

# Parallel Type Air Gripper

## With Dust Cover

# Series *MHZJ2*

### How to Order

**MHZJ2-16 D [ ] [ ] F9PV [ ]**

**Number of fingers**

2	2 fingers
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**Bore size**

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

**Action**

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

**Body option**

\* ø6 is only applicable with basic type.

**Number of auto switches**

Nil	2 pcs.
S	1 pc.

**Auto switch type**

Nil	Without auto switch (built-in magnet)
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\* Select an applicable auto switch model from the table below.

**Dust cover type**

Nil	Chloroprene rubber (CR)
F	Fluoro rubber (FKM)
S	Silicon rubber (SI)

\* Switch types D-Y5/6 and D-Y7 cannot be mounted when equipped with dust cover/MHZJ2.

#### Applicable auto switches\* Refer to pages 48 through 60 for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch part no.		Lead wire length (m) <sup>*</sup>				Applicable load	Applicable model							
					DC	AC	Electrical entry direction	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)		Flexible lead wire (-61)	ø6	ø10	ø16	ø20	ø25		
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	12V	—	F9NV	F9N	●	●	—	○	—	Relay, PLC	●	●	●	●	●	
				3 wire (PNP)				F8N	—	●	●	○	○			●	●	●	●	●	
				2 wire				F9PV	F9P	●	●	—	○			●	●	●	●	●	
				3 wire (NPN)				F8P	—	●	●	○	○			●	●	●	●	●	
				3 wire (PNP)				F9BV	F9B	●	●	—	○			●	●	●	●	●	
				2 wire				F8B	—	●	●	○	○			●	●	●	●	●	
	Diagnostic indication (2 color indicator)	—	—	—	3 wire (NPN)	—	—	—	F9NVV	F9NV	●	●	○	○	—	—	—	—	—	—	—
					3 wire (PNP)				F9PWV	F9PW	●	●	○	○			—	—	—	—	—
					2 wire				F9BWW	F9BW	●	●	○	○			—	—	—	—	—
					—				F9BA	—	●	●	○	○			—	—	—	—	—

\* Lead wire length symbols: 0.5m ..... Nil (Example) F9N  
 3m ..... L (Example) F9NL  
 5m ..... Z (Example) F9NWZ

\* Auto switches marked with a "○" symbol are produced upon receipt of order.

Note 1) Use caution regarding hysteresis in the 2 color indicator types. When using this type, refer to "Auto Switch Hysteresis" on page 56.

Note 2) When using a D-F8□ switch on sizes ø6 and ø10, mount it at a distance of 10mm or more from magnetic substances such as iron, etc.

Note 3) Add "-61" at the end of the part number for the flexible lead wire.

(Examples)

When ordering with an air gripper

MHZ □ 2-16D-F9NVS-61

Flexible lead wire

When ordering auto switches only

D-F9PL-61

Flexible lead wire

## Specifications



<b>Fluid</b>		Air
<b>Operating pressure</b>	<b>Double acting</b>	ø6: 0.15 to 0.7MPa ø10: 0.2 to 0.7MPa ø16 to ø25: 0.1 to 0.7MPa
	<b>Single acting</b>	<b>Normally open</b>
<b>Normally closed</b>		ø16 to ø25: 0.25 to 0.7MPa
<b>Ambient and fluid temperature</b>		-10 to 60°C
<b>Repeatability</b>		±0.01mm
<b>Maximum operating frequency</b>		180c.p.m.
<b>Lubrication</b>		Non-lube
<b>Action</b>		Double acting, Single acting
<b>Auto switch (option) <sup>Note)</sup></b>		Solid state switch (3 wire, 2 wire)

Note) Refer to pages 48 through 60 for details regarding auto switch specifications.

## Models

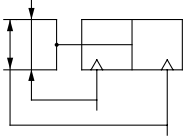
Action	Model	Bore size (mm)	Gripping force <sup>Note 1)</sup>		Opening/Closing stroke (both sides) mm	Weight <sup>Note 2)</sup> g	
			Gripping force per finger Effective value N				
			External gripping force	Internal gripping force			
Double acting	MHZJ2- 6D	6	3.3	6.1	4	28	
	MHZJ2-10D	10	9.8	17	4	60	
	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	264
	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 0.5MPa, gripping point L = 20mm, at center of stroke.

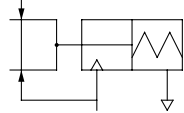
Note 2) Values excluding weight of auto switch.

### Symbols:

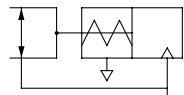
#### Double acting type



#### Single acting type, normally open



#### Single acting type, normally closed



## Options

### ● Body options/End boss type

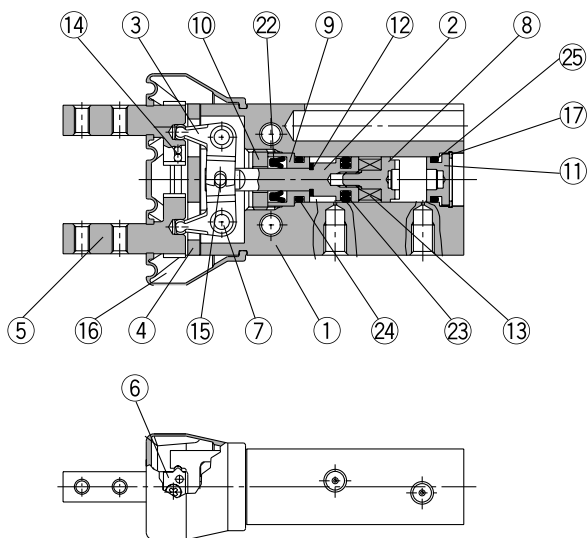
Symbol	Piping port position	Type of piping port				Applicable model	
		MHZJ2-10	MHZJ2-16	MHZJ2-20	MHZJ2-25	Double acting	Single acting
Nil	Basic type	M3 x 0.5	M5 x 0.8			●	●
E	Axial port	M3 x 0.5	M5 x 0.8			●	●
W	Axial port	With ø4 One-touch fitting for coaxial tube				●	—
K	Axial port	With ø4 One-touch fitting				—	●
M	Axial port	M5 x 0.8				—	●

\* For detailed body option specifications, refer to option specifications on pages 46 and 47.

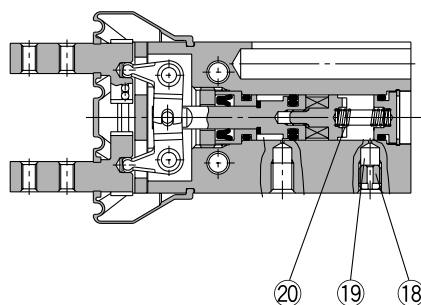
# Series MHZJ2

## Construction/MHZJ2-6□

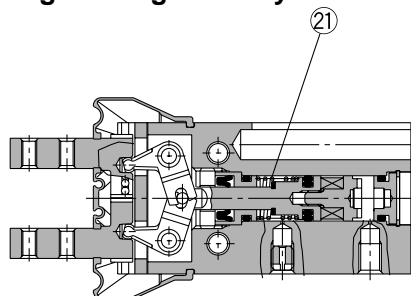
### Double acting/with fingers open



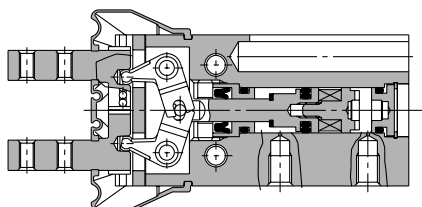
### Single acting/normally open



### Single acting/normally closed



### Double acting/with fingers closed



### Parts list

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	Nitrided
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	Rare earth magnet	Nickel plated
14	Steel balls	High carbon chromium bearing steel	
15	Needle roller	High carbon chromium bearing steel	
16	Dust cover	CR	Chloroprene rubber
		FKM	Fluoro rubber
		Si	Silicon rubber
17	C type snap 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: Seal kits

Seal kit no.	Description
MHZJ6-PS	Kit includes items 22, 23, 24 and 25 from the table on the left.

\* Seal kits consist of items 22, 23, 24 and 25 contained in one kit, and can be ordered using the seal kit number.

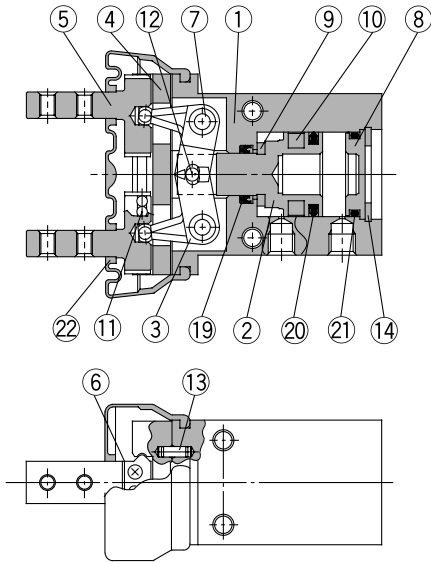
Note) Contact SMC when replacing seals.

### Replacement parts: Dust covers

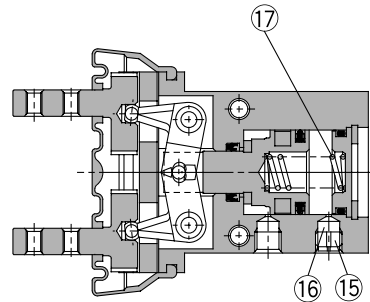
Material	Part no.
CR	MHZJ2-J6
FKM	MHZJ2-J6F
Si	MHZJ2-J6S

**Construction/MHZJ2-10□ to 25□**

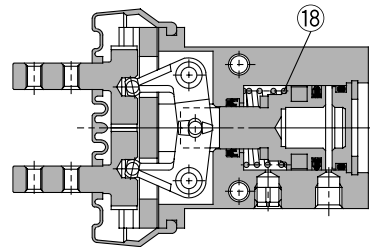
**Double acting/with fingers open**



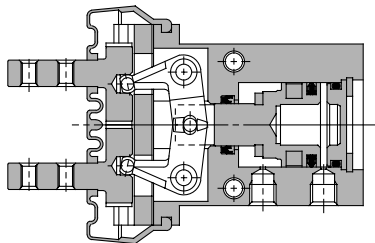
**Single acting/normally open**



**Single acting/normally closed**



**Double acting/with fingers closed**



**Parts list**

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	Nitrided
8	Cap	Aluminum alloy	Hard anodized
9	Bumper	Urethane rubber	
10	Rubber magnet	Synthetic rubber	
11	Steel balls	High carbon chromium bearing steel	
12	Needle roller	High carbon chromium bearing steel	
13	Parallel pin	Stainless steel	
14	C type snap 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	Fluoro rubber
		Si	Silicon rubber

**Replacement parts: Seal kits**

Seal kit no.				Description
MHZJ2-10□	MHZJ2-16□	MHZJ2-20□	MHZJ2-25□	Kits include <sup>Note 2)</sup> items 19, 20 and 21 from the table on the left
MHZJ10-PS	MHZJ16-PS	MHZJ20-PS	MHZJ25-PS	

Note 2) Seal kits consist of items 19, 20 and 21 in one kit, and can be ordered using the seal kit number for each cylinder bore size.

**Replacement parts: Dust covers**

Material	Part no.			
	CR	MHZJ2-J10	MHZJ2-J16	MHZJ2-J20
FKM	MHZJ2-J10F	MHZJ2-J16F	MHZJ2-J20F	MHZJ2-J25F
Si	MHZJ2-J10S	MHZJ2-J16S	MHZJ2-J20S	MHZJ2-J25S

Compact Series  
MHZA2-6/MHZA1J2-6

Standard Type  
MHZ2

Long Stroke  
MHZL2

With Dust Cover  
MHZJ2

Auto Switches

Order Made

Model Selection

Precautions

# Series MHZJ2

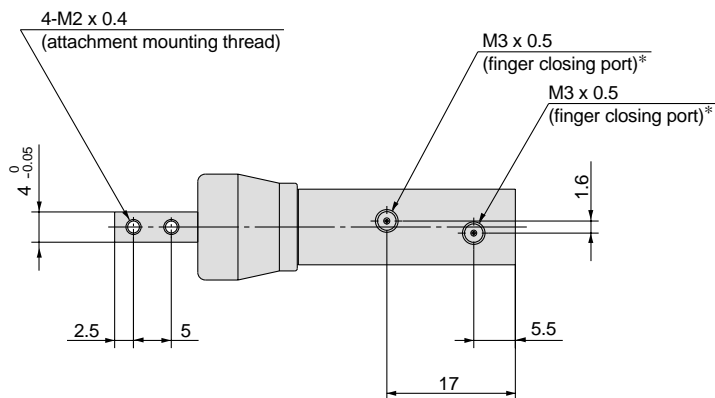
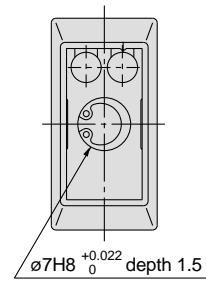
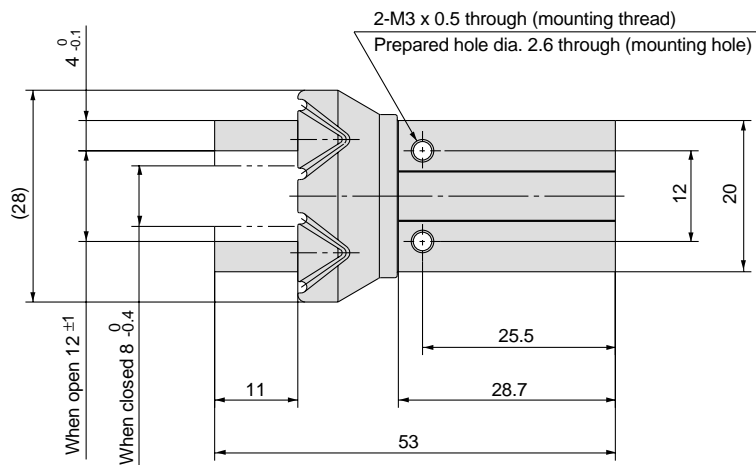
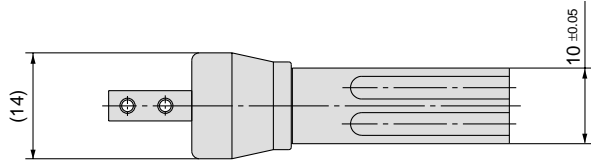
## Dimensions

MHZJ2-6□

Double acting/Single acting

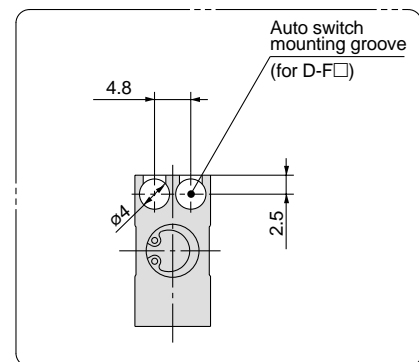
Basic type

Scale: 100%



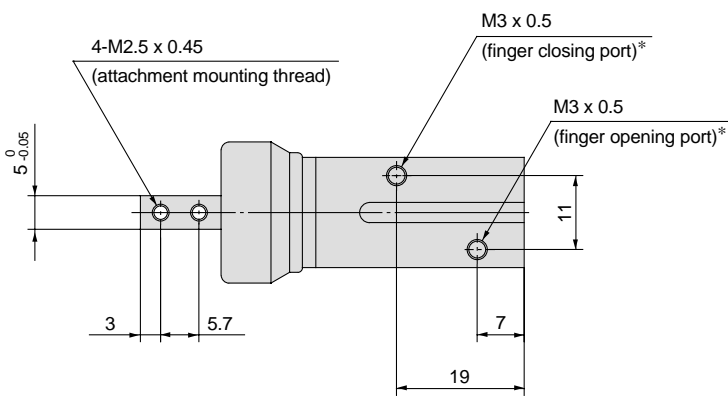
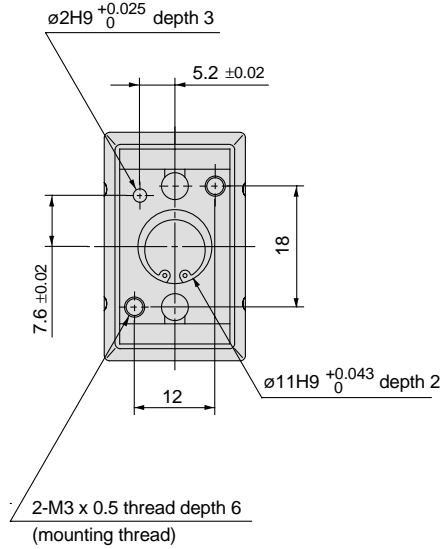
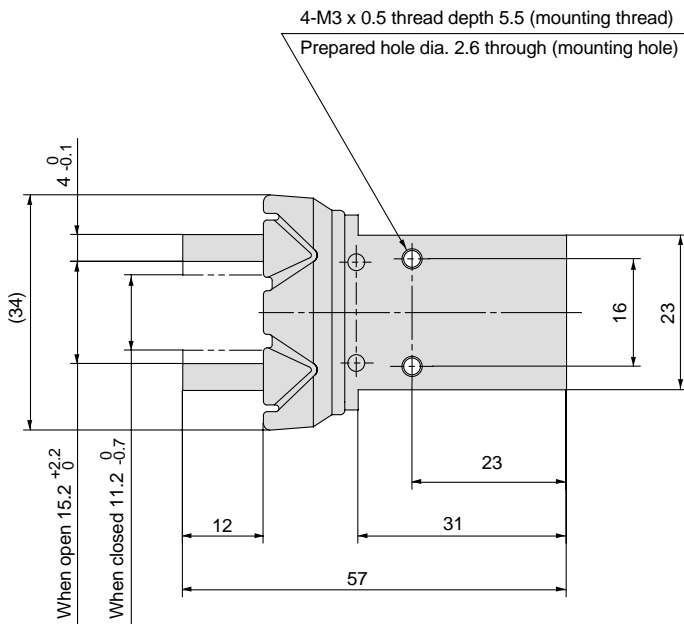
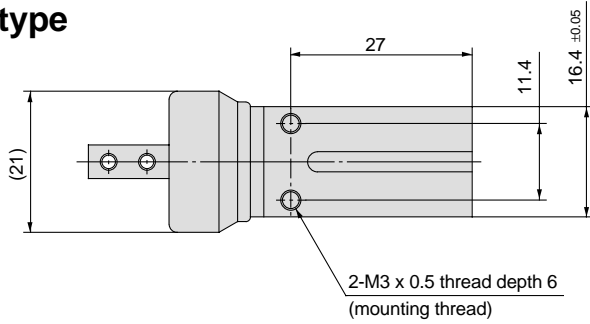
\* For single action, the port on one side is a breathing hole.

### Auto switch mounting groove dimensions



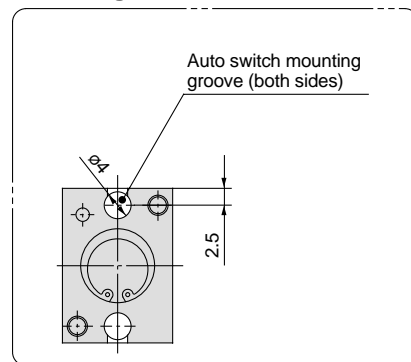
Scale: 90%

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



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

**Auto switch mounting groove dimensions**



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

# Series MHZJ2

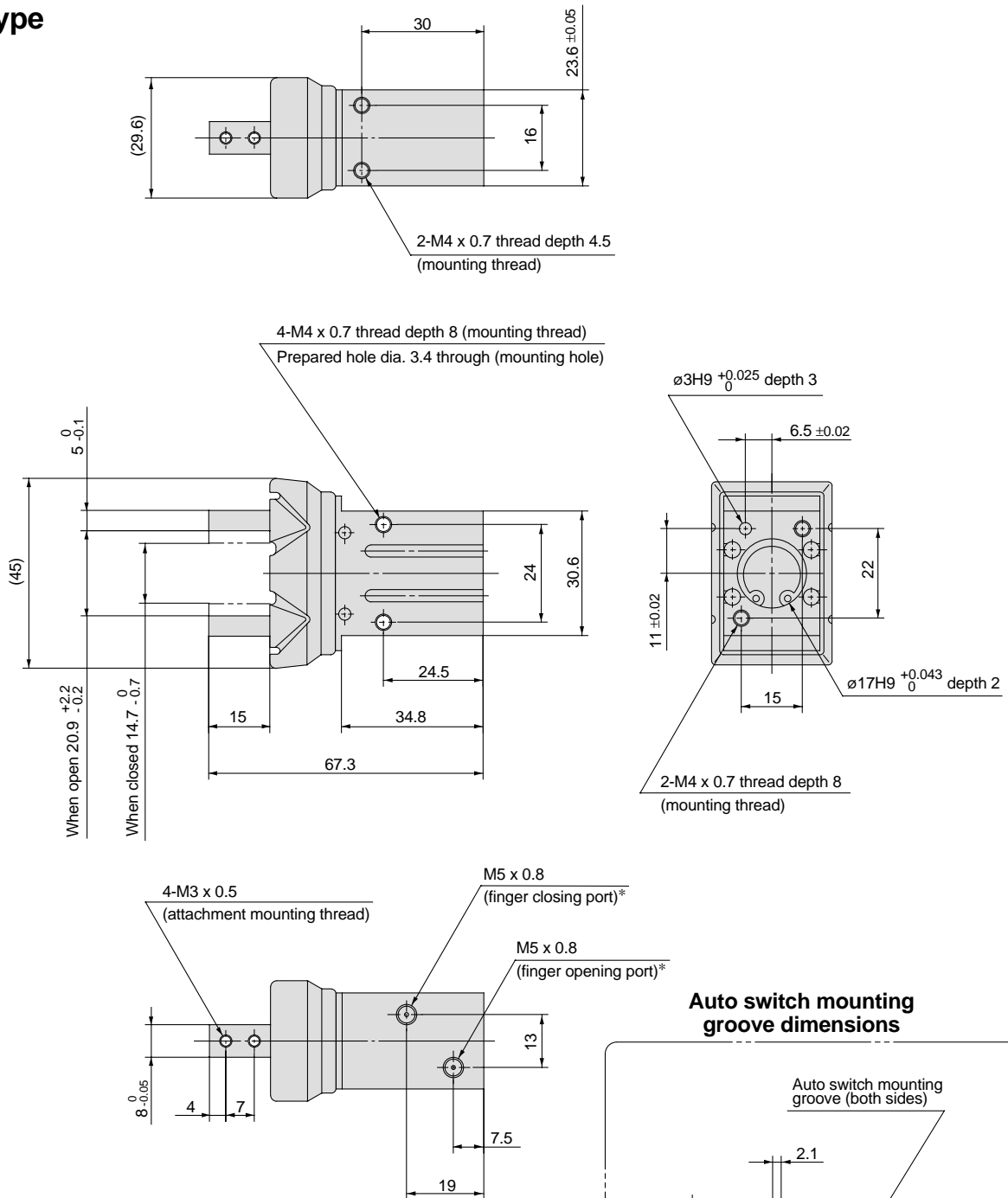
## Dimensions

MHZJ2-16□

Double acting/Single acting

Basic type

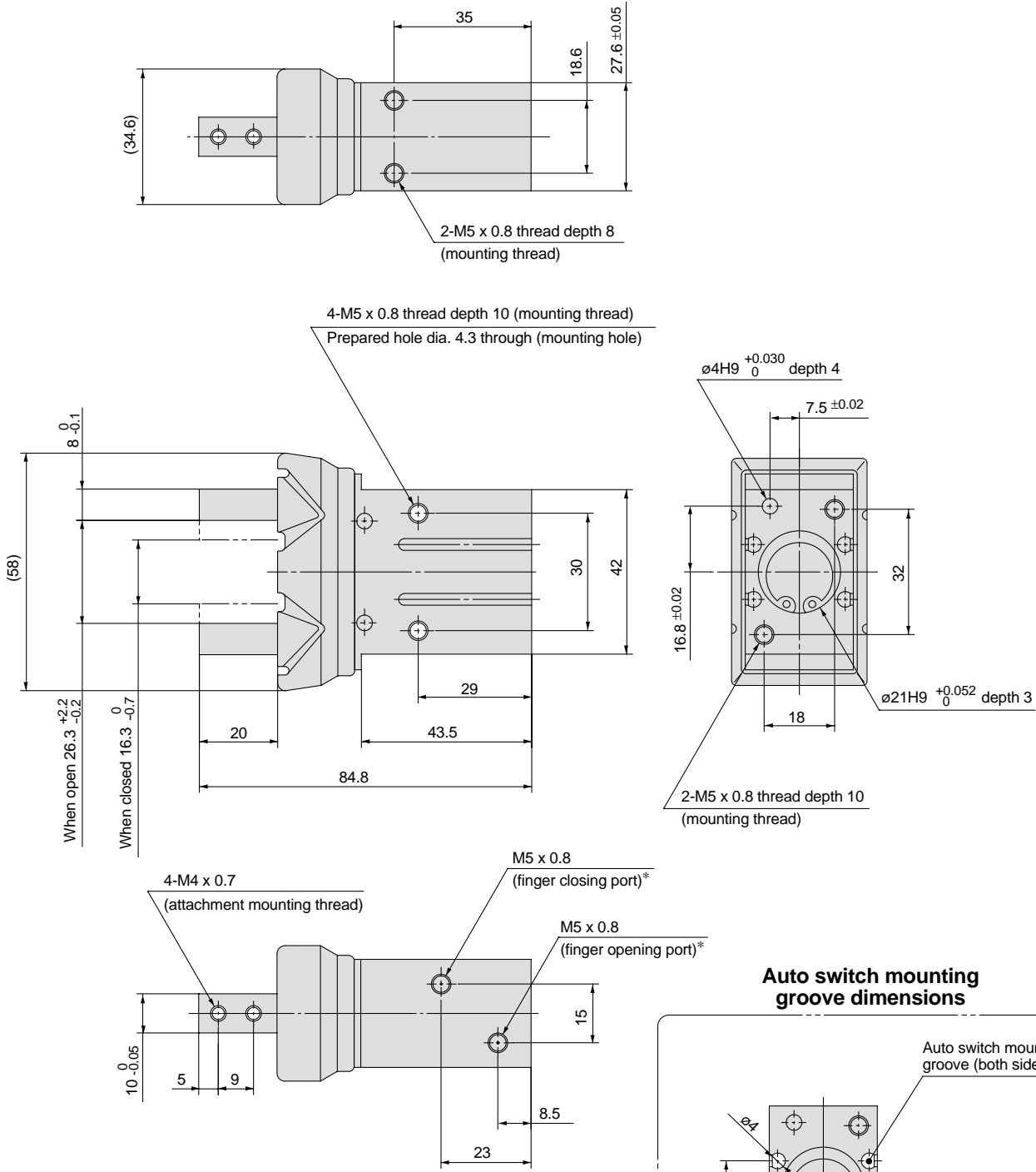
Scale: 60%



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

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

Scale: 60%



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



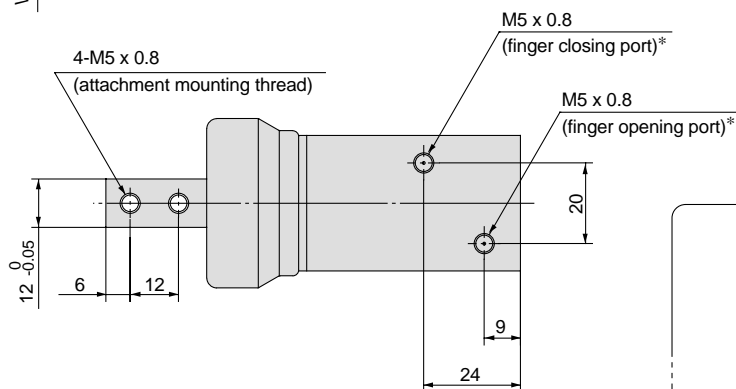
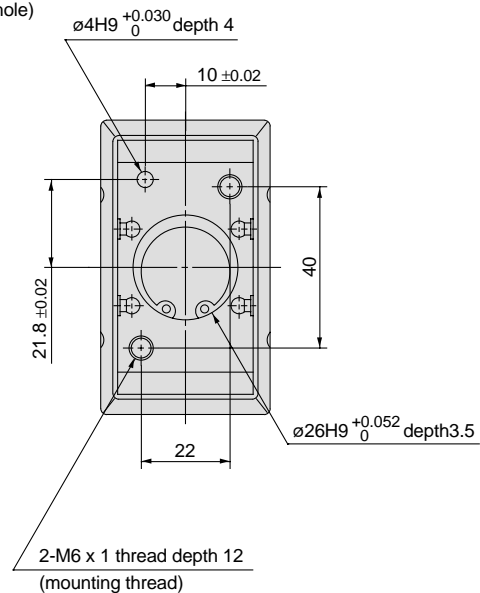
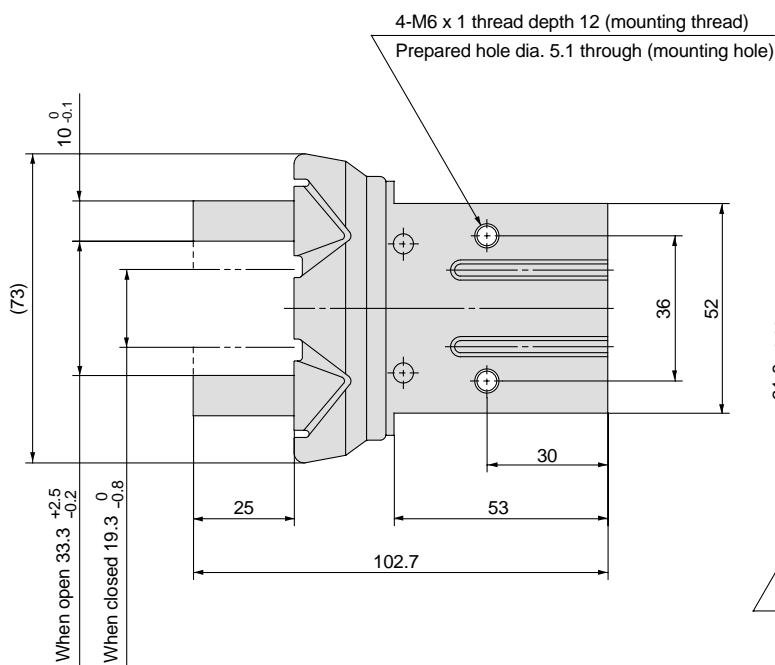
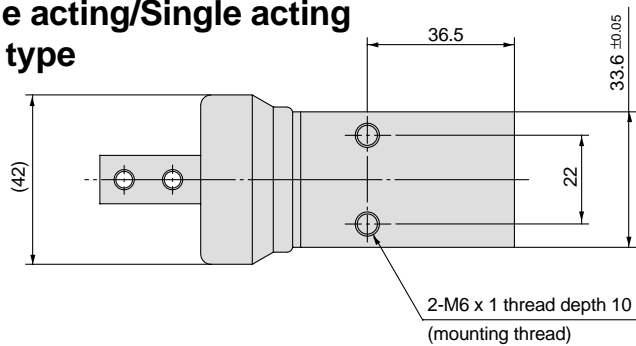
# Series MHZJ2

## Dimensions

### MHZJ2-25□

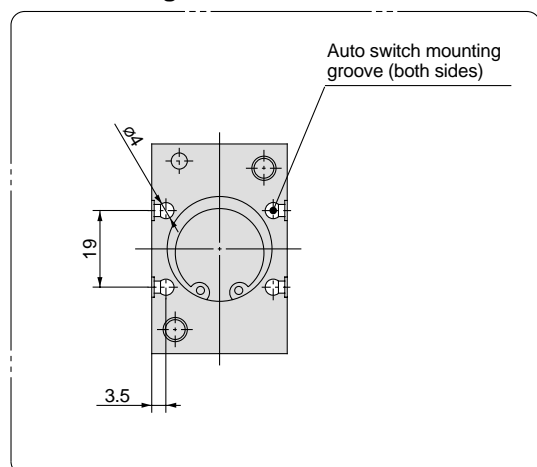
Double acting/Single acting  
Basic type

Scale: 50%



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

### Auto switch mounting groove dimensions



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

Compact Series  
MHZA2-6/MHZAJ2-6

Standard Type  
MHZJ2

Long Stroke  
MHZL2

With Dust Cover  
MHZJ2

Auto Switches

Order Made

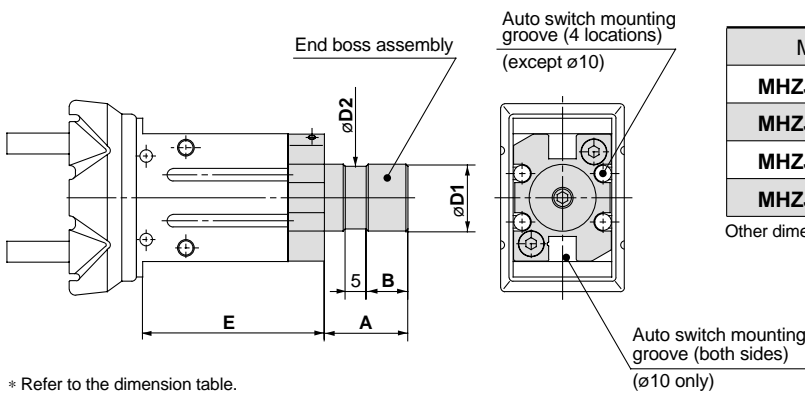
Model Selection

Precautions

## Applicable Models

Symbol	Piping port position	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 port	With ø4 One-touch fitting for coaxial tube				●	—	—
K		With ø4 One-touch fitting				—	●	●
M		M5 x 0.8				—	●	●

## Side Ported [E]



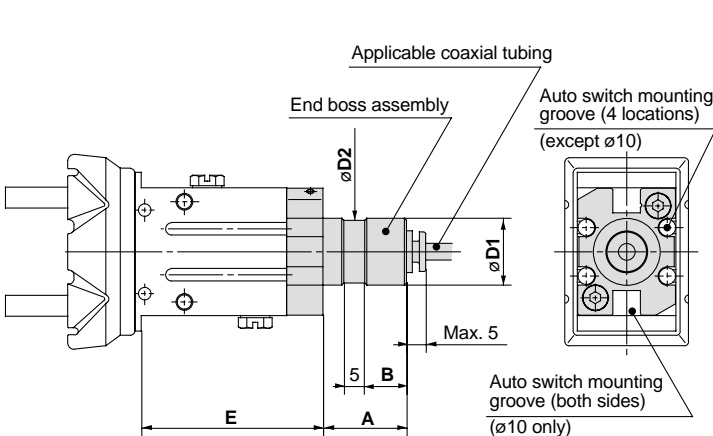
Unit: mm

Model	A	B	D1	D2	E
MHZJ2-10□□	15	7	12f8 <sup>-0.016</sup> <sub>-0.043</sub>	11	40
MHZJ2-16□□	20	10	16f8 <sup>-0.016</sup> <sub>-0.043</sub>	15	43.5
MHZJ2-20□□	22	12	20f8 <sup>-0.020</sup> <sub>-0.053</sub>	19	51.7
MHZJ2-25□□	25	15	25f8 <sup>-0.020</sup> <sub>-0.053</sub>	24	61.3

Other dimensions and specifications correspond to the standard type.

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

## Axial Port (One-touch Fitting for Coaxial Tubing) [W]



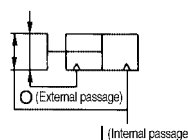
Unit: mm

Model	A	B	D1	D2	E
MHZJ2-10□□	15	7	12f8 <sup>-0.016</sup> <sub>-0.043</sub>	11	40
MHZJ2-16□□	20	10	16f8 <sup>-0.016</sup> <sub>-0.043</sub>	15	43.5
MHZJ2-20□□	22	12	20f8 <sup>-0.020</sup> <sub>-0.053</sub>	19	51.7
MHZJ2-25□□	25	15	25f8 <sup>-0.020</sup> <sub>-0.053</sub>	24	61.3

Other dimensions and specifications correspond to the standard type.

### Applicable coaxial tubing

Reference symbol

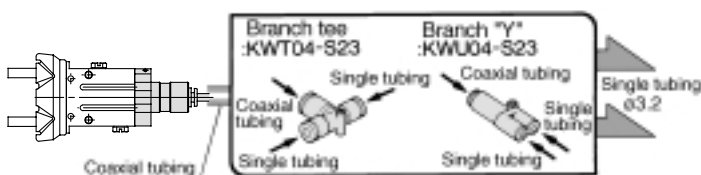


Specification	Model	TW04B-20
Outside diameter		4mm
Max. operating pressure		0.6MPa
Min. bending radius		10mm
Operating temperature		-20 to 60°C
Material		Nylon 12

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

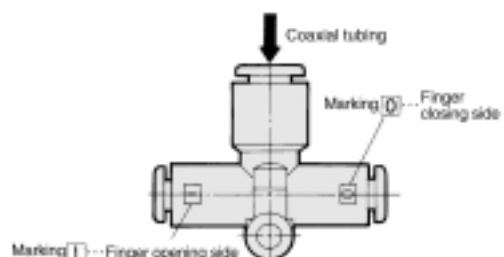
## Changing from Coaxial to Single Tubing

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



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

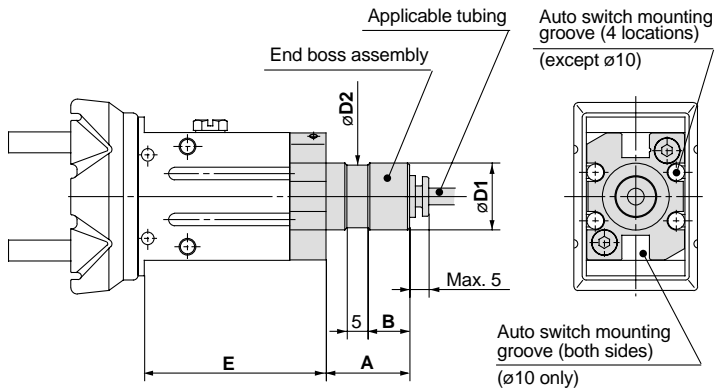
Refer to catalog CAT.E004-A "Coaxial Air Tubing System" regarding coaxial tubing.



# With Dust Cover/Series MHZJ2

## Body Options: End Boss Type

### Axial Port (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.

Unit: mm

Model	A	B	D1	D2	E
MHZJ2-10□□	15	7	12f8 <sup>-0.016</sup> <sub>-0.043</sub>	11	40
MHZJ2-16□□	20	10	16f8 <sup>-0.016</sup> <sub>-0.043</sub>	15	43.5
MHZJ2-20□□	22	12	20f8 <sup>-0.020</sup> <sub>-0.053</sub>	19	51.7
MHZJ2-25□□	25	15	25f8 <sup>-0.020</sup> <sub>-0.053</sub>	24	61.3

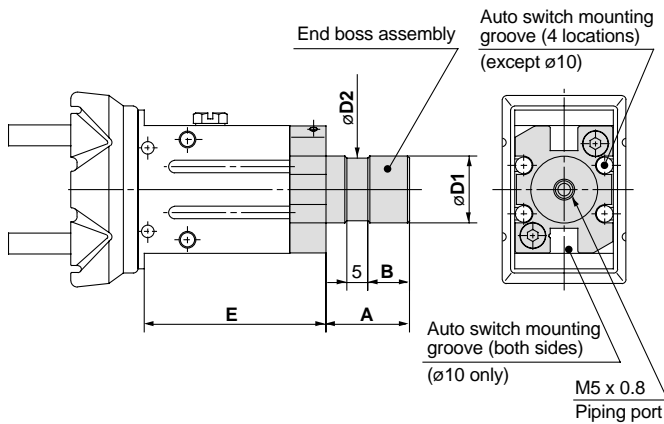
Other dimensions and specifications correspond to the standard type.

#### Applicable tubing

Description/ Model	Nylon tubing	Soft nylon tubing	Polyurethane tubing	Polyurethane coiled 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 catalog CAT. E501-B "Air Fittings and Tubing" regarding One-touch fittings and tubing.

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



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

Unit: mm

Model	A	B	D1	D2	E
MHZJ2-10□□	15	7	12f8 <sup>-0.016</sup> <sub>-0.043</sub>	11	40
MHZJ2-16□□	20	10	16f8 <sup>-0.016</sup> <sub>-0.043</sub>	15	43.5
MHZJ2-20□□	22	12	20f8 <sup>-0.020</sup> <sub>-0.053</sub>	19	51.7
MHZJ2-25□□	25	15	25f8 <sup>-0.020</sup> <sub>-0.053</sub>	24	61.3

Other dimensions and specifications correspond to the standard type.

### Weights

Unit: g

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

## Solid-state Auto Switches for Direct Mounting Series D-M9N(V)/D-M9P(V)/D-M9B(V)



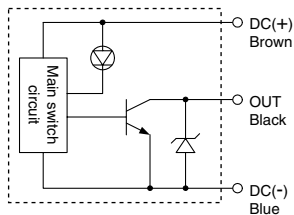
### Grommet

- Reduced load currents for two-wire model (2.5 to 40 mA)
- Compliance with lead-free requirements
- Use of UL-approved lead wires (style 2844)

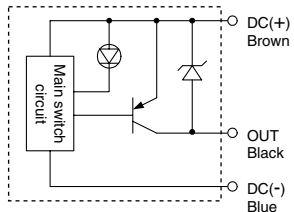


### Internal circuits

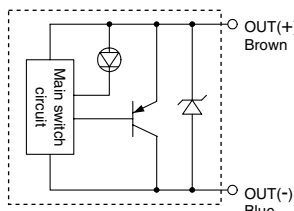
#### D-M9N/M9NV



#### D-M9P/M9PV



#### D-M9B/M9BV



### Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□/D-M9□V (with Indicator light)						
Model number	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring	Three-wire			Two-wire		
Output	NPN		PNP		—	
Applicable load	Integrated circuit, relay and PLC				24 V DC relay and PLC	
Power voltage	5, 12, or 24 V DC (4.5 to 28 V DC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 V DC or less		—		24 V DC (10 to 28 V DC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less				4 V or less	
Leakage current	100 μA max. at 24 V DC				0.8 mA or less	
Indicator light	Red LED lights when ON.					

- Lead wire: oil-proof heavy-duty vinyl cable  
2.7 x 3.2 with elliptic cross-section, 0.15 mm<sup>2</sup>, two cores (D-M9B),  
or three cores (D-M9N and D-M9P)

### Solid state switch specifications

Leakage current	3-wire: 100 μA or less; 2-wire: 0.8 mA max.
Operating time	1 ms or less
Impact resistance	1000 m/s <sup>2</sup>
Insulation resistance	50 MΩ or more at 500 V DC (between lead wire and case)
Withstand voltage	1000 V AC for 1 min. (between lead wire and case)
Ambient temperature	-10°C to 60°C
Enclosure	IEC529 standard IP67, JIS C 0920 watertight construction

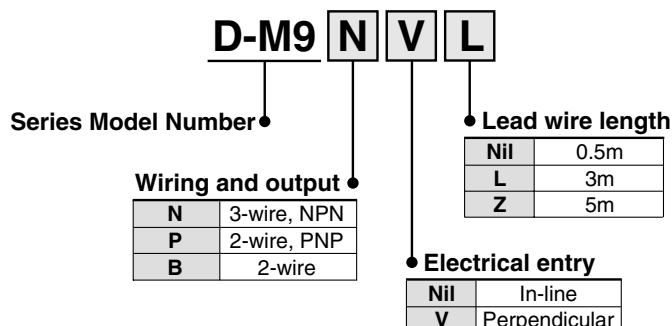
### Weight

Unit: g

Model	D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length (m)	0.5	8	8
	3	41	41
	5	68	68

### How to Order

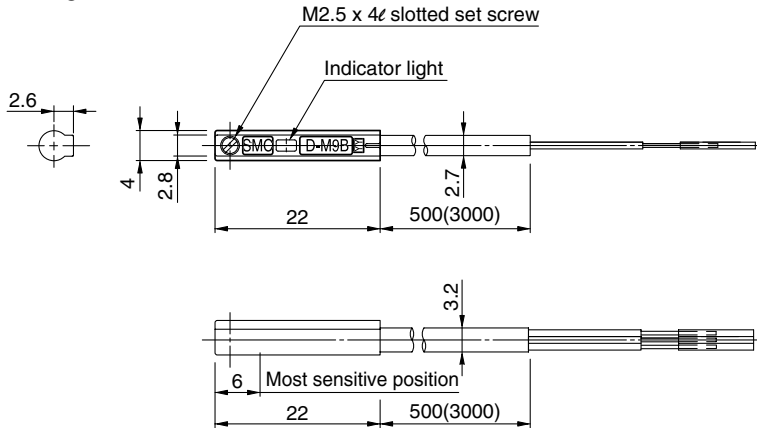
#### Standard Model Number



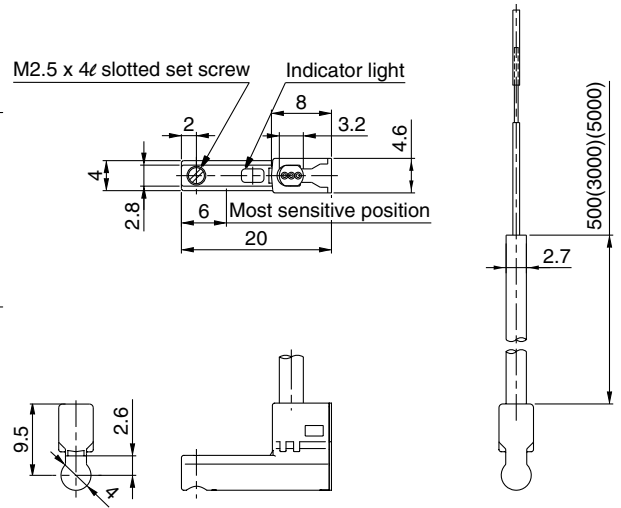
# Series D-M9

## Auto Switch Dimensions

### D-M9□



### D-M9□V



## ⚠ Specific Product Precautions

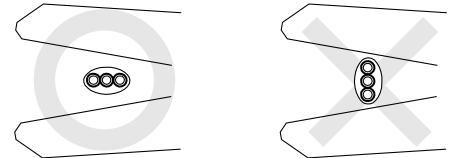
Be sure to read before handling. Contact SMC when the required specification is out of range.

### Handling

## ⚠ Caution

Observe the following precautions when handling the product.

- The D-M9 series of auto switches is not overcurrent-protected. Faulty wiring or short circuit may result in breakage or burning-out of the switch.
- When stripping the cable clad, be careful about the orientation of the cable being stripped. The insulator may be accidentally torn or damaged depending on the orientation, as shown on the right.



- We recommend the following tools

Manufacturer	Product name	Product number
VESSEL	Wire stripper	No 3000G
Tokyo Ideal	Strip master	45-089

\* The stripper for the round shape cords (ø2.0) is for a 2-wire style.

- Please do not attach the switch with any other screws than those already attached to the auto switch body.

## The operation range is shorter than that of the conventional models.

If the auto switch replaces the conventional model, it may not function depending on its application because the operation range is shorter. Refer to the examples below.

- In an application where at the end, the stopping position shifting range is larger than the operation range. For example, pushing a work against something, or pressing a work into a hole, or clamping a work.
- In an application where the auto switch is used to detect an intermediate stopping position. (Detecting time is shortened.)

Note) Please contact SMC for the operation range details for each actuator.

The switch is damaged instantly when a load is shortened since short circuit protection is not built-in. Pay special attention to avoid reversing the connection of the brown lead of the power supply line and the black output line connection.