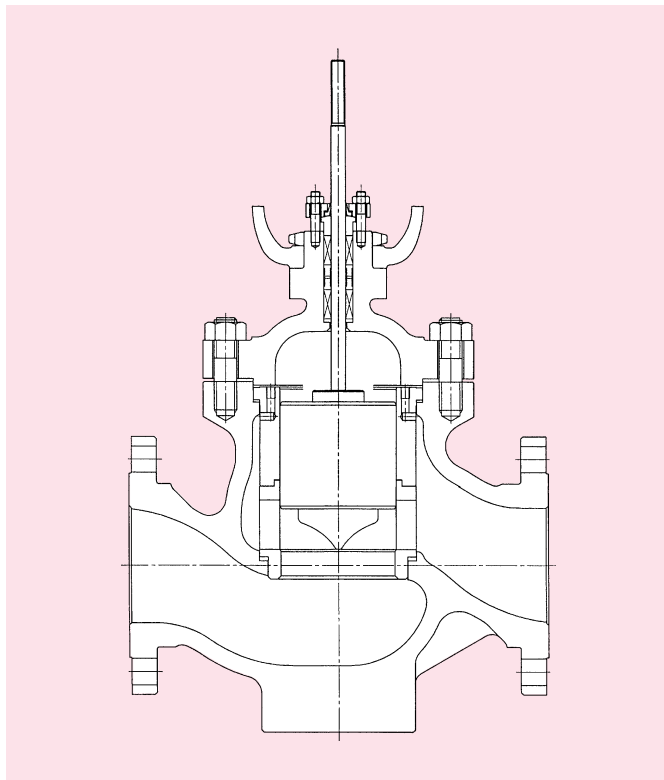


## Model 83A 150 - 300 - 600LB CAGE GUIDED TYPE CONTROL VALVES

**Model 83A** control valves have cage guided trim, providing wide controllability, having wide scope of production range for reduced port, and capable for comprehensive application for various kinds of services.

These valves permit stable control for plug closing and opening against the thrust of fluid, and are available for applications not only for general use but also for controlling high temperature and high pressure for power plants and chemical plants. Especially, these valves are suited for low noise application because of the superior noise reduction effect at high load.

The actuators are designed compactly as multi-spring diaphragm operated type and permit high thrust power.


**83  
A**

### 1. VALVE TYPE

#### Valve Style and Cage Type

83A		Cage Type	–	Plug Type															
CV	V-Port (V)	<div style="border: 1px solid black; padding: 5px;"> <table border="1"> <tr><td>CV</td><td>V-Port (V)</td></tr> <tr><td>CS</td><td>Multi-Hole</td></tr> <tr><td>CS-L</td><td>Double Stage Multi-Hole Throttling</td></tr> <tr><td>CQ</td><td>Quick Opening (Q)</td></tr> </table> </div>	CV	V-Port (V)	CS	Multi-Hole	CS-L	Double Stage Multi-Hole Throttling	CQ	Quick Opening (Q)	<div style="border: 1px solid black; padding: 5px;"> <table border="1"> <tr><td>-BP</td><td>Pilot Balance</td></tr> <tr><td>-S</td><td>Single Seat (Un -Balanced)</td></tr> <tr><td>-BS</td><td>Seal Ring Balance (Low &amp; Medium Temp.)</td></tr> <tr><td>-BSH</td><td>Seal Ring Balance (High Temp.)</td></tr> </table> </div>	-BP	Pilot Balance	-S	Single Seat (Un -Balanced)	-BS	Seal Ring Balance (Low & Medium Temp.)	-BSH	Seal Ring Balance (High Temp.)
CV	V-Port (V)																		
CS	Multi-Hole																		
CS-L	Double Stage Multi-Hole Throttling																		
CQ	Quick Opening (Q)																		
-BP	Pilot Balance																		
-S	Single Seat (Un -Balanced)																		
-BS	Seal Ring Balance (Low & Medium Temp.)																		
-BSH	Seal Ring Balance (High Temp.)																		
CS	Multi-Hole																		
CS-L	Double Stage Multi-Hole Throttling																		
CQ	Quick Opening (Q)																		
83ACP-S	Contoured Plug, Single Seat (Quick opening, Single Seat)																		
83ACP-S-RT	Labyrinth Trim																		
83-NRV	Multi-Hole & Multi-Stage																		

- [Notes]** (1)  portion is described in this catalog.  
 (2) See Catalog MCE-B4307 for -BS & -BSH, Seal Ring Balanced Type Control Valves and MCE-B4304 for -NRV, Multi-Hole & Multi-Stage Type Control Valves.  
 (3) Double Seat plug is only available for replacement parts for supplied valves. Plug Type "BS" and "BSH" are recommended for new valves.

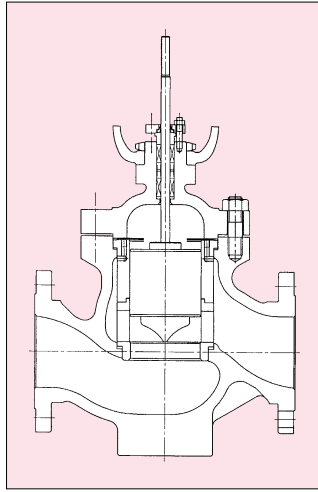
## 2. FEATURES

### Model CV V Port Type

Model CV is cage guided control valve and used for most general purpose with V port of cage characterized, proving wide applicability, excellent characteristics at high load, and easy maintenance. Moreover, the trim permits resilient seat.

■ **Typical Application**

- General use
- Power plant and chemical plant
- For medium or high pressure

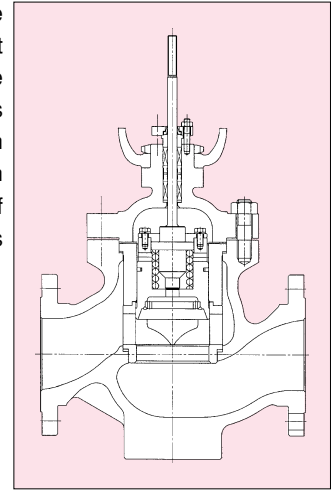


### Model CV-BP Pilot Balance Type

Model CV-BP is cage guided control valve that valve plug has pilot balance construction which permits low seat leakage ratio such as single seat, and high shutt-off thrust in spite of small actuator size such as double seat.

■ **Typical Application**

- Turbine bypass valve
- Open valve
- Shutt-off valve



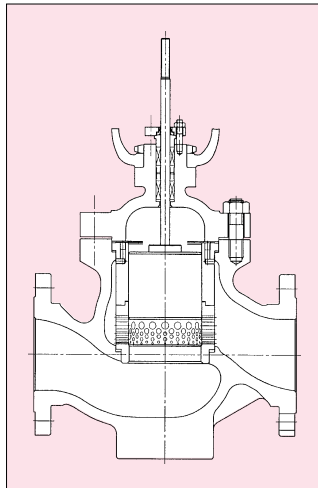
### Model CS Multi-hole Type

Model CS helps to attenuate aerodynamic 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

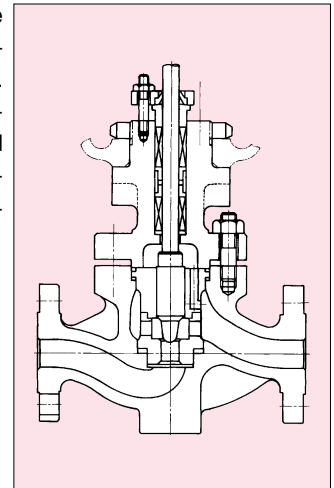


### Model CP-S Contoured Plug Type Single Seated

Model CP-S is cage guided and single seated control valve with contoured plug. Which is suited for high temperature and pressure, and stands against lateral vibration, and is available for anti-erosion material for trim.

■ **Typical Application**

- General use
- For high temperature and high differential pressure



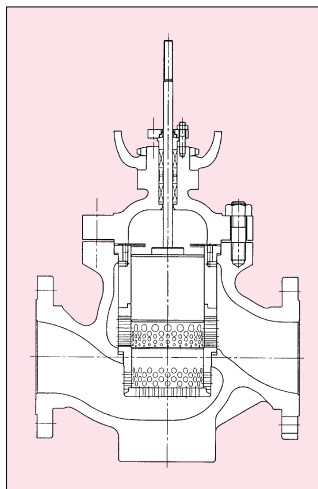
### Model CS-L Double Stage Multi-hole Throttling Type

Model CS-L is double stage multi-hole throttling type control valve providing additional fixed orifice to 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



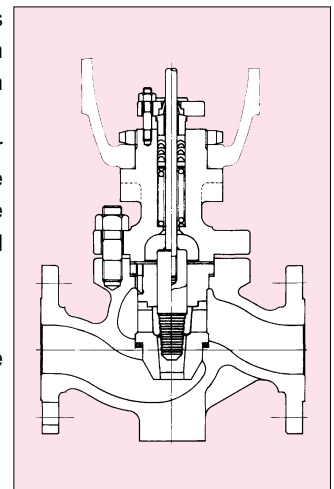
### Model CP-S-RT Labyrinth Trim Type

Model CP-S-RT provides multi-throttling with a trim having labyrinth slots on outer valve plug.


These valves hardly wear the seating surface in spite of low travel service, and are suited for high differential pressure of liquid.

■ **Typical Application**

- Boiler feed water small valve
- High differential pressure valve
- Anti-cavitation valve



## 3. SPECIFICATIONS

<b>Valve Type</b>		Diaphragm Operated Cage Guide Type Control Valve							
<b>Valve Model No.</b>		3883A, 2883A							
<b>VALVE BODY</b>	<b>Body Type</b>	Model 83ACV-S	Model 83ACQ-S	Model 83ACS-S	Model 83ACS-L-S	Model 83A CV-BP, CQ-BP CS-BP, CS-L-BP		Model 83ACP-S	Model 83ACP-S-RT
	<b>Valve Sizes</b>	<b>mm</b>	20 ~ 350			50 ~ 350		15 ~ 50	15 ~ 80
		<b>(in.)</b>	(3/4 ~ 14)			(2 ~ 14)		(1/2 ~ 2)	(1/2 ~ 3)
	<b>Pressure Rating</b>	JIS10K, 20K, 30K, 40K, ASME/JPI Class 150, 300, 600 <sup>(3)</sup>							
	<b>End Connections</b>	Flanged end : FF, RF, RJ, Male and female, Tongue and groove (Welding end* : SW, BW)							
	<b>Body Materials</b>	SCPH2, SCPH11, SCPH21, SCPH32, SCPH61, SCS13A, SCS14A, SCS16A WCB, WC1, WC6, WC9, C5, DF8, CF8M, CF3M							
	<b>Bonnet Types</b>	<ul style="list-style-type: none"> <li>■ - 196 °C ≤ T &lt; - 45 °C : Extension Bonnet, Type-H</li> <li>■ - 45 °C ≤ T &lt; - 17 °C : Extension Bonnet, Type-F</li> <li>■ - 17 °C ≤ T ≤ + 230 °C : Plain Bonnet</li> <li>■ + 230 °C &lt; T : Extension Bonnet, Type-F</li> </ul>							
		Bellows seal (See Page 6)							
	<b>Gland Type</b>	Bolted gland							
	<b>Packing (Non Asbestos)</b>	Braided packing, Molded packing							
	<b>Gaskets (Non Asbestos)</b>	Serrated gasket, Spiral wound gasket							
	<b>Guiding</b>	Cage guide							
	<b>Valve Plug Action</b>	Push-down close							
	<b>Seat Type</b>	Single seated, Double seated (Model BLCV soft seat are available only for double seated type.)				Single seated			
<b>Cage Shapes</b>	V-Port	Quick opening	Multi-hole	Double throttling with multi-hole	Pilot balance		Contoured	Labyrinth trim	
<b>Flow Direction</b> 	Single seat Double seat	FTCL liquid 2.45MPa (25kgf/cm <sup>2</sup> ) and over in diff. press. FTO : Except above		FTC : Liquid FTO : Except liquid	FTO		FTC		
		FTC		FTO		FTC		FTO	
<b>Trim Materials</b>	SUS316 (SCS14A), SUS440B, SUS630 (SCS24), See Page 5 "Main Materials"								
<b>Treatment of Trim</b>	See Page 5 "Main Materials"								
<b>ACTUATOR</b>	<b>Actuator Type</b>	Model 3800 Multi-spring type single acting diaphragm Actuator				Model 2800 Spring type single acting diaphragm Actuator			
	<b>Actuator Sizes</b>	N24	N28	N33S	N40	500S	500L	650S, XS	650L, XL
	<b>Max. Stroke (mm)</b>	25	38	38	65	65	100	65	130
	<b>Supply Air Press. kPaG (kgf/cm<sup>2</sup>G)</b>	140 (1.4), 240 (2.4), 280 (2.8), 300 (3.0) 400 (4.0) ... N33S & N40 only				120 (1.2), 140 (1.4), 240 (2.4), 280 (2.8)			
	<b>Spring Range kPaG (kgf/cm<sup>2</sup>G)</b>	20 ~ 100 (0.2 ~ 1.0), 40 ~ 200 (0.4 ~ 2.0) 80 ~ 200 (0.8 ~ 2.0) 120 ~ 280 (1.2 ~ 2.8) ... N33S & N40 only				20 ~ 100 (0.2 ~ 1.0), 40 ~ 200 (0.4 ~ 2.0) 60 ~ 220 (0.6 ~ 2.2), 80 ~ 240 (0.8 ~ 2.4) 20 ~ 180 (0.2 ~ 1.8), 100 ~ 220 (1.0 ~ 2.2)			
	<b>Action</b>	Direct action, Reverse action							
	<b>Materials</b>	(Diaphragm) Cloth reinforced chloroprene rubber, (Yoke) FC200							
	<b>Air Connection</b>	Rc 1/4, Rc 3/8 (650 & 650X only)							
<b>Ambient Temperature</b>	- 20 °C ~ + 70 °C (- 50 °C ~ - 20 °C, + 70 °C ~ + 100 °C*) Note (5)				- 30 °C ~ + 70 °C (- 50 °C ~ - 30 °C, + 70 °C ~ + 100 °C*) Note (5)				
<b>Painting Color</b>	Silver, No painting on stainless steel								

<b>VALVE CHARACTERISTICS AND PERFORMANCE</b>	<b>Body Type</b>	Model 83ACV-S	Model 83ACQ-S	Model 83ACS-S	Model 83ACS-L-S	Model 83A CV-BP, CQ-BP CS-BP, CS-L-BP	Model 83ACP-S	Model 83ACP-S-RT	
	<b>Control Mode</b>	Throttling control, On-off control							
	<b>Valve Action</b>	Direct action (Air-to close), Reverse action (Air-to open)							
	<b>Applicable Press. Range</b>	9.80 MPaG (100kgf/cm <sup>2</sup> G) or less (Pressure limit shall conform to the standard of materials & pressure temperature rating)							
	<b>Applicable Temp. Range</b>	- 196 °C ~ + 550 °C (Temperature limit shall conform to pressure temperature rating)							
	<b>Allowable Differential Pressure</b>	See Page 10 ~ 13 "Allowable Shut-off Pressure"							
	<b>Rated Cv Value</b>	See Page 8 "Rated Cv Value"							
	<b>Flow Characteristics</b>	See Page 8, 9 "Flow Characteristics"							
	<b>Inherent Rangeability</b>	50 : 1 (100 : 1*) See Page 8 "Rated Cv Value"							
	<b>Allowable Seat Leakage Ratio</b>	<b>Metal Seat</b>	<b>V-Port, Multi-hole</b>	Single Seated Type <sup>Note (5)</sup>		Double Seated Type	Single Seated Type <sup>Note (5)</sup>		
0.01% of rated Cv (ANSI/FCI Class IV) Tight shut off (TSO) * (Body size) (% of rated Cv) 25mm or smaller ... 0.0001% 100mm or smaller ... 0.001 % 125mm and larger ... 0.002 %				0.5 % of rated Cv (ANSI/FCI Class II)	0.001 % of rated Cv ANSI/FCI Class V *  25mm or smaller 0.0001 % of rated Cv 40mm or larger 0.001 % of rated Cv		0.01 % of rated Cv (ANSI/FCI Class IV)		
(Body size) (% of rated Cv) 25mm or smaller ... 0.0001% 100mm or smaller ... 0.001 % 125mm and larger ... 0.002 %				0.1 % of rated Cv (ANSI/FCI Class III)	—		—		
<b>Quick Opening</b>			—		0.001 % of rated Cv		—		
			—		—		—		
<b>Action Accuracy</b>	<b>Hysteresis Error (with Positioner)</b>		Max. 2 % F.S.						
	<b>Linearity (with Positioner)</b>		Max. 2 % F.S.						
<b>ADDITIONAL OPTIONS*</b>	<b>Valve Body</b>		Drain plug, Special treatment for trim						
	<b>Actuator</b>		Handwheel (Top-mounted handwheel, Side-mounted handwheel), Travel stop, Oil dash pot (only for Model 2800), Diaphragm material : Ethylene propylene rubber, Yoke material : SCPH2						
	<b>Accessories</b>		Pneumatic positioner (PA92A), Electro-pneumatic positioner (EA 91A, EA90A, EA10S) Pressure regulator (MR2000, Limit swich, Solenoid valve, Booster relay, Speed controller, Lock up valve, Pneumatic operated valve						
	<b>Others</b>		The High Pressure Gas Safety Law Certification, Oil-free, Water free, Sandproof, Dustproof, Anti-salt damage, Vacuum service, Cold district spec. Tropical district spec. External exposure bolt & nut S.S. Optional painting color.						

- [Notes]** (1) Valve performance is represented under the condition of standard packing (P4519 + V7010).  
 (2) \* Manufactured and attached as option according to customer's request.  
 (3) See Bulletin No. MCE-B4302 for ASME class 900 and 1500 valves.  
 (4) For ambient temperature, denoted the extended temperature range as option.  
 (5) On single seated valve, ANSI/FCI Class V (allowable seat leakage ratio) is available on request.

## 4. 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 Bolts and Nuts	A193GrB7/S45C (H)		A193GrB8CL2/SUS304	

**[Notes]** (1) This table shows typical combination of materials. The combination may be subject to change by pressure, temperature and Kind of fluid.  
 (2) Trim materials may be used casting instead of bar materials.

### 2 Trim Hard Facing Note (1)

#### SUS316 (SCS14A), SUS316L (SCS16A)

CoCr Alloy Hard Facing	CoCr Alloy Seat	CoCr Alloy Face	
Cage Type	CV-S, CQ-S CS-S, CS-L-S	CV-S, CQ-S CS-S, CS-L-S CV-BP, CQ-BP CS-BP, CS-L-BP	CP-S CP-S-RT
Valve Plug	CoCr Alloy Seat	CoCr Alloy Face	
Guide	No Hard Facing ; Design Temp. $\leq 400\text{ }^{\circ}\text{C}$ , CoCr Alloy Face ; Design Temp. $> 400\text{ }^{\circ}\text{C}$		
Cage	CoCr Alloy Seat	CoCr Alloy Face	
Applicable Temp.	Refer to SUS316(SCS14A), SUS316L(SCS16A) family Press./Temp. Range		
Applicable $\Delta P$ .			
Applicable Press.	9.8MPaG (100kgf/cm <sup>2</sup> G) or Lower		

#### SUS440B Note (2)

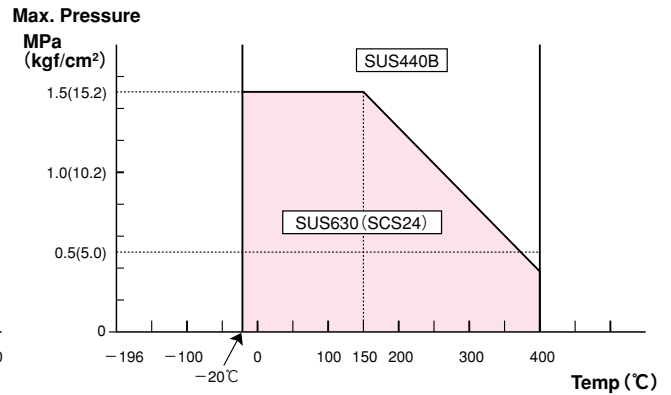
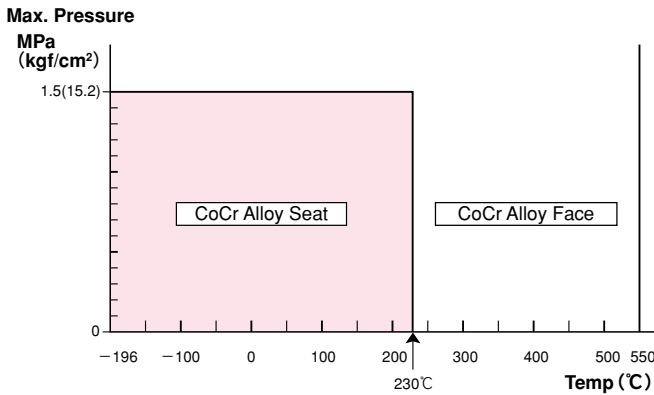
Cage Type	CV-S, CQ-S CS-S	CS-L-S	CV-BP, CQ-BP CS-BP	CP-S CP-S-RT
Valve Plug	SUS440B(Heat treatment)		SUS316 + CoCr Alloy	SUS440B(Heat treatment)
Guide	SUS316(SCS14A) No Hard Facing			
Cage	SUS440B (Heat treatment)	SUS316 (SCS14A) + CoCr Alloy Seat	SUS630(SCS24)(Heat treatment)	
Applicable Temp.	- 20 °C ~ + 400 °C			
Applicable Press.	9.8MPaG (100kgf/cm <sup>2</sup> G) or Lower			

#### SUS630(SCS24) Note (2) (3) (4)

Cage Type	CV-S, CQ-S, CS-S, CS-L-S
Valve Plug	SUS630(SCS24)(Heat treatment)
Guide	SUS316(SCS14A) No Hard Facing
Cage	SUS630(SCS24)(Heat treatment)
Applicable Temp.	- 20 °C ~ + 400 °C
Applicable $\Delta P$ .	Refer to SUS630(SCS24) family Press./Temp. Range
Applicable Press.	9.8MPaG (100kgf/cm <sup>2</sup> G) or Lower

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

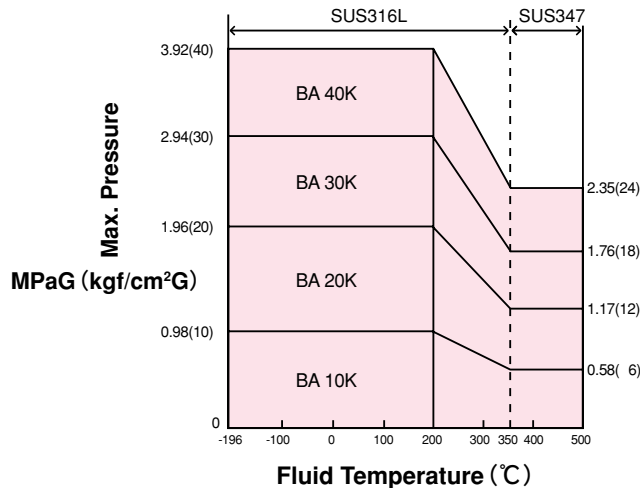
## SUS400B, SUS630(SCS24) family Press. / Temp. Range



- [Notes]**
- (1) Cage has 2 piece construction by Guide and Cage (Part name of Guide for -BS type is Holder)
  - (2) SUS440B shall be suitable for flashing or cavitation services within the temp. range of  $-20^{\circ}\text{C}$  to  $+400^{\circ}\text{C}$ . It is not applicable for type CS-L.
  - (3) Hard Facing of SUS316(SCS14A), SUS316L(SCS16A) and SUS630(SCS24) are not recommended for flashing or cavitation services.
  - (4) SUS630(SCS24) is not applicable for corrosive service as Copper(Cu) contains in the material.
  - (5) 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)

Bellows Material : SUS316L, SUS347 (Standard)  
Hastelloy C-276, Ti, Monel (Option)



## 5. SCOPE OF PRODUCTION

● : Full port      ◆ : Reduced port

### 1 Model CV, CQ, CS, CS-L

#### ■ Combination of Valve Body and Actuator

Valve Model No.	3883				2883				
	Actuator Size	N24	N28	N33S	N40	500S	500L	650S	650L
Valve Size									
20(mm) 3/4(in.)	●	●	●						
25 1	●	●	●						
40 1 1/2	●	●	●	●	●				
50 2	●	●	●	●	●				
65 2 1/2	●	●	●	●	●				
80 3		●	●	●	●			●	
100 4		●	●	●	●			●	
125 5				●	●			●	
150 6				●	●			●	
200 8				●	●			●	
250 10						●			●
300 12						●			●
350 14									●

#### ■ Scope of Port

Port Size (mm)	20	25	32	40	50	65	80	100	125	150	200	250	300	350
Valve Size														
20(mm) 3/4(in.)	●													
25 1	◆	●												
40 1 1/2	◆	◆	◆	●										
50 2		◆	◆	◆	●									
65 2 1/2			◆	◆	◆	●								
80 3				◆	◆	◆	●							
100 4					◆	◆	◆	●						
125 5						◆	◆	◆	●					
150 6							◆	◆	◆	●				
200 8								◆	◆	◆	●			
250 10									◆	◆	◆	●		
300 12										◆	◆	◆	●	
350 14											◆	◆	◆	●

### 2 Model CV-BP, CQ-BP, CS-BP

#### ■ Combination of Valve Body and Actuator

Valve Model No.	3883				2883				
	Actuator Size	N24	N28	N33S	N40	500S	500L	650S	650L
Valve Size									
50(mm) 2(in.)	●	●	●	●	●				
65 2 1/2	●	●	●	●	●				
80 3		●	●	●	●			●	
100 4		●	●	●	●			●	
125 5				●	●			●	
150 6				●	●			●	
200 8				●	●			●	
250 10						●			●
300 12						●			●
350 14									●

#### ■ Scope of Port

Port Size (mm)	32	40	50	65	80	100	125	150	200	250	300	350
Valve Size												
50(mm) 2(in.)	◆	◆	●									
65 2 1/2	◆	◆	◆	●								
80 3	◆	◆	◆	◆	●							
100 4			◆	◆	◆	●						
125 5				◆	◆	◆	●					
150 6					◆	◆	◆	●				
200 8						◆	◆	◆	●			
250 10							◆	◆	◆	●		
300 12								◆	◆	◆	●	
350 14									◆	◆	◆	●

### 3 Model CP-S

#### ■ Combination of Valve Body and Actuator

Valve Model No.	3883				2883	2883		
	Actuator Size	N24	N28	N33S	N40	500S	500S	650
Valve Size								
15(mm) 1/2(in.)	●	●	●					
20 3/4	●	●	●					
25 1	●	●	●					
40 1 1/2	●	●	●	●	●			
50 2	●	●	●	●	●			
65 2 1/2		●	●	●	●	●	●	●

#### ■ Scope of Port

Port Size (mm)	4	6	7	8	10	15	20	25	32	40	50
Valve Size											
15(mm) 1/2(in.)	◆	◆	◆	◆	◆	●					
20 3/4	◆	◆	◆	◆	◆	◆	●				
25 1	◆	◆	◆	◆	◆	◆	◆	●			
40 1 1/2	◆	◆	◆	◆	◆	◆	◆	◆	●		
50 2	◆	◆	◆	◆	◆	◆	◆	◆	◆	●	
65 2 1/2	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	●

### 4 Model CP-S-RT

#### ■ Combination of Valve Body and Actuator

Valve Model No.	3883				2883				
	Actuator Size	N24	N28	N33S	N40	500S	500L	650S	650L
Valve Size									
15(mm) 1/2(in.)	●	●	●						
20 3/4	●	●	●						
25 1	●	●	●						
40 1 1/2	●	●	●	●	●				
50 2	●	●	●	●	●				
65 2 1/2	●	●	●	●	●				
80 3		●	●	●	●			●	

#### ■ Scope of Port

Port Size (Cv)	0.2	0.4	0.6	1.0	1.5	2.0	3.0	5.2	9.0
Valve Size									
15(mm) 1/2(in.)	◆	◆	◆	◆	◆	◆			
20 3/4	◆	◆	◆	◆	◆	◆			
25 1	◆	◆	◆	◆	◆	◆			
40 1 1/2				◆	◆	◆	◆	◆	
50 2				◆	◆	◆	◆	◆	◆
65 2 1/2				◆	◆	◆	◆	◆	◆
80 3				◆	◆	◆	◆	◆	◆

## 6. FLOW CHARACTERISTICS

### 1 Rated Cv Value

Valve Model	Port Size	(mm)	4	6	7	8	10	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350			
		(in.)	-	1/8	3/16	1/4	3/8	1/2	3/4	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		130	
CV, CV-BP CQ, CQ-BP CS, CS-BP	Rated Cv Value								7.5	14	※ 18	27	46	71	110	180	275	395	640	1050	1460	2000			
CS-L CS-L-BP									6.0	11.2	※ 14.4	22	36	56	88	144	220	316	512	840	1168	1600			
Inherent Rangeability		-										50 : 1													
CP-S <sup>(4)</sup>	Rated Cv	Contoured	0.15	0.4	0.8	1.5	3.0	5.2	9.0	16	22	32	52												
		Quick Opening	-	-	-	2.5	3.5	6	10	18	25	40	60												
	Inherent Rangeability	30 : 1		50 : 1																					
Option (Inherent Rangeability)		-		100 : 1 (Eq % only)																					
CP-S-RT	Rated Cv Value <sup>(1)</sup>	0.2	0.4	0.6	1.0	1.5	2.0	3.0	5.2	9.0	12.0														
	Rated Travel (mm)	15							20	25															
	Inherent Rangeability	30 : 1																							

- [Notes]**
- (1) Port size for Model CP-S-RT represent rated Cv value.
  - (2) ※ Port size for pilot balance type (Model-BP) is larger than 32 mm (1 1/4in.).
  - (3) Please contact our sales office as to over Cv value listed above (wide rang Cv value) on Model CP-S.
  - (4) If you need the valve of smaller rated Cv value than the value on this table, Model 3306 Small Flow Control Valve (See Cat. No.MCE-B1601) is recommended.

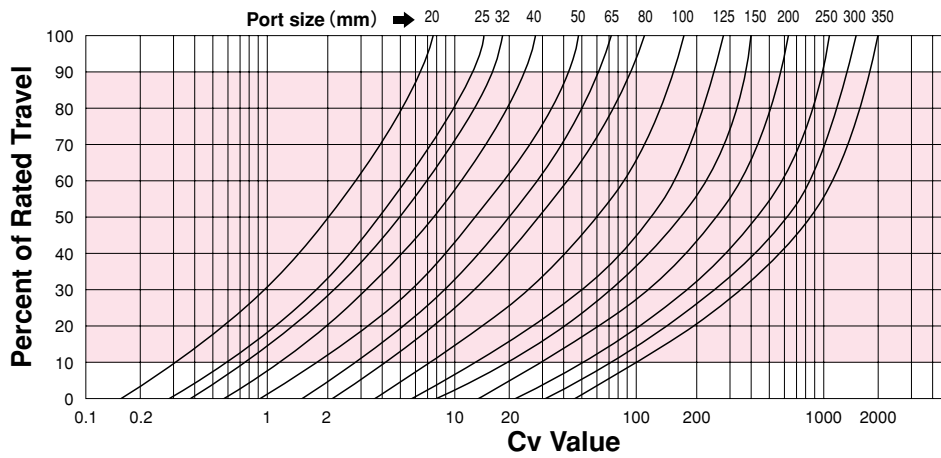
### 2 Flow Characteristics

■ Flow characteristic of each type

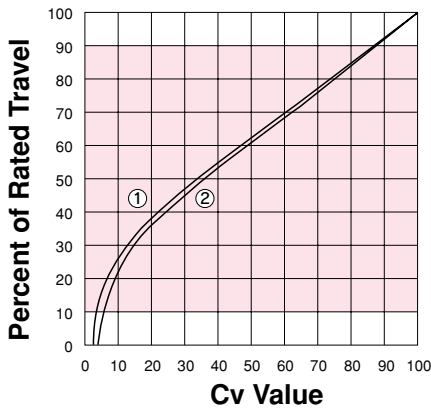
	Eq. %	Linear	Mod. parabolic	on-off
CV CV-BP	○ See the flow characteristics table.	○	/	/
CS CS-L CS-BP CS-L-BP	/	○	○	/
CP-S	○	○	/	○
CP-S-RT	/	/	○	/
CQ, CQ-BP	/	/	/	○



### ■ V-port Type Equal percentage (CV, CV-BP)

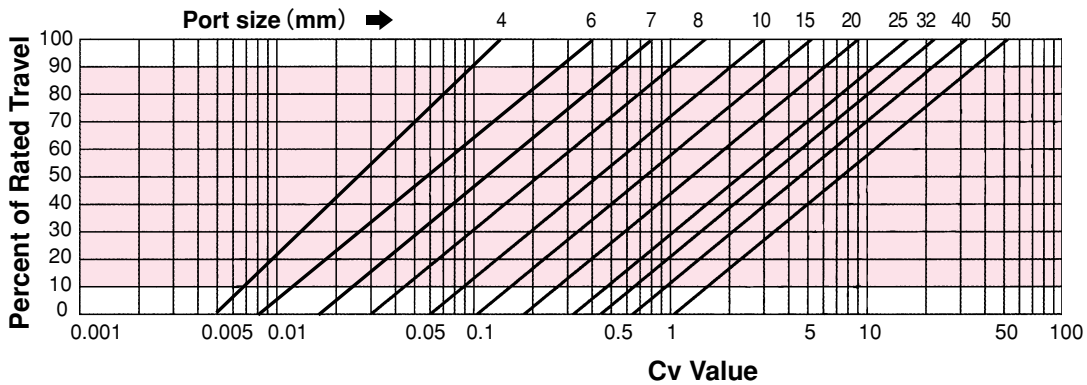


### ■ Modified Parabolic



[Note] Curve ① shows for CS, CS-L and CS-BP.  
Curve ② shows for CP-S-RT.

### ■ Contoured Plug Equal percentage (CP-S)



# 7. ALLOWABLE DIFFERENTIAL PRESSURE

## 1 Off-balance Classification

Unit : kPaG(kgf/cm<sup>2</sup>G)

Action		Spring Range Actuator Size		Supply Air Pressure	Off- balance	Positioner
		N24 ~ N40	500, 650			
Excepting Quick Opening	Direct Action 	-	20 ~ 100 (0.2 ~ 1.0)	120 (1.2)	20 (0.2)	Without
		20 ~ 100 (0.2 ~ 1.0)	20 ~ 100 (0.2 ~ 1.0)	140 (1.4)	40 (0.4)	With
		40 ~ 200 (0.4 ~ 2.0)	60 ~ 220 (0.6 ~ 2.2)	240 (2.4)	60 (0.6)	
		40 ~ 200 (0.4 ~ 2.0)	40 ~ 200 (0.4 ~ 2.0)	280 (2.8)	80 (0.8)	
		-	20 ~ 180 (0.2 ~ 1.8)	300 (3.0)	100 (1.0)	
	※ 120 ~ 280 (1.2 ~ 2.8)	-	280 (2.8)	120 (1.2)		
	Reverse Action 	-	20 ~ 100 (0.2 ~ 1.0)	120 (1.2)	20 (2.0)	Without
		20 ~ 100 (0.2 ~ 1.0)	20 ~ 100 (0.2 ~ 1.0)	140 (1.4)	40 (0.4)	With
		40 ~ 200 (0.4 ~ 2.0)	60 ~ 220 (0.6 ~ 2.2)	240 (2.4)	60 (0.6)	
		80 ~ 200 (0.8 ~ 2.0)	80 ~ 240 (0.8 ~ 2.4)	280 (2.8)	80 (0.8)	
100 ~ 220 (1.0 ~ 2.2)		-	300 (3.0)	100 (1.0)		
※ 120 ~ 280 (1.2 ~ 2.8)	-	280 (2.8)	120 (1.2)			
Quick Opening	Direct Action 	40 ~ 200 (0.4 ~ 2.0)	60 ~ 220 (0.6 ~ 2.2)	240 (2.4)	40 (0.4)	Without
		-	40 ~ 200 (0.4 ~ 2.0)	280 (2.8)	60 (0.6)	
		40 ~ 200 (0.4 ~ 2.0)	40 ~ 200 (0.4 ~ 2.0)	280 (2.8)	80 (0.8)	
		-	20 ~ 180 (0.2 ~ 1.8)	300 (3.0)	100 (1.0)	
		※ 120 ~ 280 (1.2 ~ 2.8)	-	280 (2.8)	120 (1.2)	
	Reverse Action 	40 ~ 200 (0.4 ~ 2.0)	60 ~ 220 (0.6 ~ 2.2)	240 (2.4)	40 (0.4)	Without
		-	40 ~ 200 (0.4 ~ 2.0)	280 (2.8)	60 (0.6)	
		80 ~ 200 (0.8 ~ 2.0)	80 ~ 240 (0.8 ~ 2.4)	280 (2.8)	80 (0.8)	
		100 ~ 220 (1.0 ~ 2.2)	-	300 (3.0)	100 (1.0)	
		※ 120 ~ 280 (1.2 ~ 2.8)	-	280 (2.8)	120 (1.2)	

- [Notes] (1) ※ Spring Range 120 ~ 280kPaG is available for actuator size N33S and N40.  
 (2) Off-balance 100kPaG (1.0kgf/cm<sup>2</sup>G) is available only for direct action control.  
 (3) Off-balance 20kPaG (0.2kgf/cm<sup>2</sup>G) is not available for actuator size 650 or 650X.

## 2 Allowable Shut-off Pressure

■ Type CV-S, CQ-S, CS-S, CS-L-S <sup>Note (9)</sup>

V-Port, Quick Opening, Multi-hole, Double Throttling with Multi-hole, Contoured Type

Unit : MPa (kgf/cm<sup>2</sup>)

Actuator Size	Valve Size Off-balance	83A Cage CV-S · CS-S · CS-L-S (Single Seated Metal Seat)													
		20 (mm) 3/4 (in.)	25 1	40 1 1/2	50 2	65 2 1/2	80 3	100 4	125 5	150 6	200 8	250 10	300 12	350 14	
N24	20 (0.2)	0.97 (9.9)	0.67 (6.9)	0.33 (3.4)	0.20 (2.1)	0.12 (1.3)									
	40 (0.4)	1.86 (19)	1.27 (13)	0.67 (6.9)	0.41 (4.2)	0.25 (2.6)									
	80 (0.8)	3.82 (39)	2.64 (27)	1.27 (13)	0.83 (8.5)	0.50 (5.2)									
	100 (1.0)	4.80 (49)	3.33 (34)	1.66 (17)	0.98 (10)	0.63 (6.5)									
N28	20 (0.2)	1.17 (12)	0.88 (9.0)	0.43 (4.4)	0.26 (2.7)	0.16 (1.7)	0.11 (1.2)	0.60 (0.7)							
	40 (0.4)	2.45 (25)	1.76 (18)	0.87 (8.9)	0.53 (5.5)	0.33 (3.4)	0.24 (2.5)	0.14 (1.5)							
	80 (0.8)	5.00 (51)	3.53 (3.6)	1.66 (17)	1.07 (11)	0.66 (6.8)	0.50 (5.1)	0.29 (3.0)							
	100 (1.0)	6.27 (64)	4.41 (45)	2.15 (22)	1.17 (13)	0.83 (8.5)	0.62 (6.4)	0.37 (3.8)							
N33S	20 (0.2)	1.86 (19)	1.27 (13)	0.64 (6.6)	0.39 (4.0)	0.24 (2.5)	0.17 (1.8)	0.10 (1.1)							
	40 (0.4)	3.72 (38)	2.54 (26)	1.27 (13)	0.79 (8.1)	0.49 (5.0)	0.36 (3.7)	0.21 (2.2)							
	80 (0.8)	7.45 (76)	5.19 (53)	2.54 (26)	1.56 (16)	0.98 (10)	0.73 (7.5)	0.43 (4.4)							
	100 (1.0)	9.31 (95)	6.47 (66)	3.23 (33)	1.98 (20)	1.17 (12)	0.92 (9.4)	0.54 (5.6)							
N40	120 (1.2)	9.80 (100)	7.84 (80)	3.82 (39)	2.35 (24)	1.47 (15)	1.07 (11)	0.65 (6.7)							
	20 (0.2)			0.91 (9.3)	0.55 (5.7)	0.34 (3.5)	0.25 (2.6)	0.14 (1.5)	0.09 (1.0)	0.06 (0.7)	0.03 (0.4)				
	40 (0.4)			1.76 (18)	1.07 (11)	0.68 (7.0)	0.51 (5.3)	0.30 (3.1)	0.19 (2.0)	0.13 (1.4)	0.07 (0.8)				
	80 (0.8)			3.62 (37)	2.25 (23)	1.37 (14)	0.98 (10)	0.61 (6.3)	0.40 (4.1)	0.28 (2.9)	[0.15 (1.6)]				
	100 (1.0)			4.51 (46)	2.74 (28)	1.66 (17)	1.27 (13)	0.76 (7.8)	0.47 (5.2)	0.35 (3.6)	0.20 (2.1)				
500	120 (1.2)			5.39 (55)	3.33 (34)	2.05 (21)	1.47 (15)	0.92 (9.4)	0.60 (6.2)	0.43 (4.4)	-				
	20 (0.2)			1.47 (15)	0.94 (9.6)	0.56 (5.8)	0.43 (4.4)	0.25 (2.6)	0.16 (1.7)	0.11 (1.2)	0.06 (0.7)				
	40 (0.4)			3.04 (31)	1.86 (19)	1.07 (11)	0.86 (8.8)	0.47 (5.2)	0.33 (3.4)	0.23 (2.4)	0.13 (1.4)	0.08 (0.9)	0.05 (0.6)		
	60 (0.6)			4.51 (46)	2.74 (28)	1.66 (17)	1.27 (13)	0.77 (7.9)	0.47 (5.2)	0.35 (3.6)	0.20 (2.1)	0.12 (1.3)	0.08 (0.9)		
	80 (0.8)			6.08 (62)	3.72 (38)	2.25 (23)	1.66 (17)	0.98 (10)	0.67 (6.9)	0.48 (4.9)	0.27 (2.8)	0.17 (1.8)	0.11 (1.2)		
650	100 (1.0)			7.55 (77)	4.70 (48)	2.84 (29)	2.15 (22)	1.27 (13)	0.84 (8.6)	0.59 (6.1)	0.34 (3.5)	0.21 (2.2)	0.14 (1.5)		
	40 (0.4)						1.47 (15)	0.89 (9.1)	0.58 (6.0)	0.41 (4.2)	0.23 (2.4)	0.14 (1.5)	0.09 (1.0)	0.07 (0.8)	
	60 (0.6)						2.25 (23)	1.27 (13)	0.08 (9.0)	0.62 (6.4)	0.35 (3.6)	0.22 (2.3)	0.15 (1.6)	0.11 (1.2)	
	80 (0.8)						2.94 (30)	1.76 (18)	1.17 (12)	0.83 (8.5)	0.47 (4.8)	0.30 (3.1)	0.20 (2.1)	0.15 (1.6)	
650X	100 (1.0)						3.72 (38)	2.15 (22)	1.47 (15)	0.98 (10)	0.59 (6.1)	0.38 (3.9)	0.26 (2.7)	0.19 (2.0)	
	40 (0.4)										0.47 (4.8)	0.30 (3.1)	0.20 (2.1)	0.15 (1.6)	
	60 (0.6)										0.71 (7.3)	0.46 (4.7)	0.31 (3.2)	0.23 (2.4)	
	80 (0.8)										0.95 (9.7)	0.61 (6.3)	0.42 (4.3)	0.31 (3.2)	
100 (1.0)										1.19 (12.2)	0.77 (7.9)	0.52 (5.4)	0.39 (4.0)		

See [Notes] (6) on page 13 about the allowable shut-off press. of Model CQ-S.

83  
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Upper row : Allowable shut-off press.  
Lower row : Allowable intermediate diff. press.

■ Type CV-BP, CQ-BP, CS-BP, CS-L-BP (Pilot Balance Type)

Unit : MPa(kgf/cm<sup>2</sup>)

Actuator Size	Valve Size	50 (mm)	65	80	100	125	150	200	250	300	350
	Off-balance	2 (in.)	2 <sup>1</sup> / <sub>2</sub>	3	4	5	6	8	10	12	14
N24	40 (0.4)	1.86 (19)	1.07 (11)								
		1.27 (13)									
	80 (0.8)	4.60 (47)	3.23 (33)								
		1.27 (13)									
	100 (1.0)	5.98 (61)	4.31 (44)								
		1.27 (13)									
N28	40 (0.4)	2.64 (27)	1.66 (17)	0.94 (9.6)	0.41 (4.4)						
		1.66 (17)									
	80 (0.8)	6.27 (64)	4.51 (46)	2.94 (30)	1.96 (20)						
		1.66 (17)		1.27 (13)	0.98 (10)						
	100 (1.0)	8.13 (83)	5.88 (60)	4.02 (41)	2.74 (28)						
		1.66 (17)		1.27 (13)	0.98 (10)						
N33S	40 (0.4)	3.82 (39)	2.74 (28)	1.86 (19)	1.17 (12)						
		2.54 (26)									
	80 (0.8)	8.43 (86)	6.37 (65)	4.90 (50)	3.43 (35)						
		2.54 (26)		1.86 (19)	1.37 (14)						
	100 (1.0)	9.80 (100)	8.23 (84)	6.37 (65)	4.60 (47)						
		2.54 (26)		1.86 (19)	1.37 (14)						
120 (1.2)	9.80 (100)		7.94 (81)	5.78 (59)							
	2.54 (26)		1.86 (19)	1.37 (14)							
N40	40 (0.4)	3.72 (38)	2.94 (30)	2.45 (25)	1.76 (18)	1.07 (11)	0.89 (9.1)	0.38 (3.9)			
		3.62 (37)									
	80 (0.8)	8.53 (87)	6.96 (71)	5.98 (61)	4.51 (46)	3.33 (34)	2.74 (28)	1.66 (17)			
		3.62 (37)	3.43 (35)	2.64 (27)	1.96 (20)	1.66 (17)	1.37 (14)	[1.07 (11)]			
	100 (1.0)	9.80 (100)	9.02 (92)	7.64 (78)	5.88 (60)	4.41 (45)	3.72 (38)	2.25 (23)			
		3.62 (37)	3.43 (35)	2.64 (27)	1.96 (20)	1.66 (17)	1.37 (14)	1.07 (11)			
120 (1.2)	9.80 (100)		9.41 (96)	7.25 (74)	5.49 (56)	4.70 (48)	-				
	3.62 (37)	3.43 (35)	2.64 (27)	1.96 (20)	1.66 (17)	1.37 (14)	-				
500	40 (0.4)	5.88 (60)	4.90 (50)	4.02 (41)	3.04 (31)	2.15 (22)	1.86 (19)	1.17 (12)	0.51 (5.3)	0.14 (1.5)	
	60 (0.6)	9.31 (95)	7.84 (80)	6.57 (67)	5.09 (52)	3.92 (40)	3.33 (34)	2.25 (23)	1.17 (12)	0.64 (6.6)	
		6.08 (62)	5.68 (58)	4.41 (45)	3.33 (34)	2.84 (29)	2.35 (24)	1.76 (18)			
	80 (0.8)	9.80 (100)		9.12 (93)	7.25 (74)	5.58 (57)	4.80 (49)	3.33 (34)	1.86 (19)	1.07 (11)	
		6.08 (62)	5.68 (58)	4.41 (45)	3.33 (34)	2.84 (29)	2.35 (24)	1.76 (18)	1.27 (13)	0.98 (10)	
100 (1.0)	9.80 (100)			9.31 (95)	7.35 (75)	6.27 (64)	4.41 (45)	2.54 (26)	1.56 (16)		
	6.08 (62)	5.68 (58)	4.41 (45)	3.33 (34)	2.84 (29)	2.35 (24)	1.76 (18)	1.27 (13)	0.98 (10)		
650	40 (0.4)			6.86 (70)	5.49 (56)	4.31 (44)	3.72 (38)	1.86 (19)	0.98 (10)	0.59 (6.1)	0.35 (3.6)
	60 (0.6)			9.80 (100)	8.82 (90)	7.06 (72)	6.17 (63)	3.33 (34)	1.96 (20)	1.27 (13)	0.94 (9.6)
				7.74 (79)	5.88 (60)	5.00 (51)	4.11 (42)	3.13 (32)			
	80 (0.8)			9.80 (100)			8.53 (87)	4.70 (48)	2.94 (30)	2.05 (21)	1.47 (15)
				7.74 (79)	5.88 (60)	5.00 (51)	4.11 (42)	3.13 (32)	1.17 (12)	1.66 (17)	1.27 (13)
100 (1.0)			9.80 (100)				6.08 (62)	3.92 (40)	2.74 (28)	2.05 (21)	
			7.74 (79)	5.88 (60)	5.00 (51)	4.11 (42)	3.13 (32)	2.35 (24)	1.66 (17)	1.27 (13)	
650X	40 (0.4)							4.70 (48)	2.94 (30)	2.05 (21)	1.07 (11)
	60 (0.6)							7.45 (76)	5.00 (51)	3.53 (36)	2.25 (23)
								6.27 (64)	4.70 (48)	3.33 (34)	
	80 (0.8)							9.80 (100)	6.96 (71)	5.00 (51)	3.43 (35)
								6.27 (64)	4.70 (48)	3.33 (34)	2.64 (27)
100 (1.0)							9.80 (100)	8.92 (91)	6.47 (66)	4.60 (47)	
							6.27 (64)	4.70 (48)	3.33 (34)	2.64 (27)	

See [Notes] (10) and (11) on page13.

# Model 83A (150 · 300 · 600LB)



## ■ Type CP-S

### Contoured Single Seated

Unit : MPa(kgf/cm<sup>2</sup>)

83A CP-S (Contoured)												
Actuator Size	Valve Size Off-balance	φ 4	6 (mm)	7	8	10	15	20	25	32	40	50
			1/8 (in.)	3/16	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
N24	20 (0.2)	7.35 (75)	6.96 (71)		4.60 (47)	3.04 (31)	1.86 (19)	0.98 (10)	0.69 (7.1)	0.47 (4.8)	0.34 (3.5)	0.21 (2.1)
	40 (0.4)	9.80 (100)			9.21 (94)	6.17 (63)	3.72 (38)	1.96 (20)	1.37 (14)	0.95 (9.7)	0.69 (7.1)	0.42 (4.2)
	80 (0.8)				9.80 (100)		7.45 (76)	4.02 (41)	2.74 (28)	1.86 (19)	1.37 (14)	0.83 (8.5)
	100 (1.0)				9.80 (100)		9.41 (96)	5.09 (52)	3.43 (35)	2.35 (24)	1.66 (17)	1.04 (10.7)
N28	20 (0.2)		9.02 (92)		5.98 (61)	4.02 (41)	2.35 (24)	1.27 (13)	0.90 (9.2)	0.61 (6.3)	0.45 (4.6)	0.27 (2.7)
	40 (0.4)	9.80 (100)			8.04 (82)	4.80 (49)	2.64 (27)	1.76 (18)	1.17 (12)	0.90 (9.2)	0.54 (5.5)	
	80 (0.8)				9.80 (100)		5.29 (54)	3.53 (36)	2.45 (25)	1.76 (18)	1.08 (11.0)	
	100 (1.0)				9.80 (100)		6.66 (68)	4.51 (46)	3.04 (31)	2.25 (23)	1.36 (13.8)	
N33S	20 (0.2)			7.94 (81)	5.88 (60)	3.53 (36)	1.96 (20)	1.27 (13)	0.90 (9.2)	0.66 (6.8)	0.40 (4.0)	
	40 (0.4)	9.80 (100)			7.15 (73)		3.92 (40)	2.64 (27)	1.76 (18)	1.27 (13)	0.81 (8.1)	
	80 (0.8)				9.80 (100)		7.84 (80)	5.29 (54)	3.62 (37)	2.64 (27)	1.60 (16.3)	
	100 (1.0)				9.80 (100)		9.80 (100)	6.57 (67)	4.51 (46)	3.33 (34)	2.00 (20.4)	
	120 (1.2)				9.80 (100)		7.94 (81)	5.39 (55)	3.92 (40)	2.40 (24.4)		
N40	20 (0.2)				4.90 (50)		2.74 (28)	1.86 (19)	1.27 (13)	0.93 (9.5)	0.56 (5.7)	
	40 (0.4)	9.80 (100)			5.49 (58)		3.72 (38)	2.54 (26)	1.86 (19)	1.12 (11.4)		
	80 (0.8)				9.80 (100)		7.45 (76)	5.09 (52)	3.72 (38)	2.25 (22.9)		
	100 (1.0)				9.80 (100)		9.31 (95)	6.37 (65)	4.60 (47)	2.81 (28.7)		
	120 (1.2)				9.80 (100)		9.80 (100)	7.64 (78)	5.58 (57)	3.38 (34.4)		
500	20 (0.2)					6.08 (62)	4.60 (47)	3.04 (31)	2.05 (21)	1.47 (15)	0.94 (9.5)	
	40 (0.4)	9.80 (100)			9.22 (94)		6.17 (63)	4.21 (43)	3.04 (31)	1.88 (19.1)		
	60 (0.6)				9.80 (100)		9.31 (95)	6.37 (65)	4.60 (47)	2.82 (28.7)		
	80 (0.8)				9.80 (100)		9.80 (100)	8.53 (87)	6.17 (63)	3.76 (38.3)		
	100 (1.0)				9.80 (100)		9.80 (100)	9.80 (100)	7.74 (79)	4.70 (47.9)		

83  
A

### Quick-Opening

Unit : MPa(kgf/cm<sup>2</sup>)

83A CP-S (Quick-Opening)										
Actuator Size	Valve Size Off-balance	8 (mm)	10	15	20	25	32	40	50	
		1/4 (in.)	3/8	1/2	3/4	1	1 1/4	1 1/2	2	
N24	40 (0.4)	7.74 (79)	5.09 (52)	3.13 (32)	1.66 (17)	1.07 (11)	0.79 (8.1)	0.57 (5.9)	0.35 (3.5)	
	80 (0.8)	9.80 (100)		6.27 (64)	3.33 (34)	2.25 (23)	1.56 (16)	1.07 (11)	0.70 (7.1)	
	100 (1.0)			7.84 (80)	4.21 (43)	2.84 (29)	1.96 (20)	1.37 (14)	0.87 (8.9)	
N28	40 (0.4)	9.80 (100)		6.66 (68)	4.02 (41)	2.15 (22)	1.47 (15)	0.98 (10)	0.75 (7.7)	0.45 (4.6)
	80 (0.8)			8.13 (83)	4.41 (45)	2.94 (30)	2.05 (21)	1.47 (15)	0.90 (9.2)	
	100 (1.0)			9.80 (100)	5.49 (56)	3.72 (38)	2.54 (26)	1.86 (19)	1.13 (11.5)	
N33S	40 (0.4)	9.80 (100)		5.98 (61)	3.23 (33)	2.15 (22)	1.47 (15)	1.07 (11)	0.66 (6.8)	
	80 (0.8)			6.47 (66)	4.41 (45)	2.94 (30)	2.15 (22)	1.33 (13.6)		
	100 (1.0)			9.80 (100)	8.13 (83)	5.49 (56)	3.72 (38)	2.74 (28)	1.66 (17.0)	
	120 (1.2)			9.80 (100)	9.80 (100)	6.57 (67)	4.51 (46)	3.33 (34)	2.00 (20.4)	
N40	40 (0.4)	9.80 (100)		8.43 (86)	4.51 (46)	3.04 (31)	2.05 (21)	1.47 (15)	0.93 (9.5)	
	80 (0.8)			9.12 (93)	6.17 (63)	4.21 (43)	3.04 (31)	1.87 (19.1)		
	100 (1.0)			9.80 (100)	7.74 (79)	5.29 (54)	3.82 (39)	2.34 (23.9)		
	120 (1.2)			9.80 (100)	9.31 (95)	6.37 (65)	4.60 (47)	2.81 (28.7)		
500	40 (0.4)	9.80 (100)		7.64 (78)	5.19 (53)	3.53 (36)	2.54 (26)	1.56 (15.9)		
	60 (0.6)			7.74 (79)	5.29 (54)	3.82 (39)	2.35 (23.9)			
	80 (0.8)			9.80 (100)	7.06 (72)	5.19 (53)	3.13 (31.9)			
	100 (1.0)			9.80 (100)	8.92 (91)	6.47 (66)	3.91 (39.9)			

■ Type CP-S-RT

Labyrinth Trim Type

Unit : MPa(kgf/cm<sup>2</sup>)

83A CP-S-RT (Labyrinth)											
Actuator Size	Off-balance	Port Size (Rated Cv)									
		0.2	0.4	0.6	1	1.5	2	3	5.2	9	12
N24	20 (0.2)	3.92 (40)	2.94 (30)	1.96 (20)			0.96 (9.8)				
	40 (0.4)	7.84 (80)	5.98 (61)	4.02 (41)			1.86 (19)				
	80 (0.8)	9.80 (100)			8.04 (82)			3.82 (39)			
	100 (1.0)				9.80 (100)			4.80 (49)			
N28	20 (0.2)	5.00 (51)	3.92 (40)	2.54 (26)			1.17 (12)		0.35 (3.6)	0.21 (2.2)	
	40 (0.4)	9.80 (100)		7.84 (80)	5.19 (53)			2.45 (25)		0.70 (7.2)	0.43 (4.4)
	80 (0.8)	9.80 (100)			9.80 (100)			4.90 (50)		1.37 (14)	0.86 (8.8)
	100 (1.0)							6.17 (63)		1.76 (18)	1.08 (11)
N33S	20 (0.2)	7.45 (76)	5.78 (59)	3.82 (39)			1.76 (18)		0.51 (5.3)	0.31 (3.2)	
	40 (0.4)	9.80 (100)			7.64 (78)			3.62 (37)		0.98 (10)	0.63 (6.4)
	80 (0.8)				9.80 (100)			7.25 (74)		2.05 (21)	1.27 (12.9)
	100 (1.0)							9.12 (93)		2.45 (25)	1.58 (16.2)
	120 (1.2)							9.80 (100)		3.13 (32)	1.90 (19.4)
N40	20 (0.2)			4.90 (50)			2.54 (26)		0.73 (7.5)	0.44 (4.5)	
	40 (0.4)			9.80 (100)			5.09 (52)		1.47 (15)	0.89 (9.1)	
	80 (0.8)						9.80 (100)		2.94 (30)	1.79 (18.2)	
	100 (1.0)								3.62 (37)	2.23 (22.8)	
	120 (1.2)								4.41 (45)	2.68 (27.3)	
500	20 (0.2)			6.08 (62)			4.31 (44)		1.17 (12)	0.74 (7.6)	
	40 (0.4)			9.80 (100)			8.62 (88)		2.45 (25)	1.49 (15.2)	
	60 (0.6)								3.62 (37)	2.24 (22.8)	
	80 (0.8)								4.90 (50)	2.98 (30.4)	
	100 (1.0)								6.08 (62)	3.73 (38.0)	
650	40 (0.4)			9.80 (100)			9.80 (100)		4.21 (43)	2.59 (26.4)	
	60 (0.6)								6.37 (65)	3.88 (39.6)	
	80 (0.8)								8.53 (87)	5.18 (52.8)	
	100 (1.0)								9.80 (100)	6.48 (66.0)	

- [Notes]**
- (1)  portion shows standard combination of valve Body and Actuator.
  - (2) The Unit of Off-balance is kPaG (kgf/cm<sup>2</sup>G).
  - (3) On actuator size N40, Off-balance 80 kPaG (0.8 kgf/cm<sup>2</sup>G), above Shut-off pressure is not applicable for reverse action valve.
  - (4) Shut-off pressure of this table shows the value only with standard gland packing (P4519 + V7010).
  - (5) When tight shut off (TSO) is required on type CV-S, CS-S, CS-L-S and CQ-S, allowable Shut-off pressure shall be multiplied by 1/1.2 from the table above.  
For ANSI/FCI class V, multiply 1/1.5.
  - (6) On Bellows Seal Bonnet valve, allowable Shut-off pressure is differed from above table.
  - (7) On type CV-S, CS-S and CS-L-S, when the valve is used for flow-to-close (FTC) action, it is required to check the intermediate differential pressure.
  - (8) Allowable shut-off pressure for type CV-S, CQ-S, CS-S, CS-L-S and each pilot-balance type valves is selected from the valve size.
  - (9) On pilot-balance valve (-BP), Actuator size should be selected to satisfy both Shut-off and intermediate differential pressure.
  - (10) Off-balance 120 kPaG (1.2 kgf/cm<sup>2</sup>G) is not applicable for actuator size N40 rated travel 65 mm.
  - (11) When Off-balance is 100 kPaG (1.0 kgf/cm<sup>2</sup>G) on reverse action, actuator size 500 ~ 650X, Spring Range may differs by actuator size and valve rated travel.
  - (12) Off-balance 100 kPaG (1.0 kgf/cm<sup>2</sup>G) is not applicable for reverse action, actuator size 500S rated travel 65 mm. Actuator size 500L should be selected.
  - (13) When "Use no oil", Bellow Seal Bonnet or special Gland Packing is required Off-balance 120 kPaG(1.2 kgf/cm<sup>2</sup>G) is not applicable.
  - (14) On type CP-S port size 15 mm (1/2") or larger and type CP-S-RT port size Cv = 3 or larger, when ANSI/FCI class V is required, Actuator size should be N28 or larger.

# 8. MAIN DIMENSIONS AND WEIGHT

## 1 Face-to-face Dimensions of Valve

Unit : mm

Valve Size (mm) (in.)		Press. Rating	Face-to-face Dimension F				
			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	SW 500mm less BW 65mm and over
15	1/2		184	190	203	203	206
20	3/4		184	194	206	206	206
25	1		184	197	210	210	220
40	1 1/2		222	235	251	251	270
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 dimensions in  shaded zone conform to IEC 534-3 (JIS B2002) and ISA-S75.03.  
 (2) Face-to-face dimension of male and female, tongue and groove flange for JIS-30K (ASME 150, ASME 300) are identical with JIS 30K RF.

## 2 Weight

Unit : kg

Valve Size (mm)		15 · 20		25		40		50		65		80			100			125			
Valve Size (in.)		1/2 · 3/4		1		1 1/2		2		2 1/2		3			4			5			
Press. Rating		10K	20,30,40K	10K	20,30,40K	10K	20,30,40K	10K	20,30,40K	10K	20,30,40K	10K	20K	30,40K	10K	20K	30,40K	10K	20K	30,40K	
Bonnet Shape	Actuator Size	ASME 150	ASME 300,600	ASME 150	ASME 300,600	ASME 150	ASME 300,600	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	
Plain Bonnet	N24	25	25	31	34	36	42	46	54	56	65										
	N28	28	28	34	37	39	45	49	57	59	68	75	78	91	101	109	142				
	N33S	37	37	43	46	48	54	58	66	68	77	84	87	100	110	118	151				
	N40					74	80	86	94	96	105	109	112	125	135	143	176	175	189	244	
	500S							120	128	130	139	143	146	159	169	177	210	211	225	280	
650S												331	334	347	357	365	398	399	413	468	
Extension Type-F	N24	31	31	37	40	42	48	52	60	63	72										
	N28	34	34	41	43	45	51	55	63	66	75	84	87	100	109	117	150				
	N33S	43	43	49	52	54	60	64	72	75	84	93	96	109	118	126	159				
	N40					80	86	92	100	103	112	120	123	135	145	153	186	187	201	256	
	500S							126	134	137	146	154	157	169	179	187	220	213	237	292	
650S												342	345	357	367	375	408	401	425	480	

Valve Size (mm)		150			200			250			300			350		
Valve Size (in.)		6			8			10			12			14		
Press. Rating		10K	20K	30,40K	10K	20K	30,40K	10K	20K	30,40K	10K	20K	30,40K	10K	20K	30,40K
Bonnet Shape	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	ASME 150	ASME 300	ASME 600
Plain Bonnet	N40	220	254	265	260	300	360									
	500S	256	281	301	294	336	396									
	500L							410	457	554	579	644	774			
	650S	444	469	489	479	521	581									
	650L							583	630	727	752	817	947	950	1042	1234
	650XS				574	616	676									
Extension Type-F	N40	233	258	278	268	308	368									
	500S	269	294	314	302	344	404									
	500L							418	465	562	587	652	782			
	650S	457	482	502	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	

**[Note]** The weight of actuator size 500S/L, 650S/L, 650XS/XL shows for direct action.



## 3 Standard Dimensions

Unit : mm

Valve Size (mm)	Actuator Size (in.)	D	E	Plain Bonnet		Extension Type				Bellows Seal Bonnet				Cr	S		
				G	C	-F		-H		BA20K, BA30K		BA40K					
						G	C	G	C	G	C	G	C				
15	1/2	N24	240	56/65	133/125	430/422	530/522	696/688	993/985	663/655	720/712	-	200				
		N28	280		233/225	469/461	569/561	1032/1024	702/694	759/751	220						
		N33S	330		624/616	1087/1079	757/749	814/806	240								
20	3/4	N24	240	63/65	133	430	530	697	993	663	726	-	200				
		N28	280		233	469	569	1032	702	765	220						
		N33S	330		624	1087	757	820	240								
25	1	N24	240	70/65	136	433	533	696	993	666	729	-	200				
		N28	280		236	477	572	1032	705	768	220						
		N33S	330		627	1087	760	823	240								
40	1 1/2	N24	240	83	152	449	599	716	993	695	772	-	200				
		N28	280			488	638			734	811		220				
		N33S	330		543	693	1109	789	866	240							
		N40	400		181	696	846	745	1262	498	1013		583	1098	350		
50	2	N24	240	95	171	468	618	735	1031	740	793	-	200				
		N28	280			507	657			779	832		220				
		N33S	330			562	712			834	887		240				
		N40	400		200	715	865	801	1316	1039	576		1019	350			
		500S	500		934	1084	1535	1258	1310	160	370						
65	2 1/2	N24	240	106	217	514	664	753	1050	847	924	-	200				
		N28	280			553	703			1089	550		886	624	960	220	
		N33S	330			608	758			1144	941		1015	240			
		N40	400		246	761	911	1334	1146	1219	350						
		500S	500		980	1130	847	1553	631	1365	704		1438	160	370		
80	3	N28	280	130/135	218	554	704	807	1157	887	961	-	220				
		N33S	330			609	759			1212	551		942	625	1016	240	
		N40	400			762	912			1427	632		1147	705	1220	350	
		500S	500		247	981	1131	873	1646	632	1366		716	1746	250	380	
		650S	650		1277	1427	1764	643	1673	716	1746		1746	1746	250	380	
100	4	N28	280	145	256	592	742	845	1184	925	999	-	220				
		N33S	330			647	797			1239	589		980	663	1054	240	
		N40	400			800	950			1454	670		1185	743	1258	350	
		500S	500		285	1019	1169	911	1673	670	1404		743	1477	160	370	
		650S	650		1315	1465	1969	681	1711	754	1784		1784	1784	250	380	
125	5	N40	400	180	313	828	978	939	1475	759	1274	-	350				
		500S	500			1047	1197			1694	759		1493	867	1601	160	370
		650S	650			1343	1493			1990	764		1794	872	1902	250	380
		N40	400		856	1006	1504	784	1299	895	1410		-	350			
		500S	500		341	1075	1225	967	1723	801	1518		900	1629	160	370	
200	8	N40	400	225	446	965	1112	1149	1664	1019	1534	-	350				
		500S	500			1180	1333			1883	753		1164	1679	-	350	
		650S	650			1480	1628			2179	1044		2074	1189	2219	250	380
		650XS	650		1955	2105	2658	1044	2553	1189	2698		300	410			
		500L	500		462	1285	1433	1164	1984	-	-		-	145	370		
250	10	650L	650	270	462	1595	1748	1164	2297	-	-	-	300	410			
		650XL	650			2206	2356			2908	-	-	-	300	480		
		500L	500			1380	1529			2042	-	-	-	145	370		
300	12	650L	650	290	557	1690	1844	1222	2355	-	-	-	300	410			
		650XL	650			2301	2452			2966	-	-	-	300	480		
		650L	650			1740	1890			2435	-	-	-	300	410		
350	14	650XL	650	320	603	2347	2498	1302	3046	-	-	-	300	480			

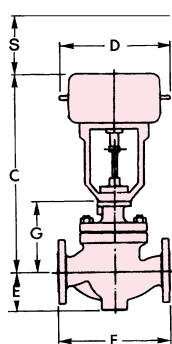
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- [Notes] (1) Dimension C represents in case of direct action. The dimension C of actuator size N24-N40 for reverse action is to be added 25mm to the numerical value of above table.  
 (2) The total valve height with reverse acting actuator size 500S/L and 650S/L and 650XS/XL is to be added dimension C and Cr.  
 (3) The upper column of dimension "E", "G" and "C" for body sizes 15mm, 20mm, 25mm and 80mm shows pressure rating of 150 ~ 300 LB and the lower column for pressure rating of 400 ~ 600 LB.  
 (4) Dimension S shows required space for dismantling Actuator.

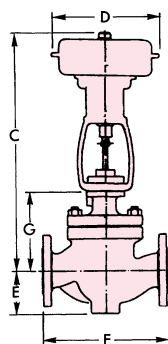
### Plain Bonnet Type Fin

Actuator Size

N24 ~ N40

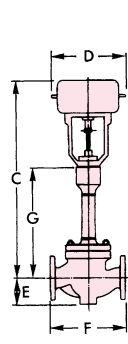


500, 650

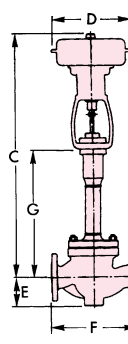


### Extension Bonnet Type

N24 ~ N40

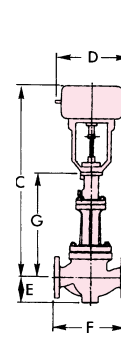


500, 650X

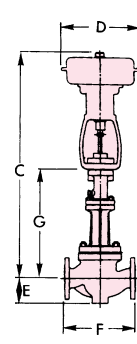


### Bellows Seal Bonnet Type

N24 ~ N40

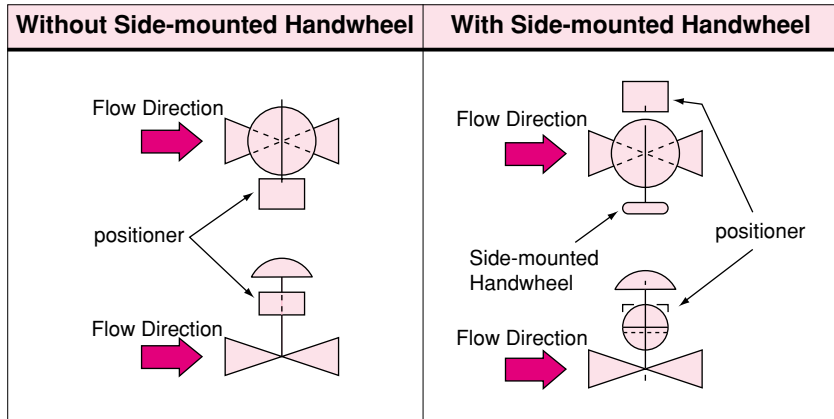


500, 650



**9. MOUNTING ORIENTATIONS**

Standard mounting orientations are as follows.



83  
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