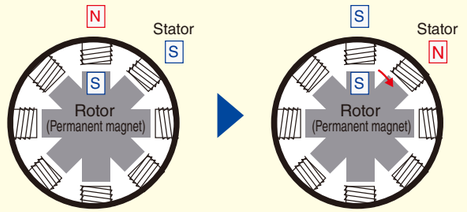
Guidance 1 Stepping Motor

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 brings 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.

CC-Link DeviceNet LONWORKS Modbus HART COMMUNICATION PROTOCOL FOUNDATION PROFIBUS

Guidance 3 Explanation of Optional Icons

Wide 100	Some types of inner valves that have an equal percentage flow characteristic can be replaced with optional inner valves with a flow rate rangeability of 100 to 1. Contact us for applicable valve specifications, applicable valve sizes, and other details.	1 PTFE	Users can choose bellows with a withstanding pressure of 1 MPa G made of polytetrafluoroethylene (PTFE).
Special End Connect	Valves with customized piping connection shapes and dimensions are available. Contact us with your desired pipe shape and dimensions in detail.	1.5 SUS316	Users can choose bellows with a withstanding pressure of 1.5 MPa G made of stainless steel (grade 316).
S Material	Users can choose non-standard materials for wetted parts. Contact us with the materials of your choice.	3 SUS316	Users can choose bellows with a withstanding pressure of 3 MPa G made of stainless steel (grade 316).
H	It is possible to manufacture products approved by the Minister of Economy, Trade and Industry of Japan in the certified range pursuant to the High Pressure Gas Safety Act (Japan). Contact us for the conditions and requirements of the fluid that needs to be controlled.	10.5 SUS316	Users can choose bellows with a withstanding pressure of 10.5 MPa G made of stainless steel (grade 316).

Notes on Catalog

Contact

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Actuator Manufacturer

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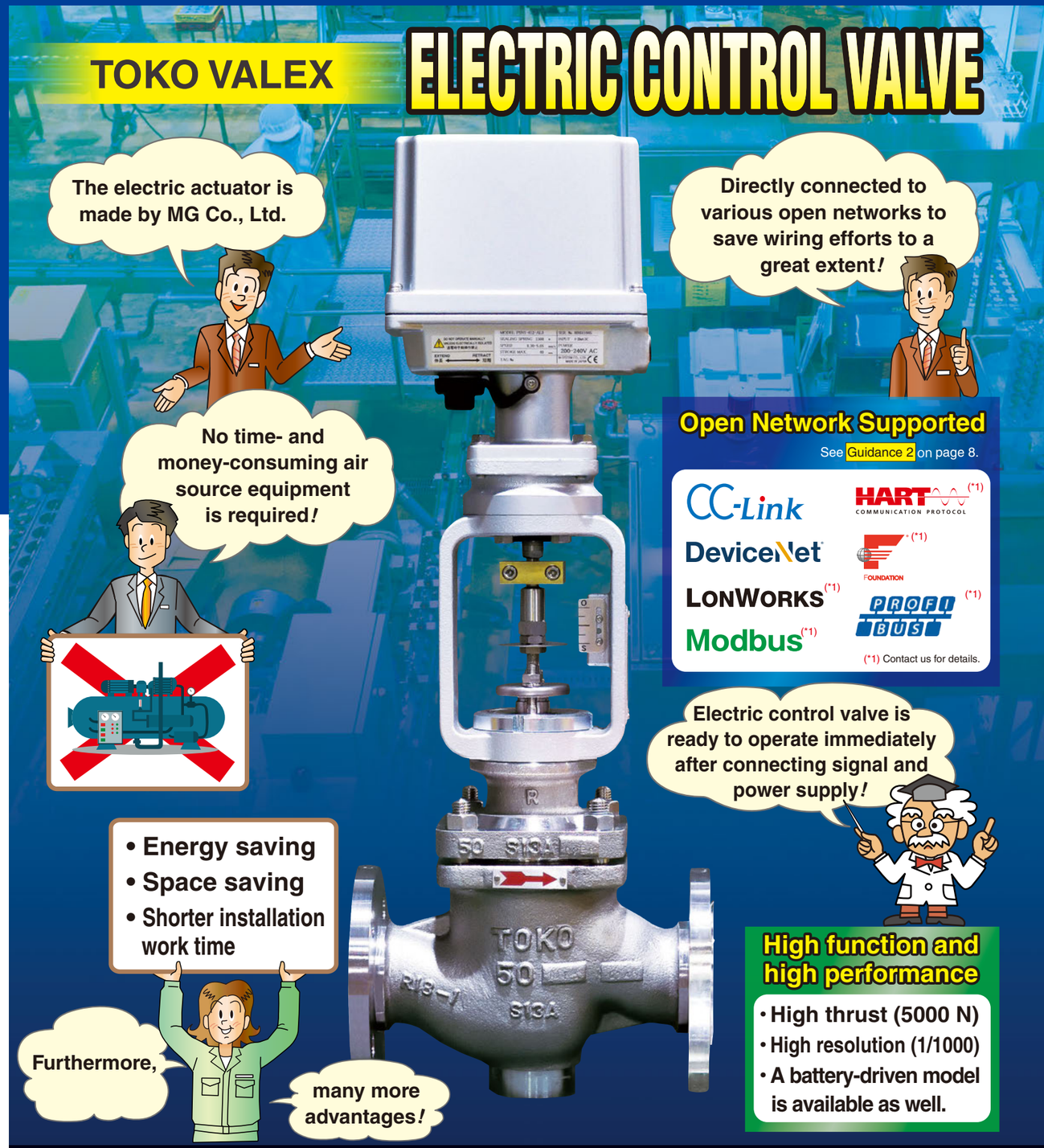
500565

TOKO VALEX
4-3005
2024-02
EC-Z675
Rev. 1

TOKO VALEX ELECTRIC CONTROL VALVE



TOKO VALEX CO.,LTD.
www.toko-valex.co.jp/EN_index.html

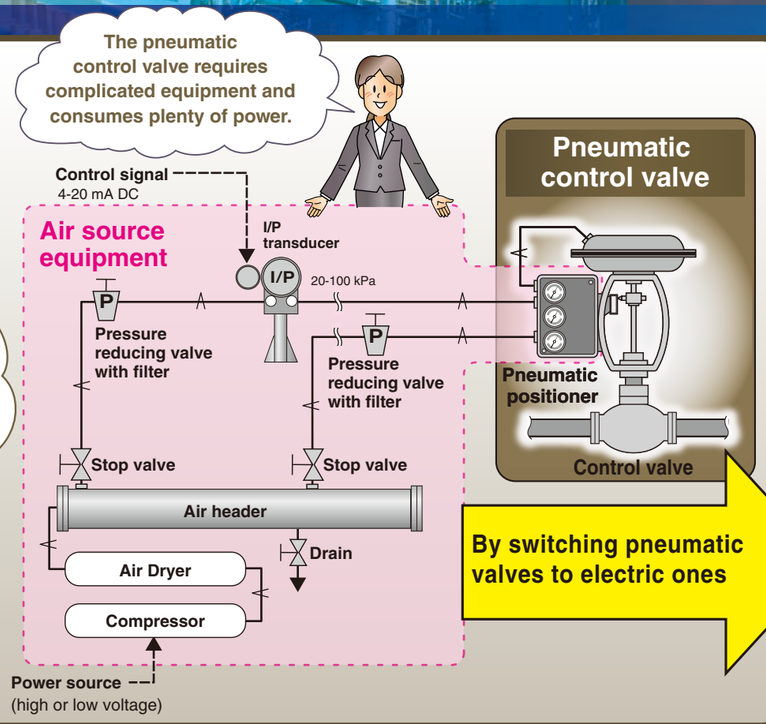
MG CO., LTD.
www.mgco.jp

The electric control valve fully demonstrates its functions by simply connecting signal and power supply!

PNEUMATIC

The pneumatic 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!



By switching pneumatic valves to electric ones

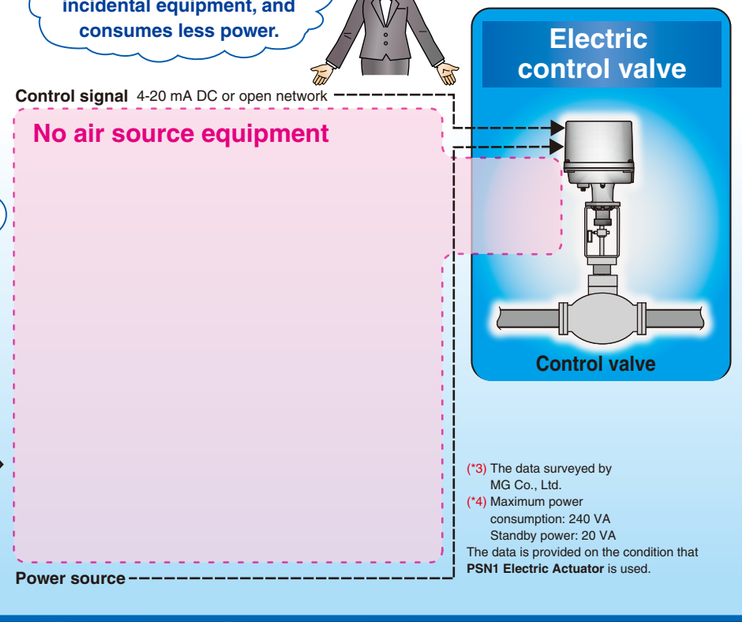
ELECTRIC

The electric control valve does not require incidental equipment, and consumes less power.

Equipment cost ↓1/5 (*3) Energy consumption ↓1/10 (*3)!

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

Instrument air system and ancillary equipment can be eliminated



(*3) The data surveyed by MG Co., Ltd.
(*4) Maximum power consumption: 240 VA
Standby power: 20 VA
The data is provided on the condition that **PSN1 Electric Actuator** is used.

The electric control valve connects to various open networks directly.

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.

PLC

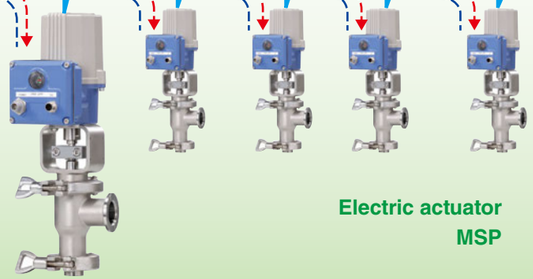
CC-Link DeviceNet Modbus (*2)
LONWORKS (*2) (*2) (*2)
HART COMMUNICATION PROTOCOL (*2) FOUNDATION PROFIBUS

For open networks, refer to Guidance 2 on page 8.

(*2) Contact us for details

Electric control valve → PLC
- Opening position feedback
- Opening position input error
- Motor lock alarm
- Maintenance information (Motor activation count and integrated operation distance)
- Others

PLC → Electric control valve
- Opening position setting
- Forced opening and closing
- Alarm reset
- Maintenance information and reset
- Others



Electric actuator MSP

The stepping motor is adopted for the drive block.

Digital control unit

Features
- Instant zero/span position setup
- Flexible opening/closing speed settings
- Opening position output
- Lock alarm output

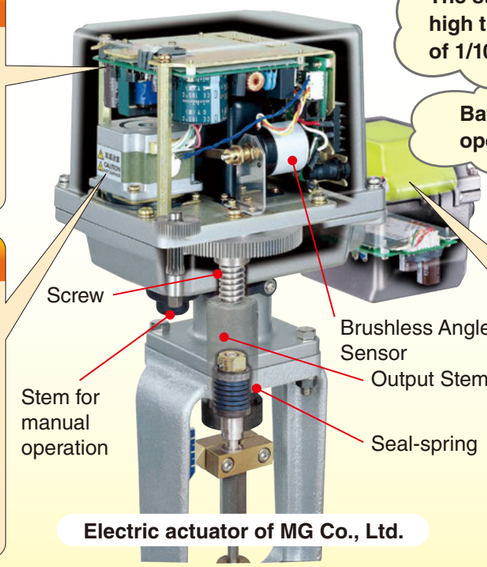
Stepping motor

High thrust 5000 N
High resolution 1/1000

Refer to Guidance 1 on page 8.

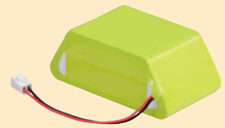
The stepping motor has high thrust and a resolution of 1/1000.

Battery for fail-safe operation is optional.



Electric actuator of MG Co., Ltd.

Power outage emergency battery



Customers can choose models provided with a battery as well as functions of emergency actions (i.e., Full Closed, Full Open, Hold Position or Target Value) in times of loss of power.

The photo shows PSN1 Electric Actuator.

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.

The electric control valve has a very simple structure compared to the pneumatic control valve.

Unit: mm

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

Classified by Industry Application Examples of Electric Control Valve

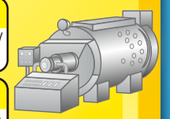
Disposal Plants, Crushing Treatment Facilities, and Clean Centers

Applications

Combustion control / Boiler feedwater control / Combustion exhaust gas control

Reasons for adoption

Space saving / Improved maintainability with no need of air supply equipment / High functions (valve position and other status output signals)



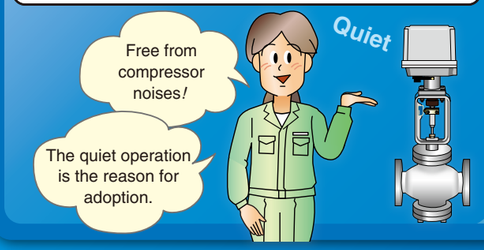
Universities and Research Facilities

Applications

Research, experiment and practice teaching facilities / Micro flow control

Reasons for adoption

Space saving / Low noise / Improved controllability with high resolution



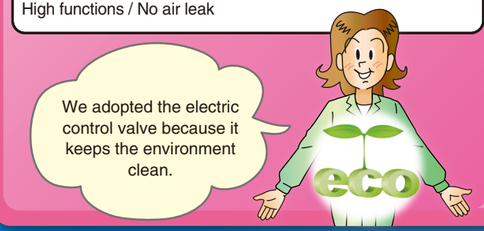
Beverage and Medical Facilities

Applications

Sterile cleaning equipment / Carbon dioxide gas injection equipment

Reasons for adoption

Space saving / Improved maintainability with no need of air supply equipment / High functions / No air leak



Car Manufacturers

Applications

Environment test equipment / Wind tunnel experiment equipment / Exhaust gas combustion experiment equipment / Others

Reasons for adoption

Improved maintainability with no need of air supply equipment

Water Purification Plant and Water Treatment

Applications

Chemical injection equipment

Reasons for adoption

Improved maintainability with no need of air supply equipment / Improved controllability with high resolution

Product Material, Building Material, Rubber, and Glass

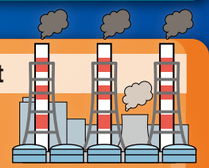
Applications

Temperature control of molding equipment / Utility equipment / Others

Reasons for adoption

Improved maintainability with no need of air supply equipment / Improved controllability with high functions and high resolution

Power plant



Applications

Oxygen supply facility / Others

Reasons for adoption

Energy saving / Improved maintainability with no need of air supply equipment / Improved controllability with high functions and high resolution

Pulp and Paper

Applications

Paper machine / Bleaching chemical injection equipment

Reasons for adoption

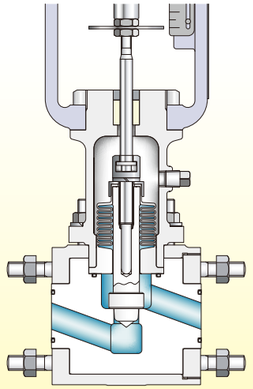
Energy saving / Improved maintainability with no need of air supply equipment

Toko Valex's Electric Control Valves Main Product Lineup

Many other products are available. Feel free to contact Toko Valex.

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. The valves provides high seal performance with a gland packingless structure equipped with a PTFE bellows.



Nominal size (A): 15 to 65

OPTION

Wide 100

1 PTFE

S Material

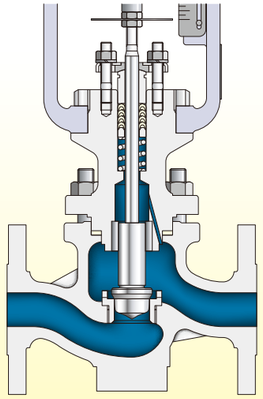
For the meaning of the above optional icons, refer to Guidance 3 on page 8.

T-8210

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.



Nominal size (A): 15 to 300

OPTION

Wide 100

S Material

Special End Connect

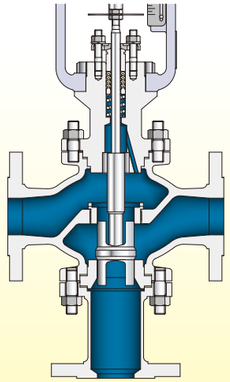
H

For the meaning of the above optional icons, refer to Guidance 3 on page 8.

T-8110

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.



Nominal size (A): 15 to 250

OPTION

S Material

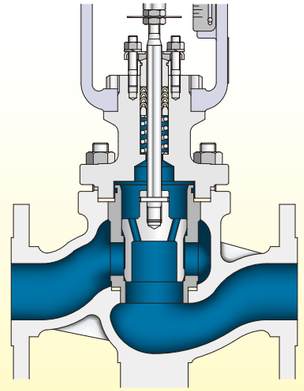
Special End Connect

For the meaning of the above optional icons, refer to Guidance 3 on page 8.

V-5310 V-5320

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.



Nominal size (A): 40 to 400

OPTION

S Material

Special End Connect

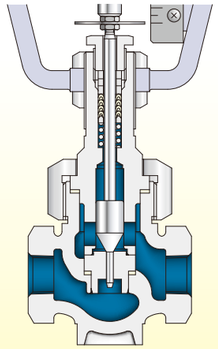
H

For the meaning of the above optional icons, refer to Guidance 3 on page 8.

T-8132

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.



Compact control valve with a face-to-face dimension of 70 mm

Nominal size (A): 8 to 15

OPTION

Wide 100

S Material

Special End Connect

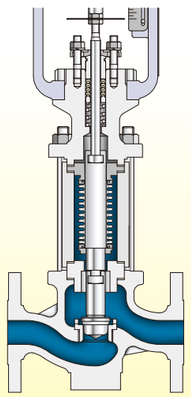
H

For the meaning of the above optional icons, refer to Guidance 3 on page 8.

T-8020

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 perfomance is superior to that of a general gland structure. Therefore, the control valve is applicable to controlling toxic fluid and vacuum service.



Nominal size (A): 15 to 300

OPTION

Wide 100

S Material

1.5 SUS316

Special End Connect

3 SUS316

H

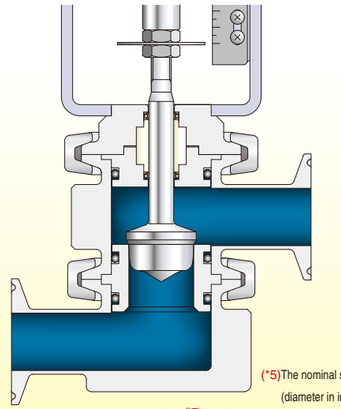
10.5 SUS316

For the meaning of the above optional icons, refer to Guidance 3 on page 8.

T-8115

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.



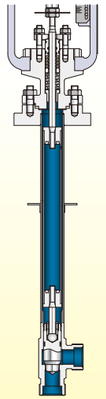
Nominal size (S) (*5): 1/2 to 4

(*5)The nominal size (diameter in inches) of the sanitary control valve.

T-8910

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 galling thermal oscillation at low-temperature operation and provides good shutoff performance even if the pipe is deformed to some degree due to thermal change.



Nominal size (A): 6 to 150

OPTION

H

For the meaning of the above optional icons, refer to Guidance 3 on page 8.

T-8800