Datasheet
Ball segment valve

KVTF/KVXF

Si-110 EN

Edition: 2023-01

- 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

Option

- KVMF-ball segment with V-port for high fibre concentrations
- LN (Low Noise Trim) Ball segment with low noise trim for high ΔP



Type KVTF/KVXF	**Flanged design**
Nominal pressure	**PN 25/Class 150**
Nominal size	**DN 80 - 600 NPS 3-24**

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Product Information

The Somas ball segment valve type KVTF is a flanged version with centrically mounted shaft while KVXF is flanged and eccentric design.

The valve body is in one piece. Somas unique shaft device is designed for torque transmission and gives backlash-free operation with accurate control.
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 KVTF for liquids, media containing impurities etc. For dry and clean media choose KVXF. In the KVXF-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-port is available for use at high fibre concentrations.
The V-port 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-port for high fibre concentrations**



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

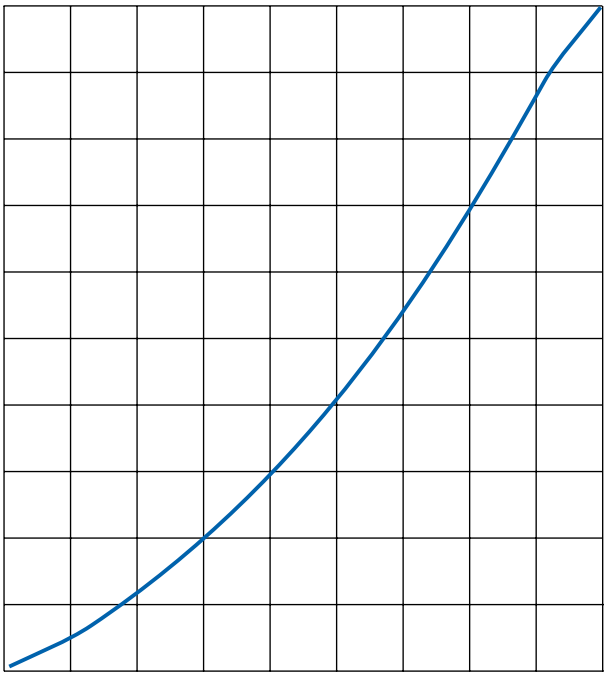
Tightness class

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

Standard leakage class	Optional leakage class
EN 60534-4	**EN 60534-4**
PTFE - Class V	PTFE - Class VI (≤DN400)
PTFE 53/PEEK - Class V	HiCo - Class V
HiCo - Class IV-S1	
	EN 12266-1
	PTFE - Rate C
	PTFE - Rate D
	PTFE 53/PEEK - Rate D
	HiCo - Rate E
	HiCo - Rate F

Flow characteristics

100% Flow



0° 90°

Opening angle

Pipe geometry factor F_P KVTF/KVXF

Valve DN	Pipe DN	Opening angle 10°	20°	30°	40°	50°	60°	70°	80°	90°
80	100	1.00	1.00	0.99	0.98	0.97	0.95	0.93	0.89	0.86
	150	1.00	0.99	0.97	0.94	0.90	0.85	0.78	0.70	0.65
	200	1.00	0.99	0.97	0.93	0.87	0.80	0.73	0.64	0.59
100	150	1.00	1.00	0.99	0.97	0.94	0.91	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	1.00	0.99	0.97	0.93	0.88	0.82	0.75	0.66	0.61
125	150	1.00	1.00	0.99	0.99	0.97	0.95	0.93	0.90	0.87
	200	1.00	0.99	0.98	0.95	0.91	0.85	0.79	0.72	0.67
	250	1.00	0.99	0.96	0.92	0.87	0.80	0.72	0.64	0.59
150	200	1.00	1.00	0.99	0.97	0.95	0.92	0.88	0.83	0.79
	250	1.00	0.99	0.97	0.94	0.90	0.85	0.78	0.71	0.66
	300	1.00	0.99	0.97	0.93	0.87	0.80	0.73	0.66	0.60
200	250	1.00	1.00	0.99	0.98	0.97	0.95	0.92	0.88	0.85
	300	1.00	0.99	0.98	0.96	0.93	0.89	0.84	0.77	0.73
	350	1.00	0.99	0.98	0.95	0.91	0.85	0.79	0.71	0.66
250	300	1.00	1.00	0.99	0.99	0.98	0.96	0.94	0.91	0.89
	350	1.00	1.00	0.99	0.97	0.95	0.91	0.87	0.81	0.77
	400	1.00	0.99	0.98	0.96	0.92	0.88	0.82	0.75	0.70
300	350	1.00	1.00	1.00	0.99	0.98	0.97	0.96	0.93	0.92
	400	1.00	1.00	0.99	0.98	0.96	0.93	0.90	0.85	0.81
	450	1.00	0.99	0.98	0.96	0.94	0.90	0.85	0.78	0.74
350	400	1.00	1.00	1.00	0.99	0.99	0.98	0.96	0.94	0.93
	450	1.00	1.00	0.99	0.98	0.96	0.94	0.91	0.86	0.83
	500	1.00	1.00	0.99	0.97	0.94	0.90	0.86	0.80	0.75
400	450	1.00	1.00	1.00	0.99	0.99	0.98	0.97	0.96	0.95
	500	1.00	1.00	0.99	0.98	0.97	0.95	0.93	0.89	0.86
	600	1.00	1.00	0.98	0.96	0.94	0.90	0.85	0.78	0.74
500	600	1.00	1.00	1.00	0.99	0.98	0.96	0.95	0.92	0.89
	700	1.00	1.00	0.99	0.97	0.95	0.92	0.88	0.82	0.78
	800	1.00	0.99	0.98	0.96	0.92	0.88	0.82	0.75	0.70
600	700	1.00	1.00	1.00	0.99	0.98	0.97	0.96	0.93	0.92
	800	1.00	1.00	0.99	0.98	0.96	0.93	0.90	0.85	0.81
	900	1.00	0.99	0.98	0.96	0.94	0.89	0.85	0.78	0.74

Factor F_{LP}

	Opening angle								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
F_{LP1}	0.85	0.82	0.78	0.75	0.70	0.66	0.60	0.55	0.50
F_{LP2}	0.85	0.82	0.78	0.73	0.68	0.62	0.56	0.50	0.45
F_{LP3}	0.85	0.82	0.78	0.73	0.67	0.61	0.54	0.49	0.43

F_{LP1} = One dimension bigger pipe size
F_{LP2} = Two dimensions bigger pipe size
F_{LP3} = Three dimensions bigger pipe size

Liquid pressure recovery factor F_L

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

Pressure and temperature rating

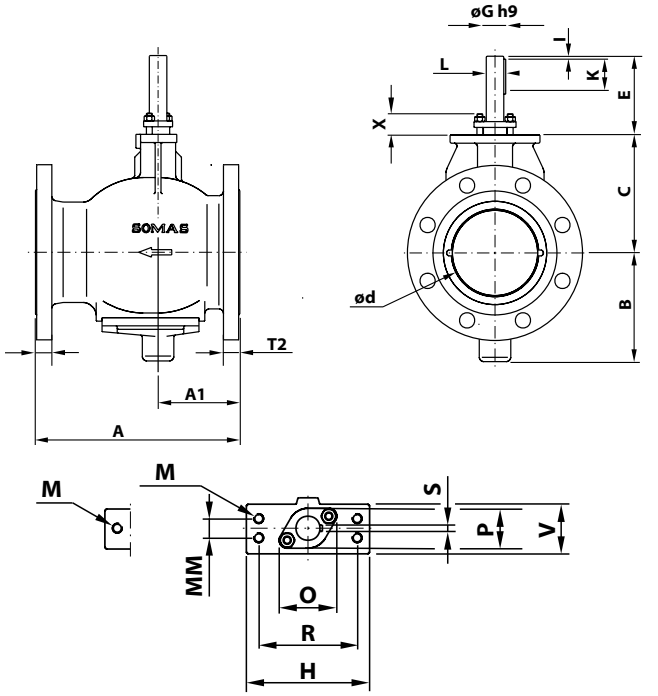
According to the material in the seat.

	Seat	Max. working pressure (bar/psi) at temperature (°C/°F)											
	Code	0 °C	32 °F	150 °C	300 °F	170 °C	340	200 °C	400 °F	350 °C	660 °F	> 350 °C	> 660 °F
PN10	A (PTFE)	10 bar	145 psi	9 bar	131 psi	8,7 bar	126 psi	-	-	-	-	Contact Somas	
	B (PTFE53)	10 bar	145 psi	9 bar	131 psi	8,7 bar	126 psi	5,05 bar	73,2 psi	-	-		
	T (HiCo)	10 bar	145 psi	9 bar	131 psi	8,7 bar	126 psi	8,4 bar	122 psi	7,1 bar	103 psi		
PN25	A (PTFE)	25 bar	363 psi	22,7 bar	329 psi	22 bar	319 psi	-	-	-	-	Contact Somas	
	B (PTFE53)	25 bar	363 psi	22,7 bar	329 psi	22 bar	319 psi	12,6 bar	183 psi	-	-		
	T (HiCo)	25 bar	363 psi	22,7 bar	329 psi	22 bar	319 psi	21 bar	305 psi	10,65 bar	154 psi		

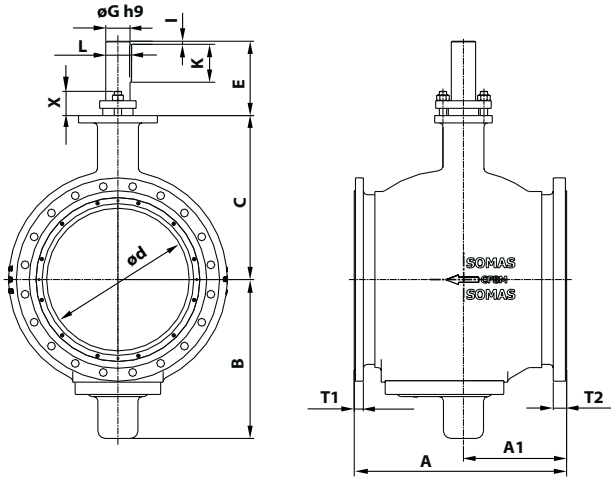
Minimum working temperature -60°.
If lower temperatures are needed contact Somas.

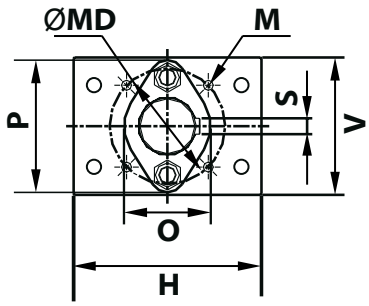
Flanged design

DN 80-400

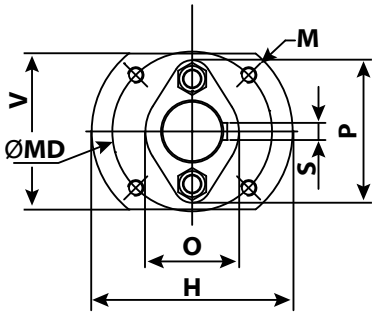


DN 500-600





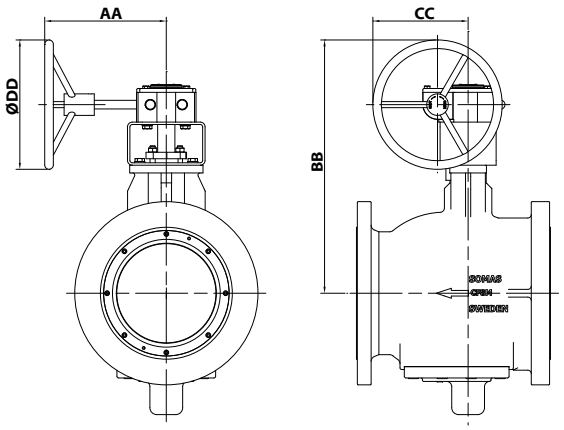
DN 400-500



DN 600

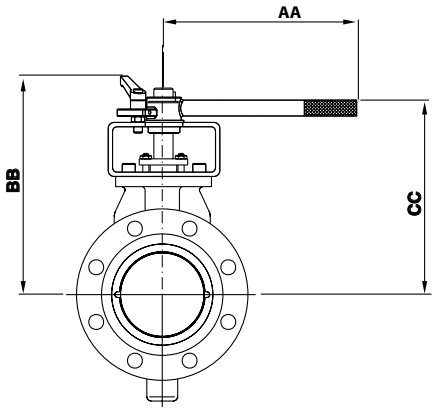
Ball segment valve type KVTF/KVXF (valve body in one piece)

DN	PN	A	A1	B	C	ød	E	øG	H/øH	I	K	L	M	øMD	MM	O	P	R	S	T1	T2	V	X	Weight
80	25	280	82	102	115	75	115	20	125	5	45	22,5	M12	–	–	61	42	98	6	24	24	48	30	18
100	25	300	94	116	140	92	115	20	125	5	45	22,5	M12	–	–	61	42	98	6	26	26	48	30	26
125	25	325	118	151	176	124	115	25	125	5	45	28	M12	–	–	66	47	98	8	26	26	50	30	38
150	25	350	140	187	202	145	135	30	155	5	60	33	M12	–	24	77	50	123	8	28	28	62	35	61
200	25	400	159	230	242	189	135	35	155	5	50	38	M12	–	24	85	55	123	10	30	39	62	50	95
250	25	450	191	281	297	232	155	40	170	5	50	43	M12	–	40	94	75	123	12	34	45	85	50	154
300	25	500	210	340	353	282	200	50	180	5	80	53,5	M16	–	55	105	85	136	14	37	46	95	50	214
350	25	550	241	385	393	326	210	60	225	5	90	64	M20	–	70	115	105	150	18	41	50	128	60	304
400	25	600	269	449	447	370	225	70	220	6	110	75	M16	160	–	112	162	–	20	43	52	154	60	395
500	16-25	700	340	525	540	470	245	80	260	10	120	85	M16	160	–	120	183	–	22	52	62	190	75	637
500	10	700	340	525	540	470	245	80	260	10	120	85	M16	160	–	120	183	–	22	30	44	190	75	520
600	10	800	410	563	570	560	352	80	258	10	160	85	M20	205	–	120	183	–	22	36	46	200	76	850
600	16	800	410	563	570	560	352	80	258	10	160	85	M20	205	–	120	183	–	22	54	63	200	76	970



Ball segment valve type KVTF/KVXF with hand gear

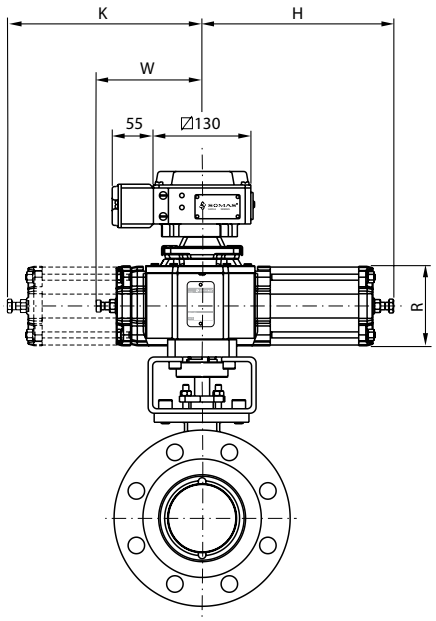
DN	Type	AA	BB	CC	øDD	Weight
80	**AB215N**	217	320	152	200	27
100	**AB215N**	217	344	152	200	35
125	**AB215N**	217	380	152	200	47
150	**AB215N**	217	411	172	300	74
200	**AB550N**	282	503	221	300	110
250	**AB550N**	282	586	221	300	169
300	**AB880N**	275	690	261	350	236
350	**AB2000N**	318	794	303	500	343
400	**AB2000N**	318	848	430	500	424
500	**AB1950N/PR 4**	398	1015	430	600	564
600	**AB1950N/PR 4**	398	1045	430	600	735

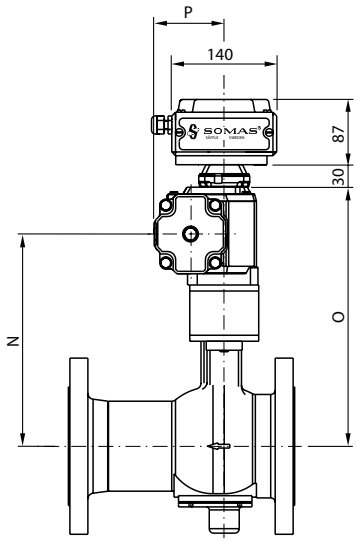


Ball segment valve type KVTF/KVXF with hand lever

DN	Type	AA	BB	CC	Weight
80	**HSR20**	355	240	210	21
100	**HSR20**	355	265	235	29

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	-	37
125	**A22**	255	260	320	380	94	106	-	49
125	**A23**	305	-	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	-	625	751	211	228	315	290
350	**A41**	550	-	666	792	211	228	315	380
350	**A42**	545	560	666	792	211	228	-	395
400	**A42**	545	560	720	846	211	228	-	490
500	**A42**	545	560	813	940	211	228	-	615
500	**A43**	680	-	813	940	279	354	315	672
600	**A42**	545	560	*952*	*990*	211	228	-	*805*
600	**A43**	680	-	*952*	*990*	279	354	315	*862*

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
500	**-**	-	-	-	-	-	-	-	-
600	**-**	-	-	-	-	-	-	-	-

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

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
600	80	5750	12000

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

	Opening angle									
DN	**10°**	**20°**	**30°**	**40°**	**50°**	**60°**	**70°**	**80°**	**90°**	**ζ 90°**
80	15	39	67	102	138	184	231	295	340	0.56
100	23	58	101	154	208	276	348	444	510	0.61
125	43	109	189	288	390	519	652	817	925	0.45
150	60	153	264	402	544	725	910	1123	1295	0.48
200	100	253	437	665	901	1197	1507	1923	2210	0.52
250	155	390	677	1030	1395	1853	2333	2976	3425	0.53
300	219	552	959	1459	1977	2626	3303	4216	4850	0.55
350	308	780	1355	2058	2793	3708	4667	5952	6843	0.51
400	385	878	1698	2580	3497	4645	5845	7482	8570	0.55
500	607	1539	2673	4063	5508	7318	9208	11746	13500	0.54
600	876	2220	3857	5864	7949	10560	13288	16951	19486	0.54

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

Flange standard

Somas ball segment 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 13.

DN	PN	Class
80-100	PN10/16/25	Cl. 150
125	PN10/16/25	Cl. 150
150-250	PN10/16/25	Cl. 150
300-400	PN10/16/25	Cl. 150
500	PN10/16/25	-
600	PN10	-

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 documents library on www.Somas.se.

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.

In the documents library on www.Somas.se there is also information about positioners, limit switches and solenoid valves.

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-port 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-port are available in the valve sizing program SOMSIZE.

Selection table

KVTF/KVXF		Pneumatic actuators						Manual operation	
		Double acting		Spring return					
Valve	Shaft			Spring to close		Spring to open			
DN	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	A23-SC	A23-SC	A23-SO	A23-SOL	HSR020	AB215N
100	20	A21	A22	A23-SC	A23-SC	A23-SO	A23-SOL	HSR020	AB215N
125	25	A22	A23	A24-SC	A24-SC	A24-SO	A24-SOL		AB215N
150	30	A31	A31	A33-SC	A33-SC	A33-SO	A33-SOL		AB215N
200	35	A31	A32	A33-SC	A33-SC	A33-SO	A33-SOL		AB550N
250	40	A32	A32	A34-SC	A34-SC	A34-SO	A34-SOL		AB550N
300	50	A41	A41	A43-SC	A43-SC	A43-SO	A43-SOL		AB880N
350	60	A41	A42	A43-SC	A43-SC	A43-SO	A43-SOL		AB2000N
400	70	A42	A42	A44-SC	A44-SC	A44-SO	A44-SOL		AB2000N
500	80	A42	A43	-	-	-	-		AB1950N/PR4
600	80	A42	A43	-	-	-	-		AB1950N/PR4

Ordering

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

Valve specification system

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

1 Type of valve

Flanged design

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

2 Valve body design

B = Flanged design (body in one piece)

3 Nominal pressure

2 = PN 10
5 = PN 25

4 Material – valve body

A = CF8M /1.4408
C = 1.4409
E = CK-3MCuN
H = 1.4470
S = Titan Gr. C-2
Z =1.4469

5 Material – ball segment

H = 1.4462 alt. 1.4470
J = 1.4460 alt SS2324-12
K = 1.4460 alt SS2324-12, hard chromed
L = 1.4460 alt. SS2324-12, HiCo Gr 21- coated
S = CK-3MCuN alt. 1.4547
U = Titan Gr. C-2 / Gr 2

6 Material – seat

A = PTFE (10% carbon (percentage by weight)
B = PTFE 53 (50% PTFE + 50% 1.4435 powder (percentage by weight)
T = HiCo Gr 6 alt. 1.4404, HiCo Gr 6 alt. Gr 21 coated

7 Material – shaft

A = 1.4460 alt. SS 2324-12
B = 1.4460 alt. SS 2324-12, hardchromed
J = CK-3MCuN alt. 1.4547 Titan Gr C-3 /Gr 3
T = Titan Gr 2 alt. Gr C-3 alt. Gr 3
Z = 1.4462 alt. 1.4470

8 Bearings – valve body/shaft

1 = Without bearing
4 = PTFE (Rulon)
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.

Somas.se LinkedIn

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