

STANDARD
SPECIFICATION

PARALLEL SLIDE VALVE
SPRING-LESS TYPE
400H SERIES

GENERAL

The Parallel Slide 400H valve provides maximum Shutoff performance through its metal-metal, wedge Type sealing mechanism (Figs.4,5) Its excellency as An emergency shutdown/relief valve, or a control valve Of a large diameter, has been proven in a variety of On-off applications. As it seals off all pressures from Low to high. Fluids of extremely low temperature can Be controlled, too. Its all metal construction automati-cally assures fire-safe function as well.

STANDARD SPECIFICATIONS

Body

- Type: Spring-less type.
- Size : 1.5” ~ 24” (40~600mm).
28” ~ 36” (non-standard).
- Rating:

L4 type body : 3” ~ 24” (80 ~600mm).
JIS10K,ANSI (JPI) class 150.

M2 type body : 1.5” ~2” (40~50mm).
JIS10K,ANSI (JPI) class 150.
5” ~ 20” (40~500mm).
JIS20K,30K,ANSI(JPI) class 300.
- Connection: Flanged (RF,RTJ).
Weld ends (BW,SW/2” under).
- Face to Face dimensions: See pages 16~27.
- Material: SCPH2, SCPH21, SCPH61, SCPL1,
SCS13A, SCS14A, and other alloy steel.
As to the operating temperature-pressure
Limitation for each material, see pages 2
~4, Table 1 ~ 2.
- Bonnet: Standard type-10 ~ 220°C
Fin-Extension type.....-45 ~ -11°C
Or over220°C
Long-Extension type.....under -45°C
Steam jacket type.
- Gland Packing: Teflon asbestos, Pillar foil.
See page 4, Fig. 1 for selection
- Gasket: Asbestos, Teflon.
Spiral-wound metal (without L4 body).
See page 4, Fig. 2 for selection.
- Painting Color: Munsell N-6(Epoxy resin group) is
Standard. For stainless steel body. No
Painting is standard.



Trim

- Disc form: Parallel disc.
- Seal ring: Full bore type.
V-orifice type (60° 90°)
- Materials & Treatment: see pages 3~4,Table 2.

Actuator

- Standard Specification: See page 2.

Performance

- Rated Cv: See page 5, Table 3.
- Flow characteristic: See page 5, Fig. 3.
- Range ability: Full bore type.

2(50mm) under.....15 : 1
3(80mm) over.....20 : 1
V-orifice type.
2(50mm) under.....20 : 1
3(80mm) over.....30 : 1
- Seat leakage: Rated Cv X 0.000001%
- Allowable pressure drop: See pages 9~15,Table4.

Dimensions: See pages 16 ~ 27.

Weight: See page 28, Table 5.

Optional Special Specification: See page.2.

Actuator Specifications.

Model	Pneumatic Cylinder	Diaphragm
	6100LA , 6200LA	5000LA
Specification	Double Acting	Spring Return
Purpose	Modulation/On-Off	Modulation/On-Off
Air Supply	3.0~5.0 kgf/cm²G	1.4,2.4,2.6,2.8 kgf/cm²G
Piping Connection	Rc1/4,Rc3/8,Rc1/2,Rc3/4	Rc1/4,Rc3/8
Input range or Spring range	: 4 kgf/cm²G ~ 5 kgf/cm²G	0.2 ~ 1.0 , 0.4 ~ 2.0 kgf/cm²G
Action	Modulation: Valve open or shut when Positioner Signal in-crease. On-off: Valve open or shut when Solenoid Valve energized.	DA: Air to Valve Shut. RA: Air to Valve Open
Hysterias	Less than 1.5% of FS with Positioner	Less than 1.0% of FS with Positioner
Linearity	Linear cam: Less than ±2% of FS with Positioner Equal % cam: Less than ±3% of FS with Positioner	Linear cam: Less than ±2% of FS with Positioner Equal % cam: Less than ±3% of FS with Positioner
Ambient Temperature	-20 ~ + 60°C	-20 ~ + 60°C
Painting	Munsell N-6 (Epoxy resin group)	Munsell N-6 (Epoxy resin group)
Option	E/P.P/P Positioner, Air set. Solenoid valve. Speed Controller. Lock-up Valve. Limit switch. Volume Tank. Manual handle. Etc.	E/P.P/P Positioner, Air set. Solenoid valve. Speed Controller. Lock-up Valve. Limit switch. Volume Tank. Manual handle. Etc.

Optional Special Specifications (additional cost is required):

- * Special testing.
 - Flow characteristics testing. Material certificate,
 - Low tempera rue testing. Steam testing.
 - Non-destructive-testing Radiographic testing.
 - * Oxygen clean.
- * Sand/Dust proof.
 - * Cold area proof.
 - * Tropical area proof.
 - * No copper alloy.
 - * Salty environment proof.
- * Special piping & fitting.
 - * Vacuum service proof.
 - * SUS bolts/nuts for exposed parts.
 - * Non-standard painting.

Table 1 Body Materials Operating Pressure-Temperature Ratings.

Table 1-1 ANSI

Unit: kgf/cm²G

Temp. °C	150#						300#					
	SPCL1 LCB	SCPH2 WCB	SCPH21 WC6	SCPH61	SCS13A	SCS14A	SPCL1 LCB	SCPH2 WCB	SCPH21 WC6	SCPH61	SCS13A	SCS14A CF8M
-196~38	-	-	-	-	19.4	19.4	-	-	-	-	50.6	50.6
-45~38	18.8	-	-	-	19.4	19.4	48.8	-	-	-	50.6	50.6
-5~38	18.8	20.0	20.4	20.4	20.4	19.4	19.4	52.1	52.1	52.7	50.6	50.6
50	18.5	19.6	19.6	19.6	18.8	18.8	48.2	51.1	52.1	52.7	48.7	49.0
100	17.6	18.0	18.0	18.0	16.0	16.5	46.0	47.3	49.8	52.5	41.7	43.0
150	16.1	16.1	16.1	16.1	14.2	15.1	44.9	46.1	47.3	51.2	37.0	39.3
200	14.3	14.3	14.3	14.3	12.8	14.0	43.5	44.7	46.4	49.8	33.4	36.4
250	12.3	12.3	12.3	12.3	11.9	12.3	41.4	42.5	45.4	47.2	31.1	34.1
300	10.4	10.4	10.4	10.4	10.4	10.4	38.4	39.5	43.2	43.2	29.7	32.2
350	8.6	8.6	8.6	8.6	8.6	8.6	36.7	37.7	41.0	41.0	28.7	31.0
375		7.5	7.5	7.5	7.5	7.5		37.2	39.6	39.6	28.3	30.3
400		6.6	6.6	6.6	6.6	6.6		35.2	37.3	37.3	28.0	29.7
425		5.7	5.7	5.7	5.7	5.7		29.4	35.8	35.2	27.7	29.3
450		4.8	4.8	4.8	4.8	4.8		20.4	34.5	31.5	27.4	28.7
475		3.8	3.8	3.8	3.8	3.8		13.8	32.3	26.4	27.1	27.9
500		2.9	2.9	2.9	2.9	2.9		9.0	28.3	20.7	26.6	27.3

Table 1-2 JIS Unit: kgf/cm²G

Temp. °C	10K	20K	30K	
	SCPH2	SCPH2	SCPH2	SCPH21
-5~120	14.0	34.0	51.0	51.0
~220	12.0	31.0	46.0	46.0
~300	10.0	29.0	43.0	43.0
~350		26.0	39.0	39.0
~400		23.0	38.0	38.0
~425		20.0	30.0	36.0
~450				34.0
~475				32.0
~490				30.0

Table 2 Body/Trim Materials Combinations. Operating Temperature & Seat leakage.
Table 2-1 When body material is carbon steel.

Body Materials		JIS/ASTM				SCPH2 (A216-WCB)				SCPH21 (A217-WC6)			
Disc	Material	A105	SUS304	SUS316	SCM435	SUS304	SUS316	SCM435		SUS304	SUS316	SCM435	
	Treatment	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite		Stellite	Stellite	Stellite	
Seat ring	Material	A105	SUS304	SUS316	SCS304	SUS304	SUS316	SUS304		SUS304	SUS316	SUS304	
	Treatment	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite		Stellite	Stellite	Stellite	
Disc follower	Material	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A		SCS13A	SCS13A	SCS13A	
Wedge	Material	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A		SCS13A	SCS13A	SCS13A	
	Treatment	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite		Stellite	Stellite	Stellite	
Stem	Material	SUS304	SUS304	SUS316	SUS304	SUS304	SUS316	SUS304		SUS304	SUS316	SUS304	
Guide	Material	SUS420J2	SUS420J2	SUS420J2	SUS420J2	SUS420J2	SUS420J2	SUS420J2		SUS420J2	SUS420J2	SUS420J2	
	Treatment	Heat treatment	Heat treatment	Heat treatment	Heat treatment	Heat treatment	Heat treatment	Heat treatment		Heat treatment	Heat treatment	Heat treatment	
Operating temperature °C		-5~350	-5~425	-5~425	-5~400	-5~425	-5~425	-5~425		-5~425	-5~425	-5~425	
Seat leakage		Rated Cv X 0.000001 %											

Note: For steam or water, please select SUS304/Stellite or SUS316/Stellite for the disc material, SCS1A/Stellite for the wedge material.

Table 2-2 When body material is carbon steel & stainless steel.

Body Materials		JIS/ASTM		SCPH61		SCPL1 (A352-LCB)		SCS13A	
Disc	Material	SUS304	SUS316	SUS304	SUS316	SUS304	SUS316	SUS304	SUS316
	Treatment	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite
Seat ring	Material	SUS304	SUS316	SUS304	SUS316	SUS304	SUS316	SUS304	SUS316
	Treatment	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite
Disc follower	Material	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A
Wedge	Material	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A	SCS13A
	Treatment	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite	Stellite
Stem	Material	SUS304	SUS316	SUS304	SUS316	SUS304	SUS316	SUS304	SUS316
Guide	Material	SUS420J2	SUS420J2	SUS420J2	SUS420J2	SUS316	SUS316	SUS316	SUS316
	Treatment	Heat treatment	Heat treatment	Heat treatment	Heat treatment	Stellite	Stellite	Stellite	Stellite
Operating temperature °C		-5~425	-5~425	-5~425	-5~425	-196~500	-10~200	-196~500	-196~500
Seat leakage		Rated Cv X 0.000001 %							

Note: If the fluid temperature is extremely low. The body material SXS13A needs to be nitride (over 9.5%)

Table 2-3 When body material is stainless steel

Body Materials		JIS/ASTM		SCS14A (A351-CF8M)	
Disc	Material	SUS316	SUS316		
	Treatment	Stellite	Stellite		
Seat ring	Material	SUS316	SUS316		
	Treatment	Stellite	Stellite		
Disc follower	Material	SCS14	SCS14		
Wedge	Material	SCS14	SCS14		
	Treatment	Stellite	Stellite		
Stem	Material	SUS316	SUS316		
Guide	Material	SUS316	SUS316		
	Treatment	Stellite	Stellite		
Operating temperature °C		-196~500	-10~200		
Seat leakage		Rated Cv X 0.000001 %			

Fig. 1 Gland Packing Pressure-Temperature Ratings.

Fig 1-1 Teflon asbestos
(P4513+ P4513L)
Oxidizing fluid
(P4513+ P#2S)

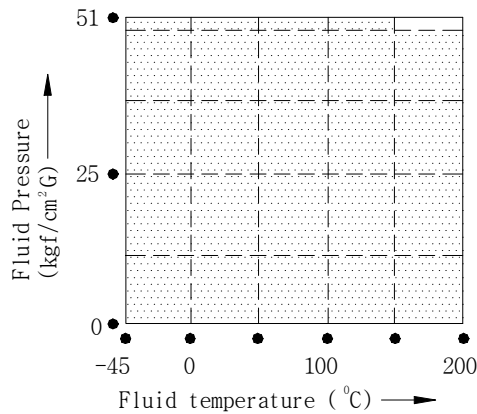


Fig. 1-2 Pillar foil.
(P6616A+ P316)

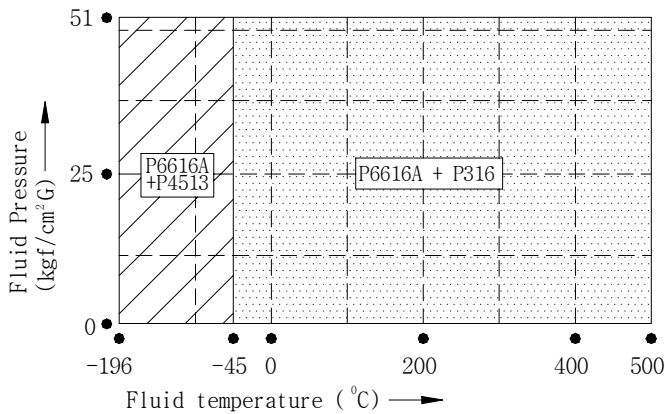


Fig. 2 Gasket Pressure-Temperature Ratings.

Fig 2-1 Asbestos.
(VAL.1500AC)

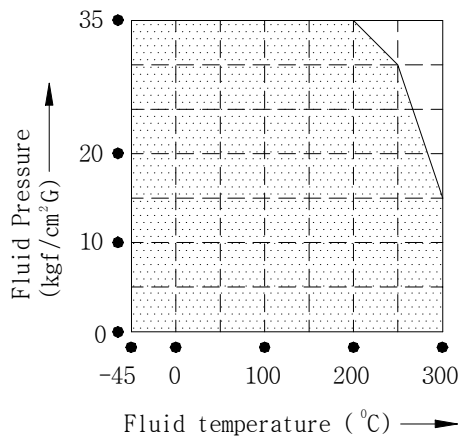


Fig. 2-2 Teflon
(VAL.7020)

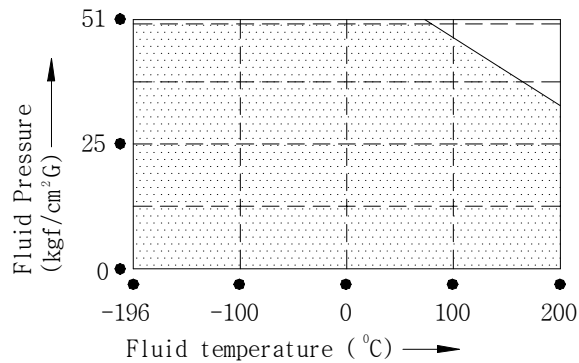


Fig 2-4 Asbestos/SUS (T/#1804,1806).
(For M2 type body)

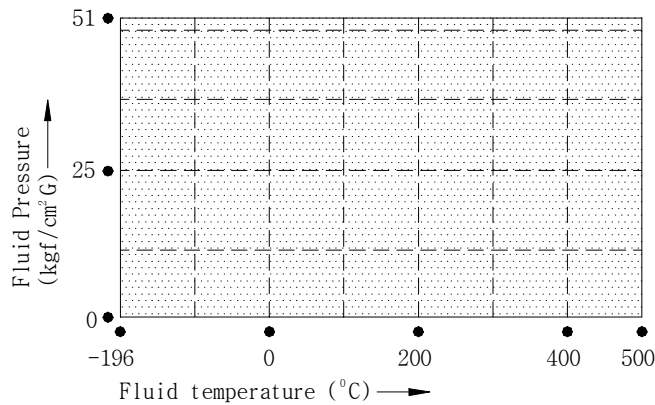


Fig. 2-5 Teflon/SUS316 (T/#9090).
(For M2 type body Oxygen clean)

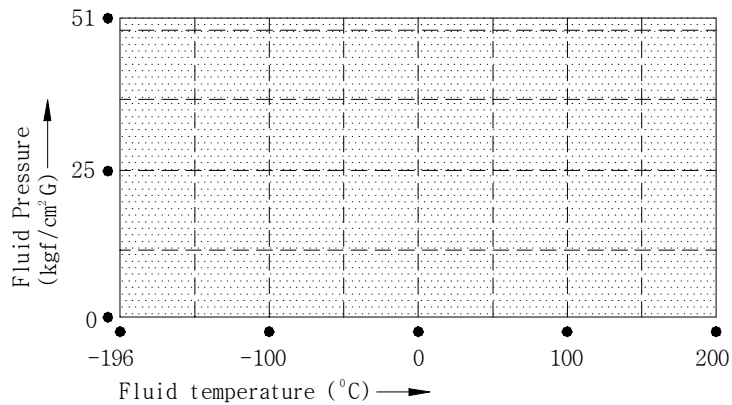


Fig. 3 Flow characteristics.

Fig 3-1 Full bore type.

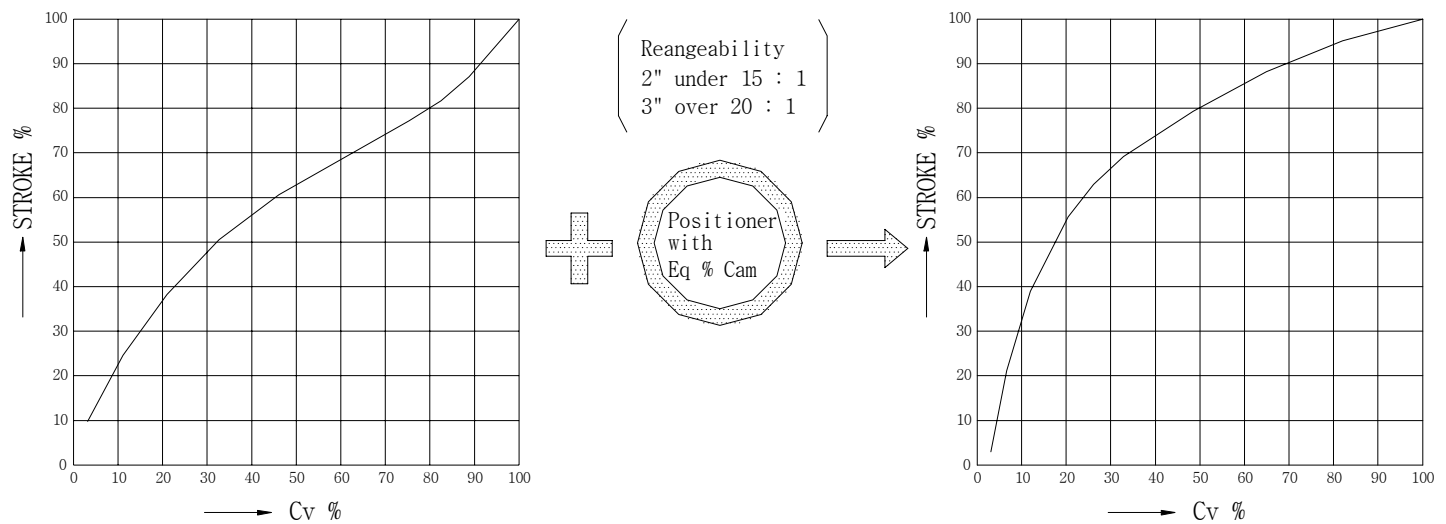


Fig. 3-2 V-orifice type

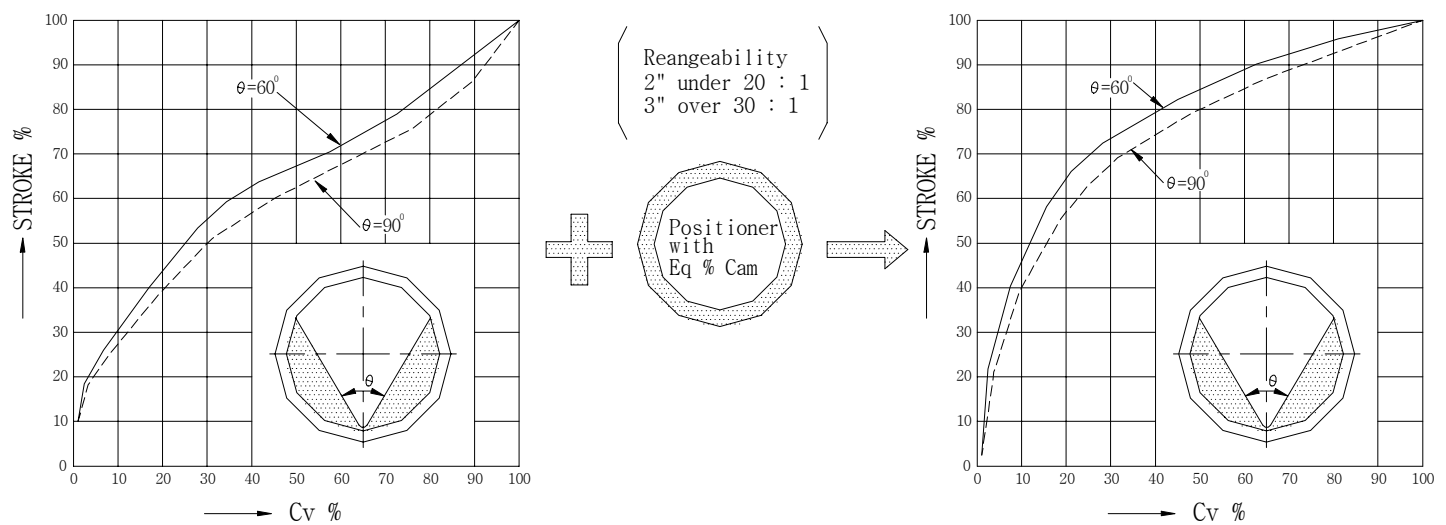


Table 3 Cv value and Stroke.

Valve size	Body Rating		L4 type body JIS10K,ANSI (JPI) Class 150			M2 type body JIS20K,30k,ANSI (JPI) Class 300			Stroke mm
	Seat form		Full bore	90° V-orifice	60° V-orifice	Full bore	90° V-orifice	60° V-orifice	
	inch	(mm)							
1½		(40)	—	—	—	50	25	15	40
2		(50)	—	—	—	120	60	36	50
3		(80)	320	165	95	320	165	100	90
4		(100)	790	410	240	790	410	240	110
5		(125)	1,040	540	310	1,000	520	300	135
6		(150)	1,380	720	415	1,150	600	350	160
8		(200)	3,550	1,850	1,065	3,310	1,630	940	210
10		(250)	4,990	2,600	1,500	3,970	2,060	1,190	260
12		(300)	8,170	4,250	2,450	6,970	3,620	2,090	310
14		(350)	10,600	5,510	3,180	9,400	4,890	2,820	360
16		(400)	14,200	7,380	4,260	13,300	6,920	3,990	410
18		(450)	18,700	9,720	5,610	17,100	8,900	5,130	460
20		(500)	23,600	12,270	7,100	22,500	11,700	6,750	510
24		(600)	34,000	—	—	—	—	—	610

Fig.4 L4 type body section view.
Fig. 4-1 Wedge-Disc assembly.

When actuator output (A) is loaded. Carefully designed wedge angle converts it into horizontal pressure
 It presses the two discs tightly against the seat rings.

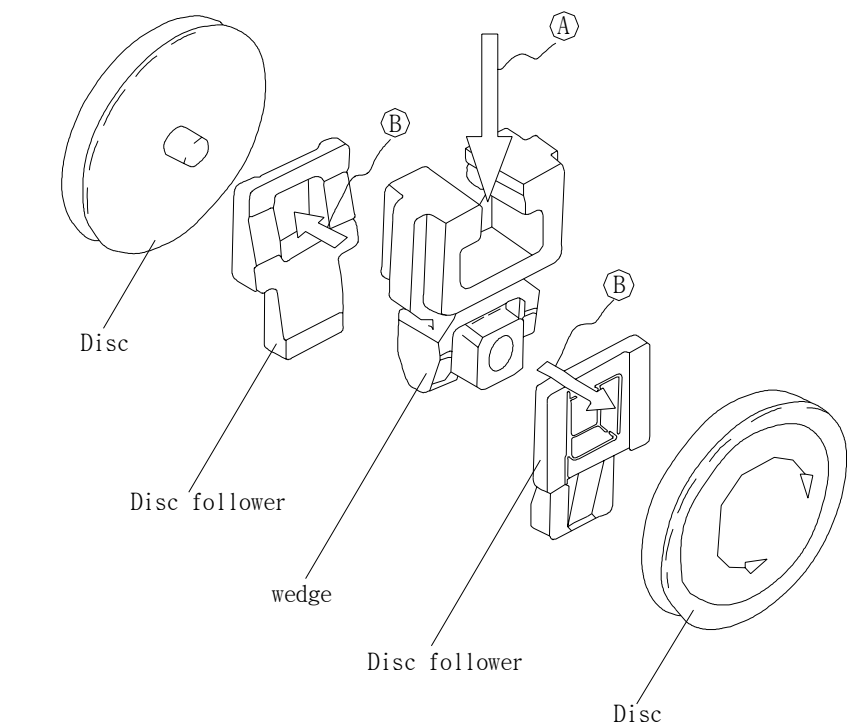


Fig. 4-3 L4 type body : Full Jacket.

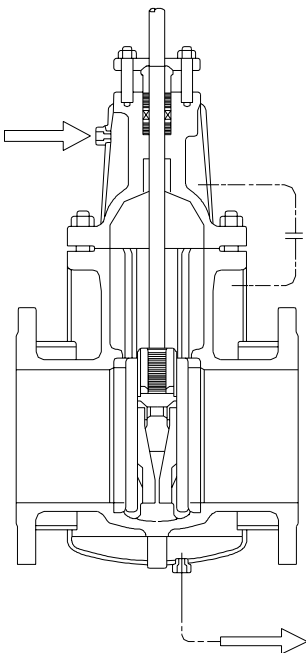


Fig. 4-2 L4 type body : Standard.

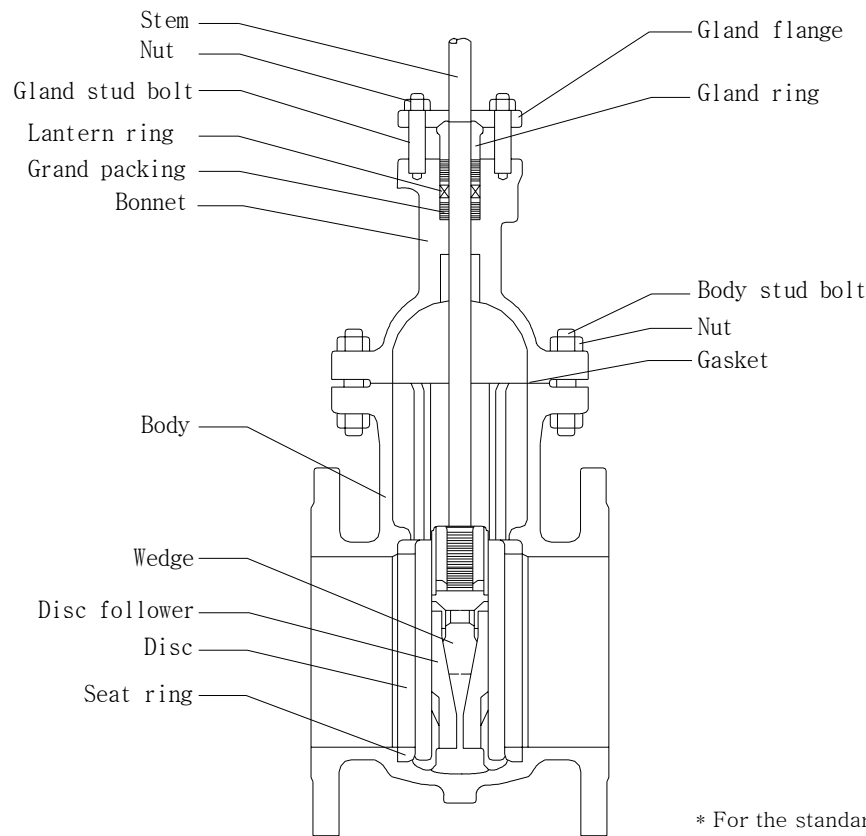
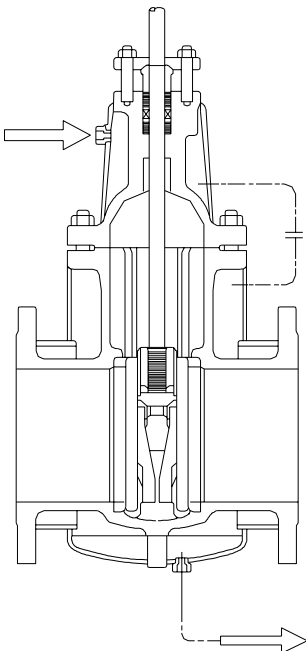


Fig. 4-4 L4 type body : Semi Jacket.



* Standard jacket material: SS41
 Standard jacket connection: PT1/2 , PT3/4

* For the standard bonnet, a screw type seat ring is applied.
 For high or low temperature , the seat ring is welded.

Fig.5 M2 type body section view.
 Fig. 5-1 Wedge-Disc assembly.

* The mechanism of how the actuator output exerted the discs is the same as in L type body.

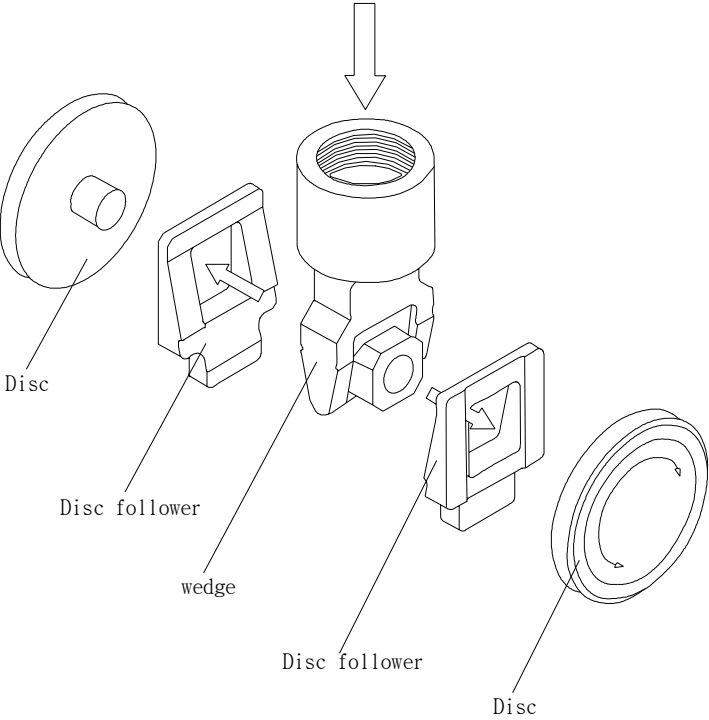
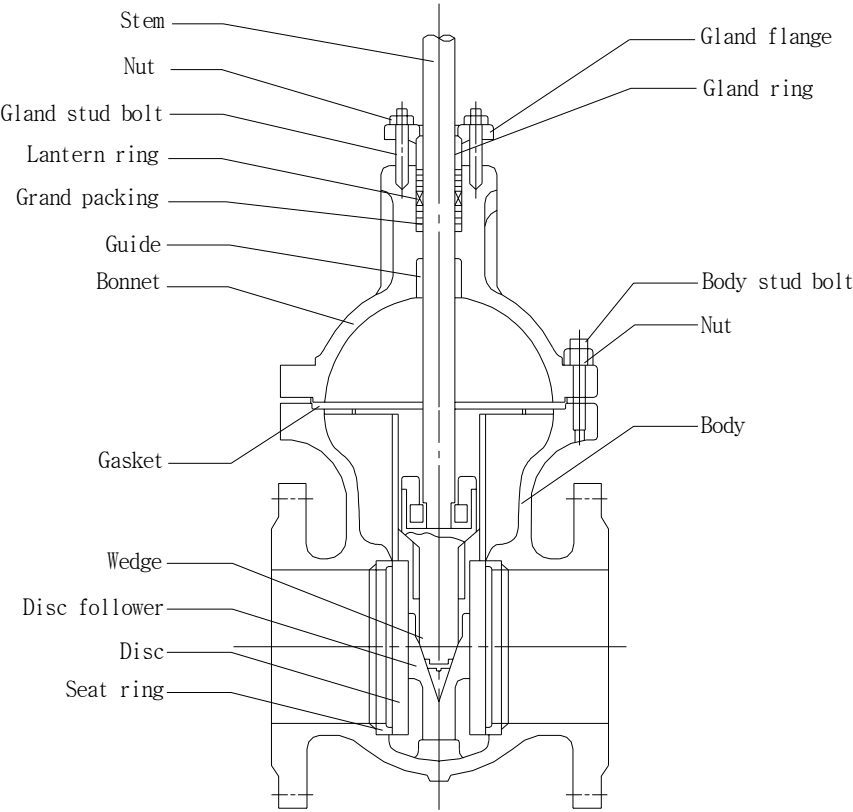


Fig. 5-2 L4 type body : Standard.



* For the standard bonnet, a screw type seat ring is applied.
 For high or low temperature , the seat ring is welded.

Fig. 5-3 M2 type body : Full Jacket.

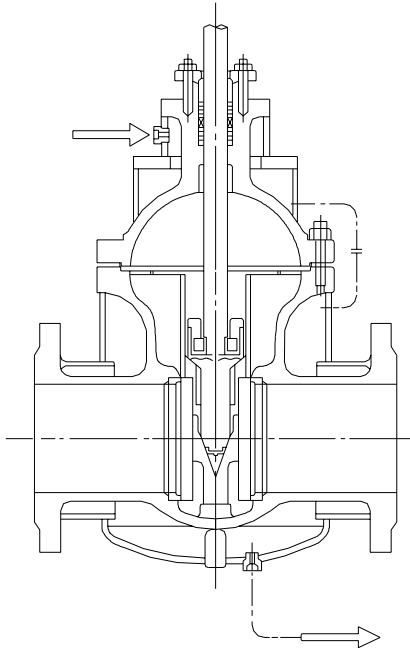
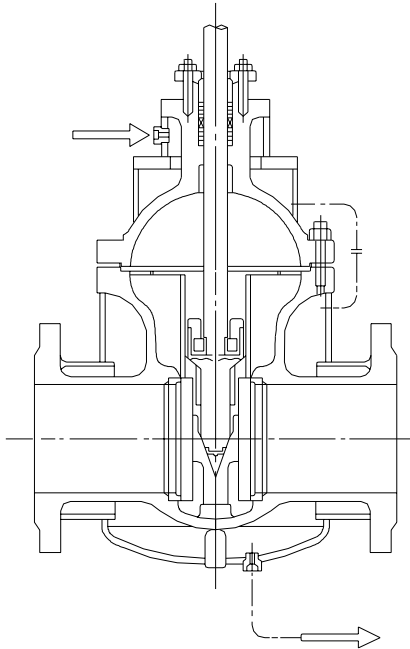


Fig. 5-4 M2 type body : Semi Jacket.



* Standard jacket material: SS41
 Standard jacket connection: PT1/2 , PT3/4

Fig.6 V-orifice type section view.

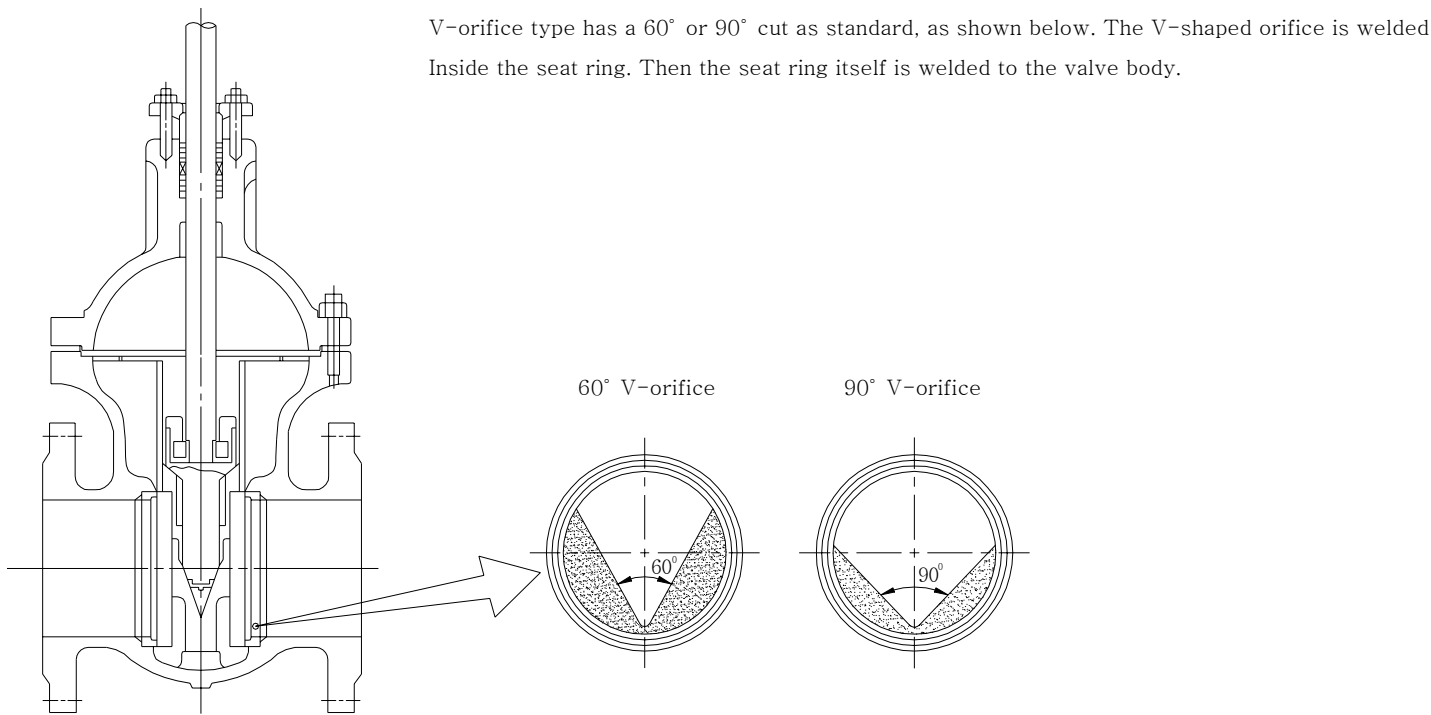
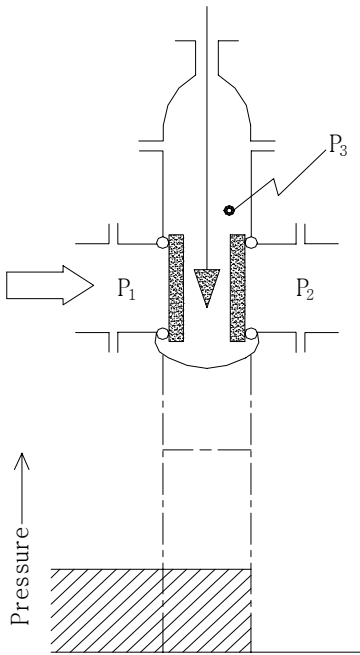
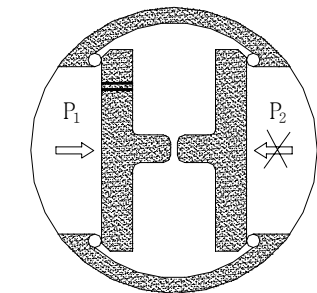


Fig.7 Prevention of abnormal inner pressure rise.

When the 400H Parallel Slide valve shuts off a fluid, a Small amount of it sealed off between the two metal Discs. If the fluid has a lower temperature than the Ambiance, it will expand gradually inside the valve Affected by the higher ambient temperature. This cre- Ates abnormally high pressure inside the valve body. Which in turn demands larger actuator output force. Or worse. Could destroy the valve body. For this type, Of fluid, the following measures are necessary Steam Also requires the same, if the operating condition is Such that the valve is closed at start-up and opens Several hours later.

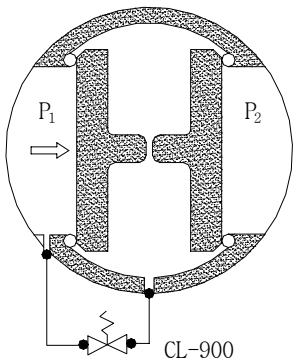


(A) A small hole in the disk on the upstream side.



Expanding fluid is forced To escape upstream in Order to keep the press- ures on the upstream in and the valve inside al- ways the same.

(B) Using a relief valve (CL-900)



A relief valve, set at 20-30% of the fluid pressure, will accordingly relieve the exceeding pressure to P_1 or P_2 side

Table 4 Maximum allowable shutoff pressure (Unit. Kg/cm² G)

When the valve inlet pressure is expressed as P_1 , the valve outlet pressure as P_2 ,
And the valve inside pressure as P_3 , the valve shutoff pressure condition is usually
Given by $P_1 = P_3 > P_2 = 0$. the maximum allowable pressures shown here are the
Values where that condition is applicable. Also, the limitations by materials and
Operating temperature is taken into account. That is why there cases where valve
Size increase does not mean max. allowable shutoff pressure increase. For the
Following operating conditions. Please contact KOSO.

- $P_3 > P_1 = P_2 = 0$ (when $P_1 = 0$, after shutoff)
- $P_1 > P_3 = P_2 = 0$ (when shutoff by the upstream side disc is required)
- $P_1 = P_2 > P_3 = 0$ (for double lock and bleed specification)

Refer to pages 16-27 for standard combinations of valve and actuator sizes.
For combination with an electric or hydraulic actuator , consult KOSO.

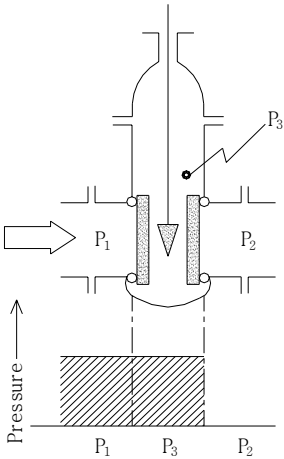


Table 4-1 Double acting pneumatic cylinder actuator (6100LA , 6200LA).

L4 type body/Disc material: SCM435													
Valve size inch (mm)	Packing	Teflon-asbestos (P4513+P4513L)						Pillarfoil (P6616A+P316)					
	Fluid Temp.	-30°C ~ 200°C						-30°C ~ 400°C					
	Actuator size	6100LA						6200L					
	Air supply kgf/cm²G	160	280	360	415	540	540	160	280	360	415	540	540
3 (80)	3	13.49	20.4	—	—	—	—	7.85	20.4	—	—	—	—
	4	20.4	20.4	—	—	—	—	15.5	20.4	—	—	—	—
	5	20.4	20.4	—	—	—	—	20.4	20.4	—	—	—	—
4 (100)	3	9.31	20.4	—	—	—	—	5.42	20.4	—	—	—	—
	4	14.58	20.4	—	—	—	—	10.69	20.4	—	—	—	—
	5	19.86	20.4	—	—	—	—	15.97	20.4	—	—	—	—
5 (125)	3	6.31	20.4	—	—	—	—	3.63	17.98	—	—	—	—
	4	9.89	20.4	—	—	—	—	7.25	20.4	—	—	—	—
	5	13.47	20.4	—	—	—	—	10.83	20.4	—	—	—	—
6 (150)	3	4.66	16.51	20.4	—	—	—	2.55	13.54	19.96	—	—	—
	4	7.35	20.4	20.4	—	—	—	5.39	20.4	20.4	—	—	—
	5	10.01	20.4	—	—	—	—	8.05	20.4	18.0	—	—	—
8 (200)	3	2.63	10.2	15.75	—	—	—	1.38	8.37	12.62	—	—	—
	4	4.32	14.98	16.01	—	—	—	3.07	13.15	16.01	—	—	—
	5	6.02	19.59	—	—	—	—	4.77	17.93	12.09	—	—	—
10 (250)	3	—	6.72	10.62	—	—	—	—	5.45	8.51	—	—	—
	4	—	9.97	—	—	—	—	—	8.75	—	—	—	—
	5	—	11.37	—	—	—	—	—	11.37	—	—	—	—
12 (300)	3	—	4.67	7.69	11.01	—	—	—	3.77	6.11	9.49	—	—
	4	—	7.03	11.33	12.01	—	—	—	6.13	9.8	12.01	—	—
	5	—	9.4	12.01	12.01	—	—	—	8.49	12.01	12.01	—	—
14 (350)	3	—	3.39	5.72	8.4	—	—	—	2.69	4.49	7.17	—	—
	4	—	5.2	8.65	9.2	—	—	—	4.5	7.42	9.2	—	—
	5	—	7.0	9.2	—	—	—	—	6.31	9.2	—	—	—
16 (400)	3	—	—	4.39	6.51	11.52	—	—	—	3.41	5.54	10.01	—
	4	—	—	6.71	9.69	—	—	—	—	5.74	8.71	9.63	—
	5	—	—	9.04	12.87	—	—	—	—	8.06	11.89	—	—
18 (450)	3	—	—	3.29	4.98	9.21	—	—	—	2.4	4.09	7.94	—
	4	—	—	5.14	7.51	13.25	—	—	—	4.25	6.61	12.19	—
	5	—	—	6.99	10.03	10.48	—	—	—	6.10	9.14	10.48	—
20 (500)	3	—	—	2.55	3.93	7.37	16.10	—	—	1.82	3.2	6.33	15.1
	4	—	—	4.06	5.98	10.9	12.4	—	—	3.33	5.25	9.86	12.4
	5	—	—	5.56	8.04	14.4	—	—	—	4.83	7.31	13.39	—
24 (600)	3	—	—	1.6	2.55	4.94	11.05	—	—	1.09	2.05	4.22	10.33
	4	—	—	2.64	3.98	7.38	12.75	—	—	2.14	3.47	6.66	12.75
	5	—	—	3.69	5.4	9.83	12.24	—	—	3.18	4.9	9.11	12.24