WVR-02 Type Series Pressure Reducing Valve (for Water)

for Builiing facilities Industrial facilities, etc.,Multipurpose Pilot Type(High capacity)

Large capacity pressure reducing valve for water supply line of air conditioning, sanitary accommodations, fire extinguishing and farm irrigating equipments. Pilot-operated valve has pressure balancing structure, thus can regulate secondary pressure without being influenced by the change of primary pressure.

FEATURES

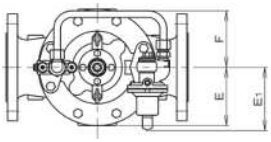
- Sensitive needle valve opening adjustment according to state of use, allow easy and reliable operation.
- The base and pilot-operated part can be dissembled easily, thus make it easy to adjust, repair or replace parts.
- Lift limiting device limits overflow.

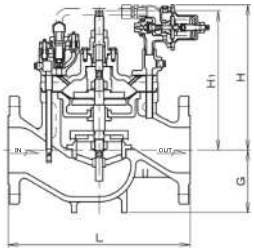
SPECIFICATIONS

Type		Standard		Nylon coating	
Model name		WVR-02		WVR-02CN	
Code name		WVR02-B☐	WVR02-L☐	WVR02CN-B☐	WVR02CN-L☐
		※L (low press.) or H (high press.) for adjustable secondary pressure is required in ☐.			
Size		50~400(2″~16″)	40~200(1½″~8″)	80~200(3″~8″)	
Applicable fluid		Water & hot water			
Fluid temperature		5~60℃			
Applicable primary pressure		Max. 1.0MPa*1.			
Adjustable secondary pressure		Size 40~200mm L:0.05~0.35, H:0.3~0.95MPa Size 250~400mm L:0.05~0.35, H:0.3~0.7MPa			
Maximum reducing rate		10:1			
Minimum pressure differential across the disc		0.05MPa			
Offset pressure		Adjustable secondary pressure 0.05~0.35MPa:Within 0.08MPa*1. Adjustable secondary pressure 0.3~0.95(0.7)MPa:Within 0.1MPa*1.			
End connection		Flanged JIS 10KRF*1.			
Materials	Body	Cast iron	Ductile cast iron	Cast iron	Ductile cast iron
	Trim	Diaphragm & disc(Synthetic rubber), Seat ring(Cast bronze)			
Painting or coating for Body		Interior:Epoxy resin		Nylon 11 coating	
Valve body pressure test		Hydraulic 1.75MPa			
Installation		In vertical and horizontal pipe line However, 250mm and bigger are allowed to install in horizontal pipe line erect position			

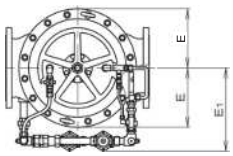
*1. Size 200mm and smaller with Flanged JIS 16K are available upon your request.
(Offset pressure with Flanged JIS 16KRF, Adjustable secondary pressure for 0.05~0.35MPa is below 0.09MPa, for 0.3~1.0MPa is below 0.14MPa)
*2. The valve with 2 pressure gauges is also available upon your request.
*3. Refer to Page 51 of value size selection chart for WV Types.

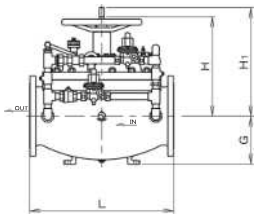
CONSTRUCTION





Size 40~200mm





Size 250~400mm

DIMENSIONS (Body materials: Cast iron)

(mm)

Size	L		G	H	H_1	E	E_1	F	Cv value	Mass(kg)
	JIS 10K	JIS 16K								
40(1½″)	260	260	80	285	230	93	136	115	18	21.5
50(2″)	270	270	85	285	230	93	136	115	32	24.5
65(2½″)	340	340	100	298	261	117	136	145	38	43
80(3″)	350	354	110	298	261	117	136	145	54	43
100(4″)	400	404	130	324	300	130	136	145	96	60
125(5″)	440	444	140	354	371	145	136	145	150	70
150(6″)	500	504	165	387	416	173	136	145	216	125
200(8″)	600	608	200	438	522	218	136	145	384	200
250(10″)	720	—	240	490	560	295	420	—	600	470
300(12″)	820	—	280	540	620	328	430	—	864	524
400(16″)	1040	—	370	690	800	440	520	—	1536	1400

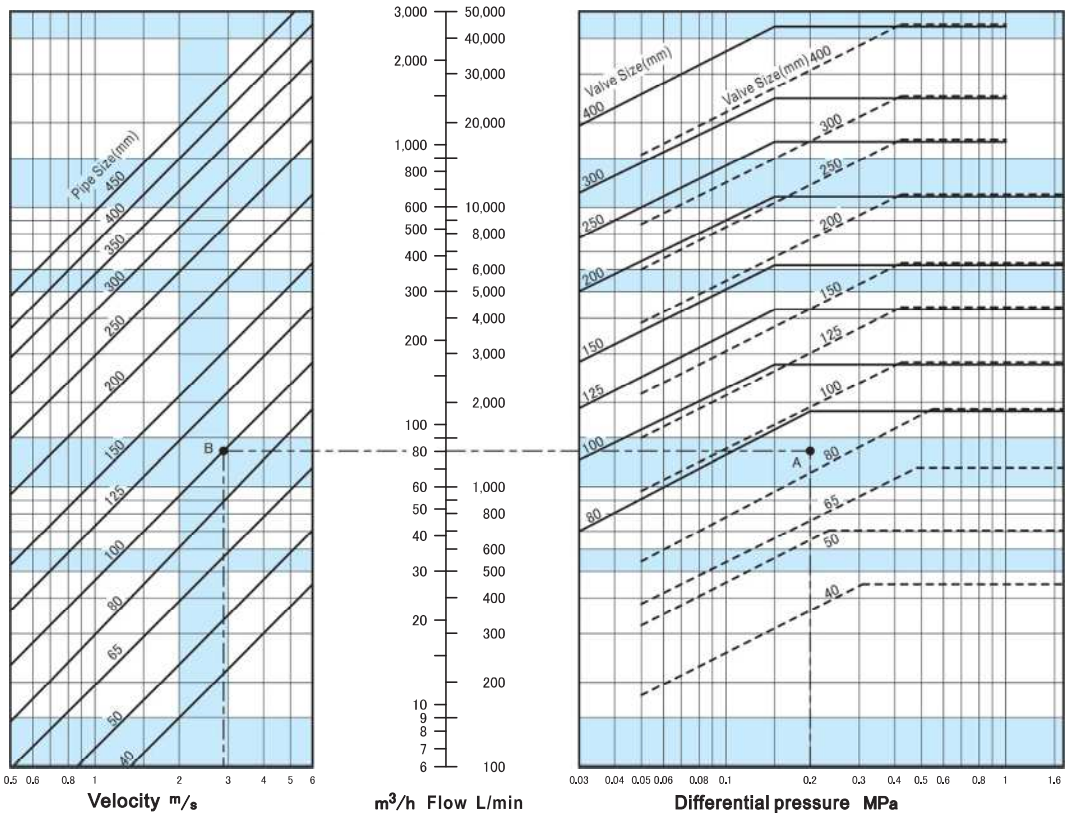
*1. JIS10K:Flanged code JIS 10KRF
JIS16K:Flanged code JIS 16KRF
*2. Please contact our local agent about figures for valve body with Ductile cast iron.
*3. Size 40mm of material is Ductile cast iron.

DATA/WV Type Regulating Valve (for Water or Hot Water)

SIZE SELECTION CHART (for Water)

■ VELOCITY RATE LINE CHART

■ SIZE SELECTION CHART



● **PRODUCTS WHOSE SIZES CAN BE DETERMINED**
------ (dashed line) in the size selection chart
Pressure reducing valve WVR-02 Type, primary pressure regulating valve WVM-02 Type.

● **VALVES APPLICABLE TO**
——— (solid line) in size selection chart
Solenoid valve WVE-02 Type, level control valve WVL-02 Type

Note 1: In the size selection chart, the horizontal position of the valve size line represents the maximum flow.
Note 2: Use velocity line of less than 3m/s in velocity line chart with obtained pipe size, if not for any special case.
Note 3: Size 40~65mm is for WVR and WVM Types only.
Note 4: For sizes 40,50mm, in case of the larger differential pressure,please contact our local agent in your area.

● HOW TO USE THE CHART

Example: Select the size of valve for the following conditions:
Primary pressure: 0.5MPa; Secondary pressure: 0.3MPa; Flow: 80m³/h
1.Calculate differential pressure between inlet and outlet of valve: 0.5−0.3=0.2MPa
2.Follow the 80m³/h flow line horizontally until it intersects with the 0.2MPa differential pressure line. The intersection point is named A.
3.Since point A is between the lines representing size 80mm and 100mm, select the larger size, which is size 100mm.

● CONFIRMING PIPE FLOW RATE

1. Assume the pipe and valve are of the same diameter. Follow the 80m³/h flow line horizontally until it intersects with the 100mm size line to obtain cross point B.
2. Draw a vertical line from point B and find out the pipe flow rate 2.8m/s.
3. Since the flow rate is less than 3m/s, the pipe size should be size 100mm. If flow rate is larger than 3m/s, select a larger size to make the flow rate less than 3m/s.

● REFERENCE

■To select the size for pressure reducing valve or primary pressure regulating valve with considering dynamic water pressure:
For pressure reducing valve, add the largest offset pressure to the secondary pressure. For primary pressure regulating valve, deduct the minimum accumulation from the primary pressure. The size can be determined using the differential pressure between primary side and secondary side of the valve.

●Pressure reducing valve
Find out the maximum offset pressure 0.1MPa from the specifications. The differential pressure is 0.5−(0.3+0.1)=0.1MPa. Use the method described in the example in “HOW TO USE THE CHART” to select the size.

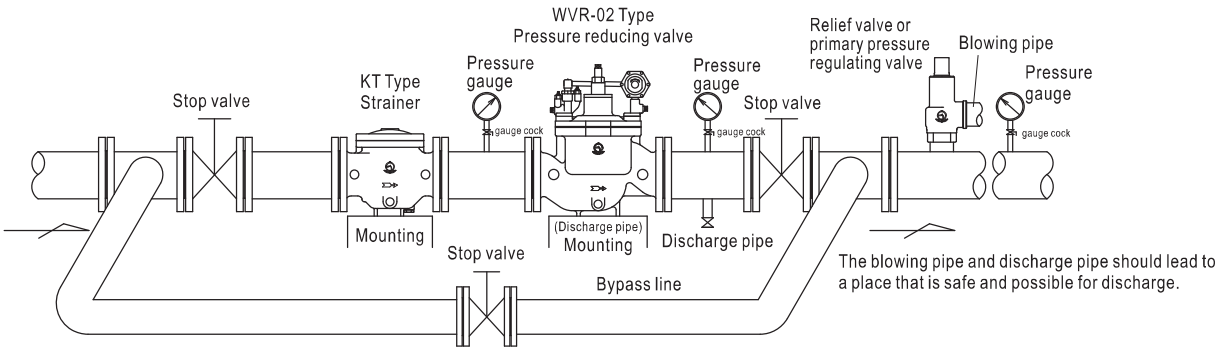
●Primary pressure regulating valve
Find out the minimum accumulation 0.03MPa from specifications. The differential pressure is (0.5−0.03)−0.3=0.17MPa. Use the method described in the example in “HOW TO USE THE CHART” to select the size.

DATA/WV Type Regulating Valve (for Water or Hot water)

PIPING EXAMPLE (horizontal piping with the size of WVR-02 Type pressure reducing valve is 200mm or smaller)

Water supply system using roof tank in tall/medium height buildings

Install water hammer preventing device closely at the primary side of pressure reducing valve if the pressure is reduced by one and more steps.



POINTS FOR INSTALLATION AND USE

BYPASS LINE

It is necessary to install a bypass pipe with stop valve, as shown in the figure above, for test before filling water, air purging, cleaning the inside of pipes, or maintenance.

STRAIGHT PIPE

To ensure stable operation of the valve, install straight pipe before and after the valve. The length of the straight pipe depends on the state before and after piping. However, the length should be approximately 10~20 times the nominal diameter (Minimum 500mm).

PIPING SUPPORT

Install piping support to avoid undesired mechanical impact due to the weight of the piping, weight of fluid, or continuous vibration, stress, or bending force.

STRAINER

Install strainer at the primary side of the valve.

SAFETY DEVICE

Considering the rise of secondary pressure, in some cases, it is necessary to install relief valve or primary pressure regulating valve at the secondary side.

See the following table for the approximate set pressure for the relief valve or primary pressure regulating valve. The outlet of the relief valve or primary pressure regulating valve should lead to a drainage that can accept the discharge of the valve.

TABLE OF SET PRESSURE FOR SAFETY RELIEF VALVE AND PRIMARY PRESSURE REGULATING VALVE (MPa)

Set pressure of pressure reducing valve	Set pressure of safety valve ※2.
0.1or 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 1.0 or less	+0.19

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.

THERMO-INSULATION

Cover the valve with insulating material if there is possibility of condensation or freezing. However, no thermo-insulation is to be applied on the coil of pilot-operated solenoid valve.

Note 1: The figure shows an example of WVR-02 Type. The piping for other types of valves are the same. However, for WVM-02 Type, there should be a rising part at the outlet piping. (See the piping example in Page 111)

Note 2: In the case of vertical piping, the piping should be the same as shown in the piping illustration. In addition, the weight of the piping should not be applied on valves, and there should be some space for maintenance purpose.

PRESSURE GAUGE

Install pressure gauge at the primary and secondary sides of the valve, and at locations that can be easily accessed after piping.

LIMITATION ON INSTALLATION LOCATION

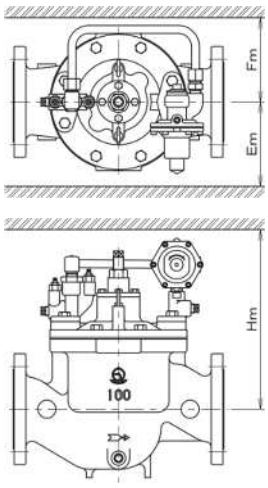
In the case solenoid valve, the valve should not be installed at locations where corrosive or explosive gas may accumulate.

DISCHARGE PIPE

To allow easy maintenance, install discharge pipe before the stop valve at the secondary side. In the case of installation inside buildings, discharge pipe is particularly necessary for locations where there are also wires or electric devices installed. The discharge pipe should be led to a drainage that can accommodate the content of stop valves before and after the drainage.

MAINTENANCE SPACE

Leave some space surrounding the valve for maintenance (see the figures below).



The figure shows an example for WVR-02 Type.
The maintenance space for other types of valves is the same.

TABLE FOR MAINTENANCE SPACE (mm)

Size	Hm	Em	Fm
40(1½″)	550	600	600
50(2″)	550	600	600
65(2½″)	600	600	600
80(3″)	600	600	600
100(4″)	800	680	680
125(5″)	1000	780	780
150(6″)	1200	910	910
200(8″)	1400	1060	1060
250(10″)	1500	1200	1200
300(12″)	1600	1300	1300
400(16″)	1800	1400	1400