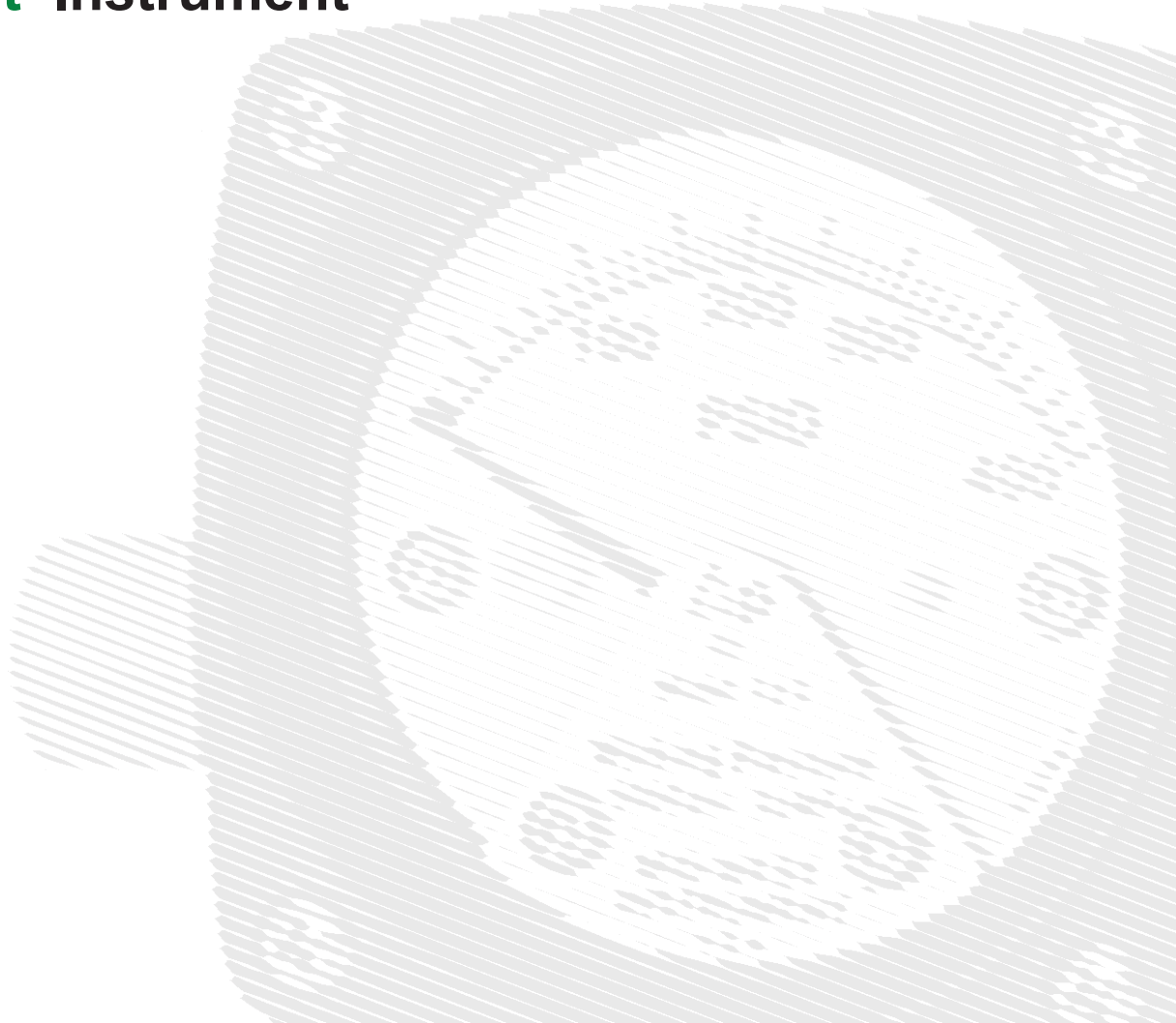




Installation & Maintenance Instructions

MODEL 123 "Filter Minder"

Mid-West[®] Instrument



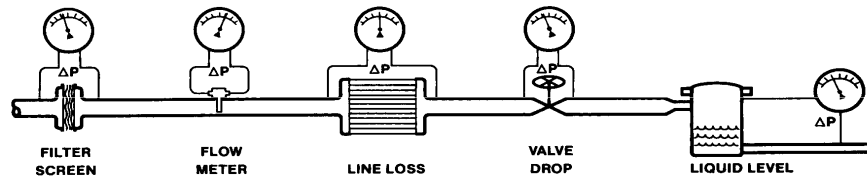
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Mid-West[®] Instrument



MODEL 123: "Filter Minder"[®] Installation and Operating Instructions

INSPECTION

Before installation check the nameplate on each instrument against the receiving paperwork and the intended application for correct part number, materials of construction, working pressure, dial range, etc. If equipped with switches, check electrical rating. Inspect for shipping damage and, if damaged, report it immediately.

NOTE - Before attempting repairs contact your local Mid-West Representative or our factory. Failure to do so will void any warranty.

PRODUCT DESCRIPTION

The Model 123 "Filter Minder"[®] is a differential pressure instrument available as a switch, a gauge, or both.

Differential pressure is sensed by the movement of a floating piston magnet against a calibrated spring. The magnetically coupled gauge pointer outside the pressure housing follows the movement of the piston magnet and indicates differential pressure on the dial scale.

When equipped with switches, a contact is made or broken by the magnetic field of the piston magnet. The unit provides full over-range protection to the rated working pressure of the housing in either direction.

INSTALLATION

The model 123 is calibrated and tested prior to shipment and is ready for immediate installation. Use of the following installation procedures should eliminate potential damage and provide optimum trouble-free operation.

1. PROCESS CONNECTIONS

1/4" FNPT are provided as standard. There are two connections on the housing identified as "hi" and "lo" for high pressure and low pressure. Be sure these get plumbed to the proper connections on your system. Improper connection will not damage the instrument, but it will not function properly. Flexible tubing is recommended to minimize effect of possible vibration.

2. INSTRUMENT LOCATION

On liquid service the instrument should be mounted **below** the process connections to facilitate self-bleeding. On gas service it should be located **above** the process connections to promote self-draining. If the process contains particulates, a "pigtail" loop or drop leg (manometer "U-tube" configuration) in the tubing will minimize the possibility of it migrating into the instrument.

3. PANEL MOUNTING

Gauges with 2-1/2" dials can only be mounted through the **rear** of the panel. Make the proper panel cutout as indicated in (Fig .1). Remove the (4) bezel screws. Insert the gauge front through the rear of the panel and reinstall the bezel screws through the front of the panel and into the gauge bezel. Tighten the screws securely, alternating in a **diagonal** pattern.

Gauges with 4-1/2" dial should be mounted from the **front** of the panel. Make the cutout as indicated in (Fig. 1). Insert the (4) panel mounting studs, finger tight, into the metal inserts located in the rear of the bezel. Insert the gauge through the panel, aligning the panel mounting studs with the holes in the panel. Install the (4) #8-32 nuts onto the studs and tighten securely.

TROUBLESHOOTING

1. Gauge does not indicate differential.

- A. Check for proper hook up, high to "hi" low to "lo".
- B. Make certain block valves are open and that the equalizer (balance) valve is closed (if using a 3 valve manifold).
- C. If A & B check out correctly, loosen high-pressure line to determine if there is pressure to the instrument.
- D. Verify gauge is not in an electromagnetic / magnetic environment. i.e.; close proximity to high current power lines.
- E. If there is pressure to the instrument, check to determine that there is differential across the unit being monitored. If so, contact the factory for assistance and/or and "RGA" (Return Goods Authorization) number to return the instrument for repair or replacement.

MODEL 123 MOUNTING INFORMATION & DIMENSIONAL DATA

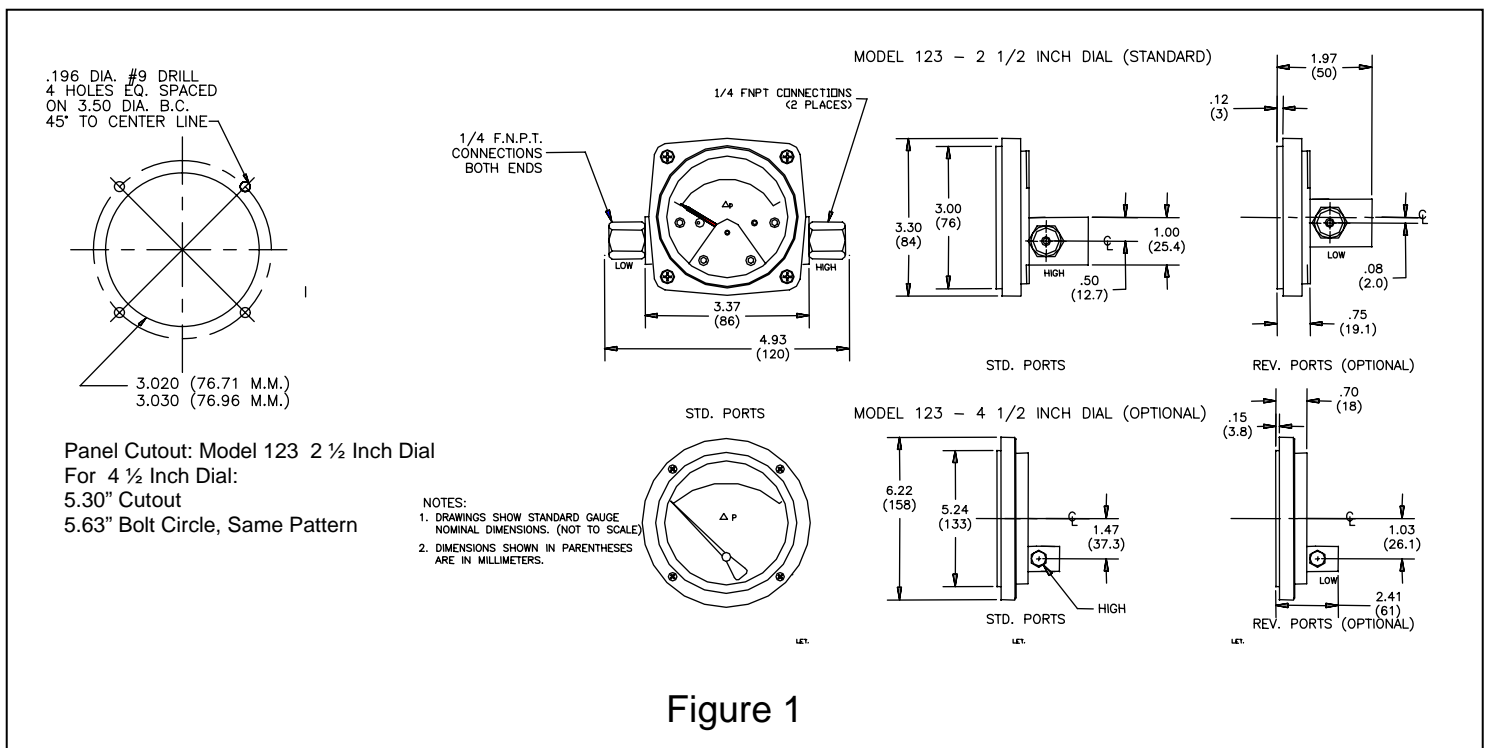


Figure 1

PROOF PRESSURE: 10,000 PSI.

TEMPERATURE LIMITS: -40°F (-40°C) to + 200°F (+93° C). These limits are based on the entire instrument being saturated to these temperatures.

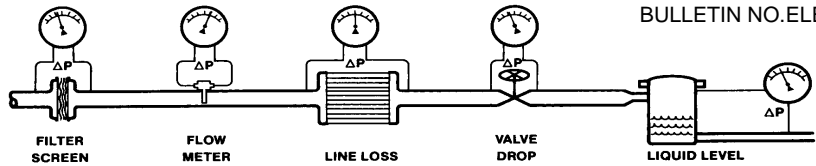
System (process) temperatures may exceed these limitations with proper installation. Contact our customer service representative for details.

Manufacturer reserves the right to change specifications without prior notice.

STANDARDS: All model 123 Series differential pressure gauges either conform to and/or are designed to the requirements of the following standards:

ASME B1.20.1
ASME B40.100
CSA-C22.2 No. 14, & 213
UL Std. No. 50,508, & 1604

NACE MRO175
NEMA Std. No. 250
SAE J514
EN-61010-1



Model 123 Electrical: Installation and Operating Instructions

ELECTRICAL

Gauges with switches have one or two hermetically sealed adjustable set point reed switch assemblies. Load ratings and capabilities for each switch type are defined as follows:

REED SWITCH RATINGS (Resistive Load)

Type	SPST	SPDT	SPDT
Option:	E ,F,G	H	A
*Power	60 W	60 W	3W
Max. Current	3.0 Amps	1.0 Amps	0.25 Amps
Max. Voltage VAC/VDC	240	240	125
**Setting (%F.S.)	25 to 95	25 to 100	15 to 90
Hysteresis (Max/Nom)	15% / 10% (F.S.)	20% / 13% (F.S.)	15% / 10% (F.S.)
Repeatability	1% F.S.	1% F.S.	1% F.S.
Leads 22 Awg.	(2), 24"	(3), 24"	(3), 24"

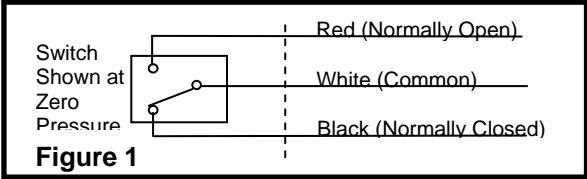
- * Product of the switching voltage and current shall not exceed the power rating of the device.
- ** Except where otherwise noted

The SPDT switch ('A' or "H" Electrical Option) lead colors and associated functionality at '0' PSID is shown in Figure 1. SPST switches ('E', 'F', or 'G' Electrical Options) may be normally closed or normally open at '0' PSID dependent upon the option specified on the purchase order.

All switch types are field adjustable. The defined range of the adjustment is specified in the table above. All switches come with a decal to identify adjustment direction to increase the set point. **Do not use excessive force when rotating the adjustment screw as the adjustment mechanism may be damaged. Also note the location of the screw adjust (See Figure 4.) Do not mistake it for the calibration adjust for the gauge.**

Note: Switches can be set below the defined minimum set point however, the switch may not remain activated at maximum PSID. If the unit is set below the defined minimum set point, the customer should verify that the switch remains activated from the set point to over range of the gauge.

Provide standard protection techniques for the switch contacts for capacitive and inductive loads. Use current limiting techniques near the switch to protect the contacts due to high inrush (i.e.; in line resistor or inductor) for long cable interfaces. Provide clamping devices at or near inductive loads (i.e.; relay). **Maximum wire length between the 3W switch and its load, should not exceed 70 – 100 Feet. for 120 VAC applications.** Contact the factory for assistance regarding this condition.



Use the Mid-West Power Relay 1000TR or equivalent relay for loads above the switch rating,.

The following warnings apply to all gauge options with electrical interface:

- WARNING: ELECTRICAL CONNECTIONS SHOULD BE PERFORMED BY QUALIFIED PERSONNEL AND MEET THE REPRESENTATIVE COUNTRY'S NATIONAL ELECTRICAL CODE.**
- WARNING: FAILURE TO CONNECT TO THE PROTECTIVE CONDUCTOR TERMINAL MAY RESULT IN A SHOCK HAZARD.**

Grommet Wire / 1/4" FNPT Wiring Interface



The standard switch enclosure is weather resistant with 24" flying lead wire interface. A rubber grommet provides the seal around the wires (See Figure 2). (Options A & B)

The conduit version provides a NEMA 4X rated environmental seal with a 1/4" FNPT wiring interface in the rear center of the gauge body (See Figure 3).(Options C & D)

A provision to connect a protective conductor terminal is provided on the High port end of the gauge body. A 6-32 screw, 18 Awg, 24 " long, green/yellow wire, and a #6 terminal is provided.

Standard location of a SPDT switch will be on the bottom of the gauge for a standard port gauge. For a reverse port gauge the switch will be on top. (See Figure 2). SPDT Switch leads are color coded and labeled as follows:

- White- 1 or 2 Com
- Black- 1 or 2 NC
- Red - 1 or 2 NO

Location for the SPST switch will vary depending on the switch type required. A standard port gauge has the normally open switch located on the bottom of the gauge body and the normally closed switch located on the top. This applies to both a single switch unit or a double switch unit with one of each type ("G" option Electrical Specifications).

A reverse port gauge has the normally open switch located on the top and the normally closed switch located on the bottom. Leads are labeled as follows:

- Single Switch Unit: 1NC or 1NO
- Double Switch Units: 1NC or 1 NO and 2NC or 2NC

Deviations from the above configurations may exist. Therefore check the description block of your order to verify your configuration.

DIN Plug-in Connector (Options L & M)




The DIN interface conforms to DIN 43 650A / ISO 4400 and **when mated** provides an IP65 rated protection class. The right angle mating connector is supplied with the gauge upon order. Clocking (orientation) can be changed by prying out the insert and rotating the insert to the desired clocking (90 ° increments). (See Figure 4)

Wiring for the SPDT bottom and top switch for the defined port configuration is as follows:

Standard Port - 1.- Common, 2. - N.C., 3. - N.O.
Reverse Port - 1. - Common, 2. - N.O., 3. - N.C.

Wiring for the SPST switch is between terminals 1 & 2.

A protective conductor terminal is provided on the DIN connector. 

Division II Hazardous Ratings (Options E & F):

The **E & F** Electrical Configuration are designed for use in **Class I, Division II, Groups A, B, C, & D, Class II, Groups F & G** hazardous environments (See Figure 5).

Interface is 24", 18 Awg. flying leads with ½" FNPT Conduit.

MISCELLANEOUS

Bi-directional Dial:

SPDT Switch units, with the bi-directional dial, require the following setting instructions:

1. If the switch is to operate for positive ΔP , rotate the adjusting screw Counter Clockwise (Red - NO, Black- NC, White- Common).
2. If the switch is to operate for negative ΔP , rotate the adjusting screw Clockwise (Red- NC, Black- NO, White -Common)

The functionality of SPST switches will be reversed for negative ΔP and positive ΔP . i.e.; a normally open switch (B option), will switch from open to closed for set points above 0 PSID, but will switch from closed to open for set points below 0 PSID.

TROUBLE SHOOTING

A. Switch doesn't function

- i. Make sure that the switch load does not exceed the specified wattage rating of the switch. (steady-state and transient). Contact factory for assistance for excessive loads, otherwise proceed to the next step.
- ii. Perform a continuity check of the switch contacts by trying to actuate the switch using an external magnet. An operational switch usually indicates a problem with the gauge. If not operational proceed to the next step.
- iii. Verify the reed switch wires are connected to the terminal strip (NEMA 4X enclosure only). Contact the factory for assistance if the switch is connected and/or request an "RGA" number.

C. Gauge accuracy and set point problems:

- i. Verify gauge is not in an electromagnetic / magnetic environment. i.e.; close proximity to high current power lines.
- ii. All others, contact the factory for assistance.

MOUNTING INFORMATION & DIMENSIONAL DATA

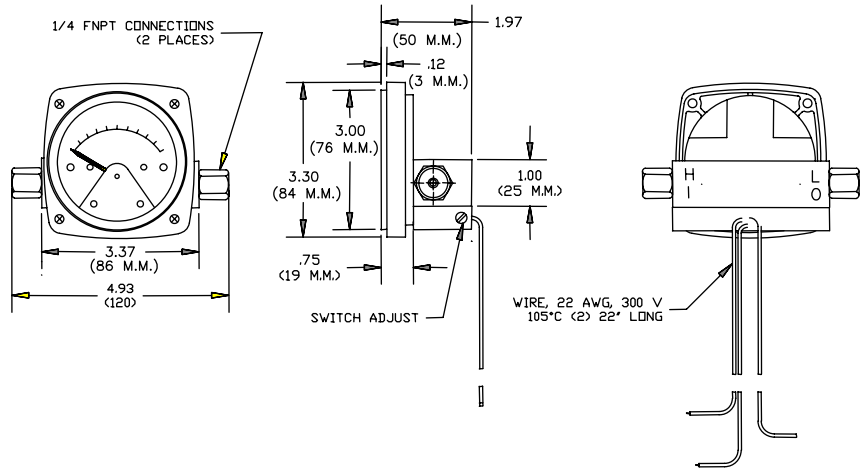


FIGURE 2
Model 123 Standard Port
Grommet Interface Switch Options A & B)

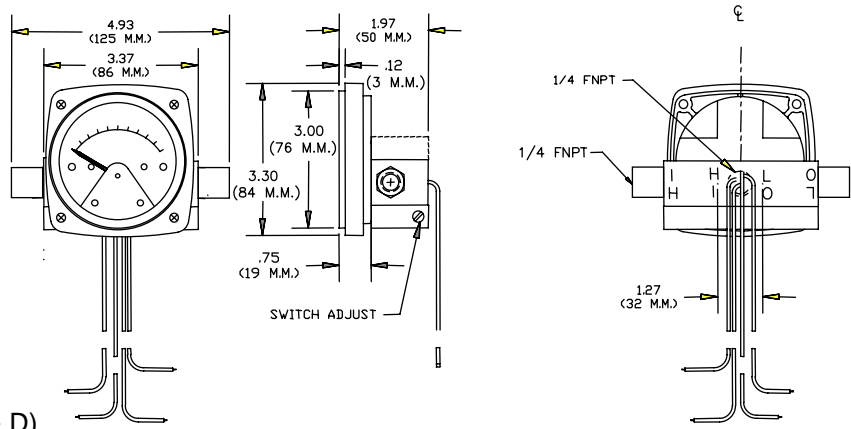


FIGURE 3
Model 123 Standard Port
1/4 FNPT Interface Switch (Options C & D)

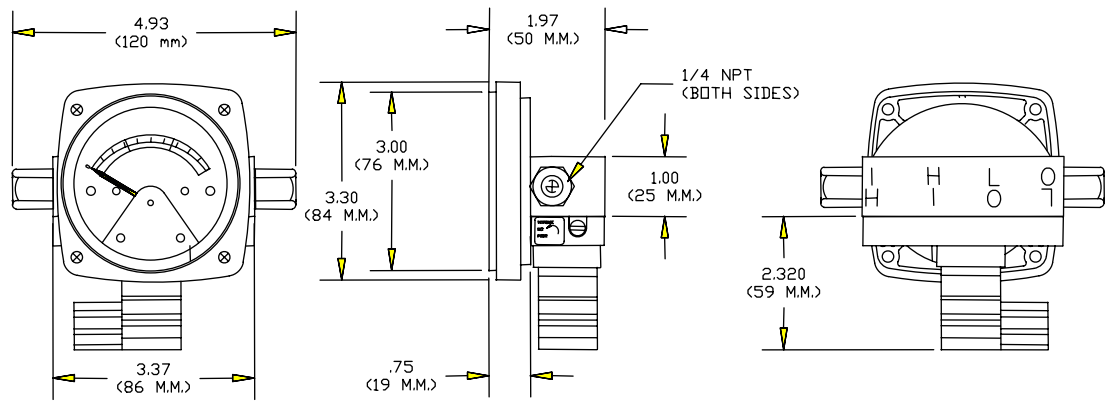


FIGURE 4
Model 123 Standard Port
Din Connector Interface
Switch (Options L & M)

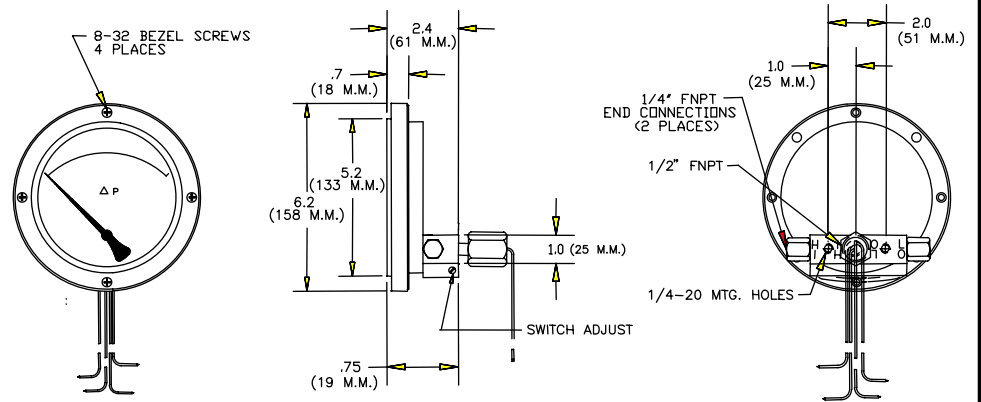


FIGURE 5
Model 123 4 1/2 Dial - Options (E & F)

Hazardous Locations,
Division II, Class I,
Groups A, B, C, D
Class II Groups F & G