

Content

1. ERIKS operating companies
2. Product description
3. Requirements for maintenance staff
4. Transport and storage
5. Function
6. Application
7. Installation
8. Maintenance
9. Service and repair
10. Troubleshooting
11. Removal

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 to DIN 3357/1,2 and EN 12516-1. Technical information about the ball valves can be found on our website www.eriks.com valves 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 (DN)
- pressure rating class
- body and bonnet material marking
- ECON logo
- heat numbers
- tag plate

3. Requirements for maintenance staff

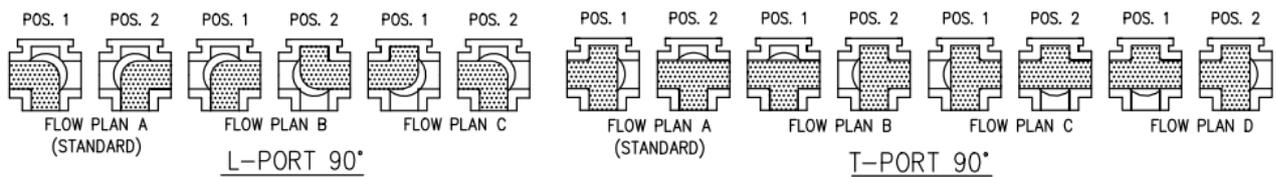
The staff assigned to assembly, operating and maintenance tasks should be qualified to carry out such jobs and in any circumstance, ensure personal safety

4. Transport and storage

Transport and storage should always be carried out with the ball complete open and 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

The ECON 3-way ball valves are designed for diverting (L-port) and mixing (T-port) of clean fluids and gasses. The ECON 3-way ball valves are not designed for applications where 100% leak tightness is required and not for throttling operations. Don't use tools to increase the torque on the lever for operation. ECON 3-way valves can only be used for the below mentioned flow plans. Other flow plans are not recommended and may lead to leakage over the ball seats! Also putting pressure on the ports which are not part of the flow plans shown below, may lead to leakage over the ball seats.



6. Application

The ECON ball valves are used for industrial systems (clean 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

During the assembly of the ball valves, the following rules should be observed:

- make sure before an assembly that the ball valves were not damaged during the transport or storage.
- make sure that applied ball valves are suitable for working conditions, medium used in the plant and the right system connections, according to pressure and temperature limits as per the tag plate.
- to take off dust caps if the valves are provided with them.
- prior to mounting, flush and/or clean the pipeline to remove all accumulated extraneous matters, which matters shall damage to the seats and ball surface.
- for a correct functioning, the valve must be stress free connected to the pipeline, supports must be arranged to prevent any additional stress, caused by the weight of the valve or the pipeline.
- check the flow direction T- or L-type on the stem, the closing direction mark is shown on the handle. Please see flow plans for possible flow directions.
- the valves are allowed for 0°-90°-180°-270°-360° by turning the handle based on the different flow plans. The valves are allowed locking in every 90° turn.
- this valve can be operated by actuator. Before mounting the actuator the stem (gland), nut(12) has to be secured by the stop-lock-cap(13). Then the actuator must be directly mounted on ISO 5211 mounting pad without any adapter or bracket. Make sure the mounted actuator must not cause a thrust load on the valve stem(5).
- if the valve is used for a high pressure difference over the connections, contact an ERIKS company for advice.

8. Maintenance

Before starting any service jobs, make sure that the medium supply to the pipeline is cut off, pressure was decreased to ambient pressure, the pipeline is completely cleaned and ventilated and the plant is cooled down. Always keep safety instructions in mind and take all personal safety precautions.

During maintenance, the following rules should be observed:

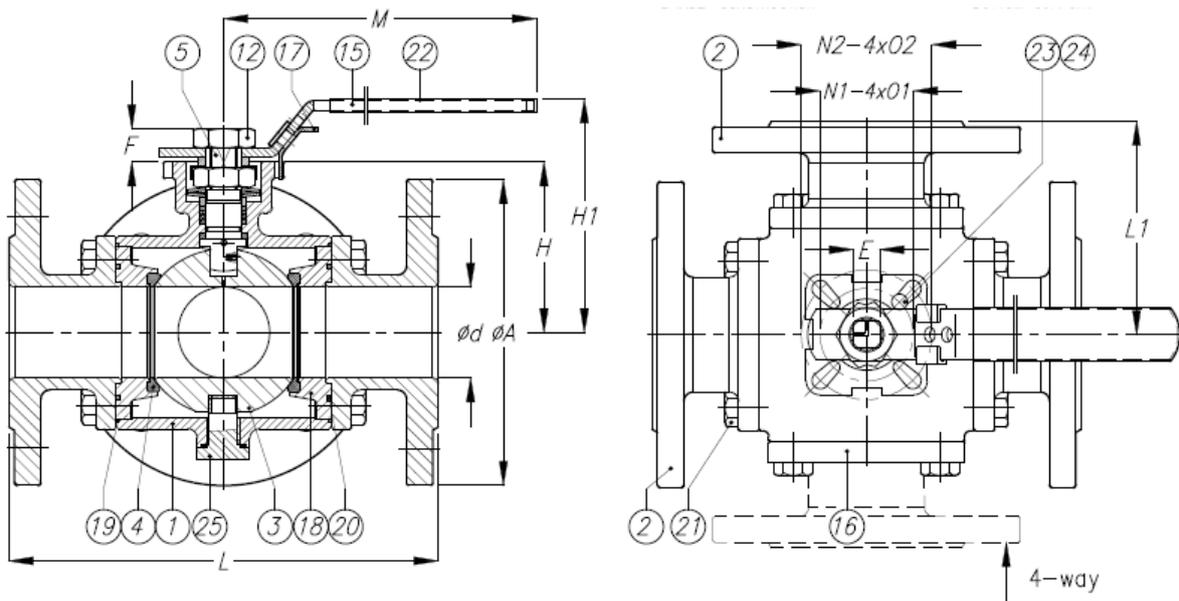
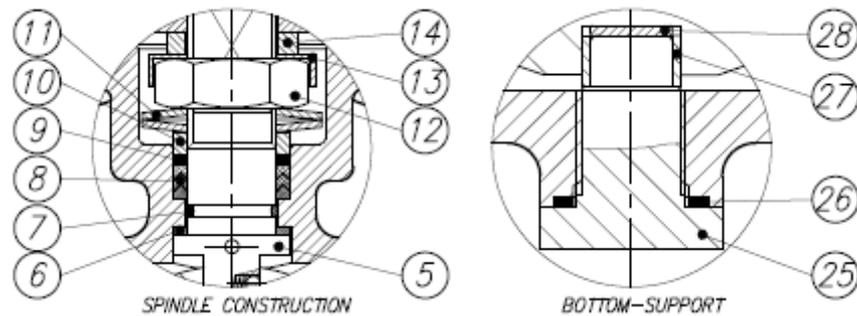
- keep always personal safety precautions in mind and always use appropriate protection e.g. clothing, masks, gloves etc.
- be alert that the temperature still can be very high or low and can cause burns.
- check the valve on all possible leaking possibilities.
- dust, grease and medium residual, must be frequently cleaned of the valve body and all moving parts, such as stem to maintain all operating functions.
- check if all bolts and nuts are still fastened.
- be alert that the ball valve can trap pressurized fluids in the ball cavity, when in closed position.

- if required replace the stem seal, for safety reasons we recommend that the valves only can be repacked when depressurized, drained and ventilated.
- the thickness of body and bonnet must be checked to ensure safety operation at an interval of at least three months.

1) Re-tighten packing

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

- Should a leakage occur at the gland packing, retighten the stem(gland), nut(12).
- Take care that the stem nut(12) are not tighten too much; normally the leakage can be stopped by simply turning the stem nut(12) by 30° to 60°.



2) Replacement of seats and seals.

A) Disassembly

- before disassembly, make sure to discharge any hazardous media from the valve inside body cavity.
- remove valves from pipeline.
- Remove handle nut(12), handle(15), washer(14), stop-lock-cap(13), stem nut(12), Belleville washer(11), gland(10), bushing(9)
- Remove all end cap(2), body gasket(19), ball seat(4), ball(3).
- Push stem(5) down into the body cavity and remove, then remove stem seal-ring(6), V-ring packing(8) from the body(1).

Caution: Use care to avoid scratching the surface of stem and packing chamber.

B) Reassembly

- Reassembly process is reverse sequence of disassembly.
- Clean and inspect all parts, full replacement of all soft parts (seats and seals) are strongly recommended.
- Tighten the body bolt (21) crosswise using the torque figure in Table 1+2
- Tighten the stem nut (12) using the torque figures in Table 3.
- Cycle the valve slowly with gentle back and forth motion to build gradually to full quarter turn.
- If possible, test the valve, then cycle valve several times before resuming service.

Table 1: Torque body bolting data for DIN PN16/40 drilled valves

Valve Size		Bolting(1)	A193-B7 & A193-B8			Bolting(2)	A193-B7 & A193-B8		
PN16	PN40	Specification	N.m	In.lb	QTY	Specification	N.m	In.lb	QTY
DN15		M8*1.25	14~19	126~168	4x4=16	-	-	-	-
DN20					4x4=16				
DN25		M10*1.5	28~38	252~336	4x4=16	-	-	-	-
DN32					4x4=16				
DN40		M12*1.75	50~67	442~589	4x4=16	M8*1.25	14~19	126~168	4
DN50					4x4=16				4
DN65					4x4=16				4
DN80		M14*2	80~107	709~945	4*5=20	-	-	-	-
					4x4=16	M16*2	127~170	1126~1500	4
	DN80				8*5=40	-	-	-	-
DN100		M16*2	127~170	1126~1500	6*3=18	M20*2.5	248~331	2200~2932	4*2=8
	DN100				8*5=40				-

Table 2: Torque body bolting data for ANSI Class150/300 drilled valves

Valve Size		Bolting(1)	A193-B7 & A193-B8			Bolting(2)	A193-B7 & A193-B8					
Class 150	Class 300	Specification	N.m	In.lb	QTY	Specification	N.m	In.lb	QTY			
1/2"		5/16-18UNC-2A	12~17	106~152	4x4=16	-	-	-	-			
3/4"					4x4=16							
1"		3/8-16UNC-2A	25~33	221~292	4x4=16	-	-	-	-			
1.1/4"					4x4=16							
1.1/2"		1/2-13 UNC-2A	58~77	513~679	4x4=16	5/16-18UNC-2A	12~17	106~152	4			
2"					4x4=16				4			
2.1/2"					4x5=20				-	-	-	-
3"		9/16-12UNC-2A	84~111	740~986	4x4=16	5/8-11UNC-2A	116~154	1024~1366	4			
					8*5=40				-	-	-	-
	3"				-				-	-	-	-
4"		5/8-11UNC-2A	116~154	1024~1366	6*3=18	3/4-10UNC-2A	209~278	1847~2462	4*2=8			
	4"				8*5=40				-	-	-	-



3" CLASS 150 (PN16)



3" CLASS 300 (PN40)

Table 3: Torque figures for stem nut tighten

Valve Size	N.m	In.lb
DN15	8,0 ~ 9,0	71 ~ 89
DN20	8,0 ~ 9,0	71 ~ 89
DN25	10 ~ 13	89 ~ 115
DN32	10 ~ 13	89 ~ 115
DN40	16 ~ 19	142 ~ 168
DN50	16 ~ 19	142 ~ 168
DN65	22 ~ 25	195 ~ 221
DN80	22 ~ 25	195 ~ 221
DN100	29 ~ 32	257 ~ 283

9. Service and repair

All service and repair jobs should be carried out by authorized staff, using suitable tools and user shall use valve packing, gasket, bolt and nut of the same size and material as the original one.

- welding repair and drilling of the valve is forbidden.
- it is forbidden to replace seats or seals when the valve is under pressure.
- before you replace seats or seals you have to clean the areas where you have to place the seats or seals.
- after replacement of seats or seals it is necessary to check the valve operation and tightness of all connections. Tightness test should be carried out.
- after installation, the valve should be checked and maintained periodically at least every 3 months, depending on the medium.

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 operate	Stuffing box seal too tight	Slacken nut
	Wrong direction of rotation	Turn counter clockwise to open
	Ball seat damaged by foreign particles.	Replace the ball seats
	Expanded medium behind the ball	Cool down the ball valve
Leakage across the stem	Stuffing box gland slack	Tighten stuffing box gland, if necessary renew stuffing box packing
Leakage across valve seat	Valve not properly closed	Pull lever tight without tools
	Seat damaged by foreign particles	Replace the ball seats
	Medium contaminated	Clean valve and install dirt screen
Operating failure	Packing too tight	Loosen gland nut

11. Removal

All 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 advice on a safe functioning.