

Parallel Style Air Gripper: 3 Finger/Single Acting

Ø 16, Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63

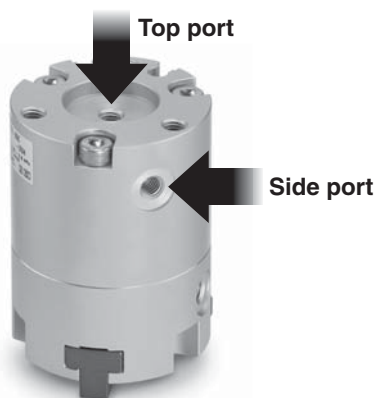
Added single acting to 3-finger type (Series MHS3).

Normally open or
normally closed type
can be selected.



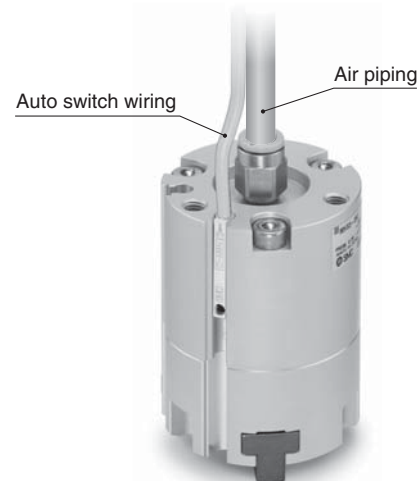
Port position can be changed according to installation conditions.

The piping can be connected from the side
port or top port of the body, which allows for
improved piping flexibility.



Piping and auto switch wiring entries are one way. (For top ported)

Space reduced through integration of air
piping and auto switch wiring.



Series Variations

Series		Action	Bore size [mm]										With dust cover
			16	20	25	32	40	50	63	80	100	125	
	MHS3	Double acting	●	●	●	●	●	●	●	●	●	●	Ø 16 to Ø 63
		Single acting	●	●	●	●	●	●	●	—	—	—	—

MHS3-X84



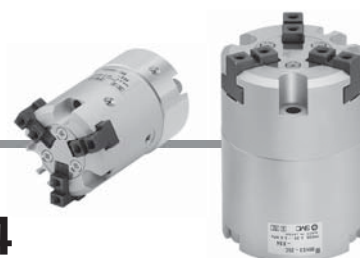
13-EU615-UK

Parallel Style Air Gripper: 3 Finger/Single Acting

MHS3-X84

ø 16, ø 20, ø 25, ø 32, ø 40, ø 50, ø 63

How to Order



MHS3-20S-M9BW-X84

Number of fingers

3	3 fingers
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Bore size

16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm

Single acting

Number of auto switches

—	2 pcs.	ø 16 to ø 63
S	1 pc.	ø 16 to ø 63
n	"n" pcs.	ø 32 to ø 63

Auto switch

—	Without auto switch (Built-in magnet)
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Action

S	Single acting (Normally open)
C	Single acting (Normally closed)

* For the applicable auto switch model, refer to the table below.

Applicable Auto Switches/Refer to the Auto Switch Guide 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	Perpendicular	In-line	0.5 (—)	1[m]	3[L]	5[Z]				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V,	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)		12 V		M9PV	M9P	●	●	●	○	○		
				2-wire		12 V		M9BV	M9B	●	●	●	○	○		
	Diagnostic indication (2-colour indication)			3-wire (NPN)		5 V,		M9NVV	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)		12 V		M9PWV	M9PW	●	●	●	○	○		
				2-wire		12 V		M9BWV	M9BW	●	●	●	○	○		
	Water resistant (2-colour indication)			3-wire (NPN)		5 V,		M9NAV**	M9NA**	○	○	●	○	○	IC circuit	
				3-wire (PNP)		12 V		M9PAV**	M9PA**	○	○	●	○	○		
				2-wire		12 V		M9BAV**	M9BA**	○	○	●	○	○		

** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

* Lead wire length symbols: 0.5 m — (Example) M9N
 1 m M (Example) M9NWM
 3 m L (Example) M9NL
 5 m Z (Example) M9NZ

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

Note 1) When using the 2-colour indication type, please make the setting so that the indicator is lit in red to ensure the detection at the proper position of the air gripper.

Note 2) When ordering the air gripper with auto switch in MHS3-32S to 63S series, auto switch mounting brackets are required (shipped together). In addition, when ordering the auto switch separately, auto switch mounting brackets (BMG2-012) are required. (For details, refer to page 12.)

Models/Specifications

Model	MHS3-16□-X84	MHS3-20□-X84	MHS3-25□-X84	MHS3-32□-X84	MHS3-40□-X84	MHS3-50□-X84	MHS3-63□-X84		
Cylinder bore size [mm]	16	20	25	32	40	50	63		
Fluid	Air								
Operating pressure [MPa]	0.35 to 0.6			0.25 to 0.6					
Ambient and fluid temperature [°C]	-10 to 60								
Repeatability [mm]	±0.01								
Max. operating frequency [c.p.m.]	120			60					
Lubrication	Not required								
Action	Single acting: Normally open, Normally closed								
Opening/Closing stroke [mm](dia.)	4	4	6	8	8	12	16		
Normally open	External grip ^{Note)} [N]	Near fully closed	9.6	17.5	29.4	56	92	144	238
		Near fully opened	10.4	19	31.7	60	99	153	258
Normally closed	Weight [g]		85	145	210	350	485	740	1330
	Internal grip ^{Note)} [N]	Near fully closed	12.3	21.2	36.5	68	108	169	279
		Near fully opened	11.3	19.9	34.2	64	103	160	259
	Weight [g]		85	145	210	345	485	740	1280

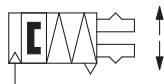
Note) Values for ø 16 to ø 25 based on gripping point L = 20 mm, for ø 32 to ø 63 based on gripping point L = 30 mm.
Refer to "Effective Gripping Force" data on pages 3 to 4 for the gripping force at each gripping position.

Symbol

Single acting/Normally open: External grip



Single acting/Normally closed: Internal grip



Replacement Parts: Seal kit (Piston seal, Rod seal, Gaskets)

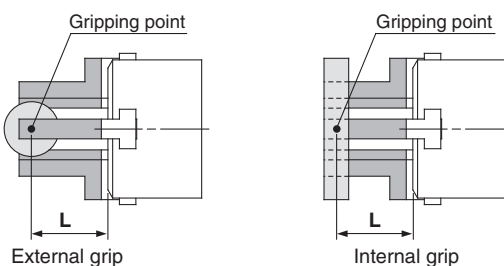
Description	MHS3-16□-X84	MHS3-20□-X84	MHS3-25□-X84	MHS3-32□-X84	MHS3-40□-X84	MHS3-50□-X84	MHS3-63□-X84
Normally open	MHS16-PS-X84-S	MHS20-PS-X84-S	MHS25-PS-X84-S	MHS32-PS-X84-S	MHS40-PS-X84-S	MHS50-PS-X84-S	MHS63-PS-X84-S
Normally closed	MHS16-PS-X84-C	MHS20-PS-X84-C	MHS25-PS-X84-C	MHS32-PS-X84-C	MHS40-PS-X84-C	MHS50-PS-X84-C	MHS63-PS-X84-C

Replacement parts/Grease pack part no.: MH-G01 (30 g)

MHS3-X84

Gripping Point

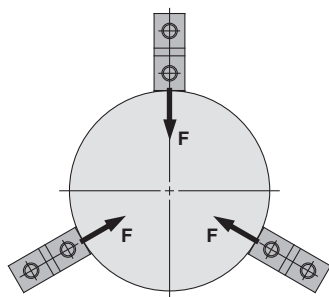
- The workpiece gripping point distance should be within the gripping force ranges given for each pressure in the effective gripping force graphs below.
- If operated with the workpiece gripping point beyond the indicated ranges, an excessive offset load will be applied to the sliding section of the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



L: Gripping point distance

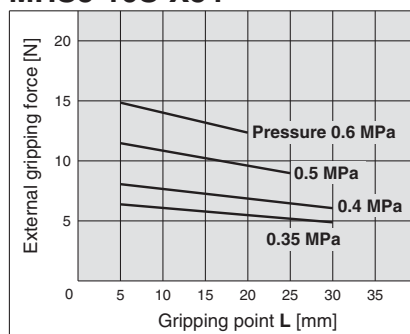
External Effective Gripping Force

- 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.

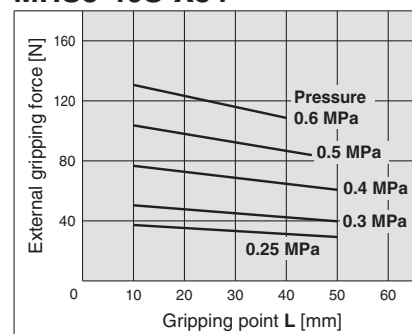


External grip

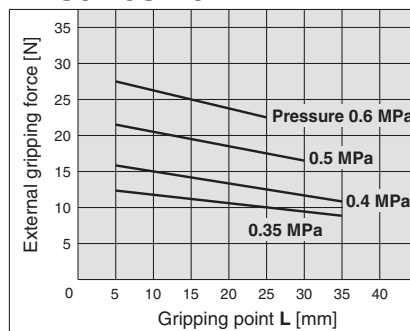
MHS3-16S-X84



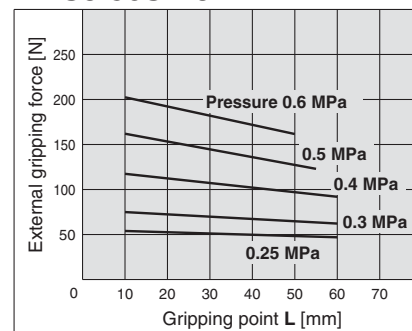
MHS3-40S-X84



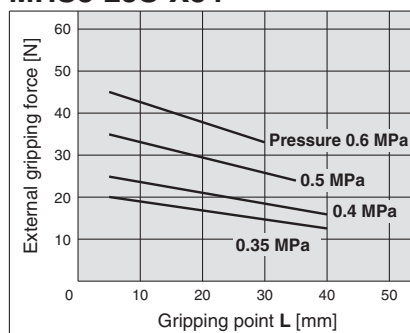
MHS3-20S-X84



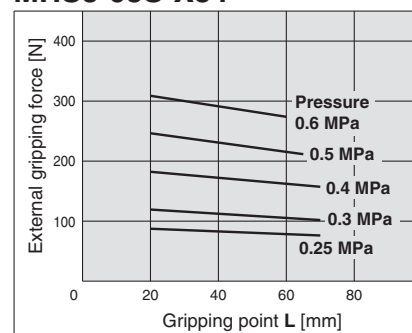
MHS3-50S-X84



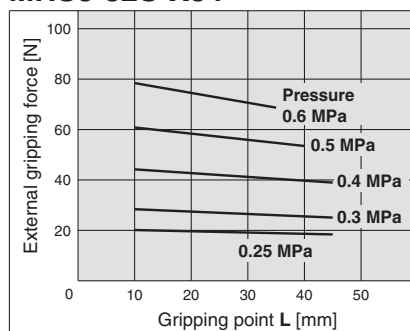
MHS3-25S-X84



MHS3-63S-X84



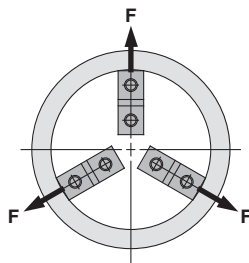
MHS3-32S-X84



Internal Effective Gripping Force

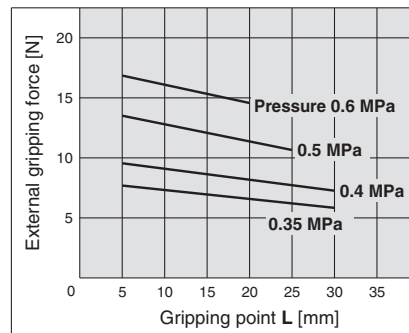
● Indication of effective gripping force

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.

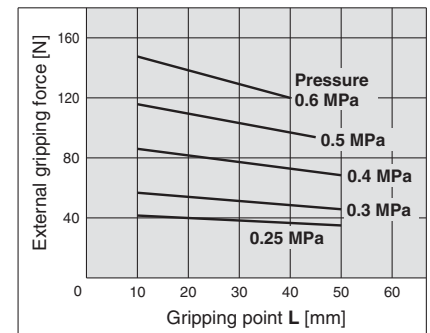


Internal grip

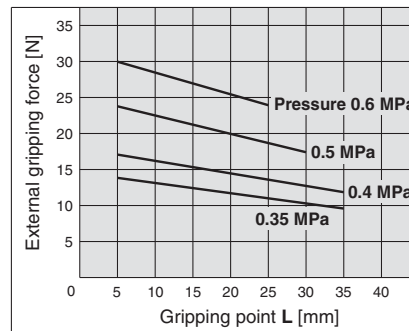
MHS3-16C-X84



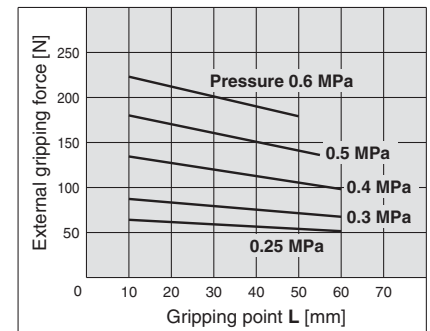
MHS3-40C-X84



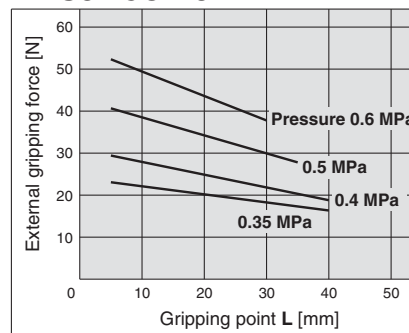
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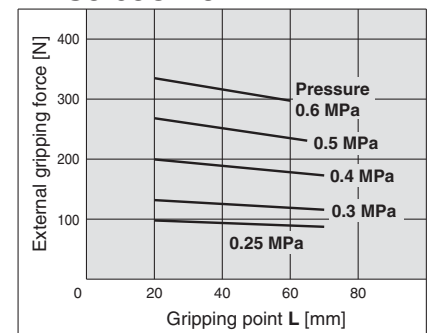
MHS3-50C-X84



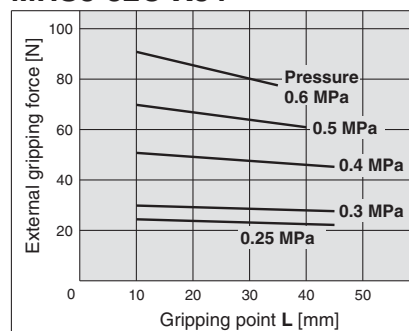
MHS3-25C-X84



MHS3-63C-X84



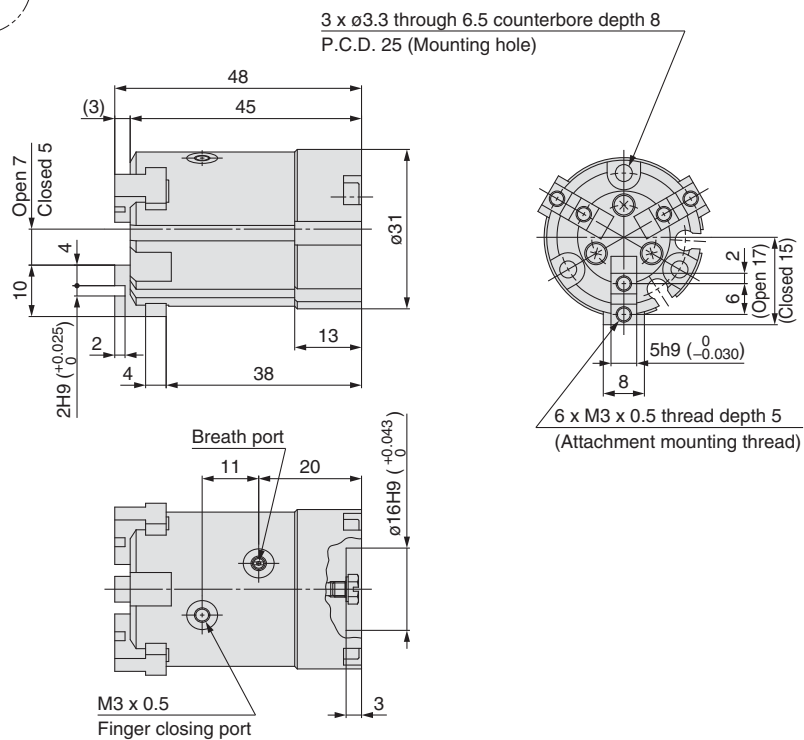
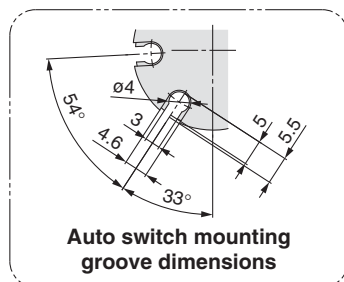
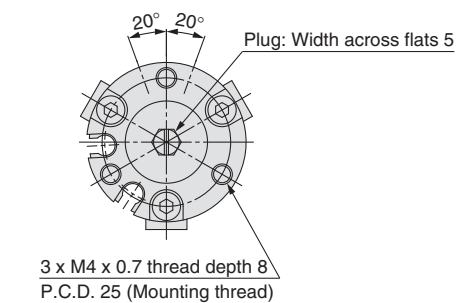
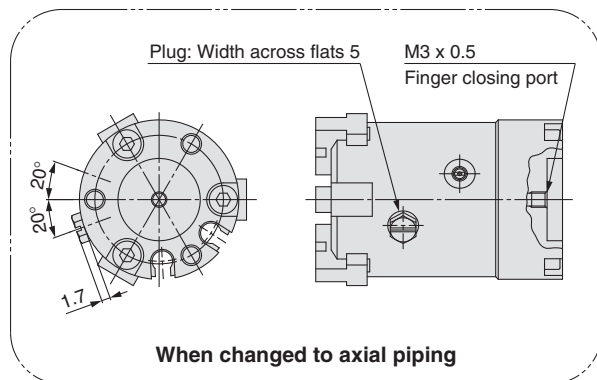
MHS3-32C-X84



MHS3-X84

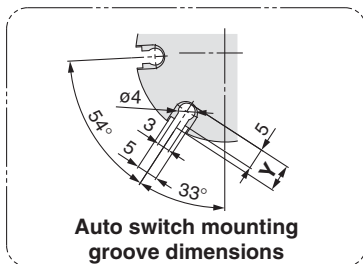
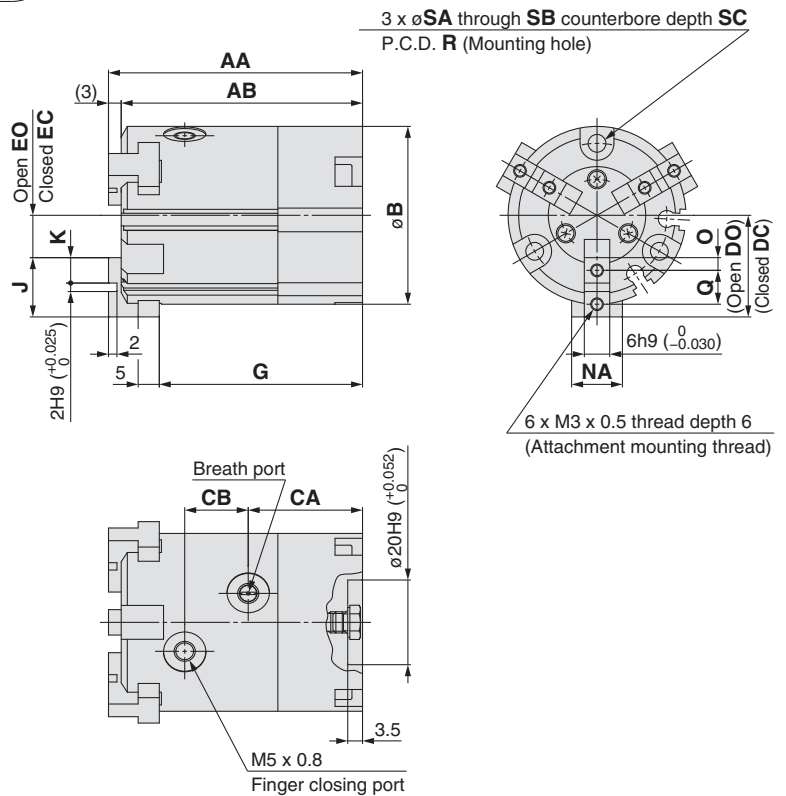
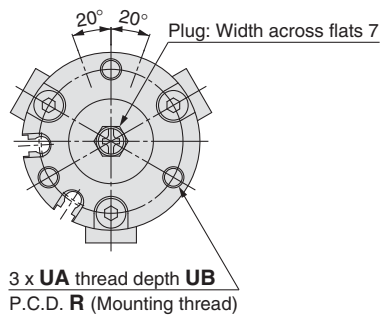
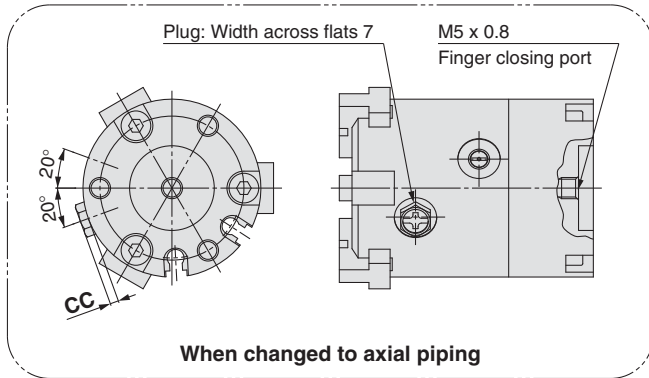
Dimensions

MHS3-16S-X84: Single acting/Normally open



Dimensions

MHS3-20S/25S-X84: Single acting/Normally open



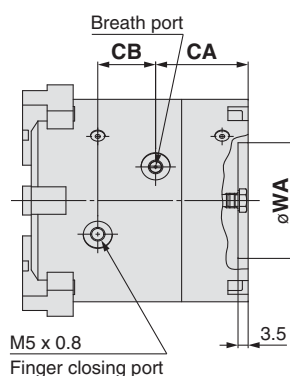
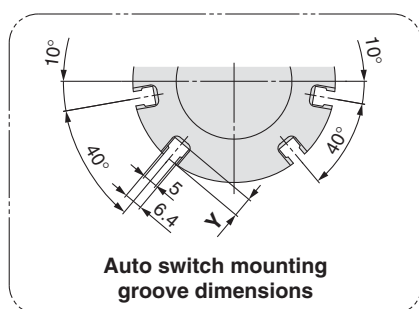
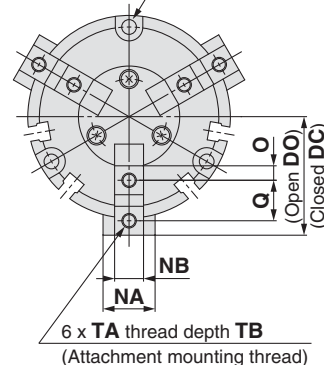
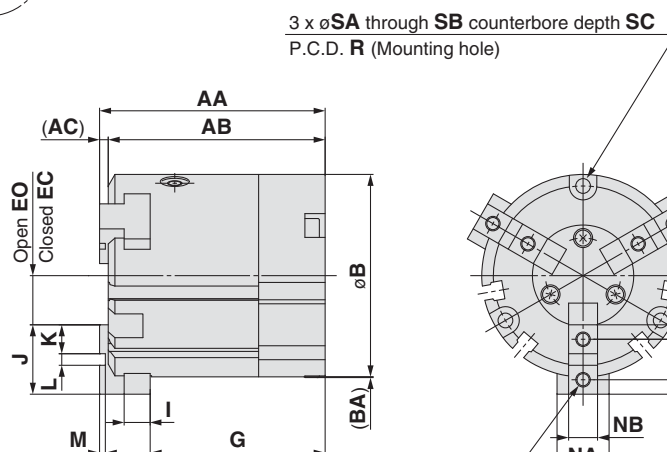
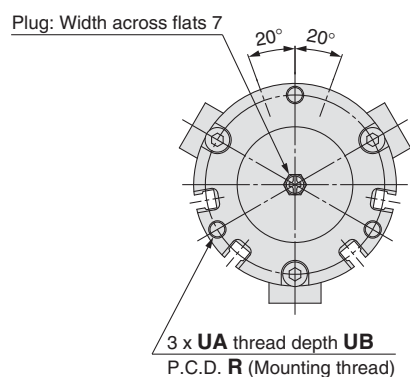
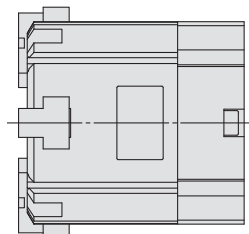
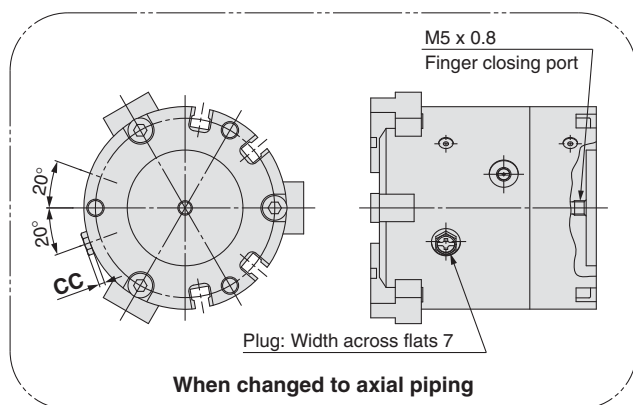
Model	AA	AB	B	CA	CB	CC	DC	DO	EC	EO	G	J	K
MHS3-20S-X84	55	52	36	24	13	2.2	18	20	6	8	44	12	5
MHS3-25S-X84	60	57	42	27	15	2	21	24	7	10	48	14	6

Model	NA	O	Q	R	SA	SB	SC	UA	UB	Y
MHS3-20S-X84	10	2.5	7	29	3.3	6.5	9.5	M4 x 0.7	8	6
MHS3-25S-X84	12	3	8	34	4.2	8	10	M5 x 0.8	10	6.5

MHS3-X84

Dimensions

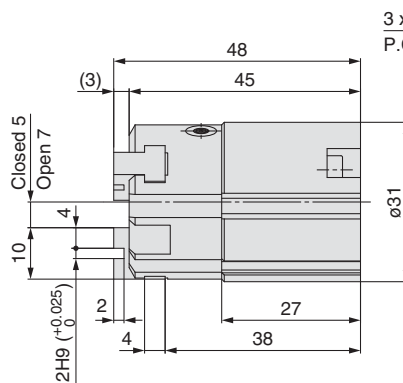
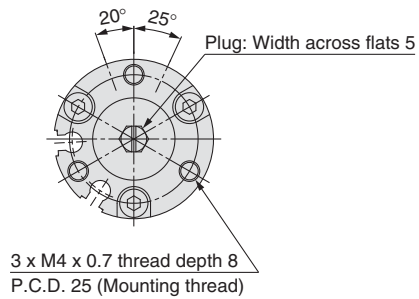
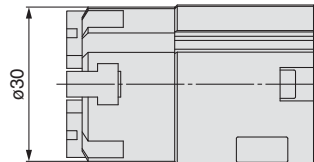
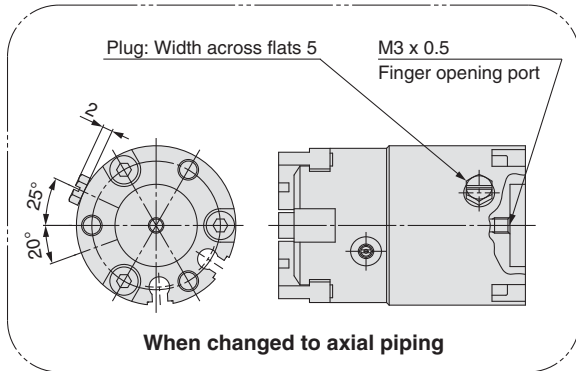
MHS3-32s to 63s-X84: Single acting/Normally open



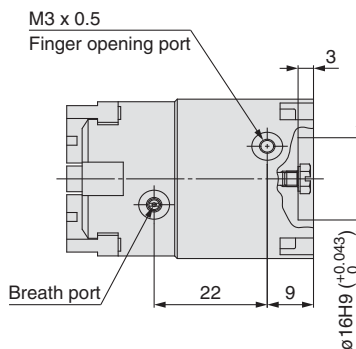
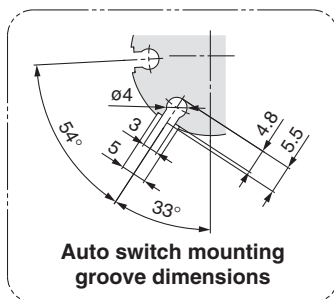
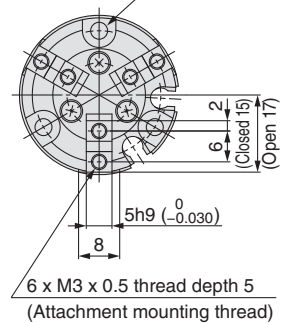
[mm]																	
Model	AA	AB	AC	B	BA	CA	CB	CC	DC	DO	EC	EO	G	I	J	K	L
MHS3-32S-X84	66	63	3	52	—	30	16	2.2	28	32	8	12	52.5	6	20	9	2H9 (+ ^{0.025} ₀)
MHS3-40S-X84	66	63	3	62	—	28	17	2	31	35	10	14	51	7	21	9	3H9 (+ ^{0.025} ₀)
MHS3-50S-X84	78	75	3	70	0.3	32	20	2	35	41	11	17	60.5	9	24	10	4H9 (+ ^{0.030} ₀)
MHS3-63S-X84	92	88	4	86	—	38	22	2	43	51	15	23	70	11	28	11	6H9 (+ ^{0.030} ₀)
Model	M	NA	NB	O	Q	R	SA	SB	SC	TA	TB	UA	UB	WA	Y		
MHS3-32S-X84	2	14	8h9 (_{-0.036} ⁰)	4.5	11	44	4.2	8	9	M4 x 0.7	8	M5 x 0.8	10	25H9 (₀ ^{+0.052})	6		
MHS3-40S-X84	2	16	8h9 (_{-0.036} ⁰)	4.5	12	53	5.1	9.5	9	M4 x 0.7	8	M6 x 1	12	30H9 (₀ ^{+0.052})	8		
MHS3-50S-X84	2	18	10h9 (_{-0.036} ⁰)	5	14	62	5.1	9.5	12	M5 x 0.8	10	M6 x 1	12	40H9 (₀ ^{+0.062})	7		
MHS3-63S-X84	3	24	12h9 (_{-0.043} ⁰)	5.5	17	76	6.6	11	14	M5 x 0.8	10	M8 x 1.25	16	50H9 (₀ ^{+0.062})	7.5		

Dimensions

MHS3-16C-X84: Single acting/Normally closed



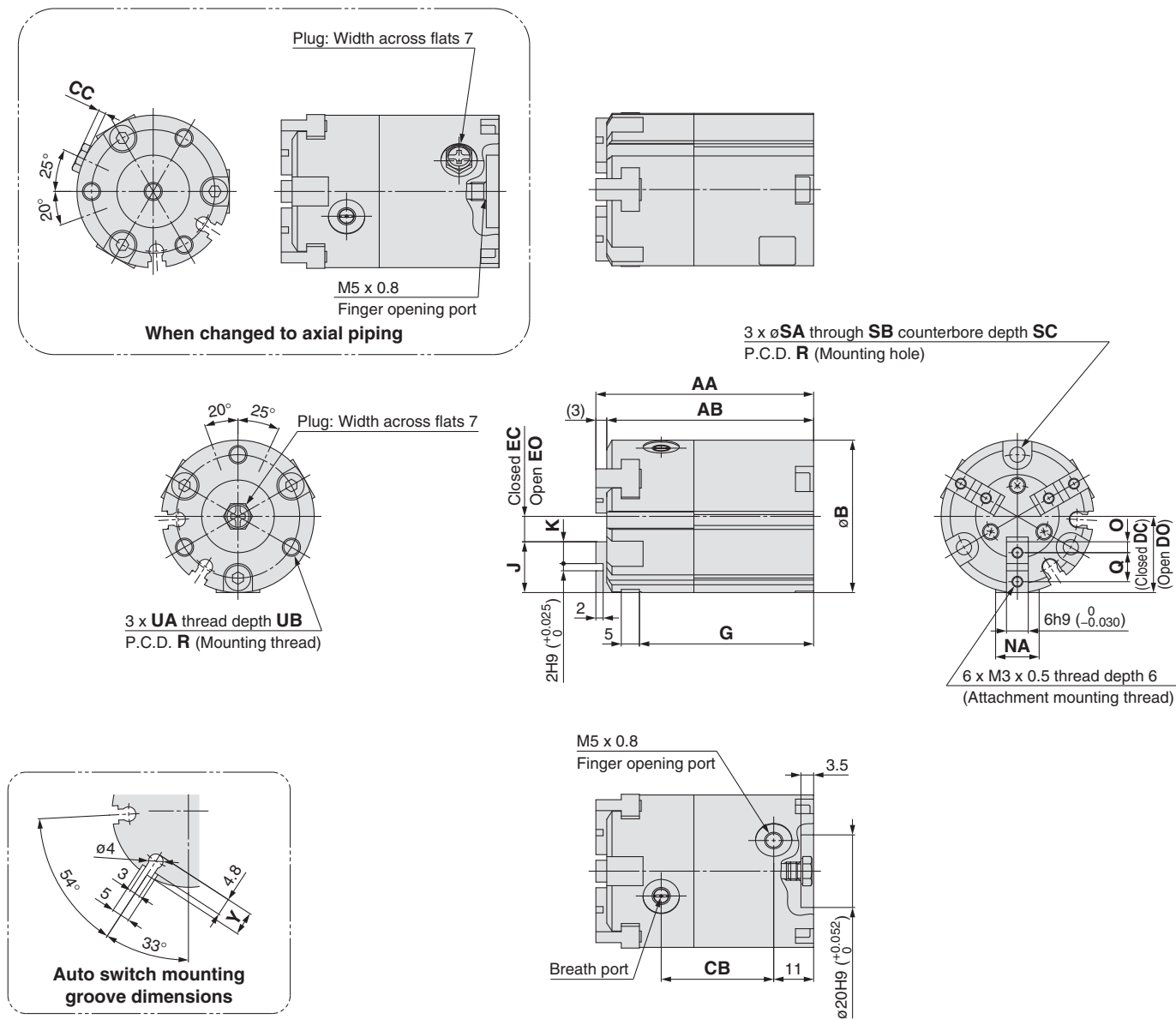
3 x ø3.3 through 6.5 counterbore depth 8
P.C.D. 25 (Mounting hole)



MHS3-X84

Dimensions

MHS3-20c/25C-X84: Single acting/Normally closed

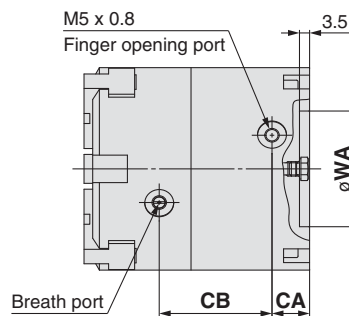
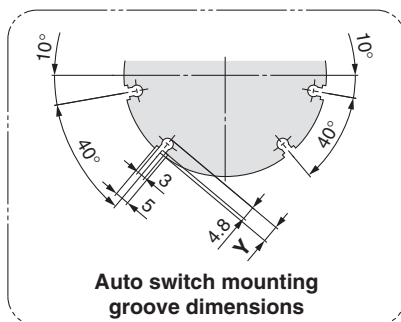
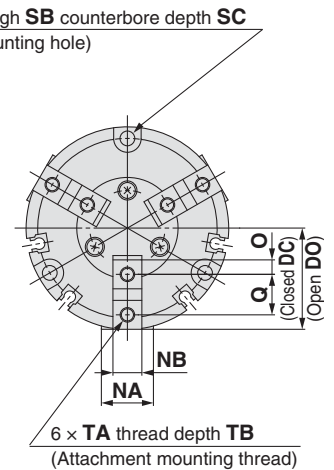
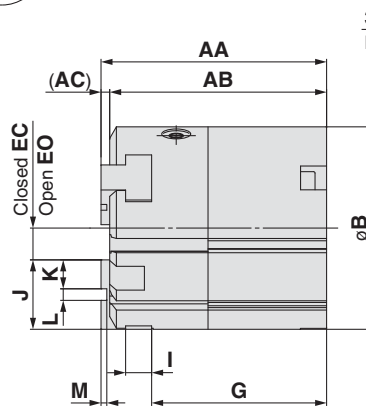
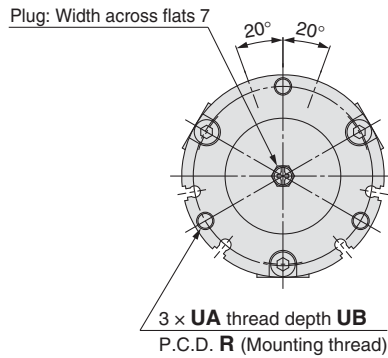
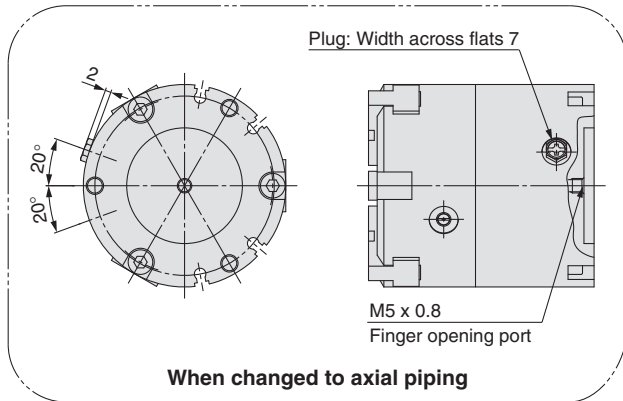


Model	AA	AB	B	CB	CC	DC	DO	EC	EO	G	J	K
MHS3-20C-X84	55	52	36	26	2.2	18	20	6	8	44	12	5
MHS3-25C-X84	60	57	42	31	2	21	24	7	10	48	14	6

Model	NA	O	Q	R	SA	SB	SC	UA	UB	Y
MHS3-20C-X84	10	2.5	7	29	3.3	6.5	9.5	M4 x 0.7	8	6
MHS3-25C-X84	12	3	8	34	4.2	8	10	M5 x 0.8	10	6.5

Dimensions

MHS3-32c to 63C-X84: Single acting/Normally closed



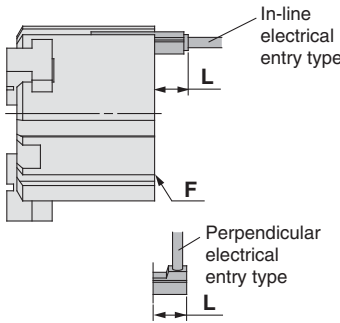
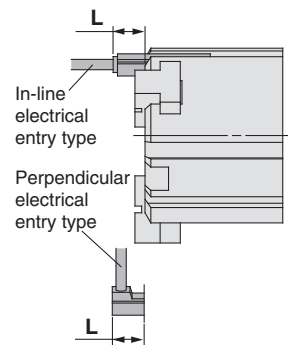
																	[mm]	
Model	AA	AB	AC	B	CA	CB	CC	DC	DO	EC	EO	G	I	J	K	L	M	
MHS3-32C-X84	66	63	3	52	12	34	2.2	28	32	8	12	52.5	6	20	9	2H9 (+0.025 0)	2	
MHS3-40C-X84	66	63	3	62	11	34	2	31	35	10	14	51	7	21	9	3H9 (+0.025 0)	2	
MHS3-50C-X84	78	75	3	70	13	39	2	35	41	11	17	60.5	9	24	10	4H9 (+0.030 0)	2	
MHS3-63C-X84	92	88	4	86	13	47	2	43	51	15	23	70	11	28	11	6H9 (+0.030 0)	3	
Model	NA	NB		O	Q	R	SA	SB	SC	TA		TB	UA		UB	WA		Y
MHS3-32C-X84	14	8h9 (0-0.036)		4.5	11	44	4.2	8	9	M4 x 0.7		8	M5 x 0.8		10	25H9 (+0.052 0)		5.7
MHS3-40C-X84	16	8h9 (0-0.036)		4.5	12	53	5.1	9.5	9	M4 x 0.7		8	M6 x 1		12	30H9 (+0.052 0)		7.5
MHS3-50C-X84	18	10h9 (0-0.036)		5	14	62	5.1	9.5	12	M5 x 0.8		10	M6 x 1		12	40H9 (+0.062 0)		6
MHS3-63C-X84	24	12h9 (0-0.043)		5.5	17	76	6.6	11	14	M5 x 0.8		10	M8 x 1.25		16	50H9 (+0.062 0)		7

MHS3-X84

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			
									
Lead wire type		In-line entry		Perpendicular entry		In-line entry		Perpendicular entry	
Auto switch model Finger position		D-M9□ D-M9□W	D-M9□A	D-M9□V D-M9□WV	D-M9□AV	D-M9□ D-M9□W	D-M9□A	D-M9□V D-M9□WV	D-M9□AV
Air gripper model									
MHS3-16S-X84	Open	—	—	—	—	1	3	—	1
	Closed	—	—	—	—	—	—	—	—
MHS3-20S-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	—	—	—	—	—	—	—
MHS3-25S-X84	Open	—	—	—	—	—	1	—	—
	Closed	—	—	—	—	—	—	—	—
MHS3-32S-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	—	—	—	—	—	—	—
MHS3-40S-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	—	—	—	—	—	—	—
MHS3-50S-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	—	—	—	—	—	—	—
MHS3-63S-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	—	—	—	—	—	—	—
MHS3-16C-X84	Open	—	—	—	—	—	—	—	—
	Closed	2.5	4.5	0.5	2.5	—	—	—	—
MHS3-20C-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	2	—	—	—	—	—	—
MHS3-25C-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	—	—	—	—	—	—	—
MHS3-32C-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	0.5	—	—	—	—	—	—
MHS3-40C-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	1	—	—	—	—	—	—
MHS3-50C-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	—	—	—	—	—	—	—
MHS3-63C-X84	Open	—	—	—	—	—	—	—	—
	Closed	—	—	—	—	—	—	—	—

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

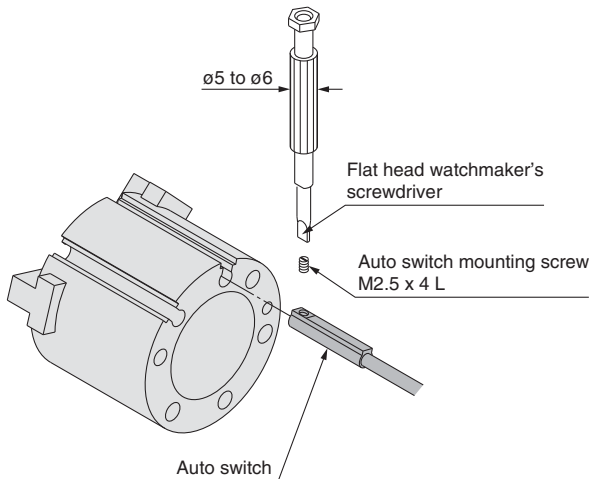
Note 2) When mounted with lead wires on the finger side, be sure that attachments and workpieces, etc., do not touch switch units or lead wires.

Note 3) The actual mounting position should be adjusted after confirming the auto switch performance.

Auto Switch Mounting

**Applicable models: MHS3-16S, 20S, 25S-X84
MHS3-16C, 20C, 25C, 32C, 40C,
50C, 63C-X84**

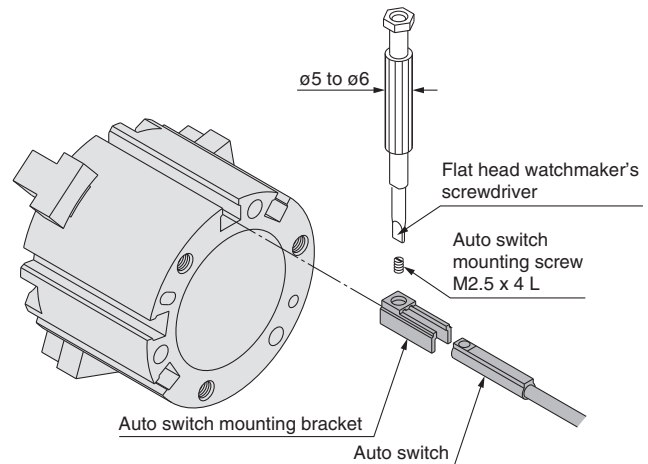
To set the auto switch, insert the auto switch into the mounting groove of the gripper from the direction indicated in the following drawing. After setting the position, tighten the attached auto switch mounting screw with a flat head watchmaker's screwdriver.



Note) Use a watchmaker's 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 0.15 N·m.

Applicable models: MHS3-32S, 40S, 50S, 63S-X84

- (1) To set the auto switch, insert the auto switch into the mounting groove of the gripper as shown below and set it roughly.
- (2) Insert the auto switch into the auto switch bracket mounting groove.
- (3) Check the detecting position of the auto switch and fix the auto switch firmly with the auto switch mounting screw (M2.5 x 4 L) attached to the auto switch.
- (4) If the detecting position is changed, go back to step (2).



Auto Switch Mounting Bracket Part No.

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

Note) Use a watchmaker's screwdriver with a grip diameter of 5 to 6 mm to tighten the auto switch mounting screw (M2.5 x 4 L). The tightening torque should be 0.05 to 1 N·m. It should be turned about 90° beyond the point at which tightening can be felt.



Series *MHS*

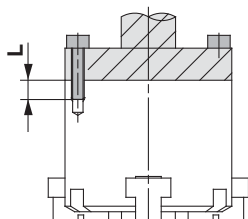
Specific Product Precautions

Be sure to read before handling.

How to Mount Air Gripper

Possible to mount from 2 directions.

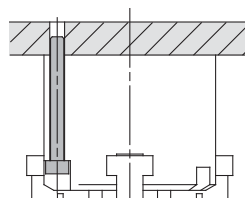
Body tapped



MHS3-X84

Model	Applicable bolts	Max. tightening torque [N·m]	Max. screw-in depth L [mm]
MHS3-16□-X84	M4 x 0.7	2.1	8
MHS3-20□-X84	M4 x 0.7	2.1	8
MHS3-25□-X84	M5 x 0.8	4.3	10
MHS3-32□-X84	M5 x 0.8	4.3	10
MHS3-40□-X84	M6 x 1	7.3	12
MHS3-50□-X84	M6 x 1	7.3	12
MHS3-63□-X84	M8 x 1.25	18	16

Body through-hole



MHS3-X84

Model	Applicable bolts	Max. tightening torque [N·m]
MHS3-16□-X84	M3 x 0.5	0.88
MHS3-20□-X84	M3 x 0.5	0.88
MHS3-25□-X84	M4 x 0.7	2.1
MHS3-32□-X84	M4 x 0.7	2.1
MHS3-40□-X84	M5 x 0.8	4.3
MHS3-50□-X84	M5 x 0.8	4.3
MHS3-63□-X84	M6 x 1	7.3



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