

Pressure-Balanced cage – Type Control Valve

Model : SCV-1100 Series

Pressure Balanced cage type control valves are designed for heavy duty services. The compact valve Body. Having a s-shape flow passage that features low pressure loss and a stabilizer that regulates Turbulent flow around the cage, allow a large flow capacity, range ability, and high accuracy flow characteristics

Specifications

Body

Type : Straight-through, cast globe valve

Nominal size : 1-1/2", 2", 2-1/2", 3", 4", 5", 6", 8"

Pressure Rating : JIS 10K, 20K, 30K, 40K
ANSI CLASS 5, 150, 300, 600
JPI CLASS 125, 150, 300, 600

End connection : Flange end : FF, RF, RJ, LG
Groove type(female) Insertion type(female)
Welding end : SW (1-1/2", 2") BW(2-1/2" ~ 8")

Material : For body trim material combinations and operating temperature ranges.
refer to Table-1,page3

Bonnet : Plain bonnet (-17 °C TO 230 °C)
Extension bonnet Type 1 (-45 °C To -17 °C AND 230 °C TO 566 °C)
Extension bonnet Type 2
Integral – cast type (-100 °C TO -45 °C)
Welded type (-196 °C TO -100 °C)
Bellows type
For operating temperature and pressure range to Fig.2,page5

Note) Take care not to exceed the operating temperature ranges specified for respective materials

Gland type : Bolted gland

Packing / Grease

Grease not provided : V-Teflon or Teflon yarn packing is used
Grease provided : Asbestos yarn, asbestos yarn with graphite,
or graphite packing is used

Gasket

Type : Combination of saw-tooth type and spiral type(integral –unit-type cage),
saw-tooth type(split cage)
Material : Stainless steel(SUS316, SUS316L, SUS329J1), copper, aluminum



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Trim

Valve plug : Pressure – balanced type

High – capacity type (for flow characteristics refer to Fig.1-1, page 4.)

Metal seat :

Equal percentage cage (%V) Linear cage(LV)

Soft seat : Equal percentage cage (%T) Linear cage(LV)

High Flow characteristics

Metal seat (for flow characteristics , refer to Fig.1-2. page4.)

Equal percentage cage (%VF) Linear cage(LVF)

Soft seat (for flow characteristics , refer to Fig.1-2. page5.)

Equal percentage cage (%TF) Linear cage(LTF)

Notes 1) integral type cage and split cage vary depending on their valve size, materials, operating temperature. Refer to Table 1, Page 3.

2) For operating temperature and max. differential pressure range of soft-seat type, refer to Fig.3. Page 5.

Material : For body/trim material combinations and operating temperature range, refer to table 1 page 3.

Actuator

Type : single acting diaphragm actuator (SA)

single acting position actuator (SV)

action : direct or reverse action

Diaphragm

Type SA: Cloth-embedded ethylene propylene rubber

Type SV: Cloth-embedded chloroprene rubber

Spring range : 0.2 ~ 1.0 or 0.4 ~ 1.2, 0.8 ~ 2.4 kgh/cm² (type SA)
1.9 ~ 3.5 or 1.9 ~ 4.0 kgh/cm² (type SV)

Supply pressure : Diaphragm actuator

type SA (1.2 ~ 4.0 kgh/cm²) type SV (1.2~2.8 kgh/cm²)

Piston cylinder : type SV (4 ~5 kgh/cm²)

Note 1) Allowable differential pressure varies depending on spring range and air supply pressure

Air connection : PT ¼" or ½"NPT internal thread

Note) As for type SV, PT ¼" adapter or ½"NPT adapter is provided on PT ½" internal thread (also providing PT3/8" adapter is possible)

Ambient temperature : -30 °C TO 70 °C

Valve action : Direct action (Direct action actuator is combined)

Reverse action (Reverse action actuator is combined)

Seat leakage

standard : ANSI CLASS II (B16.104 -1976) – Leakage less than 0.5% of maximum valve capacity.

optional : Leakage less. Than 0.1% maximum valve capacity.

soft seat : ANSI CLASS VI (B16.104-1976) – Leakage less than 0.00001% of maximum valve capacity.

Hysteresis error : Without positioner : Within 3% (Within 5%FS) , With positioner : Within 1%FS

Linearity : Without positioner : Within ±5% FS, With positioner : With in ±1%FS (±3%FS with type YT-1200L, ±2% FS with type YT-1000L positioner)



Optional accessories (provide upon request)

Positioner , Pressure regulator with filter , hand wheel , limits switch , solenoid valve , motion transmitter , volume booster , air lock relay , and other

Note 1) For the optional items, refer to the specification sheets and installation drawings of respective valves.

2) Use the following models for positioners and hand wheels according to the combined actuators.



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BODY	JIS	SCPH2	SCPH21	SCPL1	SCS13A	SCS14A	SCS16A
TRIM	ASTM	A216WCB	A217WC6	A352LCB	A351CF8	A351CF8M	A351CF3M
JIS	SCS24	-5 ~ 425	-5 ~ 425	-5 ~ 425	~	~	~
ASTM	CB7Cu-1						
JIS	SCS11	~	~	~	~	-50 ~ 300	~
ASTM	~						
JIS	SCS14A	-5 ~ 300*	-5 ~ 300*	-45 ~ 300	-195 ~ 300	-195 ~ 300	~
ASTM	A351CF8M						
JIS	SCS16A	~	~	-45 ~ 300	-195 ~ 300	-195 ~ 300	-195 ~ 300
ASTM	A351CF3M						
JIS	SCS19A	~	~	-45 ~ 300	-195 ~ 300	-195 ~ 300	~
ASTM	A351CF3						
JIS	SCS14 STELITE ARMORING	-5 ~ 425*	-5 ~ 550*	-45 ~ 350*	-195 ~ 550	-195 ~ 550	~
ASTM	A351CF8M STELITE ARMORING						
JIS	SCS14A ATOMLOY ARMORING	-5 ~ 425*	-5 ~ 550*	~	~	~	~
ASTM	A351CF8M ATOMLOY ARMORING						
JIS	SCS14A SOFT SEAT	-5 ~ 200	~	-45 ~ 200	-80 ~ 200	-80 ~ 200	
ASTM	A351CF8M SOFT SEAT						
JIS	SCS16A SOFT SEAT	~	~	-45 ~ 200	-80 ~ 200	-80 ~ 200	-80 ~ 200
ASTM	A351CF3M SOFT SEAT						

Table 1. Body/trim material combinations and operating temperature

Notes 1) Asterisk – marked(*) combinations , split cage are used when fluid temperature exceeds 230℃ or Valve size is greater then 3inch .

2) Columns bordered with solid line (" □ ")denote values applicable to standard body / trim combination.

3) ASTM Specifications indicate materials equivalent to those designated by JIS.



Pressure-Balanced cage – Type Control Valve

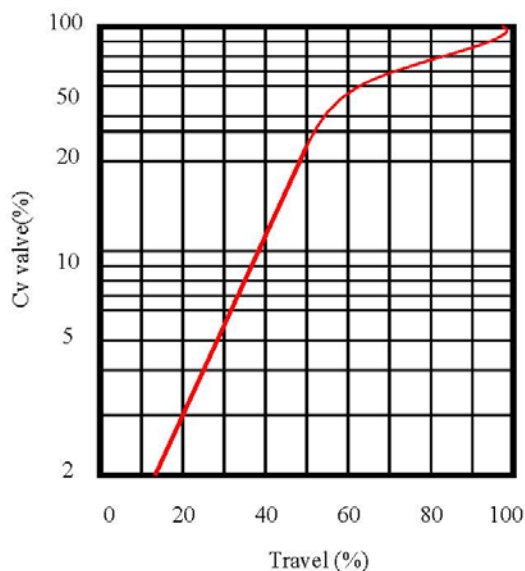
Model : SCV-1100 Series

Specifications

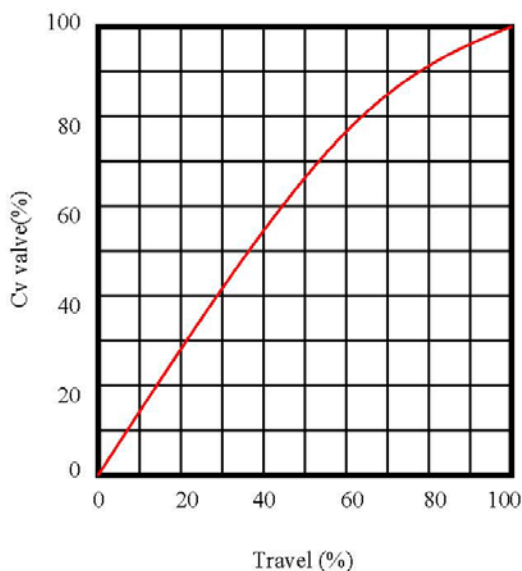
Table 2. Cv value and travel

Valve size(inch)		1½	2	2½	3	4	5	6	8
Port size(inch)		1½	2	2½	3	4	5	6	8
Rated CV value	Metal or soft seat type Equal % characteristics(%V , %T)	36	60	100	140	220	300	420	820
	Metal or soft seat type Linear characteristics(LV , LT)	40	75	110	150	240	320	435	850
Rated travel(mm)		25		38			50		75

Table 2-1. High-capacity-type cage (%V , LV , %T , LT)



**Fig. 1-1-1 Equal % characteristics
(% V metal seat, %T soft seat)**



**Fig. 1-1-2 Linear characteristics
(LV metal seat, LT soft seat)**

Fig. 1-1 High Capacity type cage



Pressure-Balanced cage – Type Control Valve

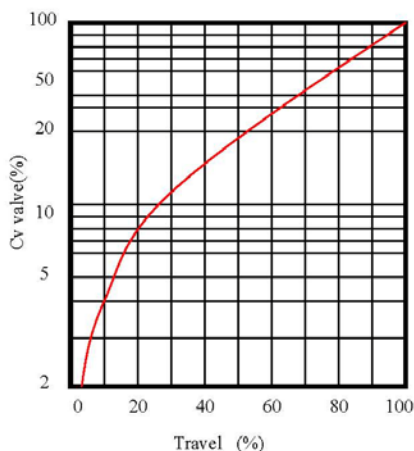
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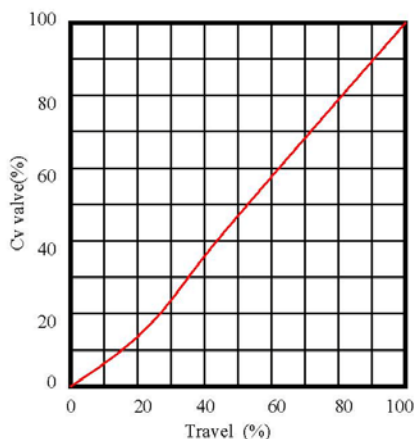
Table 2. Cv value and travel

Valve size(inch)	1½	2	2½	3	4	5	6	8
Port size(inch)	1½	2	2½	3	4	5	6	8
Rated CV value (%VF, LVF, %TF, LFT)	24	44	68	99	175	250	360	650
Rated travel(mm)	25		38			50		75

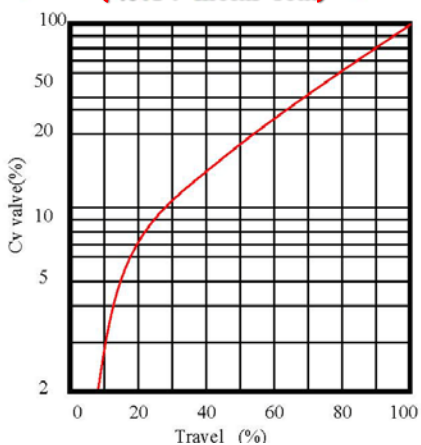
Table 2-2. High-capacity-type cage (%VF, LVF, %TF, LTF)



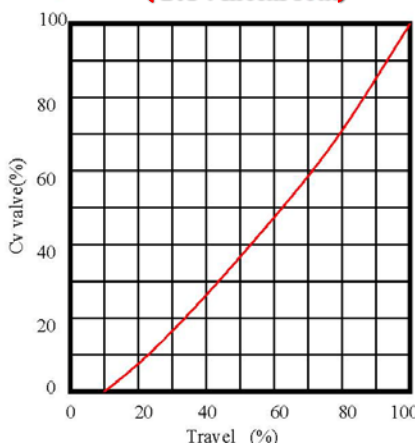
**Fig. 1-2-1 Equal % characteristics
(%VF : metal seat)**



**Fig. 1-2-2 Linear characteristics
(LVF : metal seat)**



**Fig. 1-2-3 Equal % characteristics
(%TF : soft seat)**



**Fig. 1-2-4 Linear characteristics
(LTF : soft seat)**

**Fig. 1-2 High flow characteristic type cage
FIG. Flow characteristics**

Note) The above graphs indicate typical flow characteristics



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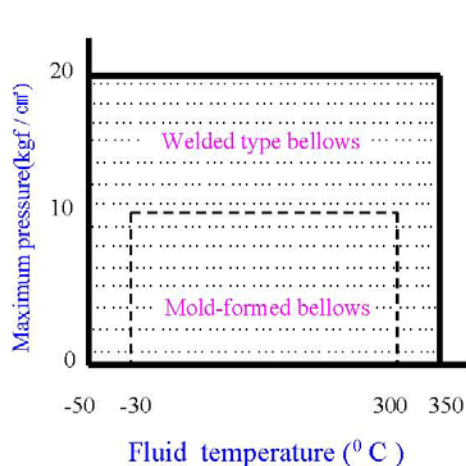


Fig. 2 Operating temperature and pressure range of Bellows type bonnet

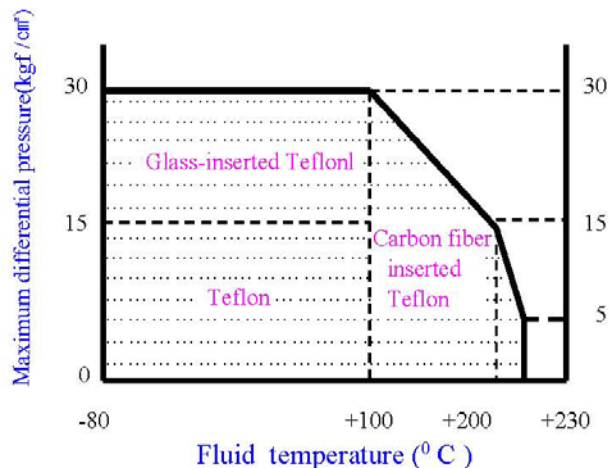
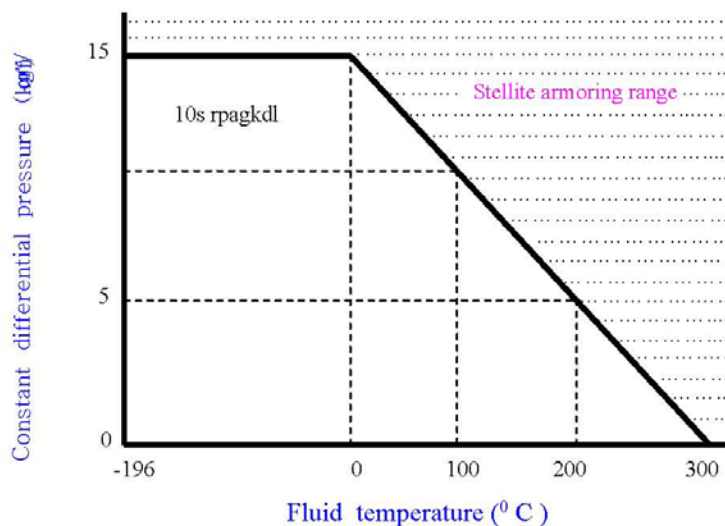


Fig. 2 Operating temperature and max. Differential pressure range of soft-seat type

Notes : If there is any possibility to cause erosion due to saturated steam or superheated-water, use the metal sheet.



Notes 1) 17-4 Ph precipitation - hardened stainless steel (SCS24) requires no Stellite armoring.

2) For cavitation / flashing service or oil – inhibited service 17 – PH (SCS24) or Stellite armoring is recommended regardless of temperature and differential pressure.

Fig. 4 Temperature / constant differential pressure ranges requiring Stellite armoring



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Specifications

Table 3. permissible differential pressure

Table 3-1 . Metal seat (%vI,lvI,%v,lv)

Table 3-1-1. Direct action (Air – to – close)

Actuator Model NO.	Supply Pressure (kgf/cm ²)	Spring range (kgf/cm ²)	Positioner	Differential pressure (by nominal size(inch) (kgf/cm ²))							
				1½	2	2½	3	4	5	6	8
SA 1D	1.4	0.2 ~ 1.0	△	5.1	4.0	~	~	~	~	~	~
	1.6	0.2 ~ 1.0	○	25	19	~	~	~	~	~	~
	4.0	0.8 ~ 2.4	○	40	40	~	~	~	~	~	~
SA 2D	1.4	0.2 ~ 1.0	△	9.9	7.7	6.6	5.4	4.2	~	~	~
	1.6	0.2 ~ 1.0	○	40	38	32.9	27.4	20.8	~	~	~
				49.2							
	4.0	0.8 ~ 2.4	○	40	40	40	40	40	~	~	~
				100	100	98.7	82.3	62.8	~	~	~
SA 3D	1.4	0.2 ~ 1.0	△	17.5	13.7	11.7	9.7	7.4	6.1	5.2	~
	1.6	0.2 ~ 1.0	○	40	40	40	40	37	32	26.1	~
				87	67	58	48.7				
	4.0	0.8 ~ 2.4	○	40	40	40	40	40	40	40	~
				100	100	100	100	100	100	78.6	~
SA 4D	1.4	0.2 ~ 1.0	△	~	~	20.2	16.7	12.8	10.7	9.0	7.4
	1.6	0.2 ~ 1.0	○	~	~	40	40	40	40	40	37
						100	83.9	63.6	52.2	45	
	4.0	0.8 ~ 2.4	○	~	~	40	40	40	40	40	40
						100	100	100	100	100	100

Notes 1) Columns bordered with solid lines ("□") denote types provided with standard-type actuator

2) ○ : positioner is necessary. △ : Can be operated either with or without positioner.

3) Take care not to cause the maximum permissible differential pressure to exceed the maximum operating pressure designated by ANSI B16.34-1981 or JIS B 2201-1984

4) Figures on the upper side of column denote the constant permissible differential pressure; those on the lower side denote permissible differential pressure during valve – close time



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Table 3. permissible differential pressure

Table 3-1 . Metal seat (%vI,lvI,%v,lv)

Table 3-1-2. REverse action (Air – to – open)

Actuator Model NO.	Supply Pressure (kgf/cm ²)	Spring range (kgf/cm ²)	Positioner	Differential pressure (by nominal size(inch) (kgf/cm ²))							
				1½	2	2½	3	4	5	6	8
SA 1R	1.4	0.2 ~ 1.0	△	5.1	4.0	~	~	~	~	~	~
	2.8	0.8 ~ 2.4	○	35	27	~	~	~	~	~	~
SA 2R	1.4	0.2 ~ 1.0	△	9.9	7.7	6.6	5.4	4.2	~	~	~
	2.8	0.8 ~ 2.4	○	40	40	40	38.4	29.3	~	~	~
				68.1	53.9	46					
SA 3R	1.4	0.2 ~ 1.0	△	17.5	13.7	11.7	9.7	7.4	6.1	5.2	~
	2.8	0.8 ~ 2.4	○	40	40	40	40	40	40	36.7	~
				100	95.7	81.7	68	51.8	44.3		~
SA 4D	1.4	0.2 ~ 1.0	△	~	~	20.2	16.7	12.8	10.7	9.0	7.4
	4.0	0.8 ~ 2.4	○	~	~	40	40	40	40	40	40
						100	100	89.7	75	63	51

Notes 1) Columns bordered with solid lines ("□") denote types provided with standard-type actuator

2) ○ : positioner is necessary. △ : Can be operated either with or without positioner.

3) Take care not to cause the maximum permissible differential pressure to exceed the maximum operating pressure designated by ANSI B16.34-1981 or JIS B 2201-1984

4) Figures on the upper side of column denote the constant permissible differential pressure; those on the lower side denote permissible differential pressure during valve – close time



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Table 3. permissible differential pressure

Table 3-2 . Soft seat (%TE,LTE,%T,LT)

Table 3-2-1. Direct action (Air – to – close)

Actuator Model NO.	Supply Pressure (kgf/cm ²)	Spring range (kgf/cm ²)	Positioner	Differential pressure (by nominal size(inch) (kgf/cm ²))							
				1½	2	2½	3	4	5	6	8
SA 1D	1.4	0.2 ~ 1.0	△	3.6*	2.8*	~	~	~	~	~	~
	1.6	0.2 ~ 1.0	○	17	13	~	~	~	~	~	~
	4.0	0.8 ~ 2.4	○	30	30	~	~	~	~	~	~
SA 2D	1.4	0.2 ~ 1.0	△	6.9*	5.4*	4.6*	3.8*	2.9*	~	~	~
	1.6	0.2 ~ 1.0	○	30	26.6	23.0	19.2	14.6	~	~	~
	4.0	0.8 ~ 2.4	○	30	30	30	30	30	~	~	~
SA 3D	1.4	0.2 ~ 1.0	△	12.3*	9.6*	8.2*	6.8*	5.2*	4.4*	3.6*	~
	1.6	0.2 ~ 1.0	○	30	30	30	30	25.9	20.1	18.3	~
	4.0	0.8 ~ 2.4	○	30	30	30	30	30	30	30	~
SA 4D	1.4	0.2 ~ 1.0	△	~	~	14.1*	11.7*	9.0*	7.6*	6.3*	5.2*
	1.6	0.2 ~ 1.0	○	~	~	30	30	30	30	30	25.9
	4.0	0.8 ~ 2.4	○	~	~	30	30	30	30	30	30

Table 3-2-2. REverse action (Air – to – open)

Actuator Model NO.	Supply Pressure (kgf/cm ²)	Spring range (kgf/cm ²)	Positioner	Differential pressure (by nominal size(inch) (kgf/cm ²))							
				1½	2	2½	3	4	5	6	8
SA 1R	1.4	0.2 ~ 1.0	△	3.6*	2.8*	~	~	~	~	~	~
	2.8	0.8 ~ 2.4	○	25	19	~	~	~	~	~	~
SA 2R	1.4	0.2 ~ 1.0	△	6.9*	5.4*	4.6*	3.8*	2.9*	~	~	~
	2.8	0.8 ~ 2.4	○	30	30	30	26.9	20.5	~	~	~
SA 3R	1.4	0.2 ~ 1.0	△	12.3*	9.6*	8.2*	6.8*	5.2*	4.4*	3.6*	~
	2.8	0.8 ~ 2.4	○	30	30	30	30	30	30	25.7	~
SA 4D	1.4	0.2 ~ 1.0	△	~	~	14.1*	11.7*	9.0*	7.6*	6.3*	~
	2.8	0.8 ~ 2.4	○	~	~	30	30	30	30	30	30

Notes 1) Columns bordered with solid lines ("□") denote types provided with standard –type actuator

2) ○ : positioner is necessary. △ : Can be operated either with or without positioner.

3) Take care not to cause the maximum permissible differential pressure to exceed the maximum operating pressure designated by ANSI B16.34-1981 or JIS B 2201 – 1984

4) Seat leakages of items marked with asterisk are less than 0.01% (ANSI B16.104-1976 CLASS IV)
Those for items without asterisk marks are less than 0.00001% (ANSI B16.104-1976 CLASS VI)



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DRAWING

