



JMC

Butterfly Valve



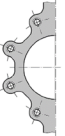
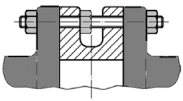
SAPAG®

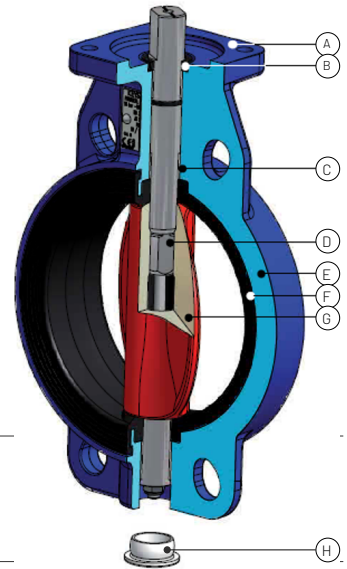
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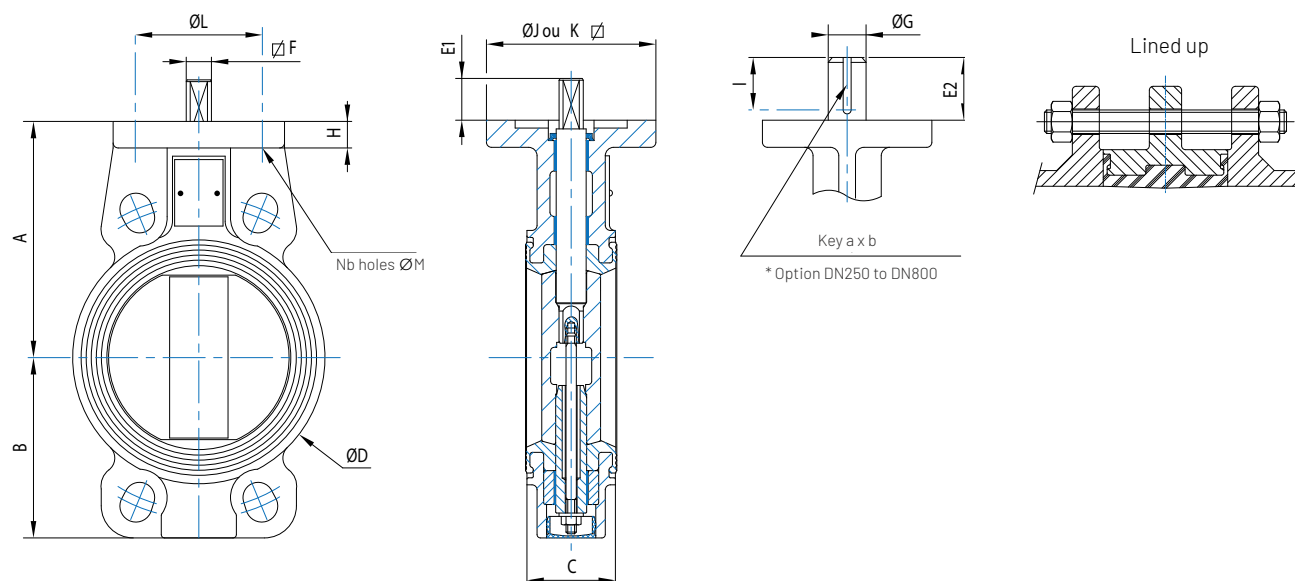


JMC BUTTERFLY VALVE FEATURES

Performance	The maximum pressures and temperatures depend on the pressure / temperature ratio and type of fluid. Temperature, °C: -196 °C → -29 °C → 170 °C → 700 °C Pressure, bar: 0* → 25 → 100 bar Diameter, mm: DN32 → DN40 → DN3000
Technology	Resilient seated and bidirectional valve.
Body type	Wafer  Lug  Double flange 
Face to Face	- ISO5752 – S20 (DN50-DN1000) 254 mm : DN1050 – DN1600 356 mm : DN1600 – DN2600
Design standard	EN593 / API609 Cat.A / ISO10631
ISO5211 Flange	Centered top flange enabling direct actuator installation.
V-Ring	This seal fitted on the flange enables you to protect shafting from the external environment.
Bearings	Bearings provide perfect shaft stability whatever pressure is exerted.
Shaft	- Fitted with a foolproof system that ensures correct butterfly assembly; - Dry shaft: no contact between shafting and fluid.
Body	Available in various materials. The monoblock design provides excellent mechanical properties.
Liner	Specially designed to ensure tightness: - Bidirectional thanks to its mechanical anchoring in the body (both low and high pressure), - no additional external seals on pipe flanges, shafting with no additional sealing. The permanent high-quality requirements with French partners ensures great durability. The valve is easy to replace and thus as good as new after harsh operating conditions.
Butterfly	Perfectly suited to all applications, notably abrasive use, because of its lenticular profile and roundness. The absence of a retention area ensures safety in food industry applications.
Plug	Protects shafting from external pollution.
Approvals	List of available approvals according to construction (and on request): 



WAFER: VALVE FEATURES



DN mm	DN inches	A	B	C	ØD	E1	E2	□F	ØG*	H	ØJ	□K	ØL	Nb	ØM	a	b	l	Weight kg
50	2"	110	74	43	94	26	-	11	-	14	90	-	70	4	9	-	-	-	3.2
65	2½"	118	81	46	107	26	-	11	-	14	90	-	70	4	9	-	-	-	3.5
80	3"	125	93	46	126	26	-	11	-	14	90	-	70	4	9	-	-	-	4.4
100	4"	140	107	52	150	26	-	14	-	16	-	100	102	4	11	-	-	-	6
125	5"	160	122	56	179	26	-	14	-	16	-	100	102	4	11	-	-	-	8.1
150	6"	175	135	56	204	26	-	19	-	17	-	100	102	4	11	-	-	-	10.1
200	8"	206	170	60	259	26	-	19	-	17	-	100	102	4	11	-	-	-	14.5
250	10"	247	230	68	313	36	70	27	35	17	-	132	125	4	14	10	8	60	25.5
300	12"	277	255	78	369	36	70	27	35	17	-	132	125	4	14	10	8	60	36.8
350	14"	300	292	78	418	36	70	27	35	17.5	-	132	125	4	14	10	8	60	39
400	16"	345	318	102	467	43	80	32	40	21	-	132	140	4	18	12	8	73	69
450	18"	375	362	114	521	49	80	36	50	22	-	140	140	4	18	14	9	60	83
500	20"	425	406	127	571	63	85	46	60	25	210	-	165	4	22	18	11	80	107
550	22"	470	442	154	622	63	85	46	60	25	210	-	165	4	22	18	11	80	135
600	24"	495	461	154	670	63	85	46	60	25	210	-	165	4	22	18	11	80	145
650	26"	545	527	165	753	81	110	55	80	30	300	-	254	8	18	22	14	100	195
700	28"	570	550	165	776	81	110	55	80	30	300	-	254	8	18	22	14	100	217
750	30"	610	580	165	843	81	110	55	80	30	300	-	254	8	18	22	14	100	275
800	32"	640	600	190	882	81	110	55	80	30	300	-	254	8	18	22	14	100	310
900	36"	700	715	203	1000	-	110	-	100	30	300	-	254	8	18	28	16	100	448
1000	40"	750	767	216	1105	-	110	-	100	30	350	-	298	8	22	28	16	100	530

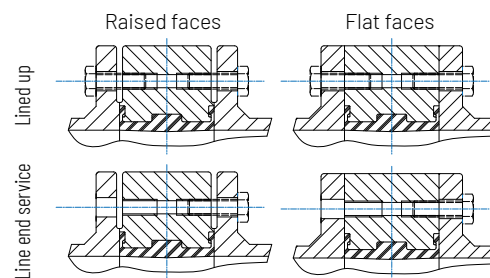
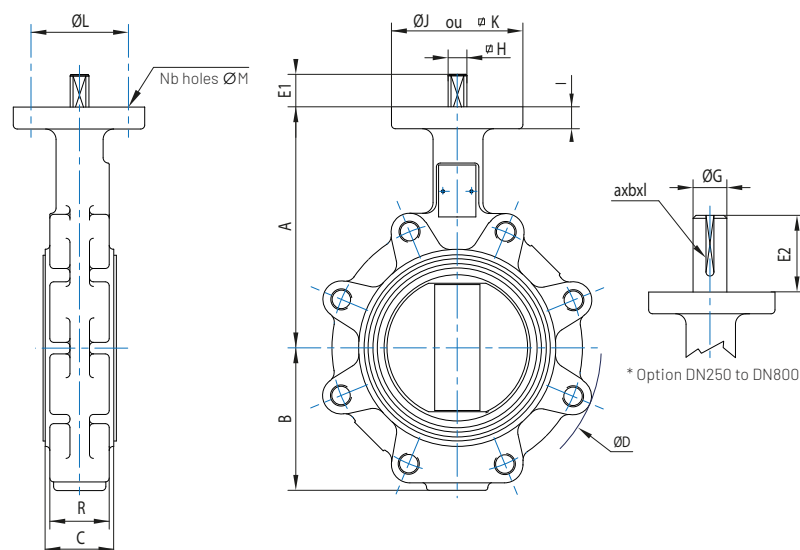
MAXIMUM PRESSURE CLASS (bar)

Valve DN	50	65	80	100	125	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000
In pipe	25	25	25	25	25	25	25	25	25	25	25	25	25	20	25	20	25	25	25	20	25	25
Wafer EOL at line end with backflange	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	14.6	18.3	14.6	18.3	18.3	18.3	14.6	18.3	18.3

Maximum valve operating pressure (PS) at pipe end (BdC) will be limited to: $PS(BdC) = PS \times 0.733$, due to valve operating pressure in pipe.

- Flange type and pressure class must be specified in the order.
- Specify diameter, figure number, name, material and flange type while ordering spare parts.
- C = FTF ISO 5752 Series 20 - NF E 29305 Series 20 - MSS SP 67 - API 609 - DIN 3202 - BS 5155 - EN 558 (except DN350).
- Shaft outer dimensions are standard.
- See specific data sheets for other valve dimensions.
- (ØG*) The SAPAG standard imposes square shaft outlets from DN 50 to DN 800, and with key from DN 850 to DN 1000. An outlet with key from DN 250 to DN 800 is available on request.
- 1 bar = 14.6 Psi

LUG: VALVE FEATURES



DN mm	DN inches	A	B	C	ØD	E1	E2	ØF	ØG*	H	ØJ	ØK	ØL	Nb	ØM	a	b	l	R	Weight kg
50	2"	152	76	43	153	26	-	11	-	14	90	-	70	4	9	-	-	-	38	3.6
65	2½"	159	84	46	173	26	-	11	-	14	90	-	70	4	9	-	-	-	40	6.2
80	3"	166	90	46	188	26	-	11	-	14	90	-	70	4	9	-	-	-	40	6.8
100	4"	182	109	52	219	26	-	14	-	16	-	100	102	4	11	-	-	-	45	8.4
125	5"	193	120	56	252	26	-	14	-	16	-	100	102	4	11	-	-	-	48	11.4
150	6"	217	140	56	286	26	-	19	-	17	-	100	102	4	11	-	-	-	48	16.8
200	8"	242	167	60	350	26	-	19	-	17	-	100	102	4	11	-	-	-	52	23.6
250	10"	280	230	68	410	36	70	27	35	17	-	132	125	4	14	10	8	60	60	35.6
300	12"	310	255	78	482	36	70	27	35	17	-	132	125	4	14	10	8	60	70	63.4
350	14"	350	292	78	540	36	70	27	35	17.5	-	132	125	4	14	10	8	60	70	67
400	16"	375	318	102	588	43	80	32	40	21	-	140	140	4	18	12	8	73	90	104
450	18"	400	362	114	650	49	80	36	50	22	-	140	140	4	18	14	9	60	100	136
500	20"	425	406	127	710	63	85	46	60	25	210	-	165	4	22	18	11	80	113	180
550	22"	470	442	154	795	63	85	46	60	25	210	-	165	4	22	18	11	80	140	230
600	24"	495	461	154	828	63	85	46	60	25	210	-	165	4	22	18	11	80	140	270
650	26"	545	527	165	885	81	110	55	80	30	300	-	254	8	18	22	14	100	150	275
700	28"	570	550	165	945	81	110	55	80	30	300	-	254	8	18	22	14	100	150	280
750	30"	610	580	165	972	81	110	55	80	30	300	-	254	8	18	22	14	100	150	370
800	32"	640	600	190	1010	81	110	55	80	30	300	-	254	8	18	22	14	100	170	400
900	36"	700	715	203	1148	-	110	-	100	30	300	-	254	8	18	28	16	100	190	618
1000	40"	750	767	216	1240	-	110	-	100	30	350	-	298	8	22	28	16	100	190	660

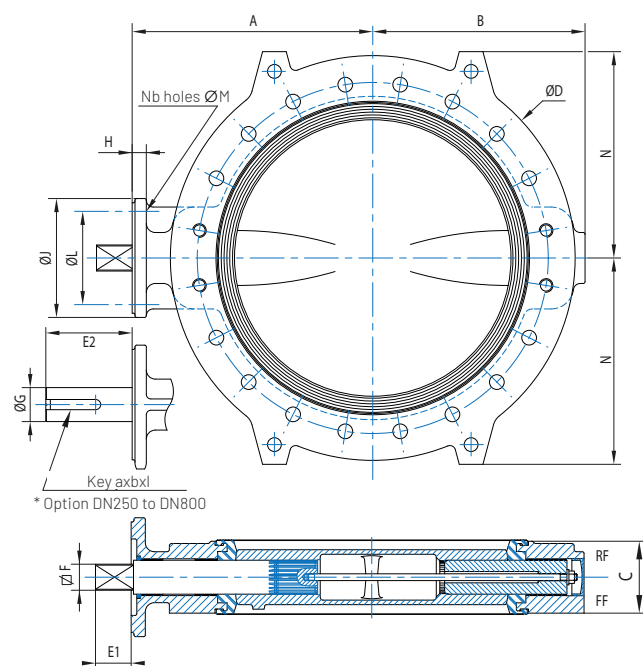
MAXIMUM PRESSURE CLASS (bar)

Valve DN	50	65	80	100	125	150	200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000
In pipe	25	25	25	25	25	25	25	25	25	25	25	25	25	20	25	20	25	25	25	25	25
In line end	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	14.6	18.3	14.6	18.3	18.3	18.3	18.3	18.3

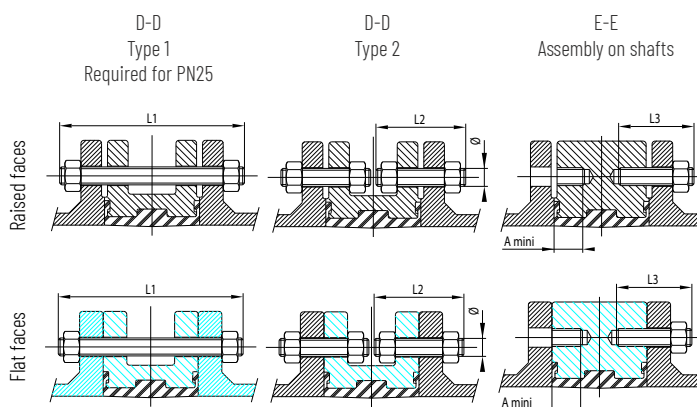
Maximum valve operating pressure (PS) at pipe end (BdC) will be limited to: $PS(BdC) = PS \times 0.733$, due to valve operating pressure in pipe.

- Flange type and pressure class must be specified in the order.
- Specify diameter, figure number, name, material and flange type while ordering spare parts.
- C = Face to face ISO 5752 Series 20 (wafer according to table 5) - NF E 29305 Series 20 - MSS SP 67 - API 609 - BS 5155.
- * Not defined by ISO 5752 Series 20 standard.

DOUBLE FLANGE: VALVE FEATURES



* Option DN250 to DN800



DN mm	DN inches	A	B	C	ØD	E1	E2	□F	ØG*	H	ØJ	ØL	Nb	ØM	a	b	l	p	Weight kg
500	20"	425	406	127	730	63	85	46	60	25	210	165	4	22	18	11	80	375	167
550	22"	470	442	154	780	63	85	46	60	25	210	165	4	22	18	11	80	400	182
600	24"	495	461	154	845	63	85	46	60	25	210	165	4	22	18	11	80	432	203
650	26"	545	527	165	890	81	110	55	80	30	300	254	8	18	22	14	100	454	243
700	28"	570	550	165	940	81	110	55	80	30	300	254	8	18	22	14	100	480	292
750	30"	610	580	165	984	81	110	55	80	30	300	254	8	18	22	14	100	505	400
800	32"	640	600	190	1060	81	110	55	80	30	300	254	8	18	22	14	100	542	403
850	34"	700	640	203	1168	-	110	-	100	30	300	254	8	18	28	16	100	597	530
900	36"	700	715	203	1160	-	110	-	100	30	300	254	8	18	28	16	100	597	493
1000	40"	750	770	216	1290	-	110	-	100	30	350	298	8	22	28	16	100	660	583
1050	42"	780	770	254	1340	-	130	-	100	30	350	298	8	22	28	16	120	695	1100
1100	44"	820	805	254	1400	-	130	-	100	30	350	298	8	22	28	16	120	710	1199
1200	48"	870	830	254	1490	-	130	-	100	30	350	298	8	22	28	16	120	760	1276
1300	52"	960	935	254	1625	-	140	-	120	40	415	356	8	32	32	18	130	835	1672
1350	54"	987	965	254	1685	-	140	-	120	40	415	356	8	32	32	18	130	865	1716
1400	56"	1015	1000	254	1690	-	140	-	120	40	415	356	8	32	32	18	130	865	1749
1500	60"	1130	1090	254	1855	-	180	-	130	50	475	406	8	38	32	18	160	950	2134
1600 (10)	64"	1170	1135	254	1930	-	180	-	130	50	475	406	8	38	32	18	160	980	2211
1600 (16)	64"	1200	1165	356	1930	-	200	-	150	50	475	406	8	38	36	20	170	980	3001
1650	66"	1230	1200	356	2035	-	200	-	150	55	475	406	8	38	36	20	170	1040	3608
1800	72"	1290	1250	356	2115	-	200	-	150	55	475	406	8	38	36	20	170	1080	3839
2000	80"	1463	1390	356	2340	-	200	-	180/200	55	560	483	12	38	45	25	170	1200	4565
2100	84"	1532	1460	356	2535	-	200	-	180/200	55	560	483	12	38	45	25	170	1290	5390
2200	88"	1566	1500	356	2545	-	200	-	180/200	55	560	483	12	38	45	25	170	1300	5060
2400	96"	1672	1590	356	2755	-	200	-	180/200	55	560	483	12	38	45	25	170	1425	5940
2600																			
2800																			
3000																			

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MAXIMUM PRESSURE CLASS (bar)

DN	500-1000	1050-1600	1650-2400
In pipe	25	16	10
In line end	18.3	11.7	7.3

Maximum valve operating pressure (PS) at pipe end (BdC) will be limited to:
 $PS(BdC) = PS \times 0.733$, due to valve operating pressure in pipe.

Flange type and pressure class must be specified in the order.

Specify diameter, figure number, name, material and flange type while ordering spare parts.

C = Face to face ISO 5752 Series 20 (wafer according to table 5) -

NF E 29305 Series 20 - MSS SP 67.

Valve shown has a nominal diameter (DN) of 500.

*Not defined by ISO 5752 Series 20 standard.

K_v VALUES

Flow coefficient (K _v and C _v)	Simplified form			Definitions	
K _v corresponds to water flow in m ³ /h, with average temperature of 20 °C, passing through the valve while creating a pressure loss of 1 bar	Pressure loss	K _v	Incompressible fluid	Gas	K _v Valve flow coefficient
	$\Delta P < \frac{P_1}{2}$	K _v	$= \frac{Q}{31,6} \sqrt{\frac{\rho_1}{\Delta P}}$	$= \frac{Q}{514} \sqrt{\frac{\rho_{N,T}}{\Delta P P_2}}$	Q Flow in m ³ /h
	$P_2 > \frac{P_1}{2}$				Δp Valve bar pressure loss
	$\Delta P > \frac{P_1}{2}$				P ₁ Upstream bar pressure
C _v = 1.16 K _v	$P_2 < \frac{P_1}{2}$	K _v	$= \frac{2Q_N}{514 P_1} \sqrt{\rho_{N,T}}$		P ₂ Downstream bar pressure
					Q _N Flow in normal conditions (0 °C, 760 mm Hg) in m ³ /h
					T Fluid temperature in °K
					ρ ₁ Fluid volumetric mass in kg/m ³
					ρ ₂ Volumetric mass in normal conditions

Disk opening	Nominal diameter (DN)												
	50	65	80	100	125	150	200	250	300	350	400	450	500
20°	3	6	10	13	30	45	68	128	197	265	345	449	566
30°	9	17	26	37	60	90	162	257	394	531	690	899	1131
40°	21	40	63	86	150	225	270	429	661	880	1134	1498	1881
50°	39	73	115	152	249	375	486	772	1183	1595	2070	2697	3395
60°	65	124	195	268	439	660	756	1201	1841	2479	3218	4195	5280
70°	93	178	280	457	747	1123	1431	2273	3486	4692	6096	7942	9997
80°	105	201	316	573	927	1393	2457	3904	5985	8057	10465	13636	17160
90°	110	210	330	610	1000	1500	2700	4300	6600	8900	11500	15000	18800

	550	600	650	700	750	800	850	900	1000	1050	1100	1200	1300
20°		828		1161	1358	1540	1750	1970	2460	2847	3093	3722	4099
30°		1656		2323	2715	3080	3500	3940	4910	5684	6186	7428	7613
40°		2750		3850	4538	5148	5812	6570	8190	9482	10310	12390	14202
50°		4969		6969	8168	9266	10511	11800	14740	17063	18558	22300	25770
60°		7730		10813	12703	14410	16244	18370	22940	26556	28868	34703	40016
70°		14630		20515	24049	27280	31045	34770	43400	50241	54643	65657	75640
80°		25124		35233	41290	46838	52712	59630	74450	86186	93718	112630	129815
90°		27600		38600	45400	51500	58777	65600	81900	94809	103100	123900	146240

	1350	1400	1500	1600	1650	1800	2000	2100	2200	2400	2600	2800	3000
20°	4520	4940	5504	6452	6654	8165	10080	11113	12197	14515			
30°	8335	9056	10287	11828	12198	14969	18480	20374	22361	26611			
40°	15539	16876	19190	22042	22731	27897	34440	37970	41672	49594			
50°	28074	30377	34818	39676	40916	50213	61992	68346	75010	89268			
60°	43364	47252	54067	61717	63646	78110	96432	106316	116683	138862			
70°	82389	89318	102198	116660	120306	147647	182280	200964	220559	262483			
80°	141548	153280	175396	200203	206459	253381	312816	344879	378507	450455			
90°	159556	172872	197830	225792	232848	292572	361200	398223	437052	520128			

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Specified maximum allowable torques are applicable for standard valves

SHAFT MAXIMUM ALLOWABLE TORQUES (NM)

Size DN	Stainless steel shaft 13% Cr	Size DN	Stainless steel shaft 13% Cr	Size DN	Stainless steel shaft 13% Cr	Size DN	Stainless steel shaft 13% Cr
50	182	350	2800	800	23700	1500	145000
65	182	400	4250	850	66000	1600 (10)	145000
80	182	450	6450	900	66000	1600 (16)	223000
100	390	500	14300	1000	66000	1800	223000
125	390	550	14300	1050	66000	2000	380000
150	1040	600	14300	1100	66000	2100	380000
200	1040	650	23700	1200	66000	2200	380000
250	2800	700	23700	1300	66000	2400	380000
300	2800	750	23700	1400	114000		

ACTUATING TORQUE

* +30 % if ebonite coated or rubber disc (EPDM and NBR liner)

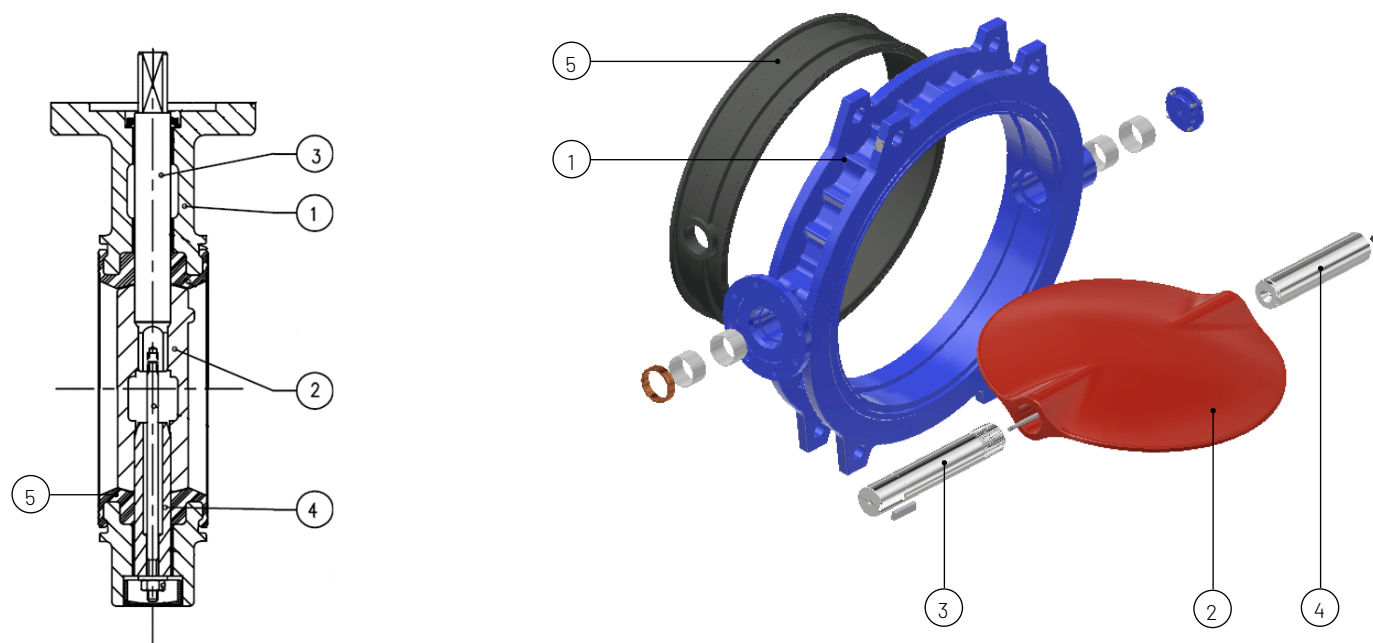
Size DN mm	Pressure bar	Torque Nm	Reduced torque ^[1] bar	Torque Nm	Size DN mm	Pressure bar	Torque Nm	Reduced torque ^[1] bar	Torque Nm	Size DN mm	Pressure bar	Torque Nm
50	25	15	6(max)	10	500	25	2300	6(max)	1530	1350	16	27000
65	25	26	6(max)	17	600	25	3200	6(max)	2130	1400	16	31000
80	25	40	6(max)	26	700	25	4500	6(max)	3000	1500	16	38000
100	25	68	6(max)	44	750	25	5200	6(max)	3800	1600	16	46000
125	25	115	6(max)	75	800	25	6000	6(max)	4000	1650	10	50000
150	25	170	6(max)	110	850	25	7000	6(max)	4600	1800	10	65000
200	25	320	6(max)	208	900	25	8000	6(max)	5300	2000	10	85000
250	25	480	6(max)	312	1000	25	10500	6(max)	7000	2100	10	95000
300	25	720	6(max)	468	1050	16	11000	-	-	2200	10	105000
350	25	950	6(max)	660	1100	16	12000	-	-	2400	10	125000
400	25	1350	6(max)	900	1200	16	15000	-	-			
450	25	1700	6(max)	1130	1300	16	22500	-	-			

Torques are OK for fresh water at ambient temperature. Please specify differential pressure when ordering.

1. Reduced torque via special body machining.

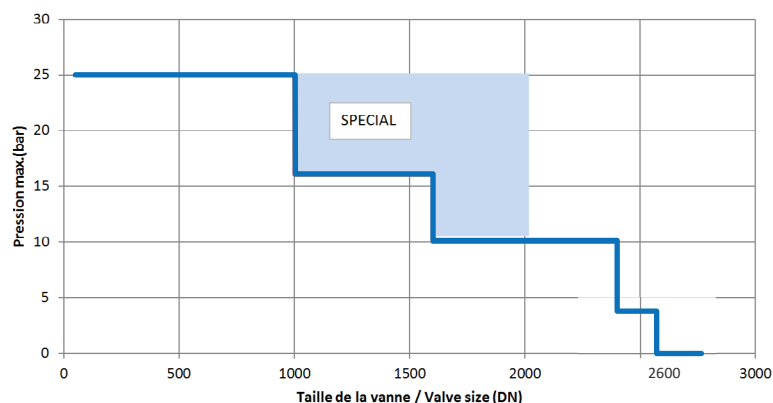
MATERIAL SPECIFICATIONS AND PARTS LIST

DN 50-300



Ref.	Material	Name EN	Material EN	Equivalent name	Comments
① Body	Ductile cast iron	GJS-400-18	JS-1020	ASTM A536 Gr. 60.40.18	Coated
	Acier au carbone	GP240GH	1.0619	ASTM A216 WCB	Coated
	Stainless steel	GX5CrNiMo19-11-2	1.4408	ASTM A351 Gr. CF8M	
	NiAlBz	CuAl10Fe5Ni5-(B ou C)		ASTM B148 Gr. 958	
	Ductile cast iron + Coating	GJS-400-15	JS-1030		Epoxy coating
② Butterfly	Ductile cast iron + Coating	GJS-400-18	JS-1020	ASTM A536 Gr. 60.40.18	Epoxy coating
	Stainless steel	GX2CrNiMo19-11-2	1.4409	ASTM A351 Gr. CF3M	Polished on request DN 50-300
	Stainless steel	GX5CrNiMo19-11-2	1.4408	ASTM A351 Gr. CF8M	Polished on request DN ≥ 350
	NiAlBz	CuAl10Fe5Ni5-(B ou C)		ASTM B148 Gr. 958	Polished on request
	Ductile cast iron + Ebonite coating				All sizes
	Ductile cast iron + Coating EPDM				Sizes up to DN 300
	Ductile cast iron + Coating NBR				Sizes up to DN 300
	Duplex		1.4470 / 1.4469		
	Monel® 400			ASTM A494 M35-1	
	Other coatings: Epoxy, Rilsan®, Halar®				
③ Shaft	Stainless steel	X20Cr13	1.4021	ASTM A276-420	
	Stainless steel	X5CrNiCuNb16-4	1.4542	ASTM A276-630 (17-4 PH)	
	Monel® K500	NiCu30Al	2.4375		
④ Spindle	NiAlBz				Reduced max. pressure
	Inconel®				
	EPDM				White EPDM on request
	EPDM-S				
	NBR				
⑤ Liner	X-NBR				Carboxylated nitrile
	FKM / FPM				Fluoroelastomer
	CSM				Chlorosulfonated polyethylene
	Therban®				Hydrogenated NBR
	Silicone				
	Other liner materials on request				

MAXIMUM OPERATING PRESSURE AT AMBIENT TEMPERATURE



Vacuum: 1 Torr = 1 mm Hg = 1.33 mbar (Bn standard)*

FACTORY TESTS

All JMC valves are subjected to hydraulic testing in compliance with standard ISO 5208 / EN12266:

1. For sealing at 1.1 x PN
2. For body resistance at 1.5 x PN. Other specific tests on request.

*Please contact our technical departments for larger vacuum.

LINER CHARACTERISTICS

DN*	Liner materials	Temperature range	
		Minimum	Maximum
50 → 2600	EPDM	-30 °C (-22 °F)	+130 °C (+266 °F)
50 → 1000	White EPDM	-30 °C (-22 °F)	+100 °C (+212 °F)
50 → 2600	EPDM-S	-30 °C (-22 °F)	+80 °C (+176 °F)
50 → 2600	Nitrile	-20 °C (-4 °F)	+80 °C (+176 °F)
50 → 500	EN682 - Nitrile	-20 °C (-4 °F)	+80 °C (+176 °F)
50 → 600	X-NBR - Carboxylated nitrile	-20 °C (-4 °F)	+60 °C (+140 °F)
50 → 1200	FKM / FPM	-15 °C (+5 °F)	+170 °C (+338 °F)
50 → 600	CSM	-15 °C (+5 °F)	+80 °C (+176 °F)
50 → 600	HNBR - Therban®	-20 °C (-4 °F)	+140 °C (+284 °F)
50 → 300	Silicone	-30 °C (-22 °F)	+170 °C (+356 °F)

Available for any stainless steel, aluminium bronze and ductile cast iron butterfly, with epoxy, Rilsan® and Halar® coating.

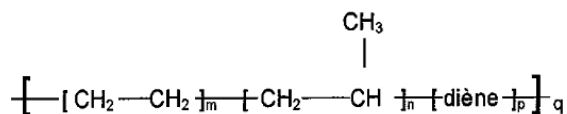
Check the behaviour of materials shown in technical sheets for any other temperature.

*Other sizes available on request.

EPDM PEROXIDE LINER

DN 50 to DN 2400

EPDM (Ethylene Propylene Diene Monomer) is vulcanized elastomer.



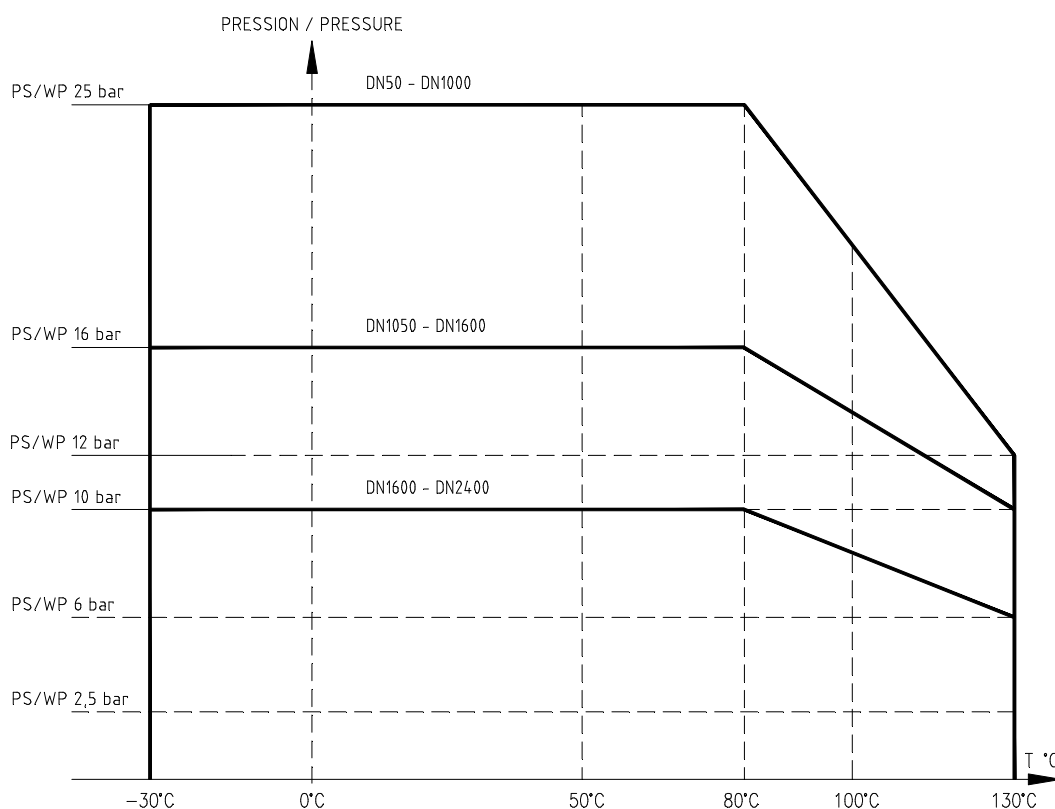
Elastomer recommended for:

- Fresh water
- Demineralized water
- Sea water
- Ketones
- Air
- Non-oxidizing diluted acids
- Non-oxidizing strong acids
- Strong bases
- Foodstuffs

Elastomer not recommended for:

- Aromatic solvents
- Mineral oils
- Aliphatic solvents
- Chlorinated solvents

PRESSURE / TEMPERATURE CURVE

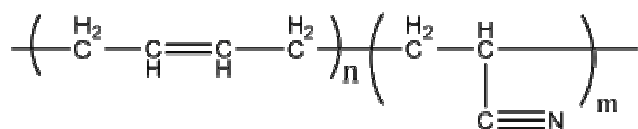


Consult our ESTIMATE Department for other service conditions.

NITRILE LINER

DN 50 to DN 2400

Nitrile (also known as Buna-N, Perbunan or NBR) is a synthetic elastomer, consisting of acrylonitrile and butadiene:



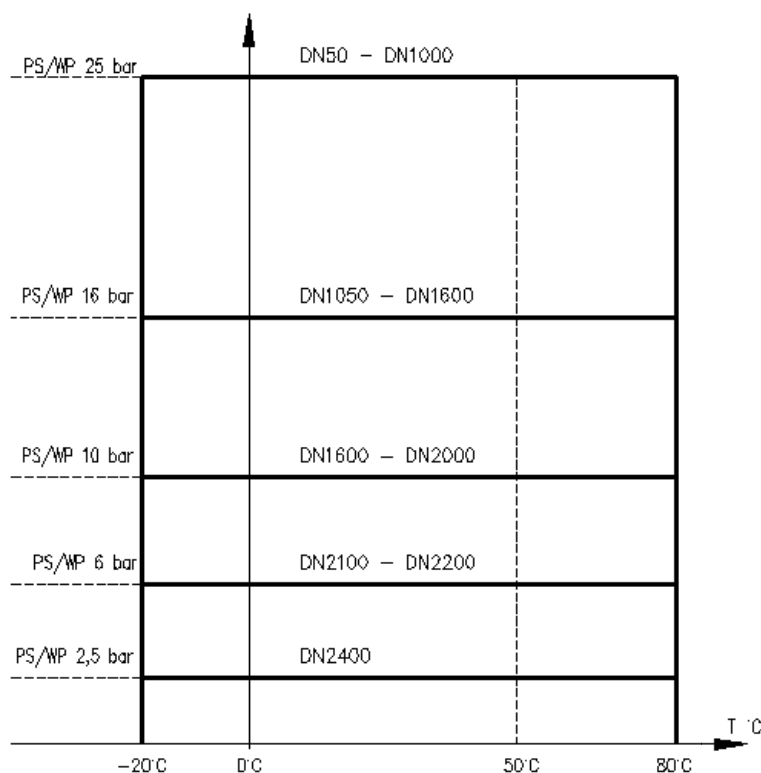
Elastomer recommended for:

- Mineral oils
- Oil products
- Aliphatic solvents

Elastomer not recommended for:

- Ketones
- Oxidizing strong acids

PRESSURE / TEMPERATURE CURVE



Consult our ESTIMATE Department for other service conditions.

FLUOROCARBON LINER

DN 50 to DN 2400

Fluorocarbon (also with acronyms FPM (ISO) or FKM (ASTM)) is a material with 'elastic' properties, like elastomers.

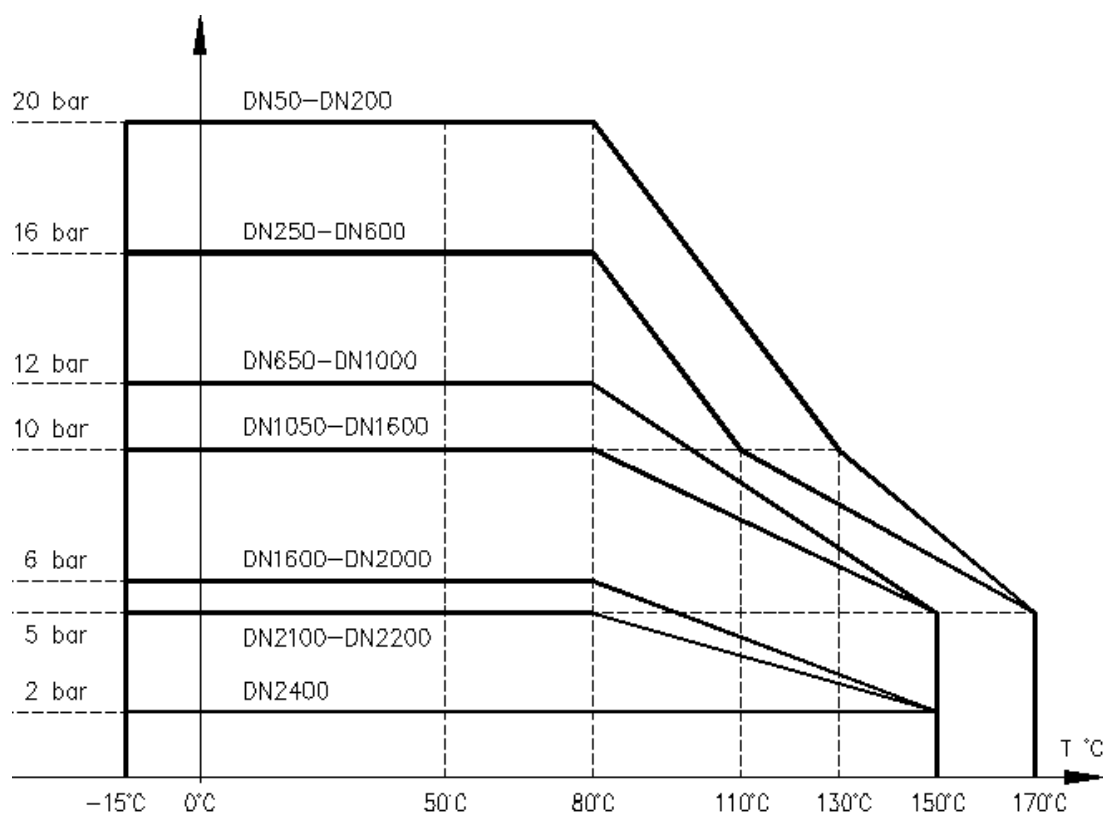
Elastomer recommended for:

- Mineral oils
- Oil products
- Aliphatic solvents
- Diluted aromatic solvents
- Chlorinated solvents
- Water
- Diluted or strong acids
- Oxidizing strong acids

Elastomer not recommended for:

- Ketones

PRESSURE / TEMPERATURE CURVE

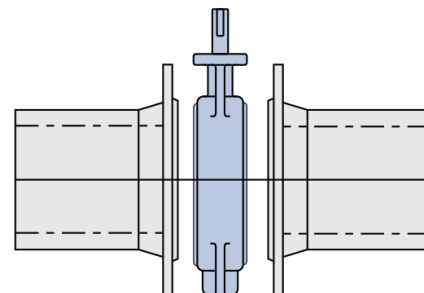


Consult our ESTIMATE Department for other service conditions.

FLANGE COMPATIBILITY

ASSEMBLY BETWEEN FLANGE AND PIPING

1. Provide enough space between pipe flanges in order to avoid damaging seat sides while sliding the valve between both flanges. Ensure that the latter have erect, aligned and parallel sealing faces.
2. Center the valve.
3. Gradually tighten diametrically-opposite screws, alternately, until the metallic valve body touches flange faces. Fully tighten screws.
4. Check free movement after assembly by fully opening, then closing butterfly.



ASSEMBLY BETWEEN FLANGES AND PIPE END FOR WAFER

	DN	40	50	65	80	100	125	150	200	250	300	350	400	450	500	550	600	650	700 ⁽³⁾	750 ⁽³⁾	800 ⁽³⁾	900 ⁽³⁾	1000 ⁽³⁾
	NPS	1½"	2"	2 ½"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	36"	40"
ISO 7005 / EN 1092	PN6	X	*		*	*	*	*	(4)	*	*	(4)*	*	*	*		*					X	X
	PN10	(1)(4)															*						
	PN16	(1)(4)															*						
	PN20	X			*									*			*						
	PN25	(1)(4)		(4)		(4)	(4)	(4)	(4)	(4)	(4)	(5)	X	X			*						
CLASS 125 / CLASS 150	ASME B16.1	X			*												*						
	ASME B16.5	X			*												*						
	ASME B16.42	X			*												*						
	ASME B16.47 A																						
	MSS SP-44																*						
	API 605																		X	X	X	X	X
AWWA C207	Table 2-3-4-5															*							
CLASS 300	ASME B16.5	X		X(2)	X(2)	X	X	X	X	X	X	X	X	X(2)	X		X						
	ASME B16.42																						
	ASME B16.47 A																		X	X	X	X	(4)
	MSS SP-44										X	X	X	X	X		X		X	X	X	X	(4)
	API 605																		(4)			(4)	
BS10	Table A	X	*	*	*			*		X	X	X	(4)	X	X		X		X		X		
	Table D	X	*	*	*			*		X			(4)						X		X		
	Table E	X	*	*	*			*				X	(4)						X		X		
JIS B2210	5K	X	*		*	*	*	*	*	*	*	(4)*	(4)		*		*					X	X
	10K	X			(4)*	(4)*	*		(4)		(4)	(4)					X				(4)		
	16K	X	(4)	(4)	X(2)	X(2)	X(2)	X(2)	(4)	X(2)	(4)	X(2)	X(2)	X	*		X			X			
	20K	X	(4)	(4)	X(2)	X(2)	X(2)	X(2)	(4)	X(2)	(4)	X(2)	X(2)	X			X		X	X	X	X	

FLANGE COMPATIBILITY

LUG (TAPPED LUGS): ASSEMBLY BETWEEN FLANGES AND PIPE END

	DN	40	50	65	80	100	125	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	1000
	NPS	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"	40"
ISO7005 / EN1092	PN6	✗				✗													(3)		(3)		✗	(4)
	PN10	(4)																	(3)		(3)		(3)	(3)
	PN16	(4)																	(3)		(3)		(3)	(3)
	PN20	✗																(3)	(3)	(3)	(3)	(3)	(3)	(3)
	PN25	(4)																(3)		(3)		(3-8)	✗	
	PN40	(4)							✗	✗	✗	✗	✗	✗	✗	✗	✗							
CLASS 150	ASME B16.1 (CI125)	✗																		(3)			(3-9)	
	ASME B16.5	✗																						
	ASME B16.42	✗																						
	ASME B16.47 A																	(3)	(3)	(3)	(3)	(3)	(3)	(3)
	MSS SP-44																	(3)	(3)	(3)	(3)	(3)	(3)	(3)
	AWWA C207 CI B/D																	(3)	(3)	(3)	(3)	(3)	(3)	(3)
	API605																	✗	✗	✗	✗	✗	✗	✗
CLASS 300	ASME B16.1 (CI250)	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	ASME B16.5	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	ASME B16.42	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
	ASME B16.47 A																							
	MSS SP-44																							
	API605																							
JIS B2210	5K	✗	(1+4)		(1+4)	✗			(1+4)		(1+4)	(1+4)							(3)		(3)			(1+3+4)
	10K	✗																	(3)	✗	✗		(3)	(3)
	16K	✗	✗		✗	✗	✗	✗	✗	✗									(3)		(3)		(3)	✗
	20K	✗	✗	✗	✗	✗	✗	✗	✗	✗									✗	✗	✗	✗	✗	✗

DOUBLE FLANGE: ASSEMBLY BETWEEN FLANGES AND PIPE END

	DN	500	550	600	650	700	750	800	850	900	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1600	1650	1800	2000	2100	2200	2250	2400	2600
	NPS	20"	22"	24"	26"	28"	30"	32"	34"	36"	40"	42"	44"	46"	48"	50"	52"	54"	56"	58"	60"	64"	66"	72"	78"	84"	88"	90"	96"	102"
ISO7005 / EN1092	PN6					(3)		(3)		(3)	(3)				(3)				(3)			(6)		(3)	(6)		(3)		(3)	(6)
	PN10					(3)		(3)		(3)	(3)		(3)		(3)				(3)		(3)	(3)		(3)	(3)		(3)		(3)	(6)
	PN16					(3)		(3)		(3)	(3)		(3)		(3)				(3)		(3)	(3)		(3)	(6)					
	PN20				(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)		(3)	(3)	(3)	(3)	(3)		(3)									
	PN25				(3)		(3)		(3)	(3)		(*)		(3)				(6)		(*)	(3)		(6)	(6)						
CLASS 150	ASME B16.1 (CI125)					(3)				(3)		(3)			(3)			(3)			(3)			(5)		(5)			(6)	
	ASME B16.5																													
	ASME B16.42																													
	ASME B16.47 A				(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)		(3)	(3)	(3)	(3)	(3)		(3)									
	MSS SP-44				(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)		(3)	(3)	(3)	(3)	(3)		(3)									
	AWWA C207 Class B/D				(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)		(3)	(3)	(3)	(3)	(3)		(3)		(5)	(5)	(3)	(5)		(5)	(6)	(5)
	API605					✗	(6)	✗		✗	(6)		✗					(6)		(6)										
JIS B2210	5K					(3)	(3)	(6)		(3)	(3)		(3)		(3)						(3)									
	10K			(6)	(3)	(3)	(3+4)	(3)		(3)	(3)		(3)								(3)									
	16K				(3)	(3)	(3)	(3)		(3)	(3)		(3)								(3)									
	20K				✗	✗	✗	✗		✗																				

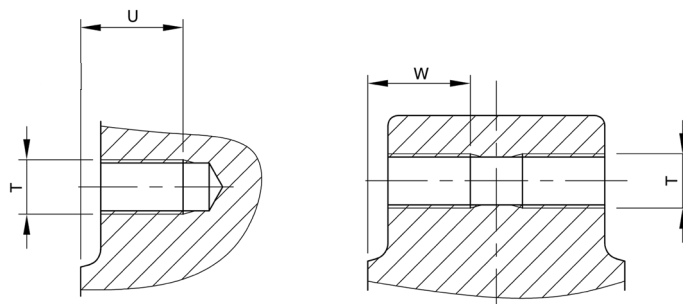
-  CONNECTABLE
 NOT CONNECTABLE
 EN10Connection not defined by 92-2 standard
 (*) EN1092-2

- (1) Interference with flange face
 (3) 4 tapped (not through) holes by face
 (4) Additional machining
 (5) 8 tapped (not through) holes by face
 (6) Consult plant

VALVE CHARACTERISTICS

TIGHTENING TORQUE

M12		26 N.m	M30	1 1/8"	430 N.m
M16	5/8"	63 N.m	M33	1 1/4"	580 N.m
M20	3/4"	120 N.m	M36		750 N.m
M22		170 N.m	M39	1 1/2"	970 N.m
M24	7/8"	210 N.m	M45	1 3/4"	1500 N.m
M27	1"	310 N.m	M52	2"	2330 N.m



WAFER VALVE

THREADED FLANGE RECEIVING BORE SIZES (mm)

DN	PN 6		PN 10		PN 16		PN 25		Class 150**	
	T	U	T	U	T	U	T	U	T *	U
700	M24	52,5	M27	52,5	M33	52,5	M39	48,5	1 1/4"	52
750	-	-	-	-	-	-	-	-	1 1/4"	47
800	M27	64	M30	64	M36	69	M45	59	1 1/2"	59
900	-	-	M30	59	M36	56	M45	52	1 1/2"	54
1000	-	-	M33	70	M39	70	M52	60	1 1/2"	50

TAPPED LUG VALVE

THREADED FLANGE RECEIVING BORE SIZES (mm)

DN	PN 6		PN 10		PN 16		PN 25		Class 150**		
	T	U	T	U	T	U	T	U	T *	U	W
700	M24	52,5	M27	52,5	M33	52,5	M39	52,5	1 1/4"	45	70
750	-	-	-	-	-	-	-	-	1 1/4"	50	65
800	M27	65	M30	65	M36	70	M45	70	1 1/2"	60	70
900	-	-	M30	60	M36	58,5	M45	56	1 1/2"	50	70
1000	-	-	M33	77	M39	72	-	-	1 1/2"	55	80

DOUBLE FLANGE VALVE

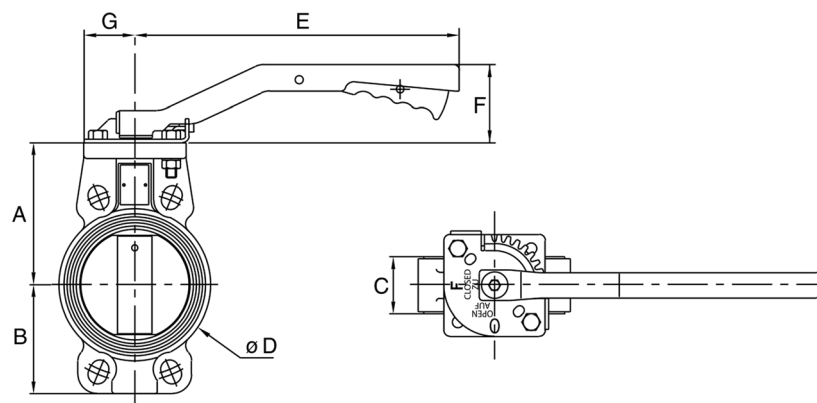
THREADED FLANGE RECEIVING BORE SIZES (mm)

DN	PN 6		PN 10		PN 16		PN 25		CI 125 / CI 150	
	T	U	T	U	T	U	T	U	T	U
700	M24	49	M27	49	M33	49	M39	49	1 1/4"	40
750	-	-	-	-	-	-	-	-	1 1/4"	49
800	M27	65	M30	65	M36	64	M45	69	1 1/2"	55
850	-	-	-	-	-	-	-	-	1 1/2"	45
900	M27	64	M30	59	M36	56	M45	64	1 1/2"	50
1000	M27	64	M33	64	M39	64	M52		1 1/2"	53
1050	-	-	-	-	-	-	-	-	1 1/2"	47
1100	-	-	M33	60	M39	60	-	-	1 1/2"	54
1200	M30	69	M36	69	M45	69	M52	69	1 1/2"	55
1250	-	-	-	-	-	-	-	-	1 3/4"	45
1300	-	-	-	-	-	-	-	-	1 3/4"	45
1350	-	-	-	-	-	-	-	-	1 3/4"	45
1400	M33	57	M39	57	M45	57	M56	53	1 3/4"	45
1500	-	-	M39	64	M52	59	-	-	1 3/4"	54
1600	M33	60	M45	51	M52	51	M56	74		
1650	-	-	-	-	-	-	-	-	1 3/4"	70
1800	M36	81	M45	84	M52	94	M64	-	1 3/4"	67
2000	M39	TBD	M45	60	M56	TBD	M64	-	2"	60
2100	-	-	-	-	-	-	-	-	2"	65
2200	M39	69	M52	69	-	-	-	-		
2250	-	-	-	-	-	-	-	-	2 1/4"	55
2400	M39	65	M52	65	-	-	-	-	2 1/4"	
2600	M45	TBD	M52	TBD	-	-	-	-	2 1/4"	55

MANUAL CONTROL

NOTCHED LC LEVER

Lockout option on request



DN		Type	Wafer				Tapped lug				E	F	G
mm	inches		A	B	ØD	Weight	A	B	ØD	Weight			
50	2"	LC4	110	74	94	3.3	152	76	153	4.2	230	71	45
65	2½"	LC4	118	81	107	3.8	159	84	173	4.7	230	71	45
80	3"	LC4	125	93	126	4.5	166	90	188	7.6	230	71	45
100	4"	LC12	140	107	150	6.7	182	109	219	9.4	320	77	50
125	5"	LC12	160	122	179	9.3	193	120	252	11.8	320	77	50
150	6"	LC20	175	135	204	12.0	217	140	285	16.0	420	77	50

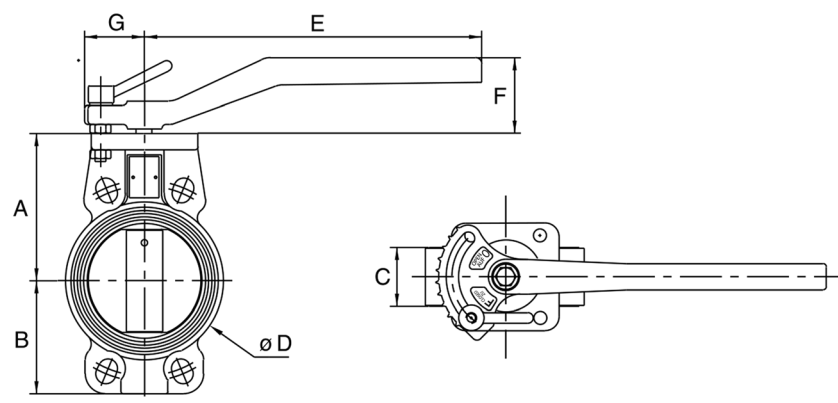
Dimensions in mm, weight in kg.

Dimensions and weight are provided for information.

Locking position number: LC4 = 9, LC12 = 9, LC20 = 7

LOCKABLE LF LEVER

Lockout option on request



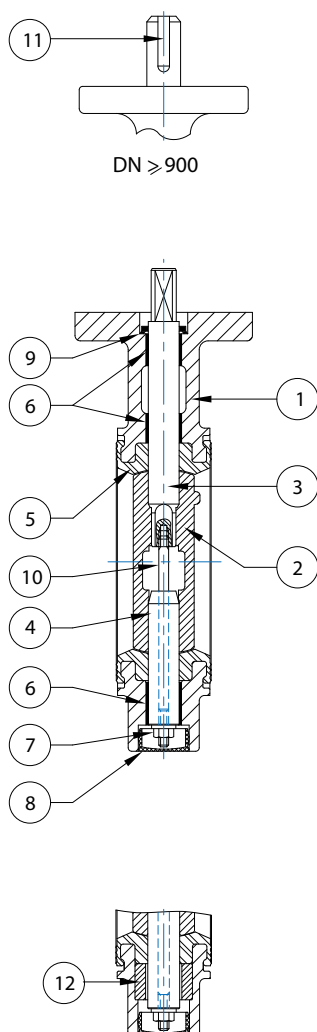
DN		Type	Wafer				Tapped lug				C	E	F	G
mm	inches		A	B	ØD	Weight	A	B	ØD	Weight				
50	2"	LF4	110	74	94	3.8	152	76	153	4.7	43	230	69	45
65	2½"	LF4	118	81	107	4.3	159	84	173	5.2	46	230	69	45
80	3"	LF4	125	93	126	5.0	166	90	188	8.1	46	230	69	45
100	4"	LF12	140	107	150	7.6	182	109	219	10.3	52	320	75	63
125	5"	LF12	160	122	179	10.1	193	120	252	12.7	56	320	75	63
150	6"	LF20	175	135	204	13.1	217	140	286	17.1	56	420	75	63
200	8"	LF20	206	170	259	17.1	242	167	350	24.1	60	420	75	63
250*	10"	L50	247	230	313	30.6	280	280	410	40.6	68	702	150	82

Dimensions in mm, weight in kg.

Dimensions and weight are provided for information. Infinitely variable.

* Key shaft only.

LINER MAINTENANCE AND MARKING



1. REMOVING LINER

Maintenance procedure :

1. Remove valve control mechanism.
2. Remove the protective cap (8).
3. Remove the V-seal or packing (9).
4. Unscrew and remove lock nut (7).
5. Remove shaft (3) and its tie rod (10) after placing the butterfly (2) in open position and checking the key orientation (11) (for DN 10" to 40" - 250 to 1000 mm).
6. Set spindle (4).
7. Remove butterfly (2).
8. Twist heart-shaped seat (5) by removing one of the two trunnions from its housing.

This operation will enable you to remove the body liner side-wise.

2. REFITTING LINER

1. Ensure that the sleeve (12) for valves DN 50...125 is in place.
2. Do not grease liner exterior or inside body.
3. Twist heart-shaped seat (5) and insert free trunnion in its body housing. Place side lips correctly on both body faces. Place central strip correctly in body. Place second trunnion in body. Ensure that liner is well placed over its whole circumference.
4. Grease lightly (ref. Dow Corning Compound type 111 «silicone grease»).
5. Reinstall butterfly (2) in open position. Check that the butterfly female part connecting the shaft is on the actuator flange side.
6. Ensure that the body and machined butterfly surface are aligned.
7. Reinstall spindle.
8. Fit drive shaft and its tie rod while checking key position (size = 900) or square end marker (size < 900) showing butterfly orientation.
9. Tighten the locknut (7) at the tie rod end on the spindle side.
10. Reinstall the protective cap (8).
11. Assemble control unit (actuator).
12. Open and close valve.

NAME

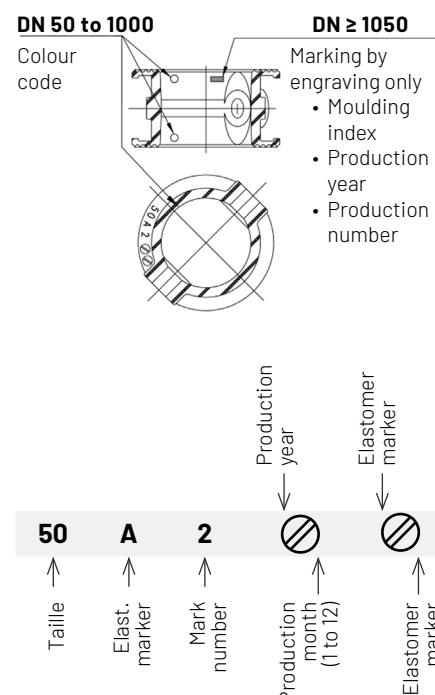
Rep.	Name
1	Body
2	Butterfly disk
3	Drive shaft
4	Spindle
5	Liner
6	Self-lubricating bearings
7	Lock nut
8	Protective cap
9	V-seal
10	Tie rod
11	Key
12	Sleeve

ELASTOMER TYPE

Name	Code	Colour code
EPDM	0	None
NBR Nitrile	1	Yellow
Carboxyl. nitrile X-NBR	2	Orange
White EPDM	0A	None
Silicone	4	Aucun
FPM / FKM	5	Red
CSM	6	Green
EPDM-S	0S	Blue
Therban®	8	White
Nitrile EN682	B	Brown

® Registered trademark

LINER MARKING



FITTING VALVE BETWEEN PIPE FLANGES

ASSEMBLY

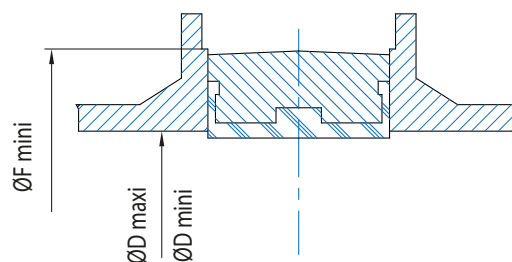
1. Provide enough space between pipe flanges in order to avoid damaging liner sides while sliding the valve between both flanges
2. Center valve via fasteners. Gradually tighten diametrically-opposite tie rods, alternately, until the metallic valve body touches flange faces.
3. Check free movement after assembly by fully opening, then closing butterfly.

FLANGE DIMENSIONS

Dimensions given for a perfectly centered valve.

Raised face flanges: assembly is impossible with PN 6 flanges.

Inner diameter of flanges.

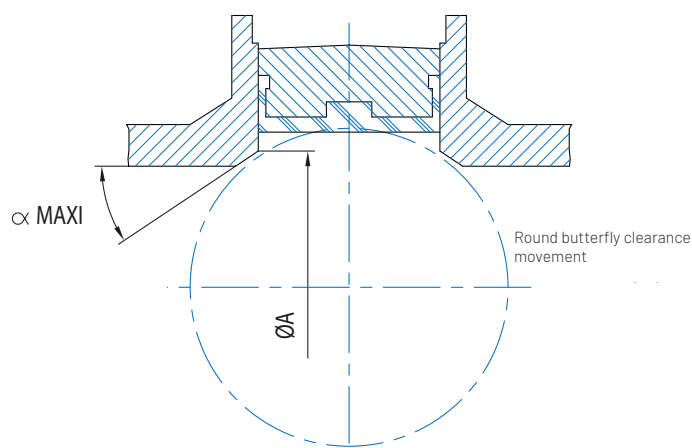


DN	50	65	80	100	125	150	200	250	300	350	400	450	500	550	600	650	700
ØD mini	40	56	72	95	117	142	196	243	292	333	382	430	475	530	570	624	670
ØD maxi	61,5	77,5	90,5	116	141,5	170,5	221,5	276,5	327,5	359	411	462	513	560	616,5	665	713
ØF mini	102	110	138	158	188	212	268	320	370	430	482	532	585	625	685	740	800

DN	750	800	900	1000	1050	1100	1200	1300	1350	1400	1500	1600	1800	2000	2200	2400
ØD mini	726	765	875	980	1008	1079	1179	1281	1339	1393	1494	1596	1734	1936	2204	2365
ØD maxi	767	815	916	1016	1068	1120	1221	1323	1390	1424	1526	1628	1831	2034	2237	2440
ØF mini	857	905	1005	1100												

Other dimensions: Consult us

Assembly with pipe of smaller inner diameter.
Producing chamfer.



DN	50	65	80	100	125	150	200	250	300	350	400	450	500	550	600	650	700
ØA	40	56	72	95	117	142	196	243	292	333	82	430	430	475	570	624	670
α	45°	40°	35°	30°	25°	20°	15°	15°	15°	15°	15°	15°	15°	15°	15°	15°	15°

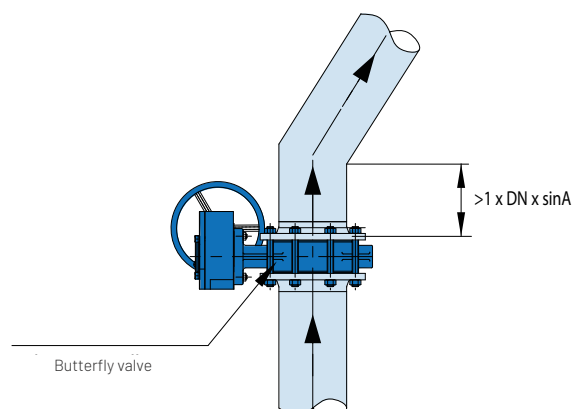
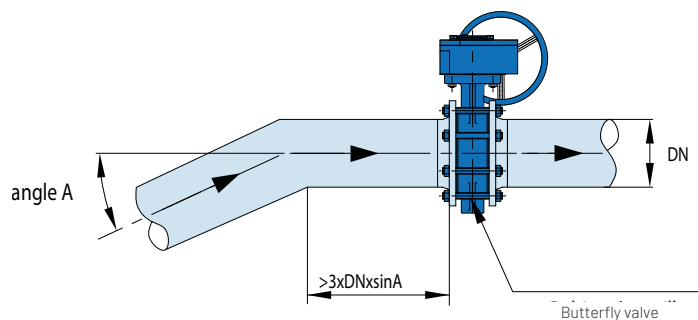
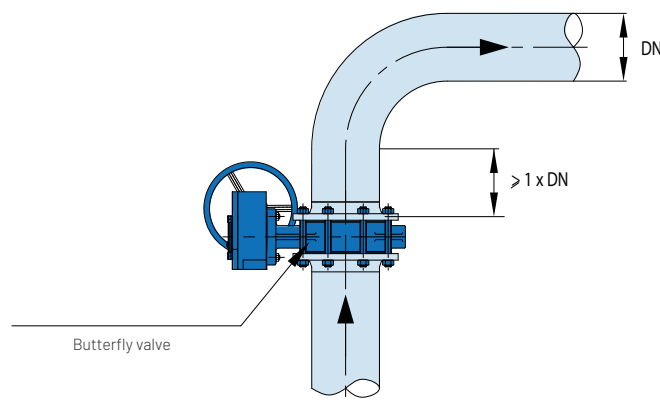
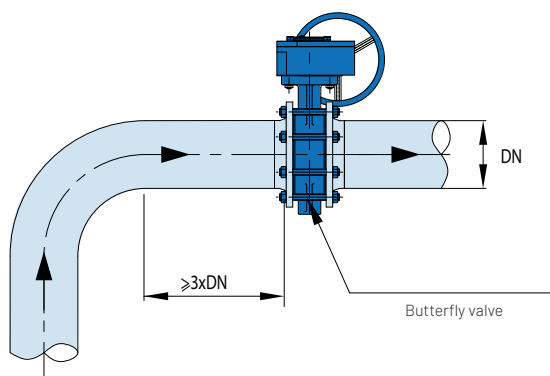
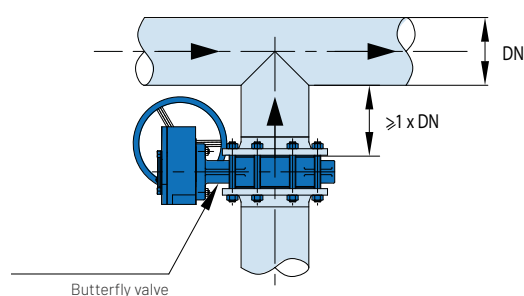
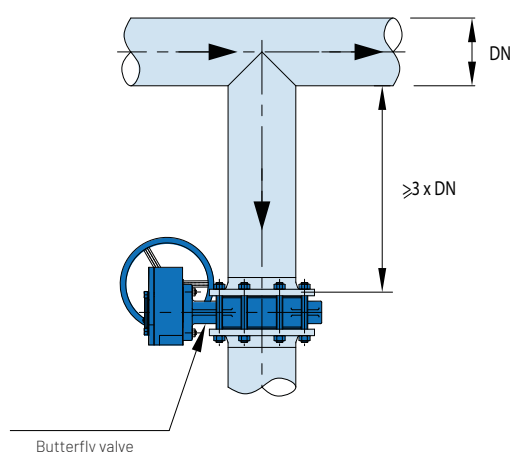
DN	750	800	900	1000	1050	1100	1200	1300	1350	1400	1500	1600	1800	2000	2200	2400
ØA	726	765	875	980	1008	1079	1179	1281	1339	1393	1494	1596	1734	1936	2204	2356
α	15°	15°	15°	15°	15°	13°	12°	10°	10°	10°	10°	9°	10°	10°	10°	8°

FITTING VALVE ON PIPING

Butterfly valves are designed for the following recommended maximum flow velocity:

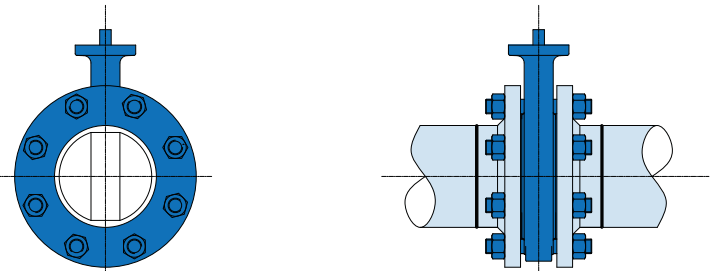
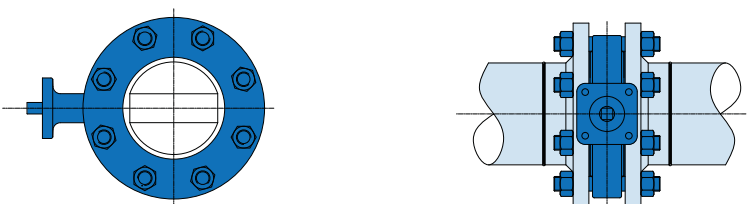
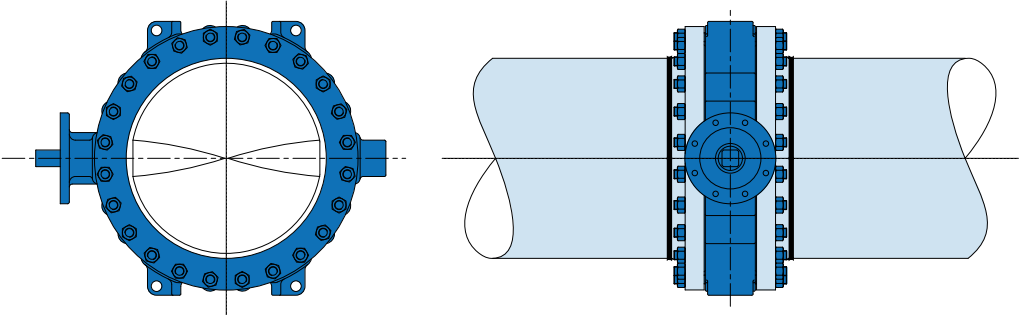
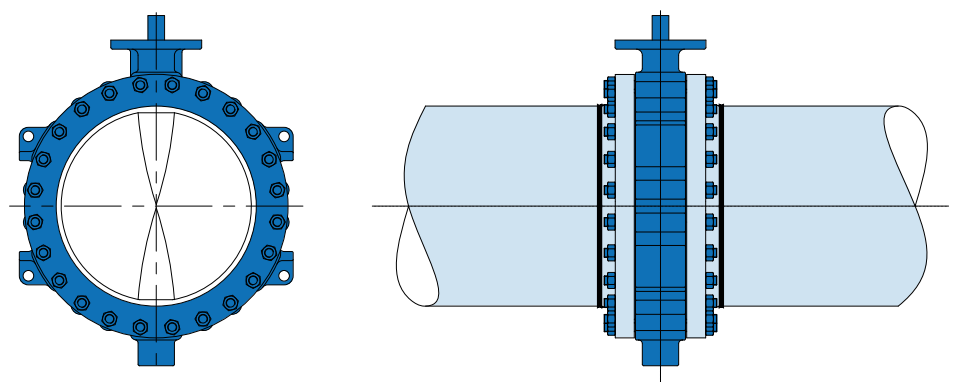
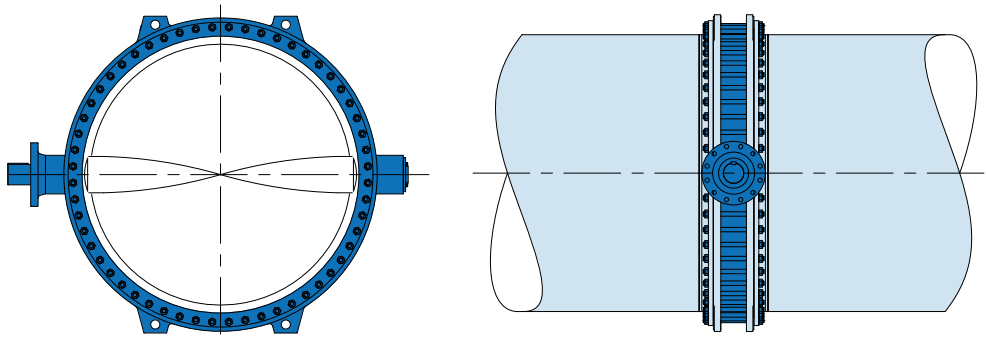
Operating pressure	Recommended maximum flow velocity	
	Liquid fluid	Gaseous fluid
PS < 6 bar	2,5 m/s	25 m/s
PS < 10 bar	3 m/s	30 m/s
PS < 16 bar	4 m/s	35 m/s
PS < 25 bar	5 m/s	40 m/s

In accordance with standards: EN593 and EN1074

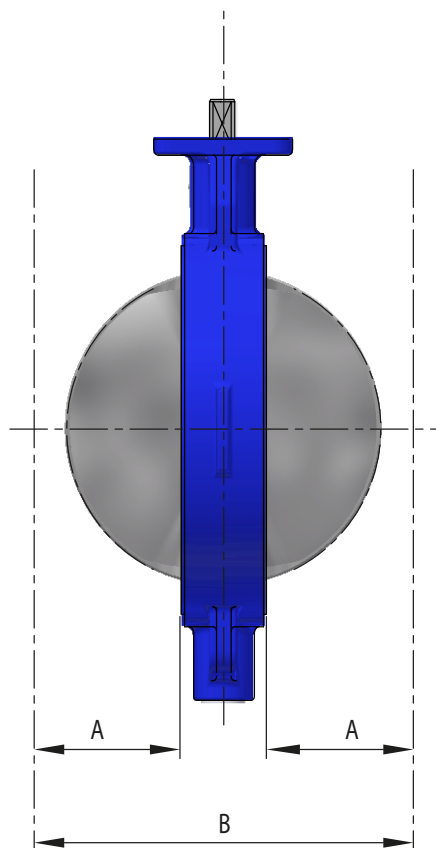


RECOMMENDATION: SHAFT ORIENTATION

WAFER - LUG - DOUBLE FLANGE

DN50 - DN600	
Vertical shaft	
or Horizontal shaft	
DN650 - DN1000	
Horizontal shaft	
<i>On request:</i> Vertical shaft • Only valve with manual actuator • Max temperature 40 °C • EPDM or Nitrile liner	
DN1050 - DN2400	
Horizontal shaft	

DN 50-1000 ASSEMBLY CONDITIONS



DN	50	65	80	100	125	150	200
A min	20,8	26,5	33,1	40,7	50	61,4	84,8
B min	84,7	99,1	112,2	133,5	156,1	178,9	229,7

DN	250	300	350	400	450	500	550
A min	105,1	125,5	145,3	159	176,2	194,1	207,9
B min	278,2	329,1	368,6	420,1	466,5	515,3	569,8

DN	600	650	700	750	800	900	1000
A min	228,8	249,3	271,6	299,3	306,5	355	400
B min	611,5	663,6	708,2	763,7	803	913	1016

STORAGE CONDITIONS

EQUIPMENT STORAGE CONDITIONS

The following equipment handling and storage precautions are required:

- Storage inside buildings (temperature $\geq 6^{\circ}\text{C}$) under original packaging. Equipment shock and stress must be avoided during occasional handling operations at lower temperatures. Such handling should be performed under packaging.
- Avoid damaging sealing surfaces while unpacking. Handle devices with care.
- Valves with elastomers must be stored away from light and heat.

ORDER DESCRIPTION

A code with the following basic information is displayed on the identification plate:

- Four characters specify the body type, as well as body, butterfly and liner materials.
- One or several characters specify the type of order (with option(s)) and actuator (if applicable).

We display the following information for any order:

- nominal diameter (DN);
- operating pressure;
- flange;
- and valve options (if applicable).

Version

- 3** Wafer
- 6** Double flange
- 7** Lug, raised face
- A** Double flange, flat face
- B** Lug, flat face

Body

- 1** Ductile cast iron
- 2** Carbon steel
- 3** Stainless steel
- A** Alumin. bronze

Butterfly

- 0** Ductile cast iron, nickelled
- 2** Alumin. bronze
- 3** Stainless steel
- 4** Stainless steel, polished
- 6** Ductile cast iron, Rubber Coating
- 7** Monel 400®
- 8** Ductile cast iron, EPDM Coating
- 9** Ductile cast iron, Halar® Coating

- A** Stainless steel, Halar® Coating
- D** Duplex®
- E** Ductile cast iron, Epoxy Coating
- F** Ductile cast iron, Epoxy Coating
- R** Ductile cast iron, Rilsan® Coating
- U** Ductile cast iron, Epoxy Powder Coating

Seat

- 0** EPDM
- 1** Nitrile, NBR
- 2** Carboxylated Nitrile
- 3** White EPDM
- 4** Silicone
- 5** Fluoroelastomer
- 6** CSM
- 7** EPDM-S
- 8** Therban®
- B** Nitrile EN682

Manual control

- 0** Bare shaft
- 1** Lever, LC
- 5** Reducer, Rotork AB/IW
- 6** Reducer, R242
- 8** Lever, LF
- 9** Reducer, MF

Options (manual control)

- B** Locking
- T** Limit switches
- M** Actuator flange (MG, GS, MR)
- S** ISOBOX
- W** Chainwheel
- Q** Stem cap

Actuators

- A** Pneumatic
- C** Electric
- H** Hydraulic
- P** Counterweight

Options: Consult us

DN (mm)

DN 50 to 3000 (2" à 120")

Flange: Type

(Specify standard for 'class' flanges).
See page 11-12

PS

Operating pressure

Valve Options

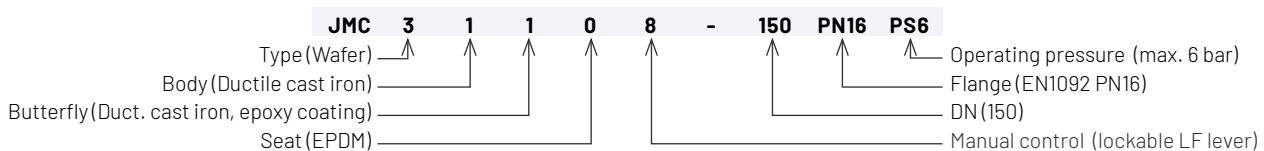
- MC** Stuck liner
- R** Shaft extension

Approvals & Certificates

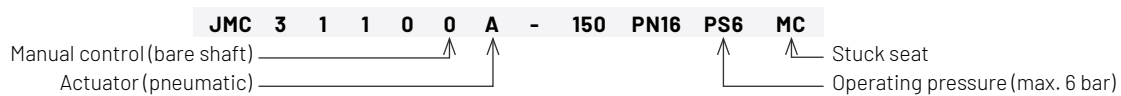
- A** Certified for food applications
- F** Certified for fire protection applications
- G** Certified for gas applications
- M** Certified for naval applications
- P** Certified for drinking water applications
- A2** Electrical continuity

EXAMPLES

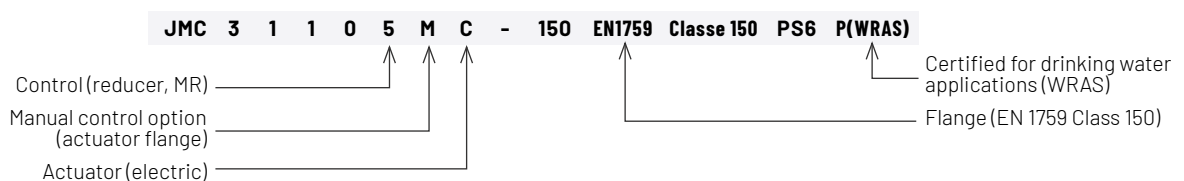
1. JMC butterfly valve with LF lever, DN 150, to be fitted between flanges defined by standard EN1092, PN16:



2. Same valve but with pneumatic actuator, 10 bar operating pressure, stuck seat:



3. Same valve but with MR reducer (option: actuator flange), electric actuator, for assembly between flanges defined by standard EN1759, Class 150, certified for drinking water applications according to WRAS certification:



SAPAG VALVES has been designing and manufacturing a wide range of high-quality and high performance industrial valves for more than 90 years. These include butterfly valves (elastomer, PTFE or metal seats), ball valves (carbon steel, stainless steel, or others on request), MONOVAR® control valves, the ultimate CLASAR® check valve, as well as gate and needle valves.

Our products are used in water, gas and other fluid transport networks in fields as diverse as petrochemicals, shipbuilding and process industries in general.

Today the company has more than 100 employees. In addition to the machining,

assembly and testing unit for industrial valves, the site includes all the administrative, technical and commercial departments. This proximity enables SAPAG VALVES to ensure responsiveness, follow-up and compliance with our clients' requirements.

Our products are present in more than 70 countries around the world and our production is regularly exported to all 6 continents.

Our Quality, Safety and Environmental Management System is certified by the following:

ISO **ISO** **ISO**
9001:2015 14001:2015 45001:2018



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