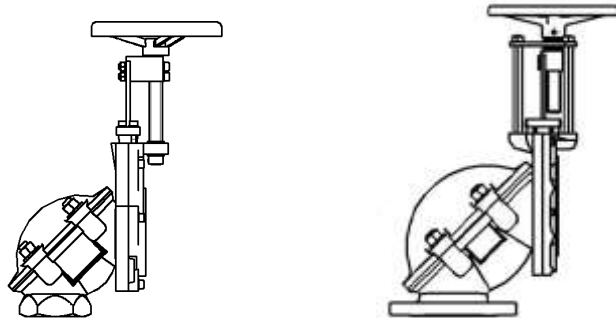


SZUSTER system

innovation is essential

OPERATING INSTRUCTIONS
OF ELBOW BALL CHECK VALVES
TYPES: COMBI 01 and COMBI 11
WITH MANUAL DRIVE



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 [μm]



EkoWodrol Ltd
13 Slowianska Str.
75-846 Koszalin, Poland
phone.: +48 94 346 22 18
fax: +48 94 348 60 41
e-mail: info@szustersystem.com
www.szustersystem.com

Version: 07.2015

TABLE OF CONTENTS:

1. GENERAL DATA.....	3
1.1. PURPOSE	3
1.2. FUNCTIONS.....	3
2. PRODUCT DESCRIPTION	3
2.1. CONSTRUCTION	4
3. ORDER PLACING.....	6
4. INSTALLATION.....	6
5. OPERATION AND STORAGE.....	8
5.1. OPERATION.....	8
6. STORAGE.....	8
7. SERVICING OF VALVES.....	8
8. DEFECTS: CAUSES AND WAYS TO REMOVE THEM	10
9. WARRANTY TERMS AND CONDITIONS	11

1. GENERAL DATA

1.1. PURPOSE

Non-return elbow check valves, SZUSTER system, COMBI 01 type (with a screw connection) and COMBI 11 type (with a flange connection) serve the purpose of an automatic prevention of any backflow of the medium from the outlet conduit the moment when the pump stops working as well as to manually shut off the medium flow. They are to be used in sewage installations with and without fecal matter with the temperature of up to 40°C and pH of 4-8. They possess a hygienic approval for potable water.

1.2. FUNCTIONS

Non-return elbow check valves, SZUSTER system, COMBI 01 type and COMBI 11 type, serve the purpose of an automatic prevention of any backflow of the medium the moment the pump/compressor stops working.

The valves possess an additional function, i.e. a possibility of a manual shut-off of the medium flow at any moment by closing the knife gate valve, which constitutes an integral part of the device.

2. PRODUCT DESCRIPTION

Non-return elbow check valves, SZUSTER system, COMBI 01 type and COMBI 11 type, have been manufactured in such a manner that their optimal working pressure ranges can be adapted to those pressures that occur in sewerage systems; these are pressures of 10/16 [bar], which vary for each model.

2.1. CONSTRUCTION

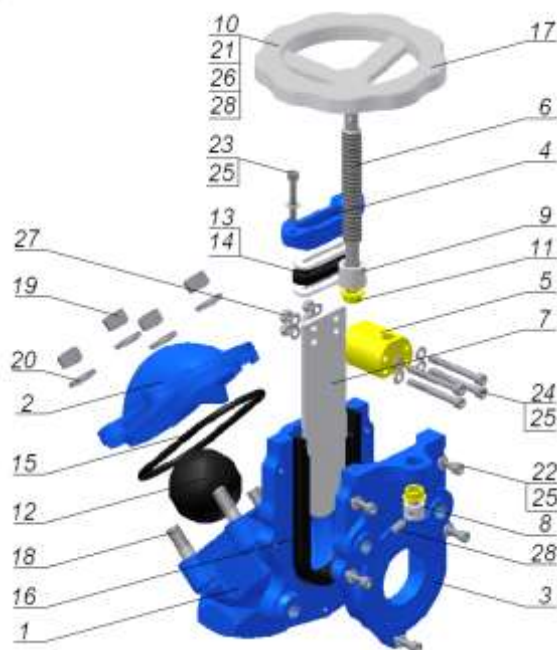


Fig. 1 List of the parts of COMBI 01

Table 1. List of COMBI 01 valve elements

Item	Part Name	Material
1	Body	EN-GJL-250, PN-EN 1561:2000
2	Cover	EN-GJL-250, PN-EN 1561:2000
3	Plate	EN-GJL-250, PN-EN 1561:2000
4	Gland clamp	EN-GJL-250, PN-EN 1561:2000
5	Spindle nut	MO58
6	Spindle	0H18N9
7	Knife	0H18N9
8	Fastening sleeve	0H18N9
9	Spacer sleeve	0H18N9
10	Wheel fastening sleeve	0H18N9
11	Slide sleeve	MO58
12	Ball	EPDM / NBR
13/14	Gland: packing	PTFE + EPDM / NBR
15	Seal: o-ring	EPDM / NBR
16	Seal: U type	EPDM / NBR
17	Wheel	AK11
18	Flat set screw M12x50	0H18N9
19	Screw cap M12	0H18N9
20	Washer Ø12	0H18N9
21	Bolt M6x10	0H18N9
22	Bolt M6x20	0H18N9
23	Bolt M6x40	0H18N9
24	Bolt M6x55	0H18N9
25	Washer Ø6	0H18N9
26	Washer Ø6x25	0H18N9
27	Screw cap M6	0H18N9
28	Spring-type pin	0H18N9

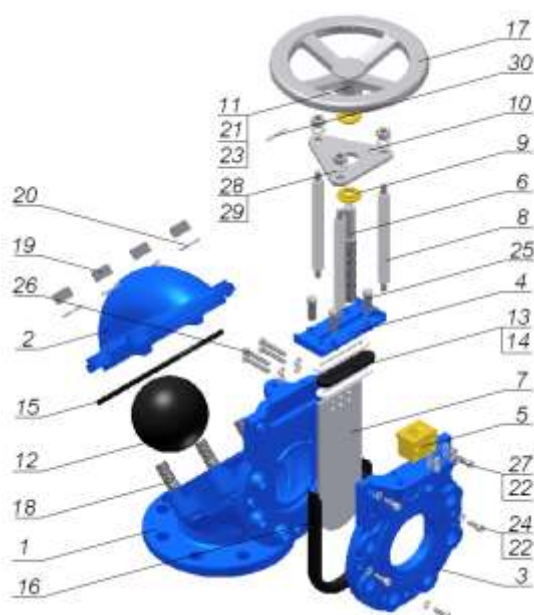


Fig.2 List of the parts of COMBI 11

Table 1. List of COMBI 11 valve elements

Item	Part Name	Material
1	Body	EN-GJL-250, PN-EN 1561:2000
2	Cover	EN-GJL-250, PN-EN 1561:2000
3	Plate	EN-GJL-250, PN-EN 1561:2000
4	Gland clamp	EN-GJL-250, PN-EN 1561:2000
5	Spindle nut	MO58
6	Spindle	0H18N9
7	Knife	0H18N9
8	Post	0H18N9
9	Slide sleeve	MO58
10	Bracket	0H18N9
11	Fastening sleeve: wheel	0H18N9
12	Ball	EPDM / NBR
13/14	Gland: packing	Sznur PTFE + EPDM / NBR
15	Seal: o-ring	EPDM / NBR
16	Seal U - type	EPDM / NBR
17	Wheel	AK11
18	Flat set screw M16x70	0H18N9
19	Screw cap M16	0H18N9
20	Washer Ø16	0H18N9
21	Washer Ø6x25	0H18N9
22	Washer Ø6	0H18N9
23	Bolt M6x10	0H18N9
24	Bolt M6x20	0H18N9
25	Bolt M6x30	0H18N9
26	Bolt M6x45	0H18N9
27	Screw cap M6	0H18N9
28	Washer Ø10	0H18N9
29	Screw cap M10	0H18N9
30	Spring-type pin	0H18N9

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.

3. ORDER PLACING

When placing an order for a valve, the following needs to be supplied:

1. Valve type
2. Valve diameter (DN)
3. Nominal working pressure [MPa]
4. Number of pieces

Sample order:

COMBI01; DN50; 1,0 [MPa]; 5 pieces

When placing an order for valve spare parts, the following needs to be supplied:

1. Valve manufacturer's number
2. Valve type
3. Valve diameter
4. Name of part
5. Nominal working pressure [MPa]
6. Number of pieces

Sample order:

03455; COMBI01; DN50; Ball; 1,0 [MPa]; 5 pieces

4. INSTALLATION

SZUSTER system COMBI type non-return elbow check valves can be installed in horizontal and vertical sewerage installations in positions shown in Fig. 3.

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, the operation of the valve needs to be verified by closing and opening of the gate valve and the correct operation of the liquid backflow blocking function needs to be checked.

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.

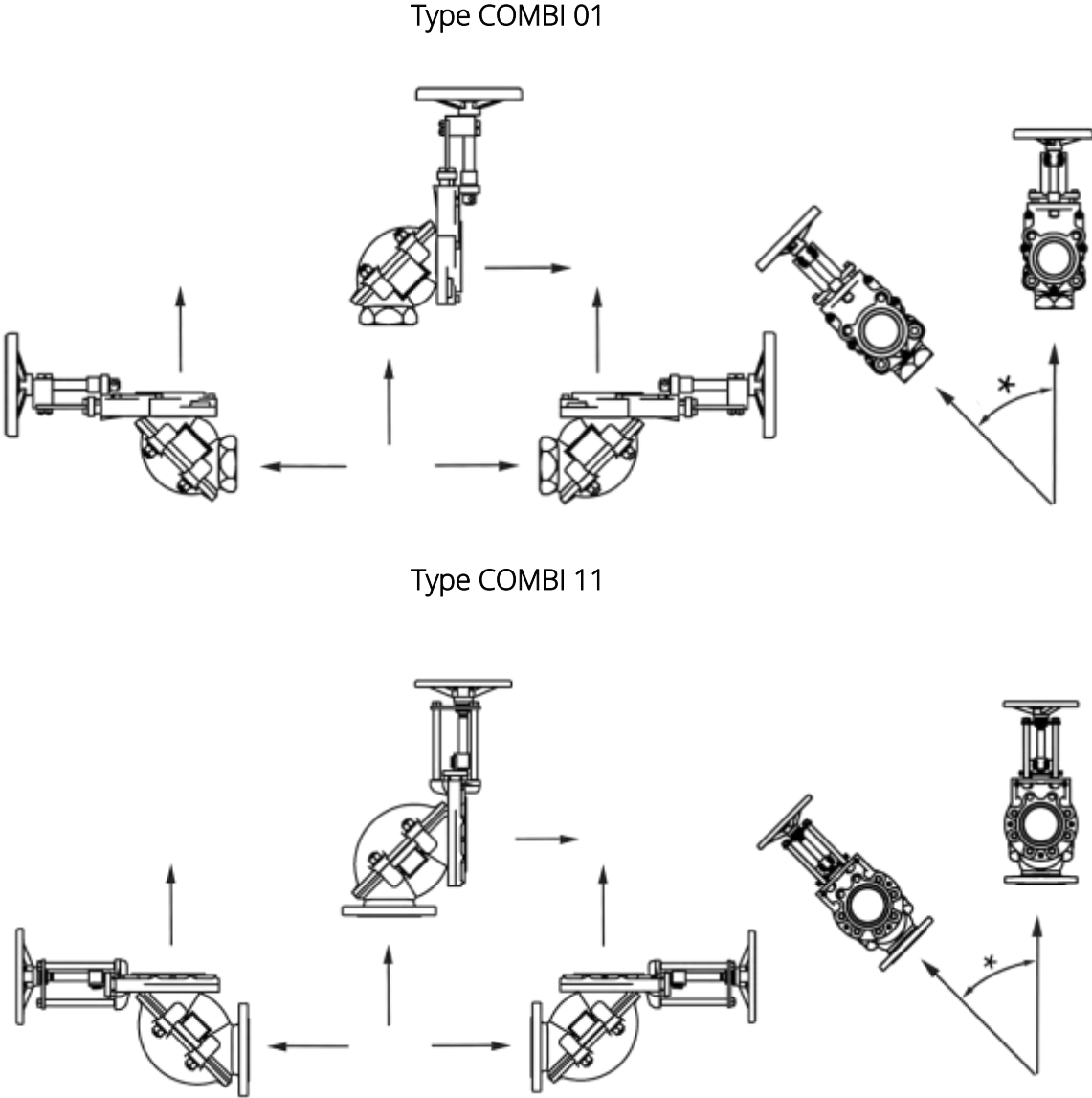


Fig. 3 Methods of installation of elbow ball check valves types with knife gate valves COMBI 01 and COMBI 11 types

5. OPERATION AND STORAGE

5.1. OPERATION

SZUSTER system COMBI 01 and COMBI 11 type elbow check valves must be operated with test runs to be performed at least once a year. A test run consists in closing and opening of the gate valve.

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.

6. STORAGE

SZUSTER system COMBI 01 and COMBI 11 type elbow check valves need to be stored in rooms that are protected from the influence of weather conditions and in a stable position.

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).

7. SERVICING OF VALVES

While servicing, the cover can be placed in a position as in Fig. 4.



Fig. 4. Servicing position of the cover of COMBI 11 valve

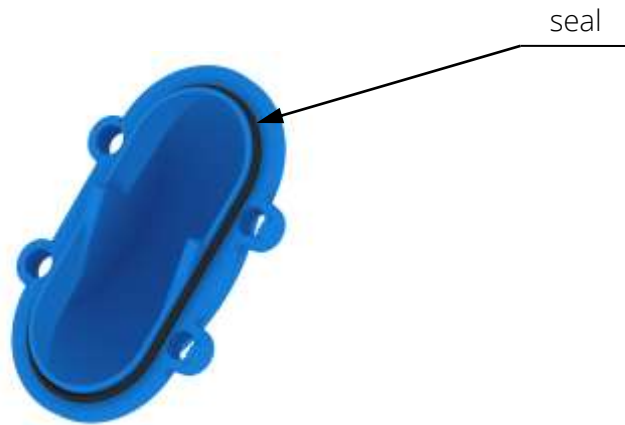


Fig. 5. Positioning of an o-ring type seal on the perimeter of the valve cover

ATTENTION!

Remember that prior to the installation of the cover on the valve body, an o-ring type seal must be placed on the perimeter of the cover as shown in Fig. 5.

ATTENTION!

The valve gate spindle needs to be cleaned dry and greased with a suitable lubricant once a year. Lubricants may not have an adverse effect on the remaining elements of the valve.

8. DEFECTS: CAUSES AND WAYS TO REMOVE THEM

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

Defect	Causes	Method to remove defect
1. Leak between the cover and the body of the valve	a) Bad o-ring position (the valve has not been assembled correctly) b) The nuts on the valve cover are not tightened	a) Correct the position of the o-ring on the cover (Fig.5) b) Tighten uniformly the nuts on the valve cover
2. Strong hammering of the ball while valve is closing automatically	a) The pipeline is not properly braced b) The check 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. High vibrations of the valve	a) Occurrence of cavitation with the flow rate being too high (>2.5m/s) b) Occurrence of the "siphon phenomenon" on the pipeline	a) Reduce the medium flow rate in the system (<2.5 m/s) b) Vent the pipeline
4. The valve does not open	a) The flow rate is too low (<0.7m/s) b) The back pressure is too high (the back pressure being higher than the pump delivery head taking into account the zeta coefficient (pressure losses) of the system)	a) The medium flow rate is to be increased (≥ 0.7 m/s) b) The back pressure needs to be reduced
5. The valve does not close (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	a) The medium is to flow several times through the valve, or switch the pump on and off several times, or possibly clean the valve b) Replace the ball
6. Noise in the form of slams or hisses	a) The occurrence of the cavitation phenomenon c) Possible displacement of the seal between the flanges which blanks off the inlet or outlet of the valve	a) Decrease the medium flow rate in the system or reduce the pressure b) Correct the position of the seal between the flanges
7. Flow suppression is too high	a) The valve inlet or outlet is blanked off by the seal between the flanges b) The inside of the valve is partly clogged	a) Correct the position of the seal between the flanges b) The medium is to flow several times through the valve, or switch the pump on and off several times, or possibly clean the valve
8. Leakage at the gland	a) The gland clamp is not tightened sufficiently	a) The gland clamp bolts need to be evenly tightened until leakage has been eliminated
9. It is not possible to screw up the gate valve	a) The valve outlet has been obstructed by solid elements	a) The medium is to flow several times through the valve, or switch the pump on and off several times, or possibly clean the valve.

9. 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. Any defects disclosed over that period shall be removed free of charge within a period of 14 days of the defect report date.
3. The Manufacturer is released from any liability in connection with the warranty covering any defects that occur as a result of an improper operation or a use being different from the one intended as well as from any damage being the result of any repairs and modifications by unauthorized persons.

PLEASE NOTE!

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