Datasheet
Butterfly valve
VSS

Si-204 EN

Edition: 2024-05

- Advanced triple eccentric design
- Designed for control and shut-off applications
- Designed for applications up to 350° C (662 °F)
- Tightness class in accordance with EN 60534-4 Class V as standard
- Solid seat made of stainless steel
- Wafer design alt. lugged or flanged design

Option

- PTFE seat
- HiNi seat



Type VSS	**Wafer design**
Type VSSL	**Lugged design**
Type VSSF	**Flanged design**
Nominal pressure	**PN 40/Class 300**
Nominal size	**DN 80 - 600 NPS 3-24**

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Product Information

Somas butterfly valve, type VSS PN 40/Class 300, is a control, on/off and shut-off valve. The valve is designed to handle a wide range of liquids, gases and steam within a broad temperature range.

Somas butterfly valve, type VSS PN 40/Class 300, can be mounted between flanges and also supplied in lugged design.

The valves have an advanced triple eccentric design including a unique shape of the disc allows the use of a solid stainless steel seat. The solid seat remains unaffected by high flow velocities and temperatures. A good valve function is achieved even on difficult applications.

The Somas valves are delivered ready for installation and operation. The valve assemblies are delivered factory tested as complete units with actuators, positioners and accessories.

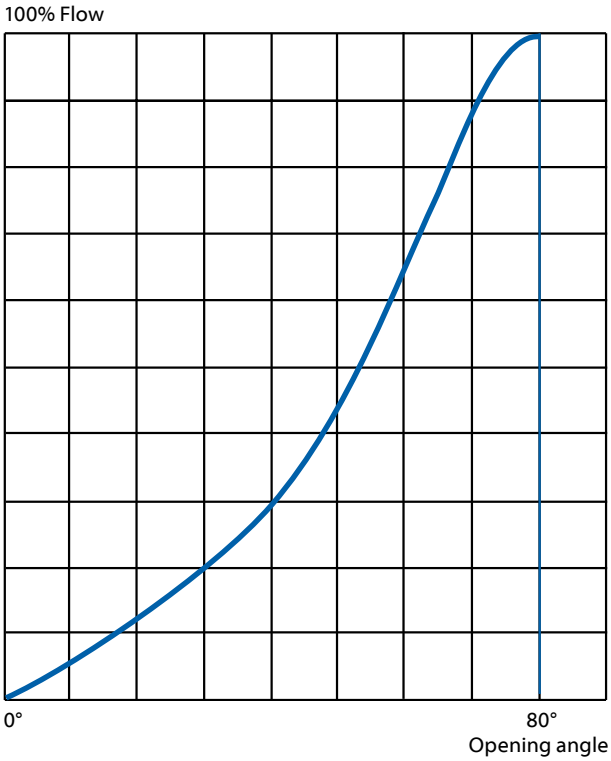
For nominal pressure PN 25, see type MTV in the datasheet Si-205 (DN 80-500) and type VSS in the data sheet Si-203 for remaining dimensions (section 2 of the Somas catalogue).

Tightness class

The tightness class is related to the chosen material in the seat ring.

Standard leakage class	Optional leakage class
EN 60534-4	**EN 60534-4**
PTFE - Class V	PTFE - Class VI (≤DN400)
Metal - Class V	
	EN 12266-1
	PTFE - Rate B
	PTFE - Rate C
	Metal - Rate D

Flow characteristics



Pressure and temperature rating

Material: CF8M/1.4408

	Max. working pressure (bar)																					
	Temperature (° C)																					
Temp.	**0-20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**120**	**140**	**160**	**180**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**550**
PN 50 / Class 300	50	49	48	47	46	45	44	43	42	41	40	38	37	36	35	33	32	31	31	30	30

10 bar = 1 MPa

Minimum working temperature -60°. If lower temperatures are needed contact Somas.

Capacity factor Kv and Resistance factor ζ

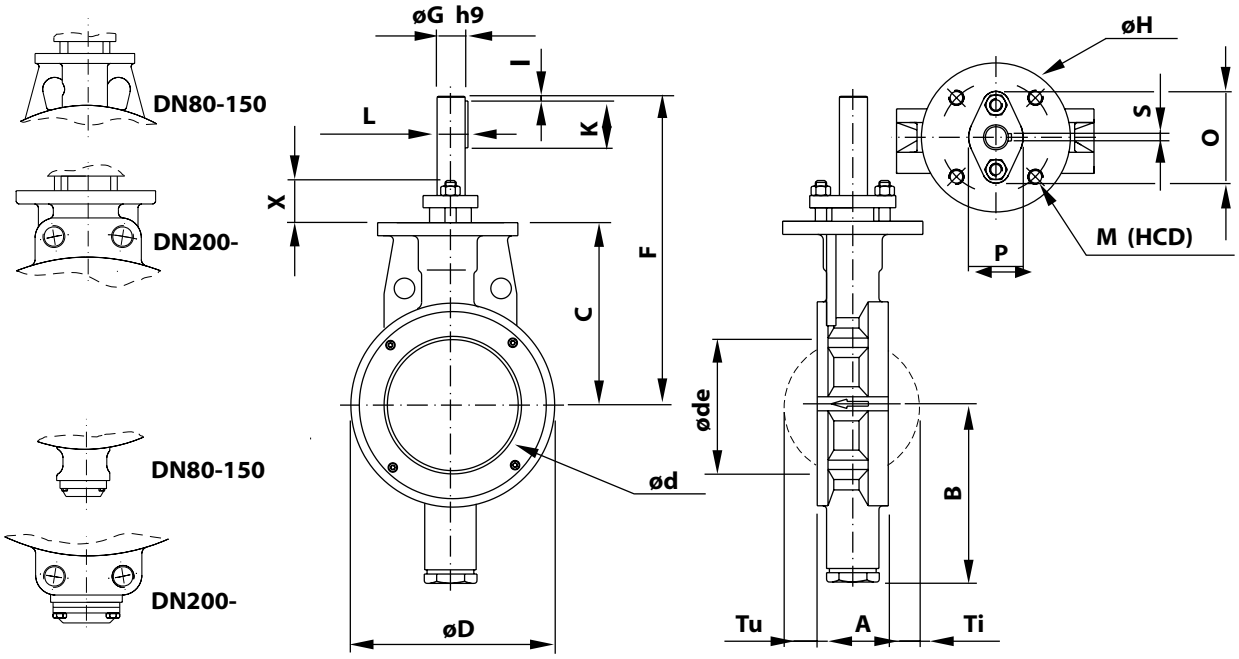
DN	Opening angle 10°	20°	30°	40°	50°	60°	70°	80°	90°	ζ 90°
80	14	31	48	73	108	165	203	235	205	1.19
100	21	45	70	107	158	247	340	394	343	1.03
150	50	108	168	256	379	598	819	950	823	0.90
200	89	193	299	457	675	1069	1460	1690	1446	0.94
250	142	307	476	727	1076	1700	2321	2683	2333	0.87
300	207	446	692	1058	1566	2472	3380	3906	3397	0.85
350	279	602	934	1427	2111	3327	4558	5271	4580	0.86
400	371	800	1242	1898	2809	4429	6064	7009	6095	0.83
500	584	1258	1951	2981	4413	6963	9525	11010	9574	0.82
600	853	1839	2851	4357	6448	10177	13920	16090	13950	0.82

Relation between Kv and Cv: Cv = 1,156 x Kv

Max. allowable pressure drops/torque figures

Maximum allowable pressure drops are valid at 20° C (see below).

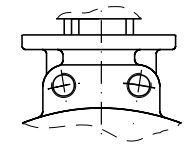
Valve DN	PN/Class	Max. pressure drop. bar at opening angle 0°	60°	80°	Torque min. at ΔP bar	Nm	Torque min. at ΔP bar	Nm	Torque max. shaft Nm
80	40/300	50	16	6	≤ 20	120	> 20	180	220
100	40/300	50	15	5	≤ 20	165	> 20	250	300
150	40/300	50	10	3	≤ 20	250	> 20	350	420
200	40/300	50	7,5	2	≤ 20	290	> 20	460	550
250	40/300	50	5	1,5	≤ 20	480	> 20	680	820
300	40/300	50	5	1,5	≤ 20	600	> 20	900	1080
350	40/300	50	5	1,5	≤ 20	950	> 20	1350	1620
400	40/300	50	5	1,5	≤ 20	1300	> 20	1750	2100
500	40/300	50	4	1,2	≤ 20	2600	> 20	3000	3600
600	40/300	50	4	1,2	≤ 20	4750	> 20	5800	6960



Butterfly valve type VSS PN 40 /Class 300

DN	A	B	C	ød	øde	øD	F	øG	øH	I	K	L	M	(HCD)	O	P	S	X	Tu	Ti	Weight
80	50	113	150	70	60	133	270	20	120	5	45	22.5	M12	90	74	44	6	40	18	6	8
100	64	148	165	90	86	162	285	25	120	5	45	28	M12	90	78	50	8	40	21	11	11
150	76	186	195	140	138	218	330	30	150	5	60	33	M12	120	92	58	8	44	38	31	20
200	89	220	225	187	186	280	360	35	150	5	50	38	M12	120	100	64	10	44	56	47	34
250	114	265	265	236	235	335	400	40	150	5	50	43	M12	120	108	70	12	48	64	62	55
300	114	295	295	285	285	395	505	50	150	10	80	53.5	M12	120	124	82	14	52	89	87	75
350	127	330	330	331	330	450	540	60	200	10	90	64	M16	160	147	96	18	68	105	103	108
400	140	375	370	382	380	512	595	70	200	10	110	74.5	M16	160	162	112	20	68	128	118	158
500	152	442	440	479	475	605	685	80	200	10	120	85	M16	160	183	120	22	78	167	164	250
600	178	490	495	579	575	745	740	80	200	10	120	95	M20	160	183	120	22	78	209	196	445

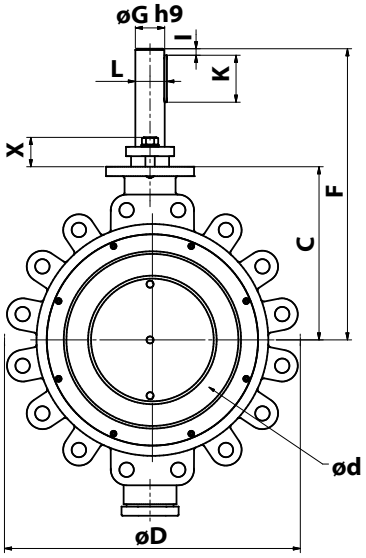
A = Face to face dimension according to EN 558 series 16 (valid for DN 100 - 600)
øde = Necessary free diameter for the disc under movement

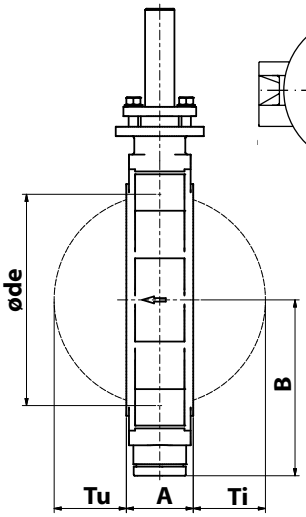


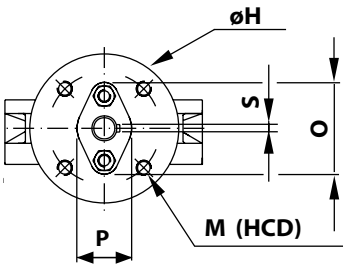
DN 80-400



DN 80-400





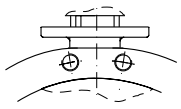


Butterfly valve type VSSL PN 40 /Class 300

DN	A	B	C	ød	øde	øD	F	øG	øH	I	K	L	M	(HCD)	O	P	S	X	Tu	Ti	Weight
80	50	145	150	70	60	204	270	20	120	5	45	22,5	M12	90	74	44	6	40	18	6	11
100	64	150	165	90	86	238	285	25	120	5	45	28	M12	90	78	50	8	40	21	11	15
150	76	191	195	140	138	310	330	30	150	5	60	33	M12	120	92	58	8	44	38	31	29
200	89	225	225	187	186	373	361	35	150	5	50	38	M12	120	100	64	10	44	56	47	46
250	114	270	265	236	235	434	401	40	150	5	50	43	M12	120	108	70	12	48	64	62	74*/146**
300	114	300	295	285	285	504	496	50	150	10	80	53,5	M12	120	124	82	14	52	89	87	101
350	127	335	330	331	330	586	540	70	200	10	90	64	M16	160	147	96	18	68	105	103	146
400	140	378	370	382	380	626	610	70	200	10	110	74,5	M16	160	162	112	20	68	128	118	203

A = Face to face dimension according to EN 558 series 16 (valid for DN 100 - 600)
øde = Necessary free diameter for the disc under movement

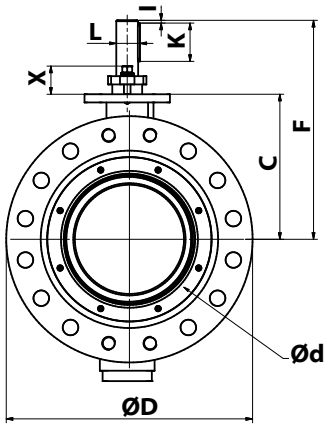
* Class 300 Lugged DN 250
** PN 40 Ring body DN 250

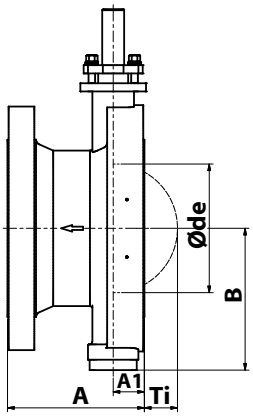


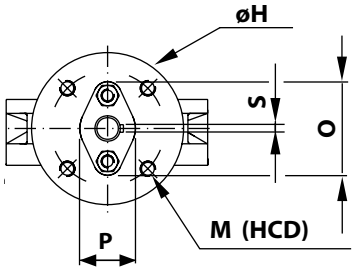
DN 80-250

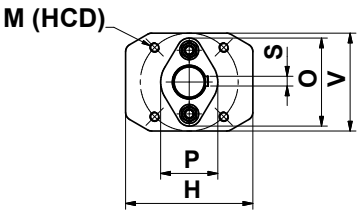


DN 80-250







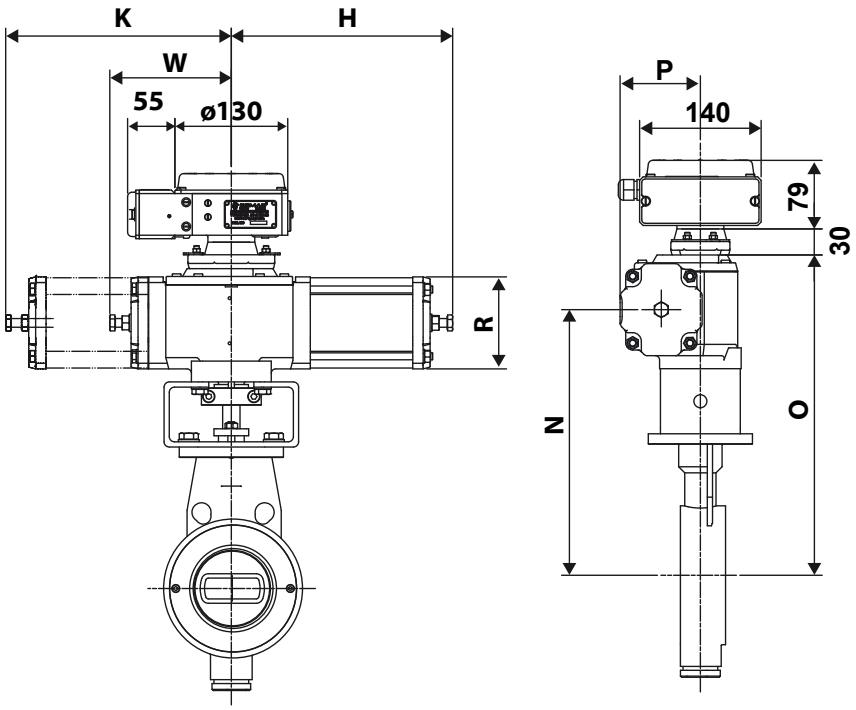


Butterfly valve type VSSF PN 40 /Class 300

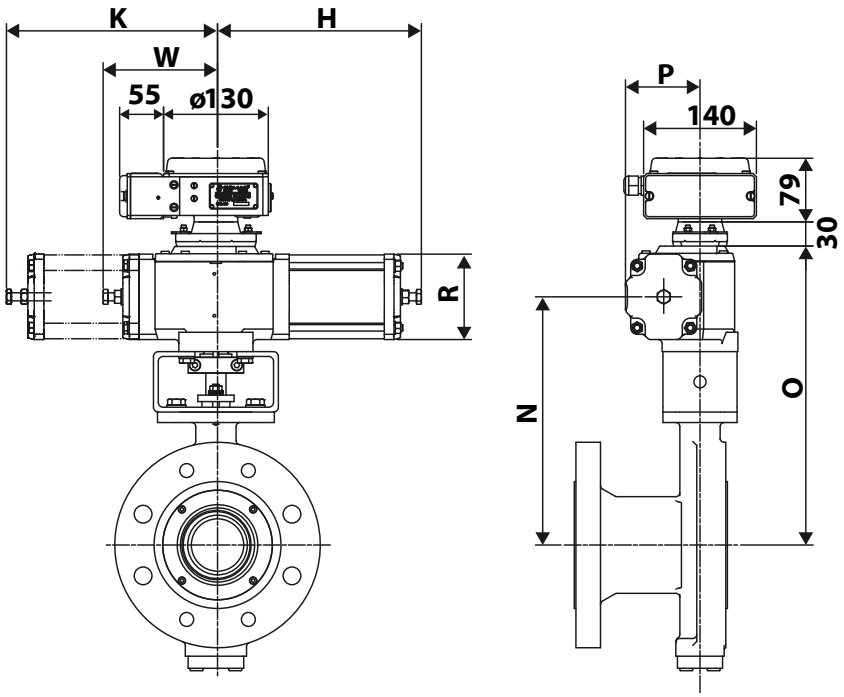
DN	A	A1	B	C	ød	øde	øD	F	øG	øH/H	I	K	L	M	(HCD)	O	P	S	V	X	Tu	Ti	Weight
80	180	26	147	150	70	60	210	271	20	145	5	45	22,5	M12	90	64	40	6	92	40	N/A	4	21
100	190	34	156	165	90	86	255	285	25	145	5	45	28	M12	90	69	50	8	92	40	N/A	8	32
150	210	38	191	195	140	138	320	330	30	Ø150	5	60	33	M12	120	80	58	8	N/A	44	N/A	31	60
200	230	44,5	217	225	187	186	380	361	35	156	5	60	38	M12	120	85	55	10	120	40	N/A	47	85
250	250	57	259	265	236	235	450	400	40	156	5	70	43	M12	120	108	70	12	120	48	N/A	61	133

A = Face to face dimension according to EN 558 series 14 (valid for DN 100 - 600)
øde = Necessary free diameter for the disc under movement

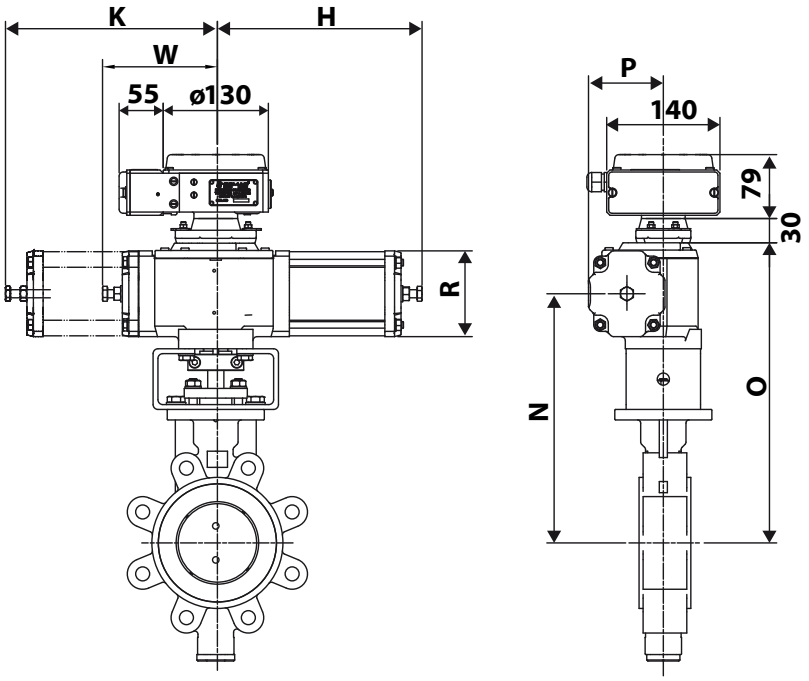
VSS



VSSF



VSSL



Butterfly valve type VSS PN 40/ Class 300 with actuator type A-DA

DN	Type	H	K	N	O	P	R	W	Weight VSS	Weight VSSF	Weight VSSL
80	**A21**	255	–	295	360	94	106	140	18	31	21
80	**A22**	255	260	295	360	94	106	–	19	32	22
100	**A22**	255	260	310	375	94	106	–	22	43	26
150	**A22**	255	260	340	410	94	106	–	31	71	40
150	**A23**	305	–	340	410	117	152	140	37	77	42
200	**A31**	380	–	420	510	144	152	215	59	110	72
250	**A31**	380	–	460	550	144	152	215	80	158	100*/172**
250	**A32**	380	395	460	550	144	152	–	86	164	106*/178**
300	**A32**	380	395	490	580	144	152	–	106	-	133
350	**A41**	550	–	605	715	210	230	315	185	-	219
400	**A41**	550	–	645	755	210	230	315	235	-	280
500	**A42**	545	560	715	840	210	230	–	345	-	-
600	**A51**	745	–	815	990	315	355	370	650	-	837

For units with the positioner type SP405, add 2 kg
For units with the positioner type SPE405, add 3 kg

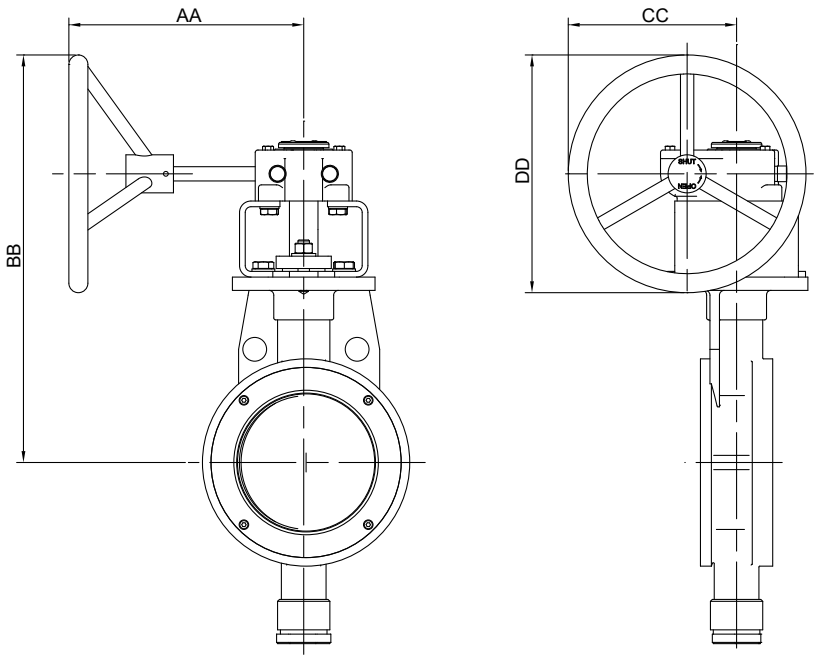
* Class 300 Lugged DN 250
** PN 40 Ring body DN 250

Butterfly valve type VSS PN 40/ Class 300 with actuator type A-SC/SO

DN	Type	H	K	N	O	P	R	W	Weight VSS	Weight VSSF	Weight VSSL
80	**A24–X**	415	420	295	360	117	152	–	35	48	38
100	**A24–X**	415	420	310	375	117	152	–	38	59	42
150	**A33–X**	660	–	390	480	185	230	215	78	118	87
200	**A33–X**	660	–	420	510	185	230	215	92	143	105
250	**A34–X**	665	680	460	550	185	230	–	141	219	161*/233**
300	**A34–X**	665	680	480	580	185	230	–	161	-	188
350	**A43–X**	920	–	605	715	280	355	315	271	-	305
400	**A43–X**	920	–	645	755	280	355	315	320	-	366
500	**A44–X**	925	935	715	840	280	355	–	470	-	-

X = SC – Spring to close
X = SO – Spring to open
For units with the positioner type SP405, add 2 kg
For units with the positioner type SPE405, add 3 kg

* Class 300 Lugged DN 250
** PN 40 Ring body DN 250



Butterfly valve type VSS PN 40/ Class 300 with gear unit

DN	Type	AA	BB	CC	øDD	Weight
80	**AB215N**	217	349	152	200	17
100	**AB215N**	217	364	152	200	20
150	**AB215N**	217	404	152	200	29
200	**AB550N**	282	496	221	300	45
250	**AB550N**	282	536	221	300	70
300	**AB880N**	275	612	261	350	88
350	**AB880N**	275	667	261	350	121
400	**AB2000N**	318	806	303	500	181
500	**AB2000N**	318	876	303	500	291
600	**AB1950 N/PR 4**	398	980	330	500	524

Selection table

		Pneumatic actuators						Manual override	
		Double acting		Spring return					
				Spring to close		Spring to open			
Valve DN	Shaft dia. (mm)	5.5 bar	4 bar	5.5 bar	4 bar	5.5 bar	4 bar	Hand lever	Gear unit
80	20	A21	A22	A24-SC	A24-SC	A24-SO	A24-SOL	–	AB215N
100	25	A22	A22	A24-SC	A24-SC	A24-SO	A24-SOL	–	AB215N
150	30	A22	A23	A33-SC	A33-SC	A33-SO	A33-SOL	–	AB215N
200	35	A31	A31	A33-SC	A33-SC	A33-SO	A33-SOL	–	AB550N
250	40	A31	A32	A34-SC	A34-SC	A34-SO	A34-SOL	–	AB550N
300	50	A32	A32	A34-SC	A34-SC	A34-SO	A34-SOL	–	AB880N
350	60	A41	A41	A43-SC	A43-SC	A43-SO	A43-SOL	–	AB880N
400	70	A41	A41	A43-SC	A43-SC	A43-SO	A43-SOL	–	AB2000N
500	80	A42	A42	A44-SC	A44-SC	A44-SO	A44-SOL	–	AB2000N
600	80	A51	A51					–	AB1950/PR4

Flange standard

Somas butterfly valve type VSS PN 40/Class 300 in this data sheet is of wafer type for mounting between flanges PN 40 or flanges Class 300 ASME B16.5:2003.

The valve can be delivered in wafer design, lugged design and in flanged design.

When ordering, please state the pressure rating of the counter flanges. See valve specification system, code 13.

Actuators and accessories

The valves can be fitted with gear unit, on/off or control actuators in accordance with the selection table in this data sheet.

The valves will be delivered as tested units ready for installation.

See Somas product catalogue for positioners, limit switches and solenoid valves. Other types of actuators and accessories can be fitted in accordance with your specifications.

Seat design

The valves have a metal seat according to the code D.

PTFE is available as an option.
Also check the valve specification system (code 6) to find further seat alternatives.

Further technical information

Technical data for the materials used in the Somas valves, flange standard, steam data, etc. can be found in Somas product catalogue.

Valve sizing

Use Somas valve sizing program SomSize to find the correct valve size. All sizing factors are included in the program.

Supplemental information

Note: Use gaskets with the correct inside diameter to ensure that pressure is applied on the cover plate.

For mounting between flanges according to PN 40, the inside gasket diameter should not exceed the dimensions specified in the standard EN 1514-1.

Gaskets according to EN 1514-1 PN 40

Valve DN	Max. Inside dia. di (mm)	Outside dia. (dy) (mm)
80	89	142
100	115	168
150	169	224
200	220	290
250	273	352
300	324	417
350	356	474
400	407	546
500	508	628
600	610	747

For mounting between flanges according to Class 300 dimensions according to the standard ASME B 16.21 RF are valid where the following dimensions refer to the gasket.

Gaskets according to ASME B 16.21 RF Class 300

Valve DN	Max. Inside dia. di (mm)	Outside dia. (dy) (mm)
80	89	149
100	114	181
150	168	250
200	219	308
250	273	362
300	324	422
350	356	486
400	406	540
500	508	654
600	610	775

Temperature range

Seat	Max. temp.
A = PTFE (10 % carbon)	170° C
C = 1.4462 alt. 1.4470, (metal seat, 3 pcs.)	350° C[1] 550° C[2]
D = 1.4462 1.4470 (metal seat, type Y)	350° C[1] 550° C[2]
E = 1.4547	500° C
P = PTFE (fibreglass 15%)	170° C
N = 1.4835 (seat, type Y)	550° C

Shaft	Max. temp.
A = 1.4460 alt. SS 2324-12	150° C
B = 1.4460 alt. SS 2324-12 hard chromed	350° C[1] 550° C[2]
C = 1.4460 alt. SS 2324-12, HiCo Gr 6 coated	350° C[1] 550° C[2]
J = CK3MCuN / 1.4547	500° C
S = 1.4469 alt. 1.4410	150° C
Z = 1.4462 hard chromed	350° C[1] 550° C[2]

Valve body	Max. temp.
A = CF8M/1.4408	550° C
E = CK3MCuN	500° C
H = 1.4470	250° C
Z = 1.4469	250° C

[1] Check with Somas for temperatures between 350 and 550° C. At higher pressures for example steam turbine applications.

[2] At lower pressures for example exhaust applications.

[3] seat, sealings and bearings may limit the temperature below 200° C.

Ordering

State desired valve according to the valve specification system below as well as type of actuator, positioner and accessories.

Valve specification system

VSS - A 6 - A A D - A 1 1 - DN... - D... - B... - PN...
1 2 3 4 5 6 7 8 9 10 11 12 13

1 Type of valve
VSS
VSSL
VSSF

2 Valve body design
A = Wafer design according to EN 558-1, Series 20
F = Lugged design
L = Flanged design

3 Nominal pressure
6 = PN 40/Class 300

4 Material – valve body
A = CF8M / 1.4408
E = CK-3MCuN
H = 1.4470
Z = 1.4469

5 Material – disc
A = CF8M/1.4408 alt. 1.4401
B = CF8M/1.4408 alt. 1.4401, hard chromed
C = CF8M/1.4408 alt. 1.4401, HiCo Gr 21 coated
H = 1.4462 alt. 1.4470
N = 1.4469 alt. 1.4410
S = CK-3MCuN alt. 1.4547

6 Material – seat
A = PTFE (10 % carbon, percentage by weight)
D = 1.4462 alt. 1.4470, (metal seat, type Y)
E = 1.4547
N = 1.4835, (seat, type Y)
T = 1.4835, HiCo Gr 6 coated
P = PTFE, glass fiber filled 15 %

7 Material – shaft
A = 1.4460 alt. SS 2324-12
B = 1.4460 alt. SS 2324-12, hard chromed
C = 1.4460 alt. SS 2324-12, HiCo Gr 6 coated
J = CK3MCuN / 1.4547
S = 1.4469 alt. 1.4410
Z = 1.4462 alt. 1.4470

8 Bearing – valve body/shaft
1 = Without bearing
3 = HiCo Gr 6
6 = N06625 (High Nickel Alloy)
7 = 1.4462

9 Stuffing box
1 = Graphite
2 = PTFE

10 Valve size, DN

11 Shaft diameter

12 Actuator mounting flange drilling

13 Drilling, counter flanges, PN/Class

Other materials are available on request. Contact Somas for further information.

Somas reserves the right to make improvements without prior notice.

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