

Datasheet

Ball segment valve

Si-110 EN

Edition: 2010-04

Type KVTW/KVXW

Wafer design

Type KVTF/KVXF

Flanged design

Nominal pressure

PN 25/20/16/10

Nominal size

DN 80 - 500

Material

Stainless steel

- **Control- and shut-off valve**
- **High capacity**
- **One-piece shaft gives a torque transmission free of backlash**
- **Excellent tightness irrespective of differential pressure**
- **Easy maintenance**

The SOMAS ball segment valve type KVTW with a centrally mounted shaft, and KVXW with an eccentrically mounted shaft are of wafer design. Type KVTF is a flanged version with centrally mounted shaft while KVXF is flanged and eccentric design.

The valve body is in one piece. Shaft device is also in one piece for torque transmission free of backlash. The spring-loaded seat is available in three alternative materials (PTFE, PTFE 53 and HiCo).

The valves can be used for control, as well as for shut-off applications on practically every type of media within a wide temperature range. Choose KVT for liquids, media containing impurities etc. For dry and clean media choose KVX. In the KVX-valve the ball segment is eccentrically mounted and rotates out from the seat when the valve is opened. This reduces the wear on seat and segment.

Low noise trim is available as an option. The designation "LN" indicates that the ball segment is equipped with a network of bars that are used to split up the pressure drop across the valve. This results in less pressure recovery, thereby reducing the noise and potential damage due to cavitation.

Note! Capacity factors will be reduced for valves with LN-trim

Ball segment with V-groove is available for use at high fibre concentrations. The V-groove design prevents dewatering at small opening angles.

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.

Option



- **KVM-ball segment with V-groove for high fibre concentrations**



- **LN (Low Noise) Ball segment with low noise trim for high ΔP**





Tightness class

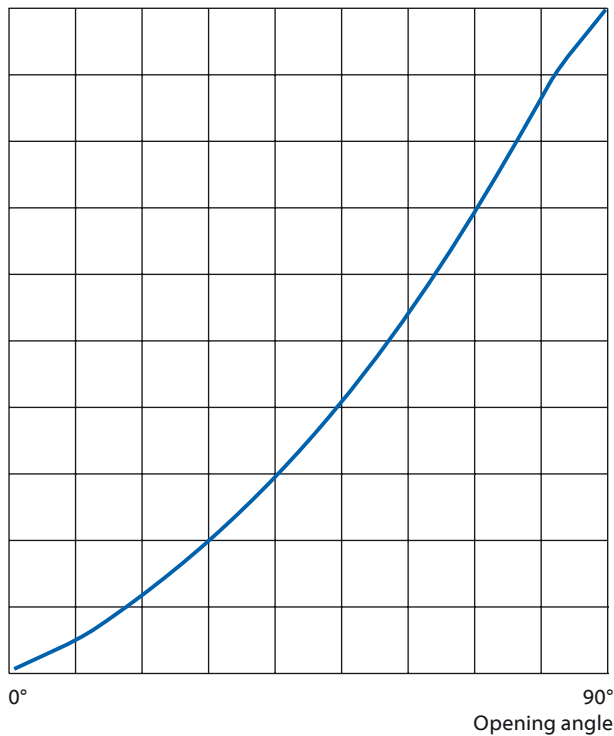
The tightness class is related to the chosen material in the seat ring.

PTFE seat	Code A	IEC 534-4 VI (ASME B16-104 Class VI)
PTFE 53 seat ¹	Code B	IEC 534-4 VI (ASME B16-104 Class VI)
HiCo seat	Code T	IEC 534-4 IV alt. V (ASME B16-104 Class IV alt. V)

¹ 50% PTFE + 50% 1.4435 (316L) powder (percentage by weight)

Flow characteristics

100% Flow



Pressure and temperature rating

According to the material in the seat.

Seat Code	Max. working pressure ¹ (bar at ° C)				
	150°	170°	200°	350°	>350°
A	25	25	–	–	Note 1
B	25	25	15	–	Note 1
T	25	25	25	15	Note 1

10 bar = 1 MPa

Note 1: Check with SOMAS

¹ **NB!** Do not exceed working pressure for the valve.

Factor FLP

	Opening angle								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
FLP1	0.85	0.82	0.78	0.75	0.70	0.66	0.60	0.55	0.50
FLP2	0.85	0.82	0.78	0.73	0.68	0.62	0.56	0.50	0.45
FLP3	0.85	0.82	0.78	0.73	0.67	0.61	0.54	0.49	0.43

FLP1 = One dimension bigger pipe size

FLP2 = Two dimensions bigger pipe size

FLP3 = Three dimensions bigger pipe size

Liquid pressure recovery factor FL

Factor	Opening angle								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
FL	0.85	0.82	0.80	0.77	0.74	0.71	0.67	0.64	0.60

Pipe geometry factor F_P KVTW/KVXW

Valve DN	Pipe DN	Opening angle								
		10°	20°	30°	40°	50°	60°	70°	80°	90°
80	100				0.98	0.97	0.95	0.93	0.80	0.76
	150	1.0	0.99	0.98	0.94	0.90	0.85	0.78	0.70	0.65
	200				0.93	0.87	0.80	0.73	0.64	0.59
100	150				0.97	0.94	0.90	0.86	0.80	0.76
	200	1.0	0.99	0.97	0.94	0.90	0.84	0.78	0.70	0.65
	250				0.93	0.88	0.82	0.75	0.66	0.61
150	200				0.99	0.97	0.96	0.93	0.90	0.87
	250	1.0	0.99	0.99	0.97	0.95	0.91	0.87	0.81	0.77
	300				0.96	0.93	0.88	0.83	0.76	0.72
200	250				0.99	0.98	0.97	0.96	0.93	0.91
	300	1.0	1.0	0.99	0.98	0.96	0.94	0.91	0.86	0.82
	350				0.97	0.95	0.91	0.87	0.81	0.77
250	300				0.99	0.99	0.98	0.97	0.95	0.94
	350	1.0	1.0	0.99	0.99	0.97	0.95	0.93	0.89	0.87
	400				0.98	0.96	0.93	0.90	0.85	0.81

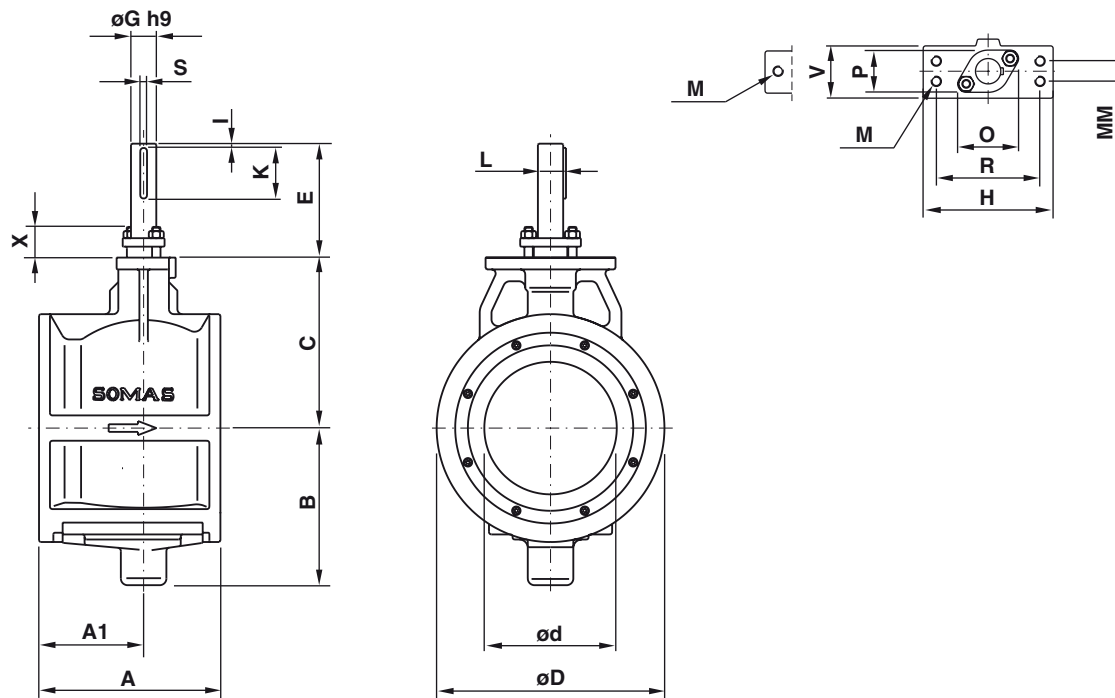
Pipe geometry factor F_P KVTF/KVXF

Valve DN	Pipe DN	Opening angle								
		10°	20°	30°	40°	50°	60°	70°	80°	90°
80	100				0.98	0.97	0.95	0.93	0.80	0.76
	150	1.0	0.99	0.98	0.94	0.90	0.85	0.78	0.70	0.65
	200				0.93	0.87	0.80	0.73	0.64	0.59
100	150				0.97	0.94	0.90	0.86	0.80	0.76
	200	1.0	0.99	0.97	0.94	0.90	0.84	0.78	0.70	0.65
	250				0.93	0.88	0.82	0.75	0.66	0.61
125	150				0.98	0.96	0.92	0.89	0.84	0.81
	200	1.0	0.99	0.99	0.97	0.94	0.90	0.86	0.80	0.76
	250				0.93	0.86	0.78	0.76	0.74	0.72
150	200				0.99	0.97	0.96	0.93	0.90	0.87
	250	1.0	1.0	0.99	0.97	0.95	0.91	0.87	0.81	0.77
	300				0.93	0.86	0.78	0.76	0.74	0.72
200	250				0.99	0.98	0.96	0.93	0.90	0.87
	300	1.0	1.0	0.99	0.98	0.96	0.93	0.88	0.85	0.78
	350				0.97	0.95	0.90	0.84	0.78	0.73
250	300				0.99	0.98	0.96	0.95	0.92	0.90
	350	1.0	1.0	0.99	0.98	0.97	0.94	0.92	0.86	0.83
	400				0.98	0.96	0.92	0.89	0.88	0.77
300	350				0.99	0.98	0.96	0.95	0.92	0.90
	400	1.0	1.0	0.99	0.98	0.97	0.94	0.92	0.86	0.83
	450				0.98	0.96	0.92	0.89	0.82	0.77
350	400				0.99	0.99	0.97	0.95	0.92	0.91
	450	1.0	1.0	0.99	0.99	0.98	0.94	0.91	0.88	0.85
	500				0.98	0.96	0.92	0.87	0.83	0.79
400	450				0.99	0.99	0.97	0.96	0.95	0.94
	500	1.0	1.0	0.99	0.99	0.98	0.94	0.92	0.89	0.87
	600				0.97	0.95	0.90	0.86	0.81	0.77

500

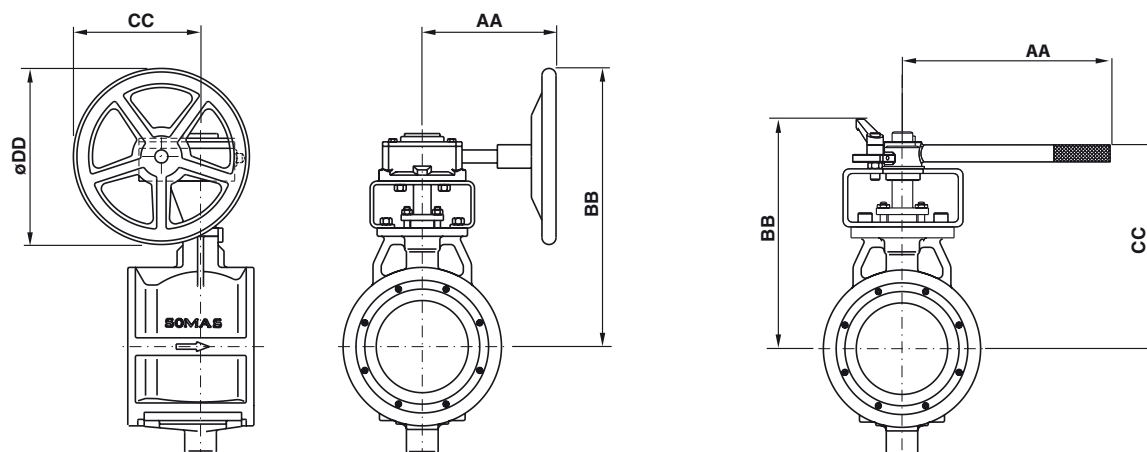


Wafer design



Ball segment valve type KVTW/KVXW (valve body in one piece)

DN	A	A1	B	C	ød	øD	E	øG	H	I	K	L	M	MM	O	P	R	S	V	X	Weight
80	111	64	102	115	75	140	115	20	125	5	45	22.5	M12	–	61	42	98	6	48	30	8.5
100	125	73	116	140	92	162	115	20	125	5	45	22.5	M12	–	61	42	98	6	48	30	11.5
150	170	101	151	176	124	216	115	25	125	5	45	28	M12	–	66	47	98	8	50	30	24
200	215	124	187	202	156	270	135	30	155	5	60	33	M12	24	77	50	123	8	62	35	44
250	260	150	230	242	189	324	135	35	155	5	50	38	M12	24	85	55	123	10	65	50	71



Ball segment valve type KVTW/KVXW with hand gear

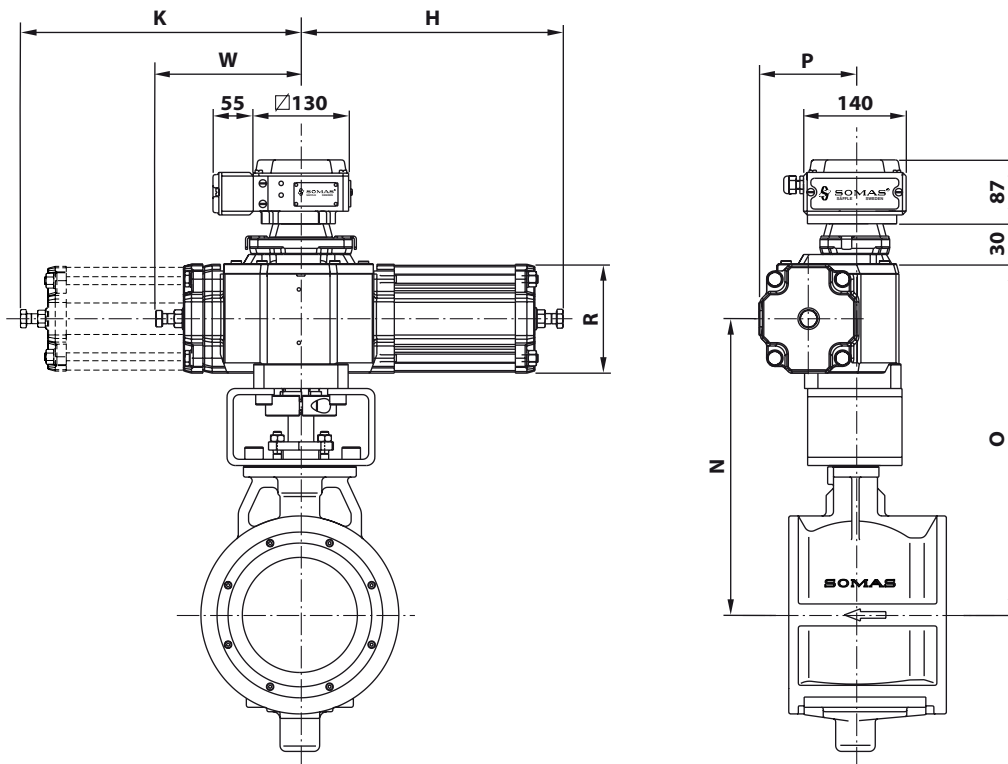
DN	Type	AA	BB	CC	øDD	Weight
80	M10/F07	190	350	190	255	16
100	M10/F07	190	380	190	255	19
150	M10/F07	190	410	190	255	32
200	M12/F12	228	475	230	305	56
250	M12/F12	228	515	230	305	83

Ball segment valve type KVTW/KVXW with hand lever

DN	Type	AA	BB	CC	Weight
80	HSR20	355	240	210	11.5
100	HSR20	355	265	135	14.5
150	HSR25	355	301	271	27



Wafer design



Ball segment valve type KVTW/KVXW with actuator type A-DA

DN	Type	H	K	N	O	P	R	W	Weight
80	A21	255	–	260	340	94	106	140	18
80	A22	255	260	260	320	94	106	–	20
100	A21	255	–	285	345	94	106	140	21
100	A22	255	260	285	345	94	106	–	23
150	A22	255	260	320	385	94	106	–	35
150	A23	305	–	320	385	117	152	140	41
200	A24	305	310	345	410	117	152	–	61
200	A31	380	–	400	485	144	152	215	69
250	A31	380	–	440	525	144	152	215	96
250	A32	380	395	440	525	144	152	–	102

For units with the positioner type SP405, add 2 kg

For units with the positioner type SPE405, add 3 kg

Ball segment valve type KVTW/KVXW with actuator type A-SC/SO

DN	Type	H	K	N	O	P	R	W	Weight
80	A23-X	415	–	260	320	117	152	140	25
100	A23-X	415	–	285	345	117	152	140	28
150	A24-X	415	420	320	385	117	152	–	50
200	A33-X	660	–	400	485	183	228	215	103
250	A33-X	660	–	440	525	183	228	215	130

X = SC - Spring to close

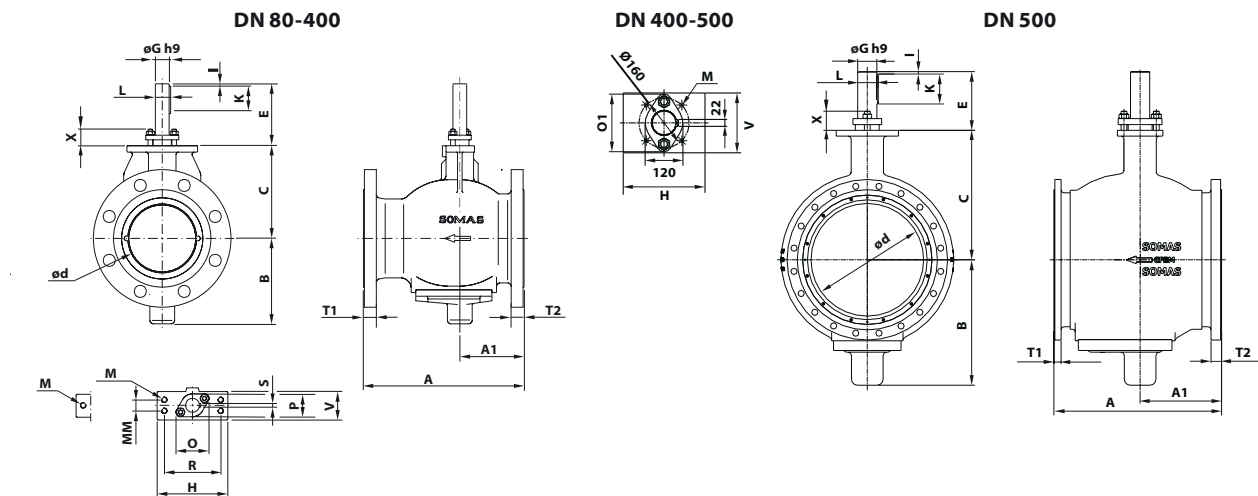
X = SO - Spring to open

For units with the positioner type SP405, add 2 kg

For units with the positioner type SPE405, add 3 kg

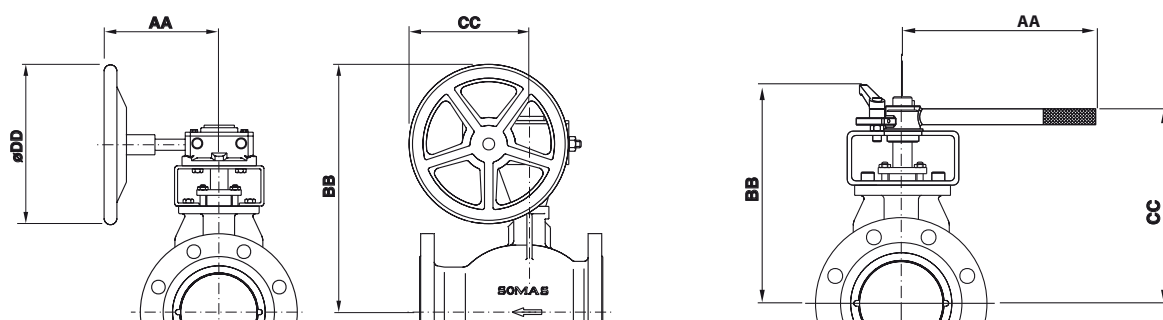


Flanged design



Ball segment valve type KVTF/KVXF (valve body in one piece)

DN	A	A1	B	C	ød	E	øG	H	I	K	L	M	MM	O	O1	P	R	S	T1	T2	V	X	Weight
80	280	82	102	115	75	115	20	125	5	45	22.5	M12	—	61	—	42	98	6	24	24	48	30	18
100	300	94	116	140	92	115	20	125	5	45	22.5	M12	—	61	—	42	98	6	26	26	48	30	26
125	325	118	151	176	124	115	25	125	5	45	28	M12	—	66	—	47	98	8	26	26	50	30	38
150	350	140	187	202	145	135	30	155	5	60	33	M12	24	77	—	50	123	8	28	28	62	35	61
200	400	159	230	242	189	135	35	155	5	50	38	M12	24	85	—	55	123	10	30	39	62	50	95
250	450	191	281	297	232	155	40	170	5	50	43	M12	40	94	—	75	123	12	34	45	85	50	154
300	500	210	340	353	282	200	50	180	5	80	53.5	M16	55	105	—	85	136	14	37	46	95	50	214
350	550	241	385	393	326	210	60	225	5	90	64	M20	70	115	—	105	150	18	41	50	128	60	304
400	600	269	449	447	370	225	70	220	6	110	75	M16	—	—	183	—	—	20	43	52	154	60	395
500	700	340	525	540	470	245	80	260	10	120	85	M16	—	—	183	—	—	22	30	44	220	75	520



Ball segment valve type KVTF/KVXF with hand gear

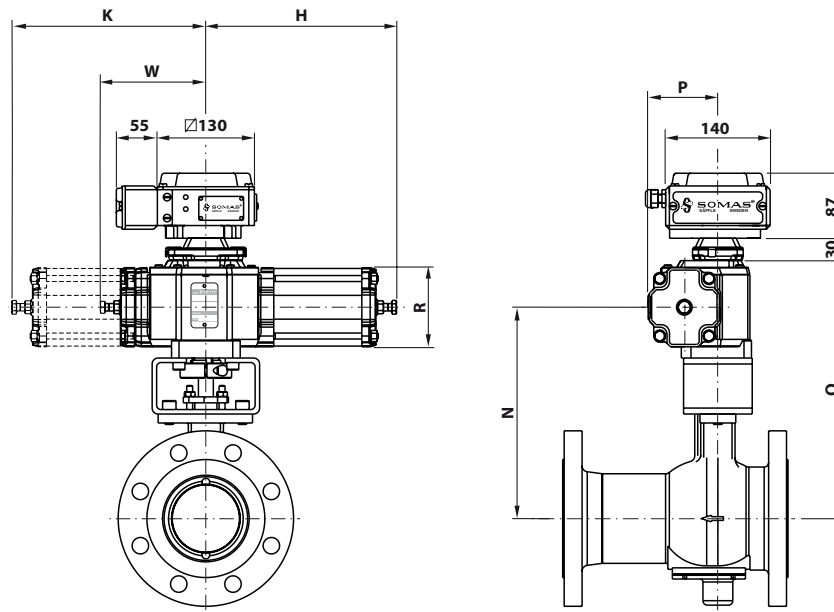
DN	Type	AA	BB	CC	øDD	Weight
80	M10/F07	190	380	190	255	25.5
100	M10/F07	190	380	190	255	33.5
125	M10/F07	190	415	190	255	45.5
150	M12/F12	228	475	230	305	73
200	M12/F12	228	515	230	305	107
250	M12/F12	228	555	230	305	166
300	M14/F14	250	700	265	350	235
350	M15/F16	385	795	353	460	342
400	M20/F25	450	942	395	610	440
500	M20/F25	450	1035	395	610	565

Ball segment valve type KVTF/KVXF with hand lever

DN	Type	AA	BB	CC	Weight
80	HSR20	355	240	210	21
100	HSR20	355	265	135	29
125	HSR25	355	301	271	41



Flanged design



Ball segment valve type KVTF/KVXF with actuator type A-DA

DN	Type	H	K	N	O	P	R	W	Weight
80	A21	255	–	260	320	94	106	140	27
80	A22	255	260	260	320	94	106	–	29
100	A21	255	–	285	345	94	106	140	35
100	A22	255	260	285	345	94	106	140	37
125	A22	255	260	320	380	94	106	–	49
125	A23	325	–	320	380	117	152	140	54
150	A31	380	–	350	415	144	152	215	87
200	A31	380	–	420	480	144	152	215	121
200	A32	380	395	415	475	144	152	–	127
250	A32	380	395	455	520	144	152	–	185
300	A41	550	–	595	750	211	228	315	290
350	A41	550	–	635	790	211	228	315	380
350	A42	545	560	635	790	211	228	–	395
400	A42	545	560	690	845	211	228	–	490
500	A43	680	–	813	939	279	354	315	662

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

Ball segment valve type KVTF/KVXF with actuator type A-SC/SO

DN	Type	H	K	N	O	P	R	W	Weight
80	A23-X	415	–	260	320	117	152	140	35
100	A23-X	415	–	285	345	117	152	140	43
125	A24-X	415	310	320	380	117	152	–	64
150	A33-X	660	–	350	415	183	228	215	120
200	A33-X	660	–	420	480	183	228	215	155
250	A34-X	665	680	455	515	183	228	–	210
300	A43-X	920	–	595	750	279	354	315	380
350	A43-X	920	–	635	790	279	354	315	470
400	A44-X	925	935	690	845	279	354	–	615

X = SC – Spring to close
X = SO – Spring to open

Torque KVTW

Valve DN	Shaft dia. (mm)	Necessary closing torque	
		Min. (Nm)	Max. (Nm)
80	20	120	200
100	20	150	200
150	25	250	370
200	30	400	640
250	35	600	1000

Torque KVTF

Valve DN	Shaft dia. (mm)	Necessary closing torque	
		Min. (Nm)	Max. (Nm)
80	20	120	200
100	20	150	200
125	25	250	370
150	30	400	640
200	35	550	1000
250	40	800	1500
300	50	1400	2800
350	60	2000	5000
400	70	2800	7500
500	80	4750	9000

**Capacity factor Kv and Resistance factor ξ for ball segment valve type KVTW/KVXW**

DN	Opening angle									ξ 90°
	10°	20°	30°	40°	50°	60°	70°	80°	90°	
80	15	39	67	102	138	184	231	295	340	0,57
100	23	58	101	154	208	276	348	444	510	0,62
150	43	109	189	288	390	519	652	817	925	0,44
200	66	167	288	439	594	790	994	1268	1450	0,45
250	97	245	425	646	875	1162	1463	1866	2150	0,44

Capacity factor Kv and Resistance factor ξ for ball segment valve type KVTF/KVXF

DN	Opening angle									ξ 90°
	10°	20°	30°	40°	50°	60°	70°	80°	90°	
80	15	39	67	102	138	184	231	295	340	0,57
100	23	58	101	154	208	276	348	444	510	0,62
125	43	109	185	288	390	519	652	817	925	0,44
150	60	153	264	402	544	725	910	1123	1295	0,42
200	100	253	437	665	901	1197	1507	1923	2210	0,42
250	155	390	677	1030	1395	1853	2333	2976	3425	0,4
300	219	552	959	1459	1977	2626	3303	4216	4850	0,38
350	308	780	1355	2058	2793	3708	4667	5952	6843	0,38
400	385	878	1698	2580	3497	4645	5845	7482	8570	0,38
500	607	1539	2673	4063	5508	7318	9208	11746	13500	0,38

Relation between Kv and Cv: $K_v = 0.86 \times C_v$

Flange standard

SOMAS ball segment valves type KVTW and KVXW are flangeless and should be clamped between flanges. The valves type KVTF and KVXF are flanged and can be drilled according to the table below. When ordering, please state the pressure rating of the counter flanges. See the valve specification system, code 11.

DN	Wafer design	Flanged design
80-100	PN 10/16/20/25	PN 10/16/20/25
125	–	PN 10/16/20/25
150-250	PN 10/16/20	PN 10/16/20/25
300-400	–	PN 10/16/20/25
500	–	PN 10/16/20/25

Face to face dimension

Flanged type of valves according to EN 558, Series 15. For details see the various tables.

Further technical information

Technical data for the materials used in the SOMAS valves, flange standard, steam data, etc. can be found in section 6 of the SOMAS catalogue.

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 then be delivered as tested units ready for installation.

Check sections 4 and 5 of the SOMAS catalogue, where positioners, limit switches and solenoid valves are also presented.

We can also fit other types of actuators and accessories in accordance with your specification.

Option

Within the process industry and the energy sector there are a number of applications where process data in combination with standard control valves will end up with problems such as high noise level and erosion. These problems are mostly related to cavitation and high flow velocities inside the valve.

Note! By using a standard ball segment valve and add a noise reduction trim many of the above mentioned problems can be solved.

See data sheet Si-108 for more theoretical information.

For controlling suspensions with high fibre concentrations it can be advantageous to use valves with a V-groove to reduce the risk of de-watering at small opening angles.

Capacity factors and remaining factors for valves with LN-trim and valves with V-groove are available in the valve sizing program SOMSIZE.



Selection table

KVTW/KVXW		Pneumatic actuators						Manual override	
Valve DN	Shaft dia. (mm)	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	5.5 bar	4 bar		
80	20	A21	A22	A23-SC	A23-SC	A23-SO	A23-SOL	HSR020	M10/F07
100	20	A21	A22	A23-SC	A23-SC	A23-SO	A23-SOL	HSR020	M10/F07
150	25	A22	A23	A24-SC	A24-SC	A24-SO	A24-SOL	–	M10/F12
200	30	A31	A24	A33-SC	A33-SC	A33-SO	A33-SOL	–	M12/F12
250	35	A31	A32	A33-SC	A33-SC	A33-SO	A33-SOL	–	M12/F12

KVTF/KVXF		Pneumatic actuators						Manual override	
Valve DN	Shaft dia. (mm)	Double acting		Spring return				Hand lever	Gear unit
		5.5 bar	4 bar	Spring to close		Spring to open			
80	20	A21	A22	A23-SC	A23-SC	A23-SO	A23-SOL	HSR020	M10/F07
100	20	A21	A22	A23-SC	A23-SC	A23-SO	A23-SOL	HSR020	M10/F07
125	25	A22	A23	A24-SC	A24-SC	A24-SO	A24-SOL	–	M10/F07
150	30	A31	A31	A33-SC	A33-SC	A33-SO	A33-SOL	–	M12/F12
200	35	A31	A32	A33-SC	A33-SC	A33-SO	A33-SOL	–	M12/F12
250	40	A32	A32	A34-SC	A34-SC	A34-SO	A34-SOL	–	M12/F12
300	50	A41	A41	A43-SC	A43-SC	A43-SO	A43-SOL	–	M14/F14
350	60	A41	A42	A43-SC	A43-SC	A43-SO	A43-SOL	–	M15/F16
400	70	A42	A42	A44-SC	A44-SC	A44-SO	A44-SOL	–	M20/F25
500	80	A42	A43	–	–	–	–	–	M20/F25

Ordering

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

Valve specification system

KVTW - A 5 - A K A - B 1 1 - DN... - PN...

- | | | |
|--|---|--|
| <p>1 Type of valve</p> <p><i>Wafer design</i></p> <p>KVTW (centrically mounted segment)</p> <p>KVXW (eccentrically mounted segment)</p> <p>KVTW LN (centr. mounted segment, Low Noise)</p> <p>KVXW LN (eccentr. mounted segment, Low Noise)</p> <p>KVMW (ball segment with V-groove)</p> <p><i>Flanged design</i></p> <p>KVTF (centrically mounted segment)</p> <p>KVXF (eccentrically mounted segment)</p> <p>KVTF LN (cent. mounted segment, Low Noise)</p> <p>KVXF LN (eccentr. mounted segment, Low Noise)</p> <p>KVMF (ball segment with V-groove)</p> <p>2 Valve body design</p> <p>A = Wafer design</p> <p>B = Flanged design (body in one piece)</p> | <p>3 Nominal pressure</p> <p>5 = PN 25</p> <p>4 = PN 20</p> <p>4 Material – valve body</p> <p>A = CF8M</p> <p>B = CF8M, hard chromed</p> <p>C = 1.4409</p> <p>5 Material – ball segment</p> <p>J = 1.4460¹</p> <p>K = 1.4460¹, hard chromed</p> <p>L = 1.4460¹, HiCo coated</p> <p>6 Material – seat</p> <p>A = PTFE (10% carbon)</p> <p>B = PTFE 53²</p> <p>T = HiCo (High Cobalt alloy)</p> | <p>7 Material – shaft</p> <p>A = 2324-12</p> <p>B = 2324-12, hard chromed</p> <p>G = 1.4435, hard chromed</p> <p>8 Bearings – valve body/shaft</p> <p>1 = Without bearing</p> <p>4 = Rulon</p> <p>7 = 1.4539</p> <p>9 Stuffing box</p> <p>1 = Graphite</p> <p>2 = PTFE</p> <p>10 Valve size, DN</p> <p>11 Drilling, counter flanges, PN/Class</p> |
|--|---|--|

¹ 2324-12 for DN 200-500

² 50% PTFE + 50% 1.4435 (316L) powder (percentage by weight)

SOMAS reserves the right to make improvements without prior notice.



SOMAS®
www.somas.se

Box 107
SE-661 23 SÄFFLE
SWEDEN

Phone: +46 533 167 00
Fax: +46 533 141 36
E-mail: sales@somas.se