# VX Series Ball Valves

## *Product Data Sheet*


# introduction

< STANDARDS >

**ASTM D1784**
**ASTM D2466**
**ASTM D2467**
**ASTM F439**
**ASTM D2464**
**ASTM F437**
**ASTM D1498**

**ANSI B1.20.1**
**ANSI B16.5**

IPEX VX Series Ball Valves are ideal for general purpose and O.E.M. applications. These valves feature an ultra-compact double block design, and full port bi-directional operation. The true union design allows the valve to be easily removed from the piping system and fully serviced. A threaded seat stop carrier provides improved seal integrity under tough service conditions while the removable handle also functions as a tool for ball seat adjustment. VX Series Ball 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 6" |
| Pressure: | 232 psi (1/2" to 2"), 150 psi (2-1/2" to 6") |
| Seats: | Teflon® (PTFE) |
| Seals: | EPDM or Viton® (FPM) |
| End Connections: | Socket (IPS), Threaded (FNPT), Flanged (ANSI 150) |

# VX Series Ball Valves

## *Sample Specification*

**1.0 Ball Valves - VX**

**1.1 Material**

- The valve body, stem, ball 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, stem, ball 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 Seats**

- The ball seats shall be made of Teflon® (PTFE) which shall comply with standards that are equivalent to NSF Standard 61 for potable water.

**1.3 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.

**1.4** 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 ANSI150 flanged CPVC end connectors shall conform to the dimensional standard ANSI B16.5.

# VX Series Ball Valves

## *Sample Specification (cont'd)*


**3.0 Design Features**

- The valve shall be double blocking with union ends.
- All sizes ½" through 4" shall be full port.
- All sizes shall allow for bi-directional flow.
- The valve body shall be single end entry with a threaded carrier (ball seat support).
- The valve body shall have an expansion and contraction compensating groove on the molded end.
- The valve body, union nuts, and carrier shall have deep square style threads for increased strength.
- The ball shall be machined smooth to minimize wear on valve seats.
- The stem design shall feature a shear point above the o-ring to maintain system integrity in the unlikely event of a stem breakage.
- The handle shall incorporate a tool for adjustment of the threaded carrier.
- The handle shall be reversible to allow for operation in tight places.

**3.1 Pressure Tested**

- All valves shall have been pressure tested in both the open and closed positions by the manufacturer.

**3.2 Pressure Rating**

- Valve sizes ½" through 2" shall be rated at 232 psi at 73°F.
- Valve sizes 2½" through 6" shall be rated at 150 psi at 73°F.
- All sizes of flanged valves shall be rated at 150 psi at 73°F.

**3.3 Markings**

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

**3.4 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.

# VX Series Ball Valves

## Valve Selection

| Size (inches) | Body Material | O-ring Material | IPEX Part Number | | | Pressure Rating |
|---|---|---|---|---|---|---|
| | | | IPS Socket | FNPT Threaded | ANSI Flanged | |
| 1/2 | PVC | EPDM | 053001 | | 053627 | 232 psi for Socket or Threaded — 150 psi for Flanged |
| | | Viton® | 053002 | | 053637 | |
| | CPVC | EPDM | 053041 | | 053651 | |
| | | Viton® | 053042 | | 053661 | |
| 3/4 | PVC | EPDM | 053003 | | 053628 | |
| | | Viton® | 053004 | | 053638 | |
| | CPVC | EPDM | 053043 | | 053652 | |
| | | Viton® | 053044 | | 053662 | |
| 1 | PVC | EPDM | 053005 | | 053629 | |
| | | Viton® | 053006 | | 053639 | |
| | CPVC | EPDM | 053045 | | 053653 | |
| | | Viton® | 053046 | | 053663 | |
| 1-1/4 | PVC | EPDM | 053007 | | 053630 | |
| | | Viton® | 053008 | | 053640 | |
| | CPVC | EPDM | 053047 | | 053654 | |
| | | Viton® | 053048 | | 053664 | |
| 1-1/2 | PVC | EPDM | 053009 | | 053631 | |
| | | Viton® | 053010 | | 053641 | |
| | CPVC | EPDM | 053049 | | 053655 | |
| | | Viton® | 053050 | | 053665 | |
| 2 | PVC | EPDM | 053011 | | 053632 | |
| | | Viton® | 053012 | | 053642 | |
| | CPVC | EPDM | 053051 | | 053656 | |
| | | Viton® | 053052 | | 053666 | |
| 2-1/2 | PVC | EPDM | 053623 | n/a | 053633 | 150 psi for all joint types |
| | | Viton® | 053624 | n/a | 053643 | |
| | CPVC | EPDM | 053647 | n/a | 053657 | |
| | | Viton® | 053648 | n/a | 053667 | |
| 3 | PVC | EPDM | 053013 | 053017 | 053634 | |
| | | Viton® | 053014 | 053018 | 053644 | |
| | CPVC | EPDM | 053053 | 053057 | 053658 | |
| | | Viton® | 053054 | 053058 | 053668 | |
| 4 | PVC | EPDM | 053015 | 053019 | 053635 | |
| | | Viton® | 053016 | 053020 | 053645 | |
| | CPVC | EPDM | 053055 | 053059 | 053659 | |
| | | Viton® | 053056 | 053060 | 053669 | |
| 6 | PVC | EPDM | 053625 | n/a | 053636 | |
| | | Viton® | 053626 | n/a | 053646 | |
| | CPVC | EPDM | 053649 | n/a | 053660 | |
| | | Viton® | 053650 | n/a | 053670 | |

**Body Material:**

❑ PVC ❑ CPVC

**Size (inches):**

❑ 1/2 ❑ 2

❑ 3/4 ❑ 2-1/2

❑ 1 ❑ 3

❑ 1-1/4 ❑ 4

❑ 1-1/2 ❑ 6

**Seals:**

❑ EPDM

❑ Viton® (FPM)

**End Connections:**

❑ Socket (IPS)

❑ Threaded (FNPT)

❑ Flanged (ANSI 150)

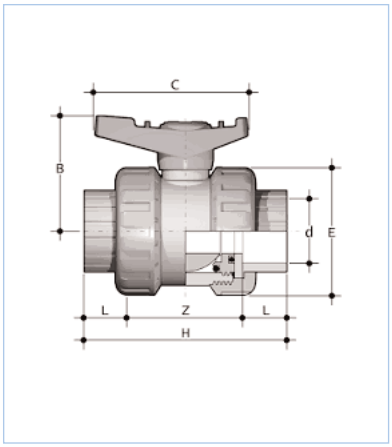
**IPEX Part Number:**

_____

# VX Series Ball Valves

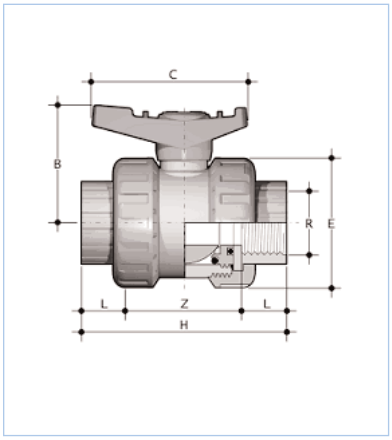
## Technical Data

### dimensions

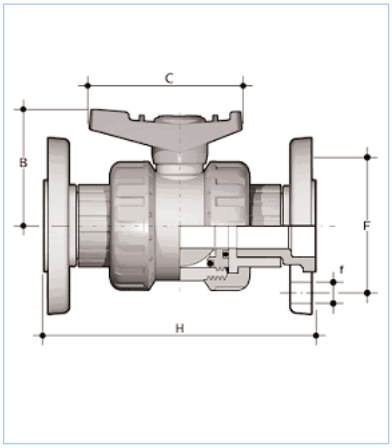



| Dimension (inches) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | d | L | Z | H | E | B | C |
| 1/2 | 0.84 | 0.89 | 2.01 | 3.78 | 2.09 | 1.97 | 2.56 |
| 3/4 | 1.05 | 1.00 | 2.13 | 4.13 | 2.44 | 2.28 | 2.99 |
| 1 | 1.32 | 1.13 | 2.34 | 4.61 | 2.80 | 2.56 | 3.35 |
| 1-1/4 | 1.66 | 1.26 | 2.83 | 5.35 | 3.31 | 2.99 | 3.94 |
| 1-1/2 | 1.90 | 1.38 | 3.03 | 5.79 | 3.86 | 3.35 | 4.41 |
| 2 | 2.38 | 1.50 | 3.84 | 6.85 | 4.61 | 4.06 | 5.39 |
| 2-1/2 | 2.88 | 1.75 | 5.00 | 8.50 | 6.06 | 5.24 | 8.74 |
| 3 | 3.50 | 1.89 | 5.47 | 9.25 | 7.44 | 6.06 | 10.63 |
| 4 | 4.50 | 2.26 | 7.64 | 12.17 | 8.70 | 6.89 | 10.63 |
| *6 | 6.63 | 3.03 | 19.59 | 25.65 | 8.70 | 6.89 | 10.63 |

**The 6" valve is a 4" with venturied ends.*




| Dimension (inches) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Size | R | L | Z | H | E | B | C |
| 1/2 | 1/2-NPT | 0.70 | 2.14 | 3.54 | 2.09 | 1.97 | 2.56 |
| 3/4 | 3/4-NPT | 0.71 | 2.24 | 3.66 | 2.44 | 2.28 | 2.99 |
| 1 | 1-NPT | 0.89 | 2.55 | 4.33 | 2.80 | 2.56 | 3.35 |
| 1-1/4 | 1-1/4-NPT | 0.99 | 3.02 | 5.00 | 3.31 | 2.99 | 3.94 |
| 1-1/2 | 1-1/2-NPT | 0.97 | 3.21 | 5.16 | 3.86 | 3.35 | 4.41 |
| 2 | 2-NPT | 1.17 | 4.01 | 6.34 | 4.61 | 4.06 | 5.39 |
| 3 | 3-NPT | 1.40 | 6.81 | 9.61 | 7.44 | 6.06 | 10.63 |
| 4 | 4-NPT | 1.48 | 9.20 | 12.17 | 8.70 | 6.89 | 10.63 |




| Dimension (inches) | | | | | | |
|---|---|---|---|---|---|---|
| Size | # holes | f | F | H | B | C |
| 1/2 | 4 | 5/8 | 2-3/8 | 5.59 | 1.97 | 2.56 |
| 3/4 | 4 | 5/8 | 2-3/4 | 6.07 | 2.28 | 2.99 |
| 1 | 4 | 5/8 | 3-1/8 | 6.74 | 2.56 | 3.35 |
| 1-1/4 | 4 | 5/8 | 3-1/2 | 7.54 | 2.99 | 3.94 |
| 1-1/2 | 4 | 5/8 | 3-7/8 | 8.29 | 3.35 | 4.41 |
| 2 | 4 | 3/4 | 4-3/4 | 9.60 | 4.06 | 5.39 |
| 2-1/2 | 4 | 3/4 | 5-1/2 | 11.13 | 5.24 | 8.74 |
| 3 | 4 | 3/4 | 6 | 11.74 | 6.06 | 10.63 |
| 4 | 8 | 3/4 | 7-1/2 | 14.99 | 6.89 | 10.63 |
| *6 | 8 | 7/8 | 9-1/2 | 28.55 | 6.89 | 10.63 |

**The 6" valve is a 4" with venturied ends.*

# VX Series Ball Valves

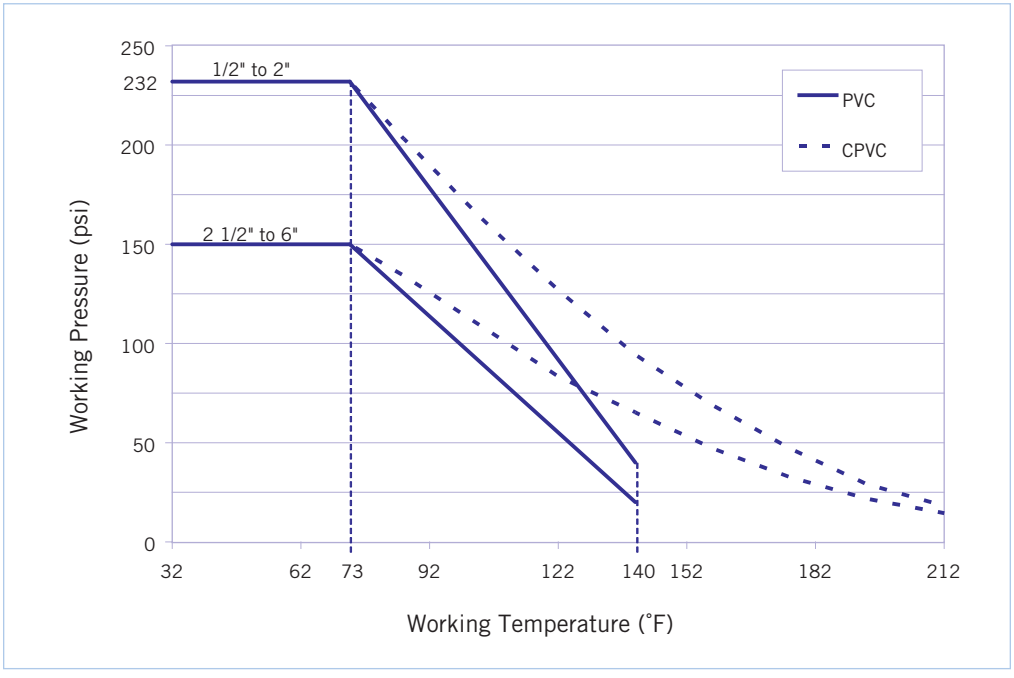
## Technical Data (cont'd)

### weights

| Size (inches) | Approximate Weight (lbs) | | | | | |
|---|---|---|---|---|---|---|
| | PVC | | | CPVC | | |
| | IPS Socket | FNPT Threaded | ANSI Flanged | IPS Socket | FNPT Threaded | ANSI Flanged |
| 1/2 | 0.32 | 0.32 | 0.72 | 0.34 | 0.34 | 0.76 |
| 3/4 | 0.49 | 0.49 | 1.07 | 0.53 | 0.53 | 1.13 |
| 1 | 0.69 | 0.69 | 1.48 | 0.76 | 0.76 | 1.58 |
| 1-1/4 | 1.11 | 1.11 | 2.11 | 1.22 | 1.22 | 2.22 |
| 1-1/2 | 1.60 | 1.60 | 2.80 | 1.75 | 1.75 | 3.02 |
| 2 | 2.74 | 2.74 | 4.62 | 3.02 | 3.02 | 5.02 |
| 2-1/2 | 5.73 | N/A | 8.31 | 6.27 | N/A | 9.35 |
| 3 | 9.55 | 9.55 | 13.29 | 10.45 | 10.45 | 14.40 |
| 4 | 16.42 | 16.42 | 22.42 | 17.97 | 17.97 | 24.30 |
| *6 | 25.02 | N/A | 35.04 | 27.14 | N/A | 37.73 |

**The 6" valve is a 4" with venturied ends.*

### pressure – temperature ratings



# VX Series Ball Valves

## Technical Data (cont'd)

## flow coefficients

The flow coefficient ($C_V$) 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,

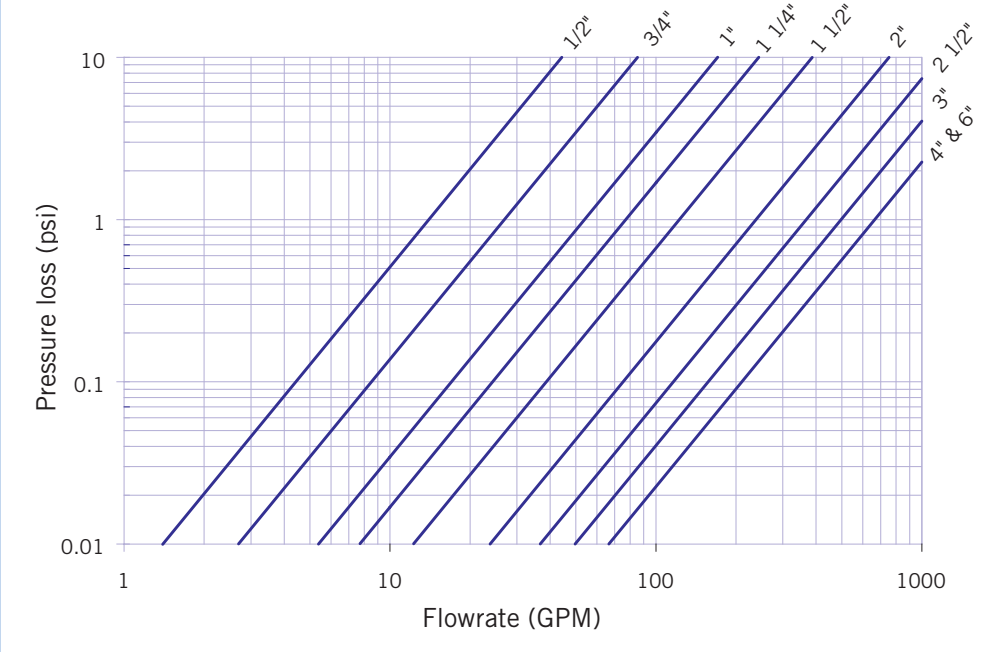
$Q$ is the flow rate in GPM,

$C_V$ is the flow coefficient.

| Size | $C_V$ |
|---|---|
| 1/2 | 14.0 |
| 3/4 | 27.0 |
| 1 | 53.9 |
| 1-1/4 | 77.0 |
| 1-1/2 | 123 |
| 2 | 238 |
| 2-1/2 | 368 |
| 3 | 497 |
| 4 | 665 |
| 6 | 665* |

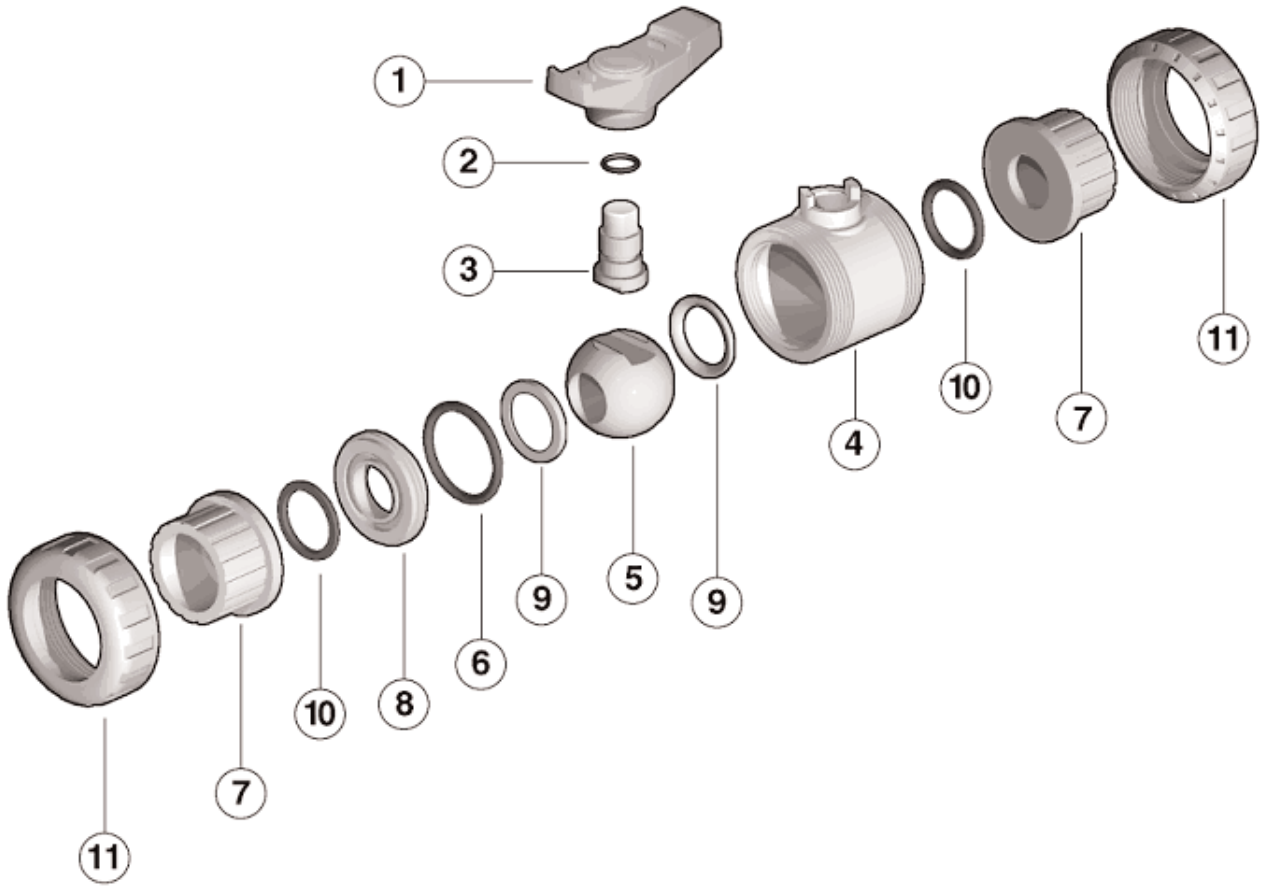
**Not including venturied ends.*

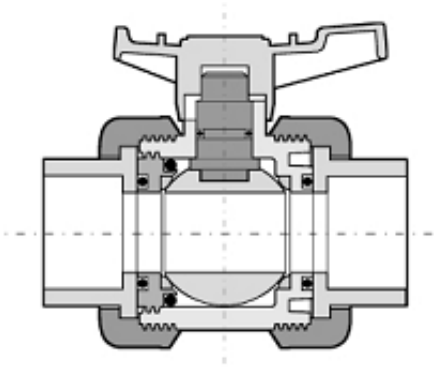
## pressure loss chart



# VX Series Ball Valves

## Components



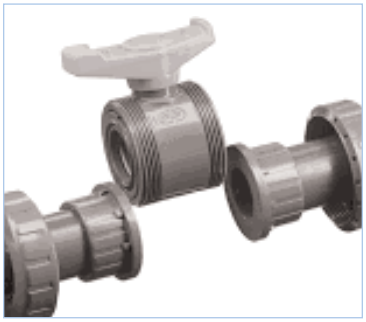
| # | Component | Material | Qty |
|---|---|---|---|
| 1* | handle | High Impact PVC | 1 |
| 2* | stem o-ring | EPDM or Viton® | 1 |
| 3* | stem | PVC / CPVC | 1 |
| 4 | body | PVC / CPVC | 1 |
| 5 | ball | PVC / CPVC | 1 |
| 6* | body o-ring | EPDM or Viton® | 1 |
| 7* | end connector | PVC / CPVC | 2 |
| 8 | support for ball seat | PVC / CPVC | 1 |
| 9* | ball seat | PTFE | 2 |
| 10* | socket o-ring | EPDM or Viton® | 2 |
| 11* | union nut | PVC / CPVC | 2 |

** Spare parts available.*

# VX Series Ball Valves

## *Installation Procedures*





1. For socket and threaded style connections, remove the union nuts (part #11 on previous page) and slide them onto the pipe. For flanged connections, remove the union nut / flange assemblies from the valve.

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

   a. For socket style, solvent cement the end connectors (7) 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 (7) 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. Open and close the valve to ensure that the ball seat support (8) is at the desired adjustment. If adjustment is required, ensure that the valve is in the closed position then remove the handle (1) from the valve stem. Line up the moldings on the handle wit the slots in the ball seat support. Tighten or loosen to the desired position then replace the handle on the valve stem.

4. Ensure that the valve is in the closed position, and that the socket o-rings (10) are properly fitted in their grooves. Carefully place the valve in the system between the two end connections.

5. Tighten the union nut on the side **opposite** to that which is marked "ADJUST". 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.**

6. Tighten the union nut on the side marked "ADJUST". Tightening the union nuts in this order results in the best possible valve performance due to optimum positioning and sealing of the ball and seat support system.

7. Open and close the valve to again ensure that the cycling performance is adequate. If adjustment is required, place the valve in the closed position, loosen the union nuts, remove the valve from system and then continue from Step 3.

# VX Series Ball Valves

## *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 (11) and drop the valve out of the line. If retaining the socket o-rings (10), take care that they are not lost when removing the valve from the line.
3. To disassemble, place the valve in the closed position then remove the handle (1) from the valve stem.
4. Line up the moldings on the handle with the slots in the ball seat support (found on the side marked "ADJUST"). Loosen and remove the ball seat support (8) by turning in a counterclockwise direction.
5. Carefully press the ball (5) out of the valve body, taking care not to score or damage the outer surface.
6. To remove the stem (3), press it into the valve body (4) from above.
7. The stem o-ring (2), body o-ring (6), and ball seats (9) can now be removed 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 ball seat (9) in the groove on the opposite end inside the valve body (4).
2. Properly fit the stem o-ring (2) in the groove on the stem (3), then insert the stem from the inside of the valve body.
3. Ensure that the valve stem is in the closed position then insert the ball (5) into the valve body taking care not to score or damage the outer surface.
4. Check that the ball seat (9) and body o-ring (6) are properly fitted on the ball seat support (8), then slightly hand tighten into the valve body. Line up the moldings on the handle (1) with the slots in the ball seat support then tighten by turning in a clockwise direction.
5. Replace the handle on the valve stem then cycle the valve open and closed to determine whether or not the performance is adequate. If so desired, the handle can be removed and used to make further adjustments.
6. Properly fit the socket o-rings (10) in their respective grooves.
7. Place the end connectors (7) into the union nuts (11), then thread onto the valve body taking care that the socket o-rings remain properly fitted in their grooves.

# VX Series Ball 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.

**For safety reasons, please contact IPEX customer service and technical support when using volatile liquids such as hydrogen peroxide ($H_2O_2$) and sodium hypochlorite (NaClO). These liquids may vaporize causing a potentially dangerous pressure increase in the dead space between the ball and the valve body. Special VX ball valves are available for these types of critical applications.**

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

# VX Series Ball 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.

Our products and systems have been designed for a broad range of customers and markets. Contact us for information on:

- PVC, CPVC, PP, FR-PVDF, ABS, PEX and PE pipe and fittings (¼" to 48")
- Industrial process piping systems
- Double containment systems
- Acid waste systems
- High purity systems
- Industrial, plumbing and electrical cements
- Municipal pressure and gravity piping systems
- Plumbing and mechanical pipe systems
- Electrical systems
- Telecommunications systems
- Irrigation systems
- PE Electrofusion systems for gas and water
- Radiant heating systems

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