BONOMI
NORTH AMERICA

IOM | HIGH-PERFORMANCE BUTTERFLY VALVES

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1. Introduction

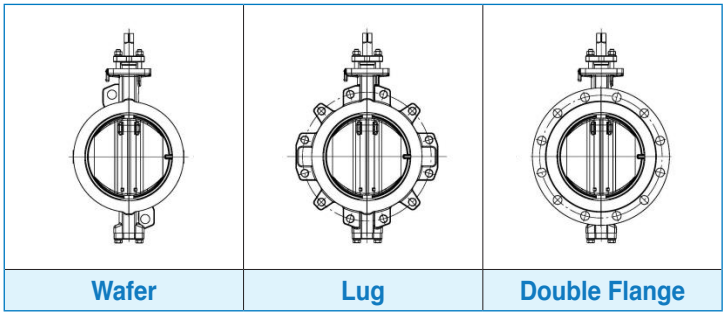
1.1 Definition of Terms

CAUTION ⚠	indicates a potentionally hazardous situation which, if not avoided, may result in minor injury or asset loss
WARNING ⚠	indicates a potentionally hazardous situation which, if not avoided, could result in death or serious injury

1.2 Flange Types

Three standard connections:

1. Wafer
2. Lug
3. Double Flange

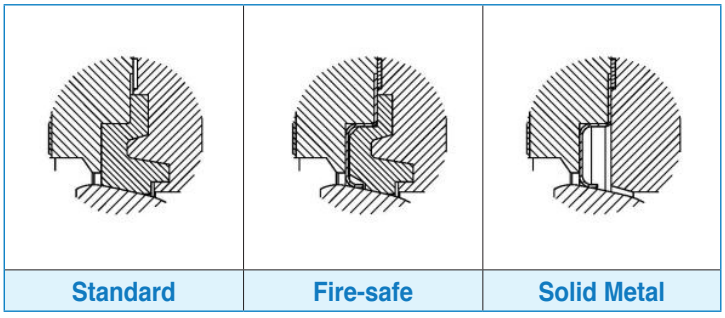


Wafer	Lug	Double Flange

1.3 Seat Types

Three valve seat types:

1. Standard
2. Fire-safe
3. Solid metal

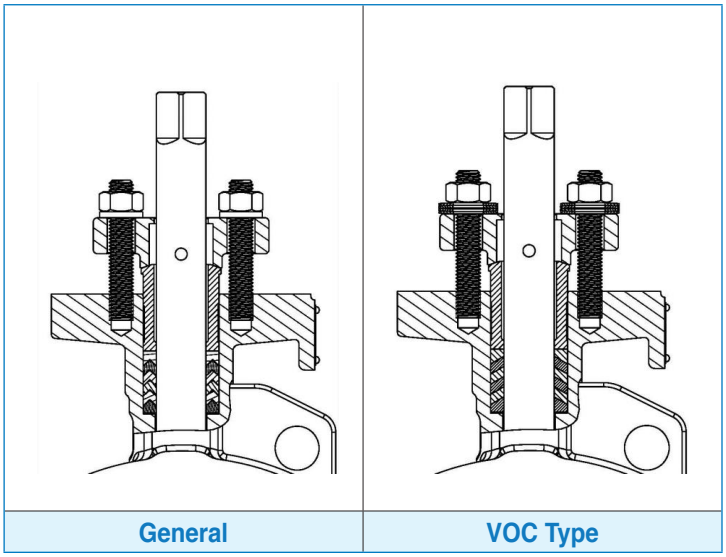


Standard	Fire-safe	Solid Metal

1.4 Gland Packing Systems

Major two (2) types:

A. General type - P.T.F.E. / R.T.F.E.
B. VOC (volatile organic compounds) type - with graphite



General	VOC Type

1.5 How to Order

Valve Material	ANSI Class	Seat Material	Valve Style
8	**1**	**0**	**0**
8 = WCB	1 = #150	0 = 25% R.T.F.E.	0 = Wafer Style
9 = CF8M	3 = #300	2 = Metal Seats	1 = Lug Style
		4 = Fire Safe	

2. Installation

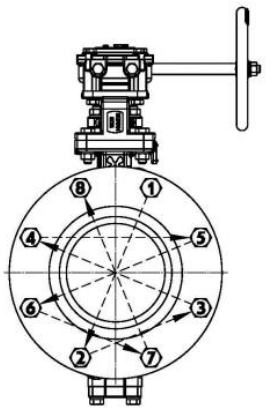
Butterfly valve structure is based on a quarter-turn 0-90° rotation of the disc, which is compact, small and lightweight. These features enable the butterfly valve to be easily disassembled and maintained, to open and close quickly, and provide precise regulation in linear flow control.

2.1 Before Installation

CAUTION ⚠	1. BONOMI butterfly valve is designed to fit between flanges. When the disc is opened, the disc will enter the tube on both sides of the pipeline (further on the body side than the seat retainer side of the valve), the piping must be large enough to open the valve.
	2. If the actuator, such as a lever or gear operator, has been removed, the valve disc must not rotate more than the fully open or closed position.
	3. In order to ensure the longest life, please follow the instructions of the valve arrow installation.
	4. Bi-directional sealing design allows the valve to be installed in any direction, but the valve disc in accordance with the proposed flow can have longer service life, especially while working with erosive fluid.

2.2 Installation

Install valve into pipeline:



A. Before installing the tube must be clean ; without welding slag or others. If necessary, clean the tube.
B. Confirm that the flow direction of the pipeline is consistent with the recommended flow direction of the valve.
C. Separate the two flanges and make the space between the two at least 8mm greater than the face-to-face dimension of valve. Ensure the valve disc is in the closed position then carefully put the valve in between the flanges.
D. Align the center of the valve to the center of the pipeline. Then locate the valve flange or threaded hole align with the pipe flange hole or threaded hole.
E. Flange bolts must use 2-stage locking in diagonal sequence (as shown in the diagram above with a less than 60 Nm (531 in. lbs.) average torque. The flanges must keep parallel during locking; otherwise it may cause leakage through the flange face.

2.3 After Installation

CAUTION ⚠	1. It is not recommended to remove the valve protection cover before installation, unless inspection or installation of the valve is required.
	2. If the valve must be placed outdoors, the valve should be supported so that it does not come into contact with the ground and protected with a waterproof cover.
	3. The performance of valve may be reduced if valve remains in a fixed position in a long time without any movement. This is due to loss of effective lubrication, packing aging, corrosion or accumulation of harmful substances. Therefore, a periodic partial or full-cycle operation plan is advised for peak performance.

3. Operation

BONOMI high performance butterfly valves can be operated with a manual actuator, pneumatic actuator, electric actuator, and other special control devices. Both on-off control and regulation control are available according to customer needs.

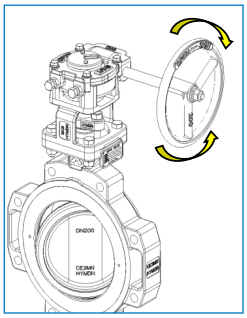
BONOMI high performance butterfly valves are designed to work with a Bonomi North America gear operator or a Bonomi North Amerca standard manual lever.

3.1 With Bonomi Gear Operator

CAUTION ⚠	1. Verify that the position of the valve with the indicator on-or-off position is the same.
	2. Rotate the gear wheel with a fully-open-close operation. Confirm all components stay in good condition then begin installation into pipeline.

Gear operating method:

- Rotate the hand wheel to open or close the valve.
- Counter-clockwise rotation is on.
- Clockwise rotation is off.

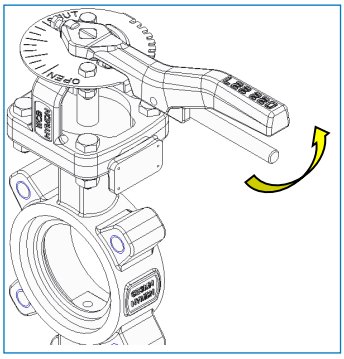


3.2 With Bonomi Lever

WARNING	Verify that the relative position of the valve to the handle indicator is the same.
	Fast rotation is prohibited. Otherwise water hammer might cause unexpected damage.

Lever operating method:

- Turn on or turn off the handle by 90°.



4. Maintenance

Maintenance components may be different depending on the valve selection. For example, as for seat replacement, Standard type only needs to change valve seat; Metal type needs to replace the metal seat and graphite gaskets; Fire-safe type needs to substitute the soft seat, metal seat, and graphite gaskets. The maintenance methods are same for above, but require attention on their relative positions.

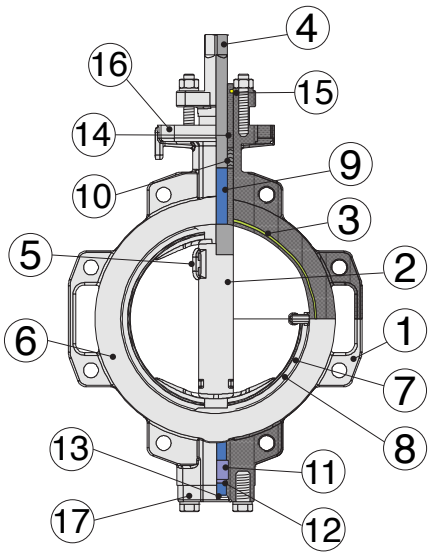
For the replacement of disc ring of VOC type, it must take right direction during installation.

4.1 Attentions

CAUTION	Before operating the valve, appropriate precautions should be taken. And if necessary, in accordance with the special fluid requirements, protective clothing should be worn.
	Before removing the operator from the valve or removing the valve (when the valve is installed at the end of the line), the valve must be closed and the line pressure released.
	If the valve must be removed from the pipeline, the valve must be stay in the closed position
	Remove the valve from the pipeline. It is mandatory to perform cleaning and inspection.

You may obtain replacement valves, fillers and other parts from Bonomi North America-authorized distributors. For more information like price and shipment, please contact your Bonomi North America distributor.

WARNING	Valves without an actuator may be opened in the pipeline due to fluid pressure.
	Do not increase the pressure in the event where the valve is not assembled with a handle or gearbox.
	When handling or moving the valve, be careful not to scratch the disc edge or seat.



N POS	PART NAME	MATERIAL	NOTE	N PCS
1	BODY	A216 Gr. WCB / A351 Gr. CF8M		1
2	DISC	A351 Gr. CF8M	●	1
3	SEAT	Carbon-filled PTFE	★	1
4	STEM	A182 Gr. F316	●	1
5	TAPER PIN	A182 Gr. F316L		2
6	RETAINER RING	A351 Gr. CF8M		1
7	SPRING	A182 Gr. F316		1
8	LOCK PIN	PTFE		1
9	STEM BUSH	PTFE + SS316L / A182 Gr. F316		2
10	GLAND PACKING	GRAPHITE	▲	1
11	THRUST RING	A351 Gr. CF8M		1
12	THRUST PLATE	PTFE + SS316L		1
13	GASKET	PTFE	▲	1
14	GLAND BUSH	A351 Gr. CF8M		1
15	ANTI-BLOWOUT PIN	A182 Gr. F316		1
16	GLAND FLANGE	A351 Gr. CF8		1
17	BOTTOM COVER	A351 Gr. CF8M		1

4.1 Attention (cont'd)

●	Surface is Hard Chrome Plated
★	Same as ITEM 3 SEAT's material. If valve is Fire-safe design, use Graphite as material.
▲	Working temperature: P.T.F.E. -29~180°C, R.T.F.E. -29~230°C
- When VOC emission is requested, ITEM10 has 2 more materials, EVSP 9000 and 3300W, in option.	
- The listed materials are assorted with standard package. We have ALLOY 20, HASTELLOY C276, Duplex A890 6A, MONEL in option. Please contact us for more details	
- Item 4 uses 17-4 PH or UNS S31803 for Class 300	

4.2 Exception Handling

Most leakage exceptions caused by two (2) major conditions:

4.2.1 Internal Leakage — Check whether the valve disc is turned to the close position. If not, close the valve.
After confirming valve can be closed to the right position, if leakage still occurs, it might means the valve seat or valve has been damaged. In this case, the valve must be removed and replaced.

4.2.2 Stem Leakage — Lock the gland packing with a 1/4 turn. Confirm the leak has stopped or decreased. If there is a small amount of leakage, it is recommended to slowly lock gland packing more. (be sure keeps both side of bolts are locked equally) If the bolts are locked in the end but still cannot lift the leak, it is recommended to replace the packing. In addition, while replacing the seat, it is also recommended to substitute packing and gasket.

4.3 Consumable Parts

If a leakage has occurred, replacement is highly recommended to return the valve to peak performance.

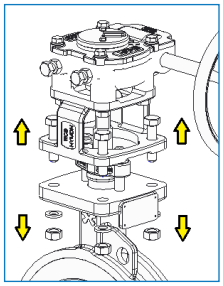
4.3.1 Packing
4.3.2 Seat (Standard type only needs to change valve seat; Metal type needs to replace the metal seat and graphite gaskets; Fire-safe type needs to sub stitute the soft seat, metal seat, and graphite gas kets.)
4.3.3 Disc and Stem (This is a set, need to change both at the same time.

4.4 Replacement of Consumable Parts

CAUTION ⚠	The installation orientation of the component should be recorded before disassembly.
	During disassembly, do not scratch the valve disc, valve stem or valve body.
	Flange surface should not be fully touched. Carefully keep the flange surface NOT be scratched.

4.4.1 Packing Replacement

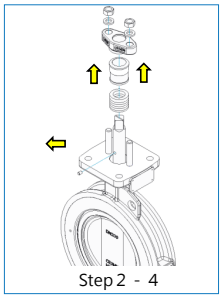
Step 1 For valves with a yoke, first remove the yoke bolts and spring washers. Second remove the yoke. For valve with actuators, turn loose yoke screw and remove the whole set of actuator-and-yoke.



Step 2 Remove the gland packing after loosening the nuts and spring washers of the gland packing.

Step 3 Remove the anti-blowout pin and gland bush in sequence.

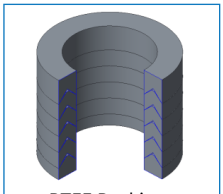
Step 4 Remove packing.



Step 2 - 4

Step 5 Before installing the new packing, first check the valve packing hole. If there is dirt, it should be cleaned before installing new packing.

Step 6 When installing new packing, it should be noted that the gap should be loaded down(asright). This provides the capability to completely block the leakage of fluid.(Reverse installation if used in vacuum applications)



PTFE Packing

4.4.1 Packing Replacement (cont'd)

Step 7 Fill the gland bush into the packing hole, put the anti-blow-out pin and then lock the gland flange.

Step 8 Lock the spring washers and nuts equally.

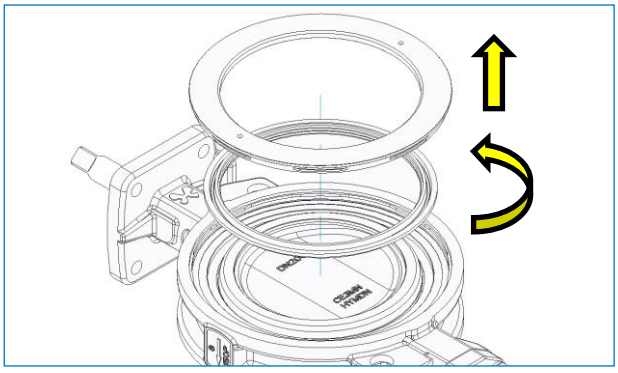
Step 9 Reinstall the actuator, or install the yoke first, if required.

Step 10 Make several on-off operation tests. Make sure the valve works smoothly. Loosen the nut, and then in accordance with the provisions of the torque value (see below) to complete the replacement of the lock.

Diameter (in)	P.T.F.E. Locking Torque (In. lbs)	Graphite Locking Torque (In. lbs)
2-4"	97	133
5-6"	150	221
8"	204	283
10"	221	310
12"	460	637
14"	531	743
16-18"	770	1,071
20"	1,168	1,611
24"	1,248	1,726
28"	1,699	2,345
30"	1,903	2,655

4.4.2 Seat Replacement

Step 1 Remove the valve and lay down in flat with flange face up. Rotate the retainer ring by rotating retainer-ring's pin hole to 3-clock and 9-clock direction. Take out the retainer ring.



Step 2 After taking out the retainer ring, carefully remove the valve seat.
Clean the valve body and the valve disc. Then check whether scratches or damages in valve disc.

Step 3 Place the new valve seat carefully in the valve body. Standard type only needs to change valve seat; Metal type needs to replace the metal seat and graphite gaskets; Fire-safe type needs to substitute the metal seat, soft seat, and graphite gaskets.

Step 4 Place the new spring and the positioning pin into retainer ring rotate to lock-position. The seat replacement process is now completed.

4.4.3 Disc and Stem Replacement

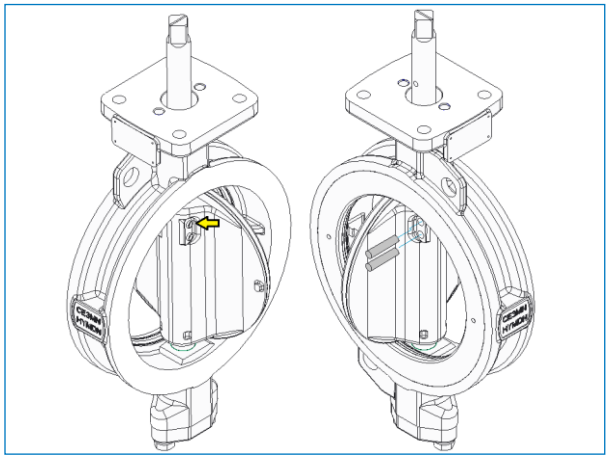
Step 1 For valves with yoke, first remove the yoke bolts and spring washers. Second, remove the yoke. For valve with actuators, turn loose yoke screw and remove the whole set of actuator-and-yoke.

Step 2 Remove the gland packing after loosening the nuts and spring washers of the gland packing.

Step 3 Remove the anti-blowout pin and gland bush in sequence. Then remove packing.

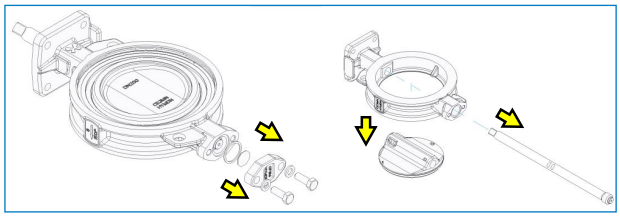
Step 4 Rotate the retainer ring by rotating retainer ring's pin hole to 3-clock and 9-clock direction. Take out the retainer ring and valve seat in sequence. Carefully clean the valve body.

Step 5 Knock out the taper-pin.



4.4.1 Packing Replacement (cont'd)

Step 6 Remove the bottom cover after loosening the screw and spring washer. Remove the thrust bearing and the bottom cover gasket. Then pull out the stem and take out the disc.



Step 7 After confirming the valve body is clean, place the replacement valve disc in the centre of the body. Insert the replacement stem into the disc (disc shall be placed inside body). Then tap the taper-pin.

WARNING 	Do **NOT** tap the taper-pin tightly. Only make the taper-pin lock the stem is enough. The replacement might be unable to complete if tap the taper-pin tightly here.

Step 8 Put back the thrust bearing and the bottom cover gasket. Lock them with screws and spring washers equally.

Step 9 Installing new packing with the gap loaded down (This will completely block the leakage of fluid).

Step 10 Fill the gland bush into the packing hole, put the anti-blowout pin and then lock the gland flange.

Step 11 Lock the spring washers and nuts equally.

Step 12 Verify that the disc is in the center of the valve body. (Use Vernier calliper to measure the up-and-down distance of disc to the valve body is same or not. The error need to be within 0.1mm)

Step 13 Place the new valve seat into valve body carefully.

Step 14 Place the new spring and the positioning pin into retainer ring, rotate to lock-position.

Step 15 Half open the disc. Tap the taper-pin completely into the pin-hole tightly.

Step 16 Re-install actuator.

Step 17 Make several on-off operation tests. Make sure the valve works smooth. Loosen the nut, and then in accordance with the provisions of the torque valve (listed in 4.4.1 Packing replacement to complete the replacement of the lock.

5. Technical Support

For questions, concerns or technical inquiries, please call your Bonomi North America authorized distributor. You may also call Bonomi North America directly at (704) 412-9031 or email us at sales@bonominorthamerica.com.

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