Guidance 1  Stepping Motor
A stepping motor rotates by a constant angle per pulse.

A stepping motor, also called a pulse motor, is a motor that rotates in synchronization with a command pulse signal. The principle of rotation of a simplified 2-phase, 8-pole stepping motor model is shown in the figure below. A stepping motor consists of a stator with windings and a rotor using a powerful neodymium magnet. Energizing the stator windings to generate a magnetic force is called excitation. By sequentially exciting the multiple stator windings based on the command pulse, the motor rotates stepwise, utilizing the action of attraction and repulsion between the magnetic poles of the stator and rotor. The rotation angle of a stepping motor is always determined by the constant mechanical accuracy (motor structure and machining accuracy) for each command pulse signal. Therefore, a stepping motor performs highly accurate positioning control.

Guidance 2  Open Network
An open network is an industrial network, the specifications of which are made public and can be commonly used by many users and manufacturers.

Open networks are roughly divided into the following two types:
1. Those specified by organizations and associations in consultation and recognized as official standards.
2. Those developed by specific manufacturers and organizations and established as de facto standards as a result of promotion activities.

Both types have well-organized and integrated specifications and are available to everyone for many purposes. Either one can connect different manufacturers' devices (multivendor devices) and bring many benefits to users. Currently, many types of open networks are expanding their tempo of popularization according to the applicable field and country in the market.
The electric control valve fully demonstrates its functions by simply connecting signal and power supply!

The electric control valve requires many pieces of air source equipment, including a compressor. The electric control valve requires complicated equipment and consumes plenty of power.

A compressor entails equipment costs as well as troublesome maintenance work! What is more, it results in high electricity bills!

The electric control valve connects to various open networks directly.

Only standby power*4 is consumed when the control loop is in a steady state.

The electric control valve does not require any air source device or other auxiliary equipment.

The stepping motor is adopted for the drive block.

The stepping motor has high thrust and a resolution of 1/1000.

A number of electric control valves with open network capability connect in a daisy-chain layout, which saves wiring effort. Various operating information on electric control valves can be collected through a single network.

The stepping motor has high thrust (5000 N) and high performance (high resolution (1/1000)).

Users can choose bellows with a withstanding pressure of 1.5 MPa G made of polytetrafluoroethylene (PTFE).

Energy consumption ↓1/10*5

(*) The data surveyed by M-System
(†) Maximum power consumption: 240 VA
Standby power: 20 VA
The data is provided on the condition that M-System’s PSN1 Electric Actuator is used.

Electric control valve

The electric control valve requires complicated equipment and consumes plenty of power.

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The stepping motor is adopted for the drive block.

The stepping motor has high thrust and a resolution of 1/1000.

A number of electric control valves with open network capability connect in a daisy-chain layout, which saves wiring effort. Various operating information on electric control valves can be collected through a single network.
The electric control valve is of a simple structure and compact, and it ensures high performance.

The electric actuator section is small, which makes it possible to narrow the distance between pipes.

After installation, the electric control valve will be operational by just providing power supply and connecting signal input (or connecting a network).

The electric control valve has a very simple structure compared to the pneumatic control valve.
Toko Valex’s Electric Control Valves Main Product Lineup

**Two-way control valve for acid and alkali service (Resin made)**
The T-8210 type control valve has excellent corrosion resistance to acid and alkali fluid because the wetted part is made of resin. This valve provides high seal performance with a gland packingless structure equipped with a PTFE bellows.

The valve is screwed connection type, small and lightweight. Compact control valve with a face-to-face dimension of 70 mm. Improved maintainability with no need of air supply equipment.

**Globe type single seated control valve for water, steam, and gas service**
The T-8110 type control valve is a control valve with a wide range of application, from water and steam to gas, etc.

- A cooling type bonnet can be selected.

**Low flow control valve for water, steam, and gas service**
The T-8020 type control valve is a control valve suitable for very small flow control. The valve is screwed connection type, small and lightweight. Nominal size (A): 8 to 15

**Three-way control valve for mixing and dividing**
There are two kinds of three-way control valves. One is a mixing three-way valve which mixes two kinds of fluid into one. The other is a flow dividing three-way valve which divides fluid into two directions.

**Sanitary control valve for food and beverage service**
The T-8910 sanitary control valve is a regulating valve for the sanitary process of products, such as food, drinks, and chemicals. It minimizes internal residual liquid, features a clamp-type split structure, and allows ease of disassembly cleaning, thus excelling in terms of sanitary and maintainability.

**Single seated bellows control valve with metal bellows for toxic fluid and vacuum service**
The T-8115 type control valve has a structure equipped with an external pressure type bellows. The seal performance is superior to that of a general gland structure. Therefore, the control valve is applicable to controlling toxic fluid and vacuum service.

**Angle-type cryogenic control valve (Vacuum container mounting)**
The T-8800 type control valve controls cryogenic fluid, such as liquid helium whose service temperature is close to the absolute zero degree. The valve is installed by welding in a vacuum container. The valve trim has a structure which prevents gaining thermal oscillation at low temperature operation and provides good shock performance even if the pipe is deformed to some degree due to thermal change.

**Cage-type control valve for high-pressure, high-differential pressure, and low-noise service (Double seated cage trim)**
A cage-type control valve is a pressure balance control valve which is applicable to controlling high pressure or high differential pressure fluid by balancing the pressure in the cage. Trims can be combined according to uses. Applicable to a wide range of temperature from -196°C to 500°C.

<table>
<thead>
<tr>
<th>T-8210</th>
<th>T-8110</th>
<th>T-8020</th>
<th>T-8115</th>
<th>T-8910</th>
<th>T-8132</th>
<th>T-8800</th>
</tr>
</thead>
<tbody>
<tr>
<td>globe type single seated</td>
<td>three-way control</td>
<td>low flow</td>
<td>single seated bellows</td>
<td>three-way control</td>
<td>cage-type</td>
<td>angle-type</td>
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<tr>
<td>control valve for acid and alkali service</td>
<td>for mixing and dividing</td>
<td>control valve for water, steam, and gas service</td>
<td>with metal bellows for toxic fluid and vacuum service</td>
<td>for food and beverage service</td>
<td>control valve for high-pressure, high-differential pressure, and low-noise service</td>
<td>cryogenic control valve (Vacuum container mounting)</td>
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<tr>
<td>Resin made</td>
<td>wide range of application</td>
<td>screwed connection type</td>
<td>external pressure type bellows</td>
<td>regulating valve for the sanitary process</td>
<td>pressure balance control valve</td>
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<td>Nominal size (A): 15 to 65</td>
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<td>Nominal size (A): 15 to 250</td>
<td>Nominal size (A): 40 to 400</td>
<td>Nominal size (A): 6 to 150</td>
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Many other products are available. Feel free to contact Toko Valex.