

Direct acting

# Type PPD41B-2 Pressure Reducing Valves

For gas

- Negligible influence is exerted by inlet pressure change due to the use of a pressure balancing construction.
- A valve disc made of synthetic rubber prevents seat leakage.
- A strainer is provided internally for bronze body valve (1.6MPa) and stainless cast steel body valve (2.0MPa).



1 Pressure Reducing Valves (For gas)

## Specifications

Fluid	Pressure (MPa)		Temp. (°C)	Material for main parts					Connection
	Inlet	Outlet set range		Body	Bottom cover	Spring case	Valve disc	Diaphragm	
Air & non-corrosive gases	0.05   1.6	0.03-0.15 0.1 -0.7	0   80	Bronze	Bronze	Cast iron	Stainless steel & synthetic rubber	Synthetic rubber	JIS Rc Screwed
	0.05   1.0	0.03-0.15 0.1 -0.7		Cast iron	Bronze				Flanged JIS10KFF
	0.05   2.0	0.03-0.15 0.1 -0.7 0.6 -1.6		Cast steel	Stainless steel or bronze				Flanged JIS10KFF or JIS20KRF
	0.05   2.0	0.03-0.15 0.1 -0.7 0.6 -1.6		Stainless cast steel	Stainless cast steel				

Remarks 1. ASME flange is available.  
 2. Non-copper alloy for fluid contact 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 (air) <sup>(1)</sup>	1m <sup>3</sup> /h (normal)
Seat leakage	Nil

Note <sup>(1)</sup> : Except for air, the flowrate should be divided by  $\sqrt{G}$  (G : sp.gr., air : 1).

## Cv values

Size	15	20	25
Cv	1.8	2.6	3.9

Note

Use as the flow rate either the Cv value calculation or the maximum flow rate, depending on which is the smaller rate. Use the smaller value as the rated flow.

Maximum flow rate conforms to the following formula which is based on the velocity 30m/s at valve outlet.

$$\text{Max. flow rate } V_{LM} = K \cdot P_2 \cdot \frac{273}{G(273+t)} \text{ m}^3/\text{h (normal)}$$

$P_2$  : Set pressure MPa abs.

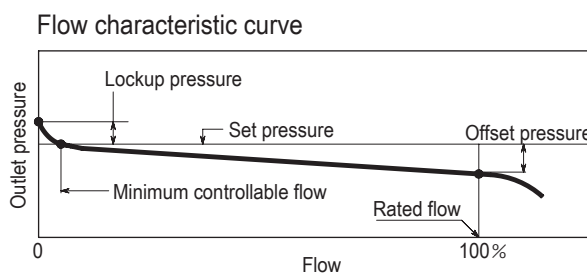
$t$  : Temperature °C

$G$  : Specific gravity (air : 1)

$K$  : 218 for size 15

392 for size 20

641 for size 25



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## Sizing

Use the following chart to select the suitable valve size.

Example Inlet pressure : 1.0MPa Outlet pressure : 0.1MPa Temperature : 20°C  
 Specific gravity : 0.8 Flow : 70m<sup>3</sup>/h (normal)

From the intersection of the 1.0MPa outlet pressure at 20°C temperature line, draw a horizontal line to 1.0 specific gravity line. Continue, in parallel with the oblique line, to the specific gravity 0.8 line.

Draw a horizontal line to the value of 70m<sup>3</sup>/h (normal) line. This point is between valve size 15 and 20 line.

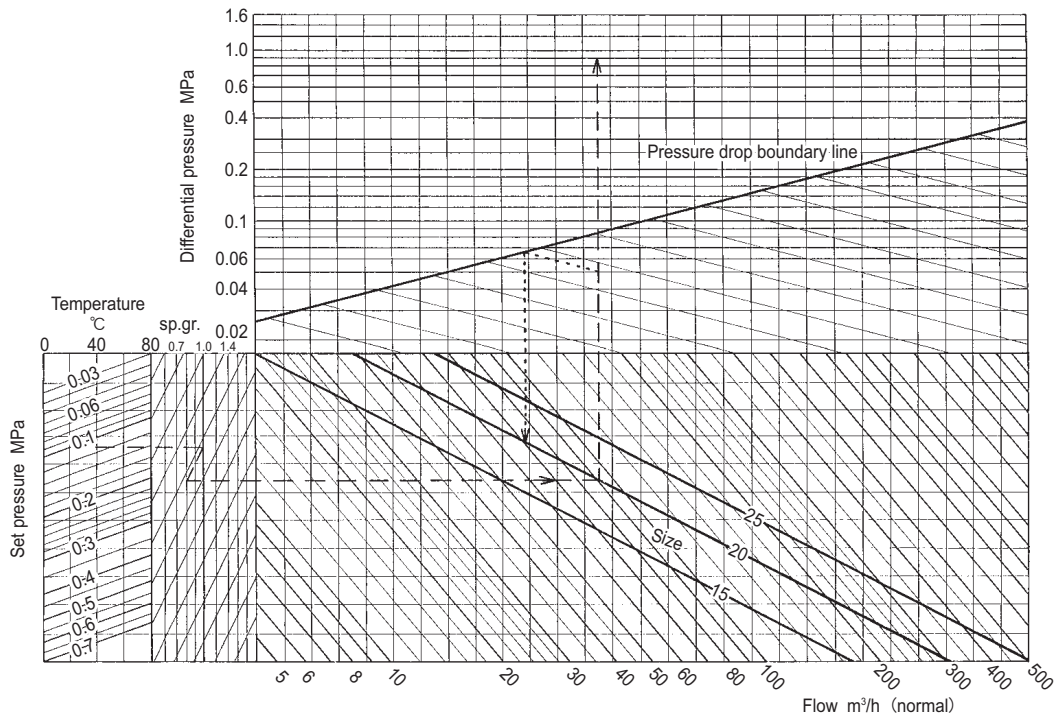
Select the larger size 20 and continue to check the pressure drop between inlet and outlet of the valve as follows.

This is, from the intersection of the valve size 20 line, draw a vertical line to the pressure drop 1.0-0.1=0.9MPa line. As this point is above the pressure drop boundary line, the valve size 20 is correct.

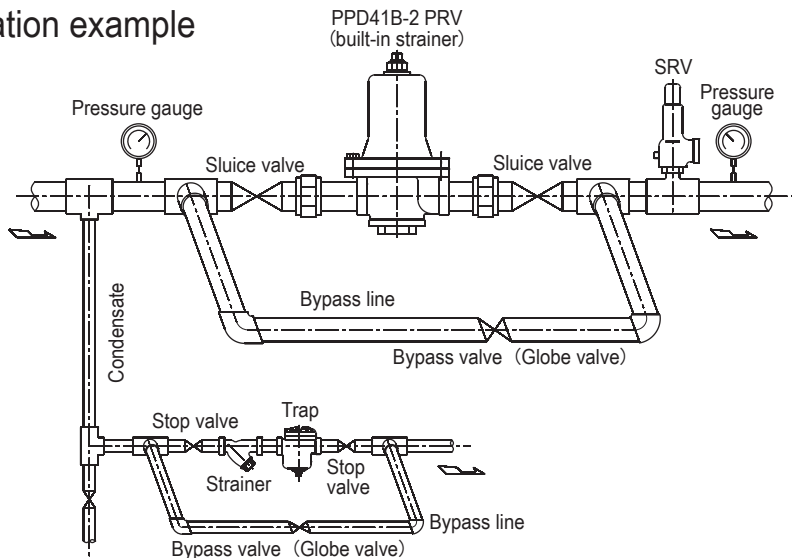
If inlet pressure is 0.15MPa, the intersection of vertical line and the pressure drop 0.15-0.1=0.05MPa line is below the pressure drop boundary line. In this case, draw a line in parallel with the oblique line, from the above point to the pressure drop boundary line. From the intersection, draw a line downward to the valve size 20 line. This intersection shows 71m<sup>3</sup>/h (normal) (which is the maximum flow of the valve size 20).

As 71m<sup>3</sup>/h (normal) is more than the given flow rate 70m<sup>3</sup>/h (normal), the valve size 20 is adequate.

If given flow rate is 80m<sup>3</sup>/h (normal), get the maximum flow of valve size 25, by the same procedure shown above, and make sure that the maximum flow is more than 80m<sup>3</sup>/h (normal). (In this case, the maximum flow of the valve size 25 is 102m<sup>3</sup>/h (normal). So, the valve size 25 is adequate).



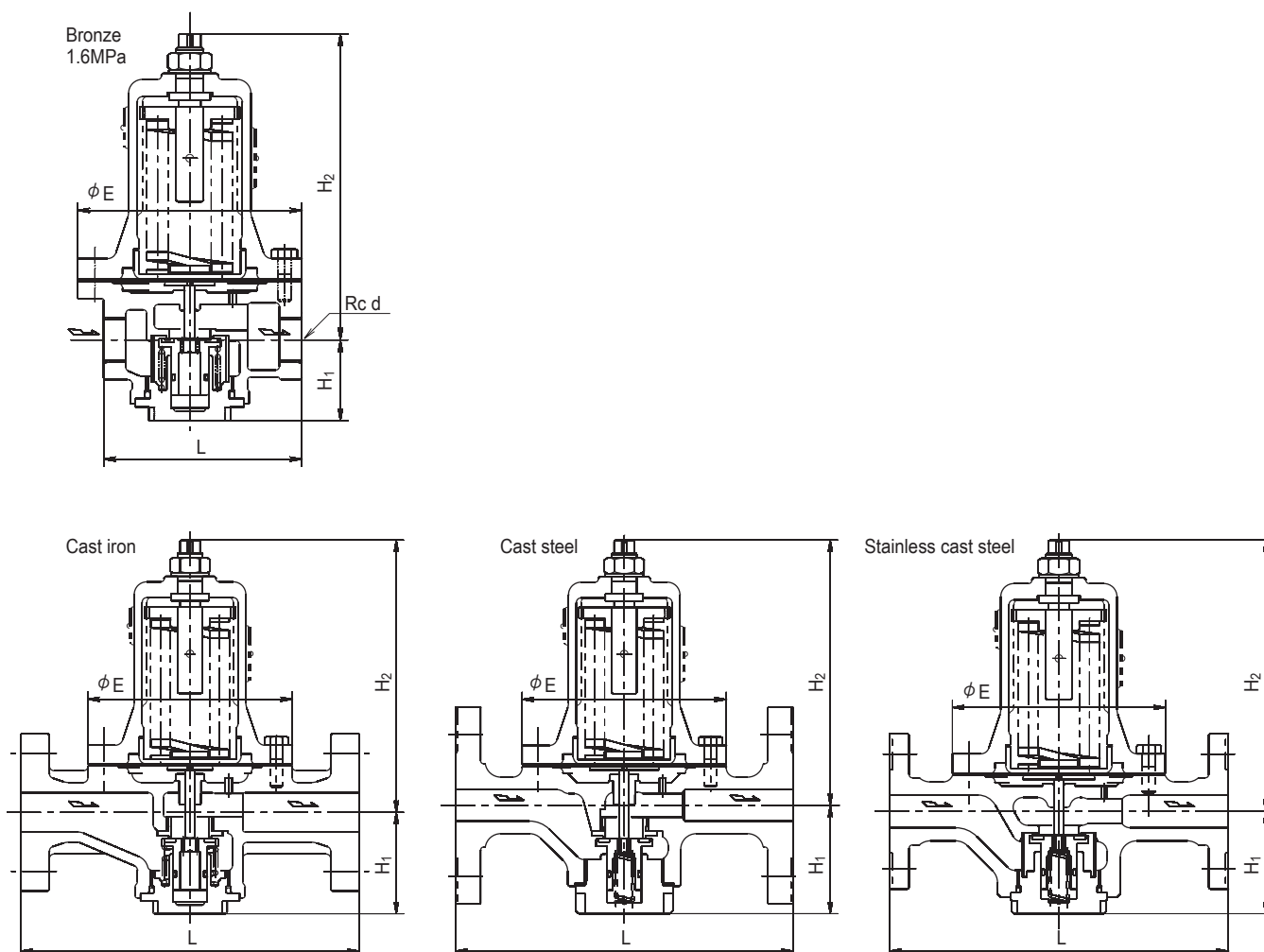
## Installation example



Note : PPD41B-2 can be installed in both horizontal and vertical piping with upright or upside-down.

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## Construction



### Dimensions and weights

(mm, kg)

Material (body)	Size	Dimensions					Weight	Connection
		d	L	H <sub>1</sub>	H <sub>2</sub>	E		
Bronze	15	1/2	85	43	131	100	2.8	Screwed JIS Rc 1.6MPa
	20	3/4	115	47	178	130	5.5	
	25	1	115	47	178	130	5.5	
Cast iron	15	—	170	54	124	100	4.6	Flanged JIS10KFF
	20	—	215	65	173	130	7.9	
	25	—	215	65	173	130	8.9	
Cast steel <sup>(1)</sup>	15	—	211	69	169	130	8.3	Flanged JIS20KRF
	20	—	215	69	169	130	8.7	
	25	—	215	69	169	130	9.3	
Stainless cast steel <sup>(1)</sup>	15	—	211	63	166	130	8.3	Flanged JIS20KRF
	20	—	215	63	166	130	8.7	
	25	—	215	63	166	130	9.3	

Note <sup>(1)</sup> : Dimension of L for JIS 10KFF is different from this table.