AQMATIC
Valves & Controls

OPERATION & MAINTAINENECE MANUAL

K52 SERIES COMPOSITE BODY DIAPHRAGM VALVES

SERIES K520- K526
½ INCH- 3 INCH

INTRODUCTION

AquaMatic diaphragm valves are designed for application on water and various other fluids. Valve body & cap are glass filled thermoplastic, with Noryl and PVC plastic internals parts, EPDM seals and discs. The diaphragm is Nitrile (Buna N) elastomer reinforced with Polyamide fabric.

The main advantages of AquaMatic valves are:

- Low pressure drop resulting in higher flow due to Y-pattern design
- Upper and lower diaphragm chambers separated from line media
- Large diaphragm area compared to the seat area; 1.2 ratio of diaphragm area to seat area provides drip tight closing
- Low initial costs and ease of maintenance
- All internal parts are replaceable without removing valves out of the service line

The diaphragm valves are available with following options.

- Normally Open Pressure to Close (NO)
- Normally Closed, Pressure to Open (NC)
- Spring Assist Open (SAO)
- Spring Assist Closed (SAC)
- Limit Stop (LS)
- Position Indicator (PI)

COMBINING OPTIONS.

OPTIONS	NO	NC	SAO	SAC	LS	PI
NO	-	NA	X*	X	X	X
NC	NA	-	NA	X	X	NA
SAO	X*	NA	-	NA	X	X
SAC	X	X	NA	-	NA**	NA
LS	X	X	X	NA**	-	NA
PI	X	NA	X	NA	NA	-

* Standard on K520 ½" size valves valves.

** Can not be combined on K520 series valves only.

X = CAN BE COMBINED. NA = NOT AVAILABLE.

NORMALLY OPEN
Line pressure under the seat opens the valve. Control pressure applied to the upper diaphragm chamber closes the valve.

NORMALLY CLOSED
Line pressure applied to the upper diaphragm chamber, through hole in the valves stem, closes the valve. Control pressure applied to the lower diaphragm chamber equalizes the pressure on the diaphragm and line pressure under the seat opens the valve.
NOTE: Normally closed valves are not recommended for use in media containing suspended particles and/or chemicals, which could attack the diaphragm.

SPRING ASSIST OPEN
Spring installed under the diaphragm forces the valve to fully open position in absence of any line or control pressure. Control pressure applied to the upper diaphragm chamber closes the valve.

SPRING ASSIST CLOSE
Spring installed above the diaphragm forces the valve to closed position in absence of any line or control pressure. Control pressure applied to the lower diaphragm chamber opens the valve.
NOTE: Depending upon size of the valve, 3-5 PSI (0.2 to 0.34 bars) on the inlet side of the valve will start to open the valve.

LIMIT STOP
An adjustable bolt installed in the cap limits valve stroke. This feature can be used to close the valve in case of emergency and also controls valve stroke, and hence the flow rate, however the **flow rate will change** with change in inlet pressure.

POSITION INDICATOR
An indicator rod attached to the valve shaft shows if the valve is open or closed. This feature is a visual indication only. This feature is available on normally open valves with spring assist open option only.

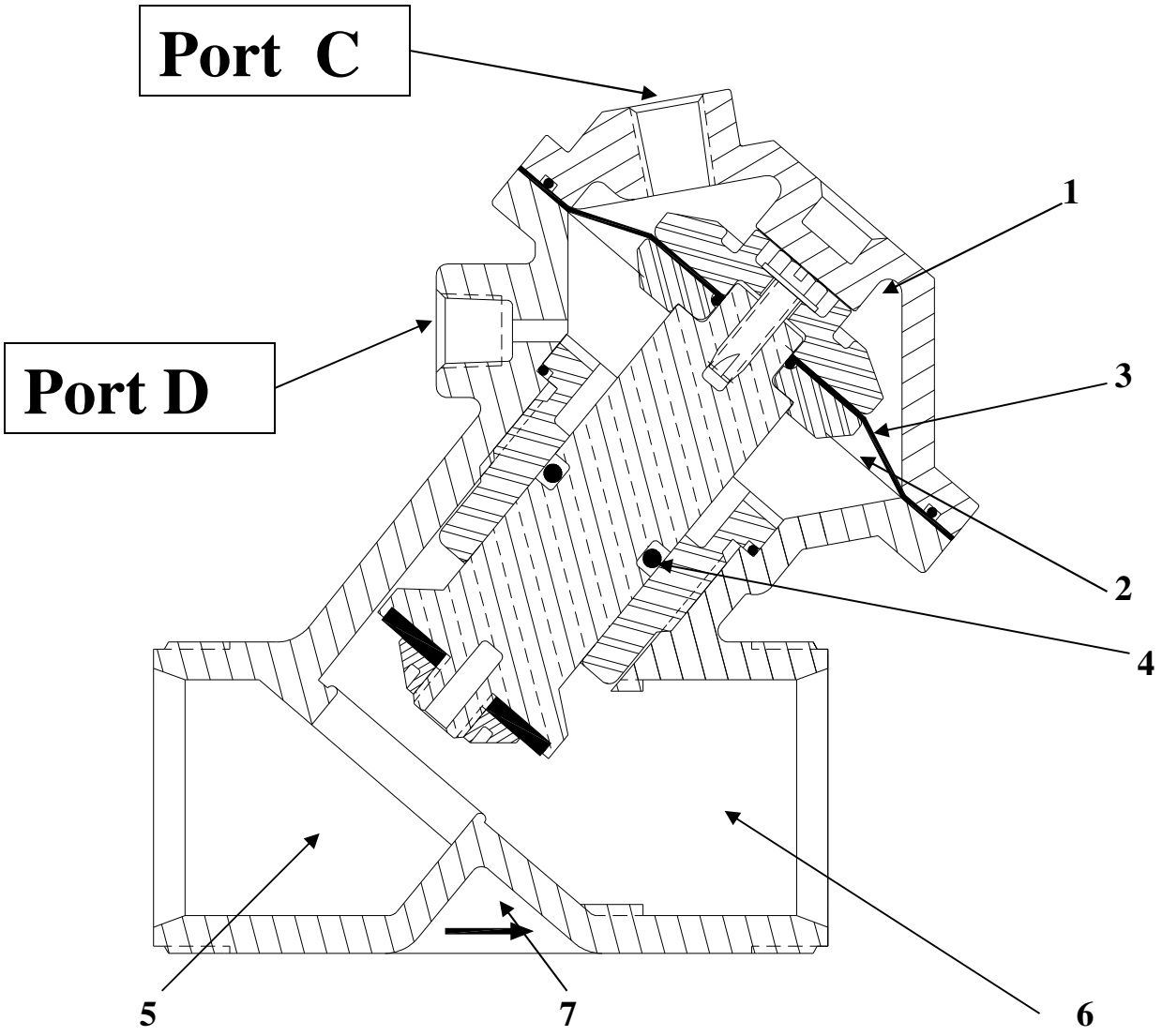


Fig. 1

1. **Upper diaphragm chamber**
2. **Lower diaphragm chamber**
3. **Diaphragm**
4. **Dynamic O-ring**
5. **Inlet chamber (upstream chamber, Influent chamber)**
6. **Outlet chamber (downstream chamber, effluent chamber)**
7. **Direction of flow arrow**

INSTALLATION

- Observe local plumbing codes when installing the valve.
- Follow good plumbing procedures.
- Use approved and appropriate pipe sealant on all threaded joints. Teflon tape or sealants designed for use with thermoplastic are required. **DO NOT** use any sealants with petroleum based fluids.
- Install valve, with flow arrow (marked on valve body) pointing toward the direction of media flow.
- Valve can be installed in a vertical pipe or horizontal pipeline. If installed in horizontal pipeline, valve cap can be either facing up or down, due to unique design feature of the valve.
- Control pressure (equal to greater than line pressure) should be connected to valve cap on normally open valves, (Port C, Fig. 1) and vent port (Port D, Fig. 1) should be left open. **DO NOT** plug vent port.
- Control pressure (equal to greater than line pressure) should be connected to the (Port D, Fig. 1) on normally closed open valves. **DO NOT** remove pipe plug installed on (Port C, Fig. 1).
- **DO NOT** use metal tubing fittings.

TROUBLE SHOOTING

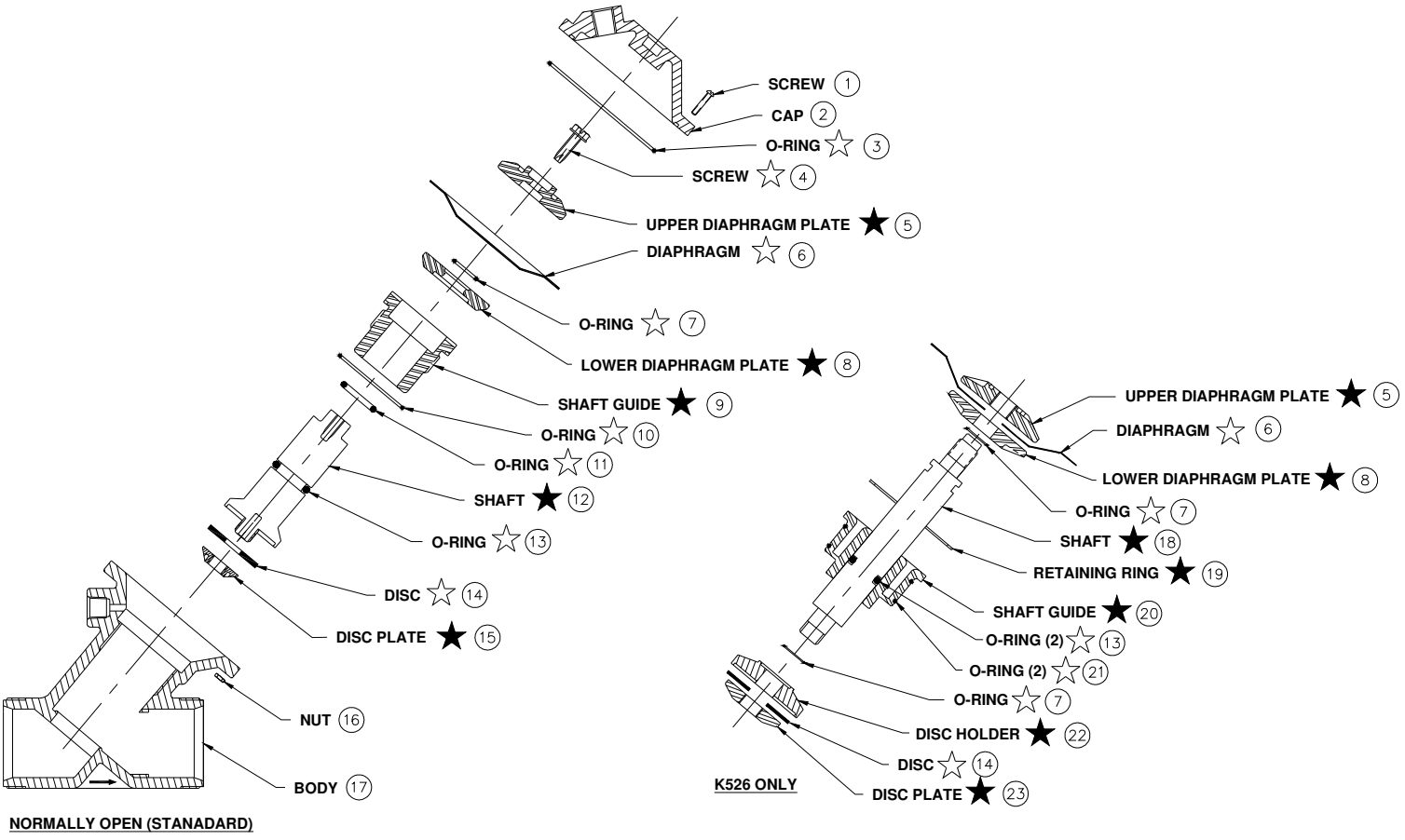
Problem	Possible Cause	Solution
1. Normally open valve, not closing	a. Insufficient control pressure. b. Valve disc damaged. c. Vent port plugged or clogged.	a. Check the control pressure source. b. Disassemble valve and replace disc. c. Remove plug from vent port or clean vent port.
2. Normally closed valve not closing	a. Insufficient line pressure or low flow. b. Orifice in the shaft plugged or clogged.	a. Add spring assist closed option to create backpressure. b. Remove restriction from the orifice in the shaft.
3. Leak through vent port.	a. Dynamic ”O” ring damaged. b. Damaged diaphragm c. Shaft guide “O” ring damaged.	a. Replace dynamic O-ring. b. Replace diaphragm. c. Replace shaft guide O-ring.
4. Occurrence of water hammer.	a. Valve closes too fast.	a. Reduce closing speed by installing a needle valve

	b. Excessive control pressure. c. Valve installed backwards.	in control line. b. Reduce control pressure. Control pressure should be within 5% of line pressure. c. Make sure media flow is in the direction of flow arrow on the valve body.
5. Valve operation sluggish.	a. Control pressure not vented. b. Dynamic O-ring swollen.	a. Make sure that control pressure is exhausted. b. Check O-ring and if swollen, check chemical compatibility.
6. Normally open valve does not open fully.	a. Control pressure not exhausted. b. Drain line Restricted.	a. Make sure the control pressure is exhausted. b. Check & remove drain line restriction.
7. Normally closed valve does not open fully.	a. Insufficient control pressure. b. Restriction in control pressure line.	a. Control pressure should be equal to greater than line pressure. b. Check for restriction and remove restriction.
8. Valve Chatters.	a. Control pressure line not vented. b. Limit stop adjustment limits opening of the valve.	a. Check and make sure control pressure line is vented. b. Adjust limit stop to allow valve to open further.

TOOLS AND REPAIR PARTS KITS.

Valve Series	Shaft Holding Tool	Shaft Guide Removal Tool	Diaphragm & Seal Kit	Int. Parts Kit "NO" Valves	Int. Parts Kit "NC" Valves
520	1077834	1074989	1081784	1079600	1079601
521	1077837	1075059	1081792	1079621	1079622
524	1077837	1075143	1070274	1070298	1076307
526	1077837	1075224	1070275	1070299	1071226

☆ Parts Included in Diaphragm & Seal Kit.
★ Parts Included in Internal Parts Kit.



DISSASSEMBLY PROCEDURE.

1. Turn off water supply to the valve.
2. Remove control pressure line.
3. Remove valve cap item No. 2 and O-ring item No. 3 from body item No. 17 by removing screws item No. 1 and hex nuts item No. 16.
4. Remove spring if valve has spring assist closed option.*
5. Slide out the position indicator rod if valve has position indicator option.*
6. Remove top screw item No. 4 while using the tool to hold shaft item No. 12.
7. Remove upper diaphragm plate item No. 5, diaphragm item No. 6, O-ring item No. 7 and lower diaphragm plate item No. 8. (Series 526

valves unscrew top diaphragm plate and remove diaphragm, lower diaphragm plate and O-ring).

8. Remove spring if valve has spring assist open option.*
9. Using the tool remove shaft guide item No. 9 by turning it **counter clockwise**. (On series 526 remove retaining ring item No. 19 and remove shaft guide.
10. Lift out shaft item No. 12
11. Remove disc plate item No. 15 and disc item No. 14. (Series 526 remove disc plate item No. 15 disc item No. 14 and disc holder item No. 22.
12. remove O-Ring item No. 13 from shaft item No. 12.

* Options not shown in the drawing.

REASSEMBLY PROCEDURE.

1. Replace damaged parts.
2. Lubricate all O-rings with Silicon lubricant provided with repair parts kit. **Do Not** use any petroleum based lubricants.
3. Reverse the disassembly procedure for reassembling the valve. Do **NOT** over tighten the shaft guide or top diaphragm plate on K526 valves.
4. Reinstall valve cap on to the valve body.

4511061-REV A