

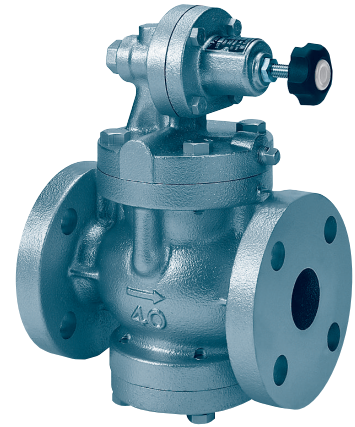
**Pilot operated**

# Type P260 Pressure Reducing Valves

**For steam**

The product of the body made from stainless cast steel is a non-oil finish.

- Wide range of sizes : 15—250mm
- Light and compact
- Excellent performance
- If another pressure reducing valve or both the two way valve and the flow meter are near the inlet of the pressure reducing valve, we recommend the use of type P260-DHC.



**1 Pressure Reducing Valves (For steam)**

## Specifications

Fluid	Pressure (MPa)		Max. temp. (°C)	Sensing	Material for main parts					Connection
	Inlet	Outlet set range			Body & cover	Main valve disc & seat	Piston & cylinder	Pilot valve disc & seat	Diaphragm	
Steam	0.1   1.0	0.03—0.2 0.1—0.8 0.5—0.9	220	Internal	Cast iron <sup>(1)</sup>	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Flanged JIS10KFF
	0.1   1.6	0.03—0.2 0.1—0.8 0.5—1.44	220		Cast iron <sup>(1)</sup>	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Flanged JIS16KFF
	0.1   2.0	0.03—0.2 0.1—0.8 0.5—1.6	220		Spheroidal graphite cast iron	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Flanged JIS20KRF
	0.1   1.0	0.03—0.2 0.1—0.8 0.5—0.9	260 300		Cast steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Flanged JIS10KRF
	0.1   1.6	0.03—0.2 0.1—0.8 0.5—1.44	260 300		Cast steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Flanged JIS16KRF
	0.1   2.0	0.03—0.2 0.1—0.8 0.5—1.6	260 300		Cast steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Flanged JIS20KRF
	0.2   3.0	0.1—0.8 0.5—1.6 1.0—2.5	240		Cast steel	Stainless steel stellited	Stainless steel	Stainless steel stellited	Stainless steel	Flanged JIS30KRF
	0.1   1.0	0.03—0.2 0.1—0.8 0.5—0.9	184		Stainless cast steel	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Flanged JIS10KFF

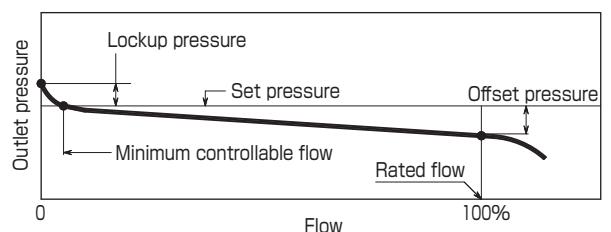
Note <sup>(1)</sup> : Body material for size 15—40 is spheroidal graphite cast iron.

Remarks 1. Max. inlet pressure for size 200 is 1.6MPa and for size 250 is 1.0MPa.  
2. ASME class 150RF and class 300RF flange are available.

## Performance

Maximum steam temperature		220, 260, 300, 240, 184°C or less	
Maximum press. range ability		20 : 1	
Minimum differential pressure		10% of inlet pressure (min. 0.07MPa)	
Offset pressure	Set press.	0.03—0.2, 0.1—0.8	0.03MPa or less
	range	0.5—0.9(1.44)(1.6)	0.05MPa or less
Lockup pressure	Set press.	0.03—0.2, 0.1—0.8	0.02MPa or less
	range	0.5—0.9(1.44)(1.6)	0.04MPa or less
Minimum controllable flow		5% of rated flow	
Seat leakage		0.05% of rated flow or less	

Flow characteristic curve



# Type P260 Pressure Reducing Valves

## Cv calculation

$Cv = A \times d^2$  where :  $d$  = Nominal valve size (inch)  
 where  $P_1$  : Inlet pressure (MPa),  $P_2$  : Set pressure (MPa)

$$A = \frac{16.2 \times P_2^{0.52}}{P_1 + 0.101} \approx \frac{16.2 \sqrt{P_2}}{P_1 + 0.101} \text{ (But maximum 4.5)}$$

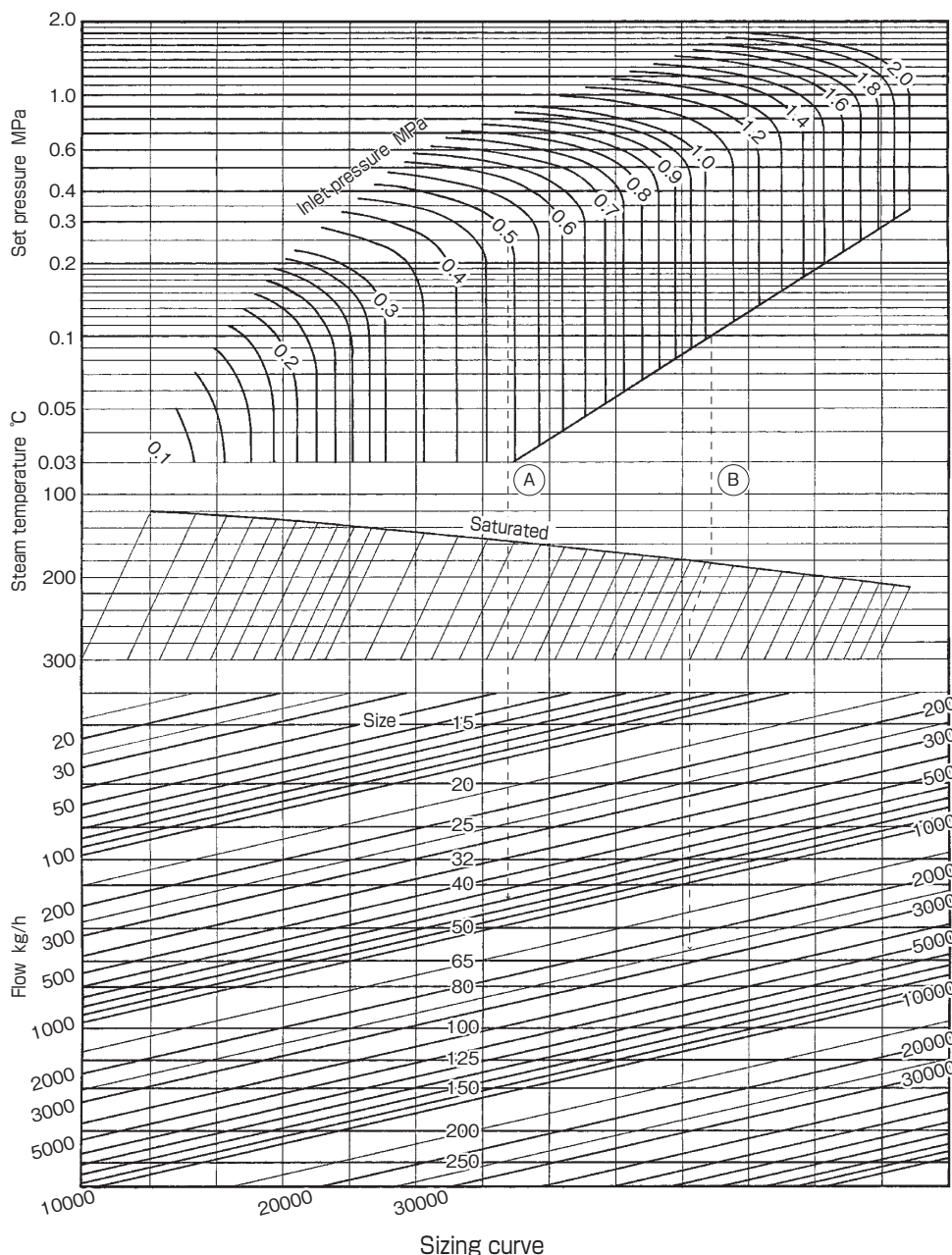
In case of  $A=4.5$ , Cv is as follows

Flange rating	10K	16 · 20K	30K
A	4.5-3.1	4.5-2.5	4.5-2.0

Size	15	20	25	32	40	50	65	80	100	125	150	200	250
Cv	1.1	2.5	4.5	7.0	10.1	18	28.1	40.5	72	112.5	162	288	450

## Sizing curve

Use the following chart to select the suitable valve size.



In the event that the inlet pressure or the outlet pressure is not constant but stays within range, select the minimum difference in pressure between the inlet pressure and outlet pressure to choose the correct size.

### Example A

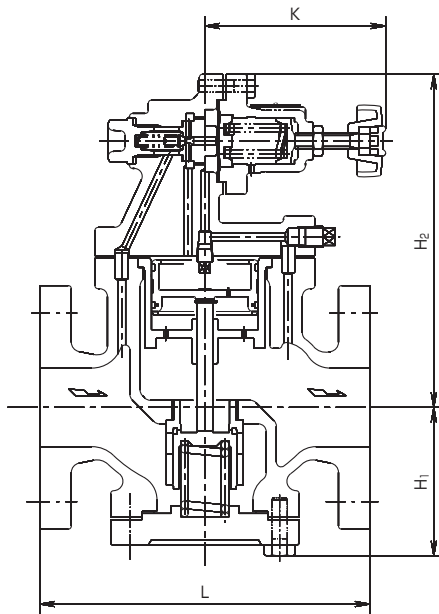
Inlet pressure : 0.5MPa  
 Inlet temperature : Saturated  
 Outlet set pressure : 0.25MPa  
 Flow : 700kg/h  
 Draw a vertical line downward from the intersecting point of 0.5MPa inlet pressure line and 0.25MPa set pressure line until it reaches 700kg/h flow line (oblique).  
 As the final point is between the size 40 line and 50 line, the required valve size is 50.

### Example B

Inlet pressure : 2.0MPa  
 Inlet temperature : 250°C  
 Outlet set pressure : 0.1MPa  
 Flow : 2500kg/h  
 Draw a line downward along the oblique line from its intersecting point with 2.0MPa inlet pressure line until it intersects 0.1MPa set pressure line (horizontal).  
 From this intersecting point, draw a vertical line downward until it reaches saturated steam temperature line and draw a line downward along the oblique line given in the chart until it intersects 250°C temperature line (horizontal).  
 As the final intersecting point is between the size 50 line and 65 line, the required valve size is 65.

# Type P260 Pressure Reducing Valves

## Construction & Dimensions



- Remarks
1. The figure shows no flow condition, i.e. when fully closed.
  2. A handle is not attached to the product made from cast steel.
  3. In 200 or more size and JIS30K, form differs from this figure in part.

### Dimensions

(mm)

Body mtl.	Dim.	Size	15	20	25	32	40	50	65	80	100	125	150	200	250
				JIS10K	145	150	160	175	190	210	235	265	310	360	400
Cast iron (1)	L	JIS16K	145	150	160	175	190	210	235	270	315	365	405	500	—
		H <sub>1</sub>	78	73	71	77	85	95	112	123	150	174	202	248	300
	H <sub>2</sub>	171	176	178	188	198	212	231	248	305	337	367	482	549	
	K	115	115	115	115	111	111	111	111	162	162	162	194	194	
Spheroidal graphite cast iron	L	JIS20K	149	154	164	179	194	206	231	266	—	—	—	—	—
		H <sub>1</sub>	82	77	75	79	85	95	110	121	—	—	—	—	—
	H <sub>2</sub>	171	176	178	188	198	212	231	248	—	—	—	—	—	
	K	115	115	115	115	111	111	111	111	—	—	—	—	—	
Cast steel	L	JIS10K	182	186	186	206	212	228	252	270	318	358	398	496	630
		JIS16K	182	186	186	206	212	228	252	274	326	362	402	504	638
		JIS20K	186	190	190	210	216	232	256	278	330	370	410	512	650
		JIS30K	194	194	195	218	224	240	268	290	—	—	—	—	—
	H <sub>1</sub>	77	77	75	77	85	95	110	124	151	175	207	248	303	
	H <sub>2</sub>	177	177	179	189	199	213	232	249	305	337	367	482	552	
	K	107	107	107	107	103	103	103	103	147	147	147	194	194	
Stainless cast steel	L	JIS10K	182	186	186	206	212	228	252	270	—	—	—	—	—
		H <sub>1</sub>	75	75	75	85	85	95	110	124	—	—	—	—	—
	H <sub>2</sub>	179	179	179	198	198	212	231	248	—	—	—	—	—	
	K	117	117	117	113	113	113	113	113	—	—	—	—	—	

- Remarks
1. K shows the dimension under no compression of the adjusting spring.
  2. H<sub>1</sub>, H<sub>2</sub> and K for JIS30K are slightly different.

### Weights

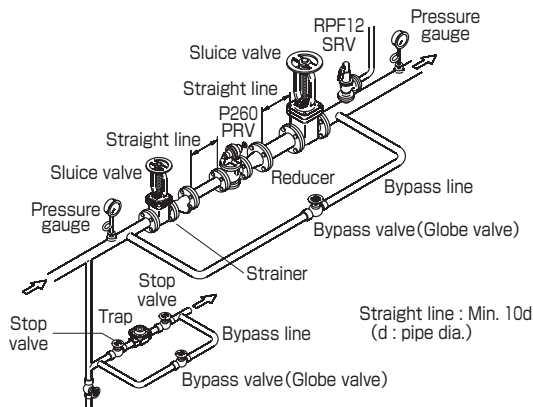
(kg)

Size	15	20	25	32	40	50	65	80	100	125	150	200	250
Cast iron (1) JIS10K	8	8.5	10	12	14	18	26	32	51	71	105	195	315
Spheroidal graphite cast iron JIS20K	9	9.5	11	13	15	19	27	35	—	—	—	—	—
Cast steel JIS20K	10	11	13	14	17	22	30	39	60	92	131	228 <sup>(4)</sup>	341 <sup>(5)</sup>
Cast steel JIS30K	12	13	15	16	20	24	35	43	—	—	—	—	—
Stainless cast steel JIS10K	9	10	12	15	16	21	28	35	—	—	—	—	—

Note <sup>(4)</sup> : For JIS16K  
<sup>(5)</sup> : For JIS10K

# Type P260 Pressure Reducing Valves

## Installation example



Note : Install upright in horizontal piping.

Space required for disassembling and maintenance (mm)

Size	15	20	25	32	40	50	65	80	100	125	150	200	250
Beneath the center of pipe line	200	200	200	200	220	250	270	300	350	410	460	560	700

## Safety relief valves recommended for use in downstream of P260 pressure reducing valves

The sizes of the safety relief valves for alarms for the type P260 outlet side are shown in the following table.

P260 pressure reducing valve		Safety relief valve	Size of P260 pressure reducing valve												
Inlet press. MPa	Outlet set press. MPa		15	20	25	32	40	50	65	80	100	125	150	200	250
		Set press. MPa	Nominal size of RPF12 safety relief valve								Upper : Nominal size of RPN6B safety relief valve Lower : Nominal size of RPF12 safety relief valve				
0.3 or less	0.03	0.08	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	25	32	40	40G65 65	40G65 65	40H80 80	50J80	80K100
0.3–0.6 or less	0.03	0.08	15 · 20	15 · 20	15 · 20	15 · 20	25	32	40	50	40G65 65	40H80 80	50J80	80K100	80L100
0.6 or less	0.05	0.1	15 · 20	15 · 20	15 · 20	15 · 20	25	32	40	50	40G65 65	40H80	50J80	80K100	80L100
0.6–1.0 or less	0.05	0.1	15 · 20	15 · 20	15 · 20	15 · 20	25	40	50	65	40G65 80	40H80	50J80	80K100	80L100
0.7 or less	0.1	0.15	15 · 20	15 · 20	15 · 20	15 · 20	25	32	40	50	40G65 65	40H80 80	50J80	80K100	80L100
0.7–1.0 or less	0.1	0.15	15 · 20	15 · 20	15 · 20	25	32	40	50	65	40G65 80	40H80	50J80	80L100	100M150
0.7 or less	0.2	0.28	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	25	32	40	40G65 65	40G65 65	40H80 80	50J80	80K100
0.7–1.0 or less	0.2	0.28	15 · 20	15 · 20	15 · 20	15 · 20	25	32	40	50	40G65 65	40G65 80	40H80	50J80	80L100
0.9 or less	0.3	0.38	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	25	32	40	40G65 65	40G65 65	40H80 80	50J80	80K100
0.9–1.0 or less	0.3	0.38	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	32	40	40G65 65	40G65 80	40G80 80	50J80	80K100
1.0 or less	0.4	0.48	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	25	32	40	40G65 50	40G65 65	40G65 80	50J80	80K100
1.0 or less	0.5	0.6	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	25	32	40	25E50 50	40G65 65	40G65 80	40H80	50J80
1.0 or less	0.6	0.7	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	25	32	25E50 40	40G65 65	40G65 65	40H80	50J80
1.0 or less	0.7	0.82	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	25	32	25E50 40	25E50 50	40G65 65	40G65 80	40H80
1.0 or less	0.8	0.92	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	15 · 20	25	25E50 32	25E50 40	40G65 50	40G65 80	40H80

- Remarks
1. Above nominal sizes are only for use in warning of pressure reducing valve failure, and have nothing to do with safety regulations or safety laws.
  2. Safety relief valve capacity is 5–10% of pressure reducing valve rated flow.
  3. Refer to the following table for safety relief valve set pressure.

Safety relief valve set pressure (MPa)

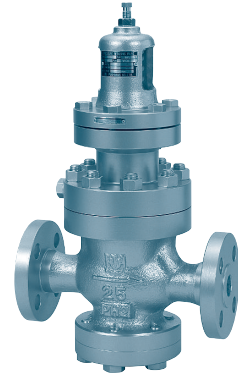
Pressure reducing valve set pressure	Safety relief valve set pressure
0.1 or less	over P.R.V. set pressure +0.05
0.1–0.4 or less	over P.R.V. set pressure +0.08
0.4–0.6 or less	over P.R.V. set pressure +0.1
0.6–0.8 or less	over P.R.V. set pressure +0.12
over 0.8	over P.R.V. set pressure +15%

Pilot operated

# Type PHP30 Pressure Reducing Valves for high pressure and high temperature steam

For steam

- For high pressure and high temperature steam
- To cope with large differential pressure and fluctuation of flow
- No damage even if inlet pressure is loaded to the outlet



1 Pressure Reducing Valves (For steam)

## Specifications

Fluid	Pressure (MPa)		Max. temp. (°C)	Material for main parts					Connection
	Inlet	Outlet set range		Body	Spring case	Valve disc	Piston	Diaphragm	
Steam	0.3-3.7	0.1-0.5	Sat.   300 (370) (1)	Cast steel (Stellited seating face)	Spheroidal graphite cast iron	Special stainless steel	Stainless steel	Stainless steel	Flanged JIS30KRF
	0.3-4.0	0.3-1.0 0.8-2.5							Flanged JIS40KRF

Note (1) : Available upon request. Material differs from 300°C type.

Remark ASME class 300RF and class 600RF flange are available.

## Performance

Applicable pressure range	Refer to illustration
Min. differential pressure	0.2MPa
Offset pressure	10% of inlet pressure (but min. 0.04MPa) or less
Min. controllable flow	5% of rated flow
Seat leakage	0.2% of rated flow or less

## Cv values

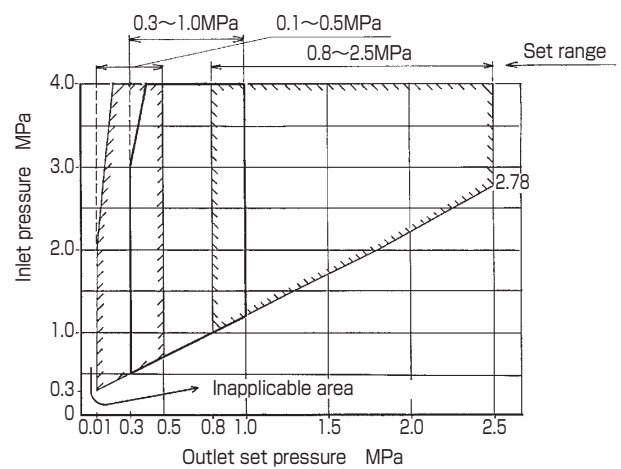
Size	25	40	50	65	80	100
Cv	5	12	19	28	44	76

## Cv calculation

Select the valve size by Cv calculation

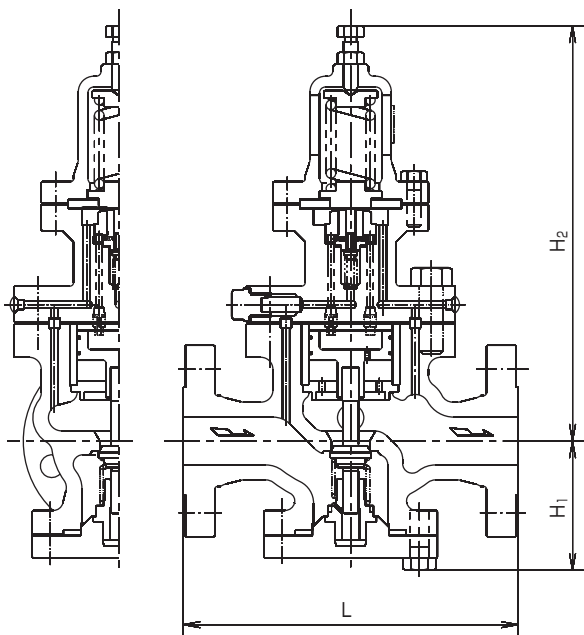
In case of $(P_1 - P_2) \leq \frac{P_1}{2}$	In case of $(P_1 - P_2) \geq \frac{P_1}{2}$	Description
$Cv = \frac{WK}{198 \sqrt{(P_1 - P_2)P_2}}$	$Cv = \frac{WK}{99P_1}$	W : Flow kg/h P <sub>1</sub> : Inlet pressure MPa abs P <sub>2</sub> : Outlet set pressure MPa abs K : 1 + 0.0013 × (superheated steam temp. - saturated steam temp.) °C

Applicable pressure range



# Type PHP30 Pressure Reducing Valves for high pressure and high temperature steam

## Construction



Dimensions and weights

(mm, kg)

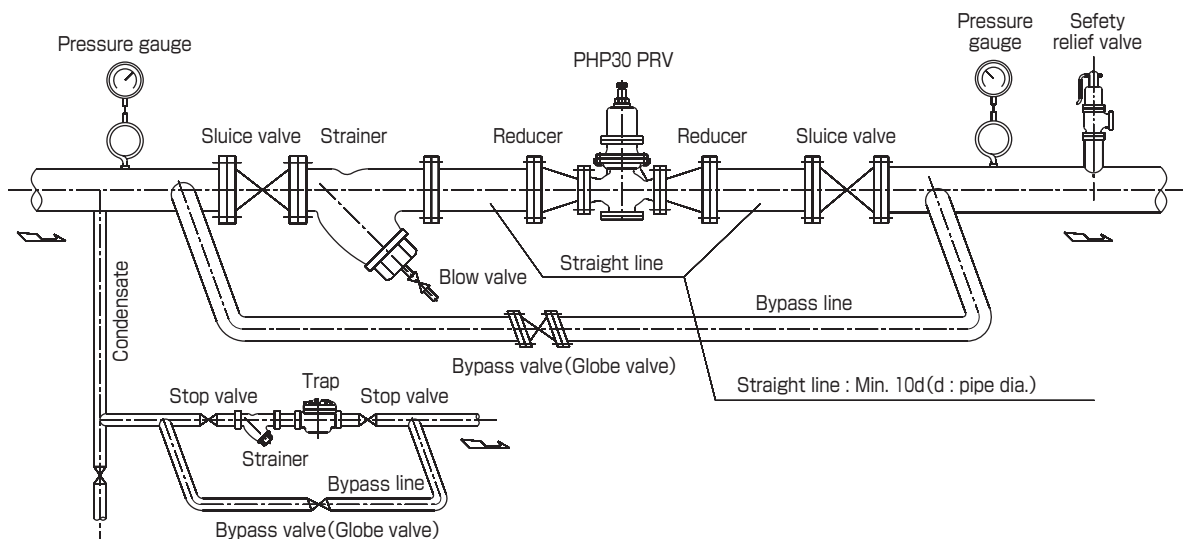
Size	25	40	50	65	80	100
L	JIS30K	260	280	320	360	370
	JIS40K					
H <sub>1</sub>	99	107	120	137	161	192
H <sub>2</sub>	340	348	370	384	417	430
Weight	30	38	46	73	130	150

## Space required for disassembling and maintenance

(mm)

Size	25	40	50	65	80	100
Above the center of pipe line.	430	450	470	490	520	530
Beneath the center of pipe line.	270	290	330	380	430	520

## Installation example



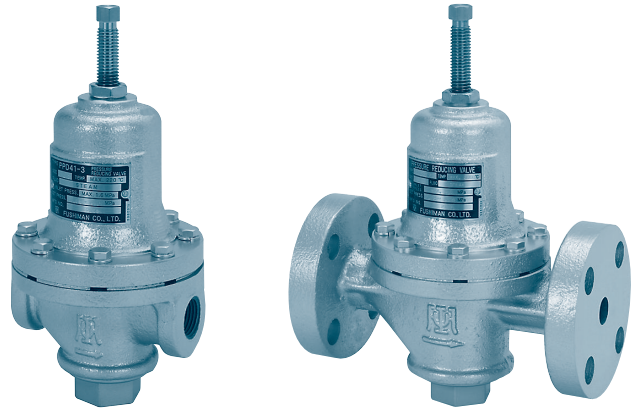
Note : Install upright in horizontal piping.

**Direct acting**

# Type PPD41-3 Pressure Reducing Valves

**For steam**
**1 Pressure Reducing Valves (For steam)**

- Compact design for small flow rate
- Free ball type valve made of wear-resistant material
- Heat-resistant rubber diaphragm performs sharp response to pressure fluctuation



## Specifications

Fluid	Pressure (MPa)		Max. temp. (°C)	Material for main parts					Connection
	Inlet	Outlet set range		Body	Spring case	Valve disc & seat	Bottom cover	Diaphragm	
Steam	0.05-1.6	0.03-0.15 0.1-0.7	Sat-220	Cast iron	Cast iron	Stainless steel	Brass	Heat resistant synthetic rubber	Screwed JIS Rc
	0.05-1.0			Cast iron			Brass		Flanged JIS10KFF
	0.05-1.6			Cast steel			Stainless steel		Flanged JIS20KRF
	0.05-1.0			Stainless cast steel			Stainless steel		Flanged JIS10KFF

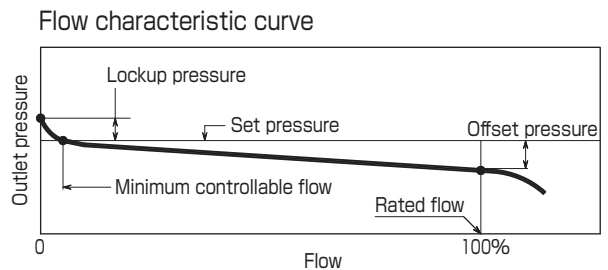
Remarks 1. ASME class 150RF and class 300RF flange of the body made from cast steel are available.  
2. Diaphragm made from stainless steel is available.

## Performance

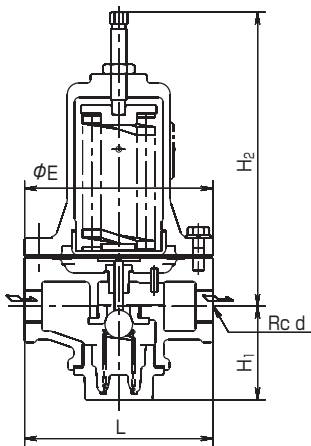
Min. differential pressure	0.02MPa
Offset pressure	10% of max. set range or less
Lockup pressure	0.02MPa or less
Min. controllable flow	0.35kg/h
Seat leakage volume	0.05% of rated flow or less

## Cv values

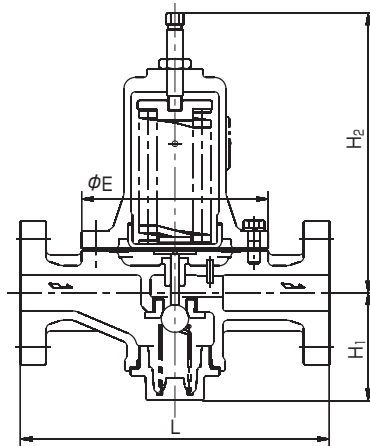
Size	15	20 · 25
Cv	0.4	1



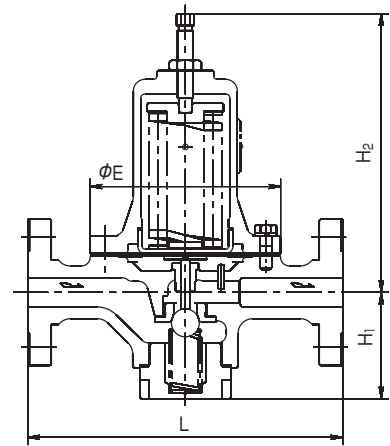
## Construction & Dimensions



Cast iron, Screwed



Cast iron, Flanged



Cast steel, Stainless cast steel, Flanged

# Type PPD41-3 Pressure Reducing Valves

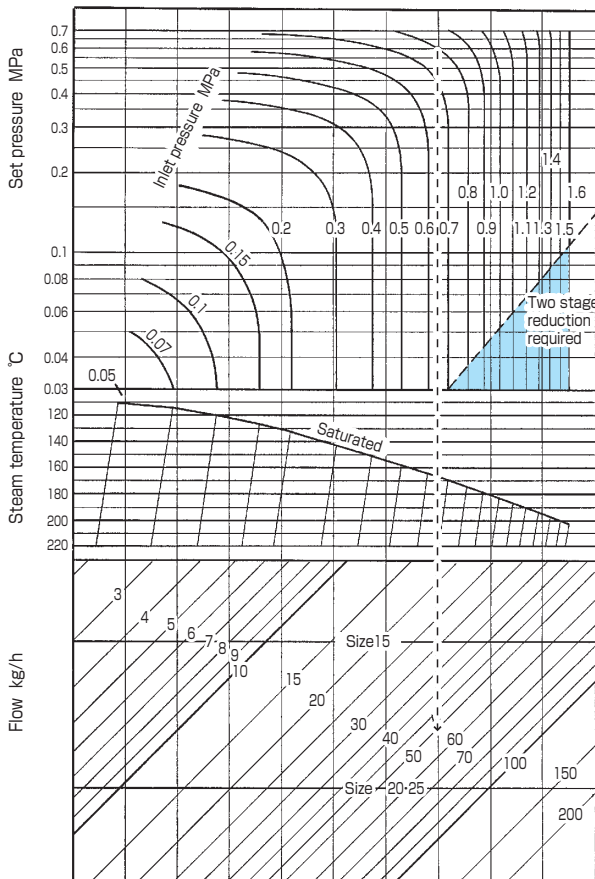
## Dimensions and weights

(mm, kg)

Body	Size	Dimensions					Weight	Connection
		d	L	H <sub>1</sub>	H <sub>2</sub>	E		
Cast iron	15	1/2	95	51	165	100	2.6	Screwed JIS Rc
	20	3/4	130	65	222	130	5.8	
	25	1	130	65	222	130	5.8	
Cast iron	15	—	170	62	162	100	4.7	Flanged JIS10KFF
	20	—	215	75	218	130	8	
	25	—	215	75	218	130	9	
Cast steel	15	—	211	73	213	130	8.3	Flanged JIS20KRF
	20	—	215	73	213	130	8.7	
	25	—	215	73	213	130	9.3	
Stainless cast steel	15	—	207	73	210	130	8.3	Flanged JIS10KFF
	20	—	211	73	210	130	8.7	
	25	—	211	73	210	130	9.3	

## Sizing curve

Use the following chart to select the suitable valve size.



In the event that the inlet pressure or the outlet pressure is not constant but stays within range, select the minimum difference in pressure between the inlet pressure and outlet pressure to choose the correct size.

### Example

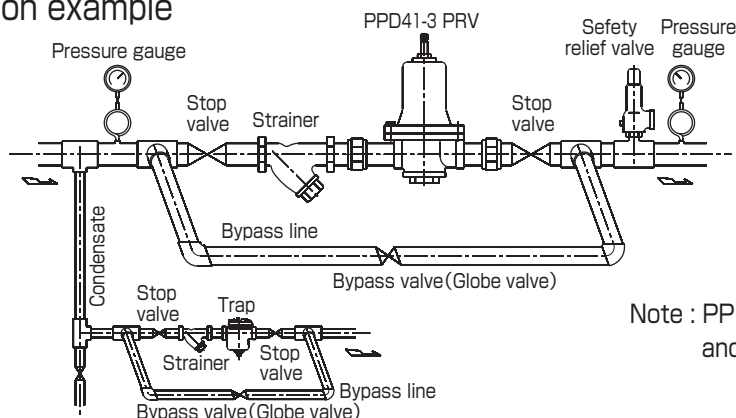
Inlet pressure : 0.8MPa  
 Outlet pressure : 0.6MPa  
 Temperature : Saturated  
 Flow : 50kg/h

Draw a vertical line from the intersection of the inlet pressure line and the outlet pressure line down to the saturated line.

As the fluid temperature is saturated, continue to draw a line downward until it reaches 50kg/h flow line.

As the final intersecting point is between the size 15 line and the size 20,25 line, the required valve size is 20 or 25.

## Installation example



Note : PPD41-3 can be installed in both horizontal and vertical piping.

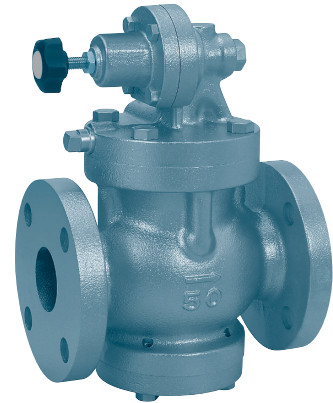


**Pilot  
operated**

# Type B260 Back Pressure Regulating Valves

**For  
steam**

- Compact design for large flow
- For continuous flow
- Large capacity

**2****Back Pressure Regulating Valves (For steam)**

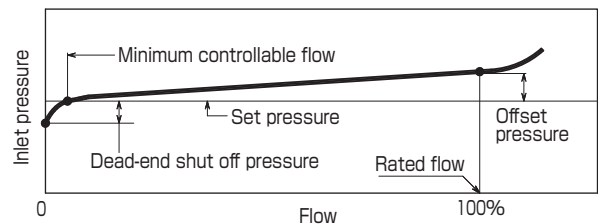
## Specifications

Fluid	Inlet set pressure range (MPa)	Maximum Temp. (°C)	Material for main parts				Connection	
			Body & cover	Main valve disc & seat	Piston & cylinder	Pilot valve disc & seat		Diaphragm
Steam	0.07–0.2 0.1–0.8 0.5–1.0	220	Cast iron <sup>(1)</sup>	Stainless steel	Stainless steel	Stainless steel	Stainless steel	Flanged JIS10KFF

Note <sup>(1)</sup> : Body material for size 15–40 is spheroidal graphite cast iron.  
Remark : Cast steel body and stainless steel body are available on request.

## Performance

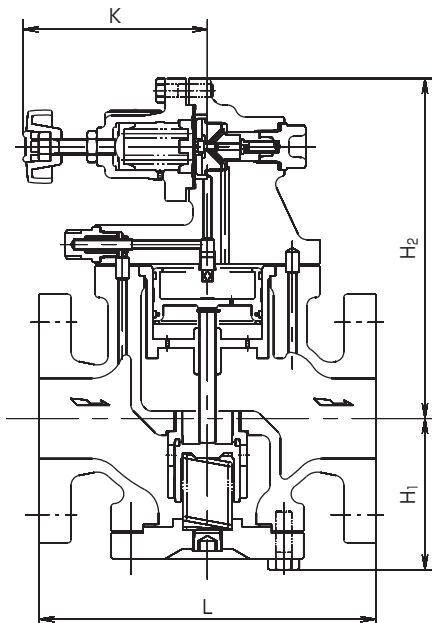
Min. differential pressure		10% of inlet pressure (min.0.07MPa)	
Offset pressure	Set press. range	0.07–0.2, 0.1–0.8	0.03MPa or less
		0.5–1.0	0.05MPa or less
Dead-end shut off pressure	Set press. range	0.07–0.2, 0.1–0.8	0.02MPa or less
		0.5–1.0	0.04MPa or less
Minimum controllable flow		5% of rated flow	
Seat leakage		0.05% of rated flow or less	

**Flow characteristic curve**

## Cv values

Size	15	20	25	32	40	50	65	80
Cv	1.1	2.5	4.5	7	10.1	18	28.1	40.5

## Construction

**Dimensions and weights**

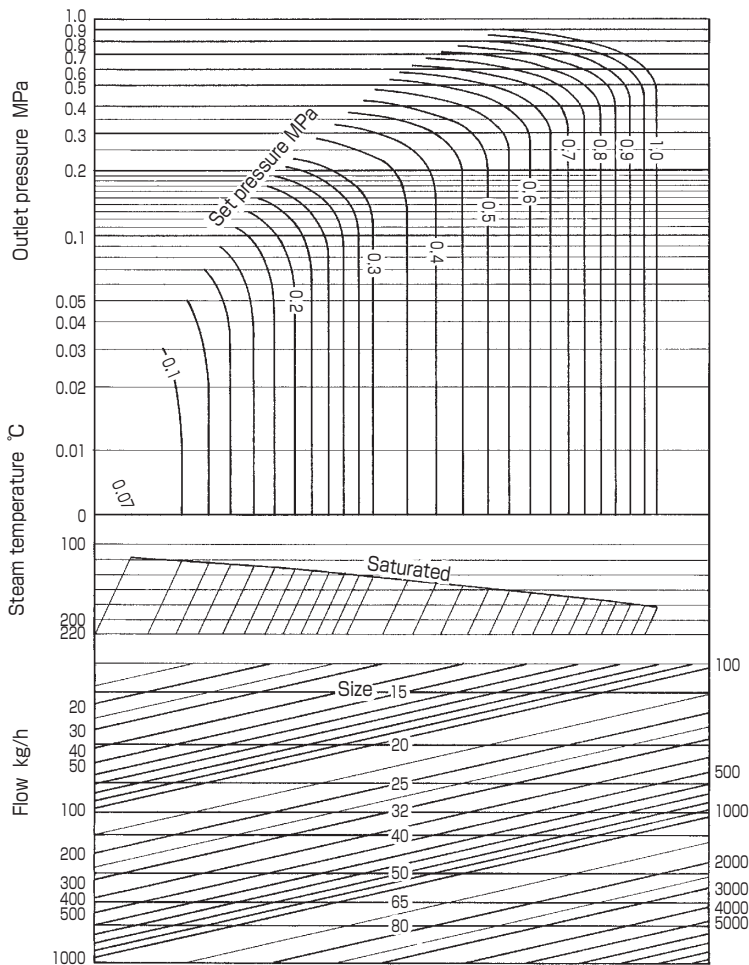
(mm, kg)

Size	L	H <sub>1</sub>	H <sub>2</sub>	K	Weight
15	145	81	171	115	8
20	150	76	176	115	8.5
25	160	73	178	115	10
32	175	77	188	115	12
40	190	85	198	111	14
50	210	95	212	111	18
65	235	111	231	111	26
80	265	123	248	111	32

Remarks 1. K show the dimension under no compression of the adjusting spring  
2. Sizes up to 150mm are available.

# Type B260 Back Pressure Regulating Valves

## Sizing



Use the following chart to select the suitable valve size.

In the event that the inlet pressure or the outlet pressure is not constant but stays within range, select the minimum difference in pressure between the inlet pressure and outlet pressure to choose the correct size.

### Example

Inlet temperature : Saturated steam

Set pressure (inlet) : 0.5MPa

Outlet pressure : 0.25MPa

Flow : 700kg/h

Draw a vertical line downward from the intersecting point of 0.5MPa set pressure line and 0.25MPa outlet pressure line until it reach 700kg/h flow line (oblique).

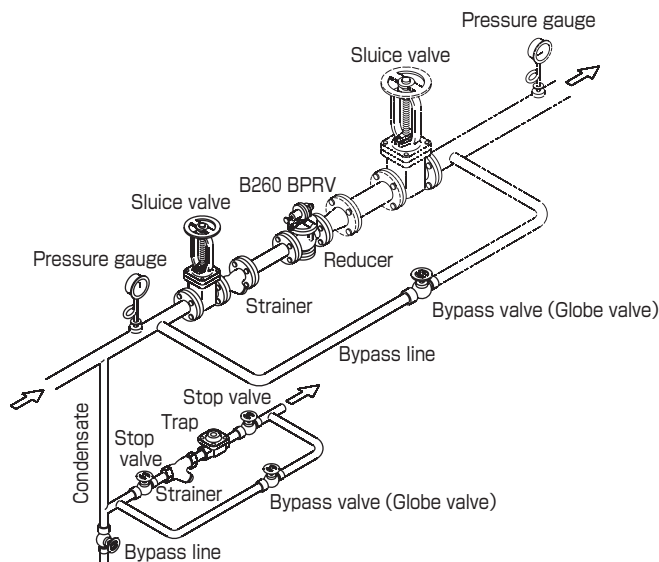
As the final point is between size 40 line and 50 line, the required valve size is 50.

## Space required for disassembling and maintenance

(mm)

Size	15	20	25	32	40	50	65	80
Beneath the center of pipe line	200	200	200	200	220	250	270	300

## Installation example



Note : Install upright in horizontal piping