BB 1... ASME
BB 2... ASME

GB

Installation Instructions 810694-00

Dual-Plate Check Valves BB 1..., BB 2... ASME

FLOWSERVE

Flow Control Division

Contents

Component Parts BB 1... ASME

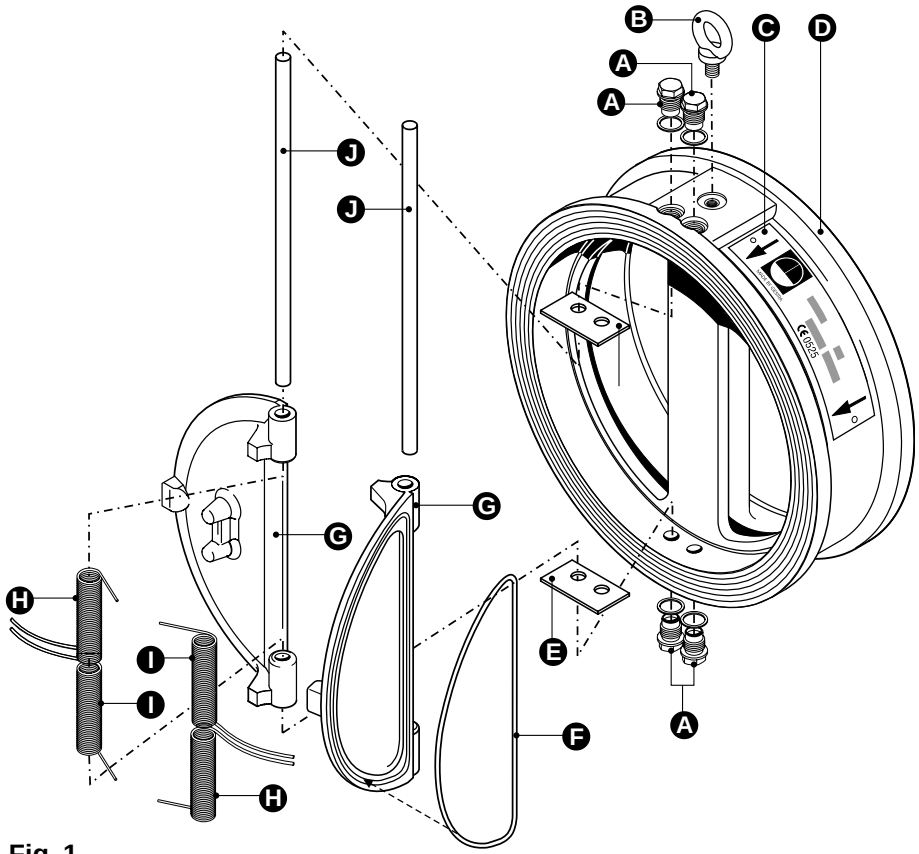


Fig. 1

Component Parts BB 2... ASME

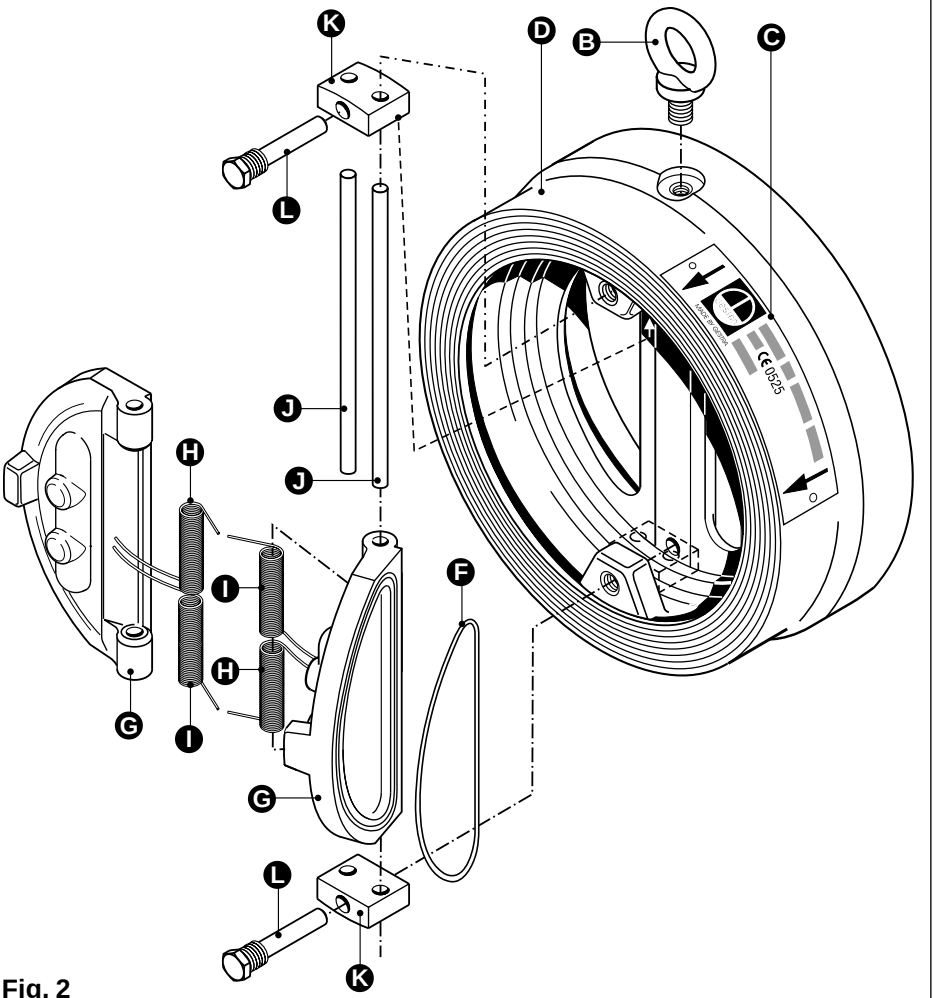


Fig. 2

Component Parts BB 1... with dampers, ASME

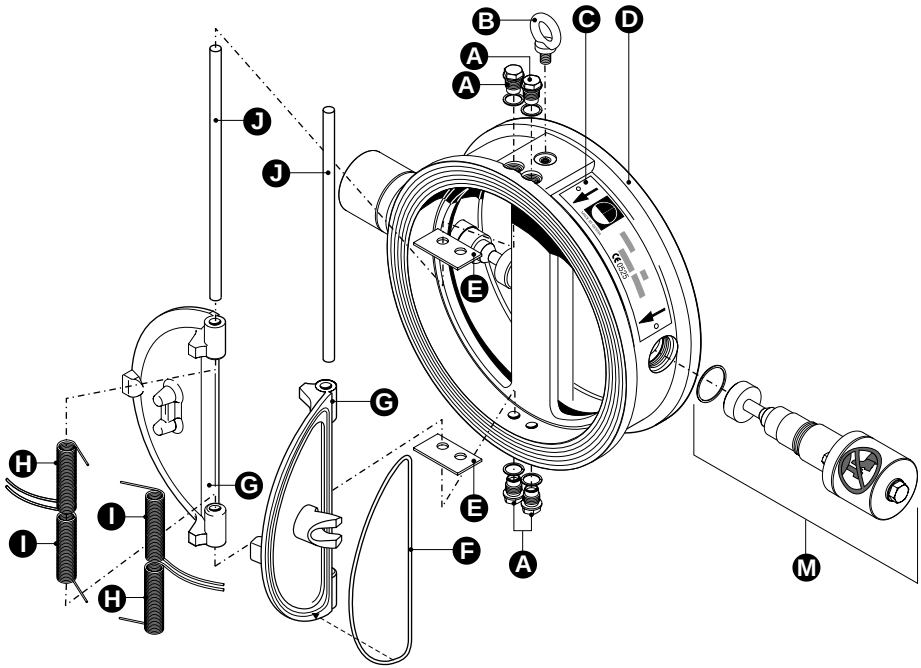


Fig. 3

Key

Ⓐ Sealing plug with gasket

Ⓑ Eyebolt

Ⓒ Name plate

Ⓓ Body

Ⓔ Plate support

Ⓕ O-ring

Ⓖ Semi-circular valve plates

Ⓗ Spring

Ⓘ Spring

Ⓙ Hinge pin

Ⓚ Hinge pin support

Ⓛ Threaded bolt

Ⓜ Damper (cpl.) with gasket

Pressure Drop Chart

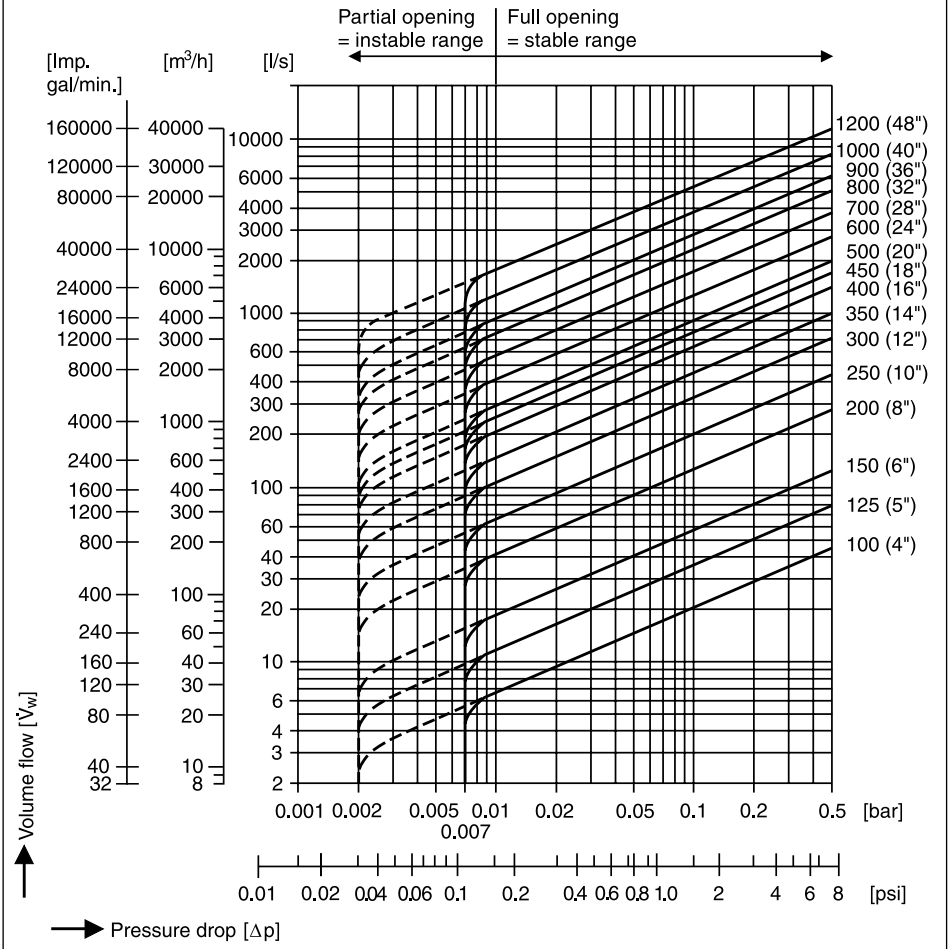


Fig. 4

Important Notes

Usage for the intended purpose

The swing and dual-plate check valves BB ensure unidirectional flow in pipes by preventing a backflow of liquids or gases.

Use this equipment only within the specified pressure and temperature ratings and check corrosion resistance and chemical suitability for the application in question.

Safety note

The valve must only be installed by qualified staff.

Qualified staff are those persons who – through adequate training in engineering, the use and application of safety equipment in accordance with regulations concerning safety systems, and first aid & accident prevention – have achieved a recognised level of competence appropriate to the installation and commissioning of this device.

Danger

The valve is under pressure during operation.

When loosening flanged connections or sealing plugs, hot water, steam, corrosive liquids or toxic gases may escape. This presents the danger of severe burns and scalds to the whole body or severe cases of poisoning.

Installation and maintenance work should only be carried out when the system is depressurized.

The valve becomes hot or extremely cold during operation. This presents the risk of severe burns to hands and arms. Installation and maintenance work should only be carried out at room temperatures.

Sharp edges on internals present a danger of cuts to hands. Always wear industrial gloves for installation and maintenance work.

Important Notes – continued –

Ratings pursuant to article 9 of the PED[1])

Fluid group	Gas		Liquid	
	1	**2**	**1**	**2**
Use BB 15/25 A, C, CL 150 to BB 19 A, C, CL 900	yes	yes	yes	yes

Category	Exception pursuant to article 3.3	I	II	III	IV
Nominal size [mm]	**DN**	**DN**	**DN**	**DN**	**DN**
BB 15/25 A, C, CL 150			4"–6" 100–150	8"–30" 200–750	
BB 15/25 A, C, CL 300				4"–30" 100–750	
BB 15/25 A, C, CL 600				4"–30" 100–750	
BB 15/25 A, C, CL 900				6"–24" 150–600	
CE marking	no	no	yes	yes	no

[1]) PED = **P**ressure **E**quipment **D**irective

Explanatory Notes

Scope of supply

BB 1... ASME

1 Dual-plate check valve type BB 1..., ASME

1 Installation manual

BB 2... ASME

1 Dual-plate check valve type BB 2..., ASME

1 Installation manual

BB 1... D, ASME

1 Dual-plate check valve type BB 1... with dampers, ASME

1 Installation manual

BB 2... D, ASME

1 Dual-plate check valve type BB 2... with dampers, ASME

1 Installation manual

Description

Swing and dual-plate check valves BB feature two separately suspended semi-circular plates pivoting on an independent hinge pin. The two plates open and close automatically allowing fluid to flow in one direction only. The opening pressure and closing time can be customized by modifying the spring characteristic. Hydraulic dampers are also available as optional extras to solve waterhammer problems. Installation in any position, with due regard to our installation recommendations. Our dual-plate check valves are fitted with eyebolts for easy installation and transit protection.

Please note that dual-plate check valves should not be used on reciprocating compressor, piston pumps or where pulsating flow exists.

Function

The min. opening pressure of the dual-plate check valves is a function of the spring characteristics. When the opening pressure is reached the hinge sides of the plates open first, thereby eliminating any possibility of the seats scuffing. As the pressure and flowrate rise, the opening angle increases symmetrically. Media entering the valve at an unfavourable angle (e. g. due to pipe bends) may cause an asymmetrical opening of the plates. If centrifugal pumps are installed upstream of the valve it becomes necessary to arrange for a defined stabilizing section. Systems where pulsating flow exists require specially designed dual-plate check valves. Make sure to install valves which are not fitted with springs in a vertical position with downward flow. Please note the installation recommendations outlined in the following pages.

Explanatory Notes – continued –

Technical Data

Pressure/temp. ratings*) for BB, carbon steel													
p-t series to ASME 16.34													
Temperature	[°C]	20	100	150	200	250	300	350	400	450	500	540	Class
BB 15 C, BB 25 C	[bar]	19.6	17.7	15.8	14.0	12.1	10.2	8.4	6.5	4.6	2.8	1.3	150
BB 16 C, BB 26 C	[bar]	51.1	48.4	45.2	43.9	41.8	38.9	36.9	34.6	20.2	8.9	3.3	300
BB 18 C	[bar]	102	92.8	90.5	87.8	83.6	77.5	74.0	69.1	40.1	17.6	6.7	600
BB 19 C	[bar]	153.2	139.1	135.7	131.5	125.2	116.2	110.9	103.5	60.1	26.4	9.8	900

*) When used for its intended purpose.

Pressure/temp. ratings*) for BB, stainless steel, DN 100 – 125, 4" – 5"													
p-t series to ASME 16.34													
Temperature	[°C]	20	100	200	250	300	350	400	450	Class			
BB 15 A	[bar]	15.9	13.3	11.1	10.2	9.7	8.4	6.5	4.6	150			
BB 16 A	[bar]	41.4	34.4	28.8	26.6	25.2	24.0	23.1	22.2	300			
BB 18 A	[bar]	82.7	69.1	57.4	53.5	50.5	48.0	46.2	44.6	600			

*) When used for its intended purpose.

Pressure/temp. ratings*) for BB, stainless steel, from DN 150, 6"													
p-t series to ASME 16.34													
Temperature	[°C]	20	100	150	200	250	300	350	400	450	500	540	Class
BB 15 A, BB 25 A	[bar]	19	17.4	14.8	14.0	12.1	10.2	8.4	6.5	4.6	2.8	1.3	150
BB 16 A, BB 26 A	[bar]	49.6	45.1	39.9	39.9	37.7	36.6	34.7	33.8	33.4	28.2	25.1	300
BB 18 A	[bar]	99.3	90.3	79.4	79.4	75.3	71.7	69.3	67.9	66.9	56.5	50.0	600
BB 19 A	[bar]	148.9	135.4	119.3	119.3	112.9	107.7	103.7	101.7	100.4	84.7	75.1	900

*) When used for its intended purpose.

Explanatory Notes – continued –

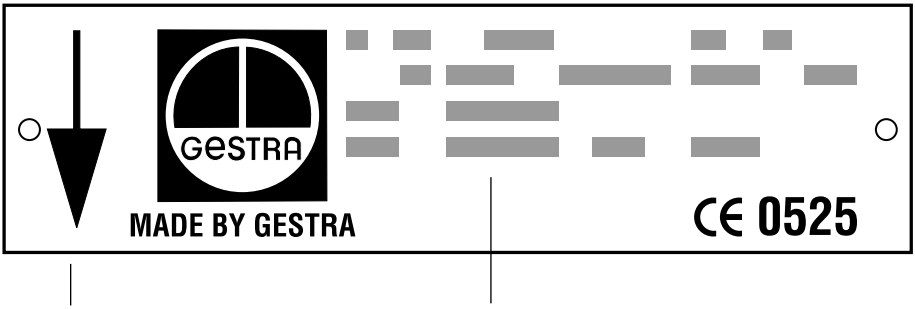
Corrosion Resistance

If the unit is used for the intended purpose, its safety is not impaired by corrosion.

Sizing

The valve body must not be subjected to sharp increases in pressure. Welds and flanges of the valve are designed to withstand dynamic loading (bending and alternative stress). The dimensional allowances for corrosion reflect the latest state of technology.

Name Plate / Marking



Direction of flow

Type code **BB 1... ASME** as specified by EN ISO 26552

For further ratings to EN 19 see body of BB 1... ASME.

Fig. 5

Installation

Springs

The dual-plate check valve BB 1..., BB 2... with standard springs may be fitted in horizontal pipework or in vertical pipework with upward flow. For downward flow special springs are required. For more information refer to our data sheet “Dual-Plate Check Valve BB”.

Spring “7 WA”
Spring for 7 mbar opening pressure, suitable for horizontal installation or vertical installation with ***upward*** flow.

Spring “2 WA”
Spring for 2 mbar opening pressure, suitable for horizontal installation or vertical installation with ***upward*** flow.

Spring “5 VO”
Spring for 5 mbar opening pressure, suitable for horizontal installation or vertical installation with ***downward*** flow.

Note

Depending on the volume flow, the dual-plate check valve opens either completely or only partly. During partial opening, i. e. at a reduced volume flow (cf. pressure drop chart – instable range), clatter may occur which gives rise to wear on the valve seat and plates, **Fig. 4**.

Installing a dual-plate check valve with spring type “**5 VO**” in horizontal lines or vertical lines with ***upward*** flow may result in loud noises, scuffing and subsequent wear on the seat.

BB 1..., BB 2...

1. Please note our installation recommendations on page 15.
2. Clean plate seats.
3. **Horizontal flow:** Insert flange bolts through bottom flange bore and tighten nuts. Use off-the-shelf seals.
4. Mount and align dual-plate check valve BB, making sure that the eyebolt Ⓔ is on top. Insert and tighten flange bolts.
5. **Vertical flow:** Insert commerical grade seals (bottom).
6. Mount and align dual-plate check valve BB. Insert off-the-shelf seals (top). Insert and tighten flange bolts.

BB 1... with dampers, BB 2... with dampers

1. Please note our installation recommendations on page 15.
2. Use only the eyebolt Ⓔ as aid for installing the valve. Do **not** attach steel or nylon slings to damping cylinder Ⓜ.
3. Do **not** tread on damping cylinder Ⓜ.
4. Proceed as described under “BB 1..., BB 2...” .

incorrect

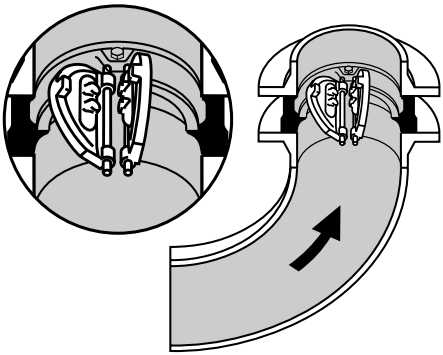


Fig. 6

correct

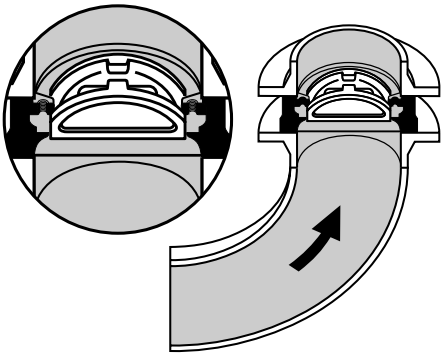


Fig. 7

optimum

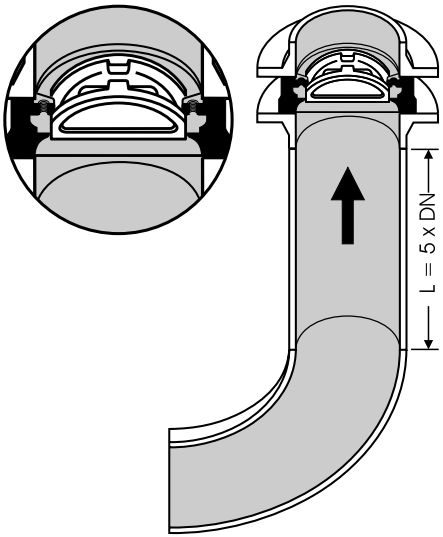


Fig. 8

with pump

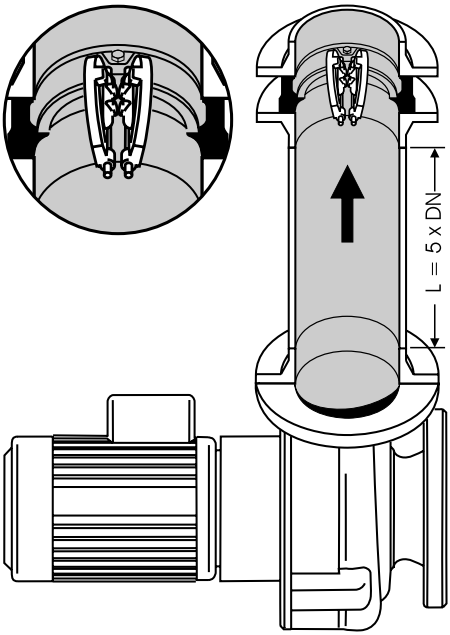


Fig. 9

Commissioning

BB 1..., BB 2...

Dual-plate check valves BB... do not require special preparations prior to their commissioning. If the springs or O-rings of the dual-plate check valves BB 1... have been replaced check plugs Ⓐ for positive sealing and, if necessary, retighten them. Please refer to pages 22 to 24 for information on torques.

If the dual-plate check valves BB... have not been properly positioned in the pipework or are fitted with unsuitable springs the consequent vibrations and clattering plates will give rise to loud noises. In this case either increase the capacity of the pump or replace the springs by suitable ones. Please observe the installation notes.

Do not attach objects to or tread on the damping cylinders Ⓜ of the dual-plate check valves BB with dampers.

Operation

BB 1..., BB 2...

If the dual-plate check valves BB... have not been properly positioned in the pipework or are fitted with unsuitable springs the consequent vibrations and clattering plates will give rise to loud noises. In this case either increase the capacity of the pump or replace the springs by suitable ones. Please observe the installation notes.

Do not attach objects to or tread on the damping cylinders Ⓜ of the dual-plate check valves BB with dampers.

Maintenance

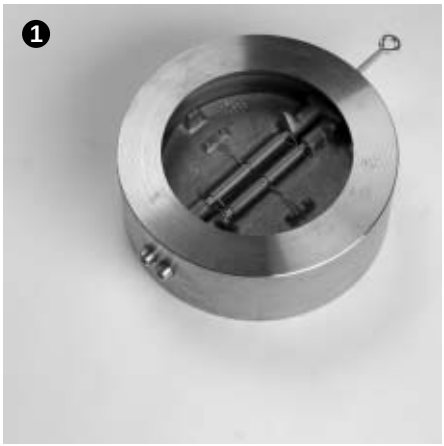
GESTRA dual-plate check valves BB ... do not require any special maintenance. However, in certain cases (cf. “Commissioning”) it might be necessary to replace the springs or O-rings.

Danger

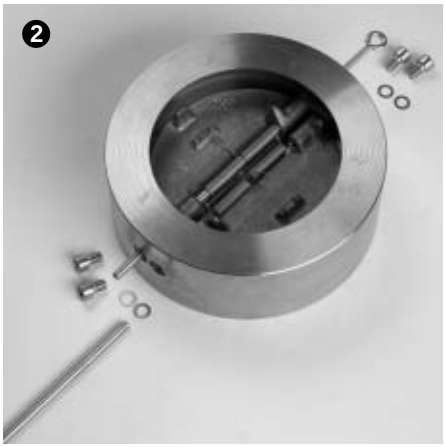
Note that springs are preloaded, which means that they can jump out of the plate body when the valve is being installed or removed.

This presents the risk of injuries to hands, arms and face.

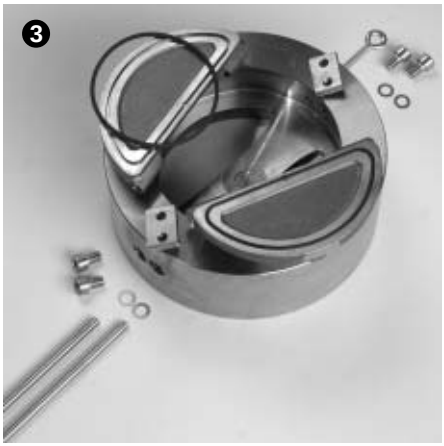
Replacing springs / O-rings of the BB 1...



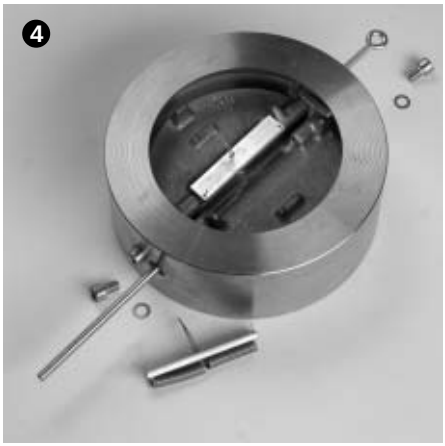
Dual-plate check valve BB 1...



Undo screws, remove springs and withdraw hinge pins.

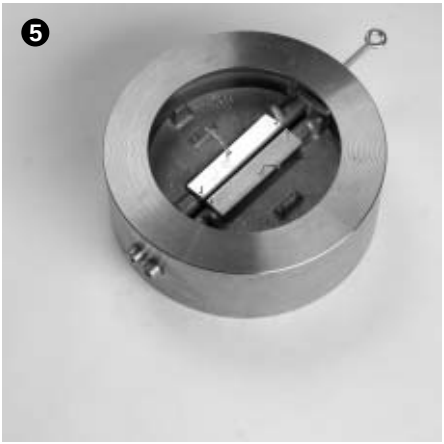


Take out springs, semicircular plates, support plates and, if fitted, O-rings.

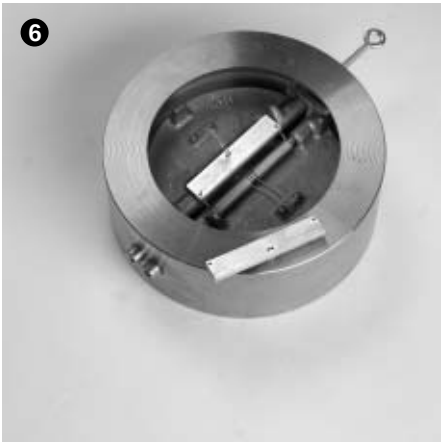


Insert new springs with tension plates and hinge pins.

Replacing springs / O-rings of the BB 1... – continued –



Screw in and tighten screws.



Remove tension plates.

Install dual-plate check valve BB 1...

Tools

- Spanner socket A.F. 17, 19, 22, 24 mm to DIN 3124
- Hexagon socket spanner A.F. 5, 6, 10, 12 mm to ISO 2936
- Torque spanner 10 - 60 Nm, DIN ISO 6789

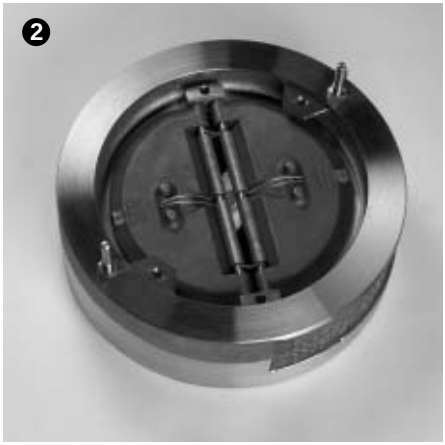
Danger

Note that springs are preloaded, which means that they can jump out of the plate body when the valve is being installed or removed.

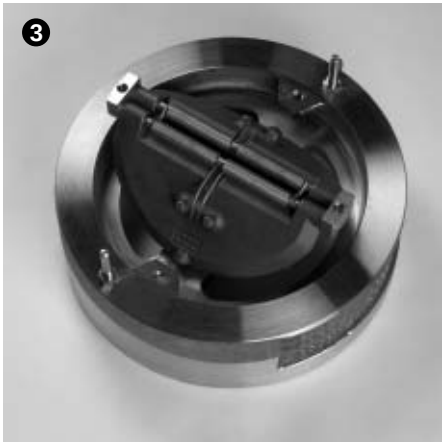
This presents the risk of injuries to hands, arms and face.

Replacing springs of the BB 2...

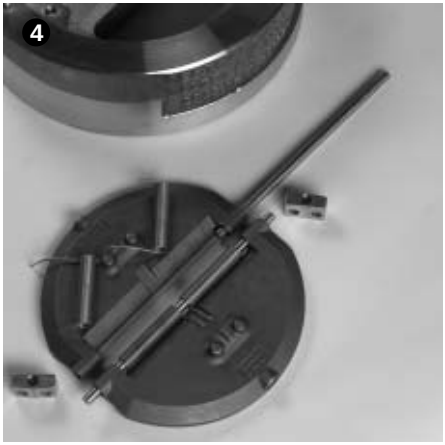
Dual-plate check valve BB 2...



Undo threaded bolts, turn semicircular plates to the left.

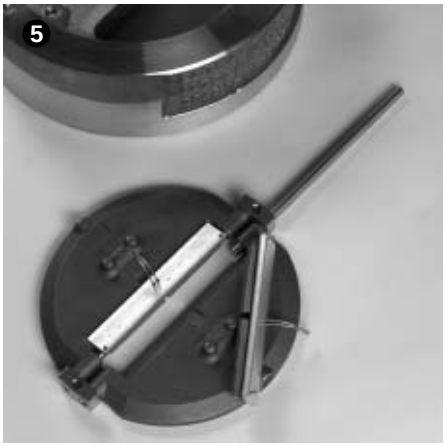


Take out semicircular plates, springs and support plates.

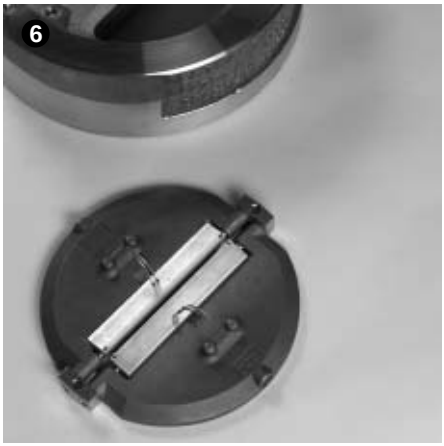


Remove support plates, cover springs and withdraw hinge pins.

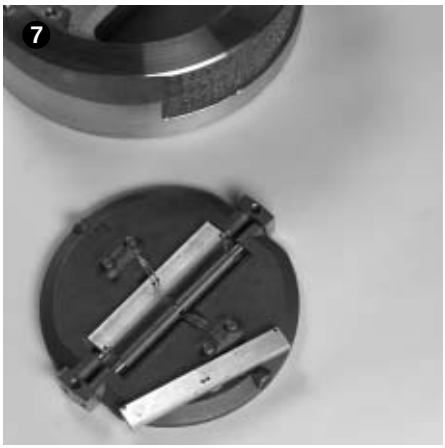
Replacing springs of the BB 2... – continued –



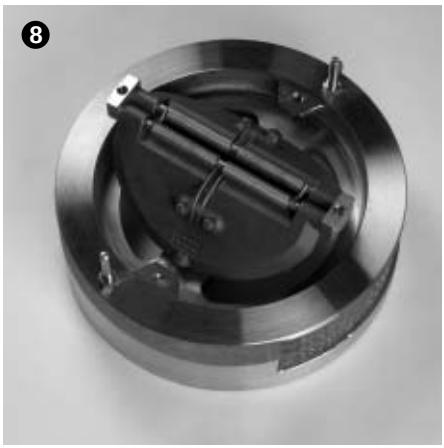
Insert new springs using tension plates.
Fit hinge pins and support plates.



Align support plates.

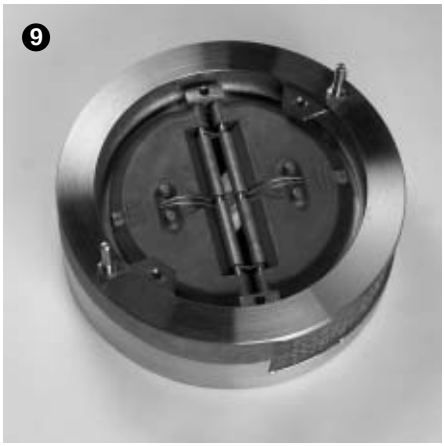


Remove tension plates.

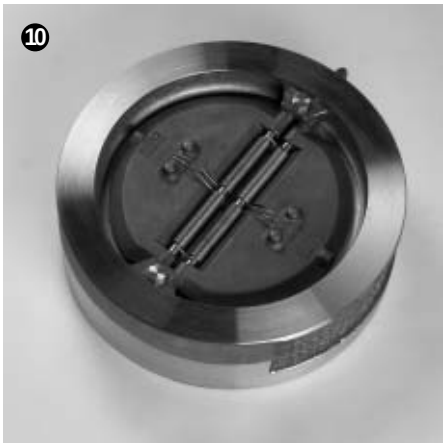


Insert semicircular plates with springs and support plates.

Replacing springs of the BB 2... – continued –



Align semicircular plates. Insert and tighten threaded bolts.



Mount dual-plate check valve BB 2...

Tools

- Spanner socket A.F. 17, 19, 22, 24 mm to DIN 3124
- Hinged face spanner A.F. 2-8 mm (for valves with polymer/hard rubber lining)
- Torque spanner 10-60 Nm, DIN ISO 6789

Maintenance – continued –

Torques [Nm]

Item	DN [mm]	Austenitic steel							
					BB 15...	BB 16...		BB 18...	BB 19...
Ⓐ	100				13	13		13	
	125				13	13		27	
	150							65	65
	200							135	135
	250							135	135
	300							135	320
	350							260	
	400							320	
	450				310	310			
	500				310	310			
	600				310	310			
	750				1080	1080			
	900				1940	1940			
	1050				1940	1940			
	1200				45	45			

Do **not** use lubricant for fastening bolts.

Item	DN [mm]	Austenitic steel				
					BB 25...	BB 26...
Ⓛ	150				15	15
	200				15	15
	250				26	26
	300				26	26
	350				26	26
	400				70	70

Do **not** use lubricant for fastening bolts.

Maintenance – continued –

Torques [Nm]

Item	DN [mm]	Bronze							
					BB 15...	BB 16...		BB 18...	BB 19...
Ⓐ	100								
	125								
	150							27	27
	200							58	58
	250							58	58
	300							58	230
	350							110	
	400							230	
	450			310	310	310			
	500			310	310	310		460	
	600			310	310	310		460	
	750			460	460	460			
	900			1420	1420	1420			
	1050			1420	1420	1420			
	1200			19	19	19			

Do **not** use lubricant for fastening bolts.

Item	DN [mm]	Bronze				
					BB 25...	BB 26...
Ⓛ	150				17	17
	200				17	17
	250				28	28
	300				28	28
	350				28	28
	400				78	78

Do **not** use lubricant for fastening bolts.

Spare Parts

Spare Parts List

Item	DN	Stock code	Stock code	Stock code	Stock code
		EPDM	FPM	NBR	PTFE
Ⓕ	100	037847	038982	038543	
	125	346777	346778	346779	
	150	342598	342711	342931	342978
	200	342710	342713	344372	343721
	250	342522	342523	344484	344491
	300	182574	038718	340825	344592
	350	342565	342569	038705	175131
	400	342584	342585	344714	344715
	450	038948	180962	037020	
	500	036002	036007	182719	343876
	600	036003	180210	122490	
	750	344939	342120	183105	

Minimum purchasing quantity 20 pcs.

Two O-rings are required per valve. Contact your local dealer for small quantities.

Spare Parts – continued –

Spare Parts List

Item	DN	Stock code	Stock code	Stock code	Stock code
		2 WA	7 WA	5 VO	
	100	348200	348190	348198	
	125	348201	348191	348199	
	150	248202	348192	348209	
	200	348203	348193	348211	
	250	348204	348194	348213	
❶	300	348205	348195	348215	
❶	350	348206	348196	348216	
	400	348207	348197	348217	
	450	348586	348580	348598	
	500	348587	348581	348600	
	600	348588	348582		
	700		348584		

Springs complete with tension plates.

Contact your local dealer for small quantities.

Annex

CE Declaration of Conformity

We hereby declare that the pressure equipment **BB 1... ASME** and **BB 2... ASME** conform to the following European Directive:

- EC Pressure Equipment Directive (PED) No. 97/23 of 29 May 1997

Dual-plate check valves are pressure equipment as defined in article 1, section 2.1.4 of the PED.

Applied conformity assessment procedure as described in Annex III: Module H.

This declaration is no longer valid if modifications are made to the equipment without consultation with us.

Bremen, 5th December 2001
GESTRA GmbH

i. V. U. Bledschun

Head of the Design Dept.
Uwe Bledschun
Academically qualified engineer

i. V.

Quality Assurance Representative
Lars Bohl

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