



Submittal - 024 Pump Station

Spears PVC & CPVC True Union 2000 Valves (Submittal on the following page(s), this sheet is the response page)

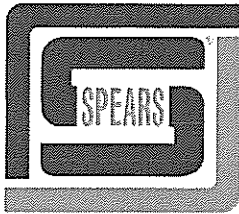
Response:

MKEC ENGINEERING, INC.
411 North Webb Road - Wichita, KS 67206

Reviewed Reviewed As Noted
 Revise and Resubmit Rejected
 Not Required by the Contract Documents

Reviewed for conformance with the design concept of the project and compliance with the information given in the contract documents. Contractor is responsible for: dimensions to be confirmed and correlated at the job site; information that pertains solely to the fabrication process or to techniques of construction; and coordination of work of all other trades. If "Resubmit" or "Rejected" are not checked resubmission is neither desired or required.

By: *Billy Shul* Date: *6-28-16*

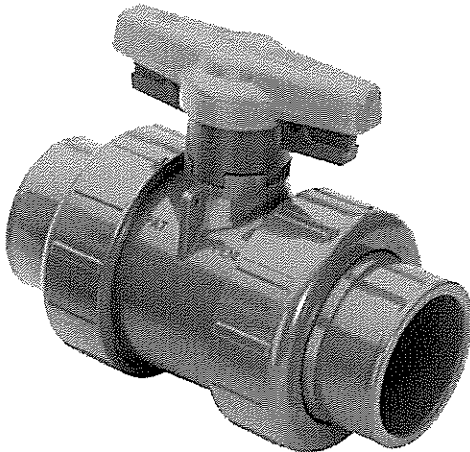


PVC & CPVC TRUE UNION 2000 VALVES

TU2000-2-1213

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 Schedule 80 Unions and Diaphragm Valves. All True Union 2000 valves feature a low profile, compact design for minimal space requirements. Available in PVC or CPVC with choice of EPDM or FKM O-ring seals and socket, threaded, flanged, spigot or optional Spears® patented Special Reinforced (SR) threaded end connectors. Additionally, Spears® offers valve Retrofit Kits for easy in-line replacement of other valves and factory installed Actuation Packages. Assembled with silicone-free lubricant.



True Union 2000 Industrial Ball Valve

Patent # 6,260,819, 5,582,439

- Multi-featured Industrial Grade
- Built-in Handle Lockout
- Fully Serviceable, Replaceable Components
- Safe-T-Blocked® Seal Carrier - Full Rated Pressure
- ISO Pattern Actuation Mounting Option
- Spears® Dual O-ring Safe-T-Shear® Stem
- Self Adjusting PTFE Floating Seat Design
- Sizes 1/2" - 4" pressure rated to 235 psi @ 73° F, sizes 6" - 8" and all flanged to 150 psi @ 73° F
- EPDM NSF Certified for Potable Water Use
- Also Available in **SPEARS® Low Extractable High Purity, PVC Material**
- Produced in IPS sizes 1/2" - 6" with Socket, Threaded, Flanged, Spigot or SR Threaded End Connectors
- 8" with Socket and Flanged End Connectors

True Union 2000 Industrial 3-Way Valve

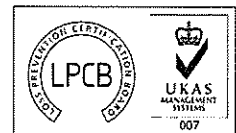
Patent # 6,260,819, 5,582,439

- Industrial Grade, Multiport, Diverter, L-Pattern & T-Pattern configurations Vertical 3-Way or Horizontal Diverter (shown)
- Built-in Handle Lockout
- Fully Serviceable, Replaceable Components
- Safe-T-Blocked® Seal Carrier - Full Rated Pressure
- ISO Pattern Actuation Mounting Option
- Spears® Dual O-ring Safe-T-Shear® Stem
- Self Adjusting PTFE Floating Seat Design
- 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 NSF Certified for Potable Water Use
- Produced in IPS sizes 1/2" - 4" with Socket, Flanged, Spigot or SR Threaded End Connectors



PROGRESSIVE PRODUCTS FROM SPEARS®
INNOVATION & TECHNOLOGY

Visit our web site:
www.spearsmfg.com



True Union 2000 Industrial Ball Check Valve

Patent # 6,899,127, 5,582,439

- Industrial Grade
- Flow-Tested for Minimum Turbulence
- Fully Serviceable, Replaceable Components, uses Standard O-ring Seat
- Safe-T-Blocked® Seal Carrier - Full Rated Pressure
- Easily Converted to Foot Valve
- EPDM NSF Certified for Potable Water Use
- Also Available in **SPEARS® Low Extractable**, High Purity PVC Material
- Sizes 1/2" - 4" pressure rated to 235 psi @ 73° F, sizes 6" - 8" and all flanged to 150 psi @ 73° F
- Produced in IPS sizes 1/2" - 6" with Socket, Threaded, Flanged, Spigot or optional SR Threaded End Connectors
- Produced in size 8" with Socket and Flanged End Connectors
- Also available in PVC White



Check Valve Size	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	6	8'
C_v	6.3	17	25	65	86	130	200	275	500	800	N/A

1: 8" Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters.

Economical True Union 2000 Standard Ball Valve

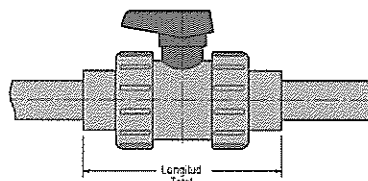
Patent # 5,582,439

- High quality Standard Ball Valve
- Allows future system upgrade
- Excellent for OEM Applications
- Replaceable Seats
- Safe-T-Blocked® Seal Carrier - Full Rated Pressure
- Spears® Safe-T-Shear® Stem
- Self Adjusting Floating Seat
- 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 NSF Certified for Potable Water Use
- Produced in IPS sizes 1/2" - 4" with Socket, Threaded, Flanged, Spigot or SR Threaded End Connectors
- Also available in PVC White

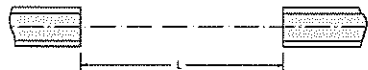


True Union 2000 Retrofit Valves or Kits

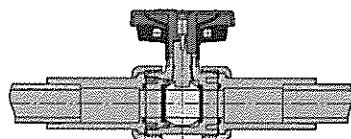
Easily converts any system over to all True Union 2000 style valves for consistent valve type and uniform maintenance. Special extended socket style End Connectors (2) allow retrofit replacement of other brand valves in existing piping systems with a new True Union 2000 valve. Simply cut out old valve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



BALL VALVE FOR REPLACEMENT



PIPE LAYING LENGTH AFTER CUTTING



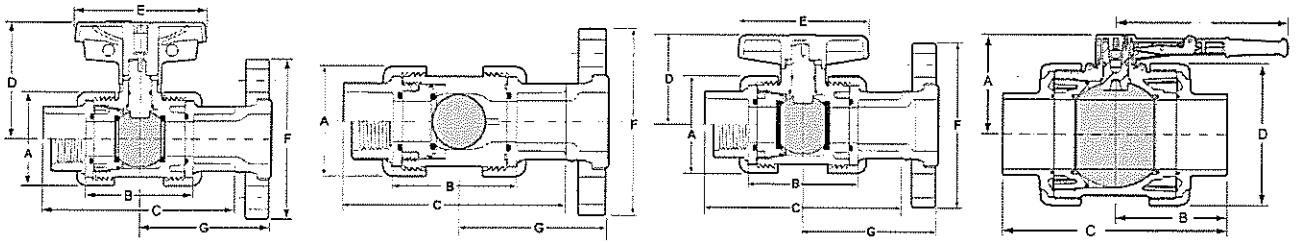
TRUE UNION 2000 BALL VALVE INSTALLED WITH RETROFIT KIT

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	14-5/16

Contact Spears® for Special Kits/Valves to replace older Spears® (Regular Style) True Union Ball Valves

True Union 2000 Valve Dimensional Data

Industrial Ball Valve, Ball Check Valve, Standard Ball Valve, 6" & 8" Industrial Lever Handle

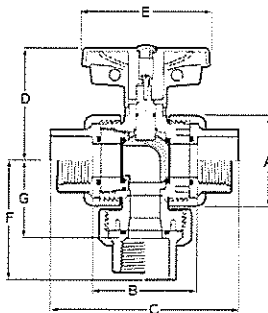


Nominal Size	A	Dimensions Reference (inches, ±1/16)										
		B ¹		C			D		E		F	G
		Soc/Thd	Spigot	Socket	Thread	Spigot	Industrial	Standard	Industrial	Standard		
1/2	1-7/8	2-3/8	2-7/8	4-3/16	3-3/16	4-5/8	2-9/16	1-5/8	2-13/16	2-1/2	3-1/2	2-31/32
3/4	2-1/4	2-3/4	3-1/4	4-3/4	4-1/4	5-1/4	2-7/8	2	3-3/8	3	3-7/8	3-5/16
1	2-1/2	2-7/8	3-1/2	5-1/8	4-11/16	5-3/4	3-1/8	2-5/16	3-7/16	3-7/16	4-1/2	3-5/8
1-1/4	3-1/16	3-1/4	3-13/16	5-3/4	5-3/16	6-5/16	3-5/8	2-13/16	3-7/8	3-9/16	4-5/8	3-31/32
1-1/2	3-1/2	3-1/2	4	6-1/4	5-7/16	6-3/4	4	3-1/16	4-3/16	3-7/8	5	4-3/8
2	4-1/4	4-3/4	5-3/16	7-3/4	6-3/4	8-1/4	4-1/2	3-3/4	5-1/8	5	6	5-1/4
2-1/2	5-3/8	6-7/8	7-13/16	10-7/16	9-11/16	11-3/8	5-1/8	5-7/8	6-1/4	7-5/8	7-1/2	6
3	6-3/16	7	7-13/16	10-11/16	9-7/8	11-9/16	5-7/8	5-7/8	7-5/8	7-5/8	7-1/2	6-13/16
4	7-5/8	7-5/16	8-1/4	11-7/8	10-1/4	12-3/4	6-3/4	6-3/4	9-3/16	6-3/4	9	7-1/2
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
8"	11-5/8	23-3/16	---	31-7/8	---	---	8-1/8	---	14-5/16	---	13-1/2	17-13/16

1: Valve Lay Length

2: B¹ Venturied Valves are 6" ball valves fitted with 6x8 end connector adapters.

Industrial 3-Way Ball Valve

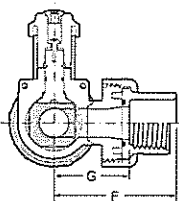
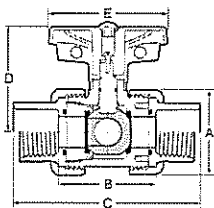


Nominal Size	A	Vertical 3-Way Ball Valves ³											Oper. ² Torque (in.lbs.)	
		B ¹		C			D	E	F			G		
		Soc/SR	Spig	Soc	SR	Spig			Soc	SR	Spig	Soc/SR		Spig
1/2	1-7/8	2-7/16	2-15/16	4-1/4	3-27/32	4-3/4	2-9/16	2-13/16	2-3/4	2-9/16	2-13/16	1-11/16	2	12
3/4	2-1/4	2-3/4	3-5/16	4-3/4	4-1/4	5-3/8	2-7/8	3-5/16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

3: Diverter style valve, no shutoff on branch



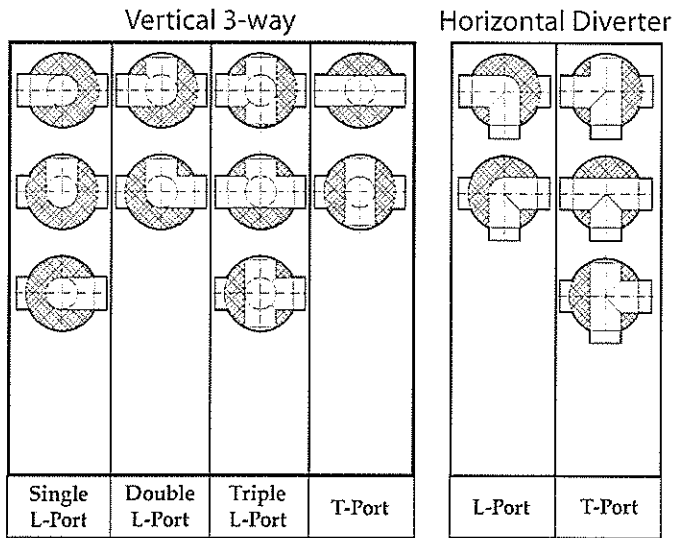
Nominal Size	A	Horizontal Diverter Ball Valves ³											Oper. ² Torque (in.lbs.)	
		B ¹		C			D	E	F			G		
		Soc/SR	Spig	Soc	SR	Spig			Soc	SR	Spig	Soc/SR		Spig
1/2	1-3/16	2-7/16	2-15/16	4-3/16	3-13/16	4-3/4	2-9/16	2-13/16	2-9/16	2-3/8	2-13/16	1-11/16	2	12
3/4	2-1/4	2-3/4	3-5/16	4-3/4	4-1/4	5-3/8	2-7/8	3-5/16	3	2-3/4	3-5/16	2	2-5/16	12
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	3-1/4	3	3-9/16	2-1/8	2-7/16	20
1-1/4	3-1/16	3-1/4	3-13/16	5-3/4	5-3/16	6-5/16	3-5/8	3-13/16	3-3/4	3-3/8	4-1/16	2-3/8	2-13/16	25
1-1/2	3-1/2	3-1/2	4	6-1/4	5-7/16	6-3/4	4	4-3/16	4-3/16	3-13/16	4-1/2	2-3/16	3-1/8	40
2	4-1/4	4-3/4	5-3/16	7-3/4	6-3/4	8-1/4	4-1/2	5-1/8	5	4-1/2	5-5/16	3-1/2	3-3/4	67
2-1/2	5-3/8	5-7/8	7-13/16	9-5/16	8-1/2	11-3/8	5-1/8	6-1/4	5-7/8	5-1/2	6-7/16	4-1/8	5-5/16	120
3	6-3/16	6-7/8	7-13/16	10-11/16	9-3/4	11-9/16	5-7/8	7-5/8	6-11/16	6-3/16	7-3/16	4-3/4	5-5/16	120
4	7-1/2	7-1/4	8-1/4	11-13/16	10-1/4	12-13/16	6-3/4	9-3/16	7-1/8	6-3/4	8-3/4	5-7/8	6-1/2	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

3: Diverter style valve, no shutoff on branch

3-Way Port Options



Ball Port Options Viewed from Top of Valve

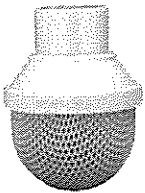
True Union 2000 Actuated Valves

Universal ISO Actuator Mounting Pattern Option

Spears® offers optional actuator mounting with standard ISO Mounting Pattern for user actuation of True Union 2000 Ball Valves.

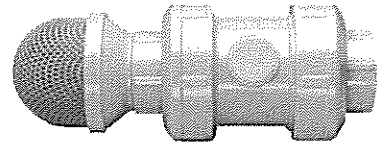
Factory Actuated Valve Packages

Spears® Electric or Pneumatic Actuation Packages eliminate customer's having to determine proper valve and actuator mating. Pre-matched packages insure proper torque, coupling and mount for optimum performance - all factory installed and tested for proper alignment and operation. Actuation packages can be custom built to user specifications from Spears® wide selection of options, voltages and accessories. Contact Spears® for additional information.



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 or CPVC construction.



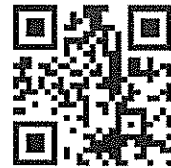
Typical Application
(VALVE NOT INCLUDED)



Split Nut Kit for True Union 2000 Valves & Union 2000 Pipe Unions

Patent # 6,302,446

Split Nut Kits are designed to replace broken union nuts on Spears® True Union 2000 Ball Valves and Union 2000 Pipe Unions. Kit includes SS316 Gear Clamp and 2-Split Nut halves. Can also be used if nut was not in place during end connector installation. Split Nut is fully serviceable to original valve pressure rating.



SPEARS® MANUFACTURING COMPANY • CORPORATE OFFICE

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