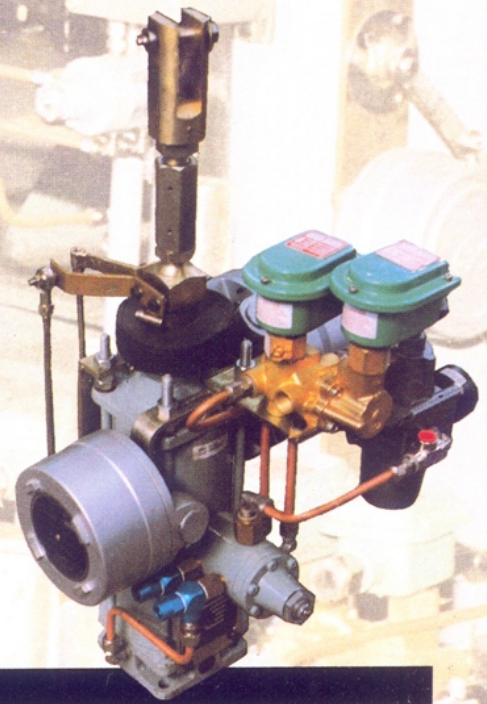
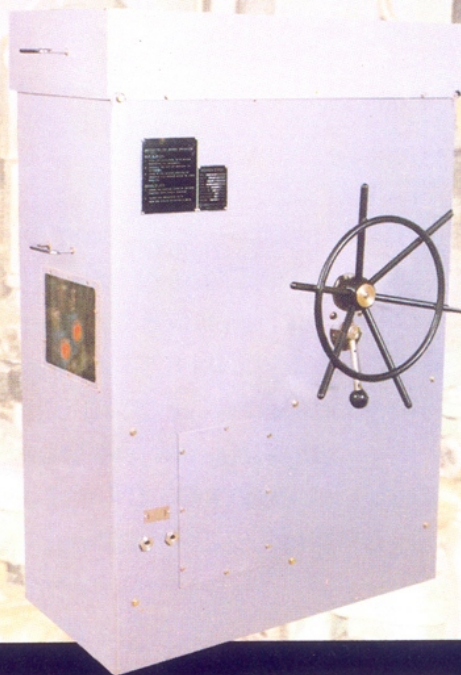
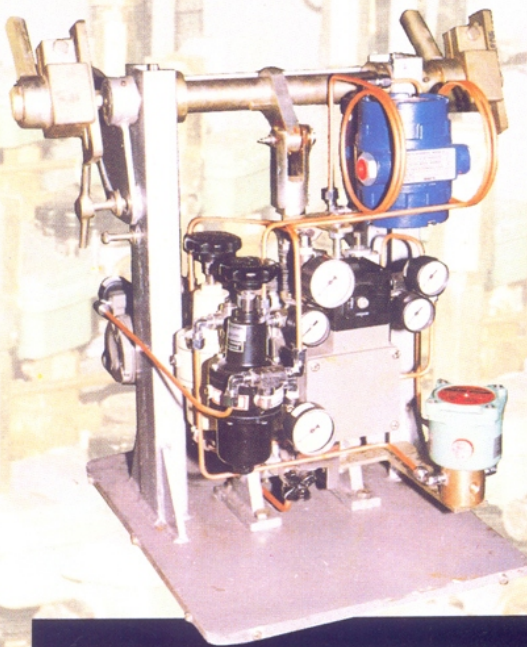
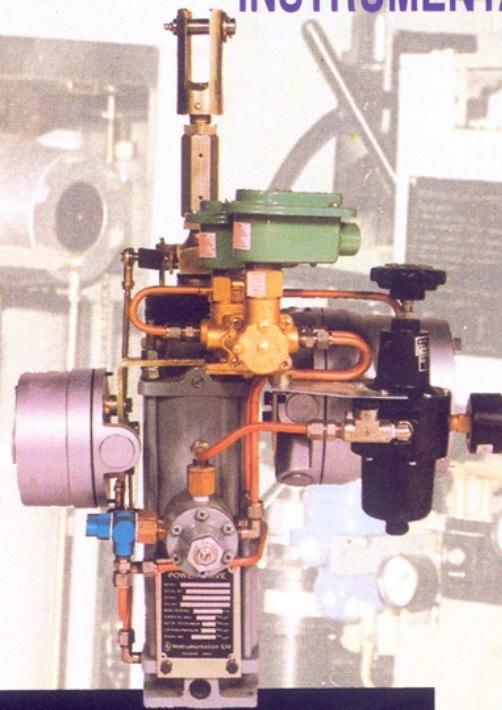
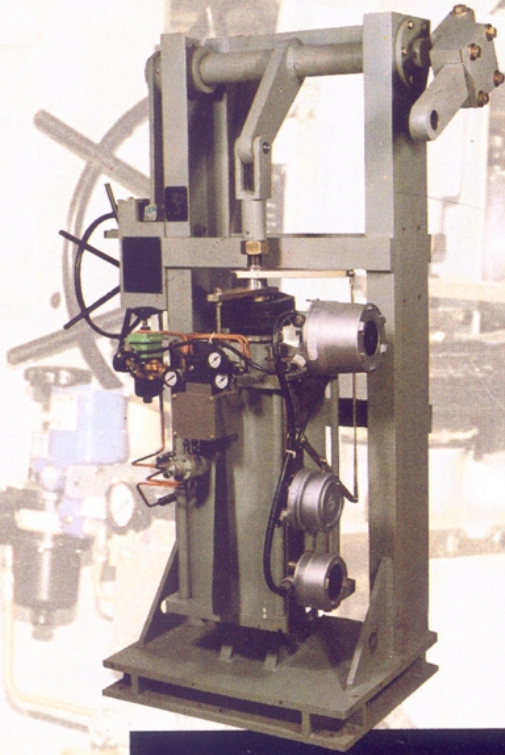




**INSTRUMENTATION LTD.,
PALAKKAD**



**POWER
CYLINDERS**



POWER CYLINDERS

Power cylinders are pneumatic power drives used extensively for actuating final control elements like butterfly valves, eccentric rotary flow wing valves, dampers including PA fan/FD fan applications etc.

Power cylinders manufactured at ILP can be broadly classified to the following.

i) Power cylinder model PC :

Trunnion mounted PC - LT series for regulating application and PC-C series with end cushion for ON/OFF application, to directly actuate the final control element.

ii) Pneumatic control drive model PCD: These are structure mounted power cylinders for regulating duty, quarter turn applications to actuate the final control elements through linkages.

iii) Pneumatic control drive model PCDE; These are PCD series with sheet metal enclosure mainly for use in dusty areas.

I. PC - LT AND PC - C SERIES CYLINDERS

These trunnion mounted actuators facilitate direct coupling of the final controlling element and their rigid construction guarantees reliable operation even in arduous working conditions like in refineries, cement factories, steel plants etc.

■ SALIENT FEATURES

- Tough and rigid construction
- Totally protected from dust and weather
- Optimum range and sizes give economic selection
- Both for regulation and On-Off
- Optional cushion arrangement for PC-C series.
- Special seal material for high temperature application

■ SPECIFICATIONS

Supply pressure	:	7kg/cm ² max.
Input signal	:	0.2-1.0 kg/cm ² to positioner (4-20 mA to I/P converter)
	:	Split signal 0.2-0.6 kg/cm ² & 0.6-1.0 kg/cm ² optional
Operating temperature	:	-20 to 150°C(-20 to 70°C for positioner)
Gaiter	:	Provided to prevent dust entry.
End cushion	:	Provided for PC - C models for ON/OFF application
Construction details	:	Refer Page 5 for PC - LT and PC - C Series
Thrust and weight details	:	Refer Page 5
Dimensional details	:	Refer Page 6

■ MODELS

Regulating duty	:	PC - LT 0404, 0408, 0608, 0616, 0808, 0816 1016, 1024, 1216, 1418.5, 2014.
ON/OFF duty	:	PC - C, 0404, 0408, 0608, 0616, 0808, 0816, 1016, 1024, 1216

Manual operation not possible in above series.



II PCD & PCDE SERIES

Pneumatic control drives of above series facilitate installation and coupling with the final control element through linkages. The output lever for quarter turn (0-90°) operation can be adjusted anywhere in 360°.

■ SALIENT FEATURES

- Tough and rigid construction
- Totally protected from dust and weather by sheet metal enclosure (for PCDE models)
- Optimum range and sizes give economic selection
- Manual operation provided
- Frame mounted

■ SPECIFICATIONS

Supply pressure	:	7kg/cm ² max.
Input signal	:	0.2-1.0 kg/cm ² (4-20 mA with I/P converter)
	:	Split range 0.2 - 0.6 kg/cm ² & 0.6-1.0 kg/cm ² , optional.
Temperature range	:	-20 to 150° C (-20 to 70° for positioner)

■ MODELS

Without enclosure	:	PCD 0404, 0408, 0608, 0616, 0808, 0816, 1216, 1416, 2014
With enclosure	:	PCDE 0404, 0408, 0608, 0616, 0808, 0816, 1216
Manual operation by hand lever for PCD & PCDE 0404, 0408, 0608 sizes and handwheel for 0616, 0808, 0816, 1016, 1216, 2014 sizes.		
Torque and weight details	:	Refer Page No. 6
Dimensional details	:	Refer Page No. 7

III ACCESSORIES

Following accessories can be offered along with above actuators

a) Positioner	:	Model PCP -001, ILP make. (Not applicable for PC - C models)
b) Air set	:	Placka/Shavo Norgan make with/without pressure gauge.
c) Air lock (Double acting)	:	Model DALR, ILP make.
d) Limit switches	:	DPDT/2NO. + 2 NC micro switches in ILP make ULA 001 (4 switches) and ULA 002 (2 switches), enclosure protection both IP65 and IIA/IIB. and in ULA 003 Ex (2 No.) for IIC application. Other makes on demand.
e) Solenoid valve	:	ASCO (I)/HERION/ROTEX (I) make as per customer request.
f) Position transmitter	:	Model EPT -002/EP2-002 EX, ILP make in IP65 IIA/IIB enclosures respectively.
g) I/P converter	:	CG - H & B/MTL/Shreyas/Watson Smith/Bells controls make as per customer requirement. Other makes on demand.
h) Junction box	:	Model UJA, ILP make, IP65 & IIA/IIB enclosure. Other makes on demand.
i) Pressure switch	:	Indfoss make. Others on request.
j) Turn buckle	:	Can be provided for PC - LT & PC - C models.
k) Backup system	:	Air cylinder unit with pneumatic relay & non return valve.
i) Manual operation	:	Hand wheel/lever for PCD & PCDE series, with equalising valve. Typical pneumatic tubing diagrams for both regulating and on off applications are given at Page No. 9 & 10.



IV. CYLINDER CONSTRUCTION & PARTS DETAILS

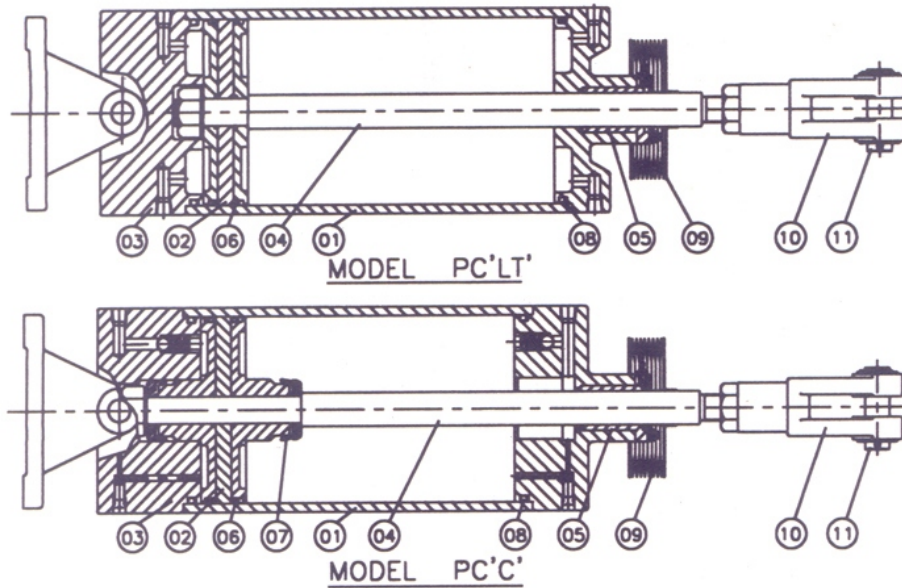


Table 1

SL.NO.	PART NAME	MATERIAL
01	CYLINDER	Seamless carbon steel tube Honed and hard chrome plated
02	PISTON	Carbon steel (Plated)
03	END COVERS	Carbon steel
04	PISTON ROD	Martensitic stainless steel (Hard chrome plated)
05	GUIDE BUSHING	Leaded tin bronze
06	PISTON SEAL	Viton
07	CUSHION SEAL	Viton
08	O'RINGS	Viton
09	GAITER	Cloth reinforced rubber
10	FORK	Carbon steel
11	FORK PIN	Martensitic stainless steel

LUBRICATION	MOLYBDENUM DISULPHIDE IN MINERAL GREASE BASE
PNEUMATIC CONNECTION	NICKEL PLATED BRASS FITTING WITH COPPER TUBING

V. THRUST & WEIGHT DETAILS OF POWER CYLINDERS

Table 2

MODEL	SIZE	POWER CYLINDER SIZE	80% OF STALL THRUST IN Kg AT SUPPLY PRESSURE IN KG/cm ²							STROKE (MM)	APPROX. WEIGHT (Kg.)
			2	3	4	5	6	7			
PCLT	0404	4" x 4"	123	184	246	307	384	430	102 (4")	10	
PCLT	0408	4" x 4"							204 (8")	18	
PCC	0404	4" x 4"							102 (4")	12	
PCC	0408	4" x 8"	277	416	552	693	832	970	204 (8")	21	
PCLT	0608	6" x 8"							204 (8")	36	
PCLT	0616	6" x 16"							406 (16")	42	
PCC	0608	6" x 8"	493	739	836	1232	1478	1735	204 (8")	41	
PCC	0616	6" x 16"							406 (16")	47	
PCLT	0808	8" x 8"							204 (8")	80	
PCLT	0816	8" x 16"	770	1155	1539	1925	2310	2694	406 (16")	90	
PCC	0808	8" x 8"							204 (8")	84	
PCC	0816	8" x 16"							406 (16")	94	
PCLT	1016	10" x 16"	1109	1664	2218	2773	3327	3882	406 (16")	163	
PCLT	1024	10" x 24"							806 (24")	245	
PCC	1016	10" x 16"							405 (16")	175	
PCC	1024	10" x 24"	2796	4194	5592	6990	8388	9786	606 (24")	260	
PCLT	1216	12" x 16"							406 (16")	290	
PCC	1216	12" x 16"							406 (16")	310	
PCLT	1418.5	14" x 18.5"	1324	1986	2347	3310	3971	4633	470 (18.5")	395	
PCLT	2014	20" x 14"	2796	4194	5592	6990	8388	9786	356 (14")	625	



VI. DIMENSIONS (MODEL PC - LT & PC - C)

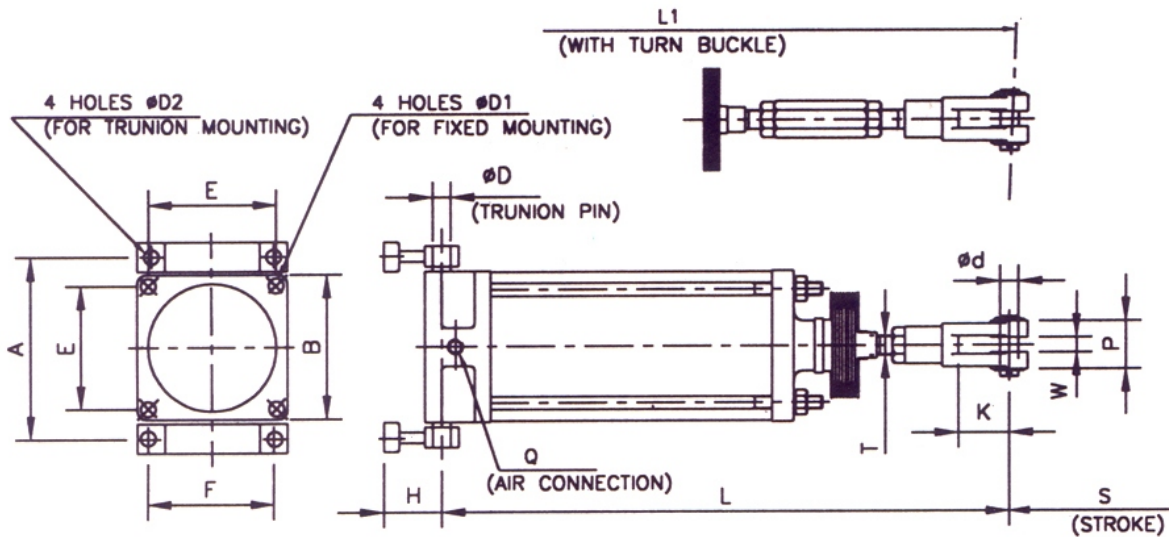


Table 3

MODEL	L	L1	H	2	P	W	d	K	B	A	E	F	T	1(NPT)	D	D1	D2
0404 LT	416	525	60	102	40	20	15	41	124	135	94	93	M 20	1/4"	20	13	16
0404 C	406	510	60	102	40	20	15	41	110	135	94	93	M 20	1/4"	20	13	16
0408 LT	502	610	60	204	40	20	15	41	124	135	94	93	M 20	1/4"	20	13	16
0408 C	614	694	.65	204	40	20	15	41	110	135	94	93	M 20	1/4"	20	13	16
0608 LT	576	695	80	204	40	16	16	41	166	197	133	130	M 20	1/4"	20	18	16
0608 C	615	720	80	204	40	16	16	41	168	197	133	130	M 20	1/4"	20	18	16
0616 LT	778	897	80	406	40	16	16	41	168	197	133	130	M 20	1/4"	20	18	16
0616 C	816	992	80	406	40	16	16	41	168	197	133	130	M 20	1/4"	20	18	16
0808 LT	712	910	100	204	68	22	22	75	218	256	171	170	M 28x1.5	1/4"	25	22	16
0808 C	790	998	100	204	68	22	22	75	218	256	171	170	M 28x1.5	3/4"	25	22	18
0816 LT	914	1112	100	406	68	22	22	75	218	256	171	170	M 28x1.5	1/4"	25	22	18
0816 C	990	1188	100	405	68	22	22	75	218	256	171	170	M 28x1.5	3/4"	25	22	18
1016 LT	1150	1360	215	406	74	36	25	75	277	320	--	165	M 33x3	3/4"	38	27	27
1016 C	1068	1278	215	406	74	26	25	75	277	333	213	260	M 33x3	3/4"	38	27	27
1024 LT	1250	1460	250	356	74	36	25	75	277	335	213	260	M 33x3	3/4"	38	27	--
1024 C	1300	1510	215	608	74	26	25	75	277	335	213	260	M 33x3	3/4"	38	27	27
1216 LT	1025	1235	215	406	74	26	25	75	326	382	255	260	M 33x3	3/4"	38	27	27
1216 C	1070	1280	215	406	74	26	25	75	326	382	255	260	M 33x3	3/4"	38	27	27
1418.5 LT	1250	1460	120	470	68	36	22	100	360	360	--	200	M 39x4	3/8"	30	--	20
2014 LT	1165	1415	160	356	85	40	36	160	512	576	--	290	M 39x3	3/4"	40	-	30

VII. TORQUE & WEIGHT DETAILS OF PNEUMATIC CONTROL DRIVES

Table 4

MODEL	PISTON CYLINDER SIZE	*80% OF STALL TORQUE IN Kgm AT SUPPLY PRESSURE IN Kg/cm ²						STANDARD LEVER LENGTH (mm)	WEIGHT (Kg. appr.)	
		2	3	4	5	6	7		WITH OUT ENCLOSURE	WITH ENCLOSURE
PCD 0404	4" x 4"	8	9	12	15	18	21	70 - 120	50	70
PCDE 0404										
PCD 0408										
PCDE 0408	4" x 8"	12	18	24	30	36	42	130 - 200	90	120
PCD 0608										
PCDE 0608										
PCD 0816	6" x 8"	28	42	55	70	83	97	130 - 200	95	125
PCDE 0816										
PCD 0808										
PCDE 0808	8" x 8"	49	74	99	123	148	173	130 - 200	160	200
PCD 0816										
PCDE 0816										
PCD 1016	8" x 16"	98	147	196	245	294	393	200 - 330	175	215
PCDE 1016										
PCD 1216										
PCDE 1216	10" x 16"	153	231	308	385	461	538	250 - 325	475	540
PCD 1216										
PCDE 1216										
PCD 1416	12"x16"	221	333	444	555	665	776	250 - 325	500	550
PCDE 1416										
PCD 2014										
PCDE 2014	14"x16"	265	397	470	662	795	927	300 - 450	660	--
PCD 2014										
PCDE 2014										
PCD 2014	20"x14"	498	746	995	1244	1493	1742	250 - 400	1000	--
PCDE 2014										
PCD 2014										



VIII. DIMENSIONS (MODEL PCD)

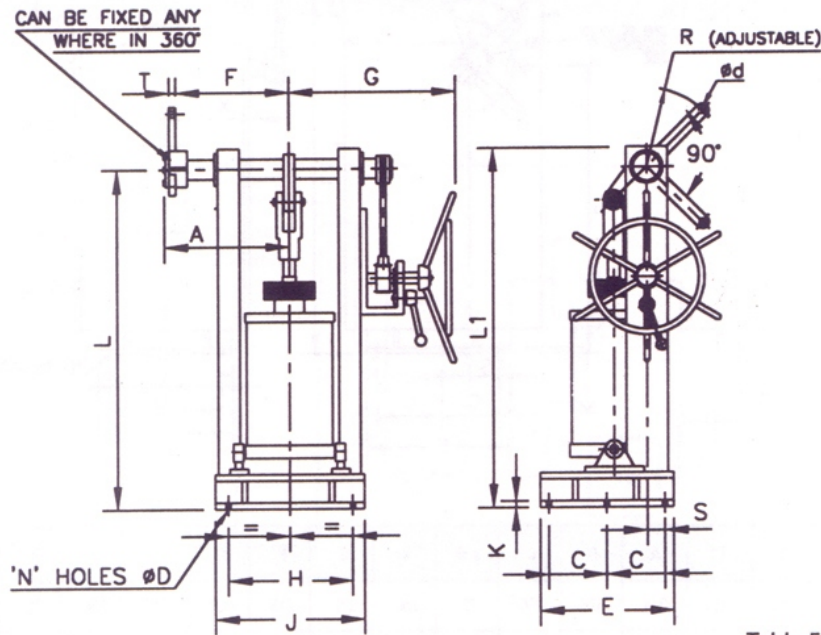


Table 5

MODEL	L	L1	A	φ d	C	R	E	F	G	H	J	K	T	S	N	φ D
PCD0404	595	635	90	23.5	140	70 Min. 120 Max.	370	239	200	225	300	12	12	104	4	24
PCD0408	882	922	300	18	160	100 Min. 290 Max.	320	276	318	180	260	12	12	90	4	18
PCD0608	882	922	300	18	160	100 Min. 290 Max.	320	276	318	180	260	12	12	90	4	18

IX. DIMENSIONS (MODEL PCDE)

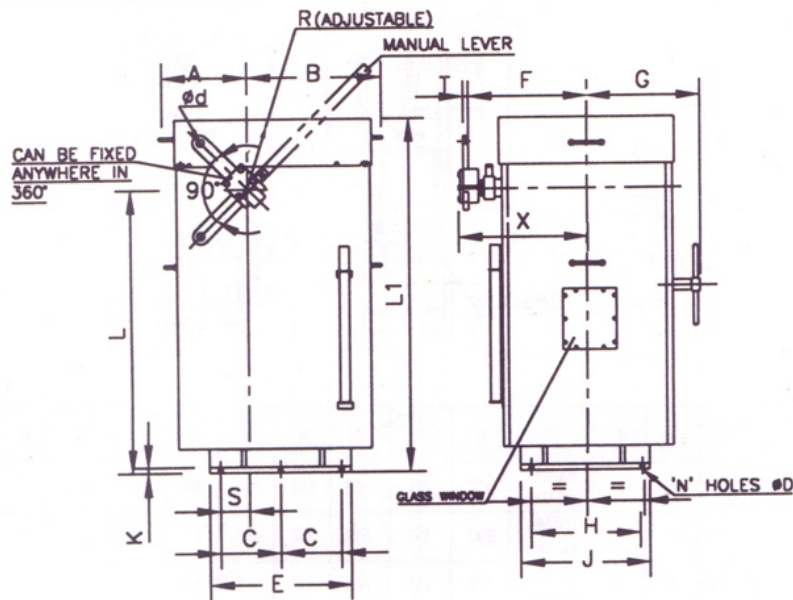


Table 6

MODEL	L	L1	A	B	C	φ d	X	E	F	G	H	J	K	T	S	R	N	φ D
PCDE0404	535	710	155	230	140	23.5	265	370	239	200	225	300	12	12	104	70 min 120 Max.	4	24
PCDE 0408	922	1135	368	424	180	23.5	300	680	276	318	266	586	12	12	90	100 min. 290 max	4	24
PCDE 0608	922	1135	368	424	160	23.5	300	680	276	318	266	586	12	12	90	100 min 290 max.	4	24



X. DIMENSIONS (MODEL PCDE)

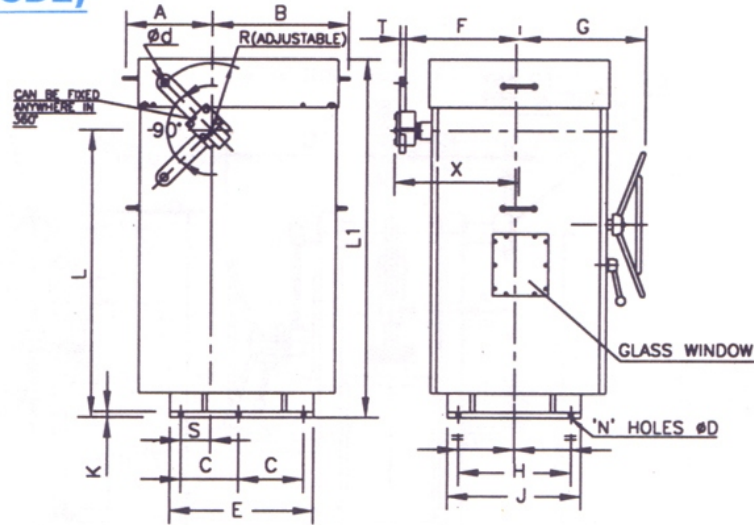


Table 7

MODEL	L	L1	A	B	C	ϕd	X	E	F	G	H	J	K	T	S	R	N	ϕD
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)

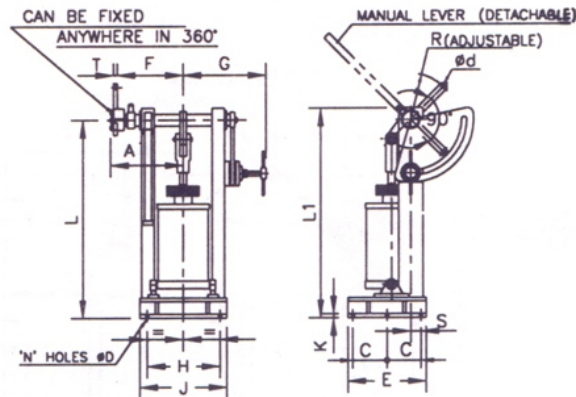
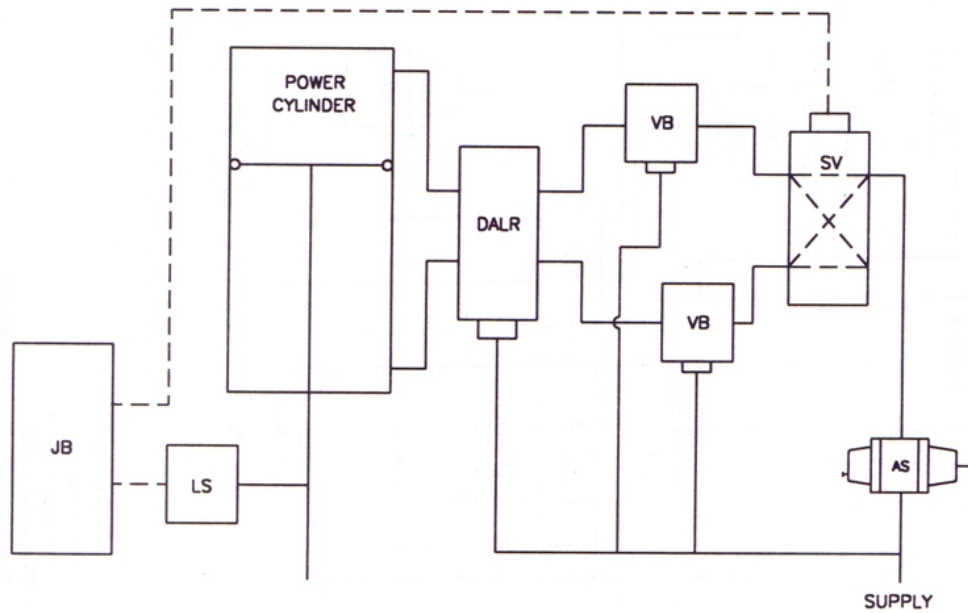


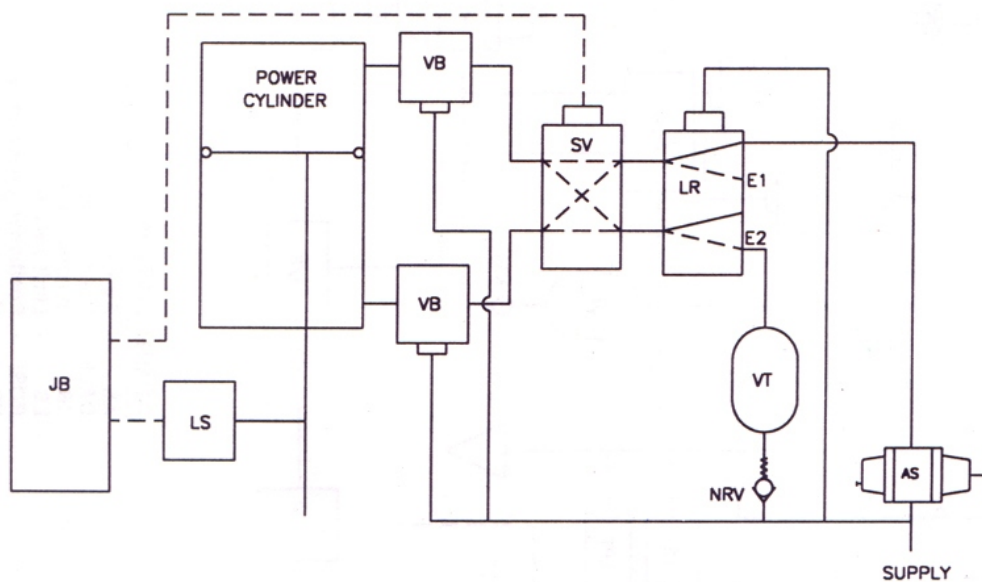
Table 8

MODEL	L	L1	A	ϕd	C	R	E	F	G	H	J	K	T	S	N	ϕD
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

XII. TYPICAL SCHEMATIC DIAGRAM FOR ON-OFF POWER CYLINDER WITH AIRLOCK RELAY

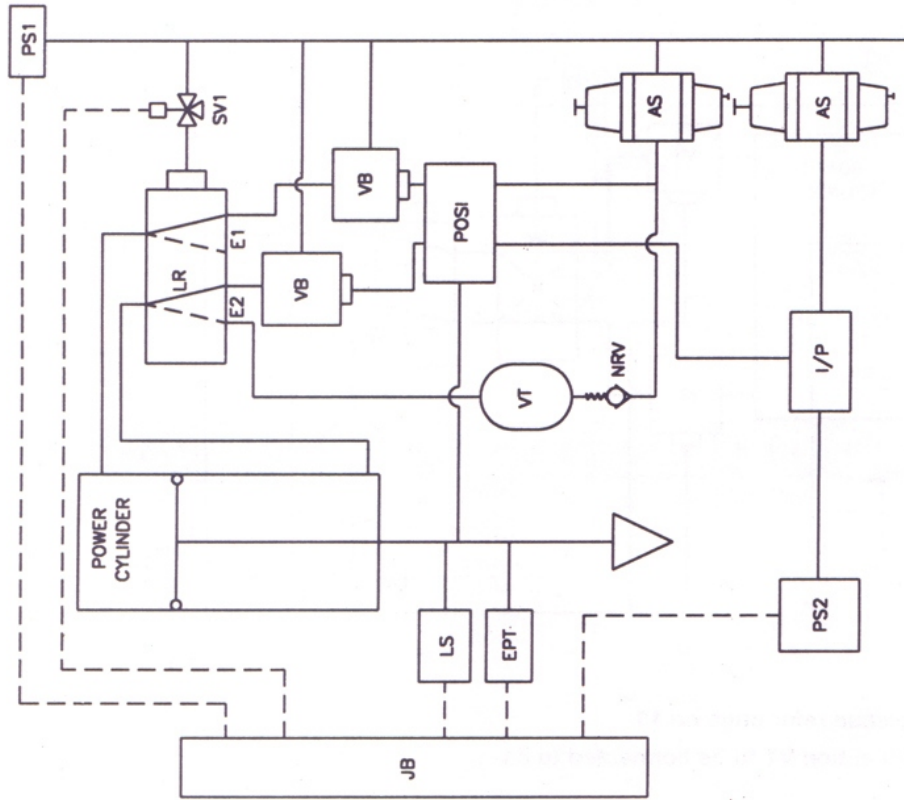


XIII. TYPICAL SCHEMATIC DIAGRAM FOR ON-OFF POWER CYLINDER WITH BACKUP SYSTEM

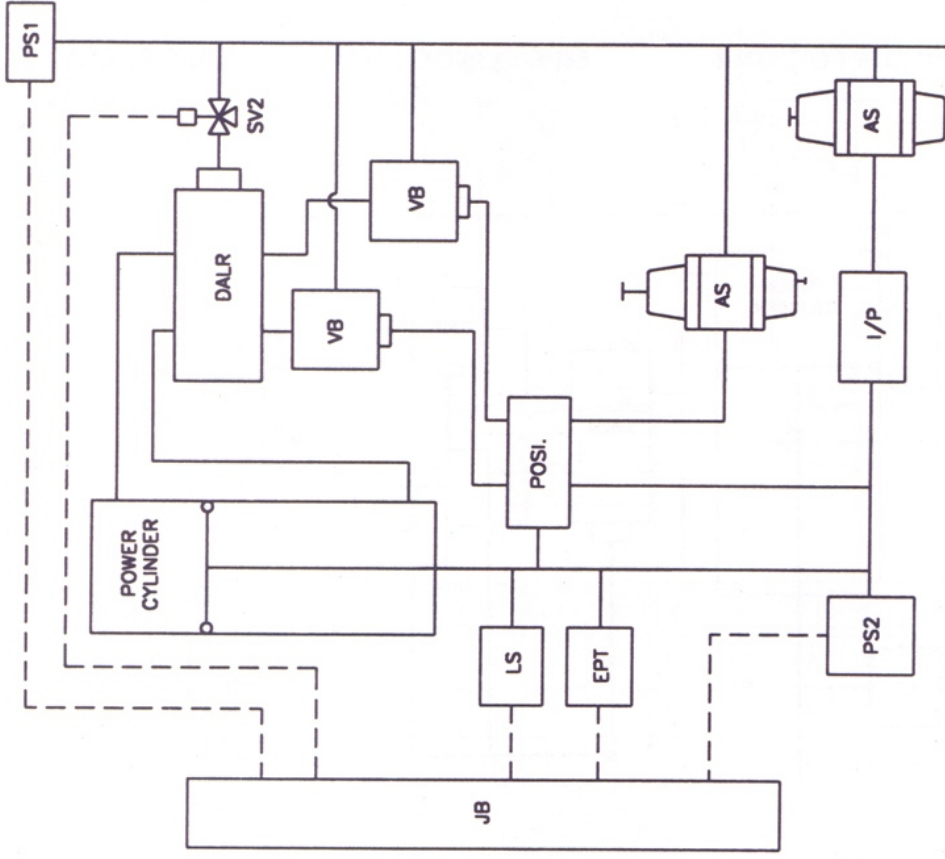


- Note:-
- 1) For abbreviations please refer page no.10.
 - 2) For change of air fall action VT to be connected to E1

XIV. TYPICAL SCHEMATIC DIAGRAM FOR REGULATING POWER CYLINDER WITH BACKUP SYSTEM



XV. TYPICAL SCHEMATIC DIAGRAM FOR REGULATING POWER CYLINDER WITH AIRLOCK RELAY



ABBREVIATIONS

- | | | | |
|------|---|------|---|
| AS | - Air set | LR | - Lock up relay |
| DALR | - Double acting airlock relay | VT | - Volume tank |
| JB | - Junction box | NRV | - Non return valve |
| LS | - Limit switch | PS | - Pressure switch |
| POSI | - Positioner (pneumatic) | EPT | - Electronic Position transmitter |
| VB | - Volume booster | I/P | - Current to pneumatic converter |
| PS1 | - PR. switch to sense air failure. | SV2 | - Solenoid valve for power failure -stayput. |
| PS2 | - PR. switch to sense signal failure. | DALR | - Double acting air lock relay for air failure - stayput. |
| SV1 | - Solenoid valve for power failure -open / close. | | |

Note:- 1) For change of air fall action VT to be connected to E1

