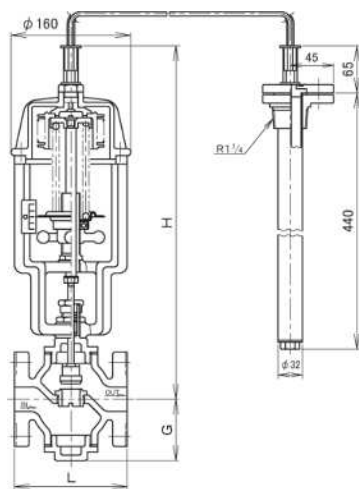


TD-4, 4L Type Temperature Regulating Valve

Small capacity, flanged, single seat temperature regulating valve with less leakage. Suitable for installation at places where leakage is not permitted and on small capacity machines.



CONSTRUCTION



SPECIFICATIONS

Utility		Heating		Low temp heating	
Model name		TD-4		TD-4L	
Code name		TD4-G		TD4L-G	
Adjustment temperature range		40~100℃*1,*2.		15~55℃*1,*2.	
Applicable ambient temperature		Setting temperature - 10℃ or below		Setting temperature +20℃ or below	
Applicable fluid		Steam & Hot water			
Fluid to be heated		Water, oil & liquids			
Fluid temperature		Max. 184℃			
Length of capillary tube		2m(Available up to 5m)			
Seat type		Single seated			
Leakage allowance		Refer to table of leakage allowance			
End connection		Size 15~25mm:Flanged JIS 10KFF Size 32~40mm:Flanged JIS 5KFF			
Materials		Body(Cast iron), Disc & seat(Stainless steel), Bellows(Phosphor bronze) Thermo bulb (Stainless steel)			
Applicable pressure for thermo bulb		Max. 1.0MPa			
Pressure limit at inlet	Size	15~20(½"~¾")	25(1")	32~40(1¼"~1½")	
	(MPa)	1.0	0.7	0.5	
Valve body pressure test		Hydraulic,1.5 times of flange rated pressure.			

* 1. Refer to below table of adjustable temperature range.

* 2. Adjustable temperature range 100~120°C(with standing temperature: 130°C) is available upon your request.

* 3. The protection cap for thermo bulb, with non-standard dimension is available upon your request.

DIMENSIONS

Size	L	G	H	Cv value	Mass(kg)
15(1/2")	126	55	470	1.5	13
20(3/4")	130	55	470	1.5	13
25(1")	130	60	475	3	15
32(1 1/4")	180	85	510	4	21
40(1 1/2")	180	85	510	4	22

Size 15~25mm: Flange code JIS 10KFF

Size 32~40mm: Flange code JIS 5KFF

ADJUSTABLE TEMPERATURE RANGE

Heating		Low temp heating	
Adjustable temp. range	Withstanding temperature	Adjustable temp. range	Withstanding temperature
40~60°C	70°C	15~35°C	50°C
50~70°C	80°C	20~40°C	
60~80°C	90°C	35~55°C	70°C
70~90°C	100°C		
80~100°C	110°C		

* Other than the above temperature range items are available upon your request.

TEMPERATURE SET ERROR

(In case of 2m of length of capillary tube)

Heating		Low temp heating
A	B	
±2°C	±3°C	±3.5°C

* A: In case of Max. 100°C or less for adjustable temperature range.

* B: In case of exceeding 100°C in all or part of adjustable temperature range.

LEAKAGE ALLOWANCE

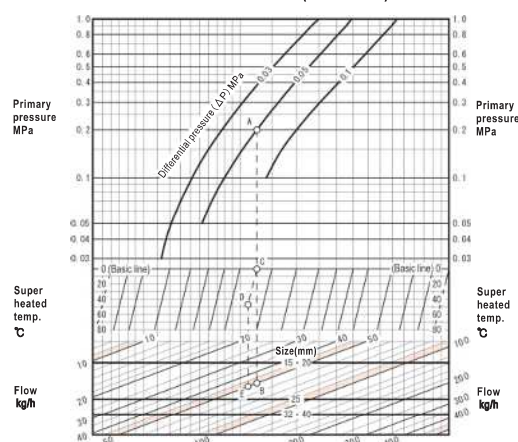
(g/min or mL/min)

Size(mm)	15	20	25	32	40
TD-4 Type	2	2	2	3	4
TD-4L Type	4	4	4	6	8

* Reading in g/min for testing fluid STEAM.

Reading in mL/min for testing fluid WATER.

SIZE SELECTION CHART (for Steam)



HOW TO USE THE CHART

Under the following conditions:

Primary pressure: 0.2MPa

Flow of saturated steam: 50kg/h

Differential pressure: 0.05MPa

Obtain point A (where the 0.2MPa primary pressure line intersects with the 0.05MPa differential pressure line) and point B (intersection point acquired using 50kg/h flow line). Since point B is located between lines size 15/20mm and size 25mm, the size 25mm is selected.

If the steam temperature is 180°C, the first thing is to find the degree of superheat.

Since degree of superheat = temperature of superheat steam-temperature of saturated steam, Degree of superheat : 180°C-132.9°C=47.1°C. Draw a vertical line from point A until it intersects with the benchmark line. The intersection point is named C. Move from point C parallelly along the superheat line (47.1°C) to decide point D. Using point D, it is able to decide point E, where the line intersects with flow line (50kg/h). Since point C is located between lines size 15/20mm and size 25mm, the larger one, 25mm, is selected.

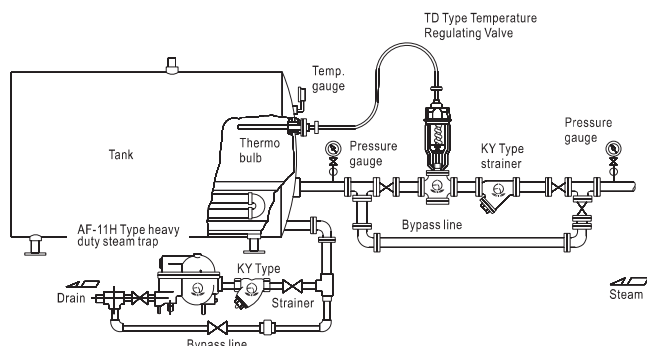
See Page 278 for temperature of saturated steam.

DATA/Temperature Regulating Valve

Key Points for Installation

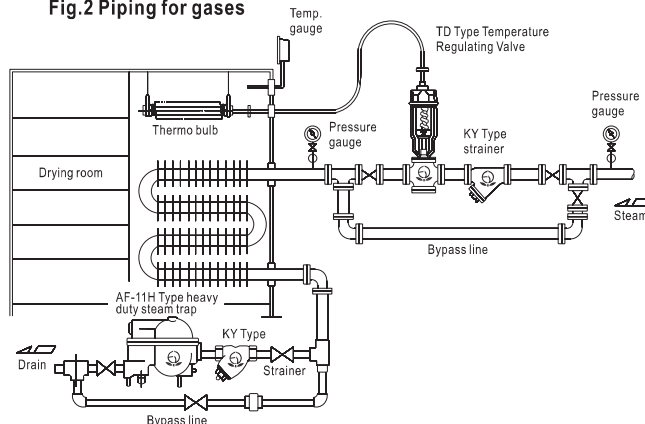
PIPING EXAMPLE

Fig.1 Piping for liquids



Note: It's required that the safety relief valve should be installed on the tank side.

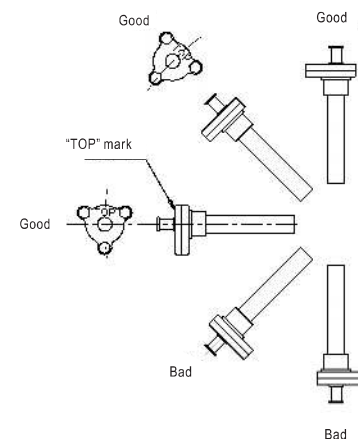
Fig.2 Piping for gases



KEY POINTS FOR SELECTION AND INSTALLATION

- Temperature regulating may not be possible if ambient temperature is very high due to direct sunlight or heat accumulated in the place where the valve is installed. The following is the allowed ambient temperature for different types of valves.
※Allowed ambient temperature:
TD-□ Type (for heating), TD-□A Type (for cooling): Atmosphere temperature -10°C or below against set temperature.
TD-□L Type (for low temperature heating), TD-□AL Type (low temperature cooling): Atmosphere temperature $+20^{\circ}\text{C}$ or below against set temperature.
- Generally, for the purpose of selecting size of valve, the differential pressure before and after valve should be 0.05MPa. In addition, the inlet pressure of temperature regulating valve should be 0.2~0.3MPa. Such a pressure can help ensuring stable temperature regulating performance and expanding the service life of the valve.
- For ideal controllability, take the median of the temperature regulating range as set temperature.
- For applications with low capacity and risk of leakage, select single seat TD-8 or TD-4 Type series that have less leakage.
- Install strainer at the primary side of temperature regulating valve.
- For equipments whose operation cannot be stopped, install bypass piping (with stop valve) between the primary and secondary sides of temperature regulating valve (see Fig.1, 2). If such a bypass piping is not installed, install blowing stop valve, which is branched from the main pipe, right before the primary stop valve of temperature regulating valve to make flushing possible.
- The temperature may exceed set temperature due to leakage of temperature regulating valve. To avoid such increase of temperature, install electric valve or other blocking devices at the outlet side of temperature regulating valve.
- Make sure the direction of flow of fluid is the same as the direction marked on the product and install temperature regulating valve vertically to horizontal pipes.
- Install stop valve and pressure gauge before and after temperature regulating valve (see Fig.1, 2).
- The thermo bulb should be installed in a manner so that the head faces horizontally or slightly downwardly (but not upwardly). In addition, the "TOP" mark must face upwardly (see Fig.3).
- The thermo bulb must have at least 3/4 of its total length submerged into the flowing fluid. The thermometer must be installed near and at the same height of the thermo bulb.
- Do not bend the capillary tube to an acute angle.
- If the fluid is steam, install steam trap for discharging drain generated by heat exchanger.
- Leave sufficient space for dismantling and maintenance purpose.
- Temperature regulating valve should be supported and fixed properly to avoid impact due to the weight of piping, bending force or vibration.
- In case of any freezing possibility, insulate or drain out.
- Deviation of temperature setting and range of temperature regulating are as below:

Fig.3 Direction for installation of thermo bulb



TEMPERATURE SET ERROR (TD-8, 8A Type, TD-2 Type Series)

Length of capillary tube	Heating & cooling		Low temp heating & cooling
	A	B	
2m	$\pm 2^{\circ}\text{C}$	$\pm 3^{\circ}\text{C}$	$\pm 3.5^{\circ}\text{C}$ 2m or longer add $\pm 0.5^{\circ}\text{C}$ per 1m
2~3.5m	$\pm 2.5^{\circ}\text{C}$	$\pm 3.5^{\circ}\text{C}$	
3.5~5m	$\pm 3^{\circ}\text{C}$	$\pm 4^{\circ}\text{C}$	

* 1. A: In case of Max. 100°C or less for adjustable temperature range.

B: In case of exceeding 100°C in all or part of adjustable temperature range.

* 2. In case of gases service, $\pm 1^{\circ}\text{C}$ is added.

ADJUSTABLE TEMPERATURE RANGE (TD-8, 8A Type, TD-2 Type Series)

Heating & cooling			Low temp heating & cooling	
Code No.	Adjustable temp. range	Withstanding temperature	Adjustable temp. range	Withstanding temperature
1	40~60 $^{\circ}\text{C}$	70 $^{\circ}\text{C}$	15~35 $^{\circ}\text{C}$	50 $^{\circ}\text{C}$
	50~70 $^{\circ}\text{C}$	80 $^{\circ}\text{C}$	20~40 $^{\circ}\text{C}$	
	60~80 $^{\circ}\text{C}$	90 $^{\circ}\text{C}$	35~55 $^{\circ}\text{C}$	70 $^{\circ}\text{C}$
2	70~90 $^{\circ}\text{C}$	100 $^{\circ}\text{C}$		
	80~100 $^{\circ}\text{C}$	110 $^{\circ}\text{C}$		

* Other than the above temperature range items are available upon your request.