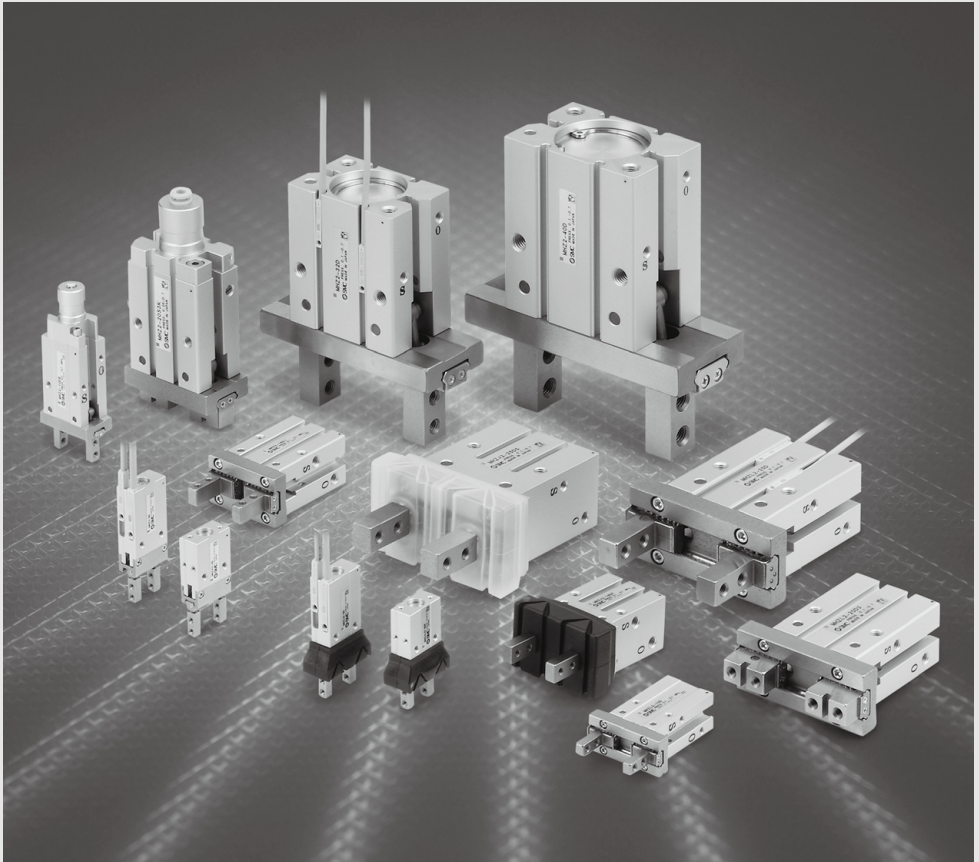


# Parallel Type Air Gripper

## MHZ Series

ø6, ø10, ø16, ø20, ø25, ø32, ø40



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

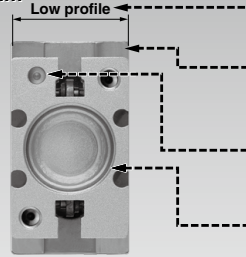
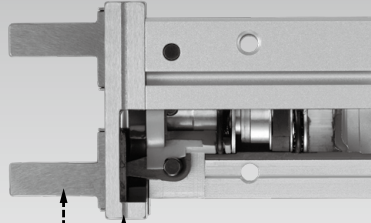
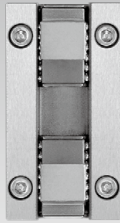
MRHQ

MA

D-□

# Integral linear guide used for high rigidity

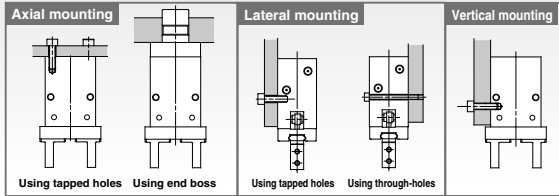
• Repeatability:  $\pm 0.01$  mm



• Martensitic stainless steel

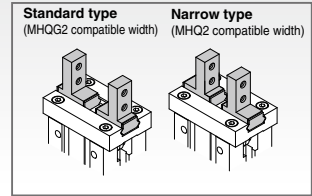
## High degree of mounting flexibility

Can be mounted five ways from three directions.

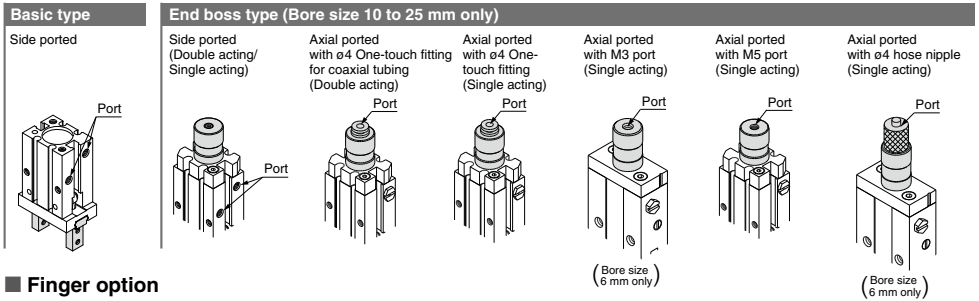


## Finger positions can be selected.

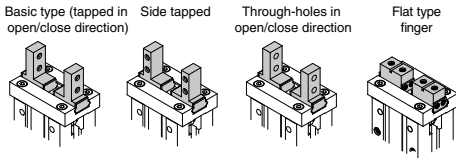
(Standard type/MHZ2)



## Body option/Piping port location

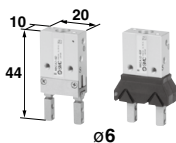


## Finger option



## Compact Series (Without auto switch) **Page 398**

### MHZJ2-6/MHZAJ2-6 (With dust cover)



## Standard Type **Page 408**

### MHZ2 Series

$\phi 6$        $\phi 10$  to  $\phi 25$        $\phi 32$ ,  $\phi 40$

# and high precision

● **Body thickness tolerance:**  
±0.05 mm

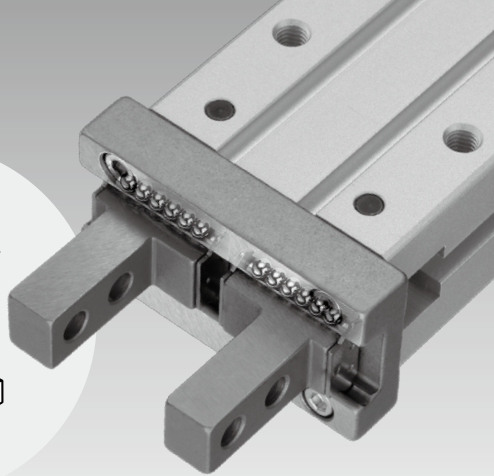
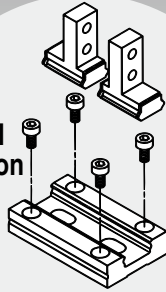
● **No guide protrusion in direction of body thickness**

● **Improved remounting accuracy**

Positioning dowel pin holes provided

● **Top mounting centering location**  
Mounting is more secure with a depth 0.5 to 2 mm greater than current types.

**Integral guide rail construction**



## Long Stroke **Page 426**

### MHZL2 Series

## Accommodates diverse workpiece diameters with a single unit

- Nearly double the standard stroke
- Long stroke are also compact and lightweight

Series	Opening/Closing stroke (mm) (Open-Closed)	Weight (g)	Body thickness (mm)
MHZL2-10	8 (4)	60	16.4
MHZL2-16	12 (6)	135	23.6
MHZL2-20	18 (10)	270	27.6
MHZL2-25	22 (14)	470	33.6

Values inside ( ) are for standard MHZ2 series.



ø10 to ø25



With dust cover

**Made to Order**

ø10 to ø20

**Page 436**

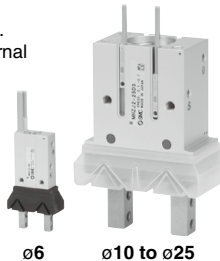
## With Dust Cover **Page 440**

### MHZJ2 Series

- Prevents entry of chips, dust, water, etc.
- Prevents dispersion of grease and external leakage of dust.

#### Cover materials

- Chloroprene rubber (Black)
- Fluororubber (Black)
- Silicone rubber (White)



ø6

ø10 to ø25



ø32, ø40

**Made to Order**

**Page 451**

- Dust cover adhesion (Powerful adhesive used): -X77□
- Dust cover caulking (Silicone caulking agent used): -X78□

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW







-X□

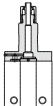




MRHQ

MA

D-□

# Series Variations

Series	Bore size (mm)	Action	Body option					
			Basic type		End boss type			
			Side ported	Side ported	With One-touch fitting for coaxial tubing	With One-touch fitting	With M3 port	With M5 port
<b>Standard MHZA2-6</b>  Page 398	6	Double acting	●	●				
		Single acting (Normally open)	●	●		●	●	
		Single acting (Normally closed)	●	●		●	●	
<b>With dust cover MHZAJ2-6</b>  Page 398	6	Double acting	●	●				
		Single acting (Normally open)	●	●		●	●	
		Single acting (Normally closed)	●	●		●	●	
<b>Standard MHZ2</b>  Page 408	6	Double acting	●					
		Single acting (Normally open)	●					
		Single acting (Normally closed)	●					
	10, 16 20, 25	Double acting	●	●	●			
		Single acting (Normally open)	●	●		●	●	
		Single acting (Normally closed)	●	●		●	●	
	32, 40	Double acting	●					
		Single acting (Normally open)	●					
		Single acting (Normally closed)	●					
<b>Long stroke MHZL2</b>  Page 426	10, 16 20, 25	Double acting	●	●	●			
		Single acting (Normally open)	●	●		●	●	
		Single acting (Normally closed)	●	●		●	●	
<b>Long stroke With dust cover MHZL2</b>  Page 436	10, 16 20	Double acting	●					
<b>With dust cover MHZJ2</b>  Page 440 Page 451	6	Double acting	●					
		Single acting (Normally open)	●					
		Single acting (Normally closed)	●					
	10, 16 20, 25	Double acting	●	●	●			
		Single acting (Normally open)	●	●		●	●	
		Single acting (Normally closed)	●	●		●	●	
	32, 40	Double acting	●					

		Finger option			
With hose nipple		Basic type (tapped in open/close direction)	Side tapped	Through-holes in open/close direction	Flat type finger
					

Made to Order common specifications	Page
-------------------------------------	------

		●	●	●	●
	●	●	●	●	●
	●	●	●	●	●

Page 398

\* Availability varies depending on the model.  
For details, refer to "Made to Order" on pages 725 to 748.

		●	●	●	●
		●	●	●	●
		●	●	●	●
		●	●	●	●
		●	●	●	●

Page 408

- X4 Heat resistance (-10 to 100 °C)
- X5 Fluororubber seal
- X7 Closing direction spring assist
- X12 Opening direction spring assist
- X46 Built-in needle valve for finger speed control
- X50 Without magnet
- X51 MHQ2/MHQG2 compatible flat type fingers
- X53 Ethylene propylene rubber seal (EPDM)
- X56 Axial ported
- X63 Fluorine grease
- X64 Finger: Side tapped
- X65 Finger: Through-holes in opening/closing directions
- X77A Dust cover adhesion
- X77B Dust cover adhesion/Finger part only
- X78A Dust cover caulking
- X78B Dust cover caulking/Finger part only
- X79 Grease for food processing machines/Fluorine grease
- X79A Grease for food processing machines/Aluminum complex soap base grease
- X81A Special black chromium treatment is made on only the finger.
- X81B Special black chromium treatment is made on the finger and guide.

Page 426

		●	●	●	●
		●	●	●	●
		●	●	●	●
		●	●	●	●

Page 436

		●			
		●			
		●			
		●			

Page 440

		●			
		●			
		●			
		●			

Page 451

MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

D-□

# MHZ Series Model Selection

## Model Selection

### Selection Procedure



### Step 1 Confirmation of Gripping Force



#### Example

Workpiece mass:  
0.1 kg

Gripping method:  
External gripping

Gripping point distance:  
L = 30 mm

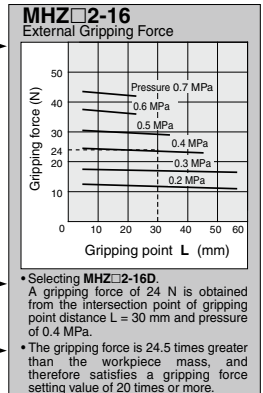
Operating pressure:  
0.4 MPa

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

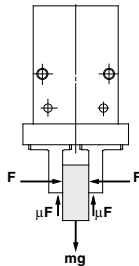
- Although conditions differ according to the workpiece shape and the coefficient of friction between the attachments and the workpiece, select a model that can provide a gripping force of 10 to 20 times the workpiece weight, or more.  
(Note) For further details, refer to the model selection illustration.

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

Example) When it is desired to set the gripping force at 20 times or more above the workpiece weight.  
Required gripping force = 0.1 kg x 20 x 9.8 m/s<sup>2</sup> = 19.6 N or more



### Model Selection Illustration



“Gripping force at least 10 to 20 times the workpiece weight”

The “10 to 20 times or more of the workpiece weight” recommended by SMC is calculated with a safety margin of a = 4, which allows for impacts that occur during normal transportation, etc.

When $\mu = 0.2$	When $\mu = 0.1$
$F = \frac{mg}{2 \times 0.2} \times 4$ $= 10 \times mg$	$F = \frac{mg}{2 \times 0.1} \times 4$ $= 20 \times mg$

10 x Workpiece weight

20 x Workpiece weight

Note) • Even in cases where the coefficient of friction is greater than  $\mu = 0.2$ , for reasons of safety, select a gripping force which is at least 10 to 20 times greater than the workpiece weight, as recommended by SMC.

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

When gripping a workpiece as in the figure to the left, and with the following definitions,

**F:** Gripping force (N)

$\mu$ : Coefficient of friction between the attachments and the workpiece

**m:** Workpiece mass (kg)

**g:** Gravitational acceleration (= 9.8 m/s<sup>2</sup>)

**mg:** Workpiece weight (N)

the conditions under which the workpiece will not drop are

$$2 \times \mu F > mg$$

↑ Number of fingers

and therefore,

$$F > \frac{mg}{2 \times \mu}$$

With “a” representing the extra margin,

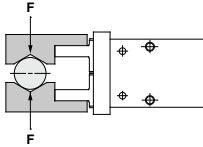
“F” is determined by the following formula:

$$F = \frac{mg}{2 \times \mu} \times a$$

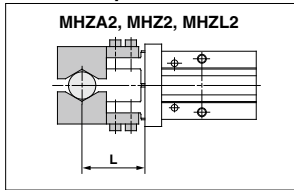
## Step 1 Effective Gripping Force: MHZ□2 Series/Double Acting/External Gripping Force

- 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 both fingers and attachments are in full contact with the workpiece as shown in the figure below.

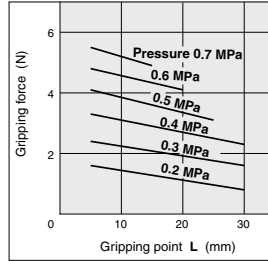


### External Grip



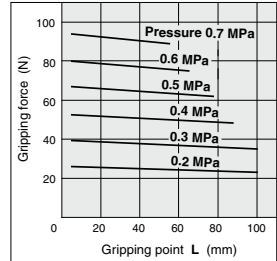
### External Gripping Force

#### MHZ2-6D/MHZA2-6D

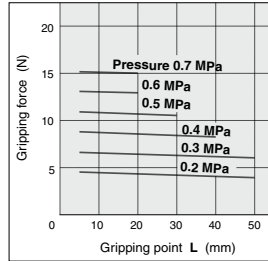


### External Gripping Force

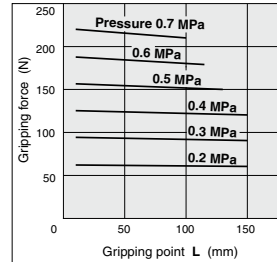
#### MHZ2-25D/MHZL2-25D



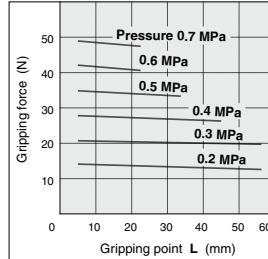
#### MHZ2-10D/MHZL2-10D



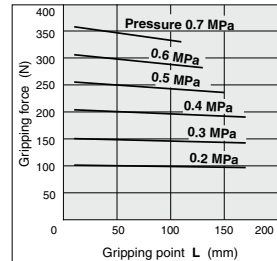
#### MHZ2-32D



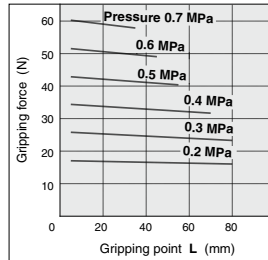
#### MHZ2-16D/MHZL2-16D



#### MHZ2-40D



#### MHZ2-20D/MHZL2-20D



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

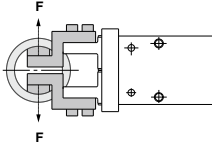
D-□

## Model Selection

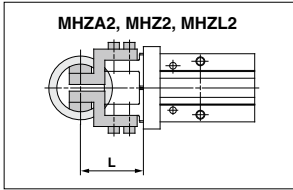
### Step 1 Effective Gripping Force: MHZ□2 Series/Double Acting/Internal Gripping Force

- 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 both fingers and attachments are in full contact with the workpiece as shown in the figure below.

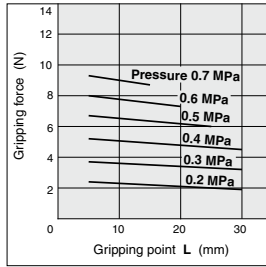


#### Internal Grip

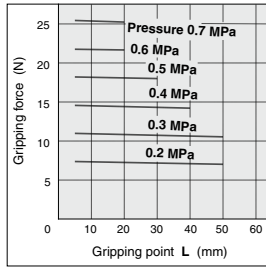


#### Internal Gripping Force

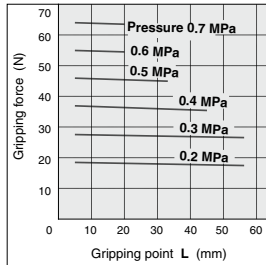
##### MHZ2-6D/MHZA2-6D



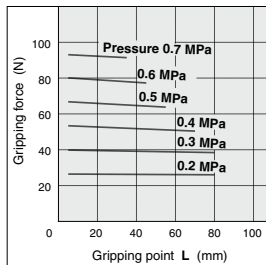
##### MHZ2-10D/MHZA2-10D



##### MHZ2-16D/MHZA2-16D

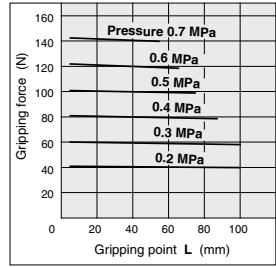


##### MHZ2-20D/MHZA2-20D

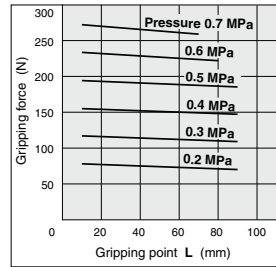


#### Internal Gripping Force

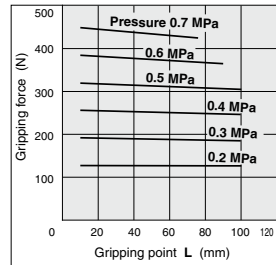
##### MHZ2-25D/MHZA2-25D



##### MHZ2-32D



##### MHZ2-40D

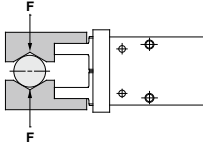




## Step 1 Effective Gripping Force: MHZ□2 Series/Single Acting/External Gripping Force

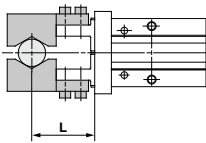
- Indication of effective gripping force

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



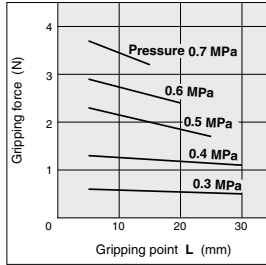
### External Grip

MHZA2, MHZ2, MHZL2

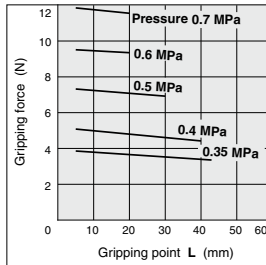


### External Gripping Force

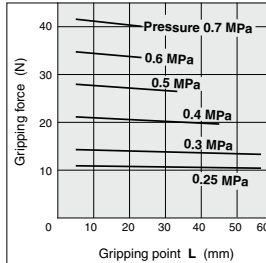
#### MHZ2-6S/MHZA2-6S



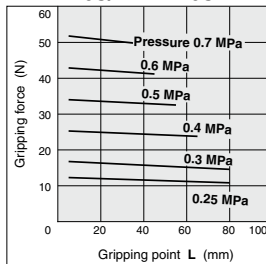
#### MHZ2-10S/MHZA2-10S



#### MHZ2-16S/MHZA2-16S

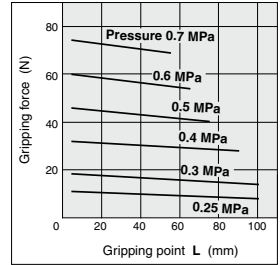


#### MHZ2-20S/MHZA2-20S

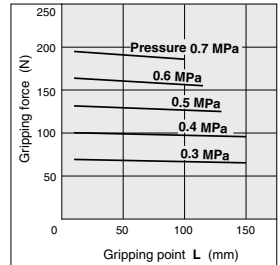


### External Gripping Force

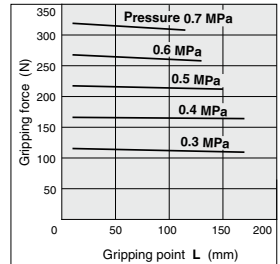
#### MHZ2-25S/MHZA2-25S



#### MHZ2-32S



#### MHZ2-40S



MHZ

MHF

MHL

MHR

MHK

MHS

MHC

MHT

MHY

MHW

-X□

MRHQ

MA

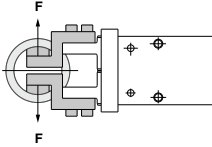
D-□

## Model Selection

### Step 1 Effective Gripping Force: MHZ□2 Series/Single Acting/Internal Gripping Force

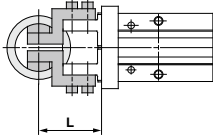
- Indication of effective gripping force

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



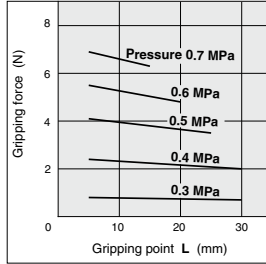
#### Internal Grip

MHA2, MHZ2, MHZL2

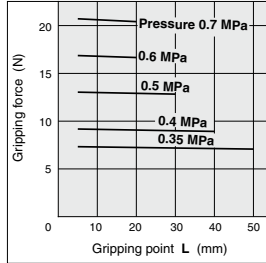


#### Internal Gripping Force

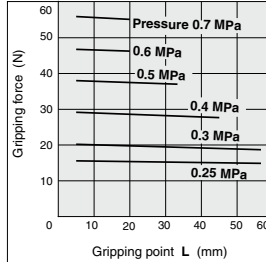
##### MHZ2-6C/MHZA2-6C



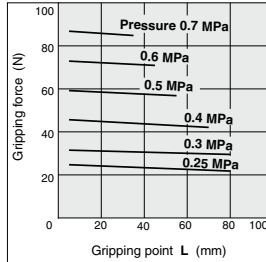
##### MHZ2-10C/MHZA2-10C



##### MHZ2-16C/MHZA2-16C

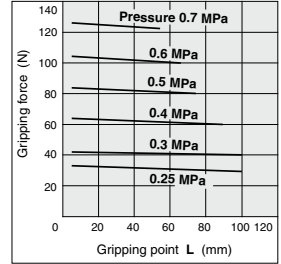


##### MHZ2-20C/MHZA2-20C

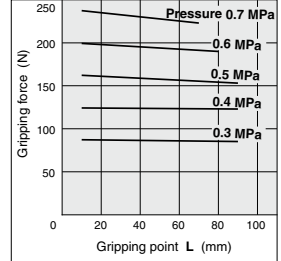


#### Internal Gripping Force

##### MHZ2-25C/MHZA2-25C



##### MHZ2-32C



##### MHZ2-40C

