



Installation and Operation Maintenance Manual for Triple Offset Butterfly Valves



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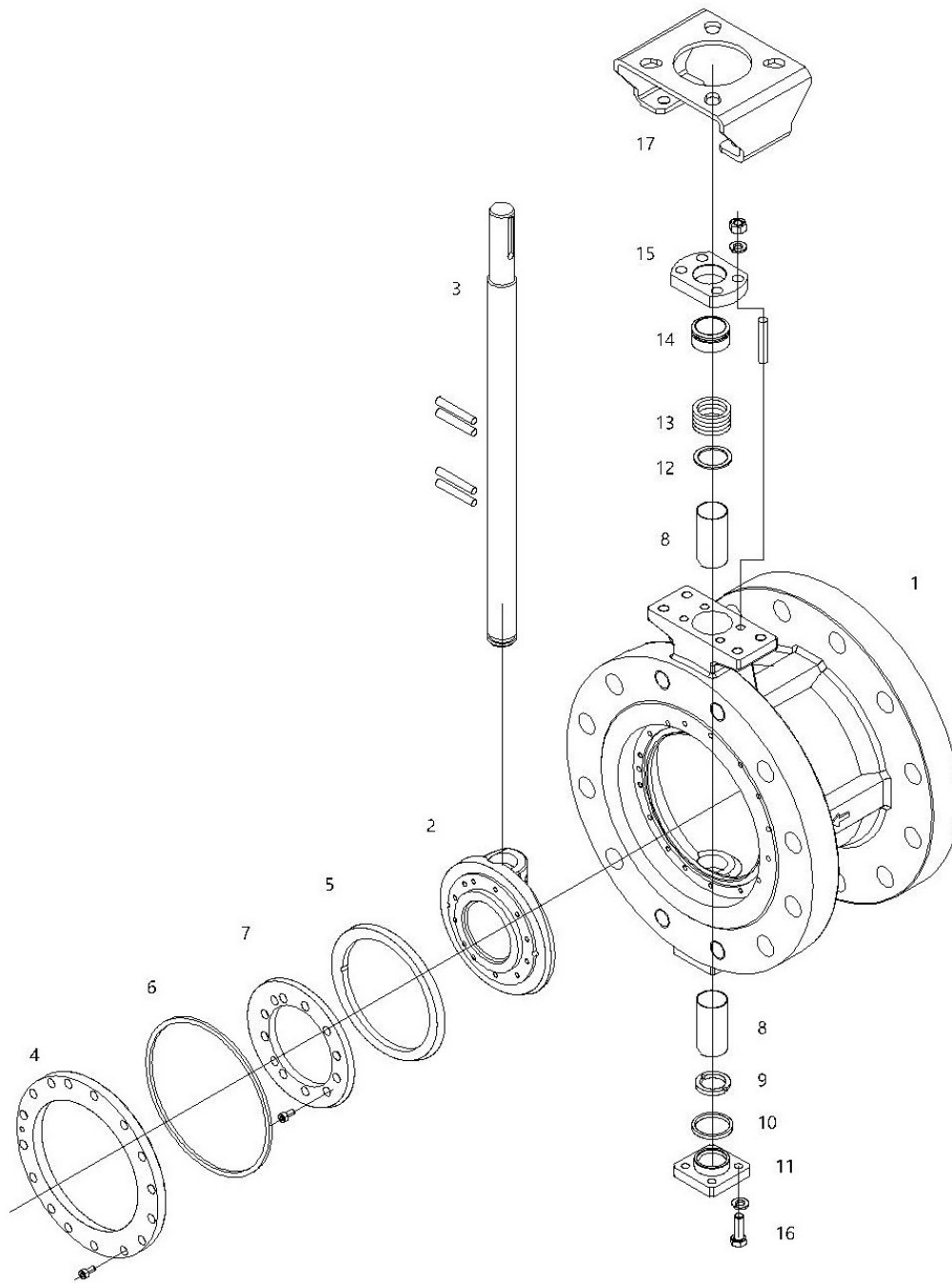
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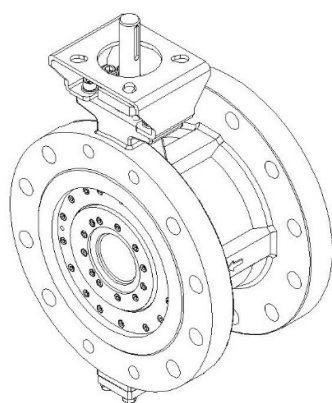
CONSTRUCTION VIEW



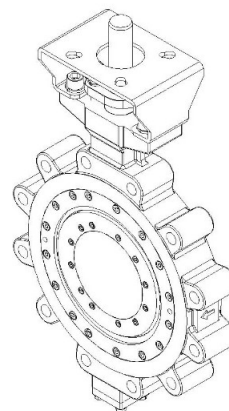
Components and Materials

Part	Material	Material standards	Part	Material	Material standards
1. Body	Carbon steel	WCB, LCB	9. Shaft retainer	Stainless steel	316
	Stainless steel	CF8, CF8M, CF3, CF3M		Copper Alloy	A271 C83600
2. Disc	Carbon steel	WCB, LCB	10. Bottom packing	PTFE / RTFE	
	Stainless steel	SCS13, SCS14, CF8, CF8M		Graphite	
3. Shaft	Stainless steel	304, 316, 316L	11. Bottom	Carbon steel	WCB, LCB
	17-4PH	ASTM A564 630		Stainless steel	CF8, CF8M, CF3, CF3M
4. Body seat	Stainless steel	304, 316, 316L	12. Packing retainer	Stainless steel	ASTM A240 316
	Hard facing	HCR, Stellite#6			
5. Disc seal	Stainless steel	316+GRAPHITE Laminated	13. Packing	PTFE / RTFE / Graphite	
6. Body seat gasjet	Spiral gasket	316+Graphite	14. Gland	Stainless steel	304+HCR, 316+HCR
	Graphite	Graphite Gasket	15. Gland bridge	Stainless steel	304, 316
7. Disc cover	Stainless steel	304, 316			
8. Bush Bearing	316 Stainless steel with TFE		16. Bolt	304 / 316 Stainless steel	
	316+HCR		17. Bracket	Carbon steel	ASTM A36

■ Contact your sales representative for appropriate material for specific service.



Double flanged type



Lug type triple offset

→ Wafer style is also available.

1. General Information

1.1 Introduction

This user manual provides general instruction and information on “900 Series” Triple Offset Butterfly Valves for installation, operation, and maintenance. As this manual contains only limited information, please contact our sales office or local representative for more details.

1.2 Type

The body styles are classified as Wafer Type, Lug Type, and Double Flange Type according to the shape of the body and installation method. Wafer types are installed between two flanges, connected by long studs/machined bolts. Lug types are installed directly to each side of the flange with short studs/machined bolts. Flanged types have a flange on each side and each body flange is connected directly to the pipe flange with short studs/machined bolts.

1.3 Operation

The valve operator may be a manual worm gear, pneumatic actuator, or an electric motor operated actuator. By rotating or closing of the disc located in the inside of the valve, the fluid flowing through the pipe can be shut-off or regulated. Operation via a lever handle is not recommended for 900 Series Triple Offset Valves.

2. Installation

2.1 Pre – Installation

All valves are tested and packaged properly prior to shipping. It is recommended that the valves still be inspected before they are installed into the pipeline.

2.1.1 Inspecting the Valve

- Inspect the valve for any damage that may have occurred during transportation.
- Remove the protective cover of the valve and clean any debris using a cloth or compressed air.
- Ensure the surface of the seat ring (Body Seat & Disc Seal) is clean enough and free from damage.
- Check that all nuts and bolts are tightened.

2.1.2 Inspecting the Pipeline

- Remove foreign materials such as a rust or carbon fines from the pipe and flange surface.
- The pipe flange and gasket surface must be clean prior to installation.

CAUTION:

As media flows through the valve, any solid material may scratch or hit the disc, seat ring, and/or inner body. Heavy amounts of debris may lead to leakage and a reduction in the valve's longevity.

2.2 Installation

- Ensure the valve is completely closed. In general, valves are delivered with their discs closed tightly to protect the surface of the seat
- Although 900 Series Triple Offset Valve is bi-directional, we recommend installing the valve with the "stem side" on the upstream (higher pressure) side of the pipeline. The recommended flow direction is marked on the body with an arrow for reference.
- Ensure that the upper/bottom packing bolt/nut is tight.
- Install a gasket between the valve flange and pipe flange.
- When connecting the valve to the pipe, install the fasteners using a "cross bolting" or "star" pattern to ensure the valve is properly aligned.

Caution:

Note the preferred direction of flow by referencing the arrow marked on the body. Also, tightening the fasteners with excessive torque may damage the flange gasket and cause leakage.

3. Maintenance and Replacement

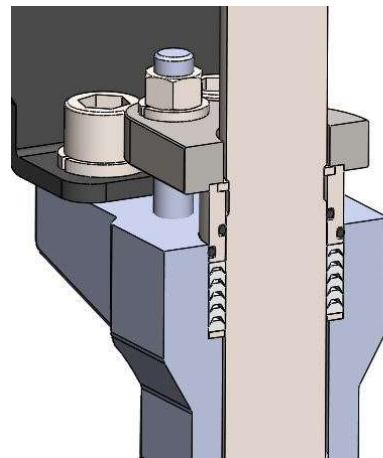
3.1 Maintenance

900 Series Triple Offset Butterfly valves do not require mandatory maintenance unless any leak is suspected. However, performing routine inspections is recommended for safety and to ensure the longevity of the valve.

- Perform a visual inspection of the body, disc, seat ring, and packing during the initial operation or during re-operation after the valve has been out of service for an extended period.
- Inspect the valve when any abnormal sounds are noticed during operation.
- Ensure each bolt is tightened down on a regular basis.

3.1.1 Packing (Packing Gland)

Most leaks from the packing gland can be prevented by tightening the gland bolts/nuts. The packing gland bolt/nut may be loose during transportation and long-term storage. Therefore, it is important to tighten the bolts/nuts regularly. If leakage persists, the bolts/nuts should be replaced.



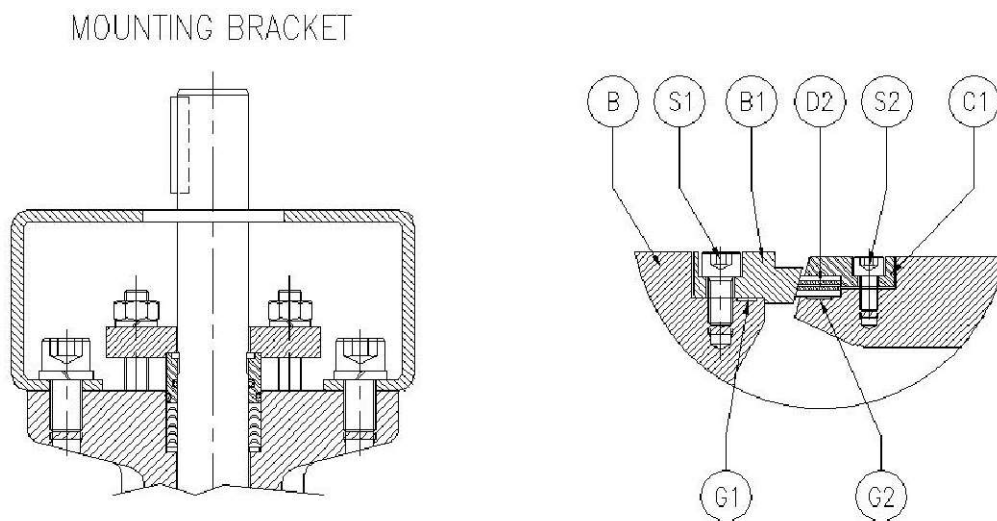
3.1.2 Seat Ring (Body Seat, Disc Seal)

If a leakage through the seat is suspected, follow the below steps to identify the cause:

- If the valve continues to leak when fully closed, check that the travel stop of the actuator is set correctly. If not, please adjust the travel stop correctly.
- If the disc does not rotate to close anymore, something may be jammed between the seat and the disc. If the valve is still leaking after removing it, the seat must be replaced.
- Inspect the seat ring surface for any debris or damage. If the valve is still leaking, then the seat may have worn out naturally and should be replaced.

3.2 Seat Replacement

Caution: All repair work should be performed by trained personnel. (Refer to the below diagram)



Although it may not be necessary, it is highly recommended that both the seat (B1) and seal ring (D2) be replaced at the same time.

1. Close the valve and remove the actuator. Place the valve a flat and stable surface with the body seat (B1) facing up.
2. Carefully clean the surface of the seat and remove all foreign matter from the hex sockets of the body seat retaining cap screws (S1) before removing them from the valve.
3. Using a soft light hammer, carefully tap around the top of the body seat to loosen the seat from the retaining cavity. Remove the body seat (B1) from the body (B).
4. Using non-abrasive tools, carefully clean any remnants of the gasket and foreign matter within the retaining cavity. Blow out all threaded holes and gasket grooves with compressed air.
5. Remove the disc cover (disc seal ring retainer) screws (C2). Remove the disc seal ring retainer. Wipe the disc seal ring (D2) clearly, then remove all remnants of the gasket and foreign matter. Place the old disc seal ring (D2) aside for reinstallation.
6. Using soft tools and a suitable wire brush, carefully clean any remnants of the gasket and foreign matter from the face of the disc. Blow out all threaded holes and the gasket groove with compressed air.
7. Place a new disc gasket (G2) into the groove on the disc face. Place the disc seal ring (D2) onto the disc and make sure that the alignment line on the seal ring matches dimple located in the disc face. Place the disc cover (C1) over the disc seal ring. Apply anti-seize compound to the seal ring retainer cap screws (S2). Install all disc seal ring retainer cap screws (S2). The seal retaining flange cap screws should be fully threaded into the disc (only finger tight at this time). Open the valve to approximately 20°.
8. Place the seat gasket (G1) into the groove of the seat. Insert the body seat (B1) into the body (B). Ensure that the alignment dimples in the body seat (B1) and the retaining cavity in the body match. Apply anti-seize compound to seat retaining cap screws (S1) and install the screws (S1) finger tight.
9. Verify that all four alignment marks match (body, seat, disc seal ring, and seal ring retainer) and then tighten the seat retainer cap screws (S1) evenly and firmly using a "cross bolting" or "star" technique.
10. Lubricate the sealing surfaces of the disc seal ring (D2) and the body seat (B1). Using a suitable actuator, close and open the valve 2-3 times, only closing the valve to the point where the seal ring engages with the seat. Check each time that the disc seal ring makes full contact without torquing into the seat. Ensure that the seat does not scratch the seal ring during the closing stroke. This will allow the seal ring and seat to remain properly aligned.
11. Re-apply lubricant to the sealing surfaces of the valve. Reinstall actuator and test the valve.