# MECP440

*Precision Pressure Calibrator*

# OPERATING INSTRUCTIONS

***Contents***


GENERAL DESCRIPTION . . . . . .2
INITIAL PROCEDURES . . . . . .2
OPERATING PROCEDURE . . . . . .2, 3
OPERATING CONSIDERATIONS AND PRECAUTIONS . . . . . .4
ACCURACY . . . . . .4
CALIBRATION . . . . . .4
SPECIFICATIONS . . . . . .5
WARRANTY . . . . . .5


**WARNING**

Before attempting to interface the MECP440 with any other device, carefully read the following instructions.


MARTEL ELECTRONICS

[redacted]

800-821-0023 [redacted]

## GENERAL DESCRIPTION

The MECP440 is designed to be a simple, low cost pressure/current calibrator for field and laboratory purposes. It combines the latest digital and analog circuitry to achieve its rated specifications in a small, reliable package. Each operating mode is indicated by low power LED's located at each switch position.

The MECP440 incorporates both high and low ranges allowing the user to gain increased resolution when operating at low pressure or currents. The built-in 24Vdc loop power supply allows the MECP440 to both power and read the current output of any pressure transmitter while supplying a calibrated pressure to the transmitter.

## INITIAL PROCEDURES

### *UNPACKING*

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 re-shipment is necessary.

Remove the Packing List and verify that all equipment has been received. If there are any questions about the shipment, please call Martel Electronics at 1-800-821-0023.

1. Check to see if your calibrator is complete.

**Calibrator only includes:**
MECP440 Calibrator
Carrying Case
Test Leads (2 red and 2 black)
9V Alkaline Battery
Allen Wrench
Teflon Tape
Instructions & Specifications

**Calibrator Kit includes:**
MECP440 Calibrator
Carrying Case
Test Leads (2 red and 2 black)
9V Alkaline Battery
Allen Wrench
Teflon Tape
Instructions & Specifications
Pump
Battery Eliminator/Charger

2. Remove the sliding battery cover door located on the bottom of the instrument and install 9 volt battery.
3. Become familiar with the designation and polarities of the three jacks located on the top of the calibrator. Refer to the back panel for polarity information.

## OPERATING PROCEDURE

1. Upon power-up, select the desired operating mode (PSI, in $H_2O$, or mA). Note that no specific default mode comes on after power-up, and multiple LED's may illuminate until a specific operating mode is selected. Once a mode has been selected, only that LED will remain on.
2. Select the desired operating range (High or Low). Refer to the specifications for your specific calibrator to determine what ranges are covered.
3. 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.

4. If the optional hand pump is being used, one of the side manifold plugs must be removed to complete the connection. (See figure 1). 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.

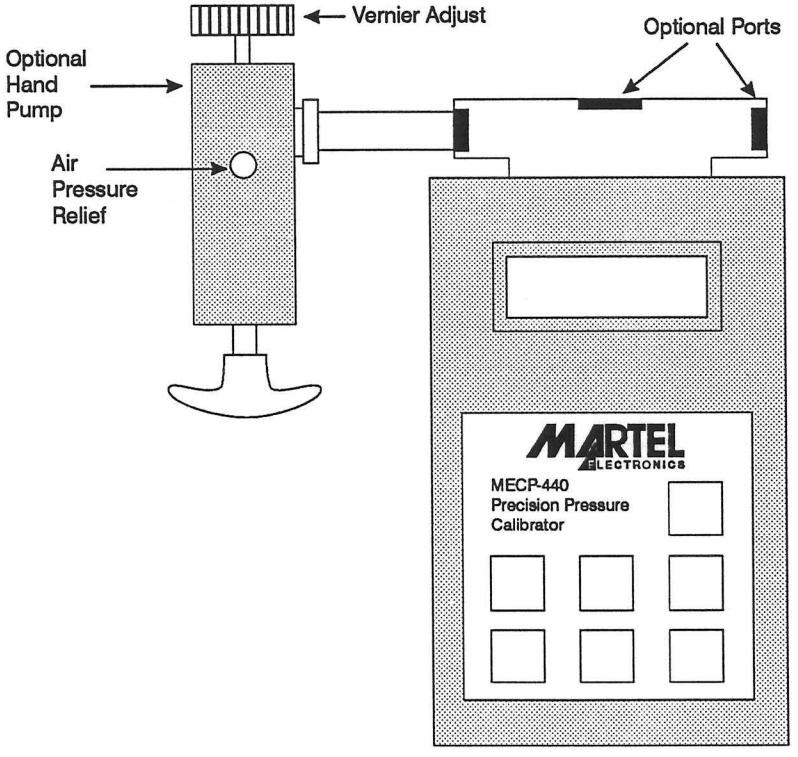


Figure 1 - Front View

MECP440 WITH OPTIONAL PUMP

About the pump: If using the optional Martel hand pump (MECP75 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 5) and you are ready to make your test.

5. Before measuring or generating pressure, be sure to "zero" the calibrator to ensure accurate readings. To do this depress the zero key on the MECP440 and hold until the display reads zero ±1 count, then release the zero key. Note: Because of the high sensor sensitivity incorporated into the MECP440, the calibrator should be re-zeroed frequently during use to ensure maximum accuracy.

6. If current is to be measured or supplied by the internal 24 volt supply, refer to figures 2 and 3.

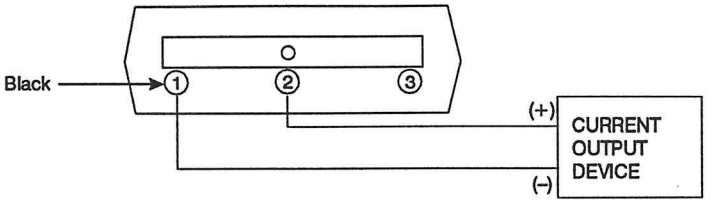


Figure 2 - Top View

MEASURING A CURRENT

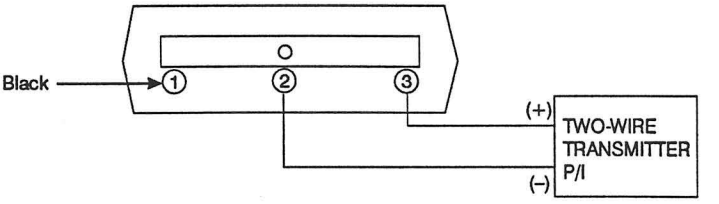


Figure 3 - Top View

POWERING A TWO-WIRE TRANSMITTER WHILE MEASURING THE OUTPUT CURRENT

## OPERATING CONSIDERATIONS AND PRECAUTIONS

1. Be sure to observe the maximum indicated pressure as labeled on the pressure manifold. Although a transient pressure of three (3) times the rated maximum can generally be tolerated without recalibration, prolonged exposure to higher pressure will cause sensor damage.
2. While the MECP440 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 MECP440, the wetted components are listed as follows:

| | | |
|---|---|---|
| Nickel Plated Brass | RTV | Silicon |
| Neoprene | Glass | |

3. When the internal 9 volt battery becomes too low to safely power the MECP440, the Low Battery indicator will appear. The battery should be replaced immediately.

## ACCURACY

The MECP440 is checked against a NBS traceable standard before shipment and should yield .1% of full scale basic accuracy for a period of at least six (6) months. However, changes in ambient temperature will cause a span shift of up to 0.01%/°C and should be taken into account when operating at temperature extremes.

## CALIBRATION

To allow for easy in-field calibration, the MECP440 incorporates a multi-turn span potentiometer which can be accessed via the battery compartment. The calibration procedure is as follows:

1. Remove the rear sliding door over the battery compartment and locate the notched area which allows access to the span potentiometer.
2. Zero the MECP440 and connect the MECP440 to a known pressure standard set to a pressure near the top end of the low PSI range.

   **EXAMPLE:** For a MECP440 with 30 PSI full scale range use a 15.00 to 19.00 PSI pressure standard.
3. Adjust the span potentiometer until correct reading is achieved.
4. Relieve the pressure and recheck the zero setting. If necessary repeat steps 2 and 3.

## SPECIFICATIONS

| | |
|---|---|
| **Ranges:** | **Low** / **High**<br>0-19.99 PSI / 0-30.0 PSI<br>0-199.9 in $H_2O$ / 0-830 in $H_2O$<br>0-19.99mA / 0-50.0mA |
| **Accuracy:** | ±0.1% ±1ct. of F.S. for both pressure and current |
| **Loop Power:** | 24Vdc ±10% Built-in |
| **Stability:** | ±0.01%/°C |
| **Temperature Range:** | 0 to 50°C operating; -20°C to 60°C storage |
| **Media Compatibility:** | Non-corrosive gases or liquids |
| **Overpressure Protection:** | 3X maximum range without re-calibration |
| **Connections:** | Pressure: 1/8" FNPT inlet with two 1/8" FNPT fittings available for optional hand pump or pressure gage<br>Current: Banana Jacks on .75" centers |
| **Current Overload Protection:** | 1/8A / 250V fuse |
| **Power Supply:** | 9V alkaline or AC Adapter |
| **Size:** | 6.5" x 3.2" x 1.5" HWD |
| **Weight:** | 15 oz. (with battery) |

## WARRANTY

Martel Electronics Corporation warrants all products against material defects and workmanship for a period of twelve (12) months after the date of shipment. Problems or defects that arise from misuse or abuse of the instrument are not covered. If any product is to be returned, a "Return Material Authorization" number must be obtained from our Customer Service Department. This number must be indicated on the return package as notice to our Receiving Department to accept the shipment. Any package not so marked will not be accepted and will be returned to the shipper. Martel will not be responsible for damage as a result of poor return packaging. Out of warranty repairs and recalibration will be subject to specific charges. Under no circumstances will Martel Electronics be liable for any device or circumstance beyond the value of the product.

MARTEL ELECTRONICS
90 Indian Rock Road
PO Box 897
Windham, NH 03087
800-821-0023 FAX (603) 898-6820