

3 Finger Air Gripper Parallel Type

Series MHS3

ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100, ø125

How to Order

Cylinder Bore Size

ø16 to ø25 MHS 3 — 20 D — M9N

Number of fingers: **3** 3 fingers

Cylinder bore size: **20** 16mm, 20mm, 25mm

Number of auto switches: **Nil** 2 pcs., **S** 1 pc.

Auto switch type: **Nil** Without auto switch (built-in magnet)

Action: **D** Double acting

Applicable 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)		
							Perpendicular	In-line						
Solid state auto switch	—	Grommet	Yes	3-wire(NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit
				3-wire(PNP)			M9PV	M9P	●	●	●	○	○	
				2-wire	12 V		M9BV	M9B	●	●	●	○	○	
	Diagnosis (2-colour indication)			3-wire(NPN)	5 V, 12 V		M9NWV	M9NW	●	●	●	○	○	IC circuit
				3-wire(PNP)			M9PWV	M9PW	●	●	●	○	○	
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	○	
	Water resistant (2-colour indication)	3-wire(NPN)	5 V, 12 V	M9NAV**	M9NA**		○	○	●	○	○	IC circuit		
		3-wire(PNP)		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 Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX

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

Note 1) When using the 2-colour indicator 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.

Cylinder Bore Size

ø32 to ø125 MHS 3 — 50 D — M9N

Number of fingers: **3** 3 fingers

Cylinder bore size: **50** 32mm, 40mm, 50mm, 63mm, 80mm, 100mm, 125mm

Port thread type: **Nil** M thread ø32 to ø63, **TN** NPT ø80 to ø125, **TF** G

Number of auto switches: **Nil** 2 pcs., **S** 1 pc., **n** "n" pcs.

Auto switch type: **Nil** Without auto switch (built-in magnet)

Action: **D** Double acting

Symbol:

Applicable 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	
							Electrical entry direction		0.5 (Nil)	1 (M)	3 (L)	5 (Z)			
					DC	AC	Perpendicular	In-line							
Solid state auto switch	—	Grommet	Yes	3-wire(NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	
				3-wire(PNP)			M9PV	M9P	●	●	●	○	○		
				2-wire	12 V		M9BV	M9B	●	●	●	○	○		—
	3-wire(NPN)			5 V, 12 V	M9NWV		M9NW	●	●	●	○	○	IC circuit		
	3-wire(PNP)				M9PWV		M9PW	●	●	●	○	○			
	2-wire			12 V	M9BWV		M9BW	●	●	●	○	○		—	
	3-wire(NPN)	5 V, 12 V	M9NAV**	M9NA**	○		○	●	○	○	IC circuit				
	3-wire(PNP)		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 Nil (Example) M9NW
1 m M (Example) M9NWM
3 m L (Example) M9NWL
5 m Z (Example) M9NWX

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

Note 1) When using the 2-colour indicator 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 the auto switch, the auto switch mounting bracket is included.

When ordering the auto switch separately, the auto switch mounting bracket (BMG2-012) is required.

Series MHS3

Models and 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	Non-lube										
Action	Double acting										
Effective gripping force N at pressure of 0.5MPa	Note 1) External gripping force	14	25	42	74	118	187	335	500	750	1,270
		16	28	47	82	130	204	359	525	780	1,320
	Internal gripping force	16	28	47	82	130	204	359	525	780	
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	

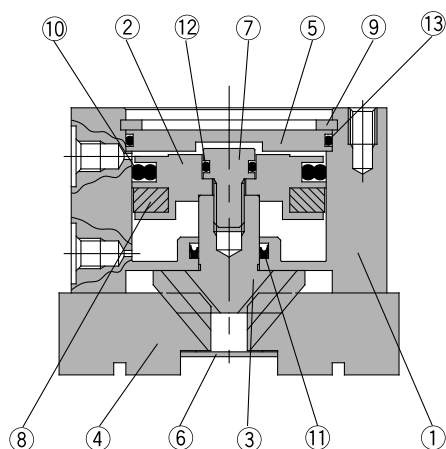
Note 1) Values for ø16 to ø25 are with gripping point L = 20mm, for ø32 to ø63 with gripping point L = 30mm, and for ø80 to ø125 with gripping point L = 50mm.

Refer to the "Effective Gripping Force" data on pages 5-169 through 5-171 for the gripping force at each gripping position.

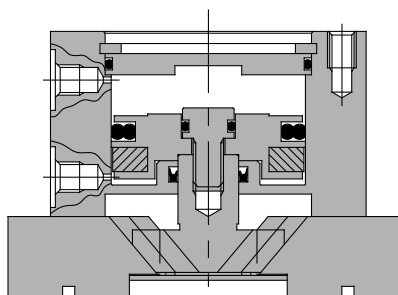
Note 2) Open and closed diameter values apply for external gripping of work pieces.

Construction

Closed condition



Open condition



Parts list

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	C type snap ring	Carbon steel	Nickel plated
10	Piston seal	NBR	
11	Rod seal	NBR	
12	Gasket	NBR	
13	Gasket	NBR	

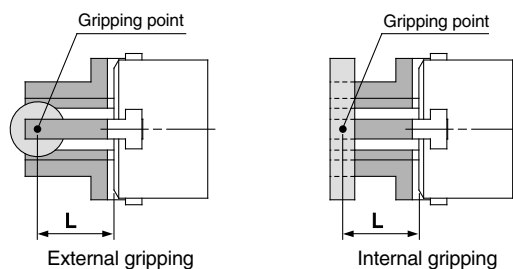
Replacement parts/Seal kits

Kit number										Contents
MHS3-16D	MHS3-20D	MHS3-25D	MHS3-32D	MHS3-40D	MHS3-50D	MHS3-63D	MHS3-80D	MHS3-100D	MHS3-125D	
MHS16-PS	MHS20-PS	MHS25-PS	MHS32-PS	MHS40-PS	MHS50-PS	MHS63-PS	MHS80-PS	MHS100-PS	MHS125-PS	A set of the above Nos. 10, 11, 12 and 13

* Seal kits are sets consisting of items 10, 11, 12 and 13, which can be ordered using the kit number for each cylinder bore size.

Gripping Point

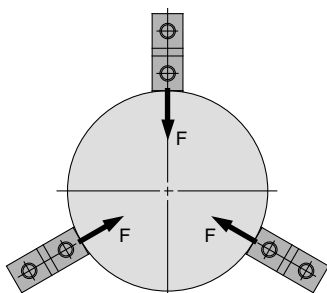
- The work piece gripping point distance should be within the gripping force ranges given for each pressure in the effective gripping force graphs below.
- If operated with the work piece gripping point beyond the indicated ranges, an excessive offset load will be applied to the sliding section of the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



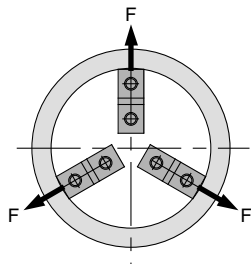
L: Gripping point distance

Effective Gripping Force

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



External gripping

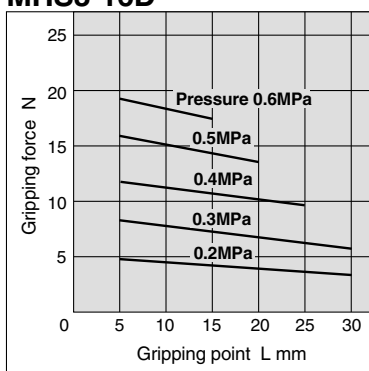


Internal gripping

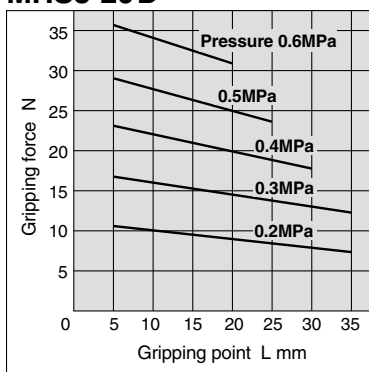
1N: Approx. 0.102kgf
1MPa: Approx. 10.2kgf/cm²

External gripping force

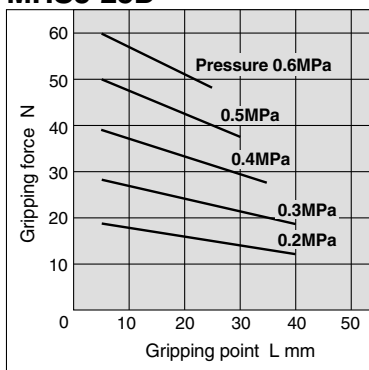
MHS3-16D



MHS3-20D

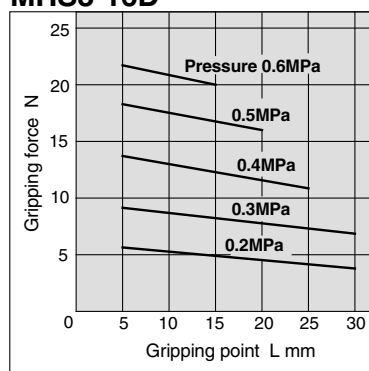


MHS3-25D

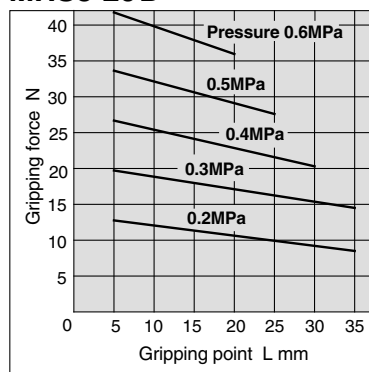


Internal gripping force

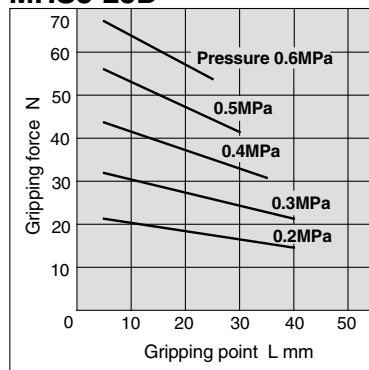
MHS3-16D



MHS3-20D



MHS3-25D

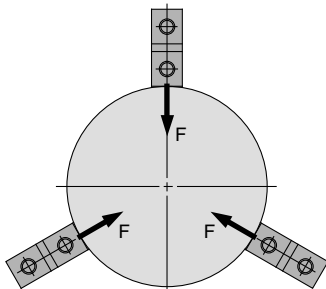


Series MHS3

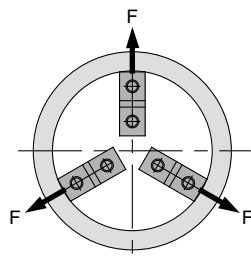
Effective Gripping Force

- Expressing the effective gripping force

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



External gripping

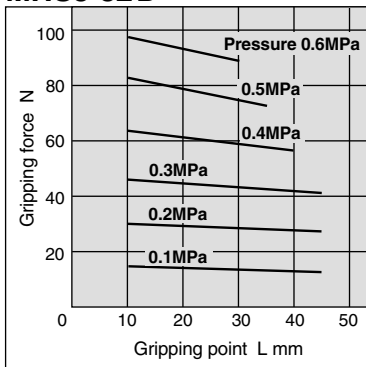


Internal gripping

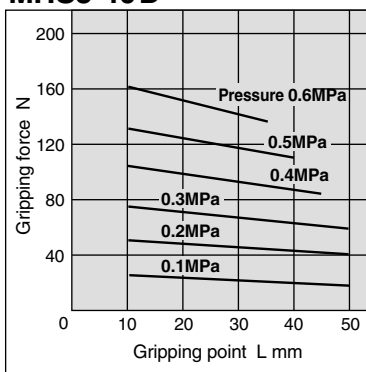
1N: Approx. 0.102kgf
1MPa: Approx. 10.2kgf/cm²

External gripping force

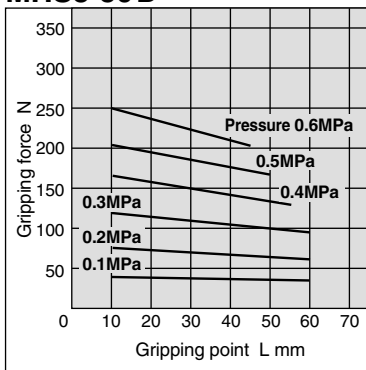
MHS3-32 D



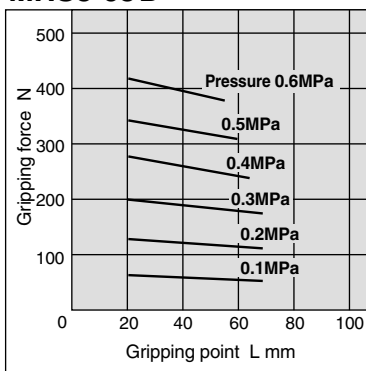
MHS3-40 D



MHS3-50 D

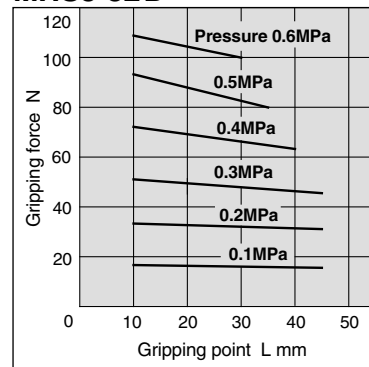


MHS3-63 D

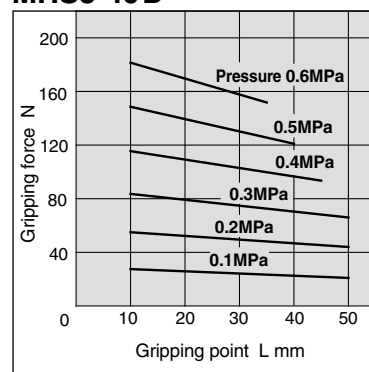


Internal gripping force

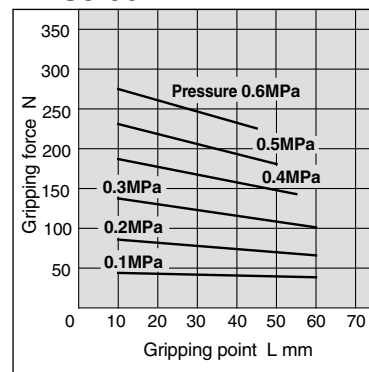
MHS3-32 D



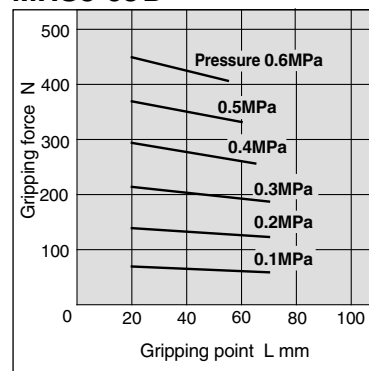
MHS3-40 D



MHS3-50 D

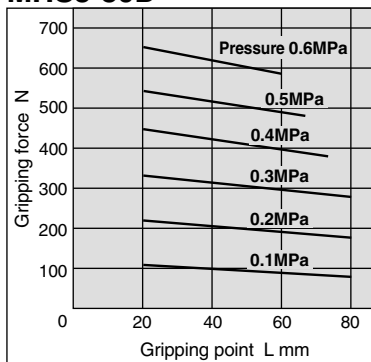


MHS3-63 D

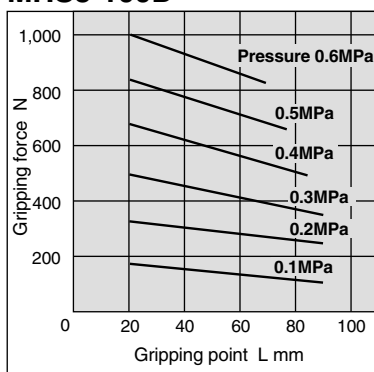


External gripping force

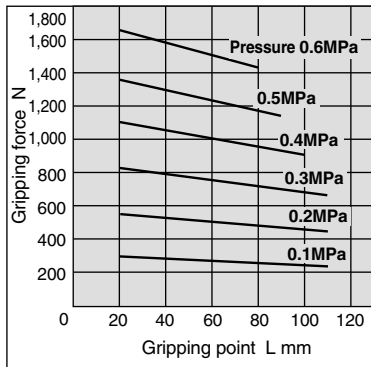
MHS3-80D



MHS3-100D

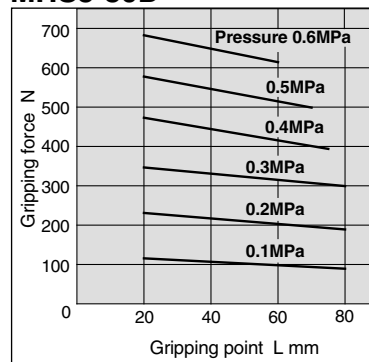


MHS3-125D

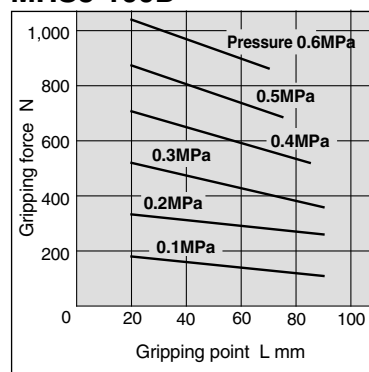


Internal gripping force

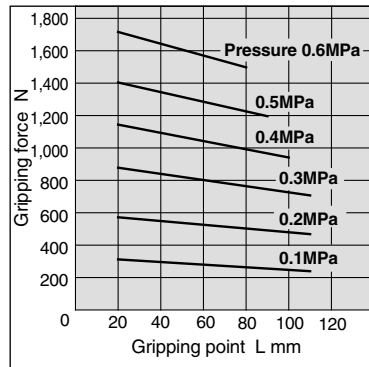
MHS3-80D



MHS3-100D



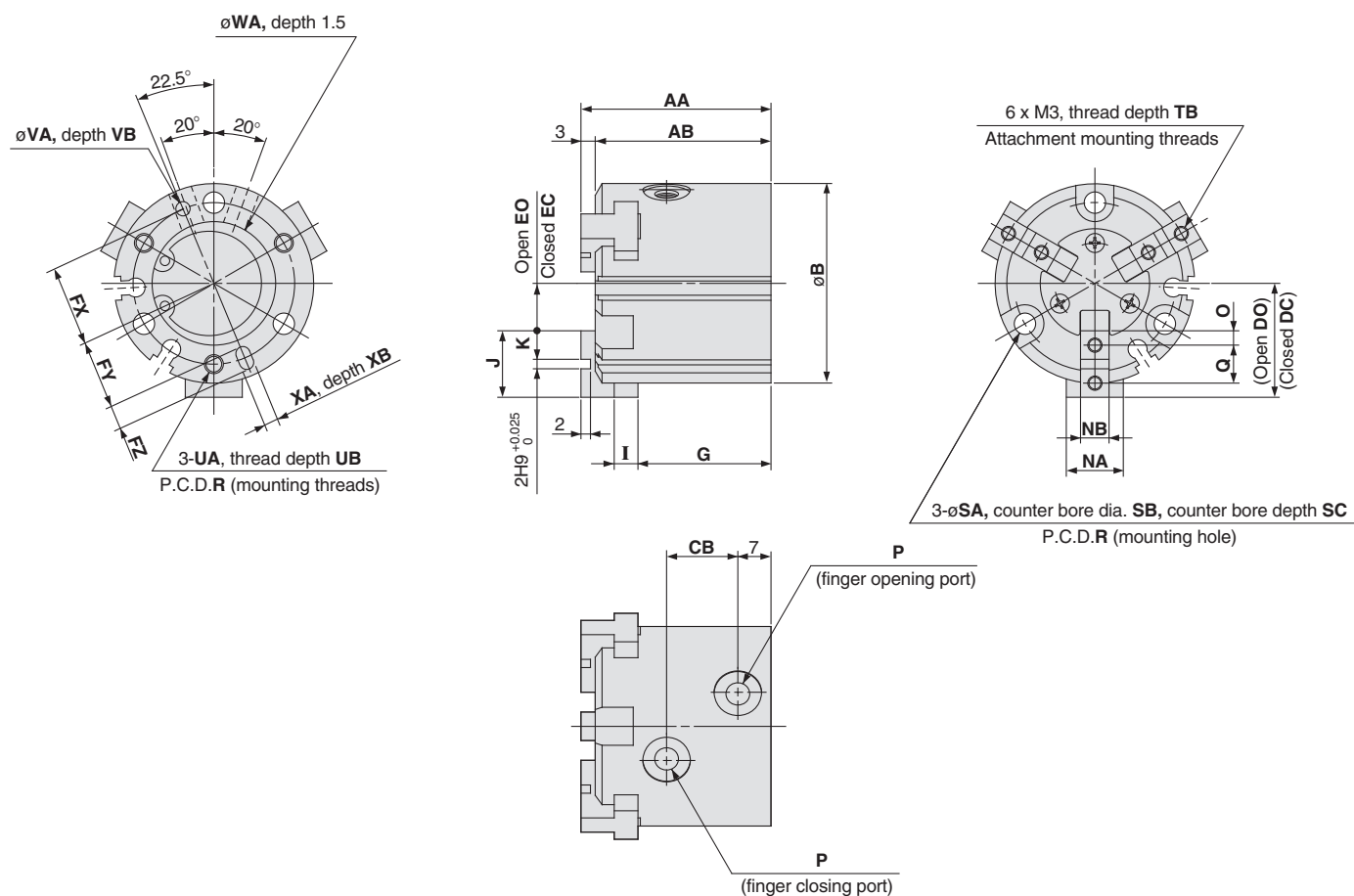
MHS3-125D



Series MHS3

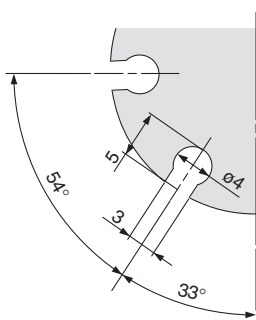
Dimensions

MHS3-16D to 25D

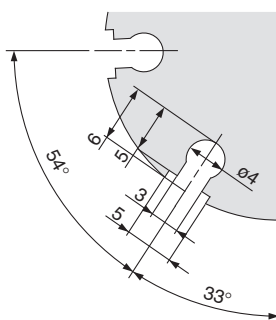


Auto switch mounting groove positions (2 locations)

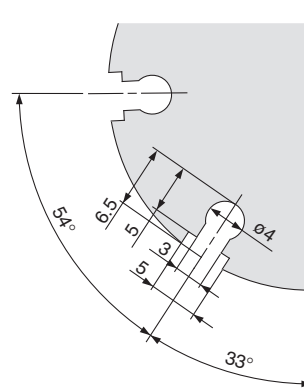
MHS3-16D



MHS3-20D



MHS3-25D



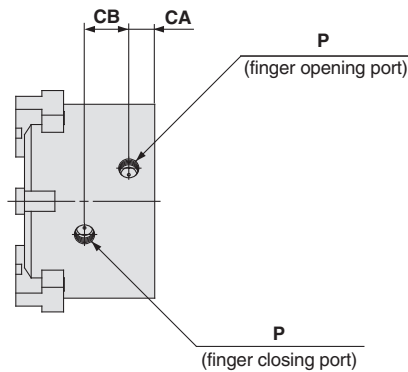
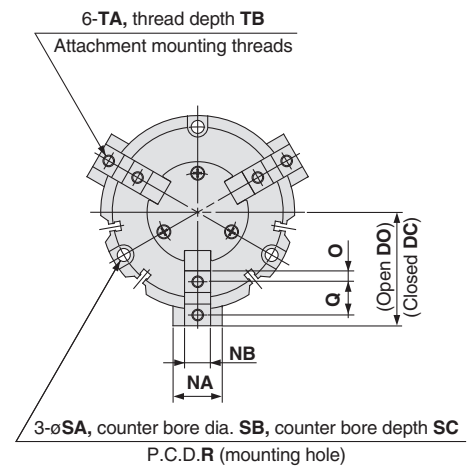
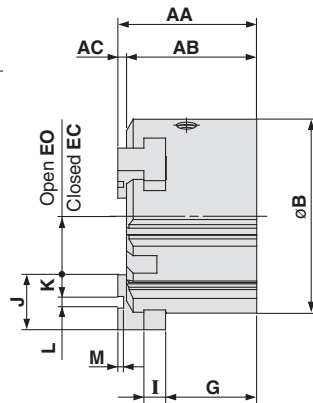
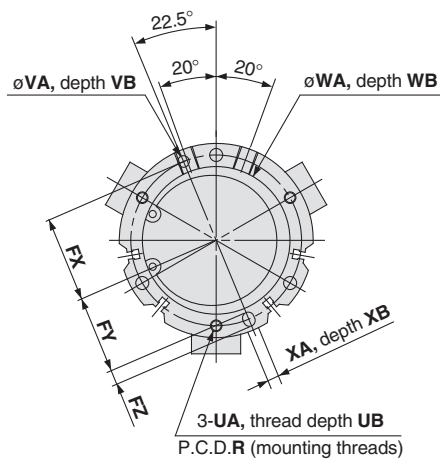
Model	AA	AB	B	CB	DC	DO	EC	EO	FX	FY	FZ	G	I	J	K	NA	NB	O	P	Q	R
MHS3-16D	35	32	30	11	15	17	5	7	12.5	11	3	25	4	10	4	8	$5h9^{+0.030}_0$	2	M3	6	25
MHS3-20D	38	35	36	13	18	20	6	8	14.5	13	3	27	5	12	5	10	$6h9^{+0.030}_0$	2.5	M5	7	29
MHS3-25D	40	37	42	15	21	24	7	10	17	14.5	5	28	5	14	6	12	$6h9^{+0.030}_0$	3	M5	8	34

Model	SA	SB	SC	TB	UA	UB	VA	VB	WA	XA	XB
MHS3-16D	3.4	6.5	8	5	M3	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	6	$2H9^{+0.025}_0$	2	$21H9^{+0.052}_0$	$2H9^{+0.025}_0$	2
MHS3-25D	4.5	8	10	6	M4	6	$3H9^{+0.025}_0$	3	$26H9^{+0.052}_0$	$3H9^{+0.025}_0$	3

Series MHS3

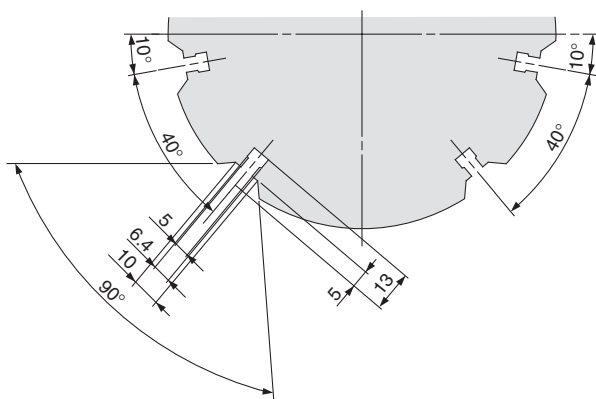
Dimensions

MHS3-100D, 125D

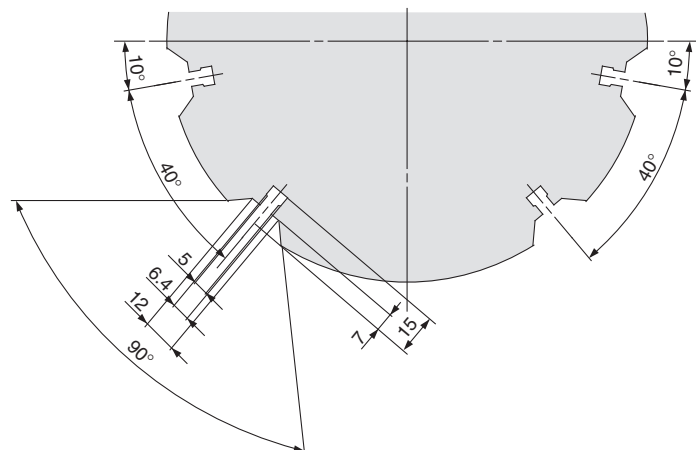


Auto switch mounting groove positions (4 locations)

MHS3-100D



MHS3-125D



																					(mm)	
Model	AA	AB	AC	B	CA	CB	DC	DO	EC	EO	FX	FY	FZ	G	I	J	K	L	M	NA	NB	
MHS3-100D	96	90	6	134	18	30.6	66	78	28	40	59	54	10	63	15	38	15	8H9 ^{+0.036} ₀	4	34	18h9 ⁰ _{-0.043}	
MHS3-125D	122	114	8	166	23.5	38	82	98	30	46	74	68	12	84	18	52	21	10H9 ^{+0.036} ₀	6	40	22h9 ⁰ _{-0.052}	
Model	O	P	Q	R	SA	SB	SC	TA	TB	UA	UB	VA	VB	WA	WB	XA	XB					
MHS3-100D	7.5	1/4	23	118	9	14	21	M8	16	M8	16	8H9 ^{+0.036} ₀	6	102H9 ^{+0.087} ₀	4	8H9 ^{+0.036} ₀	6					
MHS3-125D	10.5	3/8	31	148	11	17.5	34	M10	20	M10	20	10H9 ^{+0.036} ₀	8	130H9 ^{+0.100} ₀	6	10H9 ^{+0.036} ₀	8					