



Diaphragm Valves



Sample Engineering Specification

All thermoplastic Diaphragm valves shall be Weir-type constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447, or Polypropylene, ASTM D 4101. All diaphragms shall be EPDM, FKM or PTFE with EPDM or FKM backing. All valves shall have built-in position indicator with polypropylene handwheel. All True Union style valve union nuts shall have Buttress threads. 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 and valves with PTFE backing shall be pressure rated to 150 psi, all 6" valves shall be pressure rated to 100 psi, and all 8" valves shall be pressure rated to 75 psi for water at 73°F. All Polypropylene valves shall be pressure rated to 150 psi for water at 73°F, as manufactured by Spears® Manufacturing Company.

Features – PVC, CPVC & PP

This full-featured valve is engineered to provide accurate throttling control and shutoff for industrial, chemical and water treatment applications. Weir-type design eliminates entrapped fluids in valve and is excellent for handling liquids with suspended solids, viscous fluids and slurries. Available in PVC, CPVC and Glass Filled Polypropylene with a variety of Diaphragm material options. PVC & CPVC 1/2" - 2" valves with Flanged Body, Spigot Body or True Union style Socket & Threaded ends or Optional Special Reinforced (SR) Threads, and sizes 2-1/2" - 8" with Flanged Body. Polypropylene 1/2" - 2" valves with True Union style Special Reinforced (SR) Threaded ends and sizes 2-1/2" - 8" with Flanged Body. True Union style also available in metric socket and BSP thread sizes 1/2" through 2".

- True Union Style with Buttress Thread Union Nuts - Mate with Spears® True Union 2000 Ball valves and Union 2000 Pipe Unions.
- EPDM, FKM, or Elastomer (EPDM or FKM) Bonded PTFE Diaphragms.
- PVC & CPVC 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, 6" Pressure Rated to 100 psi and 8" to 75 psi @ 73°F
- Polypropylene Sizes 1/2" - 4" Pressure rated to 150 psi @ 73°F
- Easy-Grip, High Impact Polypropylene Handwheel
- Built-in, Clear-View Position Indicator
- Stainless Steel External Hardware
- Fully Serviceable, Replaceable Components
- Suitable for Vacuum Service
- Assembled with Silicone-Free Lubricants (no lubricant in media contact area)

Special Options

- Hypalon® (CSM) Diaphragms
- Natural Polypropylene Body
- Electric or Pneumatic Actuation

Diaphragm Valves



PVC, CPVC & PP Diaphragm Valve Quick-View Selection Chart

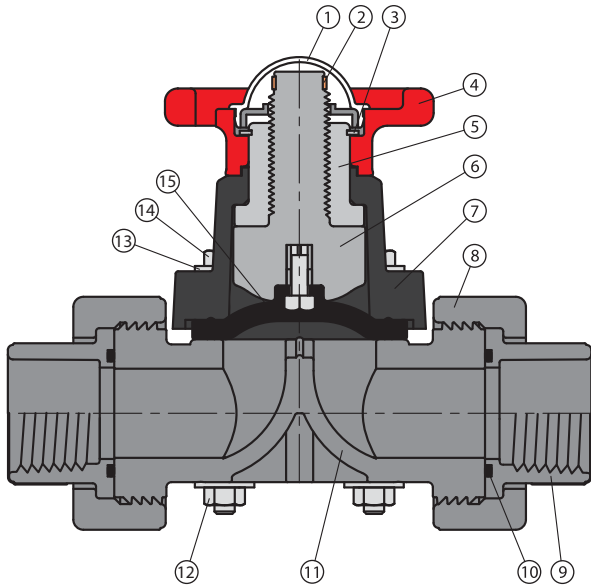
Size	O-ring Material	Diaphragm Material	PVC Part Number ¹				PP Part Number		Pressure Rating
			Soc/Thd	SR Threaded	Spigot	Flanged	SR Threaded	Flanged	
1/2	EPDM	EPDM	2729-005	2721-005SR	2727-005	2723-005	2721-005PSR	True Union & Spigot Style w/ Elastomer Diaphragms 235 psi Non-Shock Water @ 73°F	
		PTFE ²	2729T-005	2721T-005SR	2797T-005	2793T-005	2721T-005PSR		
	FKM	FKM	2739-005	2731-005SR	2737-005	2733-005	2731-005PSR		
		PTFE ²	2739VT-005	2731VT-005SR	2797VT-005	2793VT-005	2731VT-005PSR		
3/4	EPDM	EPDM	2729-007	2721-007SR	2727-007	2723-007	2721-007PSR		
		PTFE ²	2729T-007	2721T-007SR	2797T-007	2793T-007	2721T-007PSR		
	FKM	FKM	2739-007	2731-007SR	2737-007	2733-007	2731-007PSR		
		PTFE ²	2739VT-007	2731VT-007SR	2797VT-007	2793VT-007	2731VT-007PSR		
1	EPDM	EPDM	2729-010	2721-010SR	2727-010	2723-010	2721-010PSR		
		PTFE ²	2729T-010	2721T-010SR	2797T-010	2793T-010	2721T-010PSR		
	FKM	FKM	2739-010	2731-010SR	2737-010	2733-010	2731-010PSR		
		PTFE ²	2739VT-010	2731VT-010SR	2797VT-010	2793VT-010	2731VT-010PSR		
1-1/4	EPDM	EPDM	2729-012	2721-012SR	2727-012	2723-012	2721-012PSR		
		PTFE ²	2729T-012	2721T-012SR	2797T-012	2793T-012	2721T-012PSR		
	FKM	FKM	2739-012	2731-012SR	2737-012	2733-012	2731-012PSR		
		PTFE ²	2739VT-012	2731VT-012SR	2797VT-012	2793VT-012	2731VT-012PSR		
1-1/2	EPDM	EPDM	2729-015	2721-015SR	2727-015	2723-015	2721-015PSR		
		PTFE ²	2729T-015	2721T-015SR	2797T-015	2793T-015	2721T-015PSR		
	FKM	FKM	2739-015	2731-015SR	2737-015	2733-015	2731-015PSR		
		PTFE ²	2739VT-015	2731VT-015SR	2797VT-015	2793VT-015	2731VT-015PSR		
2	EPDM	EPDM	2729-020	2721-020SR	2727-020	2723-020	2721-020PSR		
		PTFE ²	2729T-020	2721T-020SR	2797T-020	2793T-020	2721T-020PSR		
	FKM	FKM	2739-020	2731-020SR	2737-020	2733-020	2731-020PSR		
		PTFE ²	2739VT-020	2731VT-020SR	2797VT-020	2793VT-020	2731VT-020PSR		
2-1/2	EPDM	EPDM				2723-025	2723-025P		
		PTFE ²				2793T-025	2793T-025P		
	FKM	FKM				2733-025	2733-025P		
		PTFE ²				2793VT-025	2793VT-025P		
3	EPDM	EPDM				2723-030	2723-030P		
		PTFE ²				2793T-030	2793T-030P		
	FKM	FKM				2733-030	2733-030P		
		PTFE ²				2793VT-030	2793VT-030P		
4	EPDM	EPDM				2723-040	2723-040P		
		PTFE ²				2793T-040	2793T-040P		
	FKM	FKM				2733-040	2733-040P		
		PTFE ²				2793VT-040	2793VT-040P		
6	EPDM	EPDM				2723-060	2723-060P		
		PTFE ²				2793T-060	2793T-060P		
	FKM	FKM				2733-060	2733-060P		
		PTFE ²				2793VT-060	2793VT-060P		
8	EPDM	EPDM				2723-080	2723-080P		
		PTFE ²				2793T-080	2793T-080P		
	FKM	FKM				2733-080	2733-080P		
		PTFE ²				2793VT-080	2793VT-080P		

1: For CPVC valves, add the letter "C" to part numbers listed (e.g., 2729-005C). Custom end connections available upon request.

2: Elastomer-backed PTFE (standard EPDM backed; special order FKM backed)



Diaphragm Valves



Replacement Parts

No.	Component	Qty.	Material
1	Indicator Cover	1	PVC Clear
2	Indicator	1	PE
3	Retaining Ring	1	SS
4	Handwheel	1	PP
5	Compressor Bushing	1	PTFE/CPVC
6	Compressor	1	CPVC
7	Bonnet	1	GFPP
8	Union Nut	1	PVC/CPVC/GFPP
9	Union End	2	PVC/CPVC/GFPP
10	Union End O-ring	2	EPDM/FKM
11	Body	1	PVC/CPVC/GFPP
12	Nut	4-16	SS
13	Flat Washer	8-32	SS
14	Bolt	4-16	SS
15	Diaphragm	1	EPDM/FKM/PTFE

1: Component applicable to True Union style valves only.
 2: True Union Socket/Threaded Valve illustrated

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-	
		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-
		PP	150 (1.03)	105 (.72)	90 (.62)	80 (.55)	75 (.52)	65 (.45)	55 (.38)	50 (.34)	45 (.31)	-0-	-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-
		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-
		PP	150 (1.03)	105 (.72)	90 (.62)	80 (.55)	75 (.52)	65 (.45)	55 (.38)	50 (.34)	45 (.31)	-0-	-0-	-0-
	6"	PVC	100 (.70)	90 (.62)	80 (.55)	65 (.38)	50 (.34)	-0-	-0-	-0-	-0-	-0-	-0-	-0-
		CPVC	100 (.70)	95 (.66)	90 (.62)	85 (.59)	80 (.55)	75 (.52)	70 (.48)	65 (.45)	60 (.41)	55 (.38)	50 (.34)	-0-
		PP	100 (.70)	90 (.62)	85 (.59)	75 (.52)	70 (.48)	60 (.41)	55 (.38)	50 (.34)	45 (.31)	-0-	-0-	-0-
	8"	PVC	75 (.52)	70 (.48)	65 (.45)	60 (.41)	50 (.34)	-0-	-0-	-0-	-0-	-0-	-0-	-0-
		CPVC	75 (.52)	72 (.49)	70 (.48)	67 (.46)	65 (.45)	62 (.43)	60 (.41)	55 (.38)	50 (.34)	45 (.31)	40	-0-
		PP	75 (.52)	62 (.43)	60 (.41)	57 (.39)	55 (.38)	52 (.36)	50 (.34)	47 (.32)	45 (.31)	-0-	-0-	-0-

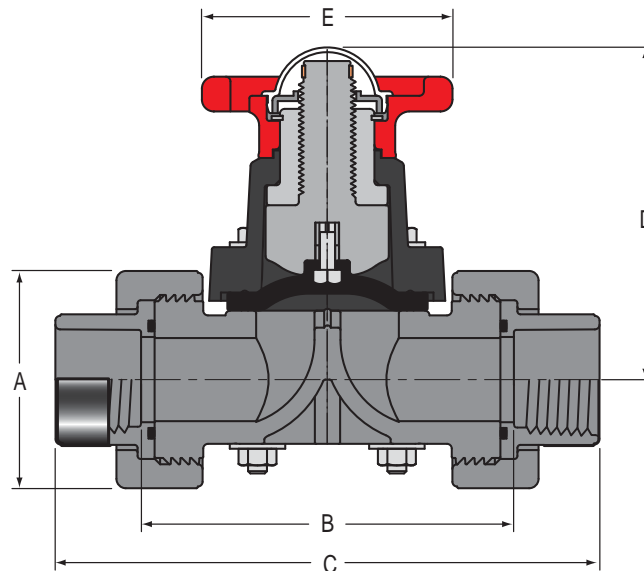
Diaphragm Valves



C_v Values PVC, CPVC & PP

Valve Size	PERCENT OPEN			
	100%	75%	50%	25%
1/2	5.1	4.8	4.2	2.4
3/4	8.0	7.5	6.5	3.8
1	11.5	10.8	9.4	5.4
1-1/4	22.0	20.6	18.0	10.3
1-1/2	28.2	26.4	23.0	13.3
2	52.9	49.6	43.2	24.9
2-1/2	119.0	111.5	97.1	55.9
3	119.0	111.5	97.1	55.9
4	189.2	177.3	154.4	88.9
6	402.2	375.8	327.0	187.5
8	700.0	659.5	573.2	328.4

Gallons per minute at 1 psi pressure drop.



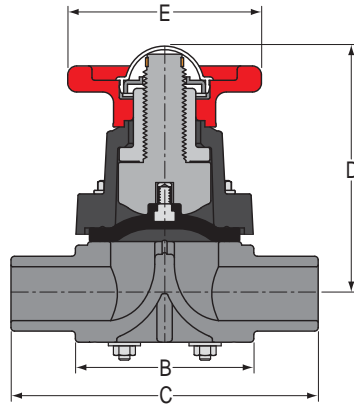
Socket, Threaded & SR Threaded End Connectors Dimension & Weights

Nominal Size	Dimension Reference (inches, ± 1/16)					Approx. Wt. (Lbs.)		
	A	B ¹	C		D	E	PVC	CPVC
			Socket	Threaded				
1/2	1-15/16	3-7/8	5-9/16	5-3/16	3-11/32	2-7/8	1.12	1.14
3/4	2-1/2	4-1/2	6-7/16	5-15/16	3-3/4	3-1/8	1.37	1.36
1	2-9/16	4-15/16	7-3/16	6-13/16	4-7/16	3-3/8	2.35	2.43
1-1/4	3-5/16	5-1/2	8-7/8	8-1/4	5-5/8	3-7/8	3.91	4.03
1-1/2	3-17/32	6-5/16	9-5/16	8-7/16	5-5/8	4-5/8	4.08	4.21
2	4-7/32	7-1/2	10-9/16	9-1/2	7	6-5/8	7.06	7.25

1: Valve Lay Length.

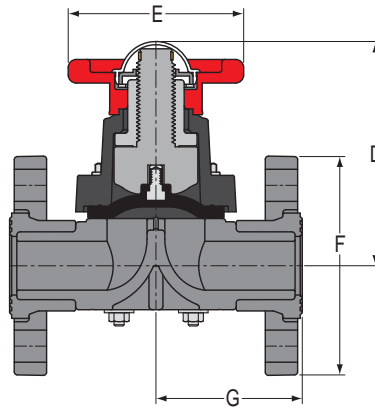


Diaphragm Valves



Spigot Diaphragm Dimensions & Weights

Nominal Size	Dimension Reference (inches, ± 1/16)				Approx. Wt. (Lbs.)	
	B	C	D	E	PVC	CPVC
1/2	2-5/8	4-3/8	3-11/32	2-7/8	.61	.63
3/4	2-3/4	4-3/4	3-3/4	3-1/4	.79	.82
1	3-1/8	5-3/8	4-7/16	3-5/16	1.32	1.36
1-1/4	3-3/4	6-1/4	5-5/8	4-19/32	2.41	2.50
1-1/2	3-3/4	6-1/2	5-5/8	4-19/32	2.43	2.52
2	4-3/4	7-3/4	7	5-7/8	4.15	4.43



Flanged Diaphragm Dimensions & Weights

Nominal Size	Dimension Reference (inches, ± 1/16)				Approx. Wt. (Lbs.)	
	D	E	F	G	PVC	CPVC
1/2	3-11/32	2-7/8	3-1/2	2-5/16	.98	1.02
3/4	3-3/4	3-1/4	3-7/8	2-1/2	1.31	1.37
1	4-7/16	3-5/16	4-1/4	2-13/16	2.00	2.08
1-1/4	5-5/8	4-19/32	4-5/8	3-1/4	3.71	3.76
1-1/2	5-5/8	4-19/32	5	3-3/8	3.88	4.04
2	7	5-7/8	6	4	5.59	5.71
2-1/2	10-1/4	8-7/8	7-1/2	5-19/32	15.75	16.43
3	10-1/4	8-7/8	7-1/2	5-19/32	15.75	16.45
4	12-1/4	10-1/2	9	6-5/8	24.44	25.37
6	16-3/4	18-13/32	11	9-3/8	53.90	58.43
8	21	21-19/32	13-1/2	11-5/32	96.28	100.05