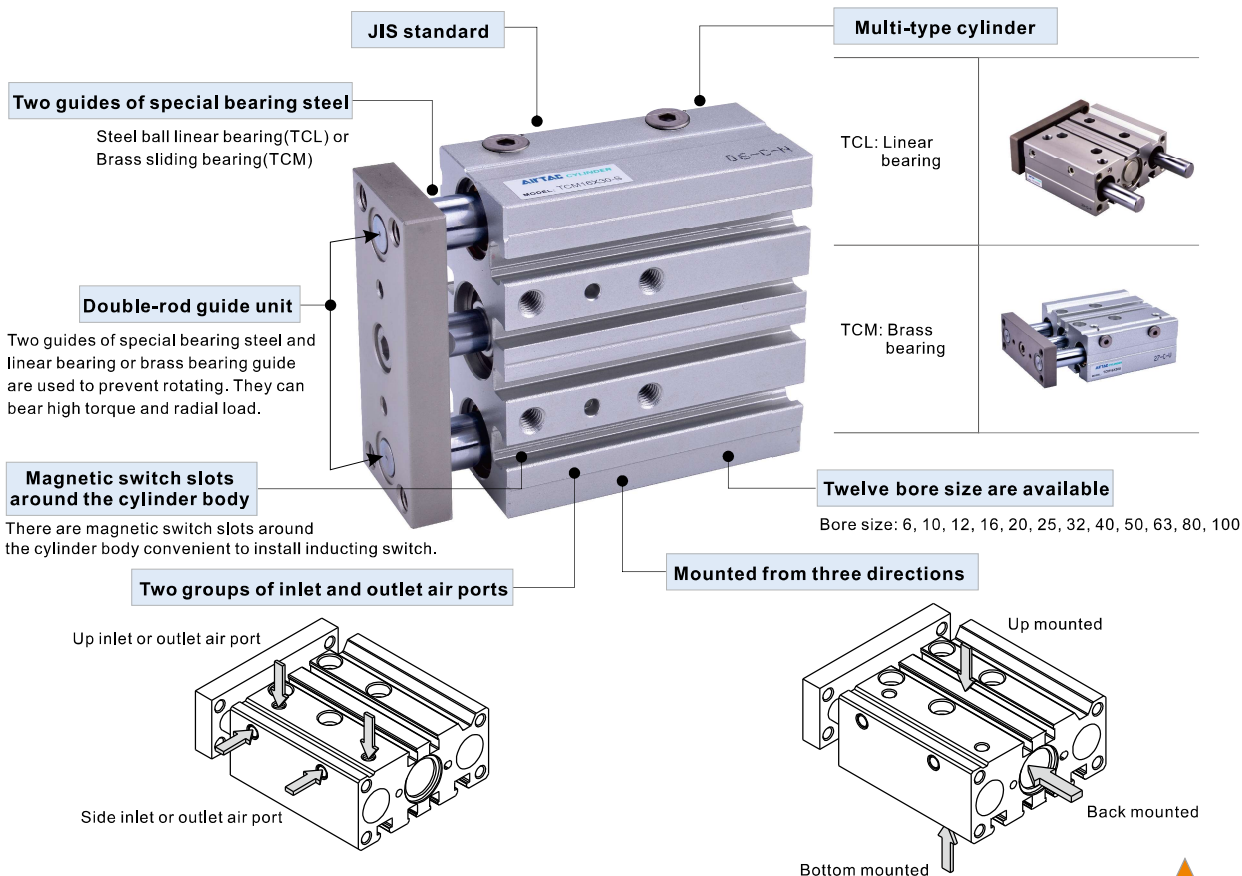




Tri-rod cylinder—TCL, TCM Series

Compendium of TCL/TCM Series



Criteria for selection: Cylinder thrust

Unit : Newton(N)

Bore size	Rod size	Acting type	Pressure area(mm ²)	Operating pressure(MPa)						
				0.1	0.2	0.3	0.4	0.5	0.6	0.7
6	3	Double acting Push side	28.3	2.8	5.7	8.5	11.3	14.1	17.0	19.8
		Double acting Pull side	21.2	2.1	4.2	6.4	8.5	10.6	12.7	14.8
10	5	Double acting Push side	78.5	7.9	15.7	23.6	31.4	39.3	47.1	55.0
		Double acting Pull side	58.9	5.9	11.8	17.7	23.6	29.5	35.3	41.2
12	6	Double acting Push side	113.1	11.3	22.6	33.9	45.2	56.5	67.9	79.2
		Double acting Pull side	84.8	8.5	17.0	25.4	33.9	42.4	50.9	59.4
16	8	Double acting Push side	201.1	20.1	40.2	60.3	80.4	100.5	120.6	140.7
		Double acting Pull side	150.8	15.1	30.2	45.2	60.3	75.4	90.5	105.6
20	10	Double acting Push side	314.2	31.4	62.8	94.2	125.7	157.1	188.5	219.9
		Double acting Pull side	235.6	23.6	47.1	70.7	94.2	117.8	141.4	164.9
25	12	Double acting Push side	490.9	49.1	98.2	147.3	196.3	245.4	294.5	343.6
		Double acting Pull side	377.8	37.8	75.6	113.3	151.1	188.9	226.7	264.4
32	16	Double acting Push side	804.2	80.4	160.8	241.3	321.7	402.1	482.5	563.0
		Double acting Pull side	603.2	60.3	120.6	181.0	241.3	301.6	361.9	422.2
40	16	Double acting Push side	1256.6	125.7	251.3	377.0	502.7	628.3	754.0	879.6
		Double acting Pull side	1055.6	105.6	211.1	316.7	422.2	527.8	633.3	738.9
50	20	Double acting Push side	1963.5	196.3	392.7	589.0	785.4	981.7	1178.1	1374.4
		Double acting Pull side	1649.3	164.9	329.9	494.8	659.7	824.7	989.6	1154.5
63	20	Double acting Push side	3117.2	311.7	623.4	935.2	1246.9	1558.6	1870.3	2182.1
		Double acting Pull side	2803.1	280.3	560.6	840.9	1121.2	1401.5	1681.9	1962.2
80	25	Double acting Push side	5026.5	502.7	1005.3	1508.0	2010.6	2513.3	3015.9	3518.6
		Double acting Pull side	4535.7	453.6	907.1	1360.7	1814.3	2267.8	2721.4	3175.0
100	25	Double acting Push side	7854.0	785.4	1570.8	2356.2	3141.6	3927.0	4712.4	5497.8
		Double acting Pull side	7363.1	736.3	1472.6	2208.9	2945.2	3681.6	4417.9	5154.2

Installation and application



- When load changes in the work, the cylinder with abundant output capacity shall be selected.
- Relative cylinder with high temperature resistance or corrosion resistance shall be chosen under the condition of high temperature or corrosion.
- Necessary protection measure shall be taken in the environment with higher humidity, much dust or water drops, oil dust and welding dregs.
- Dirty substances in the pipe must be cleared away before cylinder is connected with pipeline to prevent the entrance of particles into the cylinder.
- The medium used by cylinder shall be filtered to 40μm or below.
- The cylinder shall avoid the influence of side load in operation to maintain the normal work of cylinder and extend the service life.
- Anti-freezing measure shall be adopted under low temperature environment to prevent moisture freezing.
- If the cylinder is dismantled and stored for a long time, please conduct anti-rust treatment to the surface. Anti-dust cap shall be inserted into the inlet and outlet ports. As the precision of the manufacture and guide is high, never dismantle the fixed block or cylinder cover without permission.

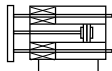


Tri-rod cylinder

TCL, TCM Series



Symbol



Product feature

1. JIS standard is implemented.
2. Two guides of special bearing steel and linear bearing or brass 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.
Brass 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 ϕ PA 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;

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		0.2~0.7MPa(29~100psi)						0.15~1.0MPa(22~145psi)					
Proof pressure		1.2MPa(175psi)				1.5MPa(215psi)							
Temperature ℃		-20~70											
Speed range mm/s		50~500				30~500				50~400			
Stroke tolerance		≤100 ^{+1.0} ₀ >100 ^{+1.5} ₀											
Cushion type		Bumper											
Non-rotating tolerance [Note1]	TCL	-		±0.08°	±0.07°	±0.06°	±0.05°	±0.05°	±0.04°				
	TCM	±0.1°		±0.10°	±0.09°	±0.08°	±0.06°	±0.05°	±0.05°				
Port size [Note2]		M3×0.5			M5×0.8		1/8"		1/4"		3/8"		

[Note1] Retract position.

[Note2] G thread is available.

Add) Refer to P590 for detail of sensor switch.

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	80	90	100	125	150
16	10	20	25	30	40	50	60	70	80	90	100	125	150
20	20	25	30	40	50	60	70	80	90	100	125	150	175
25	20	25	30	40	50	60	70	80	90	100	125	150	175
32	20	25	30	40	50	60	70	80	90	100	125	150	175
40	20	25	30	40	50	60	70	80	90	100	125	150	175
50	20	25	30	40	50	60	70	80	90	100	125	150	175
63	20	25	30	40	50	60	70	80	90	100	125	150	175
80	20	25	30	40	50	60	70	80	90	100	125	150	175
100	20	25	30	40	50	60	70	80	90	100	125	150	175

[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.

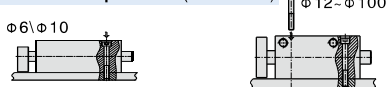
Ordering code

TC M 50 $\times$ 50 S G					
① Model	② Bearing type	③ Bore size	④ Stroke	⑤ Magnet	⑥ Thread type [Note 2]
TC: Tri-rod cylinder (Double acting type)	M: Brass bearing	6	Refer to stroke table for details	S: With magnet [Note1]	G: G Thread
		10			
		12			
		16			
		20			
		25			
		32			
		40			
		50			
		63			
		80			
		100			

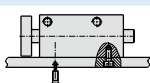
[Note1] TC Series are all with magnet. [Note2] When the thread is standard, the code is blank.

How to mount

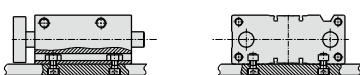
Fixation of screw on top surface($\phi 6\sim\phi 100$)



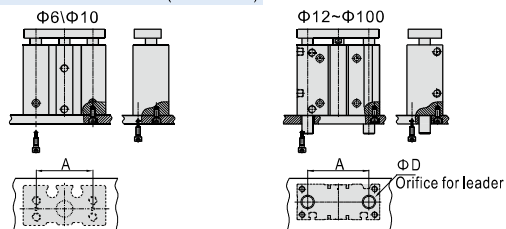
Fixation of screw at bottom surface($\phi 12\sim\phi 100$)



Fixation of T slot at bottom($\phi 12\sim\phi 100$)



Fixation of screw at back side($\phi 6\sim\phi 100$)

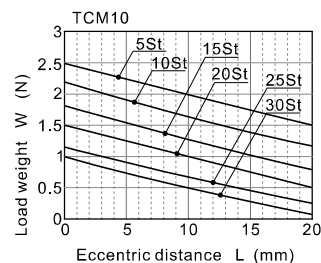
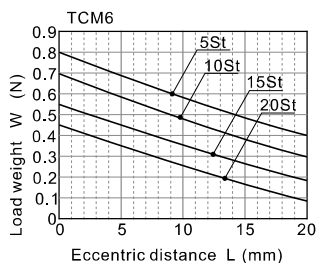
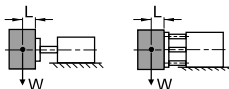


Bore size/Item	6	10	12	16	20	25	32	40	50	63	80	100
A	20.5	23	41	46	54	64	78	86	110	124	156	188
D	TCM	X	X	10	12	13	20	20	20	20	30	-
(Min)	TCL	-	-	8	10	10	13				-	30

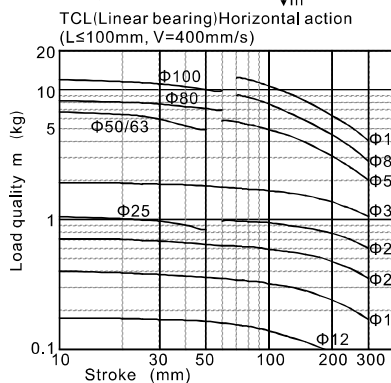
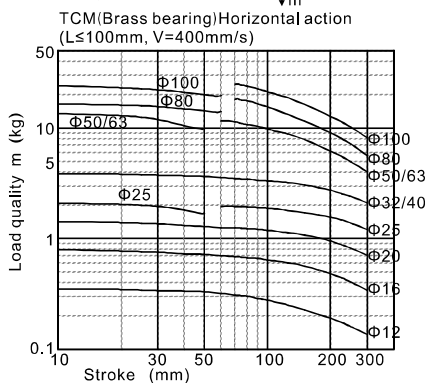
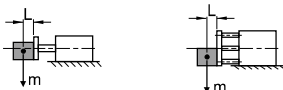
Safe load and torque

1. Max. safe load

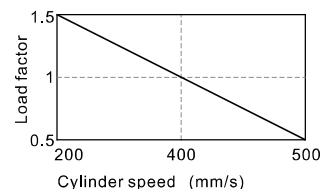
TCM6,10 Max. safe load



TC12~100 Max. safe load



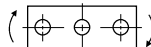
For other operating speeds of the cylinder, multiply the value of the graph when $V=400\text{mm/s}$ by the coefficient in the following table, and the obtained value is the approximate value of the allowable load mass.



2. Max. safe torque

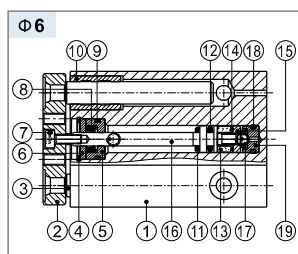
Max. safe torque

Unit: Newton-Meter(N·m)

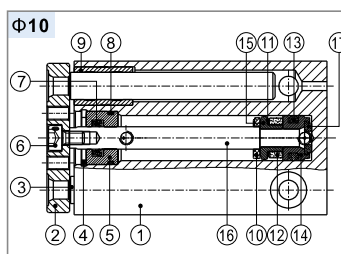


Bore size	Type	Stroke(mm)																			
		5	10	15	20	25	30	40	50	60	70	75	80	90	100	125	150	175	200	225	250
6	TCM	0.008	0.007	0.006	0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TCL	0.045	0.039	0.033	0.028	0.024	0.021	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	TCM	-	0.39	-	0.32	0.29	0.27	0.24	0.21	0.49	0.46	0.43	0.42	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
80	TCM	-	-	-	-	21.90	20.80	19.70	18.60	15.80	24.00	22.90	21.70	21.00	20.50	18.60	17.00	15.60	14.50	13.50	12.60
	TCL	-	-	-	-	15.10	14.30	13.60	12.90	12.20	21.60	20.61	19.53	18.90	18.45	16.74	15.30	14.04	13.05	12.15	11.34
100	TCM	-	-	-	-	38.80	36.80	35.00	33.50	28.50	39.40	37.50	35.60	34.50	33.80	30.90	28.40	26.20	24.40	22.50	21.40
	TCL	-	-	-	-	27.10	25.70	24.40	30.15	25.65	35.46	33.75	32.04	31.05	30.42	27.81	25.56	23.58	21.96	20.25	19.26

Inner structure and material of major parts

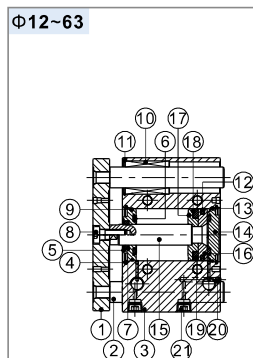


NO.	Item	Material
1	Body	Aluminum alloy
2	Fixing plate	Carbon steel
3	Guide rod	Stainless steel
4	C clip	Spring steel
5	Front cover	Aluminum alloy
6	O-ring stop block	Aluminum alloy
7	Screw	Alloy steel
8	Piston rod O-ring	NBR
9	O-ring	NBR
10	Bearing	Brass
11	Bumper	TPU
12	Piston seal	NBR
13	Magnet	Rare Earth
14	Magnet washer	NBR
15	Piston	Stainless steel
16	Piston rod	Stainless steel
17	Bumper	TPU
18	O-ring	NBR
19	Washer	Aluminum alloy



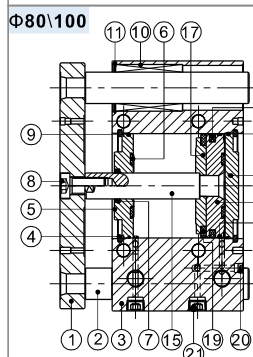
NO.	Item	Material
1	Body	Aluminum alloy
2	Fixing plate	Carbon steel
3	Guide rod	Stainless steel
4	C clip	Spring steel
5	Front cover	Aluminum alloy
6	Screw	Alloy steel
7	Piston rod O-ring	NBR
8	O-ring	NBR
9	Bearing	Brass
10	Bumper	TPU
11	Magnet washer	NBR
12	Magnet	Rare Earth
13	Piston seal	NBR
14	Piston	Brass
15	Magnet holder	Brass
16	Piston rod	Stainless steel
17	Bumper	TPU

Note: inner structure & material data sheet is based on certain bore size.
Please contact AirTAC if you need inner structure & material data sheet for specific bore size.



TCL	TCM
 Bore size Φ12, Φ16mm Strokes ≤30mm	 Bore size Φ20~Φ63mm Strokes ≤50mm
 Bore size Φ12, Φ16mm 30 < Strokes ≤100mm	 Bore size Φ20~Φ63mm 50 < Strokes ≤100mm
 Bore size Φ12, Φ16mm Stroke > 100mm	 Bore size Φ20~Φ63mm Stroke > 100mm

TCM		
		
Bore sizeΦ12~Φ25mm Strokes≤50mm	Bore sizeΦ12~Φ63mm 50 < Strokes≤100mm	Bore sizeΦ12~Φ63mm Stroke > 100mm



TCL

Stroke S=25~60mm

Stroke S=70~150mm

Stroke S=175~250mm

TCM

Stroke S=25~250mm

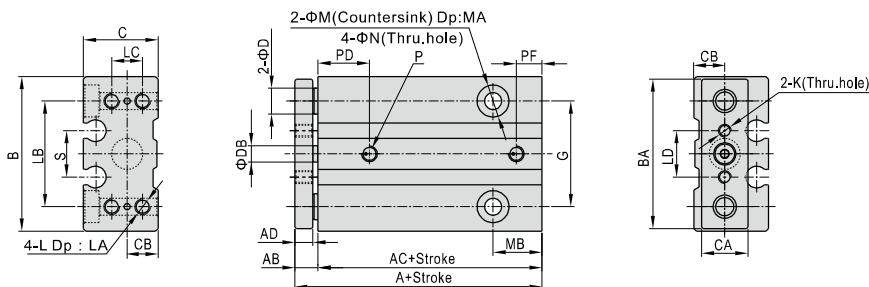
NO.	Item	Material
1	Fixing plate	Carbon steel
2	Leader	Carbon steel
3	Body	Aluminum alloy
4	C clip	Spring steel
5	Front cover	Aluminum alloy
6	Bumper	TPU
7	Piston rod O-ring	NBR
8	Screw	Alloy steel
9	O-ring	NBR
10	Bearing	Bearing steel/brass
11	C clip	Spring steel
12	Piston seal	NBR
13	O-ring	NBR
14	Back cover	Brass/aluminum alloy
15	Piston rod	Carbon steel
16	Piston	Brass/aluminum alloy
17	Magnet holder	Brass/aluminum alloy
18	Magnet washer	NBR
19	Magnet	Rare Earth/Plastic
20	Screw	Alloy steel
21	Screw	Alloy steel
22	Spacer	Aluminum alloy

Note: inner structure & material data sheet is based on certain bore size.
Please contact AirTAC if you need inner structure & material data sheet for specific bore size.

TCL,TCM Series

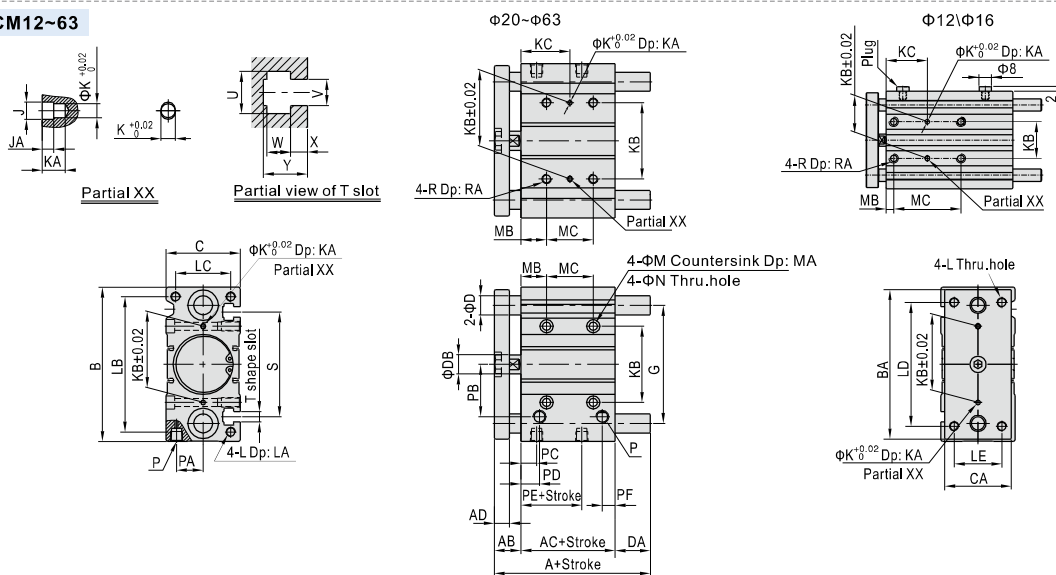
Dimensions

TCM6\TCM10



Bore size\Item	A	AB	AC	AD	B	BA	C	CA	CB	D	DB	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	3	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	5	23	M3X0.5	M4X0.7	5	23	8	11	8	4	8.5	4.5	M3X0.5	11.5	5

TCL/TCM12~63



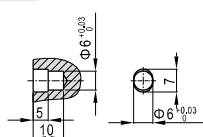
Bore size/Item	A								DA								MC				KC						
	TCL	TCM	TCL/TCM		TCL	TCM			TCL			TCM					MC					KC					
Stroke	≤30	≤50	31~51	51~100	101~200	>200	>200	≤30	31~100	101~200	>200	≤50	51~100	101~200	>200	≤30	31~100	101~200	>200	≤30	31~100	101~200	>200	≤30	31~100	101~200	>200
12	42		55.5	83.5		-	-	0	13.5	41.5	-	0	13.5	41.5	-	20	40	110	-	15	25	60	-				
16	46		65.5	93.5		-	-	0	19.5	47.5	-	0	19.5	47.5	-	24	44	110	-	17	27	60	-				
20	53		78.5	102.5	120.5	102.5	0	25.5	49.5	67.5	0	25.5	49.5	49.5	24	44	120	200	29	39	77	117					
25	53.5		80.5	103	120.5	103	0	27	49.5	67	0	27	49.5	49.5	24	44	120	200	29	39	77	117					
Stroke	≤50	≤50	51~100	101~200	>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	≤40	41~100	101~200	>200	
32	64	77	101	117	139	117	4.5	31.5	57.5	79.5	17.5	41.5	57.5	57.5	24	48	124	200	33	45	83	121					
40	66	77	101	117	139	117	0	35	51	73	11	35	51	51	24	48	124	200	34	46	84	122					
50	75	88	117	133	160	133	3	45	61	88	16	45	61	61	24	48	124	200	36	48	86	124					
63	77	88	117	133	160	133	0	40	56	83	11	40	56	56	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	6	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

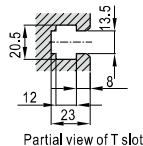
Boresize\Item	LE	M	MA	MB	N	P	PA	PB	PC	PD	PE	PF	R	RA	S	U	V	W	X	Y
12	14	8	4.5	5	4.5	M5×0.8	8	18	11	11	13	7.5	M5×0.8	12	37	7.5	4.5	4	2	6.5
16	16	8	4.5	5	4.5	M5×0.8	10	19	11	11	15	8	M5×0.8	10	38	7.5	4.5	4	2.5	7
20	18	9.5	5.5	17	5.5	1/8"	11	25	10.5	10.5	12.5	9	M6×1.0	12	44	8.5	5.5	4.5	3	8
25	26	9.5	5.5	17	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

TCL,TCM Series

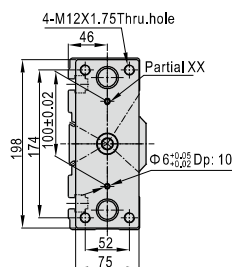
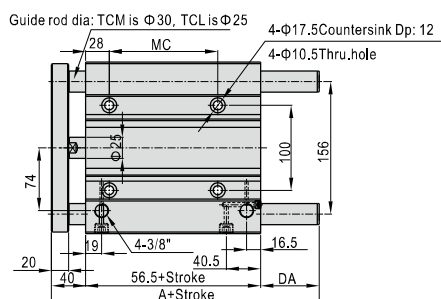
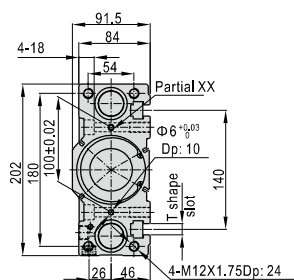
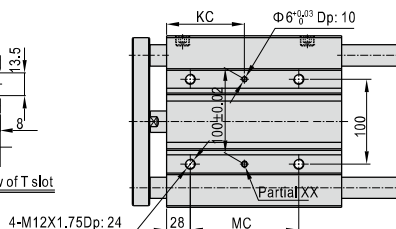
TCL/TCM80



Partial XX

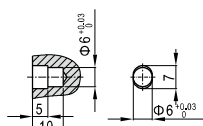


Partial view of T slot

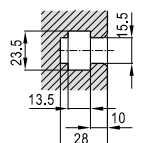


Item	Stroke	25	30	40	50	60	70	75	80	100	125	150	175	200	225	250
A		TCM=110.5/TCL=104.5					163.5					185.5				
DA		TCM=14/TCL=8					67					89				
KC		42					54					92				
MC		28					52					128				

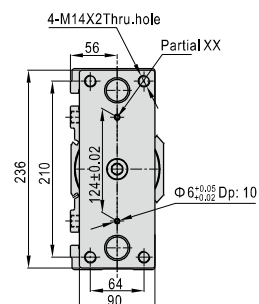
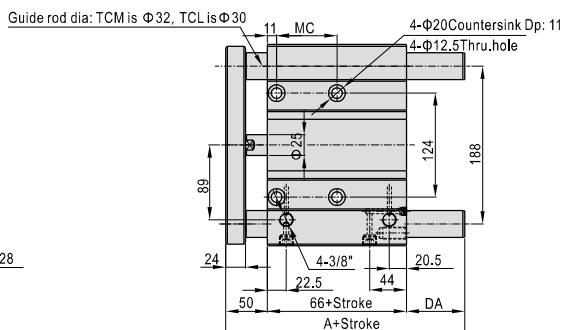
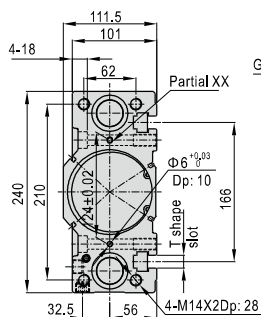
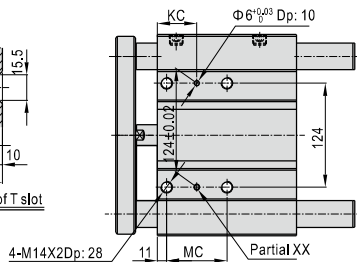
TCL/TCM100



PartialXX



Partial view of T slot



Item\Stroke	25	30	40	50	60	70	75	80	100	125	150	175	200	225	250
A	TCM=126/TCL=120					184					206				
DA	TCM=10/TCL=4					68					90				
KC	35			47					85					121	
MC	48			72					148					220	