

SERIES DFS / FS



DESCRIPTION & OPERATION

Series DFS and FS general purpose air pressure sensing switches are simple, economical and reliable. Designed for duct heater, oven, energy management, and other applications where a non-adjustable set point is required, these switches have a standard, factory-fixed set point between 0.03" wc and 0.40" wc. They can be configured to sense positive, negative, or differential air pressure. There is a wide range of standard features to choose from, including:

- Mounting brackets
- Sample line connector styles
- Terminal styles
- Open or enclosed switch terminals

Many optional features are available also, including:

- Gold contacts
- Manual reset
- Remote alarm light
- Programmable time delay
- Electronic dual set point
- Salt spray protection
- Pilot light operation indication
- Surge suppressor

Most DFS and FS models are available individually or in convenient contractor kits with installation and application hardware included. Packaging options include bar code labeling and individual chip board boxes.

While our standard products suit many applications, we readily design and configure OEM specialty switches. In addition, we offer a complete line of accessories and ancillary equipment for use with this product line. A wide variety of mounting brackets, standard and custom, can be supplied.



FS-751 is a standard switch with foot bracket, nut & ferrule compression fittings, screw terminals with cup washers, and enclosure cover.

MOUNTING (SEE FIGURE 1)

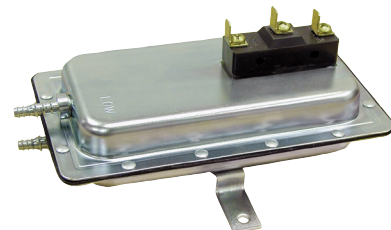
Always mount DFS/FS switches in a vibration-free location with the diaphragm positioned in a vertical plane in order to obtain the specified operating set point.* Do not mount with the sample line connections in the "up" position. *See TB 101404-01.

AIR SAMPLING CONNECTION (SEE FIGURE 2)

The sample connections are located on each side of the diaphragm. The type of connector is selected to suit the application. Available styles include:

- $\frac{7}{16}$ - 24 UNS external thread for compression nut and ferrule.
- $\frac{1}{8}$ - 27 NPT internal thread for pipe connection.
- $\frac{1}{4}$ " smooth, suitable for flexible plastic tubing
- Dual-barbed, suitable for $\frac{3}{16}$ " or $\frac{1}{4}$ " ID flexible plastic tubing.
- 1 - 14 UNS external thread combined with $\frac{1}{4}$ - 18 NPT internal thread.

Series DFS/FS switches are designed to accept firm-wall sample lines or slip-on flexible tubing. A wide variety of available adapters ensure suitable and secure sample line connections. In addition, a complete family of static



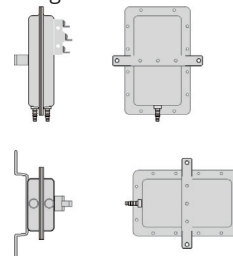
DFS-221-112 is a standard switch with foot bracket, barbed sample line connectors and $\frac{1}{4}$ " spade terminals, open-mounted (no enclosure cover).

and impact probes is available for insertion into the air stream. Refer to Figure 2 to identify the high pressure inlet (H) and/or the low pressure inlet (L). Switches equipped with the 1-14 UNS external thread combined with $\frac{1}{4}$ - 18 NPT internal thread fitting have the high (H) inlet on the back of the mounting pan.

ELECTRICAL CONNECTIONS (SEE FIGURE 3)

The optional enclosure cover protects against accidental contact with the live switch terminal screws. It accepts one or two $\frac{1}{2}$ " conduit connections. The plated housing contains a diaphragm and a snap-acting switch, SPDT in automatic reset models, and SPST in manual reset models. Before pressure is applied to the diaphragm, the switch contacts are in the normally closed (NC) position as shown in Figure 3. See the specification section of this bulletin for standard, gold contact, and manual reset specifications.

Fig. 1: Mounting



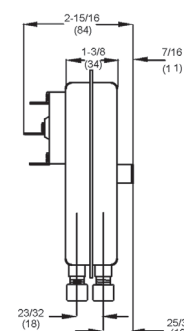
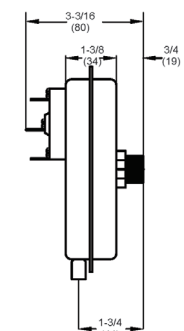
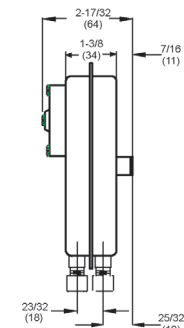
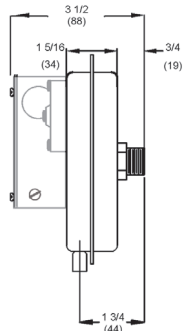
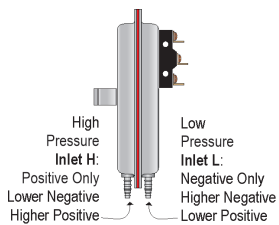
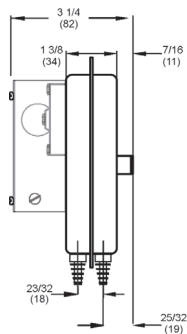


Figure 2, above, left: Air Sampling Connections

Figure 3, above, right: Electrical Connection

Fig. 4, left: Typical DFS / FS Depth Dimensions, Inches (mm): The depth of a switch is determined by the type of mounting bracket, the type of switch terminals, and whether there is a conduit cover enclosing the snap switch. The drawing at left shows some common configurations. Many other mounting brackets are available; please consult the factory for dimensions of brackets not shown here.

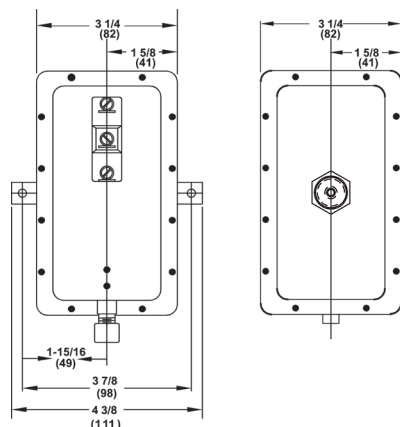


Fig. 5 (above): Typical DFS/FS Width Dimensions, Inches (mm): The switch on the left has the standard foot bracket, which affects its width as well as its depth: see first and third switch down in Figure 4, left. The switch on the right mounts via the 1-14 UNS external thread nut combined with the 1/4 - 18 NPT internal thread process connector, which affects only its depth: see second and fourth switch down in Figure 4, left.

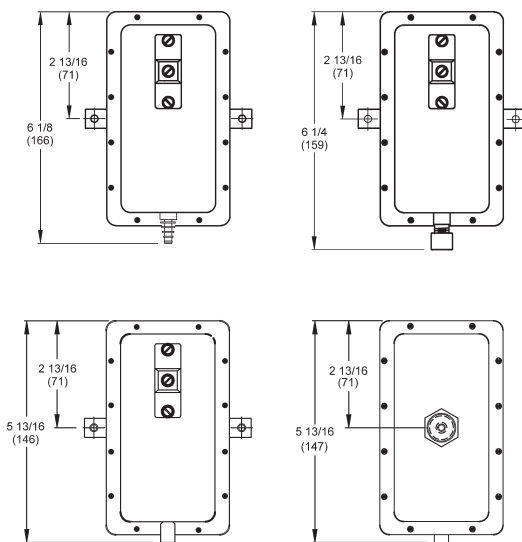


Fig. 6 (above): Typical DFS/FS Height Dimensions, Inches (mm): The type of sample line connector affects the height of the switch.

GENERAL SPECIFICATIONS SERIES DFS/FS SWITCHES

Mounting Position: Diaphragm in any vertical plane to obtain the lowest specified set point

Set Point Options: Factory set, non-adjustable; operates on pressure rise between 0.03"wc and 0.40" wc

Approximate Switching Differential:
0.02 ± 0.01" wc at lowest set point

Measured Media: Air or combustion by-products that will not degrade silicone

Maximum Pressure: 1/2 psi (0.03 bar)

Operating Temperature Range:
-40 °F to 180 °F (-40 °C to 82 °C)

Life: 100,000 cycles minimum at 1/2 psi maximum pressure each cycle and at maximum rated electrical load

Electrical Rating:

- **Standard:** 300 VA pilot duty at 115 to 277 Vac, 15 amps non-inductive to 277 Vac, 60Hz
- **Gold Contacts:** 300 VA pilot duty at 115 to 277 Vac, 15 amps non-inductive to 277 Vac, 60 Hz. 10 ma at 5 V dc (applies to dry circuit applications)
- **Manual Reset:**
15A @ 125, 250, or 277 Vac.
1/2 A @ 125 V dc, 1/4 A @ 250 V dc.
1/4 hp @ 125 V ac; 1/2 hp @ 250 V dc

Contact Arrangement:

Automatic reset: SPDT
Manual reset: SPNC

Electrical Connection Options (standard):

- **Terminal Screw and Cup Washer:**
6-32 UNC x (.219) Binding head combination terminal screw & cup washer
- **Quick-Connect Spade Terminals:**
1/4" x 0.032 or 3/16" x 0.032

Conduit Opening (models with Enclosure Cover): 7/8" diameter opening accepts 1/2" conduit; One or two openings available

Sample Line Connector Options:

- **Compression Fitting:** Male, externally threaded 7/16" 24 UNS 2A thread with nut and self-aligning ferrule; accepts rigid and semi-rigid tubing
- **Dual-barbed connectors:** 3/16" or 1/4" OD accept flexible plastic tubing
- **Straight slip on connectors:** 1/4" OD accept flexible plastic tubing
- **Internal thread for pipe connection:**
27 NPT 1/8" - 27 NPT 1/4" - 14 UNS external thread combined with 1/4 - 18 NPT internal thread accepts rigid and semi-rigid tubing

Approvals: UL/UR, FM, CSA as specified

Shipping Weight: 1.2 lbs.

Accessories:

P/N 18311 Slip-on 1/4" OD Tubing Adapter for slipping on flexible plastic tubing.

Sample line probes. Orifice plugs (pulsation dampers)