Precision pressure indicator
Model CPG2500

mensor

for further approvals
see page 4

Applications

- Pressure instrument manufacturing
- Pressure standard for calibration laboratories
- Transfer standard with external sensor
- Differential pressure measurement
- Simultaneous 3-channel pressure monitoring

Special features

- Pressure ranges: from 0 ... 25 mbar up to 0 ... 2,890 bar [0 ... 0.36 up to 0 ... 42,000 psi]
- Accuracy to 0.008 % of IS (IntelliScale)
- External pressure ranges from 25 mbar ... 1,000 bar [0.36 ... 15,015 psi]
- Precision 0.004 % FS
- Removable/interchangeable sensors

Precision pressure indicator model CPG2500

Description

Application

The model CPG2500 precision pressure indicator is used in calibration laboratories and manufacturing facilities as a source for precise pressure measurement. It is used to verify the accuracy of field pressure indicators/transmitters or as a laboratory standard and wherever there is a need for a high level of pressure accuracy in manufacturing, testing and calibration of pressure instruments or gauges.

Functionality

The CPG2500 can be configured with one, two or three pressure sensors. Two sensors are internal, and the third is external. The pressure sensors are pneumatically isolated so that one channel can be configured with a sensor as high as 2,895 bar [42,000 psi] and another as low as 25 mbar [10 inH_2O]. An optional barometric reference sensor can be added internally to display barometric pressure or used to emulate gauge or absolute pressure. Pressure ranges for each channel are specified by the customer.
Standard and premium sensors are available internally.

External sensors are Mensor's CPT9000, CPT6100 or CPT6180 digital pressure sensors.

Advantages of IntelliScale and removable sensors

With the IntelliScale specification, each sensor is calibrated to give a percent of reading in the upper portion of the range. Three sensors can be configured so that the percent of reading portions of their ranges are contiguous, giving a percent of reading accuracy over a wide range.

In addition, each sensor is removable and interchangeable which allows an external recalibration and range changes while minimising downtime.
The model CPT9000, CPT6180 or CPT6100 external pressure sensor is also available for remote applications.

WIKA

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Communication

The local user interface is displayed on a 7" colour LC display touchscreen. Navigation within the intuitive menu structure is easily learned. Recognisable touchscreen icons open screens for configuration and calibration.

Communicating to a remote computer is achieved through RS-232, IEEE-488, USB or Ethernet. Communication commands and queries are consistent with previous Mensor digital pressure gauges with added commands for the third channel.

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 CPG2500

Standard reference pressure sensor, model CPR2550			
Pressure range [1]			
Accuracy [2]	0.01 % FS [3]	0.01 % IS-50 [4]	0.008 % IS-33 [5]
Gauge pressure	0 ... 25 mbar to 0 ... 700 bar 0 ... 0.36 to 0 ... 10,000 psi	0 ... 1 to 0 ... 400 bar 0 ... 14.5 to 0 ... 6,000 psi	0 ... 1 to 0 ... 100 bar 0 ... 14.5 to 0 ... 1,500 psi
Bidirectional pressure	-12.5 ... +12.5 mbar to -1 ... 700 bar -0.18 ... +0.18 to -14.5 ... 10,000 psi	-1 ... 10 to -1 ... 400 bar -14.5 ... +145 to -14.5 ... 6,000 psi	-1 ... 10 to -1 ... 100 bar -14.5 ... +145 to -14.5 ... 1,500 psi
Absolute pressure [6]	0 ... 0.5 to 0 ... 701 bar abs. 0 ... 7.5 to 0 ... 10,015 psi abs.	0 ... 1 to 0 ... 401 bar abs. 0 ... 14.5 to 0 ... 6,015 psi abs.	0 ... 1 to 0 ... 101 bar 0 ... 14.5 to 0 ... 1,515 psi
Precision [7]	0.004 % FS		
Calibration interval	365 days [8]	365 days	365 days
Media compatibility			
Wetted parts	6000/7000 series aluminium, 316 stainless steel, brass, PTFE (Teflon®), urethane, silicone, RTV, silicone grease, PVC, epoxy, Buna N, fluoroelastomers (Viton®)		
Permissible media	Ranges ≤ 1 bar [≤ 15 psi] - only for pneumatic media Ranges > 1 bar [> 15 psi] - pneumatic media and non-corrosive hydraulic media allowed		
Sensor			
Reading rate	33 readings/second		
Calibration adjustments	Internal zero adder and span multiplier, up to 11-point linearisation for each sensor		

1) For pressure ranges from ≥ 100 ... ≤ 138 bar [≥ 1,500 ... ≤ 2,000 psi] gauge will be sealed gauge sensors.
2) 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 correction every 30 days.
3) FS = Full span = end of measuring range - start of measuring range
4) 0.01 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.01 % of half the full scale and between 50 ... 100 % of the full scale, the accuracy is 0.01 % of reading.
5) 0.008 % IS-33 accuracy: Between 0 ... 33 % of the full scale, the accuracy is 0.008 % of the lower third of the full scale and between 33 ... 100 % of the full scale, the accuracy is 0.008 % of reading.
6) The minimum calibrated range of absolute sensor(s) is 600 mTorr.
7) It is defined as the combined effects of linearity, repeatability and hysteresis throughout the stated compensated temperature range.
8) 180 days for pressure ranges below 1 bar [15 psi] gauge or absolute, and -1 ... +1 bar [-15 ... +14.5 psi] bidirectional. 365 days for the remainder of specified ranges

Teflon® is a registered trademark of DuPont Performance Elastomers.
Viton® fluoroelastomer is a registered trademark of DuPont Performance Elastomers.

Premium reference pressure sensor, model CPR2580

Pressure range [1]

Accuracy [2]	0.008 % IS-50 [9]	0.01 % FS [3]	0.014 % FS [3]
Absolute pressure [6]	0 ... 100 to 0 ... 227.5 bar abs. 0 ... 289.6 to 0 ... 455 bar abs.	0 ... 551.6 to 0 ... 758.4 bar abs.	0 ... 827.4 to 0 ... 1,517 bar abs. 0 ... 1,655 to 0 ... 2,172 bar abs. 0 ... 2,207 to 0 ... 2,896 bar abs.
	0 ... 1,500 to 0 ... 3,300 psi abs. 0 ... 4,200 to 0 ... 6,600 psi abs.	0 ... 8,000 to 0 ... 11,000 psi abs.	0 ... 12,000 to 0 ... 22,000 psi abs. 0 ... 24,000 to 0 ... 31,500 psi abs. 0 ... 32,000 to 0 ... 42,000 psi abs.

Precision [7]	0.004 % FS
Calibration interval [8]	365 days

Media compatibility

Wetted parts	6000/7000 series aluminium, 316 stainless steel, brass, PTFE (Teflon®), urethane, silicone, RTV, silicone grease, PVC, epoxy, Buna N, fluoroelastomers (Viton®)
Permissible media	Range > 401 bar abs. [> 6,015 psi abs.] - hydraulic media only available

Sensor

Reading rate	10 readings/second
Calibration adjustments	Internal zero adder and span multiplier, up to 11-point linearisation for each sensor

1) For pressure ranges from ≥ 100 ... ≤ 138 bar [≥ 1,500 ... ≤ 2,000 psi] gauge will be sealed gauge sensors.
2) 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 correction every 30 days.
3) FS = Full span = end of measuring range - start of measuring range
4) 0.01 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.01 % of half the full scale and between 50 ... 100 % of the full scale, the accuracy is 0.01 % of reading.
5) 0.008 % IS-33 accuracy: Between 0 ... 33 % of the full scale, the accuracy is 0.008 % of the lower third of the full scale and between 33 ... 100 % of the full scale, the accuracy is 0.008 % of reading.
6) The minimum calibrated range of absolute sensor(s) is 600 mTorr.
7) It is defined as the combined effects of linearity, repeatability and hysteresis throughout the stated compensated temperature range.
8) 180 days for pressure ranges below 1 bar [15 psi] gauge or absolute, and -1 ... +1 bar [-15 ... +14.5 psi] bidirectional. 365 days for the remainder of specified ranges
9) 0.008 % IS-50 accuracy: Between 0 ... 50 % of the full scale, the accuracy is 0.008 % of the half full scale and between 50 ... 100 % of the full scale, the accuracy is 0.008 % of reading.

Base instrument

Instrument

Instrument version	Standard: desktop case Optional: - 19" rack mounting kit with side panels incl. rack-mounting kit for single instrument mount - 19" rack mounting kit with side panels incl. rack-mounting kit for dual instrument mount
Dimensions	see technical drawings
Weight	5.7 kg [12.5 lbs] with all internal options
Warm-up time	approx. 15 minutes

Display

Screen	7" colour LC display touchscreen
Resolution	4 ... 7 digits, depending on range and units
Data entry	Touchscreen keypad
Pressure units	39 and two user defined units (multiplier from bar, psi or pascal) Further details see operating instructions
Rate units	/sec., /min., /hr., /3-hr
Languages	English, German, Spanish, French, Italian, Portuguese, Polish, Russian, Chinese, Japanese, Korean
Measurement filters	Off, Low, Normal (default), High

Connections

Number of integrateable sensors (selectable)	Standard: 1 reference pressure sensor Optional: 2nd reference pressure sensor, external pressure sensor and barometric reference
Pressure connections	Ranges ≤ 401 bar [≤ 6,015 psi] - up to 4 ports 7/16-20 F SAE and 1 port with 10-32 UNF female Ranges > 401 bar [> 6,015 psi] - up to 2 Autoclave F250C/HIP HF4

Base instrument	
Pressure adapters	Standard: without Optional: 6 mm tube fitting, 1/4" tube fitting, 1/4 female NPT fittings, 1/8 NPT female fittings or 1/8 BSP female fittings - on pressure ranges ≤ 401 bar [≤ 6,015 psi]
Overpressure safety	110 % FS typical, optional external relief valves are available
Voltage supply	
Power supply unit	AC 100 ... 120 V or AC 200 ... 240 V, 50/60 Hz, 24 VA max.
Power supply output	DC 12 V, 1.67 A (includes 4 region-specific plugs adapters)
Permissible ambient conditions	
Storage temperature	0 ... 70 °C [32 ... 158 °F]
Humidity	0 ... 95 % r. h. (non-condensing)
Operating temperature	15 ... 40 °C [59 ... 104 °F]
Communication	
Interface	Ethernet, IEEE-488, USB, RS-232
Command sets	Mensor, WIKA SCPI

Approvals

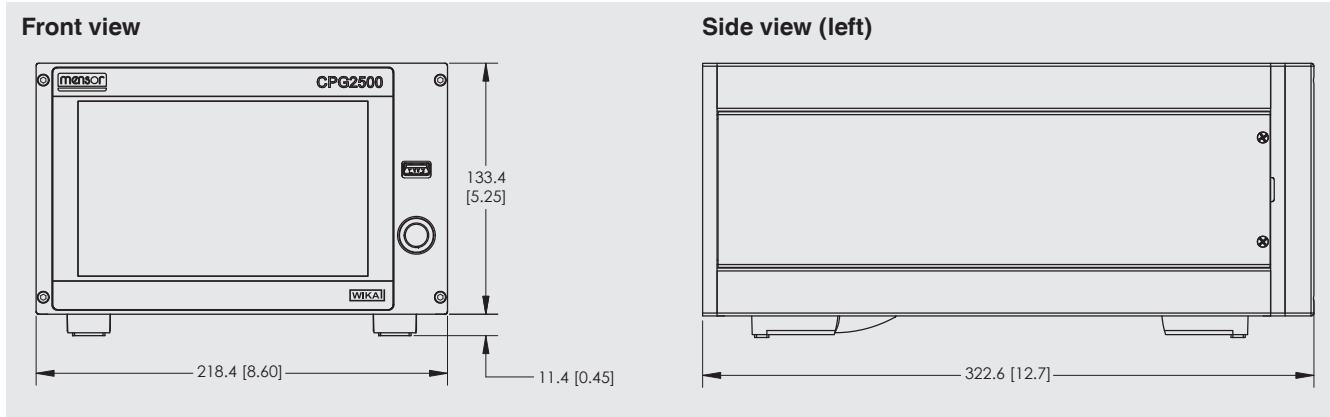| Logo	Description	Country
CE	**EU declaration of conformity** ■ EMC directive [1] EN 61326 emission (group 1, class A) and immunity (industrial application) ■ Low voltage directive ■ RoHS directive	European Union
EAC	**EAC (option)** ■ EMC directive ■ Low voltage directive	Eurasian Economic Community
⬤	**GOST (option)** Metrology, measurement technology	Russia
⬤	**BelGIM (option)** Metrology, measurement technology	Belarus
⬤	**KazInMetr (option)** Metrology, measurement technology	Kazakhstan
-	**MTSCHS (option)** Permission for commissioning	Kazakhstan
⬤	**UkrSEPRO (option)** Metrology, measurement technology	Ukraine
⬤	**Uzstandard (option)** Metrology, measurement technology	Uzbekistan

Certificates

Certificate	
Calibration [2]	Standard: A2LA calibration certificate Option: DKD/DAkkS calibration certificate
Recommended recalibration interval	1 year (dependent on conditions of use)

1) **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.
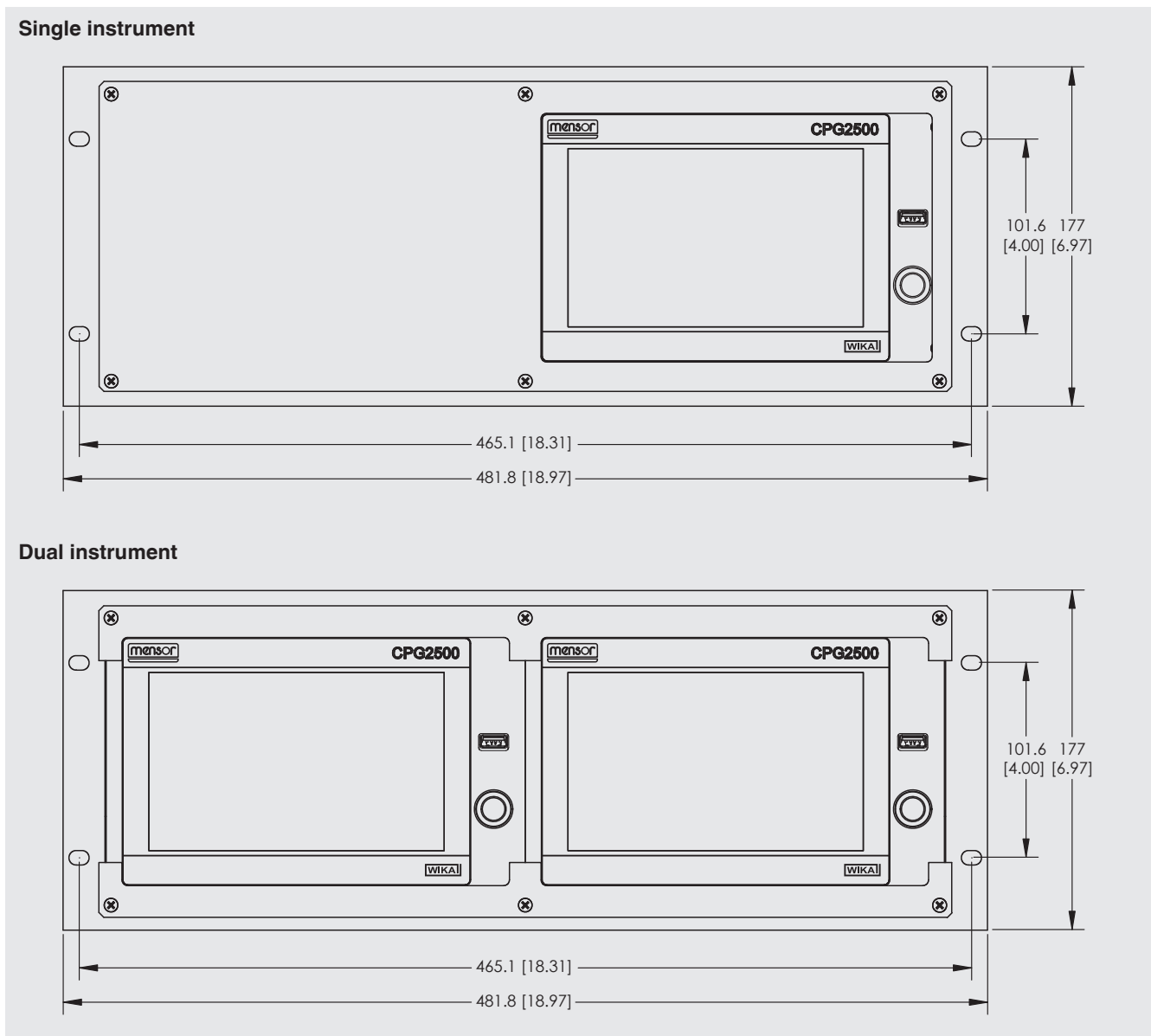2) Calibration in a horizontal position.

Approvals and certificates, see website
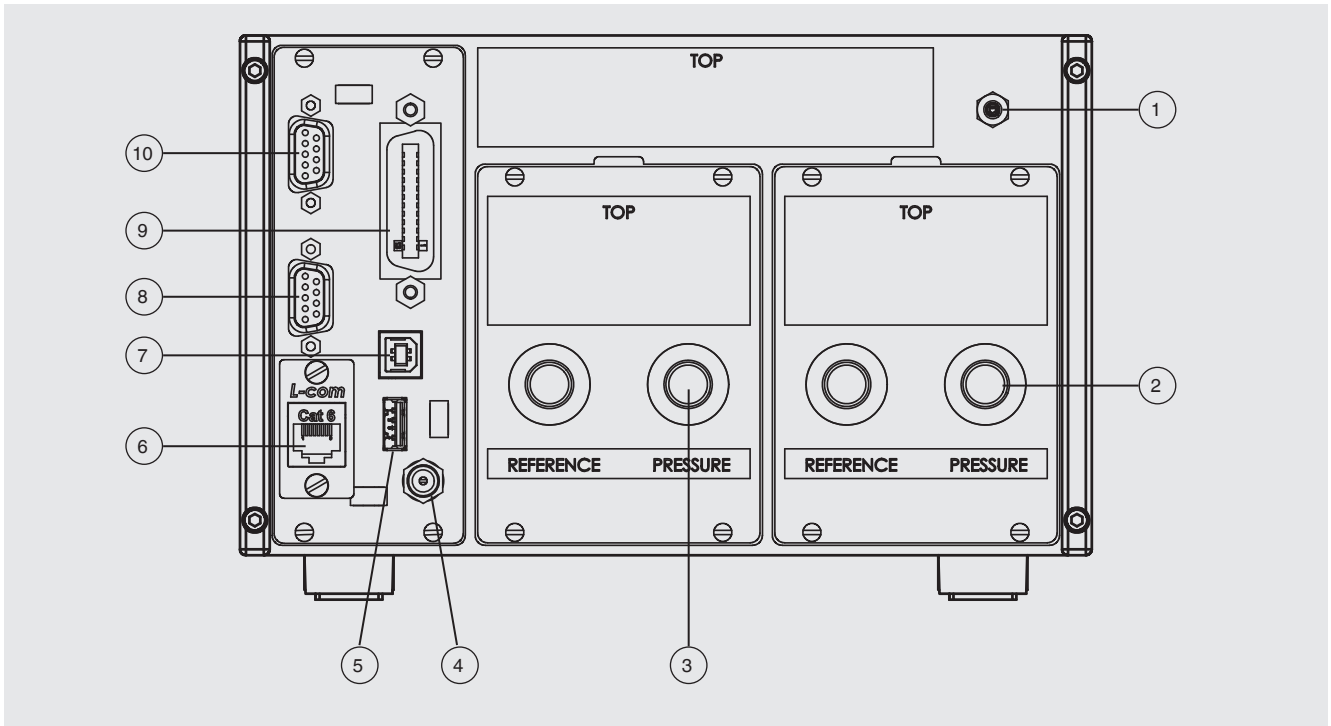
Dimensions in mm [in]

Desktop case

Front view	Side view (left)

Front view

mensor CPG2500 WIKA

133.4 [5.25]

11.4 [0.45]

218.4 [8.60]

Side view (left)

322.6 [12.7]

19" rack mounting, front view

Single instrument

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101.6 [4.00] 177 [6.97]

465.1 [18.31]

481.8 [18.97]

Dual instrument

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101.6 [4.00] 177 [6.97]

465.1 [18.31]

481.8 [18.97]

Electrical and pressure connections - rear view

1. Connection for optional barometric reference (10-32 UNF)
2. Measure port channel A (7/16-20 UNF)
3. Measure port channel B (7/16-20 UNF)
4. Power supply
5. USB interface (host) for service
6. Ethernet port
7. USB interface (instrument) for remote communication
8. RS-232 interface
9. IEEE-488 interface
10. External sensor connection

Communication panel
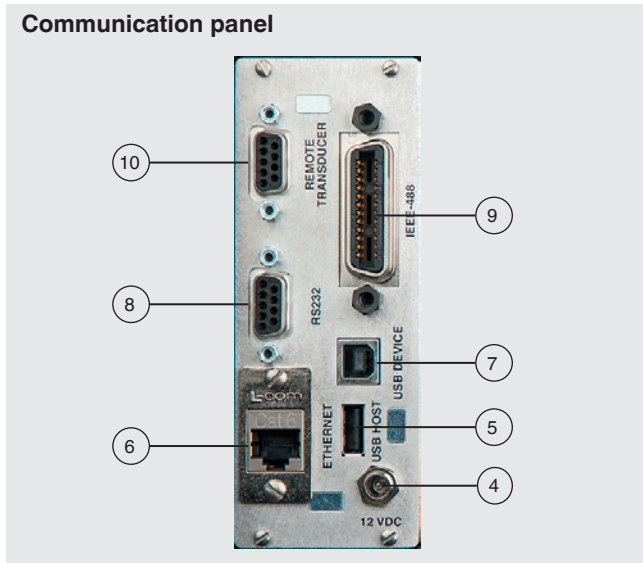
Reference pressure sensors versatility

One or two pressure sensors can be chosen (see specifications).
In addition, a remotely measuring precision pressure sensor with a measuring range of ≤ 1,000 bar [≤ 15,015 psi] can be chosen from the "standard range" section. The external pressure sensors are the models CPT9000, CPT6100 or CPT6180 from Mensor set to communicate via RS-232 with a baud rate that can be chosen from four selectable baud rates.

All internal pressure sensors are removable and interchangeable. Simply remove the four slotted screws on the rear panel, slide the reference pressure sensor out and remove the interface cable.

An optional removable internal barometric reference can also be ordered.

All CPG2500 reference pressure sensors can be calibrated while in the instrument using the instrument firmware. They can also be calibrated externally with an optional interface cable, power cord, calibration sled (needed for barometer only) and remote calibration software.

Removable / replaceable reference pressure sensor

Fig. left and centre: External reference pressure sensor
Fig. right: Removable / replaceable barometric reference

Application

**There are a variety of applications for the CPG2500:**
- Transfer standard to verify the accuracy of field or factory pressure sensors, digital or dial pressure gauges
- Laboratory pressure standard
- High-accuracy pressure indicator
- Differential pressure indication, for verification or calibration
- Precision barometer
- Component in an OEM application that requires pressure indication and precision pressure output
- Precision flow meter pressure monitoring
- Leak testing
- Remote indication of pressure in manufacturing processes

Communication via RS-232, IEEE-488, USB or Ethernet

Communication via RS-232

Remote communication to PC or laptop

External reference pressure sensor model CPT9000, CPT6100 or CPT6180

Easy operation via touchscreen

Shortly after power-up, the home screen (see following picture) is displayed.

Standard desktop / home screen
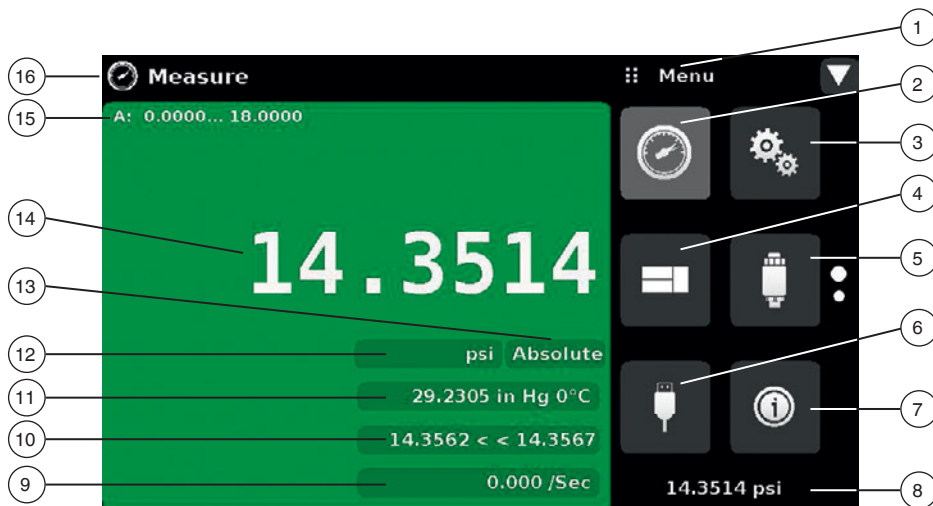
1	Application menu	9	Auxiliary display: rate of pressure change
2	Measuring application (Home)	10	Auxiliary display: peak
3	General settings	11	Auxiliary display: secondary pressure unit
4	Frame application settings	12	Current pressure unit
5	Sensor application settings	13	Current pressure type
6	Remote settings	14	Current measuring value
7	Instrument information	15	Active channel and pressure range of the sensors
8	Optional barometric pressure reading	16	Current application name

Operator interface

Single-frame channel "A"
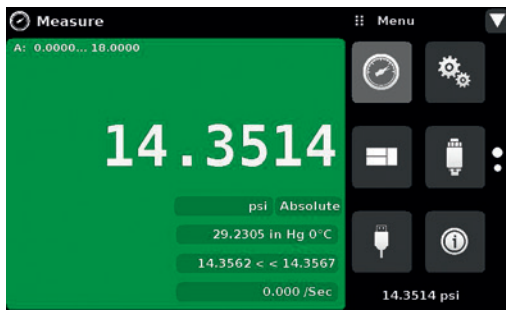
With auxiliary display of alternate units, peak and rate.

Example: Barometer units set to psi.

Reading for optional barometer

Dual-frame channel "A" and "B"

Without auxiliary display of alternate units, peak and rate.

Example: Barometer units set to psi.

Triple-frame channel "A", "B" and "Remote"

With auxiliary display of alternate units, peak and rate, plus zero button displayed.

Example: Barometer units set to psi.

Local operation
The intuitive operator interface of the CPG2500 provides visibility of one, two or three channels, each with or without the auxiliary display of "Alternate units", "Peak" and/or "Rate". Readings from the optional barometer can also be displayed in the lower right hand corner. Pressure units for each channel and the barometer can be selected from a list of 39 metric and imperial units. The setup "apps" are continuously visible for fast configuration for various applications.

Remote operation
Remote control of the CPG2500 is achieved through the use of the IEEE-488, RS-232, Ethernet or USB interface.

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. 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 pre-selection 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.

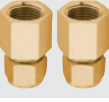For further information see data sheet CT 95.10

Three WIKA-Cal licences are available together with a precision pressure indicator.

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)
- Semi-automated calibration	- Fully automatic calibration	- Live measurement recording for a certain period of time with selectable interval, duration and start time
- Creation of calibration certificates 3.1 per DIN EN 10204 - Export of calibration reports to Excel® template or XML file - Calibration of gauge pressure measuring instruments with absolute pressure references and vice versa - Creation of calibration certificates with no limitations on measuring points		- Creation of logger protocols with graphic and/or tabular representation of the measurement results in PDF format - Export of measurement results as CSV file possible
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 the 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 CPG2500	Order code
Description	CPX-A-G1
19"-rack-mounting kit with side panels For two CPG2500 next to each other	-D-
19"-rack-mounting kit with side panels For one CPG2500	-R-
Barometric reference 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 sensors, voltage supply and software	-4-
Calibration adapter For barometric reference, voltage supply and software	-5-
Transport case	-6-
Interface cable for CPT9000 as external sensor	-7-
Interface cable for CPR2510 as external sensor	-8-
RS-232 interface cable for CPT61xx	-9-
Power supply unit	-P-
Adapter set 1/8 NPT female thread incl. safety relief valve for pressure ranges ≤ 70 bar [≤ 1,000 psi]	-1-
Adapter set 1/8 NPT female thread incl. safety relief valve for pressure ranges > 70 bar [> 1,000 psi]	-2-
Adapter set 6 mm Swagelok® male thread (2 adapters) max. 137 bar [2,000 psi], mat.: brass	-M-
Adapter set 6 mm Swagelok® male thread (2 adapter) max. 400 bar [6,000 psi], mat.: stainless steel	-C-
Adapter set 1/8" BSPG female thread (2 adapters) max. 137 bar [2,000 psi], mat.: brass	-B-

Accessories for CPG2500			Order code
Description			**CPX-A-G1**
	Adapter set 1/4" tube fitting; 2 adapter (2 adapters) max. 137 bar [2,000 psi], mat.: brass		-I-
	Adapter set 1/4" tube fitting (2 adapters) max. 400 bar [6,000 psi], mat.: stainless steel		-E-
	Adapter set 1/4 NPT female thread (2 adapters) max. 137 bar [2,000 psi], mat.: brass		-N-
	Adapter set 1/4 NPT female thread (2 adapters) max. 400 bar [6,000 psi], mat.: stainless steel		-A-
	Adapter set 1/8 NPT female thread (2 adapters) max. 137 bar [2,000 psi], mat.: brass		-S-
	Adapter set 1/8 NPT female thread (2 adapters) max. 400 bar [6,000 psi], mat.: stainless steel		-F-
Ordering information for your enquiry:			
		1. Order code: CPX-A-G1	⇓
		2. Option:	[ ]

Scope of delivery

■ Precision pressure indicator model CPG2500
■ Switching power supply with 1.5 m [5 ft] power cord
■ Operating instructions
■ A2LA calibration certificate (standard on factory)

Options

■ DKD/DAkkS calibration certificate
■ Barometric reference
■ Second internal pressure sensor
■ External pressure sensor (CPT9000, CPT6100 or CPT6180)
■ 19" rack-mounting kit
■ Single range barometer
■ Pressure relief valve kit (up to 400 bar [6,000 psi])

Ordering information

Model / Case type / Reference pressure sensor channel A / Reference pressure sensor channel B / Connection cable for external pressure sensor / Barometric reference / Type of certificate for barometric reference / Further approvals / Additional ordering information

WIKA