

2011-2012

World Class Work Holding Solutions

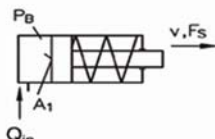


PROVEN TECHNOLOGY -- STRINGENT QUALITY & RELIABILITY

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Equipment	Formulas and description		Symbol
General information			
Basic equations (static, without any loss)			
$Q = \frac{V}{t}$	F:	force	
$V = A \cdot s$	p:	pressure	
$F = p \cdot A$	A:	area	
$p = \frac{F}{A}$	Q:	flow	
$Q = A \cdot v$	v:	speed	
$M = \frac{V \cdot p}{2 \pi}$	V:	volume	
$v = \frac{s}{t}$	t:	time	
	s:	travel (stroke)	
	M:	torque	
Hydraulic cylinders			
• Single acting			
$A \text{ [mm}^2\text{]} = \frac{\pi}{4} d^2 \text{ [mm]}$	d:	piston diameter (mm)	
$v \left[\frac{\text{m}}{\text{s}} \right] = \frac{s \text{ [mm]}}{1000 t \text{ [s]}}$	A:	piston area (mm ²)	
$F_s \text{ [N]} = -0.1 \cdot p_B \text{ [bar]} \cdot A \text{ [mm}^2\text{]}$	F _s :	force (N)	
$p_B \text{ [bar]} = \frac{-10 F_s \text{ [N]}}{A_1 \text{ [mm}^2\text{]}}$	p _B :	operating pressure (bar)	
$Q_{in} \text{ [lpm]} = 0.06 \cdot A \text{ [mm}^2\text{]} \cdot v \left[\frac{\text{m}}{\text{s}} \right]$	v:	piston speed $\left(\frac{\text{m}}{\text{s}} \right)$	
	Q _{in} :	inflow (lpm)	
	s:	stroke (mm)	
	t:	time (S)	
			
• Double acting			
Extending			
Basic equations (balance of forces):			
$A_1 = \frac{\pi}{4} d_1^2 = 0.78 d_1^2$	Simplified:		
$A_3 = \frac{\pi}{4} (d_1^2 - d_2^2)$	$p_1 \text{ [bar]} = \frac{p_3 \text{ [bar]} \cdot A_3 \text{ [mm}^2\text{]} - 10 F \text{ [N]}}{A_1 \text{ [mm}^2\text{]}}$		
$p_1 \cdot A_1 = p_3 \cdot A_3 - F$	$F \text{ [N]} = \frac{-p_1 \text{ [bar]} \cdot A_1 \text{ [mm}^2\text{]} + p_3 \text{ [bar]} \cdot A_3 \text{ [mm}^2\text{]}}{10}$		
$p_1 = \frac{1}{A_1} (p_3 \cdot A_3 - F)$			
$Q_{in} = A_1 \cdot v$	p ₃ is the result of back pressure from pipes and valves for Q _{out}		
$Q_{out} = A_3 \cdot v$	Attention: Pressure intensification could occur!		
Retracting			
Basic equations (balance of forces):			
$p_1 \cdot A_1 = p_3 \cdot A_3 + F$	Simplified:		
$p_3 = \frac{1}{A_3} (p_1 \cdot A_1 - F)$	$p_1 \text{ [bar]} = \frac{p_1 \text{ [bar]} \cdot A_1 \text{ [mm}^2\text{]} - 10 F \text{ [N]}}{A_3 \text{ [mm}^2\text{]}}$		
$Q_{in} = A_3 \cdot v$	$F \text{ [N]} = \frac{p_1 \text{ [bar]} \cdot A_1 \text{ [mm}^2\text{]} - p_3 \text{ [bar]} \cdot A_3 \text{ [mm}^2\text{]}}{10}$		
$Q_{out} = A_1 \cdot v$			
p ₁ result of back pressure from pipes and valves for Q _{out}			
A ₁ :	piston area (mm ²)	Q _{in} :	inflow (lpm)
A ₃ :	rod side area (mm ²)	Q _{out} :	outflow (lpm)
d ₁ :	piston Ø (mm)	p ₁ :	pressure, piston side (bar)
d ₂ :	rod Ø (mm)	p ₃ :	pressure, rod side (bar)
F:	force (N)	s:	stroke, travel (mm)

Conversion table

Nomenclature	Codings	Unit		Factor	x	Unit
Pressure	p	$1 \frac{\text{N}}{\text{mm}^2}$	$\frac{\text{N}}{\text{mm}^2}$	10		bar
		1 MPa	MPa	10		bar
		$1 \frac{\text{kgf}}{\text{cm}^2}$	kgf/cm ²	1		bar
		1 psi	psi	0.07		bar
Force	F	$1 \frac{\text{kg} \cdot \text{m}}{\text{s}^2}$	=	1		N
		1 lbf	lbf	4.45		N



DESIGNATION

THREADED BODY CYLINDER

Hydraulic (Manifold Mounting)

PRODUCT CODE

0101



DESCRIPTION :

Compact design

Space saving mounting

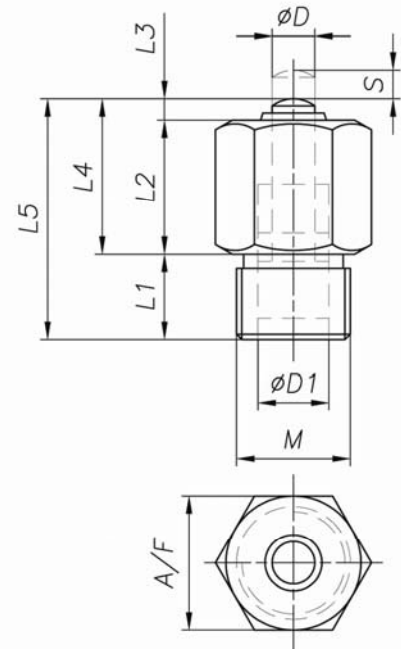
Male & Female threaded piston ends

Cylinders are threaded directly into manifold

Pushing, Pulling, Ejection & Riveting operations

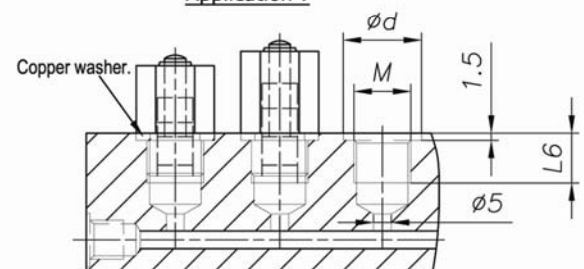
Min. Operating Pressure : 0.5 MPa

Max. Operating Pressure : 20 MPa



Model.	0101-0101	0101-0102	0101-0201	0101-0202	0101-0301	0101-0302	0101-0401	0101-0402	0101-0501	0101-0502
Rod dia.D. mm	6		8		10		12		16	
Piston dia.D1mm	10		12		16		20		25	
Stroke - S. mm	4	8	4	8	6	10	8	12	12	16
M mm	M16x1.5		M20x1.5		M24x1.5		M30x1.5		M36x1.5	
L1 mm	12		12		14		18		21	
L2 mm	19	23	19	23	21	25	27	31	33	37
L3 mm	3	3	3	3	3	3	3	3	3	3
L4 mm	22	26	22	26	24	28	30	34	36	40
L5 mm	34	38	34	38	38	42	48	52	57	61
A/F mm	19		24		27		36		41	
Ød mm	22		28		32		42		48	
L6 mm	14		14		16		23		23	
Pushing force. at 70 bar. N.										
Oil volume forward stroke. cc										

Application :



ORDERING METHOD.

PRODUCT CODE-MODEL NO.
Eg. 0101-0101.

(Specifications subject to change)



DESIGNATION
THREADED BODY CYLINDER
Hydraulic (Manifold Mounting)

PRODUCT CODE
0102

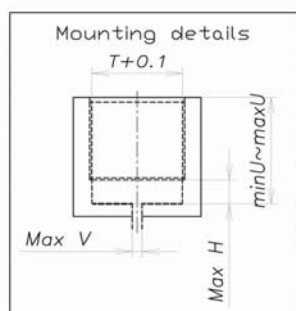
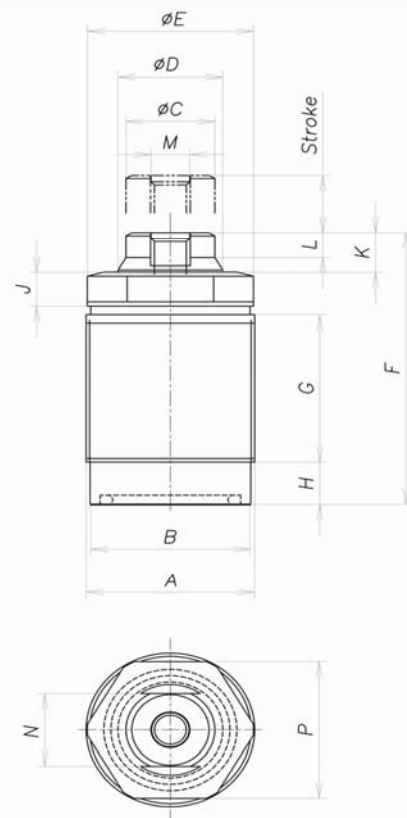


DESCRIPTION :

Compact design
Space saving mounting
Male & Female threaded piston ends
Cylinders are threaded directly into manifold
Spring Return Type Cylinder

APPLICATION :

- * Can be used for direct clamping as well as positioning & support
- * Threaded body eases installation



Size & Mounting Details :

Model code	0102 0101			0102 0201			0102 0301			0102 0401			0102 0501			0102 0601			0102 0701			0102 0801			0102 0901		
	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 size x pitch)	M16 x 1.5			M22x1.5			M24x1.5			M30x1.5			M36x1.5			M45x1.5			M55x2			M65x2			M80x2		
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	8			12			14			18			22.4			30			35.5			45			55		
E	16.0			21.2			24.5			30			35.5			45			55			66			80		
F	40.5	44.5	50.5	35	43	56	39.5	47	63.5	43.5	52.5	72	51	64	85	59	72	94.5	64	79.5	102	78	94	123.5	88	106	137
G	18.0	24.0	33.0	13	21	34	17.5	25	41.5	18	27	46.5	23.5	36.5	57.5	23	36	58.5	27	42.5	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	5.5			7			7			8.5			9.5			12			13			16			19		
L	4			5.5			5.5			7			8			10			11			13			16		
M (Nominal size x depth)	M5x8			M6 x 7			M6 x 7			M8 x 10			M8 x 10			M10 x 11			M12 x 12			M16x16			M20x20		
N	7			10			10			14			17			24			30			36			41		
P	14			19			22			27			32			41			50			60					
T	14.5			20.5			22.5			28.5			34.5			43.5			53			63			78		
Min.U	12			14			14			15			16			18			20			25			25		
Max.U	23	29	38	20	28	41	24	32	48	26	35	54	32	45	66	34	47	69	38	53	76	47	63	92	54	72	103
max. V	3			3			3			6			6			8			8			8			8		

Stroke & Load details :

Model	0102 0101			0102 0201			0102 0301			0102 0401			0102 0501			0102 0601			0102 0701			0102 0801			0102 0901		
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	12	20	32	16	25	40	16	25	40
Cylinder area cm ²	0.95			1.1			1.5			2.5			3.9			7.1			9.9			15.9			23.8		
Cylinder volume cm ³	0.6	0.95	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	11.3	17.7	11.9	19.8	31.7	25.4	39.8	63.6	38.0	59.4	95.0
Release spring force(N)	12.4~24.0			26.0~43.0			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			0.75			1.01			1.66			2.59			4.60			6.44			10.4			15.5		
Calculation formula (kN)	(0.01 P)-0.024			(0.113P)-0.041			(0.154P)-0.060			(0.254P)-0.099			(0.394P)-0.150			(0.707P)-0.319			(0.990P)-0.452			(1.59 P)-0.657			(2.38P)-1.04		
Max.operating pressure(MPa)	15																										
Min. operating pressure (MPa)	0.8																										

ORDERING METHOD.

PRODUCT CODE-MODEL NO.
Eg. 0102-0101.



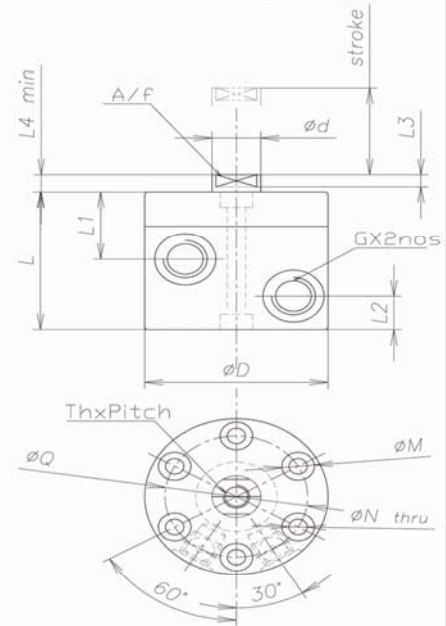
DESIGNATION
COMPACT CYLINDER
Hydraulic (Manifold Mounting)

PRODUCT CODE
0103

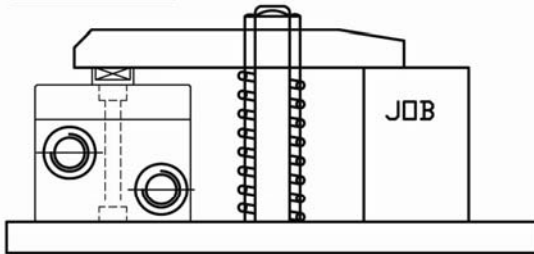


DESCRIPTION :

Compact design
Space saving & easy mounting
Male & Female threaded piston ends
Cylinders are provided with Universal
Mounting
Clamping, Riveting, Pusing, Pulling &
Ejecting
Min. Operating Pressure : 1Mpa
Max. Operating Pressure: 15Mpa



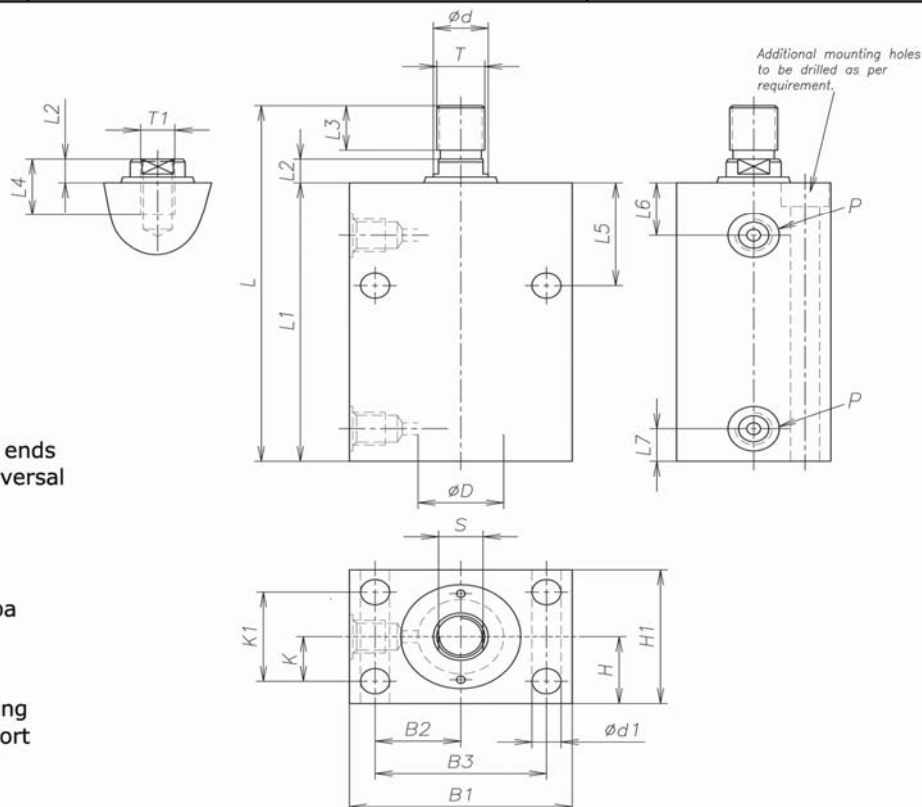
APPLICATION :



All dimensions in mm	0101	0102	0103	0104
Pushing Force (kN)	4.7kN	12kN	19kN	29kN
Pulling Force (kN)	3kN	9kN	14kN	22kN
Thxpitch	M6x10 deep	M10x18 deep	M12x20 deep	M16x25 deep
L4	6	6	7	6
d	12	16	20	25
D	45	65	76	95
G	1/8"	1/8"	1/8"	1/4"
A/F	10	14	17	22
L1	16.5	16.5	17.5	22.5
L2	12	12	12	12
L3	4	4	4	4
ØN	4.5	6.6	6.6	9
ØM x deep	8x5.0	11x7.0	11x7.0	14.5x9.0
ØQ (PCD)	35	50	60	75
Stroke	25	25	25	25
L	63	63	67	73
Oil Vol pushing (cc)	8cc	20cc	31cc	49cc
Oil Vol pulling (cc)	5cc	15cc	24cc	37cc

ORDERING METHOD.
PRODUCT CODE—MODEL NO.
Eg. 0103—0101.

(Specifications subject to change)



DESCRIPTION :

DESCRIPTION:

Double Acting Block Cylinder

Stroke": 25 / 50 / 75 / 100

Male & Female threaded piston ends

Cylinders are provided with universal mounting

Chromium plated plunger

Alloy Steel Body

Min Operating Pressure : 1Mpa

Max Operating Pressure : 15Mpa

APPLICATION :

- * Can be used for direct clamping as well as positioning & support

Model No.	MALE THREAD.	0601	0603	0605	0607	0701	0703	0701	0703	0801	0803	0801	0803	0901	0903	0901	0903
	FEMALE THREAD.	0602	0604	0606	0608	0702	0704	0702	0704	0802	0804	0802	0804	0902	0904	0902	0904
Piston ØD	mm	63				72				80				100			
Rod Ø d	mm	40				45				50				60			
Ød1	mm	13				17				22				22			
Stroke-S	mm	25	50	75	100	25	50	75	100	25	50	75	100	25	50	75	100
L1	mm	100	125	150	175	100	125	150	175	105	130	155	180	105	130	155	180
L2	mm	15				15				15				15			
L3	mm	36				36				40				40			
L4	mm	28				28				40				42			
L5	mm	50				50				60				65			
L6	mm	31.5				30				37				37			
L7	mm	20				20				23				23			
B1	mm	125				145				140				160			
B2	mm	50				55				55				65			
B3	mm	100				110				110				130			
H	mm	44				54				60				70			
H1	mm	88				108				120				140			
K	mm	30				30				40				50			
K1	mm	60				60				80				100			
P Hyd. Port.		G1/4"				G 3/8"				G1/2"				G1/2"			
A/F	mm	36				41				45				55			
T	mm	M30x1.5				M36x1.5				M40x1.5				M45x1.5			
T1	mm	M24				M30x1.5				M36x1.5				M40x1.5			
Pushing force, at 70 bar.	kN.	21.48				28.50				35.19				54.98			
Pulling force, at 70 bar.	kN.	12.68				17.37				21.44				35.19			

ORDERING METHOD.
PRODUCT CODE-MODEL NO. Eg. 0105-0101.



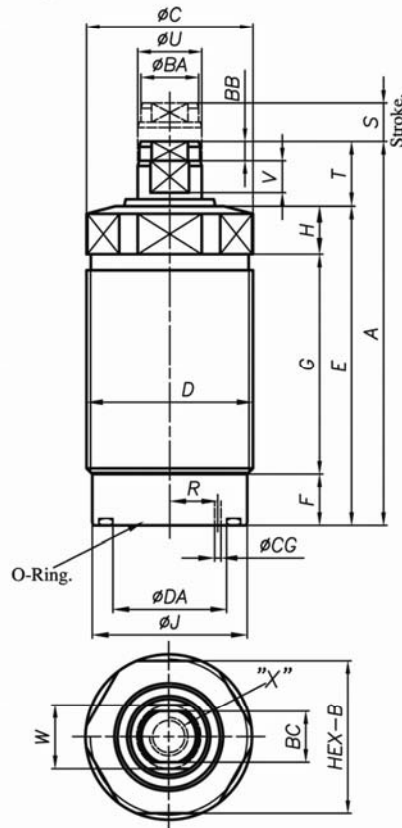
DESIGNATION
WORK SUPPORT
Hydraulic (Threaded Body)

PRODUCT CODE
0201



ORDERING METHOD.
PRODUCT CODE-MODEL NO.
Eq. 0201-0101.

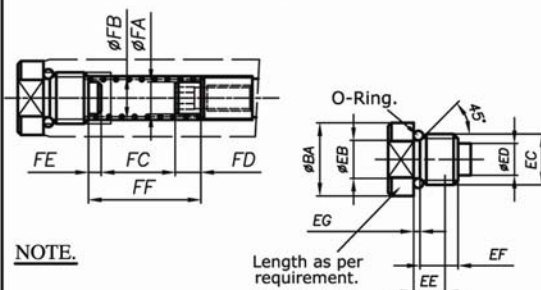
DESCRIPTION :
Compact design
Manifold Mounted
Wide Operating Pressure Range
Hydraulic Advance
Single Acting



NOTE.

The drawing shows plunger in retracted position
Refer to recommendations for making new contact bolt
Refer to recommendations for mounting torque
Do not exceed recommended torque
Do not exceed recommended working pressure

Plunger Spring & Contact Bolt Dimensions



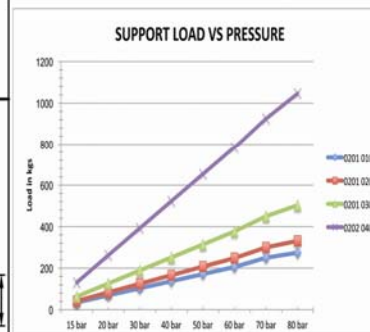
NOTE.

Length as per requirement.

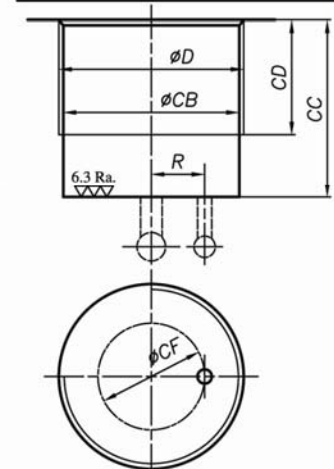
SPECIFICATIONS

Model No.	0201 0101	0201 0201	0201 0301	0201 0401
Support Force at 7Mpa (kN)	3.00	3.8	4.5	9.5
Support Force Formula for Operating pressure (Mpa)	0.53xP-0.68	0.67xP-0.91	0.825xP-1.25	1.7xP-2.28
Plunger Stroke - S (mm)	6	8	8	10
Plunger Rising Force L (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 ³)	0.60	0.90	1.30	2.00
Min Operating Pressure	2.0 Mpa			
Max Operating Pressure	7.0 Mpa			
Weight kg	0.20	0.25	0.35	0.75
A	65	73	80	80
B	24	27	32	41
ØC	26	30	36	45
D	M26x1.5	M30x1.5	M36x1.5	M45x1.5
E	55	63.5	67.5	68.5
F	7	8	9	10
G	36	42	46	46
H	8	9	8.5	10
ØJ	24.6	28.4	34	43
R	10.7	11.5	13.5	18
T	9.5	9.5	12.5	11.5
ØU	10	12	15	16
V	5	5	5.5	6
W	8	10	13	14
X	M6	M8	M10	M10
ØBA	9.5	11.5	12.5	12.5
BB	4	4	4	4
BC	8	10	12	13
ØCB	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
ØCF	pcd 21.4	pcd 23.0	pcd 27.0	pcd 36.0
ØCG	2	2	2	2
ØDA x thick	Ø12x2	Ø14x2	Ø14x2	Ø20x2
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
EF	6	7	8	7
EG	2	2	2	2
O-Ring	Ø5x1.5	Ø4x2	Ø8x1.5	Ø8x1.5
ØFA	2.6	5.0	5.8	5.8
ØFB	3.6	6	8.5	8.5
FC	11.5	13	10	12
FD	4	4	8	8
FE	2	2	2	2
FF	18	19	20	20
Mounting Torque (Nm)	31.5	50	63	80

LOAD GRAPHS



MOUNTING DIMENSIONS.



(Specifications subject to change)



DESIGNATION
WORK SUPPORT
FLANGE MOUNTED

PRODUCT CODE.
0203

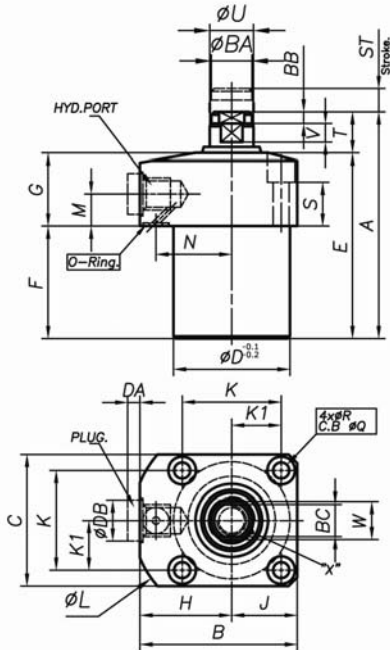


DESCRIPTION :

Flange Body
Hydraulic Advance
Low Operating Pressure
Flange Mounting
Single Acting

ORDERING METHOD.

PRODUCT CODE-MODEL NO.
Eg. 0203-0101.



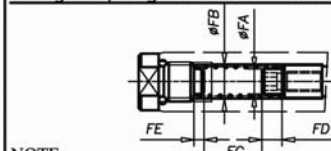
NOTE.

The Drawing shows plunger in release position
Refer recommendations for making new contact bolt
Refer to recommendations for mounting torque
Do not exceed Recommended torque
Do not exceed Recommended Working Pressure

SPECIFICATIONS.

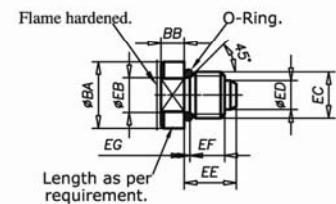
Model.No.	0203-0101	0203-0201	0203-0301	0203-0401	0203-0501	0203-0601
Support force at 7MPa.	kN 4.5	9.5	14	21	33	45
Support force (formula), for operating pr.:P (MPa).	kN 0.825xP - 1.25	1.55xP - 1.25	2.36xP - 2.28.	3.83xP - 5.7	5.60xP - 6.13	7.5xP - 6.87
Plunger Stroke - ST.	mm 8	10	12	14	16	20
Cyl. volume.	cm ³ 1.2	2.0	3.3	4.8	8.9	13.1
Plunger spring force.	L N 2.8 ~ 4.1	N 3.6 ~ 5.7	N 4.7 ~ 7.8	N 9.8 ~ 14.6	N 12.4 ~ 18.8	N 14.6 ~ 21.0
	H N 3.8 ~ 5.9	N 4.9 ~ 8.0	N 6.2 ~ 11.0	N 16.8 ~ 22.0	N 18.7 ~ 31.9	N 21.4 ~ 34.2
Max. operating pressure.	MPa 7.0					
Min. operating pressure.	MPa 2.0					
Design pressure.	MPa 10.5					
Operating temp.	°C 0-70					
Weight.	Kg. 0.6	0.8	1.4	2.2	3.6	6.0
A	78	76	89	101	126	140
B	54	61	69	81	92	107
C	45	51	60	70	80	95
ØD	40	48	55	65	75	90
E	64	64	73	85	107	128
F	39	39	45	56	72	88
G	25	25	28	29	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	11	11	11	11	13	13
N	26	30	33.5	39.5	45	52.5
Q	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	14	12	16	16	19	22
ØU	15	16	20	22	25	32
V	6	6	8	9	9	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.	Ø4x2	Ø4x2	Ø4x2	Ø6x2	Ø6x2	Ø6x2
Contact Bolt.	ØBA 12.5	12.5	16.5	16.5	21.5	30
	BB 4	4	6	6	9	9
	BC 11	11	14	15	20	28
	ØEB 7.5	7.5	10	10	13.5	13.5
	EC M10	M10	M12	M12	M16	M16
	ØED 5.5	6.5	6.0	6	9	10
	EE 11	10	10	13	16	16
	EF 2	2	2.5	2	3	3
	EG 2	2	2	2	3	3
Mounting dimn.	CA M5	M5	M6	M6	M8	M10
	ØCB 2	2.5	2.5	3	5	5
With plug.	DA 3.5			3.5	4.5	4.5
	ØDB 14			14	18	18
	ØFA 5.8	5.8	6.0	6.4	10	10
	ØFB 8.5	8.5	10.2	10.2	14	14
Plunger spring housing dimn.	FC 9.5	10	12	21	16	24
	FD 8	6	6	6	12	12
	FE 2	2	2	2	2	2
	FF 19.5	17.5	20	29.5	30	38.5

Plunger Spring & Contact Bolt Dimensions

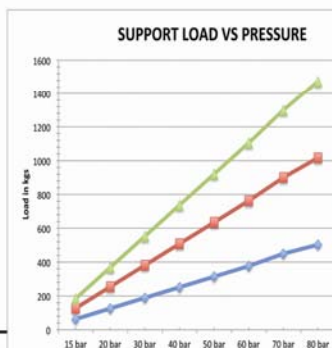


NOTE.

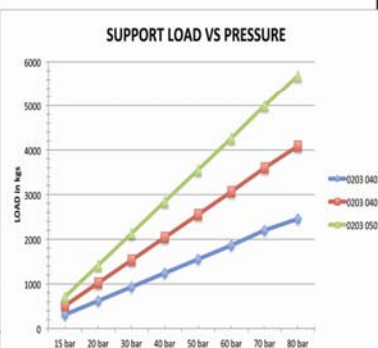
The Drawing shows plunger in release position
The Min. FF dimension when plunger spring is compressed = (FF-stroke)
To be used as reference for designing of springs.
Consider Plunger spring force to decide weight of contact bolt.
Donot change specification of contact bolt.



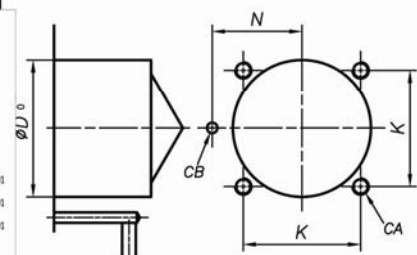
LOAD GRAPH



LOAD GRAPH



MOUNTING DIMENSIONS.



(Specifications subject to change)



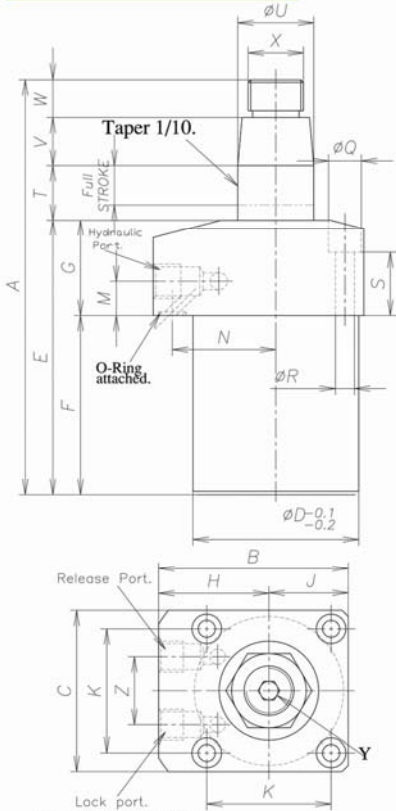
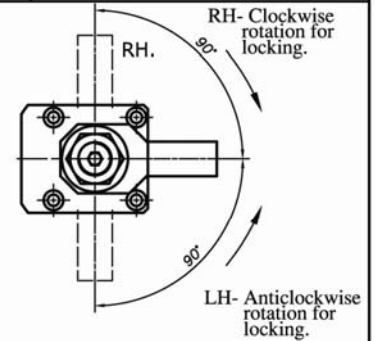
DESIGNATION
SWING CYLINDER (Top Mount)
Hydraulic (Double Acting)

PRODUCT CODE
0301



DESCRIPTION :
Double Acting Swing Clamp
90° Rotation (RH or LH)
RH: Clock wise rotation for clamping
LH: Counter-clockwise rotation for clamping
Chromium plated piston rod
Alloy steel body
Flange Mounting

Min Operating Pressure : 1Mpa
Max Operating Pressure : 12Mpa

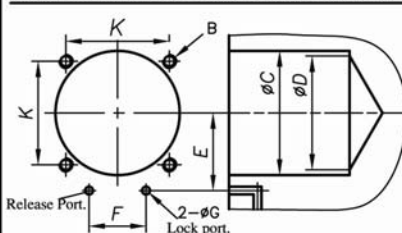


SPECIFICATIONS.

Lock cyl. area.	cm ²	2.03	2.36
Full stroke.	mm	13	13
Swing stroke. (90° rotation)	mm	5	5
Locking stroke	mm	8	8
Cyl. volume.	At lock.	cm ³	2.6
	At release.	cm ³	3.07
Max. operating pressure.	MPa	7	
Min. operating pressure.	MPa	1.5	
Design pressure.	MPa	10.5	
Operating temp.	°C	0-70	
Weight.	Kg.	0.8	1.0

(Single Acting Cylinders available on request. Please contact nearest Dealer)

MACHINING FOR MOUNTING CLAMP.

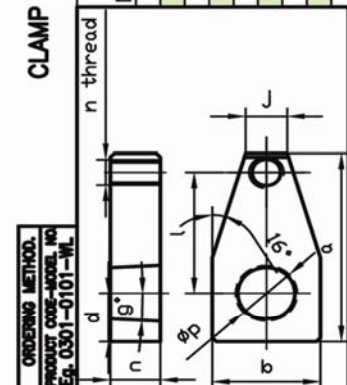


Model	90° RH.	0301-0081	0301-0091
	90° LH.	0301-0082	0301-0092
K		31.5	34
B		M4	M5
C+0.2		36	40
D		31	35
E		23.5	26
F		16	18
G		3	3

ORDERING METHOD.

PRODUCT CODE-MODEL NO. Eg. 0301-0101.			
Model	90° RH.	0301-0081	0301-0091
	90° LH.	0301-0082	0301-0092
A		95	111
B		49	54
C		40	45
D		36	40
E		64.5	75
F		39.5	50
G		25	25
H		29	31.5
J		20	22.5
K		31.5	34
ØL		66	73
M		11	11
N		23.5	26
P		3	3
Q		7.5	9.5
R		4.5	5.5
S		18	17
T		14.5	15
U		15	18
V		09	12
W		07	09
X		M10x1	M12x1.5
Y (Hex,xDepth)		5x4	6x5
Z		16	18
Hyd. Port.		G1/8	G1/8
TAPER ANGLE		6	6

CLAMP LEVER TABLE (WITHOUT SLEEVE) FOR 0301 & 0302



Model	90° RH.	0301-0081	0301-0091
	90° LH.	0301-0082	0301-0092
a		50	56.5
b		26	28
c		11	13
d		13	14
e		3	3
f		32	36.5
g		10	12
h		15	18
i		15	18
j		15	18
k		15	18
l		15	18
m		15	18
n		15	18
o		15	18
p		15	18
q		15	18
r		15	18
s		15	18
t		15	18
u		15	18
v		15	18
w		15	18
x		15	18
y		15	18
z		15	18

(Specifications subject to change)



DESIGNATION
SWING CYLINDER (Top Mount)
Hydraulic (Double Acting)

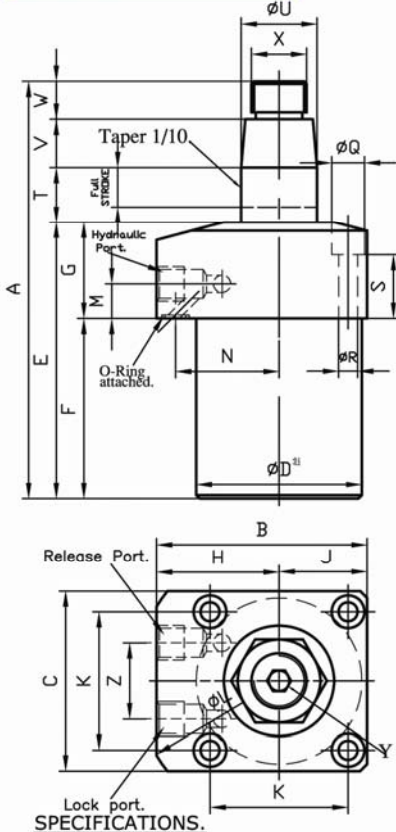
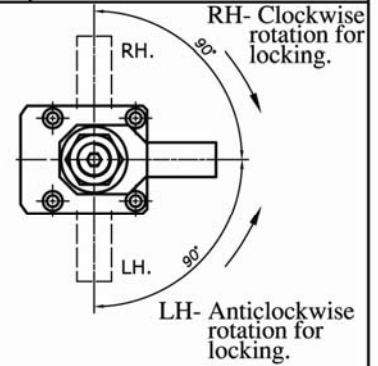
PRODUCT CODE
0301



DESCRIPTION :

Double Acting Swing Clamp
90° Rotation (RH or LH)
RH: Clock wise rotation for clamping
LH: Counter-clockwise rotation for clamping
Chromium plated piston rod
Alloy steel body
Flange Mounting

Min Operating Pressure : 1Mpa
Max Operating Pressure : 12Mpa



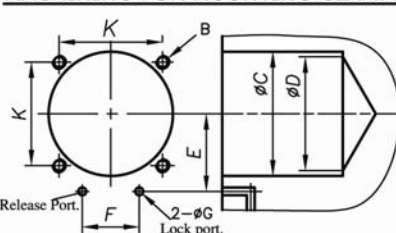
ORDERING METHOD.
PRODUCT CODE-MODEL NO.
Eg. 0301-0101.

Model	90° RH.	0301-0101	0301-0201	0301-0301	0301-0401	0301-0501	0301-0601
	90° LH.	0301-0102	0301-0202	0301-0302	0301-0402	0301-0502	0301-0602
A		122	137.5	145	171.5	185	243
B		61	69	81	92	107	127
C		52	60	70	80	95	120
D		48	55	65	75	90	105
E		80	87	93	108	114	149
F		52	59	63	71	74	99
G		28	28	30	37	40	50
H		35	39	46	52	59.5	67
J		26	30	35	40	47.5	60
K		40	47	55	63	75	88
ØL		83	88	106	116	136	152
M		11	11	12	12	16	17
N		30	33.5	39.5	45	52.5	60
P		3	3	3	3	3	4
Q		9.5	11	11	14.5	17.5	20
R		5.5	6.6	6.6	9	11	14
S		18.5	17	18	22	22	24.5
T		16	19	20	23.5	25	30.5
U		22	25	30	36	45	55
V		14	20	20	26	32	38
W		12	12	12	14	14	17
X		M16x1.5	M16x1.5	M20x1.5	M30x1.5	M36x1.5	M45x1.5
Y (Hex, xDepth)		6x6	8x6	10x8	10x8	10x10	12x10
Z		22	24	30	32	35	40
Hyd. Port.		G1/8	G1/8	G1/4	G1/4	G1/4	G1/4
TAPER ANGLE		6	6	6	6	11	11

Lock cyl. area.	cm2	5	8	14	19.7	31.2	40.7
Full stroke.	mm	14	17	18	21.5	23	28.5
Swing stroke. (90° rotation)	mm	6	8	8	9.5	11	12.5
Locking stroke	mm	8	9	10	12	12	16
Cyl. volume.	At lock.	cm3	7	13.2	25.2	42.3	102.6
	At release.	cm3	12.5	20.9	37.1	68.7	127.8
Max. operating pressure.	MPa	7					
Min. operating pressure.	MPa	1.5					
Design pressure.	MPa	10.5					
Operating temp.	°C	0-70					
Weight.	Kg.	1.3	1.8	2.7	4.2	5.5	9

(Single Acting Cylinders available on request. Please contact nearest Dealer)

MACHINING FOR MOUNTING CLAMP.



Model	90° RH.	0301-0101	0301-0201	0301-0301	0301-0401	0301-0501	0301-0601
	90° LH.	0301-0102	0301-0202	0301-0302	0301-0402	0301-0502	0301-0602
K		40	47	55	63	75	88
B		M5	M6	M6	M8	M10	M12
C+0.2		48	55	65	75	90	105
D		45	50	60	70	85	100
E		30	33.5	39.5	45	52.5	60
F		22	24	30	32	37	45
G		3	3	3	3	3	4

(Specifications subject to change)



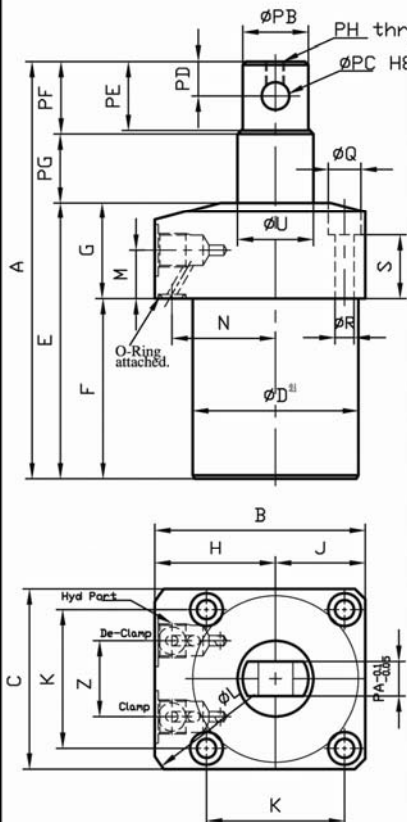
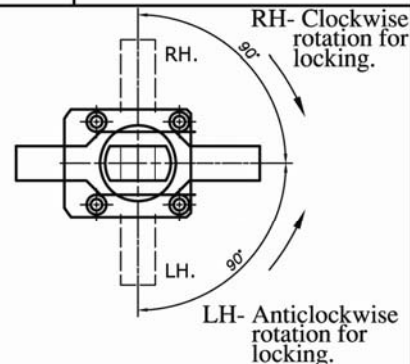
DESIGNATION
SWING CYLINDER (Top Mount)
Hydraulic (Double Acting)

PRODUCT CODE
0301- P



DESCRIPTION :
Double Acting Swing Clamp
90° Rotation (RH or LH)
RH: Clock wise rotation for clamping
LH: Counter-clockwise rotation for clamping
Chromium plated piston rod
Alloy steel body
Flange Mounting

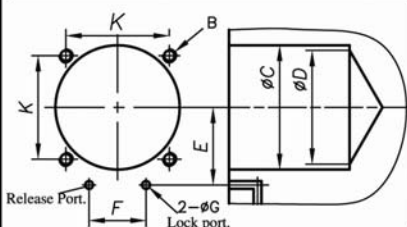
Min Operating Pressure : 1Mpa
Max Operating Pressure : 12Mpa



SPECIFICATIONS.

Lock cyl. area.	cm ²	5	8	14	19.7	31.2	40.7
Full stroke.	mm	14	17	18	21.5	23	28.5
Swing stroke. (90° rotation)	mm	6	8	8	9.5	11	12.5
Locking stroke	mm	8	9	10	12	12	16
Cyl. volume.	At lock.	cm ³	7	13.2	25.2	42.3	102.6
	At release.	cm ³	12.5	20.9	37.1	68.7	127.8
Max. operating pressure.	MPa	7					
Min. operating pressure.	MPa	1.5					
Design pressure.	MPa	10.5					
Operating temp.	°C	0-70					
Weight.	Kg.	1.3	1.8	2.7	4.2	5.5	9

MACHINING FOR MOUNTING CLAMP.



Model	90° RH.	0302-0101	0302-0201	0302-0301	0302-0401	0302-0501	0302-0601
	90° LH.	0302-0102	0302-0202	0302-0302	0302-0402	0302-0502	0302-0602
K		40	47	55	63	75	88
B		M5	M6	M6	M8	M10	M12
C+0.2		48	55	65	75	90	105
D		45	50	60	70	85	100
E		30	33.5	39.5	45	52.5	60
F		22	24	30	32	37	45
G		3	3	3	3	3	4

(Single Acting Cylinders available on request. Please contact nearest Dealer)

(Specifications subject to change)



DESIGNATION
SWING CYLINDER (Bottom Mount)
Hydraulic (Double Acting)

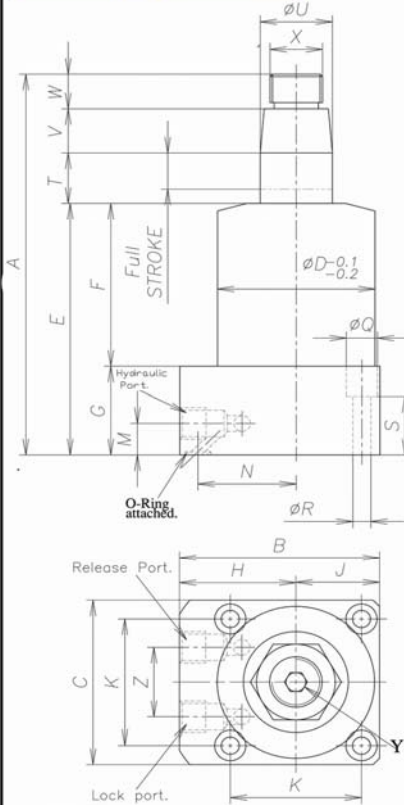
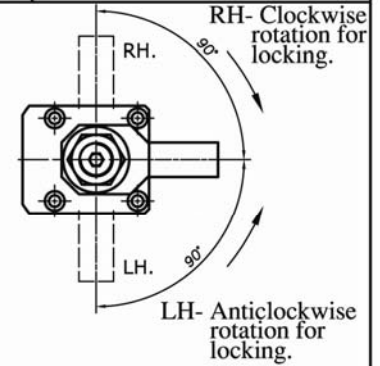
PRODUCT CODE
0302



DESCRIPTION :

Double Acting Swing Clamp
90° Rotation (RH or LH)
RH: Clock wise rotation for clamping
LH: Counter-clockwise rotation for clamping
Chromium plated piston rod
Alloy steel body
Flange Mounting

Min Operating Pressure : 1Mpa
Max Operating Pressure : 12Mpa

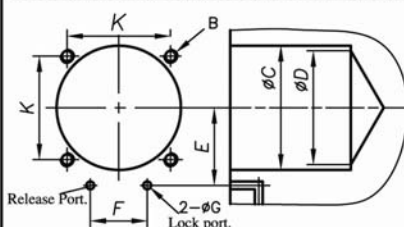


SPECIFICATIONS.

Lock cyl. area.	cm2	2.03	2.36
Full stroke.	mm	13	13
Swing stroke. (90° rotation)	mm	5	5
Locking stroke	mm	8	8
Cyl. volume.	At lock.	cm3	2.6
	At release.	cm3	3.07
Max. operating pressure.	MPa	7	
Min. operating pressure.	MPa	1.5	
Design pressure.	MPa	10.5	
Operating temp.	°C	0-70	
Weight.	Kg.	0.8	1.0

(Single Acting Cylinders available on request. Please contact nearest Dealer)

MACHINING FOR MOUNTING CLAMP.

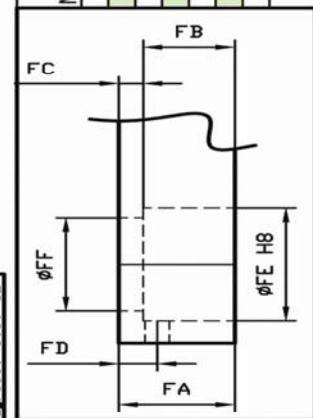


ORDERING METHOD.			
PRODUCT CODE-MODEL NO. Eg. 0301-0101.			
Model	90° RH. 90° LH.	0302-0081 0302-0082	0302-0091 0302-0092
A		95	111
B		49	54
C		40	45
D		36	40
E		64.5	75
F		39.5	50
G		25	25
H		29	31.5
J		20	22.5
K		31.5	34
ØL		66	73
M		11	11
N		23.5	26
P		3	3
Q		7.5	9.5
R		4.5	5.5
S		18	17
T		14.5	15
U		15	18
V		09	12
W		07	09
X		M10x1	M12x1.5
Y (Hex, xDepth)		5x4	6x5
Z		16	18
Hyd. Port.		G1/8	G1/8
TAPER ANGLE		6	6

CLAMP LEVER TABLE (WITH SLEEVE) FOR 0301 & 0302

Model	90° RH. 90° LH.	0301-0081 0301-0082	0301-0091 0301-0092	0301-0101 0301-0102	0301-0201 0301-0202	0301-0301 0301-0302	0301-0401 0301-0402	0301-0501 0301-0502	0301-0601 0301-0602
FA		12	16	19	25	25	32	38	45
FB		9.5	13	15	21	21	27	33	39
FC		2.5	03	04	04	04	05	05	06
FD		4.3	5.3	6.3	6.3	7.5	8.5	9.5	10.5
FE		17	20	25	28	34	40	49	60
FF		13.9	16.7	20.6	23	28	32.9	41.8	51.2
FG		3	4	4	4	6	6	8	8

ORDERING METHOD.
PRODUCT CODE-MODEL NO.
Eg. 0301-0101-SL.



(Specifications subject to change)



DESIGNATION
SWING CYLINDER (Bottom Mount)
Hydraulic (Double Acting)

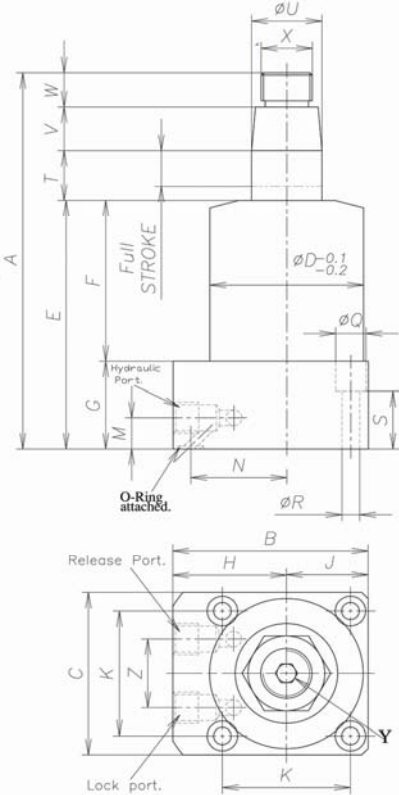
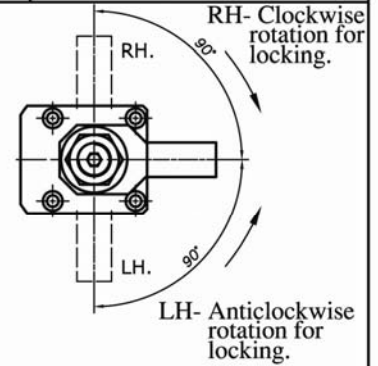
PRODUCT CODE
0302



DESCRIPTION :

Double Acting Swing Clamp
90° Rotation (RH or LH)
RH: Clock wise rotation for clamping
LH: Counter-clockwise rotation for clamping
Chromium plated piston rod
Alloy steel body
Flange Mounting

Min Operating Pressure : 1Mpa
Max Operating Pressure : 12Mpa

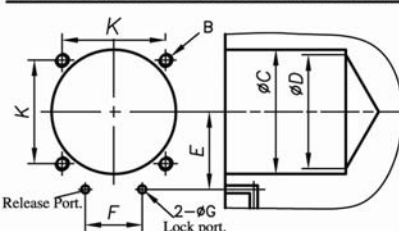


SPECIFICATIONS.

Model	90° RH.	0302-0101	0302-0201	0302-0301	0302-0401	0302-0501	0302-0601
Model	90° LH.	0302-0102	0302-0202	0302-0302	0302-0402	0302-0502	0302-0602
A		122	137.5	145	171.5	185	243
B		61	69	81	92	107	127
C		52	60	70	80	95	120
D		48	55	65	75	90	105
E		80	87	93	108	114	149
F		52	59	63	71	74	99
G		28	28	30	37	40	50
H		35	39	46	52	59.5	67
J		26	30	35	40	47.5	60
K		40	47	55	63	75	88
ØL		83	88	106	116	136	152
M		11	11	12	12	16	17
N		30	33.5	39.5	45	52.5	60
P		3	3	3	3	3	4
Q		9.5	11	11	14.5	17.5	20
R		5.5	6.6	6.6	9	11	14
S		18.5	17	18	22	22	24.5
T		16	19	20	23.5	25	30.5
U		22	25	30	36	45	55
V		14	20	20	26	32	38
W		12	12	12	14	14	17
X		M16x1.5	M16x1.5	M20x1.5	M30x1.5	M36x1.5	M45x1.5
Y (Hex, xDepth)		6x6	8x6	10x8	10x8	10x10	12x10
Z		22	24	30	32	35	40
Hyd. Port.		G1/8	G1/8	G1/4	G1/4	G1/4	G1/4
TAPER ANGLE		6	6	6	6	11	11
Lock cyl. area.	cm2	5	8	14	19.7	31.2	40.7
Full stroke.	mm	14	17	18	21.5	23	28.5
Swing stroke. (90° rotation)	mm	6	8	8	9.5	11	12.5
Locking stroke	mm	8	9	10	12	12	16
Cyl. volume.	At lock. cm3	7	13.2	25.2	42.3	102.6	151
	At release. cm3	12.5	20.9	37.1	68.7	127.8	199.5
Max. operating pressure.	MPa	7					
Min. operating pressure.	MPa	1.5					
Design pressure.	MPa	10.5					
Operating temp.	°C	0-70					
Weight.	Kg.	1.3	1.8	2.7	4.2	5.5	9

(Single Acting Cylinders available on request. Please contact nearest Dealer)

MACHINING FOR MOUNTING CLAMP.



Model	90° RH.	0302-0101	0302-0201	0302-0301	0302-0401	0302-0501	0302-0601
Model	90° LH.	0302-0102	0302-0202	0302-0302	0302-0402	0302-0502	0302-0602
K		40	47	55	63	75	88
B		M5	M6	M6	M8	M10	M12
C+0.2		48	55	65	75	90	105
D		45	50	60	70	85	100
E		30	33.5	39.5	45	52.5	60
F		22	24	30	32	37	45
G		3	3	3	3	3	4

(Specifications subject to change)



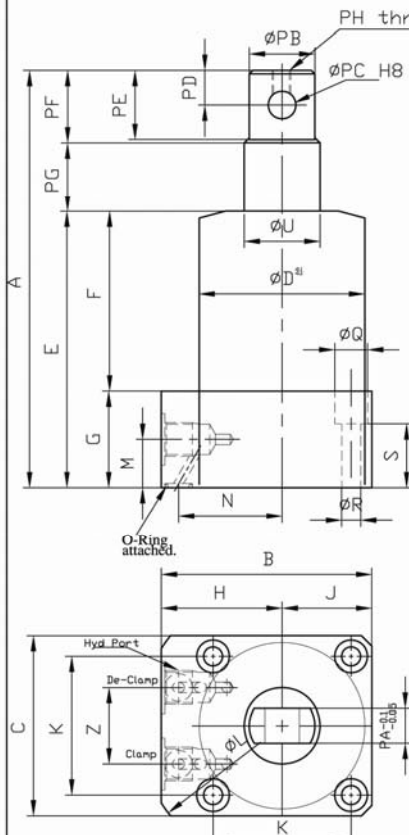
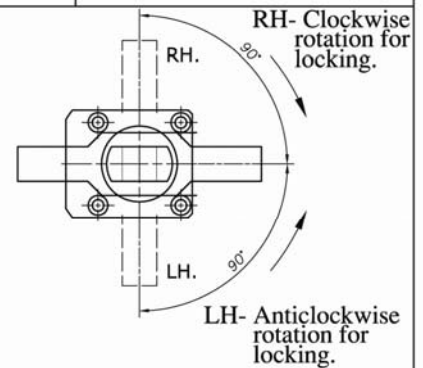
DESIGNATION
SWING CYLINDER (Bottom Mount)
Hydraulic (Double Acting)

PRODUCT CODE
0302- P



DESCRIPTION :
Double Acting Swing Clamp
90° Rotation (RH or LH)
RH: Clock wise rotation for clamping
LH: Counter-clockwise rotation for clamping
Chromium plated piston rod
Alloy steel body
Flange Mounting

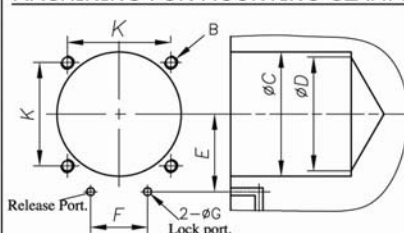
Min Operating Pressure : 1Mpa
Max Operating Pressure : 12Mpa



SPECIFICATIONS.

Model	90° RH. 90° LH.	0302-0101 0302-0102	0302-0201 0302-0202	0302-0301 0302-0302	0302-0401 0302-0402	0302-0501 0302-0502	0302-0601 0302-0602
A		122	137.5	145	171.5	185	243
B		61	69	81	92	107	127
C		52	60	70	80	95	120
D		48	55	65	75	90	105
E		80	87	93	108	114	149
F		52	59	63	71	74	99
G		28	28	30	37	40	50
H		35	39	46	52	59.5	67
J		26	30	35	40	47.5	60
K		40	47	55	63	75	88
øL		83	88	106	116	136	152
M		11	11	12	12	16	17
N		30	33.5	39.5	45	52.5	60
P		3	3	3	3	3	4
Q		9.5	11	11	14.5	17.5	20
R		5.5	6.6	6.6	9	11	14
S		18.5	17	18	22	22	24.5
U		22	25	30	36	45	55
PG		16	18.5	20	23.5	25	30.5
PF		25	30.5	32	40	46	55
PE		23.5	29	30.5	38.5	44.5	53.5
PH Thread		M4	M5	M6	M6	M8	M8
PD		10	12	15	16.5	20	24
ø PB		20	23	28	34	43	53
øPC H8		8	10	12	12	16	20
PA		10	12	14	16	22	26
Z		22	24	30	32	35	40
Hyd. Port.		G1/8	G1/8	G1/4	G1/4	G1/4	G1/4
Lock cyl. area.	cm2	5	8	14	19.7	31.2	40.7
Full stroke.	mm	14	17	18	21.5	23	28.5
Swing stroke. (90° rotation)	mm	6	8	8	9.5	11	12.5
Locking stroke	mm	8	9	10	12	12	16
Cyl. volume.	At lock. cm3	7	13.2	25.2	42.3	102.6	151
	At release. cm3	12.5	20.9	37.1	68.7	127.8	199.5
Max. operating pressure.	MPa	7					
Min. operating pressure.	MPa	1.5					
Design pressure.	MPa	10.5					
Operating temp.	°C	0-70					
Weight.	Kg.	1.3	1.8	2.7	4.2	5.5	9

MACHINING FOR MOUNTING CLAMP.



Model	90° RH. 90° LH.	0302-0101 0302-0102	0302-0201 0302-0202	0302-0301 0302-0302	0302-0401 0302-0402	0302-0501 0302-0502	0302-0601 0302-0602
K		40	47	55	63	75	88
B		M5	M6	M6	M8	M10	M12
C+0.2		48	55	65	75	90	105
D		45	50	60	70	85	100
E		30	33.5	39.5	45	52.5	60
F		22	24	30	32	37	45
G		3	3	3	3	3	4

(Single Acting Cylinders available on request. Please contact nearest Dealer)

(Specifications subject to change)



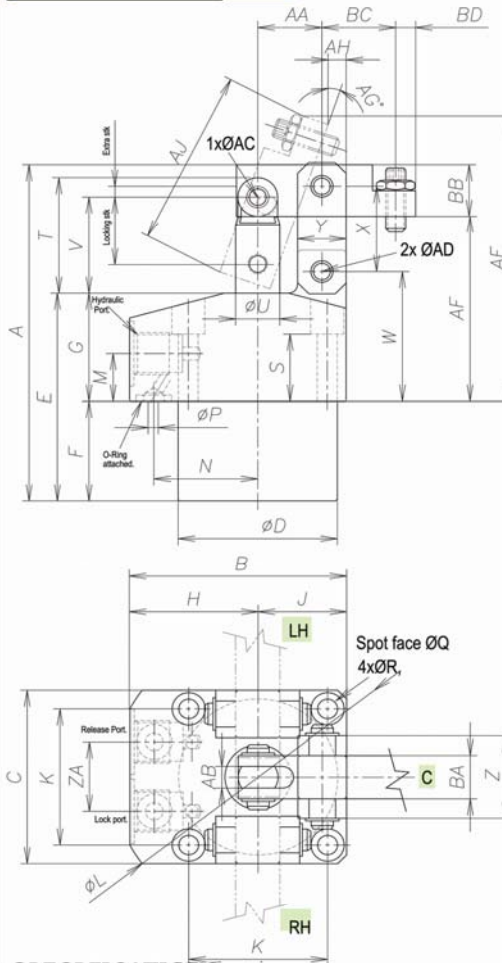
DESIGNATION
LINK CLAMP CYLINDER
Hydraulic (Double Acting)

PRODUCT CODE.
0401



DESCRIPTION :
Double Acting
LH,RH & Centre Port Configurations
Chromium Plated Piston Rod
Alloy steel body

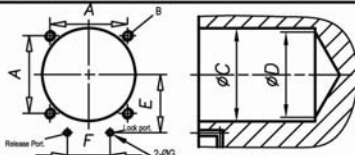
Flange Mounting
Min Operating Pressure : 1Mpa
Max Operating Pressure : 15Mpa



SPECIFICATIONS.

Lock cyl. area.	cm ²	3.14	3.8
Full stroke.	mm	18.5	20
Locking stroke.	mm	15.5	17
Extra stroke.	mm	3	3
Cyl. volume.	At lock.	cm ³	4.9
	At release.	cm ³	6.4
Max. operating pressure.	MPa	7	
Min. operating pressure.	MPa	0.5	
Design pressure.	MPa	10.5	
Operating temp.	°C	0-70	
Weight.	Kg.	0.72	1.15

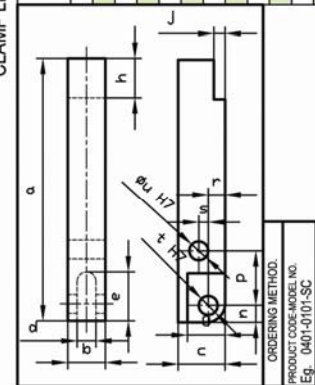
MACHINING FOR CLAMP MOUNTING.



Model.	C	
	RH	LH
	0401 0082	0401 0092
A	94.5	103.5
B	50	54
C	41	45
D	36	40
E	64	70
F	39	45
G	25	25
H	29.5	31.5
J	20.5	22.5
K	31.5	34
L	68	73
M	11	11
N	23.5	26
P	3	3
Q	7.5	9.5
R	4.5	5.5
S	18	15
T	27	30.5
U	10	12
V	22.5	25
W	30	30.5
X	20	22
Y	10	12
Z	19	21
ZA	16	18
Hyd. Port.	G 1/8"	G 1/8"
Link Lever.	AA	14.5
	AB	5
	AC	5
	AD	6
	AE	AE
	AF	43
	AG°	19.6°
	AH	5
	AJ	AJ
	BA	10
	BB	12.5
	BC	BC
	BD	BD

CLAMP LEVER TABLE (Standard) FOR 0401 & 0402

Model	0401		0402	
	036x	040x	048x	055x
a	70	75	85	105
b ^{4.1}	10	12	12	19
c	13	14	16	25
d	5	6	6	10
e	13	14.5	16	22
g	10	12	13	18
h	10.5	13	13	22
j	3	3	3	5
n	4.5	5.5	6	10
p	14.5	16	18.5	24.5
r	4.5	5.5	6	10
s	2.5	2.5	3.5	7.5
t ^{10.7}	5	6	6	8
u ^{10.7}	5	6	6	8





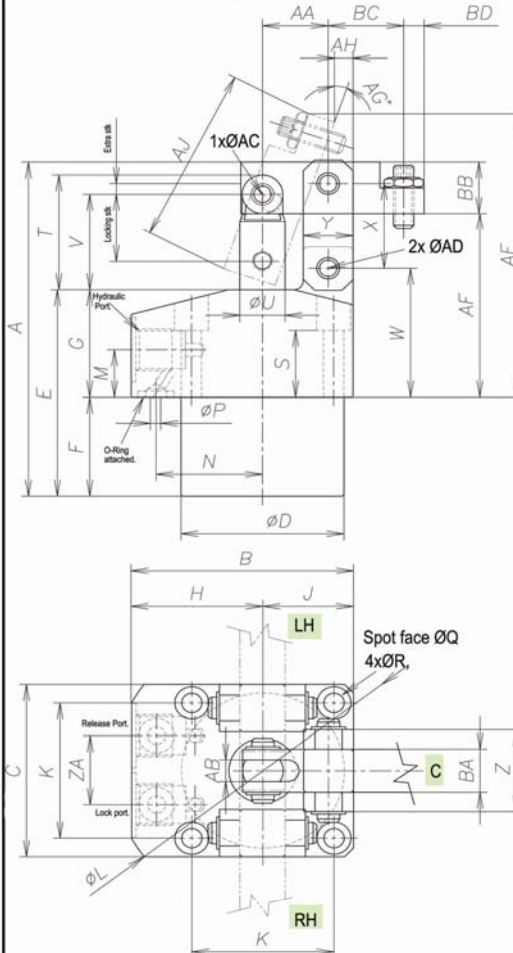
DESIGNATION
LINK CLAMP CYLINDER
Hydraulic (Double Acting)

PRODUCT CODE.
0401



DESCRIPTION :
Double Acting
LH,RH & Centre Port Configurations
Chromium Plated Piston Rod
Alloy steel body

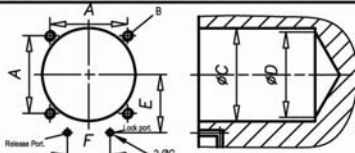
Flange Mounting
Min Operating Pressure : 1Mpa
Max Operating Pressure : 15Mpa



SPECIFICATIONS.

Lock cyl. area.	cm ²	5.3	8.0	12.6	19.6	31.2	40.7
Full stroke.	mm	23.5	26	29.5	35	41	49
Locking stroke.	mm	20.5	23	26.5	32	38	46
Extra stroke.	mm	3	3	3	3	3	3
Cyl. volume.	At lock.	cm ³	12.5	20.9	37.1	68.7	118.6
	At release.	cm ³	8.9	15.7	29.6	55.4	93.2
Max. operating pressure.	MPa	7					
Min. operating pressure.	MPa	0.5					
Design pressure.	MPa	10.5					
Operating temp.	°C	0-70					
Weight.	Kg.	1.5	1.8	2.5	4.2	6.5	10.2

MACHINING FOR CLAMP MOUNTING.



Model.	C	0401-0101	0401-0201	0401-0301	0401-0401	0401-0501	0401-0601
	RH	0401-0102	0401-0202	0401-0302	0401-0402	0401-0502	0401-0602
	LH	0401-0103	0401-0203	0401-0303	0401-0403	0401-0503	0401-0603
A		114	132.5	147	175	207	243
B		61	69	81	94.5	111	127
C		51	60	70	85	100	120
D		48	55	65	75	90	105
E		75	87	93	108	127	149
F		47	59	63	71	88	99
G		28	28	30	37	40	50
H		35.5	39	46	52	61	67
J		25.5	30	35	42.5	50	60
K		40	47	55	63	75	88
L		83	88	106	116	136	152
M		11	11	12	12	12	15
N		30	33.5	39.5	45	52.5	60
P		3	3	3	3	3	4
Q		9.5	11	11	14	17.5	20
R		5.5	6.8	6.8	9	11	14
S		17.5	15	15.5	19.5	19	24.5
T		35	37.5	45	55	65.5	77
U		14	16	18	22	28	35.5
V		29	31.5	37	45	52	62
W		34.5	35.5	39	48	52.5	64
X		26	30	35.5	43.5	52.5	64
Y		13	16	19	25	28	32
Z		21	28	37	40	49	64
ZA		22	24	30	32	37	45
Hyd. Port.		G1/8	G1/8	G1/4	G1/4	G1/4	G3/8
Link Lever.	AA	18.5	21	24.5	30	36	44
	AB	6	8	10	11	13	16
	AC	6	6	8	10	12	15
	AD	6	8	10	12	15	18
	AE	92.4	101.9	111.4	130.8	146.5	173.6
	AF	51	53.5	59	72	81	98
	AG°	18.9	19.9	20.5	21.4	22.4	23.1
	AH	4.3	4.7	4.3	4.5	5	4.1
	AJ	61.2	71.7	78.7	90.8	104.6	122.5
	BA	12	16	19	22	25	32
	BB	16	20	25	32	38	45
	BC	23.5	29	32	37.5	41.5	51
	BD	6	8	10	11	14	17
A		40	47	55	63	75	88
B		M5	M6	M6	M8	M10	M12
C+0.2		48	55	65	75	90	105
D		45	50	60	70	85	100
E		30	33.5	39.5	45	52.5	60
F		22	24	30	32	37	45
G		3	3	3	3	3	4

(Single Acting Cylinders available on request. Please contact nearest Dealer)

(Specifications subject to change)



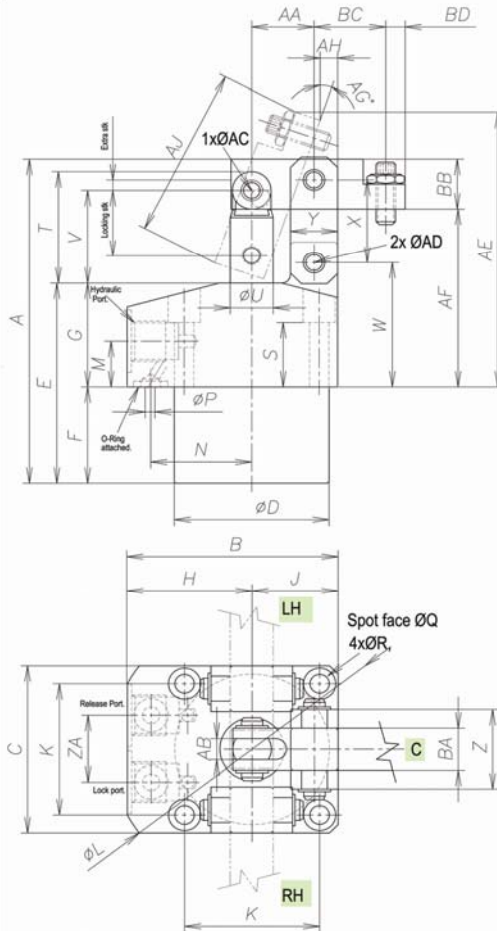
DESIGNATION
LINK CLAMP CYLINDER
Hydraulic (Double Acting)

PRODUCT CODE.
0402



DESCRIPTION :
Double Acting
LH,RH & Centre Port Configurations
Chromium Plated Piston Rod
Alloy steel body

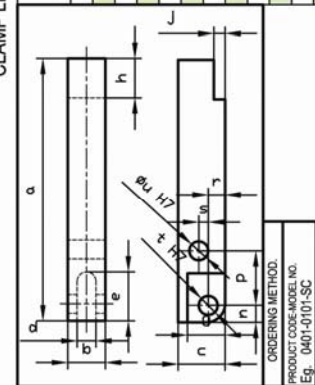
Flange Mounting
Min Operating Pressure : 1Mpa
Max Operating Pressure : 15Mpa



Model.	C	0402 0361	0402 0401
	RH	0402 0362	0402 0402
	LH	0402 0363	0402 0403
A		79	87.5
B		50	54
C		41	45
D		36	40
E		48.5	54
F		23.5	29
G		25	25
H		29.5	31.5
J		20.5	22.5
K		31.5	34
L		68	73
M		11	11
N		23.5	26
P		3	3
Q		7.5	9.5
R		4.5	5.5
S		18	15
T		27	30.5
U		10	12
V		22.5	25
W		30	30.5
X		20	22
Y		10	12
Z		19	21
ZA		16	18
Hyd. Port.		G 1/8"	G 1/8"
Link Lever.	AA	14.5	16
	AB	5	5
	AC	5	5
	AD	6	6
	AE	AE	AE
	AF	43	44.5
	AG°	19.6°	20.2°
	AH	5	6
	AJ	AJ	AJ
	BA	10	12
Link Lever.	BB	12.5	14
	BC	BC	BC
	BD	BD	BD

CLAMP LEVER TABLE (Standard) FOR 0401 & 0402

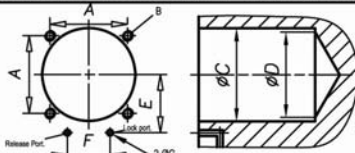
Model.	0401										0402									
	0401										0402									
	0401										0402									
060x	105x										105x									
050x	090x										090x									
040x	075x										075x									
030x	065x										065x									
020x	055x										055x									
010x	048x										048x									
009x	040x										040x									
008x	036x										036x									
a	70	75	85	10	12	12	12	12	12	12	70	75	85	10	12	12	12	12	12	12
b ^{4.1}	10	12	14	16	16	16	16	16	16	16	10	12	14	16	16	16	16	16	16	16
c	13	13	14	16	16	16	16	16	16	16	13	13	14	16	16	16	16	16	16	16
d	5	6	6	6	6	6	6	6	6	6	5	6	6	6	6	6	6	6	6	6
e	13	13	14.5	16	16	16	16	16	16	16	13	13	14.5	16	16	16	16	16	16	16
g	10	10	12	13	13	13	13	13	13	13	10	10	12	13	13	13	13	13	13	13
h	10.5	10.5	13	13	13	13	13	13	13	13	10.5	10.5	13	13	13	13	13	13	13	13
j	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
n	4.5	5.5	6	6	6	6	6	6	6	6	4.5	5.5	6	6	6	6	6	6	6	6
p	14.5	16	18.5	21	21	21	21	21	21	21	14.5	16	18.5	21	21	21	21	21	21	21
r	4.5	5.5	6	6	6	6	6	6	6	6	4.5	5.5	6	6	6	6	6	6	6	6
s	2.5	2.5	3.5	6	6	6	6	6	6	6	2.5	2.5	3.5	6	6	6	6	6	6	6
t ^{10.7}	5	6	6	6	6	6	6	6	6	6	5	6	6	6	6	6	6	6	6	6
u ^{10.7}	5	6	6	6	6	6	6	6	6	6	5	6	6	6	6	6	6	6	6	6



SPECIFICATIONS.

Lock cyl. area.	cm ²	3.8	4.9
Full stroke.	mm	18.5	20
Locking stroke.	mm	15.5	17
Extra stroke.	mm	3	3
Cyl. volume.	At lock.	cm ³	5.9
	At release.	cm ³	4.7
Max. operating pressure.	MPa	7	
Min. operating pressure.	MPa	0.5	
Design pressure.	MPa	10.5	
Operating temp.	°C	0-70	
Weight.	Kg.	0.72	1.15

MACHINING FOR CLAMP MOUNTING.



A	31.4	34
B	M4	M5
C +0.2	36	40
D	30	35
E	23.5	26
F	16	18
G	2.5	2.5



DESIGNATION
COMPACT LINK CLAMP CYLINDER
Hydraulic (Double Acting)

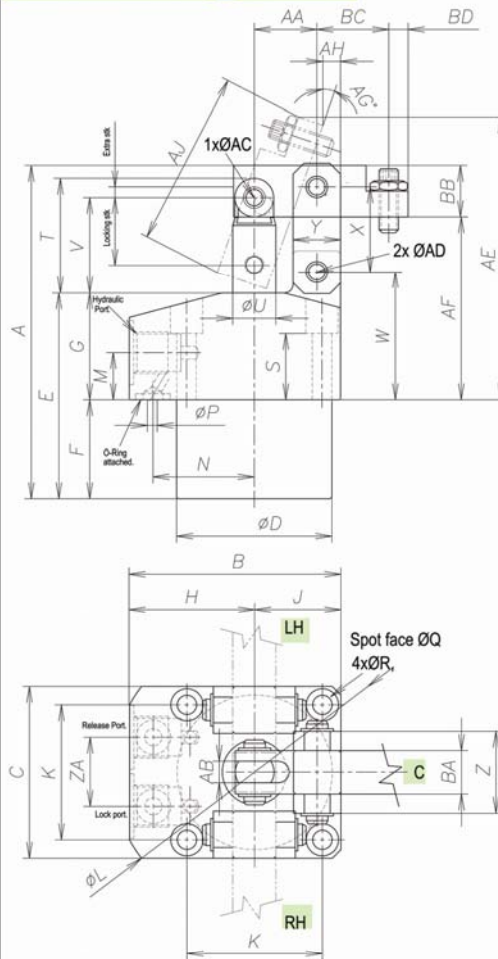
PRODUCT CODE.
0402



DESCRIPTION :

Double Acting
LH,RH & Centre Port Configurations
Chromium Plated Piston Rod
Alloy steel body
Integrated Hinge Mechanism

Flange Mounting
Min Operating Pressure : 1Mpa
Max Operating Pressure : 15Mpa
Light weight

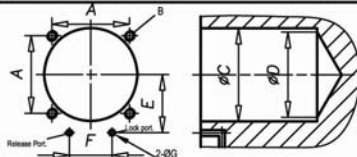


Model.	C RH LH	0402-0481	0402-0551	0402-0651	0402-0751	0402-0901	0402-1051
		0402-0482	0402-0552	0402-0652	0402-0752	0402-0902	0402-1052
		0402-0483	0402-0553	0402-0653	0402-0753	0402-0903	0402-1053
A		101	112.5	129.5	153	182	211
B		61	69	81	94.5	111	127
C		51	60	70	85	100	120
D		48	55	65	75	90	105
E		62	67	75.5	86	103	117
F		34	39	45.5	49	63	67
G		28	28	30	37	40	50
H		35.5	39	46	52	61	67
J		25.5	30	35	42.5	50	60
K		40	47	55	63	75	88
L		83	88	106	116	136	152
M		11	11	12	12	12	15
N		30	33.5	39.5	45	52.5	60
P		3	3	3	3	3	4
Q		9.5	11	11	14	17.5	20
R		5.5	6.8	6.8	9	11	14
S		17.5	15	15.5	19.5	19	24.5
T		35	37.5	45	55	65.5	77
U		14	16	18	22	28	35.5
V		29	31.5	37	45	52	62
W		34.5	35.5	39	48	52.5	64
X		26	30	35.5	43.5	52.5	64
Y		13	16	19	25	28	32
Z		21	28	37	40	49	64
ZA		22	24	30	32	37	45
Hyd. Port.		G1/8	G1/8	G1/4	G1/4	G1/4	G3/8
Link Lever.	AA	18.5	21	24.5	30	36	44
	AB	6	8	10	11	13	16
	AC	6	6	8	10	12	15
	AD	6	8	10	12	15	18
	AE	92.4	101.9	111.4	130.8	146.5	173.6
	AF	51	53.5	59	72	81	98
	AG°	18.9	19.9	20.5	21.4	22.4	23.1
	AH	4.3	4.7	4.3	4.5	5	4.1
	AJ	61.2	71.7	78.7	90.8	104.6	122.5
	BA	12	16	19	22	25	32
	BB	16	20	25	32	38	45
	BC	23.5	29	32	37.5	41.5	51
	BD	6	8	10	11	14	17

SPECIFICATIONS.

Lock cyl. area.	cm ²	7.07	9.62	15.9	23.7	33.2	44.2
Full stroke.	mm	23.5	26	29.5	35	41	49
Locking stroke.	mm	20.5	23	26.5	32	38	46
Extra stroke.	mm	3	3	3	3	3	3
Cyl. volume.	At lock. cm ³	14.5	22.13	42.14	75.85	126.2	203.35
	At release. cm ³	11.33	17.5	35.4	63.8	102.6	157.7
Max. operating pressure.	MPa	7					
Min. operating pressure.	MPa	0.5					
Design pressure.	MPa	10.5					
Operating temp.	°C	0-70					
Weight.	Kg.	1.5	1.8	2.5	4.2	6.5	10.2

MACHINING FOR CLAMP MOUNTING.



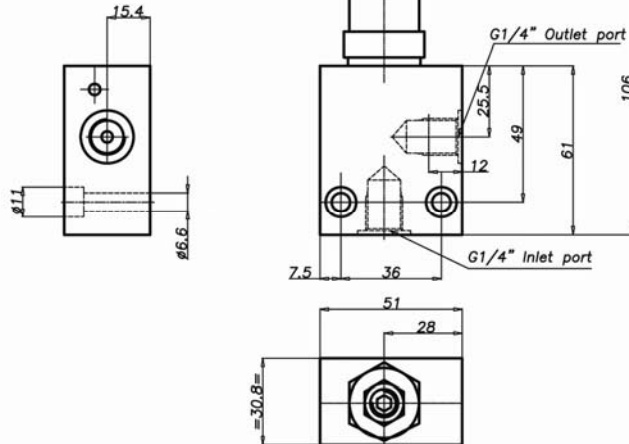
A	40	47	55	63	75	88
B	M5	M6	M6	M8	M10	M12
C+0.2	48	55	65	75	90	105
D	45	50	60	70	85	100
E	30	33.5	39.5	45	52.5	60
F	22	24	30	32	37	45
G	3	3	3	3	3	4

(Specifications subject to change)



DESIGNATION
SEQUENCE VALVE
Hydraulic (External Port)

PRODUCT CODE
0501 0101



DESCRIPTION :

Compact design
Cartridge type Insert
Space saving mounting
G $\frac{1}{4}$ Port available on manifold
Alloy steel body
External Piping Option

Min Operating Pressure : 1Mpa
Max Operating Pressure : 15Mpa

APPLICATION

Used in circuits to operate multiple actuators in a particular Pressure dependant sequence.

Used for positioning and creating delays in actuation.

Compact design allows for direct mounting on the fixture.

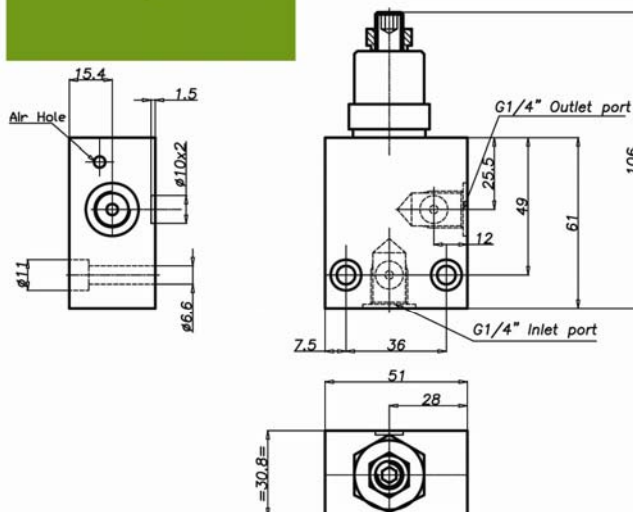
ORDERING METHOD.

PRODUCT CODE-MODEL NO.
Eq. 0501-0101.



DESIGNATION
SEQUENCE VALVE
Hydraulic (Internal Port)

PRODUCT CODE
0501 0201



DESCRIPTION :

Compact design
Cartridge type Insert
Space saving mounting
G $\frac{1}{4}$ Port available on manifold
Alloy steel body
Internal Piping Option

Min Operating Pressure : 1Mpa
Max Operating Pressure : 15Mpa

APPLICATION

Used in circuits to operate multiple actuators in a particular Pressure dependant sequence.

Used for positioning and creating delays in actuation.

Compact design allows for direct mounting on the fixture.

ORDERING METHOD.

PRODUCT CODE-MODEL NO.
Eq. 0501-0201.



DESIGNATION
FLOW CONTROL VALVE
Hydraulic (Internal Mounting)

PRODUCT CODE
0701

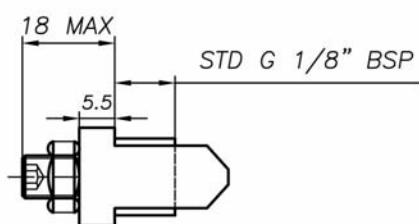
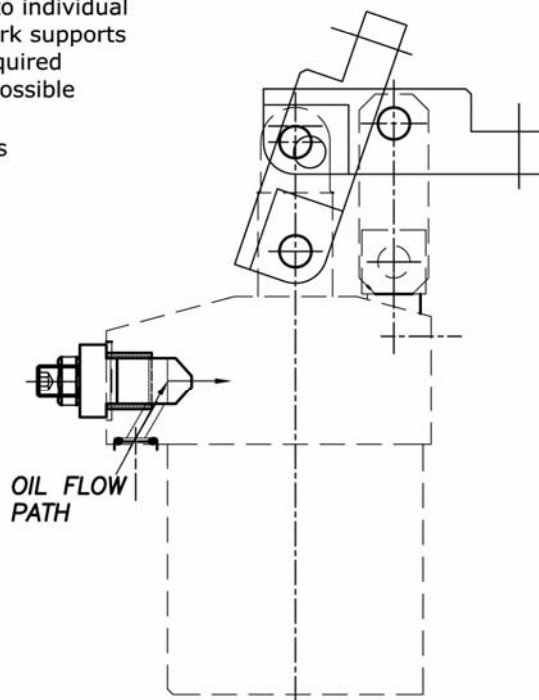


DESCRIPTION :

Compact design
Can be directly mounted on to individual elements like cylinders or work supports
No External speed control required
Easy Individual adjustment possible
Alloy steel body
Available in $G\frac{1}{8}$, $G\frac{1}{4}$, $G\frac{3}{8}$ sizes

Max Flow allowed : 10lpm

APPLICATION



ORDERING METHOD.
PRODUCT CODE-MODEL NO.
Eg. 0701-0101.



DESIGNATION
FLOW CONTROL VALVE
Hydraulic (Internal Mounting)

PRODUCT CODE
0701

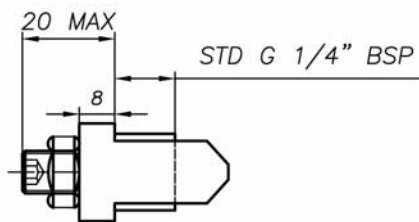
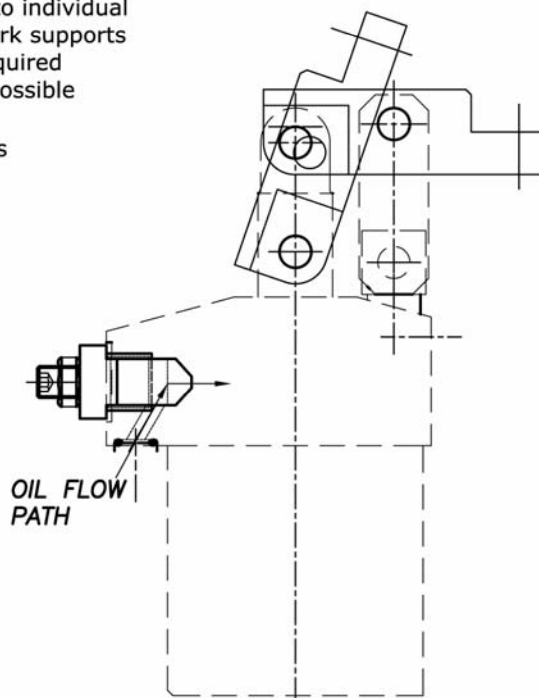


DESCRIPTION :

Compact design
Can be directly mounted on to individual elements like cylinders or work supports
No External speed control required
Easy Individual adjustment possible
Alloy steel body
Available in $G\frac{1}{8}$, $G\frac{1}{4}$, $G\frac{3}{8}$ sizes

Max Flow allowed : 10lpm

APPLICATION



ORDERING METHOD.
PRODUCT CODE-MODEL NO.
Eg. 0701-0102.



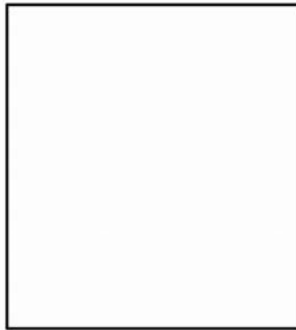
DESIGNATION
ROTARY DISTRIBUTOR
Hydraulic 4 PORT DESIGN

PRODUCT CODE
0801 0101

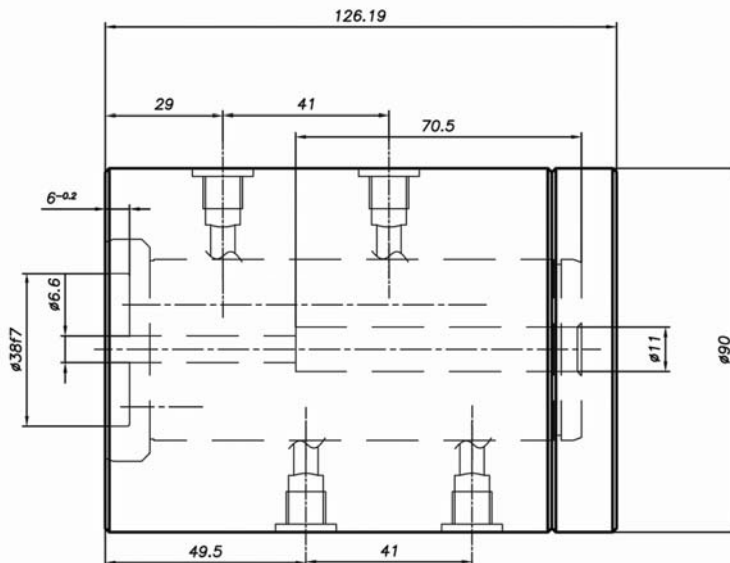
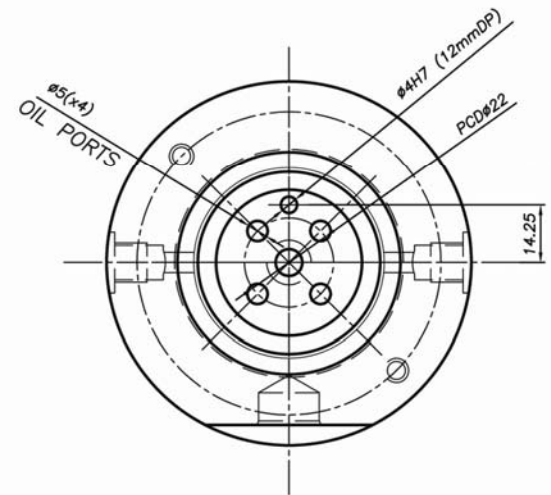
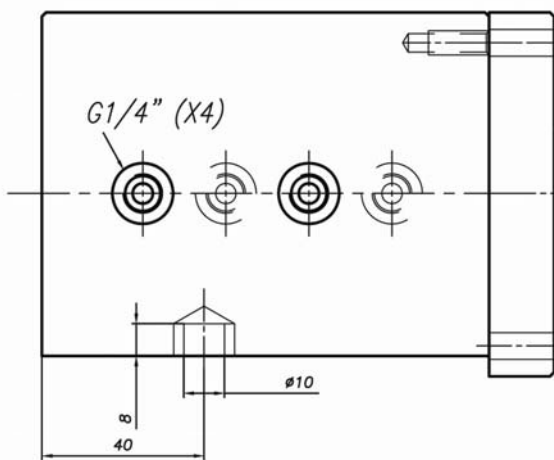
DESCRIPTION :

Compact design
Mounted through single screw from back side
4 ports available for connection
Alloy steel body
G 1/4 port available on housing

Max. flow allowed : 18lpm
Max Operating Pressure : 1-30Mpa



COVER



APPLICATION

Clamp & De Clamp oil connections
through rotating medium
Can be used for AIR & OIL connections in
parallel
Min 2 port to Max 12 port design available
CONTACT NEAREST DEALER FOR
DRAWINGS AND SPECIFICATIONS



DESIGNATION
COLLET VICE
Hydraulic (Tenon Mounting)

PRODUCT CODE
0901 0101

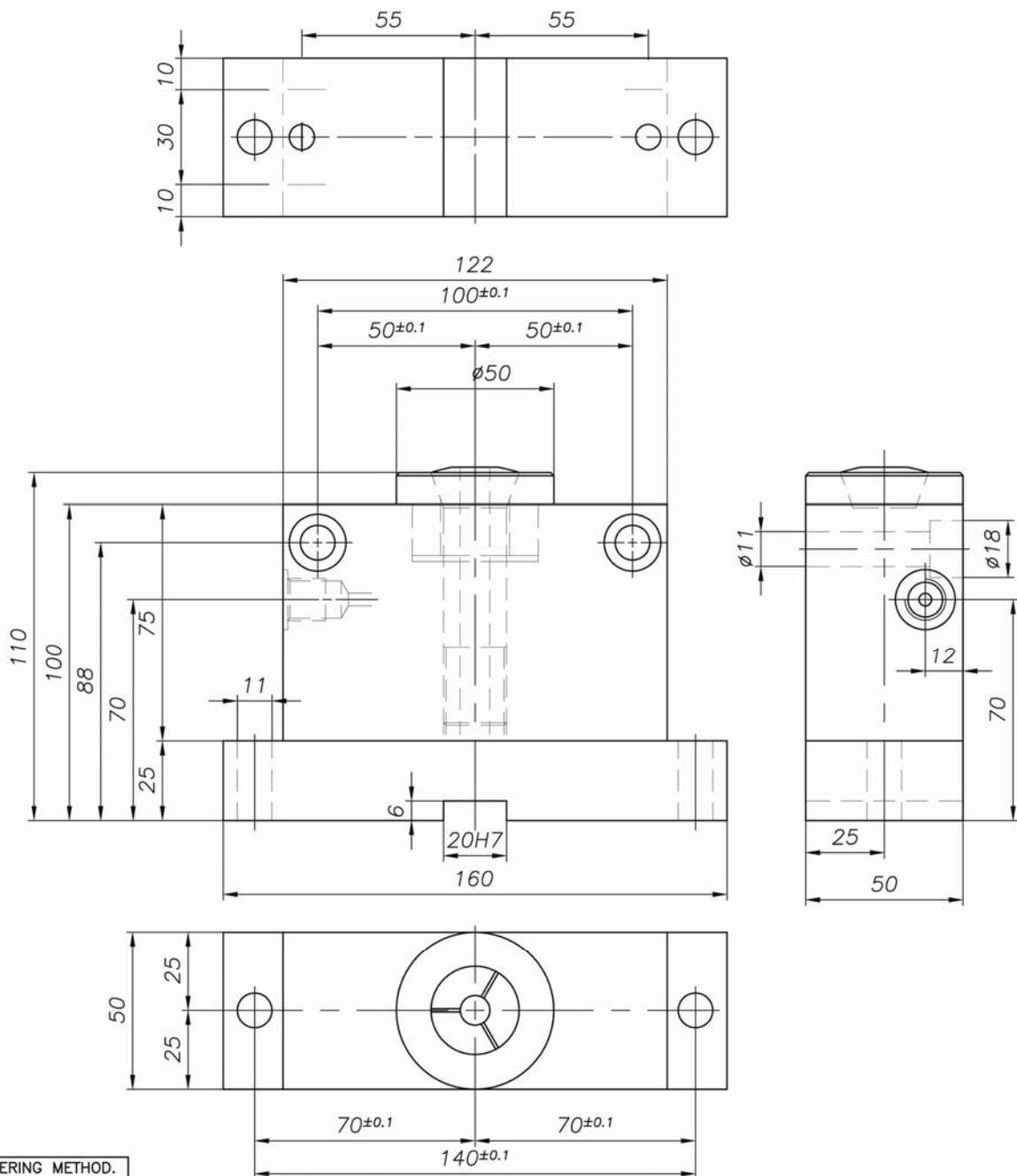


DESCRIPTION :

Max. Clamping Force, axial (kN) : 8.5
Max. Clamping Force, Radial(kN): 85
Max. Operating Pressure (Mpa) : 10
Clamping Range of Collet (mm) : $\varnothing$ 01-26
Max. Oil Flowrate (cm³/s) : 20
Max. Oil volume/clamping stroke (cm³): 1.5
Weight (kg) : 4.3

APPLICATION :

Used in circuits to clamp work pieces by Pull Down method
Can clamp a wide range of components ranging from squares to hex shaped
Compact design allows for direct mounting on the fixture, even multiple loading
Single Acting.Collet is reset by spring.



ORDERING METHOD.
PRODUCT CODE-MODEL NO.
Eg. 0901-0101.

(Specifications subject to change)

DESIGNATION
TIE ROD CYLINDER
Hydraulic

PRODUCT CODE
1001 0101

**ME5 - Head Mounting
Rectangular**



**ME6 Cap 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**



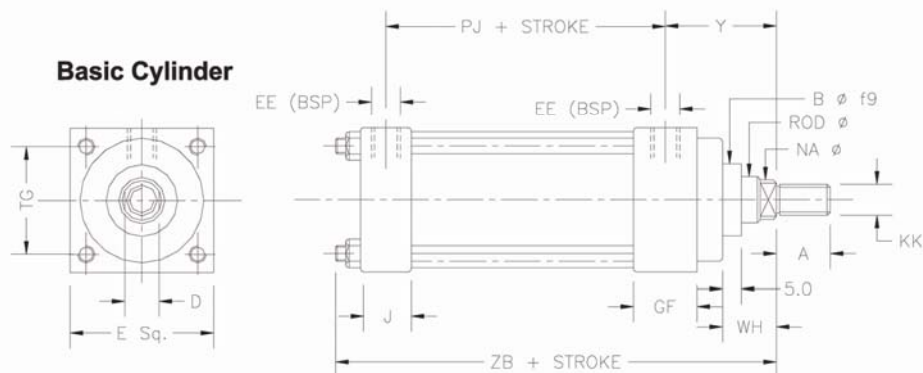
**MS2 - Mounting
with Side Lugs**



Specifications

- ◆ Max. pressure - 160 bar.
- ◆ Max reciprocating speed - 12 m/min.
- ◆ Break-away pressure - 3 to 5 bar.
- ◆ Standard cushioning length - 20 mm.
- ◆ Minimum cushioning speed - 400 mm/min or less adjustable.
- ◆ **Cushioning is available from 63 mm bore onwards only.**
- ◆ For Bronze filled teflon seals, min. speed without stick-slip - 5 mm/min.

Basic Cylinder



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	M 10 x 1.25		11	53	28.3	15	50	121
40	18	28	30	15	63	3/8"	39	30	M 14 x 1.5	M 20 x 1.5	17	73	41.7	25	62	166
50	22	36	34	18	75	1/2"	40	32	M 16 x 1.5	M 27 x 2	21	74	52.3	25	67	176
63	28	45	42	22	90	1/2"	37	32	M 20 x 1.5	M 33 x 2	26	80	64.3	32	71	185
80	36	56	50	30	115	3/4"	44	38	M 27 x 2	M 42 x 2	34	93	82.7	31	77	212
100	45	70	60	36	130	3/4"	43	38	M 33 x 2	M 48 x 2	43	101	96.9	35	82	225





DESIGNATION
TIE ROD CYLINDER
Hydraulic

PRODUCT CODE
1001 0101



APPLICATION :

Used to clamp work pieces using Push or Pull method

Can clamp a wide range of components
Can be used in assembly automation.

Design allows for direct mounting
on the application.

Various combination of endings &
Mountings are possible.

Hard Chrome Plated & Ground Piston for
improved working life

Use of International quality seals for
increased life of cylinder

FEATURES :

Min operating pressure : 0.5Mpa

Max operating pressure : 16Mpa

High finish on cylinder tube for long
seal life

All cylinders conform to ISO standards

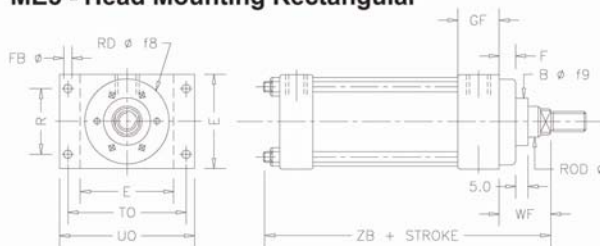
Cushioning available from Higher bore
(Ø63) only.

How to Order :

CL-(bore)x(stroke)x(rodØ)-(ending)

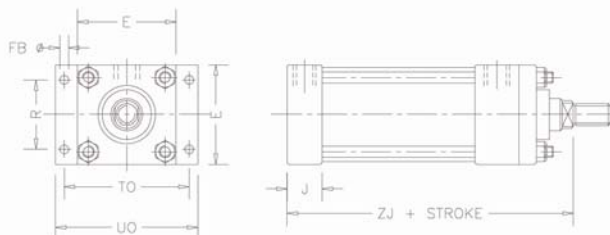
eg: CL-25x400x16-MX3

ME5 - Head Mounting Rectangular



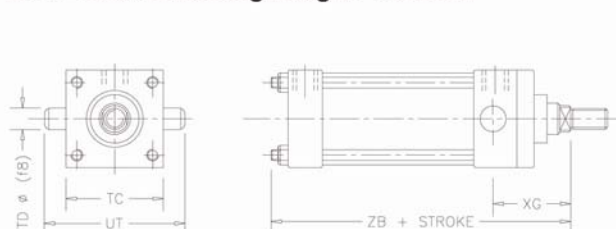
BORE	ROD	F	FB	R	RD	TO	UO	WF
25	12	10	5.5	27	38	51	65	25
40	18	28	10	41	62	87	110	35
50	22	36	16	52	74	105	130	41
63	28	45	16	65	75	88	145	48
80	36	56	20	83	82	105	180	51
100	45	70	22	97	92	125	200	57

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	T C	T D	U T	X G	Z B
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

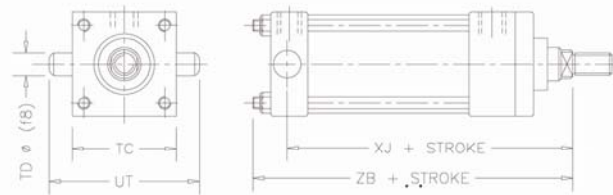


DESIGNATION
TIE ROD CYLINDER
Hydraulic

PRODUCT CODE
1001 0101

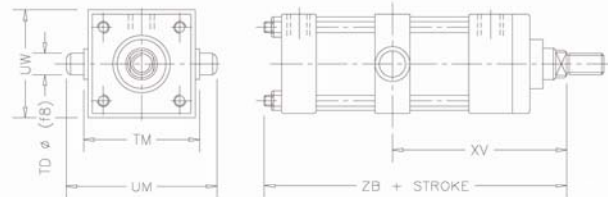
BORE	T C	T D	U T	X J	Z B
25	38	12	58	101	121
40	63	20	95	134	166
50	76	25	116	140	176
63	89	32	139	149	185
80	114	40	178	168	212
100	127	50	207	187	225

MT2- Cap Mounting Integral Trunnion



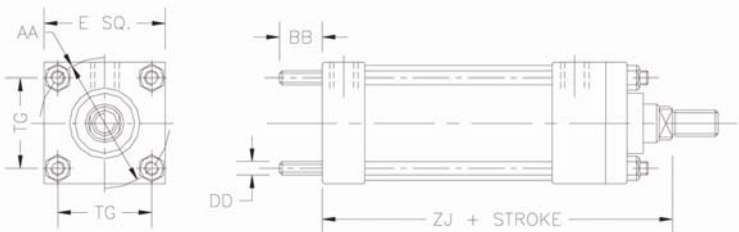
BORE	T D	T M	U M	U W	X V	Z B
25	12	48	68	63	To be specified	121
40	20	76	108	92		166
50	25	89	129	112		176
63	32	100	150	126		185
80	40	127	191	160		212
100	50	140	220	180		225

MT4- Mounting with Intermediate Fixed Trunnion



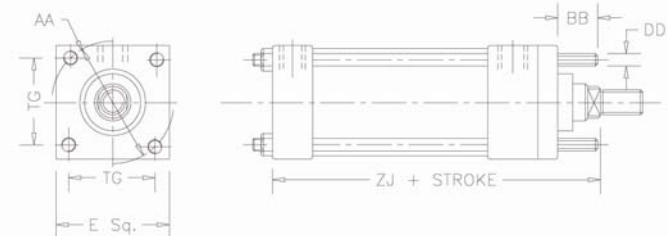
BORE	AA	BB	DD	E	TG	ZJ
25	40	19	M 5 x 0.8	40	28.3	114
40	59	35	M 8 x 1	63	41.7	153
50	74	46	M 12 x 1.25	75	52.3	159
63	91	46	M 12 x 1.25	90	64.3	168
80	117	59	M 16 x 1.5	115	82.7	190
100	137	59	M 16 x 1.5	130	96.9	203

MX2- Cap Mounting Tie Rods Extended



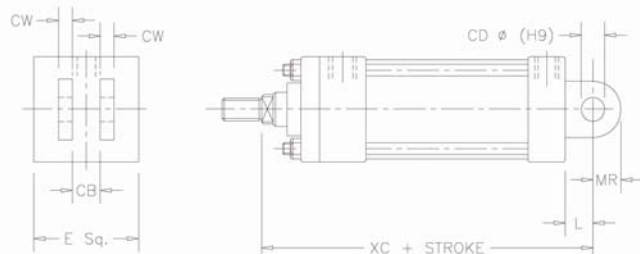
BORE	AA	BB	DD	E	TG	ZJ
25	40	19	M 5 x 0.8	40	28.3	114
40	59	35	M 8 x 1	63	41.7	153
50	74	46	M 12 x 1.25	75	52.3	159
63	91	46	M 12 x 1.25	90	64.3	168
80	117	59	M 16 x 1.5	115	82.7	190
100	137	59	M 16 x 1.5	130	96.9	203

MX3- Head Mounting Tie Rods Extended



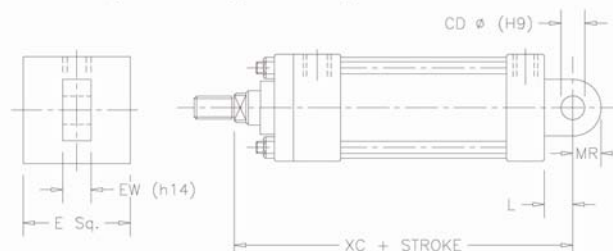
BORE	A	CB	CD	CW	E	L	MR	XC
25	14	12	10	6	40	13	12	127
40	18	28	14	10	63	19	17	172
50	22	36	20	15	75	32	29	191
63	28	45	30	20	90	32	29	200
80	36	56	40	28	115	39	34	229
100	45	63	50	36	130	54	50	257

MP1- Cap Mounting Fixed Clevis



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

MP3- Cap Mounting Fixed Eye



(Specifications subject to change)



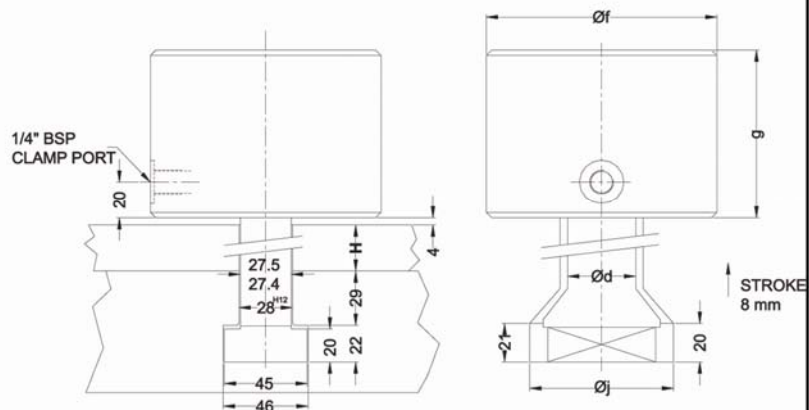
DESIGNATION

DIE CLAMP CYLINDER

SINGLE ACTING, SPRING RETURN

PRODUCT CODE

1101



PART NO.			
FORCE §	50 kN	75 kN	105 kN
ØBORE	70	80	94
d	40	40	45
g	87	87	92
f	95	105	125
j	60	74	78
H	To be specified		

Note : Force @ 200bar

Die clamping cylinder is a pull type, spring return cylinder. An integral 'T', suitable to 28 mm 'T' slot, is provided to the piston rod of the cylinder.

APPLICATION

Quick Change of Dies & Tools on Presses

OPERATION

De-Clamp the cylinders

Remove from the circuit (pneumatic / manual)

Replace the tool or die

Replace the cylinder back to original position

Clamp the cylinder

NOTES

SAFETY :

Use 2 separate cylinders for the 2 diagonals of the tool
Cylinder Stroke : 8 mm. Reserve stroke 3 mm. Clamping height of tool must be accommodated in this value.

Tolerance : 1mm

Dimension 'H' must be specified while ordering

T-slot is of DIN650 std. Please specify, if different

Specifications

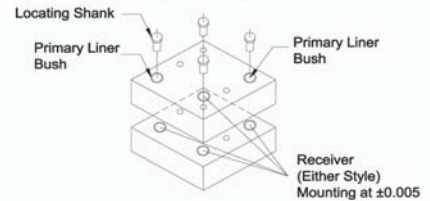
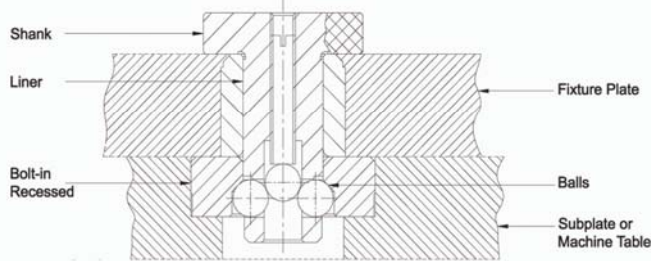
♦ Maximum operating pressure - 200 bar.



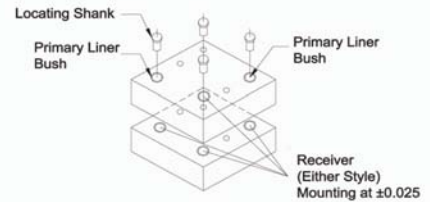
DESIGNATION
**BALL LOCK MECHANISM
MECHANICAL**

PRODUCT CODE.
1201

Application example



For Repeatability ±0.04



DESCRIPTION

Ball Lock Unit consists of

1. Shank (1no)
2. Primary / Secondary Liner (1no)
3. Receiver Bush (1no)

Ball Lock does the function of

a. Location b. Clamping

Location : 2 nos Precision Bushes & Shank combination

Clamping : Taper Seat over expanding steel ball

Application :

SMED CONCEPT IS POSSIBLE

OPERATION

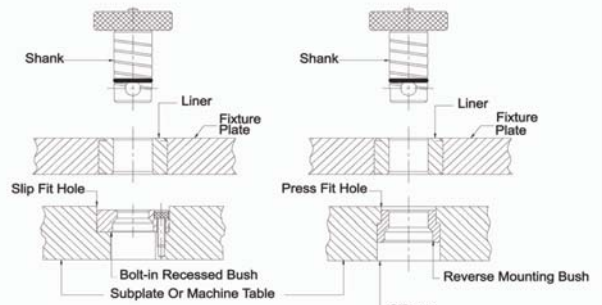
2 Nos Ball Lock for Location & Clamping of plate

2-4 nos Ball Lock for additional clamping force

Primary Liners C.D tolerance to be 0.015mm

Secondary liners C.D tolerance to be 0.05mm

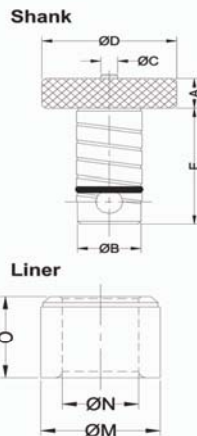
Bore Tolerance for bushes : H7



Mounting Method with
Bolt-in Recessed Bush

Mounting Method with
Reverse Mount Bush

All dimensions are in mm
Overall dimension tolerance ± 0.5 mm



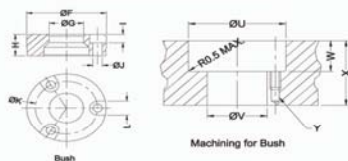
Part No.	Description	Max. Working Load (KN)	Max. Screw Torque(N-M)	Fixture Plate Thick. ± 0.05	A	Ø B	Ø C	Ø D	E
1201 0101-01	S-16 x 20	5.3	1.38	20	8	16	5	32	36.5
1201 0201-01	S-20 x 20	12.7	5.40	20	10	20	5	40	40.0
1201 0301-01	S-25 x 25	30.4	12.16	25	10	25	5	45	49.0

* Do not exceed maximum screw torque

Part No. Primary Liner	Description	Part No. Secondary Liner	Description	M	N	O -0.25 -0.50	Hole Size For Liner	
							Min.	Max
1201 0101-02	PL 16 x 20	1201 0101-03	SL 16 x 20	25	16	20	25.016	25.026
1201 0201-02	PL 20 x 20	1201 0201-03	SL 20 x 20	35	20	20	35.018	35.028
1201 0301-02	PL 25 x 25	1201 0301-03	SL 25 x 25	35	25	25	35.018	35.028

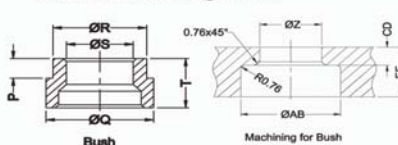
Primary Liner I.D. Is Nominal +0.005/+0.018
Secondary Liner I.D. Is Nominal + 0.025/+0.050

Bolt-in Recessed Bush



Part No.	Description	F	G	H	I	J	K	L	BORE -0.00 +0.01 U	DRILL DIA. V	DEPTH ± 0.025 W	MIN. SUBPLATE THICKNESS X	TAP Y
1201 0101-04	BB 16	37	16	11.56	4.5	4.4	29	7.6	37	16.5	11.91	20	M-4
1201 0201-04	BB 20	45	20	15.82	6.0	5.4	35	9.5	45	20.5	16.21	20	M-4
1201 0301-04	BB 25	55	25	19.94	7.0	6.4	42	11	55	25.5	20.32	25	M-5

Reverse Mounting Bush



Part No.	Description	P	Q	R	S	T	BORE -0.01 -0.00 Z	MIN. SUBPLATE THICKNESS EF	COUNTER BORE AB Ø	DEPTH ± 0.025 CD
1201 0101-05	B 16	6.81	28.6	22	16	12.1	22	20	29	7.24
1201 0201-05	B 20	6.81	32.2	28	20	17.1	28	20	33	8.74
1201 0301-05	B 25	10.27	40.2	35	25	21.0	35	25	41	10.54

(Specifications subject to change)



DESIGNATION
POWER PACKS

PRODUCT CODE
1101 0101



DESCRIPTION :

Min operating pressure : 1Mpa

Max operating pressure : 20Mpa

Fabricated tank of various capacities

Electrical panel design can be customized

All elements are of std. design & Reputed brand

Design: Gear Pump/Vane Pump/ Radial Piston Pump

Mounting: Flange mounting

Nominal voltage: 220/400 V

Power system: 3-phase AC, 50 Hz

Oil level indicator

Pressure relief valve & Return Line Filter

Temperature control (Optional)

APPLICATION :

Tank capacities available in various sizes from 10-100L

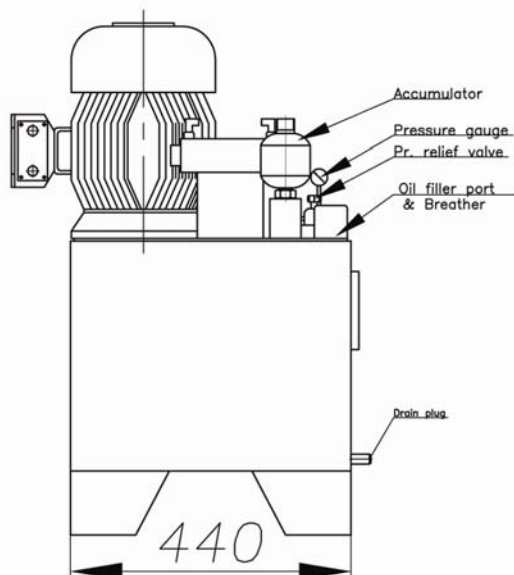
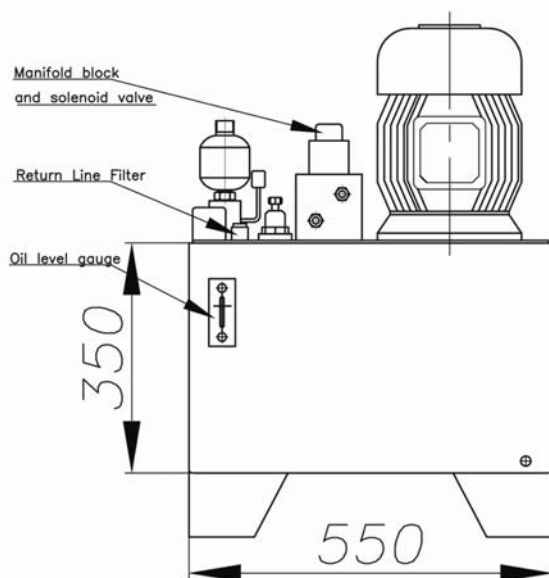
FACTOR OF SAFETY in PUMP-MOTOR ratio is high preventing overload and burn out. Can be used in assembly automation.

Manifold design is adaptable to suit 1-5 valve banks for sequential clamping.

Operating range from 5-200 bar available.

Accumulator present in case of power failure

Designed for optimal heat exchange to prevent over heating of oil and elements







CLAMPING SYSTEMS



3D modelling and Design analysis before Prototyping for reduced development cycle.

Specially designed and Made to order cylinders with Specific strokes and sizes on customer request.

Extremely Compact design and space saving mountings!

Hydraulic Testing of all clamping cylinders between 15 to 120 N/m² to assess reliability and performance.

Use of high quality seals ensures long Operating life & Leak Proof, Sustained operation .

Hydraulic units, capable of lifting, rotating,tilting and moving of work pieces.

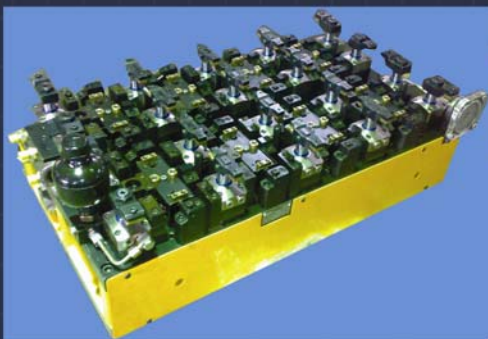
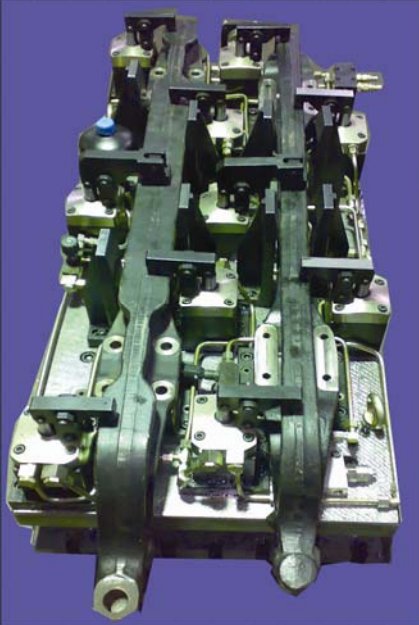
Pressing devices for riveting

A selective range of Work Supports with a range of mountings to enhance the solutions that can be offered to the customer.

Any type of linear motion or actuation is possible.

Spares & Accessories are standardised and easily available

Highly efficient Applications, Sales & Service teams



CLASYS

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