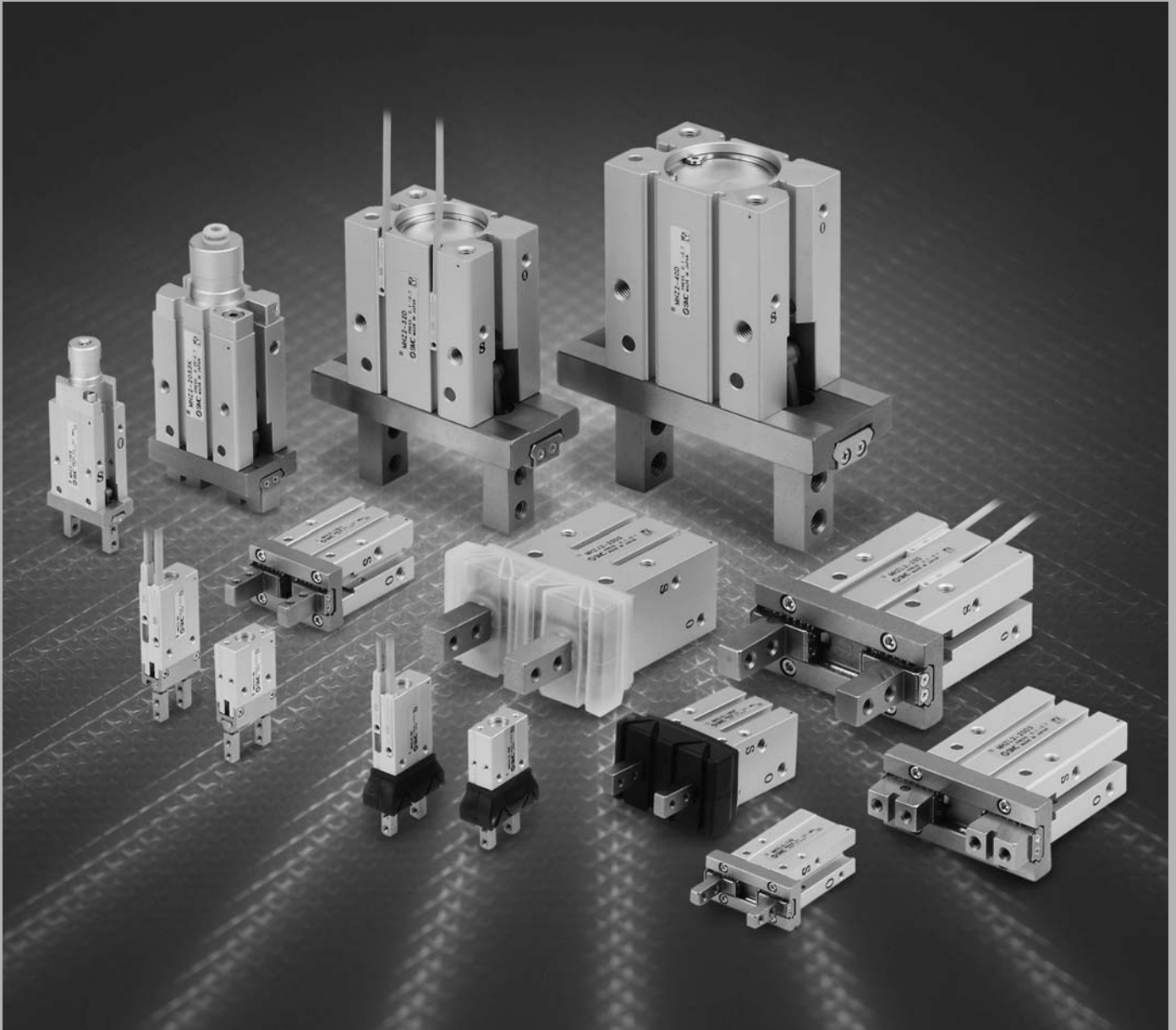


## Series MHZ

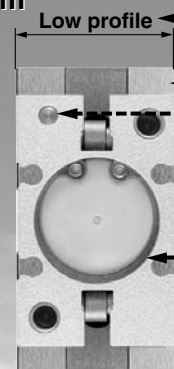
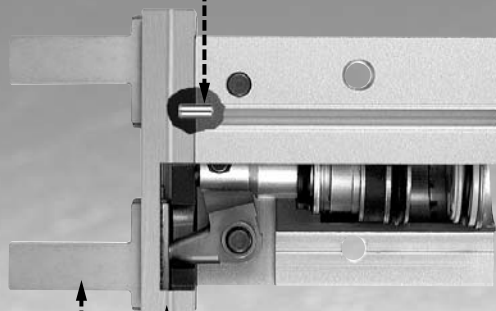
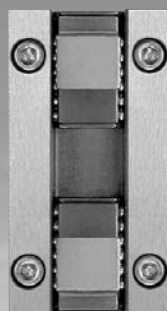
D-☐

# Integral linear guide used for high rigidity

## • Linear guide slippage prevention

Guide slippage is prevented by two positioning dowel pins.

## • Repeatability: $\pm 0.01$ mm

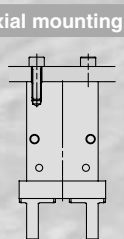


## • Martensitic stainless steel

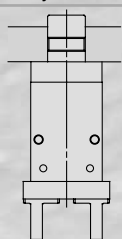
## High degree of mounting flexibility

Can be mounted five ways from three directions.

### Axial mounting

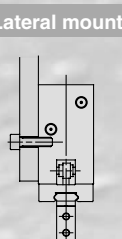


Using tapped holes

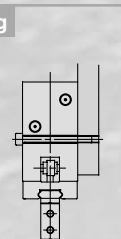


Using end boss

### Lateral mounting

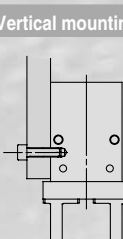


Using tapped holes



Using through-holes

### Vertical mounting

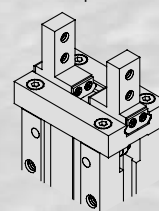


## Finger positions can be selected.

(Standard type/MHZ2)

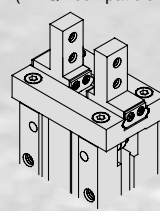
### Standard type

(MHQG2 compatible width)



### Narrow type

(MHQ2 compatible width)



## Series Variations

Series	Bore size (mm)	Action	Body option							Finger option			
			Basic type	End boss type						Basic type (tapped in open/close direction)	Side tapped	Through-holes in open/close direction	Flat type finger
			Side ported	Side ported	With One-touch fitting for coaxial tubing	With One-touch fitting	With M3 port	With M5 port	With hose nipple				
<b>Compact series</b>													
Standard MHZA2-6	6	Double acting	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally open)	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally closed)	•	•	•	•	•	•	•	•	•	•	•
With dust cover MHZAJ2-6	6	Double acting	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally open)	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally closed)	•	•	•	•	•	•	•	•	•	•	•
Standard MHZ2	6	Double acting	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally open)	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally closed)	•	•	•	•	•	•	•	•	•	•	•
	10, 16 20, 25	Double acting	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally open)	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally closed)	•	•	•	•	•	•	•	•	•	•	•
32, 40		Double acting	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally open)	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally closed)	•	•	•	•	•	•	•	•	•	•	•
Long stroke MHZL2	10, 16 20, 25	Double acting	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally open)	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally closed)	•	•	•	•	•	•	•	•	•	•	•
With dust cover MHZJ2	6	Double acting	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally open)	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally closed)	•	•	•	•	•	•	•	•	•	•	•
	10, 16 20, 25	Double acting	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally open)	•	•	•	•	•	•	•	•	•	•	•
		Single acting (Normally closed)	•	•	•	•	•	•	•	•	•	•	•

# and high precision

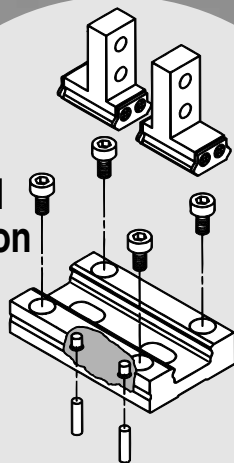
---● Body thickness tolerance:  $\pm 0.05$  mm

---● No guide protrusion  
in direction of body thickness

---● Improved remounting accuracy  
Positioning dowel pin holes provided

---● Top mounting centering location  
Mounting is more secure with a depth 0.5  
to 2 mm greater than conventional types.

## Integral guide rail construction



## Accommodates diverse workpiece diameters with a single unit

- Nearly double the standard stroke
- Long stroke are also compact and lightweight

Series	Opening/Closing stroke (mm) (Open-Closed)	Mass (g)	Body thickness (mm)
MHZL2-10	8 (4)	60	16.4
MHZL2-16	12 (6)	135	23.6
MHZL2-20	18 (10)	270	27.6
MHZL2-25	22 (14)	470	33.6

Values inside ( ) are for standard series MHZ2.

## Long stroke MHZL2



## A wide variety of types and broad size variations

### Compact series (without auto switch)

ø6



### Standard

ø6



ø10 to ø25



ø32, ø40

### With dust cover ø10 to ø25

ø6



### Long stroke ø10 to ø25



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□

# Series MHZ Model Selection

## Model Selection

### Selection Procedure

**Step 1** Confirm gripping force

**Step 2** Confirm gripping point

**Step 3** Confirm external force on fingers

### Step 1 Confirmation of Gripping Force

Confirmation of conditions

Calculation of required gripping force

Selection of model from gripping force graph

#### Example

Workpiece mass:  
0.1 kg

Gripping method:  
External gripping

Gripping point distance:  
L = 30 mm

Operating pressure:  
0.4 MPa

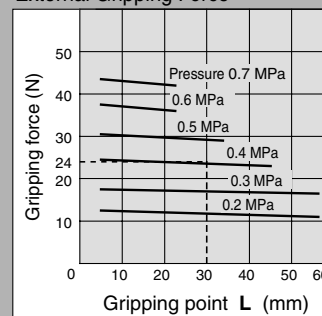
#### Guidelines for the selection of the gripper with respect to component mass

- Although conditions differ according to the work piece shape and the coefficient of friction between the attachments and the workpiece, select a model that can provide a gripping force of 10 to 20 times the workpiece weight, or more.  
(Note) For further details, refer to the model selection illustration.

- If high acceleration, deceleration or impact forces are encountered during motion, a further margin of safety should be considered.

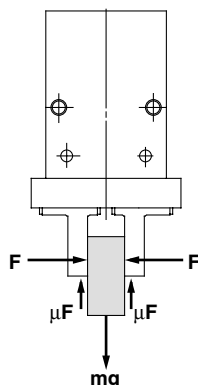
Example) When it is desired to set the gripping force at 20 times or more above the workpiece weight.  
Required gripping force =  $0.1 \text{ kg} \times 20 \times 9.8 \text{ m/s}^2 \approx 19.6 \text{ N}$  or more

#### MHZ□2-16 External Gripping Force



- Selecting MHZ□2-16D.  
A gripping force of 24 N is obtained from the intersection point of gripping point distance L = 30 mm and pressure of 0.4 MPa.
- The gripping force is 24.5 times greater than the workpiece mass, and therefore satisfies a gripping force setting value of 20 times or more.

### Model Selection Illustration



#### “Gripping force at least 10 to 20 times the workpiece weight”

The “10 to 20 times or more of the workpiece weight” recommended by SMC is calculated with a safety margin of  $a = 4$ , which allows for impacts that occur during normal transportation, etc.

When $\mu = 0.2$	When $\mu = 0.1$
$F = \frac{mg}{2 \times 0.2} \times 4$	$F = \frac{mg}{2 \times 0.1} \times 4$
$= 10 \times mg$	$= 20 \times mg$

10 x Workpiece weight

20 x Workpiece weight

Note) • Even in cases where the coefficient of friction is greater than  $\mu = 0.2$ , for reasons of safety, select a gripping force which is at least 10 to 20 times greater than the workpiece weight, as recommended by SMC.

• If high acceleration, deceleration or impact forces are encountered during motion, a further margin of safety should be considered.

When gripping a workpiece as in the figure to the left, and with the following definitions,

**F:** Gripping force (N)

$\mu$ : Coefficient of friction between the attachments and the workpiece

**m:** Workpiece mass (kg)

**g:** Gravitational acceleration ( $= 9.8 \text{ m/s}^2$ )

**mg:** Workpiece weight (N)

the conditions under which the workpiece will not drop are

$$2 \times \mu F > mg$$

Number of fingers

and therefore,

$$F > \frac{mg}{2 \times \mu}$$

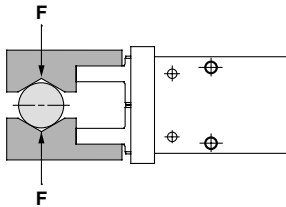
With “a” representing the extra margin, “F” is determined by the following formula:

$$F = \frac{mg}{2 \times \mu} \times a$$

## Step 1 Effective Gripping Force: Series MHZ□2/Double Acting/External Gripping Force

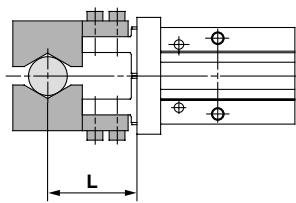
- Indication of effective gripping force

The effective gripping force shown in the graphs to the right is expressed as  $F$ , which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



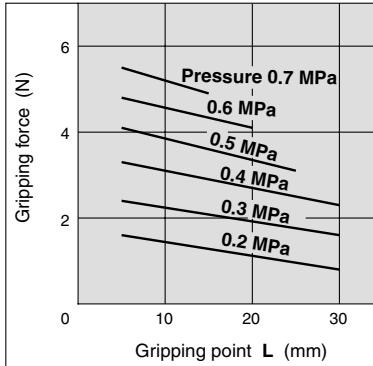
### External Grip

MHZA2, MHZ2, MHZL2

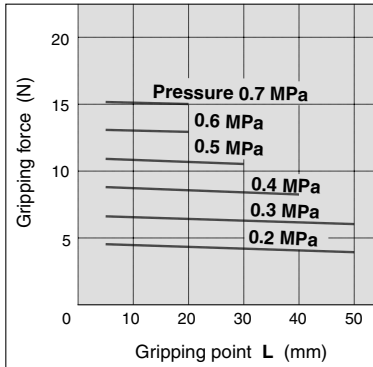


### External Gripping Force

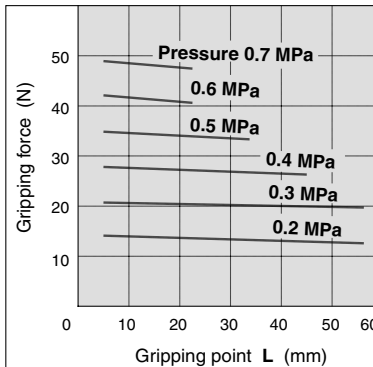
#### MHZ2-6D/MHZA2-6D



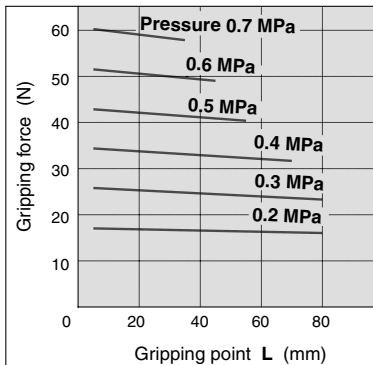
#### MHZ2-10D/MHZA2-10D



#### MHZ2-16D/MHZA2-16D

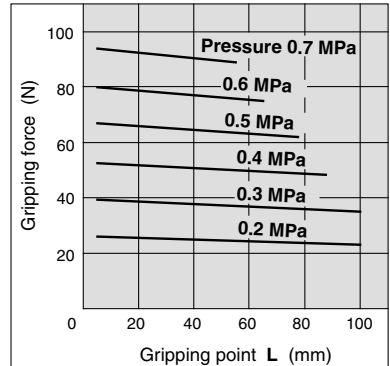


#### MHZ2-20D/MHZA2-20D

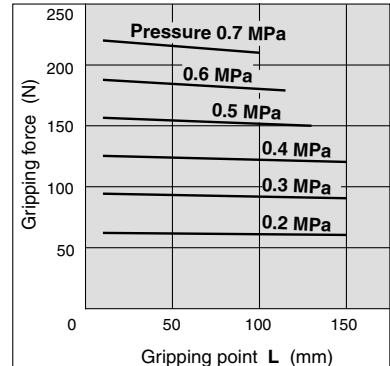


### External Gripping Force

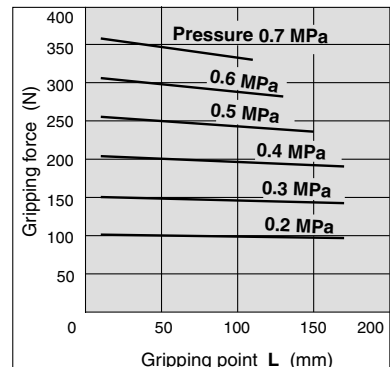
#### MHZ2-25D/MHZA2-25D



#### MHZ2-32D



#### MHZ2-40D



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

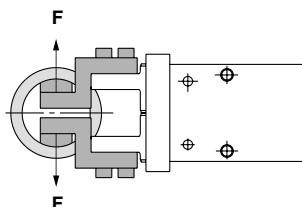
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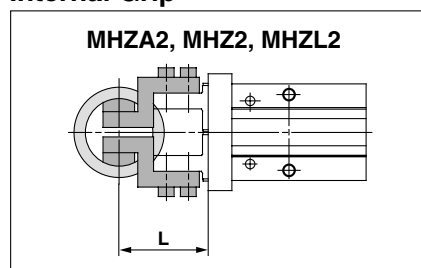
## Model Selection

### Step 1 Effective Gripping Force: Series MHZ□2/Double Acting/Internal Gripping Force

- Indication of effective gripping force  
The effective gripping force shown in the graphs to the right is expressed as  $F$ , which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

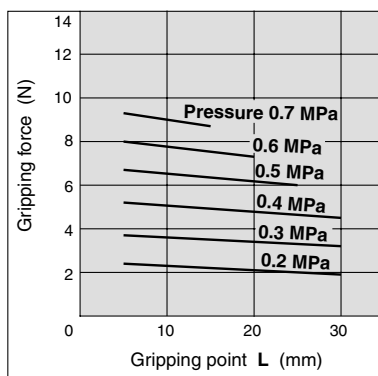


### Internal Grip

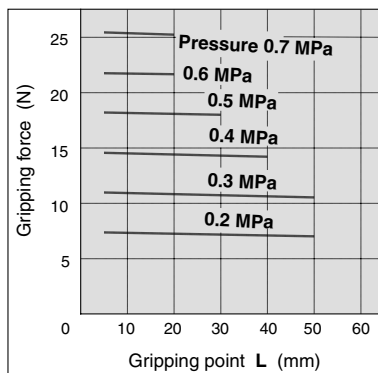


### Internal Gripping Force

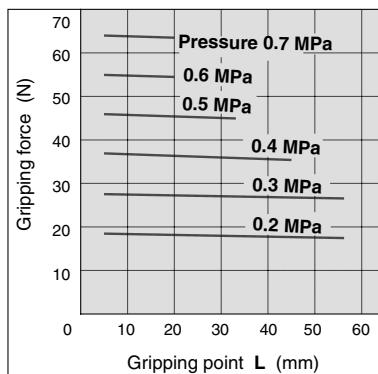
#### MHZ2-6D/MHZA2-6D



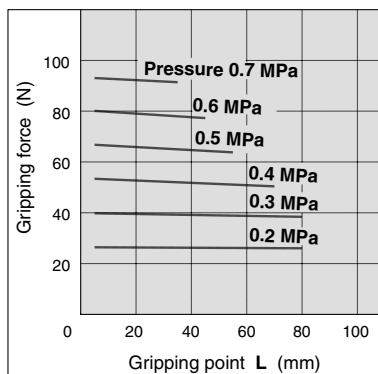
#### MHZ2-10D/MHZA2-10D



#### MHZ2-16D/MHZA2-16D

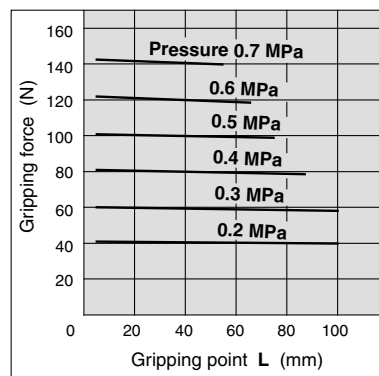


#### MHZ2-20D/MHZA2-20D

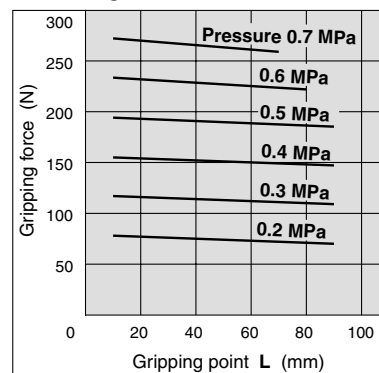


### Internal Gripping Force

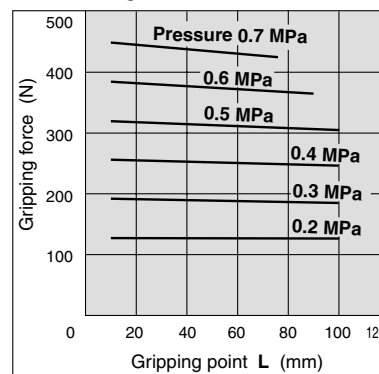
#### MHZ2-25D/MHZA2-25D



#### MHZ2-32D



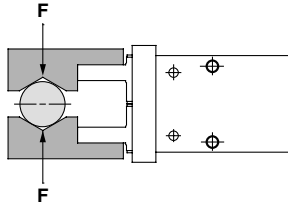
#### MHZ2-40D



## Step 1 Effective Gripping Force: Series MHZ□2/Single Acting/External Gripping Force

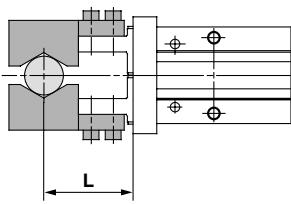
### • Indication of effective gripping force

The effective gripping force shown in the graphs to the right is expressed as  $F$ , which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



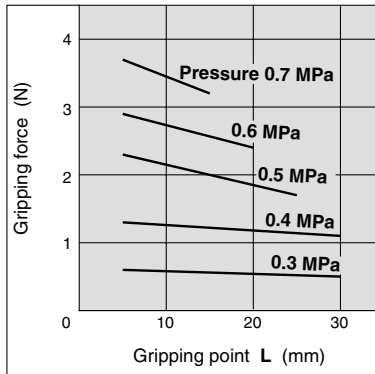
### External Grip

MHZA2, MHZ2, MHZL2

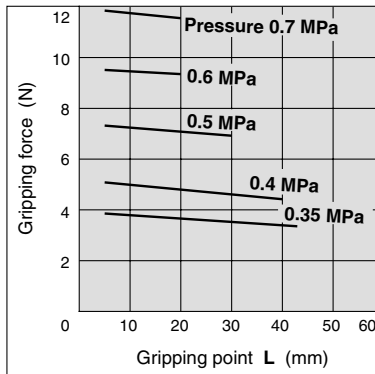


### External Gripping Force

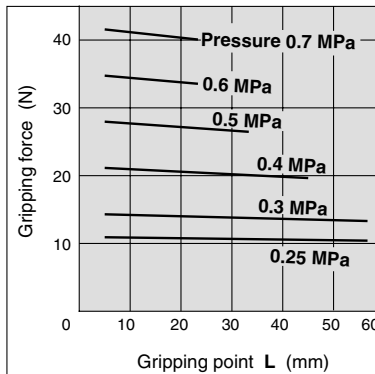
#### MHZ2-6S/MHZA2-6S



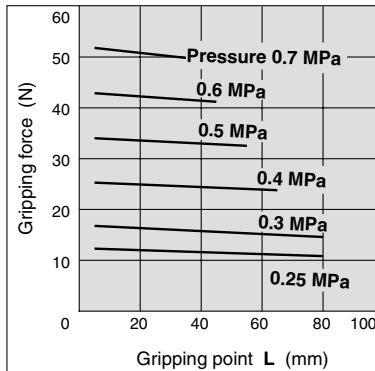
#### MHZ2-10S/MHZL2-10S



#### MHZ2-16S/MHZL2-16S

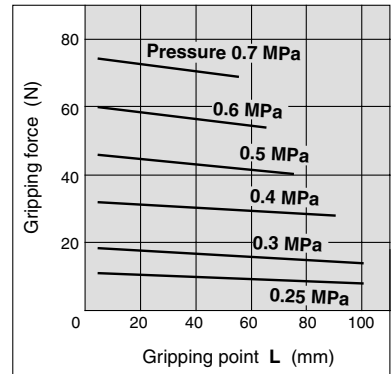


#### MHZ2-20S/MHZL2-20S

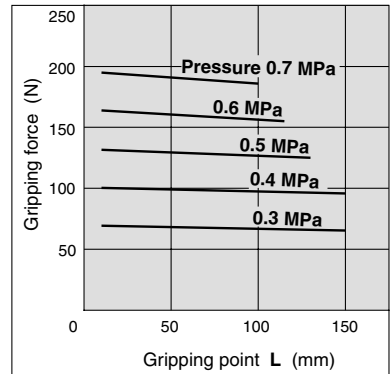


### External Gripping Force

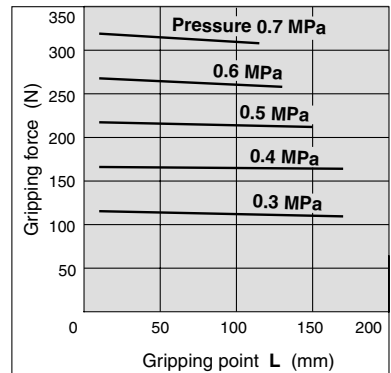
#### MHZ2-25S/MHZL2-25S



#### MHZ2-32S



#### MHZ2-40S



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

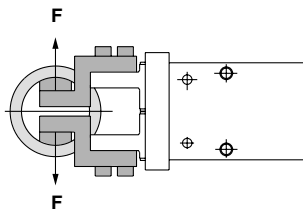
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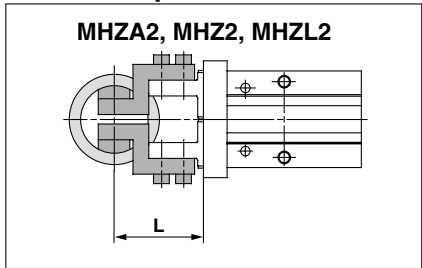
Model Selection

**Step 1** Effective Gripping Force: Series MHZ□2/Single Acting/Internal Gripping Force

- Indication of effective gripping force  
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

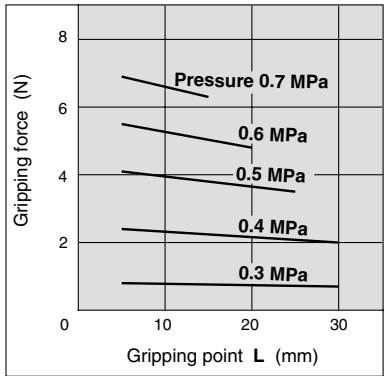


Internal Grip



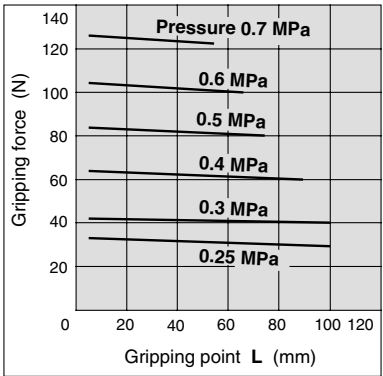
Internal Gripping Force

MHZ2-6C/MHZA2-6C

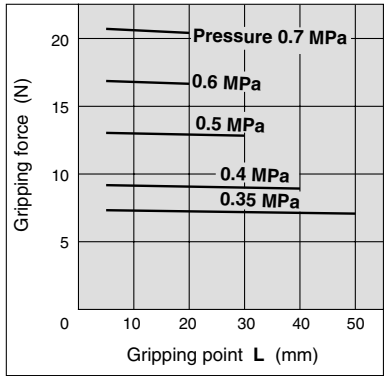


Internal Gripping Force

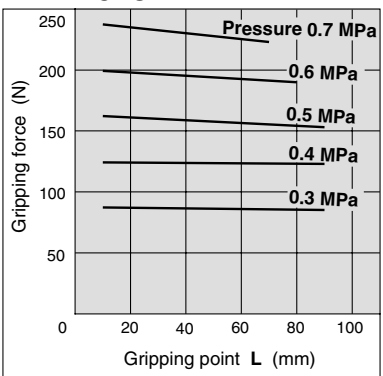
MHZ2-25C/MHZL2-25C



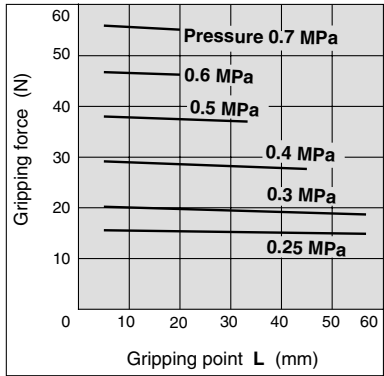
MHZ2-10C/MHZL2-10C



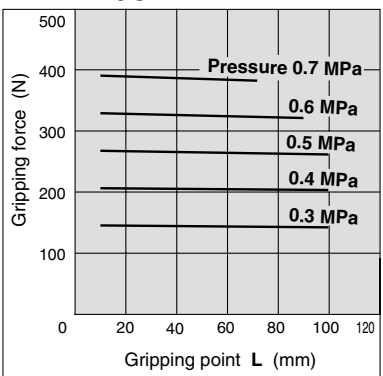
MHZ2-32C



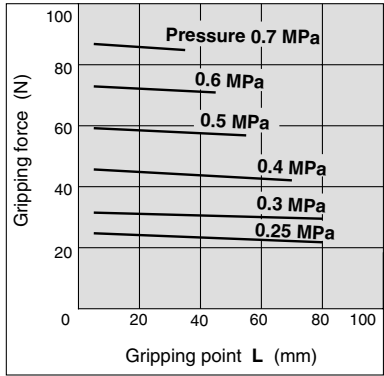
MHZ2-16C/MHZL2-16C



MHZ2-40C



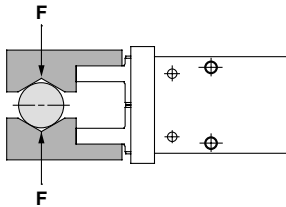
MHZ2-20C/MHZL2-20C





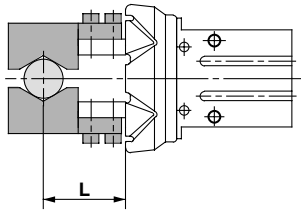
## Step 1 Effective Gripping Force: Series MHZ□2/Double Acting/External Gripping Force

- Indication of effective gripping force  
The effective gripping force shown in the graphs to the right is expressed as  $F$ , which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



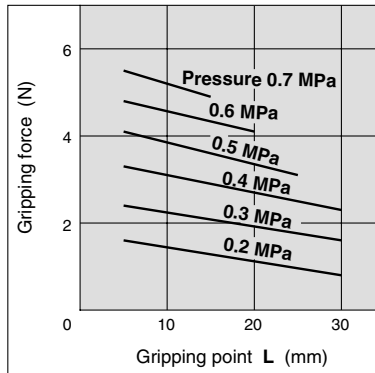
### External Grip

MHZAJ2, MHZJ2, 11-MHZ2



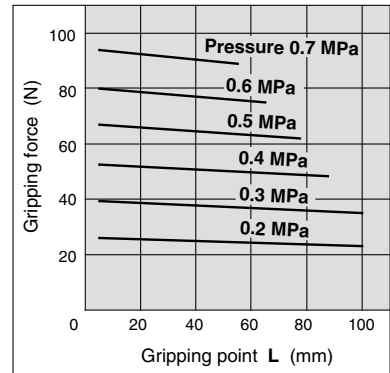
### External Gripping Force

MHZJ2-6D/MHZAJ2-6D

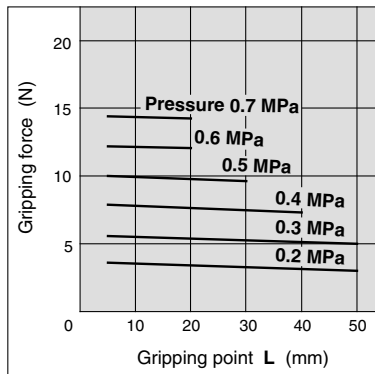


### External Gripping Force

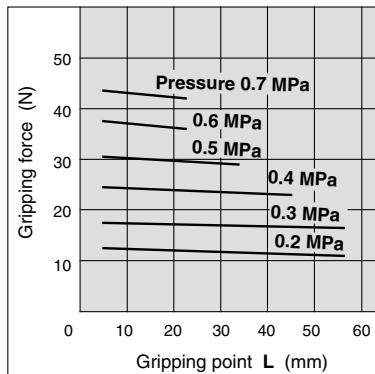
MHZJ2-25D/11-MHZ2-25D



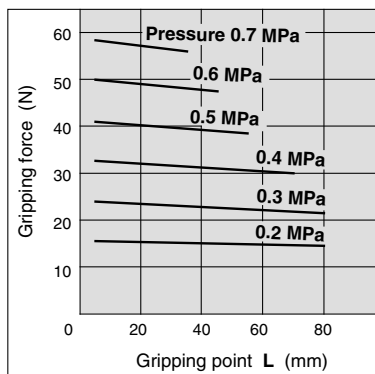
MHZJ2-10D/11-MHZ2-10D



MHZJ2-16D/11-MHZ2-16D



MHZJ2-20D/11-MHZ2-20D



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

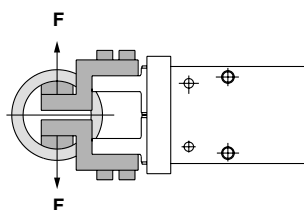
MA

D-□

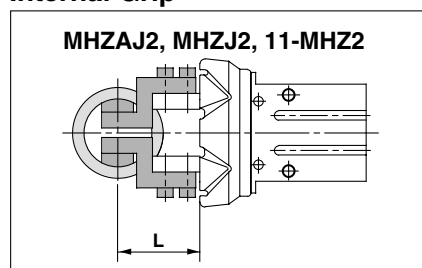
## Model Selection

### Step 1 Effective Gripping Force: Series MHZ□2/Double Acting/Internal Gripping Force

- Indication of effective gripping force  
The effective gripping force shown in the graphs to the right is expressed as  $F$ , which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

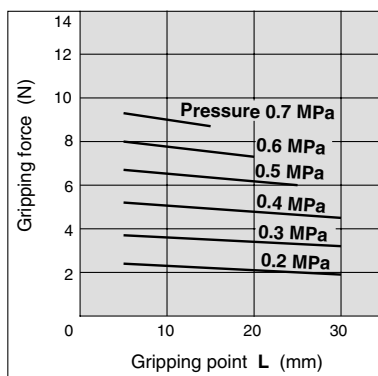


### Internal Grip

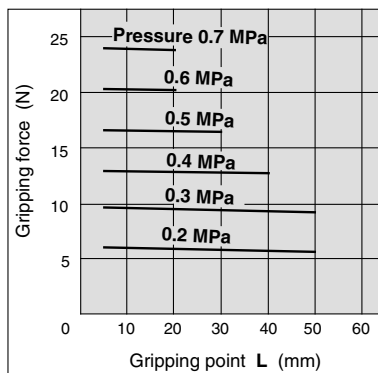


### Internal Gripping Force

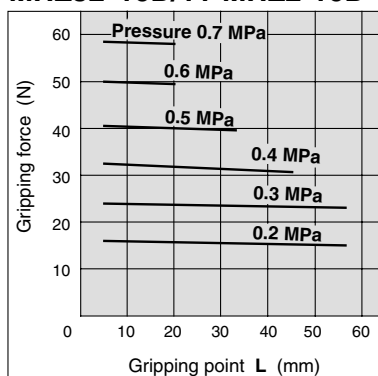
#### MHZJ2-6D/MHZAJ2-6D



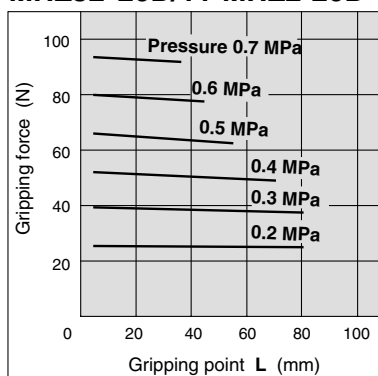
#### MHZJ2-10D/11-MHZ2-10D



#### MHZJ2-16D/11-MHZ2-16D

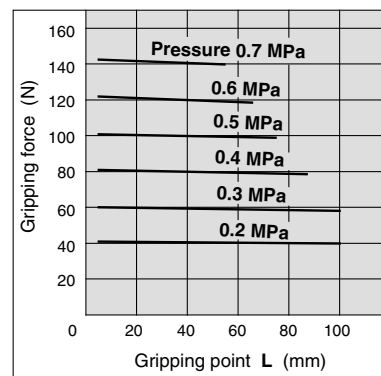


#### MHZJ2-20D/11-MHZ2-20D



### Internal Gripping Force

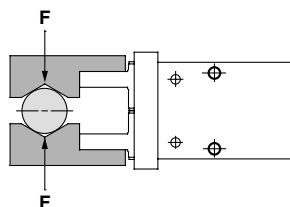
#### MHZJ2-25D/11-MHZ2-25D



## Step 1 Effective Gripping Force: Series MHZ□2/Single Acting/External Gripping Force

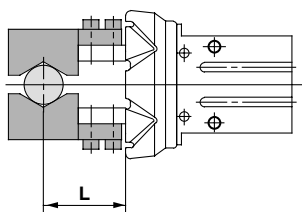
- Indication of effective gripping force

The effective gripping force shown in the graphs to the right is expressed as  $F$ , which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



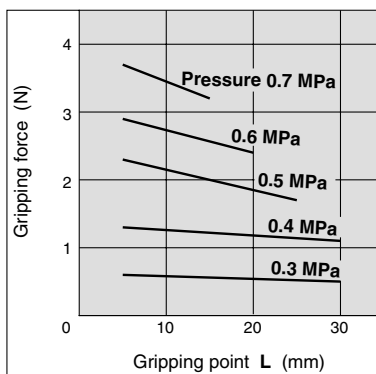
### External Grip

MHZAJ2, MHZJ2



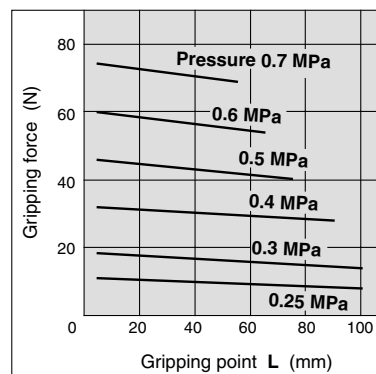
### External Gripping Force

MHZJ2-6S/MHZAJ2-6S

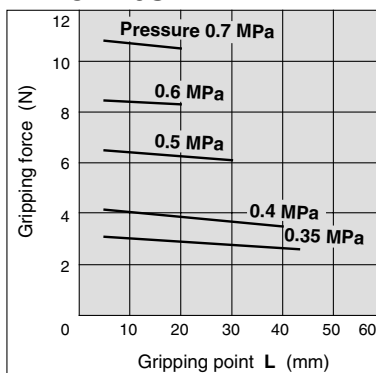


### External Gripping Force

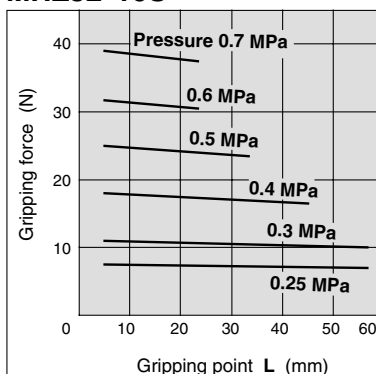
MHZJ2-25S



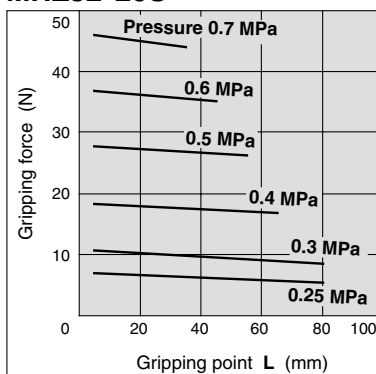
MHZJ2-10S



MHZJ2-16S



MHZJ2-20S



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

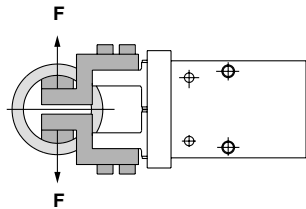
MA

D-□

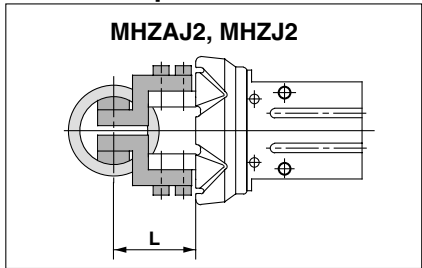
Model Selection

**Step 1** Effective Gripping Force: Series MHZ□2/Single Acting/Internal Gripping Force

- Indication of effective gripping force  
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

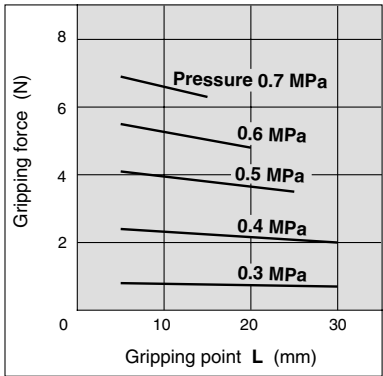


Internal Grip



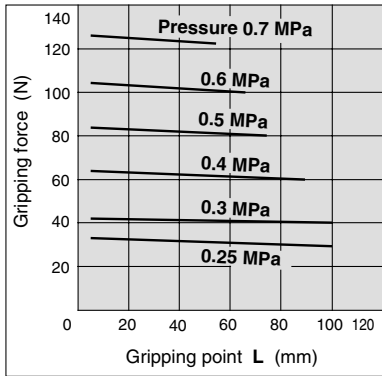
Internal Gripping Force

MHZJ2-6C/MHZAJ2-6C

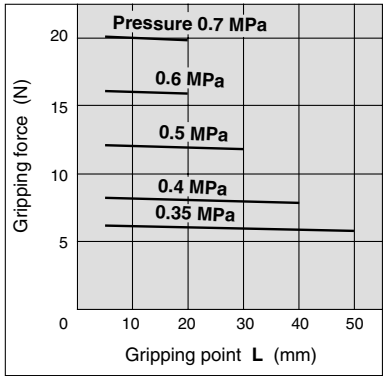


Internal Gripping Force

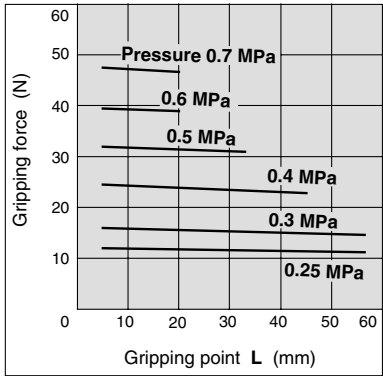
MHZJ2-25C



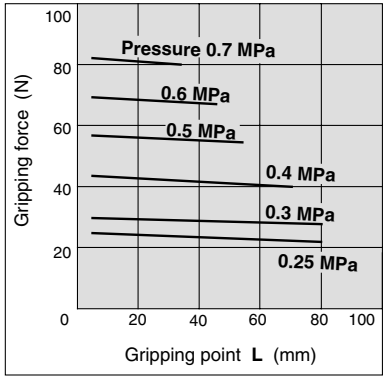
MHZJ2-10C



MHZJ2-16C

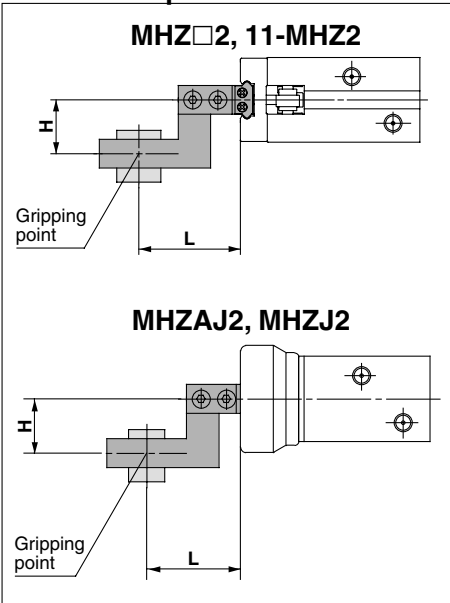


MHZJ2-20C



## Step 2 Confirmation of Gripping Point: Series MHZ□/External Grip

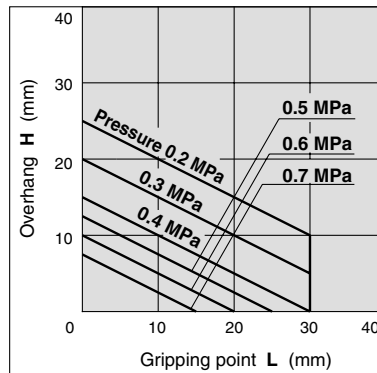
### External Grip



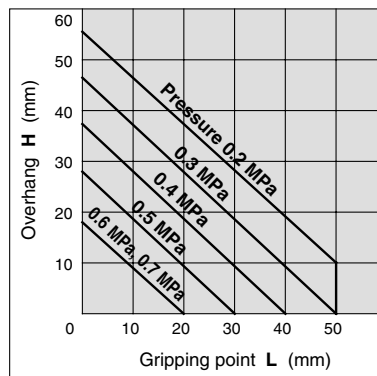
- The air gripper should be operated so that the workpiece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs to the right.
- If the workpiece gripping point goes beyond the range limits, this will have an adverse effect on the life of the air gripper.

### External Grip

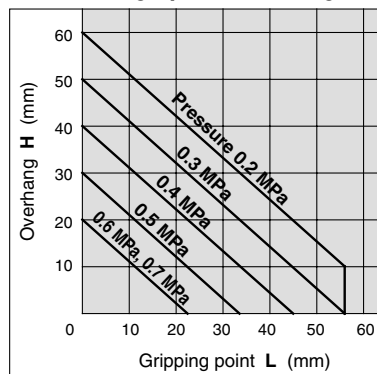
#### MHZ□2-6□



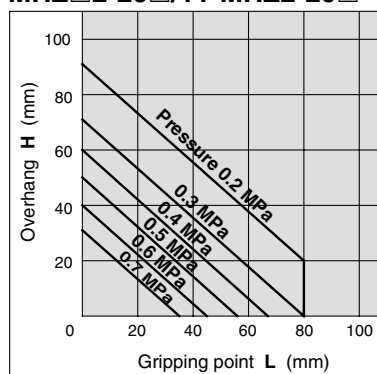
#### MHZ□2-10□/11-MHZ2-10□



#### MHZ□2-16□/11-MHZ2-16□

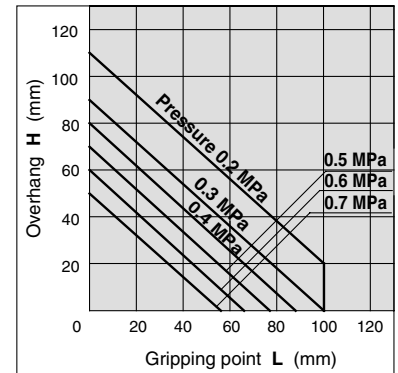


#### MHZ□2-20□/11-MHZ2-20□

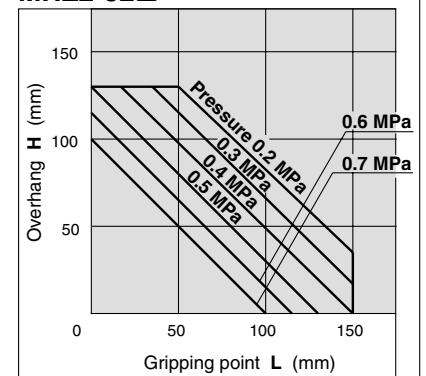


### External Grip

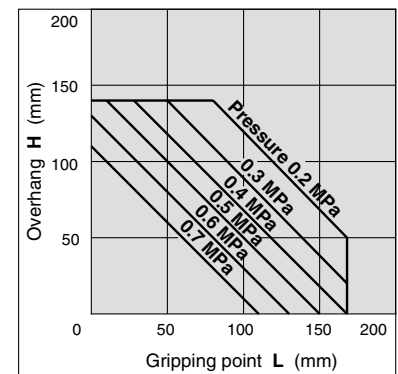
#### MHZ□2-25□/11-MHZ2-25□



#### MHZ2-32□



#### MHZ2-40□



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

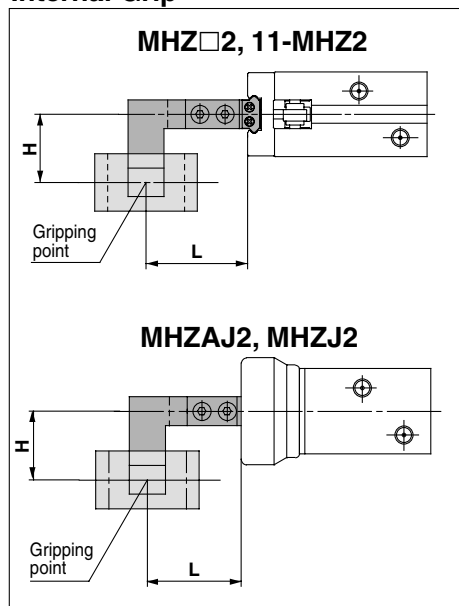
MA

D-□

## Model Selection

### Step 2 Confirmation of Gripping Point: Series MHZ□/Internal Grip

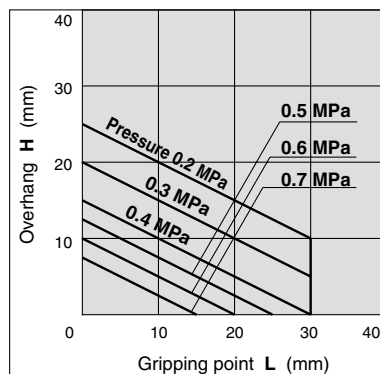
#### Internal Grip



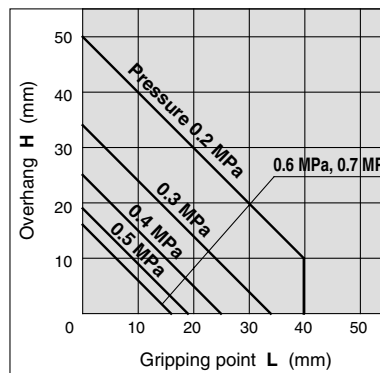
- The air gripper should be operated so that the workpiece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs to the right.
- If the workpiece gripping point goes beyond the range limits, this will have an adverse effect on the life of the air gripper.

#### Internal Grip

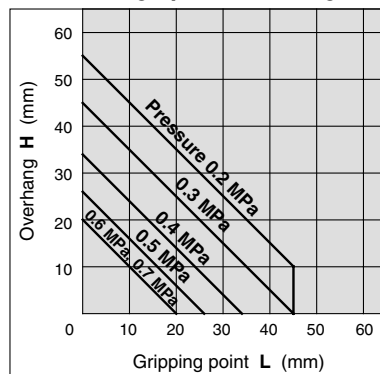
##### MHZ□2-6□



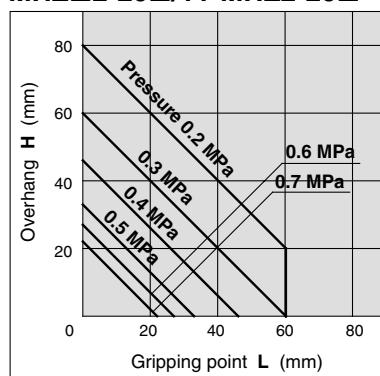
##### MHZ□2-10□/11-MHZ2-10□



##### MHZ□2-16□/11-MHZ2-16□

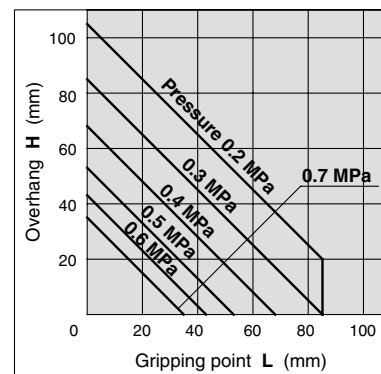


##### MHZ□2-20□/11-MHZ2-20□

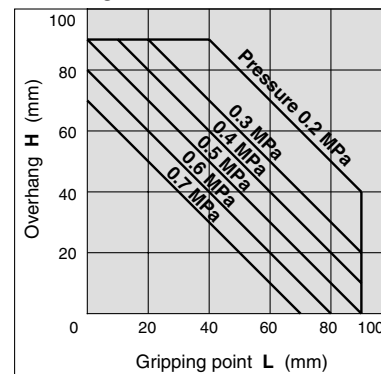


#### Internal Grip

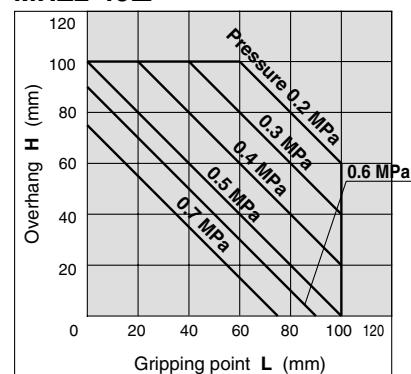
##### MHZ□2-25□/11-MHZ2-25□

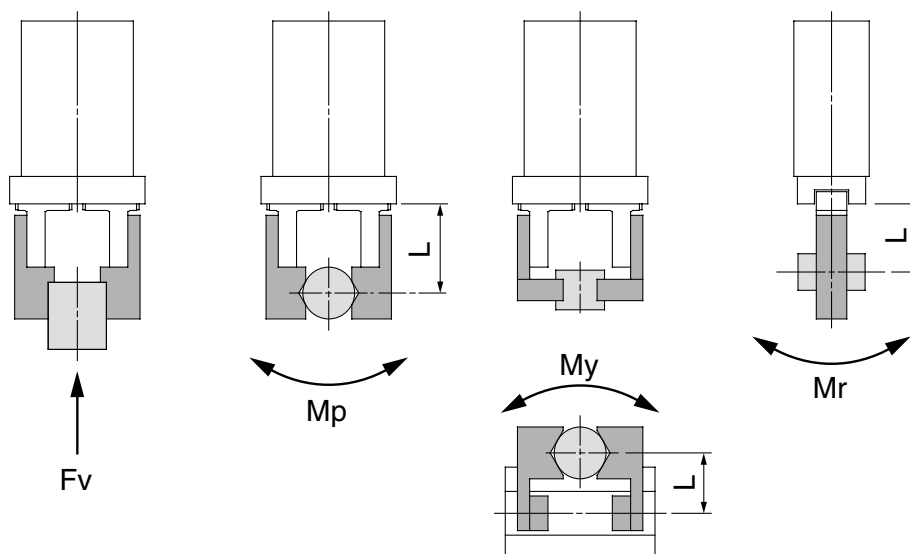


##### MHZ2-32□



##### MHZ2-40□



**Step 3 Confirmation of External Force on Fingers: Series MHZ□2**


L: Distance to the point at which the load is applied (mm)

Model	Allowable vertical load <b>Fv (N)</b>	Maximum allowable moment		
		Pitch moment: <b>Mp (N·m)</b>	Yaw moment: <b>My (N·m)</b>	Roll moment: <b>Mr (N·m)</b>
<b>MHZ□2-6</b>	10	0.04	0.04	0.08
<b>MHZ□2-10</b>	58	0.26	0.26	0.53
<b>MHZ□2-16</b>	98	0.68	0.68	1.36
<b>MHZ□2-20</b>	147	1.32	1.32	2.65
<b>MHZ□2-25</b>	255	1.94	1.94	3.88
<b>MHZ□2-32</b>	343	3	3	6
<b>MHZ□2-40</b>	490	4.5	4.5	9

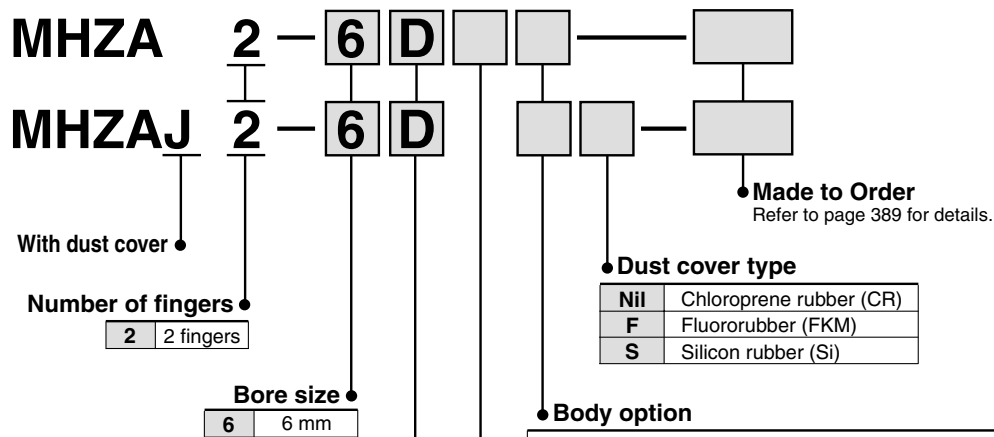
Note) Values for load and moment in the table indicate static values.

Calculation of allowable external force (when moment load is applied)	Calculation example
$\text{Allowable load } F \text{ (N)} = \frac{M \text{ (maximum allowable moment) (N·m)}}{L \times 10^{-3}}$ <p>(*: Constant for unit conversion)</p>	<p>When a static load of <math>f = 10 \text{ N}</math> is operating, which applies pitch moment to point <math>L = 30 \text{ mm}</math> from the MHZ□2-16D guide. Therefore, it can be used.</p> $\text{Allowable load } F = \frac{0.68}{30 \times 10^{-3}} = 22.7 \text{ (N)}$ <p><b>Load <math>f = 10 \text{ (N)} &lt; 22.7 \text{ (N)}</math></b></p>

**MHZ**
**MHF**
**MHL**
**MHR**
**MHK**
**MHS**
**MHC**
**MHT**
**MHY**
**MHW**
**-X□**
**MRHQ**
**MA**
**D-□**

# Parallel Style Air Gripper (Standard) Compact Series (Without Auto Switch) Series *MHZA2-6/MHZAJ2-6*

## How to Order

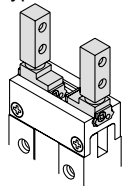


• Action •

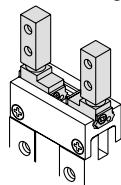
D	Double acting
S	Single acting (Normally open)
C	Single acting (Normally closed)

### Finger option •

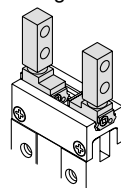
[Standard]  
Nil: Basic type



1: Side tapped mounting



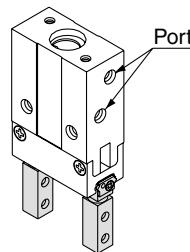
2: Through-holes in opening/closing direction



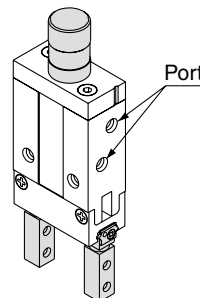
3: Flat type fingers

### • Body option

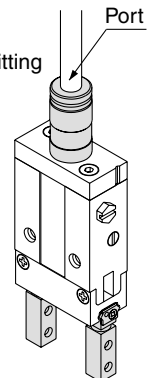
Nil: Basic type



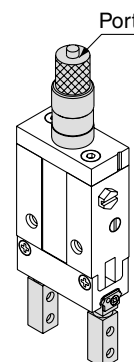
E: End boss type  
Side ported  
(Double acting/Single acting)



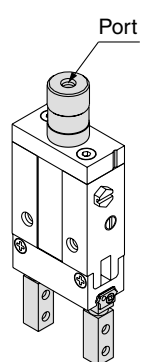
K: End boss type  
Axial ported  
with ø4 One-touch fitting  
(Single acting)



H: End boss type  
Axial ported  
with ø4 hose nipple  
(Single acting)



M: End boss type  
Axial ported  
with M3 port  
(Single acting)





# Parallel Style Air Gripper/Compact Series *Series MHZA2-6/MHZAJ2-6*



## Specifications

Operating pressure	Fluid		Air
	Double acting		0.15 to 0.7 MPa
	Single acting	Normally open Normally closed	0.3 to 0.7 MPa
Ambient and fluid temperature			-10 to 60°C
Repeatability			±0.01 mm
Max. operating frequency			180 c.p.m.
Lubrication			Not required
Action			Double acting/Single acting

\* Use the gripper with dust cover when used in a place where there may be dust.

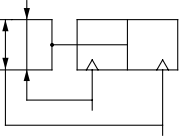
## Model

Action		Model	Bore size (mm)	Gripping force <sup>Note)</sup>		Opening/ Closing (Both sides) (mm)	Mass (g)
				Gripping force per finger			
				Effective value (N)			
				External	Internal		
Double acting		MHZA2-6D	6	3.3	6.1	4	26
		MHZAJ2-6D	6			4	27
Single acting	Normally open	MHZA2-6S	6	1.9	—	4	26
		MHZAJ2-6S	6			4	27
	Normally closed	MHZA2-6C	6	—	3.7	4	26
		MHZAJ2-6C	6			4	27

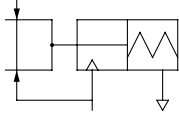
Note) Values based on pressure of 0.5 MPa, gripping point L = 20 mm, at center of stroke.

### JIS Symbol

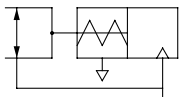
Double acting



Single acting type,  
Normally open



Single acting type,  
Normally closed



## Option

### ●Body Option/End Boss Type

Symbol	Piping port location	Type of piping port	Applicable model	
		MHZA2-6/MHZAJ2-6	Double acting	Single acting
Nil	Basic type	M3 x 0.5	●	●
E	Side ported	M3 x 0.5	●	●
K	Axial ported	With ø4 One-touch fitting	—	●
H		With ø4 hose nipple	—	●
M		M3 x 0.5	—	●



### Made to Order

(Refer to pages 683 to 713 for details.)

Symbol	Specifications/Description
-X4	Heat resistance (100°C)
-X5	Fluororubber seal
-X12	Opening direction spring assist
-X53	EPDM seal/Fluorine grease
-X56	Axial ported type
-X63	Fluorine grease
-X64	Finger: Side tapped mounting
-X65	Finger: Through-hole mounting
-X77A	Dust cover adhesion
-X77B	Dust cover adhesion (Finger part only)
-X78A	Dust cover caulking
-X78B	Dust cover caulking (Finger part only)
-X79	Grease for food

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

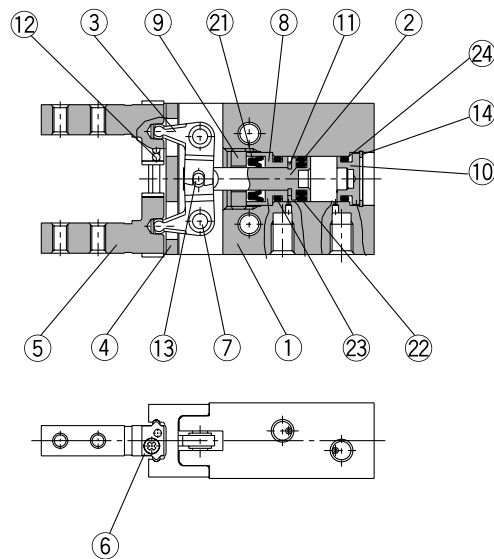
MA

D-□

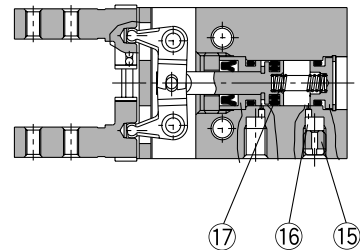
# Series MHZA2-6/MHZAJ2-6

## Construction: Standard Type MHZA2-6

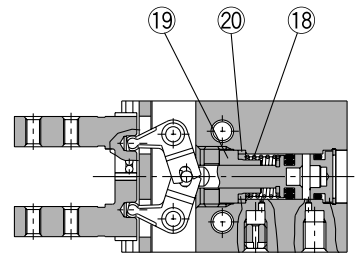
Double acting/With fingers open



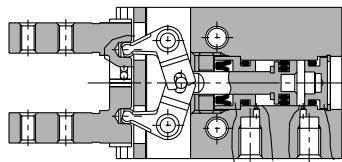
Single acting/Normally open



Single acting/Normally closed



Double acting/With fingers closed



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	Stainless steel	
3	Lever	Stainless steel	Heat treated
4	Guide	Stainless steel	Heat treated
5	Finger	Stainless steel	Heat treated
6	Roller stopper	Stainless steel	
7	Lever shaft	Stainless steel	Nitriding
8	Holder	Brass	Electroless nickel plated
9	Holder lock	Stainless steel	
10	Cap	Aluminum alloy	Clear anodized
11	Bumper	Urethane rubber	
12	Steel balls	High carbon chrome bearing steel	
13	Needle roller	High carbon chrome bearing steel	

### Component Parts

No.	Description	Material	Note
14	Type C retaining ring	Carbon steel	Nickel plated
15	Exhaust plug	Brass	Electroless nickel plated
16	Exhaust filter	Polyvinyl formal	
17	N.O. spring	Stainless steel spring wire	
18	N.C. spring	Stainless steel spring wire	
19	N.C. holder	Brass	Electroless nickel plated
20	N.C. spacer	Stainless steel	
21	Rod seal	NBR	
22	Piston seal	NBR	
23	Gasket	NBR	
24	Gasket	NBR	

### Replacement Parts

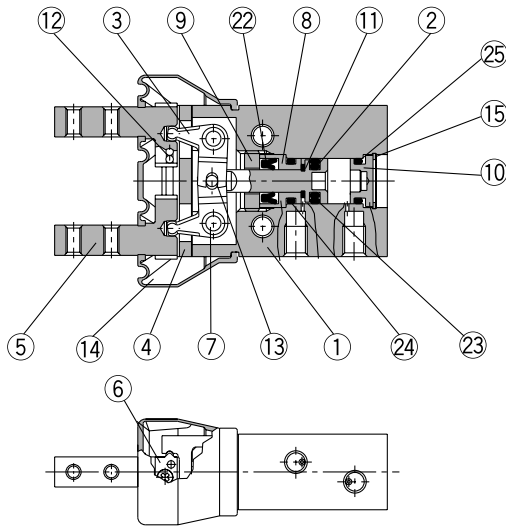
Description		MHZA2-6□	Main parts
Finger assembly		Please contact SMC to replace the seal kit and finger assembly.	
Piston assembly	MHZA2-6D□	MHZA-A0603	②⑧⑨⑪⑬⑮⑰⑲⑳㉑
	MHZA2-6S□		
	MHZA2-6C□	MHZA-A0603C	②⑨⑪⑬⑮⑰⑲⑳㉑㉒
End boss assembly	MHZA2-6□□H	MHZA-A0607	Main body of adaptor Mounting screw for adaptor Seal
	MHZA2-6□□K	MHZA-A0608	
	MHZA2-6□□M	MHZA-A0609	
	MHZA2-6□□E	MHZA-A0610	

\* The end boss assembly other than type E should be mounted on the special body.

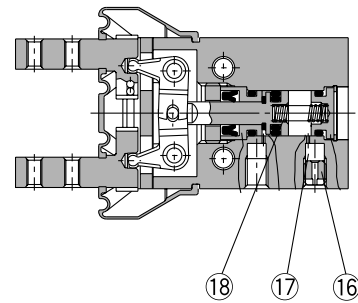
Replacement part/Grease pack part no.: GR-S-005 (5 g)

## Construction: With Dust Cover MHZAJ2-6

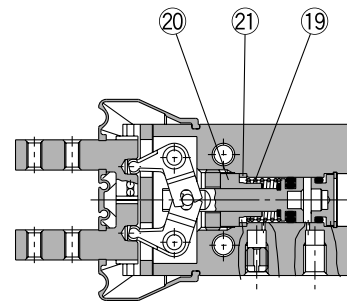
### Double acting/With fingers open



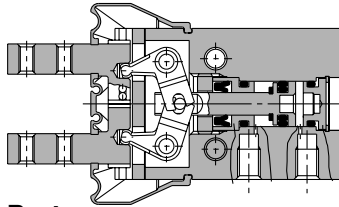
### Single acting/Normally open



### Single acting/Normally closed



### Double acting/With fingers closed



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	Stainless steel	
3	Lever	Stainless steel	Heat treated
4	Guide	Stainless steel	Heat treated
5	Finger	Stainless steel	Heat treated
6	Roller stopper	Stainless steel	
7	Lever shaft	Stainless steel	Nitriding
8	Holder	Brass	Electroless nickel plated
9	Holder lock	Stainless steel	
10	Cap	Aluminum alloy	Clear anodized
11	Bumper	Urethane rubber	
12	Steel balls	High carbon chrome bearing steel	
13	Needle roller	High carbon chrome bearing steel	

### Component Parts

No.	Description	Material	Note
14	Dust cover	CR	Chloroprene rubber
		FKM	Fluororubber
		Si	Silicon rubber
15	Type C retaining ring	Carbon steel	Nickel plated
16	Exhaust plug	Brass	Electroless nickel plated
17	Exhaust filter	Polyvinyl formal	
18	N.O. spring	Stainless steel spring wire	
19	N.C. spring	Stainless steel spring wire	
20	N.C. holder	Brass	Electroless nickel plated
21	N.C. spacer	Stainless steel	
22	Rod seal	NBR	
23	Piston seal	NBR	
24	Gasket	NBR	
25	Gasket	NBR	

### Replacement Parts

Description		MHZAJ2-6	Main parts
Seal kit		Please contact SMC to replace the seal kit.	
Dust cover	Material	CR	MHZAJ2-J6
		FKM	MHZAJ2-J6F
		Si	MHZAJ2-J6S
Finger assembly		Please contact SMC to replace the finger assembly.	
Piston assembly	MHZAJ2-6D□	MHZAJ-A0603	②⑧⑨⑪⑬⑮⑰⑲⑳㉑㉒
	MHZAJ2-6S□		
	MHZAJ2-6C□	MHZAJ-A0603C	②⑨⑪⑬⑮⑰⑲⑳㉑㉒
End boss assembly	MHZA2-6□□H	MHZA-A0607	Main body of adaptor Mounting screw for adaptor Seal
	MHZA2-6□□K	MHZA-A0608	
	MHZA2-6□□M	MHZA-A0609	
	MHZA2-6□□E	MHZA-A0610	

\* End boss type

H = With hose nipple, K = With One-touch fitting, M = With M3 port, E = Side ported

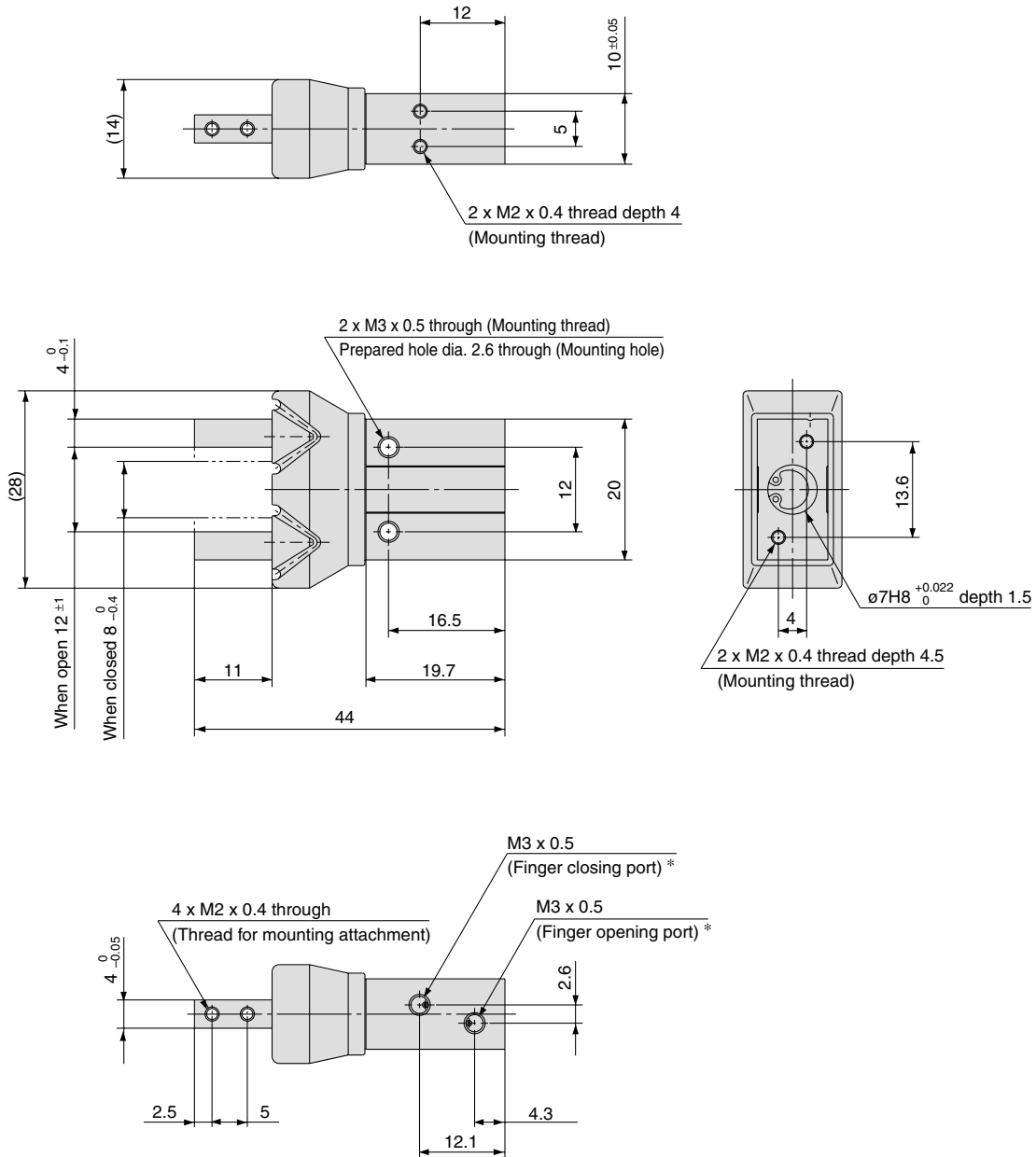
\* The end boss assembly other than type E should be mounted on the special body.

Replacement part/Grease pack part no.: GR-S-005 (5 g)



### **Dimensions: With Dust Cover**

**MHZAJ2-6** ☐ Double acting/Single acting  
Basic type



\* For single action, the port on one side is a breathing hole.

**MHZ****MHF**

MHL

MHR

**MHK**

MHS

MHC

MHT

MHY

MHW

**-X** ☐

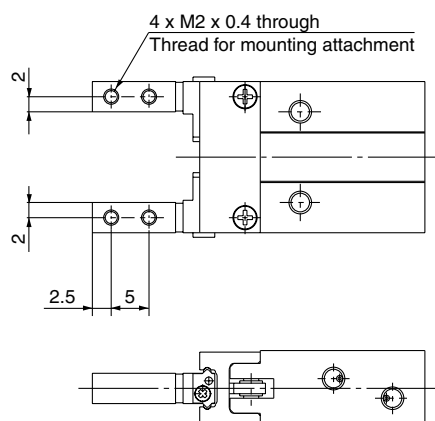
MRH0

MA

D-☐

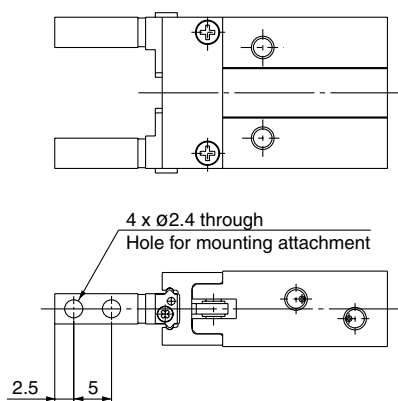
# Series MHZA2-6 Finger Option

## Side Tapped Mounting [1]



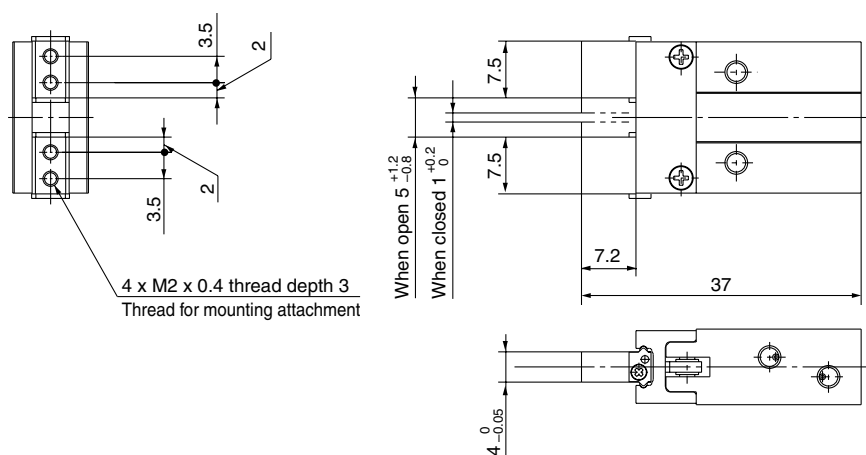
\* Specifications and dimensions other than the above are the same as the basic type.

## Through-holes in Opening/Closing Direction [2]



\* Specifications and dimensions other than the above are the same as the basic type.

## Flat Type Fingers [3]



Mass: 25 g

\* Specifications and dimensions other than the above are the same as the basic type.

## Series MHZA2-6/MHZAJ2-6

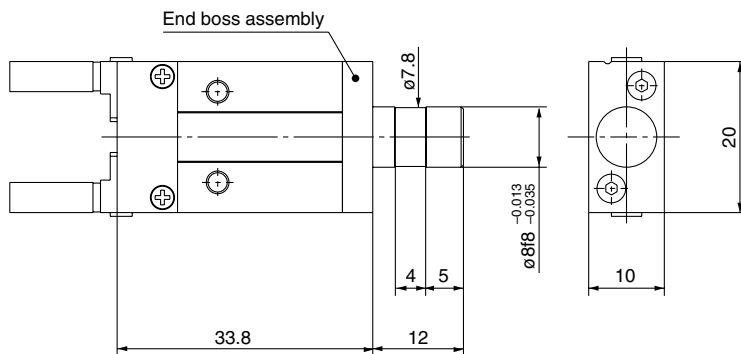
# Body Option: End Boss Type

### Applicable Model

Symbol	Piping port location	Type of piping port		Applicable model	
		MHZA2	MHZAJ2	Double acting	Single acting
E	Side ported	M3 x 0.5		●	●
H	Axial ported	With ø4 hose nipple		—	●
K		With ø4 One-touch fitting		—	●
M		M3 x 0.5		—	●

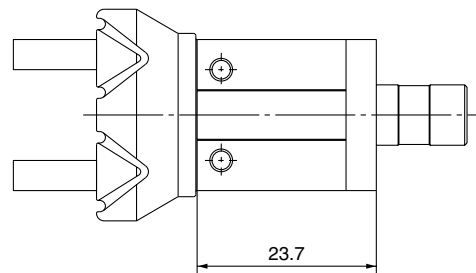
### Side Ported [E]

#### MHZA2-6□□E



\* Specifications and dimensions other than the above are the same as the basic type.

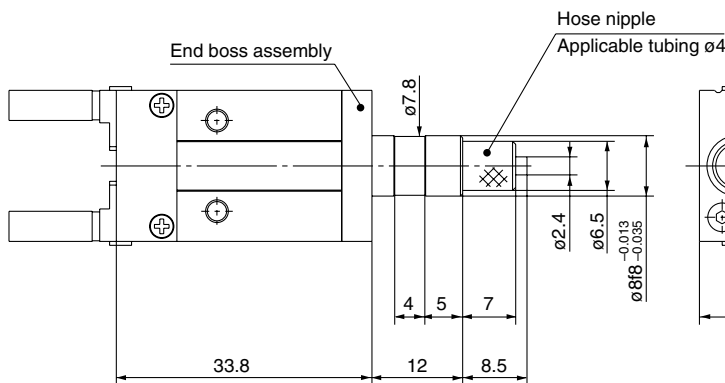
#### MHZAJ2-6□□E□



\* Specifications and dimensions other than the above are the same as the basic type or the end boss dimensions of the MHZA type.

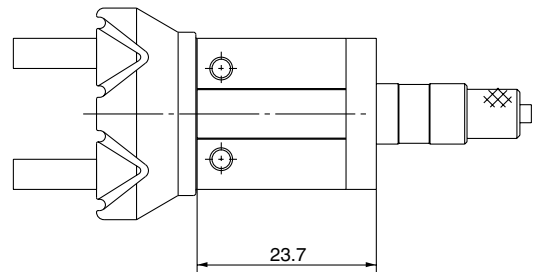
### Axial Ported (with hose nipple) [H]

#### MHZA2-6<sup>S</sup>□□H



\* Specifications and dimensions other than the above are the same as the basic type.

#### MHZAJ2-6<sup>S</sup>□□H□



\* Specifications and dimensions other than the above are the same as the basic type or the end boss dimensions of the MHZA type.

### Applicable Tubing

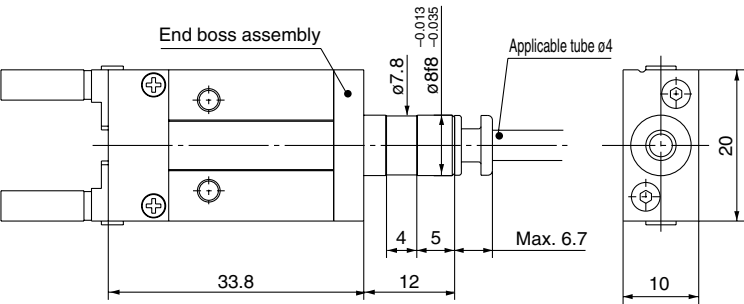
Description/ Model	Nylon tubing	Soft nylon tubing	Polyurethane tubing	Polyurethane coil tubing
	T0425	TS0425	TU0425	TCU0425B-1
Outside diameter (mm)	4	4	4	4
Max. operating pressure (MPa)	1.0	0.8	0.5	0.5
Min. bending radius (mm)	13	12	10	—
Operating temperature (°C)	-20 to 60	-20 to 60	-20 to 60	-20 to 60
Material	Nylon 12	Nylon 12	Polyurethane	Polyurethane

Refer to "Best Pneumatics No. 6" regarding One-touch fittings and tubing.

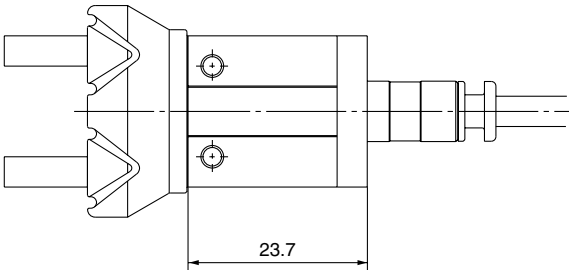
# Series MHZA2-6/MHZAJ2-6

## Axial Ported (with One-touch fitting) [K]

MHZA2-6<sup>S</sup><sub>C</sub>□K



MHZAJ2-6<sup>S</sup><sub>C</sub>□K



\* Specifications and dimensions other than the above are the same as the basic type.

\* Specifications and dimensions other than the above are the same as the basic type or the end boss dimensions of the MHZA type.

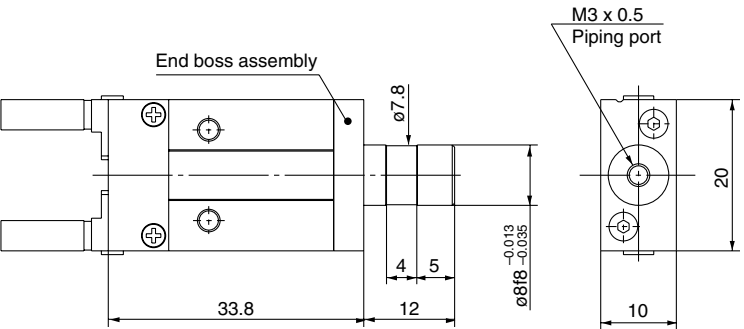
### Applicable Tubing

Description/Model	Nylon tubing	Soft nylon tubing	Polyurethane tubing	Polyurethane coil tubing
Specifications	T0425	TS0425	TU0425	TCU0425B-1
Outside diameter (mm)	4	4	4	4
Max. operating pressure (MPa)	1.0	0.8	0.5	0.5
Min. bending radius (mm)	13	12	10	—
Operating temperature (°C)	−20 to 60	−20 to 60	−20 to 60	−20 to 60
Material	Nylon 12	Nylon 12	Polyurethane	Polyurethane

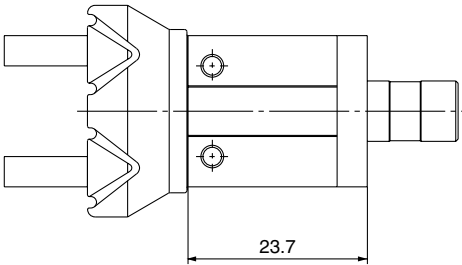
Refer to “Best Pneumatics No. 6” regarding One-touch fittings and tubing.

## Axial Ported (with M3 port) [M]

MHZA2-6<sup>S</sup><sub>C</sub>□M



MHZAJ2-6<sup>S</sup><sub>C</sub>□M



\* Specifications and dimensions other than the above are the same as the basic type.

\* Specifications and dimensions other than the above are the same as the basic type or the end boss dimensions of the MHZA type.

### Mass

Model	End boss type (Symbol)			
	E	H	K	M
MHZA2-6□□	28	28	28	28
MHZAJ2-6□□	29	29	29	29

(g)



# Parallel Style Air Gripper/Standard Type Series *MHZ2*

## How to Order

### Bore size

**ø6** **MHZ2-6D** - **M9BW** -

**Number of fingers**  
2 2 fingers

**Bore size**  
6 6 mm

**Action**  
D Double acting  
S Single acting (Normally open)  
C Single acting (Normally closed)

**Auto switch**  
Nil Without auto switch (Built-in magnet)  
S 1 pc.  
2 pcs.

**Made to Order**  
Refer to page 400 for details.

**Number of auto switches**  
Nil 2 pcs.  
S 1 pc.

**Finger option**

[Standard]  
Nil: Basic type

1: Side tapped mounting

2: Through-holes in opening/closing direction

3: Flat type fingers

### Applicable Auto Switch/Refer to pages 761 to 809 for further information on the auto switch.

Applicable Auto Switch Model (refer to pages 161 to 162 for further information on the auto switch.)																
Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage			Auto switch model		Lead wire length (m) *				Pre-wired connector	Applicable load	
							Electrical entry direction	0.5 (Nil)	1 (M)	3 (L)	5 (Z)					
					DC	AC						Perpendicular	In-line			
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				F8N	—	●	—	●	○	—		
				2-wire				M9PV	M9P	●	●	●	○	○		
				3-wire (NPN)				F8P	—	●	—	●	○	—		
	Diagnosis (2-color indicator)			3-wire (PNP)	M9BV	M9B		●	●	●	○	○	IC circuit			
				2-wire	F8B	—		●	—	●	○	—				
				3-wire (NPN)	M9NWV	M9NW		●	●	●	○	○				
				3-wire (PNP)	M9PWV	M9PW		●	●	●	○	○				
		2-wire	M9BWV	M9BW	●	●	●	○	○							
		2-wire	—	—	—	—	—	—	—							

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

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

Note 1) When using a D-F8 switch, mount it at a distance of 10 mm or more from magnetic substances such as iron, etc.  
Note 2) Take note of hysteresis with 2-color indication type switches. Refer to page 438 for detailed auto switch specifications.

MHZ  
MHF  
MHL  
MHR  
MHK  
MHS  
MHC  
MHT  
MHY  
MHW  
-X□  
MRHQ  
MA  
D-□

How to Order

**Bore size**

ø10 to ø25

**MHZ2** - **16** **D** - **M9BW** -

**Number of fingers**

2 2 fingers

**Bore size**

10	10 mm
16	16 mm
20	20 mm
25	25 mm

**Action**

D	Double acting
S	Single acting (Normally open)
C	Single acting (Normally closed)

**Auto switch**

Nil Without auto switch (Built-in magnet)

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

**Made to Order**

Refer to page 400 for details.

**Number of auto switches**

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

**Finger position/option**

**Standard**  
(MHQG2 compatible type)

**Nil:** Basic type

**1:** Side tapped mounting

**2:** Through-holes in opening/closing direction

**3: Flat type fingers**

The flat type fingers do not have standard and narrow options. When MHQG2/MHQ2 compatible types are required, see the -X51 made-to-order specifications on page 696.

**Narrow type**  
(MHQG2 compatible type)

**N:** Basic type

**N1:** Side tapped mounting

**N2:** Through-holes in opening/closing direction

**Body option**

**Nil:** Basic type

**E:** End boss type  
Side ported  
(Double acting/  
Single acting)

**W:** End boss type  
Axial ported  
ø4 One-touch fitting  
for coaxial tubing  
(Double acting)

**K:** End boss type  
Axial ported  
with ø4 One-touch  
fitting  
(Single acting)

**M:** End boss type  
Axial ported  
with M5 port  
(Single acting)

Applicable Auto Switch/Refer to pages 761 to 809 for further information on the auto switch.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) *				Applicable model				Pre-wired connector	Applicable load		
							Electrical entry direction		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	ø10	ø16	ø20	ø25				
					DC	AC	Perpendicular	In-line												
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	●	●	●	●	○	IC circuit	Relay, PLC
				F8N				—	●	—	●	○	—	●	●	●	—			
				M9PV				M9P	●	●	●	○	●	●	●	●	○			
				F8P				—	●	—	●	○	—	●	●	●	—			
				2-wire	M9BV	M9B	●	●	●	○	●	●	●	●	○	—				
				F8B	—	●	—	●	○	—	●	●	●	—						
	Diagnosis (2-color indicator)	3-wire (NPN)	5 V, 12 V	M9NWV	M9NW	●	●	●	○	●	●	●	●	○	IC circuit					
	3-wire (PNP)	M9PWV		M9PW	●	●	●	○	●	●	●	●	○							
	2-wire	M9BWV		M9BW	●	●	●	○	●	●	●	●	○	—						

\* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW  
1 m..... M (Example) M9WM  
3 m..... L (Example) M9NL  
5 m..... Z (Example) M9WZ

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

Note 1) Take note of hysteresis with 2-color indication type switches. Refer to page 438 for detailed auto switch specifications.

Note 2) Through-hole mounting is not possible when using the auto switch at the square groove on the side.

Note 3) Only MHZ2-10 is shipped with the auto switch mounting brackets. When the auto switch is used at the square groove on the side with MHZ2-16 to 25, mounting brackets are required. Please order them separately. Refer to page 439 for the auto switch mounting brackets.

## How to Order

### Bore size

ø32 to ø40

**MHZ2-32 D - M9BW**

Number of fingers  
2 2 fingers

Bore size  
32 32 mm  
40 40 mm

Action  
D Double acting  
S Single acting (Normally open)  
C Single acting (Normally closed)

Made to Order  
Refer to page 400 for details.

Number of auto switches  
Nil 2 pcs.  
S 1 pc.  
n n pc.

Auto switch  
Nil Without auto switch (Built-in magnet)  
\* For the applicable auto switch model, refer to the table below.

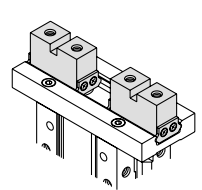
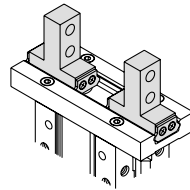
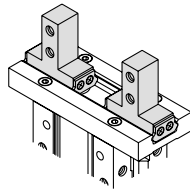
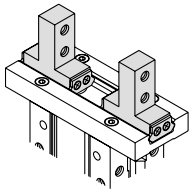
### Finger option

[Standard]  
Nil: Basic type

1: Side tapped mounting

2: Through-holes in opening/  
closing direction

3: Flat type fingers



### Applicable Auto Switch/Refer to pages 761 to 809 for further information on the auto switch.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) *				Pre-wired connector	Applicable load			
							Electrical entry direction		0.5 (Nil)	1 (M)	3 (L)	5 (Z)					
					DC	AC	Perpendicular	In-line									
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC	
				3-wire (PNP)				F8N	—	●	—	●	○	—			
				2-wire				M9PV	M9P	●	●	●	○	○			
								F8P	—	●	—	●	○	—			
	Diagnosis (2-color indicator)	Grommet	Yes	2-wire	24 V	5 V, 12 V	—	M9BV	M9B	●	●	●	○	○	—		—
								F8B	—	●	—	●	○	—			
								3-wire (NPN)	M9NWV	M9NW	●	●	●	○	○		IC circuit
								3-wire (PNP)	M9PWV	M9PW	●	●	●	○	○		
								2-wire	M9BWV	M9BW	●	●	●	○	○		—

\* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW  
1 m..... M (Example) M9NWM  
3 m..... L (Example) M9NWL  
5 m..... Z (Example) M9NWX

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

Note 1) Take note of hysteresis with 2-color indication type switches. Refer to page 438 for detailed auto switch specifications.

Note 2) Through-hole mounting is not possible when using the auto switch at the square groove on the side.

Note 3) When the auto switch is used at the square groove on the side with MHZ2-32 and 40, mounting brackets are required. Please order them separately. Refer to page 439 for the auto switch mounting brackets.

**MHZ**

**MHF**

**MHL**

**MHR**

**MHK**

**MHS**

**MHC**

**MHT**

**MHY**

**MHW**

**-X□**

**MRHQ**

**MA**

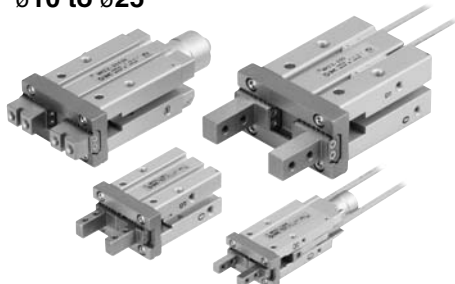
**D-□**

# Series MHZ2

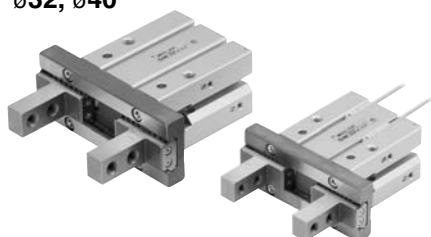
ø6



ø10 to ø25

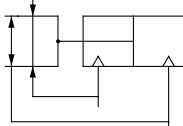


ø32, ø40

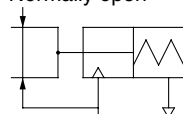


## JIS Symbol

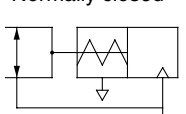
Double acting



Single acting type, Normally open



Single acting type, Normally closed



Refer to pages 436 to 440 for the specifications with auto switch.

- Auto switch installation examples and mounting positions
- Auto switch hysteresis
- Auto switch mounting
- Protrusion of auto switch from edge of body



## Made to Order

(Refer to pages 683 to 713 for details.)

Symbol	Specifications/Description
-X4	Heat resistance (100°C)
-X5	Fluororubber seal
-X7	Closing direction spring assist
-X12	Opening direction spring assist
-X46	With needle
-X50	Without magnet
-X51	MHQ(G)2-compliant finger flat type
-X53	EPDM seal/Fluorine grease
-X56	Axial ported type
-X63	Fluorine grease
-X79	Grease for food

## Specifications

Operating pressure	Fluid		Air	
	Double acting		ø6: 0.15 to 0.7 MPa ø10: 0.2 to 0.7 MPa ø16 to ø40: 0.1 to 0.7 MPa	
	Single acting	Normally open Normally closed	ø6: 0.3 to 0.7 MPa ø10: 0.35 to 0.7 MPa ø16 to ø40: 0.25 to 0.7 MPa	
Ambient and fluid temperature			-10 to 60°C	
Repeatability			ø6 to ø25: ±0.01 mm ø32, ø40: ±0.02 mm	
Max. operating frequency			ø6 to ø25: 180 c.p.m. ø32, ø40: 60 c.p.m.	
Lubrication			Not required	
Action			Double acting/Single acting	
Auto switch (Option) <sup>Note)</sup>			Solid state auto switch (3-wire, 2-wire)	

Note) Refer to pages 761 to 809 for further information on auto switches.

\* Use the gripper with dust cover when used in a place where there may be dust.

## Model

Action		Model	Bore size (mm)	Gripping force <sup>Note 1)</sup>		Opening/ Closing stroke (Both sides) (mm)	<sup>Note 2)</sup> Mass (g)
				Gripping force per finger Effective value (N)			
				External	Internal		
Double acting		MHZ2-6D	6	3.3	6.1	4	27
		MHZ2-10D(N)	10	11	17	4	55
		MHZ2-16D(N)	16	34	45	6	115
		MHZ2-20D(N)	20	42	66	10	235
		MHZ2-25D(N)	25	65	104	14	430
		MHZ2-32D	32	158	193	22	715
		MHZ2-40D	40	254	318	30	1275
Single acting	Normally open	MHZ2-6S	6	1.9	—	4	27
		MHZ2-10S(N)	10	7.1		4	55
		MHZ2-16S(N)	16	27		6	115
		MHZ2-20S(N)	20	33		10	240
		MHZ2-25S(N)	25	45		14	435
		MHZ2-32S	32	131		22	760
		MHZ2-40S	40	217		30	1370
	Normally closed	MHZ2-6C	6	—	3.7	4	27
		MHZ2-10C(N)	10		13	4	55
		MHZ2-16C(N)	16		38	6	115
		MHZ2-20C(N)	20		57	10	240
		MHZ2-25C(N)	25		83	14	430
		MHZ2-32C	32		161	22	760
		MHZ2-40C	40		267	30	1370

Note 1) Values based on pressure of 0.5 MPa, gripping point L = 20 mm, at center of stroke.

Note 2) Values excluding mass of auto switch.

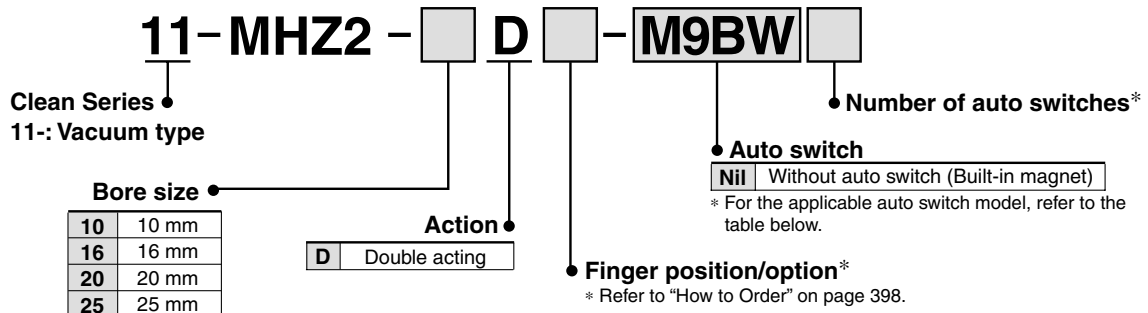
## Option

### ●Body Option/End Boss Type

Symbol	Piping port location	Type of piping port							Applicable model	
		MHZ2-6	MHZ2-10	MHZ2-16	MHZ2-20	MHZ2-25	MHZ2-32	MHZ2-40	Double acting	Single acting
Nil	Basic type	M3 x 0.5		M5 x 0.8					●	●
E	Side ported	—	M3 x 0.5	M5 x 0.8			—		●	●
W	Axial ported	—	With ø4 One-touch fitting for coaxial tubing				—		●	—
K	Axial ported	—	With ø4 One-touch fitting				—		—	●
M	Axial ported	—	M5 x 0.8				—		—	●

\* For detailed body option specifications, refer to option specifications on pages 412 and 413.

## Clean Series: Air Gripper



**Applicable Auto Switch**/Refer to pages 761 to 809 for further information on the auto switch.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) *				Pre-wired connector	Applicable load		
							Electrical entry direction		0.5 (Nil)	1 (M)	3 (L)	5 (Z)				
					DC	AC	Perpendicular	In-line								
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
				F8N				—	●	—	●	○	—			
				M9PV				M9P	●	●	●	○	○			
				F8P				—	●	—	●	○	—			
	2-wire			5 V, 12 V	M9BV	M9B	●	●	●	○	○	—				
	3-wire (NPN)			5 V, 12 V	M9NWV	M9NW	●	●	●	○	○	IC circuit				
	3-wire (PNP)				M9PWV	M9PW	●	●	●	○	○					
	2-wire				12 V	M9BWV	M9BW	●	●	●	○		○	—		

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

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

Note 1) Take note of hysteresis with 2-color indication type switches. Refer to page 438 for detailed auto switch specifications.

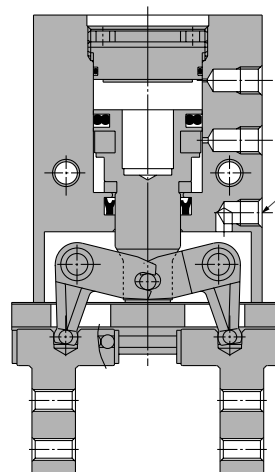
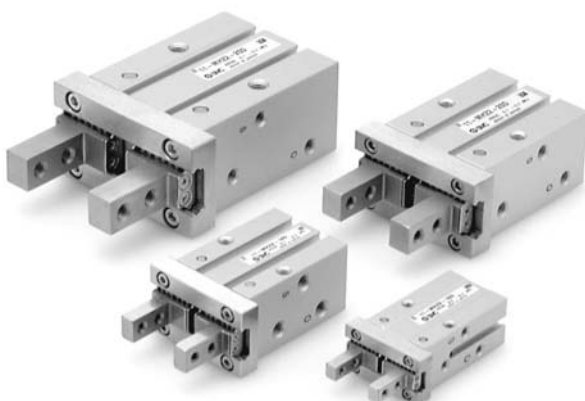
Note 2) When using a D-F8□ switch, mount it at a distance of 10 mm or more from magnetic substances such as iron, etc.

Note 3) Through-hole mounting is not possible when using the auto switch at the square groove on the side.

Note 4) Only MHZ2-10 is shipped with the auto switch mounting brackets. When the auto switch is used at the square groove on the side with MHZ2-16 to 25, mounting brackets are required. Please order them separately. Refer to page 439 for the auto switch mounting brackets.

## Specifications

Fluid	Air
Operating pressure	ø10: 0.2 to 0.7 MPa ø16 to ø25: 0.1 to 0.7 MPa
Ambient and fluid temperature	-10 to 60°C
Repeatability	±0.01 mm
Max. operating frequency	180 c.p.m.
Lubrication	Not required
Action	Double acting
Particulate generation grade	Grade 2
Auto switch (Option)	Solid state auto switch (3-wire, 2-wire)



### Vacuum port

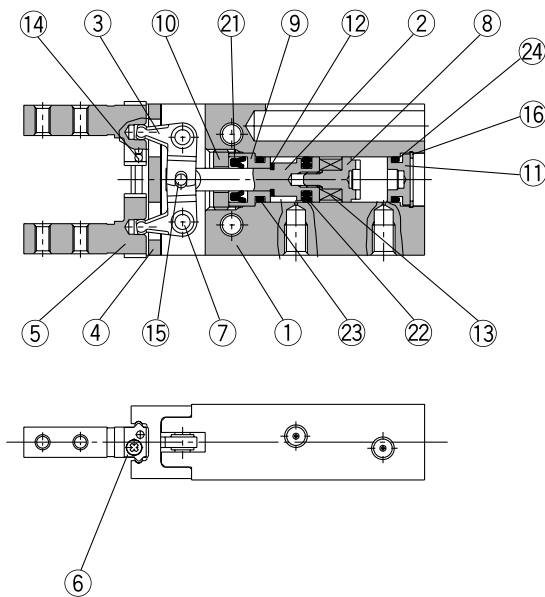
The concentrated vacuuming of internally generated particulates prevents them from spreading into the clean room.

For details, refer to "Pneumatic Clean Series" catalog.

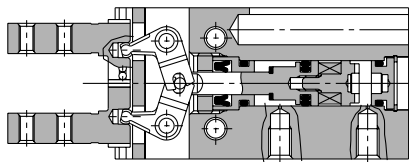
# Series MHZ2

## Construction: MHZ2-6□

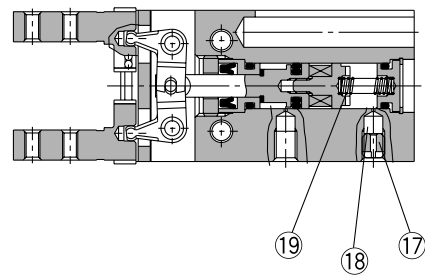
### Double acting/With fingers open



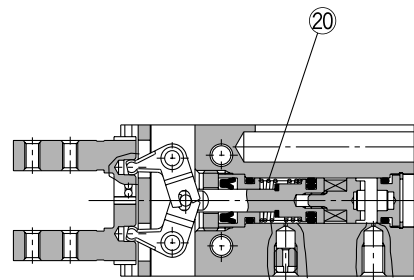
### Double acting/With fingers closed



### Single acting/Normally open



### Single acting/Normally closed



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	Stainless steel	
3	Lever	Stainless steel	Heat treated
4	Guide	Stainless steel	Heat treated
5	Finger	Stainless steel	Heat treated
6	Roller stopper	Stainless steel	
7	Lever shaft	Stainless steel	Nitriding
8	Magnet holder	Stainless steel	
9	Holder	Brass	Electroless nicked plated
10	Holder lock	Stainless steel	
11	Cap	Aluminum alloy	Clear anodized
12	Bumper	Urethane rubber	
13	Magnet	—	Nickel plated

### Component Parts

No.	Description	Material	Note
14	Steel balls	High carbon chrome bearing steel	
15	Needle roller	High carbon chrome bearing steel	
16	Type C retaining ring	Carbon steel	Nickel plated
17	Exhaust plug	Brass	Electroless nickel plated
18	Exhaust filter	Polyvinyl formal	
19	N.O. spring	Stainless steel spring wire	
20	N.C. spring	Stainless steel spring wire	
21	Rod seal	NBR	
22	Piston seal	NBR	
23	Gasket	NBR	
24	Gasket	NBR	

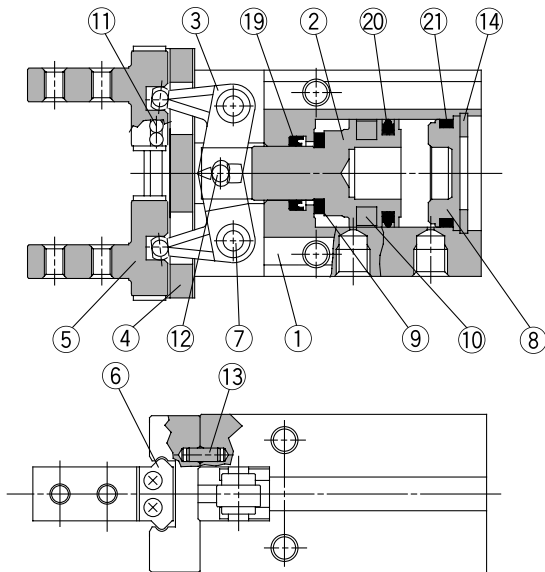
### Replacement Parts

Description	MHZ2-6	Main parts
Finger assembly	Please contact SMC to replace the seal kit and finger assembly.	
Piston assembly	MHZ2-6D□	MHZ-A0603 ②⑧⑨⑫⑬⑮⑰⑲⑳㉑㉒㉓
	MHZ2-6S□	
	MHZ2-6C□	MHZ-A0603C ②⑧⑨⑫⑬⑮⑰⑲⑳㉑㉒㉓

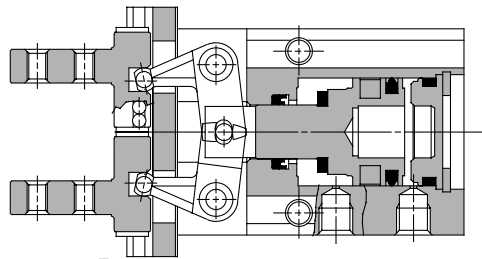
Replacement part/Grease pack part no.: GR-S-005 (5 g)

## Construction: MHZ2-10□ to 40□

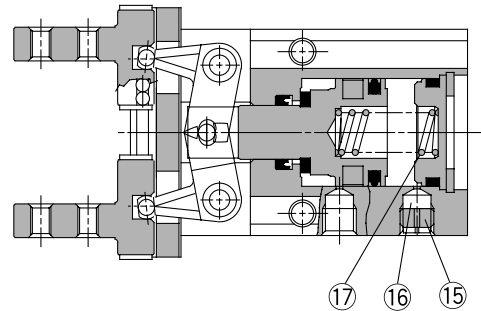
### Double acting/With fingers open



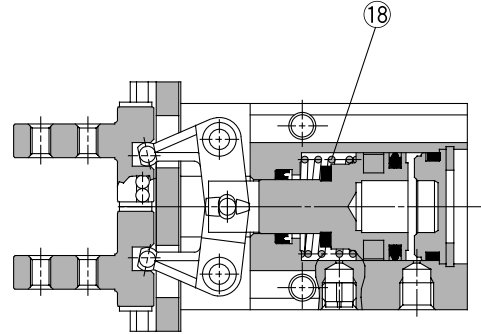
### Double acting/With fingers closed



### Single acting/Normally open



### Single acting/Normally closed



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	ø10, ø16: Stainless steel ø20 to ø40: Aluminum alloy	ø20 to ø40: Hard anodized
3	Lever	Stainless steel	Heat treated
4	Guide	Stainless steel	Heat treated
5	Finger	Stainless steel	Heat treated
6	Roller stopper	Stainless steel	
7	Lever shaft	Stainless steel	Nitriding
8	Cap	ø10 to ø25: Synthetic resin ø32, ø40: Aluminum alloy	ø32, ø40: Clear anodized
9	Bumper	Urethane rubber	
10	Rubber magnet	Synthetic rubber	

### Component Parts

No.	Description	Material	Note
11	Steel balls	High carbon chrome bearing steel	
12	Needle roller	High carbon chrome bearing steel	
13	Parallel pin	Stainless steel	
14	Type C retaining ring	Carbon steel	Nickel plated
15	Exhaust plug A	Brass	Electroless nickel plated
16	Exhaust filter A	Polyvinyl formal	
17	N.O. spring	Stainless steel spring wire	
18	N.C. spring	Stainless steel spring wire	
19	Rod seal	NBR	
20	Piston seal	NBR	
21	Gasket	NBR	

### Replacement Parts

Description		MHZ2-10	MHZ2-16	MHZ2-20	MHZ2-25	MHZ2-32	MHZ2-40	Main parts
Seal kit		MHZ10-PS	MHZ16-PS	MHZ20-PS	MHZ25-PS	MHZ32-PS	MHZ40-PS	⑱⑳㉑
Finger assembly	MHZ2-□□□(N)	MHZ-A1002(N)	MHZ-A1602(N)	MHZ-A2002(N)	MHZ-A2502(N)	MHZ-A3202	MHZ-A4002	④⑤⑥⑪⑬ Mounting screw
	MHZ2-□□□(N)1	MHZ-A1002(N)-1	MHZ-A1602(N)-1	MHZ-A2002(N)-1	MHZ-A2502(N)-1	MHZ-A3202-1	MHZ-A4002-1	
	MHZ2-□□□(N)2	MHZ-A1002(N)-2	MHZ-A1602(N)-2	MHZ-A2002(N)-2	MHZ-A2502(N)-2	MHZ-A3202-2	MHZ-A4002-2	
Piston assembly	MHZ2-□□□3	MHZ-A1002-3	MHZ-A1602-3	MHZ-A2002-3	MHZ-A2502-3	MHZ-A3202-3	MHZ-A4002-3	②⑨⑩⑫
	MHZ2-□□□□	MHZ-A1003	MHZ-A1603	MHZ-A2003	MHZ-A2503	MHZ-A3203	MHZ-A4003	
	MHZ2-□□□□S					MHZ-A3203S	MHZ-A4003S	
End boss assembly	MHZ2-□□□□W	MHZ-A1007	MHZ-A1607	MHZ-A2007	MHZ-A2507	—	—	Main body of adaptor, Mounting screw for adaptor, Seal kit
	MHZ2-□□□□K	MHZ-A1008	MHZ-A1608	MHZ-A2008	MHZ-A2508	—	—	
	MHZ2-□□□□M	MHZ-A1009	MHZ-A1609	MHZ-A2009	MHZ-A2509	—	—	
	MHZ2-□□□□E	MHZ-A1010	MHZ-A1610	MHZ-A2010	MHZ-A2510	—	—	

\* Finger option  
1 = Side tapped, 2 = Through-hole, 3 = Flat type fingers

\* End boss type

W = One-touch-fitting for coaxial tubing, K = With One-touch fitting, M = With M5 port, E = Side ported

\* The end boss assembly other than type E should be mounted on the special body.

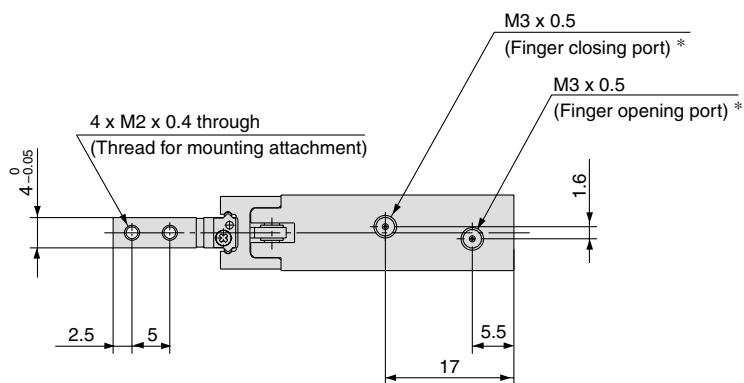
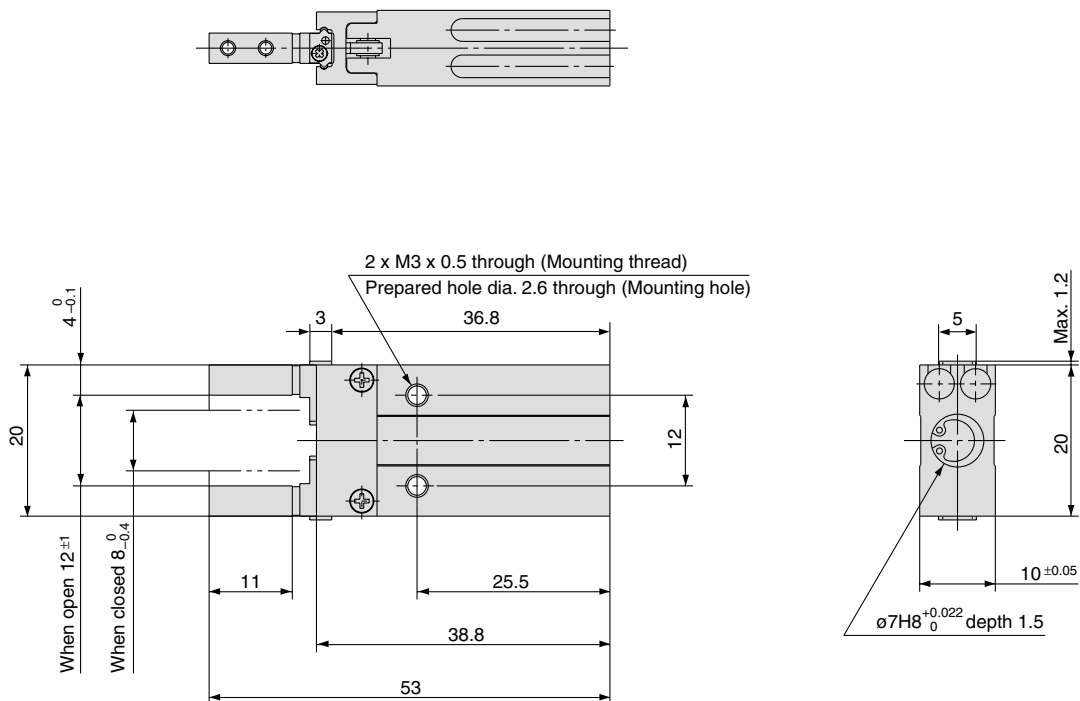
Replacement part/Grease pack part no.: GR-S-005 (5 g)

# Series MHZ2

## Dimensions

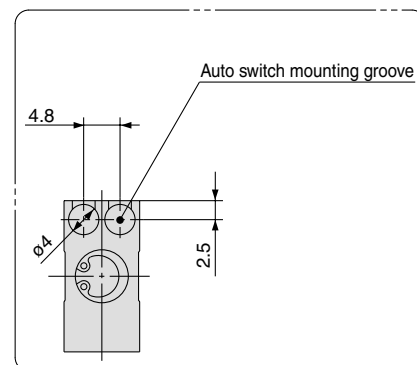
### MHZ2-6 □ Double acting/Single acting Basic type

Use series MHZJ2 with a dust cover when used in a place where there may be dust.



\* For single action, the port on one side is a breathing hole.

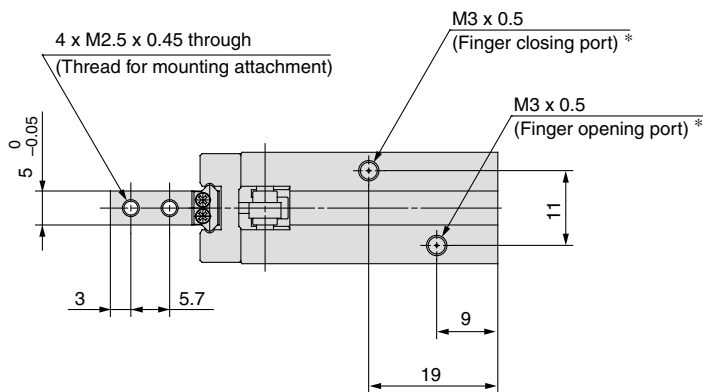
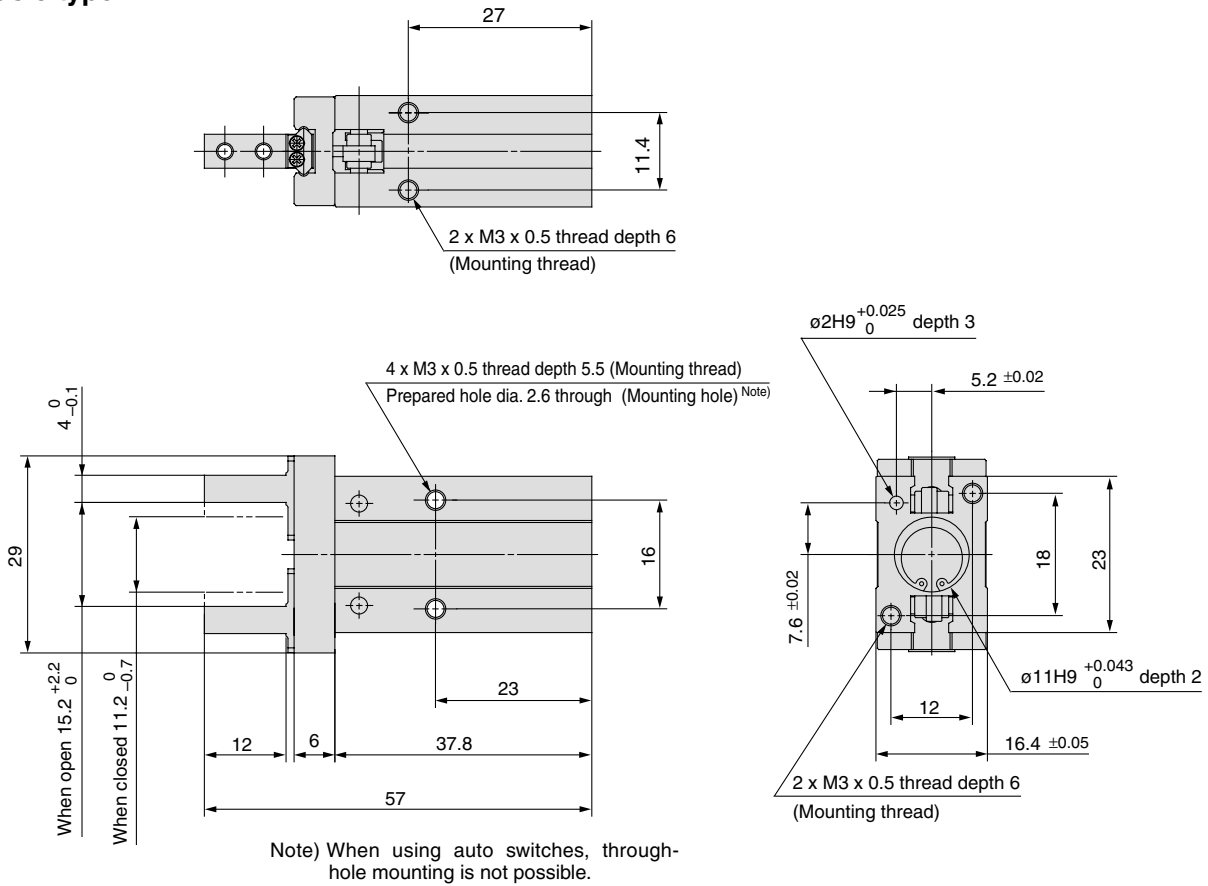
### Auto Switch Mounting Groove Dimensions





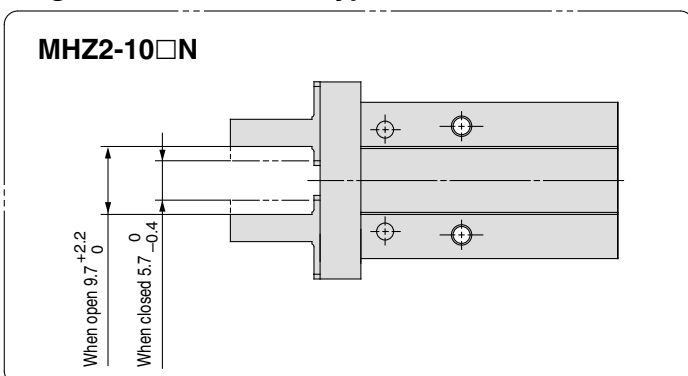
### MHZ2-10 ☐ Double acting/Single acting Basic type

Use series MHZJ2 with a dust cover when used in a place where there may be dust.

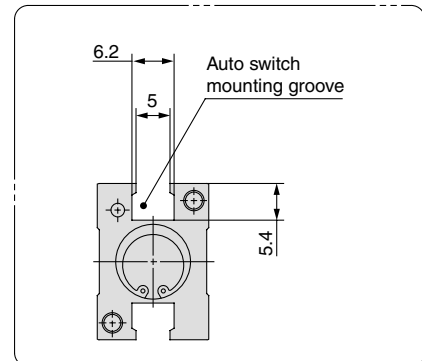


\* For single action, the port on one side is a breathing hole.

### Finger Position/Narrow Type



### Auto Switch Mounting Groove Dimensions



Note) When using auto switches, through-hole mounting is not possible.

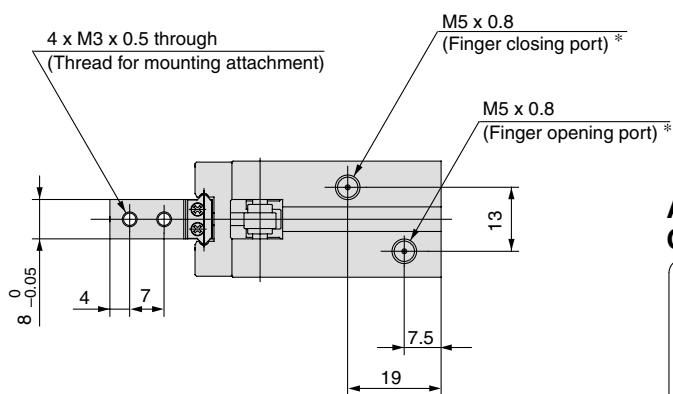
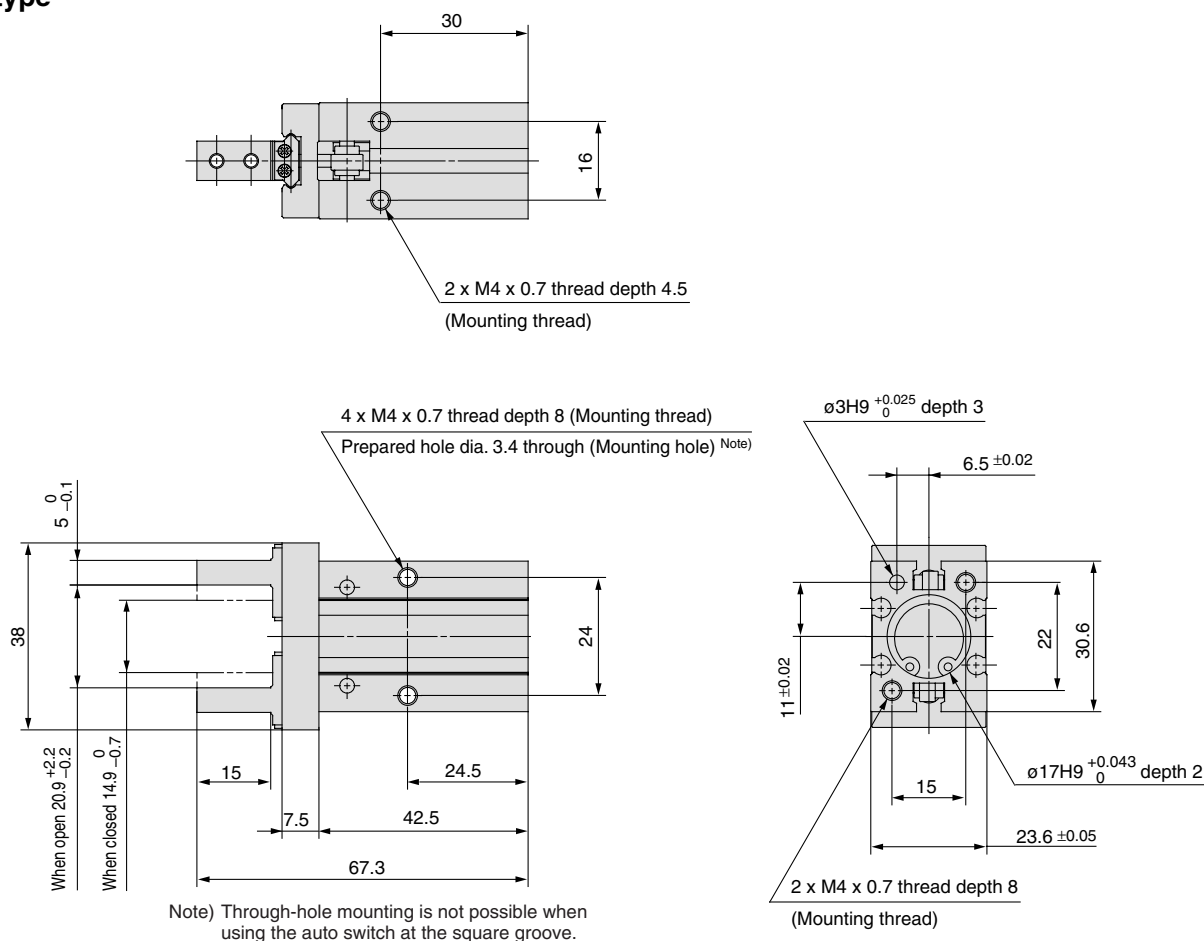
<b>MHZ</b>
<b>MHF</b>
<b>MHL</b>
<b>MHR</b>
<b>MHK</b>
<b>MHS</b>
<b>MHC</b>
<b>MHT</b>
<b>MHY</b>
<b>MHW</b>
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<b>MRHQ</b>
<b>MA</b>
<b>D-</b> <input type="checkbox"/>

# Series MHZ2

## Dimensions

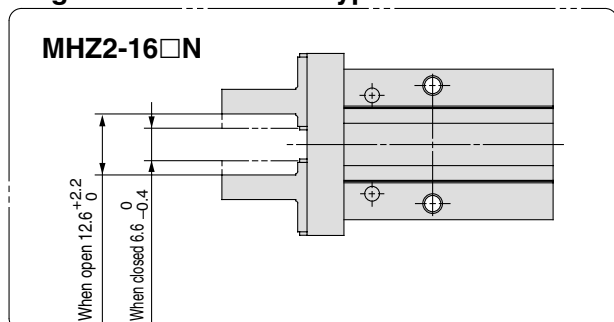
### MHZ2-16□ Double acting/Single acting Basic type

Use series MHZJ2 with a dust cover when used in a place where there may be dust.

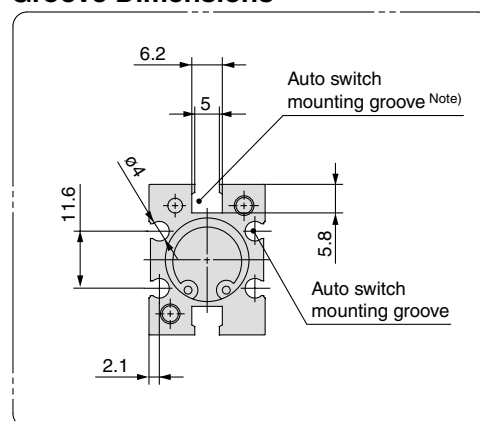


\* For single action, the port on one side is a breathing hole.

### Finger Position/Narrow Type



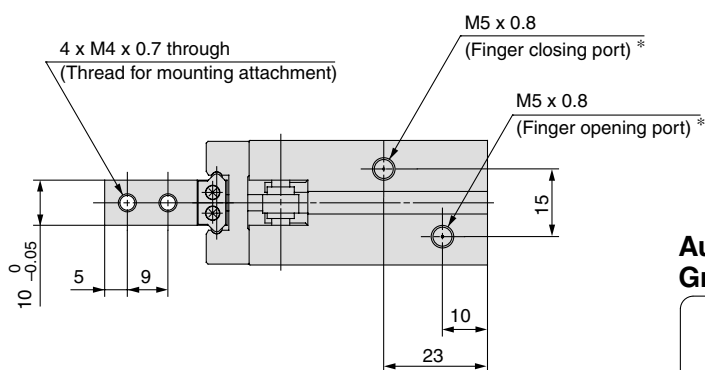
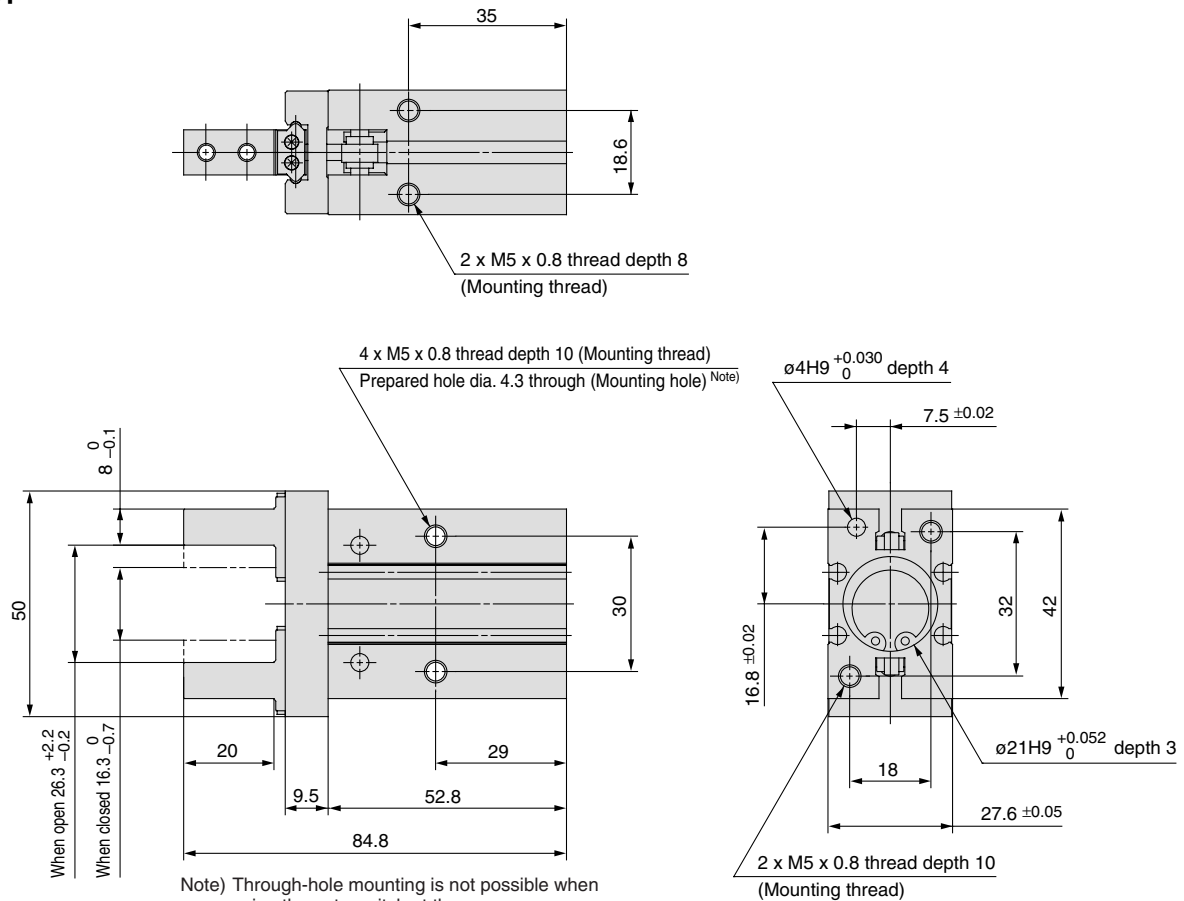
### Auto Switch Mounting Groove Dimensions



**Note:** Through-hole mounting is not possible when using the auto switch at the square groove.

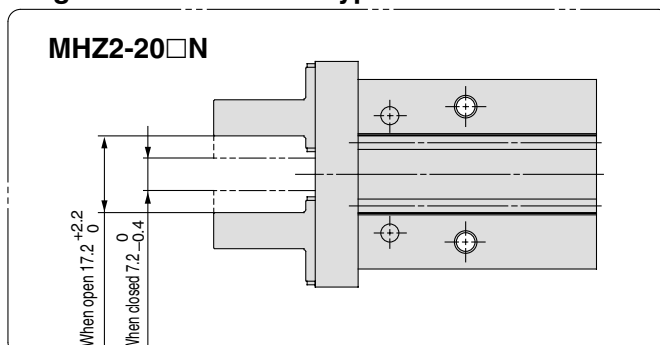
## MHZ2-20□ Double acting/Single acting Basic type

Use series MHZJ2 with a dust cover when used in a place where there may be dust.

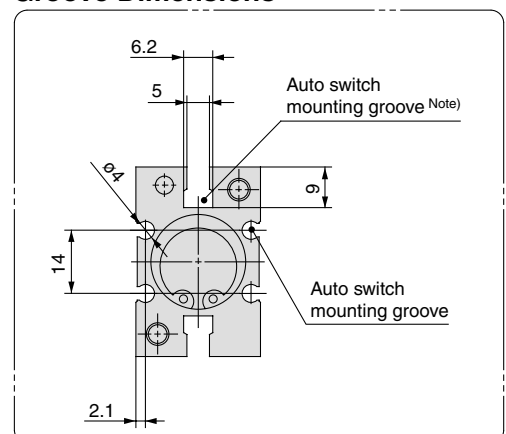


\* For single action, the port on one side is a breathing hole.

### Finger Position/Narrow Type



### Auto Switch Mounting Groove Dimensions



Note) Through-hole mounting is not possible when using the auto switch at the square groove.

**MHZ**

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**MHF**

---

**MHL**

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**MHR**

---

**MHK**

---

**MHS**

---

**MHC**

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**MHT**

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**MHY**

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**MHW**

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**-X** ☐

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**MRHQ**

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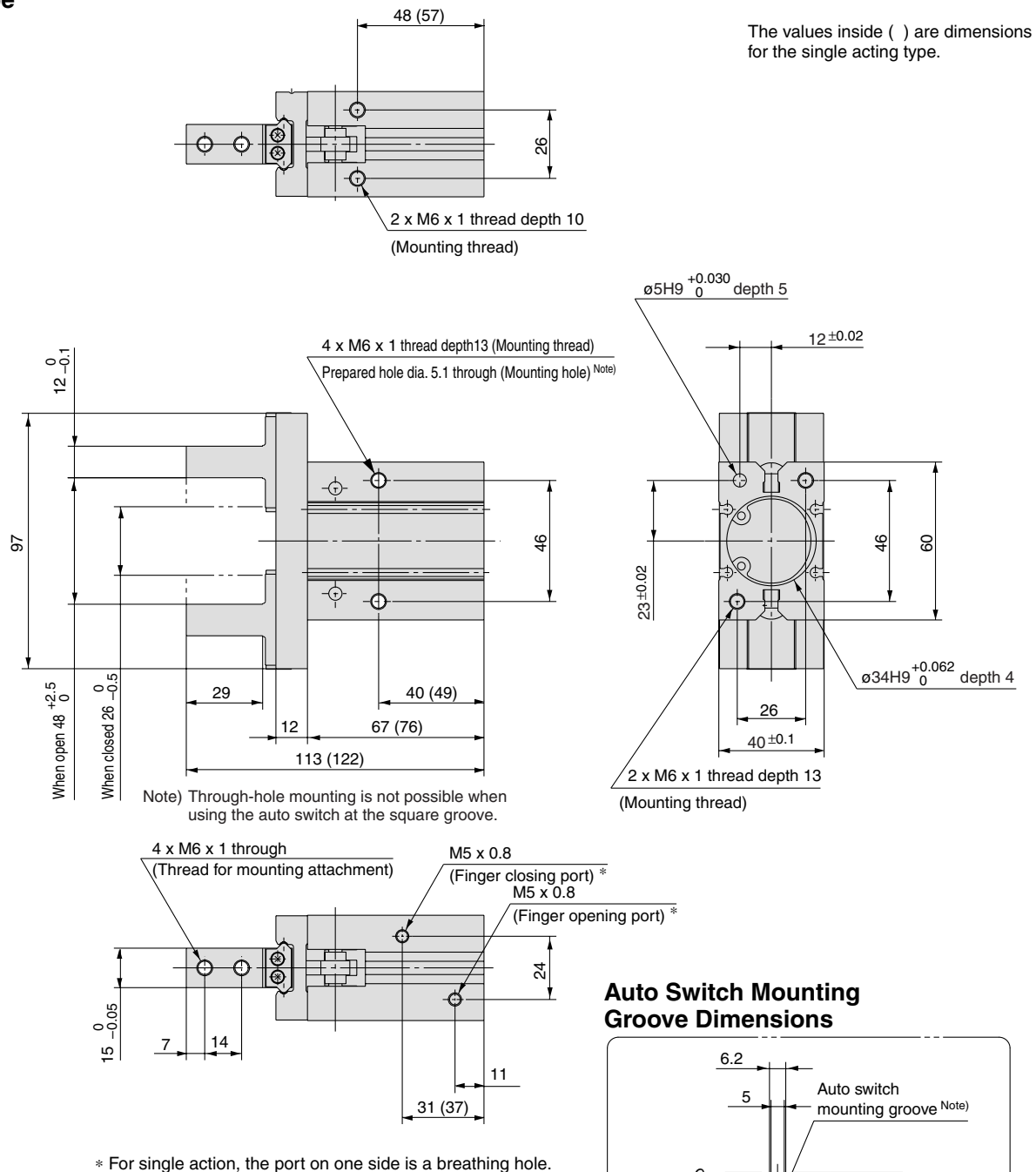
**MA**

---

**D-** ☐



## MHZ2-32□ Double acting/Single acting Basic type



Note) Through-hole mounting is not possible when using the auto switch at the square groove.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

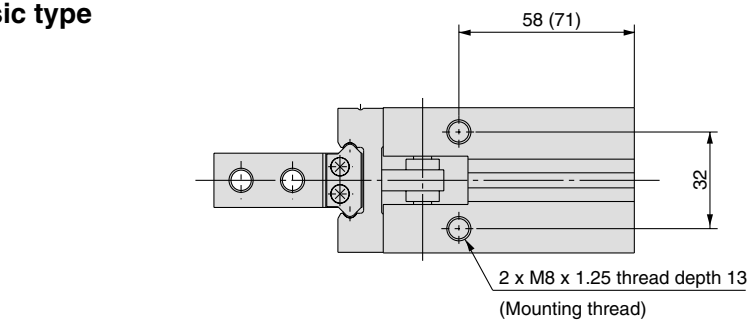
MRHQ

MA

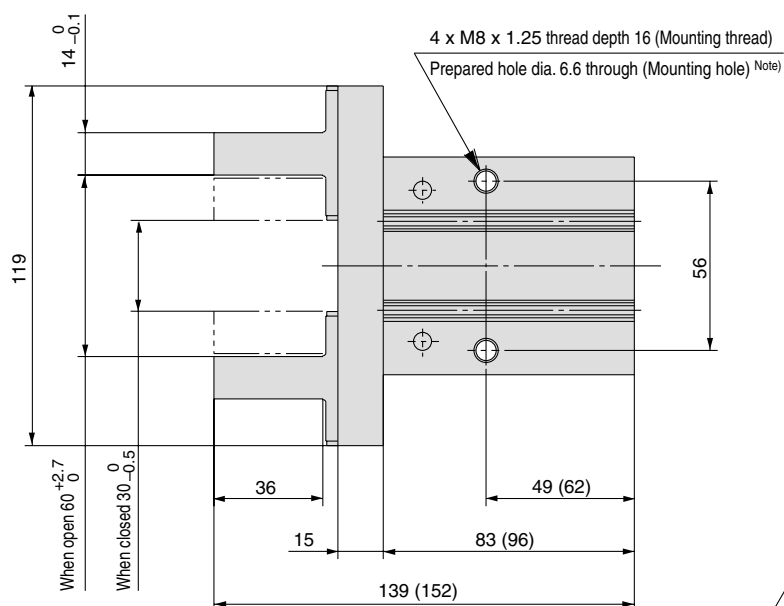
D-□

## Dimensions

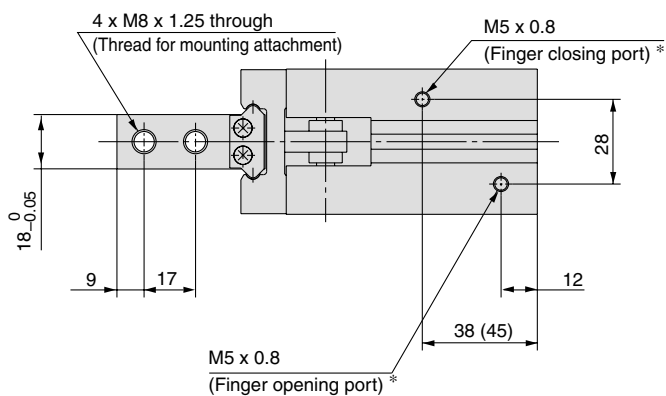
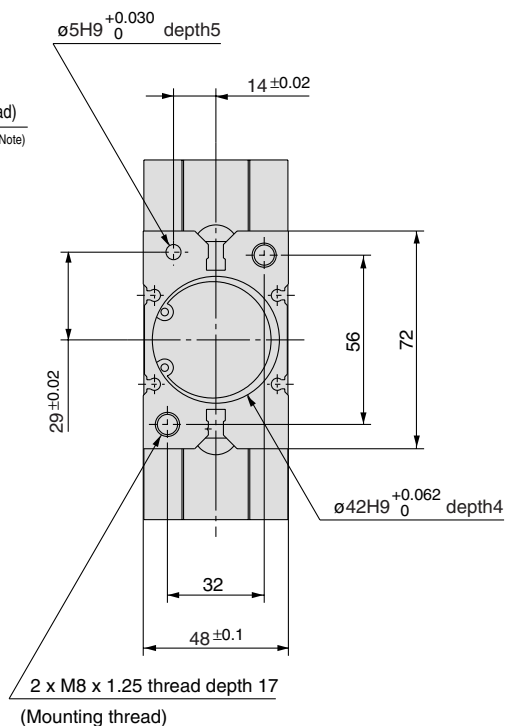
### MHZ2-40□ Double acting/Single acting Basic type



The values inside ( ) are dimensions for the single acting type.

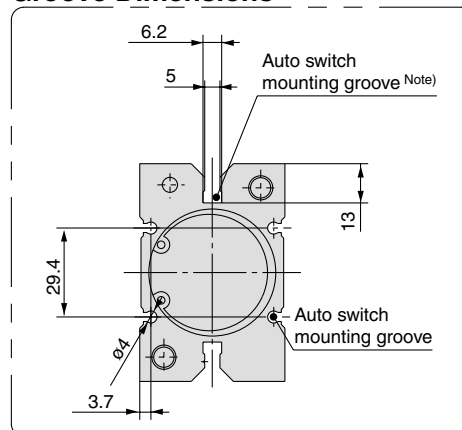


*Note)* Through-hole mounting is not possible when using the auto switch at the square groove.



\* For single action, the port on one side is a breathing hole.

### Auto Switch Mounting Groove Dimensions

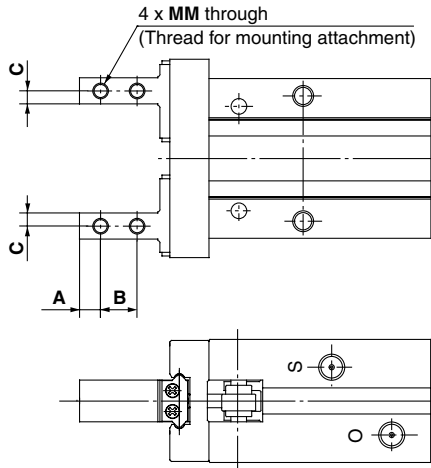


*Note)* Through-hole mounting is not possible when using the auto switch at the square groove.

# Standard Type/series *MHZ2*

## Finger Option

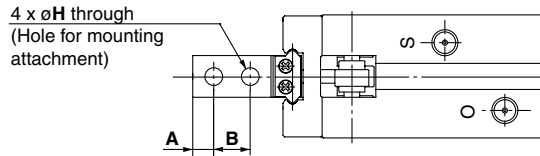
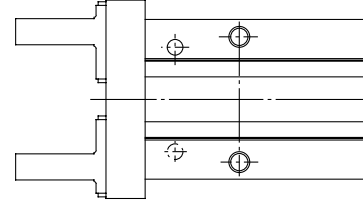
### Side Tapped Mounting [1/N1]



Model	A	B	C	MM
MHZ2-6□ 1	2.5	5	2	M2 x 0.4
MHZ2-10□ 1 N1□	3	5.7	2	M2.5 x 0.45
MHZ2-16□ 1 N1□	4	7	2.5	M3 x 0.5
MHZ2-20□ 1 N1□	5	9	4	M4 x 0.7
MHZ2-25□ 1 N1□	6	12	5	M5 x 0.8
MHZ2-32□ 1□	7	14	6	M6 x 1
MHZ2-40□ 1□	9	17	7	M8 x 1.25

\* Specifications and dimensions other than the above are the same as the basic type (including narrow type).

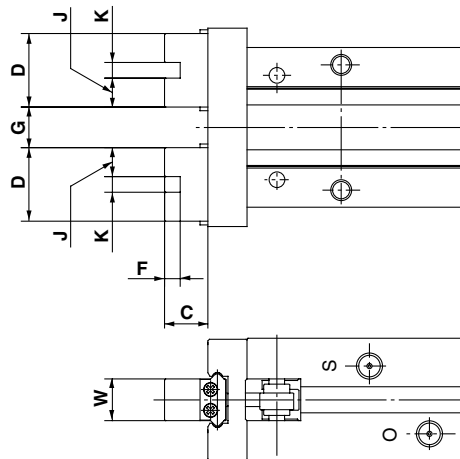
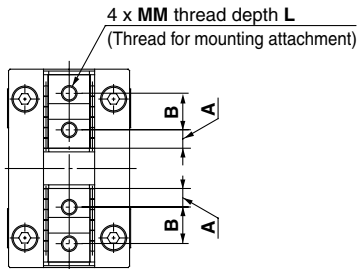
### Through-holes in Opening/ Closing Direction [2/N2]



Model	A	B	H
MHZ2-6□ 2	2.5	5	2.4
MHZ2-10□ 2 N2□	3	5.7	2.9
MHZ2-16□ 2 N2□	4	7	3.4
MHZ2-20□ 2 N2□	5	9	4.5
MHZ2-25□ 2 N2□	6	12	5.5
MHZ2-32□ 2□	7	14	6.6
MHZ2-40□ 2□	9	17	9

\* Specifications and dimensions other than the above are the same as the basic type (including narrow type).

### Flat Type Fingers [3]



Model	A	B	C	D	F	G		J	K	MM	L	W	Mass (g)
						Open	Closed						
MHZ2-6□ 3 <sup>(1)</sup>	2	3.5	7.2	7.5	—	5 <sup>+1.2</sup> <sub>-0.8</sub>	1 <sup>+0.2</sup> <sub>-0.1</sub>	—	—	M2 x 0.4	3	4 <sup>0</sup> <sub>-0.05</sub>	26
MHZ2-10□ 3□ <sup>(2)(3)</sup>	2.45	6	5.2	10.9	2	5.4 <sup>+2.2</sup> <sub>-0</sub>	1.4 <sup>0</sup> <sub>-0.2</sub>	4.45	2H9 <sup>+0.025</sup> <sub>-0</sub>	M2.5 x 0.45	5	5 <sup>0</sup> <sub>-0.05</sub>	55
MHZ2-16□ 3□ <sup>(2)(3)</sup>	3.05	8	8.3	14.1	2.5	7.4 <sup>+2.2</sup> <sub>-0</sub>	1.4 <sup>0</sup> <sub>-0.2</sub>	5.8	2.5H9 <sup>+0.025</sup> <sub>-0</sub>	M3 x 0.5	6	8 <sup>0</sup> <sub>-0.05</sub>	115
MHZ2-20□ 3□ <sup>(2)(3)</sup>	3.95	10	10.5	17.9	3	11.6 <sup>+2.3</sup> <sub>-0</sub>	1.6 <sup>0</sup> <sub>-0.2</sub>	7.45	3H9 <sup>+0.025</sup> <sub>-0</sub>	M4 x 0.7	8	10 <sup>0</sup> <sub>-0.05</sub>	235
MHZ2-25□ 3□ <sup>(2)(3)</sup>	4.9	12	13.1	21.8	4	16 <sup>+2.5</sup> <sub>-0</sub>	2 <sup>0</sup> <sub>-0.2</sub>	8.9	4H9 <sup>+0.030</sup> <sub>-0</sub>	M5 x 0.8	10	12 <sup>0</sup> <sub>-0.05</sub>	420
MHZ2-32□ 3□	7.3	20	18	34.6	5	25 <sup>+2.7</sup> <sub>-0</sub>	3 <sup>0</sup> <sub>-0.2</sub>	14.8	5H9 <sup>+0.030</sup> <sub>-0</sub>	M6 x 1	12	15 <sup>0</sup> <sub>-0.05</sub>	740 (785) <sup>(4)</sup>
MHZ2-40□ 3□	8.7	24	22	41.4	6	33 <sup>+2.9</sup> <sub>-0</sub>	3 <sup>0</sup> <sub>-0.2</sub>	17.7	6H9 <sup>+0.030</sup> <sub>-0</sub>	M8 x 1.25	16	18 <sup>0</sup> <sub>-0.05</sub>	1335 (1430) <sup>(4)</sup>

Note 1) To mount attachments, use M2 hexagon socket head cap screws with ø3.3 top diameter, or JISB1101 type M2 round head screws.

Note 2) Specifications and dimensions other than the above are the same as the basic type (including narrow type).

Note 3) The overall length is the same as the MHQ(G) flat finger type.

Note 4) The values inside ( ) are for the single acting type.

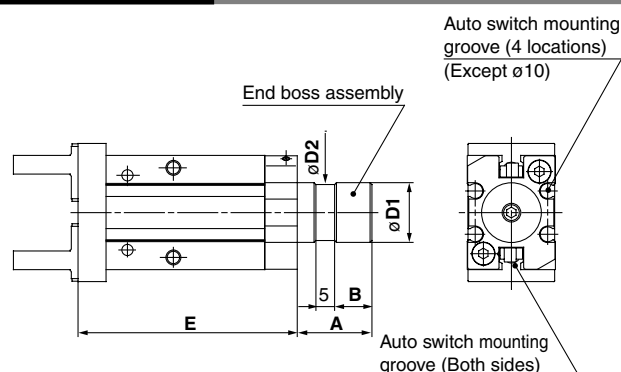
# Standard Type/series MHZ2

## Body Option: End Boss Type

### Applicable Model

Symbol	Piping port location	Type of piping port				Applicable model		
		MHZ2-10	MHZ2-16	MHZ2-20	MHZ2-25	Double acting	Single acting	
							Normally open	Normally closed
E	Side ported	M3 x 0.5	M5 x 0.8			●	●	●
W	Axial ported	With ø4 One-touch fitting for coaxial tubing				●	—	—
K		With ø4 One-touch fitting				—	●	●
M		M5 x 0.8				—	●	●

### Side Ported [E]



(mm)

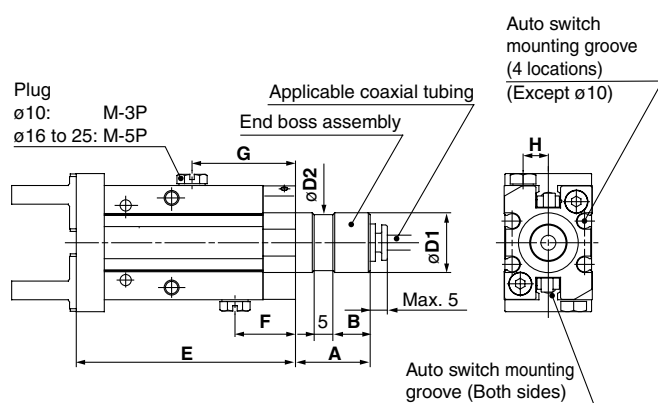
Model	A	B	D1	D2	E
MHZ2-10□□E	15	7	12f8 <sup>-0.016</sup> <sub>-0.043</sub>	11	52.8
MHZ2-16□□E	20	10	16f8 <sup>-0.016</sup> <sub>-0.043</sub>	15	58.7
MHZ2-20□□E	22	12	20f8 <sup>-0.020</sup> <sub>-0.053</sub>	19	70.5
MHZ2-25□□E	25	15	25f8 <sup>-0.020</sup> <sub>-0.053</sub>	24	82.9

Other dimensions and specifications correspond to the standard type.

\* Refer to the dimension table.

\* When auto switches are used, side mounting with through-holes is not possible.

### Axial Ported (with One-touch fitting for coaxial tubing) [W]



(mm)

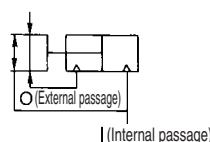
Model	A	B	D1	D2	E	F	G	H
MHZ2-10D□W	15	7	12f8 <sup>-0.016</sup> <sub>-0.043</sub>	11	52.8	18	28.3	5.5
MHZ2-16D□W	20	10	16f8 <sup>-0.016</sup> <sub>-0.043</sub>	15	58.7	16.2	27.7	6.5
MHZ2-20D□W	22	12	20f8 <sup>-0.020</sup> <sub>-0.053</sub>	19	70.5	18.2	31.2	7.5
MHZ2-25D□W	25	15	25f8 <sup>-0.020</sup> <sub>-0.053</sub>	24	82.9	19	31.8	10

Other dimensions and specifications correspond to the standard type.

#### Applicable Coaxial Tubing

Model	TW04B-20
Specifications	
Outside diameter	4 mm
Max. operating pressure	0.6 MPa
Min. bending radius	10 mm
Operating temperature	-20 to 60°C
Material	Nylon 12

Reference symbol

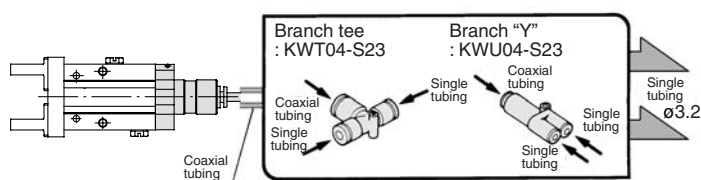


\* Refer to the dimension table.

\* When auto switches are used, side mounting with through-holes is not possible.

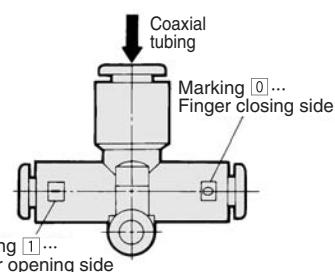
### Changing from Coaxial to Single Tubing

Changing to single tubing is possible by using a branch "Y" or branch tee fitting. In this case particularly, single tube fittings and tube for ø3.2 will be necessary.



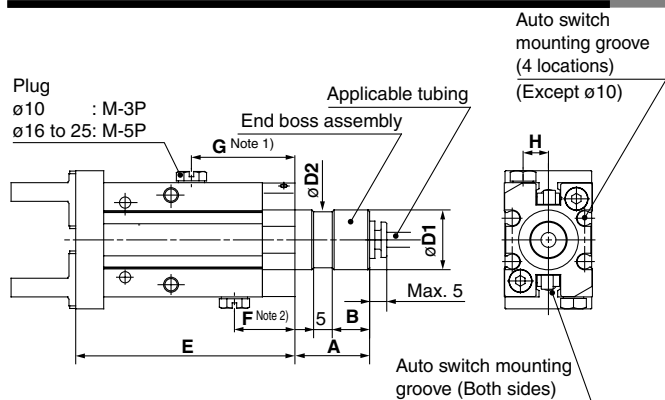
### Branch Tee, Different Diameter Tee, Branch "Y", Male Run Tee

Please contact SMC for the coaxial fittings and tubing.





## Axial Ported (with One-touch fitting) [K]



- \* Refer to the dimension table.  
 \* When auto switches are used, side mounting with through-holes is not possible.  
 Note 1) Normally open type plug position.  
 Note 2) Normally closed type plug position.  
 The plug is mounted on only one side for the single acting type.

Model	A	B	D1	D2	E	F	G	H
MHZ2-10 $\frac{S}{C}$ $\square$ K	15	7	12f8 $\begin{smallmatrix} -0.016 \\ -0.043 \end{smallmatrix}$	11	52.8	18	28.3	5.5
MHZ2-16 $\frac{S}{C}$ $\square$ K	20	10	16f8 $\begin{smallmatrix} -0.016 \\ -0.043 \end{smallmatrix}$	15	58.7	16.2	27.7	6.5
MHZ2-20 $\frac{S}{C}$ $\square$ K	22	12	20f8 $\begin{smallmatrix} -0.020 \\ -0.053 \end{smallmatrix}$	19	70.5	18.2	31.2	7.5
MHZ2-25 $\frac{S}{C}$ $\square$ K	25	15	25f8 $\begin{smallmatrix} -0.020 \\ -0.053 \end{smallmatrix}$	24	82.9	19	31.8	10

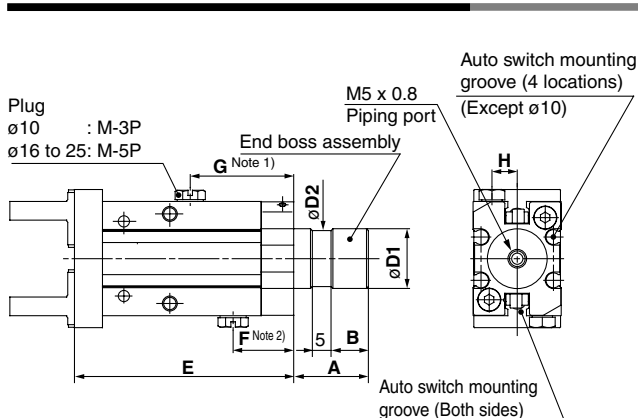
Other dimensions and specifications correspond to the standard type.

### Applicable Tubing

Description/Model	Nylon tubing	Soft nylon tubing	Polyurethane tubing	Polyurethane coil tubing
Specifications	T0425	TS0425	TU0425	TCU0425B-1
Outside diameter (mm)	4	4	4	4
Max. operating pressure (MPa)	1.0	0.8	0.5	0.5
Min. bending radius (mm)	13	12	10	—
Operating temperature (°C)	-20 to 60	-20 to 60	-20 to 60	-20 to 60
Material	Nylon 12	Nylon 12	Polyurethane	Polyurethane

Refer to "Best Pneumatics No. 6" regarding One-touch fittings and tubing.

## Axial Ported (with M5 Port) [M]



- \* Refer to the dimension table.  
 \* When auto switches are used, side mounting with through-holes is not possible.  
 Note 1) Normally open type plug position.  
 Note 2) Normally closed type plug position.  
 The plug is mounted on only one side for the single acting type.

Model	A	B	D1	D2	E	F	G	H
MHZ2-10 $\frac{S}{C}$ $\square$ M	15	7	12f8 $\begin{smallmatrix} -0.016 \\ -0.043 \end{smallmatrix}$	11	52.8	18	28.3	5.5
MHZ2-16 $\frac{S}{C}$ $\square$ M	20	10	16f8 $\begin{smallmatrix} -0.016 \\ -0.043 \end{smallmatrix}$	15	58.7	16.2	27.7	6.5
MHZ2-20 $\frac{S}{C}$ $\square$ M	22	12	20f8 $\begin{smallmatrix} -0.020 \\ -0.053 \end{smallmatrix}$	19	70.5	18.2	31.2	7.5
MHZ2-25 $\frac{S}{C}$ $\square$ M	25	15	25f8 $\begin{smallmatrix} -0.020 \\ -0.053 \end{smallmatrix}$	24	82.9	19	31.8	10

Other dimensions and specifications correspond to the standard type.

## Mass

Model	End boss type (Symbol)			
	E	W	K	M
MHZ2-10 $\square$ $\square$	65	64	66	65
MHZ2-16 $\square$ $\square$	148	147	148	147
MHZ2-20 $\square$ $\square$	277	277	277	277
MHZ2-25 $\square$ $\square$	495	495	496	494

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X  $\square$

MRHQ

MA

D- $\square$

# Parallel Style Air Gripper/Long Stroke Type Series *MHZL2*

## How to Order

**MHZL2-16 D - M9BW**

**Number of fingers**  
2 2 fingers

**Bore size**

10	10 mm
16	16 mm
20	20 mm
25	25 mm

**Action**

D	Double acting
S	Single acting (Normally open)
C	Single acting (Normally closed)

**Auto switch**  
Nil Without auto switch (Built-in magnet)

**Number of auto switches**

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

**Made to Order**  
Refer to page 415 for details.

**Finger option**

Nil: Basic type

1: Side tapped mounting

2: Through-holes in opening/closing direction

3: Flat type fingers

**Body option**

Nil: Basic type

E: End boss type Side ported (Double acting/Single acting)

W: End boss type Axial ported with ø4 One-touch fitting for coaxial tubing (Double acting)

K: End boss type Axial ported with ø4 One-touch fitting (Single acting)

M: End boss type Axial ported with M5 port (Single acting)

## Applicable Auto Switch/Refer to pages 761 to 809 for further information on the auto switch.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) *				Applicable model				Pre-wired connector	Applicable load		
							Electrical entry direction		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	ø10	ø16	ø20	ø25				
					DC	AC	Perpendicular	In-line												
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5V, 12 V	—	M9NV	M9N	●	●	●	○	●	●	●	●	○	IC circuit	Relay PLC
				F8N				—	●	—	●	○	—	●	●	●	—			
				M9PV				M9P	●	●	●	○	●	●	●	●	○			
				F8P				—	●	—	●	○	—	●	●	●	—			
	2-wire	12 V	M9BV	M9B	●	●	●	○	●	●	●	●	○	—	—					
	F8B	—	●	—	●	○	—	●	●	●	—									
	3-wire (NPN)	5 V, 12 V	M9NWV	M9NW	●	●	●	○	●	●	●	●	○	—	IC circuit					
	3-wire (PNP)	M9PWV	M9PW	●	●	●	○	●	●	●	●	○	—	IC circuit						
	2-wire	12 V	M9BWV	M9BW	●	●	●	○	●	●	●	●	○	—	—					

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

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

Note 1) Take note of hysteresis with 2-color indication type switches. Refer to page 438 for detailed auto switch specifications.

Note 2) Through-hole mounting is not possible when using the auto switch at the square groove on the side.

Note 3) Only MHZ2-10 is shipped with the auto switch mounting brackets. When the auto switch is used at the square groove on the side with MHZ2-16 to 25, mounting brackets are required. Order them separately. Refer to page 439 for the auto switch mounting brackets.

## Specifications

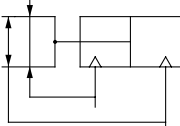


Fluid			Air
Operating pressure	Double acting		ø10: 0.2 to 0.7 MPa ø16 to ø25: 0.1 to 0.7 MPa
	Single acting	Normally open	ø10: 0.35 to 0.7 MPa ø16 to ø25: 0.25 to 0.7 MPa
		Normally closed	
Ambient and fluid temperature			−10 to 60°C
Repeatability			±0.01 mm
Max. operating frequency			120 c.p.m.
Lubrication			Not required
Action			Double acting/Single acting
Auto switch (Option) <sup>Note)</sup>			Solid state auto switch (3-wire, 2-wire)

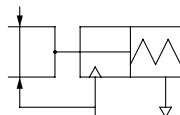
Note) Refer to pages 761 to 809 for further information on auto switches.

## JIS Symbol

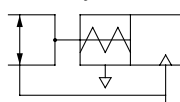
Double acting



Single acting type, Normally open



Single acting type, Normally closed



Refer to pages 436 to 440 for the specifications with auto switch.

- Auto switch installation examples and mounting positions
- Auto switch hysteresis
- Auto switch mounting
- Protrusion of auto switch from edge of body



**Made to Order**

(Refer to pages 683 to 713 for details.)

Symbol	Specifications/Description
-X4	Heat resistance (100°C)
-X5	Fluororubber seal
-X7	Closing direction spring assist
-X12	Opening direction spring assist
-X50	Without magnet
-X53	EPDM seal/Fluorine grease
-X56	Axial ported type
-X63	Fluorine grease
-X79	Grease for food

## Model

Action		Model	Bore size (mm)	Gripping force <sup>Note 1)</sup>		Opening/ Closing stroke (Both sides) (mm)	Mass <sup>Note 2)</sup> (g)
				Gripping force per finger Effective value (N)			
				External	Internal		
Double acting		MHZL2-10D	10	11	17	8	60
		MHZL2-16D	16	34	45	12	135
		MHZL2-20D	20	42	66	18	270
		MHZL2-25D	25	65	104	22	470
Single acting	Normally open	MHZL2-10S	10	7.1	—	8	70
		MHZL2-16S	16	27		12	145
		MHZL2-20S	20	33		18	290
		MHZL2-25S	25	50		22	515
	Normally closed	MHZL2-10C	10	—	13	8	70
		MHZL2-16C	16		38	12	140
		MHZL2-20C	20		57	18	290
		MHZL2-25C	25		85	22	515

Note 1) Values based on pressure of 0.5 MPa, gripping point L = 20 mm, at center of stroke.

Note 2) Values excluding mass of auto switch.

## Option

### ●Body Option/End Boss Type

Symbol	Piping port location	Type of piping port				Applicable model	
		MHZL2-10	MHZL2-16	MHZL2-20	MHZL2-25	Double acting	Single acting
Nil	Basic type	M3 x 0.5	M5 x 0.8	M5 x 0.8	M5 x 0.8	●	●
E	Side ported	M3 x 0.5	M5 x 0.8	M5 x 0.8	M5 x 0.8	●	●
W	Axial ported	With ø4 One-touch fitting for coaxial tubing				●	—
K	Axial ported	With ø4 One-touch fitting				—	●
M	Axial ported	M5 x 0.8				—	●

\* For detailed body option specifications, refer to option specifications on pages 422 and 423.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

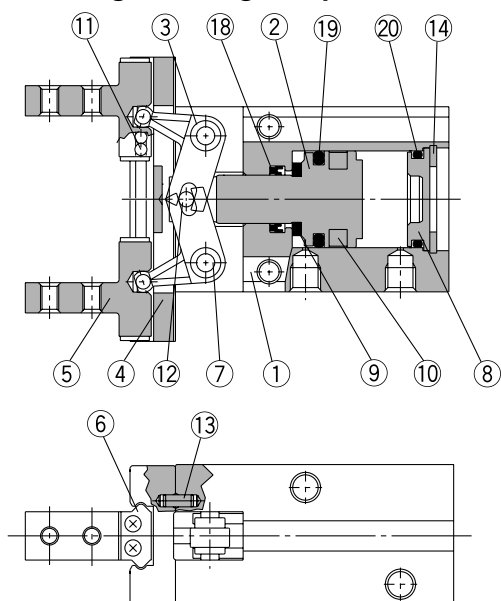
MA

D-□

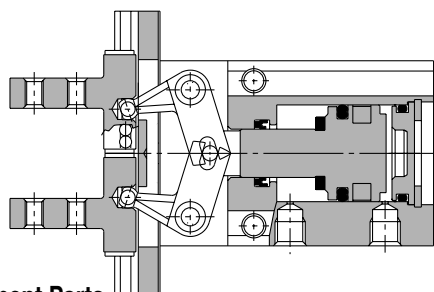
# Series MHZL2

## Construction: MHZL2-10□ to 25□

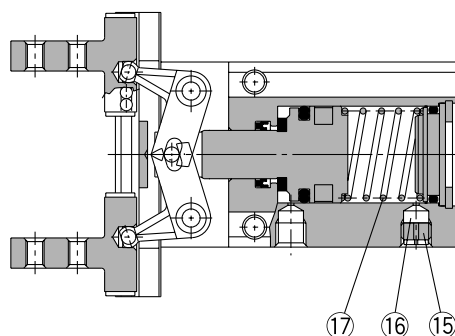
### Double acting/With fingers open



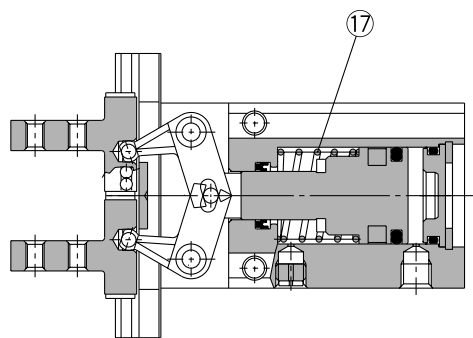
### Double acting/With fingers closed



### Single acting/Normally open



### Single acting/Normally closed



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	ø10, ø16: Stainless steel ø20, ø25: Aluminum alloy	Hard anodized
3	Lever	Stainless steel	Heat treated
4	Guide	Stainless steel	Heat treated
5	Finger	Stainless steel	Heat treated
6	Roller stopper	Stainless steel	
7	Lever shaft	Stainless steel	Nitriding
8	Cap	Aluminum alloy	Clear anodized
9	Bumper	Urethane rubber	
10	Rubber magnet	Synthetic rubber	

### Component Parts

No.	Description	Material	Note
11	Steel balls	High carbon chrome bearing steel	
12	Needle roller	High carbon chrome bearing steel	
13	Parallel pin	Stainless steel	
14	Type C retaining ring	Carbon steel	Nickel plated
15	Exhaust plug A	Brass	Electroless nickel plated
16	Exhaust filter A	Polyvinyl formal	
17	Spring	Stainless steel spring wire	
18	Rod seal	NBR	
19	Piston seal	NBR	
20	Gasket	NBR	

### Replacement Parts

Description		MHZL2-10	MHZL2-16	MHZL2-20	MHZL2-25	Main parts
Seal kit		MHZL10-PS	MHZL16-PS	MHZL20-PS	MHZL25-PS	18, 19, 20
Finger assembly	MHZL2-□□□	MHZL-A1002	MHZL-A1602	MHZL-A2002	MHZL-A2502	4, 5, 6, 11, 13 Mounting screw
	MHZL2-□□□1	MHZL-A1002-1	MHZL-A1602-1	MHZL-A2002-1	MHZL-A2502-1	
	MHZL2-□□□2	MHZL-A1002-2	MHZL-A1602-2	MHZL-A2002-2	MHZL-A2502-2	
Piston assembly	MHZL2-□□□3	MHZL-A1002-3	MHZL-A1602-3	MHZL-A2002-3	MHZL-A2502-3	2, 9, 10, 12
	MHZL2-□□□□	MHZL-A1003	MHZL-A1603	MHZL-A2003	MHZL-A2503	
	MHZL2-□□□□C	MHZL-A1003C	MHZL-A1603C	MHZL-A2003C	MHZL-A2503C	
End boss assembly	MHZL2-□□□□W	MHZ-A1007	MHZ-A1607	MHZ-A2007	MHZ-A2507	Main body of adaptor Mounting screw for adaptor Seal kit
	MHZL2-□□□□K	MHZ-A1008	MHZ-A1608	MHZ-A2008	MHZ-A2508	
	MHZL2-□□□□M	MHZ-A1009	MHZ-A1609	MHZ-A2009	MHZ-A2509	
	MHZL2-□□□□E	MHZ-A1010	MHZ-A1610	MHZ-A2010	MHZ-A2510	

\* Finger option

1 = Side tapped, 2 = Through-hole, 3 = Flat type fingers

\* End boss type

W = One-touch-fitting for coaxial tubing, K = With One-touch fitting, M = With M5 port, E = Side ported

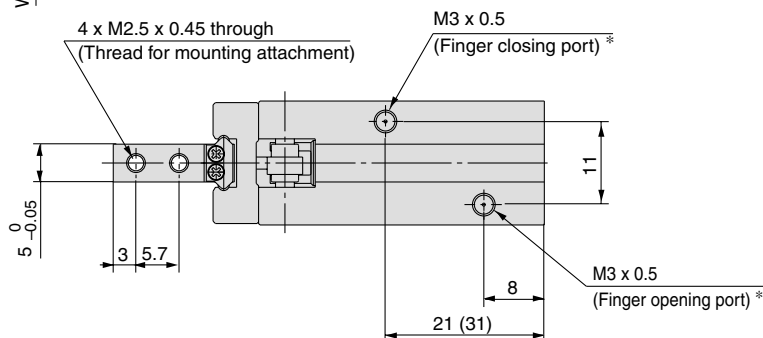
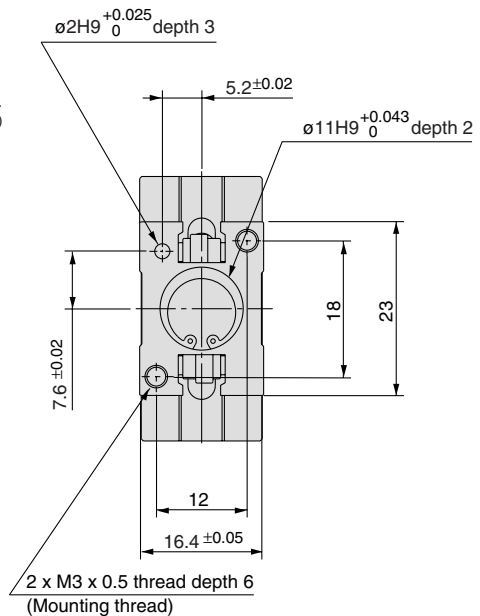
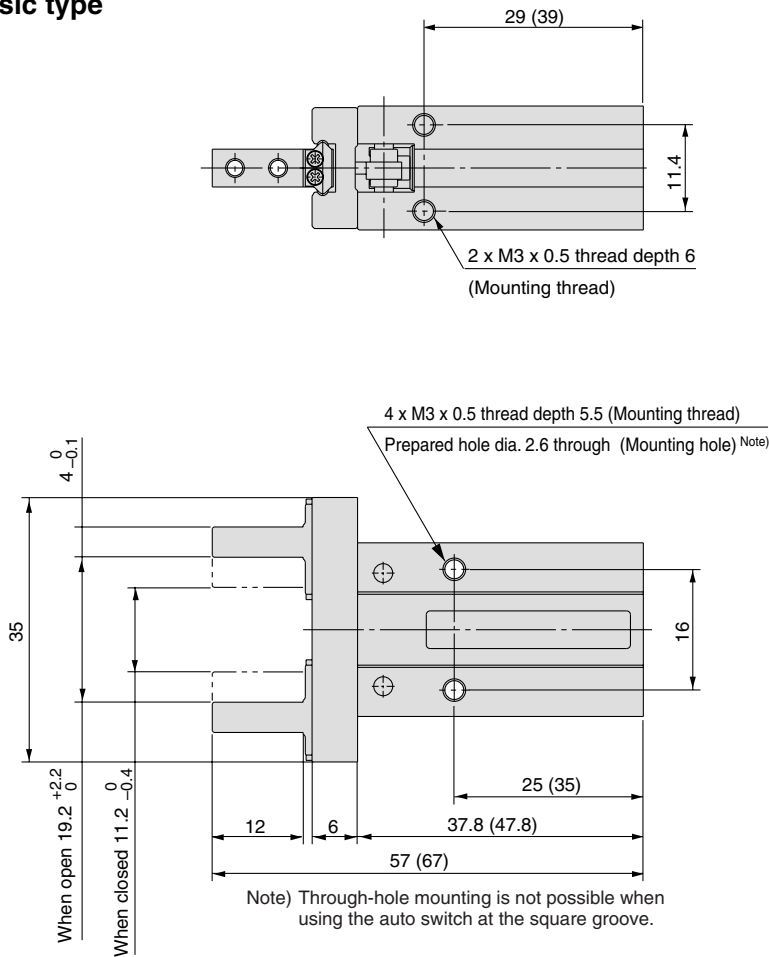
\* The end boss assembly other than type E should be mounted on the special body.

Replacement part/Grease pack part no.: GR-S-005 (5 g)

## Dimensions

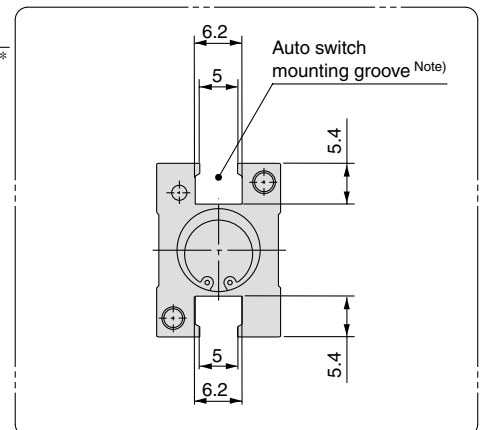
### MHZL2-10□ Double acting/Single acting Basic type

The values inside ( ) are dimensions for the single acting type.



\* For single action, the port on one side is a breathing hole.

### Auto Switch Mounting Groove Dimensions



**Note)** Through-hole mounting is not possible when using the auto switch at the square groove.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

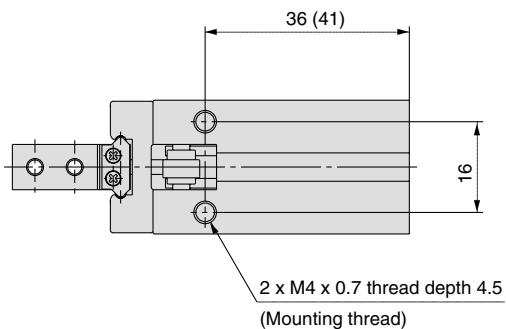
MA

D-□

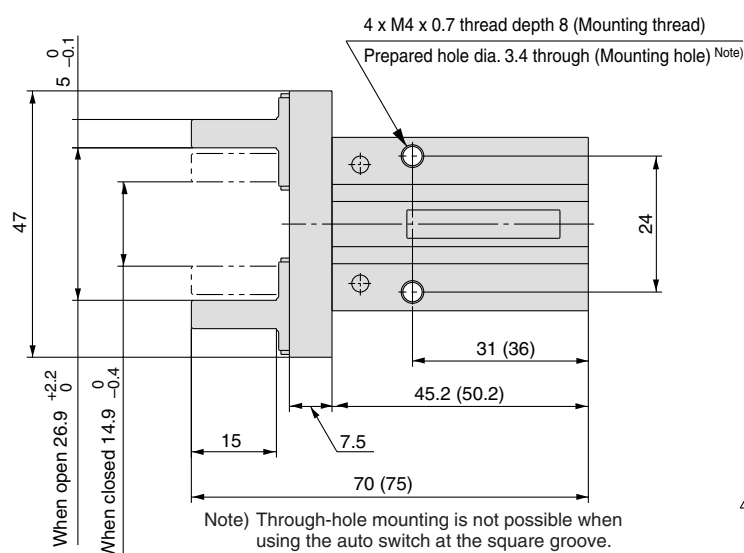
# Series MHZL2

## Dimensions

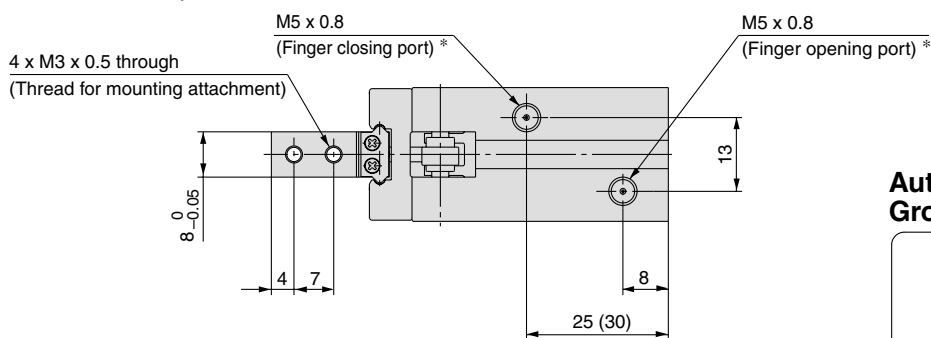
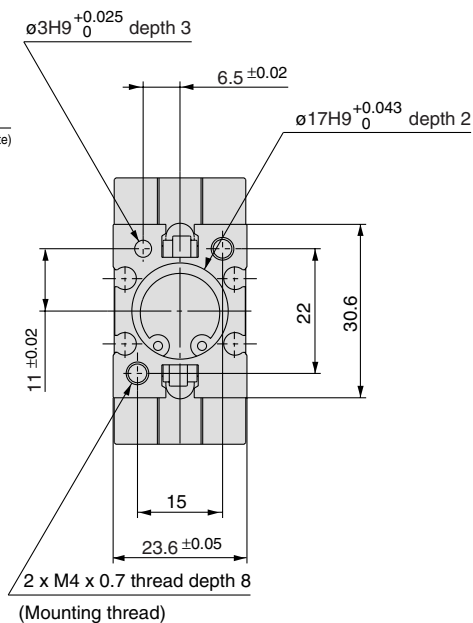
### MHZL2-16 □ Double acting/Single acting Basic type



The values inside ( ) are dimensions for the single acting type.

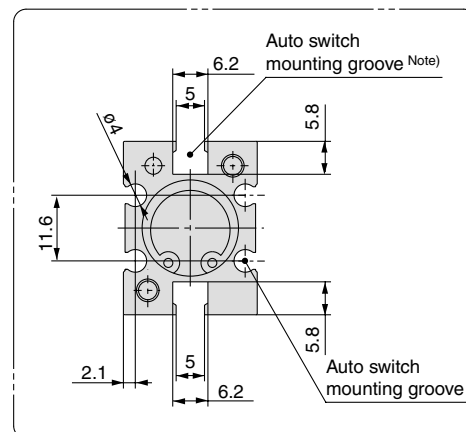


Note) Through-hole mounting is not possible when using the auto switch at the square groove.



\* For single action, the port on one side is a breathing hole.

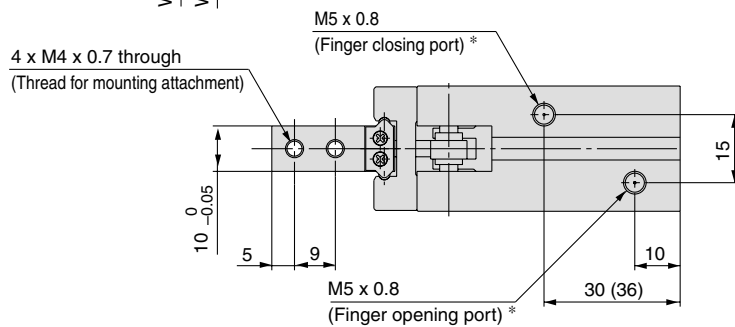
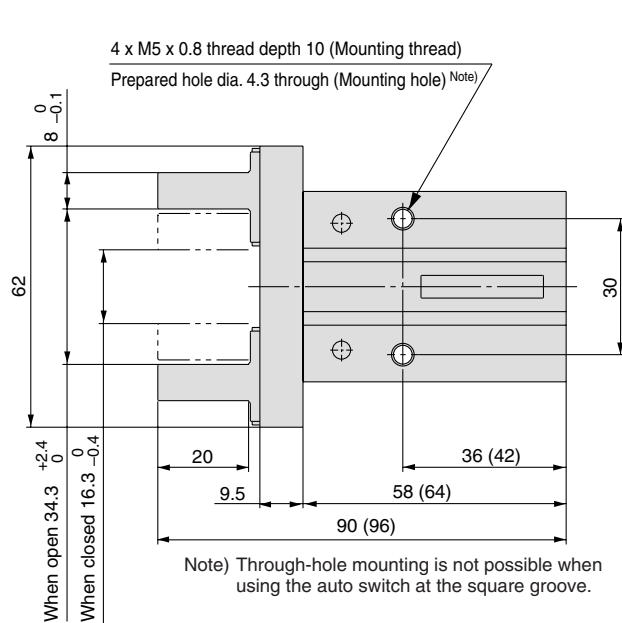
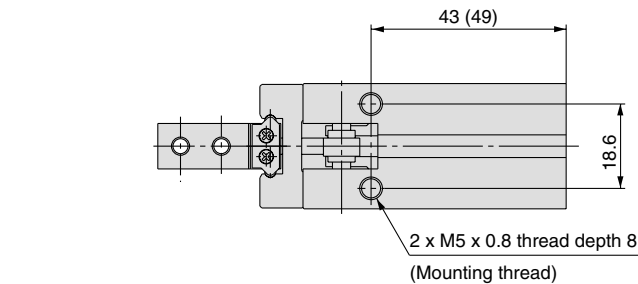
### Auto Switch Mounting Groove Dimensions



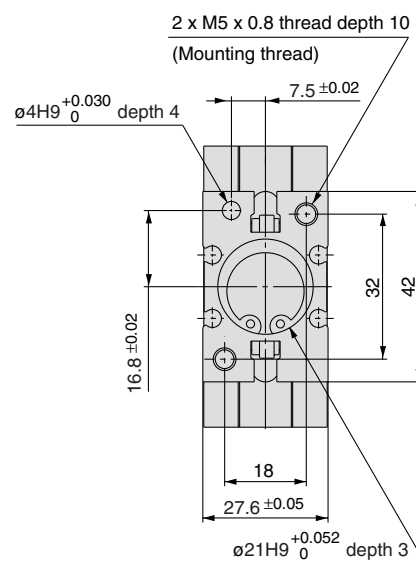
Note) Through-hole mounting is not possible when using the auto switch at the square groove.

## MHZL2-20□ Double acting/Single acting Basic type

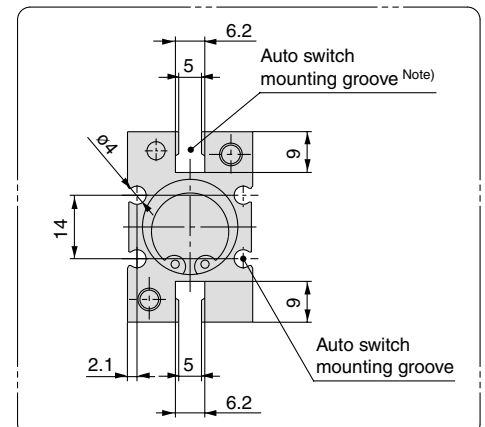
The values inside ( ) are dimensions for the single acting type.



\* For single action, the port on one side is a breathing hole.



### Auto Switch Mounting Groove Dimensions



Note) Through-hole mounting is not possible when using the auto switch at the square groove.

**MHZ**

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**MHF**

---

**MHL**

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**MHR**

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**MHK**

---

**MHS**

---

**MHC**

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**MHT**

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**MHY**

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**MHW**

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**-X**☐

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**MRHQ**

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**MA**

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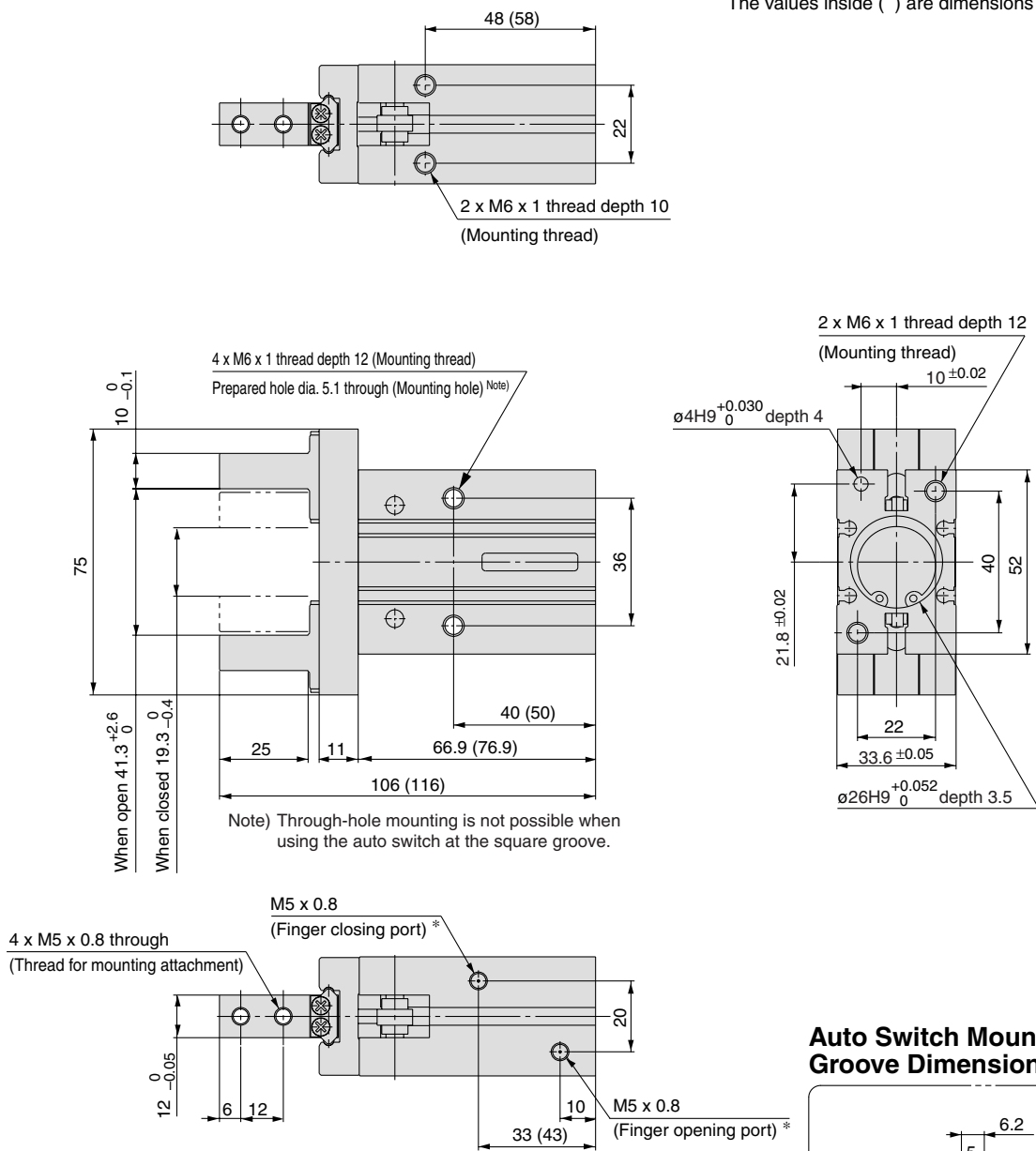
**D-**☐

# Series MHZL2

## Dimensions

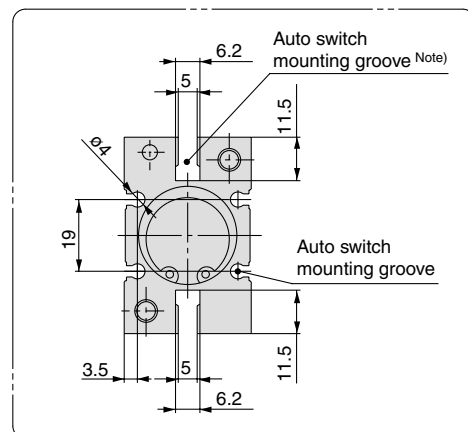
### MHZL2-25 □ Double acting/Single acting Basic type

The values inside ( ) are dimensions for the single acting type.



\* For single action, the port on one side is a breathing hole.

### Auto Switch Mounting Groove Dimensions

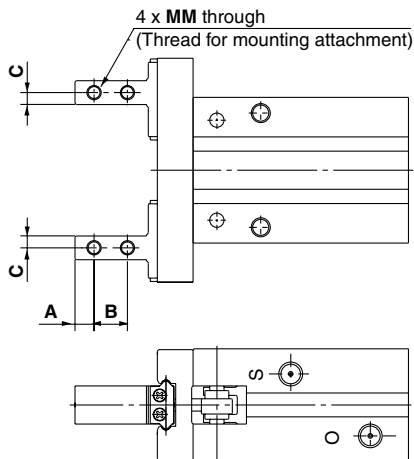


Note) Through-hole mounting is not possible when using the auto switch at the square groove.



# Long Stroke Type/*Series MHZL2* Finger Option

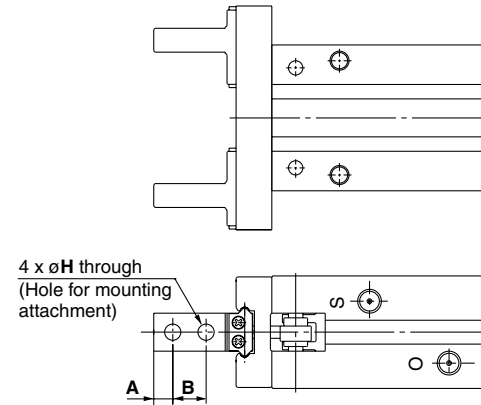
## Side Tapped Mounting [1]



Model	A	B	C	MM
MHZL2-10□1□	3	5.7	2	M2.5 x 0.45
MHZL2-16□1□	4	7	2.5	M3 x 0.5
MHZL2-20□1□	5	9	4	M4 x 0.7
MHZL2-25□1□	6	12	5	M5 x 0.8

\* Specifications and dimensions other than the above are the same as the basic type.

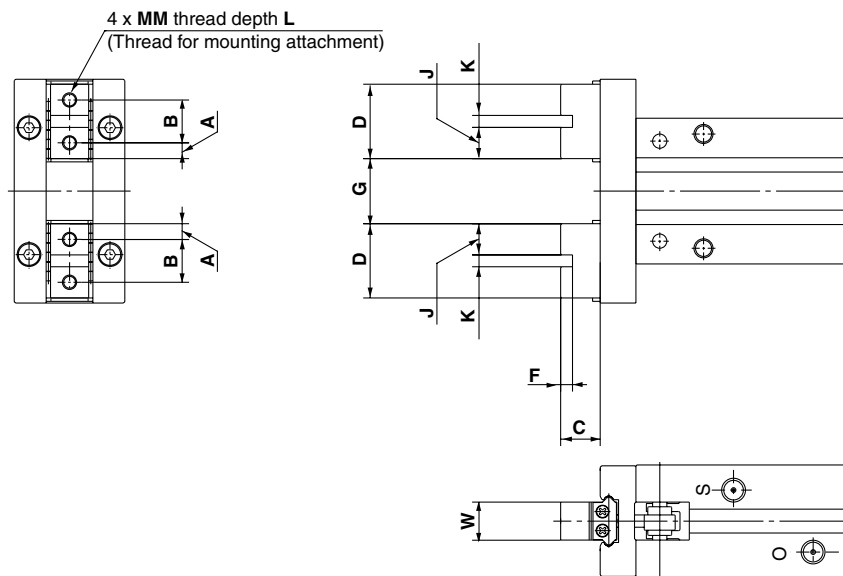
## Through-holes in Opening/ Closing Direction [2]



Model	A	B	H
MHZL2-10□2□	3	5.7	2.9
MHZL2-16□2□	4	7	3.4
MHZL2-20□2□	5	9	4.5
MHZL2-25□2□	6	12	5.5

\* Specifications and dimensions other than the above are the same as the basic type.

## Flat Type Fingers [3]



Model	A	B	C	D	F	G		J	K	MM	L	W	Mass (g)	
						Open	Closed						Double acting	Single acting
MHZL2-10□3□	2.45	7	5.2	11.9	2	9.4 <sup>+2.2</sup> <sub>0</sub>	1.4 <sup>0</sup> <sub>-0.2</sub>	4.95	2H9 <sup>+0.025</sup> <sub>0</sub>	M2.5 x 0.45	5	5 <sup>0</sup> <sub>-0.05</sub>	60	70
MHZL2-16□3□	3.3	9	8.3	15.6	2.5	13.4 <sup>+2.2</sup> <sub>0</sub>	1.4 <sup>0</sup> <sub>-0.2</sub>	6.55	2.5H9 <sup>+0.025</sup> <sub>0</sub>	M3 x 0.5	6	8 <sup>0</sup> <sub>-0.05</sub>	135	145
MHZL2-20□3□	3.95	12	10.5	19.9	3	19.6 <sup>+2.4</sup> <sub>0</sub>	1.6 <sup>0</sup> <sub>-0.2</sub>	8.45	3H9 <sup>+0.025</sup> <sub>0</sub>	M4 x 0.7	8	10 <sup>0</sup> <sub>-0.05</sub>	270	290
MHZL2-25□3□	4.9	14	13.1	23.8	4	24 <sup>+2.6</sup> <sub>0</sub>	2 <sup>0</sup> <sub>-0.2</sub>	9.9	4H9 <sup>+0.030</sup> <sub>0</sub>	M5 x 0.8	10	12 <sup>0</sup> <sub>-0.05</sub>	460	505

\* Specifications and dimensions other than the above are the same as the basic type.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□

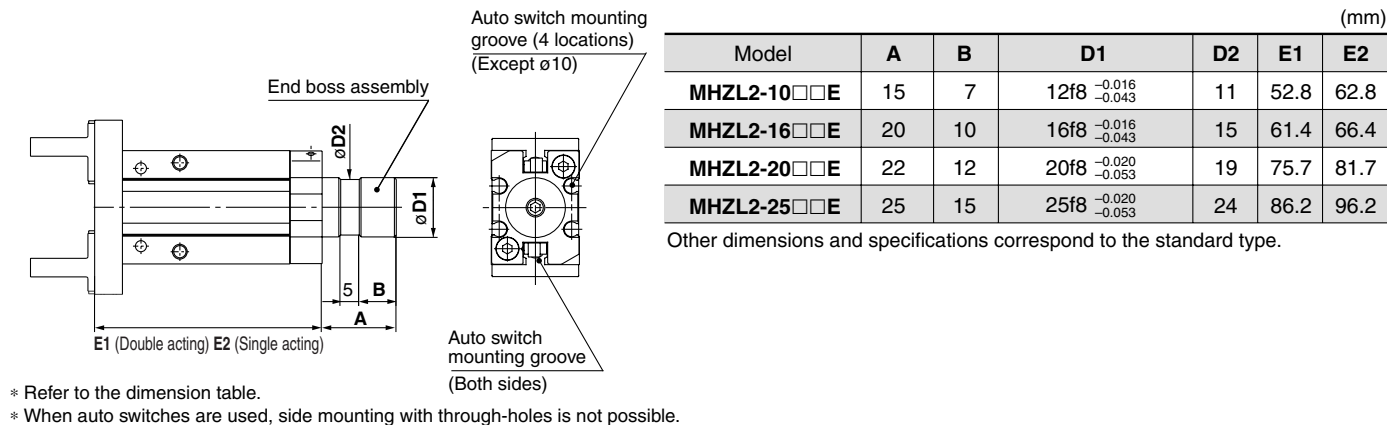
# Long Stroke Type/series MHZL2

## Body Option: End Boss Type

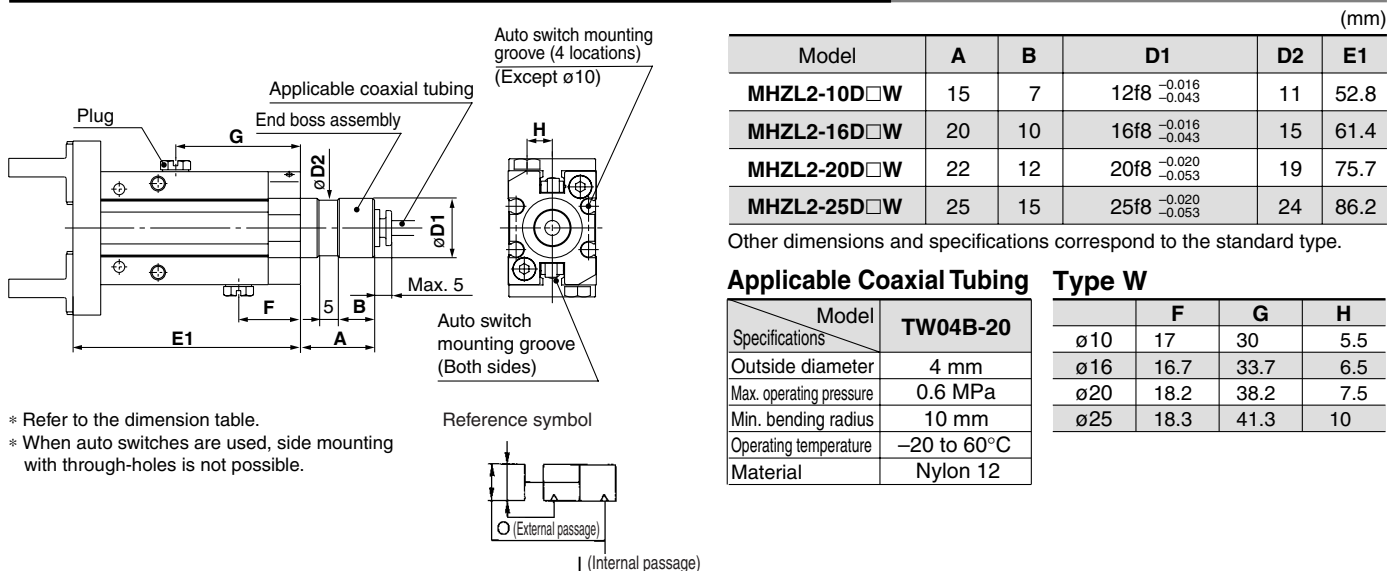
### Applicable Model

Symbol	Piping port location	Type of piping port				Applicable model		
		MHZL2-10	MHZL2-16	MHZL2-20	MHZL2-25	Double acting	Single acting	
							Normally open	Normally closed
E	Side ported	M3 x 0.5	M5 x 0.8			●	●	●
W	Axial ported	With ø4 One-touch fitting for coaxial tubing				●	—	—
K		With ø4 One-touch fitting				—	●	●
M		M5 x 0.8				—	●	●

### Side Ported [E]

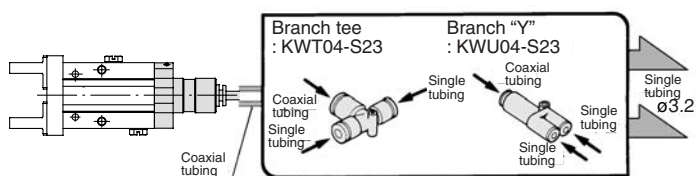


### Axial Ported (with One-touch fitting for coaxial tubing) [W]



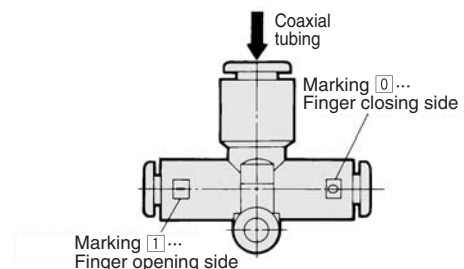
### Changing from Coaxial to Single Tubing

Changing to single tubing is possible by using a branch "Y" or branch tee fitting. In this case particularly, single tube fittings and tubing for ø3.2 will be necessary.

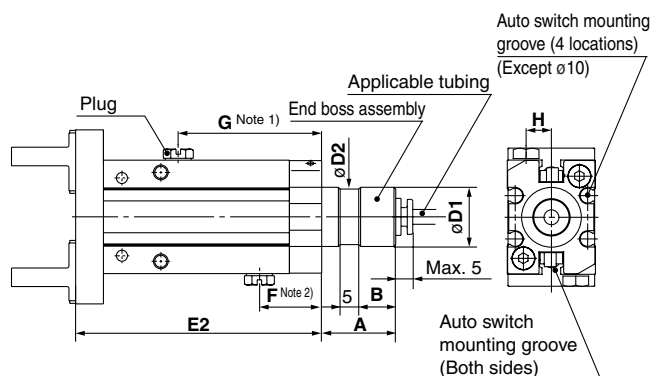


### Branch tee, Different diameter tee, Branch "Y", Male run tee

Please contact SMC for the coaxial fittings and tubing.



## Axial Ported (with One-touch fitting) [K]



- \* Refer to the dimension table.  
 \* When auto switches are used, side mounting with through-holes is not possible.  
 Note 1) Normally open type plug position.  
 Note 2) Normally closed type plug position.  
 The plug is mounted on only one side for the single acting type.

Model	A	B	D1	D2	E2
MHZL2-10 <sup>S</sup> <sub>C</sub> □K	15	7	12f8 <sup>-0.016</sup> <sub>-0.043</sub>	11	62.8
MHZL2-16 <sup>S</sup> <sub>C</sub> □K	20	10	16f8 <sup>-0.016</sup> <sub>-0.043</sub>	15	66.4
MHZL2-20 <sup>S</sup> <sub>C</sub> □K	22	12	20f8 <sup>-0.020</sup> <sub>-0.053</sub>	19	81.7
MHZL2-25 <sup>S</sup> <sub>C</sub> □K	25	15	25f8 <sup>-0.020</sup> <sub>-0.053</sub>	24	96.2

Other dimensions and specifications correspond to the standard type.

### Applicable Tubing

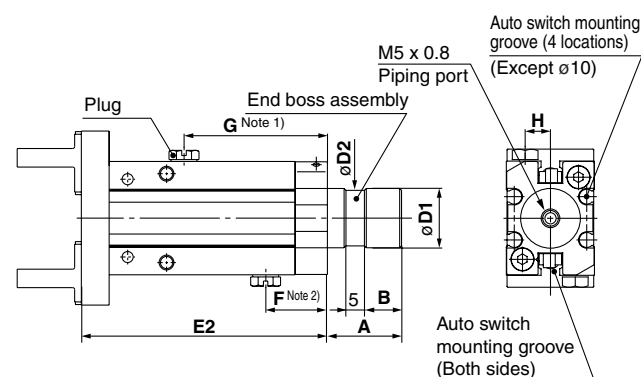
Description/ Model	Nylon tubing	Soft nylon tubing	Polyurethane tubing	Polyurethane coil tubing
Specifications	T0425	TS0425	TU0425	TCU0425B-1
Outside diameter (mm)	4	4	4	4
Max. operating pressure (MPa)	1.0	0.8	0.5	0.5
Min. bending radius (mm)	13	12	10	—
Operating temperature (°C)	-20 to 60	-20 to 60	-20 to 60	-20 to 60
Material	Nylon 12	Nylon 12	Polyurethane	Polyurethane

Refer to "Best Pneumatics No. 6" regarding One-touch fittings and tubing.

### Type K

	F	G	H
ø10	17	40	5.5
ø16	16.7	38.7	6.5
ø20	18.2	44.2	7.5
ø25	18.3	51.3	10

## Axial Ported (with M5 port) [M]



- \* Refer to the dimension table.  
 \* When auto switches are used, side mounting with through-holes is not possible.  
 Note 1) Normally open type plug position.  
 Note 2) Normally closed type plug position.  
 The plug is mounted on only one side for the single acting type.

Model	A	B	D1	D2	E2
MHZL2-10 <sup>S</sup> <sub>C</sub> □M	15	7	12f8 <sup>-0.016</sup> <sub>-0.043</sub>	11	62.8
MHZL2-16 <sup>S</sup> <sub>C</sub> □M	20	10	16f8 <sup>-0.016</sup> <sub>-0.043</sub>	15	66.4
MHZL2-20 <sup>S</sup> <sub>C</sub> □M	22	12	20f8 <sup>-0.020</sup> <sub>-0.053</sub>	19	81.7
MHZL2-25 <sup>S</sup> <sub>C</sub> □M	25	15	25f8 <sup>-0.020</sup> <sub>-0.053</sub>	24	96.2

Other dimensions and specifications correspond to the standard type.

### Type M

	F	G	H
ø10	17	40	5.5
ø16	16.7	38.7	6.5
ø20	18.2	44.2	7.5
ø25	18.3	51.3	10

## Mass

Model	End boss type (Symbol)				
	E		W	K	M
	Double acting	Single acting			
MHZL2□-10□□	70	80	70	80	80
MHZL2□-16□□	170	180	170	180	180
MHZL2□-20□□	310	330	310	330	330
MHZL2□-25□□	535	580	535	580	580

# Parallel Style Air Gripper with Dust Cover

## Series *MHZJ2*

### How to Order

**MHZJ2-16 D - M9BW**

**Number of fingers**  

2	2 fingers
---	-----------

**Bore size**  

6	6 mm
10	10 mm
16	16 mm
20	20 mm
25	25 mm

**Action**  

D	Double acting
S	Single acting (Normally open)
C	Single acting (Normally closed)

**Body option**  
 \* ø6 is only applicable with basic type.

**Made to Order**  
 Refer to page 425 for details.

**Number of auto switches**  

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

**Auto switch**  

Nil	Without auto switch (Built-in magnet)
-----	---------------------------------------

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

**Dust cover type**  

Nil	Chloroprene rubber (CR)
F	Fluororubber (FKM)
S	Silicon rubber (Si)

**Port**

**Nil:** Basic type

**E:** End boss type Side ported (Double acting / Single acting)

**W:** End boss type Axial ported with ø4 One-touch fitting for coaxial tubing (Double acting)

**K:** End boss type Axial ported with ø4 One-touch fitting for coaxial tubing (Single acting)

**M:** End boss type Axial ported with M5 port (Single acting)

**Applicable Auto Switch**/Refer to pages 761 to 809 for further information on the auto switch.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) *				Applicable model					Pre-wired connector	Applicable load			
					DC	AC	Electrical entry direction		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	ø6	ø10	ø16	ø20	ø25					
							Perpendicular	In-line														
Solid state switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	●	●	●	●	●	○	IC circuit	Relay, PLC		
				F8N			—	●	—	●	○	●	—	●	●	●	—					
				M9PV			M9P	●	●	●	○	●	●	●	●	●	○					
				F8P			—	●	—	●	○	●	—	●	●	●	—					
	Diagnosis (2-color indicator)			2-wire	12 V		M9BV	M9B	●	●	●	○	●	●	●	●	●	○	—			
				F8B			—	●	—	●	○	●	—	●	●	●	—					
				3-wire (NPN)			5 V, 12 V	M9NWV	M9NW	●	●	●	○	●	●	●	●	●			○	IC circuit
				3-wire (PNP)				M9PWV	M9PW	●	●	●	○	●	●	●	●	○				
	2-wire			12 V	M9BWV			M9BW	●	●	●	○	●	●	●	●	●	○	—			
	3-wire (NPN)				M9NAV			M9NA	○	○	●	○	●	●	●	●	○	IC circuit				
	3-wire (PNP)				M9PAV		M9PA	○	○	●	○	●	●	●	●	○	—					
	2-wire				M9BAV		M9BA	○	○	●	○	●	●	●	●	○						

\* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW  
 1 m..... M (Example) M9NWM  
 3 m..... L (Example) M9NWL  
 5 m..... Z (Example) M9NWLZ

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

Note 1) Take note of hysteresis with 2-color indication type switches. Refer to page 438 for detailed auto switch specifications.

Note 2) When using a D-F8□ switch on sizes ø6, mount it at a distance of 10 mm or more from magnetic substances such as iron, etc.

## Specifications

Fluid			Air
Operating pressure	Double acting		ø6: 0.15 to 0.7 MPa ø10: 0.2 to 0.7 MPa ø16 to ø25: 0.1 to 0.7 MPa
	Single acting	Normally open	ø6: 0.3 to 0.7 MPa ø10: 0.35 to 0.7 MPa ø16 to ø25: 0.25 to 0.7 MPa
		Normally closed	
Ambient and fluid temperature			−10 to 60°C
Repeatability			±0.01 mm
Max. operating frequency			180 c.p.m.
Lubrication			Not required
Action			Double acting, Single acting
Auto switch (option) <sup>Note)</sup>			Solid state auto switch (3-wire, 2-wire)

Note) Refer to pages 761 to 809 for further information on auto switches.

## Model

Action		Model	Bore size (mm)	Gripping force <sup>Note 1)</sup>		Opening/ Closing stroke (Both sides) (mm)	<sup>Note 2)</sup> Mass (g)
				Gripping force per finger Effective value (N)			
				External	Internal		
Double acting		MHZJ2- 6D	6	3.3	6.1	4	28
		MHZJ2-10D	10	9.8	17	4	60
		MHZJ2-16D	16	30	40	6	130
		MHZJ2-20D	20	42	66	10	250
		MHZJ2-25D	25	65	104	14	460
Single acting	Normally open	MHZJ2- 6S	6	1.9	—	4	28
		MHZJ2-10S	10	6.3		4	60
		MHZJ2-16S	16	24		6	130
		MHZJ2-20S	20	28		10	255
		MHZJ2-25S	25	45		14	465
	Normally closed	MHZJ2- 6C	6	—	3.7	4	28
		MHZJ2-10C	10		12	4	60
		MHZJ2-16C	16		31	6	130
		MHZJ2-20C	20		56	10	255
		MHZJ2-25C	25		83	14	460

Note 1) Values based on pressure of 0.5 MPa, gripping point L = 20 mm, at center of stroke.

Note 2) Values excluding mass of auto switch.

## Option

### ●Body Option/End Boss Type

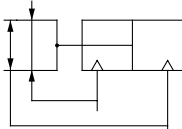
Symbol	Piping port location	Type of piping port				Applicable model	
		MHZJ2-10	MHZJ2-16	MHZJ2-20	MHZJ2-25	Double acting	Single acting
Nil	Basic type	M3 x 0.5		M5 x 0.8		●	●
E	Side ported	M3 x 0.5		M5 x 0.8		●	●
W	Axial ported	With $\phi 4$ One-touch fitting for coaxial tubing				●	—
K	Axial ported	With $\phi 4$ One-touch fitting				—	●
M	Axial ported	M5 x 0.8				—	●

\* For detailed body option specifications, refer to option specifications on pages 434 and 435.

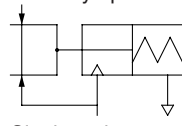


### JIS Symbol

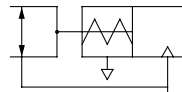
Double acting



Single acting type, Normally open



Single acting type, Normally closed



Refer to pages 436 to 440 for the specifications with auto switch.

- Auto switch installation examples and mounting positions
- Auto switch hysteresis
- Auto switch mounting
- Protrusion of auto switch from edge of body



### Made to Order

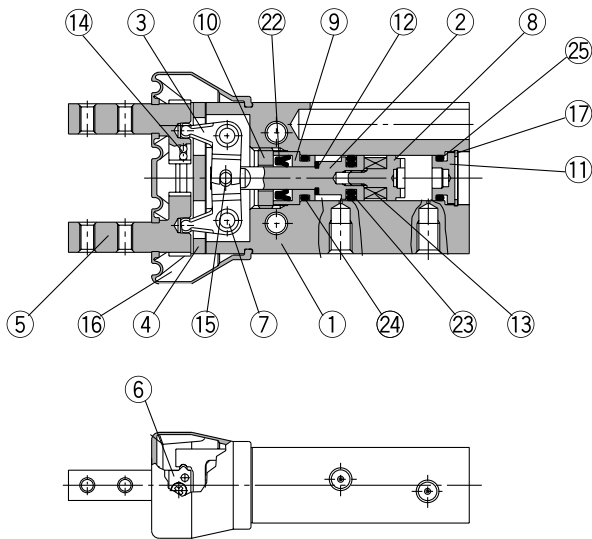
(Refer to pages 683 to 713 for details.)

Symbol	Specifications/Description
-X4	Heat resistance (100°C)
-X5	Fluororubber seal
-X7	Closing direction spring assist
-X12	Opening direction spring assist
-X50	Without magnet
-X53	EPDM seal/Fluorine grease
-X56	Axial ported type
-X63	Fluorine grease
-X64	Finger: Side tapped mounting
-X65	Finger: Through-hole mounting
-X77A	Dust cover adhesion
-X77B	Dust cover adhesion (Finger part only)
-X78A	Dust cover caulking
-X78B	Dust cover caulking (Finger part only)
-X79	Grease for food

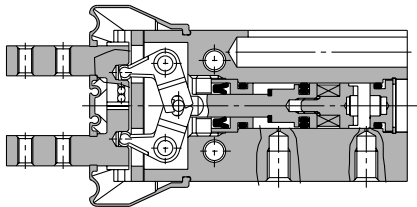
# Series MHZJ2

## Construction: MHZJ2-6□

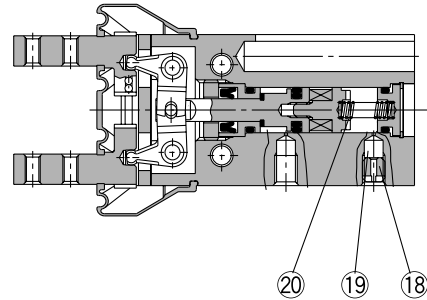
### Double acting/With fingers open



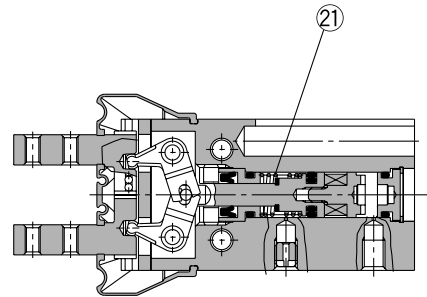
### Double acting/With fingers closed



### Single acting/Normally open



### Single acting/Normally closed



## Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	Stainless steel	
3	Lever	Stainless steel	Heat treated
4	Guide	Stainless steel	Heat treated
5	Finger	Stainless steel	Heat treated
6	Roller stopper	Stainless steel	
7	Lever shaft	Stainless steel	Nitriding
8	Magnet holder	Stainless steel	
9	Holder	Brass	Electroless nickel plated
10	Holder lock	Stainless steel	
11	Cap	Aluminum alloy	Clear anodized
12	Bumper	Urethane rubber	
13	Magnet	—	Nickel plated
14	Steel balls	High carbon chrome bearing steel	
15	Needle roller	High carbon chrome bearing steel	
16	Dust cover	CR	Chloroprene rubber
		FKM	Fluororubber
		Si	Silicon rubber
17	Type C retaining ring	Carbon steel	Nickel plated
18	Exhaust plug	Brass	Electroless nickel plated
19	Exhaust filter	Polyvinyl formal	
20	N.O. spring	Stainless steel spring wire	
21	N.C. spring	Stainless steel spring wire	
22	Rod seal	NBR	
23	Piston seal	NBR	
24	Gasket	NBR	
25	Gasket	NBR	

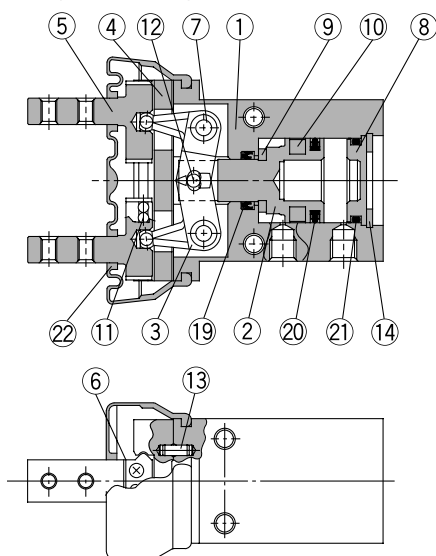
## Replacement Parts

Description			MHZJ2-6	Main parts
Seal kit			Please contact SMC to replace the seal kit.	
Dust cover	Material	CR	MHZJ2-J6	⑩
		FKM	MHZJ2-J6F	
		Si	MHZJ2-J6S	
Finger assembly			Please contact SMC to replace the finger assembly.	
Piston assembly	MHZJ2-6D□		MHZJ-A0603	②⑧⑨⑩⑫⑬⑮⑲⑳㉓㉔
	MHZJ2-6S□			
	MHZJ2-6C□		MHZJ-A0603C	②⑧⑨⑩⑫⑬⑮⑲㉓㉔

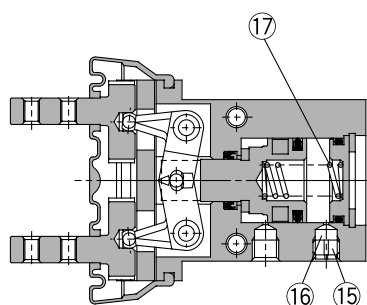
Replacement part/Grease pack part no.: GR-S-005 (5 g)

## Construction: MHZJ2-10□ to 25□

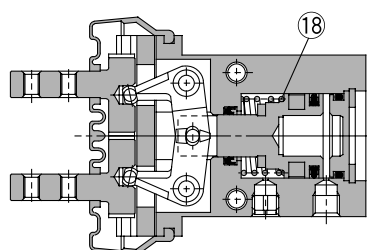
### Double acting/With fingers open



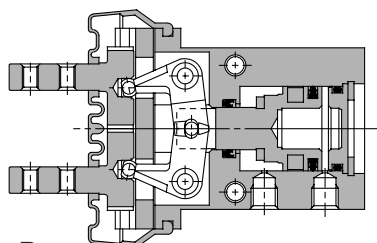
### Single acting/Normally open



### Single acting/Normally closed



### Double acting/With fingers closed



## Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Piston	ø10, ø16: Stainless steel ø20, ø25: Aluminum alloy	ø20, ø25: Hard anodized
3	Lever	Stainless steel	Heat treated
4	Guide	Stainless steel	Heat treated
5	Finger	Stainless steel	Heat treated
6	Roller stopper	Stainless steel	
7	Lever shaft	Stainless steel	Nitriding
8	Cap	Aluminum alloy	Clear anodized
9	Bumper	Urethane rubber	
10	Rubber magnet	Synthetic rubber	
11	Steel balls	High carbon chrome bearing steel	
12	Needle roller	High carbon chrome bearing steel	

No.	Description	Material	Note
13	Parallel pin	Stainless steel	
14	Type C retaining ring	Carbon steel	Nickel plated
15	Exhaust plug A	Brass	Electroless nickel plated
16	Exhaust filter A	Polyvinyl formal	
17	N.O. spring	Stainless steel spring wire	
18	N.C. spring	Stainless steel spring wire	
19	Rod seal	NBR	
20	Piston seal	NBR	
21	Gasket	NBR	
22	Dust cover	CR	Chloroprene rubber
		FKM	Fluororubber
		Si	Silicon rubber

## Replacement Parts

Description		MHZJ2-10	MHZJ2-16	MHZJ2-20	MHZJ2-25	Main parts
Seal kit		MHZJ10-PS	MHZJ16-PS	MHZJ20-PS	MHZJ25-PS	⑬⑭⑮⑯
Dust cover	Material	CR	MHZJ2-J10	MHZJ2-J16	MHZJ2-J20	⑰
	FKM	MHZJ2-J10F	MHZJ2-J16F	MHZJ2-J20F	MHZJ2-J25F	
	Si	MHZJ2-J10S	MHZJ2-J16S	MHZJ2-J20S	MHZJ2-J25S	
Finger assembly		MHZJ-A1002	MHZJ-A1602	MHZJ-A2002	MHZJ-A2502	④⑤⑥⑦⑧⑨⑩⑪⑫ Mounting thread
Piston assembly		MHZJ-A1003	MHZJ-A1603	MHZJ-A2003	MHZJ-A2503	⑫⑬⑭⑮⑯
End boss assembly	MHZJ2-□□□□W	MHZ-A1007	MHZ-A1607	MHZ-A2007	MHZ-A2507	Main body of adaptor Mounting screw for adaptor Seal kit
	MHZJ2-□□□□K	MHZ-A1008	MHZ-A1608	MHZ-A2008	MHZ-A2508	
	MHZJ2-□□□□M	MHZ-A1009	MHZ-A1609	MHZ-A2009	MHZ-A2509	
	MHZJ2-□□□□E	MHZ-A1010	MHZ-A1610	MHZ-A2010	MHZ-A2510	

\* Material of packing  
NBR = Nitrile rubber, FKM = Fluororubber

\* Material of dust cover  
CR = Chloroprene rubber, FKM = Fluororubber, Si = Silicon rubber

\* End boss type

W = One-touching fitting for coaxial tubing, K = With One-touch fitting, M = With M5 port, E = Side ported

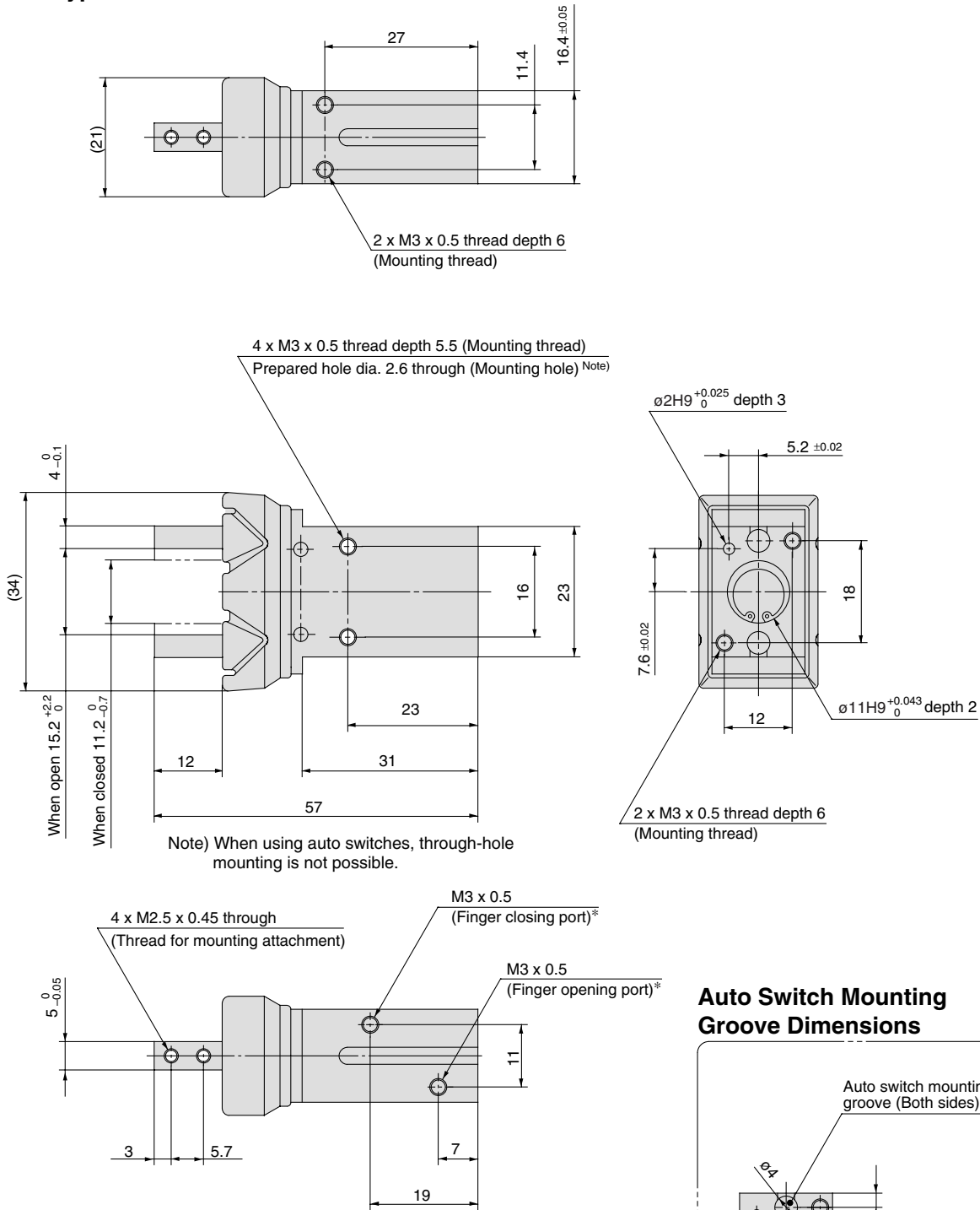
\* The end boss assembly other than type E should be mounted on the special body.

Replacement part/Grease pack part no.: GR-S-005 (5 g)

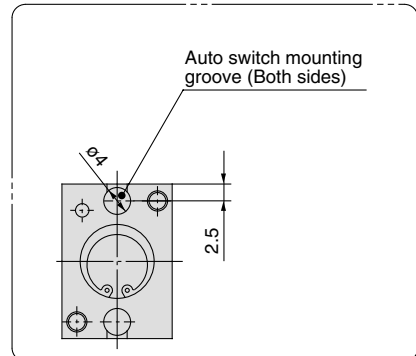




## MHZJ2-10□ Double acting/Single acting Basic type



### Auto Switch Mounting Groove Dimensions



*Note) When using auto switches, through-hole mounting is not possible.*

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

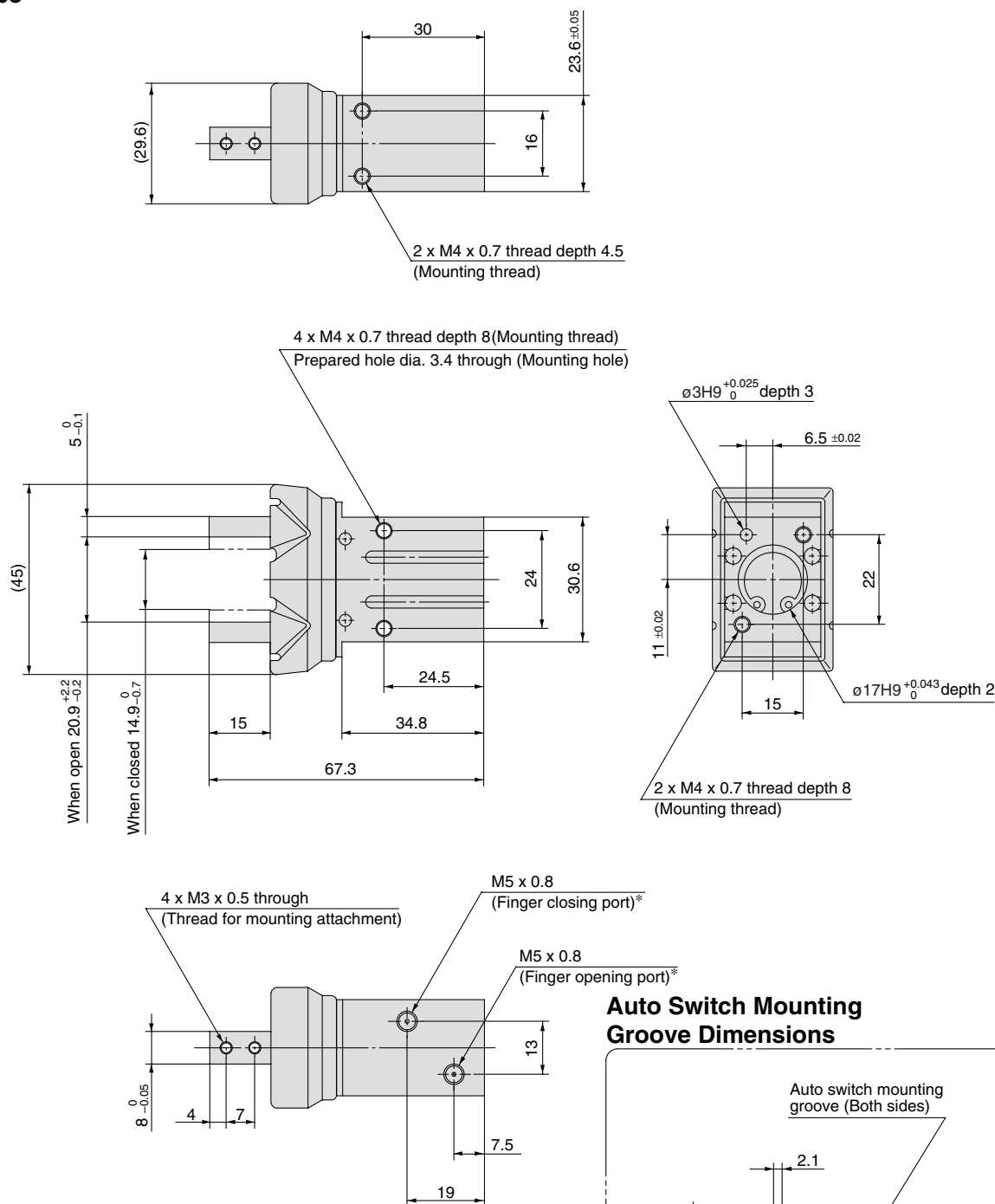
MA

D-□

# Series MHZJ2

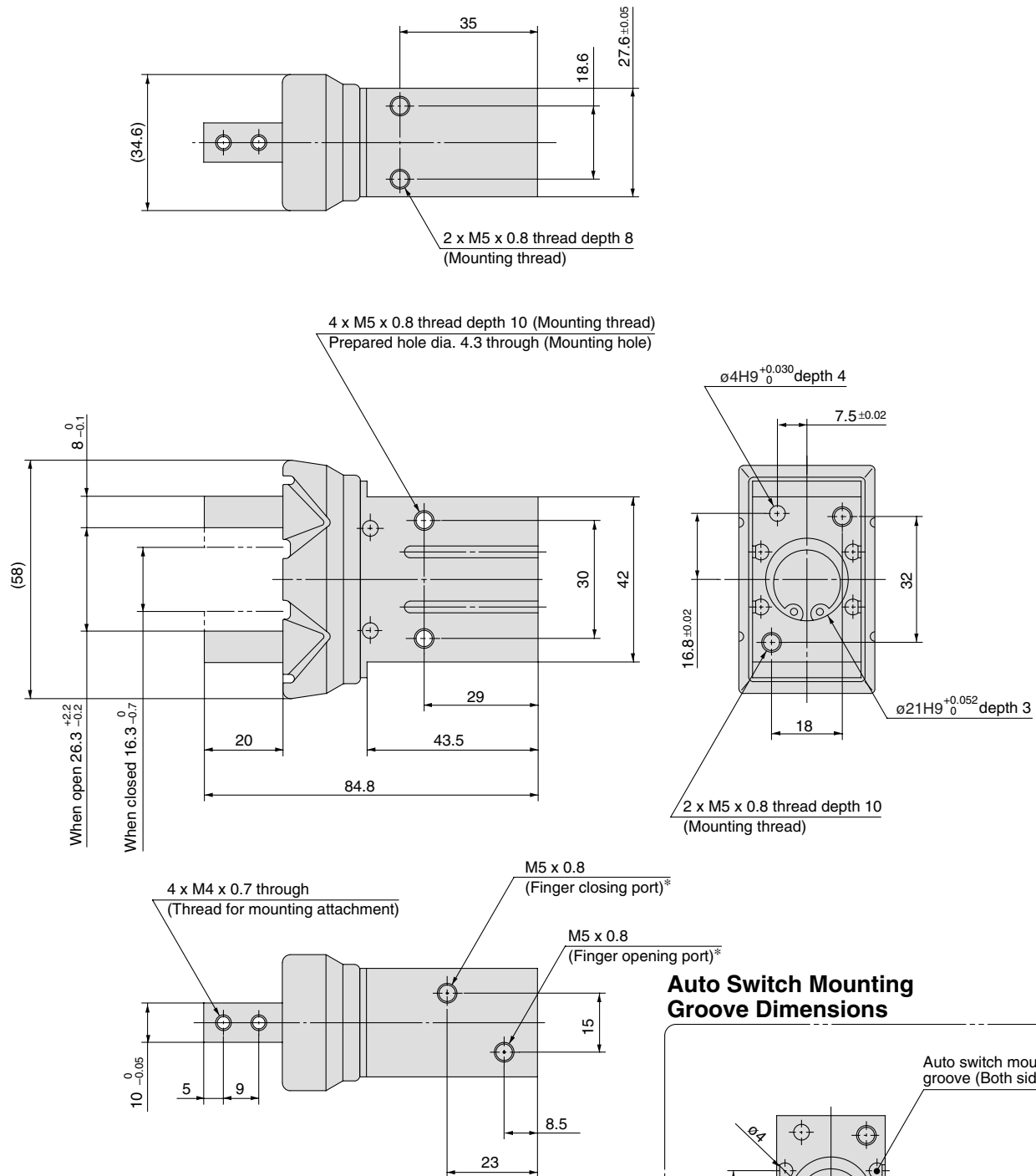
## Dimensions

### MHZJ2-16□ Double acting/Single acting Basic type

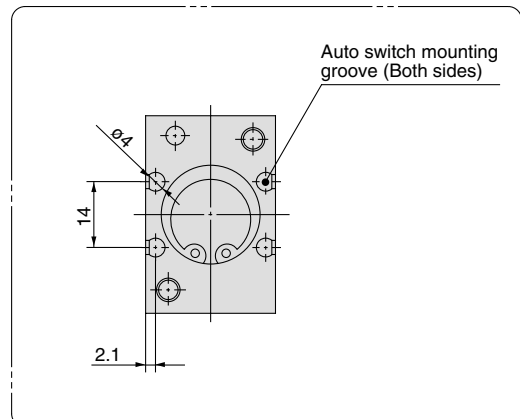


\* For single action, the port on one side is a breathing hole.

## MHZJ2-20□ Double acting/Single acting Basic type



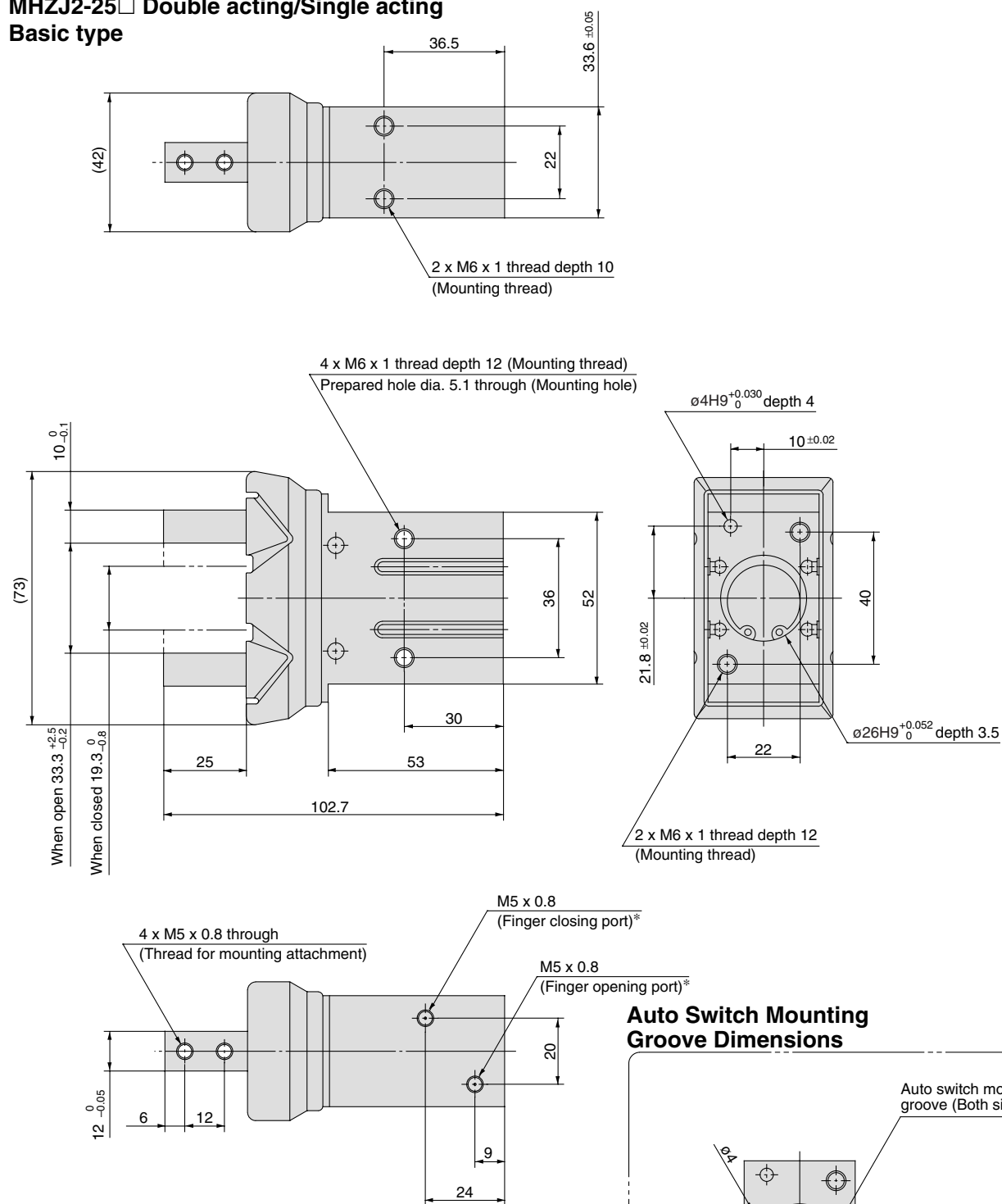
\* For single action, the port on one side is a breathing hole.



**MHZ**  
**MHF**  
**MHL**  
**MHR**  
**MHK**  
**MHS**  
**MHC**  
**MHT**  
**MHY**  
**MHW**  
**-X**☐  
**MRHQ**  
**MA**  
**D-**☐

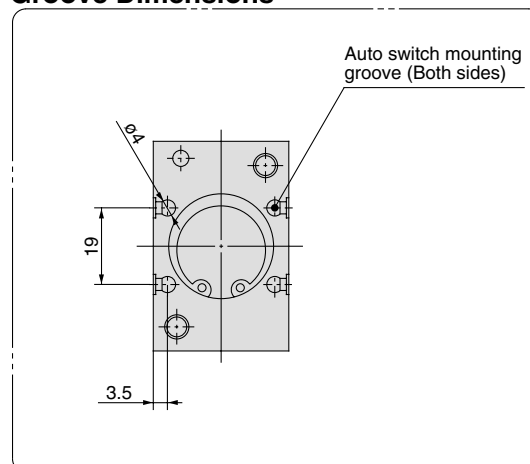
## Dimensions

**MHZJ2-25** ☐ Double acting/Single acting  
Basic type



\* For single action, the port on one side is a breathing hole.

## Auto Switch Mounting Groove Dimensions

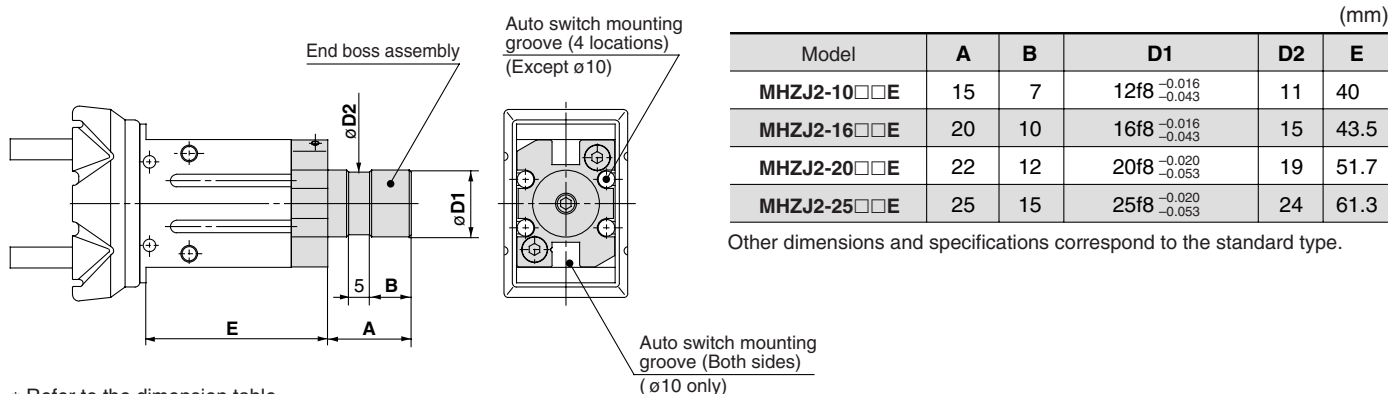


# With Dust Cover/Series MHZJ2 Body Option: End Boss Type

## Applicable Model

Symbol	Piping port location	Type of piping port				Applicable model		
		MHZJ2-10	MHZJ2-16	MHZJ2-20	MHZJ2-25	Double acting	Single acting	
							Normally open	Normally closed
E	Side ported	M3 x 0.5	M5 x 0.8			●	●	●
W	Axial ported	With ø4 One-touch fitting for coaxial tubing				●	—	—
K		With ø4 One-touch fitting				—	●	●
M		M5 x 0.8				—	●	●

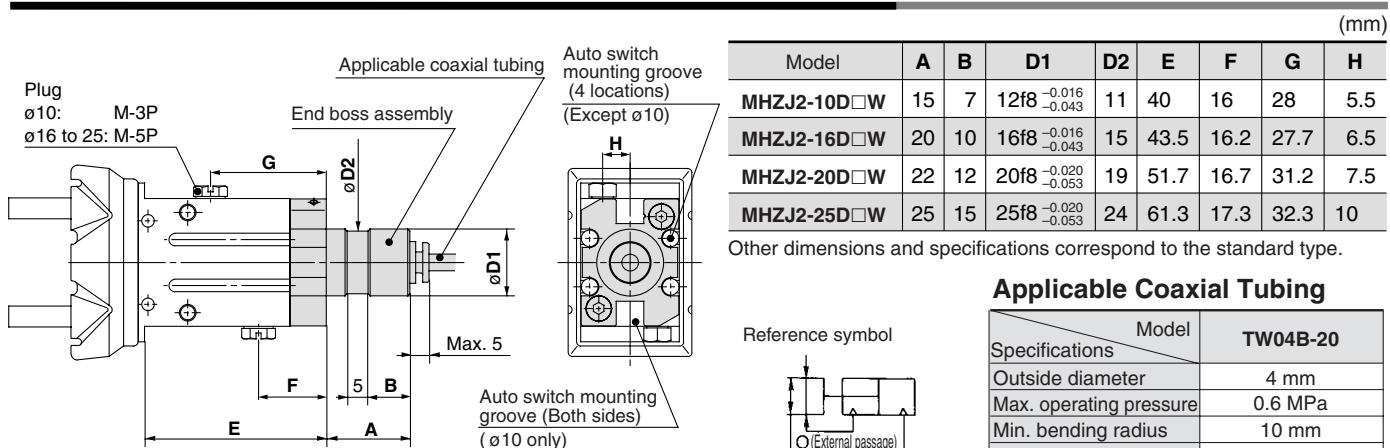
## Side Ported [E]



\* Refer to the dimension table.

\* When auto switches are used on ø10, side mounting with through-holes is not possible.

## Axial Ported (with One-touch fitting for coaxial tubing) [W]



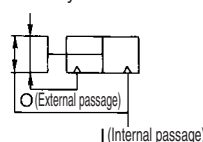
\* Refer to the dimension table.

\* When auto switches are used on ø10, side mounting with through-holes is not possible.

### Applicable Coaxial Tubing

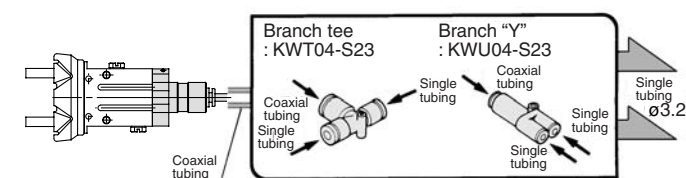
Specifications	Model
Outside diameter	TW04B-20
Max. operating pressure	4 mm
Min. bending radius	0.6 MPa
Operating temperature	10 mm
Material	-20 to 60°C
	Nylon 12

Reference symbol



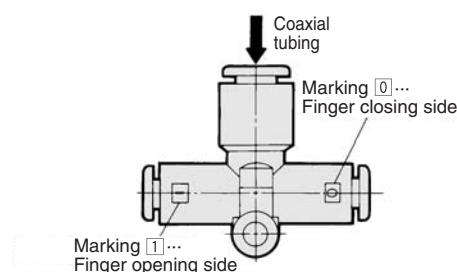
## Changing from Coaxial to Single Tubing

Changing to single tubing is possible by using a branch "Y" or branch tee fitting.  
In this case particularly, single tube fittings and tubing for ø3.2 will be necessary.

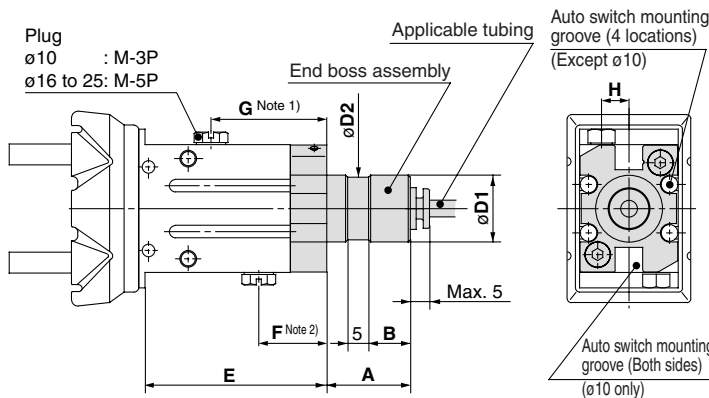


## Branch Tee, Different Diameter Tee, Branch "Y", Male Run Tee

Please contact SMC for the coaxial fittings and tubing.



## Axial Ported (with One-touch fitting) [K]



- \* Refer to the dimension table.  
 \* When auto switches are used on ø10, side mounting with through-holes is not possible.  
 Note 1) Normally open type plug position.  
 Note 2) Normally closed type plug position.  
 The plug is mounted on only one side for the single acting type.

Model	A	B	D1	D2	E	F	G	H
MHZJ2-10 <sup>S</sup> □K	15	7	12f8 <sup>-0.016</sup> <sub>-0.043</sub>	11	40	16	28	5.5
MHZJ2-16 <sup>S</sup> □K	20	10	16f8 <sup>-0.016</sup> <sub>-0.043</sub>	15	43.5	16.2	27.7	6.5
MHZJ2-20 <sup>S</sup> □K	22	12	20f8 <sup>-0.020</sup> <sub>-0.053</sub>	19	51.7	16.7	31.2	7.5
MHZJ2-25 <sup>S</sup> □K	25	15	25f8 <sup>-0.020</sup> <sub>-0.053</sub>	24	61.3	17.3	32.3	10

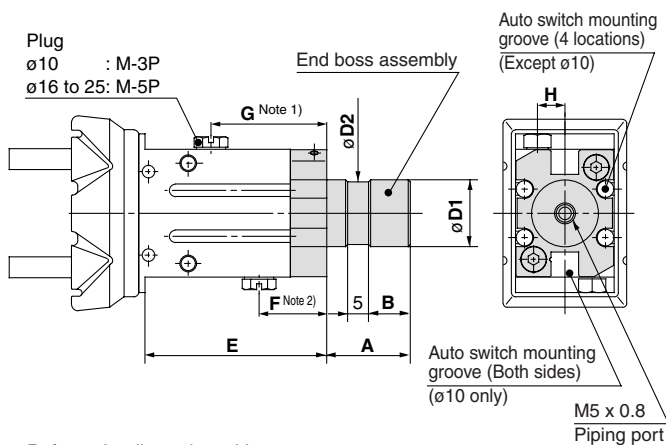
Other dimensions and specifications correspond to the standard type.

### Applicable Tubing

Description/Model	Nylon tubing	Soft nylon tubing	Polyurethane tubing	Polyurethane coil tubing
Specifications	T0425	TS0425	TU0425	TCU0425B-1
Outside diameter (mm)	4	4	4	4
Max. operating pressure (MPa)	1.0	0.8	0.5	0.5
Min. bending radius (mm)	13	12	10	—
Operating temperature (°C)	-20 to 60	-20 to 60	-20 to 60	-20 to 60
Material	Nylon 12	Nylon 12	Polyurethane	Polyurethane

Refer to "Best Pneumatics No. 6" regarding One-touch fittings and tubing.

## Axial Ported (with M5 port) [M]



- \* Refer to the dimension table.  
 \* When auto switches are used on ø10, side mounting with through-holes is not possible.  
 Note 1) Normally open type plug position.  
 Note 2) Normally closed type plug position.  
 The plug is mounted on only one side for the single acting type.

Model	A	B	D1	D2	E	F	G	H
MHZJ2-10 <sup>S</sup> □M	15	7	12f8 <sup>-0.016</sup> <sub>-0.043</sub>	11	40	16	28	5.5
MHZJ2-16 <sup>S</sup> □M	20	10	16f8 <sup>-0.016</sup> <sub>-0.043</sub>	15	43.5	16.2	27.7	6.5
MHZJ2-20 <sup>S</sup> □M	22	12	20f8 <sup>-0.020</sup> <sub>-0.053</sub>	19	51.7	16.7	31.2	7.5
MHZJ2-25 <sup>S</sup> □M	25	15	25f8 <sup>-0.020</sup> <sub>-0.053</sub>	24	61.3	17.3	32.3	10

Other dimensions and specifications correspond to the standard type.

## Mass

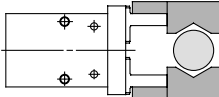
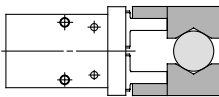
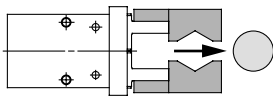












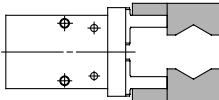
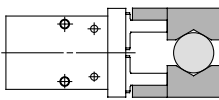
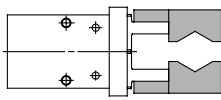
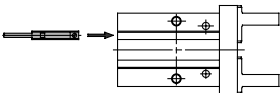
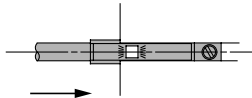
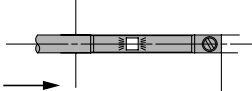
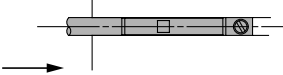
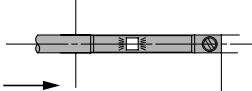
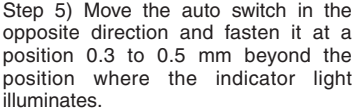
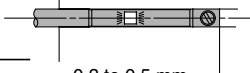
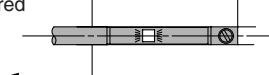
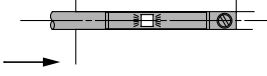

Model	End boss type (Symbol)			
	E	W	K	M
MHZJ2-10□□	70	70	70	70
MHZJ2-16□□	165	165	165	165
MHZJ2-20□□	290	290	290	290
MHZJ2-25□□	525	525	525	525

## Series MHZ2/MHZJ2

# Auto Switch Installation Examples and Mounting Positions

Various auto switch applications are possible through different combinations of auto switch quantities and detecting positions.

### 1) Detection when Gripping Exterior of Workpiece

Detection example		1. Confirmation of fingers in reset position	2. Confirmation of workpiece held	3. Confirmation of workpiece released
Position to be detected		Position of fingers fully opened 	Position when gripping workpiece 	Position of fingers fully closed 
Operation of auto switch		Auto switch turned on when fingers return. (Light ON)	Auto switch turned on when gripping a workpiece. (Light ON)	When a workpiece is held (Normal operation): Auto switch to turn OFF (Light not illuminating) When a workpiece is not held (Abnormal operation): Auto switch to turn ON (Light illuminating)
Detection combinations	One auto switch			
				
	Two auto switches			
				
How to determine auto switch installation position		Step 1) Fully open the fingers. 	Step 1) Position fingers for gripping a workpiece. 	Step 1) Position fingers for gripping a workpiece. 
At no pressure or low pressure, connect the auto switch to a power supply, and follow the directions.		Step 2) Insert the auto switch into the switch installation groove in the direction shown in the following drawing. 		
		Step 3) Slide the auto switch in the direction of the arrow until the indicator light illuminates. 	Step 3) Slide the auto switch in the direction of the arrow until the light illuminates and fasten it at a position 0.3 to 0.5 mm in the direction of the arrow beyond the position where the indicator light illuminates. 	
		Step 4) Slide the auto switch further in the direction of the arrow until the indicator light goes out. 	Position where light turns ON 	
		Step 5) Move the auto switch in the opposite direction and fasten it at a position 0.3 to 0.5 mm beyond the position where the indicator light illuminates.  Position where light turns ON  Position to be secured 	Position to be secured  0.3 to 0.5 mm 	

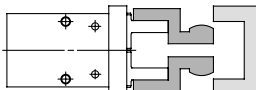
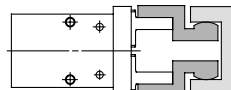
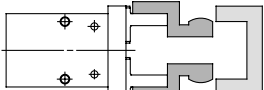


















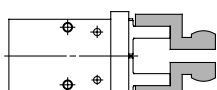
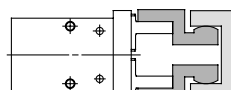
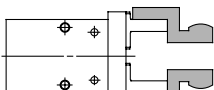
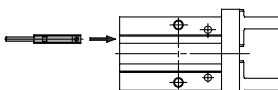
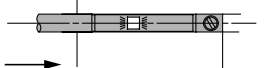
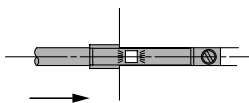
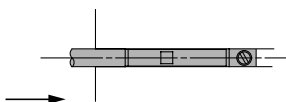
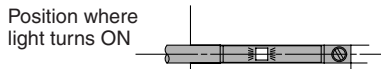


Note 1) It is recommended that gripping of a workpiece be performed close to the center of the finger stroke.

Note 2) When holding a workpiece close at the end of open/close stroke of fingers, detecting performance of the combinations listed in the above table may be limited, depending on the hysteresis of an auto switch, etc.

Various auto switch applications are possible through different combinations of auto switch quantities and detecting positions.

## 2) Detection when Gripping Interior of Workpiece

Detection example		1. Confirmation of fingers in reset position	2. Confirmation of workpiece held	3. Confirmation of workpiece released
Position to be detected		Position of fingers fully closed 	Position when gripping 	Position of fingers fully opened 
Operation of auto switch		Auto switch turned ON when fingers return. (Light ON)	Auto switch turned ON when gripping a workpiece. (Light ON)	When a workpiece is held (Normal operation): Auto switch to turn OFF (Light not illuminating) When a workpiece is not held (Abnormal operation): Auto switch to turn ON (Light illuminating)
Detection combinations	One auto switch			
				
	Two auto switches	 	 	 
		 	 	 
How to determine auto switch installation position		Step 1) Fully close the fingers. 	Step 1) Position fingers for gripping a workpiece. 	Step 1) Fully open the fingers. 
At no pressure or low pressure, connect the auto switch to a power supply, and follow the directions.		Step 2) Insert the auto switch into the switch installation groove in the direction shown in the following drawing. 		
		Step 3) Move the auto switch in the direction of the arrow and fasten it at a position 0.3 to 0.5 mm beyond the position where the indicator light illuminates.    Position where light turns ON  Position to be secured  0.3 to 0.5 mm	Step 3) Slide the auto switch in the direction of the arrow until the indicator light illuminates.  	
		  Position where light turns ON  Position to be secured  0.3 to 0.5 mm	Step 4) Slide the auto switch further in the direction of the arrow until the indicator light goes out.  	
		  Position where light turns ON  Position to be secured  0.3 to 0.5 mm	Step 5) Move the auto switch in the opposite direction 0.3 to 0.5 mm in the direction indicated by the arrow from its location when the indicator light comes on again.  	
		  Position where light turns ON  Position to be secured  0.3 to 0.5 mm	  Position where light turns ON  Position to be secured  0.3 to 0.5 mm	



Note 1) It is recommended that gripping of a workpiece be performed close to the center of the finger stroke.

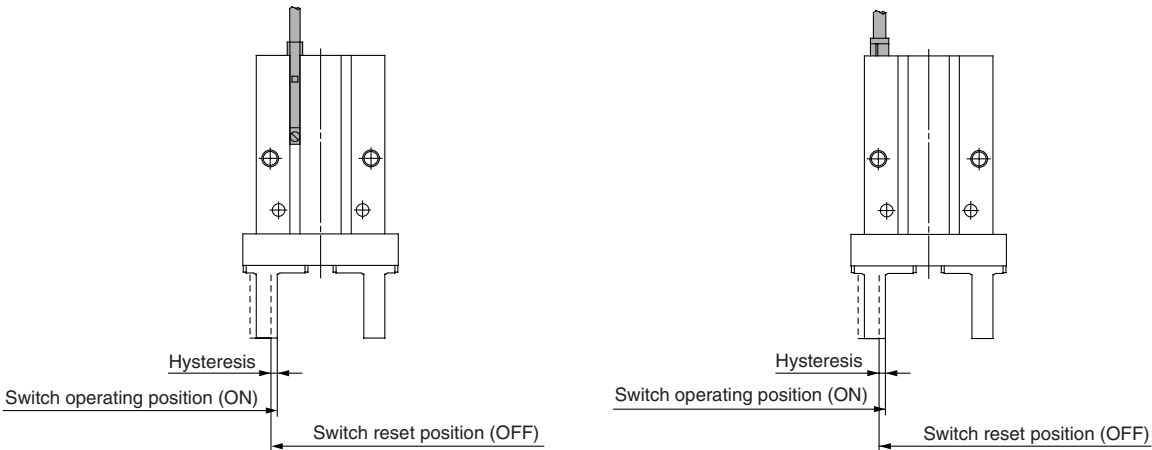
Note 2) When holding a workpiece close at the end of open/close stroke of fingers, detecting performance of the combinations listed in the above table may be limited, depending on the hysteresis of an auto switch, etc.



# Series MHZ2, MHZJ2

## Auto Switch Hysteresis

Auto switches have hysteresis similar to micro switches.  
Use the table below as a guide when adjusting auto switch positions, etc.



## Hysteresis

Auto switch model	Air gripper model		
	D-Y59A/Y59B D-Y69A/Y69B D-Y7P(V) D-Y7□W(V)	D-F8□	D-M9□(V) D-M9□W(V) D-M9□A(V)L
MHZ2-6□	No setting	0.5	0.5
MHZ2-10□, MHZL2-10□	0.5	0.5 <small>Note)</small>	0.5 <small>Note)</small>
MHZ2-16□, MHZL2-16□	0.5	0.5	0.5
MHZ2-20□, MHZL2-20□	0.5	0.5	0.8
MHZ2-25□, MHZL2-25□	0.5	0.5	0.5
MHZ2-32□	0.5	0.5	0.7
MHZ2-40□	0.5	0.5	0.9
MHZJ2-6□	No setting	0.5	0.5
MHZJ2-10□		0.5	0.5
MHZJ2-16□		0.5	0.5
MHZJ2-20□		0.5	0.8
MHZJ2-25□		0.5	0.5

Note) When mounting D-M9□(V), M9□W(V) and M9□A(V)L on MHZ2-10□ and MHZL2-10, mounting brackets (BMG2-012) are required.

## Auto Switch Mounting

### Applicable models:

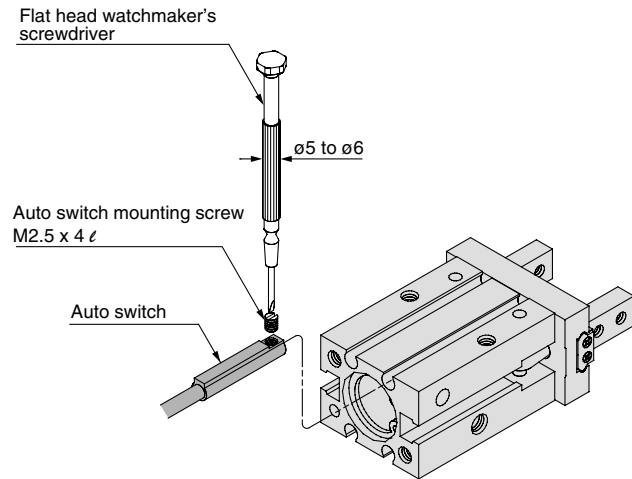
MHZ2-6

Series MHZJ2

Round groove of Series MHZ2

Round groove of Series MHZL2

To set the auto switch, insert the auto switch into the auto switch installation groove of the gripper from the direction indicated in the following drawing. After setting the position, tighten the attached auto switch mounting screw with a flat head watchmaker's screwdriver.



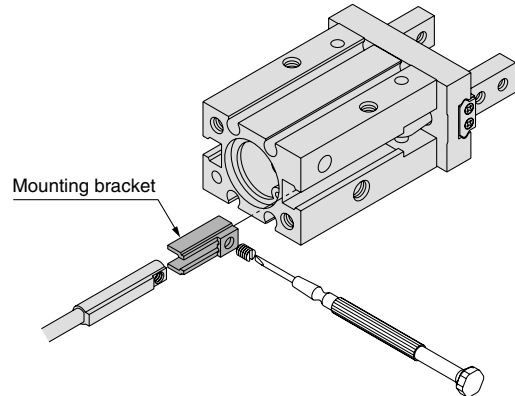
Note) Use a watchmaker's screwdriver with a grip diameter of 5 to 6 mm to tighten the auto switch mounting screw.  
The tightening torque should be 0.05 to 0.15 N·m.

### Applicable models:

Square groove on the side of Series MHZ2

Square groove on the side of Series MHZL2

- (1) To set the auto switch, insert the auto switch into the installation groove of the cylinder as shown below and set it roughly.
- (2) Insert the auto switch into the auto switch bracket installation groove.
- (3) After confirming the detecting position, tighten the set screws (M2.5) attached to the auto switch and set it.
- (4) Be sure to change the detecting position in the state of (2).



### Auto Switch Mounting Bracket: Part No.

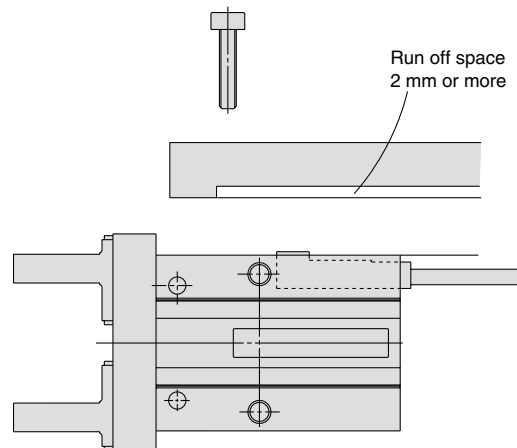
Auto switch part no.	Auto switch mounting bracket part no.
D-M9□(V)	BMG2-012
D-M9□W(V)	
D-F8□	
D-M9□A(V)L	

Note) Use a watchmaker's screwdriver with a grip diameter of 5 to 6 mm to tighten the set screws (M2.5).  
The tightening torque should be 0.05 to 0.1 N·m.  
As a guide, it should be turned about 90° beyond the point at which tightening can be felt.

Note) D-F8□ cannot be mounted on MHZ2-10□ and MHZL2-10□.

### [Handling of Mounting Brackets: Precautions]

When auto switch is set on the mounting side as shown below, allow at least 2 mm run off space on mounting plate since the auto switch is protruded from the gripper edge.



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□

# Series MHZ2, MHZJ2

## Protrusion of Auto Switch from Edge of Body

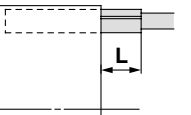
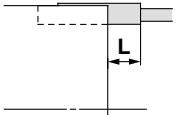
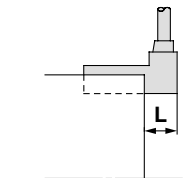
The amount of auto switch protrusion from the body's end surface is as shown in the table below.

Use this as a standard when mounting, etc.

D-F8□ has no protrusion from the body's end surface.

The end boss type has no protrusion either.

### Standard Body

Lead wire type			In-line electrical entry type			Perpendicular electrical entry type						
Explanatory drawing												
Auto switch model Finger position			D-Y59□ D-Y7P D-Y7□W	D-M9□ D-M9□W	D-M9□AL	D-Y69□ D-Y7PV D-Y7□WV	D-M9□V D-M9□WV	D-M9□AVL				
Air gripper model												
Standard	MHZ2-6□	Open	No setting	11	13	No setting	9	11				
		Close		13	15		11	13				
	MHZ2-10□	Open	1	3.5 <small>Note 3)</small>	5.5 <small>Note 3)</small>	—	1.5 <small>Note 3)</small>	3.5 <small>Note 3)</small>				
		Close	7.5	6.5 <small>Note 3)</small>	8.5 <small>Note 3)</small>	6.5	4.5 <small>Note 3)</small>	6.5 <small>Note 3)</small>				
	MHZ2-16□	Open	—	1	3	—	—	—				
		Close	6	4	6	5	2	4				
	MHZ2-20□	Open	—	—	—	—	—	—				
		Close	4	2	4	3	—	—				
	MHZ2-25□	Open	—	—	—	—	—	—				
		Close	1	—	—	—	—	—				
	MHZ2-32□	Open	—	—	—	—	—	—				
		Close	3	—	—	2	—	—				
	MHZ2-40□	Open	—	—	—	—	—	—				
		Close	2	—	—	1	—	—				
With dust cover	MHZJ2-6□	Open	No setting	11	13	No setting	9	11				
		Close		13	15		11	13				
	MHZJ2-10□	Open		5	7		3	5				
		Close		7	9		5	7				
	MHZJ2-16□	Open		2	4		—	—				
		Close		5	7		3	5				
	MHZJ2-20□	Open		—	—		—	—				
		Close		3	5		1	3				
	MHZJ2-25□	Open		—	—		—	—				
		Close		2	4		—	—				
	Long stroke	Double acting		MHZL2-10D	Open		0.5	1.5 <small>Note 3)</small>	3.5 <small>Note 3)</small>	—	—	—
					Close		8.5	8 <small>Note 3)</small>	10 <small>Note 3)</small>	7.5	6 <small>Note 3)</small>	8 <small>Note 3)</small>
				MHZL2-16D	Open		—	—	—	—	—	—
					Close		8	6	8	7	4	6
MHZL2-20D			Open	—	—	—	—	—	—			
			Close	7	5	7	6	3	5			
Single acting (Normally open)		MHZL2-25D	Open	—	—	—	—	—	—			
			Close	5.5	3.5	5.5	4.5	1.5	3.5			
		MHZL2-10S	Open	—	—	—	—	—	—			
			Close	—	—	—	—	—	—			
		MHZL2-16S	Open	—	—	—	—	—	—			
			Close	3	1	3	2	—	—			
Single acting (Normally closed)		MHZL2-20S	Open	—	—	—	—	—	—			
			Close	1	—	—	—	—	—			
	MHZL2-25S	Open	—	—	—	—	—	—				
		Close	—	—	—	—	—	—				
	Single acting (Normally closed)	MHZL2-10C	Open	—	—	—	—	—	—			
			Close	5.5	5 <small>Note 3)</small>	7 <small>Note 3)</small>	4.5	3 <small>Note 3)</small>	5 <small>Note 3)</small>			
MHZL2-16C		Open	—	—	—	—	—	—				
		Close	5.5	3.5	5.5	4.5	1.5	3.5				
MHZL2-20C		Open	—	—	—	—	—	—				
		Close	3.5	1.5	3.5	2.5	—	—				
MHZL2-25C	Open	—	—	—	—	—	—					
	Close	1.5	—	—	0.5	—	—					

Note 1) There is no protrusion if no values are entered in the table.

Note 2) The actual mounting position should be adjusted after confirming the auto switch operating conditions.

Note 3) When mounting D-M9□(V), M9□W(V) and M9□A(V)L on MHZ2-10□ and MHZL2-10, mounting brackets (BMG2-012) are required.



# Series MHZ Specific Product Precautions

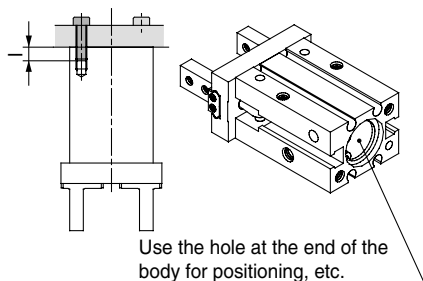
Be sure to read before handling.

## Mounting Air Grippers/Series MHZ□2

Possible to mount from 3 directions.

### How to mount air grippers

#### Axial mounting (Body tapped)

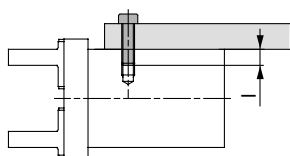


Model	Applicable bolts	Max. tightening torque (N·m)	Max. screw-in depth (ℓ mm)
MHZ□2-6 <sup>(Note)</sup>	M2 x 0.4	0.15	4.5
MHZ□2-10	M3 x 0.5	0.88	6
MHZ□2-16	M4 x 0.7	2.1	8
MHZ□2-20	M5 x 0.8	4.3	10
MHZ□2-25	M6 x 1	7.3	12
MHZ□2-32	M6 x 1	7.9	13
MHZ□2-40	M8 x 1.25	17.7	17

(Note) Axial mounting type is not available for MHZ2-6 and MHZJ2-6.

Model	Hole diameter (mm)	Hole depth (mm)
MHZ□2- 6	ø7H8 <sup>+0.022</sup> <sub>0</sub>	1.5
MHZ□2-10	ø11H9 <sup>+0.043</sup> <sub>0</sub>	2
MHZ□2-16	ø17H9 <sup>+0.043</sup> <sub>0</sub>	2
MHZ□2-20	ø21H9 <sup>+0.052</sup> <sub>0</sub>	3
MHZ□2-25	ø26H9 <sup>+0.052</sup> <sub>0</sub>	3.5
MHZ□2-32	ø34H9 <sup>+0.062</sup> <sub>0</sub>	4
MHZ□2-40	ø42H9 <sup>+0.062</sup> <sub>0</sub>	4

#### Perpendicular mounting (Body tapping)



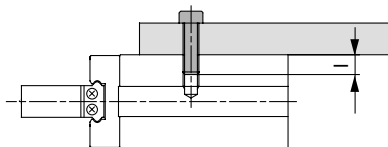
Model	Applicable bolts	Max. tightening torque (N·m)	Max. screw-in depth (ℓ mm)
MHZ□2-6 <sup>(Note)</sup>	M2 x 0.4	0.15	4
MHZ□2-10	M3 x 0.5	0.9	6
MHZ□2-16	M4 x 0.7	1.6	4.5
MHZ□2-20	M5 x 0.8	3.3	8
MHZ□2-25	M6 x 1	5.9	10
MHZ□2-32	M6 x 1	5.9	10
MHZ□2-40	M8 x 1.25	13.7	13

(Note) Except MHZ2-6 and MHZJ2-6.

### How to mount air grippers

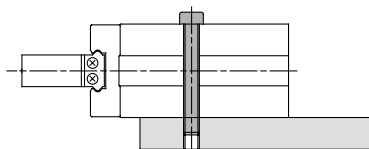
#### Lateral mounting (Body tapped and through-hole)

##### ●Body tapped



Model	Applicable bolts	Max. tightening torque (N·m)	Max. screw-in depth (ℓ mm)
MHZ□2- 6	M3 x 0.5	0.88	10
MHZ□2-10	M3 x 0.5	0.69	5
MHZ□2-16	M4 x 0.7	2.1	8
MHZ□2-20	M5 x 0.8	4.3	10
MHZ□2-25	M6 x 1	7.3	12
MHZ□2-32	M6 x 1	7.9	13
MHZ□2-40	M8 x 1.25	17.7	16

##### ●Body through-holes



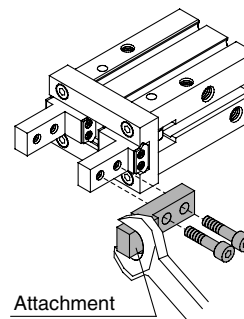
Model	Applicable bolts	Max. tightening torque (N·m)
MHZ□2- 6	M2.5 x 0.45	0.49
MHZ□2-10	M2.5 x 0.45	0.49
MHZ□2-16	M3 x 0.5	0.88
MHZ□2-20	M4 x 0.7	2.1
MHZ□2-25	M5 x 0.8	4.3
MHZ□2-32	M5 x 0.8	4.3
MHZ□2-40	M6 x 1	7.3

(Note) Use body tapped for D-Y59, D-Y69, D-Y7P with auto switch types. Make sure that the bolt's screw-in depth is less than those shown in the table below to prevent the tip of the bolt from pressing the switch body.

Model	Max. screw-in depth (ℓ mm)
MHZ□2- 6	—
MHZ□2-10	5
MHZ□2-16	8
MHZ□2-20	10
MHZ□2-25	12
MHZ□2-32	13
MHZ□2-40	16

### How to mount the attachment to the finger

The attachment must be mounted on fingers using bolts such as finger mounting female threads, etc., which should be tightened with the tightening torque in the table below.



Attachment

Model	Applicable bolts	Max. tightening torque (N·m)
MHZ□2- 6	M2 x 0.4	0.15
MHZ□2-10	M2.5 x 0.45	0.31
MHZ□2-16	M3 x 0.5	0.59
MHZ□2-20	M4 x 0.7	1.4
MHZ□2-25	M5 x 0.8	2.8
MHZ□2-32	M6 x 1	4.9
MHZ□2-40	M8 x 1.25	11.8

## Operating Environment

### ⚠ Caution

Use caution for the anti-corrosiveness of linear guide section.

Martensitic stainless steel is used for the finger guide. But, use caution that anti-corrosiveness is inferior to the austenitic stainless steel. Especially, in an environment where waterdrops are adhered by condensation, etc., rust might be generated.



# Air Grippers Precautions 1

Be sure to read this before handling.

## Design / Selection

### ⚠ Warning

#### 1. Confirm the specifications.

Products represented in this catalog are designed only for use in compressed air systems (including vacuum).

Do not operate at pressures or temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction. (Refer to the specifications.)

Please contact SMC when using a fluid other than compressed air (including vacuum).

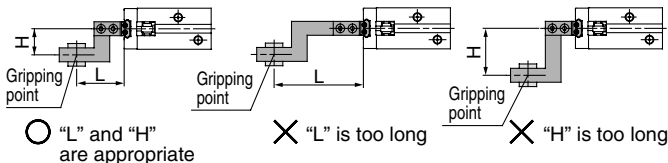
We do not guarantee against any damages if the product is used outside of the specification range.

#### 2. Take safety measures (e.g. mounting protective covers) when workpieces pose a danger of fingers being caught in a gripper, etc.

#### 3. If circuit pressure drops due to a power failure or trouble with the air supply, etc., there is a danger of workpieces dropping because of reduced gripping force. Implement drop prevention measures to avoid human injury and equipment damage.

#### 4. Keep the gripping point within the specified range of the gripping distance.

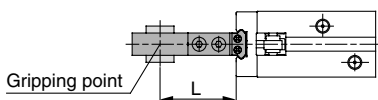
When the gripping point distance becomes large, the gripper attachment applies an excessively large load to the gripper sliding section, and causes adverse affects on the service life. Refer to the graph of the specified range of the gripping distance for each series.



#### 5. Attachment should be designed as light and short as possible.

1) A long or heavy attachment increases the inertia force to open or close the fingers. Therefore, it may cause unsteady movement of fingers and have an adverse affect on life.

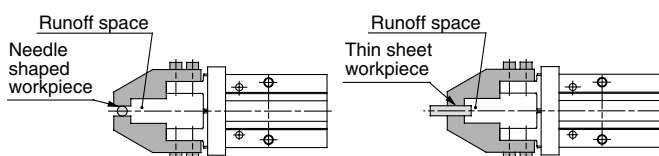
2) Even if the gripping point remains within the range limit, make the attachment as light and short as possible.



3) Select a larger size gripper or use two or more grippers for handling a long and/or large workpiece at one time.

#### 6. Provide a run off space in the attachment when using with a small or thin workpiece.

If a runoff space is not provided within the finger part, gripping becomes unsteady, and it may lead to gripping failure or slippage.



#### 7. Select a model whose gripping force is compatible with the workpiece mass.

Incorrect selection may lead to the dropping of a workpiece, etc. Refer to the model selection criteria of each series of the effective gripping force and the workpiece mass.

#### 8. Do not use in applications where excessive external force or impact force may be applied to the gripper.

Excessive external force or impact force may cause a malfunction. Please consult with SMC regarding any other applications.

#### 9. Select a model having a sufficient working finger opening/closing width.

<In case of insufficient width>

1) Gripping becomes unsteady due to variations in opening/closing width or workpiece diameter.

2) When using an auto switch, the detection may not be reliable. Refer to the Auto Switch Hysteresis section and set the stroke including the hysteresis length for a reliable switch function.

When using the water resistant 2-color indicator auto switch, the gripper stroke may be limited by the setting of the indicator color during detection.

#### 10. Please consult with SMC regarding a single acting, spring force only grip type.

This can cause unstable gripping in some cases or return malfunction, due to faulty operation, etc.

#### 11. Do not disassemble the product or make any modifications, including additional machining.

It may cause human injury and/or an accident.

#### 12. Refer to the Auto Switches Precautions if using with an auto switch.

## Mounting

### ⚠ Warning

#### 1. Operation manual

Install the product and operate it only after reading the operation manual carefully and understanding its contents. Also, keep the manual in a location where it can be referred to as necessary.

#### 2. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

#### 3. Tighten threads with the proper tightening torque.

When installing the products, follow the listed torque specifications.

#### 4. Do not scratch or dent the air gripper by dropping or bumping it when mounting.

Slight deformation can cause inaccuracy or malfunction.

#### 5. Tighten the screw within the specified torque range when mounting the attachment.

Tightening with higher torque than the specified range may cause malfunction, while the tightening with lower torque may allow movement of gripping position and dropping of work.



# Air Grippers Precautions 2

Be sure to read this before handling.

## Mounting

### ⚠ Caution

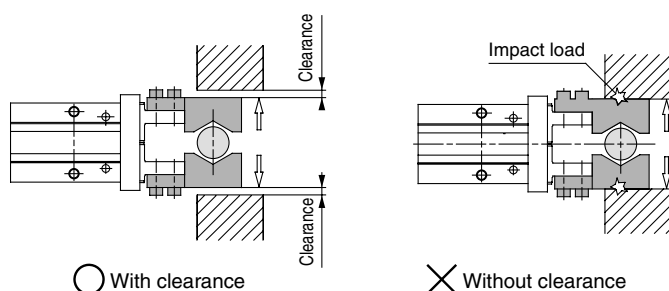
#### 1. Avoid twisting the gripper when mounting an attachment.

Any damage to the gripper may cause malfunction and reduce the accuracy.

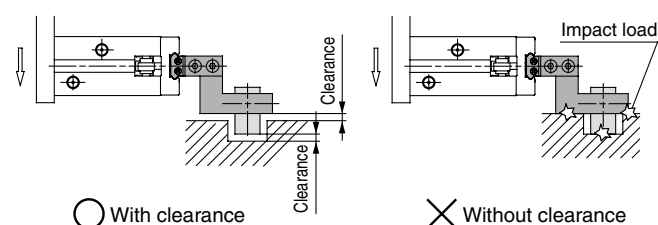
#### 2. Avoid external force to fingers.

Fingers may be damaged by a continual lateral or impact load. Provide clearance to prevent the workpiece or the attachment from striking against any object at the stroke end.

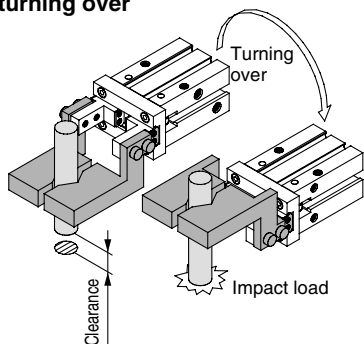
##### 1) Stroke end when fingers are opened



##### 2) Stroke end when gripper is moving

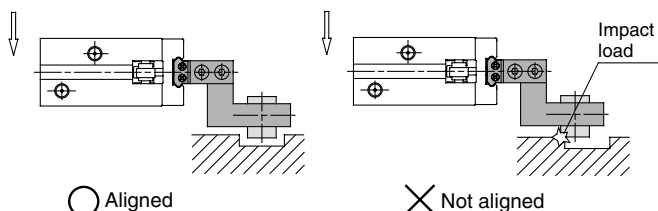


##### 3) When turning over



#### 3. Adjust the gripping point so that an excessive force will not be applied to the fingers when inserting a workpiece.

Confirm that the gripper can operate without receiving any shock by testing it in manual operation mode or by low speed operation.



#### 4. Control the opening/closing speed with the speed controller to avoid excessive high-speed operation.

If the finger opening/closing speed is greater than necessary, impact forces on the fingers and other parts will increase. This can cause a loss of repeatability when gripping a workpiece and have an adverse effect on the life of the unit.

#### Finger Opening/Closing Speed Adjustment Example of Using SMC's Speed Controller

Double acting	<ul style="list-style-type: none"> <li>The speed can be adjusted with the built-in speed controller in the following series: MHC2-10D to 25D, MHK2-12D to 25D and MHKL2-12D to 25D. Use the table below as a guide for adjusting the speed.</li> <li>Series other than those previously mentioned For a cylinder with an inner diameter of <math>\phi 6</math> and <math>\phi 10</math>, connect 2 speed controllers in a meter-in state or 1 dual speed controller. If the cylinder has a bore size of <math>\phi 16</math> or larger, connect 2 speed controllers in a meter-out state.</li> </ul>
Single acting	Connect one speed controller, then adjust the speed with the meter-in control. External gripping — Connect to closing port. Internal gripping — Connect to opening port.

Applicable speed controllers

Air gripper mounted type — AS1200-M3/M5

AS2200-01, etc.

Piping type — AS1000 series  
AS1001F, AS2051F, etc.

#### Guide to Built-in Needle Adjustment

Model	Number of needle rotations from fully closed state (*)
MHC2-10	1/4 to 1/2
MHC2-16	1/2 to 1
MHC2-20	1 to 1 1/2
MHC2-25	1 1/2 to 2
MHK2-12D	3/4 to 1
MHK2-16D	1 to 1 1/4
MHK2-20D	1 1/2 to 1 3/4
MHK2-25D	1 3/4 to 2
MHKL2-12D	1 to 1 1/4
MHKL2-16D	1 1/4 to 1 1/2
MHKL2-20D	1 3/4 to 2
MHKL2-25D	2 to 2 1/4

(\*) Needle is tightened until it strikes the end lightly.

When an angular gripper is used, depending on the length of the attachment, it might be necessary to adjust the open/close movement to a slower speed. This will prevent the base of the fingers from being exposed to shocks that are created by inertial force.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□



# Air Grippers Precautions 3

Be sure to read this before handling.

## Piping

### ⚠ Caution

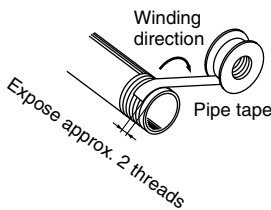
1. Refer to the Fittings and Tubing Precautions (Best Pneumatics No. 6) for handling one-touch fittings.

2. 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.

3. Wrapping of pipe tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter the piping. Also, if pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



## Lubrication

### ⚠ Caution

1. The non-lube type air gripper is lubricated at the factory, and can be used without any further lubrication.

In the event that lubrication will be applied, use class 1 turbine oil (without additives) ISO VG32. Furthermore, once lubrication is applied, it must be continued.

If lubrication is later stopped, malfunction can occur due to loss of the original lubricant.

Refer to the Material Safety Data Sheet (MSDS) of the hydraulic fluid when supplying the fluid.

## Air Supply

### ⚠ Warning

1. Type of fluids

Please consult with SMC when using the product in applications other than compressed air.

2. When there is a large amount of drainage.

Compressed air containing a large amount of drainage can cause malfunction of pneumatic equipment. An air dryer or water separator should be installed upstream from filters.

3. Drain flushing

If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensation to enter the compressed air lines. It causes malfunction of pneumatic equipment.

If the drain bowl is difficult to check and remove, installation of a drain bowl with an auto drain option is recommended.

For compressed air quality, refer to Best Pneumatics No. 5.

4. Use clean air.

Do not use compressed air that contains chemicals, synthetic oils including organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

### ⚠ Caution

1. When extremely dry air is used as the fluid, degradation of the lubrication properties inside the equipment may occur, resulting in reduced reliability (or reduced service life) of the equipment. Please consult with SMC.

2. Install an air filter.

Install an air filter upstream near the valve. Select an air filter with a filtration size of 5 µm or smaller.

3. Take measures to ensure air quality, such as by installing an aftercooler, air dryer, or water separator.

Compressed air that contains a large amount of drainage can cause malfunction of pneumatic equipment such as air grippers. Therefore, take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer, or water separator.

4. Ensure that the fluid and ambient temperature are within the specified range.

If the fluid temperature is 5°C or less, the moisture in the circuit could freeze, causing damage to the seals and equipment malfunction. Therefore, take appropriate measures to prevent freezing.

For compressed air quality, refer to Best Pneumatics No. 5.



# Air Grippers Precautions 4

Be sure to read this before handling.

## Operating Environment

### ⚠ Warning

1. Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.

Refer to each construction drawing on the air grippers material.

2. Do not expose the product to direct sunlight for an extended period of time.
3. Do not use in a place subject to heavy vibration and/or shock.
4. Do not mount the product in locations where it is exposed to radiant heat.
5. Do not use in dusty locations or where water or oil, etc., splash on the equipment.

## Maintenance

### ⚠ Warning

1. Perform maintenance inspection according to the procedures indicated in the operation manual.

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

2. Maintenance work

If handled improperly, compressed air can be dangerous. Assembly, handling, repair and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.

3. Drain flushing

Remove drainage from air filters regularly.

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

When components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply pressure and electric power, and exhaust all compressed air from the system using the residual pressure release function.

When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent cylinders from sudden movement.

5. Do not allow people to enter or place objects in the carrying path of the air gripper.

This can cause an injury or accident, etc.

6. Do not put hands, etc. in between the air gripper fingers or attachments.

This can cause an injury or accident, etc.

7. When removing the air gripper, first confirm that no workpieces are being held and then release the compressed air before removing the air gripper.

If a workpiece is still being held, there is a danger of it being dropped.

### ⚠ Caution

1. The dust cover is a consumable part. Replace it as necessary.

Fine particles, cutting oil, etc., may cause the main body to malfunction.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□





# Auto Switches Precautions 1

Be sure to read this before handling.

## Design / 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 specification range for current load, voltage, temperature or impact.

We do not guarantee against any damage if the product is used outside of the specification range.

#### 2. 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.

#### 3. Do not make any modifications (including exchanging the printed circuit boards) to the product.

It may cause human injuries and accidents.

### Caution

#### 1. 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:

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

In cases of high piston speed, the use of an auto switch (D-F5NTL, F7NTL, G5NTL, M5NTL, M5PTL) with a built-in OFF delay timer ( $\approx 200$  ms) makes it possible to extend the load operating time.

The wide-range detection type D-G5NBL (operating range 35 to 50 mm) may also be useful, depending on the application. Please consult with SMC for other models.

### Caution

#### 2. Keep wiring as short as possible.

##### <Reed>

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

2) Even if an auto switch has a built-in contact protection circuit, when the wiring is more than 30 m 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 consult with SMC in this case.

##### <Solid state>

3) Although wire length should not affect switch function, use a wire 100 m or shorter.

If the wiring is longer it will likely increase noise although the length is less than 100 m.

When the wire length is long, we recommend the ferrite core is attached to the both ends of the cable to prevent excess noise.

A contact protection box is not necessary for solid state switches due to the nature of this product construction.

#### 3. Do not use a load that generates surge voltage. If a surge voltage is generated, the discharge occurs at the contact, possibly resulting in the shortening of product life.

If driving a load such as a relay that generates a surge voltage,

##### <Reed>

Use an auto switch with built-in contact protection circuit or use a contact protection box.

##### <Solid state>

Use a built-in surge absorbing element type device.

#### 4. Take precautions when multiple cylinders/actuators are used close together.

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

The auto switches may malfunction due to the interference from the magnetic fields.

Use of a magnetic screen plate (MU-S025) or commercially available magnetic screen tape can reduce the interference of magnetic force.



# Auto Switches Precautions 2

Be sure to read this before handling.

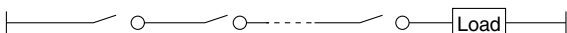
## Design / Selection

### ⚠ Caution

#### 5. Pay attention to the internal voltage drop of the auto switch.

##### <Reed>

- 1) Auto switch with an indicator light (Except D-A56, A76H, A96, A96V, C76, E76A, Z76)
  - 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 the 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.



- 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.

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

- 2) If the internal resistance of a light emitting diode causes a problem, select an auto switch without an indicator light (D-A6□, A80, A80H, A90, A90V, C80, R80, 90, E80A, Z80).

##### <Solid state/2-wire type>

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

#### 6. Pay attention to leakage current.

##### <Solid state/2-wire type>

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. Ensure sufficient clearance for maintenance activities.

When designing an application, be certain to allow sufficient clearance for maintenance.

#### 8. When multiple auto switches are required.

“n” indicates the number of auto switches which can be physically mounted on the cylinders/actuators. Detection intervals depends on the auto switch mounting structure and set position, therefore some required interval and set positions may not be available.

#### 9. Limitations of detectable positioning

When using certain mounting brackets, the surface and position where an auto switch can be mounted maybe restricted due to physical interference. For example, when using some bracket types the auto switch cannot be surface mounted at the bottom side of foot bracket, etc.

Select the set position of the auto switch so that it does not interfere with the mounting bracket of the cylinders/actuators (such as trunnion or reinforcement ring).

#### 10. Use the cylinder and auto switch in proper combination.

The auto switch is pre-adjusted to activate properly for an auto-switch-capable SMC cylinder/actuator.

If the auto switch is mounted improperly, used for another brand of cylinders/actuators or used after the alternation of the machine installation, the auto switch may not activate properly.

## Mounting / Adjustment

### ⚠ Caution

#### 1. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300 m/s<sup>2</sup> or more for reed auto switches and 1000 m/s<sup>2</sup> or more for solid state auto switches) while handling. Although the body of the auto switch may not be damaged, the inside of the auto switch could be damaged and cause malfunction.

#### 2. Observe the proper tightening torque for mounting an auto switch.

When an auto switch is tightened beyond the range of tightening torque, auto switch mounting screws, auto switch mounting brackets or auto switch may be damaged.

On the other hand, tightening below the range of tightening torque may allow the auto switch to slip out of position.

#### 3. 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 auto switch to be damaged by the stress.

#### 4. Fix the auto switch with appropriate screw installed on the switch body. If using other screws, auto switch may be damaged.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□



# Auto Switches Precautions 3

Be sure to read this before handling.

## Wiring

### ⚠ Caution

#### 1. 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.

#### 2. 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.

#### 3. Avoid repeatedly bending or stretching lead wires.

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

Stress and tensile force applied to the connection between the cable and auto switch increases the possibility of disconnection.

Fix the cable in the middle so that it is not movable in the area where it connects with the auto switch.

#### 4. Be certain 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 auto switch will be instantly damaged because of excess current (short circuit).

It is the same as when the 2-wire brown lead wire (+, output) is directly connected to the (+) power supply terminal.

#### 5. Do not allow short-circuit of loads.

##### <Reed>

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

##### <Solid state>

All models of D-J51, G5NB and PNP output type auto switches do not have built-in short circuit protection circuits.

If a load is short circuited, the auto switch will be instantly damaged as in the case of reed auto switches.

Take special care to avoid reverse wiring with the brown power supply line and the black output line on 3-wire type auto switches.

#### 6. Avoid incorrect wiring.

##### <Reed>

A 24 VDC auto switch with indicator light has polarity. The brown lead wire or terminal No. 1 is (+), and the blue lead wire or terminal No. 2 is (–).

[For D-97, (+) is on the no-displayed side, (–) is on the black line side.]

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

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

Applicable model:

D-A73, A73H, A73C, C73, C73C, E73A, Z73

D-R73, R73C, 97, 93A, A93, A93V

D-A33, A34, A33A, A34A, A44, A44A

D-A53, A54, B53, B54

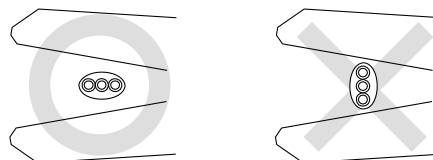
2) When using a 2-color indicator type auto switch (D-A79W, A59W and B59W), the auto switch will constantly remain ON if the connections are reversed.

##### <Solid state>

1) If connections are reversed on a 2-wire type auto switch, the auto switch will not be damaged if protected by a protection circuit, but the auto switch will always stay in an ON state. However, it is still necessary to avoid reversed connections, since the auto switch could be damaged by a load short circuit in this condition.

2) If connections are reversed (power supply line + and power supply line –) on a 3-wire type auto switch, the auto switch will be protected by a protection circuit. However, if the power supply line (+) is connected to the blue wire and the power supply line (–) is connected to the black wire, the auto switch will be damaged.

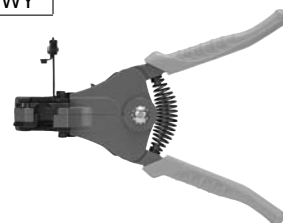
#### 7. When the cable sheath is stripped, confirm the stripping direction. The insulator may be split or damaged depending on the direction. (D-M9□ only)



#### Recommended Tool

Description	Model
Wire stripper	D-M9N-SWY

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





# Auto Switches Precautions 4

Be sure to read this 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.

Please contact SMC concerning ATEX compliant products.

### ⚠ Caution

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

Auto switches will malfunction or magnets inside cylinders/actuators will become demagnetized. (Please consult with SMC if a magnetic field resistant auto switch can be used.)

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

Although auto switches satisfy IEC standard IP67 construction (JIS C 0920: waterproof construction) except some models (D-A3□, A44□, G39□, K39□, RNK, RPK) do not use auto switches in applications where continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside auto switches may cause malfunction.

#### 3. Do not use in an environment with oil or chemicals.

Please consult with 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.

#### 4. Do not use in an environment with temperature cycles.

Please consult with SMC if auto switches are used where there are temperature cycles other than normal temperature changes, as there may be adverse effects inside the auto switches.

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

<Reed>

When excessive impact (300 m/s<sup>2</sup> or more) is applied to a reed auto switch during operation, the contact point will malfunction and generate or cut off a signal momentarily (1 ms or less). Please consult with SMC if a solid state auto switch can be used according to the environment.

#### 6. Do not use in an area where surges are generated.

<Solid state>

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

### ⚠ Caution

#### 7. 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 a cylinder with auto switches, or an actuator, it may cause the auto switch to malfunction due to a loss of the magnetic force inside the cylinder/actuator.

#### 8. Please contact SMC concerning water resistance, elasticity of lead wires, usage at welding sites, etc.

#### 9. Do not use in direct sunlight.

#### 10. Do not mount the product in locations where it is exposed to radiant heat.

## Maintenance

### ⚠ Warning

#### 1. 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 actuators from moving suddenly.

### ⚠ Caution

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

##### 1) Secure and tighten auto 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 auto switches or repair lead wires, etc., if damage is discovered.

##### 3) Confirm the lighting of the green light on the 2-color indicator type auto 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.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□



# Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), Japan Industrial Standards (JIS)\*<sup>1)</sup> and other safety regulations\*<sup>2)</sup>.

\* 1) ISO 4414: Pneumatic fluid power – General rules relating to systems.

ISO 4413: Hydraulic fluid power – General rules relating to systems.

IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)

ISO 10218-1992: Manipulating industrial robots -Safety.

JIS B 8370: General rules for pneumatic equipment.

JIS B 8361: General rules for hydraulic equipment.

JIS B 9960-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)

JIS B 8433-1993: Manipulating industrial robots - Safety.

etc.

\* 2) Labor Safety and Sanitation Law, etc.

**⚠ 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 possibility of serious injury or loss of life.

## **⚠ Warning**

### **1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### **2. Only personnel with appropriate training should operate machinery and equipment.**

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### **3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### **4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



# Safety Instructions

## Caution

**The product is provided for use in manufacturing industries.**

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

## Limited Warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited Warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

### Limited Warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.\*3)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

\* 3) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).