CAUTION: 1. For your safety read this manual before installation or servicing.
2. Before installing or servicing, please ensure the line pressure has been relieved, and any hazardous fluids have been drained or purged from the system.
3. Please do not use the valve in excess of its designed pressure and temperature ranges.

1. USE:

1.1 Maximum results and optimum valve life can be maintained under normal service conditions and in accordance with pressure/temperature ratings and corrosion data chart.

2. STORAGE:

If valves are not to be installed immediately, please note the following:

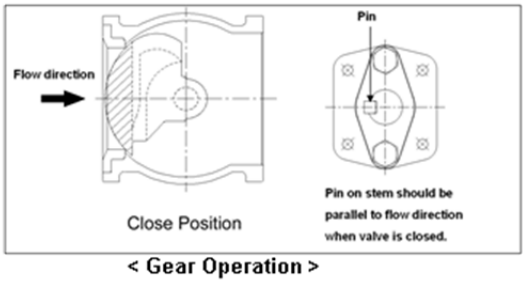
2.1 Valves should be stored in a dry & clean indoor space.
2.2 Check to see that the valve is in the CLOSED position for bare shaft or manual type in order to avoid damage to the seal. For automated packages, the valve position will be set according to the requirement of the actuator.
2.3 The surface of the valves should be greased properly for protection.
2.4 Valve ports should be sealed by plastic caps to prevent dirt from entering and damaging inner parts.

3. INSTALLATION & OPERATION

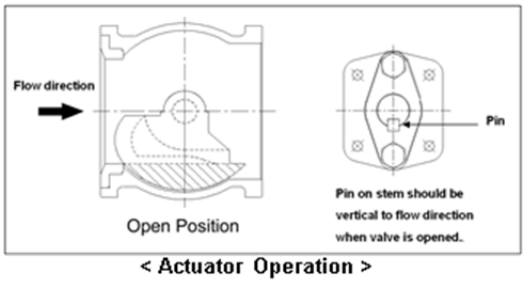
3.1 Before installing, check all valves & mating flanges to ensure gasket surfaces are free from defects.
3.2 Ensure all valves and lines are flushed clean without any dirt or debris which may damage valve seals.
3.3 Check pipe alignment & appropriate supports. It is not recommended to install valves to improperly positioned pipes.
3.4 Valves are designed with a preferred flow direction; a flow arrow on the valve body indicates preferred flow direction. Valves installed with reversed flow direction will not seal properly.
3.5 Check to see that valve is in OPEN position to protect the Seat from damage during installation.
3.6 Install valve into pipeline and tighten bolts properly. Note: over tightening of any side may cause leakage.

Do not overturn the Segment when operating the valve to avoid scratching the seat. If this happens, please follow the Disassembly & Assembly instructions to remove cover and seat; then turn the Segment back to right position and reassemble the valve parts.

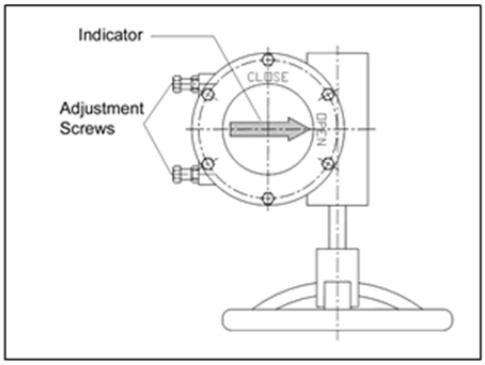
< Bare Shaft >

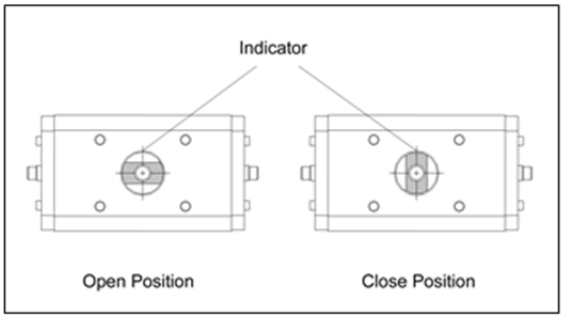


< Gear Operation >



< Actuator Operation >





4. GENERAL MAINTENANCE

Check valve periodically to ensure the system is performing properly. Follow the instructions and refer to the parts list below if it is necessary to disassemble the valve.

5. DISASSEMBLY

For Soft-Seated Type

5.1 Relieve line pressure and flush to remove any hazardous material. Allow temperature in pipeline and valve to cool to a temperature safe for handling.

5.1.1 Remove valve from pipeline.

5.2 Turn the valve to the CLOSED position.

5.3 Loosen the Bolts (8), remove the Cap (7) and Seat (6A) from the Body (1).

5.4 Remove the Gland bolts (14) then remove the Gland (13). Remove the Lower Cover Bolts (17) and the End Cover (5)

5.5 CAUTION: BEFORE REMOVING STEM (3) AND SHAFT (4) INSURE THAT SEGMENT (2) IS NOT GOING TO FALL OUT OF THE VALVE AND BE DAMAGED.

5.6 Remove Stem (3) and Shaft (4) carefully while supporting Segment (2).

5.7 Remove Gland Packing (12) being careful not to scratch or damage gland bore. Remove washers (10, 11) and Upper Thrust Bearing(9).

5.8 Remove cover gasket (16) again being careful not to scratch the surface. Remove Lower Thrust Bearing (9) and Support (15).

5.9 Carefully clean and inspect all parts for wear and damage. Insure all gasket and packing residue is thoroughly cleaned before valve is reassembled. All soft parts should be replaced.

For Metal-Seated Type

5.10 Relieve line pressure and flush to remove any hazardous material. Allow temperature in pipeline and valve to cool to a temperature safe for handling.

5.11 Turn the valve to the CLOSED position.

5.12 Remove valve from pipeline.

5.13 Loosen the Bolts (8), remove the Cap (7), Spring (6F), Seat Gland (6E), Packing (6D), and Seat Support (6B) from Body (1).

5.14 Remove the Gland bolts (14) then remove the Gland (13). Remove the Lower Cover Bolts (17) and the End Cover (5)

5.15 CAUTION: BEFORE REMOVING STEM (3) AND SHAFT (4) INSURE THAT SEGMENT (2) IS NOT GOING TO FALL OUT OF THE VALVE AND BE DAMAGED.

5.16 Remove Stem (3) and Shaft (4) carefully while supporting Segment (2).

5.17 Remove Gland Packing (12) being careful not to scratch or damage gland bore. Remove washers (10, 11) and Upper Thrust Bearing(9).

5.18 Remove cover gasket (16) again being careful not to scratch the surface. Remove Lower Thrust Bearing (9) and Support (15).

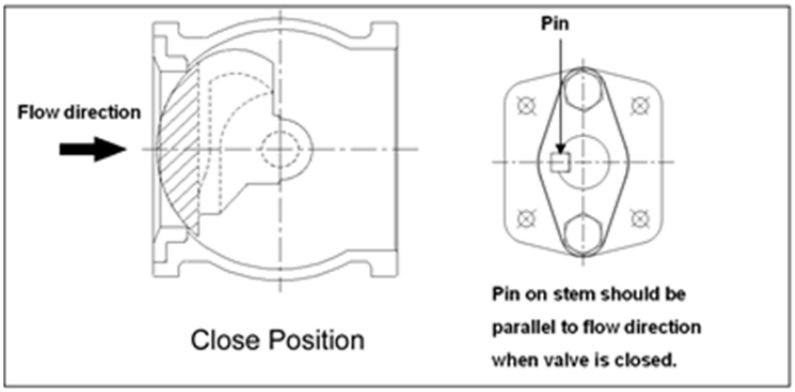
5.19 Carefully clean and inspect all parts for wear and damage. Insure all gasket and packing residue is thoroughly cleaned before valve is reassembled. All soft parts should be replaced.

6. ASSEMBLY

For Soft-Seated Type

6.1 Install Upper Thrust Bearing (9) and Lower Support (15) along with Lower Thrust Bearing (9).
6.2 Carefully support Segment (2) in housing while inserting Stem (3) and Shaft (4) into body and into Segment (2).
6.3 Install Cover Gasket (16) and End Cover (5) then secure with Cover Bolts (17).
6.4 Install Washer (10) followed by Washer (11) then carefully install Gland Packing (12).
6.5 Install Gland (13) the secure with Gland Bolts (14)

6.6 The Segment should be in the closed position as shown below before installing the Seat and Cover. See figure below.



6.7 Insert the Seat (6A) and End Cover (5) into the Body (1),
6.8 Tighten Cover Bolts (17) and Bolts (8) in diagonal pattern with even strength. Tighten Gland Bolts (14).
6.9 Check that it is assembled correctly and in the CLOSED position.

For Metal-Seated Type

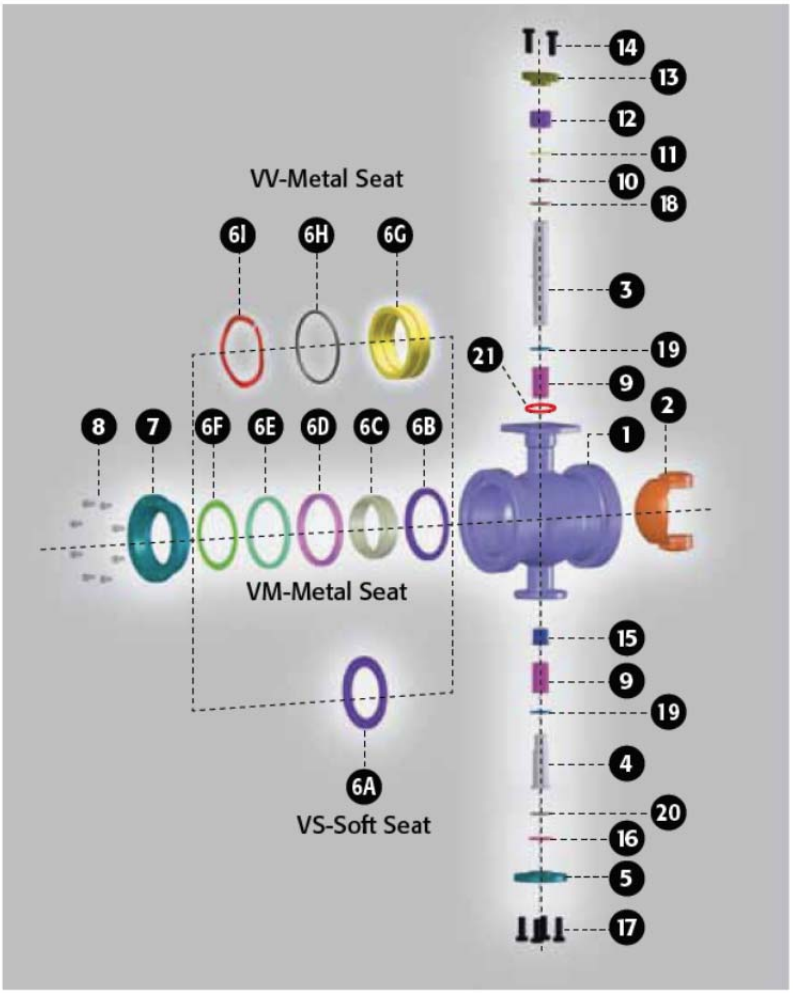
6.10 Complete steps 6.1 through 6.5 under Soft-Seated Type.
6.11 Insert the Seat Support (6B), Seat (6C), Packing (6D) Seat Gland (6E), Spring (6F) and Cap into the Body (1).
6.12 Tighten Cover Bolts (17) and Bolts (8) in diagonal pattern with even strength. Tighten Gland Bolts (14).
6.13 Check that it is assembled correctly and in the CLOSED position.

TROUBLE SHOOTING VALVE LEAKAGE

Location	Description	Solution	
		Soft-Seated	Metal-Seated
Internal	Leakage from upstream	1. Turn the valve to the half open position to check if there is any damage on the contacted surface of the Segment (2) and the Seat (6A). 2. If there is no damage, then the leakage may be caused by normal wear of the seat. Replace the Seat (6A). 3. If there is damage, replace the damaged Segment (2) or Seat (6A).	1. Turn the valve to the half open position to check if there is any damage on the contacted surface of the Segment (2) and the Seat (6C). 2. If there is damage, replace the damaged Segment (2) or Seat (6C). As long as the valve is disassembled, you should also replace the Packing (6D). 3. If there is no damage, please contact the manufacturer.
External	Leakage from stem	1. Tighten the Gland Bolts (14). 2. If step 1 does not fix the problem, disassemble the valve to replace Gland Packing (12).	1. Tighten the Gland Bolts (14). 2. If step 1 does not fix the problem, disassemble the valve to replace Gland Packing (12) and Packing (6D).
	Leakage from cover gasket	Replace the Cover Gasket (16).	Replace the Cover Gasket (16).

APPLICABLE STANDARDS

- **Body material**:
  Standard in WCB, CF8M
  (Special material is available on request)
- **Nominal size:**
  1" to 12"
- **Pressure rating:**
  ANSI 150/300LB
- **End connections:**
  Raised face Flanged & Flangeless
- **Range ability:**
  Greater than 150:1
- **Seat leakage:**
  According to FCI 70-2(B16.104)
  a) Type: Soft seat : ANSI class VI
  b) Type: Metal seat : ANSI class IV
- **Temperature Range:**
  -20 Deg F to 600 Deg F
- **Face to face dimension:**
  According to ISA S75.04



PARTS & MATERIALS

Technical Specifications Material Reference	Page
VS SERIES - 50/50 SEAT - 400 Deg F	6
VV Metal Seat - VITON Seat Packing - 500 Deg F	7
VM Metal Seat - Graphite Seat Packing - 600 Deg F	8

TECHNICAL SPECIFICATIONS - MATERIALS

VS SERIES - 50/50 SEAT - 400 Deg F

NO	PART NAME	MATERIAL	
1	Body	A216-WCB	A351-CF8M
2.1	Segment- Soft Seat	A351-CF8M	A351-CF8M
3	Stem	A276-316	A276-316
4	Shaft	A276-316	A276-316
5	End Cover	AISI-1045	A276-316
6A	Soft Seat	STFE	
7	Cap	A351-CF8M	A351-CF8M
8	Bolt	304SS	
9	Thrust Bearing	TFE COMP	
10	Washer	RTFE	
11	Washer	A240-316 + HARDEN FACE	
12	Gland Packing	RTFE	
13	Gland	A351-CF8	
14	Gland Bolt	304SS	
15	Support	A276-316	
16	Cover Gasket	RTFE	
17	Cover Bolt	304SS	
18	Stem O-Ring	VITON	
19	Washer	TFE COMP	
20	Washer	TFE COMP	
21	C-Clip	316SS	

TECHNICAL SPECIFICATIONS - MATERIALS

VV Metal Seat - VITON Seat Packing - 500 Deg F

NO	PART NAME	MATERIAL	
1	Body	A216-WCB	A351-CF8M
2	Segment-Metal Seat	A351-CF8M + HCr	A351-CF8M + HCr
3	Stem	A276-316	A276-316
4	Shaft	A276-316	A276-316
5	End Cover	AISI-1045	A276-316
6G	Seat	A351-CF8M + ST-6	A351-CF8M + ST-6
6H	O-Ring	Viton	
6I	Spring	INCONEL X-750	
7	Cap	A351-CF8M	A351-CF8M
8	Bolt	304SS	
9	Thrust Bearing	TFE COMP	
10	Washer	RTFE	
11	Washer	A240-316 + HARDEN FACE	
12	Gland Packing	RTFE	
13	Gland	A351-CF8	
14	Gland Bolt	304SS	
15	Support	A276-316	
16	Cover Gasket	RTFE	
17	Cover Bolt	304SS	
18	Stem O-Ring	VITON	
19	Washer	TFE COMP	
20	Washer	TFE COMP	
21	C-Clip	316SS	

Notes: 1. HCr = Hard Chrome Plated

TECHNICAL SPECIFICATIONS - MATERIALS

VM Metal Seat - Graphite Seat Packing - 600 Deg F

NO	PART NAME	MATERIAL	
1	Body	A216-WCB	A351-CF8M
2.2	Segment-Metal Seat	A351-CF8M + HCr	A351-CF8M + HCr
3	Stem	17-4PH + HCr	17-4PH + HCr
4	Shaft	17-4PH + HCr	17-4PH + HCr
5	End Cover	AISI-1045	A276-316
6B	Seat Support	A351-CF8M	A351-CF8M
6C	Seat	A351-CF8M + ST-6	A351-CF8M + ST-6
6D	Packing	GRAPHITE	
6E	Seat Gland	A351-CF8M	A351-CF8M
6F	Spring	INCONEL X-750	
7	Cap	A351-CF8M	A351-CF8M
8	Bolt	304SS	
9	Thrust Bearing	A240-316 + HARDEN FACE	
10	Washer	GRAPHITE	
11	Washer	A240-316 + HARDEN FACE	
12	Gland Packing	GRAPHITE	
13	Gland	A351-CF8	
14	Gland Bolt	304SS	
15	Support	A276-304/A276-316	
16	Cover Gasket	GRAPHITE	
17	Cover Bolt	304SS	
19	Washer	A240-316 + HARDEN FACE	
20	Washer	TFE COMP	
21	C-Clip	316SS	

Notes: 1. HCr = Hard Chrome Plated

A-T Controls product, when properly selected, is designed to perform its intended function safely during its useful life. However, the purchaser or user of A-T Controls products should be aware that A-T Controls products might be used in numerous applications under a wide variety of industrial service conditions. Although A-T Controls can provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser / user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of A-T Controls products. The user should read and understand the installation operation maintenance (IOM) instructions included with the product, and train its employees and contractors in the safe use of A-T Controls products in connection with the specific application.

While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only. Because A-T Controls is continually improving and upgrading its product design, the specifications, dimensions and information contained in this literature are subject to change without notice. Should any question arise concerning these specifications, the purchaser/user should contact A-T Controls.

For product specifications go to http://download.a-tcontrols.com/

A-T Controls, Inc. • 9955 International Boulevard, Cincinnati, OH 45246 • Phone: (513) 530-5175 • Fax: (513) 247-5462 • www.a-tcontrols.com