

AHC System

Auto Hand Changing System

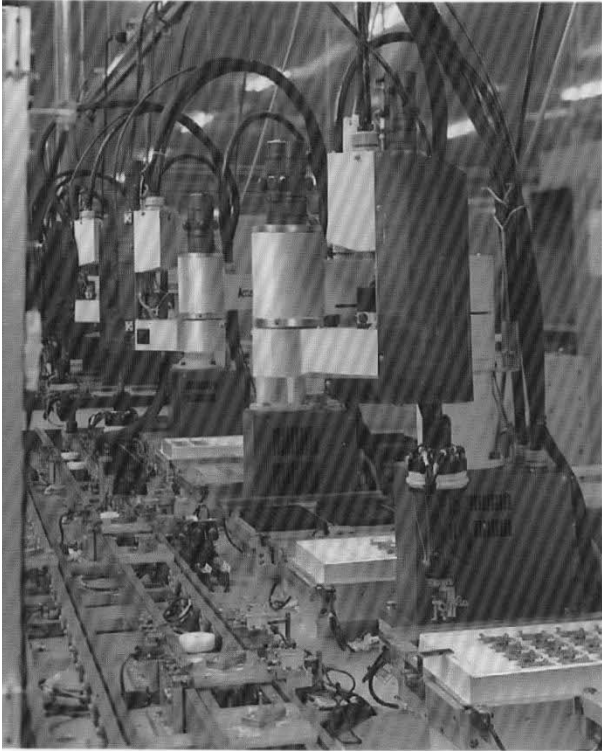
Series MA

**Automatic robot hand tool exchange materializes FMS.
Small type Series MA210 / Double-acting type Series MA3□1**

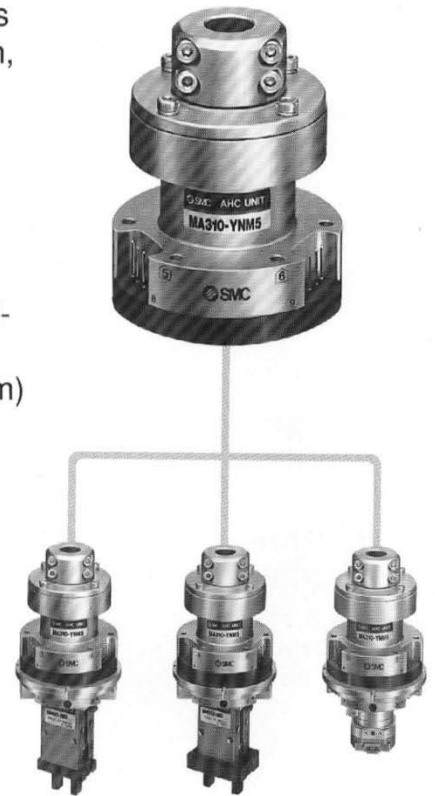


Automatic robot hand tool exchange materializes

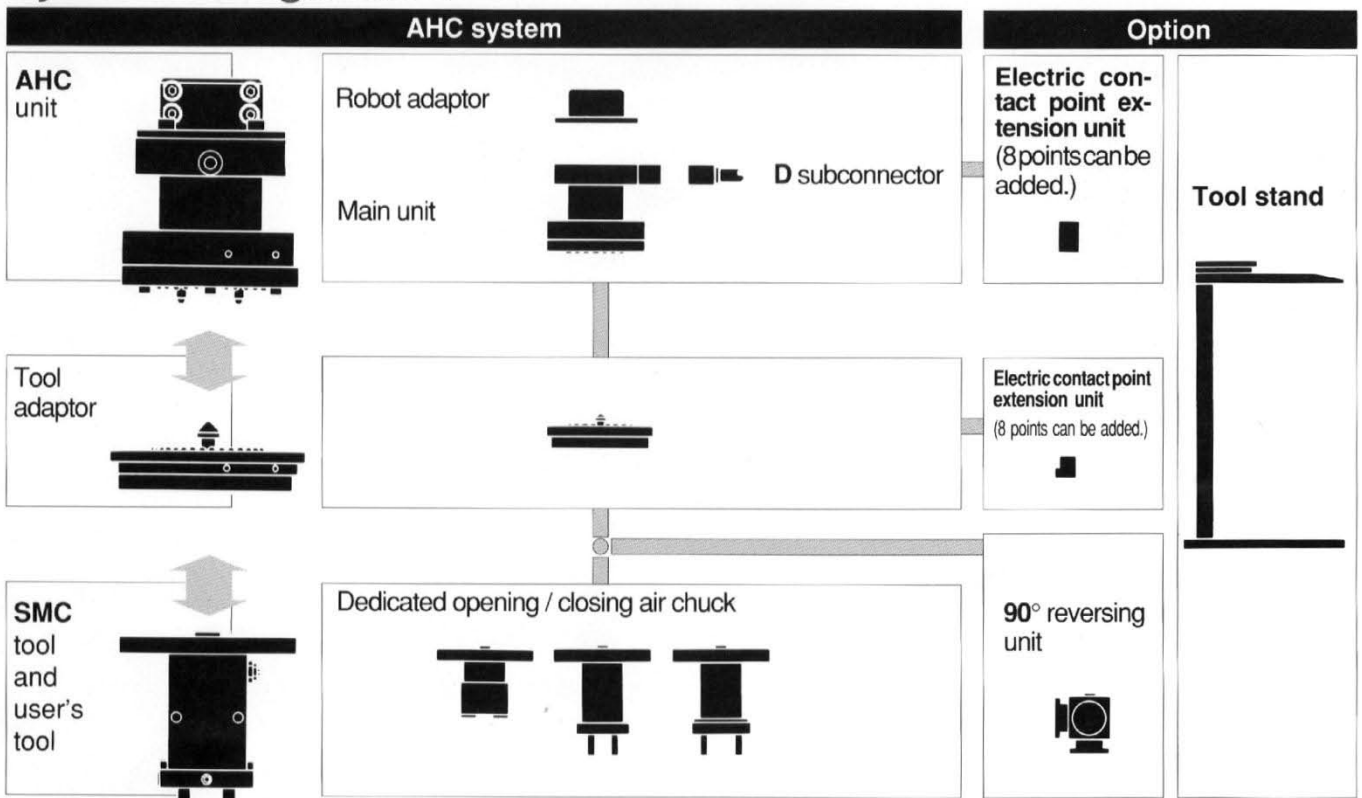
Auto Hand Changing System



Developed to meet the most advanced needs for factory automation, the AHC (Automatic Hand Changing) system automatically changes robot hand tools according to works in different shapes, thus materializing FMS (Flexible Manufacturing System) in the assembly line.



System Configuration



FMS in the assembly line.

Series MA

Small type

Double acting type

Series **MA210** and **MA311** are now on sale!

A variety of models meet the diversified needs.

Series MA210 (small type)

Max. load capacity: 3kg
Compact and lightweight
O.D.: 52mm, Weight: 360g



Series MA311 (double acting type)

Ideal for use under large load
Withstand moment and torque resistances are about 2.5 times in comparison with existing models.



Adjustment and teaching are unnecessary for tool exchange.

Tools are attached/detached automatically. Thus troublesome tool exchange work is dispensed with, and tool exchange time can be cut substantially.

Assembly line operation can be started early.

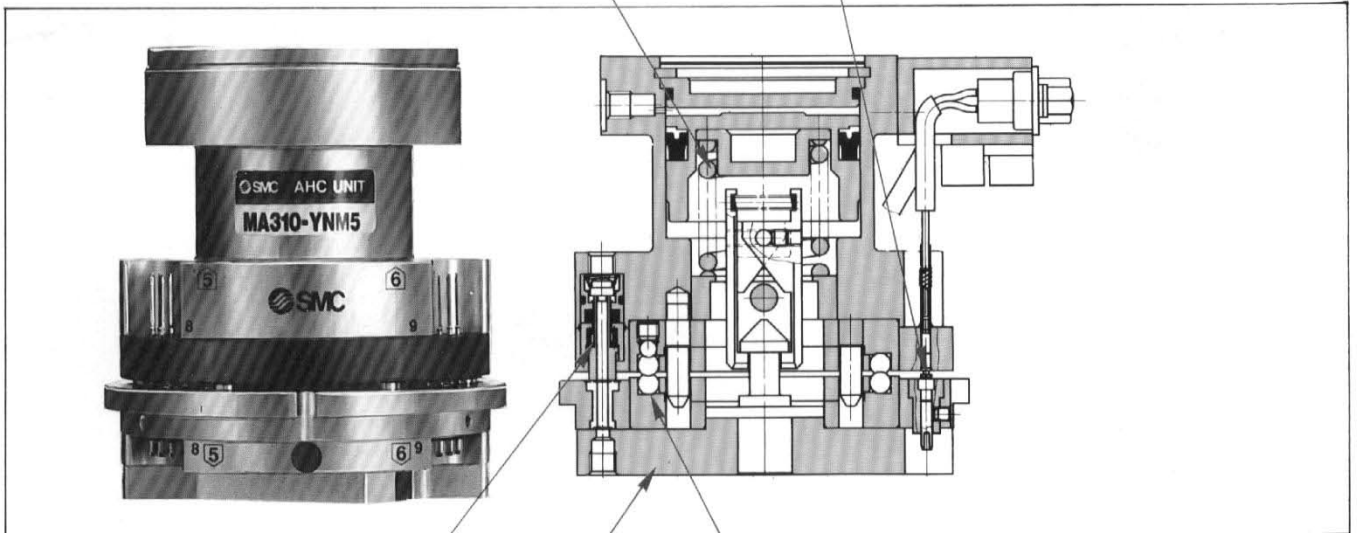
Adoption of the AHC system cuts down equipment design time and manufacturing period.

Fail-safe mechanism

Prevents release of robot hand tool resulting from pressure drop.

Electric interface

Series **MA2**: 8 systems (gilded contact point)
Series **MA3**: 12 systems (gilded contact point)
Extension unit: 8 systems (option)
With D subconnector and robot cable (option)



Air interface

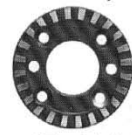
Series **MA2**: 4 systems, self-seal mechanism, built-in check valve
Series **MA3**: 6 systems, self-seal mechanism, built-in check valve

High repeatability: ±0.01 mm

Series **MA210**
Series **MA311**
Ball coupling



Series **MA32**
Curvic coupling



(For high torque)

Max. load capacity

Series **MA2**: 3kg
Series **MA3**: 5kg

Series MA

A variety of models

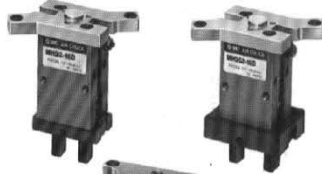
Assembly robot adaptors
 Series **MA2**
 φ8, φ10, φ11, φ14, φ15, φ20
 Series **MA3**
 φ10, φ11, φ14, φ15, φ20, φ24, φ25



Dedicated air chuck: 8 types (φ10-φ20)

Standard type 10D
MHQ2-16D 20D

High rigidity type 10D
MHQG2-16D 20D



Rotary driving type
MHR2-10 15



Electric contact point extension unit
 (8 points can be added.)

Added to standard AHC unit



Added to standard tool adaptor



(Series **MA3** only)

90° reversing unit

With two tools, one robot can be used for two kinds of work. An auto switch for positioning can be mounted.



(Series **MA3** only)

Tool stand



The tool setting height is adjustable. An auto switch for tool detection can be mounted.

AHC System/Series Variation

		MA210	MA31 ⁰ ₁				MA32 ⁰ ₁			
Electric specifications		Without D subconnector	Without D subconnector	D subconnector take-out	With D subconnector	With robot cable	Without D subconnector	D subconnector take-out	With D subconnector	With robot cable
AHC unit	Robot adaptor	Nil	●	●	●	●	●	●	●	●
		φ8	●	—	—	—	—	—	—	—
		φ10	●	●	●	●	●	●	●	●
		φ11	●	●	●	●	●	●	●	●
		φ14	●	●	●	●	●	●	●	●
		φ15	●	●	●	●	●	●	●	●
		φ20	●	●	●	●	●	●	●	●
		φ24	—	●	●	●	●	●	●	●
Tool adaptor	Port	M3	—	—	●	—	—	●	—	—
		M5	—	—	—	●	—	—	●	—

		MA210	MA31 ⁰ ₁				MA32 ⁰ ₁			
Electric specifications		Without D subconnector	Without D subconnector	D subconnector take-out	With D subconnector	With robot cable	Without D subconnector	D subconnector take-out	With D subconnector	With robot cable
Dedicated parallel opening/closing air chuck	MHR2	φ10	●	—	●	—	—	—	●	—
		φ15	●	—	●	—	—	—	●	—
	MHQ2	φ10	●	—	—	—	—	—	—	—
		φ16	●	—	●	—	—	—	●	—
	MHQG2	φ20	—	—	●	—	—	—	●	—
		φ10	●	—	—	—	—	—	—	—
		φ16	●	—	●	—	—	●	—	
		φ20	—	—	●	—	—	●	—	
90° reversing unit		—	—	—	●	—	—	—	●	—
Tool stand		●	—	—	●	—	—	—	●	—
Extension unit	For Y	—	—	—	●	—	—	—	●	—
	For A	—	—	—	●	—	—	—	●	—

Series	MA3 ₂ 0	MA3 ₂ 1	MA210
Coupling method	<ol style="list-style-type: none"> Supply 0.4~0.7MPa {4.1~7.1kgf/cm²} compressed air to the operation port. As shown below, align the AHC unit and tool adaptor, bring the AHC unit near the tool adaptor within 0.5mm concentric circles, and insert the pilot pin into the pilot hole on the tool adaptor side. Bring the AHC unit closer until the t dimension shown below will be 0~2mm larger than the dimension measured when the AHC unit and tool adaptor are coupled. Discharge the compressed air from the operation port. 	<ol style="list-style-type: none"> Supply 0.4~0.7MPa {4.1~7.1kgf/cm²} compressed air to the uncoupling port. Discharge the compressed air from the uncoupling port and, at the same time, supply 0.4~0.7MPa {4.1~7.1kgf/cm²} compressed air to the coupling port. Discharge the compressed air from the operation port. 	<ol style="list-style-type: none"> Supply 0.4~0.7MPa {4.1~7.1kgf/cm²} compressed air to the operation port. Lift the AHC unit 12mm or more.
	<ol style="list-style-type: none"> Supply 0.4~0.7MPa {4.1~7.1kgf/cm²} compressed air to the operation port. Lift the AHC unit 12mm or more. 	<ol style="list-style-type: none"> Discharge the compressed air from the coupling port and, at the same time, supply 0.4~0.7MPa {4.1~7.1kgf/cm²} compressed air to the uncoupling port. Lift the AHC unit 12mm or more. 	<ol style="list-style-type: none"> Supply 0.4~0.7MPa {4.1~7.1kgf/cm²} compressed air to the operation port. Lift the AHC unit 12mm or more.
Coupling·uncoupling method	<p>Uncoupled state</p> <p>Coupled state</p>	<p>Uncoupled state</p> <p>Coupled state</p>	<p>Uncoupled state</p> <p>Coupled state</p>

Robot adaptor mounting	<p>[Mounting adaptor on AHC unit] Mount the robot adaptor on the AHC unit, and evenly tighten the four hexagon socket head bolts with the maximum tightening torque shown below.</p> <p>[Mounting AHC unit on assembly robot] Mount the AHC unit on the shaft of the assembly robot, and evenly tighten the four hexagon socket head bolts with the maximum tightening torque shown below.</p>

Usage and Precautions

Series	MA3	MA210
Usage of dedicated air chuck	<p>1 According to the positional relationship shown below, the tool adaptor and air chuck can be coupled at every 120° in three directions. Select the best condition.</p>	
	<p>2 Evenly tighten the three hexagon socket head bolts with the maximum tightening torque of 1.06N·m{10.8 kgf·cm}.</p> <p>3 Check that the air chuck is correctly equipped with an O-ring or gasket and the tool adaptor seat is free of dust before mounting.</p>	
Mounting	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Types MHQ2-MHQG2</p> </div> <div style="text-align: center;"> <p>Type MHR2</p> </div> </div> <div style="text-align: center; margin-top: 20px;"> </div>	
Piping/wiring method	<p>1 The bracket is provided with a passage, so piping for the tool adaptor is unnecessary. Provide piping on the AHC unit side alone. The bracket is equipped with a piping port mark for reference.</p> <ul style="list-style-type: none"> • Finger closing port - "S" mark • Finger opening port - "O" mark <p>2 When an auto switch is used, solder its cables to the terminals provided on the tool adaptor.</p>	
90° reversing unit	<p>1 The 90° reversing unit can be mounted at every 60° in 6 directions according to the positions shown below.</p> <p>2 Mount the 90° reversing unit on the tool adaptor, and evenly tighten the three M3x16 hexagon socket head bolts with the maximum tightening torque of 1.06N·m{10.8kgf·cm}.</p>	
	<div style="text-align: center;"> </div> <p>1 Connect the driving air pipe for the tool and rotary actuator to the air port of the tool adaptor.</p> <p>2 When an auto switch is used, solder its cables to the terminals provided on the tool adaptor.</p>	
Mounting electric contact point extension unit	<p>1 Position the AHC unit and staged tool adaptor correctly as shown below, and tighten the two M2.5x10 hexagon socket head bolts with the maximum tightening torque of 0.3N·m{3.2kgf·cm}.</p> <div style="text-align: center; margin-top: 20px;"> </div>	

Series

MA3 ■ ■ ■

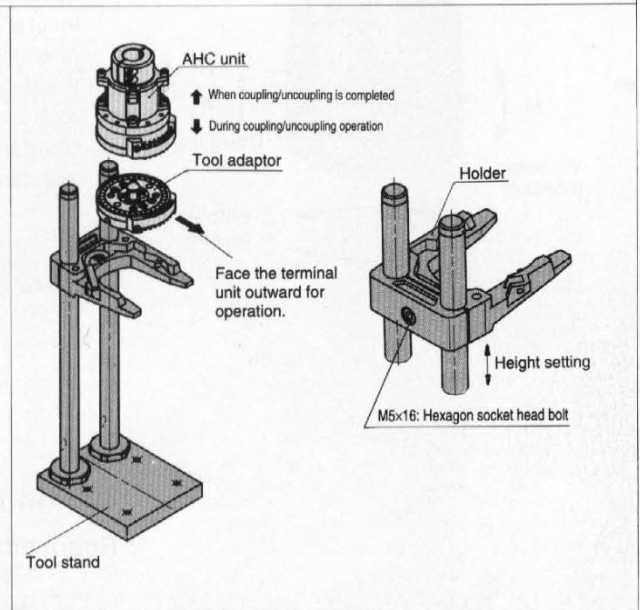
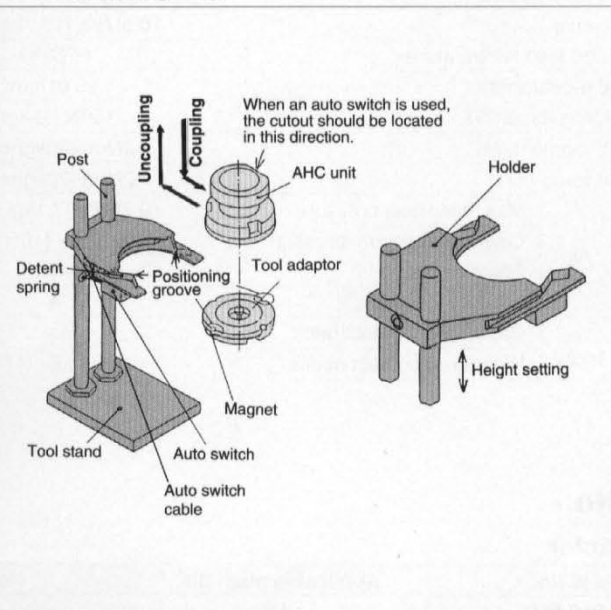
MA210

Usage of tool stand

- 1 Align the positioning groove in the tool adaptor and the detent spring of the tool stand. When an auto switch is used, align it with the magnet in the tool adaptor as shown in the figure on the bottom left-hand side. Changing the auto switch to the right-hand side will permit the use in 180° reversed position. At this time, make sure that the cable of the auto switch is on the post side. Tighten the auto switch mounting screws with the maximum tightening torque of 0.1N·m{1kgf·cm}.
- 2 Mount the AHC unit horizontally before coupling/uncoupling the AHC unit to/from the tool adaptor.

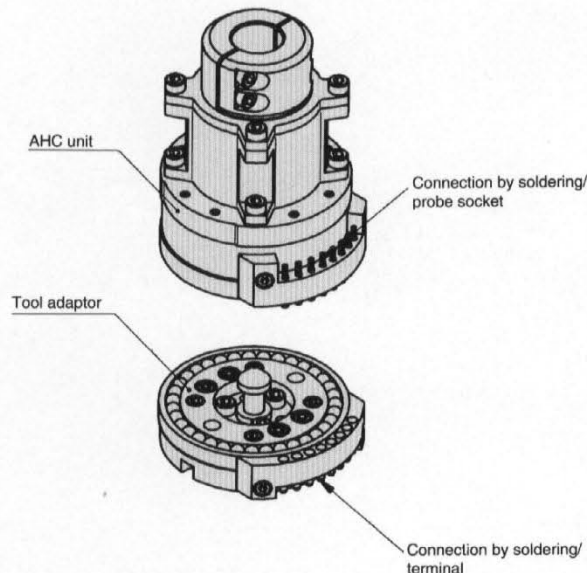
- 1 Position the tool adaptor and tool stand as shown below.
- 2 Couple/uncouple the AHC unit to/from the tool adaptor in the vertical direction of the AHC unit.

- 3 Loosen the hexagon socket head bolt, and after setting the holder height, tighten the bolt with the maximum tightening torque of 5N·m{52kgf·cm}.



Precautions for piping·wiring

- 1 Use our small one-touch fittings, "One-touch mini (M3, M5) or miniature one-touch fittings (M3, M5). The piping should thoroughly be flushed before connection to prevent entry of dust or chips.
- 2 Solder cables to the probe socket of the AHC unit and adaptor terminals but not to the D subconnector take-out. It is recommended to insulate the soldered section by heat shrinkage tubes, etc.
- 3 Take care that piping and wiring are not subjected to tension, twist, or other external forces.



AHC System / Auto Hand Changing System

Series MA2



Specifications

Series		MA210	
Positioning method		Ball coupling	
Max. load capacity		3kg	
Operation method		Single-acting/Air supply when uncoupled	
Operating air pressure		0.4~0.7MPa {4.1~7.1kgf/cm ² }	
Proof pressure		10.5MPa {10.7kgf/cm ² }	
Ambient and fluid temperature		0~60°C	
Positional repeatability		±0.01mm	
Axial coupling force (W)		150N {15kgf}	
Withstand moment (M)		2N·m {20kgf·cm}	
Withstand torque (T)		2N·m {20kgf·cm}	
Interface	Air	Max. operating pressure	0.7MPa {7.1kgf/cm ² }
		Operating vacuum pressure	-100kPa ~ {10 Torr ~}
		Effective orifice	1mm ²
		Number of circuits	4
	Electricity	Capacity of contact point	2A/pc.
		Number of contact points	8

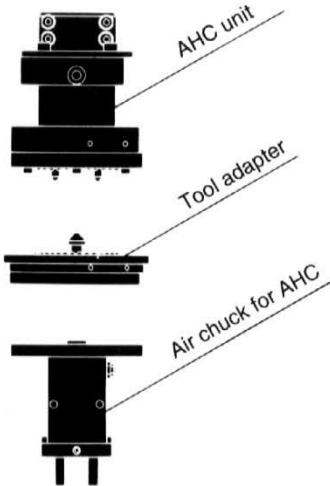
Option No.

Robot adaptor

Parts No.	Applicable shaft dia.	Notes
MA210-CS1	φ8	Hexagon socket head bolt M3×8 (4 pcs.) M3×10 (4 pcs.)
MA210-CR1	φ10	
MA210-CR2	φ11	
MA210-CR3	φ14	
MA210-CR4	φ15	
MA210-CR5	φ20	

How to Order

AHC unit



MA 210 — Y N M3 — **R3**

Auto Hand Changer
 Load capacity
2 Load capacity: 3kg

AHC unit

Electric specifications
N None

Air connection size
M3 M3×0.5

● Robot adaptor

Nil	without robot adaptor	
S1	φ 8	Applicable shaft dia.
R1	φ10	
R2	φ11	
R3	φ14	
R4	φ15	
R5	φ 20	

Tool adaptor

MA 210 — A M3

Auto Hand Changer

Load capacity
2 Load capacity: 3kg

Air connection size
M3 M3×0.5

● Tool adaptor

Air chuck for AHC

● Cylinder bore
10 10mm
15 15mm

φ10, φ15

MHR2 — **10** — A210

φ10, φ16

MHQ2 — **16** D — A210 — **Y69A** **S**

Cylinder bore
10 10mm
16 16mm
 With adaptor for MA210

● Suffix for auto switch
Nil With 2 pcs.
S With 1 pc.

● Type of auto switch

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

Tool stand

MA210 — S1 — **Y59A** **L**

Tool stand

● Lead wire length
Nil Grommet With 0.5m lead wire
L With 3m lead wire

● Type of auto switch

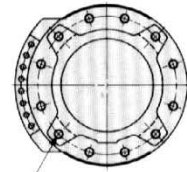
Nil	Without auto switch	
Y59A	D-Y59A (3-wire type)	Solid state auto switch
Y59B	D-Y59B (2-wire type)	Lead wire: Axial entry



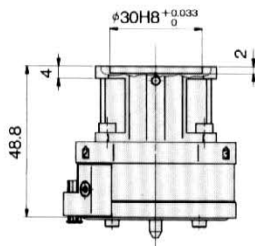
AHC Unit + Tool Adaptor

AHC unit/MA210-YNM3 (Without robot adaptor)
 AHC unit/MA210-YNM3-□ (With robot adaptor)
 Tool adaptor/MA210-AM3

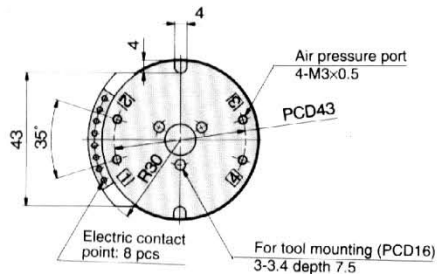
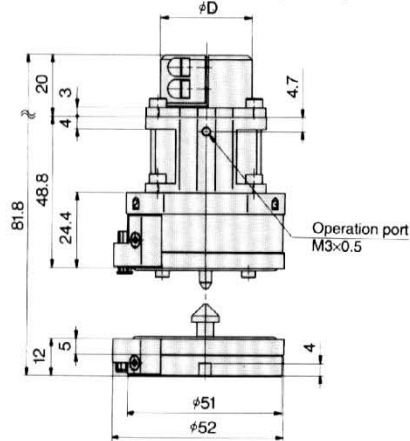
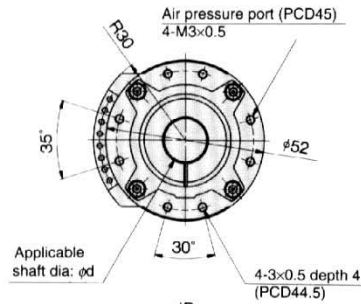
Scale: 41%



For robot adaptor mounting (PCD44.5)
 4-M3×0.5 through



AHC unit coupling section



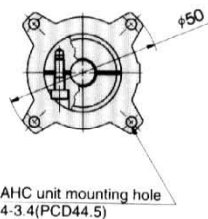
	Model	Applicable shaft dia. ϕd	ϕD	Weight (g)
AHC unit	MA210-YNM3	—	—	260
	MA210-YNM3-S1	8	25	300
	MA210-YNM3-R1	10	30	
	MA210-YNM3-R2	11		
	MA210-YNM3-R3	14		
	MA210-YNM3-R4	15		
	MA210-YNM3-R5	20		
Tool adaptor	MA210-AM3	—	—	100

Robot adaptor

MA210-C □ □

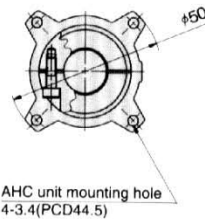
Parts No.	Applicable shaft dia.	Weight (g)
MA210-CS1	$\phi 8$	40
MA210-CR1	$\phi 10$	
MA210-CR2	$\phi 11$	
MA210-CR3	$\phi 14$	
MA210-CR4	$\phi 15$	
MA210-CR5	$\phi 20$	

MA210-CS1



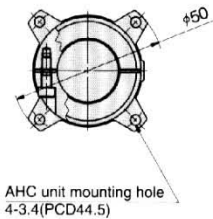
AHC unit mounting hole
 4-3.4(PCD44.5)

MA210-CR1·2·3·4

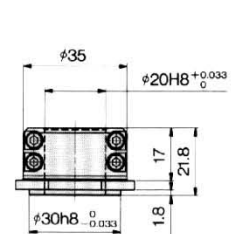
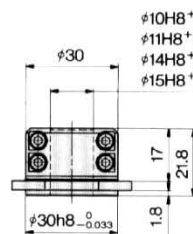
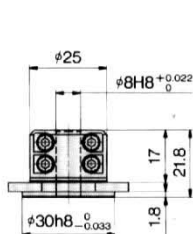


AHC unit mounting hole
 4-3.4(PCD44.5)

MA210-CR5



AHC unit mounting hole
 4-3.4(PCD44.5)





φ10, φ15 Air Chuck / Rotary Drive Type

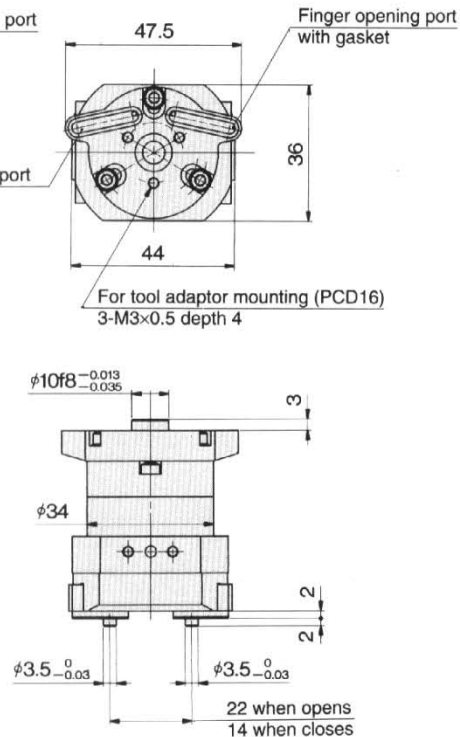
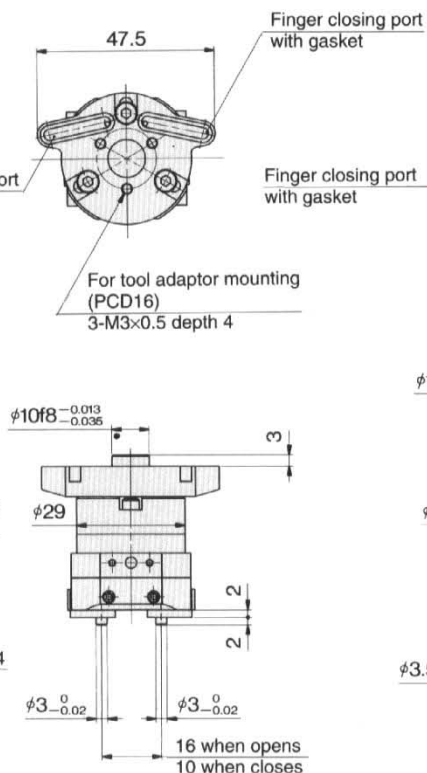
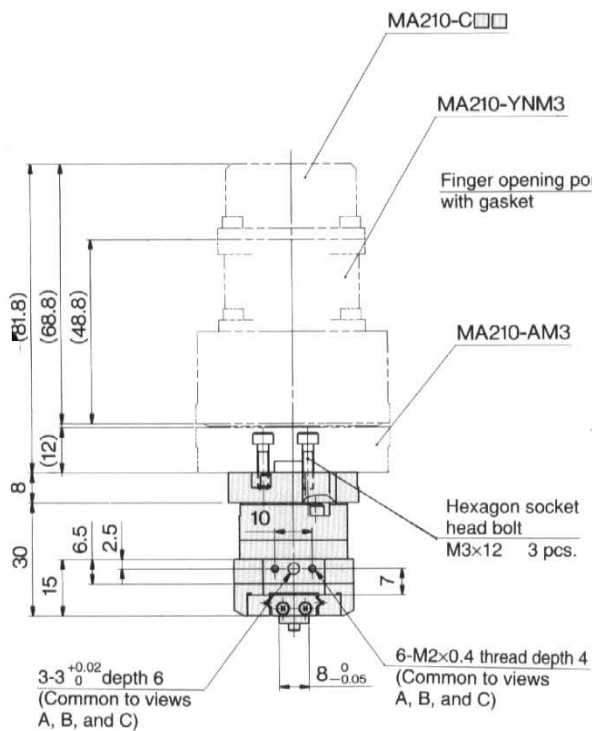
φ 10, φ 15 : MHR2-¹⁰/₁₅ -A210

Scale: 50%

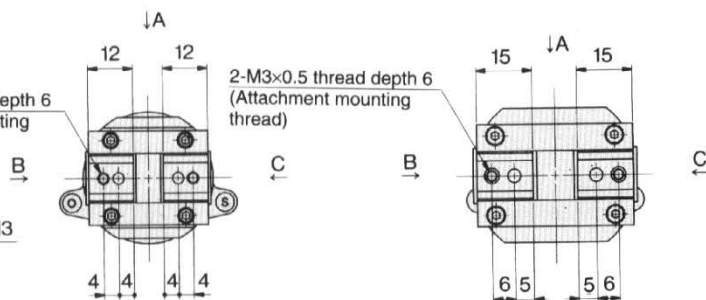
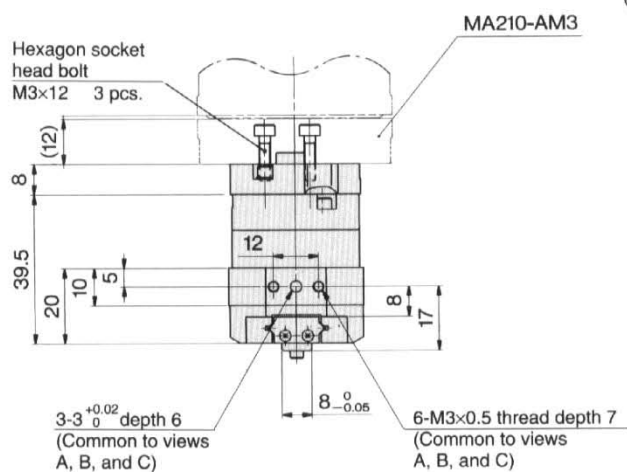
φ10
MHR2-10-A210

φ10
MHR2-10-A210

φ15
MHR2-15-A210



φ15 : MHR2-15-A210

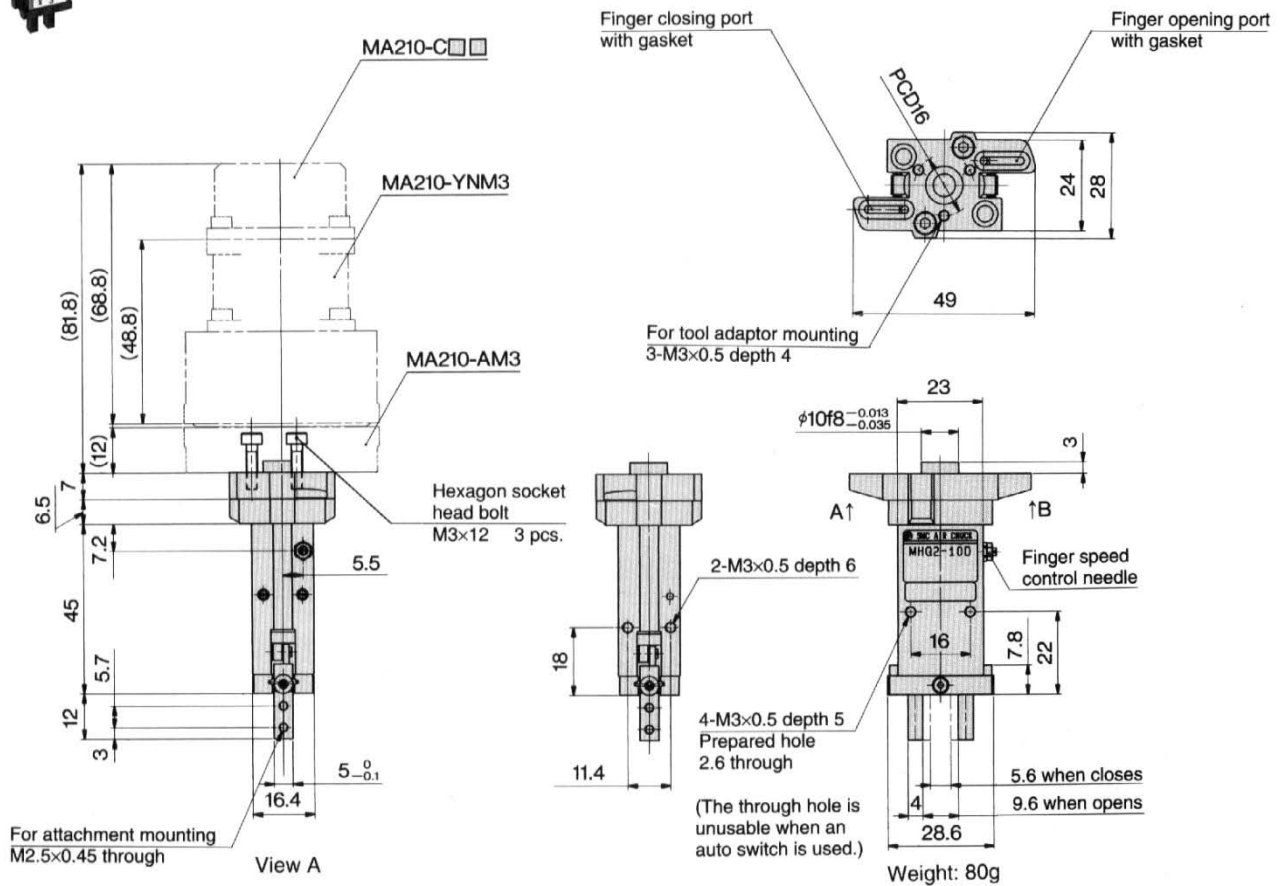




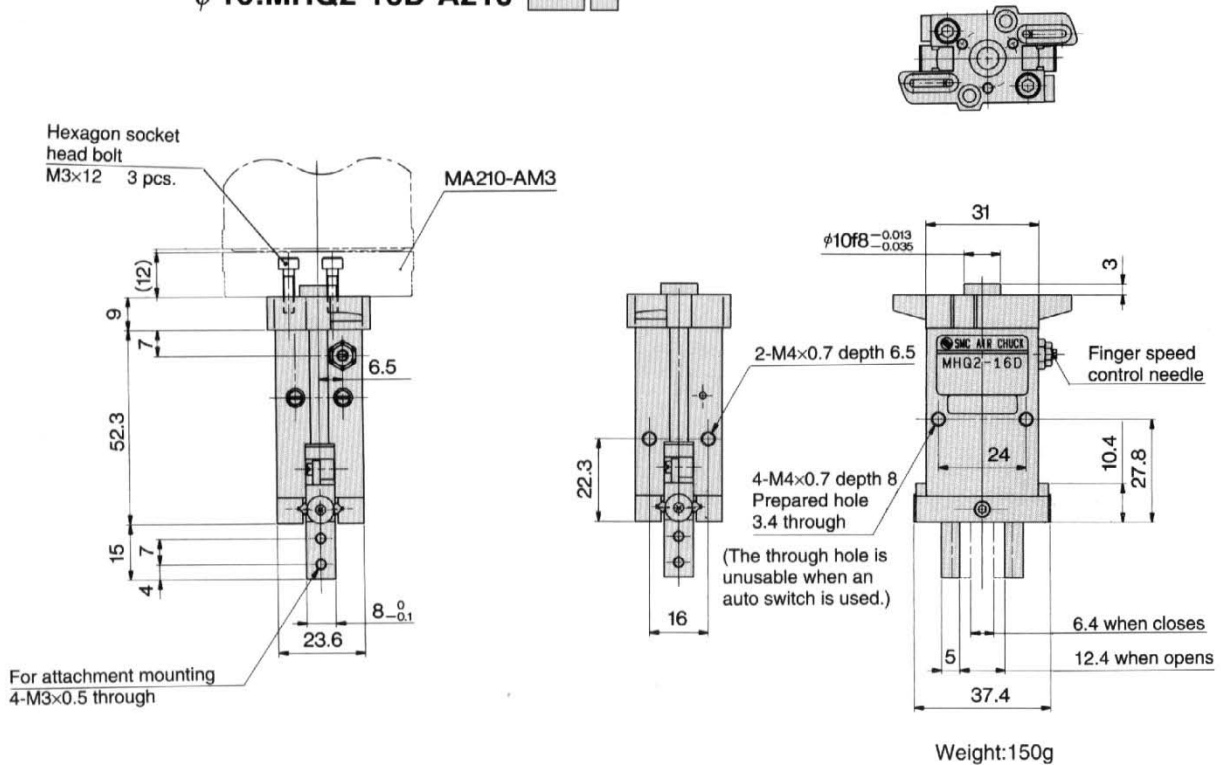
φ10, φ16 Air Chuck / Standard Type

φ10:MHQ2-10D-A210-

Scale: 50%



φ16:MHQ2-16D-A210-

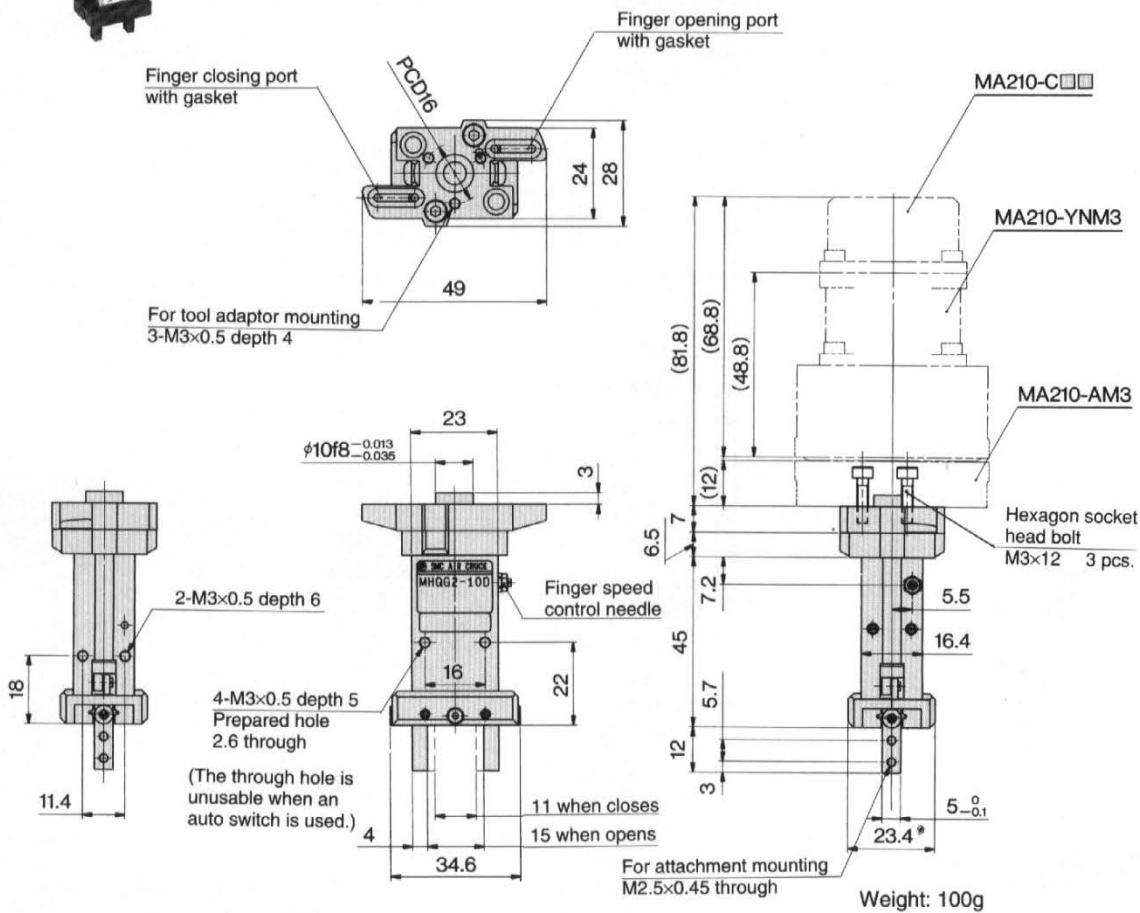


Note) Auto switches D-Y69A and D-Y69B alone are usable.
Refer to CAT.E230 for the details of the air chuck specifications.

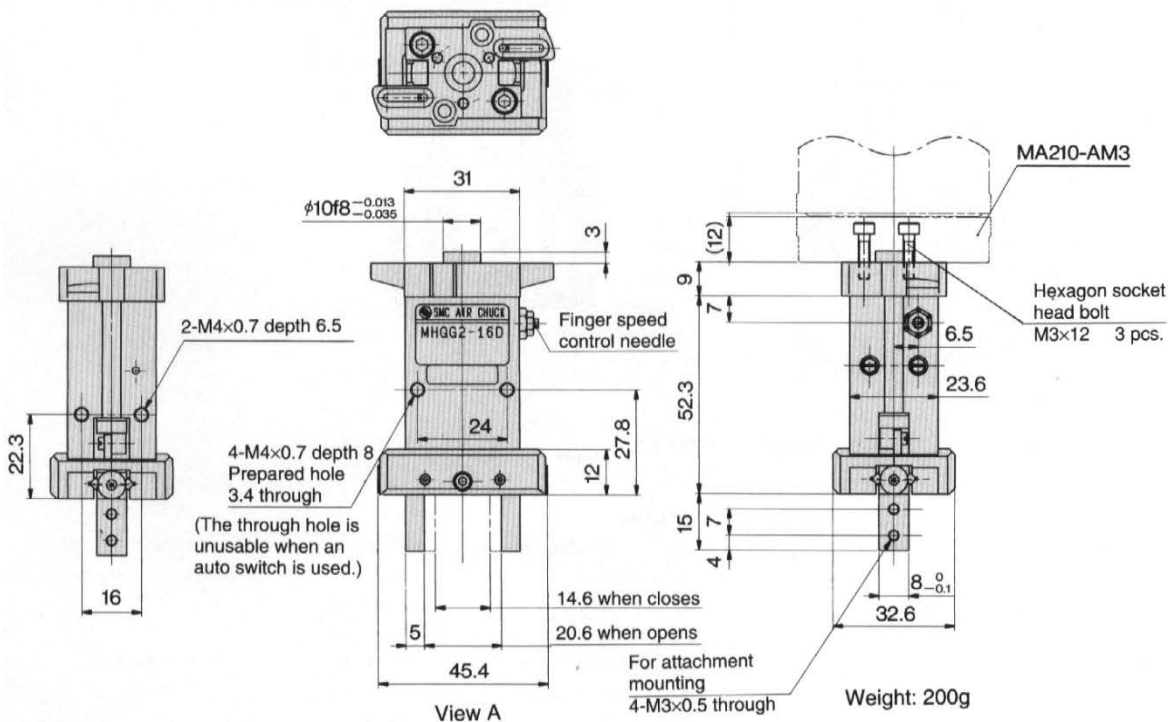


φ10, φ16 Air Chuck / High Rigidity Type

φ10:MHQG2-10D-A210-



φ 16:MHQG2-16D-A210-



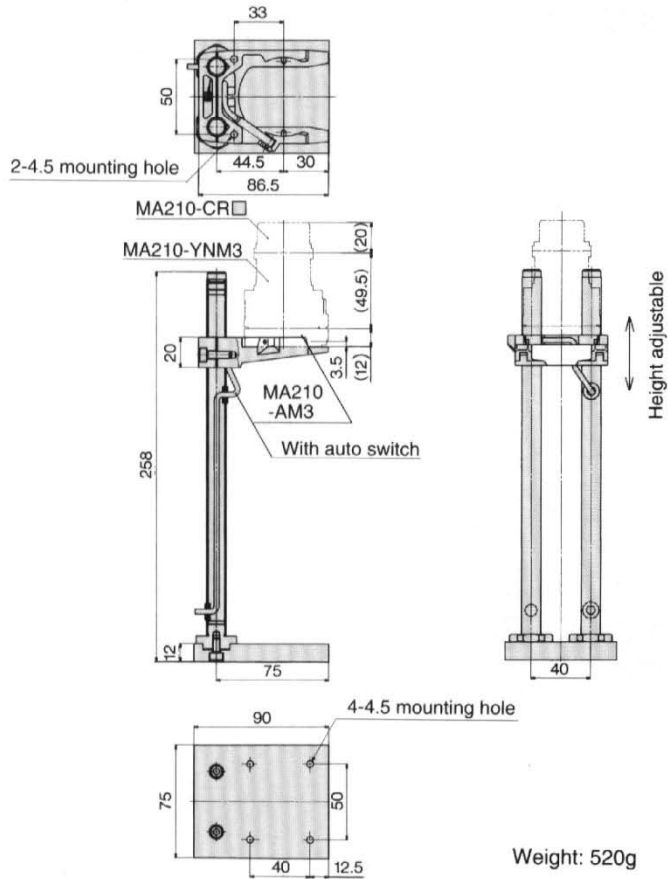
Note) Auto switches D-Y69A and D-Y69B alone are usable. Refer to CAT.E230 for the details of the air chuck specifications.



Tool Stand

MA210-S1-□

Scale: 20%

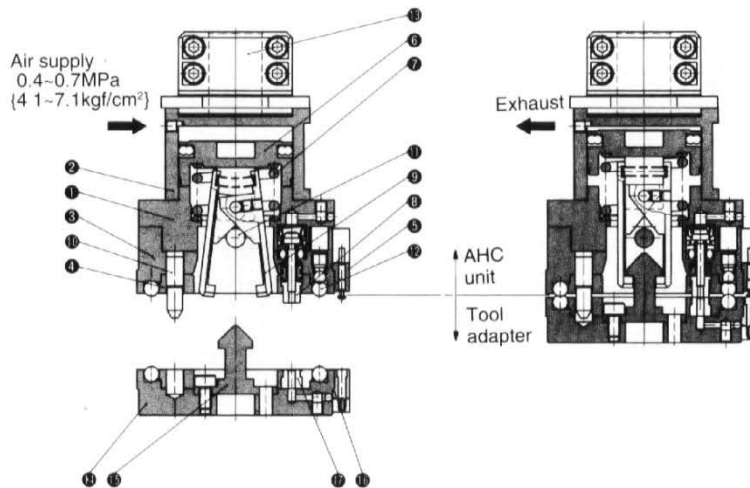


Construction/Parts List

Single-acting type

Uncoupled state

Coupled state



Parts list

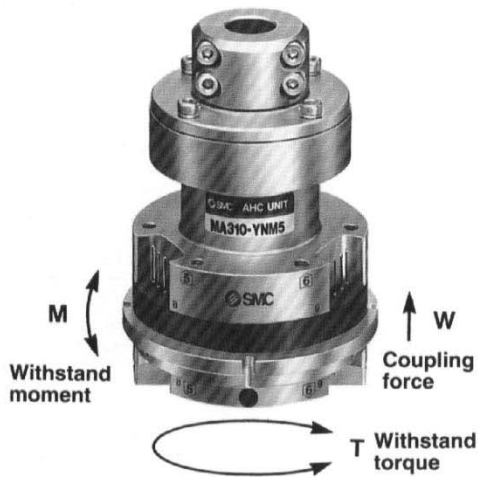
No.	Description	Material	Notes
①	Unit body	Aluminum alloy	Hard alumite
②	Head cap	Aluminum alloy	Hard alumite
③	Ball base	Aluminum alloy	Hard alumite
④	Ball cover	Carbon steel	
⑤	Contact probe ass'y		
⑥	Piston	Stainless steel	
⑦	Clamp spring	Steel wire	Zinc chromate
⑧	Check valve ass'y		
⑨	Lever	Carbon steel	Rust proofing by special black thin film

Parts list

No.	Description	Material	Notes
⑩	Pilot pin	Carbon steel	Rust proofing by special black thin film
⑪	Parallel pin	Stainless steel	
⑫	Steel ball	Stainless steel	
⑬	Robot adaptor	Aluminum alloy	Hard alumite
⑭	Tool adaptor	Aluminum alloy	Hard alumite
⑮	Hook	Carbon steel	Rust proofing by special black thin film
⑯	Contact block ass'y		Gilded contact point
⑰	Passage packing	Synthetic rubber	

AHC System / Auto Hand Changing System

Series MA3



Specifications

Series		MA310	MA311	MA320	MA321
Positioning method		Ball coupling		Curvic coupling	
Max. load capacity		5kg			
Operation method		Single-acting/ Air supply when uncoupled	Double-acting	Single-acting/ Air supply when uncoupled	Double-acting
Operating air pressure		0.4 ~ 0.7MPa {4.1 ~ 7.1kgf/cm ² }			
Proof pressure		10.5MPa {10.7kgf/cm ² }			
Ambient and fluid temperature		0 ~ 60°C			
Positional repeatability		±0.01mm			
Axial coupling force(W)		200N {20.4kgf}	500N {51kgf} (At 0.5MPa)	200N {20.4kgf}	500N {51kgf} (At 0.5MPa)
Withstand moment (M)		3 N·m {31kgf·cm}	7.5 N·m {76.5kgf·cm} (At 0.5MPa)	3 N·m {31kgf·cm}	7.5 N·m {76.5kgf·cm} (At 0.5MPa)
Withstand torque (T)		3 N·m {31kgf·cm}	7.5 N·m {76.5kgf·cm} (At 0.5MPa)	12 N·m {122kgf·cm}	30 N·m {310kgf·cm} (At 0.5MPa)
Inter- face	Air	Max. operating pressure		0.7MPa {7.1kgf/cm ² }	
		Operating vacuum pressure		-100kPa ~ {10 Torr~}	
		Effective orifice		1.3mm ²	
		Number of circuits		6	
	Elec- tricity	Capacity of contact point		2A/pc.	
		Number of contact points		12	

Option No.

Robot adaptor

Parts No.	Applicable shaft dia.	Notes
MA310-CR1	φ10	Hexagon socket head bolt M4×10 (4 pcs.) M4×14 (4 pcs.)
MA310-CR2	φ11	
MA310-CR3	φ14	
MA310-CR4	φ15	
MA310-CR5	φ20	
MA310-CS6	φ24	
MA310-CR6	φ25	

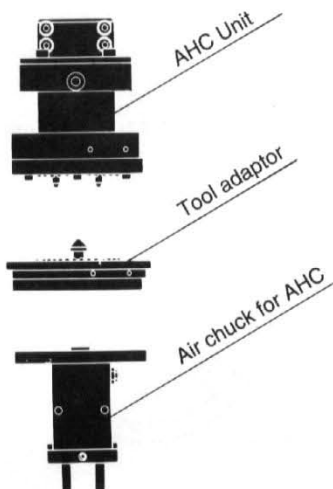
Electric contact point extension unit

Parts No.	Extension unit	Application	Notes
MA310-EY1	8 contact points	AHC unit	Hexagon socket head bolt M2.5×10(2pcs.)
MA310-EA1		Tool adaptor	

How to Order

AHC unit

MA 3 1 0 — Y A M5 — R3



Auto Hand Changer

Load capacity
3 Load capacity: 5kg

Positioning method
1 Ball coupling
2 Curvic coupling

Operation method
0 Single acting
1 Double acting

AHC unit

● Robot adaptor

Nil	without robot adaptor	
R1	φ10	Applicable shaft dia.
R2	φ11	
R3	φ14	
R4	φ15	
R5	φ20	
R6	φ25	

● Air connection size
M5 M5×0.8

● Electric specifications

Symbol	Without electric specifications	D subconnector
N	●	—
A	—	● (Without connector)
B	—	● (With connector)
C	—	● (With 3 m cable)

Tool adaptor

MA 3 10 — A M5

Auto Hand Changer

Load capacity
3 Load capacity: 5kg

Series
10 Ball coupling
20 Curvic coupling

● Air connection size
M3 M3×0.5
M5 M5×0.8

● Tool adaptor

Air chuck for AHC

● Cylinder bore
10 10mm
15 15mm

φ10, φ15

MHR2 — 10 — A310

φ16, φ20

MHQ2 — 16 D — A310 — Y69A S

Cylinder bore ● With adaptor for MA3
16 16mm
20 20mm

● Suffix for auto switch
Nil With 2 pcs.
S With 1 pc.

※ Use the tool adaptor MA3 1/2 0-AM3 when the air chuck for AHC is used.

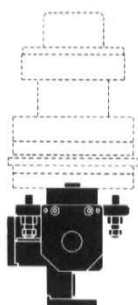
● Type of auto switch

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

90° reversing unit

MA310 — R1 — 90A

90° reversing unit



● Type of auto switch

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

※ Applicable to Series MA320.

Tool stand

MA310 — S1 — Y59A L

Tool stand



● Lead wire length
Nil Grommet With 0.5m lead wire
L With 3m lead wire

● Type of auto switch

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

※ Applicable to Series MA320.



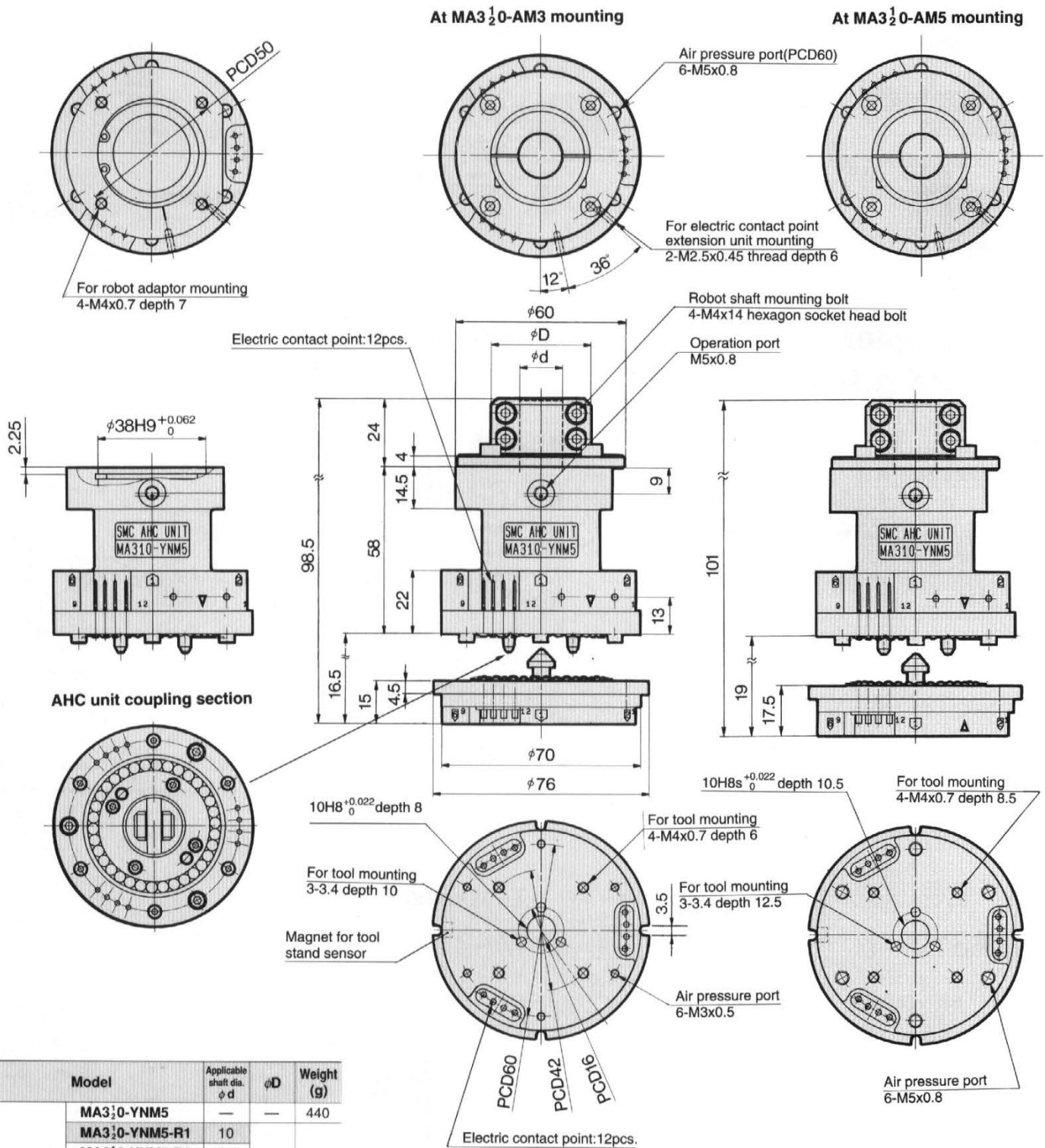
AHC Unit + Tool Adaptor / Single-acting Type

AHC unit/MA3½0-YNM5 (Without robot adaptor)

AHC unit/MA3½0-YNM5- (With robot adaptor)

Tool adaptor/MA3½0-A

Scale: 50%



	Model	Applicable shaft dia. φd	φD	Weight (g)
AHC unit	MA3½0-YNM5	—	—	440
	MA3½0-YNM5-R1	10	35	520
	MA3½0-YNM5-R2	11		
	MA3½0-YNM5-R3	14		
	MA3½0-YNM5-R4	15		
	MA3½0-YNM5-R5	20		
	MA3½0-YNM5-S6	24		
	MA3½0-YNM5-R6	25	41	
Tool adaptor	MA3½0-AM3	—	—	250
	MA3½0-AM5	—	—	270



AHC Unit + Tool Adaptor / Double-acting Type

AHC unit/MA3 1/2 1-YNM5 (Without robot adaptor)

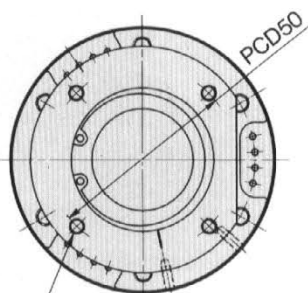
AHC unit/MA3 1/2 1-YNM5-□ (With robot adaptor)

Tool adaptor/MA3 1/2 1-A □

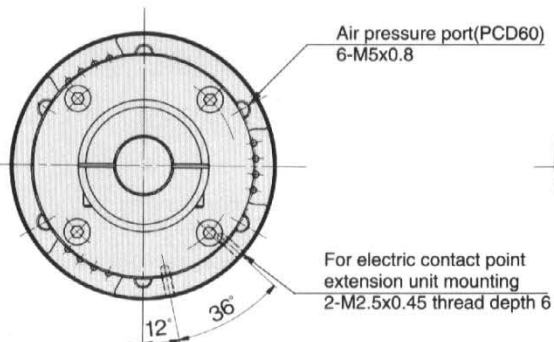
Scale: 50%

At MA3 1/2 1-AM3 mounting

At MA3 1/2 1-AM5 mounting

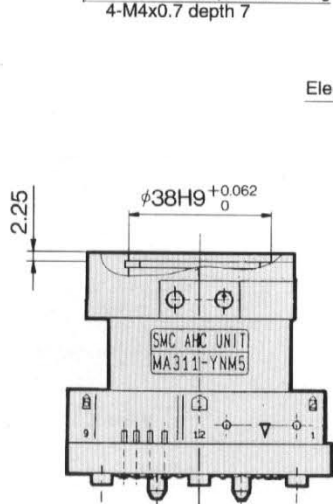
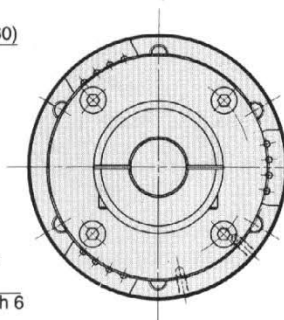


For robot adaptor mounting
4-M4x0.7 depth 7

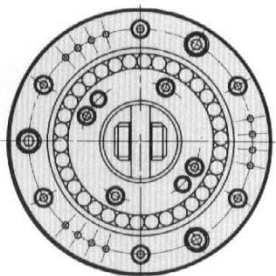
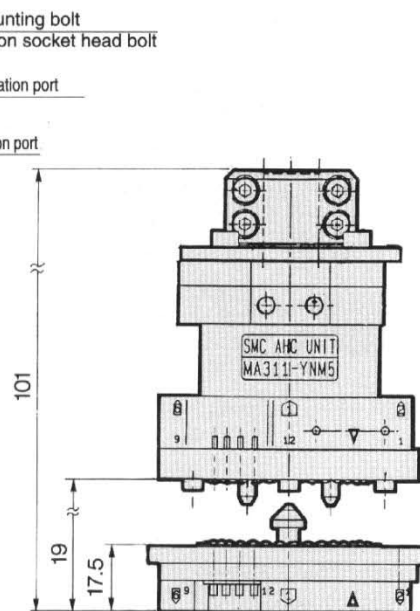
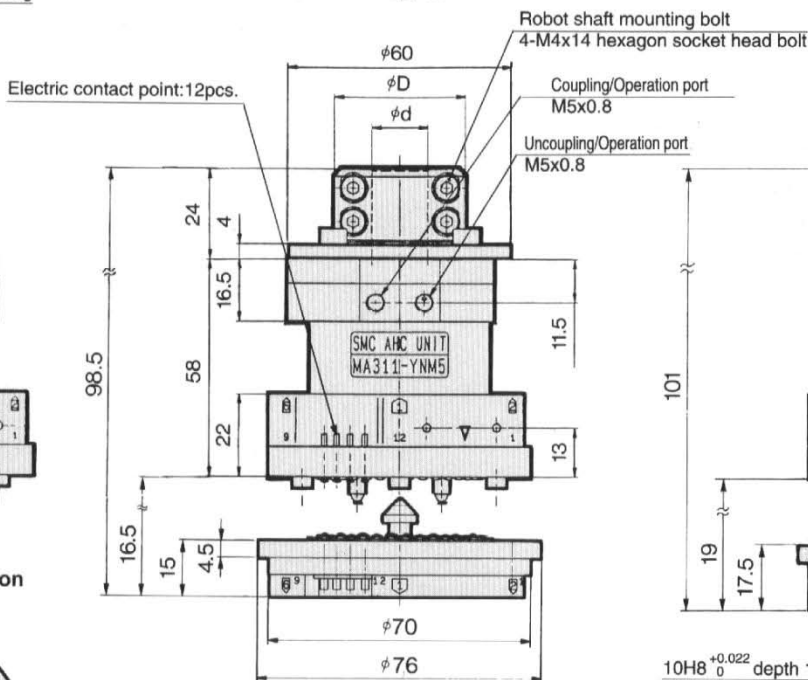


Air pressure port(PCD60)
6-M5x0.8

For electric contact point
extension unit mounting
2-M2.5x0.45 thread depth 6



AHC unit coupling section



10H8^{+0.022}/₀ depth 8

For tool mounting
3-3.4 depth 10

Magnet for tool
stand sensor

For tool mounting
4-M4x0.7 depth 6

For tool mounting
3-3.4 depth 12.5

Air pressure port
6-M3x0.5

10H8^{+0.022}/₀ depth 10.5

For tool mounting
4-M4x0.7 depth 8.5

Air pressure port
6-M5x0.8

Electric contact point: 12pcs.

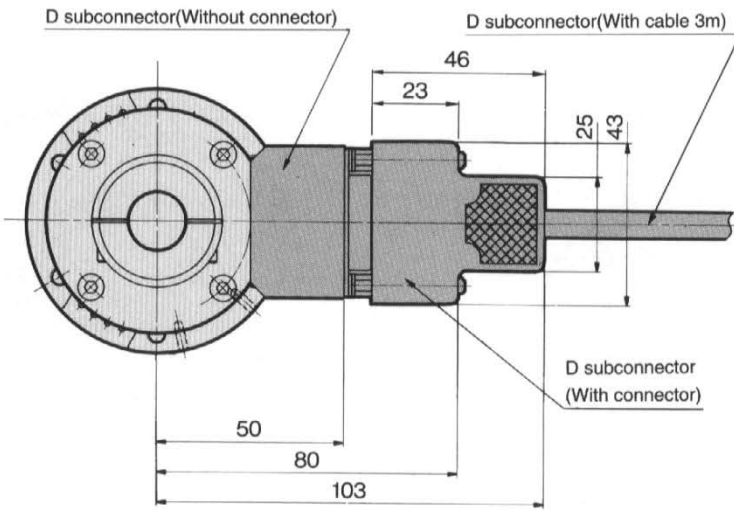
	Model	Applicable shaft dia. φ d	φ D	Weight (g)
AHC unit (Double-acting)	MA3 1/2 1-YNM5	—	—	500
	MA3 1/2 1-YNM5-R1	10	35	580
	MA3 1/2 1-YNM5-R2	11		
	MA3 1/2 1-YNM5-R3	14		
	MA3 1/2 1-YNM5-R4	15	41	
	MA3 1/2 1-YNM5-R5	20		
MA3 1/2 1-YNM5-R6	25			
Tool adaptor	MA3 1/2 0-AM3	—	—	250
	MA3 1/2 0-AM5	—	—	270



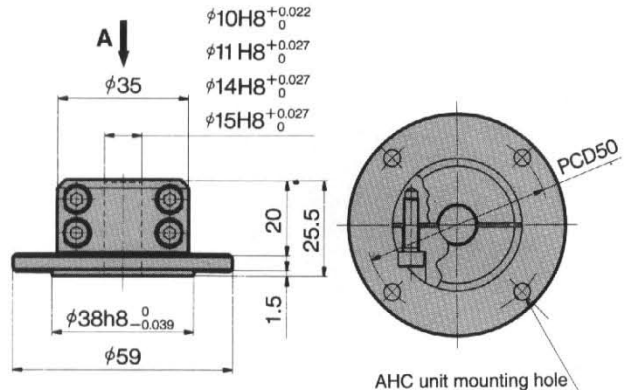
With D subconnector
MA3□□-Y□M5-□□

Robot adaptor
MA310-C□□

Scale: 50%

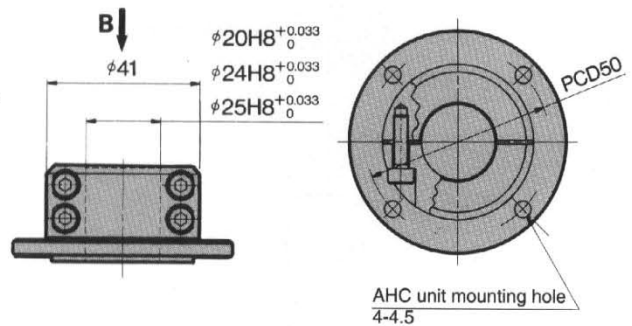


MA310-CR1·2·3·4

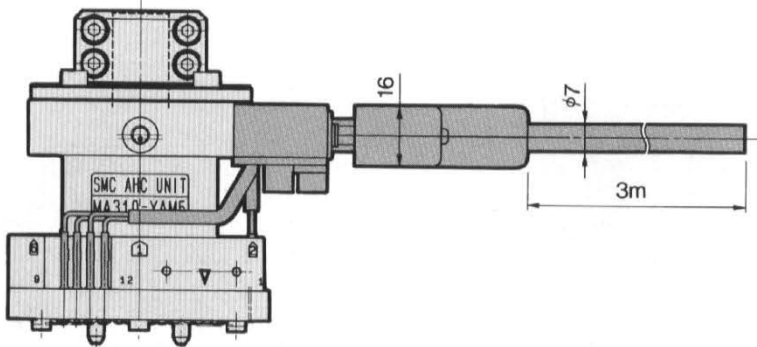


View A

MA310-CR5·6·CS6



View B



AHC unit Type with D subconnector	Weight (g)
MA3 1/2 0-YAM5-□□	600
MA3 1/2 0-YBM5-□□	620
MA3 1/2 0-YCM5-□□	890
MA3 1/2 1-YAM5-□□	660
MA3 1/2 1-YBM5-□□	680
MA3 1/2 1-YCM5-□□	950

Parts No.	Applicable shaft dia.	Weight (g)
MA310-CR1	φ10	80
MA310-CR2	φ11	
MA310-CR3	φ14	
MA310-CR4	φ15	
MA310-CR5	φ20	
MA310-CR6	φ25	

D subconnector

D subconnector specifications

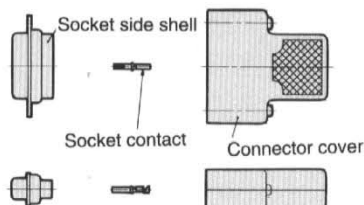
		AHC unit side	Robot cable side
D sub-connector	Contact classification	Pin	Socket
	Shell size	A	
	Number of cores	15	
Applicable connecting		Clamp connection type	
Robot cable	Orifice	—	0.2mm ²
	Number of cores	—	12

In case of MA3□□-YAM5-□□

The AHC unit has a pin contact, so prepare a socket contact.

In case of MA3□□-YBM5-□□ / with D subconnector

Twelve clamp connection type pin contacts are provided as standard equipment. The clamping tool CT150-2-D* $\text{\textcircled{C}}$ made by Japan Aviation Electronics Industry is recommended.

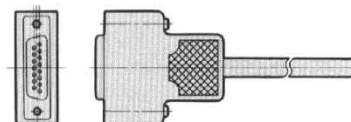


In case of MA3□□-YCM5-□□ / with robot cable

The relationship between the electric contact No. of the AHC unit and cables are shown below.

Electric contact point No./Cable wiring

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



$\phi 10, \phi 15$ Air Chuck / Rotary Drive Type

$\phi 10, \phi 15$:MHR2- $\frac{10}{15}$ -A310

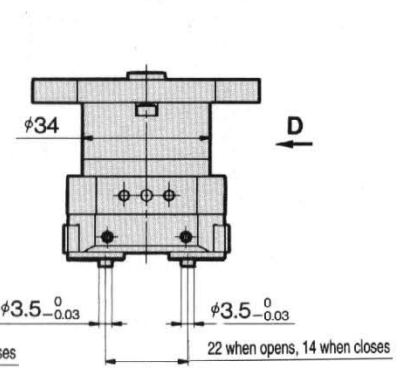
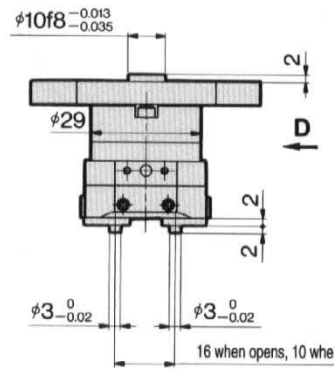
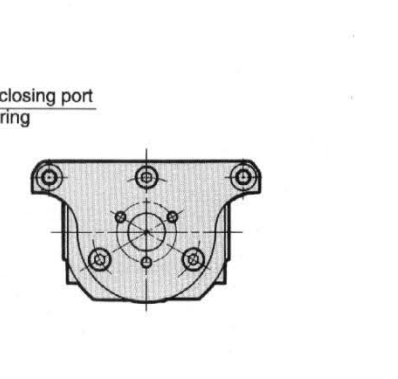
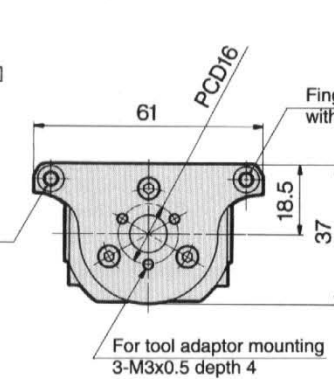
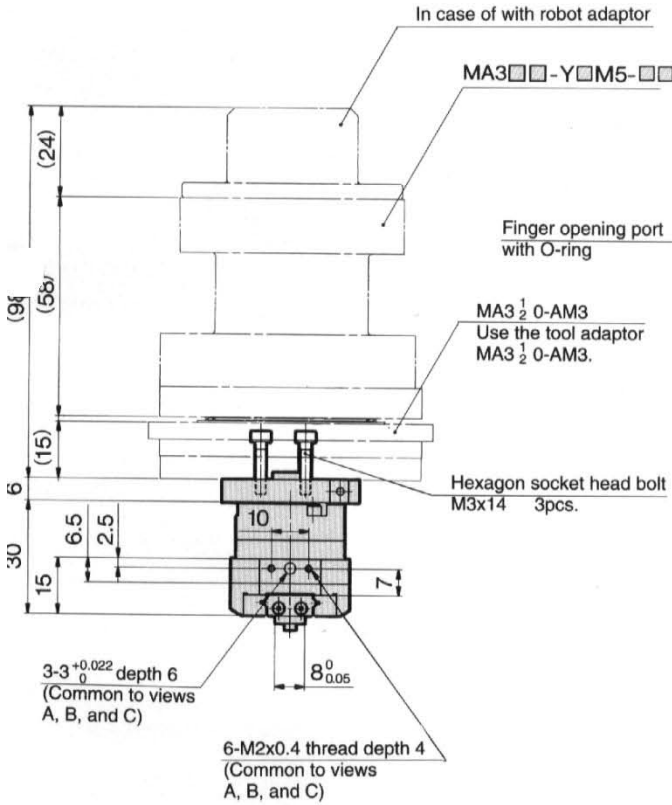
Scale: 50%



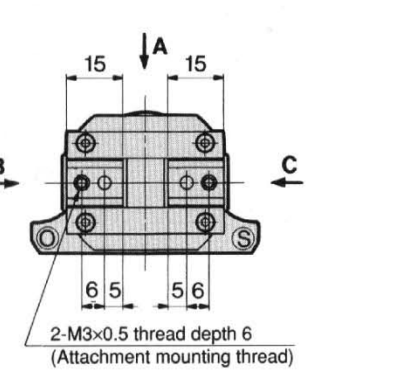
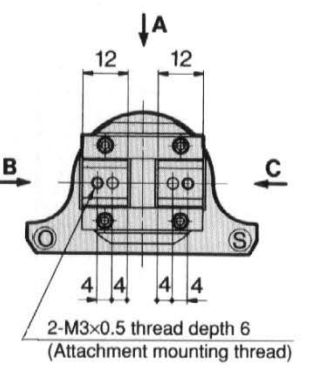
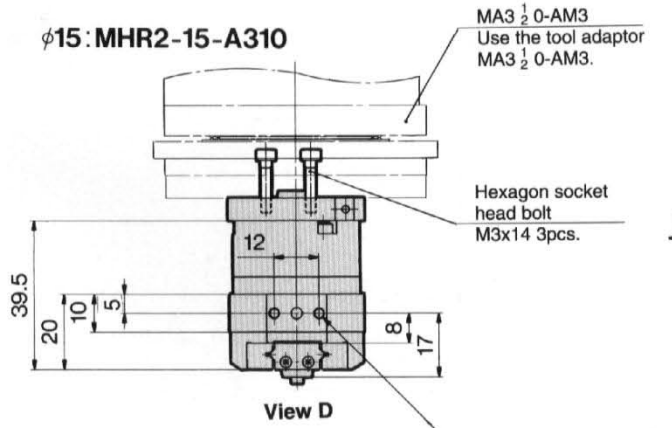
$\phi 10$
MHR2-10-A310

$\phi 10$
MHR2-10-A310

$\phi 15$
MHR2-15-A310



$\phi 15$:MHR2-15-A310



Weight:130g

Weight:210g

6-M3x0.5 thread depth 7
(Common to views
A, B, and C)

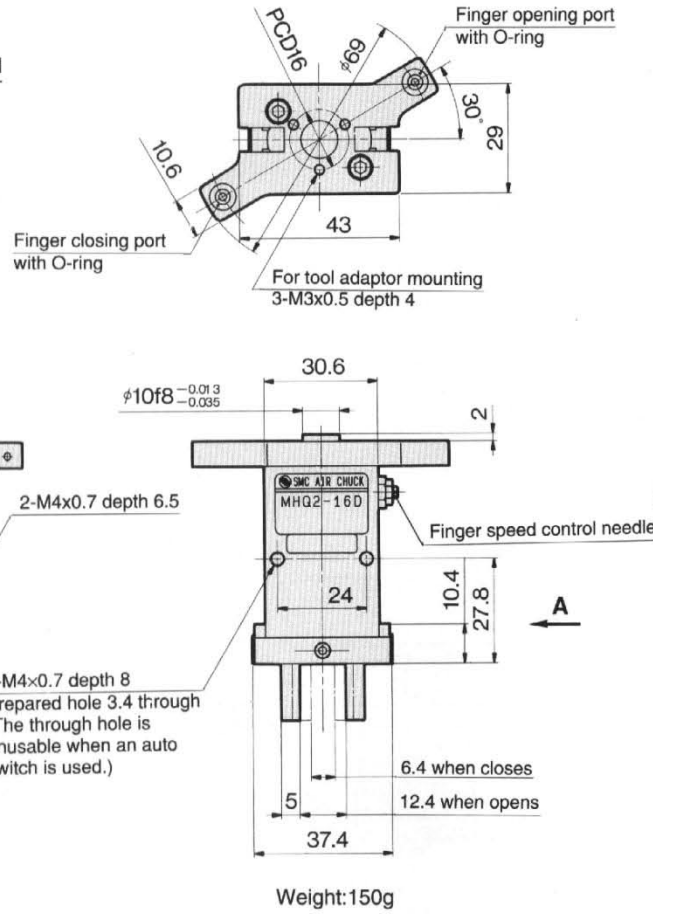
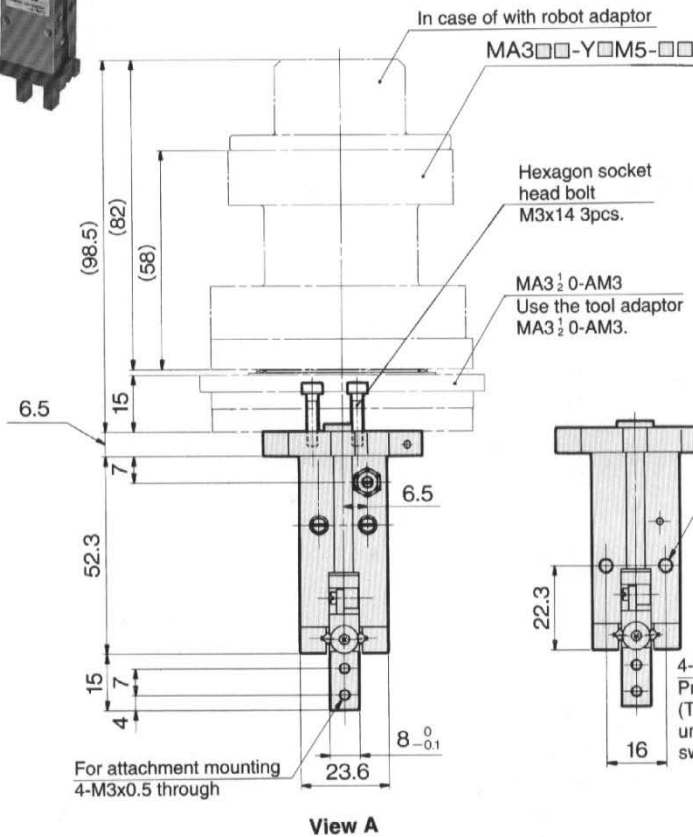
Note) Refer to CAT.E230 for the details of the air chuck specifications.



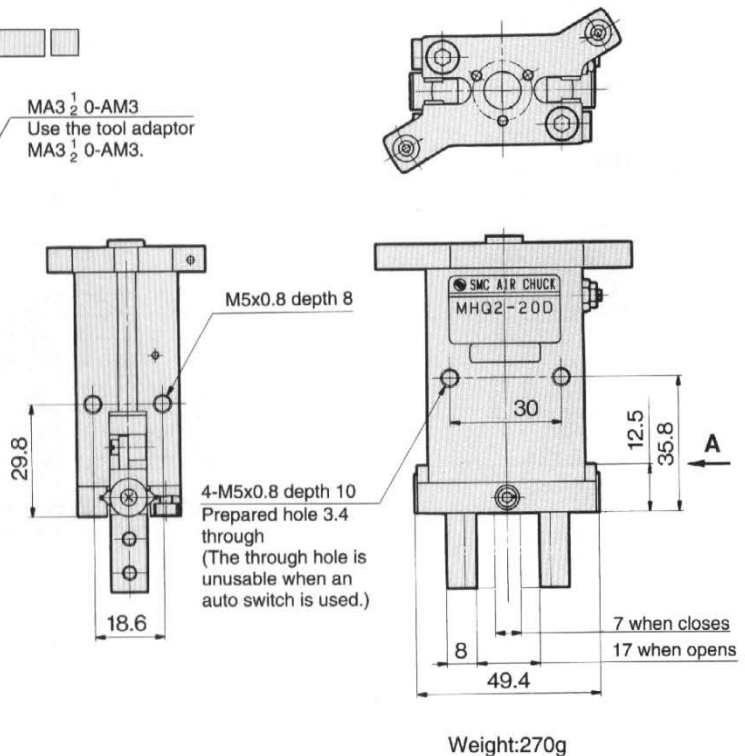
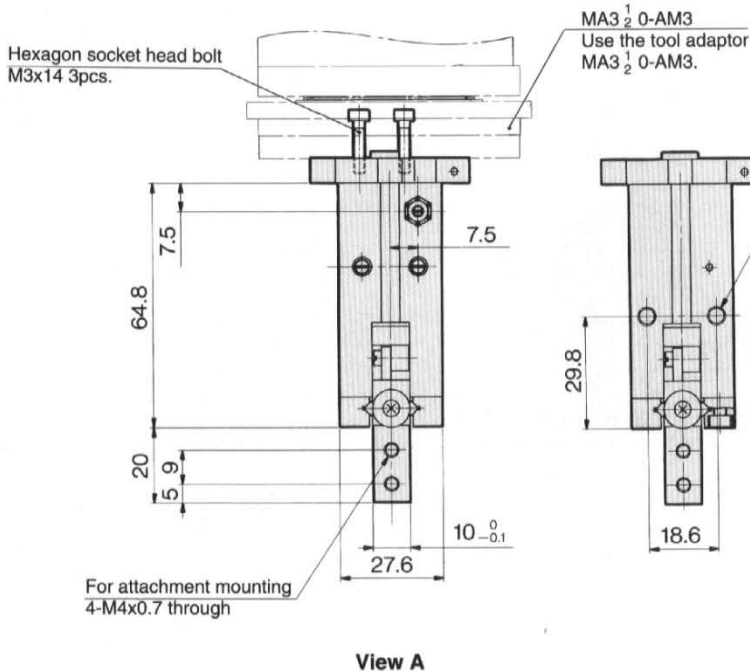
φ16, φ20 Air Chuck / Standard Type

φ16:MHQ2-16D-A310-

Scale: 50%



φ20:MHQ2-20D-A310-



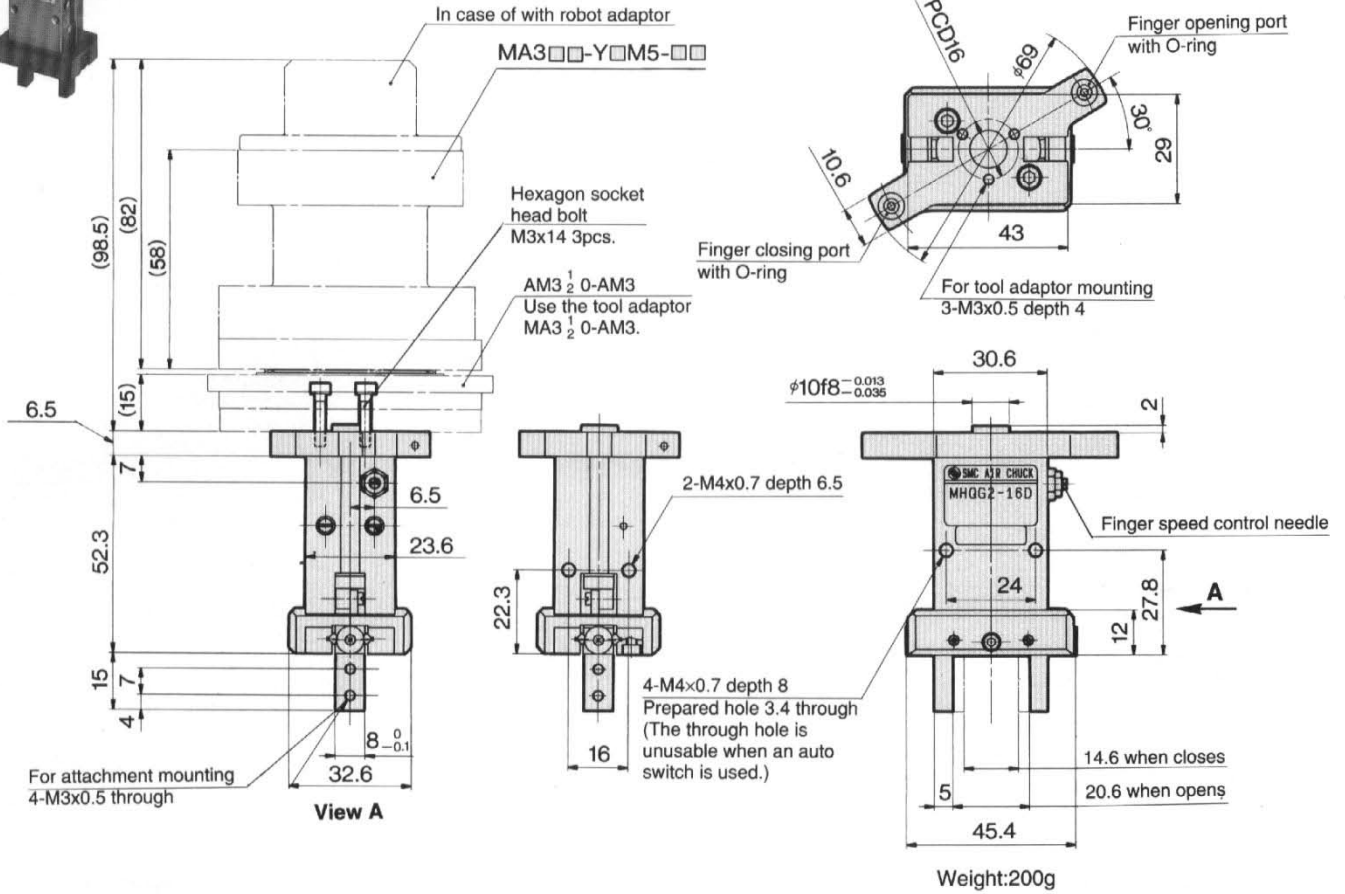
Note) Auto switches D-Y69A and D-Y69B alone are usable.
Refer to CAT.E230 for the details of the air chuck specifications.

φ16, φ20 Air Chuck / High Rigidity Type

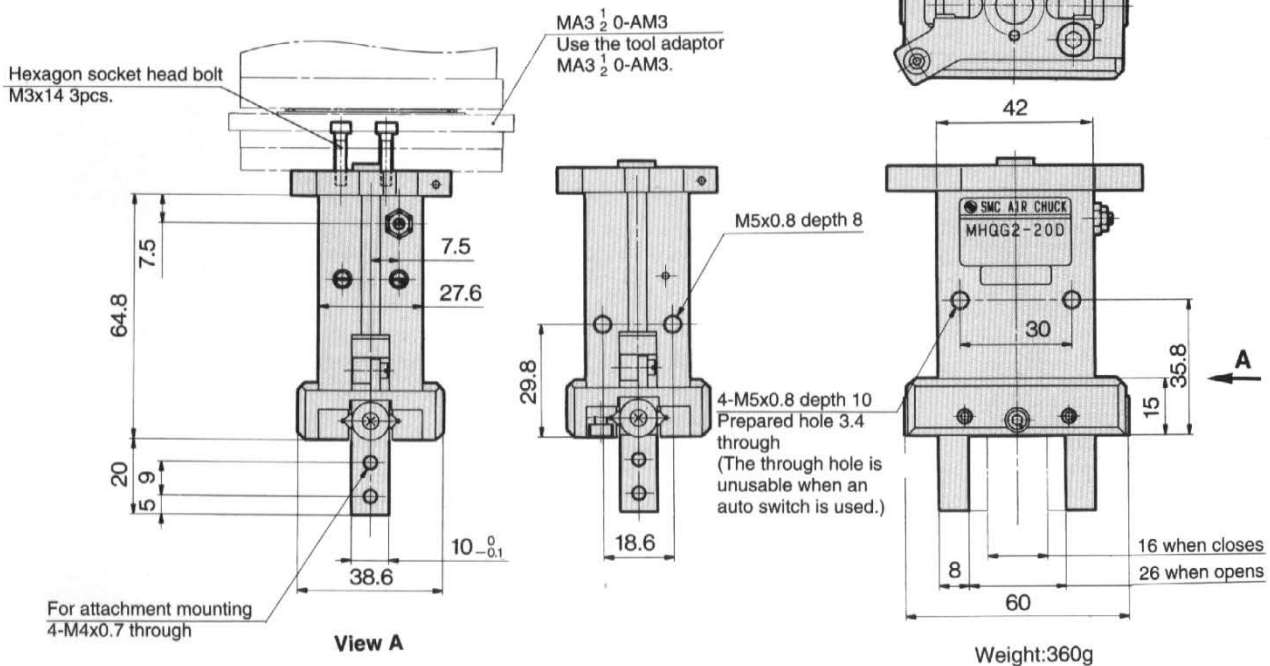


φ16:MHQG2-16D-A310-□□□□

Scale: 50%



φ 20:MHQG2-20D-A310-□□□□

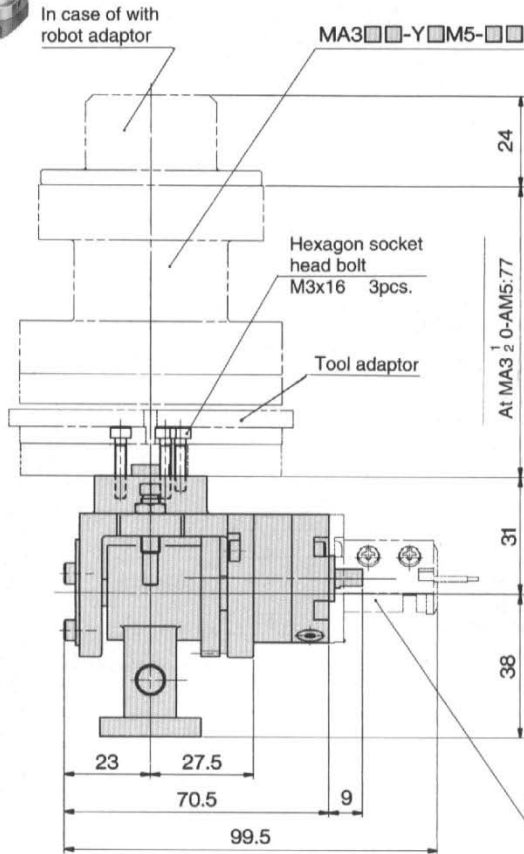


Note) Auto switches D-Y69A and D-Y69B alone are usable.
Refer to CAT.E230 for the details of the air chuck specifications.

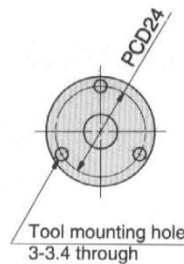
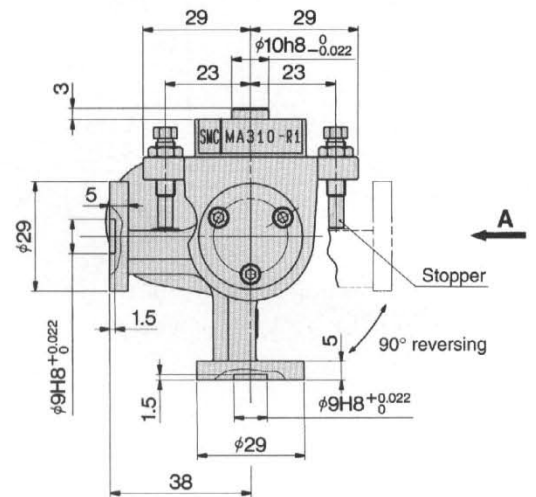
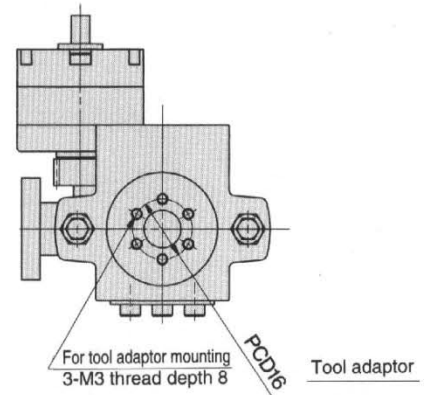
90° Reversing Unit

MA310-R1-

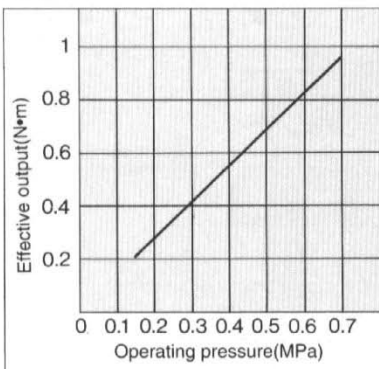
Scale: 50%



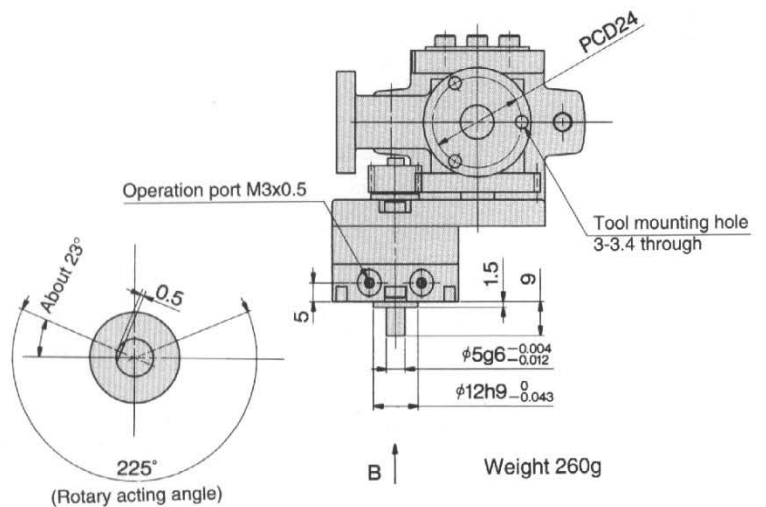
View A



Output table

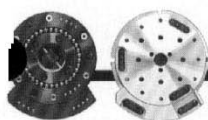


Converted value
 1MPa=10.1972kgf/cm²
 1N·m=10.1972kgf·cm



View B

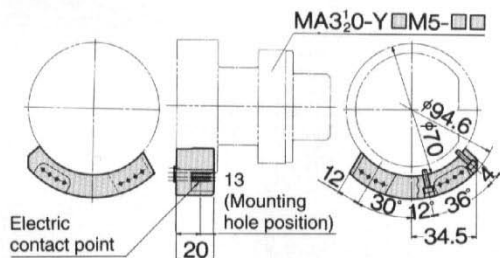
Contact us for operating conditions(load, speed, etc.)



Electric Contact Point Extension Unit

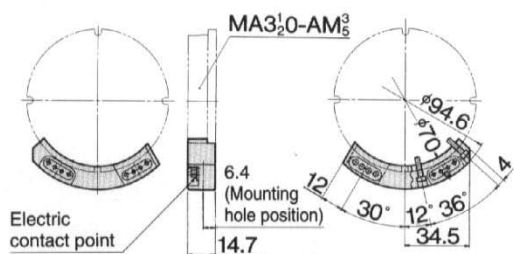
Scale: 25%

MA310-EY1: For AHC unit



Accessories	Hexagon socket head bolt M2.5x10 Flat washer, compact circle, nominal 2.5
Weight	20g

MA310-EA1: For tool adaptor

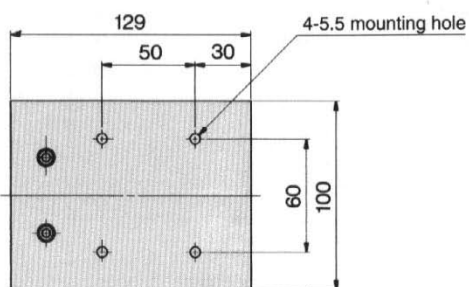
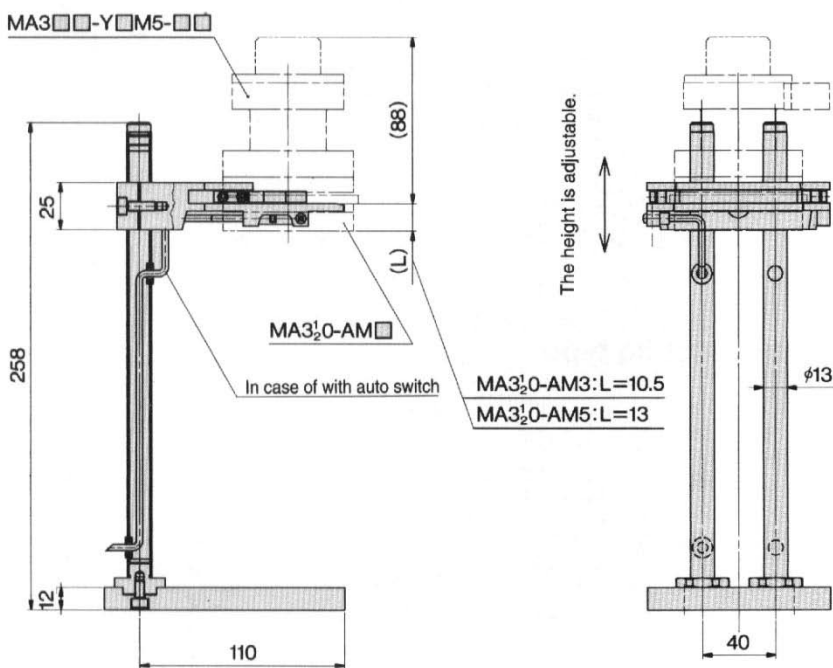
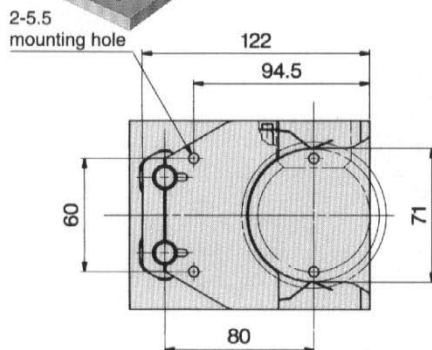


Accessories	Hexagon socket head bolt M2.5x10
Weight	25g



MA310-S1

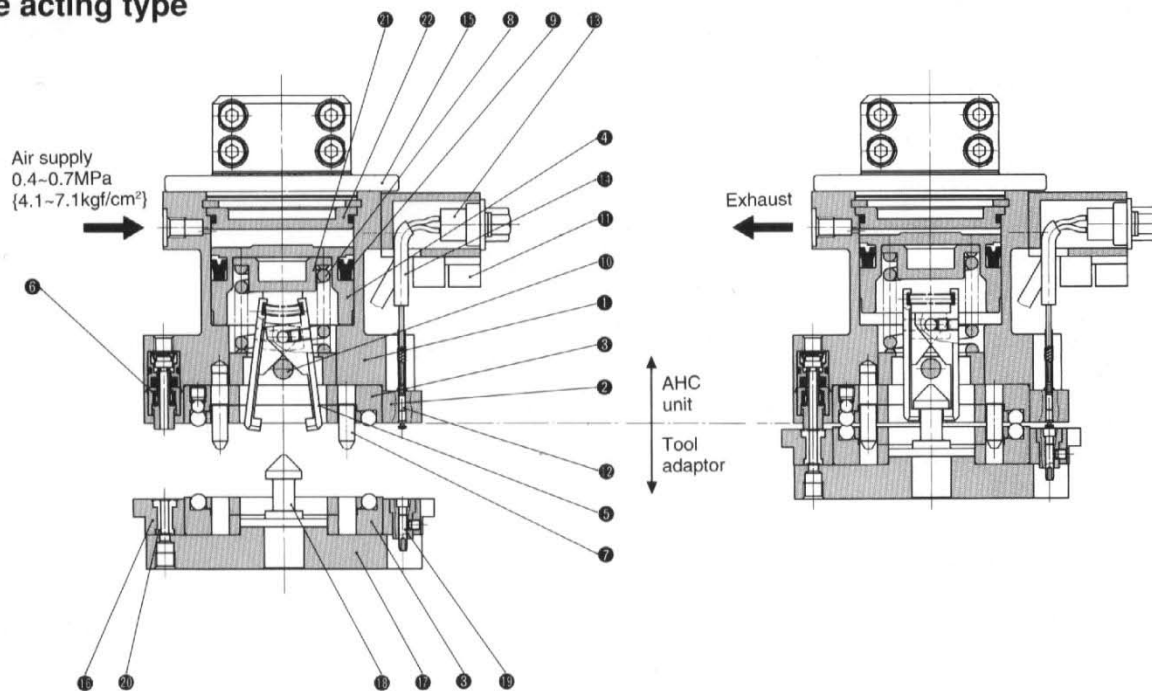
Scale: 25%



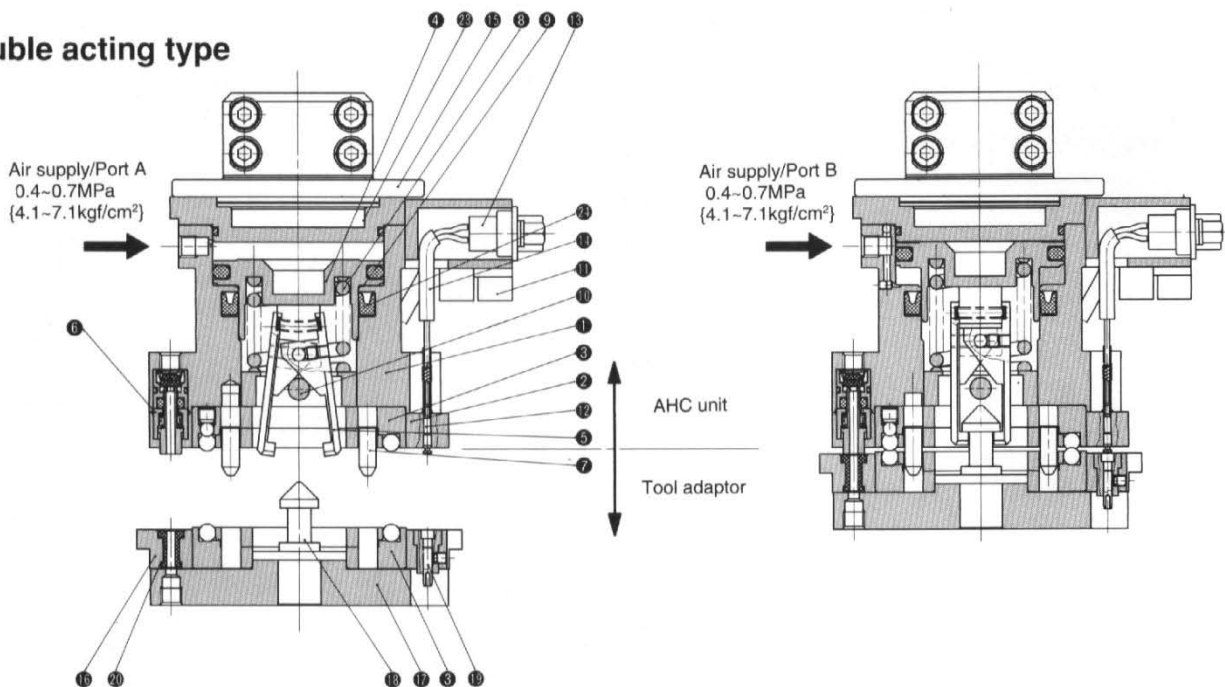
Weight: 950g

Construction / Parts List

Single acting type



Double acting type



Parts list

No.	Description	Material	Notes
1	Body	Aluminum alloy	Hard alumite
2	Insulation ring	Synthetic resin	Black
3	Coupling	Carbon steel	Rust proofing by special black thin film
4	Piston	Aluminum alloy	Chromate treated
5	Lever	Carbon steel	Rust proofing by special black thin film
6	Check valve ass'y	Brass, Steel wire, Synthetic rubber	
7	Pilot pin	Carbon steel	Rust proofing by special black thin film
8	Clamp spring	Steel wire	
9	Packing	Synthetic rubber	
10	Parallel pin	Carbon steel	
11	Multi tube holder	Synthetic resin	Black
12	Contact probe		
13	D subconnector ass'y		

Parts list

No.	Description	Material	Notes
14	Heath cable		
15	Robot adaptor	Aluminum alloy	Hard alumite
16	Connecting base	Aluminum alloy	Hard alumite
17	Tool plate	Aluminum alloy	Hard alumite
18	Hook	Carbon steel	Rust proofing by special black thin film
19	Contact block ass'y	Beryllium copper, Synthetic resin	Gilded contact point
20	Passage packing	Synthetic rubber	
Single acting type			
21	Bearing	Stainless steel	
22	Cap	Aluminum alloy	Chromate treated
Double acting type			
23	Head cap	Aluminum alloy	
24	Rod packing	Synthetic rubber	

