



# WYECO

## Automatic Control Valves

### How to select control valve



When ordering, please specify by following procedure :

1. Actuator Type
2. Bonnet Type
3. Plug Characteristics
4. Valve Body Type
5. Body Material
6. Valve Action
7. Trim Material
8. Packing Material
9. Connection Rating
10. Body Size
11. Service Condition
  - 1). Flow Medium
  - 2). Flow Rate and Unit (Max. / Nor.)
  - 3). Inlet and Outlet Pressure (Max. / Nor)
  - 4). Differential Pressure (Shut-off pressure / for sizing)
  - 5). Temperature and Specific Gravity
  - 6). Viscosity of flow medium
12. Accessory
  - 1). Positioner
  - 2). Air Set
  - 3). Limit Switch
  - 4). Booster Relay
  - 5). Lock-up Valve
  - 6). Solenoid Valve

### MODEL NUMBERS

<b>D</b>	<b>0</b>	<b>2</b>	<b>GS</b>	<b>FC</b>	<b>O</b>	<b>S0</b>	<b>P</b>	<b>1</b>	<b>50</b>	<b>FA</b>
Actuator	Bonnet type	Plug Form	Body type	Body material	Valve action	Trim material	Gland packing	Gasket	Body size	Connection rating

Code	Actuator
D	Diaphragm
C	Cylinder
M	Motor

Code	Bonnet
0	Standard
1	Extension
2	Radiator Fin
3	Bellows Seal

Code	Plug Form
2	P-port Percentage
4	P-port Linear
6	Cage Guide
8	On-off

Code	Body Type
GS	Globe Single Seat
GD	Globe Double Seat
TM	3 Way Mixing Type
TD	3 Way Diverting Type
BL	Ball
BT	Butterfly
YT	Y-type
DP	Diaphragm (Saunders)

Code	Body Material
FC	Cast Iron FC250
SC	Cast Carbon Steel SCPH2
S3	304 Stainless steel, Cast SCS13A
S4	316 Stainless steel, Cast SCS14A
S6	316L Stainless steel, Cast SCS16A
FP	Cast Iron FC200 with Porcelain
HC	Cast Hastelloy C

Code	Valve Action
O	Air to Open
C	Air to Close

Code	Trim Material
S0	Forged SUS304
S1	Forged SUS316
SL	Forged SUS316L
S4	Forged SUS440C
HC	Forged Hastelloy C

Code	Gland Packing
T	V-teflon
G	Grafoil
A	Asbestos Yarn and Carbon Graphite

Code	Gasket
P	PTFE
Y	Gylon
N	Non asbestos
S	SUS316 / Grafoil
W	Spiralwound

Code	Body Size
15	1/2"
20	3/4"
25	1"
32	1-1/4"
40	1-1/2"
50	2"
65	2-1/2"
80	3"
04	4"
05	5"
06	6"
08	8"

Code	Connection Rating
SC	Screwed end
SW	Socket Welded
BW	Butt Welded
F1	JIS10K
F2	JIS20K
F3	JIS30K
FA	ANSI150lb
FB	ANSI300lb
FC	ANSI600lb

# WYECO

## Single Seated Control Valve

- \* The actuator are designed compactly as multi-spring diaphragm operated type, ease of adjustment and permit high trust.
- \* Provide compact design and high performance in conformity with general fluid service, i.e., steam , water, oil, gases.
- \* Provide lower seat leakage.
- \* Produce high operational economy and saving of space.
- \* Molded in packing ring which are spring loaded and self-adjusting in the packing box.

### Specification

#### Body

Type : Single seated, direct or reverse type, globe valve.  
 Material : Cast iron (FC250), Carbon steel (SCPH2)  
 Stainless steel (SCS13A, SCS14A, SCS16A)  
 Cast hastelloy C,B,  
 End connections : Flanged end (FF,RF) or Butt-welded type  
 Pressure rating : JIS10K, 20K, 30K, 40K, ANSI Class150, 300, 600  
 DIN PN10, PN16, PN25, PN40  
 Bonnet : Standard (-17 °C ~ +210 °C)  
 Radiator fin (-20 °C ~ +300 °C)  
 Extension (-196 °C ~ +280 °C)  
 Bellows seal (-196 °C ~ +350 °C)

Gland packing : V-teflon, Grafoil

Gaskets : Non-asbestos, Teflon, Gylon, SUS304/Grafoil, SUS316/Grafoil

Guiding : Top guide, Top and bottom guide

#### Trim

Stem : SUS304, SUS316, SUS316L

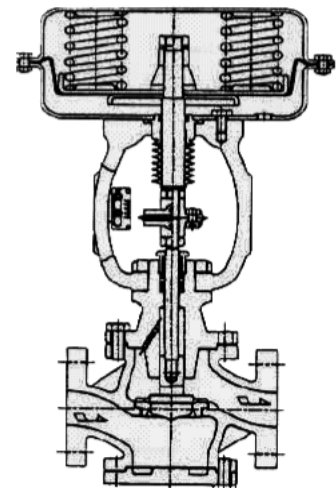
Valve plug : Single seated

Plug characteristics : Equal percentage, linear and on-off

Plug action : Push-down close

Materials : SUS304, SUS316, SUS316L, SUS440C, Hastelloy C,B

Diaphragm (RA)  
Actuated Control Valve



MODEL : D02GS

**Actuator**

Type : Multi-spring type single diaphragm actuated, direct or reverse.

Diaphragm material : Neoprene with fabric insert.

Air supply : 1.4, 2.4, 2.8, 3.2 kg/cm<sup>2</sup>

Spring range : 0.2 ~ 1.0 kg/cm<sup>2</sup> , 0.4 ~ 2.0 kg/cm<sup>2</sup>  
0.6 ~ 2.2 kg/cm<sup>2</sup> , 0.8 ~ 2.4 kg/cm<sup>2</sup>

Pneumatic tubing connection : 1/4" female tap.

Ambient temperature : -20 °C ~ +70 °C

**Valve action**

Air to open or air to close by using direct or reverse actuator

**Accessory**

Handwheel, Positioner, Solenoid Valve, Limit Switch, Air Set or Others.

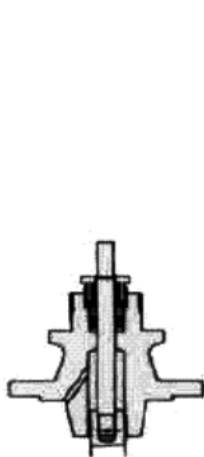
**Performance**

Rangeability : 1/2" through 1" 30:1 , 1-1/2" through 6" 50:1

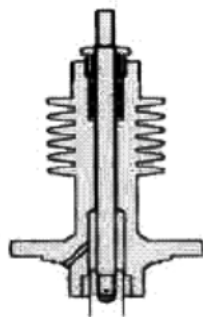
Allowable seat leakage :

Matal seat : Less than 0.01% of rated Cv (ANSI B16.104 ClassIV)

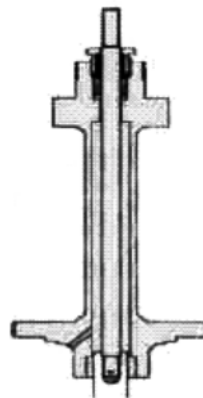
Soft seat : ANSI 16.104 ClassVI

**Type of Bonnets**

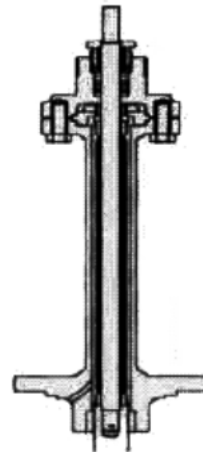
Standard  
Temperature :  
-17 °C ~ +210 °C



Radiator Fin  
Temperature :  
-20 °C ~ +300 °C



Extension  
Temperature :  
-196 °C ~ +280 °C



Bellows Seal  
Temperature :  
-196 °C ~ +350 °C

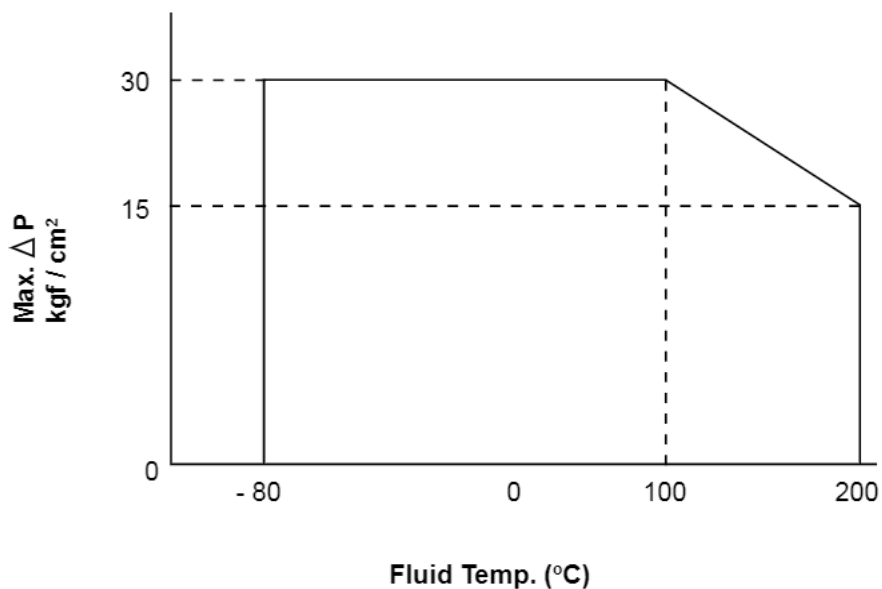
**Typical Combination of Materials**

Parts Name		Materials			
Body, Bonnet		FC250	SCPH2	SCS13A	SCS14A
Trim	Seat Ring	SUS304			SUS316
	Valve Plug	SUS304			SUS316
	Valve Stem	SUS316			SUS316
	Guide Bushing	SUS304			SUS316
Stud Bolt & Nut		SS400	S45C (H)	SUS304	SUS304

**Combination of Materials for Valve Body, Plug, and Operating Temperature limit.**

Body material	Plug material	Operating Temp. limit
Cast iron FC250	Stainless steel SUS304	0 °C ~ +230 °C
Ductile iron FCD450	Stainless steel SUS304	0 °C ~ +300 °C
Carbon steel SCPH2	Stainless steel SUS304	-20 °C ~ +350 °C
Stainless steel SCS13A	Stainless steel SUS304	-196 °C ~ +500 °C
Stainless steel SCS14A	Stainless steel SUS316	-196 °C ~ +500 °C
Cast Hastelloy C	Hastelloy C	-200 °C ~ +530 °C

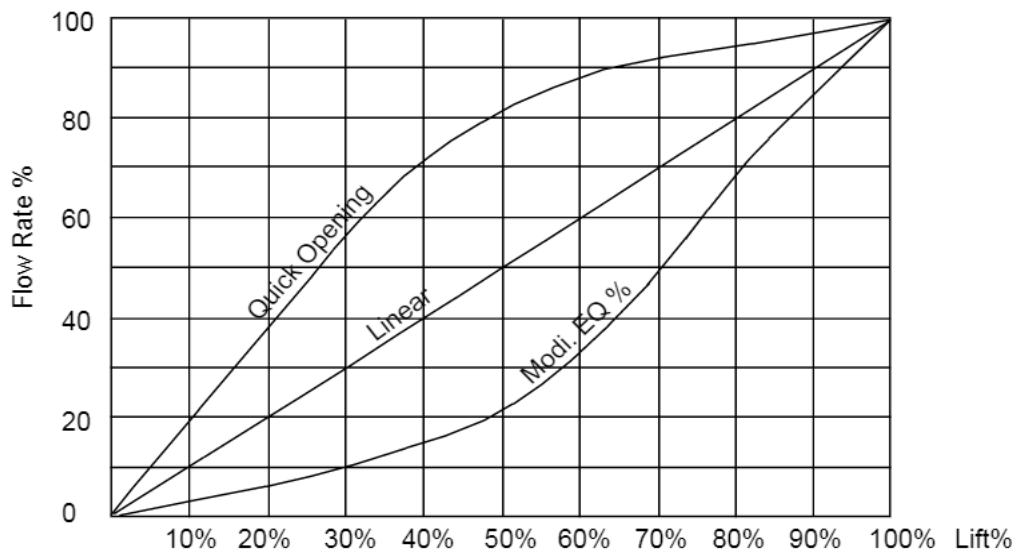
**Operating Temperature & Pressure Differential Limit of Soft Seat**



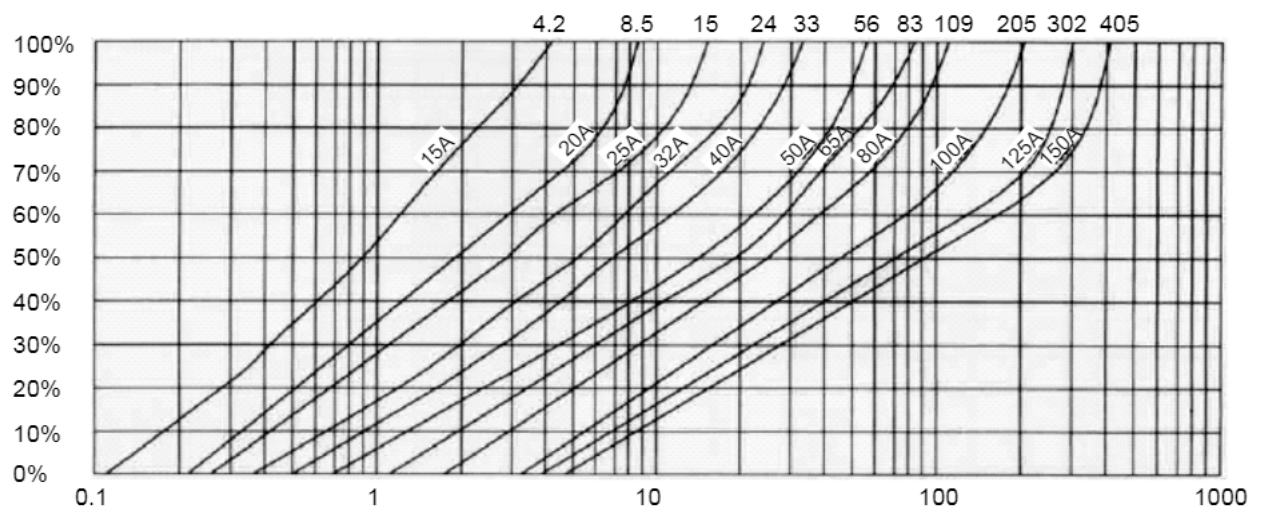
### Flow Characteristics Rated Cv Value

Body size	mm	15	20	25	32	40	50	65	80	100	125	150
	inch	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	5	6
Stroke		20						30		35	60	
Rated Cv		4.2	8.5	15.0	24.2	33.2	56.0	83.6	109.5	205.0	302.0	405.0

### Flow Rate Characteristics Curve



### Graph of Cv for Single Seat P-port Plug



**EQ% Metal Seat . Countoured Plug (P)**

Body size	Port size	Lift (mm)	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
15A 1/2"	5.0	20	0.02	0.03	0.06	0.09	0.14	0.20	0.28	0.42	0.70	0.95
	6.0	20	0.03	0.07	0.12	0.17	0.24	0.32	0.44	0.68	1.05	1.36
	8.0	20	0.08	0.13	0.20	0.28	0.37	0.50	0.70	1.00	1.45	2.10
	10.0	20	0.08	0.11	0.20	0.31	0.46	0.61	0.89	1.25	1.86	2.70
	13.0	20	0.16	0.30	0.41	0.62	0.90	1.20	1.62	2.22	3.20	4.20
20A 3/4"	6.0	20	0.04	0.07	0.12	0.20	0.27	0.36	0.50	0.73	1.11	1.50
	8.0	20	0.09	0.13	0.19	0.28	0.36	0.48	0.68	0.97	1.35	2.00
	10.0	20	0.07	0.15	0.25	0.39	0.55	0.79	1.16	1.44	2.05	2.80
	13.0	20	0.25	0.44	0.59	0.76	0.96	1.43	3.05	4.75	5.50	5.80
	19.0	20	0.35	0.56	0.85	1.26	1.78	2.70	4.70	6.60	7.70	8.50
25A 1"	8.0	20	0.13	0.18	0.23	0.32	0.42	0.54	0.74	1.03	1.44	2.20
	10.0	20	0.09	0.17	0.29	0.44	0.64	0.88	1.20	1.52	2.36	3.00
	13.0	20	0.13	0.34	0.60	0.86	1.22	1.99	3.25	4.75	5.87	6.50
	19.0	20	0.30	0.54	0.92	1.40	2.08	2.95	4.05	6.25	8.56	10.70
	25.0	20	0.42	0.73	1.20	1.95	2.86	4.21	7.40	11.08	13.45	15.00
32A 1-1/4"	25.0	20	0.68	1.12	1.72	2.58	3.67	5.51	8.73	12.32	15.55	17.60
	32.0	20	1.66	2.13	3.08	4.18	5.33	7.60	10.95	17.12	21.76	24.20
40A 1-1/2"	19.0	20	0.90	1.20	1.50	1.90	2.50	3.50	6.00	9.20	11.70	12.80
	25.0	20	1.13	1.50	1.97	2.70	3.60	5.20	8.60	13.10	17.20	18.80
	32.0	20	1.60	2.35	3.27	4.60	6.25	9.60	14.70	19.72	24.00	26.00
	38.0	20	0.16	0.38	1.50	3.95	6.78	11.37	17.29	23.71	29.02	33.20
50A 2"	25.0	20	0.80	1.30	1.80	2.50	3.50	5.20	8.60	12.60	16.20	17.80
	32.0	20	1.36	2.03	3.11	4.42	6.13	9.63	14.72	20.44	24.54	27.00
	38.0	20	1.20	1.82	3.08	4.72	7.45	11.11	16.95	28.74	28.74	33.40
	50.0	20	1.20	2.40	4.50	8.10	14.40	22.60	32.30	42.20	50.20	56.00
65A 2-1/2"	32.0	30	1.11	1.93	3.21	4.97	7.17	9.85	13.10	19.00	26.40	29.50
	38.0	30	0.92	1.90	3.50	5.71	8.44	12.10	19.85	30.56	37.81	41.00
	50.0	30	1.15	2.50	4.55	7.52	11.11	18.26	30.48	43.87	54.23	62.50
	63.0	30	1.42	3.28	6.28	10.30	15.30	22.50	35.80	53.28	70.28	83.60
80A 3"	38.0	30	0.85	1.53	2.80	4.31	7.44	12.12	17.34	23.92	29.50	33.80
	50.0	30	1.50	2.72	4.80	7.70	11.35	17.82	29.43	43.72	53.32	60.80
	63.0	30	2.30	3.50	5.80	8.40	12.20	21.60	37.40	54.14	69.20	81.80
	76.0	30	2.88	6.21	11.45	17.48	24.30	38.22	58.88	79.72	98.12	109.50
100A 4"	50.0	35	1.00	2.50	5.00	9.00	13.00	21.00	36.00	51.00	64.00	69.00
	63.0	35	2.00	4.00	8.00	13.00	20.00	29.00	46.00	68.00	85.00	93.00
	76.0	35	2.00	6.00	12.00	20.00	34.00	55.00	78.00	98.00	117.00	132.00
	100.0	35	2.00	5.00	10.00	23.00	46.00	79.00	115.00	150.00	183.00	205.00
125A 5"	100.0	60	8.00	16.60	26.80	37.50	52.00	88.00	135.00	186.50	226.00	245.00
	125.0	60	8.50	18.00	18.00	39.00	65.00	132.00	214.00	256.50	285.00	302.00
150A 6"	100.0	60	4.00	8.00	16.00	26.00	40.00	63.00	108.00	154.00	186.00	220.00
	125.0	60	6.00	12.00	21.00	32.00	55.00	110.00	185.00	266.00	330.00	350.00
	150.0	60	9.00	17.00	31.00	48.00	85.00	171.00	272.00	345.00	380.00	405.00

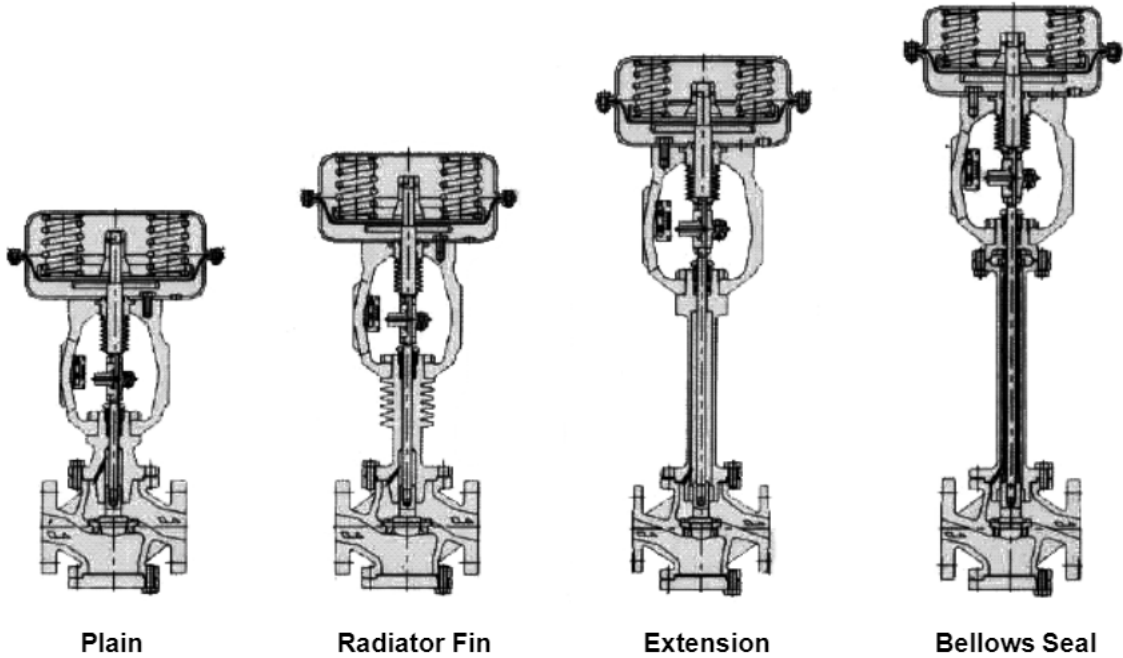
**Allowable Shut-off Pressure  
Metal Seat.Contoured Plug**

Act. size	Off-balance	15	20	25	32	40	50	65	80	100	125	150
		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"
250	0.2 kg/cm2	20.1	12.6	7.5	5.2							
	0.4 kg/cm2	40.2	25.2	15.0	10.4							
	0.8 kg/cm2	50.0	50.0	30.0	20.8							
300	0.2 kg/cm2	26.1	16.8	9.5	7.5	6.7	4.5	2.3				
	0.4 kg/cm2	52.2	33.6	19	15	13.4	9.0	4.6				
	0.8 kg/cm2	52.2	52.2	38	30	26.8	19.0	9.2				
350	0.2 kg/cm2					9.0	6.5	4.2	2.2	1.2		
	0.4 kg/cm2					18.0	13.0	8.4	4.4	2.4		
	0.8 kg/cm2					36.0	26.0	16.8	8.8	4.8		
460	0.2 kg/cm2								3.4	1.9	0.8	0.6
	0.4 kg/cm2								6.8	3.8	1.6	1.3
	0.8 kg/cm2								13.6	7.5	3.2	2.5
	1.0 kg/cm2								27	15	6.4	5.0

**Allowable Shut-off Pressure  
Metal Seat.Quick Opening**

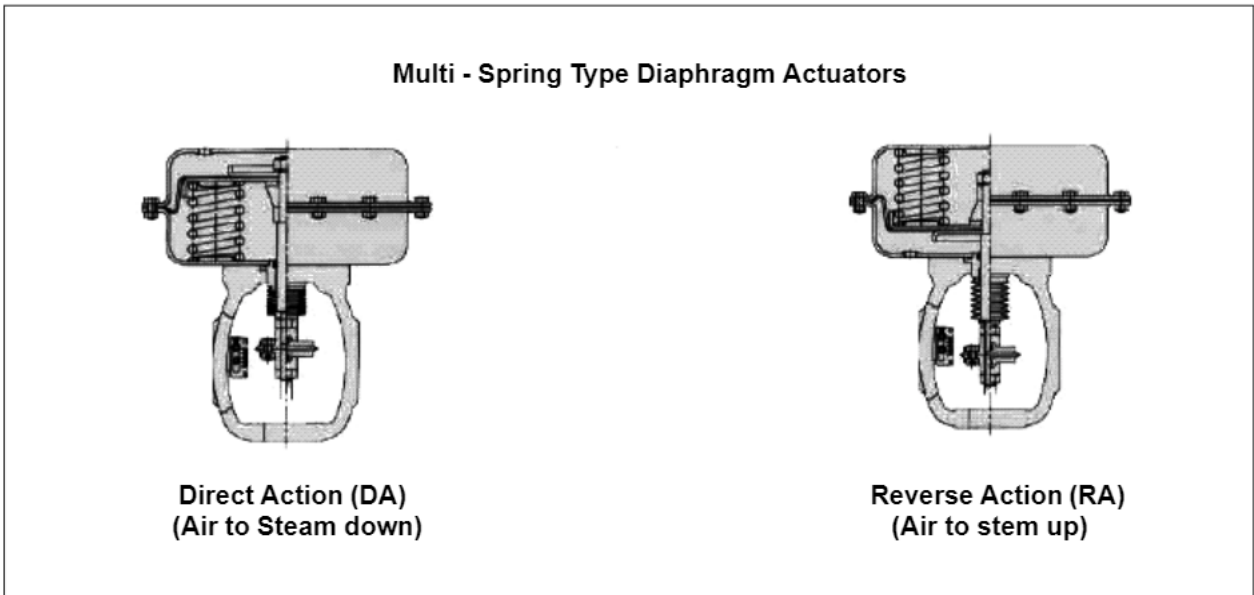
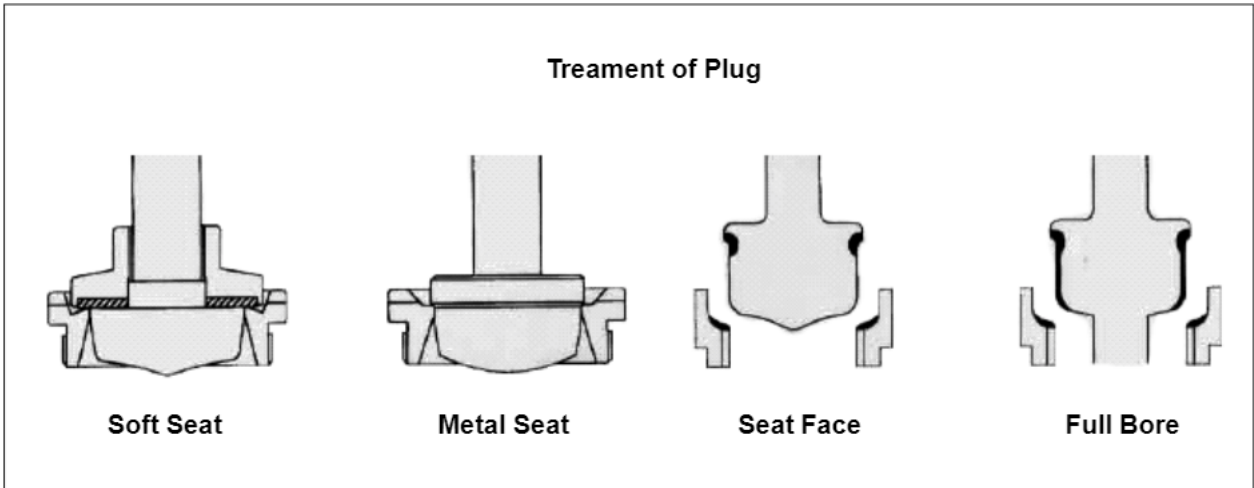
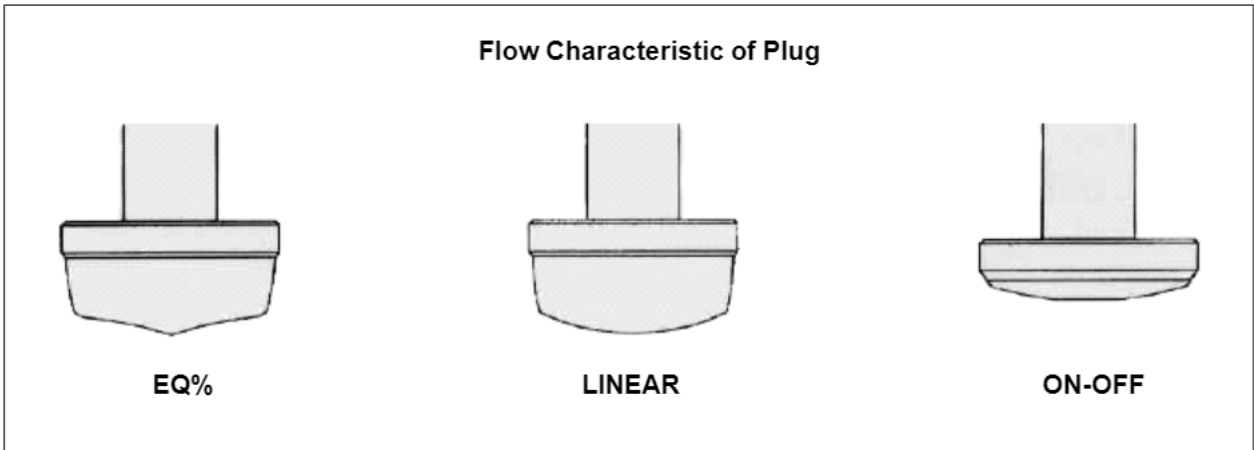
Act. size	Off-balance	15	20	25	32	40	50	65	80	100	125	150
		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"
250	0.2 kg/cm2	22.0	24.8	8.5	6.1							
	0.4 kg/cm2	43.0	27.0	16.0	11.5							
	0.8 kg/cm2	50.0	50.0	31.0	21.8							
300	0.2 kg/cm2			10.5	8.6	7.5	4.8	2.9				
	0.4 kg/cm2			20	16	14.2	9.3	5.2				
	0.8 kg/cm2			39	31	27.8	19.4	9.8				
350	0.2 kg/cm2					10.0	6.9	4.6	2.5	1.4		
	0.4 kg/cm2					19.0	13.5	9.0	4.7	2.6		
	0.8 kg/cm2					37.0	26.8	17.4	9.1	5.0		
460	0.2 kg/cm2								3.7	2.1	1.0	0.8
	0.4 kg/cm2								7.1	4.0	1.8	1.5
	0.8 kg/cm2								13.9	7.7	3.4	2.7
	1.0 kg/cm2								27.3	15.3	6.6	5.2

**Main Dimensions**



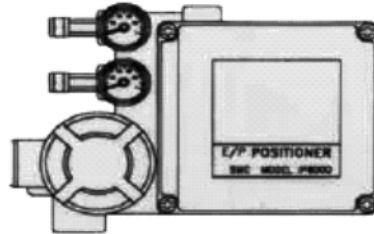
Valve Size		D	L	H1	Plain		Radiator Fin		Extension		Bellows Seal	
mm	inch				H2	H	H2	H	H2	H	H2	H
15	1/2	250	130	83	414	497	489	572	585	668	648	731
20	3/4	250	150	83	414	497	489	572	585	668	648	731
25	1	250	160	83	414	497	489	572	585	668	648	731
32	1-1/4	250	180	93	426	519	557	656	635	734	690	789
40	1-1/2	300	200	99	469	568	557	656	635	734	690	789
50	2	300	230	106	477	583	564	670	642	748	697	803
65	2-1/2	300	290	119	492	611	580	699	671	790	723	842
80	3	350	310	132	556	688	651	783	743	875	761	893
100	4	350	350	150	575	725	670	820	762	912	780	930
125	5	460	400	179	769	948	908	1087	943	1122	1213	1392
150	6	460	480	211	801	1012	940	1151	975	1186	1213	1424
200	8	460	560	222	890	1112	1028	1250	1073	1295	1299	1521





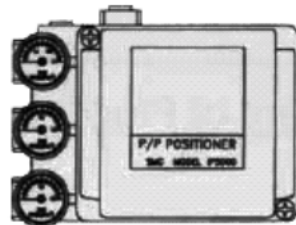
**Accessory for Control Valve**

**E/P Positioner  
SMC IP6000**



Input signal : 4-20 mA  
 Supply : 1.4 ~ 7.0 kg/cm<sup>2</sup>  
 Stroke : 10 ~ 85 mm  
 Ambient Temperature : -20 °C ~ 70°C  
 Explosion-proof : d2G4  
 Connection : Rc (PT) 1/4" female

**E/P Positioner  
SMC IP5000**



Input signal : 0.2 ~ 1.0 kg/cm<sup>2</sup>  
 Supply : 1.4 ~ 7.0 kg/cm<sup>2</sup>  
 Stroke : 10 ~ 85 mm  
 Connection : Rc (PT) 1/4" female



**Filter Regulator**  
 Supply : Max. 9.9 kg/cm<sup>2</sup>  
 Filtration : 5  $\mu$ m  
 Port size : 1/4"



**Booster Relay**  
 Supply : 9.9 kg/cm<sup>2</sup>  
 Signal pressure : Max. 7 kg/cm<sup>2</sup>  
 Output pressure : Max. 7 kg/cm<sup>2</sup>  
 Pressure ratio : 1:1  
 Port size : 1/4"



**Lock-up Valve  
(single acting)**  
 Proof pressure : Max. 9.9 kg/cm<sup>2</sup>  
 Signal pressure : Max. 9.9 kg/cm<sup>2</sup>  
 Line pressure : Max. 7 kg/cm<sup>2</sup>  
 Connection : 1/4"



**Lock-up Valve  
(Double acting)**  
 Proof pressure : Max. 9.9 kg/cm<sup>2</sup>  
 Signal pressure : Max. 9.9 kg/cm<sup>2</sup>  
 Line pressure : Max. 7 kg/cm<sup>2</sup>  
 Connection : 1/4"

Cv = WATER CAPACITY IN GPM WITH A PRESSURE DROP OF 1 P.S.I

The formulas for sizing control valves are based on fluid controls Standard FCI 162-1. The Cv number of a valve is its flow coefficient and used to determine the maximum valve capacity for any condition using the formulas below.

- Cv = Valve Coefficient
- $\Delta P$  = Pressure Drop
- $P_1$  = Inlet pressure Absolute (PSIA)
- $P_2$  = Outlet pressure Absolute
- W = 1bs. per hour satuated steam

- Q = Flow in Gallons per Minute
- $Q_1$  = Flow Cubic Feet per Hour
- G = Specific Gravity (Water = 1)
- $G_1$  = Specific Gracity (Air = 1 @ 14.7 PSIA @ 60 °F)
- T = Absolute Temperature of Flowing Medium (F 460)

**STEAM) - When  $\Delta P < P_1/2$**

$$W = 2.1 \times Cv \sqrt{\Delta P} \sqrt{P_1 + P_2}$$

$$Cv = \frac{W}{2.1 \sqrt{\Delta P (P_1 + P_2)}}$$

**AIR) - When  $\Delta P < P_1/2$**

$$Q_1 = 963 \times Cv \sqrt{\frac{\Delta P (P_1 + P_2)}{G_1 \times T}}$$

$$Cv = \frac{Q_1}{963 \sqrt{\frac{G_1 \times T}{\Delta P (P_1 + P_2)}}}$$

**WATER)**

$$Q = Cv \sqrt{\frac{\Delta P}{G}}$$

**When  $\Delta P > P_1/2$**

$$W = 1.82 \times Cv \times P_1$$

$$Cv = \frac{W}{1.82 \times P_1}$$

**When  $\Delta P > P_1/2$**

$$Cv = 832 \times Cv \times \frac{P_1}{\sqrt{G_1 \times T}}$$

$$Cv = \frac{Q_1 \sqrt{G_1 \times T}}{832 \times P_1}$$

$$Cv = Q \sqrt{\frac{G}{\Delta P}}$$

- W = Max flow capacity of steam
- $P_1$  = Inlet pressure (kgf/cm<sup>2</sup> abs)
- $\Delta P$  =  $P_1 - P_2$  (kgf/cm<sup>2</sup> abs)

- Q = Max flow capacity of gas (NM3/hr)
- $P_2$  = Outlet pressure (kgf/cm<sup>2</sup>)
- K =  $1 + 0.0013 \times [(\text{Super heated steam}) \text{ temp. } (^\circ\text{C}) - \text{Satuated steam temp. } (^\circ\text{C})]$

G = Specific gravity (water = 1), (air = 1)

**STEAM) - When  $P_2 > P_1/2$**

$$Cv = \frac{WK}{13.5 \sqrt{\Delta P (P_1 + P_2)}}$$

**AIR) - When  $P_2 > P_1/2$**

$$Cv = \frac{Q}{287 \sqrt{\frac{(273 + 0G)}{\Delta P (P_1 + P_2)}}}$$

**WATER)**

$$Cv = \frac{1.167V \sqrt{G}}{\sqrt{\Delta P}}$$

**When  $P_2 \leq P_1/2$**

$$Cv = \frac{WK}{11.7 \times P_1}$$

**When  $P_2 \leq P_1/2$**

$$Cv = \frac{Q \sqrt{(273 + 0G)}}{249P_1}$$

Steam press. (abs.)		Steam temperature		Volume of water 1 kg before avaporation (l)	Volume of steam 1 kg (m <sup>3</sup> )	weight of steam 1 m <sup>2</sup> (kg)	Calory of steam 1 kg (kcal)			Steam press. (abs.)		Steam temperature		Volume of water 1 kg before avaporation (l)	Volume of steam 1 kg (m <sup>3</sup> )	weight of steam 1 m <sup>2</sup> (kg)	Calory of steam 1 kg (kcal)		
(kgf/cm <sup>2</sup> )	(lb/in <sup>2</sup> )	(C)	(F)				calory of water h	latent heat L	Total H = h + L	(kgf/cm <sup>2</sup> )	(lb/in <sup>2</sup> )	(C)	(F)				calory of water h	latent heat L	Total H = h + L
0.02	0.28	17.2	62.9	1.0012	68.26	0.0147	17.2	587.8	605.0	13.50	192.0	192.4	378.3	1.1451	0.1485	6.734	195.5	469.9	665.4
0.04	0.57	28.6	83.5	1.0039	35.45	0.0282	28.7	581.3	610.0	14.00	199.1	194.1	381.4	1.1476	0.1434	6.974	197.3	468.4	665.7
0.06	0.85	35.8	96.4	1.0063	24.18	0.0414	35.8	577.3	613.1	14.50	206.2	195.8	384.4	1.1500	0.1386	7.214	199.0	466.9	665.9
0.08	1.14	41.2	106.2	1.0083	18.44	0.0542	41.2	574.2	615.4	15	213.3	197.4	387.3	1.1524	0.1342	7.454	200.7	465.5	666.2
0.10	1.42	45.5	113.9	1.0101	14.95	0.0669	45.4	571.8	617.2	16	227.5	200.4	392.7	1.1572	0.1260	7.934	204.1	462.6	666.7
0.15	2.13	53.6	128.5	1.0138	10.21	0.0980	53.5	567.1	620.6	17	241.7	203.4	398.1	1.1618	0.1189	8.414	207.2	459.9	667.1
0.20	2.84	59.7	139.5	1.0170	7.791	0.1284	59.6	563.5	623.1	18	256.0	206.2	403.2	1.1663	0.1124	8.894	210.2	457.2	667.4
0.25	3.56	64.6	148.3	1.0197	6.319	0.1583	64.5	560.7	625.2	19	270.2	208.8	407.8	1.1706	0.1067	9.375	213.1	454.6	667.7
0.30	4.27	68.7	155.7	1.0221	5.325	0.1878	68.7	558.2	626.9	20	284.4	211.4	412.5	1.1749	0.1015	9.857	215.9	452.1	668.0
0.35	4.98	72.3	162.1	1.0242	4.609	0.2170	72.2	556.1	628.3	21	298.6	213.9	417.0	1.1791	0.0967	10.34	218.6	459.6	668.2
0.40	5.69	75.4	167.7	1.0262	4.067	0.2459	75.4	554.2	629.6	22	312.8	216.2	421.2	1.1833	0.0924	10.82	221.2	447.2	668.4
0.45	6.40	78.3	172.9	1.0281	3.642	0.2746	78.3	552.5	630.8	23	327.1	218.5	425.3	1.1873	0.0885	11.31	223.8	444.8	668.6
0.50	7.11	80.9	177.6	1.0298	3.300	0.3030	80.9	550.9	631.8	24	341.3	220.8	429.4	1.1913	0.0848	11.79	226.2	442.6	668.8
0.60	8.53	85.5	185.9	1.0329	2.782	0.3594	85.5	548.1	633.6	25	355.5	222.9	433.2	1.1953	0.0815	12.28	228.6	440.3	668.9
0.70	9.95	89.5	193.1	1.0357	2.408	0.4152	89.5	545.7	635.2	26	369.7	225.0	437.0	1.1991	0.0784	12.76	230.9	438.1	669.0
0.80	11.4	93.0	199.4	1.0383	2.125	0.4705	93.0	543.5	636.5	27	383.9	227.0	440.6	1.203	0.0755	13.25	233.2	435.9	669.1
0.90	12.8	96.2	205.2	1.0407	1.904	0.5253	96.2	541.5	637.7	28	398.2	229.0	444.2	1.207	0.0728	13.74	235.4	433.8	669.2
1.00	14.2	99.1	210.4	1.0430	1.725	0.5797	99.2	539.6	638.8	29	412.4	230.9	447.6	1.210	0.0703	14.23	237.5	431.7	669.2
1.20	17.1	104.3	219.7	1.0471	1.454	0.6875	104.4	536.3	640.7	30	426.6	232.8	451.0	1.214	0.0679	14.72	239.6	429.7	669.3
1.40	19.9	108.7	227.7	1.0508	1.259	0.7942	108.9	533.5	642.4	32	455.0	236.4	457.5	1.221	0.0637	15.70	243.7	425.6	669.3
1.60	22.8	112.7	234.9	1.0542	1.111	0.8999	112.9	530.8	643.7	34	483.5	239.8	463.6	1.229	0.0599	16.69	247.6	421.7	669.3
1.80	25.6	116.3	241.3	1.0573	0.9952	1.005	116.6	528.4	645.0	36	511.9	243.0	469.4	1.236	0.0565	17.69	251.3	417.9	669.2
2.00	28.4	119.6	247.3	1.0603	0.9018	1.109	119.9	526.3	646.2	38	540.4	246.2	475.2	1.243	0.0535	18.69	254.9	414.2	669.1
2.50	35.6	126.8	260.2	1.0669	0.7317	1.367	127.2	521.4	648.6	40	568.8	249.2	480.6	1.249	0.0508	19.70	258.4	410.5	668.9
3.00	42.7	132.9	271.2	1.0728	0.6168	1.521	133.4	517.2	650.6	42	597.2	252.1	485.8	1.256	0.0483	20.72	261.7	407.0	668.7
3.50	49.8	138.2	280.8	1.0782	0.5337	1.874	138.8	513.4	652.2	44	625.7	254.9	490.8	1.263	0.0460	21.74	265.0	403.5	668.5
4.00	56.9	142.9	289.2	1.0831	0.4708	2.124	143.7	510.0	653.7	46	654.1	257.6	495.7	1.269	0.0439	22.77	268.2	400.0	668.2
4.50	64.0	147.2	297.0	1.0877	0.4214	2.373	148.1	506.8	654.9	48	682.6	260.2	500.4	1.276	0.0420	23.80	271.3	396.6	667.9
5.00	71.1	151.1	304.0	1.0920	0.3816	2.620	152.1	503.9	656.0	50	711.0	262.7	504.9	1.283	0.0402	24.85	274.3	393.3	667.6
5.50	78.2	154.7	310.5	1.0961	0.3489	2.867	155.8	501.2	657.0	55	782.1	268.7	515.7	1.299	0.0364	27.49	281.5	385.1	666.6
6.00	85.3	158.1	316.6	1.1000	0.3213	3.112	159.3	498.6	657.9	60	853.2	274.3	525.7	1.315	0.0331	30.18	288.3	377.2	665.5
6.50	92.4	161.2	322.2	1.1037	0.2980	3.356	162.6	496.1	658.7	65	924.3	279.5	535.1	1.331	0.0304	32.93	294.8	369.4	664.2
7.00	99.5	164.2	327.6	1.1072	0.2778	3.600	165.7	493.8	659.5	70	995.4	284.5	544.1	1.347	0.0280	35.75	301.0	361.8	662.8
7.50	106.7	167.0	332.6	1.1111	0.2602	3.843	168.6	491.6	660.2	75	1066.5	289.2	552.6	1.363	0.0259	38.62	307.0	354.3	661.3
8.00	113.8	169.6	337.3	1.1140	0.2448	4.086	171.3	489.5	660.8	80	1137.6	293.6	560.5	1.379	0.0241	41.56	312.8	346.9	659.7
8.50	120.9	172.1	341.8	1.1172	0.2311	4.328	174.0	487.4	661.4	85	1208.7	297.9	568.2	1.395	0.0224	44.58	318.4	339.6	658.0
9.00	128.0	174.5	346.1	1.1203	0.2188	4.570	176.5	485.4	661.9	90	1279.8	301.9	575.4	1.412	0.0210	47.67	323.8	332.4	656.2
9.50	135.1	176.8	350.2	1.1233	0.2079	4.811	178.9	483.5	662.4	95	1350.9	305.8	582.4	1.429	0.0197	50.85	329.1	325.2	654.3
10.00	142.2	179.0	354.2	1.1262	0.1979	5.052	181.3	481.6	662.9	100	1422.0	309.5	589.1	1.446	0.0185	54.12	334.3	318.0	652.3
10.50	149.3	181.2	358.2	1.1291	0.1890	5.293	183.5	479.8	663.3	120	1706.4	323.1	613.6	1.518	0.0147	68.22	354.0	289.4	643.4
11.00	156.4	183.2	361.8	1.1319	0.1807	5.533	185.6	478.1	663.7	140	1990.8	335.1	635.2	1.599	0.0118	84.52	372.8	260.0	632.8
11.50	163.5	185.2	365.4	1.1346	0.1732	5.774	187.7	476.4	664.1	160	2275.2	345.8	654.4	1.693	0.0096	104.0	391.3	228.4	619.7
12.00	170.6	187.1	368.8	1.1373	0.1663	6.014	189.8	474.7	664.5	180	2559.6	355.4	671.7	1.814	0.0078	128.3	410.8	192.9	603.7
12.50	177.8	188.9	372.0	1.1400	0.1599	6.254	191.7	473.1	664.8	200	2844.0	364.1	687.4	1.990	0.0062	161.6	431.6	151.2	582.8
13.00	184.9	190.7	375.3	1.1425	0.1540	6.494	193.6	471.5	665.1	225.56	3208.7	374.15	705.47	3.170	0.0032	315.5	503.3	0	503.3

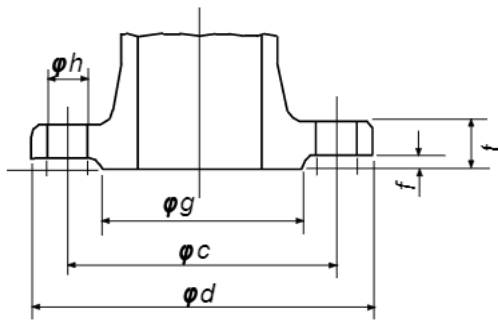
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 ISSUED DATE:

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**SPECIFICATION SHEET FOR CONTROL VALVES**

1	ITEM NO.				
2	TAG NO				
3	QUANTITY				
4	SERVICE LOCATION				
5	PIPING SIZE / SCHEDULE	/	/	/	/
6	END CONNECTION & RATING				
7	Max.Allowed Sound Lever(dBA)				
8	BODY TYPE				
9	BODY SIZE / PORT SIZE	/	/	/	/
10	MATERIAL	BODY			
11		TRIM			
12		SEAT			
13	FLOW CHARACTERISTIC				
14	GLAND PACKING				
15	SEAT LEAKAGE CLASS				
16	ENVIRON SEAL (VOC)				
17	GASKET				
18	BONNET TYPE (1)				
19	ACTUATOR	TYPE OF ACTUATOR (2)			
20		CLOSE AT / OPEN AT	/	/	/
21		FAILURE POSITION (3)			
22		HANDWHEEL & LOCATION			
23	POSITIONER	POSITIONER (4)			
24		INPUT SIGNAL / OUTPUT PRES.	/	/	/
25		AIR SET & GAUGES			
26		AIR SUPPLY			
27	ACCESSORY	LIMIT SWITCH OPEN / CLOSE			
28		SOLENOID VALVE			
29		BOOSTER			
30		ENCLOSURE			
31	FLOW UNIT	GAS: NM <sup>3</sup> /H		LIQUID: M <sup>3</sup> /H	STEAM: Kg/H
32	FLUID				
33	FLOW RATE MAX./NOR.	/	/	/	/
34	TEMP °C MAX./NOR.	/	/	/	/
35	INLET PRESS. MAX./NOR.	/	/	/	/
36	OUTLET PRESS. MAX./NOR.	/	/	/	/
37	Shut-Off ΔP.MAX. /For Sizing	/	/	/	/
38	DENSITY Kg/m <sup>3</sup> (5)				
39	S.G. / M.W. (6)	/	/	/	/
40	VAPOR PRESSURE				
41	VISCOSITY cp				
42	CALCULATED MAX./NOR.	/	/	/	/
43	VALVE VELOCITY				
44	VALVE OPENING MAX./NOR.	/	/	/	/
45	TOTAL NOISE (dBA)	/	/	/	/
46	SELECTED				

**REMARK:**  
 (1) **STD:** standard. **CF:** cooling fin. **EX:** extension. **BE:** bellows seal.  
 (2) **DP:** diaphragm. **EM:** electrical motor. **PC:** pneumatic cylinder  
 (3) **FC:** failure close **FO:** failure open  
 (4) **P/P:** pneumatic / pneumatic positioner **E/P:** electric / pneumatic positioner  
 (5) **DENSITY: GAS:** Kg/NM<sup>3</sup> **LIQUID / STEAM:** Kg/M<sup>3</sup>



Flange Table

**JIS 10K/20K  
ANSI 150/300  
DIN PN 16/25**

d	JIS 10K		JIS B 2210-1984							JIS 20K		JIS B 2210-1984		d					
	D	t		f	g	c	n	h	ø	D	t		f		g	c	n	h	ø
		PC	OTHER								PC	OTHER							
15	95	16	12	1	51	70	4	15	M12	95	16	14	1	51	70	4	15	M12	15
20	100	18	14	1	56	75	4	15	M12	100	18	16	1	56	75	4	15	M12	20
25	125	18	14	1	67	90	4	19	M16	125	20	16	1	67	90	4	19	M16	25
32	135	20	16	2	76	100	4	19	M16	135	20	18	2	76	100	4	19	M16	32
40	140	20	16	2	81	105	4	19	M16	140	22	18	2	81	105	4	19	M16	40
50	155	20	16	2	96	120	4	19	M16	155	22	18	2	96	120	8	19	M16	50
65	175	22	18	2	116	140	4	19	M16	175	24	20	2	116	140	8	19	M16	65
80	185	22	18	2	126	150	8	19	M16	200	26	22	2	132	160	8	23	M20	80
100	210	24	18	2	151	175	8	19	M16	225	28	24	2	160	185	8	23	M20	100
125	250	24	20	2	182	210	8	23	M20	270	30	26	2	195	225	8	25	M22	125
150	280	26	22	2	212	240	8	23	M20	305	32	28	2	230	260	12	25	M22	150
200	330	26	22	2	262	290	12	23	M20	350	34	30	2	275	305	12	25	M22	200
250	400	30	24	2	324	355	12	25	M22	430	38	34	2	345	380	12	27	M24	250
300	445	32	24	3	368	400	16	25	M22	480	40	36	3	395	430	16	27	M24	300

d	ANSI CLASS 150 ANSI B 16.35-1977							ANSI CLASS 300 ANSI B 16.35-1977						
	D	t	g	c	n	h	ø	D	t	g	c	n	h	ø
15	89	12	35	60.3	4	16	M14	95	15	35	66.7	4	16	M14
20	98	13	43	69.9	4	16	M14	117	16	43	82.5	4	20	M16
25	108	15	51	79.4	4	16	M14	124	18	51	88.9	4	20	M16
32	117	16	64	88.9	4	16	M14	133	20	64	98.4	4	20	M16
40	127	18	73	98.4	4	16	M14	156	21	73	114.3	4	23	M20
50	152	20	92	120.6	4	20	M16	165	23	92	127	8	20	M16
65	178	23	105	139.7	4	20	M16	191	26	105	149.2	8	23	M20
80	191	24	127	152.4	4	20	M16	210	29	127	168.3	8	23	M20
100	229	24	157	190.5	8	20	M16	254	32	157	200	8	23	M20
125	254	24	186	215.9	8	23	M20	279	35	186	234.9	8	23	M20
150	279	26	216	241.3	8	23	M20	318	37	216	269.9	12	23	M20
200	343	29	270	298.4	8	23	M20	381	42	270	330.2	12	26	M22
250	406	31	324	361.9	12	26	M22	445	48	324	387.3	16	30	M27
300	483	32	381	431.8	12	26	M22	520	51	381	450.8	16	33	M30

d	DIN PN 16							DIN PN 25						
	D	t	g	c	n	h	ø	D	t	g	c	n	h	ø
15	95	14	45	65	4	14	M12	95	14	45	65	4	14	M12
20	105	16	58	75	4	14	M12	105	16	58	75	4	14	M12
25	115	16	68	85	4	14	M12	115	16	68	85	4	14	M12
32	140	16	78	100	4	18	M16	140	16	78	100	4	18	M16
40	150	16	88	110	4	18	M16	150	16	88	110	4	18	M16
50	165	18	102	125	4	18	M16	165	18	102	125	4	18	M16
65	185	18	122	145	4	18	M16	185	18	122	145	4	18	M16
80	200	20	138	160	4/8	18	M16	200	20	138	160	4/8	18	M16
100	220	20	158	180	8	18	M16	220	20	158	180	8	18	M16
125	250	22	188	210	8	18	M16	250	22	188	210	8	18	M16
150	285	22	212	240	8	23	M20	285	22	212	240	8	23	M20