CVS Series YD & YS

Control Valves

The CVS Series YD/YS Control Valves are a 3-way cage guided design, suitable for on/off service, or throttling applications.

The CVS Series **YD** is a balanced design for service requiring general converging/diverging applications.

The CVS Series **YS** in an unbalanced design suitable for converging applications. The CVS Series YS may also be used in diverging ON/OFF service.

Flow characteristic is Linear. Standard shutoff classification is Class IV.

Standard body material is LCC, WCB/WC9 CF8M also available

CVS Series YD – 3 Inch

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

Calgary Sales Office
3516 114 Avenue SE
Calgary, Alberta
T2Z 3V6
Canada
Office: (403) 250-1416
Fax: (403) 291-9487

Website: www.cvs-controls.com
Email: info@cvs-controls.com

SPECIFICATIONS

WCC Steel and Stainless Steel:
Available in 2 through 6 inch, Class 150, 300, 600, RF (Raised Face) or RTJ (Ring Type Joint) per ASME B16.34 latest edition

Flow Characteristic:
Linear

Flow Direction:
Series YS – Orientation Plug Down, Bottom Port Closed
Converging Service flow is right to left, Diverging Service flow is left to right.

Series YD: Bottom port is common
Plug Down, Left Port Closed Position:
Converging Service flow is right to bottom, Diverging Service is bottom port to right.
Plug Up, Right Port Closed:
Converging Service flow is left port to bottom, Diverging Service is bottom port to left.
Intermediate Plug Positions
Converging Service may be from both left and right ports to bottom port, capacities proportionate to plug travel. Diverging Service flow is from the bottom port to both the left and right ports, capacities split proportionately to plug travel.

Shutoff Classification:
Series YD and Series YS – Class IV standard

Approximate Shipping Weights:
2 Inch – 85 lbs (39kg)
3 inch – 150 lbs (68kg)
4 inch – 240 lbs (109kg)
6 inch – 500 lbs (227kg)

Yoke Boss and Stem Diameter for Mounting Actuator

Valve Size - Inch	Valve Stem and Yoke Boss Diameter			
	Standard		Optional	
	Yoke Boss	Stem	Yoke Boss	Stem
	Inches			
2, 3, and 4	2 – 13/16	1/2	3 – 9/16	3/4
6	3 – 9/16	3/4	5	1
	mm			
2, 3, and 4	71	12.7	90	19.1
6	90	19.1	127	25.4

INSTALLATION

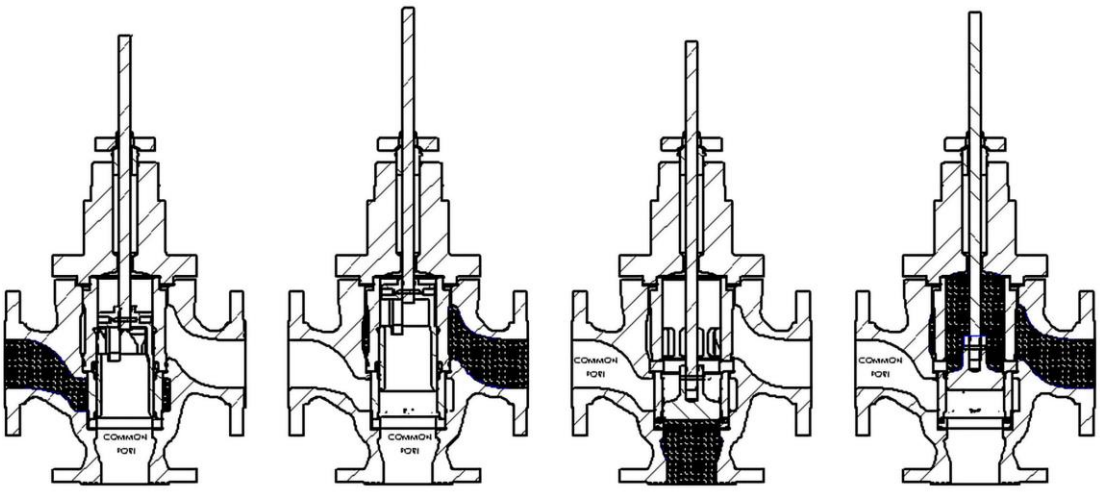
- Always follow proper safety guidelines and lockout procedures while installing or performing any maintenance. Use proper personal protective equipment and ensure any additional process and safety guidelines are followed

1. Prior to installing the valve, or assembly, inspect all components for debris and or any damage that may have occurred during shipping.
2. Ensure process lines are clean and free of debris or foreign materials.
3. Always follow proper piping bolting or welding practices when installing the valve assembly. Use suitable gaskets between the valve and pipeline flanges as required.
4. Never exceed maximum working pressures/temperature limits.
5. Should maintenance or inspections require continuous service, install a 3 valve by pass in order to isolate the valve assembly during inspections and maintenance.
6. Note flow direction as indicated by the arrows on the valve and install accordingly.
   - Common port for the Series YD is the bottom port, while the common port for the series YS is the left handed port as shown by the direction arrow plate.
7. Both series of valves may be installed in any orientation, the recommended orientation is with the actuator vertical above the valve.

Valve Body Sizes and End Connections

Valve Size	Steel or Stainless Steel	Cast Iron
2	NPT, Class 150, 300 or 600 Raised Face or Ring Type Joint flanged, Buttweld, or Socket Weld	NPT, Class 125 Flat Face, or Class 250 Raised Face
3, 4, and 6	Class 150, 300, or 600 Raised Face or Ring Type Joint flanged, or Buttweld	Class 125 Flat face, or Class 250 Raised Face

Flow Direction:



MAINTENANCE

Valves and its components are subject to normal wear and tear. Service, inspection and maintenance frequency may depend on the severity of service condition.

- Always follow proper safety guidelines and lockout procedures while installing or performing any maintenance. Use proper personal protective equipment and ensure any additional process and safety guidelines are followed.
- Use a bypass valve to isolate the valve from the process. Ensure all pressure has been relieved from both sides of the valve.
- Disconnect operating lines providing a signal to the actuator to ensure the valve cannot open or close suddenly.

If an optional lubricator is used for PTFE, composition or additional packings that may require lubrication, it will be installed in place of the pipe plug. Do not lubricate packing used in process temperatures above 500°F (260°C), or in oxygen service. Use a good quality silicon-based lubricant. To operate the lubricator, turn the cap screw clockwise in order to push the lubricant into the packing box.

PACKING MAINTENANCE

The following instructions cover maintenance for PTFE V Ring packing. Similar method may also be used for PTFE composition packing. Composition packing is possible to replace without removing the actuator from the valve because of the split ring configuration.

Special attention should be used when installing graphite ribbon/filament packing to avoid trapping air between the rings. Install only one ring at a time, do not force the packing ring below the bottom of the packing box chamber. When a ring is added, the stack should not be pushed further than the thickness of adding each ring.

1. Remove the actuator and bonnet.
2. Remove the valve stem and valve plug assembly.
3. Remove packing flange nuts, packing flange, wiper ring and packing follower.
4. Remove the old packing using a packing hook or similar. Pay attention to avoid damaging the packing box walls. Alternatively, the packing may be pushed out through the bottom of the bonnet.
5. Clean and inspect packing box and metal components.
6. Inspect additional components prior to reinstalling the bonnet on the valve assembly.
7. Install new packing as required according to the correct packing arrangement. Take care to not damage the packing while installing.
8. Install packing flange and packing flange nuts.

   For spring loaded PTFE V ring type packing: tighten the packing flange nuts so the shoulder on the packing follower contacts the bonnet.

   For Graphite packing: tighten the packing flange nuts in accordance with the recommended torque values. Loosen off the packing nuts, the tighten once again to the minimum recommended torque value.

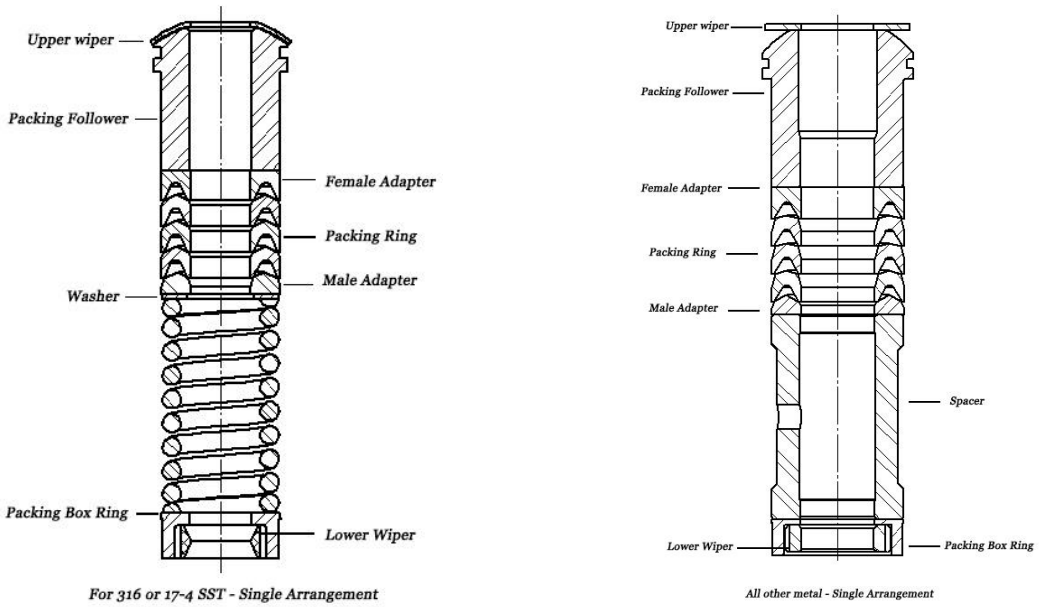
   For other packing types: tighten the packing flange nuts, alternating in small increments, until either packing nut reaches the minimum recommended torque. Then tighten the other packing flange nut, ensuring the flange is level and to a 90-degree angle with the valve stem.
9. Mount the actuator to the bonnet and make stem connection as required.

Recommended Torque for Packing Flange Nuts

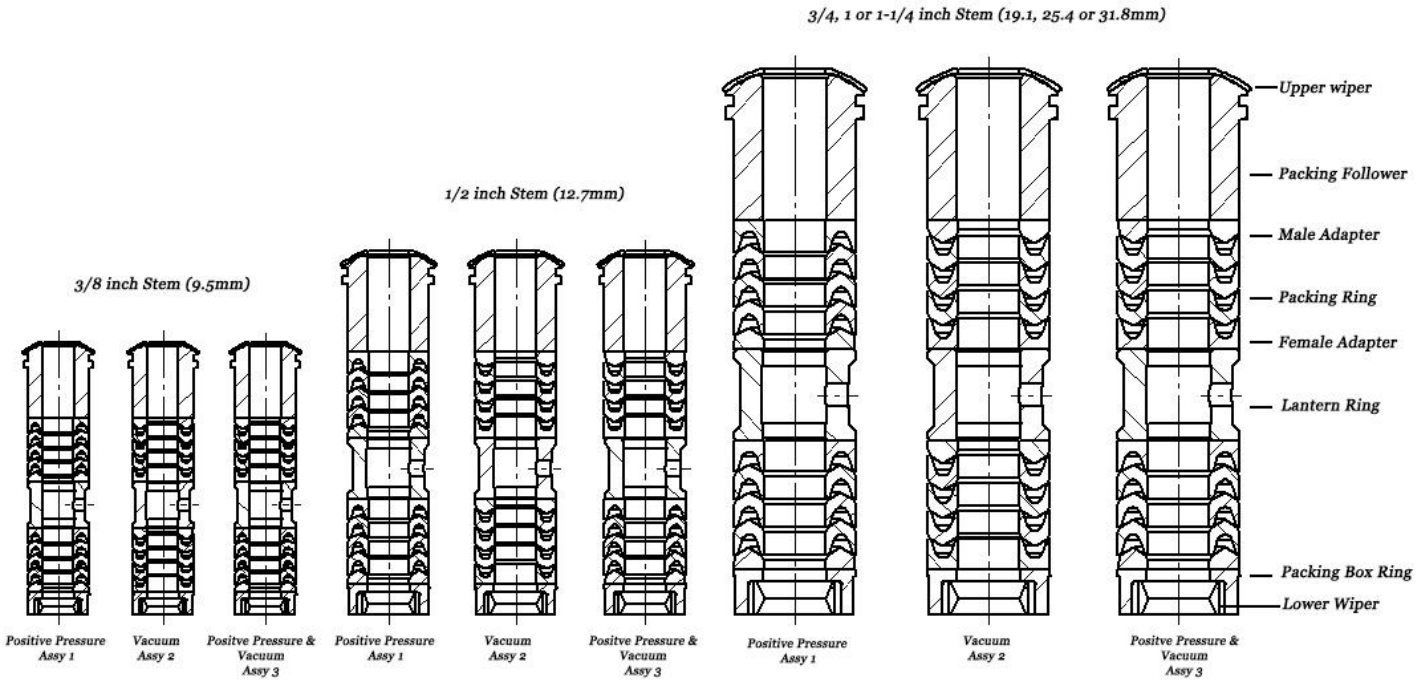
VALVE STEM DIAMETER		PRESSURE RATING	GRAPHITE TYPE PACKING				PTFE TYPE PACKING			
			Minimum Torque		Maximum Torque		Minimum Torque		Maximum Torque	
Inches	mm		LbfSin	NSm	LbfSin	NSm	LbfSin	NSm	LbfSin	NSm
3/8	9.5	CL125, 150	27	3	40	5	13	1	19	2
		CL250, 300	36	4	53	6	17	2	26	3
		CL600	49	6	73	8	23	3	35	4
1/2	12.7	CL125, 150	44	5	66	8	21	2	31	4
		CL250, 300	59	7	88	10	28	3	42	5
		CL600	81	9	122	14	39	4	58	7
3/4	19.1	CL125, 150	99	11	149	17	47	5	70	8
		CL250, 300	133	15	199	23	64	7	95	11
		CL600	182	21	274	31	87	10	131	15
1	25.4	CL300	226	26	339	38	108	12	162	18
		CL600	310	35	466	53	149	17	223	25
1-1/4	31.8	CL300	318	36	477	54	152	17	228	26
		CL600	437	49	655	74	209	24	314	36

PACKING ARRANGEMENTS

CVS PTFE Packing Arrangements:



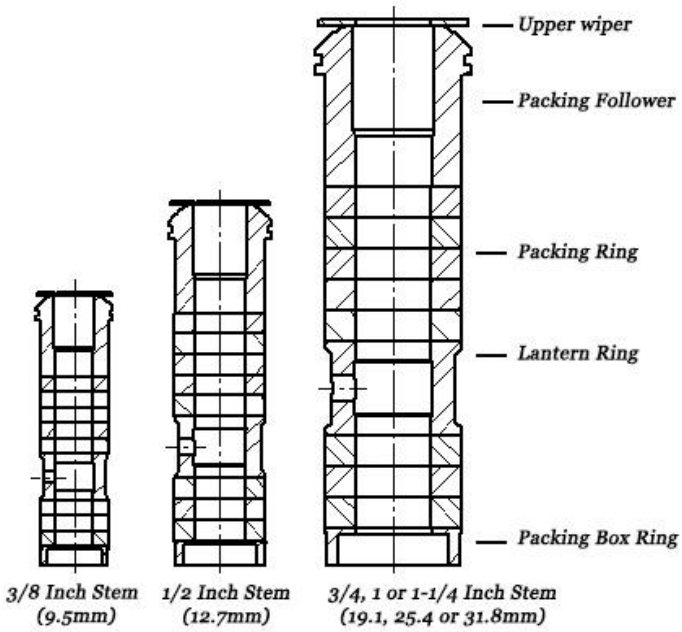
Single Arrangement



Double Arrangement

PACKING ARRANGEMENTS

CVS PTFE/Composition Packing Arrangements:



TRIM MAINTENANCE

*Follow proper safety and lockout procedures prior to any inspection or maintenance to avoid personal injury.

Disassembly:

1. Ensure control valve has been properly isolated from line pressure and pressure has been released from both sides of the valve. Disconnect actuator supply pressure.
2. Disconnect the actuator stem connector and remove the actuator locknut that secures the actuator to the valve. The actuator may now be lifted from the valve.
3. Remove the nuts that secure the bonnet flange
4. Lift the bonnet, valve plug and stem out as one assembly. Pay attention to not damage the outer portion of the cage, sealing or seating as surface nicks or damage may cause leakage.
5. Loosen off the packing flange nuts, and take the valve stem and plug out through the bottom of the bonnet. Remove the cage and seat components from the valve plug and stem. Should the stem show signs of wear or damage which require replacement, remove the drive pin securing the stem and plug, and unscrew the stem from the plug.
6. Internal components of the bonnet may now be disassembled for inspection or replacement as required.
7. For Standard CVS Series YD – Replace the cage seal, seal ring, and backup ring as part of an assembly group.
8. The remaining trim components may now be removed and replaced as required after inspection.

Assembly:

CVS Series YD - Standard

1. Prior to assembly, ensure all is clear and clean of debris. Use a cloth to wipe all sealing surfaces. Use new gaskets, seals, and shim when reassembling.
2. Install Seat Ring Gasket, then set the Seat Ring on top of the Seat Ring Gasket.
3. Place the Lower Cage into the valve. Narrow end of the cage should point downward, ensure the cage fits over the raised portion of the seat ring.
4. Place O-Ring cage seal over the bottom of the upper cage, into the cage groove.
5. The Backup Ring, and Seal Ring may now be placed into the inner groove of the upper cage.
6. If installing a new Stem, screw the Stem into the Valve Plug until tight to the Valve Plug.
7. Locate the pin hole in the Valve Plug in order to drill a hole into the stem and secure with drive pin.
8. Tap a new Drive Pin into the plug and stem in order to secure.
9. Set the Upper Cage over the Plug and Stem Assembly. Pay attention to not damage the Seal Ring.
10. Place the complete assembly into the Valve. Use a steady pressure to the top of the cage for its position inside the valve. Ensure the upper cage rests into the lower cage and the cage seal did not get damaged.
11. Install the Spiral Wound Gasket, Shim, and Bonnet Gasket over the Upper Cage
12. Mount the Bonnet on the Valve. If equipped with a lubricator or pipe plug, install so the pipe plug or lubricator is parallel with the pipeline.
13. Use an appropriate lubricant/anti seize on the valve stud bolts. Install Valve Stud Nuts onto the valve studs and follow proper bolting practice. Tightening in a criss cross pattern. Repeat torque procedure for a proper seal until none of the nuts will continue to tighten to recommended torque values.
14. Mount the Actuator to the Bonnet and make up the stem connection. Reconnect supply as required.

Valve Plug and Stem - Pin Drill Size

Valve Series	Stem Connection - Inch (mm)	Drill Size - Inch
Series YD and Series YS	3/8 (9.5)	3/32
	1/2 (12.7)	1/8
	3/4 (19.1)	3/16
	1 (25.4)	1/4

Assembly:

CVS Series YD – High Temp

1. Prior to assembly, ensure all is clear and clean of debris. Use a cloth to wipe all sealing surfaces. Use new gaskets, seals, and shim when reassembling.
2. Install Seat Ring Gasket, then set the Seat Ring on top of the Seat Ring Gasket. Install the Spiral Wound Spring.
3. Place the Lower Cage into the valve. Narrow end of the cage should point downward, ensure the cage fits over the raised portion of the seat ring.
4. Install one of the Retaining Ring Gaskets into the Valve
5. If installing a new Stem, screw the Stem into the Valve Plug until tight to the Valve Plug.
6. Locate the pin hole in the Valve Plug in order to drill a hole into the stem and secure with drive pin.
7. Tap a new Drive Pin into the plug and stem in order to secure.
8. Set the Seal Ring Retainer into the valve. Set the valve plug assembly into the retainer
9. Place the Seal Rings over the Valve Plug. The Seal Rings should rest against the Retaining Ring.
10. The Seal Rings have a cut through the cross section, orientate the cut through at 180 degrees from each other in order for a proper seal.
11. Install the remaining Seat Ring Gasket on top of the Retaining Ring.
12. Install the Upper Cage into the valve. The raised ring on the bottom of the cage will sit securely in the groove of the seal rings and retaining ring.
13. Place the Spiral Wound Gasket, Shim, and Bonnet Gasket over the upper cage.
14. Mount the Bonnet on the Valve.
15. Use an appropriate lubricant/anti seize on the valve stud bolts. Install Valve Stud Nuts onto the valve studs and follow proper bolting practice. Tightening in a criss cross pattern. Repeat torque procedure for a proper seal until none of the nuts will continue to tighten to recommended torque values.
16. Mount the Actuator to the Bonnet and make up the stem connection. Reconnect supply as required.

Bolt Torque for Body to Bonnet B7 (recommended)

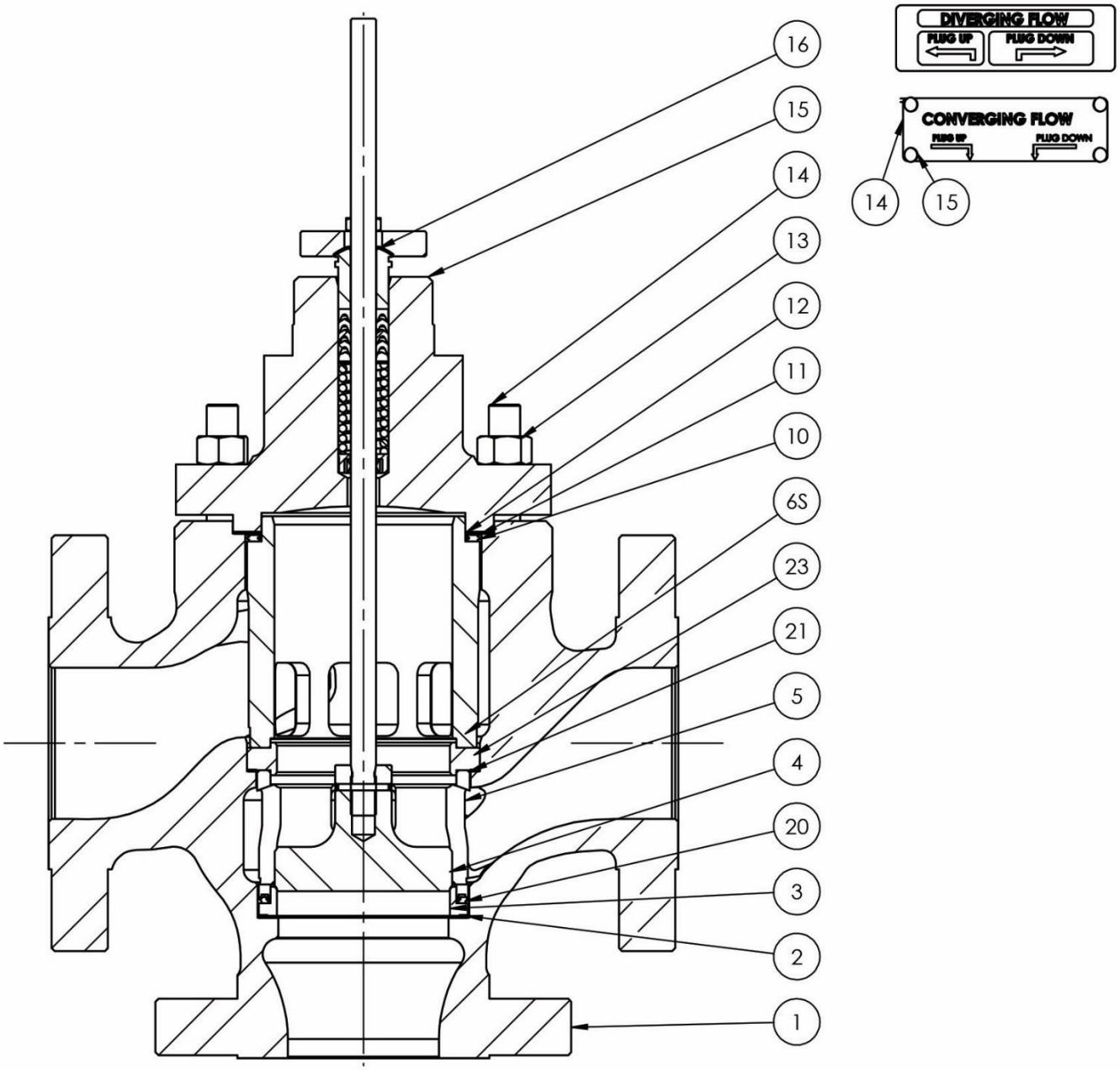
Valve Size	Recommended Bolt Torque lbf ft (Nm)
2	71 (96)
3	125 (169)
4	200 (271)
6	405 (549)

Assembly:

CVS Series YS

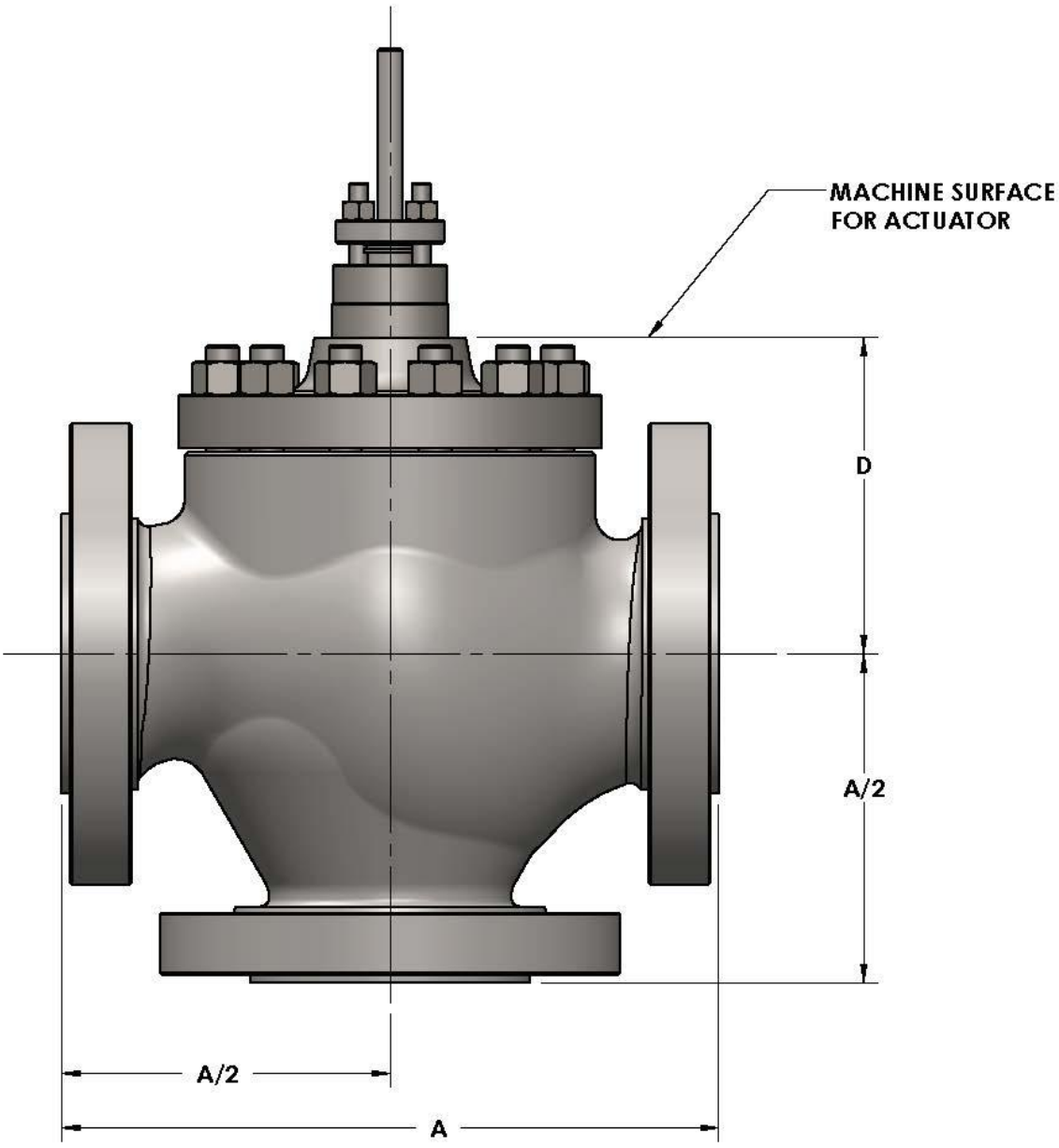
1. Prior to assembly, ensure all is clear and clean of debris. Use a cloth to wipe all sealing surfaces. Use new gaskets, and shim when reassembling.
2. Install Seat Ring Gasket, then set the Lower Seat Ring on top of the Seat Ring Gasket. Install the Spiral Wound Spring
3. Place the Lower Cage into the valve. Narrow end of the cage should point downward, ensure the cage fits over the raised portion of the seat ring.
4. Install the Upper Seat Ring Gasket into the valve.
5. If installing a new Stem, screw the Stem into the Valve Plug until tight to the Valve Plug.
6. Locate the pin hole in the Valve Plug in order to drill a hole into the stem and secure with drive pin.
7. Tap a new Drive Pin into the plug and stem in order to secure.
8. Set the Upper Cage over the Plug and Stem Assembly. Pay attention to not damage the Seal Ring.
9. Place the complete assembly into the Valve. Use a steady pressure to the top of the cage for its position inside the valve. Ensure the upper cage rests into the lower cage and the cage seal did not get damaged.
10. Install the Spiral Wound Gasket, Shim, and Bonnet Gasket over the Upper Cage
11. Mount the Bonnet on the Valve. If equipped with a lubricator or pipe plug, install so the pipe plug or lubricator is parallel with the pipeline.
12. Use an appropriate lubricant/anti seize on the valve stud bolts. Install Valve Stud Nuts onto the valve studs and follow proper bolting practice. Tightening in a criss cross pattern. Repeat torque procedure for a proper seal until none of the nuts will continue to tighten to recommended torque values.
13. Mount the Actuator to the Bonnet and make up the stem connection. Reconnect supply as required.

ASSEMBLY



ITEM	DESCRIPTION	ITEM	DESCRIPTION
1	Body	13	Nut
2	Lower Seat Ring Gasket	14	Stud
3	Lower Seat Ring	15	Bonnet
4	Plug and Stem Assembly	16	Packing Set Assembly
5	Lower Cage	14	Flow Direction Plate
6s	Upper Cage	15	3/32 Rivet, x 3/16
10	Cage Gasket	20	Spiral Gasket
11	Shim	21	Upper Seat Ring Gasket
12	Bonnet Gasket	23	Upper Seat Ring

DIMMENSIONS



VALVE SIZE	DIMENSION																		
	A							D											
	VALVE RATING END CONNECTION STYLE							STANDARD BONNET				EXTENSION BONNET							
								STEM DIAMETER, MM (INCH)				STYLE 1 STEM DIAMETER, MM (INCH)				STYLE 2 STEM DIAMETER, MM (INCH)		
	SCREWD & SWE	CL 150 RF	CL150 RTJ	CL 300 RF	CL 300 RTJ	CL 600 RF & BWE	CL 600 RTJ	9.5 (3/8)	12.7 (1/2)	19.1 (3/4)	25.4 (1)	9.5 (3/8)	12.7 (1/2)	19.1 (3/4)	25.4 (1)	9.5 (3/8)	12.7 (1/2)	19.1 (3/4)
MM																			
2	285.8	254.0	266.7	266.7	282.4	285.8	289.1		171.5	168.1			273.1	277.9			471.1	468.4
3		298.5	311.1	317.5	333.2	336.6	339.9		195.3	192.0			296.9	301.8			500.1	505.0
4		352.6	365.3	368.3	384.0	393.7	396.7		228.6	225.6			330.2	335.0			533.4	525.5
6		450.9	463.6	472.9	489.0	508.0	511.0			242.8	287.3			349.3	419.1			434.9
inches																			
2	11.25	10.00	10.50	10.50	11.12	11.25	11.38		6.75	6.62			10.75	10.94			18.56	18.44
3		11.75	12.25	12.50	13.12	13.25	13.38		7.69	7.56			11.69	11.88			19.69	19.88
4		13.88	14.38	14.50	15.12	15.50	15.62		9.00	8.88			13.00	13.19			21.00	20.69
6		17.75	18.25	18.62	19.25	20.00	20.12			9.56	11.31			13.75	16.50			21.06

PARTS

Standard Packing Kits (non live load)

Stem Diameter – In (mm) Yoke Boss Diameter In (mm)	3/8 (9.5) 2-1/8 (54)	1/2 (12.7) 2-13/16 (71)	3/4 (19.1) 3-9/16 (90)	1 (25.4) 5 (127)
PTFE	RPACKX00012	RPACKX00022	RPACKX00032	RPACKX00342
Double PTFE	RPACKX00042	RPACKX00052	RPACKX00062	RPACKX00362
PTFE/Comp	RPACKX00072	RPACKX00082	RPACKX00092	
Single Graphite Ribbon/Filament	RPACKX00102	RPACKX00112	RPACKX00122	

Gasket Kits

Valve Size	Series YD	Series YS
	Part Number	Part Number
2	RGASKETXB72	RGASKETXC32
3	RGASKETXB82	RGASKETXC42
4	RGASKETXB92	RGASKETXC52
6	RGASKETXC12	RGASKETXC62

Valve Plug and Stem Assembly – Plain Bonnet

Valve Size	Stem Diameter		Series YD Standard		Series YS	
	In	mm	17-4PH SST	CF8M 316 SST	416 SST	316 SST
2	1/2	12.7		20A3369X122	10A3373X242	
3	1/2 1/4	12.7 19.1	20A3422X102 20A3422X102	20A4322X072 20A3422X122		
4	1/2 1/4	12.7 19.1	20A3454X102 20A3465X102	20A3464X112 20A3465X112	20A3469X102	20A3469X112
6	3/4	19.1	20A3507X092	20A3507X112		

PARTS

Upper Cage – Series YD/YS, Standard

Valve Size	Series YS Upper Cage	Series YD Upper Cage	
	CF8M (316SST)	17-4PH SST	CF8M (316SST)
2		20A3376X012	20A3376X022
3		20A3431X012	20A3431X022
4	2U740748932	20A3473X012	20A3476X022
6		20A3516X012	20A3522X022

Lower Cage – Series YD/YS Standard

Valve Size	Lower Cage All Trim Styles	
	17-4PH SST	CF8M (316SST)
2	20A3381X012	20A3381X022
3	20A3434X012	20A3434X022
4	20A3476X012	20A3476X022
6	20A3522X012	20A3522X022

Upper and Lower Seat Rings

Valve Size	Upper Seat Ring		Lower Seat Ring		
	Series YS		Series YD - Standard		Series YS and YD High Temp
	416 SST	316 SST	416 SST	316 SST	416 SST
2	10A3393X012				10A3391X012
3			10A3446X012	10A3446X022	
4	10A3489X012	10A3489X022	103488X012	10A3488X022	
6			11A9076X012	11A9076X022	

Seals – Series YD only – Seal Ring/Backup Ring

Valve Size	Series YD - Standard	
	Seal Ring	Backup Ring
	PTFE	Fluorocarbon 0 to 400°F -18 to 204°C
2	10A3388X012	10A3389X032
3	10A3442X012	10A34443X032
4	10A3484X012	10A3485X032
6	10A3530X012	10A3531X032

PARTS

Packing Box Parts

Description			Stem Diameter - In (mm)			
			3/8 (9.5)	1/2 (12.7)	3/4 (19.1)	1 (25.4)
PTFE V-Ring Packing	PTFE Single Packing Set (1 req'd for single, 2 for double)		1R2900	1R2902	1R2904	1R2906
	Spring, SS (for single only)		1F1254370	1F2553702	1F1256	1D582937012
	Lantern Ring SS (for double only)		1F364135072	1J9623	0N0284	0U99735072
	Qty Req'd	Double	1	2	1	1
	Special Washer SS (for single only)		1F12523604	1F2513604	1F1250	1H982236042

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

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

Website: www.cvs-controls.com

Email: info@cvs-controls.com

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