

HP04 Series

Model Code No.

HP04 - 10 C ※ HAE - ZE135 A 2

Series Name

Nominal Size (Bore Size)

- 8 : 8mm
- 10 : 10mm
- 16 : 16mm
- 20 : 20mm
- 32 : 32mm
- 50 : 50mm

Action Type

- A : Normally Open, Single Acting
(Except HP04-32,HP04-50)
- B : Normally Close, Single Acting
(only for Custom made)
- C : Double Acting
(Only HP04-32,HP04-50)

Number of Switch

- 1 : 1 Switch
- 2 : 2 Switches

Switch Lead Wire

- A : 1m
- B : 3m

(Option)

● Sensor Switch

Blank : without Switch

Straight type

- ES13, ZE135 : Solid state type, 2 wire
- ES15, ESP15, ZE155 : Solid state type, 3 wire

L-shaped type

- ES23, ZE235 : Solid state type, 2 wire
- ES25, ESP25, ZE255 : Solid state type, 3 wire

(Option)

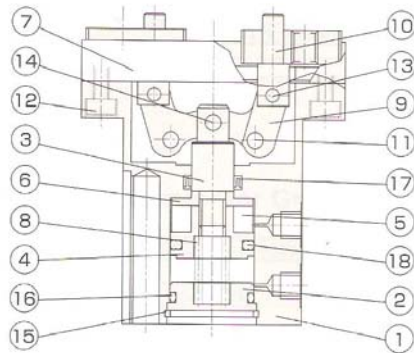
● Mounting Adapter

Blank : without Adapter

- HAE : HAE type
- HFE : HFE type
- HFEL : HFE-L type (only HP04-16)

Refer to "Mounting Adapter for Gripper" (page 179).

Internal Structure



Parts List

| No. | Name | Material |
|-----|--------------------------------------|-------------------|
| 1 | Main Body | Aluminium Alloy |
| 2 | Head Cover | Aluminium Alloy |
| 3 | Piston Rod | Stainless Steel |
| 4 | Piston | Aluminium Alloy |
| 5 | Magnet | Plastic Magnet |
| 6 | Holding Cover | Aluminium Alloy |
| 7 | Linear Bearing | Bearing Steel |
| 8 | Spring (Only for Single Acting type) | Piano Wire |
| 9 | Action Lever | Carbon Steel |
| 10 | Knuckle | Stainless Steel |
| 11 | Fulcrum Pin | Carbon Tool Steel |
| 12 | Hexagonal Socket Head Bolt | Carbon Steel |
| 13 | Press-in Pin | Carbon Steel |
| 14 | Press-in Pin | Carbon Steel |
| 15 | Snap Ring | Hard Steel |
| 16 | O-ring | NBR |
| 17 | Packing for Rod | NBR |
| 18 | Packing for Piston | NBR |

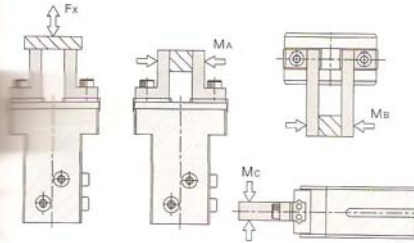
Specifications

| | |
|--|---|
| Action Type | Double Acting, Single Acting |
| Working Fluid | Air |
| Maximum Operating Pressure [MPa] | 0.7 |
| Proof Pressure [MPa] | 1.05 |
| Operating Ambient Temperature [°C] | 0 to 60 |
| Lubrication | Not required (need for Levers sliding portion only) |
| Max. Operating Cycle [cycles per min.] | 120 |
| Centering Accuracy [mm] | 0.07 (+0.07 to -0.07) |
| Repeatability Accuracy [mm] | 0.01 (+0.01 to -0.01) |
| Air port | M3×0.5 (HP04-8, HP04-10) M5×0.8 (HP04-16, HP04-20, HP04-32) Rc1/8 (HP04-50) |
| Available Switch type | ZE, ES type (Solid state type) |

| Action type | Model | Nominal Size [mm] | Minimum Operating Pressure [MPa] | Maximum Stroke [mm] | Effective Gripping Force [N] | | External Dimensions (Thick×Width×Length) [mm] | Weight [g] |
|-----------------------------|----------|-------------------|----------------------------------|---------------------|------------------------------|------|---|------------|
| | | | | | Close | Open | | |
| Double Acting | HP04-8C | 8 | 0.22 | 4 | 5.78 | 9.9 | 13×20×30 | 22 |
| | HP04-10C | 10 | 0.2 | 6.5 | 10 | 15.6 | 20×36×49 | 80 |
| | HP04-16C | 16 | 0.12 | 10 | 26 | 39 | 25×50×56 | 159 |
| | HP04-20C | 20 | 0.1 | 14 | 45 | 60 | 32×62×67 | 329 |
| | HP04-32C | 32 | 0.1 | 22 | 157 | 176 | 40×85×83 | 664 |
| | HP04-50C | 50 | 0.1 | 36 | 370 | 440 | 60×119×110 | 1850 |
| Single Acting Normally Open | HP04-8A | 8 | 0.4 | 4 | 4.1 | 2.7 | 13×20×30 | 23 |
| | HP04-10A | 10 | 0.35 | 6.5 | 6.8 | 2.4 | 20×36×49 | 81 |
| | HP04-16A | 16 | 0.25 | 10 | 20 | 5.4 | 25×50×56 | 160 |
| | HP04-20A | 20 | 0.25 | 14 | 34 | 7.3 | 32×62×67 | 330 |

Note: Effective Gripping Force (N) is the value at gripping point of 30 mm in length under operating pressure of 0.5MPa.
Effective Gripping Force at Opening is shown by spring force for Single acting type of gripper.

■ Permissible Load and Permissible Moment

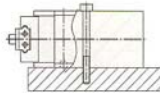


| Model | FX (N) | MA (N·m) | MB (N·m) | MC (N·m) |
|---------|--------|----------|----------|----------|
| HP04-8 | 12 | 0.04 | 0.04 | 0.08 |
| HP04-10 | 50 | 0.4 | 0.4 | 0.8 |
| HP04-16 | 120 | 1 | 1 | 2 |
| HP04-20 | 200 | 1.5 | 1.5 | 3 |
| HP04-32 | 350 | 3 | 3 | 6 |
| HP04-50 | 600 | 5.5 | 6.0 | 10 |

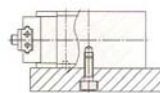
FX: Permissible Load
 MA: Permissible Moment
 MB: Permissible Moment
 MC: Permissible Moment

■ Installation Examples

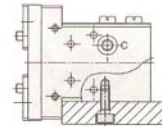
1. Using Through Holes of Body



2. Using Thread Holes at Backside

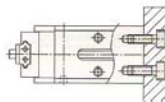


3. Using Thread Holes at Body Shoulders



4. Using Thread Holes at Bottom

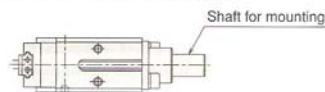
A spacer is needed at bottom to prevent sensor switches from protruding above the bottom surface.



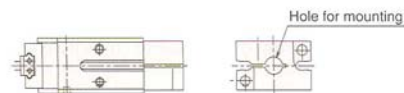
5. Using Mounting Adapter at Bottom

(Except HP04-32, HP04-50)

Using HAE type mounting adapter



Using HFE or HFEL types mounting adapter

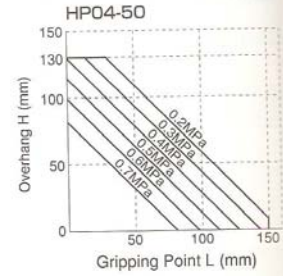
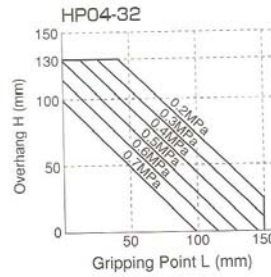
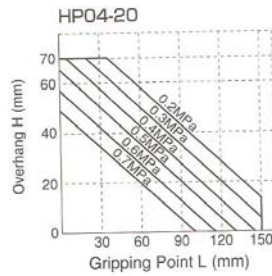
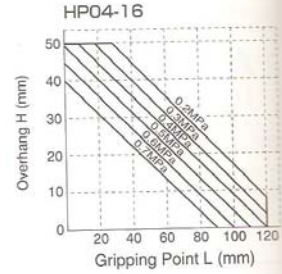
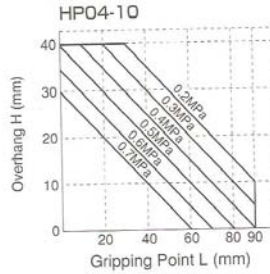
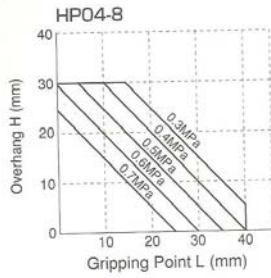


■ Mounting Adapter for Gripper

| Gripper | Applicable Mounting Adapter | | |
|---------|-----------------------------|--------|---------|
| HP04-8 | HAE-8 | — | — |
| HP04-10 | HAE-10 | HFE-10 | — |
| HP04-16 | HAE-16 | HFE-16 | HFE-16L |
| HP04-20 | HAE-20 | HFE-20 | HFE-20L |
| HP04-32 | — | — | — |
| HP04-50 | — | — | — |

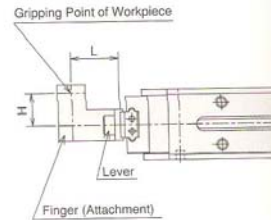
Please refer to the page 179 for "Dimensions of Mounting Adapter for Gripper".

■ Available Range of Gripping Point



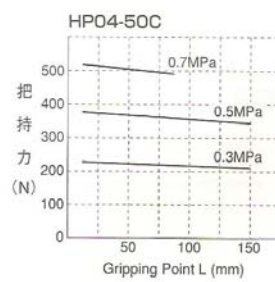
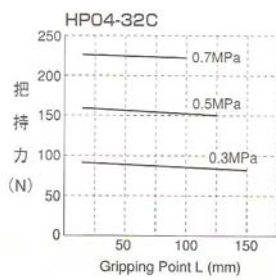
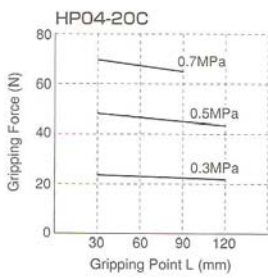
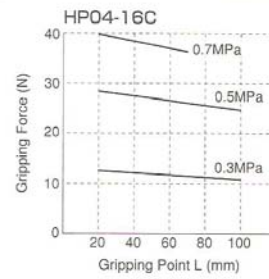
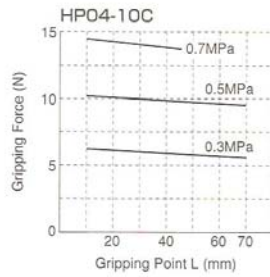
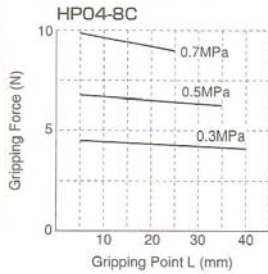
NOTE:

1. When gripping a workpiece, the mass of workpiece should be within the range between 5 to 10% of the above Effective Gripping Force.
2. When moving a workpiece with gripping it, the mass of workpiece should be within the range between 2 to 4% of the above Effective Gripping Force.
3. The necessary gripping force depends on the material (surface) of workpiece, shape of fingers and moving speed and direction (horizontally or vertically) of gripper. Therefore, please take your operational condition into consideration.

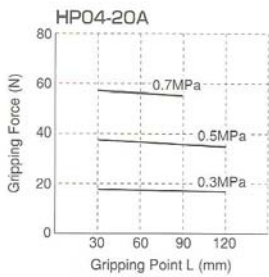
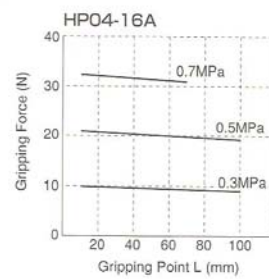
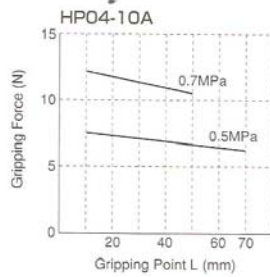
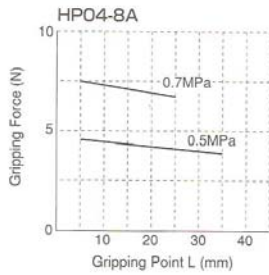


Effective Gripping Force

<Double Acting Type>



<Single Acting Type>

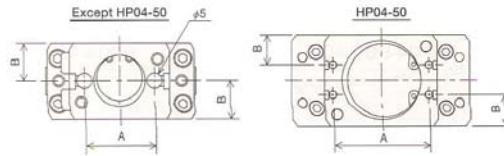


HP04

Dimensions of Groove for Sensor Switch

Unit : mm

| HP04 series | -8 | -10 | -16 | -20 | -32 | -50 |
|-------------|----|-----|------|-----|-----|-----|
| A | 15 | 17 | 24 | 30 | 43 | 64 |
| B | 3 | 10 | 12.5 | 16 | 20 | 20 |



Protruding Length of Switch

Refer to protruding length (L) of switch body from main body at the levers closed fully.

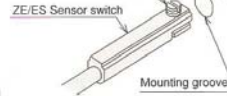
Unit : mm

| HP04 series | -8 | -10 | -16 | -20 | -32 | -50 |
|---------------------------|----|-----|-----|-----|-----|-----|
| Max.Protruding Length (L) | 2 | 0 | 0 | 1 | 0 | 0 |



Switch Installation

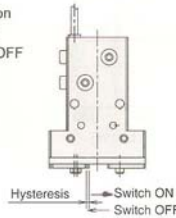
Switch set screw
(ZE-M2.5X0.45)
(ES-M2.6X0.45)



Insert switch into mounting groove. Locate in detecting position and then tighten set screw with miniature screwdriver up to 0.1N·m.

Response Differential (Hysteresis)

This shows the stroke from the location where the lever moves and turns the switch ON to where the switch turns OFF in the opposite direction.

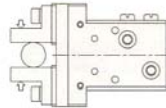


Unit : mm

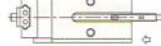
| HP04 series | -8 | -10 | -16 | -20 | -32 | -50 |
|---------------------------------|-----|-----|-----|-----|-----|-----|
| Max. Response Differential (mm) | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 |
| Operating Position Accuracy | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |

Finding & Adjustment Ideal Detecting Position

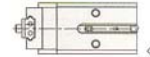
Inside Gripping (External Gripping)



① Check the levers are completely closed and inside gripping works.

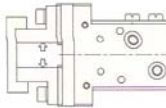


② Fit the switch into the groove in the direction of arrow. Continue inserting the switch further, then LED turns ON.



③ Insert the switch in the direction of arrow by 0.6mm from position ② furthermore and fix it there with set screw.

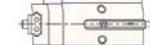
Outside Gripping (Internal Gripping)



① Check the levers are completely open and outside gripping works.



② Fit the switch into the groove in the direction of arrow. Continue inserting the switch further until LED turns ON. By moving it more, LED is OFF.



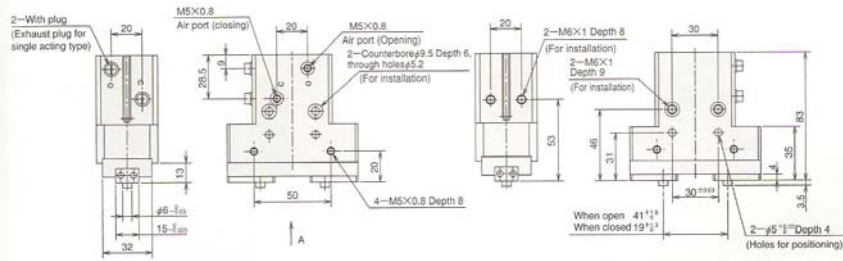
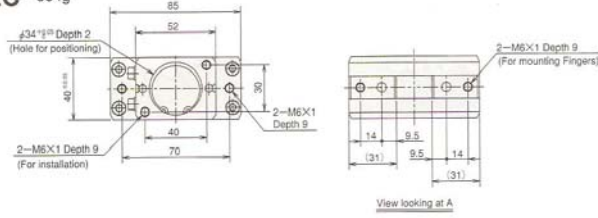
③ Move back the switch in the reverse direction of arrow by 0.6mm from position ② furthermore and fix it there with set screw.

HP04
 HP04-32C
 HP04-50C

Dimensions

Unit : mm

Weight
HP04-32C 664g



Weight
HP04-50C 1,850g

Unit : mm

