



CHEMLINE TYPE 21 BALL VALVES

Data Page



SERIES: Type 21

SIZES: 3/8" – 4"

ENDS: Socket, Threaded, Combo⁷, Flanged, Butt¹ or ChemFlare™

SEATS: PTFE

SEALS²: EPDM, FKM (Viton®), CPE³

CRN
Registered
Corrosive Chemical



Features

Pressure rated to 230 psi⁴

- 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

Safety Shear Stem Design

- Stem has double o-rings
- Designed to hold full pressure even if stem breaks due to excessive torque

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.

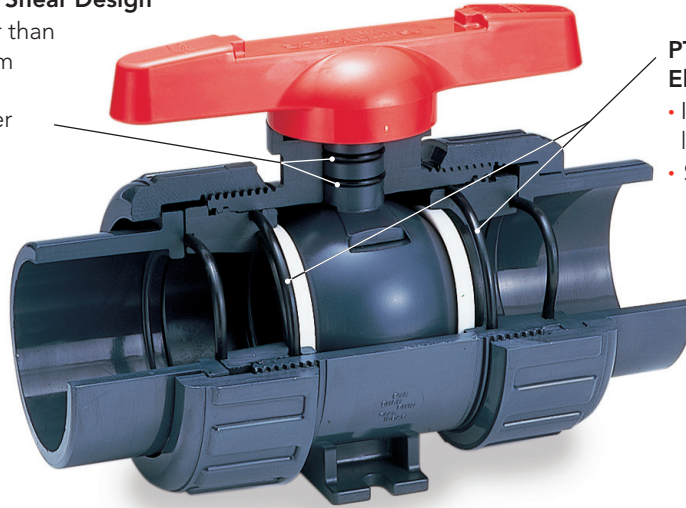
CRN Registration numbers by province

- Ontario: OC11045.5
- Newfoundland: OC11045.50
- Saskatchewan/Manitoba/Quebec: OC11045.56
- New Brunswick: OC11045.57
- Nova Scotia: OC11045.58
- P.E.I.: OC11045.59
- British Columbia: not required
- Alberta: not required⁶

Features

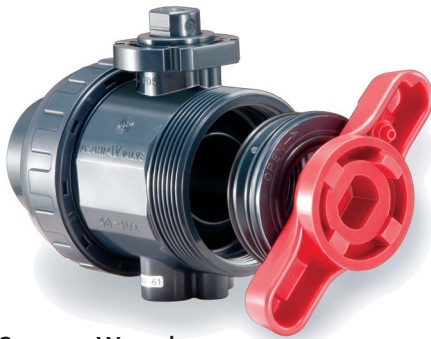
Double Stem O-Rings – Safety Shear Design

- 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.



PTFE Seats have Elastomer Cushions

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



Built in Spanner Wrench

- For removing or tightening 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 a standard ISO 5211 mounting platform which accepts bolt-on hardware.



Fully Blocking

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



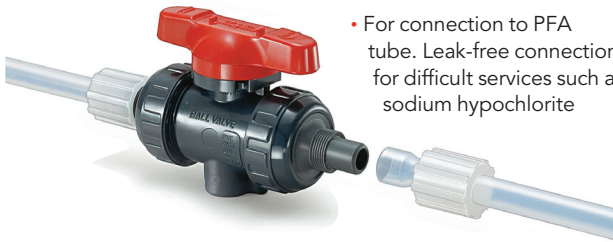
Base Mounting Pad

- Optional threaded inserts allow valves to be securely anchored
- Supplied standard with actuated valves

options + accessories

ChemFlare™ Ends

- For connection to PFA tube. Leak-free connections for difficult services such as sodium hypochlorite



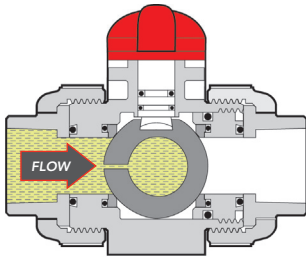
One-piece moulded PVC and CPVC 6" socket ends

- Allows installation of 4" valve in 6" line
- Factory moulded, not fabricated with couplings and reducers cemented together
- Fixed to valve mechanically just like the one-piece moulded factory flanges



Optional Lock-out Handle & Hasp

- To prevent unauthorized operation of the valve during maintenance shut-downs
- Padlocks go through holes in hasp



Vented Ball

- Recommended for all sodium hypochlorite services
- Valve shown in closed position

Different Colour Handles

- Choose a handle colour other than standard red for colour coding different services



Municipal Operating Nut

- 2" square nut for operating valves below grade using a standard municipal "key"
- Stainless Steel for corrosion resistance



Manual Limit Switch

- Electrical feedback of manual valve position
- NEMA 4X enclosure, position indicator beacon, 2x SPDT or proximity switches, stainless steel hardware

Shaft Extensions

- Different materials and lengths are available
- Several designs:
 - with no housing for indoors
 - with waterproofed PVC housing for indoors or outdoors
 - with stainless steel housing for buried or actuated services



electric + pneumatic actuation

Pneumatic and Electric Actuators

- A complete range of actuators and control accessories are available, mounted to valves using PPG plastic brackets and stainless steel couplings. Refer to separate data sheets.
- All actuators are CSA approved, have NEMA 4X enclosures, stainless steel hardware and permanently lubricated gear train



ERS Series Electric

- Type 21 ball valves up to 2"
- 180 in-lbs torque
- On-Off (3 wire, 2-wire)
- Visual feedback

E Series Electric

- Type 21 ball valves up to 4"
- Up to 885 in-lbs torque
- On-Off (3 wire, 2 wire); optional failsafe, modulating
- Visual feedback and feedback switches; optional extra switches, feedback potentiometer and feedback transmitter



Q Series Electric

- Type 21 ball valves up to 3"
- 300 in-lbs torque
- On-Off (3 wire) adjustable travel, optional On-Off (2 wire), failsafe 3-position, modulating
- Visual feedback, optional 2 feedback switches, feedback potentiometer and feedback transmitter



A Series Electric

- Type 21 ball valves up to 6"
- up to 2,000 in-lbs torque
- On-Off (3 wire) adjustable travel, optional On-Off (2 wire), failsafe multi-turn, 3 position modulating, BUS
- Visual feedback, optional 2 feedback switches, feedback potentiometer and feedback transmitter



V Series Electric

- with Local Control Station
- Type 21 ball valves up to 6"
- up to 8,850 in-lbs torque
- On-Off (2/3 wire) adjustable travel, optional failsafe, modulating, BUS
- Visual feedback, 2 feedback switches, optional 2 extra feedback switches, feedback potentiometer and feedback transmitter



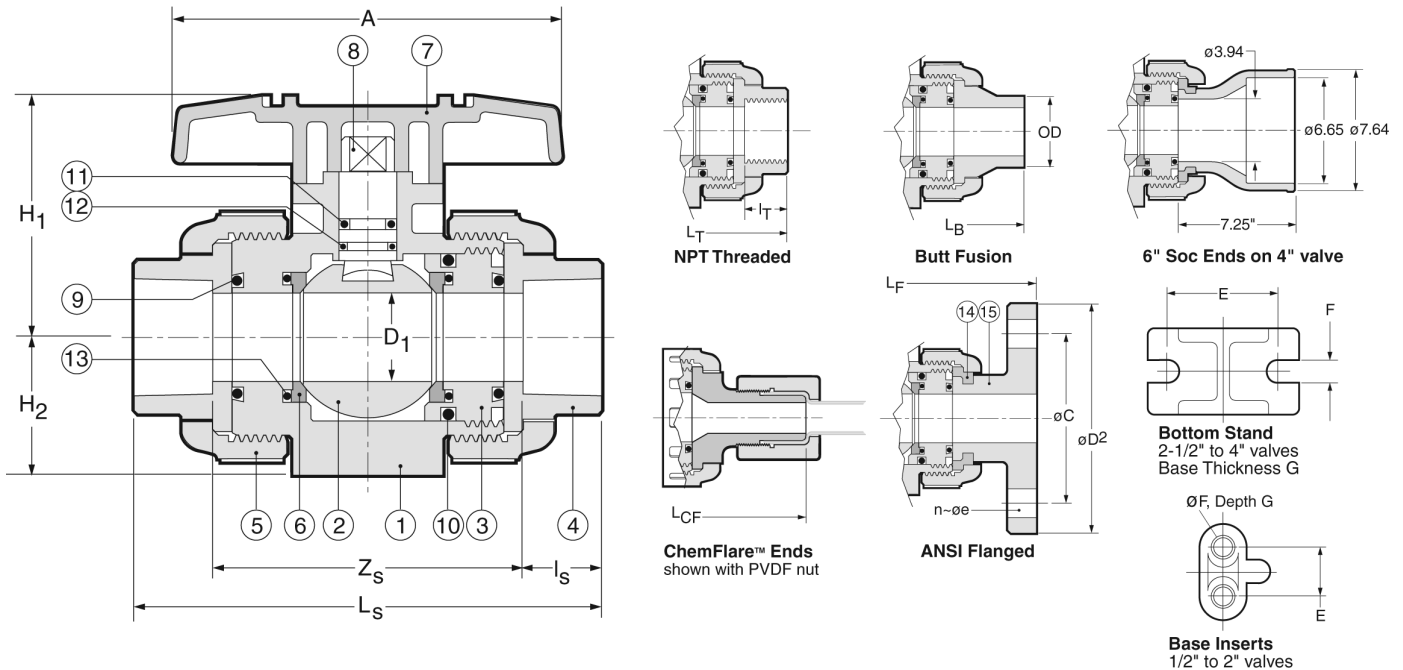
PA Series Pneumatic

- Type 21 ball valves up to 6"
- up to 10,660 in-lbs torque
- industrial process submerged
- bleach/water washdown
- Rilsan-coated aluminum



PP Series Pneumatic

- Type 21 ball valves up to 6"
- up to 1,335 in-lbs torque
- industrial process with minimal use of metal
- Glass-filled Polyamide



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	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

¹ 1 carrier for sizes 1/2" to 2", 2 carriers for sizes 2-1/2" to 4"

² EPDM seals standard with PVC, CPVC, PP; FKM (Viton®) with PVDF valves

³ 2 pcs 1/2" to 2", 6 pcs 2-1/2" to 4"

PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
8	Stem	1	PVC, CPVC, PP, PVDF
9▲	Face O-Ring ²	2	EPDM, FKM (Viton®)
10▲	Carrier O-Ring ²	2	EPDM, FKM (Viton®)
11▲	Upper Thicker Stem O-Ring ²	1	EPDM, FKM (Viton®)
12▲	Lower Thinner Stem O-Ring ²	1	EPDM, FKM (Viton®)
13	Seat Cushion ²	2	EPDM, FKM (Viton®)
14	Flange Retainer ³	2/6	PVDF
15	Flange	2	PVC, CPVC, PP, PVDF

DIMENSIONS INCHES

Size	D				End Connections													Valve Base			
	Bore	A	H ₁	H ₂	Socket		Threaded		Factory Flanged				Butt		ChemFlare™		E	F ⁵	G		
					L _S	Z _S	I _S	I _T	L _T	L _F	D ₂	C	n	e	L _B	OD				L _{CF}	Tube ⁴
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	9.58	1-1/4"	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
6" ⁶	3.54	11.81	7.01	4.33	23.15	17.09	3.03	-	-	-	-	-	-	-	-	-	-	-	2.56	.43	.32
6" ⁷	3.54	11.81	7.01	4.33	27.22	21.21	3.03	-	-	-	-	-	-	-	-	-	-	-	2.56	.43	.32

⁴ ChemFlare™ ends are available for reduced tube sizes down to 1/4"

⁵ 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.

⁶ 6" with factory moulded socket ends

⁷ 6" with fabricated socket ends

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 50°C (32 to 122°F), CPVC 0 to 90°C (32 to 194°F), PP –20 to 80°C (–4 to 176°F), PVDF –20 to 100°C (–20 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

Cv 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 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, FKM (Viton®) or CPE seals. Ball seats shall be PTFE with elastomer cushions for closure with minimum stem torques.
- All valves will have Safety Shear stem design, blowout-proof with double o-rings for safety. The top o-ring groove shall be deeper so that if the stem breaks off under excessive torque the lower o-ring will remain intact and the valve will hold pressure.
- All valves shall be full port and two-way blocking design.
- All valves will be CRN (Canadian Registration Number) registered with TSSA.
- PVC valves with EPDM or FKM (Viton®) seals shall be certified under NSF/ANSI Standard 61 for contact with drinking water.
- All valves shall have chemical resistant labels permanently marked with manufacturing number to provide production level traceability.
- 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).
- CPVC compound shall have an ASTM cell classification 23567-A with a minimum suffix "A" designation for chemical resistance as per ASTM D-1784.
- PP material will conform to ASTM D-4101 PP 021 B 67272 material requirements.
- PVDF material shall be unpigmented conforming to ASTM D-3222 material requirements and to be USDA Title 21 Chapter 1 Part 177. 2510 requirements for contact with food.
- 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.
- Butt fusion ends in PP or PVDF will be compatible with Chemline PP or PVDF metric piping systems.
- Flanged ends shall be ANSI Class 150 one-piece factory moulded (not fabricated) to ensure maximum strength and close tolerance end to end dimensions.

ORDERING EXAMPLE

Chemline True Union Ball Valves	21	A	020	E	S
Body	A – PVC	C – CPVC			
Material	B – PP	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 – FKM (Viton®)	C – CPE	N – Nitrile	A – Aflas®
Ends	S – Socket	T – Threaded	C – Combo ²	F – Flanged	B – Butt ³ CF – ChemFlare™

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

¹1/4" is normally the 3/8" valve reduced. 6" is 4" valve with 6" end connections.

²PVC and CPVC valves 1/2" to 2" are available as Combo (socket and threaded ends).

³PP, PVDF and ECTFE (Halar®) metric butt fusion ends (1/2" to 4") connect to Chemline PP, PVDF and ECTFE (Halar®) piping systems.

OTHER OPTIONS & ACCESSORIES

- **Alternate O-Ring Seals**
- **Stem Extensions** made to any length
- **Limit Switches** – For open and/or closed position indication
- **Municipal Operating Nut**
- **Lubrication-free Valves** – Factory clean room assembled
- **Vented Ball** – For sodium hypochlorite applications