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STANDARD,SPECIAL VARIABLE HYDRAULIC CYLINDER
MANUFACTURING TECHNOLOGY

ISO 9001:2015
STD Product

GANI

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CLAMPING
SOLUTION

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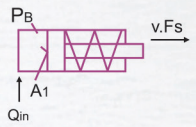
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Points to be remember

Formulas & description

where,

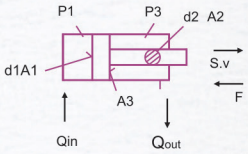
- $Q = V/t$
- $V = A.s$
- $F = p.A$
- $P = F/A$
- $Q = A.v$
- $M = V.p/2\pi$
- $v = s/t$



F: force
p: pressure
A: area
Q: flow
v: speed
V: volume
t: time

Single acting hydraulic cylinder

- $V[m/s] = s[ms]/1000t[s]$
- $A[mm^2] = \pi d^2/4\ [mm]$
- $F_s[N] = -0.1 \cdot p_B[bar] \cdot A[mm^2]$.
- $P_B[bar] = -10\ F_s[N]/A_1[mm^2]$
- $Q_{in}[lpm] = 0.06 \cdot A[mm^2] \cdot v\ [m/s]$



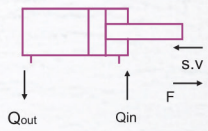
s: travel(stroke)
d:piston diameter
F_S: force
Q_{in}: inflow
P_B : operating pressure
v: piston speed

Double acting hydraulic cylinder

Extending

- $A_1 = \pi d_1^2/4 = 0.78 d_1^2$
- $A_3 = \pi(d_1^2 - d_2^2)/4$
- $P_1 . A_1 = P_3 . A_3 - F$
- $P_1 = (P_3.A_3 \quad F)/A_1$
- $Q_{in} = A_1 . v$
- $Q_{out} = A_3.V$

P_3: result back of pressure from pipes & valves for Q_{out}



A_1:piston area
d_1: piston
A_3: rod area
d_2: rod
F: force
P_1: pressure, piston side

simplified

$$P_1[bar] = \frac{P_3[bar].A_3[mm^2] - 10F[N]}{A_1[mm^2]} \qquad F[N] = \frac{-P_1[bar].A_1[mm^2] + P_3[bar].A_3[mm^2]}{10}$$

Refracting

- $Q_{out} = A_1.V$
- $Q_{in} = A_3.v$
- $P_1 . A_1 = P_3 . A_3 + F$
- $P_3 = (P_1.A_1 \quad F)/A_3$

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

A_1:piston area
d_1: piston
A_3: rod area
d_2: rod
F: force
P_1: pressure, piston side

simplified

$$P_1[bar] = \frac{P_1[bar].A_1[mm^2] - 10F[N]}{A_3[mm^2]} \qquad F[N] = \frac{P_1[bar].A_1[mm^2] - P_3[bar].A_3[mm^2]}{10}$$

Nominclature	Codings	Unit	Factor	Unit
Pressure	P	1 N/mm^2	10	bar
		1 MPa	10	
		$1kgf/cm^2$	1	
		1 psi	0.07	
Force	F	1 kg.m/s2	1	N
		1 lbf	4.45	

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Product Code : TC-01

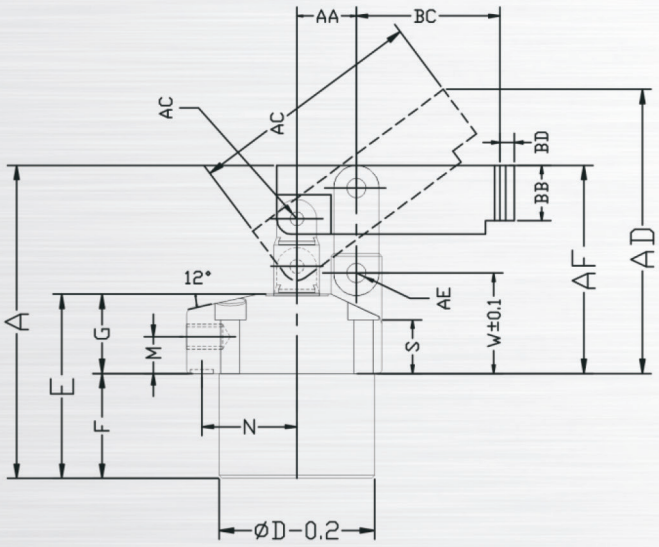


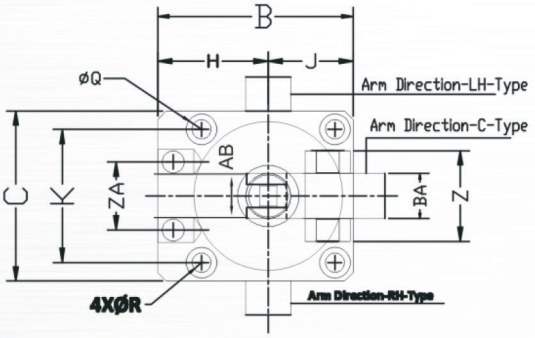
Toggle Clamp Cylinder

Features:

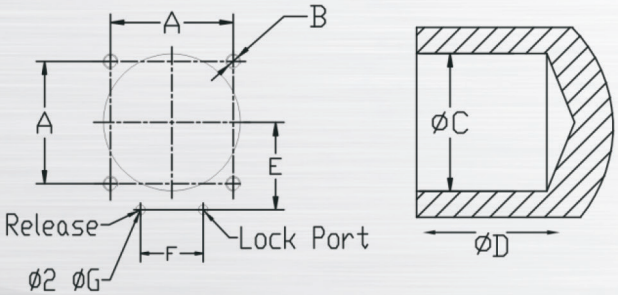
- This is a double acting cylinder with link clamp.
- It is a Chromium plated piston rod with alloy steel body.
- It is hydraulic & centre port configuration.
- These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- It can be used in the range of 15 MPa (minimum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

External Dimension Drawing :





Machining Dimension Drawing For Mounting Cylinder :



External Dimension Table:

All dimensions in mm

Model No.	C	TC01-360-C	TC01-400-C	TC01-480-C	TC01-550-C	TC01-650-C	TC01-750-C	TC01-900-C	TC01-1050-C
	RH	TC01-361-R	TC01-401-R	TC01-481-R	TC01-551-R	TC01-651-R	TC01-751-R	TC01-901-R	TC01-1051-R
	LH	TC01-362-L	TC01-402-L	TC01-482-L	TC01-552-L	TC01-652-L	TC01-752-L	TC01-902-L	TC01-1052-L
BORE DIA		Ø22	Ø25	Ø30	Ø35	Ø45	Ø55	Ø65	Ø80
A		79	87.5	101	112.5	129.5	153	182	211
B		51	55	61	69	81	94.5	111	127
C		42	45	51	60	70	85	100	120
ØD		36	40	48	55	65	75	90	105
E		54	56	62	66	74	87	101	117
F		29	31	34	37	43.5	49	61	65
G		25	25	28	28	30	38	40	50
H		30	32	35.5	39	46	52	61	67
J		21	23	25.5	30	35	42.5	50	60
K		31.5	34	40	47	55	63	75	88
L		70	74	83	88	106	116	136	152
M		11.70	10.70	11.50	13.50	13	19.50	20	22.50
N		23.5	26	30	33.5	39.5	45	52.5	60
P		3	3	3	3	3	3	3	4
Q		7.5	9.5	9.5	11	11	14	17.5	20
ØR		4.5	5.6	5.5	6.8	6.8	9	11	14
S		15	18	18	19	20	22	22	26
T		27	30.5	35	37.5	45	55	65.5	77
U		10	12	14	16	18	22	28	35.5
V		22.5	25	29	31.5	37	45	52	62
W		30	30.5	34.5	35.5	39	48	52.5	64
X		20	22	26	30	35.5	43.5	52.5	64
Y		10	12	13	16	19	25	28	32
Z		19	21	21	28	37	40	49	64
ZA		16	18	22	24	30	32	37	45
Hyd. Port		G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"	G1/4"	G3/8"
AA		14.5	16	18.5	21	24.5	30	36	44
AB		5	6	6	8	10	11	13	16
ØAC		5	6	6	6	8	10	12	15
ØAE		5	6	6	8	10	12	15	18
AD		83	89	92.4	101.9	111.4	130.8	146.5	173.6
AF		43	44.5	51	53.5	59	72	81	98
AG		18.9	19.6	19.9	20.2	20.5	21.4	22.4	23.1
AH		5	6	4.3	4.7	4.3	4.5	5	4.1
BA		10	12	12	16	19	22	25	32
BB		12.5	14	16	20	25	32	38	45
BC		14.5	16	23.5	29	32	37.5	41.5	21
BD		10.5	13	6	8	10	11	14	17

Specification Table :

Lock Cyl. Area (cm)		3.8	4.9	7.07	9.62	15.9	23.7	33.2	44.2
Full Stroke mm		18.5	20	23.5	26	29.5	35	41	49
Locking Stroke mm		15.5	17	20.5	23	26.5	32	38	46
Extra Stroke mm		3	3	3	3	3	3	3	3
Cyl. volume	Lock cm3	5.9	8.33	14.5	22.13	42.14	75.85	126.2	203.35
	Release cm3	4.7	6.4	11.33	17.5	35.4	63.8	102.6	157.7
Max operating Pressure (Mpa)		15							
Min operating Pressure (Mpa)		150							
Design Pressure (Mpa)		10.5							
Temperature (0C)		0-70							
Weight (Kg)		0.72	1.15	1.50	1.80	2.50	4.20	6.50	10.20

Machining Dimension Table For Mounting Cylinder :

Model No.	C	TC01-360-C	TC01-400-C	TC01-480-C	TC01-550-C	TC01-650-C	TC01-750-C	TC01-900-C	TC01-1050-C
	RH	TC01-361-R	TC01-401-R	TC01-481-R	TC01-551-R	TC01-651-R	TC01-751-R	TC01-901-R	TC01-1051-R
	LH	TC01-362-L	TC01-402-L	TC01-482-L	TC01-552-L	TC01-652-L	TC01-752-L	TC01-902-L	TC01-1052-L
A		31.4	34	40	47	55	63	75	88
B		M4	M5	M5	M6	M6	M8	M10	M12
C+0.2		36	40	48	55	65	75	90	105
D		30	32	35	38	44.5	48	62	66
E		23.5	26	30	33.5	39.5	45	52.5	60
F		16	18	22	24	30	32	37	45
G		2.5	2.5	3	3	3	3	3	4

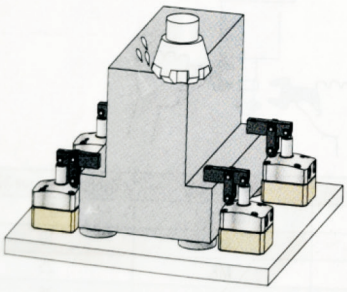
Action Description



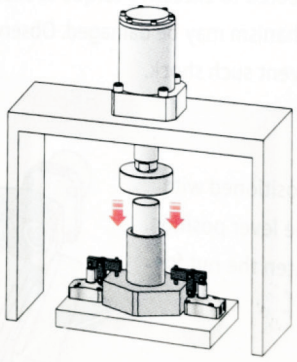
Release condition

Lock condition

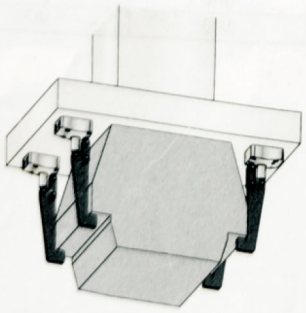
Application sample



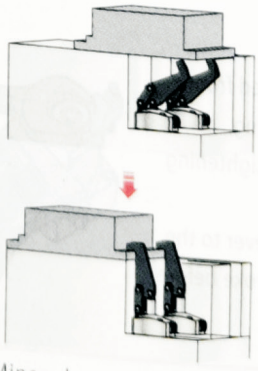
For the machining process



In the press fit process

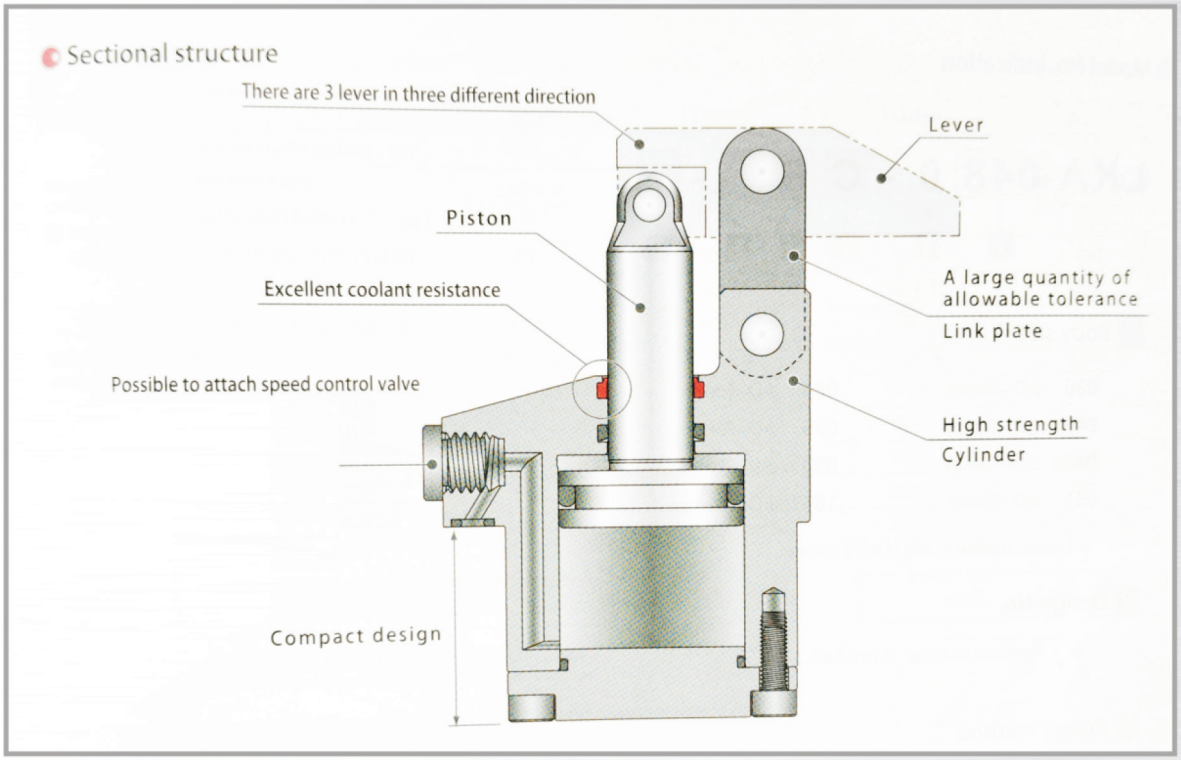


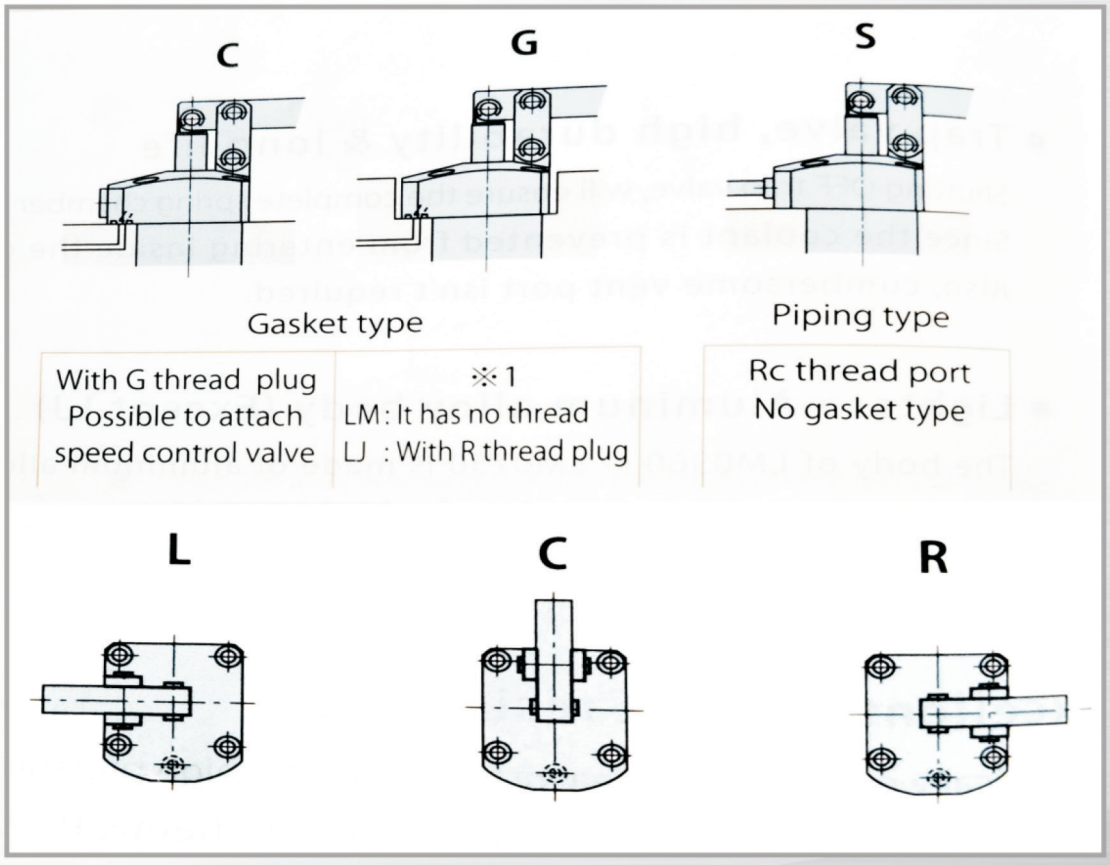
For transportation and gantry loader



Minor change on the lever,
prevents interupting with workpiece transfer

Action Description

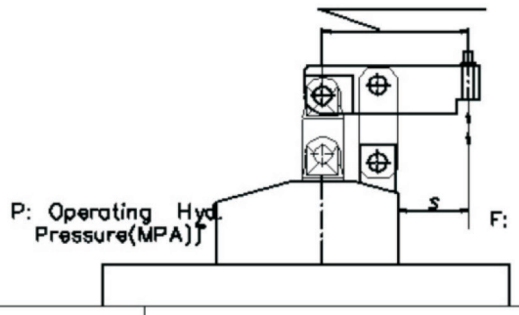




Toggle Clamp Force Calculation Formula

Clamping Force Curve. standard Type.

L: Lever Length (MM)



Note—

1—this table show the relation between clamping force and operating hyd pressure

2—cylinder out put (when l=0)canot be calculated from the calculation formulaof clamping force.

3—non useable reange can demage the clamp and lead to fluid leakag.

*1—F: clamping force(KN), P: Oerating hydraulic pressure(MPA).. L: Lever length in (MM)

4 This table only rereference the exact result should be calculated based onthe formula

TC01—360 Clamping force calculation formula (KN) F=(5.90XP)/(L—14.5)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=60MM							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=22	L=27.5	L=33.5	L=40	L=50	L=60	L=80	L=100
70—Bar	3.00			2.1	1.5	1.0	0.9	0.5	0.3

TC01—40 Clamping force calculation formula (KN) F=(7.64XP)/(L—16)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=70MM							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=25	L=30	L=36	L=40	L=50	L=60	L=80	L=100
70—Bar	3.5			2.5	2.3	1.6	1.2	0.9	0.7

TC01—480 Clamping force calculation formula (KN) F=(11.76XP)/(L—18.5)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=80MM							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=30	L=35	L=42	L=50	L=60	L=80	L=100	L=120
70—Bar	5.00			3.5	2.5	1.8	1.2	1.0	0.8

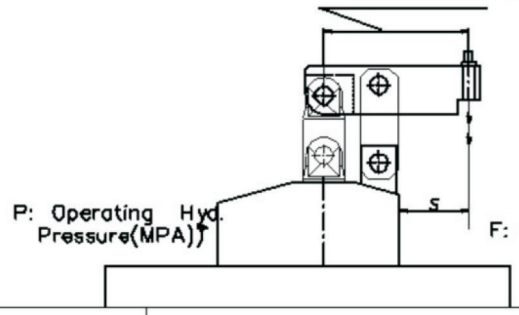
TC01—550 Clamping force calculation formula (KN) F=(18.18XP)/(L—21)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=90MM							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=35	L=40	L=50	L=60	L=70	L=80	L=100	L=120
70—Bar	6.5			4.2	3.2	2.5	2.1	1.5	1.2

Toggle Clamp Force Calculation Formula

Clamping Force Curve. standard Type.

L: Lever Length (MM)



Note—

1—this table show the relation between clamping force and operating hyd pressure

2—cylinder out put (when l=0)canot be calculated from the calculation formulaof clamping force.

3—non useable reange can demage the clamp and lead to fluid leakag.

*1—F: clamping force(KN), P: Oerating hydraulic pressure(MPA), L: Lever length in (MM)

4.This table only rereference the exact result should be. calculated based onthe formula.

TC01—650 Clamping force calculation formula (KN) F=(35.06XP)/(L—24.5)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=100MM							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=40	L=50	L=56.2	L=80	L=100	L=120	L=150	L=160
70—Bar	11.0	▬	▬	7.5	4.4	3.2	2.5	2.1	1.5

TC01—75 Clamping force calculation formula (KN) F=(64.14XP)/(L—30)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=110MM							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=50	L=60	L=67.5	L=80	L=100	L=120	L=140	L=160
70—Bar	16.5	▬	▬	12.0	9.0	6.5	5.0	4.0	3.2

TC01—900 Clamping force calculation formula (KN) F=(117X66XP)/(L—36)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=150MM							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=60	L=70	L=77.5	L=100	L=120	L=140	L=160	L=200
70—Bar	25.5	▬	▬	19.5	12.5	9.6	7.8	6.5	5..0

TC01—105 Clamping force calculation formula (KN) F=(199.05XP)/(L—44)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=200MM							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=70	L=80	L=95	L=110	L=130	L=150	L=170	L=230
70—Bar	35.0	▬	▬	27.0	21.0	16.0	13.0	11.0	7.2

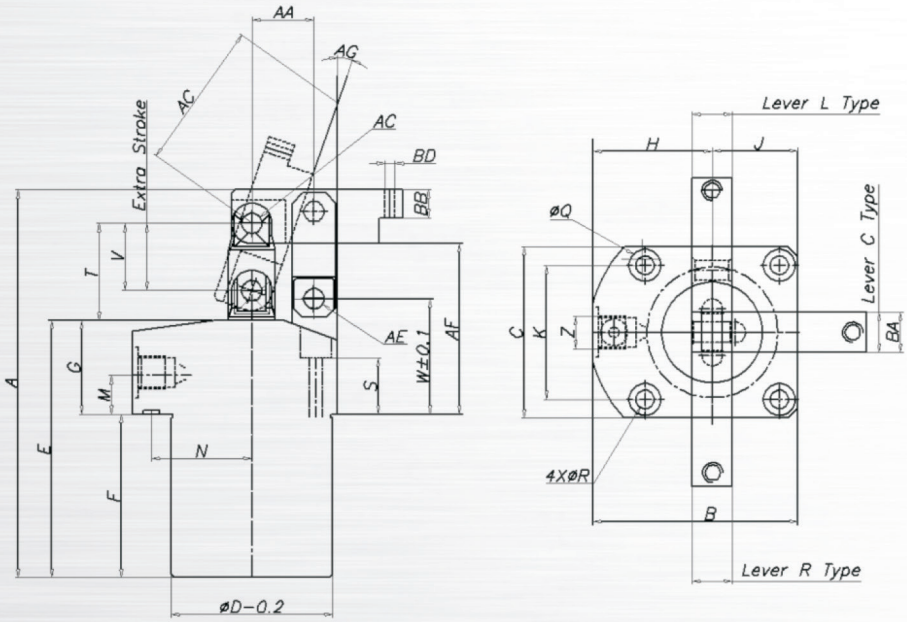


Toggle Single Acting Cylinder

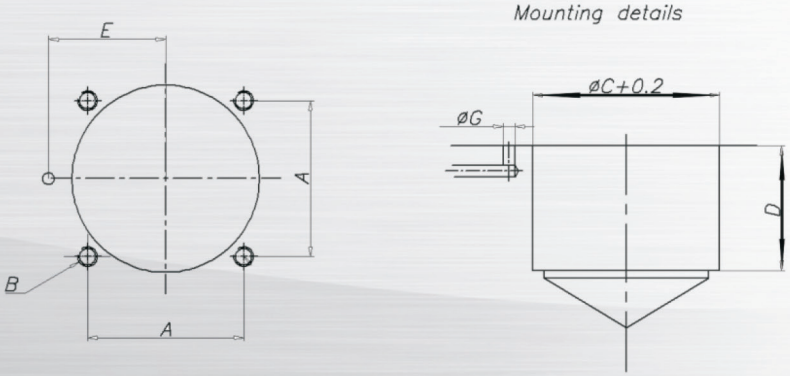
Features:

- This is a Single 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 15 MPa (minimum operating pressure)
  150 MPa (maximum operating pressure)
  70 bar N (pushing force)

External Dimension Drawing :



Machining Dimension Drawing For Mounting Cylinder :



External Dimension Table:

All dimensions in mm

Model No.									
	C	TSAC01-360-C	TSAC01-400-C	TSAC01-480-C	TSAC01-550-C	TSAC01-650-C	TSAC01-750-C		
	RH	TSAC01-361-R	TSAC01-401-R	TSAC01-481-R	TSAC01-551-R	TSAC01-651-R	TSAC01-751-R		
	LH	TSAC01-362-L	TSAC01-402-L	TSAC01-482-L	TSAC01-552-L	TSAC01-652-L	TSAC01-752-L		
BORE DIA		Ø22	Ø25	Ø30	Ø35	Ø45	Ø55		
A		88	102	156	132	157	186		
B		51	55	61	69	81	94.5		
C		42	45	51	60	70	85		
ØD		36	40	48	55	65	75		
E		64	70	76.5	86	104	118		
F		38.5	45	48.6	57	73.5	80		
G		25	25	28	28	30	38		
H		30	32	35.5	39	46	52		
J		21	23	25.5	30	35	42.5		
K		31.5	34	40	47	55	63		
L		70	74	83	88	106	116		
M		11	11	11	14	13	15		
N		23.5	26	30	33.5	39.5	45		
P		3	3	3	3	3	3		
Q		7.5	9.5	9.5	11	11	14		
ØR		4.5	5.6	5.5	6.8	6.8	9		
S		15	18	18	19	20	22		
T		27	30.5	35	37.5	45	55		
U		10	12	14	16	18	22		
V		22.5	25	29	31.5	37	45		
W		30	30.5	34.5	35.5	39	48		
X		20	22	26	30	35.5	43.5		
Y		10	12	13	16	19	25		
Z		19	21	21	28	37	40		
ZA		16	18	22	24	30	32		
Hyd. Port		G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"		
AA		14.5	16	18.5	21	24.5	30		
AB		5	6	6	8	10	11		
ØAC		5	6	6	6	8	10		
ØAE		5	6	6	8	10	12		
AD		83	89	92.4	101.9	111.4	130.8		
AF		43	44.5	51	53.5	59	72		
AG		18.9	19.6	19.9	20.2	20.5	21.4		
AH		5	6	4.3	4.7	4.3	4.5		
BA		10	12	12	16	19	22		
BB		12.5	14	16	20	25	32		
BC		14.5	16	23.5	29	32	37.5		
BD		10.5	13	6	8	10	11		

Specification Table :

Lock Cyl. Area (cm)		3.8	4.9	7.07	9.62	15.9	23.7		
Full Stroke mm		18.5	20	23.5	26	29.5	35		
Locking Stroke mm		15.5	17	20.5	23	26.5	32		
Extra Stroke mm		3	3	3	3	3	3		
Cyl. volume	Lock cm3	5.9	8.33	14.5	22.13	42.14	75.85		
	Release cm3	4.7	6.4	11.33	17.5	35.4	63.8		
Max operating Pressure (Mpa)		15							
Min operating Pressure (Mpa)		150							
Design Pressure (Mpa)		10.5							
Temperature (0C)		0-70							
Weight (Kg)		0.72	1.15	1.50	1.80	2.50	4.20		

Machining Dimension Table For Mounting Cylinder :

Model No.									
	C	TSAC01-360-C	TSAC01-400-C	TSAC01-480-C	TSAC01-550-C	TSAC01-650-C	TSAC01-750-C		
	RH	TSAC01-361-R	TSAC01-401-R	TSAC01-481-R	TSAC01-551-R	TSAC01-651-R	TSAC01-751-R		
	LH	TSAC01-362-L	TSAC01-402-L	TSAC01-482-L	TSAC01-552-L	TSAC01-652-L	TSAC01-752-L		
A		31.4	34	40	47	55	63		
B		M4	M5	M5	M6	M6	M8		
C+0.2		36	40	48	55	65	75		
D		39.5	46	49.6	58	76.5	81		
E		23.5	26	30	33.5	39.5	45		
F		16	18	22	24	30	32		
G		2.5	2.5	3	3	3	3		

Product Code : SC-02

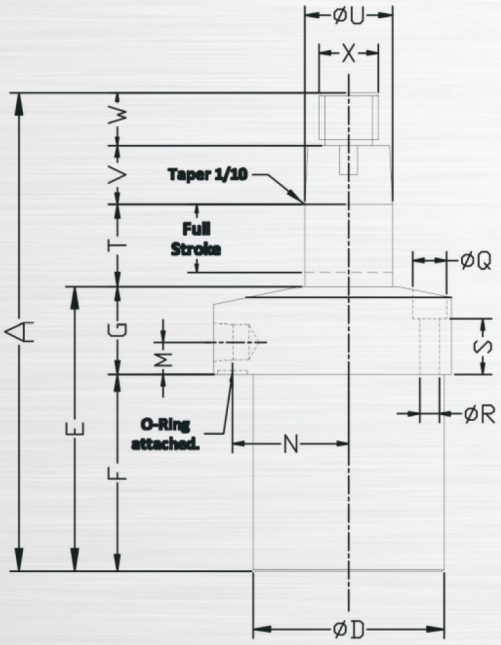


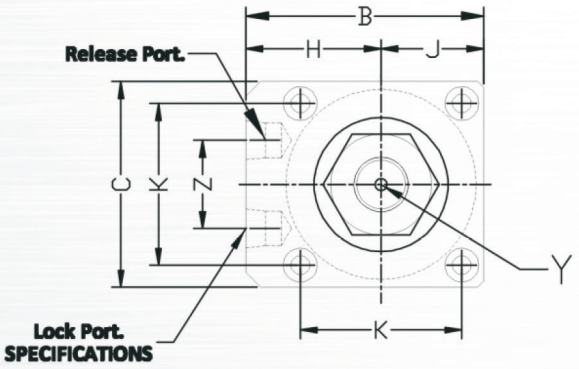
Swing Cylinder (Top Mounting)

Features:

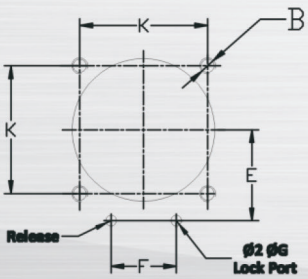
- This is a double acting cylinder with swing clamp.
- It is a Chromium plated piston rod with alloy steel body.
- It can be used with the rotation of 90°.
- These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- It can be used in the range of 15 MPa (minimum operating pressure)
  150 MPa (maximum operating pressure)
  70 bar N (pushing force)

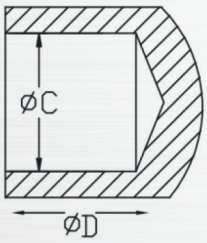
External Dimension Drawing :





Machining Dimension Drawing For Mounting Cylinder :





External Dimension Table:

All dimensions in mm

Model No.	RH	SC02-361-R	SC02-401-R	SC02-481-R	SC02-551-R	SC02-651-R	SC02-751-R	SC02-901-R	SC02-1051-R
	LH	SC02-362-L	SC02-402-L	SC02-482-L	SC02-552-L	SC02-652-L	SC02-752-L	SC02-902-L	SC02-1052-L
BORE DIA		Ø22	Ø25	Ø35	Ø40	Ø50	Ø55	Ø75	Ø80
A		114	128	141	159	163	195	215	263
B		50	55	61	69	81	92	107	127
C		41	46	51	60	70	80	95	120
ØD		36	40	48	55	65	75	90	105
E		72	78.5	88.2	97	97.8	115.5	126	153
F		45	53	58.5	68.2	67.3	78	85	102
G		25	25.5	29.6	28.8	30.5	37.5	41	51
H		29.5	32	35	39	46	52	59.5	67
J		20.5	23	26	30	35	40	47.5	60
K		31.5	34	40	47	55	63	75	88
L		69	74	83	88	106	116	136	152
M		14	11.7	12.7	10.7	12	18	18.7	29.80
N		23.5	26	30	33.5	39.5	45	52.5	60
P		3	3	3	3	3	3	3	4
Q		7.5	9.5	9.5	11	11	14.5	17.5	20
R		4.5	5.5	5.5	6.6	6.6	9	11	14
S		17	18	18	18.5	20	22	22	26
T		21	22	23	25.6	28	36	36	47
U		14	16	22	25	30	36	45	55
V		9	12	14	20	20	26	32	38
W		12	15	15	15	18	18	22	25
X		M10 X 1.5	M12 X 1.5	M16 X 1.5	M16 X 1.5	M20 X 1.5	M30 X 1.5	M36 X 1.5	M45 X 1.5
Y(Hex Depth)		5X4	6X5	6X6	8X6	10X8	10X10	10X10	12X10
Z		16	18	22	24	30	32	37	45
Hyd. Port		G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"	G1/4"	G3/8"
Taper Angle		6°	6°	6°	6°	6°	6°	11°	11°

Specification Table :

Lock Cyl. Area (cm)		2.03	2.36	5	8	14	19.7	31.2	40.7
Full Stroke (90°rotation)mm		18	20	22	24	24	31	32	42
Swing Stroke (90°rotation)mm		10	12	12	14	14	19	20	26
Locking Stroke mm		3	3	10	10	10	12	12	16
Cyl. volume	Lock cm3			7	13.2	25.2	42.3	102.6	151
	Release cm3	4.9	6.38	12.5	20.9	37.1	68.7	127.8	199.5
Max operating Pressure (Mpa)		150							
Min operating Pressure (Mpa)		15							
Design Pressure (Mpa)		10.5							
Temperature (°C)		0-70							
Weight (Kg)		0.80	1	1.30	1.80	2.70	4.20	5.50	9

Machining Dimension Table For Mounting Cylinder :

Model No.	RH	SC02-361-R	SC02-401-R	SC02-481-R	SC02-551-R	SC02-651-R	SC02-751-R	SC02-901-R	SC02-1051-R
	LH	SC02-362-L	SC02-402-L	SC02-482-L	SC02-552-L	SC02-652-L	SC02-752-L	SC02-902-L	SC02-1052-L
K		31.5	34	40	47	55	63	75	88
B		M4	M5	M5	M6	M6	M8	M10	M12
C+0.2		36	40	48	55	65	75	90	105
D		46	54	59.5	69	68	79	86	103
E		23.5	26	26	33.5	39.5	45	52.5	60
F		16	18	22	24	30	32	37	45
G		3	3	3	3	3	3	3	4

Action Description



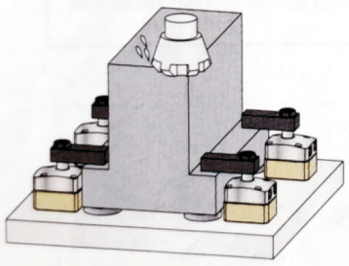
Before swinging
(Release condition)

The lever descends as it swings
(For LHS, lever swings parallel)

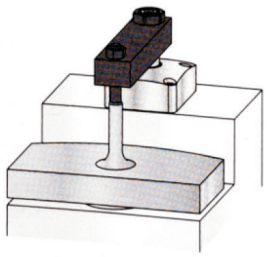
After completing swing,
it descends vertically

Action completed
(Lock condition)

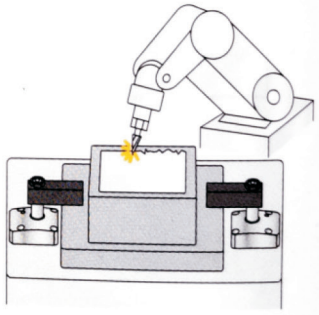
Application sample



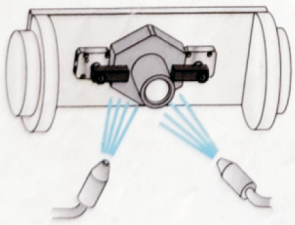
For the machining process



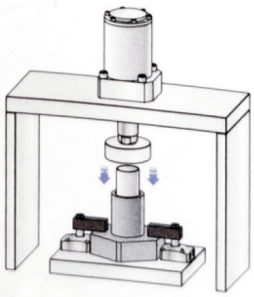
For the area where repeatability
locating accuracy is needed



For deburing

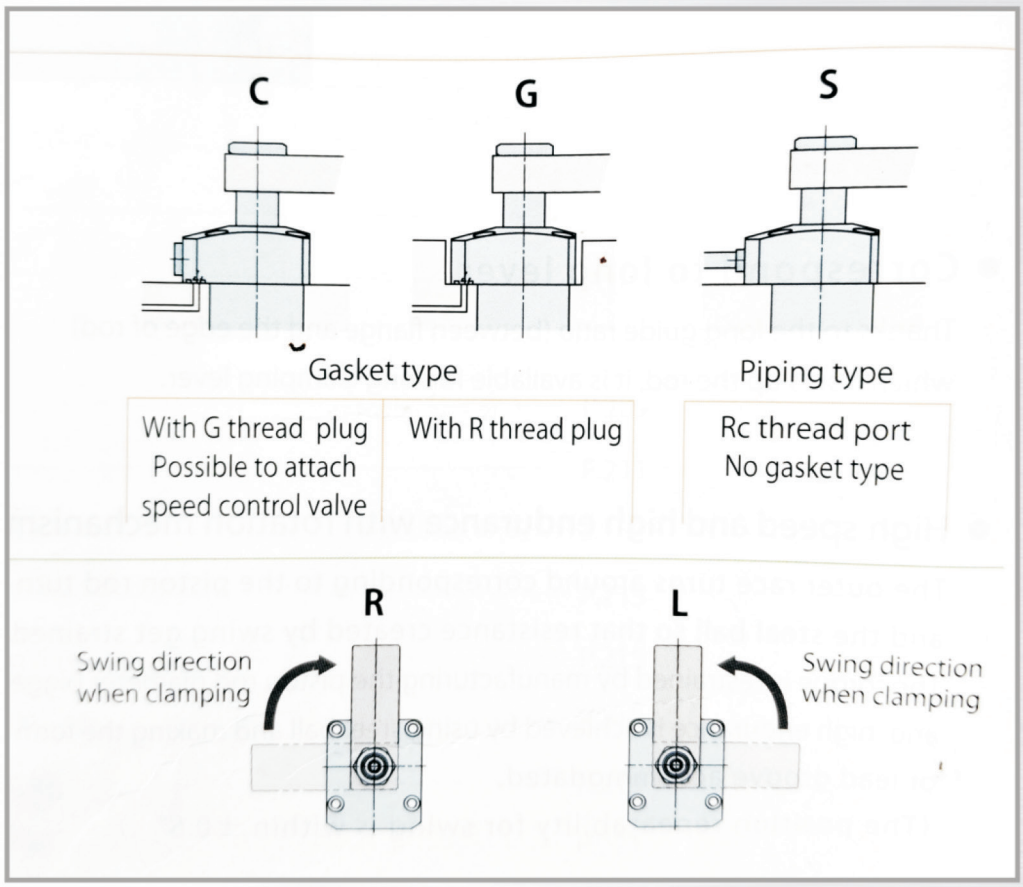


For the cleaning process

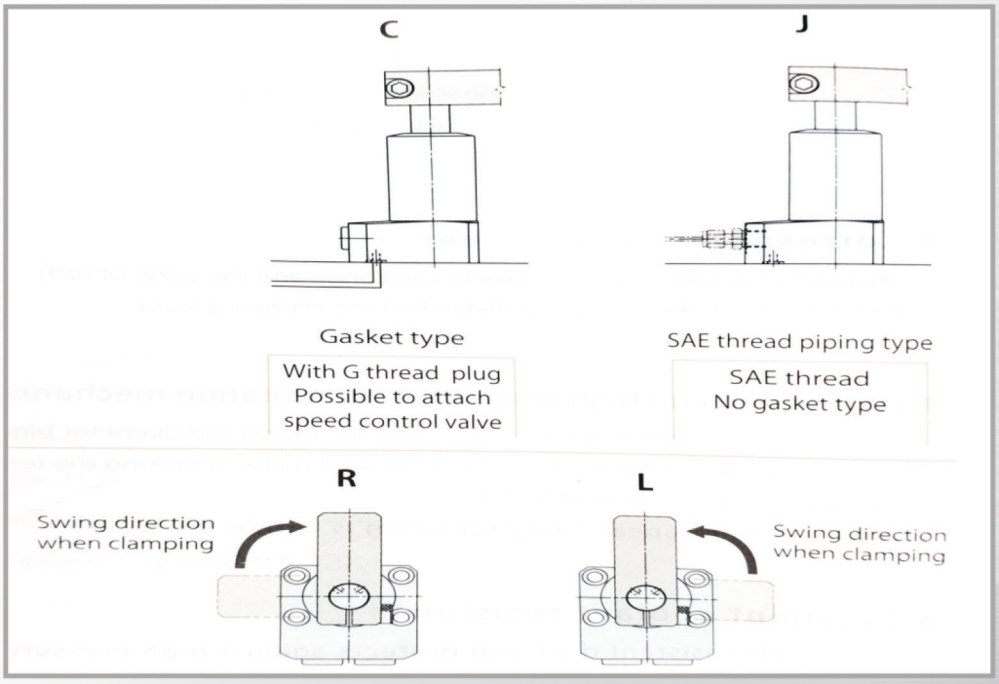


In the press fit process

Piping Method Top

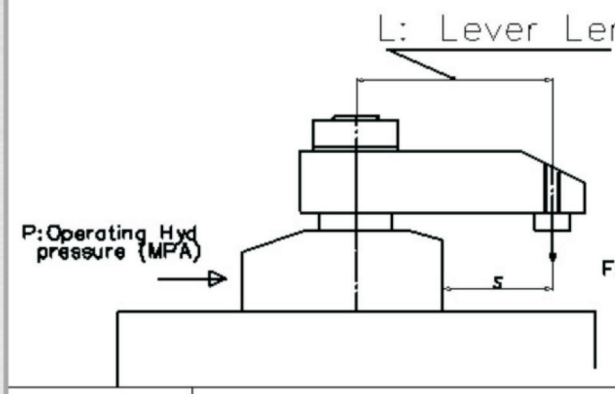


Piping Method BM



Swing Clamp Force Calculation Formula

Clamping Force Curve. standard Type.



Note–

1–this table show the relation between clamping force and operating hyd pressure

2–cylinder out put (when l=0)canot be calculated from the calculation formulaof clamping force

3–non useable reange can demage the clamp and lead to fluid leakag.

*1–F: clamping force(KN). P:Oerating hydraulic pressure(MPA).. L: Lever length in (MM)

4.This table only rereference the exact result should be calculated based onthe formula.

SC02–360 Clamping force calculation formula (KN)F=P(1–0.0021XL)/(2.9379+0.0052XL)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum–L=50MM							
		Lever Length (MM)					No use reange		
(MPA)	(KN)	L=30	L=40	L=50	L=60	L=80	L=100	L=120	L=150
70–Bar	2.3	2.0	1.9	1.6	1.3	1.0			

SC02–400 Clamping force calculation formula (KN) F=(P(1–0.0016XL/(2.0920+0.0040XL)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum–L=55MM No use reange							
		Lever Length (MM)							
(MPA)	(KN)	L=40	L=50	L=60	L=70	L=80	L=100	L=120	L=150
70–Bar	3.2	2.8	2.6	2.5	2.2	1.6	1.0	0.9	

SC02–480 Clamping force calculation formula (KN) F=(P(1–0.0009XL)/(1.4892+0.0018XL)

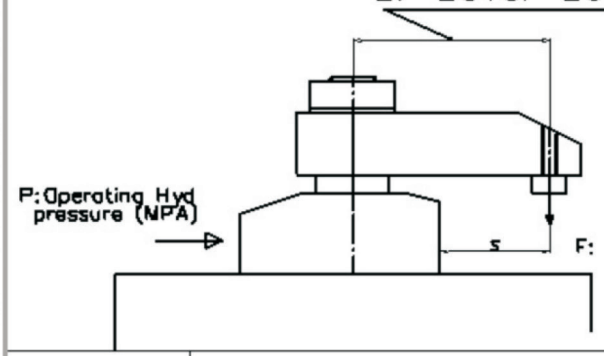
Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum–L=65MM							
		Lever Length (MM)						No use reange	
(MPA)	(KN)	L=50	L=60	L=80	L=100	L=120	L=140	L=160	L=200
70–Bar	4.8	4.2	4.1	4.0	3.8	3.6	3.3		

SC02–550 Clamping force calculation formula (KN) F=(P1–0.0011XL)/(1.0039+0.0011XL)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum–L=75MM							
		Lever Length (MM)						No use reange	
(MPA)	(KN)	L=50	L=60	L=80	L=100	L=120	L=140	L=160	L=200
70–Bar	7.2	6.2	6.0	5.7	5.3	5.1	4.8		

Swing Clamp Force Calculation Formula

Clamping Force Curve. standard Type.



Note— 1—this table show the relation between clamping force and operating hyd pressure

2—cylinder out put (when l=0)cannot be calculated from the calculation formulaof clamping force.

3—non useable reange can demage the clamp and lead to fluid leakag.

*1—F: clamping force(KN), P: Oerating hydraulic pressure(MPA)., L: Lever length in (MM)

4.This table only rereference the exact result should be. calculated based onthe formula.

SC02—650 Clamping force calculation formula (KN) F=P(1—0.1119XL)/(0.7822+0.0010XL)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=90							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=50	L=60	L=80	L=100	L=120	L=140	L=160	L=200
70—Bar	9.3	8.0	7.5	7.2	6.9				

SC02—750 Clamping force calculation formula (KN) F=P(1—0.0007XL)/(0.5175+0.0006XL)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=100MM							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=50	L=60	L=80	L=100	L=120	L=140	L=160	L=200
70—Bar	14.2	12.4	12.0	11.5	11.0	10.8	10.0		

SC02—900 Clamping force calculation formula (KN) F=P(1—0.0009XL)/(0.3547+0.0004XL)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=120							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=60	L=75	L=100	L=120	L=140	L=170	L=200	L=250
70—Bar	20.62	17.0	16.9	16.0	15.2	14.0	13.9	13.0	

SC02—105 Clamping force calculation formula (KN) F=P(1—0.0008XL)/(0.2495+0.0002XL)

Operating hydraulic pressure	Cylinder Force	Clamping Force(KN) maximum—L=150							
		Lever Length (MM) No use reange							
(MPA)	(KN)	L=80	L=100	L=120	L=140	L=170	L=200	L=250	L=300
70—Bar	28.90	24.5	23.5	23.0	22.2	21.0	20.0		

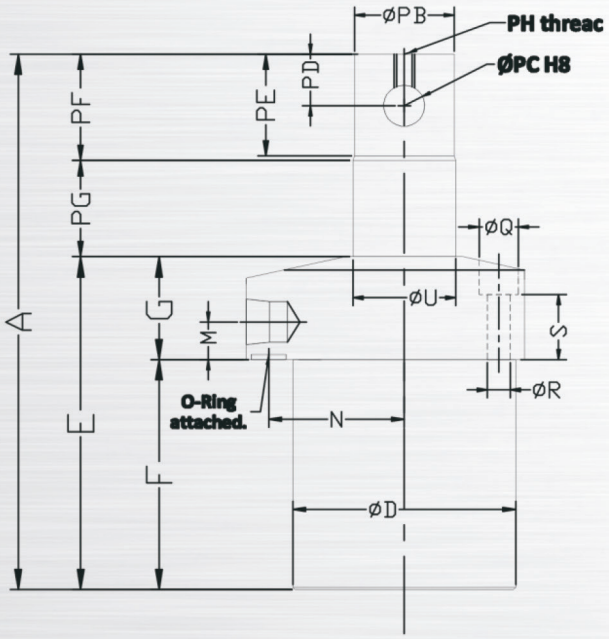


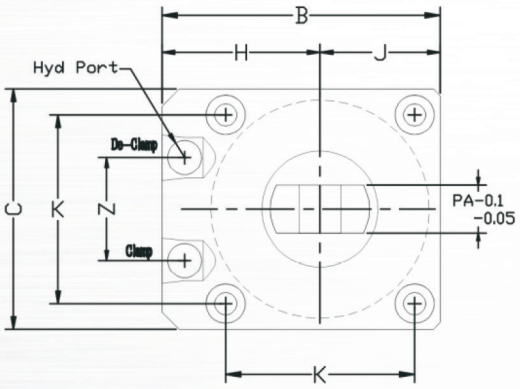
Swing Cylinder (Top Mounting P Type)

Features:

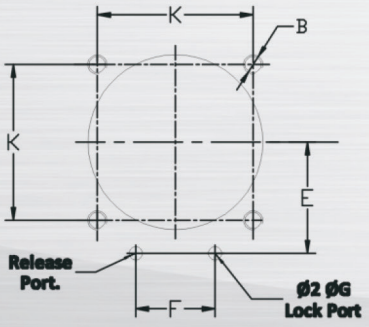
- This is a double acting cylinder with swing clamp.
- It is a Chromium plated piston rod with alloy steel body.
- It can be used with the rotation of 90°.
- These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- It can be used in the range of 15 MPa (minimum operating pressure)
  150 MPa (maximum operating pressure)
  70 bar N (pushing force)

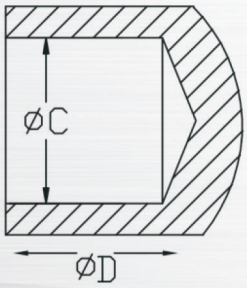
External Dimension Drawing :





Machining Dimension Drawing For Mounting Cylinder :





External Dimension Table:

All dimensions in mm

Model No.	RH	SC02-361-RP	SC02-401-RP	SC02-481-RP	SC02-551-RP	SC02-651-RP	SC02-751-RP	SC02-901-RP	SC02-1051-RP
	LH	SC02-362-LP	SC02-402-LP	SC02-482-LP	SC02-552-LP	SC02-652-LP	SC02-752-LP	SC02-902-LP	SC02-1052-LP
BORE DIA		Ø22	Ø25	Ø35	Ø40	Ø50	Ø55	Ø75	Ø80
A		110	119	136	141.5	156	189	205.5	254
B		50	55	61	69	81	92	107	127
C		41	46	52	60	70	80	95	120
ØD		36	40	48	55	65	75	90	105
E		72	78.5	88.2	97	97.8	115.5	126	153
F		45	53	58.6	68.2	67.3	78	85	102
G		27	25.5	29.6	28.8	30.5	37.5	41	51
H		29.5	32	35	39	46	52	59.5	67
J		20.5	23	26	30	35	40	47.5	60
K		31.5	34	40	47	55	63	75	88
L		69	74	83	88	106	116	136	152
M		12	12.5	14	18	18	24	24	31
N		23.5	26	30	33.5	39.5	45	52.5	60
P		3	3	3	3	3	3	3	4
Q		7.5	9	9.5	11	11	14.5	17.5	20
R		4.5	5.5	5.5	6.6	6.6	9	11	14
S		16	17	18	18.5	19	22	22	24.5
U		14	16	22	25	30	36	45	55
PG		21	21	24	28	29	32	33.5	44.5
PF		17	20	25	30.5	32	41.5	46	56.5
PE		16	18	23.5	29	30.5	38.5	44.5	53.5
PH Thread		M3	M3	M4	M5	M6	M6	M8	M8
PD		7	9	10	12	15	16.5	20	24
ØPB		13	14.5	20	23	28	34	43	53
ØPC H8		6	6	8	10	12	12	16	20
PA		7	8	10	12	14	16	22	26
Z		16	18	22	24	30	32	37	45
Hyd. Port		G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"	G1/4"	G3/8"

Specification Table :

Lock Cyl. Area (cm)		2.6	3.07	5	8	14	19.7	31.2	40.7
Full Stroke (90°rotation)mm		18	20	22	24	24	31	32	42
Swing Stroke (90°rotation)mm		10	12	12	14	14	19	20	26
Locking Stroke mm		8	8	10	10	10	12	16	17
Cyl. volume	Lock cm3	4.8	7	7.3	13.2	25.2	42.3	102.6	151
	Release cm3	7.2	10.9	12.5	20.9	37.1	68.7	127.8	199.5
Max operating Pressure (Mpa)		150							
Min operating Pressure (Mpa)		15							
Design Pressure (Mpa)		10.5							
Temperature (0C)		0-70							
Weight (Kg)		0.70	0.9	1.30	1.80	2.70	4.20	5.50	9

Machining Dimension Table For Mounting Cylinder :

Model No.	RH	SC02-361-RP	SC02-401-RP	SC02-481-RP	SC02-551-RP	SC02-651-RP	SC02-751-RP	SC02-901-RP	SC02-1051-RP
	LH	SC02-362-LP	SC02-402-LP	SC02-482-LP	SC02-552-LP	SC02-652-LP	SC02-752-LP	SC02-902-LP	SC02-1052-LP
K		31.5	34	40	47	55	63	75	88
B		M4	M5	M5	M6	M6	M8	M10	M12
C+0.2		36	40	48	55	65	75	90	105
D		46	54	59.5	69	68	79	86	103
E		23.5	26	30	33.5	39.5	45	52.5	60
F		16	18	22	24	30	32	37	45
G		3	3	3	3	3	3	3	4

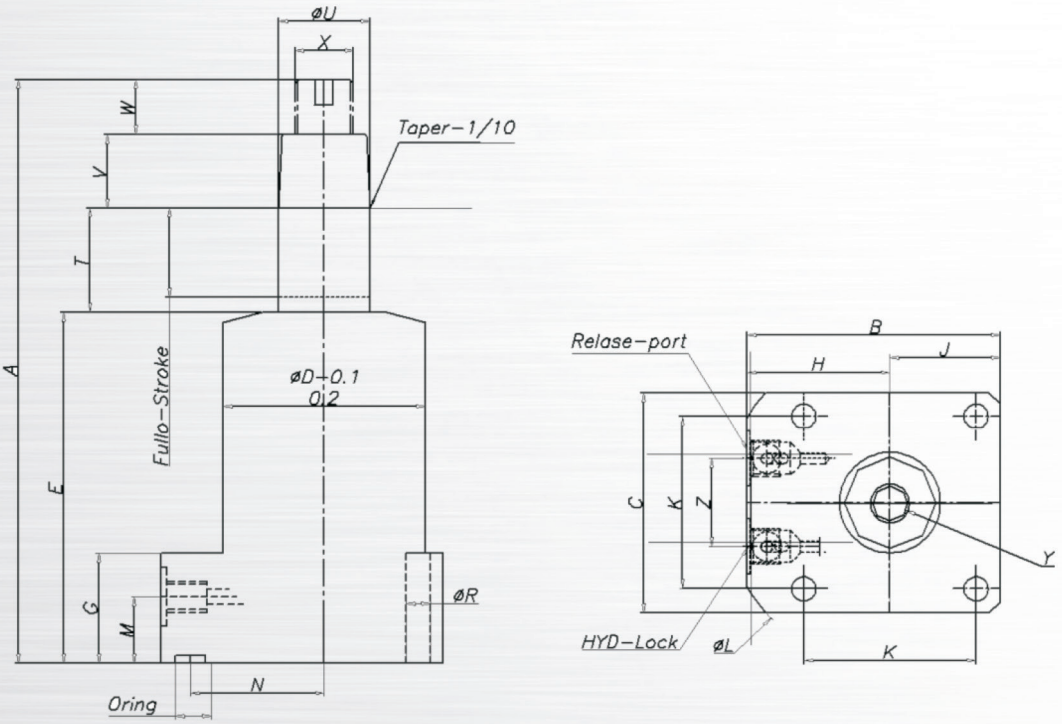


Swing Cylinder (Bottom Mounting)

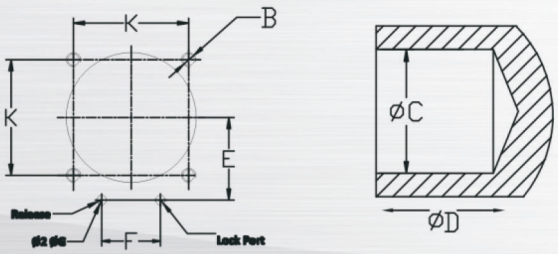
Features:

- 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 15 MPa (minimum operating pressure)
  150 MPa (maximum operating pressure)
  70 bar N (pushing force)

External Dimension Drawing :



Machining Dimension Drawing For Mounting Cylinder :



External Dimension Table:

All dimensions in mm

Model No.	RH	SB03-361-R	SB03-401-R	SB03-481-R	SB03-551-R	SB03-651-R	SB03-751-R	SB03-901-R	SB03-1051-R
	LH	SB03-362-L	SB03-402-L	SB03-482-L	SB03-552-L	SB03-652-L	SB03-752-L	SB03-902-L	SB03-1052-L
BORE DIA		Ø22	Ø25	Ø35	Ø40	Ø50	Ø55	Ø75	Ø85
A		116	127	136	159	163	194.5	215	262
B		50	55	61	69	81	92	107	127
C		41	46	52	60	70	80	95	120
D		36	40	48	55	65	75	90	105
E		73.5	78.5	88	97	97.5	115.5	126	153
F		48.5	50	58.5	66	67	77.5	84	100
G		25	28	28	30	30	37	40	53
H		29.5	32	35	39	46	52	59.5	67
J		20.5	23	26	30	35	40	47.5	60
K		31.5	34	40	47	55	63	75	88
L		69	74	83	88	106	116	136	152
M		14	15	16	18	18	19	24	31
N		23.5	26	30	33.5	39.5	45	52.5	60
P		3	3	3	3	3	3	3	4
Q		7.5	9.5	9.5	11	11	14.5	17.5	20
R		4.5	5.5	5.5	6.6	6.6	9	11	14
S		17	17	18	18	18.5	22	22	24.5
T		22	22.5	25	28	29	36	36	46
U		14	16	22	25	30	36	45	55
V		9	12	14	20	20	26	32	38
W		7	15	15	15	18	18	22	25
X		M10X1.5	M12X1.5	M16X1.5	M16X1.5	M20X1.5	M30X1.5	M36X1.5	M45X1.5
Y (Hex X Depth)		4X5	4X5	5X6	5X8	6X8	6X10	8X10	10X10
Z		16	18	22	24	30	32	37	45
Hyd. Port		G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"	G1/4"	G3/8"
Taper Angle		6°	6°	6°	6°	6°	6°	11°	11°

Specification Table :

Lock Cyl. Area (cm)		2.03	2.36	5	8	14	19.7	31.2	40.7
Full Stroke (90°rotation)mm		18	20	22	24	24	31	32	42
Swing Stroke (90°rotation)mm		10	12	12	14	14	19	20	26
Locking Stroke mm		8	8	10	10	10	12	12	16
Cyl. volume	Lock cm3	2.6	3.07	7	13.2	25.2	42.3	102.6	151
	Release cm3	4.9	6.38	12.5	20.9	37.1	68.7	127.8	199.5
Max operating Pressure (Mpa)		150							
Min operating Pressure (Mpa)		15							
Design Pressure (Mpa)		10.5							
Temperature (0C)		0-70							
Weight (Kg)		0.80	1	1.30	1.80	2.70	4.20	5.50	9

Machining Dimension Table For Mounting Cylinder :

Model No.	RH	SB03-361-R	SB03-401-R	SB03-481-R	SB03-551-R	SB03-651-R	SB03-751-R	SB03-901-R	SB03-1051-R
	LH	SB03-362-L	SB03-402-L	SB03-482-L	SB03-552-L	SB03-652-L	SB03-752-L	SB03-902-L	SB03-1052-L
K		31.5	34	40	47	55	63	75	88
B		M4	M5	M5	M6	M6	M8	M10	M12
C+0.2		36	40	48	55	65	75	90	105
D		49.5	57	59.5	67	68	78.5	85	101
E		23.5	26	30	33.5	39.5	45	52.5	60
F		16	18	22	24	30	32	37	45
G		3	3	3	3	3	3	3	4

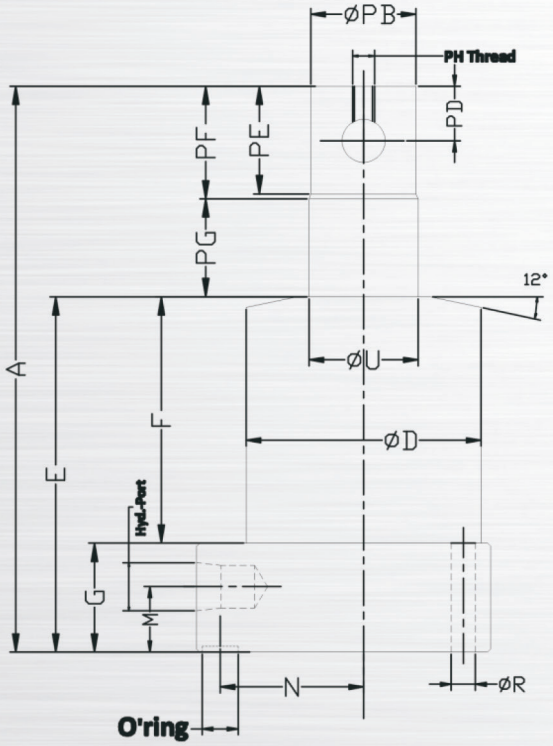


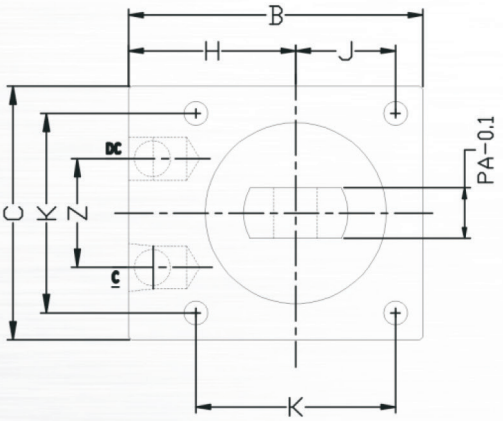
Swing Cylinder (Bottom Mounting P Type)

Features:

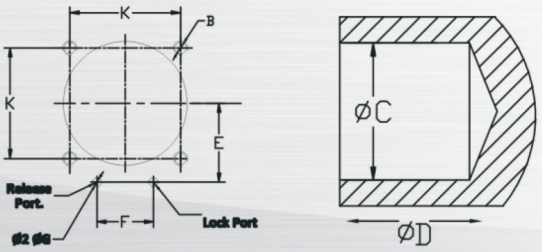
- This is a double acting cylinder with swing clamp.
- It is a Chromium plated piston rod with alloy steel body.
- It can be used with the rotation of 90°.
- These cylinders can be used for clamping of clock wise (RH) & counter clock wise direction (LH).
- It can be used in the range of 15 MPa (minimum operating pressure)
  150 MPa (maximum operating pressure)
  70 bar N (pushing force)

External Dimension Drawing :





Machining Dimension Drawing For Mounting Cylinder :



External Dimension Table:

All dimensions in mm

Model No.	RH	SB03-361-RP	SB03-401-RP	SB03-481-RP	SB03-551-RP	SB03-651-RP	SB03-751-RP	SB03-901-RP	SB03-1051-RP
	LH	SB03-362-LP	SB03-402-LP	SB03-482-LP	SB03-552-LP	SB03-652-LP	SB03-752-LP	SB03-902-LP	SB03-1052-LP
BORE DIA		Ø22	Ø25	Ø35	Ø40	Ø50	Ø55	Ø75	Ø80
A		112	119	126	141.5	156	189	205.5	254
B		50	55	61	69	81	92	107	127
C		41	46	52	60	70	80	95	120
ØD		36	40	48	55	65	75	90	105
E		73.5	78.5	88.2	97	97.8	115.5	126	153
F		48.5	50	58.5	67	68	77.5	84	100
G		25	28	28	30	30	37	40	53
H		29.5	32	35	39	46	52	59.5	67
J		20.5	23	26	30	35	40	47.5	60
K		31.5	34	40	47	55	63	75	88
L		69	74	83	88	106	116	136	152
M		14.5	16	18	18	19	24	24	31
N		23.5	26	30	33.5	39.5	45	52.5	60
P		3	3	3	3	3	3	3	4
Q		7.5	9	9.5	11	11	14.5	17.5	20
R		4.5	5.5	5.5	6.6	6.6	9	11	14
S		15	16	17	18	18.5	22	22	24.5
U		14	16	22	25	30	36	45	55
PG		21	21	25	28	29	32	33.5	46
PF		17	20	25	30.5	32	41.5	46	56.5
PE		16	18	23.5	29	30.5	38.5	44.5	53.5
PH Thread		M3	M3	M4	M5	M6	M6	M8	M8
PD		7	9	10	12	15	16.5	20	24
ØPB		13	14.5	20	23	28	34	43	53
ØPC H8		6	6	8	10	12	12	16	20
PA		7	8	10	12	14	16	22	26
Z		16	18	22	24	30	32	37	45
Hyd. Port		G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"	G1/4"	G3/8"

Dimension Specification Table:

Lock Cyl. Area (cm)		2.6	3.07	5	8	14	19.7	31.2	40.7
Full Stroke (90°rotation)mm		18	20	22	24	24	31	32	42
Swing Stroke (90°rotation)mm		10	12	12	14	14	19	20	26
Locking Stroke mm		8	8	10	10	10	12	16	17
Cyl. volume	Lock cm3	4.8	7	7.3	13.2	25.2	42.3	102.6	151
	Release cm3	7.2	10.9	12.5	20.9	37.1	68.7	127.8	199.5
Max operating Pressure (Mpa)		150							
Min operating Pressure (Mpa)		15							
Design Pressure (Mpa)		10.5							
Temperature (0C)		0-70							
Weight (Kg)		0.70	0.90	1.30	1.80	2.70	4.20	5.50	9

Machining Dimension Table For Mounting Cylinder :

Model No.	RH	SC02-361-RP	SC02-401-RP	SC02-481-RP	SC02-551-RP	SC02-651-RP	SC02-751-RP	SC02-901-RP	SC02-1051-RP
	LH	SC02-362-LP	SC02-402-LP	SC02-482-LP	SC02-552-LP	SC02-652-LP	SC02-752-LP	SC02-902-LP	SC02-1052-LP
K		31.5	34	40	47	55	63	75	88
B		M4	M5	M5	M6	M6	M8	M10	M12
C+0.2		36	40	48	55	65	75	90	105
D		49	51	59.5	68	69	78.5	85	102
E		23.5	26	30	33.5	39.5	45	52.5	60
F		16	18	22	24	30	32	37	45
G		3	3	3	3	3	3	3	4



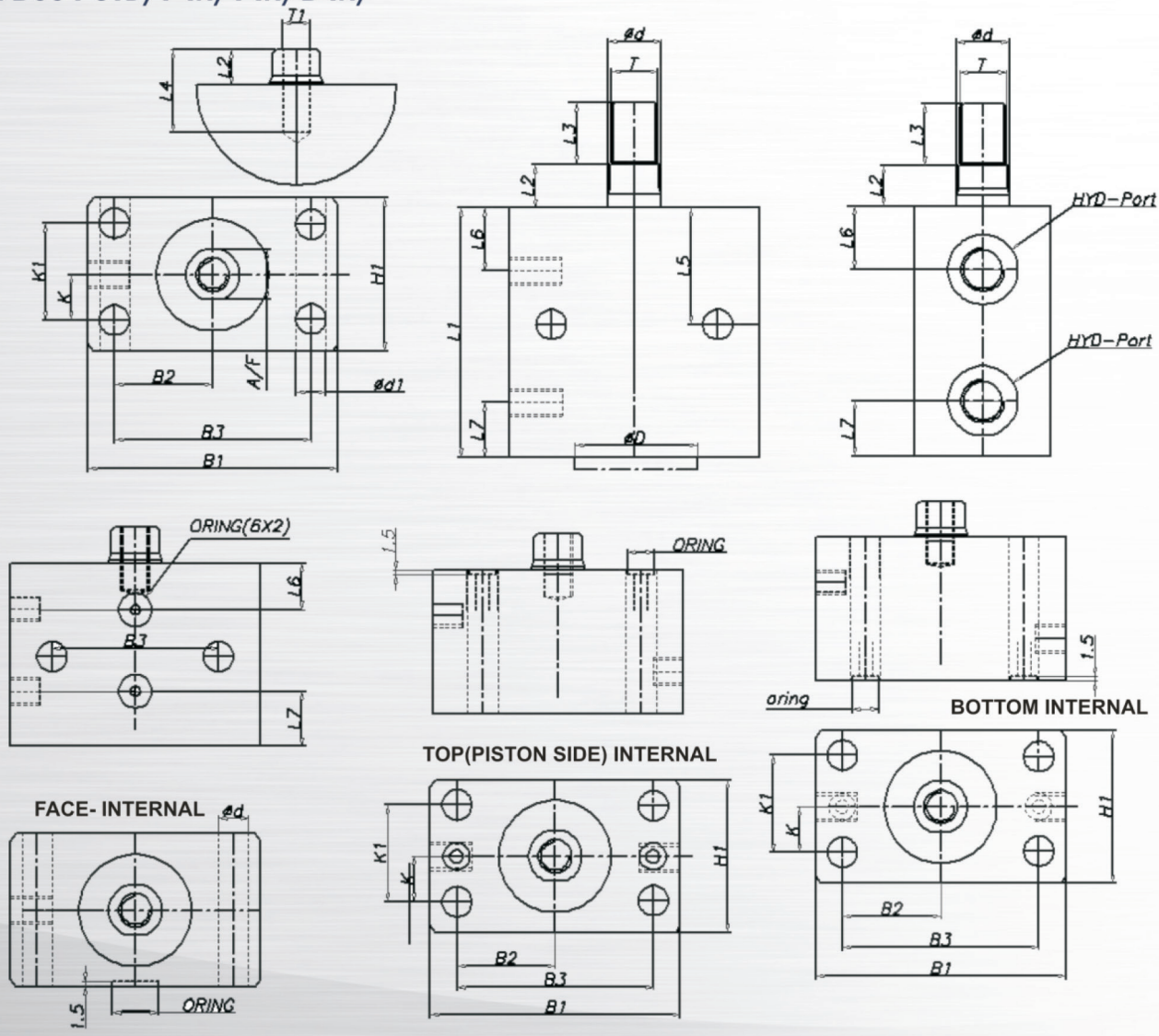
Block Cylinder

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 15 MPa (minimum operating pressure)
  150 MPa (maximum operating pressure)
  70 bar
- This cylinder are also available with internal port option

External Dimension Drawing :

Code : BC04-STD/F-IN/T-IN/B-IN/



Note : 16Bore to 32 Bore Oring Size(4x2). 40Bore to 80Bore Oring Size(6x2)

External Dimension Table:

All dimensions in mm

Model No.	Male Thread	BC04 16-16M	BC04 16-25M	BC04 16-50M	BC04 20-16M	BC04 20-25M	BC04 20-50M	BC04 25-16M	BC04 25-25M	BC04 25-50M	BC04 32-25M	BC04 32-50M	BC04 32-75M	BC04 40-25M	BC04 40-50M	BC04 40-75M
	Female Thread	BC04 16-16F	BC04 16-25F	BC04 16-50F	BC04 20-16F	BC04 20-25F	BC04 20-50F	BC04 25-16F	BC04 25-25F	BC04 25-50F	BC04 32-25F	BC04 32-50F	BC04 32-75F	BC04 40-25F	BC04 40-50F	BC04 40-75F
Piston ØD		16			20			25			32			40		
Rod Ød		10			12			16			20			25		
Ød1		7			9			9			11			11		
Stroke (S)		16	25	50	16	25	50	16	25	50	25	50	75	25	50	75
L1		60	69	94	66	75	100	66	75	100	80	105	130	80	105	130
L2		8			10			10			12			12		
L3		15			16			18			22			28		
L4		16			16			19			21			25		
L5		30			35			35			40			40		
L6		16			19			19			22.5			22.5		
L7		14			16.5			16.5			17			17		
B1		51			61			66			76			86		
B2		18			22.5			25			27.5			31.5		
B3		36			45			50			55			63		
H		17.5			20			22.5			27.5			31.5		
H1		36			41			46			56			64		
K		11.5			12.5			15			17.5			31.5		
K1		23			25			30			35			43		
Hyd. Port		G1/8"			G1/8"			G1/8"			G1/8"			G1/4"		
A/F		8			10			13			17			23		
T		M8X1.25			M10X1.5			M14X1.5			M16X1.5			M20X1.5		
T1		M6			M6			M10			M12			M16		
Pushing Force 70 Bar	KN	2			2.2			3.43			5.63			8.79		
Pulling Force 70 Bar	KN	1.00			1.41			2.03			3.43			5.63		

Model No.	Male Thread	BC04 50-25M	BC04 50-50M	BC04 50-75M	BC04 50-100M	BC04 65-25M	BC04 65-50M	BC04 65-75M	BC04 65-100M	BC04 75-25M	BC04 75-50M	BC04 75-75M	BC04 75-100M	BC04 80-25M	BC04 80-50M	BC04 80-75M	BC04 80-100M	BC04 100-25M	BC04 100-50M	BC04 100-75M	BC04 100-100M
	Female Thread	BC04 50-25F	BC04 50-50F	BC04 50-75F	BC04 50-100F	BC04 65-25F	BC04 65-50F	BC04 65-75F	BC04 65-100F	BC04 75-25F	BC04 75-50F	BC04 75-75F	BC04 75-100F	BC04 80-25F	BC04 80-50F	BC04 80-75F	BC04 80-100F	BC04 100-25F	BC04 100-50F	BC04 100-75F	BC04 100-100F
Piston ØD		50				65				75				80				100			
Rod Ød		32				40				45				50				60			
Ød1		13				13				17				22				22			
Stroke (S)		25	50	75	100	25	50	75	100	25	50	75	100	25	50	75	100	25	50	75	100
L1		95	120	145	170	100	125	150	175	100	125	150	175	105	130	155	180	105	130	155	180
L2		14				15				15				16				16			
L3		36				36				36				40				40			
L4		25				28				28				40				42			
L5		50				50				50				60				65			
L6		30				30.5				31.5				37				37			
L7		17				20				20				23				23			
B1		101				126				141				146				161			
B2		38				50				55				55				65			
B3		76				100				110				110				130			
H		38				44				54				60				70			
H1		77				89				109				121				141			
K		22.5				30				30				40				50			
K1		45				60				60				80				100			
Hyd. Port		G1/4"				G1/4"				G1/4"				G3/8"				G1/2"			
A/F		26				36				41				45				55			
T		M24X1.5				M30X1.5				M36X1.5				M40X1.5				M45X1.5			
T1		M20				M24				M30				M36				M42			
Pushing Force 70 Bar	KN	13.74				21.48				28.5				35.19				54.98			
Pulling Force 70 Bar	KN	8.12				12.68				17.37				21.44				35.9			

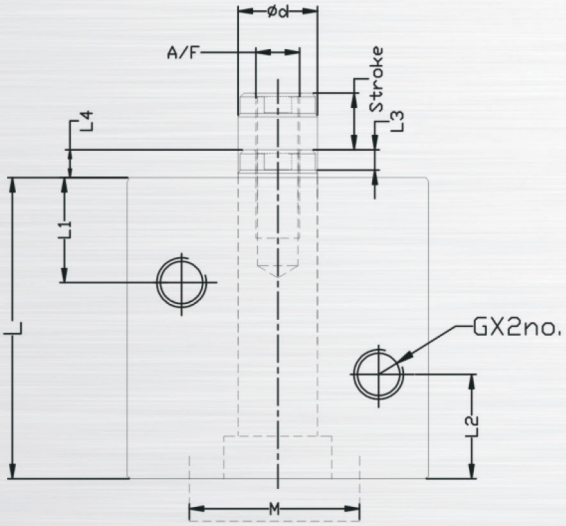


Compact Cylinder

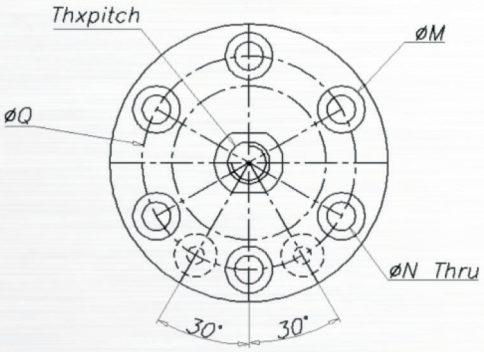
Features:

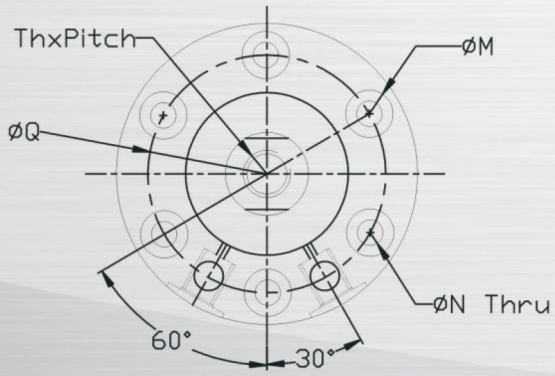
- This is a manifold mounting cylinder with compact design.
- It is a space saving & easy mounting with male & female threaded piston ends.
- These cylinders are provided with universal mounting.
- These cylinders are threaded directly into manifold, clamping, pushing, pulling, ejection & riverting operations.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

External Dimension Drawing :

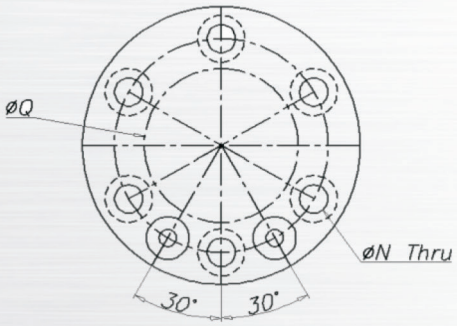


Bm-Internal





Top - Internal



External Dimension Table:

All dimensions in mm

Model No.	CC05 4525	CC05 6525	CC05 7625	CC05 9525
Bore Ø M	Ø22	Ø32	Ø40	Ø50
Pushing Force KN	3.8	8	12.5	19.63
Pulling Force KN	0.8	2.1	3.1	5.3
Thread X Pitch	M6 X 10	M10 X 18	M12 X 20	M16 X 25
L4	7	7	8	9
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	8 X 5	11 X 7	11 X 7	14.5 X 9
ØQ (PCD)	35	50	60	75
Stroke	25	25	25	25
L	63	63	67	73
Oil Volume Pushing CC	8cc	20cc	31cc	49cc
Oil Volume Pulling CC	5cc	15cc	24cc	37cc



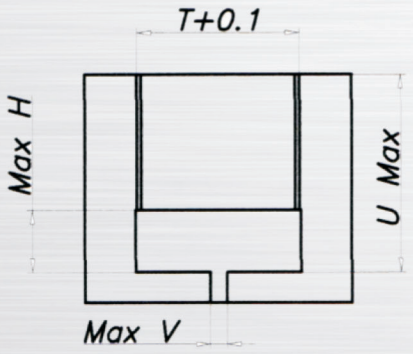
Threaded Body Cylinder

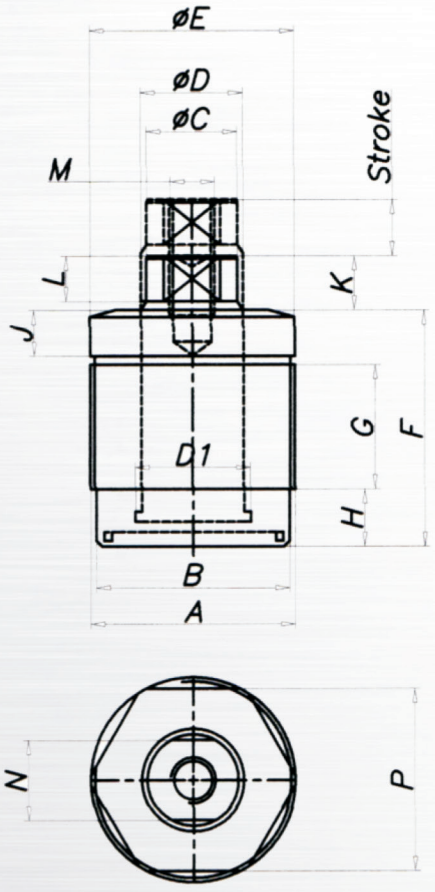
Features:

- 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 15 MPa (minimum operating pressure)
  150 MPa (maximum operating pressure)
  70 bar N (pushing force)

External Dimension Drawing :

Mounting Details Drawing :





External Dimension Table :

All dimensions in mm

Model No.	TC06 M16			TC06 M22			TC06 M24			TC06 M30			TC06 M36			TC06 M45			TC06 M55			TC06 M65			TC06 M80		
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
A (Nominal X Pitch)	M16 X 1.5			M22 X 1.5			M24 X 1.5			M30 X 1.5			M36 X 1.5			M45 X 1.5			M55 X 1.5			M65 X 1.5			M80 X 1.5		
B	14.3			20.3			22.3			28.3			34.3			43.3			52.6			62.6			77.6		
C	7.5			11.2			13			17			19			28			34.5			42			52		
D	7			12			14			16			18			30			36			45			55		
D1Ø	11	11	11	15	15	15	16	16	16	20	20	20	25	25	25	33	33	33	35	35	35	45	45	45	50	50	50
E	16			21.2			24.5			30			35.5			45			55			66			80		
F	35	39	45	28	36	49	32.5	40	56.5	35	44	63.5	41.5	62.5	75.5	47	60	82.5	52	67	89	62	78	113	69	87	118
G	24	28	34	13	21	34	17.5	25	41.5	18	27	46.5	23.5	36.5	57.5	23	36	58.5	27	43	65	35	51	80.5	42	60	91
H	6			8			8			9			10			12			12			13			13		
J	5			7			7			8			8			12			12			14			14		
K	6			7			7			8.5			9.5			12			13			16			19		
L	4			5.5			5.5			7			8			10			11			13			16		
M (Nominal X Depth)	M5 X 8			M6 X 7			M6 X 7			M8 X 10			M8 X 10			M10 X 11			M12 X 12			M16 X 16			M20 X 20		
N	7			10			10			14			17			24			30			36			41		
P	16			22			24			30			32			41			50			60					
T	14.5			20.5			22.5			28.5			34.5			43.5			53			63			78		
MAX U	12			14			14			15			16			18			20			25			25		
MAX V	23	29	38	20	28	41	24	32	48	26	54	65	32	45	66	34	47	69	38	53	76	47	63	92	54	72	103
MAX H	3			3			3			6			6			8			8			8			8		

Stroke & Load Details:

Model No.	TC06 M16			TC06 M22			TC06 M24			TC06 M30			TC06 M36			TC06 M45			TC06 M55			TC06 M65			TC06 M80		
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
Stroke mm	6	10	16	6	10	16	8	12	20	8	12	20	10	16	25	10	16	25	10	20	32	16	25	40	16	25	40
Cylinder Area cm2	0.95			1.1			1.5			2.5			3.9			7.1			9.9			15.9			23.8		
Cylinder Area cm3	0.6	1.0	1.5	0.7	1.1	1.8	1.2	1.8	3.1	2.0	3.1	5.1	3.9	6.3	9.9	7.1	11.0	17.7	12.0	20.0	31.7	25.0	40.0	63.6	38.0	59.4	95.0
Release Spring Force (N)	12.4-24.0			26.0-24.0			33.0-61.0			50.0-99.0			79.0-150			157-319			236-452			353-657			564-1040		
Supply Pressure (7Mpa) Force in KN	0.665			0.7			1.01			1.66			2.59			4.6			6.44			10.4			15.5		
Calculation Formula-KN	(0.01p)-0.024			(0.11p)-0.041			(0.154p)-0.060			(0.254p)-0.099			(0.394p)-0.150			(0.707p)-0.319			(0.990p)-0.452			(1.59p)-0.657			(2.38p)-1.04		
Max.operating pressure (Mpa)	150																										
Min.operating pressure (Mpa)	15																										

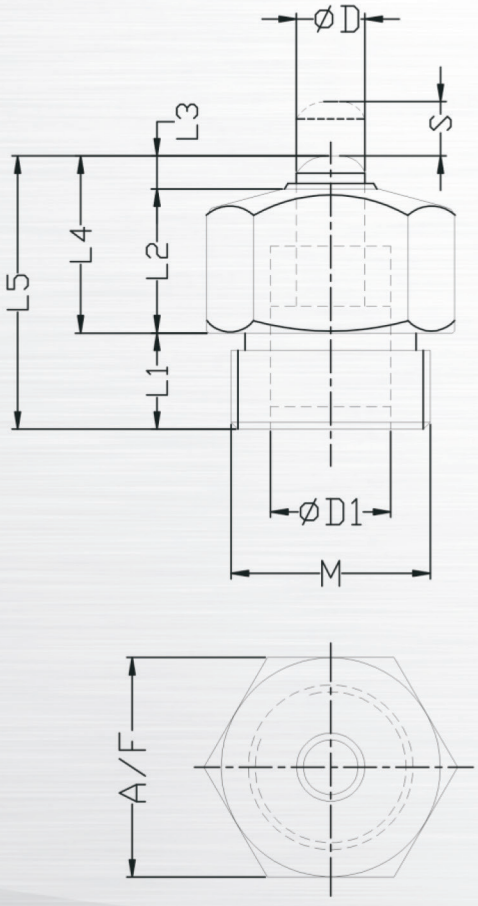


Threaded Body Cylinder
(Hexgaon Manifold Mount)

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 & riverting operations.
- It can be used in the range of 15 MPa (minimum operating pressure)
  150 MPa (maximum operating pressure)
  70 bar N (pushing force)

External Dimension Drawing :



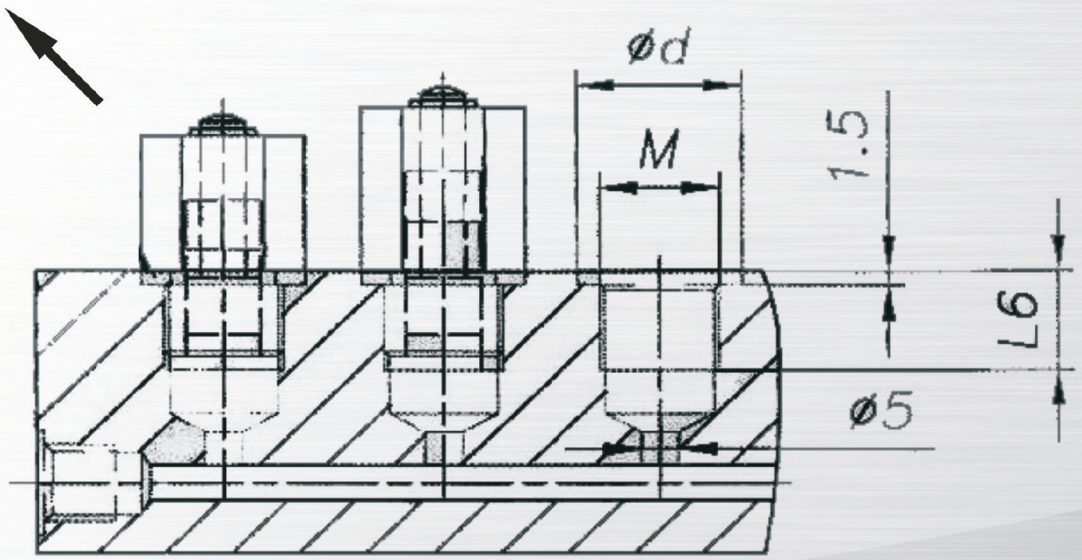
External Dimension Table :

All dimensions in mm

Model No.	TM07 M16-S	TM07 M16-M	TM07 M20-S	TM07 M20-M	TM07 M24-S	TM07 M24-M	TM07 M30-S	TM07 M30-M	TM07 M36-S	TM07 M36-M
Rod ØD	6		8		10		12		16	
PistonØD1	10		12		16		20		25	
Stroke - S	4	8	4	8	6	10	8	12	12	16
M	M16 X 1.5		M20 X 1.5		M24 X 1.5		M30 X 1.5		M36 X 1.5	
L1	12		12		14		18		21	
L2	19	23	19	23	21	25	27	31	33	37
L3	4	4	4	4	4	4	4	4	4	4
L4	22	26	22	26	24	28	30	34	36	40
L5	34	38	34	38	38	42	48	52	57	61
L6	14		14		16		23		23	
A/F	21		27		30		38		44	
Ød	22		28		32		42		48	

Typical Mounting:

Nilon Ring





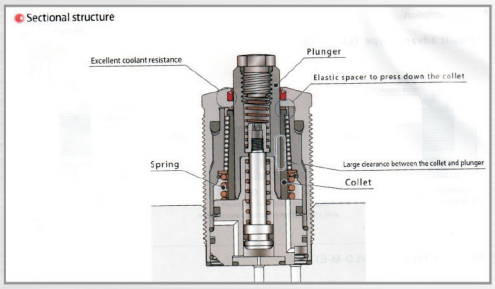
Threaded Body Work Support

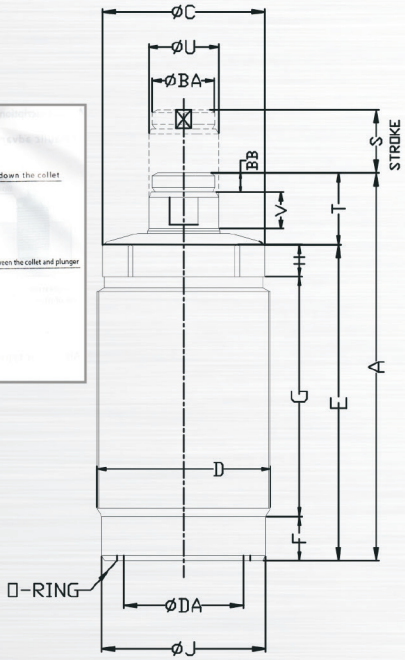
Hydraulic Advance

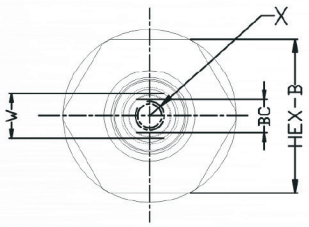
Features:

- This is a threaded body with compact design of single acting Hydraulic
- 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
- Minimum operating pressure 10bar Max
- Maximum operating pressure 70bar Max

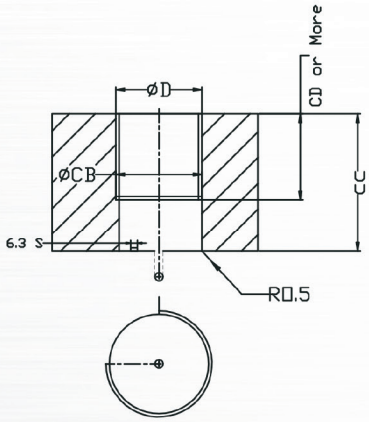
External Dimension Drawing :



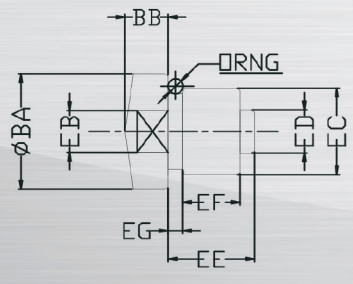


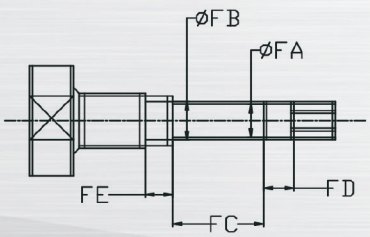


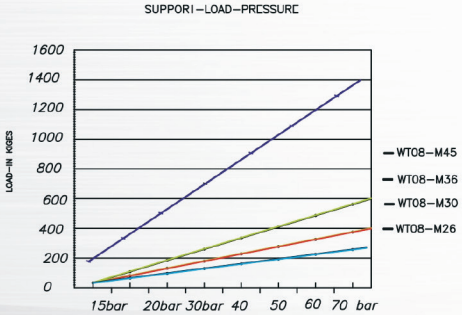
Mounting Dimension Drawing :



Plunger Spring & Contact Bolt Dimension :







External Dimension Table:

All dimensions in mm

Model No.	WT08-M26	WT08-M30	WT08-M36	WT08-M45
A	66	74	80	80
B	24	27	32	41
C	26	30	36	45
D	M26 X 1.5	M30 X 1.5	M36 X 1.5	M45 X 1.5
E	55	61	65	66
F	10	11	10	12.5
G	40	44	50	49
H	8	9	9	10
J	24.6	28.4	34	43
T	9.5	9.5	11.5	12.5
U	10	12	15	16
V	5	6	8.5	8
W	8	10	13	14
X	M6	M8	M10	M10
BA	9.5	11.5	13	13
BB	4	4	4	4
BC	8	10	12	13
CB	24.5	28.5	34.5	43.5
CC	16~47	17~50	18~48	21~58
CD	CC-7	CC-7	CC-8	CC-8
ØDA X Thick	12 X 2	14 X 2	14 X 2	20 X 2

Specification Table :

Support Force 7Mpa (KN)	3	3.8	4.5	9.5
Support Force Formula Mpa	0.53 X P-0.68	0.67 X P-0.91	0.825 X P-1.25	1.7 X P-2.28
Plunger stroke S (mm)	6	8	8	10
Plunger Rising Force I (N)	2.8~4.1	3.6~5.7	4.7~7.8	5.8~9.7
Plunger Rising Force H (N)	3.8~5.9	4.9~8	6.2~11	7.9~13.6
Cylinder Volume (cm)	0.6	0.9	1.3	2
Min. Pressure	10 Mpa			
Max. Presssure	70 Mpa			
Weight (Kg)	0.2	0.25	0.35	0.75

Pad Dimensions:

ØEB	4.9	6	8.2	10
EC	M6	M8	M10	M10
ØED	2.5	5	5	5.5
EE	9	10	10	10
EG	2	2	2	2
O-RING	5 X 1.5	4 X 2	8 X 1.5	8 X 1.5
ØFA	2.6	5	5.8	5.8
ØFB	3.6	6	8.5	8.5
FC	11.5	10	12	13
FD	4	4	8	8
FE	2	2	2	2
Mounting Torque (Nm)	31.5	50	63	80



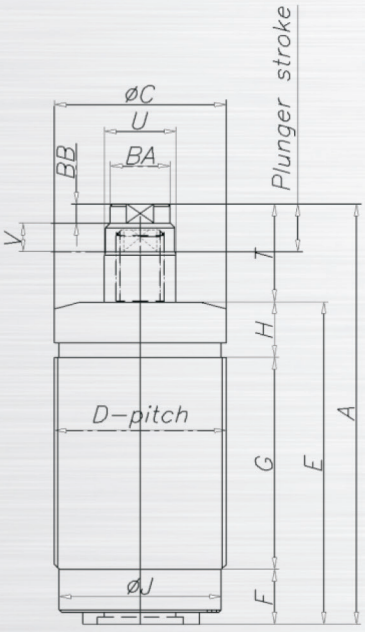
Threaded Body Work Support

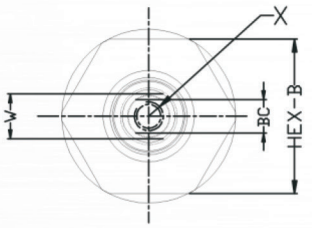
Spring Advance

Features:

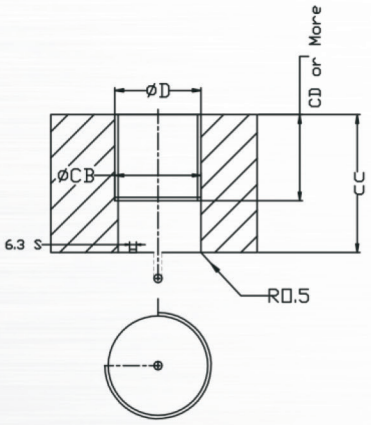
- This is a threaded body with compact design of single acting Spring Advance
- It is a wide operating pressure range.
- This work support is a hydraulic advance with manifold mounting & also, spring advance
- It can be used in the range of 7 Mpa
- Minimum operating pressure 10bar Max
- Maximum operating pressure 70bar Max

External Dimension Drawing :

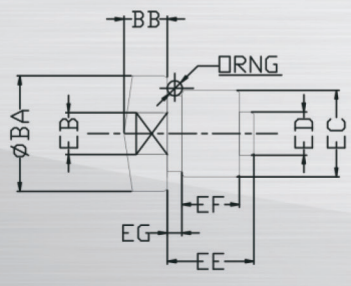


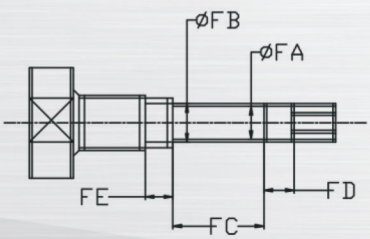


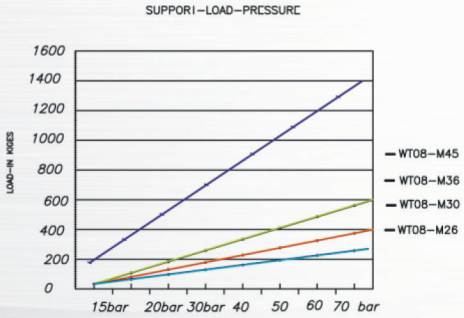
Mounting Dimension Drawing :



Plunger Spring & Contact Bolt Dimension :







External Dimension Table:

All dimensions in mm

Model No.	WTSA-08-M26	WTSA-08-M30	WTSA-08-M36	WTSA-08-M45
A	72	82	88	90
B	24	27	32	41
C	26	30	36	45
D Pitch	M26 X 1.5	M30 X 1.5	M36 X 1.5	M45 X 1.5
E	55	61	65	66
F	10	11	10	12.5
G	40	44	50	49
H	8	9	9	10
J	24.6	28.4	34	43
T	9.5	9.5	11.5	12.5
U	10	12	15	16
V	5	6	8.5	8
W	8	10	13	14
X	M6	M8	M10	M10
BA	9.5	11.5	13	13
BB	4	4	4	4
BC	8	10	12	13
CB	24.5	28.5	34.5	43.5
CC	16~47	17~50	18~48	21~58
CD	CC-7	CC-7	CC-8	CC-8
ØDA X Thick	12 X 2	14 X 2	14 X 2	20 X 2

Specification Table :

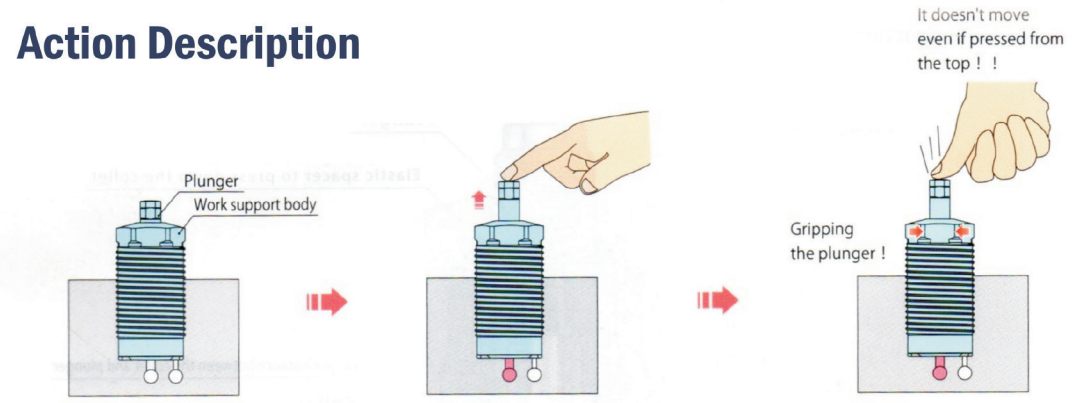
Support Force 7Mpa (KN)	3	3.8	4.5	9.5
Support Force Formula Mpa	0.53 X P-0.68	0.67 X P-0.91	0.825 X P-1.25	1.7 X P-2.28
Plunger stroke S (mm)	6	8	8	10
Plunger Rising Force I (N)	2.8~4.1	3.6~5.7	4.7~7.8	5.8~9.7
Plunger Rising Force H (N)	3.8~5.9	4.9~8	6.2~11	7.9~13.6
Cylinder Volume (cm)	0.6	0.9	1.3	2
Min. Pressure	10 Mpa			
Max. Presssure	70 Mpa			
Weight (Kg)	0.2	0.25	0.35	0.75

Pad Dimensions:

ØEB	4.9	6	8.2	10
EC	M6	M8	M10	M10
ØED	2.5	5	5	5.5
EE	9	10	10	10
EG	2	2	2	2
O-RING	5 X 1.5	4 X 2	8 X 1.5	8 X 1.5
ØFA	2.6	5	5.8	5.8
ØFB	3.6	6	8.5	8.5
FC	11.5	10	12	13
FD	4	4	8	8
FE	2	2	2	2
Mounting Torque (Nm)	31.5	50	63	80

Hydraulic Advance Type

Action Description



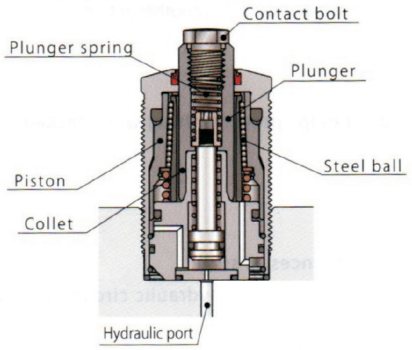
Hydraulic pressure : OFF
The state of plunger down.

Hydraulic pressure : ON
Plunger rises with oil pressure
and stops after touching work piece.

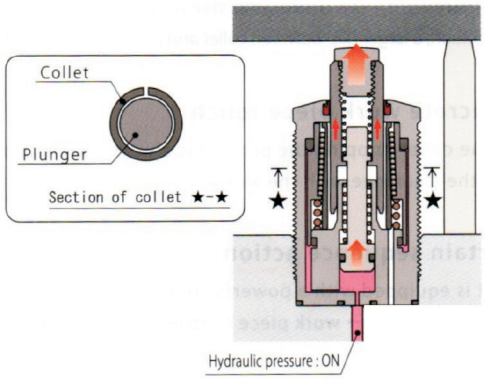
Hydraulic pressure : ON
Once it is in the stopped position where
it touches the work piece, the plunger
doesn't go down even if pressed from above.

Internal action description

- Hydraulic advance type model LD

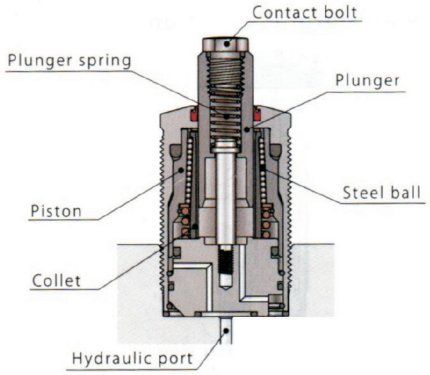


When releasing (Sectional structure)

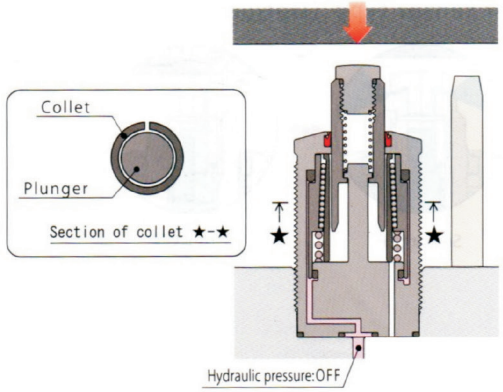


Plunger extends

- Spring advance type model LD-E

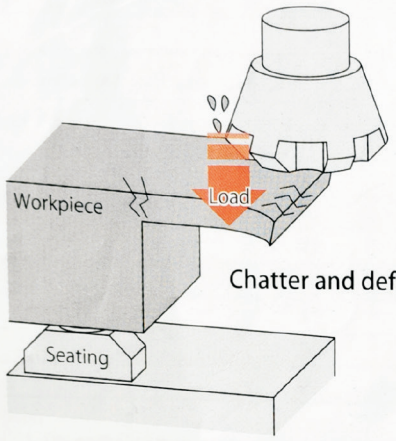


When releasing (Sectional structure)

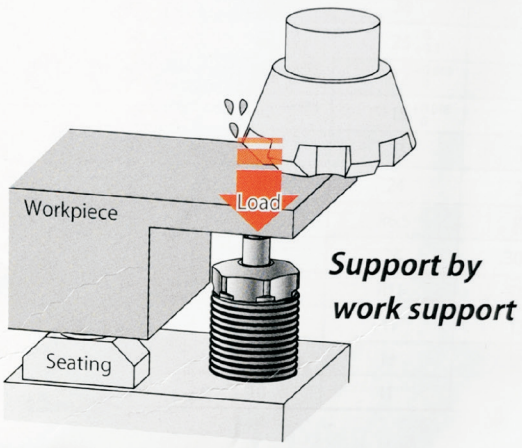


Release condition

Work support eliminates chattering while machining and prevents deformation by the cutting load.

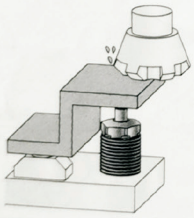


< No work support >

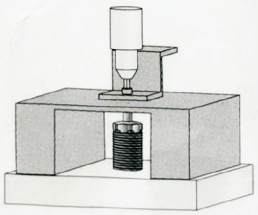


< With work support >

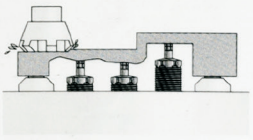
Application sample



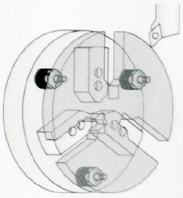
To avoid chattering during machining of thin-walled sections.



To back up the screw fastener machine and a nut-runner.



Work piece with different heights.

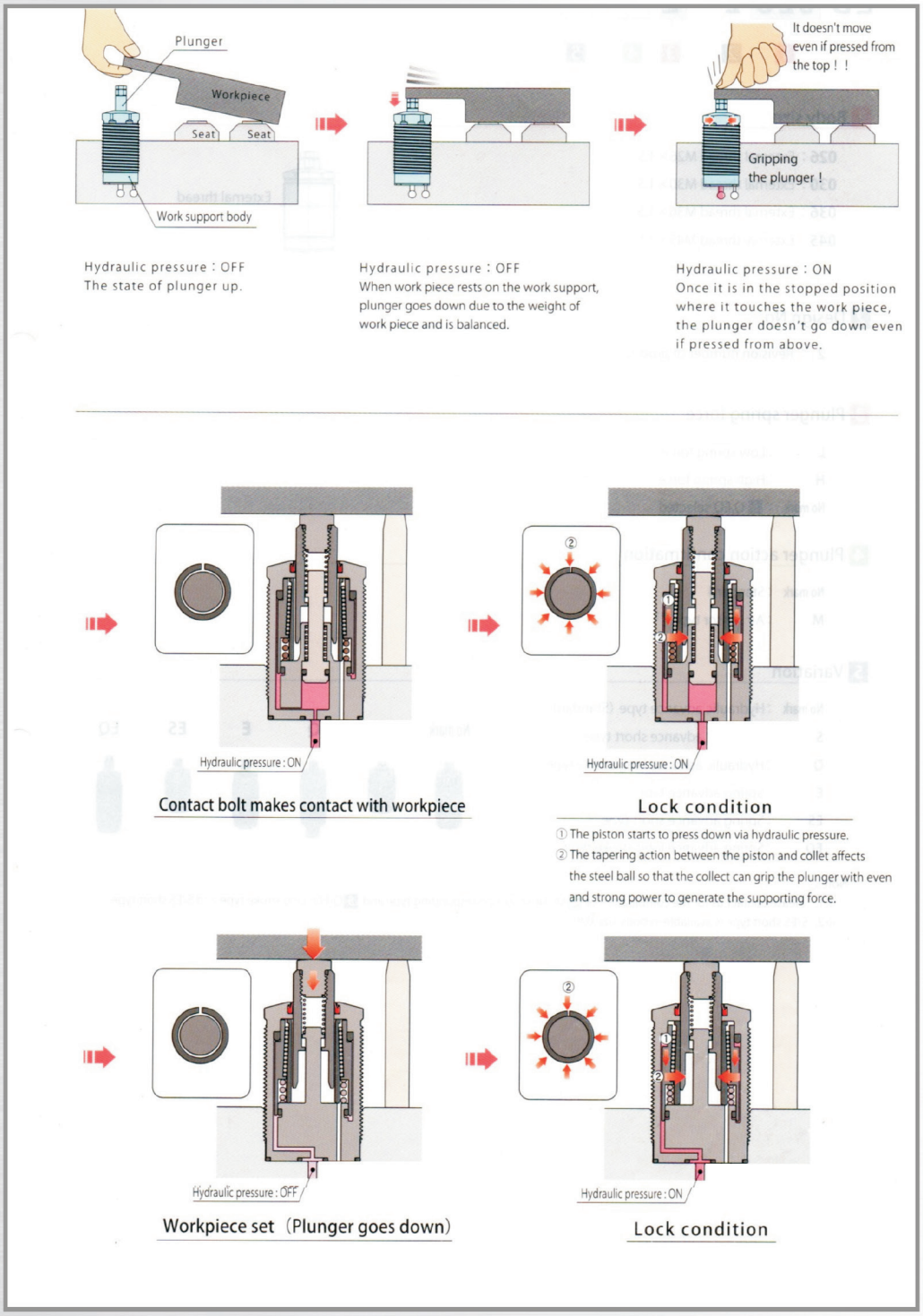


To avoid the radial chatter on lathe machining.

Spring Advance Type

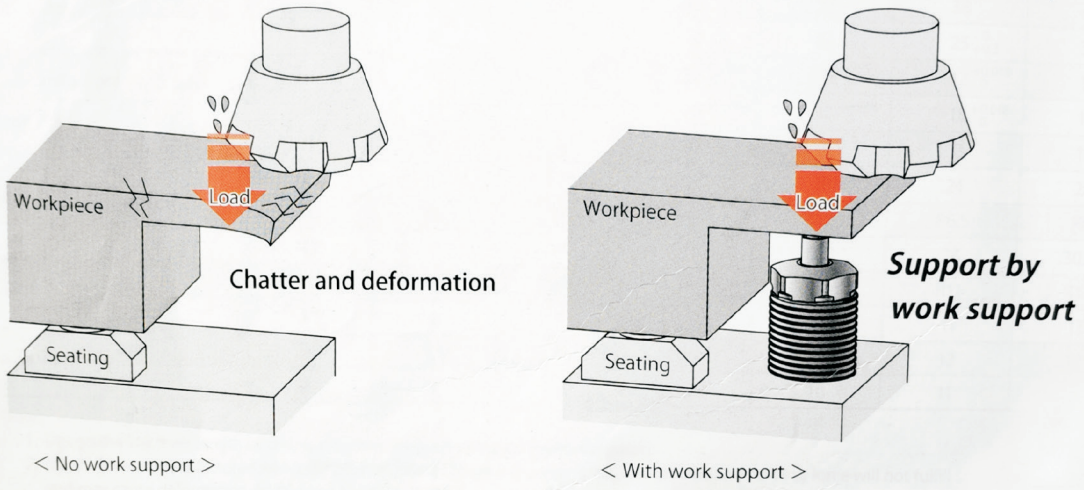
Product Code : WTSA-08

Action Description

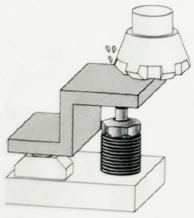


Action Description

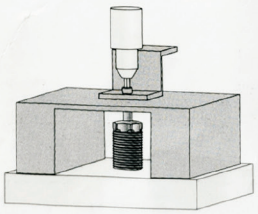
Work support eliminates chattering while machining and prevents deformation by the cutting load.



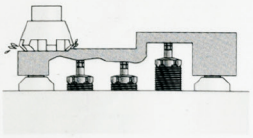
Application sample



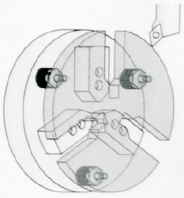
To avoid chattering during machining of thin-walled sections.



To back up the screw fastener machine and a nut-runner.



Work piece with different heights.



To avoid the radial chatter on lathe machining.

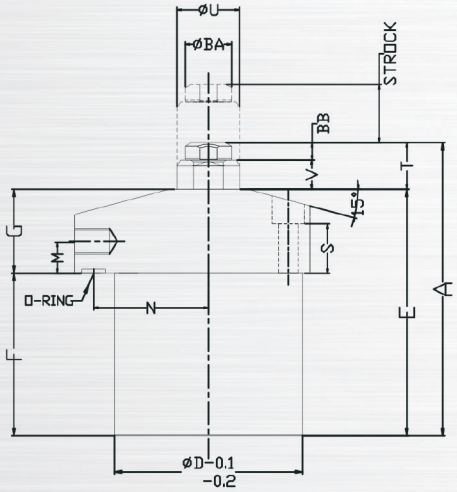


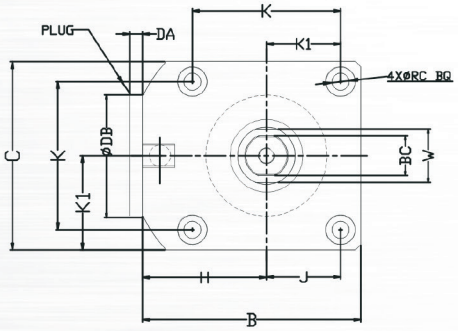
Flange Work Support
Hydraulic Advance

Features:

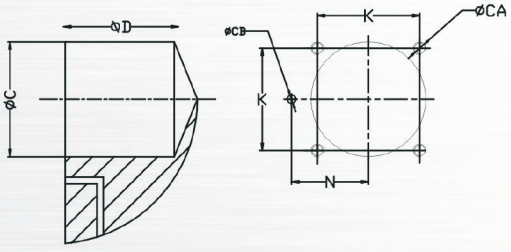
- This is a flange body with compact design of single acting Hydraulic
- It is a low operating pressure range.
- This work support is a hydraulic advance with flange mounting & With Spring Advance
- It can be used in the range of 7 Mpa
- Minimum operating pressure 10bar Max
- Maximum operating pressure 70bar Max

External Dimension Drawing :

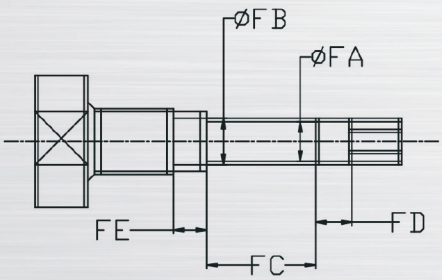


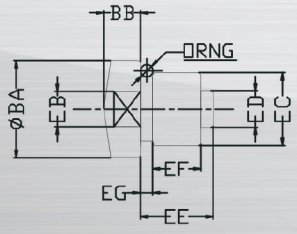


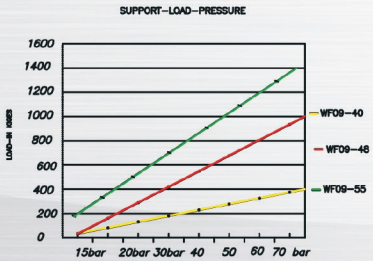
Mounting Dimension Drawing :

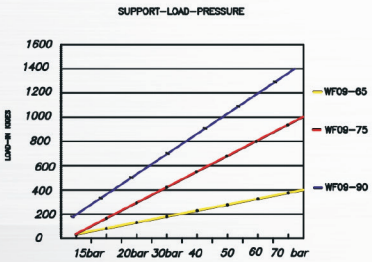


Plunger Spring & Contact Bolt Dimension :









External Dimension Table:

All dimensions in mm

Model No.	WF09-40	WF09-48	WF09-55	WF09-65	WF09-75	WF09-90
A	77	78	101	103	126	140
B	54	61	69	81	92	107
C	45	51	60	70	802	95
D	40	48	55	65	75	90
E	63	64.5	73	85	107	128
F	38	39	45	56	72	88
G	25	25	29	30	35	40
H	31.5	35.5	39	46	52	59.5
J	22.5	25.5	30	35	40	47.5
K	34	40	47	55	63	75
K1	17	20	23.5	27.5	31.5	37.5
ØL	68	73	83	94	106	126
M	10	12	11	10	12.5	13
N	26	30	33.5	39.5	45	52.5
O	9.5	9.5	11	11	14.5	17.5
R	5.5	5.5	6.6	6.6	9	11
S	15	15	17	17	17	18
T	13	13	15	16	18.5	22
ØU	15	16	20	22	25	32
V	8.7	9	9.5	9.5	10.5	10
W	13	14	18	19	22	24
X	M10	M10	M12	M12	M16	M16
Hyd. Port	G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"
O Ring	4 X 2	4 X 2	4 X 2	6 X 2	6 X 2	6 X 2

Specification Table :

Support Force 7Mpa (KN)	4.5	9.5	14	21	33	45
Support Force Formula Mpa	0.825 X P-1.25	1.55 X P-1.25	2.36 X P-2.28	3.83 X P-5.7	5.60 X P-6.13	7.5 X P-6.87
Plunger Stroke ST (mm)	8	10	12	14	16	20
Cylinder Volume (cm)	12	2	3.3	4.8	8.9	13.1
Plunger Spring Force	L N 2.8~4.1	L N 3.6~5.7	L N 4.7~7.8	L N 9.8~14.6	L N 12.4~18.8	L N 14.6~21.0
	H N 3.8~5.9	H N 4.9~8.0	H N 6.2~11	H N16.8~22.0	H N 18.7~31.9	H N 21.4~34.2
Max. Presssure	70 Mpa					
Min. Pressure	10 Mpa					
Design Pressure Mpa	10.5 Mpa					
Temperature OC	0.7					
Weight (Kg)	0.6	0.8	1.4	2.2	3.6	6

Plunger Spring, Contact Bolt & Mounting Dimension Table :

Model No.		WF09-40	WF09-48	WF09-55	WF09-65	WF09-75	WF09-90
Contact Bolt	ØBA	12.5	12.5	16.5	16.5	21.5	30
	BB	4	4	6	6	9	9
	BC	13	13	16	16	20	28
	ØEB	7.5	7.5	10	10	13.5	13.5
	EC	M10	M10	M12	M12	M16	M16
	ØED	5.5	6	6	6.5	9	10
	EE	10	10	11	13	16	16
	EF	2	2	2	2.5	3	3
Mounting Dimension	CA	M5	M5	M6	M6	M8	M10
	ØCB	2	2.5	2.5	3	5	5
	DA	3.5	3.5	3.5	3.5	4.5	4.5
	ØDB	14	14	14	14	18	18
	ØC+0.2	40	48	55	65	75	90
	D	39	40	46	57	73	89
Plunger Spring Housing Dimension	ØFA	5.8	5.8	6	6.4	10	10
	ØFB	8.5	8.5	10.2	10.2	14	14
	FC	9.5	10	12	16	21	44
	FD	6	6	6	8	12	12
	FE	2	2	2	2	2	2
	FF	7.5	19.5	20	29.5	30	38.5

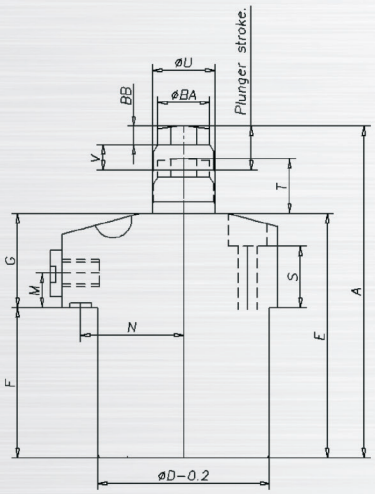


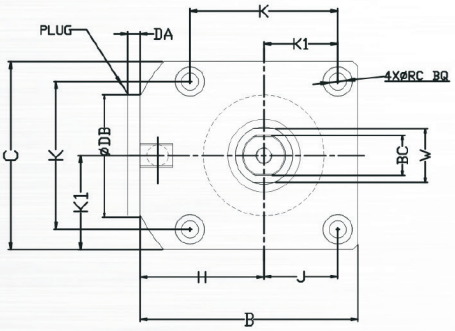
Flange Work Support
Spring Advance

Features:

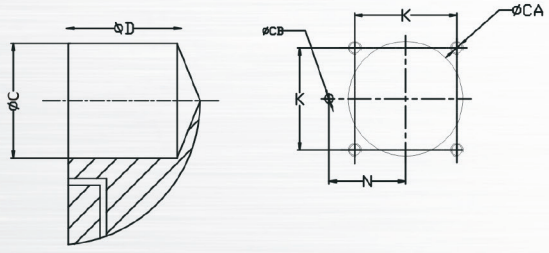
- This is a flange body with compact design of single acting Spring Advance
- It is a low operating pressure range.
- This work support is a hydraulic advance with flange mounting & With Spring Advance
- It can be used in the range of 7 Mpa
- Minimum operating pressure 10bar Max
- Maximum operating pressure 70bar Max

External Dimension Drawing :

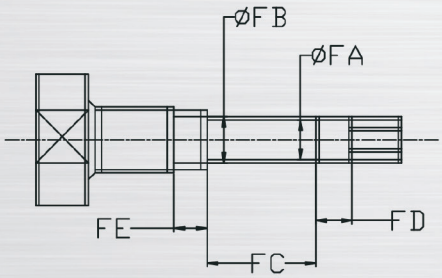


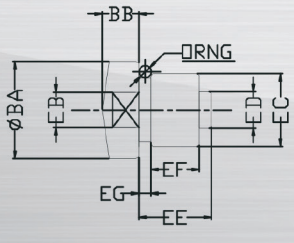


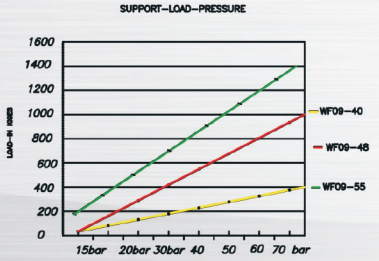
Mounting Dimension Drawing :

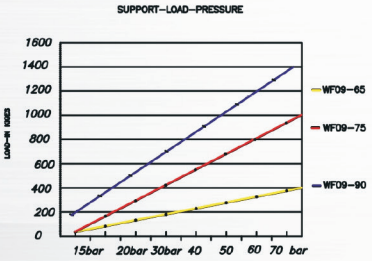


Plunger Spring & Contact Bolt Dimension :









External Dimension Table:

All dimensions in mm

Model No.	WFSA-09-40	WFSA-09-48	WFSA-09-55	WFSA-09-65	WFSA-09-75	WFSA-09-90
A	85	88	113	117	142	160
B	54	61	69	81	92	107
C	45	51	60	70	802	95
D	40	48	55	65	75	90
E	63	64.5	73	85	107	128
F	38	39	45	56	72	88
G	25	25	29	30	35	40
H	31.5	35.5	39	46	52	59.5
J	22.5	25.5	30	35	40	47.5
K	34	40	47	55	63	75
K1	17	20	23.5	27.5	31.5	37.5
ØL	68	73	83	94	106	126
M	10	12	11	10	12.5	13
N	26	30	33.5	39.5	45	52.5
O	9.5	9.5	11	11	14.5	17.5
R	5.5	5.5	6.6	6.6	9	11
S	15	15	17	17	17	18
T	13	13	15	16	18.5	22
ØU	15	16	20	22	25	32
V	8.7	9	9.5	9.5	10.5	10
W	13	14	18	19	22	24
X	M10	M10	M12	M12	M16	M16
Hyd. Port	G1/8"	G1/8"	G1/8"	G1/8"	G1/4"	G1/4"
O Ring	4 X 2	4 X 2	4 X 2	6 X 2	6 X 2	6 X 2

Specification Table :

Support Force 7Mpa (KN)	4.5	9.5	14	21	33	45
Support Force Formula Mpa	0.825 X P-1.25	1.55 X P-1.25	2.36 X P-2.28	3.83 X P-5.7	5.60 X P-6.13	7.5 X P-6.87
Plunger Stroke ST (mm)	8	10	12	14	16	20
Cylinder Volume (cm)	12	2	3.3	4.8	8.9	13.1
Plunger Spring Force	L N 2.8~4.1	L N 3.6~5.7	L N 4.7~7.8	L N 9.8~14.6	L N 12.4~18.8	L N 14.6~21.0
	H N 3.8~5.9	H N 4.9~8.0	H N 6.2~11	H N16.8~22.0	H N 18.7~31.9	H N 21.4~34.2
Max. Presssure	70 Mpa					
Min. Pressure	10 Mpa					
Design Pressure Mpa	10.5 Mpa					
Temperature OC	0.7					
Weight (Kg)	0.6	0.8	1.4	2.2	3.6	6

Plunger Spring, Contact Bolt & Mounting Dimension Table :

Model No.		WFSA-09-40	WFSA-09-48	WFSA-09-55	WFSA-09-65	WFSA-09-75	WFSA-09-90
Contact Bolt	ØBA	12.5	12.5	16.5	16.5	21.5	30
	BB	4	4	6	6	9	9
	BC	13	13	16	16	20	28
	ØEB	7.5	7.5	10	10	13.5	13.5
	EC	M10	M10	M12	M12	M16	M16
	ØED	5.5	6	6	6.5	9	10
	EE	10	10	11	13	16	16
	EF	2	2	2	2.5	3	3
Mounting Dimension	CA	M5	M5	M6	M6	M8	M10
	ØCB	2	2.5	2.5	3	5	5
	DA	3.5	3.5	3.5	3.5	4.5	4.5
	ØDB	14	14	14	14	18	18
	ØC+0.2	40	48	55	65	75	90
	D	39	40	46	57	73	89
Plunger Spring Housing Dimension	ØFA	5.8	5.8	6	6.4	10	10
	ØFB	8.5	8.5	10.2	10.2	14	14
	FC	9.5	10	12	16	21	44
	FD	6	6	6	8	12	12
	FE	2	2	2	2	2	2
	FF	7.5	19.5	20	29.5	30	38.5

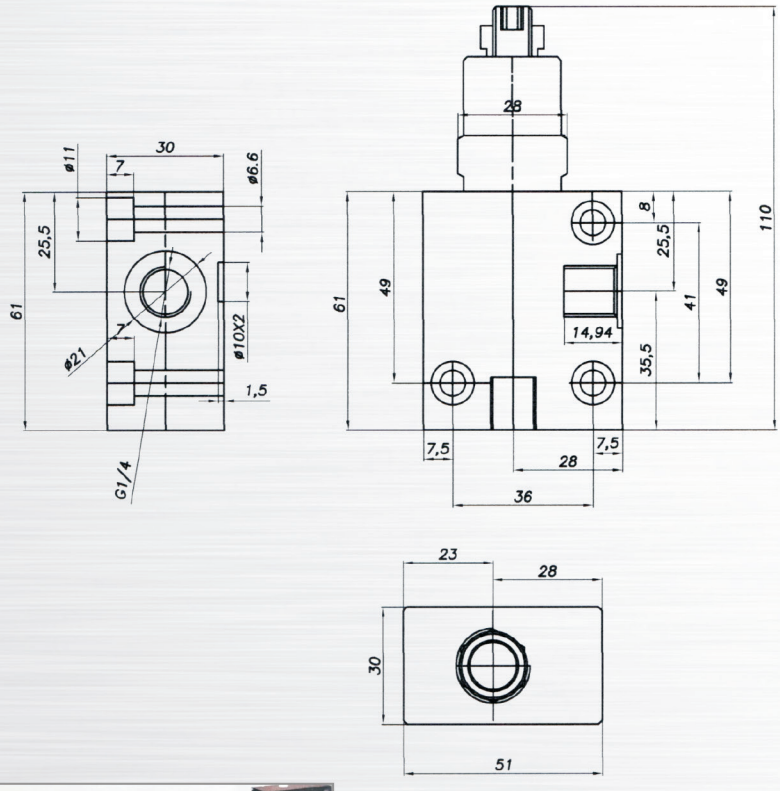


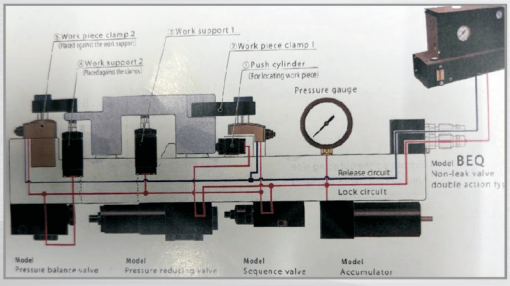
Sequence Valve (External)

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 & internal piping option.
- It can be used in the range of 1 MPa (minimum operating pressure)
  10 Mpa (maximum operating pressure)
  70 bar

External Dimension Drawing : External Sequence Valve Product Code : SV11 EX02





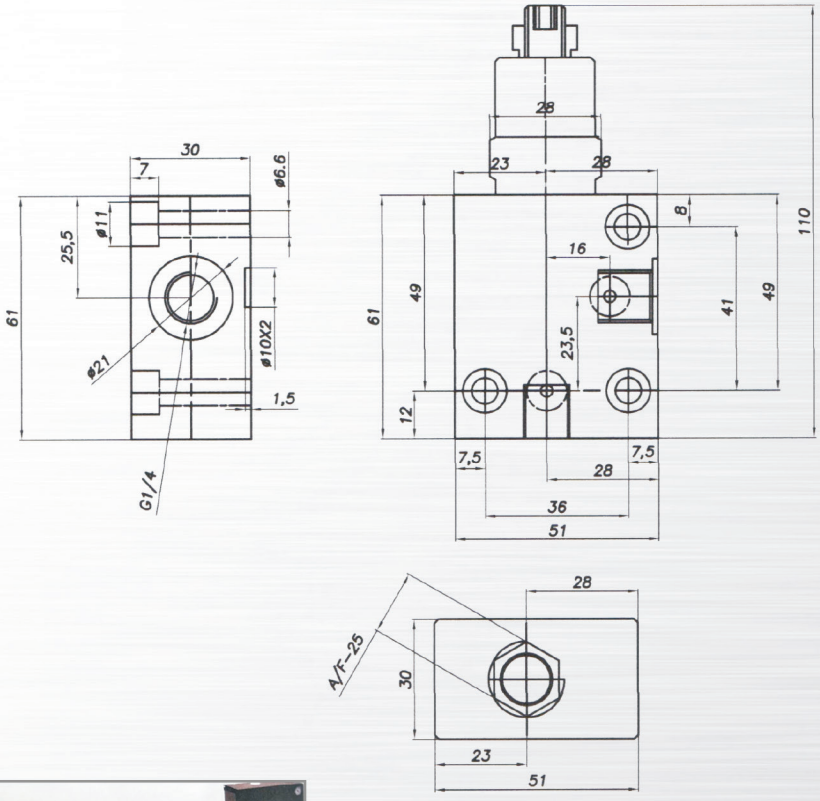


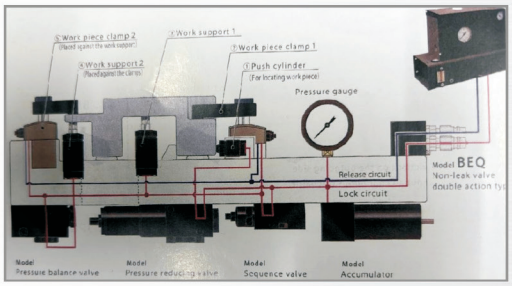
Sequence Valve (Internal)

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 & internal piping option.
- It can be used in the range of 1 MPa (minimum operating pressure)
  10 Mpa (maximum operating pressure)
  70 bar

External Dimension Drawing : Internal Sequence Valve Product Code : SV11 IN03







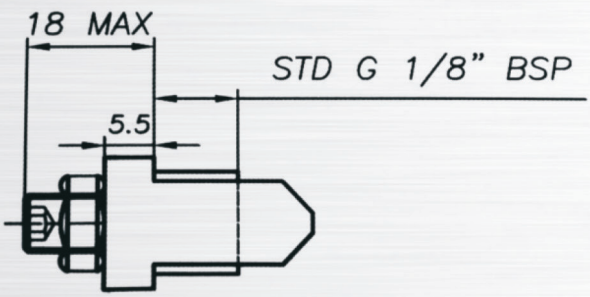
Flow Control Valve G181 & G142

Features:

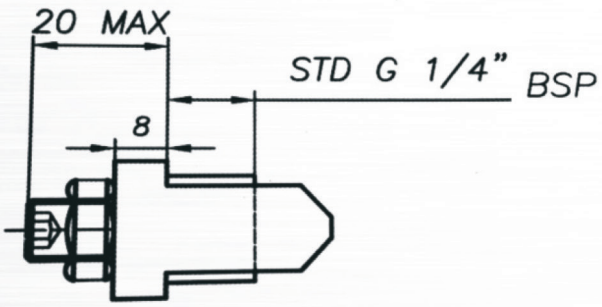
- This is a alloy steel body type with compact design.
- It can be directly mounted on to individual elements like cylinders or
- work supports.
  It is hydraulic & internal mounting.
- These valves do not required external speed control.
- It can be individual adjustment & very easy.
- It is available in G1/8, G1/4, sizes. & 101pm (maximum flow allowed)

External Dimension Drawing :

FC-10-181

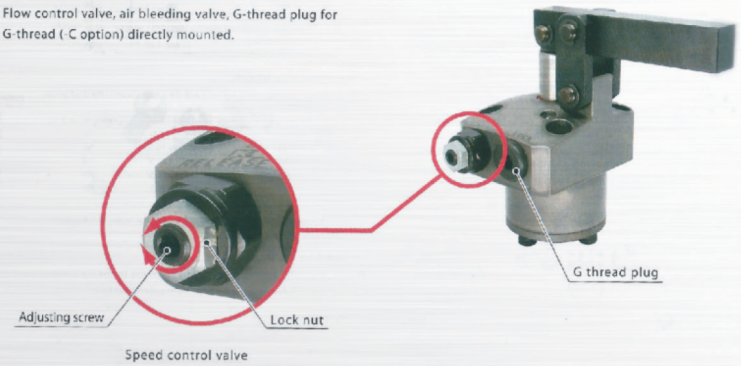


FC-10-142



- Directly mounted to clamps

Flow control valve, air bleeding valve, G-thread plug for G-thread (-C option) directly mounted.





Speed control valve — Model

Speed control valve — Model

G thread plug — Model

Model

Rotary Union - 2 Port

Low Rpm Hydraulic Rotary Union



Features:

- This is hydraulic 2port 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)

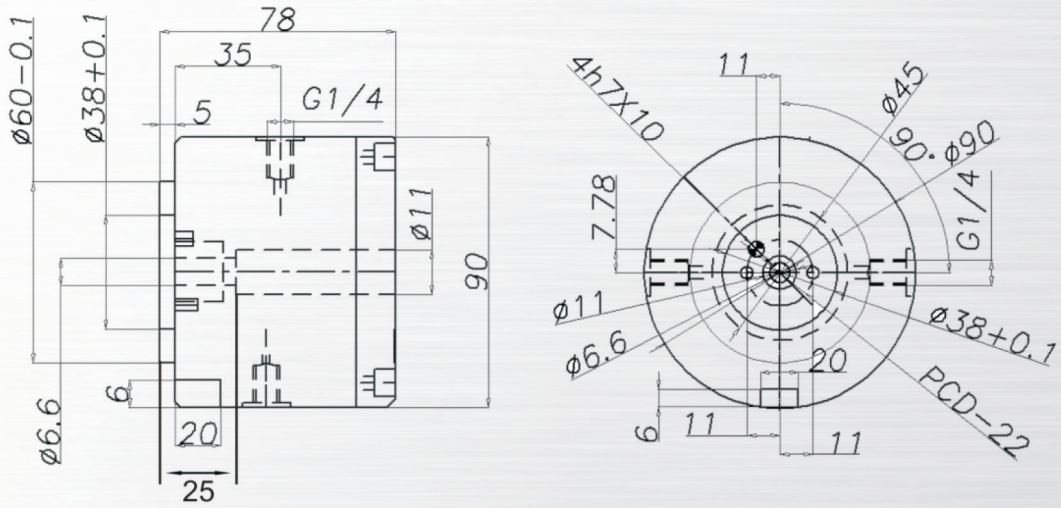
18lpm (maximum flow allowed)
15 mpa
70 bar

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.

External Dimension Drawing :

2 - Port Rotary (MTG) Details





Rotary Union - 4 Port

Low Rpm Hydraulic Rotary Union

Features:

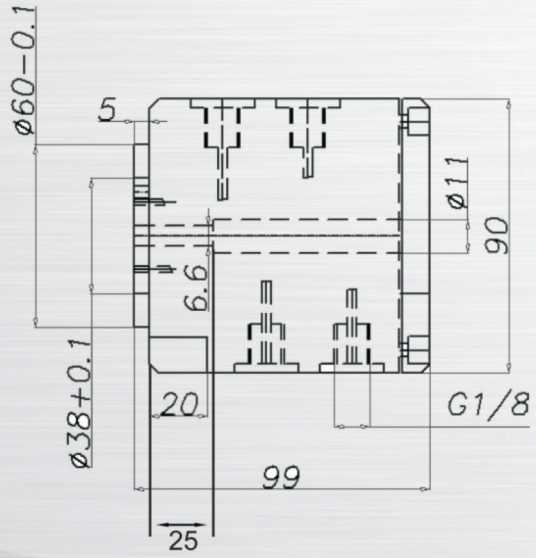
- This is hydraulic 4 port type with compact design.
- It is a G1/4 port housing with alloy steel body.
- These distributors can be mounted through single screw from back side.
- It can be used in the range of 1-30 MPa (maximum operating pressure)
  18lpm (maximum flow allowed)
  15 mpa
  70 bar

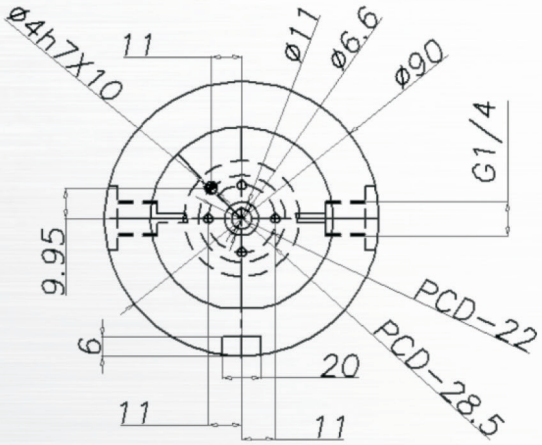
Applications:

- 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.

External Dimension Drawing :

4 - Port Rotary (MTG) Details





Rotary Union - 6 Port

Low Rpm Hydraulic Rotary Union



Features:

- This is hydraulic **6** 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)

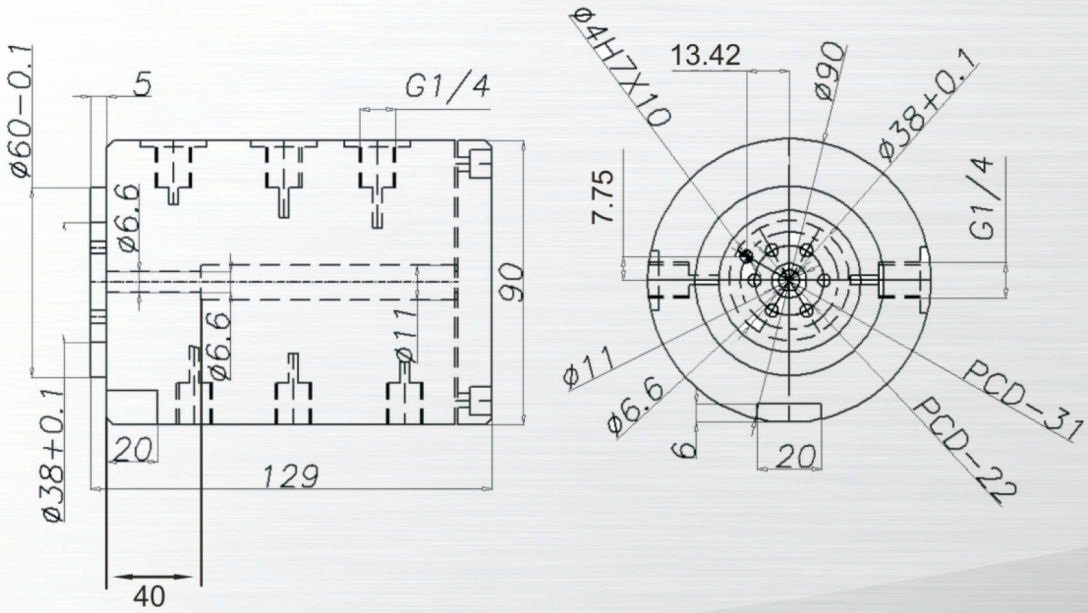
18lpm (maximum flow allowed)
15 mpa
70 bar N (pushing force)

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.

External Dimension Drawing :

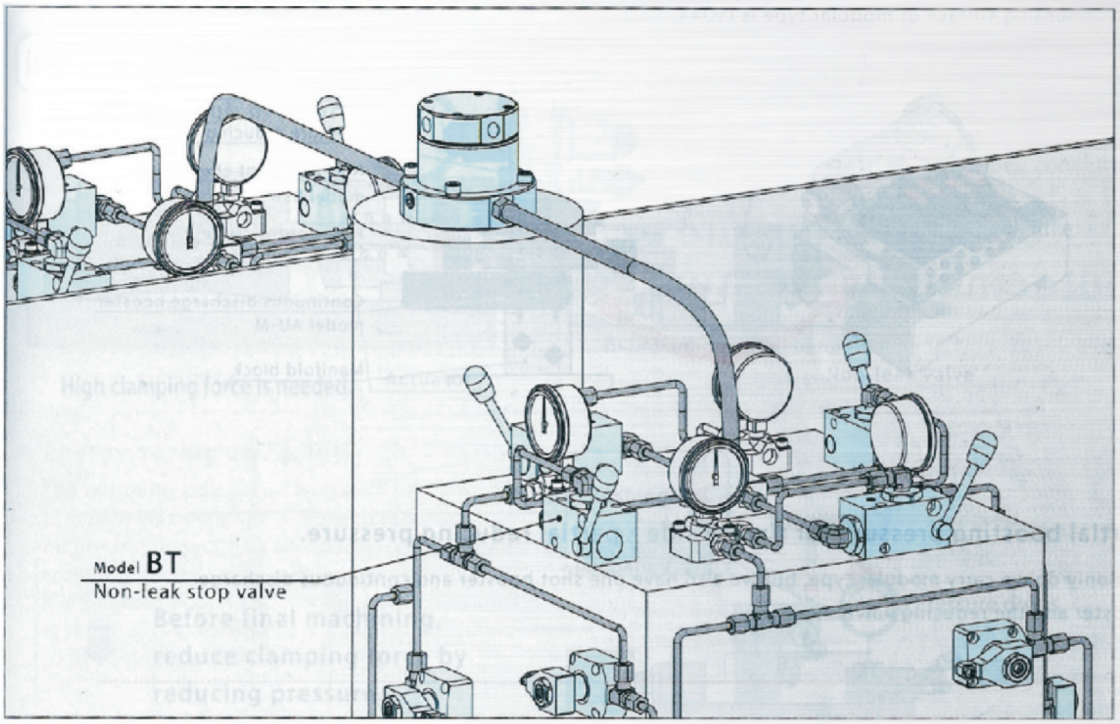
6 - Port Rotary (MTG) Details

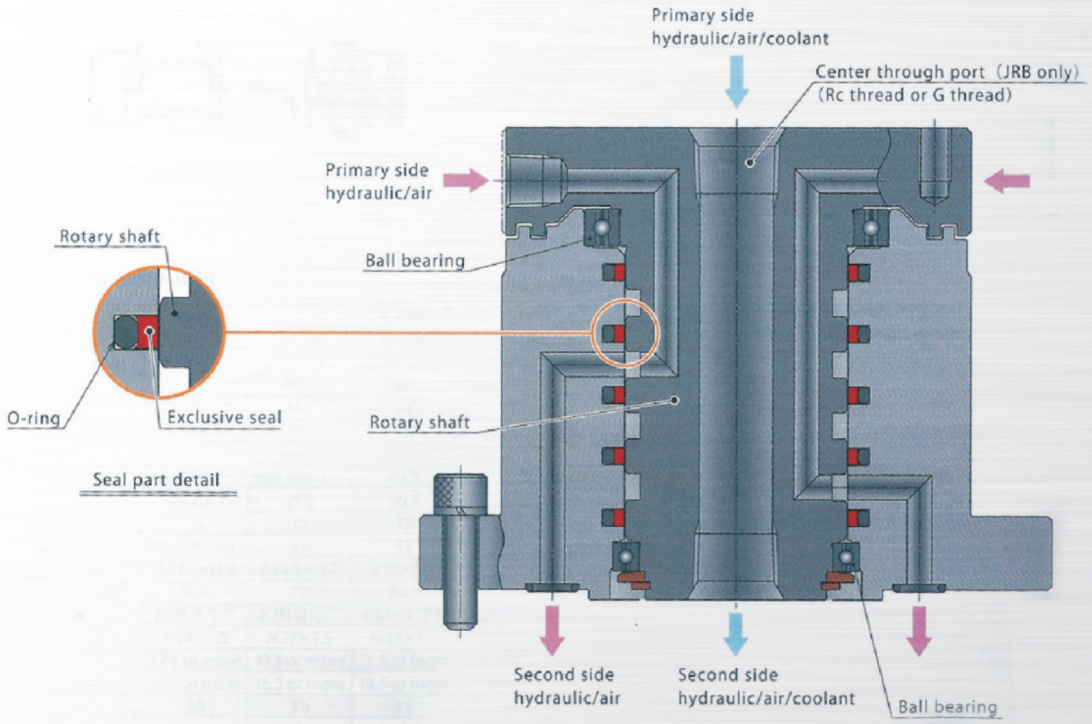


Customized Flange Type Rotary



Rotary Union Exampal





Product Code : CFTR-17

Customized Flange Type Rotary

Low Rpm Hydraulic Rotary Union



Features:

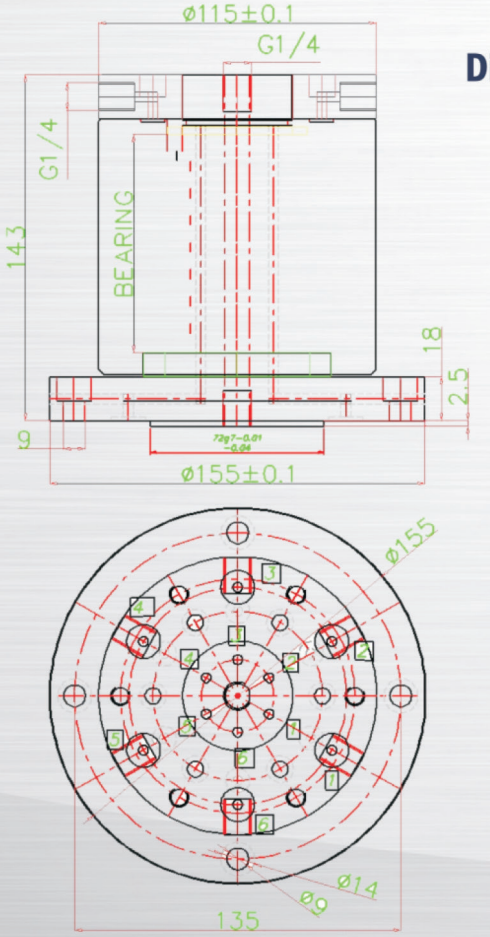
- This is hydraulic 4 port type with compact design.
- It is a G1/4 port housing with alloy steel body.
- These distributors can be mounted through single screw from back side.
- It can be used in the range of 1-30 MPa (maximum operating pressure)
  18lpm (maximum flow allowed)
  15 mpa
  70 bar

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.

External Dimension Drawing :

SPL (Customised Machine Rotary (Sample)



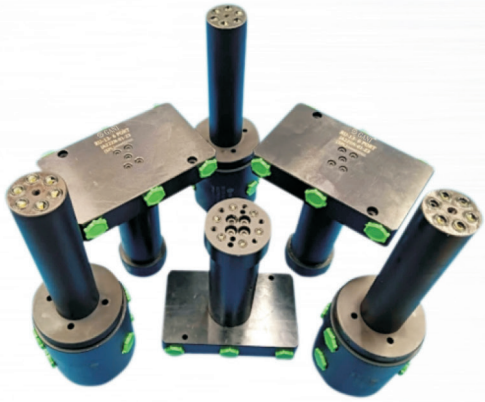
Different Types of Customized Rotary

Made to order : 2-Port to 12-Port



Customized Shaft Type Rotary

Low Rpm Hydraulic Rotary Union



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)
15 mpa
70 bar

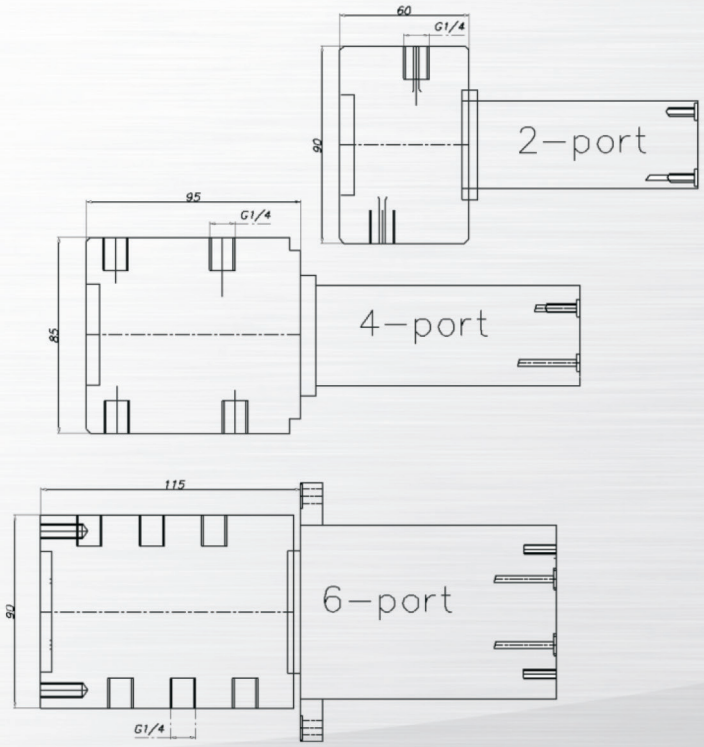
Applications:

- 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.

External Dimension Drawing :

Different Types of Customized Rotary

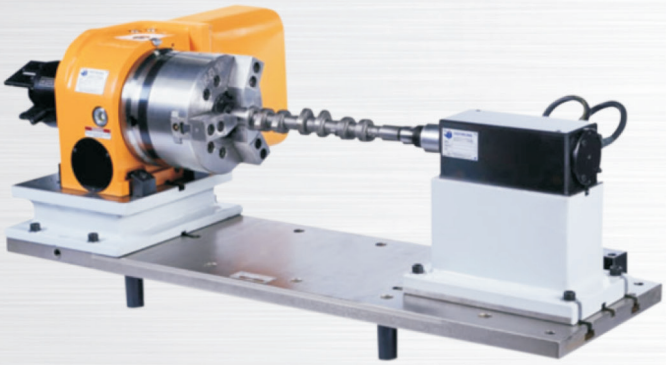
Made to order : 2-Port to 8-Port



Applications Sample shaft Type Rotary

Applications Sample

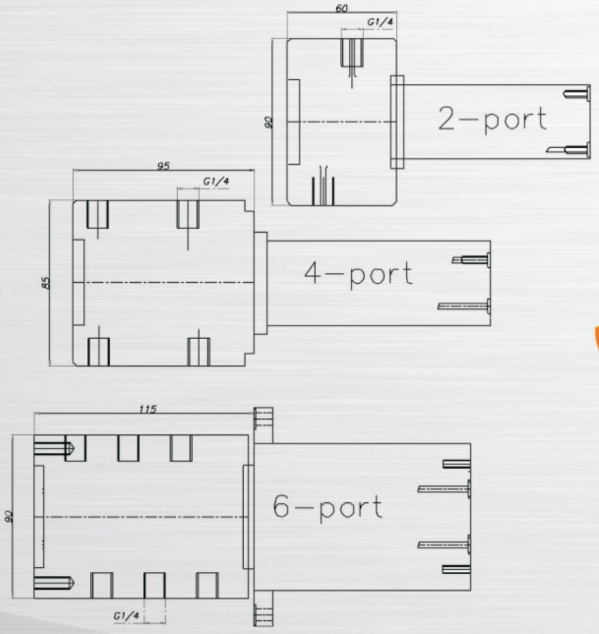
- It is used for clamp & de-clamp oil connections through rotating medium.
- Used for air & oil connections in parallel.
- It can be available in 2 port(min) to 8 port (max) design.





External Dimension Drawing :

Different Shaft Types of Customized Rotary



Application



High Speed Rotary

Product Code : HRU-200-18



Rotary

Rotary Joints Rotary Joints convey Fluid Under Pressure fro a stationary source to a rotating system or vice versa. They are also referenda Rotating unions, Rotary couplings, Swivel Joints etc.

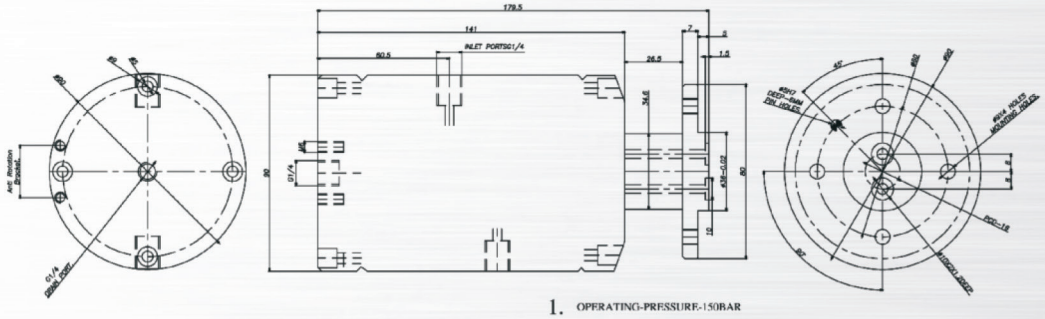
We also provide Customised solutions for individual applications based on the specific operating parameters demanded by each customer designs / application.

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

Application

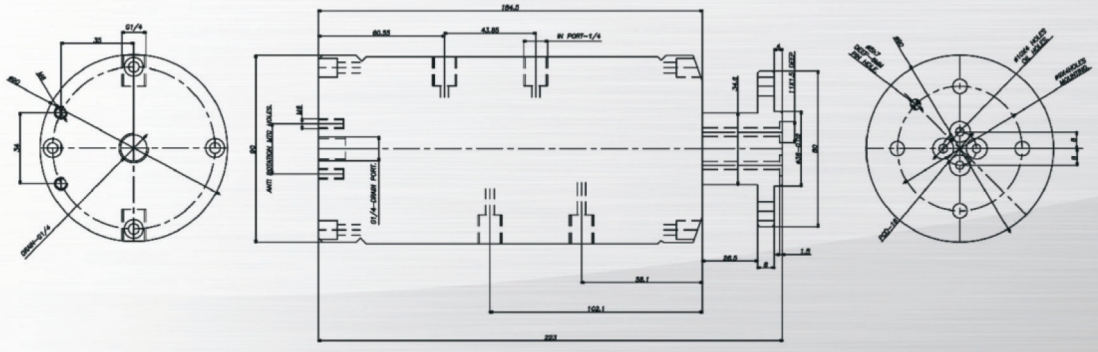
- Earth moving Equipments
- Material Handling Equipments
- Machine Tools
- Hydro Electric Turbines
- Special Purpose Machines
- Robotics & Automation
- Mobile Cranes
- Wagon Tipplers
- Test Rigs & Simulators
- Automation
- Mining Equipments.
- Available in 2 port & 4 port

External Dimension Drawing : _____ Model No. HRU 200-2P



1. OPERATING-PRESSURE-150BAR
2. RATED FLOW CAPACITY- 25LPM
3. OPERATING-PRESSURE-150BAR
4. Connection to the housing must be using flexible hoses.
5. used oring dia-8x2 2ns oring face sealing

External Dimension Drawing : _____ Model No. HRU 400-4P



Tie Rod Cylinder

Basic Cylinder

ME5- Head Mounting Rectangular



ME6- Head Mounting Rectangular



MT1- Head Mounting Integral Trunnion



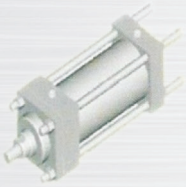
MT2- Cap Mounting Integral Trunnion



MT4-Mounting with Intermediate Fixed Trunnion



MX2- Cap Mounting Tie Rods Extended



MX3- Head Mounting Tie Rods Extended



MP1- Cap Mounting Fixed Clevis



MP3- Cap Mounting Fixed Eye

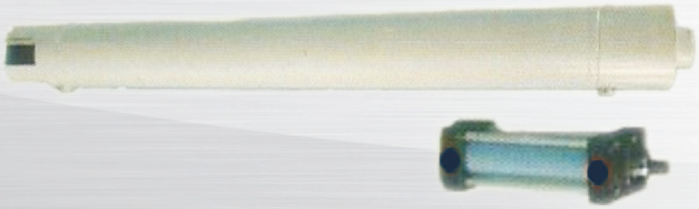


MS2- Mounting with side Lugs



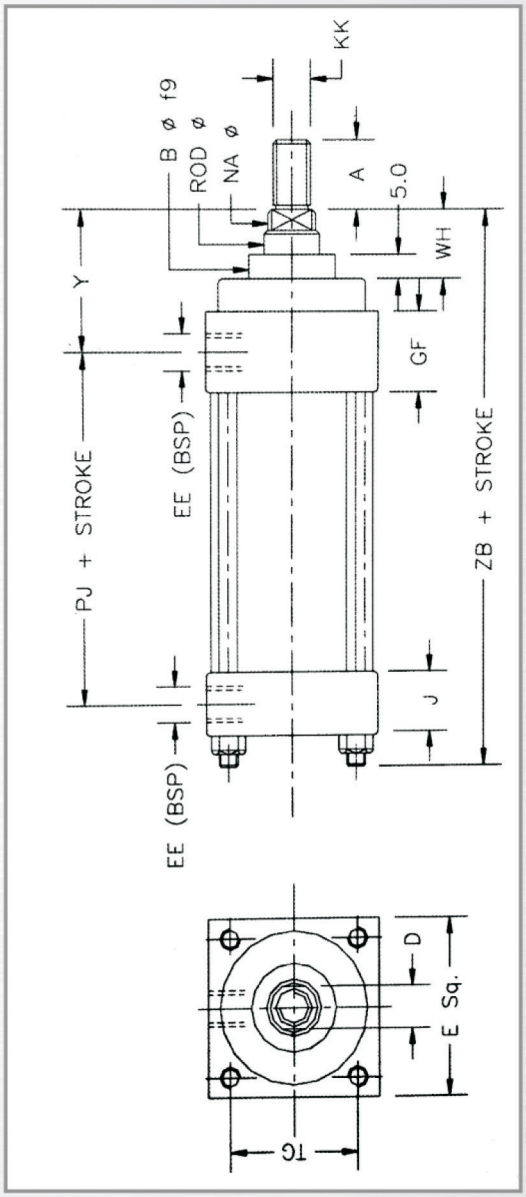
Features :

- This is hydraulic basic cylinder with cushioning from 63 mm bore onwards.
- It is used for bronze filled telfon 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)



Out line Dimension :





Dimension Table :

BORE	ROD		A		B		D		E	EE	GF	J	KK		NA		PJ	TG	WH	Y	ZB
25	12		14		24		10		40	1/4"	35	20	M10x1.25		11		53	28.3	15	50	121
40	18	28	18	28	30	42	15	22	63	3/8"	39	30	M14x1.5	M20x1.5	17	26	73	41.7	25	62	166
50	22	36	22	36	34	50	18	30	75	1/2"	40	32	M16x1.5	M27x2	21	34	74	52.3	25	67	176
63	28	45	28	45	42	60	22	36	90	1/2"	37	32	M20x1.5	M33x2	26	43	80	64.3	32	71	185
80	36	56	36	56	50	72	30	46	115	3/4"	44	38	M27x2	M42x2	34	54	93	82.7	31	77	212
100	45	70	45	63	60	88	36	60	130	3/4"	43	38	M33x2	M48x2	43	68	101	96.9	35	82	225

Tie Rod Cylinder Hydraulic



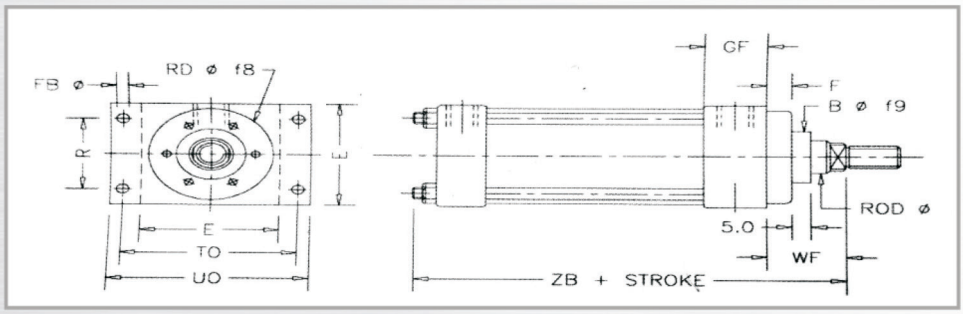
Features :

- This is hydraulic basic cylinder with cushioning from 63 mm bore onwards.
- It is used for bronze filled telfon 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 standarads.
- It can be used in the range of 0.5 MPa (minimum operating pressure)
  16MPa (maximum operating pressure)
  Ø63 (cushioning from high bore)

Applications :

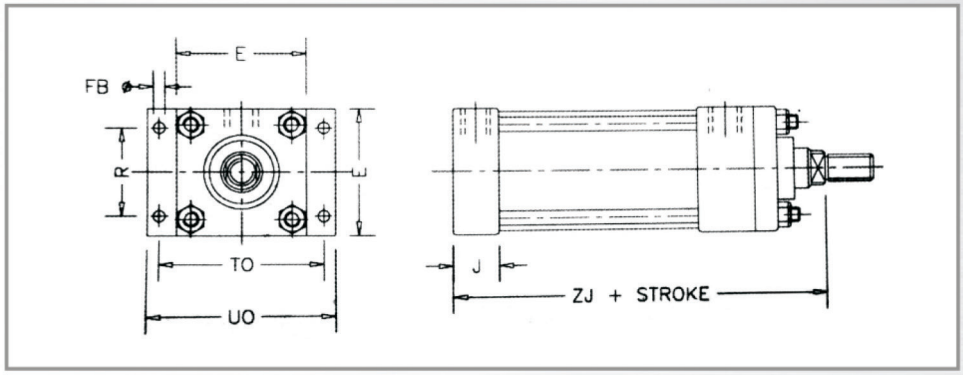
- It is used for clamp work pieces (push or pull method).
- Used for design (direct mounting on th application).
- These are used for various combination of endings & mounting.
- Used for international quality seals with hard chrome plated & ground piston.
- It can clamp a wide range of components (used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

ME5 - Head Mounting Rectangular :



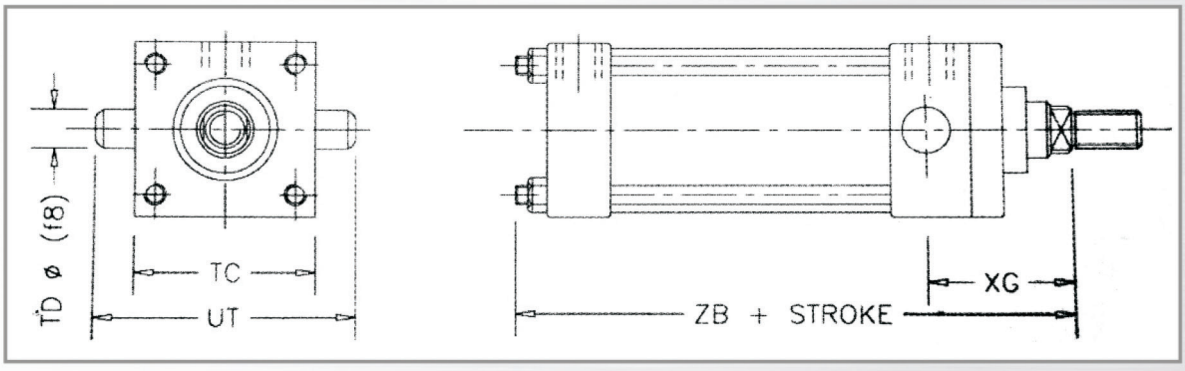
BORE	ROD		F	FB	R	RD		TO	UO	WF
25	12		10	5.5	27	38		51	65	25
40	18	28	10	11	41	62	62	87	110	35
50	22	36	16	14	52	74	74	105	130	41
63	28	45	16	14	65	75	88	117	145	48
80	36	56	20	18	83	82	105	149	180	51
100	45	70	22	18	97	92	125	162	200	57

ME6 - Cap Mounting Rectangular :



BORE	E	FB	J	R	TO	UO	ZJ
25	40	5.5	20	27	51	65	114
40	63	11	30	41	87	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

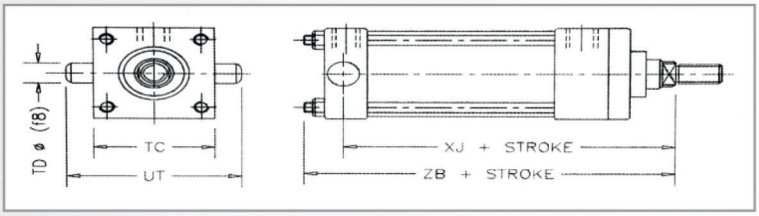
MT1 - Head Mounting integral Trunnion :



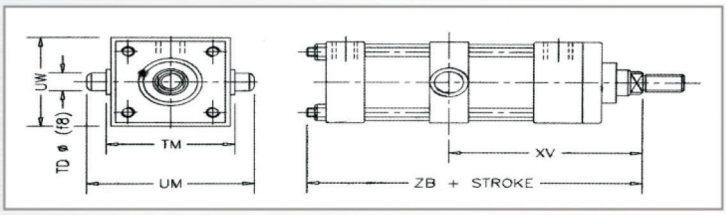
BORE	TC	TD	UT	XG	ZB
25	38	12	58	44	121
40	63	20	95	57	166
50	76	25	116	64	176
63	89	32	139	70	185
80	114	40	178	76	212
100	127	50	207	71	225

Tie Rod Cylinder

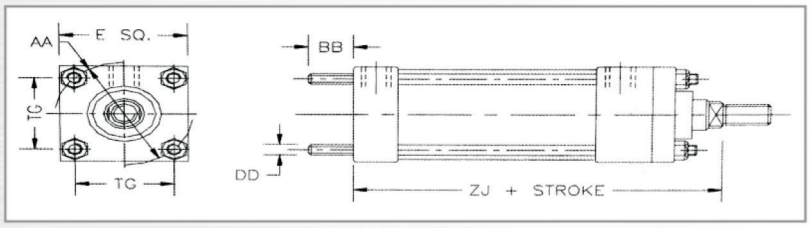
MT2 - Cap Mounting Integral Trunnion



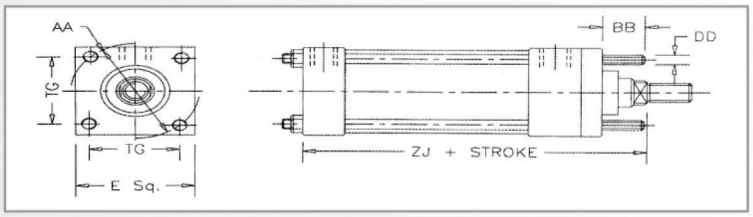
MT4 - Mounting with Intermediate Fixed Trunnion



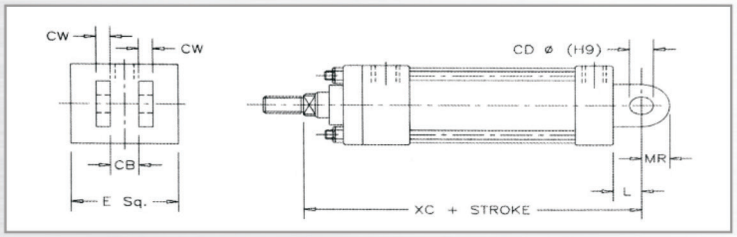
MX2- Cap Mounting Tie Rods Extended



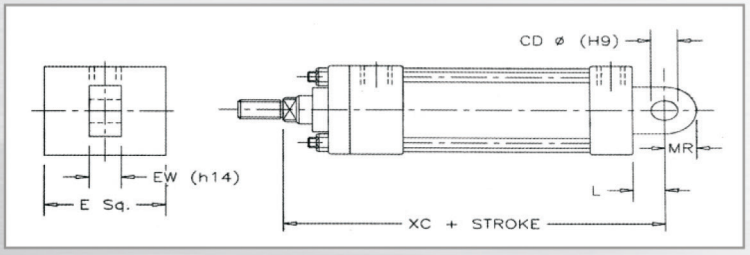
MX3- Head Mounting Tie Rods Extended



MP1- Cap Mounting Fixed Clevis



MP3- Cap Mounting Fixed Eye



Dimension Table :

BORE	TC	TD	UT	XJ	ZB
25	38	12	58	101	121
40	63	20	95	134	166
50	76	25	116	140	176
63	89	32	139	149	185
80	114	40	178	168	212
100	127	50	207	187	225

BORE	TD	TM	UM	UW	XV	ZB
25	12	48	68	63	To be specified	121
40	20	76	108	92		166
50	25	89	129	112		176
63	32	100	150	126		185
80	40	127	191	160		212
100	50	140	220	180		225

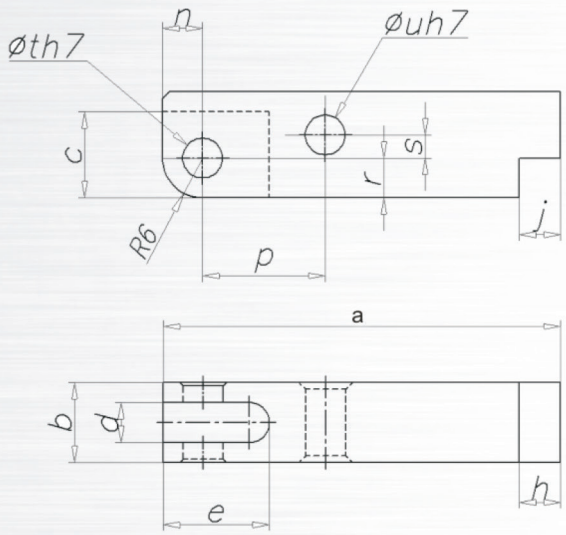
BORE	AA	BB	DD	E	TG	ZJ
25	40	19	M 5x0.8	40	28.3	114
40	59	35	M 8x1.0	63	41.7	153
50	74	46	M 12x1.25	75	52.3	159
63	91	46	M 12x1.25	90	64.3	168
80	117	59	M 16x1.5	115	82.7	190
100	137	59	M 16x1.5	130	96.9	203

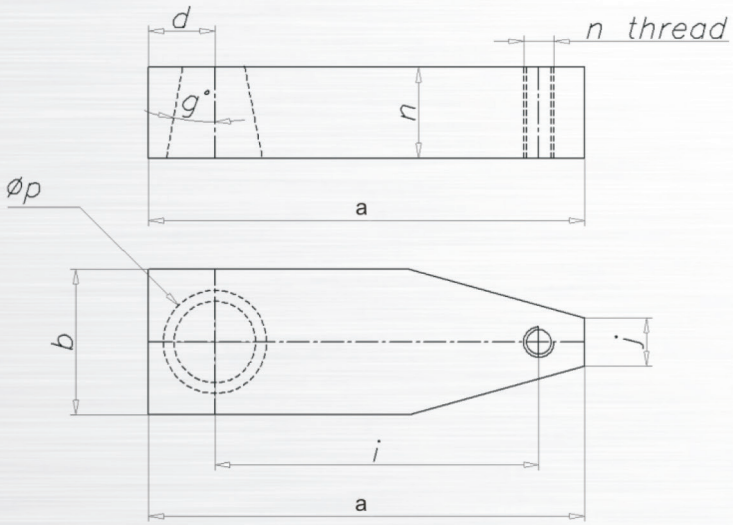
BORE	AA	BB	DD	E	TG	ZJ
25	40	19	M 5X0.8	40	28.3	114
40	59	35	M 8X1.0	63	41.7	153
50	74	46	M 12X1.25	75	52.3	159
63	91	46	M 12X1.25	90	64.3	168
80	117	59	M 16X1.5	115	82.7	190
100	137	59	M 16X1.5	130	96.9	203

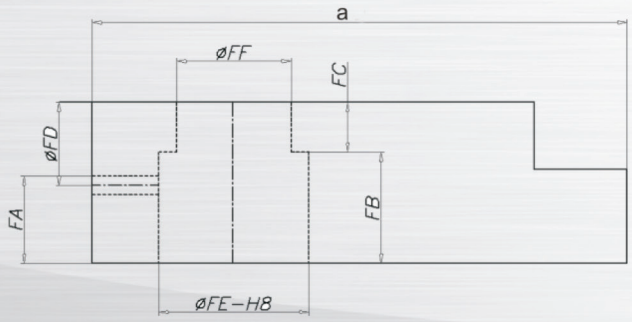
BORE	A		CB	CD	CW	E	L	MR	XC
25	14		12	10	6	40	13	12	127
40	18	28	20	14	10	63	19	17	172
50	22	36	30	20	15	75	32	29	191
63	28	45	30	20	15	90	32	29	200
80	36	56	40	28	20	115	39	34	229
100	45	63	50	36	25	130	54	50	257

BORE	A		CD	E	EW	L	MR	XC
25	14		10	40	12	13	12	127
40	18	28	14	63	20	19	17	172
50	22	36	20	75	30	32	29	191
63	28	45	20	90	30	32	29	200
80	36	56	28	115	40	39	34	229
100	45	63	36	130	50	54	50	257

Standered Clamp Arm







Clamp Arm table Standard: FOR TC01/TSAC-01

Model No.									
	C	TC01-360	TC01-400	TC01-480	TC01-550	TC01-650	TC01-750	TC01-900	TC01-1050
	R	TC01-361	TC01-401	TC01-481	TC01-551	TC01-651	TC01-751	TC01-901	TC01-1051
	L	TC01-362	TC01-402	TC01-482	TC01-552	TC01-652	TC01-752	TC01-902	TC01-1052
a		60	70	80	90	100	110	150	200
b		10	12	12	16	19	22	25	32
c		13	14	16	20	25	32	38	45
d		5	6	6	8	10	11	13	16
e		13	14.5	16	17	22	26	31	36
g		10	12	13	17	18	22	26	31
h		10.5	13	13	17	22	25	31	38
j		3	3	3	4	5	5	6	6
n		4.5	5.5	6	6	8	10	11	13
p		14.5	16	18.5	21	24.5	30	36	44
r		4.5	5.5	6	6	8	10	11	13
s		2.5	2.5	3.5	6	7.5	9.5	13	16
Øt		5	6	6	6	8	10	12	15
Øu		5	6	6	8	10	12	15	18

Clamp arm table without sleeve Standard: FOR SC02-SB03

Model	90RH	SC02- 361 R	SC02- 401 R	SC02- 481 R	SC02- 551 R	SC02- 651 R	SC02- 751 R	SC02- 901 R	SC02- 1051 R
	90LH	SC02- 362 L	SC02- 402 L	SC02- 482 L	SC02- 552 L	SC02- 652 L	SC02- 752 L	SC02- 902 L	SC02- 1052 L
a		50	55	65	75	90	100	120	150
b		26	28	35	38	50	58	75	90
c		11	13	16	22	22	28	34	40
d		13	14	17.5	19	25	29	38	45
g		3	3	3	3	3	5.5	5.5	5.5
l		32	36.5	42	50	56.5	65	75	90
j		10	12	12	17	19	22	27	32
n		M5	M6	M6	M8	M8	M10	M12	M16
Øp		15	18	22	25	30	36	45	55

Clamp arm table with sleeve Standard: FOR SC02-SB03

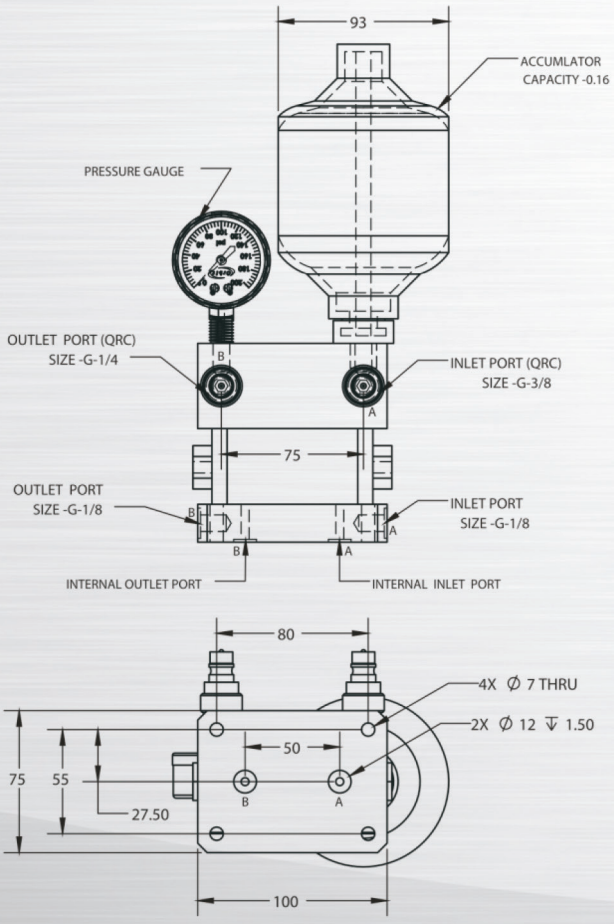
Model	90RH	SB03- 361 R	SB03- 401 R	SB03- 481 R	SB03- 551 R	SB03- 651 R	SB03- 751 R	SB03- 901 R	SB03- 1051 R
	90LH	SB03- 362 L	SB03- 402 L	SB03- 482 L	SB03- 552 L	SB03- 652 L	SB03- 752 L	SB03- 902 L	SB03- 1052 L
FA		12	16	19	25	25	32	38	45
FB		9.5	13	15	21	21	27	33	39
FC		2.5	3	4	4	4	5	5	6
FD		4.3	5.3	6.3	6.3	7.5	8.5	9.5	10.5
ØFE		17	20	25	28	34	40	49	60
FF		13.9	16.7	20.6	23	28	32.9	14.8	51.2
FG		4	5	5	6	6	8	8	8

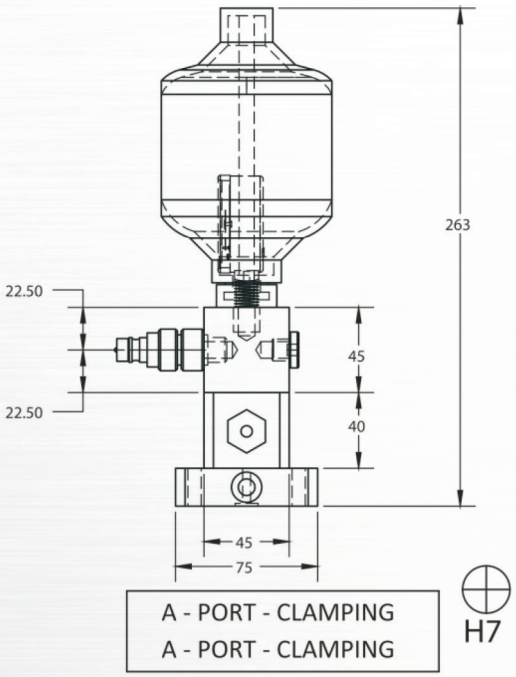
Product Code : DCU-21

D. Coupler Unit





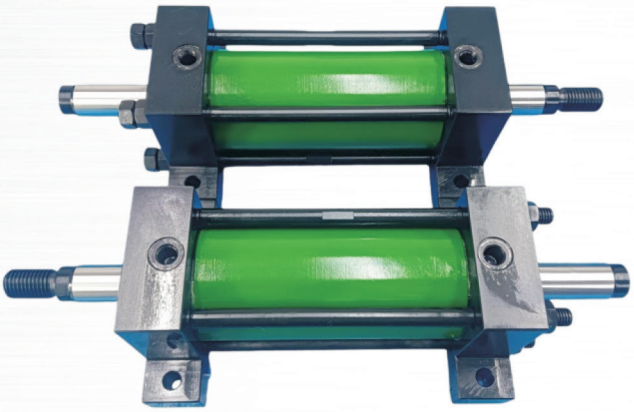


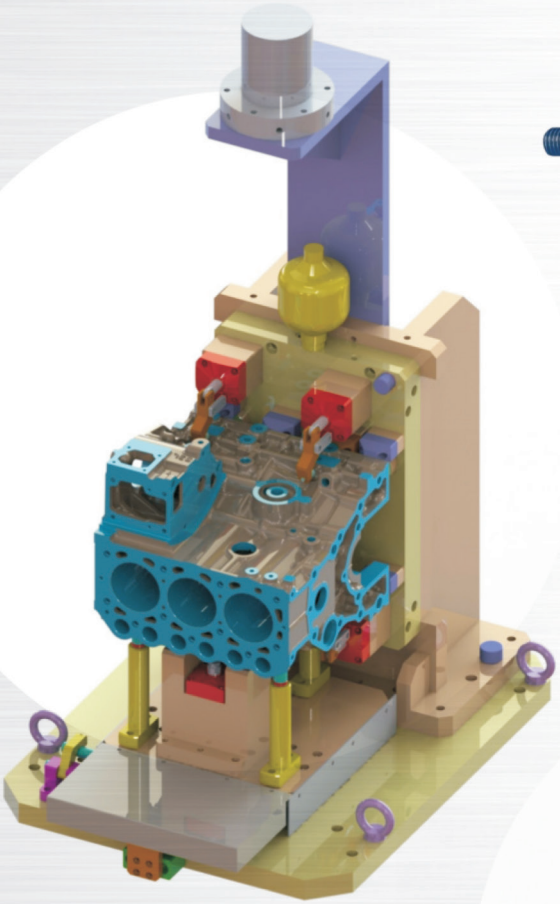


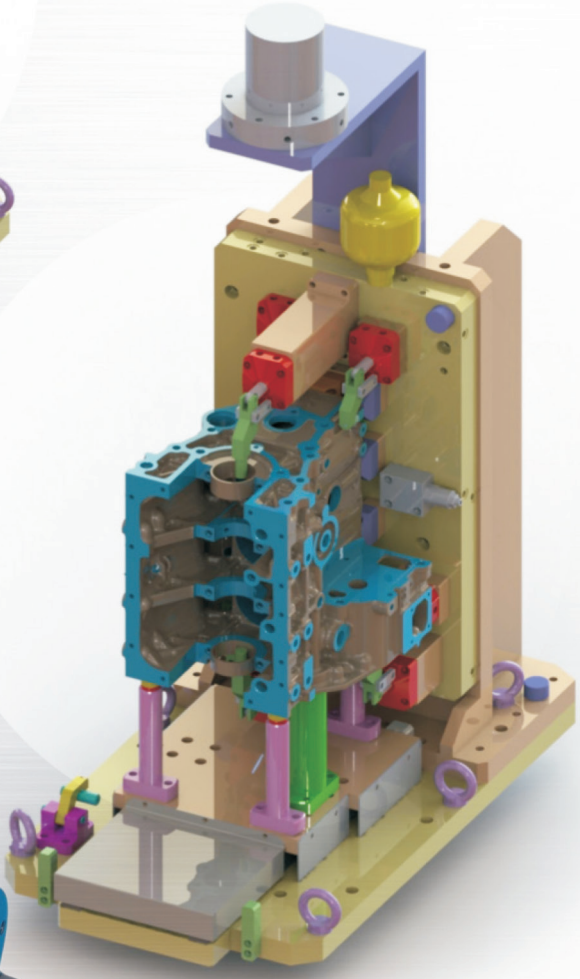
Sample


GANI
RU-13-6 PORT
AU38C-08-24
GANI
BC04-25-16-F
AU20A4C-08-24
GANI
TC01-752-L
1143-12-21
DC C
GANI
SC02-482-L
431-10-23
GANI
RU-13-4 PORT
698-03-22
(SL-100MM)
(SPL)
GANI
BC04-25-16-F
GANI
BC04-16-16-F
GANI
SV11-IN-03
643-02-22
GANI
RCL-18
258-03-22

Applications



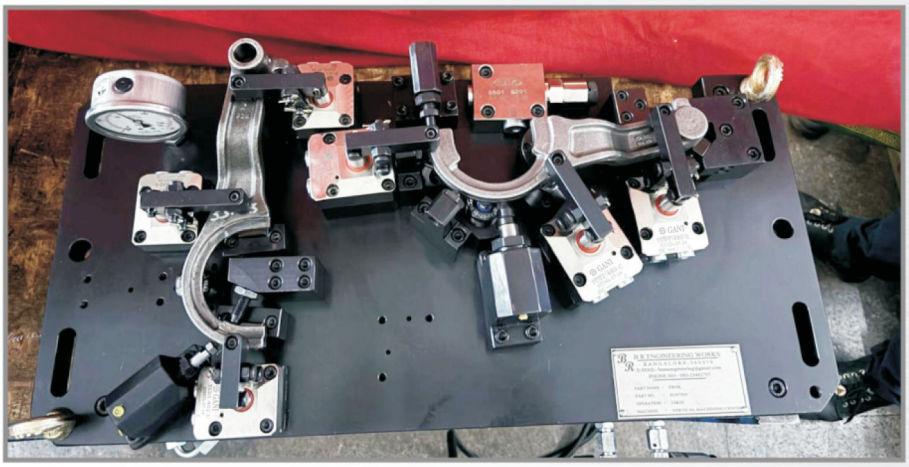








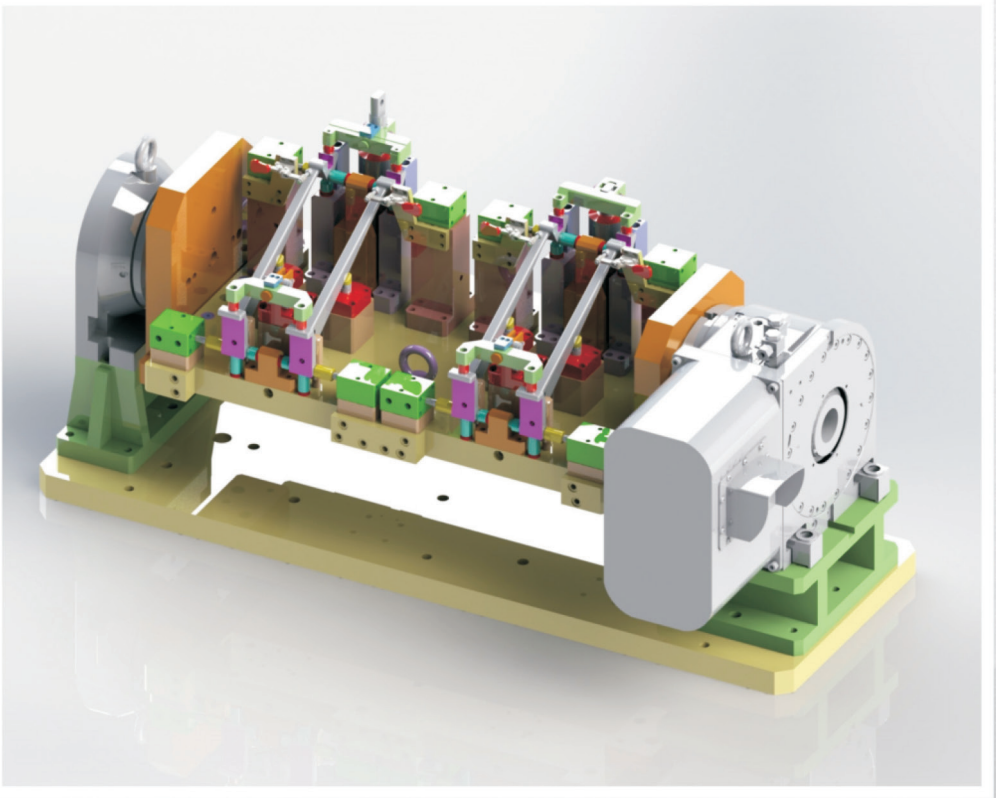
Applications











Warranty :

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

Warranty scope.
Defects or failures caudes by the following are not covered.

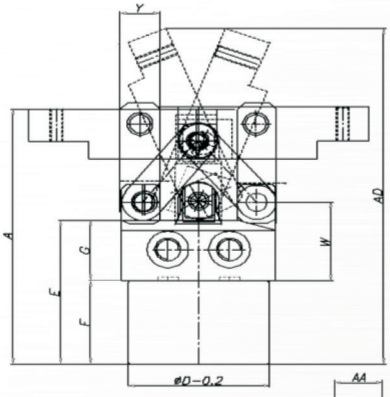
1. Proper maintenance & inspections were not performed.
2. The product was used in an imperfect state at the decision of the user.
3. The user did not use or handle the product properly. (including damages caused by a third party)
4. The cause was due to some factor other than our product.
5. The product 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, ceratin electrical components, etc.)

Double Hinge Toggle Clamp Cylinder

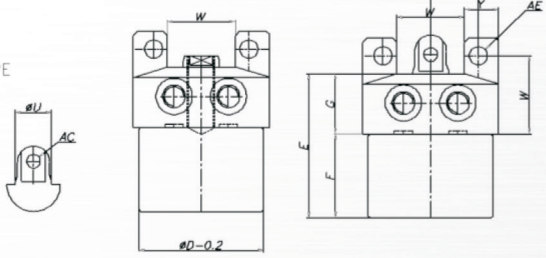
Standard Type Range - 55/65/75/95/105
Made to order



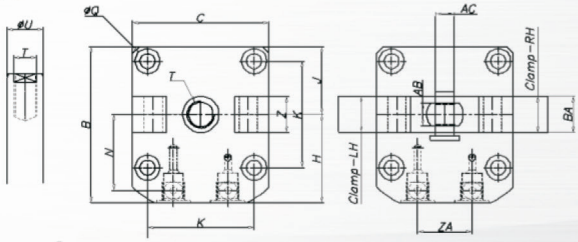




STD−TYPE



FIMALE−TYPE



Model No.	C	TC01-550-C	TC01-650-C	TC01-750-C	TC01-900-C	TC01-1050-C
	RH	TC01-551-R	TC01-651-R	TC01-751-R	TC01-901-R	TC01-1051-R
	LH	TC01-552-L	TC01-652-L	TC01-752-L	TC01-902-L	TC01-1052-L
BORE DIA		Ø35	Ø45	Ø55	Ø65	Ø80
A		112.5	129.5	153	182	211
B		69	81	94.5	111	127
C		60	70	85	100	120
ØD		55	65	75	90	105
E		66	74	87	101	117
F		37	43.5	49	61	65
G		28	30	38	40	50
H		39	46	52	61	67
J		30	35	42.5	50	60
K		47	55	63	75	88
L		88	106	116	136	152
M		13.50	13	19.50	20	22.50
N		33.5	39.5	45	52.5	60
P		3	3	3	3	4
Q		11	11	14	17.5	20
ØR		6.8	6.8	9	11	14
S		19	20	22	22	26
T		37.5	45	55	65.5	77
U		16	18	22	28	35.5
V		31.5	37	45	52	62
W		35.5	39	48	52.5	64
X		30	35.5	43.5	52.5	64
Y		16	19	25	28	32
Z		28	37	40	49	64
ZA		24	30	32	37	45
Hyd. Port		G1/8"	G1/4"	G1/4"	G1/4"	G3/8"
AA		21	24.5	30	36	44
AB		8	10	11	13	16
ØAC		6	8	10	12	15
ØAE		8	10	12	15	18
AD		101.9	111.4	130.8	146.5	173.6
AF		53.5	59	72	81	98
AG		20.2	20.5	21.4	22.4	23.1
AH		4.7	4.3	4.5	5	4.1
BA		16	19	22	25	32
BB		20	25	32	38	45
BC		29	32	37.5	41.5	21
T		M10	M12	M16	M20	M20

Specification Table :

Lock Cyl. Area (cm)		9.62	15.9	23.7	33.2	44.2
Full Stroke mm		26	29.5	35	41	49
Locking Stroke mm		23	26.5	32	38	46
Extra Stroke mm		3	3	3	3	3
Cyl. volume	Lock cm3	22.13	42.14	75.85	126.2	203.35
	Release cm3	17.5	35.4	63.8	102.6	157.7
Max operating Pressure (Mpa)		15				
Min operating Pressure (Mpa)		150				
Design Pressure (Mpa)		10.5				
Temperature (0C)		0-70				
Weight (Kg)		1.80	2.50	4.20	6.50	10.20

Machining Dimension Table For Mounting Cylinder :

Model No.	C	TC01-550-C	TC01-650-C	TC01-750-C	TC01-900-C	TC01-1050-C
	RH	TC01-551-R	TC01-651-R	TC01-751-R	TC01-901-R	TC01-1051-R
	LH	TC01-552-L	TC01-652-L	TC01-752-L	TC01-902-L	TC01-1052-L
A		47	55	63	75	88
B		M6	M6	M8	M10	M12
C+0.2		55	65	75	90	105
D		38	44.5	48	62	66
E		33.5	39.5	45	52.5	60
F		24	30	32	37	45
G		3	3	3	3	4

Clamping Cylinders







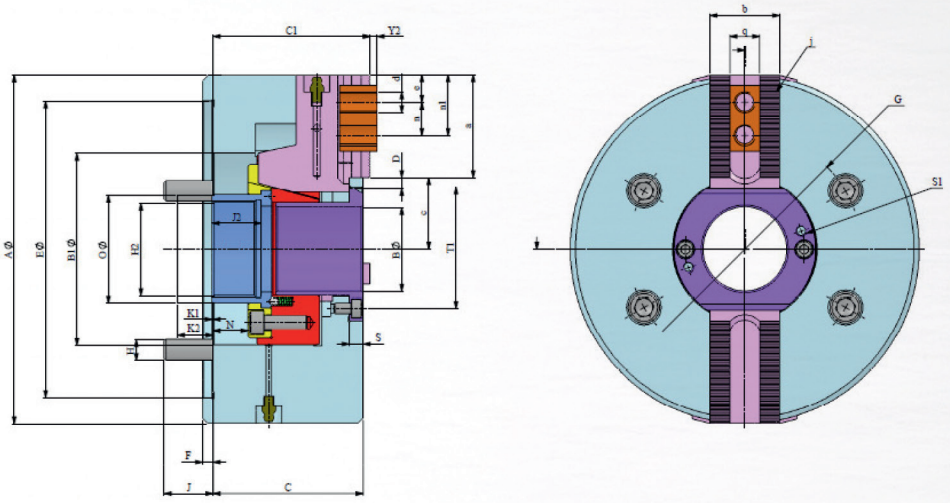






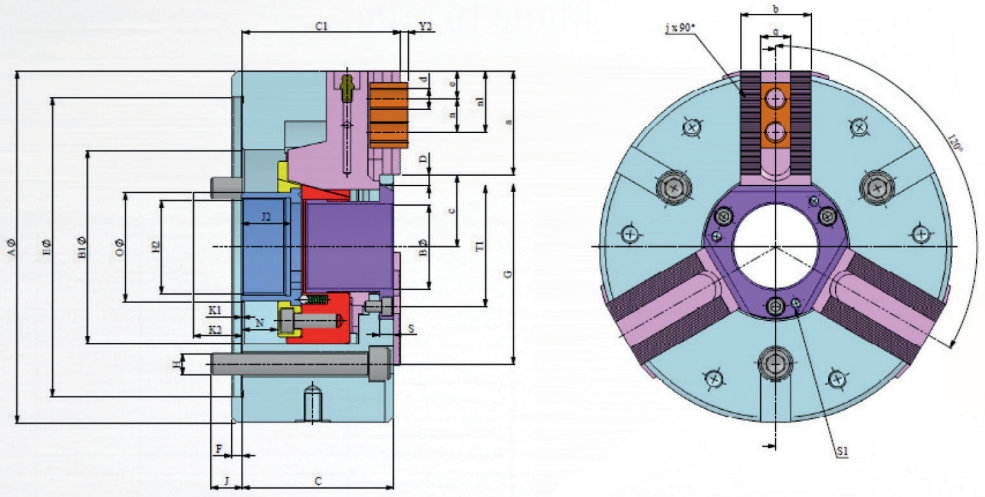


Standard Power Chuck



Dimensions / Performance data 2B - PH									
Type 2 PH / Chuck Size			135	165	200	250	315	400	500
Dimensions									
Outer diameter	AØ	mm	135	165	200	250	315	400	500
Bore	B1Ø $^{+0.1}$	mm	81	90	110	132	155	210	250
Mounting recess	EØ H6	mm	110	140	170	220	300	380	380
Actuator-Ø	F	mm							
Mounting bolts	H		M10	M10	M12	M16	M20	M24	M24
Thread mounting	H2		M36 x 1.5	M42 x 1.5	M55 x 2	M72 x 2	M92 x 2	M133 x 2	M172 x 3
Puller thread protective sleeve	S		M4	M5	M6	M6	M6	M8	M8
Chuck width	C	mm	56.2	77	85	88	85	120	120
Chuck width	C1	mm	58	82	89	92	92	125	125.5
Thread length of mounting bolts	J	mm	15	14	18	24	31	31	36
Thread length of actuator	J2	mm	17	27	28	28	28	28	28
Basejaw protr.over chuck face	S	mm	6	8	8	8	8	12	12
Actuator stroke	N	mm	10	15	20	20	20	30	30
Pitch circle - Ø of mounting bolts	G $^{\pm 0.1}$	mm	82.6	104.8	133.4	171.4	235	330.2	330.2
Pitch circle - Ø of protective sleeve	T1 $^{\pm 0.1}$	mm	44	54	68	86	104	145	185
Jaw stroke	D	mm	2.7	3.15	5.3	5.3	5.3	8	8
Position of Jaw min	c	mm	25.15	28.65	35.7	43.7	54.2	74	92
Position of Jaw max	c	mm	27.85	31.8	41	49	59.5	82	100
Jaw mounting bolts	d		M8	M10	M12	M16	M16	M20	M20
Distance of Jaw mounting bolts	e	mm	8	9	9	10	10	15	15
Distance of Jaw mounting bolts	n1	mm	30	38.5	50	60	85	103	130
Minimum distance	n	mm	14	19	19	25	25	34	34
Distance T-nut and serration	Y2	mm	2	3	3.5	3.5	3.5	3.5	3.5
Length of serration	a	mm	41	50.7	59	76	98	118	150
Jaw width	b	mm	23	35	40	45	50	60	60
Slot with imperial	q H7	mm	10	12	17	21	21	25.5	25.5
Slot with metric	q H7	mm	10	12	17	21	21	25.5	25.5
Pitch of serration / Imperial	j		1/16" x 90°	1/16" x 90°	1/16" x 90°	1/16" x 90°	1/16" x 90°	3/32" x 90°	3/32" x 90°
Pitch of serration / Metric	j		1.5 x 60°	1.5 x 60°	1.5 x 60°	1.5 x 60°	1.5 x 60°	1.5 x 60°	1.5 x 60°
Performance data									
Max. Drawbar pull		kgf	1133	1333	2660	4000	4000	6000	6000
Max. Gripping force		kgf	2400	3600	5330	8000	8660	13333	14000
Rpm max		1/min	7000	5000	5000	4000	3200	2500	2000
Weight		kg	10	13.7	16	26	38	94	132
Flywheel effect GD2		kpm2	0.15	0.2	0.38	0.8	2.6	8.4	24.8

Standard Power Chuck



Dimensions / Performance data 3B - PH									
Type 3 PH / Chuck Size			135	165	200	250	315	400	500
Dimensions									
Outer diameter	AØ	mm	135	165	200	250	315	400	500
Bore	B1Ø $^{+0.1}$	mm	81	90	110	132	155	210	250
Mounting recess	EØ H6	mm	110	140	170	220	300	380	380
Actuator-Ø	F	mm							
Mounting bolts	H		M10	M10	M12	M16	M20	M24	M24
Thread mounting	H2		M36 x 1.5	M42 x 1.5	M55 x 2	M72 x 2	M92 x 2	M133 x 2	M172 x 3
Puller thread protective sleeve	S		M4	M5	M6	M6	M6	M8	M8
Chuck width	C	mm	56.2	77	85	88	85	120	120
Chuck width	C1	mm	58	82	89	92	92	125	125.5
Thread length of mounting bolts	J	mm	15	14	18	24	31	31	36
Thread length of actuator	J2	mm	17	27	28	28	28	28	28
Basejaw protr.over chuck face	S	mm	6	8	8	8	8	12	12
Actuator stroke	N	mm	10	15	20	20	20	30	30
Pitch circle - Ø of mounting bolts	G $^{\pm 0.1}$	mm	82.6	104.8	133.4	171.4	235	330.2	330.2
Pitch circle - Ø of protective sleeve	T1 $^{\pm 0.1}$	mm	44	54	68	86	104	145	185
Jaw stroke	D	mm	2.7	3.15	5.3	5.3	5.3	8	8
Position of Jaw min	c	mm	25.15	28.65	35.7	43.7	54.2	74	92
Position of Jaw max	c	mm	27.85	31.8	41	49	59.5	82	100
Jaw mounting bolts	d		M8	M10	M12	M16	M16	M20	M20
Distance of Jaw mounting bolts	e	mm	8	9	9	10	10	15	15
Distance of Jaw mounting bolts	n1	mm	30	38.5	50	60	85	103	130
Minimum distance	n	mm	14	19	19	25	25	34	34
Distance T-nut and serration	Y2	mm	2	3	3.5	3.5	3.5	3.5	3.5
Length of serration	a	mm	41	50.7	59	76	98	118	150
Jaw breath									
Jaw width	b	mm	23	35	40	45	50	60	60
Slot with imperial	q H7	mm	10	12	17	21	21	25.5	25.5
Slot with metric	q H7	mm	10	12	17	21	21	25.5	25.5
Pitch of serration/Imperial	j		1/16" x 90°	1/16" x 90°	1/16" x 90°	1/16" x 90°	1/16" x 90°	3/32" x 90°	3/32" x 90°
Pitch of serration/Metric	j		1.5 x 60°	1.5 x 60°	1.5 x 60°	1.5 x 60°	1.5 x 60°	1.5 x 60°	1.5 x 60°
Performance data									
External Clamping Max / Min			135 / 25	165 / 32	200 / 25	250 / 28	315 / 42	400 / 45	500 / 74
Internal Clamping Max / Min			135 / 50	165 / 62	200 / 70	250 / 76	315 / 84	400 / 105	500 / 138
Max. Drawbar pull		kgf	1700	2000	4000	6000	6000	9000	9000
Max. Gripping force		kgf	3600	5400	8000	12000	13000	20000	21000
Rpm max		1/min	7000	5000	5000	4000	3200	2500	2000
Weight		kg	10	13.7	16	26	38	94	132
Flywheel effect GD2		kpm2	0.15	0.2	0.38	0.8	2.6	8.4	24.8
Max top jaw weight		kg	1.25	1.5	1.7	3.5	4	7.5	7.5

Power Chuck & Pneumatic Chuck



















High Speed Rotary:

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 knowledge & 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:

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

Warranty scope.
Defects or failures caudes 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, ceratin electrical components, etc.)















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