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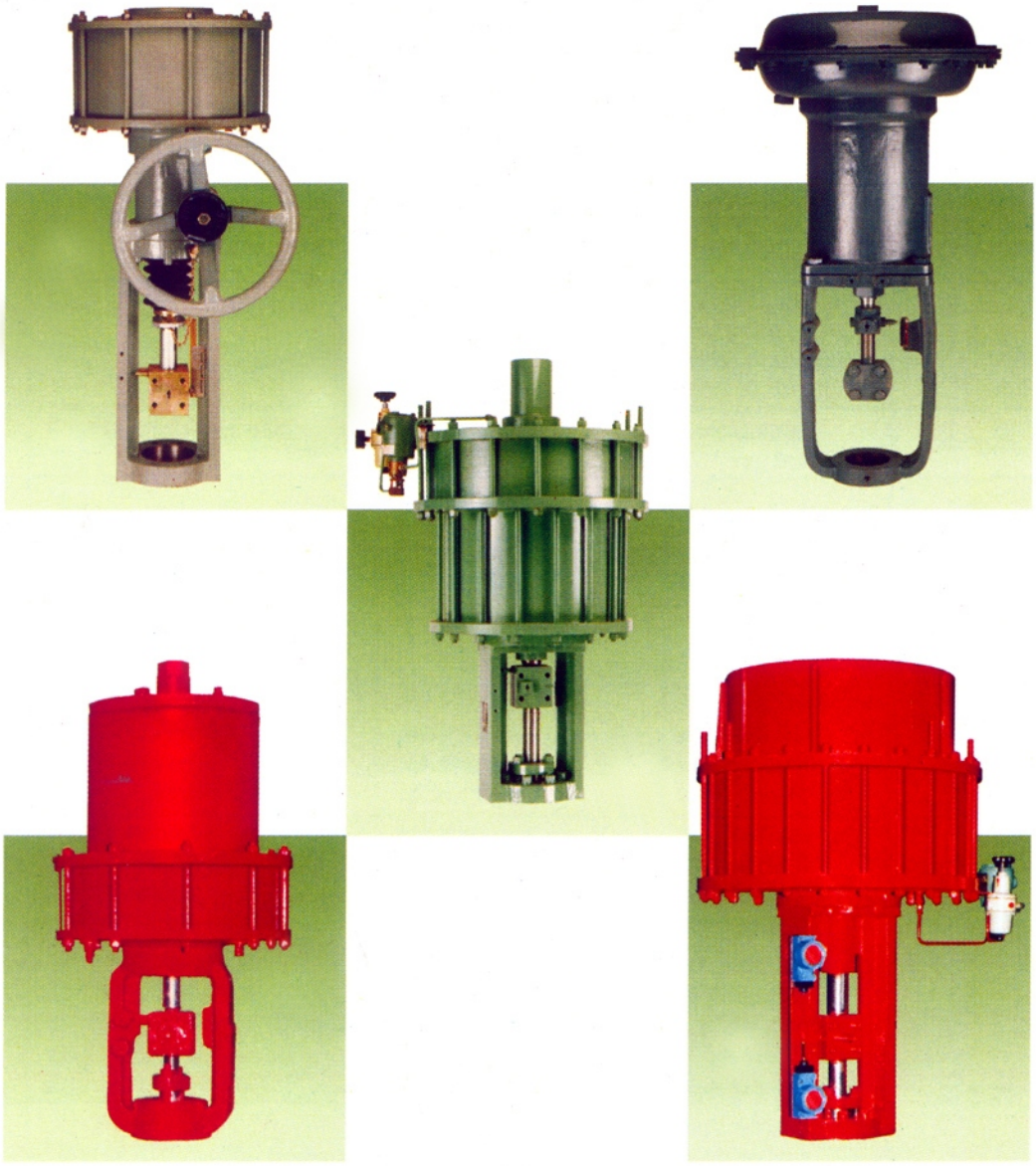


PNEUMATIC

ACTUATORS

FEATURES

	Model	Spring type Diaphragm Actuator	Spring type Piston Cylinder Actuator	Springless Piston Cyllinder Actuator	Mannual Actuator	Lever type Actuator
* SPECIFICATIONS	* Action	Direct :- VA1D, VA2D, VA3D, VA4D, VA5D, SA1D	Direct : VA6D, VA8D	SPA2, SPA2M, SPA2X, SPA2XM, SPA1, SPA1M, SPA1X, SPA1XM, SPA0X, SPA0XM, DPA1, DPA1M	VA1M ~ VA5M, SPA1 (Manual), SPA2 (Manual)	VA1L ~ VA5L
		Reverse :- VA1R, VA2R, VA3R, VA4R, VA5R, SA1R	Reverse: VA6R, VA7R, VA6RS, VA7RS, VA8R, VA8RS, VA9R			
	Spring Range	Refer Tables 4, 5	Refer Tables 8, 9	-	-	-
	Supply Pressure	1.2 ~ 2.8 kg/cm^2 (Max. 3.2 Kg in VA & 4.5 Kg/cm^2 in SA Models)	Refer Tables 8, 9	Refer Tables 10, 11	-	-
	Temperature	-30°C ~ 70°C	-30°C ~ 70°C	-30°C ~ 70°C	-30°C ~ 70°C	
	Stroke	Refer Tables 1, 2, 3, 12	Refer Tables 8, 9	Refer Tables 10, 11	Refer Table 6	Refer Table 7
	Thrust	Refer Table 3, 10	Refer Tables 8, 9	Refer Tables 10, 11	Refer Table 6	Refer Table 7
MATERIAL	Diaphragm case	Carbon steel	Cylinder : Seamless pipe (A106 Gr.A) Piston : Carbon st. A216 Gr. WCB	Cylinder : Seamless pipe (A106 Gr.A) Piston : Carbon st. A216 Gr. WCB	-	-
	Diaphragm	Chloroprene rubber with fabric reinforced	Sealing parts : ("O" ring) Buna - N	Sealing parts : ("O" ring) Buna - N		
	Actuator stem	Stainless steel 316	Piston rod : AISI 420	Piston rod : AISI 420	S.S 316	S.S 316
	** Guide Bushing	L.T. bronze	L.T. bronze	L.T. bronze	L.T. bronze	L.T. bronze
	Yoke	Cast iron (CS - A216WCB on request)	Carbon steel	Carbon steel	Carbon steel	Cast Iron/ Carbon steel
PERFORMANCE	Hysteresis error	w/o Positioner :- within 3% FS with Positioner : within 1% FS.	w/o Positioner :- within 3% FS with Positioner : within 1% FS.	w/o Positioner :- within 3% FS with Positioner : within 1% FS.	-	-
	Linearity	w/o Positioner :- within ±5% FS with Positioner : within ±1% FS.	w/o Positioner :- within ±5% FS with Positioner : within ±1% FS.	w/o Positioner :- within ±5% FS with Positioner : within ±1% FS.	-	-
OPTIONS	Pneumatic connection & tubing	1/4" NPT : VA1 ~ VA3 1/2" NPT : VA4 ~ VA5 Cu (8mm OD); Pvc-Cu (10mm OD) SS 316/(8mm OD) as std. Other sizes on request	1/2" NPT Cu (8mm OD); Pvc-Cu (10mm OD) SS 316/(8mm OD) as std. Other sizes on request	1/2" NPT Cu (8mm OD); Pvc-Cu (10mm OD) SS 316/(8mmOD) as std. Other sizes on request	-	-
	Accessories	Hand wheel (side or top mounted), Adjustable Mech. - stopper (Max./Min.) on request.	Hand wheel (Side mounted). Adjustable Mech stopper (Max./Min.) on request.	Hand wheel (Side mounted Hydraulic jack type in DPA1M) Non adjustable Mech stopper (Max./Min.) on request.	-	-

Note :

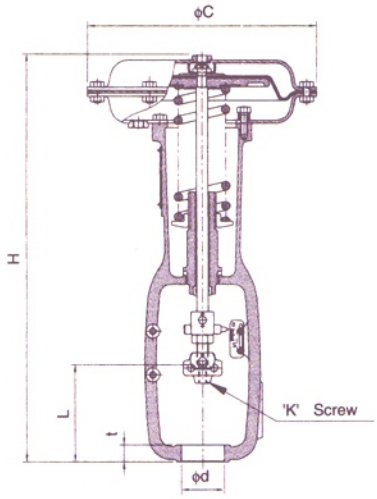
*1. Action reversal possible for VA1 ~ VA3 (VA1D ~ VA3D with additional components & in VA1R ~ VA3R by removing components).

2. In VA1 ~ VA5 & DPA1 Actuators, side mounted hand wheel can be fitted at site.

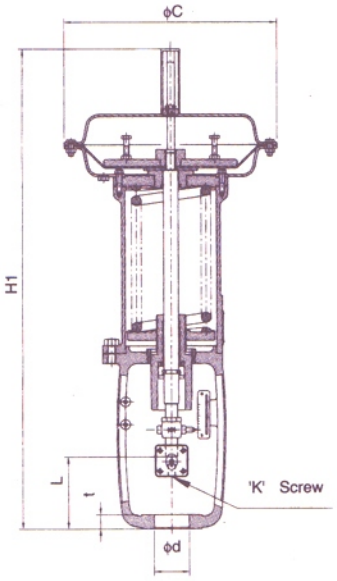
** SS 316 for Cu prohibition application.

SPRING TYPE DIAPHRAGM ACTUATOR

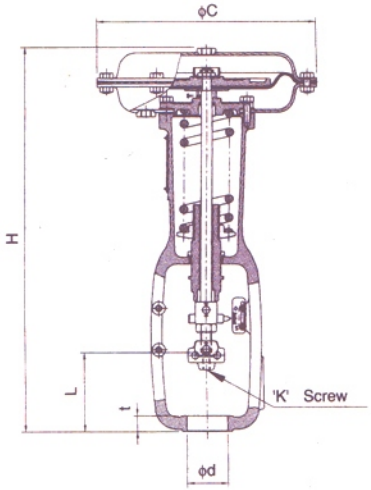
EXTERNAL DIMENSIONS AND APPROX. WEIGHTS



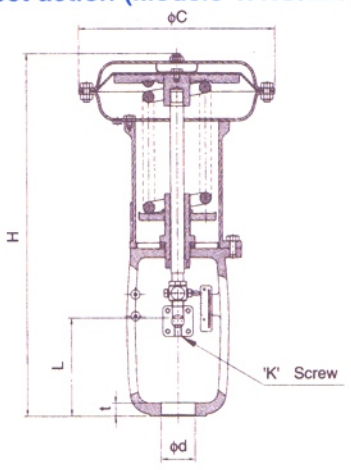
Direct action (Models VA1D/2D/3D)



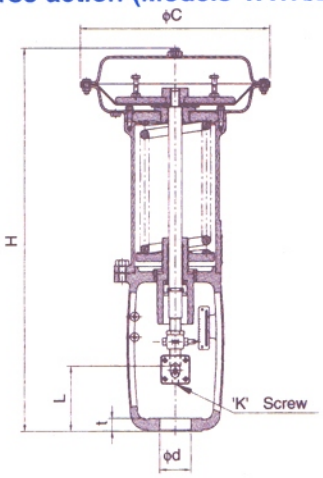
With Mechanical Stopper



Reverse action (Models VA1R/2R/3R)



Direct action (Models VA4D/5D)



Reverse action (Models VA4R/5R)

Table 1

Actuator Model	Maximum Stroke (mm)	External Dimensions (mm)						Diaphragm area (cm^2)	Max. volume of diaphragm chamber (cm^3)	Approx. weight (kg.)	With Mechanical stopper (Min. & Max.) H1	
		L	H	ϕd	t	K	ϕC				Opening	Closing
VA1D	25	126	531	56	22	M9x1	300	285	1790	21	617	
VA1R		98										
VA2D	37.5	144	652	65	26	M12x1.25	350	410	2320	32	767	
VA2R		102										
VA3D	50	195	802	80	30	M15x1.5	450	680	5210	60	959	
VA3R		140										
VA4D	75	256 *(221)	950	90	35	M18x1.5	520	950	11950	135	1245	1194
VA4R		181	1075							160	1370	1222
VA5D	75	268 *(238)	995	110	45	M28x1.5 For low Pr. and M24x1.5 For high Pr.	620	1300	19160	160	1290	1239
	100	312	1195							220	1490	---
VA5R	75	191	1105							185	---	1181
	100	207	1325							255	---	---

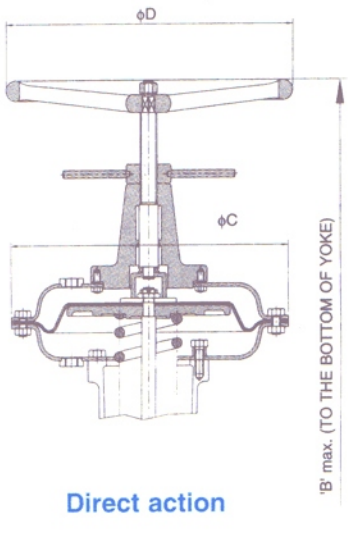
Notes :

1. Dimensions "L" is the measurement when air supply pressure = 0
*2. Dimmensions within ( ) are for strokes 50mm and less.

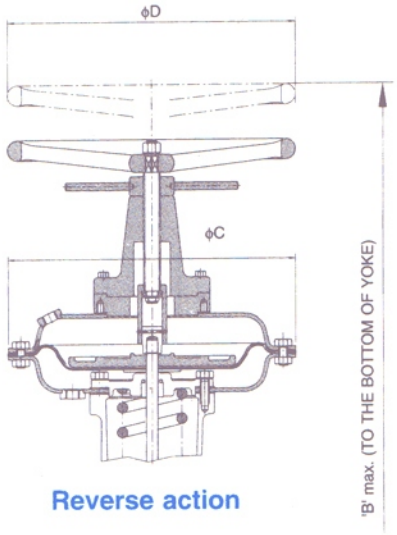
MANUAL HAND WHEEL

EXTERNAL DIMENSIONS AND APPROX. WEIGHTS

Top mounted Handwheel

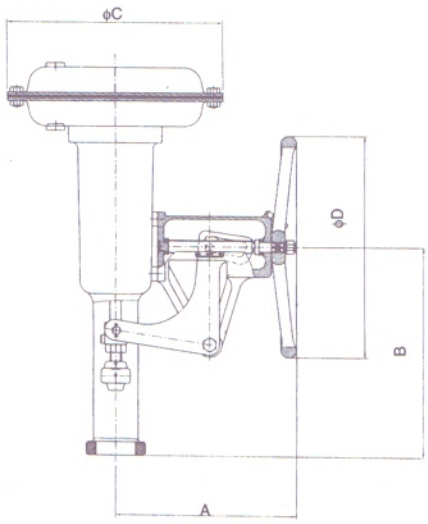


Direct action



Reverse action

Side mounted Handwheel



TOP MOUNTED HANDWHEEL

Table 2

Actuator Model	Maximum Stroke (mm)	External Dimensions (mm)			Max. operating force required at handle (kg.)	Approx. weights Side handle plus Air-O-Motor (Kg.)
		B max.	ϕC	ϕD		
VA1D	25	710	300	280	10	34
VA1R		740				
VA2D	37.5	900	350	355	12	50
VA2R		910				
VA3D	50	1110	450	450	18	100
VA3R		1110				
VA4D	75	1330	520	570	43	175
VA4R		1540				206
VA5D	75	1460	620	570	56	212
	100	1660			65	280
VA5R	75	1690	620	570	56	237
	100	1920			65	315

SIDE MOUNTED HANDWHEEL

Table 3

Actuator Model	Maximum Stroke (mm)	External Dimensions (mm)				Max. operating force required at handle (kg.)	Approx. weights Actuator plus Side H.W (Kg.)
		A	B	ϕC	ϕD		
VA1D,R	25	242	280	300	280	14	29
VA2D,R	37.5	297	335	350	355	21	45
VA3D,R	50	370	423	450	450	28	83
VA4D	75	500	581	520	570	41	176
VA4R							201
VA5D	75	610	591	620	570	56	201
	100		736			50	301
VA5R	75	610	591	620	570	56	226
	100		736			50	336

ACTUATOR THRUST

DIRECT ACTUATOR VA1D ~ VA5D

Table 4

Model	Spring Range Kg/cm²	Supply Pressure Kg/cm²	Actuator Thrust Kg
VA1D	0.2 ~ 1.0	1.2	57
		1.4	114
		2.6	456
VA2D	0.2 ~ 1.0	1.2	82
		1.4	164
		2.6	656
VA3D	0.2 ~ 1.0	1.2	136
		1.4	272
		2.6	1088
	0.2 ~ 1.8	2.8	680
	0.4 ~ 2.0	2.6	408
		2.8	544
VA4D	0.2 ~ 1.0	1.2	190
		1.4	380
		2.6	1520
	0.2 ~ 1.8	2.8	950
	0.4 ~ 2.0	2.6	570
		2.8	760
VA5D	0.2 ~ 1.0	1.2	260
		1.4	520
		2.6	2080
	0.2 ~ 1.8	2.8	1300
	0.4 ~ 2.0	2.6	780
		2.8	1040

Minimum recommended air supply to direct actuators is 1.4 Kg/cm² with positioner.

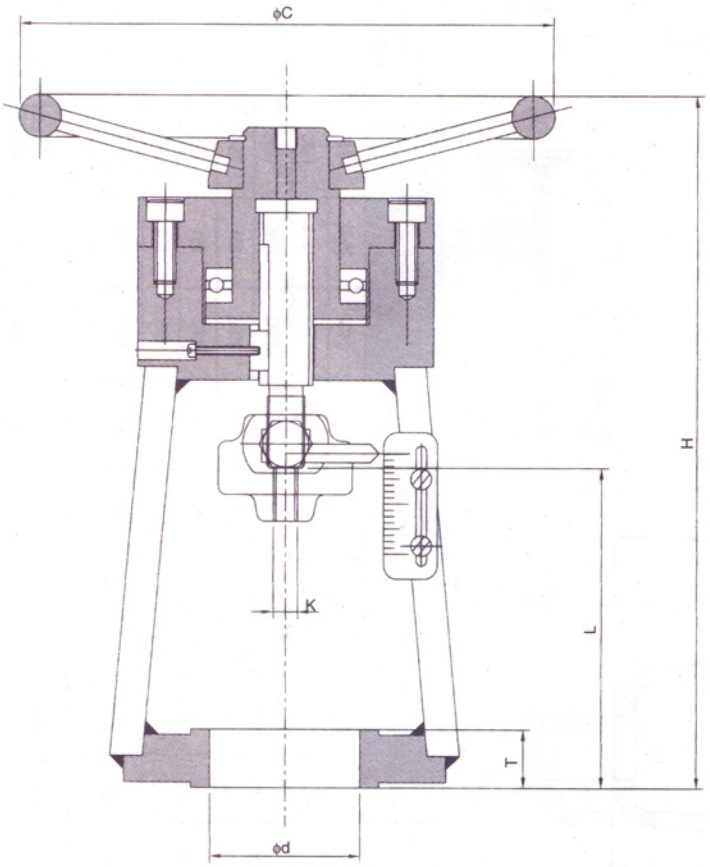
REVERSE ACTUATOR VA1R ~ VA5R

Table 5

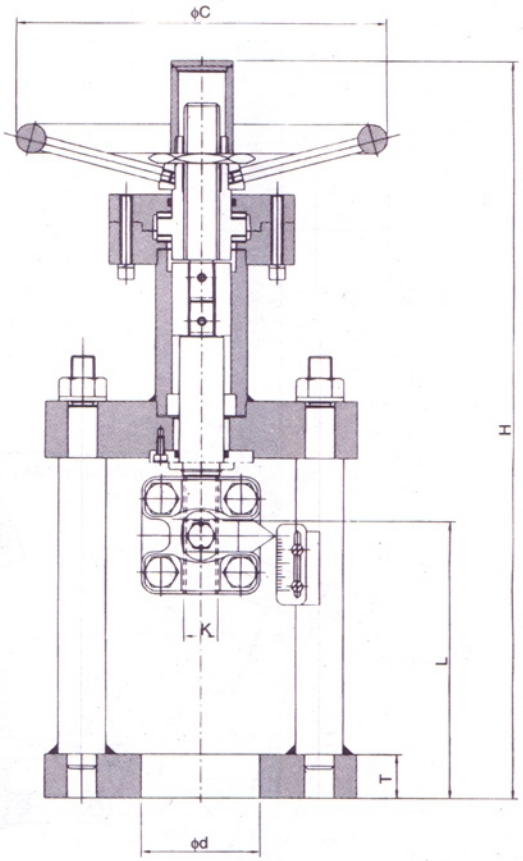
Model	Spring Range Kg/cm²	Supply Pressure Kg/cm²	Actuator Thrust Kg
VA1R	0.2 ~ 1.0	1.4	57
	0.4 ~ 1.2	1.4	114
	0.8 ~ 2.4	2.8	228
	0.4 ~ 2.0	3.0	114
	0.8 ~ 2.4	3.0	228
VA2R	0.2 ~ 1.0	1.4	82
	0.4 ~ 1.2	1.4	164
	0.8 ~ 2.4	2.8	328
	0.4 ~ 2.0	3.0	164
	0.8 ~ 2.4	3.0	328
VA3R	0.2 ~ 1.0	1.4	136
	0.4 ~ 1.2	1.4	272
	0.8 ~ 2.4	2.8	544
	0.4 ~ 2.0	2.6	272
	0.4 ~ 2.0	3.0	272
	0.8 ~ 2.4	3.0	544
VA4R	0.2 ~ 1.0	1.4	190
	0.4 ~ 1.2	1.4	380
	0.8 ~ 2.4	2.8	760
	0.4 ~ 2.0	2.6	380
	0.4 ~ 2.0	3.0	380
	0.8 ~ 2.4	3.0	760
VA5R	0.2 ~ 1.0	1.4	260
	0.4 ~ 1.2	1.4	520
	0.8 ~ 2.4	2.8	1040
	0.4 ~ 2.0	2.6	520
	0.4 ~ 2.0	3.0	520
	0.8 ~ 2.4	3.0	1040

MANUALLY OPERATED ACTUATORS

VA1M ~ VA5M



VA1M & VA2M



VA3M ~ VA5M

Table 6

Model	Maximum Stroke (mm)	External Dimensions (mm)						Thrust in Kgf.	Weight in Kg.
		L	ϕC	H	ϕd	T	K		
VA1 M	25	120	200	260	56	22	M 9x1	285	10
VA2 M	37.5	148	260	302	65	26	M 12x1.25	410	14
VA3 M	50	195	250	510	80	30	M15 x 1.5	680	20
VA4 M	50	221	250	543	90	35	M18 x 1.5	950	25
	75	256	250	655					
VA5 M	50	238	400	706	110	45	M25 x 1.5 H.P	1300	46
	75	268	400	735					
	100	312	400	780			M28 x 1.5 L.P		

X. DIMENSIONS (MODEL PCDE)

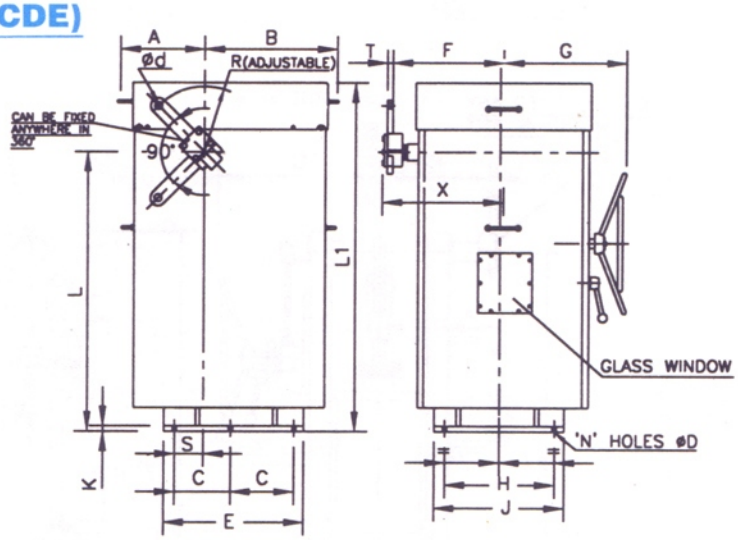


Table 7

MODEL	L	L1	A	B	C	ϕ d	X	E	F	G	H	J	K	T	S	R	N	ϕ D
PCDE 0616	1123	1325	314	576	156	25	260	372	215	408	173	368	12	20	32.5	200 min. 330 Max.	6	20
PCDE 0808	975	1180	314	450	173	20	375	196	330	510	180	450	20	20	97.5	120 min. 300 max.	4	20
PCDE 0816	1279	1532	314	576	156	25	260	372	215	408	173	388	12	20	32.5	200 min. 330 max.	6	20
PCDE 1016	1550	1855	109	595	205	30	450	480	395	580	250	570	16	30	60	250 min. 325 max.	6	27
PCDE 1216	1401	1705	109	595	205	30	450	480	395	580	250	570	16	30	60	250 min. 325 max.	6	27

XI. DIMENSIONS (MODEL PCD)

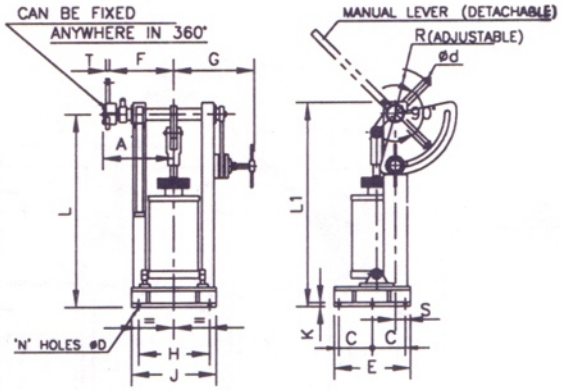
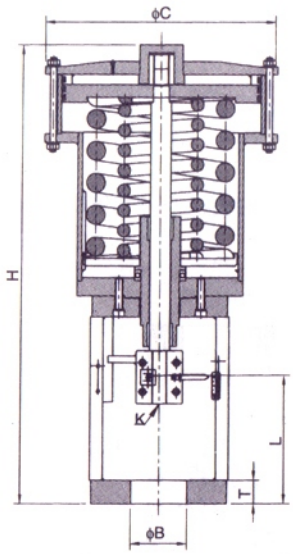


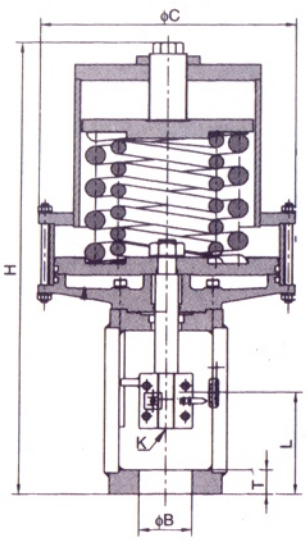
Table 8

MODEL	L	L1	A	ϕ d	C	R	E	F	G	H	J	K	T	S	N	ϕ D
PCD 0616	1124	1185	260	25	156	200 Min. 330 Max.	372	215	408	346	388	12	20	32.5	6	20
PCD 0808	975	1036	375	20	173	120 Min. 300 Max.	396	330	510	360	450	20	20	97.5	4	20
PCD 0816	1279	1340	260	25	156	200 Min. 330 Max.	372	215	408	346	366	12	20	32.5	6	20
PCD 1016	1550	1625	450	30	205	250 Min. 325 Max.	480	395	580	500	570	16	30	60	6	27
PCD 1216	1401	1478	450	30	205	250 Min. 325 Max.	480	395	580	500	570	16	30	60	6	27
PCD1416	1565	1665	555	40	235	300 Min. 450 Max.	550	527	630	600	680	20	40	85	6	30
PCD 2014	1538	1628	585	40	260	300 Min. 450 Max.	600	557	650	650	730	20	40	85	6	30

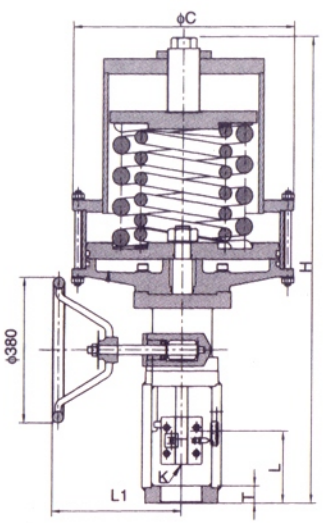
SPRING RETURN PISTON CYLINDER ACTUATORS



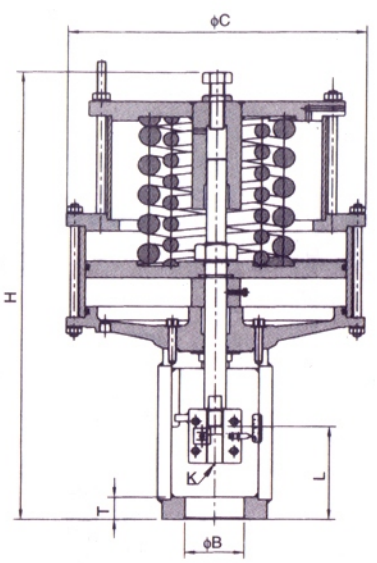
Model :- VA6 D



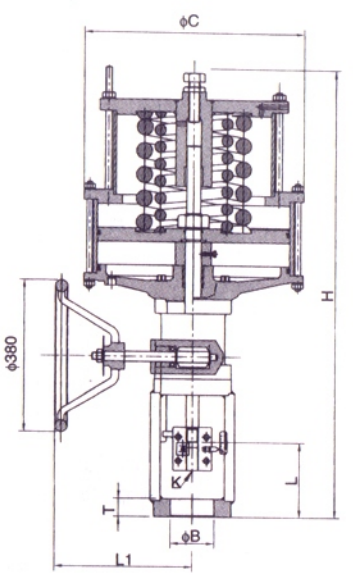
VA6 R



VA6 RS



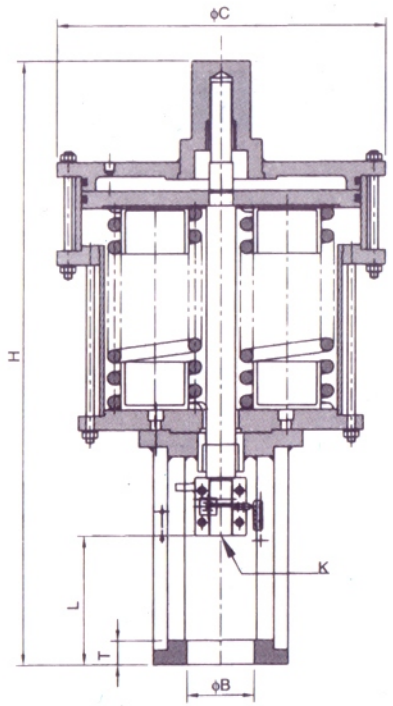
VA7 R



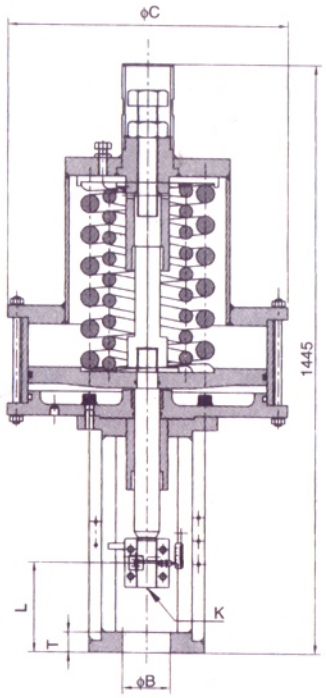
VA7 RS

Table 8

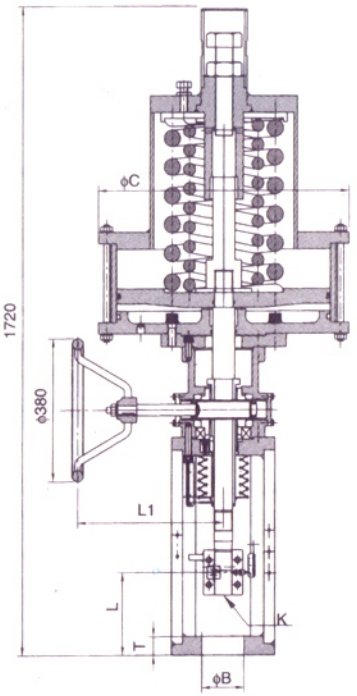
Model	Max. Stroke (in mm.)	External dimensions (in mm.)						K	Air Supply Kg/cm²	Spring range	Thrust in Kgf.	Appx. Weight in Kg.
		H	L	T	ϕC	ϕB	L1					
VA6 D	50	880	190	45	455	110	–	M28x1.5	4.4	0.8 ~ 2.4	2400	240
VA6 R		850		50	445		–		5	1.9 ~ 4.0	2100	210
VA6 RS		1050					348					250
VA7 R		926	245	45	554		–		5	1.9 ~ 3.5	3500	320
									6	2.7 ~ 5.0	5000	
VA7 RS		1125					348		5	1.9 ~ 3.5	3500	365
									6	2.7 ~ 5.0	5000	



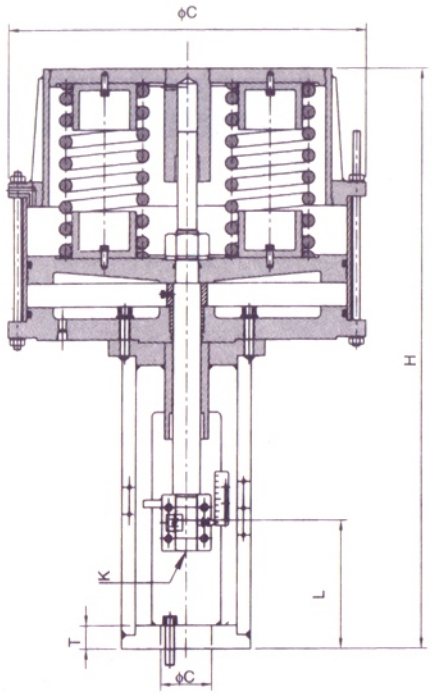
Model :- VA8 D



VA8 R



VA8 RS

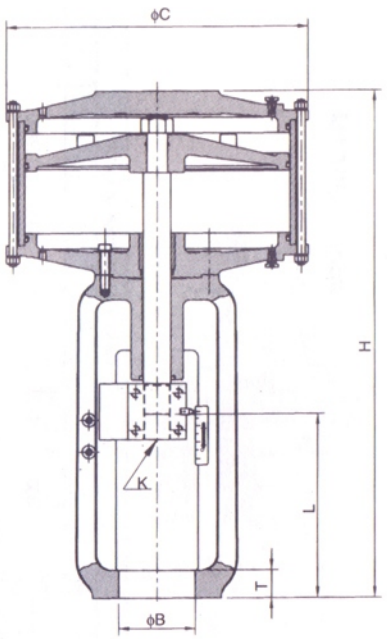


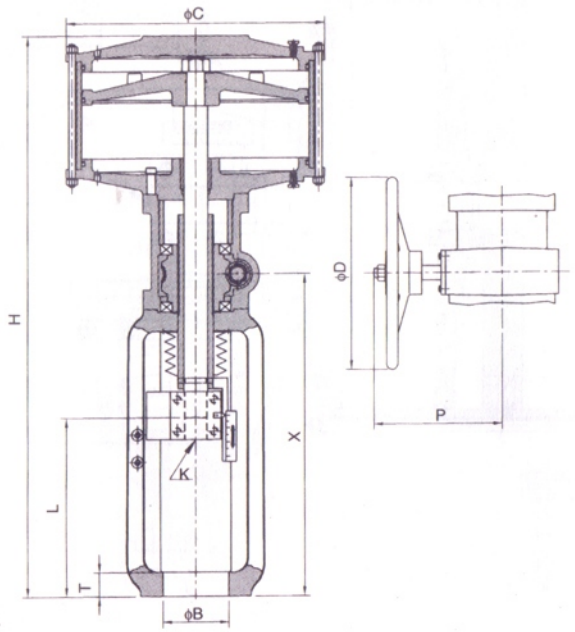
VA9 R

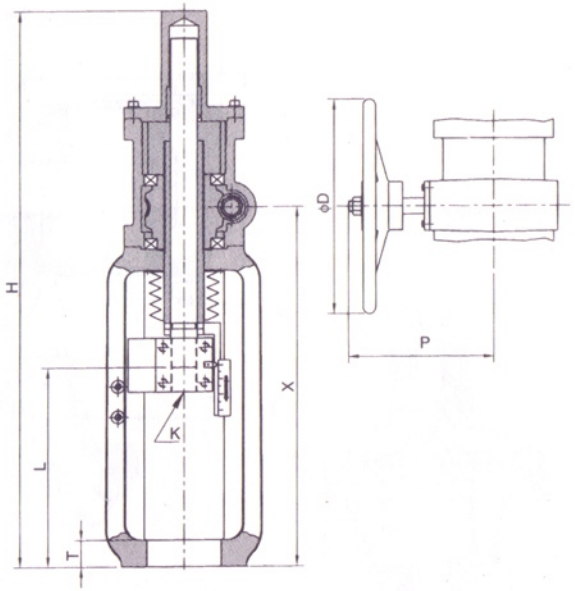
Table 9

Model	Max. Stroke (in mm.)	External dimensions (in mm.)						K	Air Supply Kg/cm²	Spring range	Thrust in Kgf.	Appx. Weight in Kg.
		H	L	T	ϕC	ϕB	L1					
VA8 D	50	1265	255	50	680	140	--	M48x1.5	4	0.7 ~ 1.6	5300	565
	75		280						5	0.7 ~ 2.0	6500	
VA8 R	100	1520	220				--			1.5 ~ 4.0	3900	655
VA8 RS	100	1825					412			1.5 ~ 4.0	3900	730
VA9 R	100	1242	225		775		--			2.0 ~ 4.0	7000	895
	150		275							1.0 ~ 4.2	3000	

DOUBLE ACTING PISTON CYLINDER ACTUATORS & MANUAL ACTUATORS







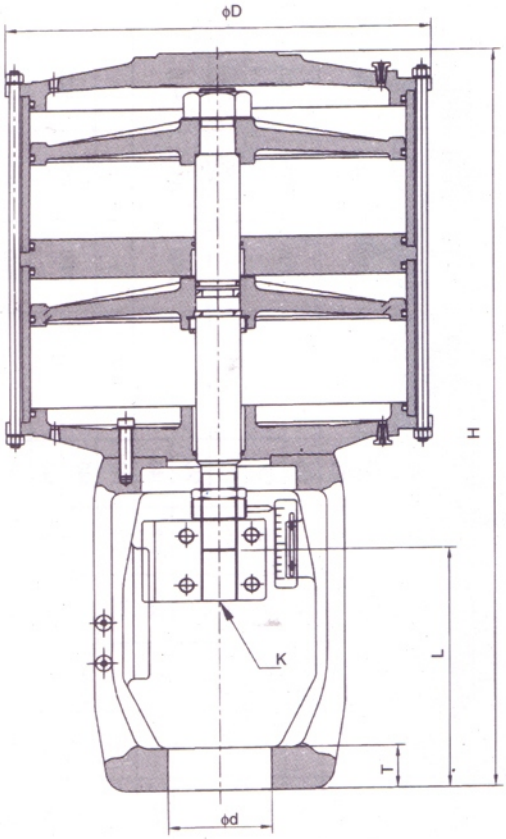
Model :- SPA 0X / SPA 1X / SPA 1 / SPA2X / SPA 2 SPA 0XM / SPA 1XM / SPA 1M / SPA2XM / SPA 2M SPA 1(Manual) / SPA 2 (Manual)

Table 10

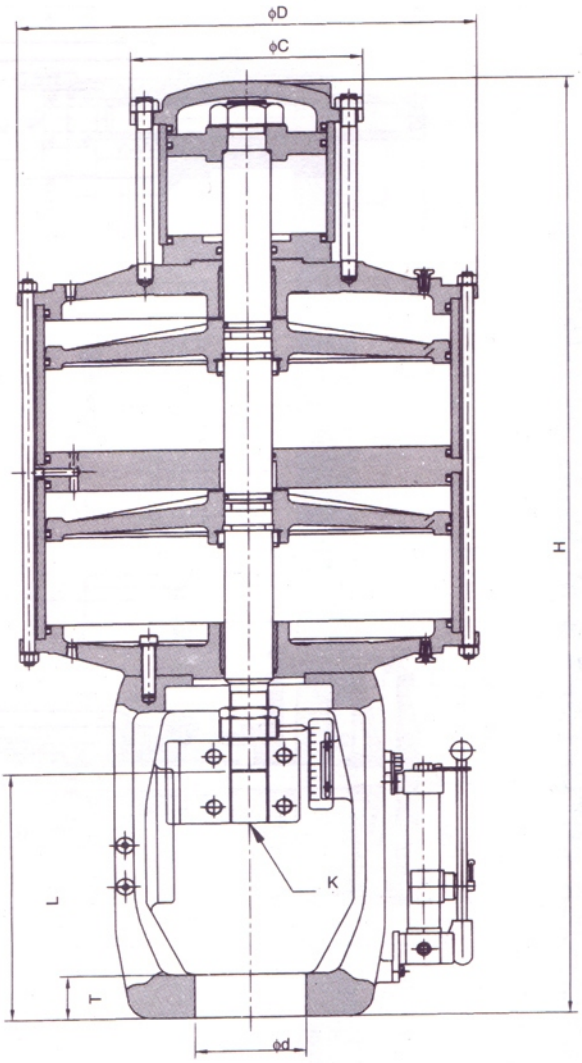
Model	Maximum Stroke (mm)	External Dimensions (mm)									Thrust in Kg. Manual Actuator	Out put thrust (kgf) at supply pressure Kg / cm²						Approx. Weight in Kg.
		H	L	T	ϕC	ϕD	K	P	X	ϕB		2	3	4	5	6	7	
SPA2 X	150	990	190	45	445	380	M39x2	295	--	125	--	1200	2900	3800	4800	5700	6700	185
SPA2 XM		1213		45	445	--		--	725	125	--							230
SPA 2	100	810		45	445	--		--	--	125	--	1200	2900	3800	4800	5700	6700	166
SPA 2M		1053		45	445	380		295	615	125	--							215
SPA 2 (MANUAL)	100	958		45	--	380		295	615	125	4800	--	--	--	--	--	--	86
SPA 1	100	926	225	50	550	--	M48x1.5	--	--	140	--	2900	4400	5800	7300	8800	10200	270
SPA1 M	100	1186		50	550	400		385	673	140	--							345
SPA 1 (MANUAL)	100	1035		50	--	400		385	673	140	7300	--	--	--	--	--	--	160
SPA 1 X	150	1056		50	550	--		--	--	140	--	2900	4400	5800	7300	8800	10200	285
SPA 1 XM	150	1350		50	550	400		385	785	140	--							367
SPA 0 X	200	1246		50	550	400		385	--	140	--	2900	4400	5800	7300	8800	10200	300
SPA 0 XM	200	1541		50	550	400		385	901	140	--	2900	4400	5800	7300	8800	10200	425

DOUBLE PISTON CYLINDER ACTUATOR

DPA1 & DPA1M



Model : DPA1



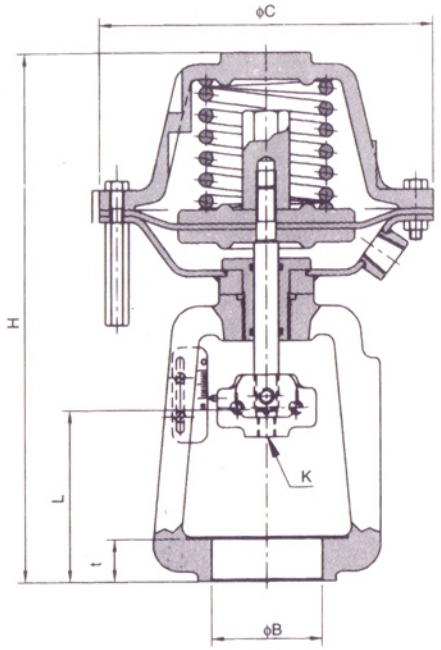
Model : DPA1M

Table 11

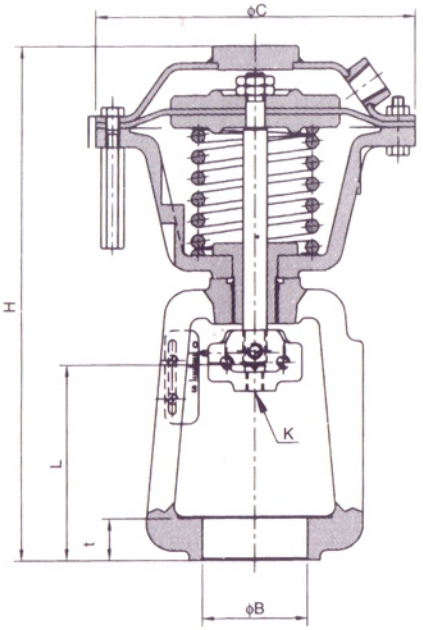
Model	Maximum Stroke (mm)	External Dimensions (mm)							Out put force (kgf) at supply pr. kg/cm²						Weight in Kg.
		H	L	T	ϕC	ϕD	K	ϕd	2	3	4	5	6	7	
DPA1	100	1085	340	60	-	575	M48x1.5	140	5800	8800	11600	14600	17600	20400	565
DPA1M	100	1335	340	60	290	575	M48x1.5	140							575

SA ACTUATOR

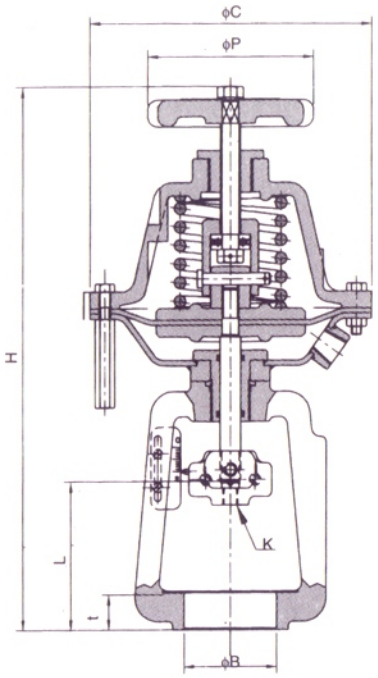
(DIRECT & REVERSE)



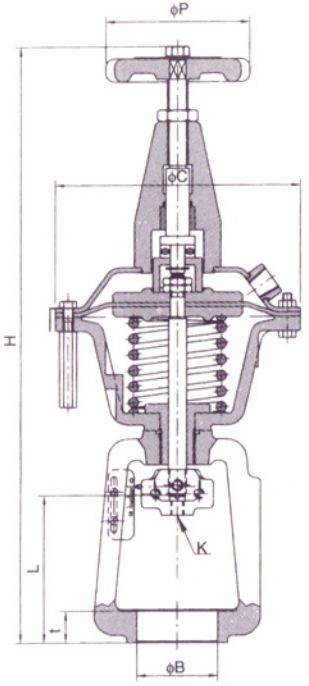
SA1 R



SA1 D



SA1 R with
Top Mounted Hand Wheel



SA1 D with
Top Mounted Hand Wheel

Table 12

Model	Max. Stroke (mm.)	External dimensions (mm.)							Out put thrust (kg) at supply pressure Kg/cm²		Weight in Kg.
		H	t	L	ϕB	ϕC	ϕP	K	2.5 Kg/cm²	4.5 Kg/cm²	
SA1 D	14.3	270	22	101	56	170	--	M9 x 1.5	150	330	5
SA1 R	14.3	275		88.5	56	170	--	M9 x 1.5	80	120	5
SA1 D (TMH)	6	420			56	170	100	M9 x 1.5	140	260	6
SA1 R (TMH)	6	320			56	170	100	M9 x 1.5	80	120	5.5