

HP04F Series

Gripper with Linear Bearing Guide

(Dustproof Cover Type)

Longer Life

Groove for ZE or ES type
Sensor Switch

Connection Ports at Both Sides

◆except HP04F-8

Positioning Holes

◆at Backside

◆at Bottom

Long Levers

(Option)
Dustproof Cover

◆NBR

◆Silicone Rubber

◆Fluorine Rubber

Linear Bearing Guide

◆High Rigidity

◆High Accuracy

(Repeat accuracy : below ± 0.01 mm)

Great Centering Accuracy

◆below ± 0.07 mm

HP04F Series**Model Code No.****HP04F - 10 C ※ JN - HAE - ZE255 A 2**

Series Name

Bore Size

8 : 8mm
10 : 10mm
16 : 16mm
20 : 20mm

Action Type

A : Single acting normally open
C : Double acting

(Option)

Dustproof Cover Material

Blank : without Dustproof Cover
JN : NBR
JF : Fluorine Rubber
JS : Silicone Rubber

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).

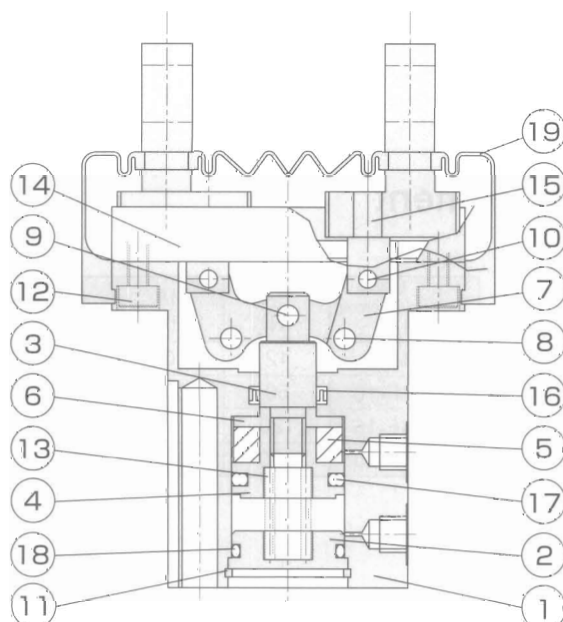
● Model Code for Dustproof Cover**JS - 04F 20**

Material

JN : NBR
JF : Fluorine Rubber
JS : Silicone Rubber

Gripper Size

Gripper Model
04F: HP04F

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	Resin
6	Holding Cover	Aluminium Alloy
7	Action Lever	Carbon Steel
8	Fulcrum Pin	Carbon Tool Steel
9	Press-in Pin	Carbon Tool Steel
10	Press-in Pin	Carbon Tool Steel
11	Snap Ring	Carbon Tool Steel
12	Hexagon Socket Head Bolt	Carbon Tool Steel
13	Spring	Piano Wire
14	Bearing	Assy
15	Knuckle	Stainless Steel
16	Packing	NBR
17	Packing	NBR
18	O-ring	NBR
19	Dustproof Cover	NBR/Fluorine/Silicone

HP04F Series**Specifications**

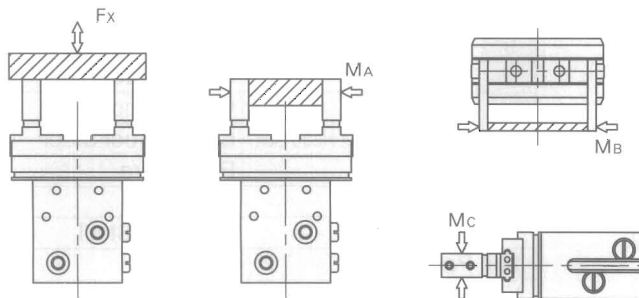
Working Fluid	Air
Maximum Operating Pressure [MPa]	0.7
Proof Pressure [MPa]	1.05
Operating Ambient Temperature [°C]	0 to 60
Lubrication	Need (mechanically sliding parts only)
Connection Ports (Air Ports)	(HP04F-8, HP04F-10) M3×0.5 (HP04F-16, HP04F-20) M5×0.8
Max. Operating Cycle [cycles per min.]	120
Centering Accuracy [mm]	0.07 (+0.07 to -0.07)
Repeatability Accuracy [mm]	0.01 (+0.01 to -0.01)
Switch Attachment	ZE, ES type (Solid state type switch)

Action type	Model	Normal Size (Bore Size) [mm]	Minimum Operating Pressure [MPa]	Maximum Stroke [mm]	Gripping Force [N]	Dimensions (T×W×L) [mm]	Weight [g]
Double Acting	HP04F-8C	8	0.22	4	Close 5.78	13×20×30	27
			※ 0.3		Open 9.9		
	HP04F-10C	10	0.2	6.5	Close 10	20×36×49	90
			※ 0.25		Open 15.6		
	HP04F-16C	16	0.12	10	Close 26	25×50×56	180
			※ 0.15		Open 39		
	HP04F-20C	20	0.1	14	Close 45	32×62×67	374
			※ 0.15		Open 60		
Single Acting Normally Open	HP04F-8A	8	0.4	4	Close 4.1	13×20×30	28
			※ 0.5		Open 2.7		
	HP04F-10A	10	0.35	6.5	Close 6.8	20×36×49	91
			※ 0.4		Open 2.4		
	HP04F-16A	16	0.25	10	Close 20	25×50×56	181
			※ 0.3		Open 5.4		
	HP04F-20A	20	0.25	14	Close 34	32×62×67	371
			※ 0.3		Open 7.3		

The Lower section (※) of Minimum Operating Pressure shows at the dustproof cover installed.

Gripping Force is measured at the levers in medium stroke with gripping point (30mm) at operating pressure (0.5MPa).

Gripping Force (Open) of Single Acting type shows spring force itself.

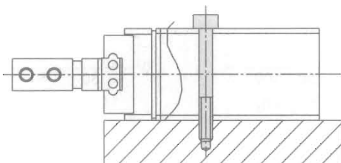
Permissible Load and Permissible Moment

Model	FX (N)	MA (N·m)	MB (N·m)	MC (N·m)
HP04F-8	12	0.04	0.04	0.08
HP04F-10	50	0.4	0.4	0.8
HP04F-16	120	1	1	2
HP04F-20	200	1.5	1.5	3

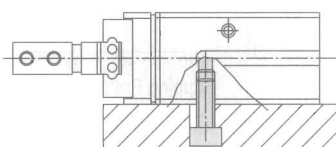
■ Installation Examples

* Several installation styles provide great versatile applications.

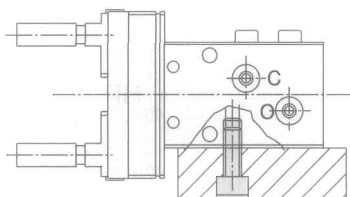
1. Using Body Through Holes (HP04F-8 only)



2. Using Holes at Backside (except HP04F-8)

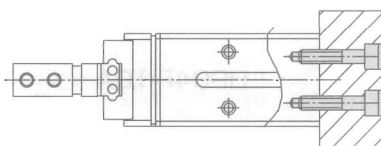


3. Using Holes at Flank (Available at both flanks)

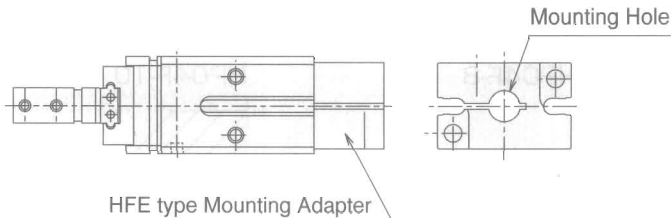
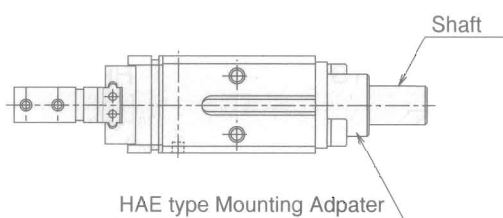


4. Using Holes at Bottom

Plate like a spacer is needed to make a space to prevent switch body from protruding above the body surface of gripper.



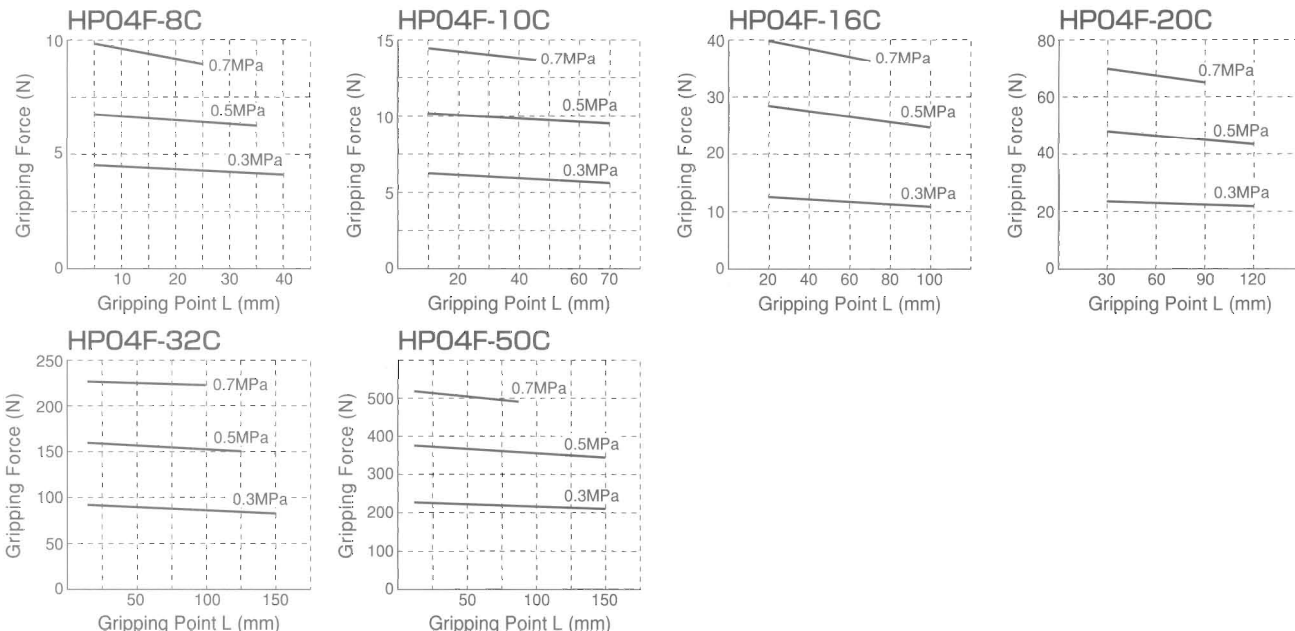
5. Using Mounting Adapters at Bottom



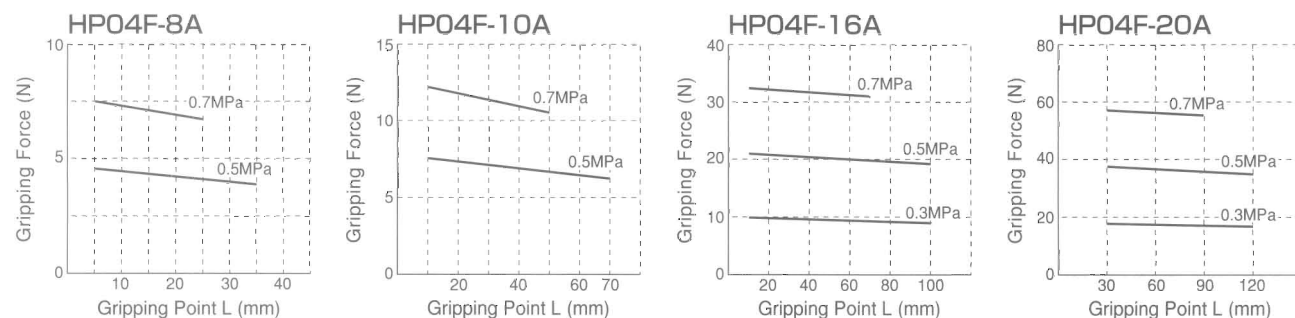
Effective Gripping Force

* Effective gripping force shown in the table is when closing the levers

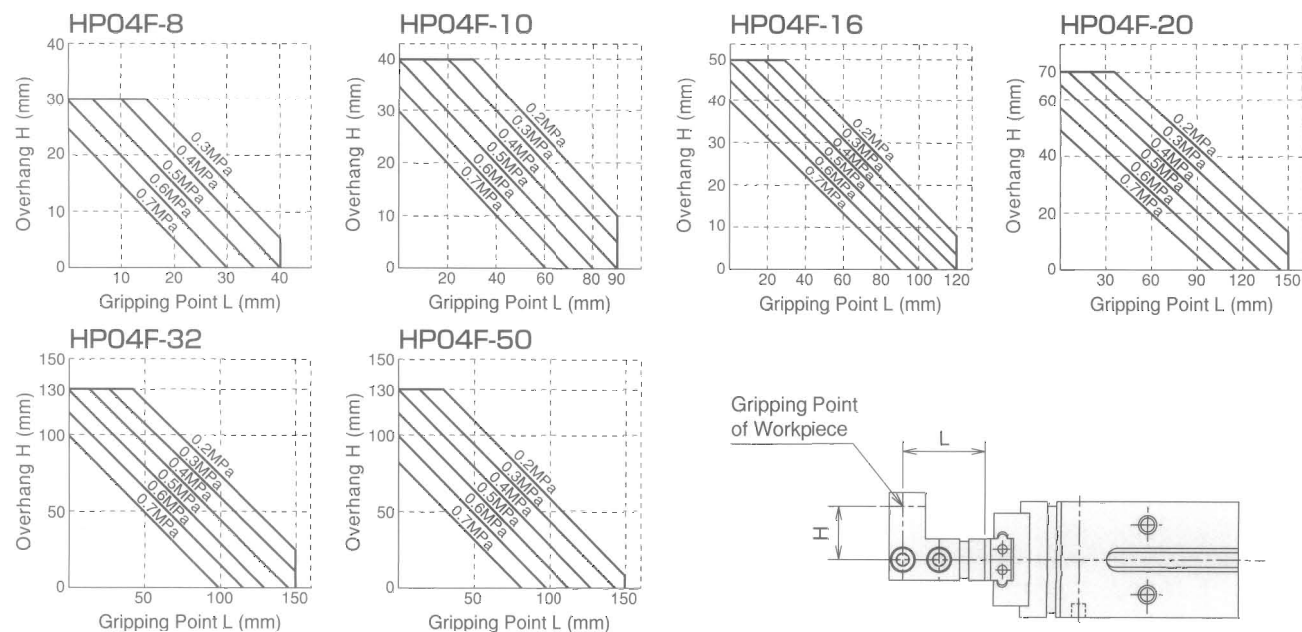
〈Double Acting Type〉



〈Single Acting Type〉



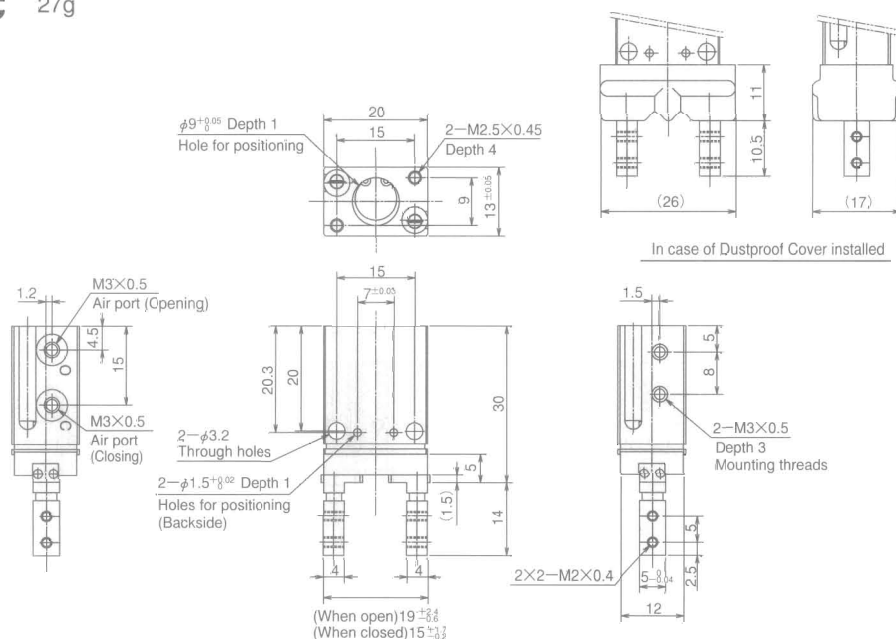
Available Range of Gripping Point



Unit : mm

Dimensions

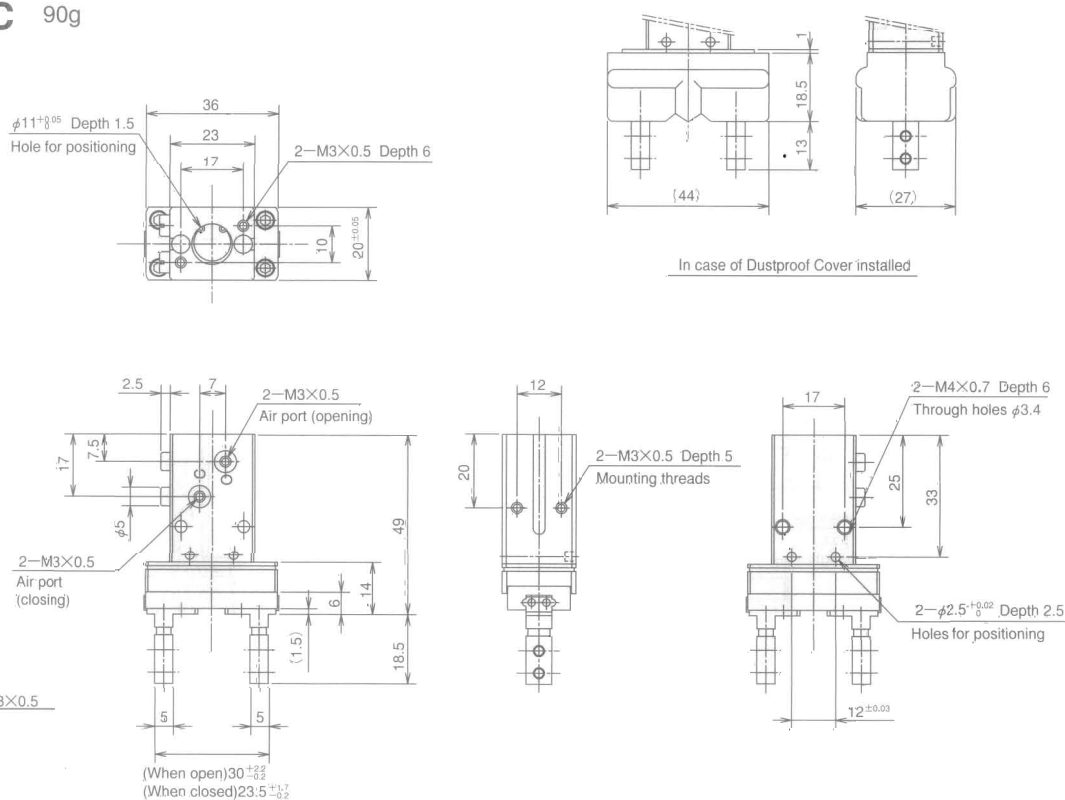
	Weight
HP04F-8A	28g
HP04F-8C	27g



In case of Dustproof Cover installed

	Weight
HP04F-10A	91g
HP04F-10C	90g

Unit : mm



In case of Dustproof Cover installed

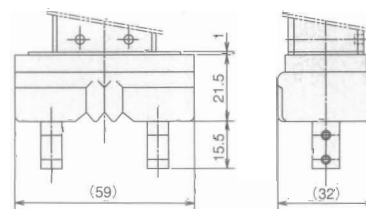
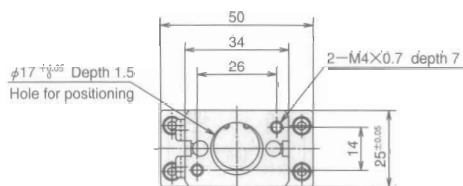
HP04F Series

HP04F

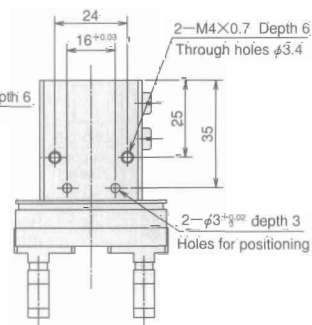
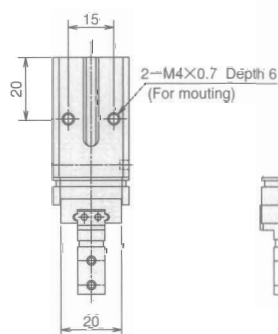
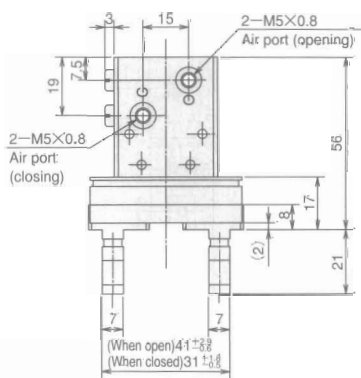
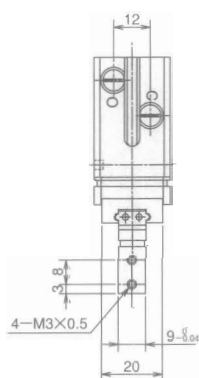
Unit : mm

Dimensions

	Weight
HP04F-16A	181g
HP04F-16C	180g

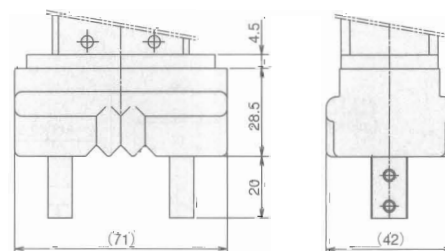
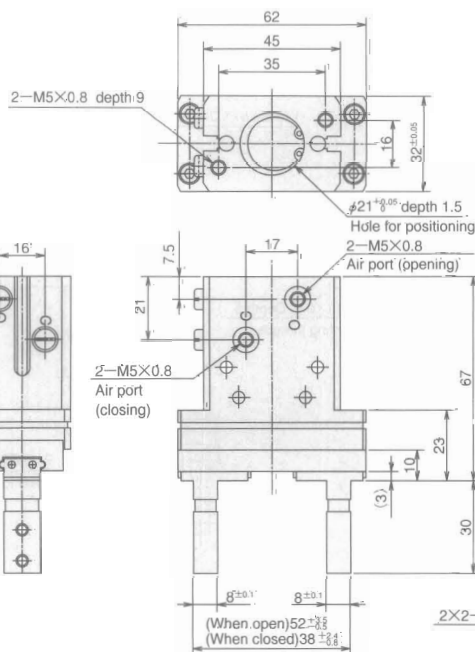


In case of Dustproof Cover installed

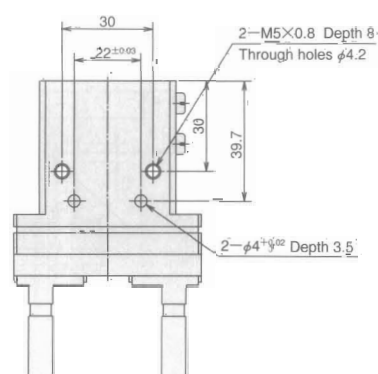
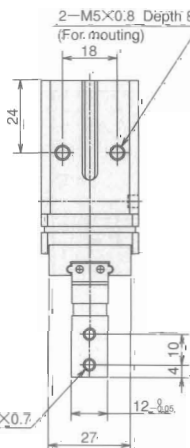
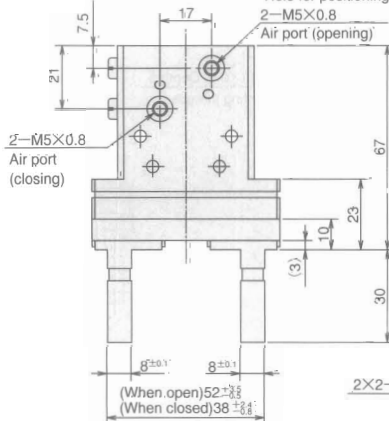
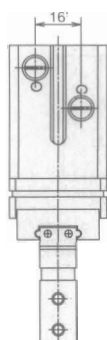


	Weight
HP04F-20A	371g
HP04F-20C	370g

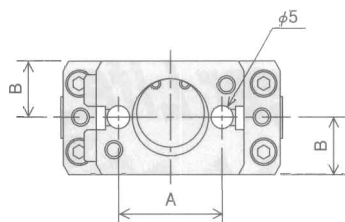
Unit : mm



In case of Dustproof Cover installed



■ Dimensions of Groove for Sensor Switch

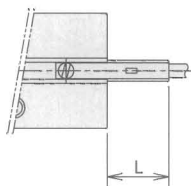


Code	Gripper : HP04F			
	HP04F-8	HP04F-10	HP04F-16	HP04F-20
A	15	17	24	30
B	3	10	12.5	16

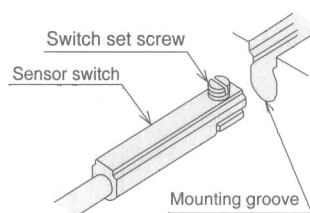
■ Protruding Length of Switch

Refer to protruding length (L) of switch body from HP04F body at the levers closed fully.

Gripper : HP04F	Unit : mm			
	φ8	φ10	φ16	φ20
Max. Protruding Length (L)	2	0	0	1



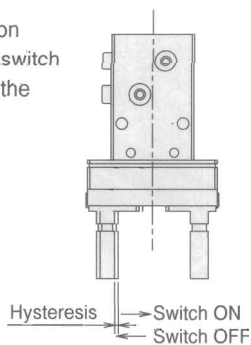
■ Switch Installation



Insert switch into mounting groove. Locate in detecting position and then tighten set screw with miniature screwdriver up to 0.1N·m. (Set screw)
ZE type: M2.5×0.45
ES type: M2.6×0.45

■ Response Differential (Hysteresis)

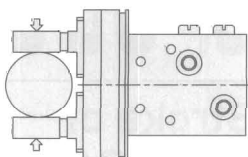
This shows the stroke from the location where the lever moves and turns the switch ON to where the switch turns OFF in the opposite direction.



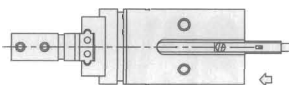
Gripper : HP04F	Unit : mm			
	φ8	φ10	φ16	φ20
Max. Response Differential (mm)	0.3	0.3	0.4	0.4
Operating Position Accuracy	0.2	0.2	0.2	0.1

■ Finding & Adjustment Ideal Detecting Position

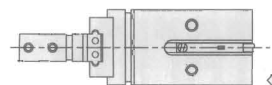
Inside Gripping (External Gripping)



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

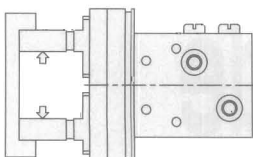


② Fit the switch into the groove in the direction of arrow. Continue inserting the switch further, then LED turns ON.

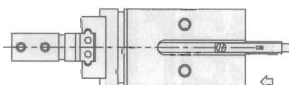


③ Insert the switch in the direction of arrow by 0.6mm from position ② furthermore and fix it there with set screw.

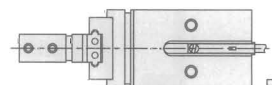
Outside Gripping (Internal Gripping)



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.