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1. ERIKS operating companies

ECON ball valves are being delivered by several ERIKS operating companies on a worldwide basis. In this manual these will be referred to as 'ERIKS', the individual terms of delivery of the ERIKS operating company having executed the order are applicable.

2. Product description

The ECON ball valves are designed according the information in our latest catalogue or see our website www.eriks.com and should be used in accordance with the applicable pressure-temperature rating as stated on this website. Ball valves are provided with marking, according to EN 19. The marking makes the identification of the valve easier and contains:

- size (inch)
- pressure rating class
- body material marking
- ECON logo
- heat numbers

3. Requirements for maintenance staff

The staff assigned to do assembly, operating and maintenance tasks should be qualified to carry out such jobs and in any circumstance, ensure personal safety

4. Transport and storage

During transport and storage the valves should be protected against external forces, influence and destruction of the painting layer as well. The purpose of the painting layer is to protect the valve against rust, during transport and storage. The valves should be stored in an unpolluted space and should also be protected against all atmospheric circumstances. There should be taken care of the temperature and humidity in the room, in order to prevent condensate formation.

5. Function

ECON ball valves are designed to stop the flow of a medium. The valve is closed by turning the lever clockwise; please don't use tools to increase the torque on the lever.

6. Application

The ECON ball valves are used for industrial systems gasses and liquids. The valves are designed for standard operating conditions. For the use of extreme conditions e.g. aggressive or abrasive media, it is recommended to mention this at the ordering stage, to verify whether the valve is suitable. The installation designer is responsible for the valve selection, suitable for the working conditions. The valves are unsuitable, without written permission of an ERIKS company, to apply for hazardous media as referred into Regulation (EC) No 1272/2008..

7. Installation

- a. Remove the protective plastic cap on 2-threaded, BW and SW ends, and clean or flush the valves.
- b. Prior to mounting, flush and/or clean the pipeline to remove all accumulated extraneous matters, which may damage the seats and ball surface and check if the valve has a preferred flow direction and take this direction into account during installation.
- c. Installation of threaded ends:
 - Use conventional sealant (e.g. Teflon) on the threads.
 - Apply a wrench only on the end cap of the valve for tightening. Applying a wrench on the valve body or lever can seriously damage the valve.
- d. Installation of BW and SW end valves
 - Tack-weld the valve on the pipe on four points on both caps, with the ball valve in open position. Extended butt-weld end ball valves allow direct welding. For short butt-weld or socket-weld end connections process the next steps.
 - Removed all body bolts except one and after losing the remaining one, the valve body can be swung out. Secure seats from falling temporary with tape.
 - Finish welding both end caps on the pipe.
 - When cooled down, clean both end caps and body surface.
 - Remove temporary tape, swing the body back to the original position and replace the bolts (if necessary). Put the valve in the open position. Tighten all nuts slightly. During this operation it is very important to keep body and end caps perfectly parallel, thus, preventing distortion of the end caps.
 - Tighten body bolts evenly. Make sure that maximum tightening torque is observed per bolting torque data. See table B
- e. Check proper operation of the valve.
- f. The pipeline shall be free of tension after installation.
- g. For any further information please contact the ERIKS company that has supplied the valves. Contact information can be found on www.eriks.com
- h. Make sure the pipeline will be flushed clean prior to operation.
- i. The operation of the valve consist of turning the stem (by manual or automated means) ¼ turn (90°) clockwise to close, and ¼ turn counter-clockwise to open.
- j. When the lever (if used) and/or stem flats or groove are in line with the pipeline, the valve is open.
- k. Besides operating by lever, Fig. 7422, 7442, 7522, 7542, 7622, 7642, 7722 and 7742 can also be operated with an actuator, mounted on the ISO 5211 "Direct Mount" top-flange. (Please see our catalogue to check top-flanges sizes)
- l. Operating torque requirements will vary depending on the length of time between cycle, media in the system line pressure and type of valve seat.

8. Maintenance

Long life and maintenance-free of valves can be maintained under normal working conditions and in accordance with pressure/temperature and compatibility data chart.

Warning:

- Before starting any service jobs, make sure that the medium supply to the pipeline is cut off, pressure is decreased to ambient pressure, the pipeline is completely cleaned and ventilated and the plant is cooled down.
- Keep always personal safety precautions in mind and always use appropriate protection e.g. clothing, masks, gloves etc.
- Be alert that ball valves can trap pressurized fluid in ball cavity when closed position.
- Be alert that the temperature still can be very high of low and can cause burns.

a. Re-tighten Packing

For maximum stem packing life, the proper packing adjustment procedure must be followed:

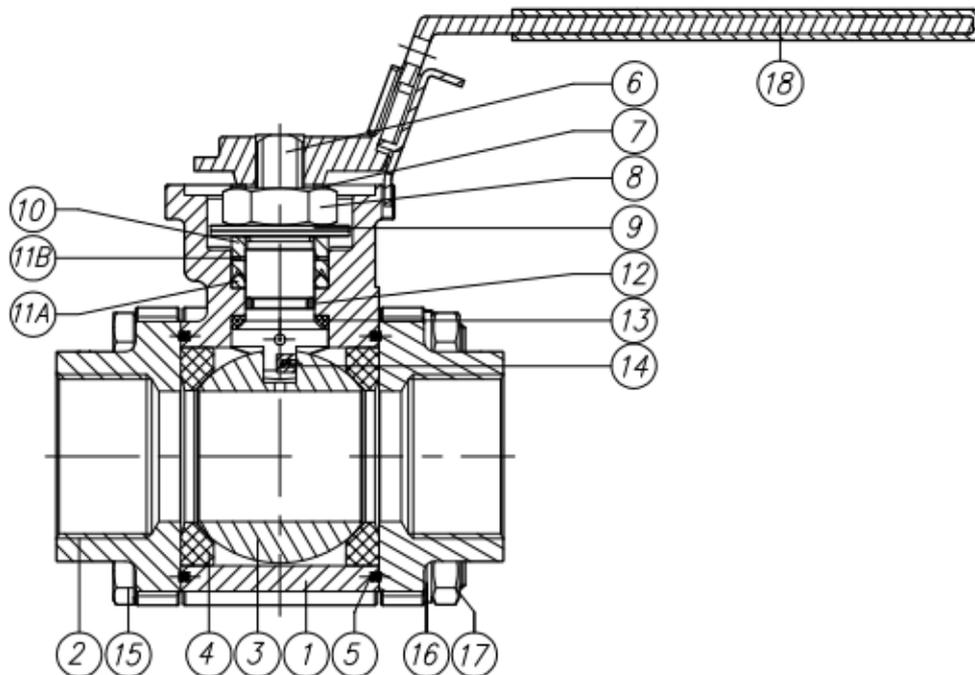
- Should a leakage occur at the stem packing, retighten the stem nut (8)
- Take care that the stem nut (8) is not tighten too much. Normally the leakage can be stopped by simply turning the stem nut (8) by 30° to 60° clockwise.

b. Replacement of seats and seals

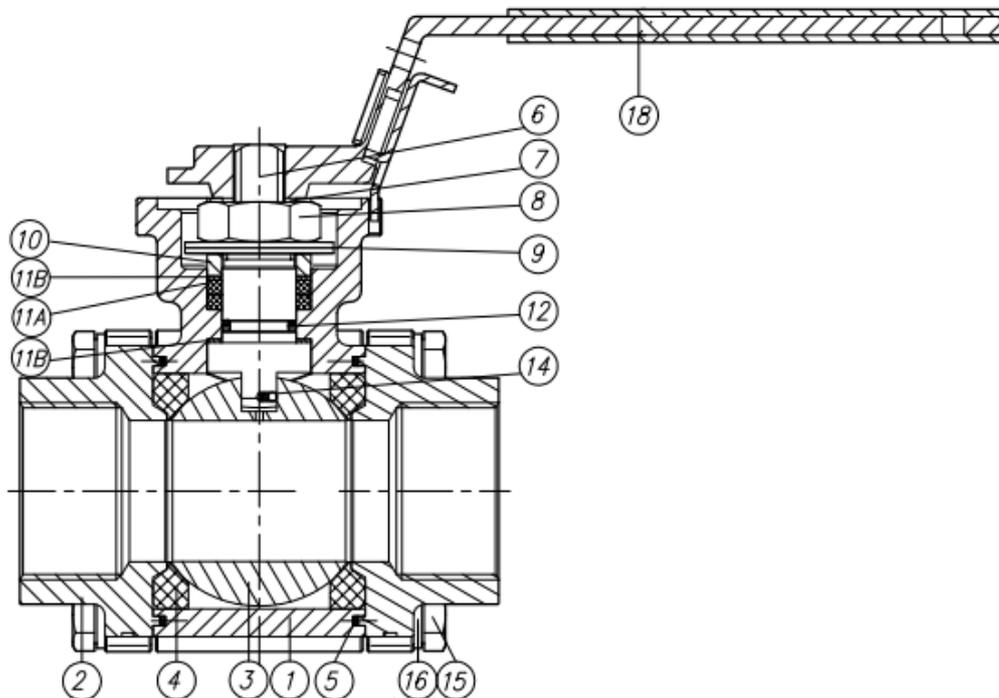
1) Disassembly of parts can be done while the valve is installed in the pipeline:

- Before disassembly, make sure the pressure is released, to discharge any hazardous media from the valve inside body cavity and to cool down the ball valve.
- Remove all body bolts and washers (15+16) except one and after losing the remaining one, the valve body can be swung out, and place valve in close position.
To swing the body can only be done at the Non Fire-Safe executions!!
- Remove body gasket (5), seat rings (4) and ball (3). Inspect the ball accurately on scratches, if any, the ball should be replaced.
- When the stem packing needs to be replaced. Remove parts of upper parts in following order: Lever nut/screw (19+20), lever (18), nut-lock-cap (7), stem nut (8), Belleville washers (9) and gland (10).
- Push stem (6) down into body cavity and remove, then remove upper washer (11B), stem packing (11A) and lower washer (11B) from the body (1).
- Also the O-ring (12) can now be taken out from the stem.

Ball valve, standard – non fire-safe execution.



Ball valve, fire-safe execution.



2) Reassembly:

- Clean and inspect all parts, reassembly by processes are reverse sequence of disassembly.
- Reassemble the ball valve by using new seat rings, body seal rings and stem packing is strongly recommended.
- Follow procedures 8b1 in reversed order. Swing the body back to original position. Put the ball in open position. Tighten body bolts evenly per Torque Data Table B.
To swing the body can only be done at the Non Fire-Safe executions!!
- Tighten the stem nut (8), using Table A stipulated torque figures.
- Pressure test the valve, then cycle valve several times before resuming services

Table A: Torque Figures for stem nut tighten

| Size FB | Size RB | Stem nut size | Torque Nm |
|-----------|---------|---------------|-----------|
| 1/4"-1/2" | 3/4" | 7/16-20 UNF | 10 |
| 3/4" | 1" | 7/16-20 UNF | 10 |
| 1" | 1.1/4" | 9/16-18 UNF | 10 |
| 1.1/4" | 1.1/2" | 9/16-18 UNF | 10 |
| 1.1/2" | 2" | 3/4-16 UNF | 20 |
| 2" | 2.1/2" | 3/4-16 UNF | 20 |
| 2.1/2" | 3" | 7/8-14 UNF | 30 |
| 3" | 4" | 7/8-14 UNF | 30 |
| 4" | X | 1.1/8-12 UNF | 50 |

Table B: Torque Figures for flange bolt tighten

| Size FB | Size RB | Body bolting size | Torque Nm | Torque Nm Fire |
|-----------|---------|-------------------|--------------------------|--------------------------------|
| | | | Standard Execution A2-70 | Safe Execution B8M Class 2 S10 |
| 1/4"-1/2" | 3/4" | M6 | 5 | 7.5 |
| 3/4" | 1" | M8 | 10 | 18 |
| 1" | 1.1/4" | M8 | 12 | 18 |
| 1.1/4" | 1.1/2" | M10 | 19 | 36 |
| 1.1/2" | 2" | M10 | 25 | 36 |
| 2" | 2.1/2" | M12 | 31 | 60 |
| 2.1/2" | 3" | M14 | 53 | X |
| 3" | 4" | M16 | 62 | X |
| 4" | x | M16 | 95 | X |

Above torques are only valid by using anti-seizing paste. This paste must be applied as well on the bolt as on the nut surface which is in contact with the body.

The body bolts need to be greased with anti-seizing paste in order to prevent galling.

Fabricate, Bechem Berulub VPN 13 Spray

9. Service and repair

All service and repair jobs should be carried out by authorized staff, using suitable tools and user shall use genuine valve parts.

- Welding repair and drilling of the valve is forbidden.
- It is forbidden to disassemble the valve when the valve is under pressure.
- Before you replace seats or seals you have to clean the working areas where you have to put the seats or seals.
- After replacement of the ball valve it is necessary to check the valve operation and tightness of all connections. Leakage test should be carried out.
- After installation, the valve should be checked and maintained periodically at least every 3 months, depending on the medium. A (partial) operation cycle of the valve is recommended.

10. Troubleshooting

It is essential that the safety regulations are observed when identifying the fault.

| Problem | Possible cause | Corrective measures |
|---------------------------|---|---|
| No flow | The ball valve is closed | Open the ball valve |
| | Dust caps were not removed | Remove dust caps |
| Little flow | Valve not completely open | Open valve completely |
| | Piping system clogged | Check piping system |
| Valve difficult to open | Stem packing too tight | Slacken stem nut |
| | Wrong direction of rotation | Turn counter clockwise to open |
| | Ball seat rings damaged by foreign particles. | Replace the seat rings |
| | Expanded medium behind the ball | Cool down the ball valve |
| Leakage across the stem | Stem packing gland slack | Tighten stem nut, if necessary replace the ball valve |
| Leakage across valve seat | Valve not properly closed | Pull lever tight without tools |
| | Seat damaged by foreign particles | Replace the seat rings |
| | Medium contaminated | Clean valve and install dirt screen |
| Operating failure | Packing too tight | Loosen stem nut |

11. Removal

Dismantled and rejected valves cannot be disposed with household waste. The valves are made of materials which can be re-used and should be delivered to designated recycling centers.

General warning:

General note for products which may be used for seawater:

Although our products can be used in seawater systems it should always be noted that, in case of installation in a piping system made of materials which are frequently used because of their excellent seawater resistance (e.g. Cunifer), large potential differences may occur possibly causing corrosion which could permanently damage the proper functioning and integrity of our product.

A combination of different materials should always be mentioned prior to the purchase of our products in order for us to give the best possible advise on a safe functioning.