

# AHC System

## MA Series

### Automatic exchange of robot hand tools, FMS (flexible manufacturing system) implemented for assembly lines.

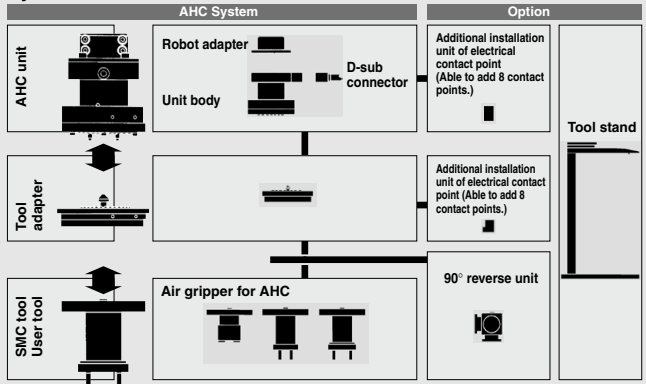
The robot hand tools change automatically to accommodate workpieces of different shapes, thus making it possible to adopt the FMS (flexible manufacturing system) in the assembly line.

#### Specifications

Series	MA210	MA310	MA311	MA320	MA321
Positioning	Ball coupling			Curved coupling	
Max. work load	3 kg		5 kg		
Handling	Single acting/Air supply at separation		Double acting	Single acting/Air supply at separation	Double acting
Handling air pressure	0.4 to 0.7 MPa				
Proof pressure	1.05 MPa				
Ambient and fluid temperature	0 to 60°C				
Positioning repeatability	±0.01 mm				



#### System Construction



#### Variations

Adapter for assembling robot  
**MA2 Series**  
ø8, ø10, ø11, ø14, ø15, ø20  
**MA3 Series**  
ø10, ø11, ø14, ø15, ø20, ø24, ø25

**Air grippers for AHC (ø10 to ø20)**

Standard type	Narrow type
10D	10DN
MHZ2-16D	MHZ2-16DN
20D	20DN

Rotary actuated type  
MHR2-10/15

**Additional installation unit of electrical contact point**  
(Able to add 8 contact points)

Added to the standard AHC unit

Added to the standard tool adapter

(MA3 series only)

**90° reverse unit**

By attaching 2 tools, a single robot can perform 2 types of tasks.  
An auto switch for detecting the location can be mounted.

(MA3 series only)

**Tool stand**

The height for setting a tool can be adjusted. An auto switch for detecting a tool can be mounted.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□

# Auto AHC and Changing System

## MA210 Series (Compact type)

Max. work load: 3 kg  
Compact/Lightweight  
O.D.: 52 mm, Weight: 360 g



## MA3□1 Series (Double acting type)

Ideal for carrying heavy loads.  
2.5 times the moment resistance  
and torque resistance of  
the current series.



### No adjustment or teaching necessary when replacing tools

All attachment and removal during tool replacement is carried out automatically, allowing for elimination of the onerous labor of the replacement process, and a major reduction of time needed for changing setups.

### Quicker launch of assembly lines

Use of the AHC system makes it possible to design the equipment layout more quickly, and reduces the time required for manufacturing.

### Failsafe mechanism

Prevents tools from dropping due to reductions in air pressure

### Electric interface

MA2 Series: 8 power systems

(Contact points: gold plated)

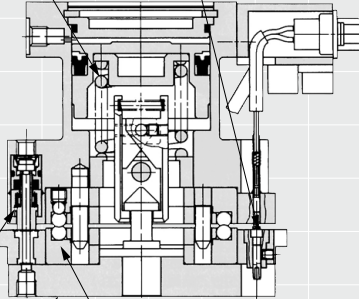
MA3 Series: 12 power systems

(Contact points: gold plated)

Additional installation unit, 8 power

systems (option)

D-sub connector, with robot cable (option)



MA2 Series: 4 power systems, self-seal mechanism,

### Air interface

built-in check valve

MA3 Series: 6 power systems, self-seal mechanism,

built-in check valve

### Max. work load:

MA2 Series: 3 kg

MA3 Series: 5 kg

### Repeatable high-precision

±0.01 mm

MA210 Series

MA31□ Series

Ball coupling

MA32□ Series

Curved coupling



(For high torque resistance)

**AHC System/Model/Specifications**

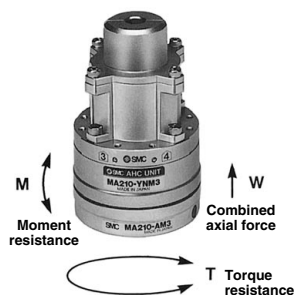
Series			MA2 Series	MA3 Series			
			MA210	MA310	MA311	MA320	MA321
Positioning			Ball coupling		Curved coupling		
Handling			Single acting	Single acting	Double acting	Single acting	Double acting
AHC unit	Electric specifications	Soldering	●	●	●	●	●
		D-sub connector	—	●	●	●	●
		D-sub connector (With socket side connector)	—	●	●	●	●
		D-sub connector (With socket side connector with 3 m cable)	—	●	●	●	●
	Robot adapter Applicable shaft diameter	Nil	●	●	●	●	●
		ø8	●	—	—	—	—
		ø10	●	●	●	●	●
		ø11	●	●	●	●	●
		ø14	●	●	●	●	●
		ø15	●	●	●	●	●
		ø20	●	●	●	●	●
		ø24	—	●	●	●	●
	Tool adapter	Air pressure port	M3	●	●	●	●
			M5	—	●	●	●
Air gripper for AHC <sup>*1</sup>	MHR2	ø10	●	●	●	●	
		ø12	●	●	●	●	
	MHZ2	ø10	●	—	—	—	
		ø16	●	●	●	●	
		ø20	—	●	●	●	
90° reverse unit			—	●	●	●	
Tool stand			●	●	●	●	
Additional installation unit of electrical contact point	For AHC unit		—	●	●	●	
	For tool adapter		—	●	●	●	

\*1) This air gripper for AHC is prepared as an optional air gripper that provides the air passage in the attachment to eliminate the fittings piping when mounting. As the mounting attachment and air piping are prepared, there is no problem even when other air gripper or vacuum pad is mounted. However, make sure that the axial force, moment, and torque due to a load are 1/2 or less of their allowable values. (For details about allowable values, refer to the specifications.)

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

# AHC System/Auto Hand Changing System

## MA2 Series



### Specifications

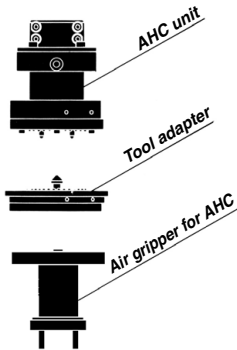
Series		MA210	
Positioning		Ball coupling	
Max. work load		3 kg	
Handling		Single acting/Air supply at disconnection	
Handling air pressure		0.4 to 0.7 MPa	
Proof pressure		1.05 MPa	
Ambient and fluid temperature		0 to 60°C	
Positioning repeatability		±0.01 mm	
Combined axial force W*		150 N	
Moment resistance M*		2 N·m	
Torque resistance T*		2 N·m	
Interface	Air	Max. operating pressure	0.7 MPa
		Operating vacuum pressure	-100 kPa or more (10 Torr or more)
		Cv value	0.056
	Electricity	Number of circuits	4
		Contact point capacity	2 A/interface
		Number of contact points	8

\* Values given on the table for combined axial force, moment resistance, and torque resistance are the values for when the AHC unit and tool adapter begin to separate. During use, make sure the axial force, moment and torque from load are 1/2 or less than those shown above, for safety reasons.

### Option Part No.

Robot adapter		
Part no.	Applicable shaft diameter	Note
MA210-CS1	ø8	Hexagon socket head cap screw M3 x 8 (4 pcs.) M3 x 10 (4 pcs.)
MA210-CR1	ø10	
MA210-CR2	ø11	
MA210-CR3	ø14	
MA210-CR4	ø15	
MA210-CR5	ø20	

**How to Order**



**AHC unit**

**MA 210-Y N M3-R3**

- Auto hand changer**
- Work load**  
2 Work load 3 kg
- AHC unit**
- Electric specifications**  
N Soldering
- Air connection size**  
M3 M3 x 0.5
- Robot adapter**

Nil	Without robot adapter	Applicable shaft diameter
S1	ø8	
R1	ø10	
R2	ø11	
R3	ø14	
R4	ø15	
R5	ø20	

**Tool adapter**

**MA 210-A M3**

- Auto hand changer**
- Work load**  
2 Work load 3 kg
- Tool adapter**
- Air connection size**  
M3 M3 x 0.5

**Air gripper for AHC**

<ø10/ø15>  
**MHR2-10-A210**

- Cylinder bore**  
10 10 mm  
15 15 mm
- For MA2 With adapter**

<ø10/ø16>  
**MHZ2-16 D N-A210-Y69A**

- Cylinder bore**  
10 10 mm  
16 16 mm
- Finger position**  
Nil Standard  
N Narrow type
- For MA2 With adapter**
- Auto switch type**
- Auto switch additional symbol**

Nil	Without auto switch	
Y69A	D-Y69A (3-wire)	Solid state auto switch Lead wire: Right angle entry Lead wire length: 0.5 m
Y69B	D-Y69B (2-wire)	

Nil	2 pcs.
S	1 pc.

**Tool stand**

**MA210-S1-Y59A**

- Tool stand**
- Auto switch type**
- Lead wire length**

Nil	Without auto switch	
Y59A	D-Y59A (3-wire)	Solid state auto switch Lead wire: Axial direction entry
Y59B	D-Y59B (2-wire)	

Nil	Grommet	With 0.5 m lead wire
L		With 3 m lead wire

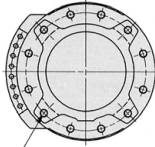
- MHZ
- MHF
- MHL
- MHR
- MHK
- MHS
- MHC
- MHT
- MHY
- MHW
- X□
- MRHQ
- MA
- D-□

# MA2 Series

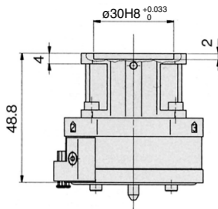
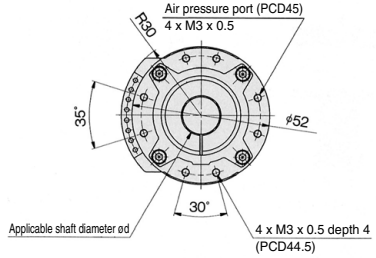


## AHC Unit and Tool Adapter

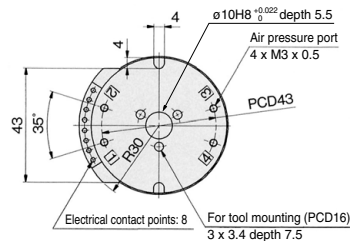
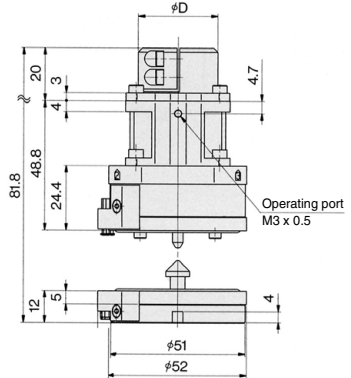
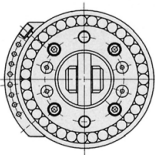
AHC Unit/MA210-YNM3 (Without robot adapter)  
 AHC Unit/MA210-YNM3-□ (With robot adapter)  
 Tool adapter/MA210-AM3



For mounting robot adapter (PCD44.5)  
 4 x M3 x 0.5 through



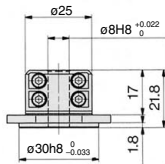
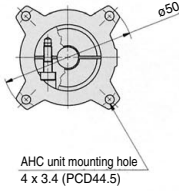
### AHC unit junction



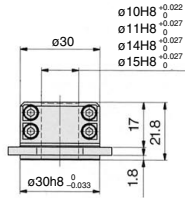
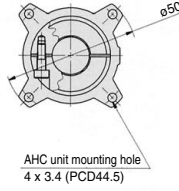
	Model	Applicable shaft diameter $\phi d$	$\phi D$	Weight (g)
AHC unit	MA210-YNM3	—	—	260
	MA210-YNM3-S1	8	25	300
	MA210-YNM3-R1	10	30	
	MA210-YNM3-R2	11	30	
	MA210-YNM3-R3	14	30	
	MA210-YNM3-R4	15	30	
	MA210-YNM3-R5	20	35	
Tool adapter	MA210-AM3	—	—	100

**Robot adapter**  
**MA210-C□□**

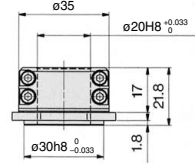
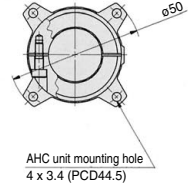
**MA210-CS1**



**MA210-CR1, 2, 3, 4**



**MA210-CR5**



Part no.	Applicable shaft diameter	Weight (g)
<b>MA210-CS1</b>	$\phi 8$	40
<b>MA210-CR1</b>	$\phi 10$	
<b>MA210-CR2</b>	$\phi 11$	
<b>MA210-CR3</b>	$\phi 14$	
<b>MA210-CR4</b>	$\phi 15$	
<b>MA210-CR5</b>	$\phi 20$	

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

**MA**

D-□

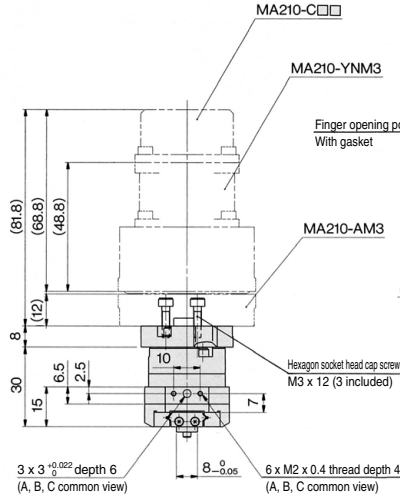
# MA2 Series



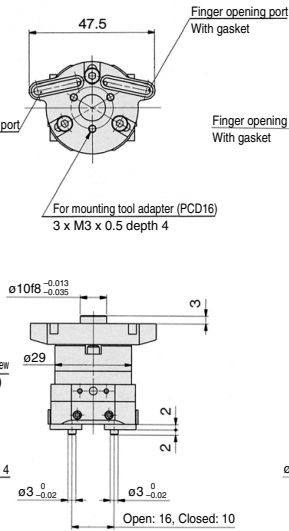
## ø10/ø15 Air Gripper: Rotary Actuated Type

ø10/ø15: MHR2- $\frac{10}{15}$ -A210

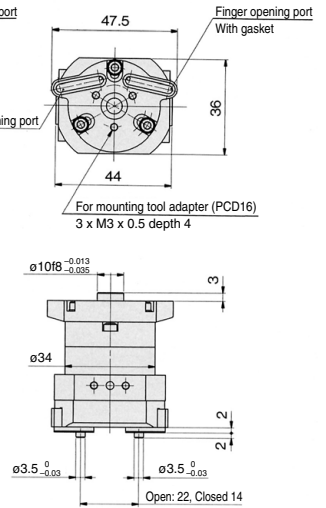
### ø10 MHR2-10-A210



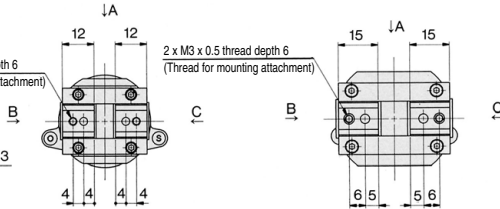
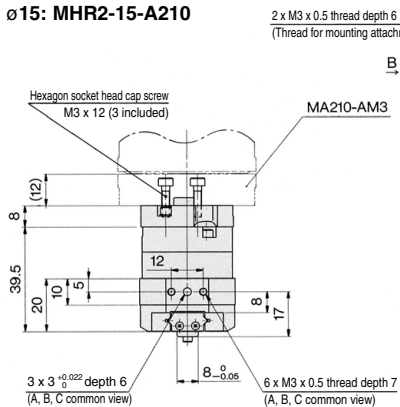
### ø10 MHR2-10-A210



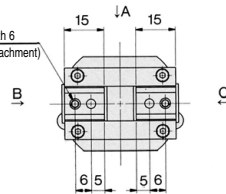
### ø15 MHR2-15-A210



### ø15: MHR2-15-A210



Weight: 130 g



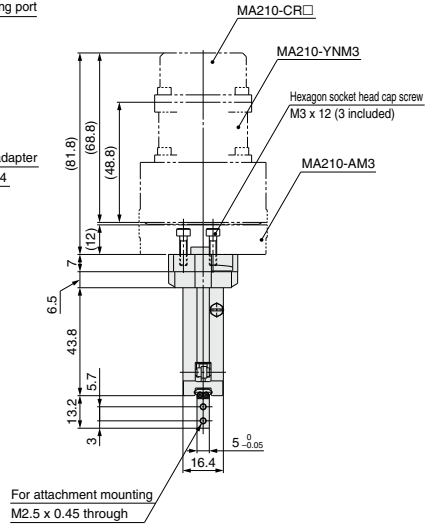
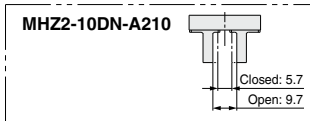
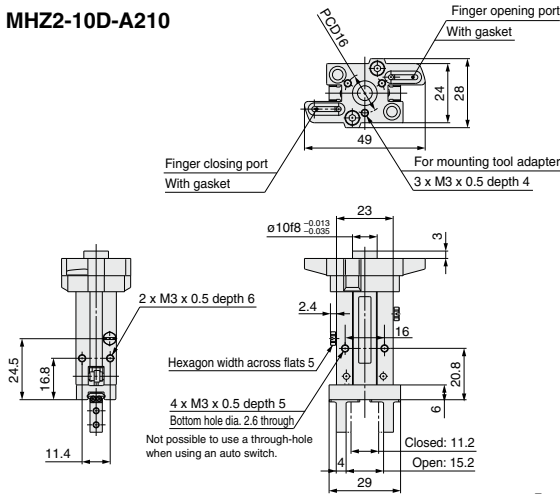
Weight: 210 g

(Note) Refer to Series MHR2 (page 518) for the detailed specifications of air grippers.

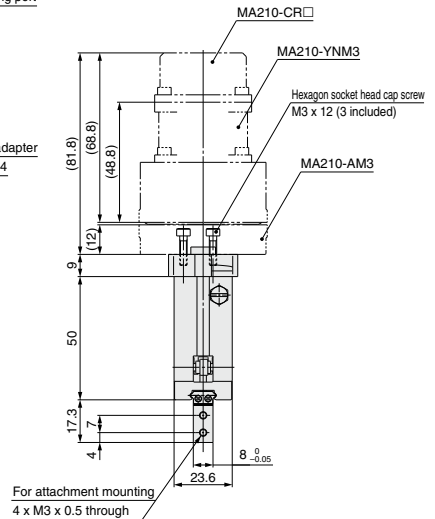
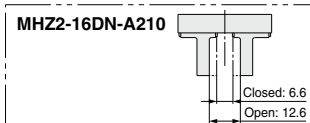
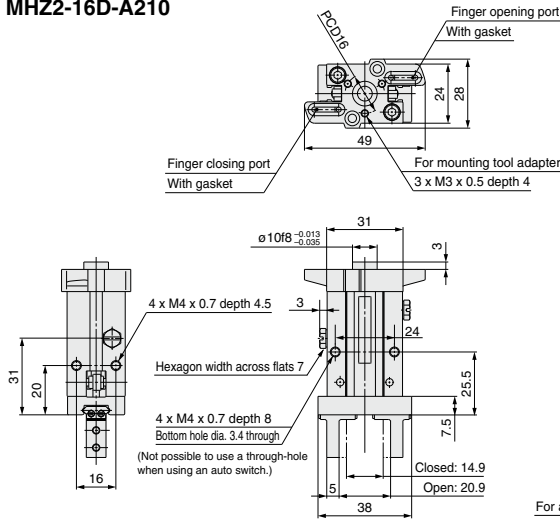


# ø10/ø16 Air Gripper: Standard Type

## MHZ2-10D-A210



## MHZ2-16D-A210



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

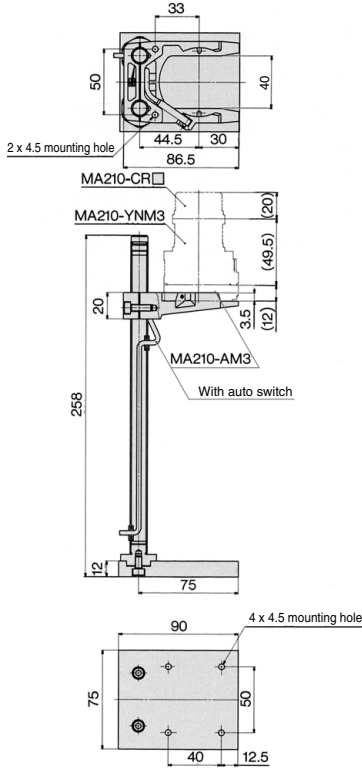
Note) Only D-Y69A and D-Y69B auto switches can be used. Refer to MHZ2 series (page 411) for the detailed specifications of air grippers.

# MA2 Series



## Tool Stand

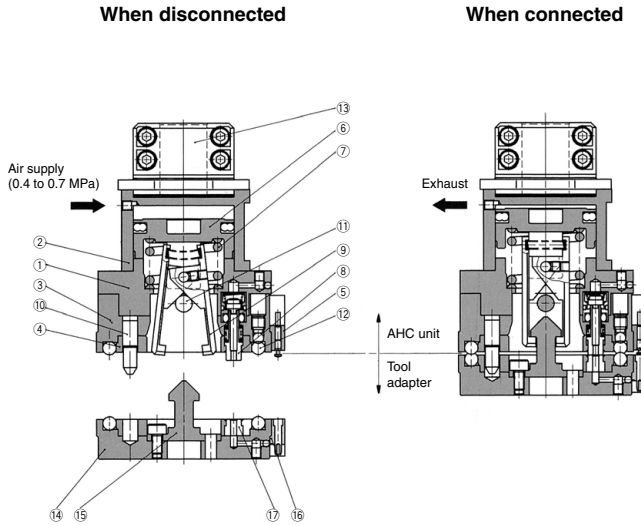
MA210-S1-□



Weight: 520 g

**Construction: Component Parts**

**Single acting type**



**Component Parts**

No.	Description	Material	Note
1	Unit body	Aluminum alloy	Hard anodized
2	Head cap	Aluminum alloy	Hard anodized
3	Ball base	Aluminum alloy	Hard anodized
4	Ball cover	Carbon steel	Electroless nickel plating
5	Contact probe assembly		
6	Piston	Stainless steel	
7	Clamp spring	Steel wire	Zinc chromated
8	Check valve assembly		
9	Lever	Carbon steel	Special black thin membrane anti-corrosive treated
10	Pilot pin	Carbon steel	Special black thin membrane anti-corrosive treated

**Component Parts**

No.	Description	Material	Note
11	Parallel pin	Stainless steel	
12	Steel ball	Stainless steel	
13	Robot adapter	Aluminum alloy	Hard anodized
14	Tool adapter	Aluminum alloy	Hard anodized
15	Hook	Carbon steel	Special black thin membrane anti-corrosive treated
16	Contact block assembly		Contact point gold plated
17	Passage seal	Synthetic rubber	

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

# AHC System/Auto Hand Changing System

# MA3 Series



## Specifications

Series		MA310	MA311	MA320	MA321
Positioning		Ball coupling		Curved coupling	
Max. work load		5 kg			
Handling		Single acting/ Air supply at disconnection	Double acting	Single acting/ Air supply at disconnection	Double acting
Handling air pressure		0.4 to 0.7 MPa			
Proof pressure		1.05 MPa			
Ambient and fluid temperature		0 to 60°C			
Positioning repeatability		±0.01 mm			
Combined axial force W*		200 N	500 N (0.5 MPa)	200 N	500 N (0.5 MPa)
Moment resistance M*		3 N·m	7.5 N·m (0.5 MPa)	3 N·m	7.5 N·m (0.5 MPa)
Torque resistance T*		3 N·m	7.5 N·m (0.5 MPa)	12 N·m	30 N·m (0.5 MPa)
Interface	Air	Max. operating pressure		0.7 MPa	
		Operating vacuum pressure		-100 kPa or more (10 Torr or more)	
		Cv value		0.072	
	Electricity	Number of circuits		6	
		Contact point capacity		2 A/interface	
		Number of contact points		12	

\* Values given on the table for combined axial force, moment resistance, and torque resistance are the values for when the AHC unit and tool adapter begin to separate. During use, make sure the axial force, moment and torque from load are 1/2 or less than those shown above, for safety reasons.

## Option Part No.

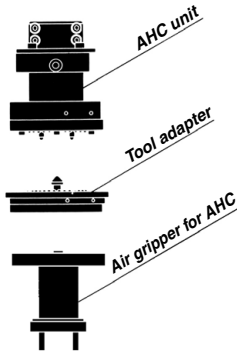
### Robot adapter

Part no.	Applicable shaft diameter	Note
MA310-CR1	ø10	Hexagon socket head cap screw M4 x 10 (4 pcs.) M4 x 14 (4 pcs.)
MA310-CR2	ø11	
MA310-CR3	ø14	
MA310-CR4	ø15	
MA310-CR5	ø20	
MA310-CS6	ø24	
MA310-CR6	ø25	

### Additional Installation Unit of Electrical Contact Point

Part no.	Additional installation unit	Application	Note
MA310-EY1	8 contact points	AHC unit	Hexagon socket head cap screw M2.5 x 10 (2 pcs.)
MA310-EA1		Tool adapter	

**How to Order**



**MA 3 1 0 - Y A M5 - R3**

- Auto hand changer**
- Work load**  
3 Work load 5 kg
- Positioning**  
1 Ball coupling  
2 Curved coupling
- Operation**  
0 Single acting  
1 Double acting
- AHC unit**
- Air connection size**  
M5 M5 x 0.8
- Robot adapter**

Robot adapter	Without robot adapter
R1	ø10
R2	ø11
R3	ø14
R4	ø15
R5	ø20
R6	ø24
	ø25

Applicable shaft diameter

Symbol	Soldering	D-sub connector
N	●	—
A	—	●
B	—	● (With socket side connector)
C	—	● (With socket side connector with 3 m cable)

**Electric specifications**

\* Refer to page 788 "D-sub connectors" for details.

**Tool adapter**

**Air gripper for AHC**

**MA 3 10 - A M5**

- Auto hand changer**
- Series**  
10 Ball coupling  
20 Curved coupling
- Work load**  
3 Work load 5 kg
- Air connection size**  
M3 M3 x 0.5  
M5 M5 x 0.8
- Tool adapter**

**MHR2-10-A310**

- Cylinder bore**  
10 10 mm  
15 15 mm
- For MA3 With adapter**

**MHZ2-16DN-A310-Y69A**

- Cylinder bore**  
16 16 mm  
20 20 mm
- Finger position**  
Nil Standard  
N Narrow type
- Auto switch type**

Auto switch type	Without auto switch
Y69A	D-Y69A (3-wire) Solid state auto switch Lead wire: Right angle entry Lead wire length: 0.5 m
Y69B	D-Y69B (2-wire) Solid state auto switch Lead wire: Right angle entry Lead wire length: 0.5 m

**90° reverse unit**  
**MA310-R1-90A**

**90° reverse unit**

Auto switch type	Without auto switch	Reed auto switch	Solid state auto switch	Lead wire length: 0.5 m
90	D-90 (2 pcs.)	3-wire	2-wire	0.5 m
90A	D-90A (2 pcs.)			
S99	D-S991, D-S992 (1 pc. each)	3-wire		0.5 m
T99	D-T991, D-T992 (1 pc. each)	2-wire		

\* Can also be used for MA320 series.

**Tool stand**  
**MA310-S1-Y59A**

**Tool stand**

Lead wire length	Without auto switch
Nil	Grommet
L	With 0.5 m lead wire With 3 m lead wire

Auto switch type	Without auto switch
Y59A	D-Y59A (3-wire) Solid state auto switch Lead wire: Axial direction entry
Y59B	D-Y59B (2-wire) Solid state auto switch Lead wire: Axial direction entry

\* Can also be used for MA320 series.

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

# MA3 Series



## AHC Unit and Tool Adapter/Single Acting Type

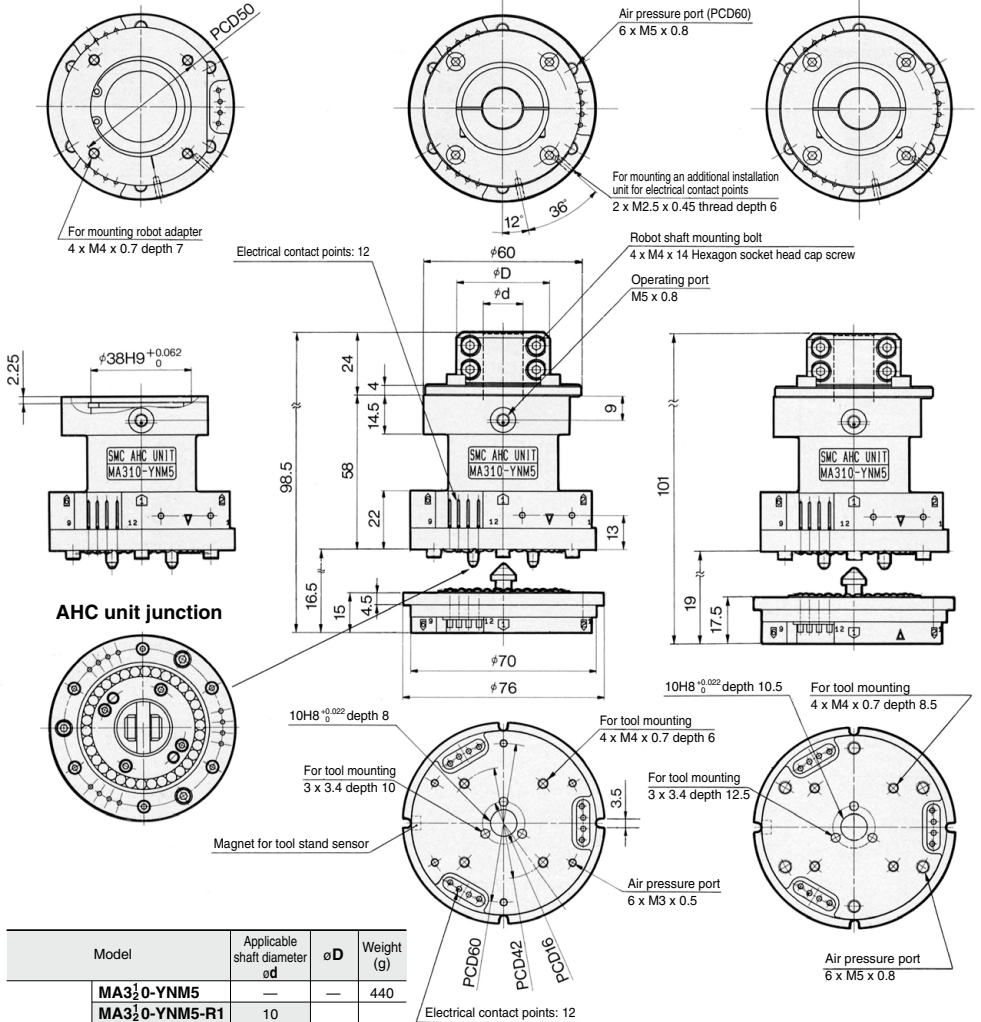
AHC Unit/MA3 $\frac{1}{2}$ 0-YNM5 (Without robot adapter)

AHC Unit/MA3 $\frac{1}{2}$ 0-YNM5-□ (With robot adapter)

Tool adapter/MA3 $\frac{1}{2}$ 0-A□

When mounting MA3 $\frac{1}{2}$ 0-AM3

When mounting MA3 $\frac{1}{2}$ 0-AM5



	Model	Applicable shaft diameter $\phi d$	$\phi D$	Weight (g)
AHC unit	MA3 $\frac{1}{2}$ 0-YNM5	—	—	440
	MA3 $\frac{1}{2}$ 0-YNM5-R1	10	35	520
	MA3 $\frac{1}{2}$ 0-YNM5-R2	11		
	MA3 $\frac{1}{2}$ 0-YNM5-R3	14		
	MA3 $\frac{1}{2}$ 0-YNM5-R4	15		
	MA3 $\frac{1}{2}$ 0-YNM5-R5	20		
	MA3 $\frac{1}{2}$ 0-YNM5-S6	24		
	MA3 $\frac{1}{2}$ 0-YNM5-R6	25	41	
Tool adapter	MA3 $\frac{1}{2}$ 0-AM3	—	—	250
	MA3 $\frac{1}{2}$ 0-AM5	—	—	270

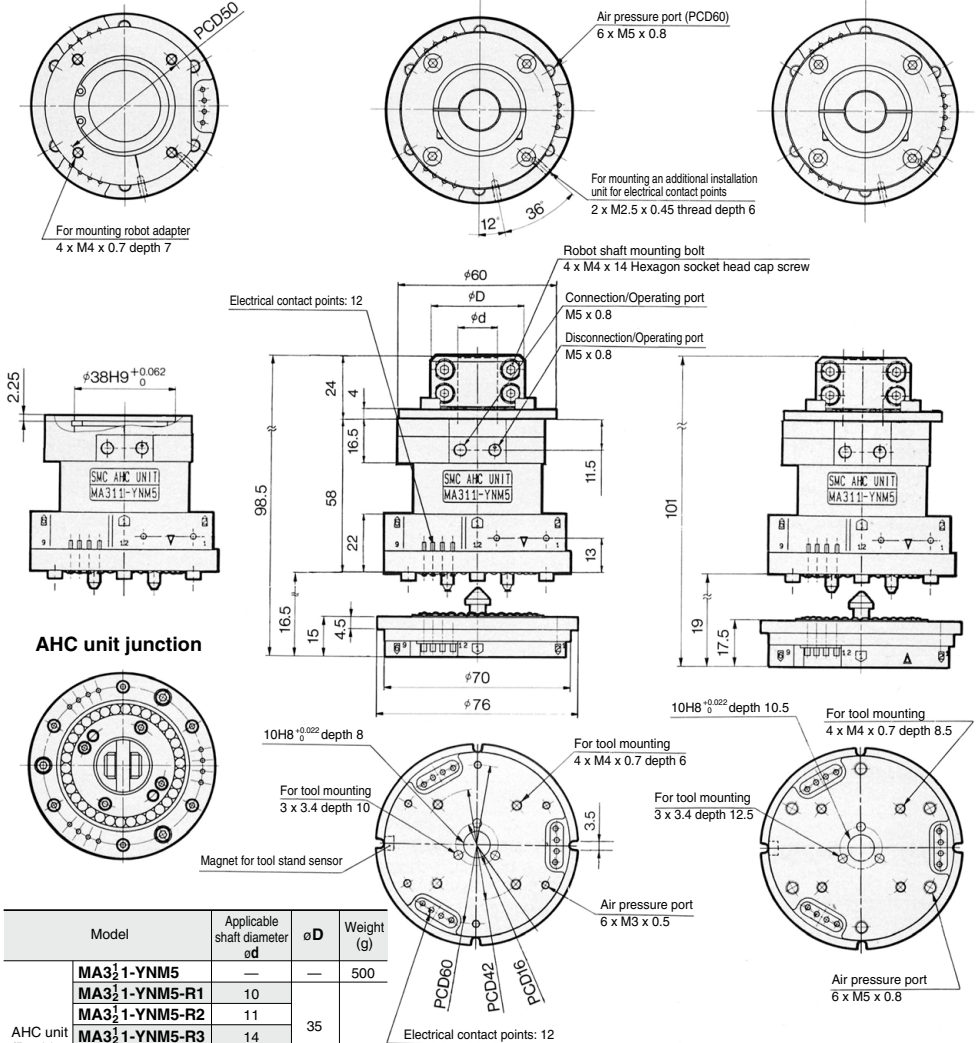


**AHC Unit and Tool Adapter/Double Acting Type**

AHC Unit/MA3 $\frac{1}{2}$ 1-YNM5 (Without robot adapter)  
 AHC Unit/MA3 $\frac{1}{2}$ 1-YNM5-□ (With robot adapter)  
 Tool adapter/MA3 $\frac{1}{2}$ 0-A□

When mounting MA3 $\frac{1}{2}$ 0-AM3

When mounting MA3 $\frac{1}{2}$ 0-AM5



Model	Applicable shaft diameter $\phi d$	$\phi D$	Weight (g)
MA3 $\frac{1}{2}$ 1-YNM5	—	—	500
MA3 $\frac{1}{2}$ 1-YNM5-R1	10	35	580
MA3 $\frac{1}{2}$ 1-YNM5-R2	11		
MA3 $\frac{1}{2}$ 1-YNM5-R3	14		
MA3 $\frac{1}{2}$ 1-YNM5-R4	15		
MA3 $\frac{1}{2}$ 1-YNM5-R5	20		
MA3 $\frac{1}{2}$ 1-YNM5-R6	25		
		41	
Tool adapter			
MA3 $\frac{1}{2}$ 0-AM3	—	—	250
MA3 $\frac{1}{2}$ 0-AM5	—	—	270

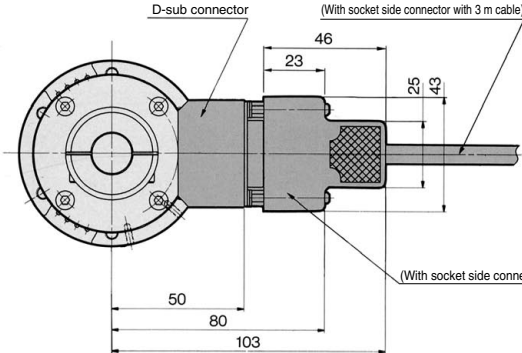
- MHZ
- MHF
- MHL
- MHR
- MHK
- MHS
- MHC
- MHT
- MHY
- MHW
- X□
- MRHQ
- MA
- D-□

# MA3 Series

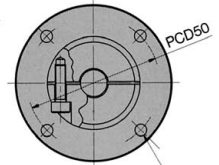
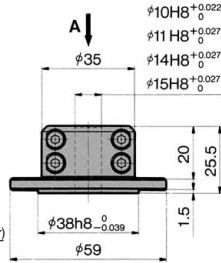


With D-sub connector  
MA3□□-Y□M5-□□

Robot adapter  
MA310-C□□



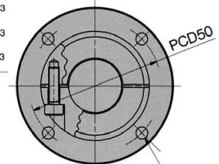
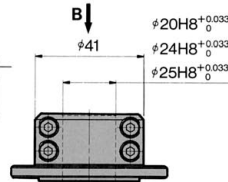
MA310-CR1, 2, 3, 4



AHC unit mounting hole  
4 x 4.5

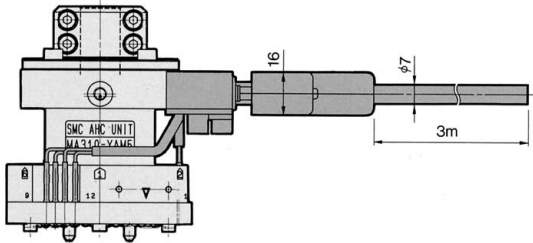
View A

MA310-CR5, 6, CS6



AHC unit mounting hole  
4 x 4.5

View B



AHC unit with D-sub connector	Weight (g)
MA3 $\frac{1}{2}$ 0-YAM5-□□	600
MA3 $\frac{1}{2}$ 0-YBM5-□□	620
MA3 $\frac{1}{2}$ 0-YCM5-□□	890
MA3 $\frac{1}{2}$ 1-YAM5-□□	660
MA3 $\frac{1}{2}$ 1-YBM5-□□	680
MA3 $\frac{1}{2}$ 1-YCM5-□□	950

Model	Applicable shaft diameter	Weight (g)
MA310-CR1	φ10	80
MA310-CR2	φ11	
MA310-CR3	φ14	
MA310-CR4	φ15	
MA310-CR5	φ20	
MA310-CS6	φ24	
MA310-CR6	φ25	

## D-sub connectors

### D-sub connector specifications

D-sub connector	Contact classification	AHC unit main body side	
	Shell size	Pin	Socket
	No. of cores	15	
	Connector type	Crimping connection type	
Robot cable	Effective area	—	0.2 mm <sup>2</sup>
	No. of cores	—	12

**MA3□□-YAM5-□□ with a D-sub connector**  
Since the AHC unit main body is compatible with a pin contact, prepare a socket contact.

**MA3□□-YBM5-□□ with a socket side connector**  
A pin contact is comprised of 12 crimping connection type pins as standard.

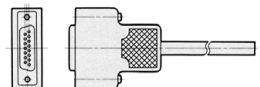
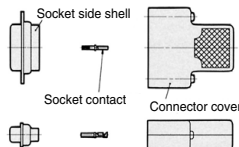
For a crimping tool, we recommend the CT150-2-D-C made by Japan Aviation Electronics Industry, Inc.

**MA3□□-YCM5-□□ with a socket side connector with 3 m cable**

The combination of the electric contact point number and cables of the AHC unit is shown in the table below.

#### Electrical Contact Point No./Cable Wiring

Electrical contact point no.	1	2	3	4	5	6	7	8	9	10	11	12
Insulation color	Red	White	Black	Pink	Light blue	Purple	Gray	Orange	Green	Yellow	Brown	Blue



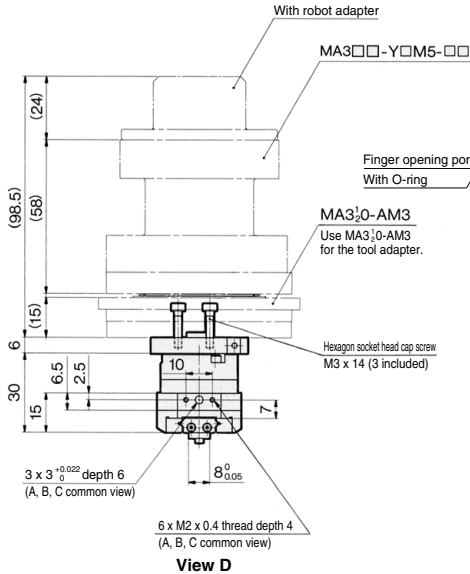




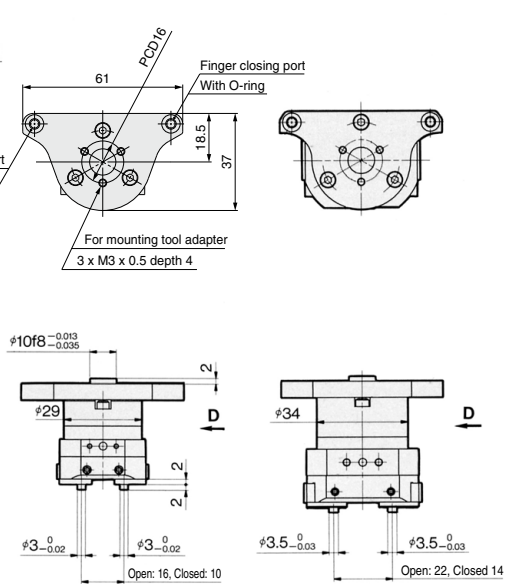
# ø10/ø15 Air Gripper: Rotary Actuated Type

ø10/ø15: MHR2-<sup>10</sup>-A310

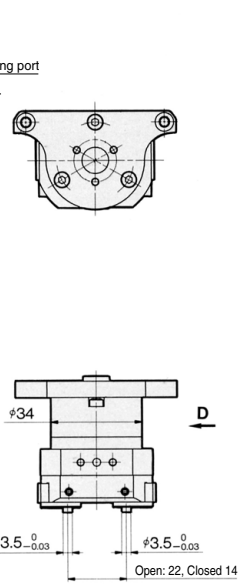
ø10  
MHR2-10-A310



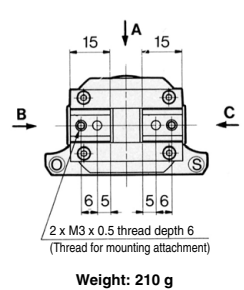
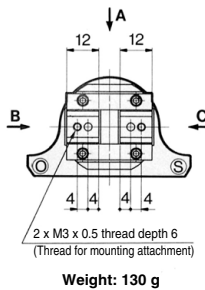
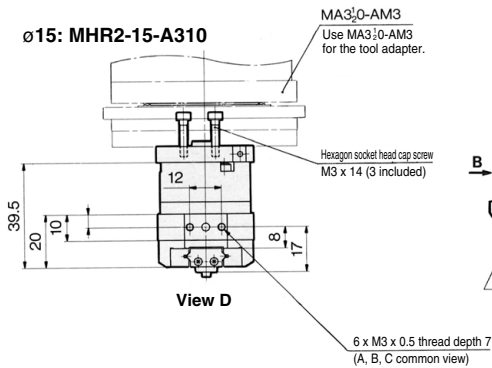
ø10  
MHR2-10-A310



ø15  
MHR2-15-A310



ø15: MHR2-15-A310



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

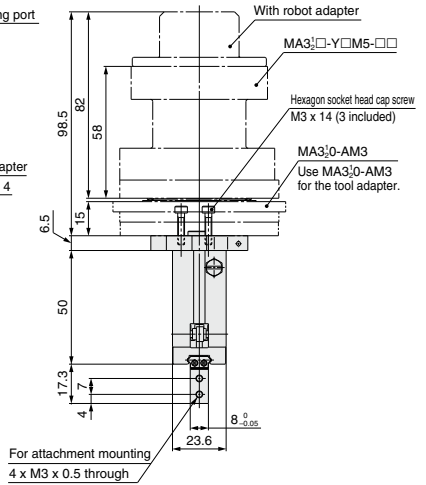
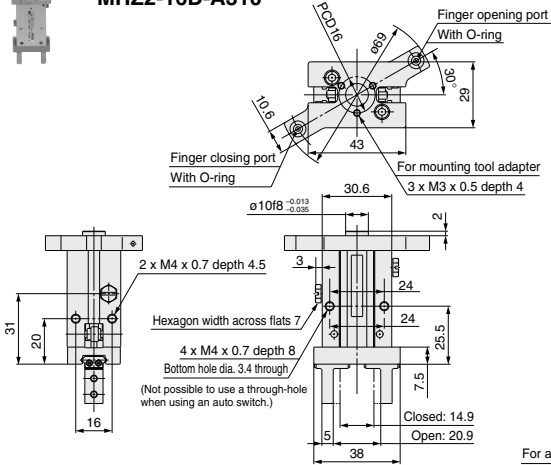
(Note) Refer to MHR2 series (page 518) for the detailed specifications of air grippers.

# MA3 Series



## ø16/ø20 Air Gripper: Standard Type

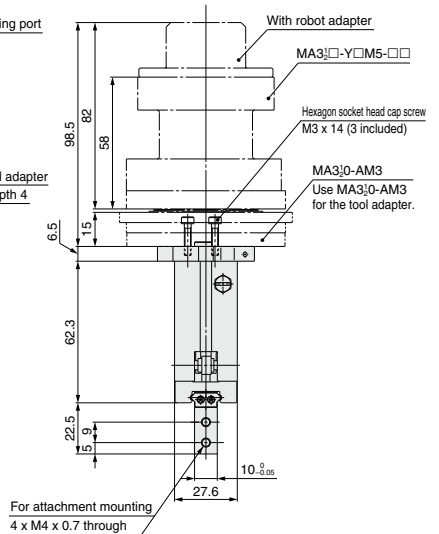
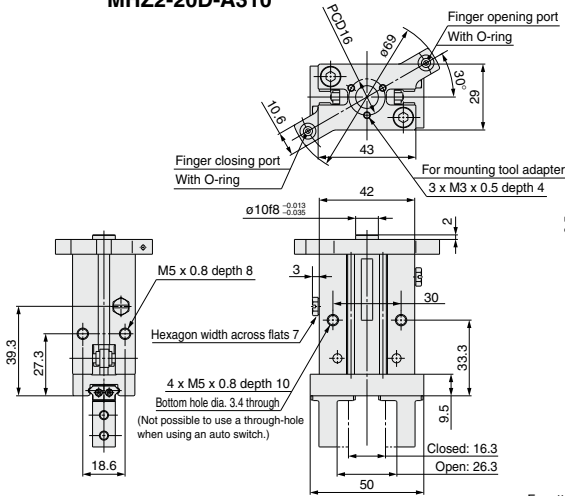
### MHZ2-16D-A310



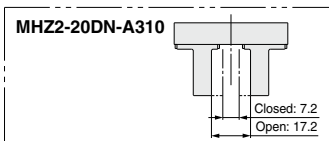
### MHZ2-16DN-A310



### MHZ2-20D-A310



### MHZ2-20DN-A310

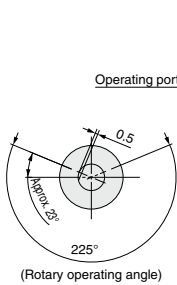
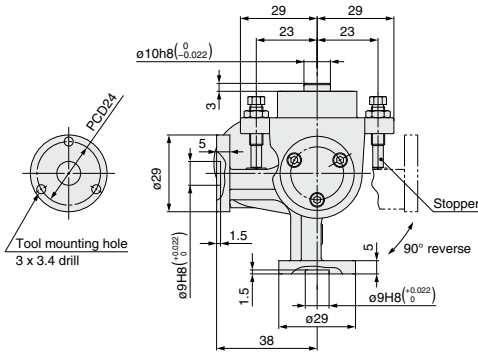
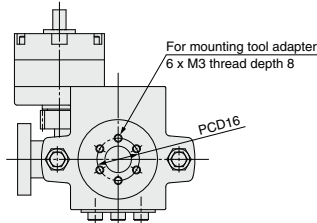


Note) Only D-Y69A and D-Y69B auto switches can be used. Refer to MHZ2 series (page 411) for the detailed specifications of air grippers.

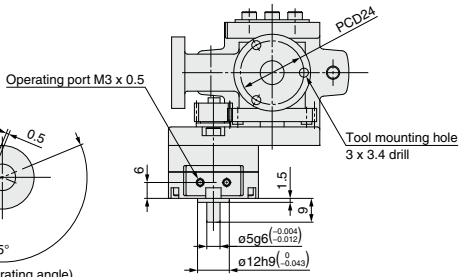


## 90° Reverse Unit

**MA310-R1-□**

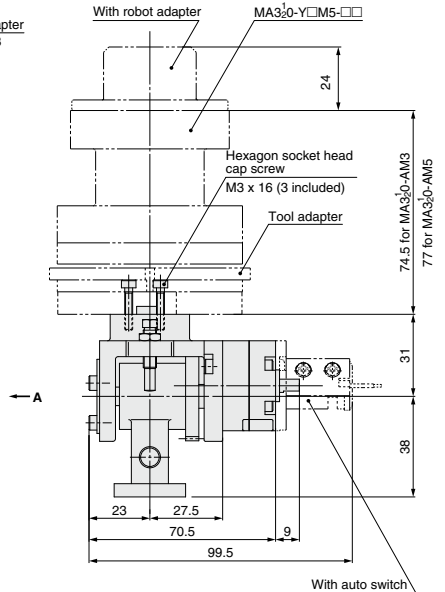


**View B**



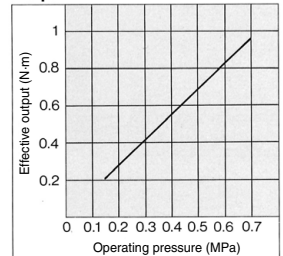
**B ↑**

Weight: 260g



**View A**

**Output Table**



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

**MA**

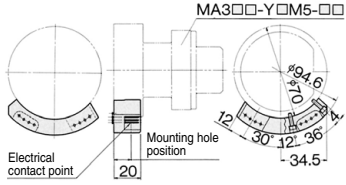
D-□

# MA3 Series



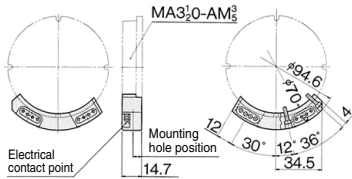
## Additional Installation Unit of Electrical Contact Point

### MA310-EY1: For AHC unit



Accessory	Hexagon socket head cap screw M2.5 x 10 Flat washer, Compact round washer, Nominal size 2.5
Weight	20 g

### MA310-EA1: For tool adapter

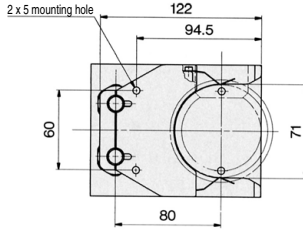


Accessory	Hexagon socket head cap screw M2.5 x 10
Weight	25 g

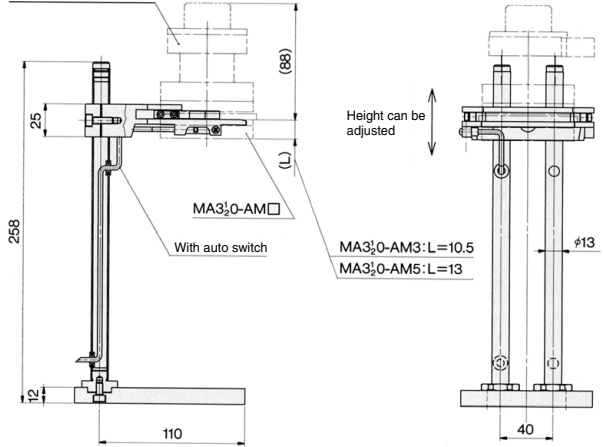


## Tool Stand

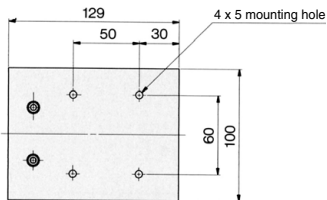
### MA310-S1-□



### MA3□□-Y□M5-□□

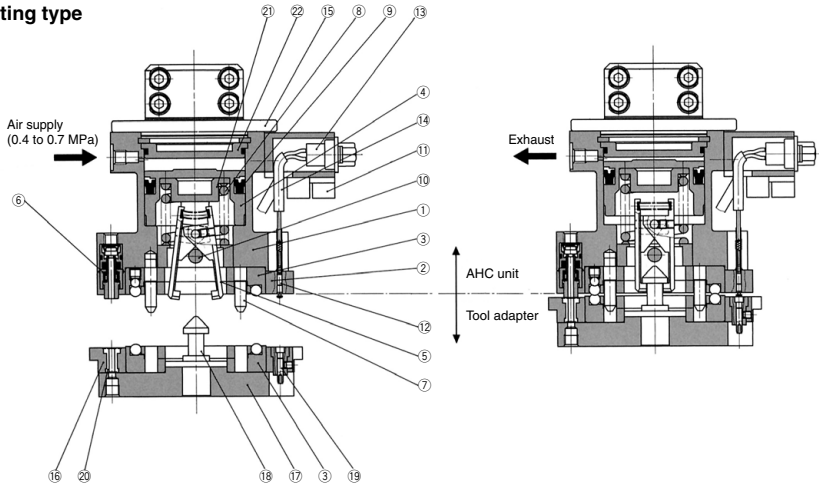


Weight: 950 g

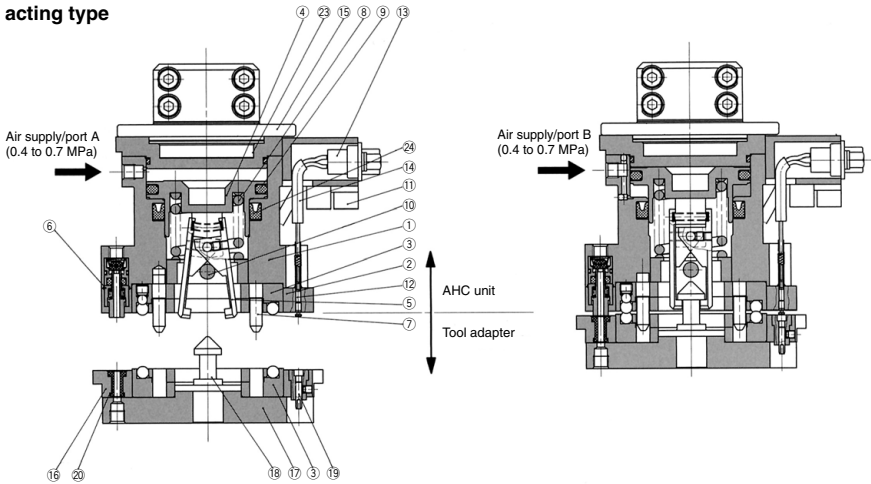


**Construction: Component Parts**

**Single acting type**



**Double acting type**



**Component Parts**

No.	Description	Material	Note
1	<b>Body</b>	Aluminum alloy	Hard anodized
2	<b>Insulation ring</b>	Synthetic resin	Black
3	<b>Coupling</b>	Carbon steel	Special black thin membrane anti-corrosive treated
4	<b>Piston</b>	Aluminum alloy	Chromated
5	<b>Lever</b>	Carbon steel	Special black thin membrane anti-corrosive treated
6	<b>Check valve assembly</b>	Brass, steel wire, synthetic rubber	
7	<b>Pilot pin</b>	Carbon steel	Special black thin membrane anti-corrosive treated
8	<b>Clamp spring</b>	Steel wire	Zinc chromated
9	<b>Seal</b>	Synthetic rubber	
10	<b>Parallel pin</b>	Stainless steel	
11	<b>Multi-tube holder</b>	Synthetic resin	Black
12	<b>Contact probe</b>		
13	<b>D-sub connector assembly</b>		

**Component Parts**

No.	Description	Material	Note
14	<b>Cable</b>		
15	<b>Robot adapter</b>	Aluminum alloy	Hard anodized
16	<b>Connecting base</b>	Aluminum alloy	Hard anodized
17	<b>Tool plate</b>	Aluminum alloy	Hard anodized
18	<b>Hook</b>	Carbon steel	Special black thin membrane anti-corrosive treated
19	<b>Contact block assembly</b>	Beryllium copper, synthetic resin	Contact point gold plated
20	<b>Passage seal</b>	Synthetic rubber	
<b>Single acting type</b>			
21	<b>Bearing</b>	Stainless steel	
22	<b>Cap</b>	Aluminum alloy	Chromated
<b>Double acting type</b>			
23	<b>Head cap</b>	Aluminum alloy	Hard anodized
24	<b>Rod seal</b>	Synthetic rubber	

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



# MA Series Specific Product Precautions 1

Be sure to read this before handling the products.

Series	MA3 <sub>2</sub> 1 <sub>0</sub>	MA3 <sub>2</sub> 1 <sub>1</sub>	MA210
Connection and disconnection procedures	<b>Connection procedures</b>		
	<ol style="list-style-type: none"> <li>Supply compressed air: 0.4 to 0.7 MPa to the operating port.</li> <li>Align the positions of the AHC unit and tool adapter as shown below, move the AHC unit to within 0.5 mm of the tool adapter, with the centers aligned, and insert the pilot pin into the pilot hole on the tool adapter side. Move the AHC unit toward until the t dimension in the figure below attains 0 to 2 mm larger than the value at the time of connection.</li> <li>Release the compressed air from the operating port.</li> </ol>	<ol style="list-style-type: none"> <li>Supply compressed air: 0.4 to 0.7 MPa to the disconnection port.</li> <li>Release the compressed air from the disconnection port, and at the same time supply compressed air (0.4 to 0.7 MPa) to the connection port.</li> </ol>	<ol style="list-style-type: none"> <li>Supply compressed air: 0.4 to 0.7 MPa to the operating port.</li> <li>Release the compressed air from the operating port.</li> </ol>
Connection and disconnection procedures	<b>Disconnection procedures</b>		
	<ol style="list-style-type: none"> <li>Supply compressed air: 0.4 to 0.7 MPa to the operating port.</li> <li>Pull up the AHC unit 12 mm or more.</li> </ol>	<ol style="list-style-type: none"> <li>Release the compressed air from the connection port, and at the same time supply compressed air (0.4 to 0.7 MPa) to the disconnection port.</li> <li>Pull up the AHC unit 12 mm or more.</li> </ol>	

Robot Adapter Mounting	<b>[Mounting the robot adapter to the AHC unit]</b> Attach the robot adapter to the AHC unit by evenly tightening the 4 hexagon socket head cap screws with the maximum tightening torque mentioned in the figures below. <b>[Mounting the robot adapter to an assembling robot]</b> Mount the AHC unit to the shaft of the assembling robot by evenly tightening the 4 hexagon socket head cap screws with the maximum tightening torque mentioned in the figures below	



# MA Series Specific Product Precautions 2

Be sure to read this before handling the products.

		Series	MA3□□	MA210
How to use dedicated air grippers	Mounting procedures	<p>1. Based on the positioning of the tool adapter and the air gripper shown in the figures below, note that it is possible to rotate them every 120° and in three different directions. Mount them accordance with your operating conditions.</p> <p>2. Evenly tighten 3 hexagon socket head cap screws with a maximum tightening torque of 1.06 N·m.</p> <p>3. Before mounting, confirm that the O-ring or gasket of the air gripper is mounted properly, and make sure there is no dust or debris on the sheet surface of the tool adapter.</p>		<p>1. Mount the tool adapter and the air gripper using the positioning shown in the figures below.</p>
		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>MHZ2</b></p> <p>M3 x 14: Hexagon socket head cap screw</p> </div> <div style="text-align: center;"> <p><b>MHR2</b></p> <p>M3 x 14: Hexagon socket head cap screw</p> </div> </div>		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>M3 x 12: Hexagon socket head cap screw</p> </div> <div style="text-align: center;"> <p>M3 x 12: Hexagon socket head cap screw</p> </div> </div>
Piping and wiring procedures		<p>1. The bracket is fitted with a fluid passage, so there is no need for piping except for on the AHC unit side. The bracket also has a mark for the position of the piping work, which can be referred to while work is taking place.</p> <ul style="list-style-type: none"> <li>• Finger closing port: "S" mark</li> <li>• Finger opening port: "O" mark</li> </ul> <p>2. When using an auto switch, solder it to the terminal on the tool adapter.</p>		
90° reverse unit	Mounting procedures	<p>1. Based on the positioning shown in the figure below, note that it is possible to rotate the tool adapter and the air gripper every 60° and in six different directions.</p> <p>2. Mount the 90° reverse unit to the tool adapter, and evenly tighten the 3 hexagon socket head cap screws (M3 x 16) with a maximum tightening torque of 1.06 N·m.</p>		
		<p>M3 x 16: Hexagon socket head cap screw</p>		
Piping and wiring procedures		<p>1. Pipe the driving air for tools or the rotary actuator to the air port of the tool adapter.</p> <p>2. When wiring for use with an auto switch, etc., solder it to the terminal on the tool adapter.</p>		
Additional installation unit of electrical contact point	Mounting procedures	<p>1. As shown in the figure below, determine the position in accordance with the leveled part of the AHC unit and tool adapter, and evenly tighten the 2 hexagon socket head cap screws (M2.5 x 10) with a maximum tightening torque of 0.3 N·m.</p>		

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□



# MA Series Specific Product Precautions 3

Be sure to read this before handling the products.

Series	MA3□□	MA210
How to use the tool stand	<ol style="list-style-type: none"> <li>Align the positions of the tool adapter positioning groove and the tool stand detent spring. When using an auto switch, position the auto switch in relation to the magnet fitted on the tool adapter in accordance with the figure below. By changing the auto switch mounting position to the right side, it is possible to use it by turning it around 180°. When doing so, be sure the auto switch cable is coming out of the post side. Tighten the auto switch mounting screws with a maximum tightening torque of 0.1 N·m.</li> <li>Connect or disconnect the AHC unit and tool adapter only after attaching the AHC unit in a horizontal direction.</li> </ol>	<ol style="list-style-type: none"> <li>Use the tool adapter and tool stand based on the positioning shown in the figure below.</li> <li>Connect or disconnect the AHC unit and tool adapter in a direction perpendicular to the AHC unit.</li> </ol>
	<ol style="list-style-type: none"> <li>When positioning the holder, loosen the hexagon socket head cap screws shown in the figure below right, and set it at the desired height, then tighten with a maximum tightening torque of 5 N·m.</li> </ol>	

Piping and wiring precautions	<ol style="list-style-type: none"> <li>Use SMC compact One-touch fittings, one-touch mini (M3, M5), or miniature fittings (M3, M5). Thoroughly flush out the connector piping and be sure that dirt and chips, etc., do not get inside the equipment.</li> <li>When wiring, except for the D-sub connector entry, solder to the probe socket of the AHC unit, or the terminal of the tool adapter. We recommend insulating the connection points with heat shrinking tube, etc.</li> <li>During piping and wiring, be sure that there is no external forces such as pulling and twisting at work.</li> </ol>