



# True Union 2000 Ball & Ball Check Valves



## ENGINEERING GUIDE

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## 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. 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, all 6" and 8" Venturied and all flanged valves shall be pressure rated to 150 psi for water at 73°F.

- 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.
- EPDM Valves NSF® Certified for Potable Water use
- Suitable for Vacuum Service
- Assembled with Silicone-Free, Water Soluble Lubricants
- Manufactured to ASTM F 1970

## Quick-View Valve Selection Chart

Valve Size	O-ring Material	PVC Part Number <sup>1,2</sup>					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		(Flanged 150 psi Non-Shock) Water @ 73°F
	FKM	1839-015	included	1831-015SR	1833-015	1837-015		
2	EPDM	1829-020	included	1821-020SR	1823-020	1827-020		
	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	150 psi Non-Shock Water @ 73°F	
	FKM	1832-060	1831-060	1831-060SR	1833-060	1837-060		
8 <sup>3</sup>	EPDM	1822-080	—	—	1823-080	—		
	FKM	1832-080	—	—	1833-080	—		

## Optional Vented Ball Valves

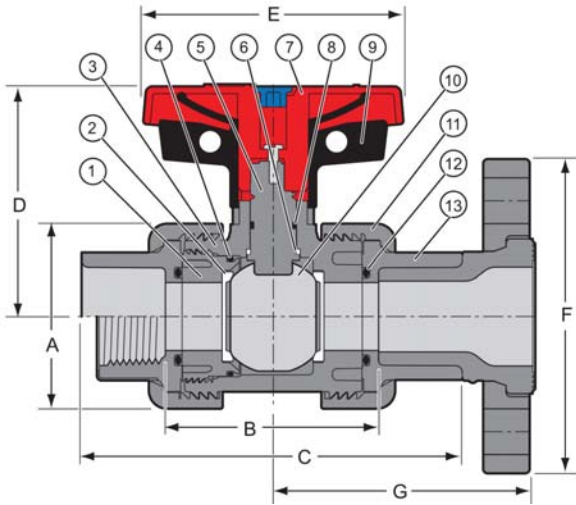
Same valve with special ball vent design for sodium hypochlorite (bleach) and other chemical applications where entrapped fluids may form caustic crystalline residues and pressure build up from gases developed. Valve has a 1/8" vent hole in ball to equalize internal fluid pressures. Install valve with 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<sub>v</sub> Values**

Nominal Size	Dimensions Reference (inches, ± 1/16)										Approx. Wt. (Lbs.)		Oper. <sup>2</sup> Torque (in. lbs.)	C <sub>v</sub> <sup>3</sup> Values		
	A	B <sup>1</sup>		C			D	E	F	G	PVC	CPVC		Soc/Thd	Flanged	Spigot
		Soc/Thd	Spigot	Socket	Thread	Spigot										
1/2	1-7/8	2-3/8	2-7/8	4-3/16	3-3/16	4-5/8	2-9/16	2-13/16	3-1/2	2-31/32	.36	.38	16	29	18	27
3/4	2-1/4	2-3/4	3-1/4	4-3/4	4-1/4	5-1/4	2-7/8	3-3/8	3-7/8	3-5/16	.56	.58	17	63	39	57
1	2-1/2	2-7/8	3-1/2	5-1/8	4-11/16	5-3/4	3-1/8	3-7/16	4-1/2	3-5/8	.74	.77	22	120	73	108
1-1/4	3-1/16	3-1/4	3-13/16	5-3/4	5-3/16	6-5/16	3-5/8	3-7/8	4-5/8	3-31/32	1.13	1.19	28	243	151	223
1-1/2	3-1/2	3-1/2	4	6-1/4	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	4-25/32	5-3/16	7-3/4	7-13/16	8-1/4	4-1/2	5-3/32	6	5-1/4	2.72	2.85	77	599	395	571
2-1/2	5-3/8	6-31/32	7-13/16	10-7/16	9-11/16	11-3/8	5-1/8	6-1/4	7-1/2	6	7.42	7.70	132	856	579	734
3	6-3/16	7	7-13/16	10-11/16	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	7-5/8	7-1/2	8-1/4	12	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	11-1/16	13	17-1/16	15-3/4	18-1/2	8-1/8	14-5/16	11-1/4	10-3/16	37.53	40.55	732	6638	4824	6149
8 <sup>4</sup>	11-5/8	23-3/16	---	31-7/8	---	---	8-1/8	14-5/16	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.