



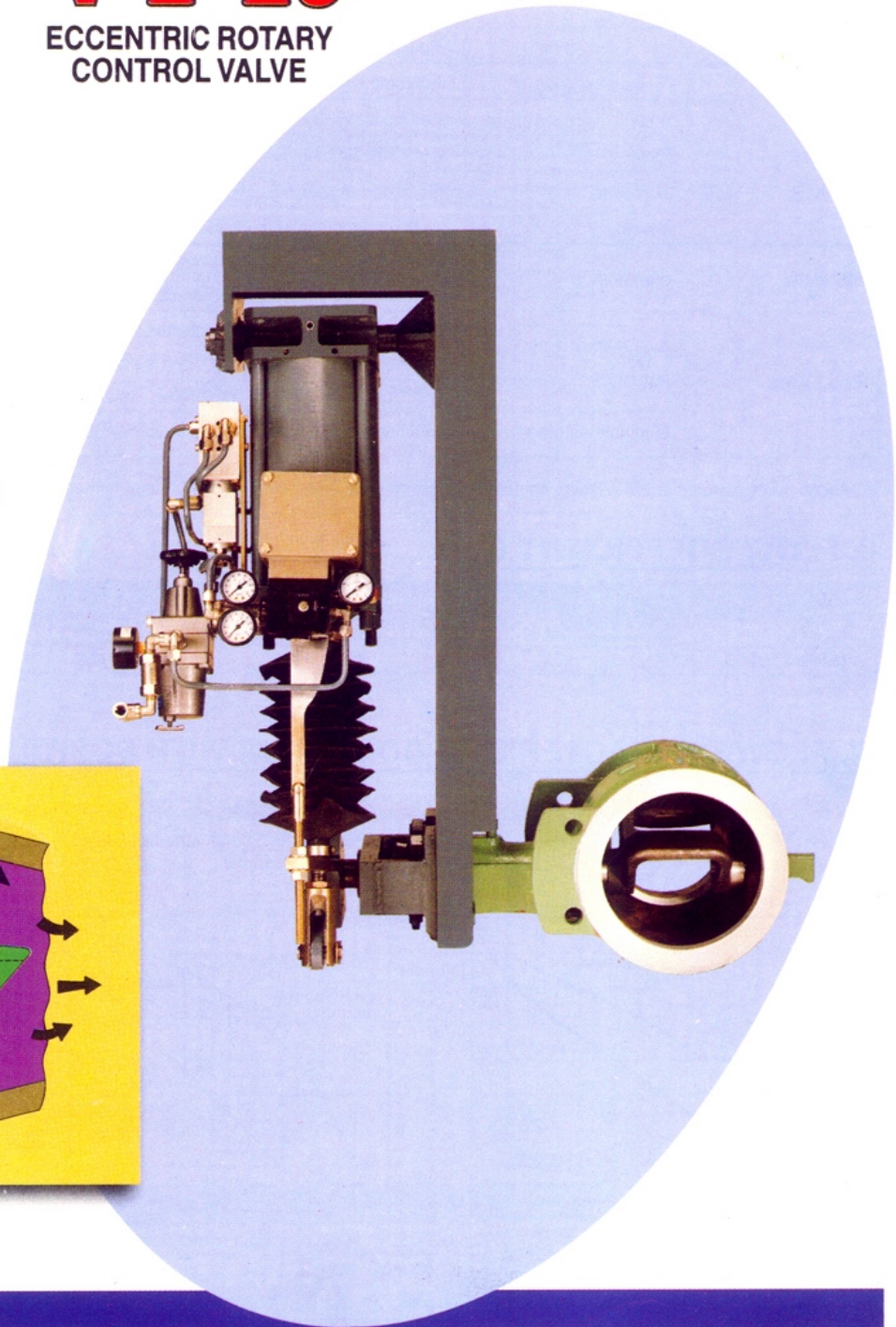
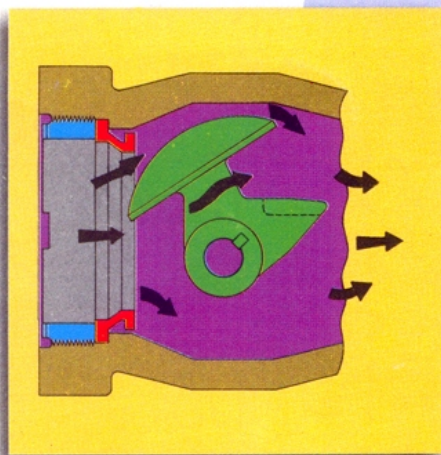
**INSTRUMENTATION LTD.,  
PALAKKAD**

The eccentric rotary control valve, model VFR called FloWing is suitable for control of higher flow capacity and slurry fluid. It is having a straight valve body with an open yoke type plug rotating eccentrically inside.

The plug with integral wing offers extra dynamic stability and stable operation at all times. The wing utilises force of fluid to control revolution generated at the back surface of the plug, leading to smoother flow and higher flow capacity with higher rangeability and extra dynamic stability.

# VFR

**ECCENTRIC ROTARY  
CONTROL VALVE**



## I. SPECIFICATIONS

Table 1

Valve type	Eccentric Rotary Type Single Seated Straight Through (VFR)	
Valve sizes	1, 1½, 2, 3, 4, 6, 8, 10, 12 Inches	
End connection	Flangeless type (Wafer)	
Rating	Std. ANSI 150, 300 Optional JIS 10K, 20 K	
Valve Opening	Rotation of 60° (Full Open)	
Gland type	Bolted gland	
Rangeability	100:1	
Cv	Refer Table 2	
Flow characteristics	Refer Section III	
Max. Differential pressure	Refer Sec IV for selection of actuators	
Leakage Class	Metallic Seat : Class IV as per ANSI-B 16.104	
	Soft Seat : (Class VI as per ANSI - B 16.104	
Bonnet	Body integral type (-60 to + 350° C)	
Plug	Eccentric rotary open yoke type with wing	
Standard materials	Body	Carbon steel (A 216 WCB), Stainless Steel (A351 CF8, CF8M)
	Plug	SS 304 (Stellited), SS 316 (Stellited)
	Seat Ring	SS 304 (Stellited), SS 316 (Stellited), SS 304 / SS 316 with Teflon
	Packing	V-7132Y (upto 200° C), Graphoil
Actuators	Standard	Spring Diaphragm Actuator, Pneumatic Cylinder (Double Acting), * Rotary Pneumatic actuator - (optional.)
Accessories	Pneumatic Actuators	Pneumatic positioner, Electro pneumatic positioner, I / P converter, Air Filter regulators, Air lock relay, Electronic position transmitter, Limit switches, Volume boosters, Back up system (for Double acting type actuator), Side mounted Handwheel, Top mounted handwheel (for Spring Diaphragm actuators only) etc.
	Electrical Actuators	Positioner, Position transmitters (4-20 mA/POT), Limit Switches, Torque switches etc.

\* Air fail action reversal at site possible by suitably positioning the lever.

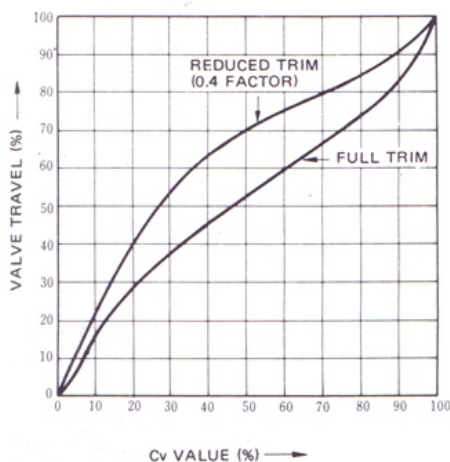
## II. FLOW COEFFICIENT Cv

Table 2

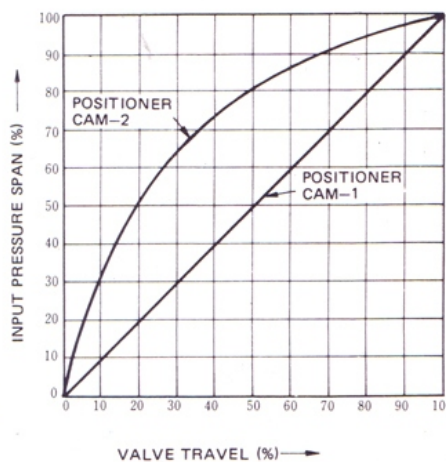
SIZE (inch)	1	1½	2	3	4	6	8	10	12
Full trim	14	30	50	150	250	600	1000	1400	1900
Reduced trim (0.4 factor)	5.6	12	20	60	100	240	400	560	760

## III. FLOW CHARACTERISTIC COMBINING WITH POSITIONER CAM

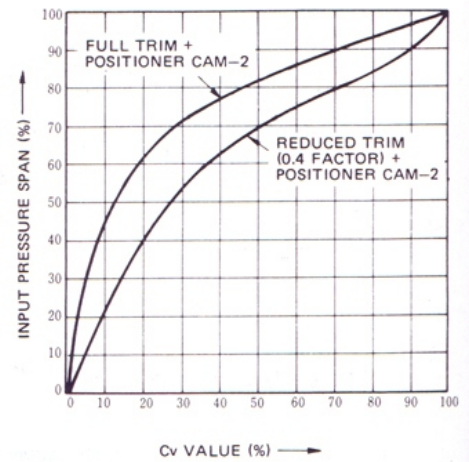
Valve flow characteristic



Positioner cam characteristic



Combined flow characteristic



## IV. MAXIMUM PRESSURE DIFFERENTIALS

### IV.1. Spring Diaphragm Actuators for Direct or Reverse action

Table 3

ACTUATOR MODEL	AIR PR. KG/CM <sup>2</sup>	SPRING RANGE	PRESSURE DIFFERENTIAL (Kg / CM <sup>2</sup> ) AT CORRESPONDING VALVE SIZE (Inch)																	
			1		1 1/2		2		3		4		6		8		10		12	
			FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP	FP	RP
VA 1D	3	0.8 - 2.4	50	50	50	50	40	50	5.7	9.0										
VA 2D	3	0.8 - 2.4					50	--	12.4	19.5	6.4	10.4	2.2	3.7						
VA 3D	3	0.8 - 2.4							27.4	43	14.2	23	4.9	8.2	2.3	3.9				
VA 4D	3	0.8 - 2.4							50	50	33.6	48.4	10.4	17.3	4.8	8.1	2.6	4.4	1.5	2.7
VA 5D	3	0.8 - 2.4									50	50	19	31.6	8.8	14.9	4.7	8.2	2.8	5
PC 68 LT	5	---											41	50	19	32.3	10.3	17.5	6.2	10.9
PC 68 LT	6	---											49	--	22.8	38.8	12.4	21.3	7.4	13.0

FP - Full Port, RP - Reduced Port

### IV.2 Electrical Actuator

Table 4

SIZE (Inch)	PRESSURE DIFFERENTIAL IN Kg / CM <sup>2</sup>					
	AS 50		BS 100		B + RS 200	
	FP	RP	FP	RP	FP	RP
1	50	50	--	--	--	--
1 1/2	50	50	--	--	--	--
2	50	50	--	--	--	--
3	50	50	--	--	--	--
4	48	50	--	--	--	--
6	16.8	28.1	28.7	47.8	50	50
8	7.8	13.2	13.3	22.4	31.2	50
10	5	8.6	8.6	14.7	20.0	34.6
12	2.5	4.4	4.3	7.5	10.2	17.8

## V. VFR ASSEMBLY DIMENSIONS

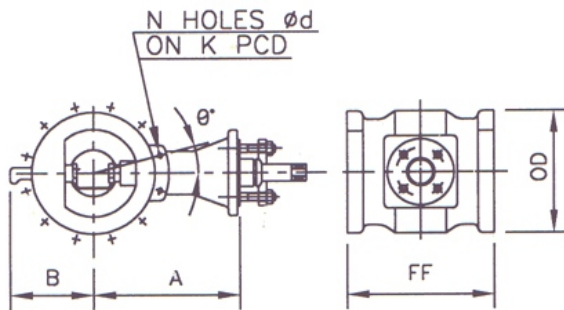


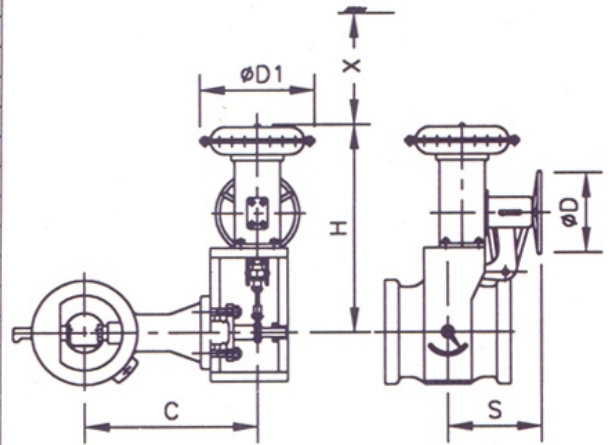
Table 5

SIZE (Inch)	A	B	FF	OD	N	K		d		θ°		Wt. Appx.
						ANSI 150	ANSI 300	ANSI 150	ANSI 300	ANSI 150	ANSI 300	
1	126	40	102	68	--	--	--	--	--	--	3	
1 1/2	132	45	114	83	--	--	--	--	--	--	4	
2	132	50	124	94	2	120.5	127.0	21	M18	45°	22° 30'	7
3	192	70	165	128	1	152.5	168.0	19	22	45°	22° 30'	25
4	195	108	194	153	1	190.5	200.0	19	22	22° 30'	22° 30'	30
6	283	150	229	214	2	241.5	270.0	22	22	22° 30'	15°	35
8	311	180	243	264	2	298.5	330.0	22	26	22° 30'	15°	55
10	372	220	297	324	2	362.0	387.5	26	30	15°	11° 15'	95
12	392	250	338	368	2	432.0	451.0	26	32	15°	11° 15'	115

## VI. VALVE WITH SPRING DIAPHRAGM ACTUATOR

Table 6

MODEL	C	φ D	φ D1	X	60° OPN.		Wt. Appx.
					H <sub>±20</sub>	S	
VFR 1" WITH VA1	186	280	300	90	500	264	24
VFR 1 1/2" WITH VA1	192	280	300	90	500	264	25
VFR 2" WITH VA1	192	280	300	90	500	264	28
VFR 3" WITH VA1	252	280	300	90	500	264	46
VFR 2" WITH VA2	221	355	350	110	610	330	36
VFR 3" WITH VA2	281	355	350	110	610	330	57
VFR 4" WITH VA2	284	355	350	110	610	330	62
VFR 6" WITH VA2	372	355	350	110	610	330	67
VFR 3" WITH VA3	312	450	450	140	686	414	89
VFR 4" WITH VA3	315	450	450	140	686	414	94
VFR 6" WITH VA3	403	450	450	140	686	414	99
VFR 8" WITH VA3	431	450	450	140	686	414	119
VFR 3" WITH VA4	374	570	520	190	876	565	185
VFR 4" WITH VA4	377	570	520	190	876	565	190
VFR 6" WITH VA4	465	570	520	190	876	565	195
VFR 8" WITH VA4	493	570	520	190	876	565	215
VFR 10" WITH VA4	554	570	520	190	876	565	255
VFR 4" WITH VA5	377	570	620	205	1094	697	275
VFR 6" WITH VA5	465	570	620	205	1094	697	280
VFR 8" WITH VA5	493	570	620	205	1094	697	300
VFR 10" WITH VA5	554	570	620	205	1094	697	340
VFR 12" WITH VA4	574	570	520	190	876	565	275
VFR 12" WITH VA5	574	570	620	205	1094	697	360



## VII. VALVE WITH PNEUMATIC CYLINDER (Double Acting)

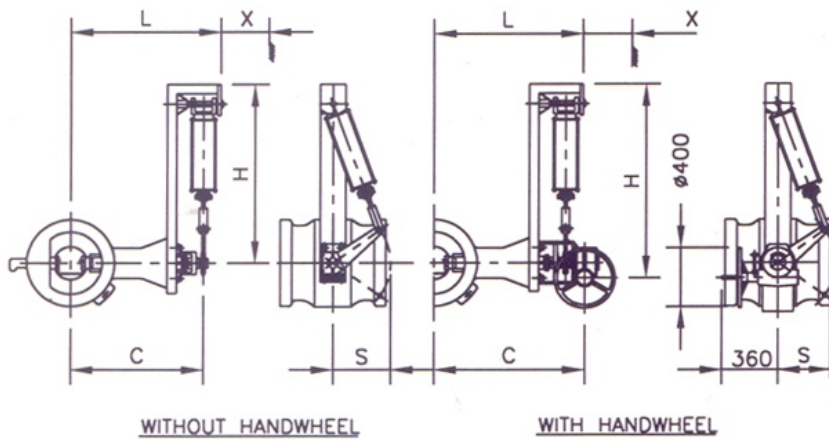


Table 7

MODEL	C	L	X	60° OPN.		Wt. * Appx.
				H <sub>±20</sub>	S	
VFR 6" WITH PC 68LT	434	573	175	838	225	108
VFR 8" WITH PC 68LT	462	601	175	838	225	128
VFR 10" WITH PC 68LT	523	662	175	838	225	168
VFR 12" WITH PC 68LT	543	682	175	838	225	188

\* For weight with Hand wheel add 60 kg.

## VIII. VALVE WITH ELECTRICAL ACTUATOR

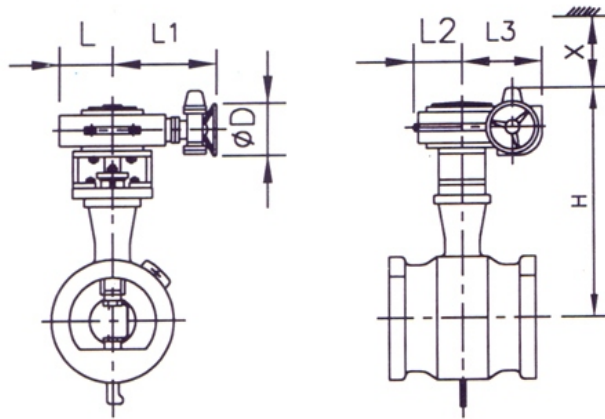


Table 8

MODEL	L	L1	L2	L3	φ D	H	X	Wt. Appx.
VFR 1" WITH AS50	280	180	75	220	250	376	65	21
VFR 1 1/2" WITH AS50	280	180	75	220	250	382	65	22
VFR 2" WITH AS50	280	180	75	220	250	382	65	25
VFR 3" WITH AS50	280	180	75	220	250	442	65	43
VFR 4" WITH AS50	280	180	75	220	250	445	65	48
VFR 6" WITH AS50	280	180	75	220	250	533	65	53
VFR 6" WITH BS100	341	190	111	264	250	533	100	76
VFR 8" WITH AS50	280	180	75	220	250	561	65	73
VFR 8" WITH BS100	341	190	111	264	250	561	100	96
VFR 10" WITH AS50	280	180	75	220	250	622	65	113
VFR 10" WITH BS100	341	190	111	264	250	622	100	136
VFR 12" WITH AS50	280	180	75	220	250	642	65	133
VFR 12" WITH BS100	341	190	111	264	250	642	100	156

## IX. VALVE WITH GEAR BOX & ELECTRICAL ACTUATOR

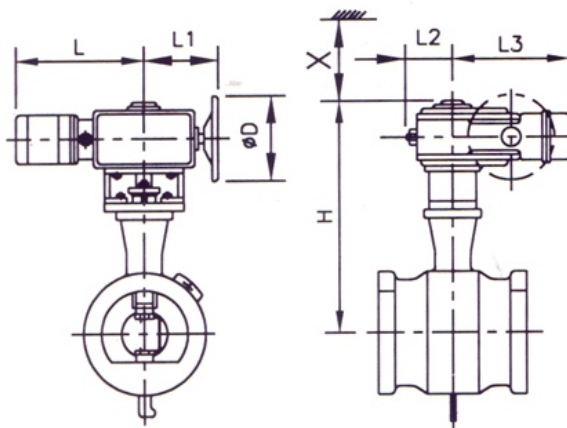


Table 9

MODEL	L	L1	L2	L3	φ D	H	X	Wt. Appx.
VFR 6" WITH B+RS 200	143	402	203	232	300	712	100	95
VFR 8" WITH B + RS 200	143	402	203	232	300	740	100	115
VFR 10" WITH B+RS 200	143	402	203	232	300	801	100	155
VFR 12" WITH B+RS200	143	402	203	232	300	821	100	175