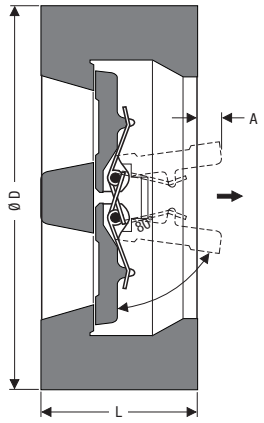
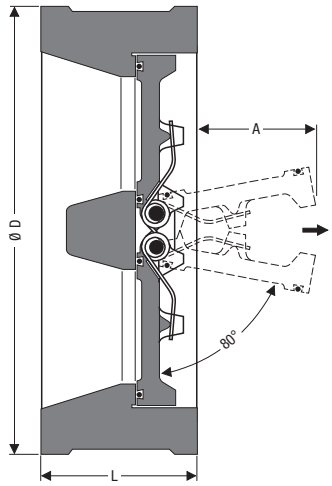


DN 50 – 125 mm



DN 150 – 500 mm
(larger sizes on request)

Application and Features

Type	PN	Application for liquids, gases and vapours	Features
BB EN **BB ASME**	PN 10 – 40 Class 150 – 300	suitable for heating, air-conditioning, water supply and cooling installations,for applications where minimum pressure loss is required,for frequency-controlled pumps	top quality, minimum pressure loss, for horizontal and vertical installations, stable operation when partly open (horizontal), downward flow (special spring), 2 hinge pins, 4 springs to close, disc plates with individually suspended stop lugs, swing stop for stable opening position, angle when fully open: 80°, coated or with with closing damper

Materials

Design	Part designation	Nominal size DN	EN reference	ASTM equivalent [1]
Grey cast iron (BB ... G)	Body	150 – 500	5.1301	A 126 Class A
	Dual plate	150 – 500	5.3106	A 536 60-40-18
Carbon steel (BB ... C)	Body	100 + 125	1.0460	A 105
	Body	150 – 500	1.0619	A 216 WCB
	Dual plate	100 – 500	1.0619	A 216 WCB
Stainless steel	Body	50 – 125	1.4404	A 182 F 316 L
	Body	150 – 500	1.4408	A 351 CF 8 M
	Dual plate	50 – 80	1.4404	A 182 F 316 L
	Dual plate	100 – 500	1.4408	A 351 CF 8 M

[1] Physical and chemical properties comply with EN grade.

Pressure/Temperature Ratings with metal-to-metal seat

EN series	Type		PN	Max. service pressure [bar] at temperature [°C] [2]										
				20	100	150	200	250	300	350	400	450	500	550
Grey cast iron down to –10 °C at nominal pressure	BB	11 G / 21 G	PN 6	6	6	5.4	4.8	4.2	3.6	–	–	–	–	–
		12 G / 22 G	PN 10	10	10	9.0	8.0	7.0	6.0	–	–	–	–	–
		14 G / 24 G	PN 16	16	16	14.4	12.8	11.2	9.6	–	–	–	–	–
Carbon steel down to –10 °C at nominal pressure	BB	12 C / 22 C	PN 10	10	10	10	9.6	8.9	7.6	7.1	6.7	6.4	–	–
		14 C / 24 C	PN 16	16	16	16	15.3	14.2	12.1	11.4	10.7	10.3	–	–
		15 C / 25 C	PN 25	25	25	25	23.9	22.2	18.9	17.8	16.7	16.1	–	–
		16 C / 26 C	PN 40	40	40	40	38.2	35.6	30.2	28.4	26.7	25.8	–	–
Stainless steel down to –200 °C at nominal pressure	BB	12 A / 22 A	PN 10	10	9.8	9.1	8.5	8.1	7.8	7.5	7.3	7.2	7	6.9
		14 A / 24 A	PN 16	16	15.6	14.6	13.7	13	12.4	12	11.7	11.4	11.2	11.1
		15 A / 25 A	PN 25	25	24.4	22.8	21.3	20.3	19.4	18.8	18.2	17.9	17.6	17.3
		16 A / 26 A	PN 40	40	39.1	36.4	34.1	32.5	31.1	30	29.2	28.6	28.1	27.7

BB 12A-16A DN 50 – 125 applicable up to max. 500 °C.

ASME series	Type	Class	Max. service pressure [bar] at temperature [°C] [2]										
			20	100	200	250	300	350	400	425	450	500	538
Carbon steel down to –29 °C at nominal pressure	DN 150 - DN 500												
	BB 15 C/BB 25 C	150	19.6	17.7	13.8	12.1	10.2	8.4	6.5	5.5	–	–	–
	BB 16 C/BB 26 C	300	51.1	46.6	43.8	41.9	39.8	37.6	34.7	28.8	–	–	–
Stainless steel down to –200 °C at nomial pressure	DN 50 - DN 125												
	BB 15 A	150	15.9	13.3	11.2	10.5	10.0	8.4	6.5	5.5	4.6	–	–
	BB 16 A	300	41.4	34.8	29.2	27.5	26.1	25.1	24.3	23.9	23.4	–	–
	DN 150 - DN 500												
	BB 15 A	150	19.0	16.2	13.7	12.1	10.2	8.4	6.5	5.5	4.6	2.8	1.4
	BB 16 A	300	49.6	42.2	35.7	33.4	31.6	30.3	29.4	29.1	28.8	28.2	25.2

[2] For temperatures above +300 °C special springs of Inconel X 750 are required.

Seat gasket	Temperature [C°]	Seat gasket	Temperature [C°]
EPDM	–40 up to +150	FPM (FKM)	–25 up to +200
NBR	–30 up to +110	PTFE / FPM	–25 up to +200 (from DN 150)

Minimum volume flow [m³/h]

Flow direction	↑	→		→	
Spring type	without spring	with spring 7 WA		with spring 2 WA	
DN	fully open	stable partial opening*)	fully open	stable partial opening*)	fully open
50	12	4	9	3	7
65	18	5	17	3,5	12
80	30	6	25	4	18
100	65	7	58	5	38
125	105	10	70	6	40
150	130	12	70	9	44
200	320	30	230	20	170
250	480	50	300	30	200
350	750	78	500	42	360
350	950	140	600	80	380
400	1300	200	800	110	460
450	1800	250	900	130	550
500	2300	280	1200	160	650

Values based on water at 20 °C

*) Provide stabilizing leg (at least 5 times DN upstream and twice DN downstream of the equipment).

If the flowrate is below the minimum volume flow (instable area) increased wear and noise are to be expected.

Opening Pressures

Differential pressures at zero volume flow.

Flow direction	↑		→	↓
Spring type	without spring	7 WA	7 WA[1])	5 VO
DN	Opening pressures [mbar]			
50	6	13	7	5
65	6	13	7	5
80	7	14	7	5
100	7	14	7	5
125	10	17	7	5
150	11	18	7	5
200	12	19	7	5
250	14	21	7	5
300	15	22	7	5
350	17	24	7	5
400	19	26	7	5
450	22	29	7	5
500	23	30	7	5

[1]) 2WA spring, opening pressure 2 mbar

Pressure Drop Chart

The curves given in the chart are valid for water at 20 °C. To read the pressure drop for other fluids the equivalent water volume flowrate must be calculated and used in the graph $\dot{V}_W$.

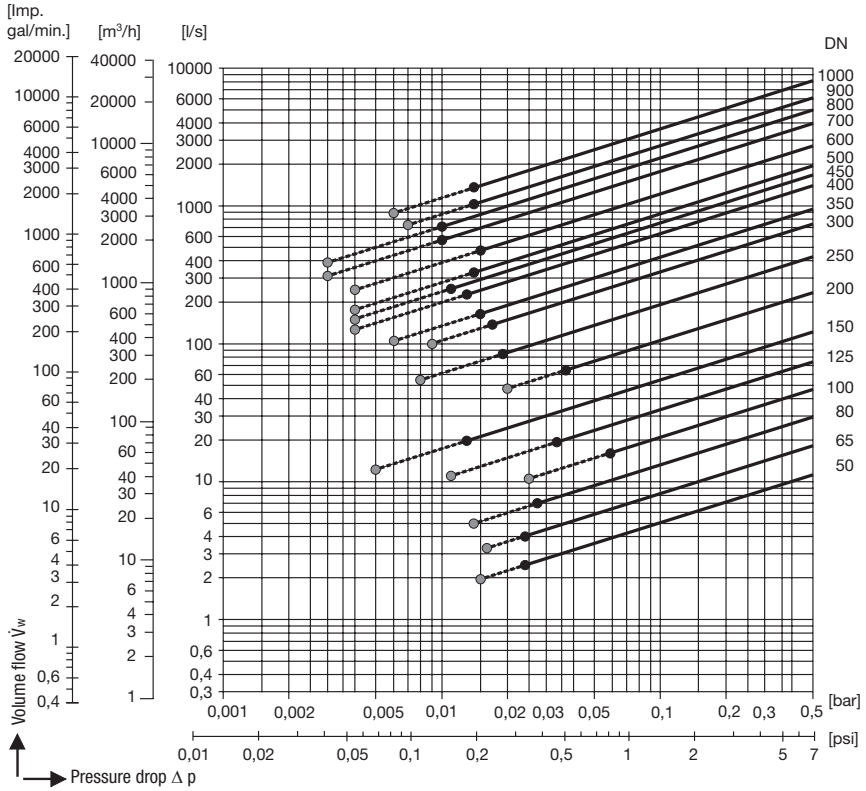
The values indicated in the chart are applicable to valves equipped with standard spring 7 mbar and horizontal flow as well as valves with special spring 2 mbar and horizontal flow.

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

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

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

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



○ Required minimum volume flow $\dot{V}_W$ for valves with special spring 2 WA and horizontal flow.

● Required minimum volume flow $\dot{V}_W$ for valves with standard spring 7 WA and horizontal flow.

Dimensions and Weights EN Series

DN	PN	Dimensions [mm] D	L	A	Weight[1] [kg]
50[2]	10	109	43	8	2.5
	16	109			2.5
	25	109			2.5
	40	109			2.5
65[2]	10	129	46	11	4
	16	129			4
	25	129			4
	40	129			4
80[2]	10	144	64	12	6
	16	144			6
	25	144			6
	40	144			6
100	10	164	64	19	7
	16	164			7
	25	171			7.5
	40	171			7.5
125	10	194	70	28	12
	16	194			12
	25	196			12
	40	196			12
150	6	209	76	40	12
	10	220			13.5
	16	220			13.5
	25	226			14
	40	226			14
200	6	264	89	64	18.5
	10	275			20
	16	275			20
	25	286			22
	40	293			23
250	6	319	114	87	33
	10	330			35
	16	330			35
	25	343			38
	40	355			41
300	6	375	114	110	44
	10	380			45
	16	386			47
	25	403			51
	40	420			55
350	6	425	127	120	62.5
	10	440			67
	16	446			69
	25	460			73
	40	477			79
400	6	475	140	142	80.5
	10	491			86
	16	498			88
	25	517			95
	40	549			107
450	6	530	152	163	125
	10	541			130
	16	558			138
	40	574			143
500	6	580	152	181	144
	10	596			152
	16	620			164
	25	627			168
	40	631			170

[1] Weights rated for cast steel grade GP 240 GH (GS-C 25).

[2] DN 50, 65 and 80 only available as BB … "A" (stainless steel).

Other sizes on request

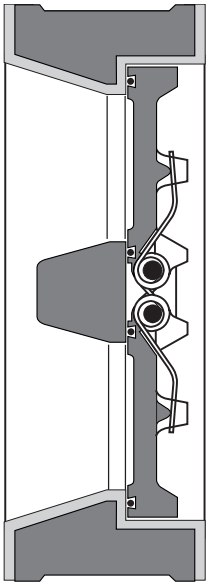
Dimensions and Weights ASME Series

DN	Class	Dimensions [mm] D	L	A	Weight [kg]
2/50	150	105	60*)	0	3.0
	300	111	60*)	0	3.5
2,5/65	150	124	67*)	0	5.0
	300	130	67*)	0	6.0
3/80	150	137	73*)	5	5.0
	300	149	73*)	5	6.5
4/100	150	175	73*)	10	9.0
	300	181	73*)	10	9.5
5/125	150	197	86[1])	12	11.0
	300	216	86[1])	12	15.0
6/150	150	222	76	36	14.0
	300	251	76	36	14.0
8/200	150	279	89	70	22,0
	300	308	89	70	23.0
10/250	150	340	114	88	38.0
	300	362	114	88	41.0
12/300	150	410	114	109	51.0
	300	422	114	109	55.0
14/350	150	451	127	113	73.0
	300	486	127	113	79.0
16/400	150	514	140	140	96.0
	300	540	140	140	107.0
18/450	150	549	152	163	138.0
	300	597	152	163	152.0
20/500	150	606	152	181	170.0
	300	654	152	181	223.0

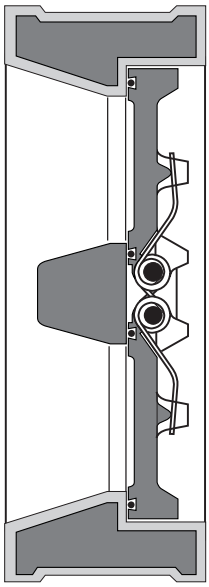
[1]) Overall length not standardized

*) DN 50 – DN 100 overall length to API 594

BB with lining from DN 150



Hard-rubber lining



Plastic lining

Dual plates, hinge pins and springs are not lined. Dual plates standard with O-rings of EPDM.

BB with Lining

Application and Features

Type	PN	Application for liquids, gases and vapours	Features
BB..GS	PN 10 – 16	for salty fluids such as sea water	hard rubber coating for protection against abrasive media, thickness of coating 3 - 5 mm
BB..GK		for salty fluids such as sea water and for drinking water installations	plastic coating incl. inside and outside lining of the valve body, coating meets requirements of plastics for drinking water and is approved by DVGW (German Technical Association for Gas and Water), more features specified under BB EN / ASME

Materials

Made from grey cast iron (BB.. GS, GK)

Component	EN number	ASME[1])
Body	EN-JL 1040	A126B
Dual plates for equipment with lining and internals made from austenitic steel	1.4408	A351CF8M
Support and hinge pin	1.4571	A316Ti
Springs	1.4571	A316Ti
Dual plates for equipment with lining and internals made from bronze	CC332G	[2])
Support and hinge pin	CW453K	C51900
Springs	CW452K	C52100

[1]) Equipment made from grey cast iron that complies with ASME specification is not available. The equivalent material specifications are stated for guidance only. Physical and chemical properties of the materials can therefore differ from the materials in accordance with ASME specification. For more details please contact the manufacturer.

[2]) There is no ASME equivalent for the EN material.

Lining materials for BB.. GS

Hard rubber based on isoprene rubber (IR), shore D hardness 75±5, max. thickness of layer 3-5 mm.

Lining materials for BB.. GK

Vestosint is a polyamide 12 based powder for fluidized bed sintering, shore D hardness 75±5, max. thickness of layer ≥ 0.4 mm.

Rilsan is a polyamide 11 based powder for fluidized bed sintering and a coating powder extracted from a purely plant based source, which means that a natural, environmentally friendly and renewable raw material is used.

Approvals/certificates acc. to KTW (recommendations for plastics in contact with drinking water) and DVGW (= German Technical Association for Gas and Water)

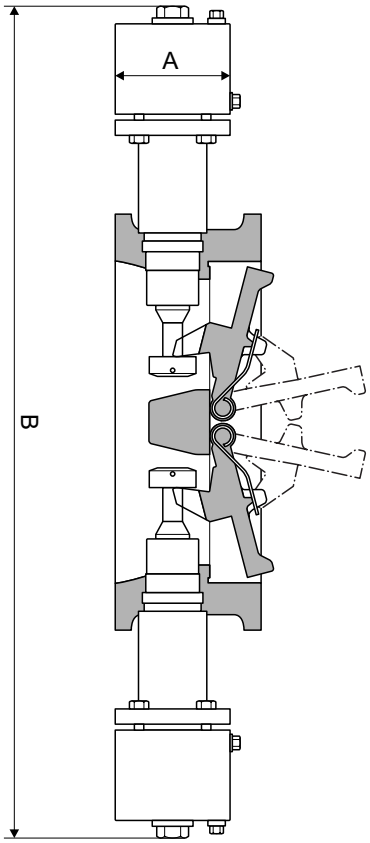
Shore D hardness 75±5, min. thickness of layer ≥ 0.4 mm

Other linings available on request.

Temperature Limits

Hard rubber lining –10 °C up to 90 °C

Plastic lining –10 °C up to 90 °C



BB with patented adjustable dampers, DN 200 – 500.

BB with Dampers *)

Application and Features

Type	PN	Application for liquids	Features
BB EN **BB ASME**	PN 10 – 40 Class 150 – 300	e. g. for water supply and cooling installations, if waterhammer occurs in pipes conducting liquids, for preventing damage to the plant. To evaluate potential waterhammer problems please aks for our questionnaire.	slows down the closing process of the non-return valve, reduces the speed of return flow, damper does not change the overall length of the equipment, dampening cylindre made of rustproof material

Materials

Component	EN	ASME[1])
Hinge pin	1.4122	–
Guide bush, flange, cover	1.4104	AISI430F
Gasket	1.4571	AISI316Ti
O ring, inside	NBR	–

[1]) The equivalent material specifications are stated for guidance only. Physical and chemical properties of the materials can therefore differ from the materials in accordance with ASME specification.

*) Not suitable for BB with coating

Dimensions and Weights of Equipment with Closing Dampers

DN	200	250	300	350	400	500
NPS	8	10	12	14	16	20
A [mm]	90				120	
B [mm][1])	600	665	715	755	900	995
Weight [kg][1])	33	48	60	82	121	197

[1]) The indicated values are based on equipment PN 16. Specifications for other equipment types available on request.

Pressure/Temperature Ratings

Size DN		200	250	300	350	400	500
	[mm]						
	[inch]	8	10	12	14	16	20
Max. service pressure	[bar]	16	16	13	9	13	9
Max. service temperature	[°C]	110					
Max. admissible pressure at line leading to the valve (pump switched off)	[bar]	0.5					