



Cleveland Controls
Division of UniControl Inc.

Model

AFS-222-181

Air Pressure Sensing Switch with Adjustable Set Point Range

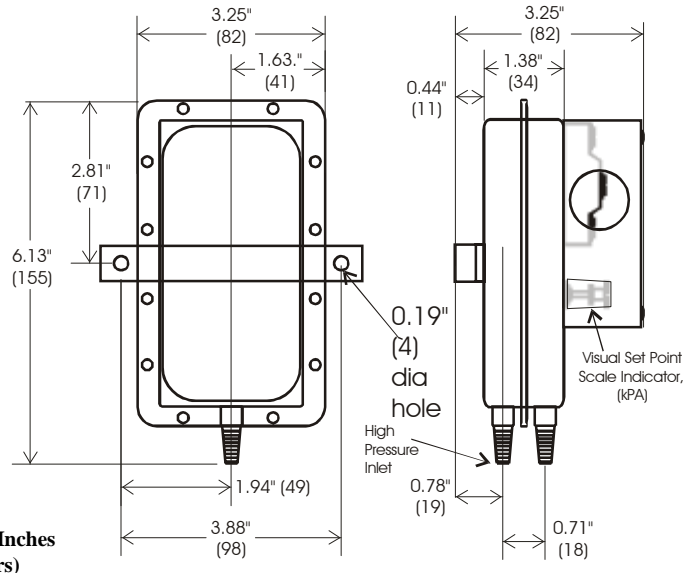
Application

The **Model AFS-222-181** is a general purpose proving switch designed for HVAC and Energy Management applications. It may be used to sense positive, negative, or differential air pressure. The **AFS-222-181** is equipped with convenient barbed sample line connectors that accept flexible tubing, and a visual set point scale indicator (shown in Figure 5).

General Description & Operation

The plated housing contains a diaphragm, a calibration spring and a snap-acting SPDT switch. The barbed sample line connections located on each side of the diaphragm accept flexible tubing.

An enclosure cover guards against accidental contact with the live switch terminal screws and the set point adjusting screw. The enclosure cover will accept a PG16 conduit connection.



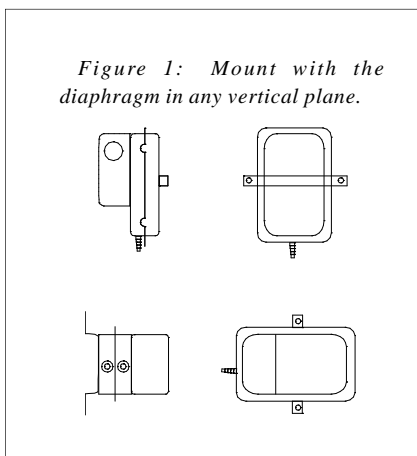
**Dimensions in Inches
(Millimeters)**

Mounting (see Figure 1)

Select a mounting location which is free from vibration. The **AFS-222-181** must be mounted with the diaphragm in any vertical plane in order to obtain the lowest specified operating set point. Avoid mounting with the sample line connections in the "up" position. Surface mount via the two 3/16" diameter holes in the integral mounting bracket. The mounting holes are 3-7/8" apart.

probe as close to the center of the air-stream as possible. Refer to Figure 2 to identify the high pressure inlet (H) and the low pressure inlet (L). Select one of the following five sample line connection options, and connect the sample lines as recommended.

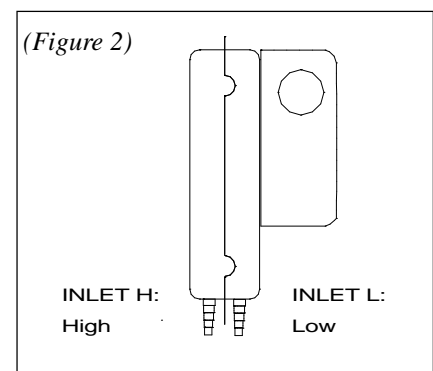
Figure 1: Mount with the diaphragm in any vertical plane.



Air Sampling Connection (see Figure 2)

The **AFS-222-181** is equipped with two slip-on sample line connectors, situated on either side of the diaphragm as shown in Figure 2. These connectors are suitable for flexible tubing. Locate the sampling probe a minimum of 1.5 duct diameters downstream from the air source. Install the sampling

(Figure 2)



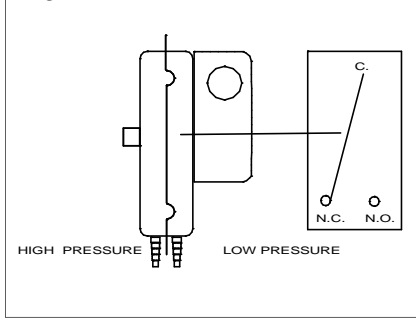
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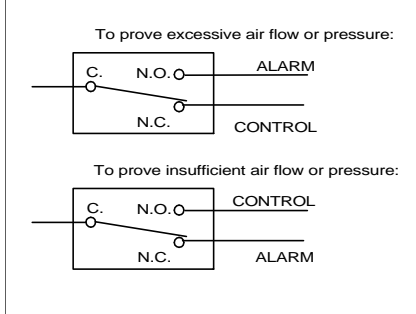
(Figure 3)



Electrical Connections (see Figure 3)

Before pressure is applied to the diaphragm, the switch contacts will be in the normally closed (NC) position. The snap switch has screw top terminals with cup washers. Wire alarm and control applications as shown in Figure 4.

(Figure 4)



POSITIVE PRESSURE ONLY: Connect the sample line to inlet H; inlet L remains open to the atmosphere.

NEGATIVE PRESSURE ONLY: Connect the sample line to inlet L; inlet H remains open to the atmosphere.

TWO NEGATIVE SAMPLES: Connect the higher negative sample to inlet L. Connect the lower negative sample to inlet H.

TWO POSITIVE SAMPLES: Connect the higher positive sample to inlet H. Connect the lower positive sample to inlet L.

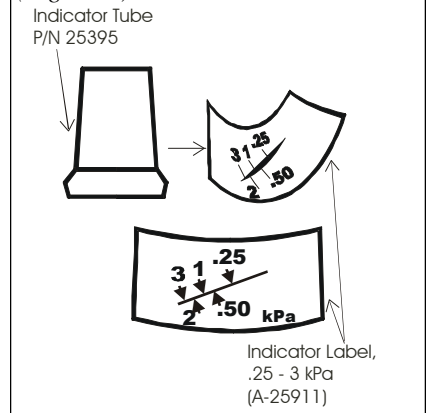
ONE POSITIVE AND ONE NEGATIVE SAMPLE: Connect the positive sample to inlet H. Connect the negative sample to inlet L.

Field Adjustment

The adjustment range of an **AFS-222-181** Air Switch is 0.05 ± 0.02" w.c. to 12.0" w.c. (.0125 ± .005 kPa to 2.99 kPa). Switches are shipped from the factory at set at the minimum set point. From this point, approximately ten turns are used for calibration. **Each full turn represents approximately 1.2" w.c. (.299 kPa).**

Please note: To properly calibrate an air switch, a digital manometer or other measuring device should be used to confirm the actual set point.

(Figure 5)



LOCATION OF SAMPLE LINES FOR TYPICAL APPLICATIONS

<p>FAN OPERATION OR TRUE AIR FLOW WITH LITTLE OR NO STATIC PRESSURE.</p> <p>PROBE MUST BE PERPENDICULAR TO FLOW.</p>	<p>FAN OPERATION OR AIR FLOW WITH NO STATIC PRESSURE.</p>	<p>PROVE POSITIVE STATIC PRESSURE</p>
<p>FAN OPERATION AND TRUE AIR FLOW WITH VARYING AMOUNTS OF STATIC PRESSURE.</p> <p>PROBE MUST BE PERPENDICULAR TO FLOW.</p>	<p>SUCTION OR FAN OPERATION</p>	<p>NEGATIVE PRESSURE INCREASES AS FILTER GETS DIRTY.</p> <p>FILTER</p>

SPECIFICATIONS

Model AFS-222-181 Air Flow Switch with Visual Set Point Indicator

Mounting Position: Mount with the diaphragm in any vertical plane.

Set Point Range: 0.05 ± 0.02" w.c. to 12.0" w.c. (.0125 ± .005 kPa to 2.99 kPa).

Field Adjustable "Operate Range": 0.07" w.c. to 12.0" w.c. (.0174 to 2.99 kPa).

Field Adjustable "Release Range": 0.04" w.c. to 11.2" w.c. (.010 to 2.79 kPa).

Approximate Switching Differential: Progressive, increasing from 0.02 ± 0.01" w.c. at minimum set point to approximately 0.8" w.c. at maximum set point. (from .005 ± .0025 kPa to .199 kPa).

Measured Media: Air, or combustion by-products that will not degrade silicon.

Maximum Pressure: 1/2 psi (0.03 bar or 3.45 kPa).

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

Life: 100,000 cycles minimum at 1/2 psi (3.45 kPa) maximum pressure each cycle and at maximum rated electrical load.

Electrical Rating: 300 VA pilot duty at 115 to 277 VAC, 15 amps noninductive to 277 VAC, 60 Hz.

Contact Arrangement: SPDT

Electrical Connections: Screw-type terminals with cup washers.

Conduit Opening: 7/8" diameter opening accepts PG16 conduit.

Sample Line Connections: Two barbed 1/4" connectors will accept flexible tubing.

Approval: UL, FM, CSA, CE

Shipping Weight: 1.2 lbs.

ACCESSORIES

- Sample line probes.
- Orifice plugs (pulsation dampers).
- Consult Factory for special features, packaging and labeling services.

Pressure Conversion Table

1"wc = 0.0361psi or 0.0736" Hg or .249 kPa.
1"Hg = 0.491psi or 13.6" wc or 3.39 kPa.
1psi = 27.7"wc or 2.036"Hg or 6.89 kPa
1 kPa = 4.01"wc or .295"Hg or .145 psi.