

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 80 | Cast iron ⁽¹⁾ | Synthetic rubber | Bronze | Bronze | Cast iron | Bronze or stainless steel | Flanged JIS10KFF |
| | 0.055—1.6 | 0.05—0.3 0.2—0.8 | | | | | | | Synthetic rubber printed) | Flanged JIS16KFF |
| | 0.055—2.0 | 0.7—1.4 1.2—1.96 | | Cast steel | | | | | | Flanged JIS20KRF |

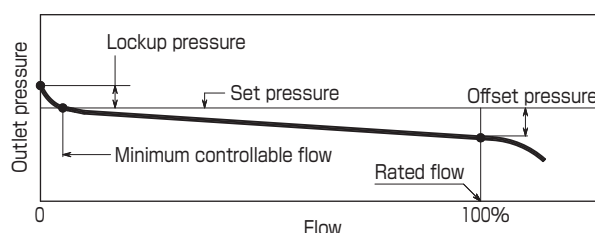
Note ⁽¹⁾ : Rust-proof paint is applied for water contact surface.

Remark : Stainless cast steel body is available on request. Cast iron body coated with nylon (60°C or less) is available on request.

Performance

| | |
|-----------------------------|--------------------------------------------|
| Max. pressure range ability | 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 |
| Seat leakage | 0.01% of rated flow 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 (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) ℓ/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

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

Where Q : Flow rate (ℓ/min)

ΔP : Differential pressure (MPa)

The rated flow shall be smaller between Cv calculation and maximum flow rate (above table) which is based on the velocity 5.6—7m/s at the piping.

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Pressure Reducing Valves (For liquid)

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

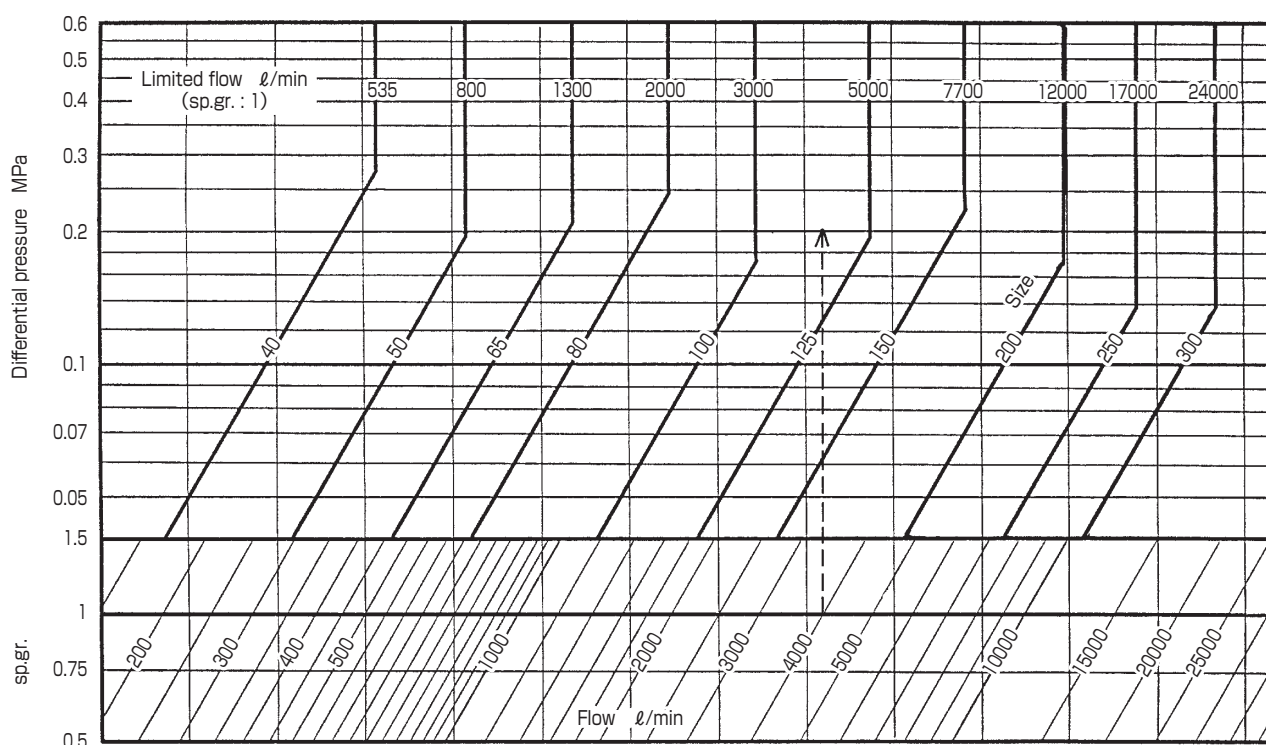
Fluid : Water Specific gravity : 1 Inlet pressure : 0.4MPa Outlet pressure : 0.2MPa Flow : 4000 ℓ /min

Differential pressure : $0.4 - 0.2 = 0.2\text{MPa}$

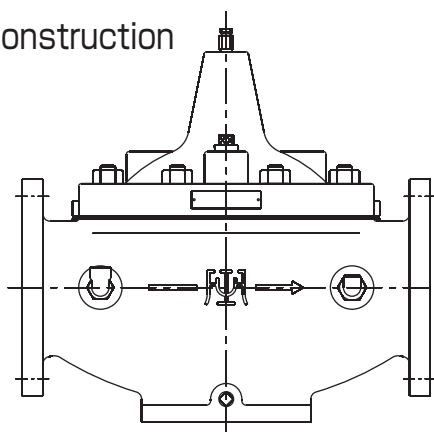
From intersecting point of 1 specific gravity line and 4000 ℓ /min flow line, draw a vertical line upward to differential pressure 0.2MPa line.

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

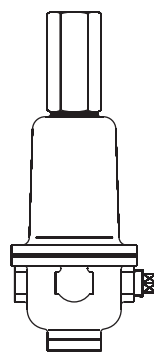
The required valve size is 125.



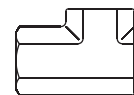
Construction



Type OD3 main valve

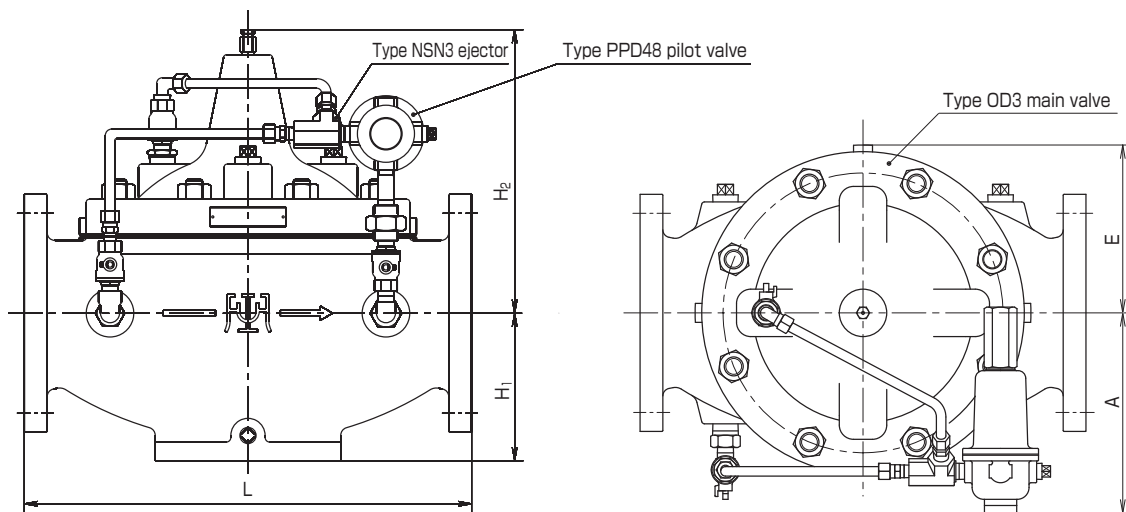


Type PPD48 pilot valve



Type NSN3 ejector

Type PFD42 Pressure Reducing Valves



Dimensions and weights

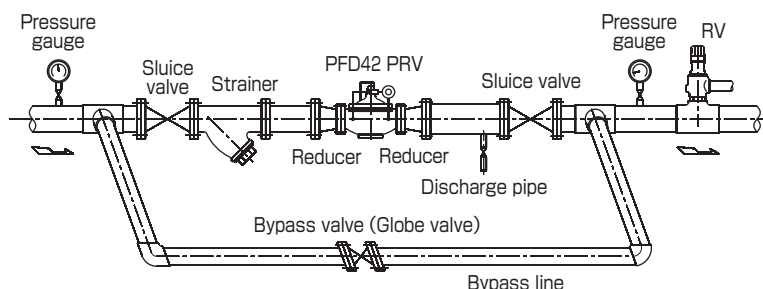
(mm, kg)

| Material/Connection | | Size | 40 | 50 | 65 | 80 | 100 | 125 | 150 | 200 | 250 | 300 |
|---------------------|--------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Symbol | | | | | | | | | | |
| 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 |

Installation example

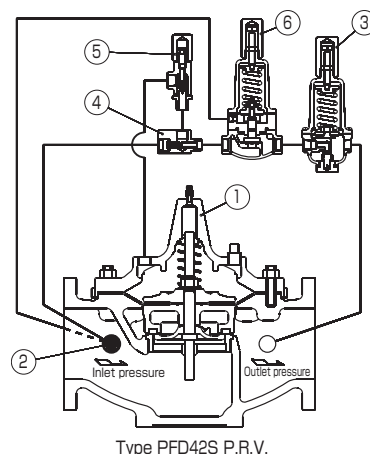


- Note
1. Vertical and horizontal installation are possible. But avoid installation in horizontal with upside-down or sideways absolutely.
 2. It is recommended that straight pipe lines of at least following table in length are provided in front of and behind the PFD42.

| Size | 40 | 50—100 | 125 · 150 | 200 · 250 | 300 |
|--------|-----|--------|-----------|-----------|------|
| Length | 600 | 900 | 1200 | 1600 | 2000 |

Typical PFD42 combination

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



It controls the outlet pressure to be constant and also sustains the inlet pressure so as not to be below 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 (RPD52-2 Back pressure regulating valve) |

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