



## Calibration

# Pneumatic high-pressure controller Model CPC7000

**mentor**

WIKA data sheet CT 27.63


 for further approvals  
see page 3

## Applications

- Automotive and avionics industry
- Industry (laboratory, workshop and production)
- Transmitter and pressure gauge manufacturers
- Calibration service companies and service industry
- Research and development laboratories

## Special features

- Pressure ranges: 0 ... 700 bar (0 ... 10,000 psi)
- Control speed 30 s
- Control stability 0.008 % FS
- Accuracy down to 0.01 % IS (IntelliScale)



**Pneumatic high-pressure controller, model CPC7000**

## Description

### Version

The CPC7000 pneumatic high-pressure controller always provides a suitable calibration solution on account of its accuracy class. Its outstanding control performance is particularly impressive thanks to special valve technology and the high-accuracy pressure sensor 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.

### Design

The CPC7000 is available as a desktop instrument or as a 19" rack-mounting kit. The sensors can be changed via the front, without having to take out the complete controller, e.g. out of a calibration rig (plug-and-play).

### Functionality

The touchscreen, through its intuitive user interface, delivers ease of use. The large number of menu languages adds to its user friendliness. In addition to specifying a specific pressure set point, either by entering it via touchscreen or sending it via remote interface, the pressure can be changed in defined, programmable steps by using the STEP buttons. Moreover, the user can also easily create extensive test programs using the instrument menu. Depending on the application, the control rate can be set as a user-defined variable rate.

## 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 and an Ethernet interface for communication with other instruments, and thus the instrument can be integrated into existing systems.

## Specifications Model CPC7000

| Reference pressure sensors    |  |   |
|-------------------------------|--|---|
| Pressure range                | CPR8000  | CPR8050                                 |
| Accuracy <sup>1)</sup>        | Standard: 0.01 % FS <sup>2)</sup><br>Optional: 0.01 % IS-50 <sup>3)</sup>  | 0.01 % FS <sup>2)</sup>                 |
| Gauge pressure                | 100 ... 400 bar <sup>4)</sup><br>1,500 ... 6,000 psi <sup>4)</sup>   | 400 ... 700 bar<br>6,000 ... 10,000 psi |
| Absolute pressure             | 101 ... 401 bar <sup>4)</sup><br>1,515 ... 6,015 psi <sup>4)</sup>   | 401 ... 701 bar<br>6,015 ... 10,015 psi |
| Calibration interval          | 365 days   | 365 days                                |
| Optional barometric reference |  |   |
| Function                      | The barometric reference can be used to switch pressure types <sup>5)</sup> , 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 <sup>1)</sup>        | 0.01 % 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 every 30 days.

2) FS = Full span = end of measuring range - start of measuring range

3) 0.01 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.01 % of half of the full scale and between 50 ... 100 % of the full scale, the accuracy is 0.01 % of reading.





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

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.

| Basic instrument           |  |
|----------------------------|--|
| Instrument                 |  |
| Instrument version         | Standard: desktop case<br>Option: 19" rack-mounting kit  |
| Dimensions                 | see technical drawings   |
| Weight                     | approx. 40 kg (88.2 lbs) incl. all internal options  |
| Warm-up time               | approx. 15 min   |
| Display                    |  |
| Screen                     | 8.9" colour LC display with resistive touchscreen  |
| Resolution                 | 4 ... 6 digits depending on range and units  |
| Connections                |  |
| Pressure connection        | Standard: 5 ports with M16 x 1.5 female with sealing cone<br>Optional: 2 ports with 9/16-18 UNF female<br>Optional barometer: M12 x 1 female |
| Filter elements            | All pressure ports have 20- $\mu$ m filters.   |
| Permissible pressure media | Nitrogen class 2.8 or better   |
| Overpressure protection    | Burst disc up to 1,000 bar (14,500 psi)  |

| Basic instrument               |   |
|--------------------------------|---|
| Permissible pressure           |   |
| Supply port                    | 107 ... 110 % FS at least 30 ... 50 bar (435 ... 725 psi) over nominal pressure, whichever is greater |
| Measure/Control port           | max. 105 % FS   |
| Voltage supply                 |   |
| Power supply                   | AC 100 ... 120 / 200 ... 240 V, 50/60 Hz  |
| Power consumption              | max. 140 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 parameters             |   |
| Control stability              | 0.008 % FS in a 25 ml test volume   |
| Control time                   | 30 s <sup>6)</sup>  |
| Control range                  | 0 ... 100 % FS  |
| Minimum control pressure       | 1 bar (14.5 psi)  |
| Test volume                    | 0 ... 50 ccm  |
| Communication                  |   |
| Interface                      | Ethernet, IEEE-488, USB, RS-232   |
| Command sets                   | Mensor, WIKA SCPI   |
| Response time                  | approx. 100 ms  |
| Internal program               | up to 24 sequences with up to 99 steps each   |

## Approvals

| Logo  | Description  | Country                     |
|---|--|-----------------------------|
|  | <b>EU declaration of conformity</b><br><ul style="list-style-type: none"> <li>■ EMC directive <sup>7)</sup><br/>EN 61326-1 emission (group 1, class A) and immunity (industrial application)</li> <li>■ Low voltage directive</li> <li>■ RoHS directive</li> </ul> | European Union              |
|  | <b>EAC (option)</b><br><ul style="list-style-type: none"> <li>■ Pressure equipment directive</li> <li>■ Low voltage directive</li> </ul>   | Eurasian Economic Community |
|  | <b>GOST (option)</b><br>Metrology, measurement technology  | Russia                      |
|  | <b>BelGIM (option)</b><br>Metrology, measurement technology  | Belarus                     |

## Certificates

| Certificate                               |   |
|---|---|
| <b>Calibration <sup>8)</sup></b>          | Standard: A2LA calibration certificate<br>Option: DKD/DAkkS calibration certificate |
| <b>Recommended recalibration interval</b> | 1 year (dependent on conditions of use)   |

6) Regarding a 10 % FS pressure increase in a 25 ml test volume.

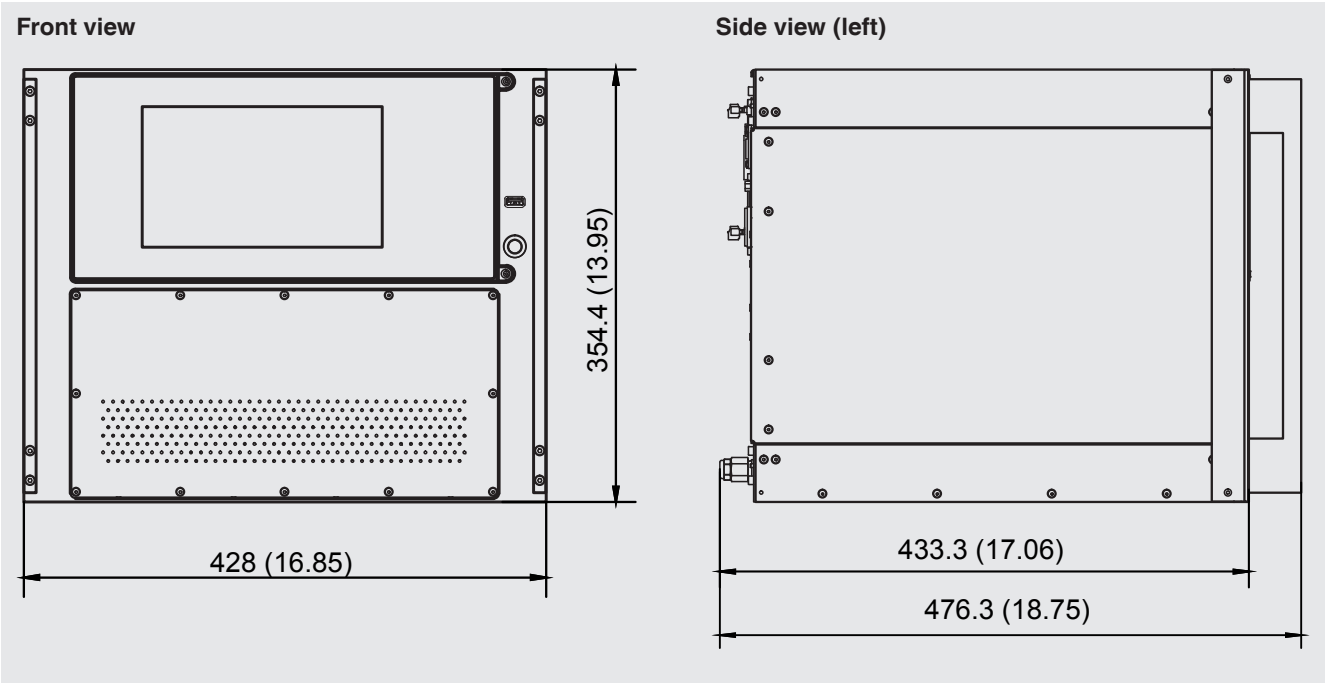
7) **Warning!** This is class A equipment for emissions and is intended for use in industrial environments. In other environments, e.g. residential or commercial installations, it can interfere with other equipment under certain conditions. In such circumstances the operator is expected to take the appropriate measures.

8) Calibration in a horizontal position / operating position.

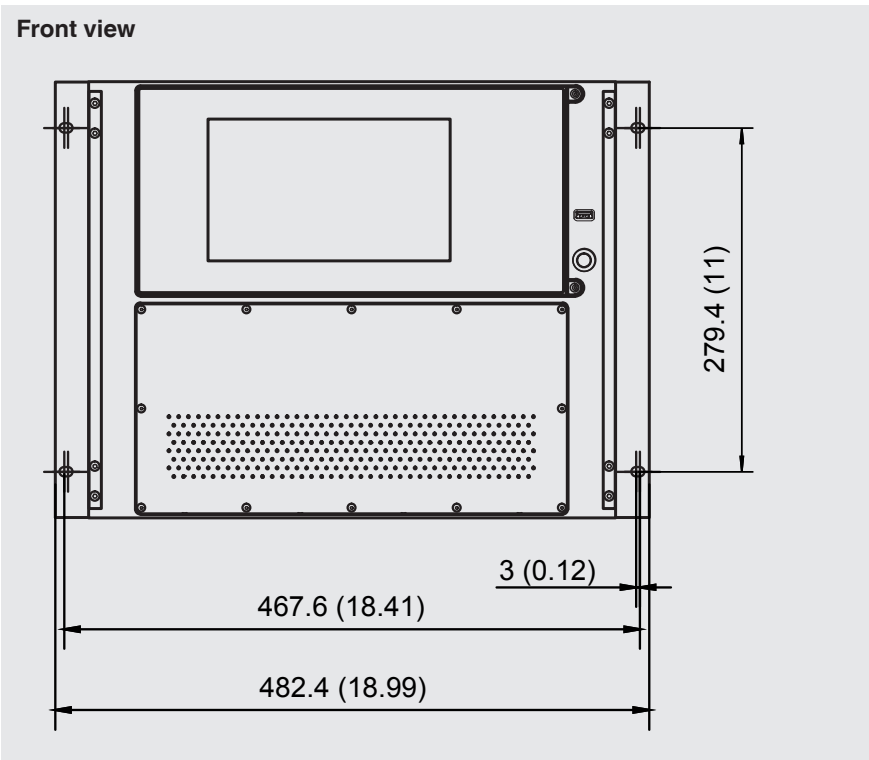
Approvals and certificates, see website

Dimensions in mm (in)

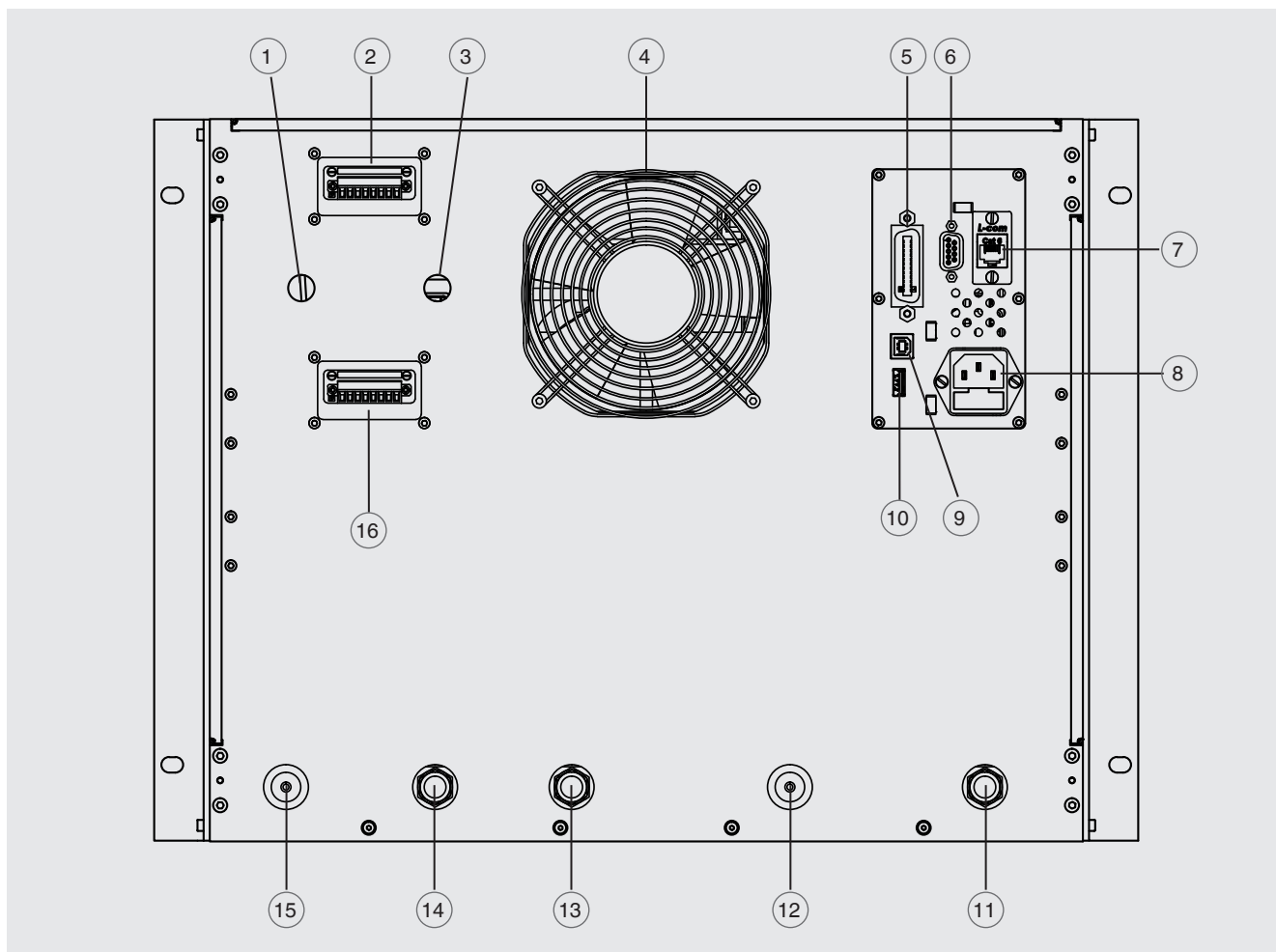
Desktop case



19" rack-mounting kit with side panels, front view



## Electrical and pressure connections - rear view



- |  |   |
|--|---|
| ① Optional: Barometric pressure connection (M12 female thread) | ⑨ USB interface (instrument) for remote communication       |
| ② Digital I/O 1-3  | ⑩ USB interface (host) for service                          |
| ③ Reference connection (M12 female thread)                     | ⑪ Vent pressure reference incl. silencer                    |
| ④ Fan  | ⑫ Measure/Control port (M16 x 1.5 female with sealing cone) |
| ⑤ IEEE-488 interface   | ⑬ Vent incl. silencer (ATM)                                 |
| ⑥ RS-232 interface   | ⑭ Controlled vent incl. silencer (ATM)                      |
| ⑦ Ethernet port  | ⑮ Supply port (M16 x 1.5 female with sealing cone)          |
| ⑧ Power supply   | ⑯ Digital I/O 4-6   |

## Efficient operation in a wide pressure range

The CPC7000 pneumatic high-pressure controller provides a high degree of flexibility by having up to three pressure sensors within the instrument. This allows the user to have a superior accuracy over a wider dynamic range of operation. Each sensor contains its calibration, characterization and communication functions and information.

The instrument can be equipped either with all gauge pressure sensors or all absolute pressure sensors. The highest sensor in the instrument must encompass the range of the smaller sensors.

### Autorangeing capability

The instrument is capable of automatically selecting between the installed sensors depending on the user's pressure set point. The transition between the sensors is automatic and provides the user a stable and seamless control.

### Emergency venting

The CPC7000 pneumatic high pressure controller has emergency venting feature when the front door is open or in case of a power failure. This ensures the operator's safety while working at high pneumatic pressures. Additionally the controller also vents any unused sensors.

These features make the instrument an efficient and safe controller to be used for various applications.



Pneumatic high-pressure controller, model CPC7000

## Easy operation via touchscreen

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

### Standard desktop / main screen



① Home application

② General settings

③ Control settings

④ Display settings

⑤ Remote settings

⑥ Step settings

⑦ Sequences settings

⑧ Favourites

⑨ Navigation within the menu

⑩ **VENT**

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

⑪ **CONTROL**

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

⑫ **MEASURE**

In measuring 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).

Temperature changes or external leakage may impact the pressure reading in this state.

⑬ Auxiliary displays either uncertainty, peak value, rate or alternative units

⑭ Current pressure unit and mode

⑮ Current measured value

⑯ Entered set point

⑰ Pressure range of the sensor

⑱ Selection of the active sensor or auto-range

⑲ Current application name

⑳ Set-point selection

## WIKA-Cal calibration software

### Easy and fast creation of a high-quality calibration certificate

WIKA-Cal calibration software serves for the creation of calibration certificates or logger protocols for pressure measuring instruments. A demo version is available for free download.

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

The pre-installed 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 will be 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 licenses are available together with a pressure controller of the CPC series

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 (light version)   | Cal-Template (full version)   | Log-Template (full version)   |
|--|---|---|
| <ul style="list-style-type: none"><li>■ Semi-automatic calibration</li></ul>   | <ul style="list-style-type: none"><li>■ Fully automatic calibration</li></ul> | <ul style="list-style-type: none"><li>■ Live measurement recording for a certain period of time with selectable interval, duration and start time</li><li>■ Creation of logger reports with graphic and/or tabular representation of the measurement results in PDF format</li><li>■ Export of measurement results as CSV file possible</li></ul> |
| <ul style="list-style-type: none"><li>■ Calibration certificate creation 3.1 per DIN EN 10204</li><li>■ Calibration reports can be exported to Excel® template or XML file</li><li>■ Calibration of gauge pressure measuring instruments with absolute pressure references and vice versa</li><li>■ Generation of calibration certificates with no limitations on measuring points</li></ul> |   |   |
|  |   |   |
| Ordering information for your enquiry for a single license   |   |   |
| WIKA-CAL-LZ-Z-Z  | WIKA-CAL-CZ-Z-Z   | WIKA-CAL-ZZ-L-Z   |
| Ordering information for your enquiry for a pair license:  |   |   |
| 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 CPC7000  |   | Order code |
|--|---|------------|
| Description  |   | CPX-A-C7   |
| <br> | <b>19" rack-mounting kit</b>  | -2-        |
|  | <b>Barometric reference</b><br>Measuring range 552 ... 1.172 mbar abs. (8 ... 17 psi abs.)<br>Accuracy to 0.01 % of reading | -3-        |
|  | for barometric reference, voltage supply and software   | -5-        |
|  | <b>Calibration adapter and voltage supply with interface cable RS-232</b>   | -6-        |
|  | <b>Adapterset</b> M12 on 9/16-18 UNF female   | -1-        |
| Ordering information for your enquiry:   |   |            |
| 1. Order code: CPX-A-C5<br>2. Option:  |   | ↓<br>[   ] |

Scope of delivery

- Pneumatic high-pressure controller model CPC7000 (desktop case)
- Power cord 1.5 m (5 ft)
- Operating instructions
- A2LA calibration certificate (standard on factory)

Options

- DKD/DAkkS calibration certificate
- Barometric reference
- Spare reference pressure sensor (CPR8050 or CPR8000)
- 19" rack-mounting kit
- Customer-specific system
- Adapters and fittings for pressure connections

Ordering information

Model / Case type / Instrument version / Reference pressure sensor 1 / Reference pressure sensor 2 / Reference pressure sensor 3 / Barometric reference / Type of certificate for the barometric reference / Pressure adapter / Power cord / Further approvals / Additional ordering information

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