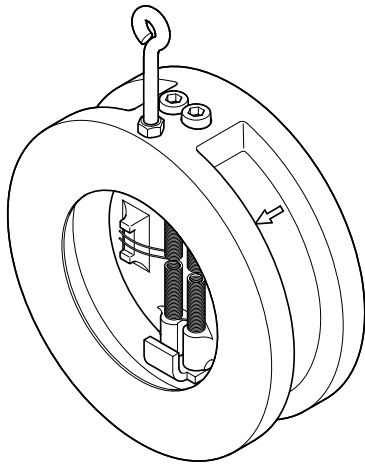
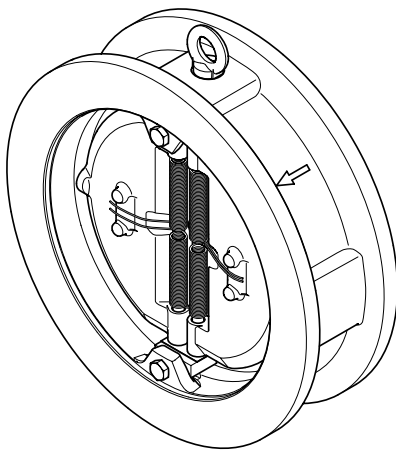
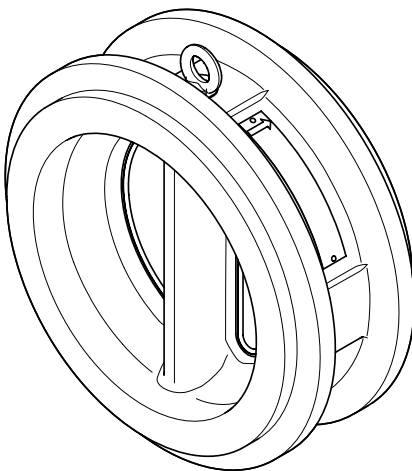




EN series BB 3... DN 50-125, DN 450/500
ASME series BB 3... NPS 2"-5", NPS 18"/20"



EN series BB 3... DN 150-400,
face to face dimension as per EN 558



ASME series BB 3... NPS 6" – 16",
face to face dimension as per API 594

Dual-Plate Check Valve

BB 3...C steel, **BB 3...A** stainless steel

EN series: PN 10/16/25/40, DN 50 - 500

ASME series: Class 150/300, NPS 2" - 20"

Description

Dual-plate check valves prevent return flow in horizontal and vertical pipelines. They are wafer-type valves of double swing design.

For installation in horizontal pipelines, they are fitted with closing springs. For installation in vertical pipes with upward flow, closing springs may be included if required. For installation in vertical pipes with downward flow, they require 5VO closing springs.

Dual-plate check valves can be used for liquids, gases and vapours in accordance with the Pressure Equipment Directive.

Versions

The EN series complies with European requirements and the ASME series complies with American requirements.

BB 3... is available made of steel (BB 3...C) or stainless steel (BB 3...A).

The swing disc's standard seat gaskets are metal-to-metal seals.

Optional features

- The ASME series BB 3...ASME (NPS 6" – 20") is optionally available with face to face dimension according to EN 558. Replaces BB 1...ASME and BB 2...ASME.
- Depending on the temperature limits and chemical resistance, seat gaskets such as EPDM, FPM (FKM), NBR or PTFE are available
- The stainless steel closing springs can be chosen according to installation position
- Closing springs optionally available made of Inconel (7WAI)
- For systems that may experience pressure surges, dampers are available

Material specifications

The equipment designations include material specifications:

BB ...C: Steel

BB ...A: Stainless steel

Type overview EN series

PN	DN [mm]												
	50	65	80	100	125	150	200	250	300	350	400	450	500
10	BB 32-36C BB 32-36A			BB 32/34C BB 32/34A					BB 32C BB 32A				
16									BB 34C BB 34A				
25				BB 35/36C BB 35/36A				BB 35C BB 35A					
40													

Type overview ASME series

Class	DN/NPS [mm/inches]												
	2 50	2½ 65	3 80	4 100	5 125	6 150	8 200	10 250	12 300	14 350	16 400	18 450	20 500
150	BB 35C BB 35A												
300	BB 36C BB 36A												

Available pipe connections

Wafer-type valve for installation between flanges as per:

- EN 1092-1, PN 10/16/25/40, B1
- ASME B 16.5, Class 150/300, RF

Pressure & temperature ratings

EN series

BB 3...C (steel) Permitted operating pressure [bar]

Type	PN	Temperature [°C]								
		-10/20	50	100	150	200	300	350 ¹⁾	400 ¹⁾	450 ¹⁾
BB 32C	10	10	10	9.4	8.9	8.4	7.0	6.5 ¹⁾	6.0 ¹⁾	3.7 ¹⁾
BB 34C	16	16	16	15	14.2	13.4	11.1	10.4 ¹⁾	9.6 ¹⁾	5.9 ¹⁾
BB 35C	25	25	25	23.4	22.2	21.0	17.4	16.2 ¹⁾	15.0 ¹⁾	9.2 ¹⁾
BB 36C	40	40	40	37.4	35.5	33.6	27.8	25.9 ¹⁾	24.0 ¹⁾	14.7 ¹⁾

1) Requires special-issue Inconel closing springs.

BB 3...A (stainless steel) Permitted operating pressure [bar]

Type	PN	Temperature [°C]									
		-196/20	100	200	300	400	450	475	500	525	550
BB 32A	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 34A	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 35A	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 36A	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⁾

1) Requires special-issue Inconel closing springs.

At operating temperatures above 300°C there is a risk of intercrystalline corrosion. Do not operate the equipment at temperatures above 300°C unless intercrystalline corrosion can be ruled out.

ASME series

BB 3...C ASME (steel) Permitted operating pressure [bar]

Type	Class	Temperature [°C]							
		-29/38	100	200	250	300	350 ¹⁾	400 ¹⁾	425 ¹⁾
BB 35C ASME	150	19.6	17.7	13.8	12.1	10.2	8.4 ¹⁾	6.5 ¹⁾	5.5 ¹⁾
BB 36C ASME	300	51.1	46.6	43.8	41.9	39.8	37.6 ¹⁾	34.7 ¹⁾	28.8 ¹⁾

1) Requires special-issue Inconel closing springs.

In compliance with ASME requirements admissible down to -29°C (w/o additional testing of pressure parts). In compliance with European requirements admissible down to -10°C.

BB 3...C ASME (stainless steel) Permitted operating pressure [bar]

Type	Class	Temperature [°C]									
		-196/20	100	200	250	300	350 ¹⁾	400 ¹⁾	450 ¹⁾	500 ¹⁾	538 ¹⁾
BB 35A ASME	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 36A ASME	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⁾

1) Requires special-issue Inconel closing springs.

At operating temperatures above 300°C there is a risk of intercrystalline corrosion. Do not operate the equipment at temperatures above 300°C unless intercrystalline corrosion can be ruled out.

Materials

BB 3...C (steel)

Component	DN (NPS)	EN	ASME
Body		1.0619	SA216WCB
Plates	50 – 80 (2" – 3")	1.4404	SA182F316L
	≥100 (≥4") ¹⁾	1.0619	SA216WCB
Support and hinge pins		1.4571	A316Ti ²⁾
Closing springs up to 300°C		1.4571	A316Ti ²⁾

- 1) Special hard-faced body seating available upon request for valve sizes from DN 150.
- 2) The material specifications are only approximates for comparison and stated for guidance only. The materials' physical and chemical properties may therefore differ from those specified for the materials by the ASME.

BB 3...A (stainless steel)

Component	DN (NPS)	EN	ASME
Body		1.4408	SA351CF8M
Plates	50 – 80 (2" – 3")	1.4404	SA182F316L
	≥100 (≥4")	1.4408	SA351CF8M
Support and hinge pins		1.4571	A316Ti ¹⁾
Closing springs up to 300°C		1.4571	A316Ti ¹⁾

1) The material specifications are only approximates for comparison and stated for guidance only. The materials' physical and chemical properties may therefore differ from those specified for the materials by the ASME.

Pressure & temperature ratings

Equipment with seat gasket

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

Closing springs

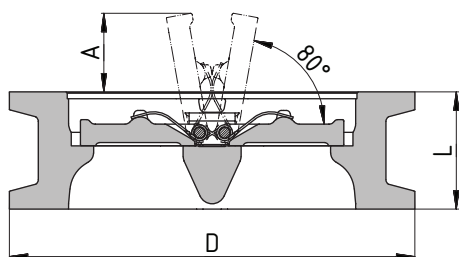
Marking	Use
7 WA	Spring with 7 mbar opening pressure, for horizontal installation
7 WAI	Inconel spring with 7 mbar opening pressure, for horizontal installation and temperatures > 300°C
2 WA	Spring with 2 mbar opening pressure, for horizontal installation
5 VO	Spring with 5 mbar opening pressure, for vertical installation with downward flow

Leak rates DIN EN 12266-1

Seat gasket	Leak rate
Metal-to-metal, PTFE	G
EPDM, NBR, FPM	A

ASME series: Seat leak test as per API 598

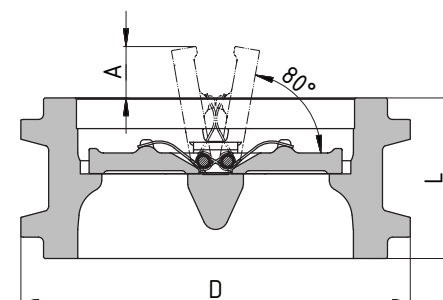
Dimensions and weights



EN series

BB 3 ... short overall length as per DIN EN 558, series 16

DN	PN	Dimensions [mm]			Weight [kg]
		D	L	A	
50	10/16/25/40	109	43	8	2.0
65	10/16/25/40	129	46	11	3.0
80	10/16/25/40	144	64	12	4.5
100	10/16	164	64	19	6.0
	25/40	171	64	19	6.5
125	10/16	194	70	28	9.0
	25/40	196	70	28	9.5
150	10/16	220	76	40	11.0
	25/40	226	76	40	11.5
200	10/16	275	89	64	19.0
	25	286	89	64	20.0
	40	293	89	64	21.0
250	10/16	330	114	87	34.0
	25	343	114	87	37.0
	40	355	114	87	40.0
300	10	380	114	110	44.0
	16	386	114	110	45.5
	25	403	114	110	57.0
	40	420	114	110	61.5
350	10	440	127	120	66.0
	16	446	127	120	67.5
	25	460	127	120	81.0
	40	477	127	120	86.0
400	10	491	140	142	90.5
	16	498	140	142	93.5
	25	517	140	142	112.0
	40	549	140	142	124.0
450	10	541	152	163	106.0
	16	558	152	163	110.0
	25	567	152	163	121.0
	40	574	152	163	128.0
500	10	596	152	181	130.0
	16	620	152	181	136.0
	25	627	152	181	148.0
	40	631	152	181	152.0



ASME series

BB 3...ASME face to face dimension as per API 594

NPS/ DN	Class	Dimensions [mm]			Weight [kg]
		D	L	A	
2/ 50	150	105	60	0	2.5
	300	111	60	0	3.0
2½/ 65	150	124	67	0	3.5
	300	130	67	0	4.0
3/ 80	150	137	73	5	4.5
	300	149	73	5	5.0
4/ 100	150	175	73	10	7.5
	300	181	73	10	8.0
5/ 125	150	197	86 ¹⁾	12	11.0
	300	216	86 ¹⁾	12	13.0
6/ 150	150	222	98	25	15.5
	300	251	98	25	19.0
8/ 200	150	279	127	51	27.5
	300	308	127	51	31.0
10/ 250	150	340	146	72	46.0
	300	362	146	72	60.0
12/ 300	150	410	181	76	80.0
	300	422	181	76	82.5
14/ 350	150	451	184	57	99.0
	300	486	222	66	123.5
16/ 400	150	514	191	115	134.5
	300	540	232	94	164.0
18/ 450	150	549	203	138	152.0
	300	597	264	107	207.0
20/ 500	150	606	219	148	201.0
	300	654	292	111	274.0

¹⁾ Non-standard face to face dimension

ASME series

BB 3 ... ASME short overall length as per DIN EN 558, series 16

(Replaces BB 1...ASME and BB 2...ASME)

NPS/ DN	Class	Dimensions [mm]			Weight [kg]
		D	L	A	
6/ 150	150	222	76	36	11.5
	300	251	76	36	16.0
8/ 200	150	279	89	70	19.5
	300	308	89	70	24.5
10/ 250	150	340	114	88	36.0
	300	362	114	88	44.0
12/ 300	150	410	114	109	58.5
	300	422	114	109	61.0
14/ 350	150	451	127	113	78.5
	300	486	127	113	88.0
16/ 400	150	514	140	140	110.0
	300	540	140	140	120.0
18/ 450	150	549	152	163	116.0
	300	597	152	163	157.0
20/ 500	150	606	152	181	142.0
	300	654	152	181	192.0

Pressure loss diagram

Values for water at 20°C. To determine pressure loss for other fluids, calculate equivalent water volume flow $\dot{V}_w$.

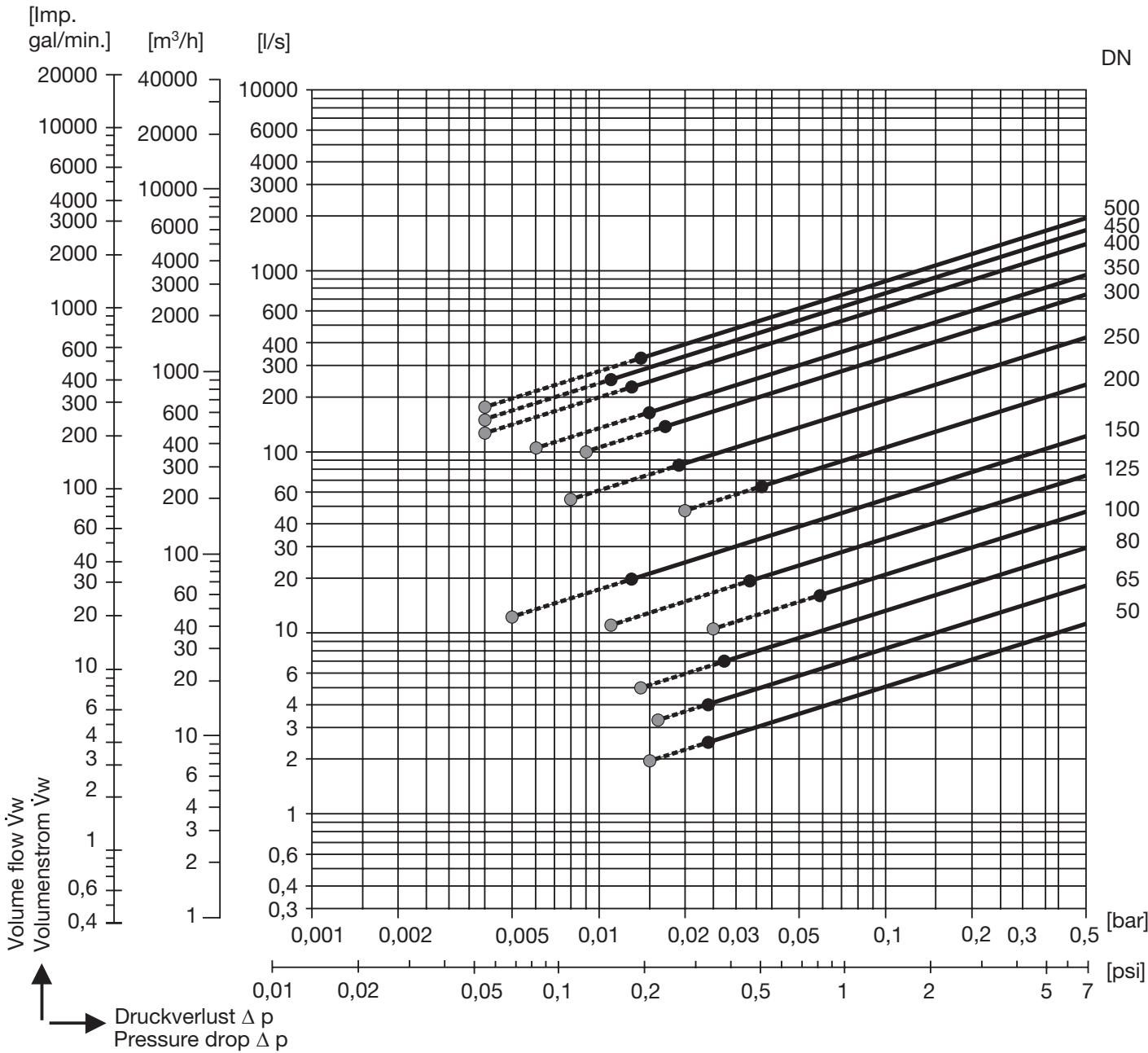
Pressure loss rates in the diagram apply to equipment with standard 7-mbar spring used in horizontal pipelines and to equipment with special-issue 2-mbar spring used in horizontal pipelines.

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

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

ρ = Density of fluid (under operation) in [kg/m³]

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



- Required minimum volume flow $\dot{V}_w$ for equipment with special-issue spring 2WA used in horizontal pipes.
- Required minimum volume flow $\dot{V}_w$ for equipment with standard spring 7WA used in horizontal pipes.

Minimum volume flow [m3/h]

Direction of flow	↑	→		→	
Spring type	w/o spring	7 WA		2 WA	
DN	Valve completely open	stable partly open*)	Valve completely open	stable partly open*)	Valve completely 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
300	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 for water at 20°C

*) Provide stabilizing leg, at least 5 x DN upstream and 2 x DN downstream of equipment.

When dropping below minimum volume flow (unstable range), wear increases and noises occur.

Opening pressures

Direction of flow	↑	→		↓
Spring type	w/o spring	2 WA	7 WA	5 VO
DN	Opening pressures [mbar]			
50 – 65	6	2	7	5
80 – 100	7	2	7	5
125	10	2	7	5
150	11	2	7	5
200	12	2	7	5
250	14	2	7	5
300	15	2	7	5
350	17	2	7	5
400	19	2	7	5
450	22	2	7	5
500	23	2	7	5

Flow characteristics

DN	Valve completely open	
	ζ values	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

Dual-Plate Check Valve
BB 3...C steel, **BB 3...A** stainless steel
EN series:
PN 10/16/25/40, DN 50 – 500
ASME series:
Class 150/300, NPS 2" – 20"

Specification text

GESTRA DISCOCHECK® Dual-Plate Check Valves
BB 3... Wafer-type valve EN series short overall length as per EN 558 series 16 or ASME series as per API standard 594 (ASME series optionally available compliant with EN 558). Two independently moving swing discs and four closing springs.
Type:
Material:
Nominal size DN/NPS:
Pressure rating PN/Class:
Direction of flow:
Seat gasket:
Closing spring:
Systems with heavily pulsating flow, e.g. systems with compressors, may require special-issue dual-plate check valves.
When ordering, please always specify such special circumstances and provide all operating data as precisely as possible.

Inspection and Certification

Verification of material and construction testing in the form of manufacturer certificates in accordance with EN 10204-2.2 or acceptance test certificate EN 10204-3.1 available.
Please specify your acceptance requirements in your enquiry or order. Test certificates can no longer be issued after delivery.
For standard testing scope and costs of test certificates, please refer to our price list "Test and Inspection Charges for Standard Equipment".
If you require amended test scopes, please contact the manufacturer.

Application of European Directives
Pressure Equipment Directive

The equipment conforms to this directive and can be used for the following fluids: BB ... A and BB ... C:
■ Fluid group 1
■ Fluid group 2

ATEX Directive

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

Please note our terms of sale and delivery.

Equipment with dampers

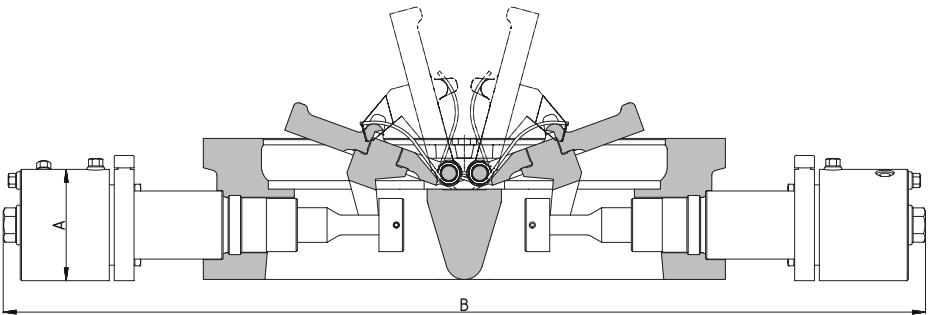
The optional dampers may affect the closing characteristics. A damper fluid slows the swing motion through the last 15° of the closing path. This reduces the swing discs' closing rate and prevents water hammers in the pipe from causing problems. The damper cylinders are maintenance-free.

Pressure & temperature ratings

DN	200	250	300	350	400	500
Operating pressure [barg]	16	16	13	9	13	9
Pressure at inlet side ¹⁾ [barg]	0.5					
Temperature [°C]	110					

¹⁾ With pump switched off.

Dimensions and weights of equipment with 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⁾ Specifications apply to equipment with PN 16. Specifications for other types available on request.

Materials

	EN	ASME ¹⁾
Hinge pin	1.4122	
Guide bush, flange, cover	1.4104	AISI430F
Sealing ring	1.4571	AISI316Ti
O-ring, inner	NBR	

¹⁾ The material specifications are only approximates for comparison and stated for guidance only. The materials' physical and chemical properties may therefore differ from those specified for the materials by the ASME.

GESTRA GmbH

Münchener Straße 77, 28215 Bremen, Germany
Tel. +49 421 3503-0, Fax +49 421 3503-393
e-mail info@de.gestra.com, Web www.gestra.com

