



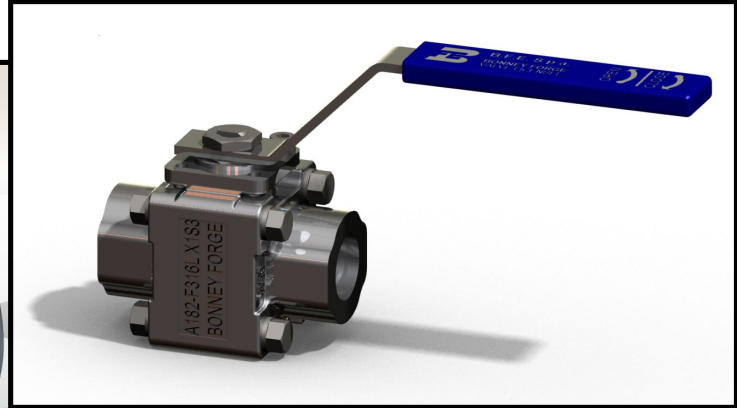
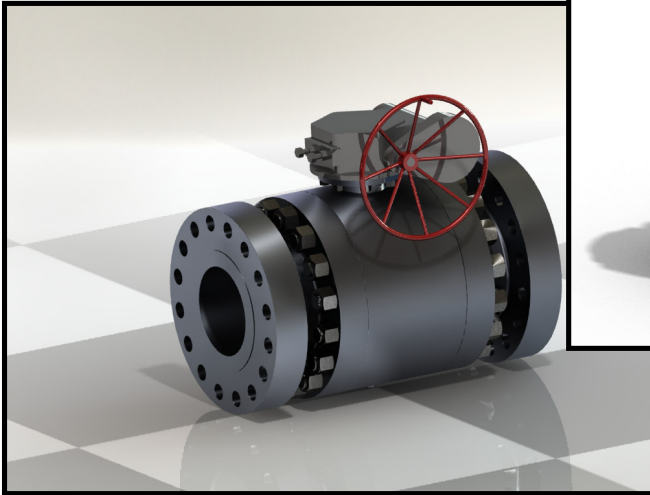
B.F.E. S.p.A.
BONNEY FORGE
VALVE LICENSEE

INSTALLATION AND MAINTENANCE INSTRUCTIONS

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BALL VALVES FLOATING TYPE & TRUNNION MOUNTED SIDE ENTRY



USE THIS MANUAL FOR:

STANDARD PRODUCT FLOATING TYPE	STANDARD PRODUCT TRUNNION TYPE SIDE ENTRY	SPECIAL CONFIGURATION	DOUBLE BLOCK & BLEED

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INSTALLATION AND MAINTENANCE INSTRUCTIONS

1. VALVE STORAGE

A. Preparation and Preservation for Shipment

Preservation and other protective measures for shipment must be sufficient to protect against deterioration and physical damage during shipment. The type of packing must be defined in the Customer's Order and shall be appropriate to ensure safe transportation and conservation before installation.

B. Inspection Procedure

Valve assemblies should be inspected upon receiving and prior to installation. Carefully remove the valve assembly from its shipping crate or box. Valve and accessories should be inspected for damage.

C. Handling

- Never lift or move the valve assembly using the bore, shafts, nut as a pressure point.
- Never lift or move the valve assembly by using the actuator, positioner, extensions or other valve options.
- It is recommended to use lifting straps (instead of chains or hooks) around the valve .
- The transportation of all packed material must be carried out safely and following the local safety regulations.

D. Storage Procedure

- Valves should stay in open position.
- Valves must be operated for 3 full cycles for each periodical check.
- Protective plastic cover on the valve ends should not be removed.
- Valves should be kept in a clean, heated, weather tight (dry), well-ventilated, fire-resistant storage facility with flooring that seals against dust and dirt and will not be subject to flooding.
- Valves should be stored off of the floor on suitable skids, pallets or racks and protected from dirt, debris and exposure to direct sunlight, particularly to soft sealing surfaces.
- Valve assemblies with electrical components, pneumatic tubing, positioners, actuators, and other accessories should be protected from impact.
- Old rust and dust, and the end faces must be protected with plastic or wooden discs fixed with straps.
- Periodical checks at least every 6 months have to be carried out in the storage area to verify that the above mentioned conditions are maintained.

2. VALVE INSTALLATION

A. General

- Remove valve assembly from box or crate with caution.
- Clean the inside of the valve using compressed air. Ensure that there are no solid objects such as pieces of wood, plastic or packing materials within the valve.
- Keep the valve in open position.
- Ensure that the materials of construction listed on the valve nameplates are appropriate for the service intended and are as specified.
- For threaded ends use conventional sealant, for flanged ends or other ends (clamp etc) use the standard method described in the international standards.
- After the valve installation and before the line testing, it is recommended to perform an accurate cleaning of the lines to eliminate dirt and any foreign objects that could seriously jeopardize the tightness between seat/disc and the correct operation of the valve.
- If the valve has been stored for a long time, check the bolt torque for all bolting.



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- If piping system is pressurized with water for testing, and in case the piping system has been shut down after testing for a long time, it is recommended to use corrosion inhibitor with water to pressurize the piping system and after testing, the piping system should be depressurized and the test water completely drained.
- The pipeline must have a pulsation dampener if there are pulsation sources in the line. Lines subjected to pipe vibration and pulsation affect the lifetime of the valve seal parts.

B. Buttwelding end valve

WARNING!!! In case of floating ball valves with short ends the ends must be dismantled from the body, before the welding in line, to avoid damaging of the soft seats due to the high temperature.

<u>SHORT ENDS – ONLY FLOATING TYPE</u>	<u>FLOATING TYPE WITH WELDED OR INTEGRAL NIPPLES</u> - <u>ALL TRUNNION TYPE</u>
<ul style="list-style-type: none"> • Tack-Weld the valve on the pipe in four points on both end caps. • Loose & remove all body screw. • Close the valve. • Lift-out the valve center subassembly. • Finish the welding. • Insert the center subassembly, replace the screw and tighten the screw according to the Bolt Tightening Specification Table. • Check the operation torque. 	<ul style="list-style-type: none"> • Tack-Weld the valve on the pipe in four points on both end caps. • Finish the welding. • Check the operation torque.

3. VALVE OPERATION

- **BALL VALVES valves are 1-0 valves.** They are made to work only in fully open or fully closed position. Operation with partially open valves will damage the internal parts due to problems associated with erosion and turbulence of the flow.
- The handle/handwheel operation direction for the valve opening/closing is indicated direct on the component.
- WARNING!!!! For electric actuated valves test the valve in “HALF OPEN” position in order to check that the stem is moving toward the right sign. This is to check the actuator electrical connections! In case of wrong direction switch the actuator direction!

4. MAINTENANCE

WARNING!!! Do not remove or disassemble the valve while it is under pressure. Depressurize the line and the valve as following:

- ✓ Place the valve in the open position and drain the line.
- ✓ Cycle the valve to relieve the pressure trapped in the body cavity.
- ✓ After removal and before disassembly, cycle the valve several times.

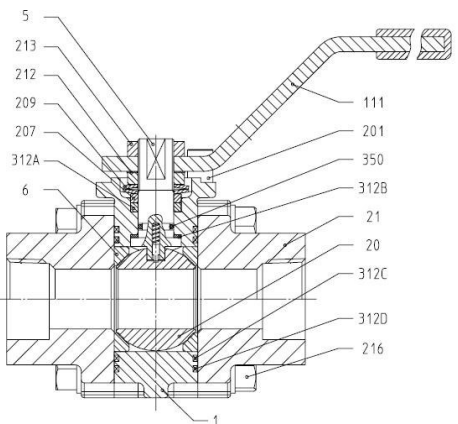
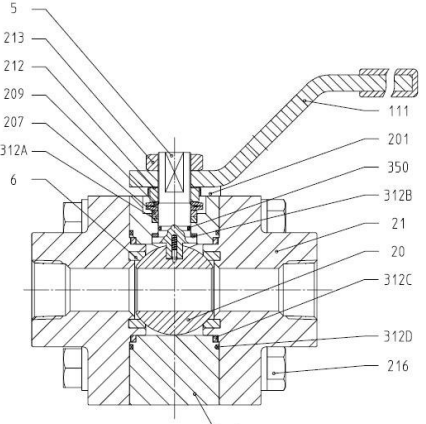
WARNING!!! Line Fluid can be toxic, corrosive or dangerous for the health safety. Protect yourself and others by observing all applicable standard procedure. Make the right choice, **SAFETY FIRST!**

- When possible (for the line maintenance shut off) disassemble the valve in order to inspect all parts. If the seats/gaskets are damaged replace them. Clean all seal surfaces.

5. DISASSEMBLY & RE-ASSEMBLY INSTRUCTION FOR FLOATING VALVES

BEFORE START THE DISASSEMBLY OPERATION THE VALVE MUST BE IN FULLY OPEN POSITION

Disassembling the valve is easily carried out very simple by following these simple steps:

PLANE SEATS	ENCAPSULATED SEATS
<ul style="list-style-type: none"> -Start the disassembly operation with the valve in open position. -Take out all body-closure screws (216). -Operate the valve, set it in close position. -Remove body-closure seals (312C/312D). -Remove seats and ball from the body (6/20). -Remove the handle kit: first handle nut (213), handle (111), stop washer (212), second handle nut (213), spring washer 209), gland (207). -Push the stem (5) into the body. -Remove stem emergency gasket (312A) from the body. -Remove o-ring (350) and thrust washer (312B) from the stem. Verify that the thrust washer has not been accidentally left in the body. 	<ul style="list-style-type: none"> -Start the disassembly operation with the valve in open position. -Take out all body-closure screws (216). -Operate the valve, set it in close position. -Remove body-closure seals (312C/312D). -Remove seats from the closure (6). -Remove ball from the body (20). -Remove the handle kit: first handle nut (213), handle (111), stop washer (212), second handle nut (213), spring washer (209), gland (207). -Push the stem (5) into the body. -Remove stem emergency gasket (312A) from the body. -Remove o-ring (350) and thrust washer (312B) from the stem. Verify that the thrust washer has not been accidentally left in the body.
	

NEEDLE DISASSEMBLY – APPLICABLE ONLY FOR DB&B VALVES

- Remove the stop pin on the main valve body.
- Unscrew the needle valve.
- Remove gasket between the needle and the main valve.
- Unscrew the retaining bush.
- Rotate the stem into the bonnet (close direction) up to then the stem screw is out from the bonnet screw.
- Remove lever nut, lever, bush and gland.
- Remove the stem.
- Remove the packing and the bottom ring.

PLEASE NOTE:

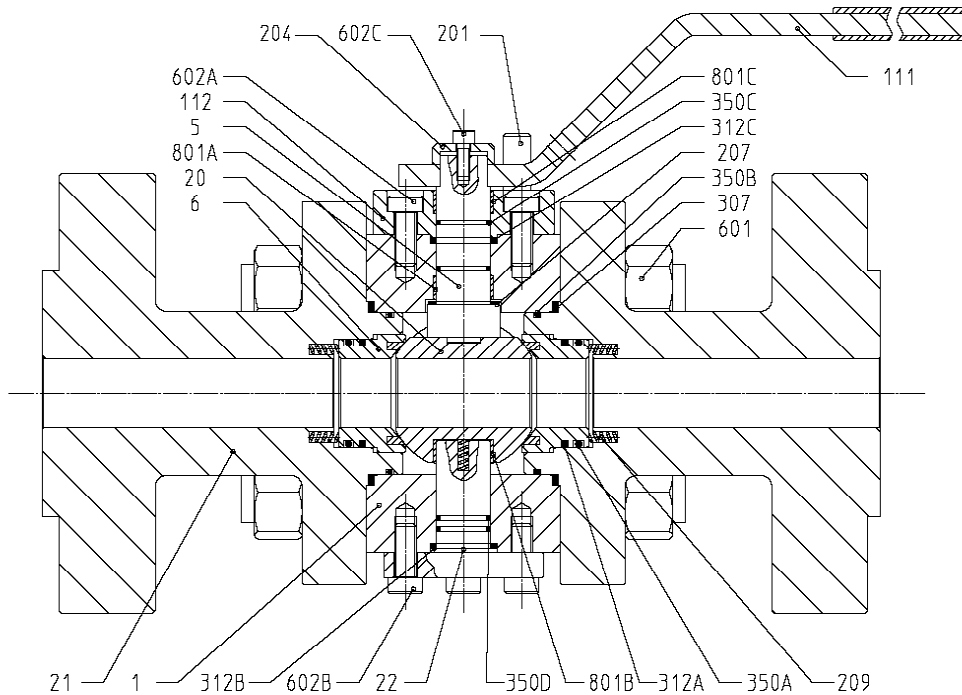
- ✓ That the Visual Graphic Instructions refer to the standard BFE product. Each valve can be different depending on the required customer option. We issue for EACH valve a general arrangement drawing with the accurate product geometry. Please refer to it and if you don't have ask for it!
- ✓ Starting the re-assembly instruction, clean all parts and use light oil or grease on ball seats and stem.
- ✓ For the valve re-assembly follow the disassembly instruction from the last item to the first.
- ✓ For actuated valves reset the stop position (open & close) and visually check that the ball is fully open and fully close into the valve.
- ✓ The instructions for DB&B valves are identical, just add the needle disassembly instruction.



6. DISASSEMBLY & RE-ASSEMBLY INSTRUCTION FOR TRUNNION VALVES

Disassembling the valve is easily carried out very simple by following these simple steps:

INSTRUCTION FOR SMALL SIZES DIAMETER VALVES



INSTRUCTION APPLICABLE FOR:
NPS ≤ 2 – ALL PRESSURE CLASSES
NPS = 3 – PRESSURE CLASSES UP TO ASME 900

- Start the disassembly operation with the valve in open position.
- Take out all body-closure bolting (601).
- Operate the valve, set it in close position.
- Remove the-closure (21) and their seals (307/350B).
- Remove seats, springs and seat gaskets from the closure (6/209/312A/350A).
- Take out all the trunnion screws (602B).
- Remove the trunnion and their gaskets (22/312B/350D). Please don't lose the anti-static spring!!!
- Remove the ball (20) and their bottom bearing (801B).
- Remove the handle kit: handle screw (602C), handle ring (204), handle (111).
- Take out all the cover screws (602A).
- Remove the cover (112) and the cover bearing (801C).
- Push the stem (5) into the body.
- Remove stem emergency gasket (312C) from the body.
- Remove o-ring (350C) the stem bearing (801A) and thrust washer (207) from the stem. Verify that the thrust washer has not been accidentally left in the body.

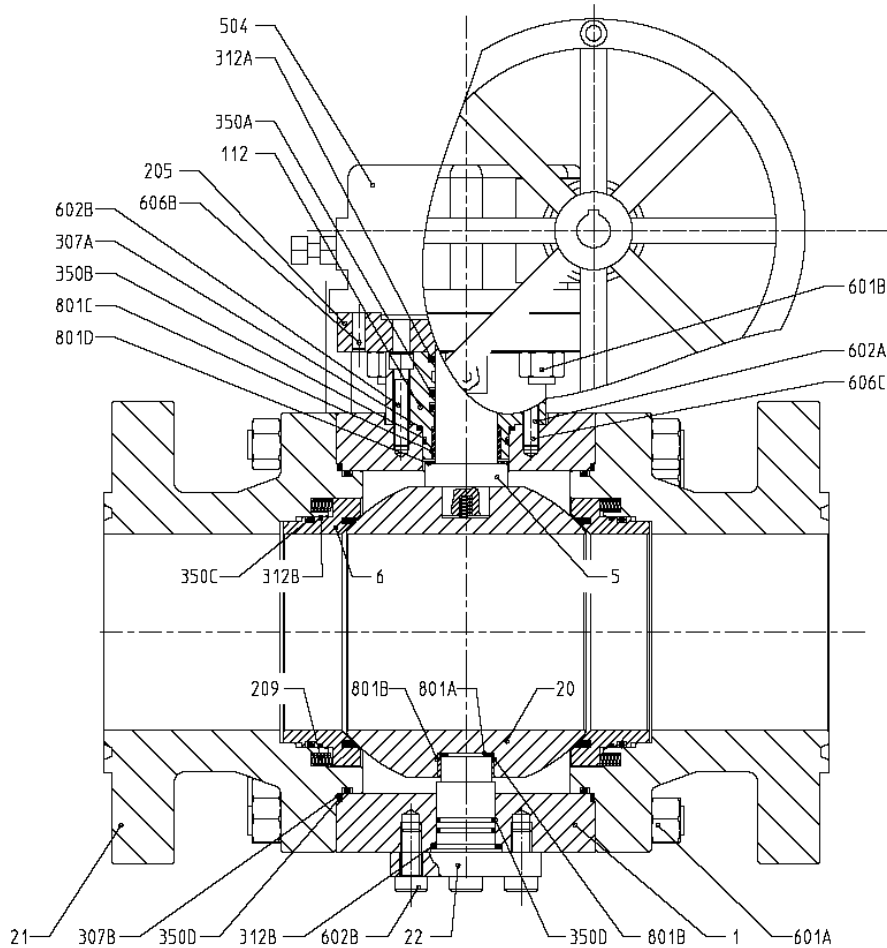
PLEASE NOTE:

- ✓ That the Visual Graphic Instructions refer to the standard BFE product. Each valve can be different depending on the required customer option. We issue for EACH valve a general arrangement drawing with the accurate product geometry. Please refer to it and if you don't have ask for it!
- ✓ Starting the re-assembly instruction, clean all parts and use light oil or grease on ball seats and stem.
- ✓ For the valve re-assembly follow the disassembly instruction from the last item to the first.
- ✓ For actuated valves reset the stop position (open & close) and visually check that the ball is fully open and fully close into the valve.
- ✓ The instructions for DB&B valves are identical, just add the needle disassembly instruction contained in the previous page.



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INSTRUCTION FOR MID SIZES DIAMETER VALVES



**INSTRUCTION APPLICABLE FOR:
 NPS = 3 – PRESSURE CLASSES ASME 1500 AND ABOVE
 NPS = 4 – ALL PRESSURE CLASSES**

- Start the disassembly operation with the valve in open position.
- Take out all body-closure bolting (601A).
- Operate the valve, set it in close position.
- Remove the-closure (21) and their seals (307/350D).
- Remove stem emergency gasket (307B) from the body.
- Remove seats, springs and seat gaskets from the closure (6/209/312B/350C).
- Take out all the trunnion screws (602B).
- Remove the trunnion and their gaskets (22/312B/350D).
- Remove the operator kit: Gear (504), gear flange (205), boltings (606B/601B/602A).
- Take out all the cover screws (602B/606C).
- Remove the cover (112), stem (5), cover bearing (801C/801D) and gasket (312A/307A/350A/350B). Please don't lose the anti-static spring!!!
- Remove the ball (20) and their bottom bearings (801A/801B).

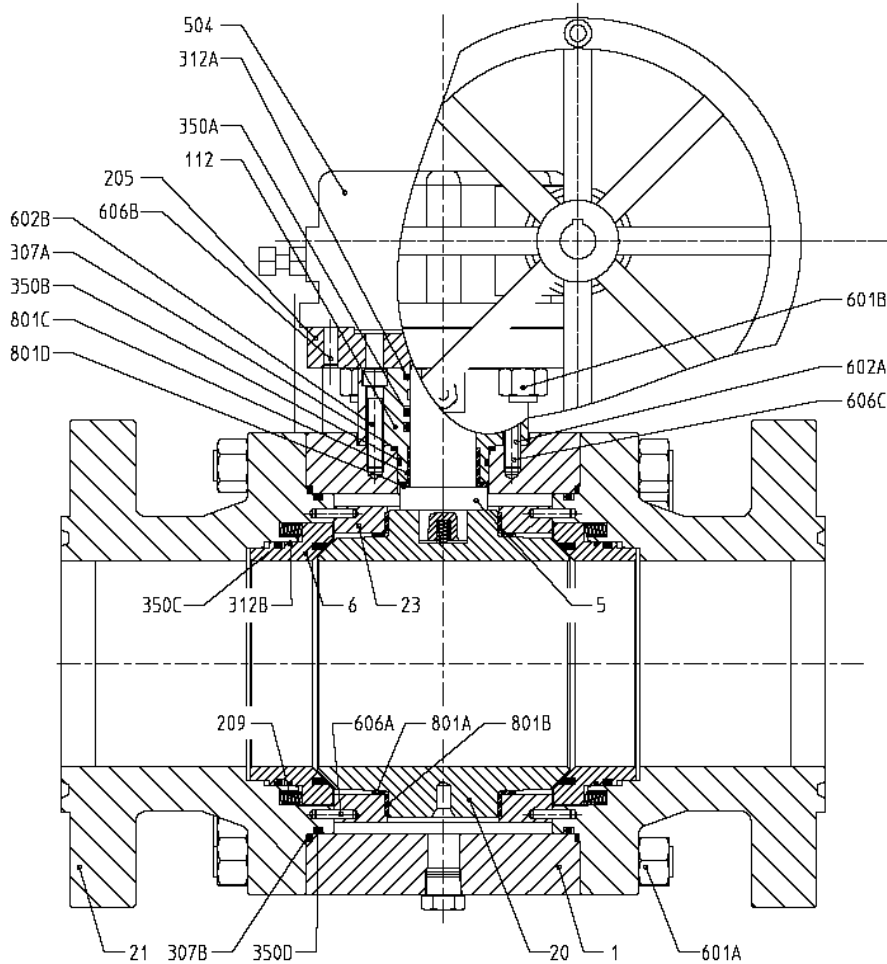
PLEASE NOTE:

- ✓ That the Visual Graphic Instructions refer to the standard BFE product. Each valve can be different depending on the required customer option. We issue for EACH valve a general arrangement drawing with the accurate product geometry. Please refer to it and if you don't have ask for it!
- ✓ Starting the re-assembly instruction, clean all parts and use light oil or grease on ball seats and stem.
- ✓ For the valve re-assembly follow the disassembly instruction from the last item to the first.
- ✓ For actuated valves reset the stop position (open & close) and visually check that the ball is fully open and fully close into the valve.
- ✓ The instructions for DB&B valves are identical, just add the needle disassembly instruction contained in the previous page.



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INSTRUCTION FOR LARGE SIZES DIAMETER VALVES



INSTRUCTION APPLICABLE FOR:
NPS ≥ 6 – ALL PRESSURE CLASSES

- Start the disassembly operation with the valve in open position.
- Take out all body-closure bolting (601A).
- Operate the valve, set it in close position.
- Remove the closure (21) and their seals (307/350D).
- Remove stem emergency gasket (307B) from the body.
- Remove seats, springs and seat gaskets from the closure (6/209/312B/350C).
- Remove the operator kit: Gear (504), gear flange (205), boltings (606B/601B/602A).
- Take out all the cover screws (602B/606C).
- Remove the cover (112), stem (5), cover bearing (801C/801D) and gasket (312A/307A/350A/350B). Please don't lose the anti-static spring!!!
- Remove the ball (20), trunnion (23) and their bearings (801A/801B/606A).

PLEASE NOTE:

- ✓ That the Visual Graphic Instructions refer to the standard BFE product. Each valve can be different depending on the required customer option. We issue for EACH valve a general arrangement drawing with the accurate product geometry. Please refer to it and if you don't have ask for it!
- ✓ Starting the re-assembly instruction, clean all parts and use light oil or grease on ball seats and stem.
- ✓ For the valve re-assembly follow the disassembly instruction from the last item to the first.
- ✓ For actuated valves reset the stop position (open & close) and visually check that the ball is fully open and fully close into the valve.
- ✓ The instructions for DB&B valves are identical, just add the needle disassembly instruction contained in the previous page.



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7. TROUBLESHOOTING GUIDE

Please contact BFE for any problem not in the table.

<i>SYMPTOM</i>	<i>POSSIBLE CAUSE</i>	<i>SOLUTION</i>
Valve leaking	Valve not fully closed due to foreign objects in the line or solid obstruction	Valve Internal part inspection (disassembly if required)
	Damaged trim	Replace damaged part
Body-Closure leaking	Screw tightness unsatisfactory	Tighten the screw according to the Bolt Tightening Specification Table
	Gasket damaged	Replace gasket
Leakage around stem	Packing Nut tightness unsatisfactory	Increase the Nut Tightness
	Gasket damaged	Replace gasket
	Stem Damaged	Replace stem
Blocked valve or operating very hard	Valve blocked due to foreign objects in the line or solid obstruction	Valve Internal part inspection (disassembly if required)
	Valve blocked due to valve parts damaged	Disassemble the valve for inspection of all parts.

8. ANNEX A - BOLT TIGHTENING SPECIFICATION TABLES

BOLT TIGHTENING TABLE FOR BODY-CLOSURE BOLTING								
ITEM	SCREW SIZE	TORQUE [Nm]	ITEM	SCREW SIZE	TORQUE [Nm]	ITEM	SCREW SIZE	TORQUE [Nm]
1	M8	20	9	M24	460	17	M48	3740
2	M10	35	10	M27	670	18	M52	4810
3	M12	60	11	M30	910	19	M56	5980
4	M14	90	12	M33	1230	20	M60	7420
5	M16	230	13	M36	1570	21	M64	8970
6	M18	250	14	M39	2030	22	M68	11400
7	M20	270	15	M42	2500	23	M72	13500
8	M22	370	16	M45	3110	24	M76	16000

BOLT TIGHTENING TABLE FOR HANDLE NUT		
ITEM	SCREW SIZE	TORQUE [Nm]
1A	M10	10
2A	M12	15
3A	M16	30
4A	M22	40
5A	M27	65
6A	M36	250