

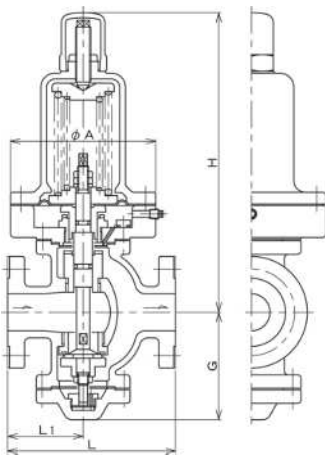
RD-16 Type Pressure Reducing Valve (for Water or Liquids)

Pressure reducing valve with diaphragm at pressure sensing part. Ideal for high-pressure liquids and for installation at places where there is large differential pressure before and after the valve.

With a pressure balancing structure, the valve ensures only tiny change of secondary pressure when primary pressure changes.



CONSTRUCTION



Depending on nominal diameter, the structure of the valve may be different from what is shown in the drawing.

SPECIFICATIONS

Model name	RD-16	
Code name	RD16-CL	RD16-CH
Applicable fluid	Water & liquids	
Fluid temperature	5~80°C	
Fluid viscosity	Max. 700cSt	
Applicable primary pressure	Max. 2.7MPa	
Adjustable secondary pressure	0.05~0.35MPa	0.3~0.7MPa
	Refer to the applicable pressure selection chart below.	
Minimum pressure differential across the disc	0.05MPa	
Lock up pressure	Max. 0.035MPa	
Offset pressure	Within 0.07MPa	Within 0.1MPa
Leakage allowance	Nil (Confirm at pressure gauge)	
End connection	Flanged JIS 10,16,20,30KRF	
Materials	Body(Cast steel), Seat(Stainless steel) Diaphragm & disc(Synthetic rubber), Spring case(Cast iron)	
Valve body pressure test	1.5 times of flange rated pressure. (Hydraulic)	

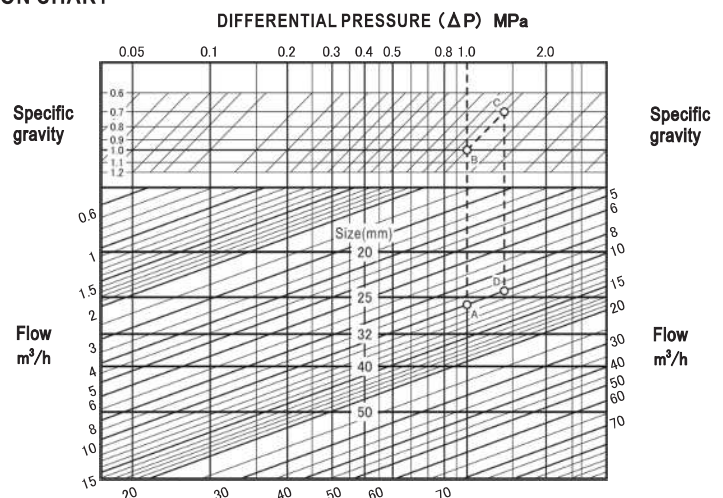
DIMENSIONS

(mm)

Size	L	L ₁	G	H	A	Cv value	Mass(kg)
20(¾")	186	88	110	365	174	2	23
25(1")	190	90	110	365	174	3.5	24
32(1¼")	220	110	115	445	218	5.5	36
40(1½")	220	110	115	445	218	8	37
50(2")	250	115	165	485	218	14	47

Flange code JIS 30KRF

SIZE SELECTION CHART



HOW TO USE THE CHART

Example: Find out the nominal diameter meeting the following conditions:

Primary pressure: 1.5MPa

Secondary pressure: 0.5MPa

Specific gravity: 1 (water)

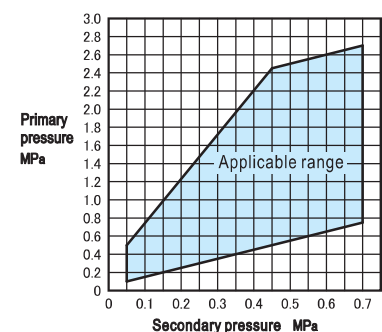
Flow: 10m³/h.

Differential pressure(ΔP): 1.5-0.5=1.0MPa

Find out the intersection point A between the 1.0MPa differential pressure (ΔP) line and the 10m³/h flow line. Since point A is between the lines representing nominal diameter size 25mm and 32mm, the nominal diameter should be the larger one, i.e. 32mm.

In the case that other conditions remain the same but the specific gravity is 0.7, find out the intersection point B between the 1.0MPa differential pressure (ΔP) line and the 1.0 specific gravity line. Move from point B on the 0.7 specific gravity line parallelly to reach point C. Now draw a vertical line from point C until it intersects with the 10m³/h flow line. The intersection point is named D. Since point D is located between the lines representing nominal diameter size 20mm and 25mm, the nominal diameter should be the larger one, i.e. 25mm.

APPLICABLE PRESSURE SELECTION CHART



In the case pressure is not within the applicable range of pressure, perform 2-stage pressure reduction or use other type of valve.

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PIPING EXAMPLE

Fig 1. With bypass line

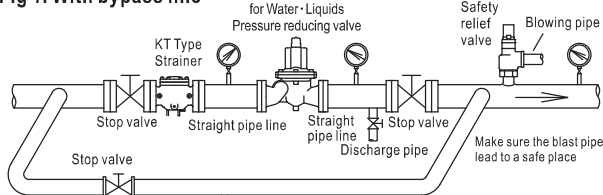


Fig 3. Screwed type connection with bypass line

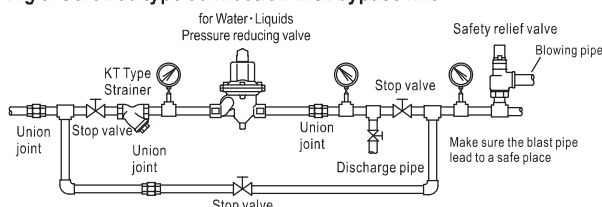
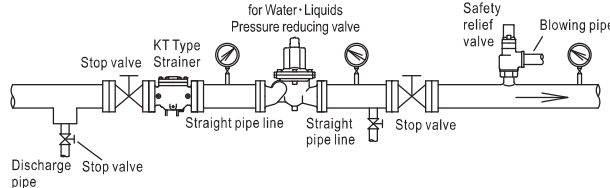


Fig 2. Without bypass line



Note: See Fig.2 for piping with screw type end connection and without bypass pipe.

POINTS FOR INSTALLATION

○ Installation of pressure reducing valve and piping

- If not otherwise specified, the pressure reducing valve should be vertical to horizontal pipe.
Install safety valve or safety relief valve at secondary side.
 - ※ 1. In the case of failure of pressure reducing valve, expansion of fluid due to rise of ambient temperature, or water hammer, the secondary pressure may rise and equipment may be damaged.
 - ※ 2. See Tab.1 for set pressure of safety valve or safety relief valve.
 - ※ 3. In the case safety valve or safety relief valve is used as an alarm, its nominal diameter should be big enough to allow discharge of 10% maximum flow of pressure reducing valve, which is about the leakage of pressure reducing valve. In very few cases, nominal diameter is selected by discharging amount of maximum flow for pressure reducing valve. (reference value: see Table 2 and Table 3)

■ TABLE2. FLOW FOR SAFETY VALVE (Water)

SL-37~40 Type

(kg/h)

Set pressure (MPa)	Size					
	15(1/2")	20(3/4")	25(1")	32(1 1/4")	40(1 1/2")	50(2")
0.05	375	640	930	1720	2690	4380
0.1	531	905	1310	2430	3810	6200
0.2	742	1260	1830	3400	5320	8650
0.3	875	1490	2160	4010	6280	10200
0.4	976	1660	2410	4480	7000	11300
0.5	1070	1820	2650	4910	7690	12400
0.6	1150	1970	2860	5310	8310	13500
0.7	1230	2110	3060	5680	8890	14400
0.8	1310	2240	3250	6030	9440	15300
0.9	1380	2360	3430	6360	9950	16100
1.0	1450	2470	3600	6680	10400	16900

■ TABLE1. SET PRESSURE FOR SAFETY RELIEF VALVE

(MPa)

Set pressure of pressure reducing valve	Set pressure of safety valve ^{※1}
0.1 or less	+0.05 (+0.08)
over 0.1 and less than 0.4	+0.08 (+0.14)
0.4 or more and less than 0.6	+0.12 (+0.2)
0.6 or more and less than 0.8	+0.15 (+0.28)
0.8 or more and less than 1.0	+0.19
1.0 or more and 1.2 or less	+0.23

Add above value to set pressure of pressure reducing valve.

※ 1. The above value is added to the set pressure of pressure-reducing valve.

※ 2. The values in parentheses are applicable to soft-seated safety relief valve (SL-37V~40FV, 43V, 44V Type).

■ TABLE3. FLOW FOR SAFETY VALVE (Air)

SL-37~40 Type

(kg/h)

Set pressure (MPa)	Size					
	15(1/2")	20(3/4")	25(1")	32(1 1/4")	40(1 1/2")	50(2")
0.05	21.7	37	53.8	99.8	156	253
0.1	28.3	48.3	70.2	130	203	331
0.2	41.2	70.2	102	189	296	481
0.3	55.3	94.3	137	254	397	645
0.4	69.5	118	171	318	498	810
0.5	83.6	142	206	383	600	975
0.6	97.7	166	241	448	701	1140
0.7	111	190	276	513	803	1300
0.8	126	214	311	578	904	1470
0.9	140	238	346	643	1000	1630
1.0	154	262	381	708	1100	1790

- Install strainer at the primary side of pressure reducing valve.
 - For devices that cannot be stopped, install bypass piping (with stop valve) from the primary side to the secondary side of pressure reducing valve (see Fig.1).
If bypass piping is not suitable, then install stop valve for blowing which is derived from the main pipe before the primary side of pressure reducing valve, so as to make flushing possible(see Fig.2).
 - Install straight piping, stop valve, and pressure gauge before and after pressure reducing valve.
In case of screwed type end connections, use union joint for easy maintenance and repair.(see Fig. 3).
 - In the case a solenoid valve (ON/OFF operation) is installed at the secondary side of pressure reducing valve, the solenoid valve should be 1~2m away from pressure reducing valve.
- There should also be a 1~2m distance between pressure reducing valves in the case of 2-step pressure reduction. (See Fig.4, Fig.5)

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Fig.4 Solenoid valve (on/off operation) installation

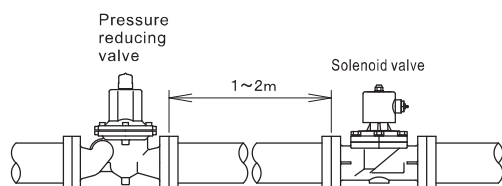
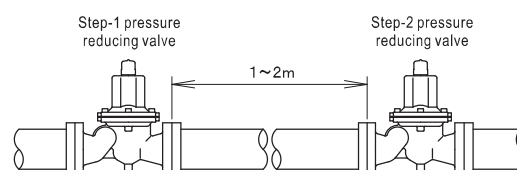


Fig.5 2-Step pressure reduction



7. In water supply system with roof tank in tall/medium height buildings, water hammer may occur if one step or 2 more steps of pressure reducing valves are installed. In such case, install a water hammer preventing device at the primary side of pressure reducing valve. (See Fig.6)
8. Leave some space for disassembling and maintenance.
9. Apply appropriate support to pressure reducing valve to protect from the weight of piping itself, bending force, or vibration.
10. If it is possibility of freezing, perform thermal insulation or discharge the drain.
11. In the case of buried piping, install pressure reducing valve in pit (box).

The pit should have drainage system to prevent accumulation of rain etc., and thermo-insulation or drainage may be necessary if there is possibility of freezing. (See Fig. 7)

Fig.6 Roof tank in tall/medium height building

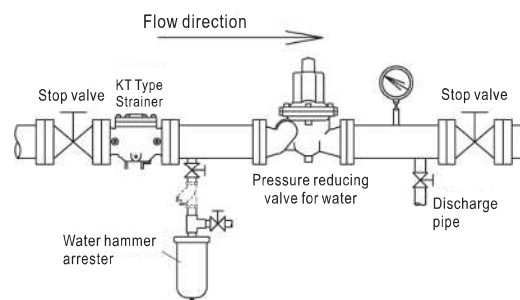
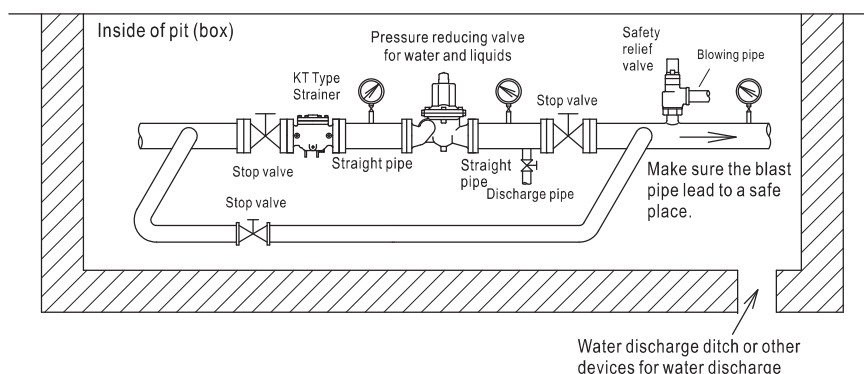


Fig.7 BURIED PIPING



12. In most cases, the secondary pressure is not adjusted when product is delivered. Therefore, adjust the secondary pressure to a desired pressure.
 - ※ The secondary pressure of a non-adjusted valve is near to zero. To adjust the secondary pressure, follow the following steps.
 - ※ How to adjust the secondary pressure:
 - ① Close the stop valves at primary and secondary sides.
 - ② Open the blowing stop valve or stop valve in bypass and remove any content inside. Such operation is called flushing and should be carried out sufficiently by spending sufficient time on it. Take care not to make the secondary pressure rise excessively.
 - ③ Close the blowing stop valve or stop valve of bypass pipe.
 - ④ Make sure there is not any spring load caused by adjusting screw.
 - ⑤ Open the stop valve at primary side gradually.
 - ⑥ Make sure you have adjusted the secondary pressure. Open the stop valve at the secondary side slightly to allow small flow.
 - ⑦ Use the adjusting screw and apply a tiny spring load. Open the secondary stop valve gradually once fluid starts to flow.
 - ⑧ Read the pressure gauge and apply more spring load to make the pressure reach the set pressure. The secondary pressure rises if you turn the adjusting screw clockwise, and the pressure drops if you turn the screw counterclockwise.
 - ⑨ Once the desired pressure is reached, use the lock nut to lock the adjusting screw. After the screw is locked, the spring load will not change.

Fig.8 A TYPICAL ADJUSTING METHOD

