Installation and Maintenance Instructions

Installation

Chemtrol Diaphragm Valves can be fitted with spigot, socket, or flanged end connections. They operate equally well with flow in either direction through the valve. And, they may be mounted in any position–vertically, horizontally, or any posture of radial orientation in the piping system. Valves should be placed in the open position before installation. This is particularly important if the joining process involves solvent cementing. By doing so, air or fumes will not be trapped between the diaphragm and sealing weir. Free ventilation through the piping system during installation is always desirable.

Spigot-End Valves–Refer to the solvent cement joining instructions for PVC and CPVC in the Chemtrol Thermoplastic Piping Technical Manual for proper joining techniques. **Caution: Do not allow purple primer or solvent cement to migrate into the valve weir and diaphragm area. Keep the valve open to promote ventilation for proper drying of the cement.**

For 3" and 4" PP and PVDF valves, refer to the heat fusion joining instruction in the Chemtrol Thermoplastic Piping Technical Manual for proper joining techniques. **Caution: Chemtrol valves require special heat fusion tools to make proper connections with Chemtrol fittings. These tools can be found in the Chemtrol Fitting Guide.**

Since 1/2" through 2" NPP and NPVDF valves are metric OD, they **cannot** be joined with Chemtrol IPS socket fittings. Only metric socket fittings may be joined, utilizing the same brand of joining tools as the fittings. Therefore, socket or flanged valves are encouraged for use with this size range of Chemtrol fittings in these materials.

Socket-End Valves–As with PVC and CPVC spigot-end valves, refer to the solvent cement joining instructions in the Chemtrol Thermoplastic Piping Technical Manual for proper joining techniques. **Caution: Exercise care to prevent purple primer or solvent cement from running back in the valve to the diaphragm or seating area. Keep the valve open for proper drying.**

For PP or PVDF valves, refer to the heat fusion joining instructions in the Chemtrol Thermoplastic Technical Manual for proper joining techniques. **Caution: Chemtrol valves and fittings require special heat fusion tools to make proper connections. These tools can be found in the Chemtrol Fitting Guide.**

Flanged-End Valves–Tightening of flange bolts must be done evenly. After finger-tightening the bolts so that the circumference of the inside bore of each flange snugly touches the gasket seal of the companion flange, make sure the valve is aligned before proceeding. Use of a torque wrench for pulling on the nuts is suggested for actual bolt tightening. **Caution: It is critical that bolts be equally tightened in a sequential pattern diametrically opposed to each other, and that the final recommended bolt torque be accomplished through a minimum of three progressive stages of tightening.** Refer to the plastic flange joining instructions in the Chemtrol Thermoplastic Piping Technical Manual for details on the progressive tightening pattern and the final torque recommended for various sizes of flanges.
When valve installation is complete, open and close the valve to check for ease of operation and proper alignment. Caution: Do not allow the valve to support the weight of any related piping. Convenient bolt holes are in the bottom of the valves for securing them to piping supports.

Valve Construction

Component	Material
1. Handle Subassy	
1a. Handle	PP/Glass
1b. Thrust Bearing	POM
1c. Secure Ring Nut	Brass
2. Bonnet	PP/Glass
3. Stem/Compressor Sub.	
3a. Indicator Stem	Stainless Steel
3b. Compressor	PAMXD6
3c. Drive Pin	Stainless Steel
4. Diaphragm	EPDM or PTFE
5. Valve Body	PVC/CPVC/PP/PVDF
6. Washer	Zinc Plated Steel
7. Hex Head Bolt	Zinc Plated Steel
8. Protective Cap	PE

Maintenance

It is most unusual that a Chemtrol Diaphragm Valve will need any maintenance beyond diaphragm replacement or cleaning. Since the bonnet and control group of a Chemtrol Diaphragm Valve are all fastened together, it is easy to remove the assembly, without disruption of adjacent piping, to inspect inside the valve.

1. Intercept the fluid medium upstream of the valve to be inspected with a shut-off valve and ensure that the subject valve is not under pressure (vent downstream, if necessary).
2. Unscrew the four bolts to separate the body from the bonnet and control group.
3. Unscrew the diaphragm from the compressor. Rotate the handle clockwise until the stem/compressor subassembly is released. Clean or replace the diaphragm and lubricate the stem, if necessary. **Caution: The sealing surface for the diaphragm on the top flange of the valve body receives special factory preparation to enhance sealing with PTFE diaphragms. This finishing operation is omitted on bodies receiving rubber diaphragms. Therefore, a PTFE diaphragm cannot be used as a replacement in an EPDM trimmed valve. But an EPDM diaphragm may be used as a replacement in a PTFE trimmed valve.**

Upon completion of the inspection/maintenance, reassemble the bonnet and control group to the body in the reverse order to that shown above. Make sure the diaphragm tab and compressor guides are properly located in their body slots by rotating the handle counterclockwise until the stem is in the full UP position.

To determine suitability of Chemtrol valves in your application, consult the Chemtrol Chemical Resistance Guide.

Do not use or test the products in this catalog with compressed air or other gases. See Chemtrol Chem-Aire® literature for information about shatter-resistant thermoplastic piping systems specifically designed for compressed air and other gases.

PVC/CPVC/Chem-Pure® (NPP)/ Natural Kynar® (PVDF)

150 psi at 73°F water–non-shock

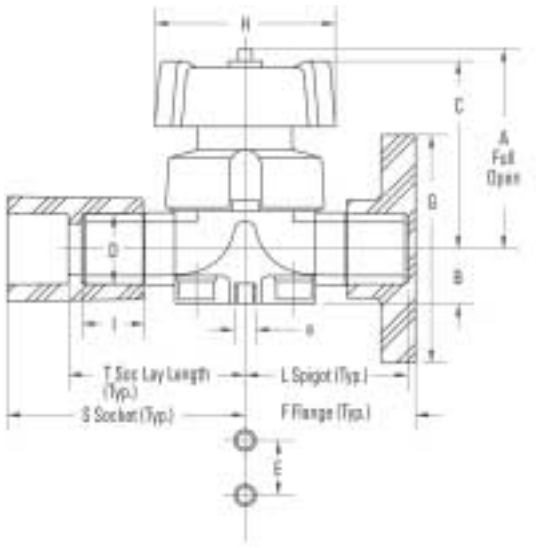
Chemtrol plastic Diaphragm Valves offer characteristics ideal for corrosive or high-purity chemicals and water, abrasive slurries, and vacuum applications. These multi-turn valves are designed for accurate flow control, outstanding durability, and leak-proof operation. The absence of stagnation pockets or crevices, together with the self-cleansing of unobstructed flow through the valves, make them ideal for slurries, salts which tend to plate-out on surfaces, and services which are sensitive to microbiological growth.

Features

- Diaphragm isolates the working parts of the valve from process medium for long life and leak-proof performance.
- Pack-less design minimizes the potential of shell leakage for ideal emissions control.
- The resilient diaphragm assures bubble-tight closure to flow.
- No pockets or dead spaces, thus preventing accumulation or stagnation of process fluids or contaminants.
- Multi-turn operation allows for precise throttling of manual valves.
- A visual position indicator is standard.
- EPDM or PTFE diaphragm selection affords wide range of applications, from corrosives to slurries and high-purity.
- Anchor/support bolt holes are located in base of body.

Notes

See page 14 for a list of *Components and Construction Materials.* For more insight into the selection of materials, refer to *Materials,* page 1. For the specific relationship of pressure vs. temperature, refer to *Engineering Data,* page 33. For *Chemtrol Valve Standards,* see page 35.



Chemtrol Figure Numbers

Valve Style		Body Material			
Diaphragm	End Connection	PVC	CPVC	Natural Polypro	Natural PVDF
EPDM	Spigot [3]	G45CD-E	G51CD-E	NA[1]	NA[1]
	Flanged	F45CD-E	F51CD-E	NA[1]	NA[1]
	Socket	S45CD-E	S51CD-E	NA[1]	NA[1]
PTFE [2]	Spigot [3]	G45CD-T	G51CD-T	G62CD-T	G66CD-T
	Flanged	F45CD-T	F51CD-T	F62CD-T	F66CD-T
	Socket	S45CD-T	S51CD-T	S62CD-T	S66CD-

1 Chem-Pure NPP and NPVDF valves are not usually specified with EPDM diaphragms. However, they can be field fabricated by purchasing an EPDM diaphragm for replacement in a PTFE trimmed valve.
2 At the point of manufacture, the diaphragm sealing surface of the flange on the valve body receives special preparation to enhance sealing with PTFE diaphragms. This finishing operation is not performed on bodies receiving rubber diaphragms. Therefore, a PTFE diaphragm **cannot** be used as a replacement in an EPDM trimmed valve.
3 All PVC and CPVC valves and 3" & 4" NPP and NPVDF valves have IPS (US) spigots. These valve styles can be field joined with any standard Chemtrol fitting of the same size and material, utilizing solvent cement or Chemtrol heat fusion equipment–material specific. NPP and NPVDF valves in sizes 1/2" - 2" have metric spigots. Factory produced flanged and socket styles in these materials and sizes utilize specially fabricated metric joining heat faces and fittings with metric sockets. Since these essential items **are not** offered for sale, purchase of spigot styles in these materials and sizes for field joining **is not** encouraged.

Dimensions–Weight–Fluid Flow Coefficient

D[1]		A	B	C	H	E	G	L		I		F		S		T		e[3]		Flow
IPS Size	Metric Size	Full Open						PVC CPVC	PP PVDF	PVC CPVC	PP PVDF	PVC CPVC	PP PVDF	PVC CPVC	PP PVDF	PVC CPVC	PP PVDF		Weight Lbs.[4]	Coeff. Cv[5]
1/2"	20	3.74	1.02	3.46	3.54	0.98	3.50	2.74	3.97	0.93	0.63	2.90	2.99	3.88	3.97	2.99	3.14	M6	1.54	6.45
3/4"	25	3.74	1.02	3.46	3.54	0.98	3.88	3.03	2.83	1.03	0.75	3.19	3.45	4.30	4.56	3.28	3.59	M6	1.54	9.43
1"	32	3.74	1.02	3.46	3.54	0.98	4.25	3.03	3.03	1.16	0.91	3.17	3.68	4.42	4.90	3.28	3.82	M6	1.54	12.14
1 1/4"	NA[2]	4.96	1.58	4.57	4.53	1.75	4.63	3.74	NA[2]	1.36	NA[2]	3.92	NA[2]	5.26	NA[2]	3.92	NA[2]	M8	3.31	20.81
1 1/2"	50	4.96	1.58	4.57	4.53	1.75	5.00	3.82	3.82	1.42	1.26	4.01	4.52	5.46	5.95	4.07	4.62	M8	3.31	28.86
2"	63	5.83	1.57	5.83	5.49	1.77	6.00	4.41	4.41	1.54	1.54	4.60	5.08	6.18	6.63	4.66	5.17	M8	5.29	53.14
2 1/2"	NA[2]	9.73	2.17	9.11	9.80	3.94	7.00	5.53	NA[2]	1.81	NA[2]	5.73	NA[2]	7.57	NA[2]	5.79	NA[2]	M12	14.33	90.18
3"	-	9.73	2.17	9.11	9.80	3.94	7.50	5.90	5.90	2.01	2.01	6.11	6.17	8.02	8.07	6.12	6.25	M12	15.43	138.73
4"	-	11.50	2.50	10.04	9.80	4.73	9.00	6.69	6.69	2.40	2.19	6.93	6.95	9.16	9.13	6.88	6.94	M12	19.84	187.29

1 All PVC and CPVC valves and 3" & 4" Chem-Pure NPP and NPVDF Valves have IPS (US) spigots. Chem-Pure NPP and NPVDF Valves in sizes 1/2" - 2" have metric spigots.
2 The 1 1/4" and 2 1/2" valve sizes are not available in Chem-Pure NPP and NPVDF.
3 Thread for metric bolt.
4 Weights are for the PVC spigot valve style.
5 C_V values are for the spigot valve style, represented by the PVC and CPVC laying length = 2 x L.

Do not use or test the products in this catalog with compressed air or other gases. See Chemtrol Chem-Aire® literature for information about shatter-resistant thermoplastic piping systems specifically designed for compressed air and other gases.