software that can drive all the same functions as local operation.
Using serial, USB, Ethernet or GPIB, the CPC3050 can be completely setup to function automatically in a process and achieve optimal output of a manufacturing process. With the Mensor legacy command set, along with PACE emulated commands, it can also be a solution for previously defined software.

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Design
The standard chassis is designed to be a desktop for bench work in a production or engineering environment. For integration into a more automated process, the sleek design fits in a 3U rack mount tray. Along with the same pressure port layout as many other Mensor controllers, the CPC3050 uses a common 7/16"-20 SAE threaded pressure ports, which makes it very easy to find the appropriate pressure adapters for most applications.

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.

Specifications
Model CPC3050

Reference pressure sensor model CPR3050		
Pressure range	**Low pressure (LP)**	**High pressure (HP)**
Accuracy [1]	0.02 % FS [2]	
Gauge pressure [3]	0 ... 0.35 up to 0 ... 100 bar [0 ... 5 up to 0 ... 1,500 psi]	0 ... 100 up to 0 ... 210 bar [0 ... 1,500 up to 0 ... 3,045 psi]
Bidirectional [3] [4]	-0.17 ... 0.17 up to -1 ... 100 bar [-2.5 ... 2.5 up to -15 ... 1,500 psi]	-1 ... 100 up to -1 ... 210 bar [-15 ... 1,500 up to -15 ... 3,045 psi]
Absolute pressure [5]	0 ... 1 up to 0 ... 101 bar abs. [0 ... 15 up to 0 ... 1,515 psi abs.]	0 ... 101 up to 0 ... 211 bar abs. [0 ... 1,515 up to 0 ... 3,065 psi abs.]
Precision [6]	0.008 % FS	
Calibration interval	365 days	
Optional barometric reference		
Function	The barometric reference can be used to switch pressure types [7], 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	39 and two 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 = end of measuring range - start of measuring range
3) For pressure ranges from ≥ 100 ... ≤ 210 barg [≥ 1,500 ... ≤ 3,045 psig] will be sealed gauge sensor.
4) The negative portion of a bidirectional range has the same accuracy as the equivalent positive range.
5) The minimum calibrated range of absolute pressure sensor(s) is 600 mTorr.
6) It is defined as the combined effects of linearity, repeatability and hysteresis throughout the stated compensated temperature range.
7) 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	■ Desktop case ■ 19" rack-mounting kit
Dimensions	See technical drawings
Weight	Approx. 12.7 kg [28 lbs] incl. all internal options
Display	
Screen	7.0" colour LC display with resistive touchscreen
Warm-up time	Approx. 15 min
Resolution	4 ... 6 digits depending on range and units

Base instrument

Connections		
Pressure connections	5 ports with 7/16"- 20 F SAE and 1 port with 10-32 UNF female	
Filter elements	The instrument has a 40-micron filters on all pressure ports.	
Pressure port adapters	■ Without ■ 6 mm tube fitting ■ 1/4" tube fitting ■ 1/4" female NPT fittings ■ 1/8" female NPT fittings ■ 1/8" female BSP fittings	
Barometer port adapters	■ Barb fitting ■ 6 mm tube fitting ■ 1/4" tube fitting	
Permissible pressure media	■ Dry, clean air ■ Nitrogen (ISO 8573-1:2010 class 5.5.4 or better)	
Wetted parts	■ Brass ■ Buna N ■ PEEK ■ RTV ■ Silicone ■ Urethane ■ Nickel ■ FKM/FPM ■ PTFE ■ Silicone grease ■ Cerazur® ceramic ■ Tungsten carbide ■ Glass-filled epoxy ■ Stainless steel (303 / 304 / 316 / 316L / 13-8 PH) ■ Stainless steel (300 series CRES) ■ Steel alloy 430FR ■ Aluminium (6061-T6 / 2024-T4)	
Overpressure protection	Safety relief valve for regulator 250 bar [3,600 psi]	
Permissible pressure		
Supply port	110 ... 120 % FS or 0.69 bar [10 psi] → Whichever is greater	
Measure/Control port	Max. 105 % FS of the primary sensor range	
Plumbing	≥ 2.8 mm [0.11 in] ID for optimal performance	
Voltage supply		
Operating voltage	■ AC 100 ... 120 V, 50/60 Hz ■ AC 220 ... 240 V, 50/60 Hz	
Power consumption	Max. 150 VA	
Permissible ambient conditions		
Compensated temperature range	10 ... 50 °C [50 ... 122 °F]	
Operating temperature range	-20 ... +70 °C [-4 ... +158 °F]	
Storage temperature range	-20 ... +70 °C [-4 ... +158 °F]	
Humidity	5 … 95 % r. h. (non-condensing)	
Mounting position	Horizontal	
Control parameter		
Control stability	High-speed control mode	< 0.025 % FS primary sensor
	Industrial control mode	< 0.01 % FS primary sensor
Control mode	■ Industrial ■ High speed (default) ■ Customised	
Control time [1) 2)]	3 ... 4 s (regarding a 25 % FS pressure increase above atmosphere in high-speed control mode)	
Control range	0 ... 100 % FS	
Minimum control pressure [3)]	0.0017 bar [0.025 psi] over exhaust pressure or 0.05 % FS → Whichever is greater	
Overshoots	High-speed control mode	< 1 % FS
	Industrial control mode	Typical < 0.1 % FS
Test volume	0 ... 1,000 ccm	

1) 25 % FS pressure steps in high-speed mode.
2) Time includes default stable delay 0.5 s.
3) Low point specification is vacuum region for absolute pressure sensors.

Base instrument	
Communication	
Interface	■ Ethernet ■ USB ■ IEEE-488 (GPIB) ■ RS-232
Command sets	■ Mensor ■ PACE ■ WIKA SCPI
	Others command sets optional
Response time	Approx. 100 ms
Internal program	Up to 24 sequences with up to 99 steps each

Approvals

Logo	Description	Region
CE	**EU declaration of conformity**	European Union
	EMC directive [1)] EN 61326-1 emission (group 1, class A) and immunity (industrial environments)	
	Low voltage directive	
	RoHS directive	

1) 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

Certificates	
Calibration [1)]	
CPC3050	■ Without ■ A2LA calibration certificate (standard on factory) (traceable and accredited in accordance with ISO/IEC 17025) ■ DAkkS calibration certificate for barometric reference (traceable and accredited in accordance with ISO/IEC 17025)
CPR3050	■ A2LA calibration certificate (standard on factory) (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)
Recommended calibration interval	1 year (dependent on conditions of use)

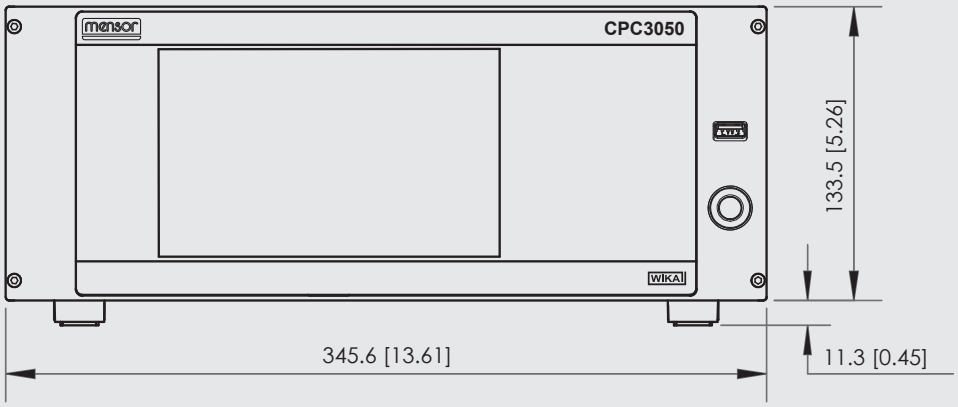
1) Calibration in a horizontal position/operating position.

Approvals and certificates, see website

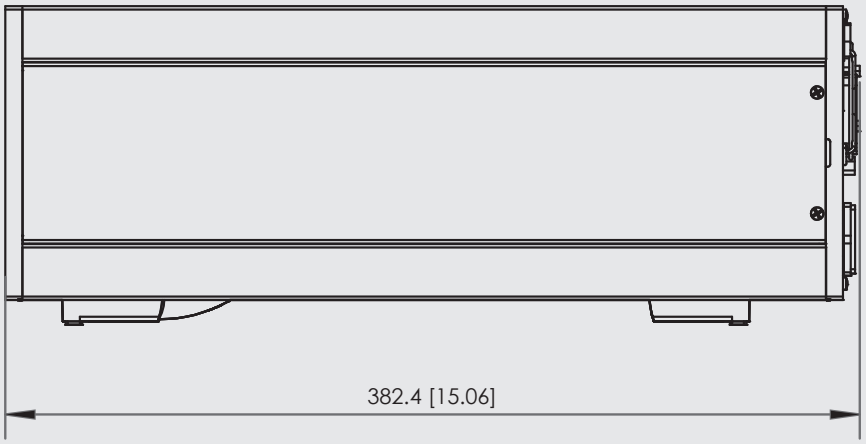
Dimensions in mm [in]

Desktop case

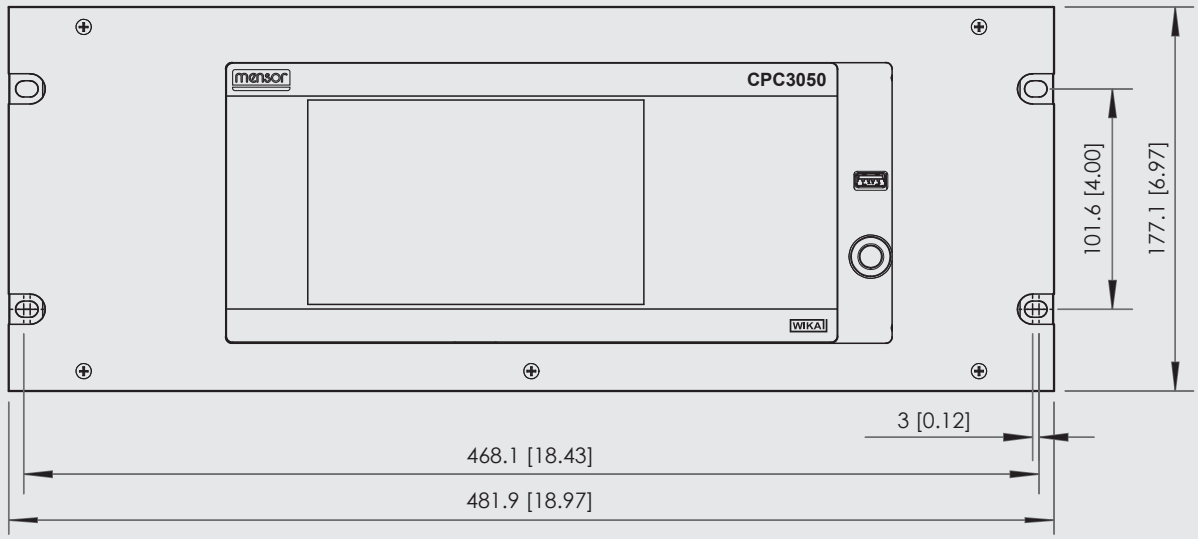
Front view



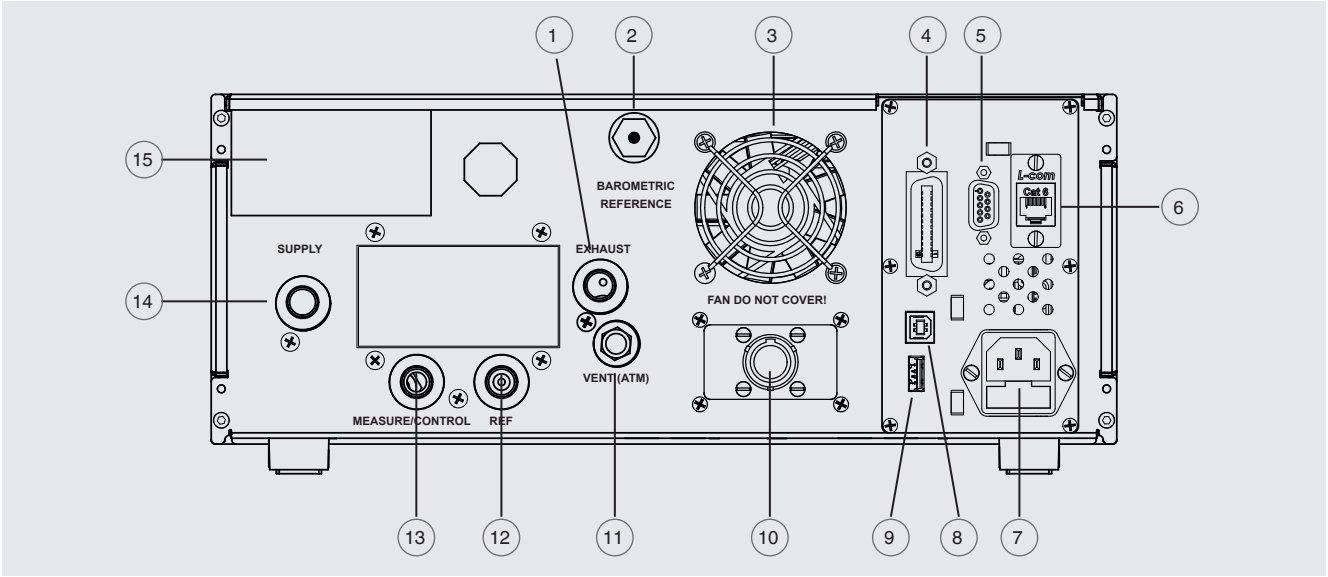
Side view (left)



19" rack-mounting kit, front view



Electrical and pressure connections - rear view

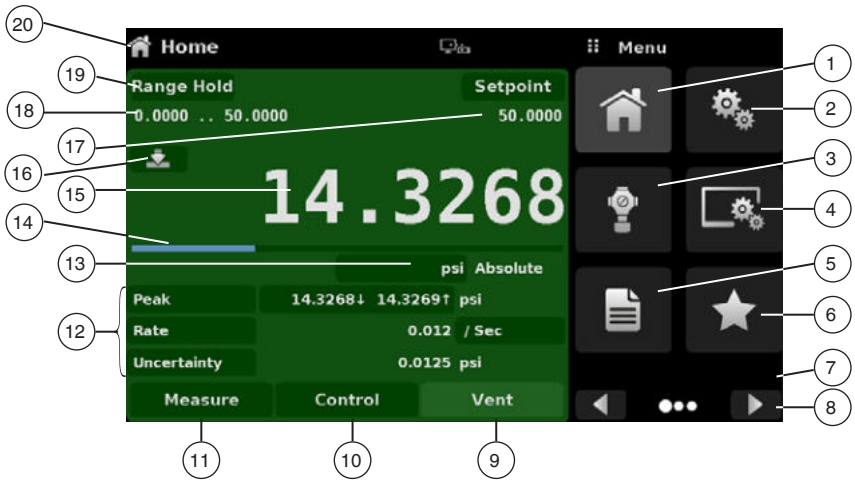


1 Exhaust port (7/16-20 UNF)
2 Barometric reference port (10-32 UNF)
3 Fan
4 IEEE-488 interface
5 RS-232 interface
6 Ethernet port
7 Power supply
8 USB interface (instrument) for remote communication
9 USB interface (host) for service
10 Automatic CPC connector
11 Vent (ATM)
12 Reference port (7/16-20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

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**, **CONTROL** and **VENT**. The instrument is a precision pressure controller, whose setup (incl. optional functions) can be easily configured via the touchscreen.

Standard desktop/main screen



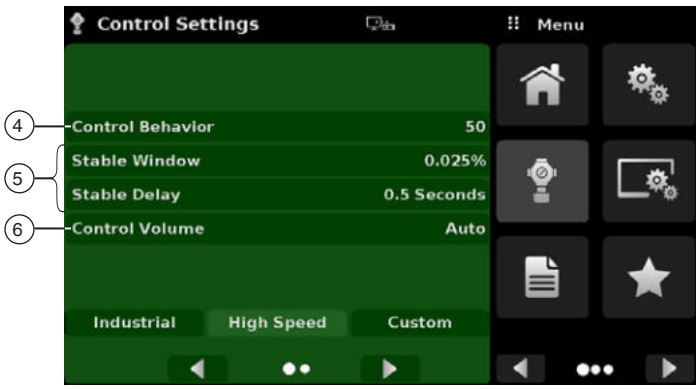
1. Home application
2. General settings
3. Control settings
4. Display settings
5. Programs
6. Favourites
7. Barometric pressure reading (optional)
8. Menu scroll features forward / back
9. **VENT**
   Immediately vents the system, including the test assembly connected to the Measure/Control port, to 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 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).
12. Auxiliary displays either peak, rate or alternate units
13. Current pressure unit and type
14. Optional bar graph
15. Current measured value
16. Zero 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

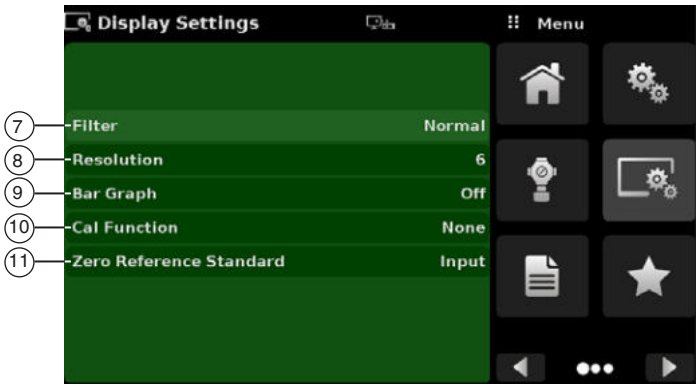
1. Instrument language, screen brightness and volume settings
2. User-defined measuring units
3. Multiple user-specific configurations to create and save for ease of access

B) Control settings of the instrument



4. Control behaviour between low overshoot and high speed
5. The stability of the control can be defined by the user by setting the stable window as “% FS” and by setting the stable delay.
6. 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



7. Electronic filter to smooth the pressure measurement
8. The resolution of the sensor display can be changed
9. Switching the bar graph on or off
10. Easy zeroing and tare features
11. Selection between barometer, lowest range or input

Specifications

Model A-CPS

Base instrument	
Operating conditions	
Maximum operating pressure	211 bar [3,065 psi]
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 CPC3050	1 port with 1/4" tube adapted 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" female NPT fittings ■ 1/8" female NPT fittings ■ 1/8" female BSP fittings
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	3.99 kg [8.8 lbs]

A-CPS operation

Active decontamination

The **A**utomatic **C**ontamination **P**revention **S**ystem, or A-CPS, is an accessory to the CPC3050 high-speed pressure controller that prevents particles, water or oil contaminants from entering the instrument through the test item. The A-CPS uses a coalescing filter and an automatically actuated vent valve to remove all the contaminants and then stores them in a transparent sump bottle for easy cleanup.

The A-CPS allows hassle-free operation between the test item and the CPC3050 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.

The A-CPS also acts like a test gauge stand for easy mounting and setup of the test item. This reduces the requirement of additional manifolds and setup.

Automatic or manual purging with CPC3050

The A-CPS can be driven seamlessly with the CPC3050 in manual or auto mode. The auto mode will engage the purge sequence every time 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. A purge button appears on the instrument's home screen when the A-CPS is activated. The purge button enables setting the desired maximum pressure for decontaminating the test item prior to normal operation with the model CPC3050 high-speed pressure controller.

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.
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

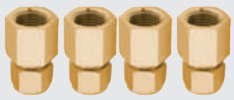
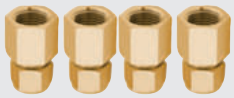
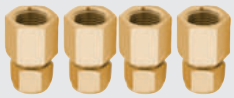
The supported instruments are continuously expanded and even customer-specific adaptations are possible.

For further information, see data sheet CT 95.10

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

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 of the measuring points 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 your enquiry for a single licence:			
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 your enquiry for a 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 for CPC3050		Order code
	Description	CPX-A-C4
-	**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 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 8 ... 17 psi abs. Accuracy to 0.01 % of reading	-3-
	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 adapter** For reference pressure sensor, voltage supply and software	-4-
	For barometric reference, voltage supply and software	-5-
	**Transport case**	-7-
	**Adapter set** 1/4" tube fitting (4 adapters) Max. 137 bar [2,000 psi] Material: brass	-I-
	**Adapter set** 6 mm tube fitting (4 adapters) Max. 137 bar [2,000 psi] Material: brass	-M-
	**Adapter set** 1/8" BSPG female thread (4 adapters) Max. 137 bar [2,000 psi] Material: brass	-B-
	**Adapter set** 1/4" NPT female thread (4 adapters) Max. 137 bar [2,000 psi] Material: brass	-N-
	**Adapter set** 1/8" NPT female thread (4 adapters) Max. 137 bar [2,000 psi] 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-

Accessories for CPC3050			Order code
Description			CPX-A-C4
	Automatic contamination protection system Pressure range: ≤ 211 bar [3,065 psi]		-A-
	Replacement filters for automatic CPS		-2-
Ordering information for your enquiry:			
		1. Order code: CPX-A-C4 **2. Option:**	⇓ **[ ]**

Scope of delivery

- High-speed pressure controller model CPC3050 (desktop case)
- 1.5 m [5 ft] power cord
- Operating instructions
- A2LA calibration certificate (standard on factory)

Options

- Customer-specific system

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