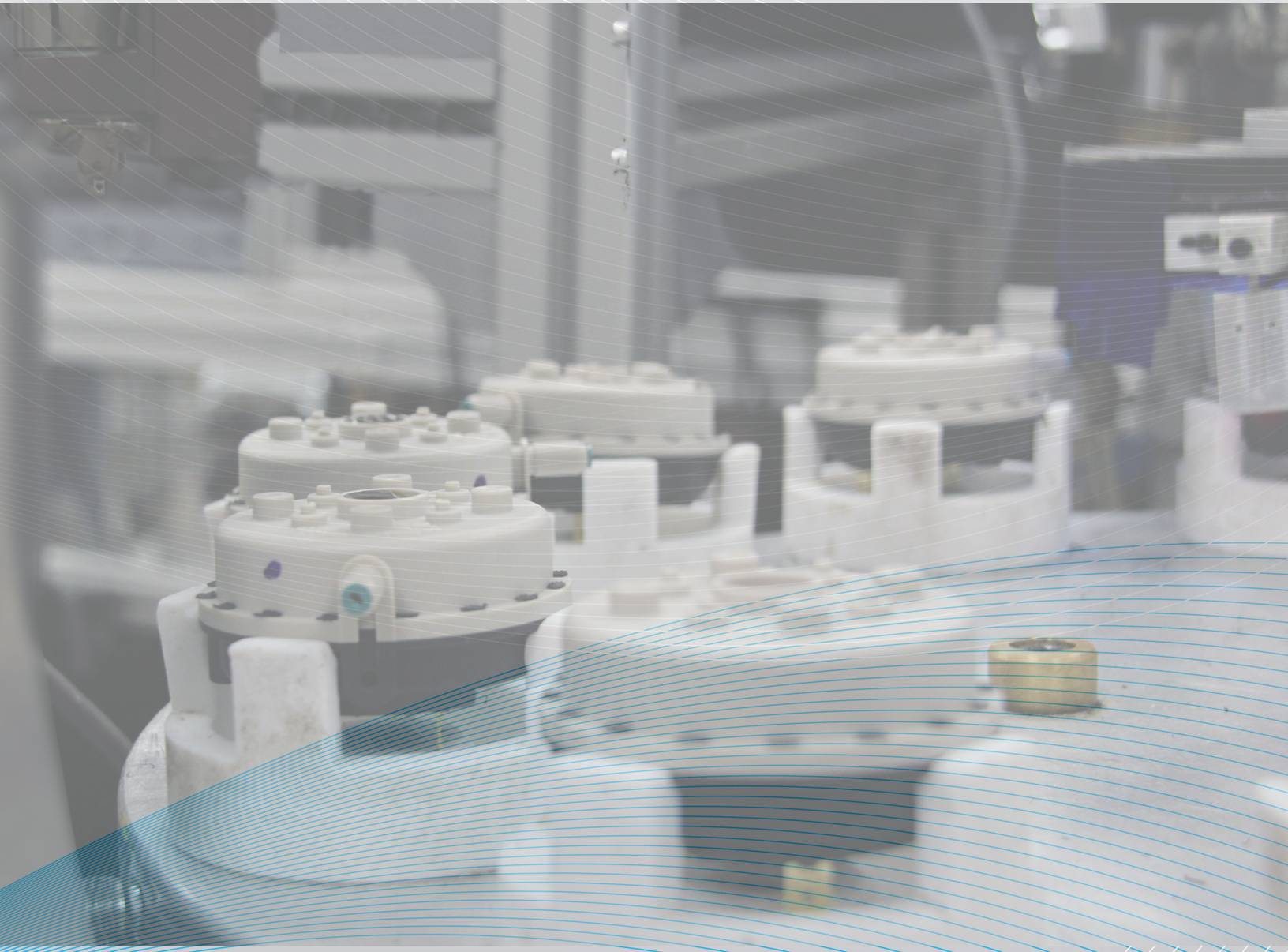
CLEVELAND CONTROLS™

Precision.
Every Day.



Air Pressure Sensing Switch Catalog

2024

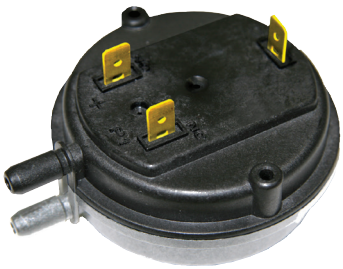
PLASTIC & METAL SENSING SWITCHES

Cleveland Controls manufactures over two hundred different thermoplastic and metal-body air flow pressure sensing switches. They vary in configuration options including fixed set point (nonadjustable models), set point range (adjustable models), switching action, mounting style, sample line connection style and terminal style. Many standard options, such as operation indication and timer delay, are available. In addition, we offer a complete line of switch accessories, including sensing probes and NEMA-rated housings. We readily quote custom designs to suit any application.

CONTENTS

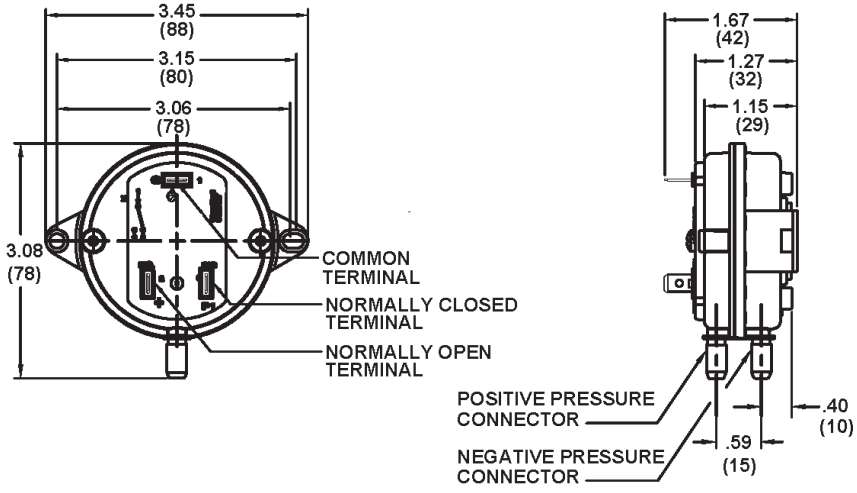
NS2™ SERIES SWITCHES WITH THERMOPLASTIC BODIES

NS2™ switches offer a narrow switching differential and low set point tolerance over a broad operating temperature and set point range. They are manufactured in a contaminant-free environment to ensure the highest quality and accuracy. The glass-filled polycarbonate housing contains a sensing diaphragm and an integral snap-acting switch. This design provides a high degree of stability and accommodates many sample line connector, terminal, and mounting options. The high and low pressure ports are color-coded for ease of identification. Air sample line connectors are located on either or both sides of the diaphragm in virtually any position required. An optional bleed hole is available. The standard electrical connection consists of male 90° quick-connect spade terminals. The integral snap action switch is actuated by a pressure or vacuum air flow, or by a pressure or vacuum differential. SPNO, SPNC, and SPDT terminal configurations are available, and terminal orientation on the housing can be specified. NS2™ switches are equipped either with integral mounting feet or one of a large selection of separate mounting brackets. Brackets can be oriented in any specified position. Numerous standard options are available for the NS2™ series. We quote custom features upon request.



NS2™ Switches for OEM's have fixed, factory-calibrated set points between .05" wc and 10" wc, and are configurable to sense positive, negative or differential air pressure. Every switch is designed to meet specific customer requirements. Reliable and economical, NS2™ switches are the ideal solution for high volume OEM applications.

NS2™-0000-0X Switches are the right choice for residential and light commercial HVAC applications. These models have field-adjustable set points between 0.10" to 10.0" wc, and offer all the features and options available for the non-adjustable NS2™ switch. In addition, field-adjustable NS2™'s are available in a convenient packaged kit. Designed with contractors in mind, the kit contains an adjustable NS2™ switch, instruction booklet, and the hardware necessary to calibrate the set point and install the switch.



Specifications

Material: Glass-filled polycarbonate body with silicone diaphragm

Mounting Position: Vertical or custom angle: specify with request for quotation.

Set Point Range:

Nonadjustable models: set point between 0.05" wc to 10.0" wc

Field Adjustable models: set point between 0.10" wc to 10.0" wc

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

Maximum Pressure: 14" wc

Operating Temperature Range:

-40 °F to 190 °F (-40 °C to 88 °C)

Life: 100,000 cycles minimum

Contact Arrangement: SPNO, SPNC, SPDT

Electrical Connections:

- Standard quick-connect copper-alloy terminals; ¼" x 0.032
- Optional quick-connect copper-alloy terminals; 3/16" x 0.032

Electrical Rating:

- **Standard Fine Silver Contacts:**

SPDT, SPST Electrical load: 1/10 hp @120 to 277 V ac; 28 VA pilot duty @ 24 V ac, 125 VA pilot duty @ 120 V ac

SPST Electrical load: 5 Amps resistive @ 24,120 to 277 V ac

- **Optional Gold Contacts:**

0.15 Amp resistive @ 24 V ac or V dc

Sample Line Connections: Black is positive, Gray is negative. Many configurations are available.

Sample Line Connectors:

Integral slip-on connectors, ¼" OD, accept 3/16" ID flexible tubing. For other available types, consult factory.

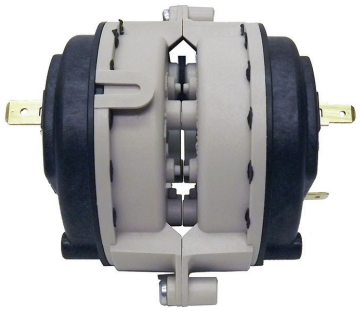
Approvals: UL, CUL, CSA, CE, AGA

Shipping Weight: < 1 lb; varies with configuration

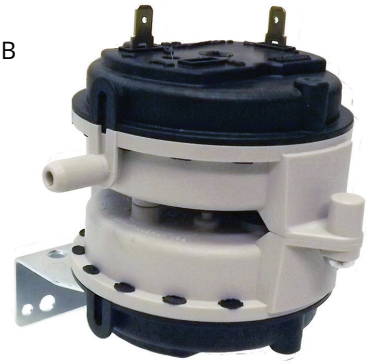
Accessories (Purchase separately):

- Adapters for slip-on flexible tubing: male/female duo-barb, suitable for 3/16" or ¼" ID tubing. Consult factory for additional types.
- Sample Line Probes
- Restricting Orifice Plugs (Pulsation Dampers)

A



B



DNS2™ SERIES

SWITCHES WITH THERMOPLASTIC BODIES

Series DNS2™ Switches are the best solution for applications that require dual set points. Typically, DNS2™ switches are applied to two-stage furnaces where high fire and low fire set points are required. Like all other NS2 switches, DNS2™ models have a narrow switching differential, and low set point tolerance over a wide operating temperature and set point range. Each of the two glass-filled polycarbonate housings contains a sensing diaphragm and an integral snap-acting switch. One or two sample line connectors are located on either or both sides of the diaphragm to accept air sample connections. Factory-calibrated and sealed set points are available from 0.05" to 10.0" wc for each module. The DNS2™ switch can be used to sense positive, negative or differential air pressure: the snap action switches are actuated by a pressure or vacuum air flow, or by a pressure or vacuum differential.

DNS2™ switches can be supplied with any of the configurations and options available for single NS2™ switches. The integral snap-acting switch mechanism is available in SPNO, SPNC, and SPDT terminal configurations. All standard and custom NS2™ options and accessories are available. Custom brackets specific to an OEM application are commonly specified for the DNS2™ switch. Please inquire about the many other custom features we offer.

DNS2™ Switches are essentially two separate NS2™ switches joined together. Two configurations are available:

- **A. Interconnected** models have a single inlet so that only one pressure/vacuum connection needs to be made. The cavities of the two switch pans are joined as shown in photo and drawing A.
- **B. Independent** models are simply two completely separate switches joined externally to provide the convenience of a single compact mount as shown in photo and drawing B. Use these in any situation where two switches are needed.

Specifications

Specifications for the DNS2™ switch are the same as the specifications for the two individual NS2™ switches that are joined to create the dual switch. Please consult the individual switch literature.

Factory Set Point Range:
Set point of each module is factory-calibrated and sealed to customer requirements. Each set point must have a value between 0.05" wc and 10.0 ± 0.05" wc.

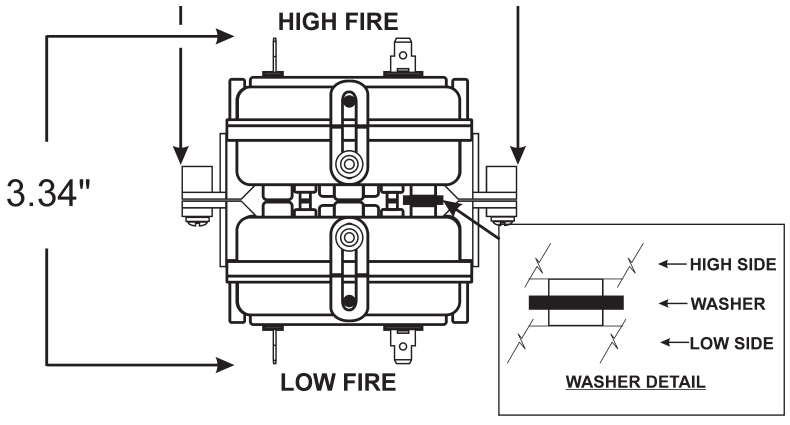
Options:
Most NS2™ option can be provided on DNS2™ models.

Accessories:
Please consult the factory for more information on in-line orifices, mounting bracket kits, sensing probes and more.

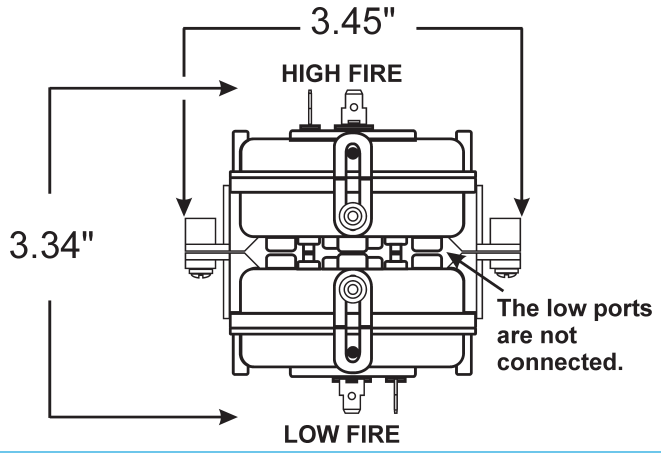
Approvals:
UL, CUL, CSA, CE and IAPMO-R&T Oceana.

Shipping Weight:
¼ lb., approximately

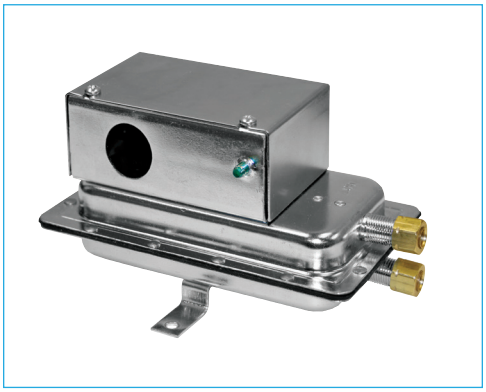
A



B



AFS SERIES ADJUSTABLE SET POINT SWITCHES



AFS Series are general purpose switches for HVAC, DDC, and Energy Management applications where they are used to sense positive, negative, or differential air pressure. They have field-adjustable or factory-calibrated set points between .03” wc and 12” wc. In all models, the plated housing contains a diaphragm, a calibration spring and a snap-acting SPDT switch. Sample connections are located on each side of the diaphragm. Numerous standard switch configurations are available, with a full range of mounting brackets, sample line connectors, and open or enclosed spade, screw, or wire lead switch terminals. Standard options include an enclosure cover with knockout for 1/2" conduit connection, gold contacts, set point indication, alarm light, timer delay, electronic dual set point, salt spray protection and NEMA-rated enclosures.

Specifications

Set Point Range:
0.05 ± 0.02" wc to 12.0" wc

Approximate Switching Differential:
Progressive, increasing from 0.02± 0.01 " wc at minimum set point to 0.8 " wc at maximum set point.

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

Maximum Pressure: ½ 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:
300 VA pilot duty at 115 to 277 V ac, 15 Amps noninductive to 277 V ac, 60 Hz.

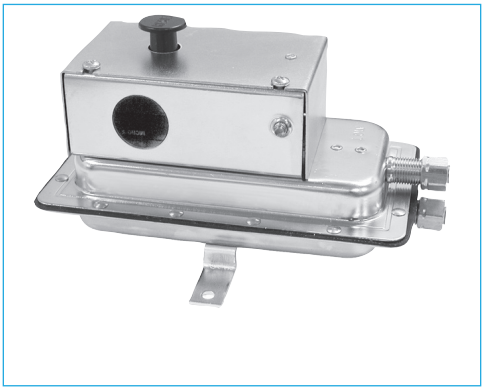
Contact Arrangement:
SPDT or custom.

Conduit Opening (optional):
⅞" diameter opening accepts ½" conduit.

Electrical & Sample Line Connectors:
See Selection Guide (p. 9) for available styles.

Approvals: UL and CSA. See specific models for additional approvals.

AFS SERIES MANUAL RESET SWITCHES



Series AFS Manual Reset Switches are general purpose switches for HVAC, DDC, and Energy Management applications that require the operator to reset the switch manually following actuation. They can sense positive, negative, or differential air pressure. Set points can be factory sealed, or field adjustable. All Series AFS Manual Reset Switches consist of a plated housing containing a diaphragm, a calibration spring and a snap-acting switch with manual reset button. Ranges of 0.40" to 12.0" wc are available with SPST-NC switches. Dual set point SPST-NC switches are also available. DPDT contacts can be provided for either 24 or 120 V ac applications. Sample connections located on each side of the diaphragm are available in common types to accept any rigid or flexible tubing. The switch enclosure cover accepts a 0.5" conduit connection. Switch enclosures for dual set point models accept two 0.5" conduit connections. Various standard and custom mounting brackets are available.

Specifications

Sample Media: Air.

Set Point Range:
0.40 ± 0.06" wc to 12.0" wc

Switch Differential:
Progressive, increasing from approximately 0.06± 0.01" wc at minimum set point, to approximately 0.8" wc at maximum set point.

Maximum Pressure: 0.5 psi (0.03 bar)

Operating Temperature Range:
-40 °F to 180 °F (-40.0 °C to 82.2 °C)

Life:
Exceeds UL-recognized mechanical endurance test of 6,000 cycles minimum at 0.5 psi maximum pressure each cycle and at maximum electrical load.

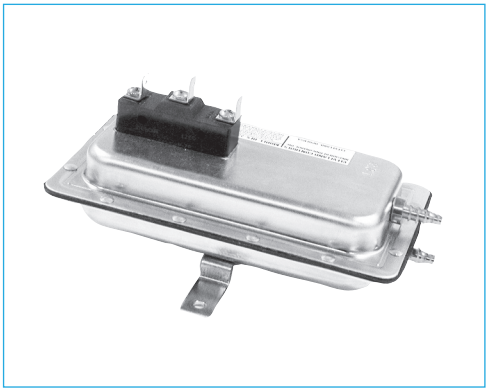
Electrical Rating:
@ 60 Hz., 15 Amp 125, 250, or 277 V ac
¼ hp 125 V ac, ½ hp 250 V ac,
½ amp 125 V dc, ¼ amp 250 V dc.

Contact Arrangement:
SPST-NC; DPDT; Dual SPST-NC.

Electrical & Sample Line Connectors:
See Selection Guide (p. 9) for available styles.

Approvals: UL and CSA. See specific models for additional approvals.

DFS & FS SERIES NONADJUSTABLE SWITCHES



These simple, economical and reliable switches have a standard, factory-fixed set point that actuates on pressure rise as low as .03" wc. DFS switches are ideal for duct heater, oven, or energy management applications where a non-adjustable set point is required. Numerous switch configurations are available, including mounting choices, sample line connector styles, open or enclosed switch terminals. Options include manual reset, set point indication, alarm light, time delay, electronic dual set point, salt spray protection and NEMA-rated enclosures.

Specifications

Set Point:
Fixed to operate on pressure rise or fall at 0.05±0.02" wc or 0.03" wc, + 0.02" wc

Switch Differential (Approximate):
0.02±0.01"wc (0.508±0.254 mm wc).

Maximum Pressure: ½ psi (0.03 bar).

Electrical Rating:
300 VA pilot duty at 115 to 277 V ac;
15 amp noninductive to 277 V ac, 60 Hz.

Contact Arrangement: SPDT.

Conduit Opening (optional):
⅞" diameter opening accepts ½" conduit.

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

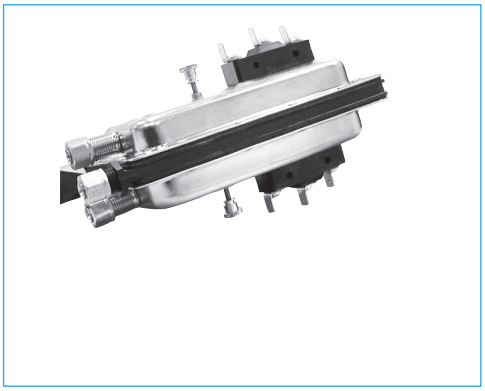
Mounting Position:
Diaphragm in any vertical plane to obtain specified operating set point.

Electrical & Sample Line Connectors: See Selection Guide (pp 9-11) for available styles.

Shipping Weight: 1.2 lbs.

Approvals: UL and CSA. See specific models for additional approvals.

DDP SERIES DUAL SET POINT SWITCHES



Series DDP Switches provide dual switching action for HVAC and Energy Management applications. Two separately operated, independently adjustable SPDT snap-acting switches are mounted on a common foot bracket. Differential pressures from 0.05±0.02 to 12.0" wc can be measured. Since the two snap switches are set independently, an adjustable "deadband" can be established for control circuits requiring both high and low actuation points. Each of the two plated housings contains a diaphragm, a calibration spring and a snap-acting SPDT switch. Two low pressure sample connections (one for each switch assembly), and the common high pressure sample connection (located on the foot bracket between the two low pressure connections) accept any rigid or flexible tubing. Several types of sample line connectors are available. Optional switch enclosure covers that accept ½" conduit connections can be provided for each switch assembly. A variety of terminal styles and materials can be provided, including screw terminals with cup washers, wire leads, and spade terminals. Surface-mount the Series DDP switch via the two 3/16" diameter holes (spaced 7" apart) in the integral mounting bracket.

Specifications

General

Operating temperature range:
-40 to 176 °F (-40 to 80 °C).

Shipping Weight: 1.5 lb. approx..

Common Foot Bracket Material:
Cycolac® T4500.

For Switching Elements "A" and "B"

Set Point Range:
0.05 ± 0.02" wc to 12.0"wc

Approximate Switching Differential:
Progressive, increasing from 0.02± 0.01 "wc at minimum set point to 0.8 " wc at maximum set point.

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

Maximum Pressure: ½ psi (0.03 bar).

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

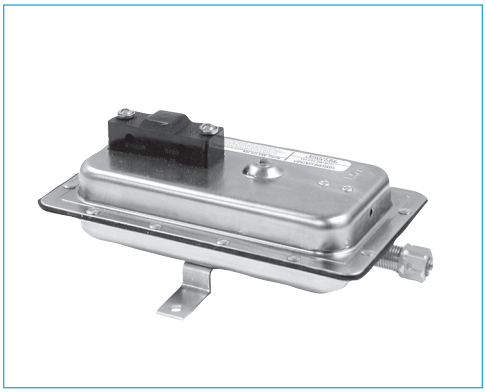
Contact Arrangement: SPDT or custom.

Conduit Opening (optional):
⅞" diameter opening accepts ½" conduit.

Electrical & Sample Line Connectors:
See Selection Guide (pp 9-11) for available styles.

Approvals:
UL and CSA. See specific models for additional approvals.

ANA SERIES SWITCHES FOR OEM APPLICATIONS



Series ANA switches are rugged economical models specifically designed for OEM markets. ANA switches can sense positive, negative, or differential air pressure. The plated switch housing containing a diaphragm and an SPDT or SPST snap-acting switch. A fixed set point between 0.05"wc and 12.0"wc is factory-calibrated and sealed. The switch operates at the specified set point when pressure rise or fall produces sufficient movement of the diaphragm. Sample line connections situated on either or both sides of the diaphragm accept rigid or flexible tubing. Many common sample line connectors and adapters are available. Available terminal styles include screw terminals with cup washers, wire leads, and spade terminals. The optional switch enclosure cover accepts a ½" conduit connection. Custom mounting brackets are available in addition to the standard foot bracket. The many available options include alarm light, timer delay, NEMA-rated housings, and brand labeling.

Specifications

Set Point Range:
0.05"± 0.02" wc to 2.0" wc

Switch Differential:
Progressive, from 0.02" ± 0.01" wc at minimum set point, to approximately 0.10" wc at maximum set point

Maximum Pressure: ½ psi (0.03 bar)

Electrical Rating:
300 VA pilot duty at 115 to 277 V ac; 15 Amp noninductive; to 277 V ac, 60 Hz

Electrical Switch: Snap-action switch

Contact Arrangement:
SPDT, SPST/NO or SPST/NC logic

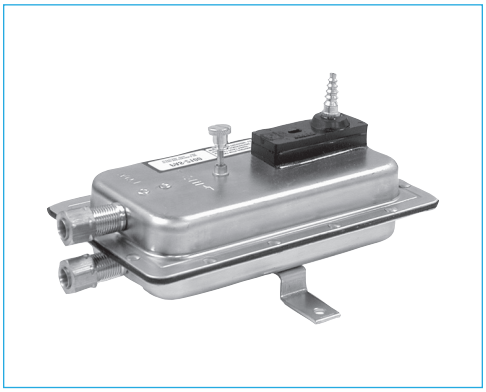
Electrical & Sample Line Connectors:
See Selection Guide (pp 9-11) for available styles.

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

Mounting Position:
Diaphragm in any vertical plane to obtain specified operating set

Approvals: UL and CSA. See specific models for additional approvals.

PAS SERIES PNEUMATIC SWITCHES



Series PAS Pneumatic Switches are general purpose proving switches for the HVAC and Energy Management industry that sense the flow of air and provide a proportional pneumatic signal for pneumatic actuation applications (such as intrinsically safe environments or any area where it is desirable to avoid electrical arcing). Series PAS switches can be used to sense static or differential air pressure between 0.15"wc and 12.0"wc. The plated housing contains a diaphragm, a calibration spring and a pneumatic module with a 5-barbed connector suitable for flexible tubing from 0.125" to 0.25" ID. The sample connections located on each side of the diaphragm accept any rigid or metallic tubing. Several types of sample line connectors are available. The pneumatic switch vents a restricted compressed air source until reaching set point, where switch actuation closes the vent and sends a full pressure pneumatic signal to an electrical switch outside of the hazardous area, or actuates a pneumatically driven element directly. Output is 20 psi maximum. **Series PAS** Switches are surface-mounted via two 3/16" diameter holes located 3-7/8" apart on the integral strap bracket.

Specifications

Set Point Range:
0.15 ± 0.01" wc to 2.0"wc or
0.15 ± 0.01"wc to 12.0"wc

Output:
Fan ON and Air Flow:
20 psig @ 0.15"wc or higher.
Fan OFF and no Air Flow:
¼ psig @ 0.015"wc or lower

Measured Media: Air.

Maximum Pressure: 1 psi (0.06 bar)

Operating Temperature Range:
0 °F to 135 °F (-18 °C to 57 °C)

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

Pneumatic Connection:
5-barbed connector suitable for flexible tubing

Sample Line Connectors:
Male, externally threaded 7/16" 24 UNS 2A thread, complete with nuts and self-aligning ferrules

Sample Line Connections:
Connectors accept ¼" OD rigid or semi-rigid tubing

Shipping Weight: 1.2 lbs.

Approvals: UL and CSA. See specific models for additional approvals.

RFS Series Specifications

Mounting Position: Diaphragm in any vertical plane

Standard Set Point Ranges

0.15 ±0.02" wc to 2.0" wc

0.15 ±0.02" wc to 5.0" wc

Approximate Switch Differentials:

For 2.0"wc set point range: progressive, increasing from 0.05±0.02" wc at minimum set point to approximately 0.2" wc at maximum set point.

For 5.0"wc set point range: progressive, increasing from 0.05±0.02" wc at minimum set point to approximately 0.3" wc at maximum set point.

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

Maximum Pressure: ½ psi (0.03 bar).

Operating Temperature Range:

-40 to 180 °F (-40 to 82 °C).

Life: 100,000 cycles minimum at ½ psi maximum pressure each cycle and at maximum rated electrical load.

Electrical Rating: 300 VA pilot duty at 115 to 277 V ac; 15 Amp noninductive to 277 V ac, 60 Hz.

Contact Arrangement: SPST-NO, SPST-NC, SPDT

Electrical Connections:

¼", 90° quick-connect spade terminals or screw terminals with cup washers

Sample Line Connectors

See Selection Guide (pp 9-11) for available styles.

Approvals: UL, CUL

Shipping Weight: < 1 lb.

GRFS Series Specifications

Mounting Position: Diaphragm in any vertical plane. Neither the gas connection nor the vent connection should point upward.

Standard Fixed Set Point (Non-adjustable Models): 0.18±0.05" wc

Adjustable Set Point Models:

5 standard set point ranges: See specific model literature.

Approximate Switch Differentials:

progressive, increasing from 0.05±0.02" wc at minimum set point, to value determined by range:

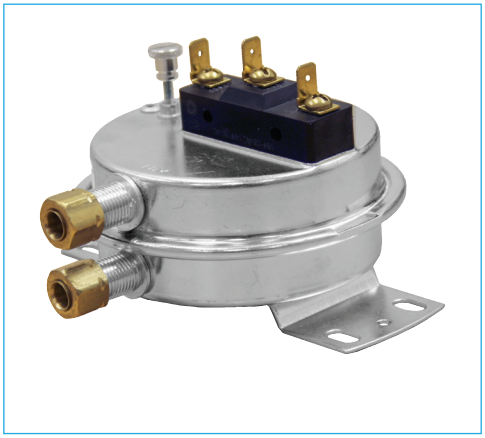
Measured Media: Air or natural, manufactured, LP, or other gas that will not degrade nitrile

Maximum Pressure: ½ psi (0.03 bar)

Operating Temperature Range: 0 to 190 °F (-18.0 to 88 °C)

All Other Specifications: Same as RFS Series, above.

RFS SERIES COMPACT METAL SWITCHES



RFS Series switches are compact general purpose proving switches designed for HVAC and Energy Management applications. They can sense positive, negative, or differential air pressure. Adjustable and nonadjustable set points are available. The plated housing encloses a diaphragm and a snap-acting switch. The sample line connections located on each side of the diaphragm accept rigid or flexible tubing. Mounting styles, sample line connections, and electrical terminations styles are available as shown on page 9. An enclosure cover is available to guard against accidental contact with the live switch terminals. The enclosure cover has five knockouts that accept a ½" conduit connection.

GRFS SERIES LOW PRESSURE GAS SENSING SWITCHES

Series GRFS are compact, economical switches specifically designed for use with natural, manufactured or LP gas in furnaces, package burners and other fuel-burning equipment. They are ideal for any low gas pressure proving or flow proving application. Models are available with field adjustable set point ranges or nonadjustable set points between 0.10" wc and 12" wc are available.

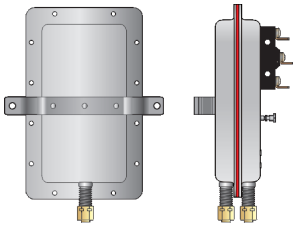
The plated housing encloses a diaphragm and a snap-acting switch. The gas inlet is located on the high pressure side of the diaphragm, and the vent is located on the low pressure side of the diaphragm. The gas inlet and vent accept a pipe nipple or coupling suitable for gas flow applications.

Various electrical configurations are available. Standard models have screw terminals with cup washers or ¼" 90° quick connect spade terminals. SPDT and SPST configurations are available. An enclosure cover is available to guard against accidental contact with the live switch terminals. The enclosure cover has five knockouts that accept a ½" conduit connection.

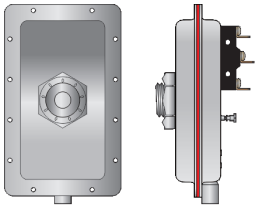
TYPICAL METAL SENSING SWITCH FEATURES

Cleveland Controls manufactures hundreds of sensing switch models. The three most common switch configuration variables are mounting style, sample line connections, terminal style, and electrical rating. In addition to the standard styles shown below, we offer custom variations to suit any application. Note that the alphabetic designations for each option below refer to the Selection Guide Tables on pages 10 and 11 of this catalog.

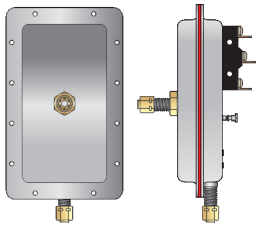
Mounting Styles



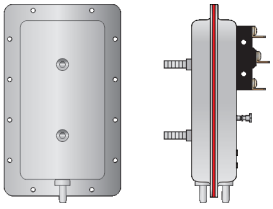
A
Standard Foot Bracket



B
1" - 14 UNS "PAL" Nut

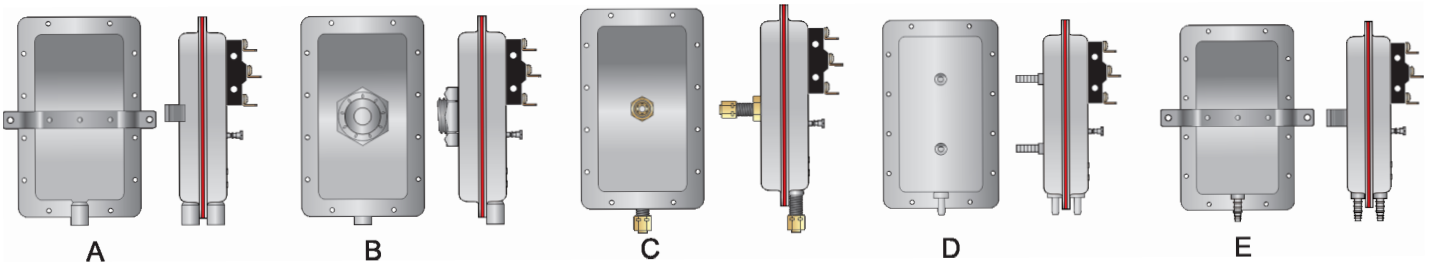


C
7/16" - 24 UNS Thread with Nut



D
#10 - 32 UNF Studs

Sample Line Connectors



1/8" - 27 NPT Female Thread

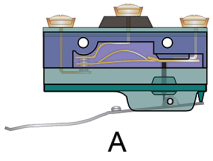
1/4" - 18 NPT Female Thread & 1/8" - 27 NPT Female Thread

1/4" Compression Nut & Ferrule

1/4" OD Slip-On Fitting

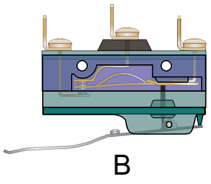
1/4" OD Barbed Fitting Suitable for Flexible Tubing

Standard Terminal Styles



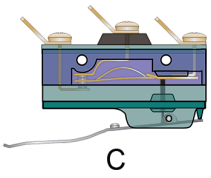
A

Screw Terminals with Cup Washers



B

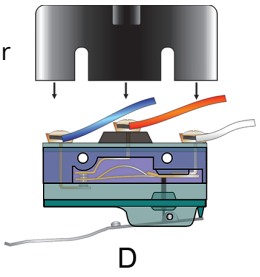
1/4" - 90° "Quick Connect Spade Terminals



C

1/4" - 45° "Quick Connect Spade Terminals

Optional Snap Switch Cover



D

Three 18-gauge Wire Leads (11.5" long) in Termflex (6" long)

Electrical Specifications

A. Standard Contacts:
15 A noninductive to 277 V ac;
300 VA pilot duty at 115 or 277 V ac.

B. Gold Contacts:
300 vA pilot duty at 115 or 277 V ac;
15 A noninductive to 277 V ac; 10 mA at 5 V dc.

C. Manual Reset Switch:
15 A noninductive to 277 V ac (60 Hz);
¼ hp 125 V ac, ½ hp 250 V ac.
½ A 125 V dc, ¼ a 250 V dc.

METAL BODY SENSING SWITCH SELECTION GUIDE

(Alphabet codes refer to illustrations on page 9)

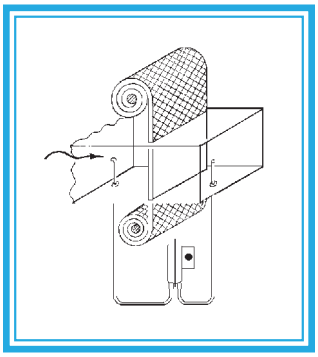
SET POINT RANGE, INCHES WC	MODEL	ENCLOSED SWITCH MODULE	MOUNTING BRACKET	SAMPLE LINE CONNECTORS	TERMINATION STYLES	CONTACT TYPE	ELECTRICAL RATING	APPROVALS, LISTINGS, RECOGNITION UL	FM	CSA	CE
AFS SERIES: AIR PRESSURE SENSING SWITCHES WITH FIELD-ADJUSTABLE SET POINTS											
.03-2.0" wc	AFS-398	•	A	C	A	SPDT	A	•			
.05-2.0" wc	AFS - 148		A	A	B	SPDT	A	•		•	•
	AFS-150-112		D	E	C	SPST-NO	A	•		•	•
	AFS - 155		A	A	A	SPDT	A	•		•	•
	AFS - 156		LEFT-SIDE	C	C	SPST-NO	A	•		•	•
	AFS - 179		B	B	C	SPST-NO	A	•		•	•
	AFS - 181	•	A	A	A	SPDT	A	•	•	•	•
	AFS - 202	•	LEFT-SIDE	C	C	SPST-NO	A	•		•	•
	AFS - 219		A	C	C	SPST-NO	A	•		•	•
	AFS - 232		B	A	D	SPDT	A	•	•	•	•
	AFS - 246		RIGHT-SIDE	C	B	SPST-NO	A	•		•	•
	AFS-249-112		A	E	C	SPST-NO	A	•	•	•	•
	AFS - 262	•	A	C	A	SPDT	A	•	•	•	•
	AFS - 271		A	C	B	SPDT	A	•	•	•	•
	AFS - 273		C	C	B	SPDT	A	•	•	•	•
	AFS-275-112		A	E	B	SPDT	A	•		•	•
	AFS - 299		D	C	C	SPST-NO	A	•		•	•
	AFS-399-112		D	E	B	SPDT	A				
	AFS - 414		A	C	D	SPST-NO	A	•		•	•
	AFS - 432	•	C	C	A	SPDT	A	•		•	•
	AFS - 438	•	B	B	A	SPDT	A	•	•	•	•
	AFS - 440		B	B	A	SPDT	A	•		•	•
	AFS - 442	•	A	A	A	SPDT	A	•	•	•	•
	AFS - 447	•	RIGHT-SIDE	C	A	SPDT	A	•		•	•
	AFS - 449	•	NONE	C	A	SPDT	A	•		•	•
	AFS - 477	•	A	C	A	SPDT (Gold)	B	•		•	•
.05 - 12.0" wc	AFS - 145	•	A	A	A	SPDT	A	•	•	•	•
	AFS - 222	•	A	C	A	SPDT	A	•	•	•	•
	AFS - 227		A	C	A	SPDT	A	•	•	•	•
	AFS - 228		A	C	B	SPDT	A	•	•	•	•
	AFS - 236	•	B	B	A	SPDT	A	•		•	•
	AFS - 238		C	C*	A	SPDT	A	•	•	•	•
	AFS - 240	•	C	C*	A	SPDT	A	•	•	•	•
	AFS-298-112		A	E	B	SPDT	A	•		•	•
	AFS - 405	•	A	C	A	SPDT (Gold)	B	•		•	•
	AFS - 409	•	C	C*	A	SPDT	A	•		•	•
	AFS - 410		Flat Strap	C	A	SPDT (Gold)	B	•		•	•
	AFS - A	•	B	B	A	SPDT	A	•	•	•	•
	AFS-D-AO		B	B	B	SPDT	A	•	•	•	•
.40-12.0" wc	AFS - 460	•	A	C	A	SPST-NC (manual reset)	C	•		•	•
1.25-12.0" wc	AFS-460-DSS	•	A	C	A	DUAL SPST-NC (manual reset)	C	•			

METAL BODY SENSING SWITCH SELECTION GUIDE

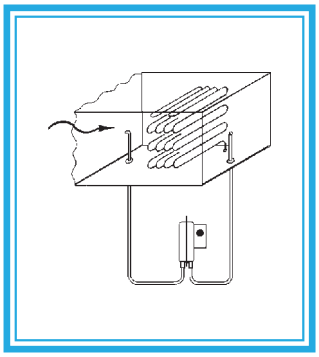
(Alphabet codes refer to illustrations on page 9)

SET POINT RANGE, INCHES WC	MODEL	ENCLOSED SWITCH MODULE	MOUNTING BRACKET	SAMPLE LINE CONNECTORS	TERMINATION STYLES	CONTACT TYPE	ELECTRICAL RATING	APPROVALS, LISTINGS, RECOGNITION UL FM CSA CE			
AFS 900 SERIES AIR PRESSURE SENSING SWITCHES IN NEMA-RATED HOUSINGS											
.05-12.0" wc	AFS-951	•	CUSTOM	B	SCREW	SPDT	A	•	•	•	•
	AFS-952	•	CUSTOM	B	SCREW	SPDT	A	•	•	•	•
	AFS-952-55	•	CUSTOM	B	SCREW	SPDT	A	•	•	•	•
	AFS-953	•	CUSTOM	B	SCREW	SPDT	A	•	•	•	•
ANA SERIES AIR PRESSURE SENSING SWITCHES											
.05-2.0" wc	ANA-101	•	B	B	A	SPDT	A	•		•	•
	ANA-122		A	C	C	SPST-NO	A	•		•	•
DDP SERIES: DUAL DIFFERENTIAL PRESSURE SENSING SWITCHES (INDEPENDENT SET POINTS)											
.05-2.0" wc	DDP-106		MANIFOLD	C	B	SPDT	A	•		•	•
	DDP-109	•	MANIFOLD	C	A	SPDT	A	•		•	•
.05-12.0" wc	DDP-105		MANIFOLD	C	A	SPDT	A	•		•	•
	DDP-111	•	MANIFOLD	C	A	SPDT	A	•		•	•
DFS SERIES: AIR PRESSURE SENSING SWITCHES WITH FIXED SET POINTS											
SET @ 0.03" wc	DFS-301-112		A	E	B	SPDT	A	•	•	•	•
SET @ 0.05" wc	DFS-221-112		A	E	B	SPDT	A	•	•	•	•
	DFS-231		C	C	B	SPDT	A	•		•	•
	DFS-243		A	C	B	SPDT	A	•		•	•
	DFS-423-112		A	E	A	SPDT	A	•		•	•
	DFS-458		A	C/VENT TO ATM.	C	SPST-NO	A	•		•	•
	FS-751	•	A	C	A	SPDT	A	•		•	•
SET @ 0.2" wc	DFS-292	•	A	C	A	SPDT	A	•		•	•
	DFSL-CO	•	B	B	A	SPDT	A	•	•	•	•
SET @0.4" wc	DFS-411	•	A	C	A	SPDT	A	•		•	•
	DFSH-CO	•	B	B	A	SPDT	A	•		•	•
PAS SERIES: PNEUMATIC AIR PRESSURE SENSING SWITCHES											
0.15-2.0" wc	PAS-2100		A	C	N/A	PNEUMATIC	E				
0.15-12.0" wc	PAS-2200		A	C	N/A	PNEUMATIC	E				
RFS SERIES: COMPACT METAL AIR PRESSURE SENSING SWITCHES											
0.15-5.0" wc	RFS-4150		A	E	A	SPDT	A	•			
0.15-5.0" wc	RFS-4100		A	C	A	SPDT	A	•			
GRFS: GAS SENSING SWITCH FOR AIR, NATURAL GAS, LP, OR ANY GAS THAT WILL NOT DEGRADE SILICONE											
0.18-20.0" wc	Adjustable	•	Any	Any	Any	SPDP or SPST					
0.18±0.005" wc	Std. Fixed SP	•	Any	Any	Any						

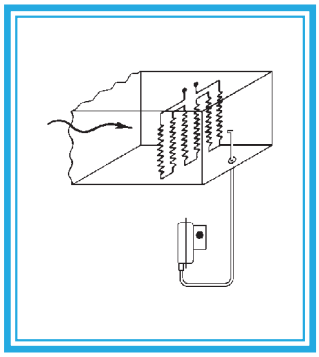
TYPICAL APPLICATIONS



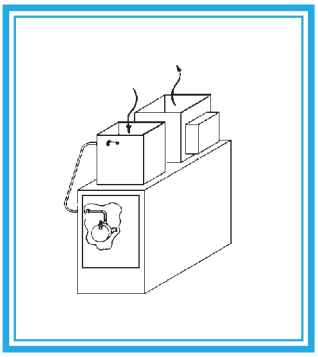
1. Conditioned air filters that accumulate particulate employ sensing switches to sense the differential pressure/airflow drop across the filter to signal condition or actuate roll filter drive motor.



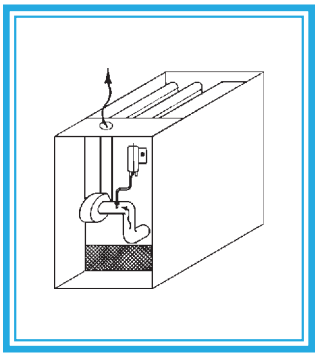
2. Refrigeration and cooling coils are maintained by sensing differential pressure/airflow drop across coils; switch actuation signals condition when they ice, or actuates the defrost cycle.



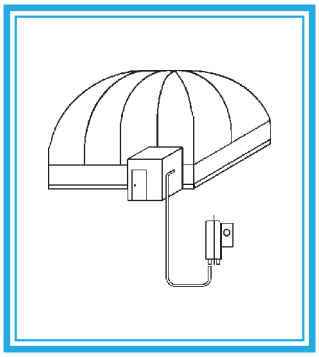
3. Strip heaters employ airflow sensing switches to prove positive pressure/airflow in duct and air movement across heat source; shuts heat source off with insufficient airflow.



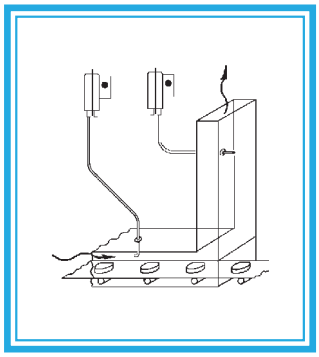
4. Electronic air cleaners and humidifier units can employ sensing switches to prove airflow; switch actuation starts unit with sufficient airflow or draft.



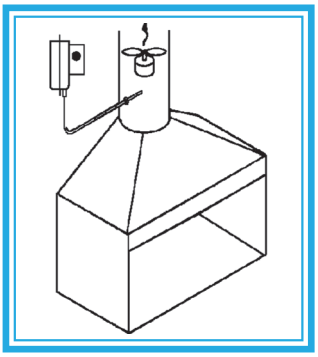
5. On gas-fired units, prove fan flow by sensing draft down from blower; switch actuation allows ignition start-up or shuts system down upon insufficient draft.



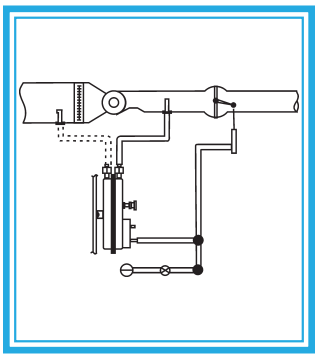
6. On air-supported structures and enclosures, sensing switches ensure proper inflation or internal pressure; switch actuation controls blower to maintain pressure.



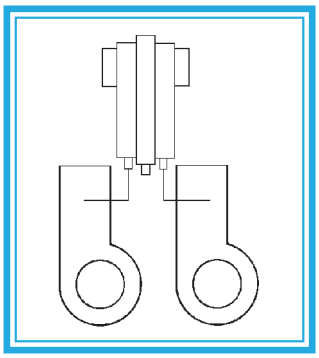
7. In drying processes, positive and negative pressure sampling ensure adequate airflow and draft; switches signal fan/airflow failure or insufficient draft, and control drying conveyor.



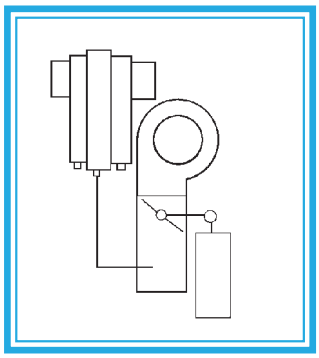
8. Exhaust fans and fume hoods employ sensing switches to sense draft down from exhaust fan; switch actuation signals condition upon fan failure or insufficient draft.



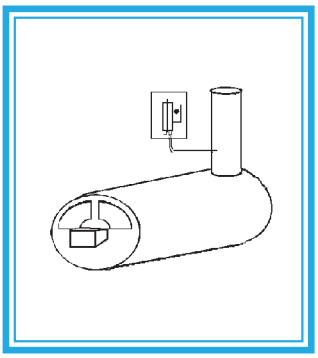
9. A Series PAS Pneumatic Air Switch provides a pneumatic signal proportional to differential pressure for pneumatic control systems.



10. A Series DDP Dual Differential Pressure Switch can be used to prove air flow on a dual-fan system with a single switch.



11. A Series DDP Dual Differential Pressure Switch can provide two independent spdt switches with independent set points for alarm and control circuits. In this example, fan operation and filter condition are proved.



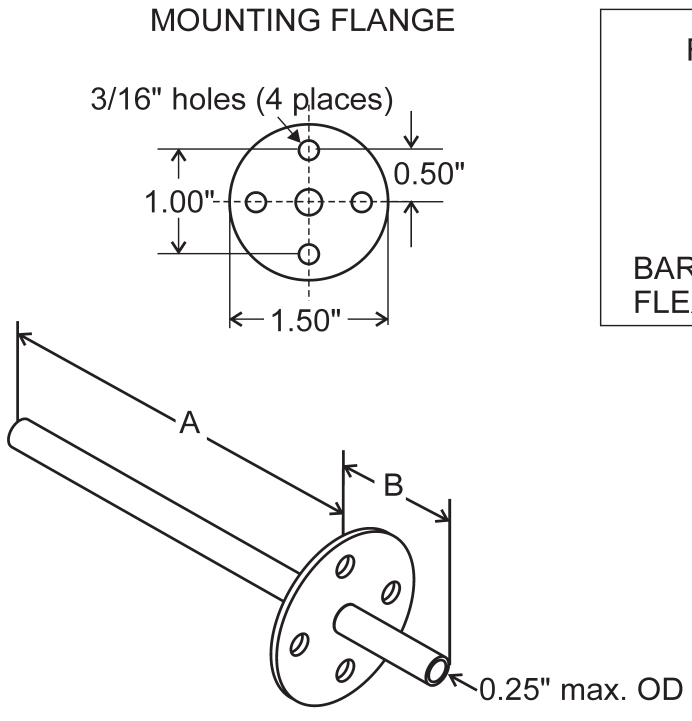
12. AFS-950 Series switches have time delay relays to eliminate nuisance boiler shut downs on low draft or high furnace pressure protection applications.

Note: See Bulletin AFS-05.01 for probes used in these applications.
Consult Sales Office for set point indicators, special enclosures, and other options.

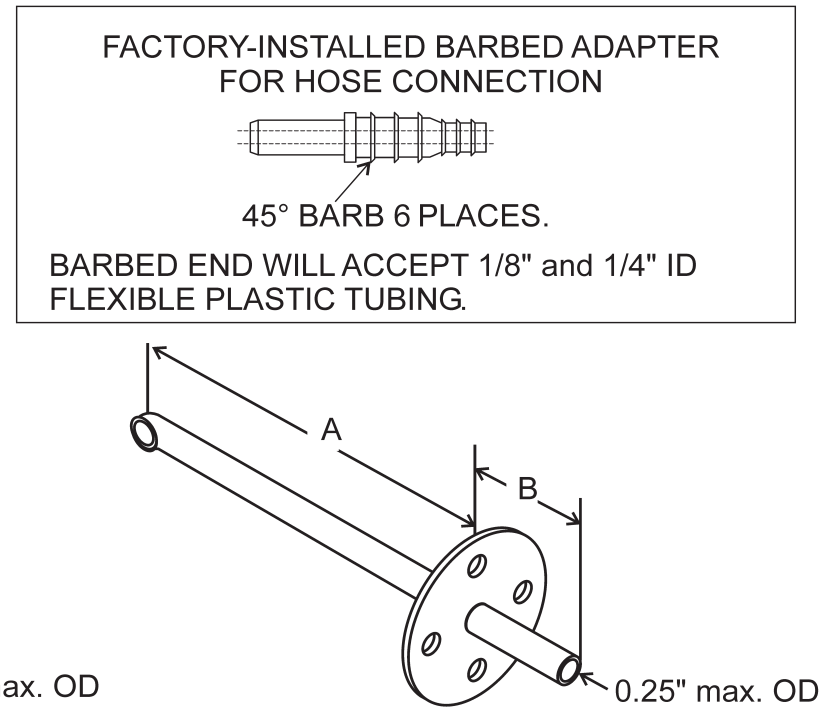
SENSING PROBES

FOR AIR PRESSURE SENSING SWITCH APPLICATIONS

STATIC PRESSURE PROBES					TOTAL PRESSURE (IMPACT) PROBES				
Dimension A	Smooth OD Dimension B	Part Number	Barbed End Dimension B	Part Number	Dimension A	Smooth OD Dimension B	Part Number	Barbed End Dimension B	Part Number
1.5	1.0	21397	1.75	21397-112	1.5	1.0	21401	1.75	21401-112
2.0	.5	21116	1.25	21116-112	2.0	.5	21120	1.25	21120-112
3.5	1.0	21398	1.75	21398-112	3.5	1.0	21402	1.75	21402-112
4.0	.5	21117	1.25	21117-112	4.0	.5	21121	1.25	21121-112
5.5	1.0	21399	1.75	21399-112	5.5	1.0	21403	1.75	21403-112
6.0	.5	21118	1.25	21118-112	6.0	.5	21122	1.25	21122-112
7.	1.0	21400	1.75	21400-112	7.5	1.0	21404	1.75	21404-112
8.0	.5	21119	1.25	21119-112	8.0	.5	21123	1.25	21123-112
					10.0	.5	28527	1.25	28527-112
					12.0	.5	28528	1.25	28528-1



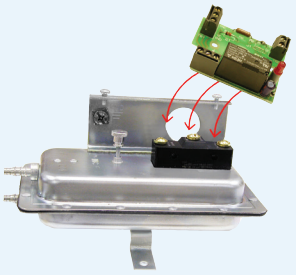
STATIC PRESSURE PROBE
(ASPIRATION)



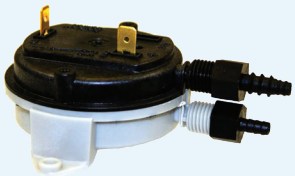
TOTAL PRESSURE PROBE
(IMPACT)

OPTIONS & SERVICES

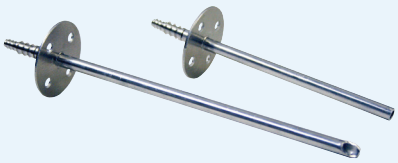
Cleveland Controls offers more air pressure sensing switch features and options than any other manufacturer. Here are some of the most popular:



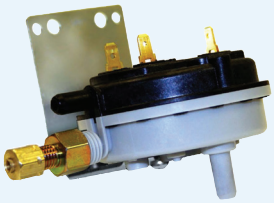
- CSA, CE, FM, UL approvals
- Name branding
- Individual and custom packaging
- Factory-calibrated and Factory-fixed Set Points
- Visual set point indicators
- Operation Indicators (Mechanical and Visual)



- NEMA-rated housings
- Field-adjustable Replacement Kits
- Sample line probes
- Adapters for flexible tubing
- Restricting Orifices



- Barbed fittings
- Manual reset



- Gold contacts
- Two-year factory warranty
- Salt-spraying and other special coatings
- Indicator light
- Time delay relays
- Interposing Relay for electronic "DPDT" applications

We are happy to quote custom features and accessories upon request.

SENSING SWITCH APPLICATION DATA

Date:	
Requested By:	
Title:	
Company:	
Address:	
Phone: Ext:	
E-mail:	
Prepared By:	
Company:	

APPLICATION DATA
Industry:
Use:
Annual Volume (Units):

1.0. LOCATION (check all that apply)							
	Indoor		Outdoor		Enclosed		Exposed

2.0 ATMOSPHERE	
	Noncorrosive (Normal)
	Corrosive. Identify:

3.0 SAMPLE MEDIA	
	Air
	Other. Identify:

4.0 TEMPERATURE (include ambient air and sample media)		
	Ambient Air:	Sample Media:
-40-180 °F (40-82 °C)		
Other. Specify:		

5.0. ENCLOSURE			
	None		Weather proof
	Conduit Enclosure		Explosion proof

6.0 DIAPHRAGM POSITION			
	Vertical		Horizontal
Custom. Specify:			

7.0 MOUNTING CONFIGURATION			
	Strap bracket, vertical (std)		Foot mount, right angle
	1" - 14 UNS, center bottom		#10-32 studs
	7/16" -24 UNS, center bottom		Strap bracket, horizontal
	Custom. Attach sketch or description.		

8.0 SAMPLING TYPE			
	Positive only		Negative only
	Differential pressure		

9.0 SET POINT
Field-Adjustable Factory Set @
Non Field-Adjustable Factory Set & Sealed @
Non-Adjustable Set Point @

10.0 SWITCHING ACTION	
	Change contacts on increasing pressure or vacuum.
	Change contacts on decreasing pressure or vacuum.

11.0 SWITCHING LOGIC			
	SPDT		DPDT
	SPST-NC		SPST-NO

12.0 ELECTRICAL RATING	
	300 VA Pilot duty at 120 to 277 V ac. 15 A noninductive to 277 V ac. 60 Hz.
	120 VA Pilot duty at 120 V ac. 5 A noninductive at 120-277 V ac. 60 Hz.

13.0 ELECTRICAL TERMINALS			
	Screw terminals with cup washers		
	Wire Leads		
	Gauge:	Length:	
Quick-connect Spade Terminals			
	¼", 90°		¼", 45°
	$^{3}/_{16}$", 90°		$^{3}/_{16}$", 45°

14.0 SAMPLE LINE CONNECTORS: Select HIGH & LOW pressure connections		
High	Sample Line Connectors	Low
	1/8"-27 NPT, Female	
	1"-14 external and ¼-18 NPT	N/A
Internal (center bottom location)		
	¼" Smooth Slip-on	
	¼" Barbed Slip-on	
	¼" Internal Tube, 5/16"-18 male	
Integral connector (with nut & ferrule)		
	No Connector	
	Custom (attach description)	

15.0 AGENCY RECOGNITION OR APPROVAL REQUIRED			
	None		CE
	FM		CSA
	UL/CUL		Other (attach code)

16.0 CUSTOM OPTIONS: DESCRIBE BELOW OR ATTACH SKETCH.
17.0 SKETCH OR NOTES ATTACHED?

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Precision.
Every Day.

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