

# Angular Style Air Gripper Standard Type

# Series MHC2

Size: 10, 16, 20, 25

A large amount of gripping force is provided through the use of a double piston mechanism, while maintaining a compact design.

### Built-in variable throttle

A solid state auto switch with an indicator light can be mounted.



MHC2-16S

MHC2-10D

### JIS Symbol

Double acting



Single acting

### Caution

Be sure to read before handling.  
Refer to pages 12-15-3 to 12-15-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to page 12-1-4 to 12-1-6 for Precautions on every series.



Refer to page 12-13-25 for solid state switch with pre-wire connector.

### Specifications

Fluid		Air
Operating pressure	Double acting	0.1 to 0.6 MPa
	Single acting	0.25 to 0.6 MPa
Ambient and fluid temperature		-10 to 60°C
Repeatability		±0.01 mm
Max. operating frequency		180 c.p.m.
Lubrication		Not required
Action		Double acting, Single acting
Auto switch (Option) Note)		Solid state switch (3-wire, 2-wire)



Note) Refer to page 12-13-1 for further information on auto switches.

### Model

Action	Model	Bore size (mm)	Gripping moment (N·m) (Effective value) (1)	Opening/closing angle (Both sides)	Weight (2) (g)
Double acting	MHC2-10D	10	0.10	30 to -10°	39
	MHC2-16D	16	0.39		91
	MHC2-20D	20	0.70		180
	MHC2-25D	25	1.36		311
Single acting	MHC2-10S	10	0.070	30 to -10°	39
	MHC2-16S	16	0.31		92
	MHC2-20S	20	0.54		183
	MHC2-25S	25	1.08		316

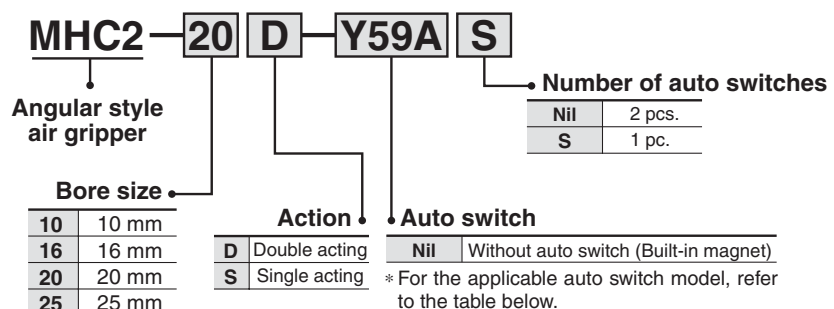


Note 1) At the pressure of 0.5 MPa.

Refer to "Effective Gripping Force" data on page 12-8-3 for gripping force of each gripping point.

Note 2) Except auto switch.

### How to Order



### Applicable Auto Switch

Refer to page 12-13-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)*			Pre-wire (1) connector	Flexible (2) lead wire (-61)	Applicable load	
					DC	AC	Electrical entry		0.5 (Nil)	3 (L)	5 (Z)			IC circuit	Relay, PLC
							Perpendicular	In-line							
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V	Y69A	Y59A	●	●	○	Standard	—	—	—
				3-wire (PNP)		12 V	Y7PV	Y7P	●	●	○				
				2-wire		12 V	Y69B	Y59B	●	●	○				

\* Lead wire length symbols: 0.5 m ..... Nil (Example) Y59A  
3 m ..... L (Example) Y59AL  
5 m ..... Z (Example) Y59AZ

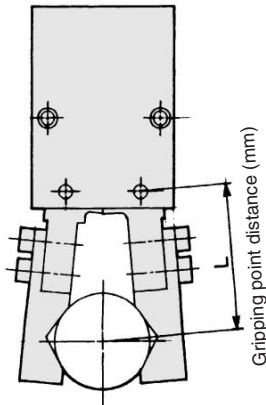
\* Auto switches marked with a "O" symbol are produced upon receipt of order.

Note) No need to add -X61 at the end of the part number for the flexible lead wire for D-Y\*\* type auto switch, because it adopts flexible lead wire as standard.

\* Through-hole mounting is not available when using auto switch types D-Y59, D-Y69, or D-Y7.

## Gripping Point

- Workpiece gripping point should be within the range indicated in the graph.

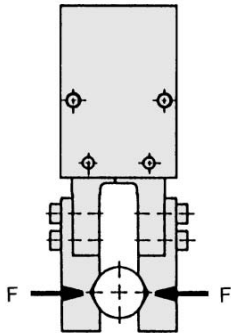


## Guidelines for the selection of the gripper with respect to component weight

- Although conditions differ according to the workpiece shape and the coefficient of friction between the attachments and the workpiece, select a model that can provide a gripping force of 10 to 20 times the workpiece weight, or more.
- If high acceleration, deceleration or impact forces are encountered during motion, a further margin of safety should be considered.

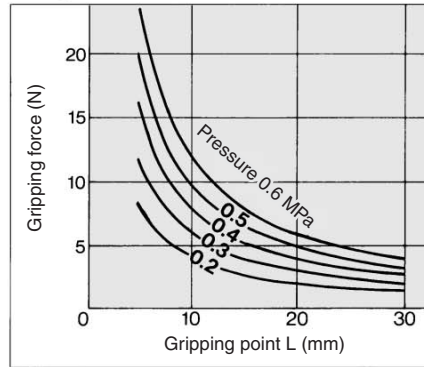
## ● Indication of effective gripping force

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

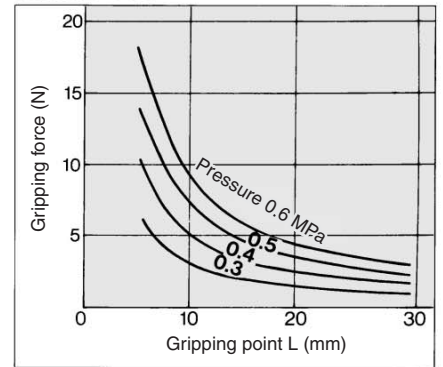


## Effective Gripping Force

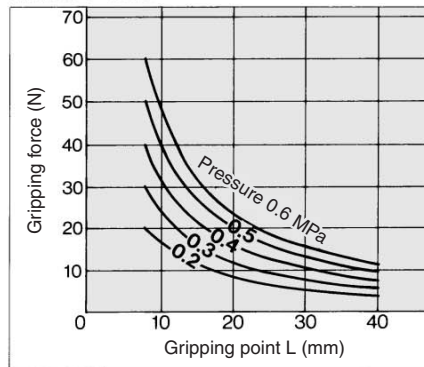
### Double Acting MHC2-10D



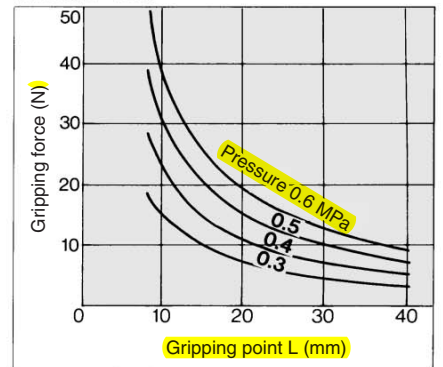
### Single Acting MHC2-10S



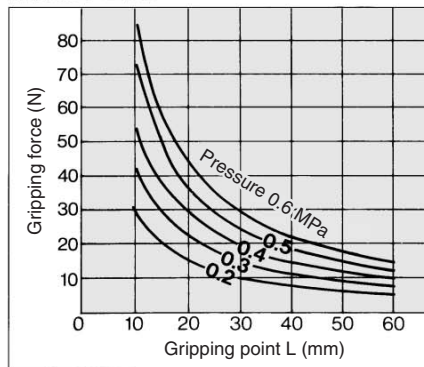
### MHC2-16D



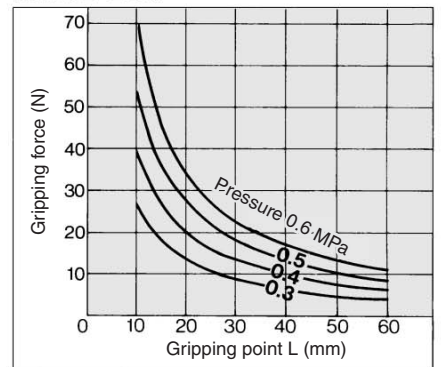
### MHC2-16S



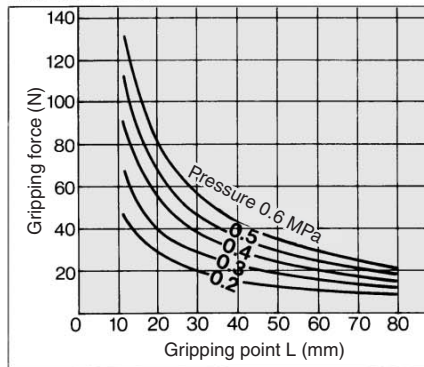
### MHC2-20D



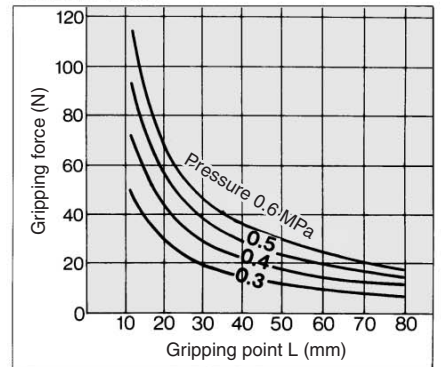
### MHC2-20S



### MHC2-25D



### MHC2-25S



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

MRHQ

Misc.

D-

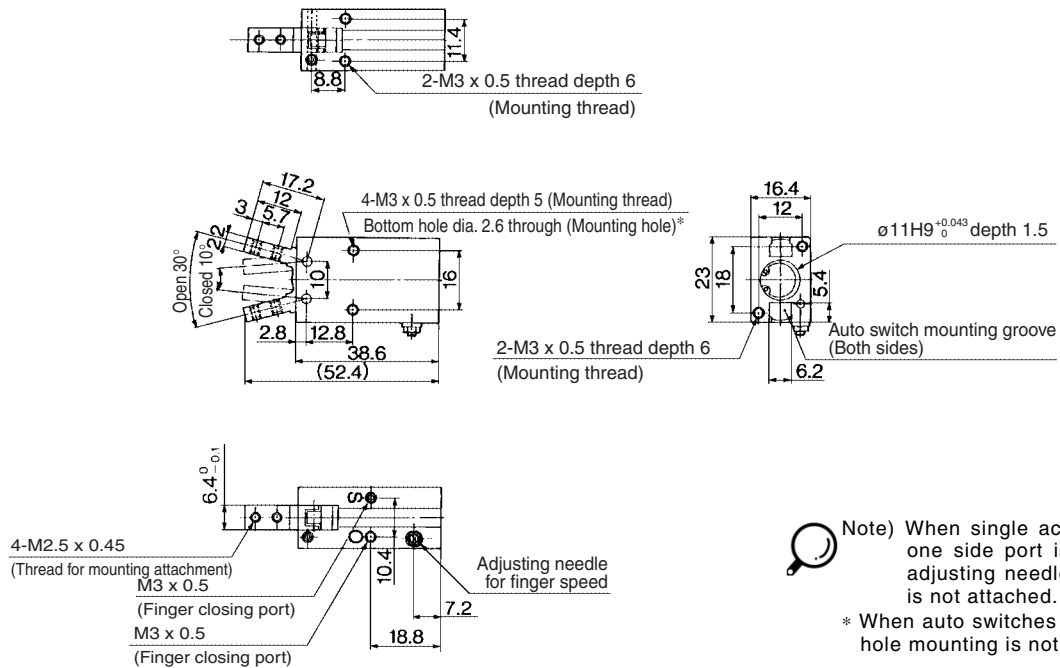
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# Series MHC2

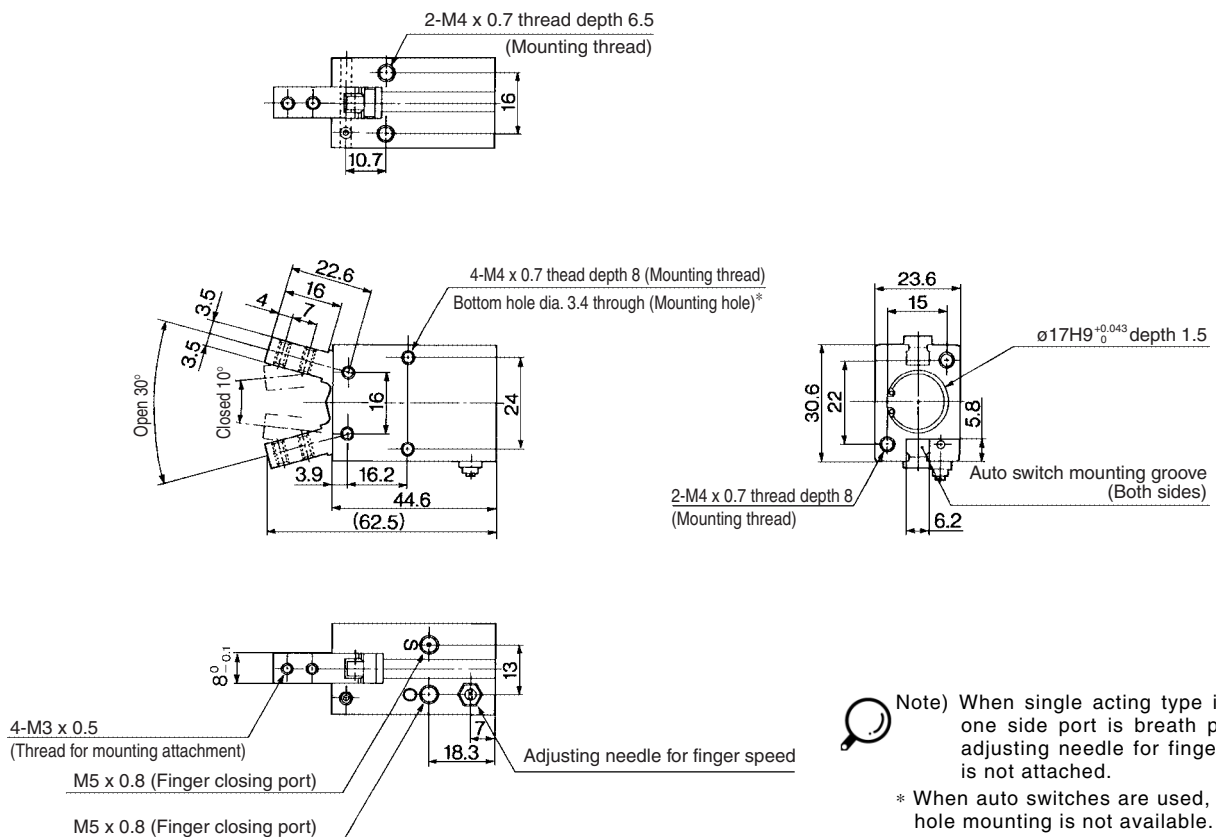


## Double Acting: Size 10, 16, 20, 25

### MHC2-10□

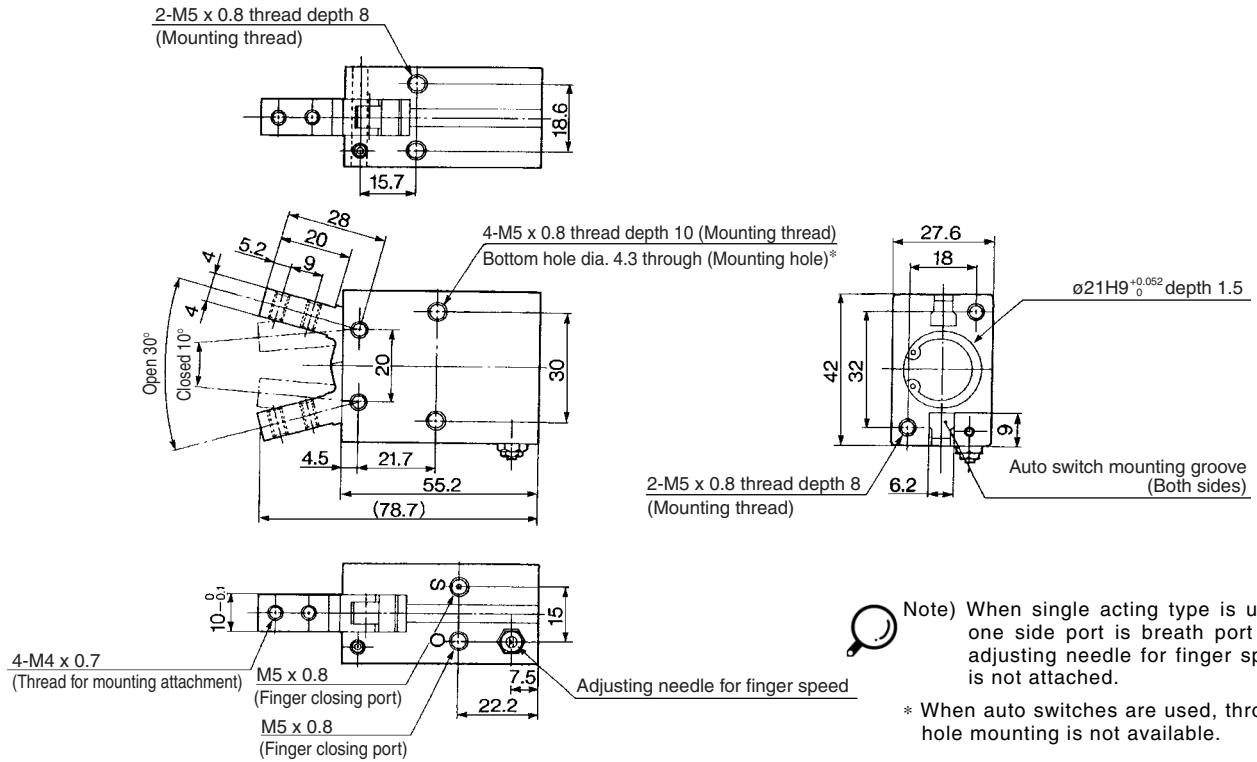


### MHC2-16□

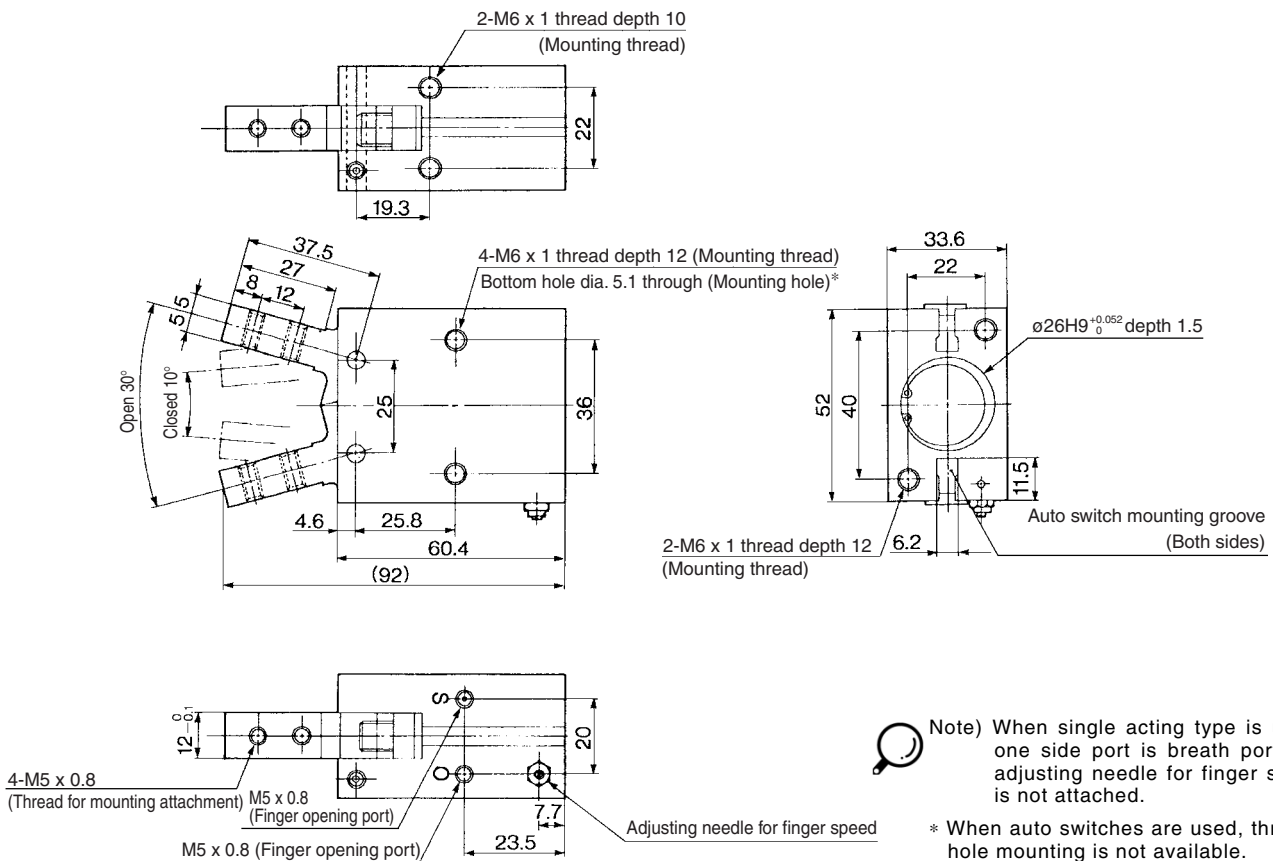


## Double Acting: Size 10, 16, 20, 25

### MHC2-20



### MHC2-25

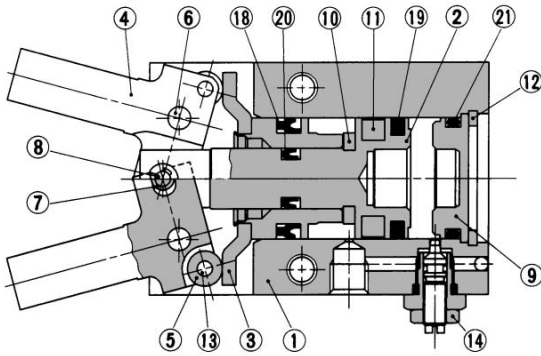


MHZ
MHF
MHL
MHR
MHK
MHS
<b>MHC</b>
MHT
MHY
MHW
MRHQ
Misc.
D-
20-

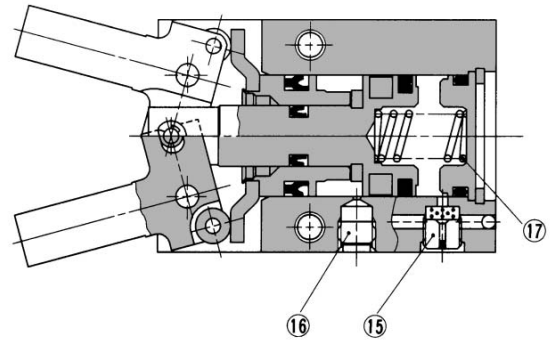
# Series MHC2

## Construction

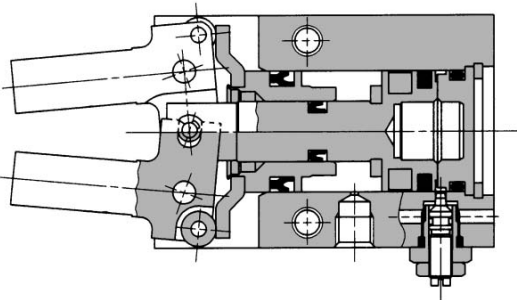
### Double acting/With fingers open



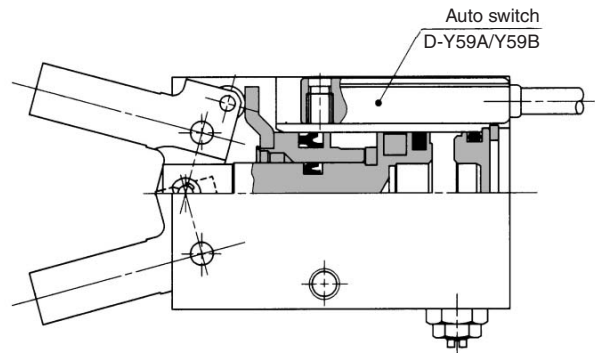
### Single acting



### Double acting/With fingers closed



### With auto switch



## Component Parts

No.	Description	Material	Note
①	Body	Aluminum alloy	Hard anodized
②	Piston A	Aluminum alloy	Hard anodized
③	Piston B assembly		
④	Finger	Carbon steel	Heat treated
⑤	Side roller	Carbon steel	Nitrided
⑥	Lever shaft	Stainless steel	Nitrided
⑦	Center roller	Carbon steel	Nitrided
⑧	Center pin	Carbon steel	Nitrided
⑨	Cap	Resin	
⑩	Bumper	Urethane rubber	
⑪	Rubber magnet	Synthetic rubber	

No.	Description	Material	Note
⑫	Type C snap ring	Carbon steel	Nickel plated
⑬	Needle roller	High carbon chrome bearing steel	
⑭	Needle assembly	Brass	Electroless nickel plated
⑮	Exhaust plug	Brass	Electroless nickel plated
⑯	Plug	Brass	Electroless nickel plated
⑰	Spring	Stainless steel spring wire	
⑱	Piston seal	NBR	
⑲	Piston seal	NBR	
⑳	Piston seal	NBR	
㉑	Gasket	NBR	

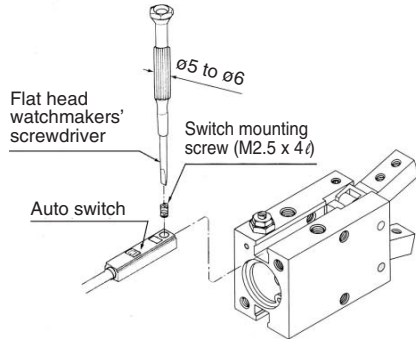
## Replacement Parts

Description	MHC2-10□	MHC2-16□	MHC2-20□	MHC2-25□	Main parts
Seal kit	MHC10-PS	MHC16-PS	MHC20-PS	MHC25-PS	⑱⑲⑲⑲⑲
Finger assembly	MHC-A1003	MHC-A1603	MHC-A2003	MHC-A2503	④⑤⑥⑦⑧⑬
Piston assembly set	MHC-A1002	MHC-A1602	MHC-A2002	MHC-A2502	②③⑦⑧⑩⑪⑱⑲⑲
Piston A assembly	MHC-A1001	MHC-A1601	MHC-A2001	MHC-A2501	②⑩⑪
Piston B assembly	P3311145B	P3311245B	P3311345B	P3311445C	③
Needle assembly	MH-A1006		MH-A1606		⑭

\* Order 1 piece finger assembly per one unit.

## Mounting of Auto Switch

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

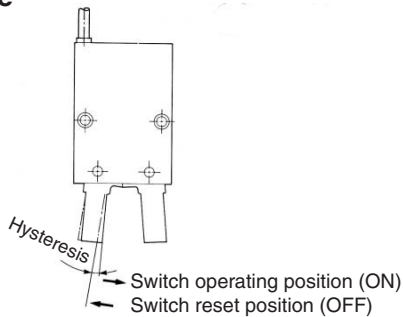


Note) Use a watchmakers' screwdriver with a grip diameter of 5 to 6 mm to tighten the auto switch mounting screw. The tightening torque should be about 0.05 to 0.1 N·m. As a rule, it should be turned about 90° beyond the point at which tightening can be felt.

## Auto Switch Hysteresis

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

### Angular Style

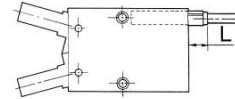


Air gripper model	Hysteresis degree (Max. value)
MHC2-10	4
MHC2-16	3
MHC2-20	2
MHC2-25	2

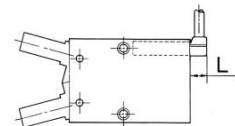
## Protrusion of Auto Switch from Edge of Body

The maximum protrusion of an auto switch (when fingers are fully closed) from the edge of the body is shown in the table below.

### Angular Style



When auto switch D-Y59□, D-Y7P is used



When auto switch D-Y69□, D-Y7PV is used

### Max. Protrusion of Auto Switch from Edge of Body (L)

Air gripper model	Auto switch model	(mm)	
		D-Y59□ D-Y7P	D-Y69□ D-Y7PV
MHC2-10		8	6
MHC2-16		7	6
MHC2-20		6	5
MHC2-25		4	3

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

MRHQ

Misc.

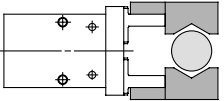
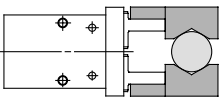
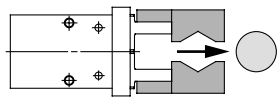
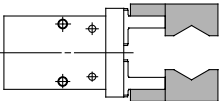
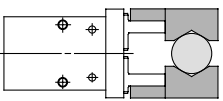
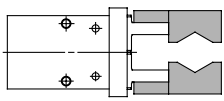
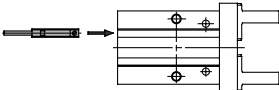
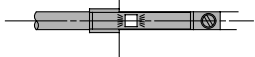
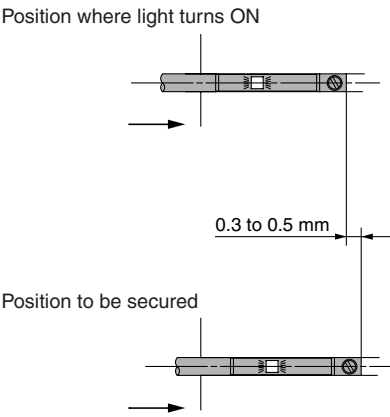
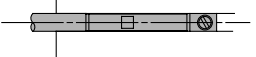
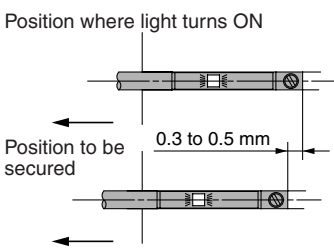
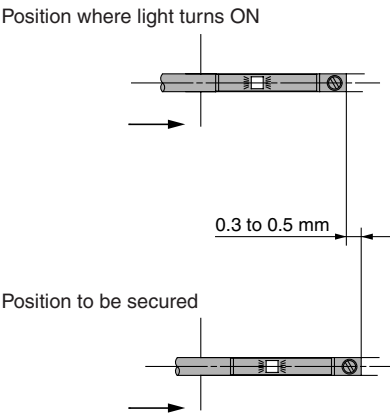
D-

20-

# Series MHZ2/MHZJ2/MHK2/MHKL2/MHC2/MHT2 Auto Switch Installation Example and Mounting Position

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

## 1) Detection when Gripping Exterior of Workpiece

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

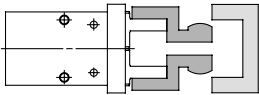
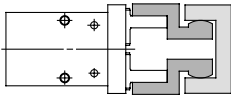
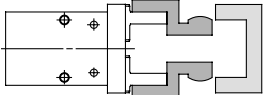
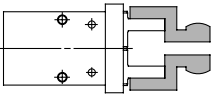
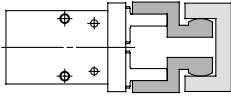
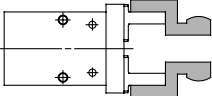
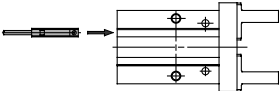
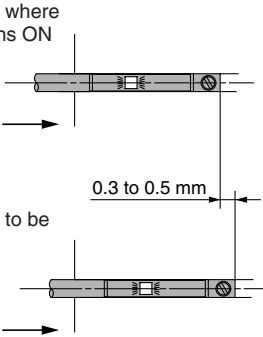
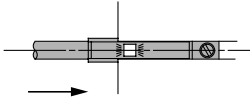
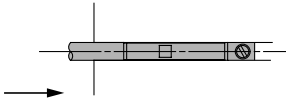
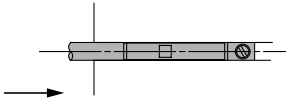

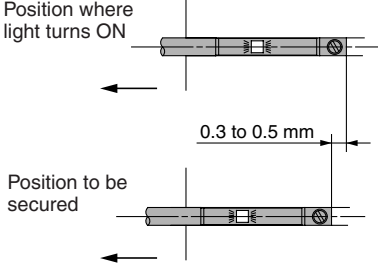


Note 1) It is recommended that gripping of a workpiece be performed close to the center of the finger stroke.

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

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

## 2) Detection when Gripping Interior of Workpiece

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

- MHZ
- MHF
- MHL
- MHR
- MHK
- MHS
- MHC
- MHT
- MHY
- MHW
- MRHQ
- Misc.
- D-
- 20-

Note 1) It is recommended that gripping of a workpiece be performed close to the center of the finger stroke.  
 Note 2) When holding a workpiece close at the end of open/close stroke of fingers, detecting performance of the combinations listed in the above table may be limited, depending on the hysteresis of an auto switch, etc.