



True Union 2000 Ball & Ball Check Valves



ENGINEERING GUIDE

Contact Spears® for any Information not found.

Valves Technical
True Union 2000 Valve Overview



One of the Most Versatile, Compact Valve Designs Available

Spears® True Union 2000 Ball Valves, 3-Way Ball Valves and Ball Check Valves provide maximum versatility with fully interchangeable valve cartridges. Provides for easier system design modifications and upgrades in multiphase projects, or anywhere changes in valve types are desired. Simply exchange any True Union 2000 valve in-line using existing union nuts. Also mates with Spears® new 2000 Pipe Unions. All True Union 2000 valves feature a low profile, compact design for minimal space requirements. Additionally, Spears® offers valve Retrofit Kits for easy in-line replacement of other valves and factory installed Actuation Packages.



**True Union 2000
Industrial Ball Valve**



**True Union 2000
Industrial Ball Check Valve**



**True Union 2000
Standard Ball Valve**



**True Union 2000
Industrial 3-Way Horizontal
Diverter Ball Valve &
3-Way Full Port Ball Valve
with Branch shut-Off**



**True Union 2000
Industrial 3-Way Vertical
Ball Valve &
3-Way Full Port Ball Valve
with Branch shut-Off**



**True Union 2000
Industrial Tee-Style
Ball Valve**



True Union 2000 Industrial Ball Valves



Features — PVC, CPVC

This multi-featured, space saving quarter-turn shutoff valve is designed to meet the demands of today's industrial and chemical processing applications. PVC and CPVC valves are available in IPS sizes 1/2" through 6" with socket/regular thread, SR (Special Reinforced) thread, flanged or spigot end connectors and 8" Venturied valve with socket or flanged ends. Also available in metric socket and BSP thread sizes 1/2" through 2".

Sample Engineering Specification

All thermoplastic ball valves shall be True Union 2000 Industrial type manufactured to ASTM F 1970 and constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or FKM. All valves shall have Safe-T-Shear® stem with double O-ring stem seals. All valve handles shall be polypropylene with built-in lockout mechanism. All valve union nuts shall have Buttress threads. All seal carriers shall be Safe-T-Blocked®. All valve components shall be replaceable. Valves in sizes 1/2" through 4" with EPDM shall be listed by NSF® for use in potable water service. All 1/2" through 4" valves shall be pressure rated to 235 psi, all 6" and 8" Venturied and all flanged valves shall be pressure rated to 150 psi for water at 73°F.

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Number ^{1,2}					Pressure Rating
		Socket	Threaded	SR Threaded	Flanged	Spigot	
1/2	EPDM	1829-005	included	1821-005SR	1823-005	1827-005	235 psi Non-Shock Water @ 73°F
	FKM	1839-005	included	1831-005SR	1833-005	1837-005	
3/4	EPDM	1829-007	included	1821-007SR	1823-007	1827-007	
	FKM	1839-007	included	1831-007SR	1833-007	1837-007	
1	EPDM	1829-010	included	1821-010SR	1823-010	1827-010	
	FKM	1839-010	included	1831-010SR	1833-010	1837-010	
1-1/4	EPDM	1829-012	included	1821-012SR	1823-012	1827-012	
	FKM	1839-012	included	1831-012SR	1833-012	1837-012	
1-1/2	EPDM	1829-015	included	1821-015SR	1823-015	1827-015	
	FKM	1839-015	included	1831-015SR	1833-015	1837-015	
2	EPDM	1829-020	included	1821-020SR	1823-020	1827-020	(Flanged 150 psi Non-Shock) Water @ 73°F
	FKM	1839-020	included	1831-020SR	1833-020	1837-020	
2-1/2	EPDM	1822-025	1821-025	1821-025SR	1823-025	1827-025	
	FKM	1832-025	1831-025	1831-025SR	1833-025	1837-025	
3	EPDM	1822-030	1821-030	1821-030SR	1823-030	1827-030	
	FKM	1832-030	1831-030	1831-030SR	1833-030	1837-030	
4	EPDM	1822-040	1821-040	1821-040SR	1823-040	1827-040	
	FKM	1832-040	1831-040	1831-040SR	1833-040	1837-040	
6	EPDM	1822-060	1821-060	1821-060SR	1823-060	1827-060	
	FKM	1832-060	1831-060	1831-060SR	1833-060	1837-060	
8 ³	EPDM	1822-080	—	—	1823-080	—	150 psi Non-Shock Water @ 73°F
	FKM	1832-080	—	—	1833-080	—	

1) For CPVC, add the letter "C" following the size code of part number listed (e.g., 1829-005C, 1821-005CSR)

2) For Special Ball Vent Design, add the letter "V" before the dash separator (e.g., 1829V-005, 1821V-005CSR)

3) 8" Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters.

- Chemical & Corrosion Resistant PVC or CPVC Construction
- Also available in Spears® High Purity, Low Extractable PVC Material
- Interchangeable with all True Union 2000 Valves Mates with Union 2000 Pipe Unions
- High Impact Polypropylene Handle
- Built-in Handle Lockout
- Schedule 80 Full-Port Design
- Strong, Buttress Thread Union Nuts
- Spears® Double O-ring Safe-T-Shear® Stem Design
- EPDM or FKM O-rings
- Spears® Safe-T-Blocked® Seal Carrier
- Self Adjusting PTFE Floating Seat Design
- Fully Serviceable, Replaceable Components
- Sizes 1/2" - 4" pressure rated to 235 psi @ 73°F. Sizes 6" and 8" Venturied and all Flanged to 150 psi @ 73°F.
- Valves in sizes 1/2" through 4" with EPDM are NSF® Certified for Potable Water use
- Suitable for Vacuum Service
- Assembled with Silicone-Free, Water Soluble Lubricants
- Manufactured to ASTM F 1970

Optional Vented Ball Valves

Same valve with special ball vent design for sodium hypochlorite (bleach) and other chemical applications where entrapped fluids may form caustic crystalline residues and pressure build up from gases developed. Valve has a 1/8" vent hole in ball to equalize internal fluid pressures. Install valve with ball vent on the pressure (upstream) side when in closed position.

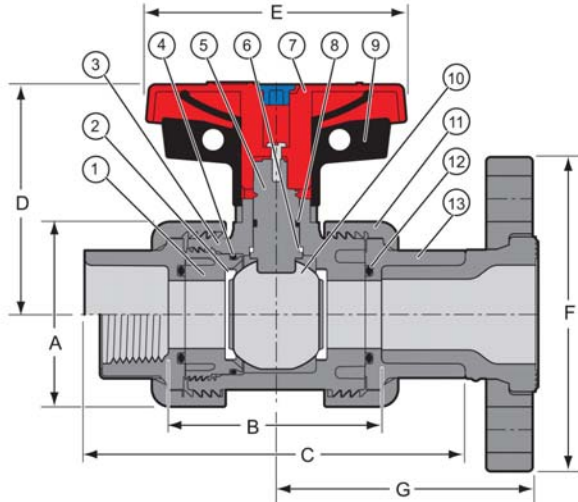
Optional Accessories*

- Retro-Fit End Connector Sets for Valve Replacement
- Split-Nut Repair Kits for Union Nut Replacement
- Supplemental End Connectors
- Round Safety Handles
- Handle Lockout Ring
- Stem Extension Kits
- Square Operator Nuts
- Multi Mount Valve/Actuation Mounting Kits
- Mini-Mount Actuation Mounting Kits

* See **"BALL VALVE ACCESSORIES"** section for details of individual products.

Valves Technical

True Union 2000 Industrial Ball Valves



Replacement Parts

No.	Component	Qty.	Material
1	Seal Carrier	1	PVC/CPVC
2	Seat	2	PTFE
3	Body	1	PVC/CPVC
4	Carrier O-ring	1	EPDM/FKM
5	Stem	1	PVC/CPVC
6	Stem Bearing	1	PP
7	Handle	1	PP
8	Stem O-ring	2	EPDM/FKM
9	Handle Lock	1	PP
10	Ball	1	PVC/CPVC
11	Union Nut	2	PVC/CPVC
12	End Connector O-ring	2	EPDM/FKM
13	End Connector	2	PVC/CPVC

1: An additional O-ring is used behind each seat on 2-1/2" or larger.

Dimensions, Weights, Operating Torque & C_v Values

Nominal Size	Dimensions Reference (inches, ± 1/16)										Approx. Wt. (Lbs.)		Oper. ² Torque (in. lbs.)	C _v ³ Values		
	A	B ¹		C			D	E	F	G	PVC	CPVC		Soc/Thd	Flanged	Spigot
		Soc/Thd	Spigot	Socket	Thread	Spigot										
1/2	1-15/16	2-1/2	2-7/8	4-1/4	3-3/16	4-5/8	2-9/16	2-7/8	3-1/2	2-31/32	.36	.38	16	29	18	27
3/4	2-3/8	2-13/16	3-1/4	4-13/16	4-1/4	5-1/4	2-7/8	3-3/8	3-7/8	3-3/8	.56	.58	17	63	39	57
1	2-5/8	2-15/16	3-1/2	5-3/16	4-11/16	5-3/4	3-1/16	3-1/2	4-1/2	3-5/8	.74	.77	22	120	73	108
1-1/4	3-3/16	3-5/16	3-13/16	5-13/16	5-3/16	6-5/16	3-9/16	3-7/8	4-5/8	3-31/32	1.13	1.19	28	243	151	223
1-1/2	3-9/16	3-9/16	4	6-5/16	5-7/16	6-3/4	4	4-3/16	5	4-3/8	1.54	1.60	61	357	223	333
2	4-5/16	4-13/16	5-3/16	7-13/16	7-13/16	8-1/4	4-7/16	5-1/8	6	5-1/4	2.72	2.85	77	599	395	571
2-1/2	6-3/16	7-1/16	7-13/16	10-9/16	9-11/16	11-3/8	5-7/8	7-5/8	7-1/2	6	7.42	7.70	132	856	579	734
3	6-3/16	7-1/16	7-13/16	10-13/16	9-7/8	11-9/16	5-7/8	7-5/8	7-1/2	6-13/16	7.46	7.81	132	1416	974	1322
4	7-3/4	7-3/8	8-1/4	11-7/8	10-1/4	12-3/4	6-3/4	9	9	7-1/2	12.35	12.48	396	2865	1952	2672
6	11-5/8	11-3/16	13	17-5/16	15-3/4	18-1/2	8-1/8	14-1/4	11-1/4	10-3/16	37.53	40.55	732	6638	4824	6149
8 ⁴	11-5/8	23-1/4	---	31-3/4	---	---	8-1/8	14-1/4	13-1/2	17-13/16	50.84	55.92	732	N/A	N/A	N/A

1: Valve Lay Length

2: Torque required at valve maximum internal pressure rating, 5ft/sec. Flow velocity; due to adjustment differences during installation, actual values may vary.

3: Gallons per minute at 1 psi pressure drop. Valves calculated from laying length, based on derivative of Hazen-Williams equation with surface roughness factor of C=150.

4: 8" Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters.

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 4"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	6" and 8"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

NOTE: Flanged Valves have a base pressure rating of 150 psi.



True Union Industrial 3-Way Full Port Ball Valves

**Quick-View Valve Selection Chart**
3-Way Vertical Full Port Ball Valve

Valve Size	O-ring Material	PVC Part Number ^{1, 2, 3, 4}				Pressure Rating
		Socket	SR Threaded	Flanged	Spigot	
1/2	EPDM	7122L1-005	7121L1-005SR	7123L1-005	7127L1-005	235 psi Non-Shock Water @ 73°F
	FKM	7132L1-005	7131L1-005SR	7133L1-005	7137L1-005	
3/4	EPDM	7122L1-007	7121L1-007SR	7123L1-007	7127L1-007	
	FKM	7132L1-007	7131L1-007SR	7133L1-007	7137L1-007	
1	EPDM	7122L1-010	7121L1-010SR	7123L1-010	7127L1-010	
	FKM	7132L1-010	7131L1-010SR	7133L1-010	7137L1-010	
1-1/4	EPDM	7122L1-012	7121L1-012SR	7123L1-012	7127L1-012	
	FKM	7132L1-012	7131L1-012SR	7133L1-012	7137L1-012	
1-1/2	EPDM	7122L1-015	7121L1-015SR	7123L1-015	7127L1-015	(Flanged 150 psi Non-Shock) Water @ 73°F
	FKM	7132L1-015	7131L1-015SR	7133L1-015	7137L1-015	
2	EPDM	7122L1-020	7121L1-020SR	7123L1-020	7127L1-020	(Flanged 150 psi Non-Shock) Water @ 73°F
	FKM	7132L1-020	7131L1-020SR	7133L1-020	7137L1-020	

1: For CPVC valve, add the letter "C" to the part number (e.g. 7122L1-005C)

2: For Double L-Port, add the number "2" to the part number (e.g. 7122L2-005)

3: For Triple L-Port, add the number "3" to the part number (e.g. 7122L3-005)

4: For T-Port, add the letter "T" to the part number (e.g. 7122T1-005)

Quick-View Valve Selection Chart
3-Way Horizontal Full Port Ball Valve

Valve Size	O-ring Material	PVC Part Number ^{1, 2}				Pressure Rating
		Socket	SR Threaded	Flanged	Spigot	
1/2	EPDM	7022L1-005	7021L1-005SR	7023L1-005	7027L1-005	235 psi Non-Shock Water @ 73°F
	FKM	7032L1-005	7031L1-005SR	7033L1-005	7037L1-005	
3/4	EPDM	7022L1-007	7021L1-007SR	7023L1-007	7027L1-007	
	FKM	7032L1-007	7031L1-007SR	7033L1-007	7037L1-007	
1	EPDM	7022L1-010	7021L1-010SR	7023L1-010	7027L1-010	
	FKM	7032L1-010	7031L1-010SR	7033L1-010	7037L1-010	
1-1/4	EPDM	7022L1-012	7021L1-012SR	7023L1-012	7027L1-012	(Flanged 150 psi Non-Shock) Water @ 73°F
	FKM	7032L1-012	7031L1-012SR	7033L1-012	7037L1-012	
1-1/2	EPDM	7022L1-015	7021L1-015SR	7023L1-015	7027L1-015	(Flanged 150 psi Non-Shock) Water @ 73°F
	FKM	7032L1-015	7031L1-015SR	7033L1-015	7037L1-015	
2	EPDM	7022L1-020	7021L1-020SR	7023L1-020	7027L1-020	(Flanged 150 psi Non-Shock) Water @ 73°F
	FKM	7032L1-020	7031L1-020SR	7033L1-020	7037L1-020	

1: For CPVC valve, add the letter "C" to the part number (e.g. 7022L1-005C)

2: For T-Port, add the letter "T" to the part number (e.g. 7022T1-005)

Valves Technical

True Union Industrial 3-Way Full Port Ball Valves

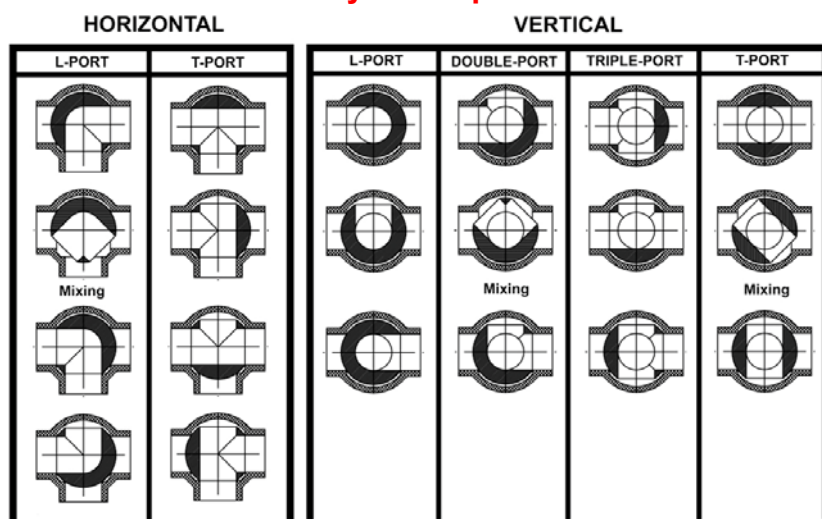


Features — PVC, CPVC

Versatile Full-Port design provides full flow capability through this multiple port 3-way valve with configuration options for controlling flow distribution in industrial and chemical processing applications. Choose Full-Port Vertical 3-Way or Full-Port Horizontal 3-way with branch shutoff. Valves are available in IPS sizes 1/2" through 2" with socket, SR threaded (Special Reinforced), flanged or spigot end connectors.

- Chemical & Corrosion Resistant PVC or CPVC Construction
- Vertical 3-Way or Horizontal Design
- L-Port, Multi L-Port & T-Port with increased Ball Configuration Options, including special mixing configurations
- High Impact Polypropylene Handle
- Built-in Handle Lockout
- Strong, Buttress Thread Union Nuts
- Spears® Double O-ring Safe-T-Shear® Stem Design
- EPDM or FKM O-rings
- Spears® Safe-T-Blocked® Seal Carrier
- Self Adjusting PTFE Floating Seat Design
- Fully Serviceable, Replaceable Components
- Sizes 1/2" - 2" pressure rated to 235 psi @ 73°F
- All Flanged Pressure Rated to 150 psi @ 73°F
- EPDM Valves NSF® Certified for Potable Water use
- Suitable for Vacuum Service
- Assembled with Silicone-Free, Water Soluble Lubricants
- Manufactured to ASTM F 1970
- Metric Socket and BSP Thread Available

3-Way Port Options



Optional Accessories*

- Retro-Fit End Connector Sets for Valve Replacement
- Split-Nut Repair Kits for Union Nut Replacement
- Supplemental End Connectors
- Stem Extension Kits
- Square Operator Nuts
- Multi Mount Valve/Actuation Mounting Kits
- Adjustable Stop Ring for Mixing Port Options

* See **"BALL VALVE ACCESSORIES"** section for details of individual products.

The Adjustable Stop Ring (sold separately) must be used with any "MIXING" Port Option to provide proper mid-way handle stop function.

Ball Port Options viewed from top of valve.

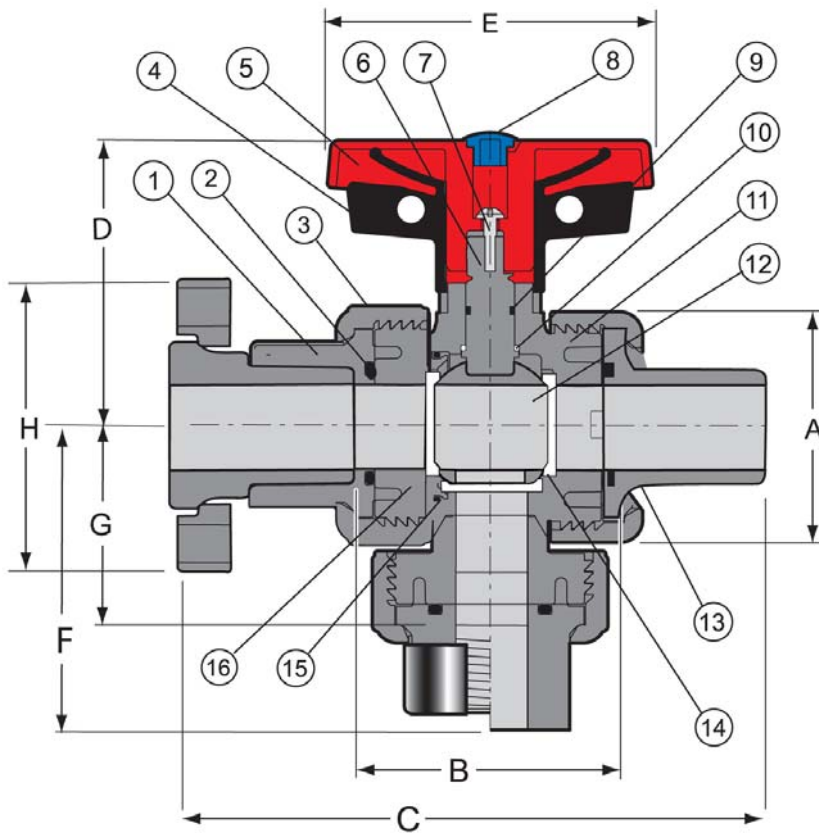
Sample Engineering Specification

All thermoplastic ball valves shall be True Union Industrial 3-Way Full Port Ball Valves [specify horizontal or vertical] type with [specify port option] manufactured to ASTM F 1970 and constructed from PVC Type I, ASTM D 1784 Cell Classification 12454, or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or FKM. All valves shall have Safe-T-Shear® stem with double O-ring stem seals. All valve handles shall be polypropylene with built-in lockout mechanism. All valve union nuts shall have Buttress threads. All seal carriers shall be Safe-T-Blocked®. All valve components shall be replaceable. All EPDM valves shall be certified by NSF International for use in potable water service. All PVC and CPVC 1/2" through 2" valves shall be pressure rated to 235 psi, all flanged valves shall be pressure rated to 150 psi for water at 73°F as manufactured by Spears® Manufacturing Company.



Valves Technical

True Union Industrial 3-Way Full Port Ball Valves



Replacement Parts

No.	Component	Qty.	Material
1	End Connector	3	PVC/CPVC
2	End Connector O-ring	3	EPDM/FKM
3	Union Nut	3	PVC/CPVC
4	Handle Lock	1	PP
5	Handle	1	PP
6	Stem	1	PVC/CPVC
7	Screw	1	Stainless Steel
8	Handle Cover	1	PP
9	Stem O-ring	2	EPDM/FKM
10	Stem Bearing	1	PTFE
11	Body	1	PVC/CPVC
12	Ball	1	PVC/CPVC
13	End Connector Collar	3	Stainless Steel
14	Seat	3	PTFE
15	Carrier O-ring	3	EPDM/FKM
16	Seal Carrier	3	PVC/CPVC

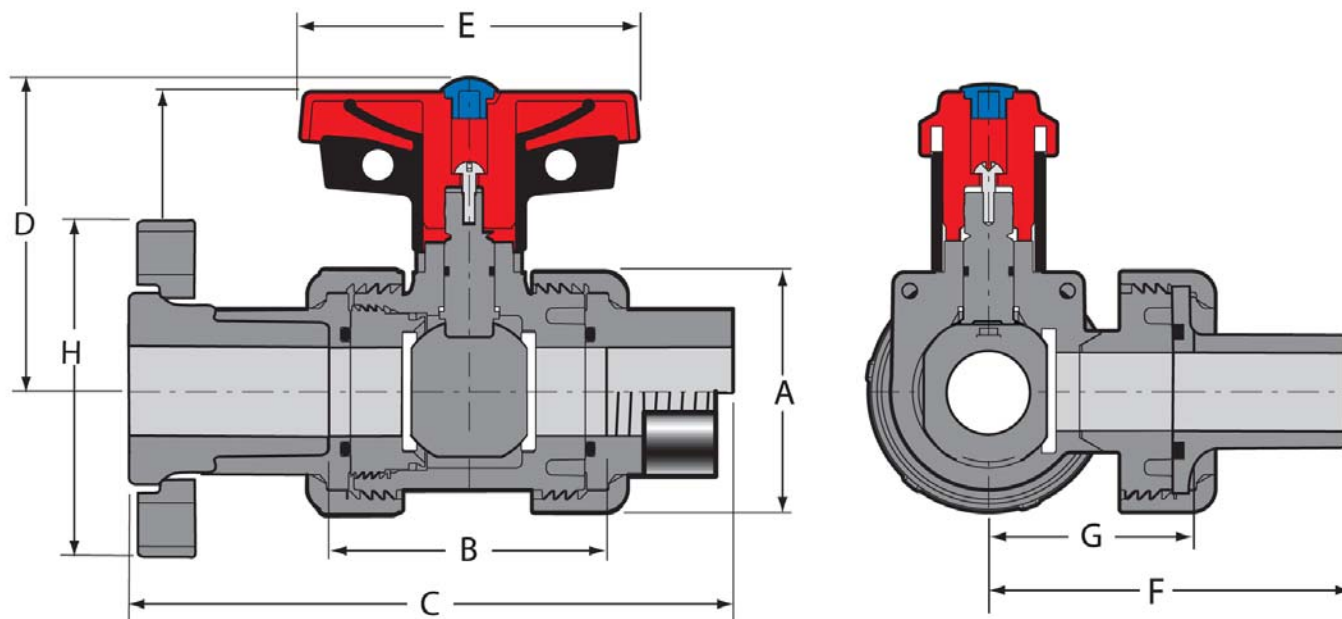
Vertical 3-Way Full Port Ball Valves — Dimensions & Operating Torque

Vertical 3-Way Ball Valve															Oper. ² Torque (in. lbs.)
Nominal Size	A	B ¹		C			D	E	F			G		H	
		Soc/SR Thd	Spigot	Socket	SR Thd	Spigot			Socket	SR Thread	Spigot	Soc/SR Thd	Spigot		
1/2	2-1/8	3-5/8	4-1/8	5-3/8	5	5-7/8	2-5/8	2-13/16	2-11/16	2-1/2	2-15/16	1-13/16	2-11/16	3-1/2	12
3/4	2-9/16	4-1/4	4-3/4	6-1/4	5-3/4	6-3/4	3	3-3/8	3-1/8	2-7/8	3-3/8	2-1/8	2-3/8	3-7/8	12
1	2-7/8	4-1/2	5	6-3/4	6-3/8	7-3/8	3-3/16	3-7/16	3-1/8	3-3/16	3-11/16	2-1/2	2-1/2	4-1/4	20
1-1/4	3-9/16	5-3/4	6-1/4	8-1/8	7-5/8	8-3/4	3-3/4	3-7/8	4-1/16	3-3/4	4-3/8	2-13/16	3-1/8	4-5/8	25
1-1/2	4	6-1/4	6-5/8	9-1/16	8-1/8	9-1/2	4-3/16	4-1/4	4-1/2	4-1/16	4-3/4	3-1/8	3-5/16	5	40
2	4-5/8	7-5/16	8-1/16	10-11/32	9-1/4	10-3/4	4-9/16	5-3/32	5-1/4	4-5/8	5-3/8	3-23/32	3-7/8	6	67

1: Valve Lay Length

2: Torque required at valve maximum internal pressure rating, 5ft/sec. Flow velocity; due to adjustment differences during installation, actual values may vary.

Valves Technical
True Union Industrial 3-Way Full Port Ball Valves



Horizontal 3-Way Full Port Ball Valves Dimensions & Operating Torque

Nominal Size	A	B ¹		C			D	E	F			G		H	Oper. ² Torque (in. lbs.)
		Soc/SR Thread	Spigot	Socket	SR Thread	Spigot			Socket	SR Thread	Spigot	Soc/SR Thread	Spigot		
1/2	2-1/8	3-5/8	4-1/8	5-3/8	5	5-7/8	2-5/8	2-13/16	2-11/16	2-1/2	2-15/16	1-13/16	2-1/16	3-1/2	12
3/4	2-9/16	4-1/4	4-3/4	6-1/4	5-3/4	6-3/4	3	3-3/8	3-1/8	2-7/8	3-3/8	2-1/8	2-3/8	3-7/8	12
1	2-7/8	4-1/2	5	6-3/4	6-3/8	7-3/8	3-3/16	3-7/16	3-3/8	3-3/16	3-11/16	2-1/2	2-1/2	4-1/4	20
1-1/4	3-9/16	5-3/4	6-1/4	8-1/8	7 5/8	8-3/4	3-3/4	3-7/8	4-1/16	3-3/4	4-3/8	2-13/16	3-1/8	4-5/8	25
1-1/2	4	6-5/16	6-5/8	9-1/16	8-1/8	9-1/2	4-3/16	4-1/8	4-1/2	4-1/16	4-3/4	3-1/8	3-5/16	5	40
2	4-5/8	7-3/8	8-1/16	10-3/8	9-1/4	10-3/4	4-9/16	5-3/32	5-1/8	4-5/8	5-3/8	3-5/8	3-7/8	6	67

1: Valve Lay Length

2: Torque required at valve maximum internal pressure rating, 5ft/sec. Flow velocity; due to adjustment differences during installation, actual values may vary.

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

Note: Flanged Valves have a base pressure rating of 150 psi.



Valves Technical

True Union 2000 Industrial 3-Way Ball Valves



Quick-View Valve Selection Chart 3-Way Vertical Ball Valve

Valve Size	O-ring Material	PVC Part Number ^{1, 2, 3, 4}				Pressure Rating
		Socket	SR Threaded	Flanged	Spigot	
1/2	EPDM	4722L1-005	4721L1-005SR	4723L1-005	4727L1-005	235 psi Non-Shock Water @ 73°F
	FKM	4732L1-005	4731L1-005SR	4733L1-005	4737L1-005	
3/4	EPDM	4722L1-007	4721L1-007SR	4723L1-007	4727L1-007	
	FKM	4732L1-007	4731L1-007SR	4733L1-007	4737L1-007	
1	EPDM	4722L1-010	4721L1-010SR	4723L1-010	4727L1-010	
	FKM	4732L1-010	4731L1-010SR	4733L1-010	4737L1-010	
1-1/4	EPDM	4722L1-012	4721L1-012SR	4723L1-012	4727L1-012	
	FKM	4732L1-012	4731L1-012SR	4733L1-012	4737L1-012	
1-1/2	EPDM	4722L1-015	4721L1-015SR	4723L1-015	4727L1-015	
	FKM	4732L1-015	4731L1-015SR	4733L1-015	4737L1-015	
2	EPDM	4722L1-020	4721L1-020SR	4723L1-020	4727L1-020	150 psi Non-Shock Water @ 73°F
	FKM	4732L1-020	4731L1-020SR	4733L1-020	4737L1-020	
2-1/2	EPDM	4722L1-025	4721L1-025SR	4723L1-025	4727L1-025	
	FKM	4732L1-025	4731L1-025SR	4733L1-025	4737L1-025	
3	EPDM	4722L1-030	4721L1-030SR	4723L1-030	4727L1-030	
	FKM	4732L1-030	4731L1-030SR	4733L1-030	4737L1-030	
4	EPDM	4722L1-040	4721L1-040SR	4723L1-040	4727L1-040	
	FKM	4732L1-040	4731L1-040SR	4733L1-040	4737L1-040	

- 1: For CPVC valve, add the letter "C" to the part number (e.g. 4722L1-005C)
2: For Double L-Port, add the number "2" to the part number (e.g. 4722L2-005)
3: For Triple L-Port, add the number "3" to the part number (e.g. 4722L3-005)
4: For T-Port, add the letter "T1" to the part number (e.g. 4722T1-005)

Quick-View Valve Selection Chart 3-Way Horizontal Diverter Valve (no branch shutoff)

Valve Size	O-ring Material	PVC Part Number ^{1, 2}				Pressure Rating
		Socket	SR Threaded	Flanged	Spigot	
1/2	EPDM	5022L1-005	5021L1-005SR	5023L1-005	5027L1-005	235 psi Non-Shock Water @ 73°F
	FKM	5032L1-005	5031L1-005SR	5033L1-005	5037L1-005	
3/4	EPDM	5022L1-007	5021L1-007SR	5023L1-007	5027L1-007	
	FKM	5032L1-007	5031L1-007SR	5033L1-007	5037L1-007	
1	EPDM	5022L1-010	5021L1-010SR	5023L1-010	5027L1-010	
	FKM	5032L1-010	5031L1-010SR	5033L1-010	5037L1-010	
1-1/4	EPDM	5022L1-012	5021L1-012SR	5023L1-012	5027L1-012	
	FKM	5032L1-012	5031L1-012SR	5033L1-012	5037L1-012	
1-1/2	EPDM	5022L1-015	5021L1-015SR	5023L1-015	5027L1-015	
	FKM	5032L1-015	5031L1-015SR	5033L1-015	5037L1-015	
2	EPDM	5022L1-020	5021L1-020SR	5023L1-020	5027L1-020	150 psi Non-Shock Water @ 73°F
	FKM	5032L1-020	5031L1-020SR	5033L1-020	5037L1-020	
2-1/2	EPDM	5022L1-025	5021L1-025SR	5023L1-025	5027L1-025	
	FKM	5032L1-025	5031L1-025SR	5033L1-025	5037L1-025	
3	EPDM	5022L1-030	5021L1-030SR	5023L1-030	5027L1-030	
	FKM	5032L1-030	5031L1-030SR	5033L1-030	5037L1-030	
4	EPDM	5022L1-040	5021L1-040SR	5023L1-040	5027L1-040	
	FKM	5032L1-040	5031L1-040SR	5033L1-040	5037L1-040	

- 1: For CPVC valve, add the letter "C" to the part number (e.g. 5022L1-005C)
2: For T-Port, add the letter "T1" to the part number (e.g. 5022T1-005)

Valves Technical
True Union 2000 Industrial 3-Way Ball Valves



Features — PVC, CPVC

Versatile design provides multiple port and configuration options for controlling flow distribution in industrial and chemical processing applications. Choose Vertical 3-Way (L-Port Diverter, T-Port Off) or Horizontal Diverter configurations with open branch (no shutoff) design. Valves are available in IPS sizes 1/2" through 4" with socket, SR threaded (Special Reinforced), flanged or spigot end connectors. Venturied 6" (4" valves with 4 x 6 reducers) are also available with socket or flanged valve end connections.

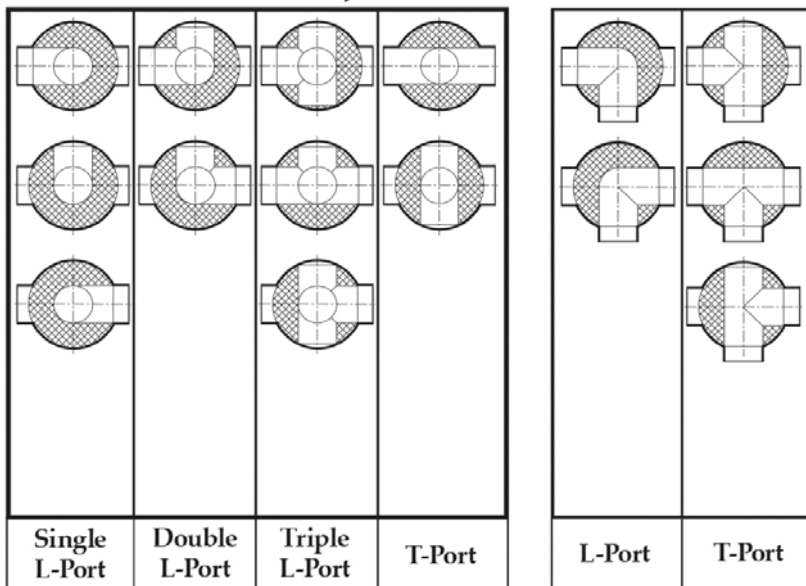
- Chemical & Corrosion Resistant PVC or CPVC Construction
- Vertical 3-Way or Horizontal Diverter Design (no branch shutoff)
- L-Port, Multi L-Port & T-Port Ball Configuration Options
- Interchangeable with all True Union 2000 Valves, Mates with Union 2000 Pipe Unions
- High Impact Polypropylene Handle
- Built-in Handle Lockout
- Strong, Buttress Thread Union Nuts
- Spears® Double O-ring Safe-T-Shear® Stem Design
- EPDM or FKM O-rings
- Spears® Safe-T-Blocked® Seal Carrier
- Self Adjusting PTFE Floating Seat Design
- Fully Serviceable, Replaceable Components
- Sizes 1/2" - 2" pressure rated to 235 psi @ 73°F Sizes 2-1/2" - 4" and all Flanged to 150 psi @ 73°F
- EPDM Valves NSF® Certified for Potable Water use
- Suitable for Vacuum Service
- Assembled with Silicone-Free, Water Soluble Lubricants
- Manufactured to ASTM F 1970
- Metric Socket and BSP Thread Available

3-Way Port Options

Diverter Valves have no shut-off on branch.

Vertical 3-way

Horizontal Diverter



Ball Port Options viewed from top of valve.

Optional Accessories*

- Retro-Fit End Connector Sets for Valve Replacement
- Split-Nut Repair Kits for Union Nut Replacement
- Supplemental End Connectors
- Stem Extension Kits
- Square Operator Nuts
- Multi Mount Valve/Actuation Mounting Kits

* See **"BALL VALVE ACCESSORIES"** section for details of individual products.

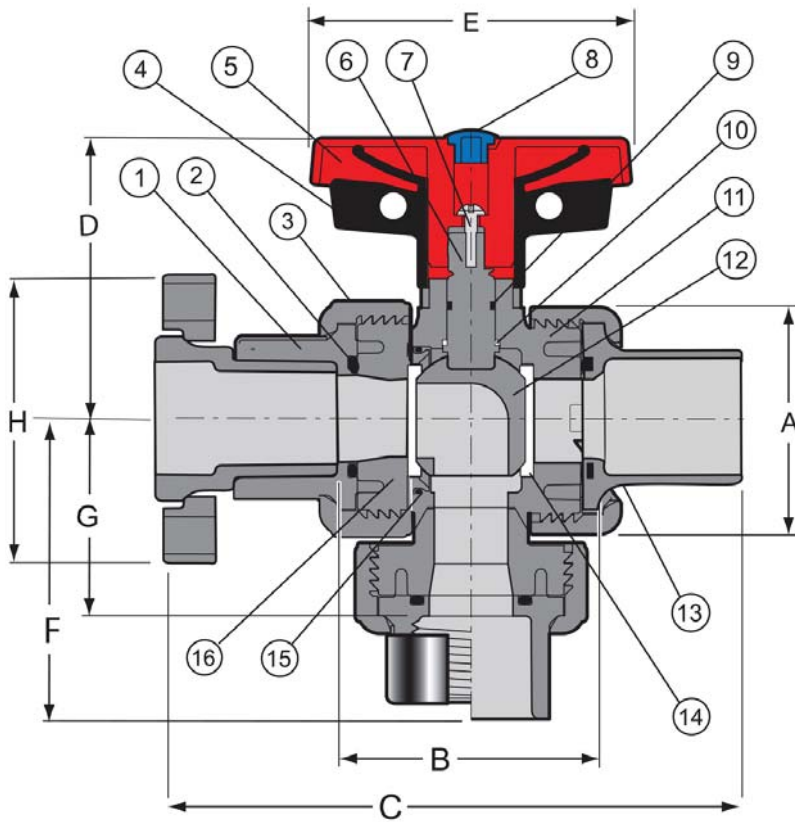
Sample Engineering Specification

All thermoplastic ball valves shall be True Union 2000 3-Way [specify horizontal or vertical] type with [specify port option] manufactured to ASTM F 1970 and constructed from PVC Type I, ASTM D 1784 Cell Classification 12454, or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or FKM. All valves shall have Safe-T-Shear® stem with double O-ring stem seals. All valve handles shall be polypropylene with built-in lockout mechanism. All valve union nuts shall have Buttress threads. All seal carriers shall be Safe-T-Blocked®. All valve components shall be replaceable. All EPDM valves shall be certified by NSF International for use in potable water service. All PVC and CPVC 1/2" through 2" valves shall be pressure rated to 235 psi, all 2-1/2" through 4" and all flanged valves shall be pressure rated to 150 psi for water at 73°F as manufactured by Spears® Manufacturing Company.



Valves Technical

True Union 2000 Industrial 3-Way Ball Valves



Replacement Parts

No.	Component	Qty.	Material
1	End Connector	3	PVC/CPVC
2	End Connector O-ring	3	EPDM/FKM
3	Union Nut	3	PVC/CPVC
4	Handle Lock	1	PP
5	Handle	1	PP
6	Stem	1	PVC/CPVC
7	Screw	1	Stainless Steel
8	Handle Cover	1	PP
9	Stem O-ring	2	EPDM/FKM
10	Stem Bearing*	1	PTFE
11	Body	1	PVC/CPVC
12	Ball	1	PVC/CPVC
13	End Connector Collar	3	Stainless Steel
14	Seat	2	PTFE
15	Carrier O-ring	1	EPDM/FKM
16	Seal Carrier	1	PVC/CPVC

Note: Applies to both Vertical and Horizontal configurations.

* For sizes 2-1/2, 3 & 4 only.

NOTE: Diverter style valve has no shutoff on branch.

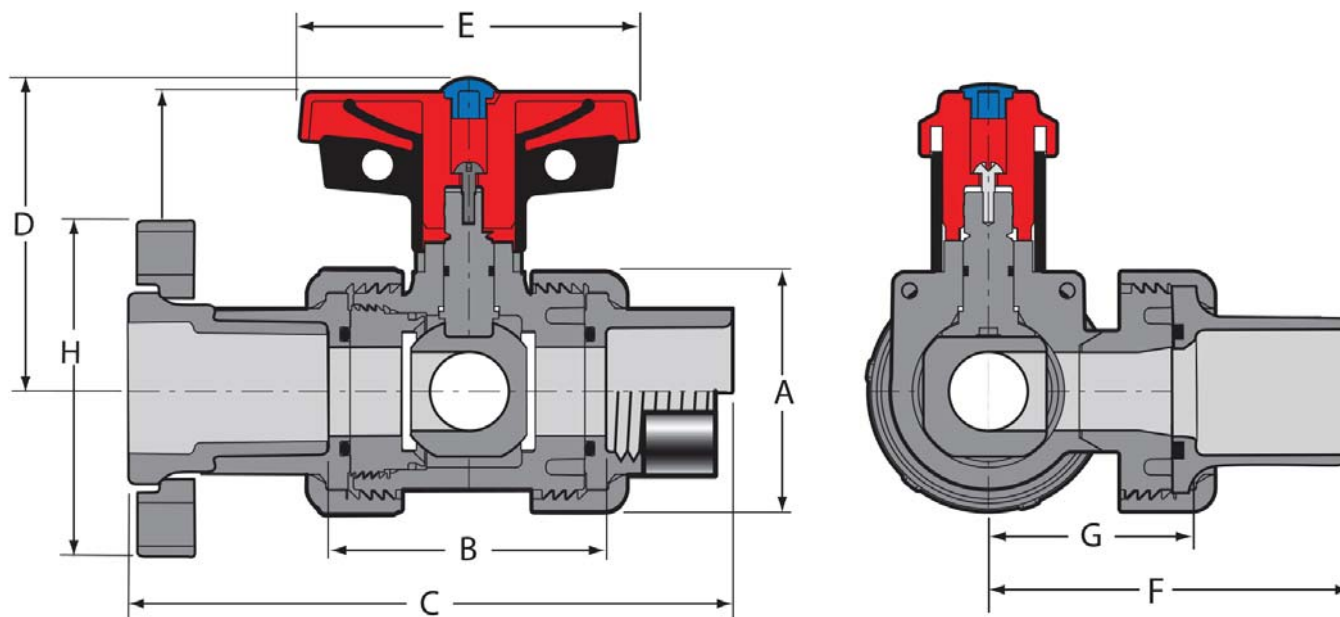
Vertical 3-Way Ball Valves — Dimensions & Operating Torque

Vertical 3 Way Ball Valve															Oper. ² Torque (in. lbs.)
Nominal Size	A	B ¹		C			D	E	F			G		H	
		Soc/SR Thd	Spigot	Socket	SR Thd	Spigot			Socket	SR Thread	Spigot	Soc/SR Thd	Spigot		
1/2	1-15/16	2-1/2	2-15/16	4-1/4	3-27/32	4-3/4	2-17/32	2-7/8	2-11/16	2-9/16	2-13/16	1-13/16	2	3-1/2	12
3/4	2-3/8	2-3/4	3-5/16	4-3/4	4-1/4	5-3/8	2-7/8	3-3/8	3-1/16	2-3/4	3-5/16	2-1/16	2-5/16	3-7/8	12
1	2-11/16	2-15/16	3-1/2	5-3/16	4-11/16	5-3/4	3-1/16	3-1/2	3-5/16	3	3-9/16	2-3/16	2-7/16	4-1/4	20
1-1/4	3-3/16	3-5/16	3-13/16	5-13/16	5-3/16	6-5/16	3-5/8	3-7/8	3-3/4	3-3/8	4-1/16	2-1/2	2-13/16	4-5/8	25
1-1/2	3-5/8	3-5/8	4	6-3/8	5-7/16	6-3/4	4	4-3/16	4-5/16	3-13/16	4-1/2	2-15/16	3-1/8	5	40
2	4-5/16	4-7/8	5-3/16	7-7/8	6-3/4	8-1/4	4-7/16	5-1/16	5	4-1/2	5-5/16	3-1/2	3-3/4	6	67
2-1/2	6-3/16	7-1/8	8-1/8	10-5/8	9-7/8	11-5/8	5-7/8	7-5/8	6-5/8	6-1/4	7-1/16	4-7/8	5-5/16	7-1/2	120
3	6-3/16	7	7-13/16	10-3/4	9-3/4	11-9/16	5-7/8	7-5/8	6-3/4	6-3/16	7-3/16	4-7/8	5-5/16	7-1/2	120
4	7-3/4	7-7/16	8-1/4	11-15/16	10-1/4	12-13/16	6-11/16	9	8-3/16	6-3/4	8-3/4	5-15/16	6-1/2	9	336

1: Valve Lay Length

2: Torque required at valve maximum internal pressure rating, 5ft/sec. Flow velocity; due to adjustment differences during installation, actual values may vary.

Valves Technical
True Union 2000 Industrial 3-Way Ball Valves



NOTE: Diverter style valve has no shutoff on branch

Horizontal Diverter 3-Way Ball Valves Dimensions & Operating Torque

Nominal Size	A	B ¹		C			D	E	F			G		H	Oper. ² Torque (in. lbs.)
		Soc/SR Thread	Spigot	Socket	SR Thread	Spigot			Socket	SR Thread	Spigot	Soc/SR Thread	Spigot		
1/2	1-15/16	2-1/2	2-15/16	4-1/4	3-13/16	4-3/4	2-17/32	2-7/8	2-3/4	2-3/8	2-13/16	1-7/8	2	3-1/2	12
3/4	2-3/8	2-3/4	3-15/16	4-3/4	4-1/4	5-3/8	2-7/8	3-3/8	3-1/8	2-3/4	3-5/16	2-1/8	2-5/16	3-7/8	12
1	2-11/16	2-15/16	3-1/2	5-3/16	4-11/16	5-3/4	3-1/16	3-1/2	3-5/16	3	3-9/16	2-3/16	2-7/16	4-1/4	20
1-1/4	3-3/16	3-5/16	3-13/16	5-13/16	5-3/16	6-5/16	3-5/8	3-7/8	3-13/16	3-3/8	4-1/16	2-9/16	2-13/16	4-5/8	25
1-1/2	3-5/8	3-5/8	4	6-3/8	5-7/16	6-3/4	4	4-3/16	4-5/16	3-13/16	4-1/2	2-15/16	3-1/8	5	40
2	4-5/16	4-7/8	5-3/16	7-7/8	6-3/4	8-1/4	4-7/16	5-1/16	5-1/16	4-1/2	5-5/16	3-9/16	3-3/4	6	67
2-1/2	6-3/16	7-1/8	8-1/8	10-5/8	8-1/2	11-5/8	5-7/8	7-5/8	6-5/8	5-1/2	7-1/16	4-7/8	5-5/16	7-1/2	120
3	6-3/16	7	7-13/16	10-3/4	9-3/4	11-9/16	5-7/8	7-5/8	6-3/4	6-3/16	7-3/16	4-7/8	5-5/16	7-1/2	120
4	7-3/4	7-7/16	8-1/4	11-15/16	10-1/4	12-13/16	6-11/16	9	8-1/4	6-3/4	8-3/4	6	6-1/2	9	336

1: Valve Lay Length

2: Torque required at valve maximum internal pressure rating, 5ft/sec. Flow velocity; due to adjustment differences during installation, actual values may vary.

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	2-1/2" - 4"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

Note: Flanged Valves have a base pressure rating of 150 psi.

Made in the U.S.A.

Suitable for Oil-Free air handling to 25 psi, not for distribution of compressed air or gas
See Spears® Product Sourcebook for product offerings



Valves Technical

True Union 2000 Industrial Tee Style Ball Valves



Tee x Socket

Features — PVC, CPVC

Spears® True Union 2000 Industrial Tee-Style Ball Valve design integrates valve and Tee-fitting for direct branch take-off laterals. The "Tee-Valve" provides a stronger, more compact connection by eliminating the need for a reducer, additional length of pipe, and one of the end connections on the ball valve. Close proximity of valve to mainline emulates a "zero dead-leg" design to minimize any areas of fluid stagnation. Custom produced to specified Tee and Valve connection sizes. Also available in metric sizes.

- Chemical & Corrosion Resistant PVC, CPVC or Low Extractable PVC materials
- Multi-featured Industrial Grade
- Schedule 80 Full-Port Design on branch
- Built-in Handle Lockout
- Fully Serviceable, Replaceable Components
- Seal Carrier Adjustment Tool included
- ISO Pattern Actuation Mounting Option
- Spears® Dual O-ring Safe-T-Shear® Stem
- Self Adjusting PTFE Floating Seat
- Sizes 1/2" - 4" Pressure Rated to 235 psi @ 73°F. All Flanged to 150 psi @ 73°F.
- EPDM Valves NSF® Certified for Potable Water Use
- Assembled with Silicone-Free, Water Soluble Lubricants

Sample Engineering Specification

All lateral branch valve connections shall be made using integrated Tee-style ball valve and Tee fitting. Tee-style ball valves shall be True Union 2000 Industrial type manufactured to ASTM F 1970 and constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447; or Low Extractable PVC, ASTM D 1784 Cell Classification 12343. All O-rings shall be EPDM or FKM. All valves shall have Safe-T-Shear® stem with double O-ring stem seals. All valve handles shall be polypropylene with built-in lockout. All valve union nuts shall have Butress threads. All seal carriers shall be Safe-T-Blocked®. All valve components shall be replaceable. Mainline Tee fittings shall be Schedule 80 manufactured in accordance with ASTM D 2467 for PVC or F 439 for CPVC. All EPDM valves shall be certified by NSF International for use in potable water service. All 1/2" through 4" valves shall be pressure rated to 235 psi for water @ 73°F and all flanged to 150 psi @ 73°F, as manufactured by Spears® Manufacturing Company.

Valves Technical
True Union 2000 Industrial Tee Style Ball Valves



Quick-View Valve Selection Chart

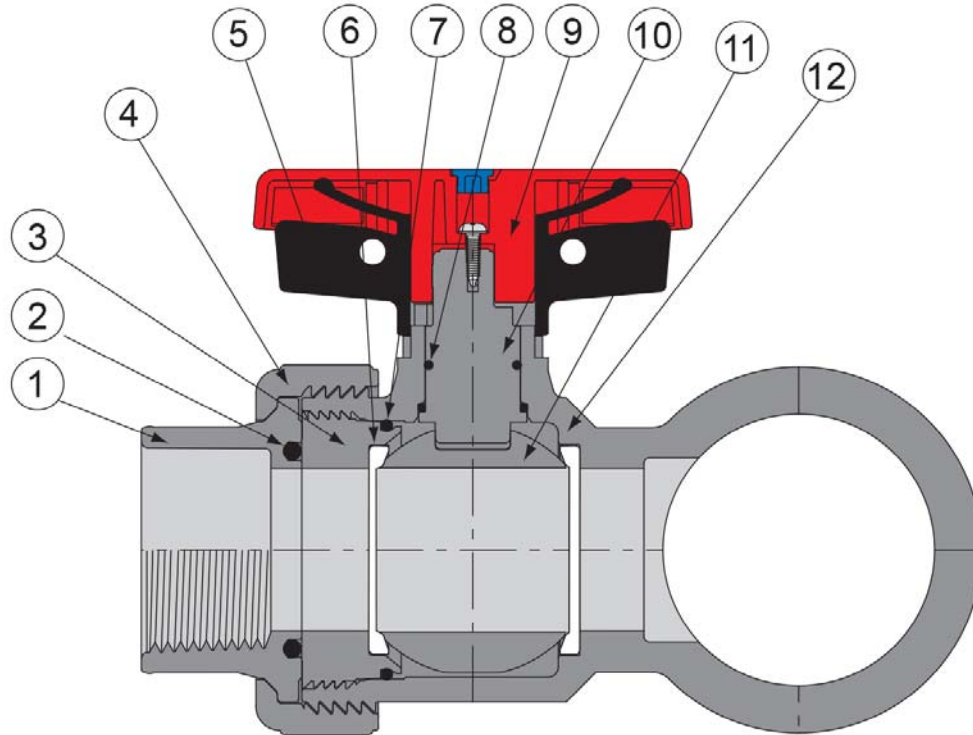
T-Valves can be custom produced in any standard Tee and Valve size combination

Size (Tee x Valve Outlet)	PVC		CPVC	
	EPDM	FKM	EPDM	FKM
1/2	182901-005	183901-005	182901-005C	183901-005C
3/4	182901-007	183901-007	182901-007C	183901-007C
1	182901-010	183901-010	182901-010C	183901-010C
1-1/4	182901-012	183901-012	182901-012C	182901-012C
1-1/2	182901-015	183901-015	182901-015C	183901-015C
2	182901-020	183901-020	182901-020C	183901-020C
3/4x1/2	182901-101	183901-101	182901-101C	183901-101C
1x1/2	182901-130	183901-130	182901-130C	183901-130C
1x3/4	182901-131	183901-131	182901-131C	183901-131C
1-1/4x1/2	182901-166	183901-166	182901-166C	182901-166C
1-1/4x3/4	182901-167	183901-167	182901-167C	183901-167C
1-1/4x1	182901-168	183901-168	182901-168C	183901-168C
1-1/2x1/2	182901-209	183901-209	182901-209C	183901-209C
1-1/2x3/4	182901-210	183901-210	182901-210C	183901-210C
1-1/2x1	182901-211	183901-211	182901-211C	183901-211C
2x1/2	182901-247	183901-247	182901-247C	183901-247C
2x3/4	182901-248	183901-248	182901-248C	183901-248C
2x1	182901-249	183901-249	182901-249C	183901-249C
2x1-1/2	182901-251	183901-251	182901-251C	183901-251C
3x1/2	182901-333	183901-333	182901-333C	183901-333C
3x1	182901-335	183901-335	182901-335C	183901-335C
3x1-1/2	182901-337	183901-337	182901-337C	183901-337C
3x2	182901-338	183901-338	182901-338C	183901-338C
4x1	182901-417	183901-417	182901-417C	183901-417C
4x1-1/2	182901-419	183901-419	182901-419C	183901-419C
4x2	182901-420	183901-420	182901-420C	183901-420C
6x2	182901-528	183901-528	182901-528C	183901-528C
8x2	182901-578	183901-578	182901-578C	183901-578C

Additional Notes: For Low Extractable PVC valves, add the letters BL to the part number (e.g. 182901-005BL) Valve assembly includes debris plug in valve socket end (to be removed on installation) and cable-tie affixed spare end connector.



True Union 2000 Industrial Tee Style Ball Valves



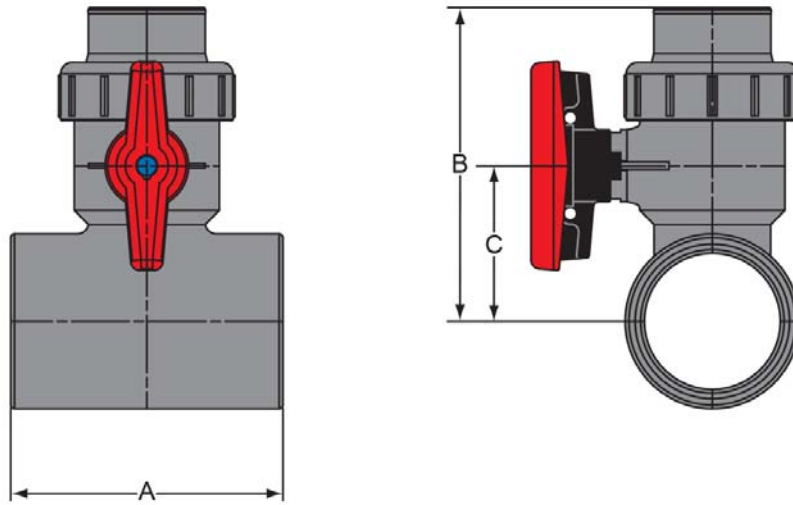
Replacement Parts

No.	Component	Qty.	Material
1	End Connector	1	PVC/CPVC
2	End Connector O-ring	1	EPDM/FKM
3	Seal Carrier	1	PVC/CPVC
4	Union Nut	3	PVC/CPVC
5	Handle Lock	1	PP
6	Seat	2	PTFE
7	Carrier O-ring	1	EPDM/FKM
8	Stem O-ring	2	EPDM/FKM
9	Handle	1	PP
10	Stem	1	PVC/CPVC
11	Ball	1	PVC/CPVC
12	Body	1	PVC/CPVC

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

Valves Technical
True Union 2000 Industrial Tee Style Ball Valves



Dimensions, Operating Torque & Cv Values

Nominal Size	Dimensions Reference (inches, ± 1/16)				Approx. Wt. (Lbs.)		Oper. ¹ Torque (in. lbs.)	Cv ² (Valve only)
	A	B		C	PVC	CPVC		
		Socket	Threaded					
1/2	2-5/16	3-3/4	3-9/16	1-5/8	.48	.52	16	29
3/4	3-7/16	4-1/4	4	1-7/8	.70	.77	17	63
1	4	4-11/16	4-7/16	2-1/16	1.10	1.15	22	120
1-1/4	4-1/4	5-5/16	5	2-7/16	1.64	1.73	28	243
1-1/2	5-1/8	6-1/8	5-11/16	3	2.26	2.37	61	357
2	5-7/8	7-5/16	6-13/16	3-7/16	3.72	3.82	77	599
3/4x1/2	4	3-7/8	3-11/16	1-3/4	.51	.54	16	29
1x1/2	3-7/16	4	3-13/16	1-7/8	.58	.61	16	29
1x3/4	3-11/16	4-3/8	4-1/2	2	.78	.80	17	63
1-1/4x1/2	4-1/4	4	3-13/16	1-7/8	.77	.80	16	29
1-1/4x3/4	4-1/4	4-1/4	4	1-7/8	.90	.94	17	63
1-1/4x1	4-1/4	4-13/16	4-5/8	2-3/16	1.78	1.96	22	120
1-1/2x1/2	4-3/8	4-1/4	4-1/16	2-1/8	.86	.89	16	29
1-1/2x3/4	4-1/8	4-5/8	4-3/8	2-3/16	.91	.94	16	63
1-1/2x1	4-1/2	5	4-13/16	2-3/8	1.37	1.51	16	120
2x1/2	4-3/16	4-9/16	4-3/8	2-7/16	1.06	1.17	16	29
2x3/4	4-3/8	4-15/16	4-11/16	2-9/16	1.23	1.28	17	63
2x1	4-3/4	5-1/4	5-1/16	2-5/8	1.38	1.45	22	120
2x1-1/2	5-7/8	6-1/16	5-7/8	2-15/16	2.33	2.63	61	29
3x1/2	5-1/2	5-1/8	4-15/16	3	1.60	1.66	16	29
3x1	5-1/2	5-7/8	5-11/16	3-1/4	2.19	2.25	22	120
3x1-1/2	7-1/4	6-9/16	6-3/8	3-7/16	3.66	3.87	61	357
3x2	6-11/16	7-11/16	7-3/16	3-13/16	4.61	4.86	77	599
4x1	7-7/16	6-5/16	6-1/8	3-11/16	3.25	3.52	22	120
4x1-1/2	7-3/8	7-5/16	7-1/8	4-3/16	4.01	4.37	61	357
4x2	7-3/4	8-5/16	7-3/4	4-7/16	5.20	5.68	77	599
6x2	10-3/16	9-5/8	9-1/8	5-3/4	9.26	11.68	77	599
8x2	15-5/8	12-5/8	12-1/8	8-3/4	17.42	18.70	77	599

1: Torque required at valve maximum internal pressure rating, 5ft/sec. Flow velocity; due to adjustment differences during installation, actual valves may vary.

2: Gallons per minute at 1 psi pressure drop. Valves calculated from laying length, based on derivative of Hazen-Williams equation with surface roughness factor of C=150. Cv values are for basic Ball Valve only, excluding Tee end connection.



Valves Technical

True Union 2000 Industrial Ball Check Valves



Features — PVC, CPVC

Flow tested design provides quick response with positive seal for prevention of system backflow in industrial and chemical processing applications. Valves are available in IPS sizes 1/2" through 6" with socket/regular thread, SR threaded (Special Reinforced), flanged or spigot end connectors and 8" venturied valve with socket or flanged ends. Also available in metric socket and BSP thread sizes 1/2" through 2".

Sample Engineering Specification

All thermoplastic check valves shall be True Union 2000 Industrial Ball Check type manufactured to ASTM F 1970 and constructed from PVC Type I, ASTM D 1784, Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or FKM. All valve union nuts shall have Buttress threads. All valve seats shall be a standard O-ring type. All seal carriers shall be Safe-T-Blocked®. All valve components shall be replaceable. Valves in sizes 1/2" through 4" with EPDM shall be listed by NSF® for use in potable water service. All PVC and CPVC 1/2" through 4" valves shall be pressure rated to 235 psi, all 6" and 8" Venturied and all flanged valves shall be pressure rated to 150 psi for water at 73°F as manufactured by Spears® Manufacturing Company.

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Number ¹					Pressure Rating
		Socket	Threaded	SR Threaded	Flanged	Spigot	
1/2	EPDM	4529-005	included	4521-005SR	4523-005	4527-005	235 psi Non-Shock Water @ 73°F
	FKM	4539-005	included	4531-005SR	4533-005	4537-005	
3/4	EPDM	4529-007	included	4521-007SR	4523-007	4527-007	
	FKM	4539-007	included	4531-007SR	4533-007	4537-007	
1	EPDM	4529-010	included	4521-010SR	4523-010	4527-010	
	FKM	4539-010	included	4531-010SR	4533-010	4537-010	
1-1/4	EPDM	4529-012	included	4521-012SR	4523-012	4527-012	
	FKM	4539-012	included	4531-012SR	4533-012	4537-012	
1-1/2	EPDM	4529-015	included	4521-015SR	4523-015	4527-015	
	FKM	4539-015	included	4531-015SR	4533-015	4537-015	
2	EPDM	4529-020	included	4521-020SR	4523-020	4527-020	(Flanged 150 psi Non-Shock) Water @ 73°F
	FKM	4539-020	included	4531-020SR	4533-020	4537-020	
2-1/2	EPDM	4522-025	4521-025	4521-025SR	4523-025	4527-025	
	FKM	4532-025	4531-025	4531-025SR	4533-025	4537-025	
3	EPDM	4522-030	4521-030	4521-030SR	4523-030	4527-030	
	FKM	4532-030	4531-030	4531-030SR	4533-030	4537-030	
4	EPDM	4522-040	4521-040	4521-040SR	4523-040	4527-040	
	FKM	4532-040	4531-040	4531-040SR	4533-040	4537-040	
6	EPDM	4522-060	4521-060	4521-060SR	4523-060	4527-060	
	FKM	4532-060	4531-060	4531-060SR	4533-060	4537-060	
8 ²	EPDM	4522-080	—	—	4523-080	—	150 psi Non-Shock Water @ 73°F
	FKM	4532-080	—	—	4533-080	—	

1: For CPVC valve, add the letter "C" to the part number (e.g., 4529-005C, 4521-005CSR)

2: 8" Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters

- Chemical & Corrosion Resistant PVC or CPVC Construction
- Also Available in Spears® High Purity, Low Extractable PVC Material
- Strong, Buttress Thread Union Nuts
- Schedule 80 Full-Port Design
- Spears® Safe-T-Blocked® Seal Carrier
- Uses Standard O-ring Seat
- EPDM or FKM O-rings
- Fully Serviceable, Replaceable Components
- Sizes 1/2" - 4" Pressure Rated to 235 psi @ 73°F, Sizes 6" and 8" Venturied and all Flanged Pressure Rated to 150 psi @ 73°F
- Suitable for Either Horizontal or Vertical Installations
- Valves in sizes 1/2" through 4" with EPDM are NSF® Certified for Potable Water use
- Suitable for Vacuum Service
- Assembled with Silicone-Free, Water Soluble Lubricants
- Manufactured to ASTM F 1970

Optional Accessories*

- Retro-Fit End Connector Sets for Valve Replacement
- Split-Nut Repair Kits for Union Nut Replacement
- Supplemental End Connectors

* See **"BALL VALVE ACCESSORIES"** section for details of individual products.

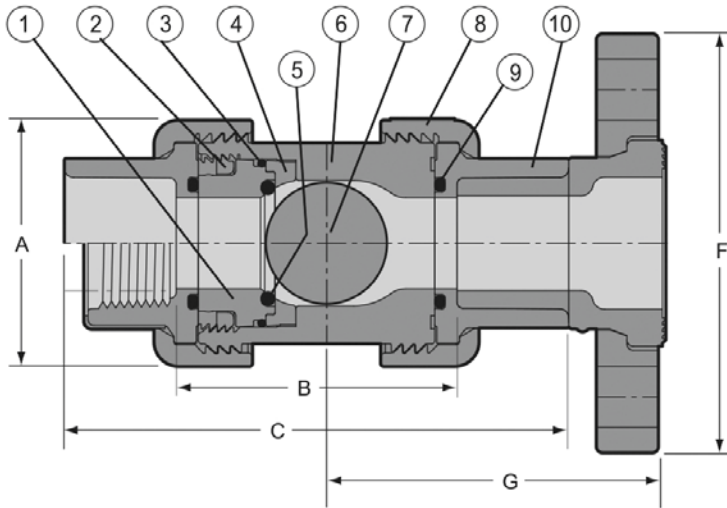
Ball Check Foot Valves



Spears® Ball Check Valves easily convert to foot valves utilizing optional Foot Valve Screen adapters found in Ball Valve Accessories section.

Valves Technical

True Union 2000 Industrial Ball Check Valves



Replacement Parts

No.	Component	Qty.	Material
1	Seal Carrier	1	PVC/CPVC
2	Seal Carrier Nut	1	PVC/CPVC
3	Carrier O-ring	1	EPDM/FKM
4	Seat Plate	1	PVC/CPVC
5	Seat O-ring	1	EPDM/FKM
6	Body	1	PVC/CPVC
7	Ball	1	PVC/CPVC
8	Union Nut	2	PVC/CPVC
9	End Connector O-ring	2	EPDM/FKM
10	End Connector	2	PVC/CPVC

Dimensions, Weights, & C_v Values

Nominal Size	Dimensions Reference (inches, ± 1/16)								Approx. Wt. (Lbs.)		C _v ² Values			Horizontal Closing	
	A	B ¹		C			F	G	PVC	CPVC	Soc/Thd	Flange	Spigot	Feet of Head (water)	GPM (minimum)
		Soc/Thd	Spigot	Socket	Thread	Spigot									
1/2	1-15/16	2-7/16	2-7/8	4-3/16	3-13/16	4-5/8	3-1/2	2-31/32	.30	.33	6.3	6	6.3	1.6	.10
3/4	2-3/8	2-3/4	3-1/4	4-3/4	4-1/4	5-1/4	3-7/8	3-5/16	.46	.50	17	16	17	1.6	.10
1	2-5/8	2-15/16	3-1/2	5-3/16	4-11/16	5-3/4	4-1/4	3-5/8	.70	.74	25	24	25	1.6	.25
1-1/4	3-3/16	3-5/16	3-3/16	5-13/16	5-3/16	6-5/16	4-5/8	3-31/32	1.04	1.09	65	61	65	1.6	.40
1-1/2	3-9/16	3-9/16	4	6-5/16	5-7/16	6-3/4	5	4-3/8	1.37	1.45	86	82	86	1.6	.75
2	4-5/16	4-13/16	5-3/16	7-13/16	7-27/32	8-1/4	6	5-1/4	2.47	2.62	130	125	130	1.6	.75
2-1/2	6-3/16	6-15/16	7-13/16	10-7/16	8-1/2	11-3/8	7-1/2	6	6.80	7.25	200	193	200	1.0	1.50
3	6-3/16	7	7-13/16	10-3/4	9-3/4	11-9/16	7-1/2	6-13/16	6.98	7.35	275	268	275	1.0	4.00
4	7-3/4	7-1/4	8-1/4	11-13/16	10-1/4	12-3/4	9	7-1/2	12.13	12.96	500	489	500	1.0	5.50
6	11-5/8	11-3/16	13	17-1/4	15-3/4	18-1/2	11-1/4	10-3/16	37.07	39.98	800	794	800	N/A	N/A
8 ³	11-5/8	23-3/8	---	31-7/8	---	---	---	---	50.84	55.92	N/A	N/A	N/A	N/A	N/A

1: Valve Lay Length

2: Gallons per minute at 1 psi pressure drop. Valves calculated from laying length, based on derivative of Hazen-Williams equation with surface roughness factor of C=150.

3: 8" Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 4"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	6" and 8"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)

NOTE: Flanged valves have a base pressure rating of 150 psi

General Installation Information: Ball check valves may be installed in either horizontal or up-flow vertical applications. A minimum of ten (10) pipe diameters distance maintained from any pump or other source of turbulence. Check valves **MUST** be installed with the valves **FLOW** arrow pointing in the direction of flow.



True Union 2000 Standard Ball Valves



Features — PVC, CPVC

Economical, low profile quarter-turn shutoff valve is excellent for general purpose and many O.E.M applications. PVC and CPVC valves are available in IPS sizes 1/2" through 4" with socket, regular thread, SR threaded (Special Reinforced), flanged or spigot end connectors.

- Chemical & Corrosion Resistant PVC or CPVC Construction
- Interchangeable with all True Union 2000 Valves, Mates with Union 2000 Pipe Unions
- High Impact Polypropylene Handle
- Schedule 80 Full-Port Design
- Strong, Buttress Thread Union Nuts
- Spears® Single O-ring Safe-T-Shear® Stem Design
- Spears® Safe-T-Blocked® Seal Carrier
- Replaceable PTFE/HDPE Floating Seat Design
- EPDM or FKM O-rings
- Sizes 1/2" - 2" pressure rated to 235 psi @ 73°F
- Sizes 2-1/2" - 4" and all flanged pressure rated to 150 psi @ 73°F
- EPDM valves NSF® Certified for Potable Water use
- Suitable for Vacuum Service
- Assembled with Silicone-Free, Water Soluble Lubricants
- Manufactured to ASTM F 1970

Sample Engineering Specification

All thermoplastic ball valves shall be True Union 2000 Standard type manufactured to ASTM F 1970 and constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or FKM. All valves shall have Safe-T-Shear® stem with O-ring stem seal. All handles shall be polypropylene. All union nuts shall have Buttress threads. All seal carriers shall be Safe-T-Blocked®. All EPDM valves shall be certified by NSF® International for use with potable water. All 1/2" - 2" valves shall be pressure rated to 235 psi, all 2-1/2" - 4" and all flanged valves to 150 psi for water @ 73°F, as manufactured by Spears® Manufacturing Company.

Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Number ¹					Pressure Rating
		Socket	Threaded	SR Threaded	Flanged	Spigot	
1/2	EPDM	3629-005	included	3621-005SR	3623-005	3627-005	235 psi Non-Shock Water @ 73°F
	FKM	3639-005	included	3631-005SR	3633-005	3637-005	
3/4	EPDM	3629-007	included	3621-007SR	3623-007	3627-007	
	FKM	3639-007	included	3631-007SR	3633-007	3637-007	
1	EPDM	3629-010	included	3621-010SR	3623-010	3627-010	
	FKM	3639-010	included	3631-010SR	3633-010	3637-010	
1-1/4	EPDM	3629-012	included	3621-012SR	3623-012	3627-012	(Flanged 150 psi Non-Shock) Water @ 73°F
	FKM	3639-012	included	3631-012SR	3633-012	3637-012	
1-1/2	EPDM	3629-015	included	3621-015SR	3623-015	3627-015	
	FKM	3639-015	included	3631-015SR	3633-015	3637-015	
2	EPDM	3629-020	included	3621-020SR	3623-020	3627-020	
	FKM	3639-020	included	3631-020SR	3633-020	3637-020	
2-1/2	EPDM	3622-025	3621-025	3621-025SR	3623-025	3627-025	150 psi Non-Shock Water @ 73°F
	FKM	3632-025	3631-025	3631-025SR	3633-025	3637-025	
3	EPDM	3622-030	3621-030	3621-030SR	3623-030	3627-030	
	FKM	3632-030	3631-030	3631-030SR	3633-030	3637-030	
4	EPDM	3622-040	3621-040	3621-040SR	3623-040	3627-040	
	FKM	3632-040	3631-040	3631-040SR	3633-040	3637-040	

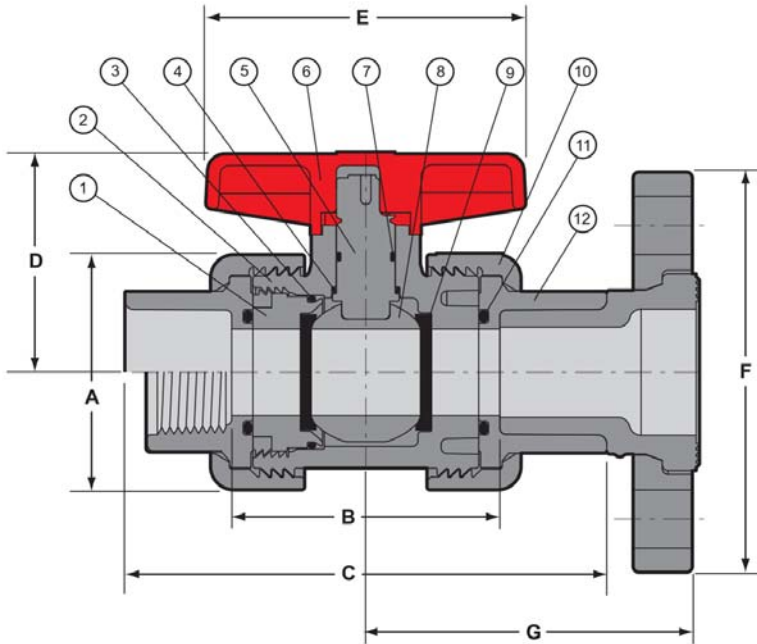
1: For CPVC valve, add the letter "C" to the part number (e.g., 3629-005C, 3621-005CSR)

Optional Accessories*

- Retro-Fit End Connector Sets for Valve Replacement
- Split-Nut Repair Kits for Union Nut Replacement
- Supplemental End Connectors
- Round Safety Handles
- Stem Extension Kits
- Square Operator Nuts
- Multi Mount Valve/ Actuation Mounting Kits
- Mini-Mount Actuation Mounting Kits

* See **"BALL VALVE ACCESSORIES"** section for details of individual products.

Valves Technical
True Union 2000 Standard Ball Valves



Replacement Parts

No.	Component	Qty.	Material
1	Seal Carrier	1	PVC/CPVC
2	Body	1	PVC/CPVC
3	Carrier O-ring	1	EPDM/FKM
4	Stem Bearing ^{1,2}	1	PP
5	Stem	1	PVC/CPVC
6	Handle	1	PP
7	Stem O-ring	1	EPDM/FKM
8	Ball	1	PVC/CPVC
9	Seat	2	PTFE/HDPE
10	Union Nut	2	PVC/CPVC
11	End Connector O-ring	2	EPDM/FKM
12	End Connector	2	PVC/CPVC

1: O-Ring up to 2"

2: PTFE Thrust Bearing: 2-1/2", 3" & 4"

3: An additional O-ring is used behind each seat on 2-1/2" or larger.

Dimensions, Weights, Operating Torque & C_v Values

Nominal Size	A	B ¹		C			D	E	F	G	Approx. Wt. (Lbs.)		Oper. ² Torque (in. lbs.)	C _v ³ Values	
		Soc/Thd	Spigot	Socket	Thread	Spigot					PVC	CPVC		Soc/Thd/Spig	Flanged
1/2	1-15/16	2-1/2	2-15/16	4-1/4	3-15/16	4-3/4	1-5/8	2-1/2	3-1/2	2-31/32	.33	.35	12	29	18
3/4	2-3/8	2-13/16	3-5/16	4-13/16	4-1/4	5-5/16	2	3	3-7/8	3-5/16	.51	.54	20	63	39
1	2-5/8	2-15/16	3-1/2	5-3/16	4-11/16	5-3/4	2-5/16	3-3/8	4-1/4	3-5/8	.71	.75	25	120	73
1-1/4	3-3/16	3-3/16	3-13/16	5-13/16	5-3/16	6-3/8	2-13/16	3-1/2	4-5/8	4	1.12	1.17	35	243	151
1-1/2	3-9/16	3-9/16	4	6-5/16	5-7/16	6-13/16	3-1/16	3-7/8	5	4-13/16	1.47	1.53	45	357	223
2	4-5/16	4-13/16	5-1/4	7-13/16	6-3/4	8-1/4	3-3/4	4-15/16	6	5-1/4	2.62	2.75	94	599	395
2-1/2	6-3/16	7-1/8	8	10-9/16	9-7/8	11-1/2	5-1/2	7-5/8	7	6-5/8	10.49	7.70	120	856	579
3	6-3/16	7-1/16	8	10-13/16	9-7/8	11-3/4	5-1/2	7-5/8	7-1/2	6-27/32	11.22	7.81	120	1416	974
4	7-3/4	7-3/8	8-7/16	11-7/8	10-3/8	12-15/16	6-1/8	9	9	7-1/2	18.46	12.48	336	2865	1952

1: Valve Lay Length

2: Torque required at valve maximum internal pressure rating, 5ft/sec. Flow velocity; due to adjustment differences during installation, actual valves may vary.

3: Gallons per minute at 1 psi pressure drop. Valves calculated from laying length, based on derivative of Hazen-Williams equation with surface roughness factor of C=150.

Temperature Pressure Rating

System Operating Temperature °F (°C)			100 (38)	110 (43)	120 (49)	130 (54)	140 (60)	150 (66)	160 (71)	170 (77)	180 (82)	190 (88)	200 (93)	210 (99)
Valve Pressure Rating psi (MPa)	1/2" - 2"	PVC	235 (1.62)	211 (1.45)	150 (1.03)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	235 (1.62)	219 (1.51)	170 (1.17)	145 (1.00)	130 (.90)	110 (.76)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)
	2-1/2" - 4"	PVC	150 (1.03)	135 (.93)	110 (.76)	75 (.52)	50 (.34)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)	-0- (-0-)
		CPVC	150 (1.03)	140 (.97)	130 (.90)	120 (.83)	110 (.76)	100 (.70)	90 (.62)	80 (.55)	70 (.48)	60 (.41)	50 (.34)	-0- (-0-)