

# PCS 400



*Pressure Calibration System  
Model PCS 400*



## Features

- 0.010% FS accuracy
- Ranges from 0.36 to 2000 psi
- High resolution (up to 1 ppm)
- 0.004% FS control stability
- 38 selectable pressure units
- IEEE-488 and RS-232 communications
- Absolute, gauge, bidirectional and vacuum

**Control**

**With a precision to 0.003% FS and an accuracy to .010% FS, the Model PCS 400 provides exceptional performance.**

The PCS 400 is a third generation of precision pressure measuring and controlling instruments manufactured by Mensor Corporation. This "intelligent controller/calibrator" is designed for use in automated test stands, or on a test bench in the metrology lab. Communications through IEEE-488 or RS-232 permit easy interfaces to your computer and custom software programs.

Fast response and minimal overshoot are provided via the proprietary solenoid-type regulator that employs "intelligent" gain and damp to eliminate manual adjustments.

The pressure transducer and regulator combine for a reliable pressure measurement/control module. The transducer is a calibrated unit that has a built-in RAM, digital interface and a 20-bit A/D converter. To minimize the possibility of damage from over pressurization, relief valves protect all transducers.

## Options

- 0.025% FS accuracy
- Dual range with auto-switching
- Gauge emulation
- Absolute emulation
- Rack Mount Kit

Through the addition of a barometric reference, gauge or absolute pressures can be measured or generated (emulation mode) from the same instrument, thereby reducing the investment in pressure instrumentation for these different pressure types.

The PCS 400 guarantees a high level of system reliability with virtually no moving parts and extensive internal diagnostics features. Reliability, versatility, advanced design and ease of use make the PCS 400 the best value precision pressure controller/calibrators.

# PCS 400

## Pressure Calibration System Specific Data Model PCS 400

### General Specifications

#### Pressure Units Available

psi, inHg @ 0°C and 60°F, inH<sub>2</sub>O @ 4°C, 20°C and 60°F, ftH<sub>2</sub>O @ 4°C, 20°C and 60°F, mTorr, inSW @ 0°C, ftSW @ 0°C, mSW @ 0°C, ATM, bars, mbars, mmH<sub>2</sub>O @ 4°C and 20°C, cm H<sub>2</sub>O @ 4°C and 20°C, MH<sub>2</sub>O @ 4°C, mH<sub>2</sub>O @ 20°C, mmHg @ 0°C, cmHg @ 0°C, Torr, hPa, kPa, Pa, D/cmsq, G/cmsq, Kg/cmsq, OSl, PSF, TSF, TSl, μHg @ 0°C, mA, %FS. All sea-water units are 3.5% salinity.

<b>Warm-up</b>	15 minutes depending on environment
<b>Reading Rate</b>	Typically 30 readings per second
<b>Response Time</b>	0.25 seconds for FS step typical
<b>Gravity/Orientation</b>	Negligible effect on zero, span, linearity, and repeatability
<b>Shock and Vibration</b>	2 Gs max. for 10 minutes
<b>Communications</b>	IEEE-488-STD-1978 and RS-232 LabVIEW <sup>®1</sup> drivers are available
<b>Display</b>	Vacuum fluorescent, 2 lines 40 characters
<b>Keypad</b>	16 dual function keys
<b>Size</b>	17.05" (43.31 cm) x 6.97" (17.70 cm) x 20" (51 cm)
<b>Weight</b>	43 lbs (19.5 kg) single range 45 lbs (20.4 kg) dual range 47 lbs (21.3 kg) dual range with baro. ref.
<b>Pressure Media</b>	Clean, dry, non-corrosive gases; no oxygen
<b>Fittings</b>	7/16-20 SAE/MS (female) 1/8 female NPT adapters provided
<b>Power</b>	90 to 264 volts AC, 50 to 60 Hz autoswitching, 175 VA max

<sup>1</sup> LabVIEW<sup>®</sup> is a trademark of National Instruments Corporation

### Control Specifications

#### Pressure Ranges (Standard)

psia: 0 – 5 to 0 – 2000 max.  
psig: 0 – 0.36 to 0 – 2000 max.

#### Pressure Range (Bidirectional, Vacuum)

-0.36 to +0.36 min, -atm to 2000 max.

Represented by:

### Mensor Corporation

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**Over Pressure Limit** Protected by relief valves

**Source Pressure > 5 psi**

Instrument air or dry nitrogen at pressure equal to FS plus 10 psi or 110% of FS. Accurate external regulation is not required.

**Exhaust Pressure**

Atmospheric exhaust for gauge pressure control above 0.05 psig and absolute pressure control. A vacuum pump is recommended for gauge control of positive pressures below 0.25 psig. Pump capacity of 21 liters of free air displacement is recommended.

**Reference Pressure**

Atmospheric for gauge models.  
Permanent vacuum for absolute models.

**Stability of Controlled Pressure**

>2 psi: ± 0.004% FS  
<2 psi: ± 0.008% FS

With pressure stable indication available on display or via IEEE-488 or RS-232

**Minimum Controlled Pressure**

Exhaust pressure plus 0.05%FS or 0.025 psia, whichever is greater

**Control Time**

When controlling, for the output pressure to be in the stable window 55 seconds is typical between any two pressure points from 0.5%FS above the exhaust pressure to full scale with a 1/2 liter volume. A larger volume can lengthen this time. The time will also be longer for absolute pressures below 0.5 psia.

### Measurement Specifications

**Accuracy** 0.010% FS

**Precision** 0.003% FS

**Calibration Stability** 0.010% FS for 180 days after re-zeroing.  
Optional 0.025% accuracy instruments are 0.025% for 180 days after re-zeroing.

**Calibration Adjustments**

Zero and Span

Zero and Span may be reset without affecting each other or the linearity.

**Resolution**

up to 1 ppm

**Temperature Compensation**

15°C to 45°C

**Accuracy** includes the following uncertainties in the pressure reading: repeatability, pressure hysteresis, creep, linearity, and temperature effects over the compensated range.

**Precision** is the closeness of agreement between independent test results obtained under stipulated conditions.

Per ANSI/NCSL Z540-2-1997 (U.S Guide to the Expression of Uncertainty in Measurement) that "the term precision should not be used for accuracy".

These models are calibrated with primary standards traceable to NIST. The calibration program at Mensor is compliant to ANSI/NCSL Z540-1-1994.

For more details on calibration of Mensor products see Technical Note entitled "Accuracy Specifications for Mensor Products" (available on our web site [www.mensor.com](http://www.mensor.com)).

Since product improvement is a continuous process at Mensor, we reserve the right to change specifications without notice.



CDS400K