MOTOYAMA

General Specifications

Model 83A-BS & 83A-BSH

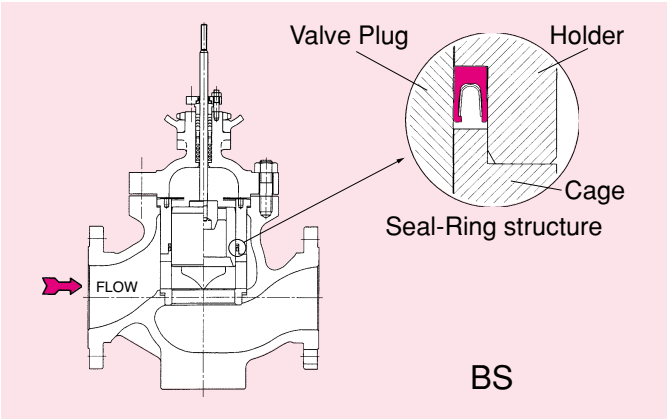
SEAL-RING BALANCE TYPE · CAGE GUIDED CONTROL VALVE

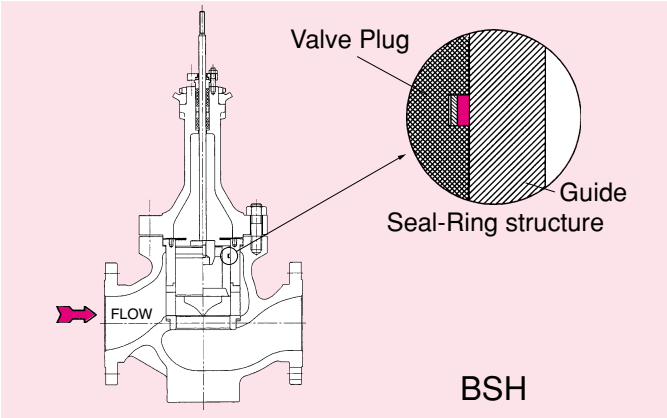
Model 83A-BS and **83A-BSH Cage Guided Control Valve** realized very limited seat leakage like single seat valves with installing small actuator like double seat valves.

This design adopted Seal-Ring Balance on Cage for Type BS and same design on Valve Plug for Type BSH.

Seal-Ring inserted in Cage for Type BS and inserted in Valve Plug for Type BSH, seals the guide clearance tightly between Valve Plug and Cage to prevent the valve inlet pressure comes into the Bonnet.

This design makes the outlet pressure comes into the upper and lower side of the Plug and it makes the pressure well balanced. Consequently, small actuator is required to operate the valve.





1. VALVE TYPE

Valve Style and Cage Type

83A [Cage Type] – [Plug Type]

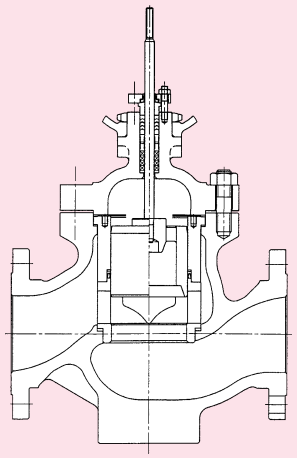
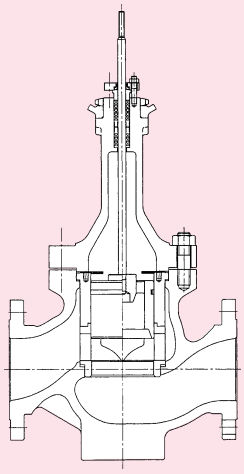
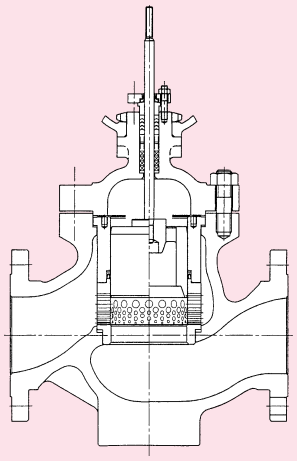
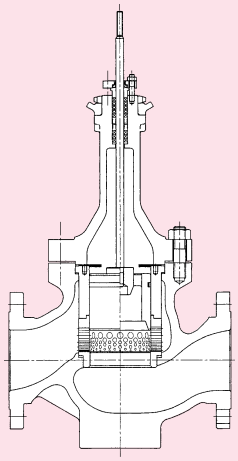
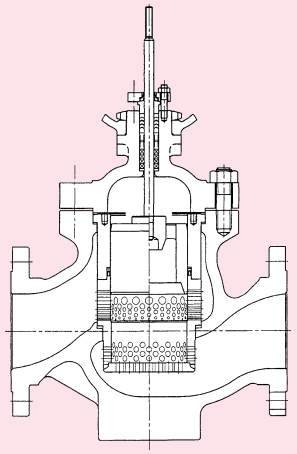
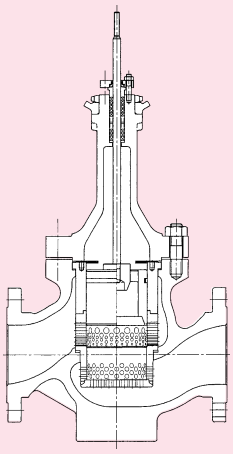
Cage Type	
CV	V-Port (V)
CS	Multi-Hole
CS-L	Double Stage Multi-Hole Throttling
CQ	Quick Opening (Q)

Plug Type	
-BS	Seal-Ring Balance (Low & Medium Temp.)
-BSH	Seal-Ring Balance (High Temp.)
-BP	Pilot Balance
-S	Single Seat (Un-Balanced)

83ACP-S	Contoured Plug, Single Seat (Quick opening, Single Seat)
83ACP-S-RT	Multi-Stage Plug with Cage Guide
83-NRV	Low Noise Multi-Hole & Multi Stage

【Notes】 (1) ▭ portion is described in this catalog.
(2) See Catalog MCE-B4306 for Cage Guide Type Control Valves and MCE-B4304 for -NRV, Multi-Hole & Multi-Stage Type Control Valves.
(3) See Catalog MCE-B4308 for Model 83A-BS ANSI class 900 & 1500.

2. FEATURES

	83A - BS	83A - BSH
Model CV V Port Type Model CV is cage guided control valve and is used for most general purpose with V port of cage characterized, proving wide applicability, excellent characteristics at high load, and easy maintenance. ■ Typical Application ○ General services ○ Chemical ○ For medium or high pressure Type CQ for quick opening is also available.		
Model CS Multi-hole Type Model CS-BSH helps to attenuate aero-dynamic noise in gas service, with Multi-hole in outer cage. In liquid service which may occur cavitation, CS helps to prevent trim from cavitation damage. ■ Typical Application ○ Low noise valve ○ Anti-cavitation valve ○ Anti-erosion valve		
Model CS-L Double Stage Multi-hole Throttling Type Model CS-L is double stage, multi-hole throttling type control valve providing fixed orifice at the bottom of cage of the Model CS. Because of double throttling mechanism, these valves permit large noise reduction effect. ■ Typical Application ○ For medium and high pressure gas ○ Steam control valve ○ Low noise valve		

3. SPECIFICATIONS

Valve Type		Diaphragm Operated Cage Guided Control Valve							
Valve Model No.		3883A, 2883A							
VALVE BODY	Body Type	83ACV-BS	83ACS-BS	83ACS-L-BS	83ACQ-BS	83ACV-BSH	83ACS-BSH	83ACS-L-BSH	83ACQ-BSH
	Body Size (mm)	50～350							
	Body Size (In.)	2～14							
	Pressure Rating	JIS10K, 20K,30K,40K ASME/JPI Class 150, 300, 600							
	End Connections	Flanged end : FF, RF, RJ, Male and female, Tongue and Groove (※ Welding end : SW, BW)							
	Body Materials	SCPH2, SCPH11, SCPH21, SOPH32, SCPH61, SCS13A, SCS14A, SCS16A WCB, WC1, WC6, WC9, C5, DF8, CF8M, CF3M							
	Bonnet Types	■－196℃≦T＜－45℃ : Extension Bonnet, Type-H ■－45℃≦T＜－17℃ : Extension Bonnet, Type-F ■－17℃≦T≦＋230℃ : Plain Bonnet ■＋230℃＜T : Extension Bonnet, Type-F							
		Bellows Sealed (See Page 6)							
	Gland Type	Bolted gland							
	Packing (Non Asbestos)	Braided packing, Molded packing							
	Gaskets (Non Asbestos)	Serrated gasket, Spiral wound gasket							
	Guiding	Cage guide							
	Valve Plug Action	Push-down close							
	Seat Type	Single seated							
	Cage Type	Seal Ring Balance Type for Low & Medium Temperature				Seal Ring Balance Type for High Temperature			
	Cage Port Characteristics	Equal Percentage Linear	Linear Modified Parabolic	ON-OFF Quick Opening		Equal Percentage Linear	Linear Modified Parabolic	ON-OFF Quick Opening	
	Flow Direction	FTC (Flow to close) Note (3)							
	Trim Materials	SUS316 (SCS14A), SUS440B, SUS630 (SCS24) See Page 5～6 [5.Main Materials]							
	Treatment of Trim	See Page 5～6 [5.Main Materials]							
	Seal-ring Material	PTFE with Carbon Graphite Note (7) (Spring : Inconel X750)				Metal-reinforced carbon Note (7)			
	Back-up ring Material	PTFE with Carbon Graphite Note (7) (for Body Size 200A & Larger)				————			
	Tension-ring Material	————				SUS316			

ACTUATOR	Actuator Type	Model 3800 Multi-spring type single diaphragm Actuator			Model 2800 Spring type single diaphragm Actuator					
	Actuator Sizes	N28	N33S	N40	500S	500L	650S	650XS	650L	650XL
	Max. Stroke (mm)	38	38	65	65	100	65		130	
	Supply Air Press. kPaG (kgf/cm²G)	240 (2.4), 280 (2.8), 300 (3.0) 400 (4.0) ··· N33S · N40 only			240 (2.4), 280 (2.8) 300 (3.0) ··· BSH only					
	Spring Range kPaG (kgf/cm²G)	40～200 (0.4～2.0) 80～200 (0.8～2.0) 120～280 (1.2～2.8) ··· N33S, N40 only			20～180 (0.2～1.8), 40～200 (0.4～2.0) 60～220 (0.6～2.2), 80～240 (0.8～2.4) 80～200 (0.8～2.0) ··· BSH only 100～220 (1.0～2.2)					
	Action	Direct action, Reverse action								
	Materials	(Diaphragm) Cloth reinforced chloroprene rubber, (Yoke) FC200								
	Air Connection	Rc 1/4, Rc 3/8 (650, 650X only)								
	Ambient Temperature	－20℃～＋70℃ (※－50～－20℃, ＋70℃～＋100℃) Note (2)			－30℃～＋70℃ (※－50～－30℃, ＋70℃～＋100℃) Note (2)					
Painting Color		Silver, (No painting on stainless steel)								

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VALVE CHARACTERISTICS AND PERFORMANCE Note (1)	Body Type	83ACV-BS	83ACS-BS	83ACS-L-BS	83ACQ-BS	83ACV-BSH	83ACS-BSH	83ACS-L-BSH	83ACQ-BSH
	Control Mode	Throttling control, On-Off control							
	Valve Action	Direct action (Air-to close), Reverse action (Air-to open)							
	Applicable Max. Pressure	9.80 MPaG (100kgf/cm²G) or less (limited by P-T rating)							
	Applicable Temp.	−50℃～+230℃ (See Page 5 [4.Applicable Press. & Temp.])				Max. +550℃ (See Page 5 [4.Applicable Press. & Temp.])			
	Allowable Differential Pressure	See Page 8 [Allowable Differential Pressure]							
	Rated Cv Value	See Page 7 [Rated Cv Valve]							
	Flow Characteristics	See Page 7 [Flow Characteristics]							
	Inherent Rangeability	50 : 1 See Page 7 [Rated Cv Valve]							
	Allowable Seat Leakage Ratio	0.01 % of rated Cv (ANSI/FCI Class Ⅳ)				ANSI/FCI Class Ⅳ (0.01 % at Rated CV) Note (6)			
		Tight Shut Off (TSO), Body Size 100A & Smaller ··· 0.001 % Body Size 125A & Smaller ··· 0.002 %							
		ANSI/FCI Class Ⅴ Note (5)							
	Function Accuracy: Hysteresis Error (With Positioner)	Max. 2 % F.S.							
	Function Accuracy: Linearity (With Positioner)	Max. ±2 % F.S.							
OPTIONS	Valve Body	Drain plug, Special treatment for trim							
	Actuator	Handwheel (Top-mounted, Side-mounted), Travel stop, Diaphragm material ; Ethylene propylene rubber, Yoke material : SCPH 2							
	Accessories	Pneumatic positioner (PA92A), Electro-pneumatic positioner (EA90A, EA91A, EA10S), Air filte regulator (MR2000), Limit switch, Solenoide valve, Booster relay, Speed controller, Lock up valve, Pneumatic operated valve							
	Others	The hige pressure gas safety low certification, Oil-free, Water-free, Sand-proof, Dustproof, Anti-salt damage, vacuum service, Cold district spec, Tropical district spec, External exprosure bolt & nut S.S, Optional painting color							

【Notes】 (1) Valve performance specified above is the condition assembled with standard gland packing (P4519 + V7010).
(2) It is applicable as Option.
(3) Please install the valve in correct direction. Wrong installation will increase seat leakage and shorten Seal Ring life cycle. This valve is not applicable to a system reverse pressure is expected.
(4) Various Option is available on request.
(5) ANSI/FCI class V seat leakage ratio is available as option.
Seal Ring design for seat leakage class V is deferent from class Ⅳ.
(6) Please select single seat valve or pilot balance type valve when severe seat leakage ratio less than 0.01% is required on type 83-BSH.
(7) Application service is limited as follows because of Seal Ring material property for Type BS and BSH control valves.

(Type BS)

It is not acceptable to use Type BS for following application.

- Food processing service
- Oxygen service
- Any process, coloring by resin is undesirable.
- Acids at high temperature and pressure (Aqua Regina, Nitric Acid, Sulfuric Acid, Hydrochloric Acid, etc.)
- Fluorine gas(F2), CIF3, OF2 etc. at high temperature.
- Metal-hydrogen compound such as 80% KOH, B2H6 etc.

(Type BSH)

It is recommended to use Type BS & BSH control valves within the following range because of Seal Ring material properties to prevent oxidation.

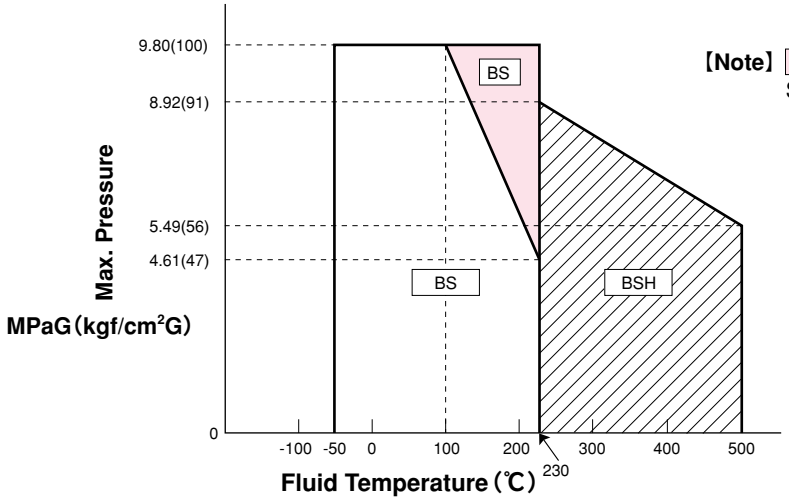
① For Air service : 0 ～+400℃
② For steam and Non-oxide service : 0 ～+500℃

(8) It is applicable to use type 83-BS valves for some services listed on (7) above, by changing the Seal Ring materials. Please contact our sales office for special application.
(9) It is not recommended to install type 83-BS and 83-BSH horizontally.
It will decline the sealing performance.
(10) Type 83-BS seal ring design is not recommended for the services required frequent operation or exposed rapid temperature change to protect the life cycle or sealing performance of the seal ring.

It is recommended to change Seal Ring on every overhaul services like Gland Packing or Gaskets.
Kindly keep some Seal Rings for your stock.

4. APPLICABLE PRESSURE AND TEMPERATURE

Available temperature and pressure of Model 83-BS and 83-BSH is shown below.



【Note】 BS Sheded area needs specialized Seal-Rings.

5. MAIN MATERIALS

1 Typical Combination of Materials

Parts Name	Materials			
Body, Bonnet	SCPH2, 11, 21, 32, 61 WCB, WC1, WC6, WC9, C5	SCS13A CF8	SCS14A CF8M	SCS16A CF3M
Trim	SUS316 SUS440B SUS630	SUS316 SUS440B SUS630	SUS316	SUS316L
Stud Bolt and Nuts	A193GrB7/S45C (H)	A193GrB8CL2/SUS304		

【Notes】 (1) This table shows typical combination of materials. The combination may be subject to change with pressure, temperature and kind of fluid.
(2) Trim materials may be used casting instead of bar materials.

2 Hard Facing for Trim

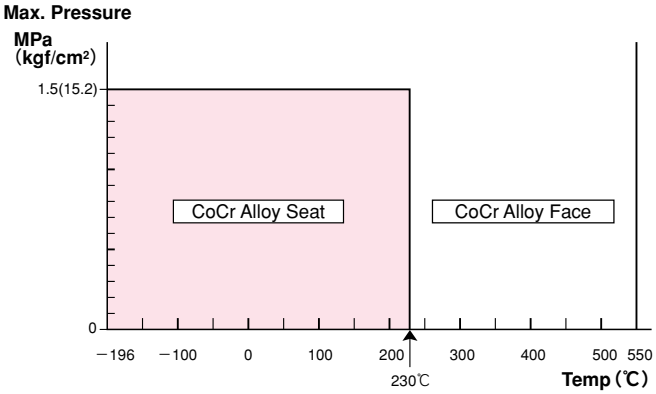
①SUS316(SCS14A), SUS316L(SCS16A)

CoCr Alloy Hard Facing		CoCr Alloy Seat	CoCr Alloy Face
Cage Type		CV-BS, CQ-BS CS-BS, CS-L-BS	CV-BS, CQ-BS, CS-BS, CS-L-BS CV-BSH, CQ-BSH, CS-BSH, CS-L-BSH
Valve plug		CoCr Alloy Seat	CoCr Alloy Face
Holder : BS		No Hard Facing SUS316(SCS14A)／SUS316L(SCS16A)	
Guide : BSH		No Hard Facing ; Design Temp. ≦ 400℃, CoCr Alloy Face ; Design Temp. ＞ 400℃	
Cage		CoCr Alloy Seat	
Applicable Temp.	BS	−50℃～+230℃	
	BSH	—	+500℃ or Lower

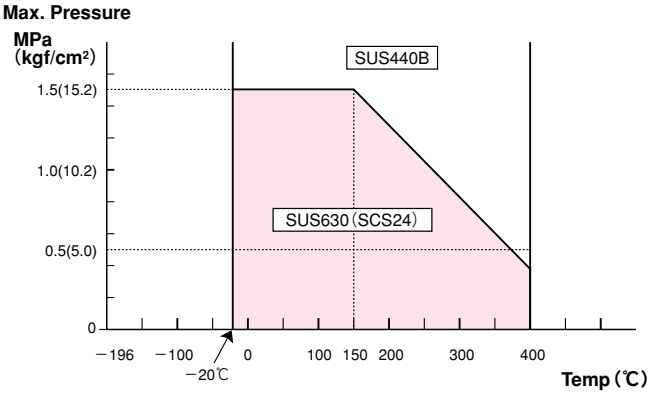
②SUS440B, SUS630(SCS24) Note (1) (2) (3)

Materials		SUS440B		SUS630 (SCS24)	
Cage Type		CV-BS, CQ-BS CS-BS CV-BSH, CQ-BSH CS-BSH	CS-L-BS CS-L-BSH	CV-BS, CQ-BS CS-BS CV-BSH, CQ-BSH CS-BSH	CS-L-BS CS-L-BSH
Valve plug		SUS440B(Heat treatment)		SUS630(SCS24)(Heat treatment)	
Holder : BS		SUS316(SCS14A)			
Guide : BSH					
Cage		SUS440B (Heat treatment)	SUS316(SCS14A) +CoCr Alloy	SUS630(SCS24)(Heat treatment)	
Applicable Temp.	BS	−20℃～+230℃			
	BSH	−20℃～+400℃ or Lower			

SUS316 (SCS14A), SUS316L (SCS16A) family Press. / Temp. Range

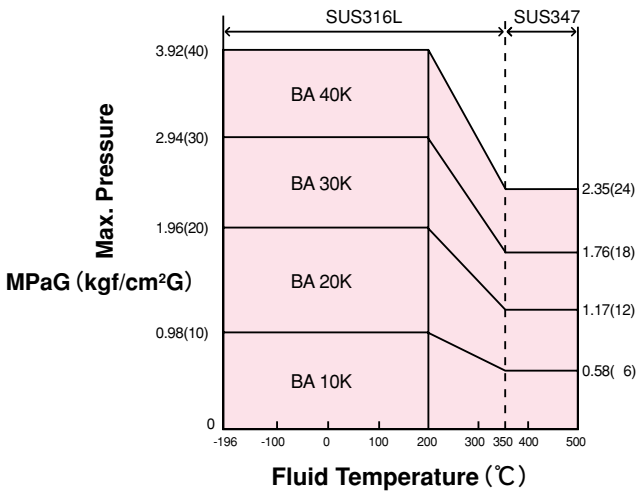


SUS400B, SUS630(SCS24) family Press. / Temp. Range



【Notes】(1) SUS440B shall be suitable for flashing or cavitation services within the temp. range of −20℃ to +400℃. It is not applicable for type CS-L.
Hard Facing on SUS316(SCS14A), SUS316L(SCS16A) and SUS630(SCS24) are not recommended for flashing or cavitation services.
(2) SUS630(SCS24) in not applicable for corrosive service as Copper(Cu) contains in the material.
(3) When ANSI/FCI seat leakage class V is required, hard facing shall be other materials than SUS630(SCS24).

3 Applicable Pressure and Temperature of Bellows Seal Bonnet(BS, BSH)



6. SCOPE OF PRODUCTION

BS ■ Combination of Valve Body and Actuator

(1) Allowable Seat Leakage Ratio : 0.01% of rated Cv

Valve Model No.		3883A			2883A					
Actuator Size / Valve Size		N28	N33S	N40	500S	500L	650S	650L	650XS	650XL
50 (mm)	2 (inch)	●	●	●	●					
65	2 1/2	●	●	●	●					
80	3	●	●	●	●		●			
100	4	●	●	●	●		●			
125	5			●	●		●			
150	6			●	●		●			
200	8			●	●		●		●	
250	10					●		●		●
300	12					●		●		●
350	14							●		●

(2) Allowable Seat Leakage Ratio : ANSI/FCI Class V (Oprion)

Valve Model No.		3883A			2883A					
Actuator Size / Valve Size		N28	N33S	N40	500S	500L	650S	650L	650XS	650XL
50 (mm)	2 (inch)	●	●	●	●					
65	2 1/2	●	●	●	●					
80	3		●	●	●		●			
100	4		●	●	●		●			
125	5			●	●		●			
150	6			●	●		●			
200	8						●		●	
250	10							●		●
300	12									●
350	14									●

BSH ■ Combination of Valve Body and Actuator

Valve Model No.		3883A			2883A					
Actuator Size / Valve Size		N28	N33S	N40	500S	500L	650S	650L	650XS	650XL
50 (mm)	2 (inch)	●	●	●	●					
65	2 1/2	●	●	●	●					
80	3		●	●	●		●			
100	4		●	●	●		●			
125	5			●	●		●			
150	6			●	●		●			
200	8				●		●		●	
250	10					●		●		●
300	12							●		●
350	14							●		●

BS, BSH ■ Scope of Port Size

● : Full port
◆ : Reduced port

Port Size (mm)		25	32	40	50	65	80	100	125	150	200	250	300	350
Rated Travel (mm) / Valve Size		15	20		25		38		50		65	90	100	130
50 (mm)	2 (inch)	◆	◆	◆	●									
65	2 1/2		◆	◆	◆	●								
80	3			◆	◆	◆	●							
100	4				◆	◆	◆	●						
125	5					◆	◆	◆	●					
150	6						◆	◆	◆	●				
200	8							◆	◆	◆	●			
250	10								◆	◆	◆	●		
300	12									◆	◆	◆	●	
350	14										◆	◆	◆	●

7. FLOW CHARACTERISTICS

1 Rated Cv Value

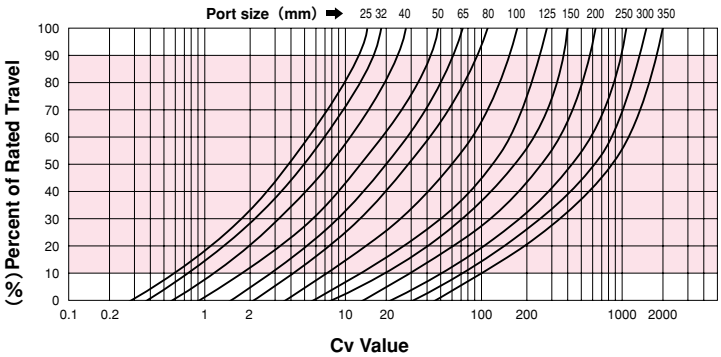
Body Model	Port size	mm	25	32	40	50	65	80	100	125	150	200	250	300	350
		in.	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14
	Rated Travel (mm)		15	20		25		38		50		65	90	100	130
CV-BS, BSH CS-BS, BSH CQ-BS, BSH	Rated Cv Value		14	18	27	46	71	110	180	275	395	640	1050	1460	2000
CS-L-BS, BSH			11.2	14.4	22	36	56	88	144	220	316	512	840	1168	1600
	Inherent Rangeability		50 : 1												

2 The flow characteristic of each type

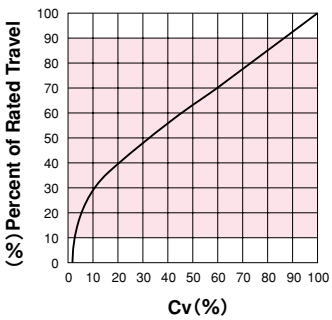
	Eq. %	Linear	Mod. parabolic	ON-OFF
CV-BS, BSH	○	○		
CS-BS, BSH		○	○	
CS-L-BS, BSH		○	○	
CQ-BS, BSH				○

3 Flow Characteristics

V-port Type Equal percentage (CV-BS, CV-BSH)



■ Modified Parabolic



【Note】 Shaded zone represents proper throttling control range.

8. ALLOWABLE DIFFERENTIAL PRESSURE

1 Off-balance Classification

■ BS

Unit : kPaG(kgf/cm²G)

Action	Spring Range / Actuator Size: N28 ~ N40	Spring Range / Actuator Size: 500 ~ 650X	Supply Air Pressure	Off-balance	Positioner
Direct Action	40 ~ 200(0.4 ~ 2.0)		240(2.4)	40(0.4)	with
	–	60 ~ 220(0.6 ~ 2.2)	280(2.8)	60(0.6)	
	40 ~ 200(0.4 ~ 2.0)	40 ~ 200(0.4 ~ 2.0)		80(0.8)	
		–	300(3.0)	100(1.0)	
	–	20 ~ 180(0.2 ~ 1.8)	280(2.8)		
	120 ~ 280(1.2 ~ 2.8)	–	400(4.0)	120(1.2)	with out
Reverse Action	40 ~ 200(0.4 ~ 2.0)		240(2.4)	40(0.4)	with
	–	60 ~ 220(0.6 ~ 2.2)	280(2.8)	60(0.6)	
	80 ~ 200(0.8 ~ 2.0)	80 ~ 240(0.8 ~ 2.4)		80(0.8)	
	–	100 ~ 220(1.0 ~ 2.2)		100(1.0)	
	120 ~ 280(1.2 ~ 2.8)	–	400(4.0)	120(1.2)	with out

■ BSH

Unit : kPaG(kgf/cm²G)

Action	N28 ~ N40	500 ~ 650X	Supply Air Pressure	Off-balance	Positioner
Direct Action	80 ~ 200(0.8 ~ 2.0)		280(2.8)	80(0.8)	with
	80 ~ 200(0.8 ~ 2.0)		300(3.0)	100(1.0)	
	120 ~ 280(1.2 ~ 2.8)	–	400(4.0)	120(1.2)	with out
Reverse Action	80 ~ 200(0.8 ~ 2.0)	80 ~ 240(0.8 ~ 2.4)	280(2.8)	80(0.8)	with
	–	100 ~ 220(1.0 ~ 2.2)		100(1.0)	
	120 ~ 280(1.2 ~ 2.8)	–	400(4.0)	120(1.2)	with out

2 Allowable Shut-off Pressure

■ BS

(1) Allowable Seat Leakage Ratio : 0.01 % of rated Cv

Unit : MPa(kgf/cm²)

Actuator Size	Body Size	50 (mm)	65	80	100	125	150	200	250	300	350
	Off-balance	2 (in.)	2 1/2	3	4	5	6	8	10	12	14
N28	40(0.4)	1.96(20)	1.37(14)	1.18(12)	0.83(8.5)						
	80(0.8)	3.92(40)	2.74(28)	2.35(24)	1.67(17)						
	100(1.0)	5.00(51)	3.43(35)	2.94(30)	2.06(21)						
N33S	40(0.4)	2.94(30)	1.96(20)	1.77(18)	1.17(12)						
	80(0.8)	5.88(60)	4.02(41)	3.53(36)	2.45(25)						
	100(1.0)	7.35(75)	5.09(52)	4.41(45)	3.04(31)						
	120(1.2)	8.82(90)	6.08(62)	5.29(54)	3.62(37)						
N40	40(0.4)	4.11(42)	2.84(29)	2.45(25)	1.66(17)	1.37(14)	1.18(12)	—			
	80(0.8)	8.23(84)	5.78(59)	4.90(50)	3.43(35)	2.75(28)	2.25(23)	[1.57 (16)]			
	100(1.0)	9.80(100)	7.15(73)	6.17(63)	4.31(44)	3.43(35)	2.87(29)	1.96(20)			
	120(1.2)		8.62(88)	7.45(76)	5.19(53)	4.11(42)	3.43(35)	—			
500	40(0.4)	6.86(70)	4.81(49)	4.12(42)	2.84(29)	2.25(23)	1.86(19)	1.27(13)	1.08(11)	0.66(6.8)	
	60(0.6)	9.80(100)	7.15(73)	6.17(63)	4.31(44)	3.43(35)	2.84(29)	1.96(20)	1.56(16)	0.98(10)	
	80(0.8)		9.61(98)	8.33(85)	5.78(59)	4.60(47)	3.82(39)	2.65(27)	2.16(22)	1.27(13)	
	100(1.0)		9.80(100)	9.80(100)	7.15(73)	5.78(59)	4.80(49)	3.33(34)	2.65(27)	1.66(17)	
650	40(0.4)			7.15(73)	5.00(51)	4.02(41)	3.33(34)	2.25(23)	1.86(19)	1.07(11)	0.79(8.1)
	60(0.6)			9.80(100)	7.45(76)	5.98(61)	5.00(51)	3.43(35)	2.74(28)	1.67(17)	1.18(12)
	80(0.8)					8.04(82)	6.76(69)	4.60(47)	3.73(38)	2.25(23)	1.57(16)
	100(1.0)					9.80(100)	8.43(86)	5.78(59)	4.60(47)	2.84(29)	1.96(20)
650X	40(0.4)							4.60(47)	3.72(38)	2.25(23)	1.56(16)
	60(0.6)							6.96(71)	5.58(57)	3.43(35)	2.35(24)
	80(0.8)							9.31(95)	7.45(76)	4.60(47)	3.13(32)
	100(1.0)							9.80(100)	9.31(95)	5.78(59)	3.92(40)

【Note】 When tight shut off (T.S.O. : 0.001% or 0.002%) is requied for On-Off port or Throttle port for Type BS, Allowable Shut-Off Pressure shall be multiplied by 1/1.2 from the table above.

(2) Allowable Seat Leakage Ratio : ANSI/FCI Class V (Oprion)

Unit : MPa(kgf/cm²)

Actuator Size	Body Size	50(mm)	65	80	100	125	150	200	250	300	350
	Off-balance	2(in.)	2 1/2	3	4	5	6	8	10	12	14
N28	80(0.8)	3.23(33)	2.25(23)								
	100(1.0)	4.11(42)	2.84(29)								
N33S	80(0.8)	4.90(50)	3.33(34)	2.94(30)	1.96(20)						
	100(1.0)	6.08(62)	4.21(43)	3.62(37)	2.45(25)						
	120(1.2)	7.35(75)	5.00(51)	4.41(45)	2.94(30)						
N40	80(0.8)	6.86(70)	4.80(49)	4.02(41)	2.84(29)	2.25(23)					
	100(1.0)	8.62(88)	5.88(60)	5.09(52)	3.53(36)	2.84(29)					
	120(1.2)	9.80(100)	7.15(73)	6.17(63)	4.31(44)	3.43(35)	2.84(29)				
500	60(0.6)	8.62(88)				3.43(35)	—				
	80(0.8)	9.80(100)	7.94(81)	6.86(70)	4.80(49)	3.82(39)	3.13(32)				
	100(1.0)		9.80(100)	8.62(88)	5.88(60)	4.80(49)	3.92(40)				
650	60(0.6)			9.02(92)	6.17(63)	4.90(50)	4.11(42)	2.84(29)	—		
	80(0.8)			9.80(100)	8.33(85)	6.66(68)	5.58(57)	3.82(39)	3.04(31)		
	100(1.0)				9.80(100)	8.33(85)	6.96(71)	4.80(49)	3.82(39)		
650X	60(0.6)							5.78(59)	4.60(47)	2.84(29)	—
	80(0.8)							7.74(79)	6.17(63)	3.82(39)	—
	100(1.0)							8.13(83)	7.74(79)	4.80(49)	3.23(33)

■ BSH

Unit : MPa(kgf/cm²)

Actuator Size	Body Size	50(mm)	65	80	100	125	150	200	250	300	350
	Off-balance	2(in.)	2 1/2	3	4	5	6	8	10	12	14
N28	80 (0.8)	3.53(36)	2.35(24)								
	100 (1.0)	4.51(46)	3.04(31)								
N33S	80 (0.8)	5.39(55)	3.62(37)	3.04(31)	2.05(21)						
	100 (1.0)	6.86(70)	4.70(48)	3.92(40)	2.64(27)						
	120 (1.2)	8.33(85)	5.68(59)	4.80(49)	3.23(33)						
N40	80 (0.8)	7.74(79)	5.29(54)	4.51(46)	3.04(31)	2.35(24)	1.86(19)				
	100 (1.0)	9.80(100)	6.76(69)	5.87(59)	3.92(40)	3.04(31)	2.45(25)				
	120 (1.2)		8.23(84)	6.96(71)	4.80(49)	3.72(38)	3.04(31)				
500	80 (0.8)		9.21(94)	7.84(80)	5.39(55)	4.21(43)	3.43(35)	2.25(23)	1.76(18)		
	100 (1.0)		9.80(100)	9.80(100)	6.76(69)	5.39(55)	4.41(45)	2.94(30)	2.25(23)		
650	80 (0.8)				9.61(98)	7.64(78)	6.37(65)	4.21(43)	3.33(34)	2.05(21)	1.37(14)
	100 (1.0)				9.80(100)	9.70(99)	8.04(82)	5.39(55)	4.31(44)	2.64(27)	1.76(18)
650X	80 (0.8)							8.92(91)	7.06(72)	4.31(44)	2.94(30)
	100 (1.0)							9.80(100)	8.92(91)	5.49(56)	3.72(38)

【Notes】(1) ▭ portion shows standard combination of valve Body and Actuator.
(2) The Unit of off-balance is kPaG(kgf/cm²G).
(3) On type BS, Actuator Size N40, Off-balance 80kPaG(0.8 kgf/cm²G), above Shut-off Pressure is not applicable for reverse action Type with rated travel 65mm.
(4) Shut-off pressure of this table shows the value only with standard gland packing. (P4519 + V7010)
(5) On Bellow Seal Bonnet valve, Allowable Shut-Off Pressure is differed from above table because of Bellows effective area.
(6) Off-Balance 120kPaG(1.2kgf/cm²G) is not applicable for Actuator N40 with rated travel 65mm.
(7) Actuator size N33S & N40 with Off-Balance 120kPaG(1.2kgf/cm²G) is only applicable for type CQ-BS and CQ-BSH.
(8) On Model 83A-BS, seat leakage class V and Off-balanse 40kPaG(0.4kgf/cm²G) is not applicable.
On Model 83A-BSH, Off-balanse is not applicable lower than 60kPaG(0.6kgf/cm²G).
(9) When Off-Balance is 100kPaG(1.0kgf/cm²G) on reverse action actuator size 500 ~ 650X, Spring Range may differs by actuator size and valve rated travel.
(10) Off-Balance 100kPaG(1.0kgf/cm²G) is not applicable for reverse action actuator size 500S rated travel 65mm.
Actuator size 500L should be selected.
(11) For Model 83BS, seat leakage class V and for "Use no oil" application, smallest actuator size is N33S.

9. MAIN DIMENSIONS AND WEIGHT

1 Face-to-face Dimensions of Valve

Unit : mm

Valve Size (mm)	Valve Size (In.)	Face-to-face Dimension: JIS 10 K / ASME 150 RF	JIS 20 K / ASME 300 RF	JIS 30 K 40 K RF / ASME 300 RJ / ASME 600 RF	ASME 600 RJ	50mm or less : SW / 60mm or more: BW
50	2	254	267	286	289	320
65	2 1/2	276	292	311	314	380
80	3	298	317	337	340	430
100	4	352	368	394	397	490
125	5	403	425	457	460	580
150	6	451	473	508	511	630
200	8	543	568	610	613	800
250	10	673	708	752	755	910
300	12	737	775	819	822	1030
350	14	889	927	972	975	1150

【Notes】(1) Face-to-face dimension in ▭ shaded zone conform to IEC 534-3 (JIS B2002) and ISA-S75.03.
(2) Face-to-face dimensions of male and female, tongue and groove flange for JIS 10K-30K (ASME 150, ASME 300) are identical JIS 30K RF.

2 Weight

Unit : Kg

Valve Size	(mm)	50		65		80			100			125			150		
	(In.)	2		2 1/2		3			4			5			6		
Press. Rating		10K	20,30,40K	10K	20,30,40K	10K	20K	30,40K	10K	20K	30,40K	10K	20K	30,40K	10K	20K	30,40K
Bonnet Type	Actuator Size	ASME 150	ASME 300,600	ASME 150	ASME 300,600	ASME 150	ASME 300	ASME 600	ASME 150	ASME 300	ASME 600	ASME 150	ASME 300	ASME 600	ASME 150	ASME 300	ASME 600
Plain Bonnet	N28	49	57	59	68	75	78	91	101	109	142						
	N33S	58	66	68	77	84	87	100	110	118	151						
	N40	86	94	96	105	109	112	125	135	143	176	175	189	244	220	245	265
	500S	120	128	130	139	143	146	159	169	177	210	211	225	280	256	281	301
	650S					331	334	347	357	365	398	399	413	468	444	469	489
Extension Bonnet -F	N28	55	63	66	75												
	N33S	64	72	75	84	93	96	109	118	126	159						
	N40	92	100	103	112	120	123	135	145	153	186	187	201	256	233	258	278
	500S	126	134	137	146	154	157	169	179	187	220	213	237	292	269	294	314
	650S					342	345	357	367	375	408	401	425	480	457	482	502

Valve Size	(mm)	200			250			300			350		
	(In.)	8			10			12			14		
Press. Rating		10K	20K	30,40K	10K	20K	30,40K	10K	20K	30,40K	10K	20K	30,40K
Bonnet Type	Actuator Size	ASME 150	ASME 300	ASME 600	ASME 150	ASME 300	ASME 600	ASME 150	ASME 300	ASME 600	ASME 150	ASME 300	ASME 600
Plain Bonnet	N40	260	300	360									
	500S	294	336	396									
	500L	–	–	–	410	457	554	579	644	774			
	650S	479	521	581	–	–	–	–	–	–			
	650L				583	630	727	752	817	947	950	1042	1234
	650XS	574	616	676	–	–	–	–	–	–	–	–	–
	650XL				703	750	847	872	937	1067	1070	1162	1354
Extension Bonnet -F	N40	268	308	368									
	500S	302	344	404									
	500L	–	–	–	418	465	562	587	652	782			
	650S	487	529	589	–	–	–	–	–	–			
	650L				583	630	727	752	817	947	950	1042	1234
	650XS	582	624	684									
	650XL				703	750	847	872	937	1067	1070	1162	1354

【Notes】The masses of actuator size 500S/L and 650S/L and 650XS/XL show only for direct action.

3 Standard Dimensions

Unit : mm

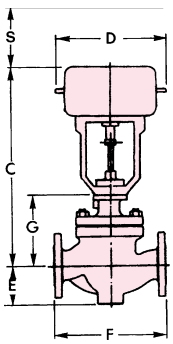
Valve Size (mm)	Valve Size (inch)	Actuator Size	D	E	Plain Bonnet G	Plain Bonnet C	Extension Bonnet Type-F G	Extension Bonnet Type-F C	Extension Bonnet Type-H G	Extension Bonnet Type-H C	Bellows Seal Bonnet Welded Type BA20K, 30K G	Bellows Seal Bonnet Welded Type BA20K, 30K C	Bellows Seal Bonnet Welded Type BA40K G	Bellows Seal Bonnet Welded Type BA40K C	CR Note (2)	S Note (4)
50	2	N28	280	95	171	507	321	657	735	1070	443	779	496	832	–	220
		N33S	330			562		712		1125		834		887		240
		N40	400		200	715	350	865	801	1316	524	1039	576	1019		350
		500S	500			934		1084		1535		1258		1310	160	370
65	2 1/2	N28	280	106	217	553	367	703	753	1089	550	886	624	960	–	220
		N33S	330			608		758		1144		941		1015		240
		N40	400		246	761	396	911	847	1334	631	1146	704	1219		350
		500S	500			980		1130		1553		1365		1438	160	370
80	3	N28	280	130/135	218	554	368	704	807	1157	551	887	625	961	–	220
		N33S	330			609		759		1212		942		1016		240
		N40	400		247	762	397	912	873	1427	632	1147	705	1220		350
		500S	500			981		1131		1646		1366		1439	160	370
		650S	650			1277		1427		1764	643	1673	716	1746	250	380
100	4	N28	280	145	256	592	406	742	845	1184	589	925	663	999	–	220
		N33S	330			647		797		1239		980		1054		240
		N40	400		285	800	435	950	911	1454	670	1185	743	1258		350
		500S	500			1019		1169		1673		1404		1477	160	370
		650S	650			1315		1465		1969	681	1711	754	1784	250	380
125	5	N40	400	180	313	828	463	978	939	1475	759	1274	867	1382	–	350
		500S	500			1047		1197		1694		1493		1601	160	370
		650S	650			1343		1493		1990	764	1794	872	1902	250	380
150	6	N40	400	205	341	856	491	1006	967	1504	784	1299	895	1410	–	350
		500S	500			1075		1225		1723		1518		1629	160	370
		650S	650			1371		1521		2019	801	1831	900	1930	250	380
200	8	N40	400	225	446	965	597	1112	1149	1664	1019	1534	1164	1679	–	350
		500S	500			1180		1333		1883		1753		1898	160	370
		650S	650			1480		1628		2179	1044	2074	1189	2219	250	380
		650XS				1955		2105		2658		2553		2698	300	410
250	10	500L	500	270	462	1285	612	1433	1164	1984	–	–	–	–	145	370
		650L	650			1595		1748		2297					300	410
		650XL				2206		2356		2908						480
300	12	500L	500	290	557	1380	707	1529	1222	2042	–	–	–	–	145	370
		650L	650			1690		1844		2355					300	410
		650XL				2301		2452		2966						480
350	14	650L	650	320	603	1740	753	1890	1302	2435	–	–	–	–	300	410
		650XL				2347		2498		3046						480

【Notes】 (1) Dimension C shows for Direct Action. For Reverse Action Actuator N28-N40, add 25mm.
(2) Dimension C for Actuator 500S, 500L, 650S and 650L Reverse Action, add CR dimension.
(3) E dimension for Valve size 80mm, upper shows for class 150-300 lb and lower shows 400-600 lb.
(4) Dimension S shows after dismantling Actuator.

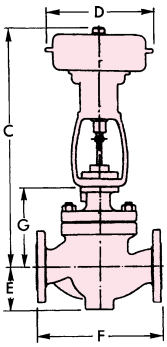
■ Plain Bonnet Type

Actuator Siz

N28 ~ N40

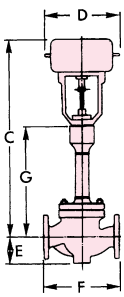


500 ~ 650X



■ Extension Bonnet Type (Type-F, Type-H)

N28 ~ N40



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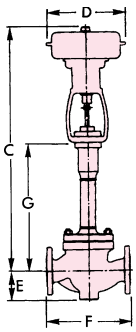
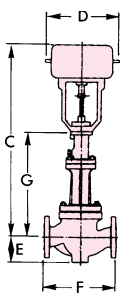


■ Bellows Seal Bonnet Type

N28 ~ N40



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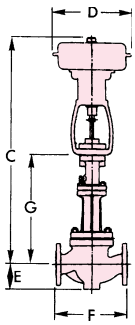
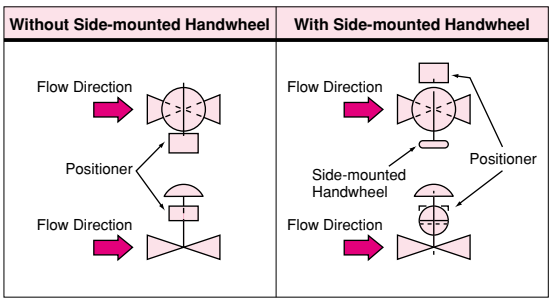


10. MOUNTING ORIENTATIONS

Standard mounting orientations are as follows.



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