

Order example

MCSH – 10 – 60

MODEL

TUBE I.D.

STROKE

Features

- Compact precision cylinder.
- Cylinder can take high lateral loads and is also non rotating.
- Cylinder can be mounted in 3 or 4 positions.
- Magnetic as standard.

Specification

Model	MCSH			
Acting type	Double acting			
Tube I.D. (mm)	6	10	16	20
Guide rail width (mm)	5	7	9	12
Port size	M5×0.8			
Medium	Air			
Min. operating pressure	0.12 MPa	0.06 MPa	0.05 MPa	
Max. operating pressure	0.7 MPa			
Proof pressure	1.07 MPa			
Ambient temperature	-10~+60°C (No freezing)			
Operating speed range	50~500 mm/sec			
Allowable kinetic energy J (kgf · cm)	0.125	0.25	0.5	1.0
Lubricator	Not required			
Cushion	Rubber bumper			
Stroke length tolerance	+1.0 0			
Sensor switch (*)	RCE, RCE1, RDEP			

* RCE, RCE1, RDEP specification, please refer to page 8-10, 14.

Cylinder weight

Unit: g

Stroke (mm)	Tube I.D.			
	ø6	ø10	ø16	ø20
5	62	117	216	437
10	67	125	227	455
15	76	140	247	486
20	81	148	258	505
25	91	162	279	542
30	96	170	290	560
40	111	192	323	597
50	125	215	353	656
60	140	238	386	700

Table for standard stroke

Tube I.D.	Stroke (mm)
ø6, 10, 16, 20	5, 10, 15, 20, 25, 30, 40, 50, 60

Theoretical force

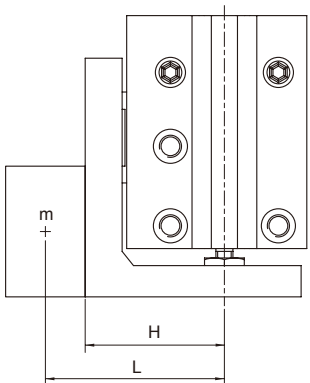
Unit: N

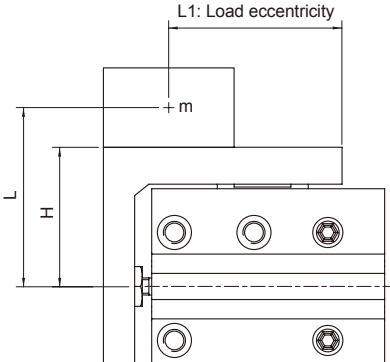
Tube I.D. (mm)	Piston rod (mm)	Operating direction	Piston area (mm ²)	Operating pressure (MPa)		
				0.3	0.5	0.7
6	3	OUT	28.3	8.49	14.2	19.8
		IN	21.2	6.36	10.6	14.8
10	4	OUT	78.5	23.6	39.3	55.0
		IN	66.0	19.8	33.0	46.2
16	6	OUT	201.0	60.3	101.0	141.0
		IN	172.0	51.6	86.0	121.0
20	8	OUT	314.0	94.2	157.0	220.0
		IN	264.0	79.2	132.0	185.0

Allowable moment

Tube I.D. (mm)	Allowable moment (N.m)		
	Roll moment load	Yaw moment load	Pitch moment load
	Mr	My	Mp
ø6	0.53	0.35	0.42
ø10	1.23	0.73	0.86
ø16	2.47	1.43	1.69
ø20	4.94	2.47	2.82

Selection conditions

Selection fig	a1	a2	a3
Max. speed (mm)	Up to 100	Up to 300	Up to 500
Vertical Mounting direction			

Selection fig	b1	b2	b3	b4	b5	b6	b7	b8	b9
Load eccentricity L1 (mm)	50	100	200	50	100	200	50	100	200
Max. speed (mm)	Up to 100			Up to 300			Up to 500		
Horizontal Mounting direction									

Tube I.D.	ø6	ø10	ø16	ø20
H dimension (mm)	24.5	30.5	34.5	41.5

Selection example

• Vertical mounting

Maximum speed: 300 mm/s
 Overhang L: 20 mm
 Load mass m: 0.2 kg

1. Refer to Graph a2 based on vertical mounting and a speed of 300 mm/s.
2. In Graph a2, find the intersection of a 20 mm overhang L and load mass m of 0.2 kg, which results in a determination of ø16.

• Horizontal Mounting

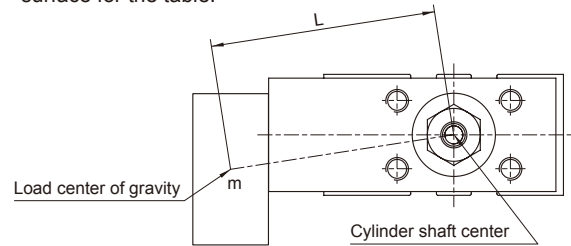
Maximum speed: 300 mm/s
 Load eccentricity L1: 50 mm
 Overhang L: 60 mm
 Load mass m: 0.1 kg

1. Refer to Graph b4 based on horizontal mounting, a speed of 300 mm/s and load eccentricity L1 of 50 mm.
2. In Graph b4, find the intersection of a 60 mm overhang L and load mass m of 0.1 kg, which results in a determination of ø20.

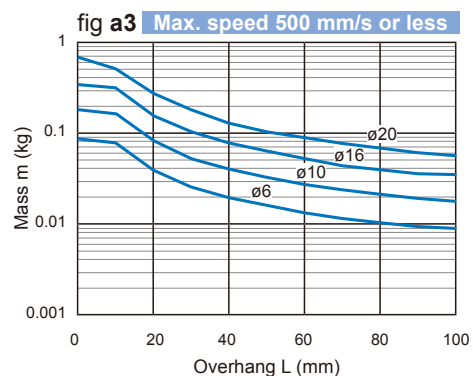
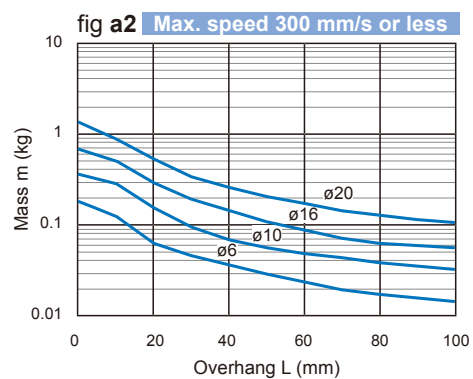
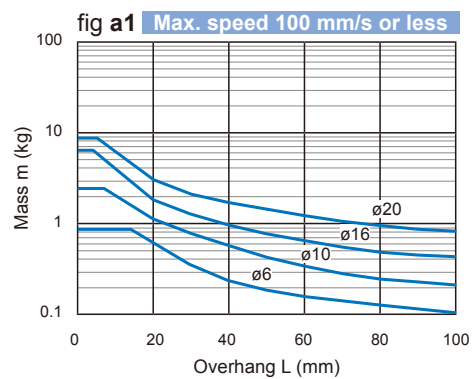
- L: Overhang (the distance from the cylinder shaft center to the load center of gravity)

The direction of L can also be a diagonal direction. (Refer to the drawing below)

- H: Distance from the cylinder center axis to the mounting surface for the table.

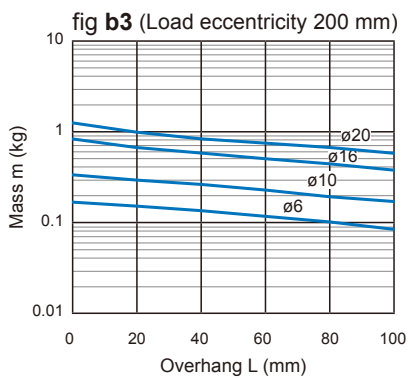
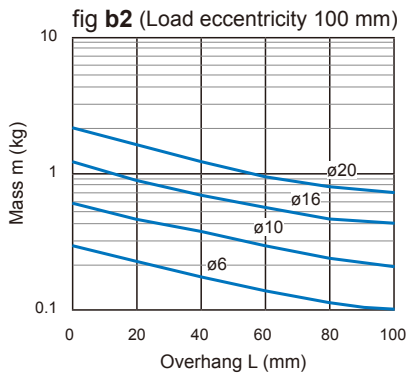
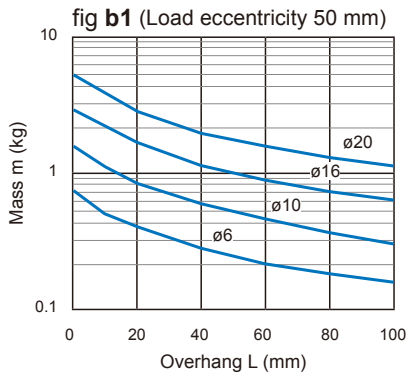


Vertical mounting (fig a1 ~ a3)

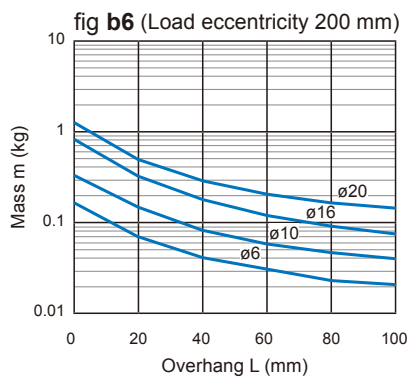
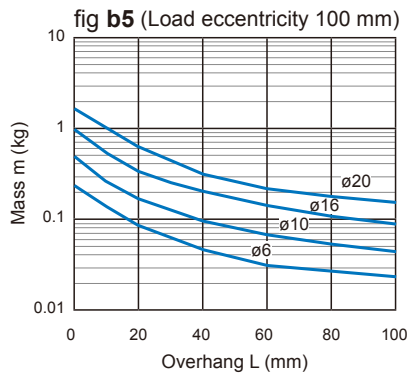
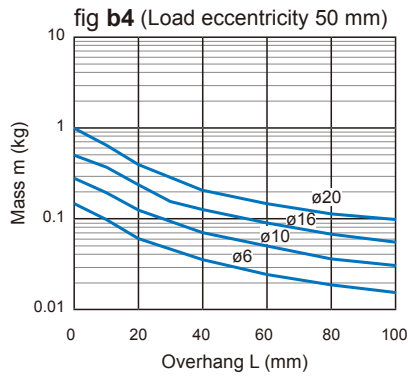


Horizontal mounting (fig b1 ~ b9)

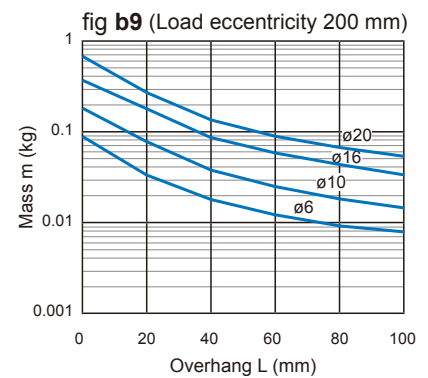
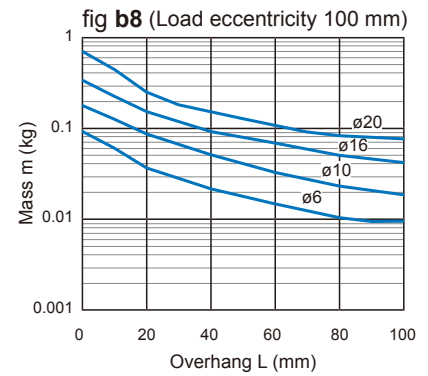
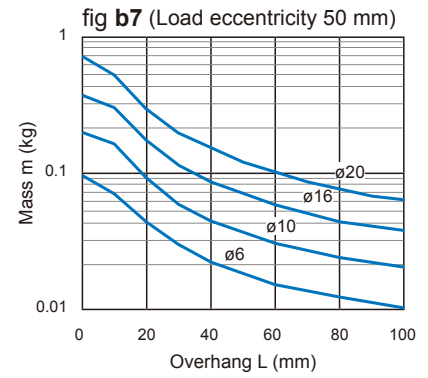
Max. speed 100 mm/s or less



Max. speed 300 mm/s or less



Max. speed 500 mm/s or less



SLIDE CYLINDER

Table deflection (Reference values)

Table displacement due to roll moment load

Table displacement of section A when loads are applied to the section F with this side table retracted.

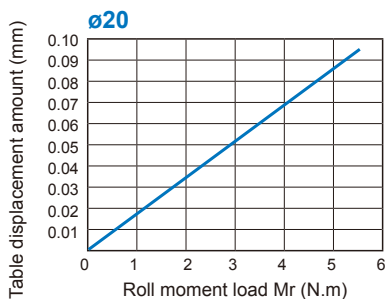
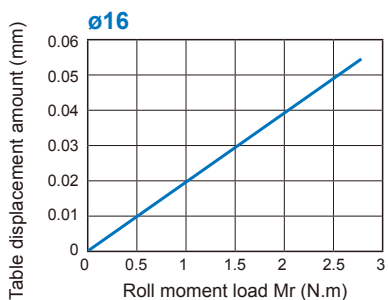
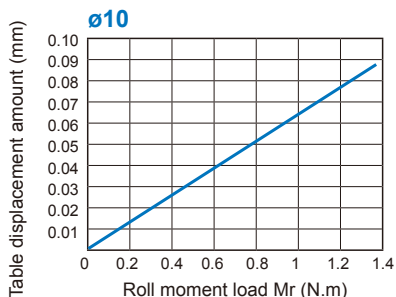
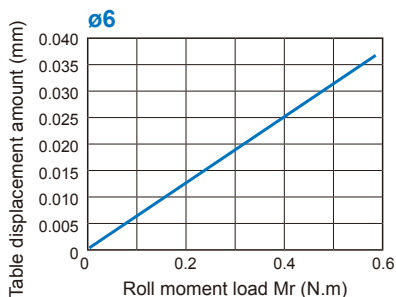
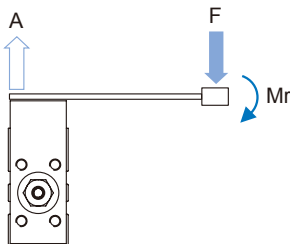


Table displacement due to yaw moment load

Table displacement when loads are applied to the section marked with the arrow at the full stroke.

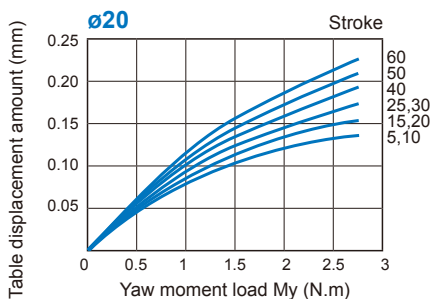
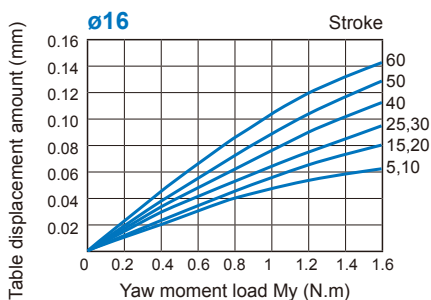
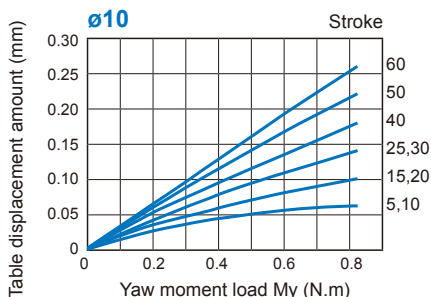
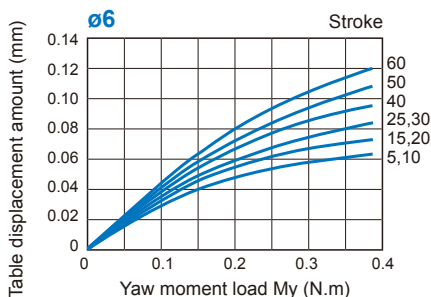
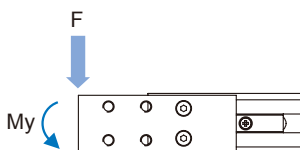
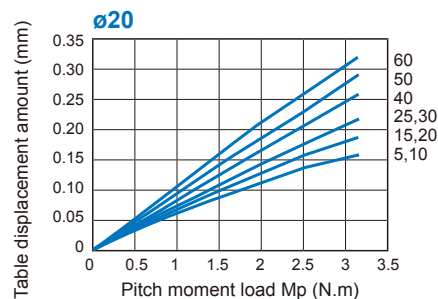
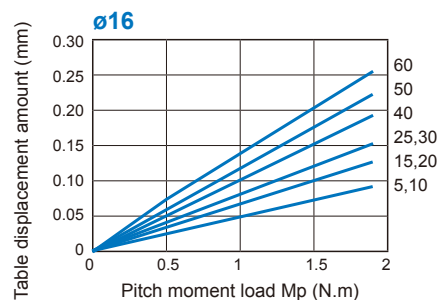
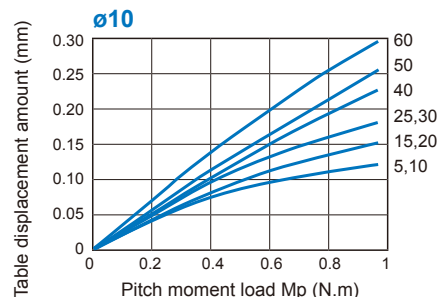
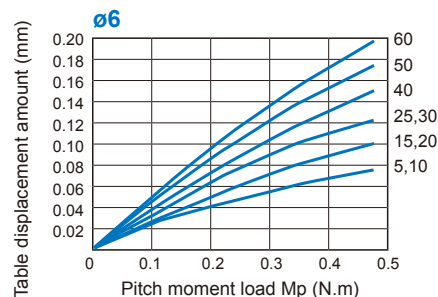
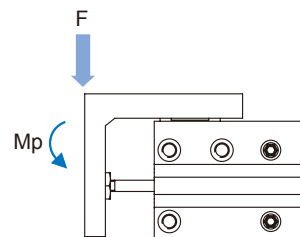
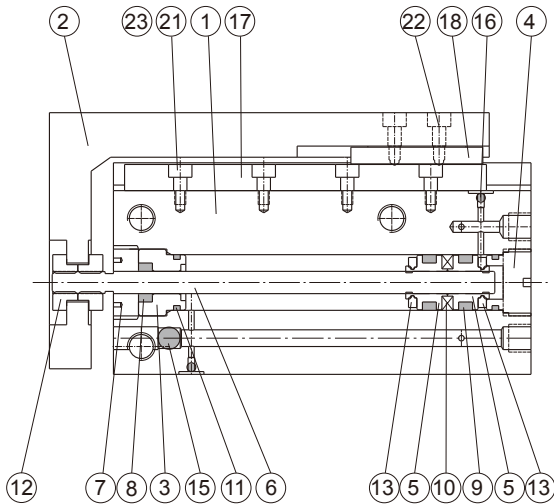


Table displacement due to pitch moment load

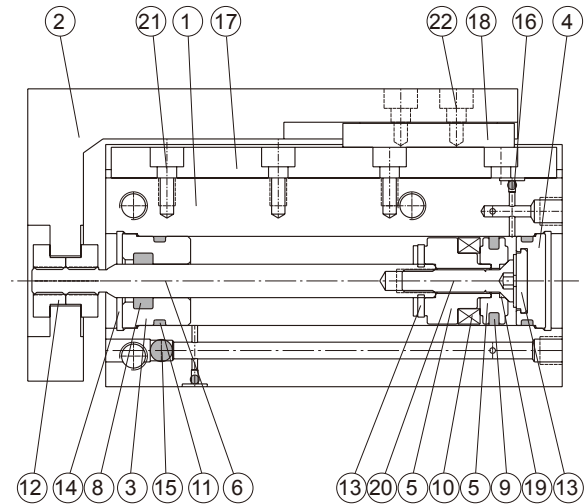
Table displacement when loads are applied to the section marked with the arrow at the full stroke.



$\varnothing 6, \varnothing 10$



$\varnothing 16, \varnothing 20$



Material

No.	Tube I.D. Part name	6	10	16	20	Note	Q'y	Repair kits (inclusion)
1	Body	Aluminum alloy					1	
2	Table	Aluminum alloy					1	
3	Rod cover	Brass	Aluminum alloy				1	
4	Head cover	Aluminum alloy					1	
5	Piston	Aluminum alloy					2	
6	Piston rod	Stainless steel					1	
7	Rod cover locker	*1	-				1	
8	Rod packing	NBR					1	●
9	Piston packing	NBR				Tube I.D. $\varnothing 6, \varnothing 10 \times 2, \varnothing 16, \varnothing 20 \times 1$	1 or 2	●
10	Magnet ring	Magnet material					1	
11	Cover ring	NBR					2	●
12	Rod front nut	Brass					2	
13	Cushion packing	NBR					2	●
14	C type snap ring for hole	-	Spring steel				2	
15	Steel ball A	Stainless steel					1	
16	Steel ball B	Stainless steel					2	
17	Linear guide	Stainless steel					1	
18	Guide seat	Stainless steel					1	
19	Piston gasket	-	NBR				1	●
20	Piston bolt	-	*1				1	
21	Hexagon socket head cap screw A	Stainless steel				Tube I.D. $\varnothing 10 \sim 20$ (*3)	2~5	
22	Hexagon socket head cap screw B	*2	Stainless steel			Tube I.D. $\varnothing 6 \times 2, \varnothing 10 \sim 20 \times 4$	2 or 4	
23	Round head Phillips screw	Stainless steel				Only for tube I.D. $\varnothing 6$ (*3)	2~5	
24	Plug gasket	NBR					4	●

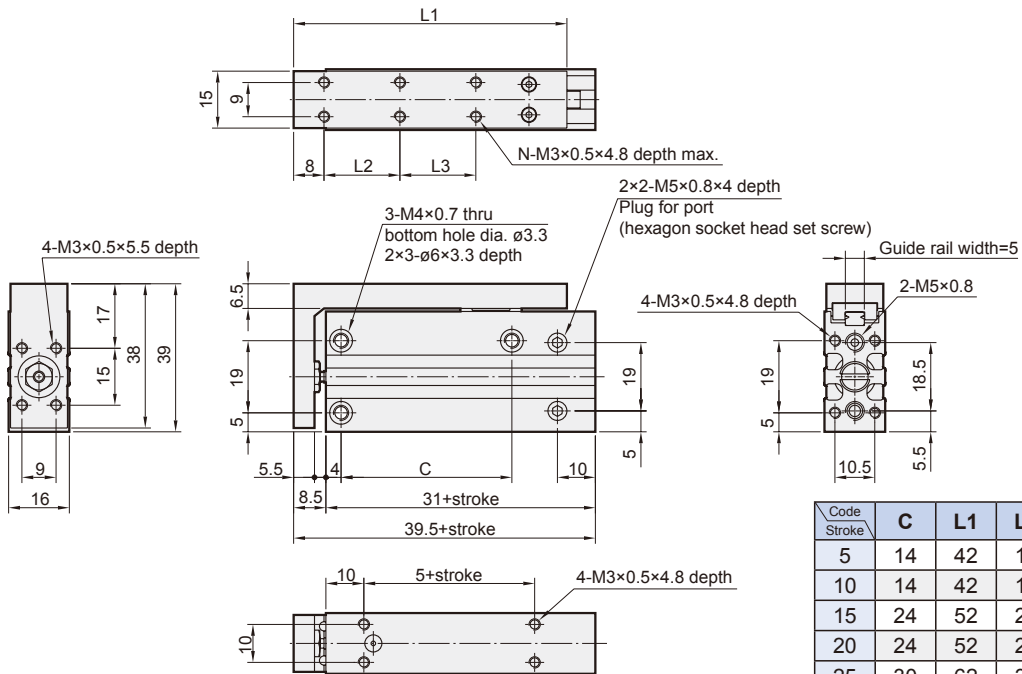
*1. Stainless steel *2. Carbon steel

*3. Quantity varies depending on the stroke length.

Order example of repair kits

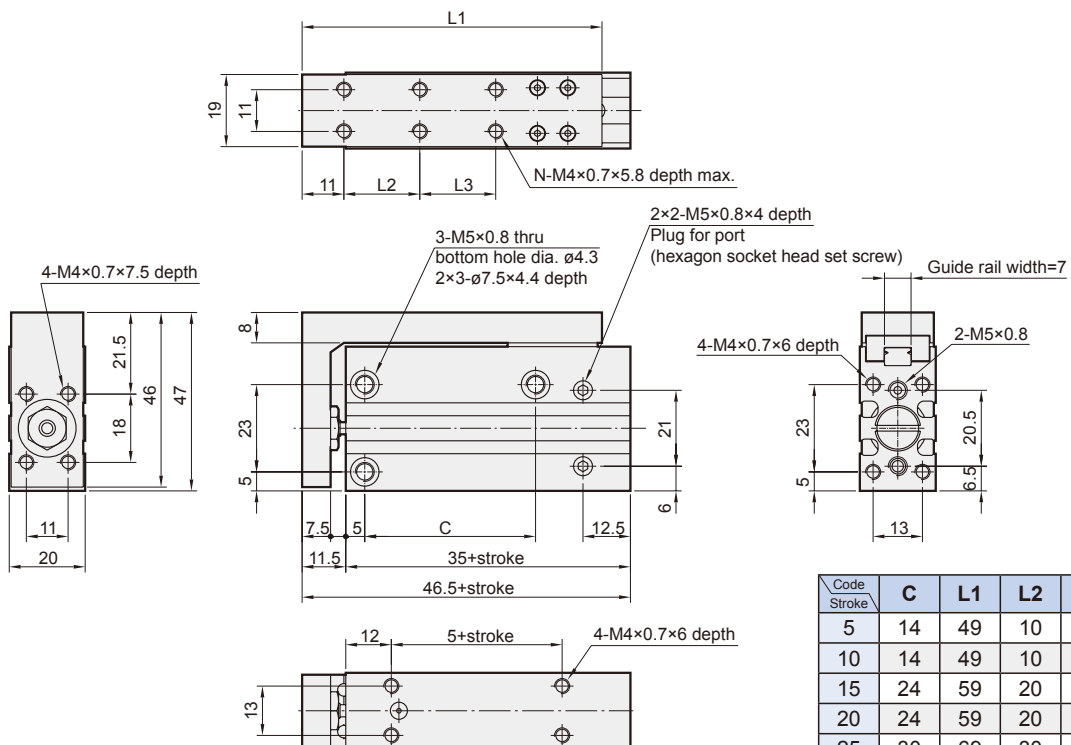
Tube I.D.	Repair kits
$\varnothing 6$	PS-MCSH-6
$\varnothing 10$	PS-MCSH-10
$\varnothing 16$	PS-MCSH-16
$\varnothing 20$	PS-MCSH-20

$\phi 6$



Code Stroke	C	L1	L2	L3	N
5	14	42	10	-	4
10	14	42	10	-	4
15	24	52	20	-	4
20	24	52	20	-	4
25	30	62	30	-	4
30	30	62	30	-	4
40	45	72	20	20	6
50	55	82	25	25	6
60	60	92	30	30	6

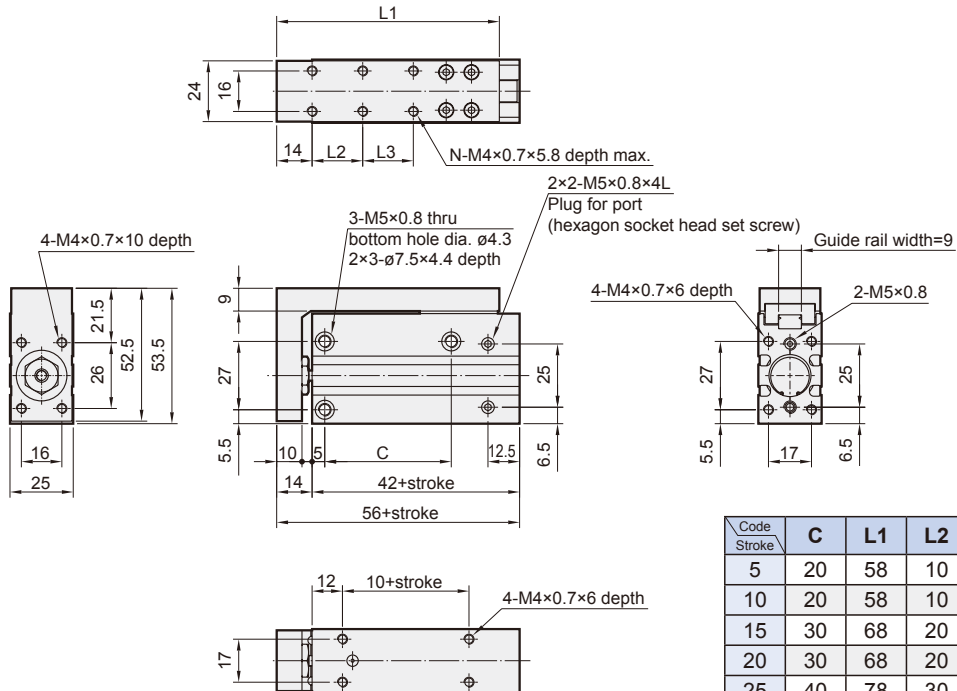
$\phi 10$



Code Stroke	C	L1	L2	L3	N
5	14	49	10	-	4
10	14	49	10	-	4
15	24	59	20	-	4
20	24	59	20	-	4
25	30	69	30	-	4
30	30	69	30	-	4
40	45	79	20	20	6
50	55	89	25	25	6
60	60	99	30	30	6

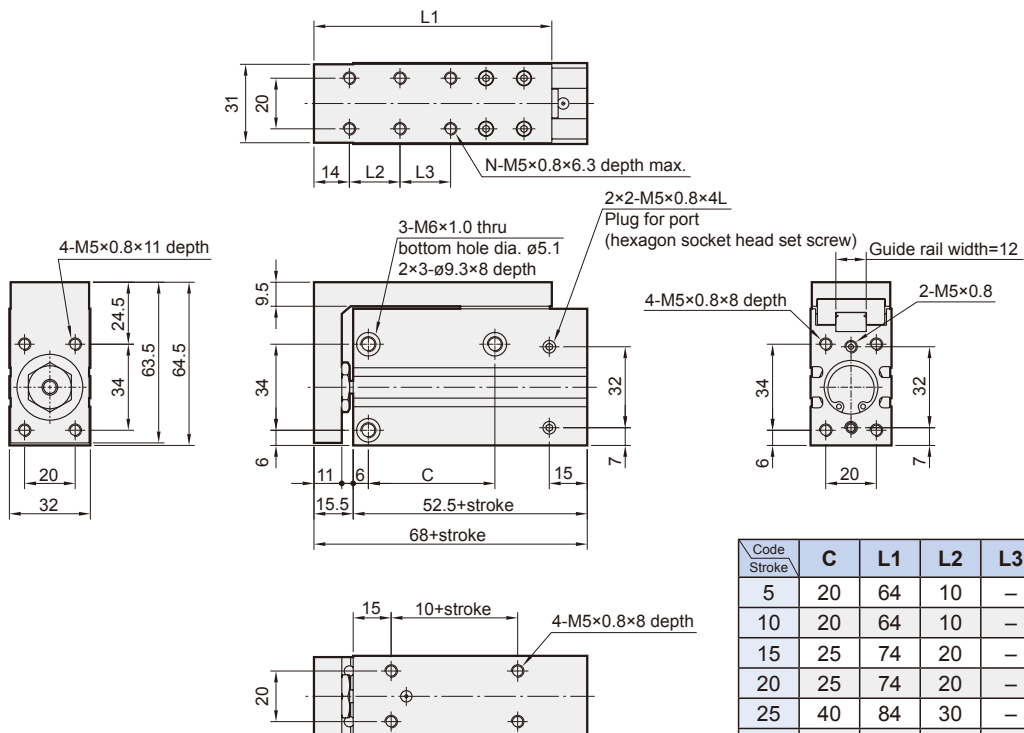
COMPACT SLIDE CYLINDER

$\phi 16$



Code Stroke	C	L1	L2	L3	N
5	20	58	10	-	4
10	20	58	10	-	4
15	30	68	20	-	4
20	30	68	20	-	4
25	40	78	30	-	4
30	40	78	30	-	4
40	50	88	20	20	6
50	60	98	25	25	6
60	60	108	30	30	6

$\phi 20$



Code Stroke	C	L1	L2	L3	N
5	20	64	10	-	4
10	20	64	10	-	4
15	25	74	20	-	4
20	25	74	20	-	4
25	40	84	30	-	4
30	40	84	30	-	4
40	50	94	20	20	6
50	70	104	25	25	6
60	70	114	30	30	6