Industrial Pressure Controller
Model CPC4000

Applications
- Oil & 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 of 10 s
- Control stability < 0.005 % FS
- Accuracy down to 0.02 % IS (IntelliScale)

Description
Design
The CPC4000 offers a broad pressure range from -1 ... 210 bar (-15 ... 3,045 psi). This instrument can be specified as a desktop or as a 19" rack-mounted device. It can have up to two reference pressure sensors and an optional barometer for displaying barometric pressure or used to emulate gauge or absolute pressure.

Application
Since the controller offers a measurement 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 devices or a factory/working standard for the calibration of all types of pressure measuring devices. The contamination prevention accessories like the coalescing filter and block and bleed valve make the CPC4000 an ideal solution in oil and gas plants.

Functionality
The touchscreen, along with an intuitive user interface, provide maximum ease-of-use. In addition, the large number of menu languages add to its operability. The device can have up to two internal pressure transducers and the ranges for each unit are determined by the customer within the allowable range.

Depending on the application, the operator can choose between three methods of pressure control:
1) Direct numeric entry via keypad for the precise input of the pressure value (set point) which will be controlled.
2) Define steps to reach the desired pressure value by either defining fixed pressure increments or a percentage of span value.
3) Program and store individual test sequences based on users’ application.

Software
The WIKA-CAL calibration software enables the convenient calibration of pressure measuring instruments and the generation of test certificates. Additionally the device 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 (along with an optional USB-WiFi adapter) and an Ethernet interface for communication with other instruments, and thus the instrument can be integrated into existing systems.
Specifications
CPC4000

Reference Pressure Sensors

<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</td>
<td>0.02 % IS-50 2)</td>
</tr>
<tr>
<td>Gauge pressure</td>
<td>0 ... 0.35 up to 0 ... 210 bar (0 ... 5 up to 0 ... 3,045 psi)</td>
<td>0 ... 1 up to 0 ... 210 bar (0 ... 15 up to 0 ... 3,045 psi)</td>
</tr>
<tr>
<td>Bi-directional</td>
<td>-0.35 ... 0.35 up to -1 ... 210 bar (-5 ... 5 up to 0 ... 3,045 psi)</td>
<td>-1 ... 10 up to -1 ... 210 bar (-15 ... 145 up to 0 ... 3,045 psi)</td>
</tr>
<tr>
<td>Absolute pressure</td>
<td>0 ... 1 up to 0 ... 211 bar abs. (0 ... 15 up to 0 ... 3,060 psi abs.)</td>
<td>0 ... 1 up to 0 ... 211 bar abs. (0 ... 15 up to 0 ... 3,060 psi abs.)</td>
</tr>
</tbody>
</table>

Calibration interval 365 days 365 days

Optional barometric reference

Function
The barometric reference can be used to switch pressure types 3), 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 1) 0.02 % 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.
2) 0.02 % IS-50 accuracy: 0.02 % of reading in the upper half of the measuring range.
3) 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
Standard: desktop case
Option: 19" mounting with rack-mounting kit

Dimensions in mm
see technical drawings

Weight
approx. 12.7 kg (28 lbs.) with all internal options

Warm-up time
approx. 15 min

Display

Screen
7.0" color LCD display

Resolution
4 ... 6 digits depending on range and units

Input methods
Resistive touchscreen

Connections

Pressure connections
4 ports with 7/16" 20 F SAE and 1 port with 1/8" F NPT
Optional Barometer: 1 port with barb fitting

Filter elements
Filter element (40 micron) included in each pressure port

Pressure port adapters
Standard: without
Option: 6 mm tube fitting, 1/4" tube fitting, 1/4" NPT female, 1/8" NPT female or 1/8" BSPG female

Permissible pressure and media

Permissible pressure media
Dry, clean air or nitrogen (ISO8573-1:2010 Class 5.5.4 or better)

Wetted parts
Aluminum, 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 adjusted to specific customized pressure range

Supply Port
~ 110 % FS

Measure/Control Port
max. 105 % FS
### Base Instrument

#### Power supply
- **Power supply**: AC 100 ... 240 V, 50 Hz / 60 Hz
- **Power consumption**: max. 120 VA

#### Permissible ambient conditions
- **Storage temperature**: 0 ... 70 °C (32 ... 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 active range
- **Control mode**: Slow, normal, fast and variable
- **Control time**: 10 s (with a 10% pressure increase in a 50cc test volume)
- **Control range**: 0.05% FS or 0.0017 bar (0.025 psi) over exhaust pressure to 100% FS
- **Overshoots**: < 0.3% FS in fast control mode (typical <0.1% FS in slow control mode)
- **Test volume**: 50 ... 1,000 ccm

#### Communication
- **Interface**: Standard: Ethernet, IEEE-488, USB, RS-232. Optional: WiFi (with a USB-WiFi adapter)
- **Command sets**: Menso, WIKA SCPI, others optional
- **Response time**: 100 ms

### Approvals and Certificates

#### CE conformity
- **EMC directive**<sup>5)</sup>: 2004/108/EC, EN 61326-1: 2013 emission (group 1, class A) and interference immunity (industrial application)
- **Low voltage directive**: 2006/95/EC, EN 61010-1:2010

#### Approvals
- **GOST**: Metrology/measuring technology, Russia

#### Certificate
- **Calibration**<sup>6)</sup>: Standard: A2LA calibration certificate (standard on factory) Option: DKD/DAkkS calibration certificate

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4) **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.

5) Calibration in a horizontal position.

Approvals and certificates, see website
### Working Ranges of the Controller Modules

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

<table>
<thead>
<tr>
<th>Range</th>
<th>LPSVR MODULE ±0.175 bar (±2.5 psi)</th>
<th>MPSVR MODULE ±0.7 bar (±5 psi)</th>
<th>HPSVR 3) MODULE ±5.2 bar (-15…75 psi)</th>
<th>EPSVR 3) MODULE ±10 bar (-15…150 psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1 (-15)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.4 (50)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 (150)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 (1,500)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>210 (3,045)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Range</th>
<th>LPSVR MODULE 0…0.5 bar (0…7.5 psi)</th>
<th>MPSVR MODULE 0…1 bar (0…15 psi)</th>
<th>HPSVR 3) MODULE 0…5.2 bar (0…75 psi)</th>
<th>EPSVR 3) MODULE 0…11 bar (0…165 psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.4 (65)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 (165)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101 (1,515)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>211 (3,060)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Mixing of absolute pressure and gauge pressure sensors in a module is not possible.
2) Smallest recommendable sensor range

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

### Easy Operation via Touchscreen

**Home Screen**

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

- **Selection of the active sensor or auto-range**
- **Range of sensors**
- **Optional zero/tare function**
- **Current measuring value**
- **Optional bar graph**
- **Current pressure unit**
- **Auxiliary displays with either Pressure mode, peak, rate or alternate units**

**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).

**CONTROL**

In control mode, the instrument provides a highly accurate pressure to the Measure/Control port, corresponding to the desired set point.

**VENT**

Immediately vents the system, incl. the test assembly connected to the Measure/Control port, to atmosphere.
Simple Instrument Configurations

A) General Settings of the Instrument

- Instrument language, screen brightness and volume settings
- User defined measurement units
- Units for the optional barometer
- Multiple user specific configurations created and saved for ease of access

B) Control Settings of the Instrument

- The maximum and minimum limits for the desired control can be set
- The stability of the control can be defined by the user by setting the Stable Window as “% of set point” and by setting the Stable Delay
- The control rate parameters can be adjusted by setting the Rate Stable Window & Delay. The actual rate can be set using the Rate Setpoint.
- The vent rate of the instrument can be set

C) Display Settings of the Instrument

- Electronic filter to smooth the readings
- The resolution of the reading can be changed
- Bar graph can be turned on or off
- Easy zeroing and tare features
19" Rack Mount

Electrical and Pressure Connections – Rear

- Exhaust Port (7/16-20 UNF)
- Supply Port (7/16-20 UNF)
- Measure/Control Port (7/16-20 UNF)
- Reference Port (7/16-20 UNF)
- Vent (ATM)
- Power Supply
- USB (host)
- USB (device)
- IEEE-4888
- RS-232 Ethernet Port
- Baro Ref Port (10-32 UNF)
WIKACAL Calibration Software

Easy and fast creation of a high-quality calibration certificate

The WIKACAL 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 relative 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

- Model CPC4000 industrial pressure controller (desktop case)
- 1.5 m / 5 ft power cord
- Operating instructions
- A2LA calibration certificate (standard on factory)

Options

- DKD/DAkkS Calibration certificate
- Barometric reference
- Second reference pressure sensor
- 19” rack mounting kit
- Customer-specific system
- Adapters & fittings for pressure connections

Accessories

- Pressure adapters
- Interface cable
- Coalescing filter
- Block & bleed valve
- Pressure booster
- WIKA-CAL calibration software

Ordering information

Model / Housing / Pressure range transducers / 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 order details

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WIKA data sheet CT 27.40 - 04/2015

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