

Precision pressure indicator Model CPG2500



WIKA data sheet CT 25.02



for further approvals
see page 5

Applications

- Pressure standard for calibration laboratories
- Transfer standard with external sensor
- Pressure instrument manufacturing
- 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)
- Removable/interchangeable sensors
- Accuracy down to 0.008 % of IS (IntelliScale)
- External pressure ranges from 0.36 to 6,000 psi
- Precision 0.004 % FS

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 690 bar (10,000 psi) and another as low as 25 mbar / 10 inH₂O. 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 CPT6100 or CPT6180 digital pressure sensors.



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See sensor chart on page 3 for ranges and uncertainty specification.

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 remote recertification and quick sensor range changes while minimising downtime. The CPT6180 or CPT6100 external pressure sensor is also available for remote applications.

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

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.

Specifications Model CPG2500

Standard reference pressure sensor, model CPR2550		
Pressure range		
Accuracy ¹⁾	0.01 % FS ²⁾	0.01 % IS-50 ³⁾
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)
Bi-directional pressure	-12.5 ... +12.5 mbar to -1 ... 700 bar (-0.18 ... +0.18 psi to -14.5 ... 10,000 psi)	-1 ... 10 to -1 ... 400 bar (-14.5 ... +14.5 to -14.5 ... 6,000 psi)
Absolute pressure ⁴⁾	0 ... 500 mbar to 0 ... 701 bar abs. (0 ... 7.5 psi to 0 ... 10,015 psi abs.)	0 ... 1 to 0 ... 401 bar abs. (0 ... 14.5 to 0 ... 6,015 psi abs.)
Precision ⁵⁾	0.004 % FS	0.004 % FS
Calibration interval	365 days ⁶⁾	365 days
Media compatibility		
Metals in contact with media	6000/7000 series aluminium, 316 SS, brass	
Non-metals in contact with media	PTFE (Teflon [®]), urethane, silicone, RTV, silicone grease, PVC, epoxy, Buna N, fluoroelastomers (Viton [®])	
Sensor		
Reading rate	33 readings/second	
Calibration adjustments	Internal zero adder and span multiplier, up to 11-point linearisation for each sensor	

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 the full scale and between 50 ... 100 % of the full scale, the accuracy is 0.01 % of reading.

4) The minimum calibrated range of absolute sensor(s) is 600 mTorr.

5) It is defined as the combined effects of linearity, repeatability and hysteresis throughout the stated compensated temperature range.

6) 180 days for pressure ranges below 1 bar (15 psi) and above 400 bar (6,000 psi) gauge or absolute, and -1 ... 1 bar (-15 ... 14.5 psi) bi-directional. 365 days for the remainder of the 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

Accuracy ¹⁾	0.008 % IS-33 ⁷⁾
Gauge pressure	0 ... 12 to 0 ... 16.5 psig 0 ... 17.5 to 0 ... 33 psig 0 ... 80 to 0 ... 110 psig 0 ... 120 to 0 ... 220 psig
Precision ⁵⁾	0.004 % FS
Calibration interval	365 days

Pressure range

Accuracy ¹⁾	0.008 % IS-33 ⁷⁾	0.008 % IS-50 ⁸⁾
Absolute pressure ⁴⁾	0 ... 12 to 0 ... 16.5 psia 0 ... 18.4 to 0 ... 33 psia 0 ... 36 to 0 ... 50 psia 0 ... 80 to 0 ... 110 psia 0 ... 160 to 0 ... 220 psia 0 ... 240 to 0 ... 500 psia	0 ... 700 to 0 ... 1,100 psia 0 ... 1,400 to 0 ... 3,300 psia 0 ... 4,200 to 0 ... 6,015 psia
Precision ⁵⁾	0.004 % FS	0.004 % FS
Calibration interval	365 days	365 days

Pressure range

Accuracy ¹⁾	0.01 % FS ³⁾	0.014 % FS ³⁾
Absolute pressure ⁴⁾	0 ... 8,000 to 0 ... 11,000 psia	0 ... 12,000 to 0 ... 22,000 psia 0 ... 24,000 to 0 ... 31,500 psia 0 ... 32,000 to 0 ... 42,000 psia
Precision ⁵⁾	0.004 % FS	0.004 % FS
Calibration interval	365 days	365 days

Media compatibility

Metals in contact with media	6000/7000 series aluminium, 316 SS, brass, Inconel
Non-metals in contact with media	PTFE (Teflon [®]), urethane, silicone, RTV, silicone grease, PVC, epoxy, Buna N, fluoroelastomers (Viton [®])

Sensor

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








- 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.
- 3) 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.
- 4) The minimum calibrated range of absolute sensor(s) is 600 mTorr.
- 5) It is defined as the combined effects of linearity, repeatability and hysteresis throughout the stated compensated temperature range.
- 7) 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.
- 8) 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.

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Base instrument	
Instrument	
Instrument version	Standard: desktop case Option: - 19" rack mounting with side panels incl. rack-mounting kit for single instrument mount - 19" rack mounting 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
Resolution	4 ... 7 digits depending on range and units
Data entry	Touchscreen keypad
Measurement units	psi, psf, osi, atm, inH ₂ O (4 °C), inH ₂ O (20 °C), inH ₂ O (60 °F), mbar, bar, Dy/cm ² , pascal, hPa, kPa, MPa, inHg (0 °C), inHg (60 °F), mTorr, Torr, mmHg (0 °C), cmHg (0 °C), mHg (0 °C), mmH ₂ O (4 °C), cmH ₂ O (4 °C), mH ₂ O (4 °C), mmH ₂ O (20 °C), cmH ₂ O (20 °C), mH ₂ O (20 °C), mSW, ftH ₂ O (4 °C), ftH ₂ O (20 °C), ftH ₂ O (60 °F), inSW, ftSW, tsi, tsf, g/cm ² , kg/cm ² , kg/m ² , % of range, + 2 user-defined units (multiplier from psi, bar or pascal)
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 Option: 2nd reference pressure sensor, external pressure sensor and barometric reference
Pressure connections	up to 400 bar (6,000 psi): 7/16-20 F SAE/MS. 1/8" FNPT, adapter fittings selectable above 400 bar (6,000 psi): Autoclave F250C/HIP HF4
Pressure adapters	Standard: without Option: 6 mm Swagelok® tube fitting, 1/4" Swagelok® tube fitting, 1/8 NPT female fittings or 1/8 BSP female fittings
Overpressure limits	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 A 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	IEEE 488, RS-232, USB and Ethernet
Command sets	Mensor, WIKA SCPI

Approvals

Logo	Description	Country
	EU declaration of conformity <ul style="list-style-type: none"> ■ EMC directive ⁹⁾ EN 61326 emission (group 1, class A) and immunity (industrial application) ■ Low voltage directive ■ RoHS directive 	European Union
	EAC <ul style="list-style-type: none"> ■ EMC directive ■ Low voltage directive ■ Pressure equipment directive 	Eurasian Economic Community
	GOST Metrology, measurement technology	Russia
	KazInMetr Metrology, measurement technology	Kazakhstan
-	MTSCHS Permission for commissioning	Kazakhstan
	BelGIM Metrology, measurement technology	Belarus
	UkrSEPRO Metrology, measurement technology	Ukraine
	Uzstandard Metrology, measurement technology	Uzbekistan

9) **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.

Certificates

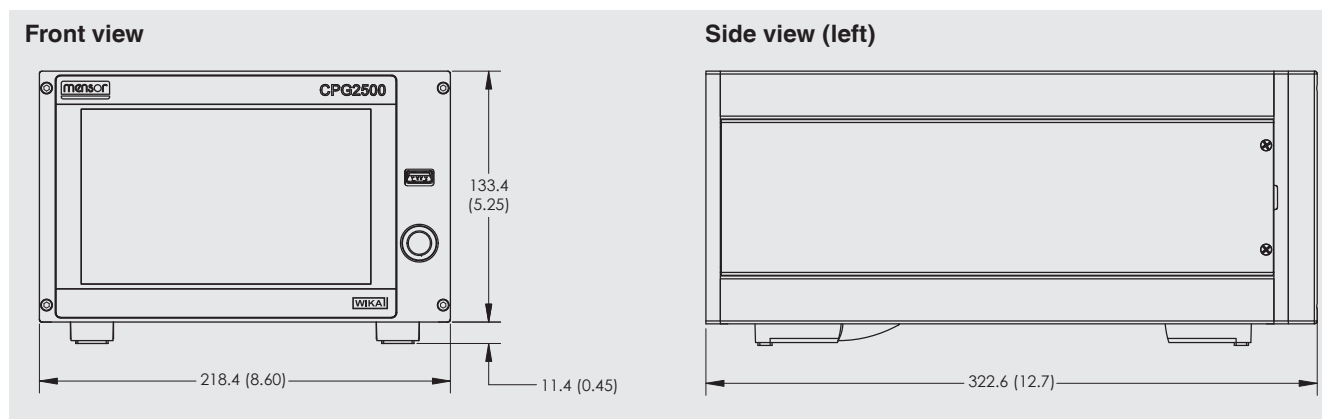
Certificate	
Calibration ¹⁰⁾	Standard: A2LA calibration certificate (standard on factory) Option: DKD/DAkkS calibration certificate
Recommended recalibration interval	1 year (dependent on conditions of use)

10) Calibration in a horizontal position.

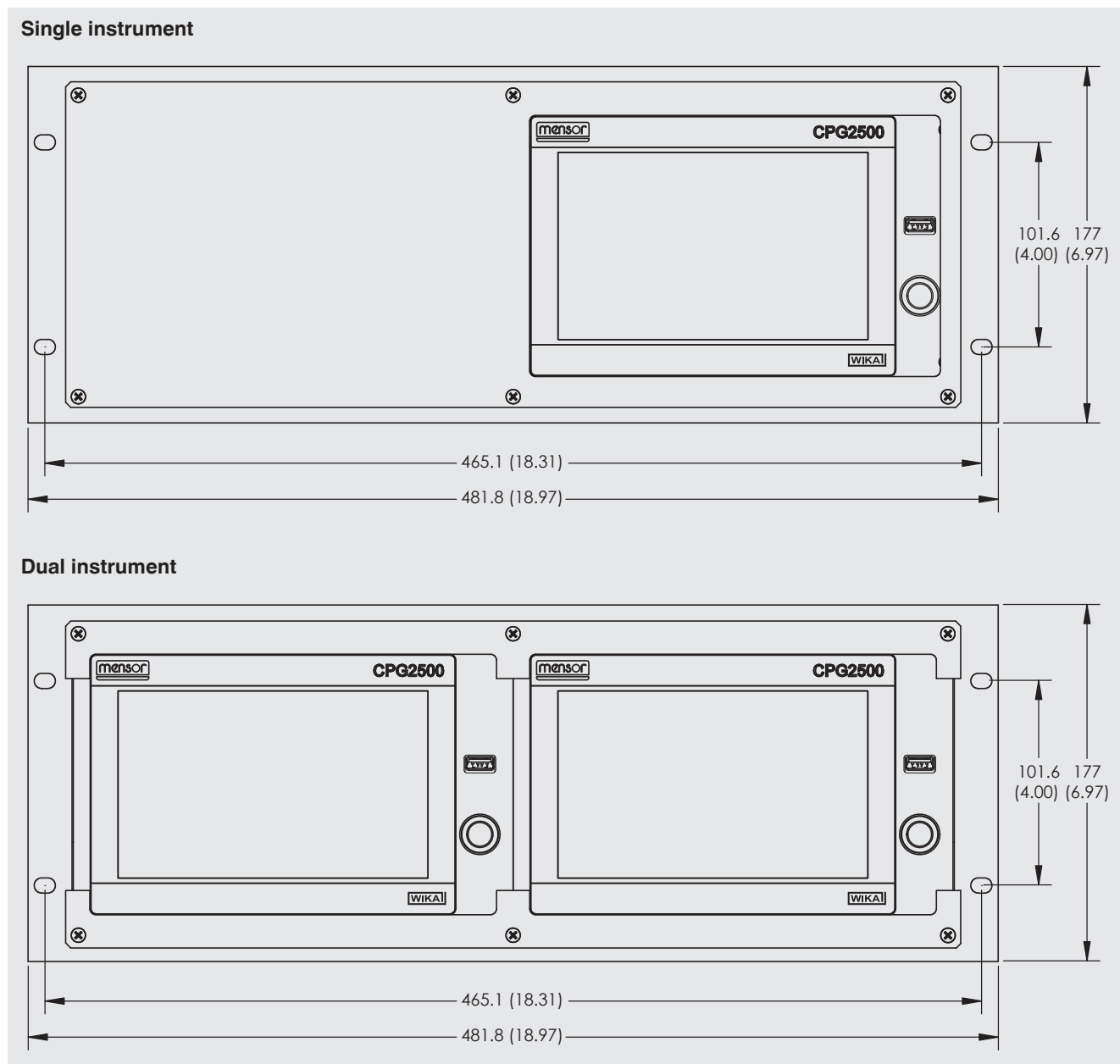
Approvals and certificates, see website

Dimensions in mm (in)

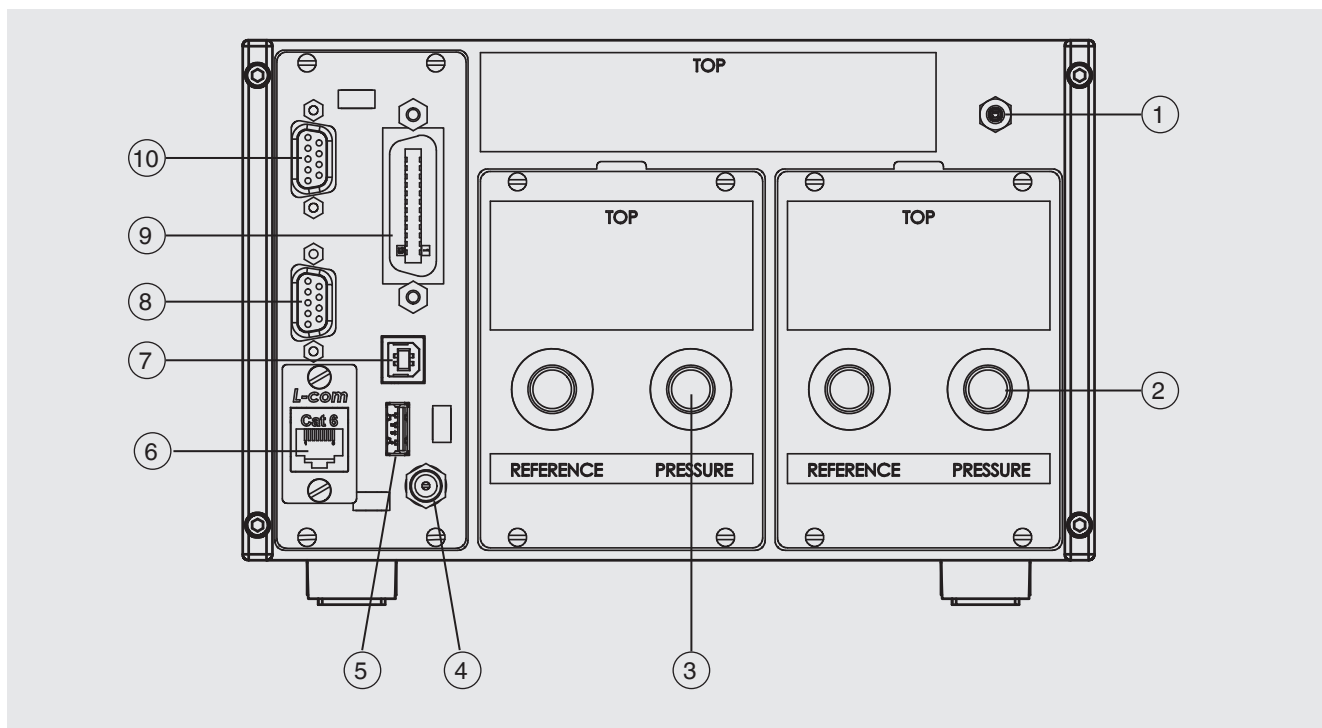
Desktop case



19" rack mounting, front view

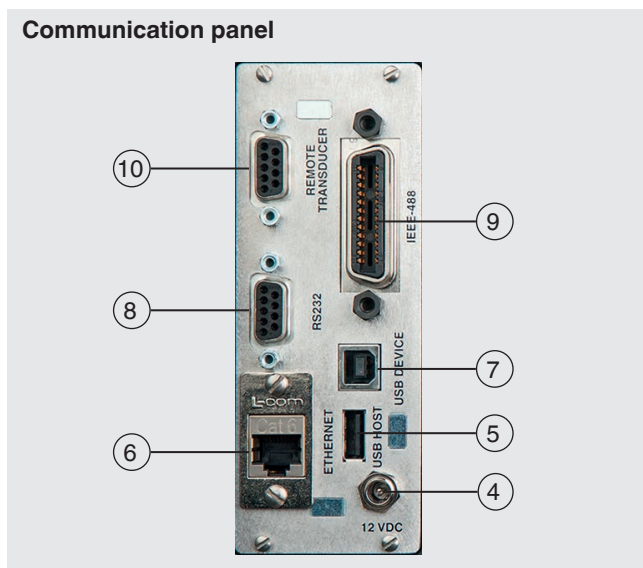


Electrical and pressure connections - rear view



- ① Connection for optional barometric reference
- 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 ≤ 401 bar ($\leq 6,015$ psi) can be chosen from the “standard range” section. Remote pressure sensors are Mensor CPT6100 or CPT6180 models 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



Figure left: External reference pressure sensor
Figure 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



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 38 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 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 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.



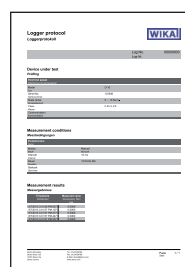
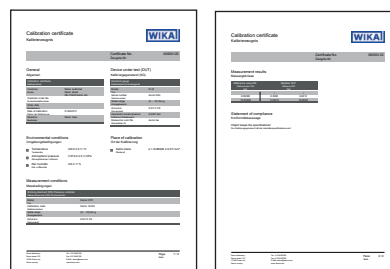
Log Demo

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

- Precision pressure indicator model CPG2500
- Switching power supply with 1.5 m (5 ft) power cord
- Operating instructions
- A2LA accredited calibration certificate

Options

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

Accessories

- Robust transport case
- Pressure adapters
- Interface cable
- WIKA-Cal calibration software
- Barometer calibration sled

Ordering information

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

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