

Where Do I Find Everything I Need for Process Measurement and Control? OMEGA...Of Course!

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- ✓ Wire: Thermocouple, RTD & Thermistor
- ✓ Calibrators & Ice Point References
- ✓ Recorders, Controllers & Process Monitors
- ✓ Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- ✓ Transducers & Strain Gauges
- ✓ Load Cells & Pressure Gauges
- ✓ Displacement Transducers
- ✓ Instrumentation & Accessories

FLOW/LEVEL

- ✓ Rotameters, Gas Mass Flowmeters & Flow Computers
- ✓ Air Velocity Indicators
- ✓ Turbine/Paddlewheel Systems
- ✓ Totalizers & Batch Controllers

pH/CONDUCTIVITY

- ✓ pH Electrodes, Testers & Accessories
- ✓ Benchtop/Laboratory Meters
- ✓ Controllers, Calibrators, Simulators & Pumps
- ✓ Industrial pH & Conductivity Equipment

DATA ACQUISITION

- ✓ Data Acquisition & Engineering Software
- ✓ Communications-Based Acquisition Systems
- ✓ Plug-in Cards for Apple, IBM & Compatibles
- ✓ Datalogging Systems
- ✓ Recorders, Printers & Plotters

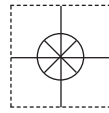
HEATERS

- ✓ Heating Cable
- ✓ Cartridge & Strip Heaters
- ✓ Immersion & Band Heaters
- ✓ Flexible Heaters
- ✓ Laboratory Heaters

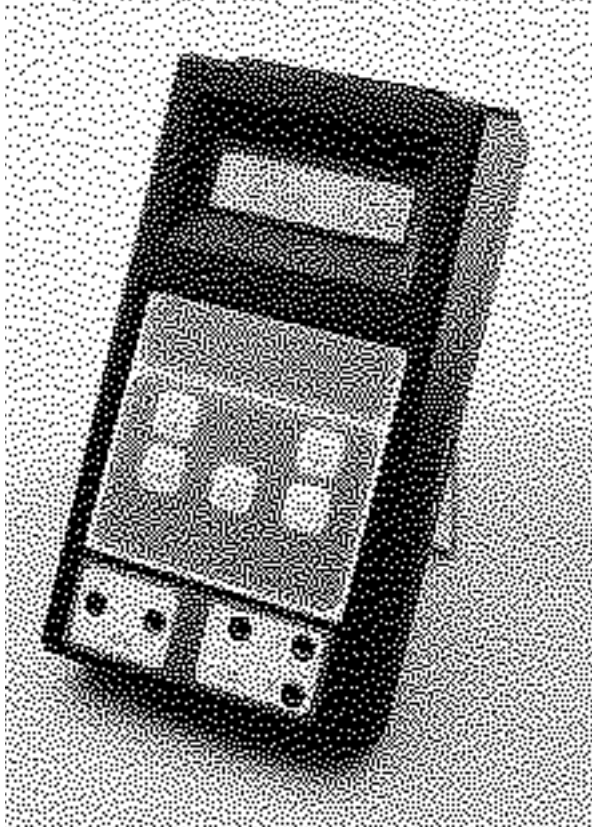
ENVIRONMENTAL MONITORING AND CONTROL

- ✓ Metering & Control Instrumentation
- ✓ Refractometers
- ✓ Pumps & Tubing
- ✓ Air, Soil & Water Monitors
- ✓ Industrial Water & Wastewater Treatment
- ✓ pH, Conductivity & Dissolved Oxygen Instruments

CE



User's Guide



<http://www.omega.com>
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PCL9001 SERIES Pressure Calibrator

WARNING Before attempting to interface the PCL9001 with any other device, carefully read the following instructions.

I. GENERAL DESCRIPTION

The PCL9001 is designed as a full function pressure calibration system combining highly accurate pressure and electrical range in a simple to use hand-held device. The PCL9001 also incorporates a built in 24 volt loop power supply to simultaneously power the loop while reading the resultant current. A rugged manifold allows quick connections for the device under test and or connection of the optional hand pump.

II. INITIAL PROCEDURES

UNPACKING

Remove the Packing List and verify that all equipment has been received. If there are any questions about the shipment, please call OMEGA Engineering at 1-800-826-6342.

Upon receipt of shipment, inspect the container and equipment for any signs of damage. Take particular note of any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

Check to see if your calibrator is complete - it should include:

Calibrator only includes:

- Carrying Case
- Test Leads
- Batteries already installed
- Allen Wrench
- Teflon Tape
- Instructions & Specifications

Calibrator Kit includes:

- Carrying Case
- Test Leads
- Batteries already installed
- Allen Wrench
- Teflon Tape
- Instructions & Specifications
- Battery Eliminator/Charger
- Pump

Remove sliding battery cover door located on the bottom of the instrument and verify battery installation.

Become familiar with the designation and polarities of the five jacks located below the keypad of the calibrator. Refer to the back panel for polarity information.

On the right hand side of the calibrator is the connection for the RS-232 port. This connection is only used when data communication is required between the PCL9001 and another device. Refer to section V for more detailed information.

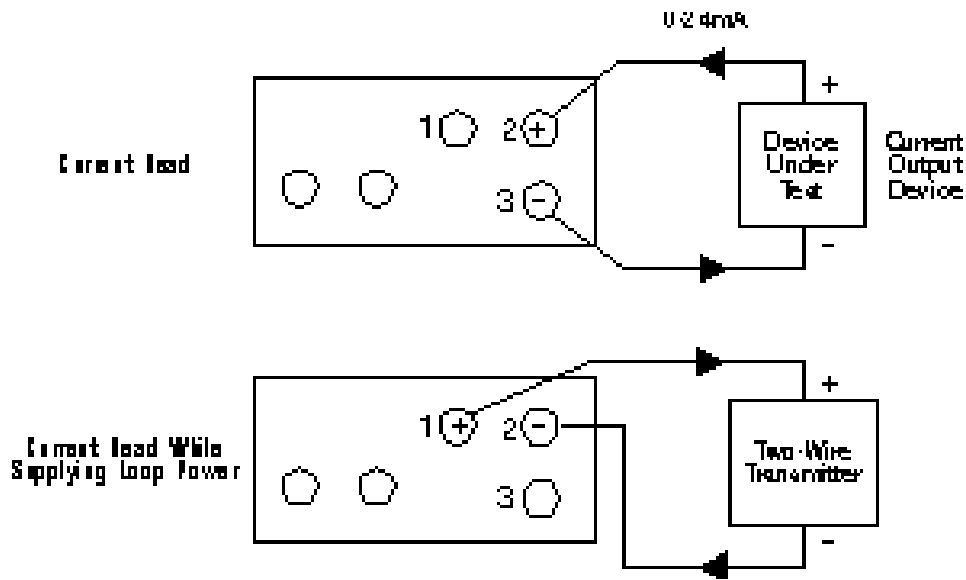


Figure 1

III. OPERATING PROCEDURE

1. Turn on calibrator and select desired range by pressing the “Range Select” key.
2. If electrical measurements are being made, select either volts or milliamps using the “Volts/mA” key.
3. Electrical connections for milliamps are shown in figure 1.
4. Pressure connections are made to the manifold via 1/8 NPT connectors which are user supplied.

IMPORTANT Always be sure to use teflon tape on all fittings being connected to the manifold. Even at low pressures, leaks will occur if teflon tape is not used. It is recommended that threads are wrapped 3 to 4 times with tape to ensure an airtight fit.

5. If the optional hand pump is being used, one of the side manifold plugs must be removed to complete the connection. A 3/16 allen wrench is supplied for removing and retightening these plugs. For ease of use, the pump can be attached on either side of the manifold.

About the pump - if using the optional OMEGA hand pump (PLC425-Pump) the following set up applies. After connecting the hand pump to the pressure manifold (ensure that threads have been wrapped 3 or 4 times with tape) adjust the vernier knob on top of the pump to medium range. This can be accomplished by screwing the vernier knob all the way in and backing it off approximately 10 turns. The small knurled knob near the middle of the pump should be opened one turn to the left, to relieve any pressure in the pump, and then retightened prior to pressurizing the device under test. Your calibrator can now be zeroed (See paragraph 6) and you are ready to make your test.

6. Before any pressure measurements can be made, the calibrator must be zeroed out. This can be done when the calibrator is exposed to ambient pressure by pressing the zero key. It is advisable to do this often to ensure accurate calibrations are being made.

7. The “Send Data” key is used only when the PCL9001 is connected to a data collection device. Refer to section V for more information concerning the RS-232 port and its uses.

IV. OPERATING CONSIDERATIONS AND PRECAUTIONS

1. Be sure to observe the maximum indicated pressure as labeled on the pressure manifold. Although a transient pressure of two (2) times the rated maximum can generally be tolerated without recalibration, prolonged exposure to higher pressure will cause sensor damage. The calibrator will flash OVER if the rated input pressure is exceeded.
2. While the PCL9001 is designed to be compatible with a wide range of media (both gases and liquids), strong corrosive gases should be avoided. To be sure what you are measuring is compatible with the PCL9001, the wetted components are listed as follows:
 - Nickel Plated Brass - Silicon - Glass - RTV - Polyurethane
3. All electrical connections are fused with a 1/8 Amp 2AG size fuse located on the printed circuit board near the input jacks. These fuses can be replaced in the field by removing the four (4) screws located on the bottom of the case. With the screws removed, lift off the top of the case to expose the printed circuit board, then change the fuse in question and reassemble the calibrator. If any questions arise, please contact the factory at 1-800-826-6342.
4. When using the internal 24 volt power supply to power a device under test, be aware that the internal power supply is current limited to approximately 25mA.
5. When the batteries near the end of their life “BT” appears. The batteries should be replaced or recharged if Ni-Cd batteries are used. If Ni-Cd batteries are being used, charging will take 10 to 12 hours.

V. SERIAL COMMUNICATIONS PORT

The PCL9001 is equipped with a standard RS-232 port which can be accessed via the 9 pin type “D” connector mounted on the right side of the case. The purpose of the RS-232 port is to allow data from the PCL9001 to be transferred to a data collection device or another RS-232 device such as a PC or a printer. If you are connecting the PCL9001 to your own computer, the following specifications will apply:

1. Baud Rate - 2400
2. 8 data bits with 1 stop bit
3. No Parity

When connected to a computer, the PCL9001 will begin to send data as soon as the calibrator is turned on. The data can be stopped by pressing the send data key. From now on, data will be sent to the computer only when the “Send Data” key is pressed.

Other commands can be sent to the PCL9001 from the computer to do all of the PCL9001’s functions such as range change, pressure zero, etc. For information on these procedures, please contact the factory.

VI. ACCURACY AND CALIBRATION

The PCL9001 is designed to hold its rated accuracy specifications for a minimum of one (1) year, provided it is used properly and is not abused. Recalibration of the pressure sensor may be required more often if the calibrator has been subjected to high over-pressure or corrosive media not compatible with the wetted materials. If this is the case, the PCL9001 can be quickly recalibrated by the customer, as long as a suitable pressure standard is available. The recalibration procedure is as follows:

1. Connect the PCL9001 to an appropriate standard such as a dead weight tester.
2. Turn on the PCL9001 and allow it to warm up for a minimum of 10 minutes at room temperature.
3. With the calibrator exposed to ambient pressure, press the zero key.
4. Apply pressure equal to the full scale rating of the PCL9001 (5, 30, or 100 lbs).

Model	PCL9001-5	PCL9001-30	PCL9001-100
Range			
PSI	0-5.000	0-30.000	0-100.00
In H ₂ O	0-138.40	0-830.4	0-2768.0
cm H ₂ O	0-351.5	0-2109.0	0-7030
mm H ₂ O	0-3515	0-21090	0-70310
BAR	0-0.3447	0-2.0680	0-6.895
Kg/cm ²	0-0.3515	0-2.1090	0-7.030
mm Hg	0-258.60	0-1551.0	0-5171

Range, Electrical	mA: 0 to 24.000 Volts: 0 to 20.000
Accuracy	0.05% ± 1 LSD for both pressure and mA/V
Loop Power	24Vdc ± 10% Built-In
Stability	0.01%/°C
Operating Temperature	0 to 50°C
Storage Temperature	-20 to 60°C
Media Compatibility	Non-Corrosive Gasses or Liquids For Corrosive Media, Contact the Factory
Connections	Pressure: 1/8" FNPT Inlet with two, 1/8" FNPT fittings available for optional hand pump or pressure gauge. Banana Jacks for current/voltage
Current Overload Protection	1/8A Fuse
Maximum Over Pressure Protection	2 times rated pressure
Power	4 AA Alkaline Cells, or 4 AA Ni-Cd Cells Optional AC Adaptor. Ni-Cd Charger Available



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Engineering Service: 1-800-872-9436 / 1-800-USA-WHENSM
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Toll Free in England: 0800-488-488
e-mail: uk@omega.com

It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient connected applications.



WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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