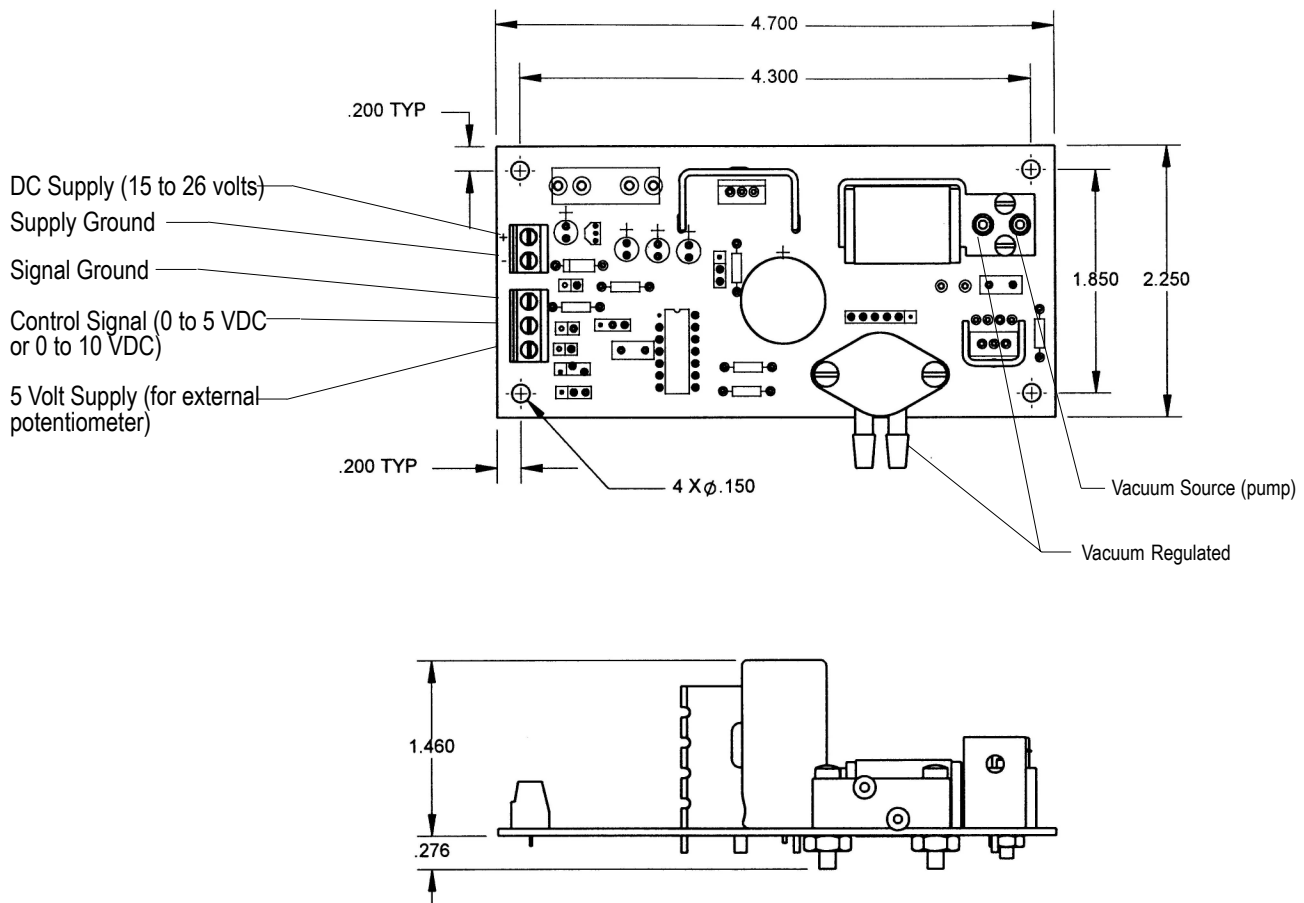


## MODEL 484-0XX ELECTRONIC VACUUM REGULATOR INSTALLATION INSTRUCTIONS



All mounting dimensions are in inches with a tolerance of  $\pm .015$

### Note:

1. The board assembly must be mounted on standoff supports to provide a minimum of 1/4 inch clearance between the board surface and mounting surface. Conductive materials must not touch the bottom of the board, since they could short out components and damage the board and/or "control signal" generating source. The board should be installed inside an enclosure to prevent contact by people and objects with the electrical components. The user-furnished DC power supply must be capable of providing 250 mA of current.

2. The user has a number of options for generating the "control signal" used to set the vacuum level of the regulator. An analog control voltage source can be provided from a user-supplied control system or computer, (Jumper J2 must be installed.) If desired the user can connect a 5K or 10K ohm, single-turn or multi-turn, potentiometer to the signal connector, which will then use the 5-volt supply provided within the board (Jumper J2 & J3 must be installed.) Alternately, the user can choose to use the 25-turn potentiometer already installed on the board and labeled R11 in place of adding a separate potentiometer. The board-mounted potentiometer is only intended for occasional adjustment due to its small, plastic construction/design. Its use should be limited to applications which only require occasional adjustment, such as initial setup and/or periodic calibration or adjustment of the vacuum setting. (Jumper J1 & J2 must be installed.) Note: J1 must be removed if either an external potentiometer or a user-supplied control voltage source is utilized.

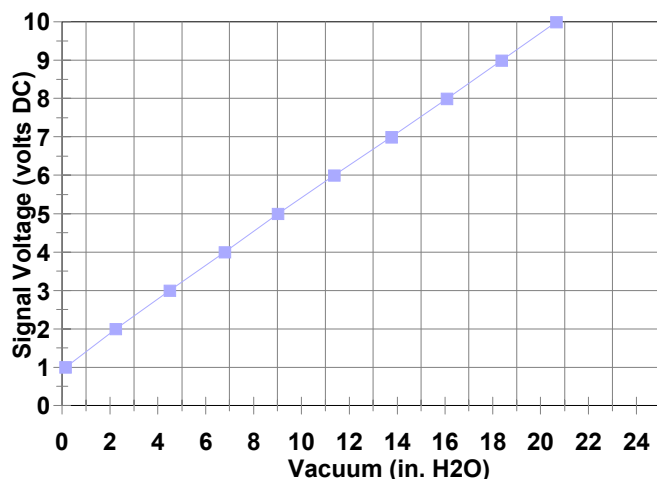
3. A hose connection from the "vacuum source" must connect to the port (brass barb) as shown above. All vacuum connections should be made with 1/8 inch inside diameter flexible rubber or polyurethane hose. The "vacuum regulated" port (brass barb) connects to the user's vacuum chamber. A separate hose should be used to connect the vacuum chamber to the vacuum regulated port of the black plastic vacuum sensor. The pressure sensor port should not "tee" into the same line as the valve, since small pressure fluctuations produced from the valve's operation will be measured by the sensor, possibly causing poor regulator stability. The other pressure sensor (vacuum regulated) port is left open to atmosphere.

## Vacuum Regulator Scale Adjustments

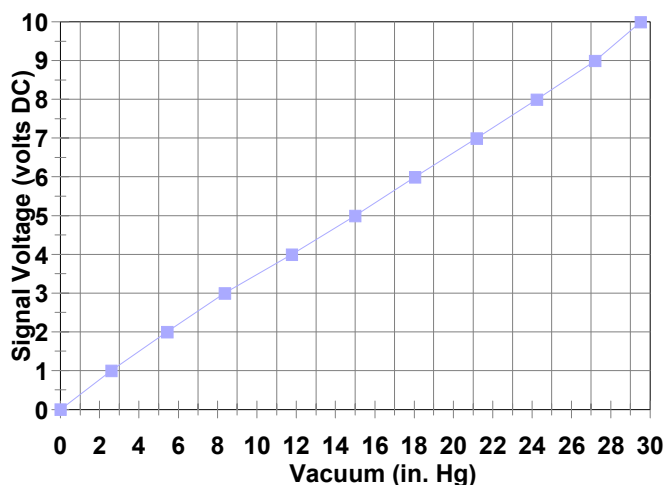
The ratio of control signal voltage to regulated vacuum is set by the adjustment of potentiometer R6. Adjusting R6 will also influence the maximum vacuum level attainable. All assemblies are adjusted at the factory to a preset level as defined by the model number. If a user desires to rescale the unit for a different control signal level, the following procedure should be followed:

1. Jumper positions must be set as required for the type of control input desired, i.e., on-board potentiometer or control signal. A vacuum gauge will be required to measure the vacuum level and to determine the full scale vacuum setting. During the calibration/adjustment procedure, ensure that only a minimum amount of leakage is present in the system and that the vacuum pump/source is capable of maintaining the maximum desired vacuum. Also ensure that the flow limitation of the valve is not exceeded, since inaccurate scaling will result if flow is being limited by the maximum flow capacity of the valve thereby preventing the system from reaching the desired full vacuum setting. The state of the valve (percent opening) can be monitored by measuring the voltage at the valve leads, which is about 11 volts when the valve is in its fully open position. If the voltage to the valve stays continuously at a maximum condition and does not intermittently pulse or decrease to some lower level, then the flow capacity of the valve is exceeded. The open air flow rate through Model 484-XXX-Y is based on the "-Y" in the part number: -1 is 2.5 SCFH (standard cubic feet per hour), -4 is 12 SCFH, and -6 is 25 SCFH (all measured with 14 psi differential across the valve).
2. Apply the maximum desired control signal up to 10 volts maximum or set the potentiometer at its maximum setting. Then adjust R6 to produce the desired full scale vacuum. Note that the vacuum level changes as R6 is adjusted, therefore it is important to ensure that leakage in the system does not exceed the flow capacity of the valve as mentioned in paragraph 1 above. The vacuum level must not be exceed the capacity of the pressure sensor, which is 1.5 psi (41 in. water) for P/N 484-001 which uses the MPX5010 sensor and 15 psi (30 in. Hg) for P/N 484-002 which uses the MPX5100DP. Control signal values and potentiometer settings of less than full scale will produce reduced vacuum levels in proportionate ratios. Typical vacuum versus control voltage curves for both models are shown below.

**Vacuum vs. Volts Model 484-001**



**Vacuum vs. Volts Model 484-002**



The regulator can be used to regulate positive pressure up to the range of the sensor on the board. Supply pressure should be connected to the valve in place of a vacuum source. Supply pressure should not exceed the sensor range as explained in paragraph 2 above. Connect the pressure port of the sensor (port opposite the vacuum port) to the regulated vacuum in the system.