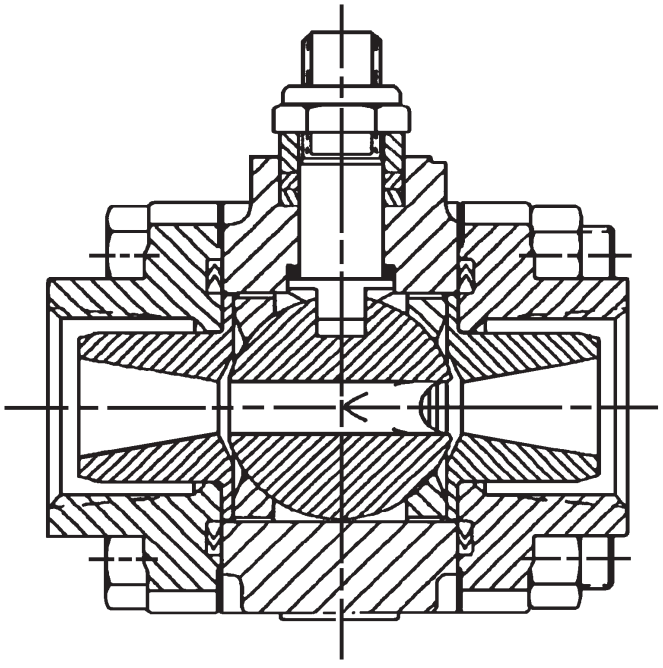
Jamesbury control valves
ICV & ICVA
Injection control valves
series 4000

Installation, maintenance and
operating instructions



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READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

1. GENERAL

This instruction manual contains information regarding the installation, operation and troubleshooting of the Jamesbury™ Series 4000 ICV and ICVA Injection Control Valves. Please read these instructions carefully and save then for further reference.

WARNING:

FOR YOUR SAFETY, TAKE THE FOLLOWING PRECAUTIONS BEFORE REMOVING THE VALVE FROM THE LINE, OR BEFORE ANY DISASSEMBLY:

1. DURING REMOVAL AND DISASSEMBLY, TO PROTECT AGAINST DISCHARGE OF TRAPPED FLUID, WEAR ANY PROTECTIVE EQUIPMENT NORMALLY REQUIRED.
2. DEPRESSURIZE THE LINE AND VALVE AS FOLLOWS:
   A. PLACE THE LINE VALVE IN THE OPEN POSITION AND DRAIN THE LINE.
   B. CYCLE THE VALVE TO RELIEVE RESIDUAL PRESSURE IN THE BODY CAVITY BEFORE REMOVAL FROM THE LINE.
   C. AFTER REMOVAL AND BEFORE DISASSEMBLY, CYCLE THE VALVE AGAIN SEVERAL TIMES.
3. SEAT AND BODY RATINGS - THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE SEAT AND BODY RATINGS. THIS PRODUCT IS AVAILABLE WITH A VARIETY OF SEAT MATERIALS. SOME OF THE SEAT MATERIALS HAVE PRESSURE RATINGS THAT ARE LESS THAN THE BODY RATINGS. ALL OF THE BODY AND SEAT RATINGS ARE DEPENDENT ON VALVE SEAT MATERIAL AND TEMPERATURE. DO NOT EXCEED THESE RATINGS.

1.1 SAFETY PRECAUTIONS

WARNING:

VALVE RATINGS!

THE PRACTICAL AND SAFE USE OF THIS PRODUCT IS DETERMINED BY BOTH THE CWP RATINGS: CAREFULLY CHECK RATING. THIS IS THE SAFE USE PRESSURE FOR THIS VALVE BETWEEN -20 TO +100F (-29 TO +38C). DO NOT EXCEED THESE RATINGS! FOR INSTALLATION TEMPERATURES BELOW AND ABOVE THESE LIMITS CONTACT VALMET.

WARNING:

AS THE USE OF THE VALVE IS APPLICATION SPECIFIC, A NUMBER OF FACTORS SHOULD BE TAKEN INTO ACCOUNT WHEN SELECTING A VALVE FOR A GIVEN APPLICATION. THEREFORE, SOME OF THE SITUATIONS IN WHICH THE VALVES ARE USED ARE OUTSIDE THE SCOPE OF THIS MANUAL. IF YOU HAVE ANY QUESTIONS CONCERNING THE USE, APPLICATION OR COMPATIBILITY OF THE VALVE WITH THE INTENDED SERVICE, CONTACT VALMET FOR MORE INFORMATION.

WARNING:

BEWARE OF BALL MOVEMENT!

KEEP HANDS, OTHER PARTS OF THE BODY, TOOLS AND OTHER OBJECTS OUT OF THE OPEN FLOW PORT. LEAVE NO FOREIGN OBJECTS INSIDE THE VALVE. WHEN THE VALVE IS ACTUATED, THE BALL FUNCTIONS AS A CUTTING DEVISE. FAILURE TO DO THIS MAY RESULT IN DAMAGE OR PERSONAL INJURY**!**

2. INSTALLATION

Screwed End Style - Use standard piping practices to install valves with threaded end caps. When tightening the valve to the pipe, apply wrench to end cap nearest the pipe being worked on.

SPECIAL PRECAUTIONS FOR WELDED END VALVES:

1. End caps must be completely removed from the valve.
2. Remove all diffusers if necessary and related seals or sealants from each end cap.
3. Weld the end caps into the pipeline.
4. After welding valve reassemble the diffusers (32) using Loctite® Gasket Eliminator #515 or equivalent, then asseble valve per the **ASSEMBLY** Section of this IMO.

TABLE 1

Stem Nut Torque

Valve Size	Full Port Size	lb-in (Nm)
1" (DN 25)	3/4" (44.45)	60 – 72 (81 – 98)

3. MAINTENANCE

Although *Jamesbury* valves are designed to work under severe conditions, proper preventative maintenance can significantly help to prevent unplanned downtime and in real terms reduce the total cost of ownership. Valmet recommends inspecting valves at least every five (5) years. The inspection and maintenance frequency depends on the actual application and process condition.

1. **Routine Maintenance** consists of tightening the lower stem nut to the value in (**Table 2**) periodically to compensate for the wear caused by the stem's turning against the stem seals. The upper stem nut should be tightened a corresponding amount. When tightening stem seals on actuated valves where the valve is connected to the actuator with a no-play (clamped) coupling, loosen the coupling before tightening the stem nut. Re-tighten the coupling.

TABLE 2

Recommended Torques

Required Fastener Torques (lb. - in.)			
Fastener Last Digit in Fig. No.		-1	-5
Valve Size - Full Port Size in ( )	Fastener Material	A193 GR.B7	A193 GR.B7M
	Fastener Ident. Mark	B7	B7M
1" (DN 25) / (3/4" [44.45])	Req'd. Fastener Torque	30 – 40 lb-ft (41 – 54 Nm)	22 – 32 lb-ft (30 – 43 Nm)

2. **Overhaul Maintenance** consists of replacing seats and seals. A standard Repair Kit consisting of these parts may be obtained from your Valmet Distributor (**See Table 3**).

3.1 DISASSEMBLY

The ICV and ICVA ball valves are designed to be serviced in or out of the line. The following instructions are for in-line disassembly. (For bench disassembly, which may be more convenient, follow a similar sequence.)

1. Comply fully with the instructions in the **WARNING** Section.
2. Be sure to cycle the valve. Leave in the open position. The body center section will not swing out in the closed position.
3. Loosen all four body bolts/tie rods (52). Remove three from the valve. Leave the remaining bolt in place with the nut (53) backed off at least 1/4" (6.35 mm).

TABLE 3	
ICV & ICVA	
Seat Combinations	Repair Kits
Delrin® & Filled PTFE Seats	RKN-119RM
DELRIN Seats	RKN-119RT
Peek® Seats	RKN-119LT
Metal Seats	RKN-119DT
NOTE: Repair kits include two seats (5) or one (5) and one (10), two stem seals (8), one stem bearing (13), another stem bearing (24), and two 316 stainless steel/graphite body seals (6). Two "O" rings (49) are included if ordering metal seats (DT kit).	
ICVA, 11/32 (8.73 mm) PORT	
Seat Combinations	Repair Kits
DELRIN & Filled PTFE Seats	RKN-173-RM
DELRIN Seats	RKN-173-RT
Peek Seats	RKN-173-LT
Metal Seats	RKN-173DT
NOTE: Repair kits include two seats (5) or one (5) and one (10), two stem seals (8), one stem bearing (13), another stem bearing (24), two 316 stainless steel/ graphite body seals (6), 11/32 port diffuser (32) and LOCTITE Gasket Eliminator #515. Two "O" rings (49) are included if ordering metal seats (DT kit).	
ICV, 5/8" (15.88 mm) PORT	
Seat Combinations	Repair Kits
DELRIN & Filled PTFE Seats	RKN-179RM
DELRIN Seats	RKN-179RT
Peek Seats	RKN-179LT
Metal Seats	RKN-179DT
NOTE: Repair kits include two seats (5) or one (5) and one (10), two stem seals (8), one stem bearing (13), another stem bearing (24), two 316 stainless steel/ graphite body seals (6), 5/8 port diffuser (32) and LOCTITE Gasket Eliminator #515. Two O-rings (49) are included if ordering metal seats (DT kit).	

4. For positive alignment and ease of in-line assembly, each end cap is piloted by the diffusers approximately 1/16" (1.58 mm) into the body as shown in (**Figure 5**). To overcome this feature during in-line disassembly it is necessary to separate each cap at least 1/16" (1.58 mm) from the body. Sharply rap body and caps with a block of wood or plastic mallet to break loose body seal. Spread end caps and swing the body out of the line. If pipe does not allow simple spreading, remove the remaining body bolt and rotate center section (See **Figure 3**). This will improve access to the end cap flange for ease of spreading. Swing the valve body (1) out from between the end caps (2). Be careful not to damage the sealing surfaces "A" (**See Figure 5**) at each end of the valve.
5. Turn the stem (4) so that the valve is fully closed. Remove body seals (6) and seats (5). Body seals may be tightly compressed in their grooves. Use extreme care when prying them out. Damage, such as scratches to the bottom of the groove, will cause leaks. If the seats are not easily removed, gently tap the ball (3) with a piece of wood or other soft material.
6. Remove the ball (3).
7. Remove the stem nut (16) and the compression ring (21).
8. Press the stem (4) from the top into the valve body (1) and remove it through the end of the body.
9. Carefully pry out and discard the old stem seals (8), the stem bearings (13) and (24), being careful not to damage the bearing surfaces.
10. Remove diffusers (32) if necessary, by tapping them out of the end caps (2) with a piece of wood, then discard old diffuser if damaged.

3.2 ASSEMBLY

(See Figure 8)
(See Figure 6 and new assembly, and Figure 7 for obsoleted.)

The following instructions are for on-line assembly. For bench assembly, which may be more convenient follow a similar sequence. In this case, hold the valve in the vise by one end cap. Use care not to cut or scratch the seats, seals or sealing surfaces.

1. With the valve body swung to the out-of-line position, insert from the inside a stem bearing (13), then another stem bearing (24) into the stem bore.
2. Insert the stem (4) horizontally into the body bore (threaded end first). The blade at the ball end of the stem must be vertical (**See Figure 4**). Guide the stem into the stem hole being careful not to scratch the bearings.
3. Holding the stem in place from the bottom, drop on from the outside two stem seals (8), a compression ring (21), and thread on the stem nut (16) until the stem starts to turn.
4. Place a wrench through the body and on the bottom stem blade. Place another wrench on the stem nut and turn the nut down until the seals are bottomed and the stem comes snugly into place, applying the torque shown in (**Table 1 on page 3**).
5. Insert the ball (3) rotating it onto the stem (4) in the closed position. If necessary, turn the stem blade to align with the ball slot.
6. If removal of diffuser is absolutely necessary, clean off sealing surfaces of diffuser and body caps (**See Figure 6**). Apply Loctite Gasket Eliminator #515 360° around diffuser (32) and mating surfaces of body cap (2). Now insert the small end of the diffuser into the body cap. The diffuser may not press all the way into the body cap at this time. This is normal. The diffuser will seat itself when the valve is fully assembled. Repeat this procedure with the other diffuser and body cap.
7. Work at either end of body (1). You must pay attention to the flow arrows only if you have a RM coded valve, then place the seat (5) upstream and seat (10) downstream (**See Figure 5**). Place a seat (5) into the body. Fit it snugly against the closed ball.
8. **NOTE:** The sealing surface of the seat is toward the ball (**See Figure 5**).

9. Place a body seal (6) into the machined sealing groove of the end cap (2) (**See Figure 5**). Be certain the groove and seal are clean.
10. Repeat instructions 7 and 8 for assembly at the opposite end.
11. Turn the stem to the full open position.
12. Swing the entire assembly back into the proper aligned and piloted position between the end caps, being careful not to scratch the body seals. Caps may have to be spread slightly to accept the body.
13. Close the valve.
14. Lubricate the body bolts (52) and fasten the valve together with the bolts (52) and the nuts (53). Tighten these bolts evenly and alternately. (**See Table 2 for the torques.**)

4. ACTUATOR MOUNTING

IMPORTANT: When the actuator is removed to service the valve, **PROPER ALIGNMENT OF THE ACTUATOR DRIVER AND VALVE STEM IS ESSENTIAL WHEN THE ACTUATOR IS REMOUNTED**. With a split no-play coupling, tighten the coupling bolts before final tightening of the valve bracketry bolts.

NOTE:

1. Install the actuator and bracket before the valve is in the pipeline. For maximum potential Cv adjust the actuator so that the ball port is in line with the pipe axis (**Figure 7**). For minimum potential Cv adjust the actuator so that the position indicator on top of the actuator reads, overclosed, or past the closed position as much as possible. i.e., the valve and actuator should stroke as close to 105° as possible.
2. Refer to AMI-10 for proper linkage assembly and actuator adjustment.

PORT VIEW MAXIMUM Cv

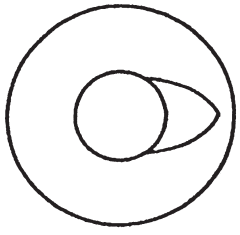


Figure 1

5. REPAIR KITS

REPAIR KITS FOR ICV & ICVA (RKN-119)
Note: Repair kit includes two seats (5) or one (5) and one (10), two stem seals (7), one stem bearing (8), another stem bearing (13), and two 316 stainless steel/graphite body seals (6).

REPAIR KITS FOR ICVA (RKN-173)
Note: Repair kit includes two seats (5) or one (5) and one (10), two stem seals (7), one stem bearing (8), another stem bearing (13), two 316 stainless steel/graphite body seals (6), 11/32” (8.73 mm) port diffuser (31) and Loctite Gasket Eliminator #515.

REPAIR KITS FOR ICV (RKN-179)
Note: Repair kit includes two seats (5) or one (5) and one (10), two stem seals (7), one stem bearing (8), another stem bearing (13), two 316 stainless steel/graphite body seals (6), 5/8” (15.88 mm) port diffuser (31) and Loctite Gasket Eliminator #515.

6. SERVICE/SPARE PARTS

We recommend that valves be directed to our service centers for maintenance. The service centers are equipped to provide rapid turn-around at a reasonable cost and offer new valve warranty with all reconditioned valves.

NOTE: When sending goods to the service center for repair, do not disassemble them. Clean the valve carefully and flush the valve internals. Include the material safety datasheet(s) (MSDS) for all media flowing through the valve. Valves sent to the service center without MSDS datasheet(s) will not be accepted.

For further information on spare parts and service or assistance visit our web-site at **www.valmet.com/flowcontrol**.

NOTE: When ordering spare parts, always include the following information:

a. Valve catalog code from identification plate,

b. If the valve is serialized – the serial number (from identification plate).

c. From **Figure 8**, the ballooned part number, part name and quantity required.

7. WELDING WARNING

WARNING:

WELDING AND/OR GRINDING OF STAINLESS STEEL AND OTHER ALLOY STEELS CONTAINING CHROMIUM METAL MAY CAUSE THE RELEASE HEXAVALENT CHROMIUM. HEXAVALENT CHROMIUM, CHROMIUM(VI) OR CR(VI), IS KNOWN TO CAUSE CANCER. BE SURE TO USE ALL APPROPRIATE PPE WHEN WELDING METALS CONTAINING CHROMIUM. IF YOU HAVE ANY QUESTIONS CONSULT YOUR SUPERVISOR.

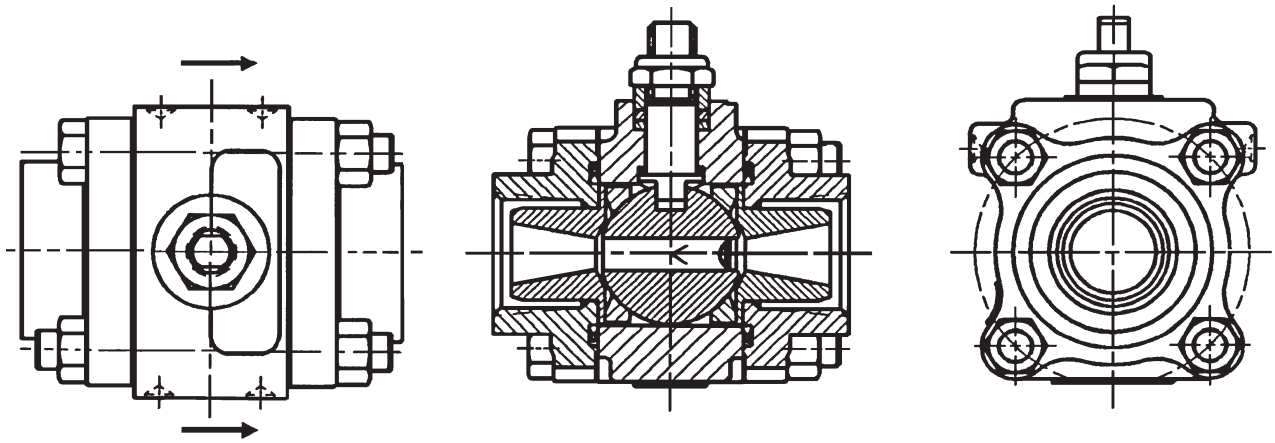


Figure 2

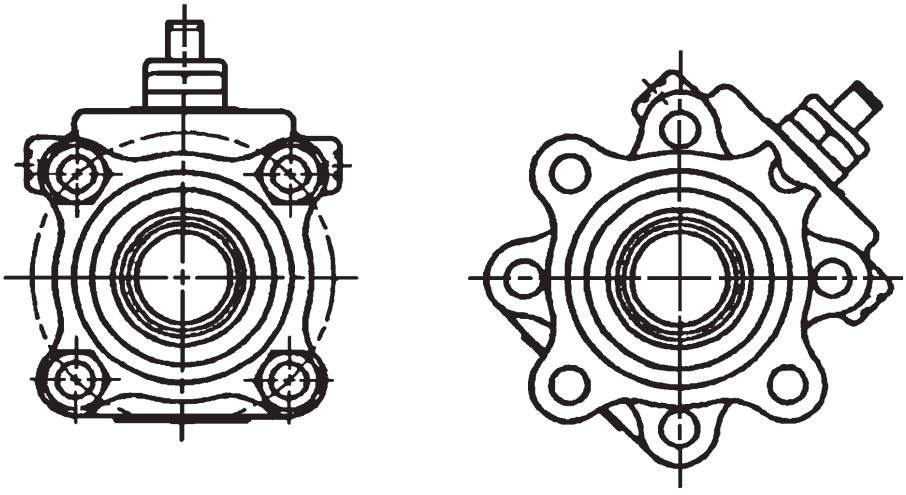


Figure 3

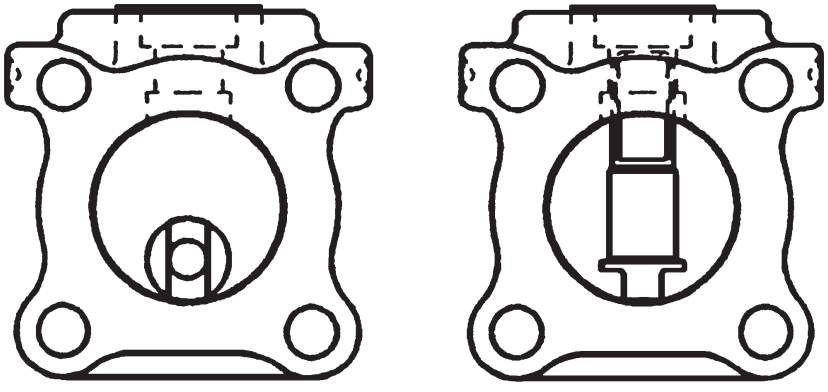


Figure 4

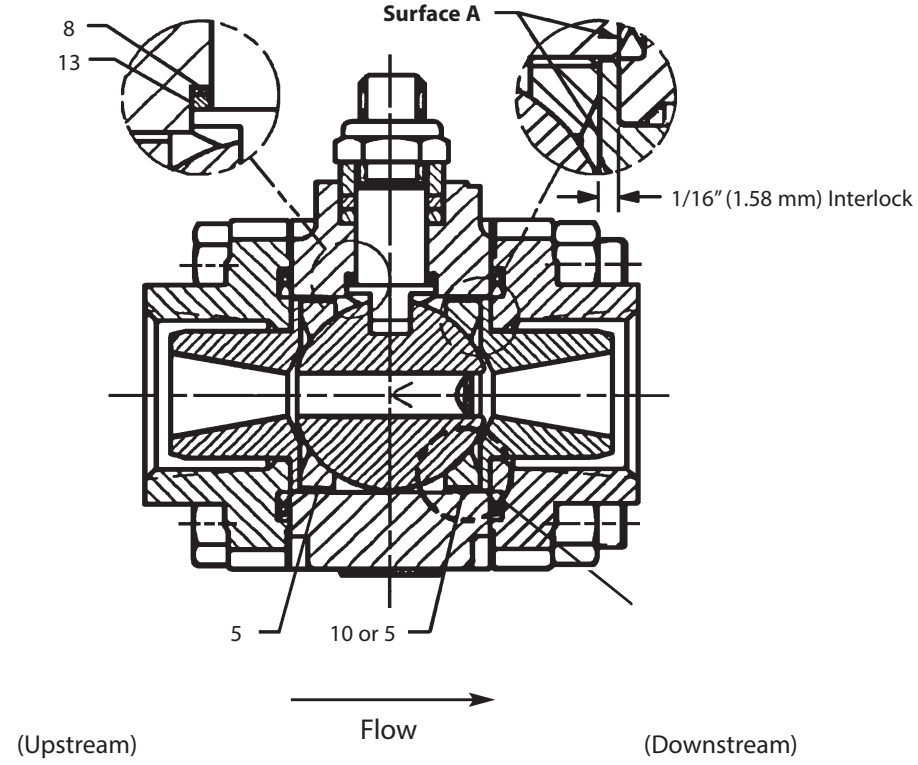


Figure 5

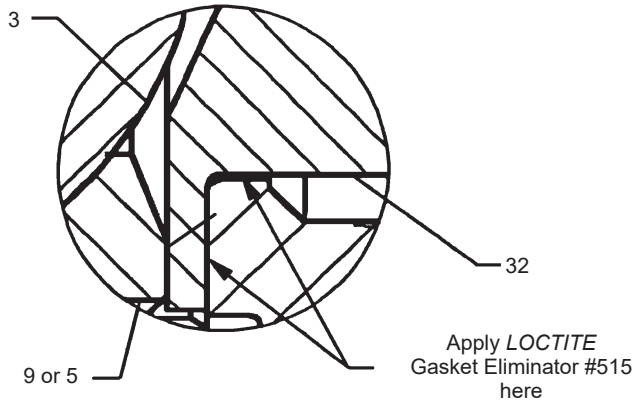


Figure 6

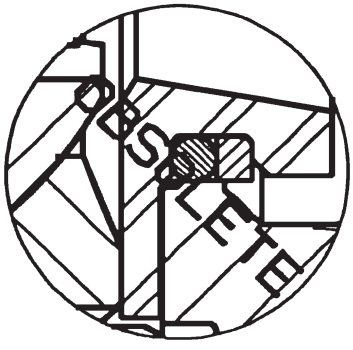
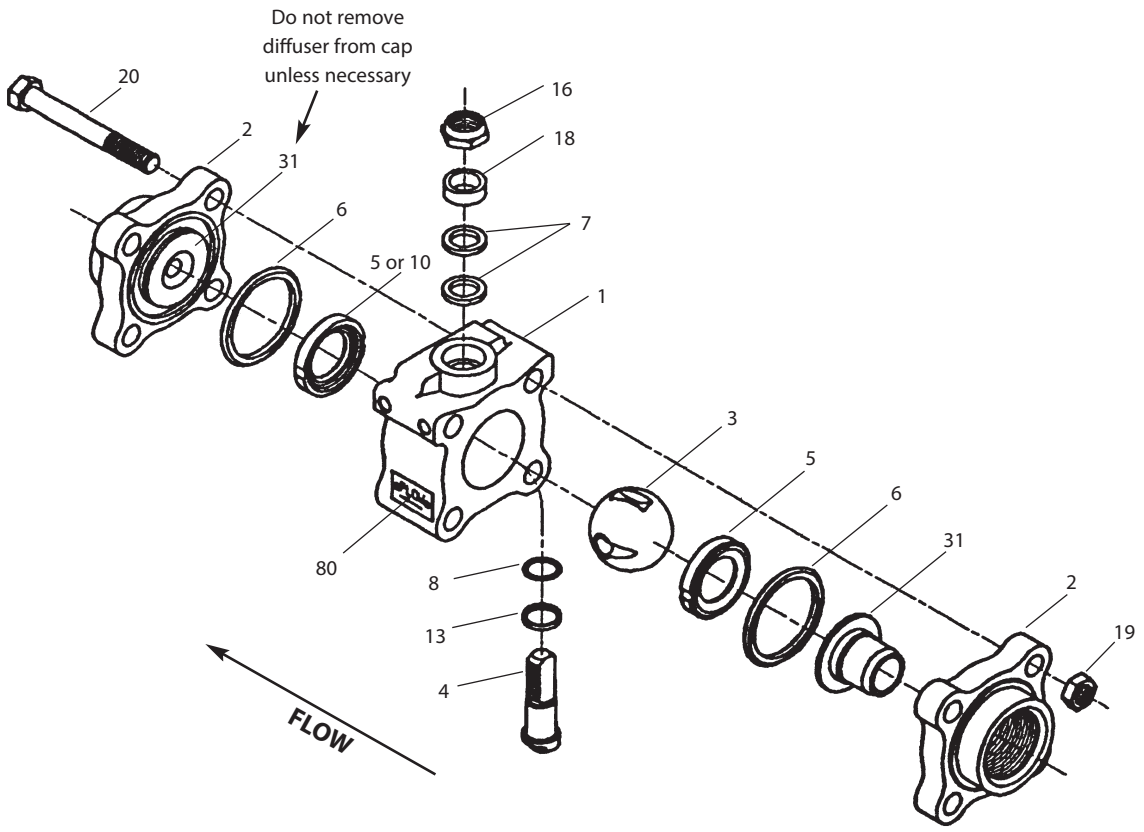


Figure 7



Parts List					
Item No.	**Part Name**	**Qty.**	**Item No.**	**Part Name**	**Qty.**
1	Body	1	10	Seat	1**
2	Body Cap	2	13	Stem Bearing	1
3	Ball	1	16	Stem Nut	1
4	Stem	1	18	Comp. Ring	1
5	Seat	*	19	Body Nut	4
6	Body Seal	2	20	Body Bolt	4
7	Stem Seal	2	31	Diffuser	2
8	Stem Bearing	1	80	Flow Tag	1

* Qty. is 2 on LT. and RT. coded valves. Qty. is 1 on RM coded valves, and is black colored.
** This seat is only used on RM coded valves, and it is lighter colored.
NOTE: On RM coded valves the white colored material (10) is always placed down stream, and the black colored seat (5) is always placed up stream.

Figure 8

Valmet Flow Control Oy
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www.valmet.com/flowcontrol