

# Precision Pressure Indicator

## Model CPG2500



Data Sheet CPG2500 • 11/2014

### Applications

- Pressure standard for calibration labs
- Transfer standard with remote transducers
- Pressure instrument manufacturing
- Differential pressure measurement
- Simultaneous three channel pressure monitoring

### Features

- Pressure ranges from 0.36 to 42,000 psi
- Removable / Interchangeable transducers
- Accuracy down to 0.008% of reading
- External pressure ranges from 0.36 to 6,000 psi



Precision Pressure Indicator CPG2500

## Description

### Application

The CPG2500 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 1, 2, or 3 pressure transducers. Two transducers are internal, and the third is external. The transducer channels are pneumatically isolated so that one channel can be configured with a sensor as high as 10,000 psi / 690 bar and another as low as 10 inH<sub>2</sub>O / 25 mbar. 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 transducers are Mensor's CPT6100 or CPT6180 digital pressure transducers. See transducer chart on page 3 for ranges and uncertainty specification.

### The advantage of IntelliScale and removable transducers

With the IntelliScale specification, each sensor is calibrated to give a percent of reading in the upper portion of the range. Three transducers can be configured so that the percent of reading portions of their ranges are contiguous, giving a percent of reading uncertainty over a wide range. In addition, each transducer is removable and interchangeable which allows remote recertification and quick transducer range changes while minimising downtime. The CPT6180 or CPT6100 external sensor is also available for remote applications.

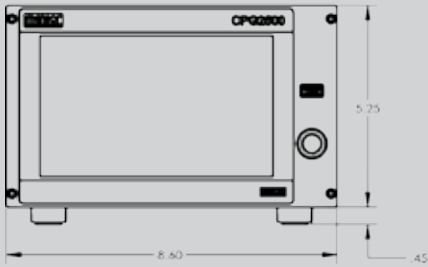
### Communication

The local user interface is displayed on a 7" color LCD touchscreen display. Navigation within the intuitive menu structure is easily learned. Recognizable 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.

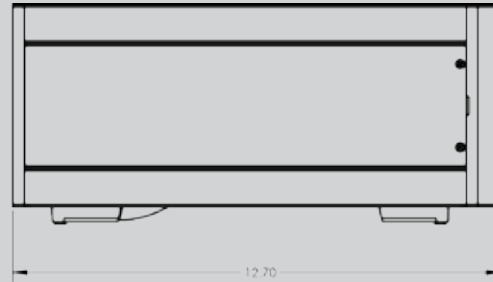
Dimensions in inches

Desk top case

Front view



Side view

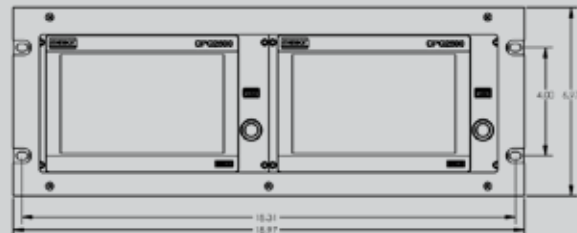


19" rack mount

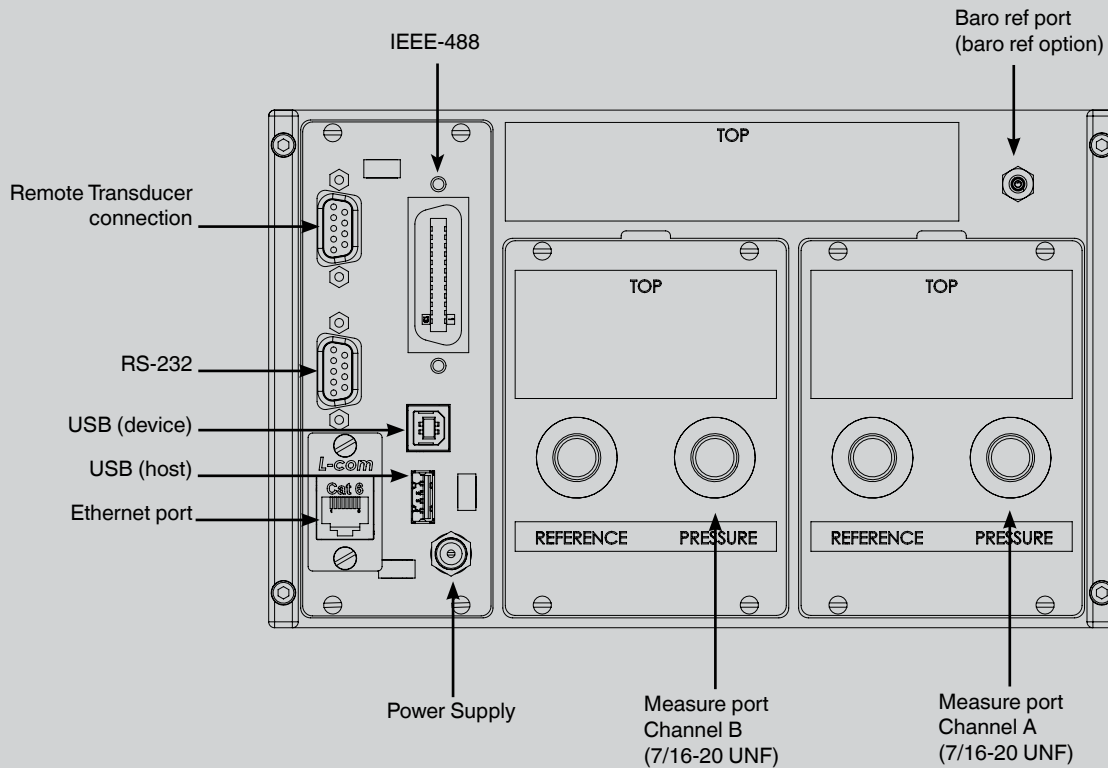
Single mount - Front view



Dual mount - Front view



Rear Panel



# Specifications

## Model CPG2500

### Standard Reference Transducers, Model CPR2550

Accuracy <sup>(1)</sup>	0.03% Full Span	0.01% Full Span	0.01% IS-50 <sup>(2)</sup>
Gauge Pressure	0 ... 0.36 up to <1 psi 0 ... 25 up to <70 mbar	0 ... 1 up to 10,000 psi 0 ... 70 mbar up to 700 bar	0 ... 14.5 up to 6000 psi 0 ... 1 up to 400 bar
Bi-Directional Pressure	-0.18 ... 0.18 to >-0.5 ... <0.5 psi -12.5 ... 12.5 to >-35 ... <35 mbar	-0.5 ... 0.5 to -14.5 ... 10,000 psi -35 ... 35 mbar to -1 ... 400 bar	-14.5 ... 145 to -14.5 ... 6000 psi -1 ... 10 to -1 ... 400 bar
Absolute Pressure	—	0 ... 7.5 up to 10,000 psia 0 ... 0.5 up to 690 bar	0 ... 14.5 up to 6015 psia 0 ... 1 up to 401 bar
Calibration Interval	180 days	365 days <sup>(3)</sup>	365 days
<b>Media Compatibility</b>			
Metals in contact with media	6000/7000 series Aluminum, 316 SS, brass		
Non-metals in contact with media	PTFE (Teflon®), Urethane, Silicone, RTV, Silicone grease, PVC, Epoxy, Buna-N, fluoroelastomers (Viton®)		
<b>Sensor</b>			
Reading rate	33 readings/second		
Calibration adjustments	Internal zero adder and span multiplier, up to 11 point linearization for each sensor		

### Premium Reference Transducers, Model CPR2580

Accuracy <sup>(1)</sup>	0.008% IS-33 <sup>(2)</sup>	0.008% IS-50 <sup>(2)</sup>	0.01% FS	0.014% FS
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	—	—	—
Absolute Pressure	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 ... 1100 psia 0 ... 1400 to 0 ... 3300 psia 0 ... 4200 to 0 ... 6015 psia	0 ... 8000 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
Calibration Interval	365 days	365 days	365 days	365 days
<b>Media Compatibility</b>				
Metals in contact with media	6000/7000 series aluminum, 316 SS, brass, inconel			
Non-metals in contact with media	PTFE (Teflon®), Urethane, Silicone, RTV, Silicone grease, PVC, Epoxy, Buna-N, fluoroelastomers (Viton®)			
<b>Sensor</b>				
Reading rate	10 readings/second			
Calibration adjustment	Internal Zero adder and Span multiplier, up to 11 point linearization for each sensor			

<sup>(1)</sup> Accuracy is defined by total measurement uncertainty with the coverage factor (k=2) and includes the intrinsic performance of the instrument (linearity, hysteresis, repeatability), the measurement uncertainty of the reference instrument, long term stability, influences of ambient conditions, drift and temperature effects over the calibrated range, with periodic zero point adjustment.

<sup>(2)</sup> The Intelliscale (IS) specification is a percent of reading specification combined with a percent of full scale specification. For example the designation "0.01% IS-50", simply means that the uncertainty of the sensor is 0.01% of reading above 50% of Full Scale, and 0.01% of 50% of Full Scale below 50% of the Full Scale. The 0.008% IS-33 specification is the same except the uncertainty is 0.008% and the break over from percent of reading to percent of Full Scale is at 33% of Full Scale. Same rules apply for bidirectional ranges.

<sup>(3)</sup> Gauge and Bidirectional ranges with full scale or full span range less than 14.5 psi have a calibration interval of 180 days, otherwise the calibration interval is 365 days.

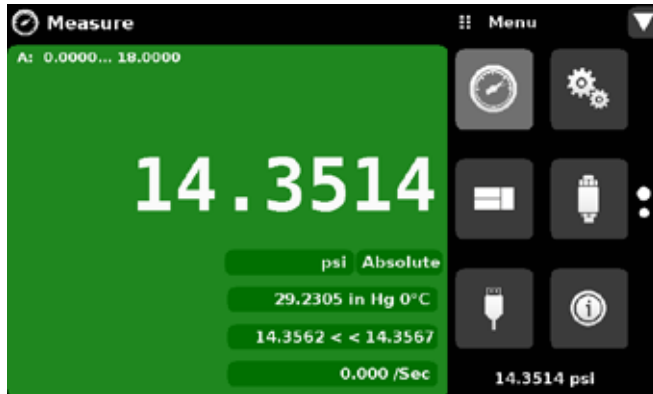
## Specifications (Continued)

### Model CPG2500

Basic Instrument	
Instrument	
Instrument version	Standard: Table top with tilt feet 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 drawing
Weight	12.5 lbs./ 5.7 kg (with all internal options)
Warm-up time	Approximately 15 minutes
Display	
Screen	7" color LCD display
Resolution	Selectable from 4 to 6 digits, depending on range and units
Data entry	Touch screen keypad
Measurement Units	psi, psf, osi, atm, inH2O@4C, inH2O@20C, inH2O@60F, mbar, bar, Dy/cm <sup>2</sup> , pascal, hPa, kPa, MPa, inHg@0C, inHg@60F, mTorr, Torr, mmHg@0C, cmHg@0C, mHg@0C, mmH2O@4C, cmH2O@4C, mH2O@4C, mmH2O@20C, cmH2O@20C, mH2O@20C, mSW, ftH2O@4C, ftH2O@20C, ftH2O@60F, inSW, ftSW, tsi, tsf, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , kg/m <sup>2</sup> , % of Range, + plus 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 integrated transducer (selectable)	Standard: 1 reference transducer Optional: 2nd reference transducers, external transducer, internal barometric reference
Pressure connections	To 6000 psi: 7/16 - 20 female SAE/MS. 1/8" FNPT adapters provided. Ranges >6000 psi: Autoclave F250C/HIP HF4
Pressure adaptors	Standard: None Optional: 1/4 inch Swagelok® tube fittings, 6 mm Swagelok® tube fittings, 1/8 in. female NPT fittings or 1/8 in. female BSP fittings.
Overpressure limits	110 % FS typical, optional external relief valves are available
Voltage supply	
Power input requirements	100-120 or 200-240 VAC, 50-60Hz, 24VA max
Switching power supply	Output: 12 VDC, 1.67 A (includes 4 region specific plugs adapters)
Permissible ambient conditions	
Storage temperature range	0 to 70 deg C
Operating environment	0 ... 95 % RH (relative humidity, non-condensing)
Operating temperature range	15 ... 40 deg C
Communications	
Remote interface	IEEE 488, RS--232, USB and Ethernet
Command sets	Mensor, WIKA SCPI

CE conformity and certificates	
CE compliance	EN61326-1:2013 electromagnetic compliance EN61010-1:2010 safety/CB scheme
Calibration	Calibration certificate per ISO/IEC 17025:2005. Accreditation is by the American Association for Laboratory Accreditation (A2LA).

## Operator Interface



Single frame Channel “A” with auxiliary display of Alternate Units, Peak and Rate. Barometer units set to psi.

← Reading for optional barometer



Dual frame Channel “A” and “B” without auxiliary display of Alternate Units, Peak and Rate. Barometer units set to inHg 0°C.



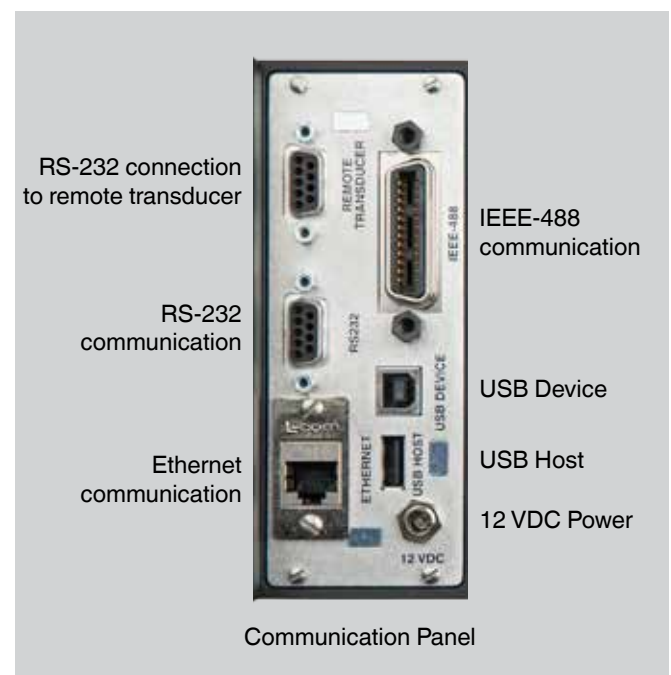
Triple frame Channel “A”, “B” and “Remote” with auxiliary display of Alternate Units, Peak and Rate, plus Zero button displayed. Barometer units set to psi.

### 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 communication interface.



## Transducer versatility

One or two transducers can be chosen from the list provided in the “Transducers” section of the specifications on page 3. In addition, a remote transducer range (Max Range  $\leq 6015$  psi) can be chosen from the “Standard Range” section. Remote transducers 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 transducers are removable and interchangeable. Simply remove the 4 slotted screws on the rear panel, slide the transducer out and remove the communication cable. An optional removable internal barometric reference can also be ordered.

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



Remote Transducer



Removable / Replaceable Transducer

Removable / Replaceable Barometric Reference



Precision Pressure Indicator CPG2500

Communication  
↔  
RS-232



CPT6100 or CPT6180  
Remote Digital Pressure Transducer

Communication  
↔  
RS-232  
IEEE-488  
USB  
Ethernet



Remote communication to PC

There are a variety of applications for the CPG2500:

- Transfer standard to verify the accuracy of field or factory transducers, 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



One or two  
internal transducer(s)



## Scope of delivery

- Precision Pressure Indicator CPG2500
- Switching power supply with 5 ft / 1.5 m power cord
- Operating instructions
- ISO/IEC 17025:2005, A2LA accredited calibration certificate

## Options

- DKD/DAkkS calibration certificate
- 19" rack mount kits
- Second internal sensor
- External pressure sensor (CPT6100 or CPT6180)
- Barometric reference
- Analog output
- Single range barometer
- Pressure relief valve kit (up to 6000 psi (410 bar))

## Accessories

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

The calibration program at Mensor is accredited by A2LA as complying with both the ISO/IEC 17025:2005 and the ANSI/ NCSL Z540-1-1994 standards. All Mensor primary standards are traceable to NIST. Mensor is registered to ISO9001:2008.



### **Mensor**

201 Barnes Drive  
San Marcos, TX 78666  
phone: 512.396.4200  
fax: 512 396.1820  
www.mensor.com  
e-mail: sales@mensor.com