Datasheet
Ball segment valve
KVTW-A/KVXW-A

Si-113 EN

Edition: 2024-05

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

Option

- Ball segment with V-port for high mass concentrations
- Ball segment with Low Noise Trim, sound-dampening insert for high ΔP



Type KVTW-A/KVXW-A:	**Wafer design**	
Nominal pressure:	**PN 40/Class 300**	**PN 25/Class 150**
Nominal size:	**DN 25/15 - 65**	**DN 80 - 250**
	NPS 1 - 2 1/2	**NPS 3-10**

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Sales and distribution

Somas Instrument AB
P.O. Box 107
SE-661 23 SÄFFLE, Sweden
Visiting address: Norrlandsv. 26-28

Phone: +46 533 69 17 00
Mail to: sales@somas.se
Internet: www.somas.se

Product Information

The Somas ball segment valve type KVTW with a centrically mounted shaft, and KVXW with an eccentrically mounted shaft are of wafer design. The valve called the A-version is manufactured in standard face to face dimensions common in certain markets.

The valve is also manufactured in D-type version with a short face to face dimension. (See Si-114).

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 [High Cobalt Alloy]).

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 KVTW for liquids, media containing impurities etc. For dry and clean media choose KVXW. In the KVXW-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 on DN50 to DN250. 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 DN50 to DN250 with V-port is available for use at high fiber 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

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 issues are mostly related to cavitations 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 issues can be solved.

See data sheet Si-108 for more theoretical information.

For controlling suspensions with high fiber 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.



V-port for high mass concentrations.



Low Noise trim

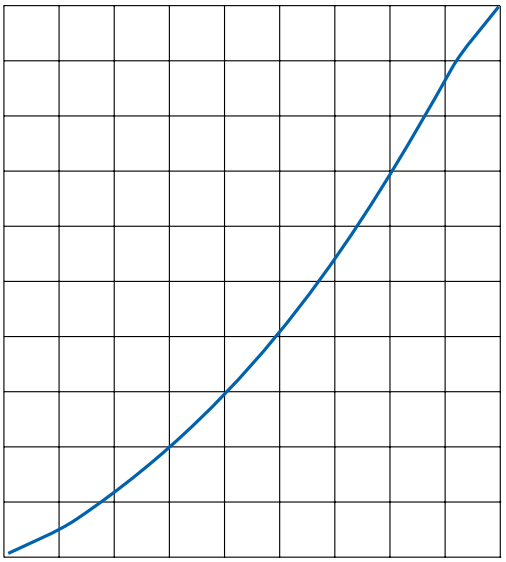
Tightness class

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
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



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								
Factor	**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

Pipe geometry factor F_P

Valve	Pipe				Opening angle					
DN	**DN**	**10°**	**20°**	**30°**	**40°**	**50°**	**60°**	**70°**	**80°**	**90°**
	32				0.98	0.96	0.93	0.90	0.85	0.81
25	40	1.0	0.99	0.98	0.95	0.91	0.85	0.79	0.71	0.66
	50				0.92	0.87	0.80	0.73	0.64	0.59
	50				0.98	0.97	0.94	0.91	0.87	0.83
40	65	1.0	0.99	0.98	0.95	0.91	0.85	0.79	0.71	0.66
	80				0.92	0.87	0.80	0.73	0.64	0.59
	65				0.98	0.96	0.93	0.89	0.86	0.84
50	80	1.0	0.99	0.98	0.95	0.91	0.85	0.79	0.71	0.66
	100				0.92	0.87	0.80	0.73	0.64	0.59
	80				0.99	0.98	0.97	0.96	0.93	0.91
65	100	1.0	0.99	0.98	0.95	0.91	0.85	0.79	0.73	0.64
	125				0.92	0.87	0.80	0.73	0.64	0.59

Pressure and temperature rating

According to seat material and body material.

		Max working temperature								
Seat material		**150°C**		**170°C**		**200°C**		**350°C**		**>350°C**
Code		**300°F**		**340°F**		**400°F**		**660°F**		**>660°F**
PN50	**A (PTFE)**	36.3 bar	526 psi	35.3 bar	512 psi	-	-	-	-	-
	B (PTFE53)	36.3 bar	526 psi	35.3 bar	512 psi	20.15 bar	292 psi	-	-	Consult Somas
	T (HiCo)	36.3 bar	526 psi	35.3 bar	512 psi	33.7 bar	489 psi	17.03 bar	247 psi	
PN25	**A (PTFE)**	22.7 bar	329 psi	22 bar	319 psi	-	-	-	-	-
	B (PTFE53)	22.7 bar	329 psi	22 bar	319 psi	12.6 bar	183 psi	-	-	Consult Somas
	T (HiCo)	22.7 bar	329 psi	22 bar	319 psi	21 bar	305 psi	10.65 bar	155 psi	

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

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

Metric

	Opening angle									
DN	**10°**	**20°**	**30°**	**40°**	**50°**	**60°**	**70°**	**80°**	**90°**	**ζ 90°**
25/15	0.21	0.90	1.8	2.8	3.8	5.7	8.1	9.9	-	-
25/20	0.21	0.95	2	4.3	6.8	9.5	13.9	20	-	-
25	1.7	4.3	7.5	11.3	15.4	20.4	25.7	32.8	38	0.57
40/32	1	3.3	6.9	12.9	19	25	35	48	-	-
40	4.3	11	19	29	39	53	66	84	96	0.44
50	6.8	17	30	45	61	82	103	131	150	0.44
65	9.8	25	43	65	87	113	139	171	191	0.77
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 Cv and Resistance factor ζ for ball segment valve type KVTW/KVXW

US

	Opening angle									
NPS	**10°**	**20°**	**30°**	**40°**	**50°**	**60°**	**70°**	**80°**	**90°**	**ζ 90°**
1/0.6	0.24	1.0	2.1	3.3	4.4	6.6	9.4	11.5	-	-
1/0.8	0.24	1.1	2.3	5.0	7.9	11.0	16.2	23.3	-	-
1	2.0	5.0	8.7	13.1	17.9	23.7	29.9	38.1	44.2	0.57
1.5/1.25	1.2	3.8	8.0	15.0	22.1	29.1	40.7	55.8	-	-
1.5	5.0	12.8	22.1	33.7	45.3	61.6	76.7	97.7	112	0.44
2	7.9	19.8	34.9	52.3	70.9	95.3	120	152	174	0.44
2,5	11.4	29.1	50.0	75.6	101	131	162	199	222	0.77
3	17.4	45.3	77.9	119	160	214	269	343	395	0.57
4	26.7	67.4	117	179	242	321	405	516	593	0.62
6	50.0	127	220	335	453	603	758	950	1076	0.44
8	76.7	194	335	510	691	919	1156	1474	1686	0.45
10	113	285	494	751	1017	1351	1701	2170	2500	0.44

Metric (mm)
Ball segment valve type KVTW -A (standard)

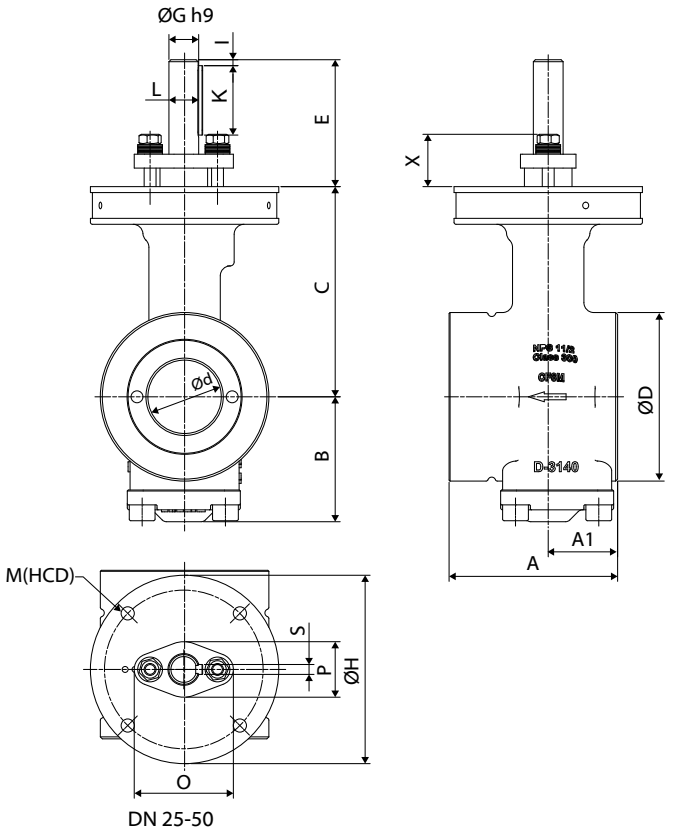
DN	PN	A (mm)	A1 (mm)	B (mm)	C (mm)	Ød (mm)	ØD (mm)	E (mm)	ØG (mm)	H (mm)	I (mm)	K (mm)	L (mm)	HCD (mm)	M (mm)	MM (mm)	O (mm)	P (mm)	R (mm)	S (mm)	V (mm)	X (mm)	Weight (kg)
25	40	60	31	47	83	25	65	62	15	75	3	35	17	60	M6	-	50	28	0	5	0	25	2.3
40	40	85	35	63	106	37	85	64	15	95	3	35	17	80	M8	-	50	28	0	5	0	25	4.4
50	40	95	43	72	106	50	102	64	15	105	3	35	17	80	M8	-	50	28	0	5	0	25	5.6
65	40	120	56	90	115	60	122	115	20	127	5	45	22.5	-	M12	-	61	42	98	6	48	30	8.5
80	25	111	64	102	115	75	140	115	20	127	5	45	22.5	-	M12	-	61	42	98	6	48	30	8.5
100	25	125	73	116	140	92	162	115	20	127	5	45	22.5	-	M12	-	61	42	98	6	48	30	11.5
150	25	170	101	151	176	124	216	115	25	127	5	45	28	-	M12	-	64	47	98	8	50	30	24
200	25	215	124	187	202	156	270	135	30	154	5	60	33	-	M12	24	72	50	123	8	62	40	44
250	25	260	150	230	242	189	324	135	35	154	5	50	38	-	M12	24	75	55	123	10	70	40	71

US (in)
Ball segment valve type KVTW-A (standard)

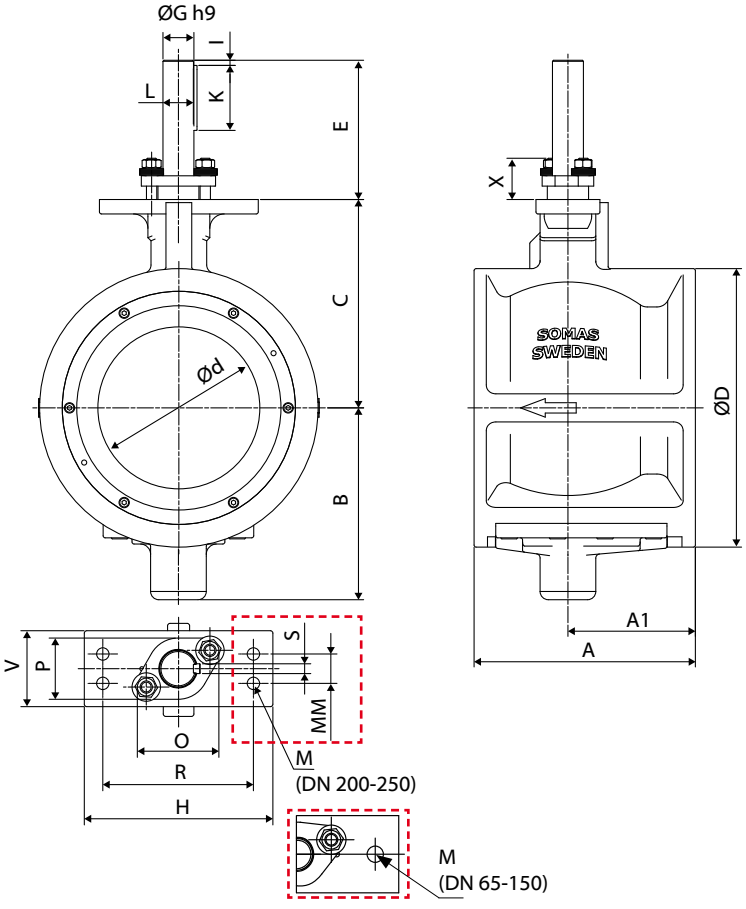
NPS	Class	A (in)	A1 (in)	B (in)	C (in)	Ød (in)	ØD (in)	E (in)	ØG (in)	H (in)	I (in)	K (in)	L (in)	HCD (in)	M (in)	MM (in)	O (in)	P (in)	R (in)	S (in)	V (in)	X (in)	Weight (lbs)
1	300	2.36	1.22	1.85	3.27	0.98	2.56	2.44	0.59	2.95	0.12	1.38	0.67	2.36	M6	-	1.97	1.10	0.00	0.20	0.00	0.98	5.07
1.5	300	3.35	1.38	2.48	4.17	1.46	3.35	2.52	0.59	3.74	0.12	1.38	0.67	3.15	M8	-	1.97	1.10	0.00	0.20	0.00	0.98	9.7
2	300	3.74	1.69	2.84	4.17	1.97	4.02	2.52	0.59	4.13	0.12	1.38	0.67	3.15	M8	-	1.97	1.10	0.00	0.20	0.00	0.98	12.35
2.5	300	4.72	2.20	3.54	4.53	2.36	4.80	4.53	0.79	5.00	0.20	1.77	0.89	-	M12	-	2.40	1.65	3.89	0.24	1.89	1.18	18.74
3	150	4.37	2.52	4.02	4.53	2.95	5.51	4.53	0.79	5.00	0.20	1.77	0.89	-	M12	-	2.40	1.65	3.86	0.24	1.89	1.18	18.74
4	150	4.92	2.87	4.57	5.51	3.62	6.38	4.53	0.79	5.00	0.20	1.77	0.89	-	M12	-	2.40	1.65	3.86	0.24	1.89	1.18	25.35
6	150	6.69	3.98	5.95	6.93	4.88	8.50	4.53	0.98	5.00	0.20	1.77	1.10	-	M12	-	2.52	1.85	3.86	0.32	1.97	1.18	52.91
8	150	8.47	4.88	7.36	7.95	6.18	10.63	5.31	1.18	6.06	0.20	2.36	1.30	-	M12	0.94	2.84	1.97	4.84	0.32	2.44	1.58	97.00
10	150	10.24	5.91	9.06	9.53	7.48	12.76	5.31	1.38	6.06	0.20	1.97	1.50	-	M12	0.94	2.95	2.17	4.84	0.39	2.76	1.58	156.53

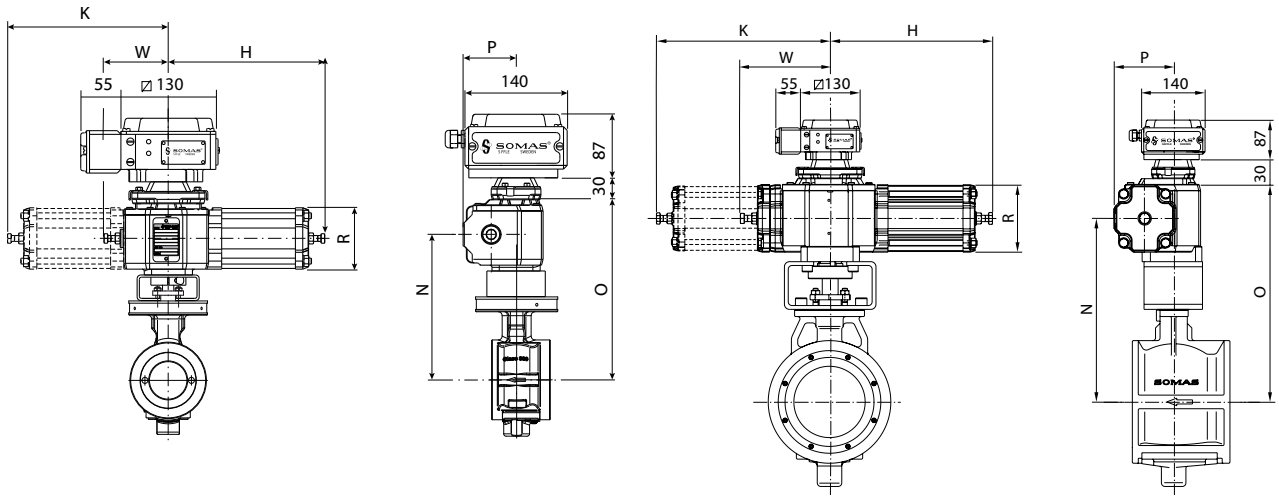
Wafer design

DN 25-50



DN 65-250





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

DN	Type	H	K	N	O	P	R	W	Weight
25	**A11**	215	-	170	215	73	84	90	7
40	**A11**	215	-	190	240	73	84	90	9
50	**A13**	250	-	200	250	83	106	90	12
65	**A21**	255	-	260	345	94	106	140	18
65	**A22**	255	260	260	345	94	106		20
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	3,45	94	106	-	23
150	**A22**	255	260	320	385	94	106	-	35
150	**A23**	305	-	320	385	117	152	140	33
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

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

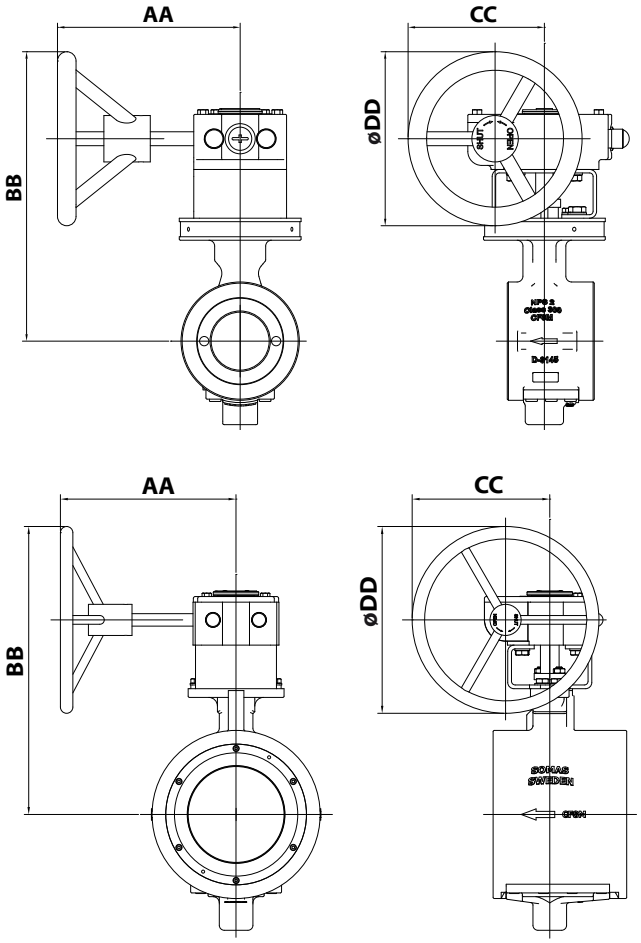
Ball segment valve type KVTW/KVXW with actuator type A-SC/SO

DN	Type	H	K	N	O	P	R	W	Weight
25	**A13-X**	325	-	170	215	83	106	90	11
40	**A13-X**	325	-	190	240	83	106	90	13
50	**A13-X**	325	-	201	250	83	106	90	14
50	**A23-X**	415	-	240	305	117	152	140	22
65	**A23-X**	415	-	280	345	117	152	140	26
80	**A23-X**	415	-	260	320	117	152	140	26
100	**A23-X**	415	-	285	345	117	152	140	29
150	**A24-X**	415	420	320	385	117	152	-	51
200	**A33-X**	660	-	400	485	183	228	215	102
250	**A33-X**	660	-	440	525	183	228	215	129

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

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

Wafer design



Ball segment valve type KVTW-A/KVXW-A with hand gear

DN	Type	AA	BB	CC	ØDD	Weight
25	**AB150N**	158	210	117	150	6
40	**AB150N**	158	250	117	150	9
50	**AB150N**	158	260	117	150	11
65	**AB215N**	247	360	117	200	22
80	**AB215N**	247	339	117	200	16
100	**AB215N**	247	364	117	200	19
150	**AB215N**	247	409	117	200	32
200	**AB215N**	282	463	221	300	57
250	**AB550N**	282	513	221	300	84

Actuator selection table air supply 5.5 bar

Valve DN	Shaft (mm) dia.	Closing torque (Nm) Min required Δp>10(bar)	Δp≤10(bar)	Max allowable	Double acting 5,5 (bar) supply air Δp>10(bar)	Δp≤10(bar)	Condition Δp≤10(bar)	Single acting 5,5 (bar) supply air Δp>10(bar)	Δp≤10(bar)	Condition Δp≤10(bar)
25/15-25	15	25	23	80	A11-DA	A11-DA		A13-SC/SO	A13-SC/SO	
40/32-40	15	45	41	80	A11-DA	A11-DA		A13-SC/SO	A13-SC/SO	
50	15	55	50	80	A13-DA	A11-DA		A13-SC/SO	A13-SC/SO	
65	20	120	110	200	A21-DA	A13-DA		A23-SC/SO	A23-SC/SO	
80	20	120	110	200	A21-DA	A13-DA		A23-SC/SO	A23-SC/SO	
100	20	150	120	200	A21-DA	A13-DA	No HiCo	A23-SC/SO	A23-SC/SO	
150	25	250	185	370	A22-DA	A21-DA	No HiCo	A24-SC/SO	A24-SC/SO	
200	30	400	295	640	A31-DA	A22-DA		A33-SC/SO	A24-SC/SO	No HiCo
250	35	600	449	1000	A31-DA	A31-DA		A33-SC/SO	A33-SC/SO	

No HiCo ="No HiCo seats" Valves with HiCo seats should not use PN10 actuators. PTFE/PTFE53 is OK

Actuator selection table air supply 4 bar

Valve DN	Shaft (mm) dia.	Closing torque (Nm) Min required Δp>10(bar)	Δp≤10(bar)	Max allowable	Double acting 4,0 (bar) supply air Δp>10(bar)	Δp≤10(bar)	Condition Δp≤10(bar)	Single acting 4,0 (bar) supply air Δp>10(bar)	Δp≤10(bar)	Condition Δp≤10(bar)
25/15-25	15	25	23	80	A11-DA	A11-DA		A13-SCL/SOL	A13-SCL/SOL	
40/32-40	15	45	41	80	A11-DA	A11-DA		A13-SCL/SOL	A13-SCL/SOL	
50	15	55	50	80	A13-DA	A11-DA		A23-SC/SOL	A23-SC/SOL	
65	20	120	110	200	A22-DA	A21-DA		A23-SC/SOL	A23-SC/SOL	
80	20	120	110	200	A22-DA	A21-DA		A23-SC/SOL	A23-SC/SOL	
100	20	150	120	200	A22-DA	A21-DA	No HiCo	A23-SC/SOL	A23-SC/SOL	
150	25	250	185	370	A23-DA	A22-DA		A24-SC/SOL	A24-SC/SOL	
200	30	400	295	640	A24-DA	A23-DA	No HiCo	A33-SC/SOL	A24-SC/SOL	No HiCo
250	35	600	449	1000	A32-DA	A31-DA	No HiCo	A33-SC/SOL	A33-SC/SOL	

No HiCo ="No HiCo seats" Valves with HiCo seats should not use PN10 actuators. PTFE/PTFE53 is OK
SC/SCL = Spring to close at air failure
SO/SOL = Spring to open at air failure

Face to face dimension

According to Industrial branch standards, standard face to face dimension.

Flange standard

Somas ball segment valves type KVTW DN 80–250 and KVXW with nominal size DN25–250 are flangeless and should be clamped between flanges.

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

Ordering

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

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 gear units, 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.

Valve sizing

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

Valve specification system

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

1 Type of valve
KVTW (centrically mounted segment)
KVXW[2] (excentrically mounted segment)
KVTW LN[1] (centrically mounted segment, Low Noise)
KVXW LN[1] (excentrically mounted segment, Low Noise)
KVMW (ball segment with V-port)

2 Valve body design
A = Wafer style design according to branch standard
Standard face to face length

3 Nominal pressure
5 = PN25
6 = PN40/Class 300

4 Material – valve body
A = CF8M (1.4408)
E = CK-3MCuN
H = 1.4470
S = Titan Gr C-2
T = CW6M (High Nickel Alloy)
Z = 1.4469

5 Material – segment
F = 1.4307 alt. 1.4309
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
N = 1.4469 alt. 1.4410
S = CK-3MCuN alt. 1.4547
T = 1.4409 alt. 1.4404
U = T itan Gr C-2 / Gr 2
V = CW6M (High Nickel Alloy)
Y = 1.4462 alt. 1.4470

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 Hard chromed
J = CK3MCuN alt. 1.4547
S = 1.4469 alt. 1.4410
T = Titan Gr C-3 alt. Gr 3
U = CW6M (High Nickel Alloy)
Z = 1.4462 alt. 1.4470

8 Material bearings
1 = Without bearing
4 = PTFE (Rulon)
6 = N06625 (High Nickel Alloy)
7 = 1.4462
8= 316L PTFE coated

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

1) From DN 50
2) From DN 25

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

Somas reserves the right to make improvements without prior notice.

Somas.se LinkedIn

Head office:
Somas Instrument AB
Norrlandsvägen 26
SE-661 40 SÄFFLE
Sweden

Phone: +46 (0)533 69 17 00
E-mail: sales@somas.se
www.somas.se

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