

TPS-22, TPF-22 Type Temperature Regulating Solenoid Valve (for Steam or Hot Water)

For on/off control
SSS&AAS Used*

※ Contact-free swinging mechanism (AASTM) with special shape spring (SSSTM).
※ 1. Special Shape Spring ※ 2. Anti Abrasion System

A combination of electric temperature regulator and solenoid valve, with no need for selecting temperature regulator and connecting solenoid valve. For temperature regulating, connect the temperature sensor, which is attached to the valve, and switch the knob to set temperature.

Face-to-face dimensions are the same as TPS-12 and TPF-12 Types.

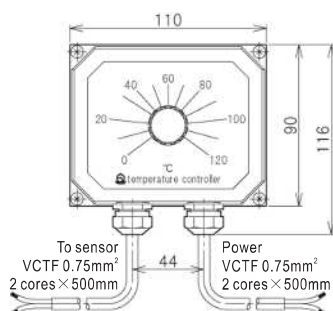


TPS-22 Type
(Size 10~25mm)

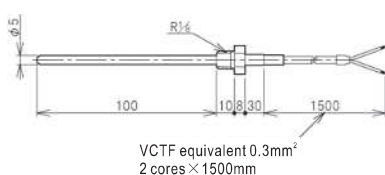


TPF-22 Type
(Size 15~25mm)

[Temperature regulating unit]



[Temperature measuring resistance (sensor)]



FEATURES

- A combination of electric temperature regulator and solenoid valve, with no need for selecting temperature regulator and valve.

- Temperature regulating knob.
- Compact, saving space.

SPECIFICATIONS

Solenoid valve body	Use	Heating*1	
	Operation	ON/OFF(Energized open)	
	Model name	TPS-22	TPF-22
	Code name	TPS22-W	TPF22-W
	Size	10~50(3/8"~2")	15~50(1/2"~2")
	Applicable fluid	Steam & hot water	
	Fluid temperature	5~170°C(For hot water:Max. 100°C)	
	Applicable pressure	0~0.7MPa	
	Min. pressure differential across the disc	0MPa	
	Leakage allowance	Nil (Confirm at pressure gauge)	
	Rated voltage	AC100V 50/60Hz, AC110V 60Hz or AC200V 50/60Hz, AC220V 60Hz	
	Insulation	Class H	
	Ambient temperature	5~55°C	
	Protection	Dust proof(Indoor use)	
Temperature controller	End connection	Screwed JIS Rc	Flanged JIS 10KFF
	Materials	Body(Cast bronze), Disc(Brass with Teflon tip)	
	Installation	Install the valve vertically in horizontal piping placing coil part above.	
	Valve body pressure test	Hydraulic 2.0MPa	
	Input	Resistance temperature detector (RTD):Pt 500 (With leads of 1.5m for indoor use)*2,*3	
Temperature controller	Control type	Two-position	
	Temperature setting range	0~120°C	
	Rated electric capacity	2VA	

*1. The solenoid valve for cooling (applicable fluid: Water) is also available upon your request. (Code name: TPS22-WA, TPF22-WA)

*2. The length of leads connected to the RTD can be extended up to 10m using commercially available.

*3. The RTD is for indoor applications. Please contact our local agent for other types of RTD.

CURRENT VALUES

Size(mm)	10	15	20	25	32	40	50
AC100V Rated(Starting)	0.21(0.70)		0.30(1.25)			0.42(1.62)	
AC200V Rated(Starting)	0.10(0.35)		0.15(0.63)			0.18(0.80)	

DIMENSIONS (TPS-22 Type)

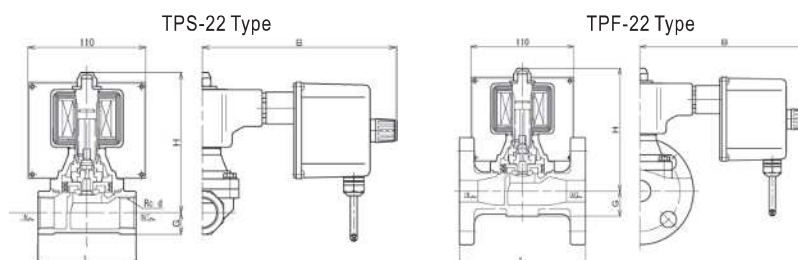
Size	d	L	G	H	B	Port size	Cv value	Mass(kg)
10(3/8")	3/8"	63	15	102	172	18	3	2
15(1/2")	1/2"	63	15	102	172	18	4	2
20(3/4")	3/4"	80	18	115	174	23	6	2.3
25(1")	1"	90	22	120	174	28	10	2.8
32(1 1/4")	1 1/4"	106	27	150	171	32	18	3.9
40(1 1/2")	1 1/2"	118	30	153	171	40	23	4.8
50(2")	2"	140	37	165	171	48	35	6.2

DIMENSIONS (TPF-22 Type)

Size	L	G	H	B	Port size	Cv value	Mass(kg)
15(1/2")	112	21	102	172	18	4	3.5
20(3/4")	118	24	115	174	23	6	4.3
25(1")	140	27	120	174	28	10	6.1
32(1 1/4")	150	32	150	171	32	18	7.9
40(1 1/2")	160	35	153	171	40	23	9.2
50(2")	190	41	165	171	48	35	11.5

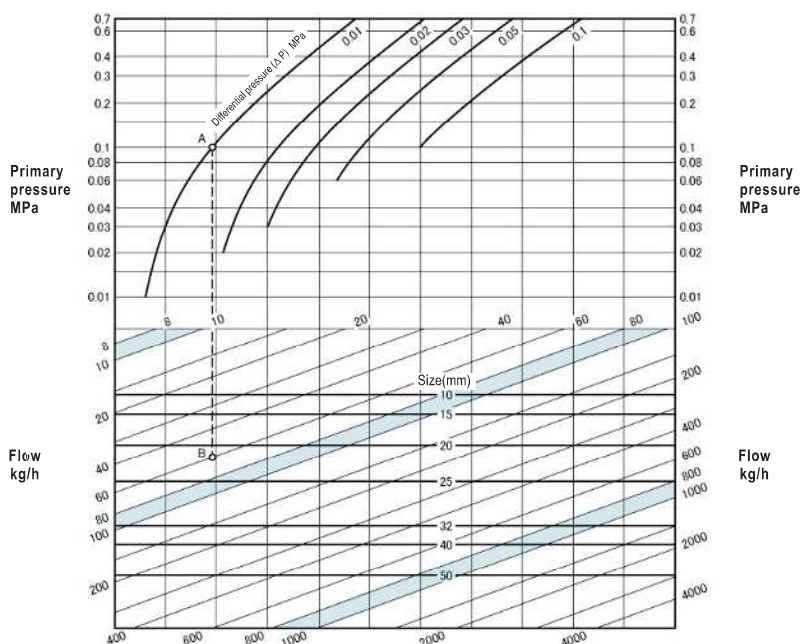
Flange code JIS 10KFF

CONSTRUCTION



Note: Depending on size, the structure may vary.

SIZE SELECTION CHART (for Steam)



● HOW TO USE THE CHART

Example: Determine the size of valve meeting the following conditions:

Primary pressure: 0.1 MPa

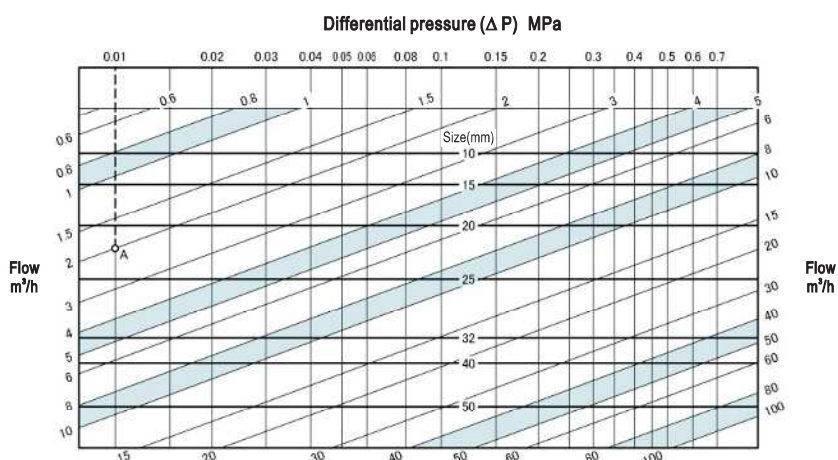
Differential pressure: 0.01 MPa

Flow of steam (saturated): 60 kg/h

Identify intersection point (A) of the 0.1 MPa primary pressure line and the 0.01 MPa differential pressure curve.

Draw a vertical line from point A until it intersects with the 60 kg/h flow line. The intersection point is named B. Since point B is between the 20 mm and 25 mm size lines, the larger size, which is 25 mm, is selected.

SIZE SELECTION CHART (for Hot water)



● HOW TO USE THE CHART

Example: Determine the size of valve meeting the following conditions:

Primary pressure: 0.3 MPa

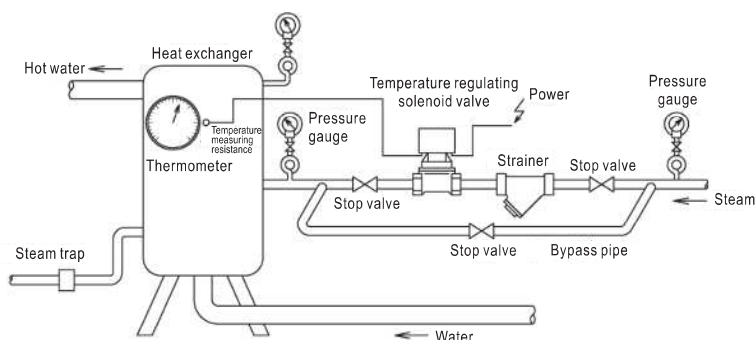
Secondary pressure: 0.29 MPa

Flow of water: 2 m³/h

Differential pressure (ΔP): $0.3 - 0.29 = 0.01$ MPa. Find out the intersection point A between the 0.01 MPa differential pressure (ΔP) line and the 2 m³/h flow line.

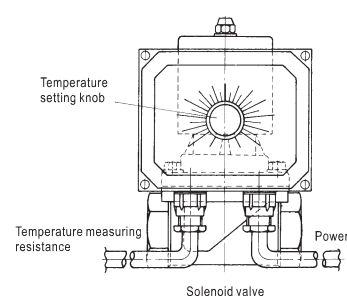
Since point A is between the lines representing nominal diameter 20 mm and 25 mm, the nominal diameter should be the larger one, i.e., 25 mm.

■ PIPING EXAMPLE



Note: Install a safety valve if there is risk of temperature increase due to thermal expansion for heat exchanger.

■ TEMPERATURE SETTING



Adjust the knob to desired temperature.

DATA/Solenoid Valve

METHOD FOR CONNECTION OF COIL

As shown in relevant specification table, different models of solenoid valves have different rated voltages. When connecting to power, make sure the voltage does not exceed the rated voltage of solenoid valve.

<Common voltage coil>

- Connect the 4 lead wires (in different colors) to power source.

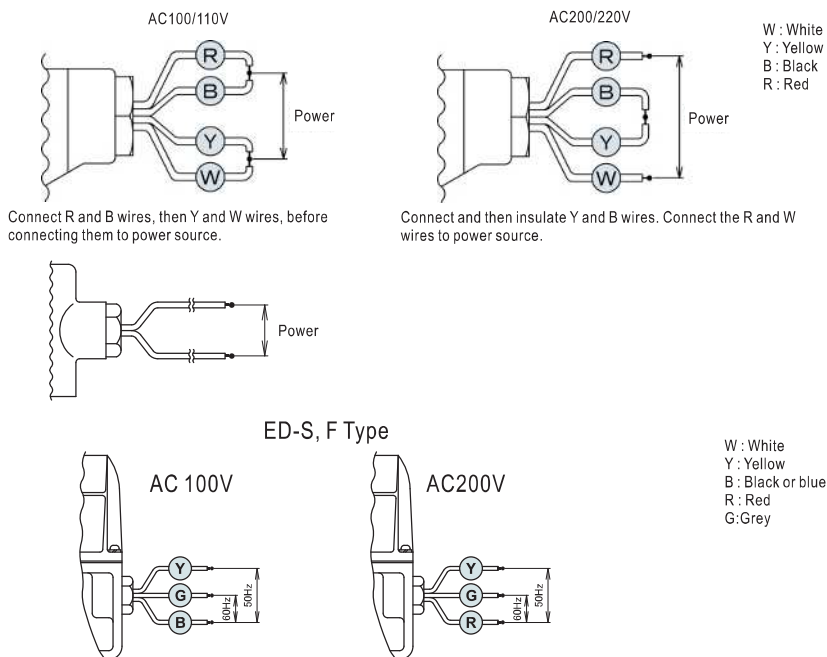
<Exclusive/Special voltage coil>

- Connect 2 lead wires to power source.

<Frequency selecting coil>

- There are 3 lead wires on coil. Read the connection method shown on product before connecting to power source.

The lead wire left unused should be insulated by using insulating tape.



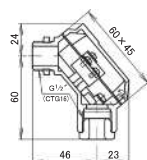
REFERENCE: ABOUT EXPLOSION PREVENTION

Terminal box specially designed for solenoid valve. Can be screwed in with lead wire of solenoid valve and protect power cable and lead wire from being exposed to rain or dust. TB-03 series are for outdoor cables and conduit.

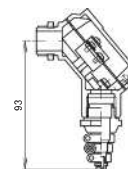
TB-03 TYPE SERIES (for indoor/outdoor, metal body, rainproof)

(Without indication lamp) Rated power: 250V 15A

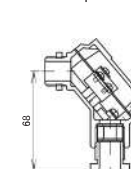
- TB-03 Type (standard model) With gland nut



- TB-03C Type With cap cone

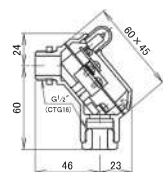


- TB-03F Type With ship-class gland

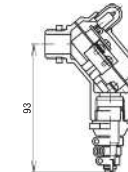


(With indication lamp) Rate power: AC100V or AC200V
Please specify voltage when ordering.

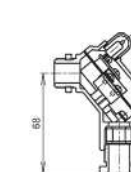
- TB-03L Type With indication lamp



- TB-03LC Type Lamp + cap cone

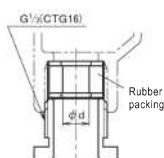


- TB-03LF Type Lamp + ship-class gland



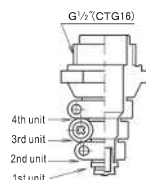
An example of TB-03 installation

SPECIFICATIONS OF GLAND (TB-03F, 03LF Type)



Gland size	d (mm)
15a	9
15b	10
15c	11

SPECIFICATIONS OF CAPCONE PLUG (TB-03C, 03LC Type)



Cut position	Applicable cable diameter(mm)
4th unit	10~12
3rd unit	8~10
2nd unit	6~8
1st unit	4~6

■ Fig.1 Piping example

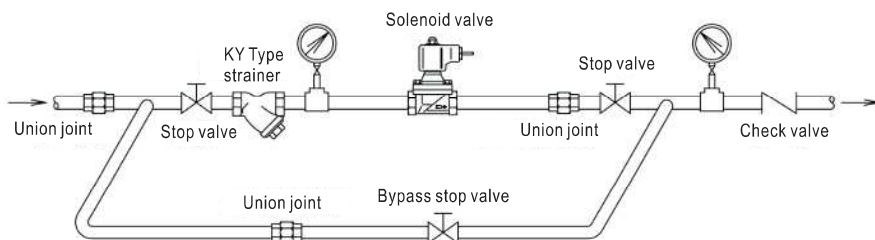


Fig.2 Installation position

Upright to horizontal pipe

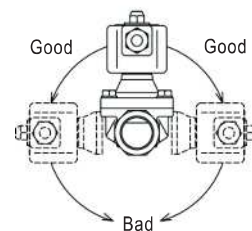


Fig.3: Elevated piping at secondary side

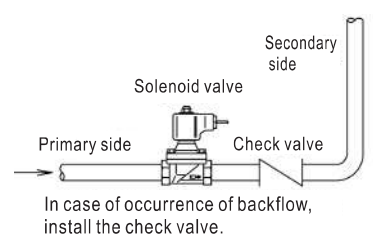


Fig.4 Steam line application

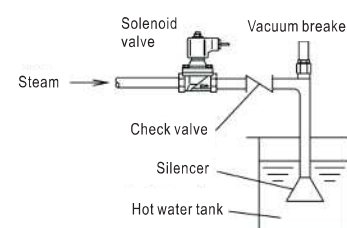
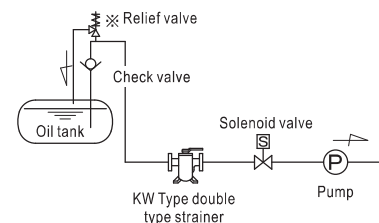


Fig.5 Relief valve installation



※ Install relief valve if pressure rise due to thermal expansion or other factors is anticipated.

■ SELECTION AND INSTALLATION

1. Install strainer on the primary side of solenoid valve (see Fig.1).
2. Install a bypass pipe (with stop valve) between the primary and secondary sides of solenoid valve if the operation of equipment cannot be stopped (see Fig.1).
If you do not intend to install bypass pipe, install blowing stop valve, which is branched from the main pipe, right before the stop valve on the primary side of solenoid valve, to allow flushing.
3. The coil should stand upright above horizontal pipe (see Fig.1, 2).
For size 50mm (and below) valve of WS, PS series, the coil can be upright above or at the same level of (and perpendicular to) horizontal pipe. In this case, make sure the pressure differential before and after the valve is larger than 0.03MPa (see Fig.2).
4. Back flow may occur when the secondary pressure is larger than the primary pressure. To prevent back flow, install check valve on the secondary side (see Fig. 3).
5. If the valve is used for steam and the secondary pressure is negative pressure when the valve is closed, install vacuum regulating valve (vacuum breaker) on the secondary side of solenoid valve (see Fig.4).
6. Install steam trap on piping if the valve is used for steam.
7. When used for liquid, the pressure inside the piping may increase due to water hammer which occurs when valve is closed or due to the expansion caused by ambient temperature increase. In this case, it is recommended to install relief valve to protect machine (see Fig.5).
8. Connect coil properly using 0.75mm² above wire. Install fuse to protect electric circuit.
9. Repeated power-on and power-off for a long period may make the surface temperature rise up to about 70°C. Attentions should be paid to avoid burning. (Depending on conditions and models, the temperature rise varies.)
10. Make sure the arrow mark on solenoid valve match with the direction of flow of fluid.
11. Leave some space for disassembling and maintenance.
12. Fix and support piping properly to prevent solenoid valve from being damaged due to weight of piping, excessively large stress, bending force or vibration.
13. Discharge drain or apply thermal insulation if there is risk of freezing.
However, the coil should not be applied with any thermal insulation.