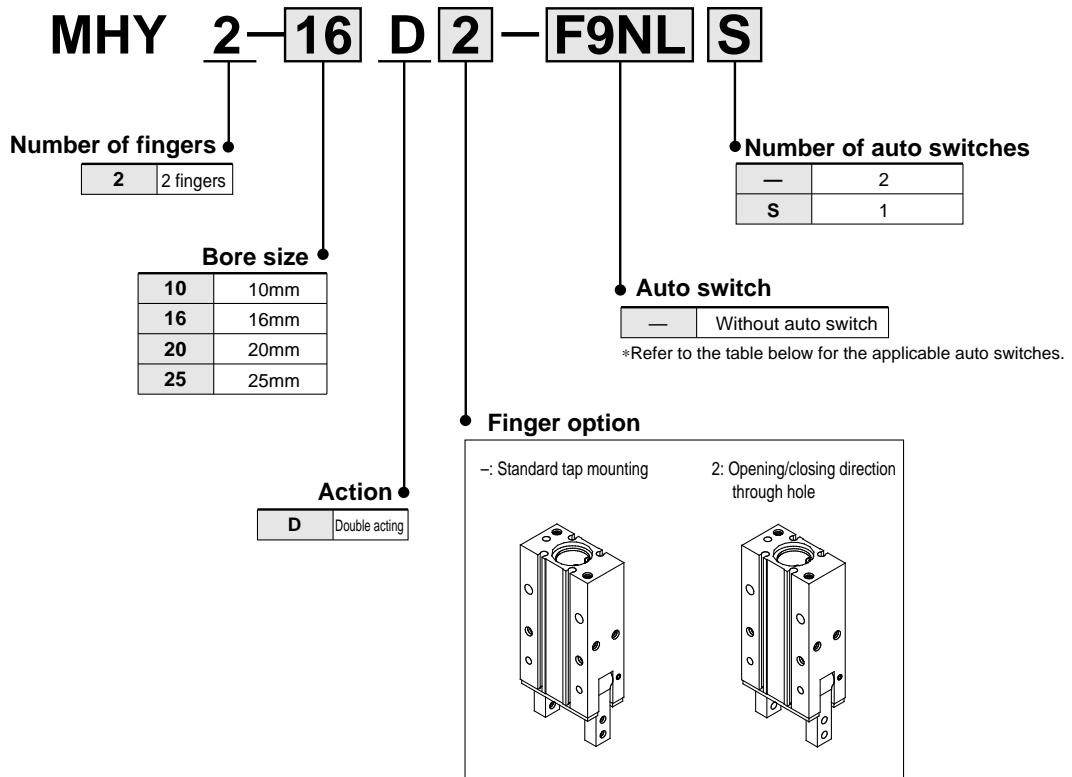


Series *MHY2*

∅10, ∅16, ∅20, ∅25

How to Order



Applicable Auto Switches

Type	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage		Symbol		Lead wire length (m)		Applicable load			
					DC	AC	Electrical entry		0.5 (-)	3 (L)				
							Perpendicular	In-line						
Solid state	—	Grommet	With	3 wire (NPN)	24V	—	F9NV	F9N	●	●	Relay PLC			
				3 wire (PNP)					F9PV	F9P		●	●	
				2 wire					F9BV	F9B		●	●	
	3 wire (NPN)			F9NWV					F9NW	●		●		
	3 wire (PNP)									F9PWV		F9PW	●	●
	2 wire									F9BWV		F9BW	●	●



*Lead wire length: 0.5m.....— (Example) F9N
3m.....L (Example) F9NL
Note 1) Refer to "Auto Switch Specifications" on p.2.11-1.

Specifications



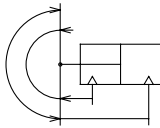
Fluid	Air
Operating pressure	0.1 to 0.6MPa
Ambient and fluid temperature	-10 to 60°C
Repeatability	±0.2mm
Max. operating frequency	60c.p.m
Lubrication	Not required
Action	Double acting
Auto switch (Optional) ^{Note)}	Solid state switch (3 wire, 2 wire)



Note) Refer to p. 2.11-1 for details of auto switch specifications.

Symbol

Double acting



Model

Model	Bore size (mm)	Effective holding force (Nm) ⁽¹⁾	Opening angle (Both sides)		Weight ⁽²⁾ (g)
			Opening side	Closing side	
MHY2-10D	10	0.16	180°	-3°	70
MHY2-16D	16	0.54			150
MHY2-20D	20	1.10			320
MHY2-25D	25	2.28			560



Note 1) At the pressure of 0.5MPa

Note 2) Not including auto switch



- Refer to the "How to Select the Applicable Model" on p.2.8-4.
- Refer to p.2.8-4 and 2.8-5 for the details of effective holding force and allowable overhanging distance.

MHZ2

MHZJ2

MHQ

MHL2

MHR

MHK

MHS

MHC2

MHT2

MHY2

MHW2

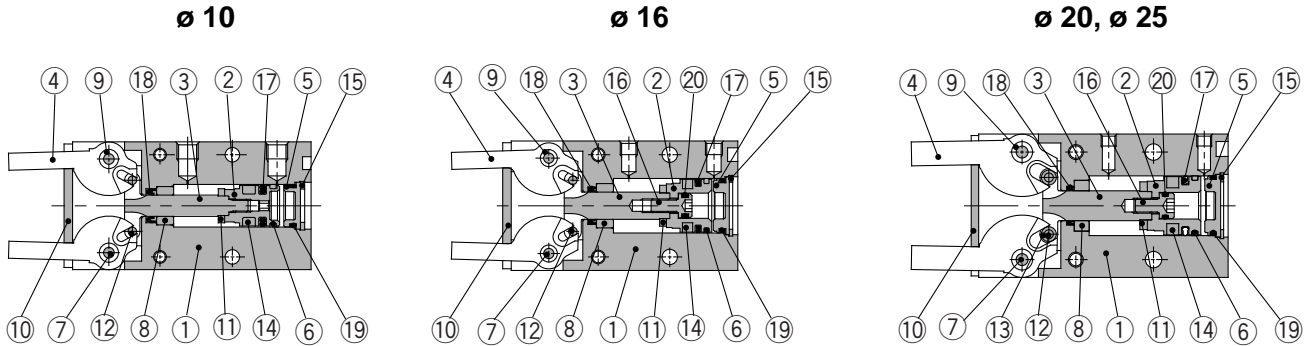
MRHQ

Auto switch

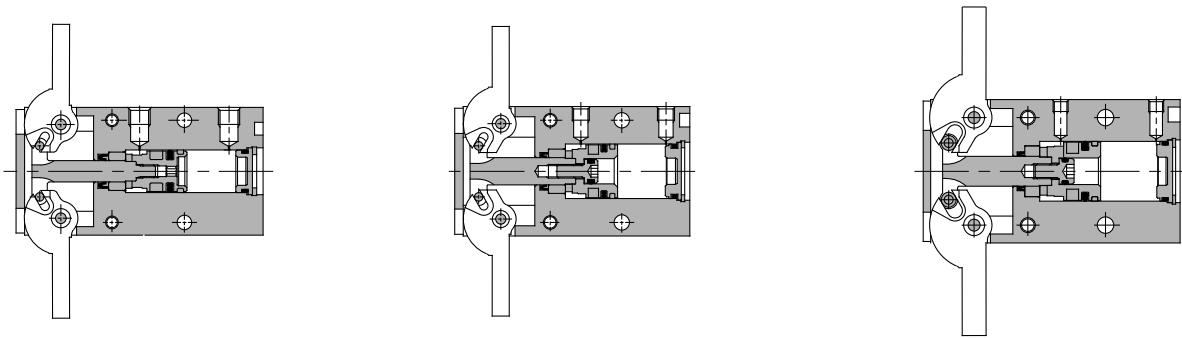
Series MHY2

Construction

Closed



Open



Component Parts

No.	Description	Material	Note
①	Body	Aluminum alloy	Hard anodized
②	Piston	ø10: Stainless steel ø16 to 25: Aluminum alloy	ø16 to 25: Chromated
③	Joint	Stainless steel	Heat treatment
④	Finger	Stainless steel	Heat treatment
⑤	Cap	Resin	
⑥	Ware ring	Resin	
⑦	Shaft	Stainless steel	Nitriding
⑧	Bushing A	Sintered alloy steel	

Component Parts

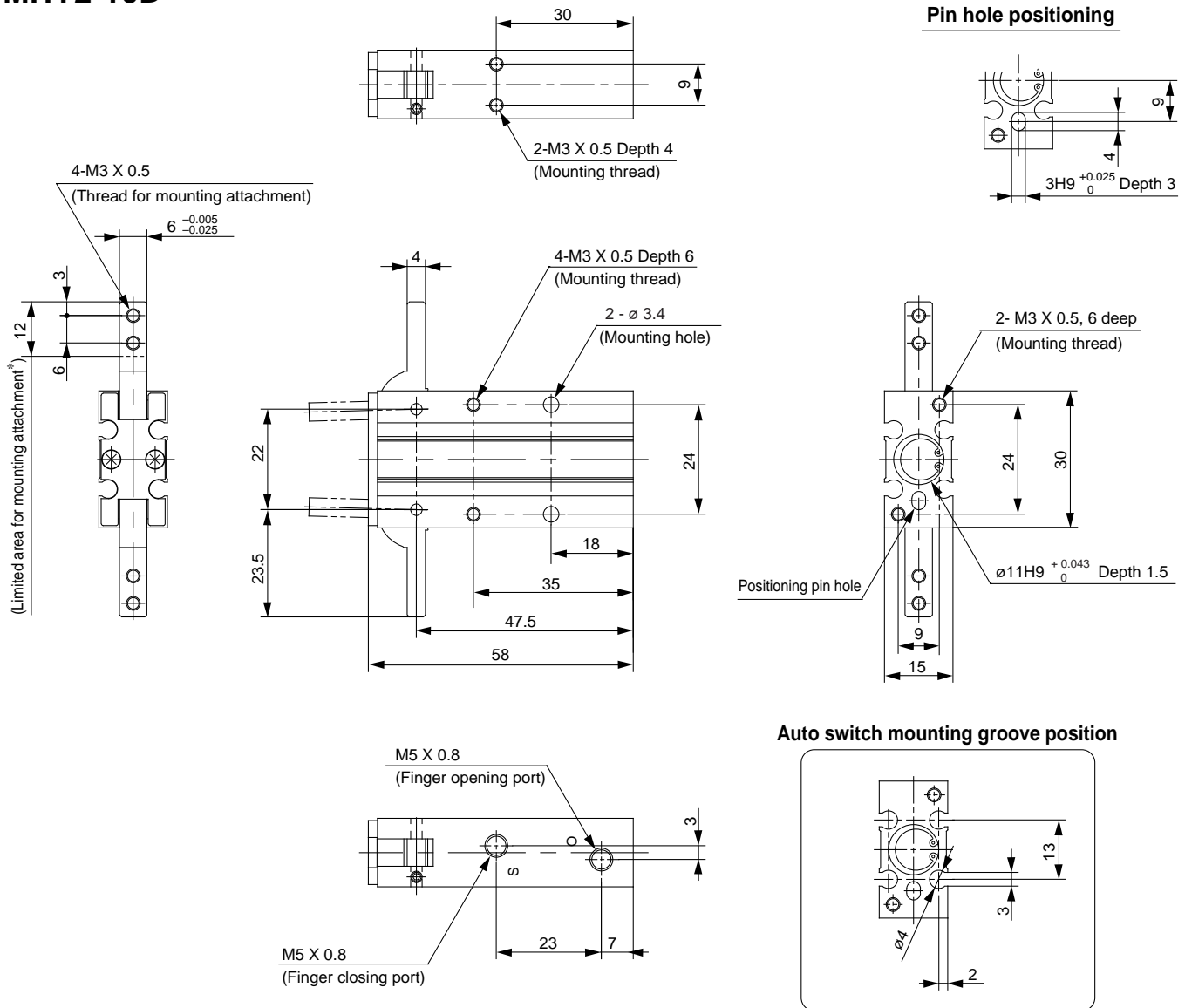
No.	Description	Material	Note
⑨	Bushing B	Sintered alloy steel	
⑩	End plate	Stainless steel	
⑪	Bumper	Urethane rubber	
⑫	Cylindrical roller	High carbon chrome bearing steel	
⑬	Joint roller	Carbon steel	Nitriding
⑭	Rubber magnet	Synthetic rubber	
⑮	C-shape snap ring	Carbon steel	Nickel plated
⑯	Piston bolt	Stainless steel	

Replacement Parts: Seal Kits

No.	Description	Material	Kit No.			
			MHY2-10D	MHY2-16D	MHY2-20D	MHY2-25D
⑰	Seal kit	NBR	MHY10-PS	MHY16-PS	MHY20-PS	MHY25-PS
⑱						
⑲						
⑳						

Dimensions

MHY2-10D

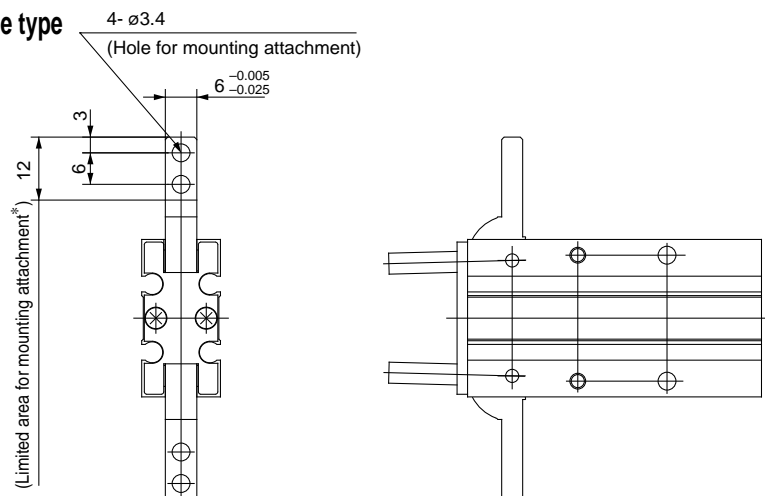


- MHZ2
- MHZJ2
- MHQ
- MHL2
- MHR
- MHK
- MHS

- MHC2
- MHT2
- MHY2**
- MHW2
- MRHQ
- Auto switch

MHY2-10D2

Opening/closing direction through hole type

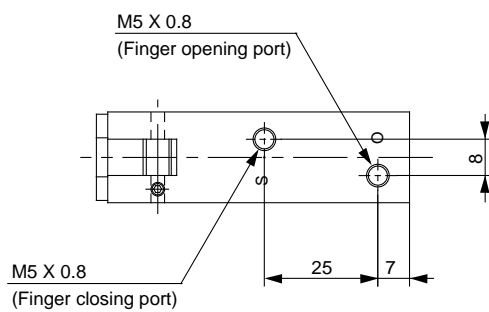
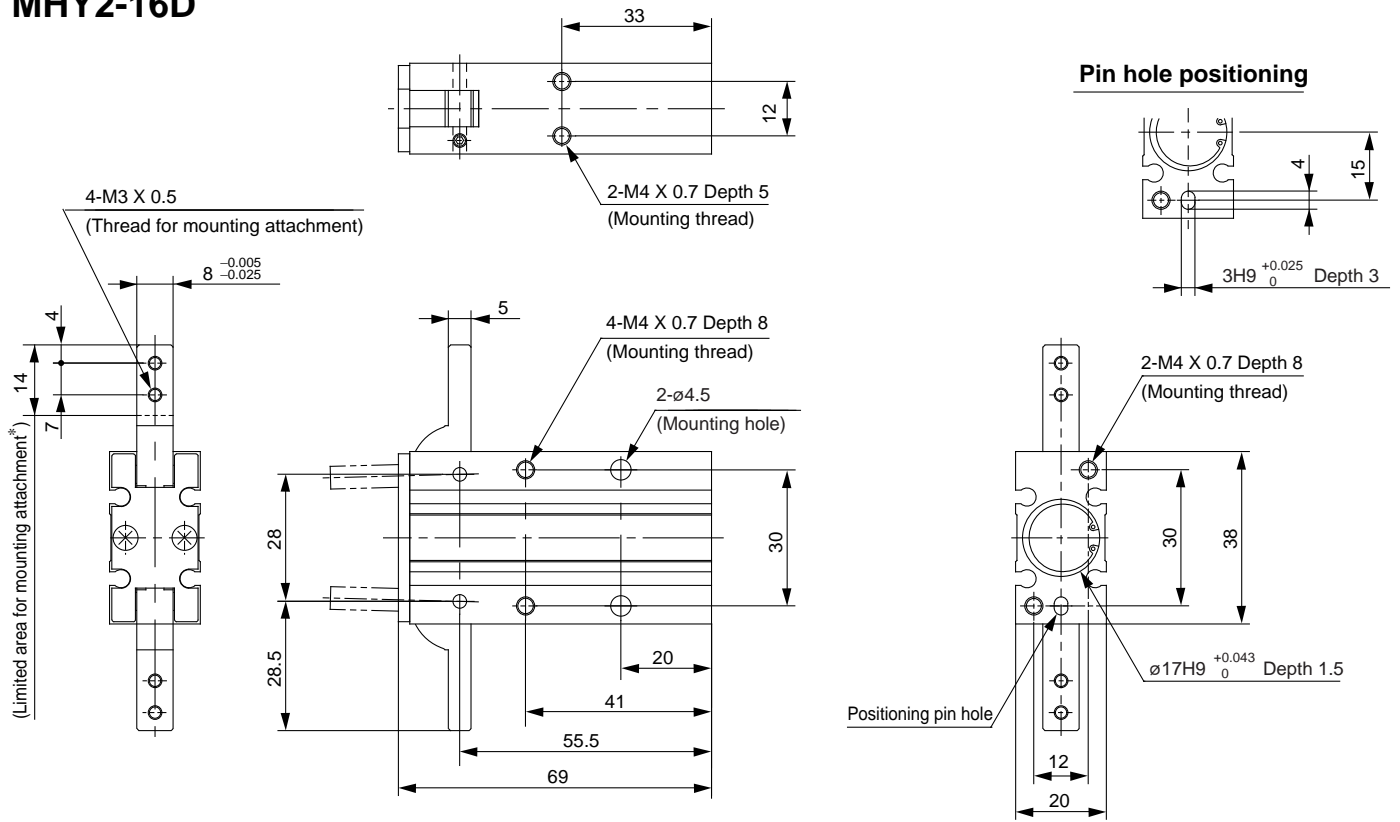


* Do not extend the attachment from limited area for mounting to avoid interference with the attachment or main body.

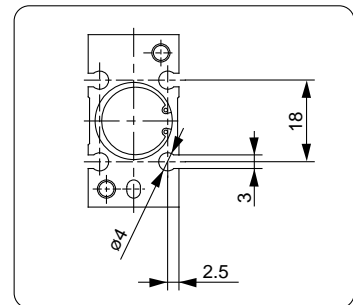
Series MHY2

Dimensions

MHY2-16D

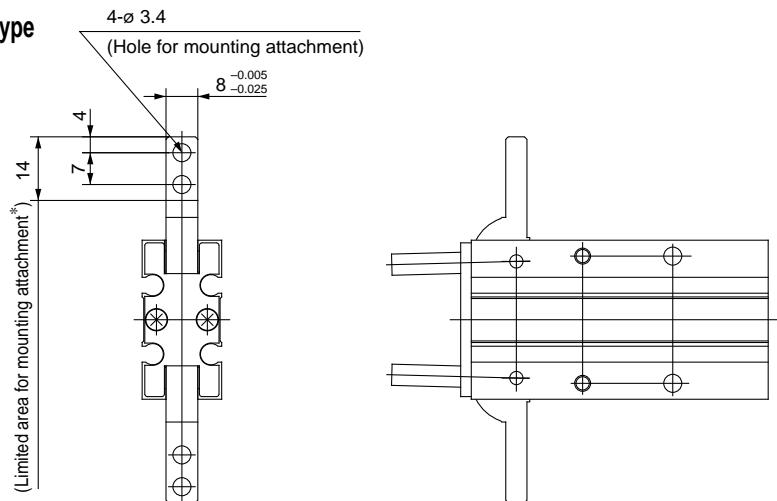


Auto switch mounting groove position



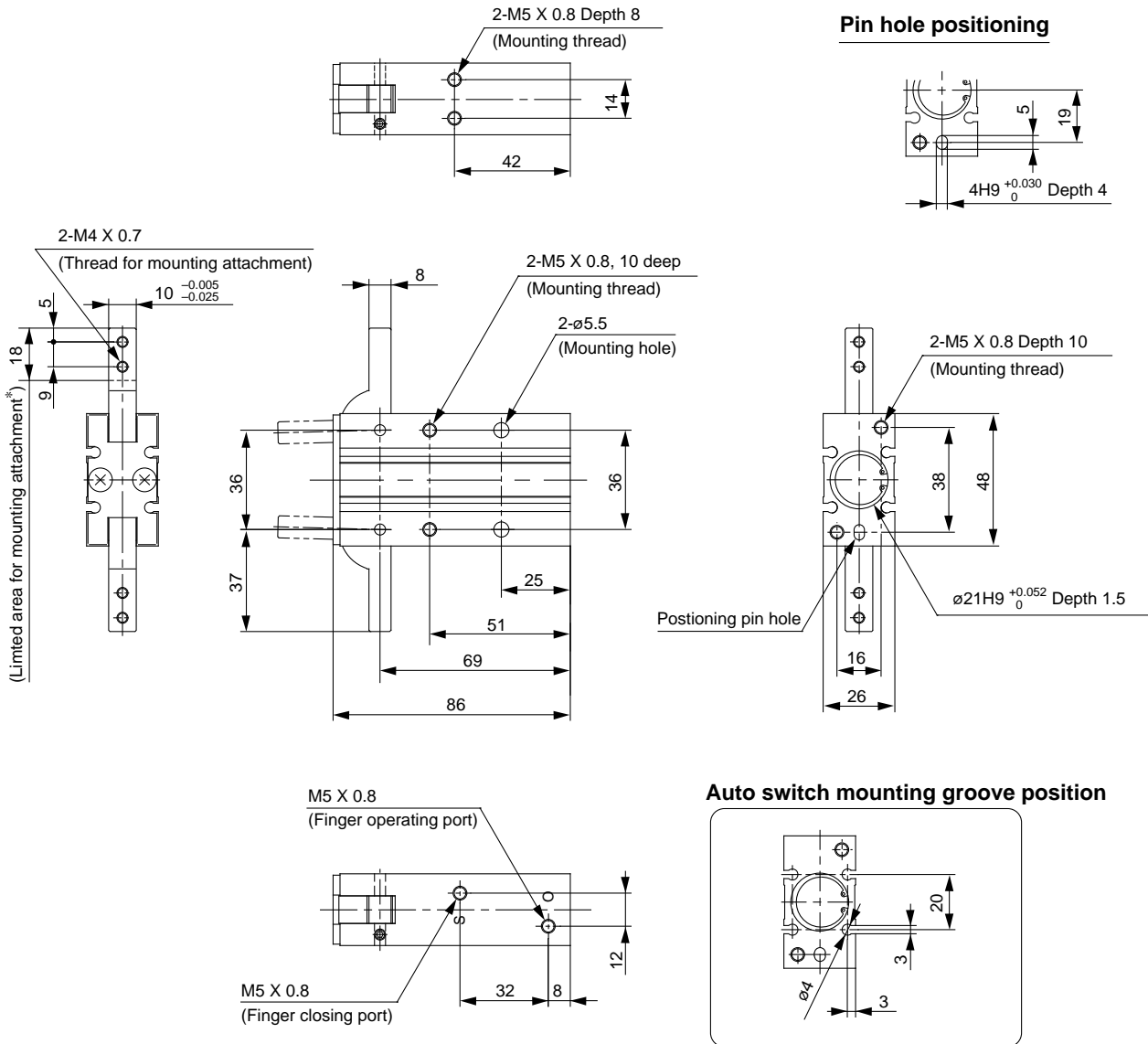
MHY2-16D2

Opening/closing direction through hole type



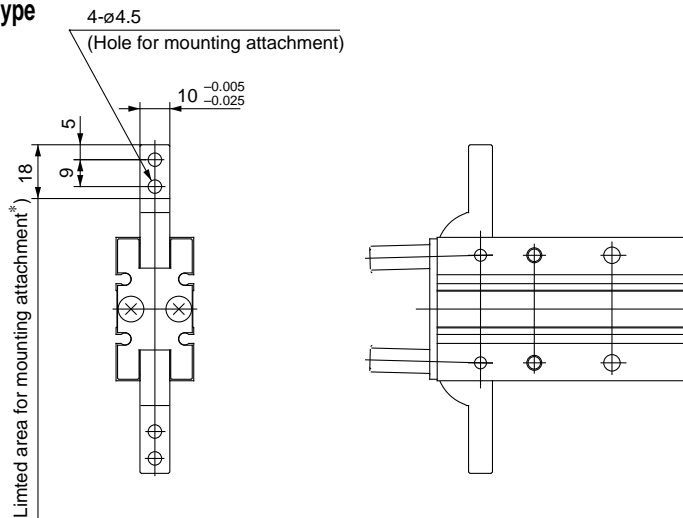
* Do not extend the attachment from limited area for mounting to avoid interference with the attachment or main body.

MHY2-20D



MHY2-20D2

Opening/closing direction through hole type



* Do not extend the attachment from limited area for mounting to avoid interference with the attachment or main body.

MHZ2

MHZJ2

MHQ

MHL2

MHR

MHK

MHS

MHC2

MHT2

MHY2

MHW2

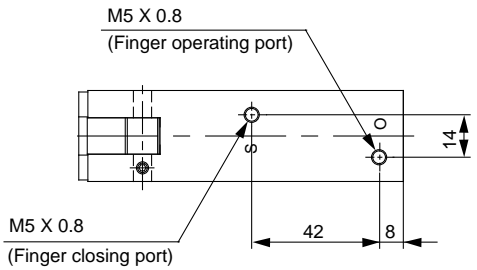
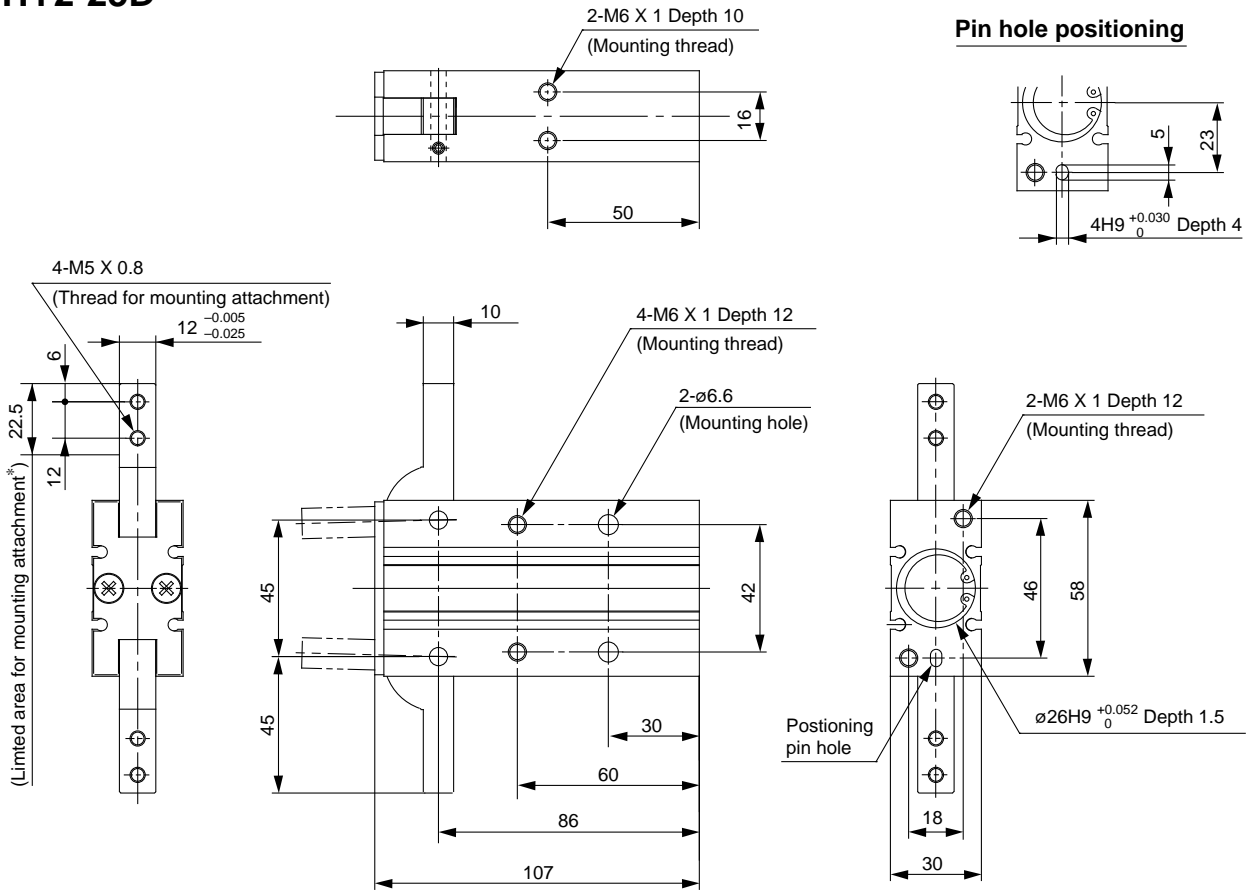
MRHQ

Auto switch

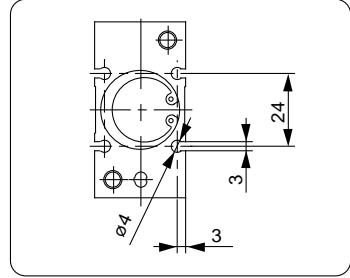
Series MHY2

Dimensions

MHY2-25D

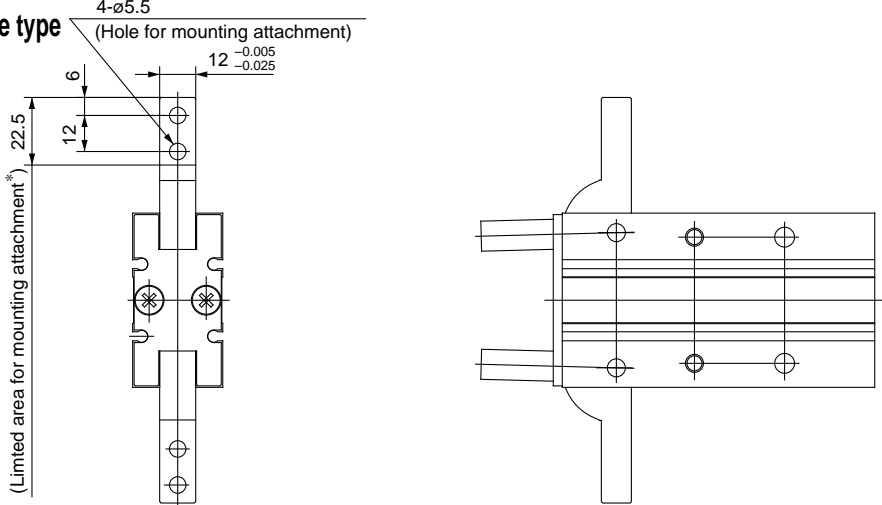


Auto switch mounting groove position



MHY2-25D2

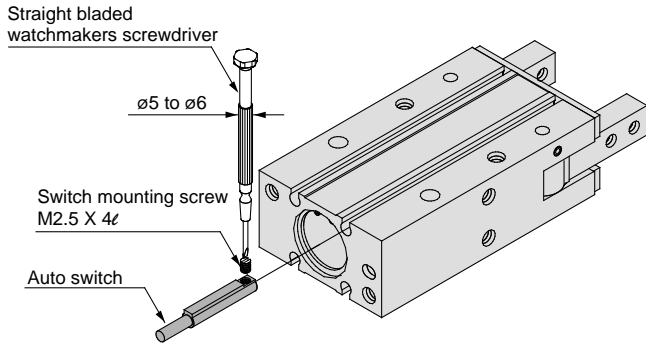
Opening/closing direction through hole type



* Do not extend the attachment from limited area for mounting to avoid interference with the attachment or main body.

Setting Method 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 establishing the installation position, tighten the attached switch mounting screw with a straight bladed watchmakers screwdriver.

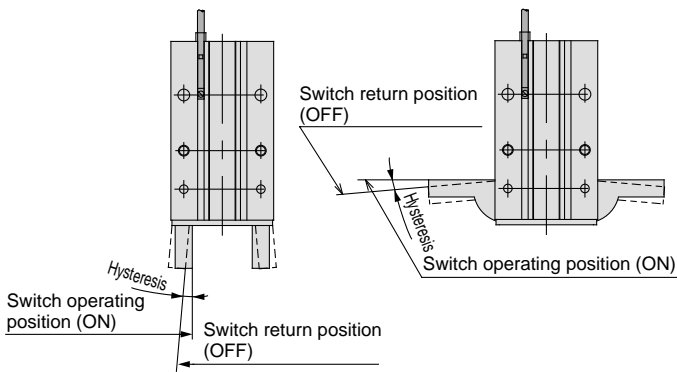


Note) Use a watchmakers screwdrivers with a grip diameter of 5 to 6 mm to tighten the auto switch mounting screw. Use a tightening torque of 0.05 to 0.1Nm. As a rough guide, tighten the screw an additional 90° after feeling a tighter resistance.

*Refer to the p.2.11-7 for the details of "Solid State Switch /Connection Method and Connection Example".

Auto Switch Hysteresis

Auto switches have a differential like a micro switch. Please refer to the following table as a guide when setting auto switch positions.

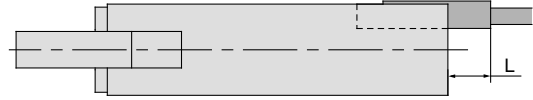


		D-F9N(V) D-F9B(V)	D-F9NW(V)		D-F9BA	
			Red light at ON	Green light at ON	Red light at ON	Green light at ON
MHY2-10D	Finger fully closed	2°	2°	4°	2°	3°
	Finger fully open	4°	4°	7°	4°	5°
MHY2-16D	Finger fully closed	2°	2°	4°	2°	2°
	Finger fully open	3°	3°	6°	3°	4°
MHY2-20D	Finger fully closed	2°	2°	3°	2°	2°
	Finger fully open	3°	3°	5°	3°	3°
MHY2-25D	Finger fully closed	1°	1°	3°	1°	2°
	Finger fully open	2°	2°	5°	2°	3°

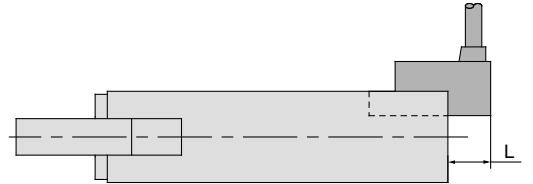
Projection of Auto Switch from Body Edge

The projection of an auto switch from the edge of the body is shown in the table below. Use the table as a guideline for mounting.

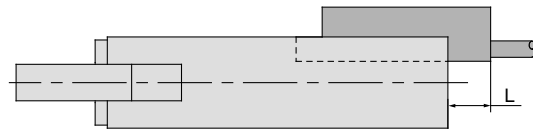
Note) 2 color indicator type and perpendicular entry type protrude in the direction of the lead wire entry.



When auto switch D-F9N is used



When auto switch D-F9□V is used



When auto switch D-F9BA is used

Max. protrusion of auto switch from edge of body (L) Unit: mm

Gripper Model No.	Auto switch model No.	Protrusion						
		In-line			Perpendicular			
		D-F9N	D-F9B	D-F9BA	D-F9NW	D-F9NV	D-F9BV	D-F9NWV
MHY2-10D	O	—	—	—	—	—	—	—
	S	3	8	13	6	1	1	8
MHY2-16D	O	—	—	—	—	—	—	—
	S	3	8	13	7	1	1	8
MHY2-20D	O	—	—	—	—	—	—	—
	S	—	5	10	4	—	—	5
MHY2-25D	O	—	—	—	—	—	—	—
	S	—	3	9	3	—	—	3

MHZ2

MHZJ2

MHQ

MHL2

MHR

MHK

MHS

MHC2

MHT2

MHY2

MHW2

MRHQ

Auto switch

Solid-state Auto Switches for Direct Mounting Series D-M9N(V)/D-M9P(V)/D-M9B(V)



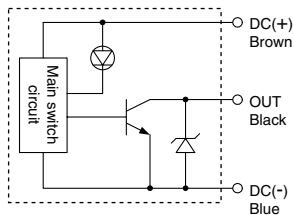
Grommet

- Reduced load currents for two-wire model (2.5 to 40 mA)
- Compliance with lead-free requirements
- Use of UL-approved lead wires (style 2844)

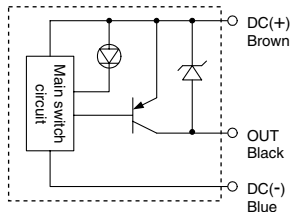


Internal circuits

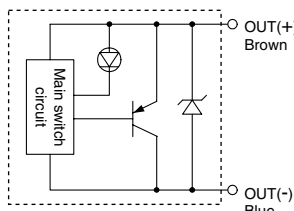
D-M9N/M9NV



D-M9P/M9PV



D-M9B/M9BV



Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□/D-M9□V (with Indicator light)						
Model number	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring	Three-wire			Two-wire		
Output	NPN		PNP		—	
Applicable load	Integrated circuit, relay and PLC				24 V DC relay and PLC	
Power voltage	5, 12, or 24 V DC (4.5 to 28 V DC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 V DC or less		—		24 V DC (10 to 28 V DC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less				4 V or less	
Leakage current	100 μA max. at 24 V DC				0.8 mA or less	
Indicator light	Red LED lights when ON.					

- Lead wire: oil-proof heavy-duty vinyl cable
2.7 x 3.2 with elliptic cross-section, 0.15 mm², two cores (D-M9B),
or three cores (D-M9N and D-M9P)

Solid state switch specifications

Leakage current	3-wire: 100 μA or less; 2-wire: 0.8 mA max.
Operating time	1 ms or less
Impact resistance	1000 m/s ²
Insulation resistance	50 MΩ or more at 500 V DC (between lead wire and case)
Withstand voltage	1000 V AC for 1 min. (between lead wire and case)
Ambient temperature	-10°C to 60°C
Enclosure	IEC529 standard IP67, JIS C 0920 watertight construction

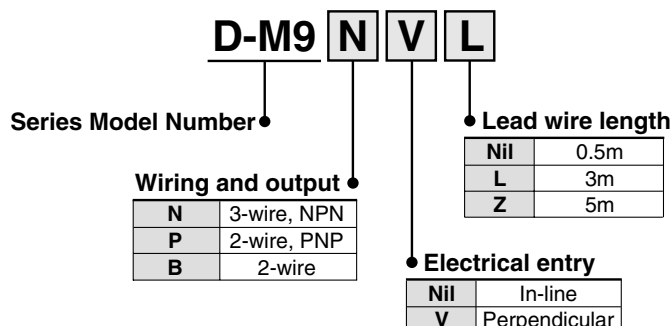
Weight

Unit: g

Model	D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length (m)	0.5	8	7
	3	41	38
	5	68	63

How to Order

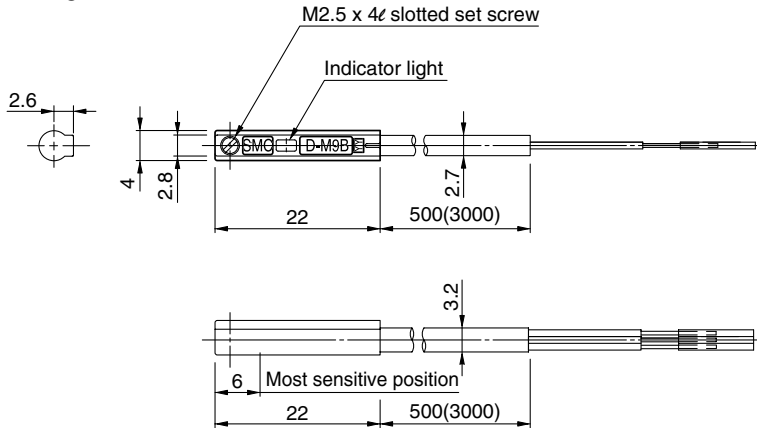
Standard Model Number



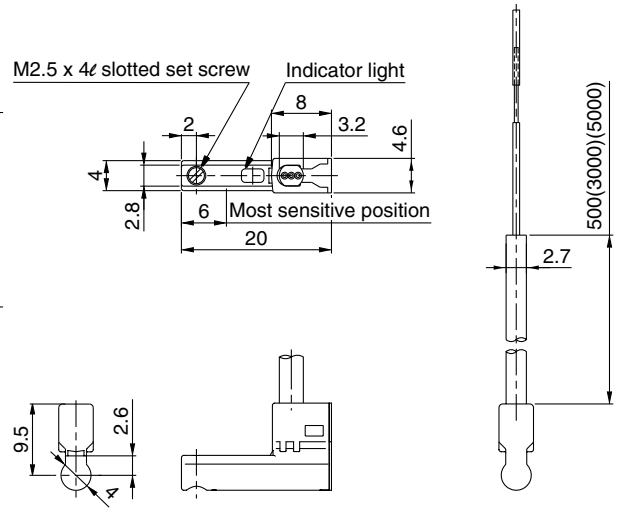
Series D-M9

Auto Switch Dimensions

D-M9□



D-M9□V



⚠ Specific Product Precautions

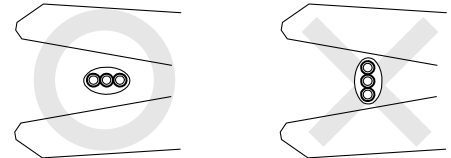
Be sure to read before handling. Contact SMC when the required specification is out of range.

Handling

⚠ Caution

Observe the following precautions when handling the product.

- The D-M9 series of auto switches is not overcurrent-protected. Faulty wiring or short circuit may result in breakage or burning-out of the switch.
- When stripping the cable clad, be careful about the orientation of the cable being stripped. The insulator may be accidentally torn or damaged depending on the orientation, as shown on the right.



- We recommend the following tools

Manufacturer	Product name	Product number
VESSEL	Wire stripper	No 3000G
Tokyo Ideal	Strip master	45-089

* The stripper for the round shape cords (ø2.0) is for a 2-wire style.

- Please do not attach the switch with any other screws than those already attached to the auto switch body.

The operation range is shorter than that of the conventional models.

If the auto switch replaces the conventional model, it may not function depending on its application because the operation range is shorter. Refer to the examples below.

- In an application where at the end, the stopping position shifting range is larger than the operation range.**
For example, pushing a work against something, or pressing a work into a hole, or clamping a work.
- In an application where the auto switch is used to detect an intermediate stopping position. (Detecting time is shortened.)**

Note) Please contact SMC for the operation range details for each actuator.

The switch is damaged instantly when a load is shortened since short circuit protection is not built-in. Pay special attention to avoid reversing the connection of the brown lead of the power supply line and the black output line connection.