

Installation & Maintenance Instructions

MID-WEST INSTRUMENT

Model 123



Supplied by

247cable.com

Call us on +44 (0)118 916 9420 | Email info@247able.com

Installation and Operating Instructions - Model 123

1. Safety



Before installing verify compatibility to the process media and temperature in contact with the wetted parts. Incompatible media and / or operation at temperature extremes can cause premature degradation of materials which could result in safety risk to personnel.

Verify the selected pressure range (differential pressure and working pressure) and the switch ratings are within specification for your application.

The Model 123 product utilizes a piston design which inherently has a small amount of leakage from high process connection to low process (15 SCFH air max at 100 PSID) connection. Do not use this product in an application with the low side process connection left open to atmosphere.

Warning! Remaining media may result in a risk to personnel, environment etc. Use sufficient precautionary measures when removing and transporting the product.

1.1 Intended use: The indicating / non-indicating differential pressure switches are used for monitoring differential pressures in industrial applications. The manufacturer shall not be liable for any claims if the product is used in applications contrary to the intended use.

1.2 Personnel: Personnel installing and putting this instrumentation into service shall be suitably trained and qualified in accordance with local codes, practices and regulations.



PRODUCT DESCRIPTION

The Model 123 Series “Filter Minder”[®] is a rugged, medium-range differential pressure instrument available as a switch, a gauge, or both. See “Part Numbering System” for available options.

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. See Bulletin ELECIM123/latest for gauges with switches.

The unit provides full over-range protection to the rated working pressure of the housing in either direction.

INSPECTION

Before installation check the product label 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, type of enclosure, etc. Inspect for shipping damage and, report it immediately.

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

Installation and Operating Instructions - Model 123

INSTALLATION

Model 123 Series "Filter Minder"® 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

¼" FNPT are provided. 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 the effect of possible vibration.

2. INSTRUMENT LOCATION

It is recommended that installation is no closer than one inch of a steel surface otherwise accuracy will be affected. 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.

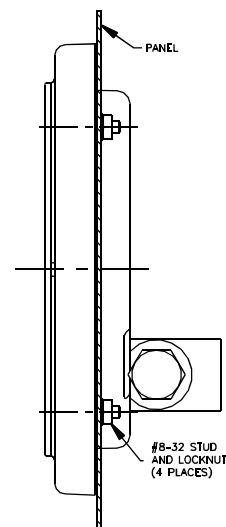
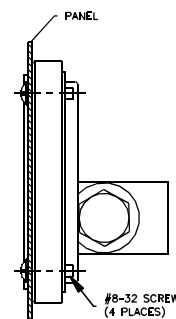
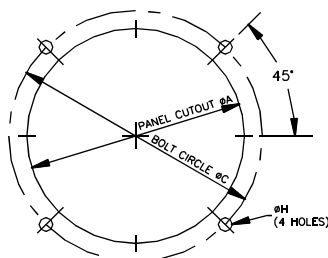
3. PIPE MOUNTING

If specified, your Model 123 will have a pipe mount kit installed. This provides for mounting on a 2" vertical or horizontal pipe.

3. PANEL MOUNTING

This gauge may be mounted into a panel. The cutout dimensions and hole position is described below:

DIAL SIZE	DIAMETER A	DIAMETER C	DIAMETER H
	Inch (mm)	Inch (mm)	Inch (mm)
2-1/2 in.	3.00 (76.2)	3.50 (88.9)	0.19 (4.7)
4-1/2 in.	5.30 (134.6)	5.63 (143.0)	0.19 (4.7)
6 in.	6.50 (165.1)	7.00 (177.8)	0.19 (4.7)



TROUBLE SHOOTING

1. Gauge does not indicate differential

- Check for proper hook up, high to "HI" and low to "LO"
- Make certain block valves are open and, if using a 3-valve manifold, that the equalizer (balance) valve is closed.
- If a & b check out correctly, loosen or disconnect the high pressure line to determine if there is pressure to the instrument.
- 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 an "RGA" (return goods authorization) number to return the instrument for repair or replacement.

Installation & Maintenance Instructions

MID-WEST INSTRUMENT

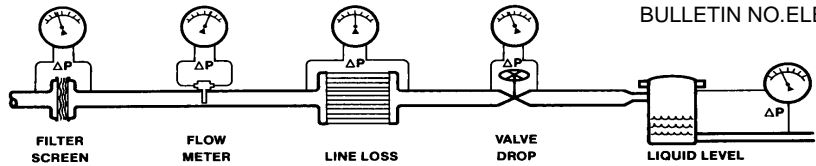
Model 123 Electrical



Supplied by

247able.com

Call us on +44 (0)118 916 9420 | Email info@247able.com



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"

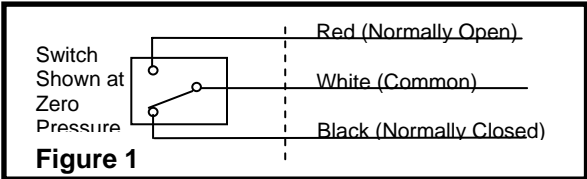
- * Product of the switching voltage and current shall not exceed the power rating of the device.
- ** Except where otherwise noted

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

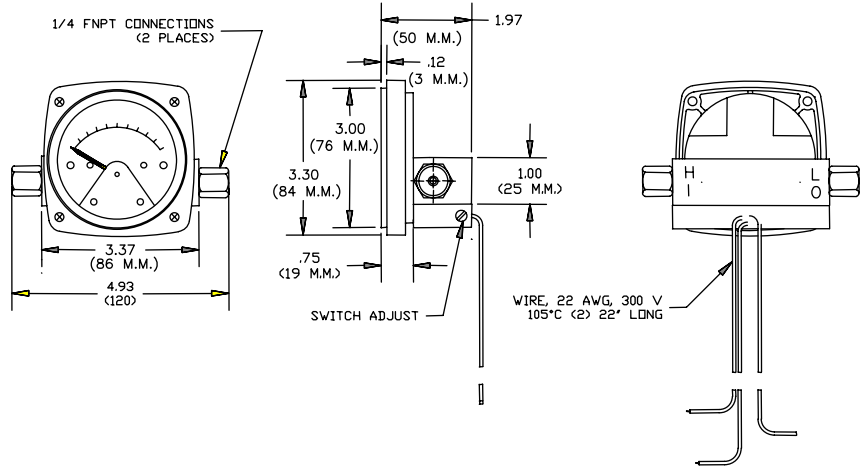


FIGURE 2
Model 123 Standard Port
Grommet Interface Switch Options A & B)

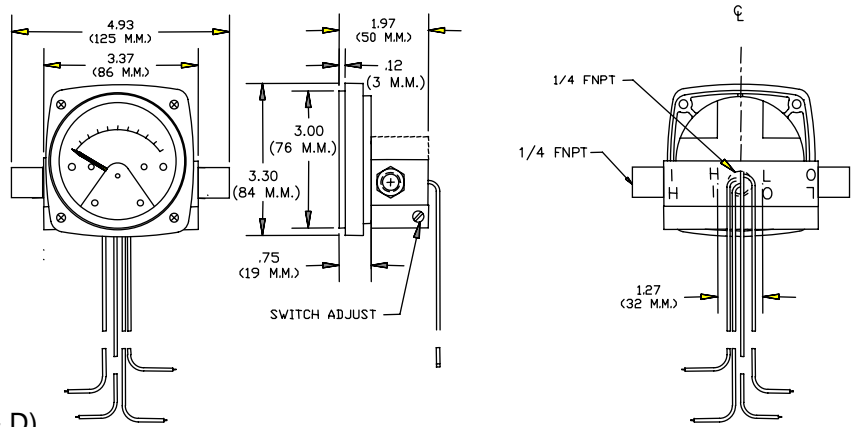


FIGURE 3
Model 123 Standard Port
1/4 FNPT Interface Switch (Options C & D)

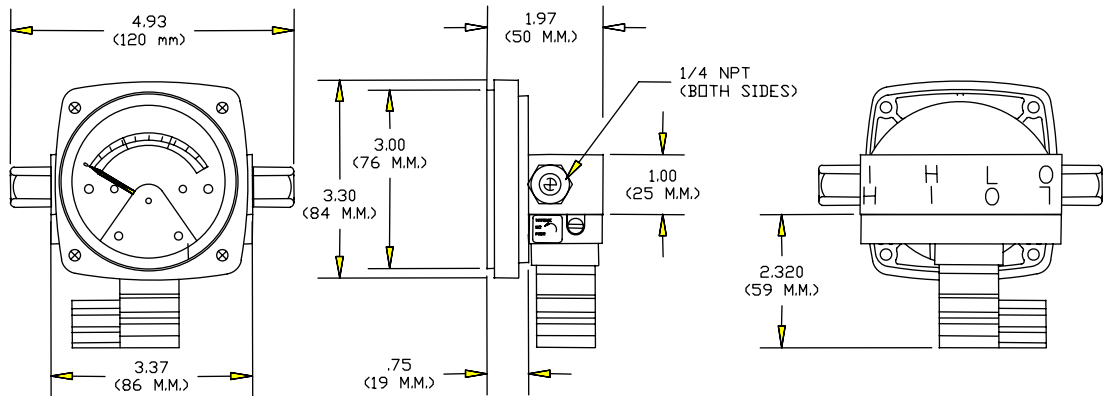


FIGURE 4
Model 123 Standard Port
Din Connector Interface
Switch (Options L & M)

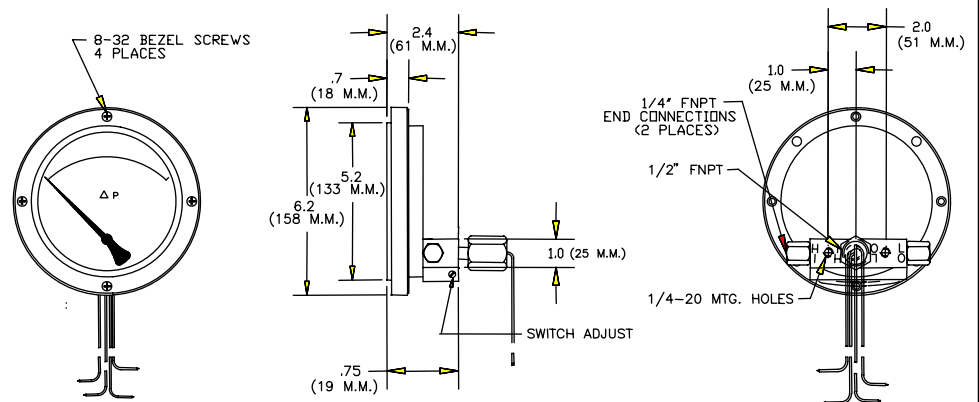
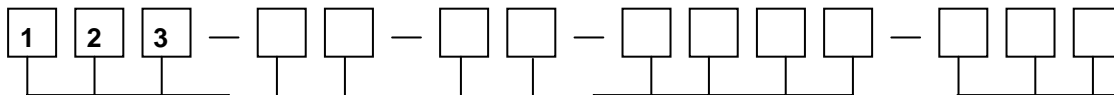


FIGURE 5
Model 123 4 1/2 Dial - Options (E & F)

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



① BASIC MODEL NUMBER

② MATERIAL

- A. Aluminum
- S. 316 S.S.
- Z. Special

③ DIAL SIZE

- A. 2-1/2" Round Uni-Directional Dial
- C. 4-1/2" Round Uni-Directional Dial
- G. 4-1/2" Round Uni-Directional Anod. Alum. Hous. Assy.
- T. Non-indicating Differential Pressure Switch Only
Selection Appropriate Electrical Options
- Z. Special (Uncoded Options)

④ SEALS & DIAPHRAGM

- 0. Buna N
- 1. * Viton®
- 2. Neoprene
- 4. ** Teflon®
- 5. Ethylene Propylene
- 9. Special (Uncoded Options)

⑤ CONNECTIONS

- 2. 1/4" FNPT End Connections
- 4. 1/2" FNPT End Connected Stainless Steel Adapters

* Viton is a registered trademark of Dupont Dow Elastomers

** Teflon is registered trademark of Dupont Dow

⑥ OPTIONS (Up to four options)

- O. None
- A. Reversed High/Low Process Connections
- C. Mounting Holes in Gauge Body for field mounting of Electrical Configurations A & B
- D. Mounting Holes in Gauge Body for field mounting of Electrical Configurations L & M
- F. Pipe Mounting Kit (Carbon Steel) (Contact Factory)
- G. Pipe mounting kit (stainless steel) (No back or bottom Connections for C, D, E or F switch options)
- L. Liquid Fill (Not available w/follower pointer)
- M. Maximum Indicator Follower Pointer
- N. NACE
- S. Shatterproof lens (Available only with 4 1/2" metal front)
- T. Oxygen Cleaning
- U. S.S. Tag w/S.S. Wire
- V. S.S. Tag w/S.S. Screws
- W. Wall Mounting Kit
- Z. Special (Uncoded Options)

NOTE: NOT ALL OPTIONS AVAILABLE IN COMBINATION WITH OTHER OPTIONS.

⑦ ELECTRICAL CONFIGURATIONS

(Switch Adjustable Range 15-90% except where stated below)

- O. None
- A. One (1) Switch in STD Encl. with Grommet Wire Seal
- B. Two (2) Switches in STD Encl. with Grommet Wire Seal
- C. One (1) Switch in STD Encl. with 1/4" FNPT Electrical Connection NEMA 4X.
- D. Two (2) Switches in STD Encl. with 1/4" FNPT Electrical Connection NEMA 4X.
- E. One (1) Switch in NEMA 4X General Purpose Enclosure, Div. II Hazardous Locations.
- F. Two (2) Switches in NEMA 4X General Purpose Enclosure, Div. II Hazardous Locations.
- L. One (1) Switch in STD Enclosure with Plug In Connector (DIN 43650/IP65 – PG-11)
- M. Two (2) Switches in STD Enclosure with Plug In Connector (DIN 43650/IP65 – PG-11)
- Z. Special

⑧ ELECTRICAL SPECIFICATIONS

- A. SPDT 3W, 0.25 Amp, 125 VAC/VDC
- E. SPST 60W, 3 Amp, 240 VAC/VDC Normally Open (Switch adjustable range of 25-95%)
- F. SPST 60W, 3 Amp, 240 VAC/VDC Normally Closed (Switch adjustable range of 25-95%)
- G. SPST 60W, 3 Amp, 240 VAC/VDC 1Normally Open, 1 Normally Closed (Switch adjustable range of 25-95%) (Available with Electrical Configurations B, D, F, & M)
- H. SPDT 60W, 1 Amp, 240 VAC/VDC (Switch adjustable range of 25-95%)
- Z. Special

Mid-West®

Instrument

6500 Dobry Dr. Sterling Heights, MI 48314

(586)254-6500 FAX (586)254-6509

E-Mail: sales@midwestinstrument.com

Web Page: www.midwestinstrument.com