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SPECIAL CYLINDER AS PER CUSTOMER REQUIREMENT

Block Cylinder



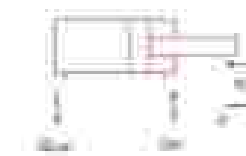
Features :

- ★ This is a double acting cylinder with universal mounting.
- ★ It is a Chromium plated piston alloy steel body with male & female threaded piston ends.
- ★ It can be used with the stroke range : 10 /16 /25 /50 /75 /100
- ★ It can be used in the range of 1 MPa (minimum operating pressure)
15 MPa (maximum operating pressure)
70 bar N (pushing force)

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2 / 4 = 0.785 d_1^2$
- $A_2 = \pi (d_1^2 - d_2^2) / 4$
- $F_1 = P_1 A_1 - P_2 A_2 - F$
- $F_2 = P_2 A_2 - P_1 A_1 + F$
- $Q_{in} = A_1 v$
- $Q_{out} = A_2 v$
- P_2 - result back of pressure from pipes & valves for Q_{in}



- A_1 piston area
- d_1 piston
- A_2 rod area
- d_2 rod
- F force
- P_1 pressure, piston side

simplified

$$F_1 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot 10 (\text{N})}{A_1 (\text{mm}^2)}$$

$$F_2 (\text{N}) = \frac{P_2 (\text{bar}) \cdot A_2 (\text{mm}^2) \cdot 10 (\text{N})}{10}$$

Retracting

- $Q_{in} = A_2 v$
- $Q_{out} = A_1 v$
- $F_1 = P_1 A_1 - P_2 A_2 + F$
- $F_2 = P_2 A_2 - P_1 A_1 - F$
-
- P_2 - result back of pressure from pipes & valves for Q_{in}

- A_1 piston area
- d_1 piston
- A_2 rod area
- d_2 rod
- F force
- P_1 pressure, piston side

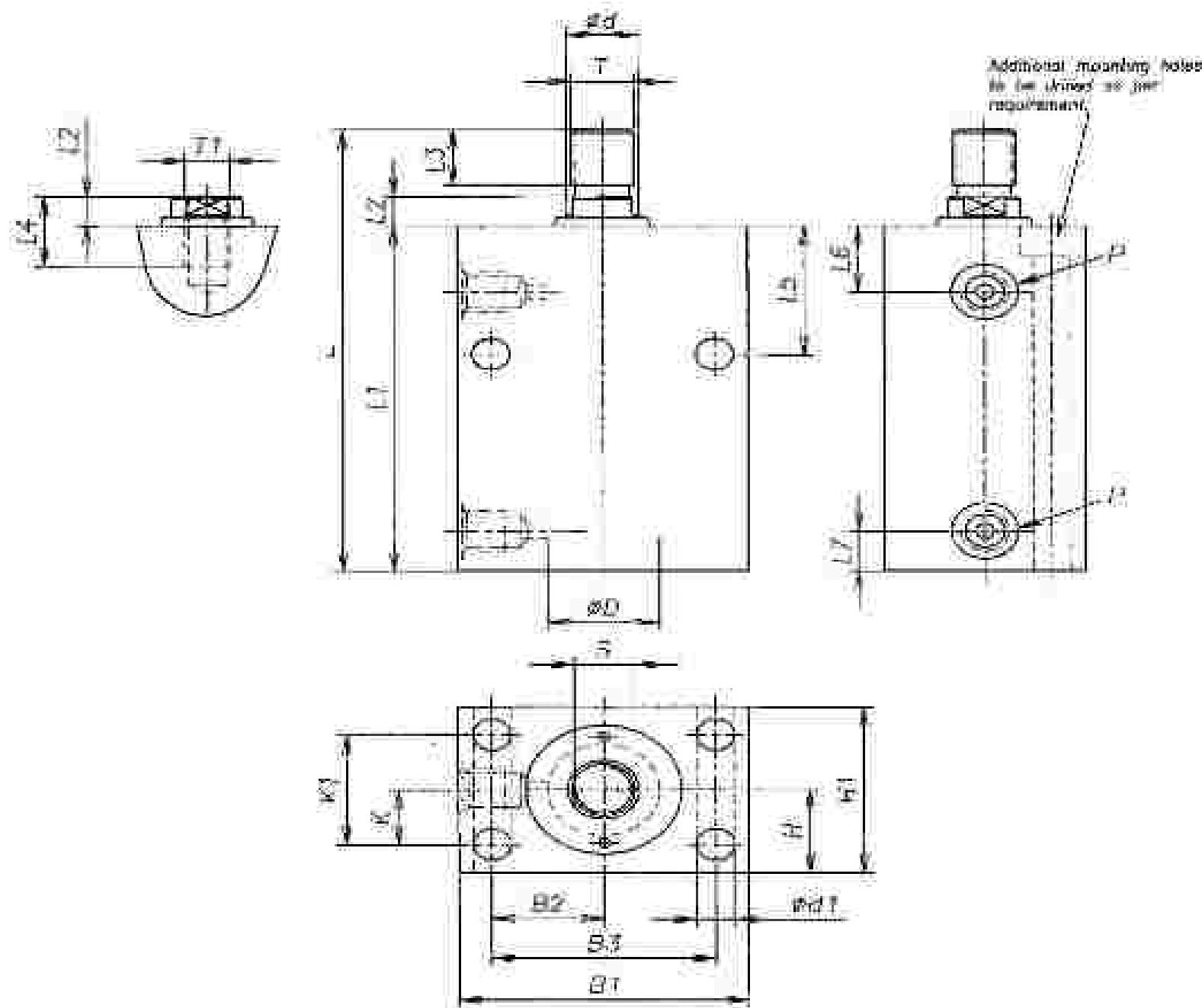
simplified

$$F_1 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot 10 (\text{N})}{A_1 (\text{mm}^2)}$$

$$F_2 (\text{N}) = \frac{P_2 (\text{bar}) \cdot A_2 (\text{mm}^2) \cdot 10 (\text{N})}{10}$$

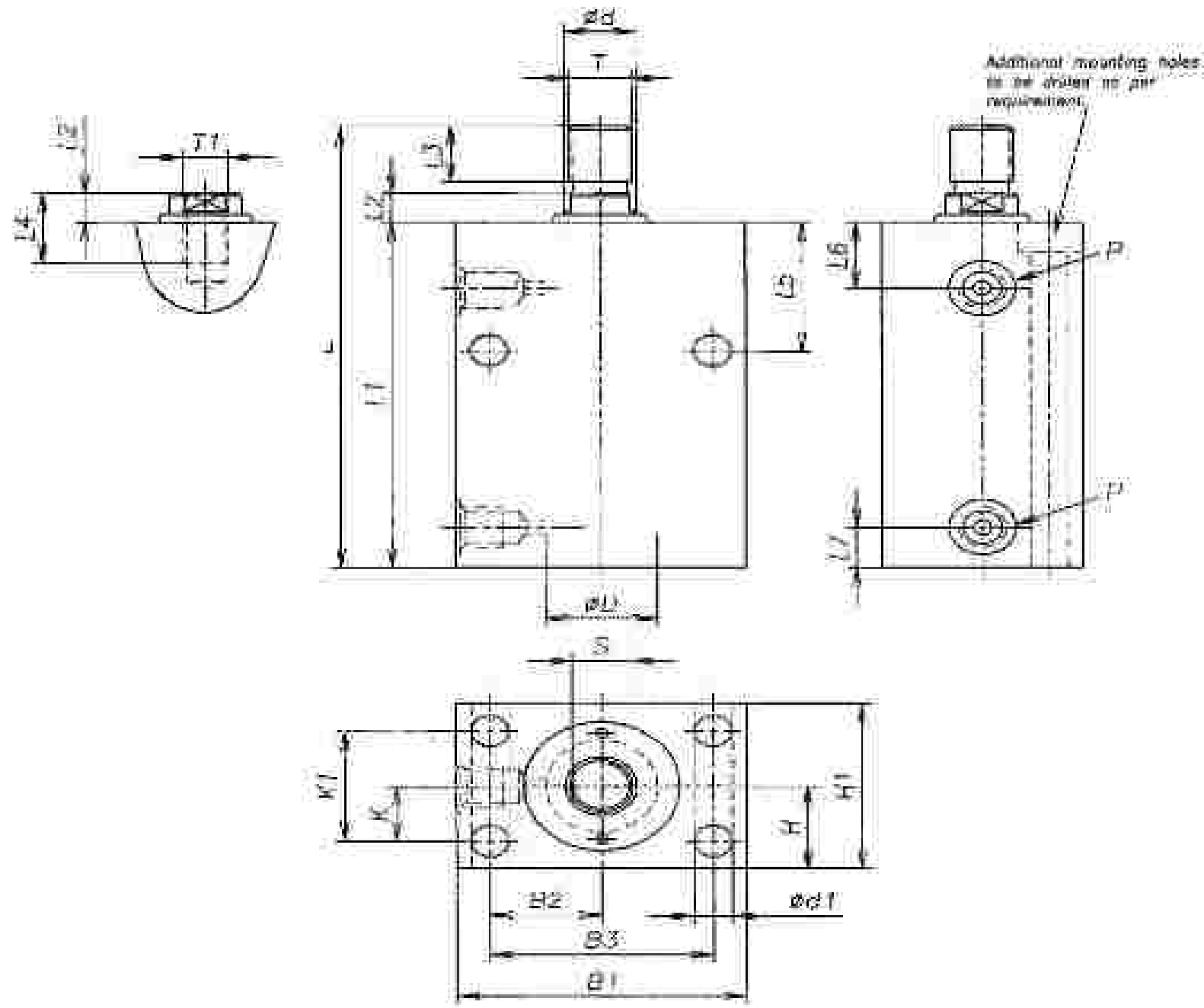
Specification

Outline Dimension :



MODEL	Male thread	M16	M20	M25	M32	M40	M50	M63	M80	M100	M125	M160	M200	M250	M320	M400	M500	M630	M800	M1000
	Female thread	M16	M20	M25	M32	M40	M50	M63	M80	M100	M125	M160	M200	M250	M320	M400	M500	M630	M800	M1000
Stroke OD	mm	16	20	25	32	40	50	63	80	100	125	160	200	250	320	400	500	630	800	1000
Rod dia	mm	16	20	25	32	40	50	63	80	100	125	160	200	250	320	400	500	630	800	1000
Ød1	mm	7	9	9	11	11	13	13	15	15	17	17	19	19	21	21	23	23	25	25
Stroke L	mm	16	25	50	16	25	50	16	25	50	25	50	75	25	50	75	25	50	75	100
L1	mm	60	69	94	66	75	100	66	75	100	80	105	110	80	105	130	95	120	140	170
L2	mm	8	8	8	12	12	14	12	12	14	12	12	14	12	12	14	12	12	14	14
L3	mm	15	16	16	18	18	20	18	18	20	18	18	20	18	18	20	18	18	20	20
L4	mm	15	16	16	18	18	20	18	18	20	18	18	20	18	18	20	18	18	20	20
L5	mm	30	35	35	40	40	50	30	35	40	30	35	40	30	35	40	30	35	40	40
L6	mm	16	19	19	22.5	22.5	30.5	16	19	19	22.5	22.5	30.5	16	19	19	22.5	22.5	30.5	30.5
L7	mm	14	16.5	16.5	17	17	17	14	16.5	16.5	17	17	17	14	16.5	16.5	17	17	17	17
B1	mm	50	40	40	65	65	100	50	40	40	65	65	100	50	40	40	65	65	100	100
B2	mm	18	22.5	25	27.5	31.5	38	18	22.5	25	27.5	31.5	38	18	22.5	25	27.5	31.5	38	38
B3	mm	16	19	19	22.5	22.5	30.5	16	19	19	22.5	22.5	30.5	16	19	19	22.5	22.5	30.5	30.5
B4	mm	17.5	20	20	22.5	22.5	28	17.5	20	20	22.5	22.5	28	17.5	20	20	22.5	22.5	28	28
B5	mm	35	40	45	55	60	76	35	40	45	55	60	76	35	40	45	55	60	76	76
F	mm	18	12.5	15	17.5	21.5	27.5	18	12.5	15	17.5	21.5	27.5	18	12.5	15	17.5	21.5	27.5	27.5
K1	mm	23	25	30	35	40	45	23	25	30	35	40	45	23	25	30	35	40	45	45
P. Hydr. port		G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"	G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"	G1/8"	G1/8"	G1/8"	G1/8"	G1/8"	G1/8"	G1/8"
A/T	mm	8	10	13	17	21	26	8	10	13	17	21	26	8	10	13	17	21	26	26
T	mm	M16X1.5	M16X1.5	M16X1.5	M16X1.5	M20X1.5	M24X1.5	M16X1.5	M16X1.5	M16X1.5	M16X1.5	M16X1.5	M20X1.5	M16X1.5	M16X1.5	M16X1.5	M16X1.5	M16X1.5	M16X1.5	M16X1.5
T1	mm	M6	M6	M10	M12	M16	M20	M6	M6	M6	M6	M6	M6	M6	M6	M6	M6	M6	M6	M6
Pushing force	20bar	2.00	2.20	3.43	5.63	8.79	13.74	2.00	2.20	3.43	5.63	8.79	13.74	2.00	2.20	3.43	5.63	8.79	13.74	13.74
Pushing force	70 bar	1.00	1.41	2.03	3.43	5.63	8.12	1.00	1.41	2.03	3.43	5.63	8.12	1.00	1.41	2.03	3.43	5.63	8.12	8.12

Outline Dimension :



Specification

MODELS	Male thread	B01C	B01C	B01C	B01C	B01C	B01C	B01C	B01C	B01C	B01C	B01C	B01C	B01C	B01C	B01C	B01C	B01C
		825F	650F	675F	610F	725F	750F	775F	710F	825F	850F	875F	810F	925F	950F	975F	910F	910F
Stroke	mm	25	50	75	100	25	50	75	100	25	50	75	100	25	50	75	100	100
Stroke	mm	100	125	150	175	100	125	150	175	105	130	155	180	105	130	155	180	180
L1	mm	25	36	47	58	25	36	47	58	25	36	47	58	25	36	47	58	58
L2	mm	36	47	58	69	36	47	58	69	36	47	58	69	36	47	58	69	69
L3	mm	47	58	69	80	47	58	69	80	47	58	69	80	47	58	69	80	80
L4	mm	58	69	80	91	58	69	80	91	58	69	80	91	58	69	80	91	91
L5	mm	69	80	91	102	69	80	91	102	69	80	91	102	69	80	91	102	102
L6	mm	80	91	102	113	80	91	102	113	80	91	102	113	80	91	102	113	113
L7	mm	91	102	113	124	91	102	113	124	91	102	113	124	91	102	113	124	124
L8	mm	102	113	124	135	102	113	124	135	102	113	124	135	102	113	124	135	135
L9	mm	113	124	135	146	113	124	135	146	113	124	135	146	113	124	135	146	146
L10	mm	124	135	146	157	124	135	146	157	124	135	146	157	124	135	146	157	157
L11	mm	135	146	157	168	135	146	157	168	135	146	157	168	135	146	157	168	168
L12	mm	146	157	168	179	146	157	168	179	146	157	168	179	146	157	168	179	179
L13	mm	157	168	179	190	157	168	179	190	157	168	179	190	157	168	179	190	190
L14	mm	168	179	190	201	168	179	190	201	168	179	190	201	168	179	190	201	201
L15	mm	179	190	201	212	179	190	201	212	179	190	201	212	179	190	201	212	212
L16	mm	190	201	212	223	190	201	212	223	190	201	212	223	190	201	212	223	223
L17	mm	201	212	223	234	201	212	223	234	201	212	223	234	201	212	223	234	234
L18	mm	212	223	234	245	212	223	234	245	212	223	234	245	212	223	234	245	245
L19	mm	223	234	245	256	223	234	245	256	223	234	245	256	223	234	245	256	256
L20	mm	234	245	256	267	234	245	256	267	234	245	256	267	234	245	256	267	267
L21	mm	245	256	267	278	245	256	267	278	245	256	267	278	245	256	267	278	278
L22	mm	256	267	278	289	256	267	278	289	256	267	278	289	256	267	278	289	289
L23	mm	267	278	289	300	267	278	289	300	267	278	289	300	267	278	289	300	300
L24	mm	278	289	300	311	278	289	300	311	278	289	300	311	278	289	300	311	311
L25	mm	289	300	311	322	289	300	311	322	289	300	311	322	289	300	311	322	322
L26	mm	300	311	322	333	300	311	322	333	300	311	322	333	300	311	322	333	333
L27	mm	311	322	333	344	311	322	333	344	311	322	333	344	311	322	333	344	344
L28	mm	322	333	344	355	322	333	344	355	322	333	344	355	322	333	344	355	355
L29	mm	333	344	355	366	333	344	355	366	333	344	355	366	333	344	355	366	366
L30	mm	344	355	366	377	344	355	366	377	344	355	366	377	344	355	366	377	377
L31	mm	355	366	377	388	355	366	377	388	355	366	377	388	355	366	377	388	388
L32	mm	366	377	388	399	366	377	388	399	366	377	388	399	366	377	388	399	399
L33	mm	377	388	399	410	377	388	399	410	377	388	399	410	377	388	399	410	410
L34	mm	388	399	410	421	388	399	410	421	388	399	410	421	388	399	410	421	421
L35	mm	399	410	421	432	399	410	421	432	399	410	421	432	399	410	421	432	432
L36	mm	410	421	432	443	410	421	432	443	410	421	432	443	410	421	432	443	443
L37	mm	421	432	443	454	421	432	443	454	421	432	443	454	421	432	443	454	454
L38	mm	432	443	454	465	432	443	454	465	432	443	454	465	432	443	454	465	465
L39	mm	443	454	465	476	443	454	465	476	443	454	465	476	443	454	465	476	476
L40	mm	454	465	476	487	454	465	476	487	454	465	476	487	454	465	476	487	487
L41	mm	465	476	487	498	465	476	487	498	465	476	487	498	465	476	487	498	498
L42	mm	476	487	498	509	476	487	498	509	476	487	498	509	476	487	498	509	509
L43	mm	487	498	509	520	487	498	509	520	487	498	509	520	487	498	509	520	520
L44	mm	498	509	520	531	498	509	520	531	498	509	520	531	498	509	520	531	531
L45	mm	509	520	531	542	509	520	531	542	509	520	531	542	509	520	531	542	542
L46	mm	520	531	542	553	520	531	542	553	520	531	542	553	520	531	542	553	553
L47	mm	531	542	553	564	531	542	553	564	531	542	553	564	531	542	553	564	564
L48	mm	542	553	564	575	542	553	564	575	542	553	564	575	542	553	564	575	575
L49	mm	553	564	575	586	553	564	575	586	553	564	575	586	553	564	575	586	586
L50	mm	564	575	586	597	564	575	586	597	564	575	586	597	564	575	586	597	597
L51	mm	575	586	597	608	575	586	597	608	575	586	597	608	575	586	597	608	608
L52	mm	586	597	608	619	586	597	608	619	586	597	608	619	586	597	608	619	619
L53	mm	597	608	619	630	597	608	619	630	597	608	619	630	597	608	619	630	630
L54	mm	608	619	630	641	608	619	630	641	608	619	630	641	608	619	630	641	641
L55	mm	619	630	641	652	619	630	641	652	619	630	641	652	619	630	641	652	652
L56	mm	630	641	652	663	630	641	652	663	630	641	652	663	630	641	652	663	663
L57	mm	641	652	663	674	641	652	663	674	641	652	663	674	641	652	663	674	674
L58	mm	652	663	674	685	652	663	674	685	652	663	674	685	652	663	674	685	685
L59	mm	663	674	685	696	663	674	685	696	663	674	685	696	663	674	685	696	696
L60	mm	674	685	696	707	674	685	696	707	674	685	696	707	674	685	696	707	707
L61	mm	685	696	707	718	685	696	707	718	685	696	707	718	685	696	707	718	718
L62	mm	696	707	718	729	696	707	718	729	696	707	718	729	696	707	718		

Compact Cylinder



Features :

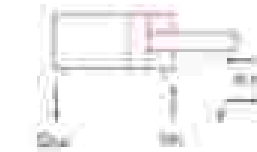
- ★ This is a manifold mounting cylinder with compact design.
- ★ It is a space saving & easy mounting with male & female threaded piston ends.
- ★ These cylinders are provided with universal mounting.
- ★ These cylinders are threaded directly into manifold, clamping, pushing, pulling, ejection & riveting operations.
- ★ It can be used in the range of
 - 1 MPa (minimum operating pressure)
 - 15 MPa (maximum operating pressure)
 - 70 bar N (pushing force)

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2 / 4 = 0.785 d_1^2$
- $A_2 = \pi(d_1^2 - d_2^2) / 4$
- $F_1 = A_1 P_1 - A_2 P_2$
- $P_2 = (P_1 A_1 - F) / A_2$
- $Q_{in} = A_1 v$
- $Q_{out} = A_2 v$

P_2 : result back of pressure from pipes & valves for Q_{out}



Applied area
 A_1 piston
 A_2 rod area
 d_1 rod
 F_1 force

P_2 : pressure, piston side

simplified

$$F_1 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) - 10(F) (\text{N})}{A_2 (\text{mm}^2)}$$

$$(F) (\text{N}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) - P_2 (\text{bar}) \cdot A_2 (\text{mm}^2)}{10}$$

Retracting

- $Q_{in} = A_2 v$
- $Q_{out} = A_1 v$
- $F_2 = A_2 P_2 - A_1 P_1$
- $P_1 = (P_2 A_2 - F) / A_1$
-
-

P_1 : result back of pressure from pipes & valves for Q_{in}

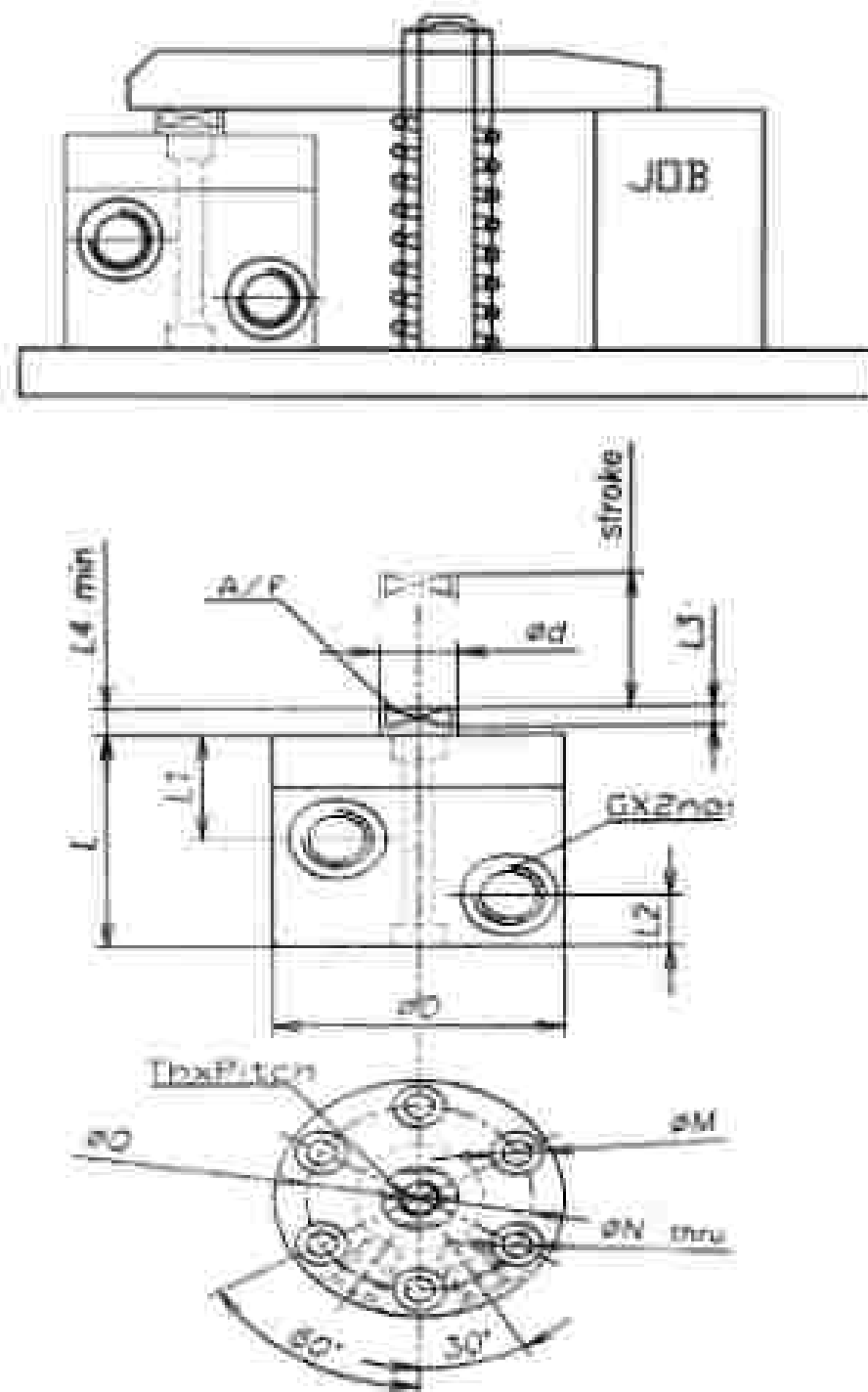
Applied area
 A_2 piston
 A_1 rod area
 d_2 rod
 F_2 force

P_1 : pressure, piston side

simplified

$$P_1 (\text{bar}) = \frac{P_2 (\text{bar}) \cdot A_2 (\text{mm}^2) - 10(F) (\text{N})}{A_1 (\text{mm}^2)}$$

$$(F) (\text{N}) = \frac{P_2 (\text{bar}) \cdot A_2 (\text{mm}^2) - P_1 (\text{bar}) \cdot A_1 (\text{mm}^2)}{10}$$

Outline Dimension :**Specification**

Model	CO2C-4525	CO2C-6525	CO2C-7625	CO2C-9525
BORE-DIA M	Ø 22	Ø 32	Ø 40	Ø 50
Pushing force, KN	47	17	19	29
Pulling force, KN	3	9	14	22
Thread pitch	M6X10 deep	M10X18 deep	M12X20 deep	M16X25 deep
L4	6	6	7	6
d	12	16	20	25
D	45	65	76	95
G	1/8"	1/8"	1/8"	1/4"
A/F	10	14	17	22
L1	16.5	16.5	17.5	22.5
L2	12	12	12	12
L3	4	4	4	4
ØN	4.5	6.6	6.6	9
ØM x deep	8x5.0	11x7.0	11x7.0	14.5x9.0
ØD (PCD)	35	50	60	75
Stroke	25	25	25	25
L	63	63	67	73
Oil volume Pushing, CC	8	20	31	49
Oil volume Pulling, CC	5	15	24	37

Threaded Body Cylinder

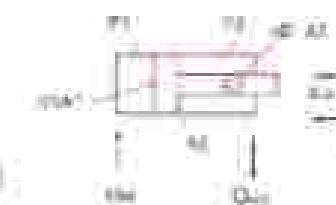


Features :

- ★ It is a manifold mounting spring return type cylinder with compact design.
- ★ It is a space saving mounting with male & female threaded piston ends.
- ★ These cylinders are threaded directly into manifold, pushing, pulling, ejection & reverting operations.
- ★ It can be used for direct clamping as well as positioning & support.
- ★ The range of use :
 - 0.5 MPa (minimum operating pressure)
 - 7 MPa (maximum operating pressure)
 - 70 bar N (pushing force)

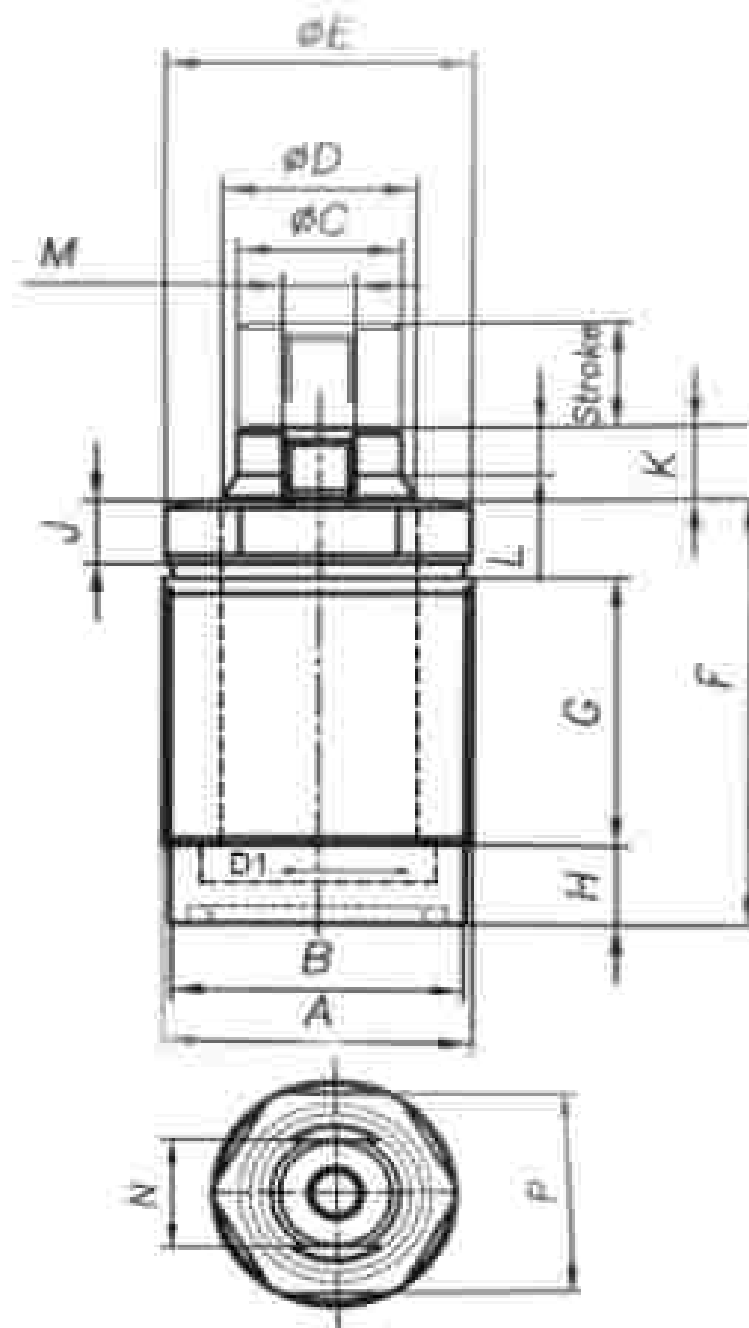
Single acting hydraulic cylinder

- $V[m^3/s] = s[ms]/1000[m/s]$
- $A[mm^2] = \pi d^2/4 [mm]$
- $F_p[N] = 0.1 \cdot p_s[bar] \cdot A[mm^2]$
- $p_s[bar] = 10^7 \cdot [N]/A[mm^2]$
- $Q_s[lpm] = 0.06 \cdot A[mm^2] \cdot v [m/s]$

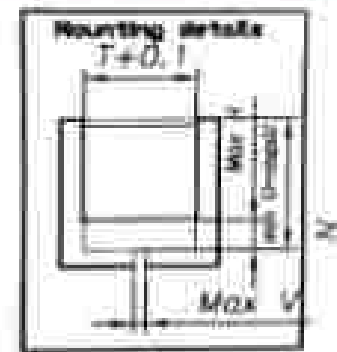


- s: travel(stroke)
- d: piston diameter
- F_p : force
- Q_s : inflow
- p_s : operating pressure
- v: piston speed

Outline Dimension :



Mounting Details :



Specification

Model	T03C M160	T03C M221	T03C M242	T03C M303	T03C M364	T03C M455	T03C M556	T03C M657	T03C M808
Stroke Code	S M L	S M L	S M L	S M L	S M L	S M L	S M L	S M L	S M L
Thread (mm)	M16x1.5	M22x1.5	M24x1.5	M30x1.5	M36x1.5	M45x1.5	M55x2	M65x2	M80x2
ϕ	14.3	20.3	22.3	28.3	34.3	43.3	52.6	62.6	77.6
ϕ	7.5	11.2	13	17	19	28	34.5	42	52
ϕ	8	12	14	18	22.4	30	35.5	45	55
Stroke	11 11 11	11 13 15	14 14 14	18 20 20	20 20 25	25 25 25	31 31 31	35 35 35	40 40 40
ϕ	16.0	21.2	24.5	30	35.5	45	55	66	80
ϕ	21 21 21	25 25 25	28 28 28	35 35 35	40 40 40	50 50 50	60 60 60	70 70 70	85 85 85
ϕ	24.0 24.0 24.0	28 28 28	32 32 32	40 40 40	45 45 45	55 55 55	65 65 65	75 75 75	90 90 90
ϕ	6	8	8	9	10	12	12	13	13
ϕ	5	7	7	8	8	12	12	14	14
ϕ	5.5	7	7	8.5	9.5	12	13	16	19
ϕ	4	5.5	5.5	7	8	10	11	13	16
Mounting (mm)	M5x8	M6x7	M6x7	M8x10	M8x10	M10x11	M12x12	M16x16	M20x20
ϕ	7	10	10	14	17	24	30	36	43
ϕ	14	19	22	27	32	41	50	60	
ϕ	14.5	20.5	22.5	28.5	34.5	43.5	53	63	78
Stroke	12	14	14	15	16	18	20	25	25
Stroke	23 25 28 30 38 41	24 32 48 26 35 54	32 40 66	34 47 68	38 53 70	47 63 92	54 72 100		
Stroke	3	3	3	6	6	8	8	8	8

Stroke & Load Details :

Model	T03C-M160	T03C-M221	T03C-M242	T03C-M303	T03C-M364	T03C-M455	T03C-M556	T03C-M657	T03C-M808
Stroke	S M L	S M L	S M L	S M L	S M L	S M L	S M L	S M L	S M L
Stroke (mm)	6, 10, 16	6, 10, 16	8, 12, 20	8, 12, 20	10, 16, 25	10, 16, 25	12, 20, 32	16, 20, 40	16, 25, 40
Stroke (mm)	0.85	1.1	1.5	2.5	2.9	7.3	8.8	15.0	23.8
Stroke (mm)	0.8 0.8 1.5	0.7 1.1 1.8	1.2 1.8 3.3	1.0 1.1 5.3	1.8 6.3 9.8	2.1 11.3 17	1.5 11.1 17	2.4 11.1 17	2.4 11.1 17
Stroke (mm)	12.4-24.0	25.0-24.0	33.0-16.0	50.0-9.0	70.0-15.0	107.0-19	230-85.2	257-67	326-108
Stroke (mm)	0.245	0.25	1.01	1.66	2.59	6.00	6.44	10.1	15.5
Stroke (mm)	0.017/0.018	0.027/0.028	0.038/0.039	0.049/0.050	0.060/0.061	0.071/0.072	0.082/0.083	0.093/0.094	0.104/0.105
Stroke (mm)	0								
Stroke (mm)	0.8								

Threaded Body Cylinder (Manifold Mount)



Features :

- ★ This is a manifold mounting cylinder with compact design.
- ★ It is a space saving mounting with male & female threaded plunger ends.
- ★ These cylinders are threaded directly into manifold, pushing,
- ★ pulling, ejection & riving operations.

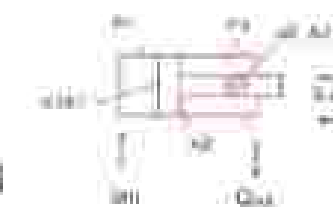
It can be used in the range of 0.5 MPa (minimum operating pressure)

7 MPa (maximum operating pressure)

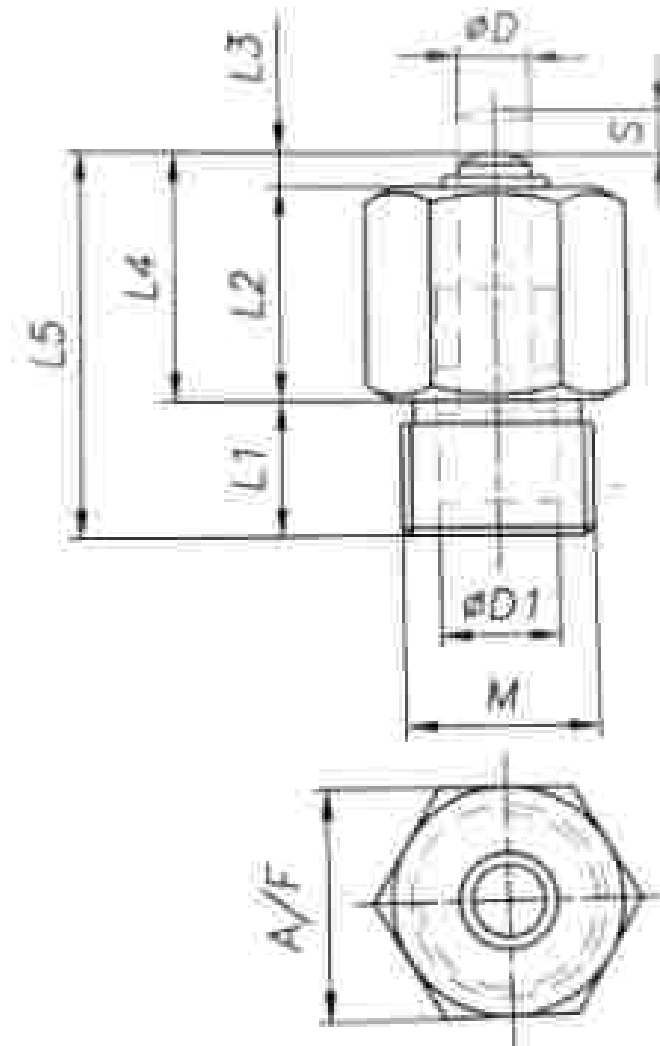
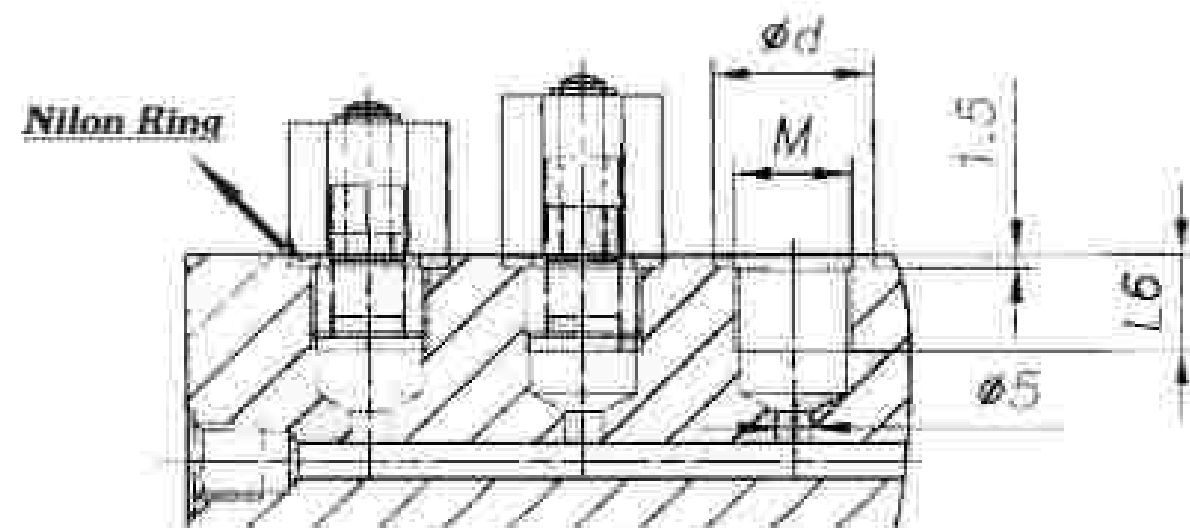
70 bar N (pushing force)

Single acting hydraulic cylinder

- ↓ $V [m^3/s] = v [m/s] / 1000 [s]$
- ↓ $A [mm^2] = \pi d^2 / 4 [mm]$
- ↓ $F_s [N] = 0.1 \cdot p_s [bar] \cdot A [mm^2]$
- ↓ $P_s [bar] = 10 F_s [N] / A_s [mm^2]$
- ↓ $Q_{in} [lpm] = 0.06 \cdot A [mm^2] \cdot v [m/s]$



- L : travel (stroke)
- d : piston diameter
- F_s : force
- Q_{in} : inflow
- P_s : operating pressure
- v : piston speed

Outline Dimension :**Typical Mounting :****Specification**

MODEL	T04C M161	T04C M162	T04C M201	T04C M202	T04C M241	T04C M242	T04C M301	T04C M302	T04C M361	T04C M362
Rod dia, D mm	6		8		10		12		16	
Piston dia, D1 mm	10		12		16		20		25	
Stroke, S mm	4	8	4	8	6	10	8	12	12	16
M mm	M16X1.5		M20X1.5		M24X1.5		M30X1.5		M36X1.5	
L1 mm	12		12		14		18		21	
L2 mm	19	23	19	23	21	25	27	31	33	37
L3 mm	3	3	3	3	3	3	3	3	3	3
L4 mm	22	26	22	26	24	28	30	34	36	40
L5 mm	34	38	34	38	38	42	48	52	57	61
L6 mm	14		14		16		23		23	
A/F mm	19		24		27		36		41	
ØD mm	22		28		32		42		48	

Compact Link Clamp Cylinder



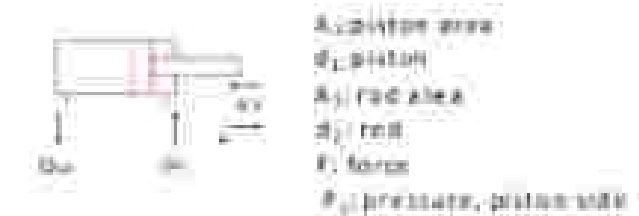
Features :

- ★ This is a double acting cylinder with link clamp.
- ★ It is a Chromium plated piston rod with alloy steel body.
- ★ It is hydraulic & centre port configuration.
- ★ These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- ★ It can be used in the range of
 - 1 MPa (minimum operating pressure)
 - 15 MPa (maximum operating pressure)
 - 70 bar N (pushing force)

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2 / 4$ (786)
- $A_2 = \pi (d_1^2 - d_2^2) / 4$
- $F_1 = A_1 P_1 - A_2 P_2$
- $F_2 = (P_1 A_1 - P_2 A_2) - F$
- $Q_{in} = A_1 v$
- $Q_{out} = A_2 v$
- P_2 result back of pressure from pipes & valves for Q_{in}



simplified

$$F_1 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot 10 (\text{N})}{A_1 (\text{mm}^2)}$$

$$F_2 (\text{N}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot P_2 (\text{bar}) \cdot A_2 (\text{mm}^2)}{10}$$

Retracting

- $Q_{in} = A_2 v$
- $Q_{out} = A_1 v$
- $F_1 = A_1 P_1 - A_2 P_2$
- $F_2 = (P_1 A_1 - P_2 A_2) - F$
-
- P_2 result back of pressure from pipes & valves for Q_{in}

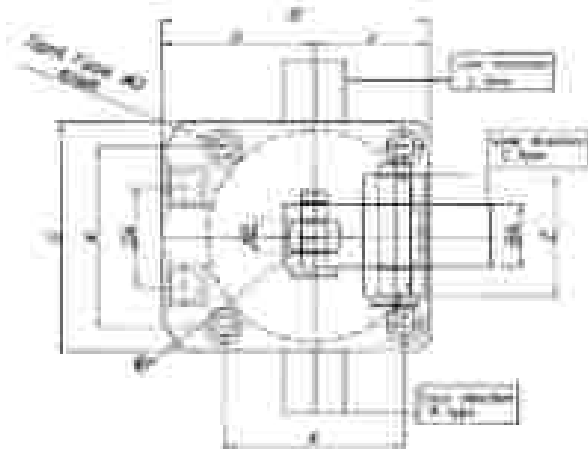
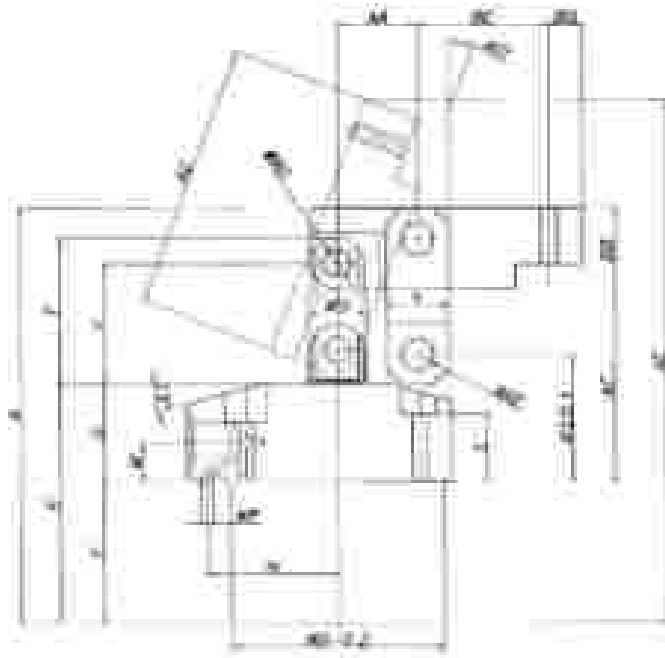
A_1 piston area
 d_1 piston
 A_2 rod area
 d_2 rod
 F force
 P_1 pressure, piston side

simplified

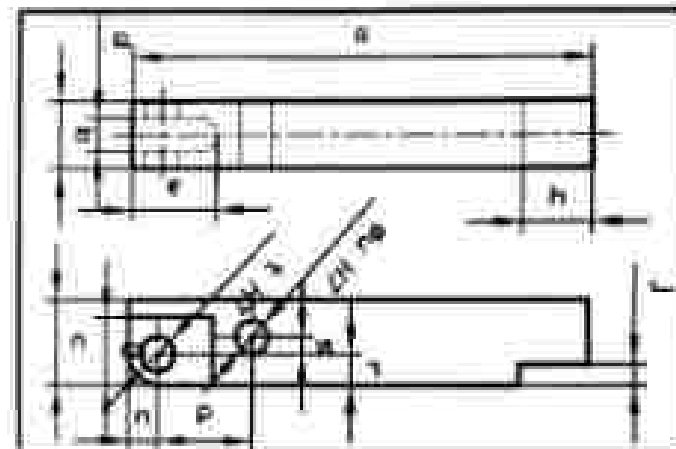
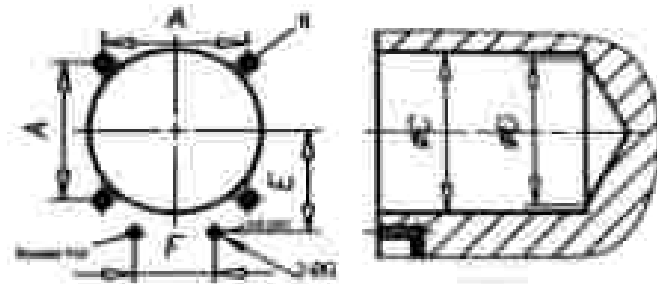
$$F_1 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot 10 (\text{N})}{A_1 (\text{mm}^2)}$$

$$F_2 (\text{N}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot P_2 (\text{bar}) \cdot A_2 (\text{mm}^2)}{10}$$

Outline Dimension :



Machining For Mounting Details :



Specification

MODEL	BU	CLAMP	
		CL06-001	CL06-002
		25	25
		30	30
		35	35
		40	40
		45	45
		50	50
		55	55
		60	60
		65	65
		70	70
		75	75
		80	80
		85	85
		90	90
		95	95
		100	100
		105	105
		110	110
		115	115
		120	120
		125	125
		130	130
		135	135
		140	140
		145	145
		150	150
		155	155
		160	160
		165	165
		170	170
		175	175
		180	180
		185	185
		190	190
		195	195
		200	200
		205	205
		210	210
		215	215
		220	220
		225	225
		230	230
		235	235
		240	240
		245	245
		250	250
		255	255
		260	260
		265	265
		270	270
		275	275
		280	280
		285	285
		290	290
		295	295
		300	300
		305	305
		310	310
		315	315
		320	320
		325	325
		330	330
		335	335
		340	340
		345	345
		350	350
		355	355
		360	360
		365	365
		370	370
		375	375
		380	380
		385	385
		390	390
		395	395
		400	400
		405	405
		410	410
		415	415
		420	420
		425	425
		430	430
		435	435
		440	440
		445	445
		450	450
		455	455
		460	460
		465	465
		470	470
		475	475
		480	480
		485	485
		490	490
		495	495
		500	500
		505	505
		510	510
		515	515
		520	520
		525	525
		530	530
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		540	540
		545	545
		550	550
		555	555
		560	560
		565	565
		570	570
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		655	655
		660	660
		665	665
		670	670
		675	675
		680	680
		685	685
		690	690
		695	695
		700	700
		705	705
		710	710
		715	715
		720	720
		725	725
		730	730
		735	735
		740	740
		745	745
		750	750
		755	755
		760	760
		765	765
		770	770
		775	775
		780	780
		785	785
		790	790
		795	795
		800	800
		805	805
		810	810
		815	815
		820	820
		825	825
		830	830
		835	835
		840	840
		845	845
		850	850
		855	855
		860	860
		865	865
		870	870
		875	875
		880	880
		885	885
		890	890
		895	895
		900	900
		905	905
		910	910
		915	915
		920	920
		925	925
		930	930
		935	935
		940	940
		945	945
		950	950
		955	955
		960	960
		965	965
		970	970
		975	975
		980	980
		985	985
		990	990
		995	995
		1000	1000

Clamp Lever Table (Standard) :

BU	CL06-001	CL06-002	CL06-003	CL06-004	CL06-005	CL06-006	CL06-007	CL06-008	CL06-009	CL06-010
25	25	25	25	25	25	25	25	25	25	25
30	30	30	30	30	30	30	30	30	30	30
35	35	35	35	35	35	35	35	35	35	35
40	40	40	40	40	40	40	40	40	40	40
45	45	45	45	45	45	45	45	45	45	45
50	50	50	50	50	50	50	50	50	50	50
55	55	55	55	55	55	55	55	55	55	55
60	60	60	60	60	60	60	60	60	60	60
65	65	65	65	65	65	65	65	65	65	65
70	70	70	70	70	70	70	70	70	70	70
75	75	75	75	75	75	75	75	75	75	75
80	80	80	80	80	80	80	80	80	80	80
85	85	85	85	85	85	85	85	85	85	85
90	90	90	90	90	90	90	90	90	90	90
95	95	95	95	95	95	95	95	95	95	95
100	100	100	100	100	100	100	100	100	100	100
105	105	105	105	105	105	105	105	105	105	105
110	110	110	110	110	110	110	110	110	110	110
115	115	115	115	115	115	115	115	115	115	115
120	120	120	120	120	120	120	120	120	120	120
125	125	125	125	125	125	125	125	125	125	125
130	130	130	130	130	130	130	130	130	130	130
135	135	135	135	135	135	135	135	135	135	135
140	140	140	140	140	140	140	140	140	140	140
145	145	145	145	145	145	145	145	145	145	145
150	150	150	150	150	150	150	150	150	150	150
155	155	155	155	155	155	155	155	155	155	155
160	160	160	160	160	160	160	160	160	160	160
165	165	165	165	165	165	165	165	165	165	165
170	170	170	170	170	170	170	170	170	170	170
175	175	175	175	175	175	175	175	175	175	175
180	180	180	180	180	180	180	180	180	180	180
185	185	185	185	185	185	185	185	185	185	185
190	190	190	190	190	190	190	190	190	190	190
195	195	195	195	195	195	195	195	195	195	195
200	200	200	200	200	200	200	200	200	200	200

Specification Table :

Working Area (sq)	25	40
Net Weight (kg)	18.5	26
Working Stroke (mm)	50.5	57
Max. Speed (mm/s)	27	37
Cl. Stroke (mm)	2.8	3.1
Max. Working Pressure (MPa)	4.2	4.4
Min. Working Pressure (MPa)		0.1
Seals (mm)		1.5
Temperature (°C)		0-70
Wipe Up	0.72	1.0

Machining Dimension Table For Mounting Clamp :

MODEL	BU	CLAMP	
		CL06-001	CL06-002
A		31.4	34
B		66	65
C002		35	40
D		20	25
E		23.5	26
F		16	18
G		25	25

Compact Link Clamp Cylinder



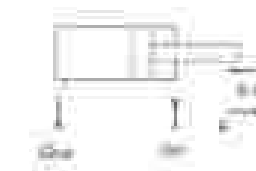
Features :

- ★ This is a double acting cylinder with compact link clamp.
- ★ It is a Chromium plated piston rod with alloy steel body.
- ★ It is hydraulic & centre port configuration.
- ★ These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- ★ It is a integrated hinge mechanism with light weight.
- ★ It can be used in the range of 1 MPa (minimum operating pressure) 15 MPa (maximum operating pressure) 70 bar N (pushing force)

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2 / 4$
- $A_2 = \pi (d_1^2 - d_2^2) / 4$
- $F_1 = A_1 P_1 - A_2 P_2$
- $F_2 = (P_2 A_2 - F) / A_1$
- $Q_{in} = A_1 v$
- $Q_{out} = A_2 v$
- P_2 : result back of pressure from pipes & valves for Q_{out}



- A_1 : piston area
- d_1 : piston
- A_2 : rod area
- d_2 : rod
- F : force
- P_2 : pressure, piston side

simplified

$$F_1(\text{bar}) = \frac{P_1(\text{bar}) \cdot A_1(\text{mm}^2) \cdot 10720}{A_2(\text{mm}^2)}$$

$$F(N) = \frac{P_1(\text{bar}) \cdot A_1(\text{mm}^2) + P_2(\text{bar}) \cdot A_2(\text{mm}^2)}{10}$$

Retracting

- $Q_{in} = A_2 v$
- $Q_{out} = A_1 v$
- $F_1 = A_1 P_1 - A_2 P_2$
- $F_2 = (P_2 A_2 - F) / A_1$
-
- P_2 : result back of pressure from pipes & valves for Q_{out}

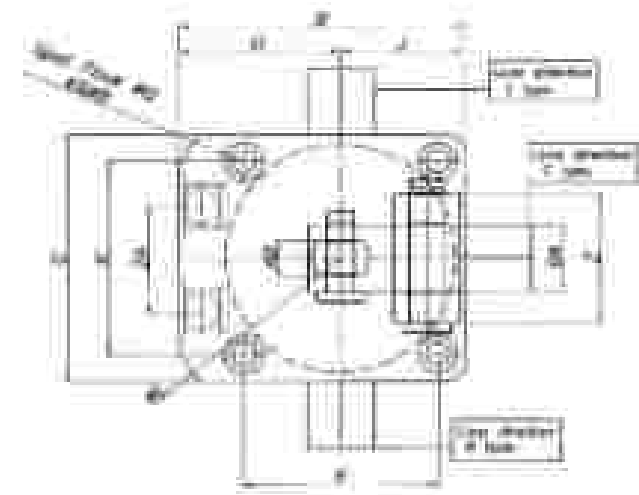
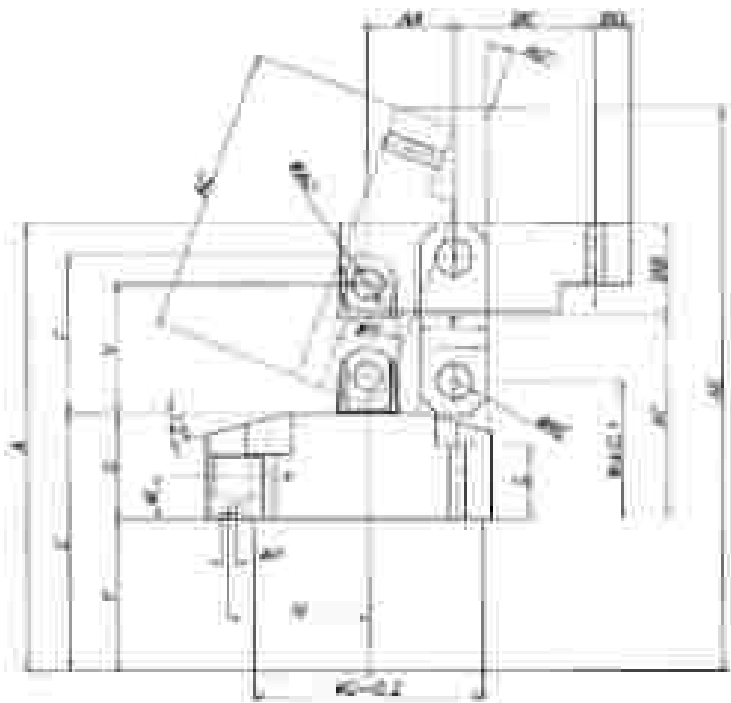
- A_1 : piston area
- d_1 : piston
- A_2 : rod area
- d_2 : rod
- F : force
- P_2 : pressure, piston side

simplified

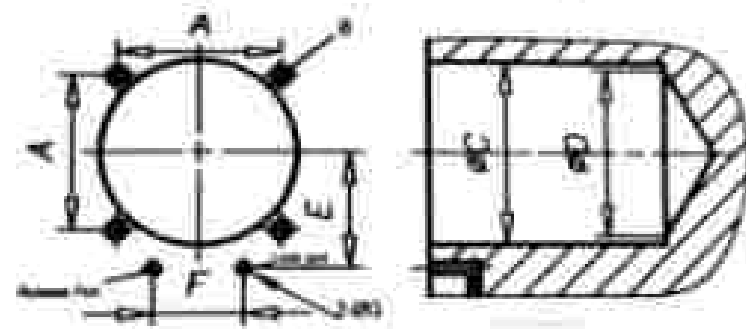
$$F_1(\text{bar}) = \frac{P_2(\text{bar}) \cdot A_2(\text{mm}^2) \cdot 10720}{A_1(\text{mm}^2)}$$

$$F(N) = \frac{P_2(\text{bar}) \cdot A_2(\text{mm}^2) - P_1(\text{bar}) \cdot A_1(\text{mm}^2)}{10}$$

Outline Dimension :



Machining For Mounting Details :



Machining dimension table for mounting clamp :

MODEL	NI	D402	D502	D63	D75	D90	D105
	D1	D402	D502	D63	D75	D90	D105
A		40	47	55	63	75	90
B		M5	M6	M6	M8	M10	M12
C-02		4K	55	65	75	90	105
D		45	50	60	70	85	100
E		30	33.5	39.5	45	52.5	60
F		22	24	30	32	37	45
G		3	3	3	3	3	4

Specification

MODEL	C	D402	D502	D63	D75	D90	D105
		D402	D502	D63	D75	D90	D105
A		302	323	329	333	342	351
B		45	48	48	48	48	48
C		55	60	70	75	90	105
D		40	55	65	71	90	105
E		42	47	55	60	70	85
F		24	28	35	40	48	60
G		28	28	30	32	40	50
H		35.5	38	46	52	64	80
I		23.5	30	35	42.5	50	60
J		40	47	55	63	75	90
K		61	68	100	105	130	152
L		11	11	12	12	12	15
M		30	33.5	39.5	45	52.5	60
N		3	3	3	3	3	4
O		33.5	38	46	52	64	80
P		6.5	6.5	6.8	8	11	14
Q		17.5	18	20.5	23.5	28	34.5
R		25	27.5	45	55	67.5	77
S		14	15	16	20	24	28.5
T		25	27.5	37	45	52	62
U		14.5	15.5	18	20	23.5	28
V		26	30	35.5	43.5	51.5	64
W		13	14	16	18	22	27
X		21	24	27	40	48	64
Y		22	24	30	32	37	45
HYDRO		51.8	53.8	61.8	73.4	87.8	103.8
AA		18.5	20	24.5	30	36	44
AB		6	6	8	11	13	16
AC		6	6	8	10	12	15
AD		6	6	8	12	15	18
AE		90.4	93.9	112.4	130.8	158.5	175.6
AF		10	11.5	14	17	21	26
AG		18.5	20	24.5	30	36	44
AH		4.2	4.7	4.3	4.5	5	4.1
AI		61.2	71.2	78.3	90.8	104.4	122.5
AJ		12	15	18	22	25	32
AK		38	40	48	52	58	65
AL		23.5	28	32	37.5	43.5	51
AM		6	6	8	11	14	17

Specification Table :

Model	100	150	200	250	300	400
Stroke	100	150	200	250	300	400
Weight	200	300	400	500	600	800
Pressure	1	1	1	1	1	1
Flow rate	100	150	200	250	300	400
Power	100	150	200	250	300	400
Efficiency	90%	90%	90%	90%	90%	90%
Material	Steel	Steel	Steel	Steel	Steel	Steel
Finish	Paint	Paint	Paint	Paint	Paint	Paint
Lead time	100	150	200	250	300	400

Swing Cylinder



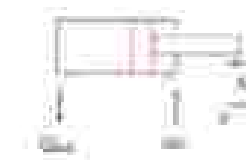
Features :

- ★ This is a double acting cylinder with swing clamp.
- ★ It is a Chromium plated piston rod with alloy steel body.
- ★ It can be used with the rotation of 90°.
- ★ These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- ★ It can be used in the range of 1 MPa (minimum operating pressure) 8 MPa (maximum operating pressure) 70 bar N (pushing force)

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2 / 4$
- $A_2 = \pi (d_1^2 - d_2^2) / 4$
- $F_1 = A_1 P_1 - P_2 A_2 = F$
- $P_2 = (P_1 A_1 - F) / A_2$
- $Q_{in} = A_1 v$
- $Q_{out} = A_2 v$
- P_2 result back of pressure from pipes & valves for Q_{out}



- A_1 piston area
- d_1 piston
- A_2 rod area
- d_2 rod
- F force
- P_1 pressure, piston side

simplified

$$F_1 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot 0.1 (\text{N/mm}^2)}{A_2 (\text{mm}^2)}$$

$$Q_{in} (\text{l/min}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot (P_2 (\text{bar}) \cdot A_2 (\text{mm}^2))}{10}$$

Retracting

- $Q_{in} = A_2 v$
- $Q_{out} = A_1 v$
- $F_2 = A_2 P_2 - P_1 A_1 = F$
- $P_2 = (F + P_1 A_1) / A_2$
-
-
- P_2 result back of pressure from pipes & valves for Q_{in}

- A_1 piston area
- d_1 piston
- A_2 rod area
- d_2 rod
- F force
- P_1 pressure, piston side

simplified

$$F_2 (\text{bar}) = \frac{P_2 (\text{bar}) \cdot A_2 (\text{mm}^2) \cdot 0.1 (\text{N/mm}^2)}{A_1 (\text{mm}^2)}$$

$$Q_{in} (\text{l/min}) = \frac{P_2 (\text{bar}) \cdot A_2 (\text{mm}^2) \cdot (P_1 (\text{bar}) \cdot A_1 (\text{mm}^2))}{10}$$

Swing Cylinder



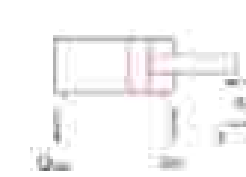
Features :

- ★ This is a double acting cylinder with swing clamp.
- ★ It is a Chromium plated piston rod with alloy steel body.
- ★ It can be used with the rotation of 90°.
- ★ These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- ★ It can be used in the range of 1 MPa (minimum operating pressure) 8 MPa (maximum operating pressure) 70 bar N (pushing force)

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2 / 4$
- $A_2 = \pi (d_1^2 - d_2^2) / 4$
- $F_1 = P_1 A_1$
- $F_2 = (P_2 A_2 - P_1 A_1)$
- $Q_{in} = A_1 V$
- $Q_{out} = A_2 V$
- P_1 result back of pressure from pipes & valves for Q_{in}



- A_1 piston area
- d_1 piston
- A_2 rod area
- d_2 rod
- F_1 force
- P_1 pressure, piston side

simplified

$$F_1 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot 10 (\text{N})}{A_1 (\text{mm}^2)}$$

$$F_2 (\text{bar}) = \frac{P_2 (\text{bar}) \cdot A_2 (\text{mm}^2) - P_1 (\text{bar}) \cdot A_1 (\text{mm}^2)}{10}$$

Retracting

- $Q_{in} = A_2 V$
- $Q_{out} = A_1 V$
- $F_1 = P_1 A_1$
- $F_2 = (P_2 A_2 - P_1 A_1)$
-
-
- P_1 result back of pressure from pipes & valves for Q_{in}

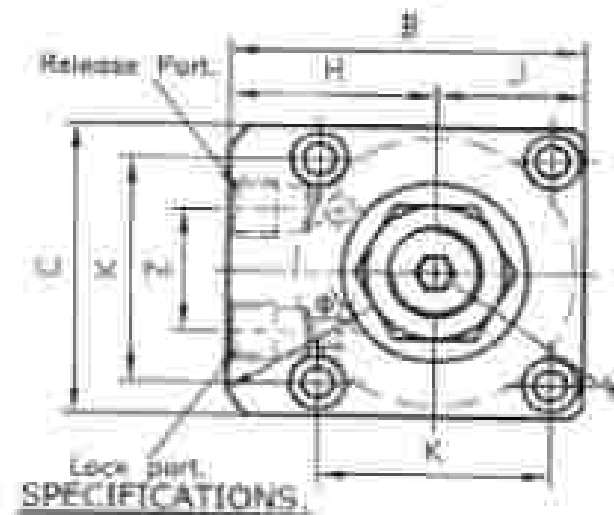
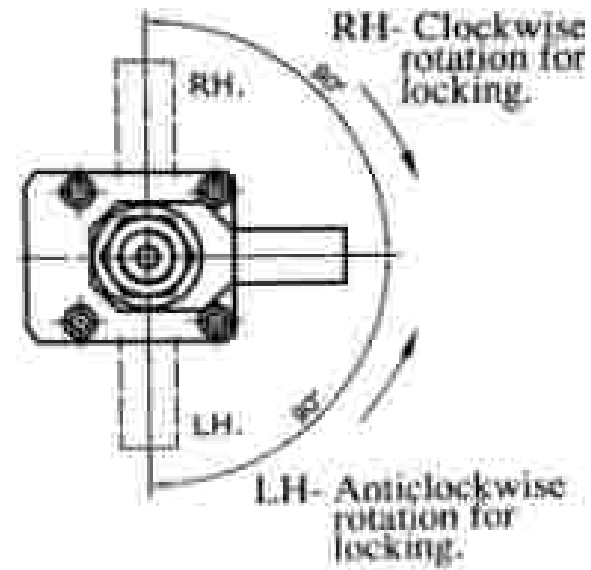
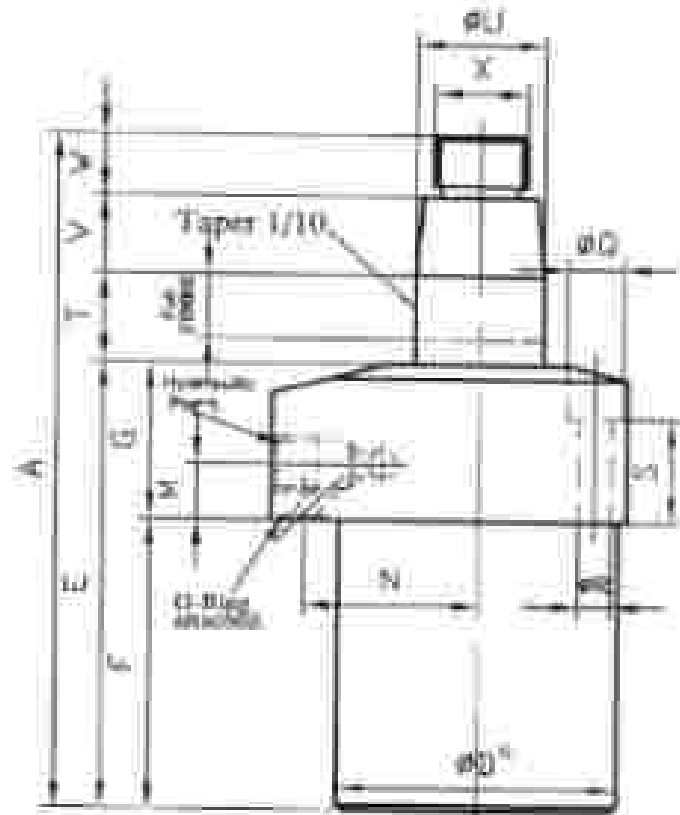
- A_1 piston area
- d_1 piston
- A_2 rod area
- d_2 rod
- F_1 force
- P_1 pressure, piston side

simplified

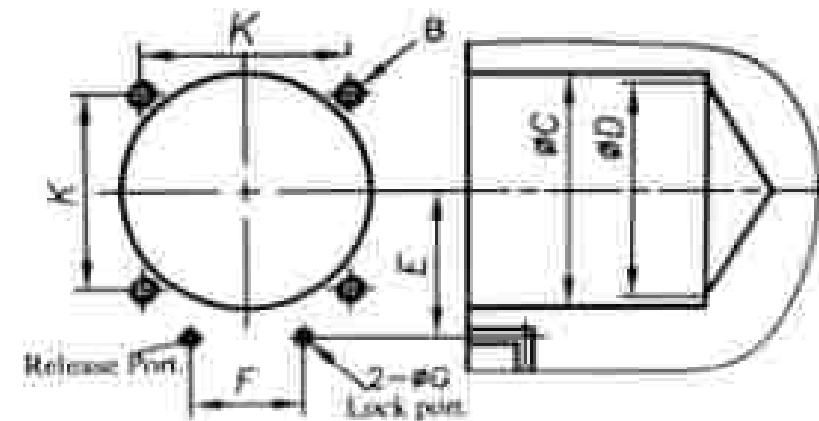
$$F_1 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot 10 (\text{N})}{A_1 (\text{mm}^2)}$$

$$F_2 (\text{bar}) = \frac{P_2 (\text{bar}) \cdot A_2 (\text{mm}^2) - P_1 (\text{bar}) \cdot A_1 (\text{mm}^2)}{10}$$

Outline Dimension :



Mounting Dimensions :



Specification

MODEL	Bore	SC07042	SC07052	SC07062	SC07072	SC07082	SC07102
		42	52	62	72	82	102
Stroke	mm	120	141.5	150	179	189	233
Stroke	in	4.7	5.5	5.9	7.0	7.4	9.2
Stroke	mm	62	80	83	93	107	137
Stroke	in	2.4	3.1	3.3	3.7	4.2	5.4
Stroke	mm	52	60	70	80	95	120
Stroke	in	2.0	2.4	2.8	3.1	3.7	4.7
Stroke	mm	80	87	93	108	114	141
Stroke	in	3.1	3.4	3.7	4.2	4.5	5.5
Stroke	mm	24	30	30	37	40	50
Stroke	in	0.9	1.2	1.2	1.5	1.6	2.0
Stroke	mm	35	39	48	52	66.5	87
Stroke	in	1.4	1.5	1.9	2.0	2.6	3.4
Stroke	mm	30	47	58	63	75	88
Stroke	in	1.2	1.9	2.3	2.5	3.0	3.5
Stroke	mm	80	88	104	118	136	152
Stroke	in	3.1	3.5	4.1	4.6	5.3	6.0
Stroke	mm	11	11	12	12	14	17
Stroke	in	0.4	0.4	0.5	0.5	0.6	0.7
Stroke	mm	30	33.5	38.5	46	52.5	60
Stroke	in	1.2	1.3	1.5	1.8	2.1	2.4
Stroke	mm	3	3	3	3	3	3
Stroke	in	0.1	0.1	0.1	0.1	0.1	0.1
Stroke	mm	17.5	22	22	24.5	27.5	30
Stroke	in	0.7	0.9	0.9	1.0	1.1	1.2
Stroke	mm	18.5	17	18	27	23	24.5
Stroke	in	0.7	0.7	0.7	1.1	0.9	1.0
Stroke	mm	11	11	11	23.5	25	32.5
Stroke	in	0.4	0.4	0.4	0.9	1.0	1.3
Stroke	mm	22	25	30	36	45	55
Stroke	in	0.9	1.0	1.2	1.4	1.8	2.2
Stroke	mm	14	20	20	26	32	38
Stroke	in	0.6	0.8	0.8	1.0	1.3	1.5
Stroke	mm	12	12	12	14	14	17
Stroke	in	0.5	0.5	0.5	0.6	0.6	0.7
Stroke	mm	103	113	120	140.15	154.15	180.15
Stroke	in	4.1	4.5	4.7	5.5	6.1	7.1
Stroke	mm	65	86	108	100.8	100.8	120.8
Stroke	in	2.6	3.4	4.3	4.0	4.0	4.8
Stroke	mm	22	24	30	32	37	45
Stroke	in	0.9	1.0	1.2	1.3	1.5	1.8
Stroke	mm	67	78	78	67	57	57

Specification Table :

Stroke	42	52	62	72	82	102	
Full stroke	20	22	23	26	30	36	
Working stroke	10	12	11	13	16	21	
Stroke	mm	14	14	16	18	18	
Stroke	in	0.5	0.5	0.6	0.7	0.7	
Stroke	mm	7	12.2	25.2	42.2	102.6	111
Stroke	in	0.3	0.5	1.0	1.7	4.0	4.4
Stroke	mm	12.5	20.9	17.1	68.7	111.8	201.5
Stroke	in	0.5	0.8	0.7	2.7	4.3	8.0
Stroke	mm	7	15	15	15	15	15
Stroke	in	0.3	0.6	0.6	0.6	0.6	0.6
Stroke	mm	115	115	115	115	115	115
Stroke	in	4.5	4.5	4.5	4.5	4.5	4.5
Stroke	mm	3.1	3.8	2.7	4.2	5.5	9

Machining Dimension Table For Mounting Clamp :

MODEL	Bore	42	52	62	72	82	102
Stroke	mm	40	47	55	63	75	88
Stroke	in	1.6	1.9	2.2	2.5	3.0	3.5
Stroke	mm	48	55	65	75	90	105
Stroke	in	1.9	2.2	2.6	3.0	3.5	4.1
Stroke	mm	30	33.5	38.5	46	52.5	60
Stroke	in	1.2	1.3	1.5	1.8	2.1	2.4
Stroke	mm	3	3	3	3	3	3

Swing Cylinder



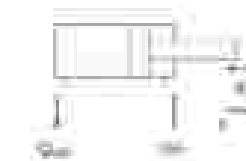
Features :

- ★ This is a double acting cylinder with swing clamp.
- ★ It is a Chromium plated piston rod with alloy steel body.
- ★ It can be used with the rotation of 90°.
- ★ These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- ★ It can be used in the range of 1 MPa (minimum operating pressure) 8 MPa (maximum operating pressure) 70 bar N (pushing force)

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2 / 4 = 0.785 d_1^2$
- $A_2 = \pi d_2^2 / 4$
- $F_1 = A_1 P_1 - A_2 P$
- $F_2 = (P_2 A_2 - P_1 A_1)$
- $Q_{in} = A_1 v$
- $Q_{out} = A_2 v$
- P_1 - result back of pressure from pipes & valves for Q_{in}



- A_1 piston area
- d_1 piston
- A_2 rod area
- d_2 rod
- P_1 force
- P_2 pressure, atm on side

simplified

$$F_1 (kN) = \frac{P_1 (bar) \cdot A_1 (mm^2) \cdot 0.101325}{A_1 (m^2)}$$

$$F_1 (N) = \frac{P_1 (bar) \cdot A_1 (mm^2) \cdot 0.101325 \cdot 10}{10}$$

Retracting

- $Q_{in} = A_2 v$
- $Q_{out} = A_1 v$
- $F_1 = A_2 P_1 - A_1 P$
- $F_2 = (P_2 A_2 - P_1 A_1)$
-
-
- P_1 - result back of pressure from pipes & valves for Q_{in}

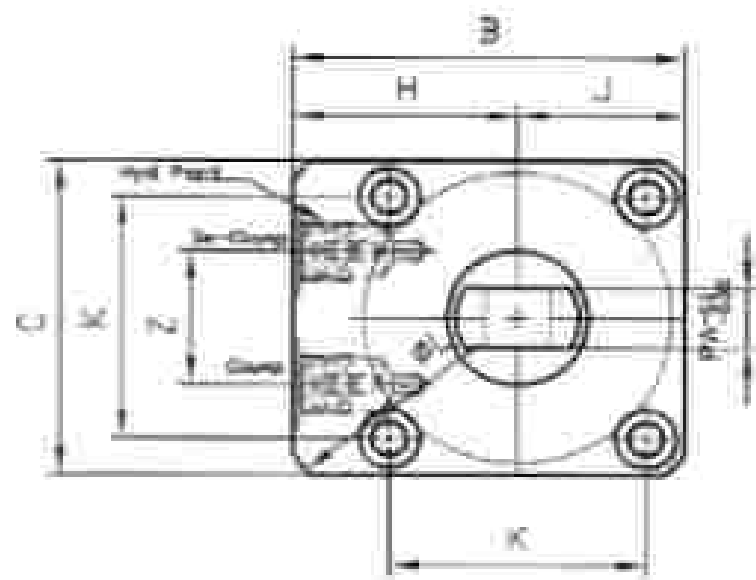
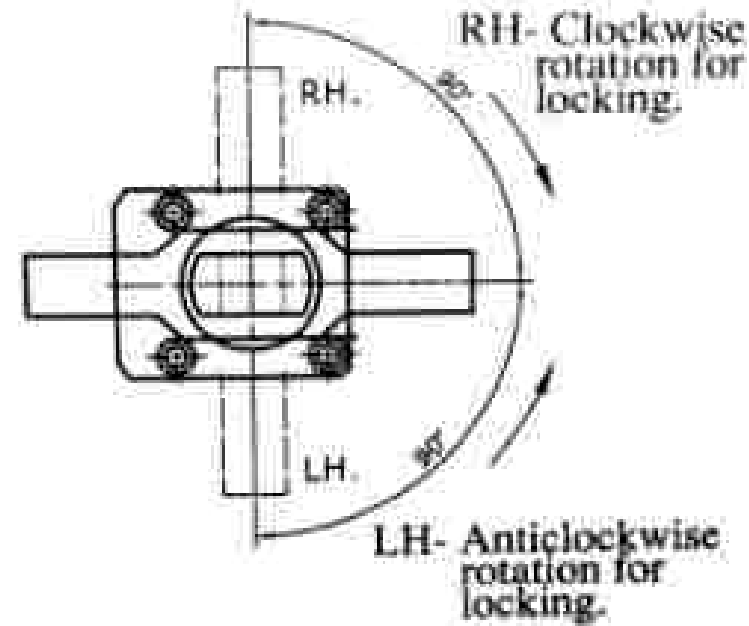
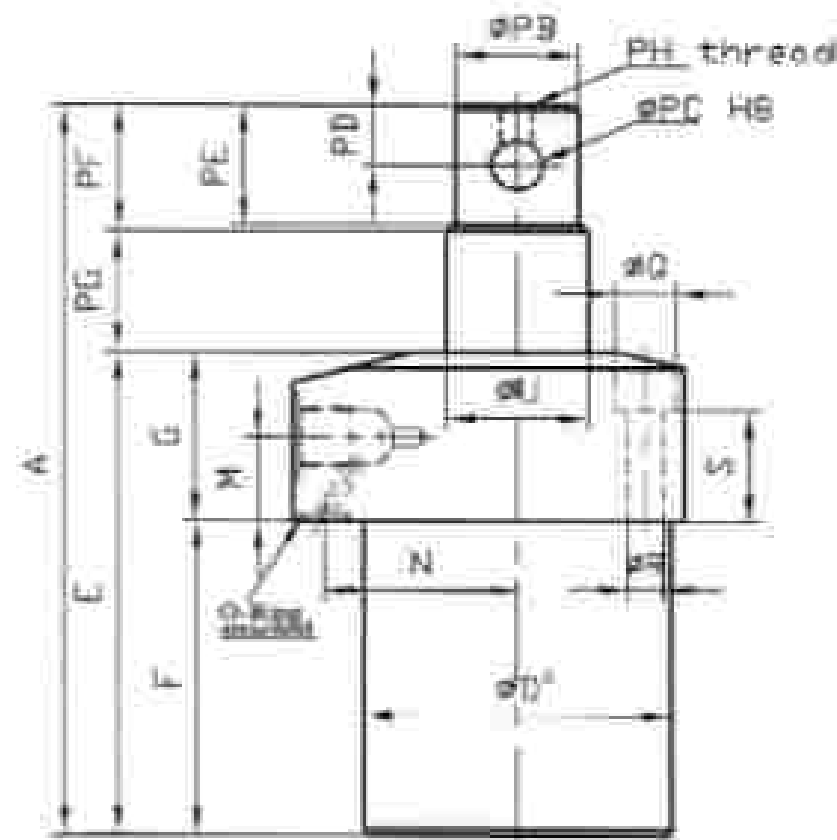
- A_1 piston area
- d_1 piston
- A_2 rod area
- d_2 rod
- P_1 force
- P_2 pressure, atm on side

simplified

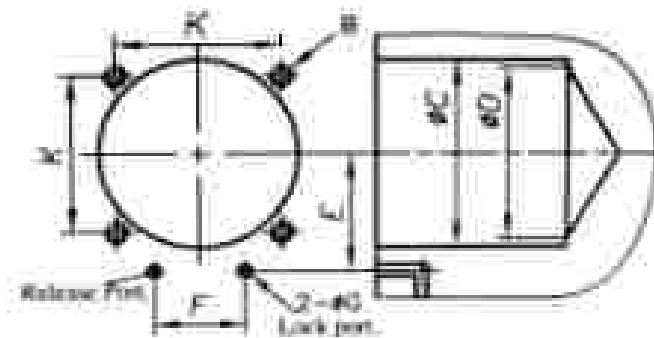
$$F_1 (kN) = \frac{P_1 (bar) \cdot A_2 (mm^2) \cdot 0.101325}{A_1 (m^2)}$$

$$F_1 (N) = \frac{P_1 (bar) \cdot A_2 (mm^2) \cdot 0.101325 \cdot 10}{10}$$

Outline Dimension :



Mounting Dimensions :



Dimension Table :

MODEL	ØPC	ØPC H6	ØD	ØD	ØD	ØD	ØD
MODEL	ØPC	ØPC H6	ØD	ØD	ØD	ØD	ØD
SC07-1	12	14.5	18	18	18	18	18
SC07-2	15	17	21	21	21	21	21
SC07-3	18	20	24	24	24	24	24
SC07-4	21	23	27	27	27	27	27
SC07-5	24	26	30	30	30	30	30
SC07-6	27	29	33	33	33	33	33
SC07-7	30	32	36	36	36	36	36
SC07-8	33	35	39	39	39	39	39
SC07-9	36	38	42	42	42	42	42
SC07-10	39	41	45	45	45	45	45
SC07-11	42	44	48	48	48	48	48
SC07-12	45	47	51	51	51	51	51
SC07-13	48	50	54	54	54	54	54
SC07-14	51	53	57	57	57	57	57
SC07-15	54	56	60	60	60	60	60
SC07-16	57	59	63	63	63	63	63
SC07-17	60	62	66	66	66	66	66
SC07-18	63	65	69	69	69	69	69
SC07-19	66	68	72	72	72	72	72
SC07-20	69	71	75	75	75	75	75
SC07-21	72	74	78	78	78	78	78
SC07-22	75	77	81	81	81	81	81
SC07-23	78	80	84	84	84	84	84
SC07-24	81	83	87	87	87	87	87
SC07-25	84	86	90	90	90	90	90
SC07-26	87	89	93	93	93	93	93
SC07-27	90	92	96	96	96	96	96
SC07-28	93	95	99	99	99	99	99
SC07-29	96	98	102	102	102	102	102
SC07-30	99	101	105	105	105	105	105
SC07-31	102	104	108	108	108	108	108
SC07-32	105	107	111	111	111	111	111
SC07-33	108	110	114	114	114	114	114
SC07-34	111	113	117	117	117	117	117
SC07-35	114	116	120	120	120	120	120
SC07-36	117	119	123	123	123	123	123
SC07-37	120	122	126	126	126	126	126
SC07-38	123	125	129	129	129	129	129
SC07-39	126	128	132	132	132	132	132
SC07-40	129	131	135	135	135	135	135
SC07-41	132	134	138	138	138	138	138
SC07-42	135	137	141	141	141	141	141
SC07-43	138	140	144	144	144	144	144
SC07-44	141	143	147	147	147	147	147
SC07-45	144	146	150	150	150	150	150
SC07-46	147	149	153	153	153	153	153
SC07-47	150	152	156	156	156	156	156
SC07-48	153	155	159	159	159	159	159
SC07-49	156	158	162	162	162	162	162
SC07-50	159	161	165	165	165	165	165
SC07-51	162	164	168	168	168	168	168
SC07-52	165	167	171	171	171	171	171
SC07-53	168	170	174	174	174	174	174
SC07-54	171	173	177	177	177	177	177
SC07-55	174	176	180	180	180	180	180
SC07-56	177	179	183	183	183	183	183
SC07-57	180	182	186	186	186	186	186
SC07-58	183	185	189	189	189	189	189
SC07-59	186	188	192	192	192	192	192
SC07-60	189	191	195	195	195	195	195
SC07-61	192	194	198	198	198	198	198
SC07-62	195	197	201	201	201	201	201
SC07-63	198	200	204	204	204	204	204
SC07-64	201	203	207	207	207	207	207
SC07-65	204	206	210	210	210	210	210
SC07-66	207	209	213	213	213	213	213
SC07-67	210	212	216	216	216	216	216
SC07-68	213	215	219	219	219	219	219
SC07-69	216	218	222	222	222	222	222
SC07-70	219	221	225	225	225	225	225
SC07-71	222	224	228	228	228	228	228
SC07-72	225	227	231	231	231	231	231
SC07-73	228	230	234	234	234	234	234
SC07-74	231	233	237	237	237	237	237
SC07-75	234	236	240	240	240	240	240
SC07-76	237	239	243	243	243	243	243
SC07-77	240	242	246	246	246	246	246
SC07-78	243	245	249	249	249	249	249
SC07-79	246	248	252	252	252	252	252
SC07-80	249	251	255	255	255	255	255
SC07-81	252	254	258	258	258	258	258
SC07-82	255	257	261	261	261	261	261
SC07-83	258	260	264	264	264	264	264
SC07-84	261	263	267	267	267	267	267
SC07-85	264	266	270	270	270	270	270
SC07-86	267	269	273	273	273	273	273
SC07-87	270	272	276	276	276	276	276
SC07-88	273	275	279	279	279	279	279
SC07-89	276	278	282	282	282	282	282
SC07-90	279	281	285	285	285	285	285
SC07-91	282	284	288	288	288	288	288
SC07-92	285	287	291	291	291	291	291
SC07-93	288	290	294	294	294	294	294
SC07-94	291	293	297	297	297	297	297
SC07-95	294	296	300	300	300	300	300
SC07-96	297	299	303	303	303	303	303
SC07-97	300	302	306	306	306	306	306
SC07-98	303	305	309	309	309	309	309
SC07-99	306	308	312	312	312	312	312
SC07-100	309	311	315	315	315	315	315

Specification Table :

Specification	1	2	3	4	5	6
Pressure (bar)	10	22	28	35	50	70
Flow rate (l/min)	18	12	15	17	15	15
Locking stroke (mm)	40	31	38	47	57	56
Stroke	lock	12	20.1	41.1	101.8	111
	release	21.5	21.8	17.1	16.7	12.8
Max. pressure (bar)	7					
Min. pressure (bar)	1.5					
Design pressure (bar)	10.5					
Temperature (°C)	0-70					
Speed (mm/s)	1.1	1.4	2.1	4.2	5.5	4

Machining Dimension Table For Mounting Clamp :

MODEL	ØPC	ØPC H6	ØD	ØD	ØD	ØD	ØD
MODEL	ØPC	ØPC H6	ØD	ØD	ØD	ØD	ØD
E	45	47	55	61	75	88	88
B	55	55	58	58	82	82	82
Co.2	48	55	65	75	90	100	100
D	45	50	60	70	85	100	100
E	60	65	80	90	105	120	120
F	22	24	30	32	37	45	45
G	3	3	3	3	3	4	4

Swing Cylinder



Features :

- ★ This is a double acting cylinder with swing clamp.
- ★ It is a Chromium plated piston rod with alloy steel body.
- ★ It can be used with the rotation of 90°.
- ★ These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- ★ It can be used in the range of 1 MPa (minimum operating pressure) 8 MPa (maximum operating pressure) 70 bar N (pushing force)

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2 / 4 = 0.785 d_1^2$
- $A_2 = \pi (d_1^2 - d_2^2) / 4$
- $P_1 A_1 = P_2 A_2 + F$
- $F_1 = P_1 A_1 - P_2 A_2$
- $Q_{in} = A_1 v$
- $Q_{out} = A_2 v$

P_2 = result back of pressure from pipes & valves for Q_{out}



- A_1 : piston area
- d_1 : piston
- A_2 : rod area
- d_2 : rod
- F : force
- P_2 : pressure, piston side

simplified

$$F_1 (\text{bar}) = \frac{Q_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot 10 (\text{bar})}{A_2 (\text{mm}^2)}$$

$$F_2 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) - P_2 (\text{bar}) \cdot A_2 (\text{mm}^2)}{10}$$

Retracting

- $Q_{in} = A_2 v$
- $Q_{out} = A_1 v$
- $P_1 A_1 = P_2 A_2 + F$
- $F_1 = P_1 A_1 - P_2 A_2$
-
-

P_2 = result back of pressure from pipes & valves for Q_{in}

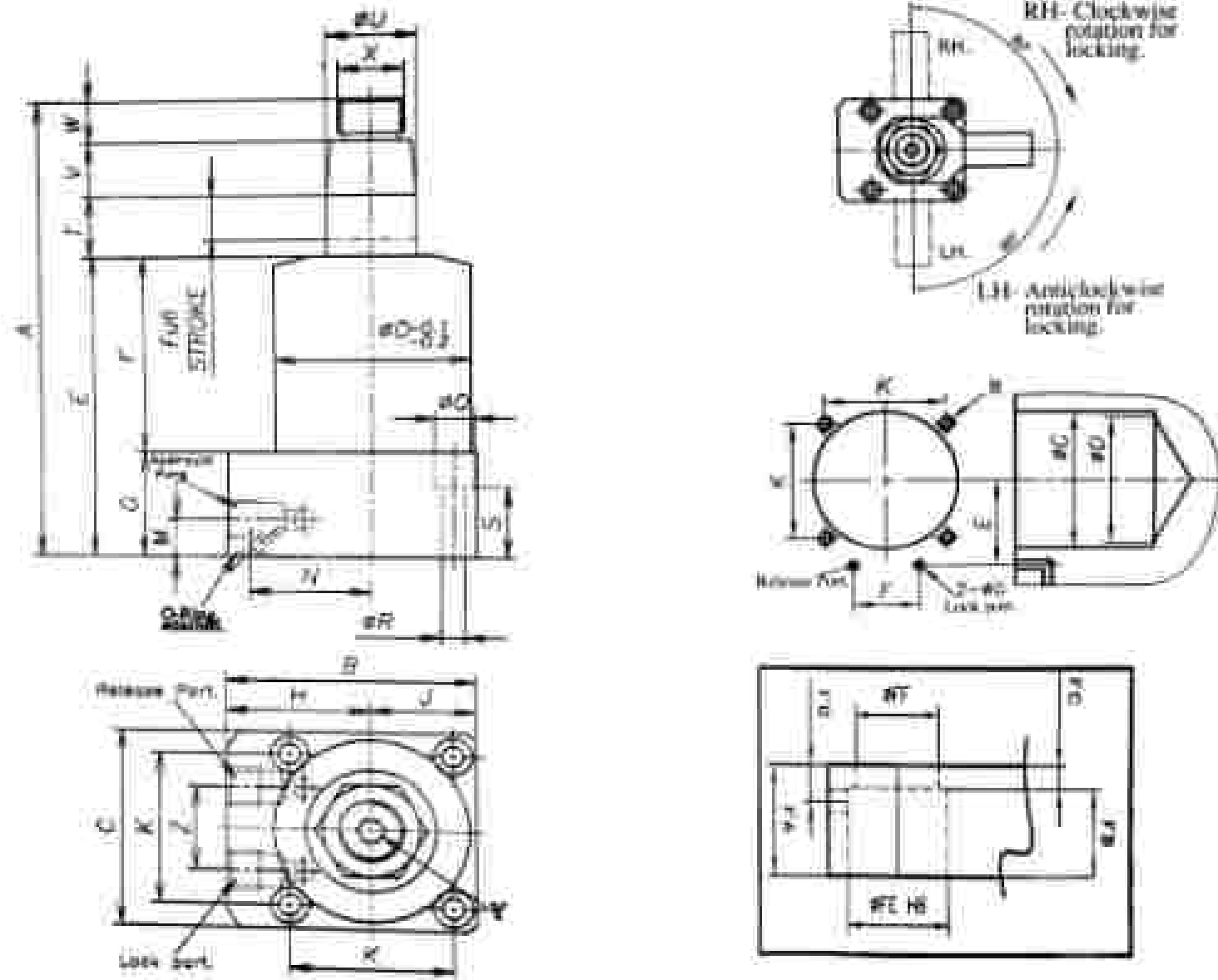
- A_1 : piston area
- d_1 : piston
- A_2 : rod area
- d_2 : rod
- F : force
- P_2 : pressure, piston side

simplified

$$F_1 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) \cdot 10 (\text{bar})}{A_2 (\text{mm}^2)}$$

$$F_2 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) - P_2 (\text{bar}) \cdot A_2 (\text{mm}^2)}{10}$$

Outline Dimension :



Clamp lever dimension table (with sleeve) :

MODEL	0362	0402	0482	0552	0652	0752	0902	01052
FA	12	16	19	25	25	32	38	45
FB	10	12	16	18.5	20.8	25	32	38
FC	2.5	3	4	4	4	5	5	6
FD	4.3	5.3	6.3	6.3	7.3	8.5	9.3	10.5
DE	17	20	25	28	34	40	49	60
DF	13.9	16.7	20.6	23	28	32.9	41.8	51.2
DG	3	4	4	4	6	6	8	8

Specification

MODEL	MM	SC08-0402-R	SC08-0402-L
BORE DIA	mm	40	40
A	mm	48	54
B	mm	40	45
C	mm	38	40
D	mm	64.5	75
E	mm	28.5	30
F	mm	25	25
G	mm	28	31.5
H	mm	20	22.5
I	mm	11.5	14
J	mm	66	77
K	mm	31	31
L	mm	21.5	20
M	mm	3	3
N	mm	15	15
O	mm	45	50
P	mm	18	17
Q	mm	16.5	15
R	mm	18	18
S	mm	8	12
T	mm	7	9
U	mm	M10x1	M12x1.5
V	mm	54	65
W	mm	18	18
X	mm	31.8	31.8
Y	mm	6	6

Specification Table :

Lock-in area (cm ²)	2.8	3.8
Full stroke 90° rotation time	18	18
Swing stroke 180° rotation time	8	10
Locking stroke	8	8
Cylinder	Lock cm ³ Release cm ³	2.6 3.07
Max. working pressure (MPa)		7
Min. operating pressure (MPa)		1.5
Design pressure (MPa)		10.5
Temperature (°C)		6-70
Weight (kg)	0.8	1.0

Machining Dimension Table For Mounting Clamp :

MODEL	MM	SC08-0402-R	SC08-0402-L
KBZ	mm	31.5	34
B	mm	66	65
CBZ	mm	38	40
D	mm	31	35
E	mm	21.5	28
F	mm	18	18
G	mm	3	3

Swing Cylinder



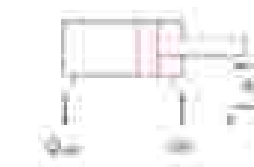
Features :

- ★ This is a double acting cylinder with swing clamp.
- ★ It is a Chromium plated piston rod with alloy steel body.
- ★ It can be used with the rotation of 90°.
- ★ These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- ★ It can be used in the range of 1 MPa (minimum operating pressure) 8 MPa (maximum operating pressure) 70 bar N (pushing force)

Double acting hydraulic cylinder

Extending

$$\begin{aligned} & \leftarrow A_1 = \pi d_1^2 / 4 \approx 0.785 d_1^2 \\ & \leftarrow A_2 = \pi (d_1^2 - d_2^2) / 4 \\ & \leftarrow F_1 = A_1 P_1 - A_2 P_2 \\ & \leftarrow F_2 = (P_1 A_1 - P_2 A_2) / 2 \\ & \leftarrow Q_{in} = A_1 v \\ & \leftarrow Q_{out} = A_2 V \\ & P_2: \text{result back of pressure from pipes \& valves for } Q_{out} \end{aligned}$$



A_1 : piston area
 d_1 : piston
 A_2 : rod area
 d_2 : rod
 F_1 : force
 P_1 : pressure, piston side

simplified

$$\leftarrow F_1 [\text{bar}] = \frac{P_1 [\text{bar}] \cdot A_1 [\text{mm}^2] \cdot 10 [\text{N}]}{A_1 [\text{mm}^2]}$$

$$F_2 [\text{N}] = \frac{(P_1 [\text{bar}] \cdot A_1 [\text{mm}^2] - P_2 [\text{bar}] \cdot A_2 [\text{mm}^2])}{10}$$

Retracting

$$\begin{aligned} & \leftarrow Q_{in} = A_2 v \\ & \leftarrow Q_{out} = A_1 V \\ & \leftarrow F_1 = A_2 P_1 - A_1 P_2 \\ & \leftarrow F_2 = (P_1 A_2 - P_2 A_1) / 2 \\ & \leftarrow \\ & P_2: \text{result back of pressure from pipes \& valves for } Q_{out} \end{aligned}$$

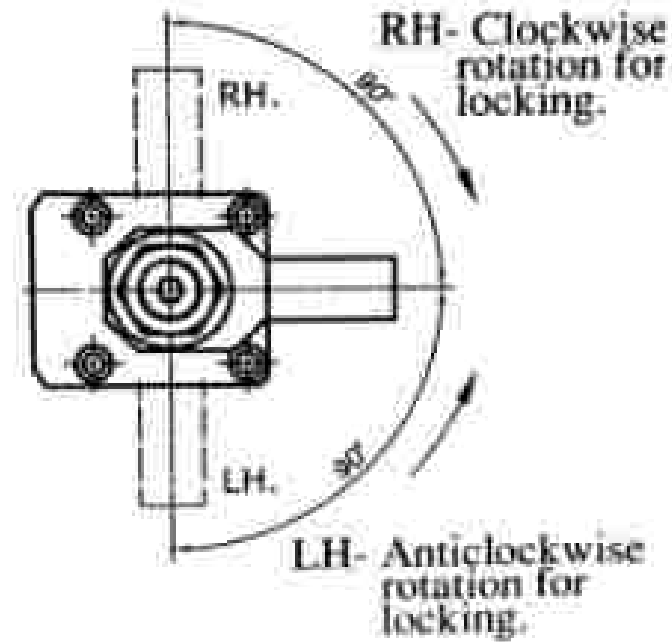
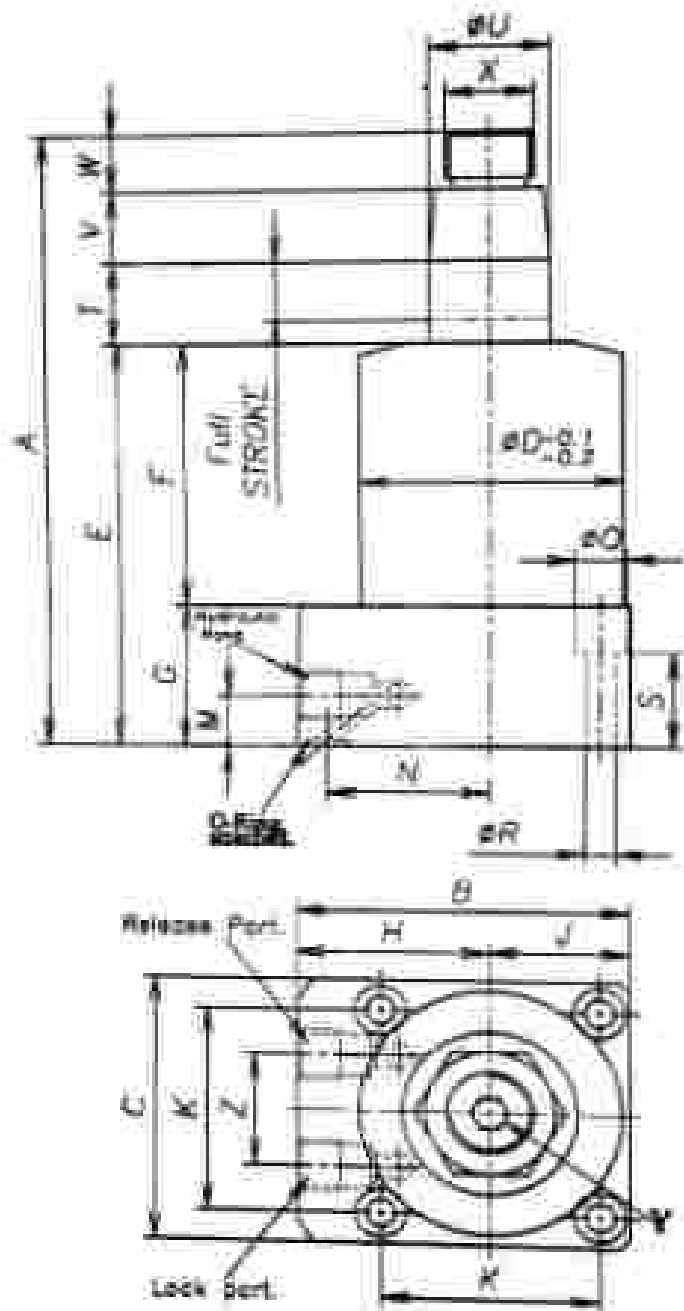
A_1 : piston area
 d_1 : piston
 A_2 : rod area
 d_2 : rod
 F_1 : force
 P_1 : pressure, piston side

simplified

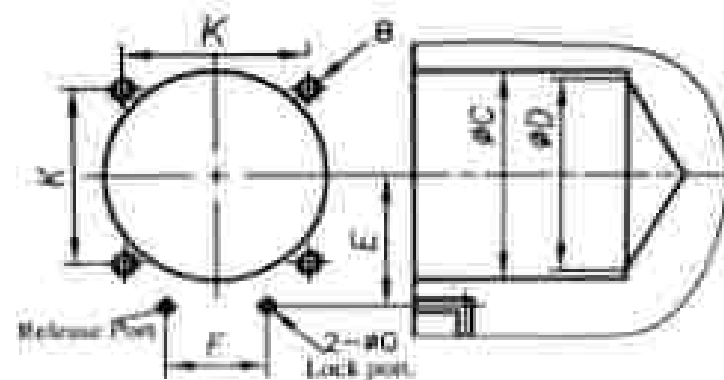
$$\leftarrow F_1 [\text{bar}] = \frac{P_1 [\text{bar}] \cdot A_2 [\text{mm}^2] \cdot 10 [\text{N}]}{A_2 [\text{mm}^2]}$$

$$F_2 [\text{N}] = \frac{(P_1 [\text{bar}] \cdot A_2 [\text{mm}^2] - P_2 [\text{bar}] \cdot A_1 [\text{mm}^2])}{10}$$

Outline Dimension :



Mounting Details :



Specification

MODEL	MM	DS1-R	DS2-R	DS3-R	DS4-R	DS5-R	DS6-R
Stroke (mm)		25	40	50	75	100	125
A		120	141.5	150	175	190	213
B		81	88	81	81	97	127
C		52	60	70	80	95	120
D		48	55	65	75	90	105
E		30	37	43	50	61	75
F		12	18	23	25	34	43
G		28	30	30	37	40	50
H		35	38	40	52	58.5	67
I		26	30	35	40	47.5	55
J		40	47	55	65	75	90
K		61	68	100	116	136	162
L		11	11	12	12	16	17
M		30	33.5	38.5	45	52.5	60
N		3	3	3	3	3	4
O		15	15	15	14.5	17.5	20
P		5.5	6.2	6.8	8	11	14
Q		18.5	17	18	21	27	34.5
R		38	38	40	48.5	55	67.5
S		22	25	30	35	45	55
T		14	20	30	28	32	38
U		12	12	12	14	14	17
V		63.6	61.6	62.0	66.65	68.65	68.65
Flow capacity		60	88	100	132	150	180
Weight		22	24	30	37	47	61
Thread		G1/8	G1/8	G1/8	G1/4	G1/4	G1/4
Lead end		8"	9"	9"	9"	10"	11"

Specification :

Stroke (mm)	3	8	18	25.2	37.2	45.2
Full stroke port	29	22	21	29	38	38
Full stroke	10	11	11	17	18	23
Port rotation (mm)						
Lock rotation (mm)	10	10	10	12	12	16
Capacity	Lock (m ³)	7	11.2	25.2	42.8	102.6
	Release (m ³)	125	103	37.2	60.7	127.8
Maximum pressure (MPa)	7					
Minimum pressure (MPa)	1.5					
Design pressure (MPa)	10.5					
Temperature (°C)	0/70					
Weight (kg)	1.1	1.4	2.7	4.2	5.5	9

Machining Dimension Table For Mounting Clamp :

MODEL	MM	DS1-R	DS2-R	DS3-R	DS4-R	DS5-R	DS6-R
		DS1-L	DS2-L	DS3-L	DS4-L	DS5-L	DS6-L
K		40	47	55	63	75	88
B		35	36	36	36	38	42
C/D		48	55	65	75	90	105
D		45	50	60	70	85	100
E		30	33.5	38.5	45	52.5	60
F		22	24	30	32	37	45
G		3	3	3	3	3	4

Swing Cylinder



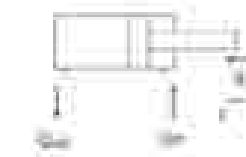
Features :

- ★ This is a double acting cylinder with swing clamp.
- ★ It is a Chromium plated piston rod with alloy steel body.
- ★ It can be used with the rotation of 90°.
- ★ These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- ★ It can be used in the range of 1 MPa (minimum operating pressure) 8 MPa (maximum operating pressure) 70 bar N (pushing force)

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2 / 4 = 0.785 d_1^2$
- $A_2 = \pi (d_1^2 - d_2^2) / 4$
- $F_1 A_1 = P_1 A_2 + F$
- $F_1 = (P_1 A_2 + F) / A_1$
- $Q_{in} = A_1 V$
- $Q_{out} = A_2 V$
- P_1 - result back of pressure from pipes & valves for Q_{in}



- A_1 piston area
- d_1 piston
- A_2 rod area
- d_2 rod
- F force
- P_1 pressure, piston side

simplified

$$F_1 (\text{bar}) = \frac{P_1 (\text{bar}) \cdot A_2 (\text{mm}^2) + 10 F (\text{N})}{A_1 (\text{mm}^2)}$$

$$F (\text{N}) = \frac{P_1 (\text{bar}) \cdot A_1 (\text{mm}^2) - F_1 (\text{bar}) \cdot A_2 (\text{mm}^2)}{10}$$

Retracting

- $Q_{in} = A_2 V$
- $Q_{out} = A_1 V$
- $F_2 A_2 = P_2 A_1 + F$
- $F_2 = (P_2 A_1 + F) / A_2$
-
-
- P_2 - result back of pressure from pipes & valves for Q_{in}

- A_1 piston area
- d_1 piston
- A_2 rod area
- d_2 rod
- F force
- P_2 pressure, piston side

simplified

$$F_2 (\text{bar}) = \frac{P_2 (\text{bar}) \cdot A_1 (\text{mm}^2) + 10 F (\text{N})}{A_2 (\text{mm}^2)}$$

$$F (\text{N}) = \frac{P_2 (\text{bar}) \cdot A_2 (\text{mm}^2) - F_2 (\text{bar}) \cdot A_1 (\text{mm}^2)}{10}$$

Work Support

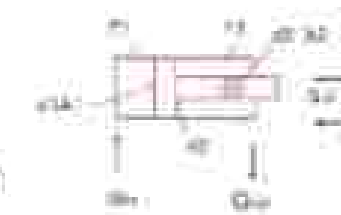


Features :

- ★ This is a threaded body with compact design of single acting.
- ★ It is a wide operating pressure range.
- ★ This work support is a hydraulic advance with manifold mounting & also, spring advance
- ★ It can be used in the range of 7 Mpa
- ★ Maximum operating pressure 70bar Max

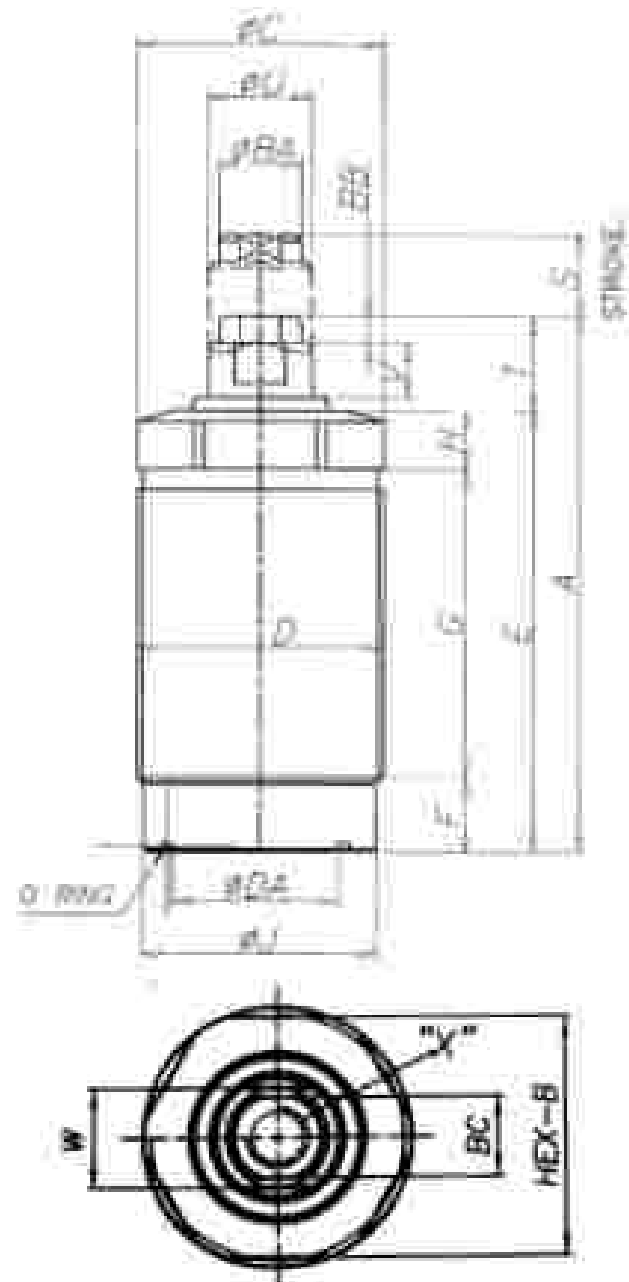
Single acting hydraulic cylinder:

- $V[\text{m}^3/\text{s}] = s[\text{m}]/1000[\text{s}]$
- $A[\text{mm}^2] = \pi d^2/4$ [mm]
- $F[\text{N}] = 0.1 \cdot p_s[\text{bar}] \cdot A[\text{mm}^2]$
- $P_s[\text{bar}] = 10 F[\text{N}]/A[\text{mm}^2]$
- $Q_s[\text{dm}^3] = 0.08 \cdot A[\text{mm}^2] \cdot v[\text{m/s}]$

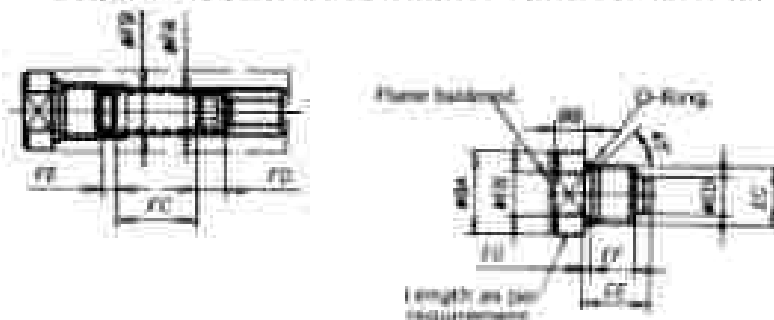


- s: travel(stroke)
- d: piston diameter
- F_p : force
- Q_s : inflow
- P_s : operating pressure
- v: piston speed

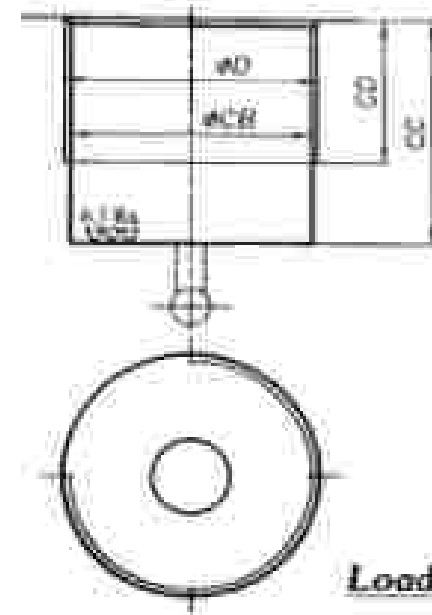
Outline Dimension :



Plunger Spring & Contact Bolt Dimensions :

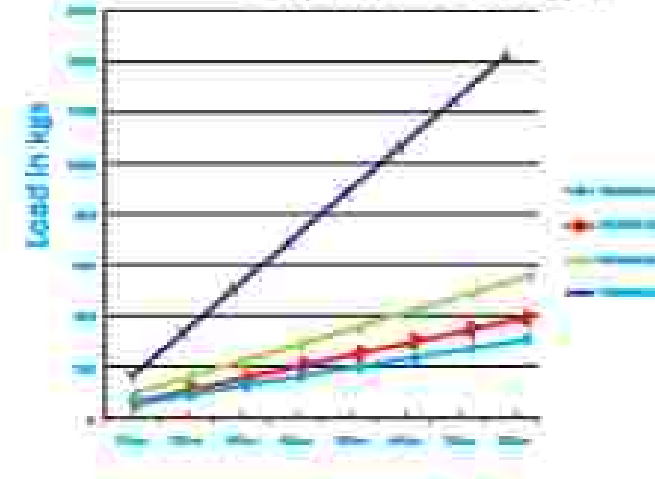


Mounting Dimensions :



Load Graphs :

Support Load vs Pressure :



Specification

MODEL	TYPE-M38	TYPE-M33	TYPE-M32	TYPE-M31
Support Load (kgs)	3.00	3.8	4.5	3.5
Support Force Formula MPa	0.500F0.68	0.650F0.69	0.800F0.725	1.00F0.738
Plunger Stroke (mm)	6	8	8	10
Plunger ring Force (N)	2.8-4.1	3.6-5.7	4.7-7.8	5.9-9.7
Plunger ring Force (kg)	2.8-5.1	4.7-8	6.2-11	1.9-11.6
Cylinder volume (cc)	0.40	0.60	1.00	1.00
Max. Pressure	20MPa			
Min. Pressure	7.0MPa			
Weight (kg)	0.20	0.25	0.30	0.25
A	68	74	80	80
B	24	27	32	41
C	26	20	16	6
D	M38x1.5	M30x1.5	M30x1.5	M30x1.5
E	55	62.5	67.5	68.5
F	7	8	9	10
G	56	42	40	40
H	8	9	8.5	10
I	24.5	28.5	34	45
J	9.5	9.5	12.5	13.5
K	38	22	15	18
L	5	5	5.5	6
M	8	10	11	14
N	58	68	80	80
O	11.5	11.5	12.5	12.5
P	4	4	4	4
Q	8	10	12	13
R	24.5	28.5	34.5	43.5
S	10-17	17-20	18-28	21-28
T	CC-7	CC-7	CC-8	CC-8
U	Ø14x1.5	Ø14x1.5	Ø14x1.5	Ø14x1.5

Pad Dimensions :

MODEL	TYPE-M38	TYPE-M33	TYPE-M32	TYPE-M31
BC	4.8	6	8.2	10
CC	56	68	80	80
EE	2.5	3	3	3.5
FF	9	10	10	10
GG	4	7	8	7
HH	7	7	7	7
II	11.5	13	13	13
KK	11.5	13	13	13
LL	4	4	4	4
MM	4	4	4	4
NN	3	2	2	2
OO	18	18	20	20
Mounting torque (Nm)	11.5	10	14	10

Work Support

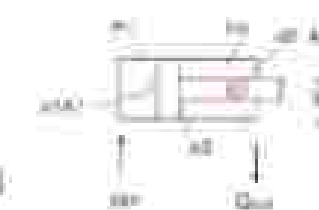


Features :

- ★ This is a flange body with compact design of single acting.
- ★ It is a low operating pressure range.
- ★ This work support is a hydraulic advance with flange mounting & With Spring-Advance
- ★ It can be used in the range of 7 Mpa
- ★ Maximum operating pressure 70bar Max

Single acting hydraulic cylinder

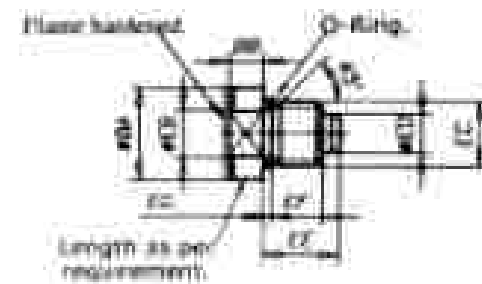
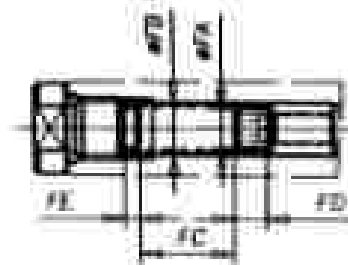
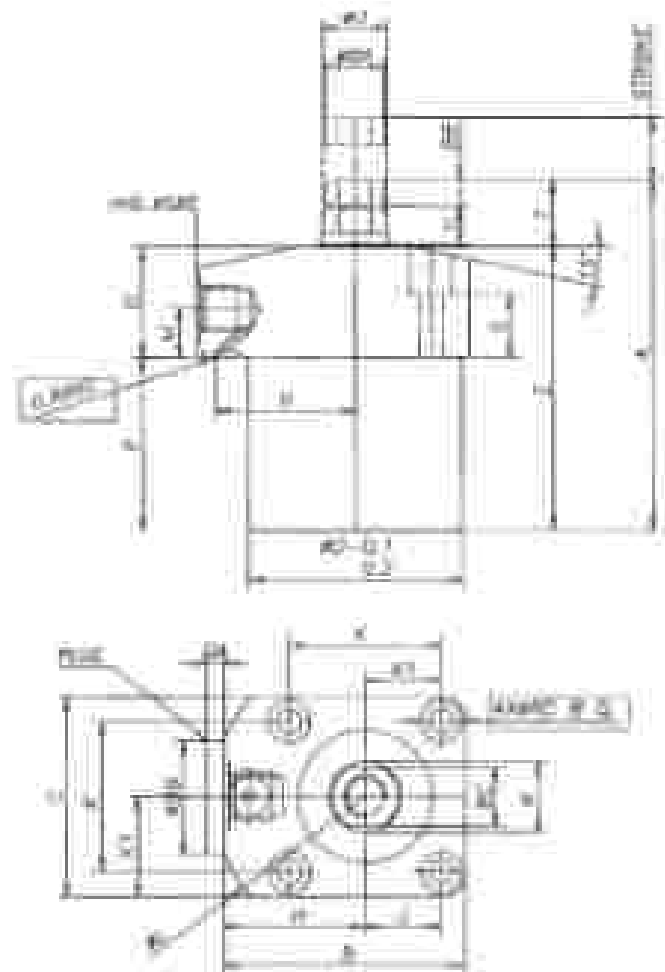
$$\begin{aligned}
 \downarrow v \text{ [m/s]} &= s \text{ [m]} / 100 \text{ [ms]} \\
 \downarrow A \text{ [mm}^2\text{]} &= \pi d^2 / 4 \text{ [mm]} \\
 \downarrow F \text{ [N]} &= 0.1 \cdot p_s \text{ [bar]} \cdot A \text{ [mm}^2\text{]} \\
 \downarrow P_s \text{ [bar]} &= 10 \cdot F \text{ [N]} / A \text{ [mm}^2\text{]} \\
 \downarrow Q_v \text{ [l/min]} &= 0.06 \cdot A \text{ [mm}^2\text{]} \cdot v \text{ [m/s]}
 \end{aligned}$$



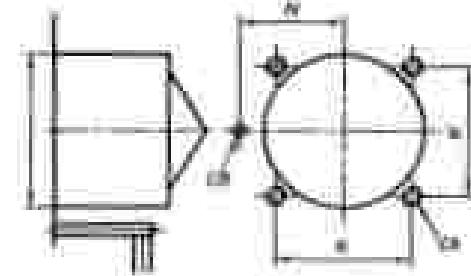
s : travel (stroke)
 d : piston diameter
 F : force
 Q_v : inflow
 P_s : operating pressure
 v : piston speed

Plunger Spring & Contact Bolt Dimensions :

Outline Dimension :

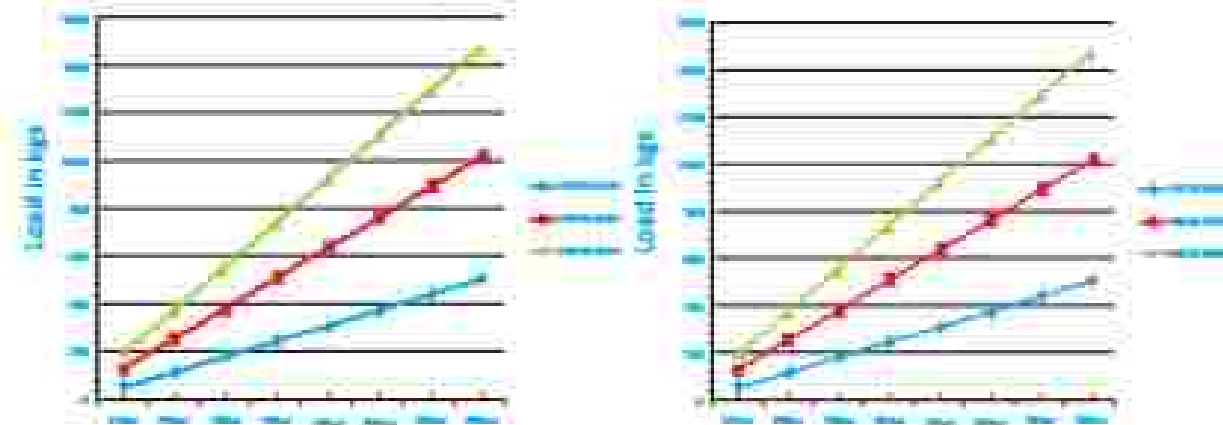


Mounting Dimensions :



Load Graphs :

Support Load vs Pressure :



Specification

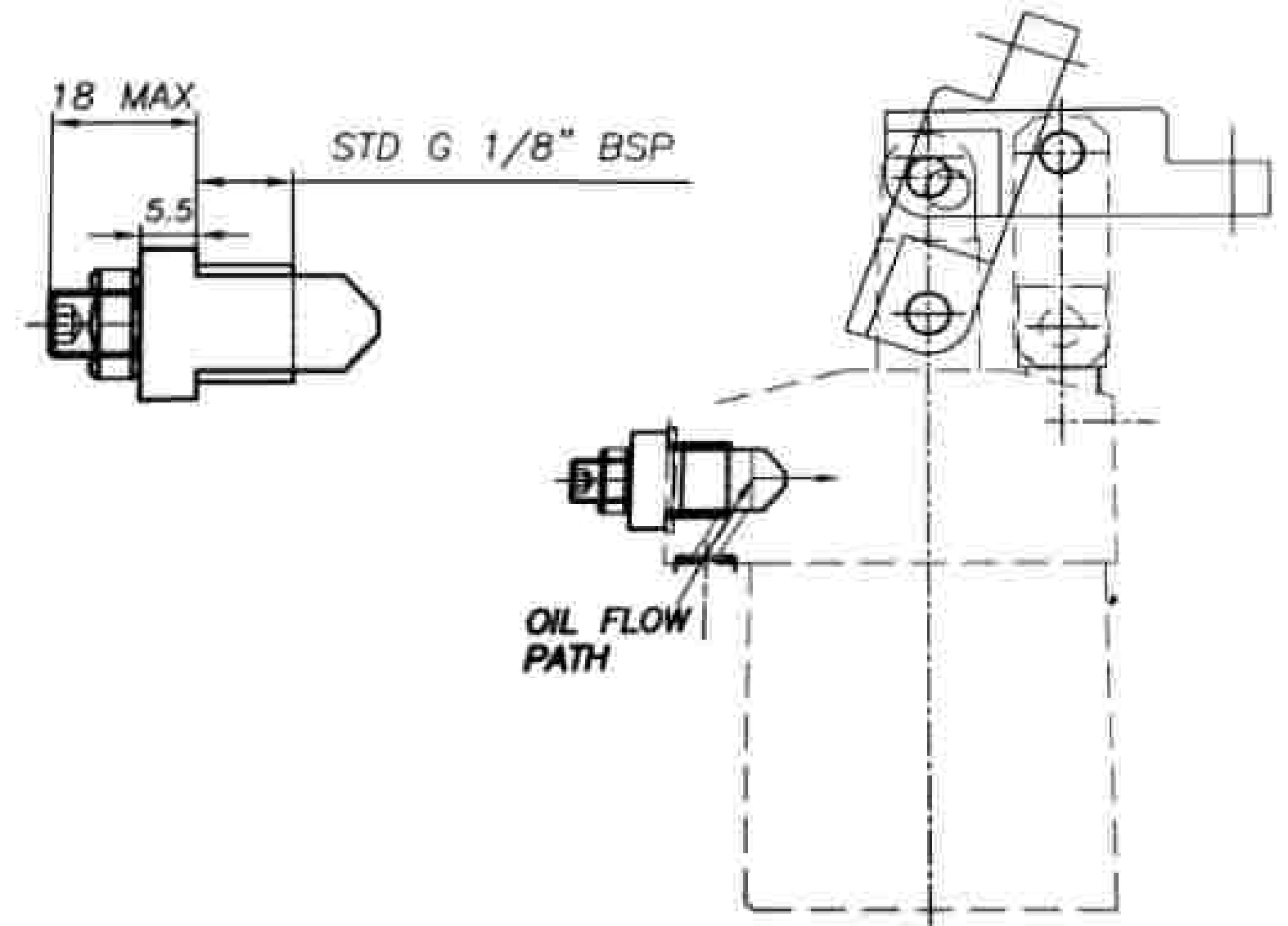
MODEL	FW10-040	FW10-042	FW10-044	FW10-046	FW10-048	FW10-050
Stroke (mm)	45	45	44	21	21	45
Support Load (max) (kg)	8250-1.25	1200-1.25	1200-1.25	1430-1.25	1400-1.13	1500-1.07
Plunger diameter (mm)	8	10	12	14	16	20
Cylinder diameter (mm)	42	40	44	46	48	50
Plunger extension	L/N R/N	12-43 12-55	12-53 12-65	12-53 12-65	12-43 12-55	12-43 12-55
Max Pressure (MPa)	20					
Min Pressure (MPa)	2.0					
Operating Pressure (MPa)	16.5					
Temperature (°C)	0-70					
Weight (kg)	0.6	0.8	1.4	2.2	3.4	6
A	8	8	10	10	12	14
B	38	42	48	50	52	57
C	40	42	44	46	48	50
D	40	42	44	46	48	50
E	14	16	18	20	22	24
F	38	40	42	44	46	48
G	20	22	24	26	28	30
H	20.5	22.5	24	26	28	30
I	22.5	24.5	26	28	30	32
J	36	40	44	48	52	56
K	17	18	19	20	21	22
L	11	12	13	14	15	16
M	25	28	31	34	37	40
N	65	71	77	83	89	95
O	55	59	63	67	71	75
P	15	16	17	18	19	20
Q	34	36	38	40	42	44
R	19	20	21	22	23	24
S	14	15	16	17	18	19
T	12	13	14	15	16	17
U	10	11	12	13	14	15
V	8	9	10	11	12	13
W	12	14	16	18	20	22
X	10	11	12	13	14	15
Y	10	11	12	13	14	15
Z	10	11	12	13	14	15
AA	10	11	12	13	14	15
AB	10	11	12	13	14	15
AC	10	11	12	13	14	15
AD	10	11	12	13	14	15
AE	10	11	12	13	14	15
AF	10	11	12	13	14	15
AG	10	11	12	13	14	15
AH	10	11	12	13	14	15
AI	10	11	12	13	14	15
AJ	10	11	12	13	14	15
AK	10	11	12	13	14	15
AL	10	11	12	13	14	15
AM	10	11	12	13	14	15
AN	10	11	12	13	14	15
AO	10	11	12	13	14	15
AP	10	11	12	13	14	15
AQ	10	11	12	13	14	15
AR	10	11	12	13	14	15
AS	10	11	12	13	14	15
AT	10	11	12	13	14	15
AV	10	11	12	13	14	15
AW	10	11	12	13	14	15
AX	10	11	12	13	14	15
AY	10	11	12	13	14	15
AZ	10	11	12	13	14	15
BA	10	11	12	13	14	15
BB	10	11	12	13	14	15
BC	10	11	12	13	14	15
BD	10	11	12	13	14	15
BE	10	11	12	13	14	15
BF	10	11	12	13	14	15
BG	10	11	12	13	14	15
BH	10	11	12	13	14	15
BI	10	11	12	13	14	15
BJ	10	11	12	13	14	15
BK	10	11	12	13	14	15
BL	10	11	12	13	14	15
BM	10	11	12	13	14	15
BN	10	11	12	13	14	15
BO	10	11	12	13	14	15
BP	10	11	12	13	14	15
BQ	10	11	12	13	14	15
BR	10	11	12	13	14	15
BS	10	11	12	13	14	15
BT	10	11	12	13	14	15
BU	10	11	12	13	14	15
BV	10	11	12	13	14	15
BW	10	11	12	13	14	15
BX	10	11	12	13	14	15
BY	10	11	12	13	14	15
BZ	10	11	12	13	14	15
CA	10	11	12	13	14	15
CB	10	11	12	13	14	15
CC	10	11	12	13	14	15
CD	10	11	12	13	14	15
CE	10	11	12	13	14	15
CF	10	11	12	13	14	15
CG	10	11	12	13	14	15
CH	10	11	12	13	14	15
CI	10	11	12	13	14	15
CJ	10	11	12	13	14	15
CK	10	11	12	13	14	15
CL	10	11	12	13	14	15
CM	10	11	12	13	14	15
CN	10	11	12	13	14	15
CO	10	11	12	13	14	15
CP	10	11	12	13	14	15
CQ	10	11	12	13	14	15
CR	10	11	12	13	14	15
CS	10	11	12	13	14	15
CT	10	11	12	13	14	15
CU	10	11	12	13	14	15
CV	10	11	12	13	14	15
CW	10	11	12	13	14	15
CX	10	11	12	13	14	15
CY	10	11	12	13	14	15
CZ	10	11	12	13	14	15
DA	10	11	12	13	14	15
DB	10	11	12	13	14	15
DC	10	11	12	13	14	15
DD	10	11	12	13	14	15
DE	10	11	12	13	14	15
DF	10	11	12	13	14	15
DG	10	11	12	13	14	15
DH	10	11	12	13	14	15
DI	10	11	12	13	14	15
DJ	10	11	12	13	14	15
DK	10	11	12	13	14	15
DL	10	11	12	13	14	15
DM	10	11	12	13	14	15
DN	10	11	12	13	14	15
DO	10	11	12	13	14	15
DP	10	11	12	13	14	15
DQ	10	11	12	13	14	15
DR	10	11	12	13	14	15
DS	10	11	12	13	14	15
DT	10	11	12	13	14	15
DU	10	11	12	13	14	15
DV	10	11	12	13	14	15
DW	10	11	12	13	14	15
DX	10	11	12	13	14	15
DY	10	11	12	13	14	15
DZ	10	11	12	13	14	15
EA	10	11	12	13	14	15
EB	10	11	12	13	14	15
EC	10	11	12	13	14	15
ED	10	11	12	13	14	15
EE	10	11	12	13	14	15
EF	10	11	12	13	14	15
EG	10	11	12	13	14	15
EH	10	11	12	13	14	15
EI	10	11	12	13	14	15
EJ	10	11	12	13	14	15
EK	10	11	12	13	14	15
EL	10	11	12	13	14	15
EM	10	11	12	13	14	15
EN	10	11	12	13	14	15
EO	10	11	12	13	14	15
EP	10	11	12	13	14	15
EQ	10	11	12	13	14	15
ER	10	11	12	13	14	15
ES	10	11	12	13	14	15
ET	10	11	12	13	14	15
EU	10	11	12	13	14	15
EV	10	11	12	13	14	15
EW	10	11	12	13	14	15
EX	10	11	12	13	14	15
EY	10	11	12	13	14	15
EZ	10	11	12	13	14	15
FA	10	11	12	13	14	15
FB	10	11	12	13	14	15
FC	10	11	12	13	14	15
FD	10	11	12	13	14	15
FE	10	11	12	13	14	15
FF	10	11	12	13	14	15
FG	10	11	12	13	14	15
FH	10	11	12	13	14	15
FI	10	11	12	13	14	15
FJ	10	11	12	13	14	15
FK	10	11	12	13	14	15
FL	10	11	12	13	14	15
FM	10	11	12	13	14	15
FN	10	11	12	13	14	15
FO	10	11	12	13	14	15
FP	10	11	12	13	14	15
FQ	10	11	12	13	14	15
FR	10	11	12	13	14	15
FS	10	11	12	13	14	15

Speed Control Valve 1/8th



Features :

- ★ This is a alloy steel body type with compact design.
- ★ It can be directly mounted on to individual elements like cylinders or work supports.
- ★ It is hydraulic & internal mounting.
- ★ These valves do not required external speed control.
- ★ It can be individual adjustment & very easy.
- ★ It is available in G1/8, G1/4, sizes. & 10lpm (maximum flow allowed)

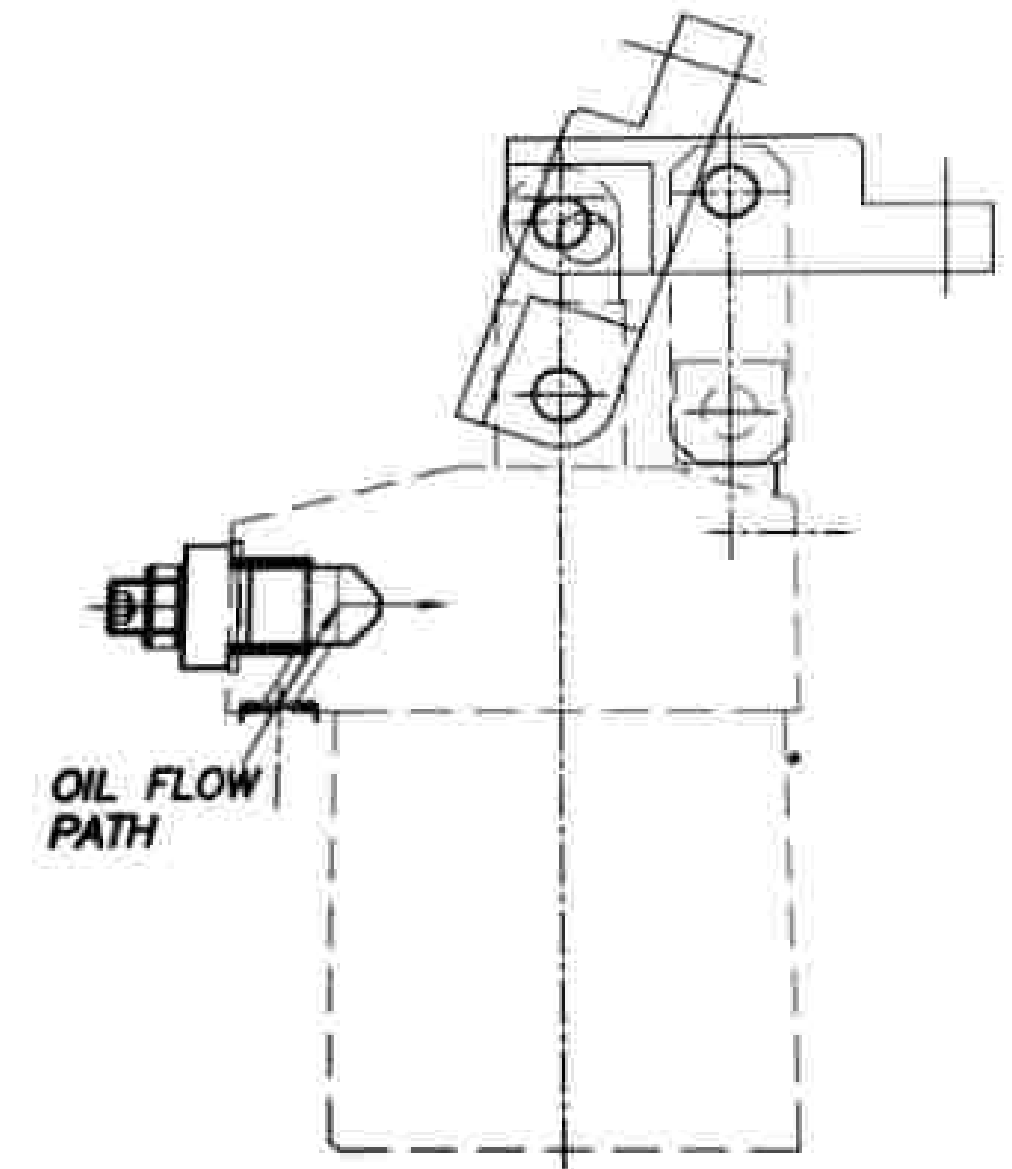
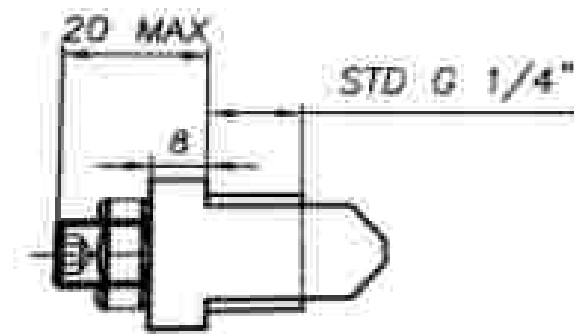


Speed Control Valve 1/4th



Features :

- ★ This is a alloy steel body type with compact design.
- ★ It can be directly mounted on to individual elements like cylinders or work supports.
- ★ It is hydraulic & internal mounting.
- ★ These valves do not required external speed control.
- ★ It can be individual adjustment & very easy.
- ★ It is available in G1/8, G1/4, sizes. & 10lpm (maximum flow allowed)



Sequence Valve

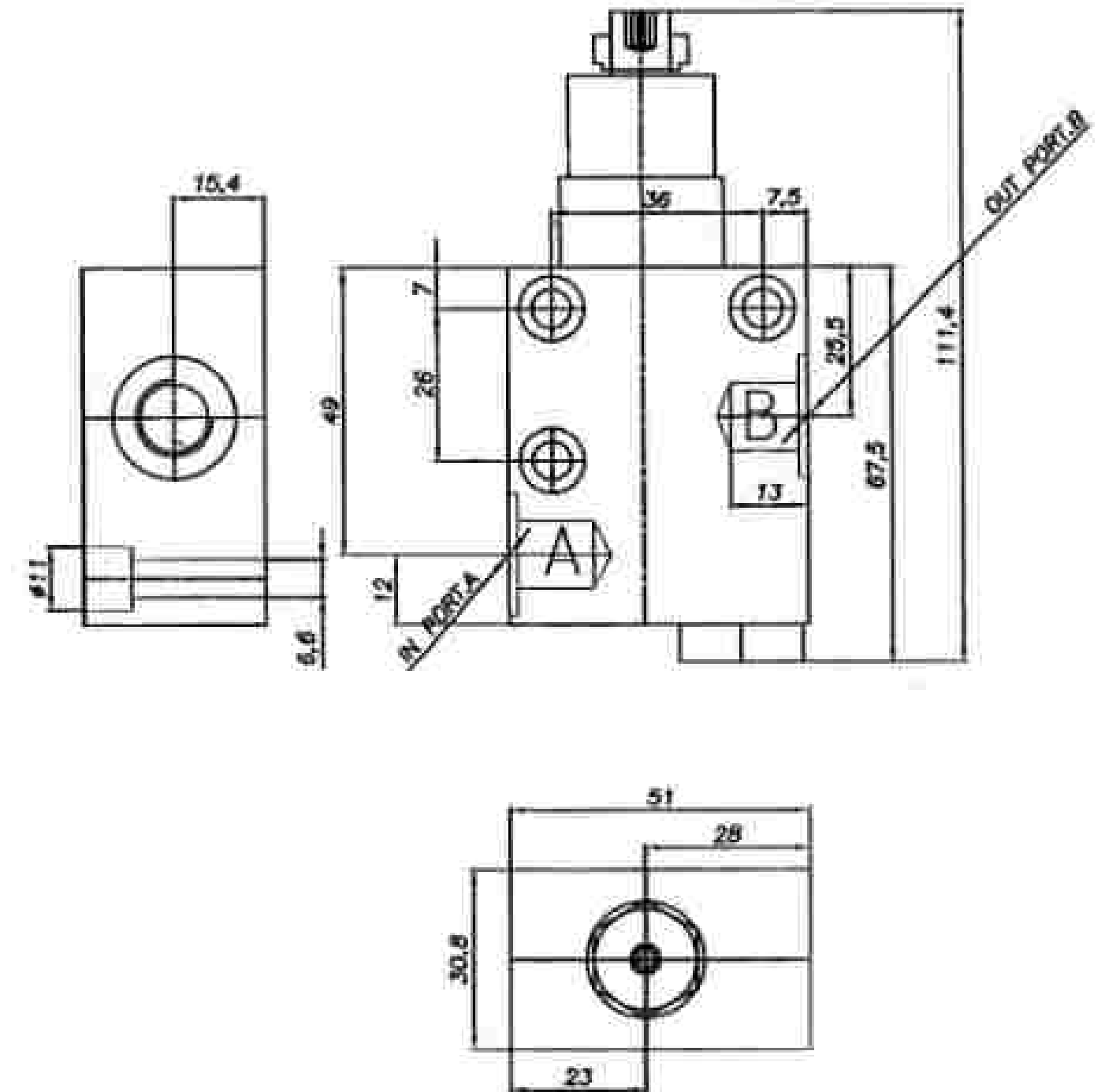


Features :

- ★ This is a cartridge type with compact design.
- ★ It is a G1/4 port with alloy steel body.
- ★ It is hydraulic & space saving mounting.
- ★ These valves can be used for external piping option.
- ★ It can be used in the range of
 - 1 MPa (minimum operating pressure)
 - 10 Mpa (maximum operating pressure)
 - 70 bar N (pushing force)

Applications :

- ★ It is used in circuits to operate multiple actuators in particular pressure dependent sequence.
- ★ Used for positioning and creating delays in actuation.
- ★ Compact design allows for direct mounting on the fixture.



Sequence Valve

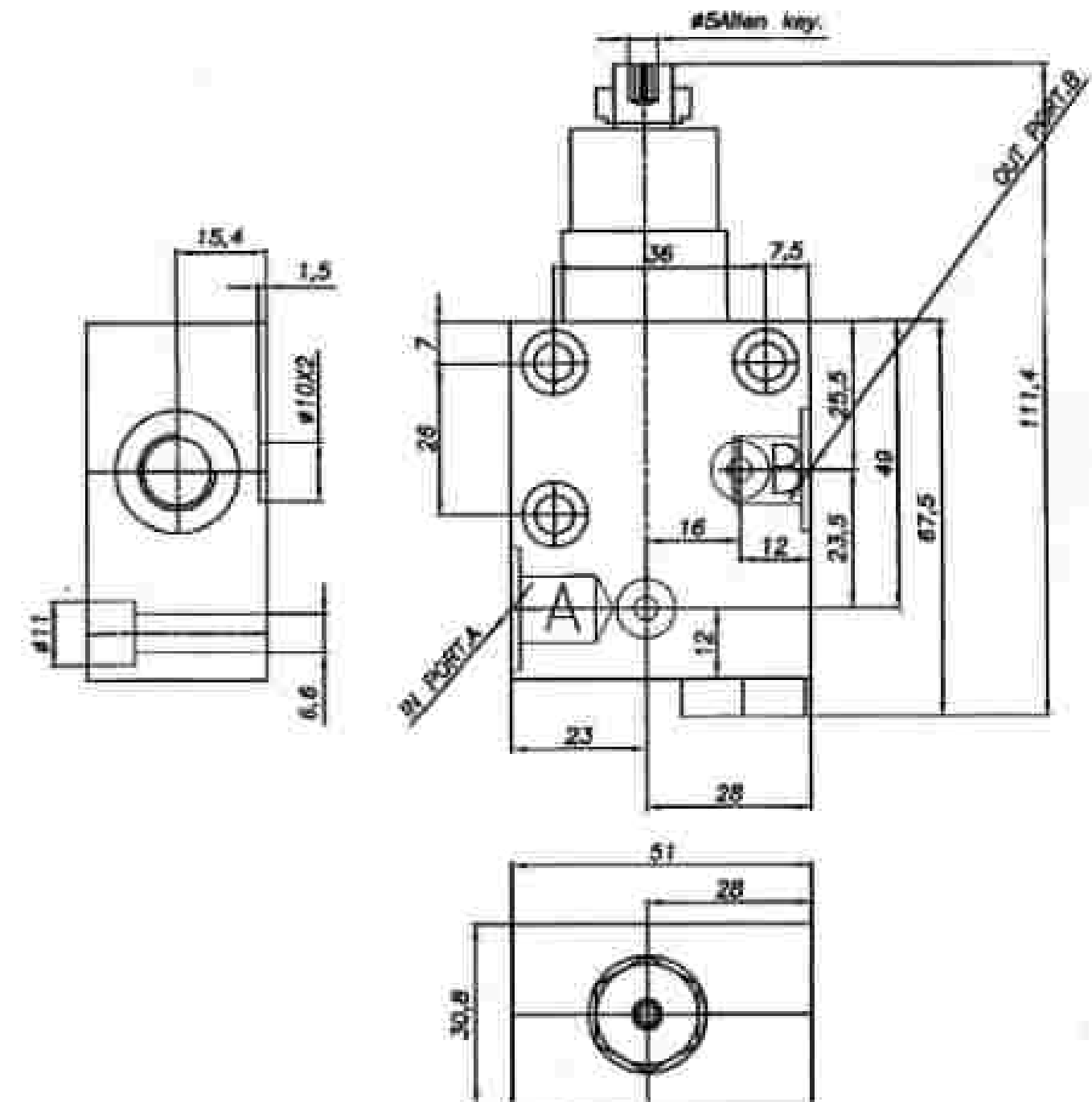


Features :

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Tie Rod Cylinder

MES- Head Mounting Rectangular ME6- Head Mounting Rectangular ME1- Head Mounting Integral Trunnion ME2- Cap Mounting Integral Trunnion ME4-Mounting with Intermediate Fixed Trunnion



ME2- Cap Mounting Tie Rods Extended ME3- Head Mounting Tie Rods Extended MP1- Cap Mounting Fixed Clevis MP3- Cap Mounting Fixed Eye MS2- Mounting with side Lugs



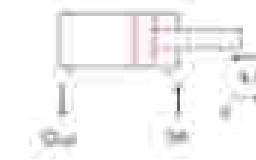
Features :

- ★ This is hydraulic basic cylinder with cushioning from 63 mm bore onwards.
- ★ It is used for bronze filled teflon seals with minimum speed & without stick-slip (5mm/min).
- ★ It can be used in the range of
 - 160 bar (maximum operating pressure)
 - 12 m/min (maximum reciprocating speed)
 - 3-5 bar (break away pressure)
 - 20mm (standard cushioning length)
 - 400mm/min or less(minimum cushioning speed)

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2 / 4 + 0.785 d^2$
- $A_2 = \pi (d_1^2 - d^2) / 4$
- $F_1 = A_1 P_1 - F_2 - F_f$
- $F_2 = (P_2 A_2 - F) / A_1$
- $Q_{in} = A_1 v$
- $Q_{out} = A_2 v$



A_1 piston area
 d_1 piston
 A_2 rod area
 d_2 rod
 F force
 P_1 pressure, piston side

F_2 result back of pressure from pipes & valves for Q_{out}

simplified

$$F_1 (kN) = \frac{P_1 (bar) \cdot A_1 (mm^2) \cdot 10^{-2} (N)}{A_1 (m^2)}$$

$$F(N) = \frac{P_1 (bar) \cdot A_1 (mm^2) - P_2 (bar) \cdot A_2 (mm^2)}{10}$$

Retracting

- $Q_{in} = A_2 v$
- $Q_{out} = A_1 v$
- $F_1 = A_1 P_1 - F_2 - F_f$
- $F_2 = (P_2 A_2 - F) / A_1$
-
-

A_1 piston area
 d_1 piston
 A_2 rod area
 d_2 rod
 F force
 P_1 pressure, piston side

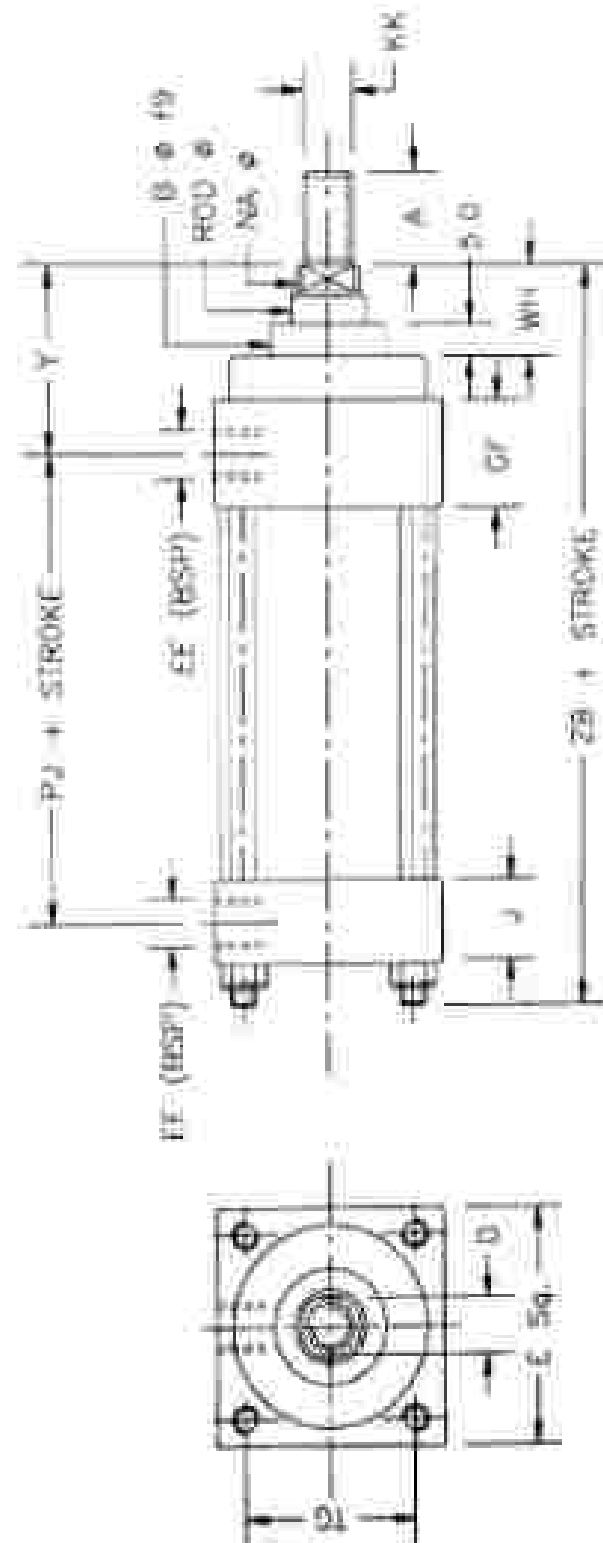
F_2 result back of pressure from pipes & valves for Q_{in}

simplified

$$F_1 (kN) = \frac{P_1 (bar) \cdot A_1 (mm^2) \cdot 10^{-2} (N)}{A_1 (m^2)}$$

$$F(N) = \frac{P_1 (bar) \cdot A_1 (mm^2) - P_2 (bar) \cdot A_2 (mm^2)}{10}$$

Out line Dimension :



Specification

SIZE	ROU	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
12	14	24	10	40	1/8"	20	20	MINIJO		11	55	28.2	15	38	12.1												
16	18	28	12	50	1/8"	25	25	MINIJO		17	20	7.1	41.7	25	62	116											
20	22	32	14	60	1/2"	30	31	MINIJO		21	24	24	52.3	20	57	178											
25	28	40	16	80	1/2"	37	37	MINIJO		26	41	38	44.3	17	71	185											
30	36	48	18	100	3/8"	44	38	MINIJO		34	34	33	62.7	11	77	212											
40	48	60	22	120	3/4"	53	38	MINIJO		41	68	101	83.8	21	82	221											

Tie Rod Cylinder



Features :

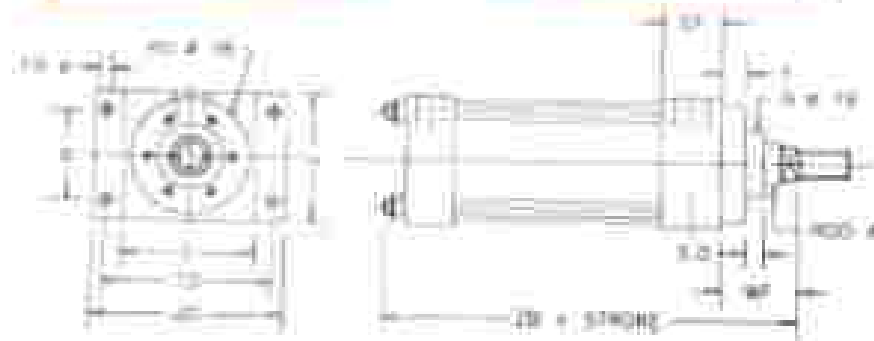
- ★ This is hydraulic basic cylinder with cushioning from 63 mm bore onwards.
- ★ It is used for bronze filled teflon seals with minimum speed & without stick-slip (5mm/min).
- ★ These are high finish on cylinder tube for long seal life.
- ★ All cylinders confirm to ISO standards.
- ★ It can be used in the range of 0.5 MPa (minimum operating pressure)
16MPa (maximum operating pressure)
Ø63 (cushioning from high bore)

Applications :

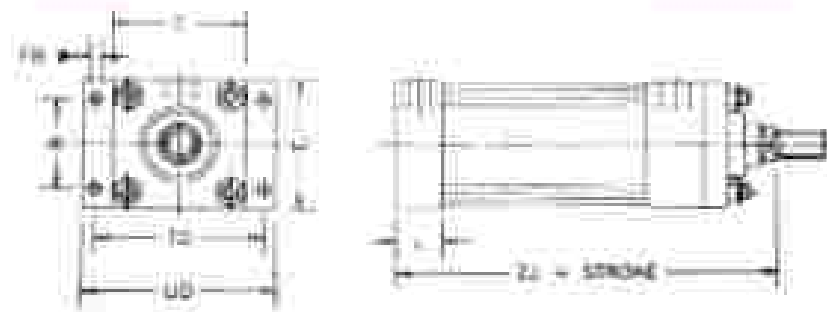
- ★ It is used for clamp work pieces (push or pull method).
- ★ Used for design (direct mounting on th application).
- ★ These are used for various combination of endings & mounting.
- ★ Used for international quality seals with hard chrome plated & ground piston.
- ★ It can clamp a wide range of components (used in assembly auto machine).

Tie Rod Cylinder

ME5 - Head Mounting Rectangular



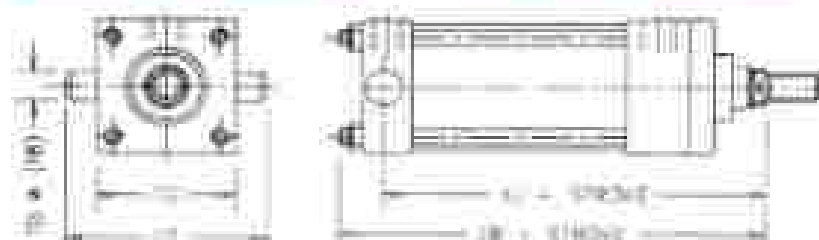
ME6 - Cap Mounting Rectangular



ME1 - Head Mounting Integral Trunnion



MT2 - Cap Mounting Integral Trunnion



Specification

BORE	ROD	F	FB	R	RD	TO	UO	WF
25	12	10	5.5	27	38	51	65	25
40	18	10	11	41	62	62	87	35
50	22	16	14	52	74	74	105	41
63	28	16	14	65	75	88	117	48
80	36	20	18	83	82	105	149	51
100	45	22	18	97	92	125	162	57

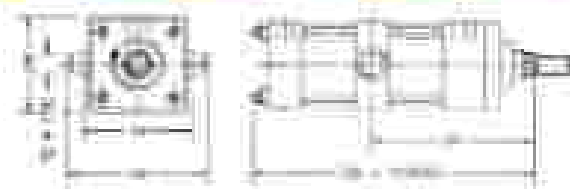
BORE	E	FB	J	R	TD	UD	ZL
25	40	5.5	20	27	51	65	134
40	63	11	30	41	62	110	153
50	75	14	32	52	105	130	159
63	90	14	32	65	117	145	168
80	115	18	38	83	149	180	190
100	130	18	38	97	162	200	203

BORE	TC	TD	UT	XG	ZL
25	38	12	58	44	121
40	63	20	95	57	166
50	76	25	115	64	176
63	89	32	139	70	185
80	114	40	178	76	212
100	127	50	207	71	225

BORE	TC	TD	UT	ZL	ZL
25	38	12	58	101	121
40	63	20	95	134	166
50	76	25	115	160	176
63	89	32	139	149	185
80	114	40	178	149	212
100	127	50	207	167	225

Tie Rod Cylinder

MT4: Mounting with Intermediate Fluid Transfer



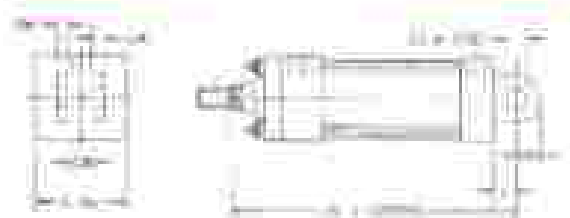
MX2: Cap Mounting Tie Rods Extended



MX3: Head Mounting Tie Rods Extended



MP1: Cap Mounting Fixed Class



MP3: Cap Mounting Fixed Lip



BORE	T8	T8	UM	UM	UV	UV
25	12	48	68	61	To be specified	122
40	20	76	108	92		166
50	25	89	129	112		176
63	32	100	150	126		185
80	40	117	171	160		212
100	50	140	200	190		225

BORE	AA	BB	CD	E	TC	D
25	40	19	M 5x0.8	40	78.3	114
40	58	31	M 8x1.0	61	91.7	133
50	74	46	M 10x1.25	75	103.3	155
63	91	60	M 12x1.25	90	114.3	168
80	117	79	M 16x1.5	115	132.7	190
100	137	99	M 18x1.5	130	146.3	201

BORE	AA	BB	BD	E	TC	D
25	40	19	M 5x0.8	40	78.3	114
40	58	31	M 8x1.0	61	91.7	133
50	74	46	M 10x1.25	75	103.3	155
63	91	60	M 12x1.25	90	114.3	168
80	117	79	M 16x1.5	115	132.7	190
100	137	99	M 18x1.5	130	146.3	201

BORE	A	CB	CD	CE	E	L	MB	TC
25	18	12	10	6	40	13	17	122
40	28	20	14	10	61	19	17	166
50	37	30	20	15	75	22	19	176
63	45	36	26	15	90	27	19	185
80	58	48	38	20	115	34	19	212
100	74	63	50	25	130	44	19	225

BORE	A	CD	E	EW	L	MB	TC
25	18	10	40	17	13	17	122
40	28	14	61	20	19	17	166
50	37	20	75	19	22	19	176
63	45	26	90	20	27	19	185
80	58	38	115	25	34	19	212
100	74	50	130	25	44	19	225

Rotary Distributor

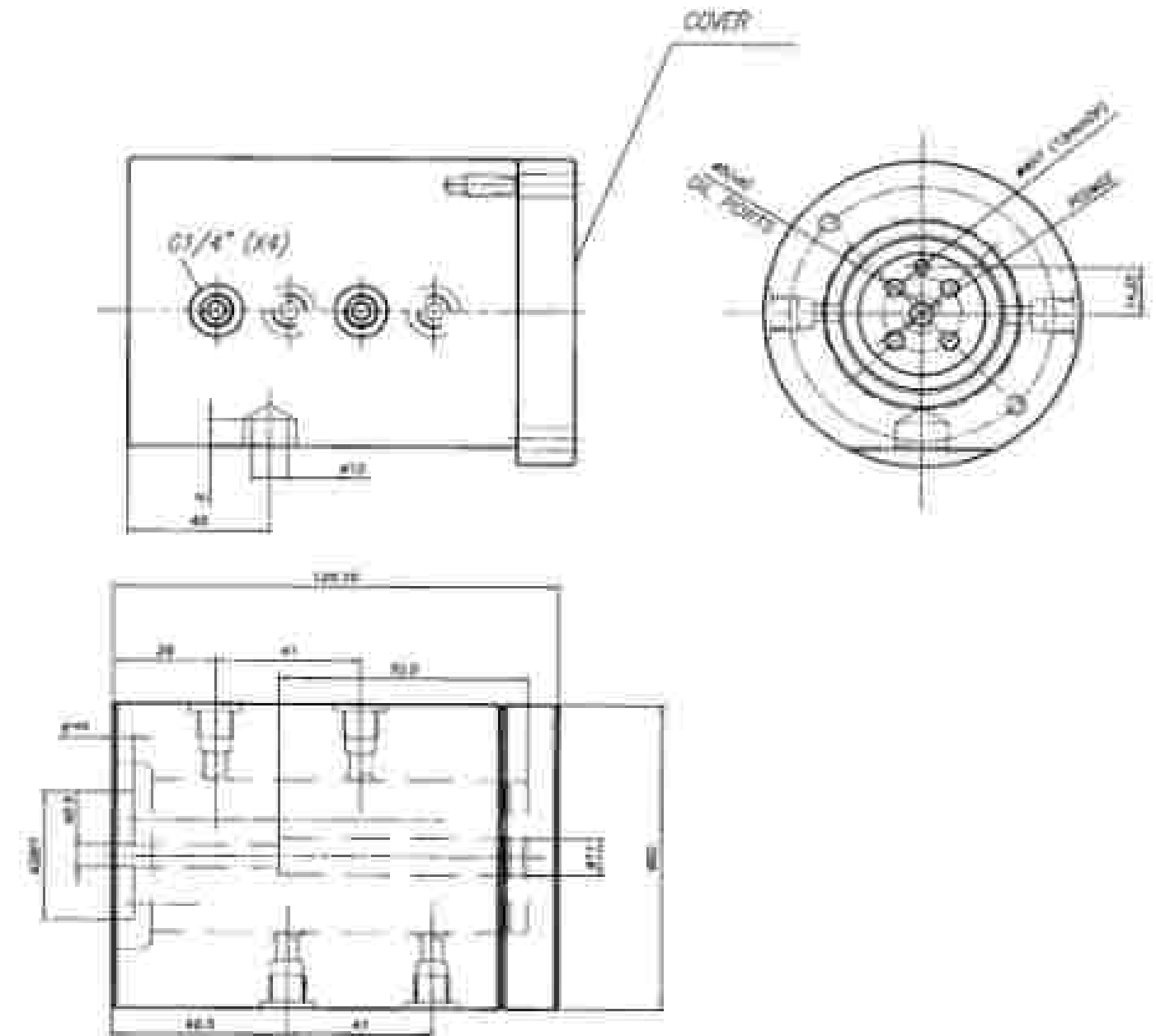


Features :

- ★ This is hydraulic 4 port type with compact design.
- ★ It is a G1/4 port housing with alloy steel body.
- ★ These distributors can be mounted through single screw from back side.
- ★ It can be used in the range of
 - 1-30 MPa (maximum operating pressure)
 - 18lpm (maximum flow allowed)
 - 70 bar N (pushing force)

Applications :

- ★ It is used for clamp & de-clamp oil connections through rotating medium.
- ★ Used for air & oil connections in parallel.
- ★ It can be available in 2 port (min) to 12 port (max) design.



D. Coupler Unit



Pull Down Cylinder

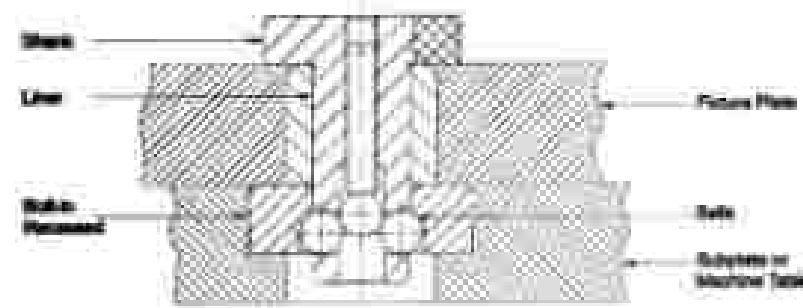


Ball Lock Mechanism

Features :

- ★ This is mechanical with shank mounting.
- ★ It consists of shank (1 no), primary or secondary liner (1 no), receiver bush (1 no).
- ★ It does the function of location (2 nos precision bushes & shank combination), clamping.
- ★ (taper sheet over expanding stud ball)
- It can be used for SMED concept.

Application example :

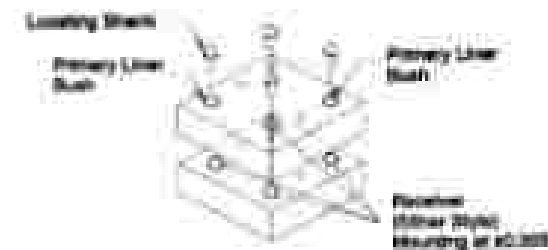


Applications :

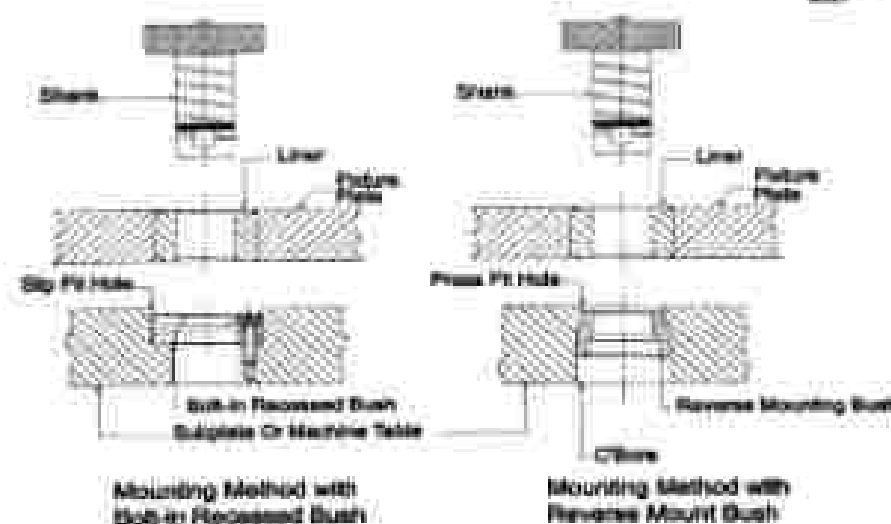
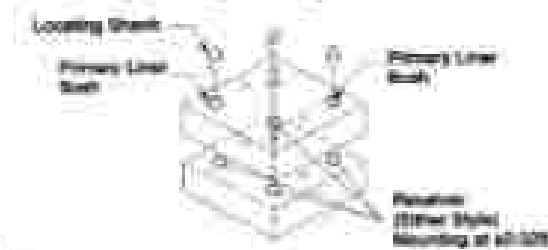
- ★ 2 nos ball lock for location & clamping plate.
- ★ 2-4 nos ball lock for additional clamping force.
- ★ Primary liners C.D tolerance to be 0.015mm.
- ★ Secondary liners C.D tolerance to be 0.05mm.
- Bore tolerance for bushes H7.

Note :

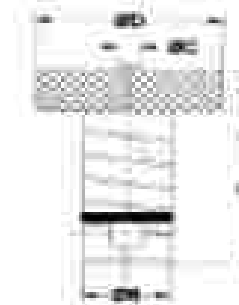
Do not exceed maximum screw torque
 Primary liner I.D. is Nominal +0.005/+0.015
 Secondary Liner I.D. is Nominal +0.025/+0.050



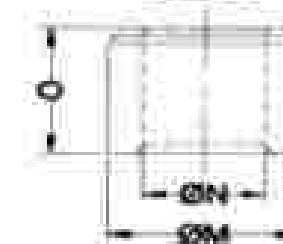
For Repeatability 20.04



Shank :



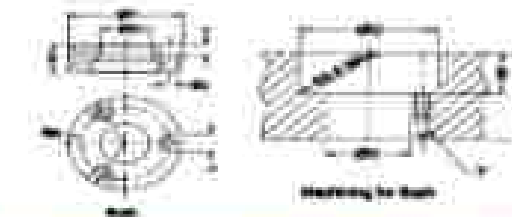
Liner :



Part no.	Description	QTY	QTY	Material	QTY	QTY	QTY	QTY
BL15-0401	SHANK	1.0	1.0	304	1.0	1.0	1.0	1.0
BL15-0402	LINER	1.0	1.0	304	1.0	1.0	1.0	1.0
BL15-0403	BUSH	2.0	2.0	304	2.0	2.0	2.0	2.0

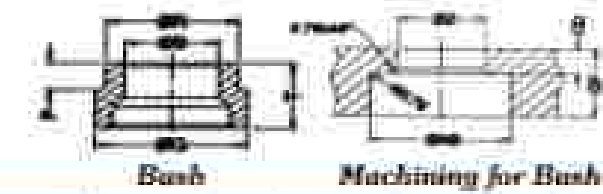
Part no. Primary Liner	Description	Part no. Secondary Liner	Description	M	N	P	Min. Qty. to Order	Max. Qty. to Order
BL15-0404	PL1000	BL15-0405	SL1000	10	10	20	25,000	25,000
BL15-0405	PL1005	BL15-0406	SL1005	10	10	20	25,000	25,000
BL15-0406	PL1010	BL15-0407	SL1010	10	10	20	25,000	25,000

Bolt-in Recessed Bush :



Part no.	Description	QTY	QTY	Material	QTY	QTY	QTY	QTY
BL15-0408	BUSH	1.0	1.0	304	1.0	1.0	1.0	1.0
BL15-0409	BUSH	1.0	1.0	304	1.0	1.0	1.0	1.0
BL15-0410	BUSH	1.0	1.0	304	1.0	1.0	1.0	1.0

Reverse Mounting Bush :



Part no.	Description	QTY	QTY	Material	QTY	QTY	QTY	QTY
BL15-0411	BUSH	1.0	1.0	304	1.0	1.0	1.0	1.0
BL15-0412	BUSH	1.0	1.0	304	1.0	1.0	1.0	1.0
BL15-0413	BUSH	1.0	1.0	304	1.0	1.0	1.0	1.0

- ★ 3D modelling and Design analysis before Prototyping for reduced development cycle.
- ★ Specially designed and Made to order cylinders with Specific strokes and sizes on customer request.
- ★ Extremely Compact design and space saving mountings !
- ★ Hydraulic Testing of all clamping cylinders between 15 to 120 N/m² to assess reliability and performance.
- ★ Use of high quality seals ensures long Operating life & Leak Proof, Sustained operation.
- ★ Hydraulic units, capable of lifting, rotating, tilting and moving of work pieces.
- ★ Pressing devices for riveting
- ★ A selective range of Work Supports with a range of mountings to enhance the solutions that can be offered to the customer.
- ★ Any type of linear motion or actuation is possible.
- ★ Spares & Accessories are standardised and easily available
- ★ Highly efficient Applications, Sales & Service teams

Nomenclature	Codings	Unit	Factor	Unit
Pressure	P	1 N/mm ²	10	bar
		1 MPa	10	
		1 kgf/cm ²	1	
Force	F	1 psi	0.07	N
		1 kgm/s ²	1	
		1 lbf	4.45	

Cautions for Mounting :

There is no filter provided with this product to prevent foreign materials & contaminants from getting into the hydraulic system & pipes.

Cautions for Use :

1. The product should be operated by persons with the necessary knowle & experience.
2. Do not take the equipment apart or modify it. If the equipment is taken apart or modified the warranty will be void, even within the warranty period.

Warranty :

1. Warranty period.

The product warranty period is for 1.5 years after shipment from our plant or 1 year of use, whichever is shorter.

2. Warranty scope.

Defects or failures caused by the following are not covered.

1. Proper maintenance & inspections were not performed.
2. The product was used in an imperfect state at the decision of the user.
3. The user did not use or handle the product properly. (including damages caused by a third party)
4. The cause was due to some factor other than our product.
5. The product was modified or repaired by another company or was modified or repaired without our approval or confirmation.
6. The damage or defect was caused by natural disaster or accident through no fault of our own.
7. Parts & replacements necessary due to wear & tear. (rubber, plastic, sealant, certain electrical components, etc.)