VALVES & MEASUREMENT

TBV™

OPERATION AND MAINTENANCE MANUAL

SERIES 1100: THREE PIECE BALL VALVE

For technical questions, please contact the following:

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TBV ball valves have been designed and engineered to provide long lasting, trouble-free service when used in accordance with these instructions and specifications.

INSTALLATION

1. *TBV ball valves are bi-directional and may be installed for flow or vacuum in either direction. Valves with vented ball or body are unidirectional valves.*
2. *TBV chlorine ball valves are designed, cleaned, and packaged according to Chlorine Institute specifications. TBV chlorine ball valves are unidirectional and must be installed for flow in one direction as indicated by the flow arrow marked on the body. When installed with the flow arrow pointing downstream (opposite the side that you wish to maintain pressure), the valve cavity will self relieve to the upstream side.*
3. *During installation, it is recommended that the valve ball be in the open position in order to prevent any possible damage to the ball.*
4. *After installation, cycle valve several times to assure smooth operation.*

CAUTION FOR BRAZING, SOLDERING OR WELDING.

1. *If valve is to be brazed, soldered, or welded, the seats and body seals must be removed before installation in the following manner:*
   a. *Rotate valve ball into open position.*
   b. *Remove four body bolts.*
   c. *Rotate valve ball back to closed position and remove seats and ball.*
   d. *Remove body seals from pipe ends.*
   e. *Place ball, seats, and body seals in a clean suitable container during installation.*
   f. *Reassemble end plates to body.*
2. *When brazing, follow standard procedures for brazing minimizing a direct flame on the valve body (center section).*
3. *When welding, it may be desirable to wrap a damp towel around the center section.*
4. *After brazing or welding, allow the valve to cool. Reassemble the seats, seals, and ball with the valve.*
5. *Carefully tighten the body bolts diagonally across from each other before securing to the following recommended torque:*

VALVE SIZE	RECOMMENDED BOLT TORQUE
1/2" – 3/4"	10-12 foot-pounds
1"	20-24 foot-pounds
1 1/2“ – 2”	30-35 foot-pounds
2 1/2"	45-50 foot-pounds

6. *After installation, cycle valve several times to assure smooth operation.*

   Note: TBV chlorine valves are factory cleaned, lubricated, and prepared. Care must be exercised in order to ensure valve cleanliness during installation.

OPERATION

1. *A quarter turn of the handle clockwise closes the valve and a quarter turn counterclockwise opens the valve.*
2. *Soft-seated ball valves perform best with the ball either fully open or fully closed. Consult the factory regarding characteristics of the media or pressure drop for applications other than fully open or closed.*
3. *In the event that erosive media is present, consult the factory regarding alternate seating materials.*
4. *Any media that might solidify, crystallize, or polymerize should not be allowed to stand in the ball valve cavities. In the event that this should happen, DO NOT force the valve in either direction; disassemble and clean before resuming service.*
5. *Break-away torque (i.e. force which must be exerted to start moving the valve ball) will vary depending on the media, pressure and length of time between cycles, as well as valve seat and packing materials. Consult the factory for specific values.*
6. *The only mechanism of the valve that is adjustable is the stem packing. If adjustment is required, the stem nut may be taken up on by first loosening the handle nut. Adjustment of the stem nut should be no more than one-quarter turn at a time. Over tightening will produce high torque and a shortened seal life.*

MAINTENANCE

A repair kit containing the appropriate number of components is available for rebuilding each size and configuration of valve. Be sure to specify the complete valve model number, and the TBV Inc. sales order number that is stamped on the valve body, when ordering. Additional components, such as balls, stems, etc. are also available for repair purposes. Refer to illustration for part identification.

AT ALL STAGES OF THE FOLLOWING DISASSEMBLY AND REASSEMBLY PROCEDURES, CARE MUST BE TAKEN TO AVOID DAMAGE TO ALL SEALING SURFACES.

1. *Before removing valve from line, make absolutely certain that line pressure is shut down, and that the line is vented, to remove all pressure from the valve. Operate the valve to assure that there is no pressure or media trapped within the valve body cavity. Flush the line as appropriate to remove harmful chemicals that may be present.*
2. *Remove the valve from the line. Be certain to fully decontaminate the valve, if it has been used in services that have any degree of toxicity. Wear protective gloves and clothing as appropriate to avoid contact with potentially harmful chemicals.*

REBUILDING

1. *Stem flats should be in line with valve body before valve is removed from line.*
2. *Remove body bolts and disassemble from line making sure to allow sufficient pipe and clearance for center section removal.*
3. *Remove body seals from end plates.*
4. *With stem flats rotated perpendicular to valve body, remove seats and ball.*
5. *If it is necessary to replace the stem seal, remove handle nut, lockwasher, handle, packing nut, stop, bellevilles, and follower in that order. Lower stem into body cavity and remove stem seal assembly.*
6. *Clean and inspect all components to be sure that they are free from foreign matter and pit marks, paying particular attention to the areas that must maintain a seal (e.g., finished diameter on stem, inside pipe end surface, ball, and bonnet hole). These areas must be free from scratches and pitting.*
7. *Once all components have been cleaned, inspected, and replaced as necessary, the valve can be rebuilt using the factory repair kit provided.*
8. *Reassemble new stem seal/thrust bearing package (refer to illustration).*
9. *Replace follower, belleville washer, stop, and stem seal adjusting nut. Loosely adjust stem packing. Replace handle, lockwasher, and handle nut.*
10. *Lightly lubricate ball and seats with a lubricant compatible with the media for which the service is intended.*
11. *Replace ball into cavity with stem flats in perpendicular position, making sure that the port holes are in the desired position for operation. Once ball is engaged with stem, rotate to in-line position. This will prevent the ball from falling out during assembly.*
12. *Insert new seats into body and body seals on pipe ends.*
13. *Assemble center section back into line again making sure that there is sufficient clearance to avoid end plate sealing surface damage.*
14. *Assemble body bolts and nuts to valve following steps 5 and 6 of the installation procedure.*

15. *Adjust stem packing as follows:*

    a. *Tighten packing nut firmly. The following approximate torque values are given as a guide. It is recommended that the packing be compressed, relaxed, and then re-compressed to these same values. This has been found to provide optimum life for the stem packing.*

NOTE: Periodic stem packing adjustment may be required depending on pressure and temperature and number of cycles. Refer to the recommended stem nut torque chart located below

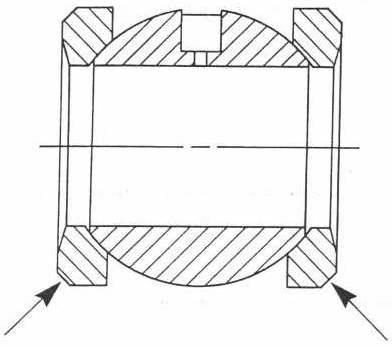
VALVE SIZE	STEM NUT TORQUE
1/2" – 3/4"	80-100 inch-pounds
1"	140-180 inch-pounds
1 1/2“ – 2”	250-300 inch-pounds
3” – 4”	75-95 foot-pounds
6” – 8”	90-110 foot-pounds

    b. *Cycle valve several times to assure smooth operation.*

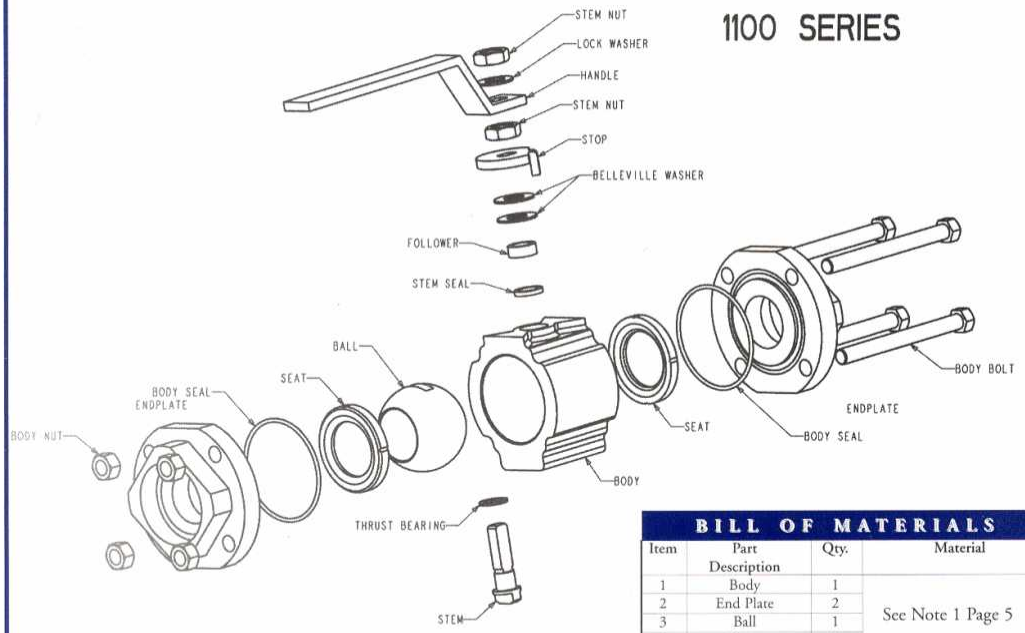
    c. *It is recommended that the rebuilt valve be pressure tested prior to re-installation. Perform seat and shell tests using media compatible with the service, checking for any evidence of leakage. If necessary, adjust packing nut in 1/6-turn increments as necessary to stop leakage. Do not over-tighten, as this will shorten the life of the packing. If there is leakage at the flange joint due to body seal leakage, verify proper and consistent body bolt torque. If leakage persists, check for proper installation of the body seals.*

    d. *Install valve in line following procedures described above.*

16. *Valve is now ready for service.*



1100 SERIES



BILL OF MATERIALS

Item	Part Description	Qty.	Material
1	Body	1	See Note 1 Page 5
2	End Plate	2	
3	Ball	1	
4	Stem	1	
5	Follower	1	
6*	Seat	2	See Note 2 Page 5
7*	Stem Seal	1	As specified
8*	Body Seal	2	
9	Stop	1	300 SS
10	Handle	1	300 SS
11*	Thrust Bearing	1	Filled P.T.F.E.
12	Stem Nut	2	300 SS
13	Body Nut	2	300 SS / Carbon Steel
14	Body Bolt	4	others available
15	Lockwasher	1	400 SS
16	Belleville Washer	2	17-7 SS

*Recommended spares available as kits.