



Air Switch

A device that detects changes in air pressure or air flow and completes or interrupts an electrical control signal. In operation, the movement of a diaphragm in response to changes in air pressure, actuates an electrical switch to perform a wide variety of alarm and control functions. An air switch is often called an air flow pressure sensing switch, a pressure switch, or a sensing switch.

Set Point

The pressure value to which the adjustment mechanism is preset to initiate switching action.

Adjustable Set Point Switch

A switch designed with a mechanism to permit field or factory selection of the set point.

Set Point Range

The array of pressure values defined by an upper limit and a lower limit within which an adjustable set point may be selected.

Fixed Set Point Switch

A switch which is factory calibrated for a specific set point that cannot be altered later.

Atmospheric Pressure

The pressure exerted in every direction at any given point by the weight of the atmosphere. The factory "zero" setting of a Cleveland Controls air switch is calibrated to match atmospheric pressure.

Positive Pressure Switch

A switch that operates in response to pressure greater than atmospheric pressure.

Negative Pressure or Draft Switch

A switch that operates in response to pressure less than atmospheric pressure.

Differential Pressure Switch

A switch that operates in response to the difference between two pressure inputs.

Operate

Mechanically change the electrical contact position of the switch due to a change in pressure.

Release

Mechanically return the electrical contact position to the original (pre-operate) state.

Make and Break

The result of operating and releasing: the closing of the switch contacts completes or makes a circuit, while the opening of the switch contacts interrupts or breaks the circuit.

Sensitivity

The minimum amount of pressure required to operate or release the air switch.

Switching Differential

The difference between the pressure change required to operate the switch (cause it to "make" the circuit) and the pressure change required to release the switch (cause it to "break" the circuit), expressed in inches water column.

Pressure Differential

The difference between any two pressures.

Operate Range

The theoretical **minimum** range of field adjustable set points available after application of tolerances to the specified low and high set points. To determine the minimum operating range:

1. Add the high tolerance of the minimum specified set point to the minimum specified set point, resulting in the minimum low operating set point.
2. Add the low tolerance of the maximum specified set point to the maximum specified set point, resulting in the maximum high operating set point.

Table 1: Minimum Operate Range

Operate Range Calculations	Example
A. Minimum Set Point + High Tolerance	0.05"wc + 0.02"wc
= Minimum Operate Point	= 0.07"wc
B. Maximum Set Point + Low Tolerance	12.00"wc + (- 0.20)"wc
= Maximum Operate Point	= 11.80"wc

Release Range

The theoretical minimum range of points at which an air switch releases to its original contact state, after having initially passed through the set point. To determine the minimum release range, determine its upper and lower values as follows:

- A.
 1. Add the high tolerance of the minimum specified set point to the minimum specified set point.
 2. Add the specified approximate switching differential at the minimum set point to the high tolerance of the specified approximate switching differential.
 3. Subtract Step 2 from Step 1. The result is the minimum release point.
- B.
 1. Add the low tolerance of the maximum specified set point to the maximum specified set point.
 2. Add the specified approximate switching differential at the maximum set point to the high tolerance of the specified approximate switching differential.
 3. Subtract Step 2 from Step 1. The result is the **maximum release point**.

Table 2: Release Range

Release Range Calculations	Example
A. (Minimum Set Point + High Tolerance)	(0.05"wc + 0.02"wc)
- (<u>Differential + High Tolerance</u>)	- (<u>0.02"wc + 0.01"wc</u>)
= Minimum Release Point	= 0.04"wc
B. (Maximum Set Point + Low Tolerance)	[12.00"wc + (-0.20)"wc]
- (<u>Differential + High Tolerance</u>)	- (<u>0.80"wc + 0.20"wc</u>)
= Maximum Release Point	= 10.80"wc



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