Model EB Series, Segment Eccentric Ball Control Valves with V Series Actuators

Valution model EB Series is a Segment Ball control valve that allows precision control even in fine signal fluctuations as the ball and seat surfaces rotate non-contact, when the center of the body, seat and the center of the valve plug/stem are at an eccentric angle.

It is a control valve that has simple internal flow paths in an Eccentric Ball trim structure, so it can have good effects not only in clean fluid conditions but also in highly corrosive slurry services.

Depending on the characteristics of the eccentric ball, the characteristics of the flow are basically the standard of the Modified Linear, and support of EQ-% by the positioner is possible.

According to the required seat tightness, it is also possible to apply metal or soft seat and to support the fulfillment of the leakage class IV, V, and IV.
The body has a straight shape structure, which has low fluid resistance and enough space around the trim.

This model can apply spring-diaphragm, cylinder and electric motor type actuators.
It mainly performs modulating functions with traditional E/P, smart and HART positioners.

1. Numbering System

V70	-	EB	1	1	1	1

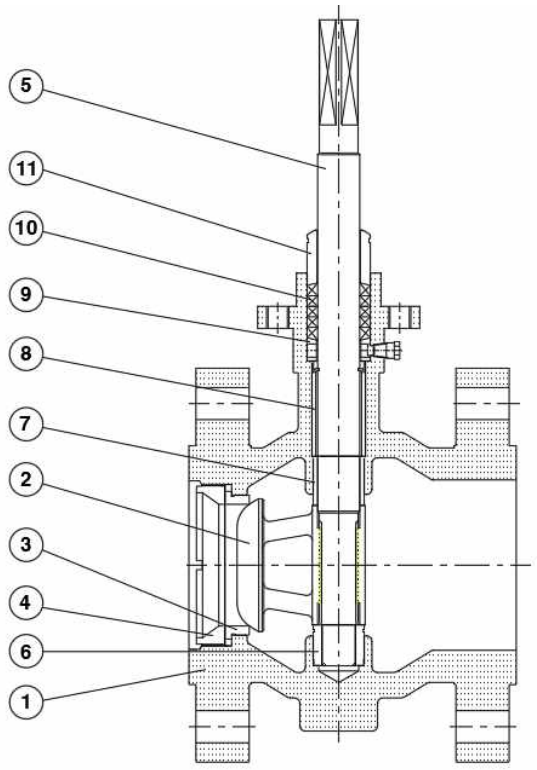
Actuator Type	Model	Body Type	Trim Type	Flow Characteristics	Plug Type
V40. Spring Diaphragm V50. Spring Cylinder Rack & Pinion V60. Cylinder, Double Rack & Pinion V70. Spring Cylinder Scotch Yoke V80. Cylinder, Double Scotch Yoke V90. Electric Motor V01. Other Type	EB	1. Wafer (Flangeless) 2. RF Flanged 3. Other	0. Undefined 1. Metal Seat / Metal Disc 2. Soft Seat / Metal Disc 3. Other	0. Undefined 1. Modified Linear 2. EQ-%(Option) 3. Other	0. Undefined 1. E-Ball 2. E-Ball + 1 Stage 3. E-Ball + 2 Stage 4. Other

2. Features

1. Allows precision control even in fine signal fluctuations as the ball and seat surfaces rotate non-contact when the center of the body/seat and the center of the valve plug/stem are at an eccentric angle.
2. The detachable seat retainer design provides easy access to the trim parts of the valve through the valve inlet by simply removing the retainer screw, thus allowing users to save a lot of costs by maintenance the seat spare instead of replacing the entire valve body.
3. The split connection between the stem and the ball ensures correct control and a low hysteresis.
4. Excellent trunnion bearing technology is designed to provide excellent wear resistance.
5. Rugged metal seating options are ideal for high temperatue applications or slurries.
6. Eccentric mounting seats improve sealing performance through non-contact rotation of the ball.
7. The non-contact action between the ball and the seat facilitates smooth and unblocked operation, perfect for fiber or slurry application.

3. Body Type

■ Model EB Eccentric Ball, Sectional View



■ Model EB Segment Ball, Parts & Materials

No.	Part Name	Q`ty(EA)	Materials
1	Body	1	WCB, CF8, CF8M, CF3M, Others
2	Eccentric Ball	1	CF8(M), CF3(M), HCr or Stellite Surfacing, Others
3	Seat Ring	1	CF8(M), CF3(M), HCr or Stellite Surfacing, Others
4	Seat Retainer	1	304(L), 316(L)SS, 317(L)SS. Others
5	Valve stem	1	304(L), 316(L)SS, 317(L)SS, 630SS, Others
6	Lower Bush	1	304(L), 316(L)SS, 317(L)SS with hardened coating
7	Top Bush	2	304(L), 316(L)SS, 317(L)SS with hardened coating
8	Spacer Pipe	1	304(L), 316(L)SS, 317(L)SS, Others
9	Lantern Ring	1	304(L), 316(L)SS, 317(L)SS, Others
10	Packing	1	PTFE, Graphite
11	Gland	1	304(L), 316(L)SS, 317(L)SS, Others

4. Specifications

■ General Specifications

Size Range	1" ~ 20" (other sizes are available)
Pressure Range	ASME 150#~600#
Temperature Range	-20 ~ 350 ℃ according to the material spec.
Body Materials	WCB, CF8(M), CF3(M), Inconel, Titaium & others
Trim Materials	304(L), 316(L), 317L, Inconel, W-Co. overay, Titanium & others
Trim Design	Segment Eccentric Ball
Trim Characteristics	Modified Linear, EQ-%(Option)
Seak Leakage Class	ANSI/FCI 70-2, Class IV, V, VI according to the spec.
Applicable Actuators	Pneumatic Diaphragm, Cylinder, Electric Motor, others
Applicable Instruments	P/P & E/P & Smart Positioners, SOV & other Relays
Options	Handwheel, Limit Stopper, Special NDT

■ Trim Material Combinations

Code No.	Trim Materials				Temp. Range(℃)
	Disc	Seat Ring	Seat Insert	Stem	
TR1	316SS + HCr	316SS + HCr	-	316 SS	-20 ~ +350
TR2	316 SS+Stellite	316SS + Stellite	-	316 SS	-20 ~ +350
TR3	316SS + HCr	316SS	PTFE	316 SS	-20 ~ +160
TR4	316SS + HCr	316SS	RTFE	316 SS	-20 ~ +230
TR5	317SS + HCr	317SS + HCr	-	317 SS	-20 ~ +350
TR6	317SS + Stellite	317 SS + Stellite	-	317 SS	-20 ~ +350
TR7	317SS + HCr	317 SS	PTFE	317 SS	-20 ~ +160
TR8	317SS + HCr	317 SS	RTFE	317 SS	-20 ~ +230
TR9	304SS+Stellite	304SS+Stellite	-	304SS	-20 ~ +350

■ Seat Leakage Classifications (per ANSI FCI 70-2)

Code No.	Trim Style	Leakage Class
SL1	Metal to metal seat, TR1, TR2, TR5, TR6, TR9	Class IV
SL2	Soft seal & metal seat, TR-3,4 & TR-7,8	Class V
SL3	Metal to metal seat, TR1, TR2, TR5, TR6, TR9	Class V
SL4	Soft seal & metal seat, TR-3,4 & TR-7,8	Class VI

*. Note

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4. Specifications

■ O-Ring Applications

Code No.	Material & Style	Temp. Range(℃)
SR1	EPDM O-Ring	-20 ~ +120
SR2	Viton O-Ring	-20 ~ +230
SR3	PFA O-Ring	-20 ~ +230
SR4	FEP Ring	-20 ~ +160
SR5	Graphite Ring	-20 ~ +350

■ Packing Applications (This is a general specification, not only EB model)

Code No.	Material & Style	Gasket Materials	Temp. Range(℃)
PK1	PTFE + Carbon fiber, Braided	#150 ~ #900	-196 ~ +260
PK2	PTFE V-Ring	#150 ~ #600	-196 ~ +235
PK3	Graphite(Braided + Mold)	#150 ~ #2500	-196 ~ +410
PK4	Hi-Graphite(Braided + Mold)	#150 ~ #2500	-196 ~ +592
PK5	GTFE V-Ring + SPC	#150 ~ #2500	-196 ~ +260

■ Bolt(Stud) & Nut Applications (This is a general specification, not only EB model)

Code No.	Body, Bonnet Materials	Bolt(Stud) / Nut Materials	Temp. Range(℃)
BN1	WCB, A105 Carbon steel	Stud : ASTM A193, B7 Nut : ASTM A194, 2H	-29 ~ +425
BN2	CF8,CF8M,CF3,CF3M Stainless steel	Stud : ASTM A193(320), B8(M) Nut : ASTM A194(320), 8(M)	-196 ~ +592
BN3	WC6,WC9,C12A,F91 Cr-Mo. steel	Stud : ASTM A193, B16 Nut : ASTM A194, 4	-29 ~ +592

■ Gaskets Applications (This is a general specification, not only EB model)

Code No.	Body, Bonnet Materials	Gasket Materials	Temp. Range(℃)
GS1	WCB, A105 Carbon steel	316 SS + Graphite S/W	-29 ~ +425
GS2	CF8,CF8M,CF3,CF3M Stainless steel	316 SS + Graphite S/W	-196 ~ +592
GS3		316 SS + PTFE S/W	-196 ~ +235
GS4	WC6,WC9,C12A,F91 Cr-Mo. steel	316 SS + Graphite S/W	-29 ~ +592

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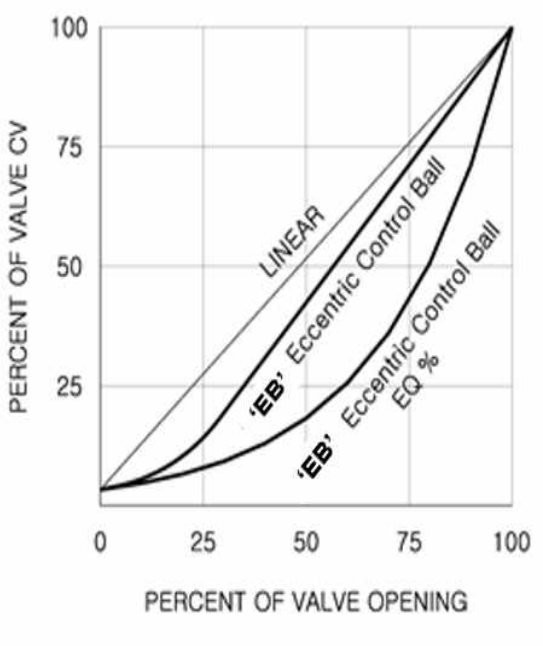
5. Flow Coefficients – Rated Cv

■ Flow Coefficients – Rated Cv Model EB

Valve Size (inch/mm)	Rated Cv	
	Full Port	Reduced Port(40%)
1(25)	14	5.6
1-1/2(40)	34	13.6
2(50)	50	20
3(80)	140	56
4(100)	235	94
6(150)	510	204
8(200)	860	344
10(250)	1320	528
12(300)	1780	712
14(350)	2600	1040
16(400)	3800	1520
18(450)	4665	1870
20(500)	6075	2450

■ Flow Characteristics – Modified Linear



Standard : Modified Linear, EQ-% : Option(available by positioner)

EB Series with Wafer End

EB Series with Flanged End

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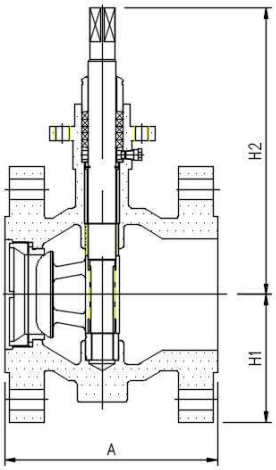
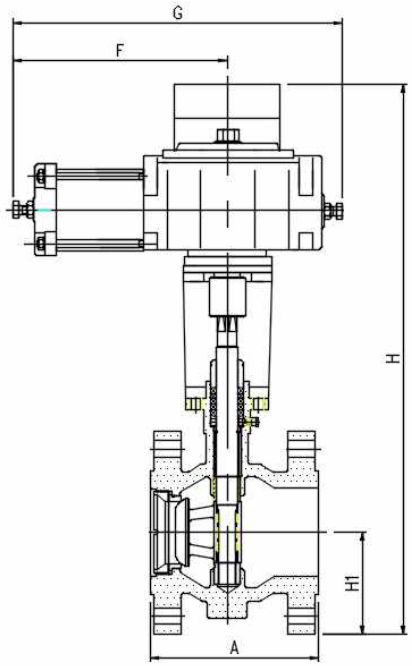
6. Dimensions for EB Series





■ Dimensions for EB Series (unit : mm)

Valve Size (inch/mm)	A		H1	H2	H	F	G	Weight (Kgs)	
	Wafer(Flange less) Type	RF Flanged Type						Wafer Type	300# RF Flanged Type
1(25)	102	102	58	95	505	235	345	18	20.5
1-1/2(40)	114	114	64	100	505	235	345	19.5	25
2(50)	124	124	100	105	525	300	422	21	27.5
3(80)	165	165	130	145	580	315	440	47	58
4(100)	194	194	155	165	605	328	474	55	74
6(150)	229	229	205	220	695	328	474	105	134
8(200)	243	243	250	250	790	356	530	124	163
10(250)	297	297	290	295	870	396	570	180	238
12(300)	338	338	345	340	990	500	700	254	312
14(350)	400	400	375	392	1050	500	700	387	426
16(400)	400	400	409	422	1210	750	1050	468	549
18(450)	457	457	420	455	1290	750	1050	558	675
20(500)	510	510	450	505	1320	850	1150	695	820

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■ Applicable Instruments

– Positioners : Smart, E/P, P/P Positioners for Single/Double Acting
– Instruments : Transfer(Trip) Valves, Volume Booster Relay, Lock-up Valves, Check Valves Air Regulators(Air Set), Speed Control Valves, Volume Tanks
– limit Switches & Stoppers
– Solenoid Valves

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3. The standard warranty period for all Valution products is one year after shipment, and we are not responsible for defects caused by arbitrary modification or customer error.

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