

## Air Pressure Sensing Switch with Adjustable Set Point Range

### Application

Cleveland Controls Model **AFS-A-173** is a general purpose airflow proving switch typically applied to package burners, furnaces, and fuel-burning equipment. It accurately senses positive, negative, or differential air pressure.

### General Description & Operation

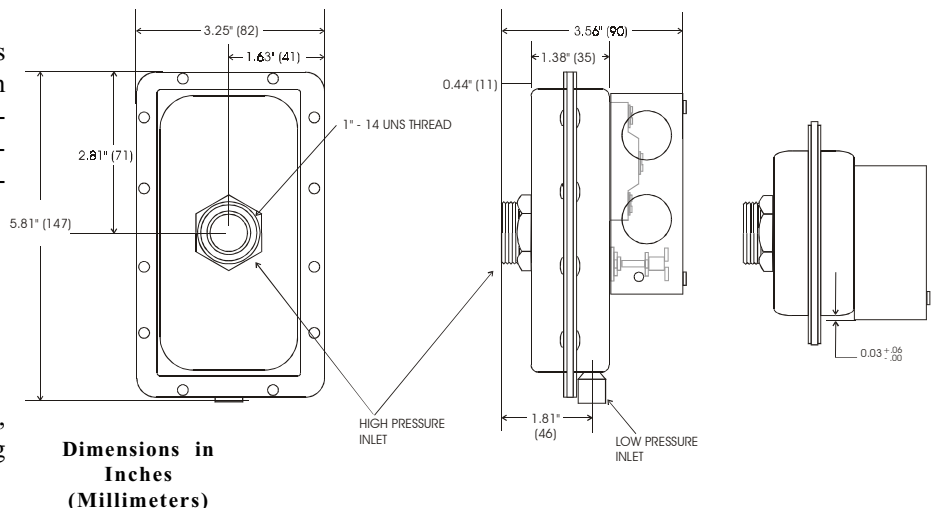
The plated housing contains a diaphragm, a calibration spring and a snap-acting SPDT switch.

The sample connections located on each side of the diaphragm accept a variety of threaded connection fittings suitable for air flow applications.

An enclosure cover guards against accidental contact with the live switch terminal screws and the set point adjusting screw. The enclosure cover accepts dual .5" conduit connections.

### Mounting (see Figure 1)

Select a mounting location which is free from vibration. The **AFS-A-173** 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 the switch to a flange via the 1" - 14 UNS externally threaded connector with pal nut. This connector is also internally threaded (1/4" - 18 NPT) for rigid mounting to a pipe nipple.

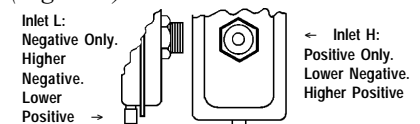
Refer to Figure 2 to identify the high pressure inlet (H) and the low pressure inlet (L). Select one of the five application options listed below, and connect the sample lines as recommended.

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

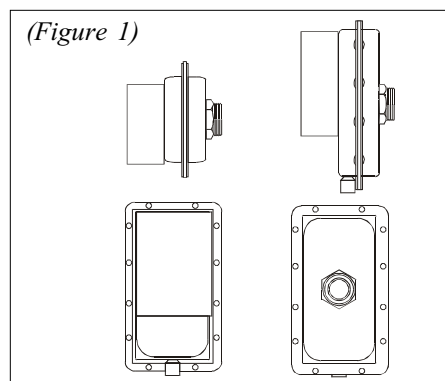
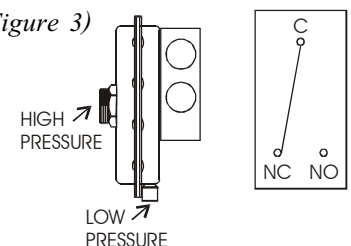
### Air Sampling Connection (see Figure 2)

The **AFS-A-173** is equipped with a 1/4" - 18 NPT female connector ("Inlet H" in Figure 2) and a 1/8" - 27 NPT female connector ("Inlet L" in Figure 2). For sample lines of up to 10 feet, 1/8" pipe is acceptable. For lines up to 20 feet, use 1/4" pipe. For lines up to 60 feet, use 1/2" pipe. For each right angle bend, add 4' to the computed sample line length to determine correct pipe size.

(Figure 2)



(Figure 3)



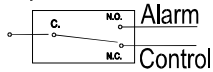
**Cleveland Controls**  
Division of UniControl Inc.  
1111 Brookpark Rd  
Cleveland OH 44109

Tel: 216-398-0330  
Fax: 216-398-8558  
Email: [sales@unicontrolinc.com](mailto:sales@unicontrolinc.com)  
Web page: <http://www.clevelandcontrols.com>

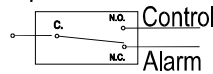
Distributed by:

(Figure 4)

To prove excessive air flow or pressure:



To prove insufficient air flow or pressure:



**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.

## 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.

## Field Adjustment

The adjustment range of an AFS-A-173 Air Switch is 0.05 to 12.0" w.c.,  $\pm 0.02$ " w.c. To adjust the set point:

Turn the adjusting screw counterclockwise until motion has stopped. Next, turn the adjusting screw 4 complete turns in a clockwise direction to engage the calibration spring. From this point, the next ten turns will be used for the actual calibration. **Each full turn represents approximately 1.2" w.c.**

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

## Specifications

### Model AFS-A-173 Air Flow Switch

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

**Set Point Range:**

0.05  $\pm$  0.02" w.c. to 12.0" w.c. (1.27  $\pm$  0.508 mm w.c. to 304.8 mm w.c.) (0 to 0.43 psi).

**Approximate Switching Differential:**

Progressive; increases from 0.02  $\pm$  0.01" w.c. at minimum set point to approximately 0.8" w.c. at maximum set point.

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

**Maximum Pressure:** 1/2 psi (0.03 bar)

**Operating Temperature Range:**

-40F to 180F (-40 to 82C)

**Life:** 100,000 cycles minimum at 1/2 psi 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 1/2" conduit.

**Sample Line Connectors:** 1/4" - 18 NPT female (high pressure inlet) 1/8" - 27 NPT female (low pressure inlet)

**Sample Line Connections:** Connectors will accept 1/4" OD rigid or semi-rigid tubing.

**Approval:** UL, FM, CSA

**Shipping Weight:** 1.2 lbs.

### Accessories

- Sample line probes.
- Orifice plugs (pulsation dampeners).

### Pressure Conversion Table

1" H<sub>2</sub>O = .0361 lbs./sq. in. or .0735 in. mercury

1" Hg. = .491 lbs./sq. in. or 13.6 in. water

1 psi = 27.7 in. water or 2.036 in. mercury

AFS-A-173 Sensing Switches are manufactured by Cleveland Controls Div. of UniControl Inc.

