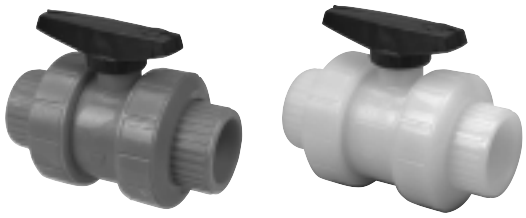
Kynar (PVDF) Tru-Bloc Ball Valves
True Union Red and Natural

150 psi at 73°F water–non-shock–full port



Red Kynar

PVDF, absent of any color pigment, is opaque to ultraviolet light. So while PVDF is one of the few plastic materials that is not degraded by UV radiation, exposure of the fluid medium inside a piping system to direct sunlight can frequently adversely affect its stability. Therefore, all PVDF piping components, including valves that Chemtrol produces for general chemical service, contain an FDA-approved red pigment to mask the penetration of UV rays.

Natural Kynar

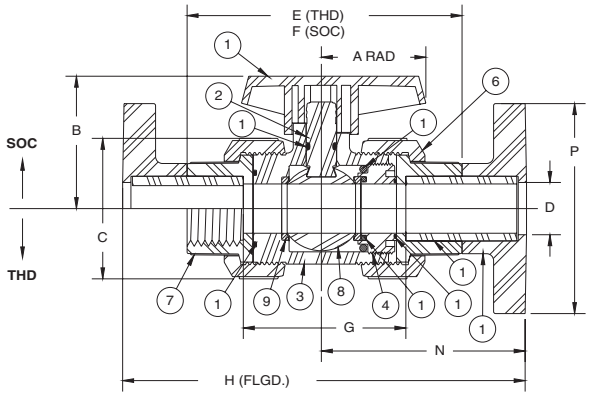
PVDF Type I (polymerized in emulsion) homopolymer is notably free of metallic ions and foreign organic compounds. Extractable ions by 18-megohm water are in the low parts-per-billion. And since the resin does not require processing or other external additives to aid manufacturing or long-term stability, the hard-polish surface of components will remain intact, so that piping systems will not release particulate to the fluid medium. Further, there will be no surface micropores to encourage biological growth. Natural Kynar systems are intended for ultra high pure water and chemical services.

Features

- The laying length of the body and the heavy-duty modified-acme threads in the union connections to the body have not changed in the 30-year history of the valve. This permits fouled valve replacement with a new body cartridge, which will fit the old union nuts. No change in piping length is required.
- Model-C design features, under the TFE seats at both ends of the valve, ensure no leakage around the back-side of the seats. Open piping attached to a filled tank will not start to drip-leak following installation and test of a Chemtrol Tru-Bloc shut-off valve.
- Model-C design, with an energizer O-ring beneath the seat-carrier, enables the valve to automatically adjust for seat wear. Adjustments for envelope squeeze on seats and valve testing are done by machine during factory assembly. Upon installation, a hand-tightened union nut serves to compress the face-seal of a Chemtrol valve.
- Full port design produces minimum flow restriction with the lowest possible pressure drop.
- Valves are manufactured and assembled without exposure to silicone compounds.
- Distinctive black handle indicates "open/close" and direction of flow at a distance. And molded-in arrows on top of the handle dictate rotational direction to personnel for easy operation within 90° stops. For applications requiring handle removal, the D-ring stem flats indicate "open/close" and a molded-in arrow on top of the stem indicates flow direction.
- Refer to the *Chemtrol Valve Actuation Guide* for a full selection of electrical and pneumatic actuators with accessories, including plastic housings and plastic mounting kits for field or factory assembly to valves.

Notes

See page 2 for a list of *Components and Construction Materials.* For more insight into the selection of materials, refer to *Materials,* page 1. *Actuation Mounting Data* and a complete listing of *Optional Accessories* for ball valves begins on page 21. *Installation and Maintenance Instructions* for these valves appear on page 8. For specific relationships of pressure vs. temperature ratings, refer to *Engineering Data*, page 33. For *Chemtrol Valve Standards,* see page 35.



Chemtrol Figure Numbers

Valve Sizes	Material	Elastomeric Trim	End Connections		
			Soc.	Thd.	Flgd.
1/2"– 4"	Red PVDF[1]	FPM (Viton)	S65TB-V	T65TB-V	F65TB-V
1/2"– 4"	Natural PVDF[1]	FPM (Viton)	S66TB-V	T66TB-V	F66TB-V

1 No Kynar pipe, fittings, or valves are offered in the 1 1/4" size.

Dimensions–Weights–Flow Coefficients

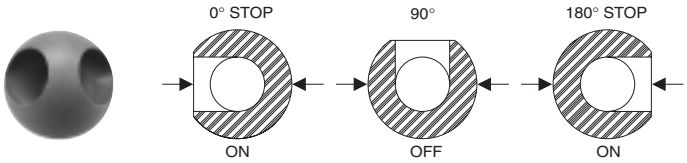
Valve Size[4]	Profile A[1]	B	C	D	N	P	End-to-End E Thd.	F Soc.	G Soc.	H Flgd.	Approx.[2] Wt. Lbs.	Fluid Flow Coefficient C_V[3]
1/2	1.70	1.94	1.95	0.50	2.98	3.41	4.19	4.19	2.49	6.04	0.47	22
3/4	2.12	2.50	2.36	0.75	3.63	3.77	5.00	5.00	3.05	7.32	0.84	55
1	2.12	2.69	2.75	1.00	4.13	4.15	5.50	5.50	3.30	8.06	1.15	112
1 1/2	2.56	3.74	3.98	1.50	4.98	4.86	6.76	6.76	4.06	9.92	2.59	285
2	2.92	4.25	5.13	2.00	5.78	5.82	8.01	8.01	5.06	11.41	5.30	540
3	4.00	5.59	6.99	2.90	7.42	7.31	10.39	10.39	6.70	14.87	12.58	1348
4	8.00	6.05	8.54	3.95	8.52	8.70	12.22	12.22	7.78	17.52	24.41	2602

1 Handle is not symmetrical about the centerline. Dimension shown represents the longest operational radius, but the handle position must be rotated 180° from that shown for the 4" size.
2 Weight shown represents the socket figure.
3 C_V values were computed for the basic valve laying lengths (G).
4 No pipe, fittings, or valves are offered in the 1 1/4" size.

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.

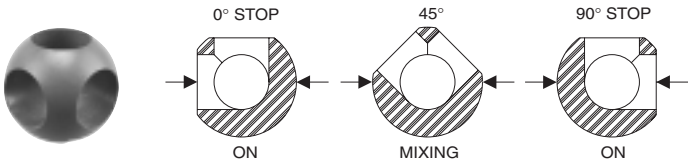
PVC & CPVC 3-Way Ball Valves, True Union 3-Position (Multiport) and 2-Position (Diverter)

150 psi at 73°F water–non-shock–full port*



The Chemtrol True Union Multiport Valve is a 3-Way/3-Position Ball Valve

It is ideally suited for applications where flow direction and on-off control are needed. When the handle is rotated 180°, the three (3) positions of on, off, and on may direct flow from the branch center-inlet to one side run-outlet (at the 0° stop position), then to shut-off (at the 90° position), and then to the opposite side run-outlet (at the 180° stop position). The multiport may also be used to alternately direct flow from either of the side run-inlet ports to the branch center-outlet port, with shut-off at the mid-position (when handle is perpendicular to the body). Cross-contamination of the two inlet streams is prevented at all intermediate positions between the 180° stops.



The Chemtrol True Union Diverter Valve is a 3-Way/2-Position Ball Valve

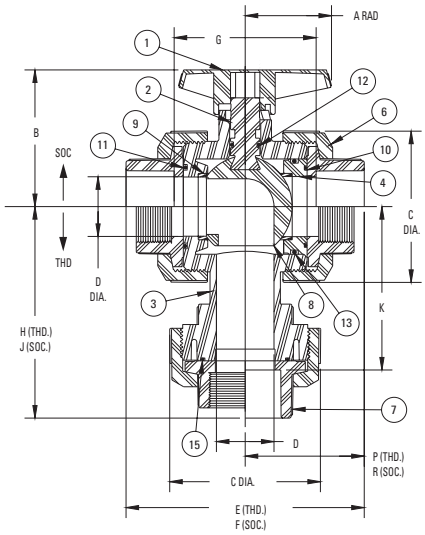
It is used for applications where a quarter-turn will achieve diversion of flow, but shut-off control is not required. When the handle is rotated 90°, the two positions of on and on may direct flow from the branch center-inlet to one side run-outlet (at the 0° stop position), and then to the opposite side run-outlet (at the 90° stop position). The diverter may also be used to alternately divert flow from either of the side run-inlet ports to the branch center-inlet port. The internal porting of the diverter makes no provision for shut-off. Therefore, the valve can be used for proportional mixing at all intermediate positions between the 90° stops.

Features

- The laying length of the body and the heavy-duty modified-acme threads in the union connections to the body have not changed in the 30-year history of the valve. Thus, the True Union design permits the replacement of a fouled valve with a new body cartridge, which will fit the old union nuts that are likely to be permanently attached to adjacent piping. No disruption or length change of connected piping is required.
- FLOW externally molded onto the body to indicate the fixed end containing a TFE seat. Flow can be blocked at this port while adjacent piping is disconnected for repair or alteration.
- ADJ externally molded onto the body to indicate the open end used for assembly. Adjustment of this union nut can compensate for wear of TFE seats, with no production loss to remove valve for internal adjustment.
- Valves are manufactured and assembled without exposure to silicone compounds.
- Full port design produces minimum flow restriction with the lowest possible pressure drop for 90° porting.
- Refer to the *Chemtrol Valve Actuation Guide* for a full selection of electrical and pneumatic actuators with accessories, including plastic housings.

Notes

See page 2 for a list of *Components and Construction Materials*. For more insight into the selection of materials, refer to *Materials,* page 1. *Actuation Mounting Data* and a complete listing of *Optional Accessories* for ball valves begins on page 21. *Installation and Maintenance Instructions* for these valves appear on page 8. For specific relationships of pressure vs. temperature ratings, refer to *Engineering Data*, page 33. For *Chemtrol Valve Standards,* see page 35.



Chemtrol Figure Numbers

Valve Style	Elastomeric Trim	PVC Soc.	PVC Thd.	CPVC Soc.	CPVC Thd.
1/2" – 2" Multiport	FPM	S45M3-V	T45M3-V	S51M3-V	T51M3-V
(3-Way/3-Position)	EPDM	S45M3-E	T45M3-E	S51M3-E	T51M3-E
1/2" – 2" Diverter	FPM	S45D2-V	T45D2-V	S51D2-V	T51D2-V
(3-Way/2-Position)	EPDM	S45D2-E	T45D2-E	S51D2-E	T51D2-E

Dimensions–Weights–Flow Coefficients

Valve Size	Soc. & Thd Figures A[1]	B	C	D	Socket Figures F	G	J	K	R	Approx.[2] Wt. Lbs.	Threaded Figures E	H	P	Approx.[2] Wt. Lbs	Fluid Flow Coefficient C_V[3]
1/2	1.70	1.94	2.00	0.50	4.19	2.41	3.56	2.69	2.13	0.64	4.00	3.50	2.06	0.60	8
3/4	2.12	2.50	2.44	0.75	5.00	2.97	4.19	3.19	2.50	1.15	4.63	4.00	2.31	1.05	19
1	2.12	2.69	2.86	1.00	5.50	3.22	4.63	3.50	2.75	1.59	5.18	4.44	2.63	1.50	36
1 1/4	2.56	3.74	4.08	1.25	6.47	3.94	5.88	4.63	3.25	3.43	6.10	5.63	3.06	3.24	55
1 1/2	2.56	3.74	4.08	1.25	6.76	3.98	6.00	4.63	3.38	3.62	6.15	5.63	3.06	3.37	55
2	2.92	4.25	5.25	2.00	8.01	4.98	7.08	5.63	3.96	7.02	7.35	6.81	3.62	6.25	149

1 Handle is not symmetrical about stem centerline. Dimension shown represents the longest operational radius.

2 Weights shown for socket figures are CPVC models. Weights for threaded figures are PVC models.

3 C_V values were computed using equivalent cylinder length for 90° turn with full bore.

* 1 1/2" valve has conventional port on center outlet.

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Installation and Maintenance Instructions True Union Style Ball Valves

Tru-Bloc – True Union
Tru-Bloc – Single Union
Multiport – 3-Way/3-Position
Diverter – 3-Way/2-Position

Installation

Chemtrol Union-End Ball Valves can be fitted with socket, threaded, or flanged end connections. When joining union-end valves, or when flanging end connectors, **never make the joint to the end connectors while they are attached to the valve body.** Remove the union nuts and end connectors from the valve cartridge first. In order to prevent mishaps with the union nut, slide it (smallest bore first) over the pipe or nipple and flange hub (when flanging) before making the joint to the end connector.

Threaded-End Valves–Refer to the plastic thread joining instructions in the Chemtrol Thermoplastic Piping Technical Manual for proper joining techniques. **Caution: Do not overtighten threads. Usually, one to two turns beyond hand-tight using a suitable strap-wrench, if necessary, is sufficient. (ANSI B1.20.1 defines hand-tight as 4 to 5 threads for sizes through 2" and 5 to 6 3/4 threads for sizes over 2".)**

Socket-End Valves–Refer to the solvent cement joining instructions in the Chemtrol Thermoplastic Piping Technical Manual for proper joining techniques. **Caution: Do not allow purple primer or solvent cement to come in contact with the sealing face of the end connectors. When joining the fixed end of a single union valve, place the ball in the open position to allow for proper drying and to avoid primer or solvent cement contacting internal components of the valve.**

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

Flanged-End Valves–Refer to the plastic flange joining instructions in the Chemtrol Thermoplastic Piping Technical Manual for proper joining techniques. **Caution: Do not overtighten flanges. When flanging the fixed end of single union valves, care should be taken to properly align the flange bolt holes, unless Van Stone type flanges are used.**

Valve Cartridge–After allowing the proper joint drying time, end connections may be joined to the valve cartridge. O-rings provide the seal between the valve cartridge faces and the end connectors. *Ensure that these O-rings are clean and in their proper grooves before slipping the valve cartridge between its end connectors.* Slide the union nuts over the end connectors and screw onto the valve cartridge threads, no more than hand-tight. **Caution: Do not overtighten. Once the end connector engages the O-ring seal, no more than 1/8 to 1/4 turn of the union nut will fully compress the O-ring in its groove.** The pipe supports surrounding the valve must be loose and the adjoining piping must be well aligned with the valve. The union nuts cannot be expected to bend and/or stretch the adjoining pipe in order to allow the end connectors to make the required flush seal against the valve cartridge faces.

Adjustment–The "squeeze" on the operating envelope within the cartridge of *Tru-Bloc Model-C Valves* is optimized during assembly at the factory. 100% of these valves are tested for shell leaks and seat leaks in both directions. Since the seat-carrier, with its seat-energizer O-ring, is adjusted to achieve O-ring compression with no leaks, *field adjustment should not be required.*

The seat-carrier in *multiport and diverter valves* is of the Model-A design, meaning that it is not fastened to the valve body with internal threads. Therefore, the *union nut on the valve end with "ADJ" marked on the body serves the dual purpose of external adjustment* for "squeeze" on the operating envelope within the cartridge, preventing leakage across the ball, as well as compression of the face-seal, preventing shell leakage at the cartridge face. Upon installation of multiport or diverter valves, with the handle parallel with the body and fully against the handle/body stop, tighten that union nut on the "ADJ" body end while minutely operating the handle off the stop and back to the stop. The handle turning torque should become snug, but not excessive when the valve is properly adjusted for leak-free operation. If proper adjustment cannot be made by hand-tightening the union nut (valves larger than 1-1/2"), a suitable strap-wrench may be used. **Caution: Do not overtighten. Do not adjust the union nut with the handle in any position other than fully parallel or perpendicular to the body.**

Maintenance
Should a valve need repair, depressurize and drain the system on all sides of the valve. Loosen the valve union nuts and slide them back over the end connectors. To minimize downtime, it may be advisable to have a replacement valve cartridge ready to install in place of the one to be repaired. An advantage of the Chemtrol design is that the current model is interchangeable with all earlier models. Disassemble valve cartridge as follows:

1. Turn handle to be perfectly perpendicular to valve body.
2. Using a Chemtrol spanner wrench[1], unscrew the seat-carrier (Tru-Bloc Model-C) by rotating in the counterclockwise direction. If the valve is of an earlier Tru-Bloc vintage (Model-B), it will be a retaining ring that is removed. If the valve has the original seat-carrier design (Model-A; Tru-Bloc feature not included; multiport or diverter), this step is unnecessary.
3. Insert a soft, blunt instrument into the valve end marked with the FLOW arrow and push the ball out of the valve end marked with the ADJ. arrow. In Model-A and Model-B valves the seat-carrier will also be pushed out by the ball.
4. Remove the handle from the stem by pulling upward and away from the body.
5. Examine all parts and replace any damaged or worn components. If the body is damaged, replacement of the entire valve cartridge is recommended. The current Model-C cartridge is interchangeable with the Model-A or Model-B valve cartridges.

A replacement parts list for all Chemtrol True Union style ball valves may be found on page 2. The valve should be properly identified before selecting replacement parts. **Caution: Valve repair should only be performed by qualified maintenance personnel. Contact our nearest Chemtrol distributor should further information be required.**

TFE seat kits and O-ring kits are available for all True Union style valves. See page 2 for a list of Components and Construction Materials for more details.

1 The Chemtrol Tru-Bloc Seat-Carrier (Model-C) or Retaining Ring (Model-B) may also be removed using a standard adjustable-face spanner wrench (steel) available from McMaster-Carr (Armstrong brand), or equivalent. Modification, where necessary, is shown below:

Spanner Wrench Identification	Pins		
McMaster-Carr Item No.	Diameter	Width*	Valve Sizes
5481A1	0.18"	0.09"	1/2" - 1 1/2"
5481A2	0.25"	0.22"	2" - 3"
5481A3	0.31"	As Is	4"

* Modified by removing sides of pins equally to produce width. Flats on each pin must be parallel to respective wrench arm.

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PVC and CPVC Horizon Ball Valves

150 psi at 73°F water–non-shock

Features

- Pre-loaded, self-adjusting TFE seats
- Schedule 80 industrial quality at an economy price
- Fluroelastomer O ring seals and self-lubricating TFE seats
- Provides a tight seal through thousands of operations
- Available in 1/2" through 2" iron pipe size, with threaded or socket ends

Chemtrol Figure Numbers

Material	Ends	(1/2" - 2")
PVC	Soc. Thd.	S45HV-V T45HV-V
CPVC	Soc. Thd.	S51HV-V T51HV-V

Notes

For more insight into the selection of materials, refer to *Materials,* page 1. A complete listing of *Optional Accessories* for ball valves begins on page 21. For specific relationships of pressure vs. temperature ratings refer to *Engineering Data*, page 31. For *Chemtrol Valve Standards*, see page 34.

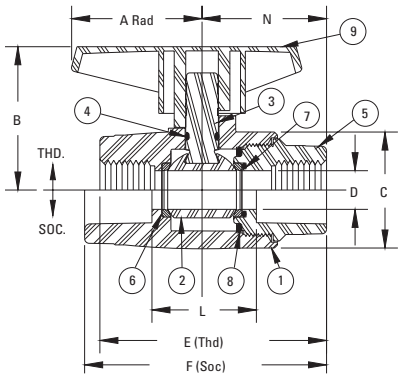
Installation

Threaded Valves–Refer to the plastic threaded joining procedures outlined in the Chemtrol Thermoplastic Piping Technical Manual. **Caution: Do not overtighten joints; one to two turns beyond hand-tight with a strap-wrench is sufficient.**

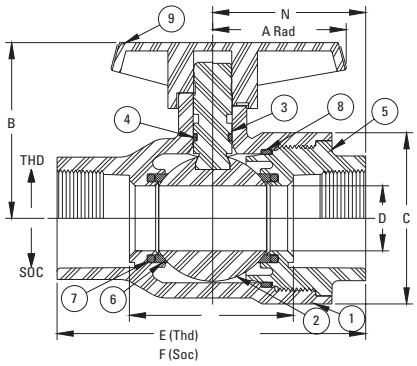
Socket Valves–Refer to the solvent cement joining procedures outlined in the Chemtrol Thermoplastic Piping Technical Manual. **Caution: Place ball in open position before joining. Do not allow purple primer or cement to contact internal components of the valve.**

Maintenance

Horizon Ball Valves are factory assembled and self-adjusting. The valves require no maintenance and are not repairable. **Do not attempt to disassemble. If repairs are necessary, remove valve from system and replace with a new one.**



1/2" – 1" Full Port



1 1/2" – 2" Conventional Port

	Construction	
Item No.	Description	Material
1	Body	PVC or CPVC
2	Ball	PVC or CPVC
3	Stem	PVC or CPVC
4	Stem O-Ring	FPM (Viton)
5	Inlet	PVC or CPVC
6	Seat (2)	TFE (Teflon)
7	Seat O-Ring (2)*	FPM (Viton)
8	Body O-Ring	FPM (Viton)
9	Handle**	PVC

* 1/2" - 1" have seat energizer O-ring under the inlet seat only.
** Round safety handle available as optional accessory.

Dimensions–Weights–Flow Coefficients

	Profile					End-to-End				Fluid Flow Coefficient
Valve Size	A	B	C	D	N	E Thd.	F Soc.	L Soc.	Approx.[1] Wt. Lbs.	C_V[2]
1/2	1.70	1.45	1.50	0.50	1.61	2.93	3.13	1.35	0.24	29
3/4	2.12	2.49	1.94	0.75	1.98	3.58	3.96	1.93	0.44	70
1	2.12	2.63	2.25	1.00	2.25	4.08	4.42	2.14	0.60	138
1 1/2	2.57	3.38	3.29	1.25	2.94	5.93	5.93	3.15	1.42	202
2	2.57	3.50	3.60	1.50	3.38	6.54	6.54	3.51	1.80	307

1 Weight for PVC figures with soc. end connections.
2 C_V values computed for basic valve envelope length (L).