

Article 3 – Basic Function

The Diaphragm is attached to the Stem, and the Stem is attached to Valve Plug. This assembly moves Up and Down, or, if you will; Off and On the Seat.

These Basic Valves (See page 7 – Types) are usually arranged to flow water under the seat, up, over and out. The Flow Arrow you see is from pump or up-stream pressure.

The Area of the Diaphragm is approx. 50% larger than the Seat. The Basic Valve has no function of its own without Control Tubing and Pilots. The Pilots are valves themselves (check valves, ball valves, solenoids, spring loaded regulators, etc.).

Drawing “A” shows Tube Line 1 attached from the Up-Stream Tap to the Cover Chamber above the Diaphragm. The Line Pressure is trying to push the assembly up and off the Seat, however the Diaphragm has the same line pressure above it. The Diaphragm wins, and the Valve stays closed.

Drawing “B” shows Tube Lines 1 & 2, with 2 attached to the Down-Stream Tap. Does the Valve now come open? It makes sense that it does, since you have given the pressure that you introduced above the Diaphragm a chance to get out.

Actually, the Valve stays closed, as long as Line 2 is no larger than Line 1. If Line 2 were larger than Line 1, then the Valve would open. Why? Because you are relieving the pressure (or flow) above the Diaphragm faster than it is being replaced.

So, to open an ACV, take water out of the Cover; and to close it, trap water in the Cover. To Position the Valve, create a balance.

In Drawing “C”, we now actually have a Control Valve (though it is manual, and not yet automatic). We have introduced a Throttling Device on Line 1 and an On/Off Cock on Line 2. With the Throttling Device, you can limit the flow into the Cover, and with the On/Off Cock; you can Open, Close, or Position the Valve.

Follow the Logic on this page, learn about how Pilots operate, and you will be able to understand how Automatic Control Valves work.

Stem is attached to Diaphragm and moves up and down.

