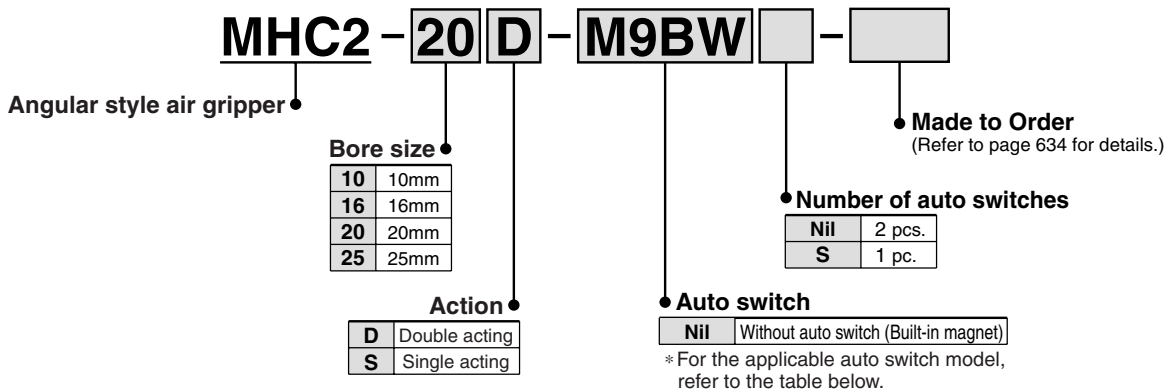


Angular Style Air Gripper/Standard Type Series **MHC2**

How to Order



Applicable Auto Switch/Refer to pages 761 to 809 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-wired connector	Applicable load		
					DC	AC	Electrical entry direction		0.5 (Nil)	1 (M)	3 (L)	5 (Z)		IC circuit	Relay, PLC	
							Perpendicular	In-line								
Solid state switch	Diagnosis (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○	—	
				2-wire				M9BV	M9B	●	●	●	○	○	—	
				3-wire (NPN)				M9NVV	M9NV	●	●	●	○	○	IC circuit	
				3-wire (PNP)				M9PVV	M9PV	●	●	●	○	○	IC circuit	
				2-wire				M9BVV	M9BV	●	●	●	○	○	—	

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW
 1 m..... M (Example) M9NWM
 3 m..... L (Example) M9NWL
 5 m..... Z (Example) M9NWZ

* Solid state auto switches marked with a "○" symbol are produced upon receipt of order.

Note 1) Take note of hysteresis with 2-color indication type switches. Refer to "Auto Switch Hysteresis" on page 640.
 Note 2) Refer to pages 761 to 809 for further information on auto switches.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

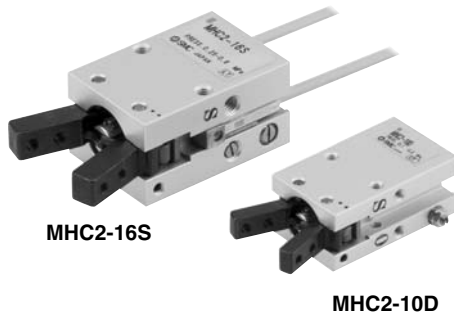
MRHQ

MA

D-□

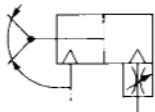
Series MHC2

- 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.

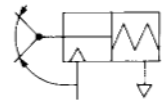


JIS Symbol

Double acting



Single acting



Made to Order

(Refer to page 683 to 713 for details.)

Symbol	Specifications/Description
-X4	Heat resistance (100°C)
-X5	Fluororubber seal
-X50	Without magnet
-X53	EPDM seal/Fluorine grease
-X56	Axial Ported
-X63	Fluorine grease
-X64	Finger: Side tapped mounting
-X65	Finger: Through-hole mounting
-X79	Grease for food

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) <small>Note)</small>	Solid state auto switch (3-wire, 2-wire)	



Note) Refer to pages 761 to 809 for further information on auto switches.

Model

Action	Model	Bore size (mm)	Gripping moment (N·m) (Effective value) ⁽¹⁾	Opening/closing angle (Both sides)	Mass ⁽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



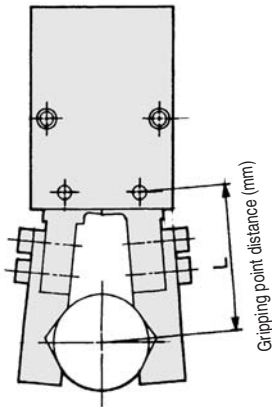
Note 1) At the pressure of 0.5 MPa.

Refer to "Effective Gripping Force" data on page 635 for gripping force of each gripping point.

Note 2) Except auto switch.

Gripping Point

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

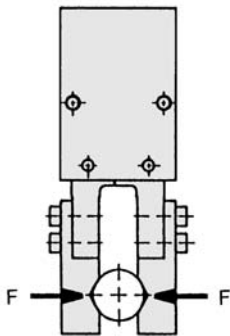


Guidelines for the selection of the gripper with respect to component weight

- 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

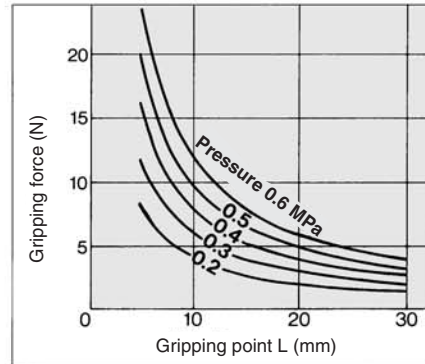
The effective gripping force shown in the graphs below is expressed as F , which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



Effective Gripping Force

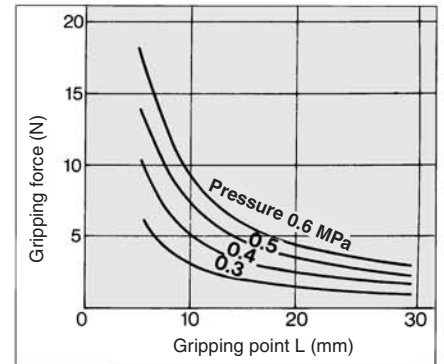
Double Acting

MHC2-10D

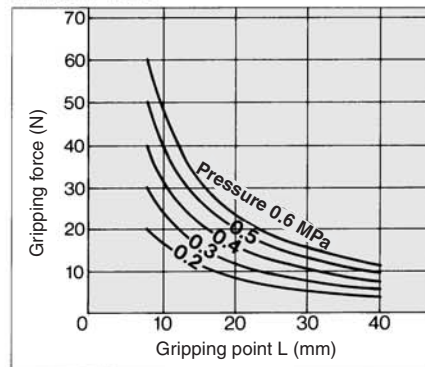


Single Acting

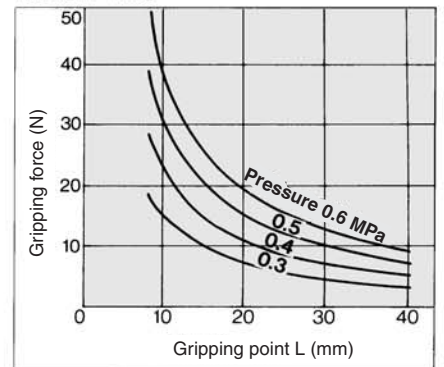
MHC2-10S



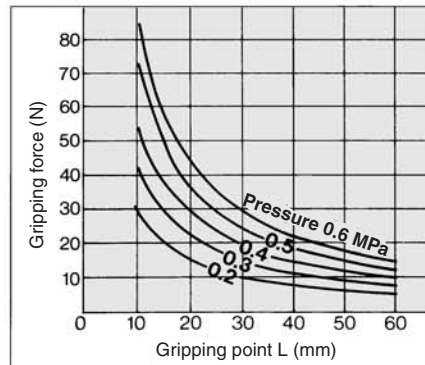
MHC2-16D



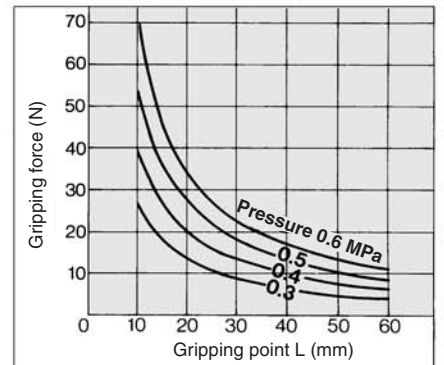
MHC2-16S



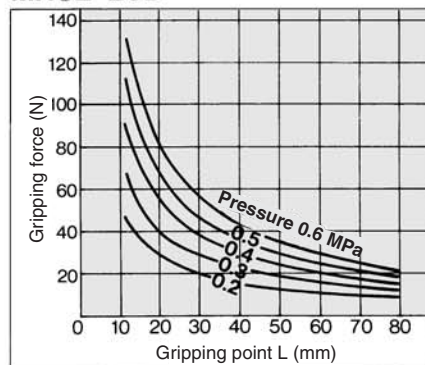
MHC2-20D



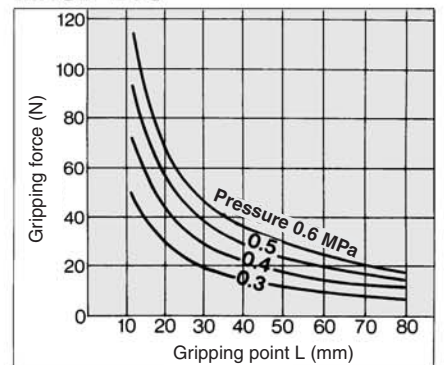
MHC2-20S



MHC2-25D



MHC2-25S



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

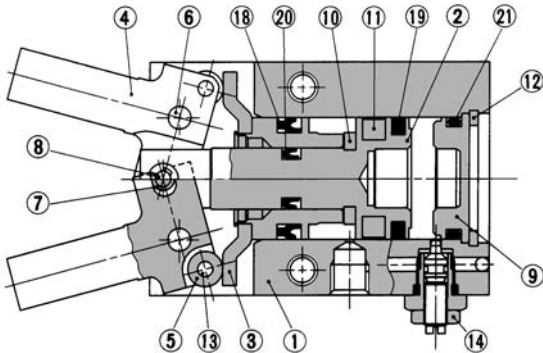
MA

D-□

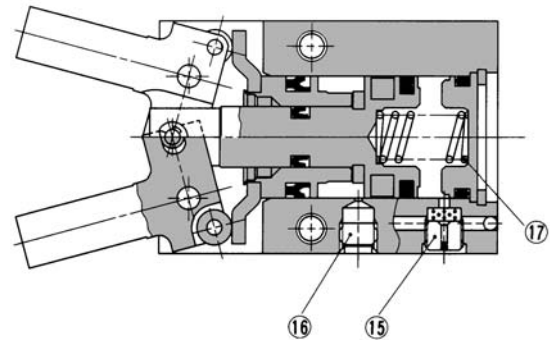
Series MHC2

Construction

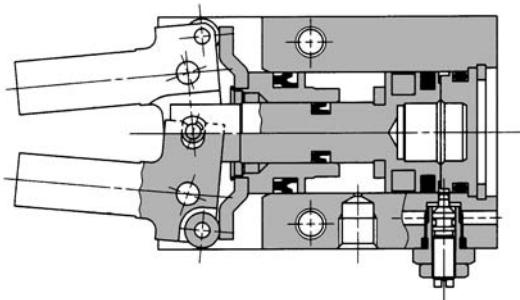
Double acting/With fingers open



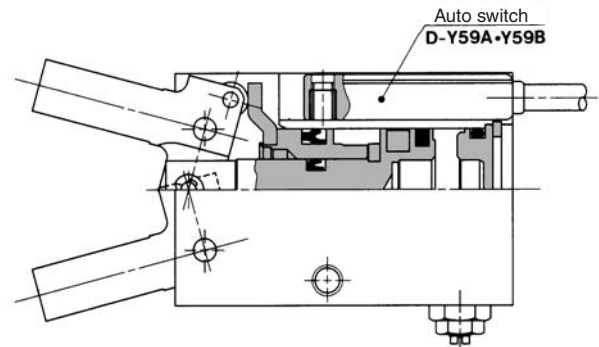
Single acting



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	Nitriding
6	Lever shaft	Stainless steel	Nitriding
7	Center roller	Carbon steel	Nitriding
8	Center pin	Carbon steel	Nitriding
9	Cap	Resin	
10	Bumper	Urethane rubber	
11	Rubber magnet	Synthetic rubber	

Component Parts

No.	Description	Material	Note
12	Type C retaining 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	18 19 20 21
Finger assembly	MHC-A1003	MHC-A1603	MHC-A2003	MHC-A2503	4 5 6 7 8 13
Piston assembly set	MHC-A1002	MHC-A1602	MHC-A2002	MHC-A2502	2 3 7 8 10 11 18 19 20
Piston A assembly	MHC-A1001	MHC-A1601	MHC-A2001	MHC-A2501	2 10 11
Piston B assembly	P3311445B	P3311245B	P3311345B	P3311445C	3
Needle assembly	MH-A1006		MH-A1606		14

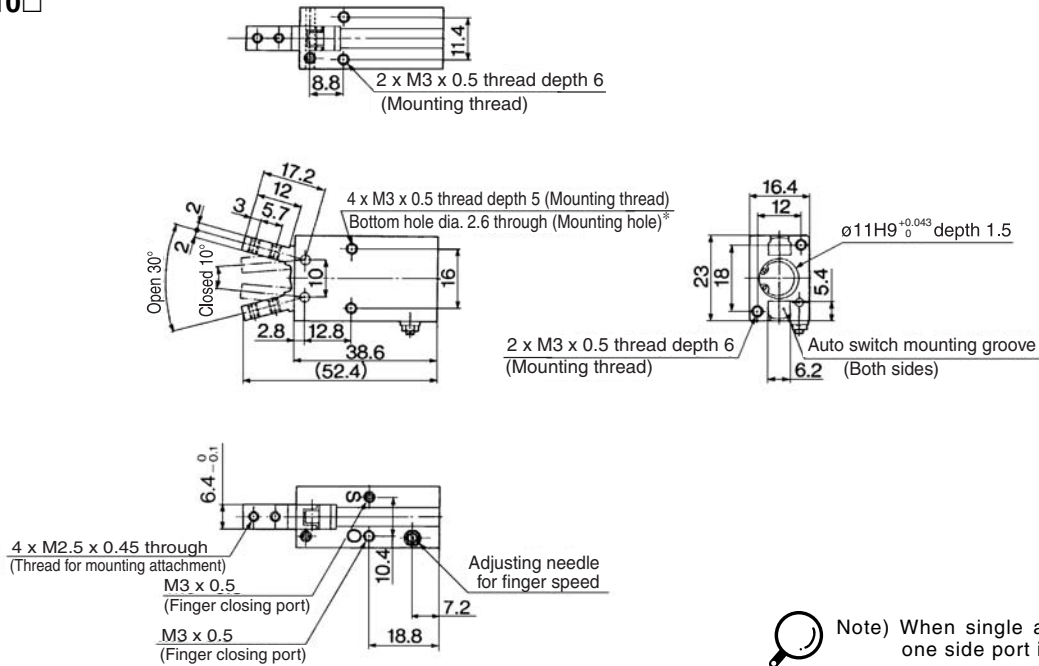
* Order 1 piece finger assembly per one unit.

Replacement part/Grease pack part no.: GR-S-005 (5g)



Double Acting: Size 10, 16

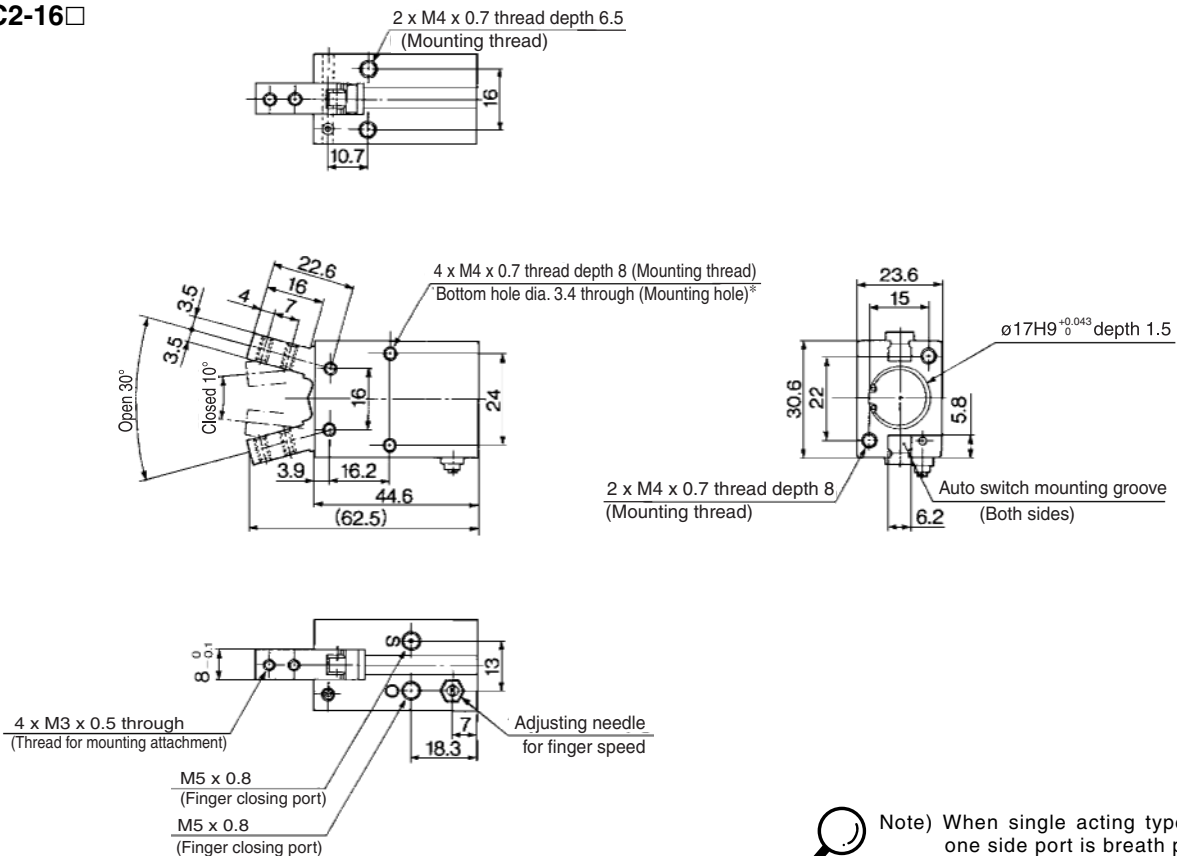
MHC2-10□



Note) When single acting type is used, one side port is breath port.

* When auto switches are used, through hole mounting is not available.

MHC2-16□



Note) When single acting type is used, one side port is breath port.

* When auto switches are used, through hole mounting is not available.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

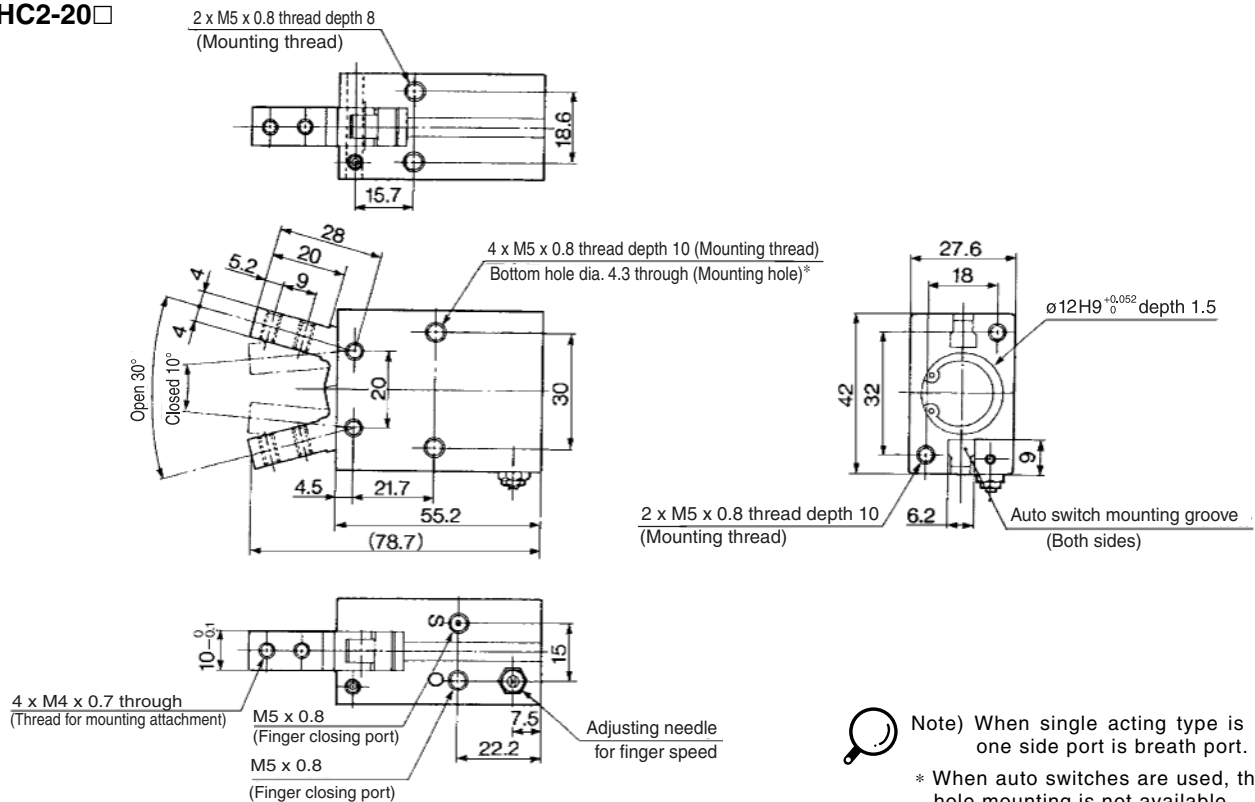
MA

D-□

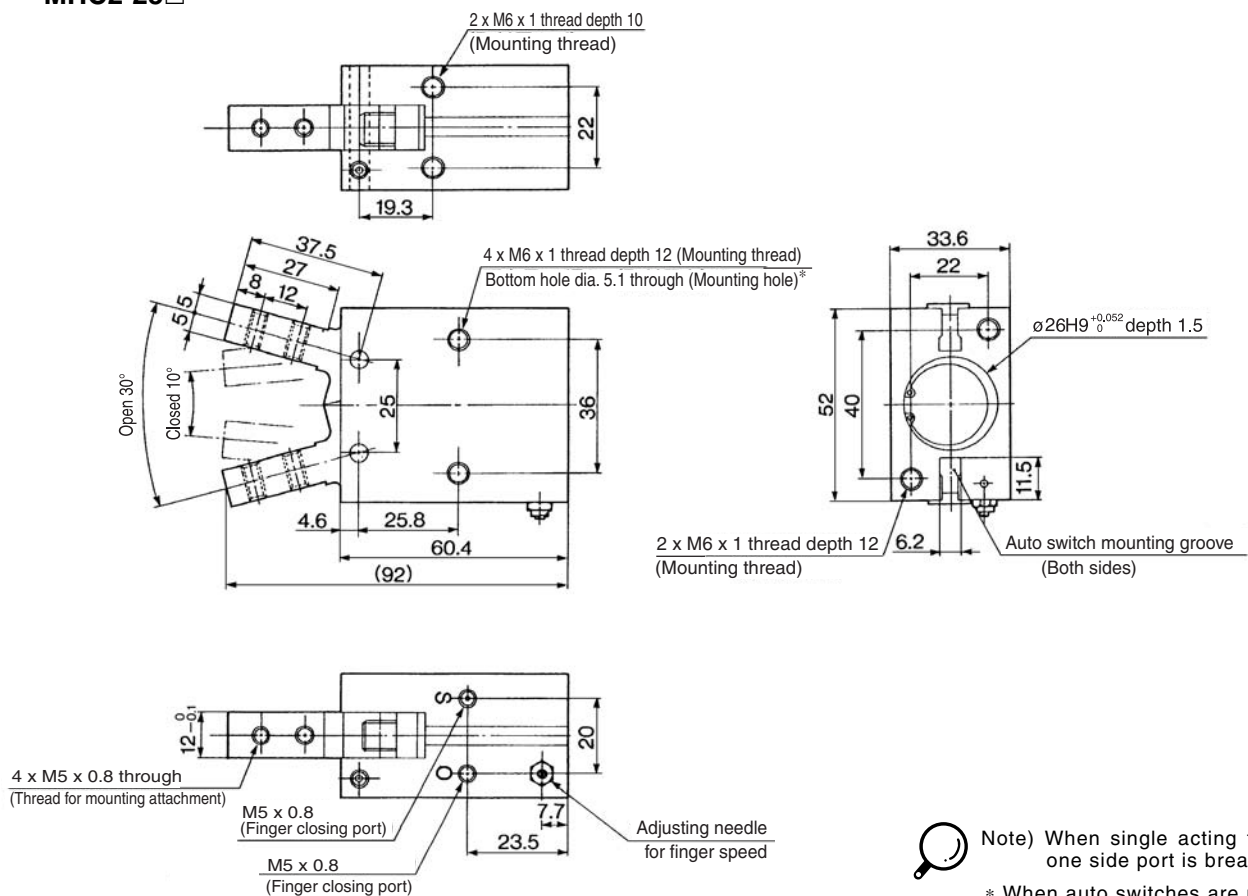
Series MHC2

Double Acting: Size 20, 25

MHC2-20



MHC2-25



Series MHC2

Auto Switch Installation Examples and Mounting Positions

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

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

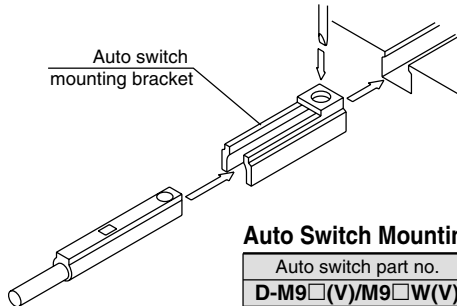
- MHZ
- MHF
- MHL
- MHR
- MHK
- MHS
- MHC**
- MHT
- MHY
- MHW
- X□
- MRHQ
- MA
- D-□

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.

Series MHC2

Auto Switch Mounting

- (1) To set the auto switch, insert the auto switch into the installation groove of the cylinder as shown below and set it roughly.
- (2) Insert the auto switch into the auto switch bracket installation groove.
- (3) After confirming the detecting position, tighten the set screws (M2.5) attached to the auto switch and set it.
- (4) Be sure to change the detecting position in the state of (2).



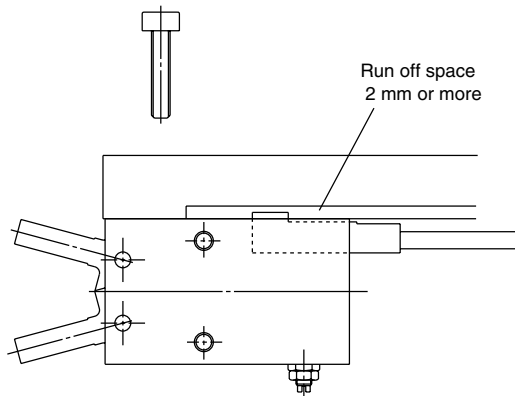
Auto Switch Mounting Bracket: Part No.

Auto switch part no.	Auto switch mounting bracket part no.
D-M9□(V)/M9□W(V)	BMG2-012

Note) Use a screwdriver with a grip diameter of 5 to 6 mm to tighten the set screws (M2.5).
The tightening torque should be 0.05 to 1 N·m.
As a guide, it should be turned about 90° beyond the point at which tightening can be felt.

Handling of Mounting Brackets: Precautions

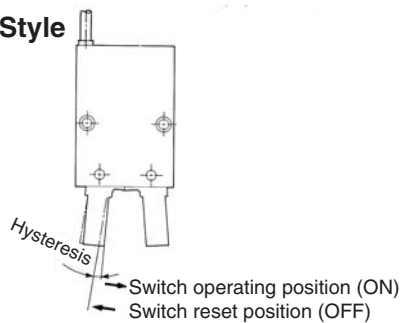
When auto switch is set on the mounting side as shown below, allow at least 2 mm run off space on mounting late since the auto switch is protruded from the gripper edge.



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



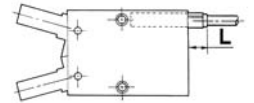
Air gripper model	Hysteresis degree (Max. value)
MHC2-10	4
MHC2-16	3
MHC2-20	2
MHC2-25	2

Protrusion of Auto Switch from Edge of Body

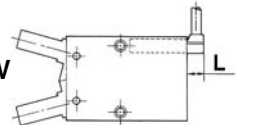
The maximum protrusion of an auto switch (when fingers are fully closed) from the edge of the body is shown in the table below.

Angular Style

When auto switch
D-M9□/M9□W/Y59□/Y7P/Y7□W
is used



When auto switch
D-M9□V/M9□WV/Y69□/Y7PV/Y7□WV
is used



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

Auto switch model	(mm)	
	D-Y59□ D-Y7P D-Y7□W	D-Y69□ D-Y7PV D-Y7□WV
MHC2-10	8	6
MHC2-16	7	6
MHC2-20	6	5
MHC2-25	4	3

Auto switch model	(mm)	
	D-M9□ D-M9□W	D-M9□(V) D-M9□W(V)
MHC2-10	7.5	5.5
MHC2-16	6.5	5.5
MHC2-20	5.5	4.5
MHC2-25	3.5	2.5

Note) The actual setting position should be adjusted after confirming the auto switch operating condition.



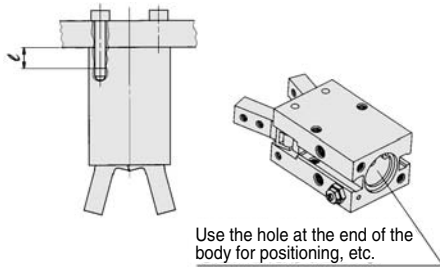
Series MHC2 Specific Product Precautions

Be sure to read before handling.

Mounting Air Grippers/Series MHC2

Possible to mount from 3 directions.

Axial Mounting (Body tapped)



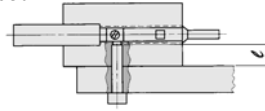
Use the hole at the end of the body for positioning, etc.

Model	Applicable bolts	Max. tightening torque N·m	Max. screw-in depth/mm
MHC2-10	M3 x 0.5	0.88	6
MHC2-16	M4 x 0.7	2.1	8
MHC2-20	M5 x 0.8	4.3	10
MHC2-25	M6 x 1	7.3	12

Model	Hole size (mm)	Hole depth (mm)
MHC2-10	ø11H9 ^{+0,043} ₀	1.5
MHC2-16	ø17H9 ^{+0,043} ₀	1.5
MHC2-20	ø21H9 ^{+0,052} ₀	1.5
MHC2-25	ø26H9 ^{+0,052} ₀	1.5

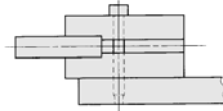
Lateral mounting (Body tapped and through-hole)

● Body tapped



Model	Applicable bolts	Max. tightening torque N·m	Max. screw-in depth/mm
MHC2-10	M3 x 0.5	0.69	5
MHC2-16	M4 x 0.7	2.1	8
MHC2-20	M5 x 0.8	4.3	10
MHC2-25	M6 x 1	7.3	12

● Body through-hole

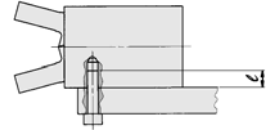


Model	Applicable bolts	Max. tightening torque N·m
MHC2-10	M2.5 x 0.45	0.49
MHC2-16	M3 x 0.5	0.88
MHC2-20	M4 x 0.7	2.1
MHC2-25	M5 x 0.8	4.3

Model	Max. screw-in depth/mm
MHC2-10	5
MHC2-16	8
MHC2-20	10
MHC2-25	12

Note) If an auto switch is to be mounted, only the tapped holes can be used. Make sure that the bolt's screw-in depth is less than those shown in the table on the left to prevent the tip of the bolt from pressing the switch body.

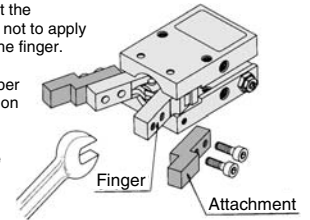
Vertical Mounting (Body tapped)



Model	Applicable bolts	Max. tightening torque N·m	Max. screw-in depth/mm
MHC2-10	M3 x 0.5	0.88	6
MHC2-16	M4 x 0.7	1.6	6.5
MHC2-20	M5 x 0.8	3.3	8
MHC2-25	M6 x 1	5.9	10

How to Mount the Attachment to the Finger

To mount the attachment to the finger, make sure to use a wrench to support the attachment so as not to apply undue strain on the finger. Refer to the table below for the proper tightening torque on the bolt used for securing the attachment to the finger.



Model	Applicable bolts	Max. tightening torque N·m
MHC2-10	M2.5 x 0.45	0.31
MHC2-16	M3 x 0.5	0.59
MHC2-20	M4 x 0.7	1.4
MHC2-25	M5 x 0.8	2.8

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□