

Datasheet

Ball segment valve

Si-112 EN

Edition: 2014-01

Type KVTF-C/KVXF-C	Flanged design Short face to face
Nominal pressure	PN 25 / ASME Class 150
Nominal size	DN 80 - 400 / NPS 3" - 16"
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 KVTF-C is a flanged ball segment valve with centrally mounted shaft and KVXF-C is a flanged ball segment valve with eccentrically mounted shaft.

The valve body is in one piece.

Face to face dim. in accordance with EN558:2008-series 36 and ANSI/ISA-75.08.02-2003.

Shaft piece is also in one piece for backlash free torque transmission.

The spring loaded seat is available in three different 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 KVTF-C for liquids, media containing impurities etc. For dry and clean media choose KVXF-C. In the KVXF-C 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.

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 fiber 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.

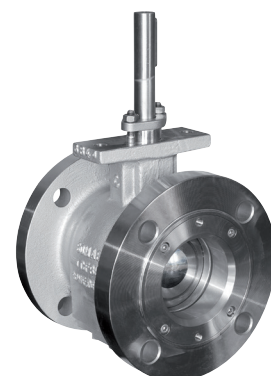
Option



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



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





Tightness class

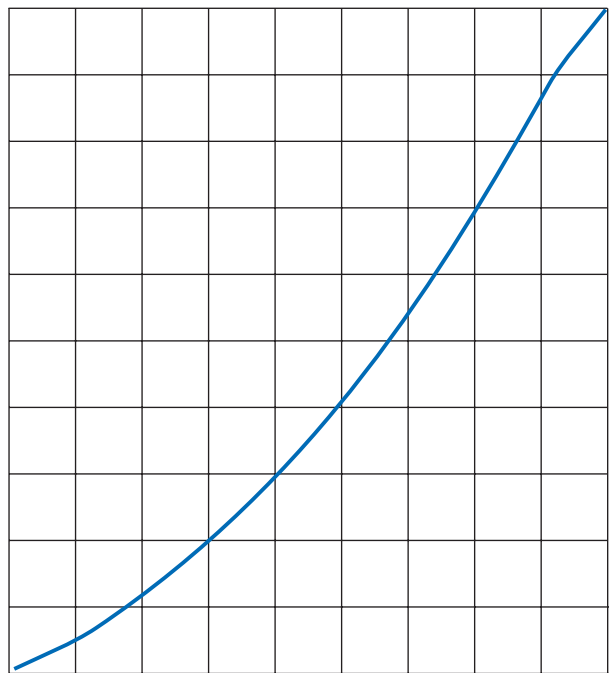
The tightness class is related to the chosen material in the seat ring.

PTFE seat	Code A	EN 60534-4 VI (ASME B16-104 Class VI)
PTFE 53 seat ¹	Code B	EN 60534-4 VI (ASME B16-104 Class VI)
HiCo seat	Code T	EN 60534-4 IV alt. V (NPS B16-104 Class IV alt. V)

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

Flow characteristics

100% Flow



0° 90°
Opening angle

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

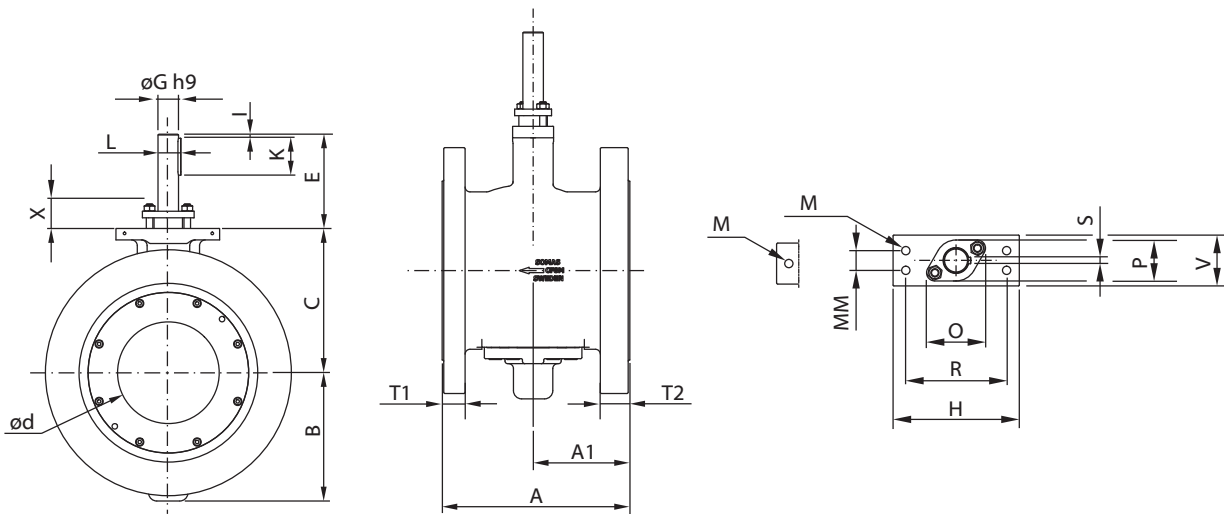
Factor	Opening angle								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
FL	0.85	0.82	0.80	0.77	0.74	0.71	0.67	0.64	0.60

Pipe geometry factor Fp KVTF-C/KVXF-C

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	1.00	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	1.00	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	1.00	1.00	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	1.00	1.00	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	1.00	1.00	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
300	350				0.99	0.97	0.94	0.93	0.89	0.86
	400	1.00	1.00	0.99	0.98	0.96	0.92	0.90	0.83	0.79
	450				0.98	0.96	0.90	0.87	0.79	0.73
350	400				0.99	0.98	0.95	0.93	0.89	0.83
	450	1.00	1.00	0.99	0.99	0.97	0.92	0.89	0.85	0.81
	500				0.98	0.95	0.90	0.85	0.80	0.75
400	450				0.99	0.98	0.95	0.94	0.92	0.90
	500	1.00	1.00	0.99	0.99	0.97	0.92	0.90	0.86	0.83
	600				0.79	0.95	0.88	0.84	0.78	0.74



Flanged design



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

DN	A	A1	B	C	ϕd	E	ϕG	H	I	K	L	M	MM	O	O1	P	R	S	T1	T2	V	X	Weight
80	165	82	105	115	75	115	20	125	5	45	22.5	M12	-	61	-	42	98	6	24	27	48	30	18
100	194	94	122	140	92	115	20	125	5	45	22.5	M12	-	61	-	42	98	6	25	29	48	30	25
150	229	118	157	176	124	115	25	125	5	45	28	M12	-	66	-	47	98	8	28	36	50	30	51
200	243	124	186	202	156	135	30	155	5	60	33	M12	24	77	-	50	123	8	29	36	62	35	75
250	297	153	228	242	189	135	35	155	5	50	38	M12	24	85	-	55	123	10	32	38	62	50	109
300	338	176	281	297	232	155	40	170	5	50	43	M12	40	94	-	47	123	12	34	45	85	50	161
350	400	207	340	353	282	200	50	180	5	80	54	M16	55	105	-	85	136	14	38	49	95	50	244
400	400	237	385	393	326	210	60	225	5	90	64	M20	70	115	-	105	150	18	45	55.5	128	60	340

Sizes and measurements in millimeters (mm). Weights in kilograms (kg).

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

NPS	A	A1	B	C	ϕd	E	ϕG	H	I	K	L	M	MM	O	O1	P	R	S	T1	T2	V	X	Weight
3	6.50	3.23	4.13	4.53	2.95	4.53	0.79	4.92	0.20	1.77	0.89	M12	-	2.40	-	1.65	3.86	0.24	1.06	0.94	1.89	1.18	40
4	7.64	3.70	4.80	5.51	3.62	4.53	0.79	4.92	0.20	1.77	0.89	M12	-	2.40	-	1.65	3.86	0.24	1.14	0.98	1.89	1.18	55
6	9.02	4.65	6.18	6.93	4.88	4.53	0.98	4.92	0.20	1.77	0.89	M12	-	2.60	-	1.85	3.86	0.31	1.42	1.10	1.97	1.18	112
8	9.57	4.88	7.32	7.95	6.18	5.31	1.18	6.10	0.20	2.36	1.30	M12	0.94	3.03	-	1.97	4.84	0.31	1.42	1.14	2.44	1.38	165
10	11.69	6.02	8.98	9.53	7.48	5.31	1.38	6.10	0.20	1.97	1.30	M12	0.94	3.35	-	2.17	4.84	0.39	1.50	1.26	2.44	1.97	240
12	13.31	6.91	11.06	11.69	9.13	6.10	1.57	6.69	0.20	1.97	1.69	M12	1.57	3.70	-	1.85	4.84	0.47	1.75	1.34	3.35	1.97	355
14	15.75	8.13	13.39	13.90	11.10	7.87	1.97	7.09	0.20	3.15	2.11	M16	2.17	4.13	-	3.35	5.35	0.55	1.91	1.50	3.74	1.97	538
16	15.75	9.33	15.16	15.47	12.83	8.27	2.36	8.86	0.20	3.54	2.52	M20	2.76	4.53	-	4.13	5.91	0.71	2.19	1.77	5.04	2.36	750

Sizes and measurements in inches (in). Weights in pounds (lb).

Flange standard

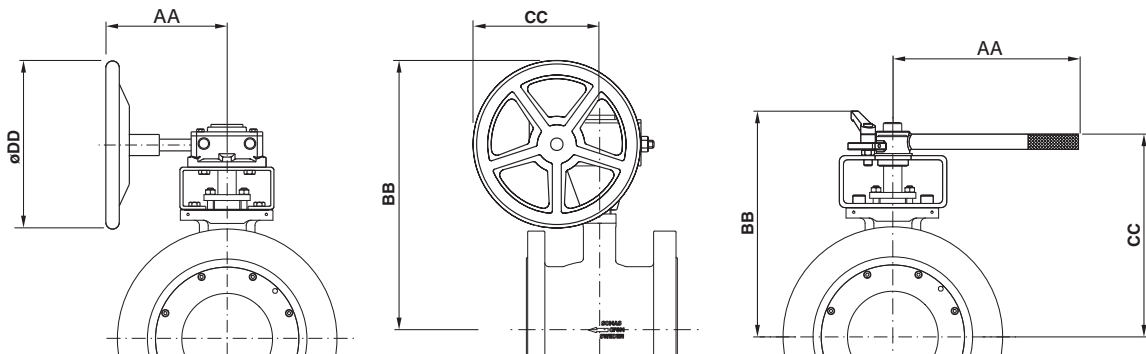
SOMAS ball segment valves type KVTF-C and KVXF-C are flanged and can be drilled according to PN10/16/20/25 ASME Cl 150. When ordering, please state the pressure rating of the counter flanges. See the valve specification system, code 11 (page 8).

Face to face dimension

Flanged type of valves according to EN 558, Series 36 or ANSI/ISA-75.08.02-2003. For details see the various tables.



Flanged design



Ball segment valve type KVTF-C/KVXF-C with hand gear						
DN	Type	AA	BB	CC	øDD	Weight
80	M10/F07	190	380	190	255	26
100	M10/F07	190	380	190	255	33
150	M10/F07	190	415	190	255	59
200	M12/F12	228	475	230	305	83
250	M12/F12	228	515	230	305	121
300	M12/F12	228	555	230	305	173
350	M14/F14	250	700	265	350	265
400	M15/F16	385	795	265	460	370

Sizes and measurements in millimeters (mm).
Weights in kilograms (kg).

Ball segment valve type KVTF-C/KVXF-C with hand lever					
DN	Type	AA	BB	CC	Weight
80	HSR20	355	240	210	21
100	HSR20	355	265	235	29

Sizes and measurements in millimeters (mm).
Weights in kilograms (kg).

Ball segment valve type KVTF-C/KVXF-C with hand gear						
NPS	Type	AA	BB	CC	øDD	Weight
3	M10/F07	7.48	14.96	7.48	10.04	56
4	M10/F07	7.48	14.96	7.48	10.04	72
6	M10/F07	7.48	16.34	7.48	10.04	129
8	M12/F12	8.98	18.70	9.06	12.01	192
10	M12/F12	8.98	20.28	9.06	12.01	267
12	M12/F12	8.98	21.85	9.06	12.01	381
14	M14/F14	9.84	27.56	10.43	13.78	584
16	M15/F16	15.16	31.30	10.43	18.11	815

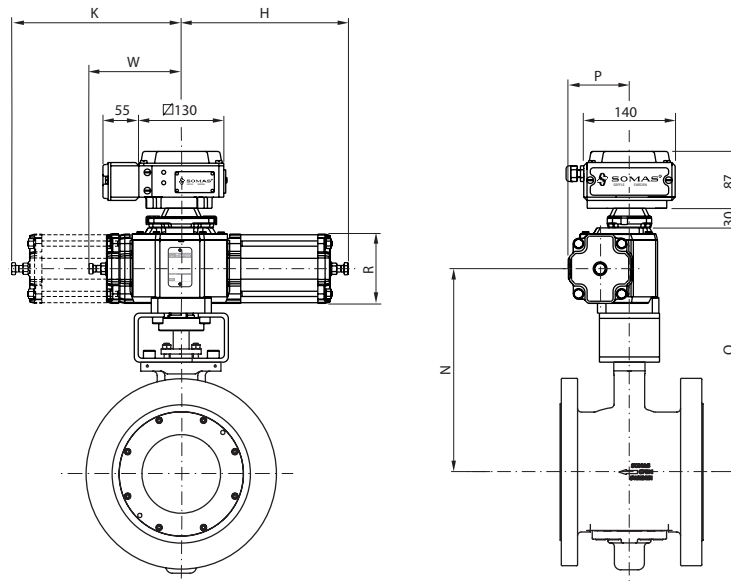
Sizes and measurements in inches (in). Weights in pounds (lb).

Ball segment valve type KVTF-C/KVXF-C with hand lever					
NPS	Type	AA	BB	CC	Weight
3	HSR20	13.98	9.45	8.27	46
4	HSR20	13.98	10.43	9.25	64

Sizes and measurements in inches (in). Weights in pounds (lb).



Flanged design



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

DN	Type	H	K	N	O	P	R	W	Weight
80	A21-DA	255	-	260	320	94	106	140	27
80	A22-DA	255	260	260	320	94	106	-	29
100	A21-DA	255	-	285	345	94	106	140	34
100	A22-DA	255	260	285	345	94	106	-	36
150	A22-DA	255	260	320	380	94	106	-	62
150	A23-DA	325	-	320	380	117	152	140	67
200	A31-DA	380	-	350	415	144	152	215	101
250	A31-DA	380	-	420	480	144	152	215	135
250	A32-DA	380	395	415	475	144	152	-	141
300	A32-DA	380	395	455	520	144	152	-	192
350	A41-DA	550	-	595	750	211	228	315	320
400	A41-DA	550	-	635	790	211	228	315	426
400	A42-DA	545	560	635	790	211	228	-	435

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

DN	Type	H	K	N	O	P	R	W	Weight
80	A23-SX	415	-	260	320	117	152	140	35
100	A23-SX	415	-	285	345	117	152	140	42
150	A24-SX	415	310	320	380	117	152	-	77
200	A33-SX	660	-	350	415	183	228	215	134
250	A33-SX	660	-	420	480	183	228	215	169
300	A34-SX	665	680	455	515	183	228	-	217
350	A43-SX	920	-	595	750	279	354	315	409
400	A43-SX	920	-	635	790	279	354	315	506
400	A44-SO	925	935	635	790	279	354	-	560

X = SC – Spring to close

X = SO – Spring to open

Sizes and measurements in millimeters (mm).

Weights in kilograms (kg).

For units with the positioner type SP405, add 2 kg

For units with the positioner type SPE405, add 3 kg

Sizes and measurements in millimeters (mm).

Weights in kilograms (kg).

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

NPS	Type	H	K	N	O	P	R	W	Weight
3	A21-DA	10.04	-	10.24	12.60	3.70	4.17	5.51	60
3	A22-DA	10.04	10.24	10.24	12.60	3.70	4.17	-	64
4	A21-DA	10.04	-	11.22	13.58	3.70	4.17	5.51	75
4	A22-DA	10.04	10.24	11.22	13.58	3.70	4.17	-	79
6	A22-DA	10.04	10.24	12.60	14.96	3.70	4.17	-	137
6	A23-DA	12.80	-	12.60	14.96	4.61	5.98	5.51	148
8	A31-DA	14.96	-	13.78	16.34	5.67	5.98	8.46	223
10	A31-DA	14.96	-	16.54	18.90	5.67	5.98	8.46	298
10	A32-DA	14.96	15.55	16.34	18.70	5.67	5.98	-	311
12	A32-DA	14.96	15.55	17.91	20.47	5.67	5.98	-	423
14	A41-DA	21.65	-	23.43	29.53	8.31	8.98	12.40	705
14	A42-DA	21.65	-	25.00	31.10	8.31	8.98	12.40	939
16	A42-DA	21.46	22.05	25.00	31.10	8.31	8.98	-	960

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

NPS	Type	H	K	N	O	P	R	W	Weight
3	A23-SX	16.34	-	10.24	12.60	4.61	5.98	5.51	77
4	A23-SX	16.34	-	11.22	13.58	4.61	5.98	5.51	93
6	A24-SX	16.34	12.20	12.60	14.96	4.61	5.98	-	170
8	A33-SX	25.98	-	13.78	16.34	7.20	8.98	8.46	295
10	A33-SX	25.98	-	16.54	18.90	7.20	8.98	8.46	373
12	A34-SX	26.18	26.77	17.91	20.28	7.20	8.98	-	478
14	A43-SX	36.22	-	23.43	29.53	10.98	13.94	12.40	902
16	A43-SX	36.22	-	25.00	31.10	10.98	13.94	12.40	1115
16	A44-SO	36.41	36.81	25.00	31.10	10.98	13.94	-	1235

X = SC – Spring to close

X = SO – Spring to open

Sizes and measurements in inches (in). Weights in pounds (lb).

For units with the positioner type SP405, add 4.4 lb

For units with the positioner type SPE405, add 6.6 lb

Sizes and measurements in inches (in). Weights in pounds (lb).



Torque KVTF-C

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
300	40	800	1500
350	50	1400	2800
400	60	2000	5000

Sizes and measurements in millimeters (mm).

Torque KVTF-C

Valve NPS	Shaft dia. (in)	Necessary closing torque	
		Min. (lbf-in)	Max. (lbf-in)
3	0.79	1062	1770
4	0.79	1328	1770
6	0.98	2213	3275
8	1.18	3540	5664
10	1.38	5310	8851
12	1.57	7081	13276
14	1.97	12391	24782
16	2.36	17702	44254

Sizes and measurements in inches (in).
Torque in pounds (lbf-in).

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

DN	Opening angle									
	10°	20°	30°	40°	50°	60°	70°	80°	90°	ξ 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	246	425	647	877	1165	1466	1871	2150	0.42
300	151	380	660	1004	1360	1807	2275	2902	3340	0.40
350	214	538	935	1423	1928	2561	3221	4112	4730	0.38
400	300	761	1322	2007	2724	3617	4552	5806	6675	0.38

Relation between Kv and Cv: $K_v = 0.86 \times C_v$
Sizes in millimeters (mm).

Capacity factor Cv and Resistance factor ξ for ball segment valve type KVTF-C/KVXF-C

NPS	Opening angle									
	10°	20°	30°	40°	50°	60°	70°	80°	90°	ξ 90°
3	17	45	78	119	160	214	269	343	395	0.57
4	27	67	117	179	242	321	405	516	593	0.62
6	50	127	220	335	453	603	758	950	1076	0.44
8	77	194	335	510	691	919	1156	1474	1686	0.45
10	113	286	494	752	1019	1354	1705	2175	2500	0.42
12	176	442	768	1168	1582	2101	2645	3375	3884	0.40
14	248	626	1088	1655	2242	2978	3746	4781	5500	0.38
16	349	885	1537	2334	3168	4206	5294	6751	7762	0.38

Relation between Kv and Cv: $K_v = 0.86 \times C_v$
Sizes in inches (in).



Further technical information

Technical data for the materials used in the SOMAS valves, flange standard, steam data, etc. can be found or ordered on the of the SOMAS website www.somas.se or in sections 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 the SOMAS web-site www.somas.se or in 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 datasheet Si-108 for more theoretical information.

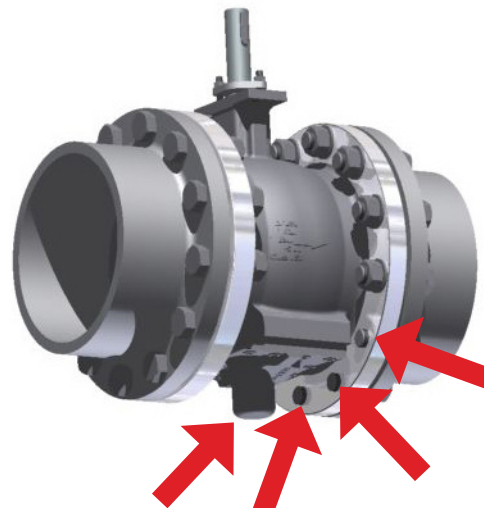
For controlling suspensions with high fibre concentrations it can be advantageous to use valves with a V-groove to reduce the risk of de-watering at small opening angles.

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

Valve	Number of bolts/holes	Flange		PN10				PN16				PN25				ASME 150			
		Inlet		Outlet		Inlet		Outlet		Inlet		Outlet		Inlet		Outlet			
		Total	Threaded	Total	Threaded	Total	Threaded	Total	Threaded	Total	Threaded	Total	Threaded	Total	Threaded	Total	Threaded		
DN	80	8	2 X M16	8	2 X M16	8	2 X M16	8	2 X M16	8	2 X M16	8	2 X M16	4	2 X 5/8"	4	2 X 5/8"		
	100	8	2 X M16	8	2 X M16	8	2 X M16	8	2 X M16	8	2 X M20	8	2 X M20	8	2 X 5/8"	8	2 X 5/8"		
	150	8	2 X M20	8	2 X M20	8	2 X M20	8	2 X M20	8	2 X M24	8	2 X M24	8	2 X 3/4"	8	2 X 3/4"		
	200	8	2 X M20	8	4 X M20	12	4 X M20	12	4 X M20	12	4 X M24	12	4 X M24	8	2 X 3/4"	8	2 X 3/4"		
	250	12	4 X M20	12	4 X M20	12	4 X M24	12	4 X M24	12	4 X M27	12	4 X M27	12	4 X 7/8"	12	4 X 7/8"		
	300	12	4 X M20	12	4 X M20	12	4 X M24	12	4 X M24	16	4 X M27	16	4 X M27	12	4 X 7/8"	12	4 X 7/8"		
	350	16	4 X M20	16	4 X M20	16	4 X M24	16	4 X M24	16	4 X M30	16	4 X M30	12	4 X 1"	12	4 X 1"		
400	16	4 X M24	16	16 X M24	16	4 X M27	16	16 X M27	16	4 X M33	16	16 X M33	16	4 X 1"	16	16 X 1"			

The KVTF-C valve has some of the holes in the flanges threaded.

For valves Size DN80 to DN350 2 alternatively 4 of the holes at the bottom of the valve is threaded. On the DN400 the inlet flange have the 4 holes at the bottom and all the holes of the outlet flange is threaded. The table above describes for each valve size and for each flange rating the number of threaded holes and the thread.





Selection table

KVTF-C/KVXF-C		Pneumatic actuators						Manual override	
Valve DN	Shaft (ØG) 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	-	M107F07
200	30	A31	A31	A33-SC	A33-SC	A33-SO	A33-SOL	-	M12/F12
250	35	A31	A32	A33-SC	A33-SC	A33-SO	A33-SOL	-	M12/F12
300	40	A32	A32	A34-SC	A34-SC	A34-SO	A34-SOL	-	M12/F12
350	50	A41	A41	A43-SC	A43-SC	A43-SO	A43-SOL	-	M14/F14
400	60	A41	A42	A43-SC	A43-SC	A44-SO	A44-SOL	-	M15/F16

Ordering

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

Valve specification system

KVTF - C 5 - A K B - B 1 1 - DN... - PN...

1 Type of valve

Flanged design

- KVTF (centrically mounted segment)
- KVXF (eccentrically mounted segment)
- KVTF LN (cent. mounted segment, Low Noise)
- KVXF LN (eccentr. mounted segment, Low Noise)
- KVMF (ball segment with V-groove)

2 Valve body design

C = Flanged design (body in one piece short face to face)

3 Nominal pressure

5 = PN 25

4 Material – valve body

A = CF8M

5 Material – ball segment

J = 1.4460¹

K = 1.4460¹, hard chromed

L = 1.4460¹, HiCo coated

6 Material – seat

A = PTFE (10% carbon)

B = PTFE 53²

T = HiCo (High Cobalt alloy)

7 Material – shaft

A = 2324-12

B = 2324-12, hard chromed

8 Bearings – valve body/shaft

1 = Without bearing

4 = Rulon

7 = 1.4539

9 Stuffing box

1 = Graphite

2 = PTFE

10 Valve size, DN

11 Drilling, counter flanges, PN/Class

¹ 2324-12 for DN 200-400

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

SOMAS reserves the right to make improvements without prior notice.



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