

Pilot operated

Type PFD42 Pressure Reducing Valves

For liquid

- Versatile for many applications
- Large capacity for its size.
- Small offset
- Wide variety of accessories



1 Pressure Reducing Valves (For liquid)

Specifications

Fluid	Pressure (MPa)		Temp. (°C)	Material for main valve			Material for pilot valve			Connection
	Inlet	Outlet set range		Body & cover	Valve disc & diaphragm	Valve seat	Body	Spring case	Valve disc	
Water, light oil & non-corrosive liquid	0.055-1.0	0.015-0.07	0 1 80	Cast iron (1)	Synthetic rubber	Bronze	Bronze	Cast iron	Bronze or stainless steel (Synthetic rubber printed)	Flanged JIS10KFF
	0.055-1.6	0.05-0.3 0.2-0.8 0.7-1.4								Flanged JIS16KFF
	0.055-2.0	1.2-1.96		Cast steel						Flanged JIS20KRF

Note (1): For water lower than 60°C, rust-proof paint is applied for water contact surface.
 Remark: Bronze body and stainless cast steel body are available on request.

Performance

Max. pressure reducing ratio	10:1
Max. differential pressure	1.5MPa
Min. differential pressure	0.04MPa
Offset pressure	10% of set pressure (min. 0.04MPa) or less
Usable max. viscosity fluid	Light oil 20mm ² /s or less

Flow characteristic curve



Lockup pressure (MPa)

Outlet pressure set range	Lockup pressure
0.015-0.07	0.01-0.03
0.05-0.3	0.02-0.05
0.2-0.8	0.04-0.08
0.7-1.4	0.06-0.1
1.2-1.96	0.08-0.12

Min. controllable flow (l/min)

Size	40	50	65	80	100	125	150	200	250	300
Min. controllable flow rate (water) (2)	10	10	10	10	75	100	135	200	335	500

Note (2): Except for water, the flow rate should be divided by $\sqrt{\gamma}$ (γ : sp.gr., water (4°C): 1).

Cv values

Size	40	50	65	80	100	125	150	200	250	300
Cv	22.5	40	62.5	90	160	250	360	640	1000	1440
Max. flow rate (water) Q /min (3)	533	800	1300	2000	3000	5000	7700	12000	17000	24000

Note (3): Except for water, the flow rate should be divided by $\sqrt{\gamma}$ (γ : sp.gr., water (4°C): 1).

The flow rate is calculated by following formula

$$Q = Cv \frac{\sqrt{\Delta P}}{0.022\sqrt{\gamma}}$$

Where Q: Flow rate (l/min)

ΔP : Differential pressure (MPa)

The rated flow shall be smaller between Cv calculation and maximum flow rate which is based on 5.6-7m/s.

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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

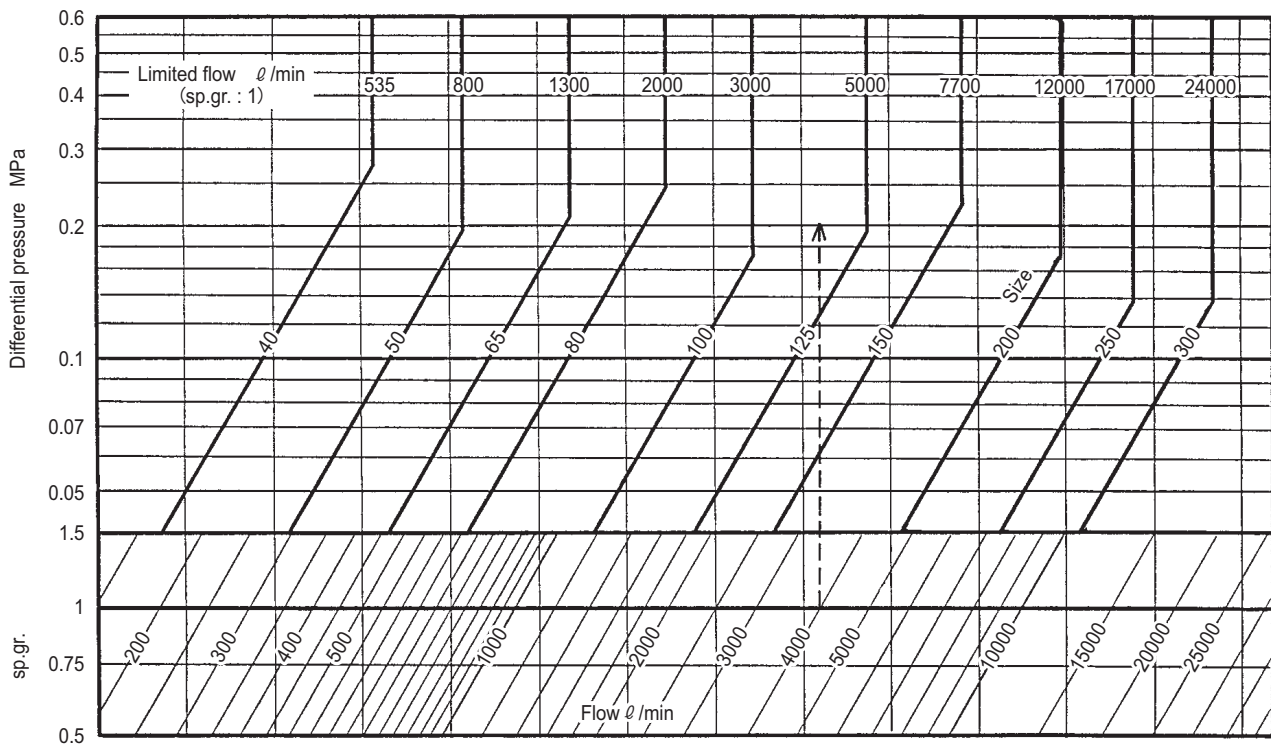
Fluid : Water Specific gravity : 1 Inlet pressure : 0.4MPa Outlet pressure : 0.2MPa Flow : 4000 ℓ /min

Differential pressure : $0.7 - 0.2 = 0.5$ MPa

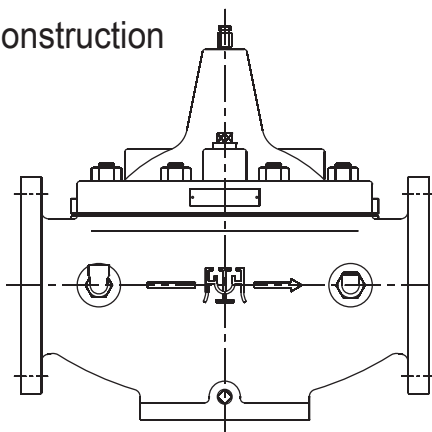
From intersecting point of 1 specific gravity line and 4000 ℓ /min flow line, draw a vertical line upward to differential pressure 0.2MPa line.

The final intersecting point is between size 100 line and size 125 line.

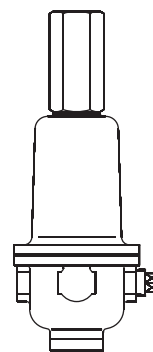
The required valve size is 125.



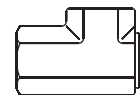
Construction



Type OD3 main valve

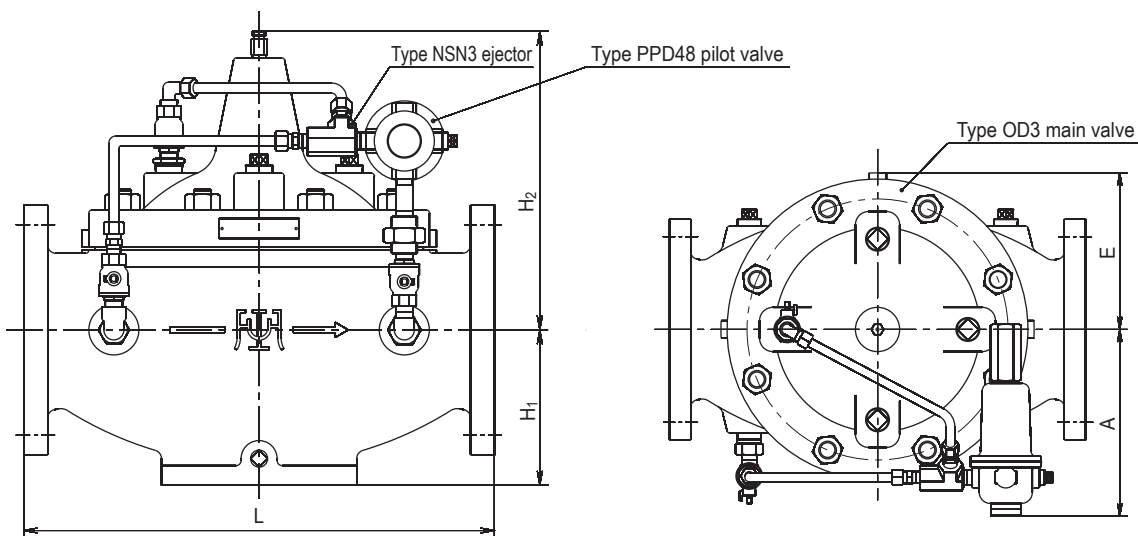


Type PPD48 pilot valve



Type NSN3 ejector

Type PFD42 Pressure Reducing Valves



Dimensions and weights

(mm, kg)

Material/Connection	Symbol	Size	Size									
			40	50	65	80	100	125	150	200	250	300
Cast iron JIS10K	L		220	260	290	330	390	470	530	670	800	900
	H ₁		75	90	97	110	125	155	175	220	275	333
	H ₂		247	268	268	268	268	298	332	424	538	640
	A		130	142	153	163	193	214	231	270	320	375
	E		87	93	105	125	147	177	207	265	320	375
	Weight		16	20	32	39	62	94	138	240	420	695
Cast iron	JIS16K	L	220	260	290	334	394	474	534	678	808	908
Cast steel	JIS20K	L	216	260	286	330	390	480	536	684	816	916

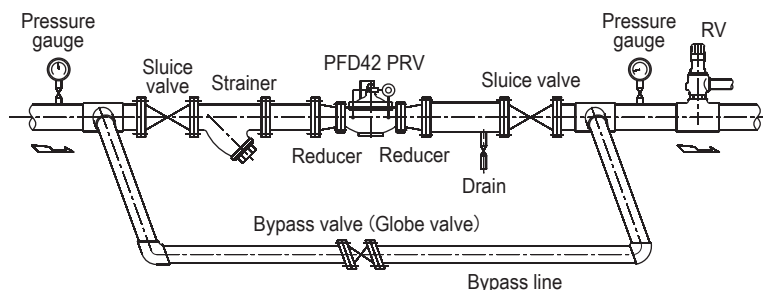
Space required for disassembling and maintenance (mm)

Size	40	50	65	80	100	125	150	200	250	300
Above the center of pipe line.	380	390	430	470	480	490	520	650	870	1040

Typical PFD42 combination

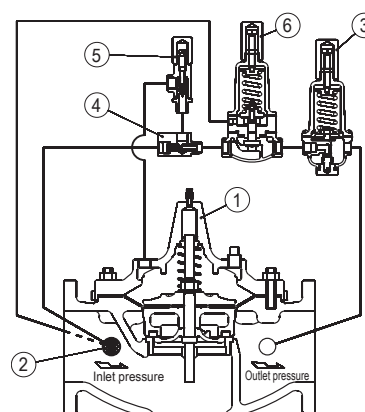
Type PFD42S P.R.V.
(pressure reducing valve + sustaining valve)

Installation example



- Note
1. Install upright in horizontal piping.
 2. It is recommended that straight pipe lines of at least following table in length are provided in front of and behind the PFD42.

	(mm)				
Size	40	50-100	125-150	200-250	300
Length	600	900	1200	1600	2000



Type PFD42S P.R.V.

Control the outlet pressure to be constant and also sustain inlet pressure at the desired pressure level.

Composition

① Main valve (OD3 diaphragm basic valve)	③ Pilot valve (PPD48 pressure reducing valve)	⑤ QRH5 flow control valve
② FL14 strainer	④ NSN3 ejector	⑥ Pilot valve (RPS2-2 Back pressure regulating valve)

Remark : QRH5 flow control valve is not used for sizes over 100.