

3 Finger Parallel Style Air Gripper

Series MHS3

Size: 16, 20, 25, 32, 40, 50, 63, 80, 100, 125



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

How to Order

Bore size

ø16 to ø25

MHS 3 — 20 D — M9N

Number of fingers
3 2 fingers

Bore size
16 16 mm
20 20 mm
25 25 mm

Action
D Double acting

Auto switch
Nil Without auto switch (Built-in magnet)
S 2 pcs.
1 pc.

Number of auto switches
Nil 2 pcs.
S 1 pc.

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)*			Flexible lead wire (-61)	Applicable load		Pre-wire connector
					DC	AC	Electrical entry	In-line	0.5 (Nil)	3 (L)	5 (Z)				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V	M9NV	M9N	●	●	○	Standard	IC circuit	Relay, PLC	○
				3-wire (PNP)		12 V	M9PV	M9P	●	●	○				○
				2-wire		12 V	M9BV	M9B	●	●	○				○
	Water resistant (2-color indication)			—			—	F9BA	—	●	○	○	—	—	○

* Lead wire length symbols: 0.5 m ... Nil (Example) M9B
3 m ... L (Example) M9BL
5 m ... Z (Example) M9BZ

Note) Take note of hysteresis with 2-color indication type switches. Refer to "Auto Switch Hysteresis" on page 12-7-62.

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

Bore size

ø32 to ø125

MHS 3 — 50 D — Y59A

Number of fingers
3 3 fingers

Bore size
32 32 mm
40 40 mm
50 50 mm
63 63 mm

Action
D Double acting

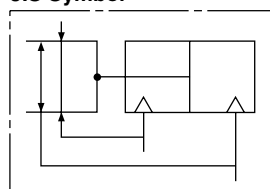
Auto switch
Nil Without auto switch (Built-in magnet)
S 2 pcs.
1 pc.
n "n" pcs.

Number of auto switch
Nil 2 pcs.
S 1 pc.
n "n" pcs.

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)*			Flexible lead wire (-61)	Applicable load		Pre-wire connector
					DC	AC	Electrical entry	In-line	0.5 (Nil)	3 (L)	5 (Z)				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	Y69A	Y59A	●	●	○	Standard	IC circuit	Relay, PLC	○
				3-wire (PNP)		12 V	Y7PV	Y7P	●	●	○				○
				2-wire		12 V	Y69B	Y59B	●	●	○				○
	Diagnosis (2-color indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	Y7NVV	Y7NW	●	●	○		IC circuit	Relay, PLC	○
				3-wire (PNP)		12 V	Y7PWV	Y7PW	●	●	○				○
	Water resistant (2-color indication)			2-wire		12 V	Y7BWV	Y7BW	●	●	○	○	—	—	○

JIS Symbol



* Lead wire length symbols: 0.5 m ... Nil (Example) Y59B
3 m ... L (Example) Y59BL
5 m ... Z (Example) Y59BZ

* Auto switches marked with a "○" symbol are produced upon receipt of order. Note) Take note of hysteresis with 2-color indication type switches. Refer to "Auto Switch Hysteresis" on page 12-7-62.

Series MHS3

Models/Specifications



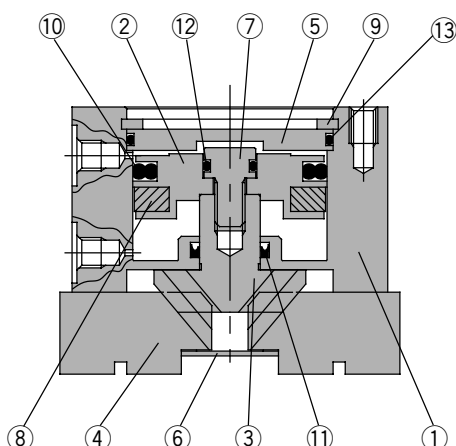
Model		MHS3-16D	MHS3-20D	MHS3-25D	MHS3-32D	MHS3-40D	MHS3-50D	MHS3-63D	MHS3-80D	MHS3-100D	MHS3-125D
Cylinder bore size (mm)		16	20	25	32	40	50	63	80	100	125
Fluid		Air									
Operating pressure (MPa)		0.2 to 0.6			0.1 to 0.6						
Ambient and fluid temperature (°C)		-10 to 60									
Repeatability (mm)		±0.01									
Max. operating frequency (c.p.m.)		120			60				30		
Lubrication		Not required									
Action		Double acting									
Effective gripping force (N) at 0.5 MPa ⁽¹⁾	External grip	14	25	42	74	118	187	335	500	750	1,270
	Internal grip	16	28	47	82	130	204	359	525	780	1,320
Opening/Closing stroke (mm) (dia.)		4	4	6	8	8	12	16	20	24	32
Weight (g)		60	100	140	237	351	541	992	1,850	3,340	6,460

Note 1) Values for $\phi 16$ to $\phi 25$ are with gripping point L = 20 mm, for $\phi 32$ to $\phi 63$ with gripping point L = 30 mm, and for $\phi 80$ to $\phi 125$ with gripping point L = 50 mm. Refer to "Effective Gripping Force" data on pages 12-7-15 through 12-7-17 for the gripping force at each gripping position.

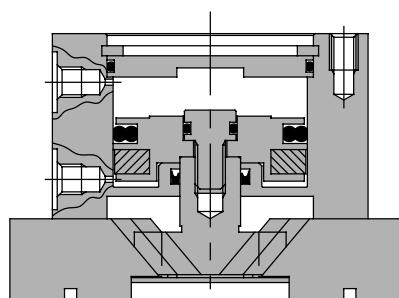
Note 2) Open and closed diameter values apply for external gripping of workpieces.

Construction

Closed condition



Open condition



Component Parts

No.	Description	Material	Note
①	Body	Aluminum alloy	Hard anodized
②	Piston	Aluminum alloy	Hard anodized
③	Cam	Carbon steel	Heat treated, Specially treated
④	Finger	Carbon steel	Heat treated, Specially treated
⑤	Cap	Aluminum alloy	Hard anodized
⑥	End plate	Stainless steel	
⑦	Piston bolt	Stainless steel	

No.	Description	Material	Note
⑧	Rubber magnet	Synthetic rubber	
⑨	Type C snap ring	Carbon steel	Nickel plated
⑩	Piston seal	NBR	
⑪	Rod seal	NBR	
⑫	Gasket	NBR	
⑬	Gasket	NBR	

Replacement Parts

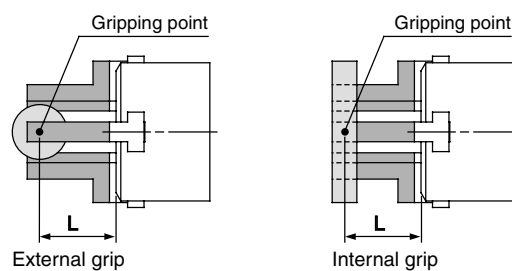
Description	MHS3-16D	MHS3-20D	MHS3-25D	MHS3-32D	MHS3-40D	Main parts
Seal kit	MHS16-PS	MHS20-PS	MHS25-PS	MHS32-PS	MHS40-PS	⑩⑪⑫⑬
Finger	P3316004	P3346104	P3316204	P3316304	P3316404	④
Cam	P3316003	P3316103	P3316203	P3316303	P3316403	③
Piston assembly	MHS-A1601	MHS-A2001	MHS-A2501	MHS-A3201	MHS-A4001	②⑦⑧

Description	MHS3-50D	MHS3-63D	MHS3-80D	MHS3-100D	MHS3-125D	Main parts
Seal kit	MHS50-PS	MHS63-PS	MHS80-PS	MHS100-PS	MHS125-PS	⑩⑪⑫⑬
Finger	P3316504	P3316604	P3316704	P3316804	P3316904	④
Cam	P3316503	P3316603	P3316703	P3316803	P3316903	③
Piston assembly	MHS-A5001	MHS-A6301	MHS-A8001	MHS-A10001	MHS-A12501	②⑦⑧

* Order 3 pieces of fingers for one unit.

Gripping Point

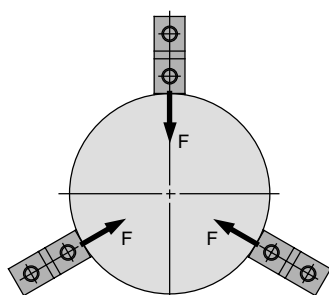
- The workpiece gripping point distance should be within the gripping force ranges given for each pressure in the effective gripping force graphs below.
- If operated with the workpiece gripping point beyond the indicated ranges, an excessive offset load will be applied to the sliding section of the fingers, which can have an adverse effect on the service life of the product.



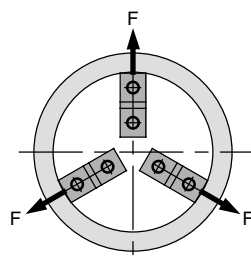
L: Gripping point distance

Effective Gripping Force

- Indication of effective gripping force
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger when all 3 of the fingers and attachments are in full contact with the workpiece as shown in the figure below.



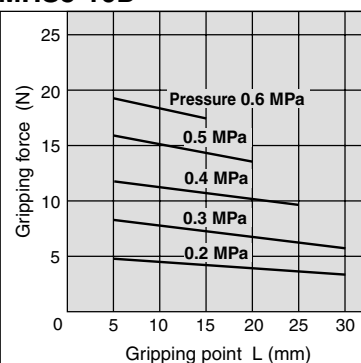
External grip



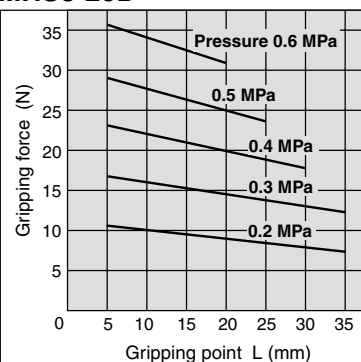
Internal grip

External Gripping Force

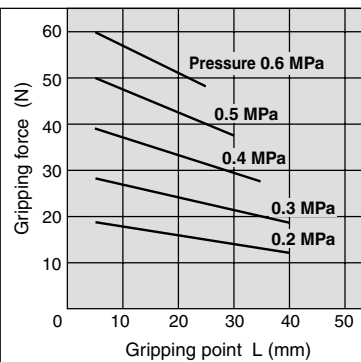
MHS3-16D



MHS3-20D

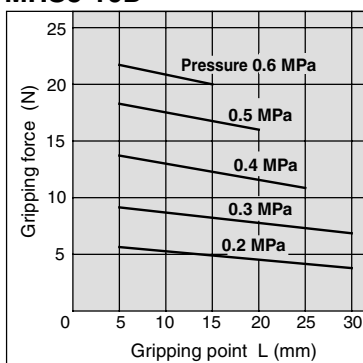


MHS3-25D

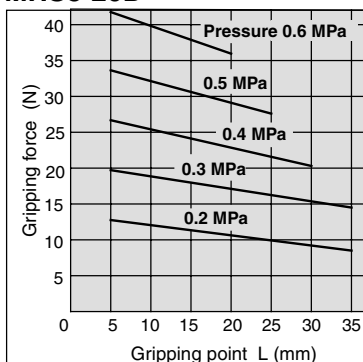


Internal Gripping Force

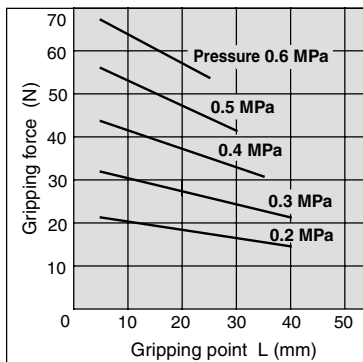
MHS3-16D



MHS3-20D



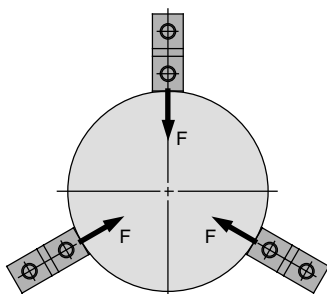
MHS3-25D



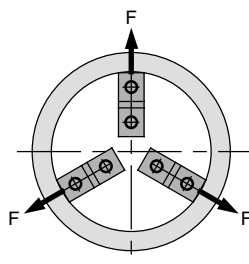
Series MHS3

Effective Gripping Force

- Indication of effective gripping force
The effective gripping force shown in the graphs to the right is expressed as F , which is the thrust of one finger when all 3 of the fingers and attachments are in full contact with the workpiece as shown in the figure below.



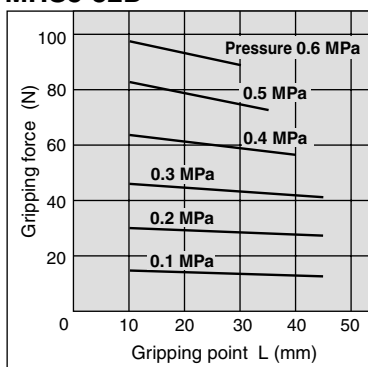
External grip



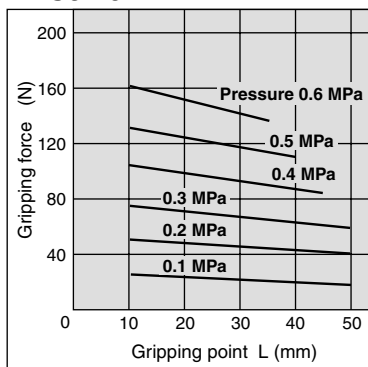
Internal grip

External Gripping Force

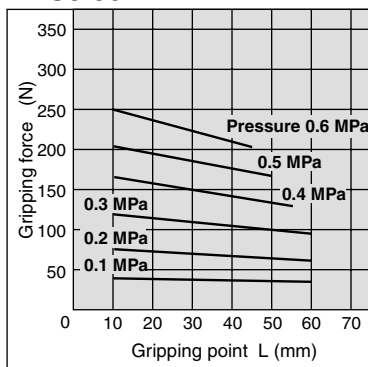
MHS3-32D



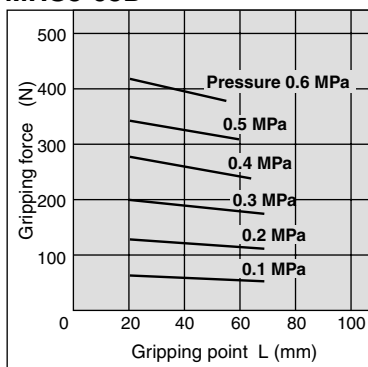
MHS3-40D



MHS3-50D

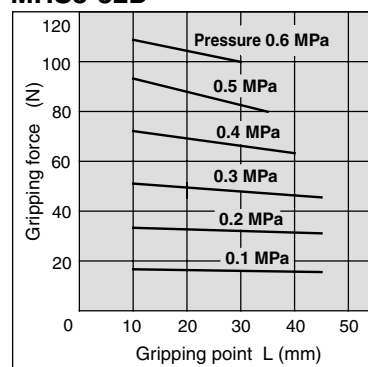


MHS3-63D

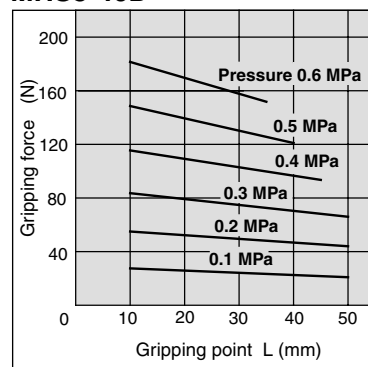


Internal Gripping Force

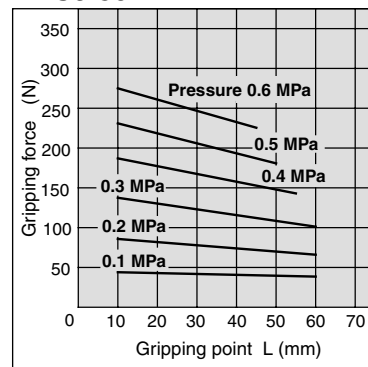
MHS3-32D



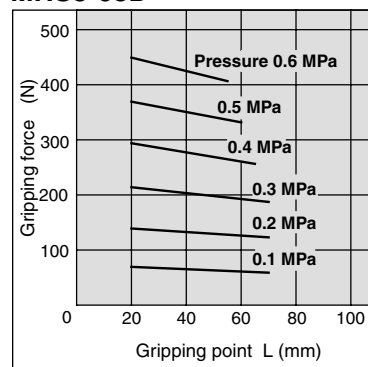
MHS3-40D



MHS3-50D

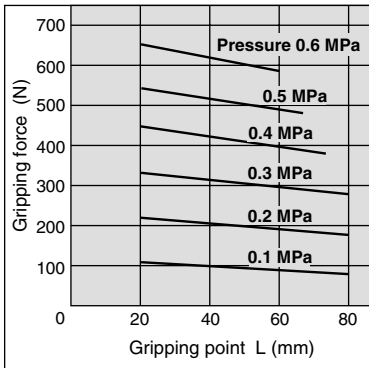


MHS3-63D

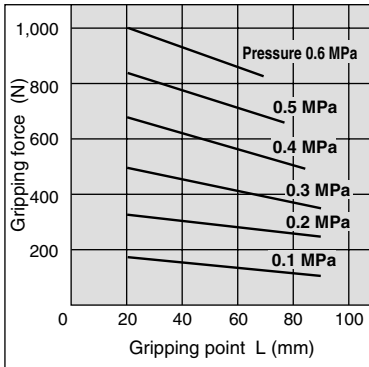


External Gripping Force

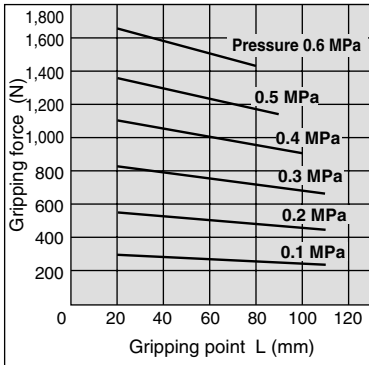
MHS3-80D



MHS3-100D

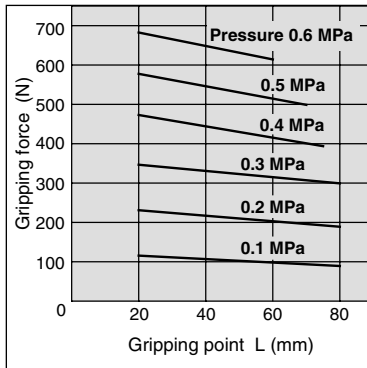


MHS3-125D

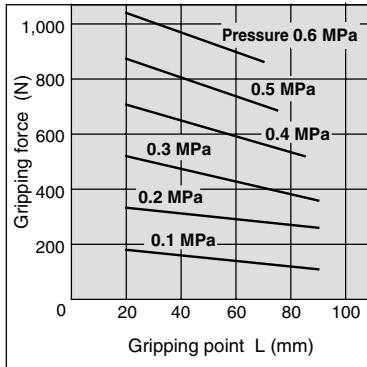


Internal Gripping Force

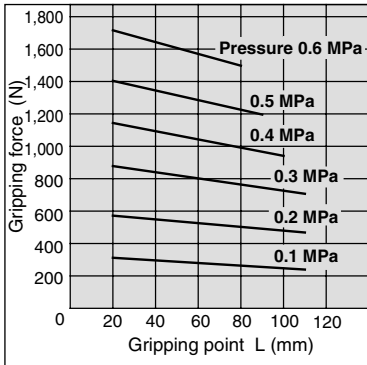
MHS3-80D



MHS3-100D



MHS3-125D

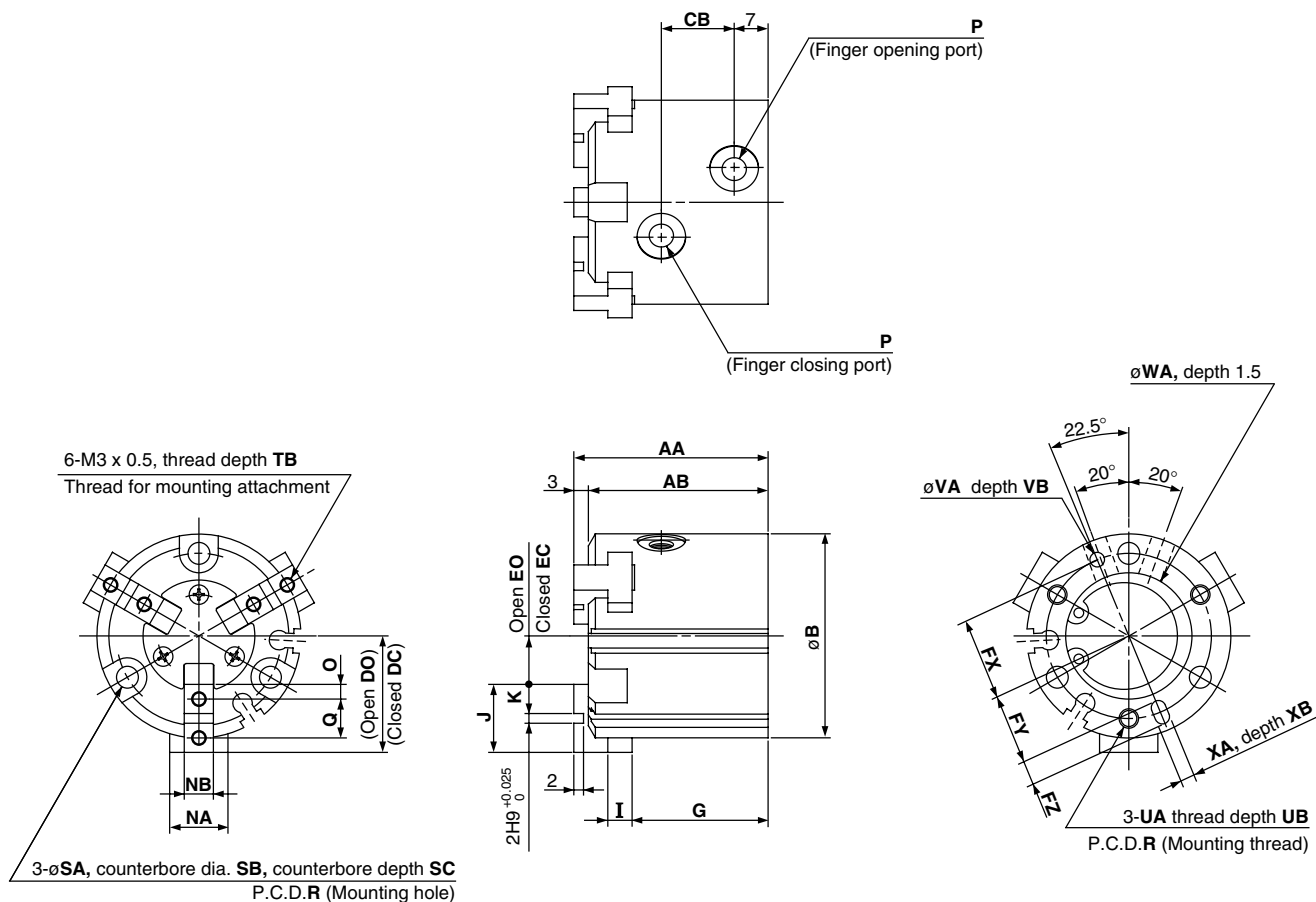


MHZ
MHF
MHL
MHR
MHK
MHS
MHC
MHT
MHY
MHW
MRHQ
Misc.
D-
20-

Series MHS3

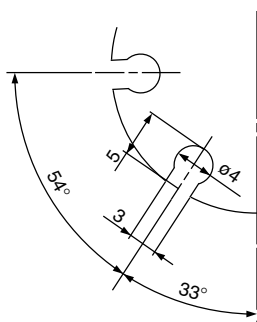
Dimensions

MHS3-16D to 25D

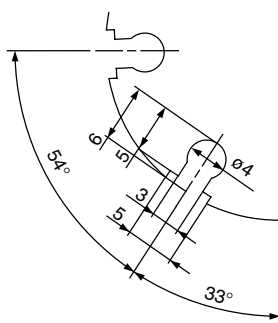


Auto switch mounting groove dimensions (2 locations)

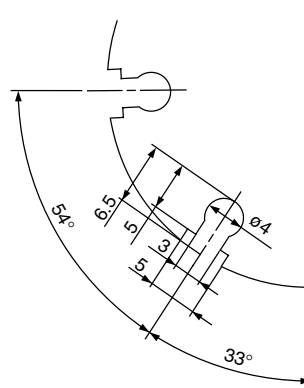
MHS3-16D



MHS3-20D



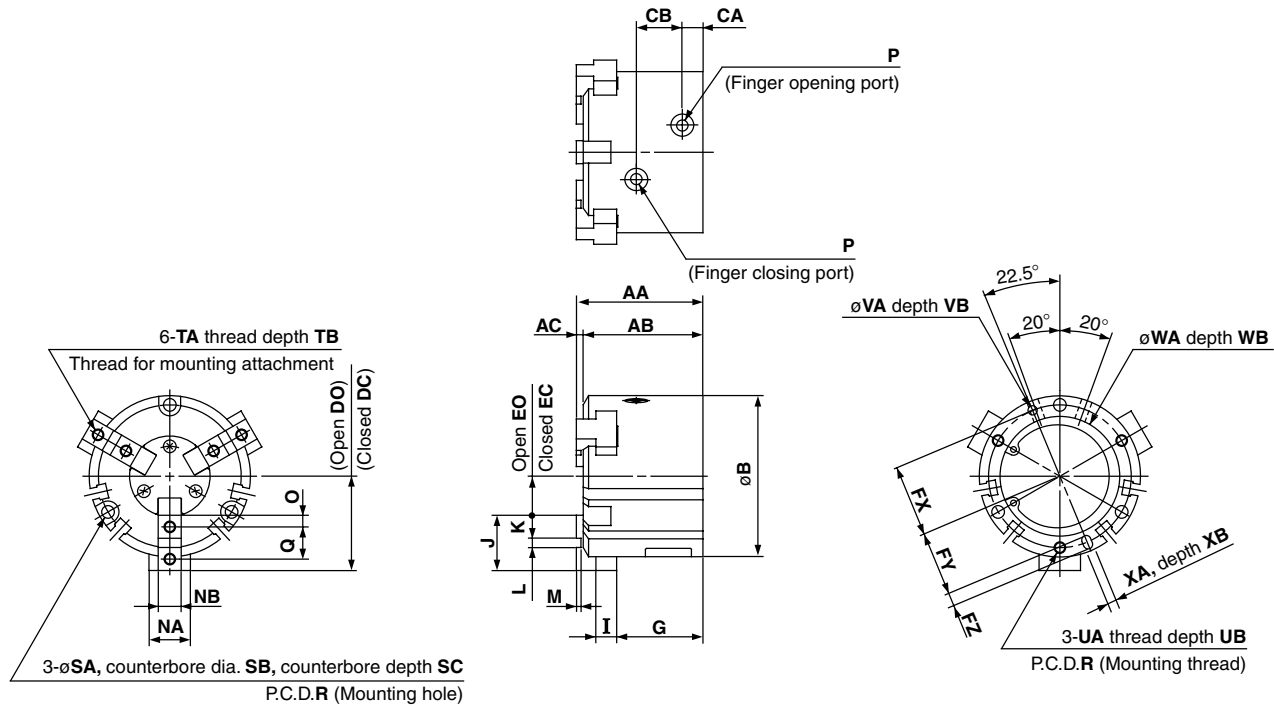
MHS3-25D



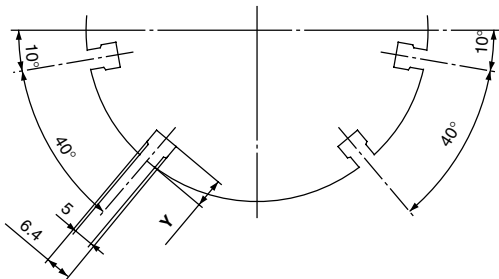
Model	AA	AB	B	CB	DC	DO	EC	EO	FX	FY	FZ	G	I	J	K	NA	NB	O	P	Q	R
MHS3-16D	35	32	30	11	15	17	5	7	12.5	11	3	25	4	10	4	8	5h9 ⁰ _{-0.030}	2	M3 x 0.5	6	25
MHS3-20D	38	35	36	13	18	20	6	8	14.5	13	3	27	5	12	5	10	6h9 ⁰ _{-0.030}	2.5	M5 x 0.8	7	29
MHS3-25D	40	37	42	15	21	24	7	10	17	14.5	5	28	5	14	6	12	6h9 ⁰ _{-0.030}	3	M5 x 0.8	8	34

Model	SA	SB	SC	TB	UA	UB	VA	VB	WA	XA	XB
MHS3-16D	3.4	6.5	8	5	M3 x 0.5	4.5	2H9 ^{+0.025} ₀	2	17H9 ^{+0.043} ₀	2H9 ^{+0.025} ₀	2
MHS3-20D	3.4	6.5	9.5	6	M3 x 0.5	6	2H9 ^{+0.025} ₀	2	21H9 ^{+0.052} ₀	2H9 ^{+0.025} ₀	2
MHS3-25D	4.5	8	10	6	M4 x 0.7	6	3H9 ^{+0.025} ₀	3	26H9 ^{+0.052} ₀	3H9 ^{+0.025} ₀	3

MHS3-32D to 80D

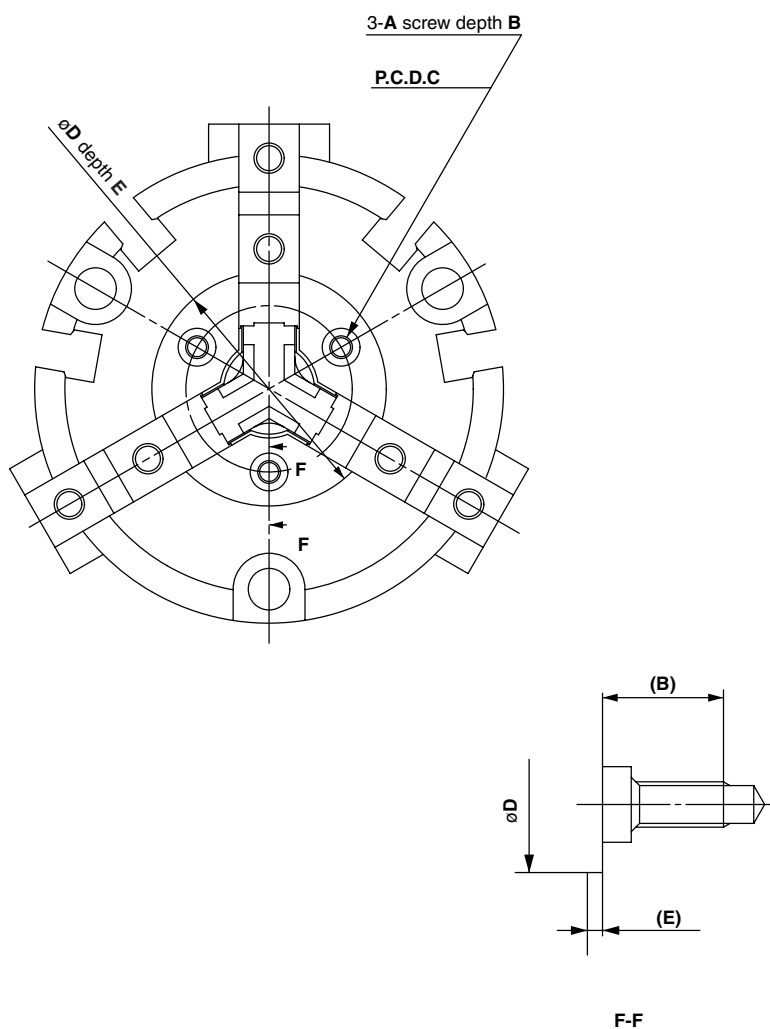


Auto switch mounting groove dimensions (4 locations)



																					(mm)	
Model	AA	AB	AC	B	CA	CB	DC	DO	EC	EO	FX	FY	FZ	G	I	J	K	L	M	NA	NB	
MHS3-32D	44	41	3	52	8	16	28	32	8	12	22	19.5	5	30.5	6	20	9	2H9 ^{+0.025} ₀	2	14	8H9 ⁰ _{-0.036}	
MHS3-40D	47	44	3	62	9	17	31	35	10	14	26.5	23.5	6	32	7	21	9	3H9 ^{+0.025} ₀	2	16	8H9 ⁰ _{-0.036}	
MHS3-50D	55	52	3	70	9	20	35	41	11	17	31	28	6	37.5	9	24	10	4H9 ^{+0.030} ₀	2	18	10H9 ⁰ _{-0.036}	
MHS3-63D	66	62	4	86	12	22	43	51	15	23	38	34.5	7	44	11	28	11	6H9 ^{+0.030} ₀	3	24	12H9 ⁰ _{-0.043}	
MHS3-80D	82	77	5	106	13.5	27	53.5	63.5	21.5	31.5	47.5	43.5	8	56	12	32	12	8H9 ^{+0.036} ₀	4	28	14H9 ⁰ _{-0.043}	
Model	O	P	Q	R	SA	SB	SC	TA	TB	UA	UB	VA	VB	WA	WB	XA	XB	Y				
MHS3-32D	4.5	M5 x 0.8	11	44	4.5	8	9	M4 x 0.7	8	M4 x 0.7	6	3H9 ^{+0.025} ₀	3	34H9 ^{+0.062} ₀	2	3H9 ^{+0.025} ₀	3	6				
MHS3-40D	4.5	M5 x 0.8	12	53	5.5	9.5	9	M4 x 0.7	8	M5 x 0.8	7.5	4H9 ^{+0.030} ₀	4	42H9 ^{+0.062} ₀	2	4H9 ^{+0.030} ₀	4	8				
MHS3-50D	5	M5 x 0.8	14	62	5.5	9.5	12	M5 x 0.8	10	M5 x 0.8	10	4H9 ^{+0.030} ₀	4	52H9 ^{+0.074} ₀	2	4H9 ^{+0.030} ₀	4	7				
MHS3-63D	5.5	M5 x 0.8	17	76	6.6	11	14	M5 x 0.8	10	M6 x 1	9	5H9 ^{+0.030} ₀	5	65H9 ^{+0.074} ₀	2.5	5H9 ^{+0.030} ₀	5	7.5				
MHS3-80D	6	Rc 1/8	20	95	6.6	11	19	M6 x 1	12	M6 x 1	12	6H9 ^{+0.030} ₀	6	82H9 ^{+0.087} ₀	3	6H9 ^{+0.030} ₀	6	8				

Series MHS3 Detailed Dimensions of Mounting Portion of End Plate

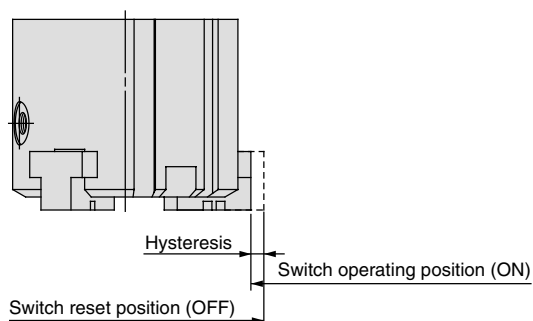


(mm)					
Model	A	B	C	øD	E
MHS3-16D	M2 x 0.4	5.5	12.5	18H8 ^{+0.027} ₀	0.5
MHS3-20D		5.4	15	21H8 ^{+0.033} ₀	0.6
MHS3-25D			17	23H8 ^{+0.033} ₀	
MHS3-32D	M3 x 0.5	5.2	21	27H8 ^{+0.033} ₀	0.8
MHS3-40D		8	22	31H8 ^{+0.039} ₀	1
MHS3-50D			26	35H8 ^{+0.039} ₀	
MHS3-63D			33	42H8 ^{+0.039} ₀	
MHS3-80D	M4 x 0.7	9.5	40	52H8 ^{+0.046} ₀	1.5
MHS3-100D			54	70H8 ^{+0.046} ₀	
MHS3-125D			62	82H8 ^{+0.054} ₀	

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

Auto Switch Hysteresis

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



Series MHS□/MHSL

ø16 to ø25

Auto switch model Air gripper model	Hysteresis (Max. value) (mm)		
	D-M9□(V)	D-F9BAL	
		Setting of ON position when red light is on	Setting of ON position when green light is on
MHS□-16D MHSL3	0.3	0.4	1.6
MHS□-20D MHSL3	0.3	0.4	1.6
MHS□-25D MHSL3	0.4	0.4	1.6

ø32 to ø125

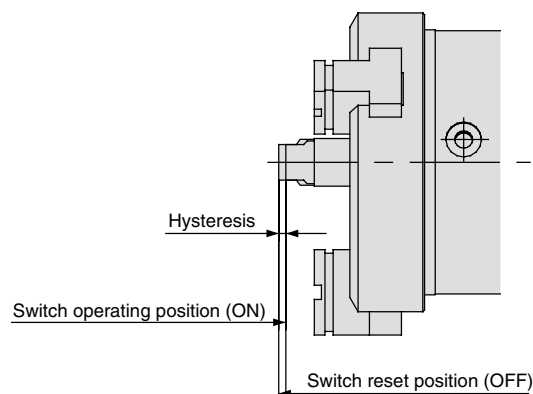
Auto switch model Air gripper model	Hysteresis (Max. value) (mm)		
	D-Y59□ D-Y69□ D-Y7P(V)	D-Y7□W(V)	D-Y7BAL
MHS□-32D MHSL3	0.7	1.2	0.7
MHS□-40D MHSL3	0.4	0.7	0.4
MHS□-50D MHSL3	0.4	0.7	0.4
MHS□-63D MHSL3	0.4	0.7	0.4
MHS□-80D MHSL3	0.4	0.7	0.6
MHS□-100D MHSL3	0.4	0.8	0.6
MHS□-125D MHSL3	0.4	0.4	0.7

Series MHSJ/MHSH

Auto switch model Air gripper model	Hysteresis (Max. value) (mm)		
	D-M9□(V)	D-F9BAL	
		Setting of ON position when red light is on	Setting of ON position when green light is on
MHSJ3-16D MHSH3	0.3	0.3	1.3
MHSJ3-20D MHSH3	0.3	0.3	1.3
MHSJ3-25D MHSH3	0.4	0.4	1.3
MHSJ3-32D MHSH3	0.6	0.4	1.5
MHSJ3-40D MHSH3	0.6	0.4	1.5
MHSJ3-50D MHSH3	0.6	0.4	1.7
MHSJ3-63D MHSH3	0.6	0.4	1.7
MHSJ3-80D MHSH3	0.6	0.5	1.8

Auto Switch Hysteresis

Center pusher/Cylinder type

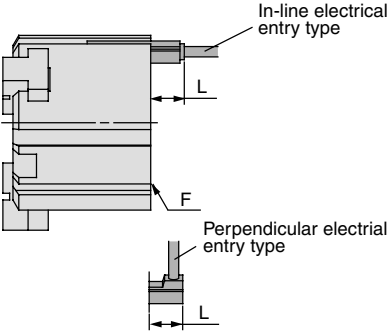
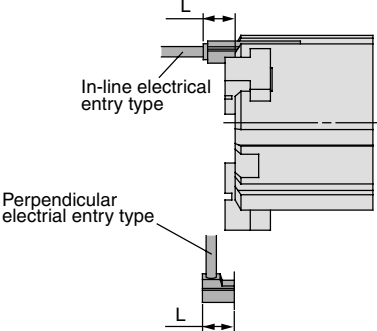


Auto switch model Air gripper model	Maximum hysteresis (mm)		
	D-M9□(V)	D-F9BAL	
		Setting of ON position when red light is on	Setting of ON position when green light is on
MHSH□3-32DA	0.5	0.3	0.8
MHSH□3-40DA	0.5	0.3	0.9
MHSH□3-50DA	0.6	0.4	1
MHSH□3-63DA	0.8	0.5	1
MHSH□3-80DA	1	0.5	1.1

Protrusion of Auto Switch from Edge of Body

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.

(mm)

Direction of auto switch mounting on air gripper		Mounting with lead wire on side opposite the fingers			Mounting with lead wire on same side as the fingers		
							
Air gripper model	Auto switch model Finger position	Lead wire type		In-line entry		Perpendicular entry	
				D-M9□	D-F9BAL	D-M9□V	D-M9□
MHS□-16D	Open	—		—	8.5	—	1
	Closed	5		5	14	3	—
MHS□-20D	Open	—		—	7	—	—
	Closed	5		5	13	3	—
MHS□-25D	Open	—		—	5	—	—
	Closed	3		3	12	1	—
MHSL3-16D	Open	—		—	8.5	—	—
	Closed	5		5	14	3	—
MHSL3-20D	Open	—		—	7	—	—
	Closed	5		5	13	3	—
MHSL3-25D	Open	—		—	5	—	—
	Closed	3		3	12	1	—
Air gripper model	Auto switch model Finger position	Lead wire type		In-line entry		Perpendicular entry	
				D-Y59□ D-Y7P D-Y7□W	D-Y7BAL	D-Y69□ D-Y7PV D-Y7□WV	D-Y59□ D-Y7P D-Y7□W
MHS□-32D	Open	—		—	—	—	5
	Closed	6		6	9	4	—
MHS□-40D	Open	—		—	—	—	2.5
	Closed	5.5		5.5	8	4	—
MHS□-50D	Open	—		—	—	—	—
	Closed	5		5	7.5	3	—
MHS□-63D	Open	—		—	—	—	—
	Closed	3		3	5	1	—
MHS□-80D	Open	—		—	—	—	—
	Closed	—		—	—	—	—
MHS□-100D	Open	—		—	—	—	—
	Closed	—		—	—	—	—
MHS□-125D	Open	—		—	—	—	—
	Closed	—		—	—	—	—
MHSL3-32D	Open	—		—	—	—	—
	Closed	6		6	9	4	—
MHSL3-40D	Open	—		—	—	—	—
	Closed	5.5		5.5	8	4	—
MHSL3-50D	Open	—		—	—	—	—
	Closed	5		5	7.5	3	—
MHSL3-63D	Open	—		—	—	—	—
	Closed	3		3	5	1	—
MHSL3-80D	Open	—		—	—	—	—
	Closed	—		—	—	—	—
MHSL3-100D	Open	—		—	—	—	—
	Closed	—		—	—	—	—
MHSL3-125D	Open	—		—	—	—	—
	Closed	—		—	—	—	—

Note 1) There is no protrusion for sections of the table with no values entered.

Note 2) When mounted with lead wires on the finger side, be sure that attachments and workpieces, etc., do not touch switch units or lead wires.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

MRHQ

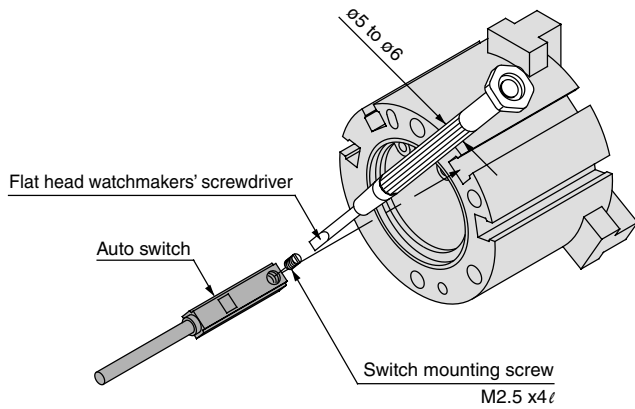
Misc.

D-

20-

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.



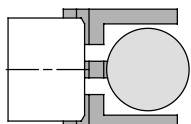
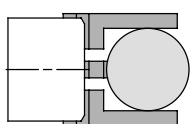
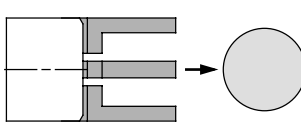
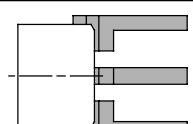
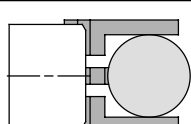
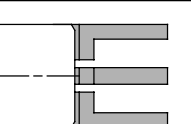
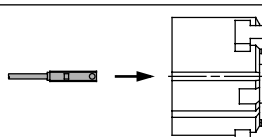
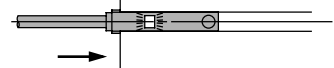
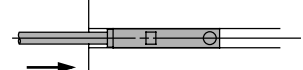
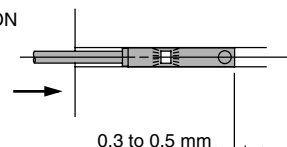
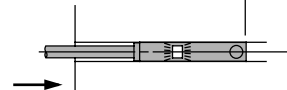
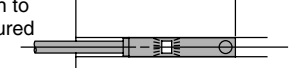
Note) Use a watchmakers' screwdriver with a grip diameter of 5 to 6 mm to tighten the auto switch mounting screw. The tightening torque should be about 0.05 to 0.1 N·m. As a rule, it should be turned about 90° beyond the point at which tightening can be felt.

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

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
Position to be detected		Position of fingers fully opened 	Position when gripping workpiece 	Position of fingers fully closed 
Operation of auto switch		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)
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) Fully close the fingers. 
		Step 2) Insert the auto switch into the switch installation groove in the direction shown in the following drawing. 		
At no pressure or low pressure, connect the switch to a power supply, and follow the directions.		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 indicator light illuminates. Move the switch further 0.3 to 0.5 mm in the direction of the arrow and fasten it. In case of 2-color indicator type, fasten it at the location when the indicator light color changes from red to green.	
		Step 4) Slide the auto switch in the direction of the arrow until the indicator light goes out. 	 Position where light turns ON 0.3 to 0.5 mm  Position to be secured	
		Step 5) Move the auto switch in the opposite direction and fasten until the indicator light illuminates. Move the switch further 0.3 to 0.5 mm beyond the position where the indicator light illuminates. In case of 2-color indicator type, fasten it at the location when the indicator light color changes from red to green.  Position where light turns ON 0.3 to 0.5 mm  Position to be secured		

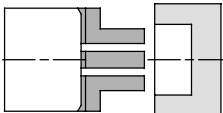
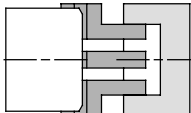
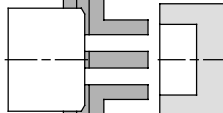
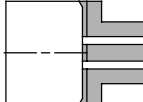
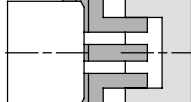
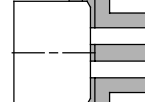
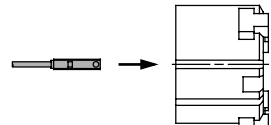
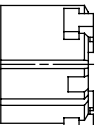
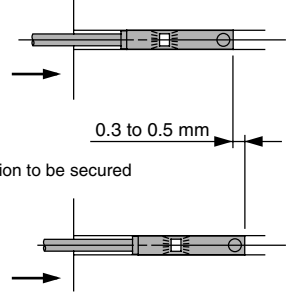
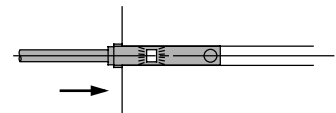
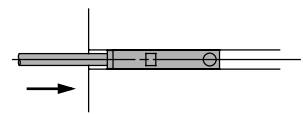
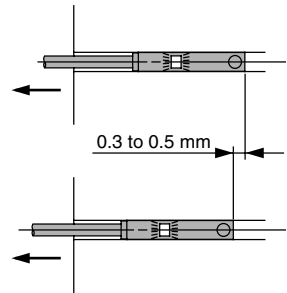
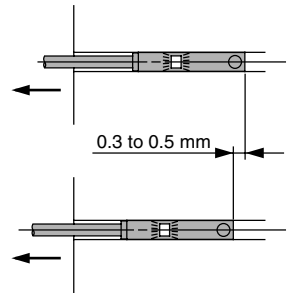


Note 1) It is recommended that gripping of a workpiece be performed close to the center of the finger stroke.

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
Position to be detected		Position of fingers fully closed 	Position when gripping workpiece 	Position of fingers fully opened  →
Operation of auto switch		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)
Detection combinations	One auto switch			
				
	Two auto switches			
				
How to determine auto switch installation position		Step 1) Fully close the fingers. 	Step 1) Position fingers for gripping a workpiece. 	Step 1) Fully open the fingers. 
At no pressure or low pressure, connect the switch to a power supply, and follow the directions.		Step 2) Insert the auto switch into the switch installation groove in the direction shown in the following drawing. 		
		Also, in case of lead wire entry from the finger direction, installation should be from the direction shown in the drawing. 		
		Step 3) Slide the auto switch in the direction of the arrow until the indicator light illuminates. Move the switch further 0.3 to 0.5 mm in the direction of the arrow and fasten it. In case of 2-color indicator type, fasten it at the location when the indicator light color changes from red to green.  Position where light turns ON 0.3 to 0.5 mm Position to be secured	Step 3) Slide the auto switch in the direction of the arrow until the indicator light illuminates. 	
		Step 4) Slide the auto switch further in the direction of the arrow until the indicator light goes out. 		
		Step 5) Move an 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. In the case of 2-color indicator type, fasten it at the location when the indicator light color changes from red to green.  Position where light turns ON 0.3 to 0.5 mm Position to be secured	Step 5) Move an 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. In the case of 2-color indicator type, fasten it at the location when the indicator light color changes from red to green. 	

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.