

SOLENOID VALVES FOR INDUSTRIAL APPLICATIONS

Coil assembly with junction box standard. Other housing available.

Class F coil, UL listed, CSA certified, long life, continuous duty, totally encapsulated, impervious to water, dust and most corrosive fluids

Spring loaded stainless steel plunger for corrosion-free operation. Design permits wide choice of operating positions.

Attractor with copper shading bends for quiet operation. (Silver with stainless steel valves.)

Diaphragm operation for lower pressure drop, better energy savings, greater tolerance of materials. Choice of diaphragm materials for fluid requirements.

Pilot orifice

Available in pipe connections from 1/4" to 3" NPT

Full-ported design permits use of small, less expensive valves.

Solenoid valves are electrically operated devices used to control flow. The valve is used for the remote on/off or directional control of liquids, gases and steam. Solenoid valves do not regulate flow.



OPERATION

Solenoid valves consist of two main elements; 1) an electrical coil (the solenoid), and 2) a valve body or pressure vessel. The solenoid is the electromagnetic unit that powers (acts to open or close) the valve. The valve is the pressure containing unit that acts to shut off or open media flow.

when the solenoid is energized by an electrical signal, current flow results in the build up of magnetic field. The field attracts a moveable plunger in the valve. Physical movement of the plunger opens or closes a valve orifice which give the valve on/off or directional control of media.

In general, solenoid valves are constructed to be 1) direct-acting, and 2) pilot-operated. In a direct-acting valve, the plunger is in direct contact with the body main orifice, and opens or closes the orifice. In a pilot-operated valve the main orifice is not directly controlled by the plunger but by a diaphragm. This diaphragm, covering the main orifice, contains both a pilot and a bleed orifice.



DUFF SUPPLY

FOR ALL YOUR VALVE NEEDS

TYPES OF SOLENOID-PILOT OPERATED

OPERATIONAL SEQUENCE, PILOT OPERATED - (normally-closed)

TO OPEN:

When the solenoid receives an electrical signal a magnetic field is formed which attracts the plunger. The plunger, covering the pilot orifice, lifts off causing system pressure (holding the diaphragm closed) to drop.

As system pressure on top of the diaphragm is reduced, full system pressure on the opposite side of the diaphragm acts to lift the diaphragm away from the main orifice thus allowing full media flow through the valve. Since the bleed orifice is dimensionally small that th pilot orifice, system pressure cannot rebuild on top of the diaphragm as long as the pilot orifice remains open.

TO CLOSE:

When the solenoid is de-energized it releases its hold on the plunger. The plunger drops and covers the pilot orifice. System pressure then builds orifice, forcing the diaphragm down until it covers the main orifice and stops media flow through the valve.

OPERATIONAL SEQUENCE, PILOT-OPERATED (normally open)

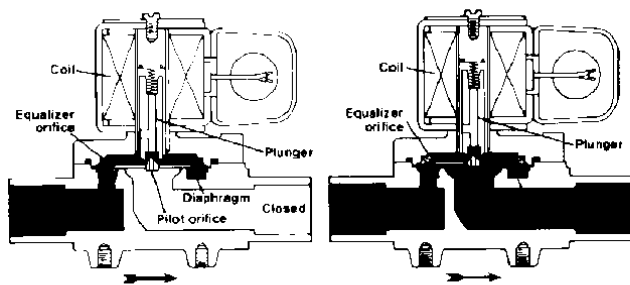
In a normally-open valve, the sequence of operation is reversed from that of a normally closed valve, the main orifice is open when the solenoid is de-energized. All other relationships (eg, the size relationship between the pilot and bleed orifice) still apply.

TO OPEN

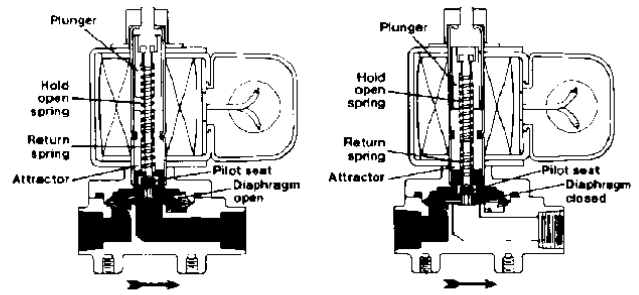
When the solenoid is de-energized it releases its hold on the plunger. The plunger uncovers the pilot orifice causing system pressure holding the diaphragm closed to drop. As system pressure on top of the diaphragm is reduced, full system pressure on the opposite side of the diaphragm acts to lift the diaphragm away from the main orifice thus allowing full media flow through the valve.

TO CLOSE

When the solenoid is energized it attracts the plunger. The plunger covers the pilot orifice. System pressure then builds up on the top of the diaphragm through the bleed orifice, forcing the diaphragm down until it covers the main orifice and stops media flow through the valve.



Coil De-energized, Valve Closed Coil Energized, Valve Open



Coil De-energized, Valve Open Coil Energized, Valve Closed

INSTALLATION INSTRUCTIONS

Proper flow direction is indicated by an arrow on the valve body. The ideal installation is in a horizontal line with the coil located directly on top of the valve. However, solenoid valves may be installed in any position as long as the coil assembly is never lower than the centerline of the valve body.

