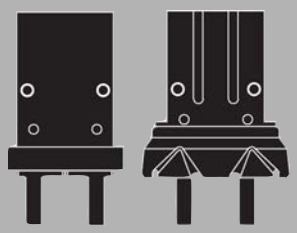
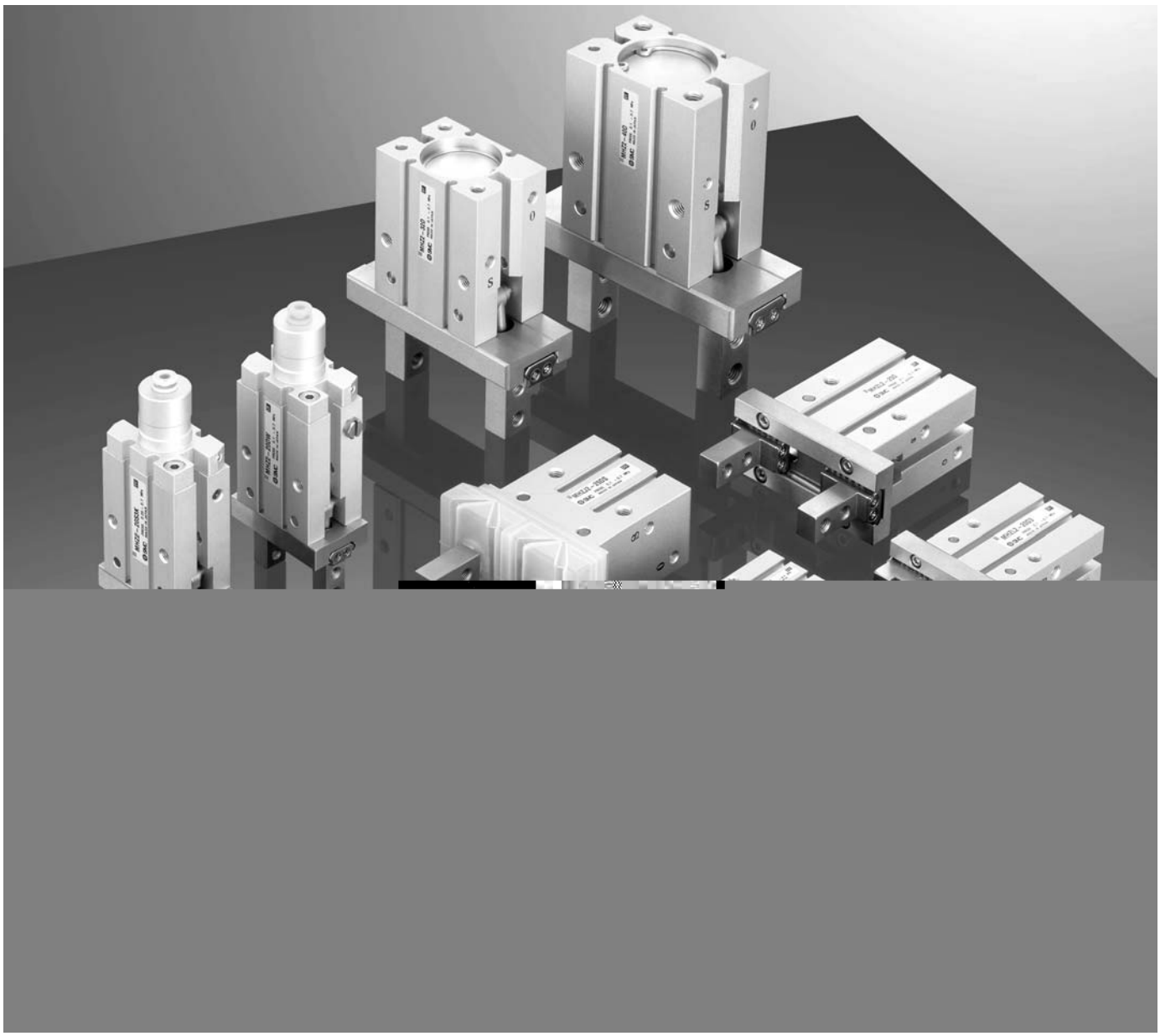


Parallel Type Air Gripper

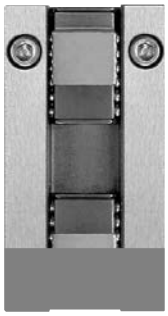
Series MHZ

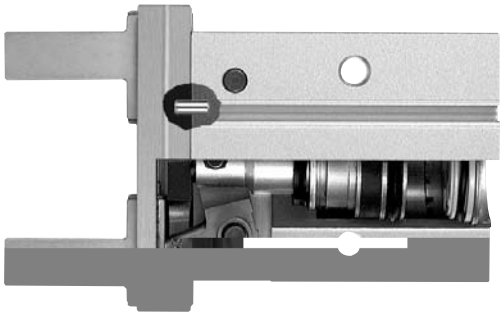
ø6, ø10, ø16, ø20, ø25, ø32, ø40



Series upgraded with the addition of new models and expanded size variations

- Long stroke/MHZL2 and compact series/MHZA□2-6 introduced
- ø6, ø32 and ø40 added to standard MHZ2
- ø6 added to MHZJ2 with dust cover





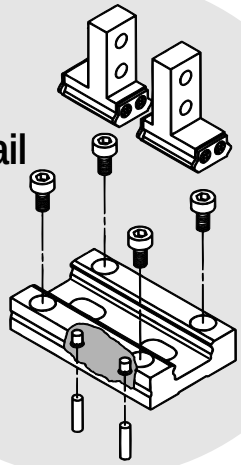
Series Variations

Series	Bore size (mm)	Action					With M5 port	With hose nipple				
32, 40												

rigidity and high precision

- **Body thickness tolerance: ±0.05mm**
- **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 2mm greater than conventional types

Integral guide rail construction



Accommodates diverse work piece diameters with a single unit

- Nearly double the standard stroke
- Long strokes are also compact and light weight

Long strokes
MHZL2

Series	Opening/Closing stroke mm (Open — Closed)	Weight 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.

A wide variety of types and broad size variations

Compact series (without auto switch)

ø6

ø32, ø40

Standard type

ø6

ø10 to ø25

With dust cover
ø10 to ø25

ø6

Long stroke
ø10 to ø25

Compact Series (Without Auto Switch)

Series MHZA2-6/MHZAJ2-6

How to Order

MHZA **2** – **6** **D** □ □

MHZAJ **2** – **6** **D** □ □

With dust cover

Number of fingers

2	2 fingers

Bore size

6	6mm

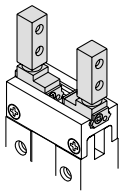
Action

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

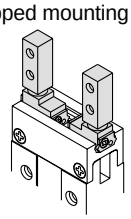
Finger option

[Standard type]

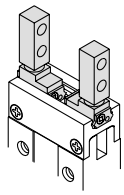
Nil: Basic



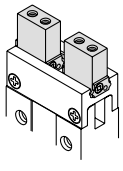
1: Side tapped mounting



2: Through holes in opening/ closing direction



3: Flat type fingers

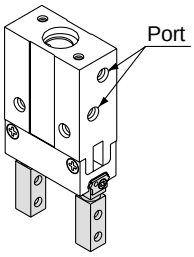


Dust cover type

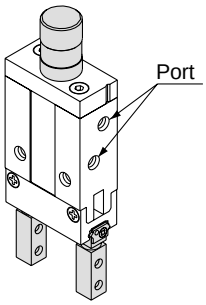
Nil	Chloroprene rubber (CR)
F	Fluoro rubber (FKM)
S	Silicon rubber (Si)

Body option

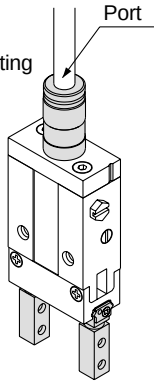
Nil: Basic



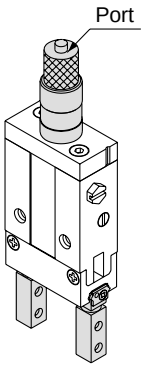
E: End boss type
Side ported
(double acting/single acting)



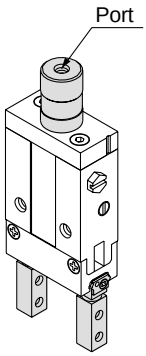
K: End boss type
Axial port with
ø4 One-touch fitting
(single acting)



H: End boss type
Axial port with
ø4 hose nipple
(single acting)



M: End boss type
Axial M3 port
(single acting)



Specifications

Fluid			Air
Operating pressure	**Double acting**		0.15 to 0.7MPa
	Single acting	**Normally open**	0.3 to 0.7MPa
		Normally closed	
Ambient and fluid temperature			–10 to 60 °C
Repeatability			±0.01mm
Maximum operating frequency			180c.p.m.
Lubrication			Non-lube
Action			Double acting, Single acting

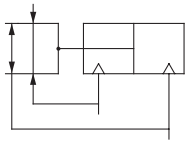
Models

Action		Model	Bore size (mm)	Gripping force Note 1) Gripping force per finger Effective value N		Opening/ Closing stroke (both sides) mm	Weight g
				External gripping force	Internal gripping force		
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

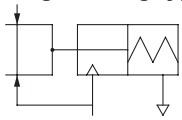
Note 1) Values based on pressure of 0.5MPa, gripping point L = 20mm, at center of stroke.

Symbols:

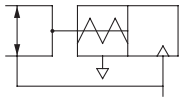
Double acting type



Single acting type, normally open



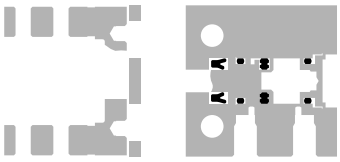
Single acting type, normally closed

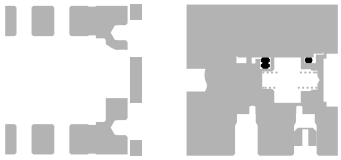


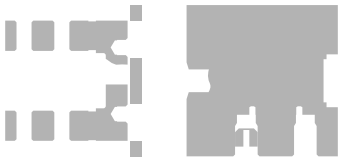
Options

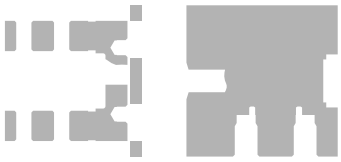
• Body options/End boss type

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



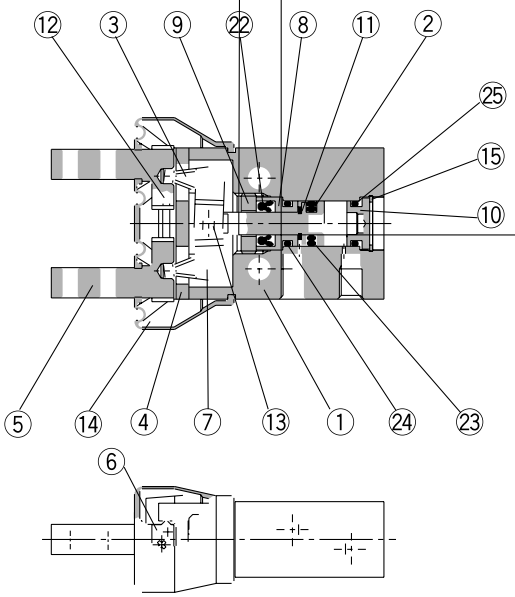




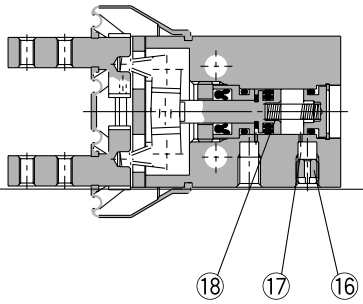


Construction/With Dust Cover MHZAJ2-6

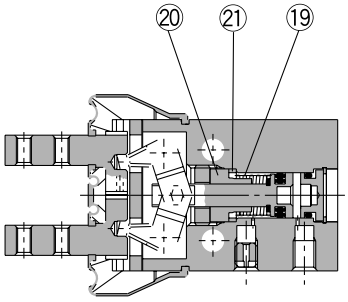
Double acting/with fingers open



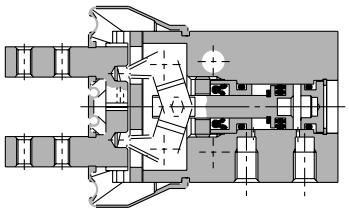
Single acting/normally open



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	**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 chromium bearing steel	
13	**Needle roller**	High carbon chromium bearing steel	

Replacement parts: Seal kits

Seal kit no.	Description
MHZAJ6-PS	Kit includes items 22, 23, 24 and 25 from the table above.

Parts list

No.	Description	Material	Note
14	**Dust cover**	CR	Chloroprene rubber
		FKM	Fluoro rubber
		Si	Silicon rubber
15	**C type snap 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	

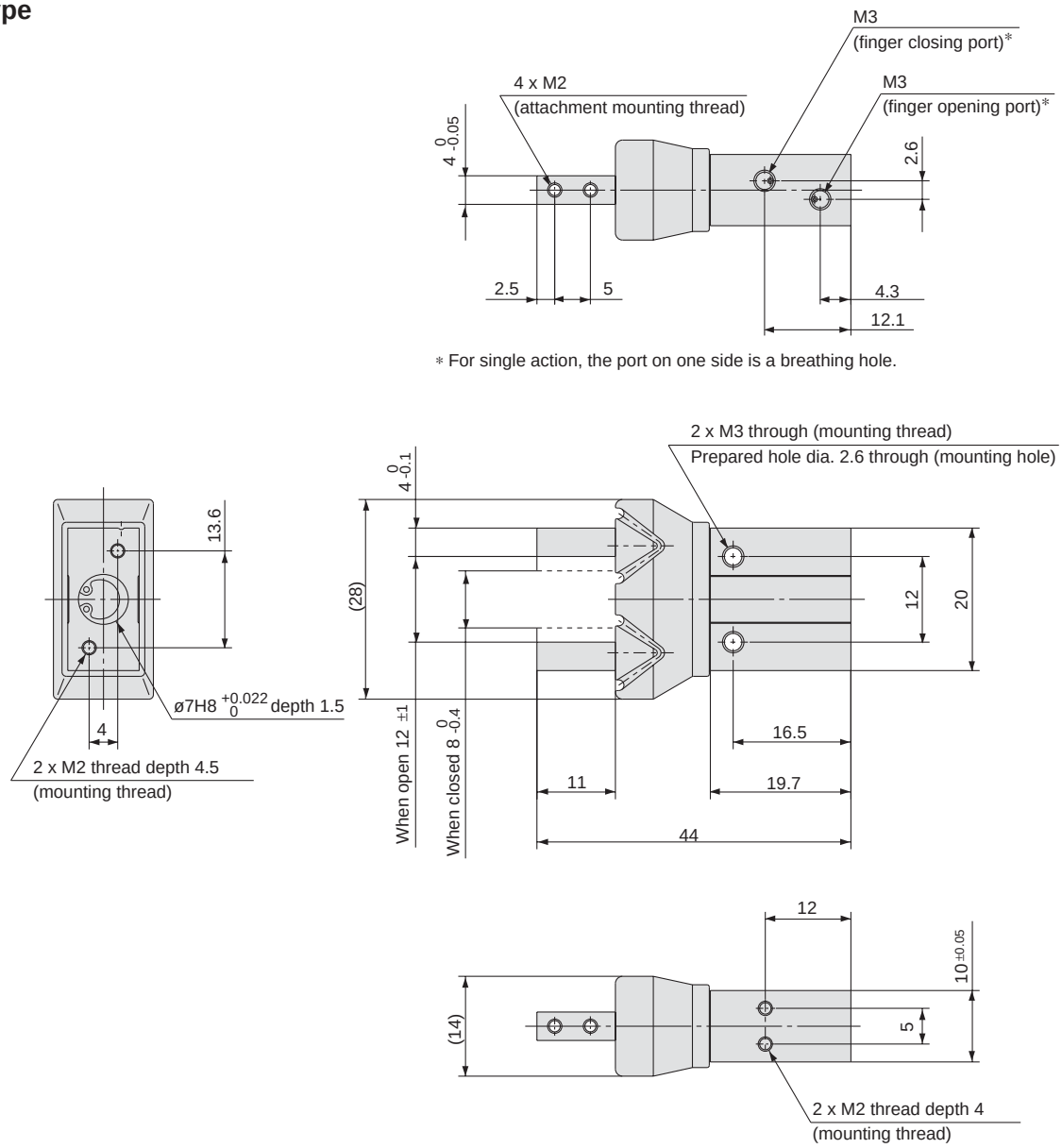
Replacement parts: Dust covers

Material	Part number
CR	MHZAJ2-J6
FKM	MHZAJ2-J6F
Si	MHZAJ2-J6S

Dimensions/With dust cover

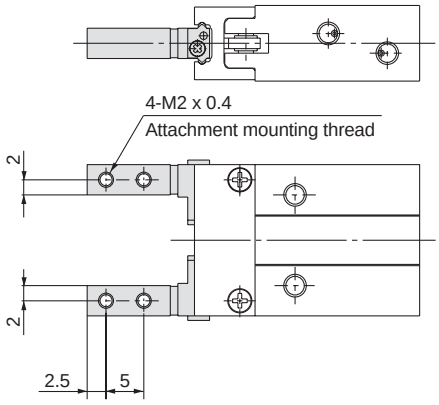
MHZAJ2-6□
Double acting/Single acting
Basic Type

Scale: 100%



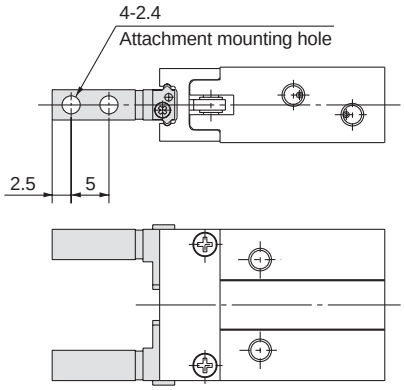
Finger Options

Side Tapped Mounting [1]



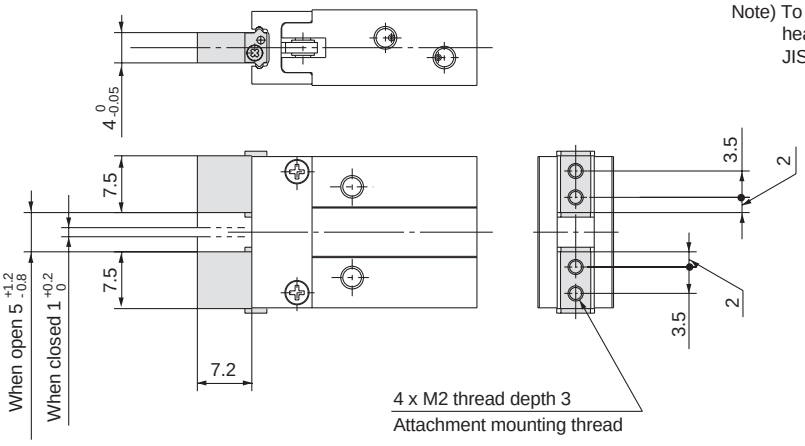
∗ Specifications and dimensions other than the above are the same as the basic type.

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]



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

Weight: 25g

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

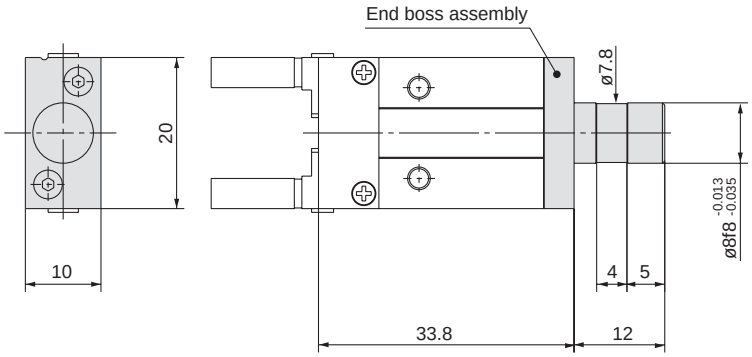
Body Options: End Boss Type

Applicable Models

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

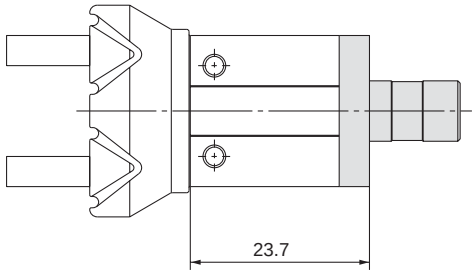
Side Ported [E]

MHZA2-6□□E



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

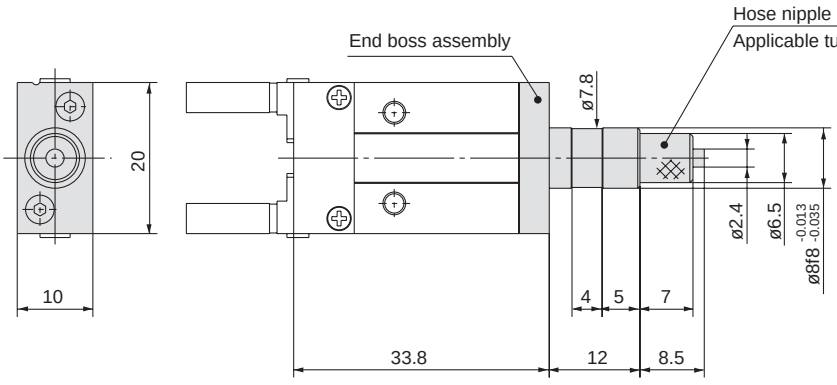
MHZAJ2-6□□E



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

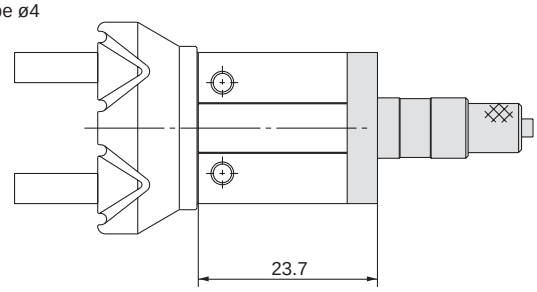
Axial Port (with Hose Nipple) [H]

MHZA2-6$^{S}_{C}$□H



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

MHZAJ2-6$^{S}_{C}$□H



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

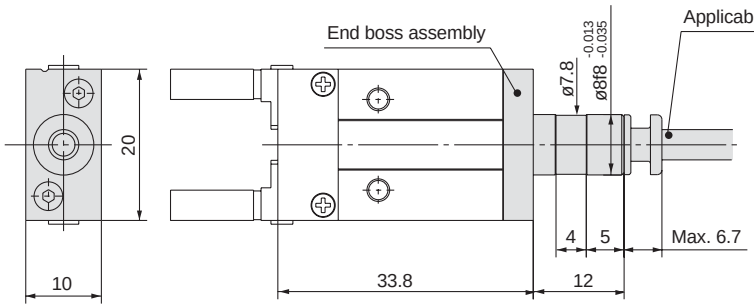
Applicable Tubing

Description/Model / Specification	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
Minimum 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 catalogue CAT.501-B "Air Fittings and Tubing" regarding One-touch fittings and tubing.

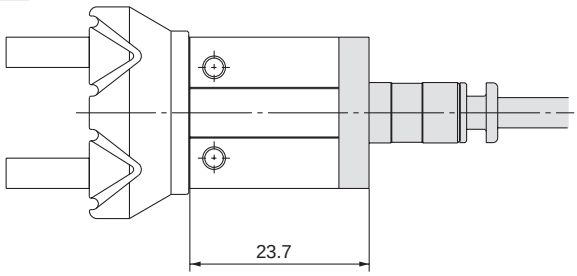
Axial Port (with One-touch Fitting) [K]

MHZA2-6 S/C□K



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

MHZAJ2-6 S/C□K



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

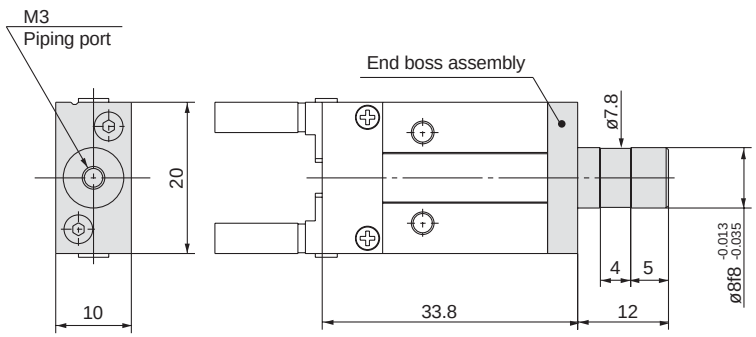
Applicable tubing

Description/Model / Specification	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
Minimum 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 catalogue CAT. 501-B "Air Fittings and Tubing" regarding One-touch fittings and tubing.

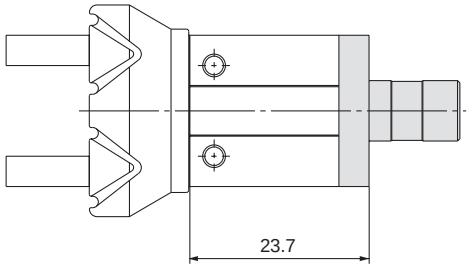
Axial Port (M3 Port) [M]

MHZA2-6 S/C□M



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

MHZAJ2-6 S/C□M



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

Weights

Unit: g

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

Standard Type
Series MHZ2

How to Order

ø6 MHZ2 – 6 D [ ] – F9PV [ ]

Number of fingers

2	2 fingers

Bore size

6	6mm

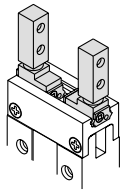
Action

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

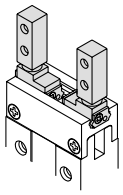
Finger option

[Standard type]

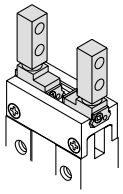
Nil: Basic type



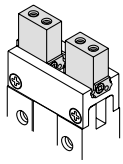
1: Side tapped mounting



2: Through holes in opening/ closing direction



3: Flat type fingers



Auto switch type

Nil	Without auto switch (built-in magnet)

∗ Select an applicable auto switch model from the table below.

Number of auto switches

Nil	2 pcs.
S	1 pc.

Applicable auto switches/∗ Refer to pages 2.11-... for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch part no.		Lead wire length (m)∗			Note 2) Flexible lead wire (-61)	Applicable load	
					DC		AC	Electrical entry direction: Perpendicular	Electrical entry direction: In-line	0.5 (Nil)	3 (L)	5 (Z)			
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	12V	—	**F9NV**	**F9N**	●	●	—	○	—	Relay, PLC
								F8N	—	●	●	○	○		
				3 wire (PNP)				**F9PV**	**F9P**	●	●	—	○		
								F8P	—	●	●	○	○		
				2 wire				**F9BV**	**F9B**	●	●	—	○		
								F8B	—	●	●	○	○		

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

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

Note 1) When using a D-F8□ switch, mount it at a distance of 10mm or more from magnetic substances such as iron, etc.

Note 2) 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

How to Order

ø10 to ø25 MHZ2 – 16 D □ □ F9PV □

Number of fingers

2	2 fingers

Bore size

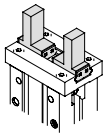
10	10mm
16	16mm
20	20mm
25	25mm

Action

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

Finger position/Option

Standard type
[MHQG2 compatible type]
Nil: Basic type



1: Side tapped mounting

2: Through holes in opening/closing direction

3: Flat type fingers

Narrow type
[MHQ2 compatible type]
N: Basic type

N1: Side tapped mounting

Number of auto switches

Nil	2 pcs.
S	1 pc.

Auto switch type

Nil	Without auto switch (built-in magnet)

∗ Select an auto switch model from the table below.

Applicable auto switches/∗ Refer to pages 2.11-1 for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch part no.		Lead wire length (m)∗				Applicable load		Applicable model			
							Electrical entry direction		0.5 (Nil)	3 (L)								
					DC	AC	Perpendicular	In-line										
	—	Grommet	Yes	3 wire (NPN)	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	Standard	IC circuit	Relay, PLC		●	●	●
					12V		**F9NV**	**F9N**	●	●	—	○	—			●	●	●
							F8N	—	●	●	○	○				●	●	●
				3 wire (PNP)	5V, 12V		**Y7PV**	**Y7P**	●	●	○	Standard	IC circuit			●	●	●
					12V		**F9PV**	**F9P**	●	●	—	○	—			●	●	●
							F8P	—	●	●	○	○				●	●	●
				2 wire	24V		**Y69B**	**Y59B**	●	●	○	○				●	●	●
					12V		**F9BV**	**F9B**	●	●	—	○				●	●	●
							F8B	—	●	●	○	○				●	●	●
	Diagnostic indication (2 colour indicator)			3 wire (NPN)	5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	Standard	IC circuit				●	●
					12V		**F9NWV**	**F9NW**	●	●	○	○	—				●	●
				3 wire (PNP)	5V, 12V		**Y7PWV**	**Y7PW**	●	●	○	Standard	IC circuit				●	●
					12V		**F9PWV**	**F9PW**	●	●	○	○					●	●
				2 wire			**Y7BWV**	**Y7BW**	●	●	○	Standard	—				●	●
							F9BWV	**F9BW**	●	●	○	○					●	●

∗ Lead wire length symbols: 0.5m ..... Nil (Example) F9N
3m ..... L (Example) F9NL
5m ..... Z (Example) Y59AZ

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

How to Order

ø32 to ø40 **MHZ2** – **32** **D** □ – **F9PV** □

Number of fingers

2	2 fingers

Bore size

32	32mm
40	40mm

Action

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

Finger option

Auto switch type

Nil	Without auto switch (built-in magnet)

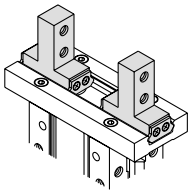
∗ Select an auto switch model from the table below.

Number of auto switches

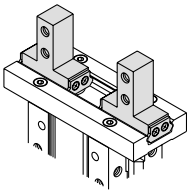
Nil	2 pcs.
S	1 pc.

Standard type

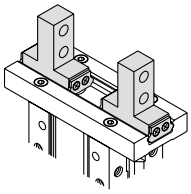
Nil: Basic type



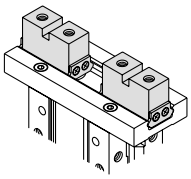
1: Side tapped mounting



2: Through holes in opening/closing direction



3: Flat type fingers



Applicable auto switches/∗ Refer to pages 2.11-1 for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage AC	Auto switch part no. Perpendicular	Auto switch part no. In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Note 2) Flexible lead wire (-61)	Applicable load		Applicable model ø32	Applicable model ø40
Solid state auto switch	—	Grommet	Yes	3 wire (NPN)	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	Standard	IC circuit	Relay, PLC	●	●
					12V		**F9NV**	**F9N**	●	●	—	○	—		●	●
							F8N	—	●	●	○	○			●	●
				3 wire (PNP)	5V, 12V		**Y7PV**	**Y7P**	●	●	○	Standard	IC circuit		●	●
					12V		**F9PV**	**F9P**	●	●	—	○	—		●	●
							F8P	—	●	●	○	○			●	●
				2 wire	12V		**Y69B**	**Y59B**	●	●	○	○			●	●
							F9BV	**F9B**	●	●	—	○			●	●
							F8B	—	●	●	○	○			●	●
	Diagnostic indication (2 colour indicator)			3 wire (NPN)	5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	Standard	IC circuit		●	●
					12V		**F9NWV**	**F9NW**	●	●	○	○	—		●	●
				3 wire (PNP)	5V, 12V		**Y7PWV**	**Y7PW**	●	●	○	Standard	IC circuit		●	●
					12V		**F9PWV**	**F9PW**	●	●	○	○			●	●
				2 wire			**Y7BWV**	**Y7BW**	●	●	○	Standard	—		●	●
							F9BWV	**F9BW**	●	●	○	○			●	●

∗ Lead wire length symbols: 0.5m ..... Nil (Example) F9N
3m ..... L (Example) F9NL
5m ..... Z (Example) Y59AZ

∗ 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 2.1-52.

Note 2) 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

Note 3) Through hole mounting is not available when using auto switch types D-Y59, D-Y69, or D-Y7.

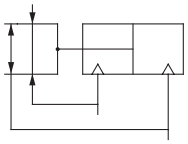
ø6

ø10 to ø25

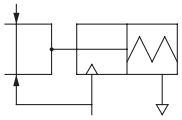
ø32, ø40

Symbols:

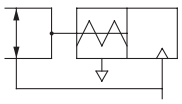
Double acting type



Single acting type, normally open



Single acting type, normally closed



Specifications

Fluid			Air
Operating pressure	**Double acting**		ø6: 0.15 to 0.7MPa ø10: 0.2 to 0.7MPa ø16 to ø40: 0.1 to 0.7MPa
	Single acting	**Normally open**	ø6: 0.3 to 0.7MPa ø10: 0.35 to 0.7MPa ø16 to ø40: 0.25 to 0.7MPa
		Normally closed	
Ambient and fluid temperature			–10 to 60°C
Repeatability			ø6 to ø25: ±0.01mm ø32, ø40: ±0.02mm
Maximum operating frequency			ø6 to ø25: 180c.p.m. ø32, ø40: 60c.p.m.
Lubrication			Non-lube
Action			Double acting, Single acting
Auto switch (option) Note)			Solid state switch (3 wire, 2 wire)

Note) Refer to pages 2.11-1 for details regarding auto switch specifications.

Models

Action		Model	Bore size (mm)	Gripping force Note 1) Gripping force per finger Effective value N External gripping force	 Internal gripping force	Opening/ Closing stroke (both sides) mm	Note 2) Weight g
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
		MHZ2-25D(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 0.5MPa, gripping point L = 20mm, at center of stroke.
Note 2) Values excluding weight of auto switch.

Options

• Body options/End boss type

Symbol	Piping port position	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		M5					●	●
E	Side ported	—	M3	M5			—		●	●
W	Axial port	—	With ø4 One-touch fitting for coaxial tube				—		●	—
K	Axial port	—	With ø4 One-touch fitting				—		—	●
M	Axial port	—	M5				—		—	●

∗ For detailed body option specifications, refer to option specifications on page 2.1-29.

Clean Room Series: Air Gripper

11– MHZ2 – □ D □ – F9N □

Clean room series
11-: Vacuum type

Bore size

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

Action

D	Double acting

Finger position/option*
* Refer to the "How to Order" section on page 2.1-15.

Auto switch type

Nil	Without auto switch (built-in magnet)

* Select an applicable auto switch model from the table below.

Number of auto switches*

Applicable auto switches/ * Refer to pages 2.11-1 for detailed auto switch specifications

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch part no.		Lead wire length (m)*			Note 2) Flexible lead wire (-61)	Applicable load	
					DC		AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)			
								Perpendicular	In-line						
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	12V	—	**F9NV**	**F9N**	●	●	—	○	—	Relay, PLC
								F8N	**––**	●	●	○	○		
				3 wire (PNP)				**F9PV**	**F9P**	●	●	—	○		
								F8P	**––**	●	●	○	○		
				2 wire				**F9BV**	**F9B**	●	●	—	○		
								F8B	**––**	●	●	○	○		

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

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

Note 1) When using a D-F8□ switch, mount it at a distance of 10mm or more from magnetic substances such as iron, etc.

Note 2) Add "-61" at the end of the part number for the flexible lead wire.

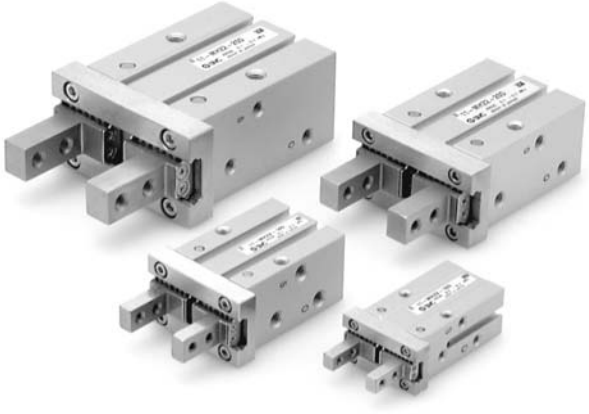
(Examples)

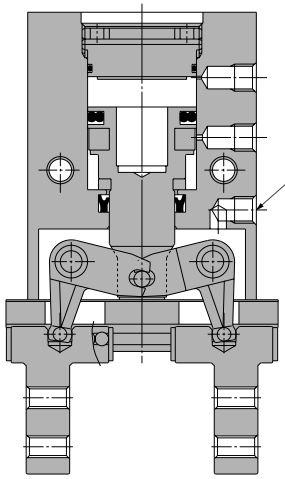
When ordering with an air gripper: MHZ□2-16D-F9NVS-61 (61: Flexible lead wire)

When ordering auto switches only: D-F9PL-61 (61: Flexible lead wire)

Specifications

Fluid	Air
Operating pressure	ø10: 0.2 to 0.7MPa ø16 to ø25: 0.1 to 0.7MPa
Ambient and fluid temperature	–10 to 60°C
Repeatability	±0.01mm
Maximum operating frequency	180c.p.m.
Lubrication	Non-lube
Action	Double acting
Particulate generation grade	Grade 2
Auto switch (option)	Solid state switch (3 wire, 2 wire)





Relief port

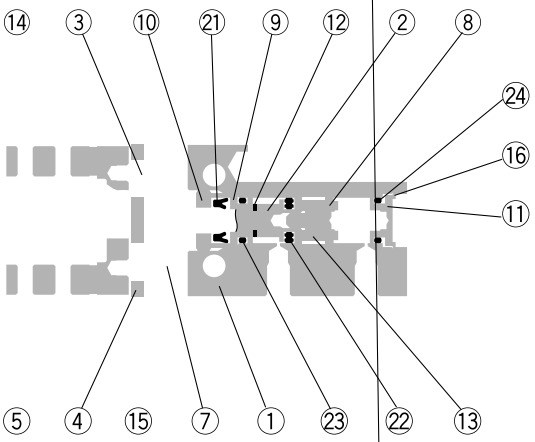
The concentrated vacuuming of internally generated particulates prevents them from spreading into the clean room.

For details, refer to SMC Information "Clean Series: Air Gripper Series 11-MHZ2" (98-E461).

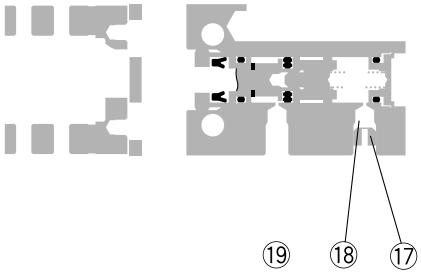
MHZ
MHQ
MHL2
MHR
MHK
MHS
MHC2
MHT2
MHY2
MHW2
MRHQ
Auto Switch

Construction/MHZ2-6□

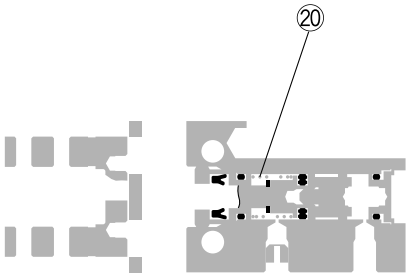
Double acting/with fingers open



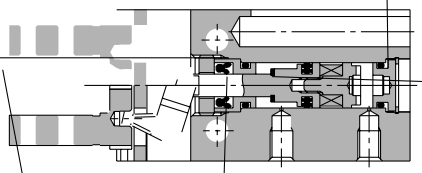
Single acting/normally open



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

Parts list

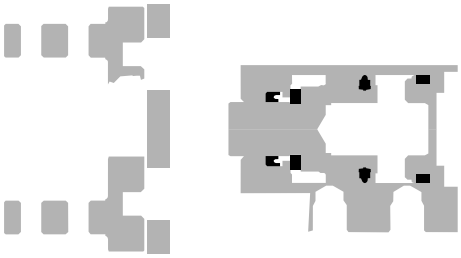
No.	Description	Material	Note
14	**Steel balls**	High carbon chromium bearing steel	
15	**Needle roller**	High carbon chromium bearing steel	
16	**C type snap ring**	Carbon steel	Nickel plated
17	**Exhaust plug**	Brass	Electroless nickel plated
18	**Exhaust filter**	Polyvinyl formal	
19	**N.O. spring**	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: Seal kits

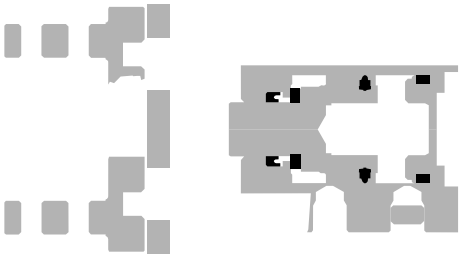
Seal kit no.	Description
MHZ6-PS	Kit includes items 21, 22, 23 and 24 from the table above.

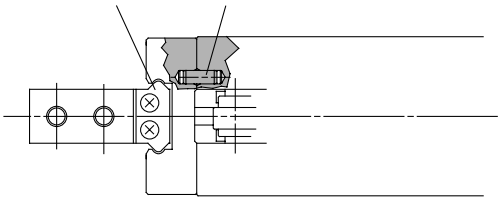
Construction/MHZ2-10□ to 40□

Double acting/with fingers open

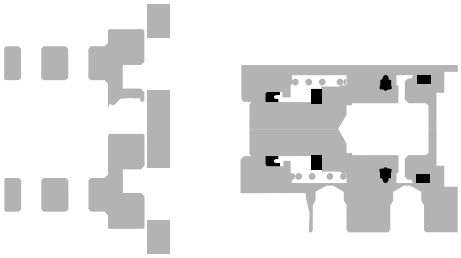


Single acting/normally open

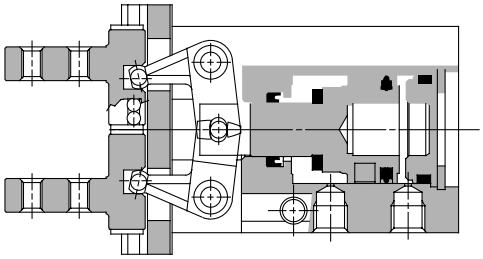




Single acting/normally closed



Double acting/with fingers closed



Parts list

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Hard anodized
2	**Piston**	ø10, ø16: Stainless steel ø20 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	Nitrided
8	**Cap**	ø10 to ø25: Synthetic resin ø32, ø40: Aluminum alloy	ø32, ø40: Clear anodized
9	**Bumper**	Urethane rubber	
10	**Rubber magnet**	Synthetic rubber	

Parts list

No.	Description	Material	Note
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	

Replacement parts: Seal kits

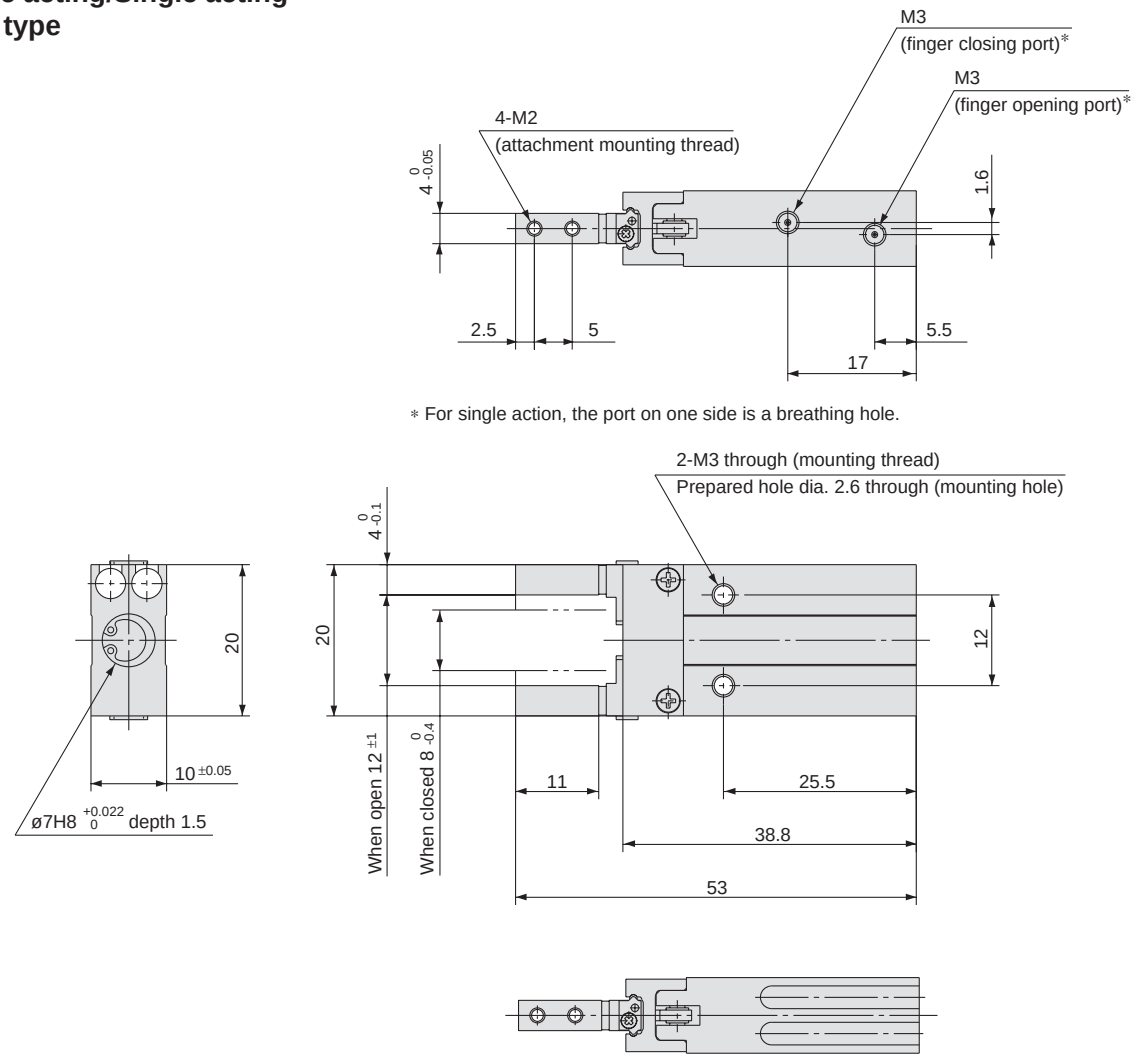
Seal kit no.						Description
						Kits include items 19, 20 and 21 from the table above.

∗ 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.

Dimensions

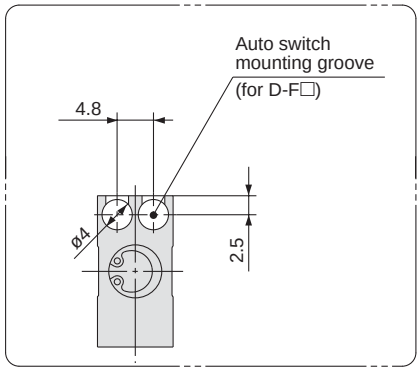
Scale: 100%

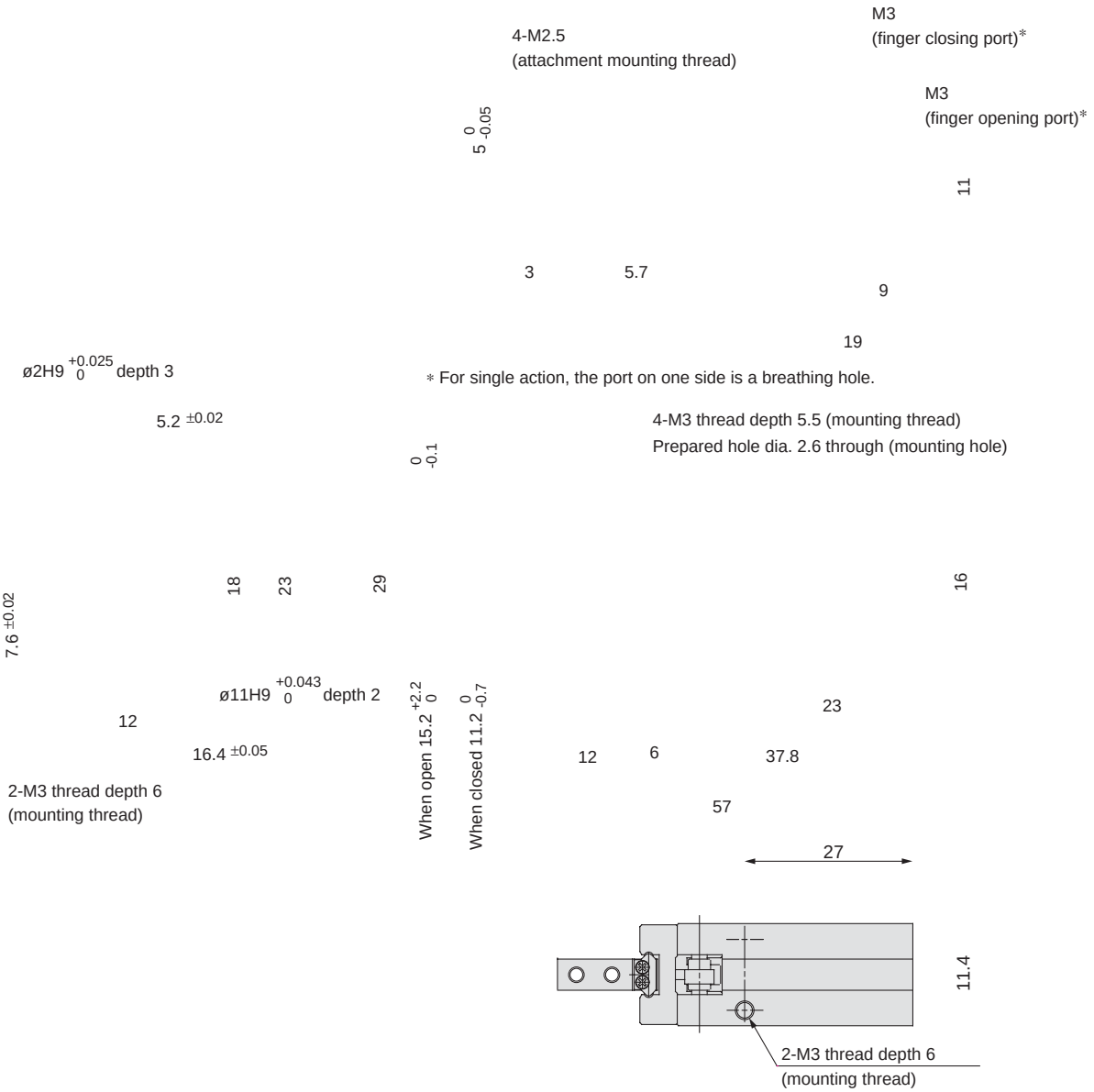
MHZ2-6□
Double acting/Single acting
Basic type



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

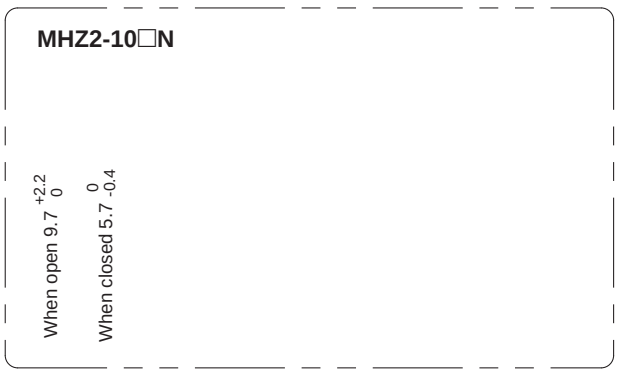
Auto switch mounting groove dimensions



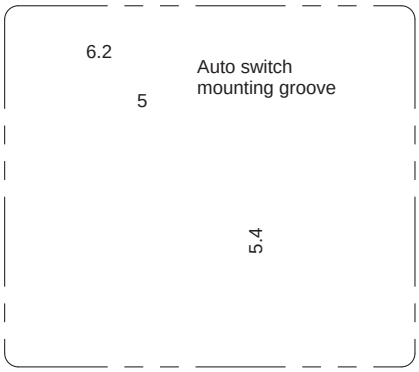


Finger position/Narrow type

MHZ2-10□N



Auto switch mounting groove dimensions

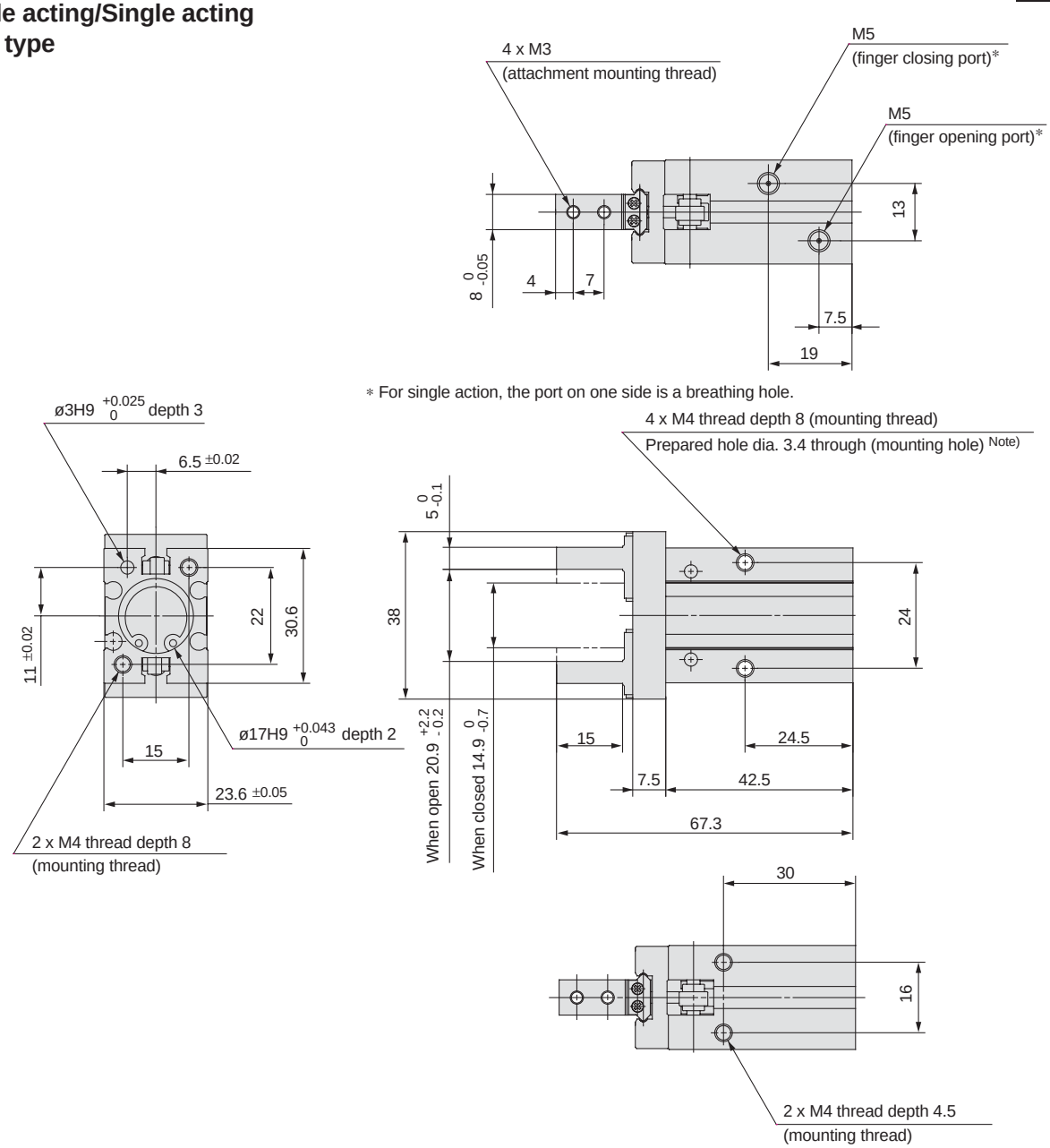


Note) When using D-Y59, D-Y69 and D-Y7 type auto switches, through hole mounting is not possible.

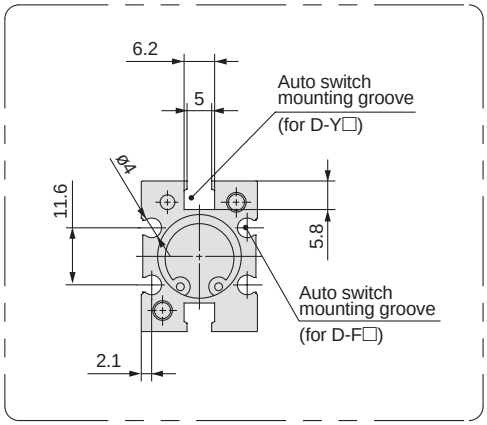
Dimensions

MHZ2-16□
Double acting/Single acting
Basic type

Scale: 65%

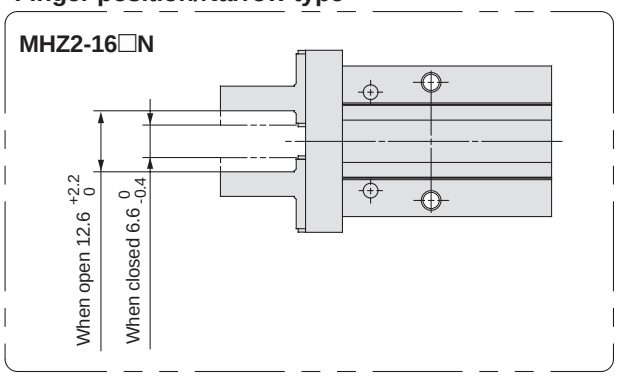


Auto switch mounting groove dimensions



Finger position/Narrow type

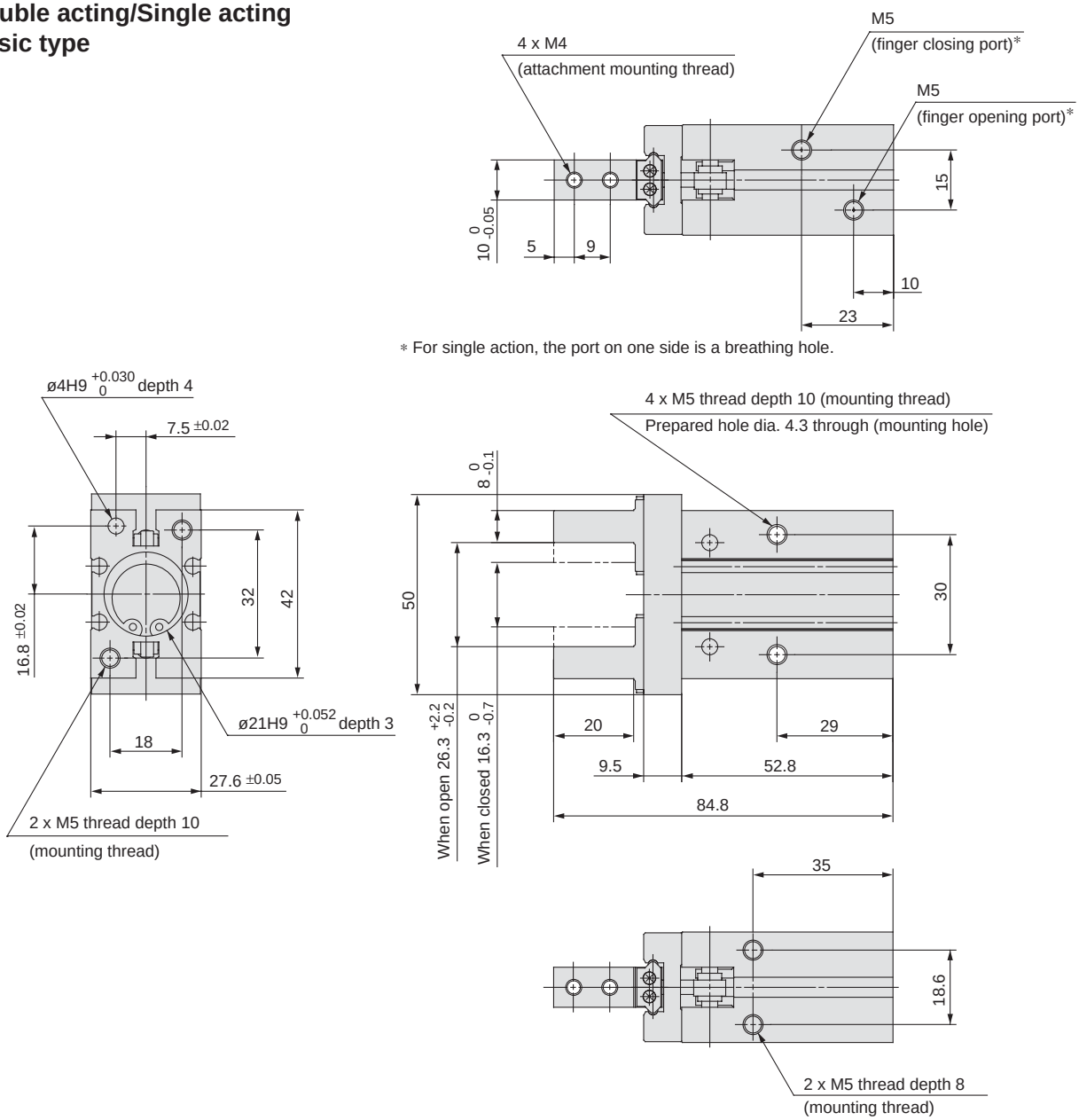
MHZ2-16□N



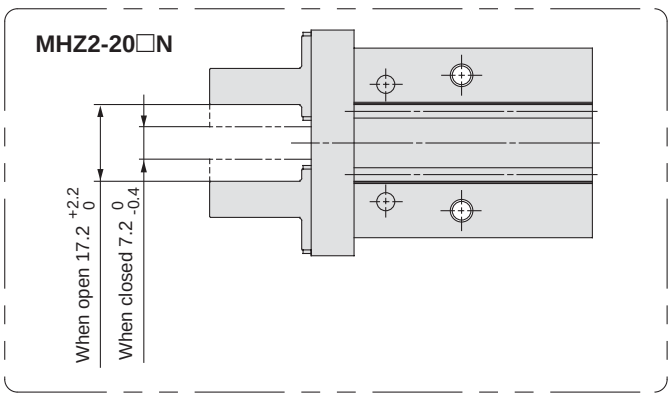
Note) When using D-Y59, D-Y69 and D-Y7 type auto switches, through hole mounting is not possible.

MHZ2-20□
Double acting/Single acting
Basic type

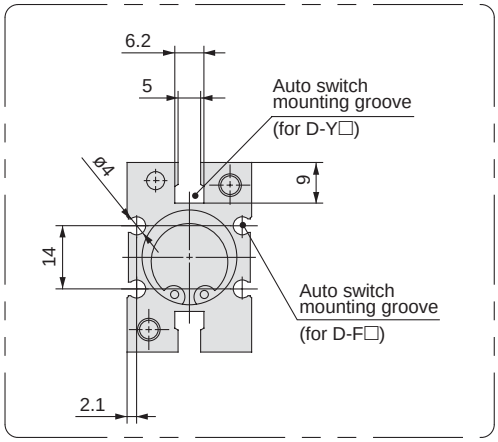
Scale: 60%



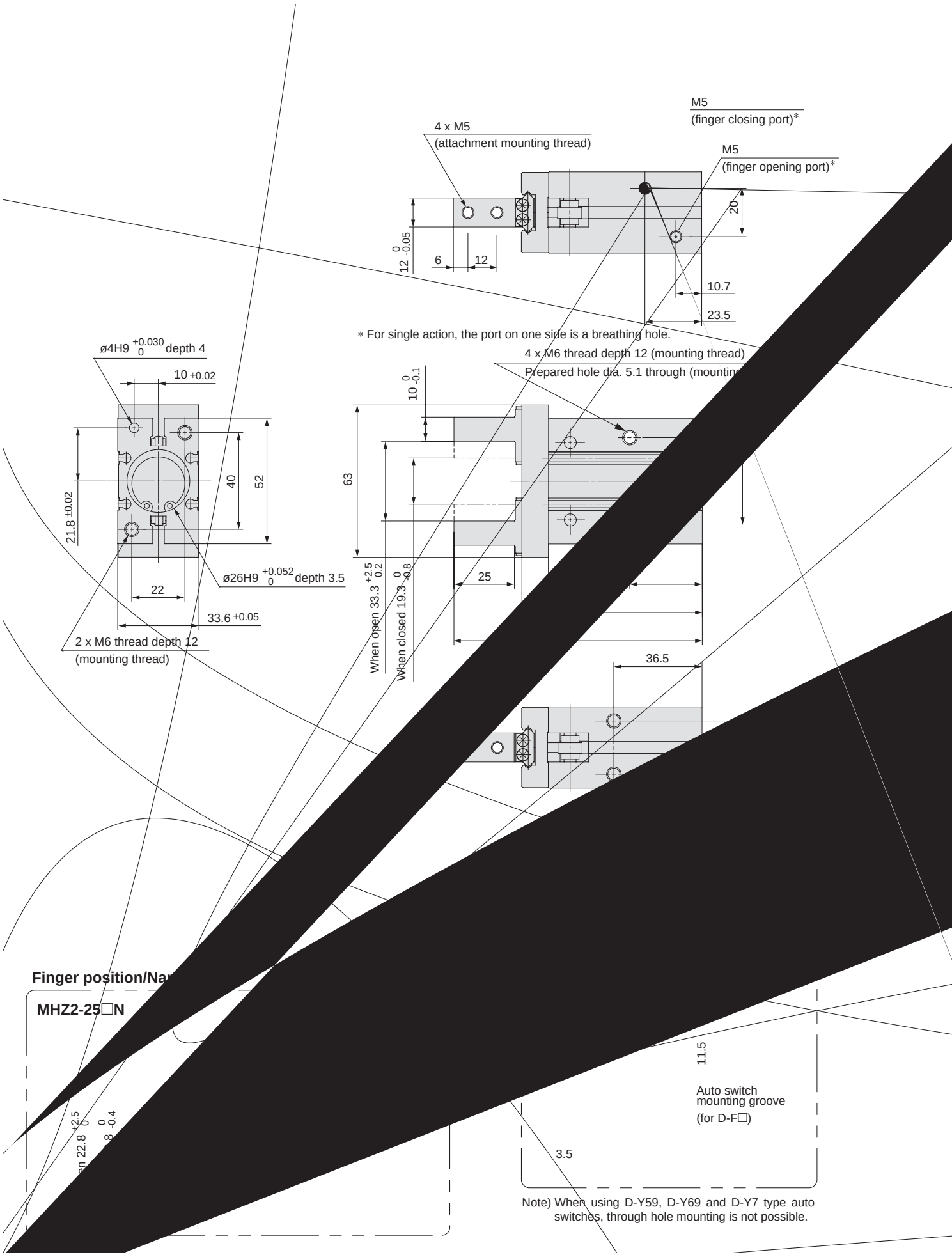
Finger position/Narrow type



Auto switch mounting groove dimensions



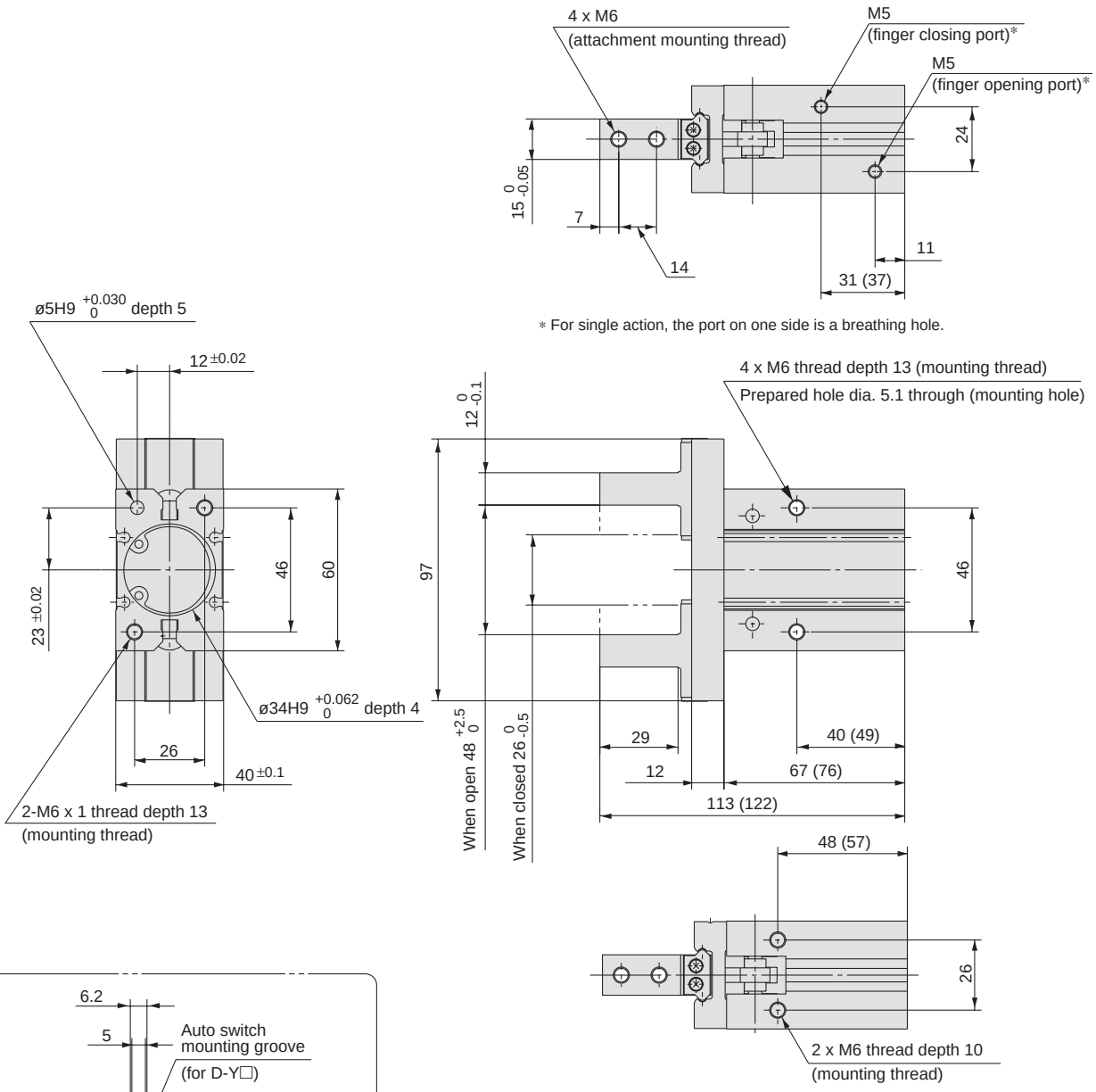
Note) When using D-Y59, D-Y69 and D-Y7 type auto switches, through hole mounting is not possible.


M5
(finger closing port)*
4 x M5
(attachment mounting thread)
M5
(finger opening port)*
20
12 0 -0.05
6
12
10.7
23.5
* For single action, the port on one side is a breathing hole.
ø4H9 +0.030 0 depth 4
10 ±0.02
4 x M6 thread depth 12 (mounting thread)
Prepared hole dia. 5.1 through (mounting
10 0 -0.1
63
21.8 ±0.02
40
52
ø26H9 +0.052 0 depth 3.5
22
33.6 ±0.05
2 x M6 thread depth 12
(mounting thread)
When open 33.3 +2.5 0.2
When closed 19.3 0 -0.8
25
36.5
Finger position/Na
MHZ2-25□N
11.5
Auto switch
mounting groove
(for D-F□)
3.5
Note) When using D-Y59, D-Y69 and D-Y7 type auto
switches, through hole mounting is not possible.

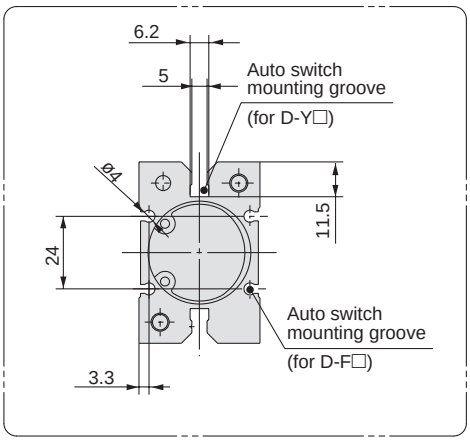
MHZ2-32□
Double acting/Single acting
Basic Type

Scale: 40%

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



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



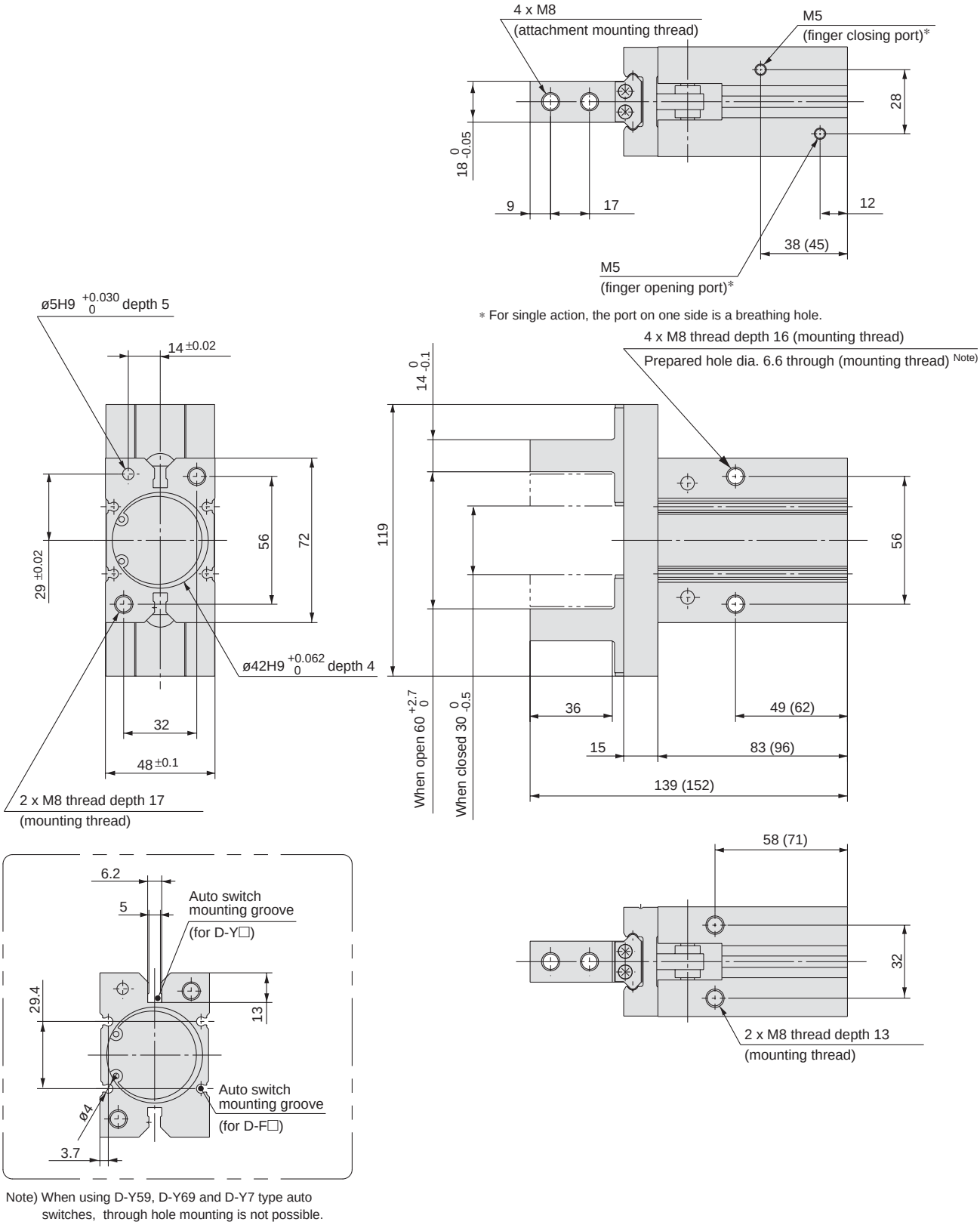
Note) When using D-Y59, D-Y69 and D-Y7 type auto switches, through hole mounting is not possible.

Dimensions

MHZ2-40□
Double acting/Single acting
Basic type

Scale: 40%

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

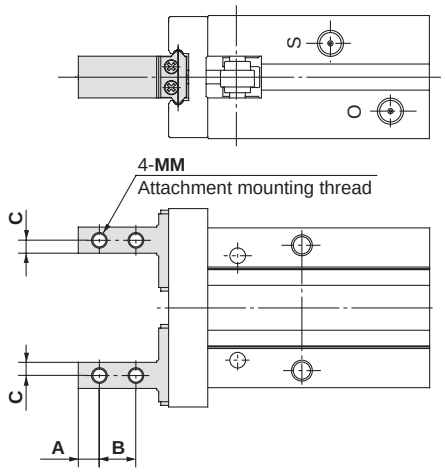


∗ For single action, the port on one side is a breathing hole.

Note) When using D-Y59, D-Y69 and D-Y7 type auto switches, through hole mounting is not possible.

Finger Options

Side Tapped Mounting [1/N1]

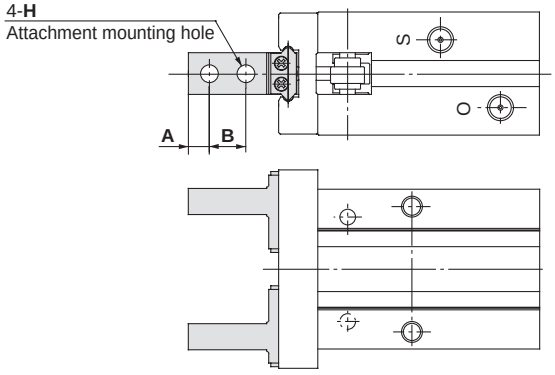


Unit: mm

Model	A	B	C	MM
MHZ2- 6□1	2.5	5	2	M2
MHZ2-10□$^{1}_{N1}$□	3	5.7	2	M2.5
MHZ2-16□$^{1}_{N1}$□	4	7	2.5	M3
MHZ2-20□$^{1}_{N1}$□	5	9	4	M4
MHZ2-25□$^{1}_{N1}$□	6	12	5	M5
MHZ2-32□1□	7	14	6	M6
MHZ2-40□1□	9	17	7	M8

∗ 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]

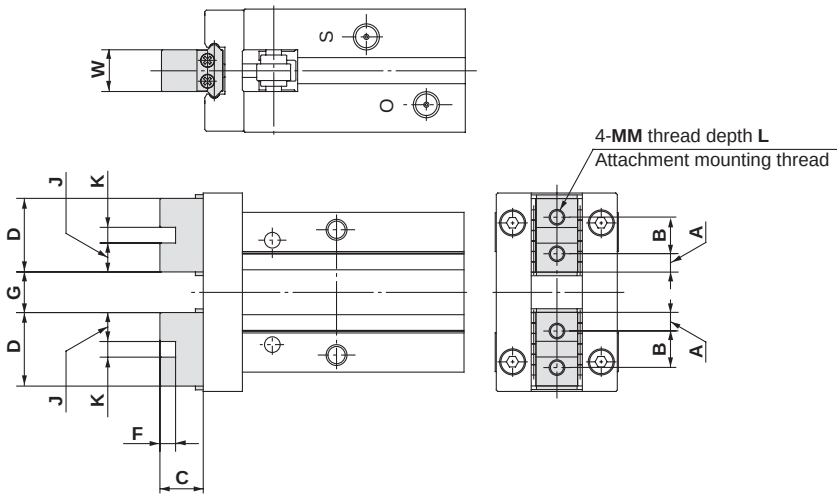


Unit: mm

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]



Unit: mm

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

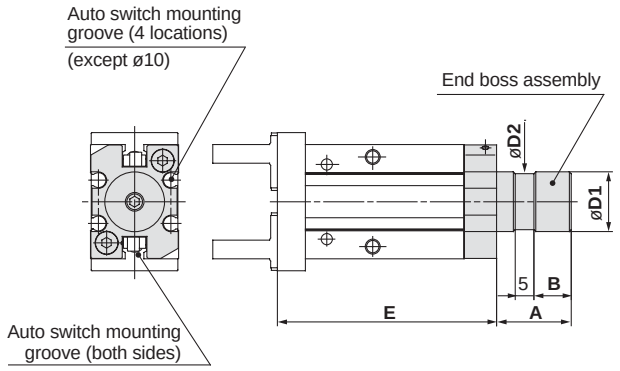
∗1) To mount attachments, use M2 hexagon socket head cap screws with ø3.3 top diameter, or JISB1101 type M2 round head screws.
∗2) Specifications and dimensions other than the above are the same as the basic type (including narrow type).
∗3) The overall length is the same as the MHQ(G) flat finger type.
∗4) The values inside ( ) are for the single acting type.

Standard Type/*Series MHZ2*
Body Options: End Boss Type

Applicable Models

Symbol	Piping port position	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	M5			●	●	●
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]



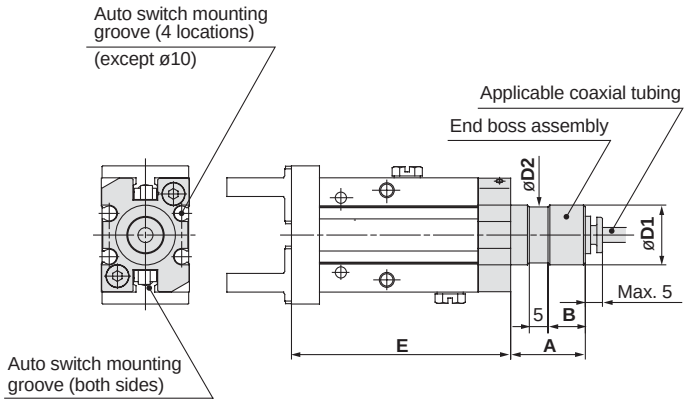
Unit: mm

Model	Kit no.	A	B	D1	D2	E
MHZ2-10□□	**MHZ-A1010**	15	7	12f8 $^{-0.016}_{-0.043}$	11	52.8
MHZ2-16□□	**MHZ-A1610**	20	10	16f8 $^{-0.016}_{-0.043}$	15	58.7
MHZ2-20□□	**MHZ-A2010**	22	12	20f8 $^{-0.020}_{-0.053}$	19	70.5
MHZ2-25□□	**MHZ-A2510**	25	15	25f8 $^{-0.020}_{-0.053}$	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 Port (One-Touch Fitting for Coaxial Tubing) [W]



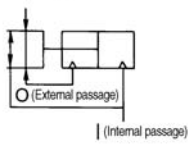
Unit: mm

Model	A	B	D1	D2	E
MHZ2-10□□	15	7	12f8 $^{-0.016}_{-0.043}$	11	52.8
MHZ2-16□□	20	10	16f8 $^{-0.016}_{-0.043}$	15	58.7
MHZ2-20□□	22	12	20f8 $^{-0.020}_{-0.053}$	19	70.5
MHZ2-25□□	25	15	25f8 $^{-0.020}_{-0.053}$	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.

Reference symbol

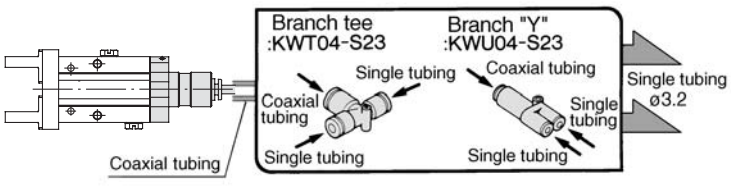


Applicable coaxial tubing

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

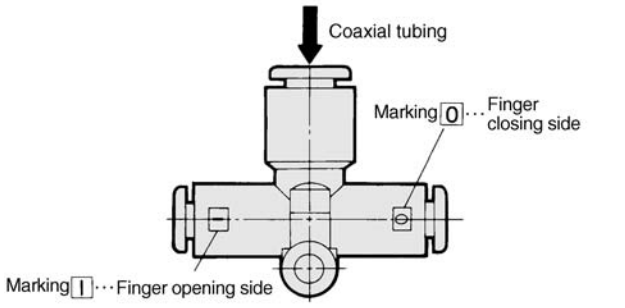
Changing from Coaxial to Single Tubing

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.

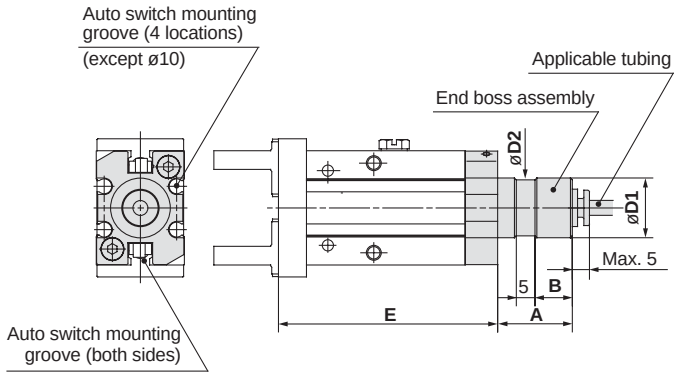


Branch tee, Different diameter tee, Branch "Y", Male run tee

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



Axial Port (with One-touch Fitting) [K]



∗ Refer to the dimension table.
∗ When auto switches are used, side mounting with through holes is not possible.

Unit: mm

Model	A	B	D1	D2	E
MHZ2-10□□	15	7	12f8 $^{-0.016}_{-0.043}$	11	52.8
MHZ2-16□□	20	10	16f8 $^{-0.016}_{-0.043}$	15	58.7
MHZ2-20□□	22	12	20f8 $^{-0.020}_{-0.053}$	19	70.5
MHZ2-25□□	25	15	25f8 $^{-0.020}_{-0.053}$	24	82.9

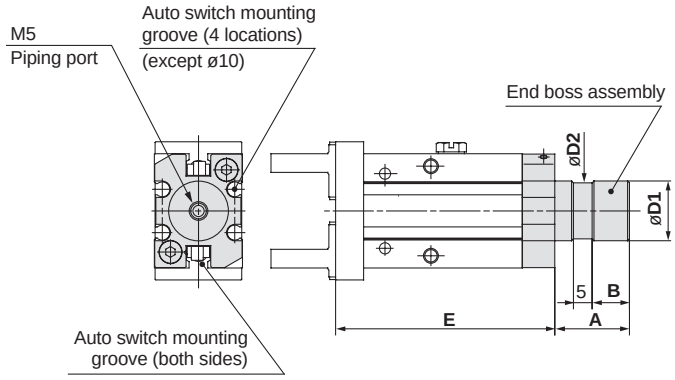
Other dimensions and specifications correspond to the standard type.

Applicable tubing

Description/ Model / Specification	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, side mounting with through holes is not possible.

Unit: mm

Model	A	B	D1	D2	E
MHZ2-10□□	15	7	12f8 $^{-0.016}_{-0.043}$	11	52.8
MHZ2-16□□	20	10	16f8 $^{-0.016}_{-0.043}$	15	58.7
MHZ2-20□□	22	12	20f8 $^{-0.020}_{-0.053}$	19	70.5
MHZ2-25□□	25	15	25f8 $^{-0.020}_{-0.053}$	24	82.9

Other dimensions and specifications correspond to the standard type.

Weights

Unit: g

Model	End boss type (symbol)			
	E	**W**	**K**	**M**
MHZ2-10□□	65	64	66	65
MHZ2-16□□	148	147	148	147
MHZ2-20□□	277	277	277	277
MHZ2-25□□	495	495	496	494

How to Order

MHZL2 — D □ □ F9PV □

Number of fingers

2	2 fingers

Bore size

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

Action

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

Number of auto switches

Nil	2 pcs.
S	1 pc.

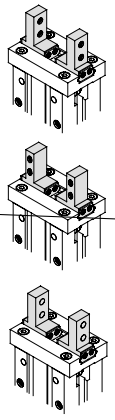
Auto switch type

Nil	Without auto switch (built-in magnet)

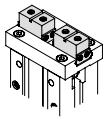
∗ Select an applicable auto switch model from the table below.

Finger option

Nil: Basic type



3: Flat type fingers

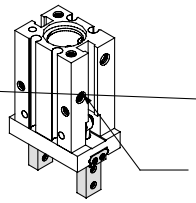


Body option

Nil: Basic type

E: End boss type
Side ported
(double acting/
single acting)

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



Port

K: End boss type
Axial port with
ø4 One-touch fitting
(single acting)

M: End boss type
Axial M5 port
(single acting)

Applicable auto switches/∗ Refer to pages 2.11-1 for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Auto switch part no.		Lead wire length (m)∗			Applicable load		Applicable model			
							Electrical entry direction		0.5 (Nil)	3 (L)							
					DC	AC	Perpendicular	In-line									
	—	Grommet	Yes	3 wire (NPN)	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay, PLC	●	●	●	●
					12V		**F9NV**	**F9N**	●	●	—	—			●	●	●
							F8N	**—**	●	●	○				●	●	●
				3 wire (PNP)	5V, 12V		**Y7PV**	**Y7P**	●	●	○	IC circuit		●	●	●	●
					12V		**F9PV**	**F9P**	●	●	—	—			●	●	●
							F8P	**—**	●	●	○				●	●	●
				2 wire	24V		**Y69B**	**Y59B**	●	●	○			●	●	●	●
					12V		**F9BV**	**F9B**	●	●	—				●	●	●
							F8B	**—**	●	●	○				●	●	●
	Diagnostic indication (2 colour indicator)			3 wire (NPN)	5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit				●	●
					12V		**F9NWV**	**F9NW**	●	●	○	—				●	●
				3 wire (PNP)	5V, 12V		**Y7PWV**	**Y7PW**	●	●	○	IC circuit				●	●
					12V		**F9PWV**	**F9PW**	●	●	○					●	●
				2 wire			**Y7BWV**	**Y7BW**	●	●	○	—				●	●
							F9BWV	**F9BW**	●	●	○					●	●

∗ Lead wire length symbols: 0.5m .....Nil (Example) F9N
3m ……L (Example) F9NL
5m…… Z (Example) Y59AZ

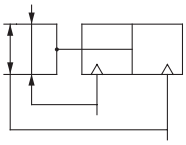
Specifications

Fluid			Air
Operating pressure	**Double acting**		ø10: 0.2 to 0.7MPa ø16 to ø25: 0.1 to 0.7MPa
	Single acting	**Normally open**	ø10: 0.35 to 0.7MPa ø16 to ø25: 0.25 to 0.7MPa
		Normally closed	
Ambient and fluid temperature			–10 to 60°C
Repeatability			±0.01mm
Maximum operating frequency			120c.p.m.
Lubrication			Non-lube
Action			Double acting, Single acting
Auto switch (option) Note)			Solid state switch (3 wire, 2 wire)

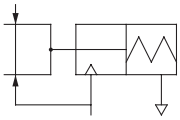
Note) Refer to pages 2.11-1 for details regarding auto switch specifications.

Symbols:

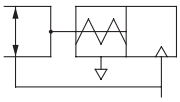
Double acting type



Single acting type, normally open



Single acting type, normally closed



Models

Action		Model	Bore size (mm)	Gripping force Note 1)		Opening/ Closing stroke (both sides) mm	Note 2) Weight g
				Gripping force per finger Effective value N			
				External gripping force	Internal gripping force		
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 0.5MPa, gripping point L = 20mm, at center of stroke.
Note 2) Values excluding weight of auto switch.

Options

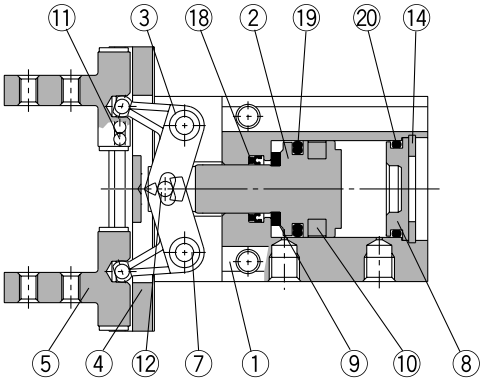
• Body options/End boss type

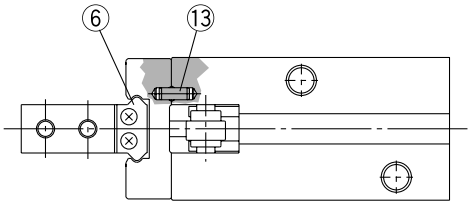
Symbol	Piping port position	Type of piping port				Applicable model	
		MHZL2-10	**MHZL2-16**	**MHZL2-20**	**MHZL2-25**	Double acting	Single acting
Nil	Basic type	M3	M5			●	●
E	Side ported	M3	M5			●	●
W	Axial port	With ø4 One-touch fitting for coaxial tube				●	—
K	Axial port	With ø4 One-touch fitting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

∗ For detailed body option specifications, refer to option specifications on pages 2.1-39 and 2.1-40.

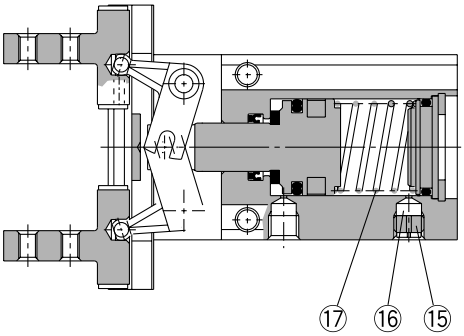
Construction/MHZL2-10□ to 25□

Double acting/with fingers open

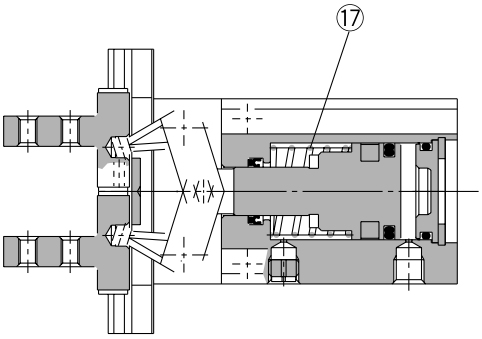




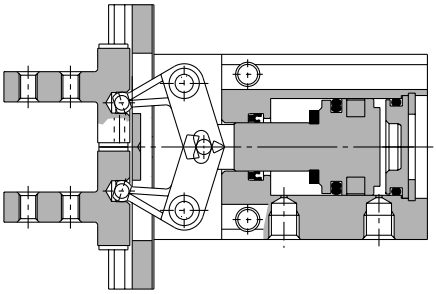
Single acting/normally open



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	Clear anodized
9	**Bumper**	Urethane rubber	
10	**Rubber magnet**	Synthetic rubber	

Parts list

No.	Description	Material	Note
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	**Spring**	Stainless steel spring wire	
18	**Rod seal**	NBR	
19	**Piston seal**	NBR	
20	**O-ring**	NBR	

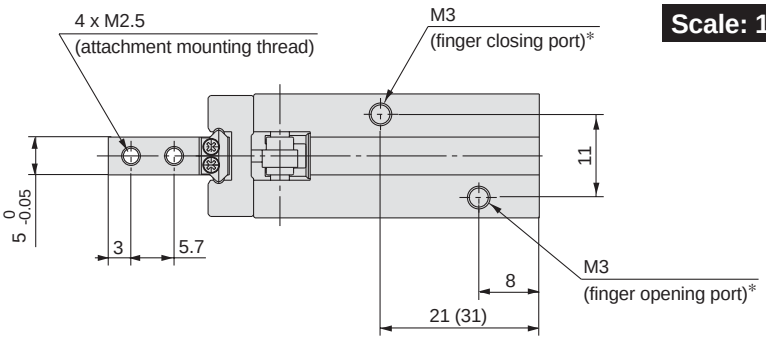
Replacement parts: Seal kits

Seal kit no.				Description
MHZL2-10D	**MHZL2-16D**	**MHZL2-20D**	**MHZL2-25D**	Kits include items 18, 19 and 20 from the table above.
MHZL10-PS	MHZL16-PS	MHZL20-PS	MHZL25-PS	

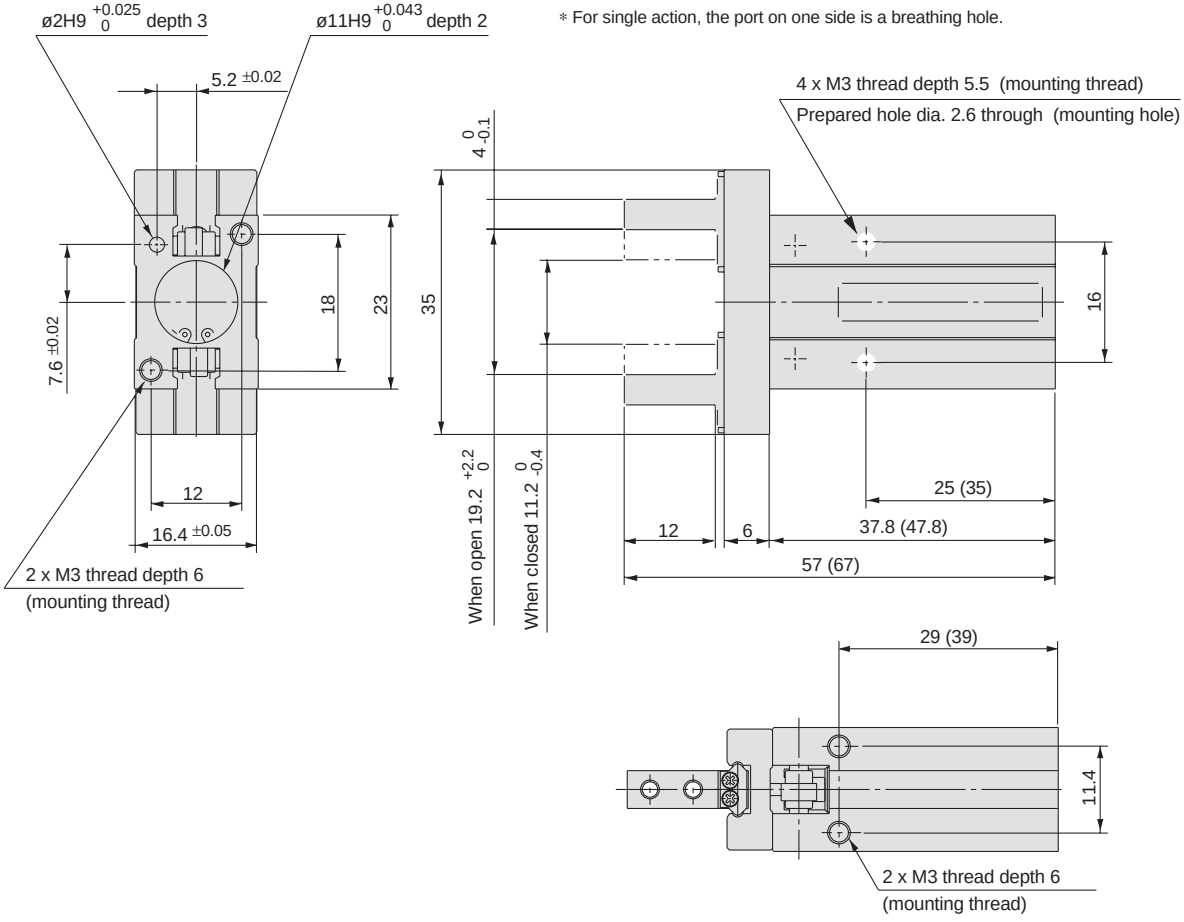
Dimensions

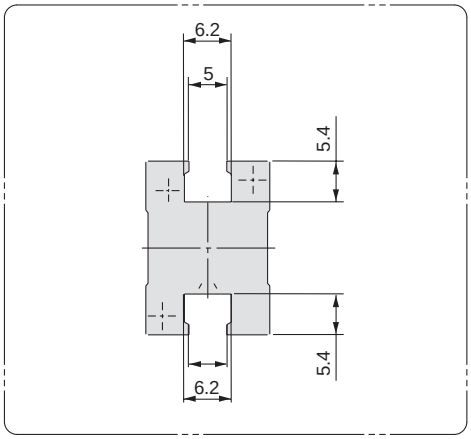
MHZL2-10□
Double acting/Single acting
Basic type

Scale: 100%



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



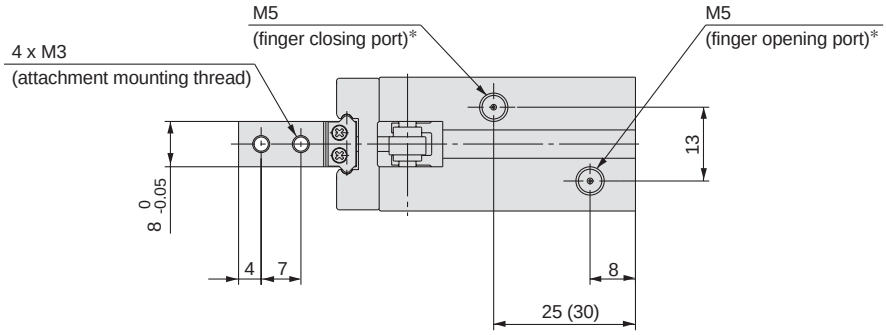


Dimensions

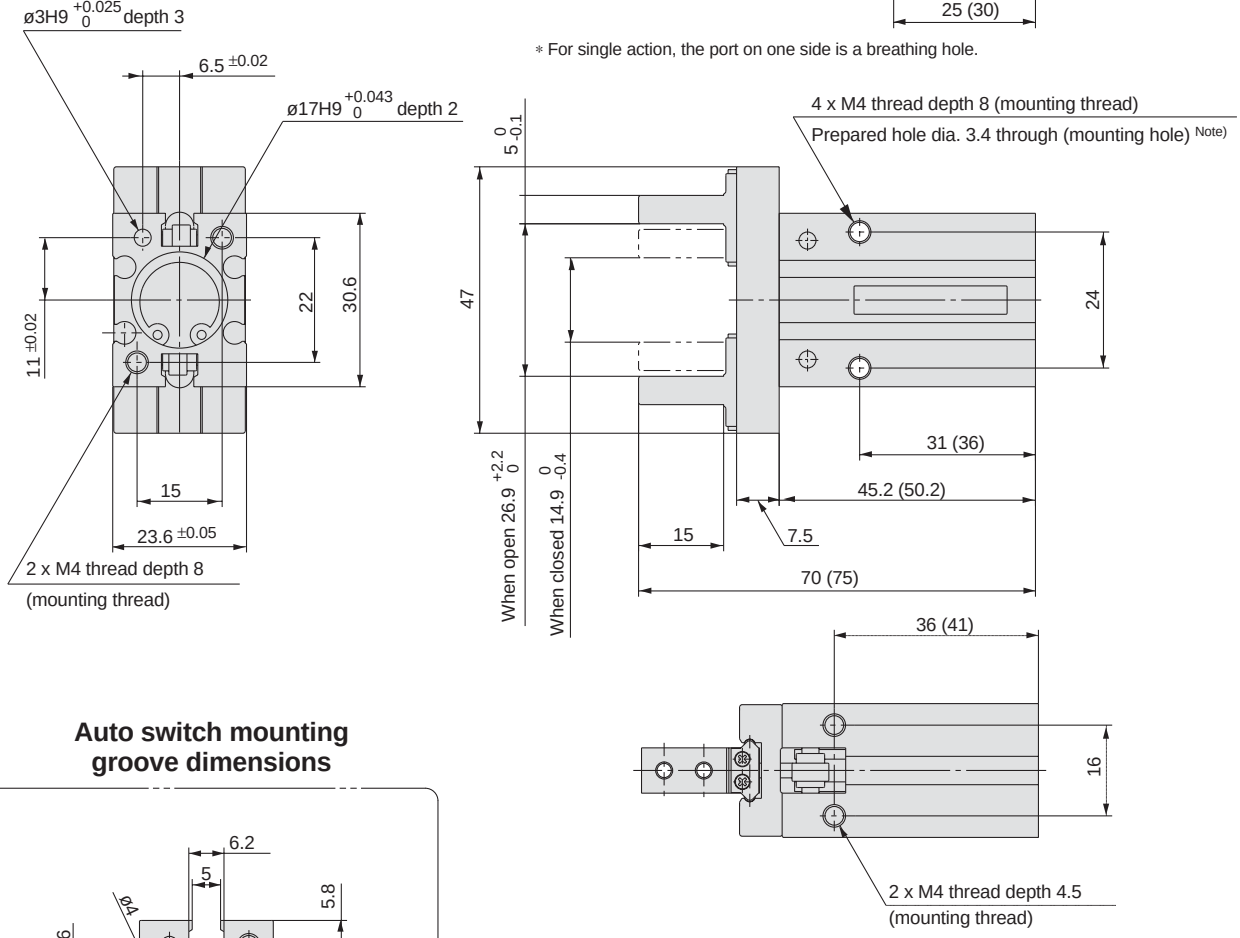
MHZL2-16□
Double acting/Single acting
Basic type

Scale: 75%

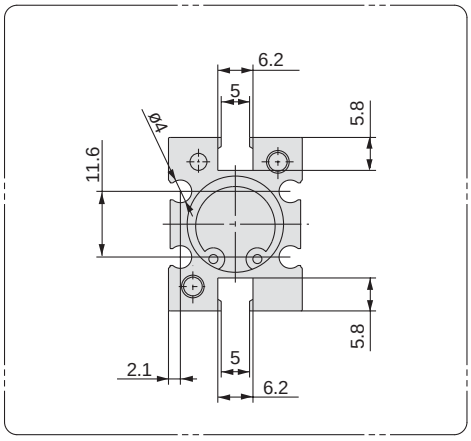
The values inside ( ) are dimensions for the single acting type.



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



Auto switch mounting groove dimensions

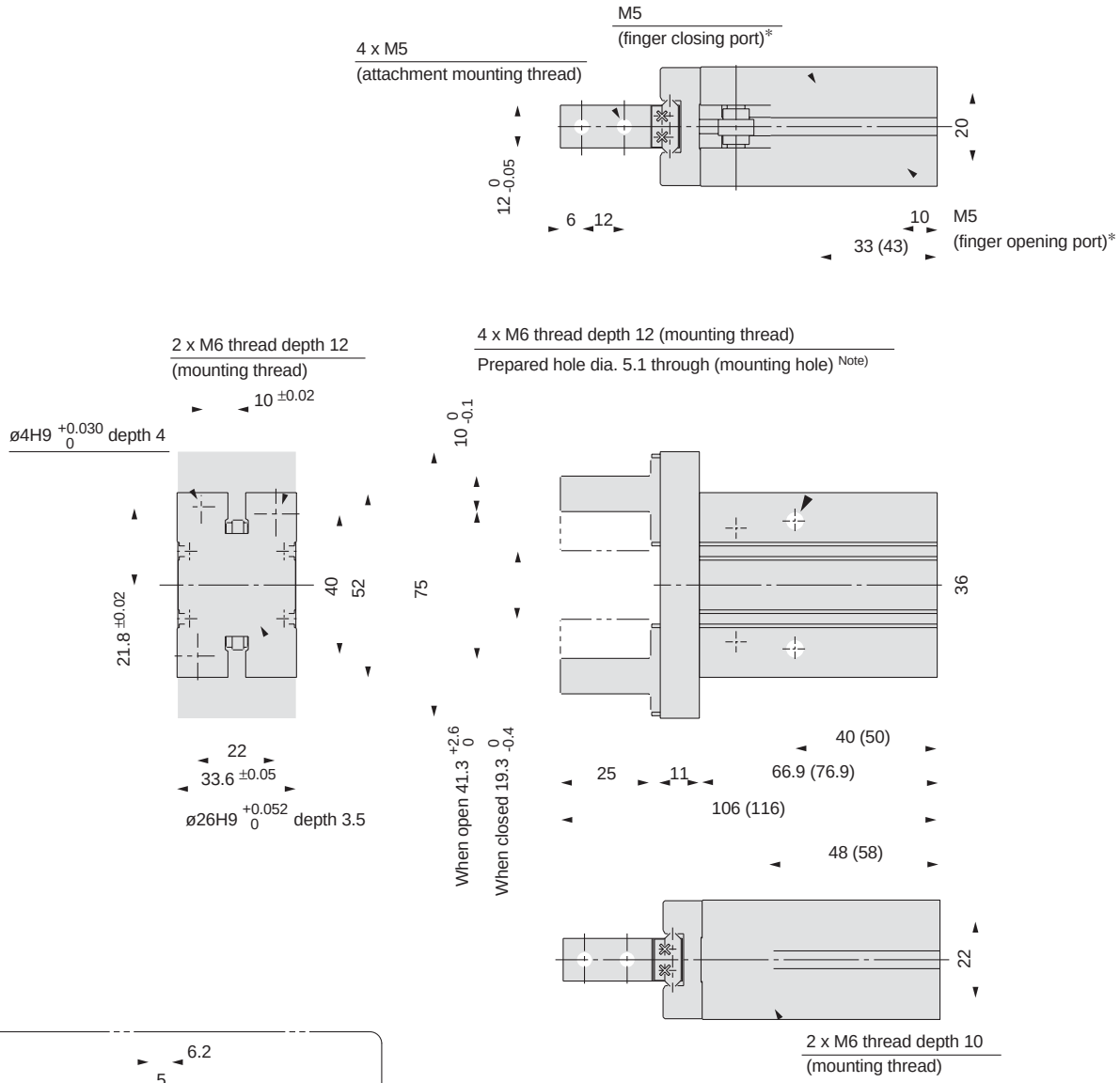


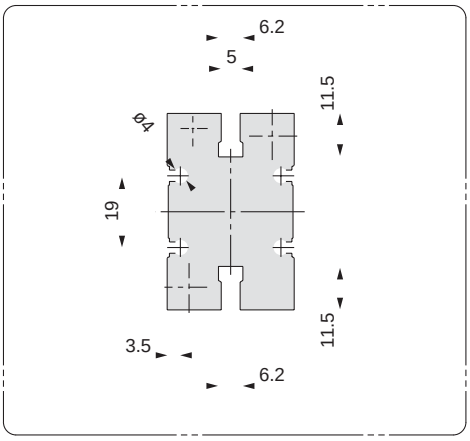
Note) When using D-Y59, D-Y69 and D-Y7 type auto switches, through hole mounting is not possible.

MHZL2-20□
Double acting/Single acting
Basic type

MHZL2-25□
Double acting/Single acting
Basic type

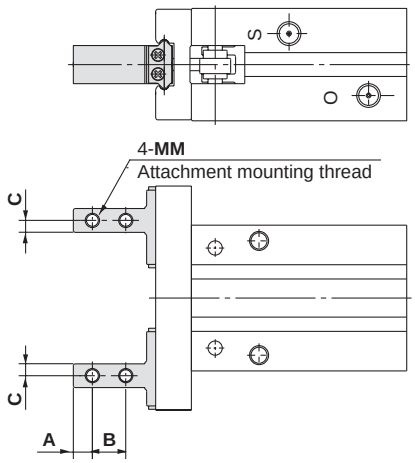
Scale: 50%





Finger Options

Side Tapped Mounting [1]

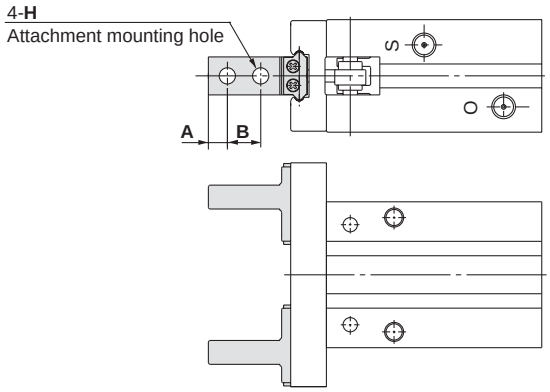


Unit: mm

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

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

Through Holes in Opening/Closing Direction [2]

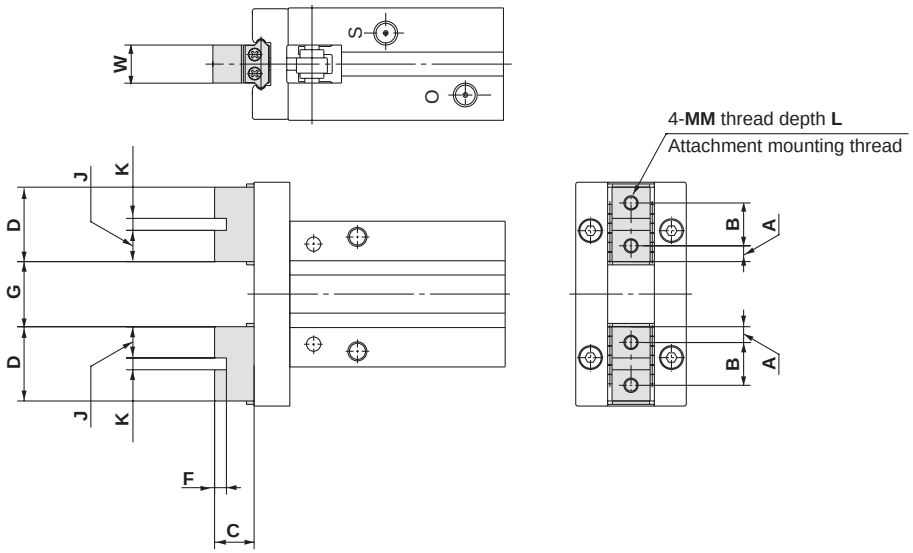


Unit: mm

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]



Unit: mm

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

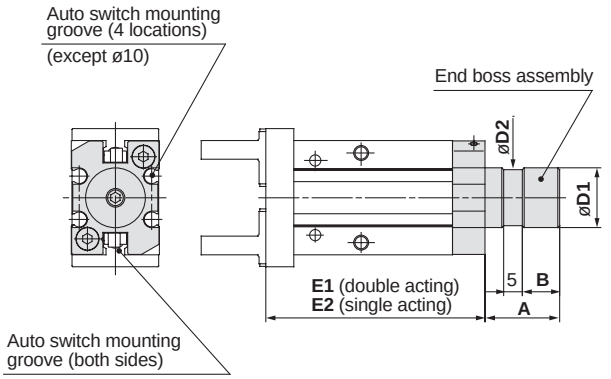
∗ Specifications and dimensions other than the above are the same as the basic type.

Long Stroke/*Series MHZL2*
Body Options: End Boss Type

Applicable Models

Symbol	Piping port position	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	M5			●	●	●
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]



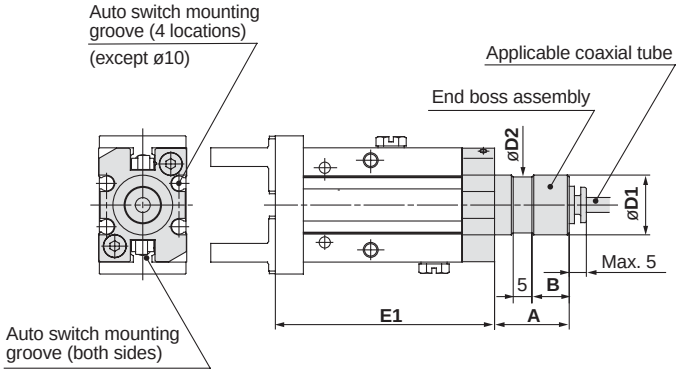
Unit: mm

Model	Kit no.	A	B	D1	D2	E1	E2
MHZL2-10□□	**MHZ-A1010**	15	7	12f8 $^{-0.016}_{-0.043}$	11	52.8	62.8
MHZL2-16□□	**MHZ-A1610**	20	10	16f8 $^{-0.016}_{-0.043}$	15	61.4	66.4
MHZL2-20□□	**MHZ-A2010**	22	12	20f8 $^{-0.020}_{-0.053}$	19	75.7	81.7
MHZL2-25□□	**MHZ-A2510**	25	15	25f8 $^{-0.020}_{-0.053}$	24	86.2	96.2

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



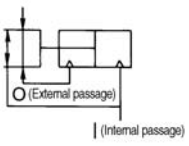
Unit: mm

Model	A	B	D1	D2	E1
MHZL2-10□□	15	7	12f8 $^{-0.016}_{-0.043}$	11	52.8
MHZL2-16□□	20	10	16f8 $^{-0.016}_{-0.043}$	15	61.4
MHZL2-20□□	22	12	20f8 $^{-0.020}_{-0.053}$	19	75.7
MHZL2-25□□	25	15	25f8 $^{-0.020}_{-0.053}$	24	86.2

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.

Reference symbol

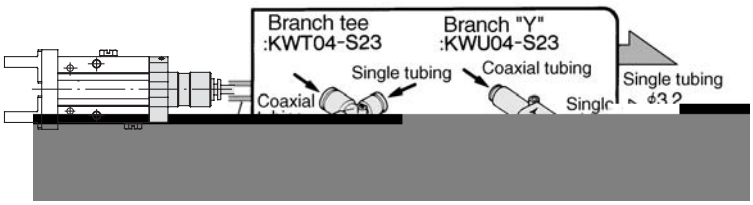


Applicable coaxial tubing

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

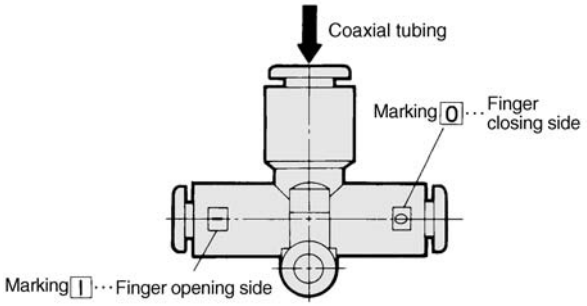
Changing from Coaxial to Single Tubing

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.

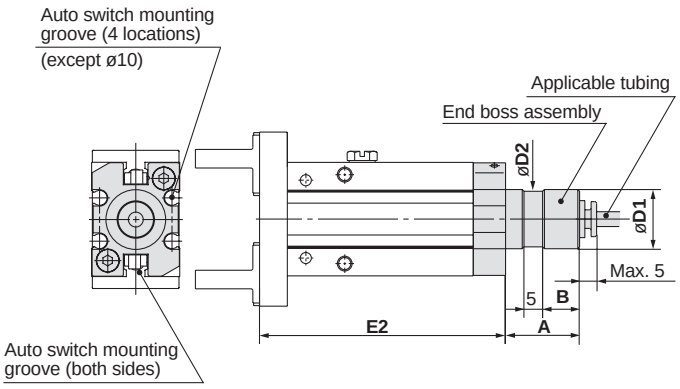


Branch tee, Different diameter tee, Branch "Y", Male run tee

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



Axial Port (with One-touch Fitting) [K]



∗ Refer to the dimension table.
∗ When auto switches are used, side mounting with through holes is not possible.

Unit: mm

Model	A	B	D1	D2	E2
MHZL2-10□□	15	7	12f8 $^{-0.016}_{-0.043}$	11	62.8
MHZL2-16□□	20	10	16f8 $^{-0.016}_{-0.043}$	15	66.4
MHZL2-20□□	22	12	20f8 $^{-0.020}_{-0.053}$	19	81.7
MHZL2-25□□	25	15	25f8 $^{-0.020}_{-0.053}$	24	96.2

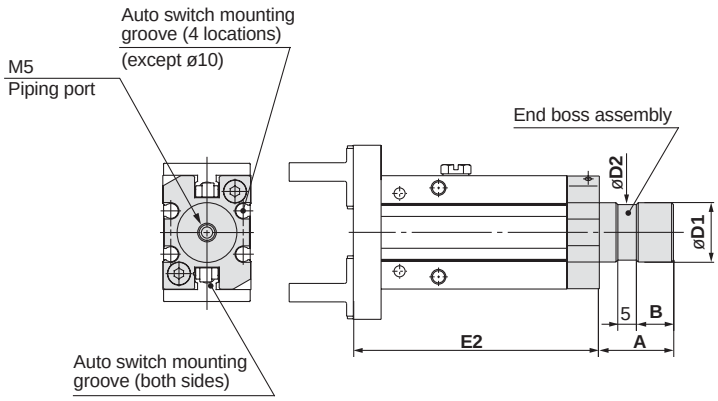
Other dimensions and specifications correspond to the standard type.

Applicable tubing

Description / Model / Specification	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. 501-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, side mounting with through holes is not possible.

Unit: mm

Model	A	B	D1	D2	E2
MHZL2-10□□	15	7	12f8 $^{-0.016}_{-0.043}$	11	62.8
MHZL2-16□□	20	10	16f8 $^{-0.016}_{-0.043}$	15	66.4
MHZL2-20□□	22	12	20f8 $^{-0.020}_{-0.053}$	19	81.7
MHZL2-25□□	25	15	25f8 $^{-0.020}_{-0.053}$	24	96.2

Other dimensions and specifications correspond to the standard type.

Weights

Unit: g

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 Type
Air Gripper

With Dust Cover
Series MHZJ2

How to Order

MHZJ2 — 16 D □ □ — F9PV □

Number of fingers

2	2 fingers

Bore size

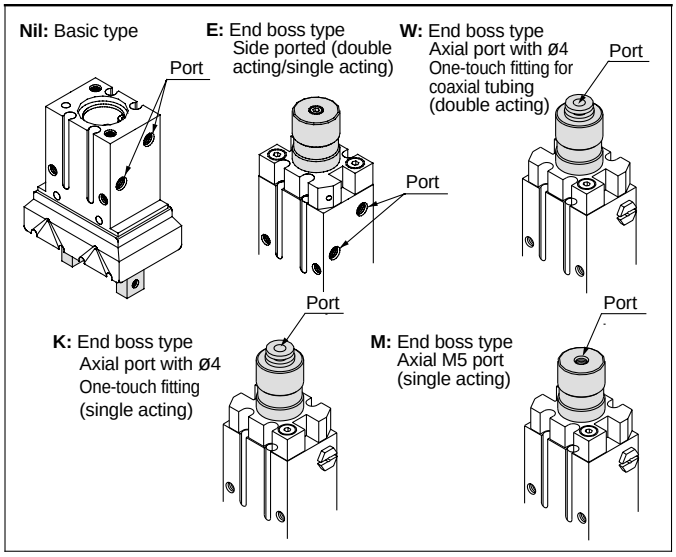
6	6mm
10	10mm
16	16mm
20	20mm
25	25mm

Action

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

Body option

∗ ø6 is only applicable with basic type.



Dust cover type

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

Auto switch type

Nil	Without auto switch (built-in magnet)

∗ Select an applicable auto switch model from the table below.

Number of auto switches

Nil	2 pcs.
S	1 pc.

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

Applicable auto switches/ ∗ Refer to pages 2.11-1 for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch part no. Electrical entry direction: Perpendicular	Auto switch part no. Electrical entry direction: In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Note 3) Flexible lead wire (-61)	Applicable load		Applicable model ø6	ø10	ø16	ø20	ø25
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	12V	—	F9NV	F9N	●	●	—	○	—	Relay, PLC	●	●	●	●	●
								F8N	—	●	●	○	○			●	●	●	●	●
				3 wire (PNP)				F9PV	F9P	●	●	—	○			●	●	●	●	●
								F8P	—	●	●	○	○			●	●	●	●	●
				2 wire				F9BV	F9B	●	●	—	○			●	●	●	●	●
								F8B	—	●	●	○	○			●	●	●	●	●
	Diagnostic indication (2 colour indicator)			3 wire (NPN)				F9NWV	F9NW	●	●	○	○						●	●
				3 wire (PNP)				F9PWV	F9PW	●	●	○	○						●	●
				2 wire				F9BWV	F9BW	●	●	○	○						●	●
	Water resistant (2 colour indicator)							—	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 colour indicator types. When using this type, refer to "Auto Switch Hysteresis" on page 2.1-52.

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

SMC

Specifications

Fluid			Air
Operating pressure	**Double acting**		ø6: 0.15 to 0.7MPa ø10: 0.2 to 0.7MPa ø16 to ø25: 0.1 to 0.7MPa
	Single acting	**Normally open**	ø6: 0.3 to 0.7MPa ø10: 0.35 to 0.7MPa ø16 to ø25: 0.25 to 0.7MPa
		Normally closed	
Ambient and fluid temperature			–10 to 60°C
Repeatability			±0.01mm
Maximum operating frequency			180c.p.m.
Lubrication			Non-lube
Action			Double acting, Single acting
Auto switch (option) Note)			Solid state switch (3 wire, 2 wire)

Note) Refer to pages 2.11-1 for details regarding auto switch specifications.

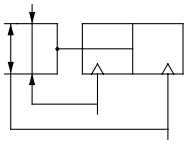
Models

Action		Model	Bore size (mm)	Gripping force Note 1)		Opening/ Closing stroke (both sides) mm	Note 2) Weight 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

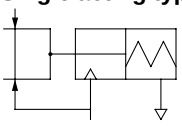
Note 1) Values based on pressure of 0.5MPa, gripping point L = 20mm, at center of stroke.
Note 2) Values excluding weight of auto switch.

Symbols:

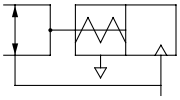
Double acting type



Single acting type, normally open



Single acting type, normally closed



Options

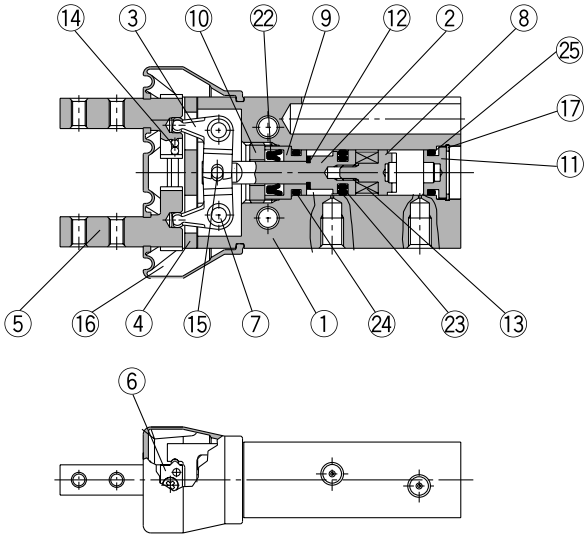
● Body options/End boss type

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				—	●

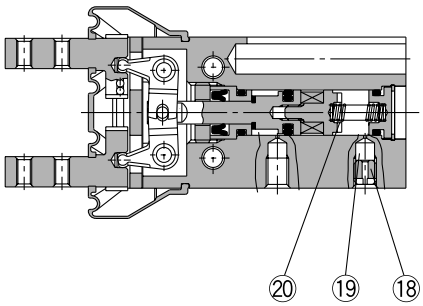
∗ For detailed body option specifications, refer to option specifications on pages 2.1-50 and 2.1-51.

Construction/MHZJ2-6□

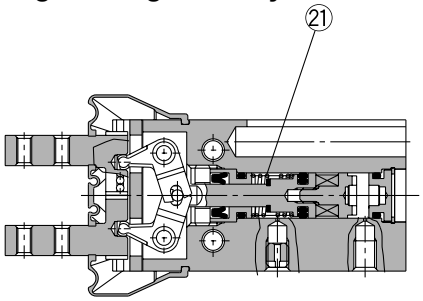
Double acting/with fingers open



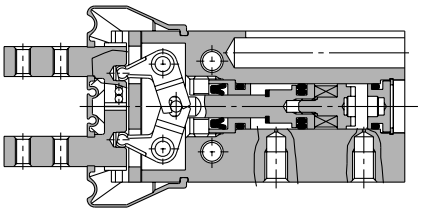
Single acting/normally open



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

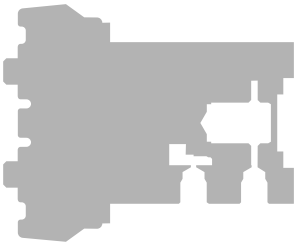
Seal kit no.	Description
MHZJ6-PS	Kit includes items 22, 23, 24 and 25 from the table on the left.

∗ 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

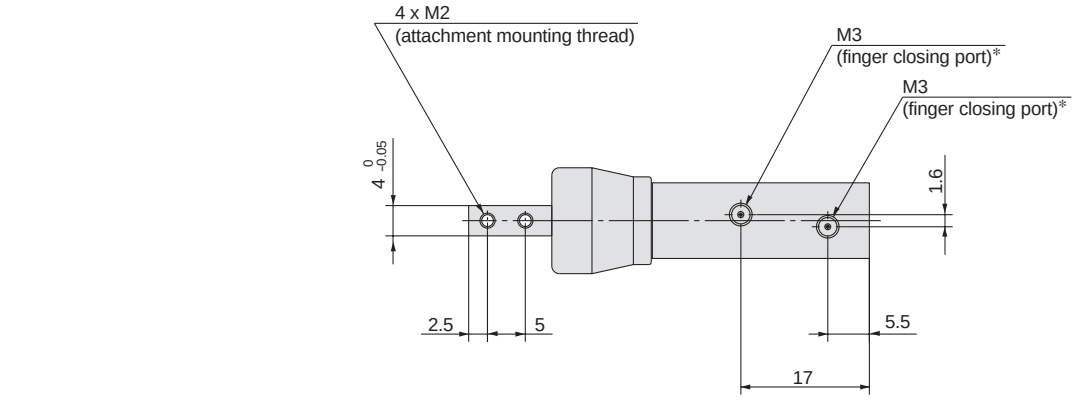
Material	Part no.
CR	MHZJ2-J6
FKM	MHZJ2-J6F
Si	MHZJ2-J6S



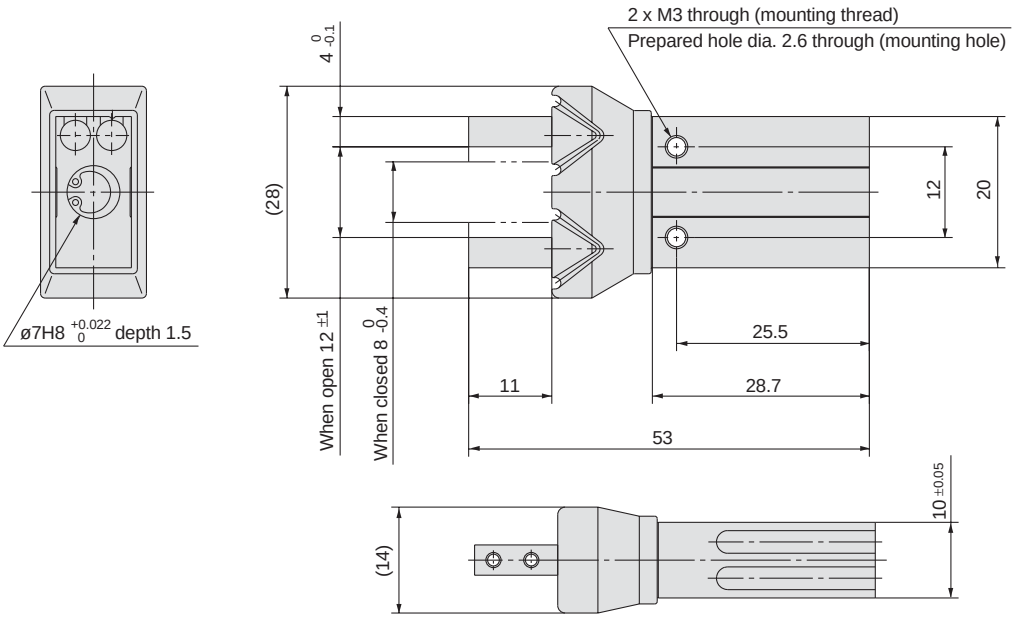
Dimensions

MHZJ2-6□
Double acting/Single acting
Basic type

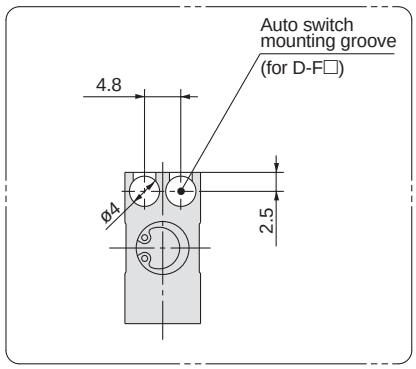
Scale: 100%



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

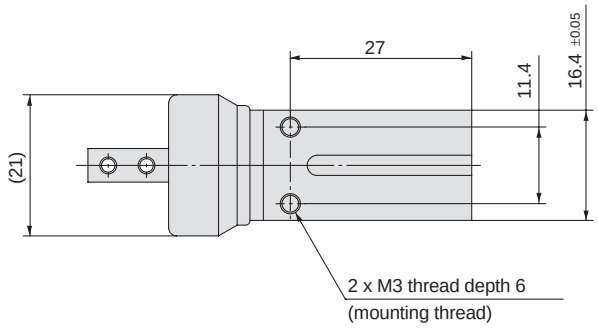


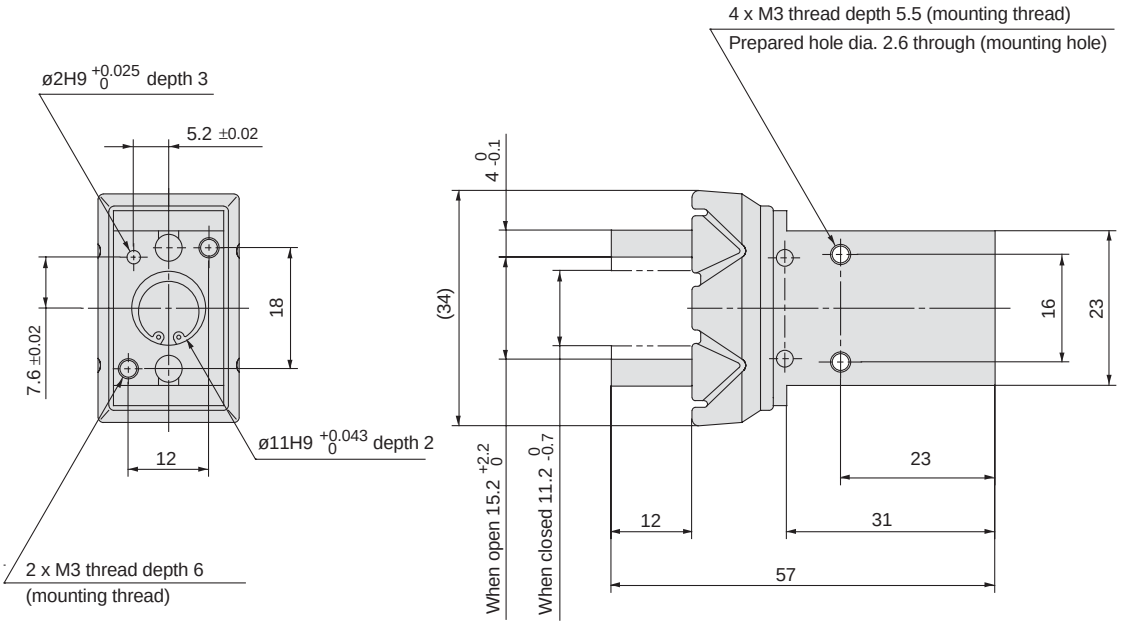
Auto switch mounting groove dimensions

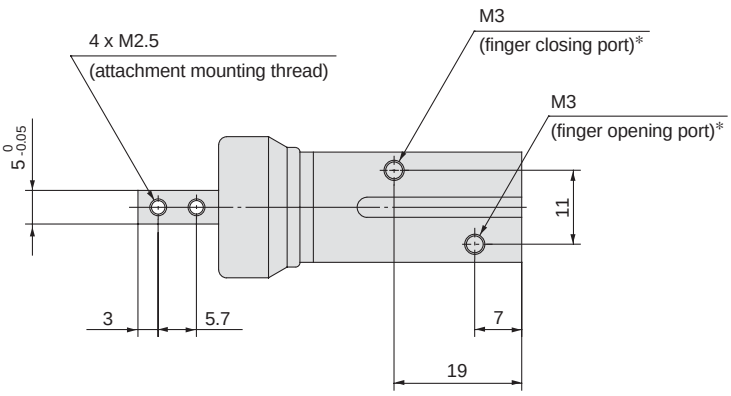


MHZJ2-10□
Double acting/Single acting
Basic type

Scale: 90%

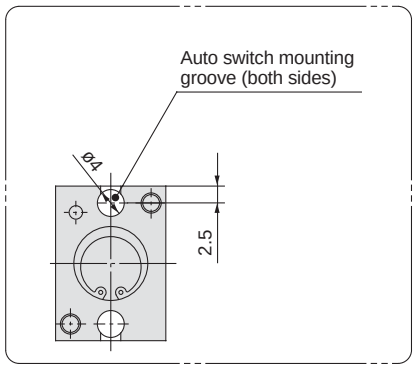






∗ For single action, the port on one side is a breathing hole.

Auto switch mounting groove dimensions

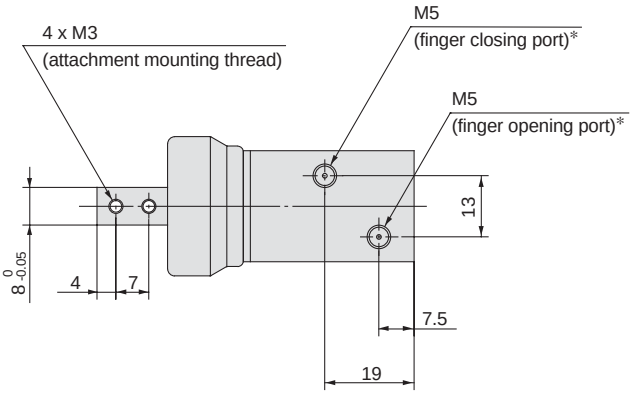


Note) When using auto switches, through hole mounting is not possible.

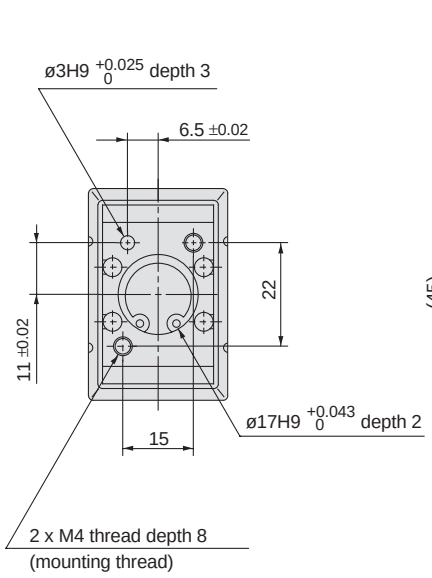
Dimensions

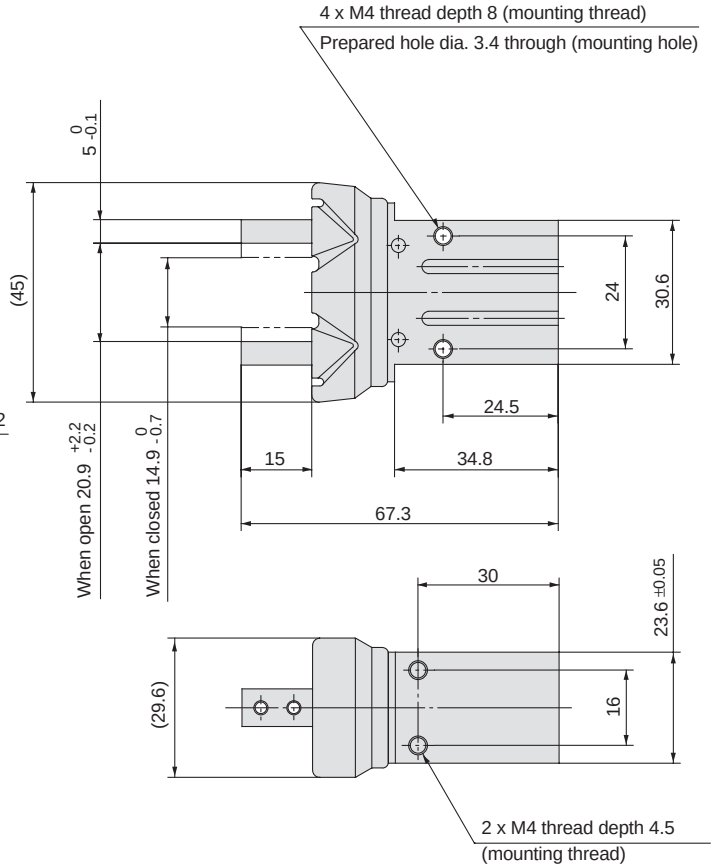
MHZJ2-16□
Double acting/Single acting
Basic type

Scale: 60%

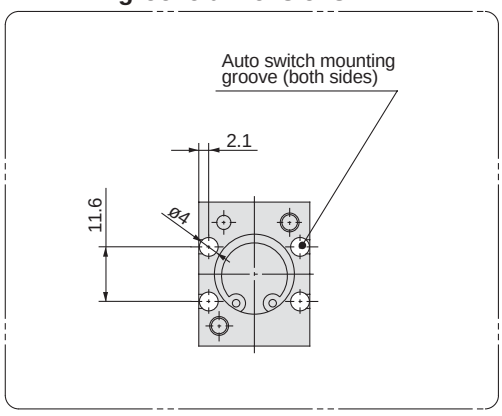


* For single action, the port on one side is a breathing hole.



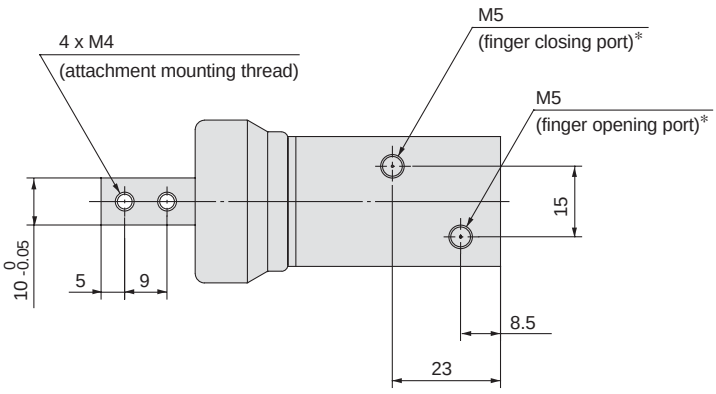


Auto switch mounting groove dimensions

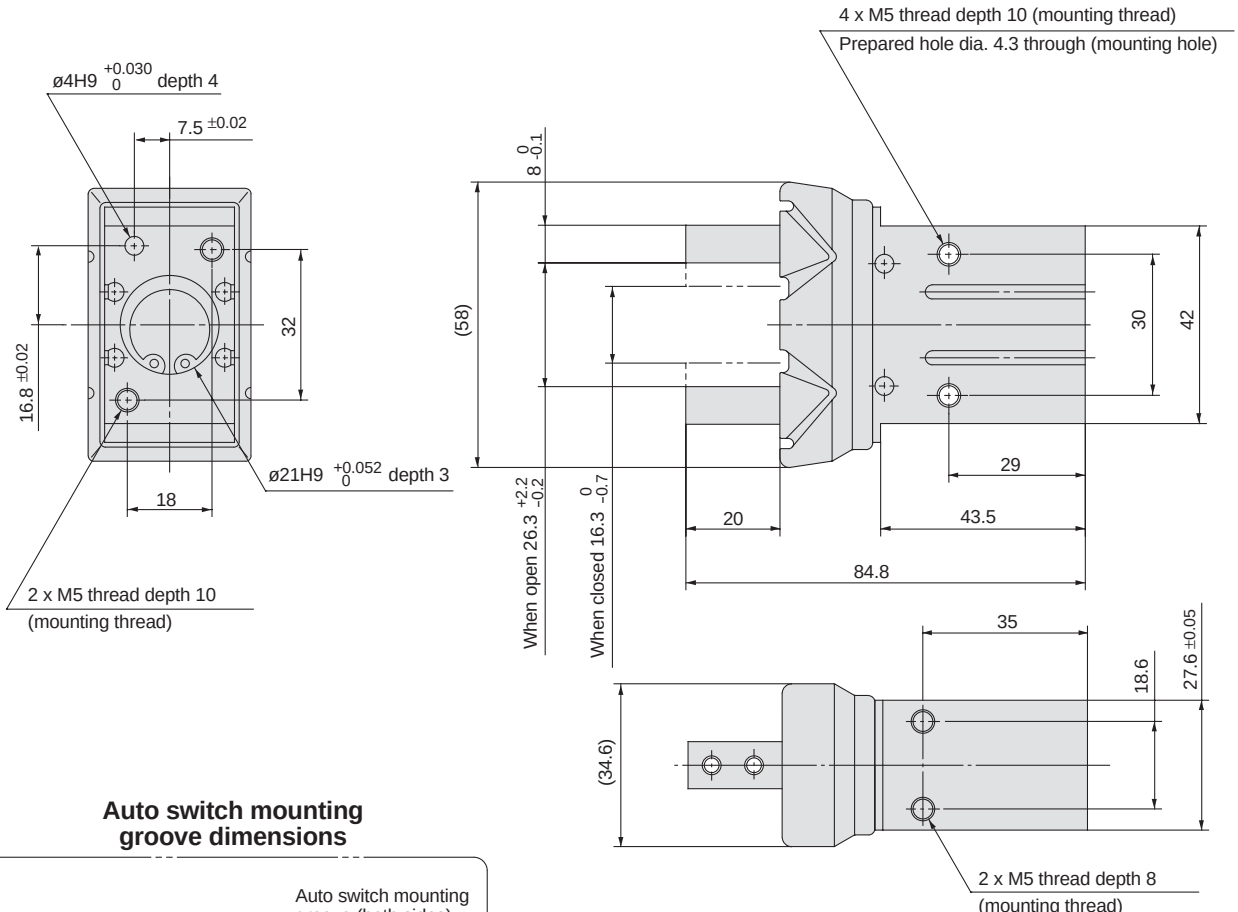


MHZJ2-20□
Double acting/Single acting
Basic type

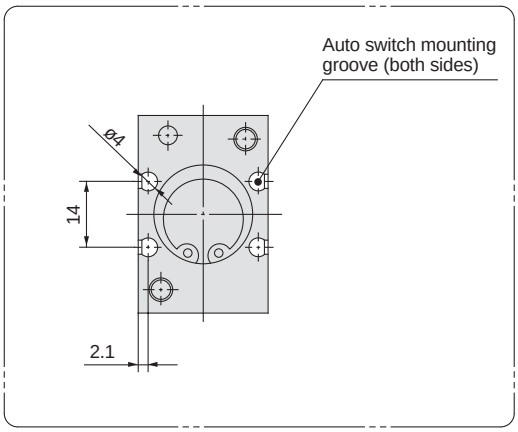
Scale: 60%



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

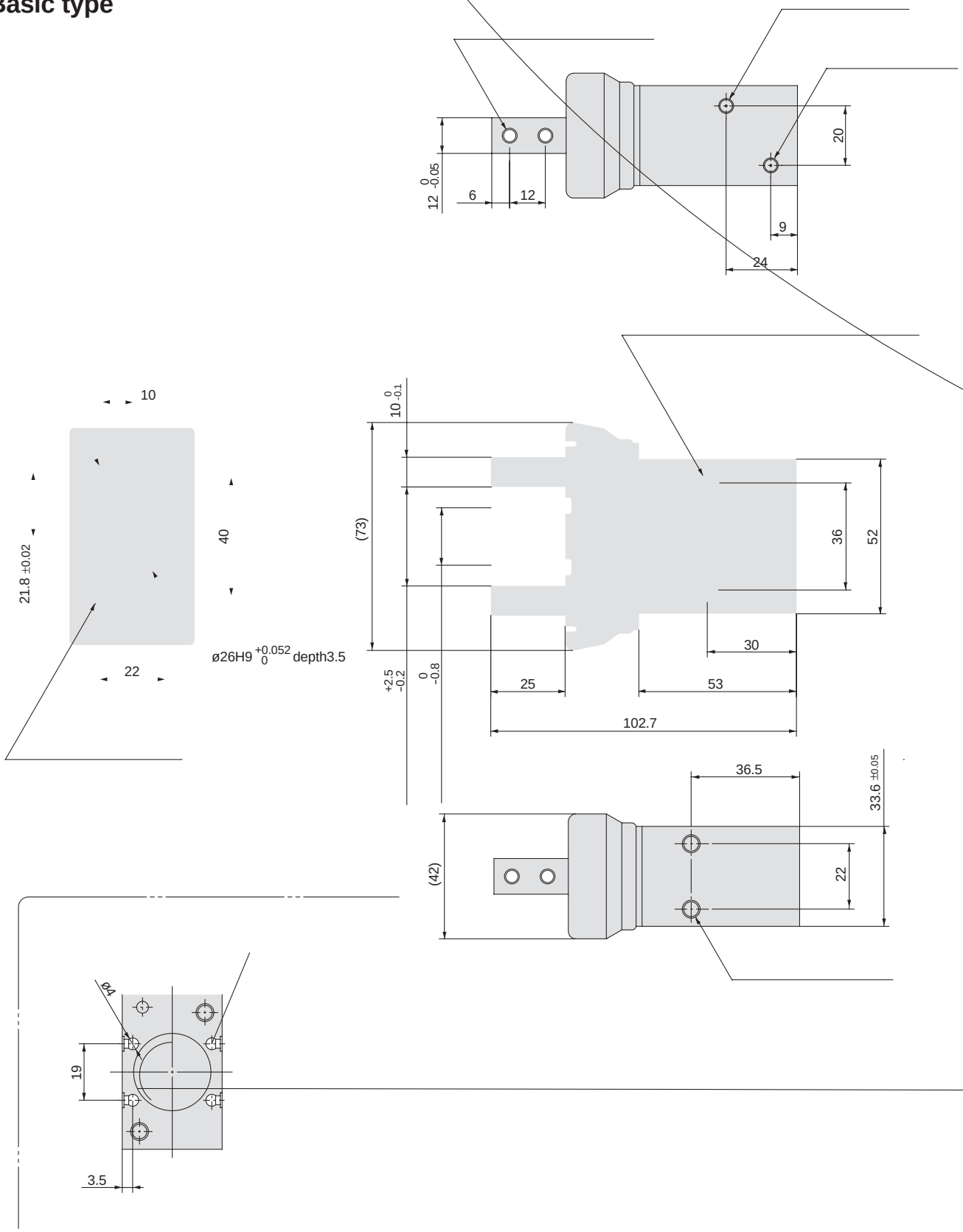


Auto switch mounting groove dimensions



Dimensions

MHZJ2-25□
Double acting/Single acting
Basic type

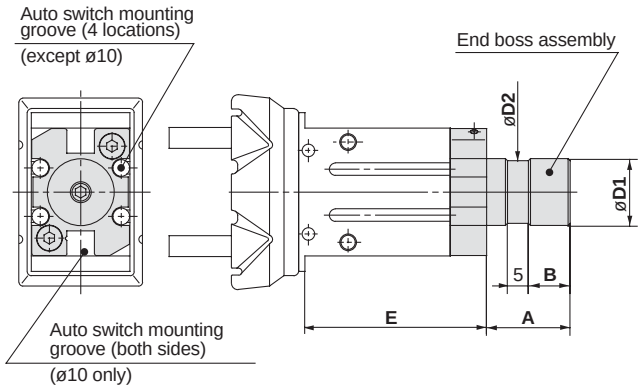


Body Options: End Boss Type

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	M5			●	●	●
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]



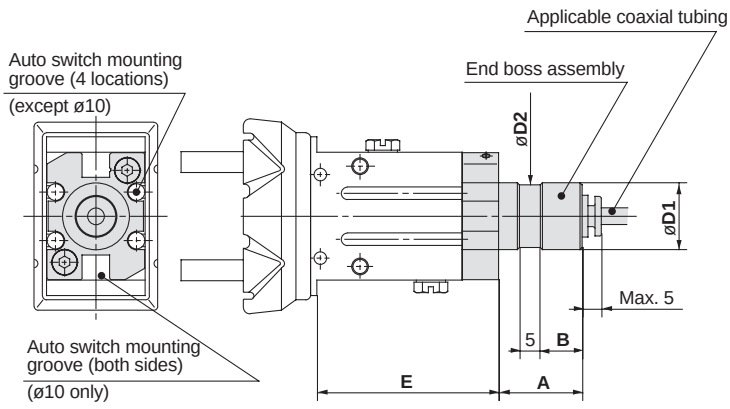
Unit: mm

Model	A	B	D1	D2	E
MHZJ2-10□□	15	7	12f8 $^{-0.016}_{-0.043}$	11	40
MHZJ2-16□□	20	10	16f8 $^{-0.016}_{-0.043}$	15	43.5
MHZJ2-20□□	22	12	20f8 $^{-0.020}_{-0.053}$	19	51.7
MHZJ2-25□□	25	15	25f8 $^{-0.020}_{-0.053}$	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]



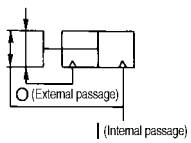
Unit: mm

Model	A	B	D1	D2	E
MHZJ2-10□□	15	7	12f8 $^{-0.016}_{-0.043}$	11	40
MHZJ2-16□□	20	10	16f8 $^{-0.016}_{-0.043}$	15	43.5
MHZJ2-20□□	22	12	20f8 $^{-0.020}_{-0.053}$	19	51.7
MHZJ2-25□□	25	15	25f8 $^{-0.020}_{-0.053}$	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.

Reference symbol

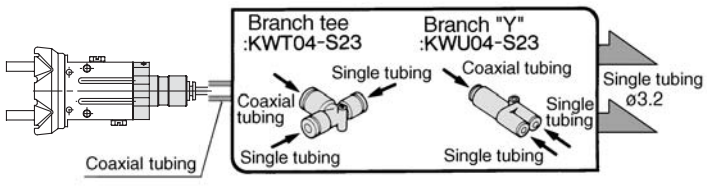


Applicable coaxial tubing

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

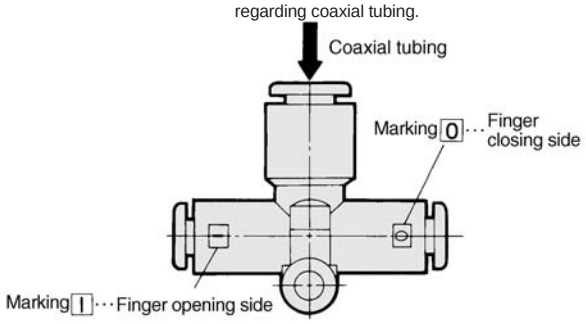
Changing from Coaxial to Single Tubing

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.



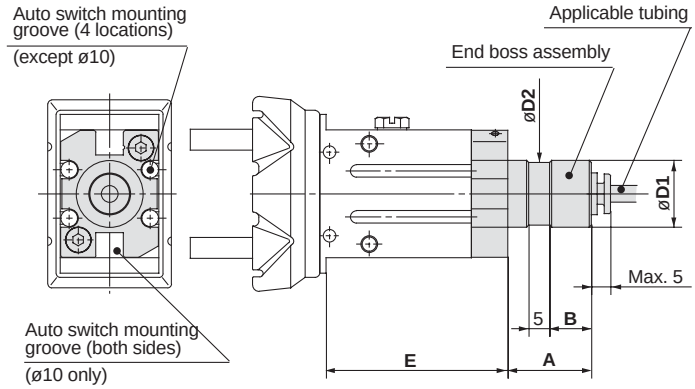
Branch tee, Different diameter tee, Branch "Y", Male run tee

Refer to catalogue 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 $^{-0.016}_{-0.043}$	11	40
MHZJ2-16□□	20	10	16f8 $^{-0.016}_{-0.043}$	15	43.5
MHZJ2-20□□	22	12	20f8 $^{-0.020}_{-0.053}$	19	51.7
MHZJ2-25□□	25	15	25f8 $^{-0.020}_{-0.053}$	24	61.3

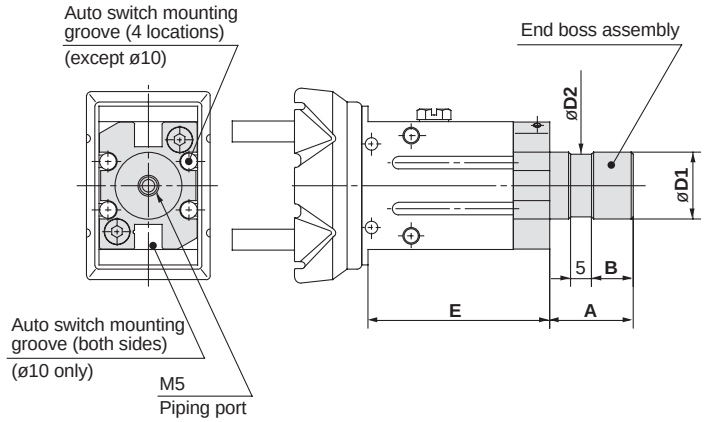
Other dimensions and specifications correspond to the standard type.

Applicable tubing

Description/Model / Specification	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 $^{-0.016}_{-0.043}$	11	40
MHZJ2-16□□	20	10	16f8 $^{-0.016}_{-0.043}$	15	43.5
MHZJ2-20□□	22	12	20f8 $^{-0.020}_{-0.053}$	19	51.7
MHZJ2-25□□	25	15	25f8 $^{-0.020}_{-0.053}$	24	61.3

Other dimensions and specifications correspond to the standard type.

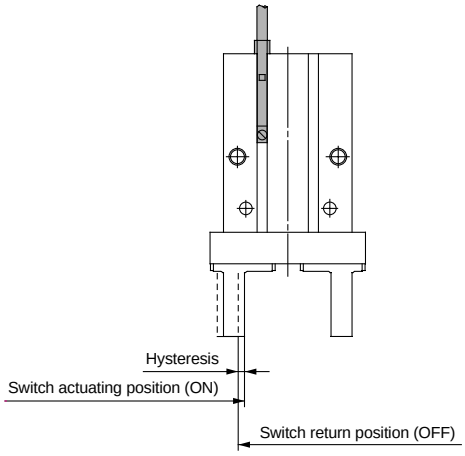
Weights

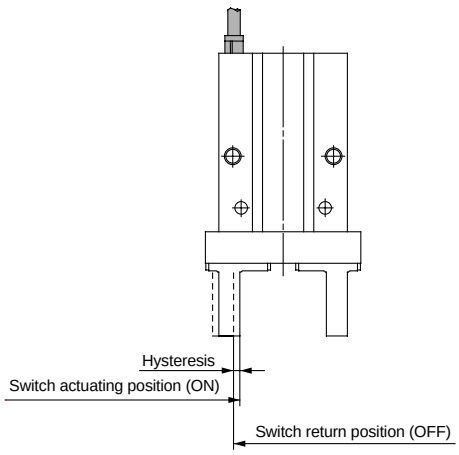
Unit: g

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

Auto Switch Hysteresis

Auto switches have hysteresis similar to micro switches. The adjustment of switch positions should be performed using the table below as a guide.



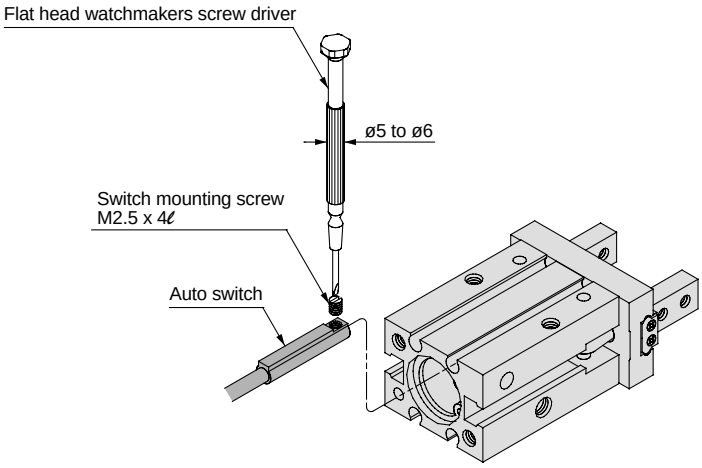


Hysteresis

	D-Y59A, B D-Y69A, B D-Y7P(V)	D-F9□(V) D-F8□	D-Y7□W(V)		D-F9□W(V)		D-F9BAL	
			Red light ON	Green light ON	Red light ON	Green light ON	Red light ON	Green light ON
MHZ2-6□	No setting	0.5	No setting		No setting		No setting	
MHZ2-10□, MHZL2-10□	0.4	No setting						
MHZ2-16□, MHZL2-16□	0.4	0.5						
MHZ2-20□, MHZL2-20□	0.4	0.5	0.5	1	0.5	1		
MHZ2-25□, MHZL2-25□	0.4	0.5	0.5	1	0.5	1		
MHZ2-32□	0.4	0.5	0.5	1	0.5	1		
MHZ2-40□	0.4	0.5	0.5	1	0.5	1		
MHZJ2-6□	No setting	0.5	No setting		No setting		0.4	0.8
MHZJ2-10□		0.5					0.4	0.8
MHZJ2-16□		0.5					0.4	0.8
MHZJ2-20□		0.5			0.5	1	0.4	0.8
MHZJ2-25□		0.5			0.5	1	0.4	0.8

Auto Switch Mounting

When mounting auto switches, insert them into one of the air gripper's switch mounting grooves from the direction shown in the figure below. After setting in the desired mounting position, tighten the switch mounting screw (included) using a flat head watchmakers screw driver.

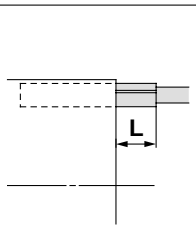
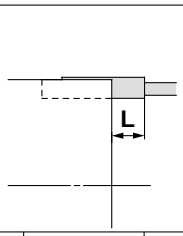
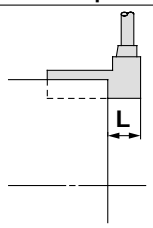


Note) When tightening the auto switch mounting screw, use a watchmakers screw driver with a handle diameter of about 5 to 6mm.
The tightening torque should be about 0.05 to 0.1N·m. As a rule, it should be turned about 90° beyond the point at which tightening can be felt.

Auto Switch Protrusion from the Body End Surface

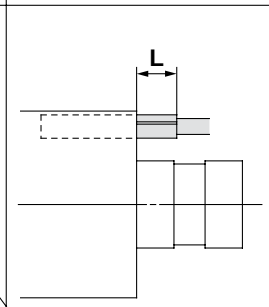
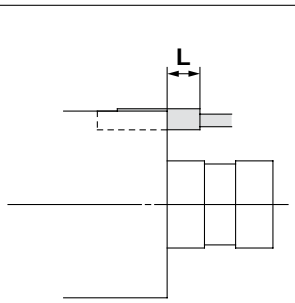
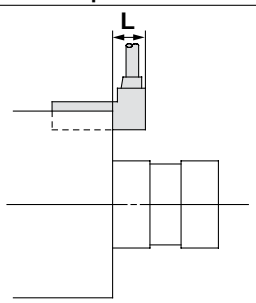
- The amount of auto switch protrusion from the body's end surface is as shown in the table below.
- Use this as a guide when mounting, etc.
- With D-F8□, there is no auto switch protrusion from the body's end surface.

Standard body

Lead wire type			In-line					Perpendicular				
Illustration												
Auto switch / Finger position / Model			D-Y59□ D-Y7P	D-Y7□W	D-F9□	D-F9□W	D-F9BAL	D-Y69□ D-Y7PV	D-Y7□WV	D-F9□V	D-F9□WV
Standard	MHZ2-6□	Open	No setting	No setting	11	No setting	No setting	No setting	No setting	9	No setting
		Closed			13					11	
	MHZ2-10□	Open	1		No setting			—		No setting	
		Closed	7.5					6.5			
	MHZ2-16□	Open	—		1			—		—	
		Closed	6		4			5		2	
	MHZ2-20□	Open	—	—	—	—		—	—	—	—
		Closed	4	4	2	2		3	3	—	—
	MHZ2-25□	Open	—	—	—	—		—	—	—	—
		Closed	1	1	—	—		—	—	—	—
	MHZ2-32□	Open	—	—	—	—		—	—	—	—
		Closed	3	3	—	—		2	2	—	—
	MHZ2-40□	Open	—	—	—	—		—	—	—	—
		Closed	2	2	—	—		1	1	—	—
With dust cover	MHZJ2-6□	Open	No setting		11	No setting	16	No setting		9	No setting
		Closed			13		18			11	
	MHZJ2-10□	Open			5		12			3	
		Closed			7		16			5	
	MHZJ2-16□	Open			2		9			—	
		Closed			5		14.5			3	
	MHZJ2-20□	Open			—	—	3			—	—
		Closed			3	3	11			1	1
	MHZJ2-25□	Open			—	—	—			—	—
		Closed			2	2	9.5			—	—
Long stroke / Double acting	MHZL2-10D	Open	0.5	No setting	No setting	No setting	No setting	—	No setting	No setting	No setting
		Closed	8.5					7.5			
	MHZL2-16D	Open	—		—			—		—	
		Closed	8		6			7		4	
	MHZL2-20D	Open	—	—	—	—		—	—	—	—
		Closed	7	7	5	5		6	6	3	3
	MHZL2-25D	Open	—	—	—	—		—	—	—	—
		Closed	5.5	5.5	3.5	3.5		4.5	4.5	1.5	1.5
Single acting (normally open)	MHZL2-10S	Open	—	No setting	No setting	No setting	No setting	—	No setting	No setting	No setting
		Closed	—					—			
	MHZL2-16S	Open	—		—			—		—	
		Closed	3		1			2		—	
	MHZL2-20S	Open	—	—	—	—		—	—	—	—
		Closed	1	1	—	—		—	—	—	—
	MHZL2-25S	Open	—	—	—	—		—	—	—	—
		Closed	—	—	—	—		—	—	—	—
Single acting (normally closed)	MHZL2-10C	Open	—	No setting	No setting	No setting	No setting	—	No setting	No setting	No setting
		Closed	5.5					4.5			
	MHZL2-16C	Open	—		—			—		—	
		Closed	5.5		3.5			4.5		1.5	
	MHZL2-20C	Open	—	—	—	—		—	—	—	—
		Closed	3.5	3.5	1.5	1.5		2.5	2.5	—	—
	MHZL2-25C	Open	—	—	—	—		—	—	—	—
		Closed	1.5	1.5	—	—		0.5	0.5	—	—

Note) There is no protrusion for sections of the table with no values entered.

End boss type

	Lead wire type		In-line					Perpendicular			
	Illustration										
	Auto switch / Finger position / Model		D-Y59□ D-Y7P	D-Y7□W	D-F9□	D-F9□W	D-F9BAL	D-Y69□ D-Y7PV	D-Y7□WV	D-F9□V	D-F9□WV
With dust cover	MHZJ2-10□□□	Open	No setting		——	No setting	4	No setting		——	No setting
		Closed			——		8			——	
	MHZJ2-16□□□	Open			——		1			——	
		Closed			——		6.5			——	
	MHZJ2-20□□□	Open			——	——	——			——	——
		Closed			——	——	3			——	——
	MHZJ2-25□□□	Open			——	——	——			——	——
		Closed			——	——	1.5			——	——

Note) There is no protrusion for sections of the table with no values entered.

1 Spring Assisted Type

Compact Type/MHZA2-6, MHZAJ2-6

With dust cover **MHZAJ2 — 6 D □ —X12**

Standard type **MHZA 2 — 6 D □ □ —X12**

Bore size ●

Action ●

D	Double acting

Finger position ●

Nil	Basic type
1	Side tapped mounting
2	Through holes in open/close direction
3	Flat type fingers

Body option ●

Nil	Basic type
E	End boss type Side ported

Assist type ●

12	Opening direction assist

Specifications

Type	Spring assisted type
Bore size	6
Action	Double acting
Fluid	Air

Note) Dimensions are the same as the standard type.

Standard Type/MHZ2

ø6 **MHZ2 — 6 D □ —X 7**

ø10 to ø40 **MHZ2 — Bore size D □ □ —X 7**

Action ●

D	Double acting

Finger position/option ●

Standard type

Nil	Basic type
1	Side tapped mounting
2	Through holes in open/close direction

Narrow type

N	Basic type
N1	Side tapped mounting
N2	Through holes in open/close direction

3	Flat type fingers

Assist type ●

7	Closing direction assist
12	Opening direction assist

● **Body option**

Nil	Basic type
E	End boss type Side ported
W	End boss type One-touch fitting for coaxial tube

Specifications

Type	Spring assisted type
Bore size	6, 10, 16, 20, 25, 32, 40
Action	Double acting
Fluid	Air

Symbol

2 With Needle (with Variable Throttle) -X46

Installation of a variable throttle allows adjustment of the finger opening/closing speed.

MHZ2— Bore size D □□ —X46

Action

D	Double acting

∗ Not available for ø6, ø32 and ø40.

Finger position/option

Standard type

Nil	Basic type
1	Side tapped mounting
2	Through holes in open/close direction
3	Flat type fingers

Narrow type

N	Basic type
N1	Side tapped mounting
N2	Through holes in open/close direction

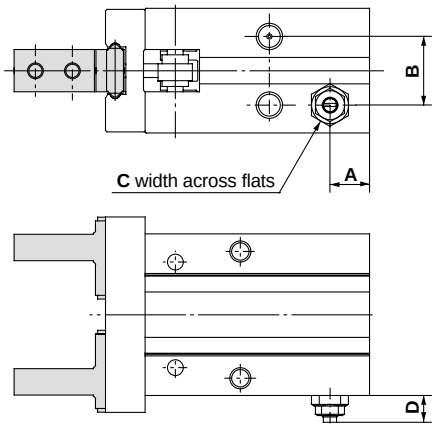
Body option

Nil	Basic type
E	End boss type Side ported
W	End boss type One-touch fitting for coaxial tube

Specifications

Type	With needle
Bore size	10, 16, 20, 25
Action	Double acting
Fluid	Air

Dimensions



Model	A	B	C	D∗
MHZ2-10D□□-X46	9	11	4.5	5.2
MHZ2-16D□□-X46	7.5	13	7	5.8
MHZ2-20D□□-X46	10	15	7	6
MHZ2-25D□□-X46	10.7	20	7	6.2

Dimensions other than the above are identical to the standard type; refer to pages 2.1-22 through 2.1-25.
∗ Reference values to establish criteria for needle adjustment.

Adjust so that the finger opening/closing speed will be no greater than necessary.
If the finger opening/closing speed is greater than necessary, impact forces acting on the fingers and other parts will increase. This can cause a loss of repeatability when gripping work pieces and have an adverse effect on the life of the unit.

Guide for internal needle adjustment

Model	Number of rotations from fully closed needle condition Note 1)
MHZ2-10D□□-X46	1/4 to 1/2
MHZ2-16D□□-X46	1/2 to 1
MHZ2-20D□□-X46	1 to 1 1/2
MHZ2-25D□□-X46	1 1/2 to 2

Note 1) The condition in which the needle is tightened gently until it stops.

Symbol

3 MHQ2/MHQG2 Compatible Flat Finger Type -X51

The flat finger type can be selected depending on the intended application.

MHZ2— Bore size | D | | | —X51

Action

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

Finger position

Nil	MHQG2 compatible type
N	MHQ2 compatible type

Body option

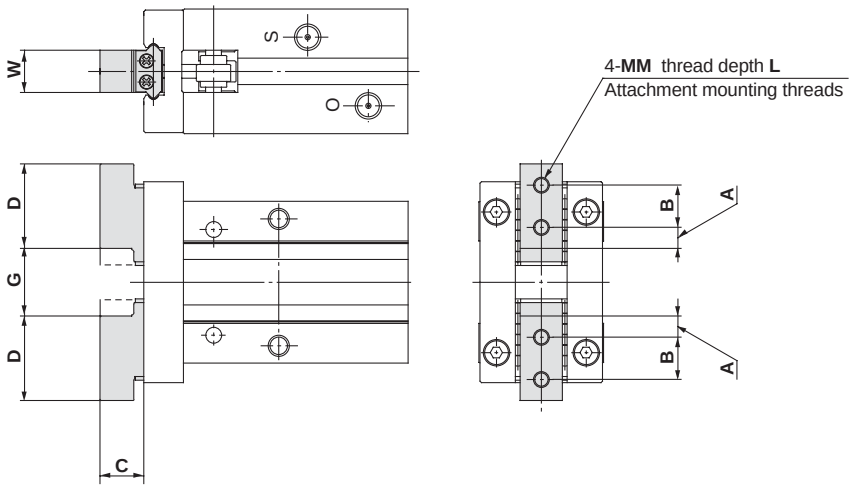
Nil	Basic type
E	End boss type Side ported
W	End boss type One-touch fitting for coaxial tube
K	End boss type One-touch fitting
M	End boss type with M5 port

∗ Not available for ø6, ø32 and ø40.

Specifications

Type	Flat finger type
Bore size	10, 16, 20, 25
Action	Double acting, Single acting (normally open, normally closed)
Fluid	Air

Dimensions



Unit: mm

Model		A	B	C	D	G Open	G Closed	MM	L	W
MHZ2-10□□□-X51	MHQG2 compatible	3	6	5.2	12	$9.7^{+2.2}_{0}$	$5.7^{0}_{-0.4}$	M2	3.6	$5^{0}_{-0.05}$
	MHQ2 compatible	2	5	5.2	9	$9.7^{+2.2}_{0}$	$5.7^{0}_{-0.4}$	M2	3.6	$5^{0}_{-0.05}$
MHZ2-16□□□-X51	MHQG2 compatible	4	8	8.3	16	$12.6^{+2.2}_{0}$	$6.6^{0}_{-0.4}$	M3	6	$8^{0}_{-0.05}$
	MHQ2 compatible	2.5	7	8.3	12	$12.6^{+2.2}_{0}$	$6.6^{0}_{-0.4}$	M3	6	$8^{0}_{-0.05}$
MHZ2-20□□□-X51	MHQG2 compatible	5	10	10.5	20.8	$17.2^{+2.2}_{0}$	$7.2^{0}_{-0.4}$	M4	8	$10^{0}_{-0.05}$
	MHQ2 compatible	3.3	9	10.5	15.5	$17.2^{+2.2}_{0}$	$7.2^{0}_{-0.4}$	M4	8	$10^{0}_{-0.05}$
MHZ2-25□□□-X51	MHQG2 compatible	6.5	12	13.1	25	$22.8^{+2.5}_{0}$	$8.8^{0}_{-0.4}$	M5	10	$12^{0}_{-0.05}$
	MHQ2 compatible	3.5	12	13.1	19	$22.8^{+2.5}_{0}$	$8.8^{0}_{-0.4}$	M5	10	$12^{0}_{-0.05}$

Dimensions other than the above are identical to the standard type; refer to pages 2.1-22 through 2.1-25.

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

Work piece weight: 0.1kg

Gripping method: External gripping

Gripping point distance: L = 30mm

Operating pressure: 0.4MPa

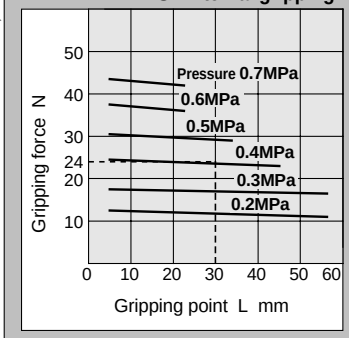
Model selection criteria with respect to work piece weight

- Although differences will exist depending upon factors such as shape and the coefficient of friction between the attachments and the work pieces, select a model which will provide a gripping force at least 10 to 20 times Note) greater than the work piece weight.

  Note) For further details, refer to the model selection illustration.
- Furthermore, in cases with high acceleration or impact, etc., it is necessary to allow an even greater margin of safety.

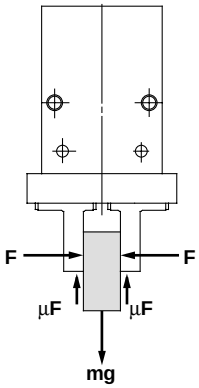
Example: When it is desired to set the gripping force at 20 times or more above the work piece weight.
Required gripping force = 0.1kg x 20 x 9.8m/s² (approx.) 19.6N or more

MHZ□2-16 External gripping



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

Model selection illustration



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

F: Gripping force (N)

μ: Coefficient of friction between the attachments and the work piece

m: Work piece mass (kg)

g: Gravitational acceleration (= 9.8m/s²)

mg: Work piece weight (N)

the conditions under which the work piece will not drop are

$$\frac{2}{\text{Number of fingers}} \times \mu F > mg$$

and therefore,

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

With "a" representing the safety margin, F is determined by the following formula:

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

"Gripping force at least 10 to 20 times the work piece weight"

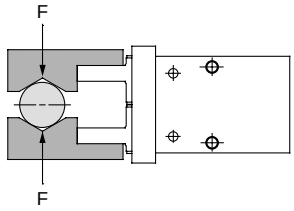
The "10 to 20 times or more of the work piece weight" recommended by SMC is calculated with a safety margin of a=4, which allows for impacts that occur during normal transportation, etc.

When μ = 0.2	When μ = 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 work piece weight	**20 x work piece weight**

Note) Even in cases where the coefficient of friction is greater than μ= 0.2, for reasons of safety, select a gripping force which is at least 10 to 20 times greater than the work piece weight, as recommended by SMC.
It is necessary to allow a greater safety margin for high accelerations and strong impacts, etc.

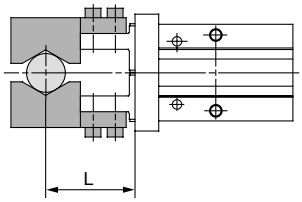
Step 1 Effective gripping force: Series MHZ□2/Double acting/External gripping force

• Expressing the effective gripping force
The effective gripping force shown in the graphs to the right is expressed as F, which is the impellent force of one finger, when both fingers and attachments are in full contact with the work piece as shown in the figure below.



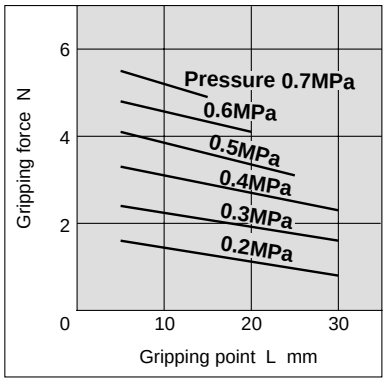
External gripping

MHZA2, MHZ2, MHZL2

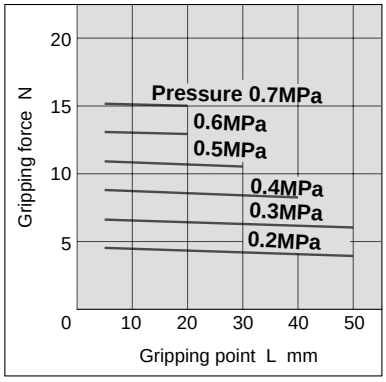


External gripping force

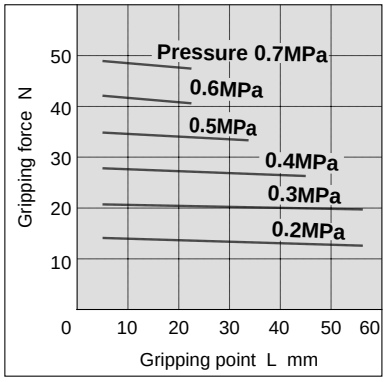
MHZ2-6D/MHZA2-6D



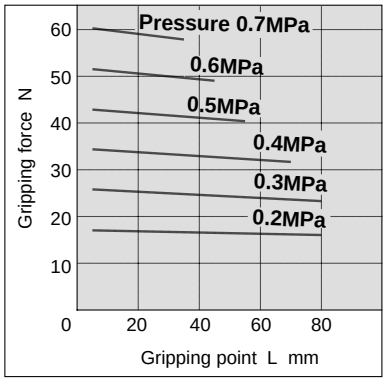
MHZ2-10D/MHZL2-10D



MHZ2-16D/MHZL2-16D

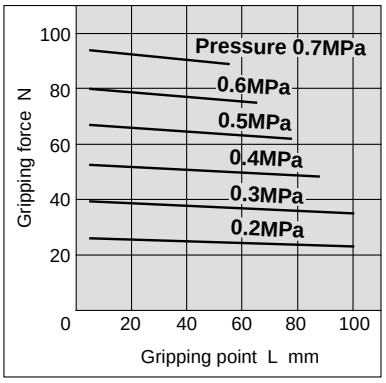


MHZ2-20D/MHZL2-20D

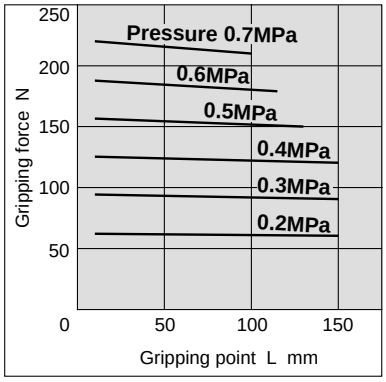


External gripping force

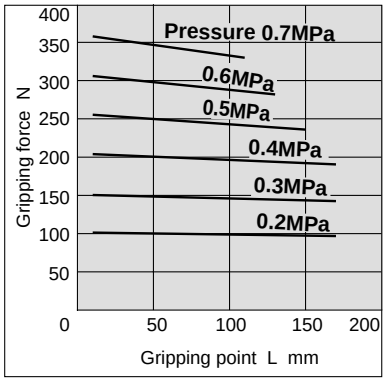
MHZ2-25D/MHZL2-25D



MHZ2-32D



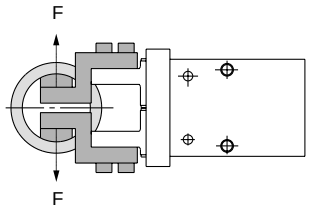
MHZ2-40D



Model Selection

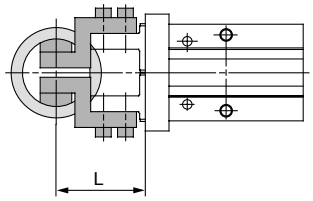
Step 1 **Effective gripping force: Series MHZ□2/Double acting/Internal gripping force**

• Expressing the effective gripping force
The effective gripping force shown in the graphs to the right is expressed as F, which is the impellent force of one finger, when both fingers and attachments are in full contact with the work piece as shown in the figure below.



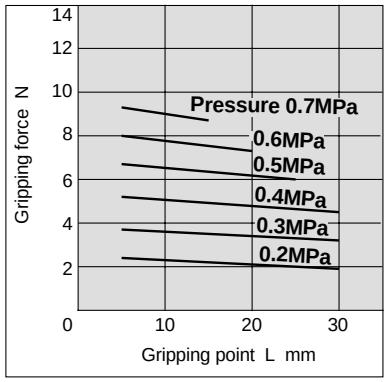
Internal gripping

MHZA2, MHZ2, MHZL2

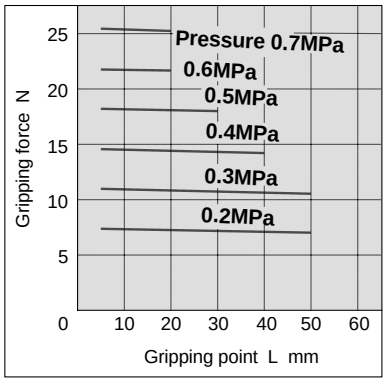


Internal gripping force

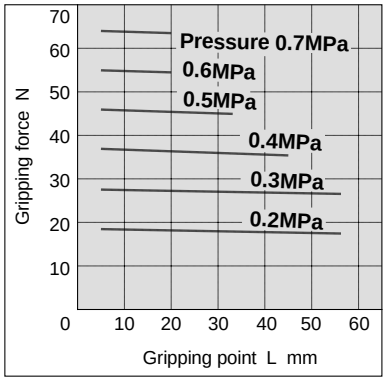
MHZ2-6D/MHZA2-6D



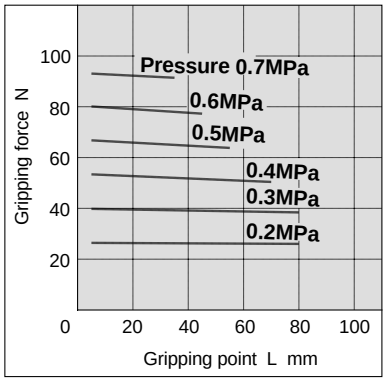
MHZ2-10D/MHZL2-10D



MHZ2-16D/MHZL2-16D

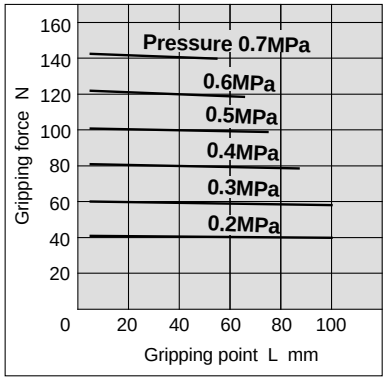


MHZ2-20D/MHZL2-20D

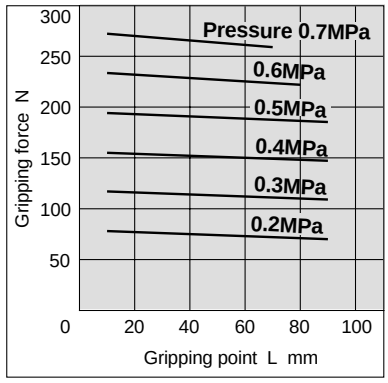


Internal gripping force

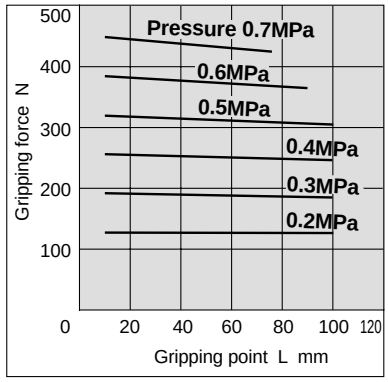
MHZ2-25D/MHZL2-25D



MHZ2-32D



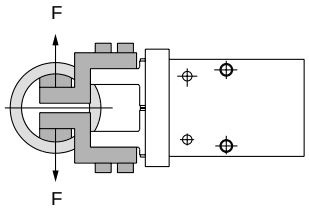
MHZ2-40D



Model Selection

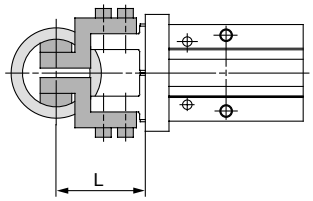
Step 1 Effective gripping force: Series MHZ□2/Single acting/Internal gripping force

• Expressing the effective gripping force
The effective gripping force shown in the graphs to the right is expressed as F, which is the impellent force of one finger, when both fingers and attachments are in full contact with the work piece as shown in the figure below.



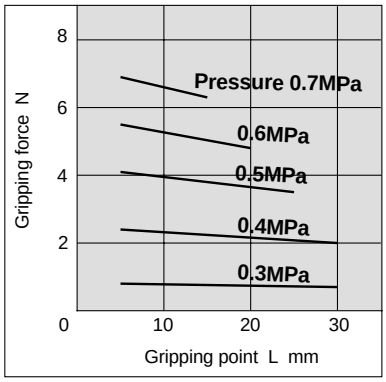
Internal gripping

MHZA2, MHZ2, MHZL2

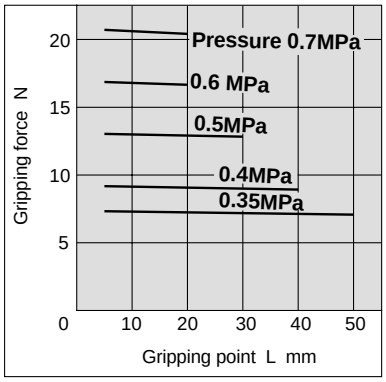


Internal gripping force

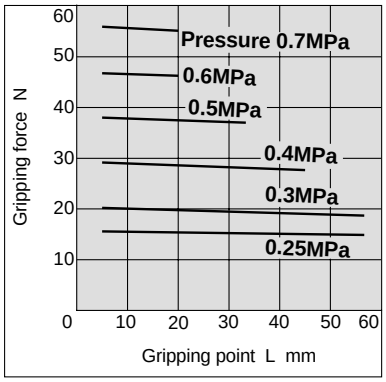
MHZ2-6C/MHZA2-6C



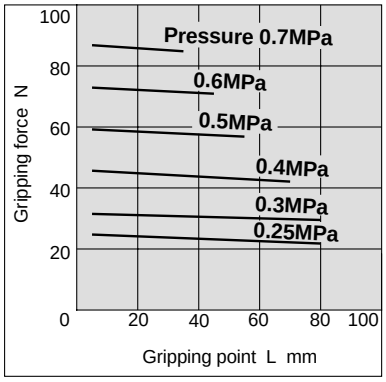
MHZ2-10C/MHZL2-10C



MHZ2-16C/MHZL2-16C

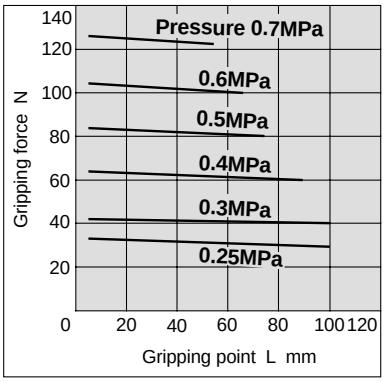


MHZ2-20C/MHZL2-20C

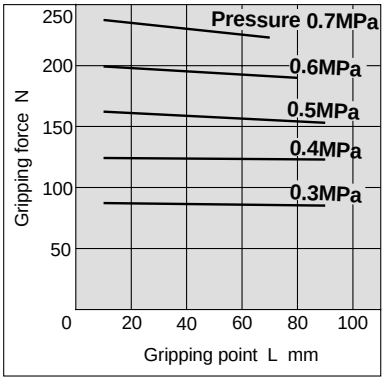


Internal gripping force

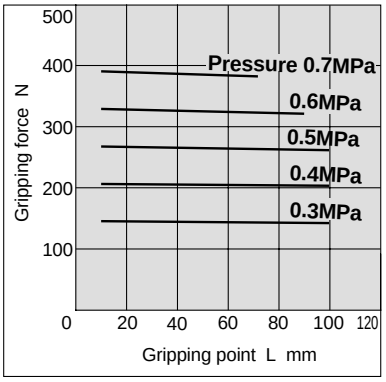
MHZ2-25C/MHZL2-25C



MHZ2-32C

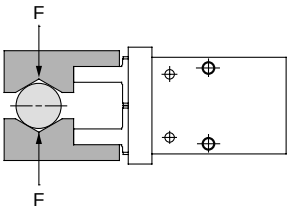


MHZ2-40C



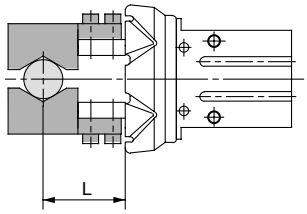
Step 1 Effective gripping force: Series MHZ□2/Double acting/External gripping force

• Expressing the effective gripping force
The effective gripping force shown in the graphs to the right is expressed as F, which is the impellent force of one finger, when both fingers and attachments are in full contact with the work piece as shown in the figure below.



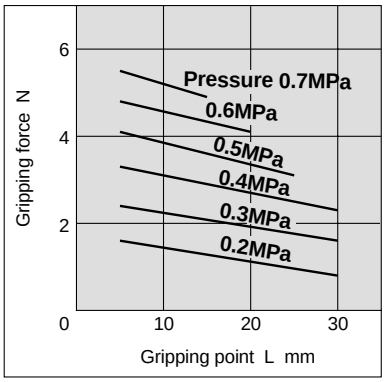
External gripping

MHZAJ2, MHZJ2, 11-MHZ2

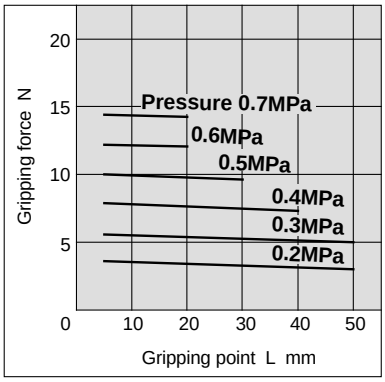


External gripping force

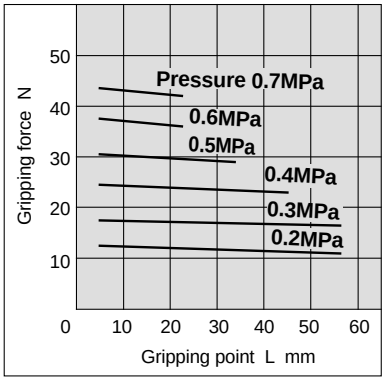
MHZJ2-6D/MHZAJ2-6D



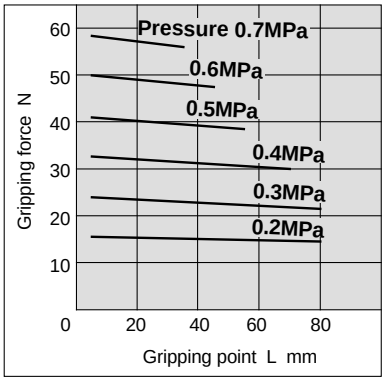
MHZJ2-10D/11-MHZ2-10D



MHZJ2-16D/11-MHZ2-16D

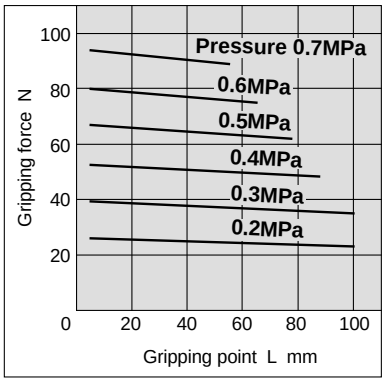


MHZJ2-20D/11-MHZ2-20D



External gripping force

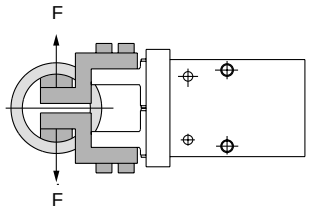
MHZJ2-25D/11-MHZ2-25D



Model Selection

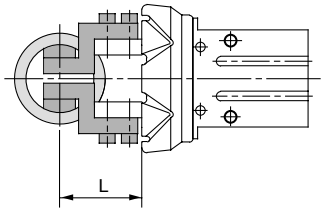
Step 1 Effective gripping force: Series MHZ□2/Double acting/Internal gripping force

• Expressing the effective gripping force
The effective gripping force shown in the graphs to the right is expressed as F, which is the impellent force of one finger, when both fingers and attachments are in full contact with the work piece as shown in the figure below.



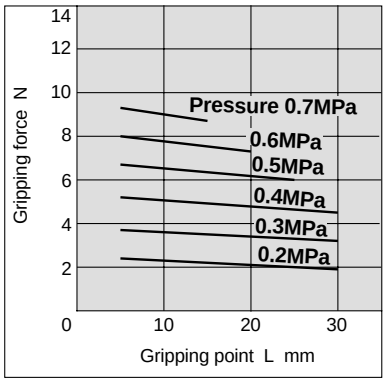
Internal gripping

MHZAJ2, MHZJ2, 11-MHZ2

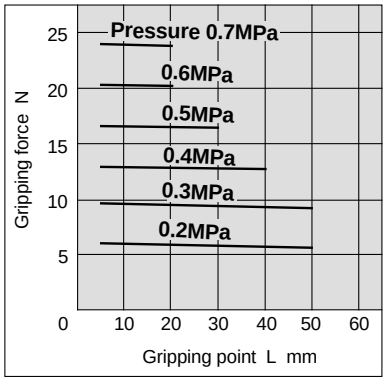


Internal gripping force

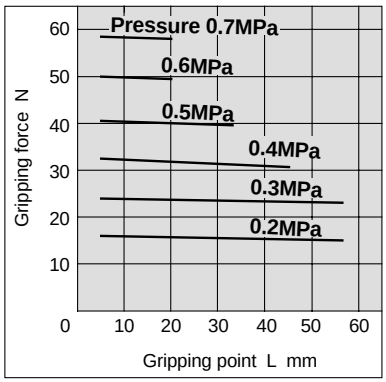
MHZJ2-6D/MHZAJ2-6D



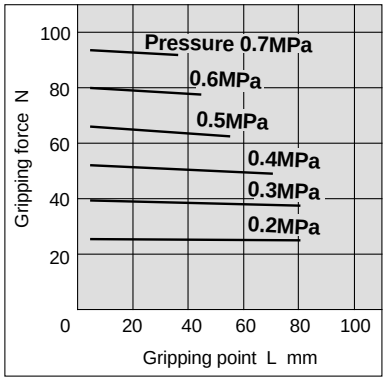
MHZJ2-10D/11-MHZ2-10D



MHZJ2-16D/11-MHZ2-16D

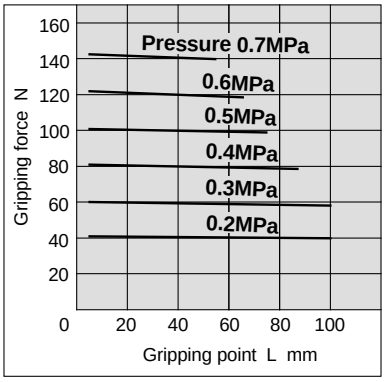


MHZJ2-20D/11-MHZ2-20D



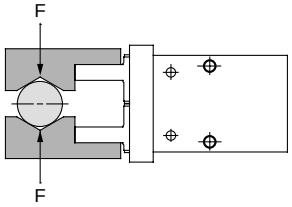
Internal gripping force

MHZJ2-25D/11-MHZ2-25D



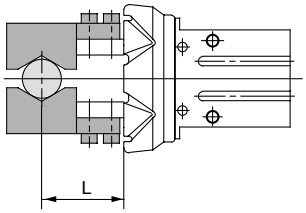
Step 1 Effective gripping force: Series MHZ□2/Single acting/External gripping force

• Expressing the effective gripping force
The effective gripping force shown in the graphs to the right is expressed as F, which is the impellent force of one finger, when both fingers and attachments are in full contact with the work piece as shown in the figure below.



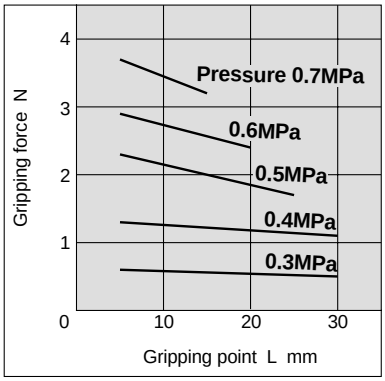
External gripping

MHZAJ2, MHZJ2

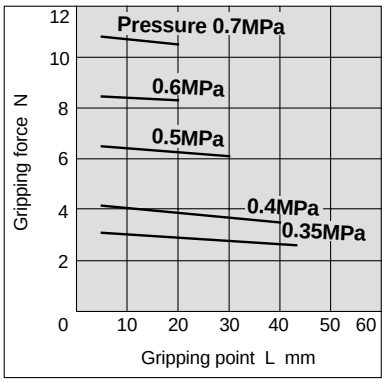


External gripping force

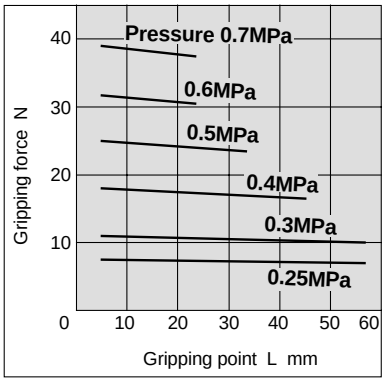
MHZJ2-6S/MHZAJ2-6S



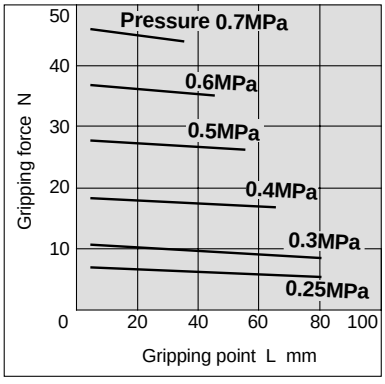
MHZJ2-10S



MHZJ2-16S

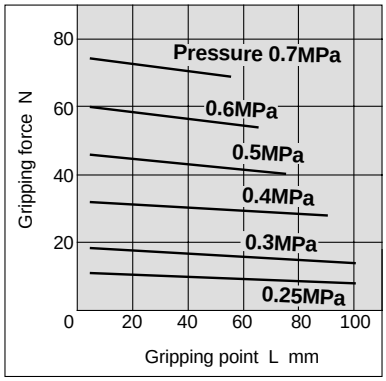


MHZJ2-20S



External gripping force

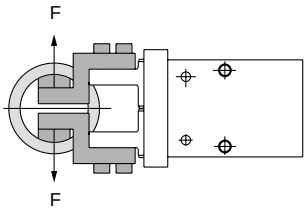
MHZJ2-25S



Model Selection

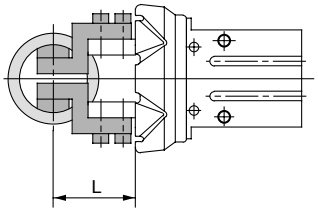
Step 1 Effective gripping force: Series MHZ□2/Single acting/Internal gripping force

• Expressing the effective gripping force
The effective gripping force shown in the graphs to the right is expressed as F, which is the impellent force of one finger, when both fingers and attachments are in full contact with the work piece as shown in the figure below.



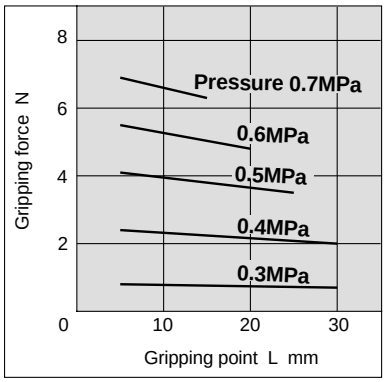
Internal gripping

MHZAJ2, MHZJ2

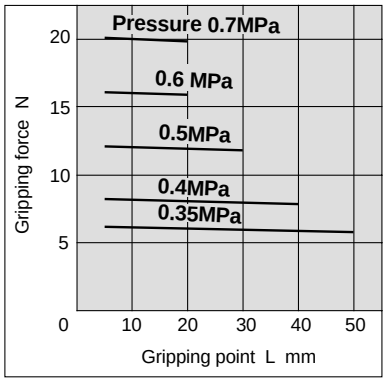


Internal gripping force

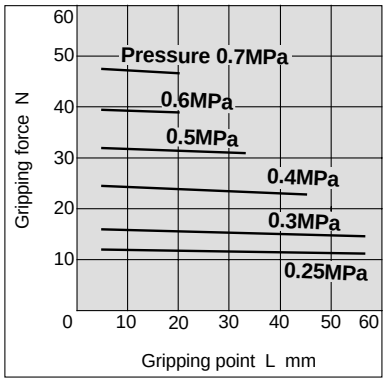
MHZJ2-6C/MHZAJ2-6C



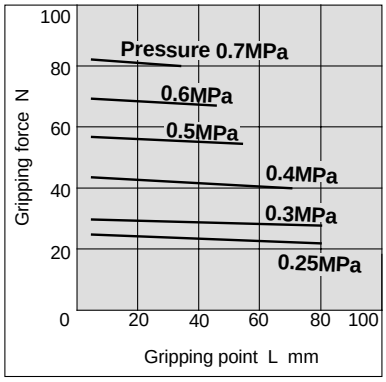
MHZJ2-10C



MHZJ2-16C

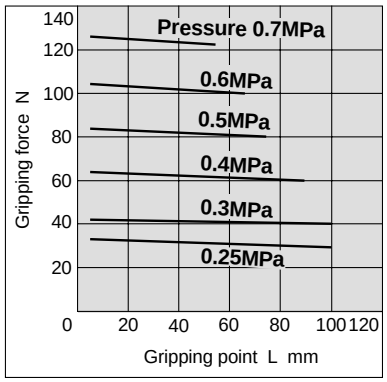


MHZJ2-20C



Internal gripping force

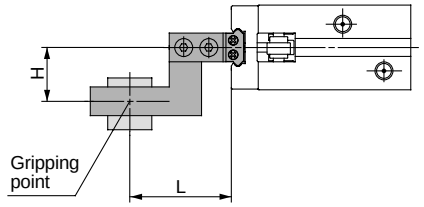
MHZJ2-25C



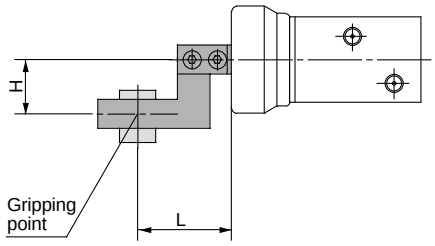
Step 2 Confirmation of gripping point: Series MHZ□/External gripping

External gripping

MHZ□2, 11-MHZ2



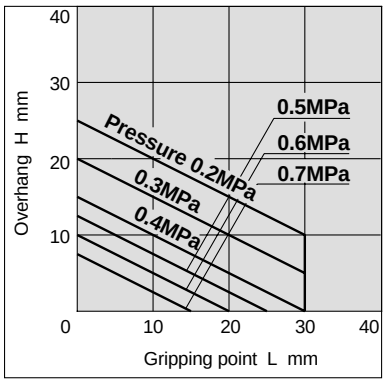
MHZAJ2, MHZJ2



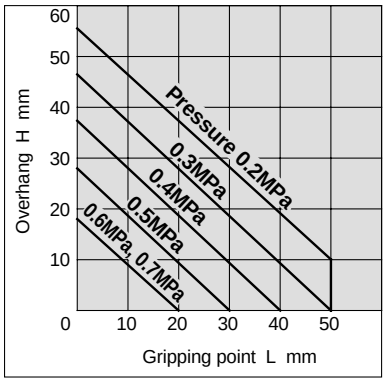
- The air gripper should be operated so that the work piece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs to the right.
- If the work piece gripping point goes beyond the range limits, this will have an adverse effect on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

External gripping

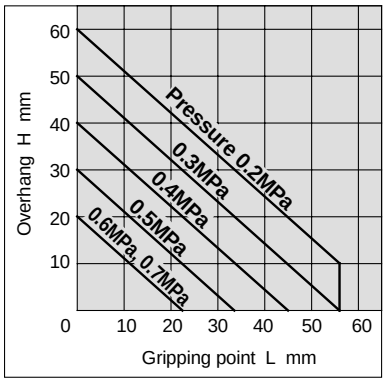
MHZ□2-6□



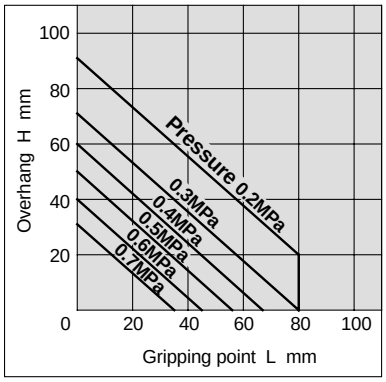
MHZ□2-10□/11-MHZ2-10□



MHZ□2-16□/11-MHZ2-16□

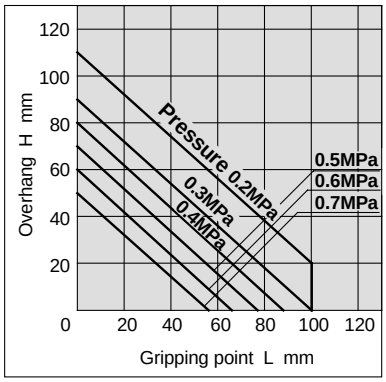


MHZ□2-20□/11-MHZ2-20□

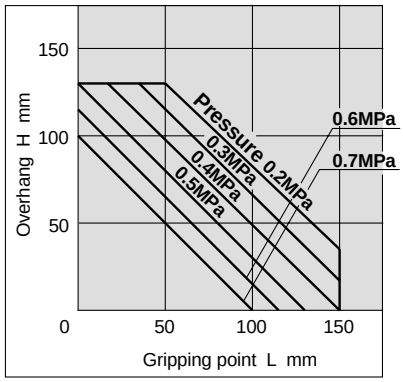


External gripping

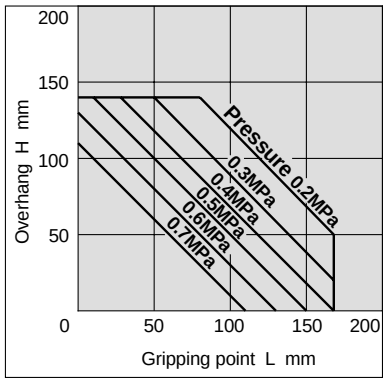
MHZ□2-25□/11-MHZ2-25□



MHZ2-32□



MHZ2-40□

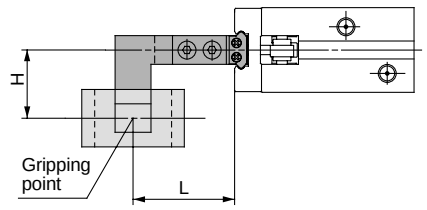


Model Selection

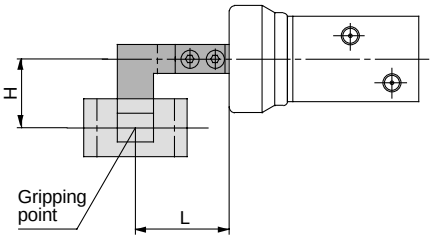
Step 2 Confirmation of gripping point: Series MHZ□/Internal gripping

Internal gripping

MHZ□2, 11-MHZ2



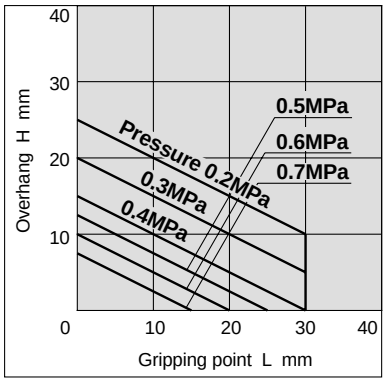
MHZAJ2, MHZJ2



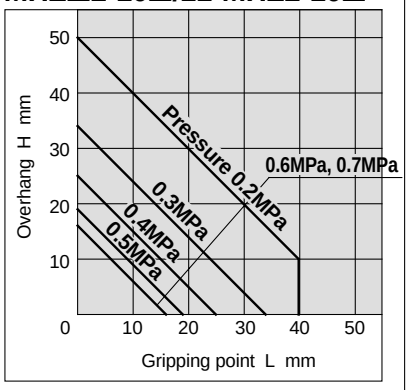
- The air gripper should be operated so that the work piece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs to the right.
- If the work piece gripping point goes beyond the range limits, this will have an adverse effect on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

Internal gripping

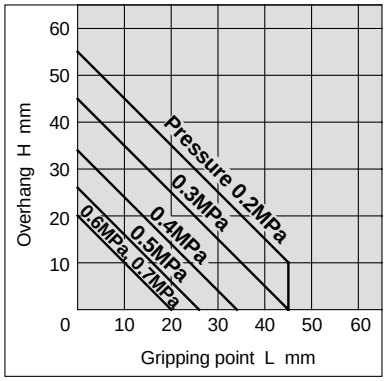
MHZ□2-6□



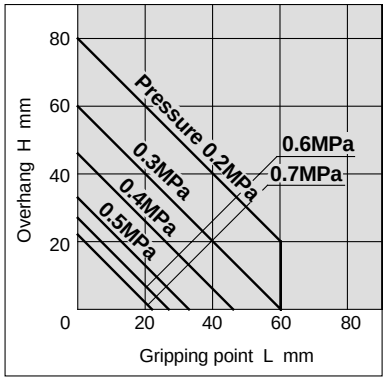
MHZ□2-10□/11-MHZ2-10□



MHZ□2-16□/11-MHZ2-16□

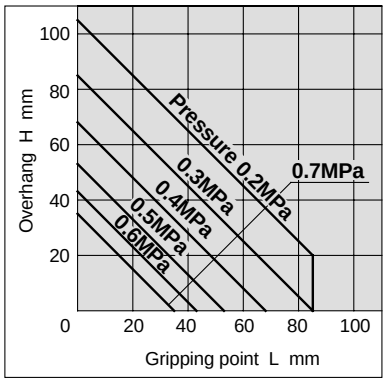


MHZ□2-20□/11-MHZ2-20□

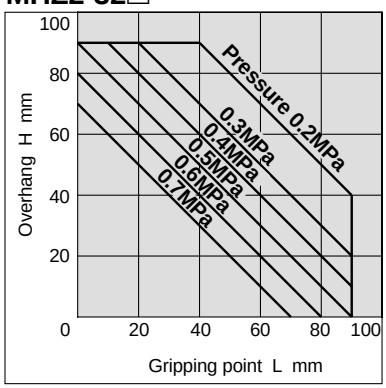


Internal gripping

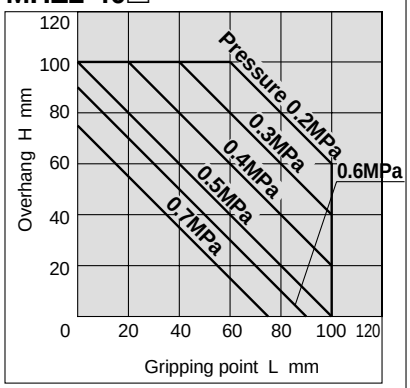
MHZ□2-25□/11-MHZ2-25□



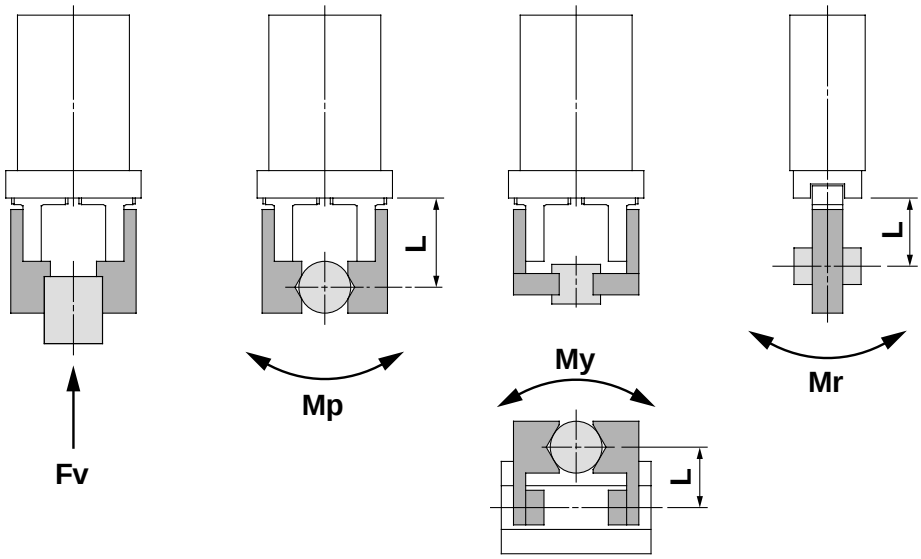
MHZ2-32□



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 **Fv (N)**	Maximum allowable moment		
		Pitch moment: **Mp (N·m)**	Yaw moment: **My (N·m)**	Roll moment: **Mr (N·m)**
MHZ□2-6	10	0.04	0.04	0.08
MHZ□2-10	58	0.26	0.26	0.53
MHZ□2-16	98	0.68	0.68	1.36
MHZ□2-20	147	1.32	1.32	2.65
MHZ□2-25	255	1.94	1.94	3.88
MHZ□2-32	343	3	3	6
MHZ□2-40	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
Allowable load F (N) $= \dfrac{\text{M (maximum allowable moment) (N·m)}}{\text{L} \times \underset{*}{10^{-3}}}$ (∗ Unit conversion constant)	When a static load of f = 10N is operating, which applies pitch moment to point L = 30mm from the MHZ□2-16D guide. **Allowable load F** $= \dfrac{0.68}{30 \times 10^{-3}}$ **= 22.7 (N)** **Load f = 10 (N) < 22.7 (N)** Therefore, it can be used.

Parallel Style Air Gripper

Series MHQ2-6

ø6 (Please refer to new series MHZ)

Ideal for high precision automatic assembly of small work pieces. Ultra compact with a body width of only 10mm.

Solid state switches with indicator light can be mounted.

High level of repeatability and long operating life of over 10 million cycles.

Specifications

Fluid			Air
Operating pressure	**Double acting**		0.15 to 0.6MPa
	Single acting	**Normally open**	0.3 to 0.6MPa
		Normally closed	
Ambient and fluid temperature			–10 to 60°C
Repeatability			±0.01mm
Max. operating frequency			180c.p.m
Lubrication			Not required
Action			Double acting, Single acting
Auto switch (Option)(1)			Solid state switch: D-F9N(V), D-F9P(V), D-F9B(V)

1) Refer to p.2.11-25 for auto switch specifications.

Model

Action		Model	Bore size (mm)	Holding force(1) (Effective value) (N)	Opening/closing stroke (Both sides) (mm)	Weight(2) (g)
Double acting		**MHQ2-6D**	6	External hold: 3.3 Internal hold: 6.1	4	29
Single acting	**Normally open**	**MHQ2-6S**	6	External hold: 1.9 Internal hold: 1.1	4	29
	Normally closed	**MHQ2-6C**	6	External hold: 2.1 Internal hold: 3.7	4	29

1) Values at 0.5MPa. Represent both external and internal holding force for double acting, external holding force for single acting normally open and internal holding force for single acting normally closed. However, the internal holding force of MHQ2-6S and external holding force of MHQ2-6C are generated by the spring return force.
2) Except weight of auto switches.
3) Refer to the separate catalogue CAT. E230 for details.

The overall length of MHQ2-6□□□-X17 is 9mm shorter than that of the standard model, enabling the end boss option.

Made to Order Specifications: -X17

Action		Double acting	Single acting	
			Normally open	Normally closed
Model		**MHQ2-6D□□-X17**	**MHQ2-6S□□-X17**	**MHQ2-6C□□-X17**
Bore size(mm)		6		
Holding force (Effective value) (N) at 0.5MPa, L=20mm	**External hold**	3.3	1.9	2.1
	Internal hold	6.1	1.1	3.7
Opening/closing stroke (Both sides) (mm)		4		
Weight (g)		27		

High Rigidity Style

Series MHQG2

ø32, ø40 (Please refer to new series MHZ)

Specifications

Fluid			Air
Operating pressure	**Double acting**		0.1 to 0.6MPa
	Single acting	**Normally open**	0.25 to 0.6MPa
		Normally closed	
Ambient and fluid temperature			–10 to 60°C
Repeatability			ø32/40: ±0.02mm
Max. operating frequency			ø32/40: 60c.p.m
Lubrication			Not required
Action			Double acting, Single acting
Auto switch (Option)(1)			Solid state switch: D-Y59 , D-Y69

1) Refer to p.2.11-26 for auto switch specifications.

Model

Action		Model	Bore size (mm)	Holding force(1) (Effective value) (N)	Opening/closing stroke (Both sides) (mm)	Weight(2) (g)
Double acting		**MHQG2-32D**	32	External hold: 88 Internal hold: 139	20	1100
		MHQG2-40D	40	External hold: 158 Internal hold: 247	28	1940
Single acting	**Normally open**	**MHQG2-32S**	32	69	20	1110
		MHQG2-40S	40	130	28	1960
	Normally closed	**MHQG2-32C**	32	127	20	1110
		MHQG2-40C	40	227	28	1960

With Dust Cover

Series MHQJ2

ø10, ø16, ø20, ø25 (Please refer to new series MHZ)

Air gripper with dust proof and drip proof construction.

Enclosed to prevent accumulation of dust.

Sealed construction with a dust cover.

Three dust cover materials are available to suit your applications.

Solid state switches with indicator light can be mounted.

Specifications

Fluid			Air
Operating pressure	**Double acting**		0.1 to 0.6MPa
	Single acting	**Normally open**	0.25 to 0.6MPa
		Normally closed	
Ambient and fluid temperature			–10 to 60°C
Repeatability			±0.01mm
Max. operating frequency			180c.p.m
Lubrication			Not required
Action			Double acting, Single acting
Auto switch (Option)(1)			Solid state switch: D-F9N(V), D-F9P(V), D-F9B(V)

1) Refer to p.2.11-25 for auto switch specifications.

Model

Action		Model	Bore size (mm)	Holding force(1) (Effective value) (N)	Opening/closing stroke (Both sides) (mm)	Weight(2) (g)
Double acting		**MHQJ2-10D**	10	11	4	90
		MHQJ2-16D	16	34	6	180
		MHQJ2-20D	20	42	10	340
		MHQJ2-25D	25	63	14	640
Single acting	**Normally open**	**MHQJ2-10S**	10	7.8	4	90
		MHQJ2-16S	16	26	6	181
		MHQJ2-20S	20	33	10	342
		MHQJ2-25S	25	49	14	643
	Normally closed	**MHQJ2-10C**	10	7.8	4	90
		MHQJ2-16C	16	26	6	181
		MHQJ2-20C	20	33	10	342
		MHQJ2-25C	25	49	14	643

1) Values at 0.5MPa. Represent both external and internal holding force for double acting, external holding force for single acting normally open and internal holding force for single acting normally closed.
2) Except weight of auto switches.
3) Refer to CAT. E230 for details.