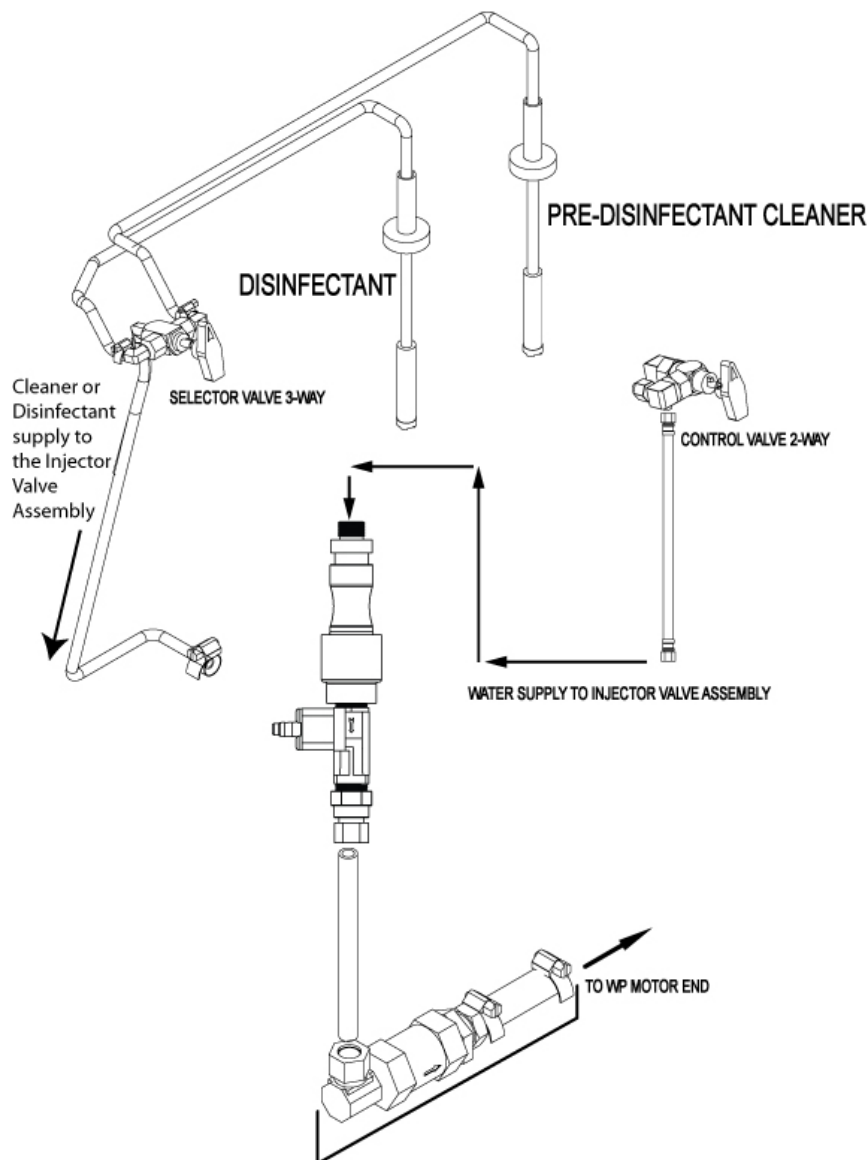


Whirlpool DS System Operation

When you turn the control valve on, water flows into the vacuum breaker and injector assembly, creating a vacuum.

The vacuum draws chemical from the selector valve. The chemical enters the metering tip and delivers about 1oz of chemical per gallon of water. This mixes with the water flowing through the injector valve. The mixture then flows through the check valve, into the wet end of the whirlpool pump, and exits through the whirlpool intake screen in the foot well of the tub.

When you turn on the whirlpool pump, the mixture is sent from the whirlpool wet end to the plumbing system and flows out of the jets.

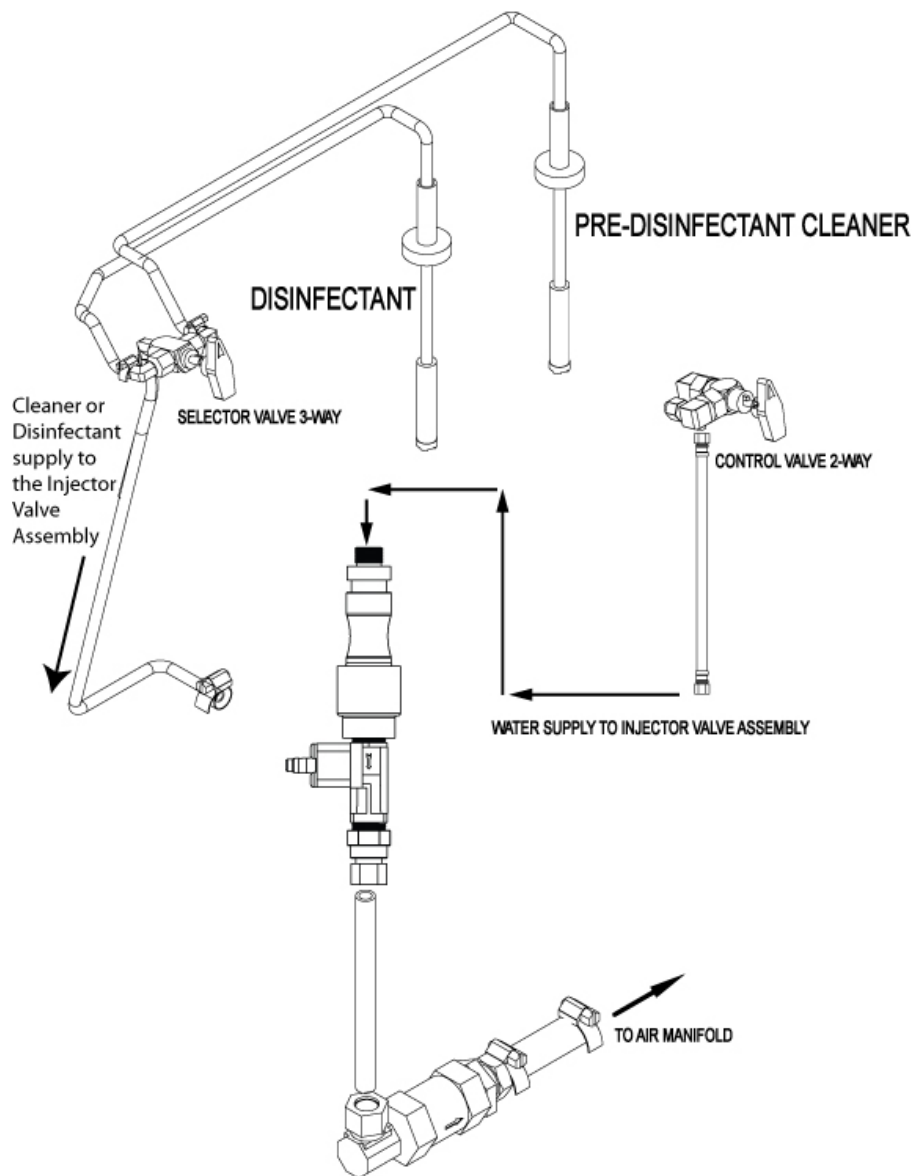


Air Spa DS System Operation

When you turn the control valve on, water flows into the vacuum breaker and injector assembly, creating a vacuum.

The vacuum draws chemical from the selector valve. The chemical enters the metering tip and delivers about 1oz of chemical per gallon of water. This mixes with the water flowing through the injector valve. The mixture then flows through the check valve into the air manifold.

When you turn on the air spa blower, the mixture is sent from the air manifold to the plumbing system and sprays out of the jets.





Whirlpool and Air Spa DS System Troubleshooting

The systems successful operation is dependent on the proper flow of water over the injector valve.

Inadequate water flow can be caused by:

- Low facility water pressure which can be from several things
 - Location of the tub. If the tub is located on upper floors of a building, there may not be an adequate pumping system to deliver adequate pressure.
 - In-line filters to collect sediment may be clogged or decrease the flow to where not enough vacuum is created.
 - A clog in the system.
 - The check valve could be plugged, cracked, or leaking.
 - The nipple on the whirlpool pump could be plugged with lime or scale.
 - The injector valve opening is very small. Debris from the water system can clog or eliminate flow.

Adequate water flow but not drawing chemicals:

- There could be an issue with the metering tip. The metering tip with an O-ring, screws into the injector valve body. The stainless-steel ball. It is held in place by a spring. These parts act as a check valve to prevent backflow into the cleaner and disinfectant bottles.
 - The stainless-steel ball gets stuck in the rubber O-ring blocking the flow.
 - The metering tip is plugged.
 - The dip tubes are not pushed down all the way in the bottles, or the bottles are empty.
 - There is a crack in the tube from the injector tip to the selector valve causing it to suck in air.
 - There is a vacuum leak somewhere in the system.
 - There is hole/crack in the tubing from the bottles to the selector valve.
 - The check valve could be plugged, cracked, or leaking.
 - The nipple on the whirlpool pump could be plugged with lime or scale.
 - The injector valve opening is very small. Debris from the water system can clog or eliminate flow.

DS System Troubleshooting

Control Valve	Selector Valve	WP Motor/AS Blower	Result	Action
Off	Off	Off	Nothing flowing from the intake screen in the foot well	None
Off	Off	Off	Water flowing from the intake screen in the foot well	Replace control valve
Off	Off	Off	Water and cleaning or disinfectant is flowing from the intake screen in the foot well	Replace control valve and selector valve
Off	Off	Off	Water in Cleaner or Disinfectant bottle	Replace selector valve and injector assembly
On	Off	Off	Water flowing from the intake screen in the foot well	None
On	Off	Off	Water not flowing from the intake screen in the foot well	No water supply or restricted water supply. Verify water is being supplied to the bathing system. Restricted water flow. Check DS System vacuum breaker, injector assembly, check valve, nipple on WP motor wet end/AS manifold elbow
On	Off	Off	Cleaner or Disinfectant is flowing from the bottle.	Replace selector valve

Control Valve	Selector Valve	WP Motor/AS Blower	Result	Action
On	On	Off	Water and cleaning or disinfectant is flowing from the intake screen in the foot well	None
On	On	Off	Cleaning or disinfectant is not flowing from the bottle or intake screen in the foot well	Check DS System vacuum breaker, injector assembly, check valve, nipple on WP motor wet end/AS manifold elbow