

Type 21 True Union Ball Valves

The Chemline Type 21 True Union Ball valve incorporates state of the art features and performance. This is a full port, full blocking True Union valve pressure rated at 16 bar (230 psi)*. Double stem o-rings are provided for safety. Pneumatic or electric actuator mounting is easily accomplished in the field – Just pull off the handle to reveal an integral ISO mounting platform. The valve base is designed to easily accept bolts for full support if desired.

230 psi Working Pressure
Easy to Actuate in the Field
Double Stem O-Rings for Safety

Features

Pressure rated to 230 psi

- Provides a high factor of safety

Integral Actuator Mounting Platform

- Actuation is easy. Electric or pneumatic actuators may be mounted in the field

Full Port

- High capacity and low pressure drops

Fully Blocking

- Downstream union nut may be safely disassembled for piping maintenance while valve is closed off under full system pressure

Built-In Spanner Wrench

- Top of the handle is designed to be used as a tool for accessing internal parts

Base Mounting Pad

- The valve base incorporates a mounting pad, enabling the valve with an actuator to be bolted securely to a support

High Chemical Resistant Material

- PVC and CPVC compounds have an "A" chemical resistance rating as per ASTM D-1784. They have outperformed other PVC and CPVC compounds on aggressive chemicals.

* PVC, CPVC and PVDF 1/2" to 2" are rated at 230 psi; 2-1/2" to 4" and all size PP valves are rated at 150 psi at 20°C.
† Other materials are available special order.



PVC, CPVC, PP, PVDF

SERIES: Type 21

SIZES: 1/2" – 4"

ENDS: Socket, Threaded, Flanged, Butt, ChemFlare

SEATS: Teflon® PTFE

SEALS: EPDM, Viton®†

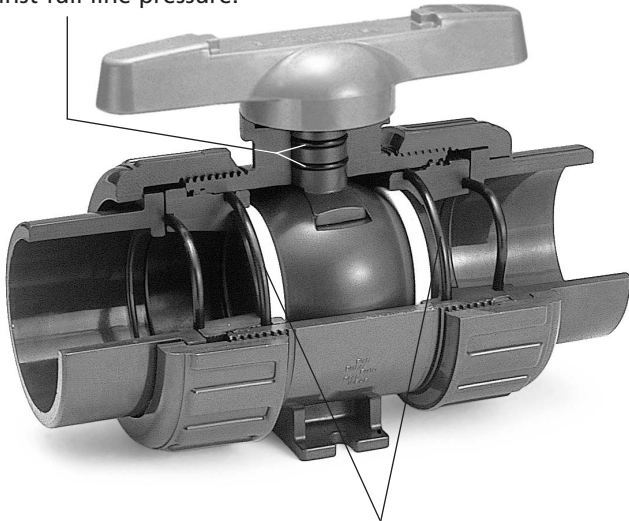


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Double Stem O-Rings for Safety

- Upper o-ring groove is deeper than lower. In case of excessive stem torque, stem will shear at the upper groove, leaving the inner o-ring intact to seal against full line pressure.



Teflon® Seats have Elastomer Cushions

- Improved sealing while lowering stem torques.
- Self adjusts for seat wear



Pneumatic and Electric Actuators

- New PPG plastic actuator mounting brackets are designed for high strength and corrosion resistance



Built in Spanner Wrench

- For tightening and loosening the seat carrier
- All parts are replaceable



Integral Actuator Mounting Platform

- Actuation is easy. Electric or pneumatic actuators may be mounted in the field. Simply pull off the handle to reveal an ISO standard mounting platform which accepts bolt-on hardware.



Base Mounting Pad

- Permits actuated valves to be securely anchored
- Valves may be used as fixation points in the piping system



Fully Blocking

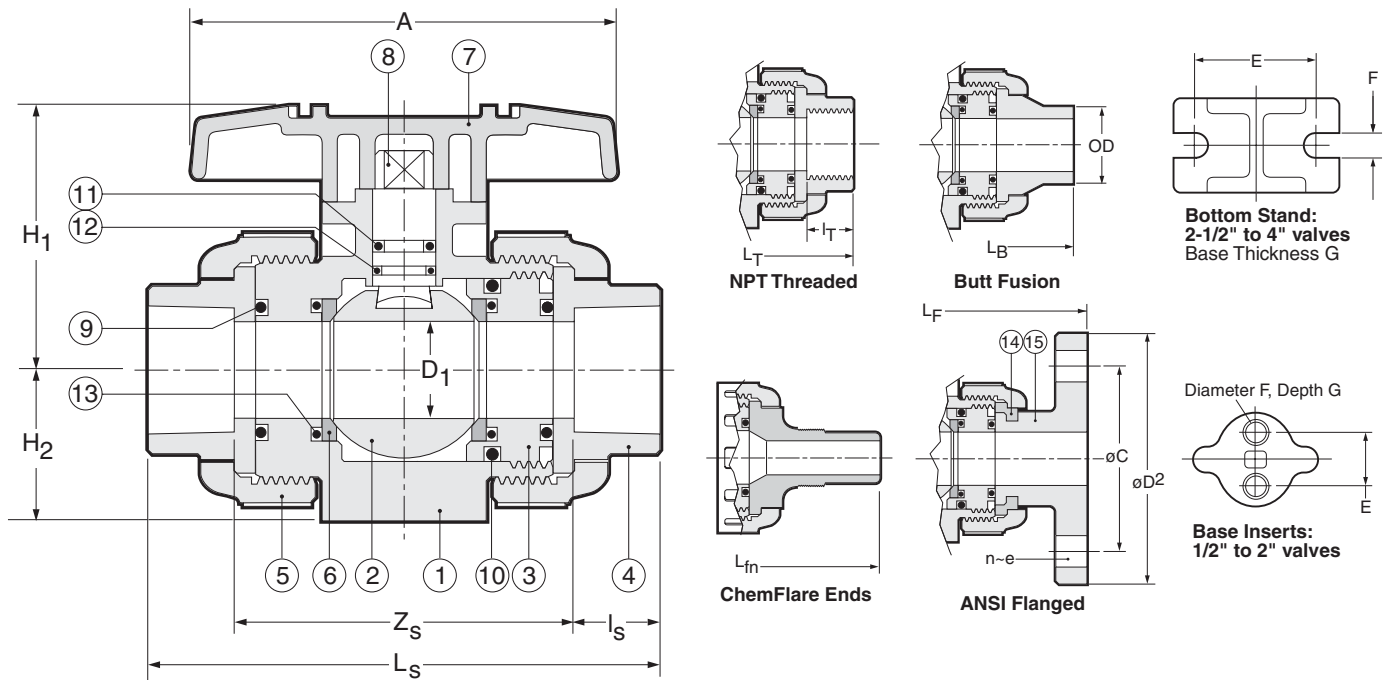
- Downstream pipe may be removed while upstream side is still pressurized. This may be done with valve installed in either direction.



ChemFlare Ends

- For connection to Teflon® tube. Prevents leakage in difficult services such as sodium hypochlorite

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PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
1	Body	1	PVC, CPVC, PP, PVDF
2	Ball	1	PVC, CPVC, PP, PVDF
3	Carrier**	1/2	PVC, CPVC, PP, PVDF
4	End Connector	2	PVC, CPVC, PP, PVDF
5	Union Nut	2	PVC, CPVC, PP, PVDF
6▲	Ball Seat	2	PTFE
7	Handle	1	ABS

* EPDM seals standard with PVC, CPVC, PP; Viton® with PVDF valves.

** 1 carrier 1/2"- 2", 2 carriers 2-1/2"- 4".

† 2 pcs 1/2"- 2", 6 pcs 2-1/2"- 4".

PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
8	Stem	1	PVC, CPVC, PP, PVDF
9▲	Face O-Ring*	2	EPDM, Viton®
10▲	Carrier O-Ring*	2	EPDM, Viton®
11▲	Upper Thicker Stem O-Ring*	1	EPDM, Viton®
12▲	Lower Thinner Stem O-Ring*	1	EPDM, Viton®
13	Seat Cushion*	2	EPDM, Viton®
14	Flange Retainer†	2/6	PVDF
15	Flange	2	PVC, CPVC, PP, PVDF

DIMENSIONS INCHES

Size	D				End Connections														Valve Base		
					Socket			Threaded		Factory Flanged				Butt		ChemFlare					
	Bore	A	H ₁	H ₂	L _s	Z _s	I _s	I _T	L _T	L _F	D ₂	C	n	Øe	L _B	OD	L _{fn}	Tube	E	F*	G
1/2"	.59	3.6	2.03	1.14	4.45	2.70	.875	.64	4.02	5.63	3.50	2.38	4	.62	4.88	.79	6.12	1/2"†	.75	.29	.43
3/4"	.79	3.9	2.34	1.38	5.08	3.08	1.00	.65	4.72	6.77	3.88	2.75	4	.62	5.67	.98	6.52	3/4"	.75	.29	.43
1"	.98	4.3	2.68	1.54	5.75	3.50	1.13	.81	5.16	7.36	4.25	3.12	4	.62	6.06	1.26	7.26	1"	.75	.29	.43
1-1/4"	1.22	4.8	3.17	1.85	6.46	5.21	1.25	.85	5.91	7.48	4.62	3.50	4	.62	6.85	1.57	-	-	1.18	.35	.59
1-1/2"	1.57	5.2	3.50	2.17	7.24	4.49	1.38	.85	6.42	8.35	5.00	3.88	4	.62	7.64	1.97	-	-	1.18	.35	.59
2"	2.01	6.3	4.02	2.60	8.23	5.23	1.50	1.90	7.76	9.21	6.00	4.75	4	.75	8.82	2.48	-	-	1.18	.35	.59
2-1/2"	2.28	7.87	4.96	2.83	9.45	5.95	1.75	1.21	8.46	10.20	7.00	5.49	4	.75	9.72	2.95	-	-	1.89	.35	.23
3"	2.70	9.45	5.51	3.35	11.10	7.35	1.88	1.30	10.39	11.97	7.50	6.00	4	.75	11.61	3.54	-	-	2.17	.43	.28
4"	3.54	11.81	7.01	4.33	13.88	9.87	2.00	1.38	14.17	14.65	9.00	7.50	8	.75	14.76	4.33	-	-	2.56	.43	.32

* Optional threaded inserts: 1/2" to 1" valves - UNC 1/4"-20; 1-1/4" to 2" valves - UNC 5/16"-18.

"Recoil" brand inserts require drilling before insertion.

† Tube size can be reduced to 1/4" tube, L_{fn} = 5.52".

Type 21 True Union Ball Valves



WORKING PRESSURES PSI, Water, Non-Shock

VACUUM RATING • 29.9 inches mercury

Size	PVC			CPVC						PP			PVDF				
	20°C 68°F	40°C 104°F	50°C 122°F	20°C 68°F	40°C 104°F	50°C 122°F	60°C 140°F	80°C 176°F	90°C 194°F	20°C 68°F	60°C 140°F	80°C 176°F	20°C 68°F	40°C 104°F	60°C 140°F	80°C 176°F	100°C 212°F
1/2" - 2"	230	165	150	230	165	150	120	75	55	150	85	55	230	185	150	110	85
2-1/2" - 4"	150	150	150	150	150	150	120	75	55	150	70	40	150	150	150	110	85

Temperature Ranges: PVC 0 to 60°C (32 to 140°F), CPVC 0 to 95°C (32 to 203°F), PP -20 to 80°C (-4 to 176°F), PVDF -40 to 100°C (-40 to 212°F).

WEIGHTS LB. THREADED or SOCKET **WEIGHTS** LB. FLANGED

Size	PVC	CPVC	PP	PVDF	PVC	CPVC	PP	PVDF
1/2"	0.4	0.4	0.4	0.4	0.9	0.9	0.7	1.1
3/4"	0.7	0.7	0.7	0.9	1.3	1.5	1.1	1.5
1"	0.9	1.1	0.9	1.1	1.8	2.0	1.5	2.2
1-1/4"	1.5	1.5	1.3	1.8	2.6	2.9	2.0	3.3
1-1/2"	2.4	2.6	1.5	2.9	3.7	4.0	2.6	4.4
2"	4.0	4.4	2.6	4.9	5.5	6.0	4.0	8.2
2-1/2"	5.1	5.5	3.7	6.2	7.3	7.7	5.3	8.8
3"	8.2	8.8	5.5	9.9	10.1	11.0	7.5	12.6
4"	19.4	21.8	13.2	24.9	21.6	23.4	15.4	26.7

C_v VALUES VS. BALL ANGLE

Size	0%	25%	50%	75%	100%
1/2"	0	0.35	1.3	5.5	14.
3/4"	0	0.73	2.8	11.5	29.
1"	0	1.2	4.5	18.6	47.
1-1/4"	0	1.8	6.8	28.4	72.
1-1/2"	0	3.9	14.7	61.2	155.
2"	0	4.8	18.0	75.0	190.
2-1/2"	0	9.1	34.7	144.0	365.
3"	0	10.2	39.0	162.0	410.
4"	0	17.0	64.6	269.0	680.

SAMPLE SPECIFICATION

- All True Union Ball Valves in PVC, CPVC, PP or PVDF shall be specified *Chemline Type 21 or equal* sizes 1/2" to 2" in PVC, CPVC, and PVDF rated at 230 psi and in PP 150 psi maximum working pressure. Sizes 2-1/2", 3" and 4" rated at 150 psi maximum working pressure with EPDM, Viton®, CPE, Hypalon, or Nitrile seals. Cushioned Teflon® PTFE ball seats shall be provided for positive closure with minimum stem torques.
- All valve sizes 1/2" to 4" shall be supplied with double stem blowout-proof stem o-rings for safety. The top o-ring groove shall be deeper so that if excessive force is applied it would shear and the lower o-ring would remain intact and the valve will continue to hold pressure.
- All valves shall be full port and two-way blocking.
- Socket ends in PVC and CPVC shall be Schedule 80 and conform to ASTM D-2467.
- Threaded ends shall be Schedule 80 and conform to ASTM D-2464. PP threaded ends shall have stainless steel reinforcing bands to prevent creep.
- Butt fusion ends in PP or PVDF will be compatible with *Chemline PP or PVDF piping systems*.
- Flanged ends shall be ANSI Class 150 one-piece factory molded using no nipples or fabrication to ensure maximum strength and close tolerance end to end dimensions and eliminating the possibility of joint failures.
- PVC compound shall have an ASTM cell classification 12454-A with a minimum suffix "A" designation for chemical resistance as per ASTM D-1784 (CSA report LO 4000-172).
- All CPVC compound shall have an ASTM cell classification 23567-A with a minimum suffix "A" designation for chemical resistance as per ASTM D-1784.
- PVC and CPVC compound and EPDM seals shall be CSA Standard B137.0 para 5.2.1. environmental requirements for toxicity (CSA Report LO 4000-1459).
- All PP materials are conformed ASTM D-4101 PP 021 B 67272 material requirements.
- All PVDF material shall be unpigmented conforming to ASTM D-3222 Type 2 suspension resin material requirements and also will be USDA Title 21 Chapter 1 Part 177. 2510 requirements for contact with food.
- All valves shall be custom tagged with manufacturers' inspection number to provide traceability.

ORDERING EXAMPLE

Chemline Type 21 True Union Ball Valve	21	A	020	E	S
Body Material	A – PVC B – PP	C – CPVC K – PVDF			
Size ¹	002 – 1/4" 003 – 3/8" 005 – 1/2" 007 – 3/4" 010 – 1" 012 – 1-1/4" 015 – 1-1/2" 020 – 2" 025 – 2-1/2" 030 – 3" 040 – 4" 060 – 6"				
Seals	E – EPDM V – Viton® C – CPE ² B – Nitrile ³ A – Aflas				
Ends	S – Socket T – Threaded F – Flanged B – Butt FN-1 – ChemFlare				

¹ 1/4" and 3/8" are 1/2" valves reduced. 6" is 4" valve with 6" end connections.

Example: Chemline Type 21 True Union Ball Valve, PVC, 2", with EPDM seals, socket ends.

² CPE = Chlorinated Polyethylene. ³ Nitrile is also called "Buna-N".

OPTIONS & ACCESSORIES

- **Alternate O-Ring Seals** – Nitrile, CPE, etc.
- **Electrically Actuated** – Refer to separate data sheets
- **Pneumatically Actuated** – Refer to separate data sheets
- **Stem Extension** made to any length
- **Limit Switches** – For open and/or closed position indication
- **Handle Lockout** – Field mountable
- **Municipal Operating Nut**
- **Lubrication-free Valves** – Factory clean room assembled



55 Guardsman Road, Thornhill, Ontario, Canada, L3T 6L2
 Tel: 905-889-7890 info@chemline.com
 Fax: 905-889-8553 www.chemline.com



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