

GESTRA Steam Systems

Dual-Plate Check Valves

BB

DIN-Range

DN 50 – 1200 (2 – 48"), PN 6 – 160

Description

Wafer-type dual-plate check valves for sandwiching between flanges, with springs for horizontal and vertical lines with upward flow. With special springs for downward flow. Self-centering valve body. Application: for liquids, gases and vapours (observe classification according to PED).

Design

Either with metal-to-metal or soft seat. Observe temperature limits for soft seats. With damper for installations susceptible to waterhammer. Body covered with Levasint or rubber for applications with drinking water or sea water.

Pressure/Temperature Ratings with metal-to-metal seat¹⁾

Design	Type	PN	Max. service pressure [bar g] at temperatures [°C] ²⁾														
			20	100	150	200	250	300	350	400	450	500	550				
Grey cast iron down to -10 °C at nom. pressure	BB 11G/21G	6	6	6	5.4	4.8	4.2	3.6									
	12G/22G	10	10	10	9	8	7	6									
	14G/24G	16	16	16	14.4	12.8	11.2	9.6									
Carbon steel down to -10 °C at nominal pressure	BB 12C/22C	10	10	10	10	9.6	8.9	7.6	7.1	6.7	6.4						
	14C/24C	16	16	16	16	15.3	14.2	12.1	11.4	10.7	10.3						
	15C/25C	25	25	25	25	23.9	22.2	18.9	17.8	16.7	16.1						
	16C/26C	40	40	40	40	38.2	35.6	30.2	28.4	26.7	25.8						
	17C	63	63	58.5	54.6	47.6	44.8	40.6	37.8	36.4							
	18C	100	100	93.3	86.7	75.6	71.1	64.4	60	57.8							
Stainless steel down to -200 °C at nominal pressure ³⁾	BB 12A/22A	10	10	9.8	9.1	8.5	8.1	7.8	7.5	7.3	7.2	7	6.9				
	14A/24A	16	16	15.6	14.6	13.7	13	12.4	12	11.7	11.4	11.2	11.1				
	15A/25A	25	25	24.4	22.8	21.3	20.3	19.4	18.8	18.2	17.9	17.6	17.3				
	16A/26A	40	40	39.1	36.4	34.1	32.5	31.1	30	29.2	28.6	28.1	27.7				
	17A	63	63	61.6	57.4	53.8	51.2	49	47.3	45.9	45.1	44.2	43.7				
	18A	100	100	93.3	86.7	82.2	77.8	74.2	71.6	69.3	67.6	66.2	63.1				
19A	160	160	149.3	138.7	131.5	124.5	118.7	114.6	110.9	108.2	105.9	101					

¹⁾ Temperature limits for soft seats see page 3

²⁾ For temperatures above 300 °C (572 °F) special springs of Inconel are required.

³⁾ DN 50 – 125 made from stainless steel applicable up to max. 500 °C.

Valve types at a glance

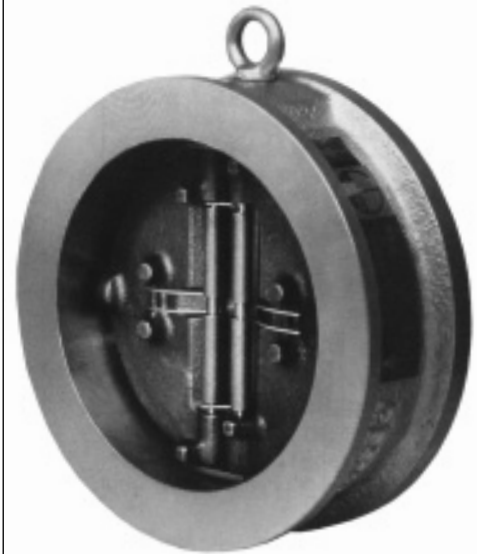
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000	1200	
PN 6																				
10	only BB 12A			BB 12C/12A																
16	only BB 14A			BB 14C/14A																
25	only BB 15A			BB 15C/15A																
40	only BB 16A			BB 16C/16A																
63	only BB 17A			BB 17C/17A										BB 17C/17A						
100	only BB 18A			BB 18C/18A										BB 18C/18A						
160																				

Product Range Group A2

BB



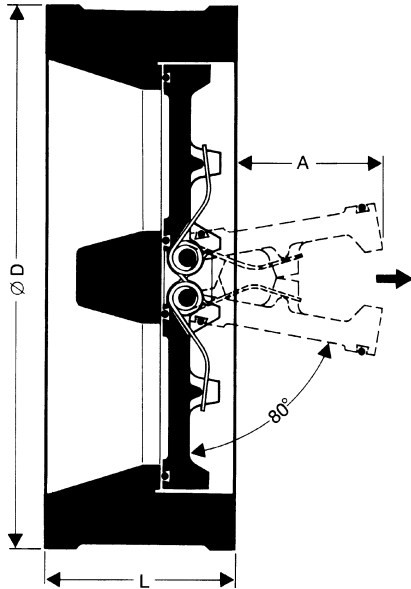
BB2... DN 150 – 400, PN 6 – 40



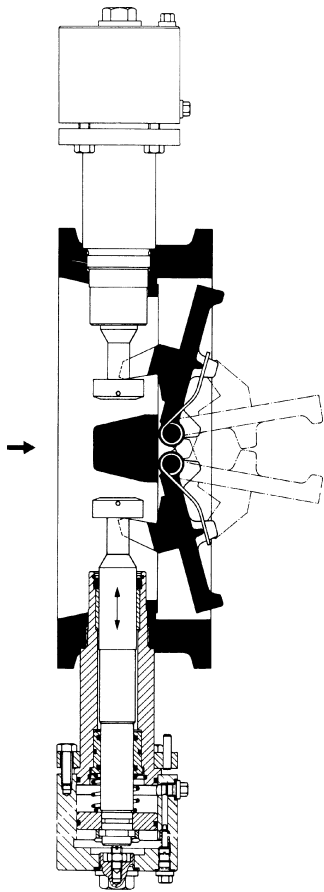
BB1... DN 50 – 125 and from DN 450, PN 6 – 40 as well as all DN from PN 63

- Wafer type valve
- Centring diameter to suit DIN flanges
- DIN materials
- Short overall length to DIN EN 558-1, series 16, for nominal pressures up to and including PN 63, higher pressures in accordance with API-Std. 594

Dimensions



Design with damper



BB with patented adjustable dampers in DN 200 – 800.
 Max. temperature limit 110 °C because of NBR seal.
 Max. admissible service pressures depend on DN.

Dimensions, Weights⁴⁾

DN	PN	Dimensions [mm]			Weight ³⁾ [kg]		
		D	L	A			
50	10/16/25/40	109	43	8	2.5		
	63	115	60	0	3.5		
	100	121	60	0	4		
65	10/16/25/40	129	46	11	4		
	63	140	67	0	6		
	100	146	67	0	6.5		
80	10/16/25/40	144	64	12	6		
	63	150	73	5	7		
	100	156	73	5	7.5		
100	10	164	64	19	7		
	16	164			7		
	25	171			7.5		
	40	171			7.5		
	63	176			79	4	9
	100	183			79	4	10
125	10	194	70	28	12		
	16	194			12		
	25	196			12		
	40	196			12		
	63	213			105 ⁴⁾	10	21
	100	220			105 ⁴⁾	10	22.5
150	6	209	76	40	12		
	10	220			13.5		
	16	220			13.5		
	25	226			14		
	40	226			14		
	63	250			137	0	31
200	6	264	89	64	18.5		
	10	275			20		
	16	275			20		
	25	286			22		
	40	293			23		
	63	312			165	3	52
250	6	319	114	87	33		
	10	330			35		
	16	330			35		
	25	343			38		
	40	355			41		
	63	367			213	3	78
300	6	375	114	110	44		
	10	380			45		
	16	386			47		
	25	403			51		
	40	420			55		
	63	427			229	6	128
350	6	425	127	120	62.5		
	10	440			67		
	16	446			69		
	25	460			73		
	40	477			79		
	63	489			273	8	205
	100	515	273	8	228		

DN	PN	Dimensions [mm]			Weight ³⁾ [kg]
		D	L	A	
400	6	475	140	142	80.5
	10	491			86
	16	498			88
	25	517			95
	40	549			107
	63	546			305
450	6	530	152	163	125
	10	541			130
	16	558			138
	25	567			140
	40	574			143
	63	546			305
500	6	580	152	181	144
	10	596			152
	16	620			164
	25	627			168
	40	631			170
	63	660			368
600	6	681	178	217	223
	10	698			234
	16	737			263
	25	734			261
	40	750			273
	63	768			394
700	6	786	229	250	305
	10	813			326
	16	807			321
	25	836			345
	40	855			390
	63	768			394
800	6	893	241	290	462
	10	920			490
	16	914			484
	25	945			526
	40	978			577
	63	312			165
900	6	993	241	327	571
	10	1020			602
	16	1014			596
	25	1045			643
	40	1088			750
	63	312			165
1000	6	1093	300	364	808
	10	1127			860
	16	1131			865
	25	1158			907
	40	1198			1140
	63	312			165
1200	6	1310	350	436	1164
	10	1344			1235
	16	1345			1237
	25	1368			1280
	40	1404			1450
	63	312			165

³⁾ The weight indications refer to GP240GH (GS-C 25).

⁴⁾ Dimension not standardized.

Connections of wafer-type valves

Optionally for fitting between flanges to EN 1092-1			
Form B1 and B2	Form C	Form F	Form G

Installation

The direction of flow is indicated by an arrow on the valve body. Installation in horizontal lines (eyebolt on top) or in vertical lines with upward flow.

Installation in vertical lines with downward flow only with springs 5V0 and up to DN 500 mm (20").

Materials

Design	Part designation	DIN materials		
Grey cast iron	Body	EN-GJL-250 (GG-25)	EN-JL 1040	
	Dual plate	EN-GJS-400-15 (GGG-40)	EN-JS 1030	
	Support/Hinge pins	X6CrNiMoTi17-12-2	1.4571	
	Springs			
Carbon steel	Body	DN 100 – 125	P250GH (C 22.8)	1.0460
		DN 150 and above	GP240GH (GS-C 25) ⁵⁾	1.0619
	Dual plate	DN 100 – 125	X10Cr13	1.4006
		DN 150 and above	GP240GH (GS-C 25)	1.0619
	Support/Hinge pins	X6CrNiMoTi17-12-2	1.4571	
	Springs ⁶⁾			
Stainless steel	Body	DN 50 – 125	X2CrNiMo17-12-2	1.4404
		DN 150 and above	GX5CrNiMo19-11-2	1.4408
	Dual plate	DN 50 – 125	X2CrNiMo17-12-2	1.4404
		DN 150 and above	GX5CrNiMo19-11-2	1.4408
	Support/Hinge pins	X6CrNiMoTi17-12-2	1.4571	
	Springs ⁶⁾			

⁵⁾ On request at extra cost, with hard-faced seating surfaces from DN 150 onwards.

⁶⁾ For temperatures > 300 °C Inconel springs.

Soft seat

Either	EPDM FPM (FKM)	–40 to +150 °C, ethylene propylene dien rubber –25 to +200 °C, fluoro rubber (e.g. Viton)
On request	NBR PTFE	–30 to +110 °C, acrylonitrile butadiene rubber (e.g. Perbunan) –25 to +200 °C, polytetrafluoroethylene (e.g. Teflon)

The values indicated in this table are only applicable if they are within the pressure and temperature ratings for metal-to-metal seats.

Springs and Corresponding Opening Pressures

The following springs are available:

7 WA – springs for 7 mbar opening pressure with horizontal installation

7 WAI – as above, but for temperatures > 300 °C

2 WA – springs for 2 mbar opening pressure with horizontal installation

5 V0 – springs for 5 mbar opening pressure with vertical installation and downward flow

For upward flow see table page 4.

Inspections, Type-Approvals

Inspections in accordance with official DIN, TRD and AD regulations (e.g. DIN 3230 part 4, 5, 6) available at extra price.

Approved by Germanischer Lloyd and USSR Register of Shipping. VdTÜV type approval.

Designs

Valves with anti-corrosion lining: hard rubber or Levasint (see separate data sheet).

Valves with patented dampers for solving waterhammer problems.

DISCOCHECK Dual Plate Check Valves BB for ANSI flanges, see separate data sheets.

Specification System

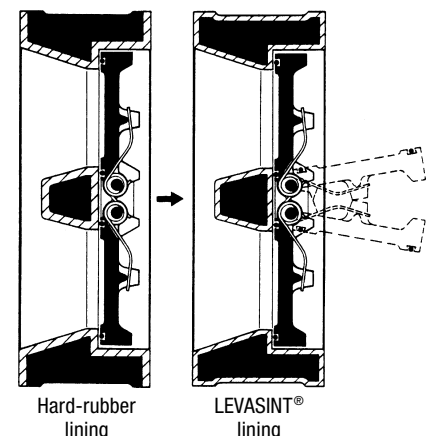
BB	Dual-plate check valve
26	Pressure rating 11/21 – PN 6 (cast iron only) 12/22 – PN 10 14/24 – PN 16 15/25 – PN 25 16/26 – PN 40 17 – PN 63 18 – PN 100 19 – PN 160
C	Body materials G – grey cast iron C – steel A – austenitic stainless steel
150	Nominal sizes DN 50 – 1200 mm (2 – 48")
FPM	Seat material HD – Metal-to-metal EPDM FPM (FKM) NBR PTFE
7 WA	Springs/Opening pressures 7 WA – spring for 7 mbar horizontal 7 WAI – Inconel spring for 7 mbar horizontal 2 WA – spring for 2 mbar horizontal 5 V0 – spring for 5 mbar downward flow

Example:

BB 26 C 150 FPM 7 WA

→ The full specification is:
Dual-plate check valve type BB 26, PN 40, of cast steel GS-C 25, DN 150 mm (6") with FPM seat and 7 mbar springs for horizontal installation.

Design with lining



LEVASINT® is a registered trademark of BAYER AG, Leverkusen.

Dual-Plate Check Valves

BB

DIN-Range

DN 50 – 1200 (2 – 48"), PN 6 – 160

Pressure Drop Chart

The chart is valid for water at 20 °C; for other fluids, the equivalent water volume flowrate must be calculated and used in the chart.

The values indicated in the chart are applicable to valves with 7 mbar springs with horizontal flow. With vertical flow deviations occur only within the range of partial opening.

The dashed lines in the chart are valid for valves with 2 mbar springs with horizontal flow.

The chart and the flow characteristics are applicable for pressure up to (and including) PN 40. With pressures higher than PN 40 the Zeta-values and the pressure drops increase with the same flowrates by approx. 20 %. The K_{VS} values are reduced accordingly.

$$\dot{V}_w = \dot{V} \cdot \sqrt{\frac{\rho}{1000}}$$

\dot{V}_w = Equivalent water volume flow
in [l/s] or [m³/h]

ρ = Density of fluid (operating condition)
in [kg/m³]

\dot{V} = Volume flow of fluid (operating condition)
in [l/s] or [m³/h]

Enquiry Specification

GESTRA DISCOCHECK dual-plate check valve type BB.

Wafer-type design to DIN EN 558-1/-2 series 16 (K3) from PN 63 in accordance with API-Std. 594. With two plates operating independently from each other and four springs.

Indication when ordering

Type BB1 . . . / BB 2 . . . , DN . . . , seat

For flanges to DIN . . .

Fluid, flowrate, service pressure and temperature. Specification of pipe flanges.

Note

The valve should not be used on compressors or where pulsating flow exists.

For these applications please consult us.



PED

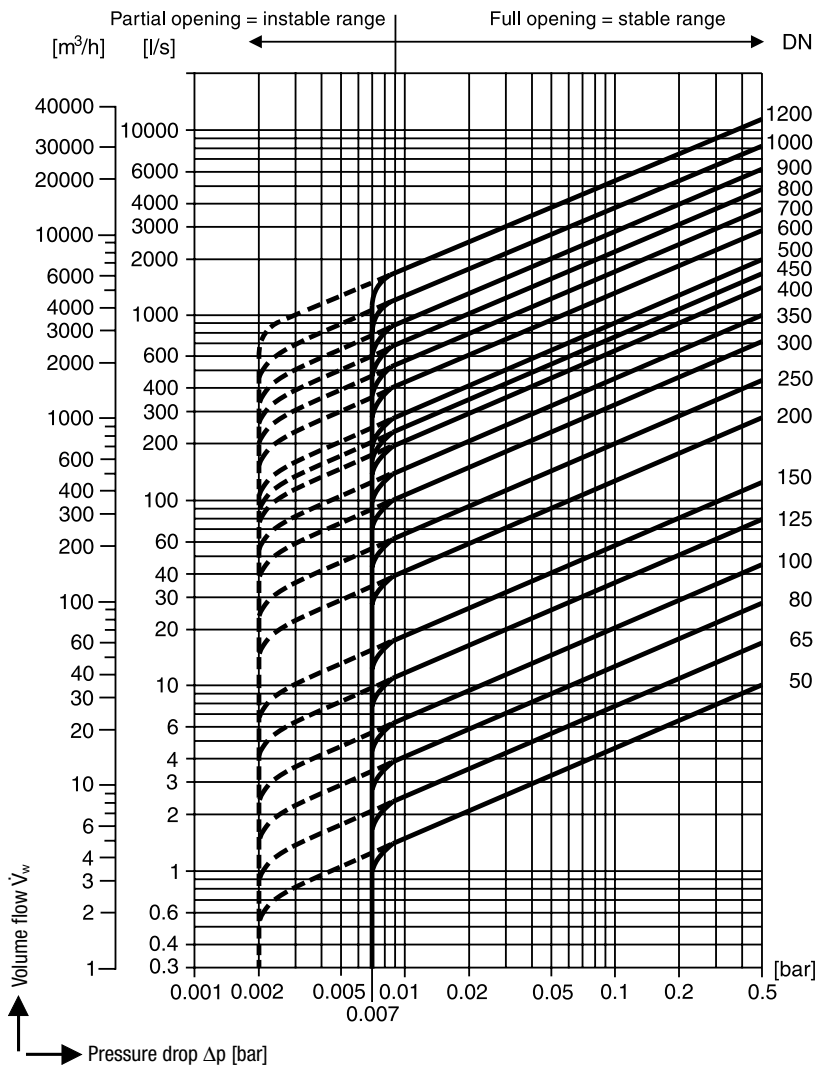
Equipment complies with the requirements of the EC Pressure Equipment Directive (PED) 97/23/EC. BB...C, BB...A, BB...M can be used with fluids of group 1 and 2; BB...G, BB...GS can be used with fluids of group 2. With CE marking (apart from equipment specified in Article 3.3).

ATEX

The equipment does not have its own potential source of ignition and is therefore excluded from the scope of the Directive 94/9/EC (ATEX). Applicable in potentially explosive zones 0, 1, 2, 20, 21, 22 (1999/92/EC). The devices do not bear an Ex marking.

Supply in accordance with our general terms of business.

Note:



Flow Characteristics

BB valves in horizontal lines.
Flow with water at 20 °C.

DN		BB fully open	
mm	in	Zeta-value	K_{VS} -value [m³/h]
50	2	3.2	58
65	2½	3.2	95
80	3	3.2	150
100	4	2.7	238
125	5	2.5	390
150	6	2.3	600
200	8	1.25	1439
250	10	1.2	2200
300	12	1.0	3800
350	14	0.9	5000
400	16	0.9	7100
450	18	0.9	8400
500	20	0.9	10180
600	24	0.9	14000
700	28	0.9	20000
800	32	0.9	25400
900	36	0.9	31000
1000	40	0.9	42000
1200	48	0.8	60000

$$C_v \text{ (U.S.)} = 1.17 \cdot k_v \quad C_v \text{ (U.K.)} = 0.98 \cdot k_v$$

Opening Pressures

Differential pressures at zero volume flow.

DN		Opening pressures [mbar] ↑ with upward flow			
mm	in	without springs	7 WA 7 WAI	2 WA	5 VO
50	2	6	13	8	17
65	2½	6	13	8	17
80	3	7	14	9	19
100	4	7	14	9	19
125	5	10	17	12	25
150	6	11(15)	18(22)	13(17)	27(35)
200	8	12(18)	19(25)	14(20)	29(41)
250	10	14(18)	21(25)	16(20)	33(41)
300	12	15(25)	22(32)	17(27)	35(55)
350	14	17(25)	24(32)	19(27)	39(55)
400	16	19(25)	26(32)	21(27)	43(55)
450	18	22	29	24	49
500	20	23(28)	30(35)	25(30)	51(61)
600	24	24(31)	31(38)	26(33)	
700	28	29	36	31	
800	32	35	42	37	
900	36	41	48	43	
1000	40	43	50	45	
1200	48	47	54	49	

The values in brackets refer to BB 17/18/19.
1 mbar \triangleq 0.0145 psi \triangleq 10 mm w.g. \triangleq 0.4 in w.g.

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