

How to Choose the Right Solenoid Valve for Your Application

How to Choose a Quality Solenoid Valve Supplier?

Right Supplier · Better Quality · Long-Term Value



1 Check Product Quality & Certifications

Ensure the supplier provides high-quality products with relevant certifications (e.g., ISO 9001, CE, RoHS).



2 Evaluate Technical Expertise & Support

Choose a supplier with strong engineering capabilities and helpful pre-sales & after-sales support.



3 Assess Manufacturing Capabilities

Look for modern production facilities, strict quality control, and consistent supply capacity.



4 Compare Price & Total Cost

Don't just look at the lowest price. Consider quality, durability, lead time and long-term value.



5 Review Delivery & Lead Time

Choose a supplier with reliable logistics and on-time delivery to keep your projects on track.



6 Check Reputation & Customer Feedback

Look for proven track records, customer reviews and long-term partnerships in your industry.



The Right Solenoid Valve Supplier Helps You Get:



Reliable Performance



Lower Maintenance Costs



Stable Supply Chain



Greater Business Growth

Dongguan, Guangdong Oct 11, 2026 ([Issuewire.com](https://www.issuewire.com)) - Introduction

Proper selection of a [solenoid valve](#) will ensure reliable control, efficient equipment operation, and extended lifespan. These compact devices of electromechanical design are widely used for automation in industry, water treatment processes, pneumatics, HVAC systems, irrigation, food processing, medical equipment, chemical applications, and many more. Incorrect choice may lead to leaking, pressure losses, heating, unreliable actuation, accelerated wear, and unplanned downtime. Solenoid valve selection must start from the application rather than the catalog. First, the medium, flow, pressure, temperature, power supply, connections, duty cycle, and environment must be defined in order to compare products. This paper reviews the key factors to be taken into account when choosing a solenoid valve, as well as the criteria to evaluate the experience of a producer, such as [Weilong](#).
Solenoid Valve Definition A solenoid valve is an electromechanical device that controls opening, closing, or redirection of the flow of a liquid or gas.

Typical solenoid valve design consists of the valve body, electromagnet, moving plunger or armature, spring, seals, and flow ports. Upon applying electricity to the coil, magnetic field is generated due to the current flowing through it. The magnetic force moves the plunger, thereby changing the position of the sealing element and, correspondingly, the direction of the flow. According to the design, energizing of the coil might open the valve, close it, or switch the flow between the ports. Due to this ability of the

automatic switching, solenoid valves are widely used in water systems, pneumatics, irrigation, HVAC, filling equipment, industrial machinery, and production lines. The proper solenoid valve is determined by its working conditions.

- **Identify the Medium** The first factor to be determined is the medium that flows through the valve. Various liquids or gases, such as water, air, oil, steam, fuel, refrigerants, and chemicals, might interact with a valve's body, seals, diaphragm, and other wetted parts in a completely different way. Typically, brass and stainless steel are used for the medium being water. Some engineered plastics might also be suitable. Brass is commonly used with pneumatics, along with aluminum, stainless steel, or polymers. Careful analysis is needed when the application is related to chemicals and steam. One should not select a solenoid valve only due to the size of its ports. It is necessary to verify the compatibility of all wetted materials with the process medium in order to avoid corrosion, swelling, hardening, and premature wear.
- **Choose the Right Body Material** The body material determines the level of corrosion resistance, mechanical properties, cleanliness, weight, and cost of the product. The most popular options are brass, stainless steel, aluminum, and plastic. Brass combines the durability and relatively low price and is widely used for the medium being water, air, and compatible oils and gases. Stainless steel is commonly selected in case of high corrosion resistance, cleanliness, and durability requirements. Plastic is often chosen for low weight and chemical applications, while aluminum is popular with pneumatics.
- **Decide Between Normally Closed and Normally Open** The de-energized position of a solenoid valve is the key operational factor. In the design of a normally closed (NC) valve, the flow is blocked when the electrical power is turned off, whereas it is allowed when the valve is energized. A normally open (NO) design is opposite; the flow is allowed in the de-energized state, while it is blocked when the valve is energized. NC designs are suitable when the flow needs to be stopped in case of loss of the electrical power. NO designs suit the applications where the flow needs to remain constant, whereas the power is used to block it.
- **Select the Correct Operating Principle** There are three main operating principles of the valves: direct acting, pilot operated, and semi-direct. In the direct design, the sealing element is moved directly by the magnetic force and does not require pressure differential, which makes it usable for low-pressure and zero-differential applications. In a pilot operated valve, the process pressure helps the diaphragm or piston to move, providing higher flow with a small-sized coil but usually requiring minimum differential pressure. In the semi-direct design, these principles are combined. The appropriate solenoid valve operating principle needs to be selected considering the minimum and maximum pressure, required flow, reaction time, and installation conditions.
- **Verify Operating Pressure** Each valve has a pressure range. The minimum inlet pressure, maximum inlet pressure, outlet pressure, and differential pressure need to be determined for the valve operation. Exceeding the rated pressure causes leakage, unreliable actuation, internal damage, or even safety risks. On the other hand, a pilot operated valve would fail to actuate if the differential pressure falls below its minimum level. One also needs to consider pressure peaks, like water hammer. The chosen solenoid valve should be selected with regard to the realistic system conditions and not only the nominal line pressure.
- **Calculate the Required Flow Capacity** The port size cannot be used for determining the flow capacity. Valves with identical threaded connections can have completely different sizes of their internal orifices and, accordingly, different pressure losses. Flow is measured with the help of Cv

and Kv coefficients that help to estimate the amount of the fluid that would flow through the valve with a specific pressure drop. The selected valve should provide the required flow at the real inlet and outlet pressures. Sizing of the liquid requires calculation of the density and viscosity, while the gas sizing also requires compressibility and pressure ratio.

- **Confirm Port Size and Connection Type** Typical connection types are NPT, BSPP, BSPT, compression fittings, push-in fittings, flanges, manifolds, and custom ports. One needs to pay attention to the connection standards because the nominal size does not identify the thread type; NPT and BSP threads are different and cannot be regarded as interchangeable. In the case of replacement of an existing valve, one needs to make sure about the thread standard, orientation of the port, mounting, and overall dimensions in order to reduce the need for adapters and possible leaks.
- **Check Fluid and Ambient Temperature** The temperature affects the seals, coil insulation, viscosity, pressure capacity, and service life. Both the temperature of the process fluid and the ambient temperature should be taken into account. The hot water and steam require special high-temperature components, while refrigeration and outdoor systems may involve low-temperature seals changes, condensation, and icing. The solenoid valve should be suitable for the combination of the process fluid temperature, ambient temperature, pressure, and duty cycle.
- **Select Compatible Seal Materials** The seals are the components directly interacting with the medium and, thus, responsible for the leakages. The most common materials are NBR, EPDM, FKM, PTFE, and special compounds. NBR is used widely with air, water, and some oils. EPDM is typically selected for water and some high-temperature water applications, but not every hydrocarbon. FKM provides high resistance to many oils, fuels, chemicals, and high temperatures. PTFE is characterized with wide resistance to chemicals and is considered for aggressive media applications. One needs to check the compatibility with the actual medium, its concentration, temperature, and exposure time. Incompatible seals might swell, crack, harden, or lose the sealing force.
- **Match the Coil Voltage to the Control System** The required voltage should be equal to the supply voltage available. Popular voltages may include 12V DC, 24V DC, 24V AC, 110/120V AC, and 220/230V AC depending on the valve family. The use of the wrong voltage causes unreliable actuation, heating, or damage to the coil. The required current should be handled by the PLC output, relay, transistor, and other switching devices. 24V DC is typically used for industrial automation, while mobile equipment requires 12V and 24V DC.
- **Duty Cycle and Coil Heating**

Valves may require long energization time or may work in continuous regime. Duty cycle is the ratio of the duration of safe coil energization over total cycle duration.

For long energization cycles use continuous duty coil rated for the required conditions. Intermittent duty coil provides strong force in a small package but can overheat in long energization cycles.

Coil heating is the function of voltage, power, ambient temperature, air flow and cycling frequency. The solenoid valve shall be thermally sufficient for the required installation.

- Environmental Protection and Response Time Evaluation

Reliability can be seriously affected by the surrounding environment. A valve working in clean indoor equipment will have different requirements to the one working in presence of rain, dust, wash down spray, humidity, oil mist, chemicals, vibration or salt.

Check the coil enclosure, connector, cable entry, IP rating, vibration and shock resistance. Response time is also important for high speed automation, dosing, sorting, packaging, pneumatic control. If response time is critical, provide response information for similar conditions.

- Fluid Cleanliness Considerations

Machining debris, rust, scale, fibers and other contaminants can clog seats and internal passages. Pilot operated valves are highly sensitive because of small pilot passages.

Filtering or using strainer will help reduce sticking, slow response, internal leakage and seals wear. Even the highest quality valve requires proper cleanliness and maintenance policy.

- How to choose the quality solenoid valve supplier?

Price per unit is an important factor, especially for a high volume OEM project, but it should be evaluated taking into account reliability, consistency, engineering support, lead time, customization possibilities and lifecycle costs.

A cheap valve causing field failures, leaking or production stoppages can be quite expensive during the service life. Compare technical specifications, manufacturing control, materials, testing, communication and supplies stability. Good solenoid valve supplier should be able to identify application risks before production.

14.1 Check List For Solenoid Valve Selection

Please check the following parameters before providing us with your request for quotation: process medium and concentration, minimum and maximum pressure, required flow, fluid and ambient temperature, body and seal materials, normally open or normally closed, direct, pilot or semi-direct, port

size and thread type, coil voltage, duty cycle, environmental protection, filtration requirements, mounting limitations and customization needs.

Providing the information in advance will help to recommend a suitable solenoid valve and reduce possible redesign and 14.2 sourcing efforts.

Installation issues also should be checked before purchase. Flow direction, mounting position, coil accessibility, connector clearances should be checked. In case of potential leakages or contaminations determine appropriate inspection and replacement intervals. Looking into these practical aspects in advance will allow to avoid technically suitable but hard to mount, service or integrate into equipment valve.

15 . Reasons to Add Weilong to Your Solenoid Valve Supply List

Selection of the supplier is not only determination of catalog prices. Range of products, experience in manufacturing, quality management, engineering support and the ability to meet the application requirements can affect long-term OEM programs.

Weilong has 20 years of industry experience in its portfolio of fluid-control and electromagnetic products for wide range of equipment applications. Portfolio includes medical valve solutions for compact fluid management, water valves for equipment requiring water flow control, proportional valves for applications requiring variable regulation, solenoid pumps for compact fluid-delivery systems.

This extended portfolio can help customers source multiple fluid-control components from one manufacturer. Weilong also complies with ISO 9001 and IATF 16949 quality management systems, which means structured manufacturing and consistent processes.

Customization can be equally important for OEM projects. Port design, materials, coil voltage, electrical connection, mounting, flow performance and package can be specified for a particular product. If the manufacturer will take care of these aspects in development stage, they will help to move the project more quickly towards the production.

While selecting supplier for Weilong or any other solenoid valve manufacturer, do not just compare prices, provide real operating conditions and compare suppliers on technical suitability, manufacturing consistency, communication and long-term support.

If you have a project in hands and need a solution, please contact Weilong sales team today.

Contact email : weilongsolenoid@gmail.com

Mobile/WeChat/Wahtsapp : 86 136 4298 0378

- Solenoid Valves – Frequently Asked Questions

What is the most important thing to consider when selecting solenoid valve?

There is no single criterion determining the correct selection. Compatibility, pressure, flow, temperature, materials, voltage, operating principle and duty cycle must be considered.

What is the difference between normally closed and normally open valves?

Normally closed valve closes flow when de-energized and opens when energized. Normally open valve works in the opposite way. Choose based on the desired fail state of your equipment.

When to choose a direct acting valve?

Direct acting designs are suitable when pressure is low, zero differential operation is required or minimum pilot pressure is unassured.

Why pilot operated valve needs minimum pressure?

In a pilot design, the process pressure is used to move the main diaphragm or piston. If the pressure differential is low, valve can switch incorrectly.

How do I select the correct seal material?

Match seal to fluid, concentration, temperature, pressure and environmental exposure it will work with. NBR, EPDM, FKM and PTFE materials have different properties.

Is the flow rate dependent on the port size?

No. Internal orifice geometry and Cv or Kv rating are the better indicators of the flow. Two valves of the same port size can have different behavior.

Is it ok to run the incorrect coil voltage for a while?

No. If the voltage is too low, the switching will be incorrect. If the voltage is too high, the coil will overheat and burn out. Use the correct voltage and current.

How to increase valve service life?

Correct size, compatible materials, clean fluid, adequate filtration, correct voltage, proper duty cycle and operation within pressure and temperature limits.

What should I tell a manufacturer for a custom application?

Tell me medium, pressure, flow, temperatures, body & seal materials, connection, coil voltage, normal state of operation, duty cycle, mounting space, environment, target life and any certification or

customization needs.

17: Summary

Selecting the right solenoid valve is not as easy as finding a connection size or a coil voltage in a catalog. The valve should be suitable for fluid, pressure, flow rate, temperature, body material, seals, electrical system, duty cycle, operating principle and installation environment.

Disciplined selection process reduces the risk of leakages, overheating, pressure drops, incorrect switching, premature wear and downtime. Start with the detailed application specification for industrial machinery, water treatment, pneumatics, HVAC, irrigation, medical devices, automation and OEM products and select solenoid valve with sufficient performance and manufacturing capabilities.

The valve is a small component but its careful specification can make a big difference to the system reliability.

For detailed product specifications or to discuss custom solenoid requirements, reach out through:
<https://www.smartsolenoid.com/>



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