Latching Solenoid Valve Design

Latching solenoid valves are high-energy-saving valves that do not need energy to maintain position after first energy consumption. When the coil is switched on or off, the energy of the coil is cut off and the energy is saved.

Latching Solenoid Valve Working Principle

Latching solenoid valves have a magnet on the stem. When the coil is energized for a short time, the core moves and the orifice opens. The moving core adheres to the magnet. This process is called Latching. In order to close the valve again, the positive and negative poles of the coil are changed and short-term energy is supplied. In this case, the coil produces a magnetic field in the opposite direction and causes the magnet to be destroyed. In this case, with the force of the core spring, the core closes the orifice and the flow is cut off. This process is called Delatching.

Latching valves need to be able to provide current in both directions for operation. Switch T1 and T4 to turn on the solenoid and switch T2 and T3 to switch off. The latching solenoid valves are energy-efficient to cut energy after moving the core of the solenoid. Otherwise, the coil will continuously waste energy.
Latching Solenoid Valve Control Card

The Latching solenoid valve control card is a special control card designed to make Latching solenoids more efficient and easy to use. When the card is energized, it opens the valve and closes the valve when the card is deenergized. The power consumption is 50 mA at a voltage of 24 VDC or 1.2 W.

Thermostat Application for Latching Solenoid Valves

Control timers in thermostats generally provide dry contact outputs. The timer is switched on if the temperature level is above the desired value. However, the problem is that when the timer is drawn, the coil is continuously energized. In this case, the desired energy savings cannot be achieved. The Latching solenoid valve control card uses the 12-24 VDC voltage from the timer contacts of the thermostat to open the solenoid. It cuts the energy of the coil 1-2 seconds after the solenoid is turned on and saves energy and extends the life of the coil. The issue to be considered here is that the control card must be continuously energized so that the solenoid is switched on. The control of the energy to the coil is done by the control card.

To close the solenoid, it is enough to cut off the energy of the control card. With the energy stored on the card, the solenoid closes. As a result, when the control card is energized, the opening process is in the process and when the control card is deenergized, the closing process is in the process. The connection diagram for the latching solenoid valves in thermostat application is given below.