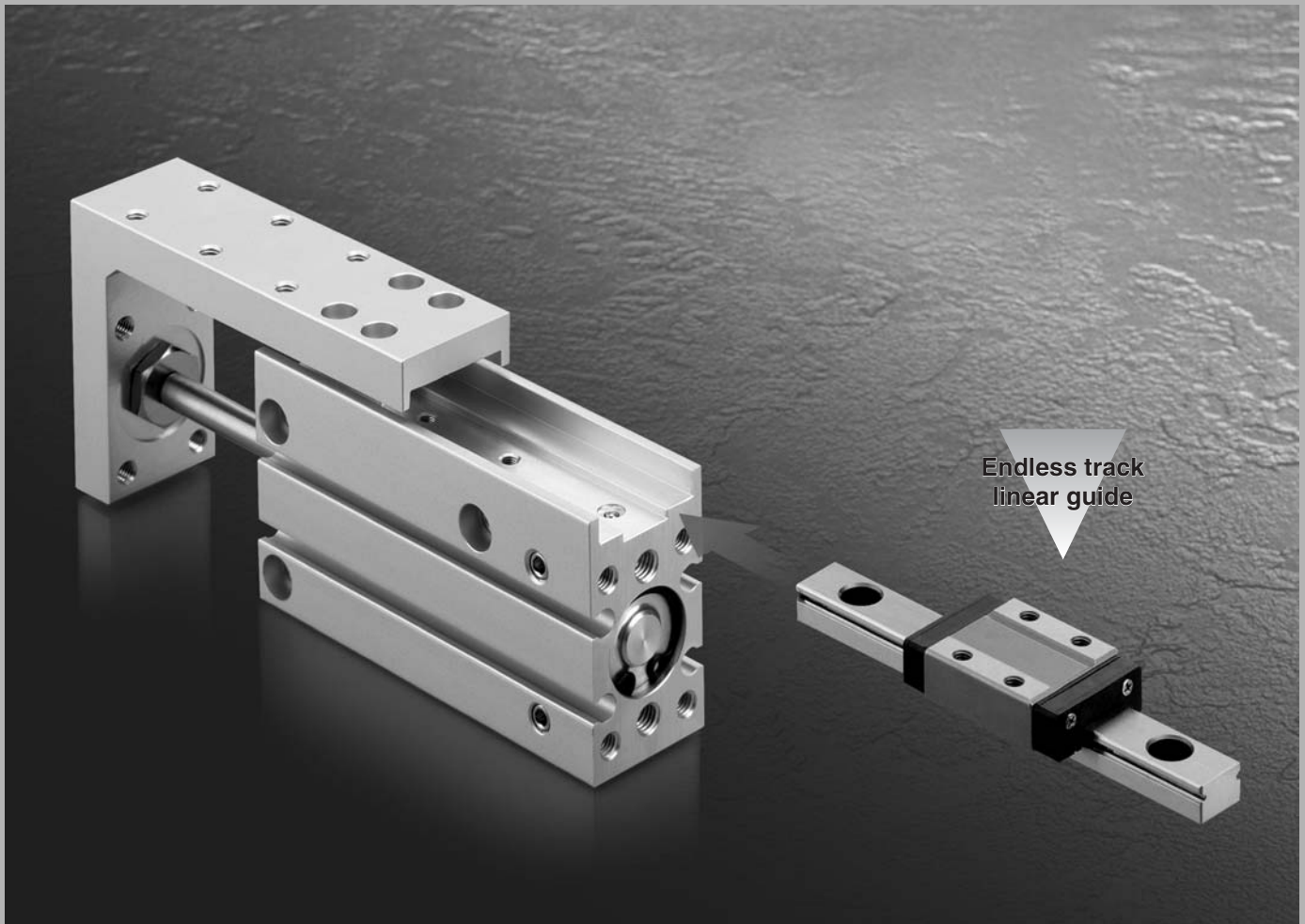


Compact Slide

Series MXH

ø6, ø10, ø16, ø20

The use of an endless track linear guide produces a table cylinder having excellent rigidity, linearity and non-rotating accuracy.



- MXH
- MXU
- MXS
- MXQ
- MXF
- MXW
- MXJ
- MXP
- MXY
- MTS

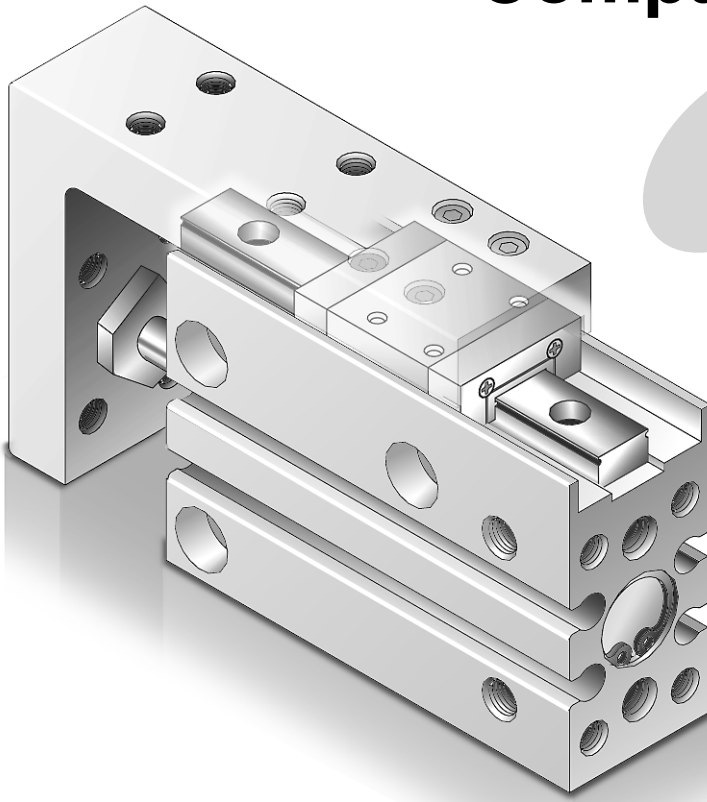
Series Variations

Model	Bore size (mm)	Standard stroke (mm)								Made to Order	
		5	10	15	20	25	30	40	50		60
MXH6	6	●	●	●	●	●	●	●	●	●	<ul style="list-style-type: none"> • -XB13 : Low-speed cylinder (5 to 50 mm/s) • -XC3□ : Special port positions • -XC19 : Intermediate stroke (Spacer type) • -XC22 : Fluororubber seals • -XC79 : Tapped hole, drilled hole, pinned hole machined additionally
MXH10	10	●	●	●	●	●	●	●	●		
MXH16	16	●	●	●	●	●	●	●	●		
MXH20	20	●	●	●	●	●	●	●	●		

- D-□
- X□
- Individual -X□

The use of an endless track linear guide having excellent rigidity, linearity,

Compact Slide *Series*



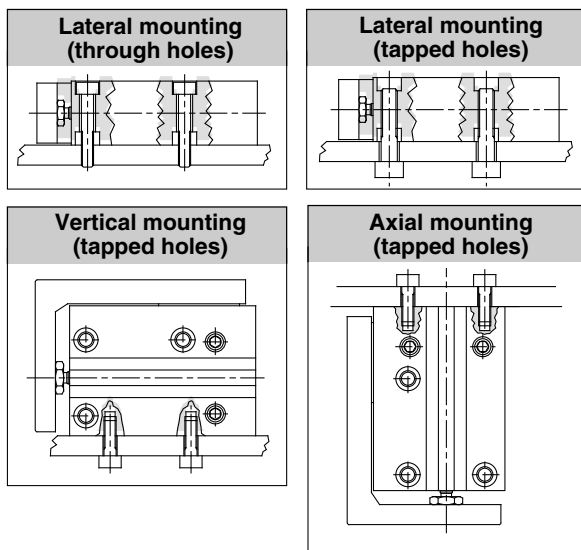
Improved moment tolerance

Allowable moment is approximately 6 times greater than the MXU series.

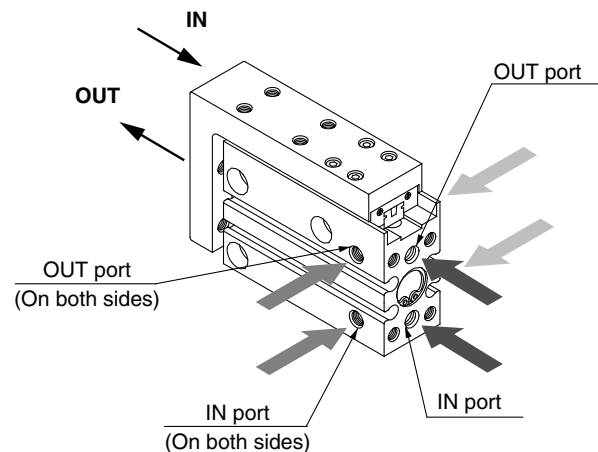
Long strokes up to 60 mm are now standard.

Traveling parallelism	Stroke (mm)	
	5 to 30	40 to 60
0.05 mm or less	0.1 mm or less	

Mounting is possible from 4 directions.



Piping is possible from 3 directions.



If changing the port positions, a made-to-order part number, -XC3□, is available.

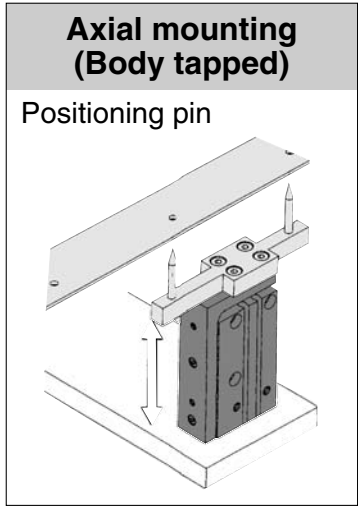
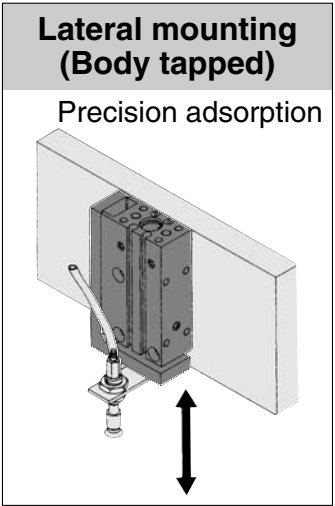
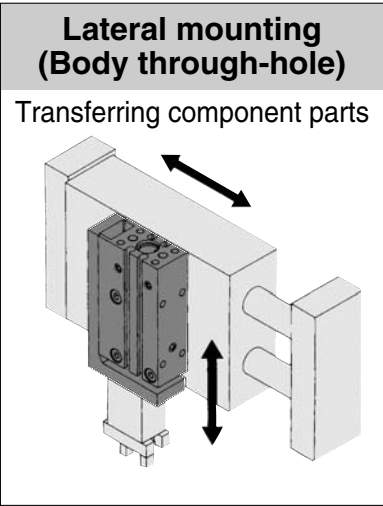
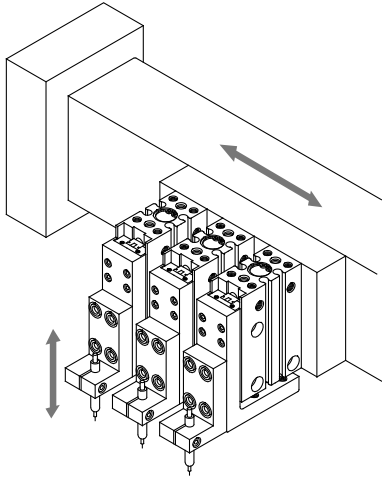
produces a table cylinder
non-rotating accuracy.



MXH / $\varnothing 6, \varnothing 10, \varnothing 16, \varnothing 20$

Applicable example

A table cylinder suitable for short pitch mounting



Auto switches offer numerous variations.
Reed switches, solid state switches and 2-color indicator type solid state switches can be mounted.

- MXH
- MXU
- MXS
- MXQ
- MXF
- MXW
- MXJ
- MXP
- MXY
- MTS

- D-□
- X□
- Individual -X□

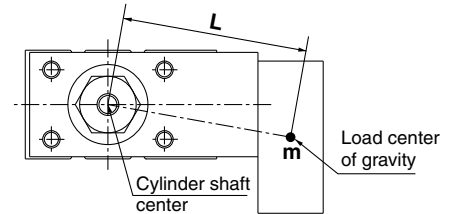
Series MXH Model Selection

⚠ Caution Confirmation of theoretical output is required separately. Refer to “Theoretical Output” on page 21.

Selection Conditions: Follow the tables below in order to determine selection conditions and choose one selection graph.

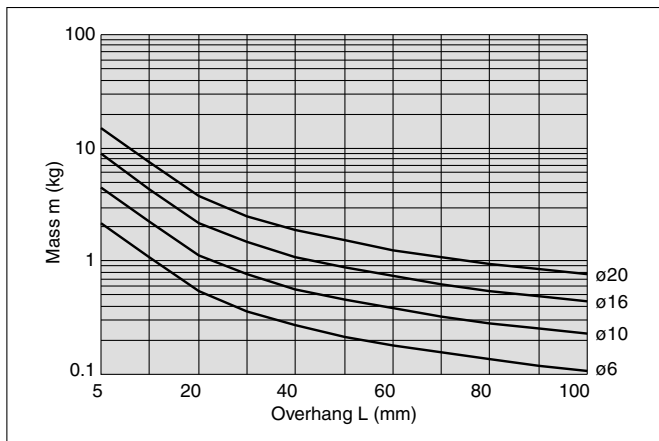
Mounting orientation	Vertical			Horizontal								
Maximum speed (mm/s)	Up to 100	Up to 300	Up to 500	Up to 100			Up to 300			Up to 500		
Load eccentricity (ε mm)	—			50	100	200	50	100	200	50	100	200
Selection graph	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

* 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. (See the drawing at right.)

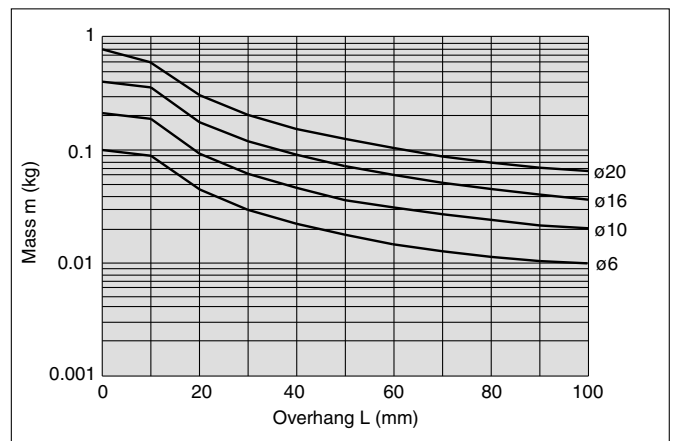


Selection Graph (1) to (3) (Vertical Mounting)

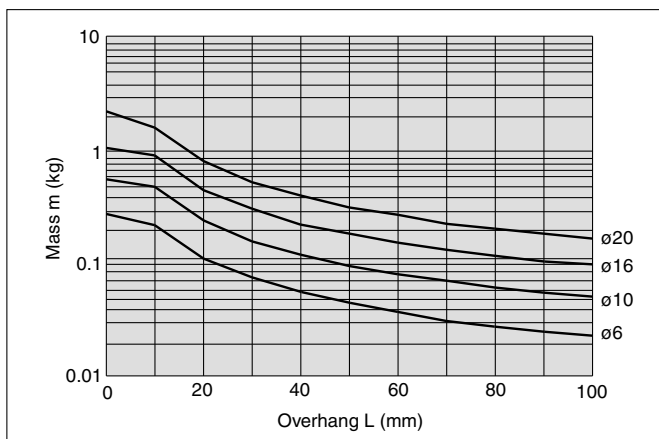
Graph (1) Maximum Speed 100 (mm/s) or Less



Graph (3) Maximum Speed 500 (mm/s) or Less



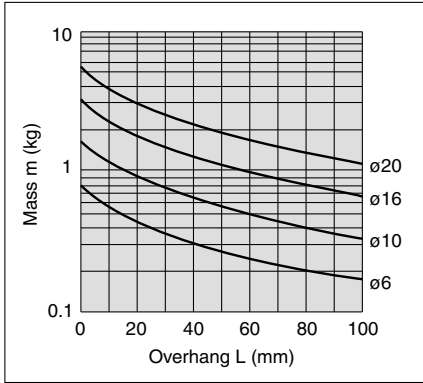
Graph (2) Maximum Speed 300 (mm/s) or Less



Selection Graph (4) to (12) (Horizontal Mounting)

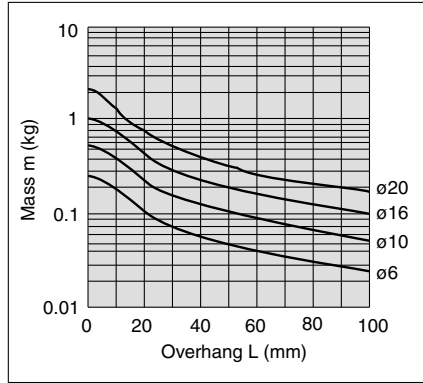
Maximum Speed 100 mm/s or Less

Graph (4) Load Eccentricity 50 mm



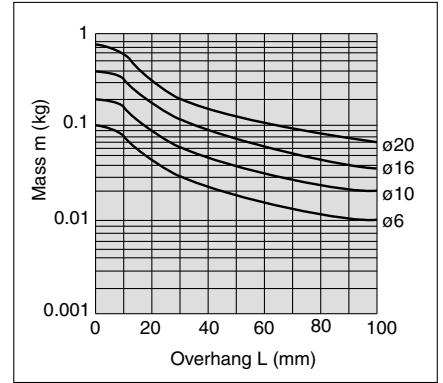
Maximum Speed 300 mm/s or Less

Graph (7) Load Eccentricity 50 mm

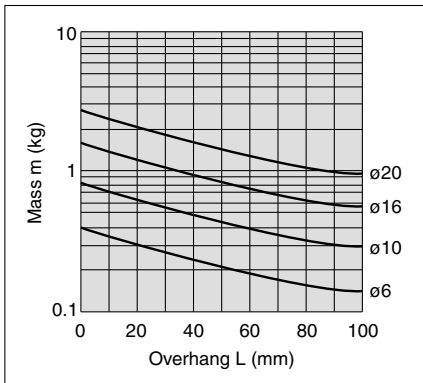


Maximum Speed 500 mm/s or Less

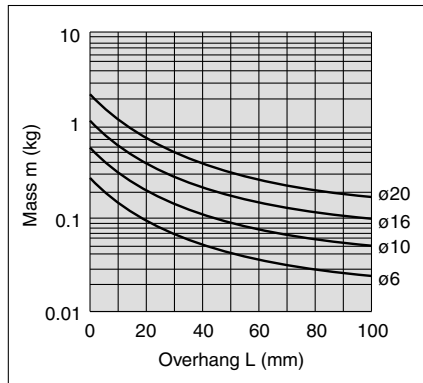
Graph (10) Load Eccentricity 50 mm



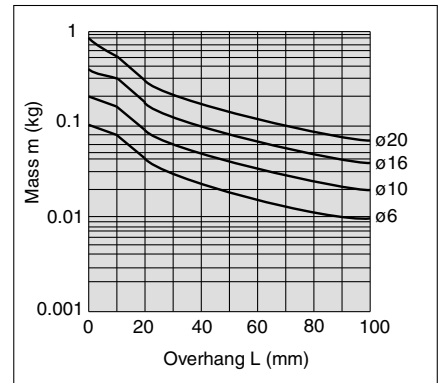
Graph (5) Load Eccentricity 100 mm



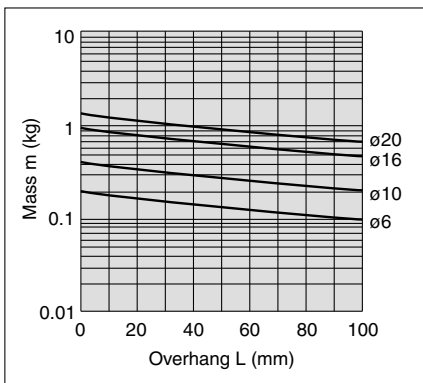
Graph (8) Load Eccentricity 100 mm



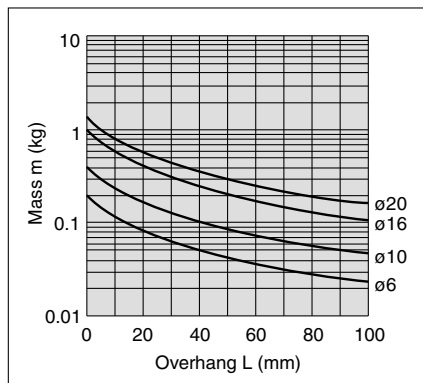
Graph (11) Load Eccentricity 100 mm



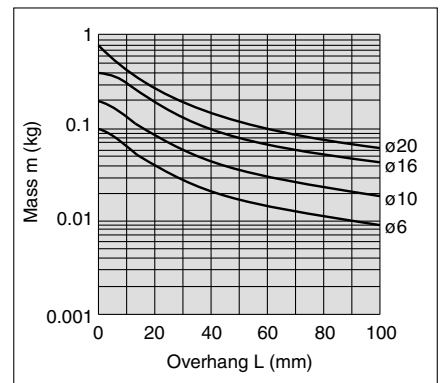
Graph (6) Load Eccentricity 200 mm



Graph (9) Load Eccentricity 200 mm



Graph (12) Load Eccentricity 200 mm



MXH

MXU

MXS

MXQ

MXF

MXW

MXJ

MXP

MXY

MTS

Selection Example

1. Selection conditions {
 Mounting: Vertical
 Max. speed: 500 mm/s
 Overhang: 40 mm
 Load mass: 0.1 kg

2. Selection conditions {
 Mounting: Horizontal
 Max. speed: 500 mm/s
 Load eccentricity: 50 mm
 Overhang: 30 mm
 Load mass: 0.1 kg

Refer to Graph (3) based on vertical mounting and a speed of 500 mm/s. In Graph (3), find the intersection of a 40 mm overhang and load mass of 0.1 kg, which results in a determination of ø20.

Refer to Graph (10) based on horizontal mounting, a speed of 500 mm/s and load eccentricity of 50 mm. In Graph (10), find the intersection of a 30 mm overhang and load mass of 0.1 kg, which results in a determination of ø16.

D-□

-X□

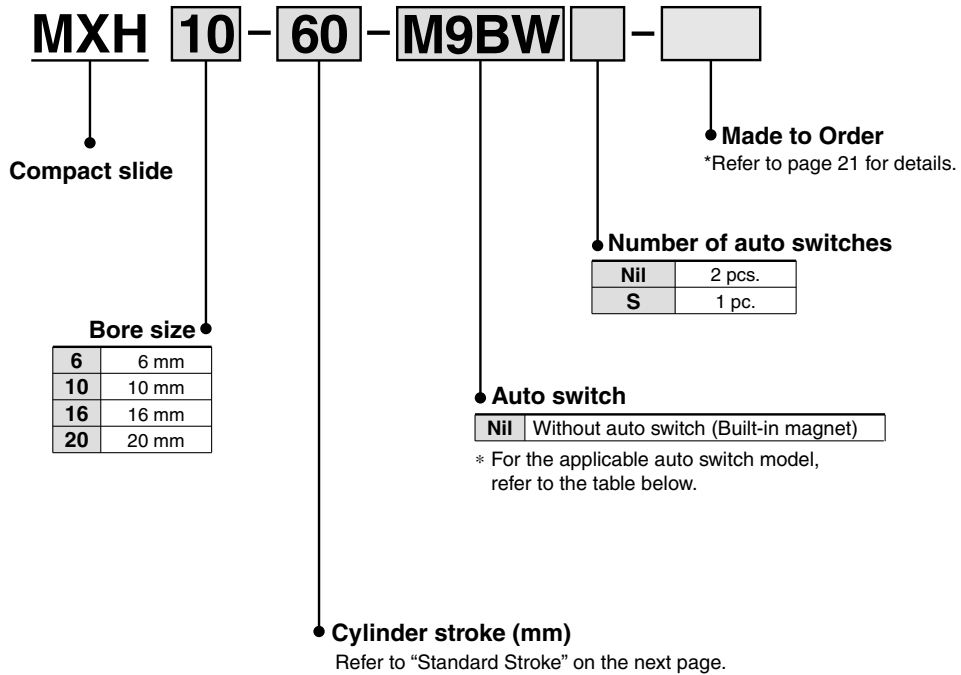
Individual
-X□

Compact Slide

Series MXH

ø6, ø10, ø16, ø20

How to Order



Applicable Auto Switches/Refer to pages 1719 to 1827 for further information on auto switches.

Type	Special function	Electrical entry	Indicator/light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)				Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)		IC circuit	Relay, PLC	
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○		
				2-wire				M9BV	M9B	●	●	●	○	○		
	3-wire (NPN)			5 V, 12 V	M9NWV	M9NW		●	●	●	○	○	IC circuit			
	3-wire (PNP)				M9PWV	M9PW		●	●	●	○	○				
	2-wire				M9BWV	M9BW		●	●	●	○	○				
Reed switch	—	Grommet	No	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	A93V	A93	●	—	●	—	—	—	Relay, PLC
							100 V or less	A90V	A90	●	—	●	—	—	IC circuit	

* Lead wire length symbols: 0.5 m Nil (Example) M9NW
 1 m M (Example) M9NWM
 3 m L (Example) M9NWL
 5 m Z (Example) M9NWZ

* Solid state auto switches marked with "○" are produced upon receipt of order.

* Refer to page 29 for applicable auto switches other than listed above.
 * For details about auto switches with pre-wired connector, refer to pages 1784 and 1785.
 * Auto switches are shipped together (not assembled).

Specifications



Made to Order
(Refer to pages 1847, and 1851 to 1954 for details.)

Symbol	Specifications
-XB13	Low-speed cylinder (5 to 50 mm/s)
-XC3	Special port positions
-XC19	Intermediate stroke (Spacer type)
-XC22	Fluororubber seals
-XC79	Tapped hole, drilled hole, pinned hole machined additionally

Bore size (mm)	6	10	16	20
Guide rail width (mm)	5	7	9	12
Fluid	Air			
Action	Double acting			
Piping port size	M5 x 0.8			
Minimum operating pressure	0.15 MPa	0.06 MPa		0.05 MPa
Maximum operating pressure	0.7 MPa			
Proof pressure	1.05 MPa			
Ambient and fluid temperature	Without auto switch: -10 to 70°C (No freezing) With auto switch: -10 to 60°C (No freezing)			
Piston speed	50 to 500 mm/s			
Allowable kinetic energy (J)	0.0125	0.025	0.05	0.1
Lubrication	Non-lube			
Cushion	Rubber bumper on both ends			
Stroke length tolerance	+1.0 0			
Auto switch (Option)	Reed auto switch: D-A9□ Solid state auto switch: D-M9□, D-M9□W			

MXH

MXU

MXS

MXQ

MXF

MXW

MXJ

MXP

MXY

MTS

Standard Stroke

Bore size (mm)	Standard stroke (mm)
6, 10, 16, 20	5, 10, 15, 20, 25, 30, 40, 50, 60

Note: Intermediate strokes are available with "Made to Order" models (-XC19). (For details, see page 1916.)

Theoretical Output

(N)

Bore size (mm)	Rod size (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	60.3	101	141
		IN	172	51.6	86.0	121
20	8	OUT	314	94.2	157	220
		IN	264	79.2	132	185

Mass

(g)

Model	Stroke (mm)								
	5	10	15	20	25	30	40	50	60
MXH6	62	67	76	81	91	96	111	125	140
MXH10	117	125	140	148	162	170	192	215	238
MXH16	216	227	247	258	279	290	323	353	386
MXH20	437	455	486	505	542	560	597	656	700

D-□

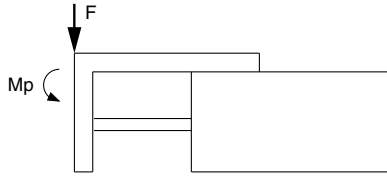
-X□

Individual
-X□

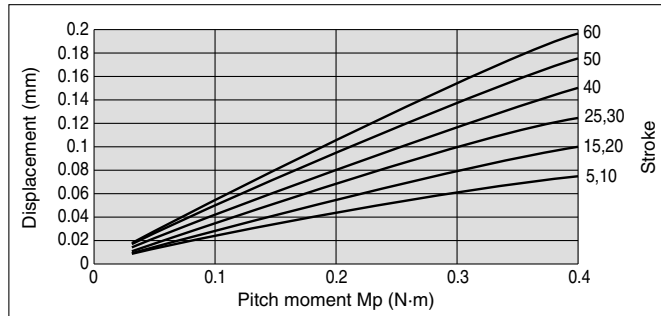
Table Displacement

Table Displacement due to Pitch Moment

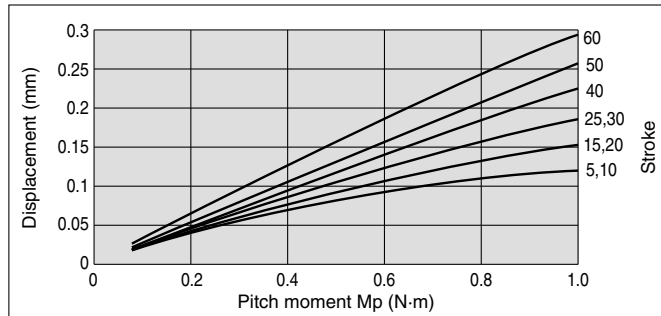
Table displacement (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide



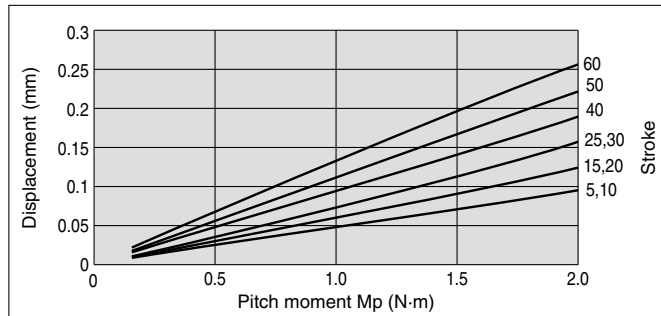
MXH6



MXH10



MXH16



MXH20

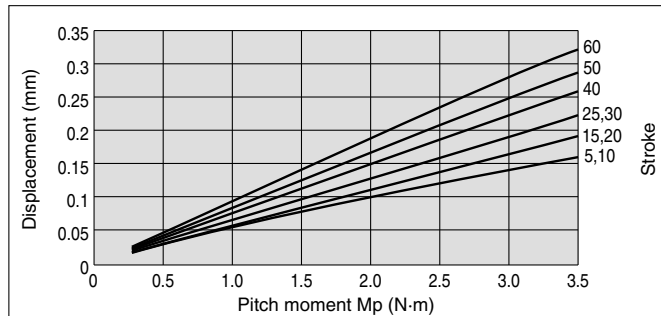
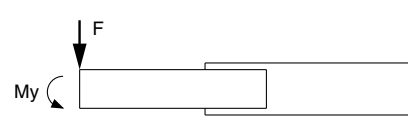
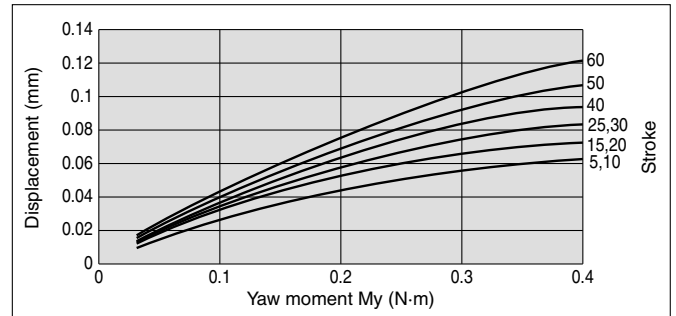


Table Displacement due to Yaw Moment

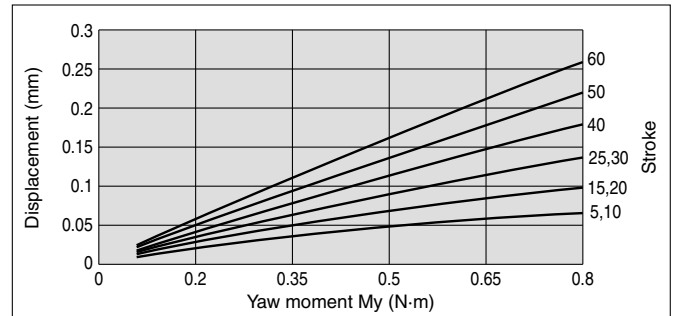
Table displacement (arrow) when a load acts upon the section marked with the arrow at the full stroke of the compact slide



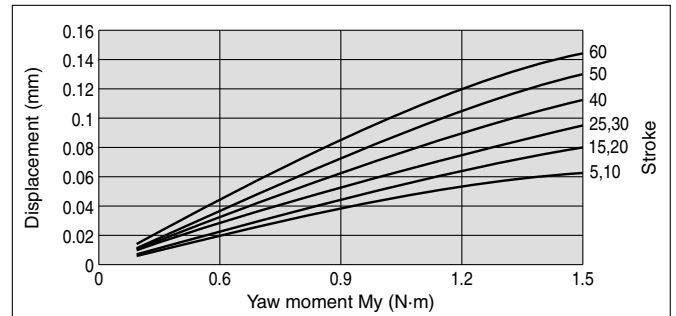
MXH6



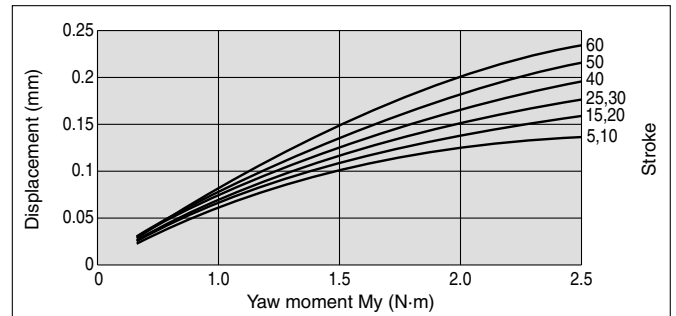
MXH10



MXH16



MXH20



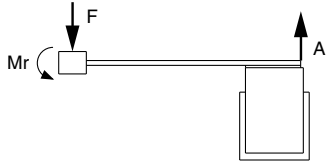
⚠ Caution Caution on Design

1. Selection of a bore size cannot be made only with above graphs. Select a bore size in accordance with "Model Selection" on page 18 and 19.
2. Displacement may increase after an impact load has been applied. When the table is subjected to an impact load, there may be permanent distortion of the guide unit and increased displacement.

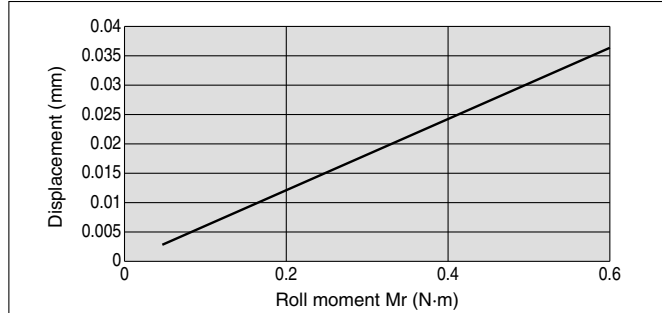
Table Displacement

Table Displacement due to Roll Moment

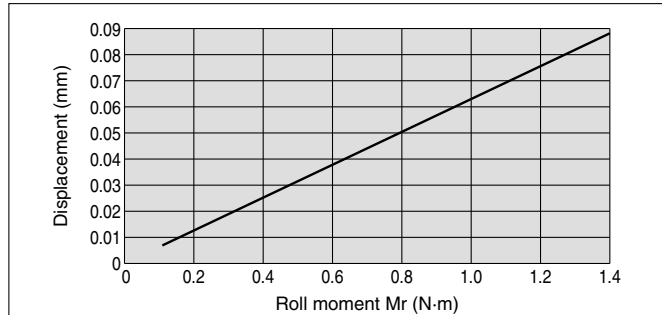
Table displacement (at A) when a load acts upon section F at the full stroke of the compact slide



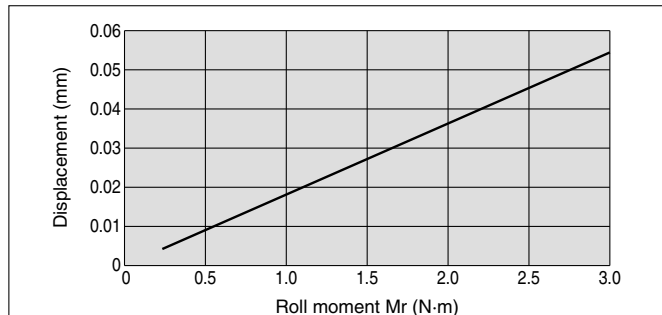
MXH6



MXH10



MXH16



MXH20

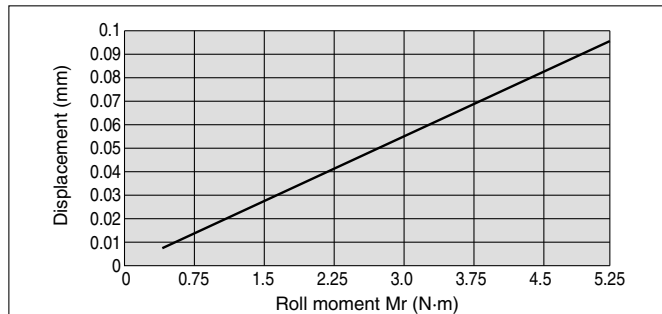


Table Accuracy

Traveling parallelism	Stroke (st)	
	5 to 30	40 to 60
	0.05 mm or less	0.1 mm or less

Model	Allowable moment (N-m)		
	Pitch moment	Yaw moment	Roll moment
	M_p	M_y	M_r
MXH6	0.47	0.39	0.59
MXH10	0.96	0.82	1.37
MXH16	1.88	1.59	2.75
MXH20	3.14	2.75	5.49

MXH

MXU

MXS

MXQ

MXF

MXW

MXJ

MXP

MXY

MTS

D-□

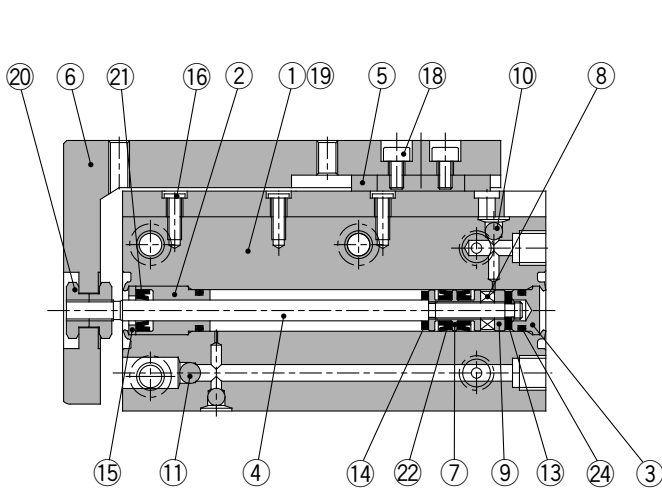
-X□

Individual
-X□

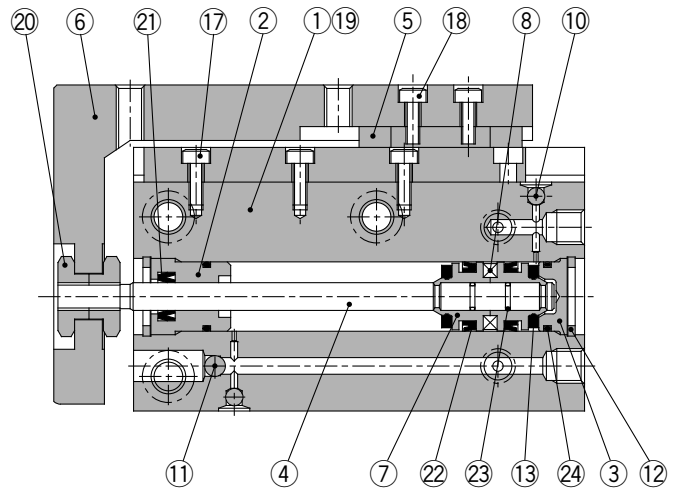
Series MXH

Construction

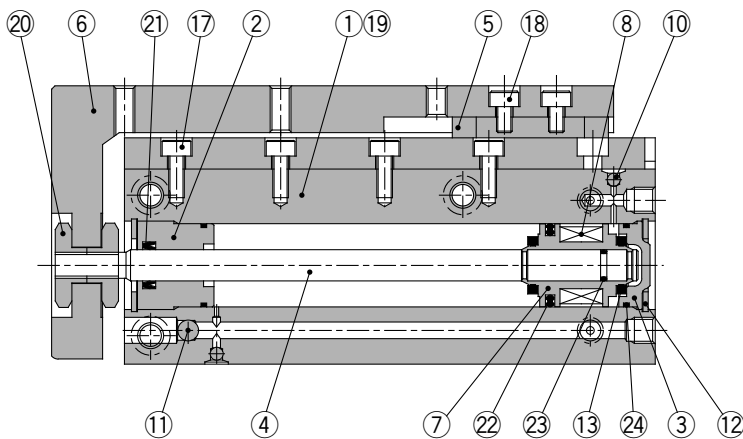
MXH6 (ø6)



MXH10 (ø10)



MXH16/20 (ø16, ø20)



Component Parts

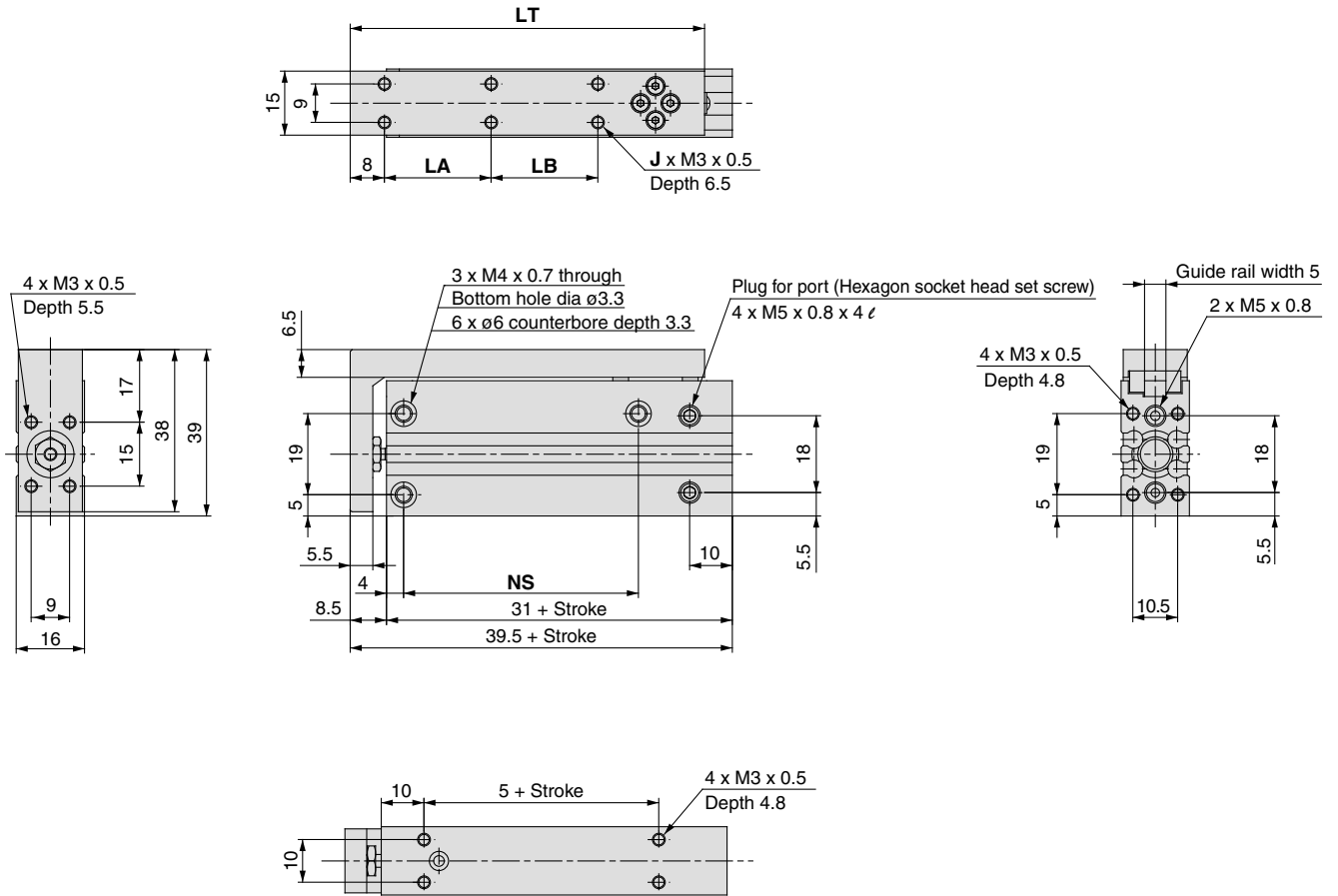
No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Rod cover	Brass	
3	Head cover	Brass	ø6, ø10 electroless nickel plated
		Aluminum alloy	ø16, ø20 chromated
4	Piston rod	Stainless steel	
5	Linear guide	—	
6	Table	Aluminum alloy	Hard anodized
7	Piston	Brass	ø6, ø10
		Aluminum alloy	ø16, ø20
8	Magnet	—	ø6, ø10 nickel plated
		Synthetic rubber	ø16, ø20
9	Magnet holder	Brass	ø6
10	Steel ball A	High carbon chrome bearing steel	
11	Steel ball B	High carbon chrome bearing steel	

Note: The MXH series cannot be disassembled.

Component Parts

No.	Description	Material	Note
12	C-type retaining ring for hole	Carbon tool steel	ø10, ø16, ø20
13	Bumper	Urethane	
14	Bumper	Urethane	
15	Seal retainer	Stainless steel	ø6
16	Round head Phillips screw	Carbon steel	ø6 black zinc chromated
17	Hexagon socket head cap screw	Chromium molybdenum steel	ø10, ø16, ø20 nickel plated
18	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
19	Hexagon socket head plug	Chromium molybdenum steel	Nickel plated
20	Nut	Brass	Nickel plated
21	Rod seal	NBR	
22	Piston seal	NBR	
23	Piston gasket	NBR	ø10, ø16, ø20
24	Gasket	NBR	

Dimensions: $\phi 6$

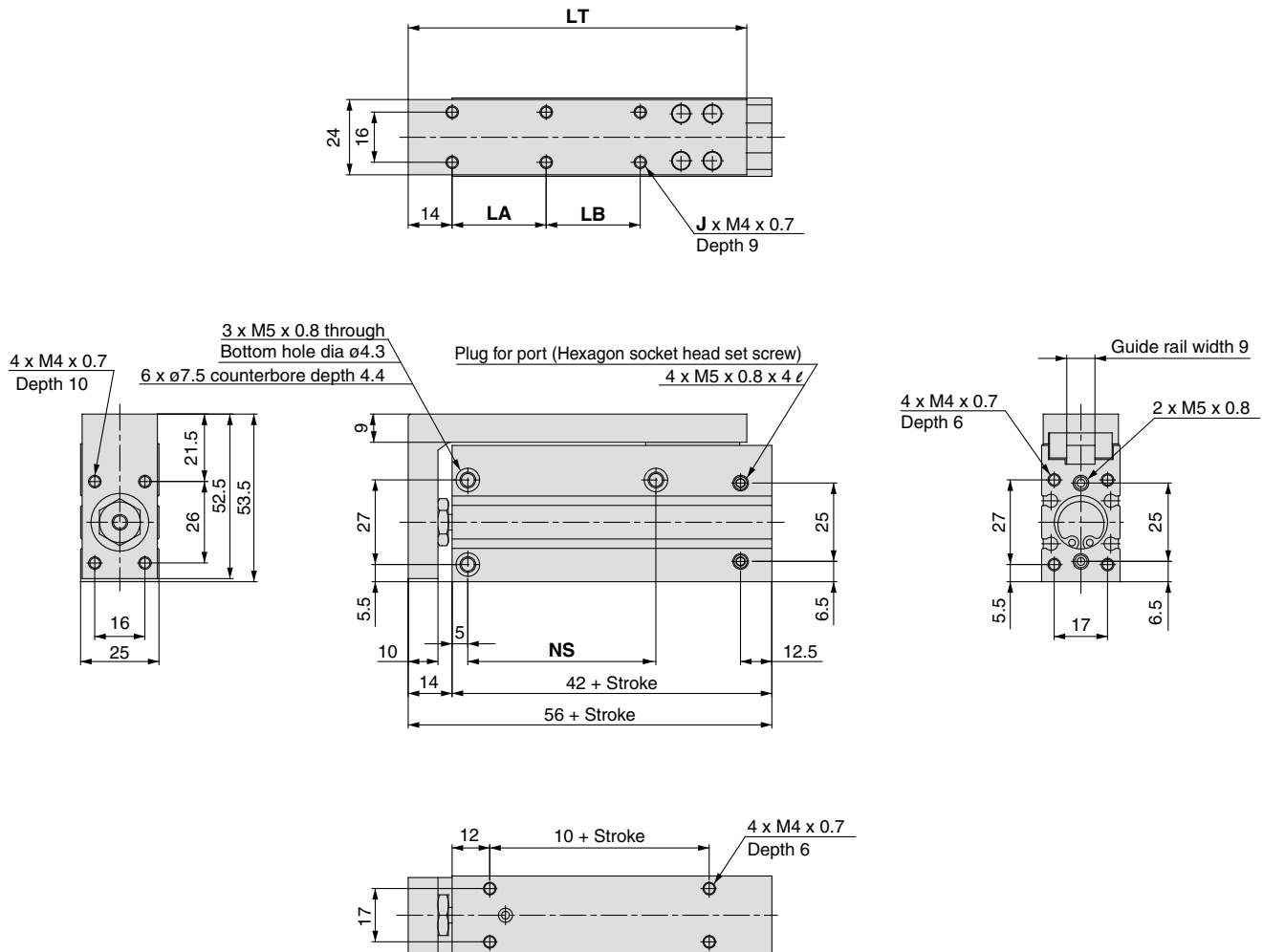


- MXH**
- MXU**
- MXS**
- MXQ**
- MXF**
- MXW**
- MXJ**
- MXP**
- MXY**
- MTS**

Stroke (mm)	J	LA	LB	LT	NS
5	4	10	—	42	14
10	4	10	—	42	14
15	4	20	—	52	24
20	4	20	—	52	24
25	4	30	—	62	30
30	4	30	—	62	30
40	6	20	20	72	45
50	6	25	25	82	55
60	6	30	30	92	60

- D-□**
- X□**
- Individual
-X□

Dimensions: ø16



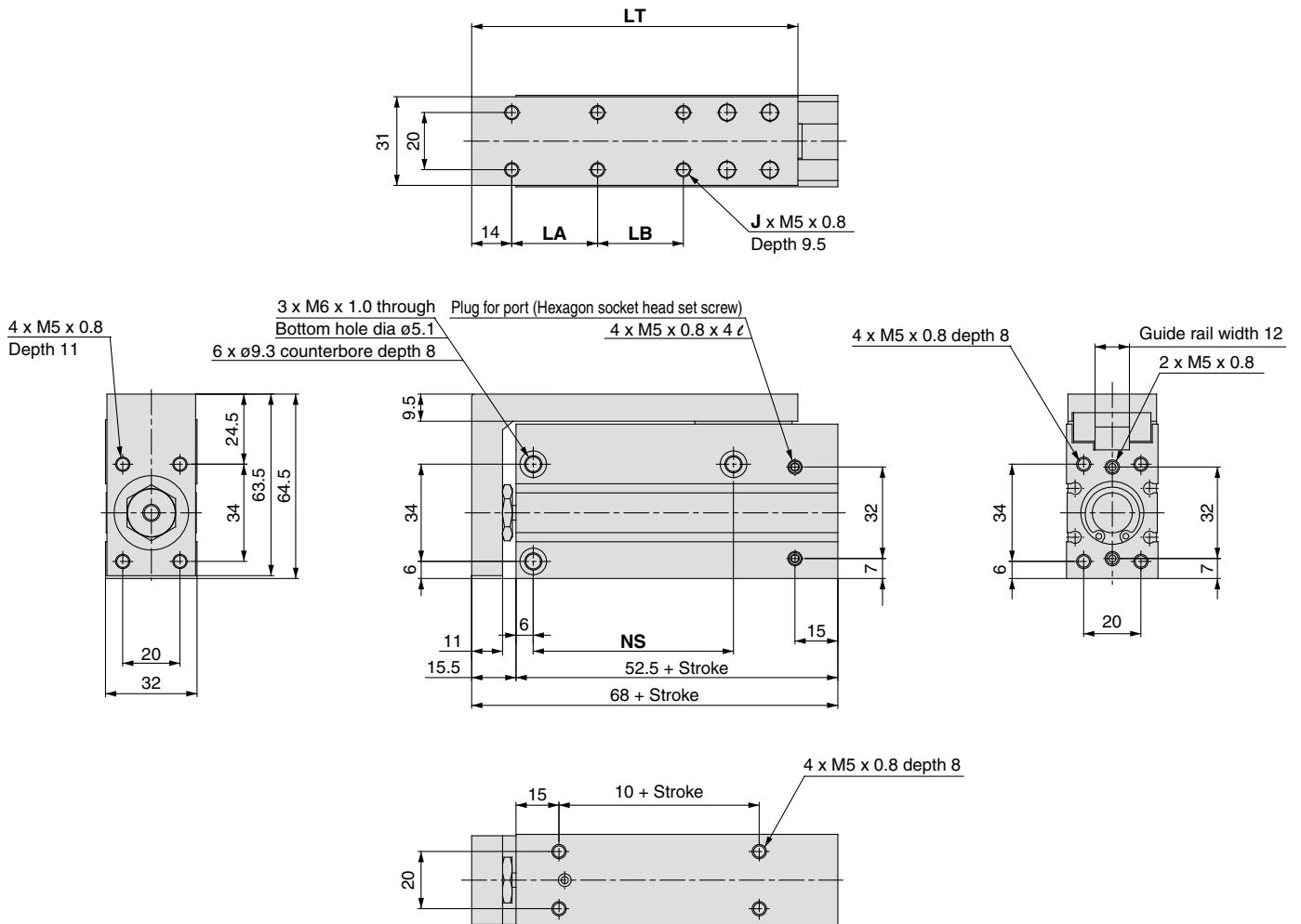
- MXH**
- MXU**
- MXS**
- MXQ**
- MXF**
- MXW**
- MXJ**
- MXP**
- MXY**
- MTS**

Stroke (mm)	J	LA	LB	LT	NS
5	4	10	—	58	20
10	4	10	—	58	20
15	4	20	—	68	30
20	4	20	—	68	30
25	4	30	—	78	40
30	4	30	—	78	40
40	6	20	20	88	50
50	6	25	25	98	60
60	6	30	30	108	60

- D-□**
- X□**
- Individual
-X□

Series MXH

Dimensions: $\phi 20$



Stroke (mm)	J	LA	LB	LT	NS
5	4	10	—	64	20
10	4	10	—	64	20
15	4	20	—	74	25
20	4	20	—	74	25
25	4	30	—	84	40
30	4	30	—	84	40
40	6	20	20	94	50
50	6	25	25	104	70
60	6	30	30	114	70

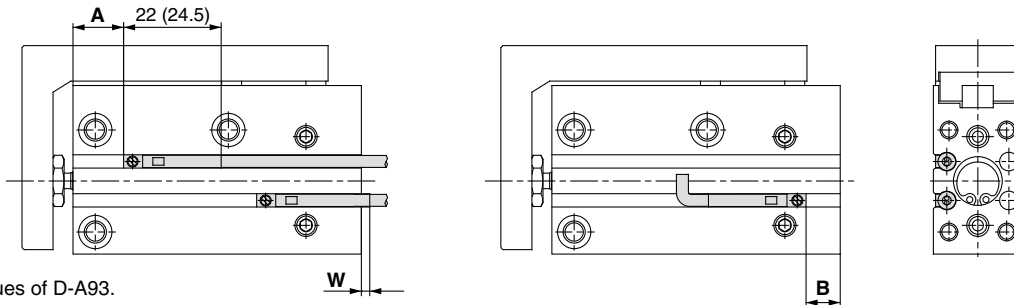
Minimum Stroke for Auto Switch Mounting

(mm)

No. of auto switches mounted	Applicable auto switch model		
	D-A9□ D-A9□V	D-M9□ D-M9□V	D-M9□W D-M9□WV
1 pc.	5	5	5
2 pcs.	10	5	10

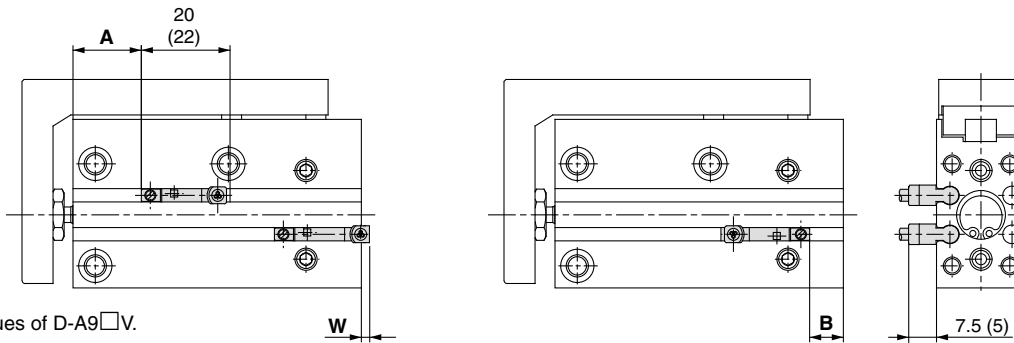
Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

D-A9□
D-M9□
D-M9□W



() : denotes the values of D-A93.

D-A9□V
D-M9□V
D-M9□WV



() : denotes the values of D-A9□V.

(mm)

Bore size (mm)	D-A9□, D-A9□V			D-M9□W, D-M9□			D-M9□WV, D-M9□V		
	A	W	B	A	W	B	A	W	B
6	12.5	3.5 (6)	—	16.5	7.5	2.5	16.5	5.5	2.5
10	11.0	-2.0 (0.5)	3.5	15.0	2.0	7.5	15.0	0	7.5
16	18.0	-2.0 (0.5)	4.0	22.0	2.0	8.0	22.0	0	8.0
20	26.0	-4.5 (-2)	6.5	30.0	-0.5	10.5	30.0	-2.5	10.5

- Note 1) Negative figures in the table W indicate an auto switch is mounted inward from the edge of the cylinder body.
 Note 2) In the case of models with 5 and 10 strokes, the switch may not turn off due to operating range or two switches may turn on simultaneously. Fix switches outside 1 to 4 mm further than the values in the above table. (if 1 switch is used, make sure that it turns ON and OFF properly; if 2 switches are used, make sure that both switches turn ON.)
 Note 3) () in column W denotes the dimensions of D-A93.

Operating Range

(mm)

Auto switch model	Bore size			
	6	10	16	20
D-A9□, A9□V	5	6	9	11
D-M9□, M9□V D-M9□W, M9□WV	3	3.5	5	6

* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion.)
 There may be the case it will vary substantially depending on an ambient environment.

Besides the models listed in How to Order, the following auto switches are applicable.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H types) are also available. Refer to page 1746 for details.

MXH

MXU

MXS

MXQ

MXF

MXW

MXJ

MXP

MXY

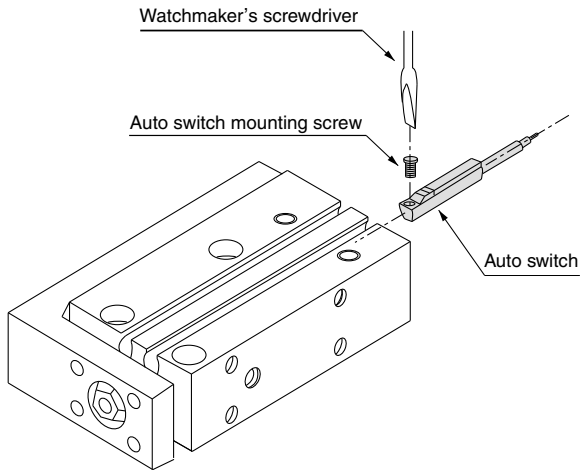
MTS

D-□

-X□

Individual
-X□

Auto Switch Mounting



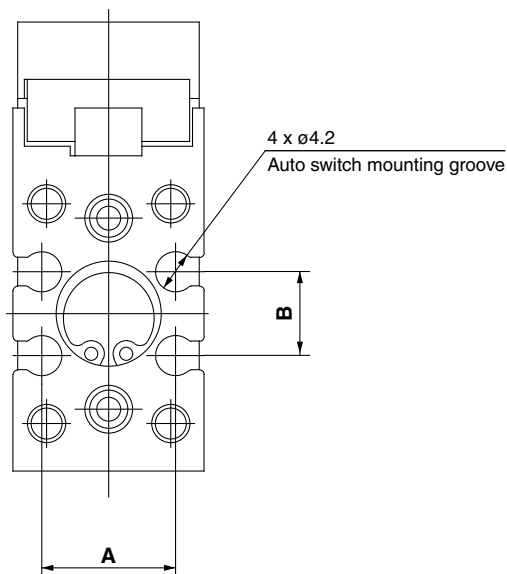
- When tightening the auto switch mounting screw, use a watchmaker's screwdriver with a handle 5 to 6 mm in diameter.

Tightening Torque of Auto Switch Mounting Screw (N·m)

Auto switch model	Tightening torque
D-A9□(V)	0.10 to 0.20
D-M9□(V) D-M9□W(V)	0.05 to 0.15

Note) When used with side piping, it is not possible to mount a D-A9□V, M9□V auto switch type on the side to which the piping is connected.

Auto switch groove position



Bore size (mm)	(mm)	
	A	B
6	10	6.9
10	14	8.8
16	19	13.7
20	26	17.1



Series MXH Specific Product Precautions 1

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Caution on Handling Auto Switches

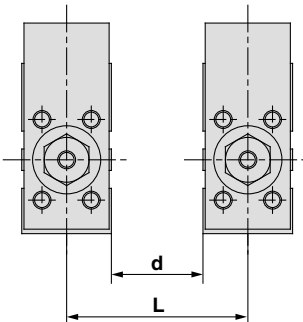
When installing in close proximity to each other

⚠ Caution

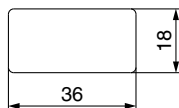
- When compact slide cylinders equipped with D-A9□ or D-M9□ auto switches are used, the auto switches could activate unintentionally if the installed distance is less than the dimension shown in Table (1). Therefore, make sure to provide at least this much clearance. Due to unavoidable circumstances, if they must be used with less distance than the dimensions given in the table below, the cylinders must be shielded. Therefore, affix a steel plate or a magnetic shielding plate (MU-S025) to the area on the cylinder that corresponds to the adjacent auto switch. (Please contact SMC for details.) The auto switch could activate unintentionally if a shielding plate is not used.

Table (1) (mm)

Bore size (mm)	d	L
MXH6	5	21
MXH10	5	25
MXH16	10	35
MXH20	15	47



Dimensions of shielding plate (MU-S025) that is sold separately are indicated as reference.

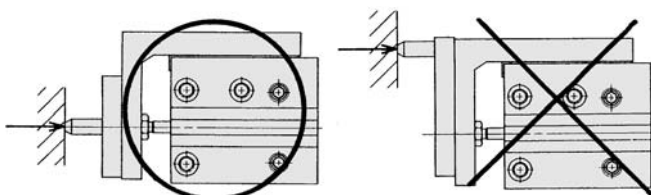


Material: Ferrite stainless steel, Thickness: 0.3 mm
Since the back side is treated with adhesive, it is possible to attach to the cylinder.

Operating Precautions

⚠ Caution

- Do not place your fingers in the clearance between the non-rotating plate and the cylinder tube. Your fingers could get caught between the table and the cylinder tube when the piston rod retracts. If fingers are caught in a cylinder, there is a danger of injury due to the strong cylinder output, and therefore caution must be exercised.
- In terms of the load mass and moment, the cylinder must be operated below the maximum load mass and allowable moment.
- If the output of the compact slide is applied directly to the table, make sure it is applied along the rod axial line. (Refer to the figure below.)

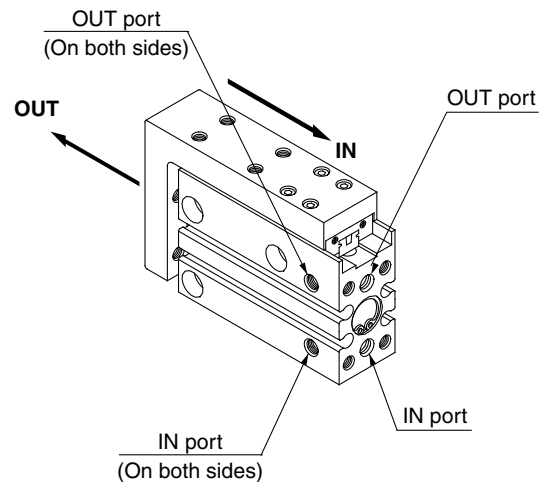


- Make sure to connect a speed controller and adjust it to a speed of 500 mm/s or less to operate the cylinder.

Operating Direction with Different Pressure Ports

⚠ Caution

- The compact slide can be mounted in three directions. Check the pressure port and the operating direction. (Refer to the figure below.)

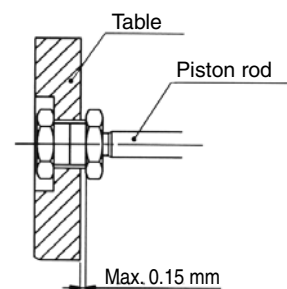


When customers change the port location, please order the plugs listed below.
Replacement plug part no.: CXS10-08-28747A

Stroke Direction Backlash

⚠ Caution

- Since the connection between the piston rod and table is a floating structure, there is a maximum table backlash of 0.15 mm in the stroke direction. (Refer to the figure below.)



Piston rod and table connection

MXH

MXU

MXS

MXQ

MXF

MXW

MXJ

MXP

MXY

MTS

D-□

-X□

Individual
-X□



Series MXH Specific Product Precautions 2

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Mounting

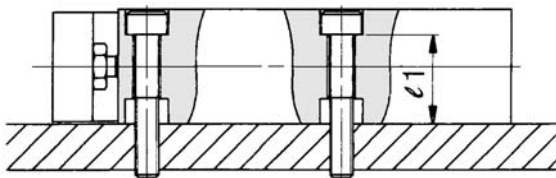
Caution

1. When tightening threads for compact slide, properly tighten within the specified torque.

How to Mount a Compact Slide

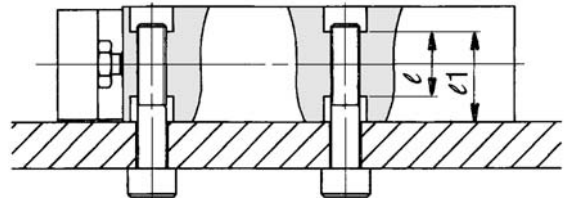
A compact slide can be mounted from 4 directions. Make a selection suitable for the applicable machinery and workpieces, etc.

Lateral Mounting (Body through-hole)



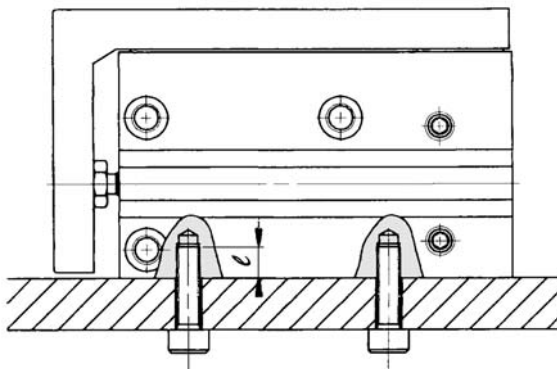
Model	Bolt	Maximum tightening torque (N-m)	ℓ_1
MXH6	M3 x 0.5	1.1	12.7
MXH10	M4 x 0.7	2.5	15.6
MXH16	M4 x 0.7	2.5	20.6
MXH20	M5 x 0.8	5.1	24.0

Lateral Mounting (Body tapped)



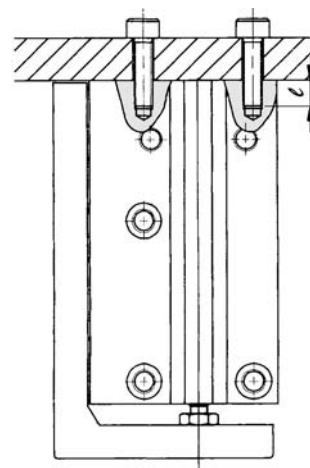
Model	Bolt	Maximum tightening torque (N-m)	ℓ_1	ℓ
MXH6	M4 x 0.7	2.5	12.7	9.4
MXH10	M5 x 0.8	5.1	15.6	11.2
MXH16	M5 x 0.8	5.1	20.6	16.2
MXH20	M6 x 1	8.1	24.0	16.0

Vertical Mounting (Body tapped)



Model	Bolt	Maximum tightening torque (N-m)	ℓ
MXH6	M3 x 0.5	1.1	4.8
MXH10	M4 x 0.7	2.5	6
MXH16	M4 x 0.7	2.5	6
MXH20	M5 x 0.8	5.1	8

Axial Mounting (Body tapped)



Model	Bolt	Maximum tightening torque (N-m)	ℓ
MXH6	M3 x 0.5	1.1	4.8
MXH10	M4 x 0.7	2.5	6
MXH16	M4 x 0.7	2.5	6
MXH20	M5 x 0.8	5.1	8



Series MXH Specific Product Precautions 3

Be sure to read before handling.

Refer to front matters 42 and 43 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Mounting

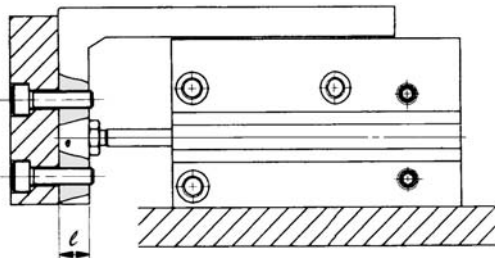
Caution

- When tightening threads for compact slide, properly tighten within the specified torque.
- When mounting a workpiece on the top of the table, do not screw a bolt in more deeper than the female thread (Below table ℓ dimension). If screwing a bolt in more deeper than the ℓ dimension, the edge of the bolt could reach the linear guide and might damage the linear guide.

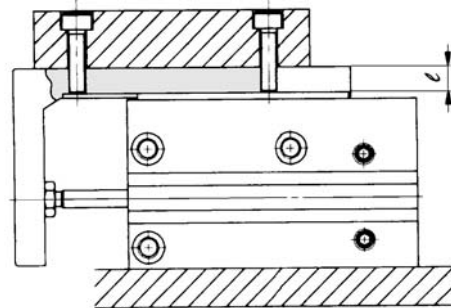
How to Mount a Workpiece

A compact slide can be mounted from 2 directions. Make a selection suitable for the applicable machinery and workpieces, etc.

Front Mounting



Top Mounting



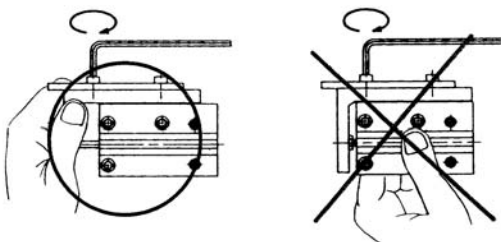
Model	Bolt	Maximum tightening torque (N-m)	ℓ
MXH6	M3 x 0.5	1.1	5.5
MXH10	M4 x 0.7	2.5	7.5
MXH16	M4 x 0.7	2.5	10
MXH20	M5 x 0.8	5.1	11

Model	Bolt	Maximum tightening torque (N-m)	ℓ
MXH6	M3 x 0.5	1.1	6.5
MXH10	M4 x 0.7	2.5	8
MXH16	M4 x 0.7	2.5	9
MXH20	M5 x 0.8	5.1	9.5

How to Mount a Workpiece

Workpieces can be mounted on 2 surfaces of the compact slide.

- Since the table is supported by the linear guide, take care not to apply strong impact or large moment, etc. when mounting workpieces.
- Hold the table when fastening workpieces to it with bolts, etc. If the body is held while tightening bolts, etc., the guide section will be subjected to a large moment, and there may be a loss of precision.



- For connection with a load having an external support/guide mechanism, select an appropriate connection method and perform careful alignment.
- Use caution, as scratches or nicks, etc. on the sliding parts of the piston rod can cause malfunction and air leakage.

MXH

MXU

MXS

MXQ

MXF

MXW

MXJ

MPX

MXY

MTS

D-□

-X□

Individual
-X□