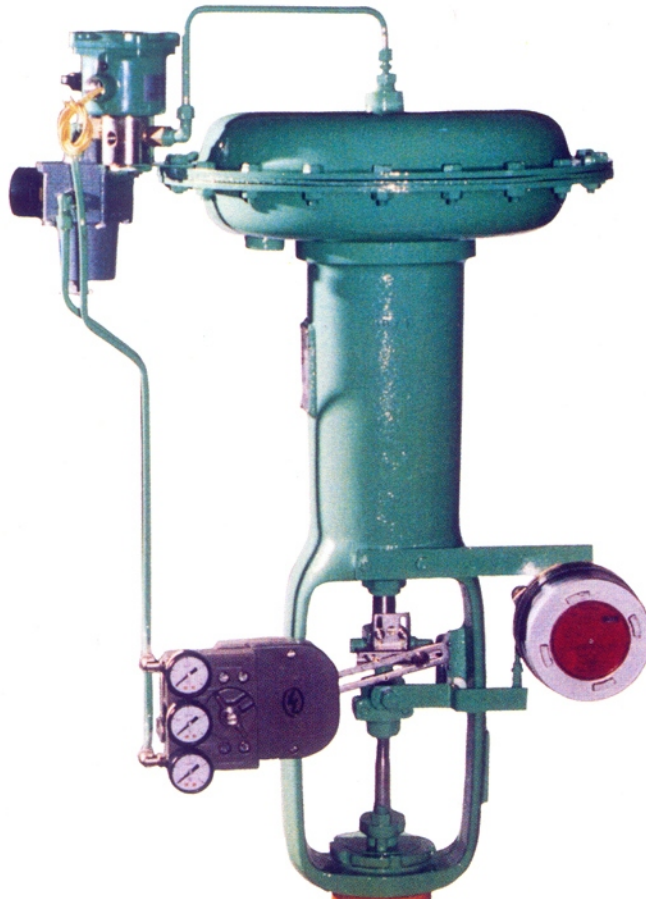




**INSTRUMENTATION LTD.,  
PALAKKAD**



Designed to precisely control the fluids, angle valve has distinct advantages in piping lay-outs and is devoid of dead pockets. The array of Internals with different designs and materials of construction results in variety of choice compatible with process fluids being handled. Internals for high pressure drop, noise reduction and slurry medium are available for selection to ensure trouble-free operation even in severe operating conditions.

**A N G L E V A L V E S**  
**VAA·VAC·VAN**  
**VSA·VAZ·VAH·VAV**





## I. FEATURES

- Fine control characterised valve with rugged construction.
- Avoids Slamming effect in reversed flow direction due to Cage guiding.
- Flexibility in changing the capacity & Char. by means of cage interchangeability.
- Balanced plug design for cage guided angle valves.
- Hardened alloy trim to prevent abrasion due to fluid pressure.
- Smooth flow in VAV suits control of slurries and viscous or flashing medium.
- Heavy guided post and sufficient sliding area prevents abrasion and vibration due to side thrust.

<b>SPECIFICATIONS *</b>	TYPE OF VALVE ASSEMBLIES	<b>VAA</b> - Single Seated angle valve with Top guided plug. <b>VAC</b> - Double Seated Cage guided angle valve. <b>VAN</b> - Double Seated Cage guided Low Noise angle valve. <b>VSA</b> - Single Seated Cage guided Angle valve. <b>VAZ</b> - Single Seated Cage guided Low Noise Angle valve. <b>VAV</b> - Single Seated Venturi throat Angle valve. <b>VAH</b> - Single Seated Heavy guided Venturi throat Angle valve.	
	PRESSURE RATING	ANSI 150, 300, 600, 900, 1500, 2500. Check Cv charts for available varieties on individual models. Allowable pressure for Bellow Sealed valve is 26 Kg/Cm <sup>2</sup> at 300° C and 40 Kg/Cm <sup>2</sup> at ambient temperature.	
	NOMINAL SIZE (Inches)	1, 1 ½, 2, 2 ½, 3, 4, 5, 6, 8, 10 & 12. Check Cv charts for available sizes in individual models	
	END CONNECTION	Flanged End (RF, FF, RJ & TG) & Butt Welded. Flanged End and Stud Bolt (RF, RJ & Lens Ring) for VAH	
	SERVICE TEMP. RANGE	-150° C to 600° C (Max 200° C for soft seat) -30° C to 300° C For Bellow sealed valves. 280° C for VSA	
<b>STANDARD MATERIALS</b>	VALVE BODY	Carbon Steel ASTM A 216 WCB Stainless Steel ASTM A 351 CF8, CF8M Alloy Steel A 217 WC6, WC9 Hastalloy & Alloy 20 Other materials against specific request.	
	TRIM	Refer table 1.	
	PACKING	Teflon, Teflon Impregnated Asbestos, Graphited Asbestos, Graphoil etc. Other materials on request	
	GASKET	Stainless Steel, Monel etc. Other materials on request.	
	FLOW CHARACTERISTICS	Linear, Equal Percentage and On-Off Modified Linear for Low noise Trims.	
<b>PERFORMANCE</b>	RANGEABILITY	30:1 (Higher rangeabilities are available against specific request)	
	LEAKAGE AT FULL CLOSURE (% OF Cv) AS PER ANSI B16.104	<b>Soft Seat &amp; Stellite Seat</b> : 0.00001% or less (For VAA & VAC ANSI 150-600) <b>Metallic Seat</b> 0.5% or less (Class II) (For VAC & VAN Valves) (Class III can be offered as a special case) 0.01% or less (Class IV) for VSA, VAH, VSZ & VAV (Class V can be offered as a special case)	
	BONNET	Plain, Finned, Extension and Bellows Bellow sealed valves are available only with actuators up to VA5	
	ACTION	With Positioner	Without positioner
	HYSTERESIS	1% FS or less	3% FS or less
	LINEARITY	± 1% FS or less	± 5% FS or less
	MAX. ALLOWABLE PRESSURE DROP	Diaphragm Type, Pneumatic Single Piston or Double piston cylinder type actuators - Refer Tables 4 to 17. The values given are for normal leakage class specified above. Electrical Actuators available on request.	
Cv VALUE	Refer Tables 2 & 3		
<b>OPTIONS</b>	TUBING	Copper Tubing (With/Without PVC Coating) size 6 or 8 mm. O.D. SS Tubing for Copper prohibition. Air Connection : ¼" NPT standard ½" NPT as option	
	ACCESSORIES	Valves with Steam Jacketing with a maximum rating of ANSI 300 can be provided. Manual Actuators; Side or Top mounted Handwheel, Pneumatic & Electro-Pneumatic Positioner, I/P Converter, Solenoid valve, Air Filter Regulator, Air lock relay, Position Transmitter, Limit Switches, Volume Boosters etc.	

\* For exact Product range refer Cv Tables





**VALVE ASSEMBLY**

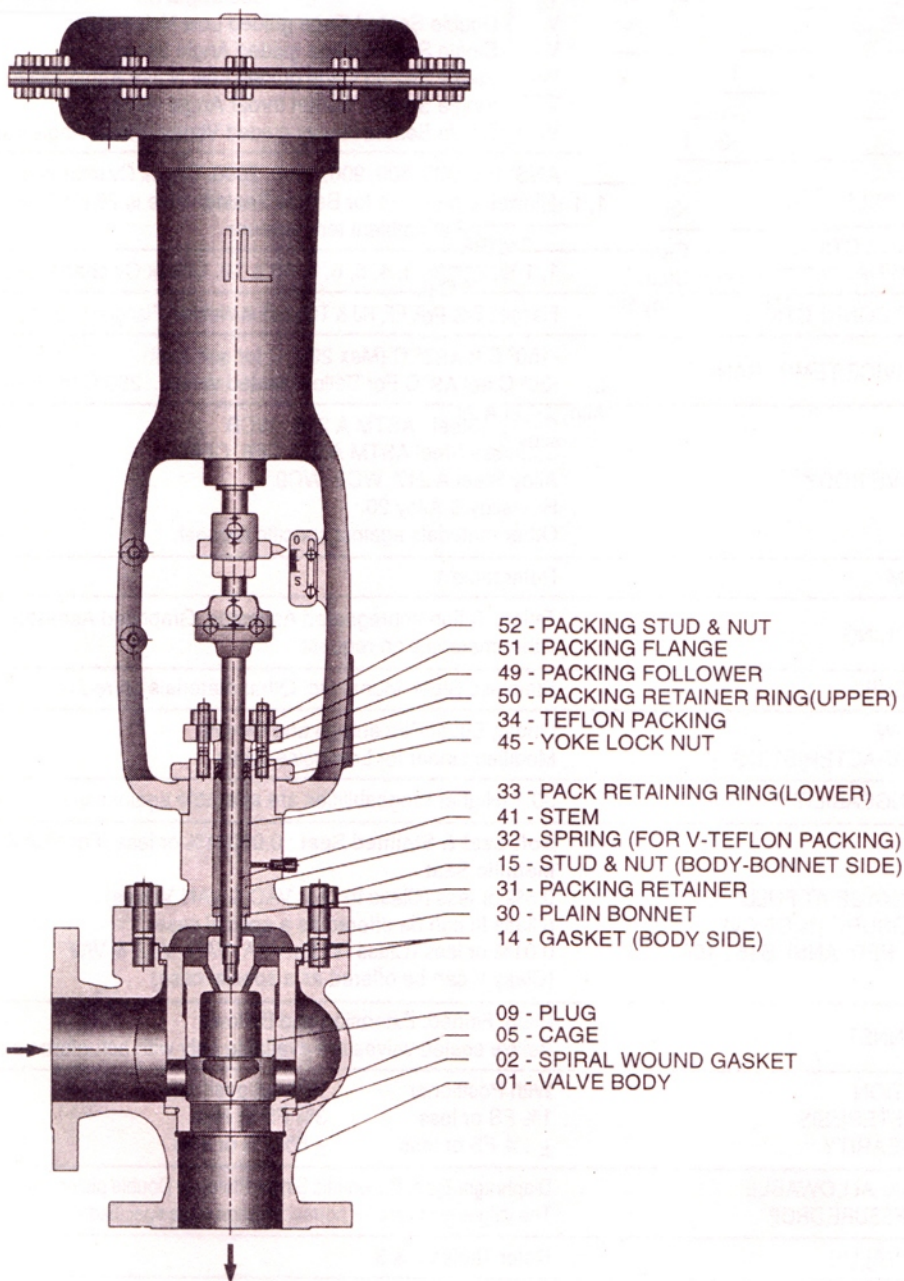


Fig. 1

General View of VAC Assembly

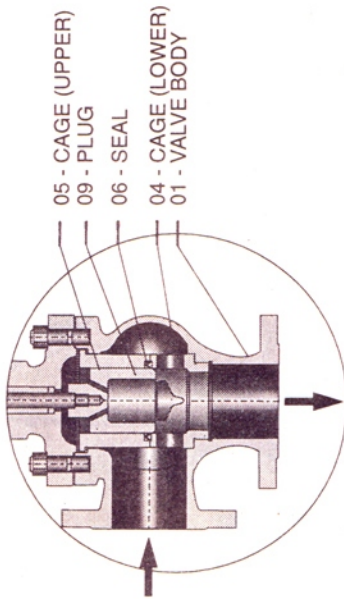


Fig. 2

Assembly with VSA Trim for ANSI 150 - 500

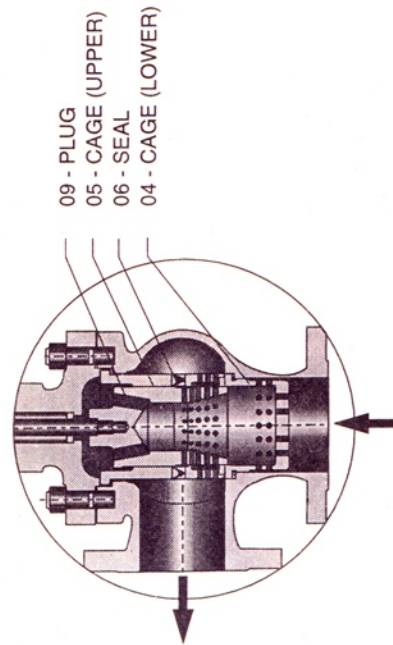


Fig. 4

Assembly with VAZ Trim for ANSI 900 - 2500

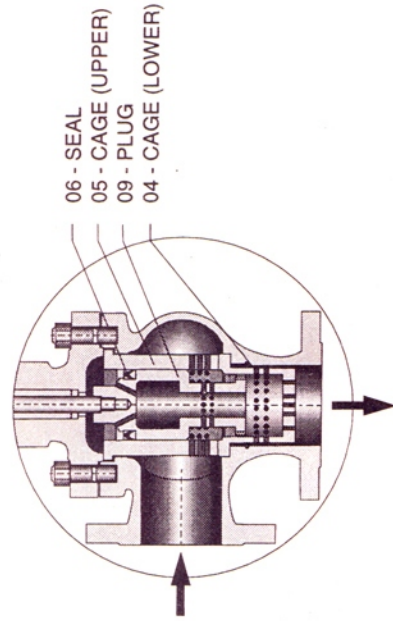


Fig. 3

Assembly with VAZ Trim for ANSI 150 - 600

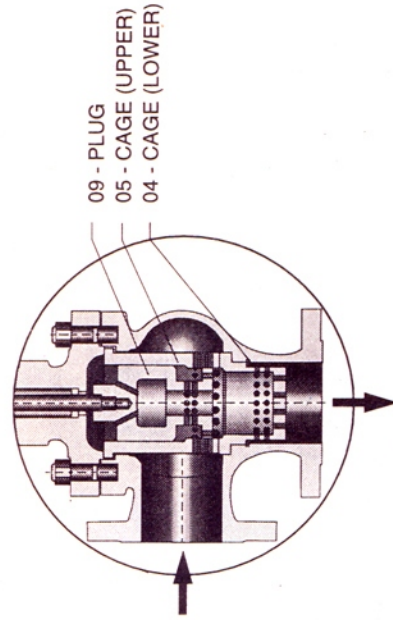


Fig. 5

Assembly with VAN Trim for ANSI 150 - 600



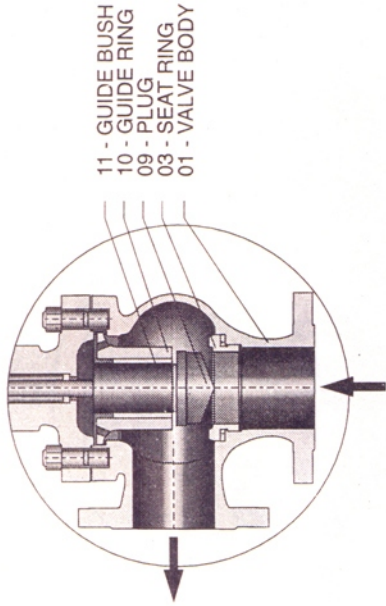


Fig. 7

Assembly with VAA Trim

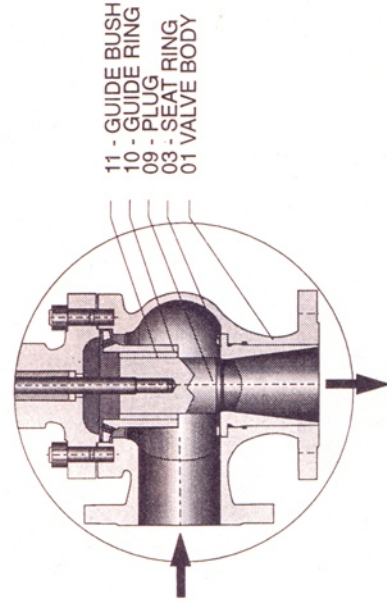


Fig. 9

Assembly with VAV Trim

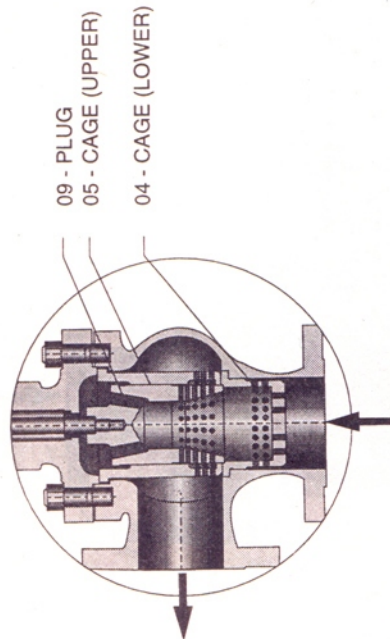


Fig. 6

Assembly with VAN Trim for ANSI 900 - 2500

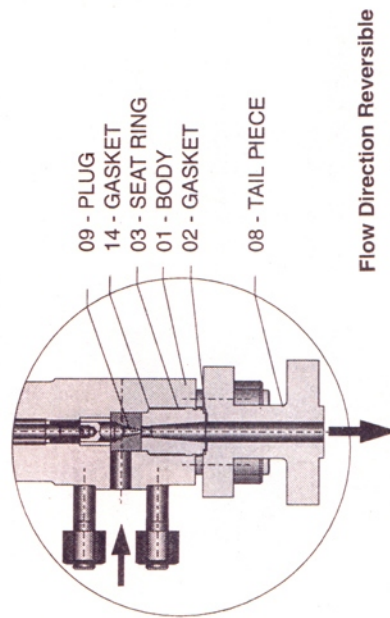
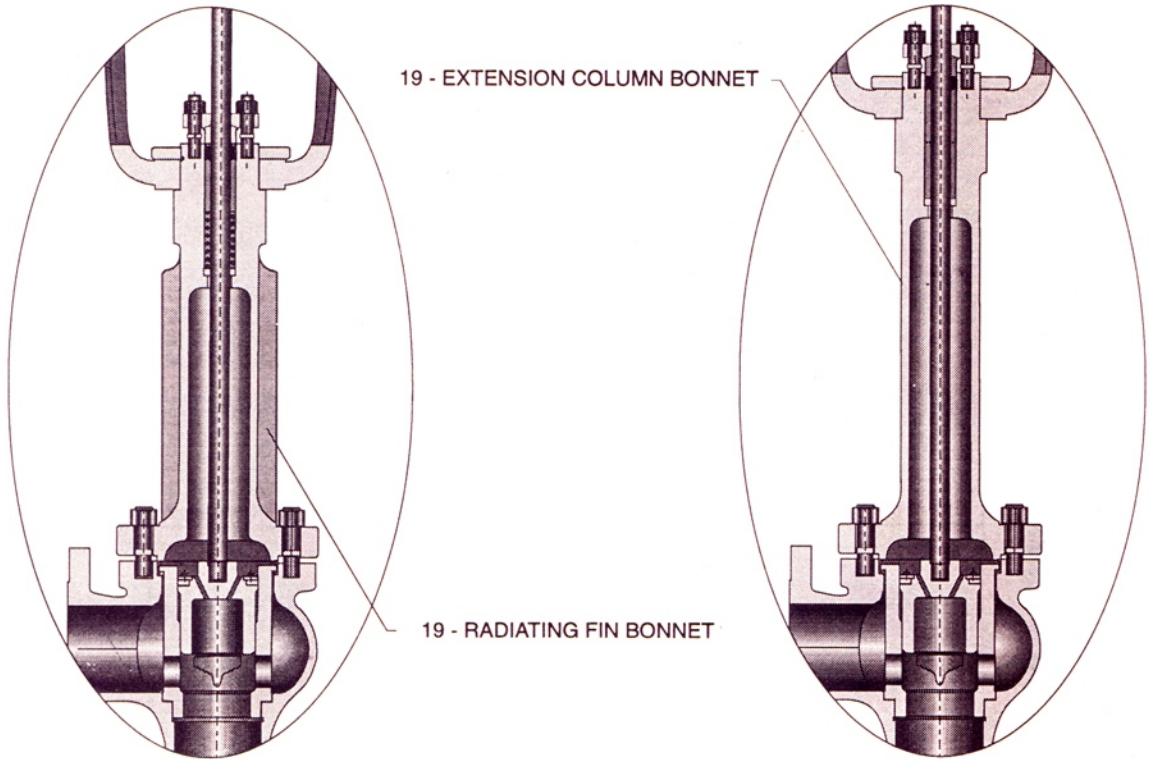


Fig. 8

VAH Valve Assembly

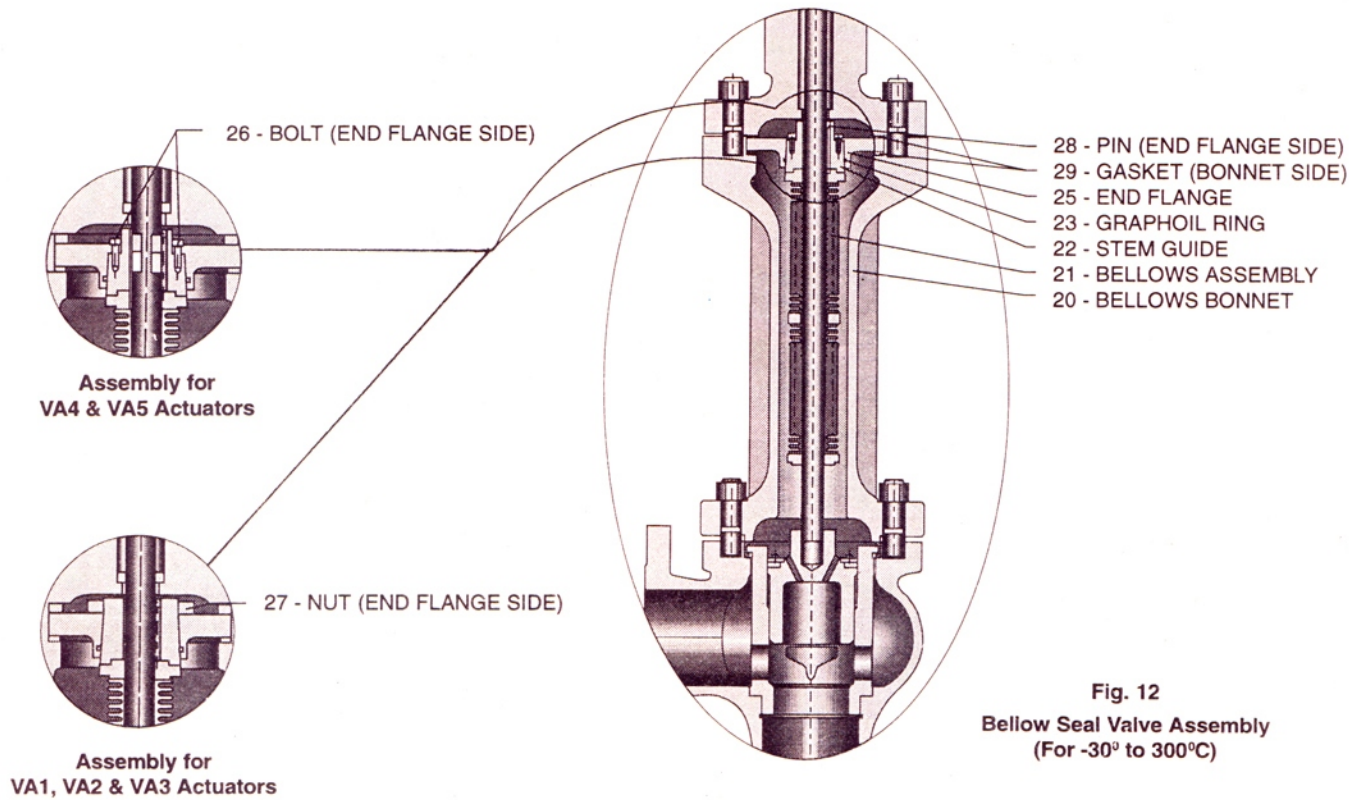
Flow Direction Reversible

\* Flow Direction is side to bottom for valves 2" and less.



**Fig. 10**  
Valve Assembly with Radiating  
Fin Bonnet (For -50° to 650°C)

**Fig. 11**  
Valve Assembly with Extension  
Column Bonnet (For 0° to -150°C)

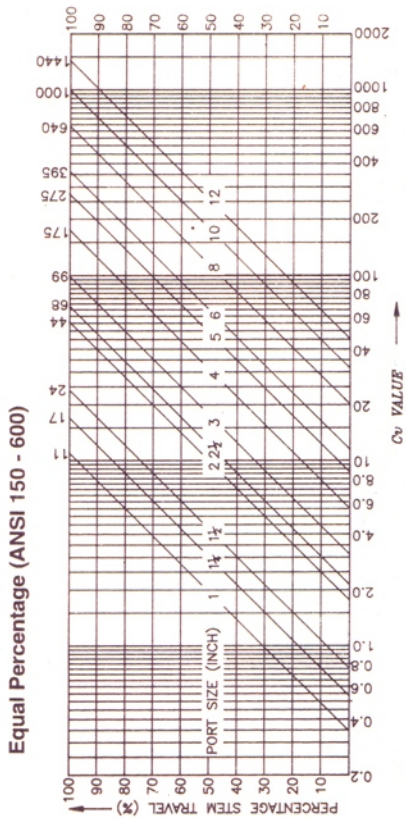


**Fig. 12**  
Bellow Seal Valve Assembly  
(For -30° to 300°C)



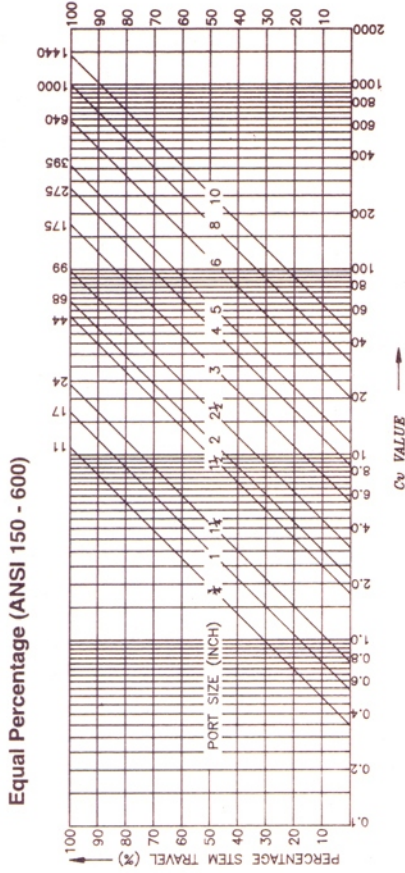
## II. FLOW CHARACTERISTICS

### II.1. Flow Characteristics for VAC & VSA Trim



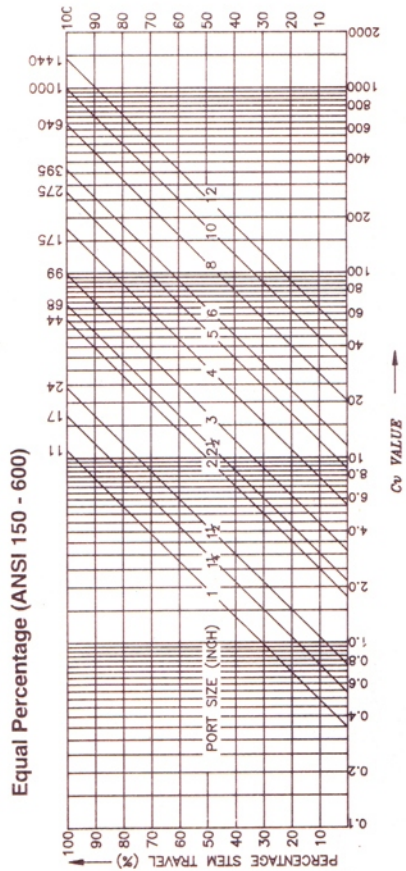
Graph 1

### II.3. Flow Characteristics for VAV Trim



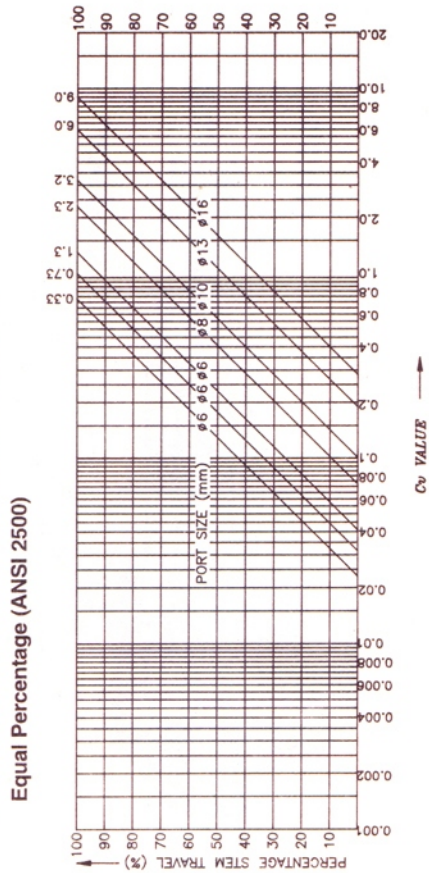
Graph 3

### II.2. Flow Characteristics for VAA Trim



Graph 2

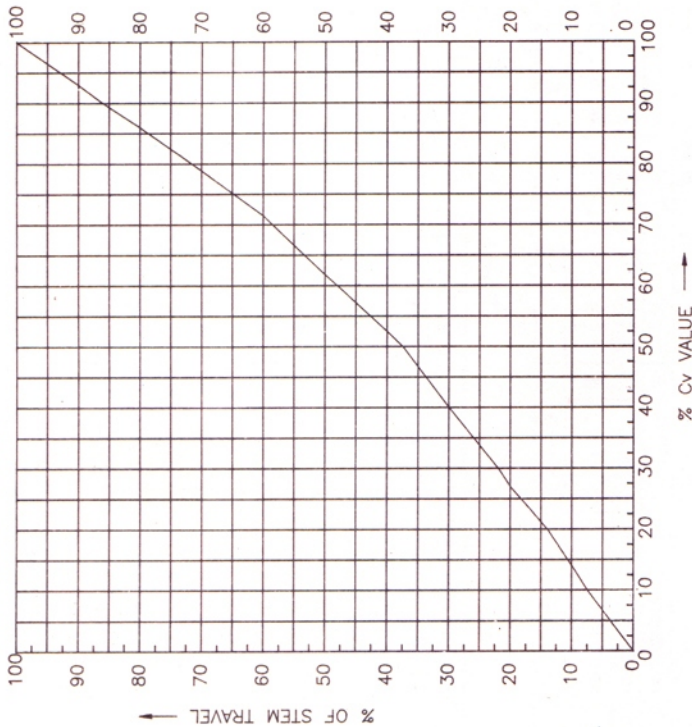
### II.4. Flow Characteristics for VAH Trim



Graph 4

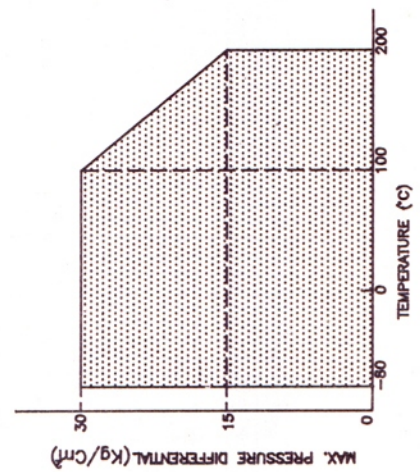


## II. 4. Flow Characteristics for VAN & VAZ Trim ANSI (150 - 2500)



Graph 4

## III. OPERATING TEMPERATURE & PRESSURE DIFFERENCE LIMIT FOR TEFLON SEAT VALVE



Graph 5

## IV. TRIM MATERIAL SELECTION

Table 1

TRIM COMBINATION NO.	TRIM DESIGNATION	PLUG	CAGE / SEAT RING	APPLICABLE TEMP. RANGE (°C)	VAA	VAV	VSA	VAZ	VAC	NVA	HVA
1	SS 304	SS 304	SS 304	-195 to 300	•	•	•	•	•	•	•
2	SS 304 St. Seat	SS 304 St. Seat	SS 304 St. Seat	-195 to 425	•	•	•	•	•	•	•
3	SS 304 St. Sheath	SS 304 St. Sheath	SS 304 St. Sheath	-195 to 600	•	•	•	•	•	•	•
4	SS 304 Teflon Ins.	SS 304 Teflon Ins.	SS 304	-70 to 200	•	•	•	•	•	•	•
5	SS 304L	SS 304L	SS 304L	-20 to 300	•	•	•	•	•	•	•
6	SS 316	SS 316	SS 316	-195 to 300	•	•	•	•	•	•	•
7*	SS 316 St. Seat	SS 316 St. Seat	SS 316 St. Seat	-195 to 425	•	•	•	•	•	•	•
8*	SS 316 St. Sheath	SS 316 St. Sheath	SS 316 St. Sheath	-195 to 650	•	•	•	•	•	•	•
9	SS 316 St. Chrome	SS 316 St. Chrome	SS 316 St. Chrome	-30 to 590	•	•	•	•	•	•	•
10	SS 316 Teflon Ins.	SS 316 Teflon Ins.	SS 316	-70 to 200	•	•	•	•	•	•	•
11	SS 316L	SS 316L	SS 316L	-195 to 300	•	•	•	•	•	•	•
12	SS 316 L Stelited	SS 316 L St. Seat	SS 316L St. Seat	-195 to 425	•	•	•	•	•	•	•
13	17-4-PH	17-4-PH	17-4-PH	-30 to 425	•	•	•	•	•	•	•
14	17-4-PH Teflon Ins	17-4-PH Teflon Ins	17-4-PH	-30 to 200	•	•	•	•	•	•	•
15	17-4-PH CA6 NM	17-4-PH	CA6 NM	-30 to 425	•	•	•	•	•	•	•
16*	SS 440C	SS 440C	SS 440C	-30 to 425	•	•	•	•	•	•	•
17	MONEL	K. MONEL	K. MONEL	-195 to 300	•	•	•	•	•	•	•
18	Hastalloy B	Hastalloy B	Hastalloy B	-195 to 370	•	•	•	•	•	•	•
19	Hastalloy C	Hastalloy C	Hastalloy C	-195 to 450	•	•	•	•	•	•	•
20	Titanium	TB 35	TB 49	-195 to 315	•	•	•	•	•	•	•
21	Alloy 20	Alloy 20	Alloy 20	-50 to 300	•	•	•	•	•	•	•
22	Monel 400	Monel 400	Monel 400	-195 to 300	•	•	•	•	•	•	•

Note : \* Maximum temperature is limited to 300°C

\*\* Applicable temperature range for VAH valve type is -20 to 425°C

Trim materials of other combinations are provided on request.





# V. FLOW COEFFICIENT Cv WITH STEM TRAVEL



Table 2

VALVE SIZE (Inch) PORT SIZE (Inch)	1		1½		2		2½		3		4		5		6		8		10		12	
	¾	1	1¼	1½	1¾	2	2¼	2½	3	3½	4	4½	5	5½	6	6½	8	8½	10	10½	12	
ANSI 150-600 RATED Cv VALUE	VAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	VAA	6.3	11	17	24	44	68	99	88	99	175	99	175	275	395	640	395	640	1000	1000	1440	1440
	VSA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANSI 900 & 1500 RATED Cv VALUE	VAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	VAA	14.3	25	44	68	99	144	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
	VSA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANSI 150 - 2500 STEM TRAVEL (mm)	VAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	VAA	14.3	25	44	68	99	144	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
	VSA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANSI 150 - 600 VALVE TYPE : VAV (ANSI 150 - 600)	VAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	VAA	14.3	25	44	68	99	144	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
	VSA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANSI 150 - 2500 VALVE TYPE : VAV (ANSI 150 - 600)	VAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	VAA	14.3	25	44	68	99	144	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
	VSA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANSI 150 - 2500 VALVE TYPE : VAV (ANSI 150 - 600)	VAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	VAA	14.3	25	44	68	99	144	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
	VSA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANSI 150 - 2500 VALVE TYPE : VAV (ANSI 150 - 600)	VAC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	VAA	14.3	25	44	68	99	144	210	210	210	210	210	210	210	210	210	210	210	210	210	210	210
	VSA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 3

Valve Type : VAH (ANSI 2500)		¾		1		1½	
VALVE SIZE (Inch)	PORT SIZE (mm)	¾	1	1	1½	1	1½
VALVE SIZE (Inch)	PORT SIZE (mm)	φ 6	φ 8	φ 10	φ 13	φ 16	φ 16
RATED Cv (Linear & Equal & Contoured)	STEM TRAVEL (mm)	0.33	0.73	1.3	2.3	6	9
STEM TRAVEL (mm)		14.3		19.05		23.8	







### VI.2.3. Springless Piston Cylinder Actuator with Positioner

Table 7

RATING	ACTUATOR MODEL	SUPPLY PRESSURE Kg/Cm <sup>2</sup> .	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> )																
			1½	2	2½	3	4	5	6	8	10	12							
150 - 600	DPA1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SFA1	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SPA2	5	100	100	100	71	50	30	16	9	6								

Note : The max. operating pressure is 250 Kg/Cm<sup>2</sup> for rating ANSI 900-1500 and 420 Kg/Cm<sup>2</sup> for rating ANSI 2500

When Inlet pressure is greater than differential pressure with a valve, use the inlet pressure for actuator sizing.

### VI.3. Metallic Seated Valves

#### VI.3.1. VAC, VAN Valves with Diaphragm Actuators (ANSI 150 - 600)

Table 8

ACTUATOR MODEL	AIR TO DIAPHRAGM (Kg/Cm <sup>2</sup> )	SPRING RANGE (Kg/Cm <sup>2</sup> )	POSITIONER	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> ) AT CORRESPONDING VALVE SIZE (Inch)															
				1½	2	2½	3	4	5*	6	8	10	12						
VAID	1.2	0.2-1.0	X	8.1	6.4														
	1.4	0.2-1.0	O	20.8	16.4														
	2.6	0.2-1.0	O	100	82														
VA2D	1.2	0.2-1.0	X	11.7	9.2	7.3	6.3	4.7											
	1.4	0.2-1.0	O	29.0	23.6	18.8	16.0	12.2											
	2.6	0.2-1.0	O	100	100	94	80.3	60.0											
VA3D	1.2	0.2-1.0	X	19.0	15.3	12.2	10.4	7.9	6.4	5.3									
	1.4	0.2-1.0	O	49.7	39.1	31.2	26.5	20.2	16.3	13									
	2.6	0.2-1.0	O	100	100	100	100	100	81.6	55									
VA4D	1.2	0.2-1.0	X	17	14.6	11	8.8	7.4	5.6										
	1.4	0.2-1.0	O	43.4	37.2	28	22.4	19	14.3										
	2.6	0.2-1.0	O	100	100	100	100	100	77	71.6									
VA5D	1.2	0.2-1.0	X	12	10	7.6	6.1	5.1											
	1.4	0.2-1.0	O	31	26	19.4	15.6	13											
	2.6	0.2-1.0	O	100	100	100	97	77.8	65										
VAIR	1.4	0.4-1.2	P	24	19														
	2.8	0.8-2.4	O	57	45														
	1.4	0.2-1.0	X or O	11	9.2	7.3	6.3	4.7											
VA2R	1.4	0.4-1.2	P	35	27	22	18	14											
	2.8	0.8-2.4	O	82	64	51	44	33											
	1.4	0.2-1.0	X or O	19	15	12	10	7.9	6.4	4.3									
VA3R	1.4	0.4-1.2	P	58	46	36	31	23	19	16									
	2.8	0.8-2.4	O	100	100	85	73	55.5	44.7	37									
	1.4	0.2-1.0	X or O	17	14	11	8.9	7.4	5.6										
VA4R	1.4	0.4-1.2	P	51	43	33	26	22	16										
	2.8	0.8-2.4	O	100	100	77.5	62.4	42.3	39										
	1.4	0.2-1.0	X or O	15	12	10	7.6	6.1	5.1										
VA5R	1.4	0.4-1.2	P	45	36	24.8	23	18	15										
	2.8	0.8-2.4	O	100	100	57.8	54	43.3	36										
	1.4	0.2-1.0	X or O	100	100	100	89												

\* Applicable only for VAC Valves.

- Note : 1. POSITIONER : X... Without O... With P... Preferably with  
 2. For Reverse Action, the pressure differential limits for 0.4 - 2.0 Kg/Cm<sup>2</sup> range is same as 0.4 - 1.2 Kg/Cm<sup>2</sup>.

### VI.3.2. VAC, VAN Valves with Piston Cylinder Actuators

Table 9

DIRECT/ REVERSE	ACTUATOR MODEL	SUPPLY PRESSURE Kg/Cm <sup>2</sup> .	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> )			
			8	10	12	
	SPA2	5	100	100	100	

Note : Pressure Differential is same for both open and closed conditions.

### VI.4. Teflon Seated Valves

#### VI.4.1. VAC Valve (ANSI 150 - 600)

Table 10

ACTUATOR MODEL	AIR TO DIAPHRAGM (Kg/Cm <sup>2</sup> )	SPRING RANGE (Kg/Cm <sup>2</sup> )	W OR W/O POSITIONER	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> ) AT CORRESPONDING PORT SIZE (Inch)															
				1½	2	2½	3	4	5	6	8	10	12						
VAID	1.2	0.2-1.0	X	8.1	6.4														
	1.4	0.2-1.0	O	16.3	12.8														
	2.6	0.2-1.0	O	30	30														
VA2D	1.2	0.2-1.0	X	11.8	9.3	7.4	6.3	4.8											
	1.4	0.2-1.0	O	23.5	18.5	14.7	12.6	9.6											
	2.6	0.2-1.0	O	-	-	-	-	-	30	30	30								
VA3D	1.2	0.2-1.0	X	19.5	15.4	12.2	10.5	7.9	6.4	4.3									
	1.4	0.2-1.0	O	30	30	24.4	21	15.9	12.8	8.6									
	2.6	0.2-1.0	O	-	-	-	-	-	-	-	30	30							
VA4D	1.2	0.2-1.0	X	17	14.6	11	8.9	6	5.6										
	1.4	0.2-1.0	O	30	29	22	17.8	12	11.3										
	2.6	0.2-1.0	O	-	-	-	-	-	-	30	30								
VA5D	1.2	0.2-1.0	X	12.2	8.3	7.7	8.2	5.2											
	1.4	0.2-1.0	O	24.4	16.5	15.4	12.4	10.3											
	2.6	0.2-1.0	O	-	-	-	-	-	30	30									
VAIR	1.4	0.4-1.2	P	16.3	12.9														
	2.8	0.8-2.4	O	30	25.7														
	1.4	0.2-1.0	X or O	11.8	9.3	7.4	6.3	4.8											
VA2R	1.4	0.4-1.2	P	23.5	18.5	14.7	12.6	9.6											
	2.8	0.8-2.4	O	-	-	-	-	-	30	29.4	25.2	19.1							
	1.4	0.2-1.0	X or O	19.5	15.4	12.2	10.5	7.9	6.4	4.3									
VA3R	1.4	0.4-1.2	P	30	30	24.5	21	15.8	12.8	8.6									
	2.8	0.8-2.4	O	-	-	-	-	-	30	30	30	25.5	17.3						
	1.4	0.2-1.0	X or O	17	14.6	11	8.9	6	5.6										
VA4R	1.4	0.4-1.2	P	30	29	22	17.8	12	11.3										
	2.8	0.8-2.4	O	-	-	-	-	-	30	29	22	17.8	12	11.3					
	1.4	0.2-1.0	X or O	15	12	10	7.6	6.1	5.1										
VA5R	1.4	0.4-1.2	P	45	36	24.8	23	18	15										
	2.8	0.8-2.4	O	100	100	57.8	54	43.3	36										
	1.4	0.2-1.0	X or O	100	100	100	89												

Note : 1. POSITIONER : X... Without O... With P... Preferably with

2. The pressure differential limit for 0.4 - 2.0 Kg/Cm<sup>2</sup> spring range is same as that of 0.4 - 1.2 Kg/Cm<sup>2</sup>.





VI.5.1. Direct Action (Air to Close)

Table 11

RATING	ACTUATOR MODEL	AIR TO DIAPHRAGM Kg/Cm <sup>2</sup>	SPRING RANGE Kg/Cm <sup>2</sup>	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> ) AT CORRESPONDING VALVE SIZE (Inch)											
				Valve Type : VAN						Valve Type : VAZ					
				2	3	4	6	2	3	4	6	2	3	4	6
ANSI 900 & 1500	VA3D	2.6	0.4-2.0	(120)	(75)			250	250	200					
		2.8		(120)	130			250	250	250					
	VA4D	2.6	0.2-1.8	(155)				250	250	250					
		2.8		250		(70)									
	VA5D	2.6	0.4-2.0			(150)									
		2.8		210	180										
ANSI 2500	VA3D	2.6	0.2-1.8	(170)				240							
		2.8		240											
	VA4D	2.6	0.4-2.0												
		2.8		(145)											
	VA5D	2.6	0.2-1.8	(155)											
		2.8		255											

Direct Action (Air to Close)

Note : 1. The maximum operating pressure is 150 Kg/Cm<sup>2</sup> for ANSI 900

2. The values indicated in the brackets are for full open position. Values without brackets are same for both fully open and fully closed position.

Table 12

RATING	ACTUATOR MODEL	AIR TO DIAPHRAGM Kg/Cm <sup>2</sup>	SPRING RANGE Kg/Cm <sup>2</sup>	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> ) AT CORRESPONDING VALVE SIZE (Inch)											
				Valve Type : VAN						Valve Type : VAZ					
				2	3	4	6	2	3	4	6	2	3	4	6
ANSI 900 & 1500	VA3R	2.6	0.4-2.0	100	100	100		250	250	207					
		2.8		(120)	(75)			250	250	250					
	VA4R	2.6	0.4-2.0					90							
		2.8		210	180	(150)	(70)								
	VA5R	2.6	0.4-2.0												
		2.8				(150)	165								
ANSI 2500	VA3R	2.6	0.4-2.0	100	100	100		273	420	420					
		2.8		(120)	(75)			420	420	420					
	VA4R	2.6	0.4-2.0												
		2.8		210	180	(150)	(95)								
	VA5R	2.6	0.4-2.0												
		2.8				(150)	145								

Reverse Action (Air to Open)

Note : 1. The maximum operating pressure is 150 Kg/Cm<sup>2</sup> for ANSI 900

2. The values indicated in the brackets are for full open position. Values without brackets are same for both fully open and fully closed position.

VI.6. VAV Valves with Diaphragm Actuators

Table 13

ACTUATOR MODEL	AIR TO DIAPHRAGM Kg/Cm <sup>2</sup>	SPRING RANGE Kg/Cm <sup>2</sup>	Positioner	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> ) AT CORRESPONDING PORT SIZE (Inch)																	
				Direct Action (Air to Close)									Reverse Action (Air to Open)								
				1/4"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	1/4"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"
VA1D,R	1.2	0.2-1.0	X	22	15	9.0	6.0														
VA2D,R	2.6	0.4-2.0	O	40	30	18	12														
	1.2	0.2-1.0	X	32	21	13	9.0	5.0	3.3	2.4											
VA3D,R	2.6	0.4-2.0	O	40	40	26	18	10	6.5	4.8											
	1.2	0.2-1.0	X	35	22	14	8.5	5.5	3.9	2.2	1.4										
VA4D,R	2.6	0.4-2.0	O	40	40	29	17	11	7.5	4.4	2.8										
	1.2	0.2-1.0	X	30	20	12	7.5	5.5	3.1	2.0	1.3	0.7									
VA5D,R	2.6	0.4-2.0	X																		
	1.2	0.2-1.0	X																		
VA6R	2.6	0.4-2.0	O																		
	5	1.9-4.0	O																		

X - WITHOUT POSITIONER O - WITH POSITIONER





**VI.7. VSA, VAZ Valve (ANSI 150 - 600)**

**VI.7.1. For Diaphragm Actuators**

**Table 14**

ACTUATOR MODEL	AIR TO DIAPHRAGM Kg/Cm <sup>2</sup>	SPRING RANGE Kg/Cm <sup>2</sup>	POSITIONER	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> ) AT CORRESPONDING VALVE SIZE (Inch)													
				1½	2	2½	3	4	5	6	8	10	12				
VA1D	1.2	0.2-1.0	X	13.5	10.7												
	1.4	0.2-1.0	O	40.5	32.2												
	2.6	0.2-1.0	O	100	100												
VA2D	1.2	0.2-1.0	X	19.4	15.4	12.4	10.6	8.1									
	1.4	0.2-1.0	O	58.3	46.3	37.1	31.8	24.3									
	2.6	0.2-1.0	O	100	100	100	100	100									
VA3D	1.2	0.2-1.0	X	32.2	25.6	20.5	17.6	13.4	11.2	7.3							
	1.4	0.2-1.0	O	96.7	76.8	61.5	52.8	40.3	33.7	22							
	2.6	0.2-1.0	O	100	100	100	100	100	100	100							
VA4D	1.2	0.2-1.0	X	28.7	24.6	18.7	15.7	10.3	9.6								
	1.4	0.2-1.0	O	86	73.8	56.2	47.1	30.9	28.8								
	2.6	0.2-1.0	O	100	100	100	100	100	100								
VA5D	1.2	0.2-1.0	X	21.5	14.1	13.1	10.6	8.9									
	1.4	0.2-1.0	O	64.4	42.2	38.4	31.7	26.5									
	2.6	0.2-1.0	O	100	100	100	100	100									
VA1R	1.4	0.2-1.0	X or O	13.5	10.7												
	1.4	0.4-1.2	P	40.5	32.2												
	2.8	0.8-2.4	O	94.6	75.1												
VA2R	1.4	0.2-1.0	X or O	19.4	15.4	12.4	10.6	8.1									
	1.4	0.4-1.2	P	58.3	46.3	37.1	31.8	24.3									
	2.8	0.8-2.4	O	100	100	86.6	74.3	56.6									
VA3R	1.4	0.2-1.0	X or O	32.2	25.6	20.5	17.6	13.4	11.2	7.4							
	1.4	0.4-1.2	P	96.7	76.8	61.5	52.8	40.2	33.7	22.1							
	2.8	0.8-2.4	O	100	100	93.9	78.6	51.6									
VA4R	1.4	0.2-1.0	X or O	28.7	24.6	18.7	15.7	10.3	9.6								
	1.4	0.4-1.2	P	86	73.8	56.2	47.1	30.9	28.8								
	2.8	0.8-2.4	O	100	100	100	100	100	100	72	67.2						
VA5R	1.4	0.2-1.0	X or O	21.5	14.1	13.1	10.6	8.8									
	1.4	0.4-1.2	P	64.4	42.2	38.4	31.7	26.5									
	2.8	0.8-2.4	O	100	100	100	100	100	98.6	92	74	61.9					

- Note : 1. POSITIONER : X... Without O... With P... Preferably with  
 2. Shut off pressure shown in the table are for class IV leakage  
 3. Class V leakage can be obtained by increasing the supply pressure and spring range for Direct and Reverse action resply.  
 4. For Reverse Action, the pressure differential limits for 0.4 - 2.0 Kg/Cm<sup>2</sup> spring range is same as for 0.4 - 1.2 Kg/Cm<sup>2</sup>

**VI.7.2. For Piston Cylinder Actuators**

**Table 15**

ACTUATOR MODEL	SUPPLY PRESSURE Kg/Cm <sup>2</sup>	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> ) VALVE SIZE (Inch)		
		8	10	12
SPA 2	2	100	75	45
	3	100	100	100

**VI.7. VAH Valve (ANSI 2500)**

**VI.7.1. For Flow Direction Horizontal to Bottom**

**Table 16**

ACTUATOR MODEL	AIR TO DIAPHRAGM Kg/Cm <sup>2</sup>	SPRING RANGE Kg/Cm <sup>2</sup>	WITH POSITIONER	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> )											
				0.33 - 1.33		2.3		3.2		6		9			
				A	B	A	B	A	B	A	B	A	B	A	B
VA2D	1.4	0.2-1.0	O	80	70	80	70	80	70						
	2.6	0.2-1.0	O	290	290	165	160	105	105						
	2.6	0.2-1.8	O	140	120	140	120	140	120						
VA3D	1.4	0.2-1.0	O	130	115	130	115	130	115	100	95				
	2.6	0.2-1.0	O	420	420	270	270	170	170	100	100				
	2.6	0.2-1.8	O	220	200	220	200	220	200	145					
VA4D	1.4	0.2-1.0	O											95	80
	2.6	0.2-1.0	O											95	95
	2.6	0.2-1.8	O											190	140
VA2R	1.4	0.4-1.2	O	120	110	120	110	105	110						
	2.6	0.5-2.4	O	235	215	235	215	210	210						
	1.4	0.4-1.2	O	195	180	195	180	175	175	100	100				
VA3R	2.6	0.8-2.4	O	300	355	300	355	300	345	205	205				
	1.4	0.4-1.2	O											95	95
	2.6	0.8-2.4	O											190	190

**VI.7.2. For Flow Direction from bottom to horizontal side**

**Table 17**

ACTUATOR MODEL	AIR TO DIAPHRAGM Kg/Cm <sup>2</sup>	SPRING RANGE Kg/Cm <sup>2</sup>	WITH POSITIONER	PRESSURE DIFFERENTIAL (Kg/Cm <sup>2</sup> )											
				0.33 - 1.33		2.3		3.2		6		9			
				A	B	A	B	A	B	A	B	A	B	A	B
VA2D	1.4	0.2-1.0	O	170	95	110	80	80	65						
	2.6	0.2-1.0	O	420	420	420	375	380	315						
	2.6	0.2-1.8	O	300	160	195	135	135	115						
VA3D	1.4	0.2-1.0	O	285	155	185	130	130	110	85	75				
	2.6	0.2-1.0	O	420	420	420	420	420	410	375					
	2.6	0.2-1.8	O	420	265	320	225	225	190	150	125				
VA4D	1.4	0.2-1.0	O											85	70
	2.6	0.2-1.0	O											405	340
	2.6	0.2-1.8	O											145	120
VA2R	1.4	0.4-1.2	O	265	145	170	120	120	100						
	2.6	0.5-2.4	O	420	285	245	240	285	200						
	1.4	0.4-1.2	O	420	235	265	200	200	165	130	115				
VA3R	2.6	0.8-2.4	O	420	420	420	395	405	335	265	225				
	1.4	0.4-1.2	O											90	110
	2.6	0.8-2.4	O											220	220

Note : A : DP = P1, P2 = 0 B : DP = 0.5P1





## VII. FACE TO FACE DIMENSIONS

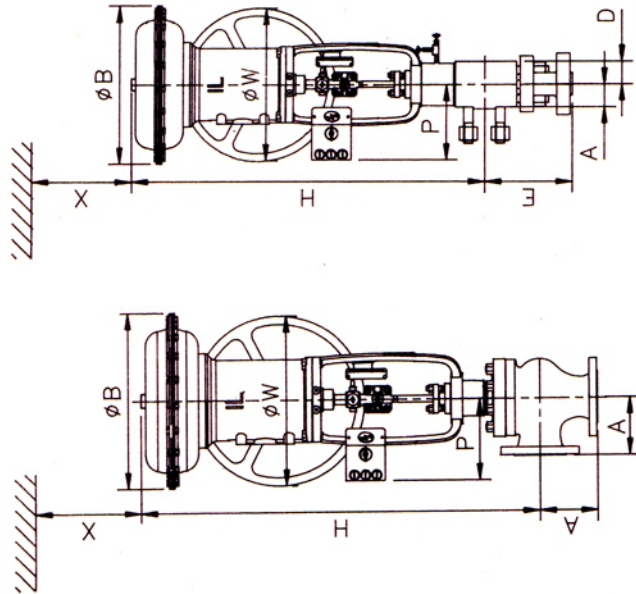


Table 19

VALVE TYPE : VAH										
VALVE SIZE (Inch)	ACTUATOR MODEL	A		E		D		B		C $\downarrow$
		RF/RJ	Lens ring	RF/RJ	Lens ring	P	RF	P	RF	
1/4	VA2 DR	61.4	55	220	220	55	55	955	1085	450
	VA3 DR	71.4	65	250	250	65	65	980	1105	450
	VA4 D	81.4	75	185	285	75	75	1160	1315	520
1/2	VA4 R	81.4	75	185	285	75	75	1160	1315	520

RF - RAISED FACE END RJ - RING JOINT END  
P - PLAIN BONNET F - RADIATING FIN BONNET

## VIII. EXTERNAL DIMENSIONS

Table 20

VALVE SIZE	ACTUATOR MODEL	H $\pm$ 10 (mm)										$\Delta$ B (mm)
		DIRECT ACTION					REVERSE ACTION					
		150 - 600		150 - 600			150 - 600		150 - 600			
1"	VA1 DR	630	780	785*	630	780	785	630	780	785	300	300
	VA1 DR	670	820	830	670	820	830	670	820	830	300	300
	VA2 DR	810	960	1030	810	960	1030	810	960	1030	350	350
1 1/2	VA3 DR	975	1125	1125	975	1125	1125	975	1125	1125	450	450
	VA1 DR	670	820	830	670	820	830	670	820	830	300	300
	VA2 DR	810	960	1030	810	960	1030	810	960	1030	350	350
2	VA3 DR	975	1125	1265	975	1125	1265	975	1125	1265	450	450
	VA4 DR	1140	1290	1255	1140	1290	1255	1140	1290	1255	520	520
	VA5 DR	1190	1340	1300	1190	1340	1300	1190	1340	1300	520	520
2 1/2	VA2 DR	845	995	1070	845	995	1070	845	995	1070	350	350
	VA3 DR	1015	1165	1305	1015	1165	1305	1015	1165	1305	450	450
	VA4 DR	1180	1330	1295	1180	1330	1295	1180	1330	1295	520	520
3	VA5 DR	1230	1380	1340	1230	1380	1340	1230	1380	1340	620	620
	VA6 R	1095	1245	1295	1095	1245	1295	1095	1245	1295	445	445
	VA6 RS	1295	1445	1445	1295	1445	1445	1295	1445	1445	445	445
4	VA2 DR	855	1010	1085	855	1010	1085	855	1010	1085	350	350
	VA3 DR	1020	1170	1310	1020	1170	1310	1020	1170	1310	450	450
	VA4 DR	1185	1335	1475	1185	1335	1475	1185	1335	1475	520	520
5	VA5 DR	1325	1475	1615	1325	1475	1615	1325	1475	1615	620	620
	VA6 R	1095	1245	1295	1095	1245	1295	1095	1245	1295	445	445
	VA6 RS	1295	1445	1445	1295	1445	1445	1295	1445	1445	445	445
6	VA3 DR	1040	1190	1335	1040	1190	1335	1040	1190	1335	450	450
	VA4 DR	1205	1355	1495	1205	1355	1495	1205	1355	1495	520	520
	VA5 DR	1255	1405	1545	1255	1405	1545	1255	1405	1545	620	620
8	VA6 R	1110	1260	1310	1110	1260	1310	1110	1260	1310	445	445
	VA6 RS	1310	1460	1460	1310	1460	1460	1310	1460	1460	445	445
	VA3 DR	1060	1210	1345	1060	1210	1345	1060	1210	1345	450	450
10	VA4 DR	1225	1375	1510	1225	1375	1510	1225	1375	1510	520	520
	VA5 DR	1275	1425	1560	1275	1425	1560	1275	1425	1560	620	620
	VA6 R	1130	1280	1330	1130	1280	1330	1130	1280	1330	445	445
12	VA6 RS	1330	1480	1480	1330	1480	1480	1330	1480	1480	445	445
	VA4 DR	1315	1460	1570	1315	1460	1570	1315	1460	1570	520	520
	VA5 DR	1410	1555	1695	1410	1555	1695	1410	1555	1695	620	620
12	VA5 DR	1420	1565	1700	1420	1565	1700	1420	1565	1700	620	620
	VA6 R	1620	1770	1820	1620	1770	1820	1620	1770	1820	620	620
	VA6 RS	1820	1970	1970	1820	1970	1970	1820	1970	1970	620	620

P - PLAIN BONNET F - RADIATING FIN BONNET B - BELLOW SEAL  
\* Applicable only for VAA & VAV Angle valves.  
\*\* Not Applicable for VAV Angle valve. \* + Not applicable for VAN & VAZ valves.  
Values in italic is applicable for valves used for ON-OFF Applications.

Table 18

Valve Size	A (mm)							
	ANSI 150	ANSI 200	ANSI 600	ANSI 1500	ANSI 2500	ANSI 1500	ANSI 1500	ANSI 2500
1"	RF	RF	RF	RF	RF	RJ	RJ	BW
1 1/2	92	105	105	105	105	105	105	105
2	111	117	125	143	143	221.5	221.5	221.5
2 1/2	138	146	156	156	156	270	270	270
3	149	159	168	168	168	375	375	375
4	176	184	197	197	197	435	435	435
5"	202	213	229	229	229	457	457	457
6	225	237	254	254	254	457	457	457
8	271	284	330	330	330	457	457	457
10	337	354	394	394	394	457	457	457
12	364	388	419	419	419	457	457	457

RF - RAISED FACE RJ - RING JOINT BW - BUTT WELD  
\* Applicable only for VAA & VAV valves.  
\*\* Not Applicable for VAN & VAZ Valves.







With piston cylinder type actuators

Table 21

VALVE SIZE	ACTUATOR MODEL	A (mm)				φ B (mm)
		150 - 300		600		
		P	F	P	F	
2½	SPA 1	1220		1220		545
	SPA 1M	1480		1480		
3	SPA 2	1090		1090		445
	SPA 2M	1340		1340		
	SPA 1	1255		1255		
4	SPA 1M	1515		1515		545
	SPA 2	1140	1450	1140	1450	
	SPA 2M	1385	1690	1385	1690	
	DPA 1	1470	1740	1470	1740	
6	DPA 1M	1720	2090	1720	2090	485
	SPA 1	1310	1580	1310	1580	
	SPA 1M	1570	1840	1570	1840	
	SPA 2	1200	1565	1200	1565	
8	SPA 2M	1445	1805	1445	1805	445
	DPA 1	1610	1610	1610	1720	
	DPA 1M	1855		1855	1965	
	SPA 1	1450		1450	1560	
10	SPA 1M	1705		1705	1815	545
	SPA 2	1335	1570	1335	1450	
	SPA 2M	1575	1810	1575	1590	
	DPA 1	1670	1870	1670	1870	
12	DPA 1M	1920	2120	1920	2120	485
	SPA 1	1510	1710	1510	1710	
	SPA 1M	1770	1970	1770	1970	
	SPA 2	1390	1590	1390	1590	
14	SPA 2M	1635	1835	1635	1835	445
	DPA 1	1725	1925	1725	1925	
	DPA 1M	1975	2175	1975	2175	
	SPA 1	1565	1765	1565	1765	
16	SPA 1M	1825	2025	1825	2025	545
	SPA 2	1450	1650	1450	1650	
18	SPA 2M	1690	1890	1690	1890	445
	DPA 1	1890	1890	1890	1890	

P - PLAIN BONNET F - RADIATING FIN BONNET

Table 22

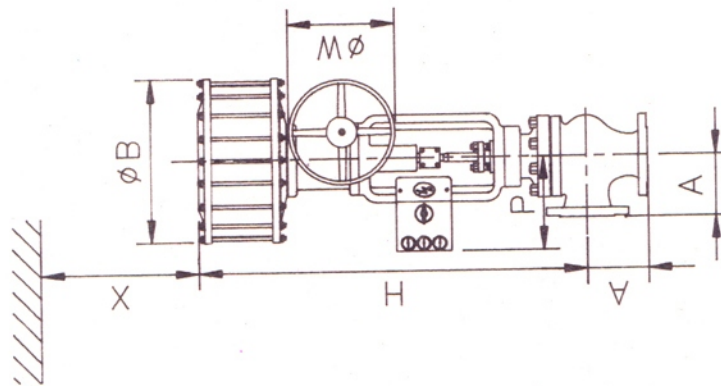
VALVE TYPE : VAN & VAZ (ANSI 900 - 2500)	VALVE SIZE (inch)	ACTUATOR MODEL	H ± 10 (mm)						φ B (mm)
			900 - 1500		2500				
			P	F	P	F			
2	3	VA 3 DR	-	-	1020	1225	450	450	
		VA 3 DR	-	-	1080	1085	450		
		VA 4 D	-	-	1230	1400	520		
3	4	VA 4 R	-	-	1350	1525	450	450	
		VA 3 DR	-	-	1065	1265	450		
		VA 4 D	-	-	1240	1420	520		
4	5	VA 4 R	-	-	1365	1545	600	600	
		VA 5 D	-	-	1270	1465	600		
		VA 5 R	-	-	1380	1575	600		
5	6	VA 4 D	-	-	1280	-	1530	520	
		VA 4 R	1330	1390	1440	1655	520		
		VA 5 D	1330	1530	1365	1555	620		
6	7	VA 5 R	1430	1630	1465	1665	620	620	
		VA 5 R	1430	1630	1465	1665	620		

P - PLAIN BONNET F - RADIATING FIN BONNET

FOR ALL TYPES OF VALVES

Table 23

ACTUATOR Model	φ W	P				X
		HTP	HEP	VPP		
VA 1 DR	280	216	300		230	
VA 2 DR	355	220	310		245	
VA 3 DR	450	240	335		245	
VA 4 DR	570	262	360		360	
VA 5 DR	570	270	375		420	
SPA 1	400		350	295	190	
SPA 2	380		350	300	300	
DPA 1	550		400	350	305	







## IX. APPROXIMATE WEIGHTS

### IX.1. VAC, VSA Valves

Table 24

SIZE (Inch)	RATING (ANSI)	Weight (Kg)																				
		VA1			VA2			VA3			VA4D			VA4R			VA5D			VA5R		
		P	F	B	P	F	B	P	F	B	P	F	B	P	F	B	P	F	B			
1 1/2	150	37	39	40	48	50	55	76	78													
	300	42	44	45	53	55	60	81	83													
	600	50	52	53	61	63	68	89	91													
2	150	43	45	46	54	56	60	82	84	88												
	300	43	46	47	54	57	61	82	85	89												
	600	60	63	64	71	74	78	91	102	106												
2 1/2	150				60	63	65	88	91	95	163	166		188	191							
	300				65	68	70	93	96	100	168	171		193	196							
	600				110	113	115	138	141	145	213	216		238	243							
3	150				80	85	87	108	113	118	183	188		208	213							
	300				83	88	90	111	116	121	186	191		211	216							
	600				120	125	127	148	153	158	223	228		248	253							
4	150				95	100	105	123	128	133	198	203		223	228			248	253			
	300				110	115	120	138	143	148	213	218		238	243			263	268			
	600				150	155	160	178	183	188	253	258		278	283			303	308			

SIZE (Inch)	RATING (ANSI)	Weight (Kg)																		
		VA3			VA4D			VA4R			VA5D			VA5R			VA6R		VA5RS	
		P	F	B	P	F	B	P	F	B	P	F	B	P	F	B	P	F	P	F
5	150	160	168		235	243		260	268		260	268		285	293		230	238	260	268
	300	170	178		245	253		270	278		270	278		295	303		240	248	270	278
	600	215	223		290	298		315	323		315	323		340	348		285	293	315	323
6	150	230	240	245	305	315	320	330	340	345	330	340	345	355	365	370	300	310	330	340
	300	240	250	265	315	325	330	340	350	355	340	350	355	365	375	380	310	320	340	350
	600	300	310	315	375	385	390	400	410	415	400	410	415	425	435	440	460	470	490	500

SIZE (Inch)	RATING (ANSI)	Weight (Kg)																				
		VA4D			VA4R			VA5D			VA5R			SPA1		SPA1M		SPA2		SPA2M		
		P	F	B	P	F	B	P	F	B	P	F	B	P	F	P	F	P	F	P	F	
8	150	380	400	430	405	425	455	410	430	435	455											
	300	430	440	470	455	465	495	460	470	485	495	510	525	570	575	400	415	450	465			
	600	550	570	600	575	595	625	580	600	605	625	690		750		585		635				
10	150							560	600	585	625	590	610	650	670	500	520	550	570			
	300							690	710	715	735	675	700	735	760	575	600	625	650			
	600							750	780	775	805	900	935	960	995	790	825	850	875			
12	150							750	780	775	805			820		700		750				
	300							900	920	945	925	935	960	995	1025	825	850	875	900			
	600							1000	1100	1025	1125	1040	1065	1100	1125	925	950	975	1000			

P - PLAIN BONNET F - FINNED BONNET B - BELLOW SEAL BONNET

### IX.2. VAN & VAZ Valves

#### IX.2.1. ANSI 150 - 600

Table 25

SIZE (Inch)	RATING (ANSI)	Weight (Kg)																								
		VA1			VA2			VA3			VA4D			VA4R			VA5D			VA5R			VA6R		VA6RS	
		P	F	B	P	F	B	P	F	B	P	F	B	P	F	B	P	F	B	P	F	B	P	F	P	F
1 1/2	150	37	39	40	48	50	55	76	78																	
	300	42	44	45	53	55	60	81	83																	
	600	50	52	53	61	63	68	89	91																	
2	150	43	45	46	54	56	60	82	84	88																
	300	43	46	47	54	57	61	82	85	89																
	600	60	63	64	71	74	78	91	102	106																
2 1/2	150				60	63	65	88	91	95	163	166		188	191											
	300				65	68	70	93	96	100	168	171		193	196											
	600				110	113	115	138	141	145	213	216		238	241											
3	150				81	86	88	109	114	119	184	189		209	214											
	300				84	88	91	112	117	122	187	192		212	217											
	600				121	126	128	149	154	159	224	229		249	254											
4	150				97	102	107	125	130	135	200	205		225	230											
	300				112	117	122	140	145	150	215	220		240	245											
	600				152	157	162	180	185	190	255	260		280	285											
6	150							235	245	250	310	320	325	335	345	350	335	345	350	360	370	375	375	385	405	415
	300							245	255	270	320	330	335	345	355	360	345	355	360	370	380	385	385	395	415	425
	600							305	315	320	380	390	395	405	415	420	405	415	420	430	440	445	535	545	565	575

SIZE (Inch)	RATING (ANSI)	Weight (Kg)																							
		VA4D			VA4R			VA5D			VA5R			SPA1		SPA1M		SPA2		SPA2M					
		P	F	B	P	F	B	P	F	B	P	F	B	P	F	P	F	P	F	P	F				
8	150	402	412	452	427	437	467	432	442	457	467														
	300	442	452	492	467	477	517	472	482	497	507														
	600	558	576	622	581	601	647	586	606	611	631														
10	150							600	620	625	645	645	665	705	725	535	555	585	605						
	300							710	730	735	755	755	775	815	835	650	675	700	725						
	600							757	787	782	812	805	835	865	895	700	720	750	770						
12	150							836	858	861	881	881	901	941	961	775	791	825	841						
	300							976	996	1001	1021	1021	1041	1081	2001	820	855	870	890						
	600							1058	1158	1083	1183	1103	1203	1163	1263	1000	1100	1050	1150						

P - PLAIN BONNET F - FINNED BONNET B - BELLOW SEAL BONNET

Note : Reduce 60 Kg for VASD model and 70 Kg for VA5R model for 10", 12" & 14" valves used for ON-OFF Applications.





IX.2.2. ANSI 900 - 2500

Table 26

VALVE SIZE (Inch)	ACTUATOR MODEL	Weight (Kg)					
		ANSI 900		ANSI 1500		ANSI 2500	
		P	F	P	F	P	F
2	VA 3 D/R	-	-	-	-	179	189
	VA 3 D/R	-	-	-	-	<i>145</i>	<i>155</i>
3	VA 3 D/R	-	-	-	-	<i>262</i>	<i>277</i>
	VA 4 D	-	-	-	-	<i>337</i>	<i>352</i>
	VA 4 R	-	-	-	-	<i>362</i>	<i>377</i>
4	VA 3 D/R	-	-	-	-	474	489
	VA 4 D	-	-	-	-	549	564
	VA 4 R	-	-	-	-	574	589
	VA 5 D	-	-	-	-	574	589
	VA 5 R	-	-	-	-	599	614
6	VA 4 D	-	-	-	790	-	<i>783</i>
	VA 4 R	-	-	-	815	-	<i>788</i>
	VA 5 D	-	-	795	815	<i>768</i>	<i>788</i>
	VA 5 R	-	-	820	840	<i>793</i>	<i>813</i>

P - PLAIN BONNET F - RADIATING FIN BONNET  
Value in *ITALIC* is for Body with Butt weld End

IX.3. VAH Valves

Table 27

VALVE SIZE (Inch)	ACTUATOR MODEL	Weight (Kg)	
		P	RF
¾	VA 2 D/R	80	90
	VA 3 D/R	105	120
1	VA 3 D/R	130	140
1½	VA 4 D	255	275
	VA 4 R	280	300

IX.4. VAA & VAV Valves

Table 28

VALVE SIZE (Inch)	RATING (ANSI)	Weight (Kg)															
		VA1D/R		VA2D/R		VA3D/R		VA4D		VA4R		VA5D		VA5R		VA6R	
		P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F
1	150	37	39	48	50	76	78										
	300	42	44	53	55	81	83										
	600	50	52	61	63	89	91										
1½	150	37	39	48	50	76	78										
	300	42	44	53	55	81	83										
	600	50	52	61	63	89	91										
2	150	43	45	54	56	82	84	157	159	182	184	182	184	242	244	222	224
	300	43	46	54	57	82	85	157	160	182	185	182	185	242	243	222	223
	600	60	63	71	74	91	102	166	177	191	202	191	202	251	262	231	242

Note : Reduce 60 Kg for VA5D model and 70 Kg for VA5R model for 10", 12" & 14" valves used for ON-OFF Applications.

VALVE SIZE (Inch)	RATING (ANSI)	Weight (Kg)																						
		VA2D/R		VA3D/R		VA4D		VA4R		VA5D		VA5R		VA6R		SPA1		SPA1M		SPA2		SPA2M		
		P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	
2½	150	60	63	88	91	163	166	188	191	188	191	248	251	228	231									
	300	65	68	93	96	168	171	193	196	193	196	253	256	233	236									
	600	110	113	138	141	213	216	238	241	238	241	298	301	278	281									
3	150	80	85	108	113	183	188	208	213	208	213	268	273	248	253									
	300	83	88	111	116	186	191	211	216	211	216	271	276	251	256									
	600	120	125	148	153	223	228	248	253	248	253	308	313	288	293					256		306		
4	150	95	100	123	128	198	203	223	228	223	228	283	288	263	268	455		515		238	248	288	298	
	300	110	115	138	143	213	218	238	243	238	243	298	303	278	283	440		500		253	263	303	313	
	600	150	155	178	183	253	258	278	283	278	283	338	343	318	323	400		460		291	301	341	351	

VALVE SIZE (Inch)	RATING (ANSI)	Weight (Kg)																							
		VA3D/R		VA4D		VA4R		VA5D		VA5R		VA6R		SPA1		SPA1M		SPA2		SPA2M		DPA1		DPA1M	
		P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F	P/E	F
5	150	160	168	235	243	280	288	280	288	285	293	300	308	370	378	430	438	260	268	310	318	530	538	570	578
	300	170	178	245	253	270	278	270	278	295	303	310	318	380	388	440	448	270	278	320	328	540	548	580	588
	600	215	223	290	298	315	323	315	323	340	348	355	363	425	433	485	493	315	323	365	373	585	593	625	633
6	150	230	240	305	315	330	340	330	340	355	365	370	380	436	446	496	506	326	336	376	386	595	606	635	646
	300	240	250	315	325	340	350	340	350	365	375	380	390	446	456	506	516	336	346	386	396	606	616	646	656
	600	300	310	375	385	400	410	400	410	515	525	530	540	506	516	566	576	396	406	446	456	656	676	706	716
8	150			340	360	365	385	370	390	395	415			472	492	532	552	382	412	432	632	652	672	692	
	300			390	400	415	425	420	430	445	455			522	532	582	592	412	422	482	482	682	692	722	732
	600			510	530	535	555	540	560	565	585			642	662	702	722	532	552	582	602	802	822	842	862
10	150							520	560	545	585			630	670	690	730	520	560	570	610	790	840	830	870
	300							650	670	675	695			760	780	820	840	650	670	700	720	920	940	960	980
	600							710	740	735	765			820	850	880	910	710	740	760	790	980	1010	1020	1050
12	150							710	740	735	765			820	860	880	920	710	750	760	800	980	1020	1020	1060
	300							860	880	885	905			970	990	1030	1050	860	880	910	930	1130	1150	1170	1190
	600							960	1060	985	1085			1070	1100	1130	1160	960	990	1010	1040	1230	1260	1270	1300

P - PLAIN BONNET E - EXTENSION BONNET F - RADIATING FIN BONNET

IX.4. VAA, VAV Bellow Sealed Valves

Table 29

SIZE (Inch)	Weight (Kg)																							
	1 ½			2			2 ½			3			4			6			8					
	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600	150	300	600			
VA1D/R	40	45	53	46	47	64																		
VA2D/R	55	60	68	60	61	78	65	70	115	87	90	127	105	120	160									
VA3D/R				88	89	106	95	100	145	118	121	158	133	148	188	245	265	315						
VA4D																320	330	390	430	470	600			
VA4R																345	355	415	455	495	625			
VA5D																345	355	415						
VA5R																370	380	440						