INSTRUCTION MANUAL

DIGIVAC Model 450D

Differential Vacuum Level Controller

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DigiVac Model 450 Digital Vacuum Level Controller

Overview

This instrument works in conjunction with a precision integrated circuit pressure transducer and a large bore proportional solenoid valve to measure and control vacuum. Its range is -3 to 2.4 PSID. Optional range is 0 to 1000 millibar.

The valve opens proportionally from 0 to 100%. The voltage to the valve is controlled using a PWM (FET transistor pulse width modulating) technique which allows precise positioning of the valve plunger without developing heat or EMI (electo-magnetic interference)

The unit, when shipped, is pre-tested, pre-calibrated, and ready for operation.

Installation

Position the unit as desired and make the following connections:

- Connect the power supply to AC power 115 to 230 volts 50/60/400 Hz.
- Connect the power jack to the rear of the unit.
- Connect the Right Hose connection (as seen from the rear of the unit) to the vacuum pump
- Connect the Left Hose connection (as seen from the rear of the unit) to the vessel to be controlled
- Connect the left hose barb below the vessel barb to the reference pressure or vessel.

Rack Installation:

The unit may be mounted on racks using the tray fittings available from VWR Scientific and other vendors.

Operation:

- Place both front panel toggle switches in the center position
- Using the knob, set the desired pressure.
- Move the right switch to the up (regulate) position.

The unit will now read:

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0.03 PSI  -3.0 SP
 48%pwm    reg loc
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- The first line shows the current pressure and the set point
- The second shows the current value of the Pulse Width to the solenoid and the mode of operation.

Accuracy:

- Indicated pressure is accurate within + / - .01 PSI.
- Control accuracy is within +/- .03PSI.
- It is often helpful to adjust the setting based on experience to achieve greater accuracy.

Switch Functions

- Purge (left) Switch Controls purge mode on units that are so equipped.
  - On units without purge, it should be left in the center position.
- Mode (right) Switch controls the mode of operation
  - Up position is Regulation
    - The unit positions the valve as required to maintain the desired pressure.
  - Center position is Off
    - This is handy for setting the set point without operating the valve yet.
  - Lower position is Full

        - Full open valve regardless of setting.
- The switches may be operated in any sequence without harming the unit.

Software

The unit comes with software version 9g29. This software is intended to control a test vessel within +/- .03 PSI of a reference pressure with a user indicated offset. For example, if the differential pressure is set to --0.5 PSI, the test vessel will be 0.5 PSI less than the reference vessel.

The RS232 port transmits the current differential pressure, the differential pressure set point, the control (local or remote), and diagnostic information. The unit can only be used with local control (the dial).

Additional Information:

- Power Supply: The unit has an external switching regulator power supply. It works with 115 or 230 Volts, AC or DC, without user intervention. Output is 18 Vdc.
- Constant voltage source: An integrated circuit based constant voltage source provides a current of 95 milliamps dc to excite the gauge tube.
- Amplifier: An integrated circuit operational amplifier senses the millivolt signal from the vacuum sensor and multiplies it by 40.
- A to D converter digitizes the voltage output from the amplifier.
- Microprocessor: The processor reads the A to D converter, performs mathematical calculations and displays the output on a 2 x 16 Character type LCD display. It also contains EEprom memory which can store calibration constants and set points.
- Has optional RS-232 output.
- Calibration:
    - The unit is calibrated at the Digivac Company.
    - Potentiometers provide for zero and span adjustments.

Special units.

It is the policy of the Digivac Company to manufacture custom vacuum instrumentation for special applications whenever it is economically feasible to do so. Visit our web site for examples. We encourage inquiries about your special needs.

For repair or recalibration, return gauge to:

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