HP04 Series — Standard type —

Linear Guide Gripper

Great Centering Accuracy

Longer Life

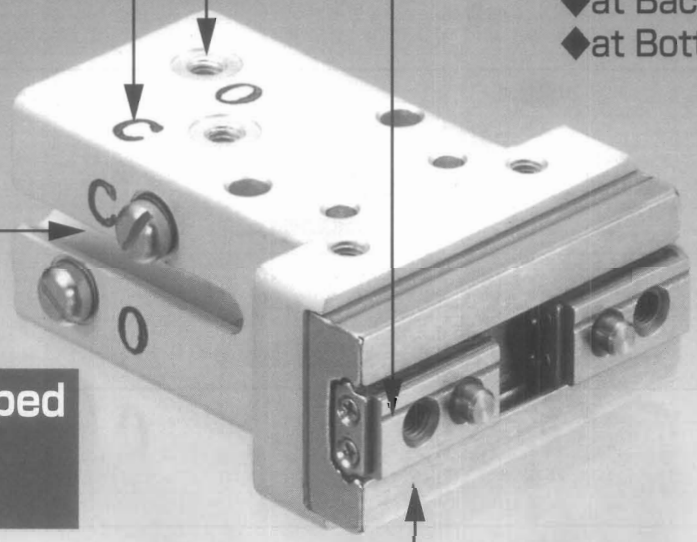
◆below±0.07mm

Positioning Holes

◆at Backside
◆at Bottom

Air port connection at two sides of body

(except HP04-8)



HP04-10
HP04-16
HP04-20
HP04-32
HP04-50

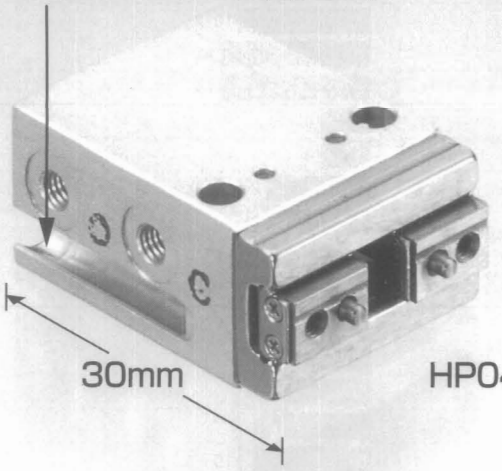
Straight and/or L-shaped ZE or ES type Sensor Switches

(Sensor switch is an option)

High Accuracy Easy Installation

◆Body thickness tolerance : ±0.05mm

Sensor switch (option)



HP04-8

Super Miniature Gripper

Linear Bearing Guide

◆High Rigidity
◆High Accuracy
(Repeat accuracy : below±0.01mm)

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)

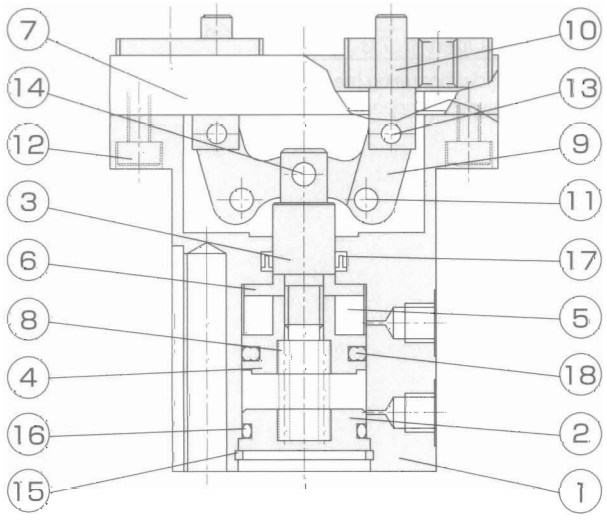
●Sensor Switch	
Blank : without Switch	
Straight type	
ES13, ZE135	: Solid state type, 2 wire
ES15, ESP15, ZE155	: Solid state type, 3 wire
L-shaped type	
ES23, ZE235	: Solid state type, 2 wire
ES25, ESP25, ZE255	: Solid state type, 3 wire

(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 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-rung	NBR
17	Packing for Rod	NBR
18	Packing for Piston	NBR

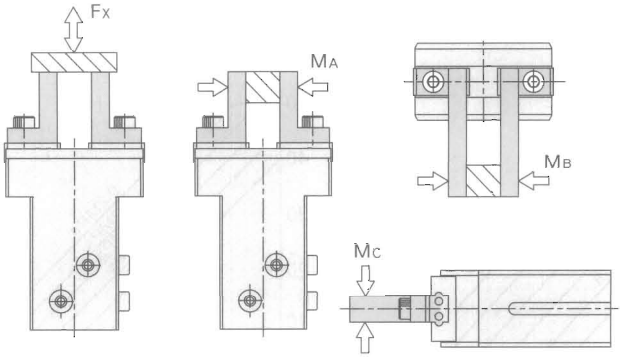
Specifications

Action Type		Double Acting, Single Acting
Working Fluid		Air
Maximum Operating Pressure	[MPa]	0.7
Proof Pressure	[MPa]	1.05
Operating Ambient Temperature	[℃]	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	Norminal Size [mm]	Minimum Operating Pressure [MPa]	Maximum Stroke [mm]	Effective Gripping Force [N]		External Dimensions (Thick×Width×Length) [mm]	Weight [g]
Double Acting	HP04-8C	8	0.22	4	Close	5.78	13×20×30	22
					Open	9.9		
	HP04-10C	10	0.2	6.5	Close	10	20×36×49	80
					Open	15.6		
	HP04-16C	16	0.12	10	Close	26	25×50×56	159
					Open	39		
	HP04-20C	20	0.1	14	Close	45	32×62×67	329
					Open	60		
	HP04-32C	32	0.1	22	Close	157	40×85×83	664
					Open	176		
	HP04-50C	50	0.1	36	Close	370	60×119×110	1850
					Open	440		
Single Acting Normally Open	HP04-8A	8	0.4	4	Close	4.1	13×20×30	23
					Open	2.7		
	HP04-10A	10	0.35	6.5	Close	6.8	20×36×49	81
					Open	2.4		
	HP04-16A	16	0.25	10	Close	20	25×50×56	160
					Open	5.4		
	HP04-20A	20	0.25	14	Close	34	32×62×67	330
					Open	7.3		

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

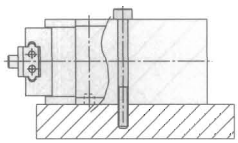


Load & Moment / Model	FX (N)	MA (N·m)	MB (N·m)	MC (N·m)
HP04-8	12	0.04	0.04	0.08
HP04-10	50	0.4	0.4	0.8
HP04-16	120	1	1	2
HP04-20	200	1.5	1.5	3
HP04-32	350	3	3	6
HP04-50	600	5.5	6.0	10

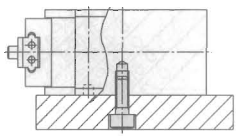
FX: Permissible Load
MA: Permissible Moment
MB: Permissible Moment
MC: Permissible Moment

■Installation Examples

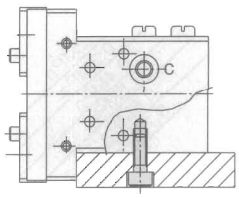
1. Using Throgh Holes of Body



2. Using Thread Holes at Backside

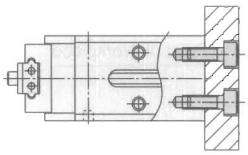


3. Using Thread Holes at Body Shoulders



4. Using Thread Holes at Bottom

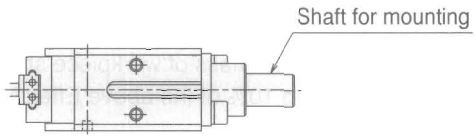
A spacer is needed at bottom to prevent sensor switches from protuding above the bottom surface.



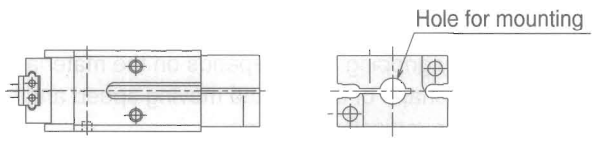
5. Using Mounting Adapter at Bottom

(Except HP04-32, HP04-50)

Using HAE type mounting adapter



Using HFE or HFEL types mounting adapter



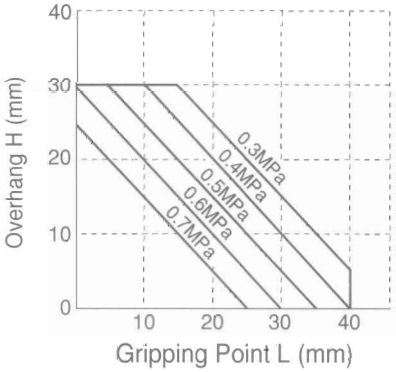
■Mounting Adapter for Gripper

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	—	—	—

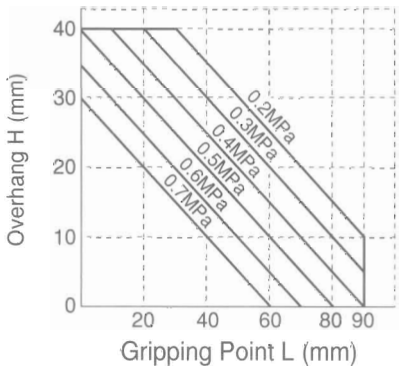
Please refer to the page 179 for "Dimensions of Mounting Adapter for Gripper".

Available Range of Gripping Point

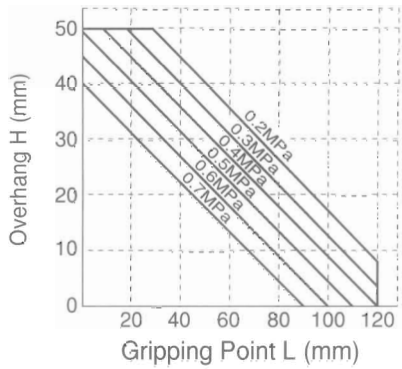
HP04-8



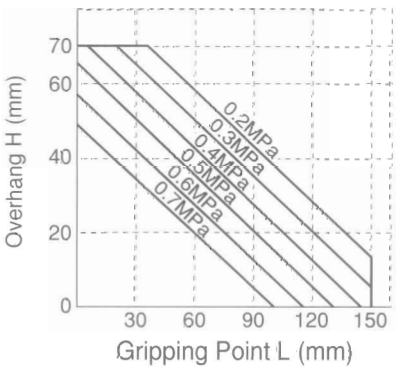
HP04-10



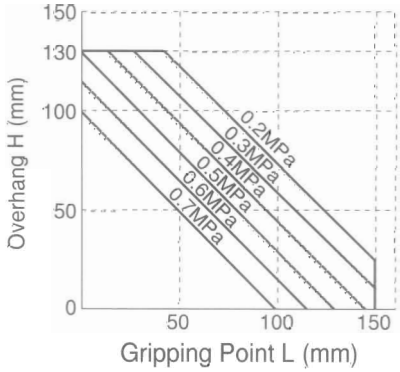
HP04-16



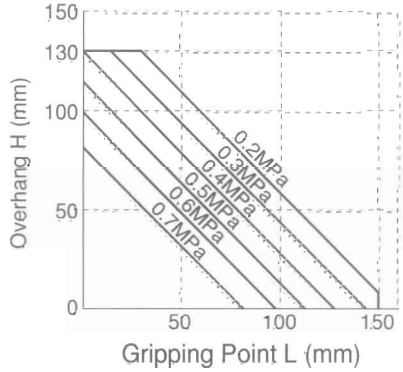
HP04-20



HP04-32

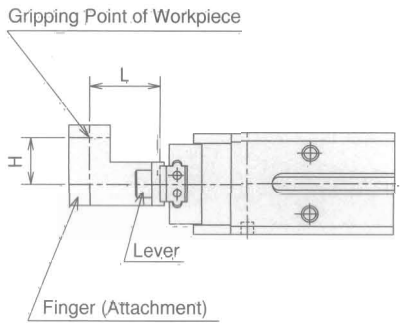


HP04-50



NOTE:

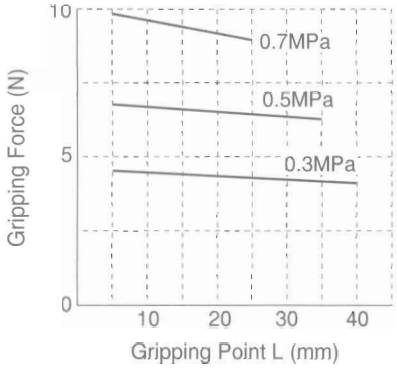
1. When gripping a workpiece, the mass of workpiece should be within the range between 5 to 10% of the above Effective Gripping Force.
2. When moving a workiece with gripping it, the mass of workpiece should be within the range between 2 to 4% of the above Effective Gripping Force.
3. The necessary gripping 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.



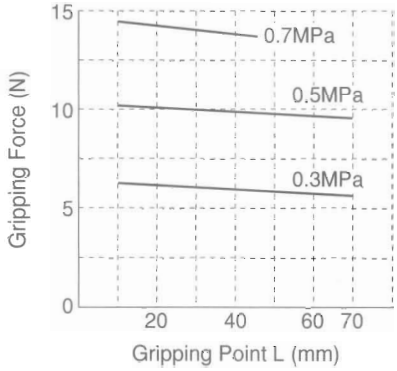
Effective Gripping Force

〈Double Acting Type〉

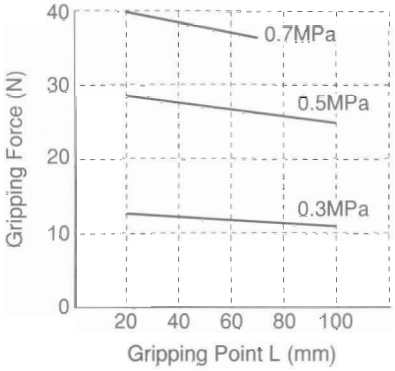
HP04-8C



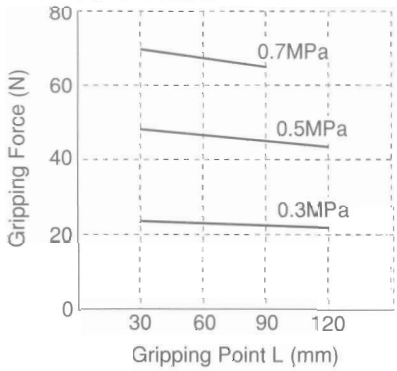
HP04-10C



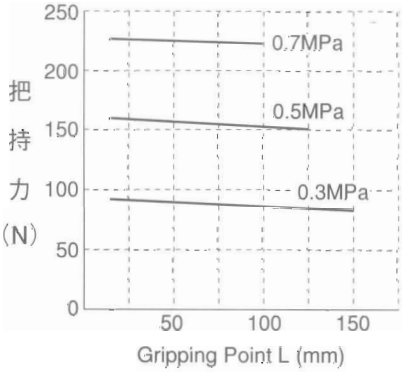
HP04-16C



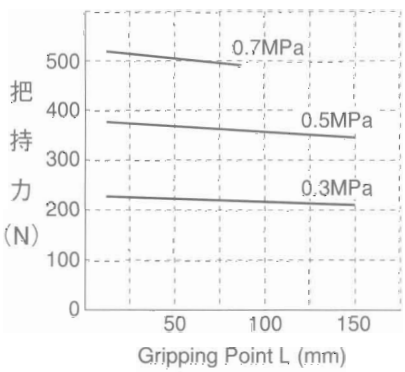
HP04-20C



HP04-32C

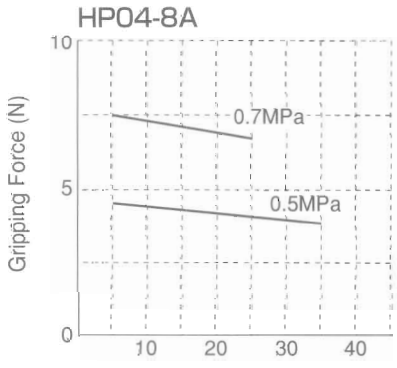


HP04-50C

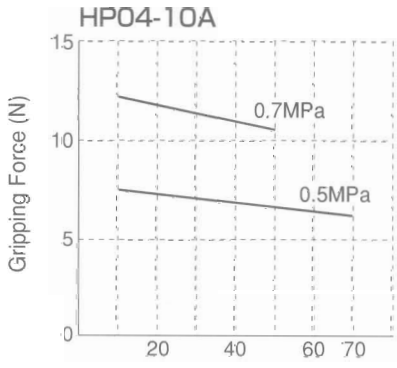


〈Single Acting Type〉

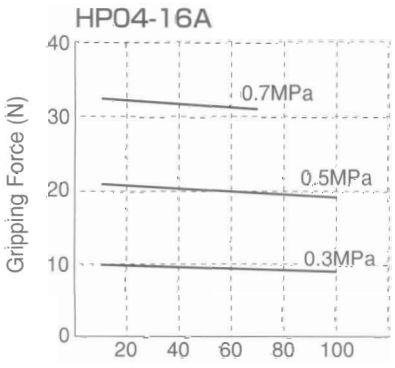
HP04-8A



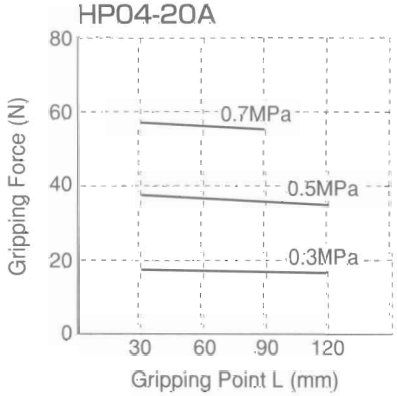
HP04-10A



HP04-16A



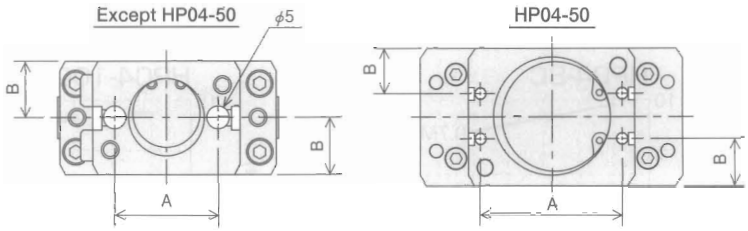
HP04-20A



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

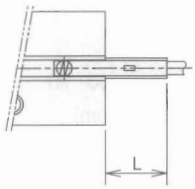


Protruding Length of Switch

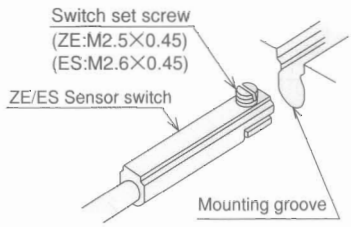
Refer to protruding length (L) of switch body from main body at the levers closed fully.

Unit : mm

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



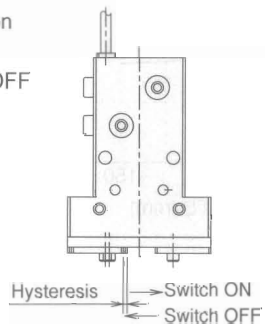
Switch Installation



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.

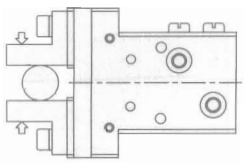


Unit : mm

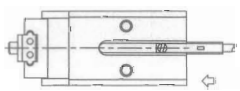
HP04 series	-8	-10	-16	-20	-32	-50
Max. Response Differential (mm)	0.3	0.3	0.4	0.4	0.4	0.4
Operating Position Accuracy	0.2	0.2	0.2	0.2	0.2	0.2

Finding & Adjustment Ideal Detecting Position

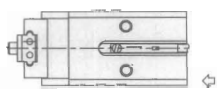
Inside Gripping (External Gripping)



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

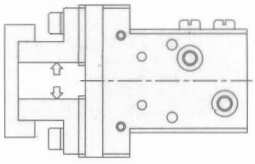


②Fit the switch into the groove in the direction of arrow. Continue inserting the switch further, then LED turns ON.

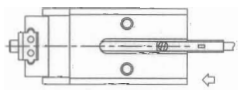


③Insert the switch in the direction of arrow by 0.6mm from position ② furthermore and fix it there with set screw.

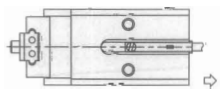
Outside Gripping (Internal Gripping)



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



②Fit 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.



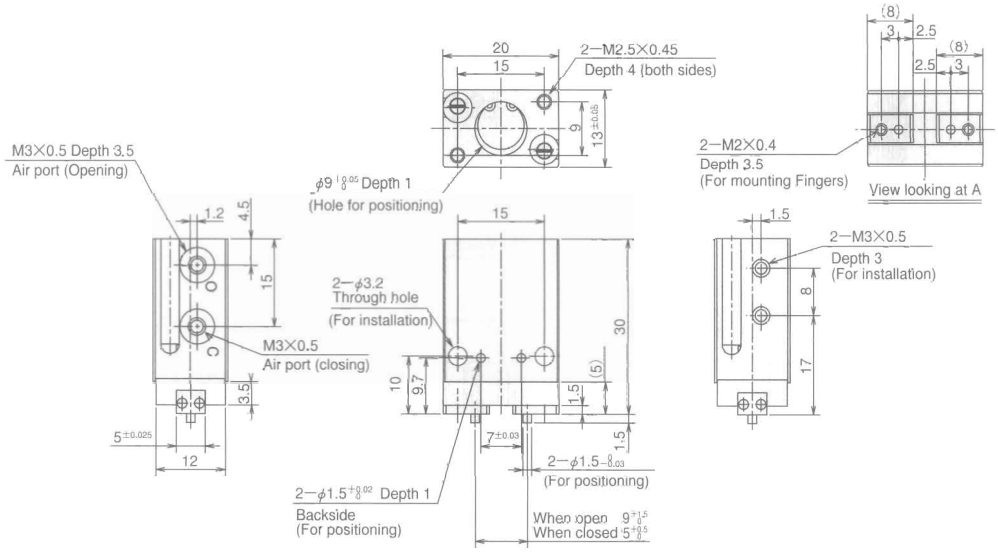
③Move back the switch in the reverse direction of arrow by 0.6mm from position ② furthermore and fix it there with set screw.

Dimensions

Unit : mm

Weight

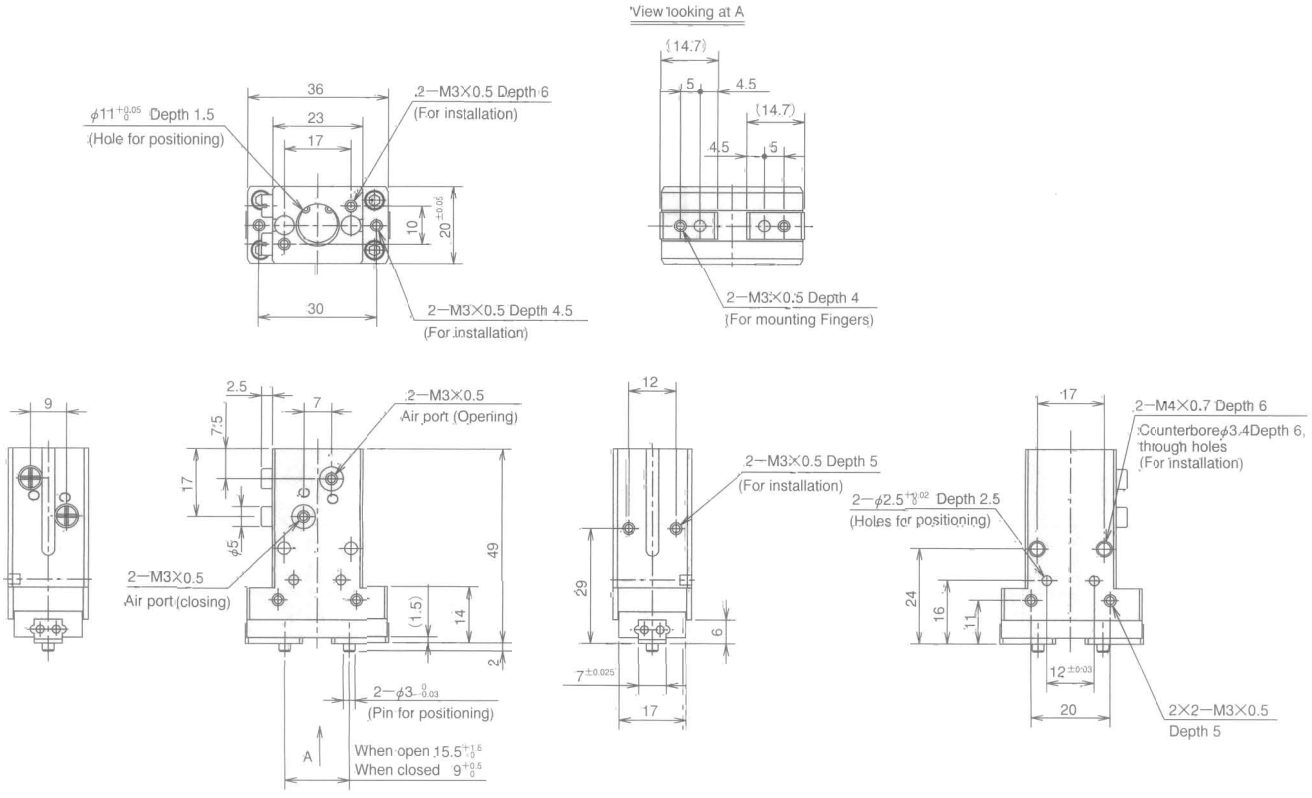
HP04-8A 23g
HP04-8C 22g



Weight

HP04-10A 81g
HP04-10C 80g

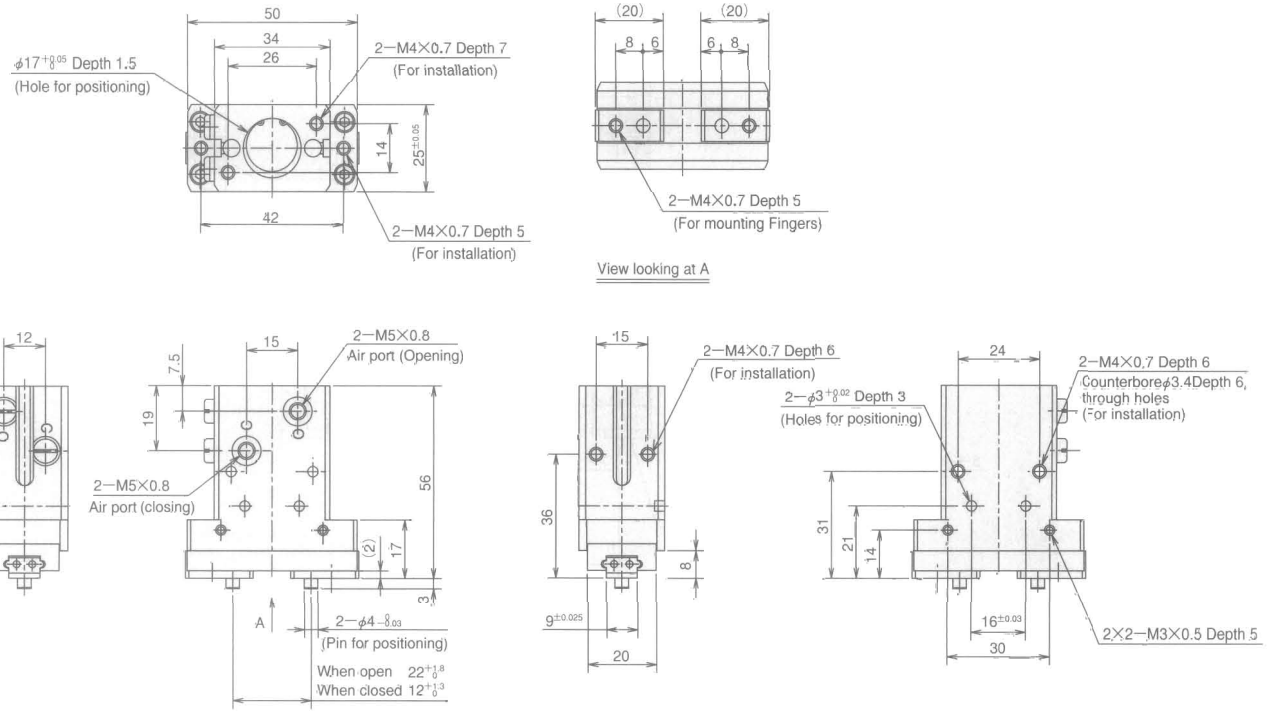
Unit : mm



Dimensions

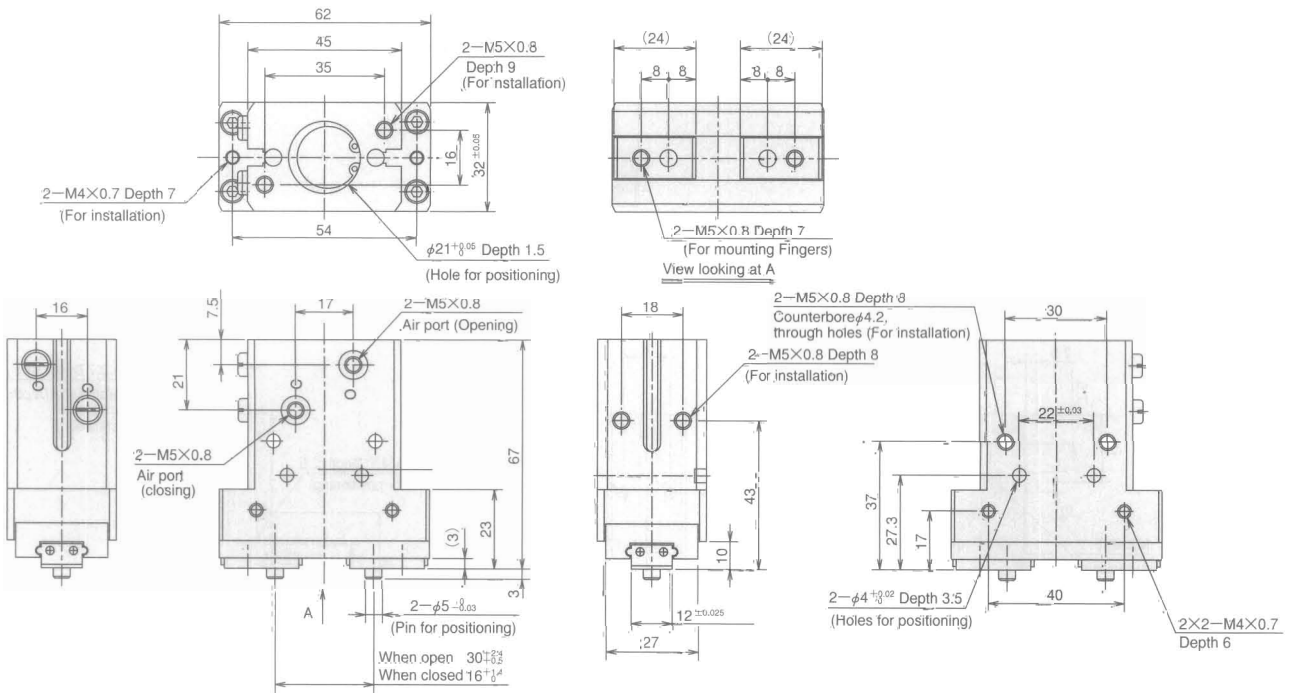
Unit : mm

Weight
HP04-16A 160g
HP04-16C 150g



Weight
HP04-20A 330g
HP04-20C 328g

Unit : mm

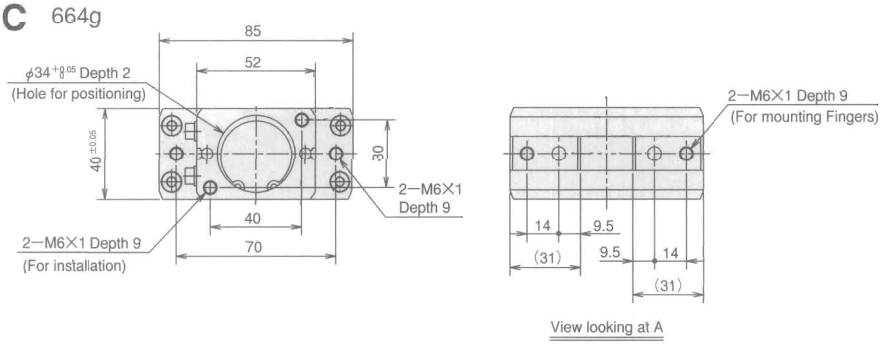


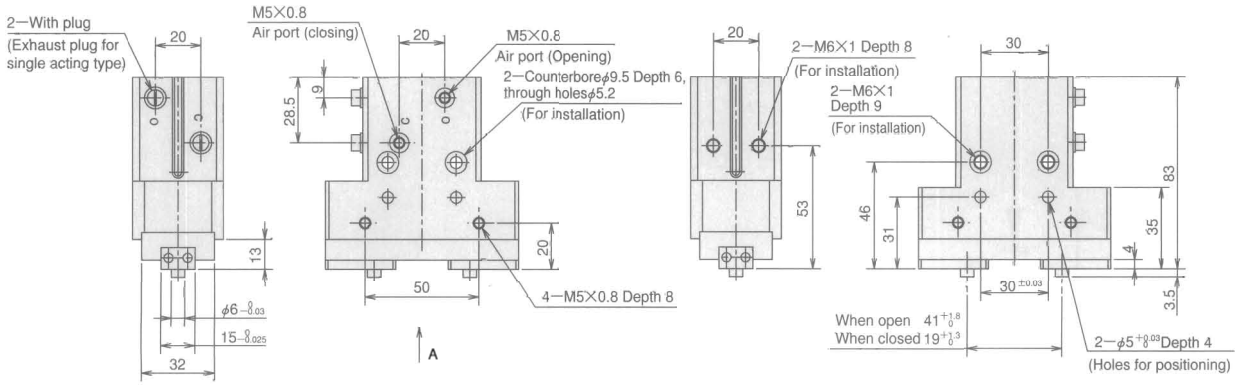
■Dimensions

Unit : mm

HP04-32C

Weight 664g





HP04-50C

Weight 1,850g

Unit : mm