

Datasheet

Butterfly valve

VSS

Si-204 EN

Edition: 2021-05

- 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 (Mounted between flanges) alt. lugged or flanged design

Option

- PTFE seat
- HiNi seat



Type VSS

Type VSSL

Type VSSF

Nominal pressure

Nominal size

Material

Wafer design

Flanged design

Lugged design

PN40/Class300

DN 80 - 600

Stainless steel



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Product Information

SOMAS butterfly valve, type VSS PN 40, 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.

The VSS PN40 valve 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).

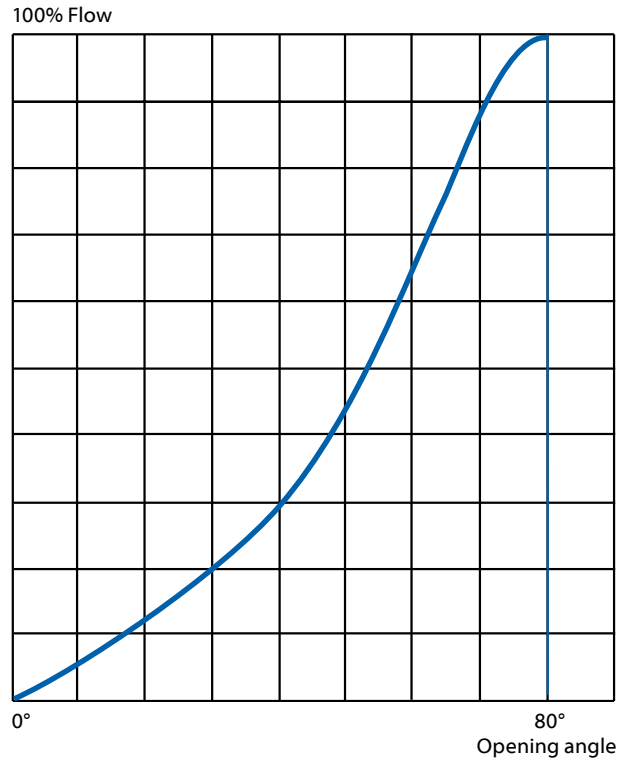


Tightness class

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
Metal - Class V	
	EN 12266-1
	PTFE - Rate B
	PTFE - Rate C
	Metal - Rate D

Flow characteristics



Pressure and temperature rating

Material: 2343 / CF8M

PN	Max. working pressure (bar)																				
	Temperature (° C)																				
	0-20	30	40	50	60	70	80	90	100	120	140	160	180	200	250	300	350	400	450	500	550
50	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

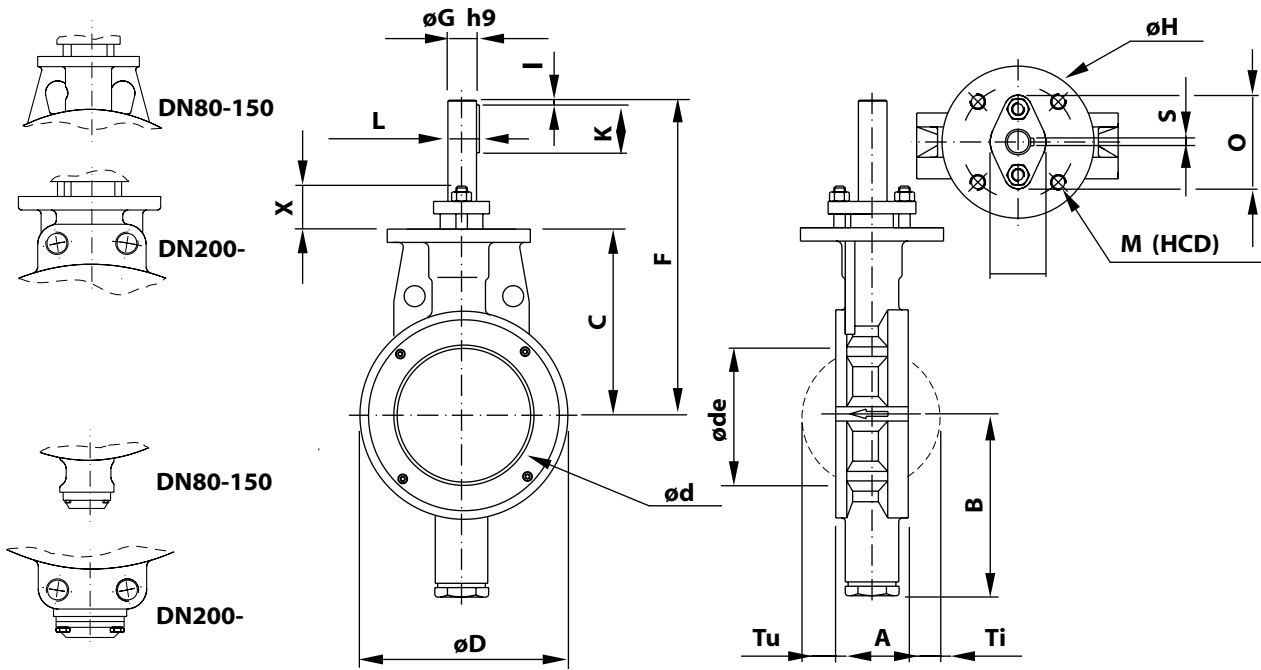
DN	Opening angle									ζ 90°
	10°	20°	30°	40°	50°	60°	70°	80°	90°	
80	4	11	19	31	48	75	114	157	177	2,09
100	6	17	29	47	72	112	172	235	265	2,28
150	15	40	71	114	177	274	420	577	650	1,92
200	30	82	143	230	358	552	846	1162	1310	1,49
250	53	142	228	398	621	911	1470	2018	2275	1,21
300	83	223	390	625	975	1506	2307	3167	3570	1,02
350	122	326	571	914	1426	2201	3373	4631	5220	0,88
400	167	449	788	1260	1967	3036	4653	6389	7200	0,79
500	279	747	1312	2099	3275	5055	7747	10637	11989	0,70
600	406	1089	1911	3060	4773	7369	11293	15504	17475	0,68

Relation between Kv and Cv: $Cv = 1,156 \times Kv$

Max. allowable pressure drops/torque figures

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

Valve DN	PN	Max. pressure drop. bar at opening angle			Torque min. at ΔP		Torque min. at ΔP		Torque max. shaft Nm
		0°	60°	80°	bar	Nm	bar	Nm	
80	50	50	16	6	≤ 20	120	> 20	180	220
100	50	50	15	5	≤ 20	165	> 20	250	300
150	50	50	10	3	≤ 20	250	> 20	350	420
200	50	50	7.5	2	≤ 20	290	> 20	460	550
250	50	50	5	1.5	≤ 20	480	> 20	680	820
300	50	50	5	1.5	≤ 20	600	> 20	900	1080
350	50	50	5	1.5	≤ 20	950	> 20	1350	1620
400	50	50	5	1.5	≤ 20	1300	> 20	1750	2100
500	50	50	4	1.2	≤ 20	2600	> 20	3000	3600
600	50	50	4	1.2	≤ 20	4750	> 20	5800	6960

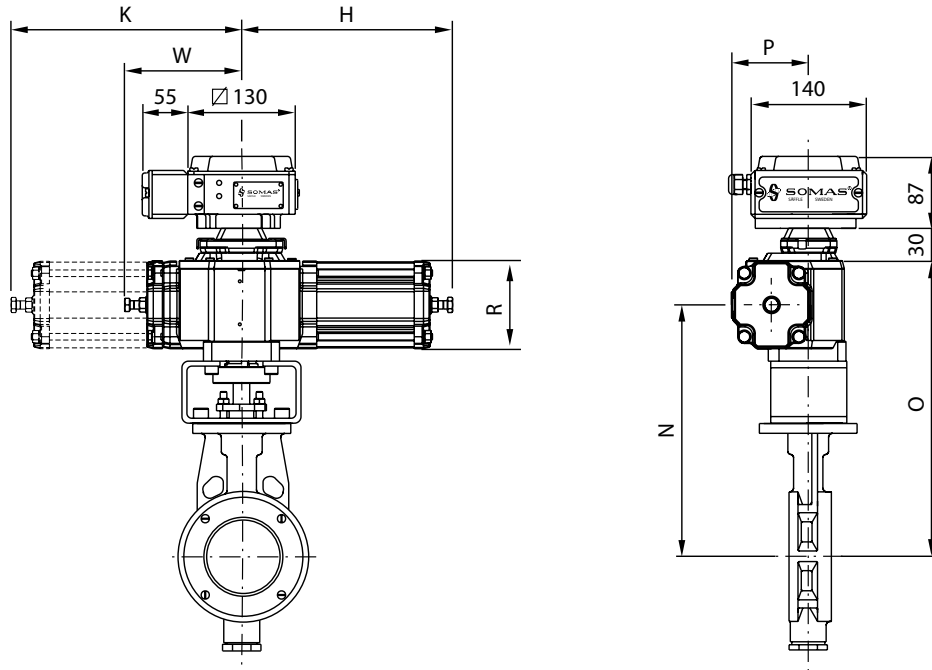


Butterfly valve type VSS PN 40

DN	A	B	C	ϕd	ϕde	ϕD	F	ϕG	ϕH	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)

ϕde = Necessary free diameter for the disc under movement



Butterfly valve type VSS PN 40 with actuator type A-DA

DN	Type	H	K	N	O	P	R	W	Weight
80	A21	255	-	295	360	94	106	140	18
80	A22	255	260	295	360	94	106	-	19
100	A22	255	260	310	375	94	106	-	22
150	A22	255	260	340	410	94	106	-	31
150	A23	305	-	340	410	117	152	140	37
200	A31	380	-	420	510	144	152	215	59
250	A31	380	-	460	550	144	152	215	80
250	A32	380	395	460	550	144	152	-	86
300	A32	380	395	490	580	144	152	-	106
350	A41	550	-	605	715	210	230	315	185
400	A41	550	-	645	755	210	230	315	235
500	A42	545	560	715	840	210	230	-	345
600	A51	745	-	815	990	315	355	370	650

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

Actuator type A-SC/SO

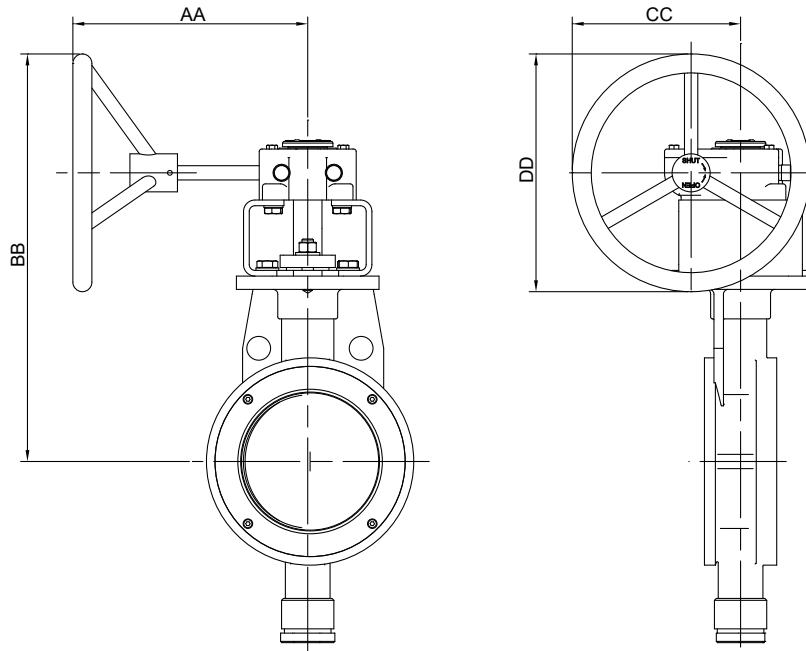
DN	Type	H	K	N	O	P	R	W	Weight
80	A24-X	415	420	295	360	117	152	-	35
100	A24-X	415	420	310	375	117	152	-	38
150	A33-X	660	-	390	480	185	230	215	78
200	A33-X	660	-	420	510	185	230	215	92
250	A34-X	665	680	460	550	185	230	-	141
300	A34-X	665	680	480	580	185	230	-	161
350	A43-X	920	-	605	715	280	355	315	271
400	A43-X	920	-	645	755	280	355	315	320
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



Butterfly valve type VSS PN 40 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

Valve DN	Shaft dia. (mm)	Pneumatic actuators						Manual override	
		Double acting		Spring return				Hand lever	Gear unit
		5.5 bar	4 bar	Spring to close		Spring to open			
				5.5 bar	4 bar	5.5 bar	4 bar		
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 in this data sheet is of wafer type for mounting between flanges PN 25-50.

The valve can also be delivered in lugged design.

Both types of valves can also be drilled for mounting between flanges according to ASME.

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 SOMAS manual, on/off or control actuators in accordance with the selection table.

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

See sections 4 and 5 of the SOMAS 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 with a nominal size between DN 80-600 have a metal seat (3 pcs.) according to the code C.

PTFE and HiNi seat 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 the SOMAS 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 10-25, the inside gasket diameter should not exceed the dimensions specified in the standard EN 1514-1.

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 EN 1514-1		
Valve DN	Max. Inside dia. di (mm)	Outside dia. (dy) (mm) PN 40
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

Gaskets according to ASME B 16.21 RF		
Valve DN	Max. Inside dia. di (mm)	Outside dia. (dy) (mm) Class 300
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



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)
C = 1.4462 alt. 1.4470, (metal seat, 3 pcs.)
D = 1.4462 alt. 1.4470, (metal seat, type Y)
E = 1.4547
L = N10276 (High Nickel Alloy)
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.



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.



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