



85 SERIES CONTROL VALVE



Features

Characteristic

Globe control valve with loose or cast integral to the body flanges.

Available Types

85-01 and 85-51

With balanced plug, cage guided and seal ring between plug and cage. Suitable for high pressure drop applications and where shutoff is not critical.

85-11 and 85-61

With balanced plug, cage guided, seal ring between plug and cage and soft seat. Suitable for applications that require tight shutoff.

85-20 and 85-70

With unbalanced plug, cage guided. Suitable for low pressure drop applications that require a good shutoff.

85-21 and 85-71

With balanced plug, cage guided and metal seat between plug and cage. Suitable for high pressure drop and high temperature applications, where shutoff is not critical.

85-02 and 85-52

With low flow contour or "V" plug, top guided. Suitable for high pressure drop applications, low flow, high temperature and that require a good shutoff.

85-12 and 85-62

With low flow contour, top guided and soft seat. Suitable for low flow applications that require tight shutoff.

85-08 and 85-58

With contour plug, top guided. Suitable for applications with fluids having particles in suspension and that require a good shutoff.

85-18 and 85-68

With contour plug, top guided and soft seat. Suitable for applications that require tight shutoff.

85-80 and 85-88

With two stage plug, cage guided. Suitable for high pressure drop and high temperature applications that require a good shutoff.

Sizes

0.5, 0.75, 1, 1.5, 2, 3, and 4 in.

End Connections

FR - Raised Face - sizes 0.5 to 4 in.

RC - Threaded - sizes 0.5 to 2 in.

SW - Socket Welding - sizes 0.5 to 2 in.

BW - Butt Welding - sizes 3 and 4 in.

Pressure-Temperature Ratings

ANSI B16.34 Class 150, 300 or 600.

Body Materials

See table 1 for standard materials. Other materials are available on application.

Flange Materials

Carbon steel or same as body material.

Bonnet Types

CE1 - Standard

CE3 - Extended, for very high or very low temperature.

CE4 - Extended with bellows seal.

Trim Materials

See tables 2a through 2e for standard materials. Other materials are available on application.

Packing Materials

See table 3.

Gasket Materials

See table 4.

Flow Characteristics and Cv

See tables 5a through 5d.

For other available Cv values, consult Hiter.

Shutoff Classifications

See table 6.

Face-to-Face Dimensions

Can be supplied with face-to-face according ANSI/ISA S75.20 (85-01/85-11/ 85-20/85-21/85-02/85-12/85-08/ 85-18/85-80 types) or according ANSI/ISA S75.03 (85-51/ 85-61/ 85-70/85-71/85-52/85-62/85-58/85-68/85-88 types).

Special Trims

Low noise cage. Anti-cavitation cage. Anti-cavitation cascade plug.

Main parts identification

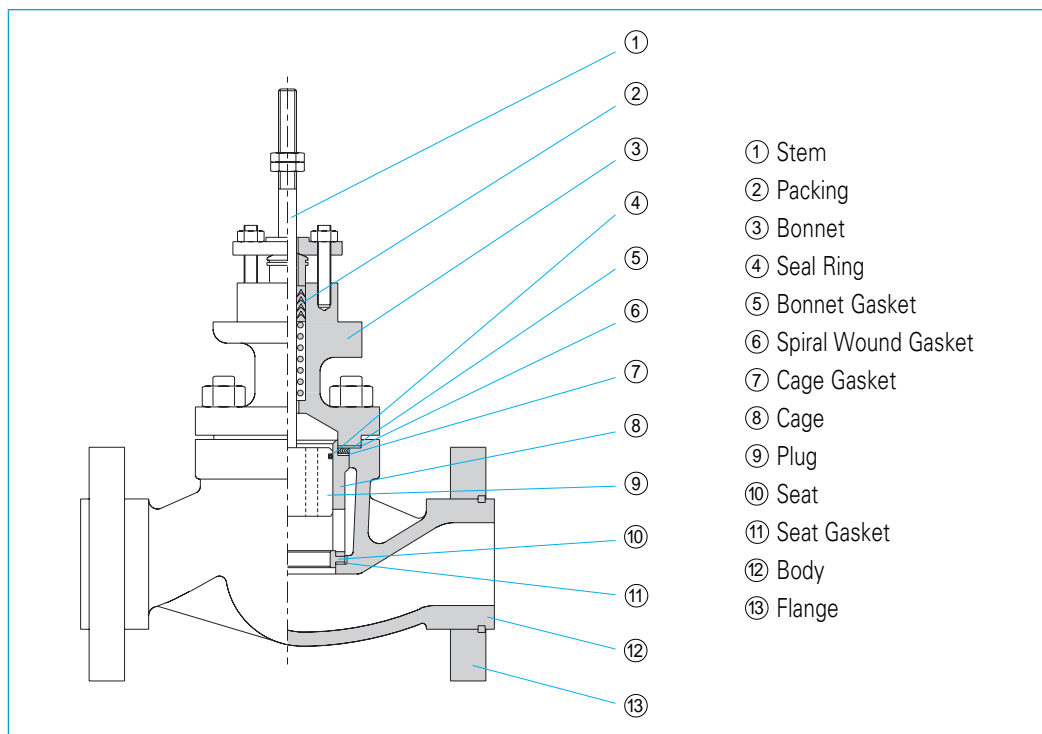


Table 1
Body materials

MATERIAL	TEMPERATURE RANGE (°F) ⁽¹⁾
Carbon steel (WCB)	-20 to 800
Cr-Mo steel (C5)	-20 to 1200 ⁽²⁾
304 stainless steel (CF8)	-425 to 1500 ⁽²⁾
304L stainless steel (CF3)	-425 to 850
316 stainless steel (CF8M)	-425 to 1500 ⁽²⁾
316L stainless steel (CF3M)	-425 to 850

(1) Do not exceed the maximum pressure and temperature for the class rating of the valve.

(2) ANSI Class 150 over 1000°F for welding ends valves only.

Table 2a
Trim materials
85-01 and 85-51
types

PLUG	SEAT	CAGE	SEAL RING	MAX. ΔP (psi)	TEMPERATURE RANGE (°F)
304 stainless steel	304 stainless steel	420 stainless steel hardened	EPDM	300	-20 to 248
316 stainless steel	316 stainless steel		PTFE		-20 to 392
304 stainless steel	304 stainless steel	17.4 PH stainless steel hardened	EPDM	300	-65 to 248
316 stainless steel	316 stainless steel		PTFE		-129 to 392
420 stainless steel hardened	420 stainless steel hardened	420 stainless steel hardened	EPDM	1450	-20 to 100
				1400	101 to 200
				1350	201 to 248
			PTFE	1450	-20 to 100
1400	101 to 200				
1350	201 to 300				
1300	301 to 392				

Table 2b
Trim materials
85-11 and 85-61
types

PLUG	SEAT	CAGE	SEAL RING	MAX. ΔP (psi)	TEMPERATURE RANGE (°F)
304 stainless steel	304 stainless steel with PTFE	420 stainless steel hardened	EPDM	300	-20 to 248
316 stainless steel	316 stainless steel with PTFE		VITON		-15 to 400
304 stainless steel	304 stainless steel with PTFE	17.4 PH stainless steel hardened	EPDM	300	-65 to 248
316 stainless steel	316 stainless steel with PTFE		VITON		-15 to 400

Table 2c
Trim materials
85-20 and 85-70
85-21 and 85-71
85-80 and 85-88
types

PLUG	SEAT	CAGE	MAX. ΔP (psi)	TEMPERATURE RANGE (°F)
304 stainless steel	304 stainless steel	420 stainless steel hardened	300	-20 to 600
316 stainless steel	316 stainless steel			
304 stainless steel	304 stainless steel	17.4 PH stainless steel hardened	300	-150 to 600
316 stainless steel	316 stainless steel			
304 stainless steel with Stellite hard faced seat	304 stainless steel with Stellite hard faced seat	17.4 PH stainless steel hardened	1450	-450 to 100
316 stainless steel with Stellite hard faced seat	316 stainless steel with Stellite hard faced seat		1400	101 to 200
			1350	201 to 300
304 stainless steel with Stellite hard faced seat and guide	304 stainless steel with Stellite hard faced seat and guide	304 stainless steel with Stellite lands	900	601 to 800
316 stainless steel with Stellite hard faced seat and guide	316 stainless steel with Stellite hard faced seat and guide	316 stainless steel with Stellite lands	800	801 to 900
			700	901 to 1000
			600	1001 to 1100
420 stainless steel hardened	420 stainless steel hardened	420 stainless steel hardened	1450	-20 to 100
			1400	101 to 200
			1350	201 to 300
			1300	301 to 400
420 stainless steel hardened	420 stainless steel hardened	17.4 PH stainless steel hardened	1050	401 to 500
			800	501 to 600
			500	601 to 700

Table 2d
Trim materials
85-02 and 85-52
85-08 and 85-58
types

PLUG	SEAT	GUIDE BUSHING	MAX. ΔP (psi)	TEMPERATURE RANGE (°F)
304 stainless steel	304 stainless steel	420 stainless steel hardened	300	-20 to 600
316 stainless steel	316 stainless steel			
304 stainless steel	304 stainless steel	17.4 PH stainless steel hardened	300	-150 to 600
316 stainless steel	316 stainless steel			
304 stainless steel with Stellite hard faced seat	304 stainless steel with Stellite hard faced seat	420 stainless steel hardened	1450	-450 to 100
316 stainless steel with Stellite hard faced seat	316 stainless steel with Stellite hard faced seat		1400	101 to 200
			1350	201 to 300
304 stainless steel with Stellite hard faced seat and contour	304 stainless steel with Stellite hard faced seat and bore	420 stainless steel hardened	1300	301 to 400
316 stainless steel with Stellite hard faced seat and contour	316 stainless steel with Stellite hard faced seat and bore		1200	401 to 500
			1100	501 to 600
304 stainless steel with Stellite hard faced seat, contour and guide	304 stainless steel with Stellite hard faced seat and bore	304 stainless steel with Stellite lands	900	601 to 800
316 stainless steel with Stellite hard faced seat, contour and guide	316 stainless steel with Stellite hard faced seat and bore	316 stainless steel with Stellite lands	800	801 to 900
			700	901 to 1000
			600	1001 to 1100
420 stainless steel hardened	420 stainless steel hardened	420 stainless steel hardened	1450	-20 to 100
			1400	101 to 200
			1350	201 to 300
			1300	301 to 400
			1050	401 to 500
			800	501 to 600

Table 2e
Trim materials
85-12 and 85-62
85-18 and 85-68
types

PLUG	SEAT	GUIDE BUSHING	MAX. ΔP (psi)	TEMPERATURE RANGE (°F)
304 stainless steel	304 stainless steel with PTFE	420 stainless steel hardened	300	-20 to 392
316 stainless steel	316 stainless steel with PTFE			
304 stainless steel	304 stainless steel with PTFE	17.4 PH stainless steel hardened	300	-129 to 392
316 stainless steel	316 stainless steel with PTFE			

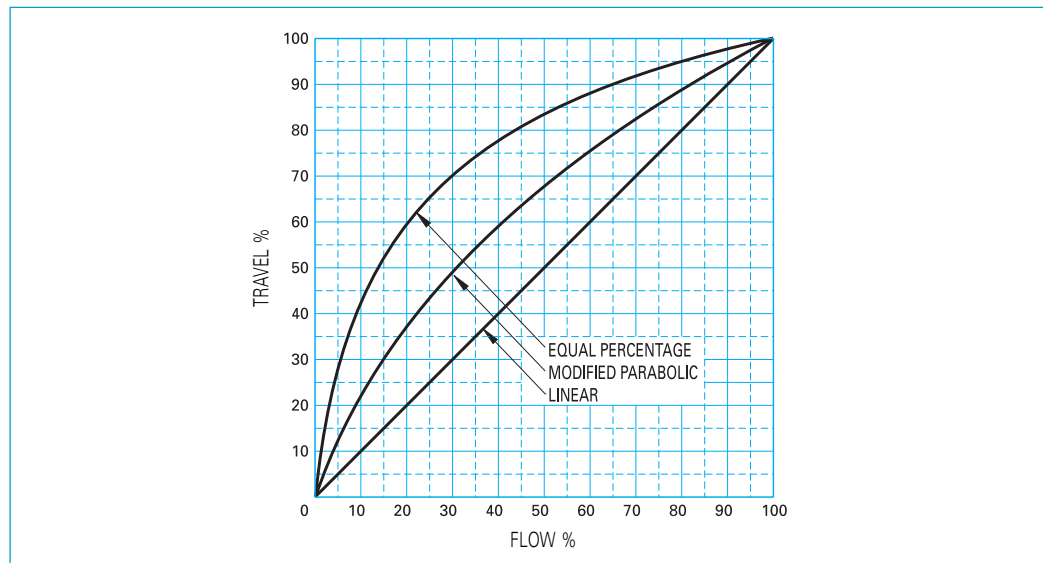
Table 3
Packing materials

MATERIAL	TEMPERATURE RANGE (°F)	
	STANDARD BONNET	EXTENDED BONNET
PTFE "V" rings	-22 to 450	-150 to 800
Braided PTFE		
Graphite	-22 to 700	-94 to 2000
Asbestos with PTFE ⁽¹⁾	-22 to 450	-150 to 800

(1) Used only in case of no restrictions to asbestos.

SEAT, BONNET and CAGE GASKET	SPIRAL-WOUND GASKET	TEMPERATURE LIMIT (°F)
Synthetic fibers with NBR rubber (non asbestos).	304 stainless steel and synthetic fibers with NBR rubber (non asbestos)	450
Carbon and graphite fibers with NBR rubber (non asbestos)	304 stainless steel and carbon and graphite fibers with NBR rubber (non asbestos)	450
PTFE	304 stainless steel and PTFE	450
Expanded graphite laminate with stainless steel insert	Inconel and expanded graphite	1100

Table 4
Gaskets materials



Flow characteristics

BODY SIZE (in.)	PORT SIZE (in.)	STROKE (in.)	FULL BORE					PORT SIZE (in.)	STROKE (in.)	REDUCED BORE				
			PV	LV	MV	BRR	BKV			PV	LV	MV	BRR	BKV
1	1.313	.75	17	19	11	18	12	—	—	—	—	—	—	—
1.5	1.75	.75	34	38	20	38	20	1.313	.75	22	23	—	23	13
2	2.313	1.125	52	63	30-40	63	35	1.313	.75	26	30	—	22	14
3	3.313	1.5	118	130	60-80-120	130	90	2.313	1.125	57	88	36	87	37
4	4.313	2	200	215	105-120-150	190	170	2.75	1.5	95	105	20-30-40-70	105	52

PV - Equal percentage LV - Linear BRR - Low noise multiple passage BKV - Anti-cavitation

Table 5a
Flow coefficient - Cv
85-01 and 85-51
85-11 and 85-61
85-20 and 85-70
85-21 and 85-71
types

BODY SIZE (in.)	ORIFICE CODE	PORT SIZE (in.)	STROKE (in.)	PC	LC	MV ⁽¹⁾	AQP ⁽¹⁾	AQPT ⁽¹⁾
.5 to 2 (2)	M1	.25	.75	—	—	.25	.25	—
	M2			—	—	.4	.4	.25
	M3			.85	.85	.85	.7	.5
	M4	.375		2	2	2	1.6	1
	M5	.5		3.4	3.4	3.4	2.9	2
	M6	.625		5.5	5.5	5.5	4.6	3.5
	M7	.75		7.5	7.5	7.5	6.5	5.5
	M8	.875		10.6	10.6	8	9	7.5
	M9	1		13	13	10	11.5	10

PC - Equal Percentage LC - Linear MV - Modified Parabolic AQP - Partial cascade linear AQPT - Full cascade linear

(1) Not available for 85-12 and 85-62.

(2) Size .5 in.. only from M1 through M5 orifice code. Size .75 in.. only from M1 through M7 orifice code.

Table 5b
Flow coefficient - Cv
85-02 and 85-52
85-12 and 85-62
types

Table 5c
Cv flow coefficient
85-08 and 85-58
85-18 and 85-68
types

BODY SIZE (in.)	PORT SIZE (in.)	STROKE (in.)	FULL BORE		PORT SIZE (in.)	STROKE (in.)	REDUCED BORE	
			PC	LC			PC	LC
1.5	1.125	.75	23	23	1	.75	17	17
2	1.5	1.125	41	16-41	1.125	1.125	26	26
3	2.5	1.5	60-80-115	115	1.5	1.5	44	44
4	3.25	2	195	195	2	2	73-120	73

PC - Equal percentage LC - Linear

Table 5d
Flow coefficient - Cv
85-80 and 85-88
types

BODY SIZE (in.)	PORT SIZE (in.)	STROKE (in.)	FULL BORE			PORT SIZE (in.)	STROKE (in.)	REDUCED BORE		
			PV	LV	MV			PV	LV	MV
1.5	1.75	.75	34	32	16	—	—	—	—	—
2	2.313	1.125	52	56	26-35	—	—	—	—	—
3	3.313	1.5	118	114	51-68-102	2.313	1.125	57	78	30
4	4.313	2	200	195	95-109-136	2.75	1.5	95	96	20-26-36-63

PV - Equal percentage LV - Linear MV - Modified parabolic

Table 6
Leakage Classes
(ANSI/FCI 70-2
formerly
ANSI B16.104)

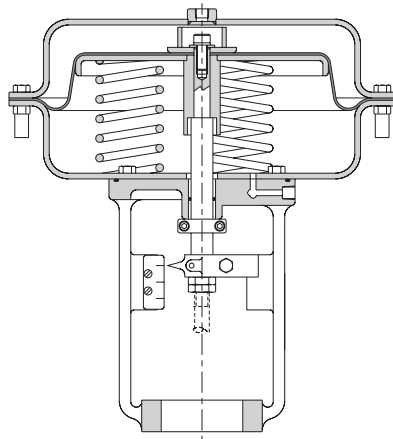
VALVE TYPE	CLASS	NOTE
85-01 and 85-51	II IV or V	With PTFE seal ring With seal ring in elastomer
85-02 and 85-52 85-08 and 85-58 85-21 and 85-71	IV	Metal seat
85-11 and 85-61 85-12 and 85-62	VI	With PTFE seat
85-20 and 85-70 85-80 and 85-88	IV or V	Metal seat

Actuators

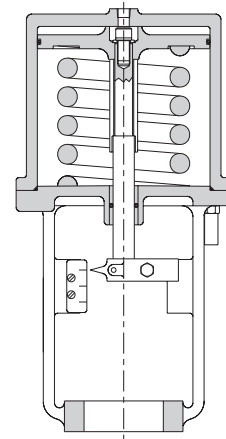
The **85 Series** control valve is normally operated by diaphragm/spring pneumatic actuators (DC series) or by double action or spring return pneumatic piston actuators (PP series). In both cases, changing action from direct to reverse or vice-versa can be

done at the field, without parts replacement and further costs.

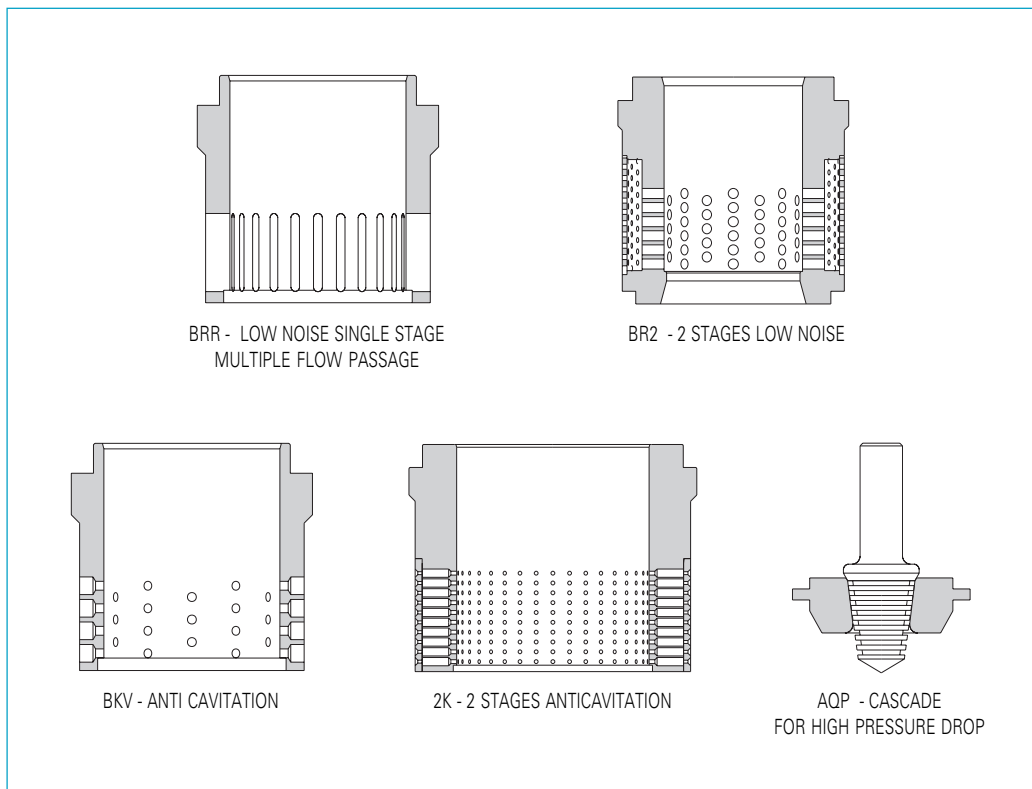
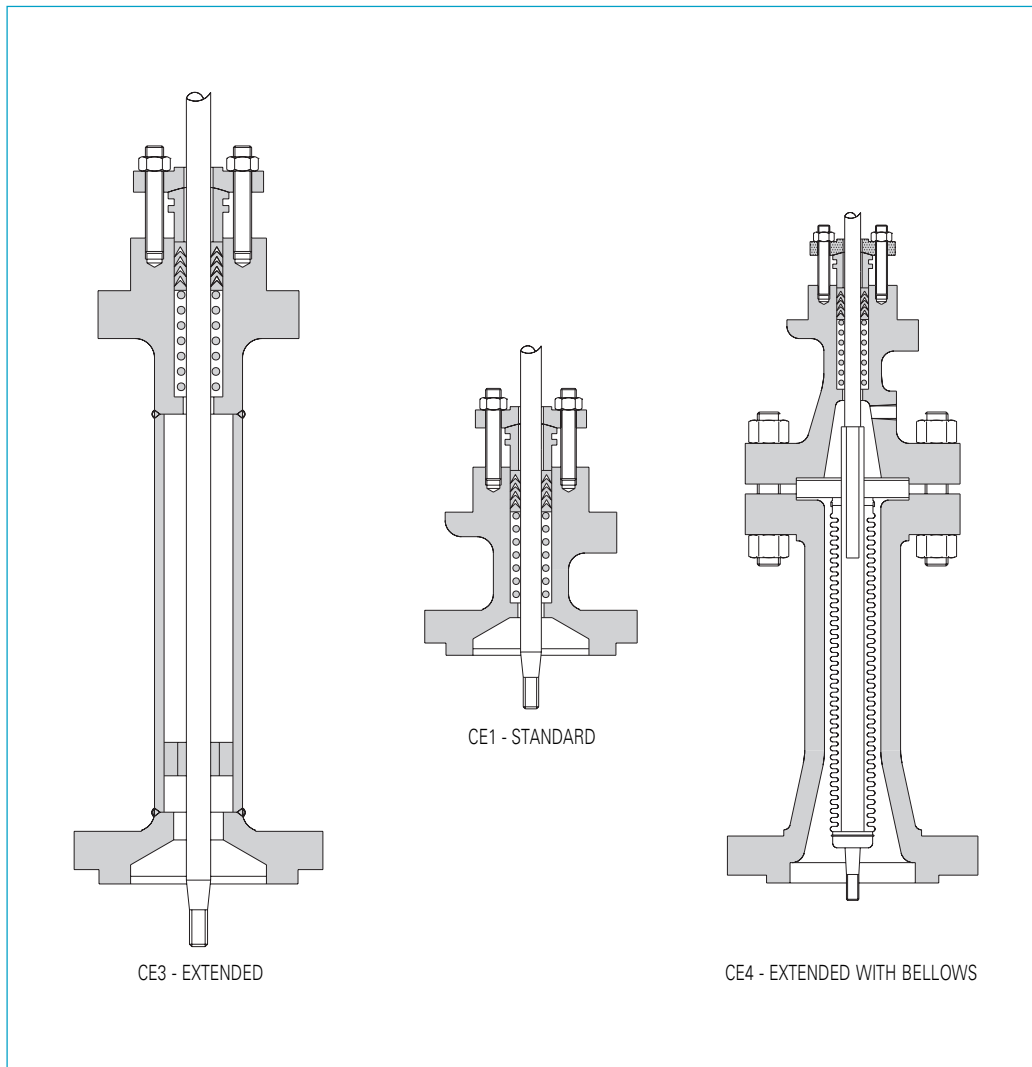
Can also be supplied electric actuator. Detailed information about actuators are given in specific bulletins.



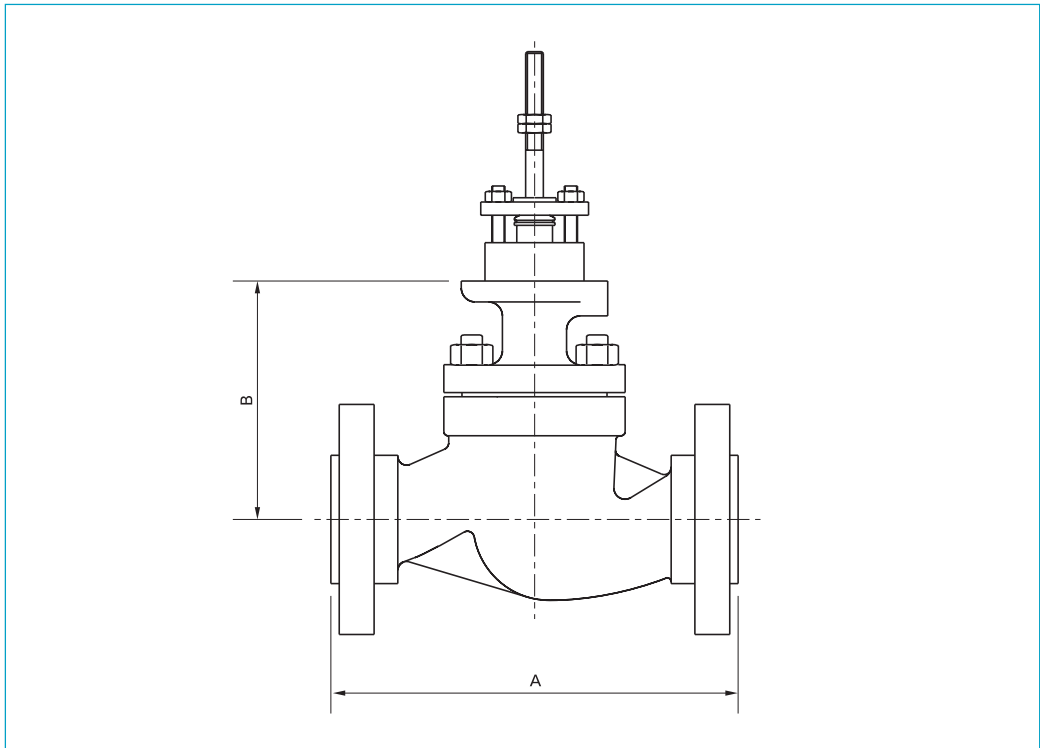
DC SERIES - DIAPHRAGM/SPRING ACTUATOR



PP SERIES - PISTON ACTUATOR



Dimensions



BODY SIZE (in.)	A (mm) - FLANGED BODY					B (mm)		
	ISA S75.20		ISA S75.03			BONNET TYPE		
	CLASS							
	150/300	600	150	300	600	CE1	CE3	CE4
.5	216	216	184	190	203	136	232	360
.75	216	216	187	194	206	136	232	360
1	216	216	184	197	210	135	232	308
1.5	241	241	222	235	251	149	302	310
2	292	292	254	267	286	171	479	450
3	356	356	298	317	337	198	506	545
4	432	—	352	368	394	218	525	712

Ordering information

1. Valve size and type
2. End connection style
3. Body material
4. Trim material
5. Bonnet type
6. Packing material
7. Maximum working condition
8. Normal working condition
9. Minimum working condition
10. Shutoff differential pressure
11. Specific gravity
12. Specific heat ratio
13. Critical pressure
14. Critical temperature
15. Viscosity
16. Inlet and outlet pipe diameter and thickness.

HITER

HITER IND. E COM. CONTR. TERMO-HIDR. LTDA.
 Rua Capitão Francisco Teixeira Nogueira, 233
 CEP 05037-030 - Água Branca - São Paulo - Brasil
 Phone.: +55 11 3611.0788
 Fax: +55 11 3611.0921/3611.1711
 e-mail: vendas@hiter.com.br - www.hiter.com.br

Representative

Bulletin 1167 / Rev. July 2000