



English version

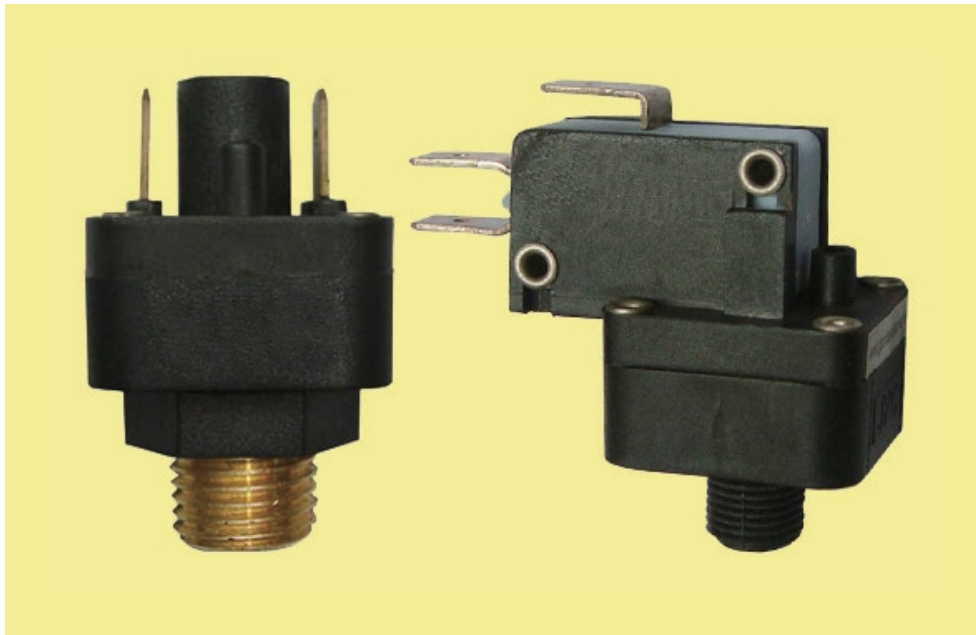


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Technology of components used in heating.

Chapter 43

Air switches and pressure switches: what differences?



Air switches and pressure switches, what difference

Air switch: An air switch is a remote control device

Description:

An air switch is a wireless control used as an electrically safe remote control to operate motors or pumps or electrical devices. This is a shockproof, explosion proof and waterproof system. The system works on a sealed air displacement principle. It uses an air bellows actuator (air button, foot pedal) joined by tubing to an air switch contained within the equipment or appliance to be switched. As the transmitter button is depressed and released, sealed air is displaced and transmitted through an air hose connected to a pressure sensitive switch, switching the equipment on. Air switches have integrated compensation system (usually a small calibrated leak named bleed hole) to avoid an erratic operation due to internal air volume pressure difference with the ambience when temperature or barometric pressure changes. Most common applications are in swimming - pools, spas and hot tubs, showers, saunas, plumbing tools, sink erasers, garbage disposals. They switch motors, pumps, lights, blowers or pc board loads.

They exist with two types of actions:

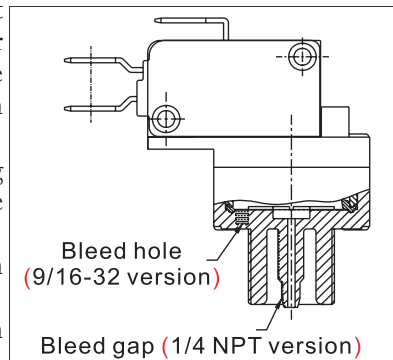
- Latching (or bistable): The circuit remains energized until the air transmitter is depressed and released again, switching the equipment off.
- Non-latching (or momentary): The circuit is energized when the air transmitter is pressed. When the air transmitter is released, it switches off.

Reasons to use an air switch:

- To put a switch where a regular electrical switch is impractical, hazardous or impossible.
- To increase safety. An air switch is a safe and convenient on/off remote control for use in wet, humid or watery places

As only air is used to switch a distant electrical circuit, it provides full electrical insulation: no risks of electrical shocks, sparks or explosion at the point of actuation. Therefore, it is the best choice for hot tubs, spas, whirlpools and garbage disposals. Air switches are also a cost effective solution in some hazardous locations (e.g. explosive vapors such as gasoline or other solvents).

- Air switches eliminate spurious switching signals and electrical interferences which can be picked up by cables used on low voltage circuits.
- Easy installation: no electrical wiring between air switch and transmitter
- Air switches are the most economical solution for short distance remote control.



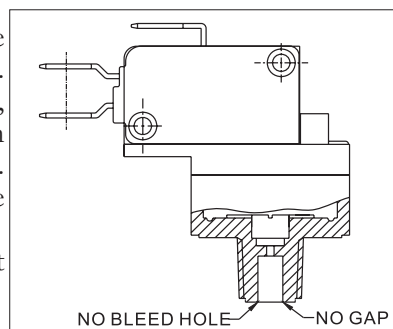
Pressure switch: A pressure switch is a pressure control device

Description:

Pressure switches are used to control the pressure of a medium and operate an electrical device. When pressure rises to the set point value, they switch off the equipment or switch on an alarm. Fluid they control can be air or water. There is no barometric or ambient temperature compensation in pressure switches. For application with other fluids, please contact our technical department.

There are 3 types of sensing:

- Positive pressure,
- Vacuum pressure,
- Differential pressure (pressure difference between 2 pressure inlets)



Air switches and pressure switches, what difference

There are two types of action:

- Control: they switch off when rising the set point and when pressure come back to previous value, they automatically switch on. Difference between these 2 values is named "differential".
- Manual reset: they switch off when rising the set point and do not automatically switch on when pressure comes back to previous value. To restart, it is necessary to manually actuate the reset button.

Ultimate Air switches and pressure switches advantages

1. Wide range of pressure connection systems:

- Center spout for 1/8" and 1/16" OD soft tubing with 1/4"NPT mounting screw (fits also directly on 1/4" pipes threads)
- Center spout for 1/8" and 1/16" OD soft tubing with 9/16-18" mounting screw, 2 flats D slot
- Side spout for 1/8" and 1/16" OD soft tubing
- 1/8 NPT plastic or metal thread
- M10 x 100 plastic or metal thread
- M8x 125 metal tread
- 1/4 BSPP plastic or metal
- Barbed fitting (metal)
- 1/4 NPT plastic or Brass or stainless steel,
- Snap on with O-ring

2. Easy to fit:

- 1" (25 mm x 25 mm) square shape housing easy to hand screw

3. Riveted switch and mechanism:

- No end customer manipulation switch change.
- No malfunction due to switch displacement

4. Air switches with temperature and pressure compensation:

- Located inside the 1/4 NPT thread: no air leak inside the electrical body, means no condensation inside it.

5. Worldwide switch approvals:

- Most of products are UL(file E246956)
- UL, CSA, CE, VDE, ENEC approved microswitches in standard. The same model can be used anywhere in the world.

6. Wide range of accessories:

Self-locking stainless steel or common plastic nuts, tubing, hose securing nut, adhesive gaskets, housing.

7. Tough Membrane design:

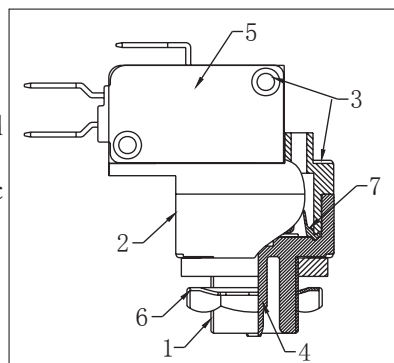
- No barometric compensation hole in membrane, rejected by some certification laboratories or customer applications,
- Most products designed to receive 2 membranes to comply with class II insulation requests in Europe.

8. Lowest market price and adapted solutions:

- 50 years OEM components experience: trained manufacturing organization: we made our first pressure switch in 1945.

9. The world's largest air switch range:

- PC board types,
- Snap action switches for high voltage and ratings
- Slow make and break contact for electronic application,
- Silver, gold or copper contacts,
- 1, 2 or 3 switches,
- 1 or 2 membranes
- Plenty of pressure connection fittings.



Air switches and pressure switches, what difference

Basics on pressure sensing devices and selection rules

- Precision, force and differential are given by membrane dimension: always have in mind these facts when you select a pressure switch.
- The bigger the surface is, the better the accuracy is, and the lower the differential is. Surface is proportional to the square of diameter. A 45 mm diameter membrane pressure switch will be 4 time more sensitive to pressure than a 22 mm diameter membrane.
- Sensitivity is also given by the membrane hardness, and thickness. The more thin and the more flexible it is, the more sensitive the pressure switch is. But thin and soft membranes cannot withstand high pressure. Selecting a product must be a compromise between these 2 requirements.
- High rating switches need a high force to actuate them. Actuating force available on a pressure switch increase by the square of membrane diameter.