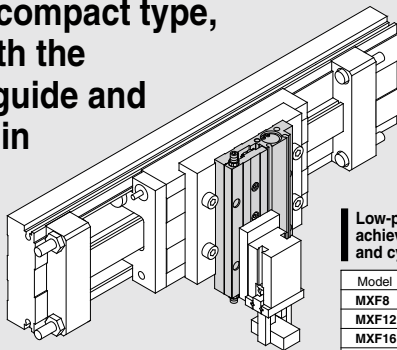# Low Profile Slide Table

MXF Series

⌀8, ⌀12, ⌀16, ⌀20

RoHS

Low-profile and compact type, air slide table with the construction of guide and cylinder aligned in parallel.

Low-profile and compactness have been achieved with the construction of guide and cylinder aligned in parallel.

Model	Height x Width (mm)	Height comparison to MXS
MXF8	16 x 58	67%
MXF12	18.5 x 68	59%
MXF16	21 x 80	53%
MXF20	27 x 92	54%

Neat appearance

Protecting stopper section with cover realizes neat appearance.

Standard stroke adjustment

Stroke can be adjusted at each stroke end within 5 mm each end and 10 mm is total.

Body mounting (Body tapped)

Auto switch is mountable

Auto switch is recessed in the groove to save space.

Slim body

Low-profile has been achieved with the construction of guide and cylinder aligned in parallel.

Reproducibility for mounting and dismounting

Positioning pin holes on table top allows precise and easy mounting to change workpiece.

Stronger thread for mounting work

Insert thread for mounting work.

High rigidity

Cross roller guide allows smooth operation without vibration.

Optional porting

Lateral and axial piping from 2 directions is possible.

Reproducibility for mounting and dismounting

Pin holes for positioning on bottom of slide allows precise and accurate mounting of actuator.

Body mounting (Body tapped)

Mounting can be done from 2 directions top side (through-hole) and bottom side (body tapped).

1. Body tapped	2. Body through-hole

Series Variations

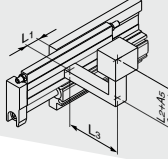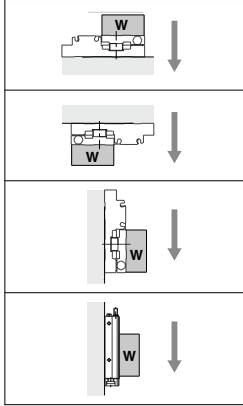| Model	Bore size (mm)	Stroke (mm)						Auto switch
		10	20	30	50	75	100	Reed auto switch D-A9☐, D-A9☐V
MXF8	8							Solid state auto switch D-M9☐, D-M9☐V
MXF12	12							2-color indicator solid state auto switch D-M9☐W, D-M9☐WV
MXF16	16							
MXF20	20							

D-☐

-X☐

SMC

MXF *Series*
Model Selection

Model Selection Step	Formula/Data	Selection Example

❶ Operating Conditions

Enumerate the operating conditions considering the mounting position and workpiece configuration. Check that the load weight does not exceed the maximum allowable load weight and that the average operating speed does not exceed the operating speed range.

- **Model to be used**
- **Type of cushion**
- **Workpiece mounting position**
- **Mounting orientation**
- **Average operating speed Va (mm/s)**
- **Load mass W (kg):** Fig. (1) · Table (2)
- **Overhang Ln (mm):** Fig. (2)

Cylinder: MXF20-50
Cushion: Rubber bumper
Workpiece table mounting
Mounting: Horizontal wall mounting
Average operating speed:
Va = 300 [mm/s]
Allowable load: W = 0.5 [kg]
L_1 = 10 mm
L_2 = 30 mm
L_3 = 30 mm

❷ Kinetic Energy

Find the kinetic energy E (J) of the load.
Find the allowable kinetic energy Ea (J).
Confirm that the kinetic energy of the load does not exceed the allowable kinetic energy.

$$E = \frac{1}{2} \cdot W \left(\frac{V}{1000} \right)^2$$

Collision speed V = 1.4 · Va ∗) Correction factor
(Reference values)
Ea = K·Emax
Workpiece mounting coefficient K: Fig. (3)
Max. allowable kinetic energy Emax: Table (1)
Kinetic energy (E) ≤ Allowable kinetic energy (Ea)

$$E = \frac{1}{2} \cdot 0.5 \left(\frac{420}{1000} \right)^2 = 0.044$$

V = 1.4 x 300 = 420

Ea = 1 · 0.16 = 0.16
Can be used based on E = 0.044 ≤ Ea = 0.16

❸ Load Factor

3-1 Load factor of load mass

Find the allowable load mass Wa (kg).
Note) No need to consider this load factor in the case of using perpendicularly in a vertical position. (Define α_1 = 0.)
Find the load factor of the load mass α_1.

Wa = K·β·Wmax
Workpiece mounting coefficient K: Fig. (3)
Allowable load mass coefficient β: Graph (1)
Max. allowable load mass Wmax: Table (2)

α_1 = W/Wa

Wa = 1 x 1 x 4 = 4
K = 1
β = 1
Wmax = 4
α_1 = 0.5/4 = 0.125

3-2 Load factor of the static moment

Find the static moment M (N·m).
Find the allowable static moment Ma (N·m).

M = W x 9.8 (Ln + An)/1000
Moment center position distance compensation amount An: Table (3)
Ma = K·γ·Mmax
Workpiece mounting coefficient K: Fig. (3)
Allowable moment coefficient γ: Graph (2)
Maximum allowable moment Mmax: Table (4)

Yawing	Rolling
Examine My.	**Examine Mr.**
My = 0.5 x 9.8 (10 + 11)/1000 = 0.11	Mr = 0.5 x 9.8 (30 + 17)/1000 = 0.23
A_3 = 11	A_6 = 17
May = 1 x 1 x 9.14 = 9.14	Mar = 9.14 (Same as May)
Mymax = 9.14	
K = 1	
γ = 1	

Find the load factor α_2 of the static moment.

α_2 = M/Ma

α_2 = 0.11/9.14 = 0.012 α_2' = 0.23/9.14 = 0.025

3-3 Load factor of dynamic moment

Find the dynamic moment Me (N·m).

$$Me = 1/3 \cdot We \times 9.8 \times \frac{(Ln + An)}{1000}$$

Collision equivalent to impact We = δ·W·V
δ: Bumper coefficient
With urethane bumper (Standard) = 4/100
Corrected value for moment center position distance An: Table (3)

Mea = K·γ·Mmax
Workpiece mounting coefficient K: Fig. (3)
Allowable moment coefficient γ: Graph (2)
Max. allowable moment Mmax: Graph (4)

Pitching	Examine Mep.

$$Mep = 1/3 \times 8.4 \times 9.8 \times \frac{(30 + 17)}{1000} = 1.3$$

We = 4/100 x 0.5 x 420 = 8.4
A_2 = 17
Meap = 1 x 0.7 x 9.14 = 6.40
K = 1
γ = 0.7
Mpmax = 9.14
α_3 = 1.3/6.40 = 0.20

Find the allowable dynamic moment Mea (N·m).

Yawing	Examine Mey.

$$Mey = 1/3 \times 8.4 \times 9.8 \times \frac{(30 + 34)}{1000} = 1.8$$

We = 8.4
A_4 = 34
Meay = 6.40 (Same value as Meap)
α_3' = 1.8/6.4 = 0.28

Find the load factor α_3 of the dynamic moment.

α_3 = Me/Mea

3-4 Sum of the load factors

Use is possible if the sum of the load factors does not exceed 1.

$$\sum\alpha n = \alpha_1 + \alpha_2 + \alpha_3 \leq 1$$

$\sum\alpha n = \alpha_1 + \alpha_2 + \alpha_2' + \alpha_3 + \alpha_3'$
= 0.125 + 0.012 + 0.025 + 0.20 + 0.28 = 0.642 ≤ 1
And it is possible to use.

SMC

Fig. (1) Load Mass: W (kg)

Note) No need to consider this load factor in the case of using perpendicularly in a vertical position.

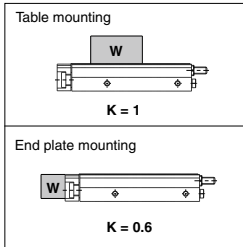### Fig. (3) Workpiece Mounting Coefficient: K

Table mounting

K = 1

End plate mounting

K = 0.6

Table (2) Maximum Allowable Load Mass: Wmax (kg)

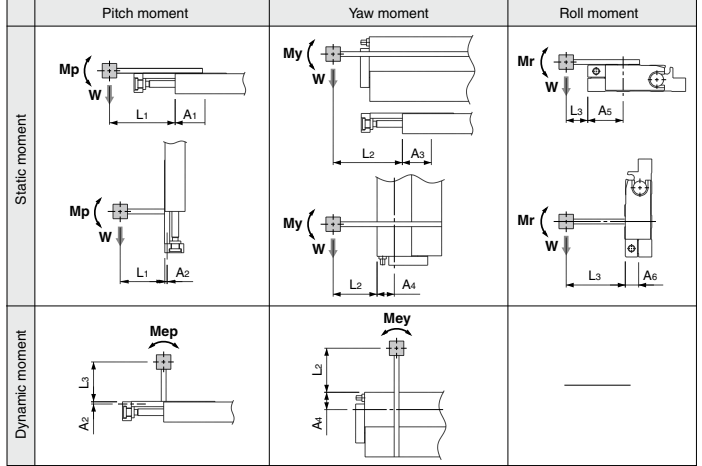| Model	Maximum allowable load mass
MXF8	0.6
MXF12	1
MXF16	2
MXF20	4

Fig. (2) Overhang: Ln (mm), Correction Values for Moment Center Distance: An (mm)

	Pitch moment	Yaw moment	Roll moment
Static moment	M_p ... L_1 A_1 / M_p ... L_1 A_2	M_y ... L_2 A_3 / M_y ... L_2 A_4	M_r ... L_3 A_5 / M_r ... L_3 A_6
Dynamic moment	M_{ep} ... L_3 A_2	M_{ey} ... L_2 A_4	

Note) Static moment: Moment generated by gravity
Dynamic moment: Moment generated by impact when colliding with stopper

Table (1) Maximum Allowable Kinetic Energy: Emax (J)

Model	Allowable kinetic energy
	Rubber bumper
MXF8	0.027
MXF12	0.055
MXF16	0.11
MXF20	0.16

Table (3) Moment Center Position Distance Compensation Amount: An (mm)

Model	Moment center position distance compensation amount (Refer to Fig. (2).)					
	A_1	A_2	A_3	A_4	A_5	A_6
MXF8	6[Note]	10	6[Note]	21	21	10
MXF12	10	11	10	23	23	11
MXF16	10	12	10	28	28	12
MXF20	11	17	11	34	34	17

Note) 16 mm for MXF8-10 only.

Table (4) Maximum Allowable Moment: Mmax (N·m)

Model	Stroke (mm)					
	10	20	30	50	75	100
MXF8	0.56	0.78	0.98	——	——	——
MXF12	——	1.65	2.22	3.34	——	——
MXF16	——	——	3.41	5.69	7.96	——
MXF20	——	——	6.66	9.14	13.70	18.27

Graph (1) Allowable Load Mass Coefficient: β

Average operating speed Va (mm/s)
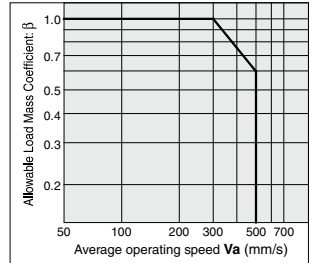
Graph (2) Allowable Moment Coefficient: γ

Average operating speed Va (mm/s) Collision speed V (mm/s)
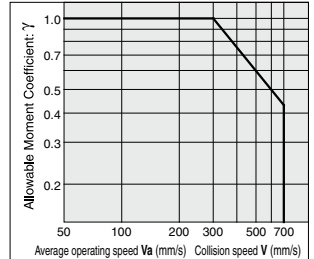
Note) Use the average operating speed when calculating static moment.
Use the collision speed when calculating dynamic moment.

MXH
MXS
MXQ□
MXQ
MXF
MXW
MXJ
MXP
MXY
MTS

Symbol

Symbol	Definition	Unit
An (n = 1 to 6)	Correction values of moment center position distance	mm
E	Kinetic energy	J
Ea	Allowable kinetic energy	J
Emax	Max. allowable kinetic energy	J
Ln (n = 1 to 3)	Overhang	mm
M (Mp, My, Mr)	Static moment (pitch, yaw, roll)	N·m
Ma (Map, May, Mar)	Allowable static moment (pitch, yaw, roll)	N·m
Me (Mep, Mey)	Dynamic moment (pitch, yaw)	N·m
Mea (Meap, Meay)	Allowable dynamic moment (pitch, yaw)	N·m
Mmax (Mpmax, Mymax, Mrmax)	Maximum allowable moment (pitch, yaw, roll)	N·m
V	Collision speed	mm/s

Symbol	Definition	Unit
Va	Average operating speed	mm/s
W	Load mass	kg
Wa	Allowable load mass	kg
We	Mass equivalent to impact	kg
Wmax	Max. allowable load mass	kg
α	Load factor	——
β	Allowable load mass coefficient	——
γ	Allowable moment coefficient	——
δ	Damper coeficient	——
K	Workpiece mounting coefficient	——

D-□
-X□

Low Profile Slide Table
MXF Series

How to Order

MXF | 12 | – | 50 | – | M9BW | | – |

Bore size/Stroke (mm)

ø8	10, 20, 30
ø12	20, 30, 50
ø16	30, 50, 75
ø20	30, 50, 75, 100

Made to Order
Refer to page 269 for details.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

Nil	Without auto switch (Built-in magnet)

∗ For the applicable auto switch model, refer to the table below.
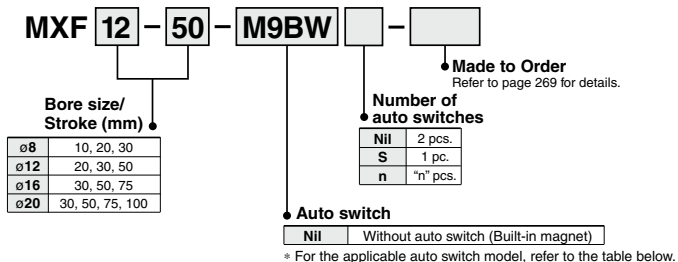
How to Order Stroke Adjusting Bolt (Accessory)

MXF – A | 16 | 27 – | X11 |

Applicable bore size

8	ø8
12	ø12
16	ø16
20	ø20

Adjustment range

Nil	5 mm	Standard
X11	15 mm	Option
X12	25 mm	
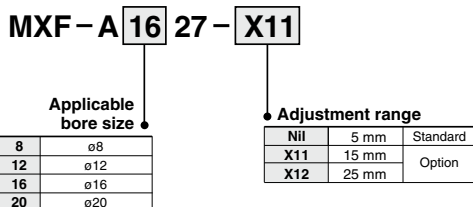
∗ -X12 (adjustable range 25 mm) is not available in the MXF8/MXF12 series.

Applicable Auto Switches/Refer to pages 1119 to 1245 for the detailed specifications of auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	Pre-wired connector	Applicable load
Solid state auto switch	———	Grommet	Yes	3-wire (NPN)	5V,12V	—	M9NV	M9N	●	●	●	○	○	IC circuit	
				3-wire (PNP)	5V,12V		M9PV	M9P	●	●	●	○	○	IC circuit	Relay, PLC
				2-wire	12V		M9BV	M9B	●	●	●	○	○	—	
	Diagnostic indication (2-color indicator)			3-wire (NPN)	5V,12V		M9NWV	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)	5V,12V		M9PWV	M9PW	●	●	●	○	○	IC circuit	
				2-wire	12V		M9BWV	M9BW	●	●	●	○	○	—	
	Water resistant (2-color indicator)			3-wire (NPN)	5V,12V		M9NAV[∗1]	M9NA[∗1]	○	○	●	○	○	IC circuit	
				3-wire (PNP)	5V,12V		M9PAV[∗1]	M9PA[∗1]	○	○	●	○	○	IC circuit	
				2-wire	12V		M9BAV[∗1]	M9BA[∗1]	○	○	●	○	○	—	
Reed auto switch	———	Grommet	Yes	3-wire (Equiv. to NPN)	—	5V	—	A96V	A96	●	—	●	—	—	IC circuit	—
			None	2-wire	24V	12V	100V	A93V[∗2]	A93	●	●	●	●	—	—	Relay, PLC
							100V or less	A90V	A90	●	—	●	—	—	IC circuit	

∗1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.
∗2 1 m type lead wire is only applicable to D-A93.

∗ 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.

∗ Since there are other applicable auto switches than listed, refer to page 277 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1192 and 1193.
∗ Auto switches are shipped together (not assembled).
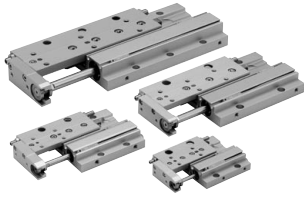
Specifications

| Bore size (mm)	8	12	16	20
Piping port size	M3 x 0.5	M5 x 0.8		
Fluid	Air			
Action	Double acting			
Operating pressure	0.15 to 0.7 MPa			
Proof pressure	1.05 MPa			
Ambient and fluid temperature	−10 to 60 °C			
Operating speed range (Average operating speed) Note)	50 to 500 mm/s			
Cushion	Rubber bumper on both sides			
Lubrication	Non-lube			
Auto switch (Option)	Reed auto switch Solid state auto switch (2-wire, 3-wire) 2-color indicator solid state auto switch (2-wire, 3-wire)			
Stroke length tolerance	$^{+1}_{0}$ mm			
Stroke adjustment range	Extension end 5 mm/Retraction end 5 mm			

Note) Average operating speed: Speed that the stroke is divided by a period of time from starting the operation to reaching the end.

MXH
MXS
MXQ□
MXQ
MXF
MXW
MXJ
MXP
MXY
MTS

Theoretical Output

OUT ◄—— ▭▭ ——► IN

(N)
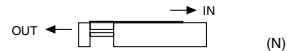
Bore size (mm)	Rod size (mm)	Operating direction	Piston area (mm²)	Operating pressure (MPa)					
				0.2	0.3	0.4	0.5	0.6	0.7
8	4	OUT	50	10	15	20	25	30	35
		IN	38	8	11	15	19	23	27
12	6	OUT	113	23	34	45	57	68	79
		IN	85	17	26	34	43	51	60
16	8	OUT	201	40	60	80	101	121	141
		IN	151	30	45	60	76	91	106
20	10	OUT	314	63	94	126	157	188	220
		IN	236	47	71	94	118	142	165

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm²)

Made to Order: Individual Specifications
(For details, refer to pages 278 and 279.)

Symbol	Specifications
-X7	PTFE grease
-X9	Grease for food processing machines
-X11	Adjusting bolt, long specification (Adjustment range: 15 mm)
-X33	Without built-in auto switch magnet
-X39	Fluororubber seal
-X42	Anti-corrosive specifications for guide unit
-X45	EPDM seal

Standard Stroke

Model	Standard stroke (mm)
MXF8	10, 20, 30
MXF12	20, 30, 50
MXF16	30, 50,7 5
MXF20	30, 50, 75, 100

Weight

(g)

Model	Standard stroke (mm)					
	10	20	30	50	75	100
MXF8	120	130	170	—	—	—
MXF12	—	210	250	360	—	—
MXF16	—	—	360	500	690	—
MXF20	—	—	600	750	1060	1370

Moisture Control Tube IDK Series

When operating an actuator with a small diameter and a short stroke at a high frequency, the dew condensation (water droplet) may occur inside the piping depending on the conditions. Simply connecting the moisture control tube to the actuator will prevent dew condensation from occurring. For details, refer to **the IDK series in the Best Pneumatics No. 6**.

D-□

-X□

SMC

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MXF *Series*

Table Deflection (Reference Values)

Table displacement due to pitch moment load

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

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 roll moment load

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

MXF**8**

Pitch graph — Table displacement amount (mm) vs Load (N); curves: MXF8-30, MXF8-20, MXF8-10.

Yaw graph — Table displacement amount (mm) vs Load (N); curves: MXF8-30, MXF8-20, MXF8-10.

Roll graph, Lr = 20 mm — Table displacement amount (mm) vs Load (N); curves: MXF8-10, MXF8-20, MXF8-30.

MXF**12**

Pitch graph — Table displacement amount (mm) vs Load (N); curves: MXF12-50, MXF12-30, MXF12-20.

Yaw graph — Table displacement amount (mm) vs Load (N); curves: MXF12-50, MXF12-30, MXF12-20.

Roll graph, Lr = 30 mm — Table displacement amount (mm) vs Load (N); curves: MXF12-20, MXF12-30, MXF12-50.

SMC

The graphs below show the table displacement when the static moment load is applied to the table. The graphs do not show the loadable mass. Refer to the Model Selection for the loadable mass.

Table displacement due to pitch moment load

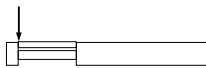Table displacement when loads are applied to the section marked with the arrow at the full stroke.

Table displacement due to yaw moment load

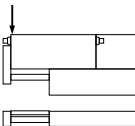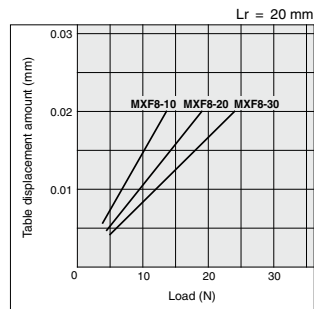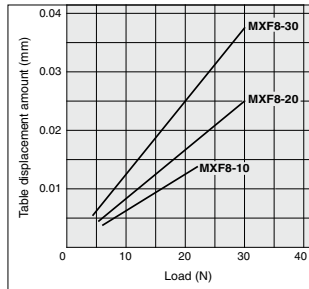Table displacement when loads are applied to the section marked with the arrow at the full stroke.
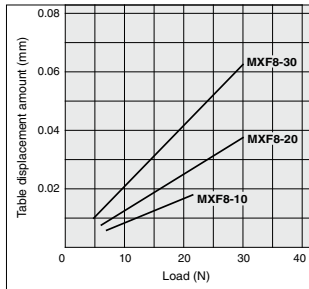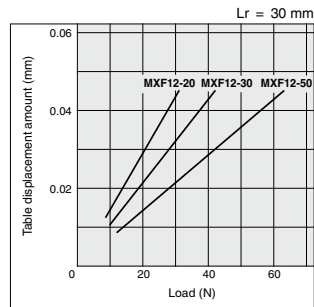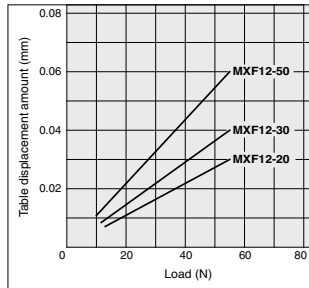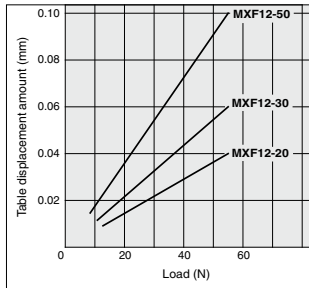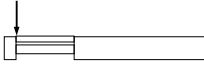
Table displacement due to roll moment load

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

MXF16

Lr = 40 mm

Pitch — Table displacement amount (mm) vs Load (N):
- y-axis: 0, 0.04, 0.08, 0.12, 0.16, 0.20
- x-axis: 0, 20, 40, 60, 80, 100
- curves: MXF16-75, MXF16-50, MXF16-30

Yaw — Table displacement amount (mm) vs Load (N):
- y-axis: 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07
- x-axis: 0, 20, 40, 60, 80, 100
- curves: MXF16-75, MXF16-50, MXF16-30

Roll — Table displacement amount (mm) vs Load (N):
- y-axis: 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07
- x-axis: 0, 20, 40, 60, 80, 100, 120
- curves: MXF16-30, MXF16-50, MXF16-75

MXF20

Lr = 50 mm

Pitch — Table displacement amount (mm) vs Load (N):
- y-axis: 0.04, 0.08, 0.12, 0.16, 0.20, 0.24, 0.28
- x-axis: 0, 50, 100, 150, 200
- curves: MXF20-100, MXF20- 75, MXF20- 50, MXF20- 30

Yaw — Table displacement amount (mm) vs Load (N):
- y-axis: 0.02, 0.04, 0.06, 0.08, 0.10
- x-axis: 0, 50, 100, 150, 200
- curves: MXF20-100, MXF20- 75, MXF20- 50, MXF20- 30

Roll — Table displacement amount (mm) vs Load (N):
- y-axis: 0.02, 0.04, 0.06
- x-axis: 0, 40, 80, 120, 160, 200, 240
- curves: MXF20-30, MXF20-50, MXF20-75, MXF20-100

MXH
MXS
MXQ□
MXQ
MXF
MXW
MXJ
MXP
MXY
MTS

D-□

-X□

271
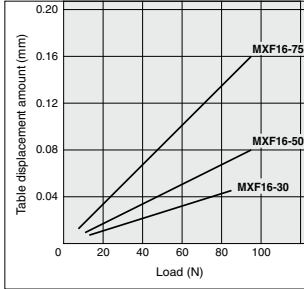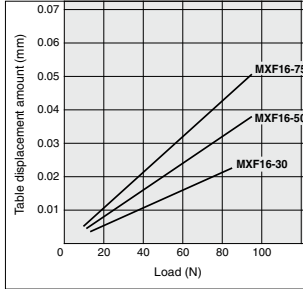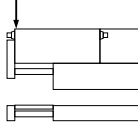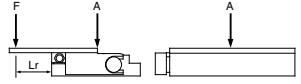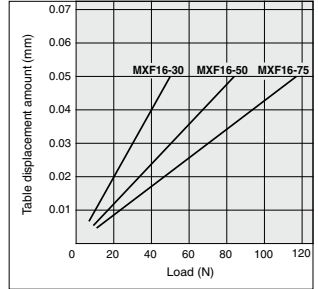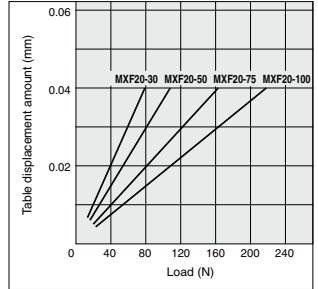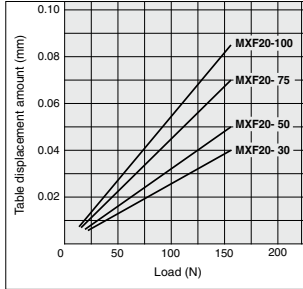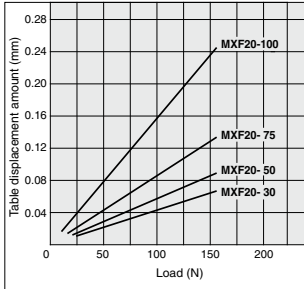
MXF Series

Construction
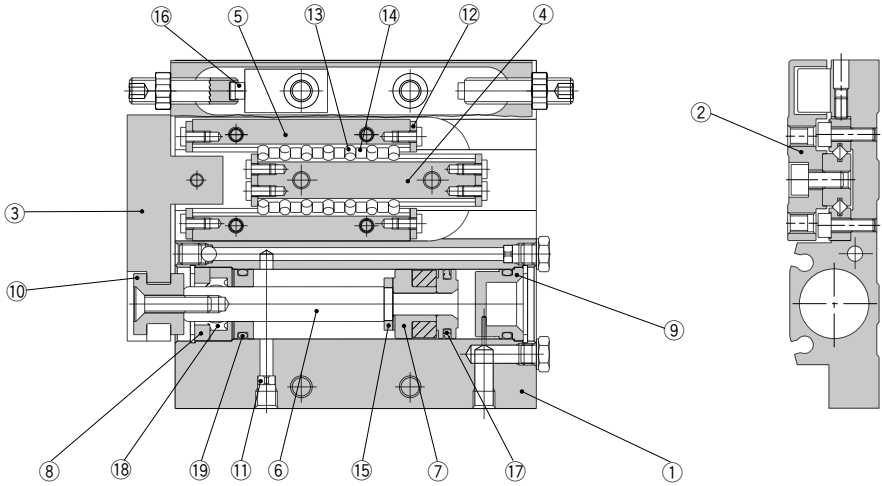
Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Table	Aluminum alloy	Hard anodized
3	End plate	Aluminum alloy	Hard anodized
4	Rail	Carbon tool steel	Heat treated
5	Guide	Carbon tool steel	Heat treated
6	Rod	Stainless steel	
7	Piston assembly	—	With magnet
8	Seal support	Brass	Electroless nickel plated
9	Head cap	Resin	
10	Floating bushing	Stainless steel	
11	Orifice	Brass	Electroless nickel plated
12	Roller stopper	Stainless steel	
13	Cylindrical roller	High carbon chrome bearing steel	
14	Roller spacer	Resin	
15	Rod bumper	Polyurethane	

Component Parts

No.	Description	Material	Note
16	Adjust bumper	Polyurethane	
17	Piston seal	NBR	
18	Rod seal	NBR	
19	O-ring	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
8	MXF8-PS	Set of nos. above ⑰ to ⑲
12	MXF12-PS	
16	MXF16-PS	
20	MXF20-PS	

∗ Seal kit includes ⑰, ⑱, ⑲. Order the seal kit, based on each bore size.

Replacement Part: Grease Pack

Applied part	Grease pack part no.
Guide	GR-S-010 (10g) GR-S-020 (20g)
Cylinder	GR-L-005 (5g) GR-L-010 (10g)

Dimensions: Stroke Adjustment Bolt
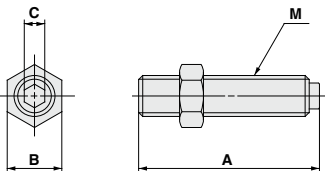
Applicable size	Model	Stroke adjustment range (mm)	A	B	C	M
MXF8	MXF-A827	5	17	6	2	M4 x 0.7
	MXF-A827-X11	15	27			
MXF12	MXF-A1227	5	23.5	7	2.5	M5 x 0.8
	MXF-A1227-X11	15	33.5			
MXF16	MXF-A1627	5	26.5	8	3	M6 x 1
	MXF-A1627-X11	15	36.5			
	MXF-A1627-X12	25	46.5			
MXF20	MXF-A2027	5	30	12	4	M8 x 1
	MXF-A2027-X11	15	40			
	MXF-A2027-X12	25	50			

SMC

Dimensions: MXF**8**

Stroke adjuster at retraction end

Stroke adjuster at extension end

Width across hexagon socket hole 2

Width across flats 6

ø3H9 $\binom{+0.025}{0}$ depth 3

19

$(\frac{N}{2} - 1)^*$ x F

F (Equal pitch)

N x M3 x 0.5 thread depth 6.5 Note)
(Insert)

Blanking plug (M-3P 2 points)
Possible to use as
operating port 2 x M3 x 0.5

4.7

2 x M3 x 0.5 thread depth 6

3H9 $\binom{+0.025}{0}$ depth 3

4 x ø6.5

4 x ø3.2

4 x M4 x 0.7

Section AA´

$* (\frac{N}{2} - 1)$: The number of pitches

Operating port 2 x M3 x 0.5

M
(Table length)

Note) If long bolts are used, they can
touch the guide block and cause
malfunction, etc.
Refer to the Specific Product
Precautions.

ø3H9 $\binom{+0.025}{0}$ depth 3

3H9 $\binom{+0.025}{0}$ depth 3

(mm)

Model	F	N	G	H	J	M	Z	ZZ
MXF8-10	20	4	13.5	22	21	49	49.5	58
MXF8-20	26	4	14.5	26	26	54	54.5	63
MXF8-30	26	6	14.5	40	41	69	69.5	78

MXH
MXS
MXQ□
MXQ
MXF
MXW
MXJ
MXP
MXY
MTS

D-□

-X□

273

MXF *Series*

Dimensions: MXF**12**

Stroke adjuster at retraction end

Stroke adjuster at extension end

Width across hexagon socket hole 2.5

Width across flats 7

Blanking plug
(MGP12-08-CA001-R 2 points)

Possible to use as
operating port 2 x M5 x 0.8

20.5

$(\frac{N}{2} - 1) \times 25$ *

25

4

N x M3 x 0.5 thread depth 5.5 (Note)
(Insert)

ø3H9 $(^{+0.025}_{0})$ depth 3

8.5

— A

16

10.5

23

16

20

45

68

6

35

24.5

58

3H9 $(^{+0.025}_{0})$ depth 3

6.5

2 x M3 x 0.5 thread depth 6

25

H

—A´

20

10

4 x ø6.5

4 x ø3.2

5.5

9.8

6.5

4 x M4 x 0.7

Section AA´

* $(\frac{N}{2} - 1)$: The number of pitches

10

M
(Table length)

Operating port 2 x M5 x 0.8

0.3

17

18.5

5.5

J

I

Z

3

ZZ

Max. 10.5

Note) If long bolts are used, they can
touch the guide block and cause
malfunction, etc.
Refer to the Specific Product
Precautions.

25

H

23

3H9 $(^{+0.025}_{0})$ depth 3

4

ø3H9 $(^{+0.025}_{0})$ depth 3

(mm)

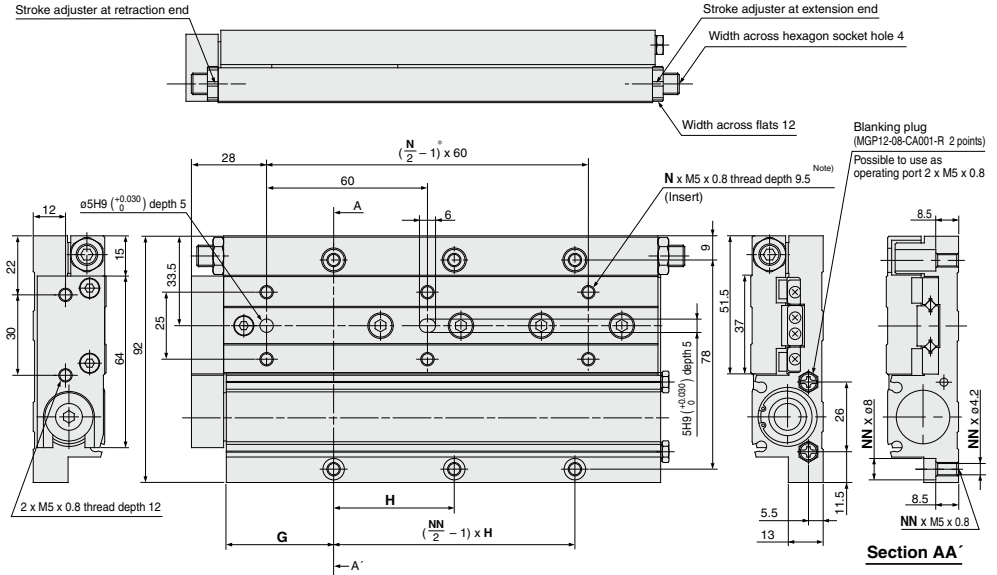| Model	N	H	I	J	M	Z	ZZ
MXF12-20	4	22	11	36	65	65	76
MXF12-30	4	30	12	45	75	75	86
MXF12-50	6	65	13	80	111	111	122

SMC

Dimensions: MXF16

Stroke adjuster at retraction end

Stroke adjuster at extension end

Width across hexagon socket hole 3

Width across flats 8

24

$(\frac{N}{2} - 1) \times 35$ *

35

5

N x M4 x 0.7 thread depth 6.5 Note)
(Insert)

ø4H9 $(^{+0.030}_{0})$ depth 4

9

18

25

12.5

27.5

20

52

80

68

41.5

7

A

A´

2 x M4 x 0.7 thread depth 10

H

G

$(\frac{NN}{2} - 1) \times H$

4H9 $(^{+0.030}_{0})$ depth 4

Blanking plug
(MGP12-08-CA001-R 2 points)
Possible to use as
operating port 2 x M5 x 0.8

6.7

28.5

23

12.5

NN x ø8

NN x ø4.2

5.5

11.5

6.7

NN x M5 x 0.8

Section AA´

10

M
(Table length)

Operating port 2 x M5 x 0.8

0.3

19.5

21

7

J

I

Z

ZZ

3

Max. 9

$* (\frac{N}{2} - 1):$ The number of pitches

Note) If long bolts are used, they can
touch the guide block and cause
malfunction, etc.
Refer to the Specific Product
Precautions.

G

H

27.5

4H9 $(^{+0.030}_{0})$ depth 4

5

ø4H9 $(^{+0.030}_{0})$ depth 4

(mm)

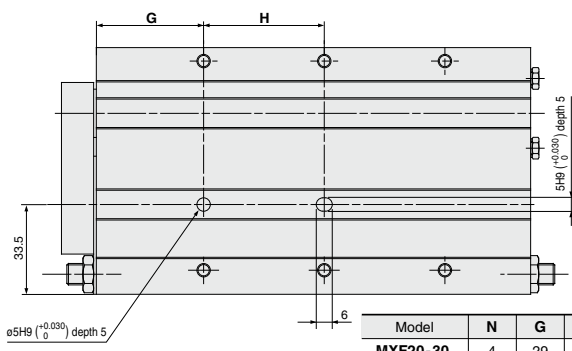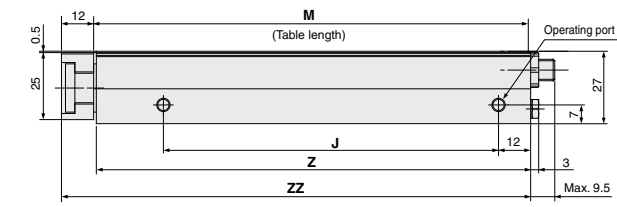| Model	N	G	H	NN	I	J	M	Z	ZZ
MXF16-30	4	29	25	4	12	50	83	83	94
MXF16-50	6	29	55	4	12	80	113	113	124
MXF16-75	6	39	45	6	13	125	159	159	170

MXH

MXS

MXQ□

MXQ

MXF

MXW

MXJ

MXP

MXY

MTS

D-□

-X□

MXF Series

Dimensions: MXF20

Stroke adjuster at retraction end

Stroke adjuster at extension end

Width across hexagon socket hole 4

Width across flats 12

$(\frac{N}{2} - 1)$ * x 60

N x M5 x 0.8 thread depth 9.5 (Note)
(Insert)

Blanking plug
(MGP12-08-CA001-R 2 points)

Possible to use as
operating port 2 x M5 x 0.8

28

60

6

A

ø5H9 $(^{+0.030}_{0})$ depth 5

12

22

30

15

33.5

25

92

64

78

51.5

37

9

5H9 $(^{+0.030}_{0})$ depth 5

26

8.5

NN x ø8

NN x ø4.2

2 x M5 x 0.8 thread depth 12

H

G

$(\frac{NN}{2} - 1)$ x **H**

A´

5.5

13

11.5

8.5

NN x M5 x 0.8

Section AA´

M
(Table length)

Operating port 2 x M5 x 0.8

12

0.5

25

27

7

J

Z

12

ZZ

3

Max. 9.5

* $(\frac{N}{2} - 1)$: The number of pitches

Note) If long bolts are used, they can touch the guide block and cause malfunction, etc.
Refer to the Specific Product Precautions.

G

H

5H9 $(^{+0.030}_{0})$ depth 5

33.5

6

ø5H9 $(^{+0.030}_{0})$ depth 5

(mm)

Model	N	G	H	NN	J	M	Z	ZZ
MXF20-30	4	29	30	4	57	91	91	104
MXF20-50	4	36	45	4	77	113	113	126
MXF20-75	6	40	45	6	125	162	162	175
MXF20-100	6	59	60	6	175	211	211	224

SMC

Auto Switch Proper Mounting Position (Detection at Stroke End)
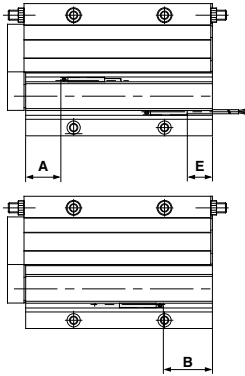
Reed Auto Switch: D-A90, D-A93, D-A96, D-A90V, D-A93V, D-A96V (mm)

Model	A	B						E					
		Stroke						Stroke					
		10	20	30	50	75	100	10	20	30	50	75	100
MXF8	9.5	10	5	10	—	—	—	8 (5.5)	3 (0.5)	8 (5.5)	—	—	—
MXF12	12	—	13.1	13.1	29.1	—	—	—	11.1 (8.6)	11.1 (8.6)	27.1 (24.6)	—	—
MXF16	17.2	—	—	15.8	25.8	46.8	—	—	—	13.8 (11.3)	23.8 (21.3)	44.8 (42.3)	—
MXF20	19.4	—	—	20.7	22.7	46.2	70.7	—	—	18.7 (16.2)	20.7 (18.2)	44.2 (41.7)	68.7 (66.2)

Solid State Auto Switch: D-M9B, D-M9N, D-M9P, D-M9BW, D-M9NW, D-M9PW, D-M9□A (mm)

Model	A	B						E						E (D-M9□A)					
		Stroke						Stroke						Stroke					
		10	20	30	50	75	100	10	20	30	50	75	100	10	20	30	50	75	100
MXF8	13.5	14	9	14	—	—	—	4	−1	4	—	—	—	2	−3	2	—	—	—
MXF12	16	—	17.1	17.1	33.1	—	—	—	7.1	7.1	23.1	—	—	—	5.1	5.1	21.1	—	—
MXF16	21.2	—	—	19.8	29.8	50.8	—	—	—	9.8	19.8	40.8	—	—	—	7.8	17.8	38.8	—
MXF20	23.4	—	—	24.7	26.7	50.2	74.7	—	—	14.7	16.7	40.2	64.7	—	—	12.7	14.7	38.2	62.7

Solid State Auto Switch: D-M9BV, D-M9NV, D-M9PV, D-M9BWV, D-M9NWV, D-M9PWV, D-M9□AV (mm)

Model	A	B						E						E (D-M9□AV)					
		Stroke						Stroke						Stroke					
		10	20	30	50	75	100	10	20	30	50	75	100	10	20	30	50	75	100
MXF8	13.5	14	9	14	—	—	—	6	1	6	—	—	—	4	−1	4	—	—	—
MXF12	16	—	17.1	17.1	33.1	—	—	—	9.1	9.1	25.1	—	—	—	7.1	7.1	23.1	—	—
MXF16	21.2	—	—	19.8	29.8	50.8	—	—	—	11.8	21.8	42.3	—	—	—	9.8	19.8	40.3	—
MXF20	23.4	—	—	24.7	26.7	50.2	74.7	—	—	16.7	18.7	42.2	66.7	—	—	14.7	16.7	40.2	64.7

∗ ( ): Denotes the values of D-A93.
Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

|	
MXH	
MXS	
MXQ□	
MXQ	
MXF	
MXW	
MXJ	
MXP	
MXY	
MTS	

Auto Switch Mounting

⚠ **Caution**

Auto Switch Mounting Tool
• When adjusting the auto switch mounting screw (included with auto switch), use a watchmaker´s screwdriver with a handle about 5 to 6 mm in diameter.

Tightening Torque

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
D-M9□A(V)	0.05 to 0.10

Auto switch mounting screw (included with auto switch)
Watchmaker´s screwdriver
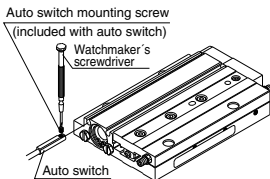
Auto switch

Operating Range

Auto switch model	Applicable bore size (mm)			
	8	12	16	20
D-A9□(V)	4.5	5	6	7
D-M9□, M9□V D-M9□W, M9□WV D-M9□A, M9□AV	3	3	4.5	5

∗ Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

D-□
-X□

MXF *Series*
Made to Order: Individual Specifications 1

Please contact SMC for detailed dimensions, specifications and lead times.

Symbol

1 PTFE Grease — **-X7**

MXF **Standard model no.** — **X7**

● **PTFE grease**

PTFE grease is used for all parts that grease is applied.

Specifications

Type	PTFE grease
Bore size (mm)	8, 12, 16, 20

∗ Dimensions other than the above is the same as the standard type.

⚠ **Warning**
Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

Symbol

2 Grease for Food Processing Machines **-X9**

MXF **Standard model no.** — **X9**

● **Grease for food processing machines**

Grease for food processing machines is used for all parts that grease is applied.

Specifications

Type	Grease for food processing machines (NSF-H1 certified)/Aluminum complex soap base grease
Bore size (mm)	8, 12, 16, 20

∗ Dimensions other than the above is the same as the standard type.

⚠ **Caution**
Do not use this cylinder in a food-related environment.
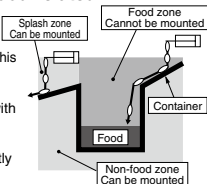
<Cannot be mounted>
Food zone···Food may directly contact with this cylinder, and is treated as food products.
<Can be mounted>
Splash zone···Food may directly contact with this cylinder, but is not treated as food products.
Non-food zone···This cylinder do not directly contact food.

Splash zone
Can be mounted

Food zone
Cannot be mounted

Container

Food

Non-food zone
Can be mounted

Symbol

3 Without Built-in Auto Switch Magnet **-X33**

MXF **Standard model no.** — **X33**

Without built-in auto switch magnet ●

Auto switch magnet is not built in.

Specifications

Type	Without built-in auto switch magnet
Bore size (mm)	8, 12, 16, 20
Auto switch	Not mountable

∗ Dimensions other than the above is the same as the standard type.

278

Symbol

4 Fluororubber Seal **-X39**

MXF **Standard model no.** — **X39**

● **Fluororubber seal**

Change the materials for the piston seal, rod seal and O-rings to fluororubber.

Specifications

Type	Fluororubber seal
Bore size (mm)	8, 12, 16, 20
Seal material	Fluororubber

∗ Dimensions other than the above is the same as the standard type.

Symbol

5 Anti-corrosive Specifications for Guide Unit **-X42**

MXF **Standard model no.** — **X42**

● **Anti-corrosive specifications for guide unit**

Rail and guide are given anti-corrosive treatment.

Specifications

Type	Anti-corrosive guide unit
Bore size (mm)	8, 12, 16, 20
Surface treatment	Special anti-corrosive treatment [2]

∗ 1 Dimensions other than the above is the same as the standard type.
∗ 2 Special anti-corrosive treatment makes the rail and the guide black.

Symbol

6 EPDM Seal **-X45**

MXF **Standard model no.** — **X45**

● **EPDM seal**

Change the materials for the piston seal, rod seal and O-rings to EPDM.

Specifications

Type	EPDM seal
Bore size (mm)	8, 12, 16, 20
Seal material	EPDM
Grease	PTFE grease

∗ Dimensions other than the above is the same as the standard type.

⚠ **Warning**
Precautions

Be aware that smoking cigarettes, etc. after your hands have come into contact with the grease used in this cylinder can create a gas that is hazardous to humans.

SMC

MXF *Series*
Made to Order: Individual Specifications 2 [Made to Order]
Please contact SMC for detailed dimensions, specifications and lead times.

Symbol
-X11

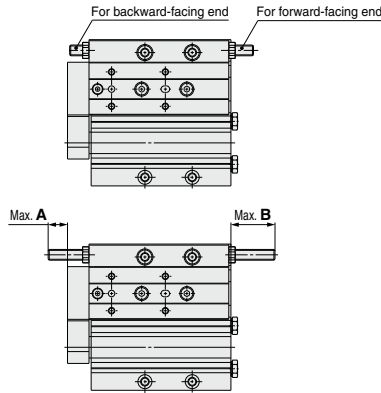## 7 Adjusting Bolt, Long Specification (Adjustment range: 15 mm)

MXF | Standard model no. | — X11

● Adjusting bolt, long specification
(Adjustment range: 15 mm)

The average adjusting stroke range was extended from 5 mm to 15 mm with a long adjusting bolt.

Dimensions

For backward-facing end   For forward-facing end

Max. **A**   Max. **B**

(mm)

Model	A	B
MXF8	10	19
MXF12	10	20.5
MXF16	10	19
MXF20	10	19.5

MXF *Series*
Specific Product Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

⚠ Caution

1. Do not scratch or dent the mounting side of the body, table or end plate. It causes play in the guide section and increases sliding resistance.
2. Do not scratch or dent on the forward side of the rail or guide. It will result in looseness of the guide section and increased sliding resistance.
3. Keep away from objects which are influenced by magnets.
   As the piston part has magnets built-in, do not allow close contact with magnetic disks, magnetic cards or magnetic tapes. Data may be erased.
4. When mounting the body, use screws with appropriate length and do not exceed the maximum tightening torque. Tightening with a torque above the limit could malfunction. Whereas tightening insufficiently could result in misalignment or come to a drop.
5. Be careful when adjusting stroke not to allow cylinder end plate to bottom out against cylinder body.

Positioning

⚠ Caution

1. The positioning hole on the table and on the bottom of the body does not have the same center. Positioning hole is meant to be for reproducibility for mounting and dismounting.

Selection

⚠ Caution

1. **If intermediate stop by external stopper is done, avoid ejection.**
   If ejection occurs, it may cause damage. In the case the slide table is stopped at an intermediate position by an external stopper then forwarded to the front, return the slide table to the back for just a moment to retract the stopper, then supply pressure to the opposite port to operate slide table.

2. **Do not use it in such a way that excessive external force or impact force could work on it.**
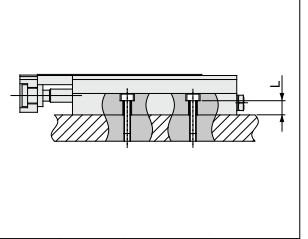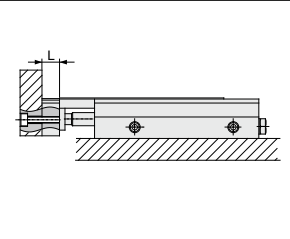   This could result in damage.

Mounting of Body

The slide table can be mounted from 2 directions. Select the best direction according to your application.

1. Body Tapped
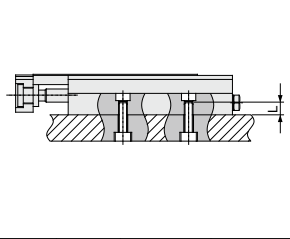
Model	Bolt	Maximum tightening torque (N·m)	Maximum screw-in depth L (mm)
MXF8	M4 x 0.7	2.1	4.7
MXF12	M4 x 0.7	2.1	6.5
MXF16	M5 x 0.8	4.4	6.7
MXF20	M5 x 0.8	4.4	8.5

2. Body Through-hole

Model	Bolt	Maximum tightening torque (N·m)	Maximum screw-in depth L (mm)
MXF8	M3 x 0.5	1.2	4.7
MXF12	M3 x 0.5	1.2	6.5
MXF16	M4 x 0.7	2.8	6.7
MXF20	M4 x 0.7	2.8	8.5

⚠ **Caution** 0.02 mm or less of flatness is recommended for the body mounting surface. An uneven mounting surface of a workpiece or a base may cause vibration or increase sliding resistance.
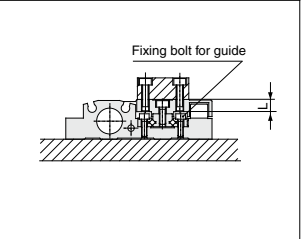
Mounting of Workpiece

Work can be mounted on two sides of the body.

1. Front Mounting

Model	Bolt	Maximum tightening torque (N·m)	Maximum screw-in depth L (mm)
MXF8	M3 x 0.5	0.9	6
MXF12	M3 x 0.5	0.9	6
MXF16	M4 x 0.7	2.1	10
MXF20	M5 x 0.8	4.4	12

2. Top Mounting

Fixing bolt for guide

Model	Bolt	Maximum tightening torque (N·m)	Maximum screw-in depth L (mm)
MXF8	M3 x 0.5	0.9	6.5
MXF12	M3 x 0.5	0.9	5.5
MXF16	M4 x 0.7	2.1	6.5
MXF20	M5 x 0.8	4.4	9.5

⚠ Caution

To prevent the workpiece holding bolts from touching the guide holding bolts, use bolts that are 0.5 mm or more shorter than the maximum screw-in depth.
If the bolts are too long, they hit the end plate and may cause malfunctions.

SMC