

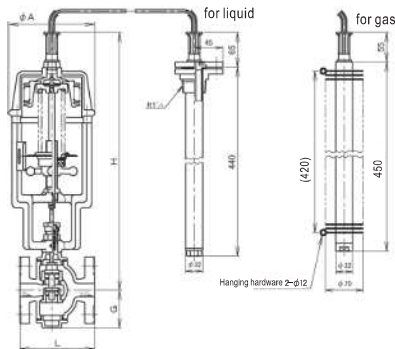
TD-2 Type Series Temperature Regulating Valve

General purpose, flanged temperature regulating valves for heating of water tank, heat exchanger, heavy oil heater etc. The series also include valves using water or coolant for cooling purpose. And we have a suitable models applicable in place where ambient temperature is higher than set temperature or applicable for the lower temperature of 40°C or below.

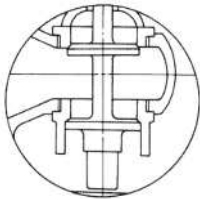


CONSTRUCTION

TD-2 Type



Depending on size, the structure may vary. The bellows of TD-2L and TD-2AL Types have different structures.



TD-2A, 2AL Type

LEAKAGE ALLOWANCE

(g/min or mL/min)

Size(mm)	15	20	25	32	40	50
TD-2 Type	20	20	20	26	32	40
TD-2A Type	20	20	20	26	32	40
TD-2L Type	40	40	40	52	64	80
TD-2AL Type	40	40	40	52	64	80

Size(mm)	65	80	100	125	150
TD-2 Type	52	64	80	100	120
TD-2A Type	52	64	80	100	120
TD-2L Type	104	128	160	—	—
TD-2AL Type	104	128	160	—	—

* Reading in g/min for testing fluid STEAM.
* Reading in mL/min for testing fluid WATER.

SPECIFICATIONS (Common use)

Utility		Heating		Low temp heating		Cooling		Low temp cooling	
Model name		TD-2		TD-2L		TD-2A		TD-2AL	
Size		15~150(½″~6″)		15~100(½″~4″)		15~150(½″~6″)		15~100(½″~4″)	
Applicable fluid		Steam & hot water				Water & cold media			
Fluid temperature		Max. 184℃				Max. 60℃			
Seat type		Double seated							
Leakage allowance		Refer to table of leakage allowance							
End connection		Flanged JIS 10KFF							
Materials		Body(Cast iron), Disc & Seat(Cast bronze*), Bellows(Phosphor bronze)							
Pressure limit at inlet	Size(mm)	15~40	50~65	80	100	125	150		
	Limit(MPa)	1.0	0.7	0.5	0.4	0.35	0.2		
Valve body pressure test		Hydraulic 1.5MPa							

* Disc and seat with stainless steel are available upon your request.

SPECIFICATIONS TD-2 Type (Heating)、TD-2A Type (Cooling)

Model name	TD-2(Heating)		TD-2A(Cooling)	
Utility	Liquids	Gases	Liquids	Gases
Code name	TD2W-B □ ^{*1}	TD2G-B	TD2AW-B	TD2AG-B
	※ 1, 2 or 3 for adjustment temperature range is required in □.			
Adjustment temperature range	1:40~60°C 2:60~80°C ^{*2,*3} 3:80~100°C	40~60°C, 50~70°C, 60~80°C, 70~90°C, 80~100°C ^{*2,*3}		
Applicable ambient temperature	Setting temperature - 10°C or below			
Fluid to be heated or cooled	Water, oil & liquids	Gases	Water, oil & liquids	Gases
Length of capillary tube	Size 15~100mm:2m ^{*5} , Size 125~150mm:4m ^{*5}			
Thermo bulb materials	Stainless steel	Stainless steel with stainless steel fin	Stainless steel	Stainless steel with stainless steel fin
Applicable pressure for thermo bulb	Max. 1.0MPa			

SPECIFICATIONS TD-2L Type (Low temp Heating), TD-2AL Type (Low temp Cooling)

Model name	TD-2L(Low temp heating)		TD-2AL(Low temp cooling)	
Utility	Liquids	Gases	Liquids	Gases
Code name	TD2LW-B	TD2LG-B	TD2ALW-B	TD2ALG-B
Adjustment temperature range	15~35, 20~40, 35~55°C			
Applicable ambient temperature	Setting temperature +20°C or below			
Fluid to be heated or cooled	Water, oil & liquids	Gases	Water, oil & liquids	Gases
Length of capillary tube	Size 15~100mm:2m* ⁵ , Size 125~150mm:4m* ⁵			
Thermo bulb materials	Stainless steel	Stainless steel with stainless steel fin	Stainless steel	Stainless steel with stainless steel fin
Applicable pressure for thermo bulb	Max. 1.0MPa			

* 1. In case of size 100mm or bigger, the code name is TD2W-B.

* 2. Items other than the above adjustment temperature range are available upon your request.

* 3. In case of liquid use, adjustable temperature range 100~120°C. (With standing temperature 130°C) is available upon your request.

* 4. Refer to Page 132 for adjustable temperature range.

* 5. Length of capillary tube up to 5m is available upon your request.

* 6. In case of liquid use, for sizes 15~65mm (1/2"~2 1/2"), the protection cap for thermo bulb, with non-standard dimension is available upon your request.

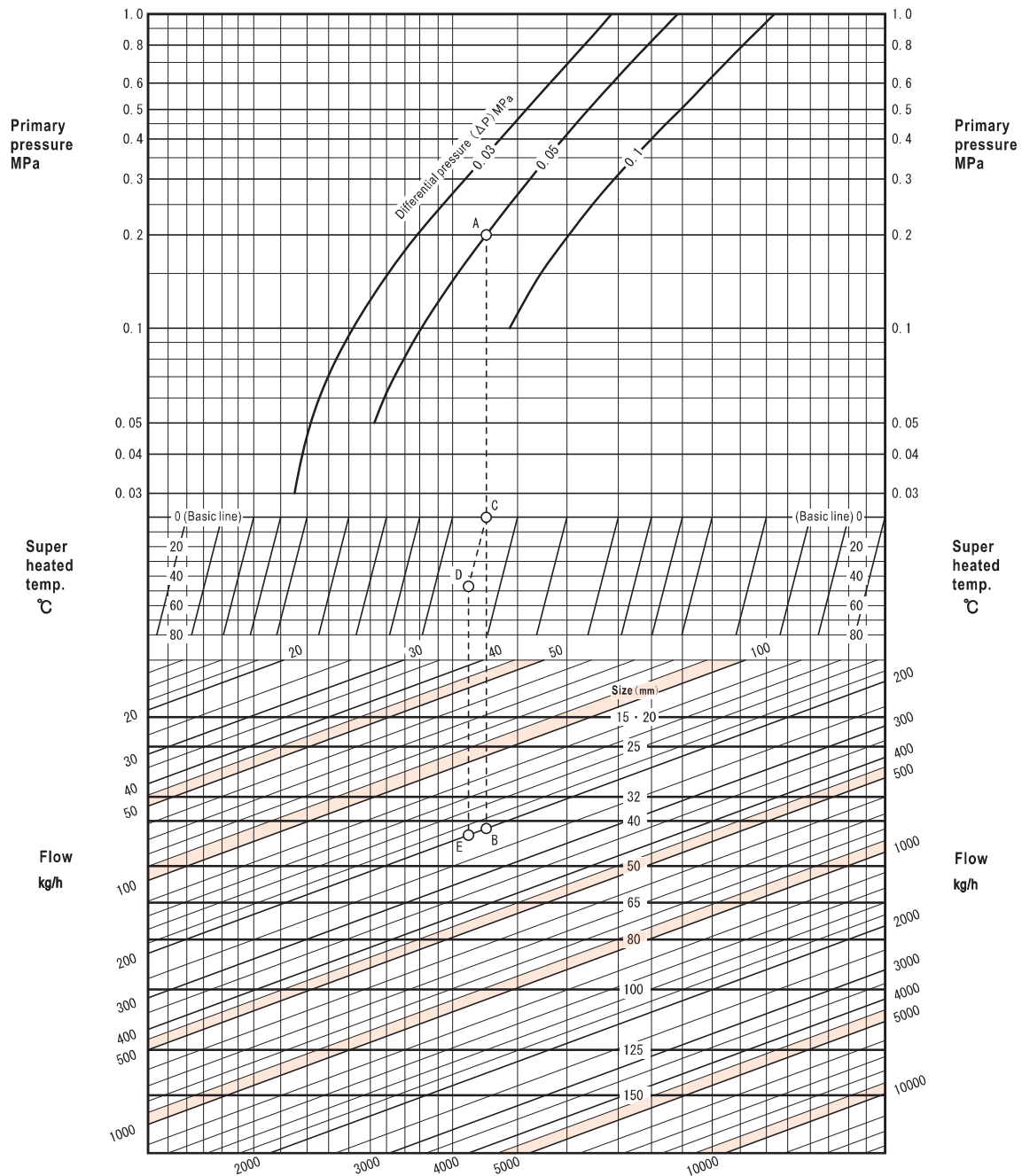
DIMENSIONS

(mm)

Size	L	G	H	A	Cv value	Mass(kg)
15(1/2")	126	60	475	160	3	12.1
20(3/4")	130	60	475	160	3	12.4
25(1")	140	70	485	160	4	13.5
32(1 1/4")	150	75	490	160	6.5	15
40(1 1/2")	160	75	490	160	8	15.5
50(2")	180	100	525	160	12.5	22.5
65(2 1/2")	215	115	535	160	18	29.2
80(3")	260	125	580	180	25	38
100(4")	300	150	605	180	40	57.5
125(5")	360	180	745	220	70	75.6
150(6")	382	205	770	220	110	125

Flange code JIS 10KFF

SIZE SELECTION CHART (for Steam)



● HOW TO USE THE CHART

Select a valve with proper size for meeting the following requirements.

Primary pressure: 0.2MPa
Flow of saturated steam: 200kg/h
Differential pressure: 0.05MPa

First, find out the point (A) where the primary pressure line (0.2MPa) intersects with the differential line (0.05MPa). Draw a vertical line from point A. This line intersects with flow curve (200kg/h). The intersection point is B. Since B is located between a nominal diameter range of 40mm~50mm. The larger value, which is 50mm, is taken as the nominal diameter that we are looking for.

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

Since degree of superheat = temperature of superheat steam-temperature of saturated steam, Degree of superheat: $180^{\circ}\text{C} - 132.9^{\circ}\text{C} = 47.1^{\circ}\text{C}$. Draw a vertical line from point A until it intersects with the benchmark line. The intersection point is named C. Move from point C parallel along the superheat line (47.1°C) to decide point D.

Draw a vertical line from point D until it intersects with flow curve (200kg/h). the intersection point is named E. Since point E is located between a nominal diameter range of 40mm~50mm. The larger value, which is 50mm, is taken as the nominal diameter that we are looking for.

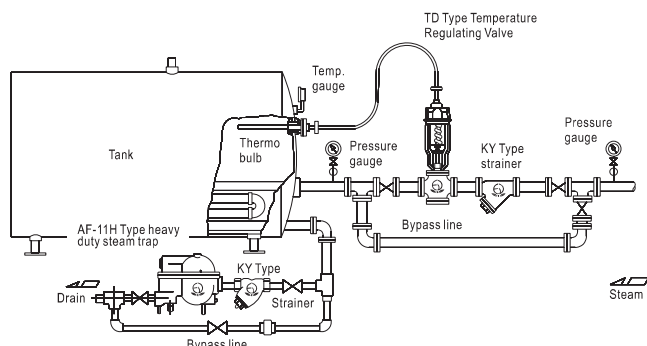
See Page 278 for temperature of saturated steam.

DATA/Temperature Regulating Valve

Key Points for Installation

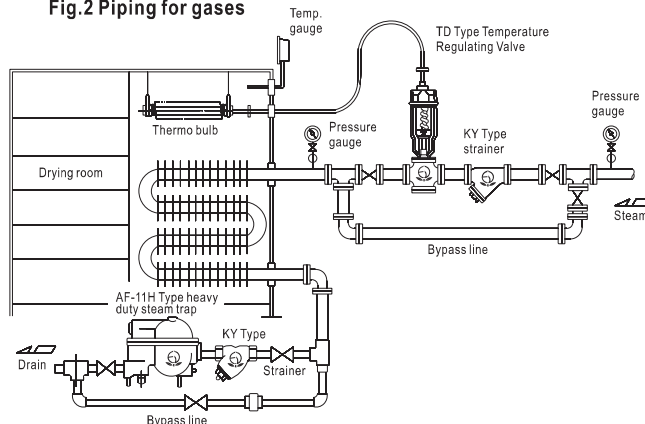
PIPING EXAMPLE

Fig.1 Piping for liquids



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

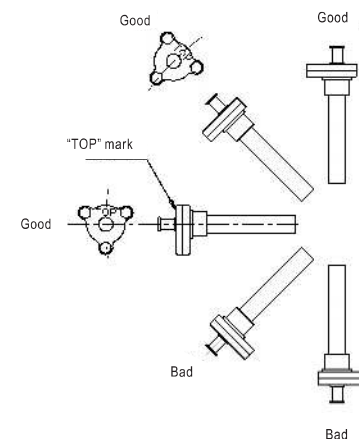
Fig.2 Piping for gases



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.