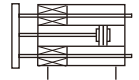




# Tri-rod cylinder—TCL, TCM Series

Bore size:  $\Phi 6, \Phi 10, \Phi 12, \Phi 16, \Phi 20, \Phi 25, \Phi 32, \Phi 40, \Phi 50, \Phi 63$



## Ordering code

**TC M 50×50 S T**

① ② ③ ④ ⑤ ⑥

### ① Model

TC: Tri-rod cylinder(Double acting type)

### ② Bearing type

M: Brass bearing

L: Linear bearing

### ③ Bore size Adapt bearing type

6	Bronze bearing(M Type)
10	
12	
16	
20	Linear bearing(L Type) Bronze bearing(M Type)
25	
32	
40	
50	
63	

### ⑤ Magnet [Note1]

S: With magnet

### ⑥ Thread type [Note 2]

T:NPT

### ④ Stroke [Note3]

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

[Note1] TC Series are all with magnet.

[Note2] When the thread is standard, the code is blank.

[Note3] 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.

## Specification

Bore size(mm)	6	10	12	16	20	25	32	40	50	63
Acting type	Double acting									
Fluid	Air(to be filtered by 40 $\mu$ m filter element)									
Operating pressure	29~100psi(0.2~0.7MPa)					22~145psi(0.15~1.0MPa)				
Proof pressure	175psi(1.2MPa)					215psi(1.5MPa)				
Temperature	-20~70°C									
Speed range mm/s	50~500					30~500				
Stroke tolerance	$\leq 100$ $\begin{matrix} +1.0 \\ 0 \end{matrix}$ $> 100$ $\begin{matrix} +1.5 \\ 0 \end{matrix}$									
Cushion type	Bumper									
Non-rotating tolerance [Note1]	TCL	-			$\pm 0.08^\circ$	$\pm 0.07^\circ$	$\pm 0.06^\circ$	$\pm 0.05^\circ$		
	TCM	$\pm 0.1^\circ$			$\pm 0.10^\circ$	$\pm 0.09^\circ$	$\pm 0.08^\circ$	$\pm 0.06^\circ$		
Port size [Note2]	M3×0.5			M5×0.8		1/8		1/4		

[Note1] Retract position.

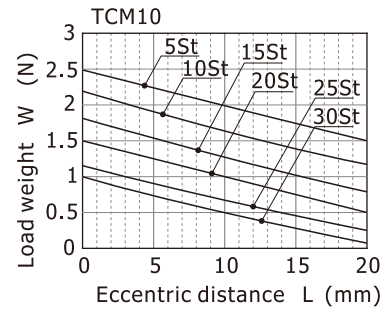
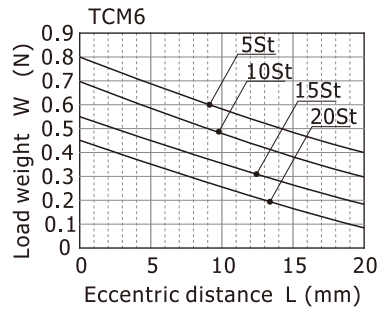
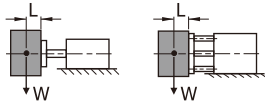
[Note2] NPT thread is available.



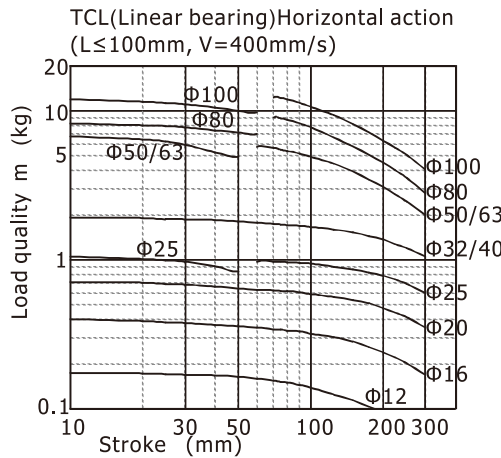
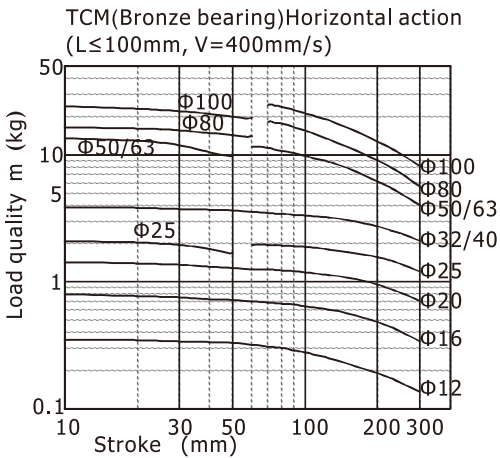
### Safe load and torque

#### 1. Max. safe load

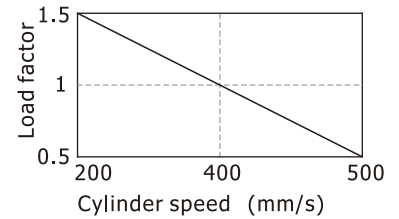
TCM6,10 Max. safe load



TC12~100 Max. safe load



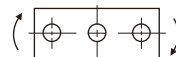
For other operating speeds of the cylinder, multiply the value of the graph when  $V=400\text{mm/s}$  by the coefficient in the following table, and the obtained value is the approximate value of the allowable load mass.



#### 2. Max. safe torque

**Max. safe torque**

**Unit: Newton-Meter(N·m)**



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
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	-	0.39	-	0.32	0.29	0.27	0.24	0.21	0.49	0.46	0.43	0.42	0.39	0.36	0.31	0.27	-	-	-	-
	TCL	-	0.35	-	0.29	0.26	0.24	0.22	0.19	0.44	0.39	0.37	0.35	0.32	0.29	0.24	0.20	-	-	-	-
16	TCM	-	0.69	-	0.58	0.54	0.49	0.43	0.38	0.75	0.72	0.69	0.65	0.61	0.58	0.50	0.44	0.40	0.36	-	-
	TCL	-	0.62	-	0.52	0.49	0.44	0.39	0.34	0.68	0.65	0.62	0.59	0.55	0.52	0.43	0.37	0.32	0.28	-	-
20	TCM	-	-	-	1.05	0.99	0.93	0.83	0.75	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	-	-	-	0.95	0.89	0.84	0.75	0.68	1.77	1.59	1.52	1.46	1.33	1.25	1.30	1.15	1.03	0.93	0.88	0.76
25	TCM	-	-	-	1.76	1.65	1.55	1.38	1.25	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	-	-	-	1.58	1.49	1.40	1.24	1.13	2.71	2.42	2.38	2.33	2.19	1.97	2.03	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	-	-	-	-	5.72	5.40	5.16	4.62	5.38	5.15	5.11	5.02	4.60	4.47	3.98	3.58	3.25	2.98	2.67	2.56
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	-	-	-	-	6.30	5.94	5.50	5.09	5.99	5.67	5.62	5.58	5.27	4.93	4.30	3.94	3.58	3.29	3.01	2.82
50	TCM	-	-	-	-	13.00	12.60	11.00	10.80	13.70	12.70	12.00	11.80	11.10	10.60	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	8.55	7.74	7.07	6.52	6.12	5.62
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	17.46	14.00	11.00	10.60	10.20	9.74	9.63	8.72	7.97	7.34	6.77	6.34

# Tri-rod cylinder

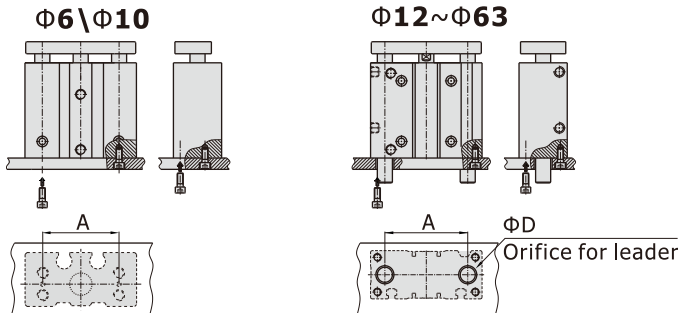


## TCL, TCM Series

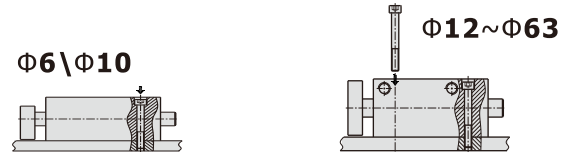
Bore size:  $\Phi 6$ ,  $\Phi 10$ ,  $\Phi 12$ ,  $\Phi 16$ ,  $\Phi 20$ ,  $\Phi 25$ ,  $\Phi 32$ ,  $\Phi 40$ ,  $\Phi 50$ ,  $\Phi 63$

### How to mount

#### Fixation of screw at back side( $\Phi 6\sim\Phi 63$ )



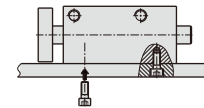
#### Fixation of screw on top surface( $\Phi 6\sim\Phi 63$ )



#### Fixation of T slot at bottom( $\Phi 12\sim\Phi 63$ )



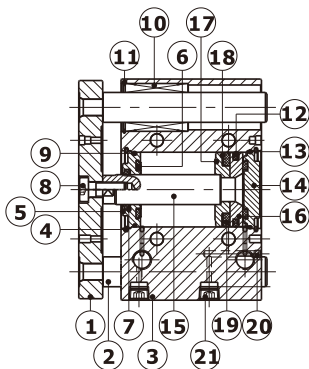
#### Fixation of screw at bottom surface( $\Phi 12\sim\Phi 63$ )



Bore size/Item	6	10	12	16	20	25	32	40	50	63
A	20.5	23	41	46	54	64	78	86	110	124
D (Min)	TCM	X	X	8	10	12	14	18	18	22
	TCL	-	-							

### Inner structure

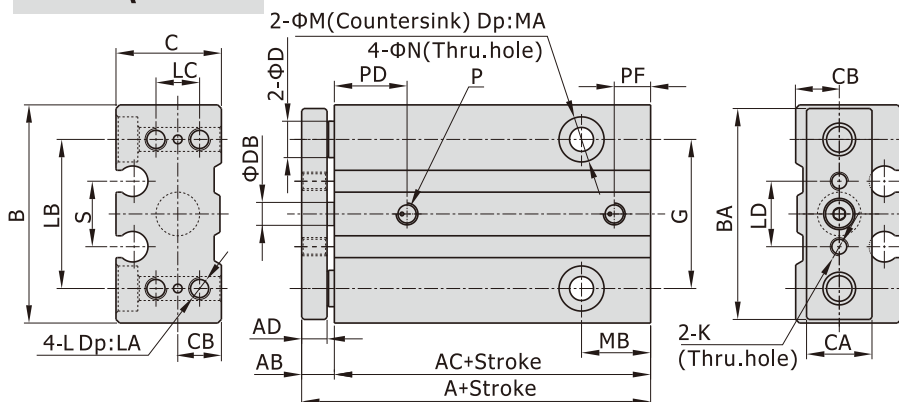
$\Phi 12\sim\Phi 63$



NO.	Item	NO.	Item
1	Fixing plate	12	Piston seal
2	Leader	13	O-ring
3	Body	14	Back cover
4	C clip	15	Piston rod
5	Front cover	16	Piston
6	Bumper	17	Magnet holder
7	Piston rod O-ring	18	Magnet washer
8	Screw	19	Magnet
9	O-ring	20	Screw
10	Bearing	21	Screw
11	C clip		

### Dimensions

#### TCM6\TCM10



[Unit: mm]

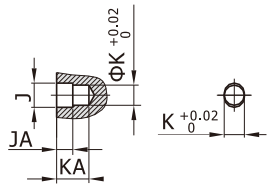
Bore size/Item	A	AB	AC	AD	B	BA	C
6	29.5	6	23.5	5	30	29	14.5
10	32	6	26	5	34	33	18
Bore size/Item	CA	CB	D	DB	G	K	
6	9	6	5	3	20.5	M2.5X0.45	
10	10	7.5	6	5	23	M3X0.5	
Bore size/Item	L	LA	LB	LC	LD	M	
6	M3X0.5	5	20.5	6	9	6	
10	M4X0.7	5	23	8	11	8	
Bore size/Item	MA	MB	N	P	PD	PF	
6	3	9.5	3.5	M3X0.5	9.5	5.5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

# Tri-rod cylinder

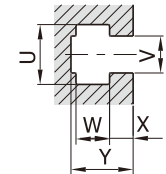
## TCL, TCM Series

Bore size:  $\Phi 6, \Phi 10, \Phi 12, \Phi 16, \Phi 20, \Phi 25, \Phi 32, \Phi 40, \Phi 50, \Phi 63$

### TCL/TCM12~63

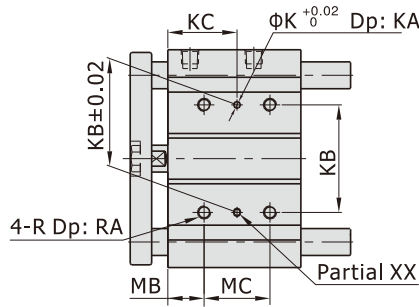


Partial XX

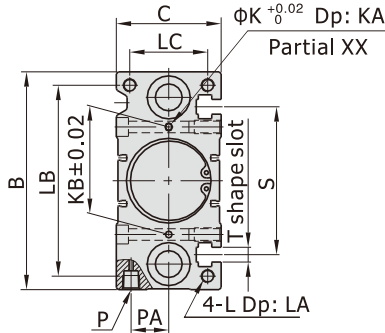
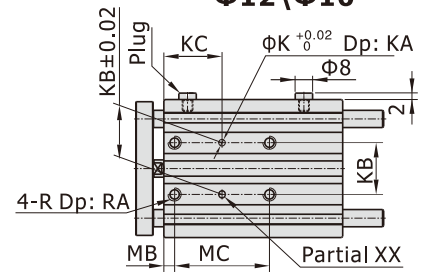


Partial view of T slot

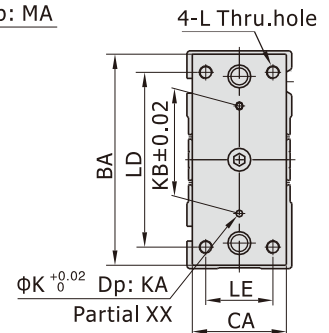
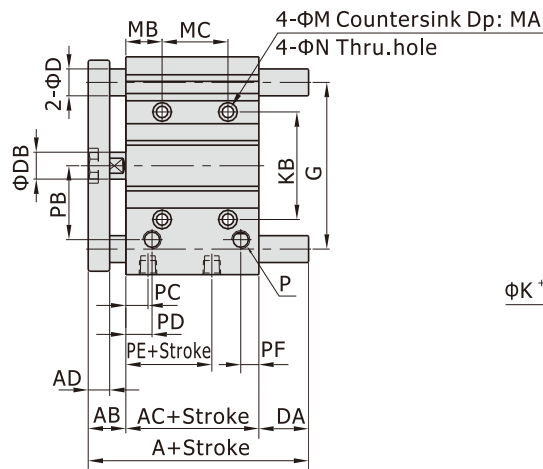
### $\Phi 20 \sim \Phi 63$



### $\Phi 12 \setminus \Phi 16$



Partial XX



[Unit: mm]

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	≤30	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)	DB	G	J	JA	K	KA	KB	L	LA	LB	LC	LD
12	13	29	8	58	56	26	22	6	8	6	41	3.5	3	3	6	23	M4×0.7	10	50	18	48
16	13	33	8	64	62	30	25	8	10	8	46	3.5	3	3	6	24	M5×0.8	12	56	22	54
20	16	37	10	83	81	36	30	10	12	10	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	12	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	16	78	4.5	3	4	6	42	M8×1.25	20	98	34	96
40	22	44	12	120	118	54	44	16	20	16	86	4.5	3	4	6	50	M8×1.25	20	106	40	104
50	28	44	16	148	146	64	60	20	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	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	10	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	15	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

