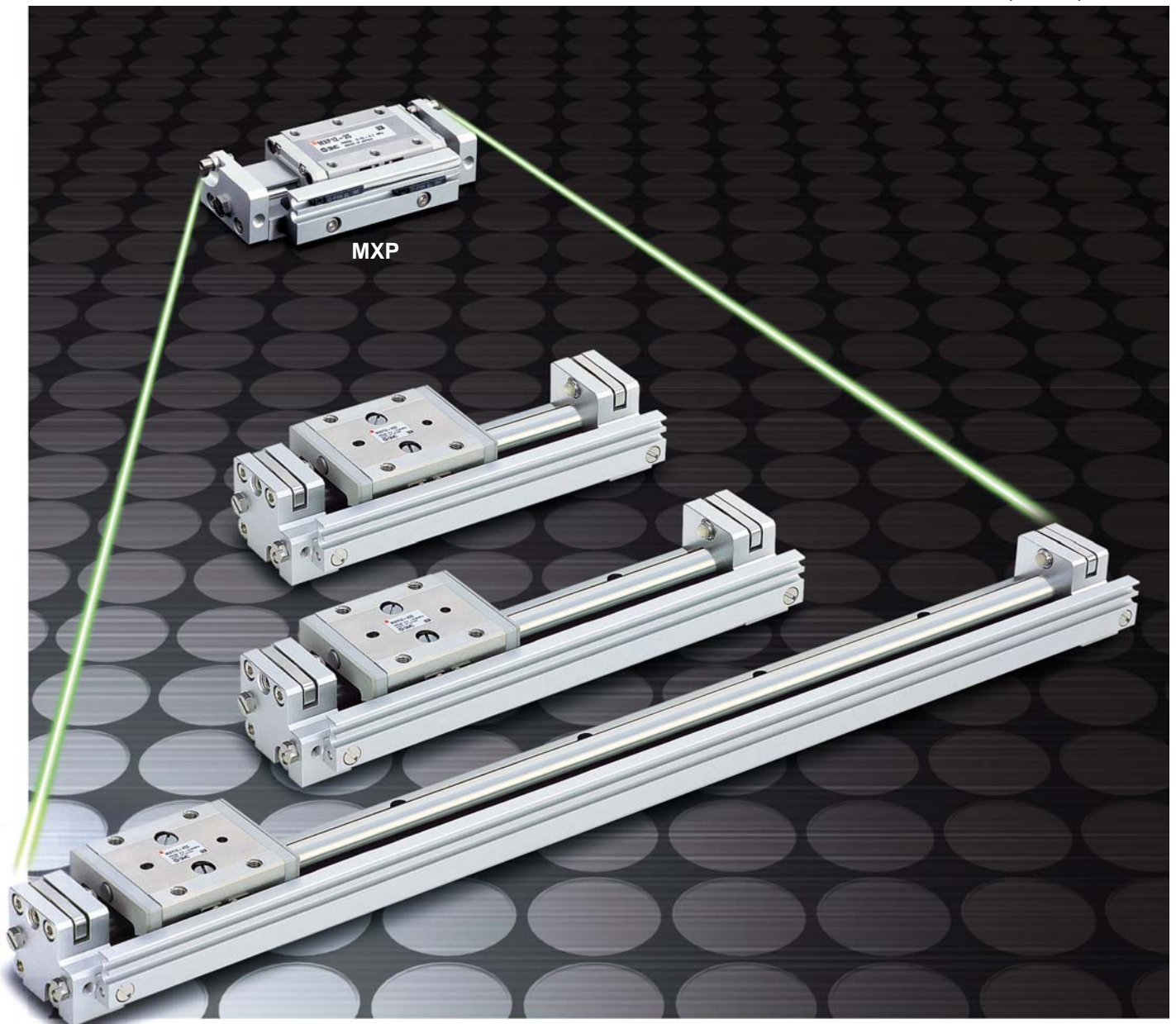


Air Slide Table Long Stroke
Series MXY
ø6, ø8, ø12

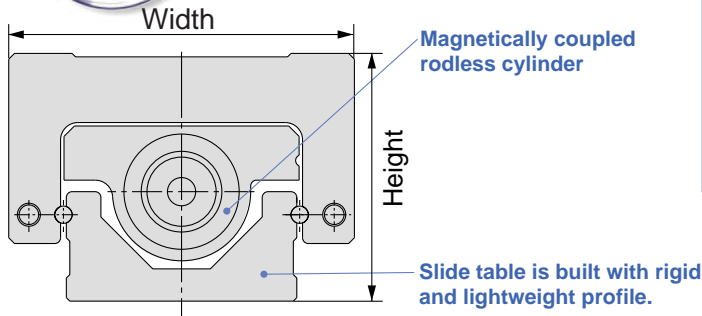


A long-stroke type of Series MXP air slide table with integrated linear guide is newly released.

Use of linear guide provides rigid, The slide table comes with a built-in

Rigid, compact, and lightweight

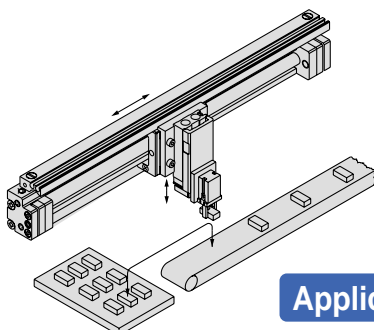
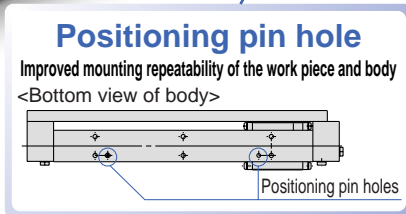
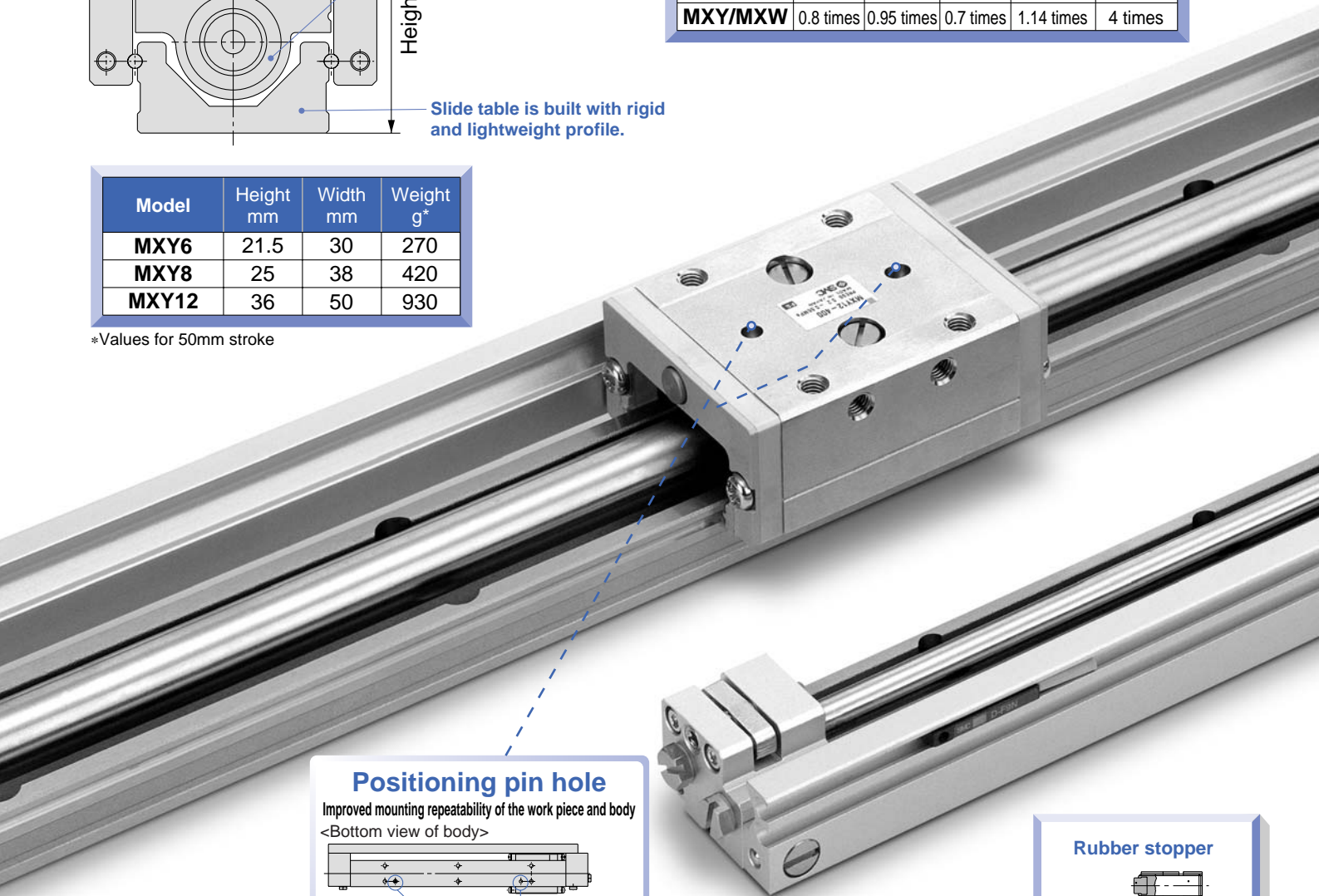
Compact design with higher allowable moment compared to MXY8/MXW8



Model	Height mm	Width mm	Weight g	Allowable moment N·m	
				Pitch, Yaw	Roll
MXY8-50	25	47	420	5.7	13
MXW8-50	30	49	610	5	3
MXY/MXW	0.8 times	0.95 times	0.7 times	1.14 times	4 times

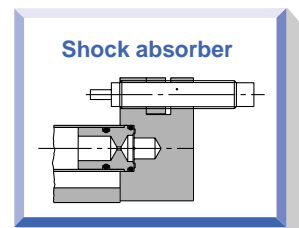
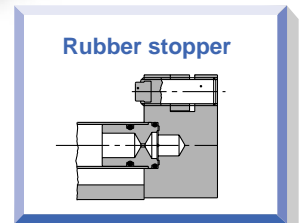
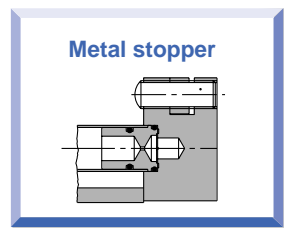
Model	Height mm	Width mm	Weight g*
MXY6	21.5	30	270
MXY8	25	38	420
MXY12	36	50	930

*Values for 50mm stroke



Application example

Adjuster options



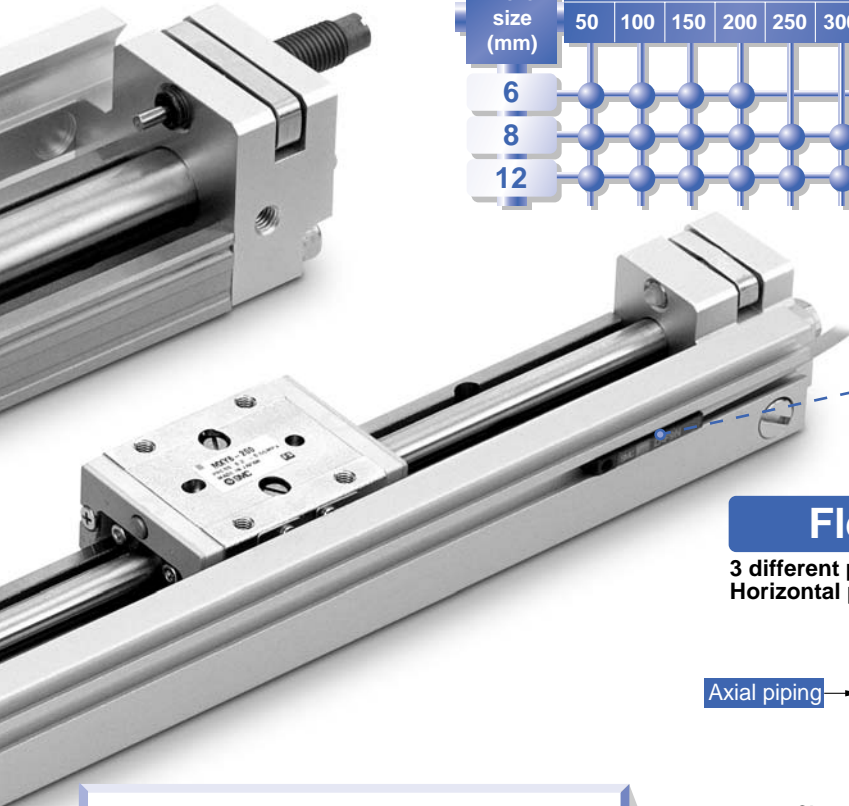
compact and lightweight design. magnetically coupled rodless cylinder.

Long stroke

MXY12-Max. stroke 400mm

Series variations

Bore size (mm)	Stroke								Adjuster options			Function options
	50	100	150	200	250	300	350	400	Rubber stopper	Shock absorber	Metal stopper	Piping concentrated on one side of the switch rail
6	●	●	●	●	●	●	●	●	●	●	●	●
8	●	●	●	●	●	●	●	●	●	●	●	●
12	●	●	●	●	●	●	●	●	●	●	●	●



Auto switch mounting

Three types of auto switches can be mounted.

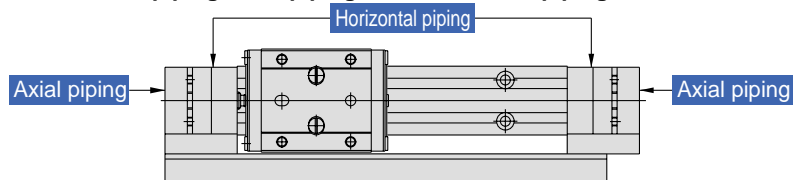
Solid state switch: F9 type

Reed switch: A9 type

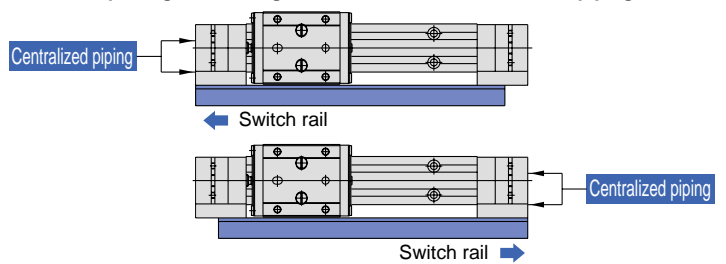
2-color display solid state switches: F9□W type

Flexible piping

3 different piping directions are available:
Horizontal piping, axial piping, and centralized piping

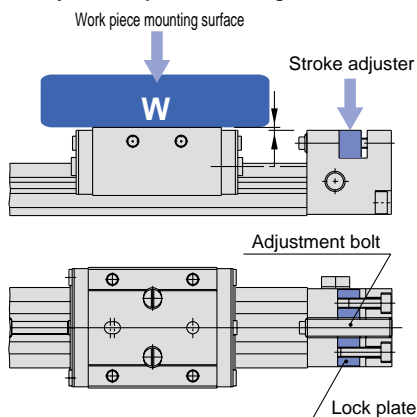


Changing the mounting position of the switch rail, which also used as an air passage can change the direction of the centralized piping.



Stroke Adjuster

The stroke adjuster does not protrude from the mounting surface of the work piece mounting surface, allowing high flexibility in work piece mounting.



Using lock plates to securely lock the adjustment bolt with minimal force.

Series MXP

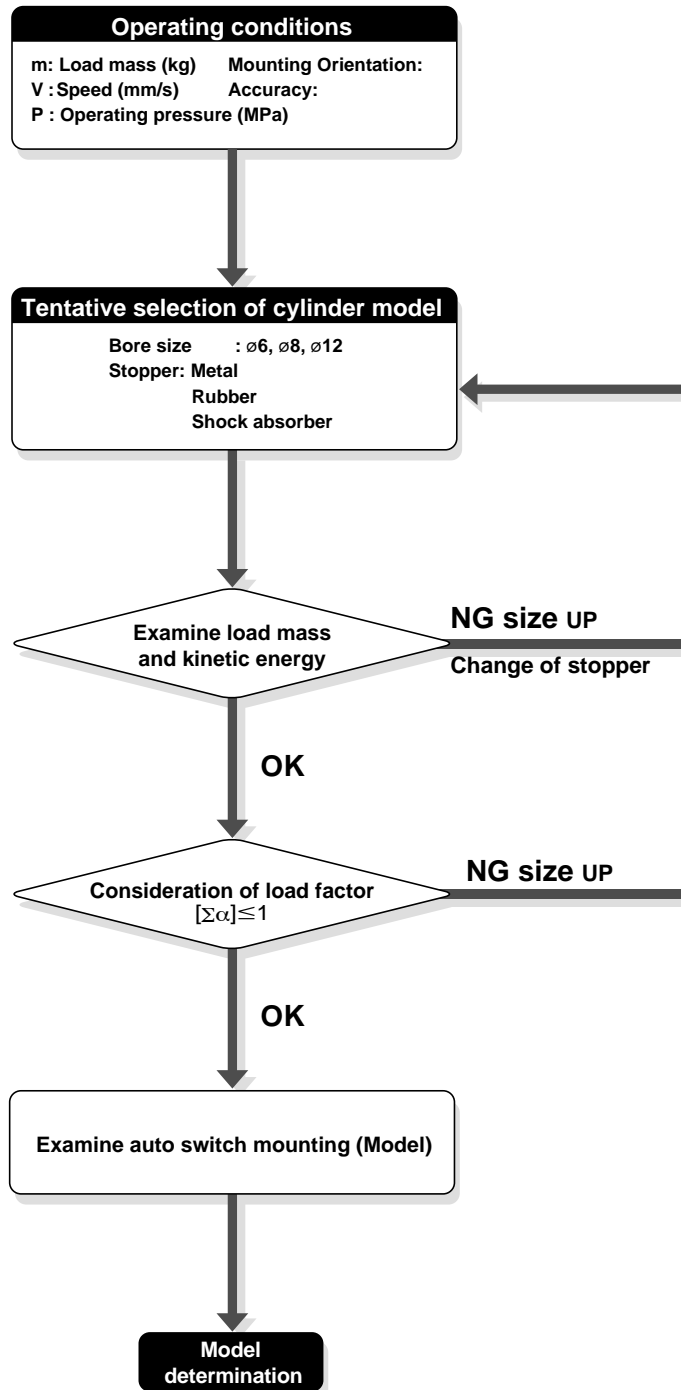
Compact air slide table that comes with linear guide with built-in cylinder

Series	Stroke (mm)						Stroke adjusters			Auto switch
	5	10	15	20	25	30	Rubber stopper	Metal stopper	Shock absorber	
MXP 6	●	●	●	●	●	●	●	●	●	●
MXP10	●	●	●	●	●	●	●	●	●	●
MXP12	●	●	●	●	●	●	●	●	●	●
MXP16	●	●	●	●	●	●	●	●	●	●

Series MXY Model Selection 1

The following are the steps for selection of the series MXY best suited to your application,

Conditions and Calculation Flow for Selection



Series MXY Model Selection 2

Model Selection Procedure

Formulae/Data

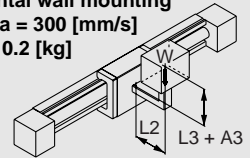
Selection Examples

1 Operating conditions

Enumerate the operating conditions considering the mounting position and work piece configuration.

- Model to be used
- Type of cushion
- Mounting orientation
- Average speed V_a (mm/s)
- Load weight W (kg)
- Overhang L_n (mm)

Cylinder: MXY8-100
Cushion: Rubber stopper
Mounting: Horizontal wall mounting
Average speed: $V_a = 300$ [mm/s]
Load weight: $W = 0.2$ [kg]
 $L_2 = 40$ mm
 $L_3 = 50$ mm



2 Load weight

Find the collision speed (mm/S)

Confirm that the load mass W (kg) and collision speed do not exceed the value in the graph.

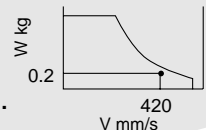
$$V = \frac{1.4 \cdot V_a}{*} \quad * \text{ Correction factor (reference value)}$$

Graph 1

$$V = 1.4 \times 300 = 420$$

Confirm that $V = 420$ and $W = 0.2$ do not exceed the values in Graph 1.

Applicable because it does not exceed the value in Graph 1.



3 Load factor

3-1 Load factor of static moment

Find the static moment M (N·m).

Find the allowable static moment M_a (N·m).

Find the load factor α_1 of the static moment.

$$M = W \times 9.8 (L_n + A_n)/1000$$

Corrected value of moment center position distance A_n : Table 1

Pitch, Yaw moment: Graph 2

Roll moment: Graph 3

$$\alpha_1 = M/M_a$$

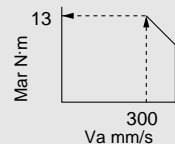
Examine M_r .

$$M_r = 0.2 \times 9.8 (40 + 15.5)/1000 = 0.1$$

$$A_2 = 15.5$$

Obtain $M_{ar} = 13$ from $V_a = 300$ in Graph 3.

$$\alpha_1 = 0.1/13 = 0.008$$



3-2 Load factor of dynamic moment

Find the dynamic moment M_e (N·m).

Find the allowable dynamic moment M_{ea} (N·m).

Find the load factor α_2 of the dynamic moment.

$$M_e = 1/3 \cdot W_e \times 9.8 (L_n + A_n)/1000$$

$$\text{Weight equivalent to impact } W_e = \delta \cdot W \cdot V$$

δ : Bumper coefficient

Rubber stopper screw: 4/100

Shock absorber: 1/100

Metal stopper screw: 16/100

Corrected value of moment center position distance A_n : Table 1

pitch, yaw moment: Graph 2

$$\alpha_2 = M_e/M_{ea}$$

Examine M_{ep} .

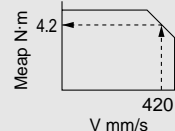
$$M_{ep} = 1/3 \times 3.36 \times 9.8 \times (40+15.5)/1000 = 0.61$$

$$W_e = 4/100 \times 0.2 \times 420 = 3.36$$

$$A^2 = 15.5$$

Obtain $M_{eap} = 4.2$ from $V_a = 420$ in Graph 2.

$$\alpha_2 = 0.61/4.2 = 0.15$$



Examine M_{ey} .

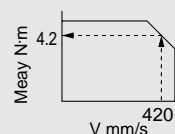
$$M_{ey} = 1/3 \times 3.36 \times 9.8 \times (50+19)/1000 = 0.76$$

$$W_e = 3.36$$

$$A^3 = 19$$

Obtain $M_{eay} = 4.2$ from $V_a = 420$ in Graph 2.

$$\alpha_2' = 0.76/4.2 = 0.18$$



3-3 Sum of the load factors

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

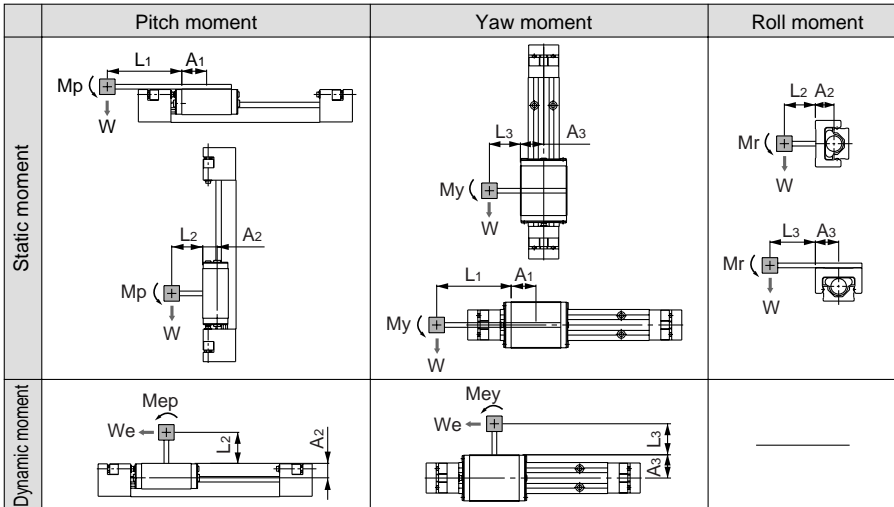
$$\alpha_1 + \alpha_2 < 1$$

$$\alpha_1 + \alpha_2 + \alpha_2' =$$

Applicable because

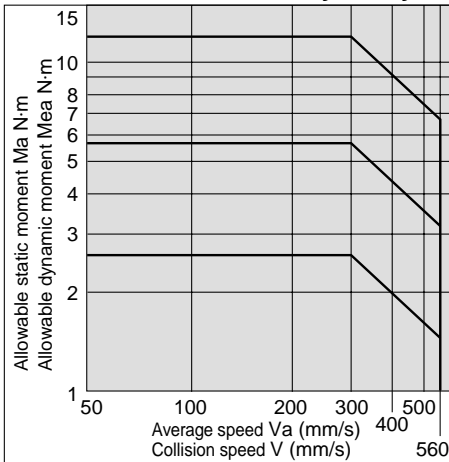
$$0.008 + 0.15 + 0.18 = 0.34 < 1$$

Fig. 1 Overhang: L_n (mm), Corrected value of moment center position distance: A_n (mm)



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

Graph2 Allowable moment
Pitch moment: M_{ap} , M_{eap}
Yaw moment: M_{ay} , M_{eay}



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

Graph3 Allowable moment
Roll moment: M_{ar}

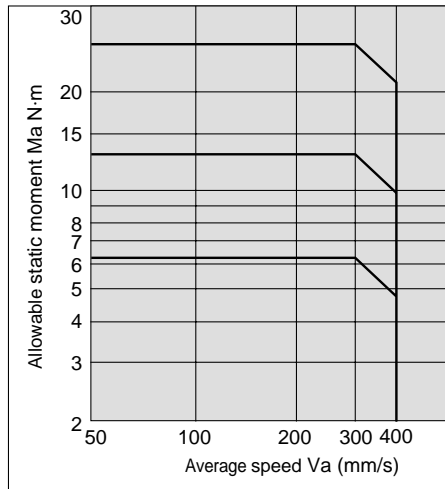


Table 1 Corrected value of moment center position distance: A_n (mm)

Model	Corrected value of moment center position distance (Refer to Figure 2.)		
	A_1	A_2	A_3
MXY6	16	14	15
MXY8	20	15.5	19
MXY12	26	23.5	25

Table 2 Max. allowable load weight: W_{max} (kg)

Model	Max. allowable load weight
MXY6	0.6
MXY8	1
MXY12	2

The above value represents the maximum value for each allowable load mass. For the maximum allowable load mass for each piston speed, please refer to Graph 1.

Table 3 Maximum allowable moment: M_{max} (N·m)

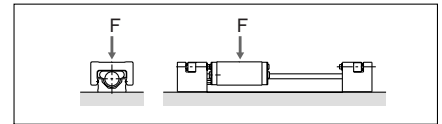
Model	Pitch/Yaw moment: M_{pmax}/M_{ymax}	Roll moment: M_{rmax}
MXY6	2.6	6.2
MXY8	5.7	13
MXY12	12	28

The above value represents the maximum value of allowable moment. For the maximum allowable moment for each piston speed, please refer to Graph 2 and 3.

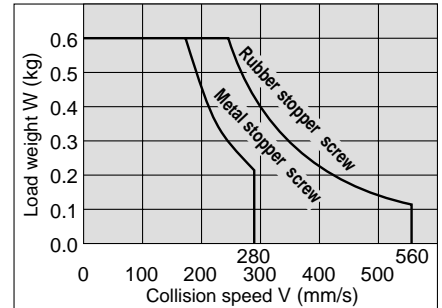
Symbol

Symbol	Definition	Unit	Symbol	Definition	Unit
A_n ($n = 1$ to 3)	Corrected value of moment center position distance	mm	F	Allowable static load	N
L_n ($n = 1$ to 3)	Overhang	mm	V	Collision speed	mm/s
M (M_p, M_y, M_r)	Static moment (pitch, yaw, roll)	Nm	Va	Average speed	mm/s
Ma (M_{ap}, M_{ay}, M_{ar})	Allowable static moment (pitch, yaw, roll)	Nm	W	Load weight	kg
Me (M_{ep}, M_{ey})	Dynamic moment (pitch, yaw)	Nm	Wa	Allowable load weight	kg
Mea (M_{eap}, M_{eay})	Allowable dynamic moment (pitch, yaw)	Nm	Wmax	Max. allowable load weight	kg
Mmax ($M_{pmax}, M_{ymax}, M_{rmax}$)	Max. allowable moment (pitch, yaw, roll)	Nm	α	Load factor	—

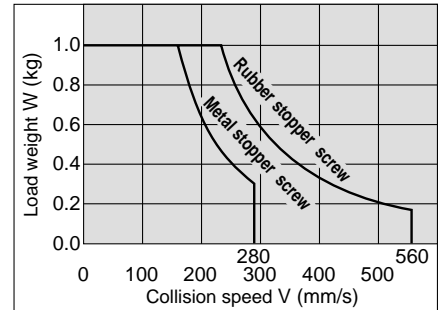
Fig. 2 Allowable static load: F (N)



Graph1 Load weight: W
MXY6



MXY8



MXY12

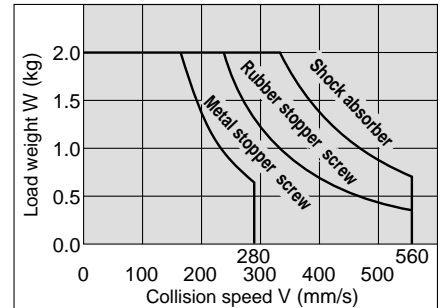


Table 4 Allowable static load: F (N)

Model	Allowable static load
MXY6	580
MXY8	980
MXY12	1600

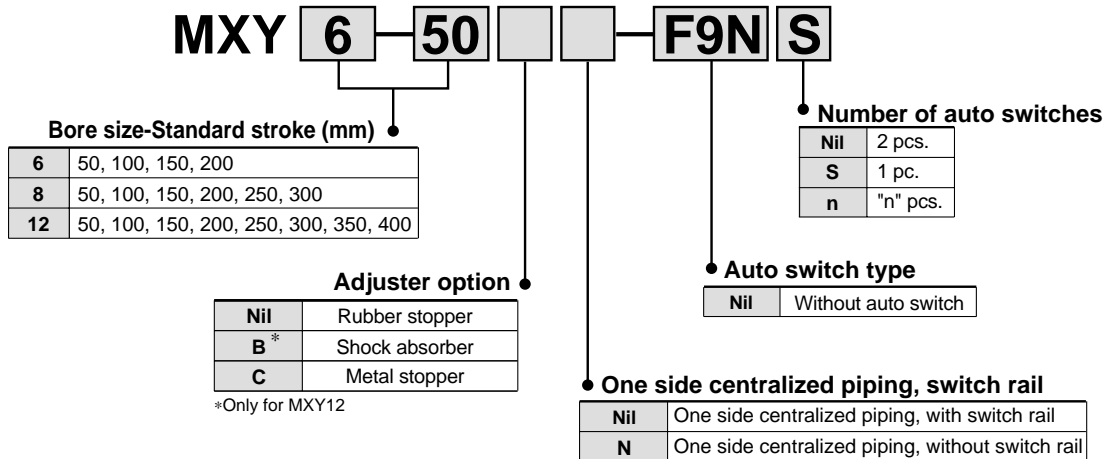
The above value represents the applicable load at the position where the moment does not work at the time of stop. Factors such as impact, etc. are not in consideration with the value.

Air Slide Table

Series MXY

ø6, ø8, ø12

How to Order



These auto switches have been changed.
Contact SMC or view www.smcworld.com

F9N→M9N	F9NV→M9NV
F9P→M9P	F9PV→M9PV
F9B→M9B	F9BV→M9BV

The auto switch cannot be mounted on the one side centralized piping type without switch rail (N).

Applicable auto switches/Refer to pages 11 through 15 for detailed specifications of auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch model		Lead wire length (m)			Applicable load				
					DC	AC	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)	IC circuit	Relay PLC				
Reed switch	—	Grommet	No	2-wire	24V	5V, 12V	100V or less	A90V	A90	●	●	○	IC circuit	Relay PLC			
			Yes			12V	100V	A93V	A93	●	●	—	—	—			
			—	3-wire (NPN equiv.)	—	5V	—	A96V	A96	●	●	—	—	IC circuit	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	F9NV	F9N	●	●	○	IC circuit	Relay PLC			
								F9PV	F9P	●	●	○	IC circuit				
				3-wire (PNP)	12V	—	F9BV	F9B	●	●	○	—					
				2-wire			F9NWV	F9NW	●	●	○	IC circuit					
				Diagnostic indication (2-colour display)	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	F9PWV	F9PW	●		●	○	IC circuit
											3-wire (PNP)	F9BWV	F9BW		●	●	○
	2-wire																

*Lead wire length symbols: 0.5m Nil (Example) F9N
 3m L (Example) F9NL
 5m Z (Example) F9NZ

*Solid state switches marked "O" are produced upon receipt of order.

Specifications



Model	MX6	MX8	MX12
Bore size (mm)	6	8	12
Port size	M5		
Fluid	Air		
Action	Double acting (type)		
Operating pressure	0.2 to 0.55MPa		
Proof pressure	0.83MPa		
Ambient and fluid temperature	-10 to 60°C		
Piston speed	50 to 400mm/S Metal stopper: 50 to 200mm/S		
Cushion	Rubber bumper Shock absorber (option, not available on MX6, MX8) None (with metal stopper)		
Lubrication	Non-lube (equipment), unlubricated		
Stroke adjuster	Standard		
Stroke adjustment range	Rubber stopper	0 to 5mm	
	Shock absorber	—	0 to 15mm
	Metal stopper	0 to 5mm	
Auto switch	Reed switches (2-wire, 3-wire) Solid state switches (2-wire, 3-wire) 2-color display solid state switches (2-wire, 3-wire)		
Stroke length tolerance	+1 0 mm		

Theoretical Output

(N)

Cylinder bore (mm)	Piston area (mm ²)	Operating pressure (MPa)				
		0.2	0.3	0.4	0.5	0.55
6	28	6	8	11	14	15
8	50	10	15	20	25	28
12	113	23	34	45	57	62

Standard Stroke

(mm)

Magnetic Holding Force

(N)

Model	Standard stroke
MX6	50, 100, 150, 200
MX8	50, 100, 150, 200, 250, 300
MX12	50, 100, 150, 200, 250, 300, 350, 400

Model	Magnetic holding force
MX6	19
MX8	34
MX12	77

Weights

(g)

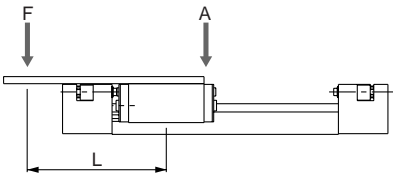
Model	One side centralized piping, with switch rail								One side centralized piping, without switch rail							
	Stroke (mm)								Stroke (mm)							
	50	100	150	200	250	300	350	400	50	100	150	200	250	300	350	400
MX6	270	330	390	450	—	—	—	—	230	280	330	380	—	—	—	—
MX8	420	510	600	690	780	870	—	—	410	480	550	620	690	760	—	—
MX12	930	1060	1190	1320	1450	1580	1710	1840	910	1020	1130	1240	1350	1460	1570	1680

Series MXY

Table Deflection

Table deflection due to pitch moment load

Displacement at "A" when load is applied "F"



L dimension mm

MXY6	100
MXY8	100
MXY12	140

Pitch moment

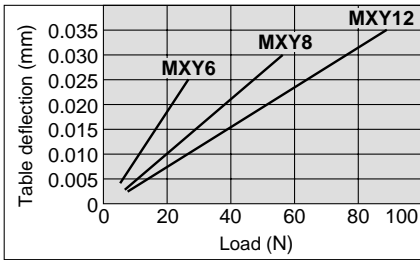
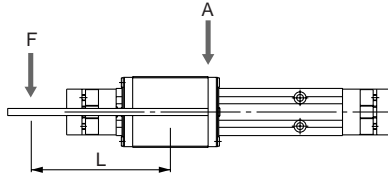


Table deflection due to yaw moment load

Displacement at "A" when load is applied "F"



L dimension mm

MXY6	100
MXY8	100
MXY12	140

Yaw moment

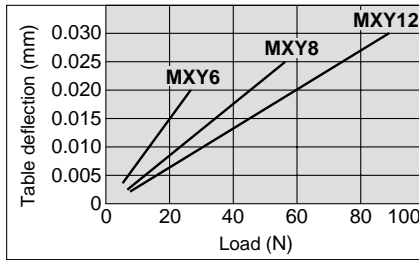
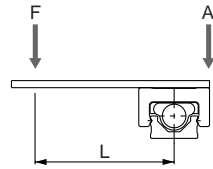


Table deflection due to roll moment load

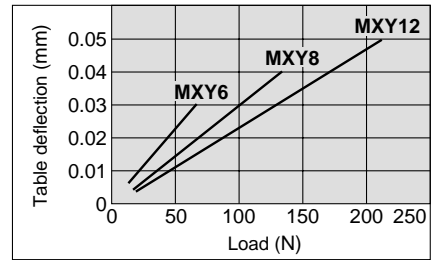
Displacement at "A" when load is applied "F"



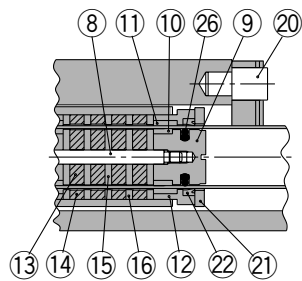
L dimension mm

MXY6	100
MXY8	100
MXY12	140

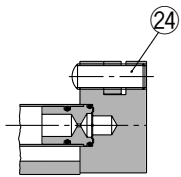
Roll moment



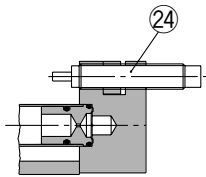
Construction



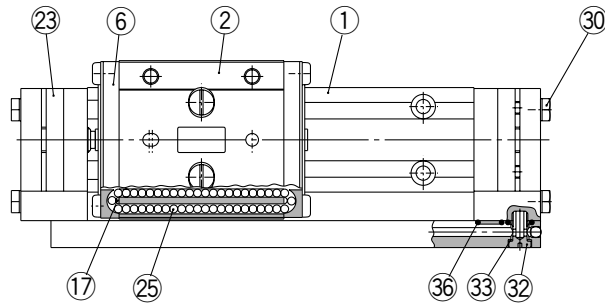
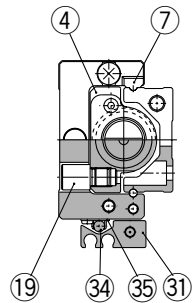
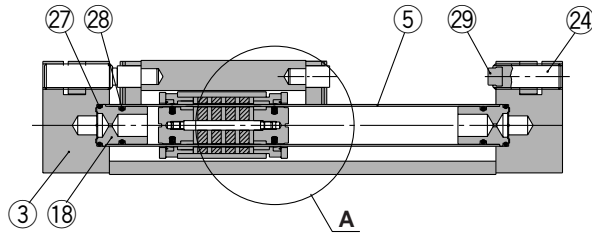
Detail drawing of part A



Metal stopper



Shock absorber



Parts list

No.	Description	Material	Note
1	Rail	Steel	Heat treatment, electroless nickel plated
2	Guide block	Steel	Heat treatment, electroless nickel plated
3	End plate	Aluminium alloy	Hard anodized
4	Body	Aluminium alloy	Hard anodized
5	Tube	Stainless steel	
6	Cover	Resin	
7	Scraper	Stainless steel, NBR	
8	Shaft	Stainless steel	
9	Piston	Brass	Electroless nickel plated
10	Wear ring A	Resin	
11	Wear ring B	Resin	
12	Spacer	Brass	Electroless nickel plated
13	Magnet A	Rare earth magnet	Nickel plated
14	Magnet B	Rare earth magnet	Nickel plated
15	Yoke A	Steel	Electroless nickel plated
16	Yoke B	Steel	Electroless nickel plated
17	Return guide	Resin	
18	End cap	Resin	
19	Stud	Steel	Heat treatment

Parts list

No.	Description	Material	Note
20	Stopper screw	Steel	Heat treatment
21	External magnet fix plate	Stainless steel	
22	Cylinder scraper	NBR	
23	Lock plate	Stainless steel	
24	Adjustment bolt	Steel	Nickel plated Rubber stopper
		Stainless steel	Metal stopper
	Shock absorber		Shock absorber
25	Steel ball	Copper	
26	Piston seal	NBR	
27	O-ring	NBR	
28	O-ring	NBR	Rubber stopper
29	Adjustment bumper	Polyurethane	
30	Plug	—	Hard anodized
31	Switch rail	Aluminium alloy	Electroless nickel plated
32	Stud	Brass	
33	Gasket	NBR	
34	Magnet	Rare earth	Electroless nickel plated
35	Magnet holder	Steel	
36	O-ring	NBR	

Replacement parts

Bore size (mm)	Kit no.	Contents
6	MX Y6-PS	Set consists of 2 pieces of above 10, 11, 22 and 26 each
8	MX Y8-PS	
12	MX Y12-PS	

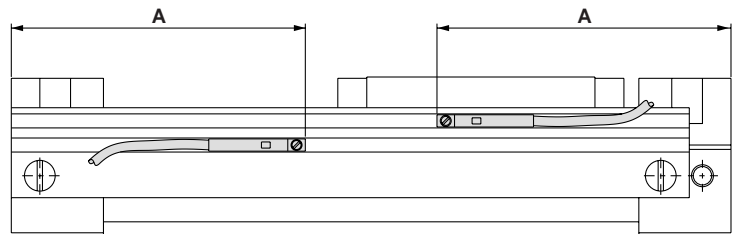
Proper Auto Switch Mounting Position for Stroke End Detection

Reed switch

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

Model	Mounting		Switch operating range
MXY6	A	54	5
	B	34	
MXY8	A	59	
	B	39	
MXY12	A	67	
	B	47	

Lead wire entries outside

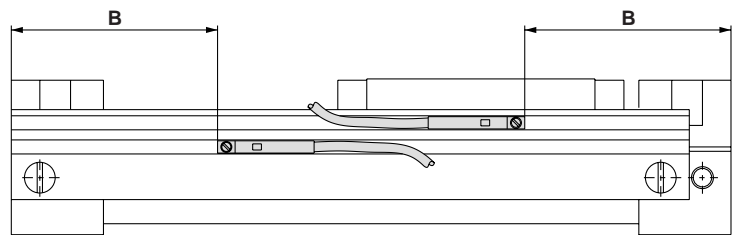


Solid state switch

D-F9B(V), D-F9N(V), D-F9P(V) (mm)

Model	Mounting		Switch operating range
MXY6	A	50	3
	B	38	
MXY8	A	55	
	B	43	
MXY12	A	63	
	B	51	

Lead wire entries inside

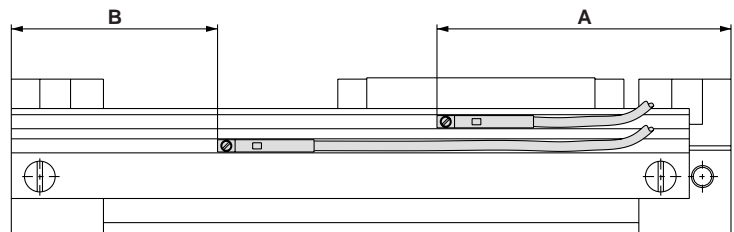


2-color display solid state switch

D-F9BW(V), D-F9NW(V), D-F9PV (mm)

Model	Mounting		Switch operating range
MXY6	A	50	4
	B	38	
MXY8	A	55	
	B	43	
MXY12	A	63	
	B	51	

Lead wire entries parallel



Auto Switch Mounting

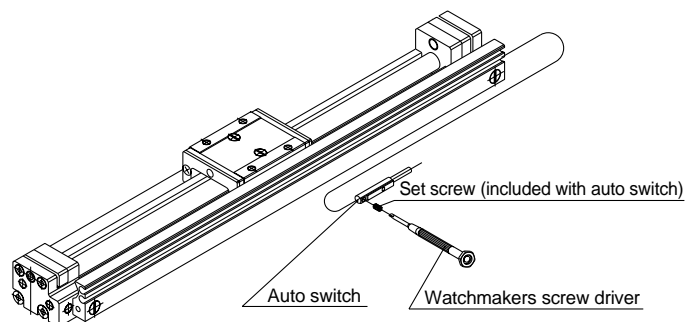
⚠ Caution

Auto switch mounting tools

- When tightening the auto switch set screw (included with auto switch), use a watchmakers screw driver with a handle diameter of about 5 to 6mm.

Tightening torque

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



Auto Switch Specifications

Auto Switch Common Specifications

Type	Reed switch	Solid state switch
Leakage current	None	3-wire: 100 μ A or less, 2-wire: 0.8mA or less
Operating time	1.2ms	1ms or less
Impact resistance	300m/s ²	1000m/s ²
Insulation resistance	50M Ω or more at 500VDC (between lead wire and case)	
Withstand voltage	1500VAC for 1 min. (between lead wire and case)	1000VAC for 1 min. (between lead wire and case)
Ambient temperature	-10 to 60°C	
Enclosure	IEC529 standard IP67, JISC0920 watertight construction	

Lead Wire Length

Lead wire length indication

(Example) **D-F9P**



Lead wire length

Nil	0.5m
L	3m
Z	5m

Note 1) Lead wire length Z: Auto switch applicable to 5m length
Solid state switch: All types are produced upon receipt of order (standard procedure).
(except for D-F9 and D-F9□V type)

Note 2) For solid state switches with flexible lead wire specification, add "-61" at the end of the lead wire length.

(Example) **D-F9PL-61**

Flexible specification

Contact Protection Boxes/CD-P11, CD-P12

<Applicable switches>

D-A9/A9□V

- ① The operating load is an induction load.
 - ② The length of wiring to the load is 5m or more.
 - ③ The load voltage is 100 or 200VAC.
- Use a contact protection box in any of the above situations.
The life of the contacts may otherwise be reduced.
(They may stay ON all the time.)

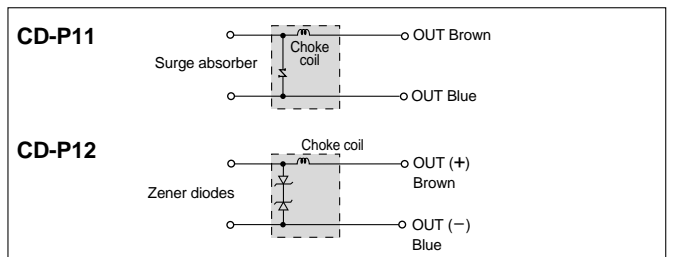
Specifications

Part number	CD-P11		CD-P12
Load voltage	100VAC	200VAC	24VDC
Maximum load current	25mA	12.5mA	50mA

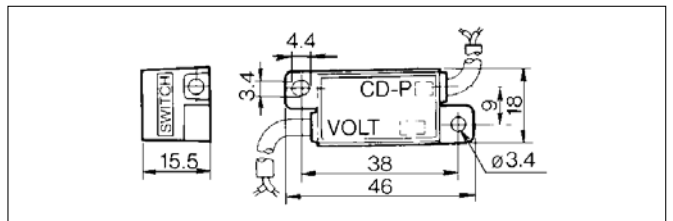
* Lead wire length — Switch connection side 0.5m
Load connection side 0.5m



Internal circuits



Dimensions



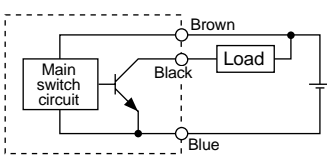
Connection

To connect a switch 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. Furthermore, the switch unit should be kept as close as possible to the contact protection box, with a lead wire length of no more than 1 meter between them.

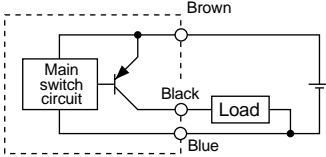
Auto Switches Connections and Examples

Basic Wiring

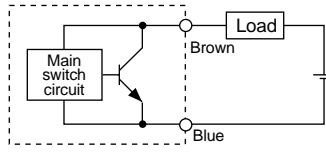
Solid state 3-wire, NPN



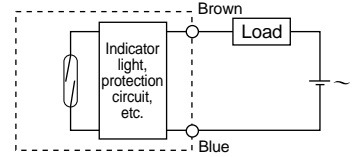
Solid state 3-wire, PNP



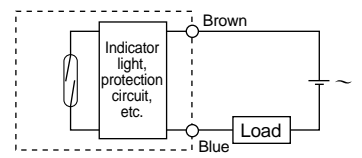
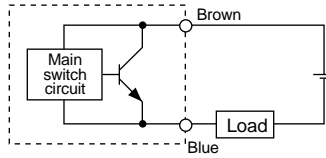
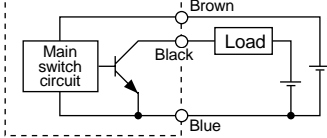
2-wire <Solid state switch>



2-wire <Reed switch>



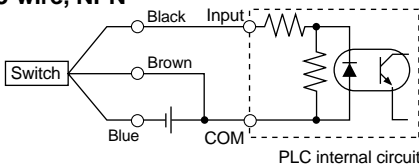
(Power supplies for switch and load are separate.)



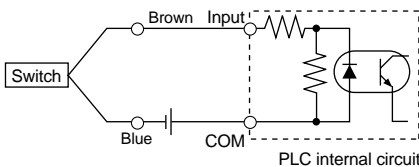
Examples of Connection to PLC

Sink input specifications

3-wire, NPN

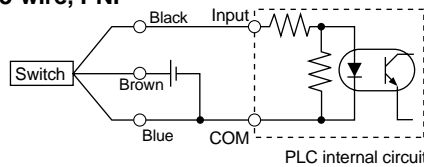


2-wire

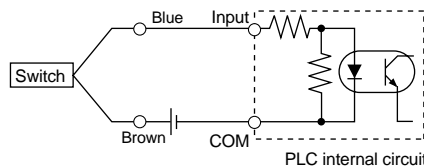


Source input specifications

3-wire, PNP



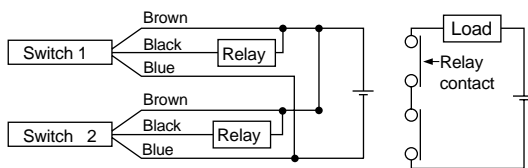
2-wire



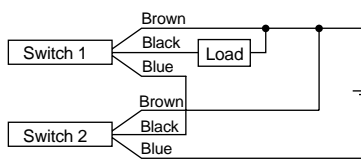
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

Connection Examples for AND (Series) and OR (Parallel)

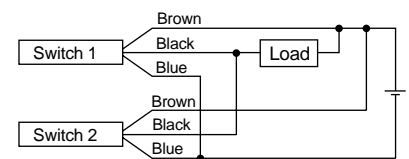
3-wire AND connection for NPN output (using relays)



AND connection for NPN output (performed with switches only)

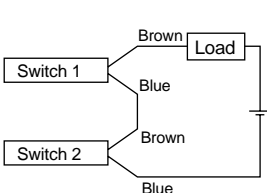


OR connection for NPN output



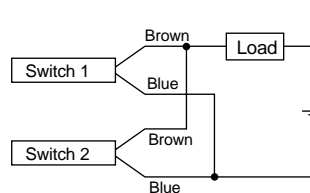
The indicator lights will light up when both switches are turned ON.

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.

2-wire with 2 switch OR connection



<Solid state>
When two switches are connected in parallel, 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 get dark or not light up, because of dispersion and reduction of the current flowing to the switches.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \text{Voltage drop} \times 2 \text{ pcs.} \\ &= 24\text{V} - 4\text{V} \times 2 \text{ pcs.} \\ &= 16\text{V} \end{aligned}$$

Example: Power supply is 24VDC
Voltage drop in switch is 4V

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \times \text{Load impedance} \\ &= 1\text{mA} \times 2 \text{ pcs.} \times 3\text{k}\Omega \\ &= 6\text{V} \end{aligned}$$

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

Reed Switches/Direct Mounting Type D-A90(V), D-A93(V), D-A96(V)

**Grommet
Electrical entry: In-line**



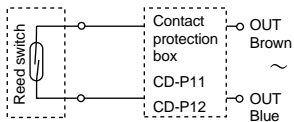
⚠ Caution

Precautions

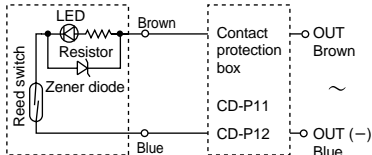
- When securing the switch, be sure to use the fixing screws attached to the auto switch body. The switch may be damaged if screws other than specified ones are used.

Auto Switch Internal Circuits

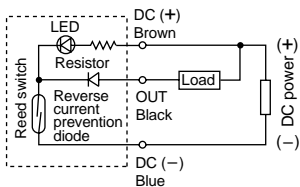
D-A90V



D-A93V



D-A96V



- Note) ① The operating load is the induction load.
 ② The wiring length to the load is 5m or more.
 ③ The load voltage is 100VAC

Under any of the above conditions, the life time of the contact may be shortened. Please use a contact protection box. (Please refer to page 7 for more information on the contact protection box.)

Auto Switch Specifications

D-A90, D-A90V (without indicator light)			
Auto switch part no.	D-A90, D-A90V		
Applicable load	IC circuit, Relay, PLC		
Load voltage	24V _{DC} ^{AC} or less	48V _{DC} ^{AC} or less	100V _{DC} ^{AC} or less
Max load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal resistance	1Ω or less (includes the lead wire length of 3m)		
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	24VDC	100VAC	4 to 8VDC
Load current range and Max load current	5 to 40mA	5 to 420mA	20mA
Contact protection circuit	None		
Internal voltage drop	D-A93 — 2.4V or less (to 20mA)/3V or less (to 40mA) D-A93V — 2.7V or less		0.8V or less
Indicator light	Red LED lights when ON		

● Lead wire

- D-A90(V), D-A93(V) — Oil proof heavy duty vinyl cable, $\phi 2.7$, 0.18mm² x 2 cores (brown, blue), 0.5m
 - D-A96(V) — Oil proof heavy duty vinyl cable, $\phi 2.7$, 0.15mm² x 3 cores (brown, black, blue), 0.5m
- Note 1) Refer to page 7 for reed switch common specifications.
 Note 2) Refer to page 7 lead wire length.

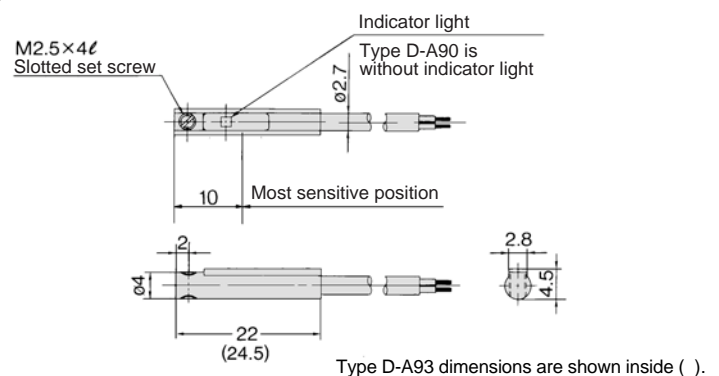
Auto Switch Weights

Model	D-A90	D-A90V	D-A93	D-A93V	D-A96	D-A96V
Lead wire length 0.5m	6	6	6	6	8	8
Lead wire length 3m	30	30	30	30	41	41

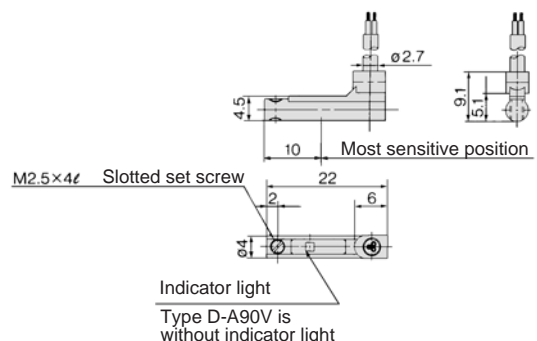
(g)

Auto Switch Dimensions

D-A90, D-A93, D-A96



D-A90V, D-A93V, D-A96V



Solid State Switches/Direct Mounting Type D-F9N(V), D-F9P(V), D-F9B(V)

Grommet



Caution

Precautions

When securing the switch, be sure to use the fixing screws attached to the auto switch body. The switch may be damaged if screws other than specified ones are used.

Auto Switch Specifications

D-F9□, D-F9□V (with indicator light)						
Auto switch part no.	D-F9N	D-F9NV	D-F9P	D-F9PV	D-F9B	D-F9BV
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				24VDC relay, PLC	
Power supply voltage	5, 12, 24VDC (4.5 to 28V)				—	
Current consumption	10mA or less				—	
Load voltage	28VDC or less		—		24VDC (10 to 28VDC)	
Load current	40mA or less		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA load current)		0.8V or less		4V or less	
Leakage voltage	100μA or less at 24VDC				0.8mA or less	
Indicator light	Red LED lights when ON					

●Lead wire — Oil proof heavy duty vinyl cable, $\phi 2.7$, 3 cores (brown, black, blue [red, white, black]), 0.15mm², 2 cores (brown, blue [red, black]), 0.18mm², 0.5m

Note 1) Refer to page 7 for solid state switch common specifications.

Note 2) Refer to page 7 for lead wire length.

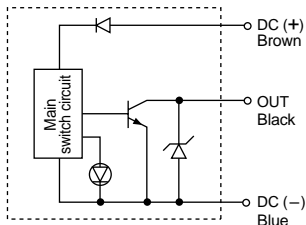
Auto Switch Weights

Unit: g

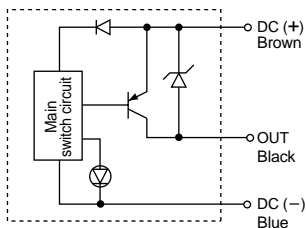
Auto switch part no.	D-F9N(V)	D-F9P(V)	D-F9B(V)	
Lead wire length m	0.5	7	7	6
	3	37	37	31
	5	61	61	51

Auto Switch Internal Circuits

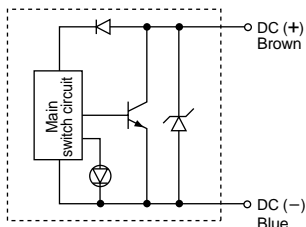
D-F9N, F9NV



D-F9P, F9PV

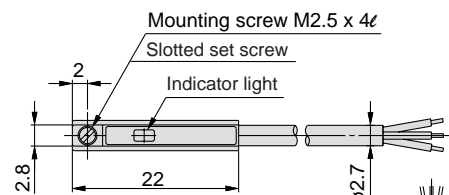
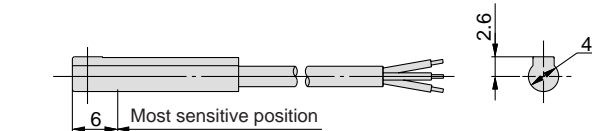


D-F9B, F9BV

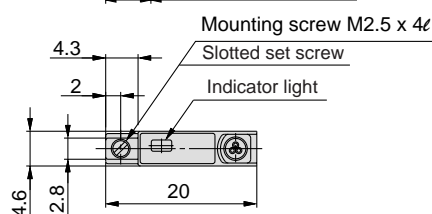
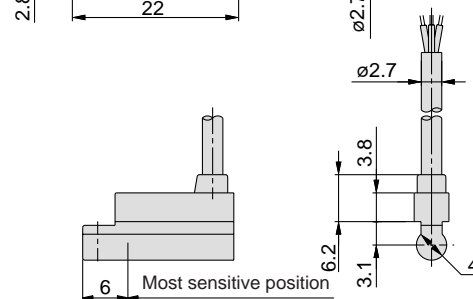


Auto Switch Dimensions

D-F9□



D-F9□V



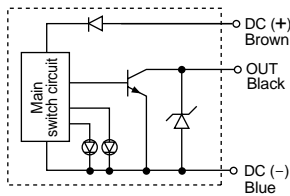
2-color Display Solid State Switches/Direct Mount Type D-F9NW(V), D-F9PW(V), D-F9BW(V)

Grommet

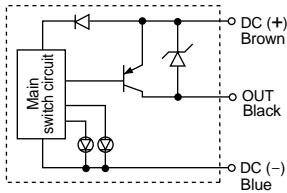


Auto Switch Internal Circuits

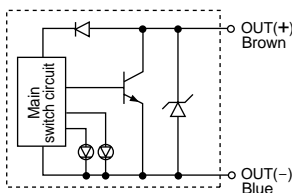
D-F9NW, F9NWV



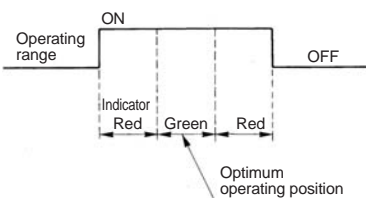
D-F9PW, F9PWV



D-F9BW, F9BWV



Indicator light/Display method



Auto Switch Specifications

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 IC, PLC				24VDC relay, PLC	
Power supply voltage	5, 12, 24VDC (4.5 to 28V)				—	
Current consumption	10mA or less				—	
Load voltage	28VDC or less		—		24VDC (10 to 28VDC)	
Load current	0.4mA or less		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA load current)		0.8V or less		4V or less	
Leakage current	100μA or less at 24VDC				0.8mA or less	
Indicator light	Operating position Red LED lights up Optimum operating position ... Green LED lights up					

- Lead wire Oil proof heavy duty vinyl cable, $\phi 2.7$, 3 cores (brown, black, blue [red, white, black]), 0.15mm², 2 cores (brown, blue [red, black]), 0.18mm², 0.5m
- Note 1) Refer to page 15 for solid state switch common specifications.
- Note 2) Refer to page 15 for lead wire length.

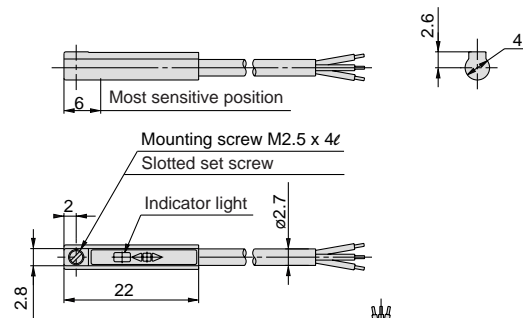
Auto Switch Weights

Unit: g

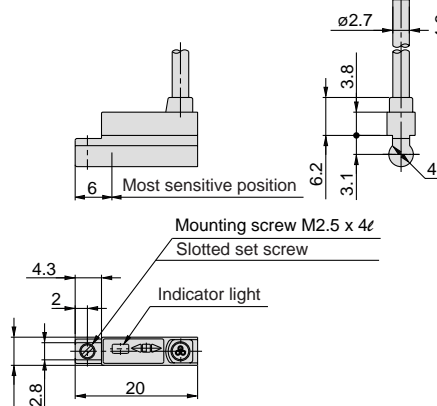
Auto switch part No.	D-F9NW(V)	D-F9PW(V)	D-F9BW(V)
Lead wire length	0.5	7	7
m	3	34	32
	5	56	52

Auto Switch Dimensions

D-F9□W



D-F9□WV





Series MXY

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of "**Caution**", "**Warning**" or "**Danger**". To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ 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 – Recommendations for the application of equipment to transmission and control

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 for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

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 after confirmation of safe locked-out control positions.

2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.

3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back pressure.)

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, press applications, or safety equipment.

3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.



Series MXY Actuator Precautions 1

Be sure to read before handling.

Design

Warning

1. There is a danger of sudden action by air cylinders if sliding parts of machinery are twisted, etc., and changes in forces occur.

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 designed to avoid such dangers.

2. Install a protective cover when there is a risk of human injury.

If a driven object and moving parts of a cylinder pose a danger of human injury, 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, etc., 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 operating pressure due to a power outage, etc.

When a cylinder is used in a clamping mechanism, there is a danger of work pieces 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/or 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 human injury and equipment damage in the event that there is a loss of power to equipment controlled by air pressure, electricity or hydraulics, etc.

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

When a cylinder is driven by an exhaust center 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 equipment 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 safe manual control equipment.

Selection

Warning

1. Confirm the specifications.

The products advertised in this catalog are designed according to use in industrial compressed air systems. If the products are used in conditions where pressure, temperature, etc., are out of specification, damage and/or malfunction may be caused. Do not use in these conditions. (Refer to specifications.)

Consult SMC if you use a fluid other than compressed air.

2. Intermediate stops

When intermediate stopping of a cylinder piston is performed with a 3 position closed center type directional control valve, it is difficult to achieve stopping positions as accurate and minute as with hydraulic pressure due to the 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 case it is necessary to hold a stopped position for an extended period.

Caution

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

Mounting

Caution

1. Do not use until you can verify that equipment can operate properly.

Verify correct mounting by suitable function and leakage inspections after compressed air and power are connected following mounting, maintenance or conversions.

2. Instruction manual

The product should be mounted and operated after thoroughly reading the manual and understanding its contents. Keep the instruction manual where it can be referred to as needed.

Piping

Caution

1. Preparation before piping

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.

Lubrication

Caution

1. Lubrication of non-lube type cylinder

The cylinder is lubricated at the factory and can be used without any further lubrication.

However, in the event that it will be lubricated, use class 1 turbine oil (without additives) ISO VG32.

Stopping lubrication later may lead to malfunction due to the loss of the original lubricant. Therefore, lubrication must be continued once it has been started.



Series MXY Actuator Precautions 2

Be sure to read before handling.

Air Supply

Warning

1. Use clean air.

Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

Caution

1. Install air filters.

Install air filters at the upstream side of valves. The filtration degree should be 5 μ m or finer.

2. Install an after cooler, air dryer or water separator, etc.

Air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an after cooler, air dryer or water separator, etc.

3. Use the product within the specified range of fluid and ambient temperature.

Take measures to prevent freezing, since moisture in circuits can be frozen under 5°C, and this may cause damage to seals and lead to malfunction.

Refer to SMC's "Best Pneumatics vol. 4" catalog for further details on compressed air quality.

Operating Environment

Warning

1. Do not use in environments where there is a danger of corrosion.

Refer to the construction drawings regarding cylinder materials.

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

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

This can cause auto switch malfunction.

Maintenance

Warning

1. Maintenance should be performed according to the procedure indicated in the instruction manual.

If handled improperly, malfunction and damage of machinery or equipment may occur.

2. Removal of equipment, and supply/exhaust of compressed air.

When equipment is removed, first check measures to prevent dropping of driven objects and run-away of equipment, etc. Then cut off the supply pressure and electric power, and exhaust all compressed air from the system.

When machinery is restarted, proceed with caution after confirming measures to prevent cylinder lurching.

Caution

1. Drain flushing

Remove drainage from air filters regularly.
(Refer to specifications.)



Series MXY 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 the range of specifications of current load, voltage, temperature or impact.

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

When multiple auto switch cylinders are used in close proximity, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40mm. (When the allowable separation is indicated for each cylinder series, use the specified value.)

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 is driven at the time the piston passes, the auto switch will operate, but 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:

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

4. Keep wiring as short as possible.

<Reed switch>

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

- 1) For an auto switch without a contact protection circuit, use a contact protection box when the wire length is 5m or longer.
- 2) Even if an auto switch has a built-in contact protection circuit, when the wiring is more than 30m long, it is not able to adequately absorb the rush current and its life may be reduced. It is again necessary to connect a contact protection box in order to extend its life. Please contact SMC in this case.

<Solid state switch>

- 3) Although wire length should not affect switch function, use wiring 100m 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 in 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.



Warning

- In the same way, when operating under a specified voltage, although an auto switch may operate normally, the load may not operate. 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 D-A90, 90V).

<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 1).

Also, note that a 12VDC 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.

$$\text{Operating current of load (OFF condition)} > \text{Leakage current}$$

If the criteria given in the above formula are not met, it will not reset correctly (stays ON). Use a 3-wire switch if this specification will not 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 that generates a surge voltage, use a switch with a built-in contact protection circuit or 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 the surge is applied repeatedly. When a load, such as a relay or solenoid valve, which generates surge is directly driven, use a type of 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, devise a double interlock system to avoid trouble by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch. Also perform periodic maintenance 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 MXY 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 more for reed switches and 1000m/s² or more 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 a cylinder 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 beyond the range of tightening torque, the mounting screws, mounting bracket or switch may be damaged. On the other hand, tightening below the range of tightening torque may allow the switch to slip out of position. (Refer to page 41 regarding switch mounting, moving, and tightening torque, etc.)

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

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

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.

3. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (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 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 other lines.

Wiring

Warning

5. Do not allow short circuit of loads.

<Reed switch>

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

<Solid state switch>

Models D-F9□(V), F9□W(V) 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 24VDC switch with indicator light has polarity. The brown (red) lead wire or terminal no. 1 is (+), and the blue (black) lead wire or terminal no. 2 is (-).

- 1) If connections are reversed, a switch will operate, however, the light emitting diode will not light up.

Also note that a current greater than that specified will damage a light emitting diode and it will no longer operate.

Applicable models: D-A93, A93V

<Solid state switch>

- 1) If connections are reversed on a 2-wire type switch, the switch will not be damaged if protected by a protection circuit, but the switch will be in a normally ON state. However, note that the switch will be damaged if reversed connections are made while the load is in a short circuited condition.

- *2) If connections are reversed (power supply line + and power supply line -) 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.

* 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

Solid state with diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Diagnostic output	Yellow	Orange

Solid state with latch type diagnostic output

	Old	New
Power supply	Red	Brown
GND	Black	Blue
Output	White	Black
Latch type diagnostic output	Yellow	Orange



Series MXY Auto Switch Precautions 3

Be sure to read before handling.

Operating Environment

⚠ Warning

1. Never use in an atmosphere of explosive gases.

The structure of auto switches 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.

Auto switches will malfunction or magnets inside cylinders will become demagnetized. (Consult SMC regarding the availability of a magnetic field resistant auto switch.)

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

Although switches, except for some models, satisfy IEC standard IP67 construction (JIS C 0920: watertight construction), do not use switches in applications where continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside switches may cause malfunction.

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

Consult SMC if auto switches will be used in an environment with coolant, cleaning solvent, various oils or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by improper insulation, 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 SMC if switches are used where there are temperature cycles other than normal temperature changes, as they may be adversely affected.

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

<Reed switch>

When excessive impact (300m/s² or more) is applied to a reed switch during operation, the contact will malfunction and generate or cut off a signal momentarily (1ms or less). Consult SMC regarding the need to use a solid state switch depending upon the environment.

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

<Solid state switch>

When there are units (solenoid type lifter, high frequency induction furnace, motor, etc.) which generate a large amount of surge in the area around cylinders with solid state auto switches, this may cause deterioration or damage to internal circuit elements of the switch. Avoid sources of surge generation and disorganized lines.

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

When a large amount of ferrous debris such as machining chips or welding 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 auto switches 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 lead wires.
To prevent faulty insulation, replace switches or repair lead wires, etc., if damage is discovered.
- 3) Confirm the lighting of the green light on a 2-color display type switch.
Confirm that the green LED is on when stopped at the established position. If the red LED is on, the mounting position is not appropriate. Readjust the mounting position until the green LED lights up.

Other

⚠ Warning

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

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 10 through 12 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. In vertical operation, it is not possible to stop the piston at an intermediate position using a closed center solenoid valve, etc.

In vertical operation, it is not possible to stop the piston at an intermediate position using a closed center solenoid valve because it can cause dislocation of the magnet coupling. The only available option in such cases is use of an external stopper for an intermediate stop.

4. When stopping the piston using a closed center solenoid valve in horizontal operation, do not allow the kinetic energy exceed the allowable kinetic energy.

When stopping the piston using a closed center solenoid valve in horizontal operation, do not allow the kinetic energy of the load to exceed the values shown below. If the allowable value is exceeded, it can cause dislocation of the magnet coupling.

Model	Allowable kinetic energy for intermediate stop (J)
MXY6	0.007
MXY8	0.014
MXY12	0.047

5. Do not operate in such a way that excessive external forces or impact forces are applied to the product.
This can cause damage.

6. Be careful in an application which requires precision in the middle of a stroke.

If straightness is required in the middle of a stroke, fix the entire rail mounting surface on the base.

Mounting

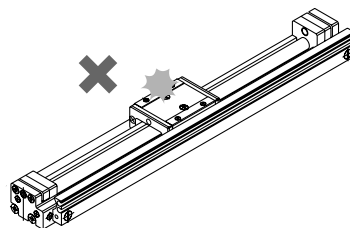
⚠ Caution

1. Do not scratch or gouge the mounting surfaces of the body, table and end plate.

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

2. Do not scratch or gouge the transfer surfaces of the rail and guide.

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 in the guide unit and increased operating resistance, etc.

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

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

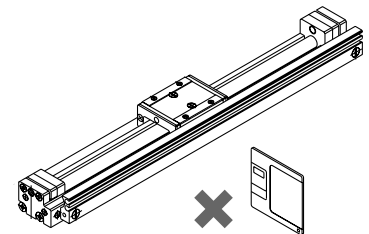
Mounting

⚠ Caution

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

6. Keep away objects which can be influenced by magnets.

A magnet is built inside the body or, in case of a type with auto switch, on the side of the guide lock. Please keep away magnetic disks, cards or tapes. Otherwise, the data can be deleted.



7. Do not bring into close contact with objects which would be influenced by a magnetic field.

As an air slide table has magnets built-in, do not allow close contact with magnetic disks, magnetic cards or magnetic tapes. Data may be erased.

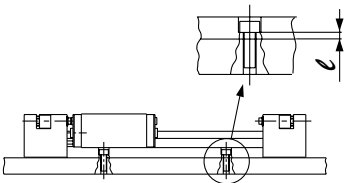
Mounting

⚠ Caution

8. Do not attach magnets to the table section.

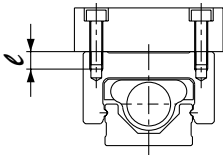
Since the table is constructed with a magnetic substance, it becomes magnetized when magnets, etc. are attached to it, and this may cause malfunction of auto switches, etc.

Using through holes



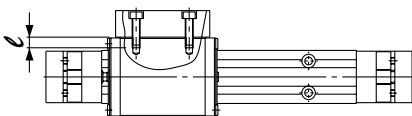
Model	Bolt	Max. tightening torque N·m	Rail thickness (ℓmm)
MX Y6	M2.5 x 0.45	0.65	1.5
MX Y8	M3 x 0.5	1.14	2
MX Y12	M4 x 0.7	2.7	2

Top mounting type



Model	Bolt	Max. tightening torque N·m	Max. screw-in depth (ℓmm)
MX Y6	M3 x 0.5	1.14	3
MX Y8	M4 x 0.7	2.7	4
MX Y12	M5 x 0.8	5.4	5

Side mounting type



Model	Bolt	Max. tightening torque N·m	Max. screw-in depth (ℓmm)
MX Y6	M3 x 0.5	1.14	3
MX Y8	M4 x 0.7	2.7	4
MX Y12	M5 x 0.8	5.4	5

9. Be careful not to bruise the outer surface of the cylinder tube.

If can damage the scraper and wear ring and result in malfunction.

10. Make sure that the magnet coupling is in position when operating.

In case it is displaced, please return it to the right position by pushing the external mover by hand (or pushing the piston mover with air pressure).

11. In vertical operation, be careful about dislocation of the magnet coupling.

Note that the mover may drop off due to dislocation of the magnet coupling if pressure or load beyond the specification is applied.

12. The positioning holes on the top surface of the guide block and those on the bottom of the rail are not aligned.

These holes are used when re-mounting the same product after having removed it for maintenance.

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. Do not use the product in the following conditions.

3. Provide shade in locations exposed to direct sunlight.

4. 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.

Operating Environment

⚠ Caution

5. Do not use in locations where vibration or impact occurs.

Do not use the product in such an environment as it can result in damage or malfunction.

6. 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. Rust may result especially in an environment that allows water drops from condensation to stay on the surface.

Handling of Adjuster Options

Stroke adjuster

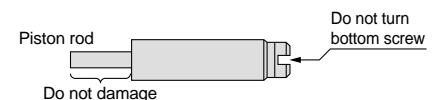
⚠ Caution

1. Do not replace the special adjusting bolt with other bolts.

This may cause looseness and damage due to impact forces, etc.

2. Use the tightening torque in the table below for the lock nut.

Insufficient torque will cause a decrease in the positioning accuracy.



3. The shock absorber is a consumable part.

Replacement is necessary when a drop in energy absorbing capacity is noted.

Applicable size	Shock absorber model
MX Y12	RB0806

Series MXY Specific Product Precautions 3

Be sure to read before handling.

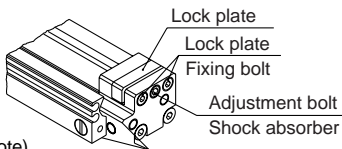
Stroke Adjustment

⚠ Caution

1. Adjustment method

Loosen the 2 lock plate fixing bolts (or shock absorbers) and rotate the adjustment bolt (or shock absorber) to adjust the stroke. Then tighten the lock plate fixing bolts evenly to secure the adjustment bolt (or shock absorber). Be careful not to tighten the lock plate adjusting bolts too firmly.

Model	Tightening torque of lock plate fixing bolt
MXY6	0.1N·m
MXY8	0.2N·m
MXY12	0.4N·m



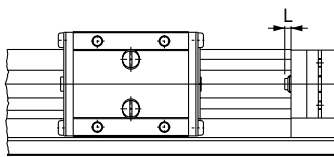
Note)

The lock plate may bend slightly due to tightening of the lock plate fixing bolts but it will not affect the adjustment bolt or shock absorber that has been secured.

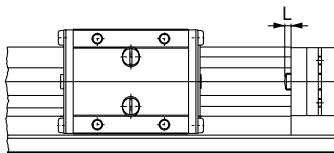
2. Adjustment range

Adjust the stroke within the range where the stopper or shock absorber works effectively. As a guideline, keep the stroke within the range where the L dimension in the figure below is larger than the value in the table. If the stroke exceeds this range, the guide lock will bump into the end plate, affecting the life time.

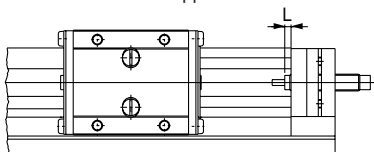
Model	L
MXY6	2mm
MXY8	2mm
MXY12	2.5mm



Rubber stopper screw



Metal stopper screw

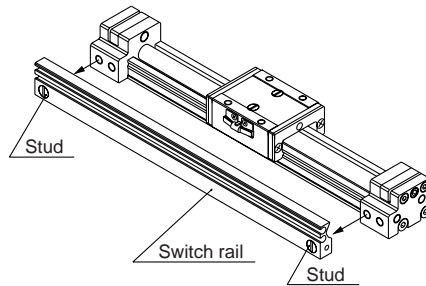


Shock absorber

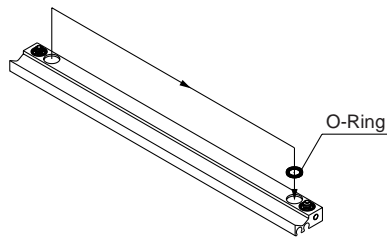
How to Change Concentrated Piping

The piping is concentrated on the left side at the time of shipment. To switch to the right side piping, follow the steps below.

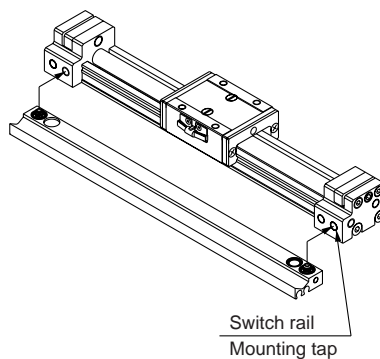
1. Loosen the 2 studs to remove the switch rail.



2. Change the position of the O-ring shown in the figure.

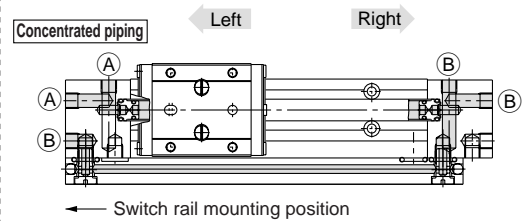


3. Fasten the stud onto the tap at the right side of the end plate and secure the switch rail.

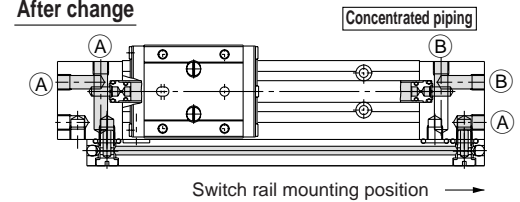


*Stud fastening: After a temporary tightening, tighten an additional 1/4 turn.

At the time of shipment



After change



Port	Actuation Direction
(A)	Right
(B)	Left

Disassembly and Maintenance

⚠ Warning

Be careful the magnets have a large absorption force.

Please pay enough attention when the external mover and piston mover are removed from the cylinder tube for maintenance, etc. Because the magnet mounted on each mover has a large adsorption force. Please refer to the disassembly instructions when disassembling the product.

⚠ Caution

1. Be careful if the external mover is removed in the normal condition, it will directly absorb the piston mover.

When removing the external mover or piston mover, first force the magnet coupling to go off the position to disable the holding power and then remove them separately. If they are removed in the normal condition, the magnets will directly absorb each other and will not go apart.

2. Never disassemble the magnet constructions (piston mover and external mover).

It can cause a drop of the holding power or malfunction.

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