

INSTRUCTION MANUAL

Digivac 760 Series

Models

100Led 760
100P / 760
100P / 29.9"
100Led 760 / SixVac
801 / 760 / 2c
801 Micro

Ranges

0 to 760 Torr
0 to 19.99 Torr
0 to 29.9 inches of mercury

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1.0 DESCRIPTION AND PRINCIPLE OF OPERATION.

DIGIVAC 760 series gauges are compact, line-powered digital vacuum sensing instruments. In addition DIGIVAC models with a /C suffix also provide control functions. Models with a /O suffix have analog outputs. /232 suffix indicates Serial output. /sw suffix indicates range change switch (.1 torr resolution)

Major model variations are as follows:

Model 1P/ 760	Panel mounting configuration; AC line powered.
Model LED / 760	Extruded Aluminum Case, Red LED display and internal power supply.
Model 760 Batt	Similar to 760 TC above; powered by internal Ni-Cad Batteries.
Model 801/760/2c/232	"801" configuration; 2.75 inch panel hole; controls, Rs232
Model 801Micro	"Micro" Configuration 1" high and 2" wide (see www.digivac.com)

The Digivac 760 senses vacuum (actually absolute pressure) using a precision integrated strain gauge transducer. The transducer has a thin silicon diaphragm with an array of resistors. One side is evacuated, while the other is exposed to the pressure to be measured. Changes in the sensed pressure cause the relative values of the resistors to change. This result is an output voltage which is linearized, temperature compensated, scaled and amplified. The voltage is displayed on the Digivac 760 as 0 to 760 torr.

Units with control and RS232 outputs use a microprocessor. The processor is programmed in a high level language and it has flash memory, so we are able to provide custom features economically.

While most units display absolute pressure, we also offer a differential pressure transducer which measures pressure differential from atmosphere. It is used in load lock and bell jar applications, and can be programmed to act as a flow meter on gauge which have a microprocessor.

A CMOS A to D converter then digitizes the signal and drives the LED display.

2.0 CONSTRUCTION.

The Digivac 760 consists of the transducer described above and an instrument built on a single printed circuit board with a separate bezel. The printed circuit board includes a AC to DC power supply, amplifiers, and an A to D converter, and the LED display.

A polarized red lens filters the view of the LED display digits and enhances contrast.

Control outputs are available from a terminal strip accessible from the rear of the unit.

3.0 UNPACKING AND INSPECTION.

After the DIGIVAC is received, it should be carefully unpacked and inspected for damage during shipment and for completeness. The package should contain, as a minimum, the instrument, the transducer and cable assembly, and an instruction manual. In the event of a loss during shipment, a claim should immediately be made to the common carrier or the postal service, as applicable. The Digivac Company's warranty pertains only to the instrument, and does not cover losses in shipping.

4.0 INSTALLATION.

The instrument should be located in a clean, dry environment for best results. Its AC power should be connected to a source of 115 or 230 volts AC. On units with a power terminal strip, there are three positions; common, 115 Volts and 230 Volts.

100P and 801 series units use a wide range power supply that connects to 115/230 vac with no user intervention. A wire adapter is available to enable direct soldering to industrial wiring.

If your instrument is a controller, connect its control output terminal strip to the appropriate external equipment. The contacts are rated 240 Vac 7 Amps.

If your instrument has an analog output, connect it from the output terminal strip to your recorder or data acquisition system.

Mounting

Models 100 are bench mounted.

The 100P series are panel mounting in a 1/8 Din cutout. It is necessary to remove the red lens to install the mounting screws. This is accomplished by carefully prying the tab at the bottom of the lens. A bracket with tapped holes goes behind the panel.

760 and 801 Series units mount in a 2.75 inch panel hole and replace analog and VRC meters. The units are normally furnished with the Varian hole pattern (three screws at the 12 o'clock, 4 o'clock and 8 o'clock positions. The circuit boards also have 4 hole mounts, compatible with Hastings gauges. A special front panel is necessary, and will be furnished upon request.

These units are mounted by removing the front bezel, preparing the panel holes, and re-assembling with the electronics behind the panel and bezel outside. 3/8" stainless screws are normally provided. Digivac will provide longer screws if necessary to accommodate different panel thicknesses.

Gauge Tube

The sensor should be installed, sensing end down, in a clean, dry vacuum system. If the tube will be exposed to corrosive gasses, contact Digivac for further guidance.

If the gauge is used in a Neon sign processing facility, the following is recommended to protect the gauge from damage from bombarding:

The gauge tube should be isolated from the system with a stopcock. The stopcock should be closed when bombarding.

It is helpful to install a 4 inch pipe nipple between the gauge tube and the system.

There should be at least 2 feet of tubing between the electrode and the Digivac.

In extreme cases, the gauge can be absolutely protected by installing a normally open solenoid valve between the gauge tube and the system. The solenoid valve coil should be in parallel with the bombarding transformer. In this way, the solenoid will be closed and the gauge tube will be positively protected whenever bombarding is done.

If a gauge is damaged by bombarding, it can generally be brought back to operating condition by replacing the Op amp which controls the gauge tube current. Consult Fairfield Digital.

Gauges which are damaged by bombarding will normally be repaired at by F-D free of charge.

5.0 OPERATION and SETTING CONTROL.

After installation, the DIGIVAC and it is ready for immediate operation.

On 100P series units controls are set as follows:

Remove the front lens.

Locate the display control jumpers.

The jumper is normally in the center position, in which the unit displays vacuum. Place the jumper in the side position to display the primary setpoint.

With a small screwdriver, adjust the potentiometer behind the jumper to the desired primary setpoint.

The secondary setpoint is 25 torr higher than the primary setpoint. (Example: Primary setpoint = 100 torr; secondary setpoint 125 torr. The relays will operate when the sensed pressure is lower than the setpoint.

On 801/2c series units, the jumpers are located on the back of the printed circuit board. When the jumper is in the center position, vacuum is displayed. In the left and right positions, the respective setpoints are displayed.

6.1 FACTORY REPAIR AND CALIBRATION.

The DIGIVAC is designed to provide years of trouble-free service, and the liberal internal use of plug-in components make it easily repairable.

No field servicing of the unit is recommended, other than replacement of the sensor assembly, but factory servicing and calibration are available at a nominal cost and turn-around times of 24 hours are typical.

Unless an instrument has been grossly damaged, it can normally be repaired and restored to original specifications for a cost of less than 25% of the purchase price of a replacement instrument.

6.2 FIELD CALIBRATION.

Although it is preferable that all calibration be performed at Fairfield Digital, field calibration can be accomplished.

Before re-calibrating the instrument, it should be ascertained that the instrument is in fact incorrect. In many cases, the problem will be with a tube that is fouled, or a system that is operating improperly. It is recommended that a spare tube be kept on hand and stored in a clean, dry place. Then, in cases of suspect readings, the tube should be changed before proceeding further.

If adjustments are to be made, proceed as follows:

A) With the sensor at atmospheric pressure, adjust the 10,000 ohm potentiometer until a reading of 760 torr is obtained. The 10,000 ohm pot is located on the right when seen from the front of the instrument.

B) Operate the system at a pressure less than one Torr, and adjust the 500 Ohm potentiometer. This pot is on the left when viewing the front of the instrument; on the right from the printed circuit end.

D) Check the operation of the gauge at other pressures. Normally, adjustment of the zero will not be interactive with the readings of the instrument at higher pressures.

801 series units use the same procedure, except that the span potentiometer is located on the circuit board. It is rectangular in shape and is oriented vertically. The zero is located on the front panel and it is adjustable in place.

7.0 NOTES ON CALIBRATION.

The Digivac 760 reads absolute pressure. The value of absolute pressure changes daily and during any day. For this reason, it is not uncommon for the initial reading of 760 millimeters to change by approximately 25 millimeters.

Instruments are also available which read 0 to 29.9 inches of mercury. Usually 29.9 instruments use a transducer which measures differential from atmosphere.

9.0 ACCESSORIES AND MODIFICATIONS.

The following are offered as accessory equipment or field-installed modifications.

SixVac: SIX GAUGES ON ONE SERIAL PORT

Using Digivac SixVac tm technology, it is possible to operate six or more instruments on a single PC serial port and log data. Digivac can provide the data logging and plotting software.

Rs-232 OUTPUT

The standard Rs232 output is 9600 baud N81. The output can be monitored using Windows Terminal, or Hyperterm, included free with Windows. Data can be captured and stored using these programs.

We also provide special data logging and plotting software for pharmaceutical, network and special applications.

MULTI - SENSOR SWITCHING.

Multiple vacuum sensor switching can easily be accomplished with the DIGIVAC 760 Tc. This can be accomplished either with an external multi-probe harness, which plugs into the probe connection at the rear of the unit, or with internally installed multi-probe wiring.

RECORDER OUTPUT.

The DIGIVAC has an internal analog signal of approximately 0 to 5.00 volt with a source impedance of approximately 500 ohms. This signal can be brought out to the rear of the unit and can be used for driving external recorders, data acquisition systems, etc. The signal is monotonic and linear in most of its useful range.

COMPATIBILITY WITH OTHER GAUGE TUBES.

On special order, Digivac Instruments can be provided to use with most other vacuum gauge tubes. AC and DC excitation are available. Gauges have been provided for Hastings, Varian, Thermionics, Veeco, and Frederics gauge tubes.

USE AS ALTIMETER or AIR VELOCITY METER

The 760 series instruments, with special programming, have been used as altimeters, altitude alarms (for parachute jumping), and velocity meters. Consult Digivac for further information.

PROCESS COMPUTER/CONTROLLER/PRINTER INTERFACE MODULE.

Fairfield Digital can offer a combination gauge and single board computer which can monitor a vacuum gauge tube, record readings, drive an external chart recorder, and control external apparatus such as valves, diffusion pumps, vaporizers, turbo pumps etc. It can be programmed to drive any Epson-compatible, Centronics interface, printer in a manner to simulate a strip-chart recorder. The hard copy output from the recorder will be labeled in pressure units, and can also incorporate custom labels, such as the customer's name. Standard tractor-feed printer paper is used. The module consists of a single-board computer, which digitizes the signal and performs other housekeeping functions as necessary to drive the printer.

The module is programmed in BASIC and includes RS-232 connections which enable it to be connected to any computer for software modification. Actual software is stored in non-volatile memory. A real time clock-calendar is included. Consult Digivac for details.

SPECIAL REQUIREMENTS.

It is the policy of the Digivac Company to customize instruments for specialized requirements whenever it is economically feasible to do so.

Consult our website, www.digivac.com for further information about our products.

We encourage inquiries about your special needs.

End.