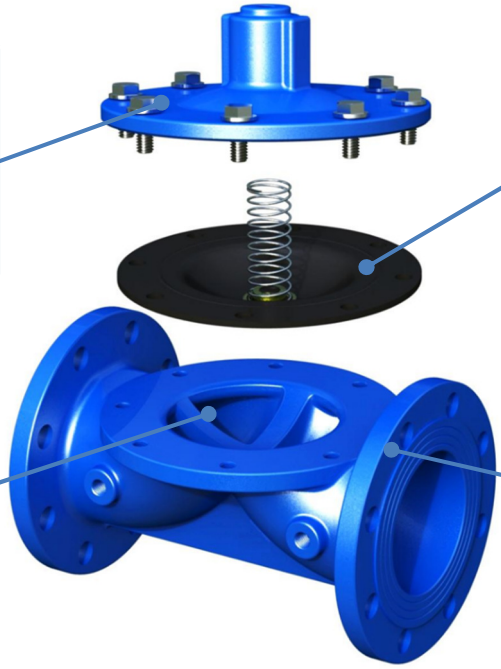
Water Control Valve - Basic Valve

Model: **47-00**

Easy of Maintenance and Clean
Just dismantle the upper cover to maintain and clean it. No need to dismantle the whole valve from the pipeline.

Anti-Shock Diaphragm
It can make the valve operation smooth, eliminate the shock, and avoid the damage caused by water hammer problems.



Simple Structure
Easy to dismantle, only one diaphragm as the consumption material, not easy to be blocked by foreign materials.

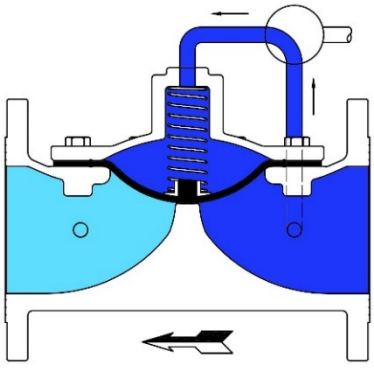
Antirust Painting
It makes the valve body a better antirust function, and extends the valve life.

Features

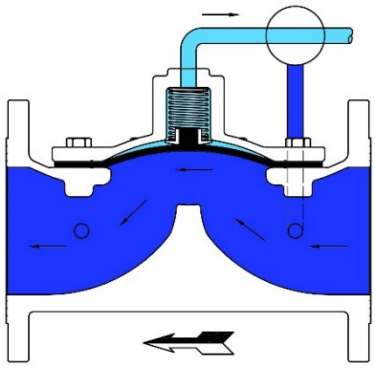
- **Reliable sealing function.**
- **No need to dismantle the whole valve from the pipeline for maintenance.**
- **Simple structure, insensitive to foreign substances.**
- **Many kinds of connection specifications for choice.**
- **Strict tests for every valve in the factory.**

Water Control Valve-Basic Valve is controlled by the liquid pressure. It is a diaphragm control valve which can be maintained on the pipeline directly without dismantling the whole valve.
47-00 Basic Valve is the foundation of all water control valves. It can join with different controllers to adapt different appliance situations, for example, Float Valve、Pressure Reducing Valve、Pressure Relief Valve、Pressure Sustaining Valve、Back Pressure Valve、Non-Slam Check Valve、Solenoid Control Valve 、Rate of Flow Control Valve、Differential Pressure Relief Valve, etc. There are various kinds of valve sizes and connections for choice. The application situations are unlimited.

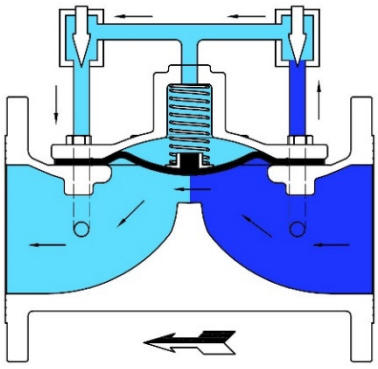
Operation Principle



●Close
When the pressure gets into the air chamber from the inlet of the valve, the valve will form an airtight seal.

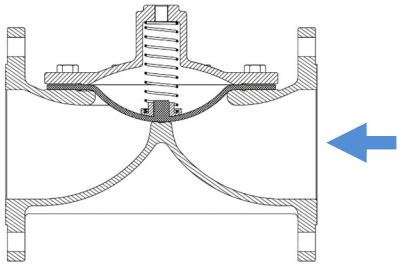
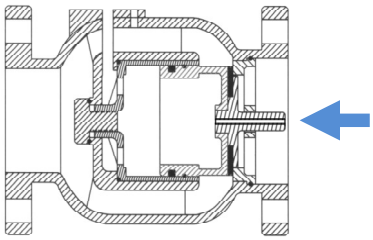


●Open
Once the fluid in the air chamber is discharged, there is no way to save the pressure in the air chamber. The valve will be opened and let the fluid pass through.



●Control
If the corresponding control appliance is assembled, the valve will automatically operate according to the pressure in the pipeline to guarantee the input/output pressure and rate of flow.

Comparisons of the advantages and disadvantages with other Valves

	Model 47 diaphragm control valve	Other valves
Structure Drawing		
Structure	Simple structure, less components, riskless assembly, less valve operation, less consumption materials and lower fault rate.	Complicated structure, more components, easy to be blocked by foreign substances, valve operation by the piston moving back and forth. O-ring is easily damaged by friction
Maintenance	It is easy to check and replace the pipelines as they are at the outside of the valve. Just dismantle the air chamber set for maintenance, no need to dismantle the whole valve.	No way to check and replace on the pipelines as part of them are inside the valve. Need to dismantle the whole valve for maintenance, which is very inconvenient.
Control	The area ratio between the diaphragm and pipeline is over two times. So, sensitivity and stabilization are good and control is accurate. The filter is built inside to avoid the blockage by foreign substances. The spring diaphragm can slow down the valve operation to get stable control, endure the shock and avoid the damage caused by water hammer problems.	The area ratio between the piston and pipeline is small. So, sensitivity and stabilization are worse. It possibly doesn't work normally during low pressure. There is no filter built inside. The inlet hole of air chamber is easily blocked by foreign substances. The piston won't endure the shock, the control is not stable and it is easy to occur vibration and noise.
Fittings	There is a Flow-Rate Control Valve to control the rate of flow and adjust the open/close speed of the valve, and reduce the water hammer problem.	The speed of open and close cannot be adjusted. If the water hammer problem happens, there is no way to overcome and eliminate the problems of vibration and noise, even worse, the valve pipelines would be damaged.
Others	When the valve is fully opened, there is no any fittings to block from inlet to outlet. It is insensitive to foreign materials and substances, so, it is not easy to be blocked.	From inlet to outlet, there are valve set, valve enhanced tendon, etc. among the pipelines. They are sensitive to foreign materials and substances, especially to the banding substances, which are easy to get into the cylinder to damage the cylinder, piston and sealing, etc. and the air inside the air chamber cannot be exhausted. That will affect the stability of valve and cause the breakdown.

Materials

Valve Body：Ductile Iron / Stainless Steel

Diaphragm：NBR / EPDM

Connection Way

DN50~DN300 Flange connection

Working Temperature and Media

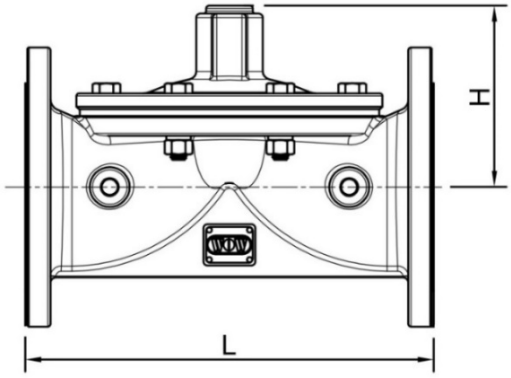
0℃~100℃ · Water

※If it is used in other situation, please indicate it when ordering

Operating Pressure

Flange Class	Max. Working Pressure	
	bar	psi
10K	14	205
16K	22	320
150LB	17.4	250
PN16	16	235

Dimension



Valve size	50	65	80	100	125	150	200	250	300
L(mm)	200	220	285	307	370	390	500	605	650
H(mm)	87	109	115	137	142	164	183	244	258
Weight(kg)	7	9	16	18	37	48	83	120	140

Notice :

※When installing the valve, strongly request to leave enough space for maintenance. It is necessary to install the filter at the front section of the valve to avoid foreign materials to block the valve and affect the operation of the valve.

※King-Tech reserves the right to make any revisions on the valve model and size without prior notification.

※When making any design drawing, installation drawing or construction drawing, please do get our approved CAD with our signature, or we will not be responsible for any mistake.

Kv/Cv Value

Size	Cv	Kv
DN50 (2")	100	87
DN65 (2.5")	158	136
DN80 (3")	185	160
DN100 (4")	215	185
DN125 (5")	400	345

Size	Cv	Kv
DN150 (6")	610	525
DN200 (8")	925	795
DN250 (10")	1490	1280
DN300 (12")	2115	1820

$$\text{Kv or Cv} = \frac{Q}{\sqrt{\Delta P}}$$

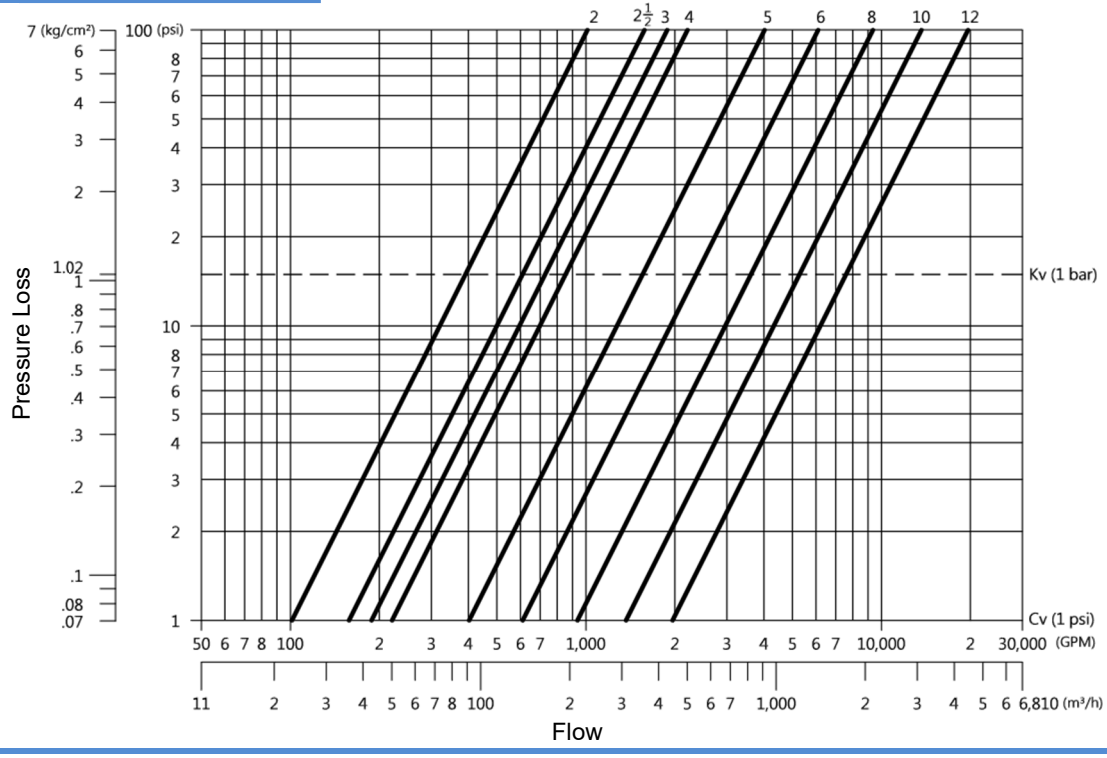
Kv=Cv×0.86

1 kg/cm^2=14.22 psi

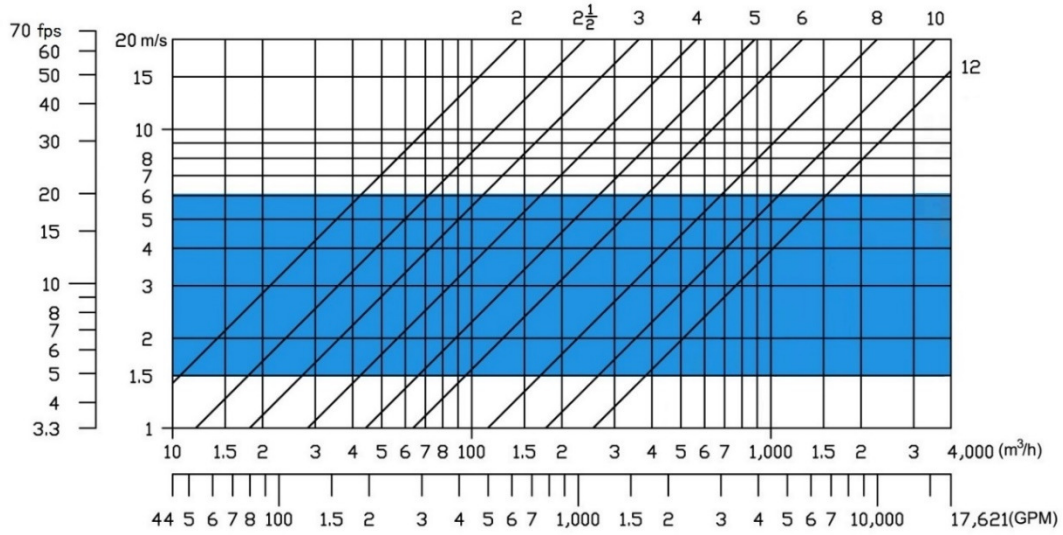
Cv = US GPM @ 1 psi with 60 °F water

Kv = m^3/h @ 1 bar with 15 °C water

Pressure Loss Curve

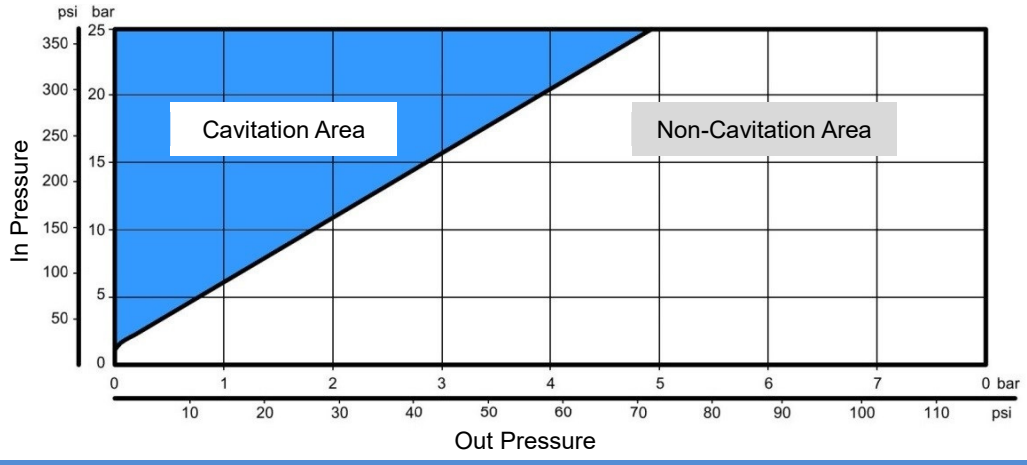


Valve Sizing Method



1. Write down your flow, for example your application is 300 GPM (68 m^3/h)
2. Calculate pressure difference (ΔP) between valve inlet and outlet. For example your application's pressure difference is 4 psi (0.28 kg/cm^2)
3. Calculate Cv (Kv) : This example should be $Cv = \frac{Q}{\sqrt{\Delta P}} = \frac{300}{\sqrt{4}} = 150$ or $Kv = \frac{Q}{\sqrt{\Delta P}} = \frac{68}{\sqrt{0.28}} = 129$
4. Decide Valve size. Chose those valve which Cv (Kv) Value are greater than the Cv (Kv) you calculated at Step 3. In general, the valve's Cv (Kv) value should be 1.4 times than the Cv (Kv) value you calculated. In this case, you should choose DN100 (4"), which Cv value is 210, Meet your requirement.
5. Check flow velocity. Having decide valve, you may check flow velocity. This case's velocity should be 7.9 fps (2.4m/s) this value may read from above photo.
6. Make your decision. Depending on your application, velocity flow through valve may different. In general, application such as pressure relief, velocity should be greater than normal. So valve size should be smaller than you have calculated at Step 4. In this case, you should choose DN80 (3"). If you need those modulating valve, such as pressure reducing valve, suggested velocity should beyond the shadow area of the above photo. In this case, DN100 (4") should be chosen, If your valve are similar with Solenoid Control valve, which act as an ON/OFF valve, velocity should below 6.5 fps (2m/s). In this case DN125 (5") should be chose.

Cavitation Area



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