

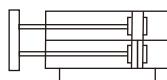
Twin-Rod cylinder——TN Series



■ Product feature

1. Enterprises standard is implemented.
2. Embedded installation and fixation mode saves the installation space.
3. It is good resistance to bending and twisting moments.
4. Mounting holes on three sides facilitates multi-position mounting.
5. Bumper in front of the barrel can adjust the stroke of cylinder and relieve impact.
6. Standard configuration of this series has magnet and the type without magnet is not available.

■ Symbol



■ Specification

Bore size(mm)	10	16	20	25	32
Acting type				Double acting	
Fluid			Air(to be filtered by 40μm filter element)		
Operating pressure			0.15~1.0MPa(22~145psi)		
Proof pressure			1.5MPa(215psi)		
Temperature □			-20~70		
Speed range mm/s			30~500		
Adjustable stroke mm			-10~0		
Stroke tolerance			$\leq 100^{+1.0}_0$	$> 100^{+1.5}_0$	
Cushion type			Bumper		
Non-rotating tolerance [Note1]	±0.4°			±0.3°	
Port size			M5×0.8		G1/8

[Note1] Retract position.

■ Standard Stroke

Bore size (mm)	Standard stroke (mm)	Max.std stroke
10	10 20 30 40 50 60 70 80 90 100	100
16	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200
20	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200
25	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200
32	10 20 30 40 50 60 70 80 90 100 125 150 175 200	200

[Note] When the stroke less than or equal to 100mm, The dimensions of non-std stroke cylinder has the same dimensions as the next longer stroke std. stroke cylinder. e.g. 35mm stroke cylinder has the same dimensions of 40 std. stroke cylinder.

Twin-Rod cylinder——TN Series

■ Ordering code

TN - 25 × 50 - S - □

① ② ③ ④ ⑤

③ Stroke

Refer to stroke table for details

④ Magnet [Note1]

S: With magnet

① Model

TN: Twin-rod cylinder (Double acting type)

② Bore size

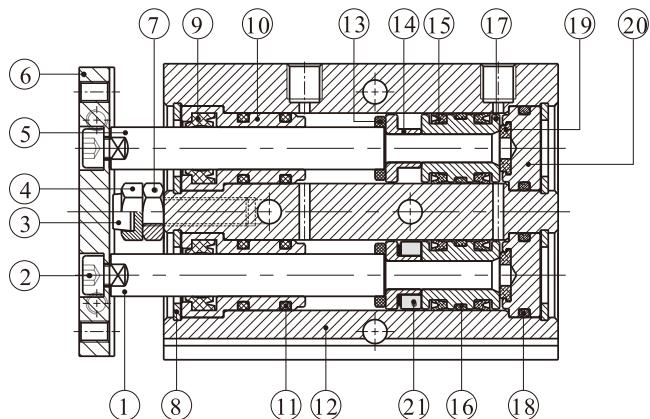
10 16 20 25 32

⑤ Thread type [Note2]

Blank: G thread

[Note1] TN Series are all with magnet. [Note2] When the thread is standard, the code is blank.

■ Inner structure and material of major parts

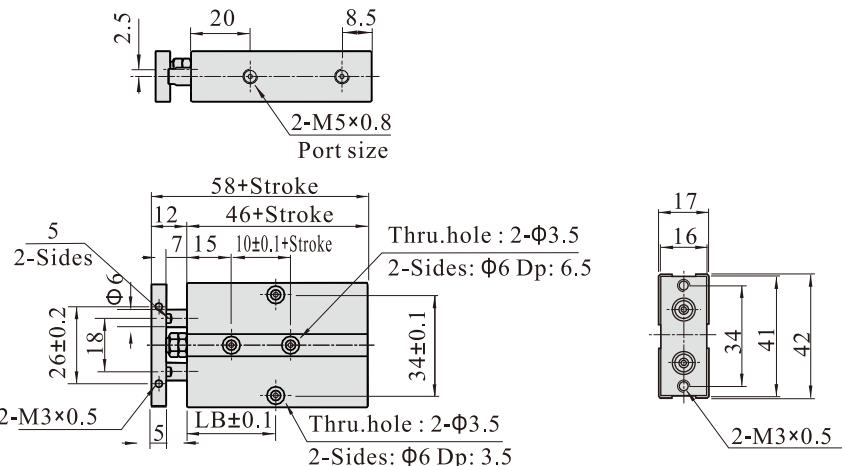


NO.	Item		Material	NO.	Item		Material
1	Piston rod B	Φ32	S45C	12	Body		Aluminum alloy
	Other		SUS304	13	Bumper		TPU
2	Screw		Carbon steel	14	Magnet holder	Φ10	SUS303
3	Bumper		POM		Other		Aluminum alloy
4	Adjustable nut		Carbon steel	15	Piston seal		NBR
5	Piston rod A		S45C	16	Wear ring		Wear resistant material
6	Fixing plate		Free cutting steel	17	Piston	Φ10	SUS303
7	Screw		Carbon steel			Other	Aluminum alloy
8	C clip		Spring steel	18	Seal ring		NBR
9	Wiper seal		NBR	19	Bumper		TPU
10	Front cover		Aluminum alloy	20	Back cover		Aluminum alloy
11	O-ring		NBR	21	Magnet		Sintered metal(Neodymium-iron-boron)

Twin-Rod cylinder——TN Series

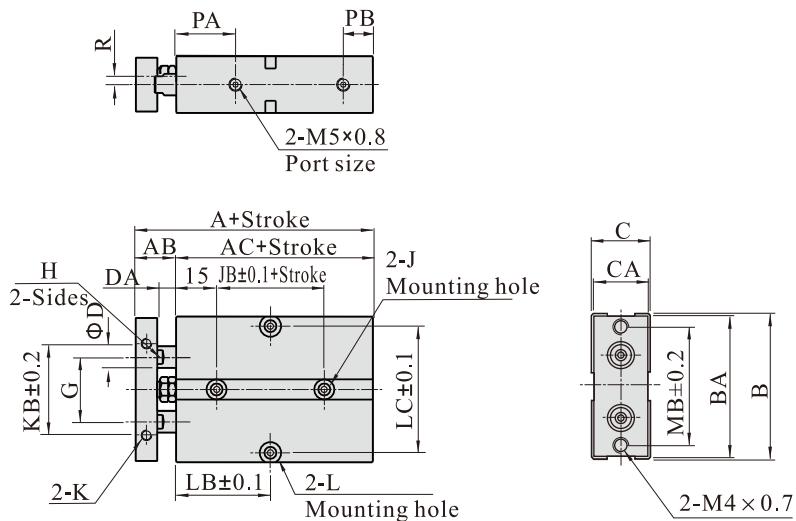
Dimensions

TN10



Item\Stroke	10	20	30	40	50	60	70	80	90	100
LB	30	30	35	40	45	50	55	60	65	70

TN16~25



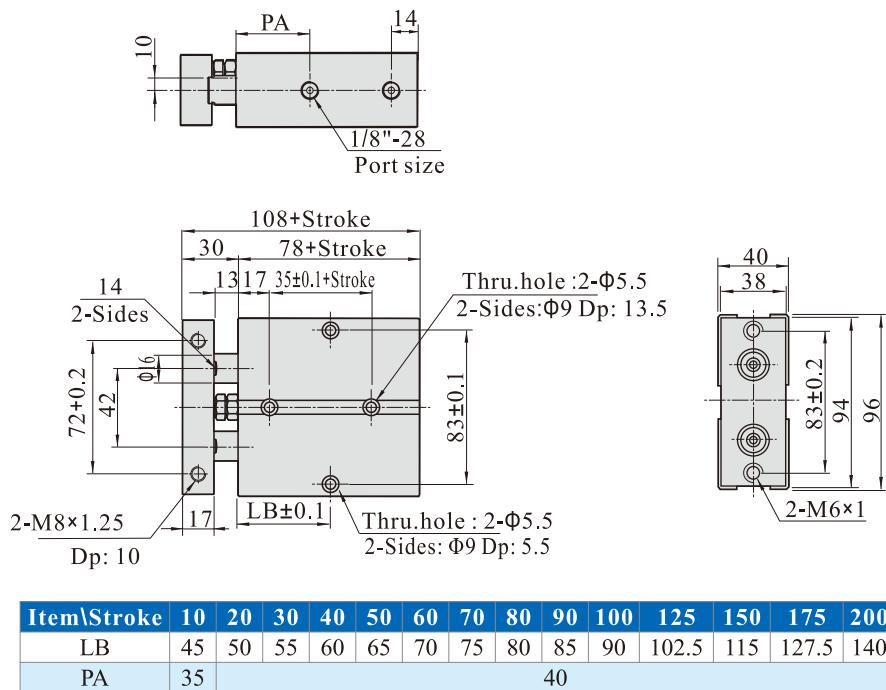
Bore size\Item	A	AB	AC	B	BA	C	CA	D	DA	G	H	J
16	68	15	53	54	53	21	20	8	7	24	6	Both sides:Φ7.5Dp:7.5 Thru.hole:Φ4.5
20	78	20	58	62	61	25	24	10	10	28	8	Both sides:Φ7.5Dp:7.5 Thru.hole:Φ4.5
25	81	19	62	73	72	30	29	12	9	34	10	Both sides:Φ7.5Dp:7.5 Thru.hole:Φ4.5

Bore size\Item	JB	K	KB	PA	PB	L	LC	MB	R
16	20	M4×0.7Dp:5	34	22	11	Both sides:Φ8Dp:4.5 Thru.hole:Φ4.5	47	47	3
20	20	M4×0.7Dp:5	44	25	12	Both sides:Φ8Dp:4.5 Thru.hole:Φ4.5	55	55	3.5
25	30	M4×0.7Dp:6	56	27	12	Both sides:Φ8Dp:4.5 Thru.hole:Φ4.5	66	66	6

Bore size\Item	LB													
Stroke≤	10	20	30	40	50	60	70	80	90	100	125	150	175	200
16	30	35	40	45	50	55	60	65	70	75	87.5	100	112.5	125
20	35	35	40	45	50	55	60	65	70	75	87.5	100	112.5	125
25	40	40	45	50	55	60	65	70	75	80	92.5	105	117.5	130

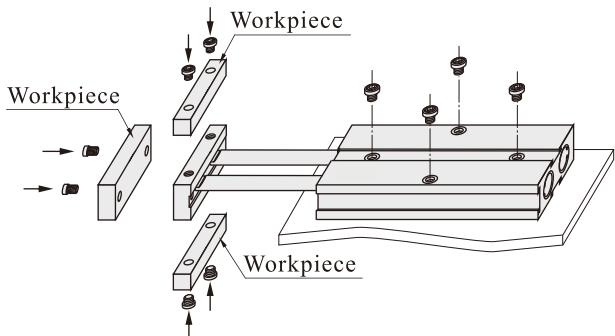
Twin-Rod cylinder——TN Series

TN32

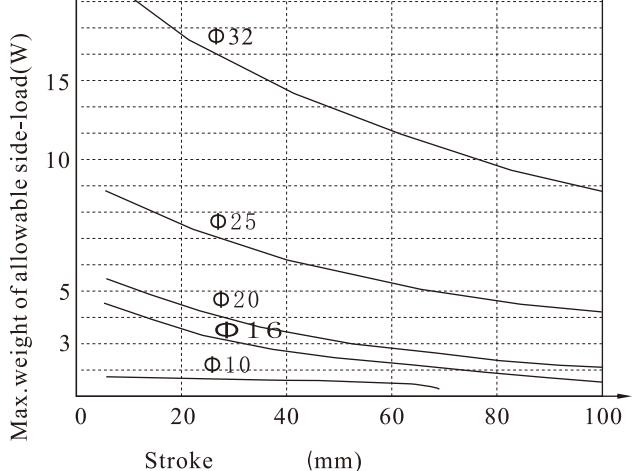
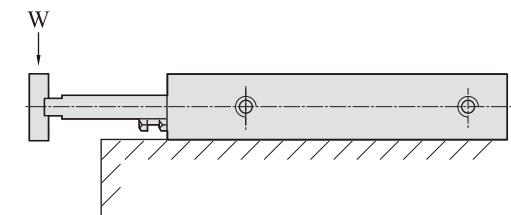


■ Installation and application

1、How to mount workpiece:



2、Max. weight of allowable side-load



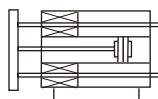
Tri-rod cylinder——TCL, TCM Series



Product feature

1. JIS standard is implemented.
2. Two guides of special bearing steel and linear bearing or bronze bearing guide are used to prevent rotating. They can bear high torque and radial load.
★Note: Steel ball linear bearing: It is suitable for elevation action of cylinder or the situation requiring high precision and high bearing ability, especially for the situation requiring low friction action process.
Bronze sliding bearing: it is suitable for the action that has radial load resistance. Compared with normal cylinder of same use, the horizontal impact resistance is doubled and it has stronger torsion rigidity.
3. Drive unit and guide unit are in the same barrel that no additional accessories are needed with minimal space required.
The air intake is optional and it is convenient to install.
4. The bottom, back side and fixing plate of main body respectively has two exact orientation orifices (See ΦPA orifice and the orifice in XX point), which can provide orientation installation with high precision for the special situation.
5. Options of switch mounting with provision 4 mounting slots.
6. Special design of main body provides multi-mount;

Symbol



Specification

Bore size(mm)	6	10	12	16	20	25	32	40	50	63	80	100										
Acting type	Double acting																					
Fluid	Air(to be filtered by 40μm filter element)																					
Operating pressure	0.15~0.7MPa(22~100psi) 0.15~1.0MPa(22~145psi)																					
Proof pressure	1.2MPa(175psi) 1.5MPa(215psi)																					
Temperature °C	-20~70																					
Speed range mm/s	50~500		30~500		50~400																	
Stroke tolerance	$\leq 100^{+1,0}_0$ $> 100^{+1,5}_0$																					
Cushion type	Bumper																					
Non-rotating tolerance [Note1]	TCL	-	$\pm 0.08^\circ$	$\pm 0.07^\circ$	$\pm 0.06^\circ$	$\pm 0.05^\circ$	$\pm 0.04^\circ$															
[Note2]	TCM	$\pm 0.1^\circ$	$\pm 0.10^\circ$	$\pm 0.09^\circ$	$\pm 0.08^\circ$	$\pm 0.06^\circ$	$\pm 0.05^\circ$															
Port size [Note2]	M3×0.5		M5×0.8	1/8"		1/4"	3/8"															

[Note1] Retract position.

[Note2] PT thread, G thread and NPT thread are available.

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Max.std stroke
6	5 10 15 20	20
10	5 10 15 20 25 30	30
12	10 20 25 30 40 50 60 70 75 80 90 100 125 150	150
16	10 20 25 30 40 50 60 70 75 80 90 100 125 150 175 200	200
20 25	20 25 30 40 50 60 70 75 80 90 100 125 150 175 200 225 250	250
32 40 50 63	25 30 40 50 60 70 75 80 90 100 125 150 175 200 225 250	250
80 100	25 30 40 50 60 70 75 80 90 100 125 150 175 200 225 250	250

[Note] When the discrepancy between non-standard stroke and standard stroke is 1~5mm, The dimensions of non-std stroke cylinder has the same dimensions as the next longer stroke std. stroke cylinder. e.g. 86mm stroke cylinder has the same dimensions of 90 std. stroke cylinder. But 84mm stroke cylinder should be ordered by non-standard stroke.

Tri-rod cylinder——TCL, TCM Series

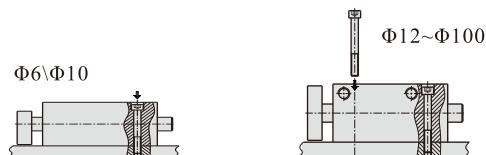
Ordering code

TC	M	50×50	S	□	③Bore size	Bearing type
①	②	③	④	⑤	6, 10 10 12, 16, 20, 25, 32, 40 50, 63, 80, 100	M: Bronze bearing L: Linear bearing M: Bronze bearing
⑥						
① Model TC: Tri-rod cylinder (Double acting type)	② Bearing type M: Bronze bearing L: Linear bearing M: Bronze bearing	④ Stroke Refer to stroke table for details				
⑤ Magnet [Note1] S: With magnet	⑥ Thread type [Note 2] Blank: PT G: G T: NPT					

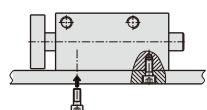
[Note1] TC Series are all with magnet.
 [Note2] When the thread is standard, the code is blank.

How to mount

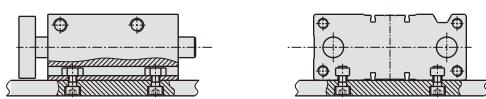
Fixation of screw on top surface(Φ6~Φ100)



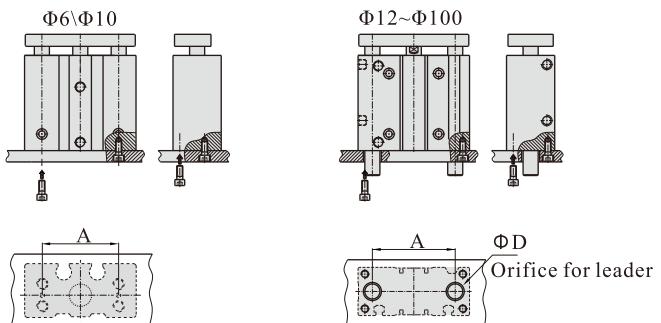
Fixation of screw at bottom surface(Φ12~Φ100)



Fixation of T slot at bottom(Φ12~Φ100)

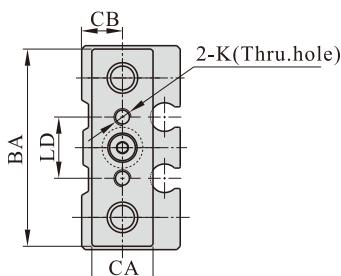
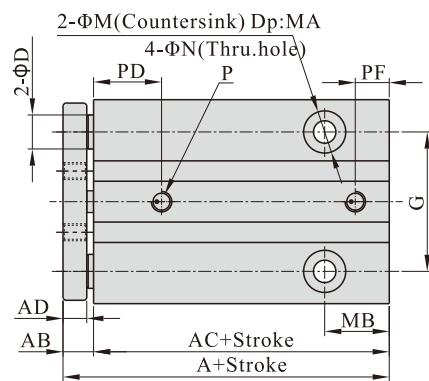
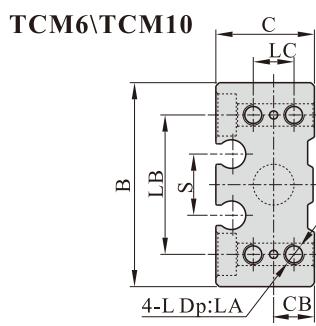


Fixation of screw at back side(Φ6~Φ100)



Bore size\Item	6	10	12	16	20	25	32	40	50	63	80	100
A	20.5	23	41	46	54	64	78	86	110	124	156	188
D	TCM	X	X	10	12	13	20					
(Min)	TCL	—	—	8	10	10	13	20	20	20	20	30

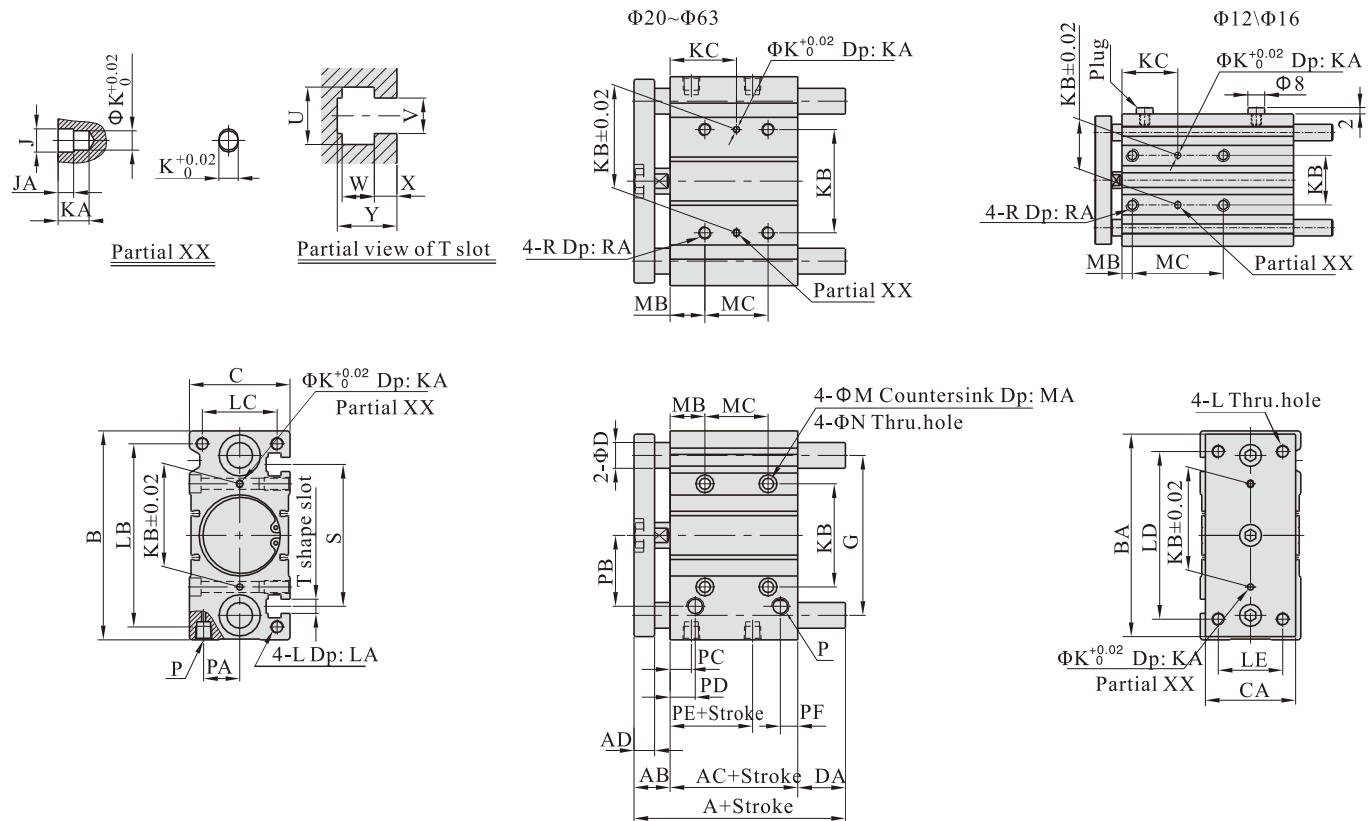
Dimensions



Bore size\Item	A	AB	AC	AD	B	BA	C	CA	CB	D	G	K	L	LA	LB	LC	LD	M	MA	MB	N	P	PD	PF
6	29.5	6	23.5	5	30	29	14.5	9	6	5	20.5	M2.5X0.45	M3X0.5	5	20.5	6	9	6	3	9.5	3.5	M3X0.5	9.5	5.5
10	32	6	26	5	34	33	18	10	7.5	6	23	M3X0.5	M4X0.7	5	23	8	11	8	4	8.5	4.5	M3X0.5	11.5	5

Tri-rod cylinder——TCL, TCM Series

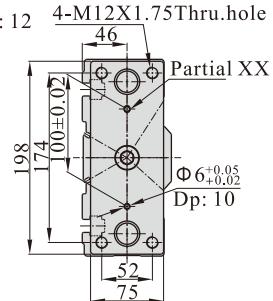
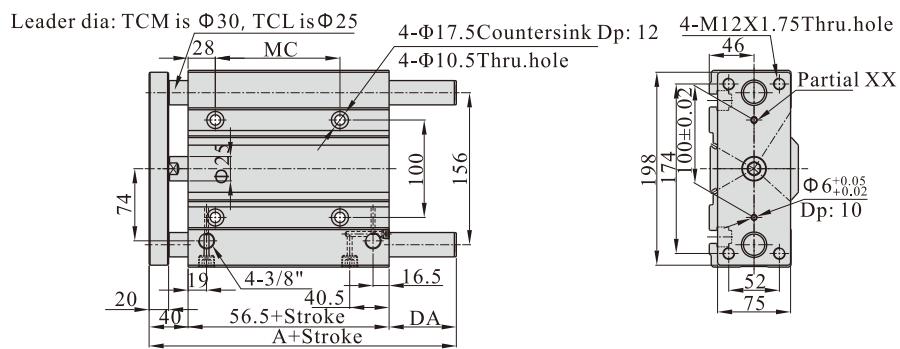
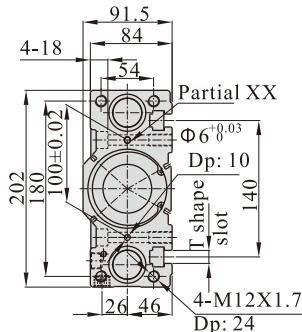
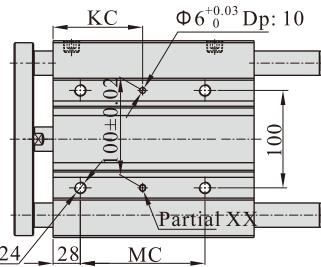
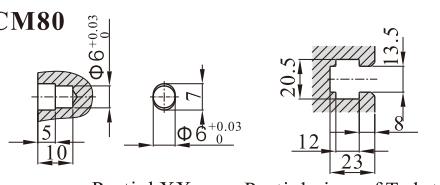
TCL/TCM12~63



Bore size\Item	A				DA								MC				KC				
	TCL	TCM	TCL	TCM	TCL				TCM				MC				KC				
Stroke	≤30	≤50	31(51)~100	101~200	>200	≤30	31~100	101~200	>200	≤50	51~100	101~200	>200	≤30	31~100	101~200	>200	≤30	31~100	101~200	>200
12	42	55	85	—	0	13	43	—	0	13	43	—	20	40	110	—	15	25	60	—	
16	46	65	95	—	0	19	49	—	0	19	49	—	24	44	110	—	17	27	60	—	
20	53	80	104	122	0	27	51	69	0	27	51	69	24	44	120	200	29	39	77	117	
25	53.5	82	104.5	122	0	28.5	51	68.5	0	28.5	51	68.5	24	44	120	200	29	39	77	117	
Stroke	≤50	≤50	51~100	101~200	>200	≤50	51~100	101~200	>200	≤50	51~100	101~200	>200	≤40	41~100	101~200	>200	≤40	41~100	101~200	>200
32	65	78	102	118	140	5.5	42.5	58.5	80.5	18.5	42.5	58.5	80.5	24	48	124	200	33	45	83	121
40	66	78	102	118	140	0	36	52	74	12	36	52	74	24	48	124	200	34	46	84	122
50	76	89	118	134	161	4	46	62	89	17	46	62	89	24	48	124	200	36	48	86	124
63	77	89	118	134	161	0	41	57	84	12	41	57	84	28	52	128	200	38	50	88	124
Bore size\Item	AB	AC	AD	B	BA	C	CA	D(TCL)	D(TCM)	G	J	JA	K	KA	KB	L	LA	LB	LC	LD	
12	13	29	8	58	56	26	22	6	8	41	3.5	3	3	6	23	M4×0.7	10	50	18	48	
16	13	33	8	64	62	30	25	8	10	46	3.5	3	3	6	24	M5×0.8	12	56	22	54	
20	16	37	10	83	81	36	30	10	12	54	3.5	3	3	6	28	M5×0.8	13	72	24	70	
25	16	37.5	10	93	91	42	38	12	16	64	4.5	3	4	6	34	M6×1.0	15	82	30	78	
32	22	37.5	12	112	110	48	44	16	20	78	4.5	3	4	6	42	M8×1.25	20	98	34	96	
40	22	44	12	120	118	54	44	16	20	86	4.5	3	4	6	50	M8×1.25	20	106	40	104	
50	28	44	16	148	146	64	60	20	20	110	6	4	5	8	66	M10×1.5	22	130	46	130	
63	28	49	16	162	158	78	70	20	20	124	6	4	5	8	80	M10×1.5	22	142	58	130	
Bore size\Item	LE	M	MA	MB	N	P	PA	PB	PC	PD	PE	PF	R	RA	S	U	V	W	X	Y	
12	14	8	4.5	5	4.5	M5×0.8	8	18	11	11	13	7.5	M5×0.8	12	37	7.5	4.5	4	2	6.5	
16	16	8	4.5	5	4.5	M5×0.8	10	19	11	11	15	8	M5×0.8	10	38	7.5	4.5	4	2.5	7	
20	18	9.5	5.5	17	5.5	1/8"	10.5	25	10.5	10.5	12.5	9	M6×1.0	12	44	8.5	5.5	4.5	3	8	
25	26	9.5	5.5	17	5.5	1/8"	13.5	28.5	11.5	11.5	12.5	9	M6×1.0	12	50	8.5	5.5	4.5	3	8.5	
32	30	11	7.5	21	6.5	1/8"	16	34	12.5	12.5	7	9	M8×1.25	16	63	10.5	6.5	5.5	3.5	9.5	
40	30	11	7.5	22	6.5	1/8"	18	38	14	14	13	10	M8×1.25	16	72	10.5	6.5	5.5	4	11	
50	40	14	9	24	8.5	1/4"	21.5	47	12	14	9	11	M10×1.5	20	92	13.5	8.5	7.5	4.5	13.5	
63	50	14	9	24	8.5	1/4"	28	55	16.5	16.5	14	13.5	M10×1.5	20	110	18	11	10	7	18.5	

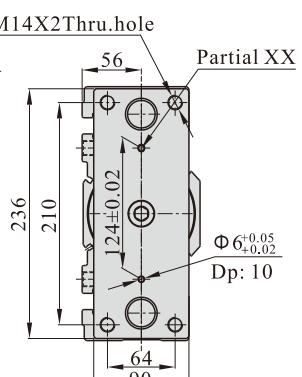
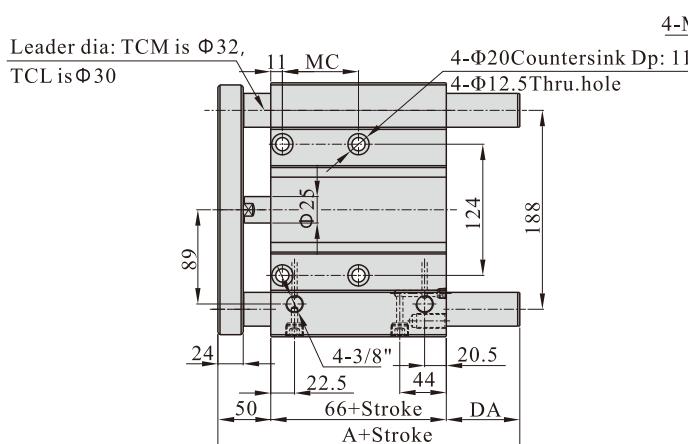
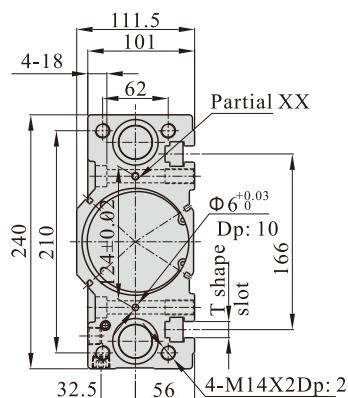
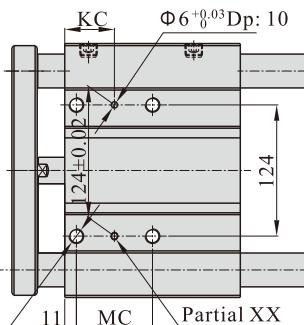
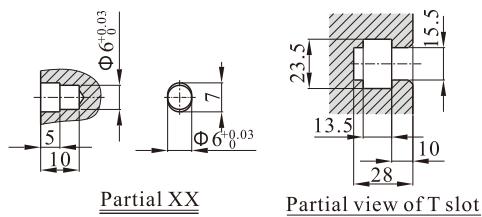
Tri-rod cylinder—TCL, TCM Series

TCL/TCM80



Item\Stroke	25	30	40	50	60	70	75	80	100	125	150	175	200	225	250
A		TCM=112.5/TCL=106.5						165.5					187.5		
DA		TCM=16/TCL=10						69					91		
KC		42				54				92			128		
MC		28				52				128			200		

TCL/TCM100



Item\Stroke	25	30	40	50	60	70	75	80	100	125	150	175	200	225	250
A				TCM=128/TCL=122				186				208			
DA				TCM=12/TCL=6				70				92			
KC		35				47				85			121		
MC		48				72				148			220		

Tri-rod cylinder——TCL, TCM Series

Safe load and torque

Bore size	Type	Stroke(mm)																			
		5	10	15	20	25	30	40	50	60	70	75	80	90	100	125	150	175	200	225	250
Max. safe load		Unit: Newton(N)																			
		 																			
6	TCM	0.4	0.3	0.18	0.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	TCM	1.5	1.2	0.8	0.5	0.25	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	TCM	-	3	-	3	3	3	3	3	3	3	3	3	3	3	2	2	-	-	-	
	TCL	-	2	-	2	2	2	2	2	2	1	1	1	1	1	1	1	-	-	-	
16	TCM	-	7	-	7	7	7	7	7	7	7	7	7	7	6	6	6	5	5	-	
	TCL	-	4	-	4	4	4	4	4	4	3	3	3	3	3	3	3	3	2	-	
20	TCM	-	-	-	14	14	14	13	12	12	12	12	12	12	11	10	10	9	8	7	
	TCL	-	-	-	7	7	7	7	6	6	6	6	6	6	5	5	5	5	4	4	
25	TCM	-	-	-	20	20	20	18	16	19	19	19	19	19	18	17	16	15	14	13	
	TCL	-	-	-	10	10	10	9	8	10	10	10	10	10	9	8	8	7	7	7	
32	TCM	-	-	-	-	37	37	37	36	35	35	34	34	34	33	33	31	29	27	26	24
	TCL	-	-	-	-	19	19	19	18	17	17	17	17	17	16	15	15	14	13	12	
40	TCM	-	-	-	-	37	37	37	36	35	35	34	34	34	33	33	31	29	27	26	24
	TCL	-	-	-	-	19	19	19	18	17	17	17	17	17	16	15	15	14	13	12	
50	TCM	-	-	-	-	140	130	120	105	165	160	155	155	150	145	130	115	100	80	70	60
	TCL	-	-	-	-	70	65	60	50	80	80	75	75	75	70	65	55	50	40	35	30
63	TCM	-	-	-	-	140	130	120	105	165	160	155	155	150	145	130	115	100	80	70	60
	TCL	-	-	-	-	70	65	60	50	80	80	75	75	75	70	65	55	50	40	35	30
80	TCM	-	-	-	-	220	210	200	190	180	220	210	205	195	185	165	155	135	120	105	80
	TCL	-	-	-	-	110	105	100	95	90	110	105	100	100	95	85	80	70	60	55	40
100	TCM	-	-	-	-	280	265	250	235	220	280	270	260	250	240	230	210	180	160	140	120
	TCL	-	-	-	-	140	130	125	120	110	140	135	130	125	120	115	105	90	80	70	60
Max. safe torque		Unit: Newton · Meter(N · m)																			
																					
6	TCM	0.008	0.007	0.006	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	TCM	0.045	0.039	0.033	0.028	0.024	0.021	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	TCM	-	0.90	-	0.79	0.71	0.65	0.77	0.72	0.65	0.53	0.50	0.47	0.41	0.36	0.31	0.27	-	-	-	
	TCL	-	0.61	-	0.45	0.40	0.35	0.58	0.50	0.44	0.39	0.37	0.35	0.32	0.29	0.24	0.20	-	-	-	
16	TCM	-	1.21	-	1.04	0.94	0.88	1.23	1.11	0.99	0.72	0.69	0.65	0.61	0.58	0.50	0.44	0.40	0.36	-	
	TCL	-	0.99	-	0.74	0.66	0.59	0.99	0.86	0.77	0.69	0.65	0.61	0.57	0.52	0.43	0.37	0.32	0.28	-	
20	TCM	-	-	-	1.57	1.42	1.31	2.39	2.15	1.97	1.90	1.88	1.86	1.72	1.63	1.44	1.28	1.16	1.06	1.01	0.90
	TCL	-	-	-	1.26	1.14	1.03	2.17	1.94	1.79	1.59	1.52	1.46	1.33	1.25	1.34	1.17	1.03	0.93	0.88	0.76
25	TCM	-	-	-	2.40	2.22	2.01	3.66	3.35	3.17	3.06	2.96	2.91	2.77	2.57	2.26	2.02	1.83	1.67	1.57	1.42
	TCL	-	-	-	2.11	1.96	1.75	3.37	3.02	2.71	2.42	2.38	2.33	2.19	1.97	2.05	1.78	1.58	1.41	1.22	1.16
32	TCM	-	-	-	-	6.35	6.00	5.73	5.13	5.98	5.74	5.69	5.62	5.11	4.97	4.42	3.98	3.61	3.31	2.97	2.84
	TCL	-	-	-	-	5.95	5.73	5.44	4.89	5.43	5.15	5.11	5.02	4.70	4.51	6.34	5.79	5.33	4.93	4.33	4.29
40	TCM	-	-	-	-	7.00	6.60	6.11	5.66	6.66	6.31	6.27	6.23	5.86	5.48	4.78	4.38	3.98	3.65	3.34	3.13
	TCL	-	-	-	-	6.55	6.21	5.77	5.39	6.17	5.67	5.62	5.58	5.33	4.96	6.98	6.38	5.87	5.43	5.00	4.72
50	TCM	-	-	-	-	13.00	12.60	11.00	10.80	13.70	12.70	12.00	11.80	11.10	10.80	9.50	8.60	7.86	7.24	6.80	6.24
	TCL	-	-	-	-	9.17	8.75	8.30	7.62	10.30	9.94	9.83	9.77	8.82	8.74	11.60	10.70	9.83	9.12	8.95	7.95
63	TCM	-	-	-	-	14.70	13.60	12.90	12.10	19.40	16.20	13.50	12.70	12.10	11.90	10.70	9.69	8.86	8.16	7.52	7.04
	TCL	-	-	-	-	10.20	9.74	9.20	8.48	17.50	14.00	11.00	10.60	10.20	9.74	13.00	11.90	11.00	10.20	9.63	8.84
80	TCM	-	-	-	-	21.9	20.8	19.7	18.6	15.8	24	22.9	21.7	21	20.5	18.6	17	15.6	14.5	13.5	12.6
	TCL	-	-	-	-	15.1	14.3	13.6	12.9	12.2	23.8	22.7	21.6	21	20.6	18.9	17.3	16	14.8	13.5	12.9
100	TCM	-	-	-	-	38.8	36.8	35.0	33.5	28.5	39.4	37.5	35.6	34.5	33.8	30.9	28.4	26.2	24.4	22.5	21.4
	TCL	-	-	-	-	27.1	25.7	24.4	30.6	26	39.8	37.9	36	35.2	34.6	31.8	29.3	27.2	25.3	23.5	22.1

Plate cylinder——MU Series

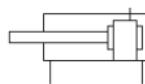


Specifications

Bore size (mm)	25	32	40	50	63
Action	Double acting, Single rod				
Fluid	Air				
Proof pressure	1.05 MPa				
Maximum operating pressure	0.7 MPa				
Minimum operating pressure	0.05 MPa				
Ambient and fluid temperature	−10 to 60°C				
Lubrication	Not required (Non-lube)				
Piston speed	50 to 500 mm/s				
Stroke length tolerance	^{+1.4} ₀				
Cushion	Rubber bumper				
Mounting	Foot, Rod flange, Head flange, Single clevis, Double clevis				
Rod end configuration	Rod end male thread, Rod end female thread				
Allowable rotational torque	0.25 N·m	0.55 N·m	1.25 N·m	2.0 N·m	
Rod non-rotating accuracy	±1°	±0.8°			±0.5°

Symbol

Rubber bumper (Oval piston)



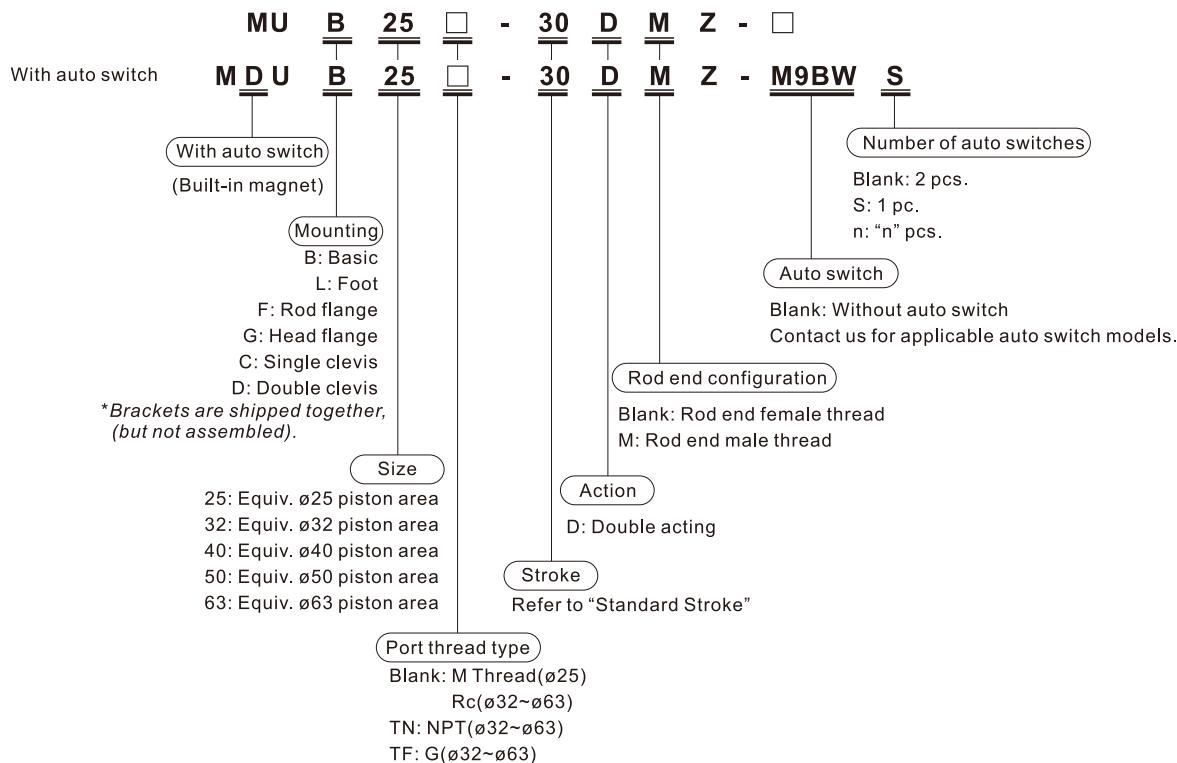
Standard Stroke

Bore size (mm)	Standard stroke (mm)	Maximum manufacturable stroke
25,32,40 50,63	5, 10, 15, 20, 25, 30, 35, 40, 45, 50 75, 100, 125, 150, 175, 200, 250, 300	300

*Other intermediate strokes can be manufactured upon receipt of order. Please contact us.

**Strokes longer than 300 mm are not available.

Ordering Code



Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.

(Example) MDUL32-30DZ

Accessory (Option)

For details about the single knuckle joint, double knuckle joint, clevis pin, and knuckle pin, please contact us.

Plate cylinder——MU Series

Mounting Bracket/Part No.

Mounting bracket\Bore size	25	32	40	50	63
Foot ^{Note 1)}	MU-L02	MU-L03	MU-L04	MU-L05	MU-L06
Flange	MU-F02	MU-F03	MU-F04	MU-F05	MU-F06
Single clevis	MU-C02	MU-C03	MU-C05	MU-C05	MU-C06
Double clevis ^{Note 3)}	MU-D02	MU-D03	MU-D04	MU-D05	MU-D06

Note 1) When ordering foot bracket, order 2 pieces per cylinder.

Note 2) Accessories for each mounting bracket are as follows.

Foot/Flange/Single clevis: Body mounting bolt

Double clevis: Clevis pin, Type C retaining ring for axis, Body mounting bolt

Note 3) Clevis pin and retaining ring are shipped together with double clevis.

Note 4) The tightening torque for body mounting bolts is shown in the below table.

Note 5) The application of a locking agent

(Example: Loctite 242) to body mounting bolts is recommended.

Recommended Tightening Torque for Mounting Bracket on Body

Bore size	Thread size	Tightening torque (N·m)
MU25	M5X0.8	4.9 to 5.9
MU32	M6X1	8.28 to 10.12
MU40	M8X1.25	19.8 to 24.2
MU50	M10X1.5	39.6 to 48.4
MU63	M12X1.75	68.4 to 83.6



Theoretical Output

Bore size	Rod size	Operating direction	Piston area (mm²)	(N)					
				0.2	0.3	0.4	0.5	0.6	0.7
25	12	OUT	491	98	147	196	246	295	344
		IN	378	76	113	151	189	227	265
32	14	OUT	804	161	241	322	402	482	563
		IN	650	130	195	260	325	390	455
40	16	OUT	1257	251	377	503	629	754	880
		IN	1056	211	317	422	528	634	739
50	20	OUT	1963	393	589	785	982	1178	1374
		IN	1946	330	495	660	824	989	1154
63	20	OUT	3117	623	935	1247	1559	1870	2182
		IN	2803	561	841	1121	1402	1682	1962

Weight

Bore size		25	32	40	50	63
Basic weight	Basic	0.17	0.27	0.39	0.75	1.16
	Foot	0.24	0.41	0.60	1.09	1.79
	Flange/Rod end, Head end	0.27	0.41	0.52	1.21	1.99
	Single clevis	0.23	0.39	0.61	1.15	1.84
	Double clevis (With pin)	0.24	0.43	0.65	1.22	1.92
Additional weight per each 50 mm of stroke		0.09	0.14	0.19	0.28	0.38
Mounting bracket weight	Single clevis (Double clevis pivot bracket)	0.06	0.12	0.22	0.40	0.68
	Double clevis (With pin) (Single clevis pivot bracket)	0.07	0.16	0.26	0.47	0.76
	Single knuckle joint	0.03	0.04	0.07	0.16	0.16
	Double knuckle joint (With pin)	0.05	0.09	0.14	0.29	0.29

Additional Weight

Bore size		25	32	40	50	63
Rod end male thread	Male thread	12	23	27	53	53
	Nut	8	10	17	32	32

Note) Weight of single clevis and double clevis includes 2 bolts for mounting bracket.

Calculation:

(Example) MUL32-100DZ

Basic weight 0.41 (Foot, Equivalent to ø32)

Additional weight 0.14/50 stroke

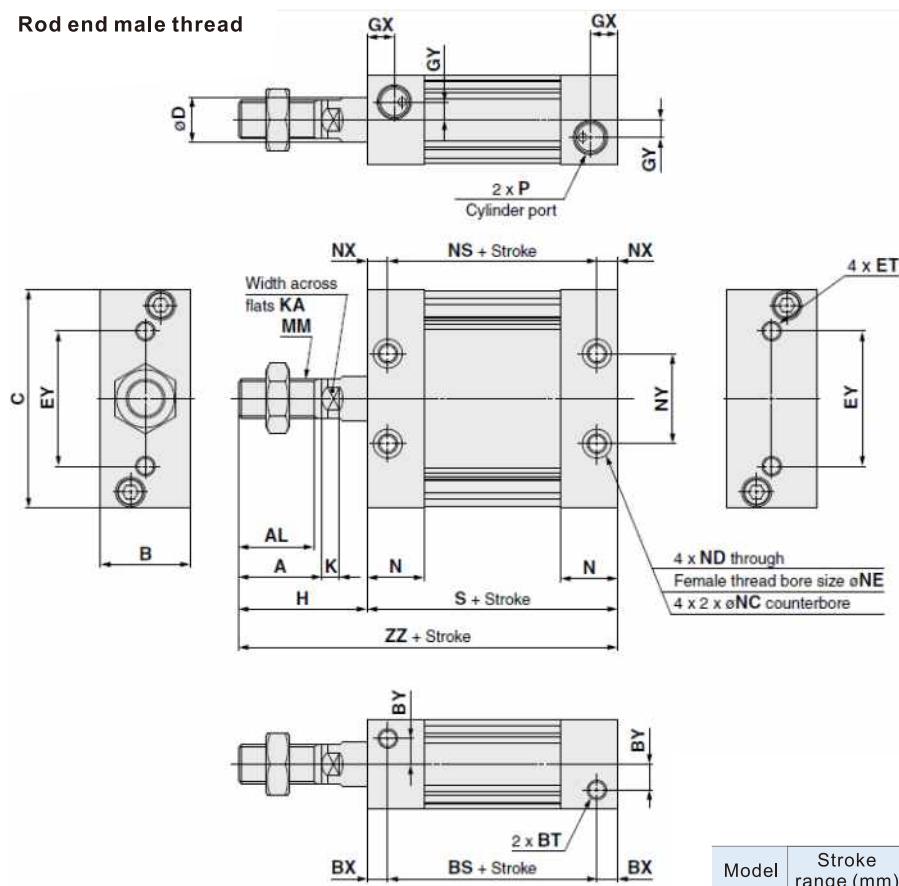
Stroke 100 stroke

0.41 + 100/50 x 0.14 = 0.69 kg

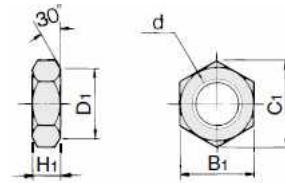
Plate cylinder——MU Series

Dimensions of Basic: MUB

Rod end male thread



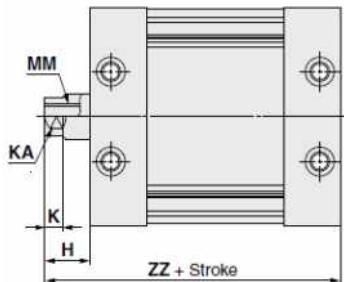
Rod end nut



Part no.	Bore size	d	H1	B1	C1	D1
NT-03	25	M10 x 1.25	6	17	19.6	16.5
NT-MU03	32	M12 x 1.25	7	19	21.9	18
NT-04	40	M14 x 1.5	8	22	25.4	21
NT-05	50/63	M18 x 1.5	11	27	31.2	26

*A nut is attached to the rod end male thread as standard.
Rod end nut material: Carbon steel
Surface treatment: Chromated

Rod end female thread



Model	Stroke range (mm)	A	AL	B	BS	BT		BX
MUB25	5 to 300	22	19.5	24	37	M5 x 0.8 depth 7.5		9
MUB32	5 to 300	26	23.5	28	45		M6 x 1 depth 12	6.5
MUB40	5 to 300	30	27	32	44	M8 x 1.25 depth 13		8
MUB50	5 to 300	35	32	39	54	M10 x 1.5 depth 14.5		10
MUB63	5 to 300	35	32	50	53	M12 x 1.75 depth 18		11

Model	Stroke range (mm)	BX	BY	C	D	ET		EY
MUB25	5 to 300	9	7	54	12	M5 x 0.8 depth 11		26
MUB32	5 to 300	6.5	8	68	14	M6 x 1 depth 11		42
MUB40	5 to 300	8	9	86	16	M8 x 1.25 depth 11		54
MUB50	5 to 300	10	9	104	20	M10 x 1.5 depth 15		64
MUB63	5 to 300	11	12	124	20	M12 x 1.75 depth 15		72

*Dimensions except mentioned on the right are the same as male thread type.
However, K and KA dimensions are the same as male thread type.

Model	GX	GY	H	K	KA	MM	N	NC	ND	NE	NS	NX	NY	P			S	ZZ
														-	TN	TF		
MUB25	10	5	36	5.5	10	M10 x 1.25	16.5	7.5 depth 4.5	M5 x 0.8	4.3	43	6	26	M5 x 0.8	-	-	55	91
MUB32	8.5	5.5	40	5.5	12	M12 x 1.25	18	9 depth 5.5	M6 x 1	5.1	45	6.8	28	Rc1/8	NPT1/8	G1/8	58	98
MUB40	9	7	45	6	14	M14 x 1.5	18.5	10.5 depth 6.5	M8 x 1.25	6.9	44	8	36	Rc1/8	NPT1/8	G1/8	60	105
MUB50	11.5	8	53	7	18	M18 x 1.5	24	13.5 depth 8.5	M10 x 1.5	8.7	54	10	42	Rc1/4	NPT1/8	G1/4	74	127
MUB63	11.5	10	56	7	18	M18 x 1.5	24	17 depth 10.5	M12 x 1.75	10.5	53	11	46	Rc1/4	NPT1/8	G1/4	75	131

*The position of the 4 flats of the piston rod is ±3° in relation to the cylinder side surface.

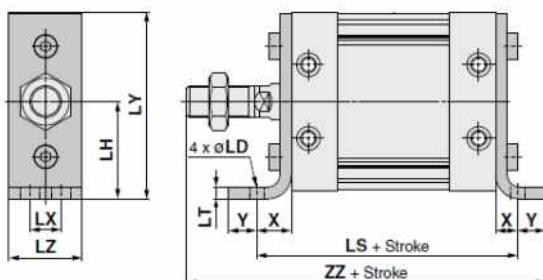
Rod end female thread

Model	H	MM		ZZ
MUB25	14	M6 x 1 depth 12		69
MUB32	15	M8 x 1.25 depth 13		72
MUB40	15	M8 x 1.25 depth 13		75
MUB50	18	M10 x 1.5 depth 15		92
MUB63	21	M10 x 1.5 depth 15		96

Plate cylinder——MU Series

Dimensions with Mounting Bracket: MUL

Foot

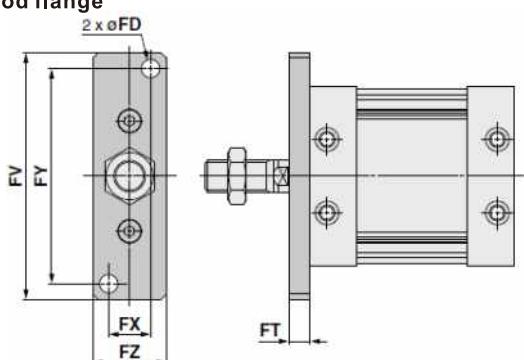


Model	LD	LH	LS	LT	LX	LY	LZ	X	Y	ZZ
MUL25	5.5	29	79	3.2	11	56	23	12	6	109
MUL32	6.6	37	90	4.5	12	71	27	16	8	122
MUL40	9	46	96	4.5	15	89	31	18	10	133
MUL50	11	57	116	5	18	109	37	21	11	159
MUL63	13.5	67	123	6	22	129	48	24	14	169

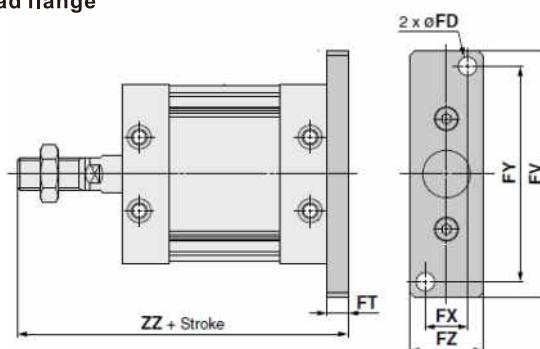
Foot bracket material: Rolled steel

Surface treatment: Nickel plated

Rod flange



Head flange

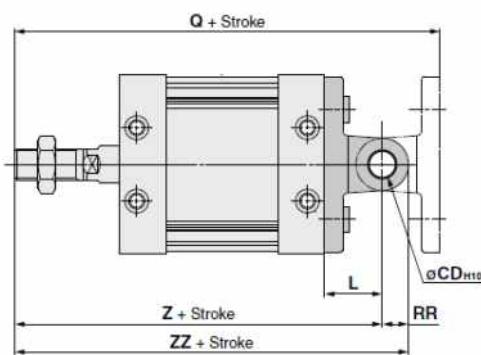


Model	FD	FT	FV	FX	FY	FZ	ZZ
MUF25, MUG25	5.5	8	76	14	66	24	99
MUF32, MUG32	7	8	94	16	82	28	106
MUF40, MUG40	9	9	118	18	102	32	114
MUF50, MUG50	11	12	144	22	126	39	139
MUF63, MUG63	13	14	168	30	148	50	145

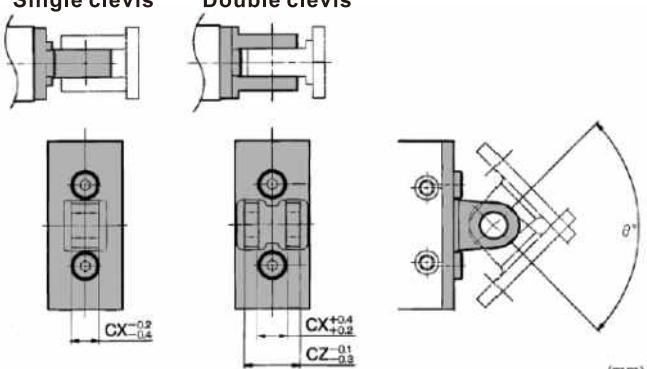
Flange bracket material: Carbon steel

Surface treatment: Nickel plated

Single clevis Double clevis



Single clevis Double clevis



Model	CDH10	CX	CZ	L	Q	RR	Z	ZZ	Rotation range (°θ)
MUC25, MUD25	8 ^{+0.058} ₀	9	18	17	125	8	108	116	100
MUC32, MUD32	10 ^{+0.058} ₀	11	22	22	142	10	120	130	90
MUC40, MUD40	10 ^{+0.058} ₀	13	26	27	159	10	132	142	80
MUC50, MUD50	14 ^{+0.070} ₀	16	32	32	191	14	159	173	80
MUC63, MUD63	14 ^{+0.070} ₀	16	32	38	207	16	169	185	80

Clevis pin and retaining ring are shipped together with double clevis.

Single/Double clevis material: Cast iron

Surface treatment: Painted