



Ball Valve Accessories & Troubleshooting Guide



ENGINEERING GUIDE

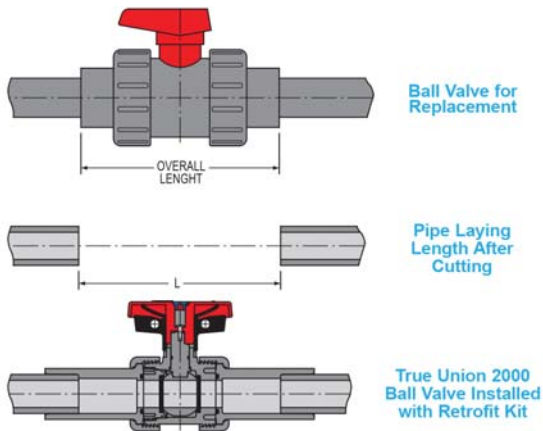
Contact Spears® for any Information not found.

Valves Technical Ball Valve Accessories



True Union 2000 Retrofit Kits

Easily converts any system over to all True Union 2000 style valves for consistent valve type and uniform maintenance. Special extended socket style End Connectors (2) allow retrofit replacement of older Spears® and other brand valves in existing piping systems with a new True Union 2000 valve. Simply cut out old valve according to specified dimension and install retrofit end connectors. End connectors are provided with either EPDM or FKM O-rings.



Ball Valve for Replacement

Pipe Laying Length After Cutting

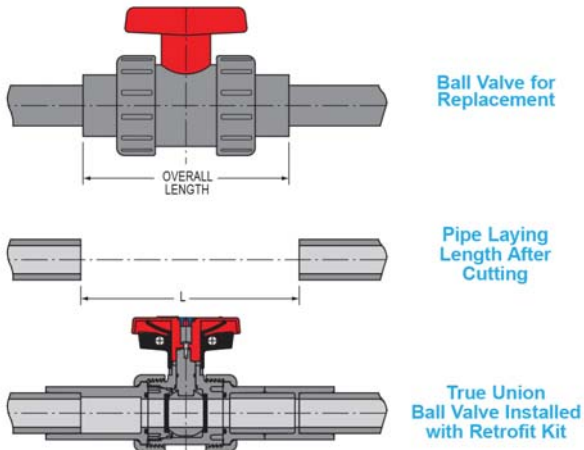
True Union 2000 Ball Valve Installed with Retrofit Kit

True Union Retrofit Kits - Other Brand Valves (Socket Style Only)

Kit Size	EPDM		FKM	
	PVC	CPVC	PVC	CPVC
1/2	RFK2-005	RFK2-005C	RFK3-005	RFK3-005C
3/4	RFK2-007	RFK2-007C	RFK3-007	RFK3-007C
1	RFK2-010	RFK2-010C	RFK3-010	RFK3-010C
1-1/4	RFK2-012	RFK2-012C	RFK3-012	RFK3-012C
1-1/2	RFK2-015	RFK2-015C	RFK3-015	RFK3-015C
2	RFK2-020	RFK2-020C	RFK3-020	RFK3-020C
2-1/2	RFK2-025	RFK2-025C	RFK3-025	RFK3-025C
3	RFK2-030	RFK2-030C	RFK3-030	RFK3-030C
4	RFK2-040	RFK2-040C	RFK3-040	RFK3-040C

Cut-Out Dimensions

Size	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
L	4-29/32	5-7/16	6-3/32	7-1/4	7-1/2	8-17/32	10-3/4	11-7/16	14-15/16



Ball Valve for Replacement

Pipe Laying Length After Cutting

True Union Ball Valve Installed with Retrofit Kit

True Union Retrofit Kits - Older (Regular Style) Spears® Valves (Socket Style Only)

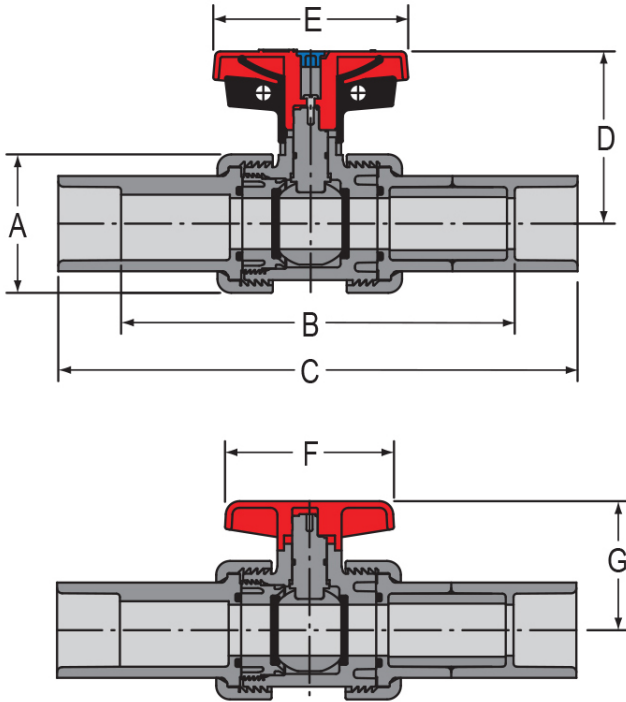
Kit Size	EPDM		FKM	
	PVC	CPVC	PVC	CPVC
1/2	RFKS2-005	RFKS2-005C	RFKS3-005	RFKS3-005C
3/4	RFKS2-007	RFKS2-007C	RFKS3-007	RFKS3-007C
1	RFKS2-010	RFKS2-010C	RFKS3-010	RFKS3-010C
1-1/4	RFKS2-012	RFKS2-012C	RFKS3-012	RFKS3-012C
1-1/2	RFKS2-015	RFKS2-015C	RFKS3-015	RFKS3-015C
2	RFKS2-020	RFKS2-020C	RFKS3-020	RFKS3-020C
2-1/2	RFKS2-025	RFKS2-025C	RFKS3-025	RFKS3-025C
3	RFKS2-030	RFKS2-030C	RFKS3-030	RFKS3-030C
4	RFKS2-040	RFKS2-040C	RFKS3-040	RFKS3-040C

Cut-Out Dimensions

Size	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
L	5-5/16	6-1/4	6-11/16	7-1/8	8-3/16	8-15/16	12	12-1/16	13-3/16



Valves Technical Ball Valve Accessories



True Union 2000 Retrofit Ball Valve Complete Replacement Valve for Older Spears® 2300 Series Regular True Union Ball Valves.

Retrofit valve consists of either Spears® Standard or Industrial True Union 2000 Ball Valve supplied with factory installed extended socket end connectors. Simply cut out old valve to specified dimensions (see preceding cut-out dimensions) and install Retrofit Valve end connectors.

Dimensions

Size	A ± 1/16	B ± 1/16	C ± 1/16	D ± 1/16	E ± 1/16	F ± 1/16	G ± 1/16
1/2	1-7/8	5-5/16	7-1/16	2-9/16	2-13/16	2-1/2	1-5/8
3/4	2-1/4	6-1/4	8-1/4	2-7/8	3-5/16	3	2
1	2-1/2	6-11/16	8-15/16	3-1/8	3-7/16	3-7/16	2-5/16
1-1/4	3-1/16	7-1/8	9-3/4	3-5/8	3-13/16	3-9/16	2-13/16
1-1/2	3-1/2	8-3/16	10-15/16	4	4-3/16	3-7/8	3-1/16
2	4-1/4	8-15/16	11-15/16	4-1/2	5-1/8	5	3-3/4
2-1/2	6-3/16	12	15-1/2	5-1/8	6-1/4	7-5/16	5-7/8
3	6-3/16	12-1/16	15-7/8	5-7/8	7-5/8	7-5/16	5-7/8
4	7-5/8	13-3/16	19	6-3/4	9-3/16	8-3/8	6-3/4

True Union 2000 Retrofit Ball Valve - Replaces Older (Regular Style) Spears® Valves

Size	TU 2000 Industrial Retrofit Ball Valves				TU 2000 Standard Retrofit Ball Valves			
	EPDM		FKM		EPDM		FKM	
	PVC	CPVC	PVC	CPVC	PVC	CPVC	PVC	CPVC
1/2	1822RS-005	1822RS-005C	1832RS-005	1832RS-005C	3622RS-005	3622RS-005C	3632RS-005	3632RS-005C
3/4	1822RS-007	1822RS-007C	1832RS-007	1832RS-007C	3622RS-007	3622RS-007C	3632RS-007	3632RS-007C
1	1822RS-010	1822RS-010C	1832RS-010	1832RS-010C	3622RS-010	3622RS-010C	3632RS-010	3632RS-010C
1-1/4	1822RS-012	1822RS-012C	1832RS-012	1832RS-012C	3622RS-012	3622RS-012C	3632RS-012	3632RS-012C
1-1/2	1822RS-015	1822RS-015C	1832RS-015	1832RS-015C	3622RS-015	3622RS-015C	3632RS-015	3632RS-015C
2	1822RS-020	1822RS-020C	1832RS-020	1832RS-020C	3622RS-020	3622RS-020C	3632RS-020	3632RS-020C
2-1/2	1822RS-025	1822RS-025C	1832RS-025	1832RS-025C	3622RS-025	3622RS-025C	3632RS-025	3632RS-025C
3	1822RS-030	1822RS-030C	1832RS-030	1832RS-030C	3622RS-030	3622RS-030C	3632RS-030	3632RS-030C
4	1822RS-040	1822RS-040C	1832RS-040	1832RS-040C	3622RS-040	3622RS-040C	3632RS-040	3632RS-040C

True Union 2000 Check Valve Seal Carrier Tool

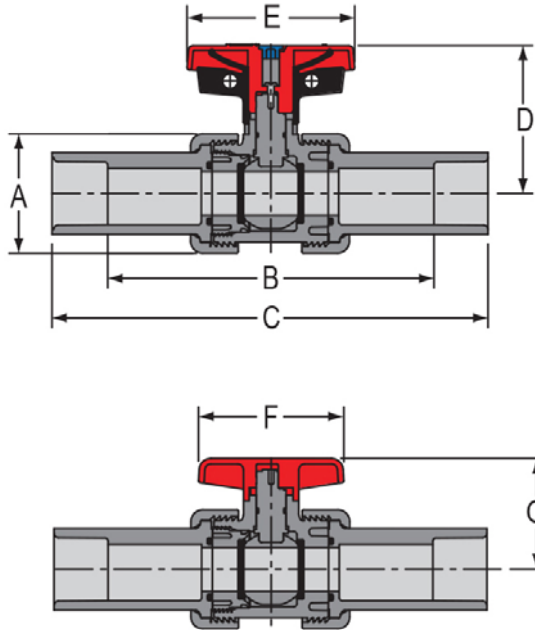
Size	Part Number
1/2	TSK-00503
3/4	TSK-00703
1	TSK-01003
1-1/4	TSK-01203
1-1/2	TSK-01503
2	TSK-02003
3	TSK-03003
4	TSK-04003
6	TSK-06003



True Union 2000 Ball Valve Seal Carrier Tool

Size	Part Number
1/2	TSK1-00503
3/4	TSK1-00703
1	TSK1-01003
1-1/4	TSK1-01203
1-1/2	TSK1-01503
2	TSK1-02003
3	TSK1-03003
4	TSK1-04003
6	TSK1-06003

Valves Technical Ball Valve Accessories



True Union 2000 Retrofit Ball Valve Complete Universal Replacement Valve for Domestic and Import PVC or CPVC Valve.

Retrofit consists of either Spears® Standard or Industrial True Union 2000 Ball Valve supplied with factory installed extended socket end connectors. Simply cut out old valve to specified dimensions (see cut-out dimensions) and install Retrofit Valve end connectors.

Dimensions

Size	A ± 1/16	B ± 1/16	C ± 1/16	D ± 1/16	E ± 1/16	F ± 1/16	G ± 1/16
1/2	1-7/8	4-15/16	6-11/16	2-9/16	2-13/16	2-1/2	1-5/8
3/4	2-1/4	5-7/16	7-1/2	2-7/8	3-3/8	3	2
1	2-1/2	6-1/16	8-5/16	3-1/8	3-7/16	3-7/16	2-5/16
1-1/4	3-1/16	7-5/16	9-7/8	3-5/8	3-7/8	3-9/16	2-13/16
1-1/2	3-1/2	7-1/2	10-5/16	4	4-3/16	3-7/8	3-1/16
2	4-1/4	8-1/2	11-1/2	4-1/2	5-1/8	5	3-3/4
2-1/2	6-3/16	10-7/8	14-3/8	5-7/8	7-5/8	7-5/16	5-7/8
3	6-3/16	11-1/2	15-3/16	5-7/8	7-5/8	7-5/16	5-7/8
4	7-5/8	14-3/8	18-15/16	6-3/4	9	8-3/8	6-3/4

True Union 2000 Retrofit Ball Valve - Replaces Other Brand Valves

Size	TU 2000 Industrial Retrofit Ball Valves				TU 2000 Standard Retrofit Ball Valves			
	EPDM		FKM		EPDM		FKM	
	PVC	CPVC	PVC	CPVC	PVC	CPVC	PVC	CPVC
1/2	1822R-005	1822R-005C	1832R-005	1832R-005C	3622R-005	3622R-005C	3632R-005	3632R-005C
3/4	1822R-007	1822R-007C	1832R-007	1832R-007C	3622R-007	3622R-007C	3632R-007	3632R-007C
1	1822R-010	1822R-010C	1832R-010	1832R-010C	3622R-010	3622R-010C	3632R-010	3632R-010C
1-1/4	1822R-012	1822R-012C	1832R-012	1832R-012C	3622R-012	3622R-012C	3632R-012	3632R-012C
1-1/2	1822R-015	1822R-015C	1832R-015	1832R-015C	3622R-015	3622R-015C	3632R-015	3632R-015C
2	1822R-020	1822R-020C	1832R-020	1832R-020C	3622R-020	3622R-020C	3632R-020	3632R-020C
2-1/2	1822R-025	1822R-025C	1832R-025	1832R-025C	3622R-025	3622R-025C	3632R-025	3632R-025C
3	1822R-030	1822R-030C	1832R-030	1832R-030C	3622R-030	3622R-030C	3632R-030	3632R-030C
4	1822R-040	1822R-040C	1832R-040	1832R-040C	3622R-040	3622R-040C	3632R-040	3632R-040C

Split-Nut Repair Kits for All True Union 2000 Valves, Union 2000 Pipe Unions and True Union Diaphragm Valves

- Allows replacement of broken Union Nuts
- No Reduction in Valve Operating Pressure
- Kit includes 2-piece Split Nut and SS 316 Gear Clamp
- Simply cut or remove broken nut, align Split-Nut halves around end connector and secure with Gear Clamp. Thread nut onto valve to complete repair.

Note: Split-Nut Repair Kit does **NOT** fit Regular Style True Union Valves



Valve Size	PVC Kit	CPVC Kit
1/2	SNK-005	SNK-005C
3/4	SNK-007	SNK-007C
1	SNK-010	SNK-010C
1-1/4	SNK-012	SNK-012C
1-1/2	SNK-015	SNK-015C
2	SNK-020	SNK-020C
2-1/2	SNK-025	SNK-025C
3	SNK-030	SNK-030C
4	SNK-040	SNK-040C



Valves Technical Ball Valve Accessories



**Socket
End
Connector
Set (2)**

Supplemental End Connector Sets for All True Union 2000 Valves, Union 2000 Pipe Unions and True Union Diaphragm Valves

- Allows easy conversion of valve end connections due to system change, modification, or inadvertent disorder of product.
- Each set includes 2 each of either Socket, SR Threaded or Spigot End connectors with either EPDM or FKM O-rings installed.

Valve Size	PVC Part Number		CPVC Part Number	
	EPDM O-ring	FKM O-ring	EPDM O-ring	FKM O-ring
1/2	ECS2-005	ECS3-005	ECS2-005C	ECS3-005C
3/4	ECS2-007	ECS3-007	ECS2-007C	ECS3-007C
1	ECS2-010	ECS3-010	ECS2-010C	ECS3-010C
1-1/4	ECS2-012	ECS3-012	ECS2-012C	ECS3-012C
1-1/2	ECS2-015	ECS3-015	ECS2-015C	ECS3-015C
2	ECS2-020	ECS3-020	ECS2-020C	ECS3-020C
2-1/2	ECS2-025	ECS3-025	ECS2-025C	ECS3-025C
3	ECS2-030	ECS3-030	ECS2-030C	ECS3-030C
4	ECS2-040	ECS3-040	ECS2-040C	ECS3-040C
6	ECS2-060	ECS3-060	ECS2-060C	ECS3-060C

Valve Size	PVC Part Number		CPVC Part Number	
	EPDM O-ring	FKM O-ring	EPDM O-ring	FKM O-ring
1/2	ECSRT2-005	ECSRT3-005	ECSRT2-005C	ECSRT3-005C
3/4	ECSRT2-007	ECSRT3-007	ECSRT2-007C	ECSRT3-007C
1	ECSRT2-010	ECSRT3-010	ECSRT2-010C	ECSRT3-010C
1-1/4	ECSRT2-012	ECSRT3-012	ECSRT2-012C	ECSRT3-012C
1-1/2	ECSRT2-015	ECSRT3-015	ECSRT2-015C	ECSRT3-015C
2	ECSRT2-020	ECSRT3-020	ECSRT2-020C	ECSRT3-020C
2-1/2	ECSRT2-025	ECSRT3-025	ECSRT2-025C	ECSRT3-025C
3	ECSRT2-030	ECSRT3-030	ECSRT2-030C	ECSRT3-030C
4	ECSRT2-040	ECSRT3-040	ECSRT2-040C	ECSRT3-040C
6	ECSRT2-060	ECSRT3-060	ECSRT2-060C	ECSRT3-060C

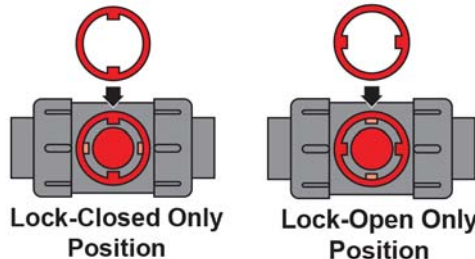
**SR Threaded
End
Connector
Set (2)**

Valve Size	PVC Part Number		CPVC Part Number	
	EPDM O-ring	FKM O-ring	EPDM O-ring	FKM O-ring
1/2	ECSP2-005	ECSP3-005	ECSP2-005C	ECSP3-005C
3/4	ECSP2-007	ECSP3-007	ECSP2-007C	ECSP3-007C
1	ECSP2-010	ECSP3-010	ECSP2-010C	ECSP3-010C
1-1/4	ECSP2-012	ECSP3-012	ECSP2-012C	ECSP3-012C
1-1/2	ECSP2-015	ECSP3-015	ECSP2-015C	ECSP3-015C
2	ECSP2-020	ECSP3-020	ECSP2-020C	ECSP3-020C
2-1/2	ECSP2-025	ECSP3-025	ECSP2-025C	ECSP3-025C
3	ECSP2-030	ECSP3-030	ECSP2-030C	ECSP3-030C
4	ECSP2-040	ECSP3-040	ECSP2-040C	ECSP3-040C
6	ECSP2-060	ECSP3-060	ECSP2-060C	ECSP3-060C

**Spigot
End
Connector
Set (2)**

Handle Lockout Ring for True Union 2000 Industrial Ball Valves

- Use with Built-in Handle Lockout Device
- Allows selective lockout position of Lock-Open Only or Lock-Closed Only
- Simply remove valve handle and install ring below handle lockout mechanism



Valve Size	Part Number
1/2	TU2LR-005
3/4	TU2LR-007
1	TU2LR-010
1-1/4	TU2LR-012
1-1/2	TU2LR-015
2	TU2LR-020
2-1/2 & 3	TU2LR-030
4	TU2LR-040

Valves Technical Ball Valve Accessories



Typical Application
(VALVE AND RISER NOT INCLUDED)

Stem Extension Kits

- Kits for True Union 2000 Valves and for Regular True Union, Single Entry or Compact Ball Valves
- Simple 2-Piece Kit for use with existing Valve Handle and Schedule 80 pipe, or can be ordered factory assembled to desired length as 1-piece unit.
- Kit includes 1 - Stem Adapter and 1 - Handle Adapter
- Corrosion resistant PVC construction

2-Piece Stem Extension Kit W/Non-Locking Handles

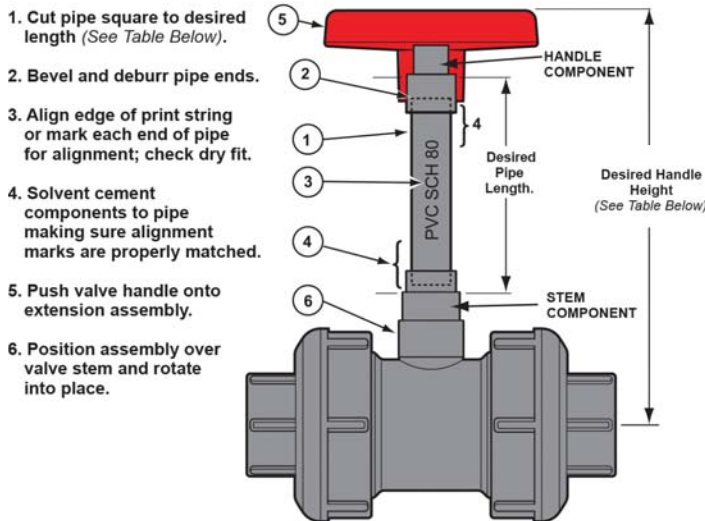
Valve Size	Part Numbers ¹	
	For True Union 2000, Compact 2000 & Single Entry Ball Valves ²	For Regular True Union & Compact Ball Valves
1/2	BVSE2-005-000	BVSE-005-000
3/4	BVSE2-007-000	BVSE-007-000
1	BVSE2-010-000	BVSE-010-000
1-1/4	BVSE2-012-000	BVSE-012-000
1-1/2	BVSE2-015-000	BVSE-015-000
2	BVSE2-020-000	BVSE-020-000
2-1/2 & 3	BVSE2-030-000	BVSE-030-000
4	BVSE2-040-000	BVSE-040-000
6	BVSE2-060-000	N/A

1. For factory assembled units, replace last 3 zeros with length code. See SPS-1 for length codes.
2. Not for use on True Union 2000 Industrial 3-Way Ball Valves.

Required for Assembly:

- Two-Piece Stem Extension Kit
- Desired Length of PVC Schedule 80 Pipe*
- Saw & Miter Box or Wheel-Type Cutter
- PVC Solvent Cement & Primer
- Black Marker
- Ruler

* NOT INCLUDED



1. Cut pipe square to desired length (See Table Below).
2. Bevel and deburr pipe ends.
3. Align edge of print string or mark each end of pipe for alignment; check dry fit.
4. Solvent cement components to pipe making sure alignment marks are properly matched.
5. Push valve handle onto extension assembly.
6. Position assembly over valve stem and rotate into place.

Use the Schedule 80 pipe size listed for the appropriate valve size											
Valve Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	
Required Sch 80 Pipe Size	3/4			1				1-1/2			
To calculate the length of Schedule 80 pipe needed, subtract the appropriate figure shown below from the desired handle height											
For True Union 2000 Industrial Ball Valves¹											
Valve Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	
Subtract (in.)	3-7/8	4	4-5/16	5	5-5/8	6-1/4	8-1/16	8-1/16	9-5/8	10-11/16	
Minimum Height (in.)	4-9/16	5-3/16	5-1/2	6-3/4	7-3/8	8	9-13/16	9-13/16	11-5/8	12-3/4	
For True Union 2000 Standard, Compact 2000 & Single Entry Ball Valves											
Valve Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	N/A	
Subtract (in.)	2-1/2	3-1/16	3-9/16	4-1/4	4-5/8	5-11/16	7-11/16	7-11/16	9	N/A	
Minimum Height (in.)	3-5/8	4-1/4	4-3/4	6	6-3/8	7-7/16	9-1/2	9-1/2	11	N/A	
For Regular True Union & Compact Ball Valves											
Valve Size (in.)	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	N/A	
Subtract (in.)	3-5/16	4	4-5/16	5-1/8	5-5/8	6-1/16	7-1/8	7-1/8	8-3/8	N/A	
Minimum Height (in.)	4-1/2	5-1/4	5-1/2	7	7-1/2	8	9	9	10-1/2	N/A	

1: Stem Extension does not permit use of Handle Lockout on True Union 2000 Industrial Ball Valves.

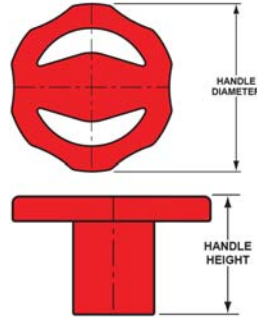


Valves Technical Ball Valve Accessories

Round Safety Handles

- Handles for True Union 2000 Valves and for Regular True Union, Single Entry or Compact Ball Valves
- Helps prevent accidental operation of valve
- Special design provides positive hand grip
- Impact and corrosion resistant Polypropylene construction

Note: Round Handle does not allow use of Handle Lockout on True Union 2000 Industrial Ball Valve. Not for use on True Union 2000 Industrial 3-Way Ball Valve.



Typical Application
(VALVE NOT INCLUDED)

Valve Size	Part Numbers					Handle Height	Handle Diameter
	For TU 2000, Compact 2000, & Single Entry, & Utility Ball Valves		For Regular True Union & Compact Ball Valves				
	3-Slot Stem	1-Slot Stem	3-Slot Stem	1-Slot Stem	Flat/2-D Stem		
1/2	RSH2-005	RSH5-005	RSH-005	RSH6-005	RSH4-005	1-13/32	2-1/2
3/4	RSH2-007	RSH5-007	RSH-007	RSH6-007	RSH4-007	1-9/16	2-7/8
1	RSH2-010	RSH5-010	RSH-010	RSH6-010	RSH4-010	1-9/16	3-1/4
1-1/4	RSH2-012	RSH5-012	RSH-012	RSH6-012	RSH4-012	1-13/16	3-9/16
1-1/2	RSH2-015	RSH5-015	RSH-015	RSH6-015	RSH4-015	1-15/16	4-3/16
2	RSH2-020	RSH5-020	RSH-020	RSH6-020	RSH4-020	2-1/4	5-1/16
2-1/2 & 3	RSH2-030	RSH5-030	NA	NA	RSH-030	2-3/4	6-11/16
4	RSH2-040	RSH5-040	NA	NA	RSH-040	3	8-1/8

2" Square / T-Style Operator Nuts

- Operator Nuts for True Union 2000 Valves and for Regular True Union, Single Entry or Compact Ball Valves
- Designed for use with standard 2" square drive or conventional "T" drive operators

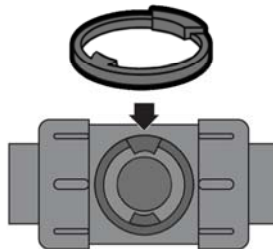
Note: Not for use on True Union 2000 Industrial 3-Way Ball Valves

Valve Size	Part Numbers		
	All True Union (Reg./2000) Compact, Compact 2000 & Single Entry Ball Valves	For True Union 2000 Industrial, Standard & Single Entry Ball Valves	For Regular True Union & Compact Ball Valves
1/2	VTN2-005	N/A	N/A
3/4	VTN2-007		
1	VTN2-010		
1-1/4	VTN2-012		
1-1/2	VTN2-015		
2	VTN2-020		
2-1/2 & 3	N/A	VTN2-030	VTN-030
4		VTN2-040	VTN-040



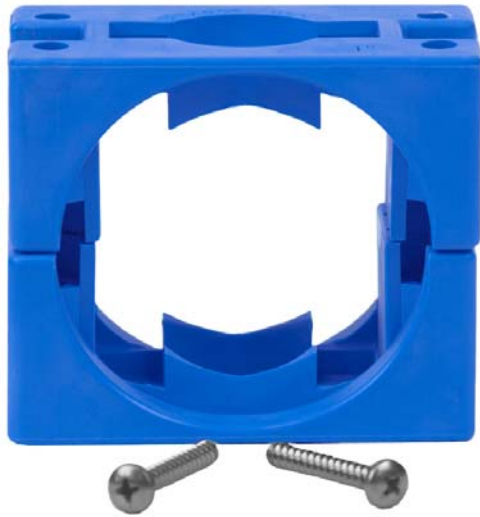
Adjustable Stop Ring for True Union Industrial 3-Way Full Port Ball Valves

- The Adjustable Stop Ring (sold separately)
- Must be used with any "MIXING" Port Option to provide proper mid-way handle stop function
- Required for handle positioning when using MIXING Ball Port Options
- For 3-Way Full Port Ball Valves Only



Vertical 3-Way Full Port top view

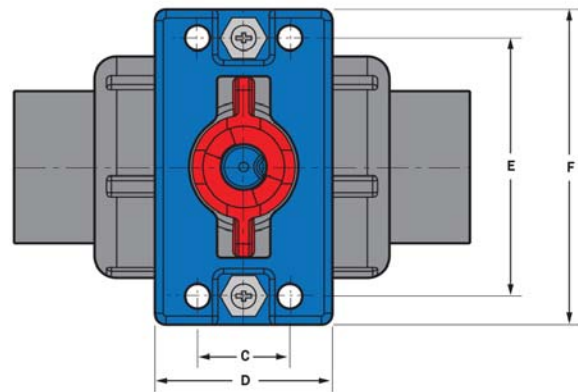
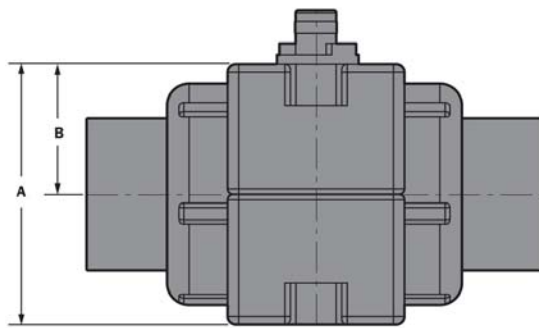
Valve Size	Part Number
1/2	ASR-005
3/4	ASR-007
1	ASR-010
1-1/4	ASR-012
1-1/2	ASR-015
2	ASR-020



Multi-Mount Valve Mounting Brackets

- Separate Brackets for True Union 2000 Industrial & Standard Ball Valves and for Regular True Union Ball Valves.
- Provides solid, versatile valve mounting to machinery supports, panels, etc.
- Simple 2-piece clamp-on unit allows quick removal of valve for maintenance or servicing without altering position.
- Includes mounting hardware.
- Impact and corrosion resistant Polypropylene construction.
- Easily adapts to actuator mount using optional Multi-Mount Actuator Mounting Platform.

- Note:**
- 1) Bracket does not fit True Union 2000 Industrial 3-Way Ball Valves.
 - 2) True Union 2000 Valve brackets come with Stainless Steel hardware, Regular True Union brackets come with zinc-plated steel hardware.
 - 3) Will not fit with Low Profile Actuation Mounting Kit.



Multi-Mount Valve Mounting Brackets

True Union 2000 Industrial Ball Valve

Valve Size	Part Number	Dimensions					
		A	B	C	D	E	F
1/2	TUMB2-005	2.38	1.19	1.04	1.72	2.46	3.54
3/4	TUMB2-007	2.82	1.41	1.10	1.81	2.75	3.54
1	TUMB2-010	2.98	1.49	1.04	2.00	2.90	3.54
1-1/4	TUMB2-012	3.60	1.80	1.25	2.00	3.50	4.13
1-1/2	TUMB2-015	4.00	2.00	1.38	2.15	3.90	4.53
2	TUMB2-020	5.00	2.50	1.50	2.50	4.50	5.10
2-1/2 & 3	TUMB2-030	6.30	3.15	2.00	3.25	6.25	7.00
4	TUMB2-040	8.25	4.12	2.00	4.10	7.72	8.50

Regular True Union Ball Valve

Valve Size	Part Number	Dimensions					
		A	B	C	D	E	F
1/2	TUMB-005	2.92	1.46	0.68	1.55	2.25	4.44
3/4	TUMB-007	3.54	1.77	0.94	1.87	2.55	4.87
1	TUMB-010	3.56	1.78	1.05	2.00	2.87	5.12
1-1/4	TUMB-012	3.98	1.99	1.19	2.09	3.25	5.31
1-1/2	TUMB-015	4.54	2.27	1.47	2.47	3.84	5.90
2	TUMB-020	5.56	2.78	1.81	2.75	4.75	7.00
2-1/2 & 3	TUMB-030	7.54	3.77	2.47	3.75	6.87	9.47
4	TUMB-040	9.16	4.58	2.72	4.19	8.28	11.41



Valves Technical Ball Valve Accessories



Multi-Mount Actuator Mounting Platforms

- Separate Platforms for True Union 2000 Valves and for Regular True Union Ball Valves.
- Add-on actuator adapter for use with Multi-Mount Valve Mounting Bracket (may also be purchased with bracket as complete kit).
- Universal actuator mounting accepts ISO, MSS or comparable square bolt-pattern actuators.
- Impact and corrosion resistant Polypropylene construction.
- Includes hardware for mounting Platform to Bracket

Note:

- 1) True Union 2000 Valve platforms come with Stainless Steel hardware, Regular True Union platform come with zinc-plated steel hardware.
- 2) See Complete Multi-Mount Actuation Mounting Kit for applicable dimensions.

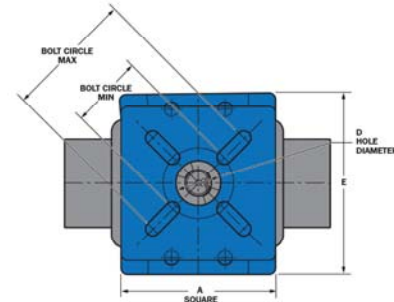
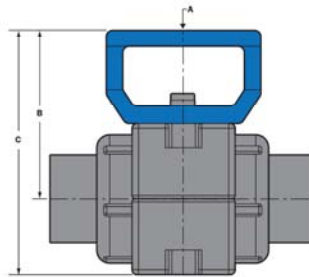
Valve Size	Part Numbers	
	For True Union 2000 Ball Valves	For Regular True Union Ball Valves
1/2	MMP1-005	MMP-005
3/4	MMP1-007	MMP-007
1	MMP1-010	MMP-010
1-1/4	MMP1-012	MMP-012
1-1/2	MMP1-015	MMP-015
2	MMP1-020	MMP-020
2-1/2 & 3	MMP1-030	MMP-030
4	MMP1-040	MMP-040

Complete Multi-Mount Actuation Mounting Kits



- Separate Platforms for True Union 2000 Industrial Ball Valves & for True Union 2000 Standard Ball Valves and for Regular True Union Ball Valves.
- Combines Multi-Mount Valve Mounting Bracket and Multi-Mount Actuator Mounting Platform into one complete kit.
- Provides solid, fully supported valve and actuator mounting.
- Impact and corrosion resistant Polypropylene construction.
- Bracket and platform hardware included

- Note:**
- 1) True Union 2000 Valve kits come with Stainless Steel hardware, Regular True Union kits come with zinc-plated steel hardware.
 - 2) Does not fit True Union 2000 Industrial 3-way Ball Valves.
 - 3) Actuator coupling not included (see Valve Stem Output Detail for design of user supplied drive coupling).



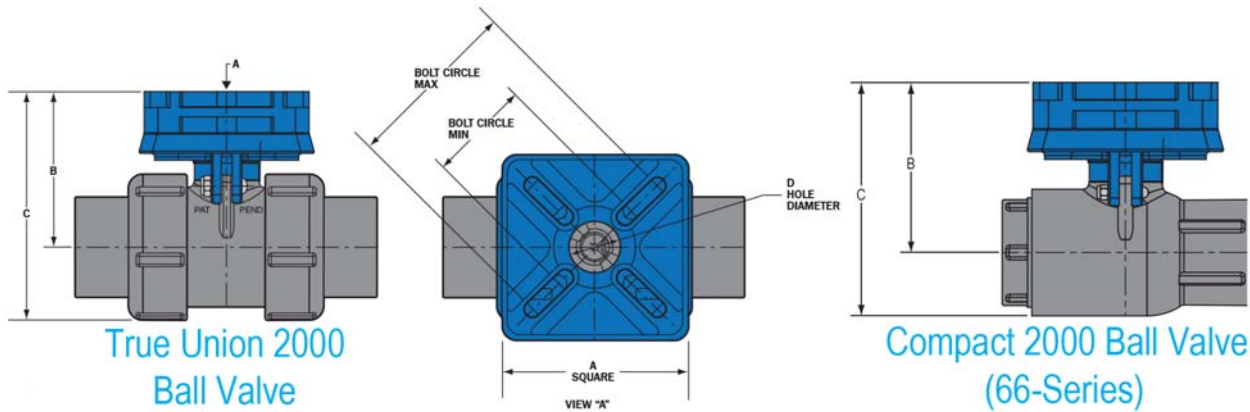
Valve Size	True Union 2000 Ball Valves	Regular True Union Ball Valves	Dimensions									
			A	TU 2000 B	Reg. TU B	TU 2000 C	Reg. TU C	D	TU 2000 E	Reg. TU E	Bolt Circle Max	Bolt Circle Min.
1/2	TUAK1-005	TUAK-005	3.00	3.00	3.24	4.19	4.67	.87	3.54	4.44	2.50	1.41
3/4	TUAK1-007	TUAK-007	3.00	3.13	3.46	4.54	5.20	.87	3.54	4.87	2.50	1.41
1	TUAK1-010	TUAK-010	3.00	3.31	3.60	4.88	5.38	.87	3.54	5.12	2.50	1.41
1-1/4	TUAK1-012	TUAK-012	3.75	4.64	4.80	6.44	6.76	.90	4.13	5.31	3.00	1.41
1-1/2	TUAK1-015	TUAK-015	3.75	5.02	5.27	7.02	7.52	.90	4.53	5.90	3.00	1.41
2	TUAK1-020	TUAK-020	3.75	5.52	5.77	8.02	8.52	1.12	5.10	7.00	3.12	1.75
2-1/2 & 3	TUAK1-030	TUAK-030	5.25	6.34	6.91	9.49	10.63	1.37	7.00	9.47	5.00	2.20
4	TUAK1-040	TUAK-040	5.25	7.99	8.36	12.11	12.86	1.37	8.50	11.41	5.00	2.20



Low Profile Actuation Mounting Kits

- Separate kits for True Union 2000 Industrial & Industrial 3-Way Ball Valves and for True Union 2000 Standard Ball Valves.
- Compact bolt-on mount provides positive actuator support and alignment.
- Universal actuator mounting plate accepts ISO, MSS or comparable square bolt-pattern actuators.
- Impact and corrosion resistant Polypropylene construction.
- Includes Stainless Steel hardware for mounting to valve.

Note: 1) Actuator coupling not included (see Valve Stem Output Detail for design of user supplied drive coupling).
 2) Will not assemble with Multi-Mount Valve mounting bracket — See Mini-Mount Actuation Mounting Kit or Mini-Mount Combo Actuation Mounting Kit.



Dimensions

Valve Size	True Union 2000 Ind Ball Valves	True Union 2000 Std Ball Valves	Compact 66-Series	Dimensions							
				A	TU 2000 B	66 Series B	TU 2000 C	66 Series C	D	Bolt Circle Max.	Bolt Circle Min.
1/2	AMB5-005	AMB6-005		3.18	2.45	2.45	3.38	3.16	0.87	3.00	1.62
3/4	AMB5-007	AMB6-007		3.18	2.61	2.61	3.78	3.50	0.87	3.00	1.75
1	AMB5-010	AMB6-010		3.18	2.77	2.77	4.10	3.79	0.87	3.00	1.75
1-1/4	AMB5-012	AMB6-012		3.68	3.40	3.40	4.97	4.68	0.87	3.75	2.00
1-1/2	AMB5-015	AMB6-015		3.68	3.64	3.64	5.42	5.12	0.87	3.75	2.00
2	AMB5-020	AMB6-020		3.68	4.31	4.31	6.45	6.10	1.12	3.75	2.50
2-1/2 & 3	AMB5-030	AMB6-030	N/A	5.25	5.56	N/A	8.64	N/A	1.96	5.62	4.50
4	AMB5-040	AMB6-040	N/A	5.75	6.11	N/A	9.97	N/A	2.68	5.88	4.80
6	AMB5-060	N/A	N/A	5.75	7.92	N/A	13.73	N/A	2.88	5.88	4.80



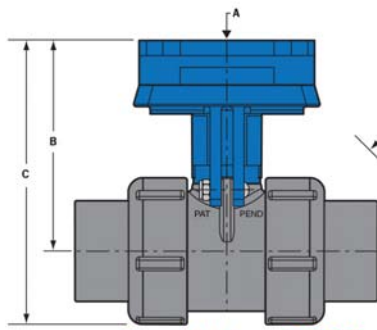
Valves Technical Ball Valve Accessories



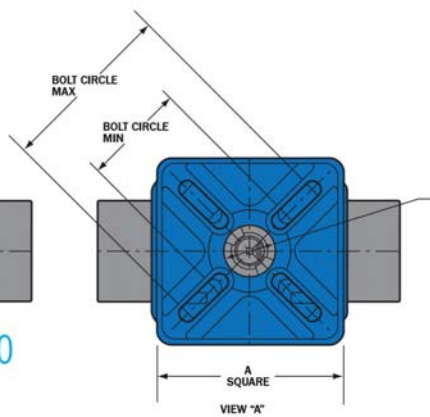
Mini-Mount Actuation Mounting Kits

- Separate kits for True Union 2000 Industrial & Industrial 3-Way Ball Valves and for True Union 2000 Standard Ball Valves.
- Simple bolt-on mount provides positive actuator support and alignment.
- Universal actuator mounting plate accepts ISO, MSS or comparable square bolt-pattern actuators.
- Impact and corrosion resistant Polypropylene construction.
- Includes Stainless Steel hardware for mounting to valve.

Note: 1) Actuator coupling not included (see Valve Stem Output Detail for design of user supplied drive coupling).



True Union 2000
Ball Valve



Compact 2000 Ball Valve
(66-Series)

Dimensions

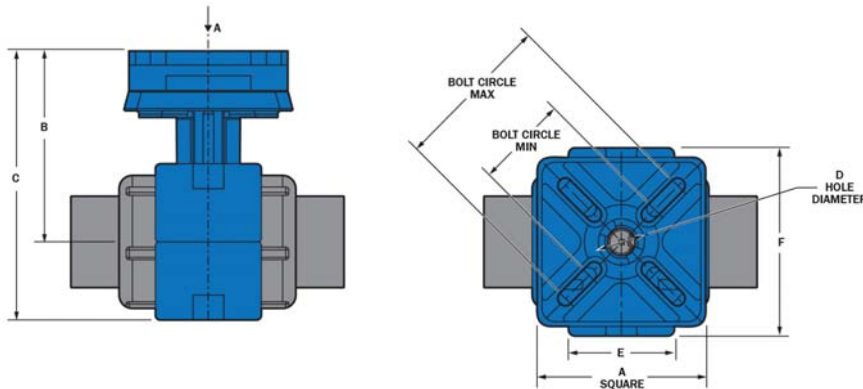
Valve Size	TU 2000 Ind Ball Valves	TU 2000 Std Ball Valves	Compact 66-Series	Compact 21-Series	Dimensions									
					A	TU 2000 B	66 Series B	21 Series B	TU 2000 C	66 Series C	21 Series C	D	Bolt Circle Max.	Bolt Circle Min.
1/2	AMB2-005	AMB3-005		AMB4-005	3.18	2.95	2.95	2.90	3.88	3.66	3.75	0.87	3.00	1.62
3/4	AMB2-007	AMB3-007		AMB4-007	3.18	3.36	3.36	3.47	4.53	4.25	4.51	0.87	3.00	1.75
1	AMB2-010	AMB3-010		AMB4-010	3.18	3.60	3.60	3.61	4.93	4.62	4.80	0.87	3.00	1.75
1-1/4	AMB2-012	AMB3-012		AMB4-012	3.68	4.37	4.37	4.30	5.94	5.65	5.71	0.87	3.75	2.00
1-1/2	AMB2-015	AMB3-015		AMB4-015	3.68	4.64	4.64	4.60	6.42	6.12	6.22	0.87	3.75	2.00
2	AMB2-020	AMB3-020		AMB4-020	3.68	5.47	5.47	5.32	7.61	7.26	7.38	1.12	3.75	2.50
2-1/2 & 3	AMB2-030	AMB3-030	N/A	AMB3-030	5.25	6.15	N/A	5.87	9.23	N/A	8.87	1.96	5.62	4.50
4	AMB2-040	AMB3-040	N/A	AMB3-040	5.75	6.92	N/A	6.91	10.78	N/A	10.59	2.68	5.88	4.80
6	AMB2-060	N/A	N/A	AMB2-060	5.75	8.31	N/A	8.31	14.12	N/A	13.39	2.88	5.88	4.85

Mini-Mount Combo Actuation Mounting Kits



- Separate, complete actuation mounting kit specially designed for True Union 2000 Industrial Ball Valve and for True Union 2000 Standard Ball Valve.
- Combines Multi-Mount Bracket with Mini-Mount Actuation Mounting Kit for additional mounting support.
- Universal actuator mounting plate accepts ISO, MSS or comparable square bolt-pattern actuators.
- Impact and corrosion resistant Polypropylene construction.
- Includes Stainless Steel hardware for mounting to valve.

Note: 1) Does not fit True Union 2000 Industrial 3-way Ball Valves
 2) Actuator coupling not included (see Valve Stem Output Detail for design of user supplied drive coupling).



Dimensions

Valve Size	True Union 2000 Industrial Ball Valves	True Union 2000 Standard Ball Valves	Dimensions							
			A	B	C	D	E	F	Bolt Circle Max.	Bolt Circle Min.
1/2	TUAK2-005	TUAK3-005	3.18	2.95	4.14	.87	1.72	3.54	3.00	1.62
3/4	TUAK2-007	TUAK3-007	3.18	3.36	4.77	.87	1.81	3.54	3.00	1.75
1	TUAK2-010	TUAK3-010	3.18	3.60	5.09	.87	2.00	3.54	3.00	1.75
1-1/4	TUAK2-012	TUAK3-012	3.68	4.37	6.17	.87	2.00	4.13	3.75	2.00
1-1/2	TUAK2-015	TUAK3-015	3.68	4.64	6.64	.87	2.15	4.53	3.75	2.00
2	TUAK2-020	TUAK3-020	3.68	5.47	7.97	1.12	2.50	5.10	3.75	2.50
2-1/2 & 3	TUAK2-030	TUAK3-030	5.75	6.15	9.30	1.96	3.25	7.00	5.62	4.50
4	TUAK2-040	TUAK3-040	5.75	6.92	11.05	2.68	4.10	8.50	5.88	4.80

Standard and Compact Foot Valve Screens



- Easily converts Ball Check Valve to a Foot Valve.
- Standard IPS spigot connection fits slip-socket valve end connector.
- Enlarged screen provides open area equivalent to valve for optimum flow characteristics.
- Chemical and corrosion resistant PVC, CPVC or Compact HDPE threaded construction.
- Compact fits any IPS socket or threaded Ball Check Valve



Typical Application
 (VALVE NOT INCLUDED)

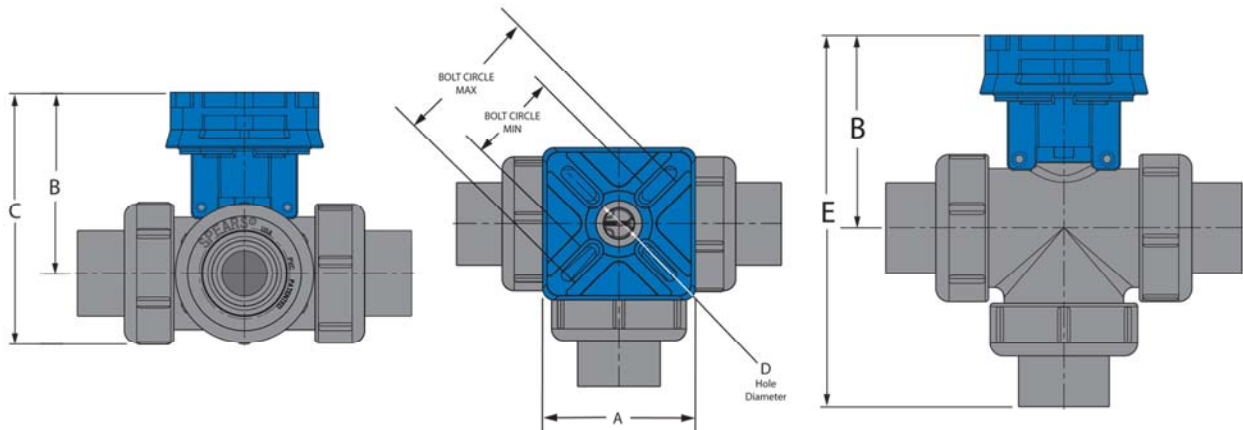


Valves Technical Ball Valve Accessories



3-Way Full Port Mini-Mount Actuation Mounting Kits

- Simple bolt-on mount provides positive actuator support and alignment.
- Universal actuator mounting plate accepts ISO, MSS or comparable square bolt-pattern actuators.
- Impact and corrosion resistant Polypropylene construction.
- Includes Stainless Steel hardware for mounting to valve.



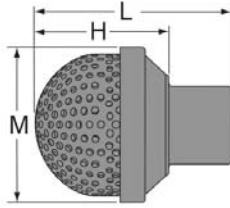
Dimensions

Valve Size	Part Number	A	B	C	D	E	BOLT CIRCLE MAX	BOLT CIRCLE MIN
1/2	AMB7-005	3.18	3.00	4.04	.95	5.70	3.00	1.62
3/4	AMB7-007	3.18	3.46	4.73	.95	6.62	3.00	1.75
1	AMB7-010	3.18	3.67	5.10	.95	7.06	3.00	1.75
1-1/4	AMB7-012	3.68	4.50	6.25	1.20	8.57	3.75	2.00
1-1/2	AMB7-015	3.68	4.79	6.79	1.20	9.28	3.75	2.00
2	AMB7-020	3.68	5.57	7.90	1.12	10.70	3.75	2.50

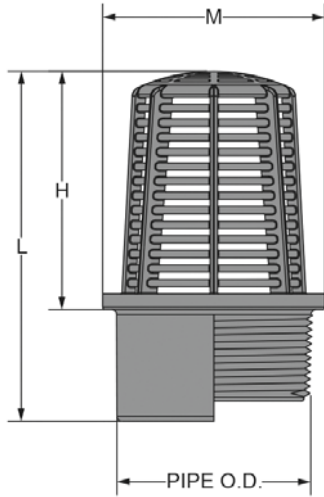
Valves Technical Ball Valve Accessories



Standard Dimensions



Size	Part Number		L	H	M
	PVC	CPVC	±1/16	±1/32	±1/16
1/2	FVS-005	FVS-005C	3-7/16	2-1/2	2-1/4
3/4	FVS-007	FVS-007C	3-1/2	2-7/16	2-5/16
1	FVS-010	FVS-010C	3-5/8	2-9/16	2-5/8
1-1/4	FVS-012	FVS-012C	3-7/8	2-9/16	2-5/8
1-1/2	FVS-015	FVS-015C	5-15/32	4-1/64	4-7/16
2	FVS-020	FVS-020C	5-1/2	4-1/64	4-7/16
2-1/2	FVS-025	FVS-025C	6-7/16	4-3/4	5-5/8
3	FVS-030	FVS-030C	6-5/8	4-3/4	5-11/16
4	FVS-040	FVS-040C	6-29/32	4-3/4	5-3/4
6	FVS-060	FVS-060C	7-3/8	4-11/16	7-3/16



Compact Dimensions

Size	Part Number			H	L		M	
	Threaded		Spigot		±1/16		±1/16	
	PVC	HDPE	PVC	±1/32	Threaded	Spigot	Threaded	Spigot
1/2	CFVS1-005	CFVS1-005P	CFVS7-005	1-9/16	2-7/32	2-5/16	31/32	1-3/32
3/4	CFVS1-007	CFVS1-007P	CFVS7-007	1-27/32	2-1/2	2-25/32	1-7/32	1-5/16
1	CFVS1-010	CFVS1-010P	CFVS7-010	2-1/16	2-7/8	3-3/32	1-7/16	1-5/8
1-1/4	CFVS1-012	CFVS1-012P	CFVS7-012	2-7/32	3-1/4	3-15/32	1-27/32	2
1-1/2	CFVS1-015	CFVS1-015P	CFVS7-015	2-19/32	3-5/8	3-29/32	2-1/8	2-1/4
2	CFVS1-020	CFVS1-020P	CFVS7-020	2-15/16	4	4-5/16	2-5/8	2-3/4

Valve Stem Output Detail

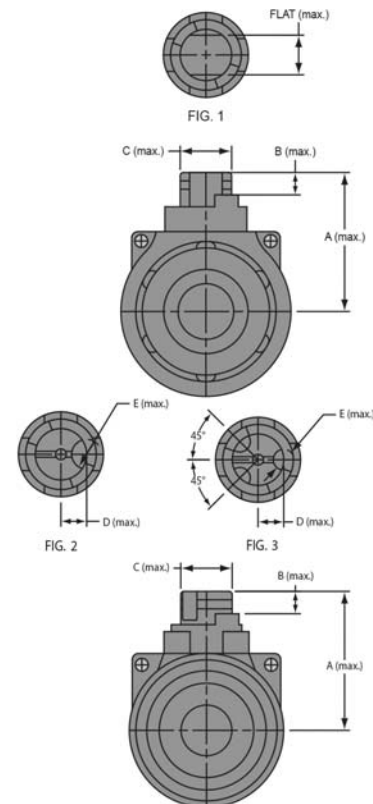
For All True Union 2000, Compact 2000, & Single Entry Ball Valves

Size	A (max.)	B (max.)	C (max.)	D (max.)	E (max.) 3-PIN SLOT	Flat (max.)	Fig
1/2	1.40	.23	.52	.26	.21	N/A	3
3/4	1.76	.30	.56	.28	.21		
1	2.07	.38	.62	.31	.23		
1-1/4	2.58	.52	.56	.28	.19		
1-1/2	2.83	.58	.75	.37	.27		
2	3.48	.61	.95	.47	.31		
2-1/2 & 3	5.24	1.16	1.28	.63	.44	1.90	3
4	5.78	.88	1.86	.93	.63		
6	7.53	1.33	2.12	N/A	N/A		

For Regular True Union & Compact* Ball Valves

Size	A (max.)	B (max.)	C (max.)	D (max.)	E (max.)	Flat (max.)	Fig.
1/2	1.45	.28	.52	.26	.21	N/A	3
3/4	1.85	.28	.56	.28	.21		
1	2.15	.44	.62	.31	.23		
1-1/4	2.66	.66	.56	.28	.19		
1-1/2	2.84	.63	.75	.37	.27		
2	3.57	.85	.95	.47	.31		
2-1/2 & 3	5.24	1.09	1.48	.63	.44	N/A	3
4	5.78	1.85	2.12	.93	.63		
6	7.53	1.28	2.12	N/A	N/A		

*The 2-1/2", 3" & 4" regular Compact Ball Valves have the same stem output detail as specified in the True Union 2000, Compact 2000, & Single Entry Ball Valves in preceding table.





Valves Technical
Ball Valve Troubleshooting Guide

Spears® True Union, Single Entry and Compact Ball Valves are designed and produced for trouble-free operation and use. However, certain aspects of installation and application can result in valve malfunctions.

This guide identifies some of the more common problems encountered and their necessary corrective actions. Such problems have been categorized as External Leaks, Internal Leaks, Frozen Movements and Structural Breakage.

External Leaks		
Location	Possible Cause	Corrective Action
At Thread/Socket Connections	Improper solvent cementing. Improper threads. Insufficient or improperly applied thread sealant; incompatible sealant (paste). Over-tightened thread joint splitting connector. Insufficient valve support splitting connector.	Replace end connector(s) according to installation instructions. Check threads for proper size; replace or reinstall. Reinstall thread connection according to proper procedures; check paste compatibility. Replace cracked end connector(s). Replace cracked end connector(s). Add support on each side of valve.
At Union Nuts	End connector misaligned. Displaced or damaged O-ring; particles in O-ring groove. System contraction pulling end connectors; improper end connector spacing. Loose Union Nut. Displaced or pinched seal carrier O-ring.	Check system alignment - end connector(s) must be parallel. Check for adequate valve support. Remove valve and inspect O-ring for physical or chemical damage. Check O-ring compatibility, replace accordingly. Clean and re-seat O-ring. Check thermal variations; anchor pipe each side of valve; install expansion loop. Correct spacing. Re-tighten nut. Remove and disassemble seal carrier; re-seat or replace O-ring.
At Stem	Damaged stem O-ring.	Remove and disassemble valve stem; inspect for physical or chemical damage. Check O-ring compatibility, clean and replace accordingly.

Valves Technical
Ball Valve Troubleshooting Guide



Internal Leaks — In-line Leakage Past Valve	
Possible Cause	Corrective Action
Ball obstruction	Check that the valve is in its "full-closed" position. If not, remove valve and check for solids blocking the ball port. Clean and reinstall valve.
Broken Stem	Remove end connector and check for ball rotation while operating valve. Replace as necessary.
Seal Carrier Loose	True Union Valves - remove valve; CAREFULLY tighten seal carrier (located on inlet end of body). Single Entry Valves - CAREFULLY tighten single Union Nut. IMPORTANT: Generally only a slight adjustment is required (either valve). A properly adjusted valve should have significant resistance to operation without binding - AVOID OVER-TIGHTENING!
PTFE Seat Damage or Debris Laden	Remove and disassemble valve seats. Check for excessive debris and physical damage (nicks, cuts, scoring, etc.). Clean and replace as necessary.
Seat O-ring Displaced, Damaged or Debris Laden	Remove and disassemble valve seat O-rings; check for physical or chemical damage. Check O-ring chemical compatibility; clean and replace accordingly. Check for excessive system flow rate.
Ball Damaged	Remove and disassemble valve ball. Check for physical damage (excessive nicks, scoring, etc.) at seat sealing surface (perpendicular to ball port). Clean surface; replace ball if necessary. Check for chemical damage and valve material (PVC, CPVC) compatibility.
Solvent-Cement (glue) Contamination from Installation Spillage	Remove valve and check for glue deposits on ball or seat areas. Clean, if possible; excessive damage may require component replacement.
Thermal Damage (component distortion)	Check system operating temperatures, external heat sources (including direct sun), and heat generated from system design or valve placement.

Frozen Movements — unable, or very difficult, to open/close; sometimes accompanied by stem break (shear)	
Possible Cause	Corrective Action
Internal Obstructions; Sediment or Particle Buildup; Solvent Cement on Ball	Remove valve and check for solids, debris or solvent cement deposits blocking the ball or valve interior. Check for sediment particles lodged around ball-to-seat contact areas. Remove stem and check for the same. Clean and reinstall.
Over-tight Seal Carrier	True-Union Valves - remove valve; slightly loosen seal carrier (located on inlet end of body). Single Entry Valves - slightly loosen single Union Nut. IMPORTANT: Generally only a slight adjustment is required (either valve). A properly adjusted valve should have significant resistance to operation without binding.
Chemical Attack (generally appears as distortion, peeling, etching or bleaching of ball sealing surfaces or other internal components)	Check valve material (PVC, CPVC) chemical compatibility with system fluids. Be sure to consider operating temperatures with this determination.



Valves Technical
Ball Valve Troubleshooting Guide

Structural Breakage		
Location	Possible Cause	Corrective Action
Handle broken	Frozen movements. External impact.	See "Frozen Movements" section. Replace. Identify and correct source.
Handle Stripped	Overextending open/close range. Excessive exposure to direct-sunlight has softened handle material.	Replace handle. Shield or screen valve from direct-sun exposure.
Stem Sheared / Broken	Frozen movements; external impact.	See "Frozen Movements" section.
Broken Union Nut	Nut has been overtightened to draw-up or align end connectors; external impact. Inadequate valve supports. Excessive internal pressure / Hydraulic Shock	Adjust spacing between end connectors for proper valve lay-lengths. Check system alignment - end connector(s) must be parallel. Provide system support on each side of valve. Check system pressures and surge pressures; check for entrapped air.
End Connector Break	System misalignment; external impact. Over-tighten thread-joint connection. Inadequate valve support.	Check system alignment - end connector(s) must be parallel. Install new end connector according to installation instructions. Provide system support on each side of valve.
Body Break	External impact. Excessive internal pressure. System misalignment. Inadequate valve support. Chemical attack.	Identify and correct source. Check system pressures and surge pressures; check for entrapped air. Check system alignment - end connector(s) must be parallel. Provide system support on each side of valve. Check chemical compatibility of system fluids.

NOTES: Certain corrective actions of this guide may not be feasible with the Compact Ball Valve (sealed unit).

Improper system operating temperatures and chemical incompatibility can cause a variety of functional and structural failures. Be sure to use proper valve material-types for both temperature and chemical resistance.

Most valve problems are traceable to improper system design or installation. Be sure to have all design performed by a qualified Engineer and installation made by properly trained personnel.

Spears® valve Installation Instructions and Maintenance/Service Procedures should be followed in conjunction with all corrective actions.