VB Ball Check Valves

Product Data Sheet

introduction

< STANDARDS >

ASTM D1784
ASTM D2466
ASTM D2467
ASTM F439
ASTM D2464
ASTM F437
ASTM F1498

ANSI B1.20.1
ANSI B16.5

IPEX VB Ball Check Valves are a simple solution for smaller diameter plastic piping systems. This popular style of check valve features a true union design allowing for easy removal and maintenance. Full length guide ribs allow for maximum flow and minimum turbulence, preventing ball sticking and chatter. Just a few psi of back pressure is needed for positive shut off in both vertical and horizontal orientations. VB Ball Check Valves are part of our complete systems of pipe, valves, and fittings, engineered and manufactured to our strict quality, performance, and dimensional standards.

Valve Availability

Body Material:	PVC, CPVC
Size Range:	1/2" through 4"
Pressure:	150 psi
Seals:	EPDM, or Viton® (FPM)
End Connections:	Socket (IPS), Threaded (FNPT), Flanged (ANSI 150)

VB Ball Check Valves

Sample Specification

1.0 Check Valves - VB

1.1 Material

- The valve body, ball, end connectors, and unions shall be made of PVC compound which shall meet or exceed the requirements of cell classification 12454 according to ASTM D1784.

or The valve body, ball, end connectors, and unions shall be made of Corzan® CPVC compound which shall meet or exceed the requirements of 23447 according to ASTM D1784.

- These compounds shall comply with standards that are equivalent to NSF Standard 61 for potable water.

1.2 Seals

- The o-ring seals shall be made of EPDM which shall comply with standards that are equivalent to NSF Standard 61 for potable water.

or The o-ring seals shall be made of Viton® (FPM) which shall comply with standards that are equivalent to NSF Standard 61 for potable water.

1.3 All other wetted and non-wetted parts of the valves shall comply with standards that are equivalent to NSF Standard 61 for potable water.

2.0 Connections

2.1 Socket style

- The IPS socket PVC end connectors shall conform to the dimensional standards ASTM D2466 and ASTM D2467.

or The IPS socket CPVC end connectors shall conform to the dimensional standard ASTM F439.

2.2 Threaded style

- The female NPT threaded PVC end connectors shall conform to the dimensional standards ASTM D2464, ASTM F1498, and ANSI B1.20.1.

or The female NPT threaded CPVC end connectors shall conform to the dimensional standards ASTM F437, ASTM F1498, and ANSI B1.20.1.

2.3 Flanged style

- The ANSI 150 flanged PVC end connectors shall conform to the dimensional standard ANSI B16.5.

or The ANSI 150 flanged CPVC end connectors shall conform to the dimensional standard ANSI B16.5.

VB Ball Check Valves

Sample Specification (cont'd)

3.0 Design Features

- The valve shall have true union ends.
- The valve cavity shall feature full body guide ribs for increased flow.
- The valve body and union nuts shall have deep square style threads for increased strength.

3.1 Pressure Rating

- All valves shall be rated at 150 psi at 73°F.

3.2 Markings

- All valves shall be marked to indicate size, material designation, and manufacturers name or trade mark.

3.3 Color Coding

- All PVC valves shall be color-coded dark gray.

or All CPVC valves shall be color-coded light gray.

4.0 All valves shall be Xirtec® 140 or Corzan® by IPEX or approved equal.

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Valve Selection

Size (inches)	Body Material	O-ring Material	IPEX Part Number			Pressure Rating
			IPS Socket	FNPT Threaded	ANSI Flanged	
1/2	PVC	EPDM	052231		053849	150 psi
		Viton®	052241		053858	
	CPVC	Viton®	052251		053867	
3/4	PVC	EPDM	052232		053850	
		Viton®	052242		053859	
	CPVC	Viton®	052252		053868	
1	PVC	EPDM	052233		053851	
		Viton®	052243		053860	
	CPVC	Viton®	052253		053869	
1-1/4	PVC	EPDM	052234		053852	
		Viton®	052244		053861	
	CPVC	Viton®	052254		053870	
1-1/2	PVC	EPDM	052235		053853	
		Viton®	052245		053862	
	CPVC	Viton®	052255		053871	
2	PVC	EPDM	052236		053854	
		Viton®	052246		053863	
	CPVC	Viton®	052256		053872	
2-1/2	PVC	EPDM	053848	n/a	053855	
		Viton®	052247	n/a	053864	
	CPVC	Viton®	053865	n/a	053873	
3	PVC	EPDM	052237	n/a	053856	
		Viton®	052248	n/a	052382	
	CPVC	Viton®	052257	n/a	052383	
4	PVC	EPDM	052238	n/a	053857	
		Viton®	052249	n/a	052384	
	CPVC	Viton®	052219	n/a	053874	

Body Material:

❑ PVC ❑ CPVC

Size (inches):

❑ 1/2 ❑ 2

❑ 3/4 ❑ 2-1/2

❑ 1 ❑ 3

❑ 1-1/4 ❑ 4

❑ 1-1/2

Seals:

❑ EPDM

❑ Viton® (FPM)

End Connections:

❑ Socket (IPS)

❑ Threaded (FNPT)

❑ Flanged (ANSI 150)

IPEX Part Number:

_____

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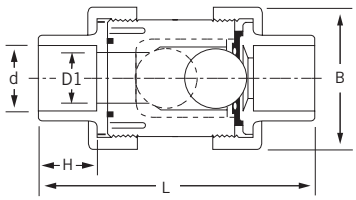
Technical Data

dimensions



Size	Dimension (inches)									
	D1	d		H	L	B	Flanged			
		Socket	Threaded				L	# holes	Bolt dia	Bolt hole CTR-CTR
1/2	0.60	0.84	1/2 NPT	0.89	3.98	2.11	5.79	4	5/8	2-3/8
3/4	0.77	1.05	3/4 NPT	1.00	4.53	2.49	6.47	4	5/8	2-3/4
1	0.98	1.32	1 NPT	1.13	5.35	2.88	7.48	4	5/8	3-1/8
1-1/4	1.26	1.66	1-1/4 NPT	1.26	6.73	3.84	8.92	4	5/8	3-1/2
1-1/2	1.57	1.90	1-1/2 NPT	1.38	6.73	3.84	9.23	4	5/8	3-7/8
2	1.97	2.38	2 NPT	1.50	7.68	4.74	10.43	4	3/4	4-3/4
2-1/2	2.56	2.88	2-1/2 NPT	1.75	8.74	6.00	11.37	4	3/4	5-1/2
3	3.15	3.50	3 NPT	1.89	10.79	7.25	13.28	4	3/4	6
4	3.94	4.50	4 NPT	2.26	14.45	8.00	17.27	8	3/4	7-1/2

weights

Size	Approximate Weight (lbs)					
	PVC			CPVC		
	IPS Socket	FNPT Threaded	ANSI Flanged	IPS Socket	FNPT Threaded	ANSI Flanged
1/2	0.25	0.25	0.65	0.26	0.26	0.68
3/4	0.50	0.50	1.08	0.53	0.53	1.13
1	0.96	0.96	1.74	1.01	1.01	1.83
1-1/4	2.23	2.23	3.23	2.34	2.34	3.34
1-1/2	2.53	2.53	3.73	2.66	2.66	3.92
2	3.80	3.80	5.68	3.99	3.99	5.99
2-1/2	6.88	6.88	9.46	7.22	7.22	10.31
3	12.87	12.87	16.61	13.51	13.51	17.47
4	19.00	19.00	24.99	19.95	19.95	26.28

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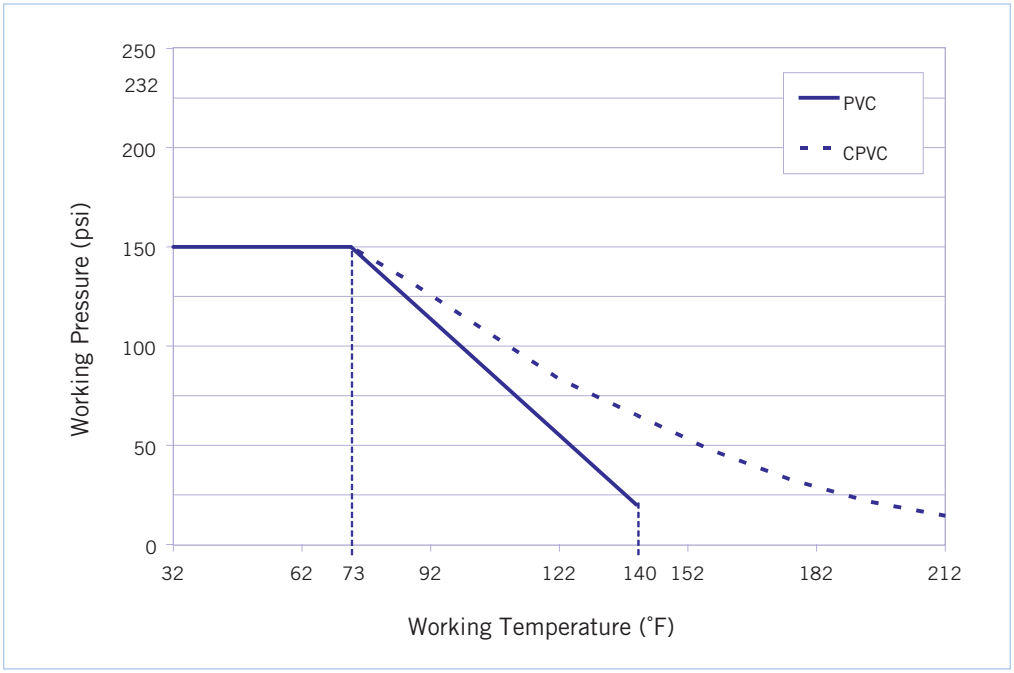
Technical Data (cont'd)

pressure – temperature ratings



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Technical Data (cont'd)

flow coefficients

The flow coefficient (CV) represents the flow rate in gallons per minute (GPM) at 68°F for which there is a 1 psi pressure drop across the valve in the fully open position. These values are determined from an industry standard testing procedure which uses water as the flowing media (specific gravity of 1.0). To determine specific flow rate and pressure loss scenarios, one can use the following formula:

$$f = sg \times \left(\frac{Q}{C_V}\right)^2$$

Where,

f is the pressure drop (friction loss) in psi,

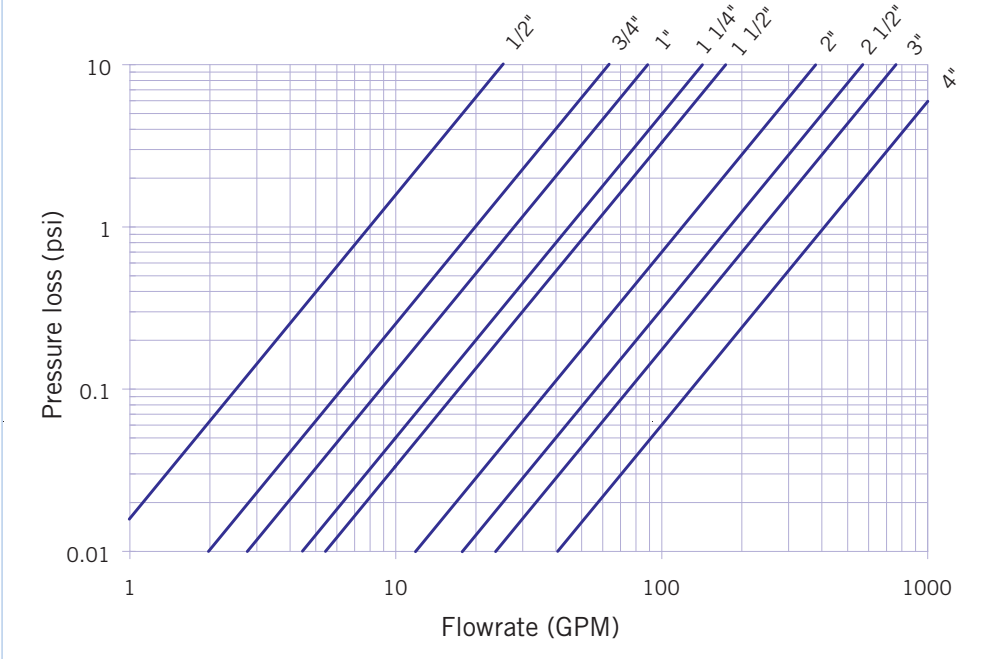
sg is the specific gravity of the fluid,

Q is the flow rate in GPM,

C_V is the flow coefficient.

Size	CV
1/2	8.00
3/4	20.0
1	28.0
1-1/4	45.0
1-1/2	55.0
2	120
2-1/2	180
3	240
4	410

pressure loss chart



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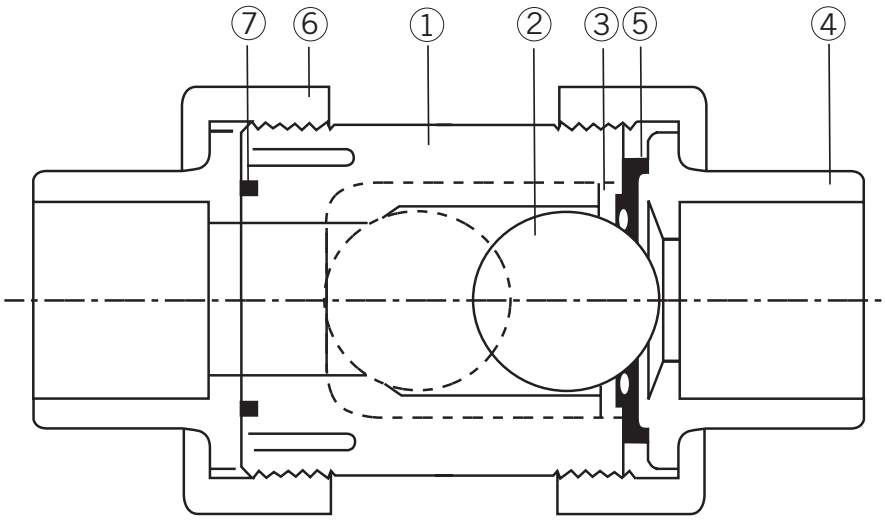
Components



#	Component	Material	Qty
1	body	PVC / CPVC	1
2	ball	PVC / CPVC	1
3	seat carrier	PVC / CPVC	1
4*	end connector	PVC / CPVC	2
5*	seat	EPDM or FPM	1
6*	union nut	PVC / CPVC	2
7*	o-ring	EPDM or FPM	1

* Spare parts available

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Installation Procedures

1. For socket and threaded style connections, remove the union nuts (part #6 on previous page) and slide them onto the pipe. For flanged connections, remove the union nut / flange assemblies from the valve. **It is important to first check the pipe flow direction and corresponding valve orientation as the two end connectors are not the same.**

2. Please refer to the appropriate connection style sub-section:

   a. For socket style, solvent cement the end connectors (4) onto the pipe ends. For correct joining procedure, please refer to the section entitled, *"Joining Methods – Solvent Cementing"* in the IPEX Industrial Technical Manual Series, *"Volume I: Vinyl Process Piping Systems"*. **Be sure to allow sufficient cure time before continuing with the valve installation.**

   b. For threaded style, thread the end connectors (4) onto the pipe ends. For correct joining procedure, please refer to the section entitled, *"Joining Methods – Threading"* in the IPEX Industrial Technical Manual Series, *"Volume I: Vinyl Process Piping Systems"*.

   c. For flanged style, join the union nut / flange assemblies to the pipe flanges. For correct joining procedure, please refer to the section entitled, *"Joining Methods – Flanging"* in the IPEX Industrial Technical Manual Series, *"Volume I: Vinyl Process Piping Systems"*.

3. Ensure that the valve is in the correct orientation, and that the seat (5) and o-ring (7) are properly fitted in their grooves. Carefully place the valve in the system between the two end connections.

4. Tighten both union nuts. Hand tightening is typically sufficient to maintain a seal for the maximum working pressure. **Over-tightening may damage the threads on the valve body and/or the union nut, and may even cause the union nut to crack.**

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Valve Maintenance

disassembly

1. If removing the valve from an operating system, isolate the valve from the rest of the system. **Be sure to depressurize and drain the isolated branch and valve before continuing.**
2. Loosen both union nuts (6) and drop the valve out of the line. If retaining the seat (5) and o-ring (7), take care that they are not lost when removing the valve from the line.
3. To disassemble, remove the seat and o-ring from the ends of the valve body (1).
4. Remove the ball (2) and the seat carrier (3).
5. The valve components can now be checked for problems and/or replaced.

assembly

Note: Before assembling the valve components, it is advisable to lubricate the o-rings with a water soluble lubricant. **Be sure to consult the "IPEX Chemical Resistance Guide" and/or other trusted resources to determine specific lubricant-rubber compatibilities.**

1. Firmly place the seat carrier (3) in the open end of the valve body (1). The grooved edge should face upwards to mate properly with the seat (5).
2. Place the ball (2) into the valve body.
3. Properly fit the o-ring (7) and the seat (5) in the grooves on either end of the valve body.
4. Place the end connectors (4) into the union nuts (6), then thread onto the valve body taking care that the o-ring and seat remain properly fitted in their grooves. **Be sure to check that the proper end connector is assembled with the seat end of the valve as the two are not the same.**

VB Ball Check Valves

Testing and Operating

The purpose of system testing is to assess the quality of all joints and fittings to ensure that they will withstand the design working pressure, plus a safety margin, without loss of pressure or fluid. Typically, the system will be tested and assessed in sub-sections as this allows for improved isolation and remediation of potential problems. With this in mind, the testing of a specific installed valve is achieved while carrying out a test of the overall system.

An onsite pressure test procedure is outlined in the IPEX Industrial Technical Manual Series, *"Volume I: Vinyl Process Piping Systems"* under the section entitled, *"Testing"*. The use of this procedure should be sufficient to assess the quality of a valve installation. **In any test or operating condition, it is important to never exceed the pressure rating of the lowest rated appurtenance in the system.**

Important points:

- Never test thermoplastic piping systems with compressed air or other gases including air-over-water boosters.
- When testing, do not exceed the rated maximum operating pressure of the valve.
- Avoid the rapid closure of valves to eliminate the possibility of water hammer which may cause damage to the pipeline or the valve.

Please contact IPEX customer service and technical support with regard to any concern not addressed in this data sheet or the technical manual.

VB Ball Check Valves

About IPEX

IPEX is a leading supplier of thermoplastic piping systems. We provide our customers with one of the world's largest and most comprehensive product lines. All IPEX products are backed by over 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, the IPEX name is synonymous with quality and performance.

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