Industrial pressure controller
Model CPC4000

Applications

- Oil and 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 10 s
- Control stability < 0.005% FS
- Accuracy down to 0.02% IS ( IntelliScale)
- Precision 0.008% FS

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 transducers 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 leak test and burst test applications allow CPC4000 to be used as a pressure line testing equipment. The optional automatic contamination prevention system makes the CPC4000 an ideal solution in oil and gas plants.

Functionality
Maximum ease-of-use is achieved through the touchscreen 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 transducers and the ranges for each reference pressure transducer are determined by the customer within the allowable range.

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

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 either the Mensor standard, SCPI or other optional command sets.

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 CPC4000

### Reference pressure transducers model CPR4000

<table>
<thead>
<tr>
<th>Pressure range</th>
<th>Standard</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy 1)</td>
<td>0.02% FS 2)</td>
<td>0.02% IS-50 3)</td>
</tr>
<tr>
<td>Pressure range</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gauge pressure</td>
<td>0 ... 0.35 to 0 ... 210 bar (0 ... 5 to 0 ... 3,045 psi) 4)</td>
<td>0 ... 1 to 0 ... 210 bar (0 ... 15 to 0 ... 3,045 psi) 4)</td>
</tr>
<tr>
<td>Bi-directional</td>
<td>-0.17 ... 0.17 to -1 ... 210 bar (-2.5 ... 2.5 to -15 ... 3,045 psi) 4)</td>
<td>-1 ... 10 to -1 ... 210 bar (-15 ... 145 to -15 ... 3,045 psi) 4)</td>
</tr>
<tr>
<td>Absolute pressure 5)</td>
<td>0 ... 1 to 0 ... 211 bar abs. (0 ... 15 to 0 ... 3,060 psi abs.)</td>
<td>0 ... 1 to 0 ... 211 bar abs. (0 ... 15 to 0 ... 3,060 psi abs.)</td>
</tr>
<tr>
<td>Precision 6)</td>
<td>0.008% FS</td>
<td>0.008% FS</td>
</tr>
<tr>
<td>Calibration interval</td>
<td>365 days</td>
<td>365 days</td>
</tr>
</tbody>
</table>

### Optional barometric reference

- Function: The barometric reference can be used to switch pressure types 7), absolute <=> gauge. With gauge pressure transducers, the measuring range of the transducers 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

### 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" color LCD with resistive touchscreen
- Resolution: 4 ... 6 digits depending on range and units

#### Connections

- Pressure connections: 4 ports with 7/16"-20 F SAE, 1 port with 1/8" F NPT and 1 port with 10-32 UNF female
- 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
- Barometer port adapters: Standard: barb fitting, Option: 6mm tube fitting, 1/4" tube fitting
- Permissible pressure media: Dry, clean air or nitrogen (ISO 8573-1:2010 class 5.5.4 or better)
- Wetted parts: Aluminum, brass, 316 and 316L stainless steel, Buna N, FKM/FFPM, PCTFE, PEEK, PTFE, PPS, glass-filled epoxy, RTV, ceramic, silicone, silicone grease, Urethane
- Overpressure protection: Safety relief valve fixed to reference pressure transducer and adjusted to specific measuring range

#### Permissible pressure

- Supply port: 110% FS or 0.69 bar (10 psi), whichever is greater
- Measure/Control port: max. 105 % FS

#### Voltage supply

- Power supply: AC 100 ... 120 V, 50/60 Hz; AC 220 ... 240 V, 50/60 Hz
- Power consumption: max. 150 VA

#### Permissible ambient conditions

- Storage temperature: -20 ... 70 °C (-4 ... 158 °F)
**Base instrument**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity</td>
<td>5 … 95% r. h. (relative humidity non-condensing)</td>
</tr>
<tr>
<td>Compensated temperature range</td>
<td>15 ... 45 °C (59 ... 113 °F)</td>
</tr>
<tr>
<td>Mounting position</td>
<td>horizontal</td>
</tr>
</tbody>
</table>

**Control parameter**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control stability</td>
<td>&lt; 0.005% FS of the primary range in precision mode</td>
</tr>
<tr>
<td>Control mode</td>
<td>precision, high speed and custom</td>
</tr>
<tr>
<td>Control time</td>
<td>10 s (regarding a 10% FS pressure increase above atm. in a 50 ml test volume, in high speed mode)</td>
</tr>
<tr>
<td>Control range</td>
<td>0 ... 100% FS</td>
</tr>
<tr>
<td>Minimum control pressure</td>
<td>0.0017 bar (0.025 psi) over exhaust pressure or 0.05% FS whichever is greater</td>
</tr>
<tr>
<td>Overshoots</td>
<td>&lt; 1% FS in high speed control mode (typical &lt;0.1% FS in precision control mode)</td>
</tr>
<tr>
<td>Test volume</td>
<td>50 ... 1,000 ccm</td>
</tr>
</tbody>
</table>

**Communication**

| Command sets                   | Mensor, WIKA SCPI, others optional                |
| Response time                  | approx. 100 ms                                    |
| Internal program               | up to 24 sequences with up to 99 steps each       |

**Approvals and certificates**

**EC declaration of conformity**

- EMC directive 8) EN 61326-1 emission (group 1, class A) and interference immunity (industrial application)
- Low voltage directive EN 61010-1
- RoHS directive 2011/65/EU, article 4

**Certificate**

- Calibration 9) Standard: A2LA calibration certificate (standard on factory)
  - Option: DKD/DAkkS calibration certificate

8) **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.

9) 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)**

<table>
<thead>
<tr>
<th>-1 (-15)</th>
<th>0</th>
<th>3.4 (50)</th>
<th>10 (150)</th>
<th>100 (1,500)</th>
<th>210 (3,045)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPSVR MODULE ±0.17 bar (±2.5 psi) 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPSVR MODULE ±0.35 bar (±5 psi) 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPSVR MODULE -1 ... 5 bar (-15 ... +75 psi) 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPSVR MODULE -1 ... 10 bar (-15 ... +150 psi) 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Absolute pressure [bar (psi)] 1)**

<table>
<thead>
<tr>
<th>0</th>
<th>4.4 (65)</th>
<th>11 (165)</th>
<th>101 (1,515)</th>
<th>211 (3,060)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPSVR MODULE 0 ... 1 bar (0 ... 15 psi) 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MPSVR MODULE 0 ... 1 bar (0 ... 15 psi) 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HPSVR MODULE 0 ... 6 bar (0 ... 90 psi) 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPSVR MODULE 0 ... 11 bar (0 ... 165 psi) 2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

2) Smallest acceptable transducer range

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

1. Home application
2. General settings
3. Control settings
4. Display settings
5. Programs
6. Favorites
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 measuring value
16. Zero or Tare function
17. Entered set point
18. Pressure range of the transducers
19. Selection of the active transducer or auto-range
20. Current application name
Automatic Contamination Prevention System (A-CPS)

**Active decontamination**

The Automatic Contamination Prevention System or A-CPS is an accessory to the CPC4000 Industrial Pressure Controller that prevents particle, water or oil contaminants from entering the instrument through the device under test. The A-CPS uses a coalescing filter and an automatically actuated bleed valve to remove all the contaminants and stores them in a transparent sump bottle for easy cleanup.

The A-CPS allows hassle free operation between the device under test and the CPC4000 by reducing the additional process of deep cleaning the device prior to calibration. The A-CPS does not require an additional power source because it is driven completely by the pressure controller itself. The A-CPS also acts like a test gauge stand for easy mounting and setup of the device under test. This reduces the requirement of additional manifolds & setup.

### A-CPS Specifications

**Operating Conditions**
- Maximum operating pressure: 3,065 psig (211 bar gauge)
- Maximum operating temperature: 80 °C (176 F)

**Voltage Supply**
- Power supply: 12 VDC
- Power consumption: 13 VA

**Pressure Connection**
- To the M/C port of CPC6050: 1 port with 1/4" tube adapted to 7/16"-20 F SAE
- To the DUT: 2 ports with
  - Standard: 7/16"-20 F SAE
  - 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

**Dimensions & Weight**
- Dimensions: 5.5 in x 10.5 in x 5.5 in (W x H x D)
- Weight: 3.9 kgs (8.8 lbs.)

### Automatic or manual purging with CPC4000

The Automatic Contamination System can be driven seamlessly with the CPC4000 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 device under test 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 device under test prior to normal operation with the Industrial Pressure Controller, CPC4000.
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 IEEE-488 interface
4 RS-232 interface
5 Ethernet port
6 Power supply
7 USB interface (instrument) for remote communication
8 USB interface (host) for service
9 Fan
10 Vent (ATM)
11 Reference port (7/16-20 UNF)
12 Measure/Control port (7/16-20 UNF)
13 Supply port (7/16-20 UNF)
14 Instrument label
15 Automatic CPS connector
**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 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 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

- 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 transducer model CPR4000
- Barometric reference
- 19” rack-mounting kit
- Customer-specific system
- Adapters and fittings for pressure connections
- Automatic contamination prevention system
- DPI5xx remote command set
- PACE remote command set

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