

PRODUCT DATA SHEET

Ramén Ball Sector Valve type KSC



Ramén Valves

We know the flow

Electric | Pneumatic

Kvs 0.025-390 | DN 25 - 100 | Wafer | PN 40/25 | Stainless steel | Soft or metal seat



Pneumatic KSC



Electric KSC

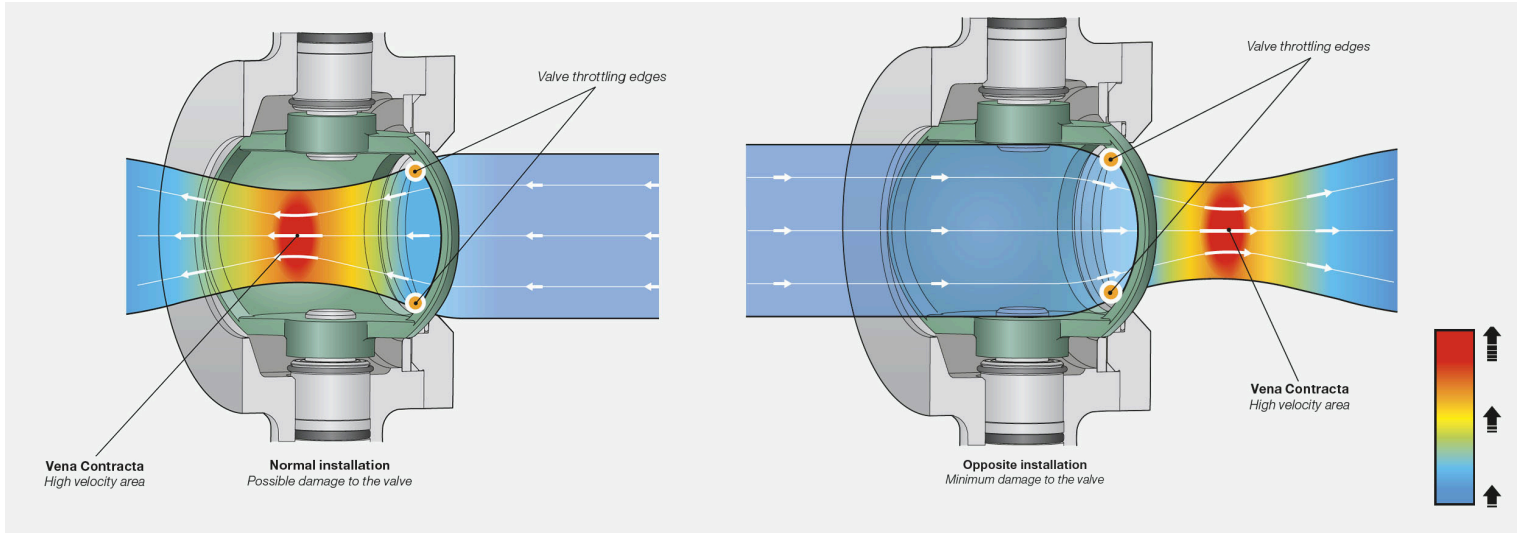
The Ramén KSC control valve series is a brand-new innovative solution that offers the highest performance for controlling and isolating gases and fluids. With a broad range of flow capacities and flangeless (wafer) design, it is the most compact solution on the market in any installation. The KSC comes in two shapes, electrical or pneumatic with highest rangeability and lowest hysteresis in any configuration. Soft or metal seated designs makes it possible to optimize life cycle cost for any application.

Typical applications: Industrial water and wastewater recycling / pH Control / Toxic Fluid / Steam / Lubricating systems / Burners, furnaces / Anti-Surge Control / Vacuum systems

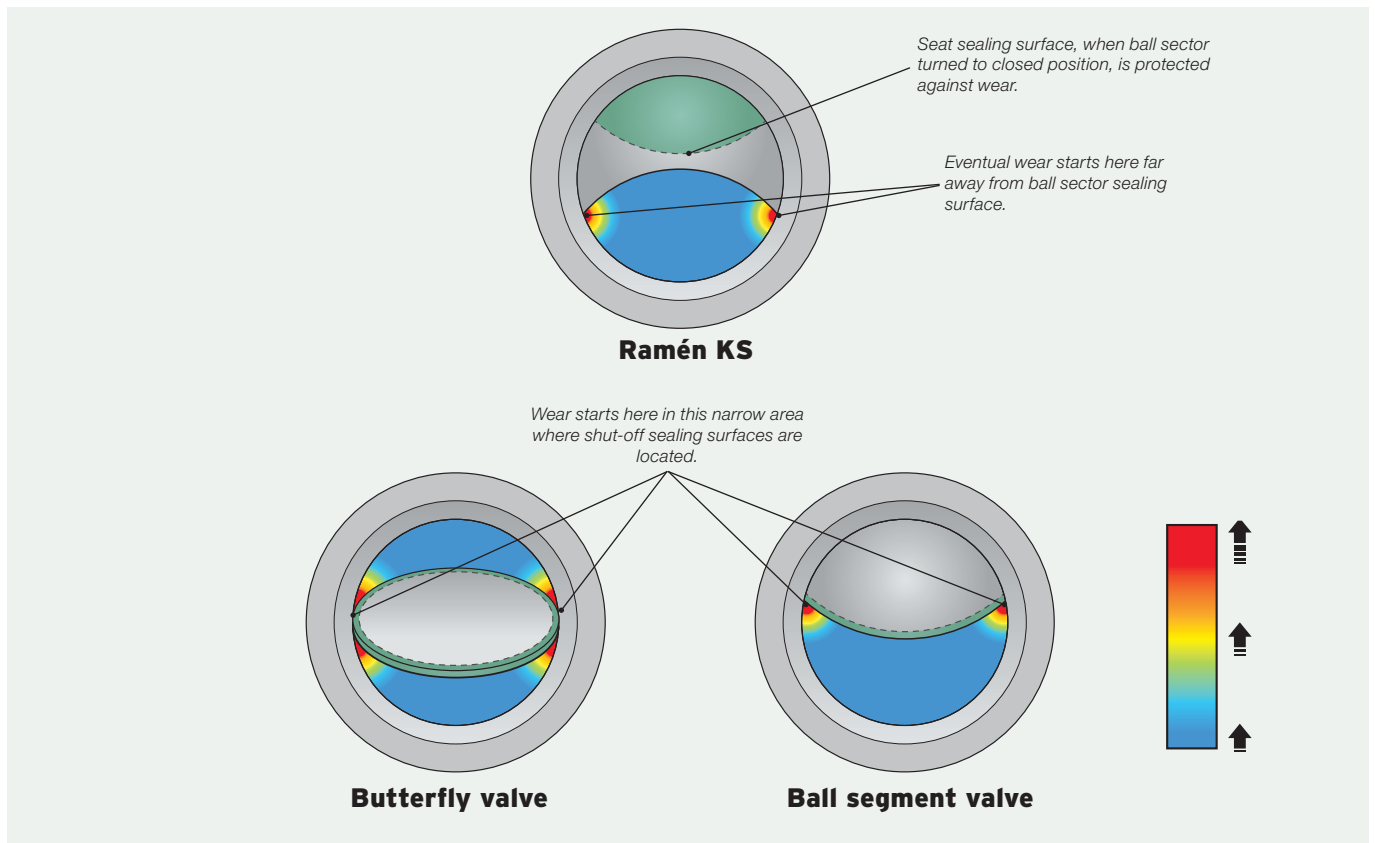
Benefits of the KSC construction

- **Control and rangeability:** control from 0-100% opening with up to 300:1 rangeability.
- **Controllability:** inherent equal percentage characteristic to manage any process independent of delta p.
- **Compact design:** Minimized build length, wafer design and low weight gives easy installation and limiting the stress on piping.

- **Self-draining and centric design with no hidden cavities:** No fluid entrapment making sure not to get unnecessary thermal expansion problems. It also avoids wear and tear to seat and sealing.
- **No hysteresis:** as the valve is trunnion mounted and is provided with a zero-backlash coupling, the valve has no hysteresis and offer an excellent repeatability.
- **No leakage:** class VI tight shut off, offering the solution to use the valve as an on/off valve and control valve.
- **Bi-directional design:** Ramén KSC is normally installed with the throttling ball sector edge on the inlet side of the valve. Thanks to its bidirectional design, it is more appropriate to mount the valve body in the opposite direction when controlling abrasive media. With the throttling orifice placed on the outlet side of the valve, velocity and thereby abrasion in the valve body is reduced to a minimum or more often to zero.



- **Easy maintenance:** Designed for service, all essential parts are easily replaced for optimal performance and life cycle cost.
- **Suitable for slurry applications:** The Ramén KSC valve seat is fully protected by the ball sector in the open position and fully supported from 0° to 90°, whereas in other valve types such as segmented ball valves the seat is fully exposed to media and there is no segment support in the open position. The ball sector design in a Ramén KSC offers increased wear-and-tear resistance for abrasive media and a secured tight shut-off with any media.



Technical specifications Ball Sector Valve (For all KSC configurations)		
Design		Flangeless, wafertype
Nominal sizes		DN 25 - DN 100, ½"-4"
Material	Body Shafts Ball Sector Seat Seat holding ring O-rings Bearing	EN 1.4409, AISI 316L EN 1.4460, AISI 329 EN 1.4409 +Cr*, AISI 316L+Cr* PTFE (Carbon/graphite reinforced) EN 1.4409, AISI 316L Viton® Rulon®
Nominal pressure	DN 25 - DN 50 DN 80 - DN 100	PN 40 (for flange PN 10/40 and ANSI 150/300/600) PN 25 (for flange PN 10/25 and ANSI 150/300)
Operating temperature		-40° C - 170° C. -40° F - 338° F
Seat leakage class according to EN60534-4		VI
Shell test according to EN12266-1		No leakage detectable
Characteristic		Equal percentage
Rangeability		Up to 300:1

*Hard chromed ball sector for DN25

Technical specifications Pneumatic modulating KSC	
Pneumatic actuator	
Type for modulating KSC	Double acting
Type for ON/OFF KSC	Spring return
Rotation angle	0° to 90°
Operating pressure	2 - 10 bar
Housing	Anodized aluminum
Operating temperature	-30°C to +80°C
Drive medium	Air (Dry or lubricated), or inert gases (Non-dangerous fluids)
Protection class	IP67
Intelligent positioner	
Input signal	4-20 mA, two wires system
Supply air pressure	1.4 - 6 bar
Communication protocol	HART 7
Housing	Aluminum coated
Protection class	IP66 and NEMA 4X
Operating temperature	-40°C to +85°C
1/4 NPT	1/4 NPT
Electrical connection	M20x1.5
Filter regulator with pressure gague	
Material	Aluminum
Set pressure	0.5 to 7 bar
Max. supply pressure	10 bar
Operating temperature	-5°C to +60°C
Filter element	5 nm
Pneumatic connection	1/4 NPT

Technical specifications Electric modulating KSC

Electrical actuator

Rotation angle	0° to 90°
Standard voltage	1-phase AC current 100 - 240 V / 50 - 60 Hz
Positioner for modulating KSC	4-20 mA input/output or 0-10V
Operating temperature	-30°C to +70°C
Modulating duty	Class C according to EN 15714-2, intermittent duty S4 - 50%, with maximum number of starts 1200 starts/hour.
Local controls	With push buttons (Under cover)
Protection class	IP68
Insulation class	F tropicalized
Bluetooth	Integrated Bluetooth interface for configuring the actuator
Operating time	From 4 to 320s. Continuous
Handwheel	Yes

Technical specifications ON/OFF KSC

Electrical actuator

Rotation angle	0° to 90°
Standard voltage	1-phase AC current 100 - 240 V / 50 - 60 Hz
Positioner for modulating KSC	4-20 mA input/output or 0-10V
Operating temperature	-30°C to +70°C
ON/OFF duty	Classes A and B according to EN 15714-2, short-time duty S2 - 15 min.
Local controls	With push buttons (Under cover)
Protection class	IP68
Insulation class	F tropicalized
Bluetooth	Integrated Bluetooth interface for configuring the actuator
Operating time	From 4 to 320s. Continuous
Handwheel	Yes

Solenoid

Material	Anodized aluminum
Mounting	NAMUR
Min/Max. supply pressure	1.5 / 8 bar
Operating temperature	-10°C to +50°C
Protection class	IP65
Insulation class	F
Voltage	230 VAC, 24 VAC, 24 VDC, 12 VDC
Connection	1/4"

Certificates and approvals

- CE marked acc. To PED 2014/68/EU, Category II, Module D1
- ATEX according to directive 2014/34/EU
- Fugitive emission standards acc. To ISO 15848-1 and VDI 2440 (TA Luft)

Kvs / Cv Ranges

KSC control valves present a broad range of Kvs (Cv) values. The higher Cv value for the same size valve, compared to other valve types, gives ball sector valves an extended control range. This makes them an excellent choice for higher flow capacities with higher turn-down ratios (max flow / min flow) in the process.

KSC in DN25 offers 9 different trims for versatile solutions, controlling very low flowrates within various applications fields. To enable high accuracy and rangeability with zero hysteresis the KSC-25 trims are engineered with individual geometries enabling an outstanding performance in low flow control of liquids and gases.

Size	25/0,03	25/0,3	25/0,7	25/1,3	25/2,5	25/5	25/10	25/15	25/20	40	50	80	100
K_{vs} [m ³ /h]	0,025	0,25	0,6	1,1	2,1	5	7,5	12,5	21	34-64	94	255	390
C_v [gpm]	0,03	0,3	0,7	1,3	2,5	5,8	9	15	25	40-75	110	300	460



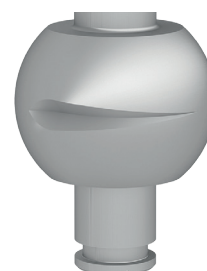
Ball Sector DN40-100



Trim KSC25/20



Trim KSC25/5



Trim KSC25/0,3

Sizing

Kv Values

Valve opening (%)										
Size	10	20	30	40	50	60	70	80	90	100
DN25/0,03	0,0007	0,0018	0,0036	0,0062	0,0093	0,0127	0,0162	0,0195	0,0225	0,025
DN25/0,3	0,007	0,018	0,036	0,062	0,093	0,127	0,162	0,195	0,225	0,25
DN25/0,7	0,016	0,042	0,088	0,149	0,223	0,304	0,388	0,468	0,54	0,6
DN25/1,3	0,03	0,078	0,161	0,273	0,409	0,558	0,711	0,858	0,989	1,1
DN25/2,5	0,06	0,138	0,243	0,656	0,419	0,718	0,976	1,3	1,682	2,1
DN25/5	0,14	0,33	0,58	0,87	1,24	1,71	2,32	3,09	4,01	5
DN25/10	0,22	0,49	0,87	1,31	1,85	2,56	3,49	4,64	6,01	7,5
DN25/15	0,27	0,65	1,17	1,76	2,44	3,32	4,54	6,32	8,92	12,65
DN25/20	0,44	1,09	1,97	2,95	4	5,57	7,63	10,62	14,98	21,24
DN40/25	0,84	1,31	2,63	4,73	7,21	9,65	12,04	15,18	21,13	33,59
DN40/32	1,6	2,47	4,96	8,91	13,51	18,17	22,66	28,57	39,77	63,23
DN50	2,35	3,63	7,28	13,08	19,94	26,68	33,28	41,97	58,41	92,87
DN80	2,57	6,06	15,46	30,37	48,81	68,99	91,39	120,85	168,65	254,62
DN100	3,92	9,26	23,65	46,45	74,65	105,51	139,77	184,83	257,94	389,42

Cv Values

Valve opening (%)										
Size	10	20	30	40	50	60	70	80	90	100
DN25/0,03	0,0007	0,0021	0,0044	0,0074	0,0111	0,0152	0,0194	0,0233	0,0286	0,03
DN25/0,3	0,007	0,02	0,042	0,071	0,108	0,147	0,1788	0,226	0,261	0,3
DN25/0,7	0,016	0,03	0,102	0,174	0,26	0,355	0,453	0,546	0,63	0,7
DN25/1,3	0,03	0,091	0,19	0,323	0,483	0,66	0,841	1,014	1,169	1,3
DN25/2,5	0,06	0,158	0,277	0,148	0,594	0,821	1,116	1,486	1,923	2,4
DN25/5	0,14	0,38	0,67	1,01	4,43	1,98	2,7	3,59	4,65	5,8
DN25/10	0,22	0,57	1	1,52	2,15	2,98	4,04	5,39	6,97	8,7
DN25/15	0,27	0,76	1,34	2,04	2,83	3,85	5,27	7,33	10,34	14,67
DN25/20	0,44	1,25	2,25	3,37	4,69	6,37	8,72	12,13	17,12	24,28
DN40/25	0,84	1,51	3,02	5,43	8,27	11,07	13,81	17,41	24,23	38,52
DN40/32	1,6	2,86	5,73	10,3	15,69	21	26,2	33,04	45,98	73,11
DN50	2,35	4,21	8,44	15,17	23,12	30,94	38,59	48,67	67,73	107,69
DN80	2,57	7,03	17,95	35,26	56,66	80,08	106,09	140,28	195,77	295,56
DN100	3,92	10,73	27,41	53,84	86,52	122,29	161,99	214,21	298,95	451,32

How to size

Calculation of the flow coefficient Kv

Kv for liquids

Volumetric flow:

$$K_v = \frac{q \times \sqrt{\left(\frac{\rho}{1000}\right)}}{\sqrt{(P_u - P_d)}}$$

Mass flow:

$$K_v = \frac{m}{\sqrt{(\rho/1000)(P_u - P_d)}}$$

Kv for gases

If $P_d > P_u / 2$

$$K_v = \frac{0,0019 \times q \times \sqrt{(\rho_g \times T_u)}}{\sqrt{P_d(P_u - P_d)}}$$

Where:

q = volume flow (m³/h)

p = fluid density (kg/m³)

p_g = density of gas at 0°C and 1013 mbar (kg/m³)

P_u = Pressure upstream the valve (bar abs)

P_d = Pressure downstream the valve (bar abs)

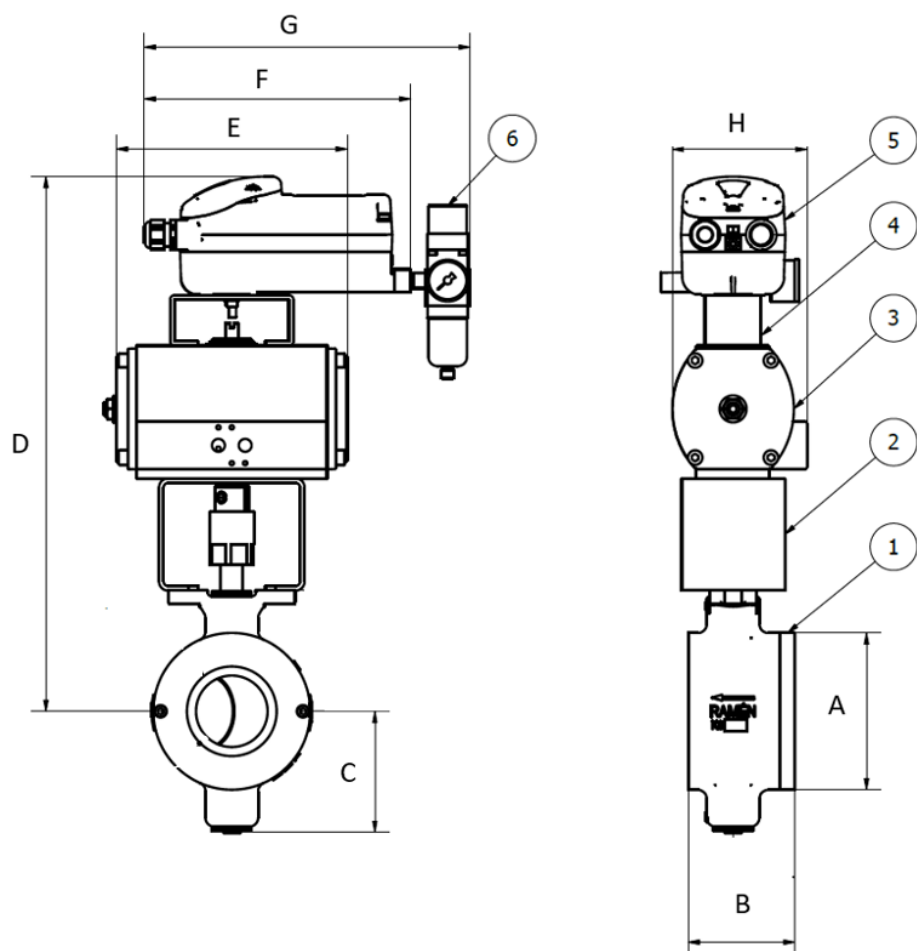
T_u = upstream temperature (K)

m = mass flow (t/h)

Note: Cv = Kv x 1,16

For other process conditions or in case you need any help for sizing according to your process conditions, please contact Ramón Valves.

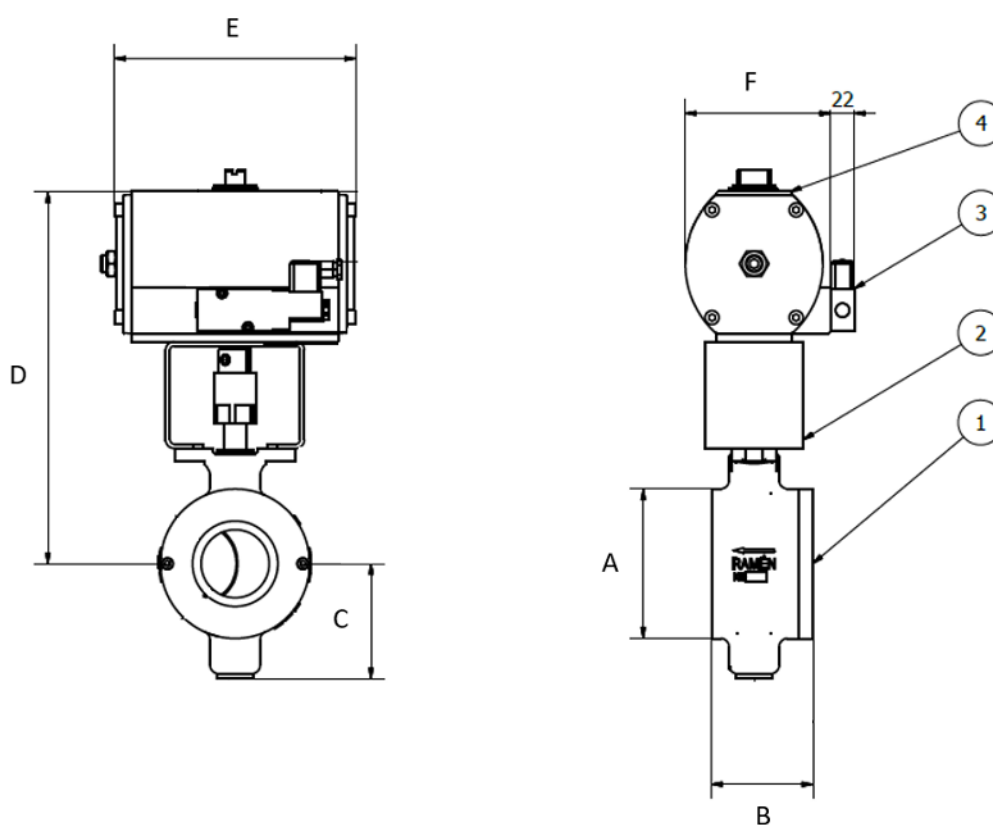
Dimensions KSC pneumatic control



Dimensions					
DN	25	40	50	80	100
A [mm]	70	94	94	140	160
B [mm]	50	71	71	95	112
C [mm]	35	95	95	108	120
D [mm]	382	415	415	478	489
E [mm]	137	177	177	206	206
F [mm]	266	266	266	266	266
G [mm]	88	105	105	121	121
WM DA size	4	8	8	12	12
Weight [kg]	11	14	14	23	25

Part list	
Part no.	Item
1	Ball Sector valve
2	Actuator mounting kit
3	Pneumatic actuator
4	Positioner bracket
5	Positioner

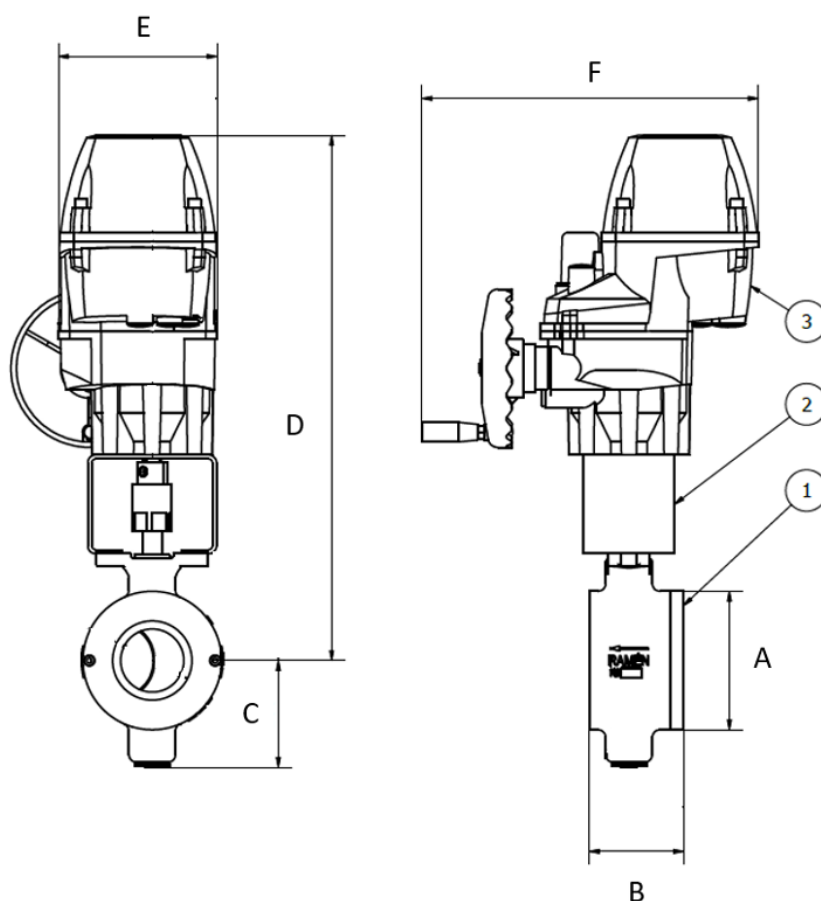
Dimensions KSC ON/OFF



Dimensions					
DN	25	40	50	80	100
A [mm]	70	94	94	140	160
B [mm]	50	71	71	95	112
C [mm]	35	95	95	108	120
D [mm]	249	274	274	349	360
E [mm]	177	206	206	226	226
F [mm]	105	120	120	137	137
WM SR size	8	12	12	20	20
Weight [kg]	7	9	9	16	20

Part list	
Part no.	Item
1	Ball Sector valve
2	Actuator mounting kit
3	Solenoid
4	Pneumatic actuator

Dimensions KSC electrical control or ON/OFF



Dimensions					
DN	25	40	50	80	100
A [mm]	70	94	94	140	160
B [mm]	50	71	71	95	112
C [mm]	35	95	95	108	120
D [mm]	427	442	442	531	542
E [mm]	161	161	161	160	160
F [mm]	315	315	315	339	339
PROFOX size	Q80	Q150	Q150	Q300	Q300
Weight [kg]	11	12	12	19	23

Part list	
Part no.	Item
1	Ball Sector valve
2	Actuator mounting kit
3	Electrical actuator



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