

HOW TO SELECT THE CORRECT SOLENOID VALVE

A solenoid valve is an electro-mechanical device predominantly used to control fluid flow. The solenoid section of the unit is an electrical coil surrounding a ferromagnetic plunger. When an appropriate electrical supply is connected to the coil, the electromagnetic field created within the coil will cause the plunger to move in a predetermined direction. This plunger movement is used to influence the flow of fluid through the other main part of the valve, the valve body. Sensata | Cynergy3 solenoid valves are of the pilot operated type (also known as servo or indirectly operated). This means that the plunger does not directly control the fluid flow through main body of the valve. Instead, through carefully designed internal fluid pathways, the plunger movement utilises the pressure difference between upstream and downstream fluid to open or close a large valve area. This allows a small electrical input to control a large or high-pressure fluid flow, much larger than is possible through a similarly powered direct acting solenoid valve. It should be noted that these valves are simple open or closed devices and do not offer proportional flow control. In order to work effectively, pilot operated valves require a pressure differential across the valve.



Uses

Solenoid valves can be used in any application requiring the control of a fluid or gas.

Simple on/off valves are popular as many process lines only need flow or no flow conditions. Solenoid valves are ideal for commercial use in a wide range of industrial applications such as autoclaves, cooling plants, watering plants, fire extinguishing systems, hygienic & sanitary equipment as well as water jet machinery and many other fluid control situations.

Function

Sensata | Cynergy3 solenoid valves are 2 port, 2-way pilot operated valves offering simple on or off control for fluid or gas applications (group 2 gases). The valves are brass bodied and designed to be mounted in-line as part of the flow system. Valves can be specified as either normally open (NO) or normally closed (NC). A NO valve will be open and allow full flow until the coil is energised, at which time it will close resulting in zero flow. When the coil is de-energised, the valve will open once again allowing full flow. The NC variant will work in exactly the opposite fashion.

Considerations

When considering what type of solenoid valve to employ, it is vital to understand the application into which the switch is to be introduced. Important factors are:

- Non energised state: Normally open or normally closed.
- Flow Rate: The size of the valve (port size) dictates the maximum flow rate that can be achieved.
- Electrical supply requirement: The voltage and current required to actuate the solenoid.
- Electrical connection requirement.
- The fluid type (to ensure chemical compatibility with the valve wetted parts).
- Minimum and maximum working pressure.
- Protection class requirement (IP rating).
- Ambient and fluid temperature requirement.
- Duty cycle required

Types

Valves can be either normally open or normally closed. Port sizes available are: G3/8", G1/2", G3/4", G1", G1-1/4", G1-1/2" and G2". Dependent upon valve size, solenoids are available in 24V dc 10W – 19W, 110V ac 10.5 VA – 21VA and 230V ac 9VA – 15VA.