CAT.EUS20-125 C -UK

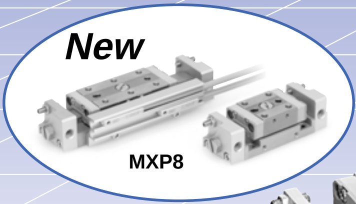
Precision Air Slide Table

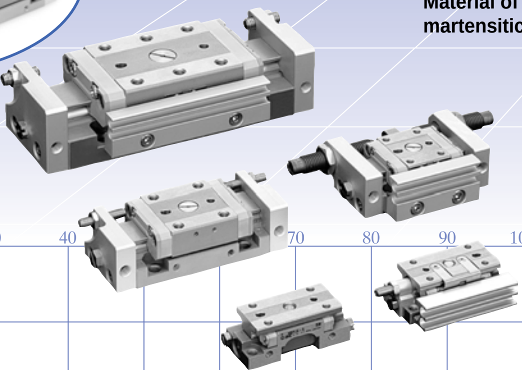
Series MXP

ø6, ø8, ø10, ø12, ø16

Size ø8 introduced to the MXP series

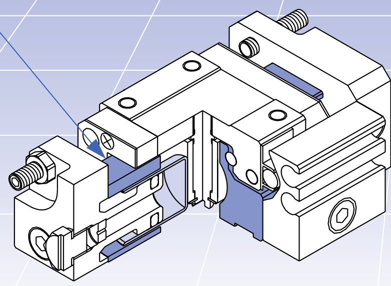
Cylinder: Built-in Linear Guide





High rigidity, High precision

Cylinder is built into the rail of the linear guide.
Material of body and guide block is martensitic stainless steel.

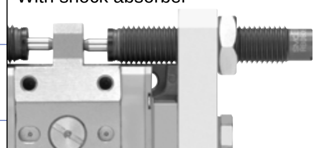


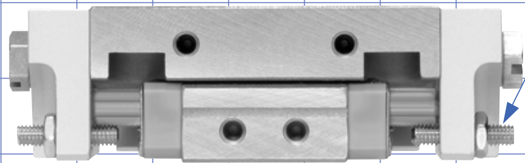
MXP 8, 10, 12, 16

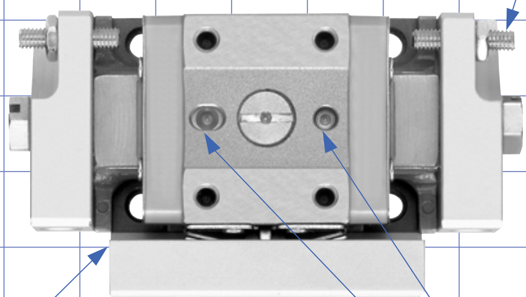
Stroke adjuster

Three types (rubber stopper, metal stopper, shock absorber) are available.

With shock absorber







Auto switch attachable

Switch rail and magnet (Standard)
Without switch rail and magnet are optional.

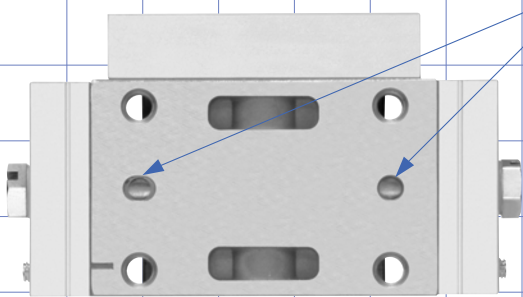
Without switch rail and magnet

Highly flexible piping methods

Piping possible in two directions: vertical or lateral.

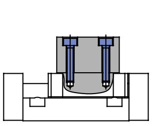
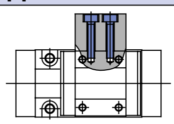
Positioning pinhole

Job performance is improved during maintenance.



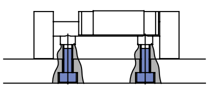
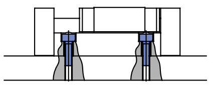
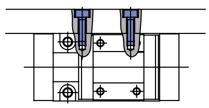
‹Scale: 100%›

Work mounting tap

❶ Tapped on table top	❷ Tapped on table side
	 Note) Side mounting with shock absorber and MXP6 is not available.

Highly flexible mounting direction

Mounting from 3 directions.

❶ Body tapped	❷ Body through-hole	❸ Tapped on body side
		 Note) Side mounting of MXP6 is not available.

SMC

Compact Air Slide Table

Travelling parallelism*: 0.004 mm
Parallelism: 0.02 mm

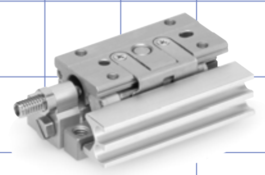
* Refer to page 6 for details of the traveling parallelism.

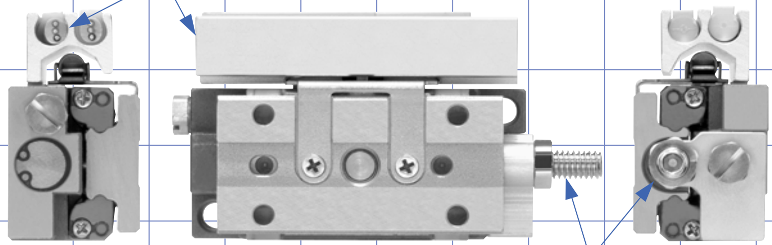
Numerous auto switch variations available

Reed switch, solid state switch, and 2-colour indication solid state switch can be mounted.

With auto switches and stroke adjuster

MXP6





⟨Scale: 100%⟩

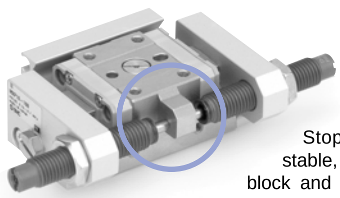
Stroke adjuster

- **Stroke adjustment range: 0 to 5 mm**
- **Available with rubber stopper, metal stopper.**

Series	Stroke (mm)						Stroke adjuster			Auto switch
	5	10	15	20	25	30	Rubber stopper	Metal stopper	Shock absorber	
MXP6	●	●					●	●		●
MXP8		●		●			●	●		●
MXP10		●		●			●	●	●	●
MXP12			●		●		●	●	●	●
MXP16				●		●	●	●	●	●

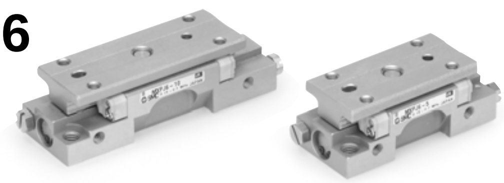
With shock absorber

Twice the allowable kinetic energy of a rubber stopper



Stopping accuracy is stable, because the guide block and the collision part of the shock absorber is a one-piece construction.

MXPJ6



Compact: Height 17 x Width 20

Compact shape is realised by the cylinder built into the linear guide block. Material of body and table is martensitic stainless steel.

Highly flexible piping methods

Piping possible in two directions: vertical or lateral.

Series MXP

Model Selection

Model Selection Steps	Formula/Data	Selection Example

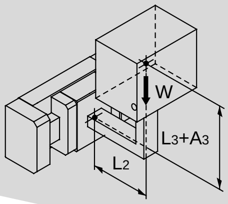
❶ Operating Conditions

Model Selection Steps: Enumerate the operating conditions considering the mounting position and workpiece configuration.

Formula/Data:

- Model to be used
- Mounting orientation
- Average speed Va (mm/s)
- Load weight W (kg): Fig. (1)
- Overhang Ln (mm): Fig. (2)

Selection Example:



Cylinder: MXP10-10
Mounting: Horizontal wall mounting
Average speed:
Va = 300 [mm/s]
Allowable load: W = 0.2 [kg]
L_2 = 20 mm
L_3 = 30 mm

❷ Kinetic Energy

Model Selection Steps: Find the kinetic energy E (J) of the load.

Formula/Data:

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

Collision speed $V = \underline{1.4}^{*} \cdot Va$ * Correction factor

Selection Example:

$$E = \frac{1}{2} \cdot 0.2 \left(\frac{420}{1000}\right)^2 = 0.018$$

V = 1.4 x 300 = 420

Model Selection Steps: Confirm that the kinetic energy of the load does not exceed the allowable kinetic energy.

Formula/Data: Kinetic energy (E) < Allowable kinetic energy (Emax)
Allowable kinetic energy Emax: Table (1)

Selection Example: Possible to use by E = 0.018 < Emax = 0.045

❸ Load Factor

3-1 Load Factor of Load Weight

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

Formula/Data: $Wa = \beta \cdot Wmax$
Allowable load weight coefficient β: Graph (1)
Max. allowable load weight Wmax: Table (2)

Selection Example:
Wa = 1 x 1.2 = 1.2
β = 1
Wmax = 1.2
α_1 = 0.2/1.2 = 0.17

Model Selection Steps: Find the load factor of the load weight α_1.

Formula/Data: α_1 = W/Wa

3-2 Load Factor of Static Moment

Model Selection Steps: Find the static moment M (N·m).

Formula/Data: M = W x 9.8 (Ln + An)/1000
Moment centre position distance compensation amount An: Table (3)

Selection Example:
Examine Mr.
[As Mp and My does not arise, examination is not needed.]
Mr = 0.2 x 9.8 (20 + 6.8)/1000 = 0.053
A_2 = 6.8

Model Selection Steps: Find the allowable static moment Ma (N·m).

Formula/Data: $Ma = \gamma \cdot Mmax$
Allowable moment coefficient γ: Graph (2)
Maximum allowable moment Mmax: Table (4)

Selection Example:
Mar = 1 x 4.2 = 4.2
γ = 1
Mrmax = 4.2

Model Selection Steps: Find the load factor α_2 of the static moment.

Formula/Data: α_2 = M/Ma

Selection Example: α_2 = 0.053/4.2 = 0.013

3-3 Load Factor of Dynamic Moment

Model Selection Steps: Find the dynamic moment Me (N·m).

Formula/Data:

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

Load equivalent to collision $We = \delta \cdot W \cdot V$
δ: Damper coefficient
Rubber stopper = 4/100
Shock absorber = 1/100
Metal stopper = 16/100
Corrected value for moment centre position distance An: Table (3)

Selection Example:
Examine Mep.

$$Mep = 1/3 \times 3.36 \times 9.8 \times \frac{(20 + 6.8)}{1000} = 0.29$$

We = 4/100 x 0.2 x 420 = 3.36
A_2 = 6.8
Meap = 0.7 x 1.7 = 1.19
γ = 0.7
Mp max = 1.7
α_3 = 0.29/1.19 = 0.24

Model Selection Steps: Find the allowable dynamic moment Mea (N·m).

Formula/Data: $Mea = \gamma \cdot Mmax$
Allowable moment coefficient γ: Graph (2)
Max. allowable moment Mmax: Table (4)

Selection Example:
Examine Mey.

$$Mey = 1/3 \times 3.36 \times 9.8 \times \frac{(30 + 10.5)}{1000} = 0.44$$

We = 33.6
A_1 = 10.5
Meay = 1.19 (Same as Meap)
α'_3 = 0.44/1.19 = 0.37

Model Selection Steps: Find the load factor α_3 of the dynamic moment.

Formula/Data: α_3 = Me/Mea

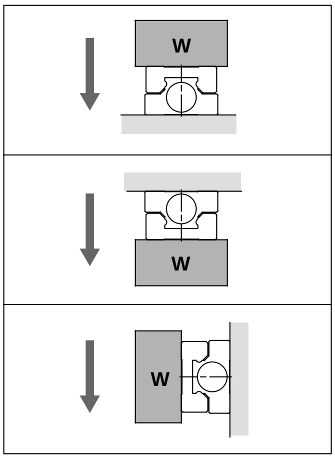
3-4 Sum of the Load Factors

Model Selection Steps: Use is possible if the sum of the load factors does not exceed 1.

Formula/Data: $\alpha_1 + \alpha_2 + \alpha_3 < 1$

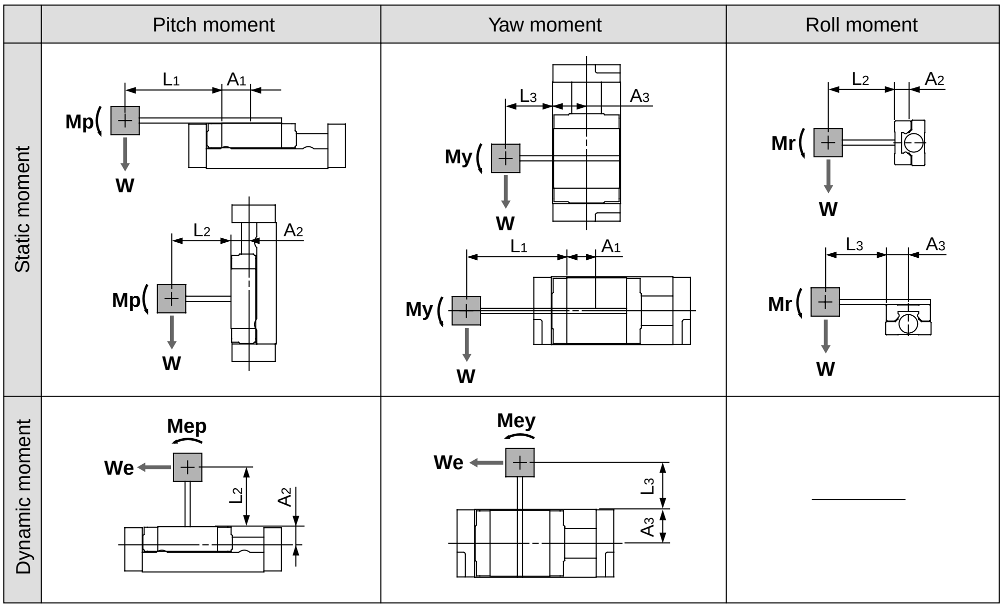
Selection Example:
Can be used based on
$\alpha_1 + \alpha_2 + \alpha_3 + \alpha'_3$ =
0.17 + 0.013 + 0.24 + 0.37 = 0.79 < 1

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



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

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



Note) Static moment: Moment by gravity   Dynamic moment: Moment by stopper collision

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

Model	Allowable kinetic energy		
	Rubber stopper	Shock absorber	Metal stopper
MXPJ6	0.010	——	——
MXP 6	0.010	——	0.005
MXP 8	0.033	——	0.017
MXP10	0.045	0.090	0.023
MXP12	0.076	0.152	0.038
MXP16	0.135	0.270	0.068

Table (2) Max. Allowable Load Weight: Wmax (kg)

Model	Maximum allowable load
MXPJ6	0.32
MXP 6	
MXP 8	0.75
MXP10	1.2
MXP12	1.7
MXP16	3

Graph (1) Allowable Load Weight Coefficient: β

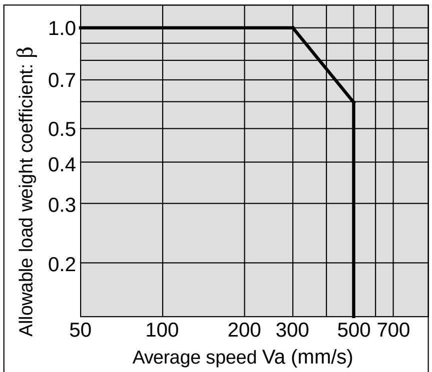
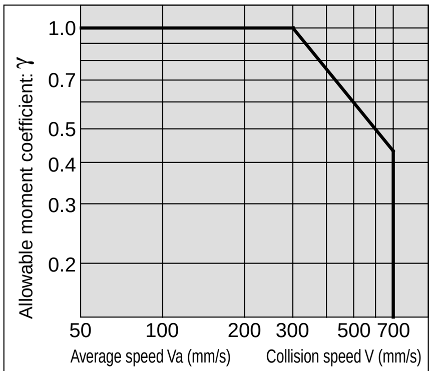


Table (3) Moment Centre Position Distance Compensation Amount: An (mm)

Model	Stroke	Moment centre position distance compensation amount (Refer to Fig. (2).)		
		A_1	A_2	A_3
MXPJ6 MXP 6	5	18.5	5.3	9
	10	23.5		
MXP 8	10	10.5	7.4	11
	20	20.5		
MXP10	10	10.5	6.8	13.5
	20	19.5		
MXP12	15	14.5	8	16
	25	24.5		
MXP16	20	20	12.5	23
	30	28		

Graph (2) Allowable Moment Coefficient: γ



Note) Use the average speed when calculating static moment.
Use the collision speed when calculating dynamic moment.

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

Model	Pitch/Yaw moment: Mpmax/Mymax						Roll moment: Mrmax					
	Stroke (mm)						Stroke (mm)					
	5	10	15	20	25	30	5	10	15	20	25	30
MXPJ6	1.4	2.3	—	—	—	—	2.6	3.5	—	—	—	—
MXP 6												
MXP 8	—	1.4	—	5.7	—	—	—	2.6	—	5.6	—	—
MXP10	—	1.7	—	6.3	—	—	—	4.2	—	8.5	—	—
MXP12	—	—	4.5	—	13	—	—	—	9.8	—	17	—
MXP16	—	—	—	12	—	28	—	—	—	26	—	41

Symbol

Symbol	Definition	Unit	Symbol	Definition	Unit
An (n = 1 to 3)	Correction values of moment centre position distance	mm	**V**	Collision speed	mm/s
E	Kinetic energy	J	**Va**	Average speed	mm/s
Emax	Allowable kinetic energy	J	**W**	Load weight	kg
Ln (n = 1 to 3)	Overhang	mm	**Wa**	Allowable load weight	kg
M (Mp, My, Mr)	Static moment (pitch, yaw, roll)	N·m	**We**	Weight equivalent to impact	kg
Ma (Map, May, Mar)	Allowable static moment (pitch, yaw, roll)	N·m	**Wmax**	Max. allowable load weight	kg
Me (Mep, Mey)	Dynamic moment (pitch, yaw)	N·m	α	Load factor	—
Mea (Meap, Meay)	Allowable dynamic moment (pitch, yaw)	N·m	β	Allowable load weight coefficient	—
Mmax (Mpmax, Mymax, Mrmax)	Maximum allowable moment (pitch, yaw, roll)	N·m	γ	Allowable moment coefficient	—

Precision Air Slide Table

Series MXP

ø6, ø8, ø10, ø12, ø16

How to Order

Precision Air Slide Table MXP 12 – 15 ☐ ☐ – M9N S

Bore size/Standard stroke (mm)

6	5, 10
8	10, 20
10	10, 20
12	15, 25
16	20, 30

Adjuster option

Symbol	Adjuster option
-	Rubber stopper
B	Shock absorber
C	Metal stopper

Note 1) Adjuster for Series MXP6 is available for one side only.
Note 2) Shock absorber is not available in Series MXP6 and MXP8.
Note 3) Stroke adjusting screw of metal stopper uses stainless steel 304.
For heat treated specifications, refer to "Made to Order Specifications".

Magnet/Switch rail

-	With magnet and rail
N	Without magnet and rail

∗ Auto switch cannot be mounted on type N (without magnet and rail).

Auto switch

-	Without auto switch

∗ For the applicable auto switch model, refer to the table below.

Number of auto switches

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

∗ In the case of MXP6-5, with 2 auto switches are available for D-M9☐ type and D-M9☐V type only. For other switches, no other choice is affordable but with 1 piece attached (symbol: S).

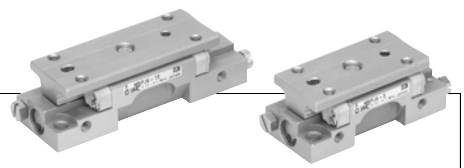
Applicable Auto Switch/Refer to page 21 for further information on auto switches.

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)	3 (L)	5 (Z)	Pre-wired connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	**A96V**	**A96**	●	●	—	—	IC circuit	—
Reed switch	—	Grommet	Yes	2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	○	IC circuit	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (PNP)	24 V	5 V, 12 V	—	**M9PV**	**M9P**	●	●	○	○	IC circuit	Relay, PLC
Solid state switch	—	Grommet	Yes	2-wire	24 V	12 V	—	**M9BV**	**M9B**	●	●	○	○	—	Relay, PLC
Solid state switch	Diagnostic indication (2-colour indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NWV**	**M9NW**	●	●	○	○	IC circuit	Relay, PLC
Solid state switch	Diagnostic indication (2-colour indication)	Grommet	Yes	3-wire (PNP)	24 V	5 V, 12 V	—	**M9PWV**	**M9PW**	●	●	○	○	IC circuit	Relay, PLC
Solid state switch	Diagnostic indication (2-colour indication)	Grommet	Yes	2-wire	24 V	12 V	—	**M9BWV**	**M9BW**	●	●	○	○	—	Relay, PLC

∗ Lead wire length symbols: 0.5 m··········Nil (Example) M9N
3 m·········· L (Example) M9NL
5 m·········· Z (Example) M9NZ

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

- Since there are other applicable auto switches than listed, refer to page 18 for details.
- For details about auto switches with pre-wired connector, refer to Best Pneumatics.



MXPJ6/Precision Air Slide Table ø6

How to Order

Air Slide Table MXPJ6 – 10

Standard stroke

5	5 mm
10	10 mm

∗ **MPXJ6 with auto switch is not available.**

Specifications

Bore size (mm)	6
Piping port size	M3
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
Piston speed	50 to 500 mm/s
Cushion	Rubber bumper
Lubrication	Non-lube
Stroke length tolerance	$^{+1}_{0}$ mm

Theoretical Output

(N)

Bore size (mm)	Piston area (mm²)	Operating pressure (MPa) 0.2	0.3	0.4	0.5	0.6	0.7
6	28	6	8	11	14	17	20

Stroke

(mm)

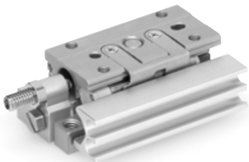
Model	Standard stroke
MXPJ6	5, 10

Weight

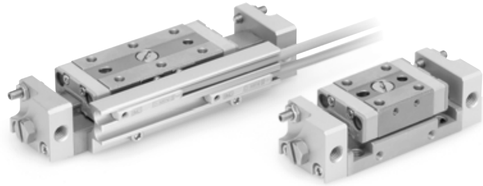
(g)

Model	Body weight
MXPJ6-5	80
MXPJ6-10	105

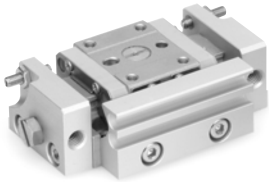
MXP6



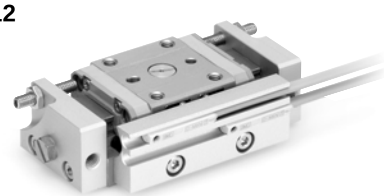
MXP8



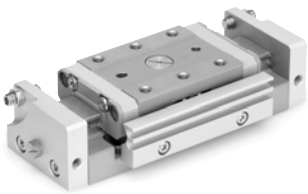
MXP10



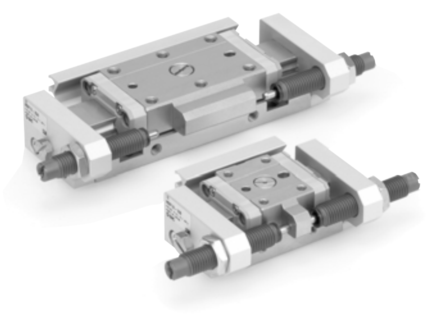
MXP12



MXP16



With Shock Absorber



∗ Exclusive body is to be used for the one with shock absorber.
Changing specifications, such as replacing component parts and retrofitting shock absorber is not possible.

Made to Order

Made to Order Specifications
(For details, refer to page 24, 25.)

Symbol	Specifications
−X16	Heat treated metal stopper bolt specification
−X23	Axial piping port set screw specification
−X42	Anti-rust guide specification
−X51	Long adjustment nut specification

For clean room specifications, refer to “Pneumatic Clean Series” catalogue.

Specifications

Model		MXP6	MXP8	MXP10	MXP12	MXP16
Bore size (mm)		6	8	10	12	16
Piping port size		M3	M5			
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				
Piston speed		50 to 500 mm/s (Adjuster option/Metal stopper: 50 to 200 mm/s)				
Cushion		Rubber bumper Shock absorber (Option is not available for Series MXP6 and MXP8) None (Adjuster option/Metal stopper)				
Lubrication		Non-lube				
Stroke adjuster		Standard equipment (Adjustable on one side only, for the MXP6)				
Stroke adjustment range	Rubber stopper	0 to 5 mm on one side only	Each 0 to 3 mm on both ends			
	Shock absorber	—	Each 0 to 5 mm on both ends			
	Metal stopper	0 to 6 mm on one side only	Each 0 to 5 mm on both ends	Each 0 to 4 mm on both ends		
Auto switch		Reed switch (2-wire, 3-wire) Solid state switch (2-wire, 3-wire) 2-colour indication solid state switch (2-wire, 3-wire)				
Stroke length tolerance		$^{+1}_{0}$ mm				

Theoretical Output

(N)

Bore size (mm)	Piston area (mm^2)	Operating pressure (MPa)					
		0.2	0.3	0.4	0.5	0.6	0.7
6	28	6	8	11	14	17	20
8	50	10	15	20	25	30	35
10	79	16	24	32	40	47	55
12	113	23	34	45	57	68	79
16	201	40	60	80	101	121	141

Standard Stroke (mm)

Model	Standard stroke
MXP6	5, 10
MXP8	10, 20
MXP10	10, 20
MXP12	15, 25
MXP16	20, 30

Weight

(g)

Model	Body weight	Additional weight of magnet and rail
MXP6-5	80	10
MXP6-10	105	10
MXP8-10	100	8
MXP8-20	160	12
MXP10-10	130	13
MXP10-20	210	20
MXP12-15	210	17
MXP12-25	320	23
MXP16-20	640	20
MXP16-30	830	23

Shock Absorber Specifications

Shock absorber model		RB0805	RB0806
Applicable slide table		MXP10/12	MXP16
Max. energy absorption (J)		0.98	2.94
Stroke absorption (mm)		5	6
Max. collision speed (mm/s)		50 to 500	
Max. operating frequency (cycle/min)		80	80
Max. allowable thrust (N)		245	245
Ambient temperature range (°C)		–10 to 60	
Spring force (N)	Extended	1.96	1.96
	Retracted	3.83	4.22
Weight (g)		15	15

Minimum Stroke for Auto Switch Mounting

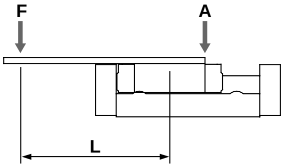
(mm)

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

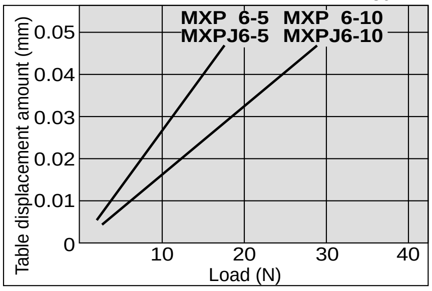
Table Deflection

Table displacement due to pitch moment load

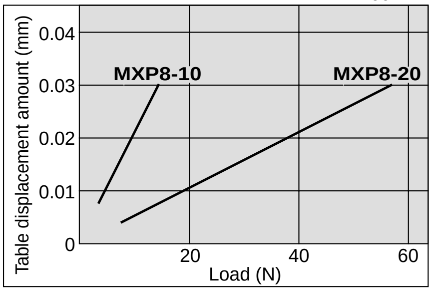
Displacement on A when load is applied on F.



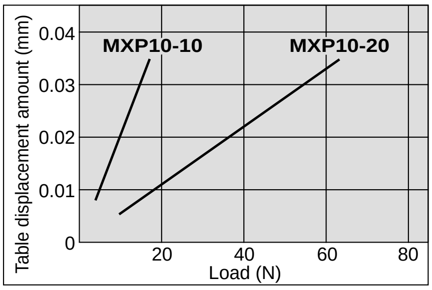
ø6 L = 80 mm



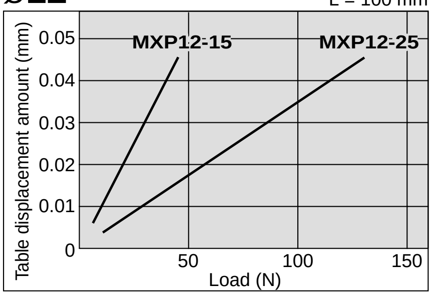
ø8 L = 100 mm



ø10 L = 100 mm



ø12 L = 100 mm



ø16 L = 120 mm

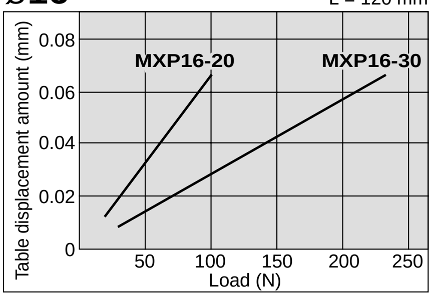
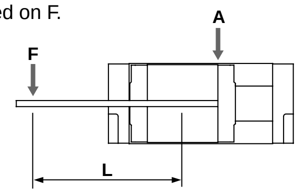
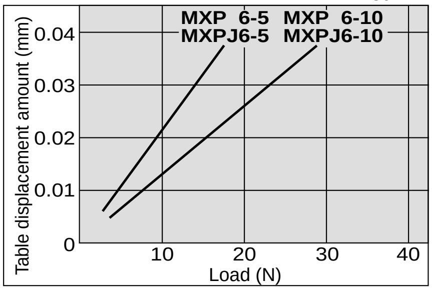


Table displacement due to yaw moment load

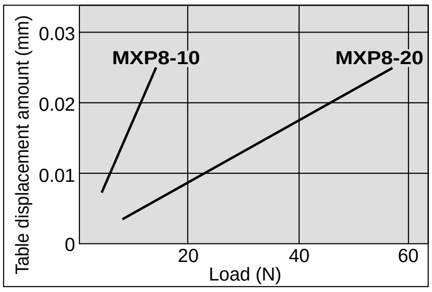
Displacement on A when load is applied on F.



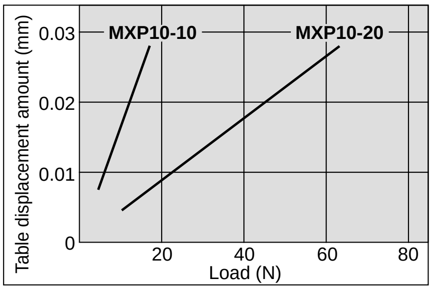
ø6 L = 80 mm



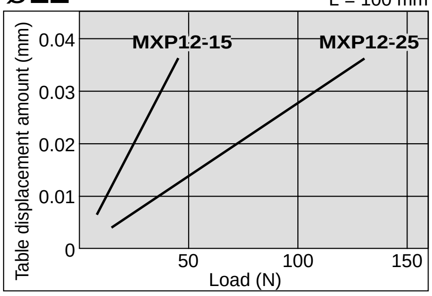
ø8 L = 100 mm



ø10 L = 100 mm



ø12 L = 100 mm



ø16 L = 120 mm

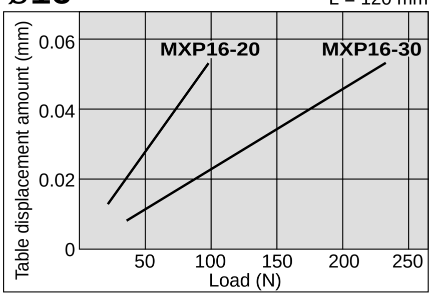
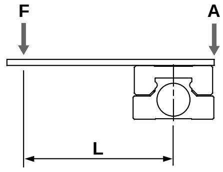
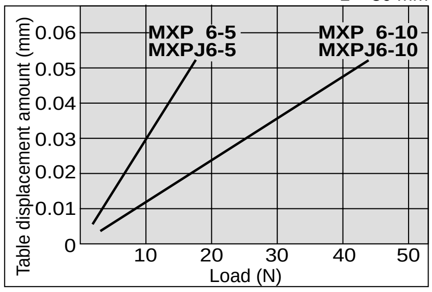


Table displacement due to roll moment load

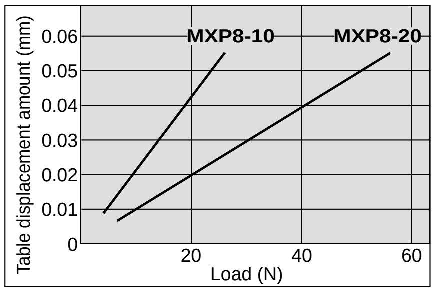
Displacement on A when load is applied on F.



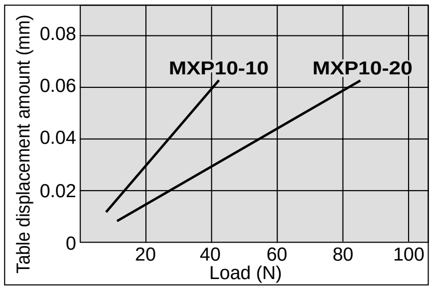
ø6 L = 80 mm



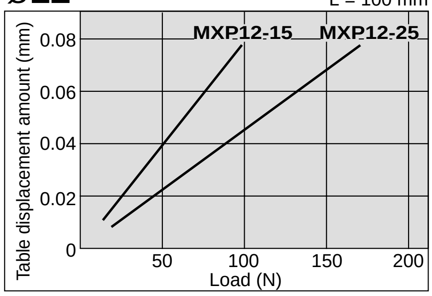
ø8 L = 100 mm



ø10 L = 100 mm



ø12 L = 100 mm



ø16 L = 120 mm

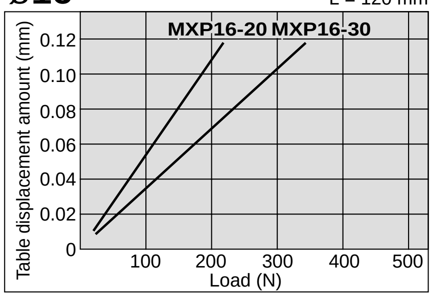
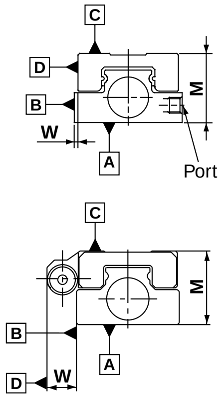
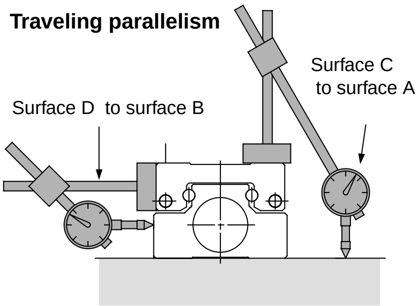
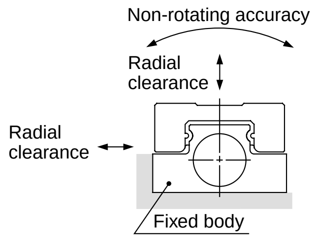


Table Accuracy





The amount of deflection on a dial gauge when the guide block travels a full stroke with the body secured on a reference base surface.



Model	MXPJ6	MXP6	MXP8	MXP10	MXP12	MXP16
Radial clearance (µm)	0 to –2	0 to –2	0 to –3	0 to –3	0 to –5	0 to –7
Table non-rotating accuracy (deg)	±0.03	±0.03	±0.03	±0.03	±0.04	±0.04

With shock absorber

(mm)

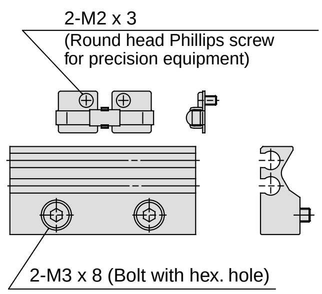
Model		MXPJ6	MXP6	MXP8	MXP10	MXP12	MXP16
Parallelism	Surface **C** to surface **A**	0.02					
	Surface **D** to surface **B**	0.02					
Traveling parallelism	Surface **C** to surface **A**	0.004					
	Surface **D** to surface **B**	0.004					
M dimension tolerance		±0.05					
W dimension tolerance		±0.05					

Option Specifications

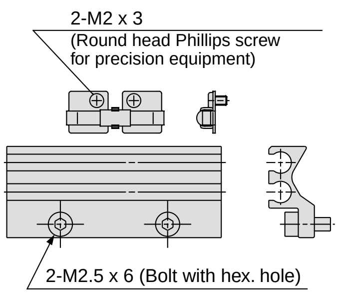
Rail assembly for mounting auto switch

When auto switch is mounted on air slide table without rail (MXP☐-☐N), this assembly is used.

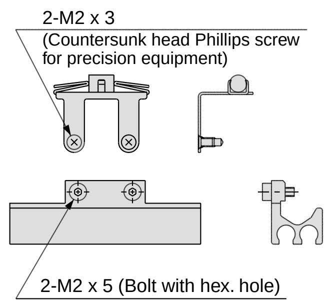
Dimensions



MXP10, 12, 16



MXP8



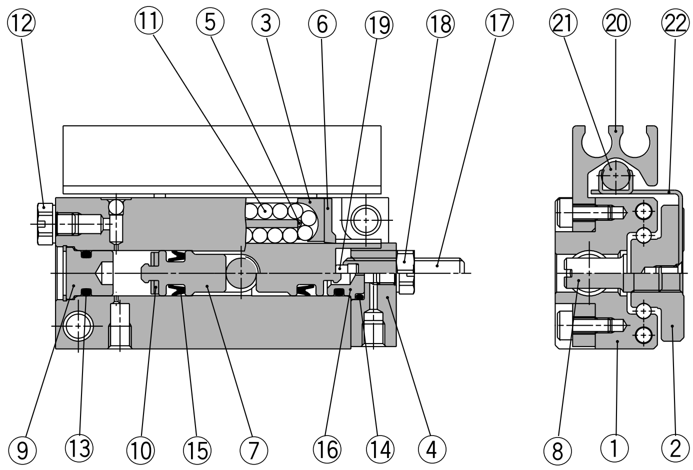
MXP6

Applicable size	Switch rail part no.	Note
MXP6-5	MXP-AD6-5	With magnet and mounting screw
MXP6-10		
MXP8-10	MXP-AD8-10	
MXP8-20	MXP-AD8-20	
MXP10-10	MXP-AD10-10	
MXP10-20	MXP-AD10-20	
MXP12-15	MXP-AD12-15	
MXP12-25	MXP-AD12-25	
MXP16-20	MXP-AD10-20	
MXP16-30	MXP-AD12-25	

Note) MXP16-20 and MXP10-20 are common.
MXP16-30 and MXP12-25 are common.

Construction

MXP6



Component Parts

No.	Description	Material	Note
1	**Body**	Stainless steel	Heat treated
2	**Table**	Stainless steel	Heat treated
3	**Cover**	Resin	
4	**End plate**	Aluminum alloy	Hard anodized
5	**Return guide**	Resin	
6	**Scraper**	Stainless steel, NBR	
7	**Piston**	Brass	Electroless nickel plated
8	**Joint shaft**	Carbon steel	Electroless nickel plated
9	**End cap**	Brass	Electroless nickel plated
10	**Rod bumper**	Polyurethane	
11	**Steel ball**	High carbon chrome bearing steel	
12	**Plug**	Brass, Stainless steel, NBR	Electroless nickel plated

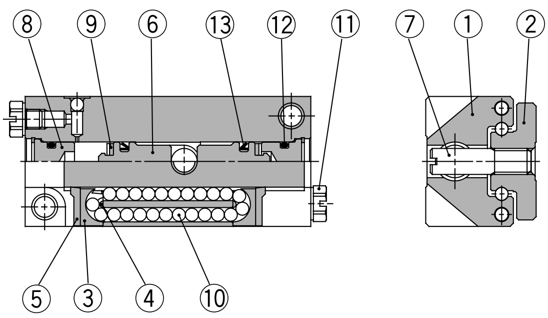
Component Parts

No.	Description	Material	Note
13	**O-ring**	NBR	
14	**O-ring**	NBR	
15	**Piston seal**	NBR	
16	**End cap**	Brass	Electroless nickel plated
17	**Adjusting bolt**	Carbon steel (Rubber stopper)	Nickel plated
		Stainless steel (Metal stopper)	
18	**Adjusting nut**	Carbon steel	Nickel plated
19	**Adjusting bumper**	Polyurethane	
20	**Switch rail**	Aluminum alloy	Hard anodized
21	**Magnet**	Rare earth	
22	**Magnet holder**	Steel	Nickel plated

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
6	MXP6-PS	2 pieces each of no. ⑬ and ⑮ and 1 piece of no. ⑭

MXPJ6



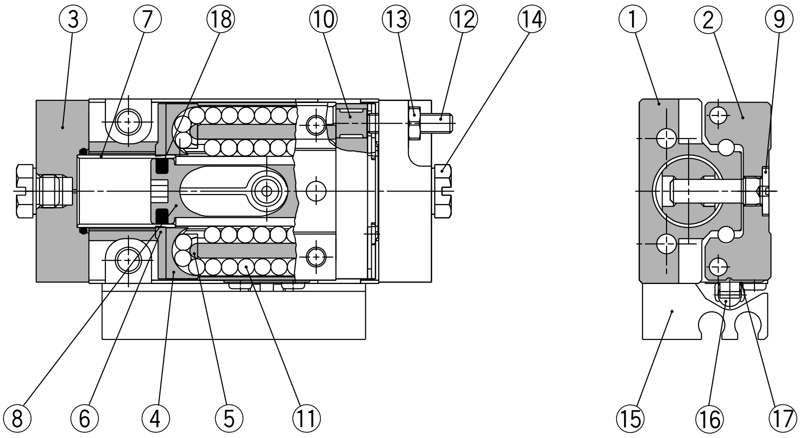
Component Parts

No.	Description	Material	Note
1	**Body**	Stainless steel	Heat treated
2	**Table**	Stainless steel	Heat treated
3	**Cover**	Resin	
4	**Return guide**	Resin	
5	**Scraper**	Stainless steel, NBR	
6	**Piston**	Brass	Electroless nickel plated
7	**Joint shaft**	Carbon steel	Electroless nickel plated
8	**End cap**	Brass	Electroless nickel plated
9	**Rod bumper**	Polyurethane	
10	**Steel ball**	High carbon chrome bearing steel	
11	**Plug**	Brass, Stainless steel, NBR	Electroless nickel plated
12	**O-ring**	NBR	
13	**Piston seal**	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
6	MXPJ6-PS	2 pieces of no. ⑫ and ⑬

MXP8,10,12,16



Component Parts

No.	Description	Material	Note
1	**Body**	Stainless steel	Heat treated
2	**Guide block**	Stainless steel	Heat treated
3	**End plate**	Aluminum alloy	Hard anodized
4	**Cover**	Resin	
5	**Return guide**	Resin	
6	**Scraper**	Stainless steel, NBR	
7	**Tube**	Brass	Electroless nickel plated (except ø8)
8	**Piston**	Resin	
9	**Joint shaft**	Carbon steel	Electroless nickel plated
10	**Adjust bumper**	Polyurethane	

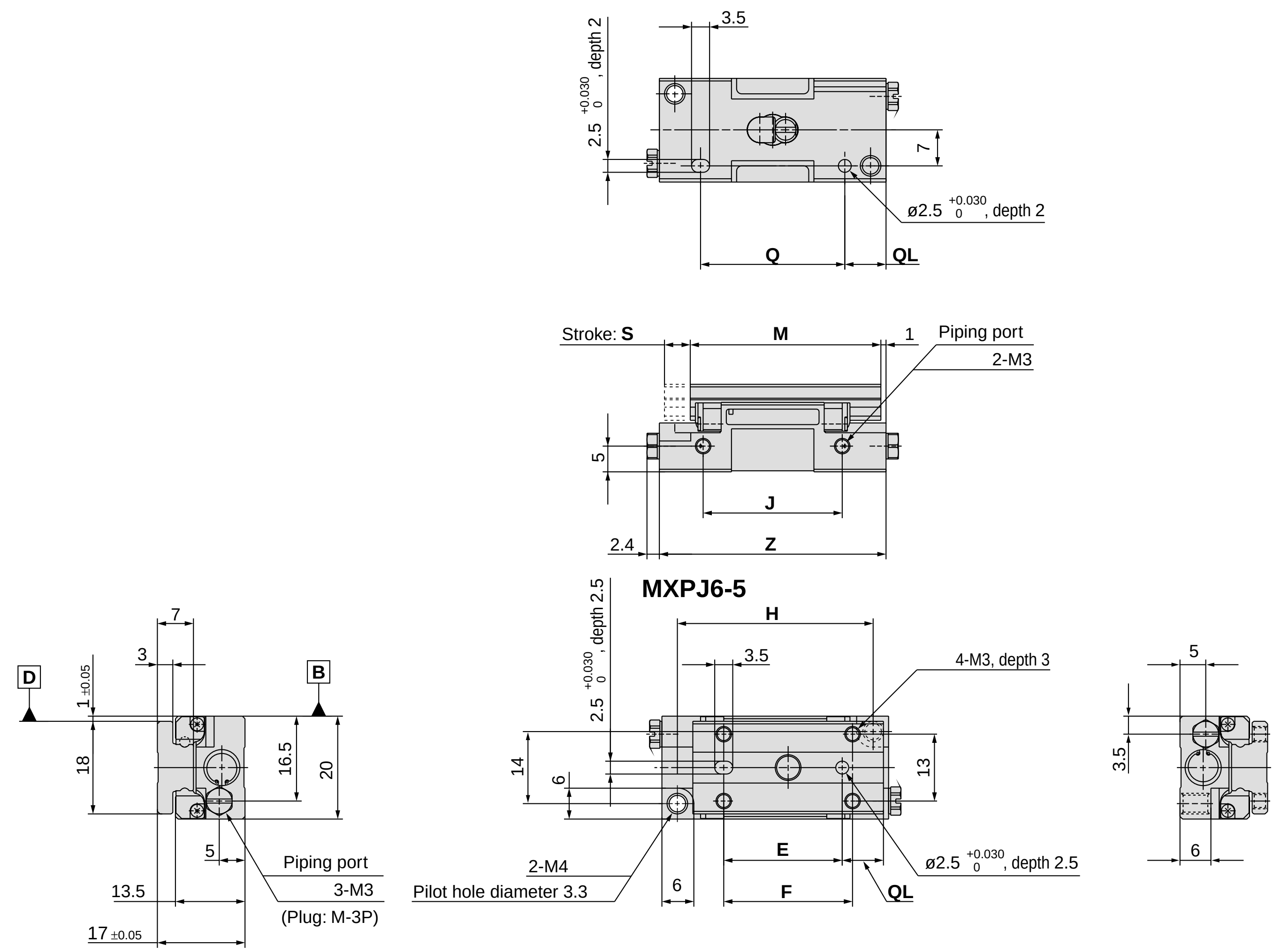
Component Parts

No.	Description	Material	Note
11	**Steel ball**	High carbon chrome bearing steel	
12	**Adjusting bolt**	Carbon steel (Rubber stopper)	Nickel plated
		Stainless steel (Metal stopper)	
13	**Adjust nut**	Carbon steel	Nickel plated
14	**Plug**	Brass, Stainless steel, NBR	Electroless nickel plated
15	**Switch rail**	Aluminum alloy	Hard anodized
16	**Magnet**	Rare earth	
17	**Magnet holder**	Steel	Electroless nickel plated
18	**Piston seal**	NBR	

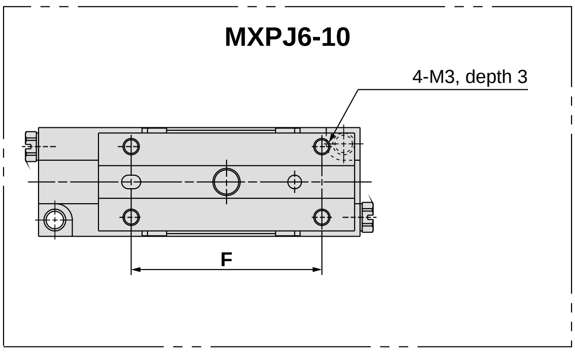
Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
8	MXP8-PS	2 pieces of no. ⑱
10	MXP10-PS	
12	MXP12-PS	
16	MXP16-PS	

Dimensions: MXPJ6



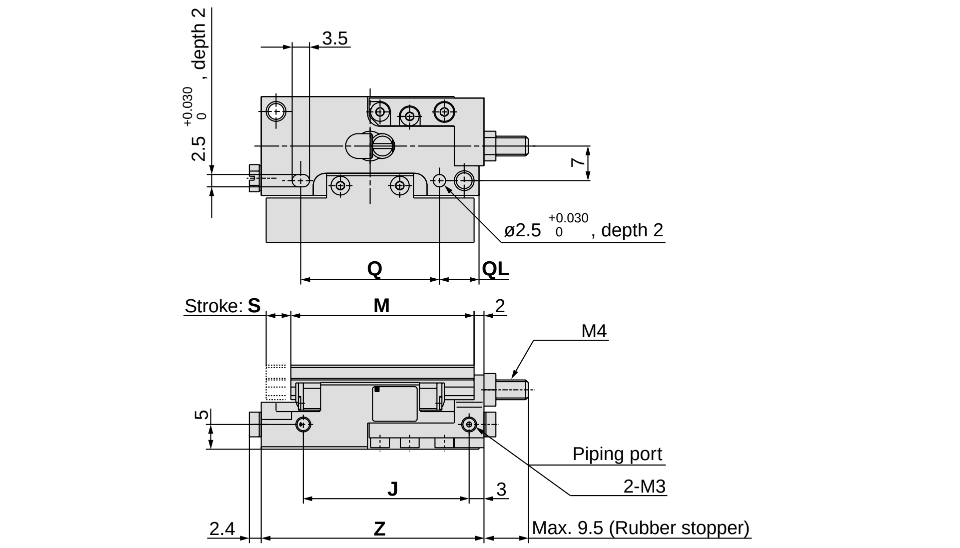
B D — Mounting datum level



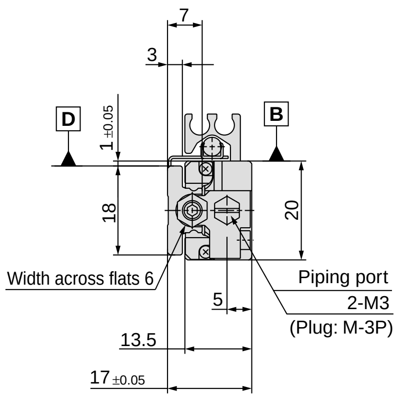
(mm)

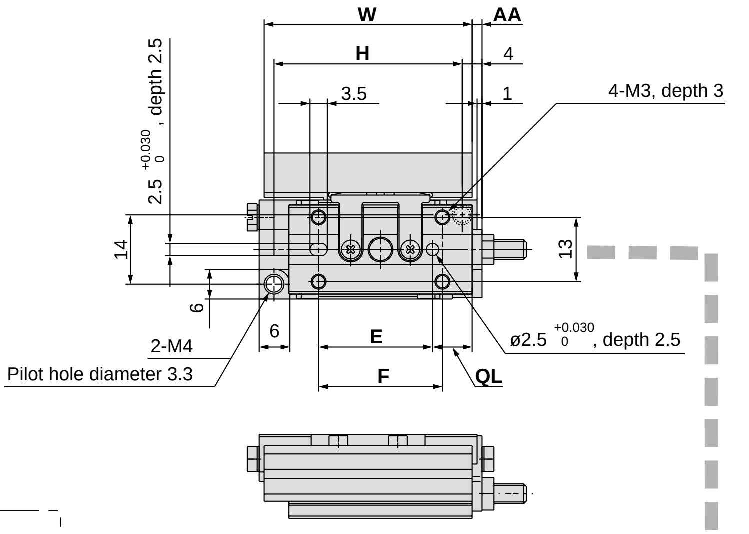
Model	E	F	H	J	M	Q	QL	S	Z
MXPJ6-5	23	25	38	27	37	28	8	5	44
MXPJ6-10	30	35	53	42	47	37	11	10	59

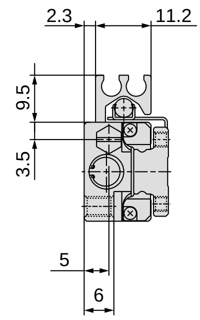
Dimensions: MXP6



MXP6-5

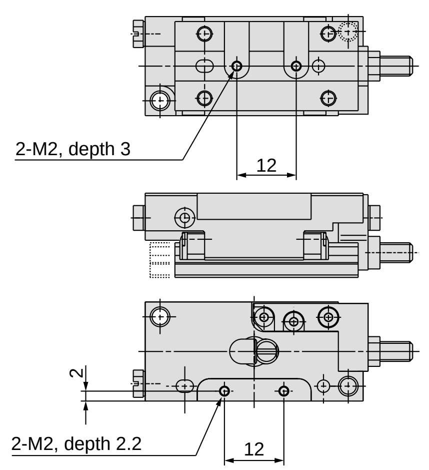




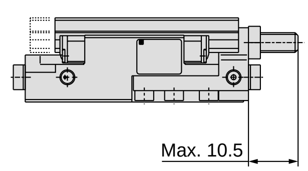


B D — Mounting datum level

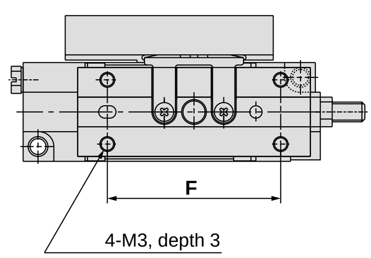
Without magnet and switch rail



Metal stopper



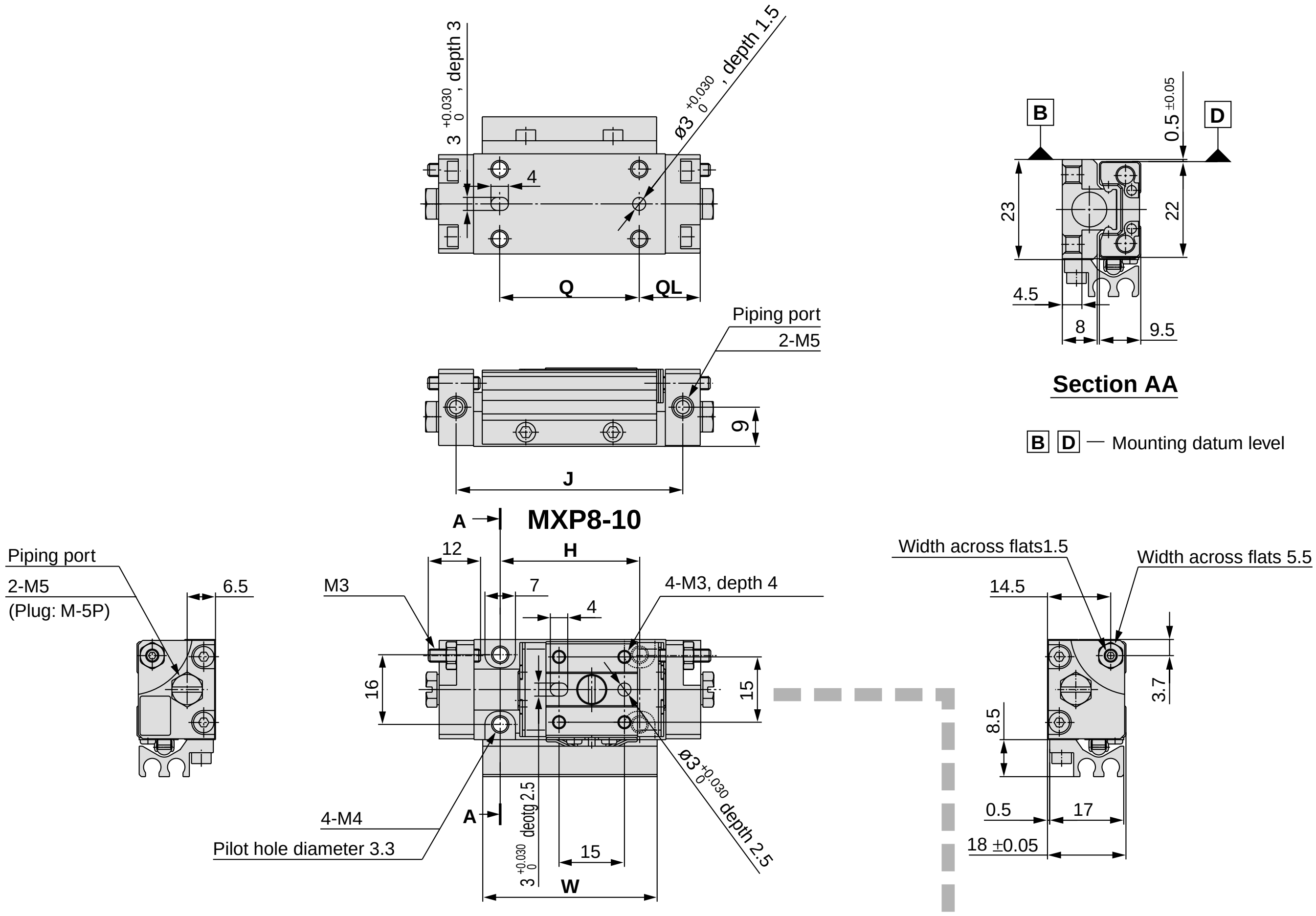
MXP6-10

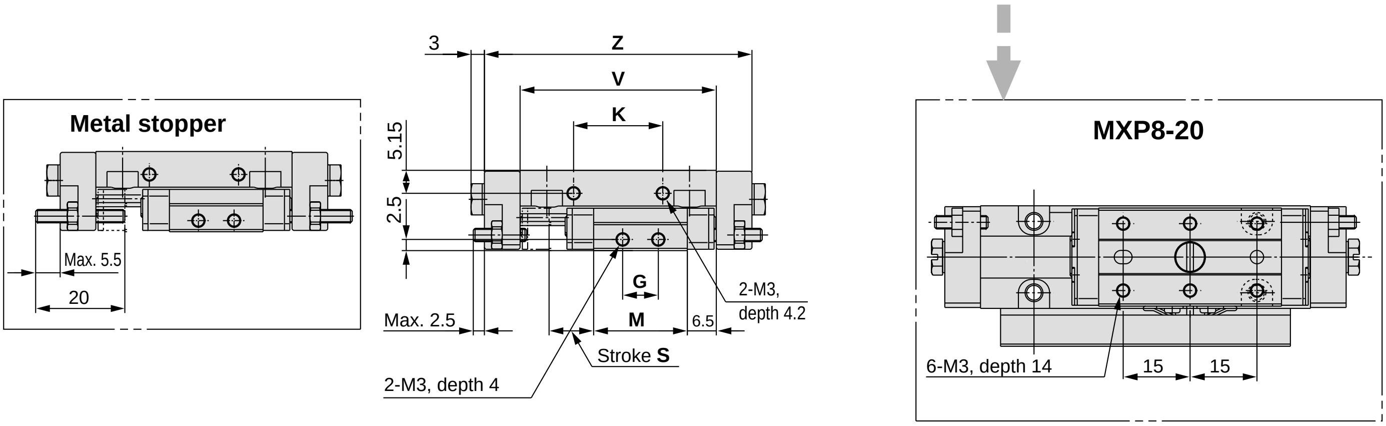


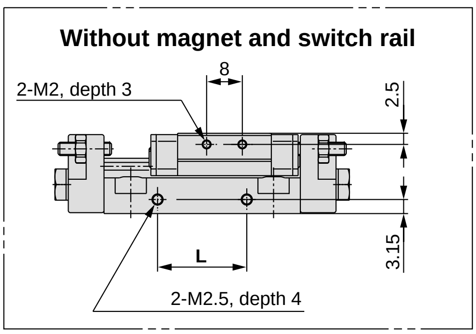
(mm)

Model	E	F	H	J	M	Q	QL	S	W	Z	AA
MXP6-5	23	25	38	33.5	37	28	8	5	42	45	2
MXP6-10	30	35	42	48.5	47	37	11	10	53	60	9.5

Dimensions: MXP8



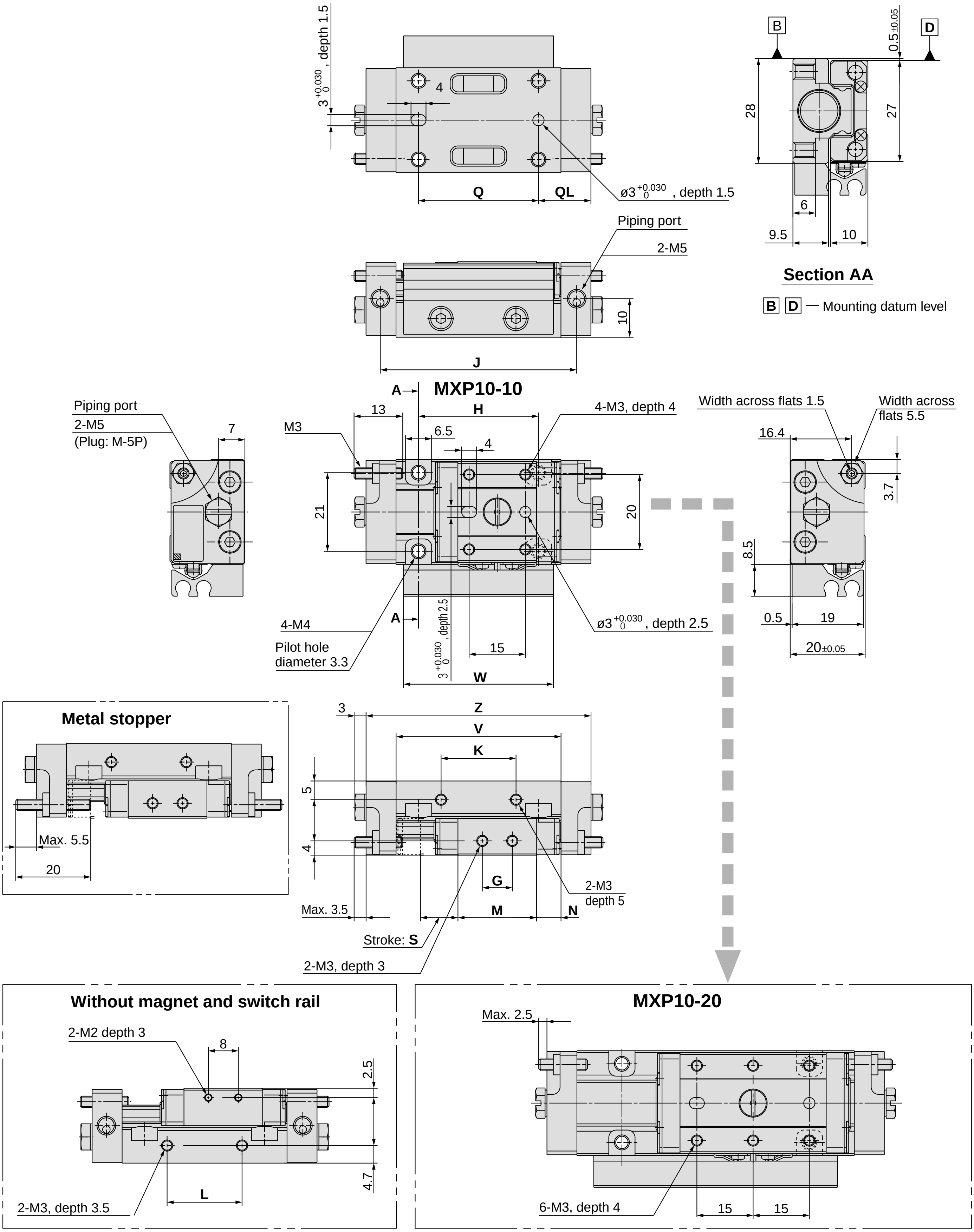




(mm)

Model	G	H	J	K	L	M	Q	QL	S	V	W	Z
MXP8-10	8	32	52	20	20	21	32	14	10	44	40	60
MXP8-20	20	50	82	36	36	41	50	20	20	74	65	90

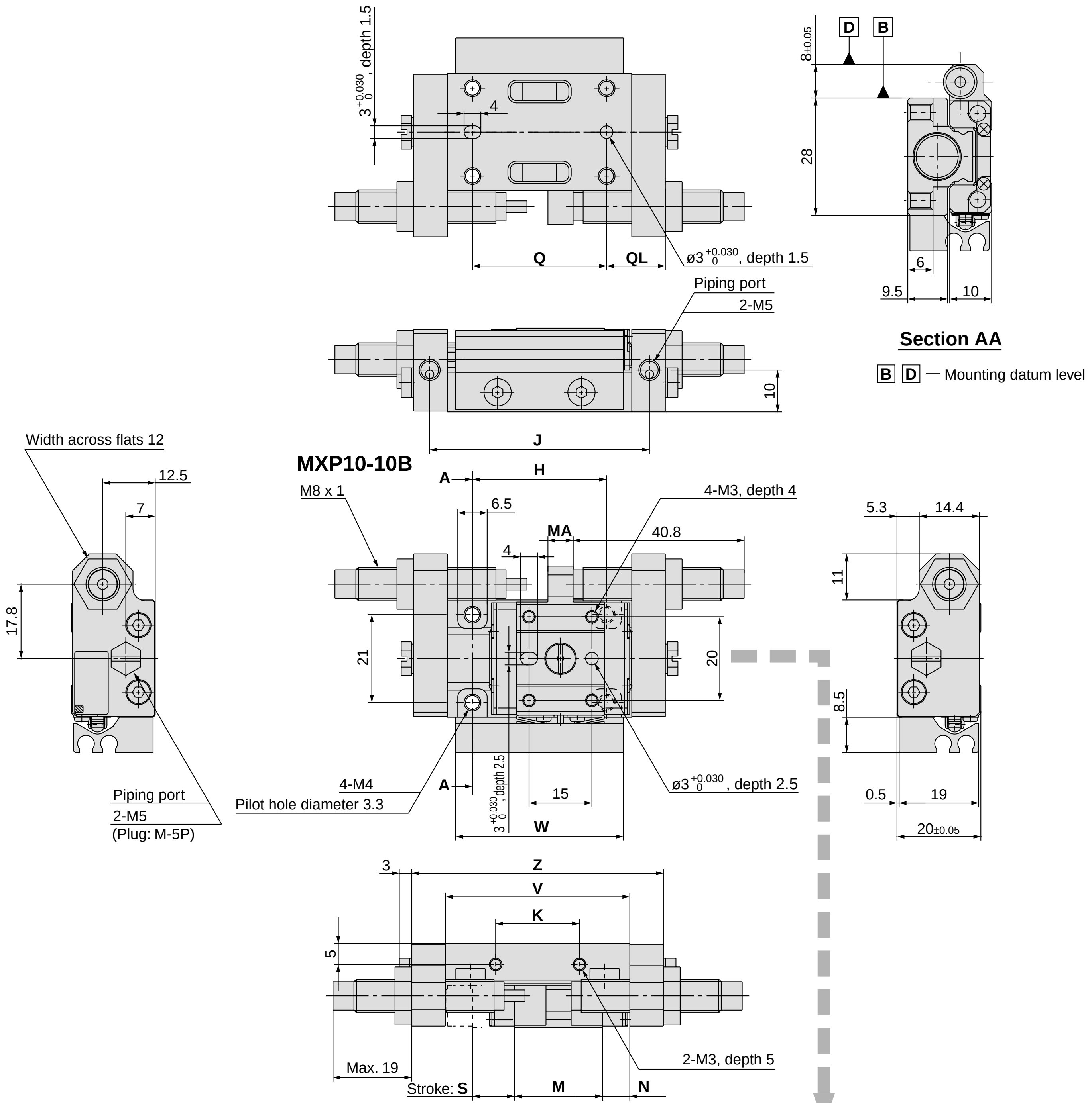
Dimensions: MXP10



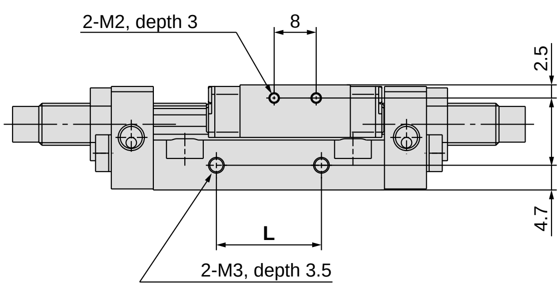
(mm)

Model	G	H	J	K	L	M	N	Q	QL	S	V	W	Z
MXP10-10	8	32	52.4	20	20	21	6.5	32	14	10	44	40	60
MXP10-20	20	50	82.4	36	36	39	7.5	50	20	20	74	65	90

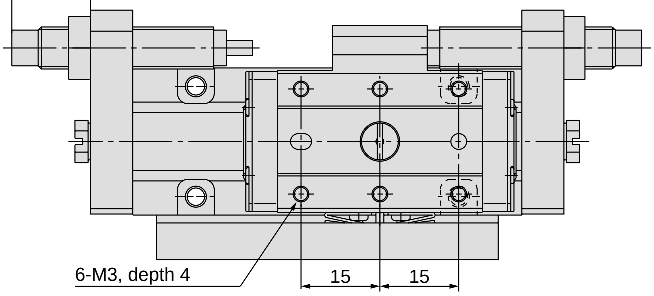
Dimensions: MXP10 with Shock Absorber



Without magnet and switch rail



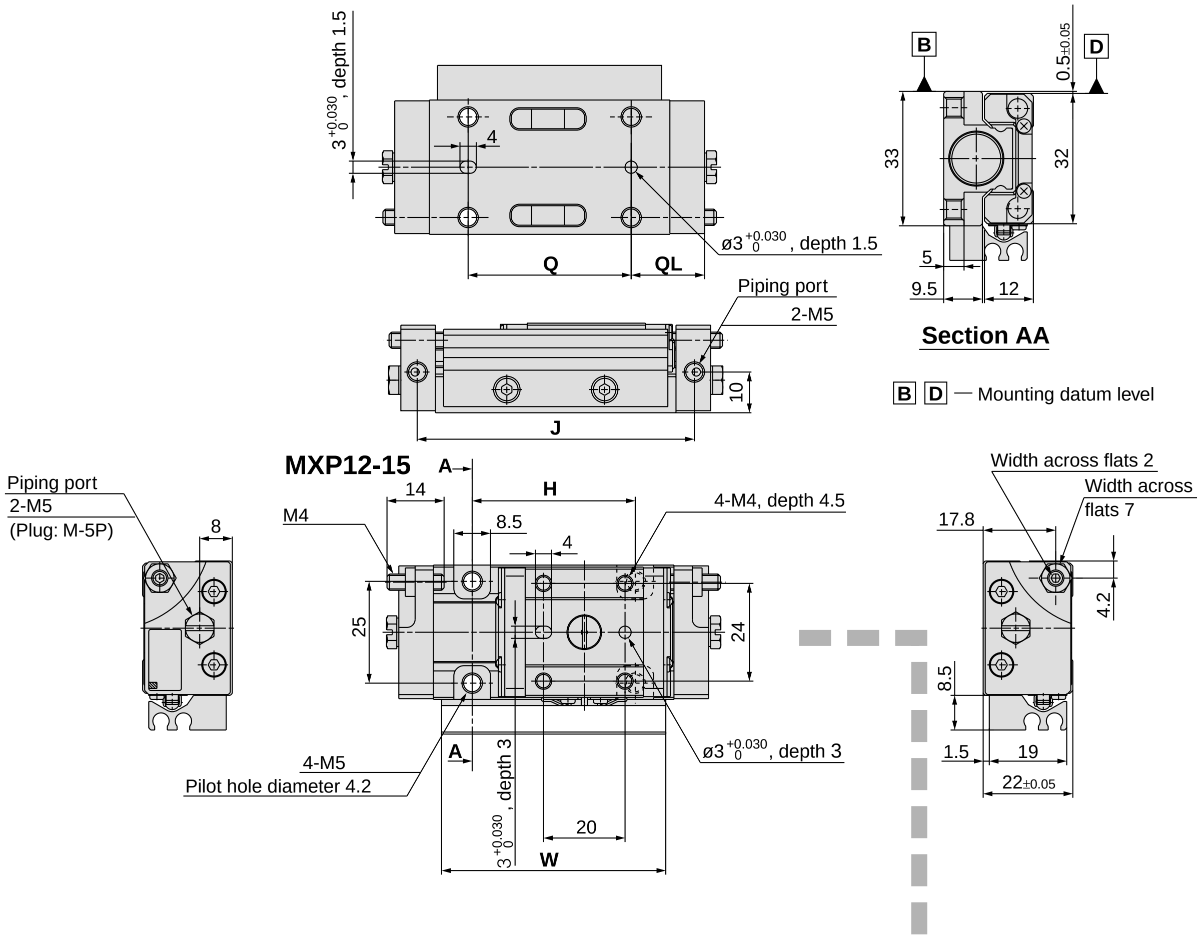
MXP10-20B

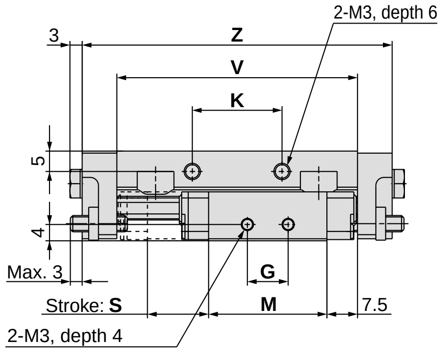


(mm)

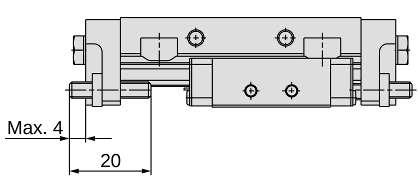
Model	H	J	K	L	M	MA	N	Q	QL	S	V	W	Z
MXP10-10B	32	52.4	20	20	21	6	6.5	32	14	10	44	40	60
MXP10-20B	50	82.4	36	36	39	18	7.5	50	20	20	74	65	90

Dimensions: MXP12

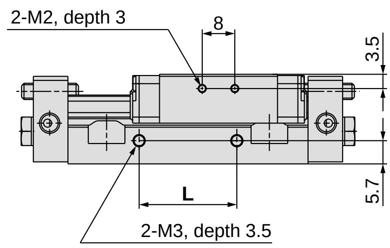




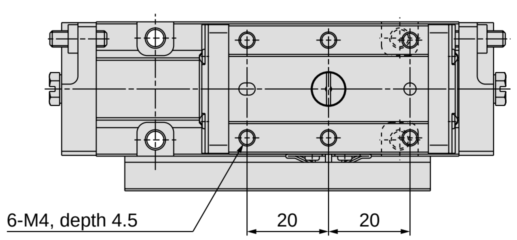
Metal stopper



Without magnet and switch rail



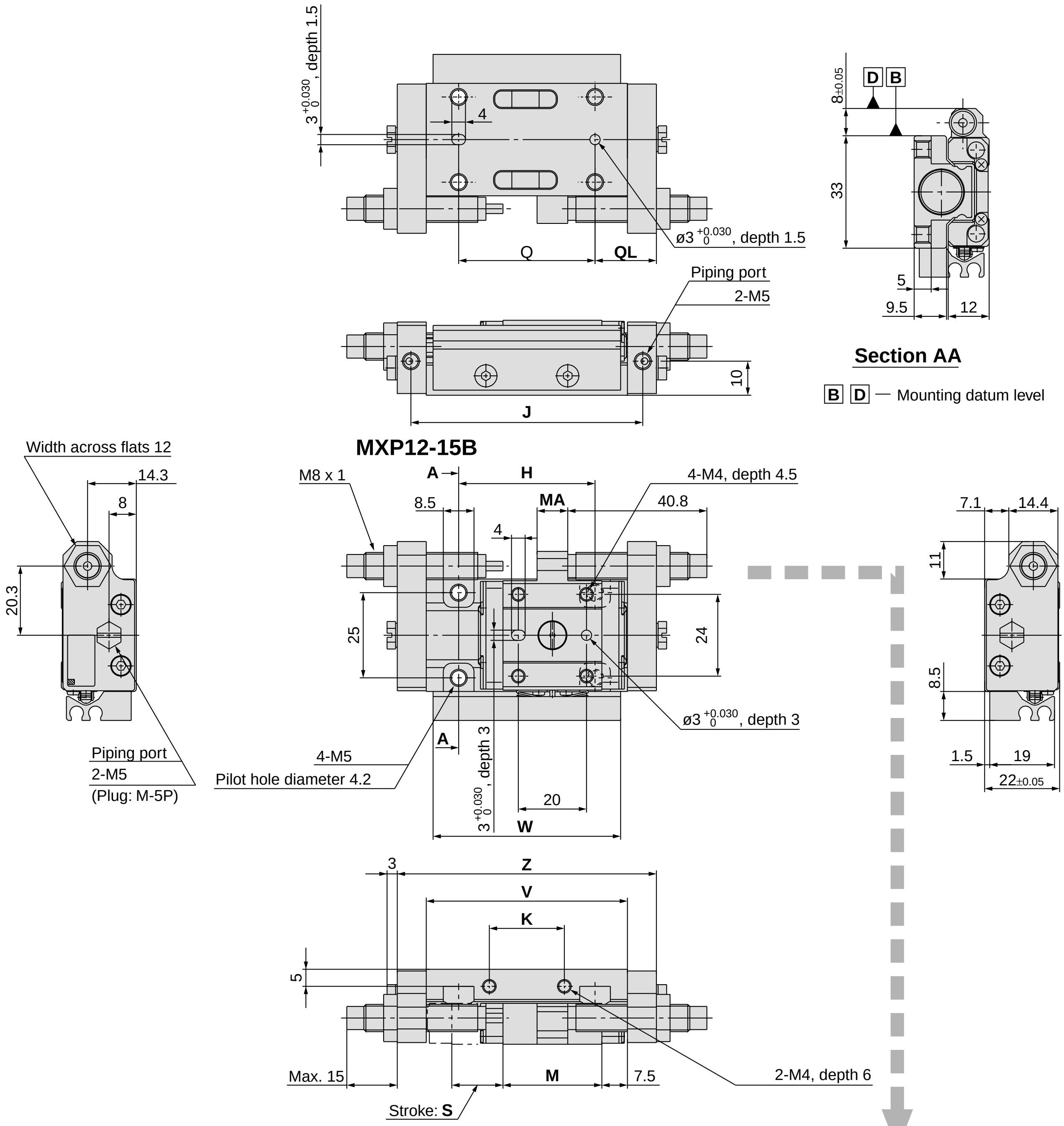
MXP12-25



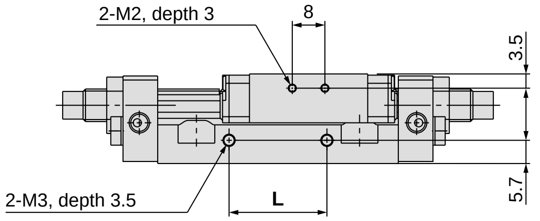
(mm)

Model	G	H	J	K	L	M	Q	QL	S	V	W	Z
MXP12-15	10	40	68	22	24	29	40	18	15	59	55	76
MXP12-25	30	60	98	40	42	49	60	23	25	89	75	106

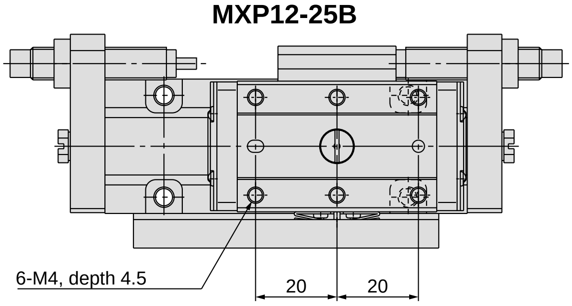
Dimensions: MXP12 with Shock Absorber



Without magnet and switch rail



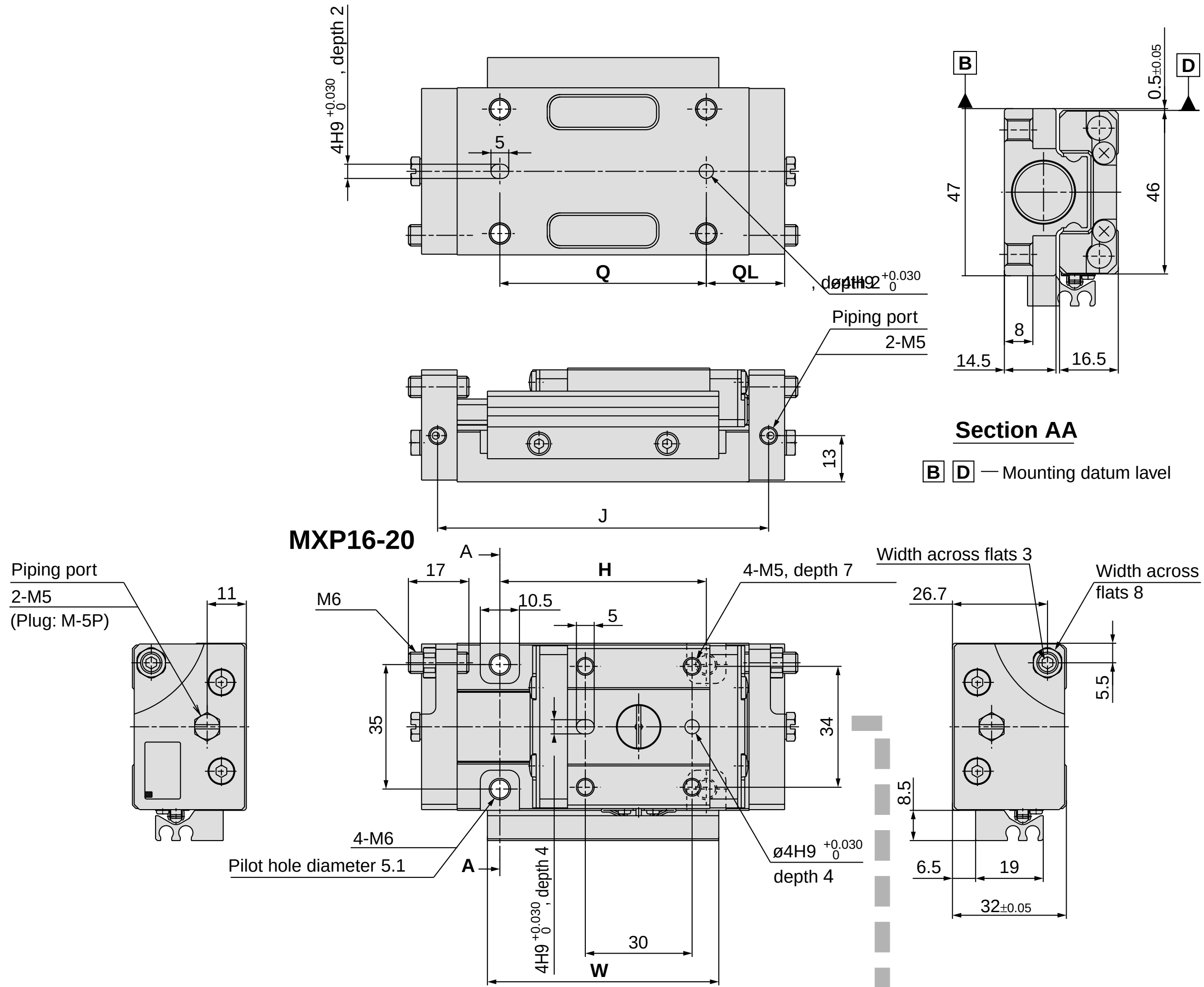
MXP12-25B

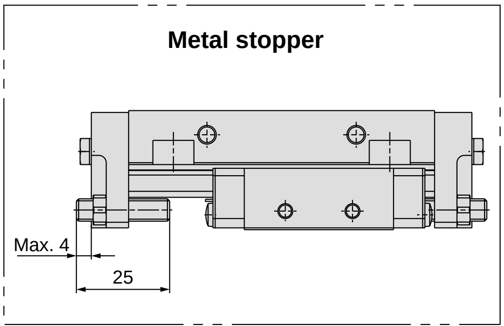


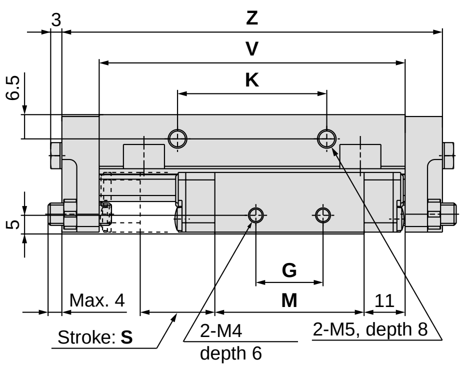
(mm)

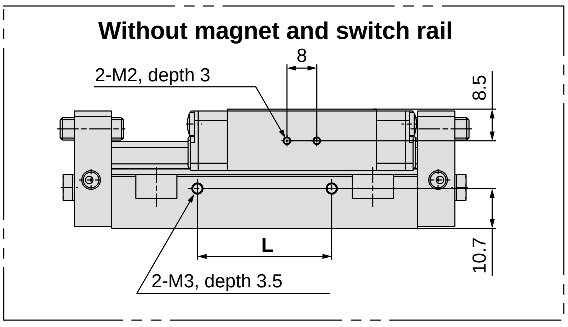
Model	H	J	K	L	M	MA	Q	QL	S	V	W	Z
MXP12-15B	40	68	22	24	29	9	40	18	15	59	55	76
MXP12-25B	60	98	40	42	49	29	60	23	25	89	75	106

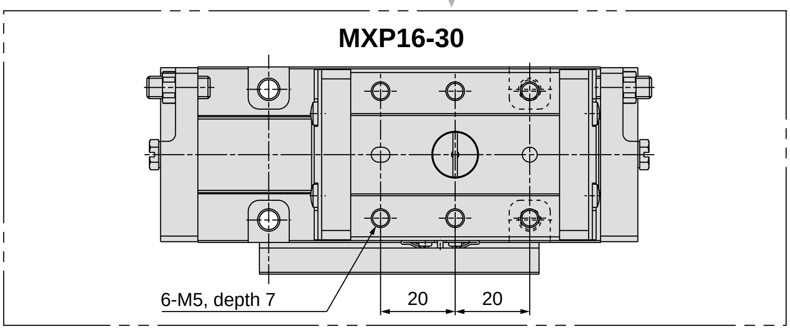
Dimensions: MXP16







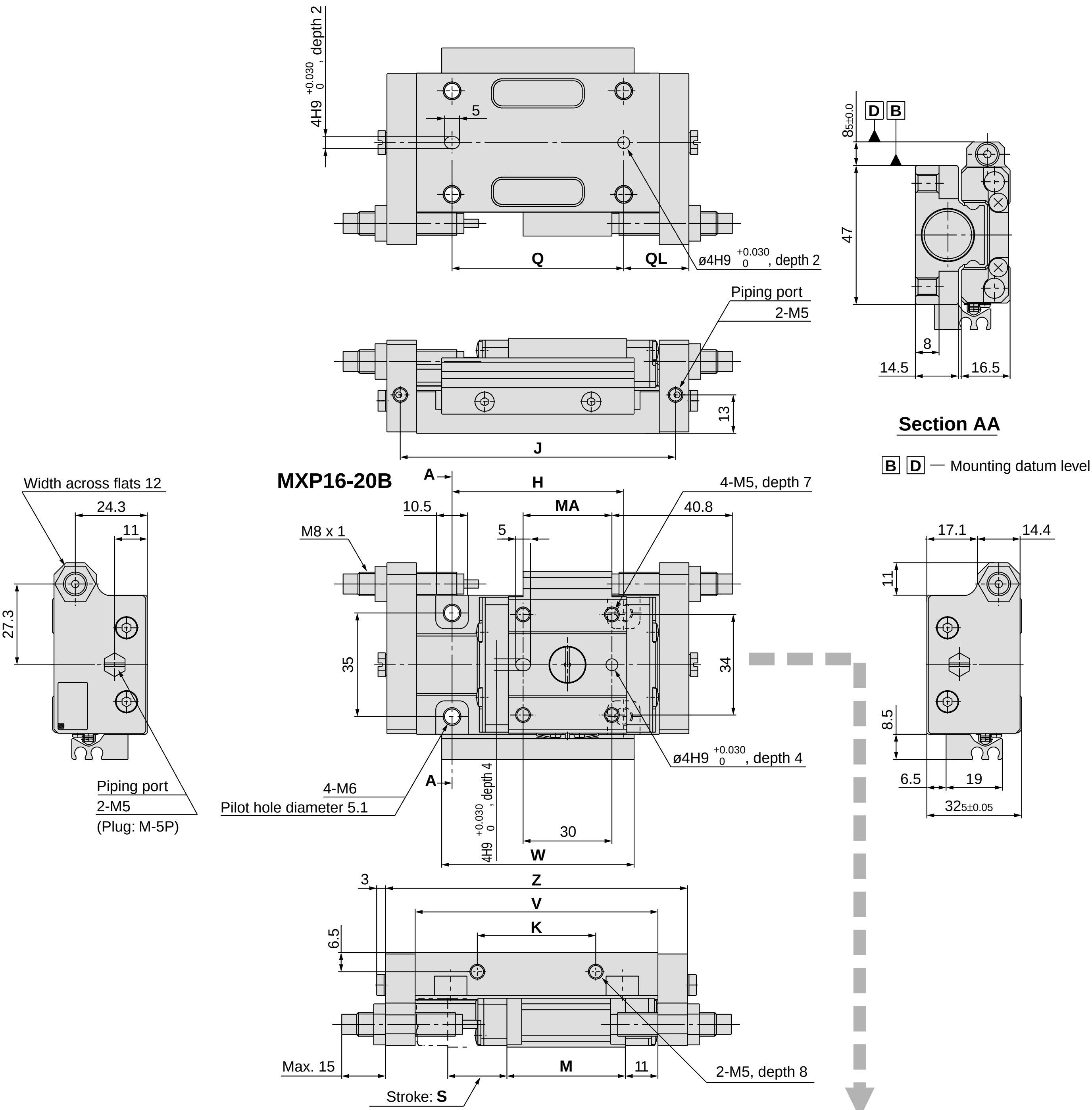




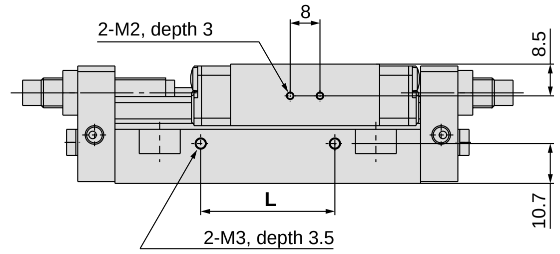
(mm)

Model	G	H	J	K	L	M	Q	QL	S	V	W	Z
MXP16-20	18	58	93	40	36	40	58	22	20	82	65	102
MXP16-30	28	70	119	50	42	56	70	29	30	108	75	128

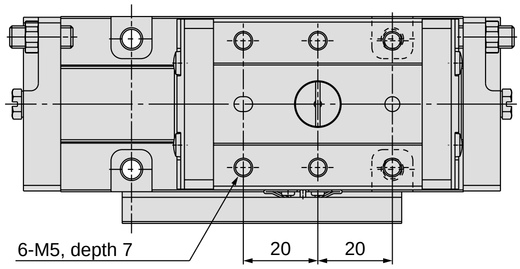
Dimensions: MXP16 with Shock Absorber



Without magnet and switch rail



MXP16-30B



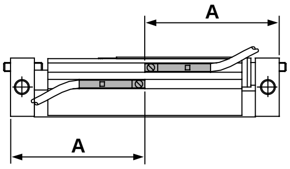
(mm)

Model	H	J	K	L	M	MA	Q	QL	S	V	W	Z
MXP16-20B	58	93	40	36	40	30	58	22	20	82	65	102
MXP16-30B	70	119	50	42	56	46	70	29	30	108	75	128

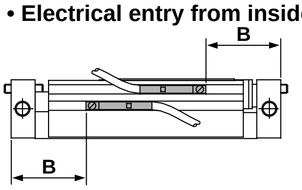
Proper Auto Switch Mounting Position (Detection at stroke end)

MXP8,10,12,16

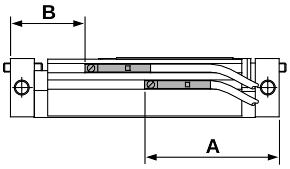
• Electrical entry from outside



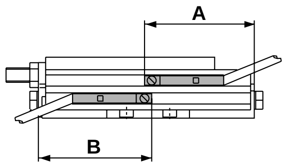
• Electrical entry from inside

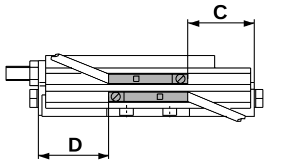


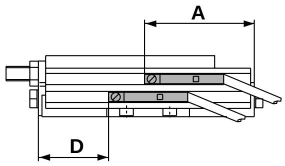
• Parallel electrical entry



MXP6







Reed Switch
D-A90(V), D-A93(V), D-A96(V) (mm)

Model		Stroke (mm)				
		10	15	20	25	30
MXP8	A	35	—	45	—	—
	B	15	—	25	—	—
MXP10	A	35	—	45	—	—
	B	15	—	25	—	—
MXP12	A	—	40.5	—	50.5	—
	B	—	20.5	—	30.5	—
MXP16	A	—	—	51	—	59
	B	—	—	31	—	39

Solid State Switch
D-M9B(V), D-M9N(V), D-M9P(V) (mm)

Model		Stroke (mm)				
		10	15	20	25	30
MXP8	A	31	—	41	—	—
	B	19	—	29	—	—
MXP10	A	31	—	41	—	—
	B	19	—	29	—	—
MXP12	A	—	36.5	—	46.5	—
	B	—	24.5	—	34.5	—
MXP16	A	—	—	47	—	55
	B	—	—	35	—	43

2-colour Indication, Solid State Switch
D-M9BW(V), D-M9NW(V), D-M9PW(V) (mm)

Model		Stroke (mm)				
		10	15	20	25	30
MXP8	A	31	—	41	—	—
	B	19	—	29	—	—
MXP10	A	31	—	41	—	—
	B	19	—	29	—	—
MXP12	A	—	36.5	—	46.5	—
	B	—	24.5	—	34.5	—
MXP16	A	—	—	47	—	55
	B	—	—	35	—	43

Reed Switch
D-A90(V), D-A93(V), D-A96(V)

Model		Stroke (mm)
		10
MXP6	A	34.5
	B	35.5
	C	14.5
	D	15.5

Solid State Switch
D-M9B(V), D-M9N(V), D-M9P(V)

Model		Stroke (mm)	
		5	10
MXP6	A	25.5	30.5
	B	26.5	31.5
	C	13.5	18.5
	D	14.5	19.5

2-colour Indication, Solid State Switch
D-M9BW(V), D-M9NW(V), D-M9PW(V)

Model		Stroke (mm)	
		5	10
MXP6	A	25.5	30.5
	B	26.5	31.5
	C	13.5	18.5
	D	14.5	19.5

Operating Range

(mm)

Auto switch model	Applicable bore size (mm)				
	6	8	10	12	16
D-A9□/A9□V	5	5	5	5	5
D-M9□/M9□V	2.5	2.5	2.5	2.5	2.5
■⌘□W/M9□WV	3	3	3	3	3

Mounting of Auto Switch

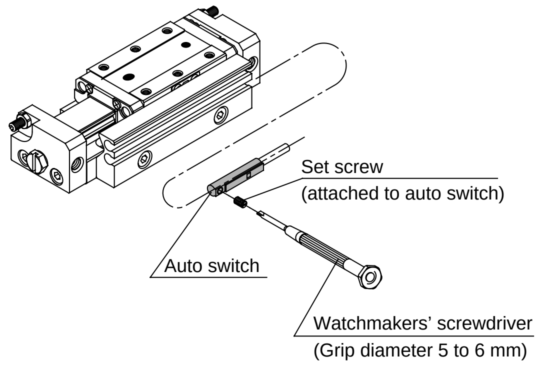
⚠ Caution

Auto Switch Mounting Tool

- Use the watchmakers' screwdriver with a handle diameter 5 to 6 mm when tightening the set screw (attached to auto switch).

Tightening Torque

- Use a tightening torque of approximately 0.05 to 0.1 N·m. As a guide, it can be tightened about 90° past the position at which tightening can be felt.



Other than the models listed in "How to Order", the following auto switches are applicable.
For detailed specifications, refer to Best Pneumatics.

Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A90	Grommet (In-line)	Without indicator light
	D-A90V	Grommet (Perpendicular)	

* Normally closed (NC = b contact), solid state switch (D-F9G/F9H type) are also available. For details, refer to Best Pneumatics.

Series MXP
Auto Switch Specifications

Auto Switch Common Specifications

Type	Reed switch	Solid state switch
Leakage current	None	3-wire: 100 µA or less 2-wire: 0.8 mA or less
Operating time	1.2 ms	1 ms or less
Impact resistance	300 m/s^2	1000 m/s^2
Insulation resistance	50 MΩ or more at 500 VDC Mega (between lead wire and case)	
Withstand voltage	1000 VAC for 1 minute (between lead wire and case)	
Ambient temperature	–10 to 60°C	
Enclosure	IEC529 standard IP67, JIS C 0920 watertight construction	

Lead Wire Length

Lead wire length indication

(Example) **D-M9P L**

Lead wire length

Nil	0.5 m
L	3 m
Z	5 m

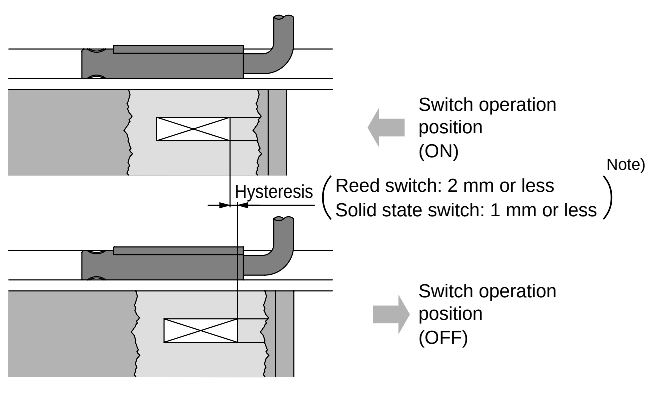
Note 1) Applicable auto switch with 5 m lead wire "Z"
Reed switch: None
Solid state switch: Manufactured upon receipt of order as standard.
Note 2) To designate solid state switches with flexible specifications, add "-61" after the lead wire length.
∗ Oilproof flexible heavy-duty cord is used for D-M9□ as standard. There is no need to suffix -61 to the end of part number.

(Example) **D-M9PWVL-61**

Flexible specification

Auto Switch Hysteresis

The hysteresis is the difference between the position of the auto switch as it turns "on" and as it turns "off". A part of operating range (one side) includes this hysteresis.



Note) Hysteresis may fluctuate depending on the operating environment. Contact SMC if hysteresis causes an operational problem.

Contact Protection Box: CD-P11, CD-P12

<Applicable switch model>

D-A9•A9□V

The auto switches above do not have a built-in contact protection circuit. Therefore, please use a contact protection box with the switch for any of the following cases:

① **Where the operation load is an inductive load.**
② **Where the wiring length to load is greater than 5 m.**
③ **Where the load voltage is 100 VAC.**

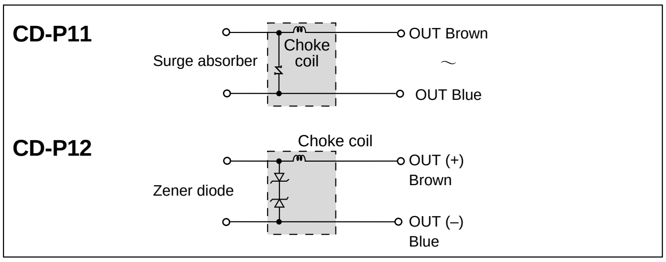
The contact life may be shortened. (Due to permanent energising conditions.)

Specifications

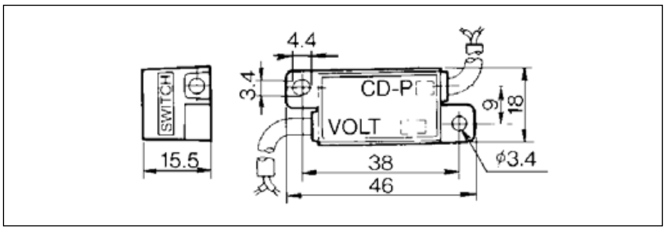
Part No.	CD-P11		CD-P12
Load voltage	100 VAC	200 VAC	24 VDC
Maximum load current	25 mA	12.5 mA	50 mA

∗ Lead wire length — Switch conneciton side 0.5 m
Load connection side 0.5 m

Internal Circuit



Dimension



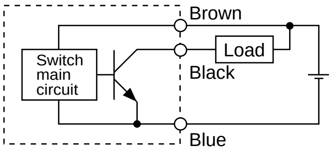
Connection

To connect a switch unit to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH to the lead wire coming out of the switch unit. Keep the switch as close as possible to the contact protection box, with a lead wire length of no more than 1 metre.

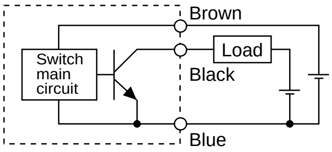
Auto Switch Connections and Examples

Basic Wiring

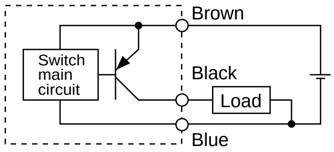
Solid state 3-wire, NPN



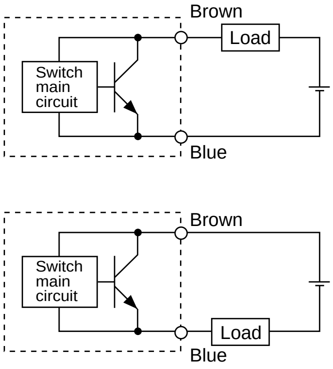
(Power supplies for switch and load are separate.)



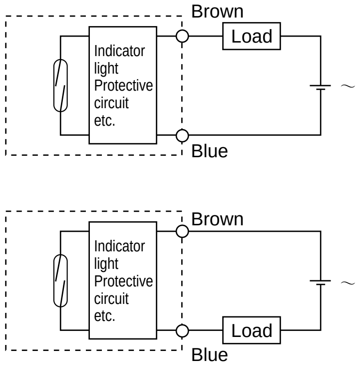
Solid state 3-wire, PNP



2-wire (Solid state switch)



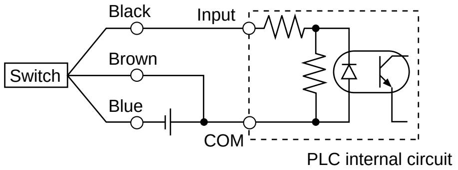
2-wire (Reed switch)



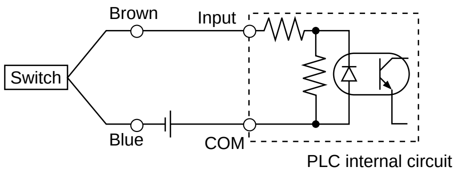
Example of Connection to PLC (Programmable Logic Controller)

• Sink input specifications

3-wire, NPN

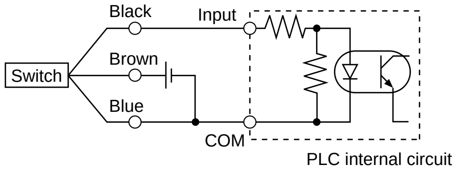


2-wire

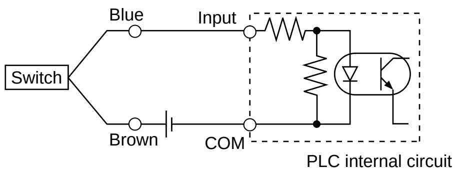


• Source input specifications

3-wire, PNP



2-wire

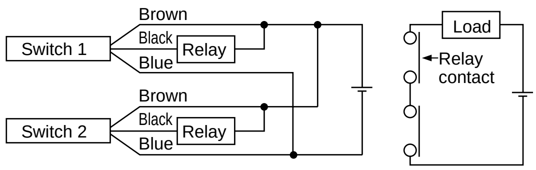


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

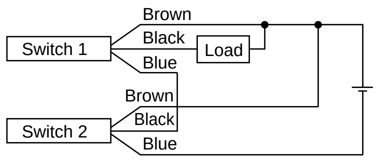
Connection Example for AND (Serial) and OR (Parallel)

● **3-wire**

AND connection for NPN output (using relays)

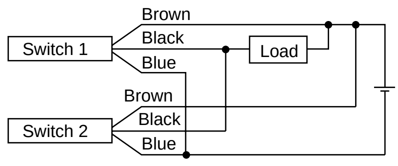


AND connection for NPN output (performed with switches only)

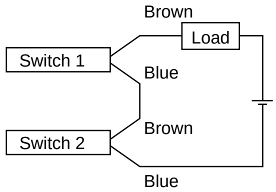


The indicator lights will light up when both switches are turned ON.

OR connection for NPN output



2-wire with 2-switch AND connection

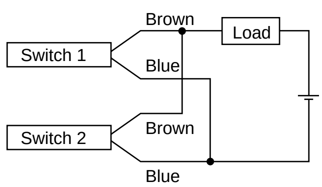


When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state.
The indicator lights will light up if both of the switches are in the ON state.

$$\text{Load voltage at ON} = \frac{\text{Power supply}}{\text{voltage}} - \frac{\text{Internal}}{\text{voltage drop}} \times 2 \text{ pcs.}$$
= 24 V - 4 V x 2 pcs.
= 16 V

Example: Power supply is 24 VDC.
Internal voltage drop in switch is 4 V.

2-wire with 2-switch OR connection



(Solid state swich)
When two switches are connected in parallel, a malfunction may occur because the load voltage will increase when in the OFF state.

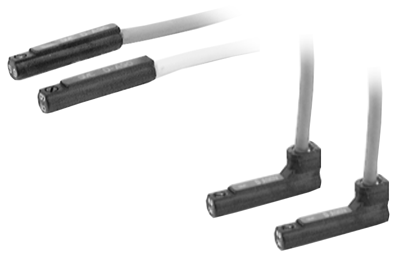
(Reed switch)
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of switches in the ON state, the indicator lights may sometimes dim or not light because of the dispersion and reduction of the current flowing to the switches.

Load voltage at OFF = Leakage current x 2 pcs. x Load impedance
= 1 mA x 2 pcs. x 3 kΩ
= 6 V

Example: Load impedance is 3 kΩ.
Leakage current from switch is 1 mA.

Reed Switch: Direct Mounting Style
D-A90(V)/D-A93(V)/D-A96(V) CE

Grommet
Electrical entry : In-line

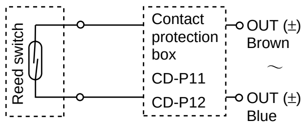


⚠Caution
Operating Precautions

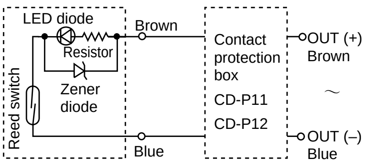
Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied, is used.

Auto Switch Internal Circuit

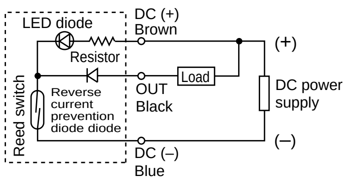
D-A90(V)



D-A93(V)



D-A96(V)



Note) ① In a case where the operation load is an inductive load.
② In a case where the wiring load is greater than 5 m.
③ In a case where the load voltage is 100 VAC.

Please use the auto switch with a contact protection box any of the above mentioned cases. (For details about the contact protection box, refer to page 19.)

Auto Switch Specifications

For details about certified products conforming to international standards, visit us at www.smcworld.com.

PLC: Abbreviation for Programmable Logic Controller

D-A90/D-A90V (without indicator light)			
Auto switch part no.	**D-A90/D-A90V**		
Applicable load	IC circuit, Relay, PLC		
Load voltage	24 V AC/DC or less	48 V AC/DC or less	100 V AC/DC or less
Maximum load current	50 mA	40 mA	20 mA
Contact protection circuit	None		
Internal resistance	1 Ω or less (including lead wire length of 3 m)		
D-A93/D-A93V/D-A96/D-A96V (with indicator light)			
Auto switch part no.	**D-A93/D-A93V**		**D-A96/D-A96V**
Applicable load	Relay, PLC		IC circuit
Load voltage	24 VDC	100 VAC	4 to 8 VDC
Load current range and max. load current	5 to 40 mA	5 to 20 mA	20 mA
Contact protection circuit	None		
Internal voltage drop	D-A93 — 2.4 V or less (to 20 mA)/3 V or less (to 40 mA) D-A93V — 2.7 V or less		0.8 V or less
Indicator light	Red LED lights when ON		

● Lead wires
D-A90(V)/D-A93(V) — Oilproof vinyl heavy-duty cord: ø2.7, 0.18 mm^2 x 2 cores (Brown, Blue), 0.5 m
D-A96(V) — Oilproof vinyl heavy-duty cord: ø2.7, 0.15 mm^2 x 3 cores (Brown, Black, Blue), 0.5 m

Note 1) Refer to page 19 for reed switch common specifications and lead wire length.
Note 2) Refer to page 19 for lead wire lengths.

Weight

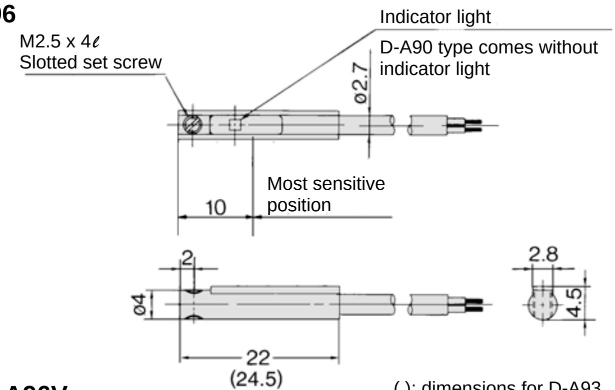
Unit: g

Auto switch model	D-A90	D-A90V	D-A93	D-A93V	D-A96	D-A96V
Lead wire length: 0.5 m	6	6	6	6	8	8
Lead wire length: 3 m	30	30	30	30	41	41

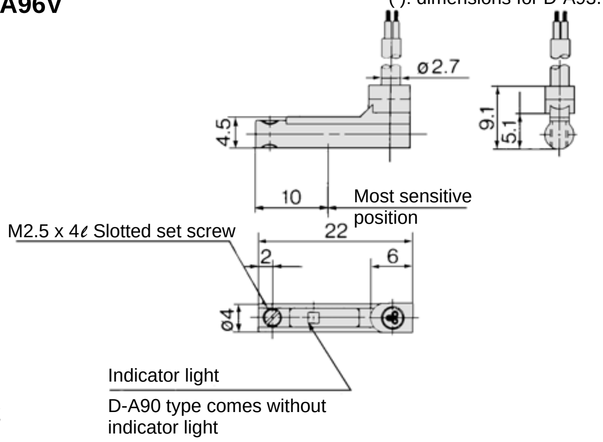
Dimensions

Unit: mm

D-A90/D-A93/D-A96



D-A90V/D-A93V/D-A96V



Solid State Switch: Direct Mounting Style
D-M9N(V)/D-M9P(V)/D-M9B(V) CE

Grommet

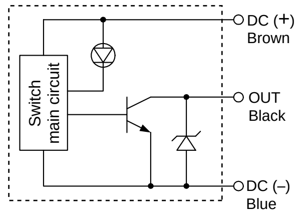
- 2-wire load current is reduced (2.5 to 40 mA)
- Lead-free
- UL certified (style 2844) lead cable is used.

⚠Caution
Operating Precautions

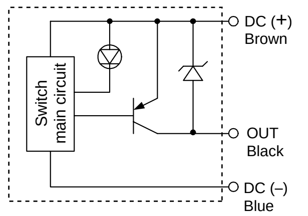
Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied, is used.

Auto Switch Internal Circuit

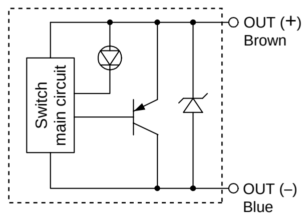
D-M9N(V)



D-M9P(V)



D-M9B(V)



Auto Switch Specifications

For details about certified products conforming to international standards, visit us at www.smcworld.com.

PLC: Abbreviation of Programmable Logic Controller

D-M9□, D-M9□V (With indicator light)

Auto switch part no.	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less				4 V or less	
Leakage current	100 µA or less at 24 VDC				0.8 mA or less	
Indicator light	Red LED lights when ON.					

- Lead wires
  Oilproof vinyl heavy-duty cord: ø2.7 x 3.2 ellipse, 0.15 mm^2,
  D-M9B(V) 0.15 mm^2 x 2 cores
  D-M9N(V), D-M9P(V) 0.15 mm^2 x 3 cores

Note 1) Refer to page 19 for solid state switch common specifications.
Note 2) Refer to page 19 for lead wire lengths.

Weight

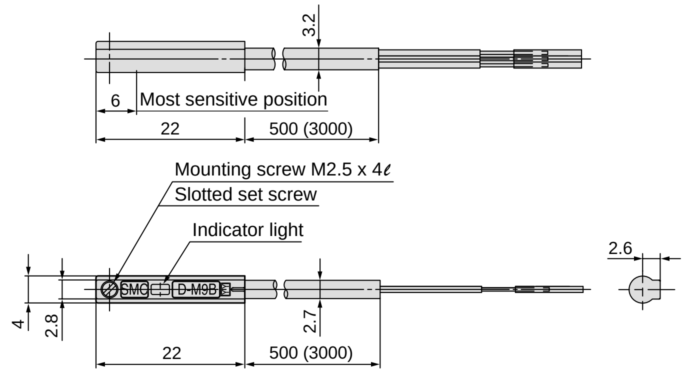
Unit: g

Auto switch model		D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length (m)	0.5	8	8	7
	3	41	41	38
	5	68	68	63

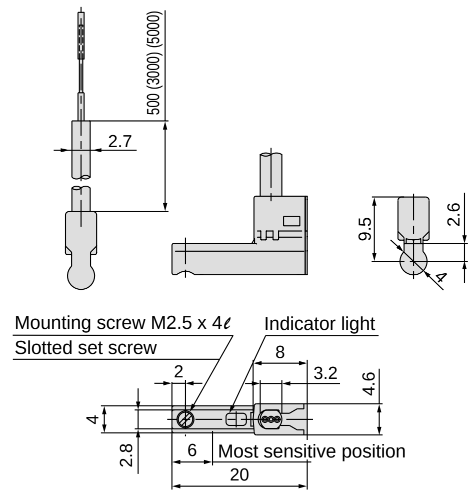
Dimensions

Unit: mm

D-M9□

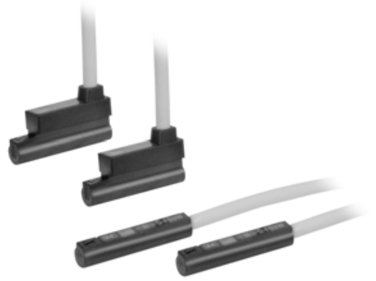


D-M9□V



2-colour Indication, Solid State Switch: Direct Mounting Style
D-F9NW(V)/D-F9PW(V)/D-F9BW(V) CE

Grommet



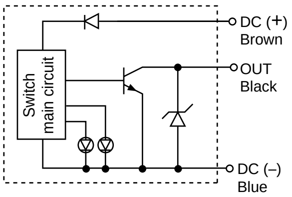
⚠Caution

Operating Precautions

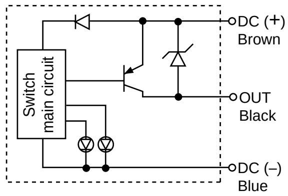
Fix the switch with the existing screw installed on the switch body. The switch may be damaged if a screw other than the one supplied, is used.

Auto Switch Internal Circuit

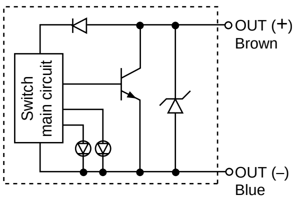
D-F9NW(V)



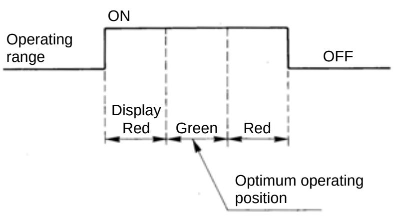
D-F9PW(V)



D-F9BW(V)



Indicator light/Display method



Auto Switch Specifications

For details about certified products conforming to international standards, visit us at www.smcworld.com.

PLC: Abbreviation for Programmable Logic Controller

D-F9□W/D-F9□WV (with indicator light)

Auto switch part no.	D-F9NW	D-F9NWV	D-F9PW	D-F9PWV	D-F9BW	D-F9BWV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 VDC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less		80 mA or less		5 to 40 mA	
Internal voltage drop	1.5 V or less (0.8 V or less at 10 mA load current)		0.8 V or less		4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Operating position ·········· Red LED lights up Optimum operating position ·········· Green LED lights up					

● Lead wires
Oilproof vinyl heavy-duty cord: ø2.7, 0.15 mm² x 3 cores (Brown, Black Blue), 0.18 mm² x 2 cores (Brown, Blue), 0.5 m

Note 1) Refer to page 19 for reed switch common specifications.
Note 2) Refer to page 19 for lead wire lengths.

Weight

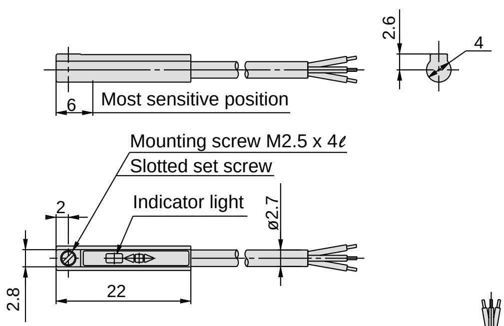
Unit: g

Auto switch model		D-F9NW(V)	D-F9PW(V)	D-F9BW(V)
Lead wire length (m)	0.5	7	7	7
	3	34	34	32
	5	56	56	52

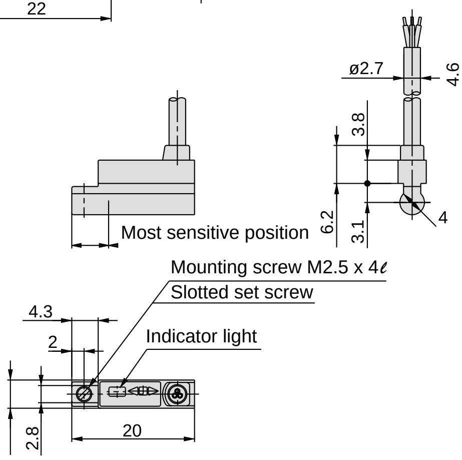
Dimensions

Unit: mm

D-F9□W



D-F9□WV



SMC

Made to Order Specifications

Made-to-Order Application Chart

Made-to-order contents		MXPJ6	MXP6	MXP8	MXP10	MXP12	MXP16	Note
① Anti-rust guide	X42	●	●	●	●	●	●	
② Heat treated metal stopper bolt	X16		●	●	●	●	●	Metal stopper only
③ Axial piping port set screw	X23	●	●	●	●	●	●	
④ Long adjustment nut	X51			●	●	●	●	Except with shock absorber

1 Anti-rust Guide Specification — Symbol -X42

MXP [Standard part no. → Indicate model on page 3] — X42

MXPJ6 [Standard part no. → Indicate model on page 3] — X42

• Anti-rust guide specification

Martensitic stainless steel is used for the body, table and guide block, but if greater rust prevention is required use this specification.
The body, table and guide block undergo an anti-rust treatment.

Specifications

Model	Anti-rust type
Bore size (mm)	6, 8, 10, 12, 16
Fluid	Air
Surface treatment	Special anti-rust treatment Note 2)

Note 1) Dimensions are the same as the standard type.
Note 2) The body, table and guide block are block due to the special anti-rust treatment.

2 Heat Treated Metal Stopper Bolt Specification — Symbol -X16

MXP [Standard part no. → Indicate model on page 3] — X16

• Metal stopper specification

To reduce wear on the metal stopper, heat treated chrome molybdenum steel (SCM435) is used for the stroke adjustment screw.

Specifications

Bore size (mm)	6	8, 10, 12	16
Fluid	Air		
Speed range	50 to 200 mm/S		
Cushion	None		
Stroke adjustment	One side only 0 to 5 mm	One side only 0 to 5 mm	One side only 0 to 4 mm

Construction/Dimensions (Dimensions are the same as standard. Refer to pages 10 to 17.)

3 Axial Piping Port Set Screw Specification

Symbol **-X23**

MXP Standard part no. → Indicate model on page 3 — **X23**

MXPJ6 Standard part no. → Indicate model on page 3 — **X23**

• **Axial piping port set screw specification**

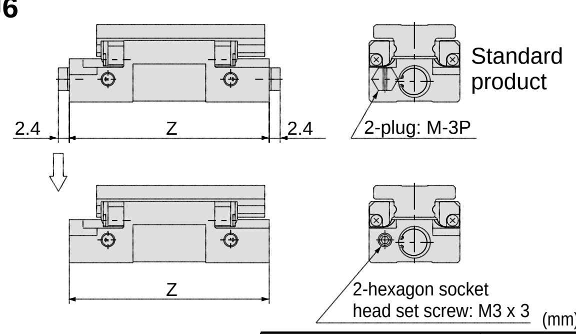
The axial piping port plug (M-3P, M-5P) is changed to a hexagon socket head set screw, and the overall length is shortened.

Note: The hexagon socket head screw is secured with an anaerobic adhesive and cannot be removed.

Dimensions

MXPJ6

-X23

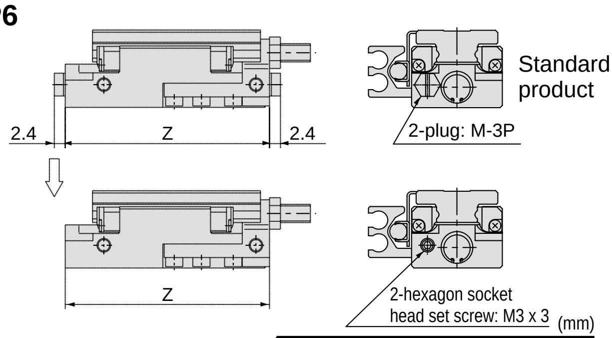


(mm)

Model	Z
MXPJ6-5-X23	44
MXPJ6-10-X23	59

MXP6

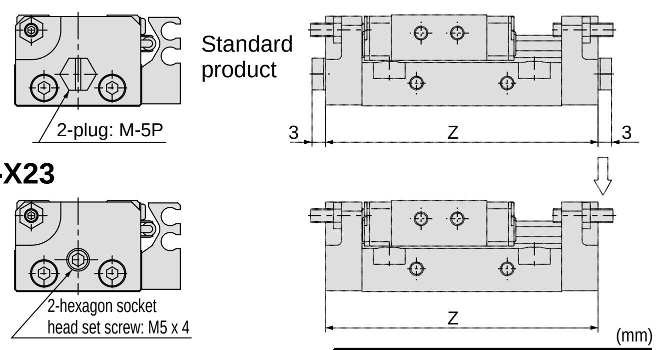
-X23



(mm)

Model	Z
MXP6-5-X23	45
MXP6-10-X23	60

MXP8,10,12,16



(mm)

Model	Z
MXP8-10-X23	60
MXP8-20-X23	90
MXP10-10-X23	60
MXP10-20-X23	90
MXP12-15-X23	76
MXP12-25-X23	106
MXP16-20-X23	102
MXP16-30-X23	128

4 Long Adjustment Nut Specification

Symbol **-X51**

MXP Standard part no. → Indicate model on page 3 — **X51**

• **Long adjustment nut specification**

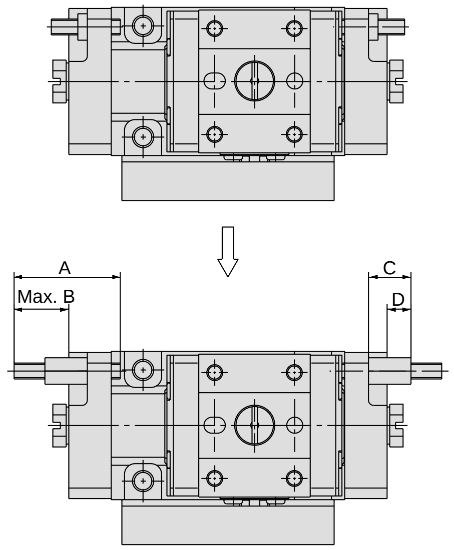
The overall length of the adjustment nut is increased to allow stroke adjustment work from any direction.

Dimensions

MXP8,10,12,16

Standard product

-X51



(mm)

Model	A	B	C	D
MXP8-□-X51	20	10.5	8	4.5
MXP10-□-X51	20	10.5	8	4.5
MXP12-□-X51	20	9	9	5
MXP16-□-X51	25	12	10	6

Series MXP

Safety Instructions

The following safety instructions are intended to prevent a hazardous situation and/or equipment damage. The instructions indicate the level of potential hazard by labels of **"Caution", "Warning"** or **"Danger"**. To ensure safety, please observe all safety practices, including ISO 4414 Note 1) and JIS B 8370 Note 2).

⚠ **Caution :** Operator error could result in injury or equipment damage.

⚠ **Warning :** Operator error could result in serious injury or loss of life.

⚠ **Danger :** In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power--General rules relating to systems.
Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility with a specific pneumatic system must be based on specifications, post analysis and/or tests to meet a specific requirement. The expected performance and safety assurance is the responsibility of the person who determines the compatibility of the system. This person should continuously review the suitability of all specified items by referring to the latest information in the catalogue and by taking into consideration the possibility of equipment failure when configuring the system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driver objects have been confirmed.
2. When equipment is to be removed, confirm the all safety precautions have been followed. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before restarting any machinery/equipment, excercise caution to prevent quick extension of a cylinder piston rod, etc.

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
3. An application which has the possibility of having a negative effect on people, property, or animals, requiring special safety analysis.

Series MXP
Actuator Precautions 1

Be sure to read before handling.

Caution on Design

⚠ Warning

1. There is a possibility of dangerous sudden action by air cylinders if sliding parts of machinery are twisted due to external forces, etc.

In such cases, human injury may occur; e.g., by catching hands or feet in the machinery, or damage to the machinery itself may occur. Therefore, the machine should be adjusted to operate smoothly and designed to avoid such dangers.

2. A protective cover is recommended to minimise the risk of personal injury.

If a stationary object and moving parts of a cylinder are in close proximity, personal injury may occur. Design the structure to avoid contact with the human body.

3. Securely tighten all stationary parts and connected parts so that they will not become loose.

Especially when a cylinder operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

4. A deceleration circuit or shock absorber may be required.

When a driven object is operated at high speed or the load is heavy, a cylinder's cushion will not be sufficient to absorb the impact. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve the impact. In this case, the rigidity of the machinery should also be examined.

5. Consider a possible drop in circuit pressure due to a power outage, etc.

When a cylinder is used in a clamping mechanism, there is a danger of workpieces dropping if there is a decrease in clamping force due to a drop in circuit pressure caused by a power outage, etc. Therefore, safety equipment should be installed to prevent damage to machinery and human injury. Suspension mechanisms and lifting devices also require consideration for drop prevention.

6. Consider a possible loss of power source.

Measures should be taken to protect against bodily injury and equipment damage in the event that there is a loss of power to equipment controlled by pneumatics, electricity, or hydraulics.

7. Design circuitry to prevent sudden lurching of driven objects.

When a cylinder is driven by an exhaust centre type directional control valve or when starting up after residual pressure is exhausted from the circuit, etc., the piston and its driven object will lurch at high speed if pressure is applied to one side of the cylinder because of the absence of air pressure inside the cylinder. Therefore, equipment should be selected and circuits designed to prevent sudden lurching, because there is a danger of human injury and/or damage to equipment when this occurs.

8. Consider emergency stops.

Design so that human injury and/or damage to machinery and euqipment will not be caused when machinery is stopped by a safety device under abnormal conditions, a power outage or a manual emergency stop.

9. Consider the action when operation is restarted after an emergency stop or abnormal stop.

Design the machinery so that human injury or equipment damage will not occur upon restart of operation.
When the cylinder has to be reset at the starting position, install manual safely equipment.

Selection

⚠ Warning

1. Confirm the specifications.

The products featured in this catalogue are designed for use in industrial compressed air systems. If the products are used in conditions where pressure and/or temperature are outside the range of specifications, damage and/or malfunctions may occur. Do not use in these conditions. (Refer to the specifications.)
Consult with SMC if you use a fluid other than compressed air.

2. Intermediate stop

In the case of 3 position closed centre of a valve, it is difficult to make a piston stop at the required position as acurately and precisely as with hydraulic pressure due to compressibility of air.
Furthermore, since valves and cylinders, etc. are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended period of time. Contact SMC in the case it is necessary to hold a stopped position for an extended period.

⚠ Caution

1. Operate within the limits of the maximum usable stroke.

The piston rod will be damaged if operated beyond the maximum stroke. Refer to the air cylinder model selection procedure for the maximum usable stroke.

2. Operate the piston within a range such that collision damage will not occur at the stroke end.

3. Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.

Mounting

⚠ Caution

1. Be certain to match the rod shaft centre with the direction of the load and movement when connecting.

When not properly matched, problems may arise with the rod and tube, and damage may be caused due to friction on areas such as the inner tube surface, bushings, rod surface and seals.

2. When an external guide is used, connect the rod end and the load in such a way that there is no interference at any point within the stroke.

3. Do not scratch or gouge the sliding parts of the cylinder tube or tube rod, etc., by striking or grasping them with other objects.

Cylinder bores are manufactured to precise tolerances, so that even a slight deformation may cause malfunction. Also, scratches or gouges, etc., in the tube rod may lead to damaged seals and cause air leakage.

4. Prevent the seizure of rotating parts.

Prevent the seizure of rotating parts (pins, etc.) by applying grease.

Series ***MXP***
Actuator Precautions 2
Be sure to read before handling.

Mounting

⚠ Caution

5. Do not use until you verify that the equipment can operate properly.
After mounting, repairs, or modification, etc., connect the air supply and electric power, and then confirm proper mounting by means of appropriate function and leak tests.

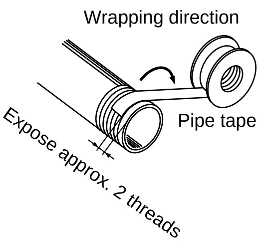
6. Instruction manual
Install the products and operate them only after reading the instruction manual carefully and understanding its contents. Also keep the manual where it can be referred to as neces-

Piping

⚠ Caution

1. Preparation before pipig
Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

2. Wrapping of pipe tape
When screwing in pipes and fittings, etc., be certain that chips from the pipe threads and sealing material will not ingress inside the piping.
Also, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



Lubrication

⚠ Caution

1. Lubrication of non-lube type cylinder
The cylinder has been lubricated at the factory and can be used without any further lubrication.
However, in the event that it is lubricated additionally, be sure to use Class 1 turbine oil (with no additive) ISO VG32.
Stopping lubrication later may lead to malfunctions because the new lubricant will cancel out the original lubricant. Therefore, lubrication must be continued once it has been started.

Air Supply

⚠ Warning

1. Use clean air.
Do not use compressed air which contains chemicals, synthetic oils containing organic solvents, salts or corrosive gases, etc., as this can cause damage or malfunction.

Air Supply

⚠ Caution

1. Install air filters.
Install air filters close to valves at their upstream side. A filtration degree of 5 µm or less should be selected.

2. Install an aftercooler, air dryer, or water separator (Drain Catch).
Air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an air dryer, aftercooler or water separator, etc.

3. Use the product within the specified range of fluid and ambient temperature.
Take measures to prevent freezing when below 5°C, since moisture in circuits can freeze and cause damage to seals and lead to malfunctions.

For compressed air quality, refer to “Air Preparation Equipment” catalogue.

Operating Environment

⚠ Warning

1. Do not use in atmospheres or locations where corrosion hazards exist.

2. In dusty locations or where water or oil, etc., splash on the equipment, take suitable measures to protect the rod.

3. When using auto switches, do not operate in an environment with strong magnetic fields.

Maintenance

⚠ Warning

1. Perform maintenance procedures as shown in the instruction manual.
If it is handled improperly, malfunction or damage of machinery or equipment may occur.

2. Removal of equipment, and supply/exhaust of compressed air
Before any machinery or equipment is removed, first ensure that the appropriate measures are in place to prevent the fall or erratic movement of driven objects and equipment, then cut off the electric power and reduce the pressure in the system to zero. Only then should you proceed with the removal of any machinery and equipment.
When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent cylinders from sudden movement.

⚠ Caution

1. Drain flushing
Remove drainage from air filters regularly. (Refer to the specifications.)

Series MXP
Auto Switch Precautions 1

Be sure to read before handling.

Design and Selection

⚠Warning

1. Confirm the specifications.

Read the specifications carefully and use this product appropriately. The product may be damaged or malfunction if it is used outside of its specification range (eg. current load, voltage, temperature or impact, etc.).

2. Take precautions when multiple actuators are used close together.

When two or more actuators are lined up in close proximity to each other, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40 mm.

3. Pay attention to the length of time that a switch is on at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load connected to the auto switch is driven at the time the slide table passes, the auto switch will operate. However if the speed is too great, the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

$$V\ (\text{mm/s}) = \frac{\text{Auto switch operating range (mm)}}{\text{Load operating time (ms)}} \times 1000$$

4. Keep wiring as short as possible.

<Reed switch>

As the length of the wiring to a load gets longer, the rush current at the time the switch is turned ON becomes greater, which may shorten the product's life. (The switch will stay ON all the time.)

1) Use a contact protection box when the wire length is 5 m or longer.

<Solid state switch>

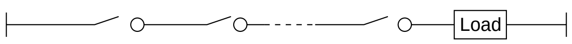
2) Although the wire length should not affect switch function, use a wire that is 100 m or shorter.

5. Take precautions for the internal voltage drop of the switch.

<Reed switch>

1) Switches with an indicator light (Except D-A96, A96V)

- If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance from the light emitting diodes. (Refer to internal voltage drop in the auto switch specifications.)
  [The voltage drop will be "n" times larger when "n" auto switches are connected.]
  Even though an auto switch operates normally, the load may not operate.



- Similarly, when operating below a specified voltage, it is possible that the load may be ineffective even though the auto switch function is normal. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}$$

2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light (Model A90, A90V).

<Solid state switch>

3) Generally, the internal voltage drop will be greater with a 2-wire solid state auto switch than with a reed switch. Take the same precautions as in item (1) as mentioned above.
Also, note that a 12 VDC relay is not applicable.

6. Pay attention to leakage current.

<Solid state switch>

With a 2-wire solid state auto switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.

$$\text{Current to operate load (Input OFF signal of controller)} > \text{Leakage current}$$

If the condition given in the above formula is not met, internal circuit will not reset correctly (stays ON). Use a 3-wire switch if this specification cannot be satisfied.
Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

7. Do not use a load that generates surge voltage.

<Reed switch>

If driving a load such as a relay which generates a surge voltage, use a contact protection box.

<Solid state switch>

Although a zener diode for surge protection is connected at the output side of a solid state auto switch, damage may still occur if a surge is applied repeatedly. When directly driving a load which generates a surge, such as a relay or solenoid valve, use a switch with a built-in surge absorbing element.

8. Cautions for use in an interlock circuit

When an auto switch is used for an interlock signal requiring high reliability, device a double interlock system to safeguard against malfunctions. The double interlock system should provide a mechanical protection function or use another switch (sensor) together with the auto switch. Also perform periodic inspection and confirm proper operation.

9. Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.

Series MXP
Auto Switch Precautions 2

Be sure to read before handling.

Mounting and Adjustment

Warning

1. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300m/s² or greater for reed switches and 1000m/s² or greater for solid state switches) while handling.
Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

2. Do not carry an actuator by the auto switch lead wires.

Never carry a cylinder by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

3. Mount switches using the proper tightening torque.

When a switch is tightened above the torque specification, the mounting screws, or switch may be damaged. On the other hand, tightening below the torque specification may allow the switch to slip out of position.

4. Mount a switch at the centre of the operating range.

Adjust the mounting position of an auto switch so that the piston stops at the centre of the operating range (the range in which a switch is ON). (The mounting positions shown in the catalogue indicate the optimum position at the stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), operation will be unstable.

<D-M9□>

When the D-M9 auto switch is used to replace old series auto switch, it may not activate depending on operating condition because of its shorter operating range.

Such as
- Application where the stop position of actuator may vary and exceed the operating range of the auto switch, for example, pushing, pressing, clamping operation, etc.
- Application where the auto switch is used for detecting an intermediate stop position of the actuator. (In this case the detecting time will be reduced.)

In these applications, please set the auto switch to the centre of the required detecting range.

Caution

1. Fix the switch with the appropriate screw installed on the switch body. The switch may be damaged if other screws are used.

Wiring

Warning

1. Avoid repeatedly bending or stretching lead wires.

Broken lead wires will result from repeatedly applying bending stress or stretching force to the lead wires.

2. Be sure to connect the load before power is applied.

<2-wire type>

If the power is turned ON when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

Wiring

3. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (such as contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

4. Do not wire in conjunction with power lines or high voltage lines.

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits containing auto switches may malfunction due to noise from these lines.

5. Do not allow short circuit of loads.

<Reed switch>

If the power is turned ON with a load in a short circuited condition, the switch will be instantly damaged because of excess current flow into the switch.

<Solid state switch>

D-M9□ and all models of PNP output type switches do not have built-in short circuit protection circuits. If loads are short circuited, the switches will be instantly damaged, as in the case of reed switches.
Take special care to avoid reverse wiring with the brown [red] power supply line and the black [white] output line on 3-wire type switches.

6. Avoid incorrect wiring.

<Reed switch>

A 24 VDC switch with indicator light has polarity. The brown [red] lead wire is (+), and the blue [black] lead wire is (–).

1) If connections are reversed, the switch will still operate, but the light emitting diode will not light up.
Also note that a current greater than the maximum specified one will damage a light emitting diode and make it inoperable.
Applicable models: D-A93, A93V

<Solid state switch>

1) Even if connections are reversed on a 2-wire type switch, the switch will not be damaged because it is protected by a protection circuit, but it will remain in a normally ON state. But reverse wiring in a short circuit load condition should be avoided to protect the switch from being damaged.
2) Even if (+) and (–) power supply line connections are reversed on a 3-wire type switch, the switch will be protected by a protection circuit. However, if the (+) power supply line is connected to the blue [black] wire and the (–) power supply line is connected to the black [white] wire, the switch will be damaged.

<D-M9□>

D-M9□ does not have built-in short circuit protection circuit. Be aware that if the power supply connection is reversed (e.g. (+) power supply wire and (–) power supply wire connection is reversed), the switch will be damaged.

∗ Lead wire colour changes

Lead wire colours of SMC switches have been changed in order to meet NECA Standard 0402 for production beginning September, 1996 and thereafter. Please refer to the tables provided.
Special care should be taken regarding wire polarity during the time that the old colours still coexist with the new colours.

2-wire

	Old	New
Output (+)	Red	Brown
Output (−)	Black	Blue

3-wire

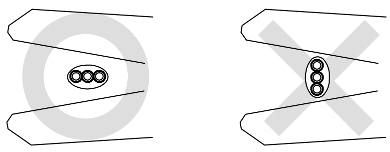
	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black

Series MXP
Auto Switch Precautions 3
Be sure to read before handling.

Wiring

⚠Caution

1. When the cable sheath is stripped, confirm the stripping direction. The insulator may be split or damaged depending on the direction. (D-M9□ only)



Recommended tool

Manufacturer	Model name	Model no.
VESSEL	Wire stripper	No 3000G
TOKYO IDEAL CO., LTD	Strip master	45-089

∗ Stripper for a round cable (ø2.0) can be used for a 2-wire type cable.

Operating Environment

⚠Warning

1. Never use in an atmosphere of explosive gases.

The construction of the auto switch is not intended to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

2. Do not use in an area where a magnetic field is generated.

The auto switch will malfunction or the magnets inside of an actuator will become demagnetised if used in such an environment.

3. Do not use in an environment where the auto switch will be continually exposed to water.

The switch satisfies the IEC standard IP67 construction (JIS C 0920: watertight construction). Nevertheless, it should not be used in applications where it is continually exposed to water splash or spray. This may cause deterioration of the insulation or swelling of the potting resin inside switch causing a malfunction.

4. Do not use in an environment with oil or chemicals.

Consult with SMC if the auto switch will be used in an environment laden with coolant, cleaning solvent, various oils or chemicals. If the auto switch is used under these conditions for even a short time, it may be adversely effected by a deterioration of the insulation, a malfunction due to swelling of the potting resin, or hardening of the lead wires.

5. Do not use in an environment with temperature cycles.

Consult with SMC if the switch is used where there are temperature cycles other than normal temperature changes, as they may adversely affected the switch internally.

Operating Environment

6. Do not use in an environment where there is excessive impact shock.

<Reed switch>

When excessive impact (300 m/s^2 or more) is applied to a reed switch during operation, the contact point may malfunction and generate a signal momentarily (1 ms or less) or cut off. Consult with SMC regarding the need to use a solid state switch in a specific environment.

7. Do not use in an area where surges are generated.

<Solid state switch>

When there are units (such as solenoid type lifters, high frequency induction furnaces, motors, etc.) that generate a large amount of surge in the area around an actuator with a solid state auto switch, their proximity or pressure may cause deterioration or damage to the internal circuit of the switch. Avoid sources of surge generation and disorganised lines.

8. Avoid accumulation of iron waste or close contact with magnetic substances.

When a large amount of iron waste such as machining chips or spatter is accumulated, or a magnetic substance (something attracted by a magnet) is brought into close proximity with an auto switch cylinder, it may cause the auto switch to malfunction due to a loss of the magnetic force inside the cylinder.

Maintenance

⚠Warning

1. Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.

1) Securely tighten switch mounting screws.
If screws become loose or the mounting position is dislocated, retighten them after readjusting the mounting position.
2) Confirm that there is no damage to the lead wires.
To prevent faulty insulation, replace switches or repair lead wires, etc., if damage is discovered.
3) Confirm that the green light on the 2-colour display type switch lights up.
Confirm that the green LED is ON when stopped at the set position. If the red LED is ON, when stopped at the set position, the mounting position is not appropriate. Readjust the mounting position until the green LED lights up.

Other

⚠Warning

1.Consult with SMC concerning water resistance, elasticity of lead wires, usage at welding sites, etc.

Specific Product Precautions 1

Be sure to read before handling.

Selection

⚠ Caution

1. Use a load within a range that does not exceed the operating limit.

Select models based on the maximum load weight and the allowable moment. Refer to model selection on pages 1 and 2 for detailed methods. If operated beyond the operating limit, the eccentric load applied to the guide section will be excessive. This can have an adverse effect on service life due to vibration in the guide unit and loss of accuracy, etc.

2. When performing intermediate stops with an external stopper, employ measures to prevent lurching.

If lurching occurs damage can result. When making a stop with an external stopper to be followed by continued forward movement, first supply pressure to momentarily reverse the table, then retract the intermediate stopper, and finally apply pressure to the opposite port to operate the table again.

3. Do not operate in such a way that excessive external forces or impact forces are applied to the product.

This can cause damage.

Mounting

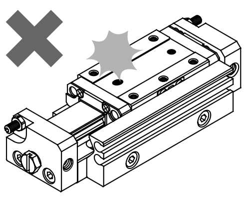
⚠ Caution

1. Do not scratch or gouge the mounting surfaces of the body and table (guide block).

This can cause loss of parallelism in the mounting surfaces, vibration of the guide unit and increased operating resistance, etc.

2. Do not scratch or gouge the transfer surfaces of the body and table (guide block).

This can cause vibration and increased operating resistance, etc.



3. Do not apply strong impacts or excessive moment when mounting work pieces.

Application of external forces greater than the allowable moment can cause vibration of the guide unit and increased operating resistance, etc.

4. Ensure that the parallelism of the mounting surface is 0.02 mm or less.

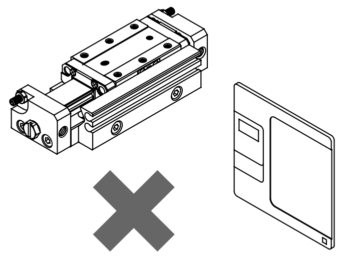
Poor parallelism of the workpiece mounted on the air slide table, the base, and other parts can cause vibration of the guide unit and increased operating resistance, etc.

5. For connection to a load that has an external support or guide mechanism, select an appropriate connection method and perform careful alignment.

Mounting

6. Do not allow objects affected by magnets in close proximity to the air slide table

Since magnets are built into the side of the guide block when equipped with auto switches, do not allow items such as magnetic disks, magnetic cards or magnetic tape close to the air slide table. Data may be erased.



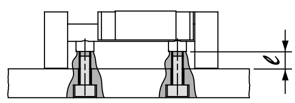
7. Do not attach magnets to the table (guide block) section.

Since the table (guide block) is constructed with a magnetic substance, it becomes magnetised when magnets, etc. are attached to it, and this may cause malfunction of auto switches, etc.

8. When mounting an air slide table, use screws of an appropriate length and tighten them properly at no more than the maximum tightening torque.

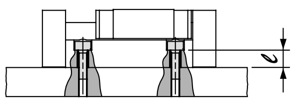
Tightening with a torque above the limit can cause malfunction, while insufficient tightening can cause slippage and dropping, etc.

1. Body Tapped



Model	Bolt	Max. tightening torque N・m	Max. screw-in depth (ℓ mm)
MXPJ6	M4 x 0.7	2.1	6
MXP6	M4 x 0.7	2.1	6
MXP8	M4 x 0.7	2.1	4.5
MXP10	M4 x 0.7	2.1	6
MXP12	M5 x 0.8	4.4	5
MXP16	M6 x 1	7.4	8

2. Body Through-hole



Model	Bolt	Max. tightening torque N・m	Body thickness (ℓ mm)
MXPJ6	M3 x 0.5	1.2	6
MXP6	M3 x 0.5	1.2	6
MXP8	M3 x 0.5	1.2	4.5
MXP10	M3 x 0.5	1.2	6
MXP12	M4 x 0.7	2.1	5
MXP16	M5 x 0.8	4.4	8

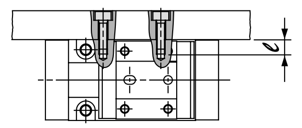
Specific Product Precautions 2

Be sure to read before handling.

Mounting

⚠Caution

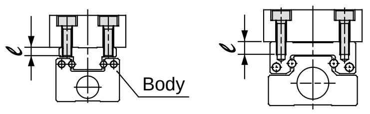
3. Tapped on Body Side



Model	Bolt	Max. tightening torque N•m	Max. screw-in depth (ℓ mm)
MXP8	M3	1.2	4
MXP10	M3	1.2	5
MXP12	M4	2.1	6
MXP16	M5	4.4	8

1. Top Mounting

MXPJ6, MXP6 **MXP10, 12, 16**

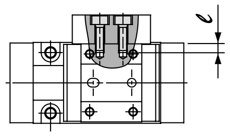


Model	Bolt	Max. tightening torque N•m	Max. screw-in depth (ℓ mm)
MXPJ6	M3	1.2	3
MXP6	M3	1.2	3
MXP8	M3	1.2	4
MXP10	M3	1.2	4
MXP12	M4	2.1	4.5
MXP16	M5	4.4	7

⚠Caution

Since the bolts pass through in the case of MXPJ6 and MXP6, use bolts shorter than the maximum screw-in depth. If long bolts are used, they can touch the body and cause trouble.

2. Side Mounting



Model	Bolt	Max. tightening torque N•m	Max. screw-in depth (ℓ mm)
MXP8	M3	1.2	4
MXP10	M3	1.2	3
MXP12	M3	1.2	4
MXP16	M4	2.1	6

⚠Caution

Side mounting is not possible when equipped with shock absorber.

Mounting

9. When the positioning pinhole is used for mounting an air slide table, select a positioning pin with an appropriate length.

MXP6, MXPJ6 **MXP8, 10, 12, 16**

Model	Pinhole diameter	Pinhole depth	
	øD	**H1**mm	**H2**mm
MXPJ6	2.5 $^{+0.030}_{0}$	2.5	2
MXP6	2.5 $^{+0.030}_{0}$		
MXP8	3 $^{+0.030}_{0}$	2.5	1.5
MXP10	3 $^{+0.030}_{0}$	2.5	1.5
MXP12	3 $^{+0.030}_{0}$	3	1.5
MXP16	4H9 $^{+0.030}_{0}$	4	2

Operating Environment

⚠Caution

1. Do not use in environments where there is direct exposure to liquids such as cutting oil.

Operation in environments where the body is exposed to cutting oil, coolant or oil mist can cause vibration, increased operating resistance and air leakage, etc.

2. Do not use in environments where there is direct exposure to foreign matter such as dust, dirt, chips and spatter.

This can cause vibration, increased operating resistance and air leakage, etc.
Consult with SMC regarding use in this kind of environment.

3. Be careful about the corrosion resistance of the linear guide.

Be careful the rail and guide block use martensitic stainless steel, which is inferior to austenitic stainless steel in terms of corrosion resistance.

Adjuster Option Handling Precautions

With Shock Absorber

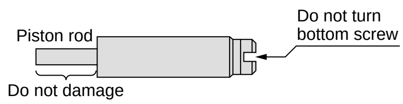
⚠Caution

1. Never turn the screw on the bottom of the shock absorber body.

This is not an adjustment screw. Turning it can cause oil leakage.

2. Do not scratch the sliding surface of the shock absorber's piston rod.

This can cause a loss of durability and return malfunction.



Specific Product Precautions 3

Be sure to read before handling.

Adjuster Option Handling Precautions

⚠Caution

3. The shock absorber is a consumable part. Replacement is necessary when a drop in energy absorbing capacity is noticed.

Applicable size	Shock absorber model
MXP10	RB0805
MXP12	RB0805
MXP16	RB0806

4. Use the tightening torque in the table below for the shock absorber's lock nut.

Bolt	Tightening torque N・m
MXP10 **MXP12** **MXP16**	1.67

Rust may occur specifically in an environment where water drops from condensation adhere to a surface.

5. Provide shade in locations exposed to direct sunlight.

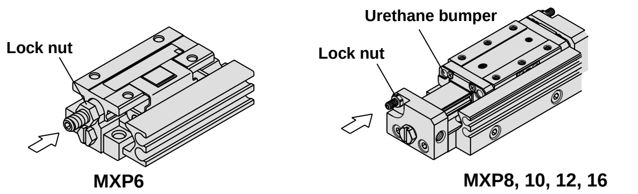
6. Block off sources of heat located near by.

When there are heat sources in the surrounding area, radiated heat may cause the product's temperature to rise and exceed the operating temperature range. Block off the heat with a cover, etc.

7. Do not use in locations where vibration or impact occur.

Consult with SMC regarding use in this kind of environment, as damage and malfunction can result.

Stroke Adjustment

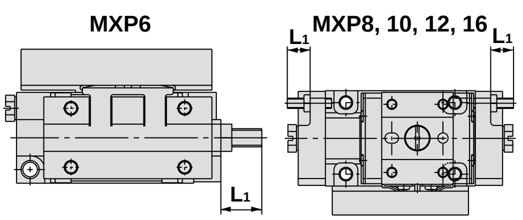


Loosen the lock nut, adjust the stroke with a hexagon wrench from the side marked with an arrow and secure with the lock nut.

⚠Caution

Urethane Bumper

If not adjusted for effective operation of the urethane bumper, impact will increase and have an adverse effect on service life.
As a guide, adjust so that dimension L_1 is less than the value shown in "Table 1".



Stroke Adjustment

Table 1

Model	L_1 (mm)
MXP6-5	9 (one side only)
MXP6-10	9 (one side only)
MXP8-10	7
MXP8-20	6
MXP10-10	7
MXP10-20	6
MXP12-15	7
MXP12-25	7
MXP16-20	8
MXP16-30	8

Metal Stopper

In the case of a metal stopper, adjust so that the stroke adjuster hits the end face of the guide block.
As a guide, adjust so that dimension L_2 is less than the value shown in "Table 2".

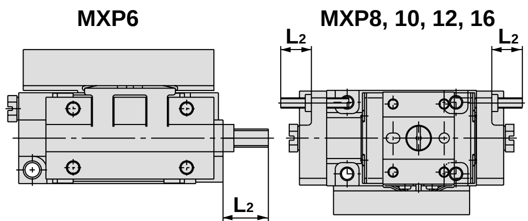


Table 2

Model	L_2 (mm)
MXP6-5C	10 (one side only)
MXP6-10C	10 (one side only)
MXP8-10C	9
MXP8-20C	8
MXP10-10C	9
MXP10-20C	8
MXP12-15C	8
MXP12-25C	8
MXP16-20C	8
MXP16-30C	8

Shock Absorber

When equipped with shock absorber, adjust so that the end face of the shock absorber hits the guide block. If the shock absorber does not operate effectively, impact will increase and have an adverse effedct on service life. As a guide, adjust so that dimension L_3 is less than the value shown in "Table 3".

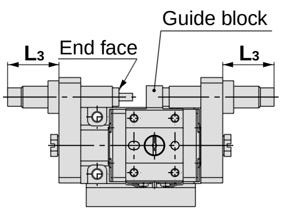


Table 3

Model	L_3 (mm)
MXP10-10B	19
MXP10-20B	15
MXP12-15B	15
MXP12-25B	15
MXP16-20B	15
MXP16-30B	15

EUROPEAN SUBSIDIARIES:

Austria
SMC Pneumatik GmbH (Austria).
Girakstrasse 8, A-2100 Korneuburg
Phone: +43 2262-62280, Fax: +43 2262-62285
E-mail: office@smc.at
http://www.smc.at

France
SMC Pneumatique, S.A.
1, Boulevard de Strasbourg, Parc Gustave Eiffel
Bussy Saint Georges F-77607 Marne La Vallee Cedex 3
Phone: +33 (0)1-6476 1000, Fax: +33 (0)1-6476 1010
E-mail: contact@smc-france.fr
http://www.smc-france.fr

Netherlands
SMC Pneumatics BV
De Ruyterkade 120, NL-1011 AB Amsterdam
Phone: +31 (0)20-5318888, Fax: +31 (0)20-5318880
E-mail: info@smcpneumatics.nl
http://www.smcpneumatics.nl

Spain
SMC España, S.A.
Zuazobidea 14, 01015 Vitoria
Phone: +34 945-184 100, Fax: +34 945-184 124
E-mail: post@smc.smces.es
http://www.smces.es

Belgium
SMC Pneumatics N.V./S.A.
Nijverheidsstraat 20, B-2160 Wommelgem
Phone: +32 (0)3-355-1464, Fax: +32 (0)3-355-1466
E-mail: post@smcpneumatics.be
http://www.smcpneumatics.be

Germany
SMC Pneumatik GmbH
Boschring 13-15, D-63329 Egelsbach
Phone: +49 (0)6103-4020, Fax: +49 (0)6103-402139
E-mail: info@smc-pneumatik.de
http://www.smc-pneumatik.de

Norway
SMC Pneumatics Norway A/S
Vollsveien 13 C, Granfos Næringspark N-1366 Lysaker
Tel: +47 67 12 90 20, Fax: +47 67 12 90 21
E-mail: post@smc-norge.no
http://www.smc-norge.no

Sweden
SMC Pneumatics Sweden AB
Ekhagsvägen 29-31, S-141 71 Huddinge
Phone: +46 (0)8-603 12 00, Fax: +46 (0)8-603 12 90
E-mail: post@smcpneumatics.se
http://www.smc.nu

Bulgaria
SMC Industrial Automation Bulgaria EOOD
16 kliment Ohridski Blvd., fl.13 BG-1517 Sofia
Phone:+359 2 9744492, Fax:+359 2 9744519
E-mail: office@smc.bg
http://www.smc.bg

Greece
S. Parianopoulus S.A.
7, Konstantinoupoleos Street, GR-11855 Athens
Phone: +30 (0)1-3426076, Fax: +30 (0)1-3455578
E-mail: parianos@hol.gr
http://www.smceu.com

Poland
SMC Industrial Automation Polska Sp.z.o.o.
ul. Konstruktorska 11A, PL-02-673 Warszawa,
Phone: +48 22 548 5085, Fax: +48 22 548 5087
E-mail: office@smc.pl
http://www.smc.pl

Switzerland
SMC Pneumatik AG
Dorfstrasse 7, CH-8484 Weisslingen
Phone: +41 (0)52-396-3131, Fax: +41 (0)52-396-3191
E-mail: info@smc.ch
http://www.smc.ch

Croatia
SMC Industrijska automatika d.o.o.
Črnomerec 12, 10000 ZAGREB
Phone: +385 1 377 66 74, Fax: +385 1 377 66 74
E-mail: office@smc.hr
http://www.smceu.com

Hungary
SMC Hungary Ipari Automatizálási Kft.
Budafoki ut 107-113, H-1117 Budapest
Phone: +36 1 371 1343, Fax: +36 1 371 1344
E-mail: office@smc-automation.hu
http://www.smc-automation.hu

Portugal
SMC Sucursal Portugal, S.A.
Rua de Engº Ferreira Dias 452, 4100-246 Porto
Phone: +351 22-610-89-22, Fax: +351 22-610-89-36
E-mail: postpt@smc.smces.es
http://www.smces.es

Turkey
Entek Pnömatik San. ve Tic Ltd. Sti.
Perpa Tic. Merkezi Kat: 11 No: 1625, TR-80270 Okmeydani Istanbul
Phone: +90 (0)212-221-1512, Fax: +90 (0)212-221-1519
E-mail: smc-entek@entek.com.tr
http://www.entek.com.tr

Czech Republic
SMC Industrial Automation CZ s.r.o.
Hudcova 78a, CZ-61200 Brno
Phone: +420 5 414 24611, Fax: +420 5 412 18034
E-mail: office@smc.cz
http://www.smc.cz

Ireland
SMC Pneumatics (Ireland) Ltd.
2002 Citywest Business Campus, Naas Road, Saggart, Co. Dublin
Phone: +353 (0)1-403 9000, Fax: +353 (0)1-464-0500
E-mail: sales@smcpneumatics.ie
http://www.smcpneumatics.ie

Romania
SMC Romania srl
Str Frunzei 29, Sector 2, Bucharest
Phone: +40 213205111, Fax: +40 213261489
E-mail: smcromania@smcromania.ro
http://www.smcromania.ro

UK
SMC Pneumatics (UK) Ltd
Vincent Avenue, Crownhill, Milton Keynes, MK8 0AN
Phone: +44 (0)800 1382930 Fax: +44 (0)1908-555064
E-mail: sales@smcpneumatics.co.uk
http://www.smcpneumatics.co.uk

Denmark
SMC Pneumatik A/S
Knudsminde 4B, DK-8300 Odder
Phone: +45 70252900, Fax: +45 70252901
E-mail: smc@smc-pneumatik.dk
http://www.smcdk.com

Italy
SMC Italia S.p.A
Via Garibaldi 62, I-20061Carugate, (Milano)
Phone: +39 (0)2-92711, Fax: +39 (0)2-9271365
E-mail: mailbox@smcitalia.it
http://www.smcitalia.it

Russia
SMC Pneumatik LLC.
36/40 Sredny pr. St. Petersburg 199004
Phone.:+812 118 5445, Fax:+812 118 5449
E-mail: smcfa@peterlink.ru
http://www.smc-pneumatik.ru

Estonia
SMC Pneumatics Estonia OÜ
Laki 12-101, 106 21 Tallinn
Phone: +372 (0)6 593540, Fax: +372 (0)6 593541
E-mail: smc@smcpneumatics.ee
http://www.smcpneumatics.ee

Latvia
SMC Pneumatics Latvia SIA
Smerla 1-705, Riga LV-1006, Latvia
Phone: +371 (0)777-94-74, Fax: +371 (0)777-94-75
E-mail: info@smclv.lv
http://www.smclv.lv

Slovakia
SMC Priemyselná Automatizáciá, s.r.o.
Námestie Martina Benku 10, SK-81107 Bratislava
Phone: +421 2 444 56725, Fax: +421 2 444 56028
E-mail: office@smc.sk
http://www.smc.sk

Finland
SMC Pneumatics Finland OY
PL72, Tiistinniityntie 4, SF-02031 ESPOO
Phone: +358 207 513513, Fax: +358 207 513595
E-mail: smcfi@smc.fi
http://www.smc.fi

Lithuania
UAB Ottensten Lietuva
Savanoriu pr. 180, LT-2600 Vilnius, Lithuania
Phone/Fax: +370-2651602

Slovenia
SMC industrijska Avtomatika d.o.o.
Grajski trg 15, SLO-8360 Zuzemberk
Phone: +386 738 85240 Fax: +386 738 85249
E-mail: office@smc-ind-avtom.si
http://www.smc-ind-avtom.si

OTHER SUBSIDIARIES WORLDWIDE:

ARGENTINA, AUSTRALIA, BOLIVIA, BRASIL, CANADA, CHILE, CHINA, HONG KONG, INDIA, INDONESIA, MALAYSIA, MEXICO, NEW ZEALAND, PHILIPPINES, SINGAPORE, SOUTH KOREA, TAIWAN, THAILAND, USA, VENEZUELA

http://www.smceu.com
http://www.smcworld.com

SMC CORPORATION 1-16-4 Shimbashi, Minato-ku, Tokio 105 JAPAN; Phone:03-3502-2740 Fax:03-3508-2480

Produced and printed by SMC European Marketing Centre 2/05

Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.