

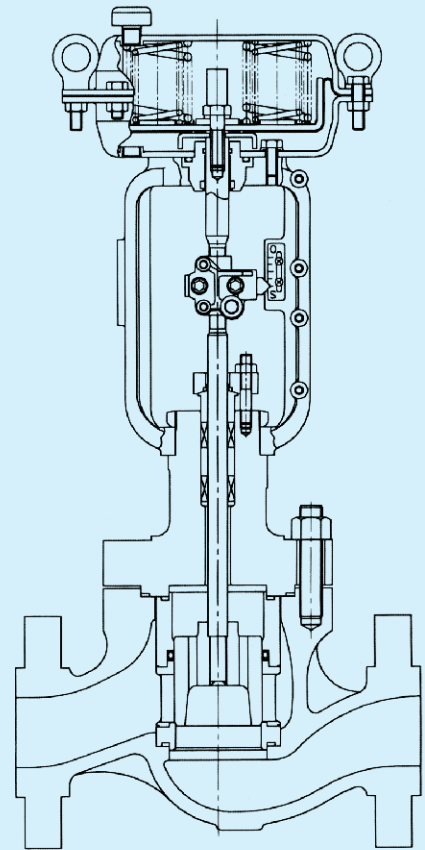
**KOSO**

***STANDARD SPECIFICATION***

***CAGE GUIDED TYPE  
GLOBE VALVES***

***FOR HIGH PRESSURE APPLICATION***

***501G SERIES***



**KOSO**

## **KOSO's Control Valves and Instrumentation Systems**

**KOSO**, the leading industrial control valve manufacturer with strong research and development capability of its own, has been meeting requirements of the time. Always making available a wide range of product lines that can satisfy the needs of the coming century, **KOSO** is committed to provide control valves, and the systems there of, of highest quality and reliability, produced under its quality assurance system complying with ISO 9001 standard.

If you have questions on this technological catalog or require additional printed materials, please contact our sales representative nearest you.

## 501 G Cage Guided Control Valves 900# 1500# 2500# Class

### GENERAL

This series is our latest cage guided control valve of large Cv value, and dynamic stability. Its is suitable to a variety of heavy duty services. This series is characterized by pressure balanced type trim for very high pressure drops. For those severe fluid conditions that cannot be covered by this series, please select KOSO VeCTor series control valves.

### STANDARD SPECIFICATIONS BODY

Type	501G
Body size	1 1/2"~18" (20A~450A)
Plug form	Pressure balanced plug type
Characteristics	Linear, EQ%
Trim materials Trim treatment	See Fig. 1 for hardening treatment and operating pressure-temperature (P.501G-4)
Body ratings	JIS 63K          ANSI Class 900, 1500, 2500 #
Body Connections	Flanged (RF, RTJ), Weld ends standard (SW : under 2", BW : over 3")
Face to Face dimension	See pages 501G-11~13
Body & Bonnet Material	SCP H2 / WCB, SCPH 21/WC6, SCPH61/C5, SCPL1/LCB, SCS13A/CF8, SCS14A/CF8M, and other alloy steels. As to the operating pressure-temperature limitation for each material, see Tables 1.
Bonnet type	Standard type                               : -5 ~+230° C Fin-Extension type                         : -45 ~ - 5° C -45 ~ -under - 5° C or over + 230° C Long -Extension type                     : -196~ - 45° C Note the allowable operating pressure - temperature limitation for each material
Packing	Teflon, Grafoil etc. See P.TD-4~6 for selection
Gasket	SUS316 Spiral wound metal, with Grafoil or Teflon filler. See P.TD-7 for selection
Painting colour	Munsell N-6 (Epoxy resin group) is standard. In the case of stainless steel body, no painting is standard.

## ACTUATOR

Type	Diaphragm type	Pneumatic Cylinder type	
	5200 LA	6300 LA	
	Multi-Spring type	Spring return type	Double acting type
Specification			
Purpose	Modulation	Modulation	
Air supply or Power supply	Air Supply (Spring range) 300 ( 80~200 ) kPa [gauge] 340 ( 80~200 ) kPa [gauge] 340 ( 120~300) kPa [gauge]	Air supply (Spring range) 500 (125~375) kPa [gauge]	400~500 kPa Air supply [gauge]
Direct action	Air to valve shut		Valve open or shut by air or electric signal.
Reverse action	Air to valve open		
Hysteresis	$\leq 1\%$ of FS with positioner	$\leq 1.5\%$ of FS with positioner	
Linearity	$\leq \pm 2\%$ of FS with positioner	$\leq \pm 2\%$ of FS with positioner	
Ambient Temp.	-10~+70°C	-20~+60°C	
Painting	Munsell N-6	Munsell N-6	
Option	E/P, P/P Positioner, Air - set, Solenoid valve, Limit switch Speed controller, Lock valve, Lock-up valve Manual handle, etc	E/P, P/P Positioner, Air - set, Solenoid valve, Limit switch Speed controller, Lock valve, Lock-up valve Manual handle etc	

## PERFORMANCE

Cv Rated Cv	See Table 2 (P.501G-5,6).
Flow Characteristics	Linear, EQ%
Rangeability	See Table 2. (P.501G-6)
Seat Leakage	See Table 1. (P.501G-3)
Allowable pressure drops	See Table 3. (P.501G-8,9)

## OPTIONAL SPECIAL SPECIFICATIONS ( additional cost is required )

Special testing for Body	Material certificate, Liquid penetrant testing, Radiographic testing, Flow characteristic testing, Low temperature testing, Steam testing.
Special Cleaning for Body	Oxygen clean, Oil-free, Water-free
Special specification for Body and Actuator	Sand and Dust proof, Salty environment proof, Cold area proof, Tropical area proof Copper-free alloy, Special piping and fitting, Vacuum service proof, SUS bolt and nut for exposed parts, Non-standard painting
Authorization	Japanese government authorization for High pressure gas

**Table 1 BODY / TRIM STANDARD MATERIAL COMBINATION, OPERATING TEMPERATURE AND SEAT LEAKAGE**

- ① Trim material / treatment vs operating temperature - pressure range : See Fig.1 (P.501G-4)
- ② When ANSI Class V for seat leakage is required, please consult with us.
- ③ In the case of cavitation service, we recommend anti-cavitation KOSO veCTor series control valves
- ④ In the case of flashing service, we recommend reduced bore

- HT Heat treatment ● Hcr Hard chrome plated
- SF Stellite full surface ● PH Precipitation hardening
- SS Stellite seat ● AT ATOMLLOY

**Table 1-1 BODY MATERIAL : CARBON STEEL**

Body material		SCPH2 / A216-WCB, SCPH21 / A 217-WC6, SCPH61 / A217-C5, SCPL1/A352-LCB		
Cage	Material	SUS630 / SCS24		A182-F11
	Treatment	PH		AT
Plug	Material	SUS410		A182-F11
	Treatment	HT		SF
Seat ring	Material	SUS410		A182-F11
	Treatment	HT		SF
Balance seal	Material	R.TFE	Grafoil	Grafoil
	Back ring	SUS316	-----	-----
Seat leakage	ANSI	Class IV	Class IV	Class IV
	Rated Cv X	0.01%	0.01%	0.01%
Operating temperature °C	SCPH2 / WCB body	-5~+230	-5~+425	-5~+538
	SCPH21 / WC6 body			
	SCPH61 / C5 body	-45~+230	-----	-----
	SCPL1 / LCB body			

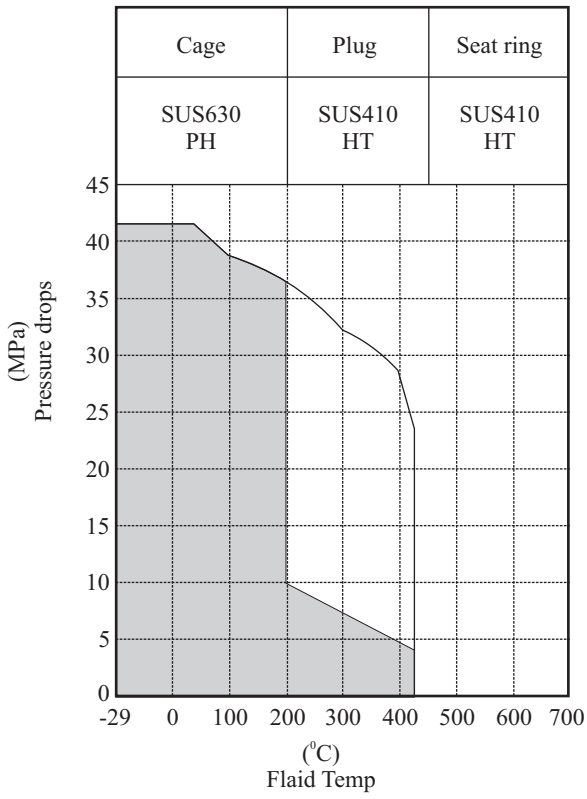
**Table 1-2 BODY MATERIAL : STAINLESS STEEL**

Body Material		SCS 13A / A 351 - CF8 SCS14A / A351 - CF-8M		
Cage	Material	SUS316 / SCS 14A		
	Treatment	Hcr		
Plug	Material	SUS316	SUS316	SUS316
	Treatment	-----	SF	SF
Seat ring	Material	SUS316	SUS316	SUS316
	Treatment	-----	SF	SF
Balance seal	Material	R.TFE ※ ①	R.TFE ※ ①	Grafoil
	Back ring	SUS316	SUS316	-----
Seat leakage	ANSI	Class IV	Class IV	Class IV
	Rated Cv x	0.01%	0.01%	0.01%
Operating temperature °C		-196~+230	-196~+230	-196~+538

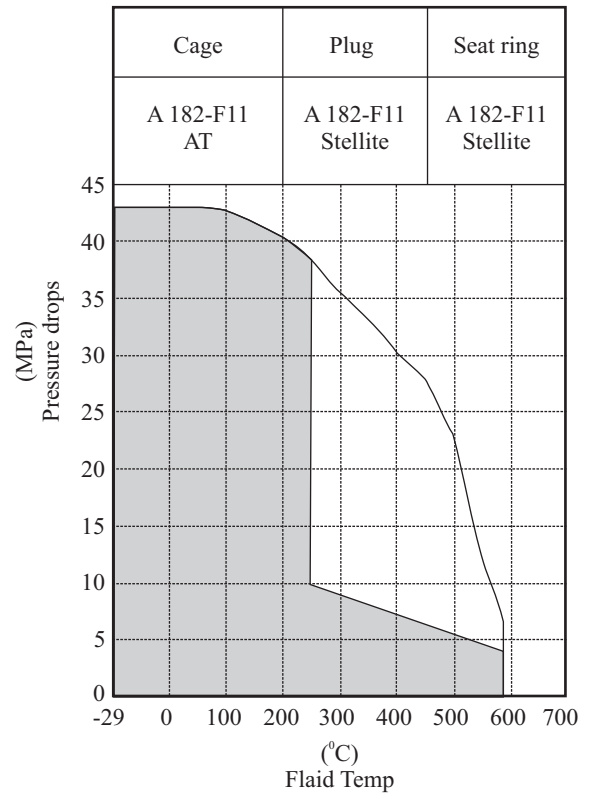
When the fluid temperature is below -75°C, the materials for the balance and the back ring will be Fluoroloy G and Elgiloy, respectively

**Fig. 1 OPERATING TEMPERATURE AND PRESSURE DROPS FOR TRIM MATERIAL COMBINATIONS**

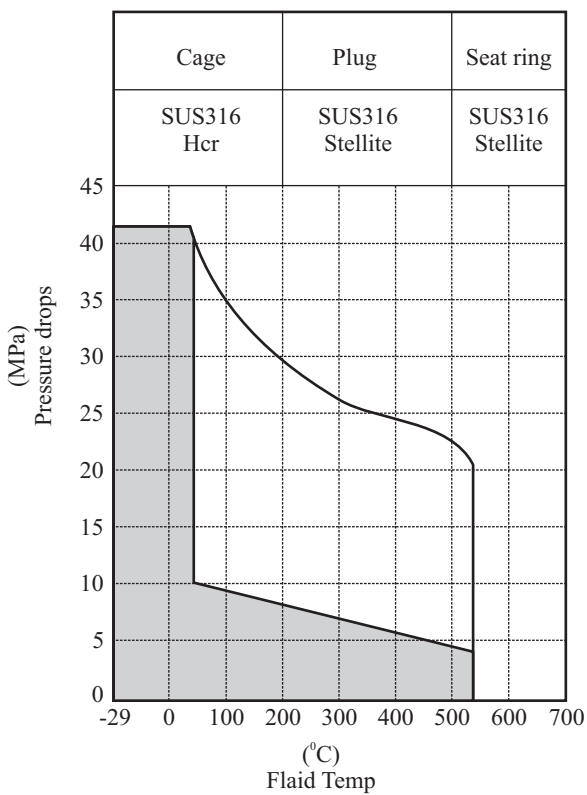
**Fig. 1-1**



**Fig. 1-2**



**Fig. 1-3**



**Table 2 Cv VALUE AND STROKE**

**Table 2-1 ANSI Class 1500# Flow Characteristics : EQ %**

Rating	Flow Characteristics	Body Size inch (mm)	(inch)											
			Plug Size (inch)											
			1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	2	2 <sup>1</sup> / <sub>2</sub>	3	4	5	6	7	8	10
ANSI Class 1500#	EQ%	1 1/2 (40)	17	25										
		2 (50)	17	25	50									
		3 (80)			50	75	110							
		4 (100)				75	110	170						
		6 (150)						170	275	370				
		8 (200)								370	500	650		
		10 (250)									500	650	900	
		12 (300)										650	900	1,300

**Table 2 Cv VALUE AND STROKE**

**Table 2-2 ANSI class 1500# Flow Characteristics / Linear**

Rating	Flow Characteristics	Body Size inch (mm)	(inch)											
			Plug Size (inch)											
			1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	2	2 <sup>1</sup> / <sub>2</sub>	3	4	5	6	7	8	10
ANSI Class 1500#	Linear	1 1/2 (40)	20	30										
		2 (50)	20	30	60									
		3 (80)			60	90	130							
		4 (100)				90	130	200						
		6 (150)						200	330	445				
		8 (200)								445	560	700		
		10 (250)									560	700	970	
		12 (300)										700	970	1,400

**Table 2 Cv VALUE AND STROKE**

**Table 2-3 ANSI Class 2500# Flow Characteristics : EQ %**

Rating	Flow Characteristics	Body Size inch (mm)	(inch)									
			Plug Size (inch)									
			1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	2	2 <sup>1</sup> / <sub>2</sub>	3	4	5	6	
ANSI Class 2500#	EQ%	1 1/2 (40)	17									
		2 (50)	17	30								
		3 (80)		30	50	75						
		4 (100)			50	75	125					
		6 (150)					125	170	275			
		8 (200)						170	275	480		
		10 (250)										

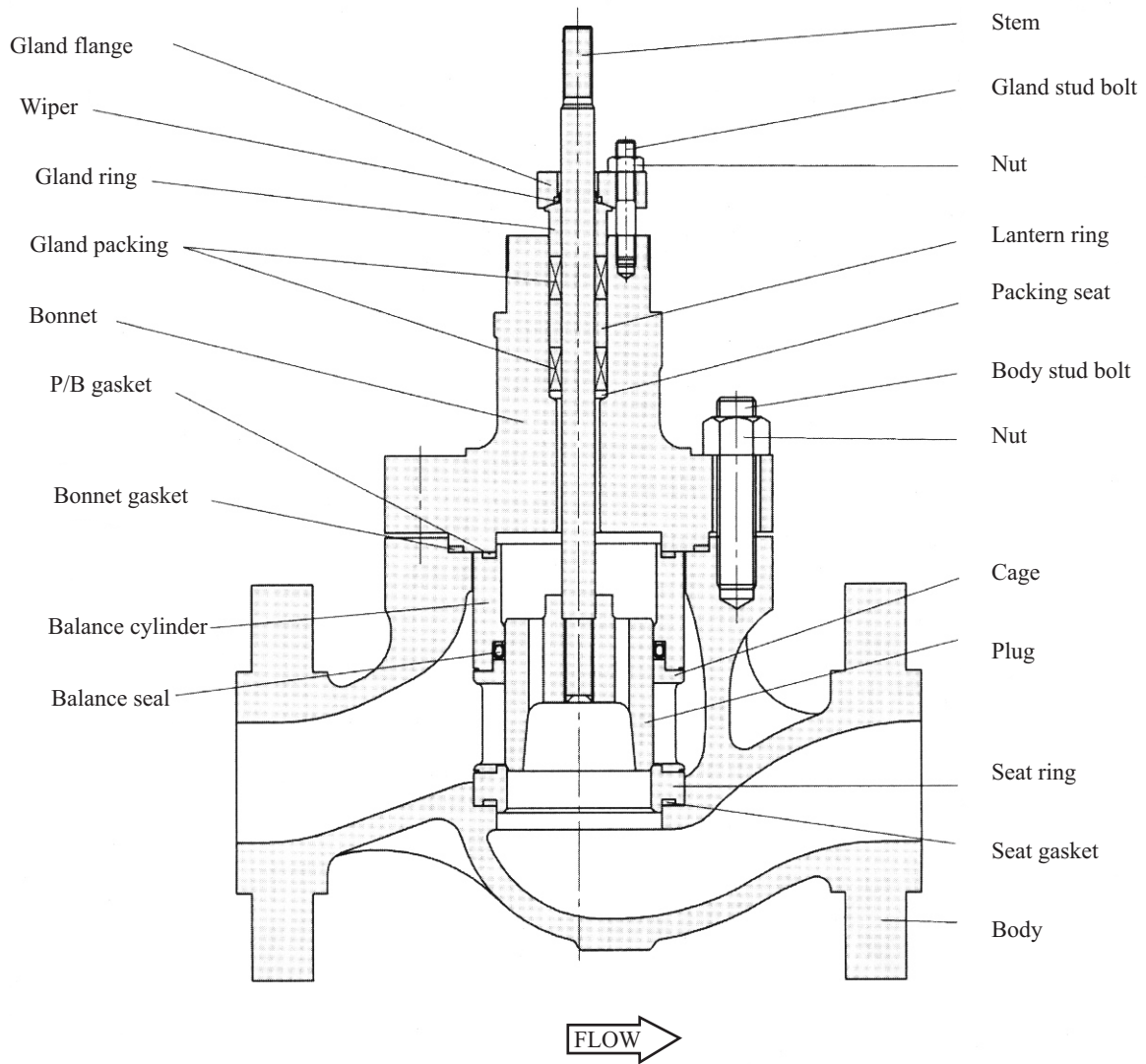
**Table 2 Cv VALUE AND STROKE**

**Table 2-4 ANSI class 2500# Flow Characteristics / Linear**

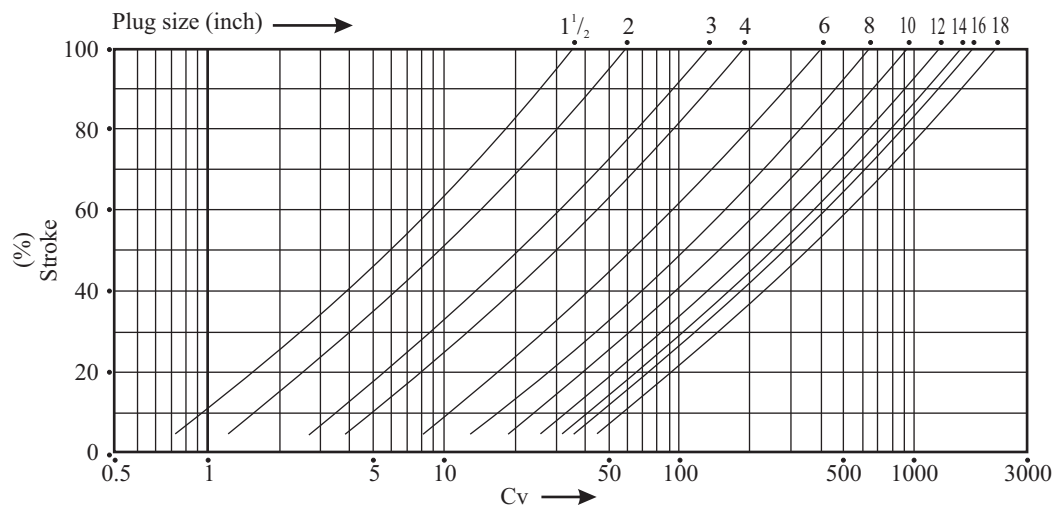
Rating	Flow Characteristics	Body Size inch (mm)	(inch)									
			Plug Size (inch)									
			1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	2	2 <sup>1</sup> / <sub>2</sub>	3	4	5	6	
ANSI Class 2500#	Linear	1 1/2 (40)	20									
		2 (50)	20	36								
		3 (80)		36	60	90						
		4 (100)			60	90	150					
		6 (150)					150	200	330			
		8 (200)						200	330	530		
		10 (300)										



**Fig. 2 BODY SECTION VIEW**



**Fig. 3 EQ% FLOW CHARACTERISTICS**



**Table 3 ALLOWABLE PRESSURE DROPS (UNIT : MPa)**  
See pages P.501G-10,11 for valve size-actuator size combinations

DA : Direct action (Air to valve shut)  
RA : Reverse action (Air to valve open)

**Table 3-1 DIAPHRAGM ACTUATOR (5200LA)/PACKING :TEFLON**

Seat-ring/Metal seat  
SUS316 Balance seal : Reinforced Teflon / SUS316

seat leakage : ANSI Class IV

Actuator Size	Air supply (Off balance) kPa (gauge)	Spring range kPa (gauge)	Balance seal : reinforced Teflon / SUS316												
			Plug size (inch)												
			1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	2	2 <sup>1</sup> / <sub>2</sub>	3	4	5	6	7	8	10	
270	300 (80)	DA & RA 80~200	6.4												
	340 (120)	DA :80~200 RA : 120~300	13.1												
350	300 (80)	DA & RA 80~200	16.8	16.4	13.9	9.9	7.1								
450	300 (80)	DA & RA 80~200	22.6	22.3	20.9	20.3	19.2	14.9	10.2	7.2					
650	300 (80)	DA & RA 80~200							23.0	22.3	21.7	18.7	15.9	13.2	10.1

**Table 3-2 DIAPHRAGM ACTUATOR (5200LA) / PACKING : GRAFOIL**

Seat ring / Metal seat  
Balance seal : GRAFOIL

Seat leakage : ANSI Class IV

Actuator Size	Air supply (Off balance) kPa (gauge)	Spring range kPa (gauge)	Balance seal : GRAFOIL												
			Plug size (inch)												
			1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	2	2 <sup>1</sup> / <sub>2</sub>	3	4	5	6	7	8	10	
350	300 (80)	DA & RA 80~200													
450	300 (80)	DA & RA 80~200	14.2	13.1											
650	300 (80)	DA & RA 80~200	-----	-----	17.2	16.5	15.5	14.4							

**Table 3 ALLOWABLE PRESSURE DROPS (UNIT : MPa)**

**Table 3-3 DIAPHRAGM ACTUATOR PACKING : TEFLON**

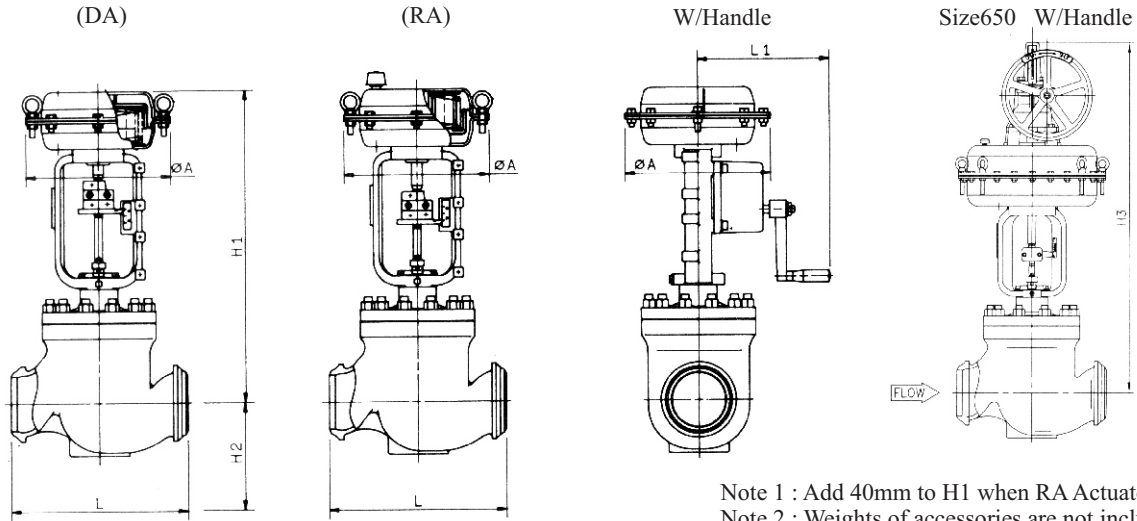
Seat-ring/Metal seat  
 SUS316 Balance seal : Reinforced Teflon / SUS316  
 seat leakage : ANSI Class IV

Actuator Size	Air supply kPa (gauge)	Balance seal : Reinforced Teflon / SUS316											
		Plug size (inch)											
		1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	2	2 <sup>1</sup> / <sub>2</sub>	3	4	5	6	7	8	10
200	400	38.9	38.3	36.1	35.1	34.1	29.7	21.8	16.7				
	500	42.5	42.5	42.5	42.5	42.5	39.8	29.7	23.2				
300	400	42.5	42.5	42.5	42.5	42.5	42.5	42.5	37.5	33.0	31.2	26.6	21.3
	500	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	42.5	41.1	35.6	28.8
450	400								42.5	42.5	42.5	42.5	42.5
	500								42.5	42.5	42.5	42.5	42.5

**Table 3-4 DOUBLE ACTING CYLINDER ACTUATOR / PACKING : GRAFOIL**

Seat-ring/Metal seat  
 Balance seal : GRAFOIL  
 seat leakage : ANSI Class IV

Actuator Size	Air supply kPa (gauge)	Balance seal : GRAFOIL											
		Plug size (inch)											
		1	1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>2</sub>	2	2 <sup>1</sup> / <sub>2</sub>	3	4	5	6	7	8	10
300	400	17.2	17.2	17.2	17.2	17.2	17.2						
	500	17.2	17.2	17.2	17.2	17.2	17.2						
450	400							17.2	17.2	17.2	17.2	17.2	
	500							17.2	17.2	17.2	17.2	17.2	
600	400												17.2
	500												17.2



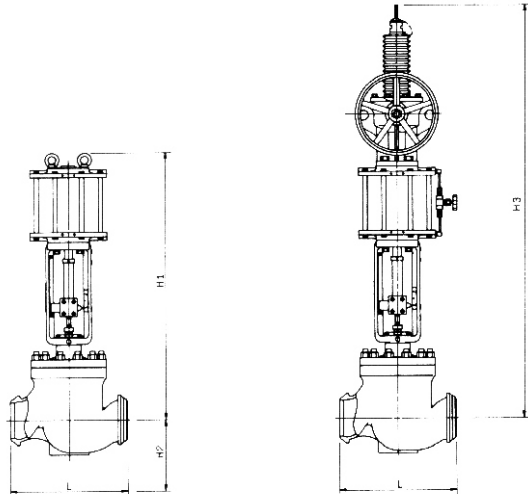
Note 1 : Add 40mm to H1 when RA Actuator  
 Note 2 : Weights of accessories are not included

**Table 4-1 Globe type dimension and weights with Diaphragm actuator (5200LA)**

Valve size	Bonnet	Actuator size	(DA)				L1 (H3)		Approx. weight							
			ANSI 900, 1500JIS63K		ANSI 2500		Handle		Standard				With Handle			
			mm	inch	mm	inch	mm	inch	kg	lbs	kg	lbs	kg	lbs	kg	lbs
1.5	STD	270	655	25.8	-----	-----	230	9.1	86	36	-----	-----	96	44	-----	-----
		350	690	27.8	-----	-----	230	9.1	110	50	-----	-----	120	54	-----	-----
		450S	755	29.7	-----	-----	336	13.2	141	64	-----	-----	156	71	-----	-----
	Fin-Extension	350	835	32.9	-----	-----	230	9.1	116	53	-----	-----	126	57	-----	-----
		450S	900	35.4	-----	-----	336	13.2	146	66	-----	-----	161	73	-----	-----
2	STD	270	675	26.6	740	29.1	230	9.1	130	59	184	83	140	64	194	88
		350	710	28.0	775	30.5	230	9.1	154	70	208	94	164	74	218	99
		450S	775	30.5	840	33.1	336	13.2	185	84	239	108	200	91	254	115
	Fin-Extension	350	860	33.9	925	36.4	230	9.1	161	73	215	98	171	78	225	102
		450S	925	36.4	990	39.0	336	13.2	191	87	245	111	206	93	260	118
3	STD	350	780	30.7	830	32.7	230	9.1	262	119	329	149	272	123	339	154
		450L	985	38.8	1035	40.7	336	13.2	317	144	384	174	332	151	399	181
	Fin-Extension	450L	1135	44.7	1185	46.7	336	13.2	323	147	391	177	338	153	406	184
		650S	1217	47.9	1267	49.9	(1667)	(65.6)	473	215	506	230	523	237	556	252
4	STD	350	850	33.5	840	33.1	230	9.1	328	149	475	215	338	153	485	220
		450L	1055	41.5	1045	41.1	336	13.2	383	174	530	240	398	181	545	247
		650L	1237	48.7	1227	48.3	(1627)	(64.1)	532	241	680	308	563	255	730	331
	Fin-Extension	450L	1205	47.4	1195	47.0	336	13.2	392	178	539	244	407	185	554	251
650L		1387	54.6	1377	54.2	(1777)	(70.0)	541	245	689	313	591	268	739	335	
6	STD	350	885	34.8	1015	40.0	230	9.1	744	337	1305	592	754	342	1315	596
		450L	1090	42.9	1220	48.0	336	13.2	799	362	1360	617	814	369	1375	624
		650L	1272	50.1	1402	55.2	(1802)	(70.9)	948	430	1509	684	998	453	1559	707
	Fin-Extension	450L	1235	48.6	1370	53.9	336	13.2	814	369	1375	624	829	376	1390	631
650L		1417	55.8	1552	61.1	(1952)	(79.6)	964	437	1525	692	1014	460	1575	714	
8	STD	450L	1195	47.0	1275	50.2	336	13.2	1238	562	2232	1012	1253	568	2247	1019
		650L	1372	54.2	1457	57.4	(1857)	(73.1)	1387	629	2382	1080	652	652	2432	1103
	Fin-Extension	450L	1345	53.0	1425	56.1	336	13.2	1257	570	2252	1022	1272	577	2267	1028
		6650L	1527	60.1	1607	63.3	(2007)	(79.0)	1407	638	2401	1089	1457	661	2451	1112

(H3) Dimensions are with Body rating ANSI 2500# only.

All dimensions and weight are for reference only



Note : Weights of accessories are not included

**Table 4-2 Globe type dimension and weights with Double acting actuator (6300 LA)**

Valve size	Bonnet	Actuator size	H1 (DA)				H3				Approx. weight							
			ANSI 900, 1500 JIS63K		ANSI 2500		With Handle		Standard		With Handle		ANSI 900, 1500 JIS 63K		ANSI 2500			
			mm	inch	mm	inch	ANSI 900, 1500 JIS 63K	ANSI 2500	ANSI 900, 1500 JIS 63K	ANSI 2500	kg	lbs	kg	lbs	ANSI 900, 1500 JIS 63K	ANSI 2500		
inch	Type	Size (A)	mm	inch	mm	inch	mm	inch	mm	inch	kg	lbs	kg	lbs	kg	lbs	kg	lbs
1 1/2	STD	200	970	38.2	----	----	1435	56.5	----	----	105	47	----	----	142	64	----	----
		300	1030	40.6	----	----	1645	64.8	----	----	160	72	----	----	229	104	----	----
	Fin-Extension	200	710	28.0	----	----	1580	62.2	----	----	110	50	----	----	147	67	----	----
		300	1175	46.3	----	----	1790	70.5	----	----	165	75	----	----	234	106	----	----
2	STD	200	710	28.0	1055	41.5	1455	57.3	1520	59.8	149	67	202	92	186	84	240	109
		300	1050	41.3	1115	43.9	1665	65.6	1730	68.1	204	92	257	117	273	124	327	148
	Fin-Extension	200	1140	44.9	1205	47.4	1605	63.2	1670	65.7	155	70	209	95	193	87	246	112
		300	1200	47.2	1265	49.8	1815	71.5	1880	74.0	210	95	264	120	279	127	333	151
3	STD	200	1060	41.7	1110	43.7	1525	60.0	1575	62.0	256	116	323	147	294	133	361	164
		300	1120	44.1	1170	46.1	1735	68.3	1785	70.3	311	141	278	172	381	173	448	203
	Fin-Extension	300	1270	50.0	1320	52.0	1885	74.2	1935	76.2	318	144	385	175	387	176	454	206
4	STD	200	1130	44.5	1120	44.1	1595	62.8	1585	62.4	322	146	470	213	360	163	507	230
		300	1190	46.9	1180	46.5	1805	71.1	1795	70.7	377	171	525	238	447	203	594	269
	Fin-Extension	300	1340	52.8	1330	52.4	1955	77.0	1945	76.6	386	175	534	242	455	207	603	273
6	STD	200	1165	45.9	1295	51.0	1630	64.2	1760	69.3	738	335	1299	589	776	352	1337	606
		300	1225	48.2	1355	53.3	1840	72.4	1970	77.6	793	360	1354	614	862	391	1423	646
	Fin-Extension	300	1370	53.9	1505	59.3	1985	78.1	2120	83.5	809	367	1370	621	878	298	1439	653
		450	1550	61.0	1685	66.3	2315	91.1	2450	96.5	990	449	1551	704	1132	513	1693	768
8	STD	300	1530	60.2	1610	63.4	2245	88.4	2325	91.5	1232	559	2226	1010	1301	590	2296	1041
		450	1710	67.3	1790	70.5	2575	101.4	2655	104.5	1414	641	2408	1092	1555	709	2550	1157
	Fin-Extension	300	1680	66.1	1760	69.3	2395	94.3	2475	97.4	1252	568	2246	1019	1321	599	2316	1050
		450	1860	73.2	1940	76.4	2725	107.3	2805	104.4	1433	650	2428	1101	1575	715	2570	1166
10	STD	300	1585	62.4	1690	66.5	2300	90.6	2405	94.7	2125	964	3139	1424	2195	995	3209	1455
		450	1765	69.5	1870	73.6	2630	103.5	2735	107.7	2307	1046	3321	1509	2449	1111	3463	1571
	Fin-Extension	450	1915	75.4	2020	79.5	2780	109.4	2885	113.6	2327	1055	3341	1515	2468	1120	3483	1580
12	STD	300	1810	71.3	----	----	2525	99.4	----	----	----	----	----	----	----	----	----	----
		450	1990	78.3	----	----	2855	112.4	----	----	----	----	----	----	----	----	----	----
	Fin-Extension	450	2140	84.3	----	----	3005	118.3	----	----	----	----	----	----	----	----	----	----

All dimensions and weight are for reference only

Top side handles are assumed mounting. Please consult factory for estimated dimension / weight of Top-handle type

**Table 5-1 Face-to Face (L)Dimension mm**

**mm**

Valve size	Body Rating							
	JIS 63K		ANSI 900#		ANSI 1500#		ANSI 2500#	
	RF	BW	BW/RF	RTJ	BW/RF	RTJ	BW/RF	RTJ
1½	323	333	333	333	333	333	447	450
2	354	375	375	378	375	378	437	440
3	431	440	440	443	460	463	498	505
4	496	510	510	513	530	533	566	575
6	699	715	715	718	770	776	820	833
8	895	854	854	857	911	920	1279	1295
10	1235	1251	1251	1254	1327	1336	1778	1800
12	1295	1311	1311	1314	1400	1416	-----	-----
14	-----	----	----	----	----	-----	*2134	

**Table 5-2 Face-to Face Dimension (L) inch**

**inch**

Valve size	Body Rating							
	JIS 63K		ANSI 900#		ANSI 1500#		ANSI 2500#	
	RF	BW	BW/RF	RTJ	BW/RF	RTJ	BW/RF	RTJ
1½	12.7	13.1	13.1	13.1	13.1	13.1	17.6	17.7
2	13.9	14.8	14.8	14.9	14.8	14.9	17.2	17.3
3	17.0	17.3	17.3	17.4	18.1	18.2	19.6	19.9
4	19.5	20.1	20.1	20.2	20.9	21.0	22.3	22.6
6	27.5	28.1	28.1	28.3	30.3	30.6	32.3	32.8
8	35.2	33.6	33.6	33.7	35.9	36.2	50.4	51.0
10	48.6	49.3	49.3	49.4	52.2	52.6	70.0	70.9
12	51.0	51.6	51.6	51.7	55.1	55.7	-----	-----
14	-----	-----	-----	-----	-----	-----	*84.02	-----

\*is BW dimension only

**Table 5-3 Dimension to bottom from the center of piping mm (inch)**

Valve size	E			
	ANSI 900#, 1500# JIS 63K		ANSI 2500#	
	mm	(inch)	mm	(inch)
1½	72	2.8	-----	-----
2	93	3.7	90	3.5
3	125	4.9	130	5.1
4	132	5.2	140	5.5
6	199	7.8	250	9.8
8	226	8.9	340	13.4
10	330	13.0	456	18.0
12	450	17.7		



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