OBSOLETE

Calibration Technology

High-Speed Pneumatic Pressure Controller Model CPC3000

Applications

- Industry (laboratory, workshop and production)
- Pressure transmitter manufacture
- Calibration service companies
- Research and development laboratories

Special features

- Pressure ranges:
  Gauge: 0 ... 5 up to 0 ... 1500 psig
  Absolute: 0 ... 7.5 to 0 ... 1515 psia
  Bi-directional: 14.5 ≤ span ≤ 1515
- Control speed: < 3 seconds.
- Uncertainty: 0.025% FS (180 day calibration interval)
  Optional Uncertainty 0.025% IS-50 (365 day calibration interval)
- Bezel and Handle
- Includes A2LA/NIST Calibration Certificate

High-Speed Pneumatic Pressure Controller Model CPC3000

Description

Overview

The CPC3000 has a compact, light weight design, a reliable high speed pressure regulator, gauge / absolute / bi-directional ranges and an optional barometric reference for emulation. These qualities make the CPC3000 suitable for a variety of applications.

Applications

With an uncertainty of 0.025% FS and a high speed regulator, the CPC3000 is well suited for use in the production of pressure sensors, transmitters, transducers, and pressure switches or as a working standard for the control and calibration of all types of pressure gauges.

Functionality

A color touch-screen, combined with user-friendly menus, guarantees high productivity in a calibration lab or production facility; all screens can be viewed in several different languages.

To enter the pressure setpoint, the operator can choose between four input modes which can be selected using the corresponding tab. The input modes are:

1. The numeric key menu provides a way to enter a specific pressure set point value to be controlled.
2. The step keypad menu provides defined steps programmed in pressure increments or percent of a user defined span to move the pressure setpoint across the range of the instrument under test.
3. The jog key menu provides a way for the operator to define small pressure steps up or down to reach a cardinal point on a dial gauge. The jog buttons increment the least significant digit by 1, 10 or 100 counts.
4. The user defined Jog menu provides a way for the operator to define any step within the span to increase or decrease the setpoint.

Software

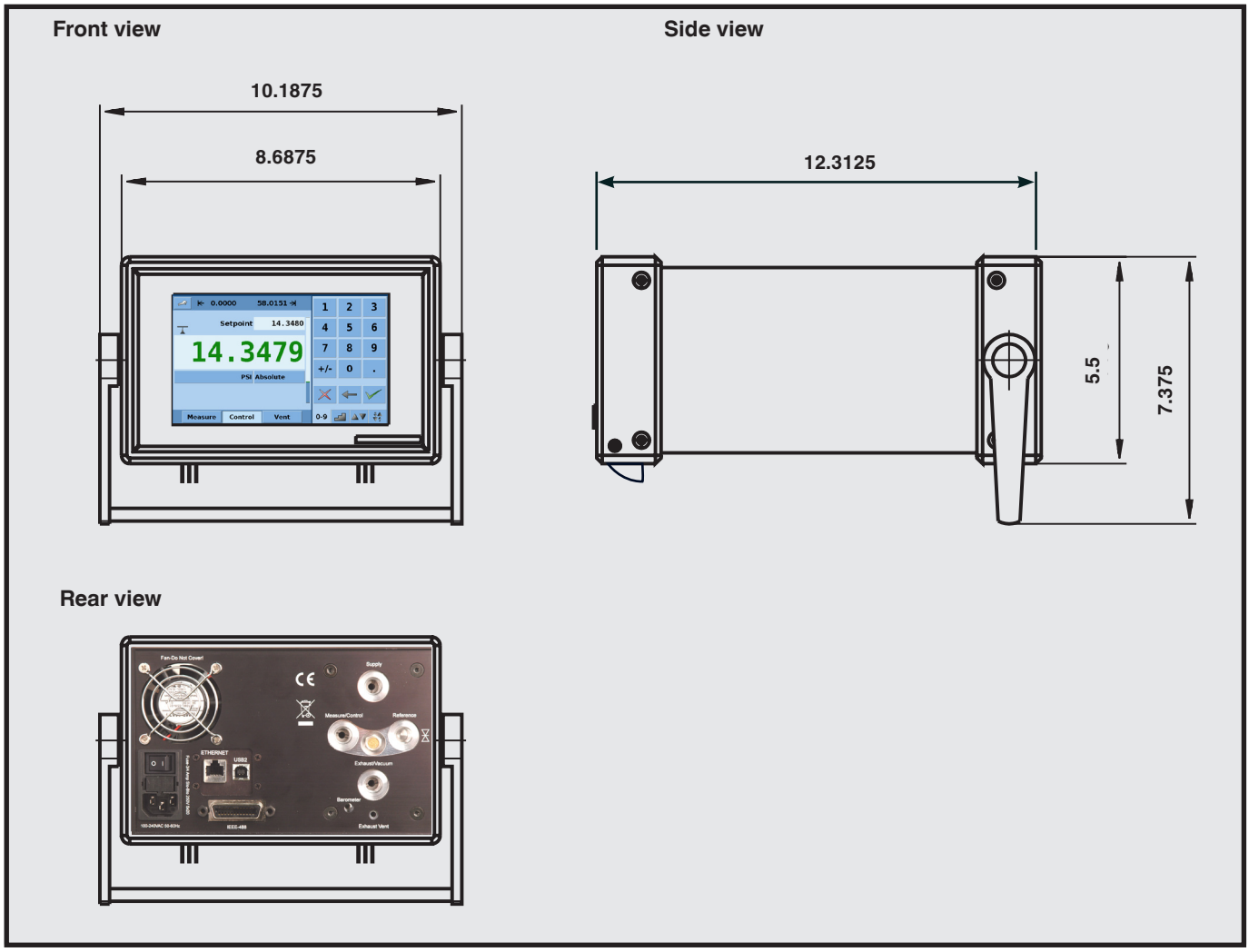
Customers can create their own test programs using the Mensor communication command set, the SCPI command set or the emulation command set used when replacing other calibrators.

Complete testing and calibration systems

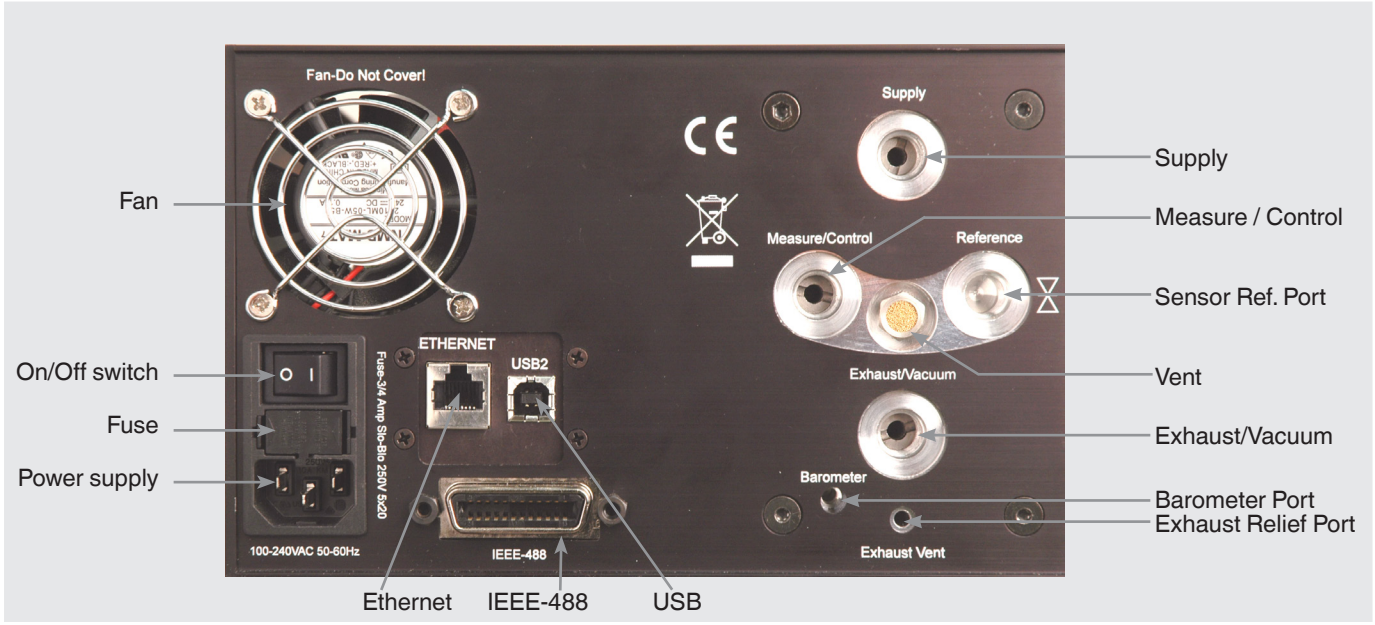
Communication with other instruments is made easy with an IEEE-488.2, an Ethernet and a USB interface. The CPC3000 can be integrated into an existing system, or our Custom Systems group can design a system to meet a specific need.

Dimensions in inches

OBSOLETE



Electrical connections and pressure ports - rear view



OBSOLETE

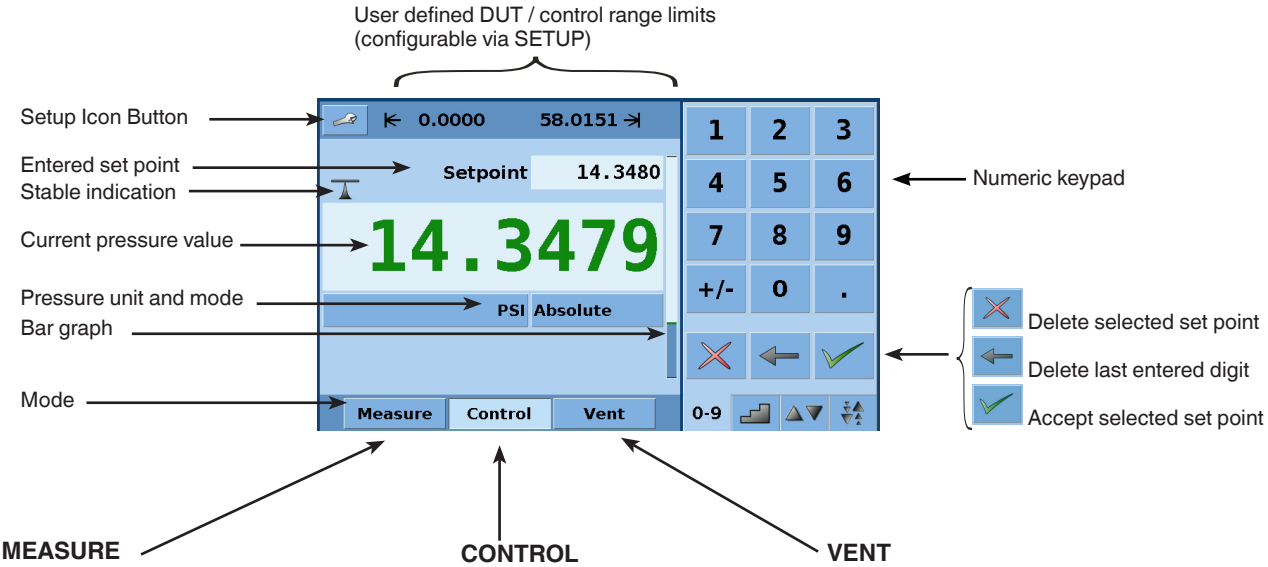
Specifications	CPC 3000
Pressure ranges	Gauge: 0 ... 5 up to 0 ... 1500 psig (0 ... 0.35 to 0 ... 103 bar) Absolute: 0 ... 7.5 to 0 ... 1515 psia (0 ... 0.52 to 0 ... 104 bar) Bi-directional: 14.5 ≤ span ≤ 1515
Pressure types	Absolute, gauge or bi-directional ranges
Uncertainty	0.025% full span for all standard pressure ranges specified above. Uncertainty (k=2) includes hysteresis, linearity, repeatability, reference standard, drift and temperature effects over the calibrated range for the calibration interval specified, with periodic re-zeroing.
Optional Intelliscale Uncertainty	Gauge Transducer Range (psig) / Total Uncertainty (1) (cal interval) 0 ... 5 to 0 ... 1500 / 0.025% IS-50 (1) (365 days) Absolute Transducer Range (psia) / Total Uncertainty (1) (cal interval) 0 ... 7.5 to 0 ... 1515 / 0.025% IS-50 (1) (365 days) Bi-directional Transducer Range (psi) / Total Uncertainty (1) (cal interval) -15 ... 145 to -15 ... 1515 / 0.025% IS-50 (1) (365 days) 14.5 ≤ span < 145 / 0.025% of Full Span (180 days) (1) 0.025% IntelliScale-50 (0.025% IS-50): Uncertainty from Min to 50% of Max = (0.025% x 50% x Max) or 0.025% of Reading from 50% to 100% of Max.
Optional barometer uncertainty	0.02% R from 8 to 17 psia for 180 days
Compensated temperature range	15 to 45 °C
Calibration interval	180 days
Pressure units: English	psi, psf, oz/si, tons/sq in, tons/sq ft, atm, inHg @0C, inHg @60F, mTorr, Torr, inSW, ftSW, inH2O @4C, inH2O @20C, inH2O @60F, ftH2O @4C, ftH2O @20C, ftH2O @60F
Pressure units: Metric	mbar, bar, g/sq cm, kg/sq cm, dyn/sq cm, pascal, hPa, kPa, MPa, mmHg @0C, cmHg @0C, mHg 0C, mSW, mmH2O @4C, cmH2O @4C, mH2O @4C, mmH2O @20C, cmH2O @20C, mH2O @20C
Pressure units user defined	2 (multiplier from psi or Pascal)
Slew rate	3 seconds to stable flag (+/-0.025% full scale pressure) for a 10% pressure change typical into 150cc volume at pressures greater than 5 PSI. Larger volumes can lengthen this time. Controlling to pressures less than atmosphere can lengthen this time.
Overshoot	<1 % FS, in high speed mode
Control stability	0.003% of range
Pressure ports	7/16-20 Female SAE threaded ports for Measure/Control, Exhaust, Reference, and Supply. Barometric Reference port is a hose barb.
Filter elements	40 micron filter element included in each pressure port (excluding the optional barometer and the reference port on a gauge sensor)
Permissible pressure media	Clean, dry, non-corrosive gases
Parts exposed to pressure media	6000 series aluminum, 316 SS, brass, Teflon, Urethane, Silicone, RTV, Silicone grease, PVC, Epoxy, Ceramics
Overpressure protection	Pressure relief valves
Instrument mounting	Desk top with bezel and handle, or optional rack mount kit.
Display	7.0" color LCD
Resolution	Six significant digits
Warm-up time	approx. 15 min
Digital interface	IEEE-488, Ethernet, USB. Optional RS-232 (null modem cable not required).
Power supply	100 - 240 VAC, 50/60 Hz, 700 mA max
Maximum pressure, supply port	110 … 120 %FS
Pneumatic overpressure protection	internal relief valves
Operating temperature	0 … 50 °C
Storage temperature	0 ... 70 °C
Air humidity	0 … 95 (% relative humidity without moisture condensation)
Operating position	Negligible, can be removed with re-zeroing
Weight	<20 lbs.(<9.1 kg) with all internal options
Dimensions	5¼ h x 8⅜ w x 12 d in (133 x 213 x 305 mm)
CE-mark	Conformity certificate
Calibration	NIST traceable calibration certificate included, A2LA certification

Touch screen operation

OBSOLETE

Main screen

The CPC3000 main operation screen appears after powering up the unit. This screen contains all of the controls needed to navigate within the menus and to operate the instrument. The setup icon button opens up a menu that provides navigation to all the set up screens, limits indication, tab selectable input menu, set point display and selection, pressure value indication, pressure units indication and selection and measure / control / vent mode selection.

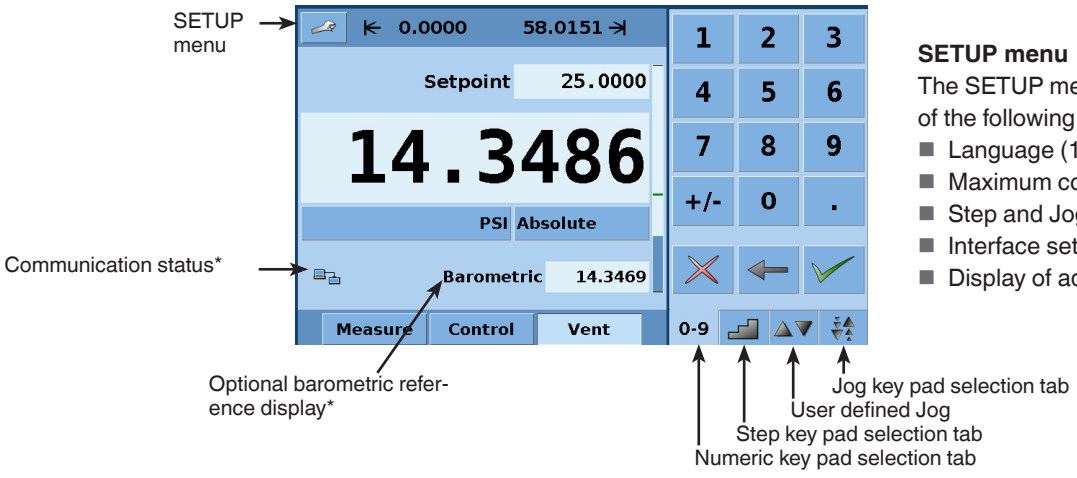


MEASURE
Measure mode pneumatically connects the pressure sensor directly to the device under test. In measure mode pressure regulation is inactive.

CONTROL
In the control mode, the device regulates the pressure output according to the set point value, providing a precise pressure at the test port.

VENT
Vent mode vents the system and the device under test to atmospheric pressure.

Optional information can be displayed in the main menu by selecting the option in the setup menu



SETUP menu
The SETUP menu allows configuration of the following points:

- Language (17 currently available)
- Maximum control range
- Step and Jog functions
- Interface setting
- Display of additional information

* optional display element

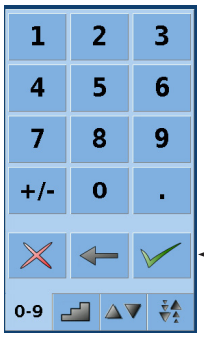
Note: See the following page for detailed information on each set point entry screen.

The pressure set point can be changed using one of three input modes

OBSOLETE

The numeric keypad

Application: Direct input of set point value.



Delete input, delete last character, input acknowledgement

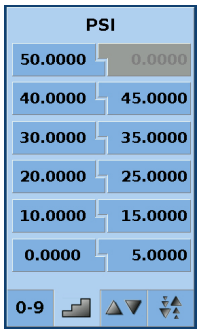
Numeric keypad

Operation

The desired pressure set point value is entered using the numeric keypad and then acknowledged by pressing the check mark key. In control mode the controller will regulate the output pressure to the entered value.

The step keypad

Application: Calibration of incremental user defined pressure points or percent of full span of the device under test.



Configurable via SETUP
- % of span of limit value
- User defined pressure steps

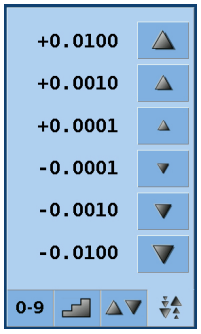
Step keypad

Operation

Each step on the step keypad can indicate user defined pressure values or percent of span values for the device under test. For example: the step keypad shown to the left is set for 10% steps going from 0% to 100%. These steps are a percent of the user defined device under test full span. In control mode, when a step is touched, the controller will regulate the output to the associated set point.

The jog keypad

Application: Fine adjustment of the pressure value to reach a cardinal value on a pressure gauge or similar device under test.



Set point increased by:
- Least significant digit x 100
- Least significant digit x 10
- Least significant digit

Set point decreased by:
- Least significant digit
- Least significant digit x 10
- Least significant digit x 100

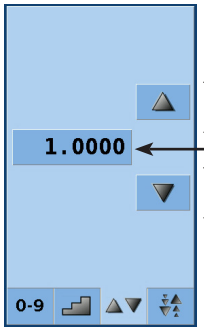
Jog keypad

Operation

The triangles on the Jog keypad have values which correspond to the 3 last digits of the pressure reading and are used to increment the set point. Triangles pointing up will increase the value and those pointing down will decrease it. The smallest triangle increments the least significant digit by one, the medium size triangle increments the least significant digit by ten and The large triangle increments the least significant digit by one hundred. The values will change accordingly if the resolution of the indication is changed.

The user defined jog keypad

Application: User defined quick pressure adjustment.



Increase by user defined amount.

User defined amount key.

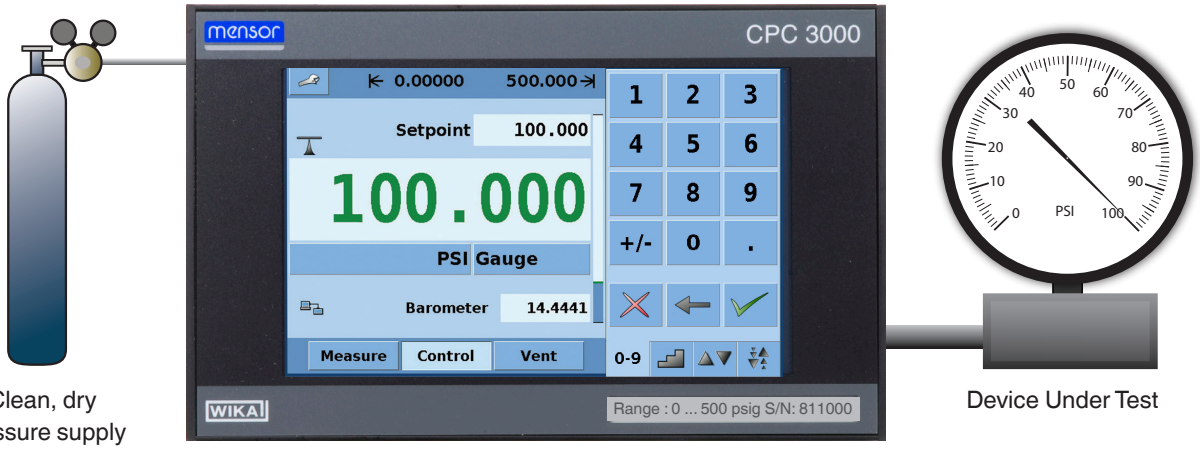
Decrease by user defined amount.

Operation

Pressing the “User Defined Amount” key will open a numeric entry screen where a user defined amount can be entered. This value will be shown in the key indication. Pressing the triangles will increase or decrease the set point by this value.

OBSOLETE

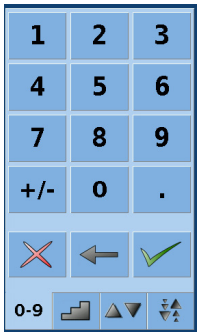
Application — Typical Setup



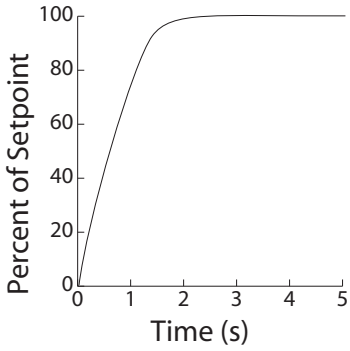
Clean, dry pressure supply

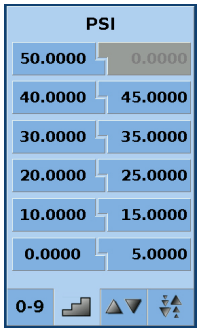
Device Under Test

Application — Setpoint entry options and function

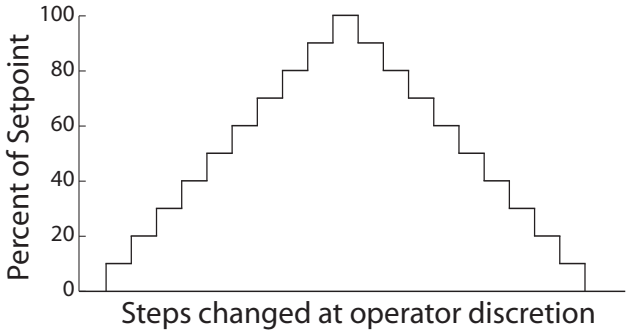


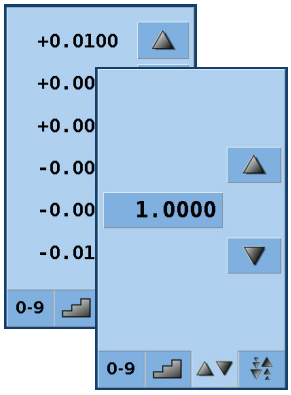
Direct entry of setpoint using the numeric keypad: enter the setpoint value and press ✓. The controller will then ramp up the setpoint.



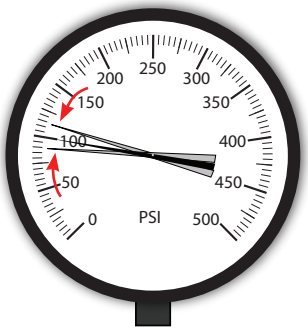


Setpoint entry using the step keypad:step changes, automatically calculated as a percent of the user defined full scale limit, and indicated in percent FS or pressure units can be entered by pressing step keys (80.000) in any sequence.





Setpoint entry using jog keypads: setpoint can be increased or decreased in small or large steps using the jog keys ▲ to reach a cardinal point on a dial gauge or step through a calibration sequence.



OBSOLETE

Communications

The variety of communications modes and command sets make the CPC3000 a good choice to replace older pressure controllers that communicate remotely via IEEE-488. The Mensor command set will integrate seamlessly with other Mensor controllers and the SCPI command set provides integration in areas where the SCPI command structure has been used. The CPC3000 even understands commands and automation programs that have been written previously for non-Mensor / non-WIKA controllers. Within the setup menu, under the remote tab, communication emulation selections are available to switch between the various command structures.

In addition to IEEE-488, the CPC3000 has Ethernet and USB communications making it remotely accessible to today's modern automation systems. Trouble shooting the initial remote setup is made easy by viewing the remote monitor which displays the most recent commands sent and responses from the CPC3000 plus any error messages.

Options and accessories

Barometric reference
An optional barometric reference is available for emulation of gauge pressure when the internal sensor is absolute and emulation of absolute pressure when the internal sensor is gauge. The internal gauge sensors must include a negative gauge range of one atmosphere in order to be able to emulate sub atmospheric absolute pressures.

Rack mount kit
A 19" x 3U rack mounted tray is available.

Pressure adaptor fittings

Customized calibration systems

LEAN CLEAN GREEN

Mensor is dedicated to manufacturing quality products in a "Lean, Clean and Green" environment. All of our processes are regularly evaluated to promote continuous improvement. Kaizen events, 5S, and SQDC boards are used on a regular basis to promote lean manufacturing. Our 5S program is called "5S plus". The traditional 5S program represents Sort, Set, Shine, Standardize and Sustain, where "5S plus" includes Safety. We have containers designated to recycle paper, metal, electronics and cardboard. Waste is recycled to do our part in keeping our environment green.

OBSOLETE

Scope of supply

- CPC3000 High-Speed Pressure Controller (Desk top version with bezel and handle)
- Power cable (6 ft.) with plug
- Operating instructions
- NIST traceable calibration certificate
- Pressure adaptor fittings
- A2LA certificate

Options

- Barometric reference
- 19" rack mounting kit
- Customized calibration system

Accessories

- Additional pressure adaptor fittings

All standard Mensor products are provided with a calibration certificate traceable to NIST. The calibration program at Mensor is accredited to both ISO/IEC 17025:2005 and Z540-1-1994 by A2LA. Mensor is certified to ISO9001:2008.

428797

Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing. Modifications may take place and materials specified may be replaced by others without prior notice.

Represented by:

Mensor
201 Barnes Drive
San Marcos, Texas 78666
Toll Free: 800-984-4200
Tel: 512-396-4200
Fax: 512-396-1820
Email: sales@mensor.com