

Rotary Actuated Air Gripper

MHR2, MDHR2/MHR3, MDHR3

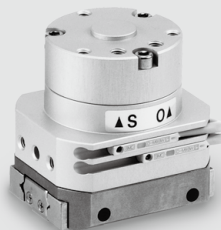
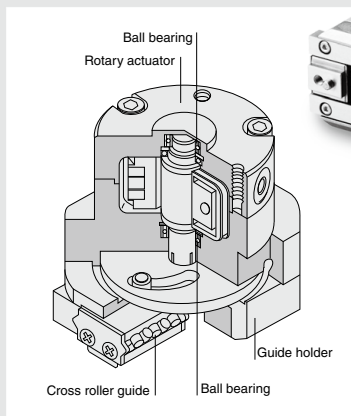
2-finger type: Size 10, 15, 20, 30/ 3-finger type: Size 10, 15

High Precision - Repeatability ± 0.01 mm

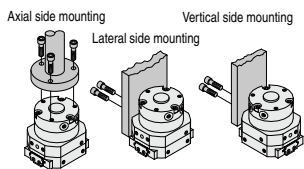
Parallel opening and closing mechanism utilizing a cross roller guide produces smooth operation without play, with high precision and long life.

Low Profile

Using rotary actuators in the part of actuating portion enables a design compact.



Universal mounting



MDHR2

MDHR3



- Possible to mount solid state switch with indicator light D-M9. Easy to locate switch to optimum set point.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□

High rigidity

Fingers operate smoothly as the holder maintains the guide from the outside and prevents finger displacement.

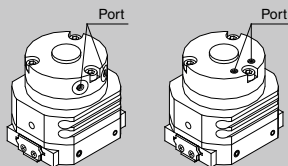


Applicable for Clean Series.

Refer to "Pneumatic Clean Series (CAT.E02-23)" catalog for details.

Internal/External gripping capability

Connection port on 2 sides



Series Variations

		(Nominal size)				Auto switch	
		10	15	20	30		
Rotary actuated air gripper	2-finger type	MHR2	●	●	●	●	P. 517 to P. 529
		MDHR2	●	●	●	●	
	3-finger type	MHR3	●	●	●	●	P. 530 to P. 537
		MDHR3	●	●	●	●	
Clean Series Rotary actuated air gripper	2-finger type	11-22-MHR2	●	●	●	●	Refer to the "Pneumatic Clean Series (CAT.E02-23)" catalog.
		11-22-MDHR2	●	●	●	●	
	3-finger type	11-22-MHR3	●	●	●	●	
		11-22-MDHR3	●	●	●	●	

Rotary Actuated Air Gripper/2-Finger Type

MHR2/MDHR2 Series

Size: 10, 15, 20, 30

How to Order

Without auto switch

MHR 2 - 10 R - []

With auto switch
(Built-in magnet)

MDHR 2 - 10 R - M9N S - []

With magnet
(For auto switch)

Made to Order
Refer to page 518 for details.

Number of fingers
2 2 fingers

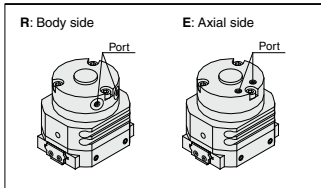
Number of auto switches

NII	2 pcs.
S	1 pc.

Nominal size

10
15
20
30

Connecting port



Applicable Auto Switches Refer to pages 797 to 850 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m) ²					Pre-wired connector	Applicable load			
					DC	AC	Electrical entry direction		0.5 (NII)	1 (M)	3 (L)	5 (Z)						
							Perpendicular	In-line										
Solid state auto switch	-	Grommet	Yes	3-wire (NPN)	24V	-	M9NV	M9N	●	●	●	○	○	IC circuit				
				3-wire (PNP)			M9PV	M9P	●	●	●	○	○					
				2-wire			M9BV	M9B	●	●	●	○	○		—			
				3-wire (NPN)			M9NVV	M9NW	●	●	●	○	○		IC circuit			
				3-wire (PNP)			M9PVV	M9PW	●	●	●	○	○		IC circuit			
				2-wire			M9BVV	M9BW	●	●	●	○	○		—			
	Water resistant (2-color indicator)			-	Grommet	Yes	3-wire (NPN)	24V	-	M9NAV**	M9NA**	○	○	●	○	○	IC circuit	
							3-wire (PNP)			M9PAV**	M9PA**	○	○	●	○	○		
							2-wire			M9BAV**	M9BA**	○	○	●	○	○		—

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

² Lead wire length symbols: 0.5 m NII (Example) M9N
1 m M (Example) M9NM
3 m L (Example) M9NL
5 m Z (Example) M9NZ

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

Note) When using the 2-color 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.

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

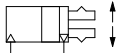
D-□

MHR2/MDHR2 Series

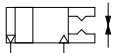


Symbol

Without auto switch/
Double acting

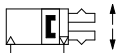


Internal grip

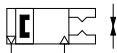


External grip

With auto switch/
Double acting



Internal grip



External grip



Made to Order: Individual Specifications
(For details, refer to page 544.)

Symbol	Specifications/Description
-X32	Grease change for rotary actuated part



Made to Order
[Click here for details](#)

Symbol	Specifications/Description
-X63	Fluorine grease

Model/Specifications

Nominal size	10	15	20	30	
Action	Double acting				
Gripping force (N) ⁽¹⁾ (Effective value) at 0.5 MPa	External grip	12	24	33	58
	Internal grip	12	25	34	59
Opening/ Closing stroke (Both sides)	Finger closing width (mm)	10	14	16	19
	Finger opening width (mm)	16	22	28	37
	Stroke (mm)	6	8	12	18
Weight (g) ⁽²⁾	100 (95)	180 (175)	390 (380)	760 (740)	
Connection port	M3 x 0.5		M5 x 0.8		
Repeatability	±0.01 mm				
Fluid	Air				
Operating pressure	0.2 to 0.6 MPa	0.15 to 0.6 MPa			
Ambient and fluid temperature	0 to 60°C				
Max. operating frequency	180 c.p.m				
Lubrication	Non-lube ⁽³⁾				

Note 1) Refer to page 520 "Effective Gripping Force" for details of Gripping force at each gripping point.
Value of effective gripping force is measured at the middle of opening/closing stroke.

Note 2) () Value shows MDHR weight, but it does not include auto switch weight.

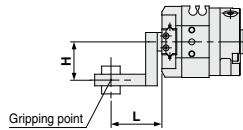
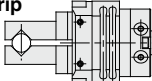
Note 3) This product should be used without lubrication. If it is lubricated, it could lead to sticking or slipping.

When the finger opening/closing speed is set as the total stroke of 0.2 seconds or more, it may cause the product to stick or completely stop its movement.

Gripping Point

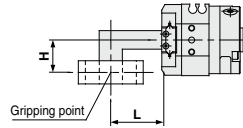
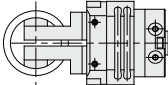
- Workpiece gripping point should be within the gripping point range: The range shown for each operating pressure given in the graphs to the right.
- When the gripping point distance becomes large, the finger attachment applies an excessively large load to the finger sliding section, causing excessive play of the fingers and possibly leading to premature failure.

External grip



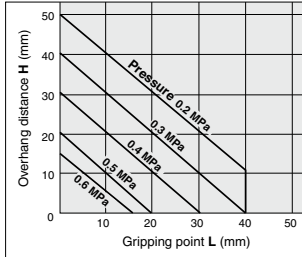
L: Distance to the gripping point
H: Overhang distance

Internal grip

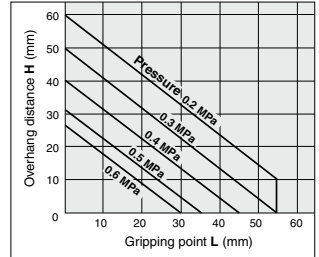


Limitation of Gripping: External Grip/Internal Grip

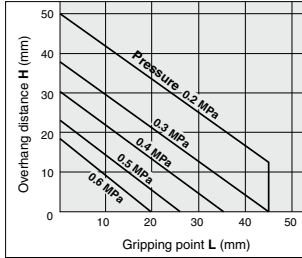
MHR2-10/MDHR2-10



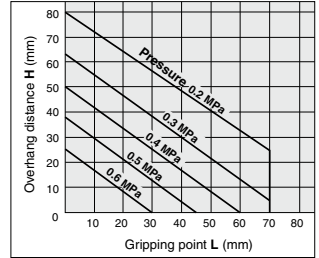
MHR2-20/MDHR2-20



MHR2-15/MDHR2-15



MHR2-30/MDHR2-30



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X

MRHQ

MA

D-

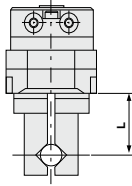
MHR2/MDHR2 Series

Effective Gripping Force

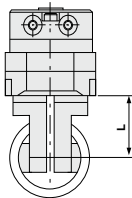
Guidelines for the selection of the gripper with respect to workpiece mass

- 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 mass, or more.
- If high acceleration, deceleration or impact forces are encountered during motion a further margin of safety should be considered.

External grip



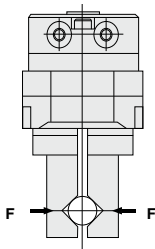
Internal grip



L: Gripping point length (mm)

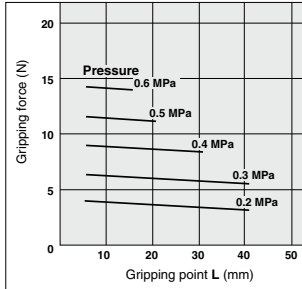
• Indication of effective gripping force

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

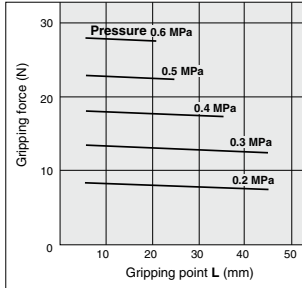


External Grip

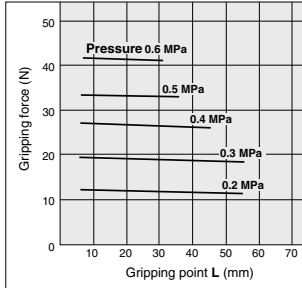
MHR2-10/MDHR2-10



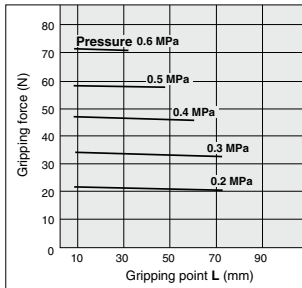
MHR2-15/MDHR2-15



MHR2-20/MDHR2-20

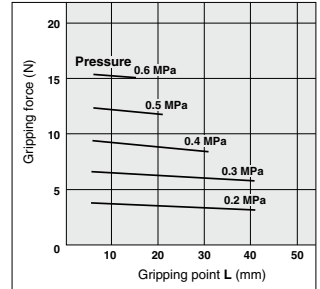


MHR2-30/MDHR2-30

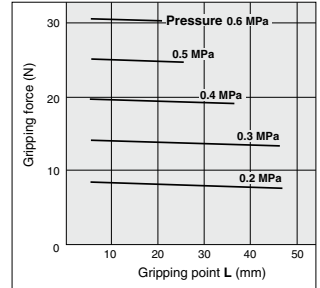


Internal Grip

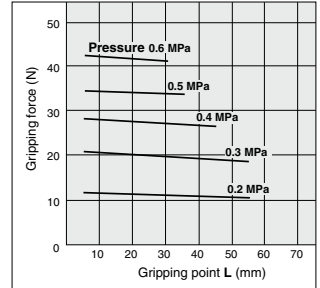
MHR2-10/MDHR2-10



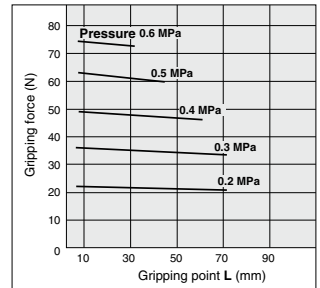
MHR2-15/MDHR2-15



MHR2-20/MDHR2-20

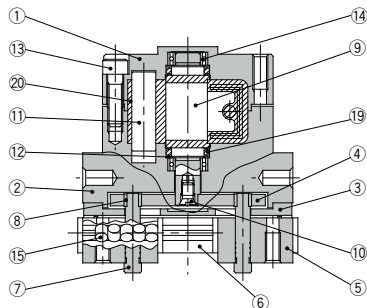


MHR2-30/MDHR2-30

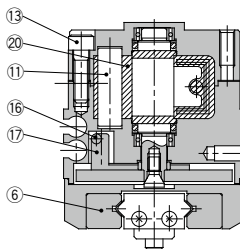
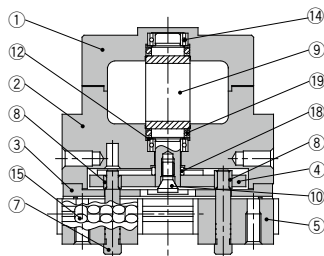


Construction

MHR2



MDHR2



Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Hard anodized
2	Adaptor body	Aluminum alloy	Hard anodized
3	Guide holder	Stainless steel	
4	Cam	Cold rolled steel	Nitriding
5	Finger assembly	Stainless steel	Heat treated
6	Guide	Stainless steel	Heat treated
7	Pin	Carbon steel	Heat treated Electroless nickel plated
8	Pin roller	Stainless steel	Nitriding
9	Vane shaft	Stainless steel, NBR	MCHR2-30 is carbon steel NBR
10	Joint bolt	Chrome molybdenum steel	Zinc chromated

Component Parts

No.	Description	Material	Note
11	Stopper	Resin	
12	Back-up ring	Stainless steel plate	
13	Hexagon socket head bolt	Stainless steel	
14	Bearing	High carbon chrome bearing steel	
15	Cylindrical roller	—	
16	Magnet	Stainless steel	
17	Magnet holder	Aluminum alloy	Hard anodized
18	Roller	Stainless steel	
19	O-ring	NBR	
20	Stopper seal	NBR	

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

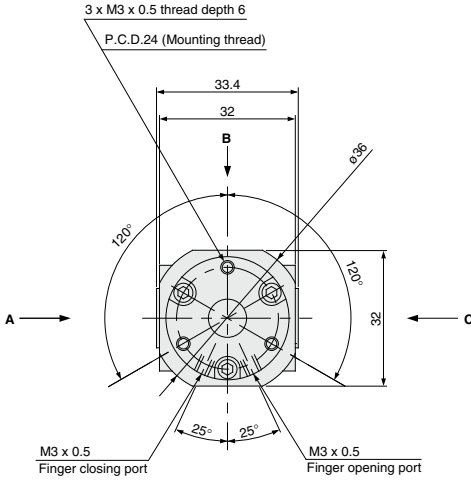
MA

D-□

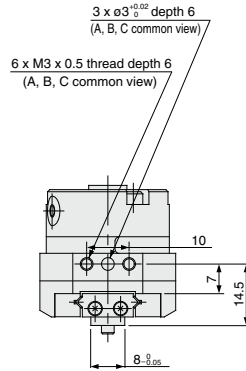
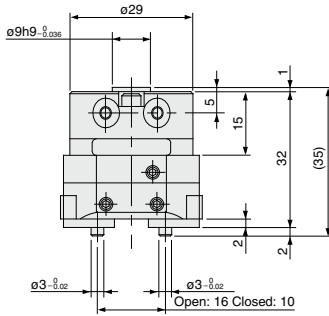
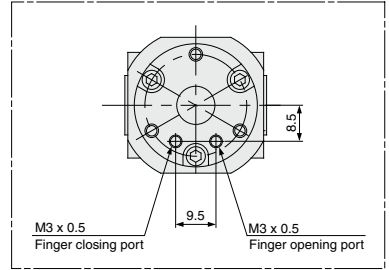
MHR2/MDHR2 Series

Nominal Size 10

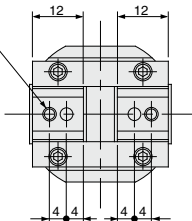
Without auto switch: MHR2-10R



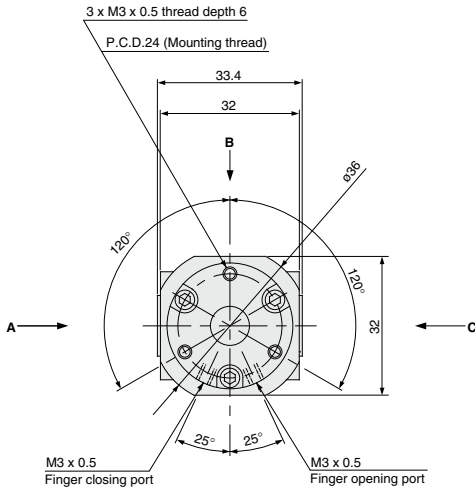
MHR2-10E Port Location



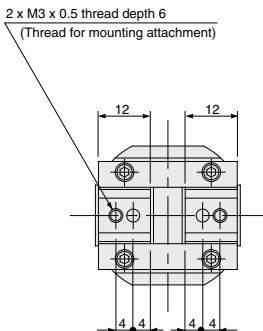
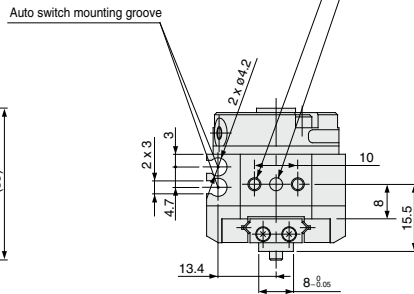
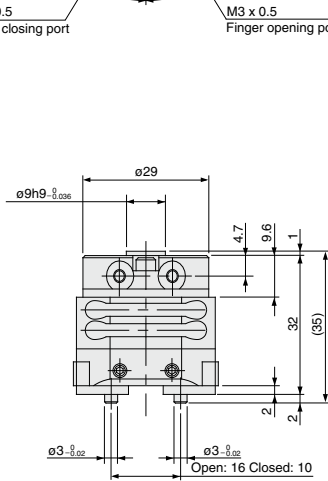
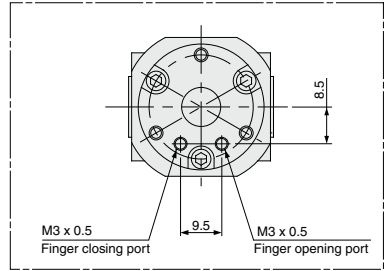
2 x M3 x 0.5 thread depth 6
(Thread for mounting attachment)



With auto switch (Built-in magnet): MDHR2-10R

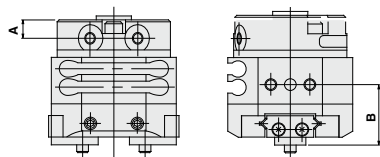


MDHR2-10E Port Location



Dimensional Differences between MHR and MDHR

The following dimensions are different between MHR and MDHR series. And also, body shapes are different depending on auto switch mounting groove.



Model	A	B	
MHR2	-10R	5	14.5
	-10E	—	14.5
MDHR2	-10R	4.7	15.5
	-10E	—	15.5

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

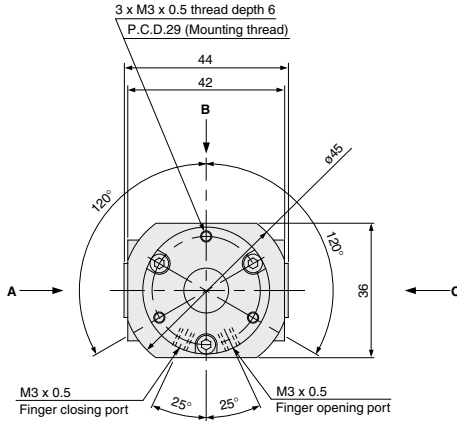
MA

D-□

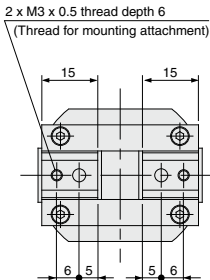
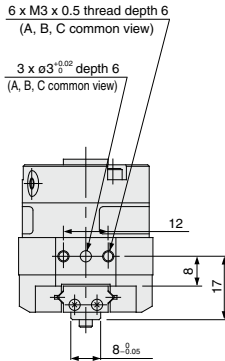
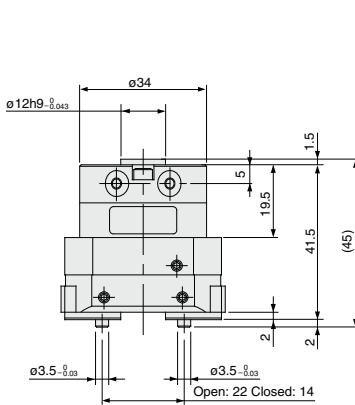
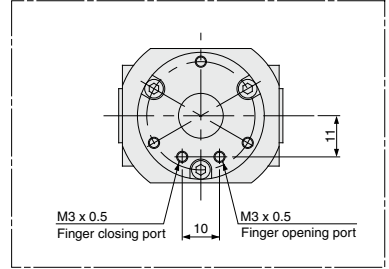
MHR2/MDHR2 Series

Nominal Size 15

Without auto switch: MHR2-15R



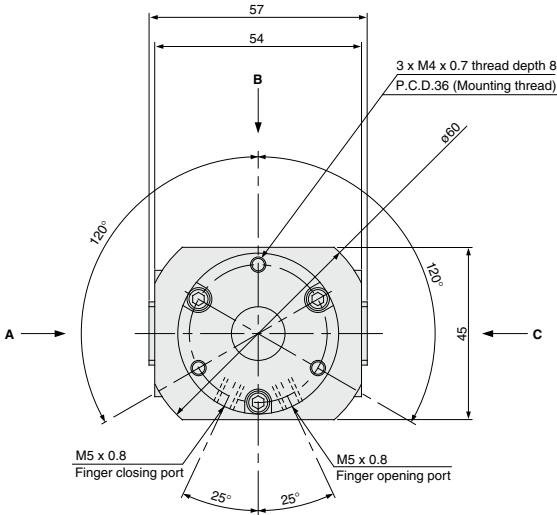
MHR2-15E Port Location



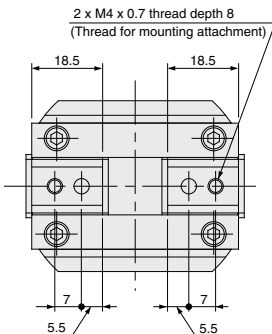
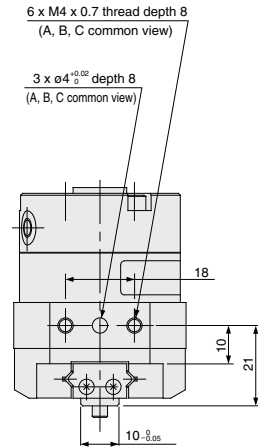
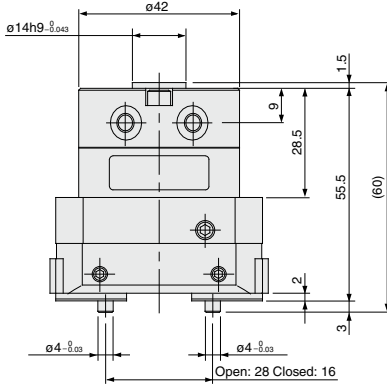
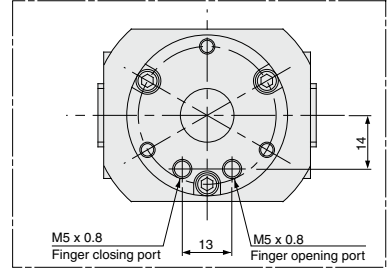
MHR2/MDHR2 Series

Nominal Size 20

Without auto switch: MHR2-20R



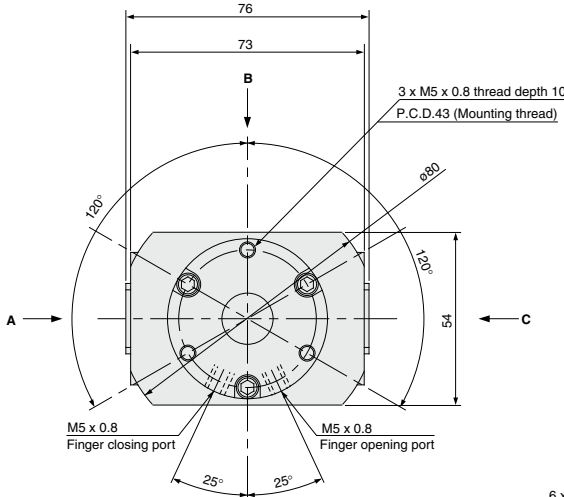
MHR2-20E Port Location



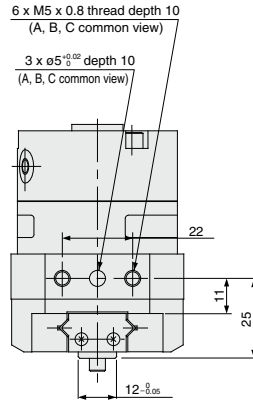
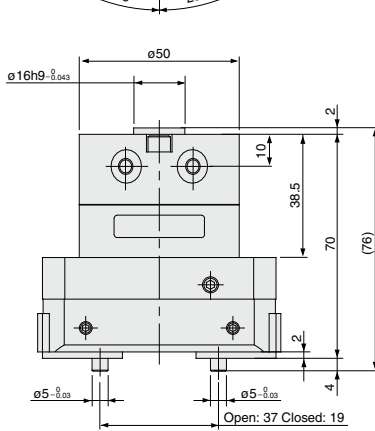
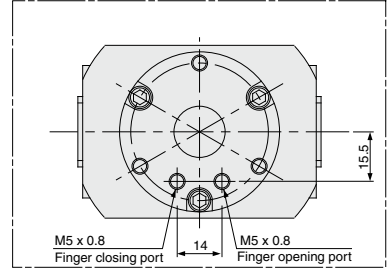
MHR2/MDHR2 Series

Nominal Size 30

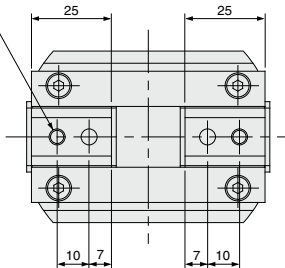
Without auto switch: MHR2-30R



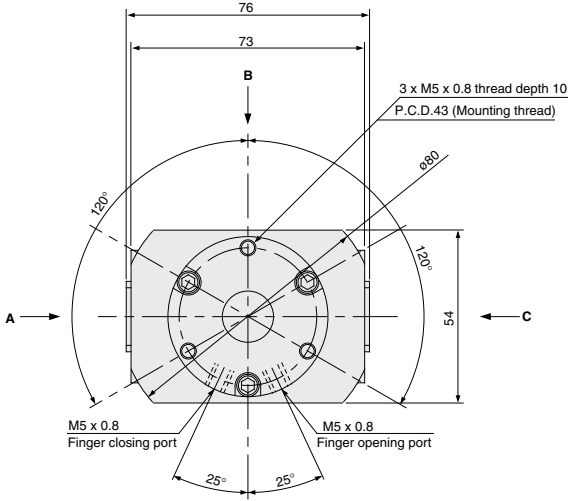
MHR2-30E Port Location



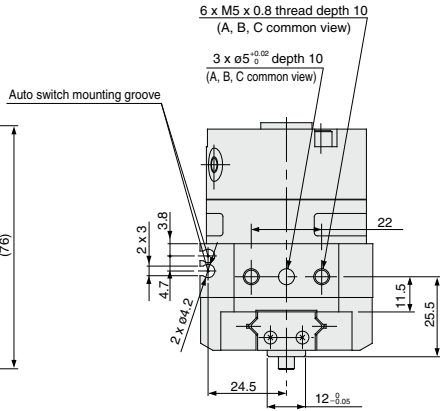
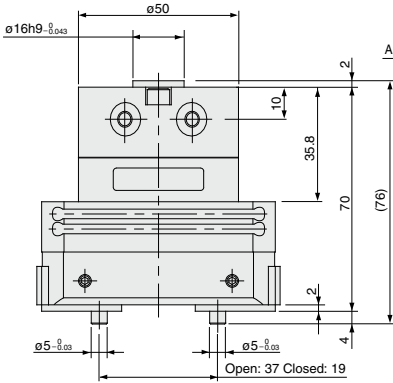
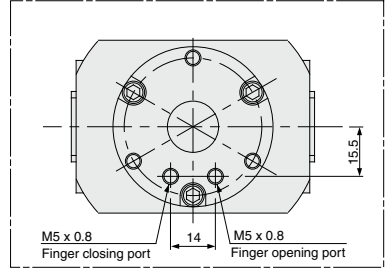
$2 \times M5 \times 0.8$ thread depth 10
(Thread for mounting attachment)



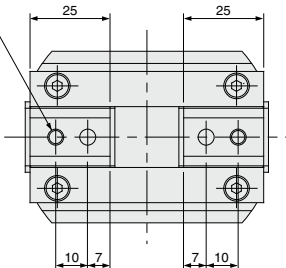
With auto switch (Built-in magnet): MDHR2-30R



MDHR2-30E Port Location

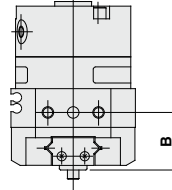


2 x M5 x 0.8 thread depth 10
(Thread for mounting attachment)



Dimensional Differences between MHR and MDHR

The following dimensions are different between the MHR and MDHR series. And also, body shapes are different depending on auto switch mounting groove.



Model	B
MHR2-30□	25
MDHR2-30□	25.5

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D□