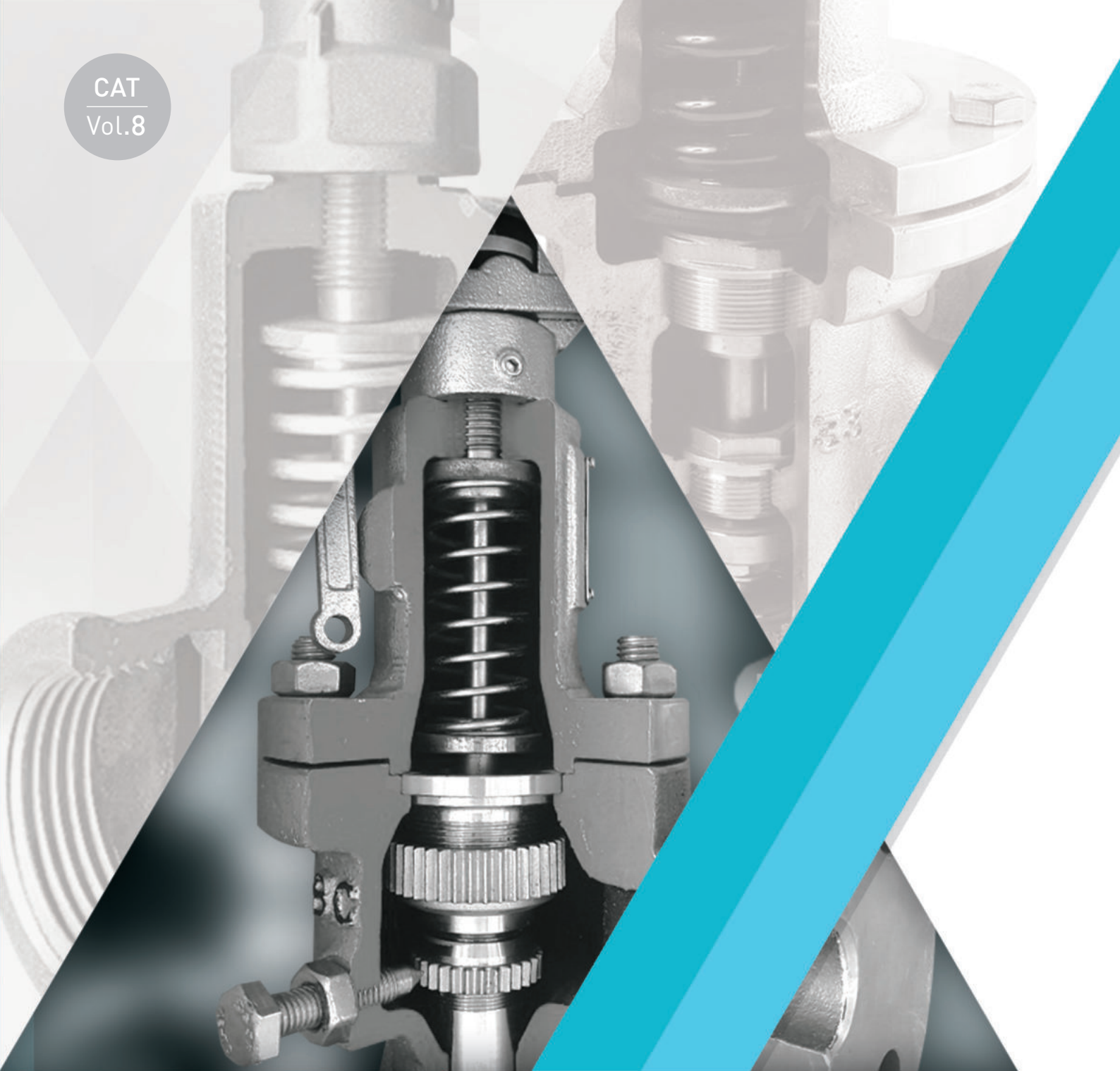


CAT  
Vol.8



SAFETY RELIEF VALVE

PRESSURE REDUCING & REGULATING VALVE

STEAM TRAP

STRAINER

OTHER VALVES



**YNV CO., LTD.**

[www.ynv.co.kr](http://www.ynv.co.kr)

# YNV Corperation Vision

**We assure you that we will be a company that promotes your best value and happiness**

Greetings! This is the CEO of YNV CO.,Ltd.

Ever since my company was established, we have been supplying various specialized valve products to shipyards, shipbuilding equipment manufacturers, industrial plants and construction sites with my innovative quality management system.

Based on our quality assurance policy, we aim to maintain customer satisfying products, acquire ppm certification for all of my products and achieve the best quality in the industry. By realizing reasonable cost on high-quality products, we would like to contribute in providing eco-friendly and energy saving environment to customers.





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# Safety Relief Valve



## Lift Type Safety Relief Valve

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## Full Bore Type Safety Relief Valve

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## Safety Relief Valve Approved by KGS

GSV-3S/4S .....	15
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### \* Lift Type Safety Relief Valve

When the lift of the safety valve is opened more than  $1/40$  and less than  $1/4$  of inlet diameter of valve seat, flow path area of valve seat is the smallest among the flow path area

### \* Full Bore Type Safety Relief Valve

Flow path area of valve seat gains larger lift than neck area of the exposure at the lower part on the valve body and seat



# Safety Relief Valve

- Angle type spring loaded lift safety relief valve for steam, air, water, oil.
- Suitable for small and medium capacity.
- Quickly popping reaction and correct re-setting.
- Easy adjustment of set pressure and blow-down pressure.
- Since this valve is produced with compact design, this is easy to install by small size and light weight.
- The simple structure of this valve allows to operating accurately and maintaining easily.

## LSV-1S | Low Lift Type Safety Relief Valve

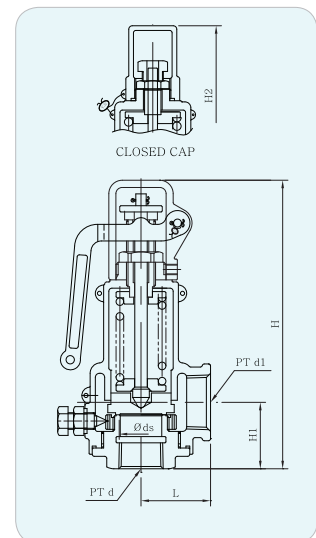
### ► Specifications

Type	Working Fluid	Setting Pressure (kgf/cm <sup>2</sup> )	Working Temperature (°C)	Materials		Connection
				Bonnet	Trim	
Lever	Steam, Air	0.5~11	220	Cast Bronze	Forged Brass	PT Screwed
No Lever	Water, Oil					



### ► Dimensions

Size	Part	d	ds	L	H1	H	Lift	Inlet	Outlet
15A × 20A		15	21	33.5	40	149	1.0	PT Screwed	PT Screwed
20A × 20A		20	21	33.5	40	149	1.0		
25A × 25A		25	26	43	46	164	1.7		
32A × 32A		32	33	45	48	177	2.2		
40A × 40A		40	41	50	54	196	2.3		
50A × 50A		50	51	62	62	213	2.5		



## HSV-3S/4S | High Lift Type Safety Relief Valve

- By separating the spring by pressure, the operation is sure and the function is excellent.
- Disc and seat material is stainless steel + PTFE, there is no corrosion or leakage.
- It is used as Safety Relief Valve for high pressure refrigerant gas.

### ► Specifications(HSV-3S)

Type	Working Fluid	Setting Pressure (kgf/cm <sup>2</sup> )	Working Temperature (°C)	Materials			Connection
				Body	Bonnet	Trim	
Lever	Steam, Air	0.5~33	220	Stainless Steel	Cast Bronze	Stainless Steel	PT Screwed
No Lever	Water, Oil						



HSV-3S

### ► Specifications(HSV-4S)

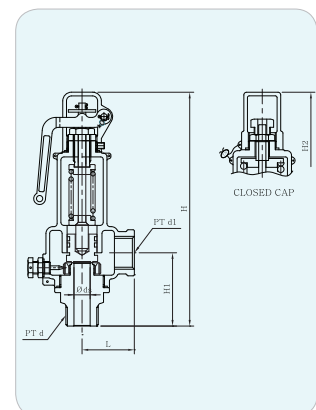
Type	Working Fluid	Setting Pressure (kgf/cm <sup>2</sup> )	Working Temperature (°C)	Materials			Connection
				Body	Bonnet	Trim	
Lever	Steam, Air	0.5~33	220	Stainless Steel	Stainless Steel	Stainless Steel	PT Screwed
No Lever	Water, Oil						



HSV-4S

### ► Dimensions

Size	Part	d	ds	L	H1	H	Lift	Inlet	Outlet
15A × 20A		15	14	42	60	192	1.0	PT Screwed	PT Screwed
20A × 20A		20	14	42	63	195	1.0		
25A × 25A		25	19	44	69	211	1.7		
32A × 32A		32	24	45	71	200	2.0		
40A × 40A		40	26	50	79	221	2.2		
50A × 50A		50	33	62	93	244	4.5		



## HSV-3S1 | High Lift Type Safety Relief Valve

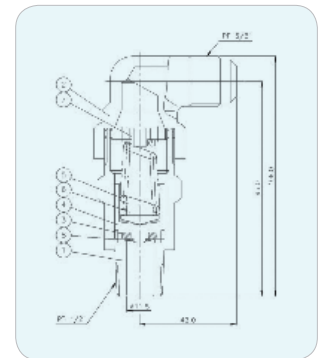
### ► Specifications

Type	Working Fluid	Setting Pressure (kgf/cm <sup>2</sup> )	Working Temperature (°C)	Materials			Connection
				Body	Bonnet	Trim	
No Lever	Gas	0.5~33	100	Forged Brass	Forged Brass	Stainless Steel	PT Screwed



### ► Dimensions

Size	Part	d	ds	L	H1	H	Lift	Inlet	Outlet
15A		11.5	11.5	42	95	106	1.0	PT 1/2"	PF 5/8"



## VSV-1S | Vacuum Breaker

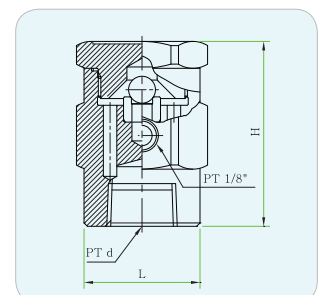
### ► Specifications

Type	Setting Pressure (kgf/cm <sup>2</sup> )	Working Temperature (°C)	Materials		Connection
			Body	Trim	
Steam	—	220	Brass	Stainless Steel	PT Screwed



### ► Dimensions

Size	Part	d	L	H	Inlet
15A		PT 1/2"	35	55	PT Screwed
20A		PT 3/4"	35	55	

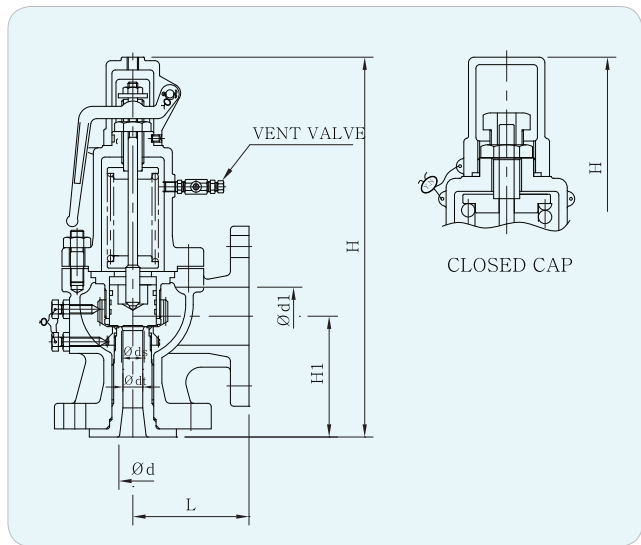






## FSV-1F | Full Bore Safety Relief Valve

- This is generally used for large-size steam boiler, various pressure vessels and tracing equipment as safety valve and relief valve in pump.
- Suitable for large capacity.
- The main parts are made of the good materials in accurate.
- Lever type could execute the discharge inspection manually at over 75% of discharge pressure.
- ANSI, DIN Flanges are available upon request.



### ► Specifications

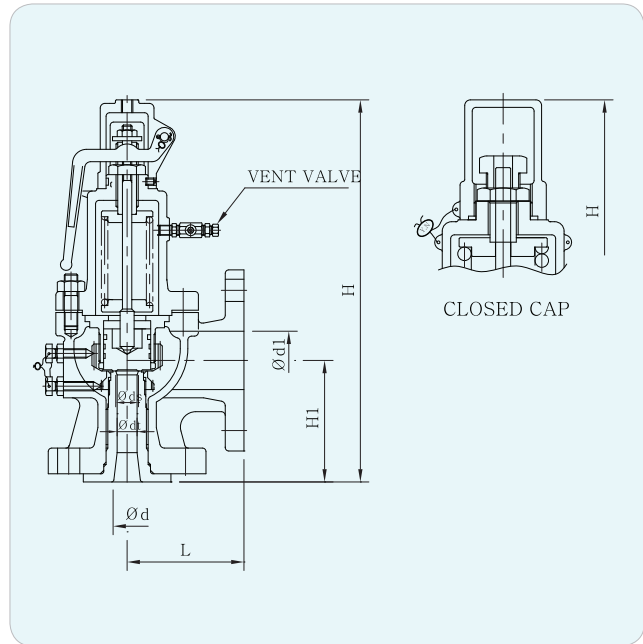
Type	Working Fluid	Setting Pressure (kgf/cm <sup>2</sup> )	Working Temperature (°C)	Materials		Connection
				Body	Trim	
Lever	Steam, Air	0.5~11	220	Ductile Iron	Stainless Steel	JIS Flanged
No Lever	Water, Oil					

### ► Dimensions

Size	Part	d	dt	ds	L	H1	H	Lift	Inlet	Outlet
15A × 25A		15	11.5	14.5	95	85	282	3.0	JIS 10K RF Flanged	JIS 10K FF Flanged
20A × 25A		20	15	17.5	95	85	282	3.8		
25A × 40A		25	19	22	100	104	324	4.8		
32A × 65A		32	30	35	115	123	419	7.5		
40A × 65A		40	30	35	115	123	419	7.5		
50A × 80A		50	38	44	128	130	478	9.5		
65A × 100A		65	49	57	145	145	544	12.3		
80A × 125A		80	61	71	162	168	600	15.2		
100A × 150A		100	76	88	190	197	725	19.0		
125A × 200A		125	95	114	220	222	900	24.0		
150A × 200A		150	115	133	225	230	961	28.7		

※ KS B6216 Flange is available upon request

## FSV-2F | Full Bore Safety Relief Valve



### ► Specifications

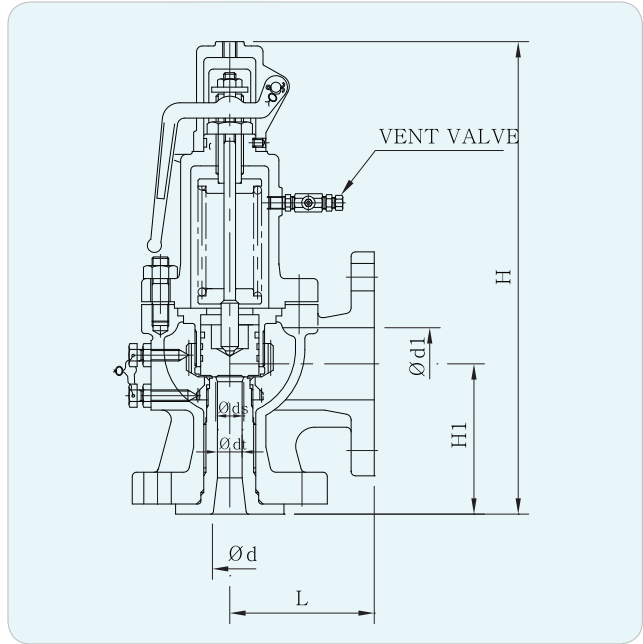
Type	Working Fluid	Setting Pressure (kgf/cm <sup>2</sup> )	Working Temperature (°C)	Materials		Connection
				Body	Trim	
Lever	Steam, Air	0.5~22	250	Cast Steel Stainless Steel	Stainless Steel	JIS Flanged ANSI Flanged
No Lever	Water, Oil					

### ► Dimensions

Size	Part	d	dt	ds	L	H1	H	Lift	Inlet	Outlet
15A × 25A		15	11.5	14.5	95	85	282	3.0	JIS 10K, 20K RF Flanged	JIS 10K FF Flanged
20A × 25A		20	15	17.5	95	85	282	3.8		
25A × 40A		25	19	22	100	104	320	4.8		
32A × 65A		32	30	35	115	123	386	7.5		
40A × 65A		40	30	35	115	123	386	7.5		
50A × 80A		50	38	44	128	130	476	9.5		
65A × 100A		65	49	57	145	150	547	12.3		
80A × 125A		80	61	71	162	168	598	15.2		
100A × 150A		100	76	88	190	197	725	19.0		
125A × 200A		125	95	114	220	222	895	24.0		
150A × 200A		150	115	133	225	230	953	28.7		
200A × 250A		200	150	175	270	255	1121	37.5		
250A × 300A		250	200	230	410	350	1720	50.0		

※ KS B6216, ANSI and DIN Flange are available upon request (more than 235°C, manufacturing open bonnet type –Korea Occupational Safety & Health Agency)

# FSV-3F | Full Bore Safety Relief Valve



## ► Specifications

Type	Working Fluid	Setting Pressure (kgf/cm <sup>2</sup> )	Working Temperature (°C)	Materials		Connection
				Body	Trim	
Lever	Steam, Air	22~33	250	Cast Steel Stainless Steel	Stainless Steel	JIS Flanged ANSI Flanged
No Lever	Water, Oil					

## ► Dimensions

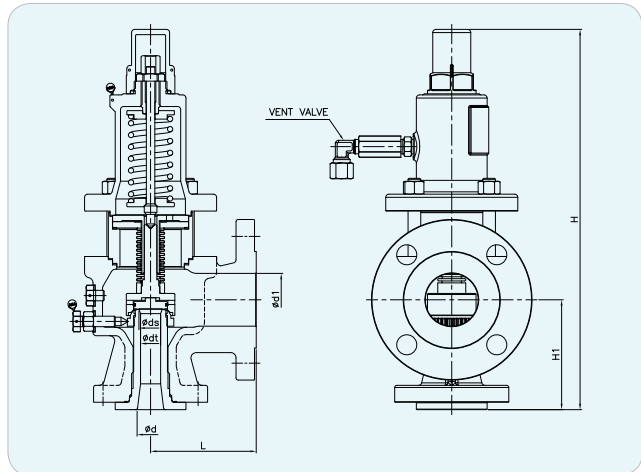
Size	Part	d	dt	ds	L	H1	H	Lift	Inlet	Outlet
15A × 25A		15	11.5	14.5	95	85	282	3.0	JIS 30K RF Flanged	JIS 10K FF Flanged
20A × 25A		20	15	17.5	95	85	282	3.8		
25A × 40A		25	19	22	100	105	320	4.8		
40A × 65A		40	30	35	115	123	386	7.5		
50A × 80A		50	38	44	128	130	476	9.5		
65A × 100A		65	49	57	145	150	547	12.3		
80A × 125A		80	61	71	162	168	598	15.2		
100A × 150A		100	76	88	190	197	725	19.0		

※ Applied pressure 33kgf/cm<sup>2</sup>[3.3Mpa] is available upon request

※ KS B6216, ANSI and DIN Flange are available upon request (more than 235°C, manufacturing open bonnet type –Korea Occupational Safety & Health Agency)

## BFSV-2F | Balanced Bellows Type Safety Relief Valve

- This is generally used for various measuring machines and piping at petroleum, gas and chemical plants
- It is used in locations affected by back pressure of outlet and the fluid is not allowed external safety relief valve to flow
- It is used in locations where springs are to corrode or deform by the corrosion of the fluid or temperature
- Internal materials are STS316 which provides excellent erosion resistance



### ► Specifications

Model	<b>BFSV-2F</b>
Working Fluid	Gas, Hot Oil
Setting Pressure	0.5~22kgf/cm <sup>2</sup> g
Working Temperature (°C)	MAX. 400°C
Type	Balanced Bellows Type
Connection	JIS Flanged , ANSI Flanged
Materials	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel
Cap Type	No Lever(STD.) or Lever

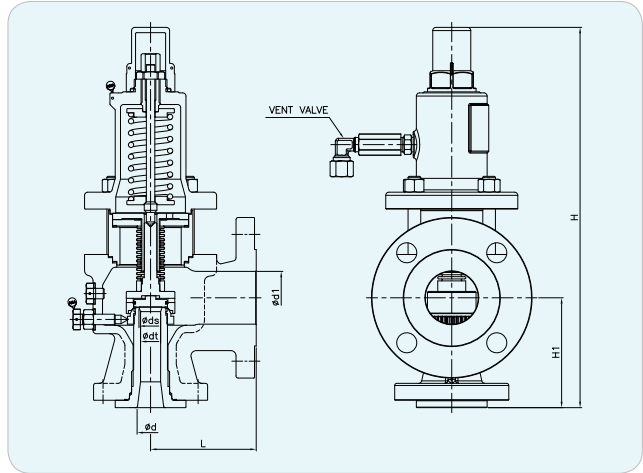
### ► Dimensions

Size	Part	d	dt	ds	L	H1	H	Lift	Inlet	Outlet
15A X 25A		15.0	11.5	14.5	95.0	85.0	317.0	3.00	JIS 10K, 20K RF Flanged	JIS 10K FF Flanged
20A X 25A		20.0	15.0	17.5	95.0	85.0	317.0	3.75		
25A X 40A		25.0	19.0	22.0	100.0	104.0	360.0	4.75		
32A X 65A		32.0	30.0	35.0	115.0	123.0	452.0	7.5		
40A X 65A		40.0	30.0	35.0	115.0	123.0	452.0	7.5		
50A X 80A		50.0	38.0	44.0	128.0	130.0	514.0	9.5		
65A X 100A		65.0	49.0	57.0	145.0	145.0	594.0	12.25		
80A X 125A		80.0	61.0	71.0	162.0	168.0	642.0	15.25		
100A X 150A		100.0	76.0	88.0	190.0	197.0	800.0	19.0		
150A X 200A		150.0	115.0	133.0	225.0	230.0	1015.0	28.75		
200A X 250A		200.0	150.0	175.0	270.0	270.0	1164.0	37.5		

※ KS B6216, ANSI, and DIN Flange are available upon request (more than 400°C is also available to manufacture)

## BFSV-3F | Balanced Bellows Type Safety Relief Valve

- This is generally used for various measuring machines and piping at petroleum, gas and chemical plants
- It is used in locations affected by back pressure of outlet and the fluid is not allowed external safety relief valve to flow
- It is used in locations where springs are to corrode or deform by the corrosion of the fluid or temperature
- Internal materials are STS316 which provides excellent erosion resistance



### ► Specifications

Model	BFSV-3F
Working Fluid	Gas, Hot Oil
Setting Pressure	22~33kgf/cm <sup>2</sup> g
Working Temperature (°C)	MAX. 400°C
Type	Balanced Bellows Type
Connection	JIS Flanged, ANSI Flanged
Materials	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel
Cap Type	No Lever(STD.) or Lever

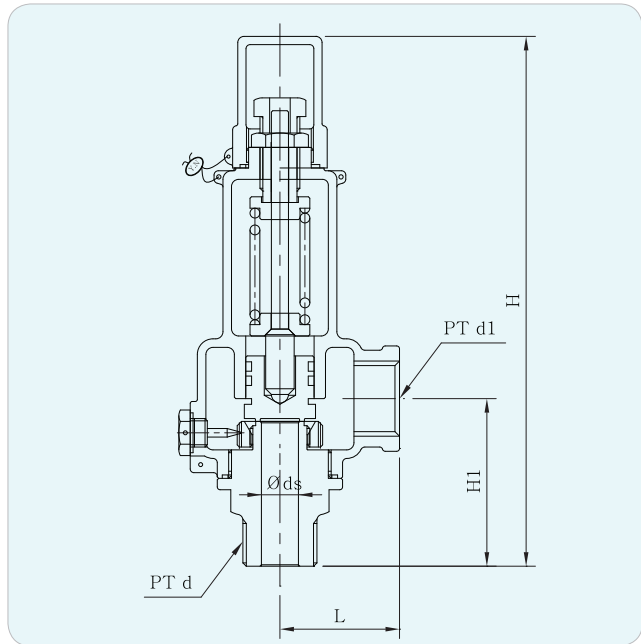
### ► Dimensions

Size	Part	d	dt	ds	L	H1	H	Lift	Inlet	Outlet
15A X 25A		15.0	11.5	14.5	95.0	85.0	317.0	3.00	JIS 30K RF Flanged	JIS 10K FF Flanged
20A X 25A		20.0	15.0	17.5	95.0	85.0	317.0	3.80		
25A X 40A		25.0	19.0	22.0	100.0	104.0	360.0	4.80		
32A X 65A		32.0	30.0	35.0	115.0	123.0	452.0	7.50		
40A X 65A		40.0	30.0	35.0	115.0	123.0	452.0	7.50		
50A X 80A		50.0	38.0	44.0	128.0	130.0	514.0	9.50		

※ KS B6216, ANSI and DIN Flange are available upon request (more than 400°C is also available to manufacture)



## GSV-3S/4S | High Lift Type Safety Relief Valve



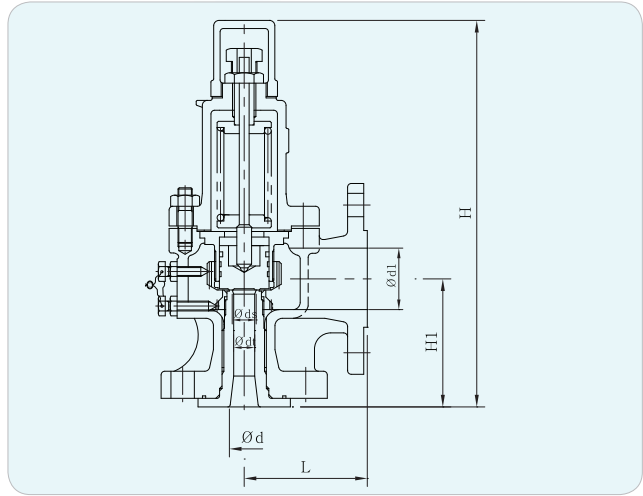
### ► Specifications

Type	Working Fluid	Setting Pressure (MPa)	Working Temperature (°C)	Materials			Connection
				Body	Bonnet	Trim	
GSV-3S	Gas	0.05~3.3	-196~220	Stainless Steel	Cast Bronze	Stainless Steel	PT Screwed
GSV-4S		0.05~8.0		Stainless Steel	Stainless Steel	Stainless Steel	

### ► Dimensions

Size	Part	d	ds	L	H1	H	Lift	Inlet	Outlet
15A × 20A		15	14	42	60	184	1.5	PT Screwed	PT Screwed
20A × 20A		20	14	42	63	187	1.5		
25A × 25A		25	19	44	69	204	2.0		
32A × 32A		32	24	45	71	192	3.0		
40A × 40A		40	27	50	79	213	3.0		
50A × 50A		50	33	62	93	236	4.7		

# GSV-2F/3F | Full Bore Type Safety Relief Valve



## ► Specifications

Type	Working Fluid	Setting Pressure (MPa)	Working Temperature (°C)	Materials		Connection
				Body	Trim	
GSV-2F	Gas	0.05~2.2	-196~250	Cast Steel Stainless Steel	Stainless Steel	JIS Flanged ANSI Flanged
GSV-3F		2.2~5.0				

## ► Dimensions

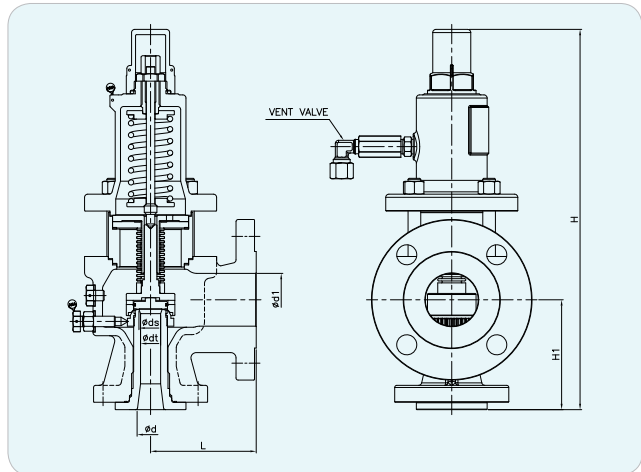
Model	Size	d	dt	ds	L	H1	H	Lift	Inlet	Outlet
GSV-2F	15A × 25A	15	11.5	14.5	95	85	282	3.0	JIS 10K, 20K RF Flanged	JIS 10K FF Flanged
	20A × 25A	20	15	17.5	95	85	282	3.8		
	25A × 40A	25	19	22	100	104	320	4.8		
	32A × 65A	32	30	35	115	123	386	7.5		
	40A × 65A	40	30	35	115	123	386	7.5		
	50A × 80A	50	38	44	128	130	476	9.5		
	65A × 100A	65	49	57	145	150	547	12.3		
	80A × 125A	80	61	71	162	168	598	15.2		
	100A × 150A	100	76	88	190	197	725	19.0		
	125A × 200A	125	95	114	220	222	895	24.0		
	150A × 200A	150	115	133	225	230	953	28.7		
	200A × 250A	200	150	175	270	255	1121	37.5		
250A × 300A	250	200	230	410	350	1720	50.0			
GSV-3F	15A × 25A	15	11.5	14.5	95	85	282	3.0	JIS 30K RF Flanged	JIS 10K FF Flanged
	20A × 25A	20	15	18	95	85	280	3.8		
	25A × 40A	25	19	22	100	104	320	4.8		
	40A × 65A	40	30	35	115	123	386	7.5		
	50A × 80A	50	38	44	128	130	476	9.5		
	65A × 100A	65	49	57	145	150	547	12.3		
	80A × 125A	80	61	71	162	168	598	15.2		
	100A × 150A	100	76	88	190	197	725	19.0		

※ Applied pressure 33kgf/cm<sup>2</sup>[3.3Mpa] is available upon request

※ KS B6216, ANSI and DIN Flange are available upon request (more than 400°C is also available to manufacture)

## BGSV-2F | Balanced Bellows Type Safety Relief Valve

- This is generally used for various measuring machines and piping at petroleum, gas and chemical plants
- It is used in locations affected by back pressure of outlet and the fluid is not allowed external safety relief valve to flow
- It is used in locations where springs are to corrode or deform by the corrosion of the fluid or temperature
- Internal materials are STS316 which provides excellent erosion resistance



### ► Specifications

Model	<b>BGSV-2F</b>
Working Fluid	Gas, Hot Oil
Setting Pressure	0.05~2.2MPa
Working Temperature (°C)	MAX. 400°C
Type	Balanced Bellows Type
Connection	JIS Flanged , ANSI Flanged
Materials	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel
Cap Type	No Lever(STD.) or Lever

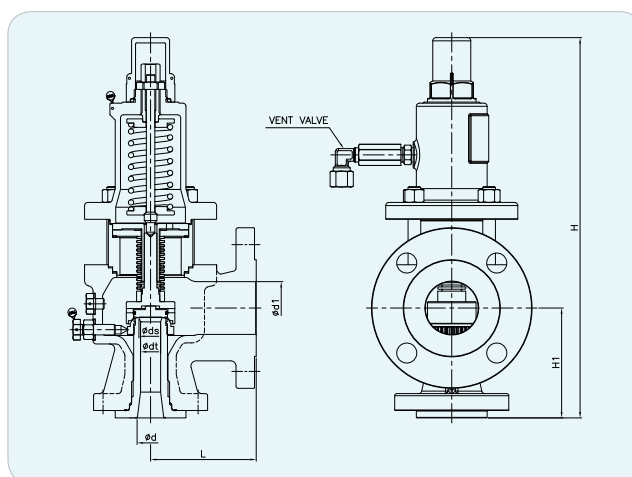
### ► Dimensions

Size	Part	d	dt	ds	L	H1	H	Lift	Inlet	Outlet
15A X 25A		15.0	11.5	14.5	95.0	85.0	317.0	3.00	JIS 10K, 20K RF Flanged	JIS 10K FF Flanged
20A X 25A		20.0	15.0	17.5	95.0	85.0	317.0	3.75		
25A X 40A		25.0	19.0	22.0	100.0	104.0	360.0	4.75		
32A X 65A		32.0	30.0	35.0	115.0	123.0	452.0	7.5		
40A X 65A		40.0	30.0	35.0	115.0	123.0	452.0	7.5		
50A X 80A		50.0	38.0	44.0	128.0	130.0	514.0	9.5		
65A X 100A		65.0	49.0	57.0	145.0	145.0	594.0	12.25		
80A X 125A		80.0	61.0	71.0	162.0	168.0	642.0	15.25		
100A X 150A		100.0	76.0	88.0	190.0	197.0	800.0	19.0		
150A X 200A		150.0	115.0	133.0	225.0	230.0	1015.0	28.75		
200A X 250A		200.0	150.0	175.0	270.0	270.0	1164.0	37.5		

※ KS B6216, ANSI and DIN Flange are available upon request (more than 400°C is also available to manufacture)

## BGSV-3F | Balanced Bellows Type Safety Relief Valve

- This is generally used for various measuring machines and piping at petroleum, gas and chemical plants
- It is used in locations affected by back pressure of outlet and the fluid is not allowed external safety relief valve to flow
- It is used in locations where springs are to corrode or deform by the corrosion of the fluid or temperature
- Internal materials are STS316 which provides excellent erosion resistance



### ► Specifications

Model	BGSV-3F
Working Fluid	Gas, Hot Oil
Setting Pressure	2.2~3.3MPa
Working Temperature (°C)	MAX. 400°C
Type	Balanced Bellows Type
Connection	JIS Flanged , ANSI Flanged
Materials	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel
Cap Type	No Lever(STD.) or Lever

### ► Dimensions

Size	Part	d	dt	ds	L	H1	H	Lift	Inlet	Outlet
15A X 25A		15.0	11.5	14.5	95.0	85.0	317.0	3.00	JIS 30K, RF Flanged	JIS 10K FF Flanged
20A X 25A		20.0	15.0	17.5	95.0	85.0	317.0	3.75		
25A X 40A		25.0	19.0	22.0	100.0	104.0	360.0	4.75		
32A X 65A		32.0	30.0	35.0	115.0	123.0	452.0	7.50		
40A X 65A		40.0	30.0	35.0	115.0	123.0	452.0	7.50		
50A X 80A		50.0	38.0	44.0	128.0	130.0	514.0	9.50		

※ KS B6216, ANSI, DIN Flange are available upon request (more than 400°C is also available to manufacture)

# Engineering Data

## ■ KS B 6216, HPGCL

Code of application and specifications	Calculation	Symbol description
<p>KS B 6216 For steam and gas Spring Safety relief valve</p>	<p>1. Gas  <math display="block">W = C' \cdot K_d \cdot A \cdot P_1 \cdot \sqrt{\frac{M}{ZT}} \times 0,9</math></p> <p>2. Steam  <math display="block">W = 0,5145 \cdot A \cdot (P+1) \cdot K \cdot C \times 0,9</math></p> <p>Lift type : <math>A = \pi D \ell</math>    <math>D</math> = Diameter of valve seat  <math>\ell</math> = Lift</p> <p>Full bore type : <math>A = \frac{\pi}{4} dt^2</math>    <math>dt</math> = Diameter of neck</p> <p><math>P</math> = Total Pressre                      when set pressure over than 1.0kgf/cm<sup>2</sup> at required flow through the device, 1.03 times of set pressure.                      when set pressure is less than 1.0 1.0kgf/cm<sup>2</sup>, add add 0.2 kgf/cm<sup>2</sup> to the set pressure</p> <ul style="list-style-type: none"> <li>• If <math>P_s \leq 1</math>  <math display="block">P = (P_s + 0,2) + 1,033</math></li> <li>• If <math>P_s &gt; 1</math>  <math display="block">P = (P_s + 1,03) + 1,033</math></li> </ul>	<p><math>W</math> = Required flow through the device (kg/h )  <math>C'</math> = adiabatic constant of gas  <math>K_d</math> = Effective coefficient of discharge  <math>A</math> = Required effective discharge area of the device(mm<sup>2</sup> )  <math>P_1</math> = relieving pressure(kgf/cm<sup>2</sup>.a)                      = (1,1×Set pressure+1,033)  <math>P_2</math> = back pressure(kgf/cm<sup>2</sup>.a)  <math>M</math> = Molecular weight of Gas  <math>Z</math> = Compressibility factor  <math>T</math> = Relieving temperature( ° K)  <math>P</math> = upstream relieving pressure(kgf/cm<sup>2</sup>)  <math>C</math> = Ratio of specific heats</p>
<p>HPGCL High-pressure gas safety management</p>	<p>1. Gas  <math display="block">W = \frac{C \cdot K_d \cdot P \cdot K_b \cdot K_c \cdot A \cdot \sqrt{M}}{13160 \times \sqrt{Z \cdot T}}</math></p> <p>2. Liquid  <math display="block">W = \frac{K_d \cdot K_w \cdot K_c \cdot K_v \cdot K_p \cdot A}{11,78} \times \sqrt{\frac{1,25P - P_b}{G}}</math></p>	<p><math>W</math> = Required flow through the device(lb/h )  <math>A</math> = Required effective discharge area of the device(mm<sup>2</sup> )  <math>C</math> = Ratio of specific heats  <math>K_d</math> = Effective coefficient of discharge  <math>P</math> = upstream relieving pressure(kPa.a)                      = (Set pressure + Over pressure)+101.3  <math>P_b</math> =  <math>M</math> = Molecular weight of Gas  <math>T</math> = Relieving temperature( ° R)  <math>Z</math> = Compressibility factor  <math>T</math> = Relieving temperature( ° K)  <math>K_b</math> = capacity correction factor due to back pressure  <math>K_c</math> = combination correction factor for installations with a rupture disk upstream of the pressure (Installation with a rupture disc 0,9 Installation with only safety relief valve 1,0)  <math>K_w</math> = correction factor due to back pressure  <math>K_v</math> = correction factor due to viscosity  <math>K_p</math> = correction factor due to overpressure  <math>G</math> = Specific gravity of liquid(water=1.0)</p>

# Engineering Data

## ASME SEC. VIII, API RP 520

Code of application and specifications	Calculation	Symbol description
ASME SEC. VIII	<p>Steam  <math display="block">W = 51.5 \cdot A \cdot P \cdot K \times 0.9</math></p> <p>Gas  <math display="block">W = C \cdot K_d \cdot A \cdot P \cdot \sqrt{\frac{M}{ZT}}</math></p> <p>Liquid  <math display="block">W = 2407A \sqrt{(P-P_b)G}</math></p>	<p>W = Required flow through the device(lb/h )                      A = Required effective discharge area of the device(in<sup>2</sup>)                      P = (Setpressure × 110)+atmospheric pressure(lb/in<sup>2</sup>)                      : SEC VIII                      K<sub>d</sub> = Effective coefficient of discharge                      C = Ratio of specific heats                      M = Molecular weight                      T = Relieving temperature( ° R)                      Z = Compressibility factor                      P<sub>b</sub> = Constant back pressure(lb/in<sup>2</sup>)                      G = Specific gravity of liquid(water=1.0)</p>
API RP 520	<p>Steam  <math display="block">W = 51.5 \cdot A \cdot P_1 \cdot K_d \cdot K_b \cdot K_c \cdot K_n \cdot K_{sh}</math></p> <p>Gas  <math display="block">W = \frac{C \cdot K_d \cdot A \cdot P_1 \cdot K_b \cdot K_c \sqrt{M}}{\sqrt{Z \cdot T}}</math></p> <p>Liquid  <math display="block">Q = \frac{38 \cdot A \cdot K_d \cdot K_p \cdot K_w \cdot K_v \cdot K_c \sqrt{1.25(P-P_b)}}{\sqrt{G}}</math></p>	<p>W = Required flow through the device(lb/h)                      A = Required effective discharge area of the device(in<sup>2</sup>)                      P<sub>1</sub> = relieving pressure                      = set pressure × 1.10+atmospheric pressure(lb/in<sup>2</sup>)                      KSH = superheat steam correction factor                      C = Ratio of specific heats                      K<sub>d</sub> = Effective coefficient of discharge                      M = Molecular weight                      T = Relieving temperature( ° R)                      Z = Compressibility factor                      K<sub>b</sub> = capacity correction factor due to back pressure                      Q = Required flow through the device(gal/min)                      P = Set pressure(lbf/in<sup>2</sup>)                      P<sub>b</sub> = Constant back pressure(lb/in<sup>2</sup>)                      G = Specific gravity of liquid(water=1.0)                      K<sub>n</sub> = correction factor for Napier equation                      (P ≤ 1,500psia : 1                      P &gt; 1,500psia and P ≤ 3,200psia : K<sub>n</sub> = 0.1906P - 1,000 / 0.2292P - 1,061)                      K<sub>p</sub> = correction factor due to overpressure                      K<sub>w</sub> = correction factor due to back pressure                      K<sub>v</sub> = correction factor due to viscosity                      K<sub>c</sub> = combination correction factor for installations with a rupture disk upstream of the pressure (Installation with a rupture disc 0.9 Installation with only safety relief valve 1.0)</p>



# Pressure Reducing Valve



## Pressure Reducing Valve for Gas and Liquid

DRE-1S(Direct Acting Type) .....	22
DRE-1F/2F(Direct Acting Type) .....	23
DRE-3F .....	26
PRE-1F/2F/3F(Piston Type) .....	28
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## Pressure Reducing Valve for Steam

PIR-1S(Direct Acting Type) .....	30
PIR-1F/2F(Pilot Type) .....	31



## Pressure Reducing Valve for Fire-fight system

HRE-1F(Hydrant Reducing Valve) ...	33
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### \* Direct Acting Type

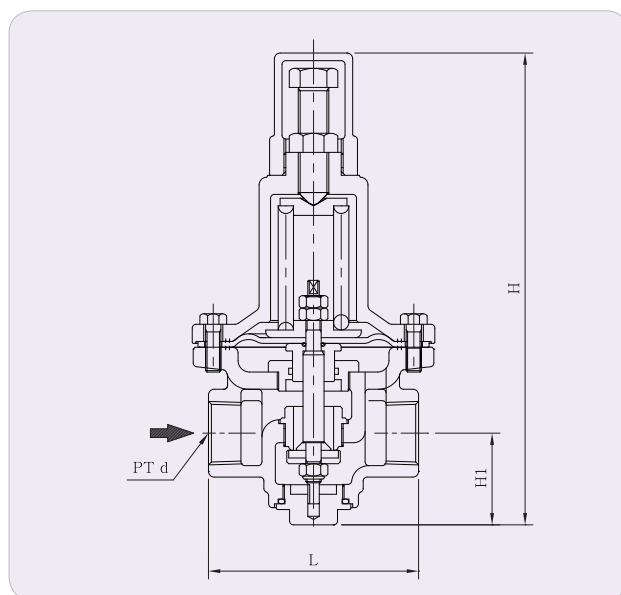
Direct acting type of pressure reducing valve is consist of the spring of the secondary pressure regulating and main valve, main valve directly operates by diaphragm connected to spring or bellows.

### \* Pilot Type

Pilot type of pressure reducing valve is consist of pilot part detects the secondary pressure and main valve. Depending on main valve operation, it can be divided into Diaphragm type and Pilot piston type.

# Pressure Reducing Valve

## DRE-1S | Pressure Reducing Valve—Direct Acting Type



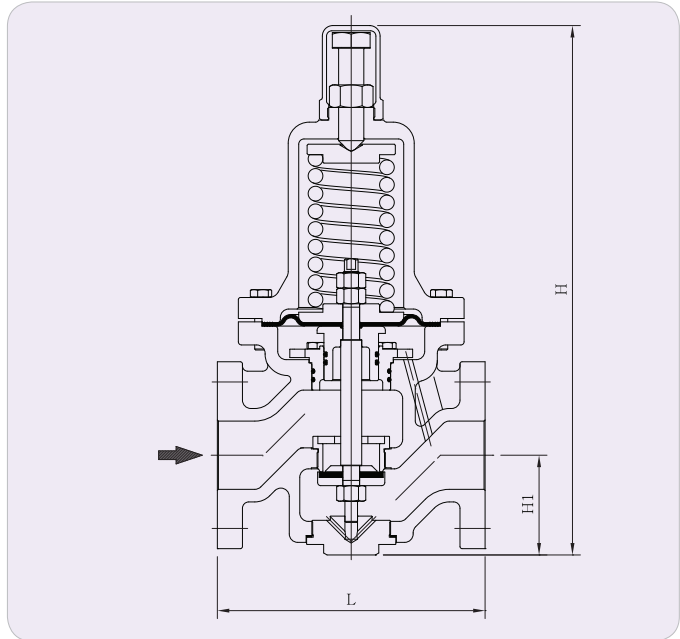
### ► Specifications

Inlet Pressure (kgf/cm <sup>2</sup> g)	Outlet Pressure (kgf/cm <sup>2</sup> g)	Max Reducing Ratio	Working Temperature (°C)	Working Fluid	Connection	Materials
10	0.5~5	10 : 1	80	Air(Gas) Water(Liquid)	PT Screwed	Body : Ductile Iron Trim : Stainless Steel, Synthetic Rubber

### ► Dimensions

Size	Part	d	L	H1	H
15A		PT 1/2"	100	47	222
20A		PT 3/4"	100	47	222
25A		PT 1"	110	51	231
32A		PT 1 1/4"	150	70	290
40A		PT 1 1/2"	160	70	290

## DRE-1F/2F | Pressure Reducing Valve—Direct Acting Type



### ► Specifications

Model	DRE-1F	DRE-2F
Inlet Pressure (kgf/cm <sup>2</sup> g)	10	20
Outlet Pressure (kgf/cm <sup>2</sup> g)	0.5~7	0.5~7
Type	Diaphragm Type	Diaphragm Type
Max Reducing Ratio	10 : 1	10 : 1
Working Temperature (°C)	80	80
Working Fluid	Air(Gas), Water(Liquid)	Air(Gas), Water(Liquid)
Connection	JIS 10K Flanged	JIS 20K Flanged
Materials	Body : Ductile Iron	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel, Synthetic Rubber	Trim : Stainless Steel, Synthetic Rubber

### ► Dimensions

Size	Part	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A
	L	160	160	160	180	180	190	230	250	300	370	400	484
	H1	65	65	65	76	76	78	95	107	127	148	163	163
	H	335	335	335	400	400	407	505	525	598	728	764	764

※ DRE-2F – ANSI and DIN Flange are available upon request

# Table for Sizing | DRE-1F(For Water)

## •How to use the chart

where,

- Primary pressure : 5.5kgf/cm<sup>2</sup>g {0.55Mpa}
- Secondary pressure : 2kgf/cm<sup>2</sup>g {0.2Mpa}
- Pressure differential : 3.5kgf/cm<sup>2</sup>g {0.35Mpa}
- Specific gravity : 1 (water)
- Flow : 24m<sup>3</sup>/h

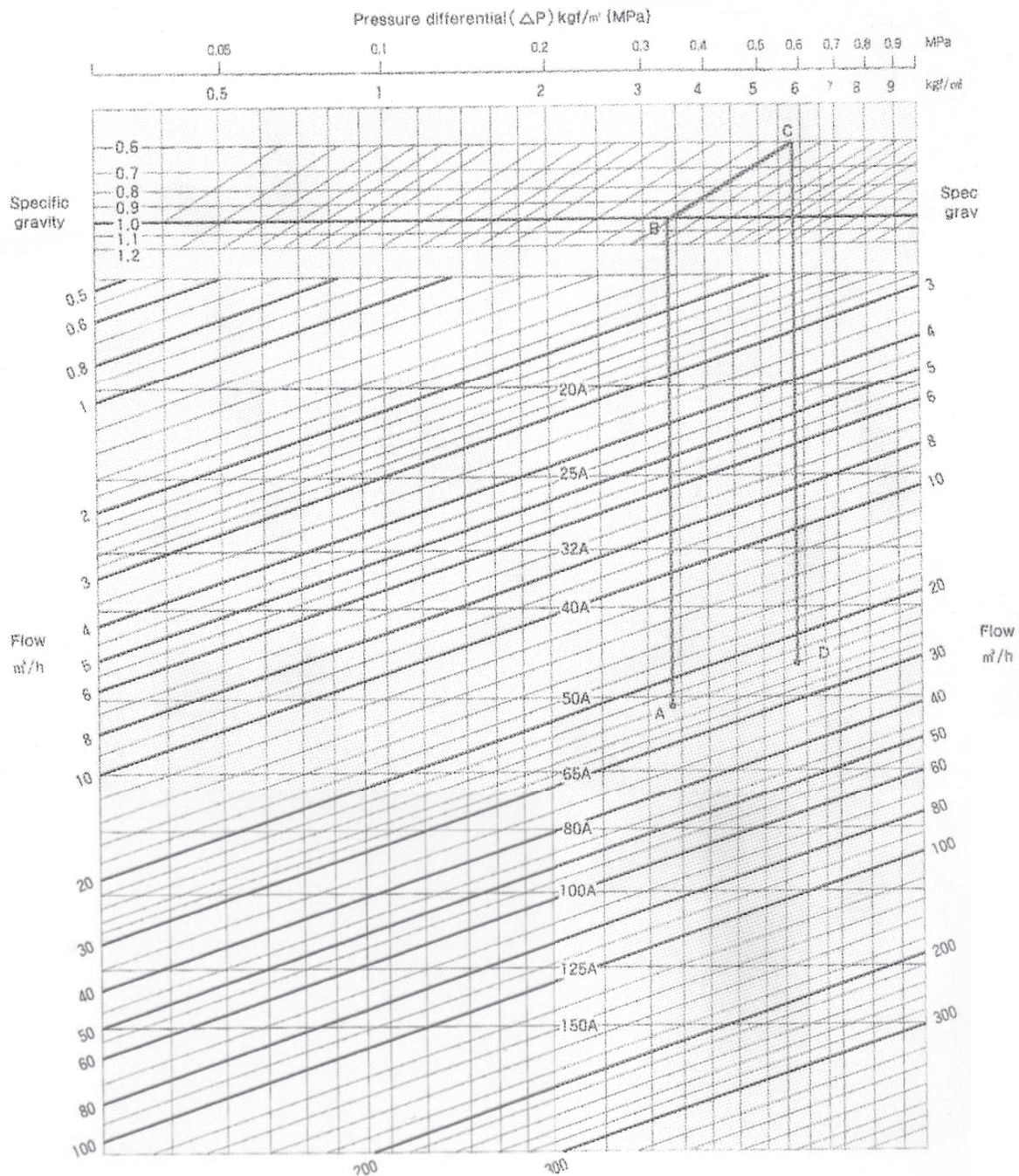
Obtain a cross point "A" by tracing down vertically from the pressure differential of 3.5kgf/cm<sup>2</sup> {0.35Mpa} L on the top up to the line of Flow 24m<sup>3</sup>/h. As the point "A" is between size 50 and 65mm. select safer size 65mm.

where,

- Same conditions except
- Specific gravity : 0.6

Obtain a cross point "B" by tracing down vertically from the pressure differential of 3.5kgf/cm<sup>2</sup> {0.35Mpa} up to the line of specific gravity 1.0

and move in paralalled with the slant line up to the cross point "C" on the line of the specific gravity 0.6 Trace down vertically to the point "D" on the cross line of Flow 24m<sup>3</sup>/h. As the point "D" is between size 40 and 50mm. select safer size 50mm.





# Table for Sizing | DRE-1F(For Air)

•How to use the chart

where,

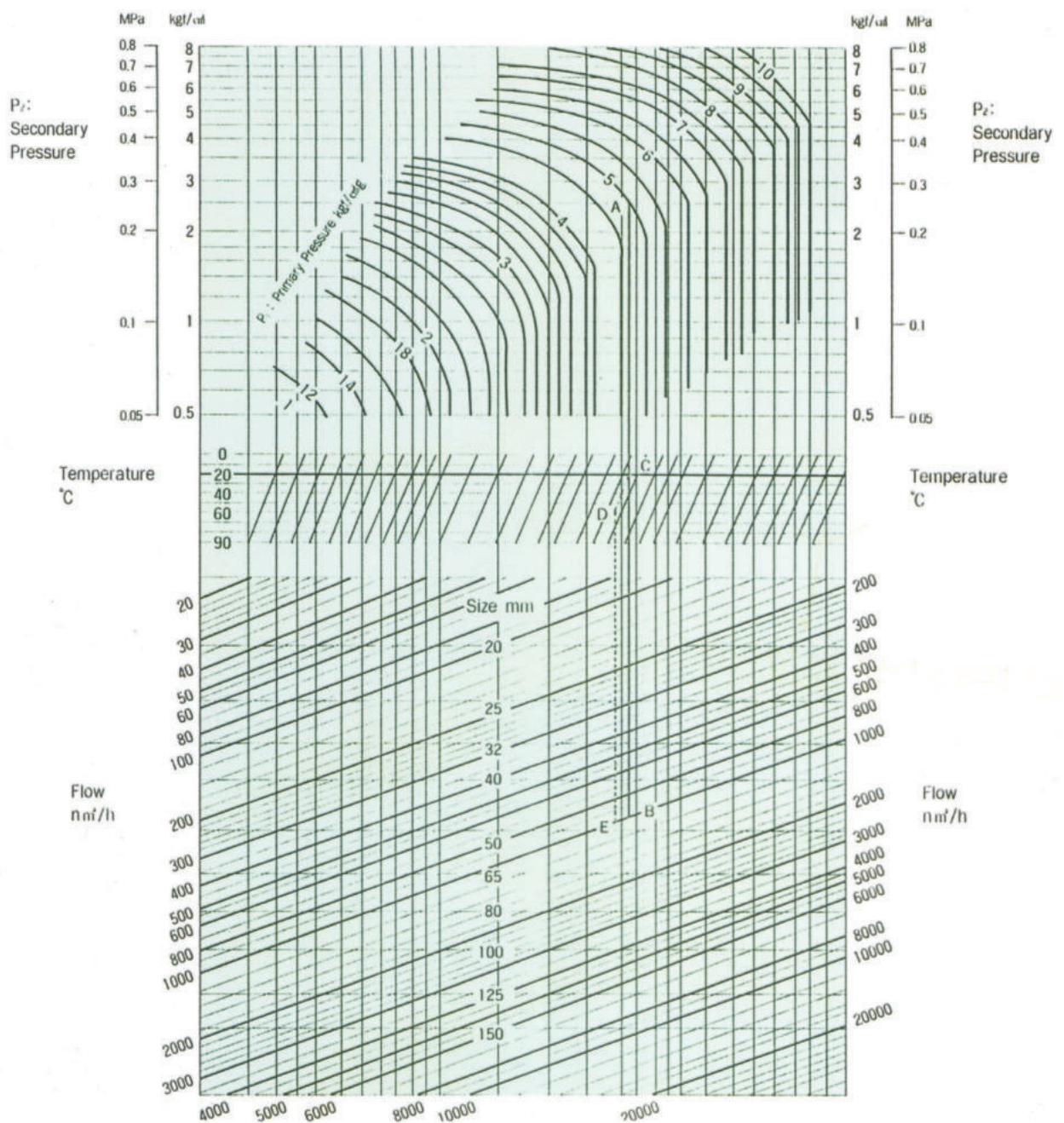
- Primary pressure : 5kgf/cm<sup>2</sup>g {0.5Mpa}
- Secondary pressure : 2.5kgf/cm<sup>2</sup>g {0.2Mpa}
- Pressure differential : 3.5kgf/cm<sup>2</sup>g {0.35Mpa}
- Specific gravity : 1 (water)
- Flow : 24m<sup>3</sup>/h

Obtain a cross point "A" by tracing down vertically from the pressure differential of 3.5kgf/cm<sup>2</sup> {0.35Mpa} L on the top up to the line of Flow 24m<sup>3</sup>/h. As the point "A" is between size 50 and 65mm. select safer size 65mm.

where,

- Same conditions except
- Specific gravity : 0.6

Obtain a cross point "B" by tracing down vertically from the pressure differential of 3.5kgf/cm<sup>2</sup> {0.35Mpa} up to the line of specific gravity 1.0 and move in parallel with the slant line up to the cross point "C" on the line of the specific gravity 0.6 Trace down vertically to the point "D" on the cross line of Flow 24m<sup>3</sup>/h. As the point "D" is between size 40 and 50mm. select safer size 50mm.



## DRE-3F | Pressure Reducing Valve—Direct Acting Type

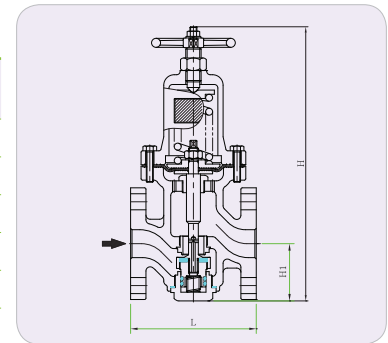
### ► Specifications

Inlet Pressure (kgf/cm <sup>2</sup> g)	30~40
Outlet Pressure (kgf/cm <sup>2</sup> g)	0.5~10
Max Reducing Ratio	10 : 1
Working Temperature (°C)	80
Working Fluid	Air(Gas), Water(Liquid)
Connection	JIS 30K, 40K Flanged
Materials	Body : Cast Steel, Stinless Steel
	Trim : Stainless Steel, Synthetic Rubber



### ► Dimensions

Size	Part	Connection	L	H1	H
15A		JIS 30K, 40K RF Flanged	145	76	366
20A			145	76	366
25A			150	76	366
32A			180	87	407
40A			180	82	407
50A			280	82	407



※ ANSI, DIN Flanges are available upon request



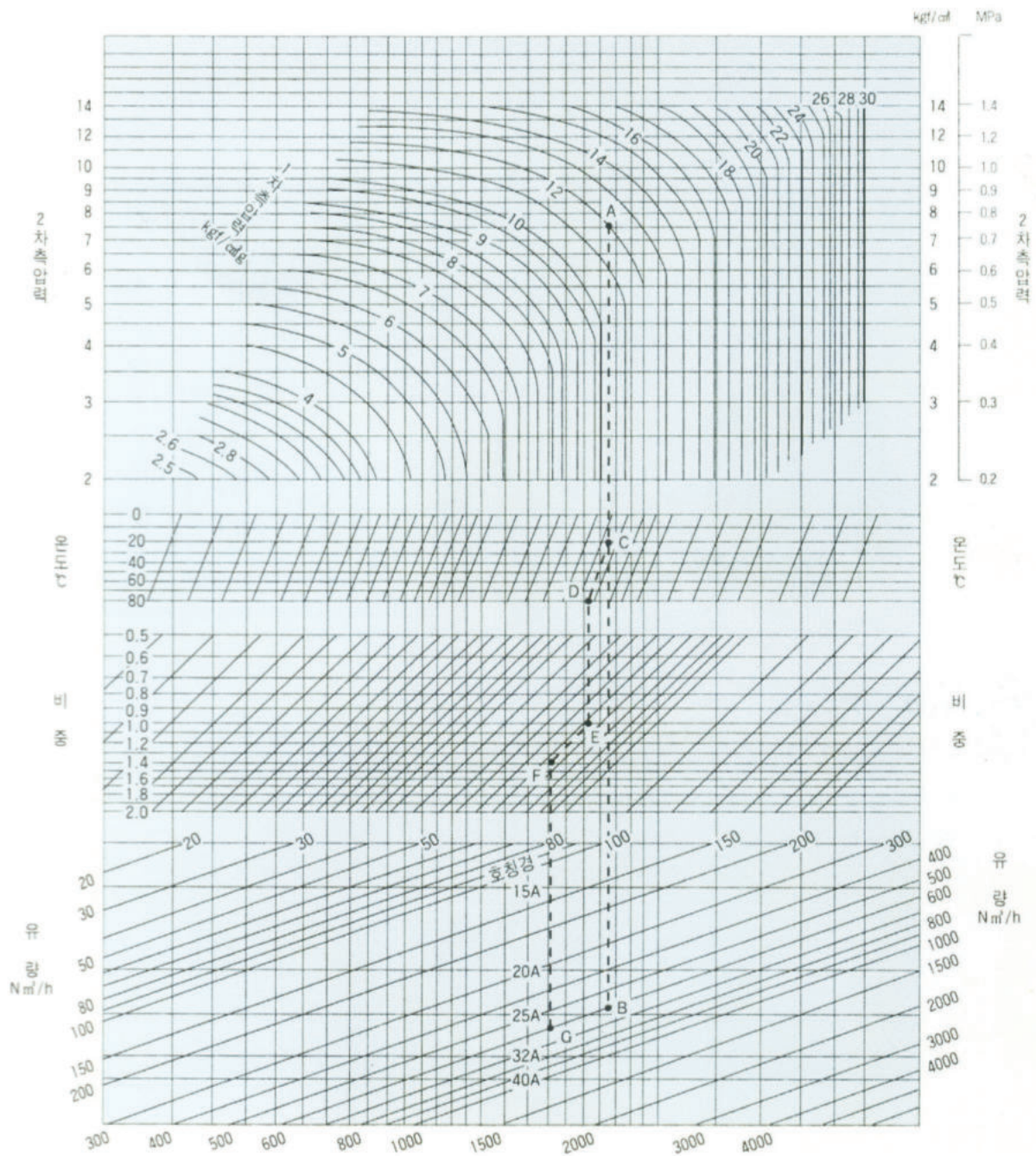
# Table for Sizing | DRE-3F(For Air)

•How to use the chart

where,  
 Primary pressure : 4kgf/cm<sup>2</sup> {0.4Mpa}  
 Secondary pressure : 2kgf/cm<sup>2</sup> {0.2Mpa}  
 Flow (Saturated steam) : 800kg/h

Obtain a cross point "A" on the vertically line of primary pressure 4kgf/cm<sup>2</sup> {0.4Mpa} with horizontal line of secondary pressure 2kgf/cm<sup>2</sup> {0.2Mpa}.

Obtain a cross point "B" on the vertical line down from the point "A" with the oblique line of flow 800kg/h. As the point "B" is between size 40 and 50mm, select safer size 50mm.



## PRE-1F/2F | Pressure Reducing Valve—Piston Type

### ► Specifications

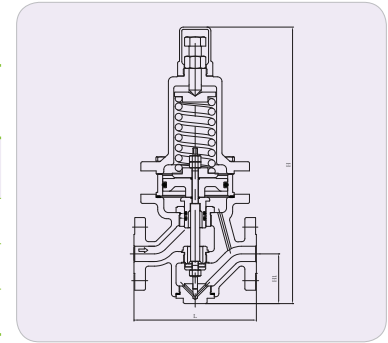
Model	PRE-1F	PRE-2F
Inlet Pressure (kgf/cm <sup>2</sup> g)	10~16	10~20
Outlet Pressure (kgf/cm <sup>2</sup> g)	0.5~12	0.5~15
Type	Piston Type	Piston Type
Max Reducing Ratio	10 : 1	10 : 1
Working Temperature (°C)	150	150
Working Fluid	Air(Gas), Water(Liquid)	Air(Gas), Water(Liquid)
Connection	JIS 10K, 16K Flanged	JIS 16K, 20K Flanged
Materials	Body : Ductile Iron	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel, Synthetic Rubber	Trim : Stainless Steel, Synthetic Rubber



### ► Dimensions

Size	Part	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A
L		160	160	160	180	180	190	251	270	300	370	400	484
H1		65	65	65	65	76	78	95	107	127	148	163	163
H		361	361	361	361	436	445	554	574	656	796	832	832

※ PRE-2F – ANSI and DIN Flange are available upon request



## PRE-3F | Pressure Reducing Valve—Piston Type

### ► Specifications

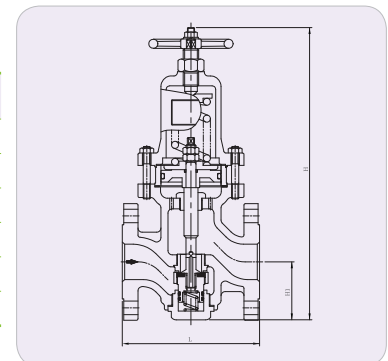
Inlet Pressure (kgf/cm <sup>2</sup> g)	30~40
Outlet Pressure (kgf/cm <sup>2</sup> g)	0.5~24
Max Reducing Ratio	10 : 1
Working Temperature (°C)	150
Working Fluid	Air(Gas), Water(Liquid)
Connection	JIS 30K, 40K Flanged
Materials	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel, Synthetic Rubber



### ► Dimensions

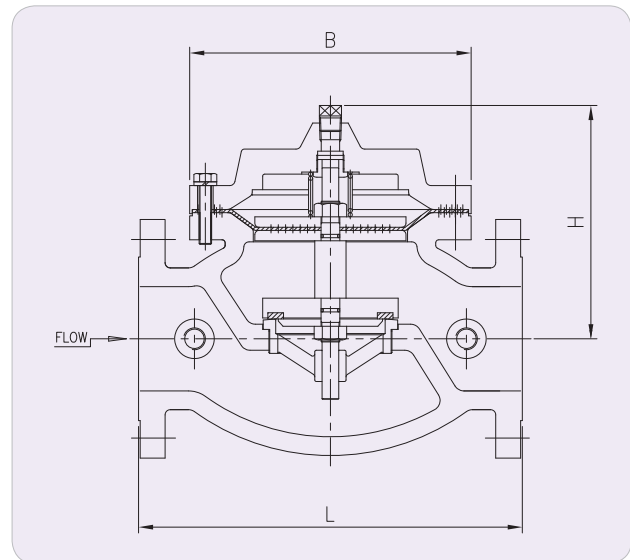
Size	Part	Connection	L	H1	H
15A	JIS 30K, 40K RF Flanges		145	76	316
20A			145	76	316
25A			150	76	316
32A			180	87	346
40A			180	82	351
50A			280	82	351

※ PRE-3F – ANSI and DIN Flange are available upon request



## FRE-1F/2F | Pressure Reducing Valve—Direct Acting Type

- Superior performance and durability with large-capacity pressure reducing valve.
- The range of adjustable flow is wide and stable flow condition can be maintained and the minimum adjustable flow rate is excellent.
- Only one adjustment keeps constant pressure at all times.



### ► Specifications

Model	FRE-1F	FRE-2F
Inlet Pressure (kgf/cm <sup>2</sup> g)	10	20
Outlet Pressure (kgf/cm <sup>2</sup> g)	0.5~7	0.5~7
Max Reducing Ratio	10 : 1	10 : 1
Working Temperature (°C)	80	80
Working Fluid	Air(Gas), Water(Liquid), Oil	Air(Gas), Water(Liquid), Oil
Type	Diaphragm Type	Diaphragm Type
Connection	JIS 10K Flanged	JIS 10K, 20K Flanged
Materials	Body : Ductile Iron	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel, Synthetic Rubber	Trim : Stainless Steel, Synthetic Rubber

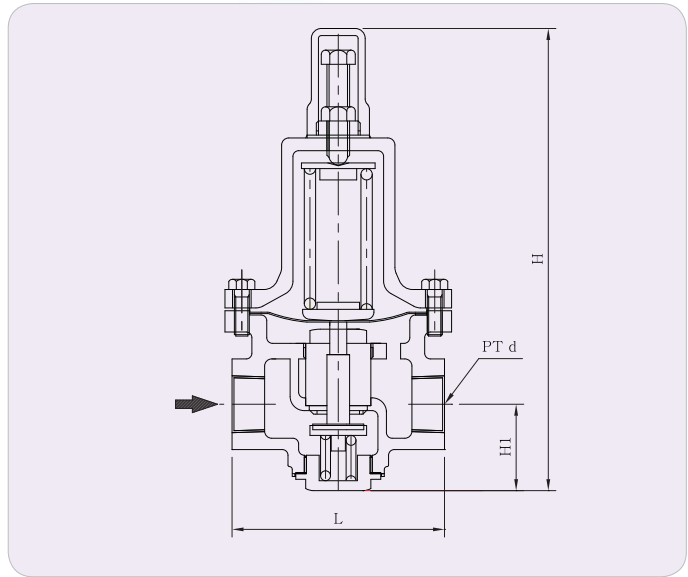
### ► Dimensions

Size	Part	50A	65A	80A	100A	125A	150A	200A	250A	300A	400A
L		240	290	290	360	360	460	560	760	800	1100
H		145	180	180	230	230	270	335	390	445	765
B		170	210	210	270	270	370	455	600	650	820

※ FRE-2F – ANSI and DIN Flange are available upon request

※ Piston Type is available from 7K to 12K

## PIR-1S | Pressure Reducing Valve For Steam-Direct Acting Type



### ► Specifications

Inlet Pressure (kgf/cm <sup>2</sup> g)	10
Outlet Pressure (kgf/cm <sup>2</sup> g)	0.5~5
Max Reducing Ratio	10 : 1
Working Temperature (°C)	220
Working Fluid	Steam
Connection	PT Screwed
Materials	Body : Ductile Iron
	Trim : Stainless Steel

### ► Dimensions

Size	Part	d	L	H1	H
15A	PT 1/2"		120	55	260
20A	PT 3/4"		120	55	260
25A	PT 1"		120	55	260
32A	PT 1 1/4"		150	62	318
40A	PT 1 1/2"		150	62	318

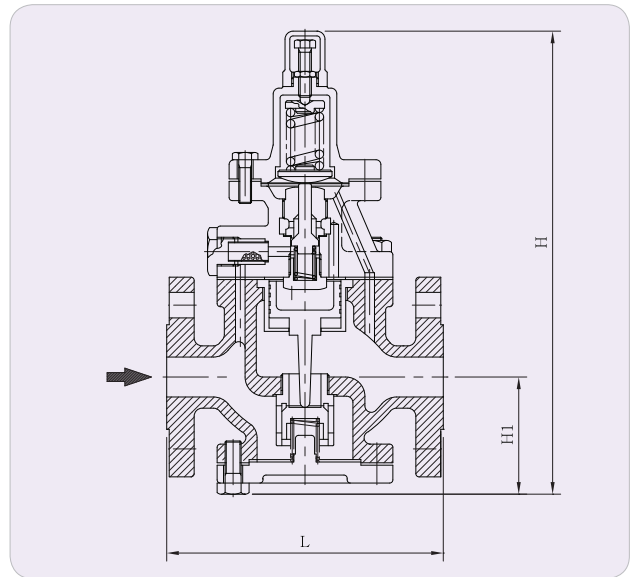
### ► CV

Model	Size	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A
DRE-1F		1	2	3.5	5.5	8	14	22	32	48	75	108
DRE-1S		0.8	0.8	1								
PIR-1F		1	2.5	4	6.5	9	16	25	36	64	100	144
DRE-3F		1	2.5	4	6.3	8						



## PIR-1F/2F | Pressure Reducing Valve For Steam—Pilot Type

- The mechanism that automatically adjusts the pressure in pressure reducing valves uses the balance between the steam pressure and the adjustment spring.
- The steam flowing through the pilot valve is controlled by the balance between the adjustment spring and the secondary pressure.
- This steam causes the piston to fall and rise, which controls the amount of opening of the main valve.



### ► Specifications

Model	PIR-1F	PIR-2F
Inlet Pressure (kgf/cm <sup>2</sup> g)	10	20
Outlet Pressure (kgf/cm <sup>2</sup> g)	0.5~7	0.5~15
Max Reducing Ratio	10 : 1	10 : 1
Working Temperature (°C)	220	250
Working Fluid	Steam	Steam
Connection	JIS 10K Flanged	JIS 20K Flanged
Materials	Body : Ductile Iron	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel	Trim : Stainless Steel

### ► Dimensions

Size	Part	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A
L		165	165	170	200	200	220	250	290	320	350	395	560	650
H1		75	75	75	85	85	95	105	125	130	148	466	620	267
H		357	357	357	375	375	395	415	440	465	459	181	250	685

※ PIR-2F – ANSI and DIN Flange are available upon request

# Nominal diameter chart | PIR-1F(For Steam)

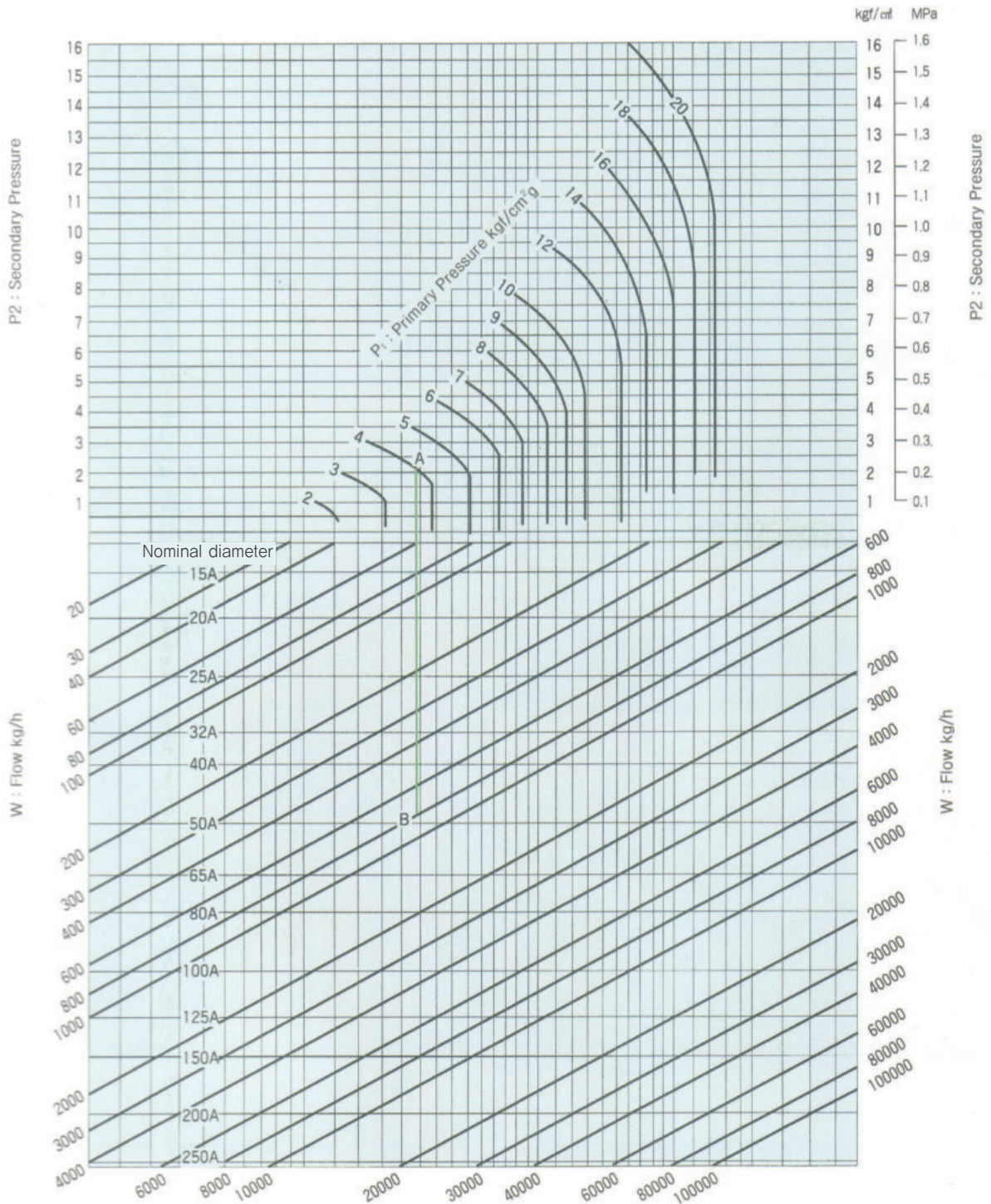
## •How to use the chart

where,

Primary pressure : 4kgf/cm<sup>2</sup> {0.4Mpa}  
 Secondary pressure : 2kgf/cm<sup>2</sup> {0.2Mpa}  
 Flow (Saturated steam) : 800kg/h

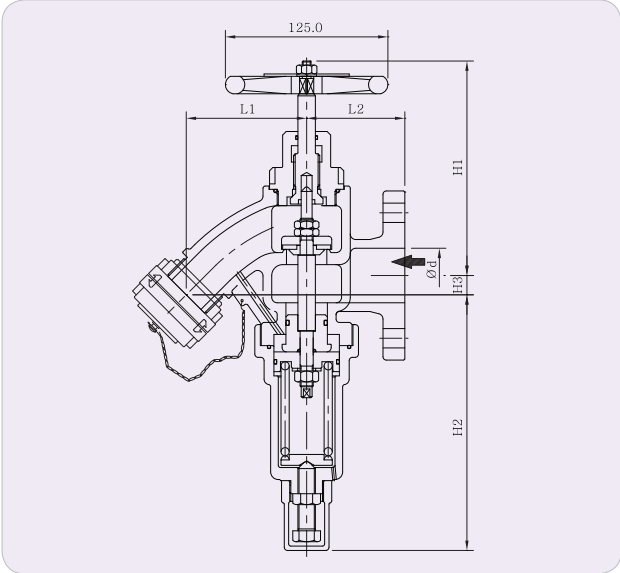
Obtain a cross point "A" on the vertically line of primary pressure 4kgf/cm<sup>2</sup> {0.4Mpa} with horizontal line of secondary pressure 2kgf/cm<sup>2</sup> {0.2Mpa}.

Obtain a cross point "B" on the vertical line down from the point "A" with the oblique line of flow 800kg/h. As the point "B" is between size 40 and 50mm. select safer size 50mm.





# HRE-1F | Hydrant Reducing Valve



## ► Specifications

Inlet Pressure (kgf/cm <sup>2</sup> )	16
Outlet Pressure (kgf/cm <sup>2</sup> )	5~7
Working Temperature (°C)	80
Working Fluid	Sea Water
Connection	ANSI 150#, 300# Flanged
Type	Globe Type, Angle Type
Materials	Body : Cast Bronze
	Trim : Stainless Steel
	Disc : Teplon
	Coupling : Cast Bronze

## ► Dimensions

Size	d	L1	L2	H1	H2	H3
50A	50	110	90	200	260	17
65A	65	140	117	240	290	23

# Primary Regulating Valve



## Primary Regulating Valve for Gas and Liquid

DRG-1F/2F(Direct Acting Type) ..... 35

## Primary Regulating Valve for Steam

PRG-1F/2F(Piston Type) ..... 36

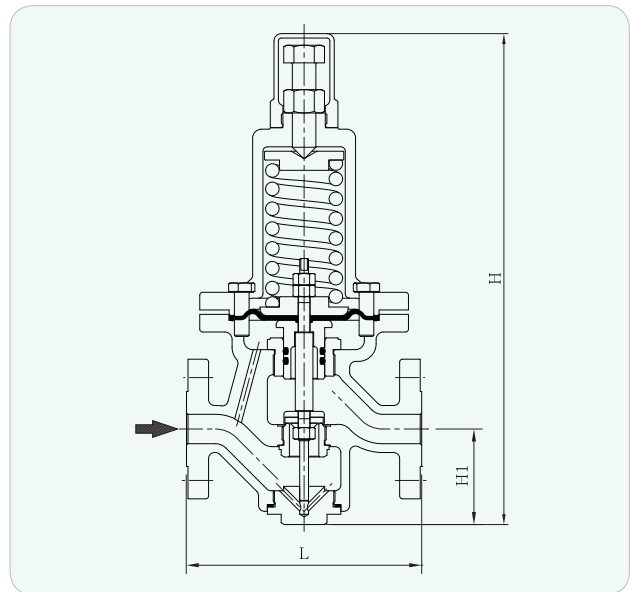


\* If the pressure exceeds certain pressure, the valve is opened to allow the fluid to be flowed, keeping constantly the pressure at the top of the valve.

# Primary Regulating Valve

## DRG-1F/2F | Primary Regulating Valve—Direct Acting Type

- Self operated pressure regulating valve for discharging the over pressure to maintain a regular pressure at the pipe arrangement so it is a kind of relief valve.
- It is used for air regulating equipment.



### ► Specifications

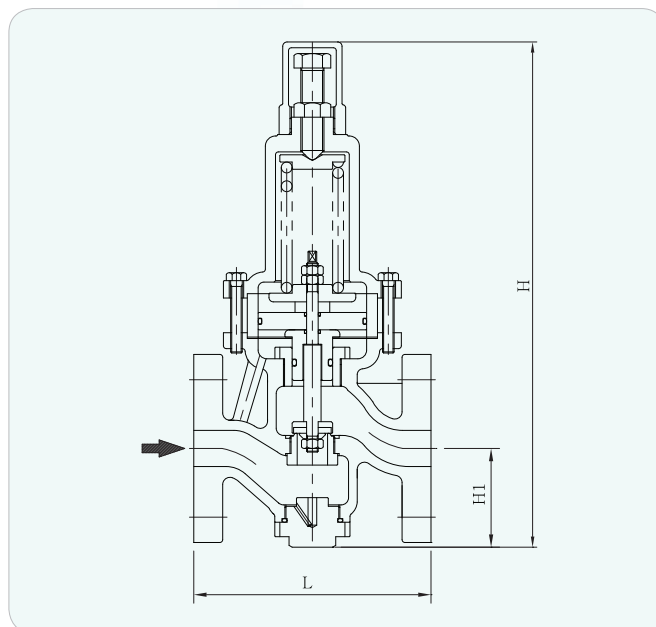
Model	DRG-1F	DRG-2F
Inlet Pressure (kgf/cm <sup>2</sup> g)	10	20
Outlet Pressure (kgf/cm <sup>2</sup> g)	0.5~7	0.5~7
Type	Diaphragm Type	Diaphragm Type
Working Temperature (°C)	80	80
Working Fluid	Air(Gas), Water(Liquid)	Air(Gas), Water(Liquid)
Connection	JIS 10K Flanged	JIS 20K Flanged
Materials	Body : Ductile Iron	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel, Synthetic Rubber	Trim : Stainless Steel, Synthetic Rubber

### ► Dimensions

Size	Part	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A
L		160	160	160	180	180	190	251	270	300	370	400	484
H1		65	65	65	76	76	78	95	107	127	148	163	163
H		335	335	335	400	400	407	505	525	598	728	764	764

※ DRG-2F – ANSI and DIN Flange are available upon request

## PRG-1F/2F | Primary Regulating Valve—Piston Type



### ► Specifications

Model	PRG-1F	PRG-2F
Inlet Pressure (kgf/cm <sup>2</sup> g)	16	20
Outlet Pressure (kgf/cm <sup>2</sup> g)	0.5~12	0.5~15
Type	Piston Type	Piston Type
Working Temperature (°C)	150	150
Working Fluid	Air(Gas), Water(Liquid)	Air(Gas), Water(Liquid)
Connection	JIS 10K(16K) Flanged	JIS 20K Flanged
Materials	Body : Ductile Iron	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel, Synthetic Rubber	Trim : Stainless Steel, Synthetic Rubber

### ► Dimensions

Size	Part	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A
L		160	160	160	180	180	190	251	270	300	370	400	484
H1		65	65	65	76	76	78	95	107	127	148	163	163
H		361	361	361	436	436	445	554	574	656	796	832	832

※ PRG-2F – ANSI and DIN Flange are available upon request

## Table for Sizing | DRG-1F, PRG-1F(For Liquid)

### •How to use the chart

where,

Primary pressure : 5.5kgf/cm<sup>2</sup>g {0.55Mpa}

Secondary pressure : 2kgf/cm<sup>2</sup>g {0.2Mpa}

Pressure differential : 3.5kgf/cm<sup>2</sup>g {0.35Mpa}

Specific gravity : 1 (water)

Flow : 24m<sup>3</sup>/h

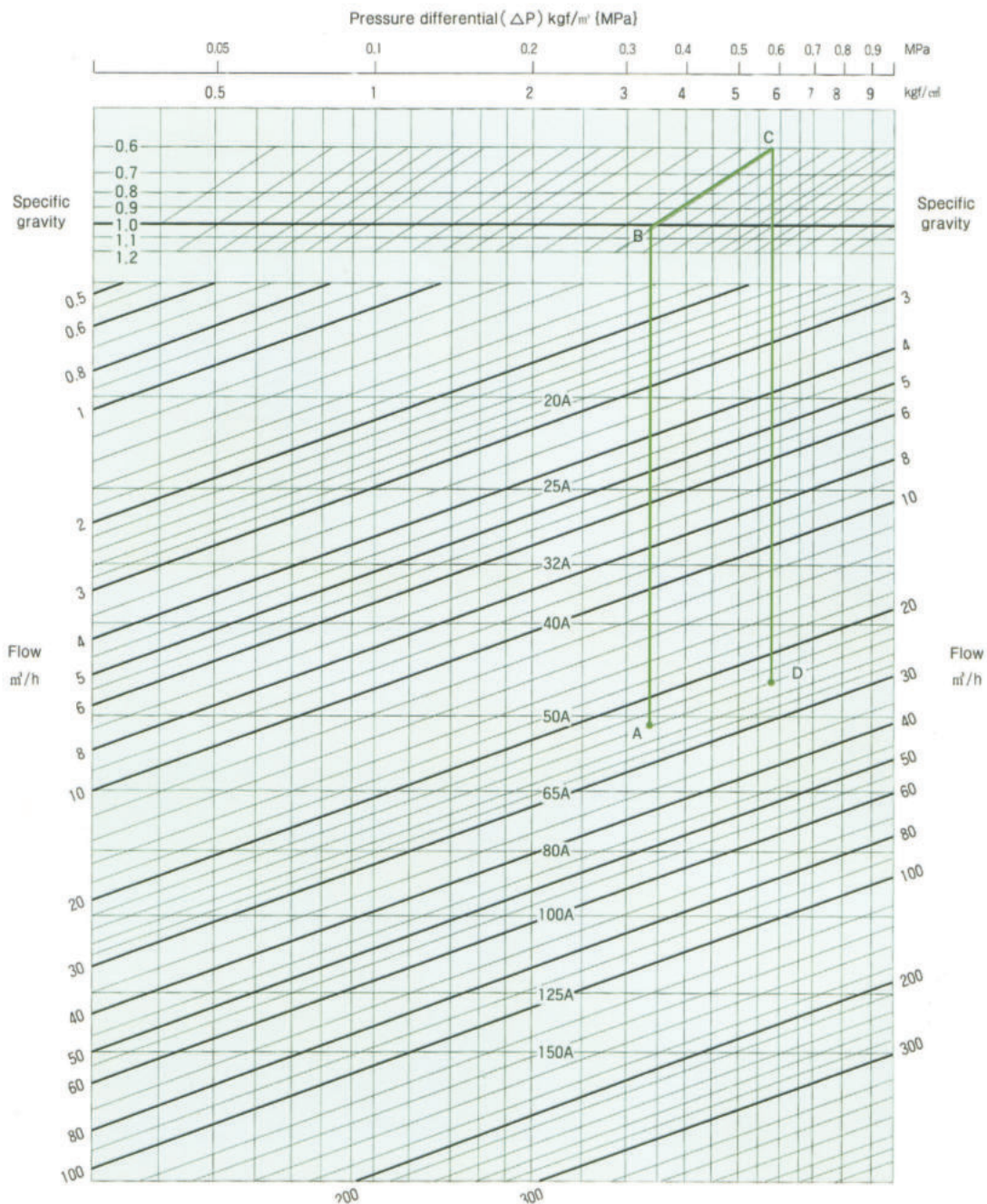
Obtain a cross point "A" by tracing down vertically from the pressure differential of 3.5kgf/cm<sup>2</sup> {0.35Mpa} L on the top up to the line of Flow 24m<sup>3</sup>/h. As the point "A" is between size 50 and 65mm. select safer size 65mm.

where,

Same conditions except

Specific gravity : 0.6

Obtain a cross point "B" by tracing down vertically from the pressure differential of 3.5kgf/cm<sup>2</sup> {0.35Mpa} up to the line of specific gravity 1.0 and move in parallel with the slant line up to the cross point "C" on the line of the specific gravity 0.6 Trace down vertically to the point "D" on the cross line of Flow 24m<sup>3</sup>/h. As the point "D" is between size 40 and 50mm. select safer size 50mm.



# Steam Trap



## Thermodynamic Type of Steam Trap

DST-3S(Disc Type) .....	39
DST-1S/1F/2F(Disc Type) .....	40
DST-4S/4F(Disc Type) .....	41
BST-1S(Bypass Type) .....	42

## Mechanical Type of Steam Trap

BKT-1S/1F(Bucket Type) .....	43
FLT-1S/1F/2F(Float Type) .....	44
PST-2F(Piston Type) .....	45





# Steam Trap

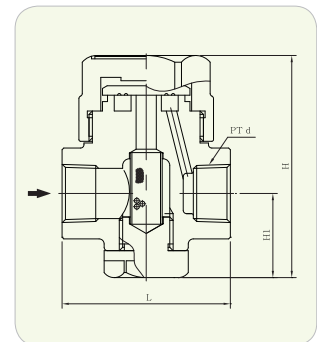
Steam traps are automatic valves that release condensed steam (condensate) from a steam space while preventing the loss of live steam. They also remove air and non-condensable from the steam space. Steam traps are design to maintain steam energy efficiency by performing specific tasks such as heating a building or maintaining heat for process.

## Type of Steam Traps

1. Thermodynamic Types
2. Mechanical Type
3. Thermostatic Type

### DST-3S | Disc Type Steam Trap

- Simple and Small construction.
- No trouble & low repair cost owing to integral construction of body & seat.
- Excellent durability owing to the heat-treated disc and seat.

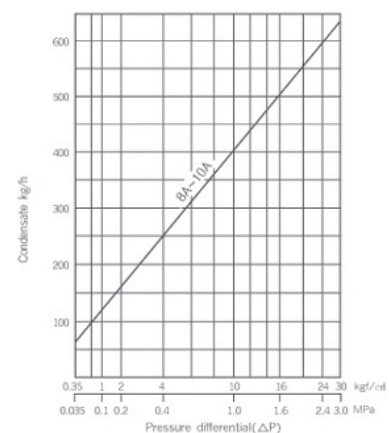


#### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> )	Max. 20
	Min. 0.35
Working Temperature (°C)	250
Connection	PT Screwed
Materials	Body : Stainless Steel
	Trim : Stainless Steel

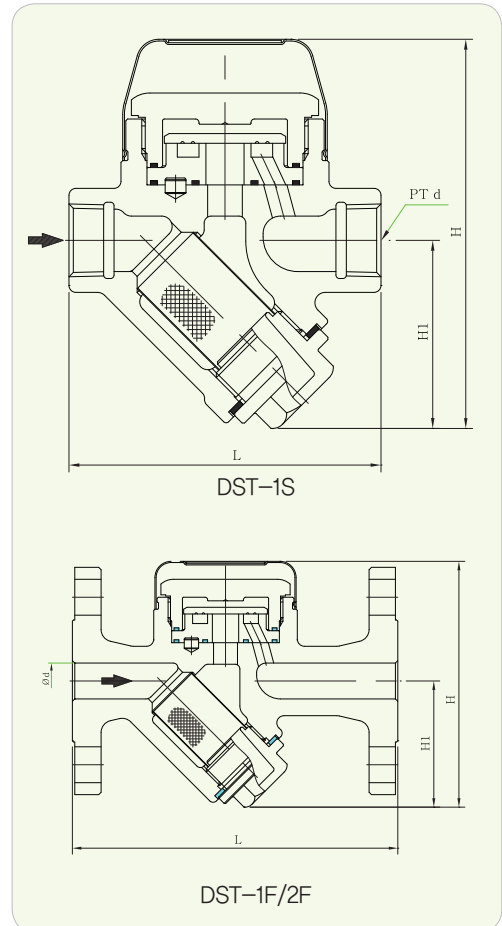
#### ► Dimensions

Size	d	L	H1	H	Connection
8A	PT 1/4"	50	25	65	PT Screwed
10A	PT 3/8"	50	25	65	



## DST-1S/1F/2F | Disc Type Steam Trap

- Insulation chamber (air warm) is adopted to lessen the affect of atmosphere and to improve the most suitable working conditions.
- The maintenance and repair of disc and seat are easy owing to its material of high-hardness-treated stainless steel and its replaceable seat.

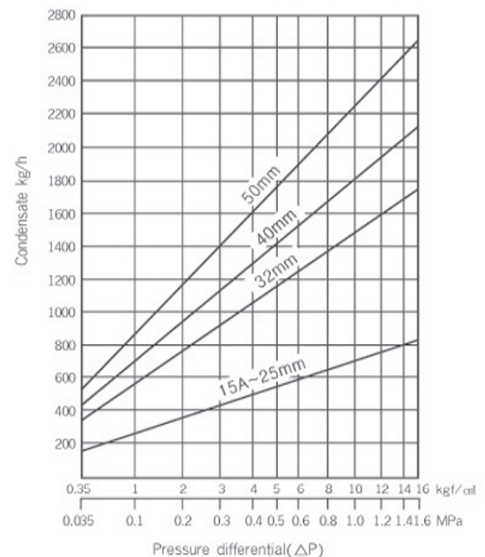


### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> )	Max. 16	Max. 20
	Min. 0.35	Min. 0.35
Working Temperature (°C)	220	220
Connection	DST-1S : PT Screwed	DST-2F : JIS Flanged
	DST-1F : JIS Flanged	
Materials	Body : Ductile Iron	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel	Trim : Stainless Steel

### ► Dimensions

Model	Size	d	L	H1	H	Connection
DST-1S	15A	PT 1/2"	90	54	104	PT Screwed
	20A	PT 3/4"	95	56	108	
	25A	PT 1"	100	58	112	
	32A	PT 1 1/4"	180	100	180	
	40A	PT 1 1/2"	180	110	205	
DST-1F DST-2F	15A	15	136	53	103	JIS 5K Flanged JIS 16K Flanged (DST-1F) JIS 20K Flanged (DST-2F)
	20A	20	140	55	108	
	25A	25	150	58	113	
	32A	32	190	103	185	
	40A	40	260	112	206	
	50A	50	260	112	206	



※ DST-2F – ANSI and DIN Flange are available upon request

## DST-4S/4F | Disc Type Steam Trap

Steam trap is designed for high temperature – pressure steam. And for integral body with the saet.

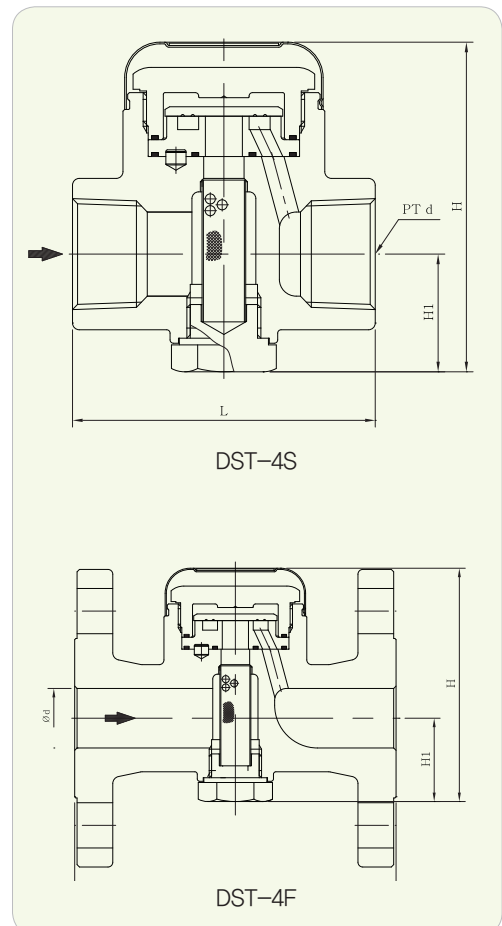
- Small and compact design.
- Easy maintenance and replacement.
- Internal strainer built – in.
- Insulation cap adopted.



DST-4S



DST-4F



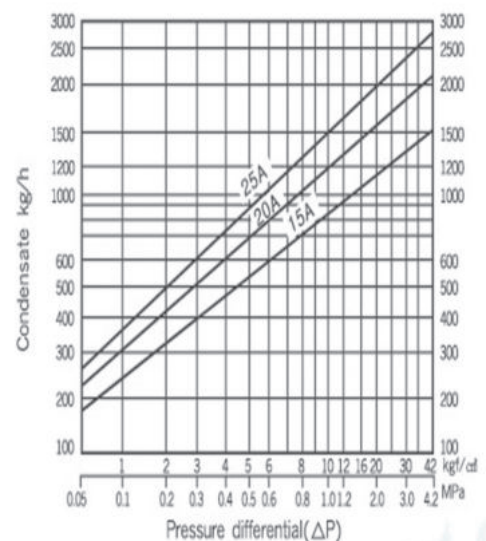
### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> )	Max. 20
	Min. 0.35
Working Temperature (°C)	250
Connection	DST-4S : PT Screwed
	DST-4F : JIS 10K, 20K Flanged
Materials	Body : Stainless Steel
	Trim : Stainless Steel

### ► Dimensions

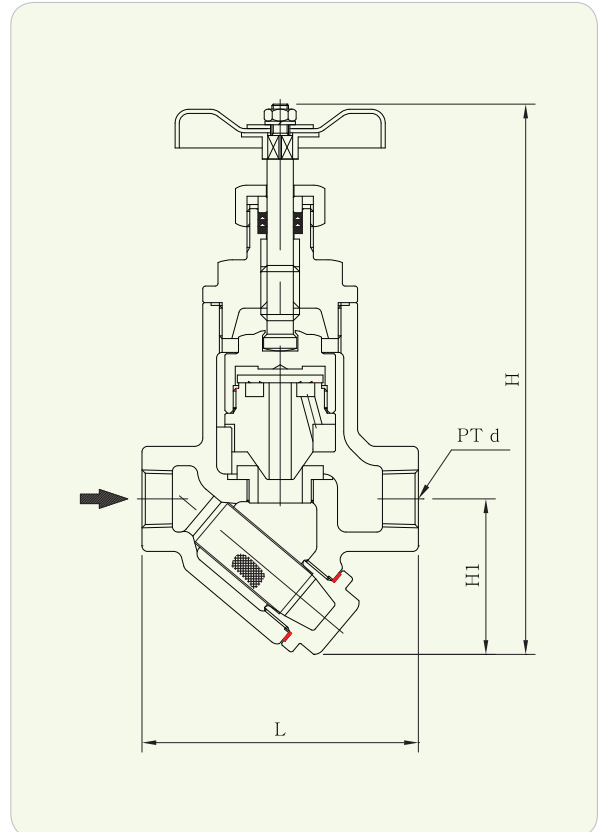
Model	Size	d	L	H1	H	Connection
DST-4S	15A	PT 1/2"	80	34	90	PT Screwed
	20A	PT 3/4"	80	34	94	
	25A	PT 1"	90	34	97	
DST-4F	15A	15	130	35	98	JIS 10K, 20K Flanged
	20A	20	130	35	98	
	25A	25	135	35	98	

※ DST-4F – ANSI and DIN Flange are available upon request



## BST-1S | By Pass Type Steam Trap

- A built-in-pass valve allows to easily blow-off larger flow at initial operating and/or admissible flow into trap while opening the valve by handle.
- This type is useful to steam mains, especially suitable for laundry machines, and dyeing machines.

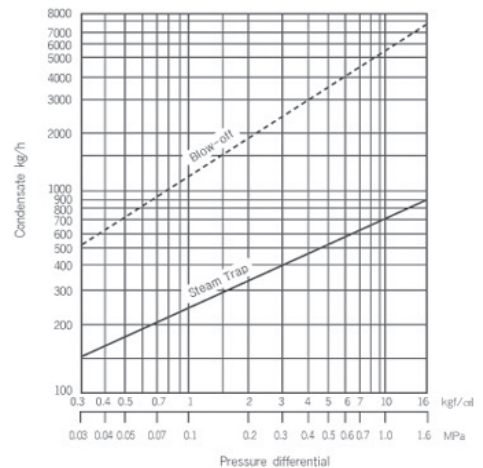


### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> )	Max. 16
	Min. 0.35
Working Temperature (°C)	220
Connection	PT Screwed
Materials	Body : Ductile Iron
	Trim : Stainless Steel

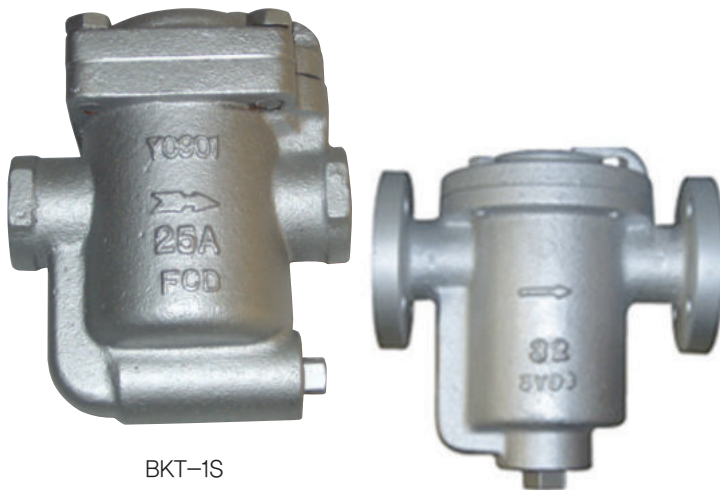
### ► Dimensions

Size	d	L	H1	H	Connection
15A	PT 1/2"	100	58	203	PT Screwed
20A	PT 3/4"	100	58	203	
25A	PT 1"	110	62	207	



## BKT-1S/1F | 버킷식 트랩(Bucket Type Steam Trap)

- It is an inverted type steam trap suitable for the heat exchangers, dryers and steam press, constructionally solving the air trouble by itself.
- All of the working parts are installed at the inside of the bonnet for easy disassembly and maintenance.

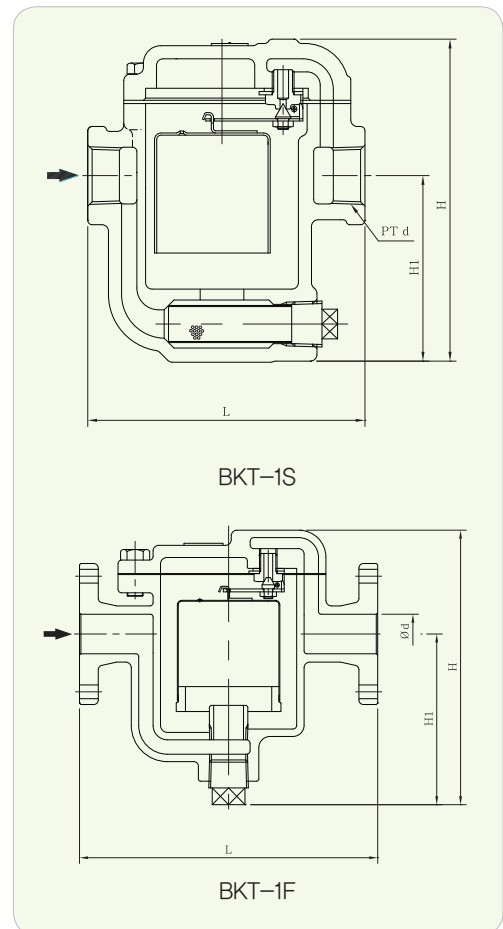


BKT-1S

BKT-1F

### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> )	Max. 8
	Min. 0.35
Working Temperature (°C)	220
Connection	BKT-1S : PT Screwed
	BKT-1F : JIS 10K Flanged
Materials	Body : Ductile Iron
	Trim : Stainless Steel

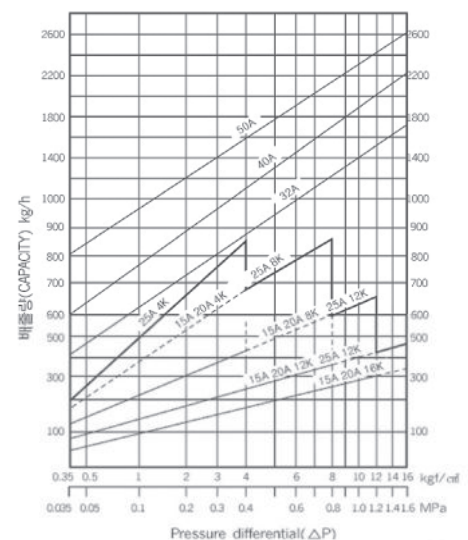


BKT-1S

BKT-1F

### ► Dimensions

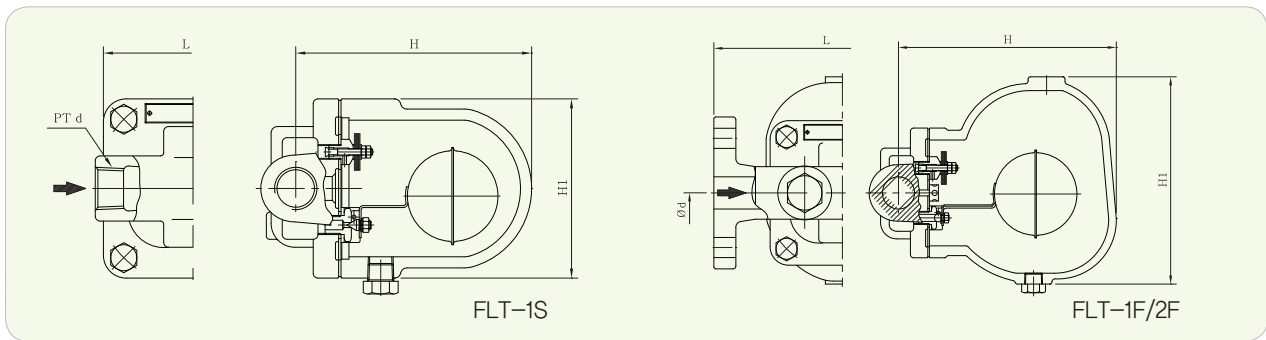
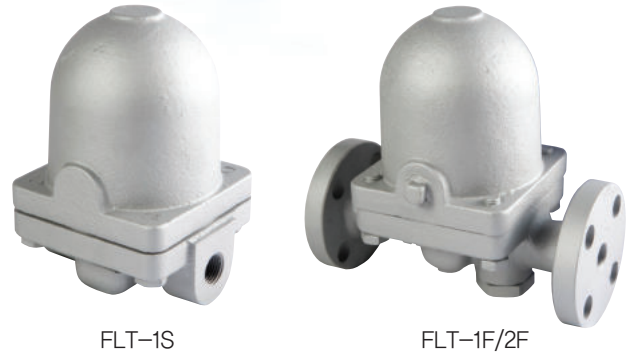
Model	Size	d	L	H1	H	Connection
BKT-1S	15A	PT 1/2"	127	70	158	PT Screwed
	20A	PT 3/4"	127	70	158	
	25A	PT 1"	137	77	171	
	32A	PT 1 1/4"	190	190	280	
	40A	PT 1 1/2"	190	190	280	
	50A	PT 2"	240	200	300	
BKT-1F	32A	32	250	190	280	JIS 10K Flanged
	40A	40	250	190	280	
	50A	50	290	200	300	





## FLT-1S/1F/2F | Float Type Steam Trap

- For Application to larger capacity than thermodynamic trap such as heat exchanger, dryer, chemical plant, and various steam systems. Excellent durability of stainless steel disc, seat, and ball float. Inbuilt air vent assembly to eliminate air-binding.
- All parts are installed at the bonnet, and the integral bonnet would be helpful for easy maintenance.

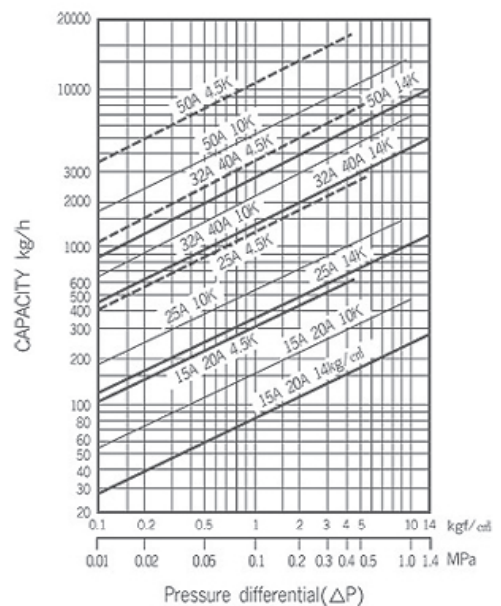


### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> )	Max. 4.5, 10, 14	Max.20
	Min. 0.35	Min. 0.35
Working Temperature (°C)	220	250
Connection	FLT-1S : PT Screwed	FLT-2F : JIS Flanged
	FLT-1F : JIS Flanged	
Materials	Body : Ductile Iron	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel	Trim : Stainless Steel

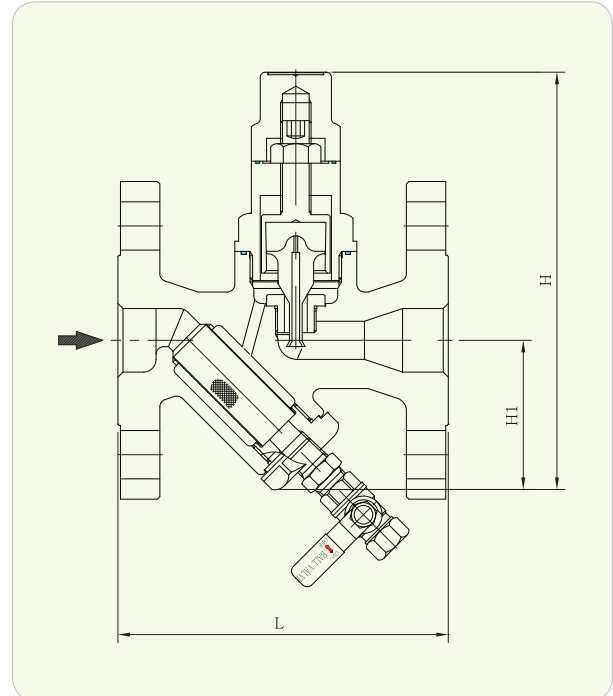
### ► Dimensions

Model	Size	d	L	H1	H	Connection
FLT-1S	15A	PT 1/2"	120	110	155	PT Screwed
	20A	PT 3/4"	120	110	155	
	25A	PT 1"	120	185	190	
	32A	PT 1 1/4"	270	240	295	
	40A	PT 1 1/2"	270	240	295	
	50A	PT 2"	300	260	310	
FLT-1F FLT-2F	15A	15	200	110	155	JIS 5K Flanged JIS 10K Flanged JIS 16K Flanged (FLT-1F) JIS 20K Flanged (FLT-2F)
	20A	20	200	110	155	
	25A	25	215	185	190	
	32A	32	320	240	295	
	40A	40	320	240	295	
	50A	50	360	260	310	



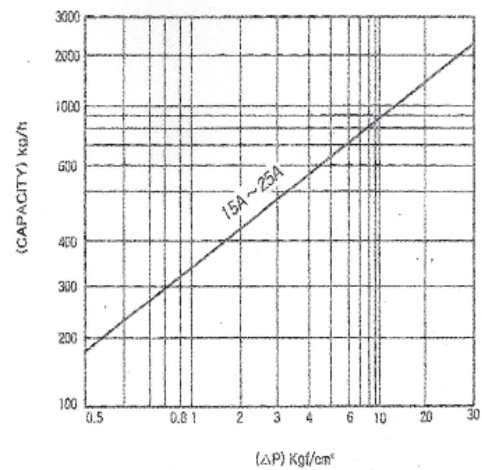
※ FLT-2F – ANSI and DIN Flange are available upon request

## PST-2F | 피스톤식 스팀트랩(Piston Type Steam Trap)



### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> )	Max. 20
	Min. 0.35
Working Temperature (°C)	220
Connection	JIS 16K, 20K Flanged
Materials	Body : Cast Steel, Stainless Steel
	Trim : Stainless Steel



### ► Dimensions

Model	Size	d	L	H1	H	Connection
PST-2F	15A	15	126	60	165	JIS 16K, 20K Flanged
	20A	20	130	60	165	
	25A	25	130	60	165	

## Reference Data | Accumulated Drain at steam pipe line

► When steam passes through at the beginning or accumulated Drain at unheated pipe line

A : when steam passes through at the beginning  
B : Unheated pipe line

diameter(mm) pressure(kgf/cm <sup>2</sup> g)		15	20	25	32	40	50	65	80	100	125	150	200	250	300
0.5 (110.7°C)	A	0.04	0.05	0.07	0.09	0.10	0.03	0.22	0.28	0.39	0.52	0.67	1.01	1.42	1.88
	B	0.08	0.10	0.13	0.16	0.18	0.23	0.29	0.33	0.42	0.52	0.61	0.80	0.99	1.17
1 (119.6°C)	A	0.04	0.05	0.07	0.10	0.11	0.15	0.25	0.30	0.43	0.58	0.74	1.11	1.57	2.07
	B	0.09	0.12	0.15	0.18	0.21	0.26	0.32	0.38	0.48	0.59	0.70	0.91	1.12	1.34
2 (132.9°C)	A	0.04	0.06	0.18	0.11	0.13	0.17	0.28	0.34	0.48	0.65	0.83	1.26	1.77	2.33
	B	0.11	0.14	0.18	0.22	0.25	0.31	0.39	0.46	0.58	0.71	0.84	1.10	1.35	1.61
3 (142.9°C)	A	0.05	0.06	0.09	0.12	0.14	0.18	0.30	0.37	0.52	0.71	0.90	1.37	1.93	1.61
	B	0.13	0.16	0.20	0.25	0.29	0.38	0.45	0.52	0.67	0.81	0.96	1.25	1.55	2.55
4 (151.1°C)	A	0.05	0.07	0.09	0.13	0.15	0.19	0.32	0.40	0.56	0.76	0.97	1.47	2.06	2.73
	B	0.14	0.18	0.22	0.28	0.32	0.39	0.50	0.58	0.74	0.90	1.07	1.40	1.72	2.05
5 (158.1°C)	A	0.05	0.07	0.10	0.13	0.16	0.20	0.34	0.42	0.59	0.80	1.02	1.55	2.18	2.88
	B	0.15	0.20	0.25	0.32	0.36	0.45	0.56	0.66	0.84	1.03	1.21	1.59	1.88	2.34
6 (164.2°C)	A	0.06	0.07	0.10	0.14	0.16	0.21	0.36	0.44	0.62	0.84	1.07	1.63	2.29	3.02
	B	0.16	0.21	0.26	0.33	0.37	0.46	0.58	0.68	0.87	1.06	1.26	1.65	2.03	2.43
7 (169.6°C)	A	0.06	0.07	0.11	0.14	0.17	0.22	0.37	0.46	0.65	0.87	1.11	1.69	2.38	3.14
	B	0.18	0.23	0.28	0.35	0.40	0.50	0.62	0.73	0.93	1.14	1.34	1.76	2.17	2.59
8 (174.5°C)	A	0.06	0.08	0.11	0.15	0.18	0.23	0.38	0.48	0.67	0.91	1.16	1.76	2.47	3.26
	B	0.19	0.24	0.30	0.37	0.42	0.53	0.66	0.77	0.99	1.21	1.28	1.87	2.31	2.76
9 (179.0°C)	A	0.06	0.08	0.12	0.15	0.18	0.24	0.40	0.49	0.70	0.94	1.20	1.82	2.56	3.39
	B	0.20	0.25	0.31	0.39	0.45	0.56	0.70	0.82	1.04	1.27	1.50	1.97	2.44	2.91
10 (183.2°C)	A	0.06	0.08	0.12	0.16	0.19	0.25	0.41	0.51	0.72	0.98	1.24	1.87	2.65	3.51
	B	0.21	0.27	0.33	0.41	0.47	0.58	0.73	0.86	1.09	1.34	1.58	2.07	2.56	3.05
15 (200.4°C)	A	0.07	0.09	0.13	0.18	0.21	0.28	0.46	0.57	0.18	1.09	1.39	2.12	2.98	3.94
	B	0.25	0.32	0.40	0.50	0.57	0.71	0.90	1.05	1.34	1.64	1.93	2.53	3.13	3.73
20 (213.9°C)	A	0.08	0.10	0.14	0.19	0.23	0.30	0.50	0.62	0.87	1.18	1.50	2.28	3.21	4.24
	B	0.29	0.26	0.46	0.57	0.65	0.81	1.02	1.19	1.53	4.87	2.21	2.89	3.57	4.26
30 (234.6°C)	A	0.00	0.12	0.174	0.23	0.27	0.35	0.59	0.73	1.03	1.39	1.77	2.69	3.78	5.00
	B	0.37	0.47	0.59	0.74	0.85	1.05	1.32	1.54	1.97	2.41	2.69	3.74	4.61	5.50

► Accumulated Drain when it is heated at pipe line

Temperature	Pipe size (mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300
100	Warm athickness mm	15	15	15	15	15	15	15	20	20	20	20	20	20	20
	Accumulated Drain kg/min	0.05	0.06	0.07	0.08	0.08	0.10	0.11	0.12	0.14	0.17	0.19	0.23	0.27	0.31
150	Warm athickness mm	15	15	20	20	20	20	25	25	25	25	25	25	30	30
	Accumulated Drain kg/min	0.09	0.10	0.11	0.12	0.13	0.14	0.17	0.18	0.20	0.23	0.26	0.32	0.37	0.42
200	Warm athickness mm	20	20	20	25	25	25	25	25	30	30	30	35	35	35
	Accumulated Drain kg/min	0.12	0.14	0.15	0.15	0.17	0.19	0.22	0.24	0.28	0.32	0.36	0.43	0.50	0.58
250	Warm athickness mm	20	25	25	25	25	30	30	30	35	35	35	40	40	40
	Accumulated Drain kg/min	0.17	0.19	0.20	0.22	0.23	0.26	0.30	0.33	0.38	0.43	0.49	0.58	0.68	0.78
300	Warm athickness mm	25	25	25	30	30	30	35	35	40	40	40	45	45	45
	Accumulated Drain kg/min	0.22	0.25	0.28	0.30	0.33	0.37	0.42	0.46	0.53	0.60	0.68	0.80	0.94	1.08



# Reference Data | Table of saturated vapour

Absolute pressure for steam (a b c)		Temperature of steam		Volume of water 1kg before evaporation	Volume of steam 1kg	Weight of steam 1m <sup>2</sup>	Specific enthalpy of steam 1kg			Absolute pressure for steam (a b c)		Temperature of steam		Volume of water 1kg before evaporation	Volume of steam 1kg	Weight of steam 1m <sup>2</sup>	Specific enthalpy of steam 1kg		
							Heat	Latent heat	Total heat								Heat	Latent heat	Total heat
kgf/cm <sup>2</sup>	lb/In <sup>2</sup>	°C	°F	ℓ	m <sup>3</sup>	kg	h	L	H=h+L	kgf/cm <sup>2</sup>	lb/In <sup>2</sup>	°C	°F	ℓ	m <sup>3</sup>	kg	h	L	H=h+L
0.02	0.28	17.2	62.9	1.0012	68.26	0.147	17.2	587.8	605.0	13.5	192.0	192.4	378.3	1.1451	0.1485	6.734	195.5	469.9	665.4
0.04	0.57	28.6	83.5	1.0039	35.45	0.0288	28.7	581.3	610.0	14.0	199.1	194.1	381.4	1.1476	0.1436	6.974	197.3	468.4	665.7
0.06	0.85	35.8	96.4	1.0063	24.18	0.0414	35.8	577.3	613.1	14.5	206.2	195.8	384.4	1.1500	0.1386	7.214	199.0	466.9	665.9
0.08	1.14	41.2	106.2	1.0083	18.44	0.0542	41.2	574.2	615.4	15.0	213.3	197.4	387.3	1.1524	0.1342	7.454	200.7	465.5	666.2
0.10	1.42	45.5	113.9	1.0101	14.95	0.0669	45.4	571.8	617.2	16.0	227.4	200.4	392.7	1.1572	0.1260	7.934	204.1	462.6	666.7
0.15	2.14	53.6	128.5	1.0136	10.21	0.0980	53.5	567.1	620.6	17.0	241.7	203.4	398.1	1.1618	0.1189	8.414	207.2	459.9	667.1
0.20	2.84	59.7	139.5	1.0170	7.791	0.1284	59.6	563.5	623.1	18.0	256.0	206.2	403.2	1.1663	0.1124	8.894	210.2	457.2	667.4
0.25	3.56	64.6	148.3	1.0197	6.319	0.1583	64.5	560.8	625.2	19.0	270.2	208.8	407.8	1.1708	0.1067	9.375	213.1	454.1	667.7
0.30	4.27	68.7	155.7	1.0221	5.326	0.1878	68.7	558.2	626.9	20.0	284.4	211.4	412.5	1.1749	0.1015	9.857	215.9	452.1	668.0
0.35	4.98	72.3	162.1	1.0242	4.409	0.2170	72.2	556.1	628.3	21.0	298.6	213.9	417.0	1.1791	0.0967	10.34	218.6	450.6	668.2
0.40	5.69	75.5	167.7	1.0362	4.067	0.2459	75.4	554.2	629.6	22.0	312.8	216.2	421.2	1.1833	0.0924	10.85	221.2	447.2	668.4
0.45	6.40	78.3	172.9	1.0280	3.642	0.2746	78.3	552.5	630.8	23.0	327.1	218.5	425.3	1.1873	0.0885	11.31	223.8	448.8	668.6
0.50	7.11	80.9	177.6	1.0296	3.300	0.3030	80.3	550.9	631.8	24.0	341.3	220.8	429.4	1.1913	0.0848	11.79	226.2	442.6	668.8
0.60	8.53	85.5	185.9	1.0329	2.782	0.3594	85.5	548.1	633.6	25.0	355.5	222.9	433.2	1.1953	0.0815	12.28	228.6	440.3	668.9
0.70	9.95	89.5	193.1	1.0357	2.408	0.4152	89.5	545.7	635.2	26.0	369.7	225.0	437.0	1.1991	0.0784	12.76	230.9	438.1	669.0
0.80	11.4	93.0	199.4	1.0383	2.125	0.4705	93.0	543.5	636.5	27.0	383.9	227.0	440.6	1.203	0.0755	13.25	233.2	435.9	669.1
0.90	12.8	96.2	205.2	1.0407	1.8904	0.5253	96.2	541.5	637.5	28.0	398.2	229.0	442.2	1.207	0.0728	13.74	235.4	433.8	669.2
1.00	14.2	99.1	210.4	1.0430	1.755	0.5797	99.2	539.6	638.8	29.0	412.4	230.9	447.5	1.210	0.0703	14.23	237.5	431.7	669.2
1.20	17.1	104.3	219.7	1.0471	1.454	0.6875	104.4	536.3	640.7	30.0	426.6	232.8	451.0	1.214	0.0679	14.72	239.6	429.7	669.3
1.40	19.9	108.7	227.7	1.0580	1.259	0.7942	108.9	535.5	642.4	32.0	455.0	236.4	457.5	1.221	0.0637	15.70	243.7	425.6	669.3
1.60	22.8	112.7	234.9	1.0542	1.111	0.8999	112.9	530.8	643.7	34.0	483.5	239.8	463.6	1.229	0.0599	16.69	247.6	421.7	669.3
1.80	25.6	116.3	241.3	1.0573	0.9952	1.005	116.6	528.4	645.0	36.0	511.9	243.0	469.4	1.236	0.0565	17.69	251.3	417.9	669.2
2.00	28.4	119.6	247.3	1.0603	0.9018	1.109	119.9	526.3	646.2	38.0	540.4	246.2	475.2	1.243	0.0535	18.69	254.9	414.2	669.1
2.50	35.6	126.8	260.2	1.0669	0.7317	1.367	127.2	521.4	648.6	40.0	566.8	249.2	480.6	1.249	0.0508	19.70	258.4	410.5	669.9
3.00	42.7	132.9	271.2	1.0726	0.6168	1.621	133.4	517.2	650.6	42.0	597.2	252.1	485.8	1.256	0.0483	20.72	261.7	407.0	669.7
3.50	49.8	138.2	280.8	1.0782	0.5337	1.874	138.8	513.4	652.2	44.0	625.7	254.9	490.8	1.263	0.0460	21.74	265.0	403.5	668.5
4.00	56.9	142.9	289.2	1.0831	0.4708	2.124	143.7	510.0	653.7	46.0	654.1	257.6	495.7	1.269	0.0439	22.77	268.2	400.0	668.2
4.50	64.0	147.2	297.0	1.0877	0.4214	2.373	148.1	506.8	654.9	48.0	682.6	260.2	500.4	1.276	0.0420	23.80	271.3	396.6	667.9
5.00	71.1	151.1	304.0	1.0920	0.3816	2.620	152.1	503.9	656.0	50.0	711.0	262.7	504.9	1.283	0.0402	24.85	274.3	393.3	667.6
5.50	78.2	154.7	310.5	1.0961	0.3489	2.877	155.8	501.2	657.0	55.0	782.1	268.7	515.7	1.299	0.0364	27.49	278.5	385.1	666.6
6.00	85.3	158.1	316.6	1.1000	0.3213	3.112	159.3	498.6	657.9	60.0	853.2	274.3	525.7	1.315	0.0331	30.18	288.3	377.2	665.5
6.50	92.4	161.2	322.2	1.1037	0.2980	3.356	162.6	496.1	658.7	65.0	924.3	279.5	535.1	1.331	0.0304	32.93	294.8	369.4	664.2
7.00	99.5	164.2	327.6	1.1072	0.2778	3.600	165.7	493.8	659.5	70.0	995.4	284.5	544.1	1.347	0.0280	35.75	301.0	361.8	662.8
7.50	106.7	167.0	332.6	1.1111	0.2602	3.843	168.6	491.6	660.2	75.0	1066.5	289.2	552.6	1.363	0.0259	38.62	307.0	354.3	661.3
8.00	113.8	169.6	337.3	1.1140	0.2448	4.086	171.3	488.5	660.8	80.0	1137.6	293.6	560.5	1.379	0.0241	41.56	312.8	346.9	659.7
8.15	120.9	172.1	341.8	1.1172	0.2311	4.328	174.0	487.4	661.4	85.0	1208.7	297.9	568.2	1.395	0.0224	44.58	318.4	339.6	658.0
9.00	128.0	174.5	346.1	1.1203	0.2188	4.570	176.5	485.4	661.9	90.0	1279.5	301.9	575.4	1.421	0.0210	47.67	323.8	332.4	655.2
9.50	135.1	176.8	350.2	1.2333	0.2079	4.811	178.9	483.5	662.4	95.0	1350.9	305.8	582.4	1.429	0.0197	50.85	329.1	325.2	654.3
10.00	142.2	179.0	354.2	1.1262	0.1979	5.052	181.3	481.6	662.9	100	1422.0	309.5	589.1	1.446	0.0185	54.12	334.3	318.0	642.3
10.50	149.3	181.2	358.2	1.1291	0.1890	5.283	183.5	479.8	663.3	120	1706.4	323.1	613.6	1.518	0.0147	68.22	354.0	289.4	643.4
11.00	156.4	183.2	357.8	1.1319	0.1807	5.533	185.6	478.1	663.7	140	1990.8	335.1	633.2	1.599	0.0118	84.52	372.8	260.0	632.8
11.50	163.5	185.2	365.4	1.1346	0.1732	5.774	187.7	476.4	664.1	160	2275.2	345.8	654.4	1.693	0.0096	104.0	391.3	228.4	619.7
12.00	170.6	187.1	368.8	1.1372	0.1663	6.014	189.8	474.7	664.5	180	2559.6	355.4	671.7	1.814	0.0078	128.3	410.8	129.9	603.7
12.50	177.8	188.9	372.0	1.1400	0.1599	6.254	191.7	473.1	664.8	200	2844.0	364.1	687.4	1.990	0.0062	161.6	431.6	15.2	582.8
13.00	184.9	190.7	375.3	1.1425	0.1540	6.494	193.6	471.5	665.1	225.56	3208.7	374.15	705.47	3.170	0.0032	315.5	503.3	0	503.3

# Strainer

## Y-Type Strainer

STR-1F/2F/3F ..... 49





# Strainer

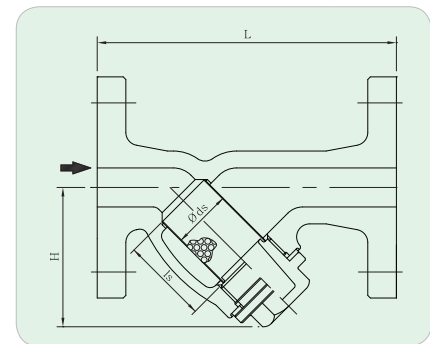
## STR-1F | Y-Type Strainer

### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	10
Working Temperature (°C)	220
Connection	JIS 10K Flanged
Materials	Body : Cast Iron
	Trim : Stainless Steel

### ► Dimensions

Size	Part	15A	20A	25A	32A	40A	50A	65A	80A	100A
L		125	140	165	178	195	220	285	305	360
H		65	75	85	95	105	115	206	236	274
Is		34.3	49	63	66	75.5	87.5	160	190	230
ds		23	28	38	46	51	59	70	85	106



## STR-2F/3F | Y-Type Strainer

### ► Specifications

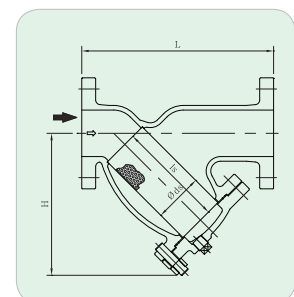
Model	STR-2F	STR-3F
Working Pressure (kgf/cm <sup>2</sup> g)	20	30
Working Temperature (°C)	250	250
Connection	JIS 20K Flanged	JIS 30K Flanged
Materials	Body : Cast Steel Stainless Steel	Body : Cast Steel Stainless Steel
	Trim : Stainless Steel	Trim : Stainless Steel



### ► Dimensions

STR-2F	15A	20A	25A	32A	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A
L	125	140	165	175	195	220	289	313	364	414	484	578	714	833
H	65	75	85	95	105	115	206	236	275	325	380	450	524	587
Is	34.3	49	63	66	75.5	87.5	160	190	230	270	320	380	430	460
ds	23	28	38	46	51	59	70	85	106	134	160	206	270	330

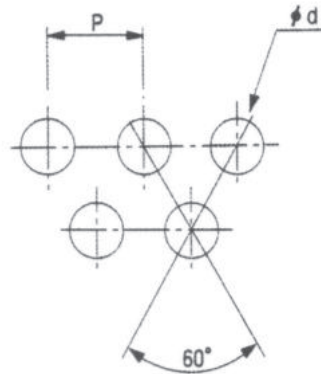
STR-3F	15A	20A	25A	32A	40A	50A
L	135	140	170	182	202	220
H	65	75	85	95	105	115
Is	34.3	49	63	66	75.5	87.5
ds	23	28	38	46	51	59



※ STR-2F/3F : ANSI and DIN Flange are available upon request

# Engineering Data | Strainer

## ▶ Screen



Type	Perforated Screen								Screen	
Part	Screen only				Double screen				Diameter	Quantity of screen
Size	t	Ød	p	Operture ratio(%)	t	Ød	p	Operture ratio(%)		
15A~25A	0.25	0.8	1.5	25.88	0.5	3.0	4.0	51.19	width : 0.55 height : 0.8	width : About 45 height : About 10
32A~50A	0.3	1.0	1.7	31.48						
65A~100A	0.5	1.2	2.0	32.76	0.7	5.0	6.5	53.85		
125A~150A	0.6	1.5	2.2	42.30	1.0	8.0	10.0	58.24		
200A	0.8	1.8	2.5	47.17						

## ▶ Operture ratio

$$F = 91.0 \times d^2 / P^2$$

F : Operture ratio(%)  
 d : HOLE diameter(mm)  
 P : HOLE pitch(mm)

## ▶ Mesh

Mesh	Pitch	S. W. G	Wire DIA(mm)	Operture ratio(%)
20	1.2700	30	0.3150	56.5
40	0.6350	35	0.2134	44.1
60	0.4233	38	0.1524	41.2
80	0.3175	41	0.1118	42.0
100	0.2540	42	0.0813	37.5
120	0.2116	44	0.0813	37.5
160	0.1588	46	0.0613	37.0
200	0.1270	48	0.0406	36.2

# Other Valves



## Globe Valve

GSO-1F ..... 52



## Angle Valve

ASO-1F ..... 52



## Air Vent

AWW-1S, AWW-1SB(For Water) 53  
 AVS-1S(For Steam) ..... 54  
 AVO-1F/2F(For Oil) ..... 54



## Air Trap

FAT-1S/1F/2F/3F ..... 55



## Sight Glass

DUG-1S/1F/5F ..... 56



## Temperature Regulating Valve

PTR-1F(Pilot Acting) ..... 57  
 DTR-1F(Direct Acting) ..... 57

- \* The spins are operated up and down by the handle operation and seat protects the gate by blocking exposure
- \* The spins are operated up and down by the handle operation and seat protects the gate by blocking exposure and the fluid direction is 90°
- \* It is installed to remove air from a radiator or pipe to prevent an air painning for boiler plant
- \* It is an automatic valve to discharge condensed water and condensate of air compressor on a plumbing system after separating from compressed air
- \* Checking visually the fluid flow and leakage
- \* The temperature of object is being maintained constant when it is more than constant temperature after inserting hot water tank, heat exchanger, evaporator and etc into the control part of fluid supply tube for heating

# Other Valves

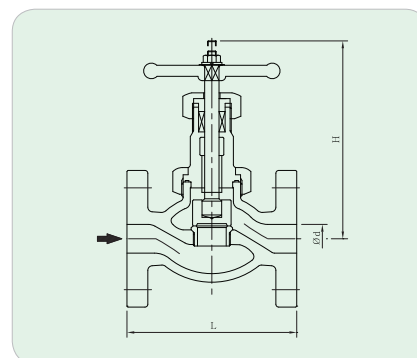
## GSO-1F | Globe Valve

### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	16
Working Temperature (°C)	220
Connection	JIS Flanged
Materials	Body : Ductile Iron
	Trim : Stainless Steel

### ► Dimensions

Model	Size	d	JIS 5K FF		JIS 16K FF	
			L	H	L	H
GSO-1F	15A	15	100	135	110	135
	20A	20	110	145	120	145
	25A	25	120	167	130	167
	32A	32	140	180	160	180
	40A	40	160	195	180	195



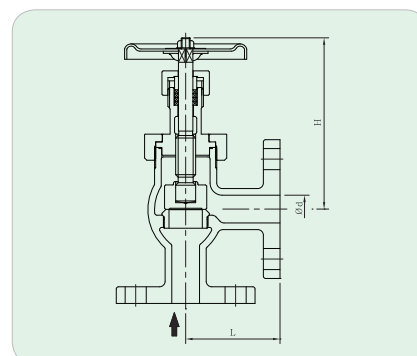
## ASO-1F | Angle Valve

### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	16
Working Temperature (°C)	220
Connection	JIS Flanged
Materials	Body : Ductile Iron
	Trim : Stainless Steel

### ► Dimensions

Model	Size	d	JIS 5K FF		JIS 16K FF	
			L	H	L	H
ASO-1F	15A	15	50	135	70	135
	20A	20	60	145	75	145
	25A	25	65	167	85	167
	32A	32	80	180	95	180
	40A	40	85	195	100	195



## AVW-1S | Air Vent for Water

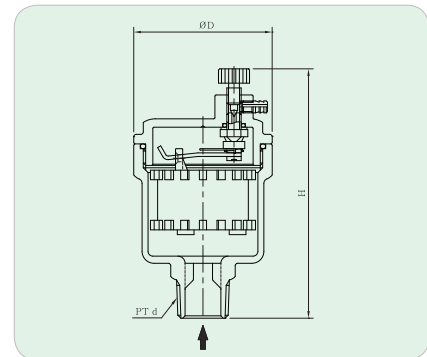
### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	10
Working Temperature (°C)	80
Working Fluid	Water
Connection	PT Screwed
Materials	Body : Forged Brass
	Trim : NBR



### ► Dimensions

Size	d	L	H	Connection
15A	PT 1/2"	58	105	PT Screwed



## AVW-1SB | Air Vent for Water

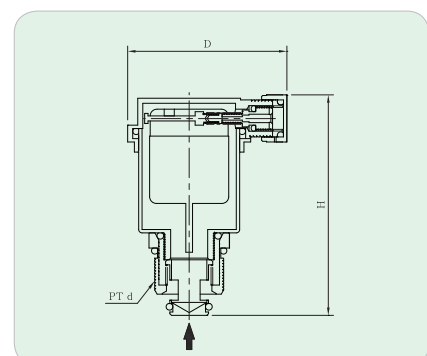
### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	10
Working Temperature (°C)	80
Working Fluid	Water
Connection	PT Screwed
Materials	Body : Forged Brass
	Trim : NBR



### ► Dimensions

Size	d	L	H	Connection
15A	PT 1/2"	58	65	PT Screwed





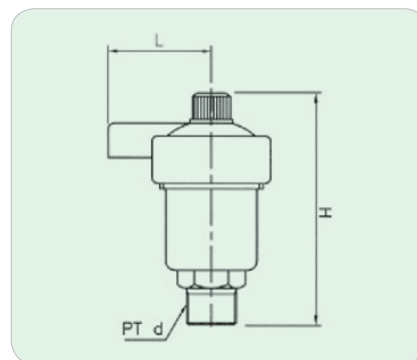
## AVS-1S | Air Vent for Steam

### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	10
Working Temperature (°C)	220
Working Fluid	Steam
Connection	PT Screwed
Materials	Body : Forged Brass
	Trim : Wax

### ► Dimensions

Size	d	L	H	Connection
15A	PT 1/2"	30	75	PT Screwed



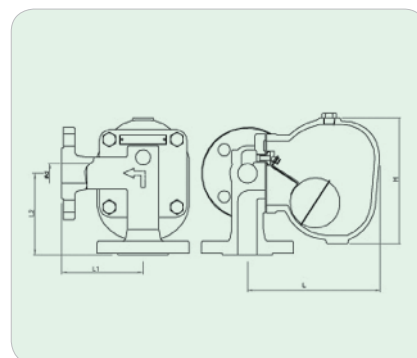
## AVO-1F/2F | Air Vent for Oil

### ► Specifications

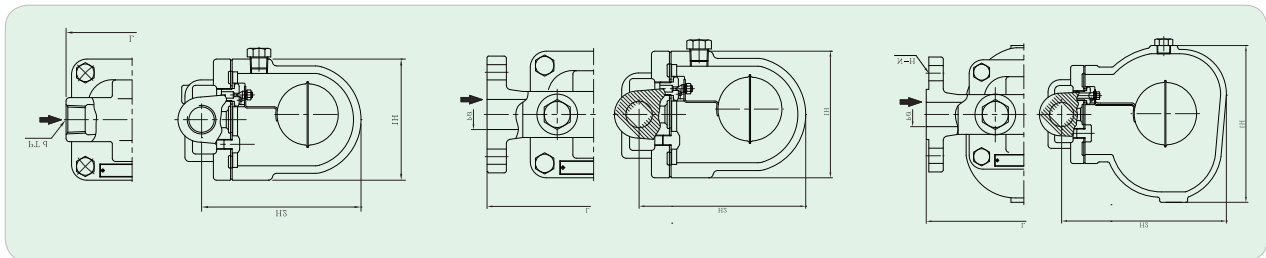
Model	AVO-1F	AVO-2F
Working Pressure (kgf/cm <sup>2</sup> g)	10	20
Working Temperature (°C)	220	220
Working Fluid	Oil, Water	Oil, Water
Connection	JIS Flanged	JIS Flanged
Materials	Body : Ductile Iron	Body : Cast Steel
	Trim : Stainless Steel	Trim : Stainless Steel

### ► Dimensions

Size	L	L1	L2	H	Connection
15A	220	105	105	185	JIS 16K, 20K Flanged
20A	220	105	105	185	
25A	220	105	105	185	



## FAT-1S/1F/2F/3F | Auto Air Trap



### ► Specifications

Model	FAT-1S	FAT-1F	FAT-2F	FAT-3F
Working Pressure (kgf/cm <sup>2</sup> g)	10	10	20	30
Working Temperature (°C)	100	100	100	100
Connection	PT Screwed	JIS Flanged	JIS Flanged	JIS Flanged
Materials	Body : Ductile Iron	Body : Ductile Iron	Body : Cast Steel Stainless Steel	Body : Cast Steel Stainless Steel
	Trim : Stainless Steel	Trim : Stainless Steel	Trim : Stainless Steel	Trim : Stainless Steel

### ► Dimensions

Model	Size	d	L	H1	H2	Connection
FAT-1S	15A	PT 1/2"	120	110	170	PT Screwed
	20A	PT 3/4"	120	110	170	
	25A	PT 1"	120	195	220	
FAT-1F	15A	15	205	110	155	JIS 10K Flanged
	20A	20	205	110	155	
	25A	25	215	185	190	
FAT-2F	15A	15	205	185	190	JIS 20K Flanged
	20A	20	205	185	190	
	25A	25	215	185	190	
FAT-3F	15A	15	205	185	190	JIS 30K Flanged
	20A	20	205	185	190	
	25A	25	215	185	190	

※ FAT-2F/3F : ANSI and DIN Flange are available upon request

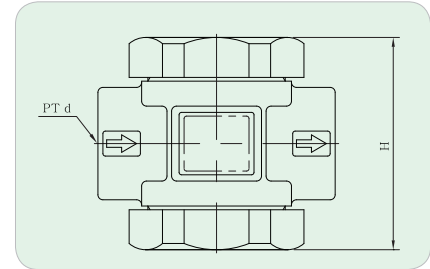
## DUG-1S | Sight Glass

### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	10
Working Temperature (°C)	150
Type	Flapper
Connection	PT Screwed
Materials	Body : Ductile Iron
	Trim : Stainless Steel

### ► Dimensions

Size	d	L	H
15A	PT 1/2"	90	85
20A	PT 3/4"	90	85
25A	PT 1"	90	85



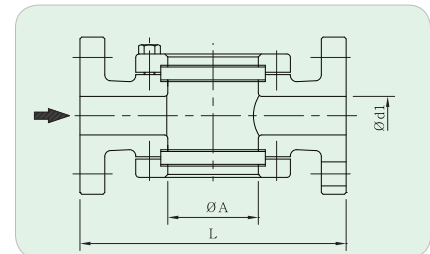
## DUG-1F | Sight Glass

### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	10
Working Temperature (°C)	150
Type	Flapper
Connection	JIS 10K Flanged
Materials	Body : Ductile Iron
	Trim : Stainless Steel

### ► Dimensions

Size	d	L	A	Size	d	L	A	Connection
15A	15	150	40	32A	32	175	65	
20A	20	150	40	40A	40	200	65	
25A	25	170	50	50A	50	220	80	



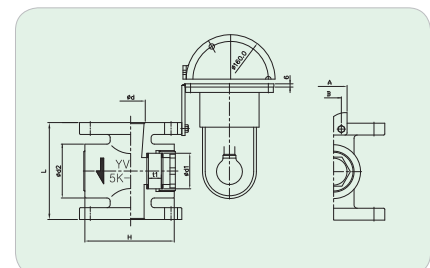
## DUG-5F | Sight Glass

### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	5
Working Temperature (°C)	150
Working Fluid	Water, Oil
Connection	JIS 5K Flanged
Materials	Body : Cast Iron
	Trim : Heat Treatment Glass

### ► Dimensions

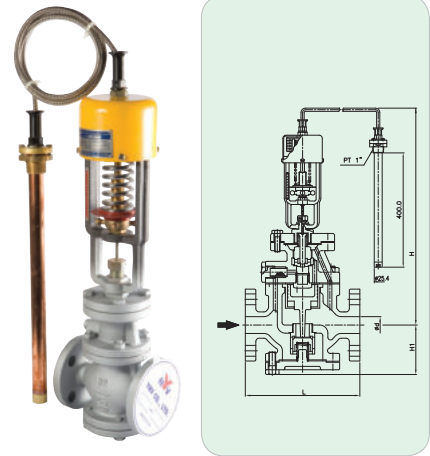
Size	d	H	L	Size	d	H	L	Connection
25A	25	86	90	100A	100	178	210	
40A	40	102	100	125A	125	208	245	
50A	50	115	115	150A	150	232	310	
65A	65	140	160	200A	200	294	380	
80A	80	158	180	250A	250	344	400	



## PTR-1F | Temperature Regulating Valve

### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	8
Temperature Range (°C)	40~120
Working Temperature (°C)	220
Working Fluid	Steam
Type	Pilot Acting
Connection	JIS 10K Flanged
Capillary Tube Length	2M, 5M (5M—upon request)
Materials	Body : Ductile Iron
	Trim : Stainless Steel
	Sensor : Copper Tube



### ► Adjusting Range

Adjusting	Max.
40~60°C	70°C
50~70°C	80°C
60~80°C	90°C
70~90°C	100°C
80~100°C	110°C
90~110°C	120°C

### ► Dimensions

Part / Size	15A	20A	25A	32A	40A	50A	65A	80A	100A
L	165	165	170	200	200	220	250	290	320
H1	75	75	75	85	85	92	110	130	150
H	490	490	490	500	500	510	530	555	570

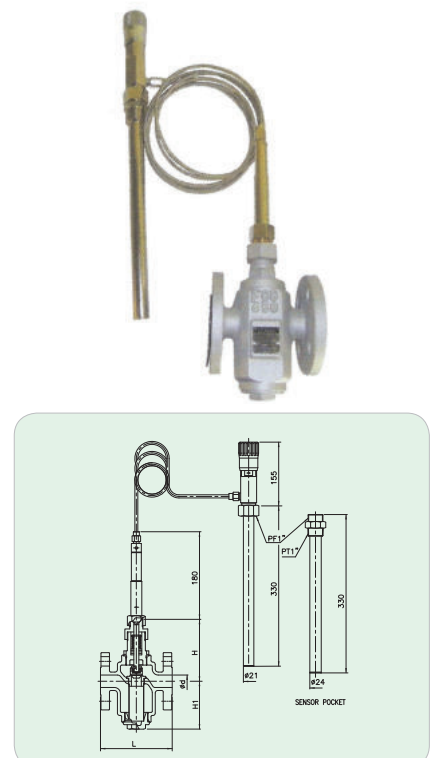
## DTR-1F | Temperature Regulating Valve

### ► Specifications

Working Pressure (kgf/cm <sup>2</sup> g)	10
Temperature Range (°C)	50~110
Working Temperature (°C)	220
Working Fluid	Steam
Type	Direct Acting Type
Connection	JIS 10K(16K) Flanged
Capillary Tube Length	3M, 5M (5M—upon request)
Materials	Body : Ductile Iron, Cast Steel
	Trim : Stainless Steel
	Sensor : Copper Tube

### ► Dimensions

Size	15A	20A	25A
L	135	140	140
H1	65	65	70
H	122	122	127



# CERTIFICATES

## ■ Certifications



Safety certificate of KOSHA



DNVGL Type Approval (LSV-1S)



DNVGL Type Approval (FSV-1F, FSV-3F)



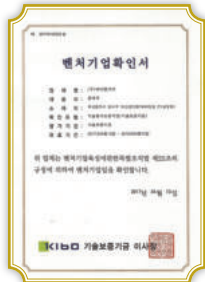
DNVGL Type Approval (HSV-3S)



Certificate of factory registration



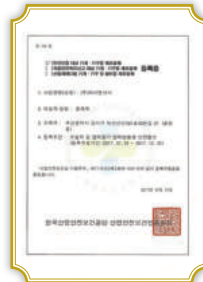
R&D Center certificate



Confirmation of Venture Business



INNO-BIZ



Manufacturer's registration



Small business confirmation



Certificate of specific equipment



Acquired the letter of patent for hydrant reducing valve



Acquired the letter of patent for safety relief valve of attachment type



Certificate of product-specific approved exporter



ISO certificate(Korean)



ISO certificate(English)

	ISO 9001 Certificate		Certificate of DNVGL
	Certificate of approval KOSHA		Certificate of CCS
	Acquired specific equipment manufacturing certificate KGS		Designated as INNO-BIZ
			Designated as venture business



## ■ Safety certificate of KOSHA



FSV-1F(G)

FSV-1F(G)

FSV-1F(G)

FSV-1F(G)

FSV-2F(G)

FSV-1F(S)



FSV-1F(S)

FSV-1F(S)

FSV-1S(25A)(S)

FSV-1S(L)-32A(S)

FSV-2F(65A)(G)

FSV-2F(25A)(G)



FSV-2F(40A)(S)

HSV-3S(25A)(S)

HSV-3S(L)(40A)(G)

HSV-3S(G)

FSV-1F(S)

HSV-3S(G)



HSV-3S(G)

LSV-1S(G)

LSV-1S(G)

LSV-1S(S)

LSV-1S(S)

BFSV-2F(G)

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