SZUSTER system

innovation is essential

elbow ball check valves
Patents no.: US 8,146,618 B2, US 8,082,949 B2

in-line ball check valves
Patent no.: US 8,146,618 B2

PRODUCT CATALOG

Version 09.2017

SZUSTER system is a brand of innovative products which, due to their unique features, are of great interest and demand on the global market. Several advantages, such as safety and ease of use, reduction of the operating costs and ability to solve Users' common problems put the SZUSTER system as one of the leading brands on the market.

INNOVATION IS ESSENTIAL

From the very beginning our Research and Development Department continuously works on new solutions. This slogan reflects the brand's philosophy – betting on innovation and meeting the needs, thereby we build long-term relations with our customers and business partners.

CONTENTS

ELBOW BALL CHECK VALVES

Technical data

- Range of available diameters: 1 1/4" – 12".
- Pressure rated to 230 PSI (all valves are tested to 145 PSI leak test / 230 PSI hydrostatic shell test).
- Medium temperature: max 104°F (temporarily to 140°F).
- Flanges complying with ANSI/ASME B16.1 Class 125.
- API 598 tests and requirements.
- Painted with a coat of epoxy paint, RAL 5015.
- Patents no.: US 8,146,618 B2, US 8,082,949 B2.

Type ESK

Type COMBI

Advantages for sectors

For Pumps

1. Enables more compact construction of the pump canopy.
2. Low service time which takes less then 15 minutes.
3. Quick replacement time – customers can quickly replace the valve balls themselves without damaging equipment.

For Lift Stations

1. Space saving – our valves enable space saving in a lift station therefore providing the possibility of using a much smaller tank.
2. Quick replacement time – customers can quickly replace valve balls themselves without damaging equipment.
3. Full opening at the velocity of 2.3 fps – the SZUSTER system check valves are fully opened at the velocity of 2.3 fps, thereby enabling the efficient working of customers' system.
4. Significant reduction of vibration – our check valves successfully reduce vibrations thereby making a system work more quietly.

For Waterworks

1. Full opening at the velocity of 2.3 fps – fully open position and constant factor K, starting from the flow rate of 2.3 fps.
2. Easy access to valves interior and the ball which enables:
   - placing the cover in the so-called servicing position
   - inspection of the inlet pipeline (including the pump impeller) and inspection of the pressure pipeline
3. Reduction of vibrations making a system work more quietly.

For Engineers

1. Combined solution – two-in-one compact solution (elbow, check valve) or even a three-in-one compact solution (elbow, check valve, knife gate valve).
2. Fully open position and constant factor K starting from the flow rate of 2.3 fps.
3. Reduction of vibrations making a system work more quietly.

Additional options

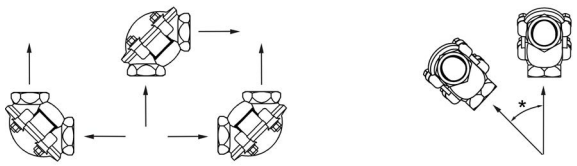
Type of check valve	Characteristics	Application examples
Version with floating ball (F)	The valve in F version is equipped with a ball, so-called „floating" ball, with a specific weight of approx 49.9 lb/ft³.	Backwater protection (valve is fully opened with the velocity of 0.66 fps).
Version with quasi ball (Q)	The valve in Q version is equipped with a quasi floating ball with a specific weight of approx 63.7 lb/ft³.	Lift stations, lift stations with separation of solids, pumps with inverter.
Version with drainage (D)	The valve in D version is equipped with drain plug for valve drainage.	Pumps, dry lift stations, gravity installations with anti reflux valves.

Table of options

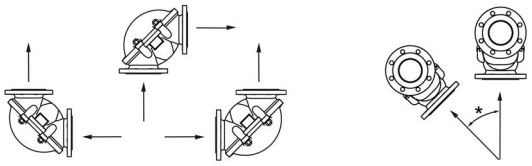
Type	DN	Size	Cast Iron	Ductile Iron	Floating Ball (F)	Quasi Ball (Q)	Drainage (D)
Type ESK 01 - threaded							
ESK 01	32	1 1/4"	regular	n/a	option	n/a	n/a
ESK 01	40	1 1/2"	regular	n/a	option	n/a	n/a
ESK 01	50	2"	regular	n/a	option	n/a	n/a
Type ESK 11 - flanged							
ESK 11	50	2"	regular	n/a	option	n/a	n/a
ESK 11	80	3"	n/a	regular	option	option	n/a
ESK 11	100	4"	n/a	regular	option	option	n/a
ESK 11	150	6"	n/a	regular	option	option	option
ESK 11	200	8"	n/a	regular	option	option	option
ESK 11	250	10"	n/a	regular	option	n/a	option
ESK 11	300	12"	n/a	regular	option	n/a	option
Type COMBI 01 - threaded inlet, flanged outlet							
COMBI 01	50	2"	regular	n/a	option	n/a	n/a
Type COMBI 11 - flanged							
COMBI 11	50	2"	regular	n/a	option	n/a	n/a
COMBI 11	80	3"	n/a	regular	option	n/a	n/a
COMBI 11	100	4"	n/a	regular	option	option	option
Type COMBI 11 - flanged, oval version							
COMBI 11	50.O	2"	n/a	regular	option	n/a	n/a

Elbow ball check valves installation method

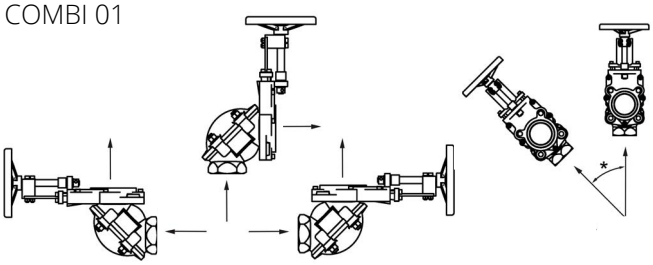
ESK 01



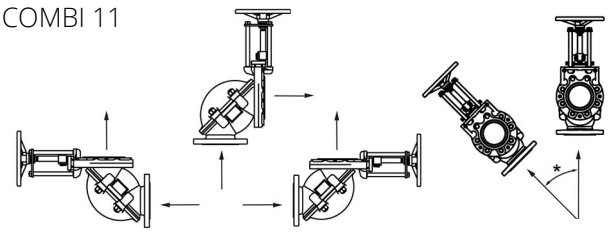
ESK 11



COMBI 01



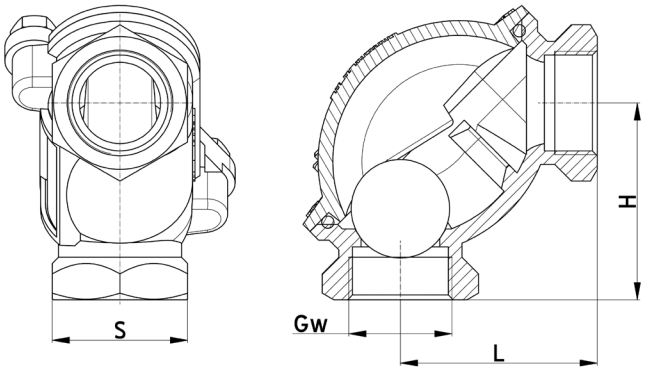
COMBI 11



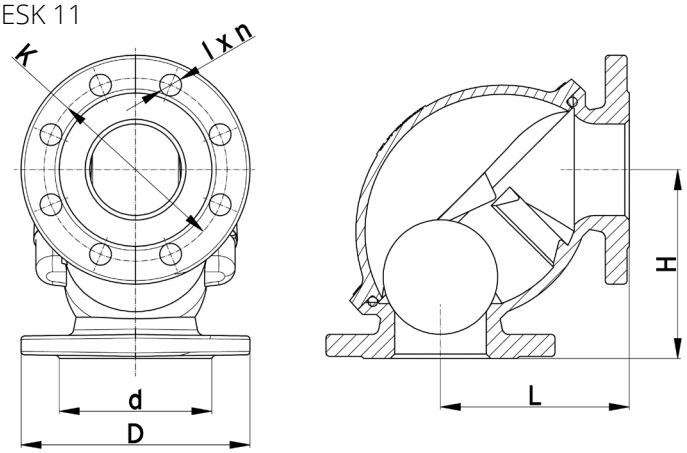
*Vertical deviation in the range:
0 – 10° – when used with solids as gravel and sand
0 – 45° – when used with drinking water

ESK ball check valves dimensions

ESK 01



ESK 11



Type	DN	Size	L	H	D	K	l x n	s	Gw	FK	Weight
						[inch]					[lb]
ESK 01	32	1 1/4″	3 1/8″	3 1/8″	—	—	—	2 3/16″	NPT 1 1/4″	1.4	4
ESK 01	40	1 1/2″	3 3/4″	3 3/4″	—	—	—	2 3/8″	NPT 1 1/2″	3.9	5.1
ESK 01	50	2″	3 3/4″	3 3/4″	—	—	—	3″	NPT 2″	2.4	9.3
ESK 11	50	2″	3 3/4″	3 3/4″	6 1/2″	4 3/4″	3/4″ x 4	—	—	2.4	16.1
ESK 11	80	3″	6 1/2″	6 1/2″	7 1/2″	6″	3/4″ x 4	—	—	1.7	33.3
ESK 11	100	4″	8″	8″	9″	7 1/2″	3/4″ x 8	—	—	1.6	56.3
ESK 11	150	6″	11″	11″	11″	9 1/2″	7/8″ x 8	—	—	1.6	109.8
ESK 11	200	8″	14″	14″	13 1/2″	11 3/4″	7/8″ x 8	—	—	1.6	203.5
ESK 11	250	10″	17″	17″	16″	14 1/4″	1″ x 12	—	—	1.5	329.4
ESK 11	300	12″	20 1/2″	20 1/2″	19″	17″	1″ x 12	—	—	1.5	491.6

FK - factor K within the recommended range of flow velocity through the valve from 2,3 fps to 8,2 fps

ESK ball check valves constructions

ESK 01

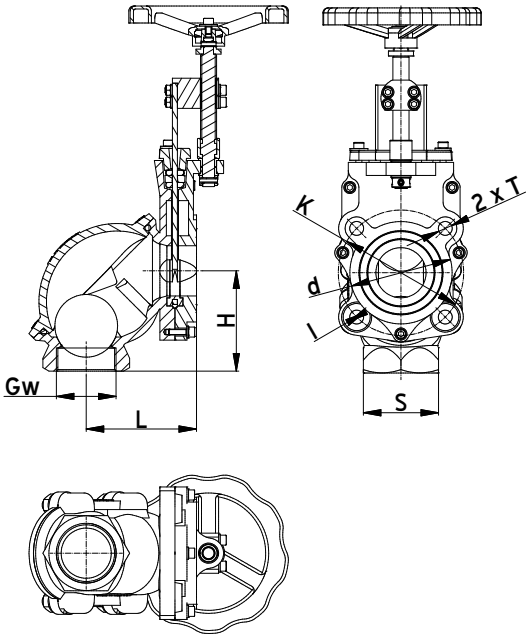
ESK 11

No.	Part	Material*
1	Body	Cast iron, ASTM A126 Class B (for sizes 1 1/4″ - 2″); Ductile iron, ASTM A536 Grade 65-45-12 (for sizes 3″-12″)
2	Cover	Cast iron, ASTM A126 Class B (for sizes 1 1/4″ - 2″); Ductile iron, ASTM A536 Grade 65-45-12 (for sizes 3″-12″)
3	Ball	Rubber NBR / EPDM
4	Gasket	Rubber NBR / EPDM
5	Screw cap	Stainless steel, ASTM A240 Grade 304
6	Nut	Stainless steel, ASTM A240 Grade 304
7	Washer	Stainless steel, ASTM A240 Grade 304

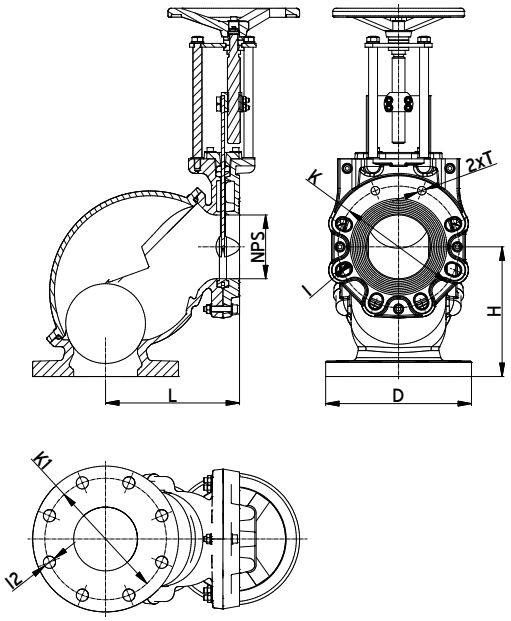
*Types of materials may be subject to change.

COMBI ball check valves dimensions in accordance with the standard ANSI/ASME B16.1-2005 Class 125

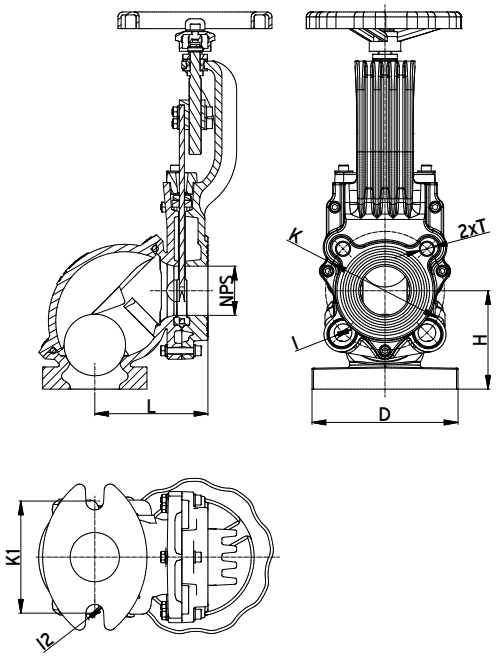
COMBI 01



COMBI 11



COMBI 11 oval



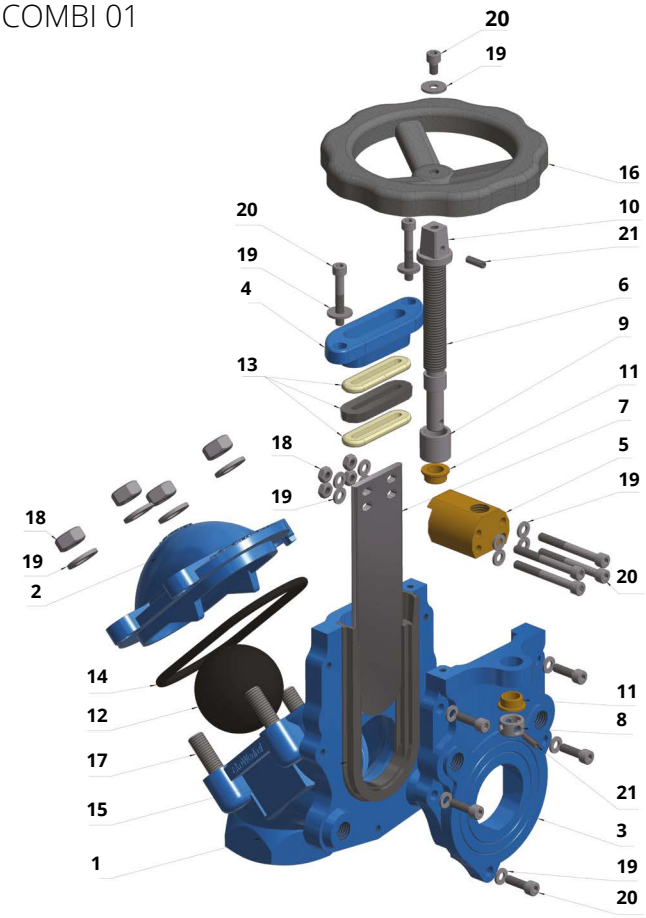
Type	DN	Size	L	H	D	K	K1	l	2 x T	l2	FK	Weight
							[inch]					[lb]
COMBI 01	50	2″	4 1/2″	3 15/16″	NPT 2″	4 3/4″	NPT 2″	3/4″ x 2	2 x 5/8-11 UNC	NPT 2″	2.6	19
COMBI 11	50	2″	4 1/2″	3 3/4″	6 1/2″	4 3/4″	4 3/4″	3/4″ x 2	2 x 5/8-11 UNC	3/4″ x 4	2.6	29
COMBI 11	50.O*	2″	4 1/2″	3 3/4″	5 7/8″	4 3/4″	4 1/2″	3/4″ x 2	2 x 5/8-11 UNC	3/4″ x 4		22.3
COMBI 11	80	3″	7 1/16″	6 1/2″	7 1/2″	6″	6″	3/4″ x 2	2 x 5/8-11 UNC	3/4″ x 4		54
COMBI 11	100	4″	8 1/4″	8″	9″	7 1/2″	7 1/2″	3/4" x 6	2 x 5/8-11 UNC	3/4" x 8		74.3

*Oval version

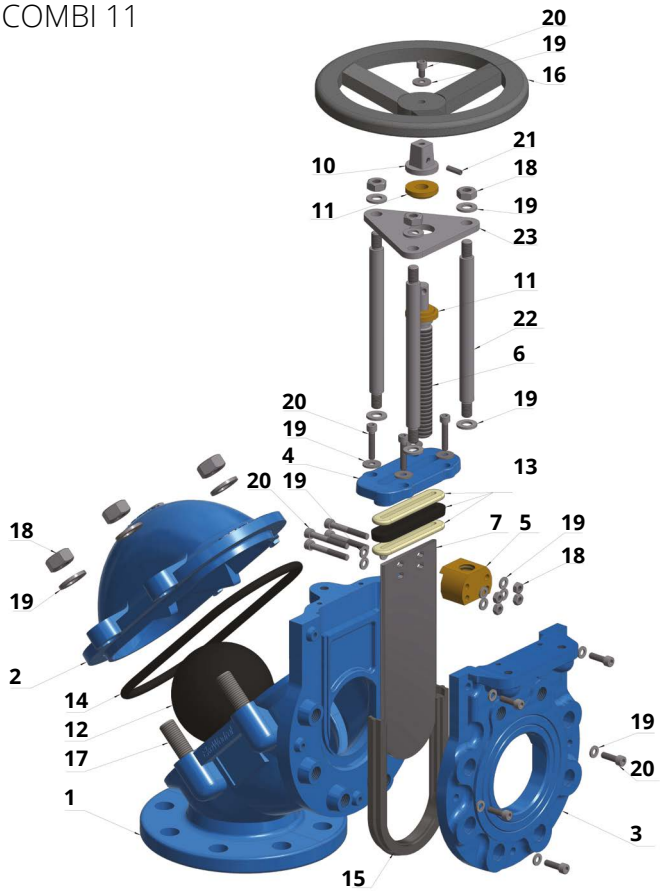
FK – factor K within the recommended range of flow velocity through the valve from 2.3 fps to 8.2 fps

COMBI ball check valves construction

COMBI 01



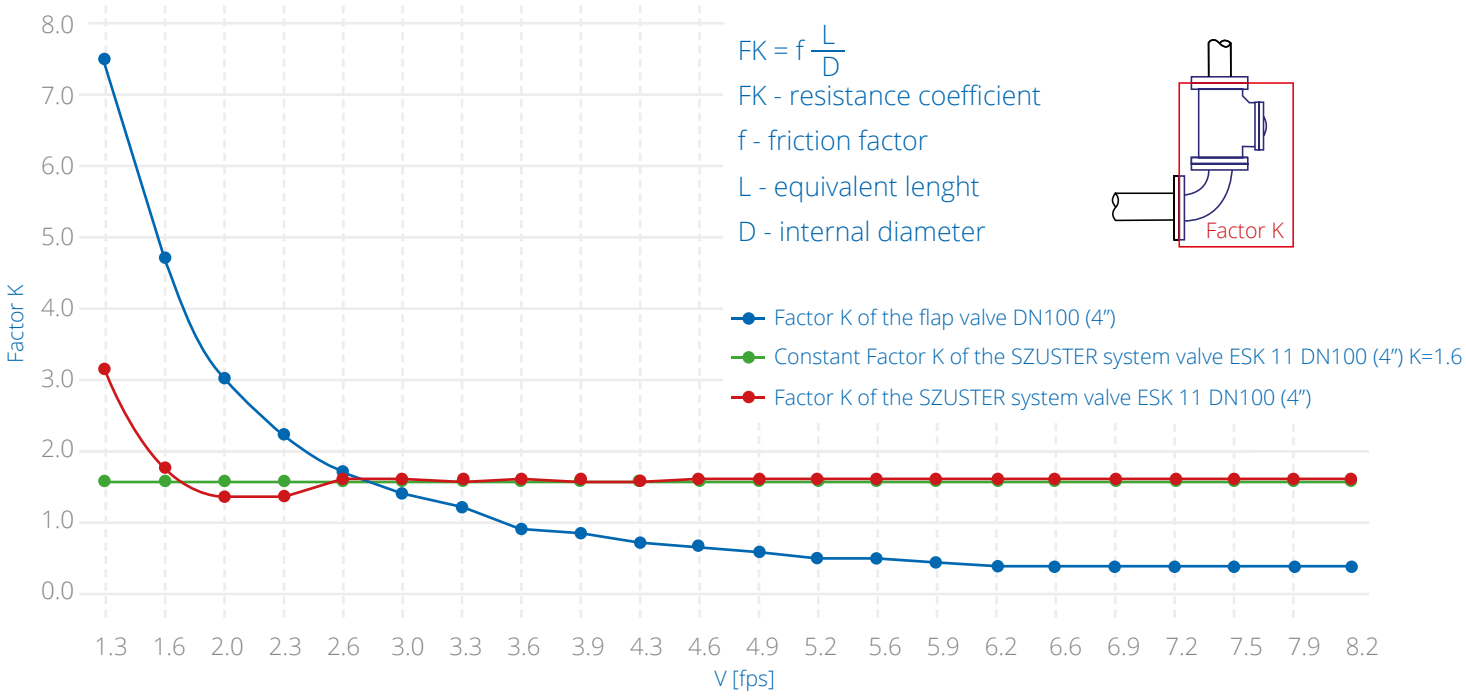
COMBI 11



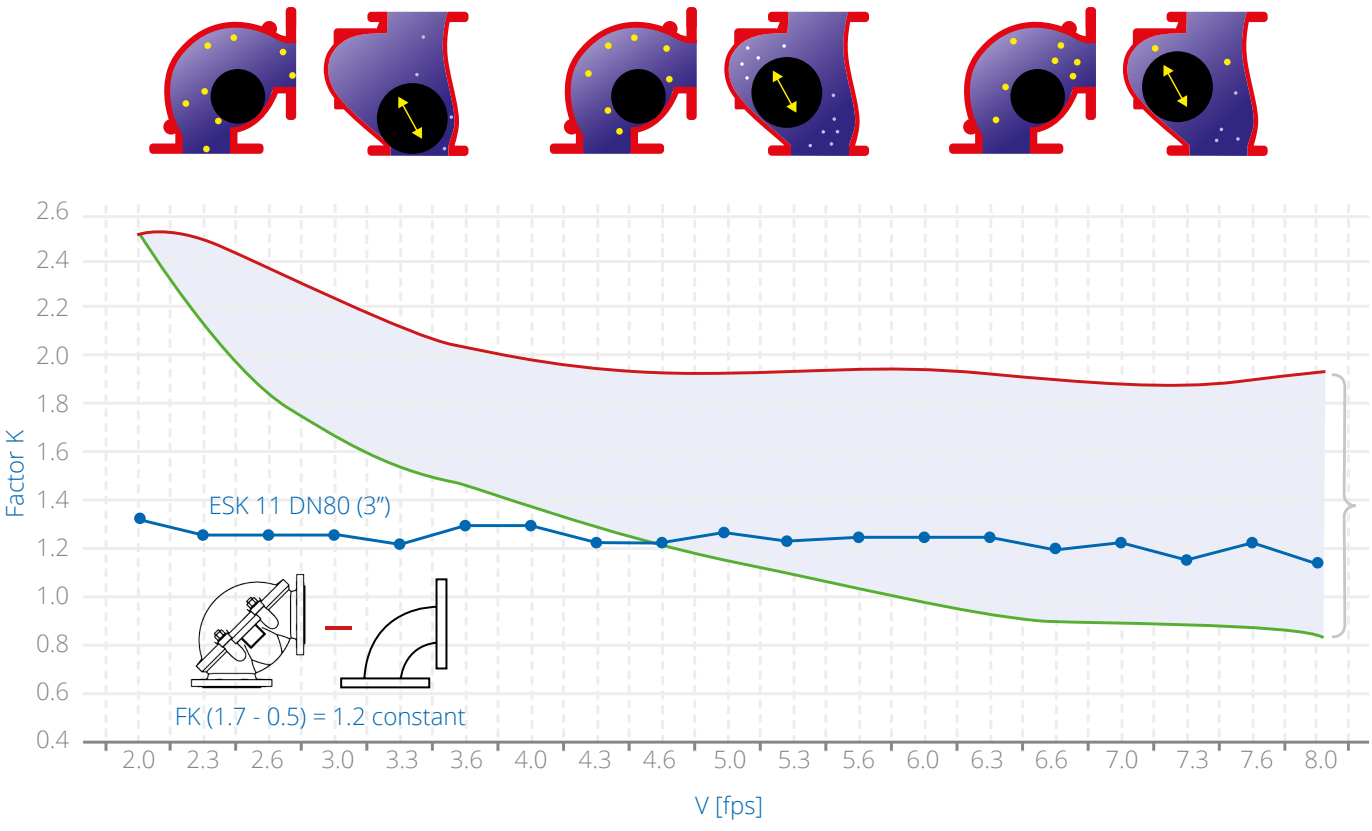
No.	Part	Material*
1	Body	Cast iron, ASTM A126 Class B (for size 2”); Ductile iron, ASTM A536 Grade 65-45-12 (for sizes from 2” - oval version to 4”)
2	Cover	Cast iron, ASTM A126 Class B (for size 2”); Ductile iron, ASTM A536 Grade 65-45-12 (for sizes from 2” - oval version to 4”)
3	Plate	Cast iron, ASTM A126 Class B; Ductile iron, ASTM A536 Grade 65-45-12 (for COMBI 11 2” - oval version, 3”, 4”)
4	Gland clamp	Cast iron, ASTM A126 Class B (for size 2”); Ductile iron, ASTM A536 Grade 65-45-12 (for sizes from 2” - oval version to 4”)
5	Spindle nut	Brass, ASTM C38500
6	Spindle	Stainless steel, ASTM A240 Grade 304
7	Knife	Stainless steel, ASTM A240 Grade 304
8	Fastening sleeve	Stainless steel, ASTM A240 Grade 304
9	Spacer sleeve	Stainless steel, ASTM A240 Grade 304
10	Wheel fastening sleeve	Stainless steel, ASTM A240 Grade 304
11	Slide sleeve	Brass, ASTM C38500
12	Ball	Rubber NBR / EPDM
13	Gland: packing	Cord PTFE + rubber NBR / EPDM
14	Seal: O-ring	Rubber NBR / EPDM
15	Seal: U-type	Rubber NBR / EPDM
16	Wheel	Aluminium, ASTM B26-B108
17	Flat set screw	Stainless steel, ASTM A240 Grade 304
18	Screw cap	Stainless steel, ASTM A240 Grade 304
19	Washer	Stainless steel, ASTM A240 Grade 304
20	Bolt	Stainless steel, ASTM A240 Grade 304
21	Spring-type pin	Stainless steel, ASTM A240 Grade 304
22	Post	Stainless steel, ASTM A240 Grade 304
23	Bracket	Stainless steel, ASTM A240 Grade 304

*Types of materials may be subject to change.

Factor K of the flap valve DN100 (4”) with one elbow 90° and Factor K of the SZUSTER system ball check valve ESK 11 DN100 (4”) chart



Factor K of the SZUSTER system ball check valve ESK 11 DN80 (3”) in comparison to other standard ball check valves without elbow resistance



Technical data

- Range of available diameters: 1 1/4" – 8".
- Pressure rated to 230 PSI (all valves are tested to 145 PSI leak test / 230 PSI hydrostatic shell test).
- Medium temperature: max 104°F (temporarily to 140°F).
- Flanges complying with ANSI/ASME B16.1 Class 125.
- API 598 tests and requirements.
- Painted with a coat of epoxy paint, RAL 5015.
- Patent no.: US 8,146,618 B2.

Type ESL

Type ESL

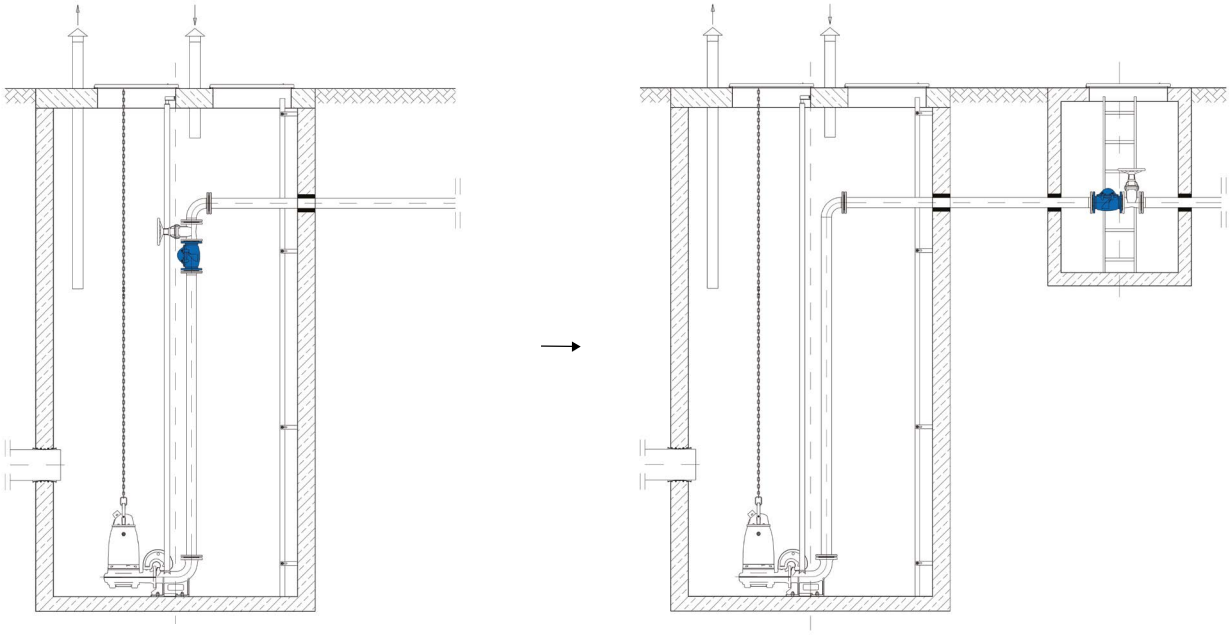
Advantages

For Lift Stations

1. Quick replacement time – customers can quickly replace valve balls themselves without damaging equipment.
2. Easy access to valves interior and the ball which enables placing the cover in the so-called servicing position.
3. Reducing energy consumption for sewage pumping due to the smaller resistance of the valve design (relative to standard ball check valves).

For Engineers

1. Fully open position and constant factor K starting from the flow rate of 2.3 fps.
2. Reduction of vibrations making a system work more quietly.



Additional options

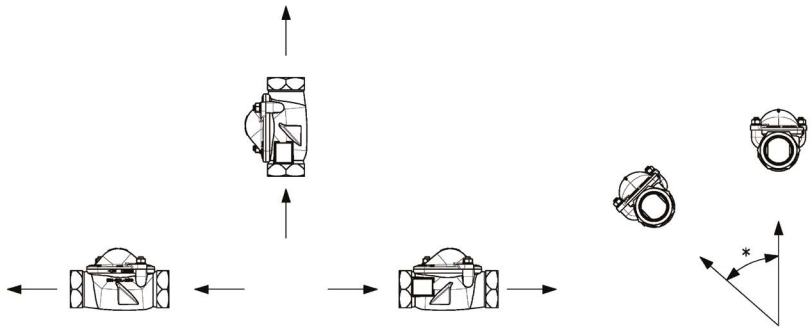
Type of check valve	Characteristics	Application examples
Version with floating ball (F)	The valve in F version is equipped with a ball, so-called „floating" ball, with a specific weight of approx 49.9 lb/ft³.	Backwater protection (valve is fully opened with the velocity of 0.66 fps).
Version with quasi ball (Q)	The valve in Q version is equipped with a quasi floating ball with a specific weight of approx 63.7 lb/ft³.	Lift stations, pumps with inverter.

Table of options

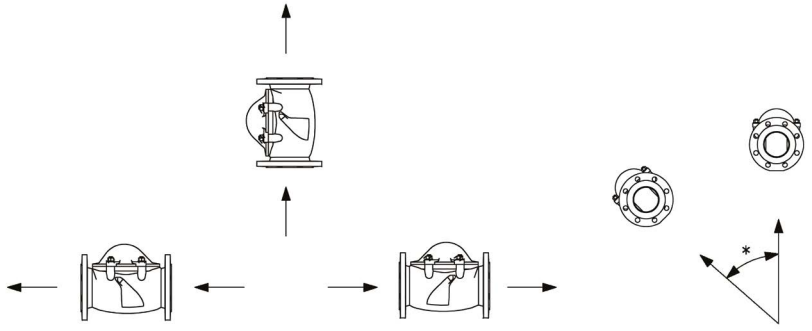
Type	DN	Size	Ductile Iron	Floating Ball (F)	Quasi Ball (Q)
Type ESL 01 - threaded					
ESL 01	32	1 1/4"	regular	n/a	n/a
ESL 01	40	1 1/2"	regular	n/a	n/a
ESL 01	50	2"	regular	option	n/a
Type ESL 11 - flanged					
ESL 11	50	2"	regular	regular	n/a
ESL 11	65	2 1/2"	regular	regular	n/a
ESL 11	80	3"	regular	regular	option
ESL 11	100	4"	regular	regular	option
ESL 11	125	5"	regular	regular	option
ESL 11	150	6"	regular	regular	option
ESL 11	200	8"	regular	regular	option

In-line ball check valves installation method

ESL 01



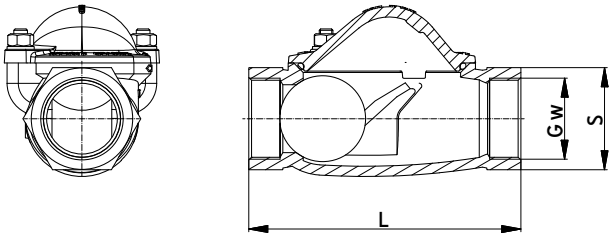
ESL 11



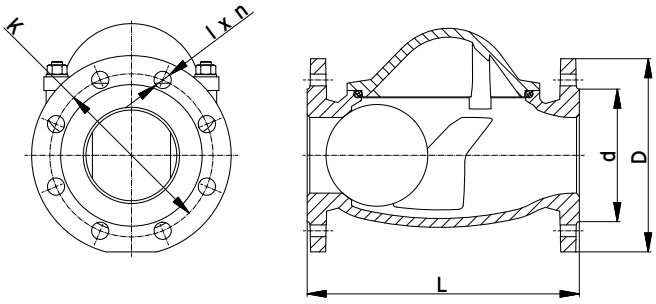
*Vertical deviation in the range:
0 – 10° – when used with solids as gravel and sand
0 – 45° – when used with drinking water

ESL ball check valves dimensions in accordance with the standard ANSI/ASME B16.1-2005 Class 125

ESL 01



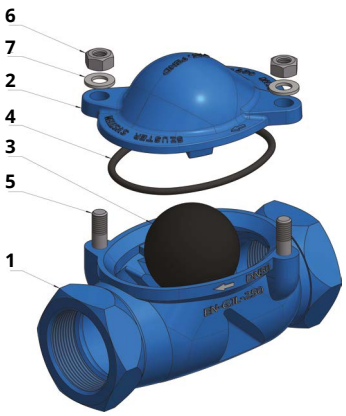
ESL 11



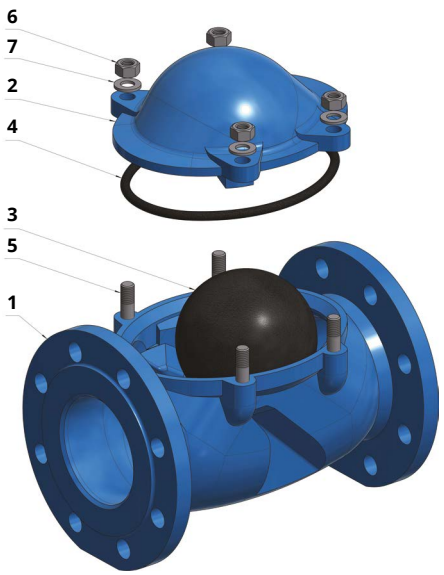
Type	DN	NPS	L	D	d	K	l x n	S	Gw	Weight
					[inch]					[lb]
ESL 01	40	1 1/2"	5 7/8	-	-	-	-	2 3/8	1 1/2	5.3
ESL 01	50	2"	7 7/8	-	-	-	-	2 15/16	2	9.0
ESL 11	50	2”	7 7/8	6 1/2	4	4 15/16	3/4" x 4	-	-	17.6
ESL 11	65	2 1/2”	9 7/16	7 1/4	4 13/16	5 11/16	3/4" x 4	-	-	25.4
ESL 11	80	3”	10 1/4	7 7/8	5 7/16	6 5/16	3/4" x 8	-	-	39.7
ESL 11	100	4”	11 13/16	8 5/8	6 1/4	7 1/8	3/4" x 8	-	-	59.5
ESL 11	125	5"	13 13/16	9 7/8	7 3/8	8 1/4	3/4" x 8	-	-	83.8
ESL 11	150	6”	15 3/4	11 1/4	8 3/8	9 7/16	7/8" x 8	-	-	105.8
ESL 11	200	8”	19 11/16	13 3/8	10 9/16	11 5/8	7/8" x 8	-	-	172.0

ESL ball check valves constructions

ESL 01



ESL 11



No.	Part	Material*
1	Body	Cast iron, ASTM A126 Class B (for sizes 1 1/4” - 2”); Ductile iron, ASTM A536 Grade 65-45-12 (for sizes 3”-12”)
2	Cover	Cast iron, ASTM A126 Class B (for sizes 1 1/4” - 2”); Ductile iron, ASTM A536 Grade 65-45-12 (for sizes 3”-12”)
3	Ball	Rubber NBR / EPDM
4	Gasket	Rubber NBR / EPDM
5	Screw cap	Stainless steel, ASTM A240 Grade 304
6	Nut	Stainless steel, ASTM A240 Grade 304
7	Washer	Stainless steel, ASTM A240 Grade 304

*Types of materials may be subject to change.