

VTB 200 Butterfly valves



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TRADEMARKS

Following brand names are Dupont registered trademarks:

- Kalrez®
- Viton®
- Teflon®
- Hypalon®
- BUNA-N®

DISCLAIMER

Vapo Techniek BV has done its utmost to ensure that all data in this documentation is correct. However, Vapo Techniek BV accepts no responsibility for possible problems caused by mistakes in this documentation.

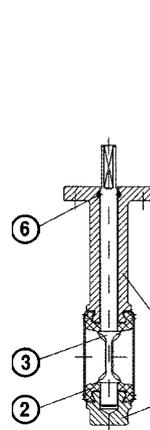
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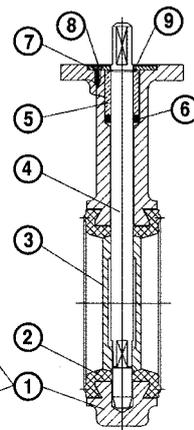
Materials of constructions

Item	Parts	Material
1	Body	GG25, GGG 40, A 216 Gr WCB, AISI 316, Aluminium
2	Seat	EPDM, NBR, Viton®, Silicon, Neoprene, Hypalon®
3	Disc	GGG40 rilsan coated, SS316, Aluminium, Bronze
4	Stem	SS 316, SS 420
5	Bushing	PTFE, PVC
6	O-ring	EPDM, NBR, Viton®, Silicone, Hypalon®
7	Washer	St. 37
8	Bolt	M8.8, SS 304
9	Circlip	Steel
10	Wedge	Ck 45
11	Spacer	PVC
12	Cap	GGG 40
13	Bolt	8.8 / SS 304
14	Bushing	Bronze

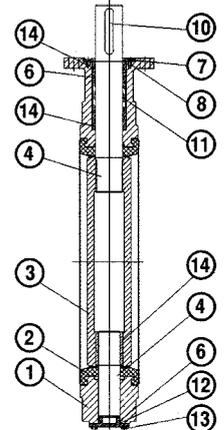
DN 32 - 40



DN 50 - 300

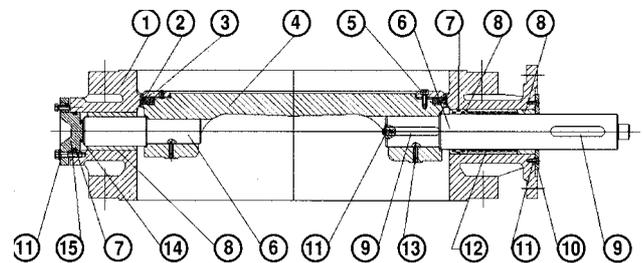


DN 350 - 600



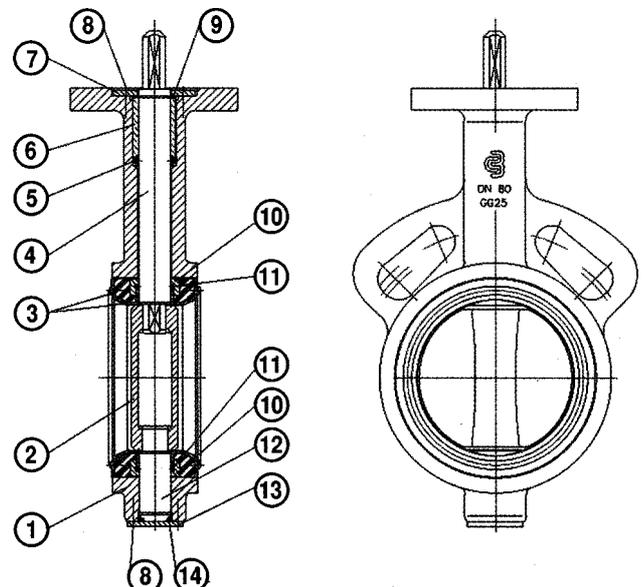
Item	Part	Material
1	Body	GGG 40, A 216 Gr WCB, AISI 316
2	Seat	EPDM, NBR, Viton
3	Gland ring	St 37, SS 304
4	Disc	GGG 40, SS 316
5	Bolt	8.8, SS 304
6	Stem	SS 316, SS 420
7	O-ring	EPDM, NBR, Viton
8	Bushing	Bronze
9	Wedge	Ck 45
10	Washer	St 37
11	Bolt	8.8, SS 304
12	Spacer	PVC
13	Screw	8.8, SS 304
14	Sleeve	Bronze
15	Cap	GGG 40

DN 700 - 1000



Item	Parts	Material
1	Body	GGG 40, AISI 316
2	Disc	AISI 316, PFA covered AISI 316
3	Seat	PTFE
4	Stem	X 20 Cr 13 DIN 17440
5	O-ring	Viton®
6	Bushing	PTFE
7	Washer	St 37 - 2 DIN 17440
8	Bolt	M 8.8 (Galvanized)
9	Circlip	Steel
10	Bushing	X 20 Cr 13 DIN 17440
11	O-ring	Viton®
12	Stem	X 20 Cr 13 DIN 17440
13	Washer	St 37 - 2 DIN 17440
14	Setting sleeve	Viton®

DN 50 - 300 PTFE seated



Material Information

Rubber seat

RubberType	Composition	General Applications	Temperature Limits	Don't use with
EPDM	Ethylene PropyleneTerpolimer	Water - Steam - Seawater -- Brine - Esters - Ketones - Caustic Soda, Alkalis	-30° C to + 125° C	Hydrocarbons - Oils - Fats - Solvents
EPDM-H.T. (High temperature)	Ethylene Propylene Terpolimer	Hot Water	-40° C to + 135° C	Hydrocarbons - Oils - Fats - Solvents
Buna-N® (NBR)	Copolymr of Butadiene and Acrylonitrile	Hydrocarbons - Natural Gas - Air - Oils - Petroleum Products - Gasoline - (Aromatics 40% or more)	-20° C to +100° C	Solvents
Hypalon® (CSM)	Poliethylene Chlorosulfine	Organic and Inorganic Acids - Corrosive Minerals	-25° C to +120° C	Mineral and Herbal Oils - Animal Fats - Ketones
Viton® (FPM)	Fluoroelastomer	Acids - Oils - Fats - Hydrocarbons, Animal Fats	-15° C to +190° C	Steam - Hot Water - Ketones - Amines, Freton 22
Silicon (MVQ)	Polysiloxane	Base - Hot Water - Steam	-60° C to +200° C Food Industry	Hydrocarbons - Acids
Teflon® (PTFE)	Polytretra Fluor Ethylene	Suitable for 95% of Industrial Chemicals	-30° C to +190° C	Frictional media

Buyers are expected to make the final decision on the suitability of seat materials for their specific applications. Buna-N®, Hypalon®, Viton® and Teflon® are registered trademarks of Dupont.

“Rilsan information”

Rilsan is a thermoplastic polyamide based coating applied on metal components by hot-dipping. It is applied on the bodies, discs and levers of butterfly valves, DN 32 through DN 600. It resists harsh chemical environments. Salt spray tests in excess of 2000 hours and immersion in salt water for 6 years provided corrosion-free results. For sanitary applications Rilsan is inert to fungus growth, highly stain resistant and US FDA approved. Due to the low coefficient of friction and high abrasion resistance the tests have shown that Rilsan-coated objects if deformed indicated no sign of peeling or exposure to bare metal. Rilsan-coated products are chemically resistant to many kinds of alkalis, acids, grease, oil, commercial solvents, LPG, natural gas, petroleum products, milk, sauce, fruit juices and weather conditions.

Some physical test results

Surface hardness: Shore D 75

Impact resistance: Steel ball weighing 20N, falling from height of 50 cm. No fracture of the coating and metal not bared (coating thickness 0,3mm)

Abrasion resistance: At “Taber” abrasimeter (type CS17, load 9,81 N) loss of weight after 1000 turns 5-8 mg. (“excellent”) 30-40 kV/mm (generally required satisfactory value: 18kV/mm, min)

Melting point: 184 -186° C

Inflammability: “Self extinguishing” acc. to ASTM D 635

Long-run resistance test results in various medias are available. Please inquire for special service conditions.

Standards of butterfly valves

General standards:

TSE 11341
DIN 3354
AWWA C504
BS 5155

Flange connection standards:

DIN 2501 - 2502 - 2503
DIN 2526 Form C
ANSI B 16.5

Face to face standards:

DIN 3202	DN 32 - 600	DIN 3202-K1
	DN 700 - 1000	DIN 3202-F16
ISO 5752	DN 32 - 600	ISO 5752 / 20 Table 5
	DN 700 - 1000	ISO 5752 / Table 13

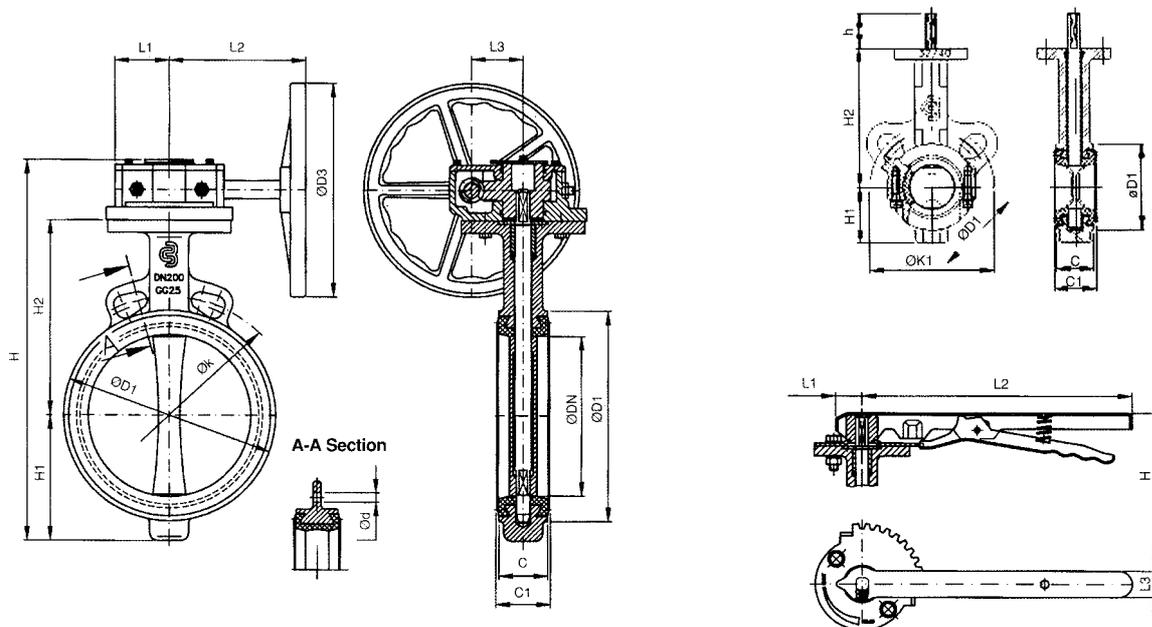
Operating System Connection Standards:

DIN 3337
ISO 5211/1

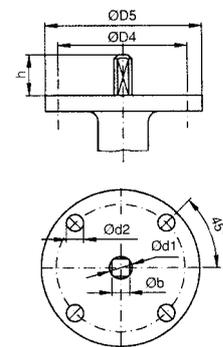
Valve Control and Delivery standards:

DIN 50.049/3.1b
BS 6755/1
DIN 3230

Dimensions Wafer Type (DN 32 - DN 300)

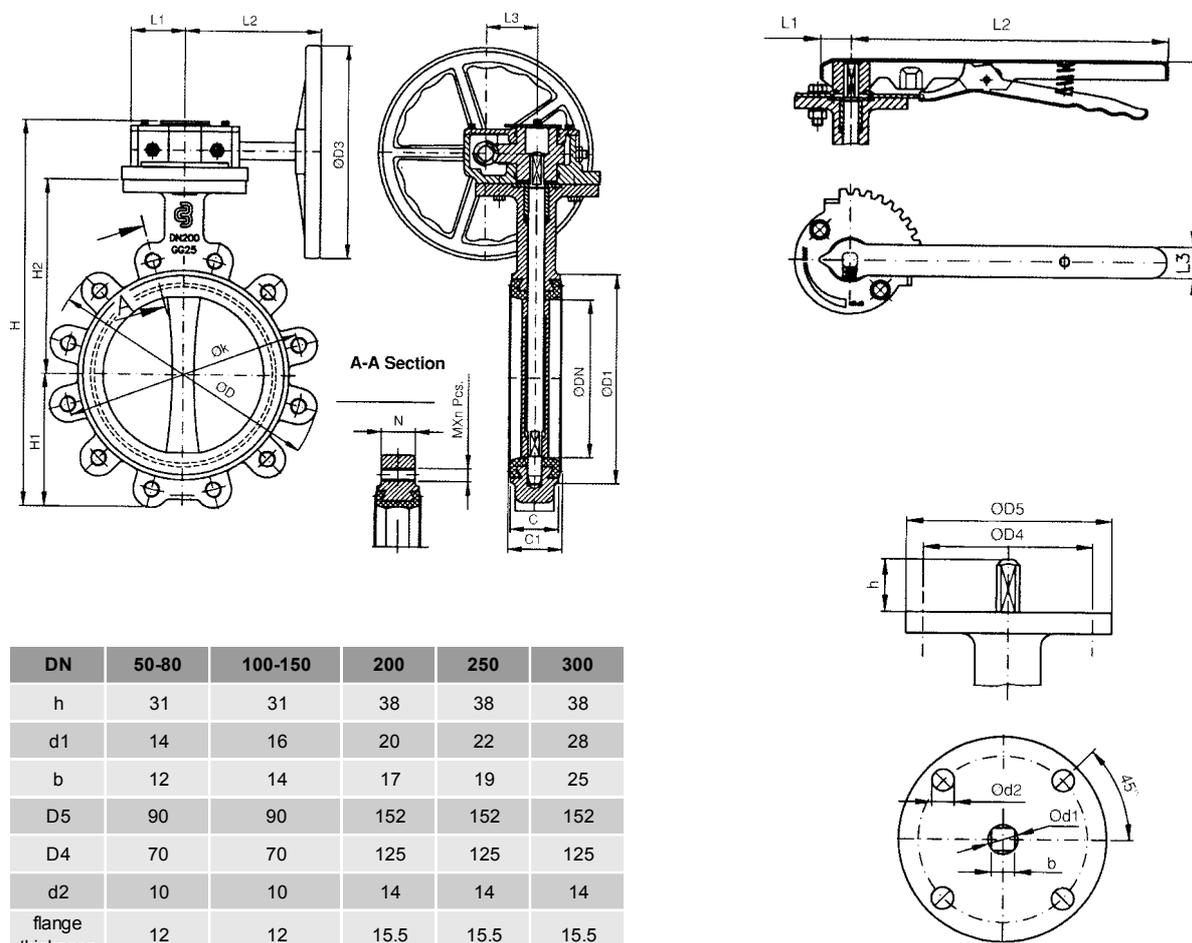


DN	32-40	50-80	100-150	200	250	300
h	31	31	31	38	38	38
d1	12	14	16	20	22	28
b	10	12	14	17	19	25
D5	65	90	90	152	152	152
D4	50	70	70	125	125	125
d2	7	10	10	14	14	14
flange thickness	10	12	12	15.5	15.5	15.5



PN	DN	32	40	50	65	80	100	125	150	200	250	300
All	C	33	33	43	46	46	52	56	56	60	68	78
	C1	37	37	47	50	50	56.5	60.5	60.5	64.5	72.5	84.5
	ØD1	76	76	94	112	126	152	185	210	262	316	372
	H1	50	50	64	70	84	95	114	131	155	187	220
	H2	125	125	140	152	159	177	190	203	241	273	311
PN 6 WAFER	Ød	14	14	14	14	18	18	18	18	18	18	23
PN 10 WAFER	Øk	90	100	110	130	150	170	200	225	280	335	395
PN 16 WAFER	Ød	18	18	18	18	18	18	18	23	23	23	23
PN 16 WAFER	Øk	100	110	125	145	160	180	210	240	295	350	400
150# WAFER	Ød	-	16	19	19	19	19	23	23	23	25	25
150# WAFER	Øk	-	98.6	120.7	139.7	152.4	190.5	215.9	241.3	298.4	361.9	431.8
Handle	H	206	206	232	250	271	300	332	362	434	498	582
	L1	28	28	28	28	28	28	28	28	45	45	45
	L2	260	260	260	260	260	260	260	260	350	350	350
	L3	26	26	26	26	26	26	26	26	35	35	35
	Kgs	2.3	2.3	3.5	4.0	4.4	6	7.3	8.5	15.8	22.4	32.9
Gear	D3	160	160	160	160	160	160	160	160	265	265	265
	H	243	243	272	290	311	340	372	402	475	540	612
	L1	45	45	45	45	45	45	45	45	78	78	78
	L2	143	143	143	143	143	143	143	143	243	243	243
	L3	38	38	38	38	38	38	38	38	63	63	63
	Kgs	5.6	5.6	6.8	7.3	7.7	9.3	10.7	11.8	24	30	31

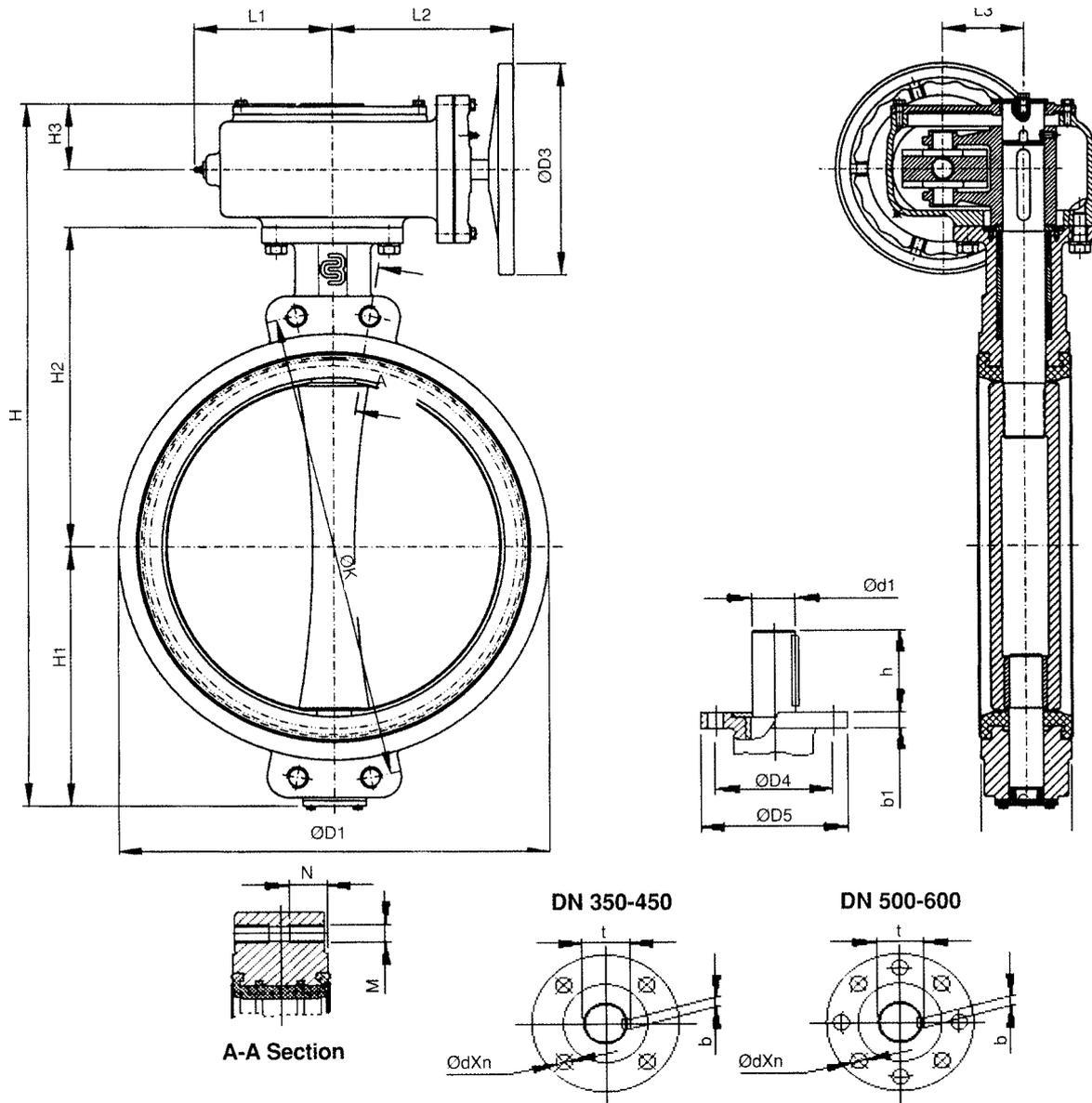
Dimensions LUG Type (DN 50 - DN 300)



DN	50-80	100-150	200	250	300
h	31	31	38	38	38
d1	14	16	20	22	28
b	12	14	17	19	25
D5	90	90	152	152	152
D4	70	70	125	125	125
d2	10	10	14	14	14
flange thickness	12	12	15.5	15.5	15.5

PN	DN	50	65	80	100	125	150	200	250	300
All	C	43	46	46	52	56	56	60	68	78
	C1	47	50	50	56.5	60.5	60.5	64.5	72.5	84.5
	ØD	168	188	204	234	258	290	343	412	486
	ØD1	94	112	126	152	185	210	262	316	372
	H1	67	74	96	110	122	136	160	201	237
	H2	140	152	159	177	190	203	241	273	311
PN 6 LUG	N	37	40	40	42	46	46	48	58	64
	M	12	12	16	16	16	16	16	16	20
	ØK	110	130	150	170	200	225	280	335	395
PN 10 LUG	M	16	16	16	16	16	20	20	20	20
	N	4	4	8	8	8	8	8	12	12
	ØK	125	145	160	180	210	240	295	350	400
PN 16 LUG	M	16	16	16	16	16	20	20	24	24
	N	4	4	8	8	8	8	12	12	12
	ØK	125	145	160	180	210	240	295	355	410
150# LUG	M	5/8" unc	5/8" unc	5/8" unc	5/8" unc	3/4" unc	3/4" unc	3/4" unc	7/8" unc	7/8" unc
	N	1/4	1/4	1/4	1/8	1/8	1/8	1/8	1/12	1/12
	ØK	120.7	139.7	152.4	190.5	215.9	241.3	298.4	361.9	431.8
Handle	H	235	254	283	315	340	367	439	512	600
	L1	28	28	28	28	28	28	45	45	45
	L2	260	260	260	260	260	260	350	350	350
	L3	26	26	26	26	26	26	35	35	35
	Kgs	4.6	5.2	6.8	8.5	10.6	12.6	20.2	29.6	46.4
	ØD3	160	160	160	160	160	160	265	265	265
Gear	H	275	294	323	355	380	407	480	553	630
	L1	45	45	45	45	45	45	78	78	78
	L2	143	143	143	143	143	143	243	243	243
	L3	38	38	38	38	38	38	63	63	63
	Kgs	7.8	8.5	10.1	11.9	14	16	28.3	37.7	54.4

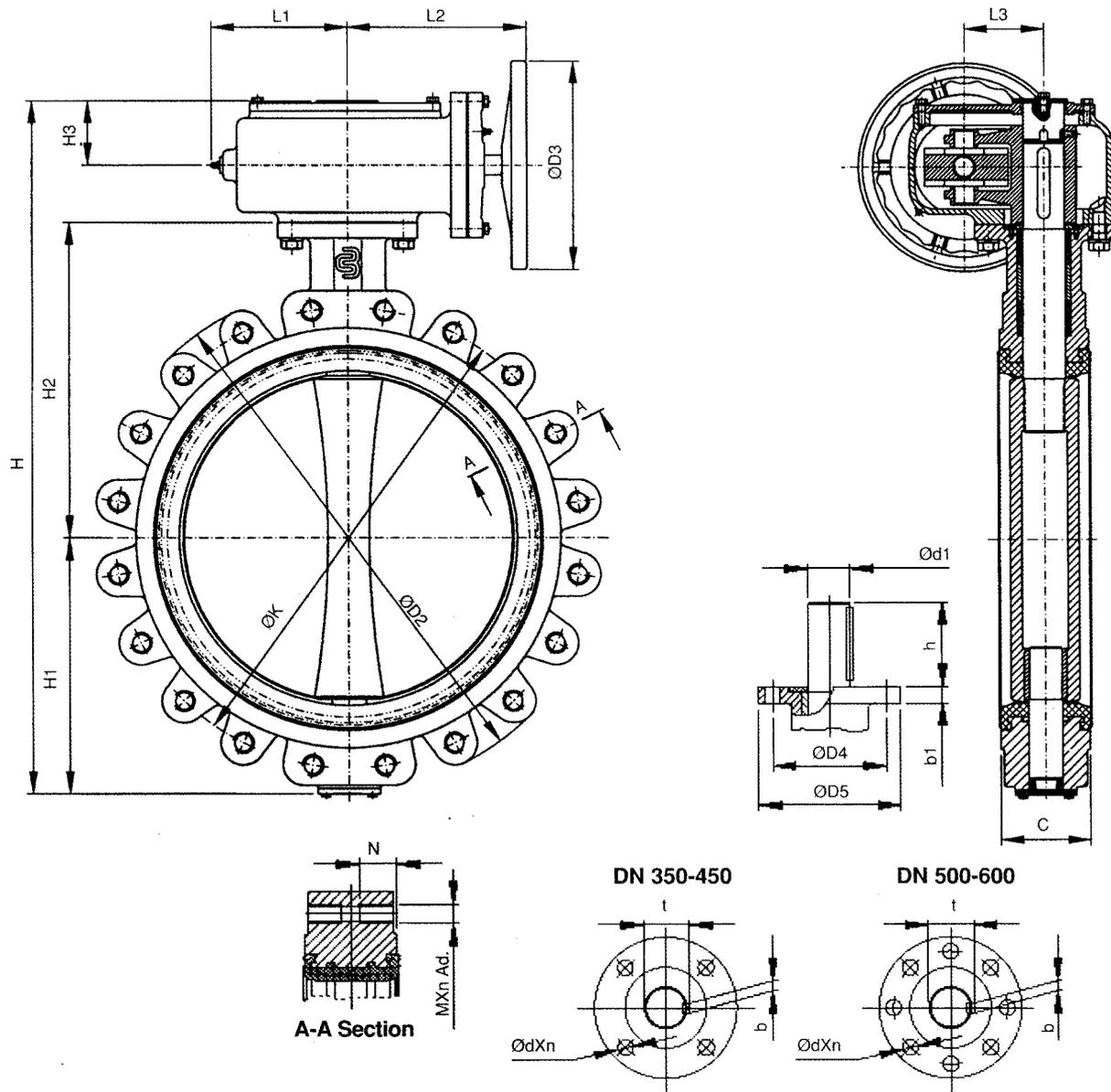
Dimensions Wafer Type (DN 350 - DN 600)



DN	H1	H2	H3	H	L1	L2	L3	ØD1	ØD3	Ød1	Ødxn	ØD4	ØD5	ØD6	h	b	b1	t
350	267	350	60	784	160	200	81	433	265	42	19x4	140	175	100	105	12	20	45
400	302	375	60	844	160	200	81	484	265	48	19x4	140	175	100	105	14	23	51.5
450	325	400	60	892	160	200	81	534	265	52	19x4	140	175	100	105	16	20	56
500	362	450	70	1008	240	285	138	589	360	58	23x8	165	210	130	130	18	25	62
600	422	510	70	1128	240	285	138	690	360	68	23x8	165	210	130	130	20	25	72.5

DN	C	K PN 10	K PN 16	K 150#	M PN 10	M PN 16	M 150#	N PN 10	N PN 16	N PN 150#	Kgs Bare shaft	Kgs. Gear box
350	78 (92)	460	470	476.2	20	24	1"-8UNC	38	38	38	54	14
400	102	515	525	539.7	24	27	1"-8UNC	40	42	42	76	14
450	114	565	585	577.8	24	27	1 1/8"-7UNC	40	40	40	93	14
500	127	620	650	635	24	30	1 1/8"-7UNC	40	45	45	133	30
600	154	725	770	749.3	27	33	1 1/4"-7UNC	55	55	55	198	30

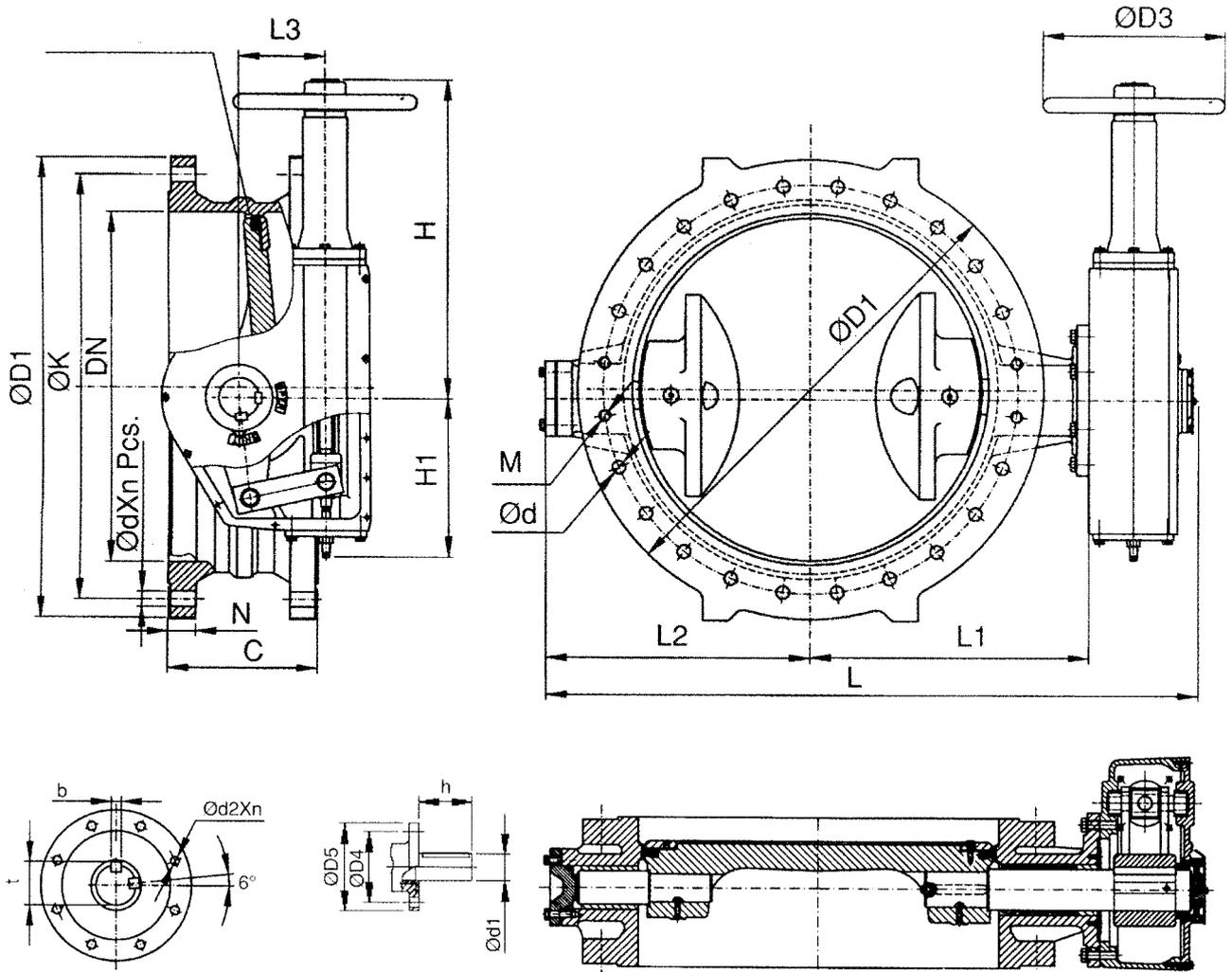
Dimensions Lug Type (DN 350 - DN 600)



DN	H1	H2	H3	H	L1	L2	L3	ØD2	ØD3	Ød1	Ødxn	ØD4	ØD5	h	b	b1	t
350	267	350	60	784	160	200	81	532	265	42	19x4	140	175	105	12	20	45
400	302	375	60	844	160	200	81	596	265	48	19x4	140	175	105	14	23	51.5
450	325	400	60	892	160	200	81	634	265	52	19x4	140	175	105	16	20	56
500	362	450	70	1008	240	285	138	710	360	58	23x8	165	210	130	18	25	62
600	422	510	70	1128	240	285	138	830	360	68	23x8	165	210	130	20	25	72.5

DN	C	K PN 10	K PN 16	K 150#	n° PN 10	n° PN 16	n° 150#	M PN 10	M PN 16	M 150#	N PN 10	N PN 16	N PN 150#	Kgs Bare shaft	Kgs. Gear box
350	78	460	470	476.2	16	16	12	20	24	1"-8UNC	38	38	38	71	14
400	102	515	525	539.7	16	16	16	24	27	1"-8UNC	40	42	42	107	14
450	114	565	585	577.8	20	20	16	24	27	1 1/8"-7UNC	40	40	40	140	14
500	127	620	650	635	20	20	20	24	30	1 1/8"-7UNC	40	45	45	186	30
600	154	725	770	749.3	20	20	20	27	33	1 1/4"-7UNC	55	55	45	267	30

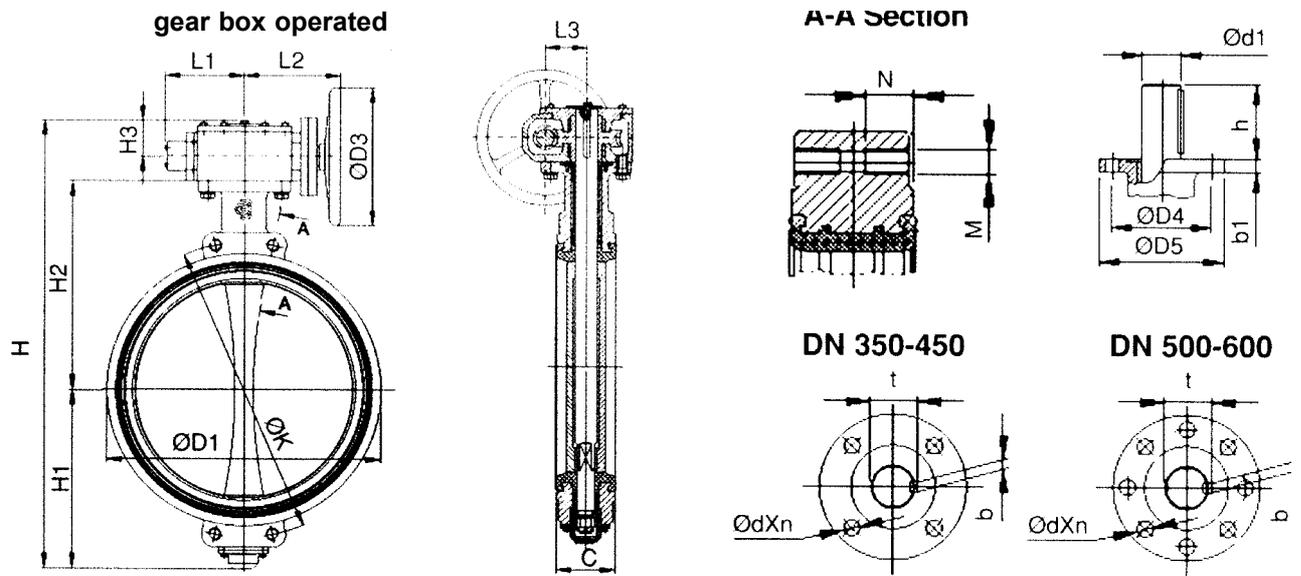
Dimensions Double-excentric (DN 700-DN 1000)



DN	C	ØD1	ØD3	H	H1	L	L1	L2	L3	Ød1	Ød2xn	ØD4	ØD5	h	b	t	Key
700	292	910	360	630	290	1276	543.5	528	170	80	18x8	254	300	178	22	85	22x14x120
800	318	1025	360	630	290	1400	605	590	170	80	18x8	254	300	178	22	85	22x14x120
900	330	1125	500	840	360	1550	675	660	230	90	22x8	298	350	210	25	95	25x14x138
1000	410	1255	500	840	360	1670	735	720	230	90	22x8	298	350	210	25	95	25x14x138

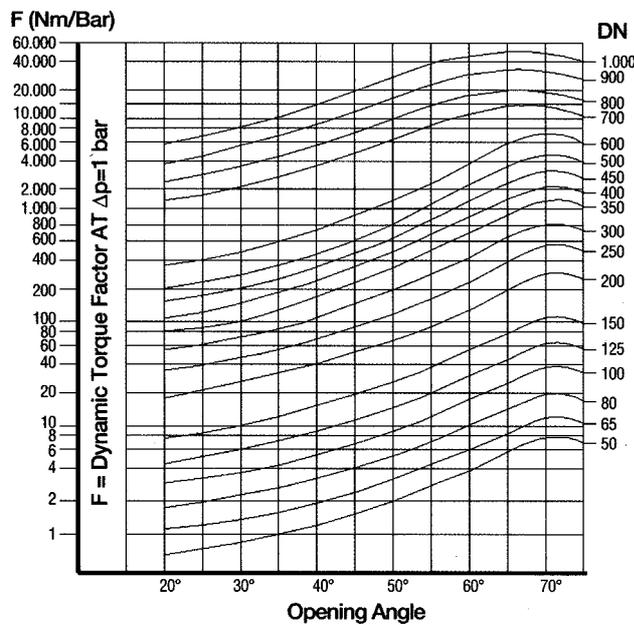
DN	ØK PN 6	n PN 6	ØD PN 6	M PN 6	ØK PN 10	n PN 10	ØD PN 10	M PN 10	ØK PN 16	n PN 16	ØD PN 16	M PN 16	ØK 150#	n 150#	ØD 150#	M 150#	Kgs bare shaft	Kgs with gear
700	810	24	27	24	840	24	30	27	840	24	36	33	863.6	28	36	33	520	630
800	920	24	30	27	950	24	33	30	950	24	39	36	977.9	28	43	39	685	795
900	1020	24	30	27	1050	28	33	30	1050	28	39	36	1085.5	32	43	39	895	1045
1000	1120	28	30	27	1160	28	36	33	1170	28	42	39	1200.2	36	43	39	1150	1300

DN 350-DN 600 Wafer type (PN 6 Series)



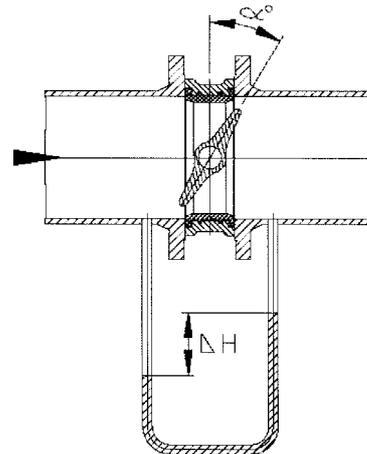
DN	C	H1	H2	H3	H	L1	L2	L3	ØD1	ØD3	Ød1 (h9)	ØdXn	ØD4	ØD5	h	b	b1	t	K	M	N	bare shaft weight kg	gear box weight kg
350	78	296	350	60	813	160	200	81	420	265	35-0.062	19x4	140	175	105	10	20	38	445	20	30	47	14
400	102	313	375	60	855	160	200	84	466	265	35-0.062	19x4	140	175	105	10	20	38	495	20	37	70	14
450	114	343	400	60	910	160	200	81	522	265	42-0.062	19x4	140	175	105	12	20	45	550	20	40	85	14
500	127	371	430	70	997	240	285	138	571	360	48-0.062	19x4	165	210	130	14	25	51.5	600	20	40	125	30
600	154	431	485	70	1112	240	285	138	672	360	60-0.074	19x4	165	210	130	18	25	64	705	24	55	211	30

Flow coefficients and Torque values



$$T_d = F \times \Delta p_a ; [Nm] = [Nm/bar] \times [bar]$$

DN	700	800	900	1000
0 bar	2850	4465	6780	10050
10 bar	3540	5535	8400	12550
16 bar	3955	6180	9370	14050



Flow

$$Q = K_v \sqrt{\frac{\Delta p_a}{\alpha}} \quad [l/s]$$

Δp_a (bar) Pressure drop through the valve at any opening angle
 α (kg/l) Specific gravity of fluid

Torque requirement due to disc / seat interference (friction)

DN	32/40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
0 bar	8	11	16	20	30	46	75	140	200	250	310	480	880	1210	2210
10 bar	9	12	18	26	38	58	90	170	250	320	380	620	1080	1510	2810
16 bar	10	13	19	30	44	65	106	195	280	380	475	705	1220	1690	3135

Flow coefficient Kv-values

DN α°	90°	80°	70°	60°	50°	40°	30°	20°
50	40	32	20	14	9	5	3	1.4
65	70	55	36	25	15	9	5	2.4
80	110	90	57	38	24	14	8	4
100	180	145	94	63	40	23	12	6
125	320	255	165	110	70	40	25	10
150	470	375	245	165	105	60	35	15
200	790	630	410	275	175	100	55	25
250	1250	1000	650	440	275	155	85	40
300	1800	1440	935	630	395	225	125	60
350	2400	1920	1250	840	530	300	170	80
400	3080	2465	1600	1080	680	390	215	105
450	4150	3320	2160	1450	915	520	290	140
500	5200	4160	2705	1820	1145	655	365	175
600	7100	5680	3690	2485	1560	895	495	240
700	10100	8075	5250	3030	1820	1000	500	200
800	13000	10400	6760	3900	2340	1300	660	260
900	16400	13120	8500	4920	2950	1640	825	330
1000	20700	16560	10765	6210	3725	2070	1040	415

Assembly and disassembly instructions

Assembly

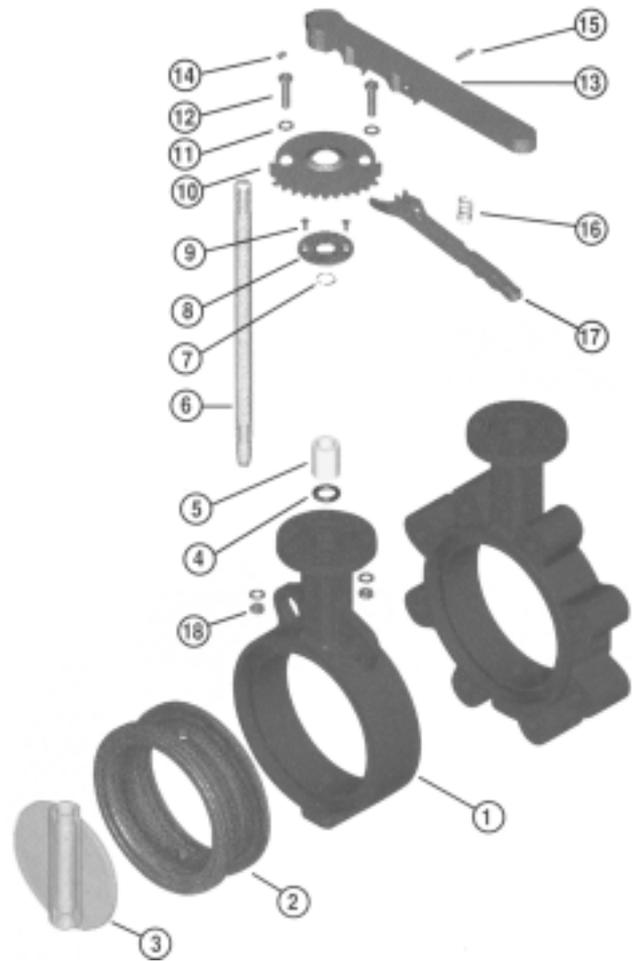
1. Connect the body (1) of the valve to the clamp from the bottom side
2. Mount the seat (2) according to the holes. Align the bigger hole with the hole on the top of the flange on the body.
3. Mount the o-ring (4) and bushing (5) to the body.
4. Insert the stem (6) through the top flange. Do not insert all the way through.
5. Mount the disc (3) on the body.
6. Mount the circlip(7) on the stem.
7. Attach the stopper plate (8) and screw (9) to the top flange.
8. Tighten the notch plate (10) using bolts (12).
9. Mount the lever (13) on the stem, while positioning the notch plate (10).
10. Tighten the bolts (12) and the toothed pin (14).
11. The valve is ready for installation.

Disassembly

1. Connect the valve body (1) to the clamp from the bottom side.
2. If the valve is lever operated, loosen the toothed pin (14) and remove the lever (13) from the valve.
3. Loosen the bolts (12) and remove the notch plate (10).
4. If any type of actuator is used; remove the bolts (12) and disconnect the unit.
5. Remove the screws (9) and stopper plate (8).
6. Disconnect the valve body from the clamp to remove the stem (6).
7. Connect the body to the clamp from the square side of the valve.
8. Remove the stem (6) from the body.
9. The valve should be secured to the clamp from the bottom and the disc (3) must be removed. Remove the seat (2) from the body.

Removing the valve from the pipeline

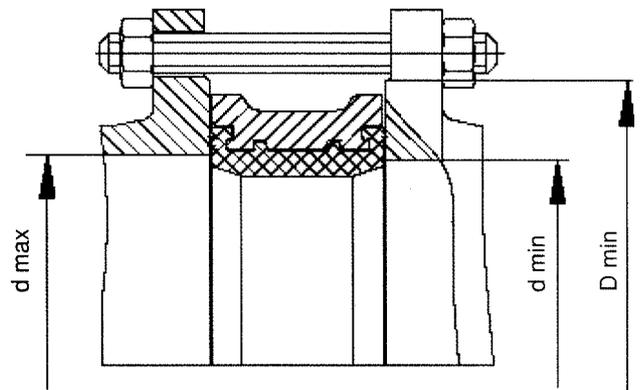
1. Stop the flow of the fluid and discharge the fluid from the line.
2. Bring the valve to a 95% closed position.
3. Loosen and remove all the bolts which prevent removing the valve from the line.
4. Remove the valve by opening the space between the flanges
5. Use a separator to remove the valve if jammed due to pressure.



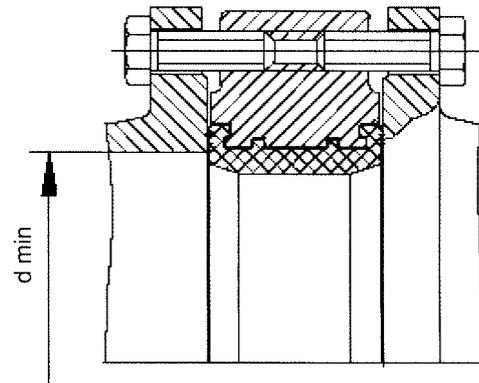
Installation instructions

Installing the valves in existing pipelines:

1. In order to make mounting easier open the flanges completely.
2. Disc must be in a 95% closed position.
3. Centre the valve between the flanges and tighten the bolts.
4. Open the valve completely and remove the flange separator.
5. Tighten the bolts using the nuts by hand only.
6. Bring the valve to full open position.
7. Tighten the bolts until the flanges touch the valve body.
8. Test the valve by opening and closing several times.



Wafer Body



Lug Body

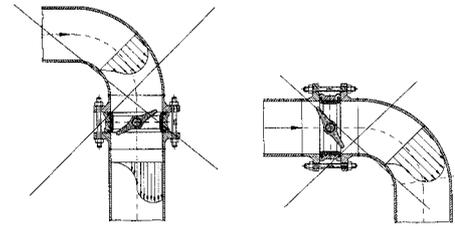
Installing the valve in a new pipeline:

1. Connect the valve with bolts between the two flanges while the disc is in a 95% closed position.
2. Weld the flange of the line only at two points. Remove the valve.
3. Loosen the bolts and remove the valve from between the two flanges.
4. Carefully weld the flange on the line and wait for cooling. To avoid heat damage to the rubber seat never weld the flange while the valve is still connected to the line.
5. Using welding gauge apparatus is advised for valves with sizes over DN 200.
6. Repeat the above instructions for mounting the valve on existing pipeline.
7. Using dismantling piece is advised for valves with sizes over DN 200.

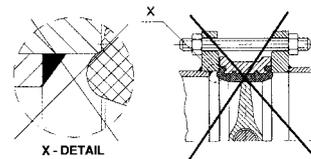
DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
Ød min/ d max	52/62	68/77	82/95	102/118	127/144	152/170	202/225	252/276	303/325	316/356	375/407	415/450	468/505	545/600
ØD min	88	104	120	146	176	200	256	310	368	405	455	500	560	655

Additional installation information

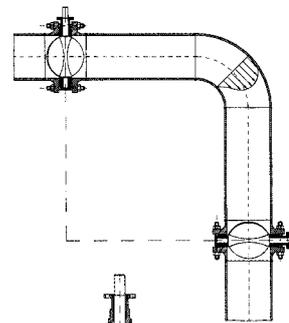
Installing the valves near the curves (see diagram) shall cause turbulence and should be avoided.



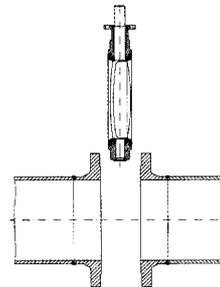
Welded neck type flanges are advised. Otherwise the valves must be centred between the flanges.



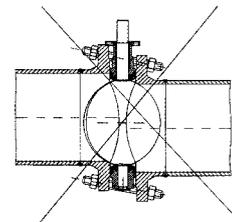
Always install the valves further from the curve equally 3 to 5 times the diameter of the line. The axis of the stem should be parallel to the line extended from the opposite side of the curve.



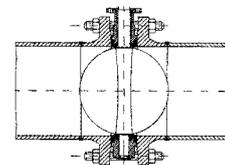
Surrounding space must be provided between the flanges to insert the valve. The disc must be at 95% closed position prior to installing the valve.



Using scrap pipes is not recommended. The pipes must not be welded to each other at short intervals. The lines connected to the two sides of the valve must be on the same axis to prevent leakage.



- lines connected to the valves must be centred with each other
- the disc must be completely open
- line and stem axis must be centred
- the bolts must be tightened until the flanges touch the valve body



If the stem must be installed parallel to the ground to accommodate dense flowing materials, lower part of the disc should open in the same direction of the flow.

