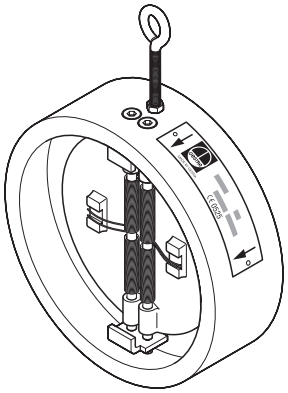
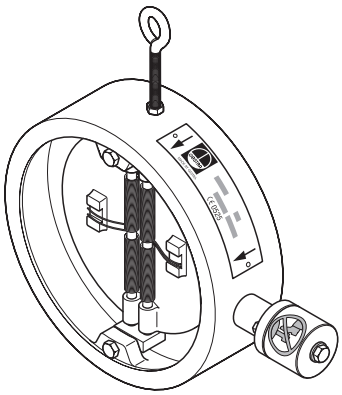


BB 1



BB 2

Dual-Plate Check Valves

BB
EN Range DN 50 up to 1000, PN 6 up to 160
ASME Range 2" up to 40", Class 150 up to 900

Description

Dual-plate check valves prevent backflow in horizontal and vertical pipes. They are of the wafer pattern designed to be sandwiched between flanges.

For installation in horizontal and vertical pipes with upward flow the valves can be fitted with springs. For installation in horizontal and vertical pipes with downward flow the valves must be fitted with special springs.

Dual-plate check valves are to be used for liquids, gases and vapours, provided that the specifications of the PED are taken into account.

Design

Dual-plate check valves are available with metal-to-metal seat. Soft seats are also available, but special temperature limits must be observed for them. BB.. G has a soft seat made from EPDM as standard.

Dampers are available for systems susceptible to water-hammer.

Body with plastic lining is available for applications with drinking water.

Body with rubber lining is available for applications with sea-water.

End connection

Wafer-type valve for installation between flanges to:

- EN 1092-1: PN 6/10/16/25/40/63/100/160
- ASME B16.1/B16.5/B16.47: Class 125/150/300/600/900

Equipment types

The equipment designation specifies the body material:

BB.. A: Body made from stainless steel

BB.. C: Body made from steel

BB.. G: Body made from grey cast iron

BB.. GS: Body made from grey cast iron with rubber lining (see separate data sheet)

BB.. GK: Body made from grey cast iron with plastic lining (see separate data sheet)

EN equipment at a glance

PN	DN																	
	50	65	80	100	125	150	200	250	300	350	400	450	500	600	700	800	900	1000
6	–					BB 21G						BB 11G						
10	only BB 12A			BB 12C BB 12A		BB 22G BB 22C BB 22A						BB 12G BB 12C BB 12A						
16	only BB 14A			BB 14C BB 14A		BB 24G BB 24C BB 24A						BB 14G BB 14C BB 14A						
25	only BB 15A			BB 15C BB 15A		BB 25C BB 25A						BB 15C BB 15A						
40	only BB 16A			BB 16C BB 16A		BB 26C BB 26A						BB 16C BB 16A						
63	only BB 17A			BB 17C BB 17A								–	BB 17C BB 17A		–			
100	only BB 18A			BB 18C BB 18A								–	BB 18C BB 18A		–			
160	–					BB 19C BB 19A						–						

ASME equipment at a glance

Class	DN [mm/inch]																	
	50 2	65 2.5	80 3	100 4	125 5	150 6	200 8	250 10	300 12	350 14	400 16	450 18	500 20	600 24	700 28	800 32	900 36	1000 40
125[1])	–					BB 24G						BB 14G						
150	only BB 15A			BB 15C BB 15A		BB 25C BB 25A						BB 15C BB 15A						
300	only BB 16A			BB 16C BB 16A		BB 26C BB 26A						BB 16C BB 16A			–			
600	only BB 18A			BB 18C BB 18A								–	BB 18C BB 18A		–			
900	–					BB 19C BB 19A						–						

[1]) On request

Limiting conditions for BB 1 and BB 2

Admissible service pressure [bar] for equipment with body made from grey cast iron (5.1301)

	PN	Temperature [°C]					
		-10/20	100	150	200	250	300
BB 11, BB 21	6	6	6	5.4	4.8	4.2	3.6
BB 12, BB 22	10	10	10	9	8	7	6
BB 14, BB 24	16	16	16	14.4	12.8	11.2	9.6

Admissible service pressure [bar] for equipment with body made from carbon steel (1.0460/1.0619)

	PN	Temperature [°C]								
		-10/20	50	100	150	200	300	350	400	450
BB 12, BB 22	10	10	10	9.4	8.9	8.4	7.0	6.5[1]	6.0[1]	3.7[1]
BB 14, BB 24	16	16	16	15	14.2	13.4	11.1	10.4[1]	9.6[1]	5.9[1]
BB 15, BB 25	25	25	25	23.4	22.2	21.0	17.4	16.2[1]	15.6[1]	9.2[1]
BB 16, BB 26	40	40	40	37.4	35.5	33.6	27.8	25.9[1]	24.0[1]	14.7[1]
BB 17	63	63	63	59	55.9	52.9	43.8	40.8[1]	37.8[1]	23.8
BB 18	100	100	100	93.6	88.8	84.0	69.6	64.8[1]	60.0[1]	36.8
BB 19	160	160	160	149.8	142.1	134.5	111.4	103.7[1]	96.0[1]	58.9

1 Requires special springs made from Inconel.

Admissible service pressure [bar] at nominal pressure for equipment with body made from stainless steel (1.4404)

	DN	PN	Temperature [°C]									
			-200/20	100	200	300	400	450	475	500	525[1]	550[1]
BB 12	50-125	10	10	9.8	8.1	6.4	5.9[2]	5.6[2]	5.5[2]	5.5[2]	–	–
BB 14	50-125	16	16	15.7	13.0	10.3	9.4[2]	9.0[2]	8.9[2]	8.8[2]	–	–
BB 15	50-125	25	25	24.5	20.3	16.1	14.7[2]	14.0[2]	13.9[2]	13.7[2]	–	–
BB 16	50-125	40	40	39.2	32.5	25.8	23.5[2]	22.4[2]	22.2[2]	22.0[2]	–	–
BB 17	50-100	63	63	61.7	51.2	40.6	37.0[2]	35.3[2]	34.9[2]	34.6[2]	–	–
BB 18	50-100	100	100	98.0	81.2	64.4	58.8[2]	56.0[2]	55.4[2]	54.9[2]	–	–

1 Not for equipment DN 50–125.

2 Requires special springs made from Inconel.

If the operating temperatures exceed 300 °C intercrystalline corrosion may occur. Do not subject the equipment to operating temperatures higher than 300 °C unless intercrystalline corrosion can be ruled out.

Admissible service pressure [bar] for equipment with body made from stainless steel (1.4408)

	DN	PN	Temperature [°C]									
			-200/20	100	200	300	400	450	475	500	525	550
BB 12, BB 22	150-1000	10	10	9.5	7.6	6.4	5.9[1]	5.7[1]	5.6[1]	5.5[1]	5.2[1]	5.2[1]
BB 14, BB 24	150-1000	16	16	15.2	12.1	10.3	9.4[1]	9.1[1]	9.0[1]	8.9[1]	8.4[1]	8.3[1]
BB 15, BB 25	150-1000	25	25	23.8	18.9	16.1	14.7[1]	14.1[1]	14.0[1]	13.9[1]	13.1[1]	12.9[1]
BB 16, BB 26	150-1000	40	40	38.1	30.2	25.8	23.5[1]	22.6[1]	22.4[1]	22.2[1]	20.9[1]	20.7[1]
BB 17	125-600	63	63	60.3	47.6	40.6	37.0[1]	35.6[1]	35.3[1]	34.9[1]	32.9[1]	32.6[1]
BB 18	125-600	100	100	95.2	75.6	64.4	58.8[1]	56.6[1]	56.0[1]	55.4[1]	52.3[1]	51.7[1]
BB 19	150-300	160	160	152.4	121.0	103.1	94.1[1]	90.5[1]	89.6[1]	88.7[1]	83.7[1]	82.8[1]

1 Requires special springs made from Inconel.

If the operating temperatures exceed 300 °C intercrystalline corrosion may occur. Do not subject the equipment to operating temperatures higher than 300 °C unless intercrystalline corrosion can be ruled out.

Limiting conditions for equipment with seat

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

Limiting conditions for BB 1 ASME and BB 2 ASME

Admissible service pressure [bar] for equipment with body made from carbon steel (A105/A216WCB)

	Class	Temperature [°C]							
		-29/ 20	100	200	250	300	350	400	425
BB 15, BB 25	150	19.6	17.7	13.8	12.1	10.2	8.4[1]	6.5[1]	5.5[1]
BB 16, BB 26	300	51.1	46.6	43.8	41.9	39.8	37.6[1]	34.7[1]	28.8[1]
BB 18	600	102.1	93.2	87.6	83.9	79.6	75.1[1]	69.4[1]	57.5[1]
BB 19	900	153.2	139.8	131.4	125.8	119.5	112.7[1]	104.2[1]	86.3[1]

1 Requires special springs made from Inconel.

Admissible service pressure [bar] for equipment with body made from stainless steel (A182F316L)

	Class	Temperature [°C]							
		-200/ 20	100	200	250	300	350	400	450
BB 15	150	15.9	13.3	11.2	10.5	10.0	8.4[1]	6.5[1]	4.6[1]
BB 16	300	41.4	34.8	29.2	27.5	26.1	25.1[1]	24.3[1]	23.4[1]
BB 18	600	82.7	69.6	58.3	54.9	52.1	50.1[1]	48.6[1]	46.8[1]

1 Requires special springs made from Inconel.

If the operating temperatures exceed 300 °C intercrystalline corrosion may occur. Do not subject the equipment to operating temperatures higher than 300 °C unless intercrystalline corrosion can be ruled out.

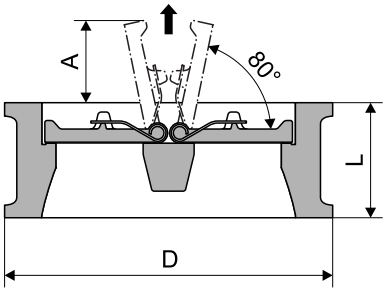
Admissible service pressure [bar] for equipment with body made from stainless steel (A351 CF8M)

	Class	Temperature [°C]									
		-200/ 20	100	200	250	300	350	400	450	500	538
BB 15, BB 25	150	19.0	16.2	13.7	12.1	10.2	8.4[1]	6.5[1]	4.6[1]	2.8[1]	1.4[1]
BB 16, BB 26	300	49.6	42.2	35.7	33.4	31.6	30.3[1]	29.4[1]	28.8[1]	28.2[1]	25.2[1]
BB 18	600	99.3	84.4	71.3	66.8	63.2	60.7[1]	58.9[1]	57.7[1]	56.5[1]	50.0[1]
BB 19	900	148.9	126.8	107.0	100.2	95.0	91.3[1]	88.2[1]	86.6[1]	82.1[1]	72.3[1]

1 Requires special springs made from Inconel.

If the operating temperatures exceed 300 °C intercrystalline corrosion may occur. Do not subject the equipment to operating temperatures higher than 300 °C unless intercrystalline corrosion can be ruled out.

Dimensions and Weights



Dimensions and weights of EN equipment

DN	PN	Dimensions [mm]			Weight [kg]
		D	L	A	
50	10/16/25/40	109	43	8	2.5
	63	115	60	0	3.5
	100	121	60	0	4.0
65	10/16/25/40	129	46	11	4.0
	63	140	67	0	6.0
	100	146	67	0	6.5
80	10/16/25/40	144	64	12	6.0
	63	150	73	5	7.0
	100	156	73	5	7.5
100	10/16	164	64	19	7.0
	25/40	171	64	19	7.5
	63	176	79	4	9.0
	100	183	79	4	10.0
125	10/16	194	70	28	12.0
	25/40	196	70	28	12.0
	63	213	105	10	21.0
	100	220	105[1])	10	22.5
150	6	209	76	40	12.0
	10/16	220	76	40	13.5
	25/40	226	76	40	14.0
	63	250	137	0	31.0
	100	260	137	0	32.0
	160	260	159	0	50.0
200	6	264	89	64	18.5
	10/16	275	89	64	20.0
	25	286	89	64	22.0
	40	293	89	64	23.0
	63	312	165	3	52.0
	100	327	165	3	56.0
	160	327	206	0	83.0
250	6	319	114	87	33.0
	10/16	330	114	87	35.0
	25	343	114	87	38.0
	40	355	114	87	41.0
	63	367	213	3	78.0
	100	394	213	3	89.0
	160	391	241	0	123.0
300	6	375	114	110	44.0
	10	380	114	110	45.0
	16	386	114	110	47.0
	25	403	114	110	51.0
	40	420	114	110	55.0
	63	427	229	6	128.0
	100	461	229	6	150.0
	160	461	292	0	191.0
350	6	425	127	120	62.5
	10	440	127	120	67.0
	16	446	127	120	69.0
	25	460	127	120	73.0
	40	477	127	120	79.0
	63	489	273	8	205.0
	100	515	273	8	228.0
400	6	475	140	142	80.5
	10	491	140	142	86.0
	16	498	140	142	88.0
	25	517	140	142	95.0
	40	549	140	142	107.0
	63	546	305	10	265.0
	100	575	305	10	294.0
450	6	530	152	163	125.0
	10	541	152	163	130.0
	16	558	152	163	138.0
	25	567	152	163	140.0
	40	574	152	163	143.0
500	6	580	152	181	144.0
	10	596	152	181	152.0
	16	620	152	181	164.0
	25	627	152	181	168.0
	40	631	152	181	170.0
	63	660	368	3	472.0
	100	708	368	3	543.0
600	6	681	178	217	223.0
	10	698	178	217	234.0
	16	737	178	217	263.0
	25	734	178	217	261.0
	40	750	178	217	273.0
	63	768	394	25	670.0
	100	819	438	10	847.0
700	6	786	229	250	305.00
	10	813	229	250	326.0
	16	807	229	250	321.0
	25	836	229	250	345.0
	40	855	229	250	390.0
800	6	893	241	290	462.0
	10	920	241	290	490.0
	16	914	241	290	484.0
	25	945	241	290	526.0
	40	978	241	290	577.0
900	6	993	241	327	571.0
	10	1020	241	327	602.0
	16	1014	241	327	596.0
	25	1045	241	327	643.0
	40	1088	241	327	750.0
1000	6	1093	300	364	808.0
	10	1127	300	364	860.0
	16	1131	300	364	865.0
	25	1158	300	364	907.0
	40	1198	300	364	1140.0

[1]) Face-to-face dimensions not standardized

Dimensions and weights of ASME equipment

DN	Class	Dimensions [mm]			Weight [kg]
		D	L	A	
2/50	150	105	60	0	3.0
	300	111	60	0	3.5
	600	111	60	0	3.5
2.5/65	150	124	67	0	5.0
	300	130	67	0	6.0
	600	130	67	0	6.0
3/80	150	137	73	5	5.0
	300	149	73	5	6.5
	600	149	73	5	6.5
4/100	150	175	73	10	9.0
	300	181	73	10	9.5
	600	193	79	4	11.0
5/125	150	197	86[1])	12	11.0
	300	216	86[1])	12	15.0
	600	241	105	14	25.0
6/150	150	222	76	36	14.0
	300	251	76	36	14.0
	600	267	137	0	34.0
	900	289	159	0	60.0
8/200	150	279	89	70	22.0
	300	308	89	70	23.0
	600	320	165	3	54.0
	900	359	206	0	92.0
10/250	150	340	114	88	38.0
	300	362	114	88	41.0
	600	400	213	0	92.0
	900	435	241	0	152.0
12/300	150	410	114	109	51.0
	300	422	114	109	55.0
	600	457	229	15	146.0
	900	499	292	0	223.0
14/350	150	451	127	113	73.0
	300	486	127	113	79.0
	600	492	273	8	207.0
	900	521	356	0	309.0
16/400	150	514	140	140	96.0
	300	540	140	140	107.0
	600	565	305	5	283.0
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
	600	683	368	5	504.0
24/600	150	718	178	217	259.0
	300	775	178	217	305.0
	600	791	438	10	789.0
28/700	150	776	229	250	305.0
32/800	150	940	241	290	526.0
36/900	150	1048	241	327	750.0
40/1000	150	1095	300	364	860.0

[1]) Face-to-face dimensions not standardized

Materials

Made from grey cast iron (BB.. G, GS, GV)

Component	EN number	ASME[1])
Body	EN-JL 1040	A126B
Dual plates for standard equipment	EN-JS 1030	A536 60-40-18
Dual plates for equipment with anti-corrosion 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 anti corrosion 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.

Made from carbon steel (BB.. C)

Component	DN	EN number	ASME
Body	100 – 125 (4" – 5")	1.0460	A105
	from 150 (from 6")[1]	1.0619	A216WCB
Dual plates		1.0619	A216WCB
Support and hinge pin		1.4571	A316Ti
Springs up to 300°C		1.4571	A316Ti
Springs from 300°C		Inconel	Inconel

[1]) Special hard-faced body sealing surfaces from DN 150 available on request.

Made from stainless steel (BB.. A)

Component	DN	EN number	ASME
Body	50 – 125 (2" – 5")	1.4404	A182F316L
	from 150 (from 6")	1.4408	A351CF8M
Dual plates	50 – 80 (2" – 3")	1.4404	A182F316L
	from 100 (from 4")	1.4408	A351CF8M
Support and hinge pin		1.4571	A316Ti
Springs up to 300°C		1.4571	A316Ti
Springs from 300°C		Inconel	Inconel

The following springs are available.

Code number/ letter	Application
7 WA	Spring for 7mbar opening pressure, for horizontal installation
7 WAI	Inconel spring for 7 mbar opening pressure, for horizontal installation and temperatures > 300 °C
2 WA	Spring for 2 mbar opening pressure, for horizontal installation
5 VO	Spring for 5 mbar opening pressure, for vertical installation with downward flow

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 $\dot{V}_w$ must be calculated and used in the graph.

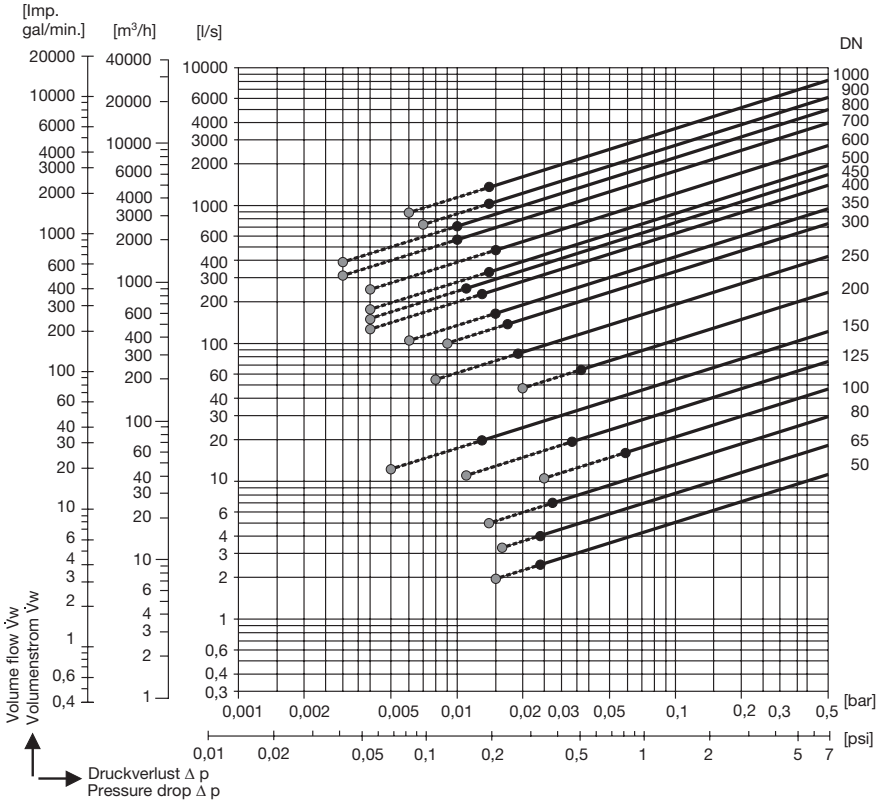
The values indicated in the chart are applicable to valves equipped with standard spring 7 mbar and horizontal flow as well as valves with special spring 2 mbar and horizontal flow.

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

$\dot{V}_w$ = 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.

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.

Flow characteristics

DN	Full opening	
	ζvalues	Kvs values [m³/h]
50	3.2	58
65	3.2	95
80	3.2	150
100	2.7	238
125	2.5	390
150	2.3	600
200	1.25	1439
250	1.2	2200
300	1.0	3800
350	0.9	5000
400	0.9	7100
450	0.9	8400
500	0.9	10180
600	0.9	14000
700	0.9	20000
800	0.9	25400
900	0.9	31000
1000	0.9	42000

Opening Pressures

Direction of flow	⬆		➡	⬇
Spring type	Without spring	7 WA	7 WA	5 VO
DN	Opening pressures [mbar]			
50 – 65	6	13	7	5
80 – 100	7	14	7	5
125	10	17	7	5
150	11 (15[1]))	18 (22[1]))	7	5
200	12 (18[1]))	19 (25[1]))	7	5
250	14 (18[1]))	21 (25[1]))	7	5
300	15 (25[1]))	22 (32[1]))	7	5
350	17 (25[1]))	24 (32[1]))	7	5
400	19 (25[1]))	26 (32[1]))	7	5
450	22	29	7	5
500	23 (28[1]))	30 (35[1]))	7	5
600	24 (31[1]))	31 (38[1]))	7	–
700	29	36	7	–
800	35	42	7	–
900	41	48	7	–
1000	43	50	7	–

[1]) For BB 17, BB 18, BB 19

Leakage testing DIN EN 12266-1

Seat	Leakage rate
Metal, PTFE	G
EPDM, NBR, FPM	A

Dual-Plate Check Valves

BB
EN Range
DN 50 up to 1000, PN 6 up to 160
ASME Range
2" up to 40", Class 150 up to 900

Specification Text

GESTRA DISCOCHECK® Dual Plate Check Valves BB. Wafer-type valve with short overall length to EN 558 series 16 (K3) or face-to-face dimensions to API standard 594. With two individually suspended plates and four springs.

Type:

Nominal size DN:

Pressure rating PN/Class:

End connection:

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

For these applications please consult us and/or specify the application in question and indicate the operating data when ordering.

Inspection & Certification

Documentation regarding material tests and in-house examination with test report to EN 10204-2.2 or inspection certificate EN 10204-3.1 available.

Please state the inspection and certification requirements when inquiring or ordering. After supply of the equipment certification cannot be established.

Charges and extent of the above mentioned certificates as well as the different tests confirmed therein are listed in our price list "Test and Inspection Charges for Standard Equipment".

For other test certificates please consult us.

Application of European Directives

Pressure Equipment Directive (PED)

The equipment conforms to this directive and can be used for the following media:

BB G, BB GS and BB GV:

- Fluids of group 2

BB A and BB C:

- Fluids of group 1
- Fluids of group 2

ATEX Directive

The equipment does not have its own potential ignition source and is not subject to this directive.

Static electricity: When installed, static electricity may arise between the equipment and the connected system.

When used in potentially explosive atmospheres, the plant manufacturer or plant operator is responsible for discharging or preventing possible static charge.

If it is possible for medium to escape, e.g. through actuating mechanisms or leaks in threaded joints,the plant manufacturer or plant operator must take this into consideration when dividing the area into zones.

Supply in accordance with our general terms of business.

Equipment with damper

Optional dampers can be used to influence the closing characteristics. A dampening medium slows down the plate movement during the last 15° of the closing path. As a result the plates close more slowly and, as a consequence, problems caused by pressure surges in the pipe are prevented.

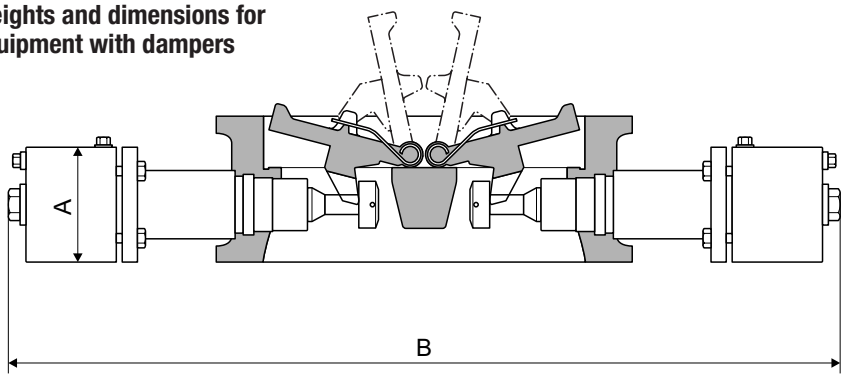
The dampening cylinders are maintenance-free.

Pressure & temperature ratings

DN	200	250	300	350	400	500	600	700	800
Service pressure [barg]	16	16	13	9	13	9	5	8	6
Pressure at inlet side[1]) [bar]	0.5								
Temperature [°C]	110								

[1]) With pump switched off.

Weights and dimensions for equipment with dampers



DN	200	250	300	350	400	500	600	700	800
NPS	8	10	12	14	16	20	24	28	32
A [mm]	90				120			140	
B [mm][1])	600	665	715	755	900	995	1110	1220	1325
Weight [kg][1])	33	48	60	82	121	197	296	367	530

[1]) The specifications refer to equipment PN 16. Other Types on request.

Materials

	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.

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