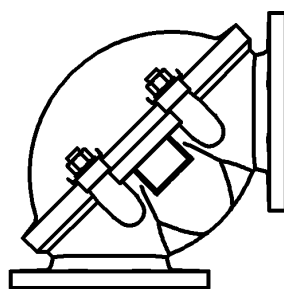
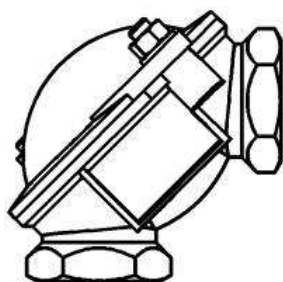


# **SZUSTER** system

*innovation is essential*

## OPERATING INSTRUCTIONS OF ELBOW BALL CHECK VALVES

TYPES: ESK 01 and ESK 11



PN-EN 12050-4: Non-return valve for sewage without fecal matter and for sewage including fecal matter size DN 50 - DN 80

Noise level: NPD

Anti-corrosion protection: epoxide coating ca 200 - 300 [ $\mu\text{m}$ ]



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# 1. TECHNICAL DESCRIPTION

## 1.1. PURPOSE

SZUSTER SYSTEM elbow ball check valves type ESK 01 (with thread connections) and ESK 11 (with flange connections) are to be used in pump systems: they automatically prevent any backflow of the medium from the outlet conduit at the moment when the pump stops working. They are used in sewage installations with and without fecal matter, of the temperature up to 40°C and pH 4-8.

The ranges of working pressures are adapted to those pressures that occur in sewage systems (10/16 bar).



Fig 1. Example of the application of SZUSTER system valves

## 1.2. CONSTRUCTION

SZUSTER system elbow ball check valves types ESK 01 and ESK 11 possess anti-corrosion protection.

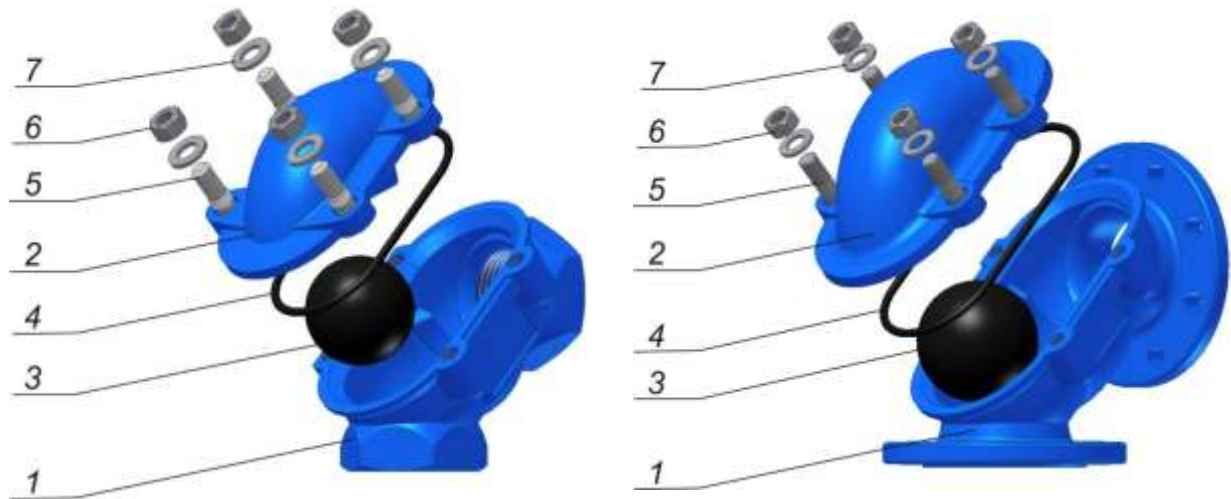


Fig. 2 List of the parts of ESK 01 and ESK 11 type valves

Table 1. List of valve elements

Item	Part Name	Material
1	Body	EN-GJL-250, PN-EN 1561:2000   EN-GJS-500-7, PN-EN 1563:2000*   EN-GJS-400-15, PN-EN 1563:2000**
2	Cover	EN-GJL-250, PN-EN 1561:2000   EN-GJS-500-7, PN-EN 1563:2000*   EN-GJS-400-15, PN-EN 1563:2000**
3	Ball	EPDM / NBR
4	Gasket	EPDM / NBR
5	Screw with seat	0H18N9, PN 82314
6	Nut	0H18N9, PN 82144
7	Washer	0H18N9, PN 82206

\*For ESK 11 DN 200

\*\*For ESK 11 DN 200, long version L

When designing the valves, the following standards were used:

PN – EN 1092-2 - flanges and their connections: round flanges for pipes, fittings, connectors and fixtures with PN marking. Cast-iron flanges.

PN – EN 10226-1- pipe threads of connections with sealing on the thread. Part 1: External taper threads and internal straight threads. Sizes, tolerances and marking.

PN-EN 12050-4 - Sewage pumping stations in buildings and near buildings. Rules of construction and examination. Part 4: Non-return valves for sewage pumping stations without and with fecal matter.

PN-EN 19: 2005 - Industrial fixture. Marking of metal fixture.

## 2. INSTALLATION

SZUSTER system elbow ball check valves types ESK 01 AND ESK 11 can be installed in the positions as presented in Fig. 3.

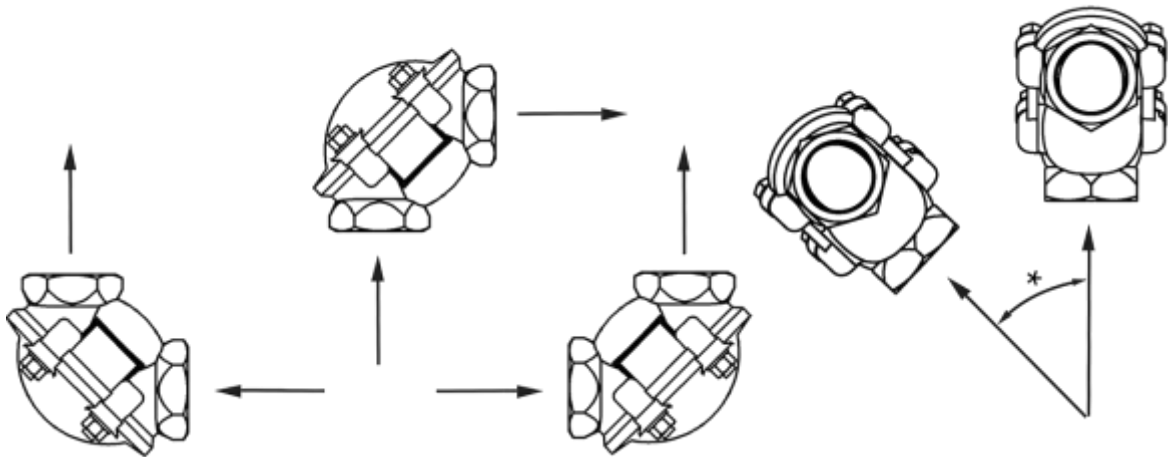
### **ATTENTION!**

The direction of the working medium flow is marked with an arrow on the elbow ball check valve.

### **ATTENTION!**

Vertical deviation (\*) in the range: 0 – 10° – using for solids as gravel and sand or 0 – 45° – using for drinking water or fibrous parts. Any deflection from the vertical position being greater from the indicated is permissible only on the Manufacturer's permission.

Type ESK 01



Type ESK 11

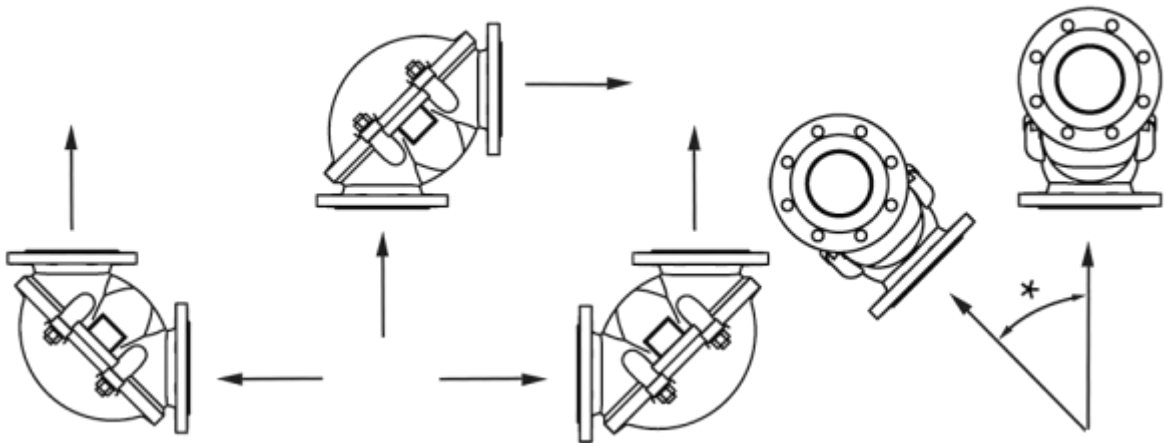


Fig. 3. Methods of installation of elbow ball check valves types ESK 01 and ESK 11

ESK 01 type valve possess thread connections and ESK 11 type valve possess flange connections. When installing the valves, care must be taken so that they are not exposed to strains resulting from being loaded with the mass of an unsupported pipeline. Once the valve has been installed in the adequate position, medium is to be supplied to the pipeline; at the same time, the leak tightness of the valve elements must be observed.

During the first operation, one needs to check whether the blocking function of the backflow of the liquid is working correctly.

## 3. OPERATION AND STORAGE

### 3.1. OPERATION

The temperature of the medium flowing through the valve should not exceed 40°C (temporarily to 60°C), and pH is to be in the range from 4 to 8.

### 3.2. STORAGE

SZUSTER system elbow ball check valves type ESK 01 and ESK 11 are to be stored in rooms that are protected from the influence of weather conditions.

For transport, the valves need to be put in a stable position and need to be protected against any displacement. Additionally, they need to be protected from weather conditions (covered means of transport are to be used).

## 4. SERVICING

SZUSTER SYSTEM elbow ball check valves are self-cleaning valves; nevertheless, periodic check-ups are recommended in order to inspect the condition of the ball surface. When servicing, the ball can be placed as shown in Fig. 4.



Fig. 4. Servicing positions of covers of ESK 01 and ESK 11 types valves

**ATTENTION!**

One needs to remember to place the o-ring type seal properly, as shown in Fig. 5, before the installation of the cover on the valve casing.



Fig. 5. Placing of the o-ring type seal on the circumference of the valve cover

SZUSTER system elbow ball check valves type ESK 01 and ESK 11 possess elements that guarantee the correct installation of their casings and covers (Figs. 6, 7 and 8).

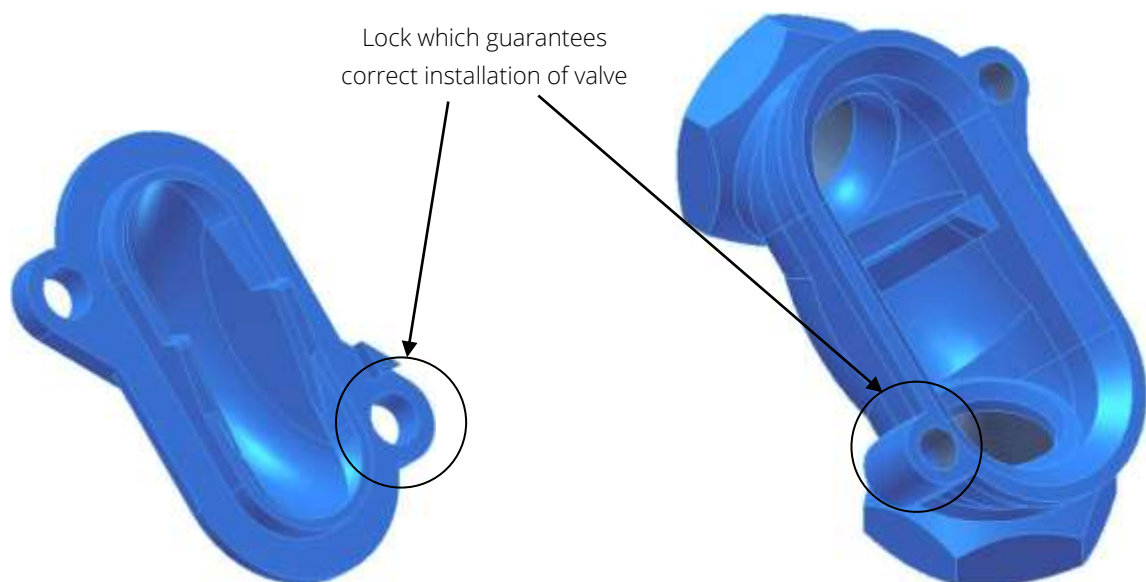


Fig. 6. Installation lock of ESK 01 DN32-DN40 valves



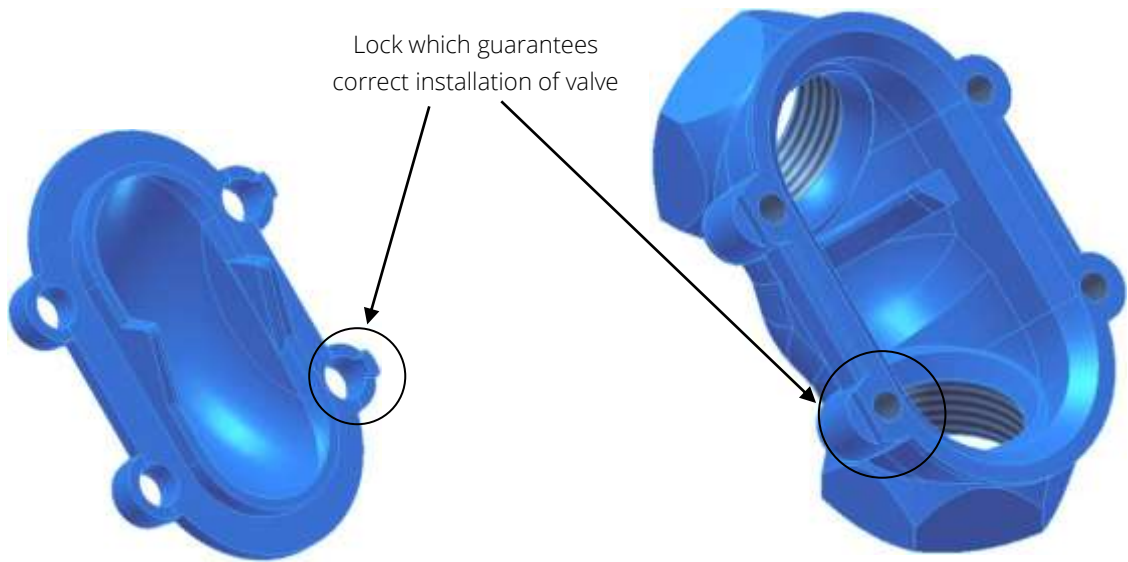


Fig. 7. Installation lock of ESK 01 DN50-DN100 valves

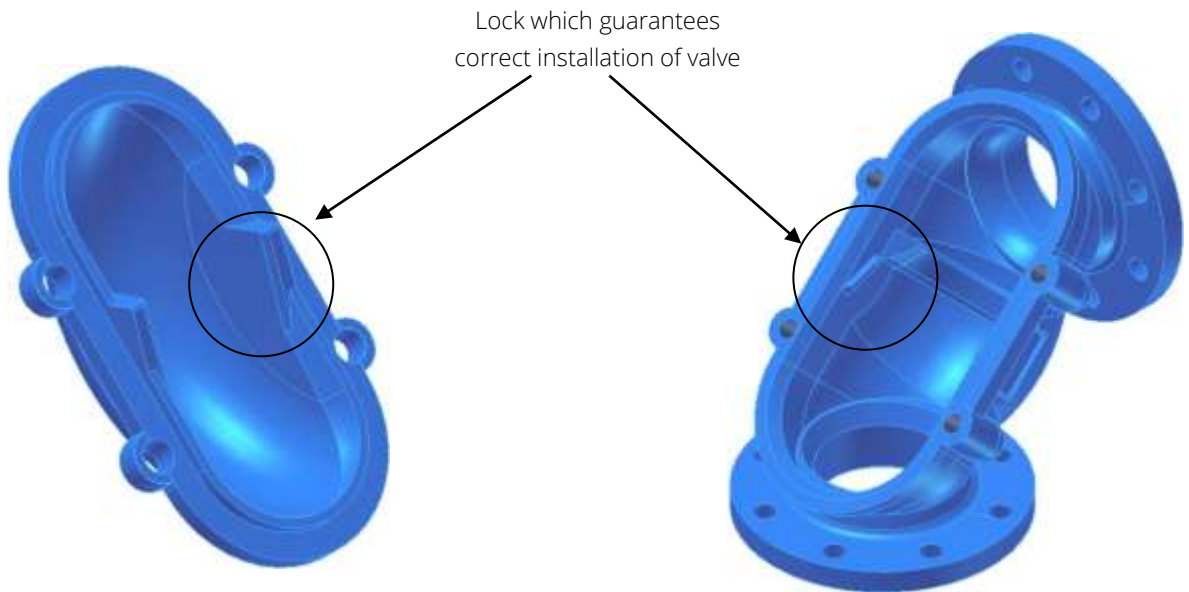


Fig. 8. Installation lock of ESK 11 valves

## 5. DEFECTS: REASONS AND METHODS TO REMOVE THEM

The table below presents possible defects of elbow ball check valves ESK 01 and ESK 11 types, their reasons as well as the methods of their prevention or removal.

Defect	Reason	Method to remove defect
1. Leak between the cover and the casing of the valve	a) Bad position of the o-ring b) The cover is not installed in compliance with the lock c) The nuts on the valve cover are not tightened	a) Correct the position of the o-ring on the cover (Fig. 3) b) Install the cover in compliance with the operating instructions (Figs. 6, 7, 8) c) Tighten uniformly the nuts on the valve cover
2. Strong hitting of the ball when closing the valve	a) The pipeline is not properly braced b) The flow rate is too large c) The working pressure is too high	a) Brace the pipeline b) Decrease the flow rate (<2.5 m/s) c) Reduce the pressure in the system or use a valve which is adapted to work with higher pressures
3. Vibrations of the valve ball after the pump has been switched off	a) Occurrence of the "siphon phenomenon" on the pipeline	a) Use an aeration valve on the pipeline in the proper place
4. The valve does not open	a) The pressure before the valve is lower than the pressure after the valve b) The ball is blocked in the closing position	a) The correct operation and the patency of the pump system is to be verified b) The pump is to be switched on and off several times at its maximum output; possibly, clean the valve and unblock the ball
5. The valve does not close once the pump has been switched off (no leak tightness of the closing element)	a) The ball is blocked by solid particles in the opening position b) Damage to the ball surface c) Occurrence of the "siphon phenomenon" on the pipeline d) Clogging of the inside of the valve	a) The pump is to be switched on and off several times at its maximum output; possibly, clean the valve and unblock the ball b) Replace the ball with a new one c) Use an aeration valve on the pipeline in the proper place d) The pump is to be switched on and off several times at its maximum output; possibly, clean the valve
6. Noise in the form of slams or hisses	a) An abrupt widening of the flow section before the valve: occurrence of the cavitation phenomenon b) Possible displacement of the seal between the flanges which blanks off the inlet or outlet of the valve	a) Decrease the flow rate of the medium in the feed pipeline or replace the construction of the pipeline on the valve inlet for the proper one b) Correct the position of the seal between the flanges
7. Too high flow suppression	a) The valve inlet or outlet is blanked off by the seal between the flanges b) The inside of the valve is clogged	a) Correct the position of the seal between the flanges b) The pump is to be switched on and off several times at its maximum output; possibly, clean the valve

## 6. WARRANTY TERMS AND CONDITIONS

1. The Manufacturer guarantees the correct operation of the valve in the period of 12 months starting from the date of sale.
2. The Manufacturer is released from any liability in connection with the guarantee covering any defects that occur as a result of an improper operation or an application being different from the one intended and covering any damage as a result of any repairs and modification by unauthorized persons.
3. The Manufacturer is also exempted from any liability in connection with a guarantee covering any defects that occur as a result of any unnatural wear, in particular of the internal paint coating and the valve ball.

### PLEASE NOTE!

The warranty terms and conditions do not apply to any product without the proof of purchase.