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 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 be installed with up to two reference pressure sensors and an optional barometer. The barometer can be used to display the barometric pressure or 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 special applications allow CPC4000 to be used as a pressure line testing equipment.
The optional automatic contamination prevention system make 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 sensors and the ranges for each reference pressure sensor 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.
Specifications
Model CPC4000

<table>
<thead>
<tr>
<th>Reference pressure sensors model CPR4000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pressure range</strong></td>
</tr>
<tr>
<td>Accuracy 1)</td>
</tr>
<tr>
<td>Gauge pressure 4)</td>
</tr>
<tr>
<td>Bi-directional 4)</td>
</tr>
<tr>
<td>Absolute pressure 5)</td>
</tr>
<tr>
<td>Precision 6)</td>
</tr>
<tr>
<td>Calibration interval</td>
</tr>
</tbody>
</table>

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) 0.02 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.02 % of half of the full scale value and between 50 ... 100 % of the full scale, the accuracy is 0.02 % of reading.
4) For pressure ranges from ≥ 100 ... ≤ 138 bar [≥ 1,500 ... ≤ 2,000 psi] gauge will be sealed gauge sensor.
5) The minimum calibrated range of absolute sensor(s) is 600mTorr.
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

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Standard: desktop case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option</td>
<td>19&quot; rack-mounting kit</td>
</tr>
<tr>
<td>Dimensions</td>
<td>See technical drawings</td>
</tr>
<tr>
<td>Weight</td>
<td>approx. 12.7 kg (28 lbs) incl. all internal options</td>
</tr>
<tr>
<td>Warm-up time</td>
<td>approx. 15 min</td>
</tr>
</tbody>
</table>

Screen
7.0" colour LC display with resistive touchscreen

Resolution
4 ... 6 digits depending on range and units
## Base instrument

### 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: 6 mm 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**: Aluminium, 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 fixed to reference pressure sensor and adjusted to specific customised 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)
- **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 the primary range in precision mode
- **Control mode**: precision, high speed and customised
- **Control time**: 10 s (regarding a 10 % FS pressure increase above atmosphere in a 50 ml test volume)
- **Control range**: 0 ... 100 % FS
- **Min. control pressure**: 0.0017 bar (0.025 psi) over exhaust pressure or 0.05 % FS whichever is greater
- **Overshoots**: < 1 % FS in high-speed control mode (typical < 0.1 % FS in precision control mode)
- **Test volume**: 50 ... 1,000 ccm

### Communication
- **Interface**: Ethernet, IEEE-488, USB, RS-232
- **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

<table>
<thead>
<tr>
<th>Logo</th>
<th>Description</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="ce.png" alt="CE" /></td>
<td>EU declaration of conformity</td>
<td>European Union</td>
</tr>
<tr>
<td></td>
<td>■ EMC directive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ EN 61326-1 emission (group 1, class A) and interference immunity (industrial application)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ Low voltage directive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ RoHS directive</td>
<td></td>
</tr>
<tr>
<td><img src="eac.png" alt="EAC" /></td>
<td>EAC (option)</td>
<td>Eurasian Economic Community</td>
</tr>
<tr>
<td></td>
<td>■ EMC directive</td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ Low voltage directive</td>
<td></td>
</tr>
</tbody>
</table>

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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.
**Working ranges of the controller modules**

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

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

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

<table>
<thead>
<tr>
<th>Absolute pressure ranges</th>
<th>LPSVR MODULE 0 ... 1 bar (0 ... 15 psi)</th>
<th>MPSVR MODULE 0 ... 1 bar (0 ... 15 psi)</th>
<th>HPSVR MODULE 0 ... 6 bar (0 ... +90 psi)</th>
<th>EPSVR MODULE 0 ... 11 bar (0 ... 165 psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>4.4 (60)</td>
<td>11 (165)</td>
<td>101 (1,515)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>101 (1,515)</td>
<td>211 (3,060)</td>
</tr>
</tbody>
</table>

1) Calibration in a horizontal position/operating position.  
2) Mixing of absolute pressure and gauge pressure sensors in a module is not possible.  
3) Smallest acceptable sensor range  

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

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).

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

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.
Simple instrument configurations

A) General settings of the instrument

1. Instrument language, screen brightness and volume settings
2. User-defined measurement units
3. Unit for the optional barometer
4. Multiple user-specific configurations to create and save for ease of access

B) Control settings of the instrument

5. Control behavior 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 the user by setting the stable window 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. Easy zeroing and tare features
Automatic Contamination Prevention System (A-CPS)

Specifications
Model A-CPS

<table>
<thead>
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<th>Base instrument</th>
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</thead>
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<tr>
<td>Operating conditions</td>
</tr>
<tr>
<td>Maximum operating pressure</td>
</tr>
<tr>
<td>Maximum operating temperature</td>
</tr>
<tr>
<td>Voltage supply</td>
</tr>
<tr>
<td>Power supply</td>
</tr>
<tr>
<td>Power consumption</td>
</tr>
<tr>
<td>Pressure connection</td>
</tr>
<tr>
<td>To the M/C port of CPC4000</td>
</tr>
<tr>
<td>To the test item</td>
</tr>
<tr>
<td>Standard: 7/16&quot; - 20 F SAE</td>
</tr>
<tr>
<td>Option: 6 mm tube fitting, 1/4&quot; tube fitting, 1/4&quot; female NPT fittings, 1/8&quot; female NPT fittings or 1/8&quot; female BSP fittings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (W x H x D)</td>
</tr>
<tr>
<td>Weight</td>
</tr>
</tbody>
</table>

A-CPS operation

Active decontamination
The Automatic Contamination Prevention System, or A-CPS, is an accessory to the CPC4000 industrial 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 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.

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 CPC4000
The A-CPS 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 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 CPC4000 industrial 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.

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 stick with the template has to be purchased.

The pre-installed demo version automatically changes to the selected full version when the USB stick is inserted and is available as long as the USB stick 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 calibration 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.
<table>
<thead>
<tr>
<th>Description</th>
<th>Order code</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accessories for CPC4000</strong></td>
<td>CPX-A-C4</td>
</tr>
<tr>
<td><strong>19” rack mounting kit with side panels</strong></td>
<td>-R-</td>
</tr>
<tr>
<td><strong>Barometric reference</strong></td>
<td>-6-</td>
</tr>
<tr>
<td>Measuring range 552 ... 1.172 mbar abs. (8 ... 17 psi abs.)</td>
<td></td>
</tr>
<tr>
<td>Accuracy to 0.02 % of reading</td>
<td></td>
</tr>
<tr>
<td>Measuring range 552 ... 1.172 mbar abs. (8 ... 17 psi abs.)</td>
<td>-3-</td>
</tr>
<tr>
<td>Accuracy to 0.01 % of reading</td>
<td></td>
</tr>
<tr>
<td><strong>Calibration adapter</strong></td>
<td>-4-</td>
</tr>
<tr>
<td>for reference pressure sensors, voltage supply and software</td>
<td></td>
</tr>
<tr>
<td>for barometric reference, voltage supply and software</td>
<td>-5-</td>
</tr>
<tr>
<td><strong>Transport case</strong></td>
<td>-7-</td>
</tr>
<tr>
<td><strong>Adapter set</strong></td>
<td>-B-</td>
</tr>
<tr>
<td>1/8&quot; BSPG female thread (4 adapter)</td>
<td>-I-</td>
</tr>
<tr>
<td>1/4&quot; tube fitting (4 adapter)</td>
<td>-M-</td>
</tr>
<tr>
<td>6 mm Swagelok® male thread (4 adapter)</td>
<td>-N-</td>
</tr>
<tr>
<td>1/4&quot; NPT female thread (4 adapter)</td>
<td>-S-</td>
</tr>
<tr>
<td><strong>Block and bleed valve, ≤ 400 bar</strong></td>
<td>-8-</td>
</tr>
<tr>
<td><strong>Coalescing filter ≤ 240 bar</strong></td>
<td>-9-</td>
</tr>
<tr>
<td><strong>Automatic contamination protection, ≤ 210 bar</strong></td>
<td>-O-</td>
</tr>
<tr>
<td><strong>Replacement filters for automatic CPS</strong></td>
<td>-2-</td>
</tr>
</tbody>
</table>

**Ordering information for your enquiry:**

1. Order code: CPX-A-C4
2. Option: 

WIKA data sheet CT 27.40 ∙ 08/2019
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 sensor model CPR4000
- Barometric reference
- 19" rack-mounting kit
- Customer-specific system
- Adapters and fittings for pressure connections
- Automatic contamination prevention system (CPS)

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