Content

1. ERIKS operating companies

ECON piston 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 piston 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. ECON piston valves are provided with casted markings according to EN 19. The marking makes the identification of the valve easier and contains:

- size (DN)
- pressure rating class
- body material marking
- arrow, indicating the preferred medium flow direction
- heat numbers (when required)
- CE marking when applicable
- tag plate with ECON logo and fig. number

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 piston complete closed and the valve 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 during storage, in order to prevent condensate formation.
It is not allowed to fit lifting devices to connection holes or hand wheel.

5. Function

ECON piston valves are used to shut off or connecting of pipelines and operate on the principle of a piston, moving inside of basically graphite sealing rings. The bottom and upper ring provide internal sealing and atmospheric sealing. To ensure the tightness of the sealing, it is very important that piston and sealing rings are manufactured and handled with utmost care, to avoid any damage.
The valve is closed by turning the hand wheel clockwise; unlike globe valves, piston valves do not require increased final torque. Due to the design of piston valves, the sealing will be achieved before the closed position is reached. The valves can also be used for throttling the media.

6. Application

ECON Piston valves are ideally suited for use in steam systems. This robust valve provides optimum sealing and is resistant to Waterhammer. This is due to the construction of the plunger, lantern and graphite rings. The piston valves are also used for hot water, oil, LPG, fuel oil, compressed air and other neutral medium etc. 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 globe 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 ECON piston valves, the following rules should be observed:

- the valves should be checked before installation if they have not any defects caused by transport and/or storage.
- make sure that the applied valves are suitable for the working conditions, medium used in the plant and the right system connections, according to pressure and temperature limits.
- protective hole plugs must be removed
- the valves may be installed in any position but preferred one is with the hand wheel in upright position.
- during fitting, the proper flow direction has to be considered. (flow direction arrow is casted on the body). Piston valves show a piston pump effect while closing. This can result in increased pressure on the inlet side when used in the preferred flow direction. When used with piston pumps and non-return valves, piston valves should therefore be installed opposed to the preferred through flow direction, see Fig. 1 below.
- the interior of the valve and pipeline must be free from foreign particles.
- the valve should be assembled in the pipeline in closed position, for a correct functioning, the valve must be stress free mounted between the flanges, supports must be arranged to prevent any additional stress, caused by the weight of the valve or the pipeline.
- bolted joints on the pipeline must not cause additional stress resulted from excessive tightening, user shall select proper bolts and gaskets according the working temperature, working pressure and medium.
- for easy operating, the clear distance around the hand wheel, shall not be less than 100MM
- before plant start-up, especially after repairs, flash out he pipeline.

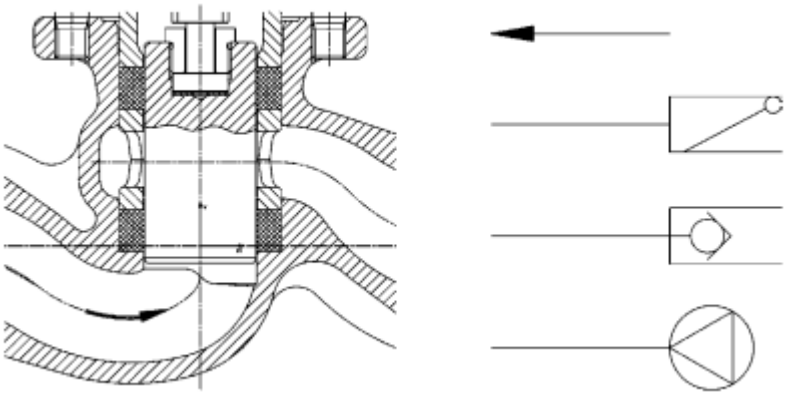


Fig. 1 Flow Direction

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:

- always keep 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.
- keep the stem well greased.
- check the valve on all possible leaking possibilities.
- check if all bolts and nuts are still fastened.
- 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 the piston still open and close in a proper manner.
- the thickness of the body must be checked to ensure safety operation at an interval of at least three months.

9. Service and repair

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

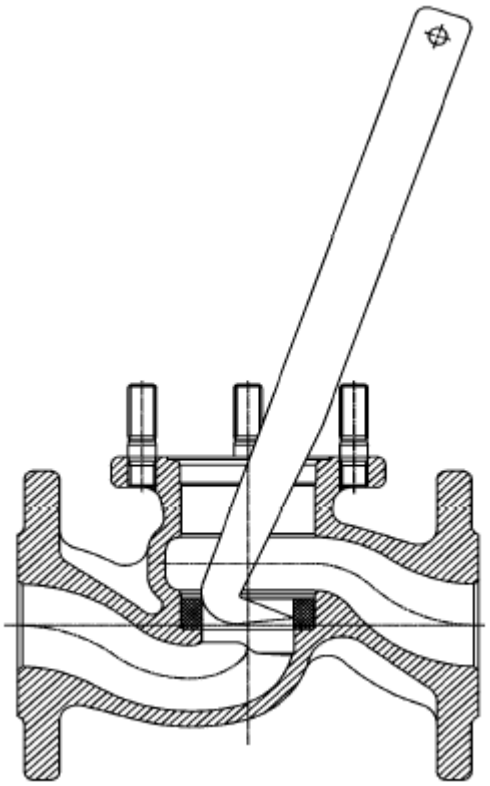
- welding (repair) and drilling of the valve is forbidden.
- it is forbidden to open the bonnet or replace the bolt, nut or packing when the valve is under pressure.
- tighten the hexagon nuts evenly crosswise in the there for standard order. For the bonnet nuts torque see table underneath. If the leakage does not stop, it is necessary to change the valve rings.

Valve Size	15	20	25	32	40	50	65	80	100	125	150	200
Torque Nm ± 20%	1	1,5	2,5	3,5	5	10	32	25	60	50	45	40

Disassembly

- fully open the valve
- unscrew body/bonnet bolting nuts and disc shape springs
- slightly turn bonnet as to rest on the studs
- remove piston free from the upper ring by turning the hand wheel in closing direction.
- remove upper ring, lantern and bottom ring from the body, respectively in the same order
- dismantle hand wheel and remove stem-piston sub-assembly from bonnet
- remove left-handed piston bolt by turning it clockwise. Remove stem from piston. In case of valves DN15-32 mm. diameters, piston bolt is composed of 2 pieces. In case of valves DN40-200 mm. diameters, there are also locking crescents, two pieces.
- clean inside of valve which will come in contact with: rings, piston surfaces and lantern.
- never grease valve internals, or sealing rings or piston.
- review other pieces to insure the assembly.

Caution: be very careful to avoid any damage to grinded piston surface and body internals.



Removing of the graphite sealing ring with special tool, for the removing of the Lantern bush, please use a proper puller.

Assembly.

- assemble stem and piston with bolt.
- smear graphited grease, on threaded section of bonnet and assemble it with piston-stem subassembly.
- bring the piston to most upper position by turning the hand wheel in counter clockwise direction.
- place bottom ring into the body and place lantern and upper ring in descript order.
- place bonnet sub-assembly into the body. After placing spring shape discs to their proper place, tighten bonnet nuts to engage several threads.
- tighten the hexagon nuts of the body/bonnet evenly crosswise according the torque stated in the table above.
- after replacement of the sealing rings, bolts or nuts, it is necessary to check the valve operation and tightness of all connections. A 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	Flange 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	Wrong direction of rotation	Turn anti-clockwise to open
Leakage across the stem	Bonnet nuts not correct tightened	Tighten the bonnet nuts with the applicable torque value
Leakage across valve seat	Valve not properly closed	Pull hand wheel tight without tools
	Medium contaminated	Clean valve and install dirt screen
Leakage across bonnet flange	Sealing damaged	Change sealing
	Bonnet nuts not correct tightened	Tighten the bonnet nuts with the applicable torque value
Operating failure	Stem bended	Rectify or replace stem
Body and/or bonnet broken and leaking	Broken because of freezing	Drain the water in the winter when valve is not used, or use proper isolation
Piston failed to open	Piston blocked	Disconnect the valve from the pipeline with proper safety pre-cautions. Open the valve and remove the blocking.
	Stem is overheated and blocks the piston	When the valve is closed and the pipeline is over-heated, rotate the hand wheel somewhat counter clockwise for unload at interval

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 centres.

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.

General note for cast iron products:

Cast iron can be used for various applications, such as listed in our catalogue. It should however always be observed, that frost (in combination with non drained products) may permanently damage the proper functioning and integrity of our product.