

Instruction Manual

CVS Series HPX and HPAX 2 through 6-Inch Globe Valves and 2-Inch Angle Valves

Introduction

Contents

Contained in this manual are installation instructions, maintenance procedures and parts information for the 2 through 6-inch designs CVS HPX2D, HPX5T, HPAX2, HPAX5, Class 900 and 1500 ratings. 2 inch Class 2500 also included. Refer to the appropriate manuals for instructions for the accompanying actuator, positioner and additional accessories.

Trained or experienced personnel should carry out operation and installation of all pressure equipment. If you have any questions regarding the equipment, contact your CVS Controls representative.

Description

The CVS Series HP Control Valves are high pressure and angle valves, designed for high-pressure applications in the process control industry. They are equipped with metal seats, cage guiding and quick-change trim and push-down-to-close valve plug action. These valves use balanced valve plugs.



Figure 1: CVS Series HPX Valve with Type 667 Actuator

In the CVS Series HPX2D and HPAX2, a piston ring provides the seal between the cage and the balanced valve plug. In the CVS Series HPX5T and HPAX5 that seal is provided by a pressure assisted seal ring.

Head Office
3900 – 101 Street
Edmonton, Alberta, Canada T6E 0A5
Office: (780) 437-3055
Fax: (780) 436-5461

CVS
Controls Ltd.

Calgary Sales Office
205, 2323 – 32 Avenue NE
Calgary, Alberta, Canada T2E 6Z3
Office: (403) 250-1416
Fax: (403) 291-9487

Website: www.cvs-controls.com E-Mail: info@cvs-controls.com



Australian Agents
www.globalsupplyline.com.au
sales@globalsupplyline.com.au

Table 1: Specifications

| Specification | Description |
|--|---|
| End Connection Style | All CVS Series Design HPX Control Valves are available in 3, 4 and 6-inch sizes, Class 900 and 1500. 2 inch available in Class 900, 1500, and 2500. |
| | Design HPAX configuration is available in a 2-inch valve, class 900 and 1500 |
| WCB and LCC Cast Steel Valves | Flanged Ends: RF (raised face) and RTJ (ring type joint) |
| CF3M (316 L SS) Valves | Flanged Ends: RF (raised face) and RTJ (ring type joint) |
| Maximum Inlet Temperature and Pressure | Flanged: Consistent with Class 900, 1500 and 2500 in accordance with ASME B16.34 1996 |
| Shutoff Classification | See Table 2 |
| Flow Characteristic | Standard Cage: equal percent, modified equal percent, or linear |
| Flow Direction | Standard Cage: Normally Flow Down |
| Approximate Shipping Weight | See Table 3 for Valve Body and Bonnet Assemblies |
| Notes: | |
| 1. Consult your CVS Controls representative for end connections and DIN ratings. | |
| 2. Class 900 and 1500 valves are identical for 2-inch valves. Class 900 and 1500 valves for sizes 3, 4 and 6-inch are not identical. | |
| 3. The centerline-to-face dimension does not conform to ANSI/ISA S75.12. | |
| 4. The Temperature and Pressure rating in this manual and any applicable standard should not be exceeded. | |

Installation

Exceeding the recommended pressure and temperature limits from Table 1, or those indicated on the nameplates of your CVS Controls valve, can result in personal injury and property damage. CVS Controls recommends the installation of a relief valve to protect against overpressure situations.

CVS Series HPX900 and 1500, HPX2D and HPX5T are designed to meet specific conditions for fluid control, temperature, pressure and pressure drop. The limiting factor on these valves can be the body/trim material combinations. Do not install these valves in any other applications without first consulting with your CVS Controls representative.

1. Inspect the valves for shipping damage and foreign debris while uncrating.
2. Ensure the pipeline is free of welding slag, chips and other debris by blowing out the line before installation.

3. Position the valve on the line so the flow direction indicator corresponds to the direction of the flow of the pipeline.
4. CVS Controls recommends the installation of a standard three-valve maintenance bypass. This will allow isolation of the control valve without shutting down the pipeline system.
5. Install approved gaskets between the valve body and the pipeline flanges.
6. If the actuator has been shipped separately, refer to the mounting procedure in the applicable instruction manual.
7. If the valve body arrives without packing installed in the packing box, it will be necessary to install the packing before putting the valve into service. To complete these procedures, follow the instructions under "packing maintenance" in this manual.
8. **Note:** It may be necessary to adjust the packing to prevent leakage. Prior to shipping the packing was tightened, and may require some adjustment for specific conditions.

Table 2: Shutoff Classifications per ANSI/FCI 70-2-1991

| Valve Design | Port Diameter Inches (mm) | ANSI Leakage Class |
|--------------|-------------------------------|--------------------|
| HPX2D | 1-7/8 (47.6) and smaller | II |
| | 2-5/16 (58.7) to 3-5/8 (92.1) | II-Standard |
| HPAX5T | All | V-Standard |

Table 3: Approximate Shipping Weights: Valve and Bonnet Assembly

| Valve Type | Valve Size (Inches) | Class | Pounds Flanged | Kilograms Flanged |
|-------------|---------------------|------------|----------------|-------------------|
| Globe Valve | 2 | 900 & 1500 | 158 | 72 |
| | 2 | 2500 | 229 | 104 |
| | 3 | 900 | 276 | 125 |
| | | 1500 | 284 | 129 |
| | 4 | 900 | 507 | 230 |
| | | 1500 | 548 | 249 |
| | 6 | 900 | 1127 | 511 |
| | | 1500 | 1228 | 557 |
| Angle Valve | 2 | 900 & 1500 | 153 | 69 |

Maintenance

Internal valve components are subject to normal deterioration and must be inspected and replaced as required. The necessity of inspections and replacement of parts will depend on the severity of service conditions. Inspections and maintenance must be carried out on a regularly scheduled basis.

To ensure the safety of personnel and to protect against property damage, the following steps should be carried out before beginning disassembly.

1. To prevent the valve from opening suddenly, disconnect any operating lines to the actuator. This would include air pressure, electrical power or control signal lines.
2. Isolate the valve by using the bypass valve or by shutting down the process completely. Relieve the pressure and drain the process fluid from both sides of the valve.
3. Relieve the pressure contained in the actuator by venting the actuator loading pressure and relieving any power actuator spring compression.
4. Lock-out procedures should be strictly adhered to while the equipment is being serviced.
5. The CVS HPX Designs use spiral-wound gaskets that are compressed to provide their seal. Spiral-wound gaskets are designed for single service, and if they are disturbed they must be replaced upon reassembly. Used spiral-wound will not seal properly within the assembly.

Table 4: Torque for Body-To-Bonnet Bolting (using Nickel Never Seez Lubricant)

| Valve Rating | Valve Size, Inches | Torque | | | |
|--------------------|--------------------|---------------------------|------------------|---------------------------|------------------|
| | | Lbf•ft | | N•m | |
| | | B7, B16, BD and 660 Studs | B8 and B8M Studs | B7, B16, BD and 660 Studs | B8 and B8M Studs |
| Class 900 and 1500 | 2 | 290 | 180 | 390 | 240 |
| | 3 | 540 | 390 | 730 | 530 |
| | 4 | 720 | 540 | 970 | 730 |
| | 6 | 1250 | 950 | 1700 | 1300 |
| Class 2500 | 2 | 540 | 390 | 730 | 530 |

Packing Lubrication

These instructions are for the lubricator or lubricator isolating valve (Figure 2). If the lubricator or lubricator isolating valve have been installed, they will be in place of the pipe plug (key 16, Figures 4 and 6) and are designed for packing that requires lubrication, including PTFE/composition. CVS Controls recommends a silicon-based lubricant. Lubricant is not recommended for oxygen services or for processes that operate in excess of 500F. To add lubricant to the packing box, turn the capscrew in a clockwise direction.

For Lubricator/Isolating Valve

1. Open the isolating valve.
2. Turn the capscrew in a clockwise direction.
3. Close the isolating valve.

Packing Leakage

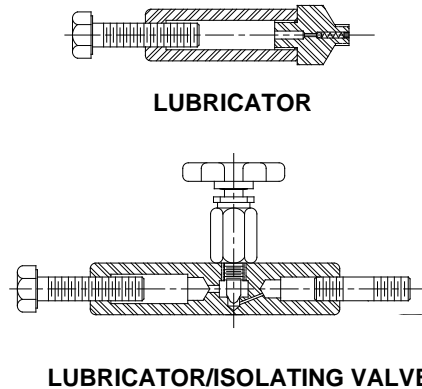
Spring-Loaded PTFE V-ring packing

To eliminate leakage, tighten the packing flange nuts (key 2, Figures 4 and 6). If leakage cannot be controlled in this manner, the packing will need to be replaced.

Other Packing

If packing other than Spring-Loaded PTFE V-ring has been used, attempt to eliminate the leaking and create a stem seal by tightening the packing flange nuts to the minimum recommended torque given in Table 5. If leakage continues, the packing will need to be replaced.

Figure 2: Lubricator and Lubricator/Isolating Valve



New Packing

If tightening the appropriate flange nuts does not solve the leakage problem and the packing is relatively new, leakage could indicate damage to the packing box wall or to the stem. Inspect the valve plug stem for a good surface finish as well as the packing box wall for nicks and scratches that could compromise the seal.

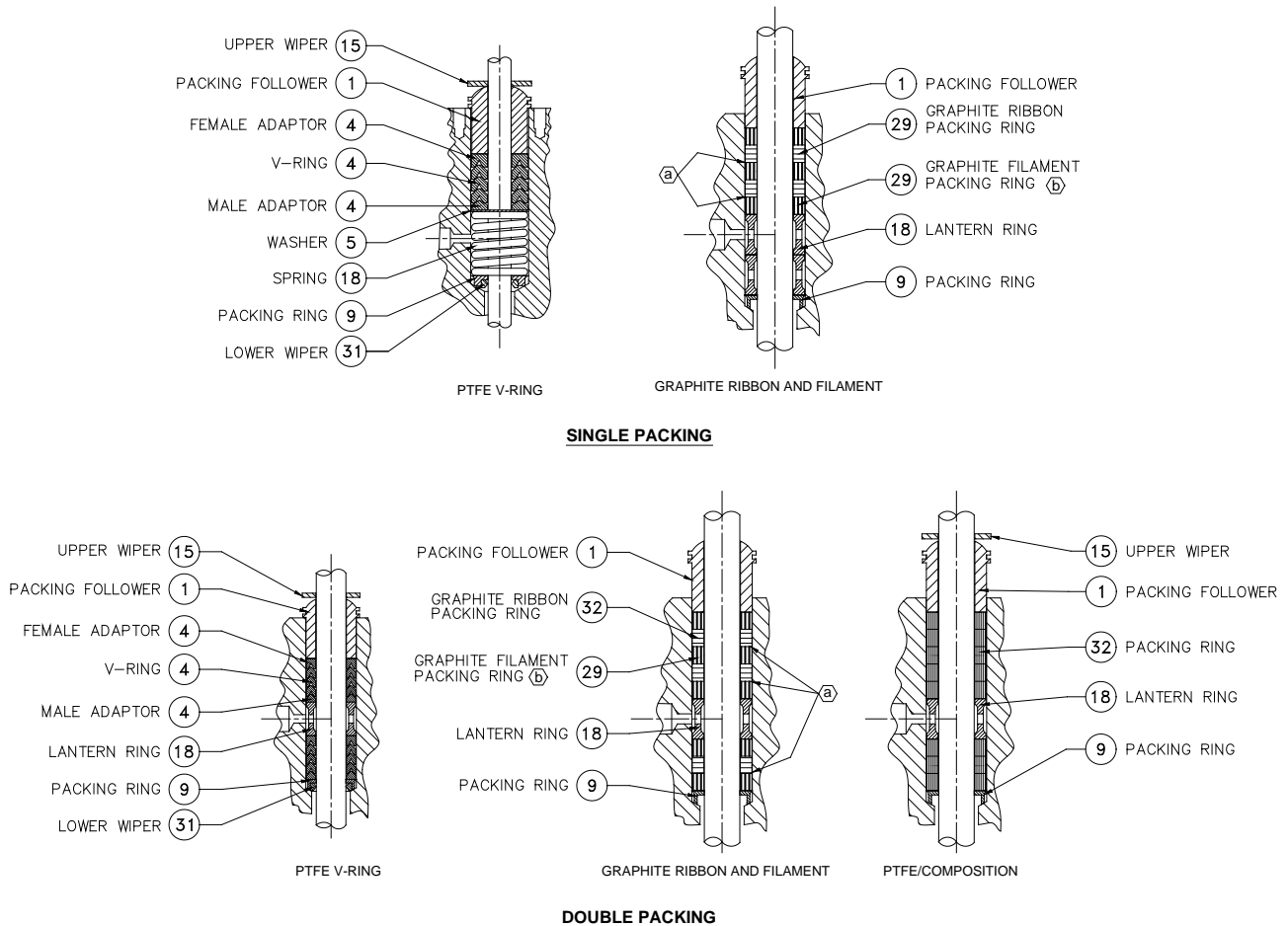
Hint:

If leakage originates from the outside diameter of the packing, check the packing box wall for nicks or scratches. If leakages originates from the inside diameter of packing, check the stem for nicks or scratches.

Table 5: Recommended Torque for Packing Flange Nuts (non live-loaded)

| Stem Diameter | | Valve Body Rating | Torque | | | |
|---------------|------|-------------------|--------|-----|-----|-----|
| Inches | mm | | Lbf•ft | | N•m | |
| | | | Min | Max | Min | Max |
| 1/2 | 12.7 | 900 | 9 | 13 | 12 | 18 |
| 1/2 | 12.7 | 1500 | 11 | 16 | 15 | 22 |
| 1/2 | 12.7 | 2500 | 13 | 18 | 18 | 24 |
| 3/4 | 19.1 | 900 | 20 | 30 | 27 | 41 |
| 3/4 | 19.1 | 1500 | 25 | 37 | 34 | 50 |
| 3/4 | 19.1 | 2500 | 30 | 45 | 41 | 61 |

Figure 3: CVS Series HPX and HPAX Packing Arrangements



NOTES:

- Ⓐ ZINC WASHER, ONE USED BELOW EACH GRAPHITE RIBBON RING.
- Ⓑ HAS THE APPEARANCE OF A WOVEN OR BRAIDED RING.

Replacing Packing

Prior to beginning any maintenance, it is important to isolate the valve from the line pressure, and to release all pressure from the valve body. Disconnect all operating lines to the actuator, including air pressure, electrical power or control signal lines. The process pressure should be released both upstream and downstream of the valve. Drain the process fluid from both sides of the valve.

Employ lock-out procedures to ensure the safety of personnel and equipment during valve service.

Note: Extreme caution must be used during disassembly. Nicks and scratches will affect the ability to seal the valve in the future.

1. Remove the cap screws in the stem connector and separate the two halves.
2. Exhaust any actuator pressure and disconnect the actuator supply line and any leakoff piping.
3. Remove the actuator from the bonnet (key 6) by removing the yoke lock nut (key 15) and then remove the actuator from the bonnet.

4. Back off the packing flange nuts (key 2) until the packing is free of constriction against the valve plug stem (key 20). Remove any additional equipment from the valve plug stem threads, including the travel indicator disk and stem locknuts.
5. When removing the bonnet ensure the valve plug and stem assembly (keys 20 and 22) remain off the seat ring (key 23). This will prevent damage to the seating surfaces as a consequence of the assembly falling from the bonnet after being partially raised.
6. Apply caution to avoid damage to the gasket seating surface.
7. **Caution** must be used when handling the HPXd and HPAX2 piston rings. These rings are brittle and in two pieces.
8. Remove the bonnet in the following steps. Do not remove a jammed bonnet with equipment that can store energy. Sudden release of the bonnet can result in unexpected and potentially dangerous movement. If the cage becomes jammed it is important to provide support for the cage. This will prevent the cage from falling unexpectedly.
9. Loosen the bonnet hex nuts (key 8) which attach the bonnet to the valve, by approximately 1/8 of an inch (3mm).
10. Pry between the bonnet (key 6) and valve body (key 21) to loosen the body to bonnet gasket joint. Continue prying around the bonnet until the bonnet loosens. If no fluid is released from the joint, unscrew the bonnet nuts (key 28) completely.
11. Carefully remove the bonnet and valve plug assembly (key 6, 20, 22) as a unit. Ensure that the valve plug and stem assembly (keys 20 and 22) remains on the seat ring (key 23) and avoid nicking or scratching the gasket sealing surface.
12. To remove the bonnet from the valve stem remove the bonnet hex nuts (key 8). Carefully lift the bonnet off the valve stem. In the event that the valve plug and stem assembly become detached they can be tapped back down with a lead or brass hammer. Place the bonnet on a suitable surface such as wood or cardboard to protect it from damage.
13. Remove parts in this order:
 - 13.1. Valve Plug Assembly (key 20, 22)
 - 13.2. Bonnet Gasket (key 19)
 - 13.3. Cage (key 12)
 - 13.4. Seat Ring (key 23)
 - 13.5. Seat Ring Gasket (key 24)
14. Clean all gasket surfaces with a wire brush, following the direction of the serrations.
15. Cover the valve body openings to protect the gasket surfaces.
16. Unscrew the packing flange nuts (key 2)
17. Remove the following from the bonnet:
 - 17.1. Packing flange (key 3)
 - 17.2. Upper wiper (key 13)
 - 17.3. Packing follower (key 14)
18. Push the remaining packing parts from the valve side of the bonnet. This can be done with a rounded rod or any other tool that will not cause damage or scratch the packing wall.
19. Clean the packing box and the following metal components: spring or lantern ring, packing box ring, packing follower and, if required, the v-ring packing washer. Finish all required maintenance.
20. Examine the valve stem threads for sharp edges that may damage the new packing. Emery cloth or a whetstone can be used to smooth out any sharp edges or burrs.
21. Remove the protective covering from the valve body. Using a new seat ring gasket (key 24) and bonnet gasket (key 19), install the seat ring (key 23) and cage (key 12).
22. Install the stem and plug assembly (key, 20, 22). Slip the bonnet (key 6) over the stem and line it up with the studs.
23. Replace the packing hex nuts (key 2)
 - 23.1. For pre-lubricated hex nuts (identified by the black film coating on the nut threads) tighten the hex nuts finger tight.
 - 23.2. For all other nuts, CVS Controls recommends that you lubricate the stud threads with Never Seez Pure Nickel special lubricant or equivalent. Tighten the hex nuts finger tight.
24. To centre the trim, the valve will need to be stroked several times. Using proper bolting procedures tighten the nuts to no more than 1/4 of the torque values specified in Table 4.

25. Increase the torque on each nut by an additional 1/4 of the torque value using the standard crisscross pattern. Repeat this pattern until the torque values in Table 4 have been reached. Apply the final torque value again and if any bolts turn, all of the bolts will require retightening.
26. Using the appropriate arrangement from Table 3, install new packing and metal packing box parts. It may be necessary to pre-lubricate packing parts with silicone-based grease.
27. Using a smooth-edged pipe, cautiously tamp each soft packing part into the packing box. To prevent trapping air between the rings, add one ring at a time without forcing them below entrance chamber of the packing box. With each additional ring the stack should only be pushed down the thickness of one ring.
28. Install:
 - 28.1. Packing Follower (key 14)
 - 28.2. Wiper (key 13)
 - 28.3. Packing Flange (key 3)
29. Lubricate both the packing flange studs (key 1) and the faces of the packing flange nuts (key 2). Finger tighten the packing flange nuts.
30. For packing type:
 - 30.1. Spring-loaded PTFE V-Ring (Figure 3): tighten the packing flange nuts until there are no leaks.
 - 30.2. Graphite: initially tighten the packing flange nuts to the maximum torque value in Table 5. Release the packing flange nuts and retighten them to the maximum torque value given in Table 5.
 - 30.3. Other packing types: tighten the packing flange nuts in small increments alternately. Repeat the process until one of the nuts reaches the maximum torque value from Table 5. Now continue tightening the flange nuts until the packing flange is level and at right angles (90 degrees) to the valve stem.

Table 7: Valve Stem Connection Torque and Drill Size for Groove Pin Hole

| Valve Size Inches | Valve Stem Diameter | | Valve Design | Valve Stem Connection | | Drill Size for Groove Pin Inches |
|----------------------|---------------------|------|------------------------------------|-----------------------|---------|-------------------------------------|
| | Inches | mm | | Lb•ft | N•m | |
| 2 | 1/2 | 12.7 | HPX2D, HPAX2 HPX5T, HPAX5 | 60-85 | 81-115 | 1/8 |
| | 3/4 | 19.1 | | 175-250 | 237-339 | 1/8 |
| 3 | 1/2 | 12.7 | HPX2D, HPX5T | 60-85 | 81-115 | 1/8 |
| | 3/4 | 19.1 | | 175-250 | 237-339 | 3/16 |
| | 1 | 25.4 | | 310-355 | 420-481 | 1/4 |
| 4 | 3/4 | 19.1 | HPX2D, HPX5T | 175-250 | 237-339 | 3/16 |
| | 1 | 25.4 | | 310-355 | 420-481 | 1/4 |
| 6 | 3/4 | 19.1 | HPX2D, HPX5T | 175-250 | 237-339 | 3/16 |
| | 1 | 25.4 | | 310-355 | 420-481 | 1/4 |
| | 1-1/4 | 31.8 | | 610-670 | 827-908 | 1/4 |

Trim Removal

1. Remove the actuator and the bonnet. Refer to steps 1-4 in replacing packing.
2. Remove the valve plug and stem assembly (key 20, 22). If the assembly is to be reused protect the valve stem and plug seating surface from nicks and scratches by taping them.
3. Remove:
 - 3.1. Cage (key 12)
 - 3.2. Bonnet Gasket (key 19)
 - 3.3. Seat Ring (key 23)
 - 3.4. Seat Ring Gasket (key 24)
4. Follow the steps in the valve plug maintenance procedure to complete the remaining steps for trim removal.

Valve Plug Maintenance

1. Remove the valve plug and stem assembly (key 20, 22) using the trim removal procedures.
2. Follow the instructions for your specific equipment:
 - 2.1. For HPX2D and HPAX2 valves, remove both halves of the piston rings (key 11) from the grooves in the valve plug.
 - 2.2. For HPX5T and HPAX5 valves, pry the retaining ring (key 27) off the valve plug with a screwdriver. Gently slide the backup ring (key 28) and seal ring (key 29) of the valve plug.
3. For replacement of the valve plug stem drive out the groove pin from the valve plug and unscrew the stem.
4. **Note:** When replacing a valve plug always replace the corresponding valve plug stem. The stem and pin should be ordered as an assembly.
5. Screw the stem (key 20) into the valve plug (key 22), tightening the stem to the recommended torque given in Table 7. Determine the correct drill size (Table 7) and drill through the stem using the groove pinhole as a guide.
6. To lock the assembly, drive in the groove pin (key 10).
7. If required, lap the seating surfaces prior to installing the piston rings or seat ring. Use the trim replacement instructions for the piston ring and seat ring installation and reassembly of the valve.
3. The CVS Controls Series HP designs have spiral gaskets, which are compressed to provide their seal. Spiral-wound gaskets are designed for single service. If they are ever disturbed they will need to be replaced on reassembly. *The previously used gasket may be used to lap the seat but the gasket must be replaced with a new gasket.*
4. Using the instructions under trim replacement, install "old" seat ring gasket, seat ring, cage and the "old" bonnet gasket.
5. Install the valve plug and stem assembly without piston rings or seal ring into the cage.
6. Slip the bonnet over the valve stem. Fasten the bonnet by securing four of the hex nuts.
7. It will be necessary to attach a handle to the valve stem. This could be a piece of strap metal attached by stem locknuts.
8. Turn the handle alternately in both directions thereby lapping the seat, taking care not to gull the seat and plug.
9. When complete, disassemble stopping to mark the positions of the cage with a soft-tipped marker.
10. Clean the seating surfaces, replace the gaskets and reassemble. Test for leakage and repeat the lapping procedure if required.
11. The position of the seat ring and cage must remain constant to preserve the effects of lapping. Ensure that when parts are removed for maintenance and cleaning, they are returned to their original position.

Seat Lapping

With metal-to-metal seating in any valve, a small amount of leaking can be expected. If the leakage becomes excessive it is possible to limit the valve leakage by seat lapping.

1. Eliminate any deep nicks through machining rather than grinding.
2. Apply a good quality lapping compound mixture of 280 to 600-grit to the bottom of the valve plug.

Trim Replacement

Complete all necessary maintenance on the trim including cleaning all gasket surfaces. Inspect sealing surfaces. Nicks and scratches will prevent the gasket from sealing properly.

1. Replace:
 - 1.1. Seat Ring Gasket (key 24)
 - 1.2. Seat Ring (key 23)
 - 1.3. Cage (key 12)
 - 1.4. Piston Rings (key 11)
 - 1.5. Seal Rings (key 29)

2. For CVS HPX2D and HPAX2 designs:

- 2.1. New piston rings will be delivered in one piece. The piston ring can be broken in half by scoring and breaking over a hard surface such as a table edge. The other recommended method is to break the ring with the use of a smooth or taped jawed vise. Install the new ring in the vise and apply pressure until the ring becomes an oval. Continue applying pressure until the ring snaps on both sides. If just one side snaps do not try to rip off the other side. Apply pressure until the second side breaks.
- 2.2. Remove the protective covering from the valve plug and stem assembly.
- 2.3. Insert the piston rings into the piston ring grooves matching the broken ends.

3. For HPX5T and HPAX5 designs:

- 3.1. Install for flow-down applications (see Figure 5, view A), install the ring with the open side facing the seat ring end of the valve plug.
- 3.2. Install the back-up ring (key 28) on the valve plug (key 22) and secure with the retaining ring (key 27).
4. Install the valve plug (key 22) in the cage (key 12) and place the bonnet gasket (key 19) on the cage.
5. After lubricating the bonnet stud threads (key 7) and the faces of the bonnet hex nuts (key 8), tighten the hex nuts finger tight.

Note: If pre-lubricated hex nuts are used, lubrication will not be necessary. CVS Controls recommends Never-Seez Pure Nickel special lubricant or equivalent for lubricating.

6. Tighten the bolts in a three-step process:

- 6.1. Begin by tightening the bolts to 1/4 of the specified normal torque (Table 4) using the standard crisscross bolting pattern.
- 6.2. Using the same method tighten the bolts to an additional 1/4 of the specified normal torque value (Table 4)
- 6.3. Continue tightening bolts to the nominal torque value from Table 4.
7. Test the nuts by applying the final torque value. If the nuts still rotate, tighten all the nuts again.
8. Install the packing and the packing box components following the instructions from "Replacing Packing".
9. Using the actuator instructions mount the actuator.
10. If leakage occurs in the packing when the valve is put back into service, it may be necessary to retighten the packing flange nuts.

Parts Ordering

Every CVS Controls Series HPX and HPAX valve is identified by a serial number, located on the valve body. Please quote this number when communicating with CVS Controls regarding your valve.

CVS Series HPX Valves

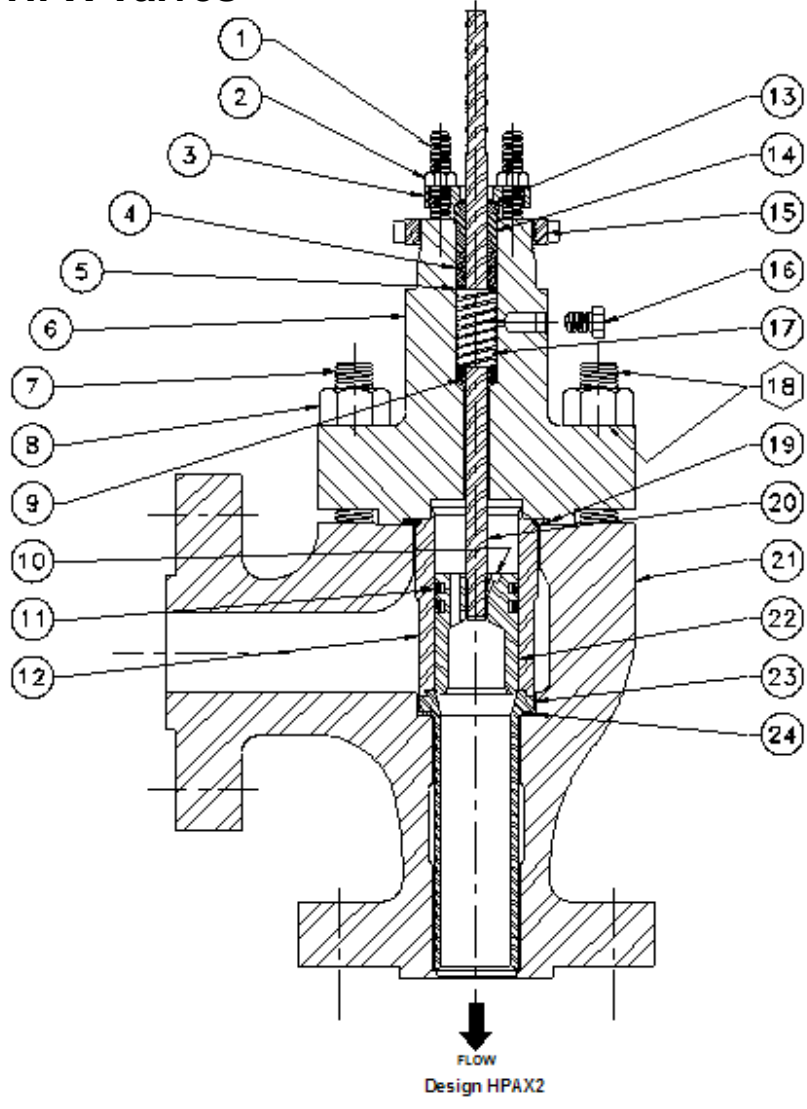


Figure 4 - 2" HPAX2 Valve

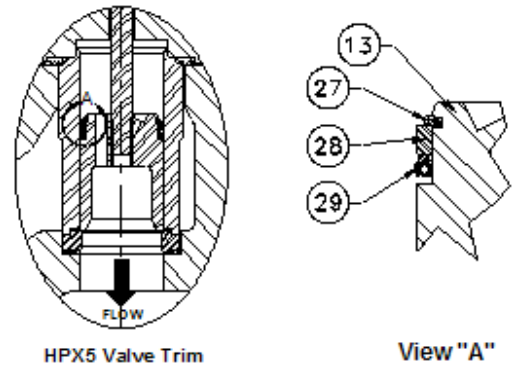


Figure 5 - Design HPX5 Trim

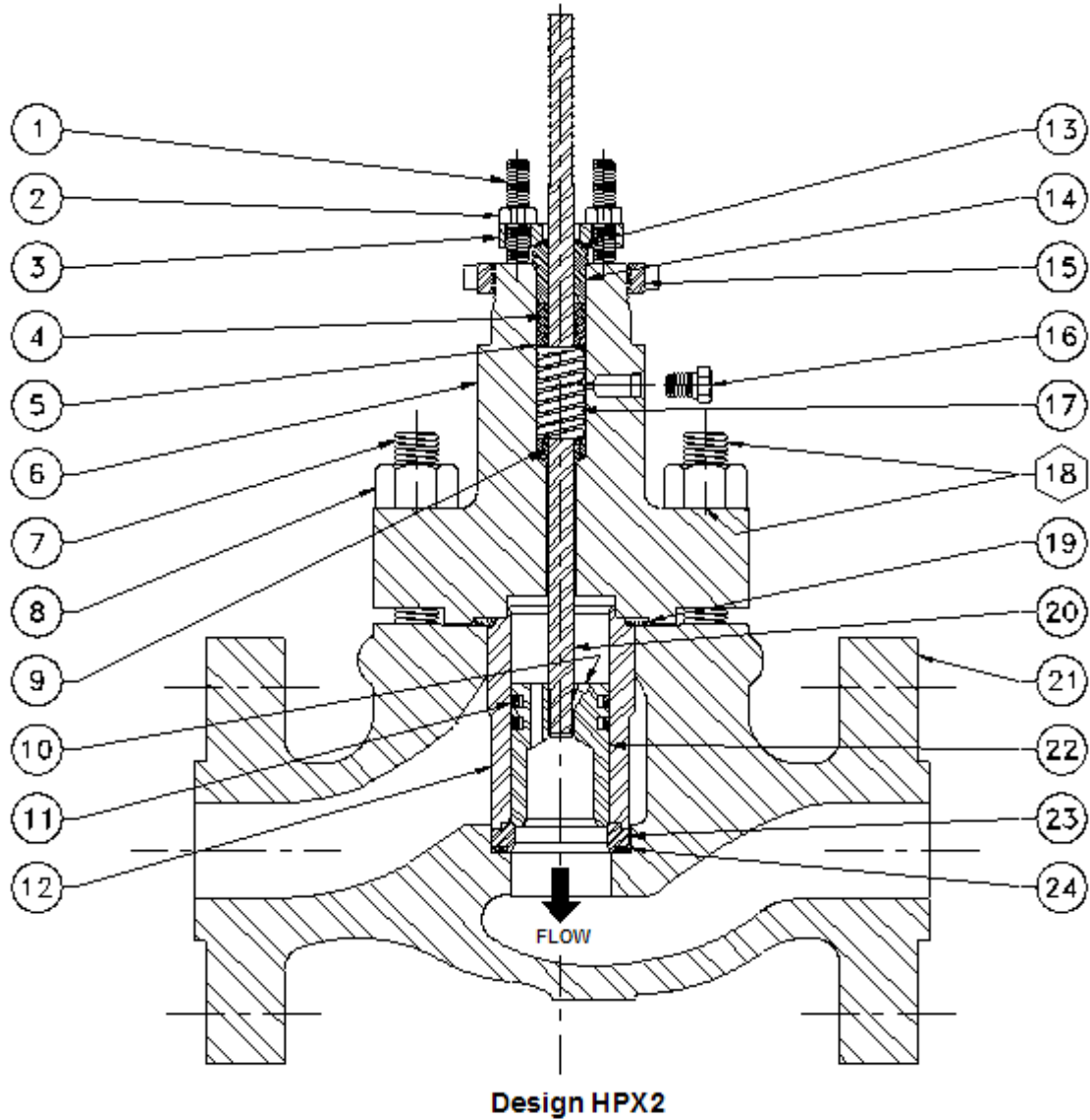


Figure 6 - 2" HPX2 Valve

Parts Reference

| Key | Description | Key | Description | Key | Description |
|-----|-------------------------------|-----|---------------------|-----|------------------|
| 1 | Packing Flange Stud | 11 | Piston Ring | 21 | Valve Body |
| 2 | Packing Flange Nut | 12 | Cage | 22 | Valve Plug |
| 3 | Packing Flange | 13 | Upper Wiper Felt | 23 | Seat Ring |
| 4 | Packing Set (TFE or Graphoil) | 14 | Packing Follower | 24 | Seat Ring Gasket |
| 5 | Packing Washer | 15 | Yoke Lock Nut | 25 | Drive Screw |
| 6 | Bonnet | 16 | Pipe Plug | 26 | Flow Arrow |
| 7 | Bonnet Stud | 17 | Spring/Lantern Ring | 27 | Retaining Ring |
| 8 | Bonnet Hex Nut | 18 | Lubricant | 28 | Back Up Ring |
| 9 | Lower Wiper | 19 | Bonnet Gasket | 29 | Seal Ring |
| 10 | Groove Pin | 20 | Valve Stem | | |

CVS Series HPX and HPAX Valves

Parts List

| Key | Description | Stem Size | Part Numbers | Key | Description | Stem Size | Part Numbers |
|-----------------|----------------------|-----------|----------------------|--|-------------------------|-----------|----------------------|
| 1 | Packing Flange Stud | 1/2" | CVS1E9444X0212 | 19* | Bonnet Gasket | N/A | See Tables |
| | | 3/4" | CVS1E9449X0162 | | | | |
| 2 | Packing Flange Nut | 1/2" | CVS1E944335252 | 20* | Valve Stem | N/A | See Tables |
| | | 3/4" | CVS1E944635252 | | | | |
| 3 | Packing Flange | 1/2" | CVS 1E944223072 | 21* ^C | Valve Body | N/A | Contact CVS Controls |
| | | 3/4" | CVS1E944823072 | | | | |
| 4* | TFE Packing Set | 1/2" | CVS1R290201012 | 22 | Valve Plug | N/A | See Following Tables |
| | | 3/4" | CVS1R290401212 | | | | |
| | Graphol Packing Set | 1/2" | CVS1V3802X0022 | | | | |
| | | 3/4" | CVS1V2396X0022 | | | | |
| 5 | Packing Washer | 1/2" | CVS1F125136042 | 23* | Seat Ring | N/A | See Tables |
| | | 3/4" | CVS1F125036042 | | | | |
| 6 ^A | Bonnet | N/A | Contact CVS Controls | 24* | Seat Ring Gasket | N/A | See Tables |
| 7 | Bonnet Stud | N/A | Contact CVS Controls | 25 ^D | Drive Screw | N/A | ----- |
| 8 | Bonnet Hex Nut | N/A | Contact CVS Controls | 26 ^D | Flow Arrow | N/A | ----- |
| 9* | Lower Wiper | 1/2" | CVS1J872206332 | 27 ^D | Ret. Ring 1-7/8" Port e | N/A | CVS10A4330X012 |
| | | 3/4" | CVS1J872306332 | | | | |
| 10* | Groove Pin | 1/2" | ----- | | | | |
| | | 3/4" | ----- | | | | |
| 11* | Piston Ring | N/A | See Tables | | | | |
| 12* | Cage | N/A | See Tables | | | | |
| 13* | Upper Wiper Felt | 1/2" | CVS1J872706332 | 28* ^D | Back Up Ring | 1/2" | See Tables |
| | | 3/4" | CVS1J872806332 | | | 3/4" | |
| 14 | Packing Follower | 1/2" | CVS1E944335072 | 29* ^D | Seal Ring | 1/2" | See Tables |
| | | 3/4" | CVS1E944735072 | | | 3/4" | |
| 15* | Yoke Lock Nut | 1/2" | CVS1E807423062 | A-If required as a replacement, specify valve size, stem diameter, serial number and desired material B-Never Seez Nickel Special C-If required as a replacement, specify valve size, stem, diameter, serial number and desired material D-Not Shown *-Recommended Spare Parts | | | |
| | | 3/4" | CVS1E832723062 | | | | |
| 16 | Pipe Plug | 1/2" | CVS1A767535072 | | | | |
| | | 3/4" | CVS1A767535072 | | | | |
| 17 | Spring /Lantern Ring | 1/2" | CVS1F125537012 | | | | |
| | | 3/4" | CVS1F125637012 | | | | |
| 18 ^D | Lubricant | N/A | ----- | | | | |

Key 11: Graphite Piston Ring for CVS Series HPX2D (2 to 4-inch) and HPAX2 (2-inch only)

| Valve Size Inches | Quantity | Port Diameter | | Class 1500 | |
|-------------------|----------|---------------|-------|----------------------------------|----------------------------------|
| | | Inches | mm | -425°F to 800°F (253°C to 426°C) | 801°F to 1000°F (427°C to 537°C) |
| 2 | 2 | 1-7/8 | 47.6 | CVS1U2216X0012 | CVS1U2216X0022 |
| 3 | 2 | 2-7/8 | 73.0 | CVS1U2300X0012 | CVS1U2300X0022 |
| 4 | 2 | 2-7/8 | 73.0 | CVS1U2300X0012 | CVS1U2300X0022 |
| | 2 | 3-5/8 | 92.1 | CVS16A5482X012 | CVS16A5482X022 |
| 6 | 4 | 4-3/8 | 111.1 | CVS1U2392X0012 | CVS1U2392X0022 |
| | 3 | 5-3/8 | 136.5 | CVS11A9727X022 | CVS11A9727X032 |

Key 29: Seal Ring for CVS Series HPX5T (2 to 6-inch) and HPAX5 (2-inch only)

| Valve Size Inches | Port Diameter | | Key 11 Seal Ring Valve Body Rating Class 1500 |
|-------------------|---------------|-------|---|
| | Inches | mm | |
| 2 | 1-7/8 | 47.6 | CVS10A4216X012 |
| 3 | 2-7/8 | 73.0 | CVS10A4215X012 |
| | 2-7/8 | 73.0 | CVS10A4215X012 |
| 4 | 3-5/8 | 92.1 | CVS16A5485X012 |
| | 4-3/8 | 111.1 | CVS10A4223X012 |
| 6 | 5-3/8 | 136.5 | CVS10A5411X022 |

Key 20: Valve Stem for Class 1500

| Valve Size, NPS | Yoke Boss Inches | Valve Stem Connection | | Valve Stem Travel | | Description | Material | | | | |
|-------------------------|--------------------------|-----------------------|--------------------------|-------------------|----------|---|-------------------------|--|---|----------------|----------------|
| | | | | | | | 316 SST Standard Bonnet | 316SST Extension Bonnet | | | |
| | | Inches | mm | Inches | mm | | | | | | |
| 1 | 2-13/16 And 3-9/16 | 1/2 | 12.7 | 0.75 | 19.1 | M-Form or M-Flute w/0.25" (6.4mm) port | CVS1N821035162 | CVS10A8840X512 | | | |
| | | | | 0.75 | 19.1 | M-Flute w/0.375" or 0.5" (9.5 or 12.7mm)port | CVS1N821035162 | CVS10A8840X512 | | | |
| | | | | 0.75, 1.125 | 19.1, 29 | M-Form w/0.5", 0.75" or 1" (12.7, 19.1, 25.4mm)port | CVS10A8840XB42 | CVS1P669435162 | | | |
| | | 3/4 | 19.1 | 0.75, 1.125 | 19.1, 29 | M-Form w/0.75" or 1" (19.1, 25.4mm)port | CVS1K5878X0012 | CVS1L384135162 | | | |
| | | | | 0.75, 1.125 | 19.1, 29 | HPAXS with 0.75" (19.1mm)port | CVS16A4704X322 | CVS16A4704X532 | | | |
| | | 2 | 2-13/16 And 3-9/16 | 1/2 | 12.7 | 0.75, 1.125, 1.5 | 19.1, 29, 38 | M-Form, M-Flute HPX, HPAX, HPX5T, HPAX5, HPXS, HPAXS | CVS1N821035162 | CVS23B0035X062 | |
| 3/4 | 19.1 | | | | | 0.75, 1.125, 1.5 | 19.1, 29, 38 | M-Form HPX, HPAX, HPX5T, HPAX5 | CVS1P6696X0012 | CVS1P669735162 | |
| | | | | 3/4 | 19.1 | 0.75, 1.125 | 19.1, 29 | HPAXS w/0.75"(19.1mm) port | CVS16A4704X042 | CVS16A4704X492 | |
| HPAXS w/1" (25.4mm)port | CVS16A4704X322 | | | | | | | CVS16A4704X512 | | | |
| 2 | 5 | 1 | 25.4 | 0.75 | 19 | M-Form w/1" (25.4mm)port | CVS10A3282X012 | CVS11A3429X152 | | | |
| | | | | | | M-Form w/1.25" (31.8mm)port | CVS10A3282X012 | CVS11A3429X152 | | | |
| | | | | | | HPAXS w/1.25" (31.8mm)port | CVS13A9206X312 | CVS13A9206X372 | | | |
| | | | | 1.125 | 29 | M-Form w/1" (25.4mm)port | CVS11A3429X232 | CVS1L199035162 | | | |
| | | | | | | M-Form w/1.25" (31.8mm)port | CVS11A3429X232 | CVS1L199035162 | | | |
| | | | | | | M-Form w/1.5" (38.1mm)port | CVS11A3429X232 | CVS1L199035162 | | | |
| | | | | | | HPAXS w/1.25" (31.8mm)port | CVS13A9206X332 | CVS13A9206X392 | | | |
| | | | | | | HPX, HPAXS w/1.875" (47.6mm)port | CVS1K778335162 | CVS11A3429X922 | | | |
| | | | | | | HPX, HPAXS w/1.875" (47.6mm)port | CVS11A3429X232 | CVS1L199035162 | | | |
| | | | | 1.5 | 38 | M-Form w/1.5" (38.1mm)port | CVS1L2687X0012 | CVS11A3429X452 | | | |
| | | | | | | HPX, HPAXS w/1.875" (47.6mm)port | CVS1L2687X0012 | CVS11A3429X452 | | | |
| | | | | 5, Type 667 | 1 | 25.4 | 0.75, 1.125, 1.5 | 19, 29, 38 | M-Form HPX, HPAXS w/1.5", 1.875" (38.1, 47.6mm)port | CVS1K744735162 | CVS1L9086X00A2 |
| | | | | | | | | | HPAXS w/1.25" (38.1mm)port | CVS13A9206X352 | CVS13A9206X412 |

Continued,

Key 20: Valve Stem for Class 1500, continued.

| Valve Size, NPS | Yoke Boss Inches | Valve Stem Connection | | Valve Stem Travel | | Description | Material | | | | | |
|-----------------|-----------------------------|-----------------------|------|-------------------|----------|-----------------------------|-------------------------|------|-----|----|-----------------------------|----------------|
| | | Inches | mm | Inches | mm | | 316 SST Standard Bonnet | | | | | |
| 3 | 2-13/16 And 3-9/16 | 1/2 | 12.7 | 1.5, 2 | 38. 50.8 | HPX2D w/2.875" (73mm)port | CVS1U217935162 | | | | | |
| | | | | | | HPX5T w/2.875" (73mm)port | CVS1U4269X0012 | | | | | |
| | | 3/4 | 19.1 | 1.5, 2 | 38. 50.8 | HPX2D w/2.875" (73mm)port | CVS10A9265X122 | | | | | |
| | | | | | | HPX5T w/2.875" (73mm)port | CVA1P6696X0012 | | | | | |
| | | | | | | HPXS w/2.875" (73mm)port | CVS10A9265X202 | | | | | |
| | 5 | 1 | 25.4 | 1.5 | 38 | HPX2D | CVS1K778335162 | | | | | |
| | | | | | | HPX5T | CVS1L2687X0012 | | | | | |
| | | | | | | HPXS | CVS1N325635162 | | | | | |
| | | | | 2 | 50.8 | HPX2D | CVS1L2687X0012 | | | | | |
| | | | | | | HPX5T | CVS1K928935162 | | | | | |
| | | | | | | HPXS | CVS1N6682X0032 | | | | | |
| | 5, Type 667 | 1 | 25.4 | 1.5, 2 | 38. 50.8 | HPX2D | CVS1L144635162 | | | | | |
| | | | | | | HPX5T | CVS1K744736162 | | | | | |
| | | | | | | HPXS | CVS1L2687X0012 | | | | | |
| | | | | | | | | | | | | |
| 4 | 2-13/16 And 3-9/16 | 3/4 | 19.1 | 1.5, 2 | 38. 50.8 | HPX2D w/3.625" (92.1mm)port | CVS1L400135162 | | | | | |
| | | | | | | HPX2D w/2.875" (73mm)port | CVS1L400135162 | | | | | |
| | | | | | | HPX5T w/3.625" (92.1mm)port | CVS10A6088X012 | | | | | |
| | | | | | | HPX5T w/2.875" (73mm)port | CVS1K587935162 | | | | | |
| | | | | | | 5 | 1 | 25.4 | 1.5 | 38 | HPX2D w/3.625" (92.1mm)port | CVS1K7891X0012 |
| | | | | | | | | | | | HPX2D w/2.875" (73mm)port | CVS1L877635162 |
| | | | | | | | | | | | HPX5T w/3.625" (92.1mm)port | CVS10A3282X012 |
| | | | | | | | | | | | HPX5T w/2.875" (73mm)port | CVS1N325635162 |
| | 5, Type 667 | 1 | 25.4 | 1.5, 2 | 38. 50.8 | HPX2D w/3.625" (92.1mm)port | CVS11A4329XN62 | | | | | |
| | | | | | | HPX2D w/2.875" (73mm)port | CVS1N325635162 | | | | | |
| | | | | | | HPX5T w/3.625" (92.1mm)port | CVS11A3429X232 | | | | | |
| | | | | | | HPX5T w/2.875" (73mm)port | CVS1N6682X0032 | | | | | |
| | | | | | | HPX2D w/3.625" (92.1mm)port | CVS11A3429X232 | | | | | |
| | | | | | | HPX2D w/2.875" (73mm)port | CVS1K778335162 | | | | | |
| | HPX5T w/3.625" (92.1mm)port | CVS1P516435162 | | | | | | | | | | |
| | HPX5T w/2.875" (73mm)port | CVS1L2687X0012 | | | | | | | | | | |

Continued.

Key 20: Valve Stem for Class 1500, continued

| Valve Size, NPS | Yoke Boss Inches | Valve Stem Connection | | Valve Stem Travel | | Description | Material | |
|-----------------|------------------------------|------------------------------|----------------|------------------------------|------------------------------|------------------------------|-------------------------|----------------|
| | | Inches | mm | Inches | mm | | 316 SST Standard Bonnet | |
| 6 | 2-13/16 And 3-9/16 | 3/4 | 19.1 | 2.5, 3 | 63.5, 76.2 | HPX2D w/5.375" (136.5mm)port | CVS1J507135162 | |
| | | | | | | HPX5T w/5.375" (136.5mm)port | | |
| | 5 | 1 | 25.4 | 2.5 | 63.5 | HPX2D w/5.375" (136.5mm)port | CVS10A3282X012 | |
| | | | | | | HPX2D w/4.375" (111.1mm)port | CVS1K778335162 | |
| | | | | | | HPX5T w/5.375" (136.5mm)port | CVS10A3282X012 | |
| | | | | HPX5T w/4.375" (111.1mm)port | CVS1K778325162 | | | |
| | | | | 3 | 76.2 | HPX2D w/5.375" (136.5mm)port | CVS11A4329X232 | |
| | | | | | | HPX2D w/4.375" (111.1mm)port | CVS1L2687X0012 | |
| | | HPX5T w/5.375" (136.5mm)port | CVS11A3429X232 | | | | | |
| | | 1-1/4 | 31.8 | 2.5 | 63.5 | HPX5T w/4.375" (111.1mm)port | CVS1L2298X0012 | |
| | | | | | | HPX2D w/5.375" (136.5mm)port | | |
| | | | | | | HPX2D w/4.375" (111.1mm)port | | |
| | | | | 3 | 76.2 | HPX5T w/5.375" (136.5mm)port | | CVS10A6073X012 |
| | | | | | | HPX2D w/5.375" (136.5mm)port | | |
| | HPX2D w/4.375" (111.1mm)port | | | | | | | |
| | 1-1/4 X 2 | 31.8 X 50.8 | 2.5 | 63.5 | HPX5T w/5.375" (136.5mm)port | Contact CVS Controls Ltd. | | |
| | | | | | HPX2D w/5.375" (136.5mm)port | | | |
| | | | 3 | 76.2 | HPX5T w/5.375" (136.5mm)port | Contact CVS Controls Ltd. | | |
| | | | | | HPX2D w/5.375" (136.5mm)port | | | |

Continued,

Key 20: Valve Stem for Class 1500, continued

| Valve Size, NPS | Yoke Boss Inches | Valve Stem Connection | | Valve Stem Travel | | Description | Material |
|-----------------|------------------|-----------------------|-------------|-------------------|------------|------------------------------|---------------------------|
| | | Inches | mm | Inches | mm | | 316 SST Standard Bonnet |
| 6 | 5, Type 667 | 1 | 25.4 | 2.5, 3 | 63.5, 76.2 | HPX2D w/5.375" (136.5mm)port | CVS11A3429X232 |
| | | | | | | HPX2D w/4.375" (111.1mm)port | CVS1L2687X0012 |
| | | | | | | HPX5T w/5.375" (136.5mm)port | CVS11A3429X232 |
| | | | | | | HPX5T w/4.375" (111.1mm)port | |
| | | 1-1/4 | 31.8 | 2.5, 3 | 63.5, 76.2 | HPX2D w/5.375" (136.5mm)port | CVS10A6073X012 |
| | | | | | | HPX2D w/4.375" (111.1mm)port | |
| | | | | | | HPX5T w/5.375" (136.5mm)port | |
| | | | | | | HPX5T w/4.375" (111.1mm)port | |
| | | 1-1/4 X 2 | 31.8 X 50.8 | 2.5, 3 | 63.5, 76.2 | HPX2D w/5.375" (136.5mm)port | Contact CVS Controls Ltd. |
| | | | | | | HPX5T w/5.375" (136.5mm)port | |

Key 20: Valve Stem for Class 2500

| Valve Size, NPS | Yoke Boss, Inches | Valve Stem Connection | | Valve Stem Travel | | Description | Material |
|-----------------|--------------------|-----------------------|------|---------------------|--------------------|---------------------------|------------------------|
| | | Inches | mm | Inches | mm | | 316SST Standard Bonnet |
| | | | | | | | |
| 2 | 2-13/16 And 3-9/16 | 1/2 | 12.7 | 0.75, 1, 1.125, 1.5 | 19.1, 25.4, 29, 38 | M-Form HPX2D, HPX5T, HPXS | CVS1N821035162 |
| | | 3/4 | 19.1 | 0.75, 1, 1.125, 1.5 | 19.1, 25.4, 29, 38 | M-Form HPX2D, HPX5T | CVS1P6696X0012 |

Key 12: Cages

| Valve Size Inches | Cage Description | Travel | | Material | | | |
|-------------------|------------------|--------------|--------|---------------------------------|------------------------|----------------------|--------------------------------|
| | | Inches | mm | 174-4 SST w/1075 Heat Treatment | SA-182-F22 Ion Nitride | 316 SST Electrolyzed | NACE MR0175 17-4 SST H1150 DBL |
| 2 | Eq. Percentage | 1-1/8, 1-1/2 | 28, 38 | CVS32B6028X012 | CVS32B6028X022 | CVS32B6029X012 | CVS32B6028X032 |
| | Linear | 1-1/2 | 38 | CVS32B6025X012 | CVS32B6025X022 | CVS32B6026X012 | CVS32B6025X032 |
| 3 | Eq. Percentage | 1-1/2, 2 | 38, 51 | CVS42B824X012 | CVS42B8240X022 | CVS42B8241X012 | CVS42B8240X032 |
| | Linear | 2 | 51 | CVS42B8242X012 | CVS42B8242X022 | CVS42B8243X012 | CVS42B8242X032 |
| 4 | Eq. Percentage | 1-1/2, 2 | 38, 51 | CVS42B9220X012 | CVS42B9320X022 | CVS42B9231X012 | CVS42B932X032 |
| | Linear | 2 | 51 | CVS42B9322X012 | CVS42B9322X022 | CVS42B9323X012 | CVS42B9322X032 |
| 6 | Eq. Percentage | 2-1/2, 3 | 64, 76 | CVS43B0078X012 | CVS43B0078X022 | CVS43B0080X012 | CVS43B0078X032 |
| | Linear | 3 | 76 | CVS43B0079X012 | CVS43B0079X022 | CVS43B0081X012 | CVS43B0079X032 |

Key 22: Valve Plug for 2 to 6-inch CVS Controls Class 1500 Globe Valve

| Valve Size Inches | Valve Design | Valve Stem Connection | | Port Diameter | | Material | | | |
|-------------------|--------------|-----------------------|-------|---------------|---------------|-----------------------------|---|--------------------------------|-------------------------|
| | | In. | mm | In. | mm | Trim 2, 3 and 4 316 SST | Trim 2, 3 and 4 316 SST CoCr-A Seat / Guide | Trim 316 SST CoCr-A Seat/Guide | Trim 2, 3 and 4 416 SST |
| 2 | HPX2D | 1/2 | 12.7 | 1-7/8 | 47.6 | CVS32B6007X012 | CVS32B6007X022 | CVS32B6007X012 | CVS32B6006X012 |
| | | 3/4 | 19.1 | 1-7/8 | 47.6 | CVS32B6008X012 | CVS32B6008X022 | CVS32B6008X012 | CVS32B6008X012 |
| | HPX5T | 1/2 | 12.7 | 1-7/8 | 47.6 | CVS32B6011X012 | ----- | CVS32B6011X012 | CVS32B6010X012 |
| | | 3/4 | 19.1 | 1-7/8 | 47.6 | CVS32B6013X012 | ----- | CVS32B6013X012 | CVS32B6012X012 |
| 3 | HPX2D | 1/2 | 12.7 | 2-7/8 | 73.0 | CVS32B8247X022 | CVS32B8247X032 | CVS32B8247X012 | CVS32B8246X012 |
| | | 3/4 | 19.1 | 2-7/8 | 73.0 | CVS32B8249X022 | CVS32B8249X032 | CVS32B8249X012 | CVS32B8248X012 |
| | HPX5T | 1/2 | 12.7 | 2-7/8 | 73.0 | CVS36A5429X012 | ----- | CVS36A5429X012 | CVS36A5350X012 |
| | | 3/4 | 19.1 | 2-7/8 | 73.0 | CVS36A5430X012 | ----- | CVS36A5430X012 | CVS36A5351X012 |
| 4 | HPX2D | 3/4 | 19.1 | 3-5/8 | 92.1 | CVS32B9347X032 | CVS36A5441X092 ¹ | CVS36A5441X052 | CVS36A5362X012 |
| | HPX5T | | | | | CVS36A5437X132 | CVS36A5441X102 ² | | |
| 6 | HPX2D | 3/4 | 19.1 | 5-3/8 | 136.5 | CVS36A5441X092 | CVS36A5441X092 ¹ | CVS36A5441X052 | CVS36A5362X012 |
| | | | | | | | CVS36A5441X102 ² | | |
| | | 1 | 25.4 | 5-3/8 | 136.5 | CVS36A5442X102 | CVS36A5442X102 ¹ | CVS36A5442X042 | CVS36A5363X012 |
| | | | | | | | CVS36Z5442X112 ² | | |
| | | 1-1/4 | 31.8 | 5-3/8 | 136.5 | CVS36A5443X082 | CVS36A5443X082 ¹ | CVS36A5443X042 | CVS36A5364X012 |
| | | | | | | | CVS38A6943X092 ² | | |
| | 2 | 50.8 | 5-3/8 | 136.5 | CVS36A943X072 | CVS38A6943X072 ¹ | CVS38A6943X042 | CVS39A6740X012 | |
| | | | | | | CVS38A6943X082 ² | | | |
| | HPX5T | 3/4 | 19.1 | 5-3/8 | 136.5 | CVS36A5444X012 | ----- | CVS36A5444X012 | CVS36A5365X012 |
| | | | | | | | | 1 | 25.4 |
| | | 1-1/4 | 31.8 | 5-3/8 | 136.5 | CVS36A5446X012 | | CVS36A5445X012 | CVS36A5367X012 |
| | | | | | | | | 2 | 50.8 |

- For -20 to 650F (-29 to 353C) temperature range
- For 500 to 105F (260 to 566C) temperature range

Key 28: Back-Up Ring for all Design HPX (2 to 6-inch) and HPAX (2-inch only) Valves

| Valve Size Inches | Port Diameter | | Material | |
|----------------------|---------------|-------|------------------|------------------|
| | Inches | mm | S31600 (316 SST) | S41600 (416 SST) |
| 2 | 1-7/8 | 47.6 | CVS10A4218X012 | CVS10A4218X022 |
| 3 | 2-7/8 | 73.0 | CVS10A4217X022 | CVS10A4217X012 |
| 4 | 2-7/8 | 73.0 | CVS10A4217X022 | CVS10A4217X012 |
| | 3-5/8 | 92.1 | CVS16A5483S022 | CVS16A5483X012 |
| 6 | 4-3/8 | 111.1 | CVS10A4224X022 | CVS10A4224X012 |
| | 5-3/8 | 136.5 | CVS10A5409X022 | CVS10A5409X012 |

Gasket Set (Includes Key 19 Bonnet Gasket and Key 24 Seat Ring Gasket)

| Valve Rating Class | Valve Size, Inches | Material | |
|-----------------------|--------------------|------------------------------------|--------------------------------------|
| | | N0660 (Inconel 600)/Graphite | NO 7750 (Inconel 750)/Graphite |
| 1500 | 2 (std) | CVS12B7100X032 | CVS12B7100X042 |
| | 3 (std) | CVS12B7100X052 | CVS12B7100X062 |
| | 4 (std) | CVS12B7100X082 | ----- |
| | 6 (std) | CVS12B7100X112 | ----- |
| 2500 | 2 (std) | ----- | CVS12B7100X132 |

Key 23: Seat Ring

| Valve Size Inches | Design | Port Diameter | | Seat Ring Material | |
|----------------------|--------------|---------------|-------|---------------------|-------------------------------|
| | | Inches | mm | S41600 (316 SST) | S31600 316 SST CoCr-A Seat |
| 2 | HPX2D, HPX5T | 1-7/8 | 47.6 | CVS22B6004X012 | CVS22B6005X012 |
| 3 | HPX2D, HPX5T | 2-7/8 | 73.0 | CVS22B6094X012 | CVS22B6095X012 |
| 4 | HPX2D, HPX5T | 3-5/8 | 92.1 | CVS22B9338X012 | CVS22B9339X012 |
| | HPX2D, HPX5T | 2-7/8 | 73.0 | CVS22B9340X012 | CVS22B9341X012 |
| 6 | HPX2D, HPX5T | 5-3/8 | 136.5 | CVS23B0093X012 | CVS23B0094C012 |
| | HPX2D, HPX5T | 4-3/8 | 111.1 | CVS23B0096X012 | CVS23B0096X012 |

Dimensional Data

Body Dimensions

| Valve Size Inches | Dimension A (Globe Valve) | | | | | Dimension B (Globe Valve) | | | | |
|-------------------|---------------------------|-----------------------|------------------|-----------------------|-----------------------|---------------------------|-----------------------|------------------|-----------------------|-----------------------|
| | ANSI Flange Rating | | | | | ANSI Flange Rating | | | | |
| | Class 900 | | Class 1500 | | Class 2500 | Class 900 | | Class 1500 | | Class 2500 |
| | Raised Face (RF) | Ring Type Joint (RTJ) | Raised Face (RF) | Ring Type Joint (RTJ) | Ring Type Joint (RTJ) | Raised Face (RF) | Ring Type Joint (RTJ) | Raised Face (RF) | Ring Type Joint (RTJ) | Ring Type Joint (RTJ) |
| Inches | Inches | Inches | Inches | Inches | Inches | Inches | Inches | Inches | Inches | Inches |
| 2 | 14.75 | 14.88 | 14.75 | 14.88 | 16.38 | 7.38 | 7.44 | 7.38 | 7.44 | 8.19 |
| 3 | 17.38 | 17.50 | 18.12 | 18.25 | --- | 8.69 | 8.75 | 9.06 | 9.12 | --- |
| 4 | 20.12 | 20.25 | 20.88 | 21.00 | --- | 9.00 | 9.06 | 9.38 | 9.44 | --- |
| 6 | 28.12 | 28.25 | 30.25 | 30.50 | --- | A/2 | A/2 | A/2 | A/2 | --- |

| Valve Size Inches | Dimension A (Angle Valve) | |
|-------------------|---------------------------|-----------------------|
| | ANSI Class 900 and 1500 | |
| | Raised Face (RF) | Ring Type Joint (RTJ) |
| | Inches | Inches |
| 2 | 7.00 | 7.06 |

Standard Bonnet Dimensions

| Valve Size Inches | Standard Bonnet Dimensions (Globe Valve) Class 900 and 1500 | | | Class 2500 (Globe Valve) | | Class 2500 (Globe Valve) | Standard Bonnet Dimensions (Angle Valve) | |
|-------------------|---|------------------------------|--------|--------------------------|--------|--------------------------|--|--------|
| | Dimension C | Dimension D | | Dimension D | | C | Dimension D | |
| | | Yoke Boss Diameters (Inches) | | | | Inches | Yoke Boss Diameters (Inches) | |
| | | 2-13/16 | 3-9/16 | 2-13/16 | 3-9/16 | | 2-13/16 | 3-9/16 |
| 2 | 3.06 | 10.31 | 10.56 | 11.91 | 11.91 | 3.31 | 8.94 | 9.19 |
| 3 | 4.75 | 12.69 | 12.25 | --- | --- | --- | --- | --- |
| 4 | 6.88 | --- | 11.81 | --- | --- | --- | --- | --- |
| 6 | 9.75 | --- | 14.38 | --- | --- | --- | --- | --- |

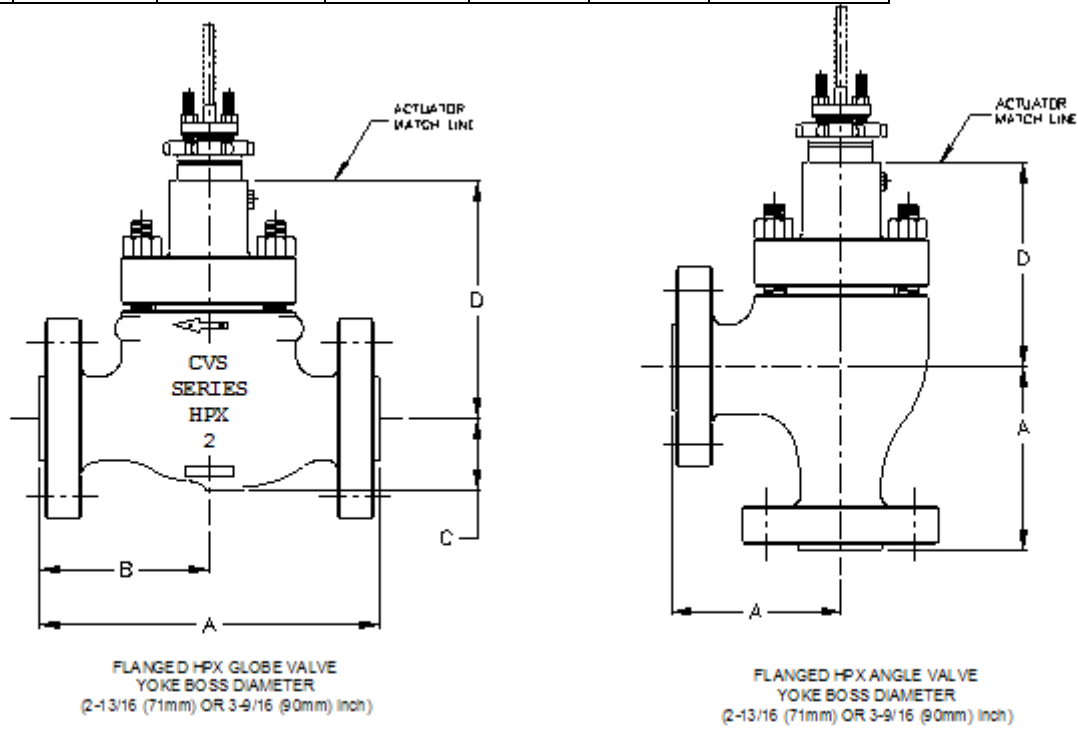


FIGURE 7. GLOBE AND ANGLE VALVE DIMENSIONS WITH STANDARD BONNET

CVS

Controls Ltd.

Head Office

3900 – 101 Street
Edmonton, Alberta, Canada T6E 0A5
Office: (780) 437-3055
Fax: (780) 436-5461

Calgary Sales Office

205, 2323 – 32 Avenue NE
Calgary, Alberta, Canada T2E 6Z3
Office: (403) 250-1416
Fax: (403) 291-9487

Website: www.cvs-controls.com E-Mail: info@cvs-controls.com

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