

PH02 Series

16

20

25

30

40

50

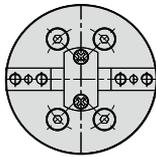
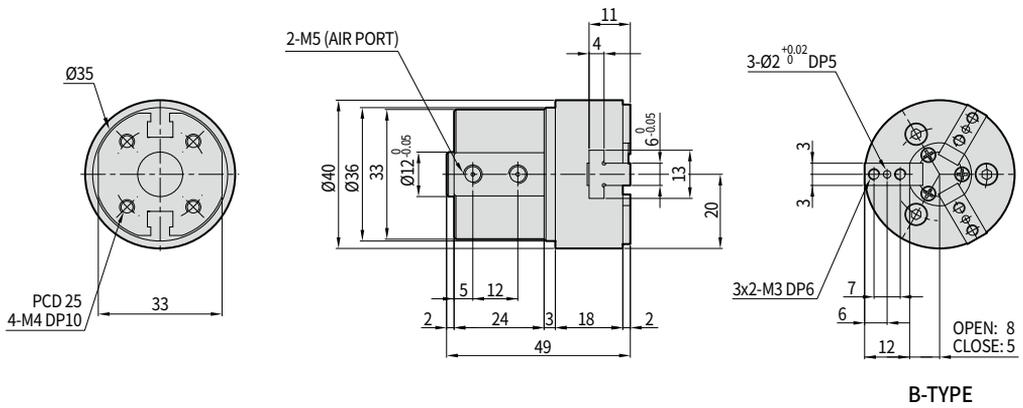
60

80

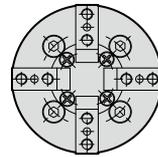
100

125

PH02-16

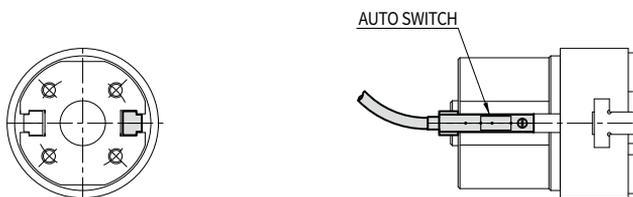


A-TYPE



C-TYPE

PH02-16 Example of Auto Switch installation



※ For PH02-16C, only 1 Auto Switch(Close) can be mounted. (Not for A and B type)

16

20

25

30

40

50

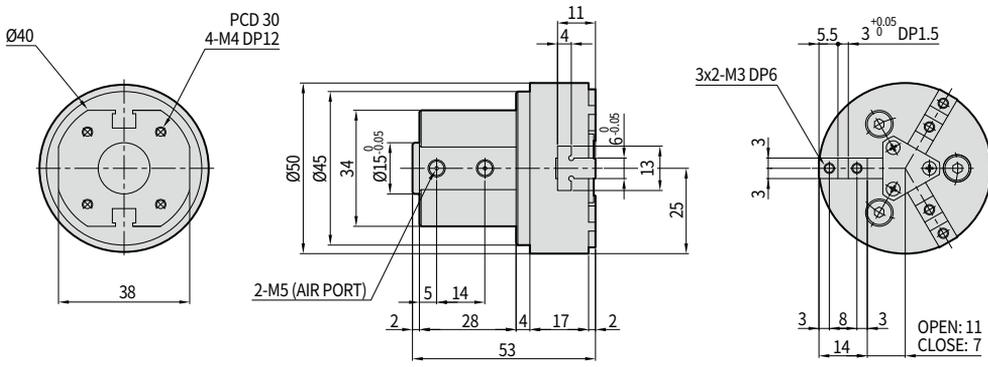
60

80

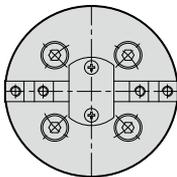
100

125

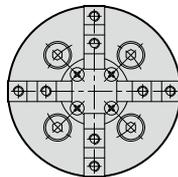
PH02-20



B-TYPE



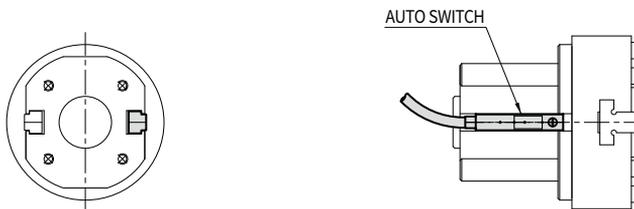
A-TYPE



C-TYPE

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02**
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH02-20 Example of Auto Switch installation



※ For PH02-20C, only 1 Auto Switch(Close) can be mounted. (Not for A and B type)

PH02 Series

16

20

25

30

40

50

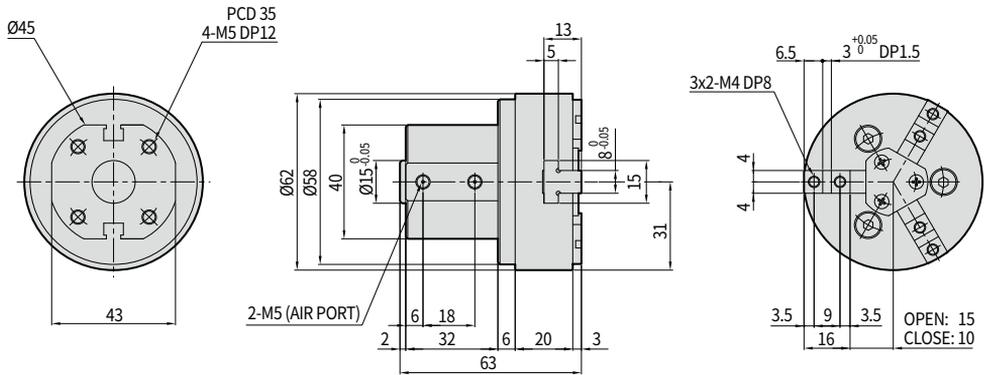
60

80

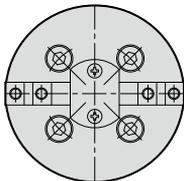
100

125

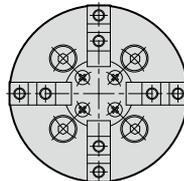
PH02-25



B-TYPE

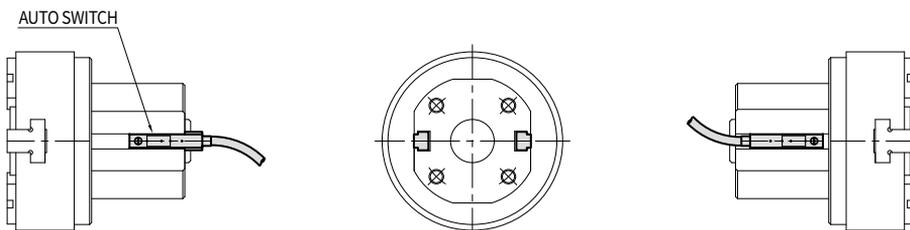


A-TYPE



C-TYPE

PH02-25 Example of Auto Switch installation



16

20

25

30

40

50

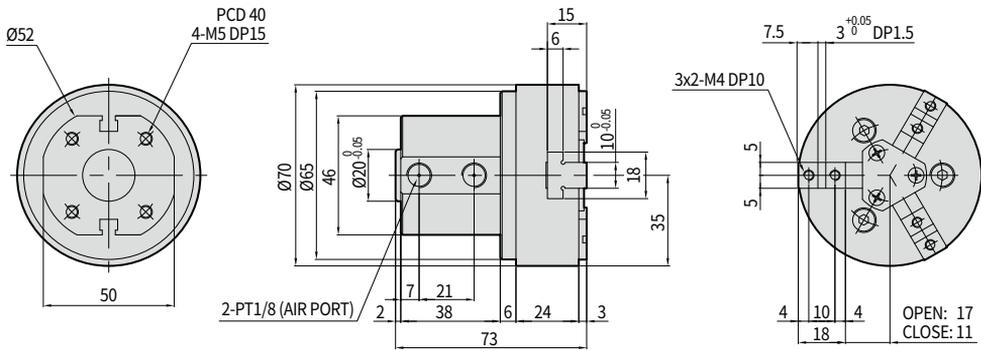
60

80

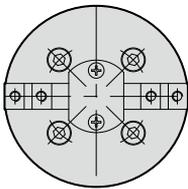
100

125

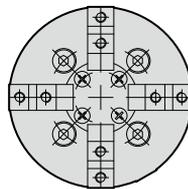
PH02-30



B-TYPE

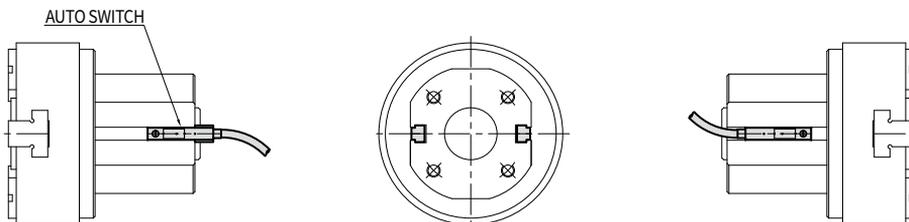


A-TYPE



C-TYPE

PH02-30 Example of Auto Switch installation



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K

PH02

- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH02 Series

16

20

25

30

40

50

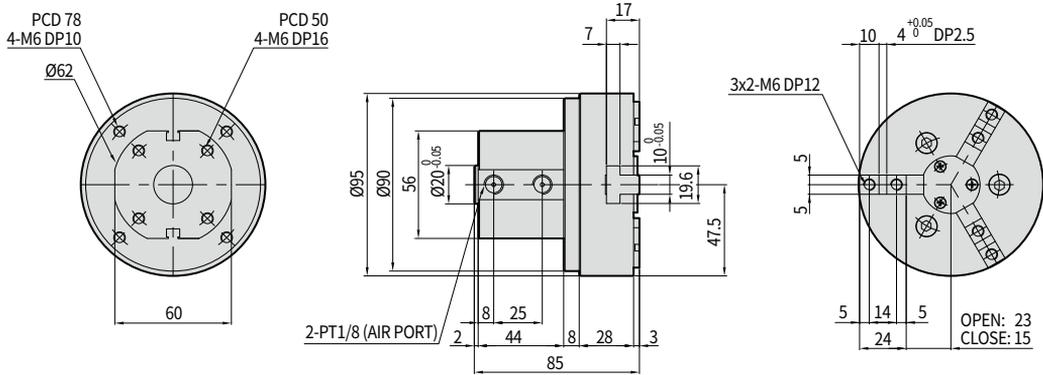
60

80

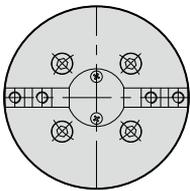
100

125

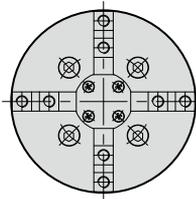
PH02-40



B-TYPE

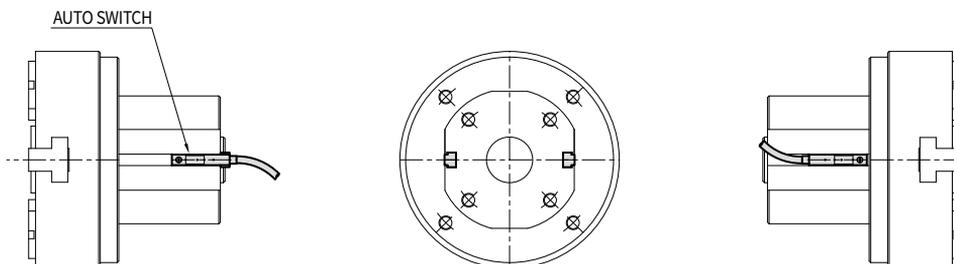


A-TYPE



C-TYPE

PH02-40 Example of Auto Switch installation



16

20

25

30

40

50

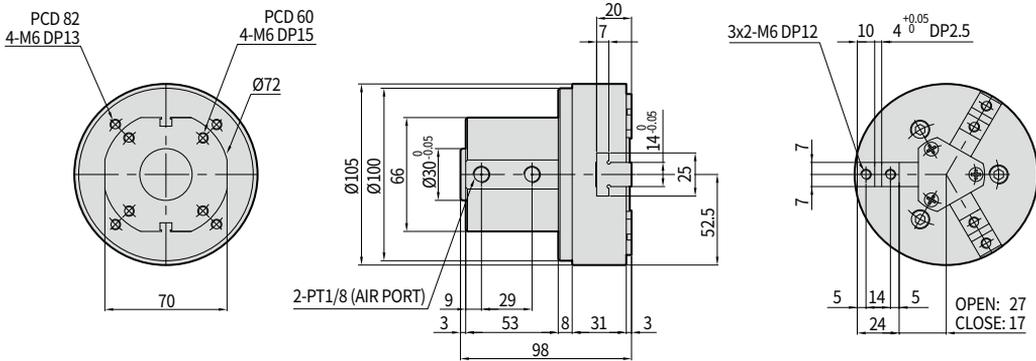
60

80

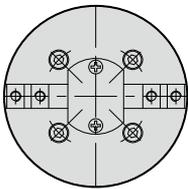
100

125

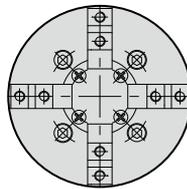
PH02-50



B-TYPE



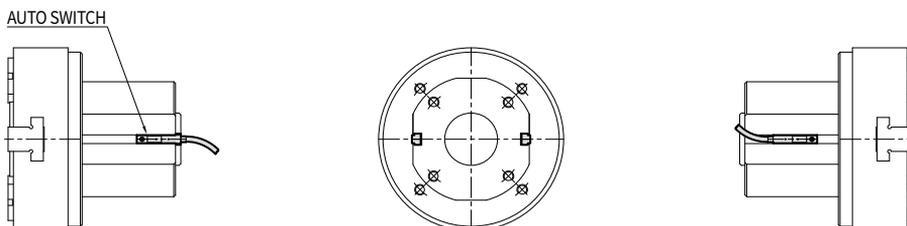
A-TYPE



C-TYPE

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02**
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH02-50 Example of Auto Switch installation



PH02 Series

16

20

25

30

40

50

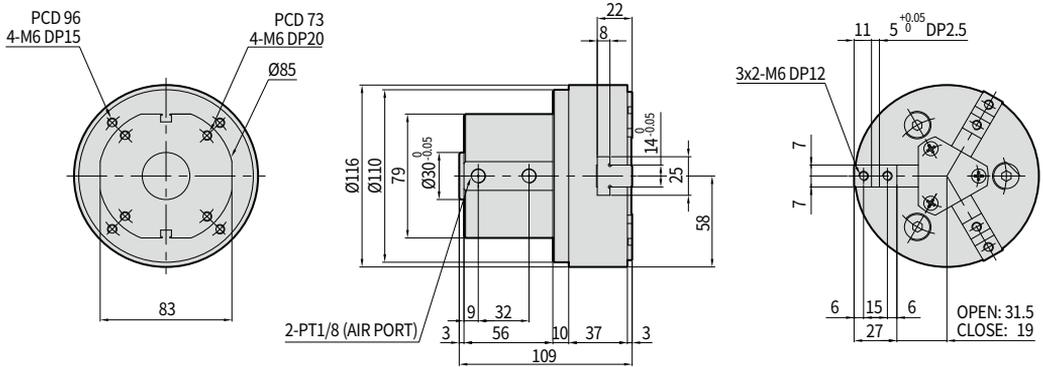
60

80

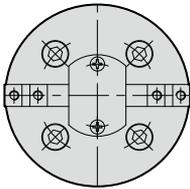
100

125

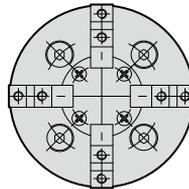
PH02-60



B-TYPE

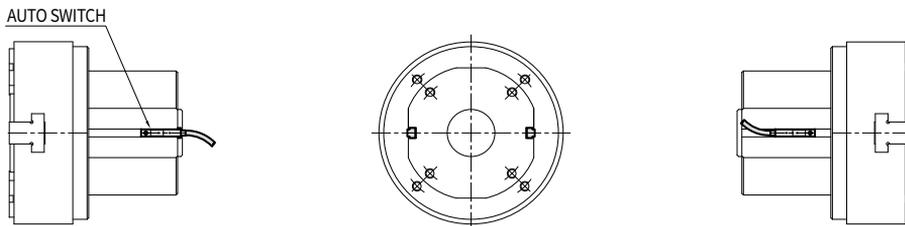


A-TYPE



C-TYPE

PH02-60 Example of Auto Switch installation



16

20

25

30

40

50

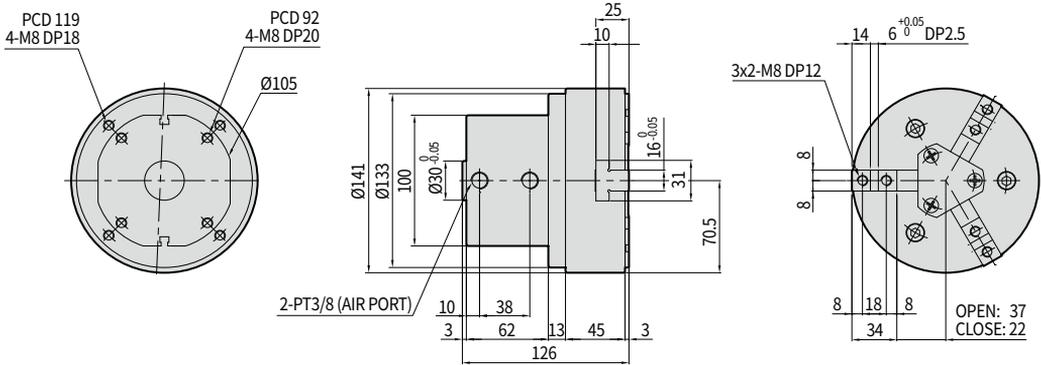
60

80

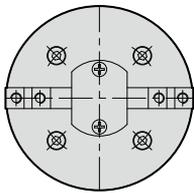
100

125

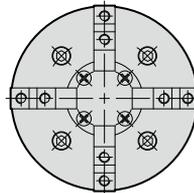
PH02-80



B-TYPE

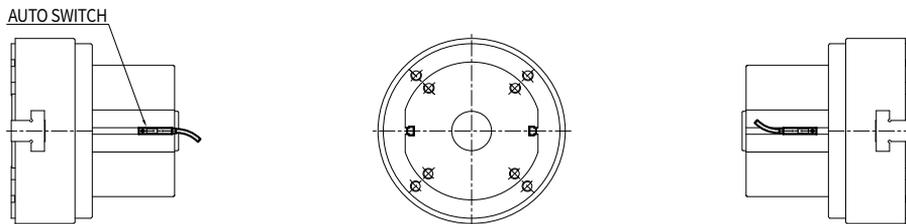


A-TYPE



C-TYPE

PH02-80 Example of Auto Switch installation



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02**
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH02 Series

16

20

25

30

40

50

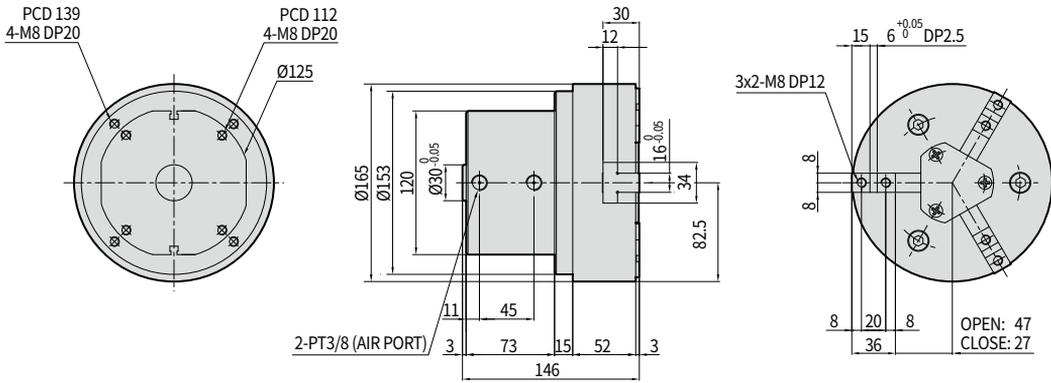
60

80

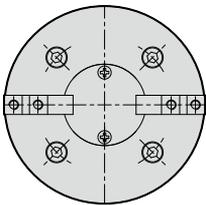
100

125

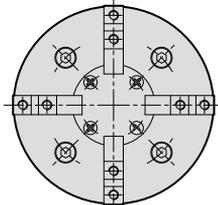
PH02-100



B-TYPE

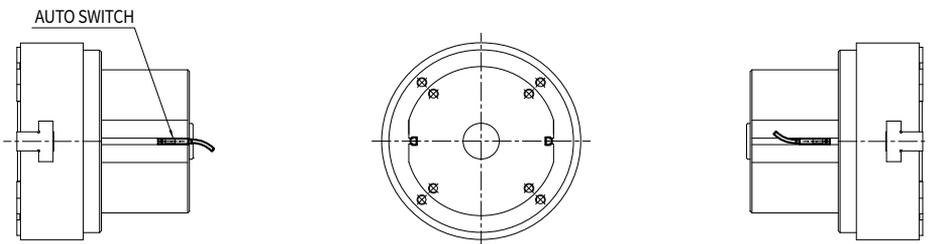


A-TYPE

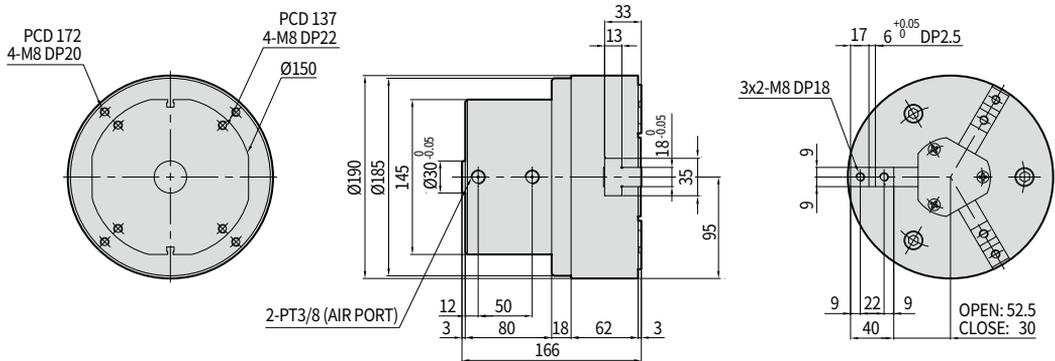


C-TYPE

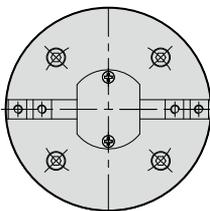
PH02-100 Example of Auto Switch installation



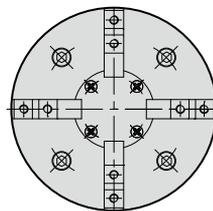
PH02-125



B-TYPE

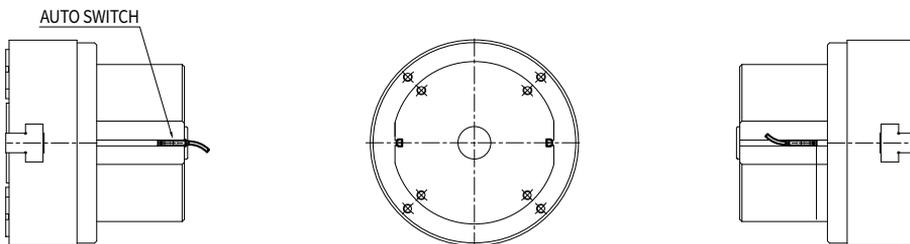


A-TYPE



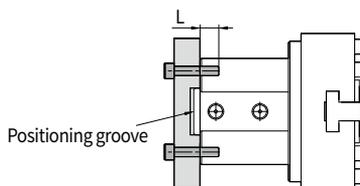
C-TYPE

PH02-125 Example of Auto Switch installation



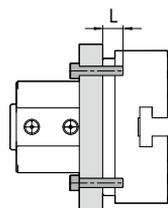
- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02**
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

1. Installation by body tap holes



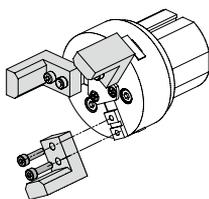
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH02-16	M4×P0.7	25	10
PH02-20	M4×P0.7	25	12
PH02-25	M5×P0.8	51	12
PH02-30	M5×P0.8	51	15
PH02-40	M6×P1	81	16
PH02-50	M6×P1	81	15
PH02-60	M6×P1	81	20
PH02-80	M8×P1.25	157	20
PH02-100	M8×P1.25	157	20
PH02-125	M8×P1.25	157	22

2. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH02-16		Not usable	
PH02-20		Not usable	
PH02-25		Not usable	
PH02-30		Not usable	
PH02-40	M6×P1	81	10
PH02-50	M6×P1	81	13
PH02-60	M6×P1	81	15
PH02-80	M8×P1.25	157	18
PH02-100	M8×P1.25	157	20
PH02-125	M8×P1.25	157	20

3. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH02-16	M3×P0.5	11	6
PH02-20	M3×P0.5	11	6
PH02-25	M4×P0.7	25	8
PH02-30	M4×P0.7	25	10
PH02-40	M6×P1	81	12
PH02-50	M6×P1	81	12
PH02-60	M6×P1	81	12
PH02-80	M8×P1.25	157	12
PH02-100	M8×P1.25	157	12
PH02-125	M8×P1.25	157	18

MEMO

Handwriting practice area with horizontal dotted lines.

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

GENERAL HAND / Parallel Operation

PH02-H Series

Features

- Circular General Hand of Parallel operation by Crank Lever.
- Hollow hole, based on PH02 series models, makes easy combination with other components.
- Auto Switch installation. (Optional)



Order Form

PH02 - 40H - A1 L S

①

②

③

④

⑤

① Series Name

② Cylinder Bore Size and Stroke

Order	CYL Bore(mm)	Stroke(mm)
30H	30	12
40H	40	16
50H	50	20

③ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
Blank		No Auto Switch provided							
A1	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
B1	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms

④ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

⑤ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

Specification

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

Item Name		PH02-30H	PH02-40H	PH02-50H
CYL Bore Size(mm)		30	40	50
Stroke(mm)		12	16	20
Effective Gripping Force(kgf)	Close	29	54	83.5
	Open	34	65	99.5
Fitting Size		PT1/8		
Weight(kgf)		0.6	1.2	1.7
Max. Attachment L(mm)		35	40	50
Max. Attachment H(mm)	Note 4)			
Fluid		Clean Air Note 1)		
Pressure Range(kgf/cm ²)		3 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)		
Lubrication		Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)		
Temperature Range(°C)		5 ~ 60		
Repeat Accuracy(mm)		±0.05	±0.08	
Max. Cycle Per Minute(C.P.M)		100	70	
Operation Type		Double Acting (Structure : Parallel Operation by Crank Lever) (Guide : Metal Guide)		
Tolerance of Stroke(mm)		Open : -0.5 ~ +1		
		Close : -1 ~ +0.5		

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

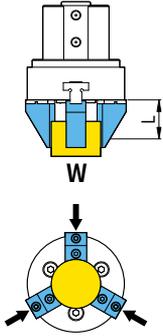
Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Note 4) For Max. Attachment L and H, please refer <GENERAL HAND Model Selection Guide>. (it is permitted length for 5kgf/cm² pressure applied)

Gripping Force Graph (Close)

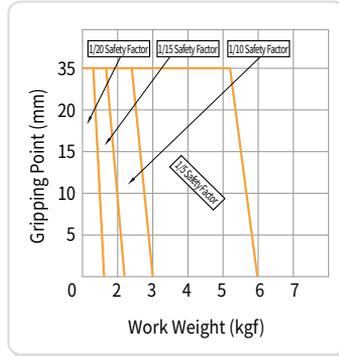
► Refer <GENERAL HAND Selection Guide> for how to read below graph.



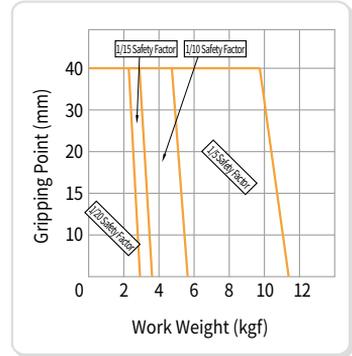
Close Grip State

W: Work Weight
L: Attachment Length

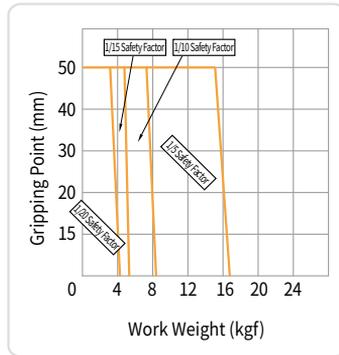
► PH02-30H



► PH02-40H



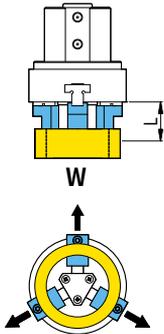
► PH02-40H



▲ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

Gripping Force Graph (Open)

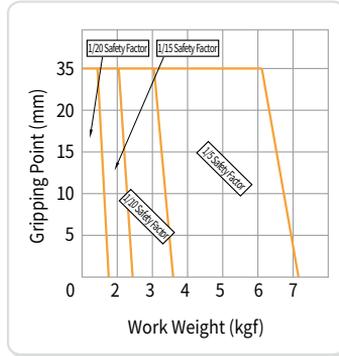
▶ Refer <GENERAL HAND Selection Guide> for how to read below graph.



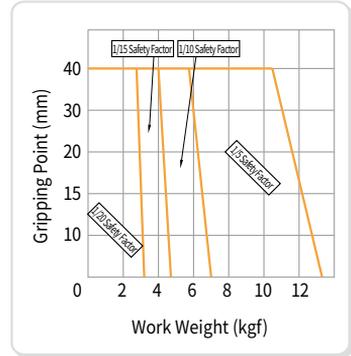
Open Grip State

W: Work Weight
L: Attachment Length

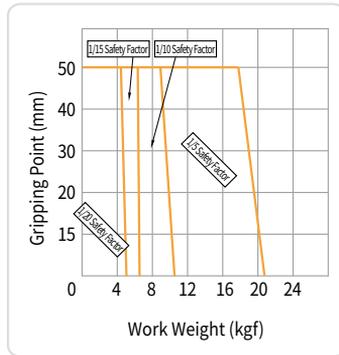
▶ PH02-30H



▶ PH02-40H



▶ PH02-50H



HAND

- PH01-A
- PH01-D
- PH01-G
- PH01-J-C
- PH01K
- PH02
- PH02-H**
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

⚠ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it within the maximum attachment length which specified.

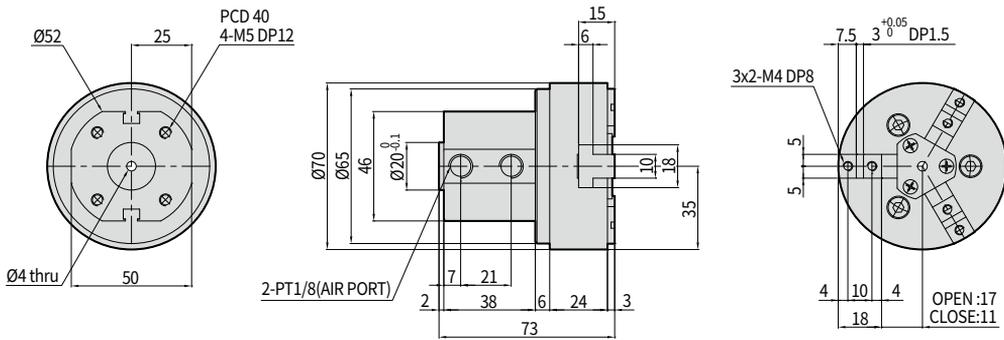
PH02-H Series

30H

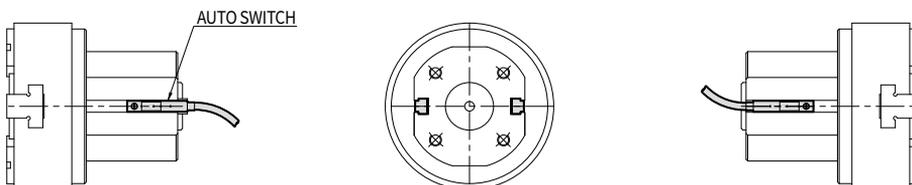
40H

50H

PH02-30H



PH02-30H Example of Auto Switch installation



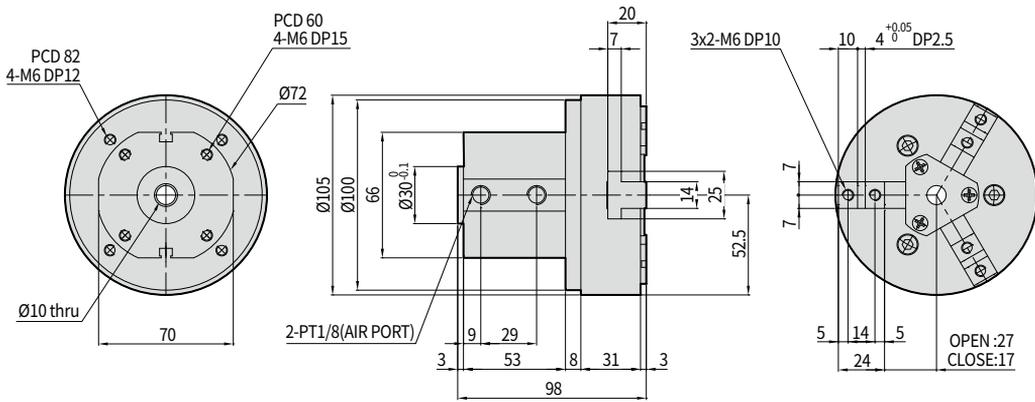
PH02-H Series

30H

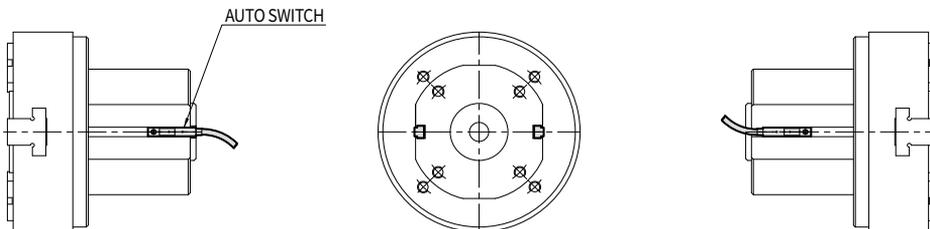
40H

50H

PH02-50H



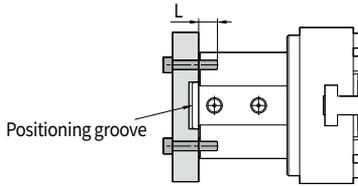
PH02-50H Example of Auto Switch installation



Installation Information

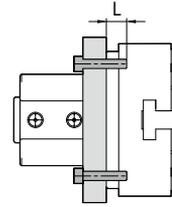
- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H**
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

1. Installation by body tap holes



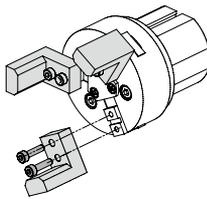
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH02-30H	M5×P0.8	51	15
PH02-40H	M6×P1	81	16
PH02-50H	M6×P1	81	15

2. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH02-30H		Not usable	
PH02-40H	M6×P1	81	13
PH02-50H	M6×P1	81	15

3. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH02-30H	M4×P0.7	25	10
PH02-40H	M6×P1	81	12
PH02-50H	M6×P1	81	12

GENERAL HAND / Parallel Operation

PH04 Series

Features

- Parallel operation by Crank Lever.
- High precise cross roller guide application.
- Suitable for small and light components handling.
- High durability from high solidity and precise structure.
- Various installation options.
- Auto Switch installation. (Optional)



Order Form

PH04 - 16 - A2 L S

① ② ③ ④ ⑤

① Series Name

② Cylinder Bore Size and Stroke

Order	CYL Bore(mm)	Stroke(mm)
12	12	5
16	16	6
20	20	8

③ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
Blank		No Auto Switch provided							
A2	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2C	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2V	Magnetic reed switch	2-Wire	Ver	100V	24V	5~20mA	5~40mA	IP 67	1ms
B2	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2B	Magnetic solid state	2-Wire	Horiz	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3B	Magnetic solid state	2-Wire	Ver	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3C	Magnetic solid state	3-Wire	Ver	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms

* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

④ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

⑤ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

Specification

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04**
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

Item Name		PH04-12	PH04-16	PH04-20
CYL Bore Size(mm)		12	16	20
Stroke(mm)		5	6	8
Effective Gripping Force(kgf)	Close	2.1	6.1	9.4
	Open	3.2	7.2	11.2
Fitting Size			M5	
Weight(kgf)		0.09	0.15	0.2
Max. Attachment L(mm)		30	40	50
Max. Attachment H(mm)	Note 4)	12	15	25
Fluid		Clean Air Note 1)		
Pressure Range(kgf/cm ²)		1.5 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)		
Lubrication		Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)		
Temperature Range(°C)		5 ~ 60		
Repeat Accuracy(mm)		±0.01		
Max. Cycle Per Minute(C.P.M)		140		
Operation Type		Double Acting (Structure : Parallel Operation by Crank Lever) (Guide : Cross Roller Bearing Guide)		
Tolerance of Stroke(mm)		Open : -0.5 ~ +1 Close : -1 ~ +0.5		

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

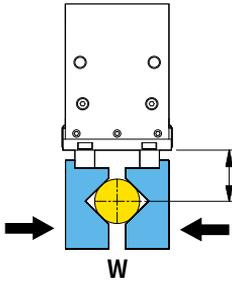
Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Note 4) For Max. Attachment L and H, please refer <GENERAL HAND Model Selection Guide>. (it is permitted length for 5kgf/cm² pressure applied)

Gripping Force Graph (Close)

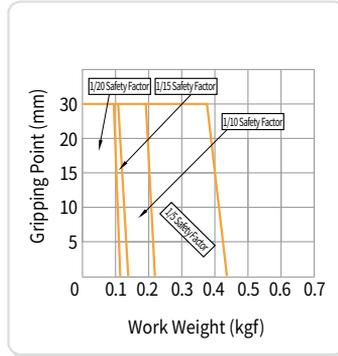
▶ Refer <GENERAL HAND Selection Guide> for how to read below graph.



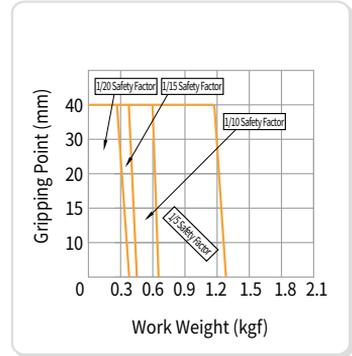
Close Grip State

W: Work Weight
L: Attachment Length

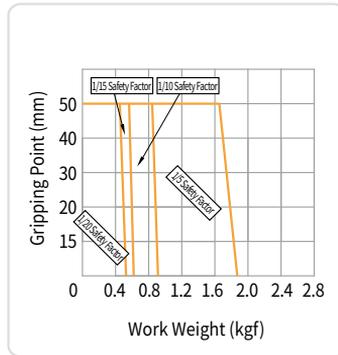
▶ PH04-12



▶ PH04-16



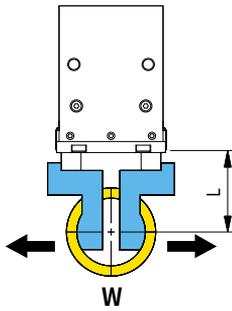
▶ PH04-20



⚠ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

Gripping Force Graph (Open)

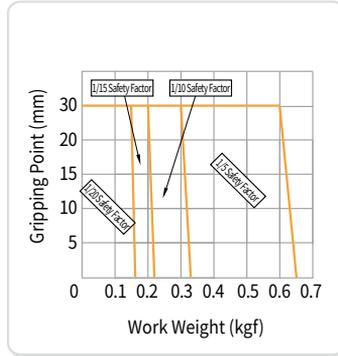
► Refer <GENERAL HAND Selection Guide> for how to read below graph.



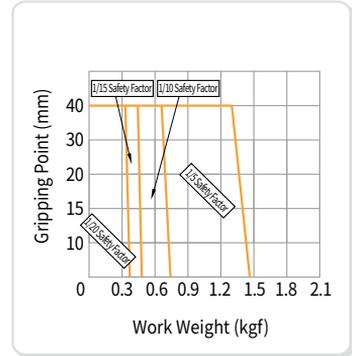
Open Grip State

W: Work Weight
L: Attachment Length

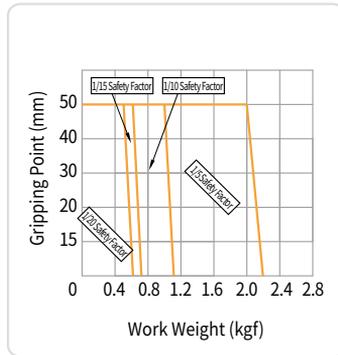
► PH04-12



► PH04-16



► PH04-20



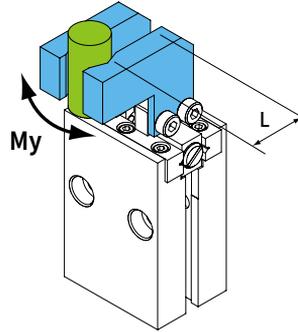
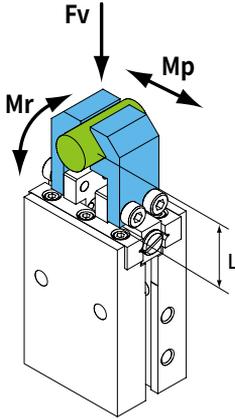
HAND

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04**
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

⚠ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it within the maximum attachment length which specified.

Check of Allowable Moment and Weight

- ※ L : Distance between the center of guide and gripping point of work.
- ※ The moment center equals with guide center.



Item	Allowable Weight for Vertical Direction. Fv (kgf)	Maximum Allowable Moment (kgf·cm)		
		Pitching moment Mp	Yawing moment My	Rolling moment Mr
PH04-12	9.3	3.3	3.3	7.2
PH04-16	14.8	6.7	6.7	16.4
PH04-20	16	8.1	8.1	21.2

※ Above listed allowable moment and weight refer static values.

Calculation of allowable weight for moment weight applied.

$$\text{Allowable Weight } F \text{ (kgf)} = \frac{\text{Maximum Allowable Moment } M \text{ (kgf·cm)}}{\text{The point of external load applied } L \text{ (cm)}}$$

Example)

Checking of 0.5kgf weight(F) force to pitching moment direction(Mp) at the 20mm attachment point on PH04-12.

$$\Rightarrow \text{Allowable Weight } F \text{ (kgf)} = \frac{\text{Maximum Allowable Moment } M \text{ (kgf·cm)}}{\text{The point of external load applied } L \text{ (cm)}} = \frac{3.3}{2} = 1.65 \text{ kgf} > 0.5 \text{ kgf}$$

The allowable weight(1.65kgf) is bigger than applied weight (0.5kgf), so, it is applicable.

PH04 Series

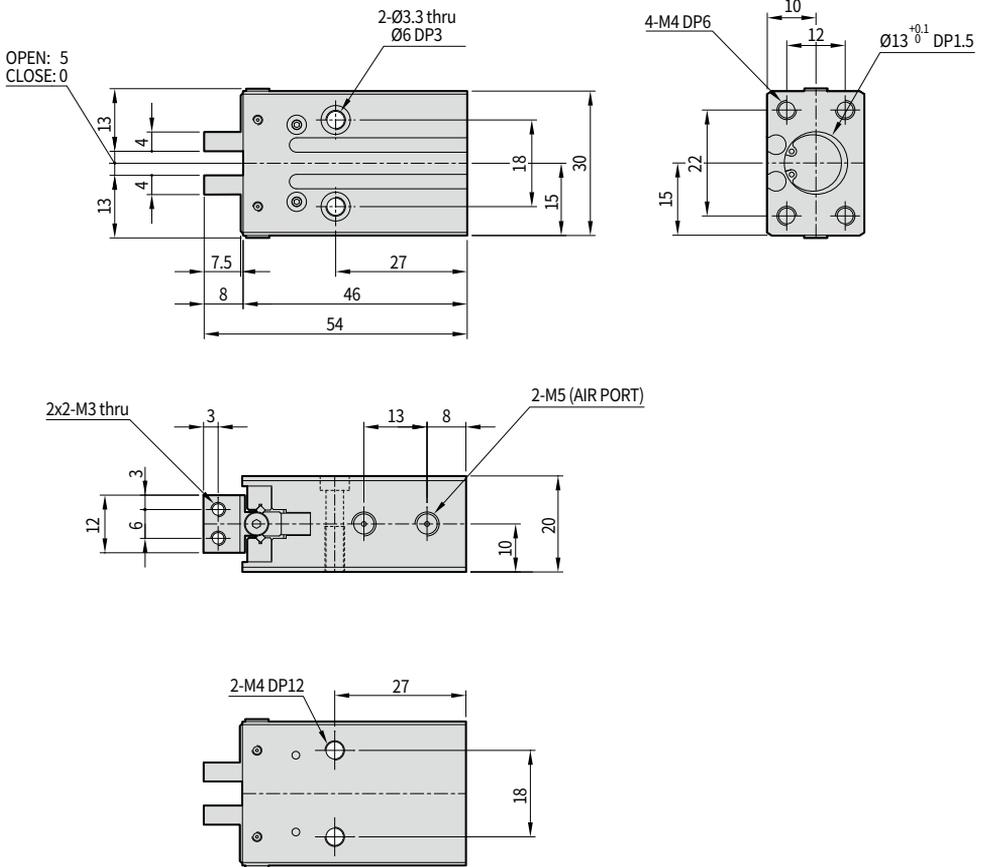
12

16

20

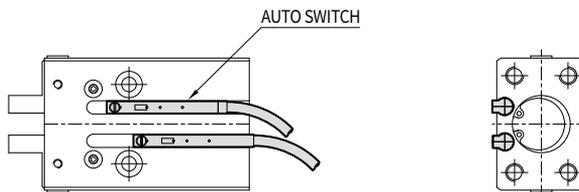
HAND

PH04-12

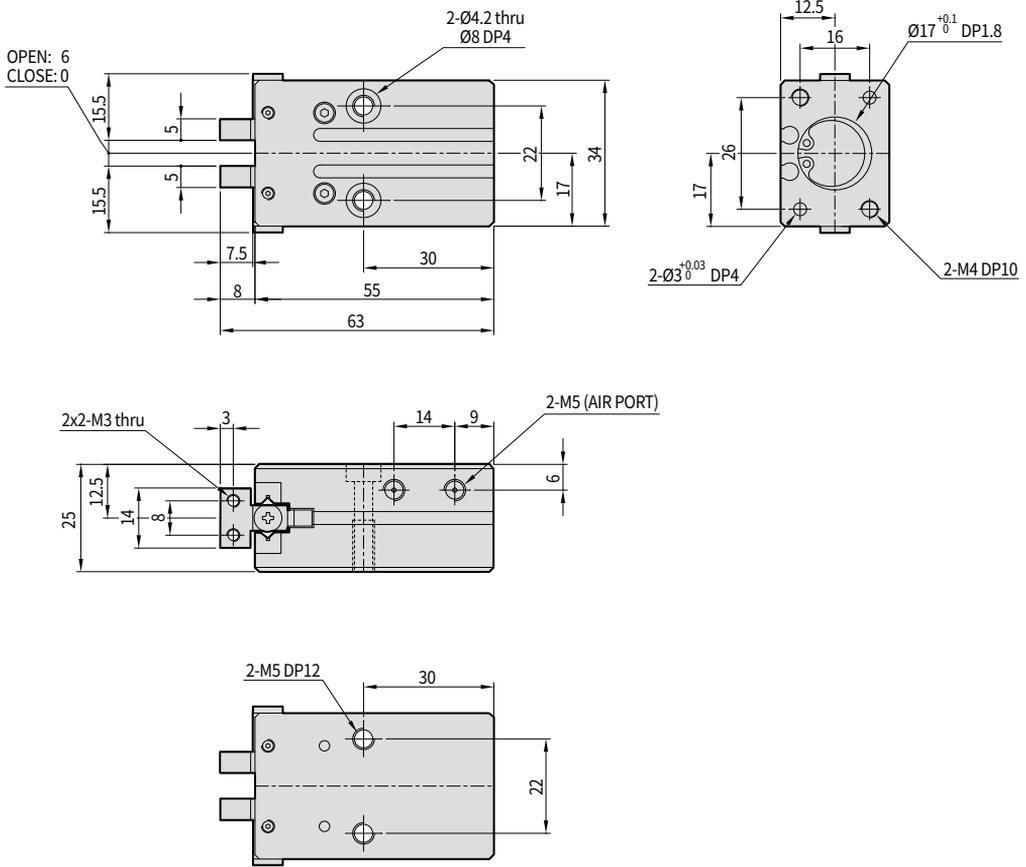


- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04**
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

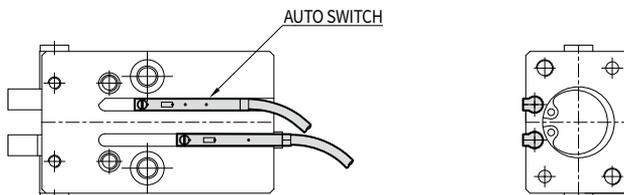
PH04-12 Example of Auto Switch installation



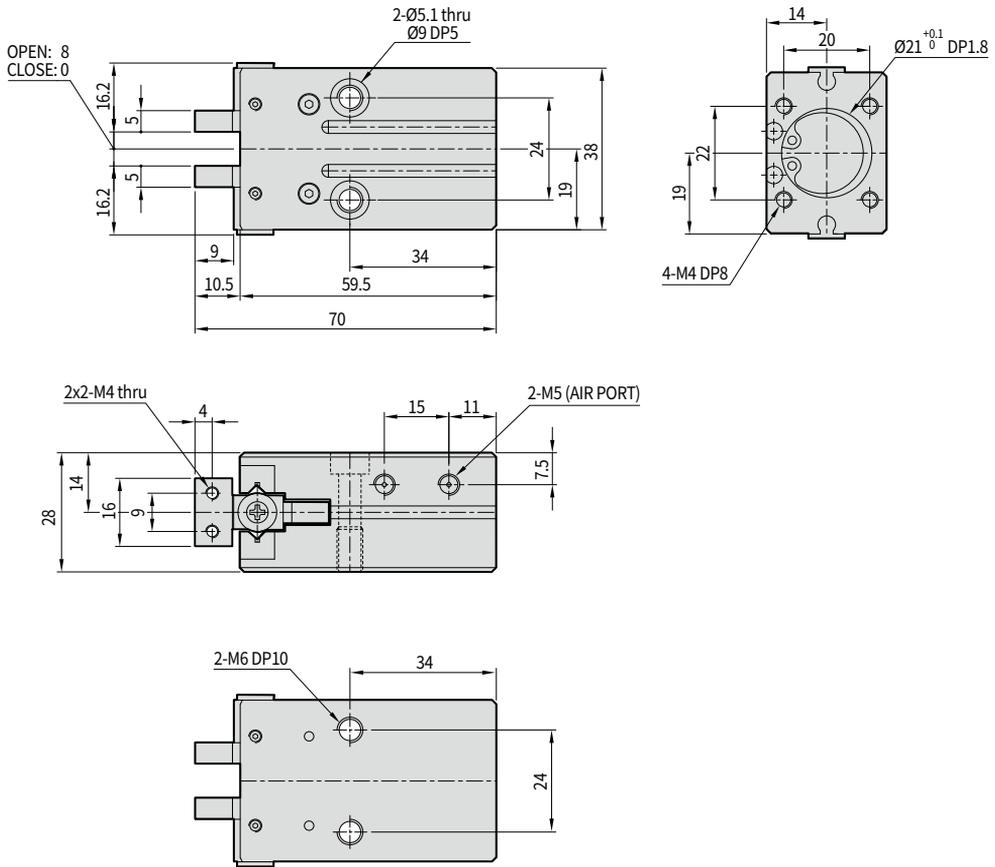
PH04-16



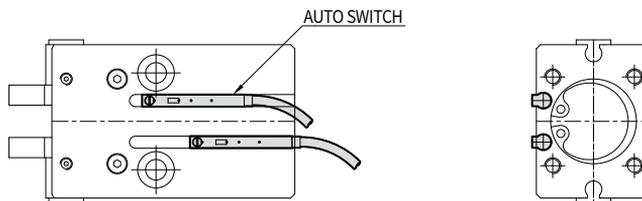
PH04-16 Example of Auto Switch installation



PH04-20



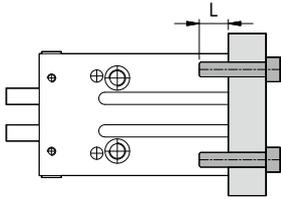
PH04-20 Example of Auto Switch installation



※ For side auto switch slot usage, please contact to office.

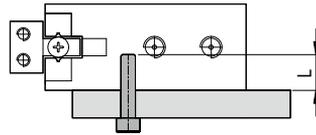
- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04**
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

1. Installation by body tap holes



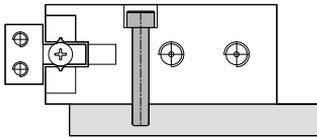
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH04-12	M4×P0.7	25	6
PH04-16	M4×P0.7	25	10
PH04-20	M4×P0.7	25	12

2. Installation by body tap holes



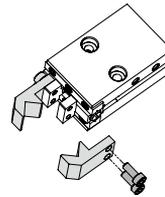
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH04-12	M4×P0.7	25	6
PH04-16	M5×P0.8	51	8
PH04-20	M6×P1	81	10

3. Installation by body through holes



Item	Fastening Bolt	Max Torque (kgf-cm)
PH04-12	M3×P0.5	11
PH04-16	M4×P0.7	25
PH04-20	M5×P0.8	51

4. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)
PH04-12	M3×P0.5	11
PH04-16	M3×P0.5	11
PH04-20	M4×P0.7	25

MEMO

Handwriting practice area consisting of 25 horizontal dotted lines.

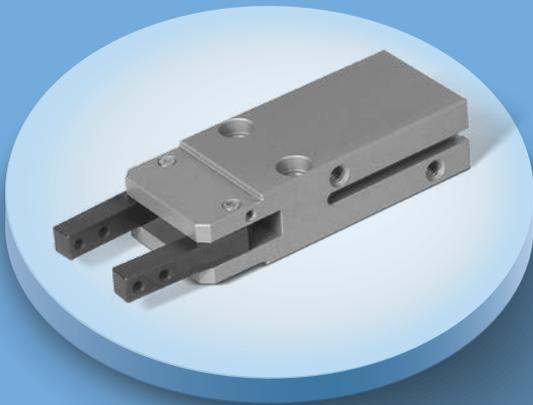
HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

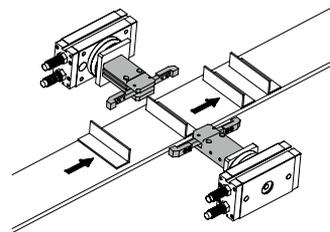
180° angular type
General Hand

PH05 Series

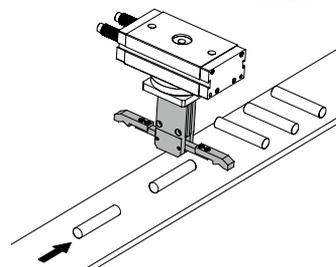
Synchronic operation by
DIRECT CAM structure



Application 1

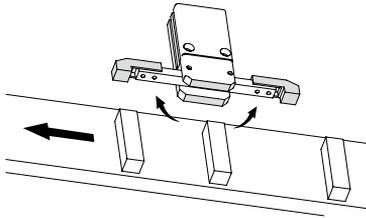


Application 2



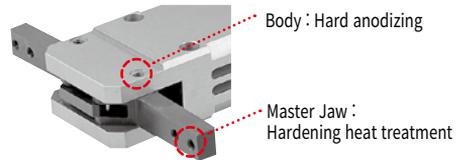
180° angular type General Hand

- Crash and interfere-less working between master jaw and workpiece due to 180° operation.



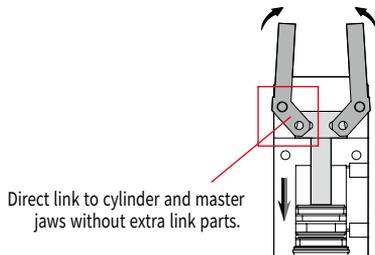
Frictional surface reinforced treatment for wear-resistance

- Improved durability by wear-resistance treatment on master jaw and body.



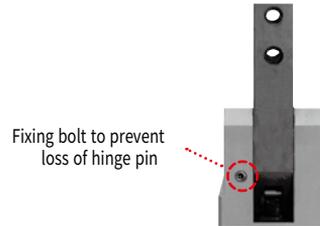
DIRECT CAM Structure

- Smooth motion and improved durability by Direct CAM structure which links cylinder and master jaws directly.



Fixing bolt for hinge pin

- Application of fixing bolt to prevent loosen of hinge pin even under frequent motion.



Auto Switch installation (Optional)

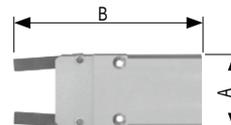
- Seated internally without projection.



Large product line up from small to heavy size

Name	Gripping Force (kgf) Air pressure : 5kgf/cm ²	Size(mm)		Weight (kgf)
		Length (B)	Width (A)	
PH05-16	2.1	98	32	0.15
PH05-20	3.4	118	44	0.3
PH05-30	8.4	140	56	0.65
PH05-40	15	165	68	1.16
PH05-50	25.7	192	92	2.1
PH05-80	83	240	124	4.5

※ Gripping force at the end of master jaw.



GENERAL HAND / Angular Operation

PH05 Series

Features

- Angular operation by Direct CAM.
- Smooth motion and improved durability by Direct CAM structure.
- Minimized interrupt to workpiece with 180° angular operation.
- Excellent durability by wear-resistance treatment at the frictional surface.
- Auto Switch installation. (Optional)



Order Form

PH05 - 30 - E - A1 L S

① ② ③ ④ ⑤ ⑥

① Series Name

② Cylinder Bore Size and Stroke

④ Available Auto Switches

Order	CYL Bore(mm)	Stroke(°)	Order						
			A1	A2	A2C	B1	B2	B2B	
16	16	-5 ~ 180		○	○		○		○
20	20	-5 ~ 180	○			○			
30	30	-5 ~ 180	○			○			
40	40	-5 ~ 180	○			○			
50	50	-5 ~ 180	○			○			
80	80	-5 ~ 180	○			○			

※ For "Blank", no Auto Switch is provided.

③ Special Option

Order	Special Option
Blank	Standard
E	Secondary battery field

⑤ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

⑥ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

※ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
A1	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2C	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
B1	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2B	Magnetic solid state	2-Wire	Horiz	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms

Specification

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

Item Name	PH05-16	PH05-20	PH05-30	PH05-40	PH05-50	PH05-80	
CYL Bore Size(mm)	16	20	30	40	50	80	
Stroke(°)	-5 ~ 180						
Effective Gripping Force(kgf) Air pressure : 5kgf/cm ² Note 3)	Close	2.1	3.4	8.4	15	25.7	83
Fitting Size		M5		PT1/8		PT3/8	
Weight(kgf)	0.15	0.3	0.65	1.16	2.1	4.5	
Max. Attachment L(mm) Note 4)	50	80	95	120	140	170	
Fluid	Clean Air Note 1)						
Pressure Range(kgf/cm ²)	3 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)						
Lubrication	Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)						
Temperature Range(°C)	5 ~ 60						
Repeat Accuracy(°)	±0.1						
Max. Cycle Per Minute(C.P.M)	60						
Operation Type	Double Acting (Structure : Angular operation by Direct CAM) (Guide : Metal Guide)						
Tolerance of Stroke(°)	Open : -2 ~ +5 Close : -5 ~ +2 (For single side master jaw)						

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3~10µm degree of filtering.

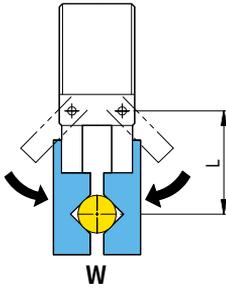
Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Note 4) For Max. Attachment L and H, please refer <GENERAL HAND Model Selection Guide>. (it is permitted length for 5kgf/cm² pressure applied)

Gripping Force Graph (Close)

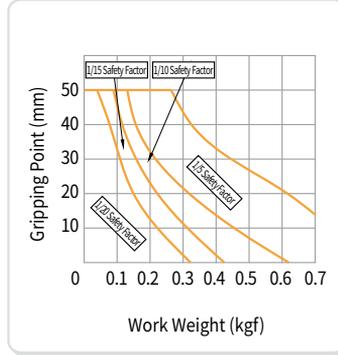
► Refer <GENERAL HAND Selection Guide> for how to read below graph.



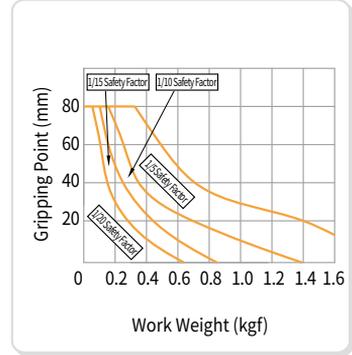
Close Grip State

W: Work Weight
L: Attachment Length

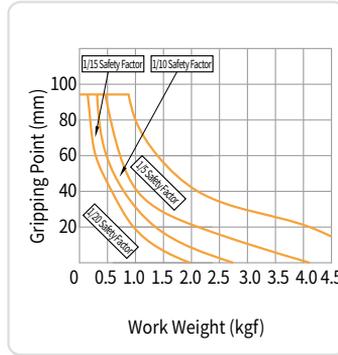
► PH05-16



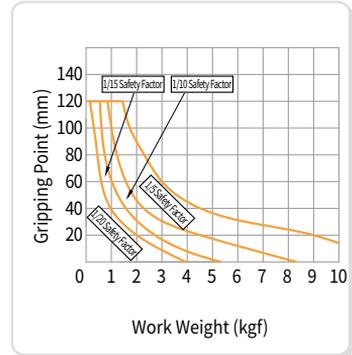
► PH05-20



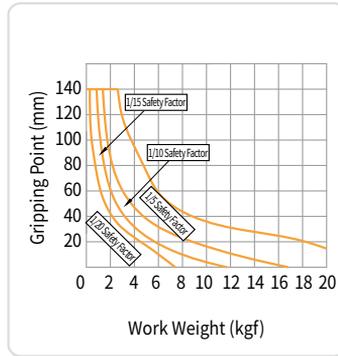
► PH05-30



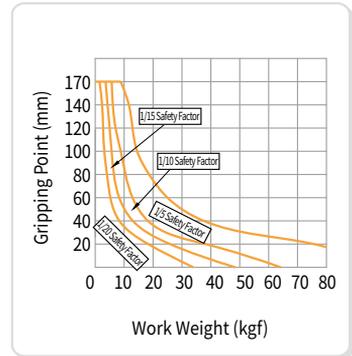
► PH05-40



► PH05-50



► PH05-80



▲ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

PH05 Series

16

20

30

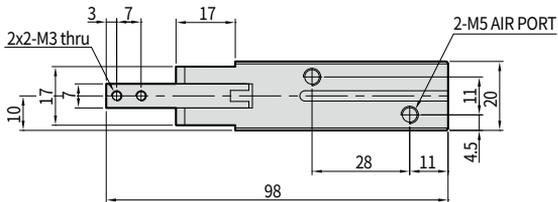
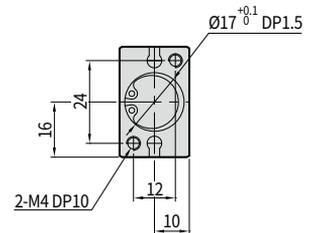
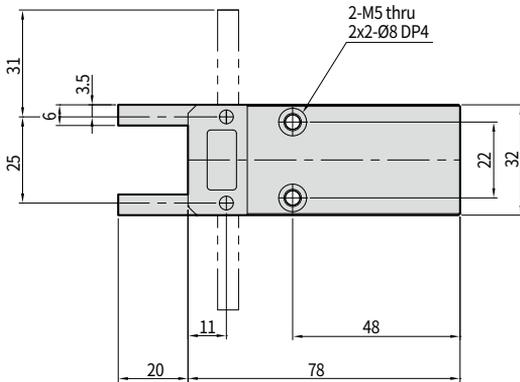
40

50

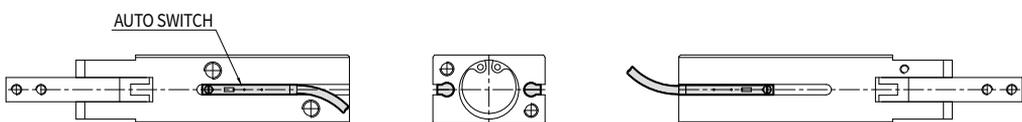
80

HAND

PH05-16



PH05-16 Example of Auto Switch installation



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05**
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH05 Series

16

20

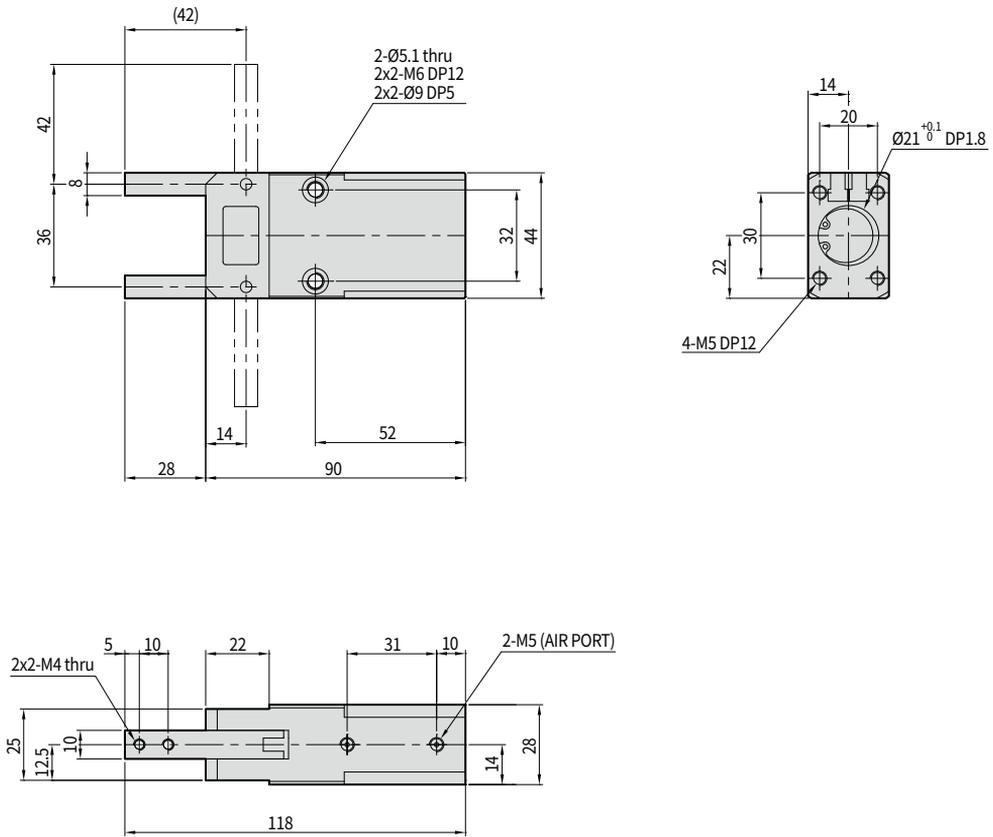
30

40

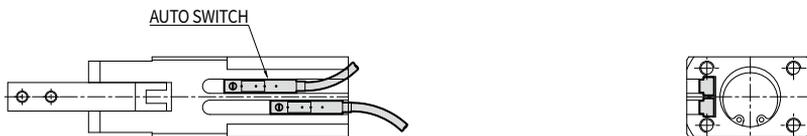
50

80

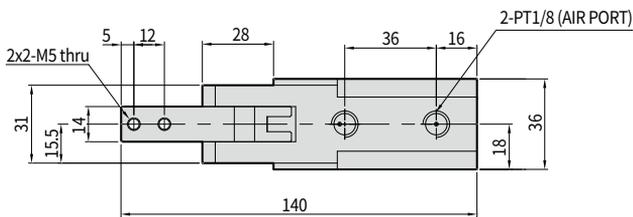
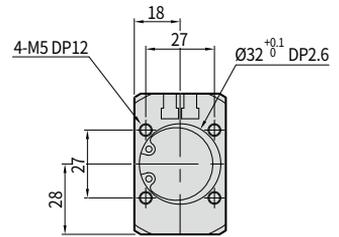
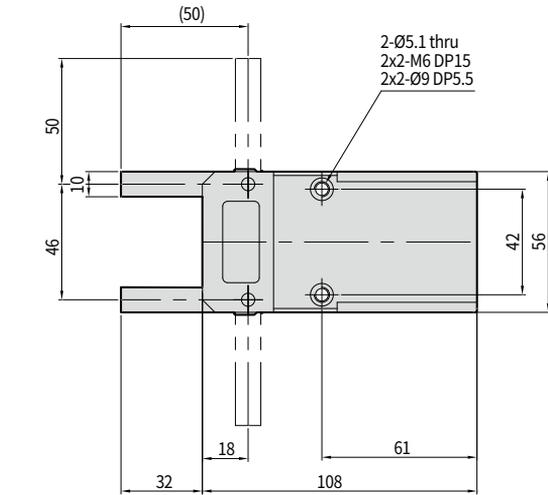
PH05-20



PH05-20 Example of Auto Switch installation

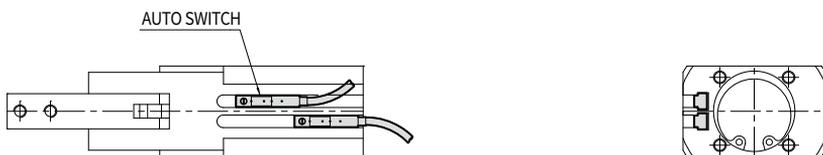


PH05-30



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05**
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH05-30 Example of Auto Switch installation



PH05 Series

16

20

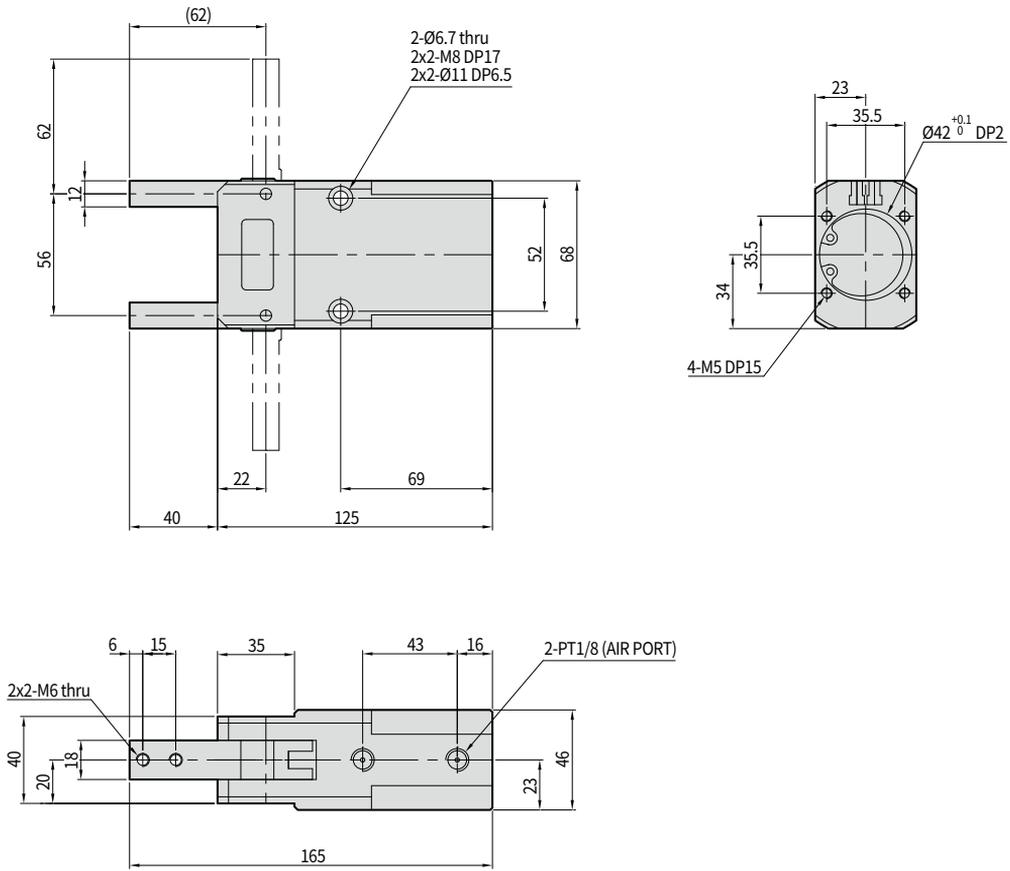
30

40

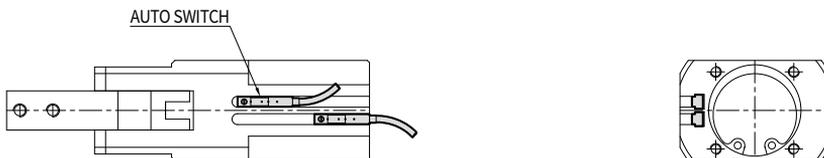
50

80

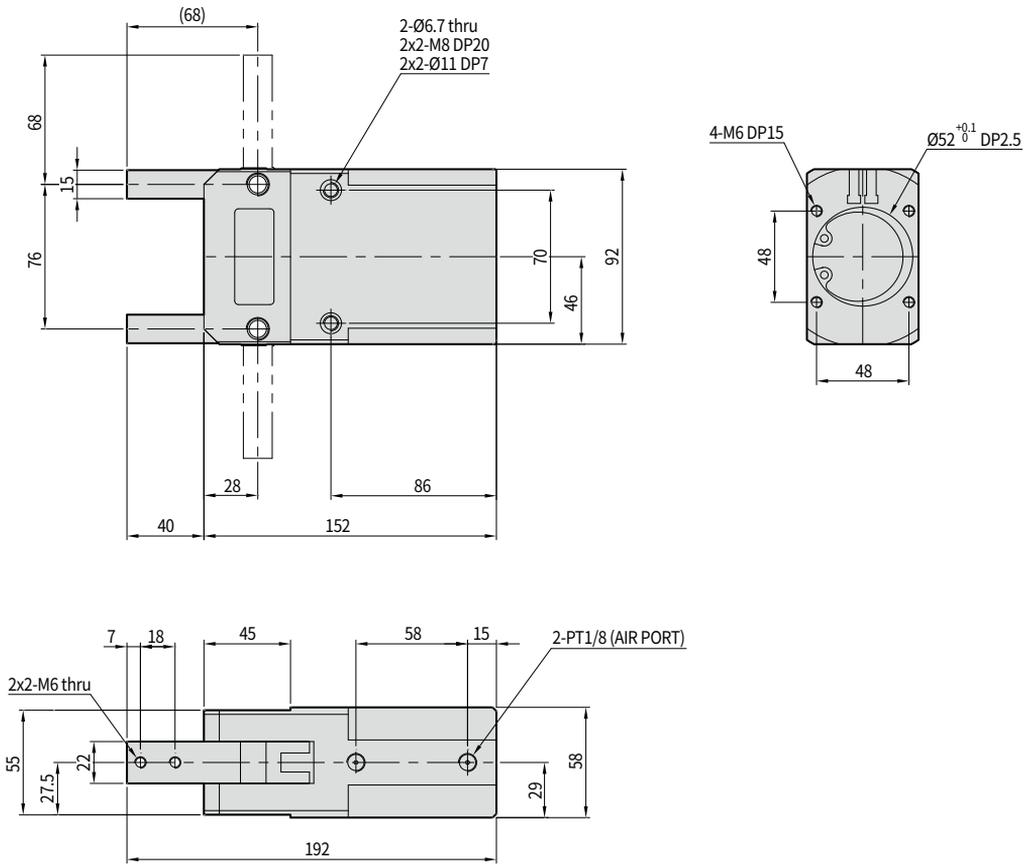
PH05-40



PH05-40 Example of Auto Switch installation



PH05-50



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05**
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH05-50 Example of Auto Switch installation



PH05 Series

16

20

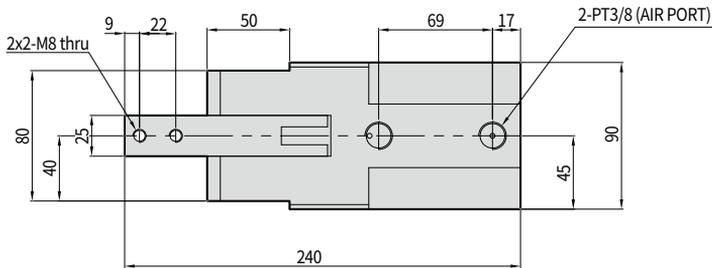
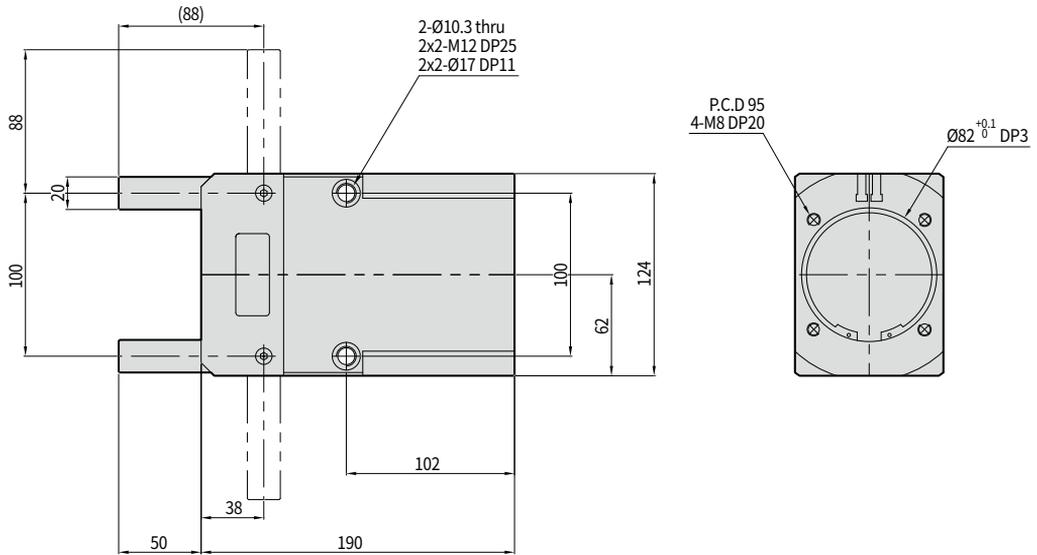
30

40

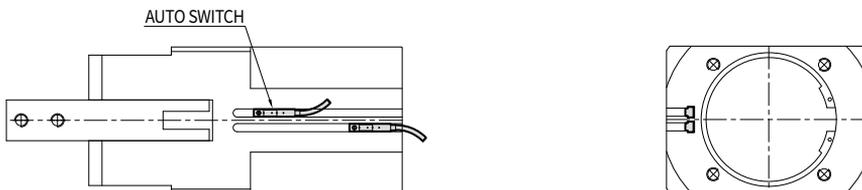
50

80

PH05-80



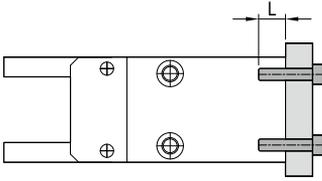
PH05-80 Example of Auto Switch installation



Installation Information

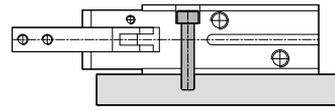
- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05**
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

1. Installation by body tap holes



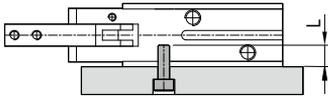
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH05-16	M4×P0.7	25	10
PH05-20	M5×P0.8	51	12
PH05-30	M5×P0.8	51	12
PH05-40	M5×P0.8	51	15
PH05-50	M6×P1	81	15
PH05-80	M8×P1.25	157	20

2. Installation by body through holes



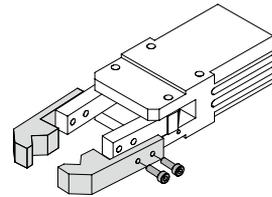
Item	Fastening Bolt	Max Torque (kgf-cm)
PH05-16	M4×P0.7	25
PH05-20	M5×P0.8	51
PH05-30	M5×P0.8	51
PH05-40	M6×P1	81
PH05-50	M6×P1	81
PH05-80	M10×P1.5	240

3. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH05-16	M5×P0.8	51	10
PH05-20	M6×P1	81	12
PH05-30	M6×P1	81	14
PH05-40	M8×P1.25	157	20
PH05-50	M8×P1.25	157	23
PH05-80	M12×P1.75	670	35

4. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)
PH05-16	M3×P0.5	11
PH05-20	M4×P0.7	25
PH05-30	M5×P0.8	51
PH05-40	M6×P1	81
PH05-50	M6×P1	81
PH05-80	M8×P1.25	157

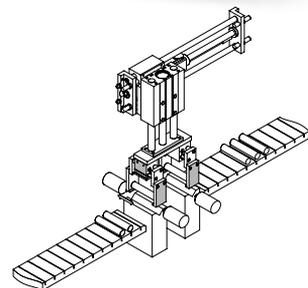
Wide parallel type
General Hand

PH06 Series

High gripping force from double
cylinders
High solidity structure

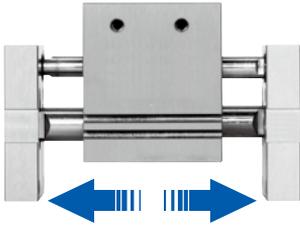


Application



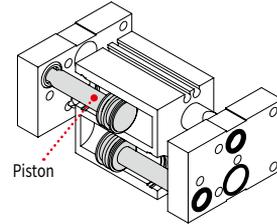
Widen parallel operation

- Suitable for middle to large workpiece handling.



Double piston inside

- Synchronous operation by Yoke(PH06), Rack & Pinion (PH06-L, PH06-L2) structure.
- High gripping force from double cylinders.



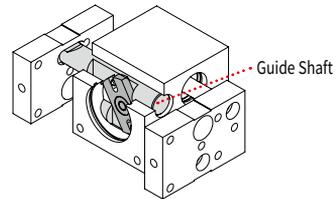
About 1.7 times increased gripping force than single cylinder type!

3 Types of stroke configuration

Model	Stroke					
	Ø10	Ø12	Ø16	Ø20	Ø30	Ø40
Short / PH06 	10	20	30	40	60	100
Middle / PH06-L 	10	20	30	90	120	-
NEW Long / PH06-L2 	40	60	80	100	160	-

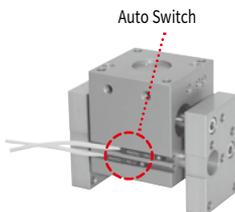
High solidity structure with Sliding Guide inside

- Improved tolerable moment to external load by whole guide shaft supporting structure.



Auto Switch installation (Optional)

- Seated internally without projection.



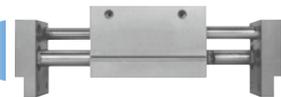
* Auto Switch for PH06-10, please contact to us.

Various sizes and stroke models

- Model Type : PH06, PH06-L, PH06-L2
- CYL Bore : Ø10, Ø12, Ø16, Ø20, Ø30, Ø40
※ Ø40 model is only for PH06 series.

Small Type

Long Stroke Type



PH06-10

PH06-30L2

GENERAL HAND / Parallel Operation

PH06 Series

Features

- Parallel operation by synchronized of Yoke structure.
- Stable gripping force from double cylinders structure.
- Suitable for handling various size workpiece by long stroke operation from centric of body.
- Auto Switch installation. (Optional)



Order Form

PH06 - 16 - E - A2 L S

① ② ③ ④ ⑤ ⑥

① Series Name

② Cylinder Bore Size and Stroke

Order	CYL Bore(mm)	Stroke(mm)	Order										
			A1	A2	A2C	A2V	B1	B2	B2B	B3B	B3C		
10	10	10											
12	12	20		○	○	○			○	○	○	○	○
16	16	30		○	○	○			○	○	○	○	○
20	20	40	○					○					
30	30	60	○					○					
40	40	100	○					○					

※ For "Blank", no Auto Switch is provided.

④ Available Auto Switches

③ Special Option

Order	Special Option
Blank	Standard
E	Secondary battery field

⑤ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

⑥ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

※ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
A1	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2C	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2V	Magnetic reed switch	2-Wire	Ver	100V	24V	5~20mA	5~40mA	IP 67	1ms
B1	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2B	Magnetic solid state	2-Wire	Horiz	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3B	Magnetic solid state	2-Wire	Ver	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3C	Magnetic solid state	3-Wire	Ver	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms

* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

Specification

HAND

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06**
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

Item Name		PH06-10	PH06-12	PH06-16	PH06-20	PH06-30	PH06-40
CYL Bore Size(mm)		10	12	16	20	30	40
Stroke(mm)		10	20	30	40	60	100
Effective Gripping Force(kgf)	Close	2.9	5.1	9.1	14.2	30.8	57
Air pressure : 5kgf/cm ² Note 3)							
Fitting Size		M5				PT1/8	
Weight(kgf)		0.15	0.28	0.52	1.1	2.85	7.65
Max. Attachment L(mm)	Note 4)	45	60	75	90	130	170
Fluid		Clean Air Note 1)					
Pressure Range(kgf/cm ²)		3 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)					
Lubrication		Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)					
Temperature Range(°C)		5 ~ 60					
Repeat Accuracy(mm)		±0.05					
Max. Cycle Per Minute(C.P.M)		60	60	60	40	30	30
Operation Type		Double Acting (Structure : Parallel operation by Yoke structure) (Guide : Metal Guide)					
Tolerance of Stroke(mm)		Open : -0.5 ~ +1.5 Close : -1.5 ~ +0.5					

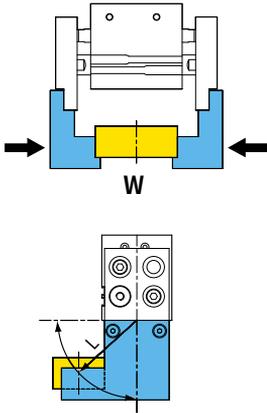
Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3~10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Note 4) For Max. Attachment L and H, please refer <GENERAL HAND Model Selection Guide>. (it is permitted length for 5kgf/cm² pressure applied)

▶ Refer <GENERAL HAND Selection Guide> for how to read below graph.



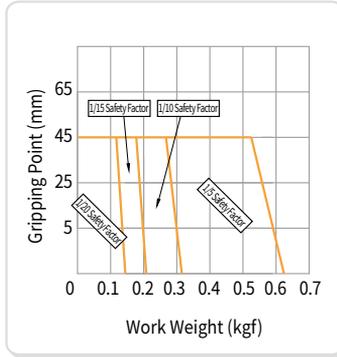
Close Grip State

W: Work Weight
L: Attachment Length

◆ Work weight in the gripping force graph means the maximum workpiece weight based of safety factor (working condition) when attachment mounted on each master jaws contacted the workpiece.

◆ As above picture, when moving at low speed (less than 100mm/sec) hanging and gripping on workpiece without position locating, safety factor on the gripping force graph could be selected as 1/5.

▶ PH06-10



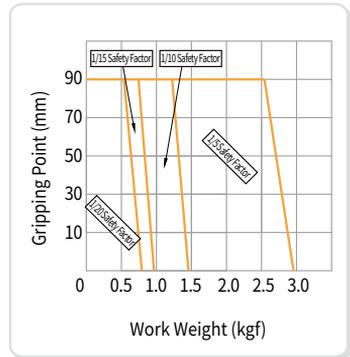
▶ PH06-12



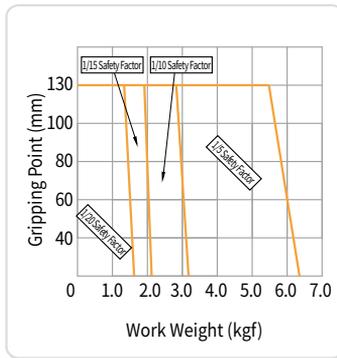
▶ PH06-16



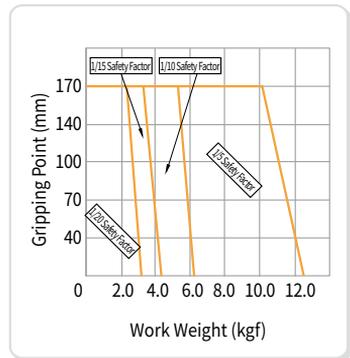
▶ PH06-20



▶ PH06-30



▶ PH06-40



▲ **Caution** If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

PH06 Series

10

12

16

20

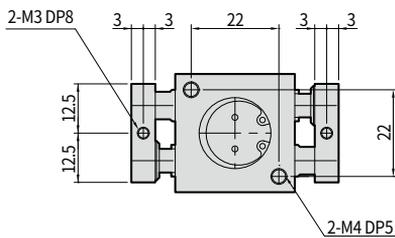
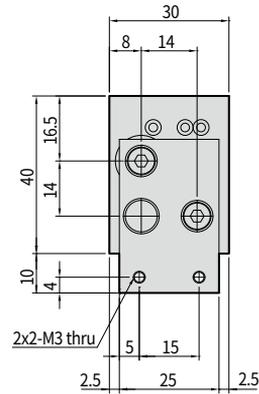
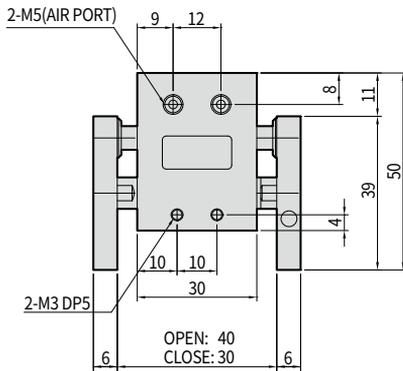
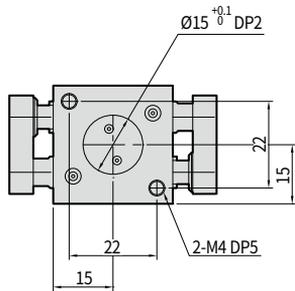
30

40

HAND

PH06-10

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06**
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC



※ For auto switch mounting, please contact to office.

PH06 Series

10

12

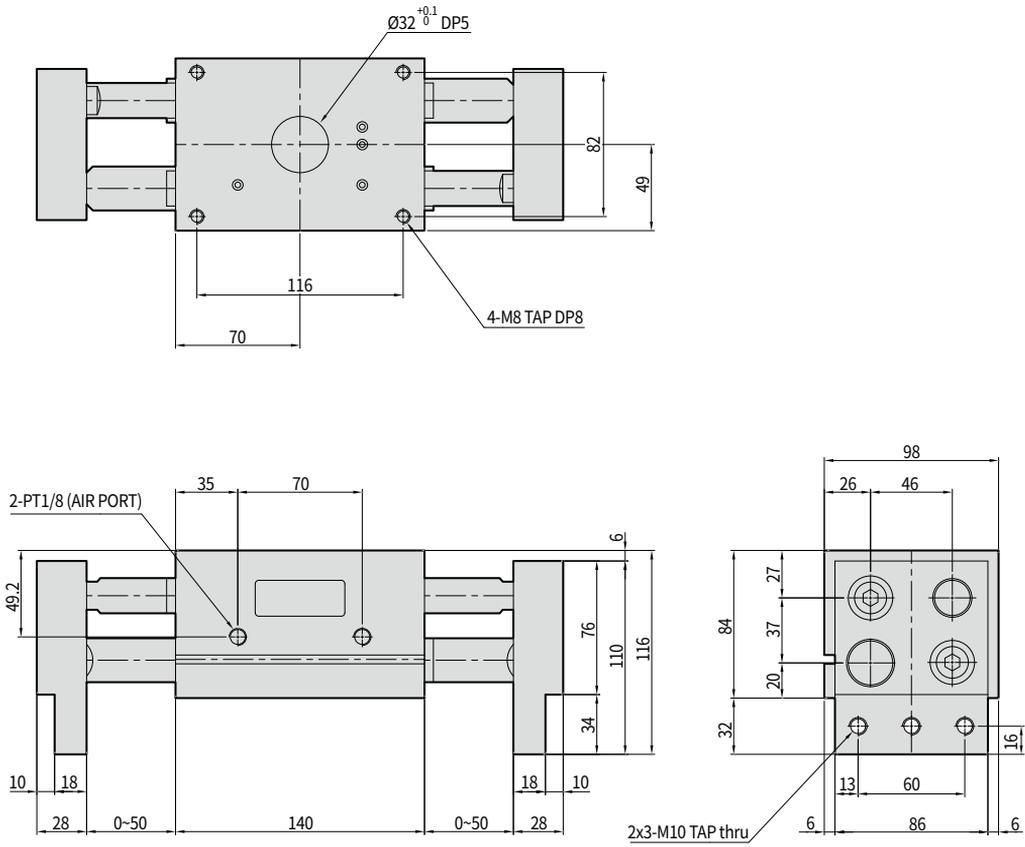
16

20

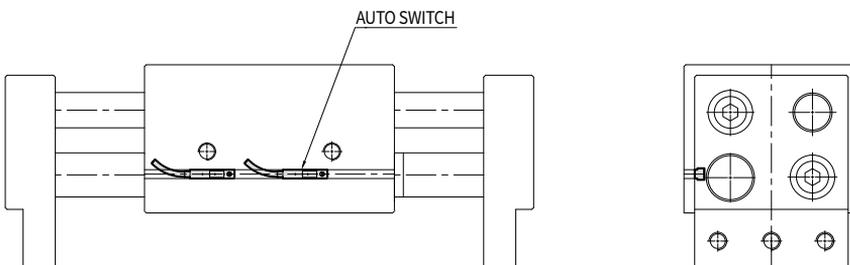
30

40

PH06-40



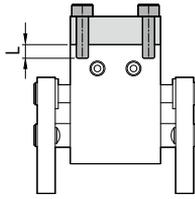
PH06-40 Example of Auto Switch installation



Installation Information

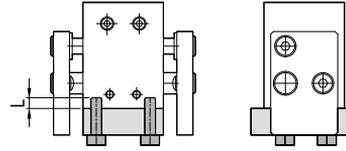
- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06**
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

1. Installation by body tap holes



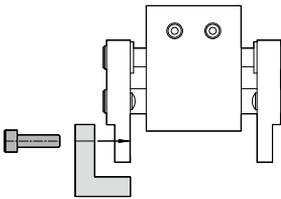
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH06-10	M4×P0.7	25	5
PH06-12	M4×P0.7	25	5
PH06-16	M5×P0.8	51	7
PH06-20	M6×P1	81	8
PH06-30	M8×P1.25	157	9
PH06-40	M8×P1.25	157	13

2. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH06-10	M4×P0.7	25	5
PH06-12	M4×P0.7	25	5
PH06-16	M5×P0.8	51	7
PH06-20	M6×P1	81	8
PH06-30	M8×P1.25	157	9
PH06-40	M12×P1.75	670	35

3. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)
PH06-10	M3×P0.5	11
PH06-12	M4×P0.7	25
PH06-16	M5×P0.8	51
PH06-20	M6×P1	81
PH06-30	M8×P1.25	157
PH06-40	M8×P1.25	157

GENERAL HAND / Parallel Operation

PH06-L Series

Features

- Parallel operation by synchronized of Rack and Pinion structure.
- Extended stroke compare with PH06 series.
- Stable gripping force from double cylinders structure.
- Suitable for handling various size workpiece by long stroke operation from centric of body.
- Auto Switch installation. (Optional)



Order Form

PH06 - 16L - E - A1 L S

① ② ③ ④ ⑤ ⑥

① Series Name

② Cylinder Bore Size and Stroke

④ Available Auto Switches

Order	CYL Bore(mm)	Stroke(mm)	Order											
			A1	A2	A2C	A2V	B1	B2	B2B	B3B	B3C			
10L	10	10	<input type="radio"/>					<input type="radio"/>						
12L	12	20	<input type="radio"/>					<input type="radio"/>						
16L	16	30	<input type="radio"/>					<input type="radio"/>						
20L	20	90		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>					
30L	30	120	<input type="radio"/>					<input type="radio"/>						

※ For "Blank", no Auto Switch is provided.

③ Special Option

Order	Special Option
Blank	Standard
E	Secondary battery field

⑤ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

⑥ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

※ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
A1	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2C	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2V	Magnetic reed switch	2-Wire	Ver	100V	24V	5~20mA	5~40mA	IP 67	1ms
B1	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2B	Magnetic solid state	2-Wire	Horiz	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3B	Magnetic solid state	2-Wire	Ver	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3C	Magnetic solid state	3-Wire	Ver	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms

* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

Specification

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

Item Name	PH06-10L	PH06-12L	PH06-16L	PH06-20L	PH06-30L
CYL Bore Size(mm)	10	12	16	20	30
Stroke(mm)	10	20	30	90	120
Effective Gripping Force(kgf) Air pressure : 5kgf/cm ² Note 3)	2.9	5.1	9.1	14.2	30.8
Fitting Size	M5				PT1/8
Weight(kgf)	0.18	0.3	0.5	1.8	3.7
Max. Attachment L(mm) Note 4)	35	40	60	70	80
Fluid	Clean Air Note 1)				
Pressure Range(kgf/cm ²)	3 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)				
Lubrication	Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)				
Temperature Range(°C)	5 ~ 60				
Repeat Accuracy(mm)	±0.05				
Max. Cycle Per Minute(C.P.M)	60	60	60	30	20
Operation Type	Double Acting (Structure : Parallel operation by Rack and Pinion structure) (Guide : Metal Guide)				
Tolerance of Stroke(mm)	Open : -0.5 ~ +1.5 Close : -1.5 ~ +0.5				

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

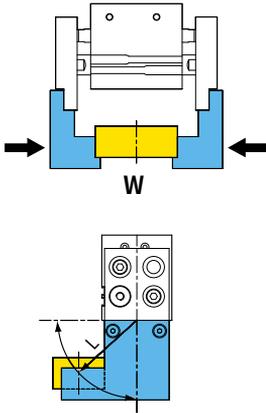
Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Note 4) For Max. Attachment L and H, please refer <GENERAL HAND Model Selection Guide>. (it is permitted length for 5kgf/cm² pressure applied)

Gripping Force Graph (Close)

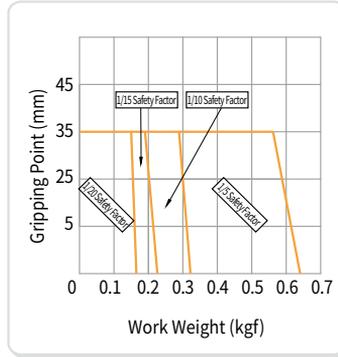
► Refer <GENERAL HAND Selection Guide> for how to read below graph.



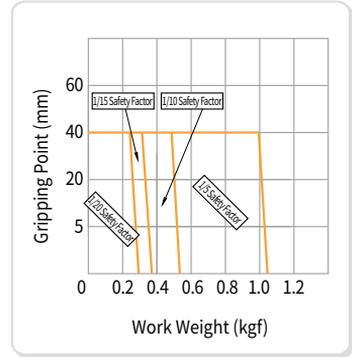
Close Grip State

W: Work Weight
L: Attachment Length

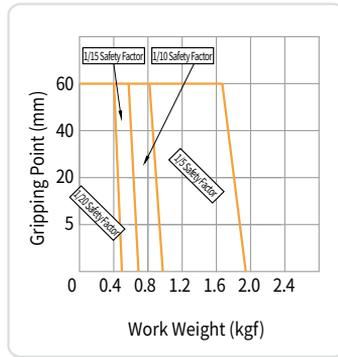
► PH06-10L



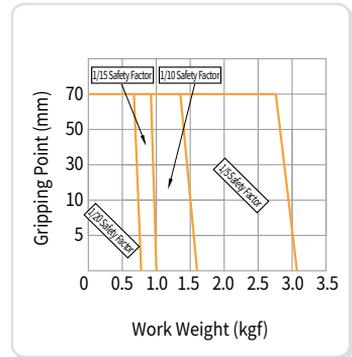
► PH06-12L



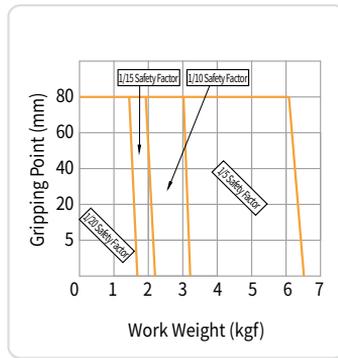
► PH16-16L



► PH06-20L



► PH06-30L



⚠ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

PH06-L Series

10L

12L

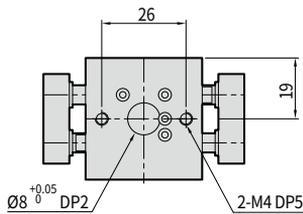
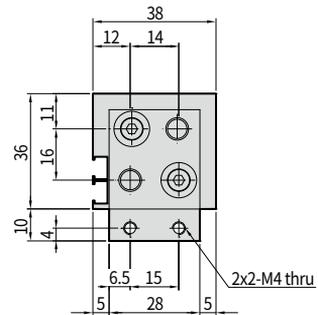
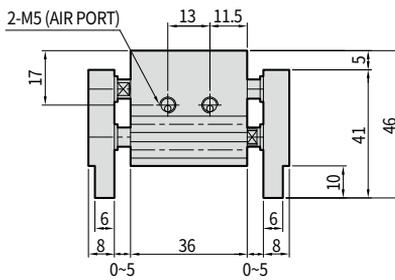
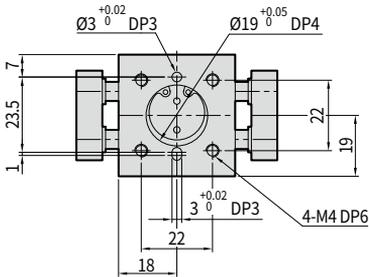
16L

20L

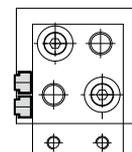
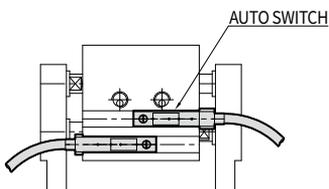
30L

HAND

PH06-10L

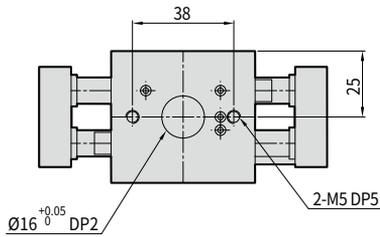
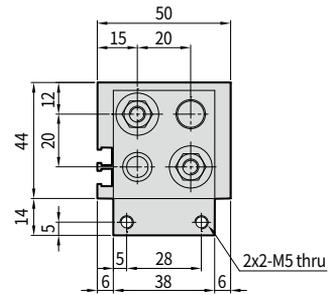
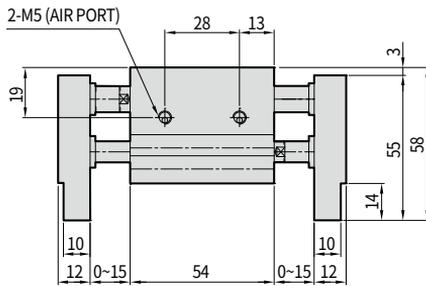
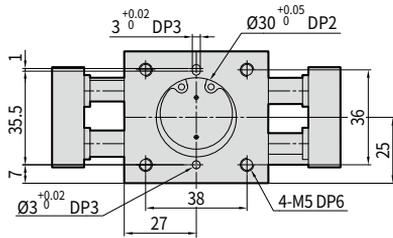


PH06-10L Example of Auto Switch installation

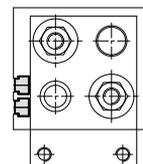
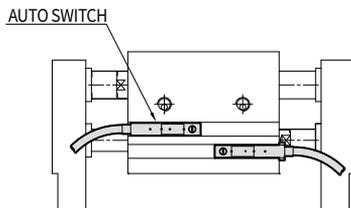


- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L**
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH06-16L

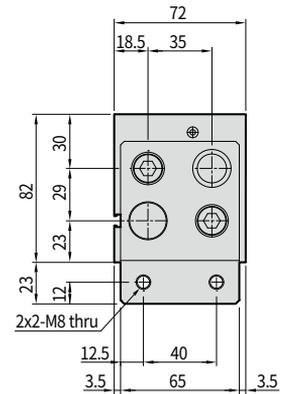
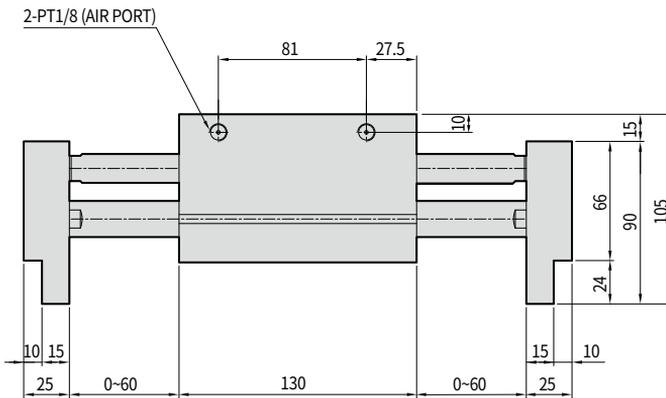
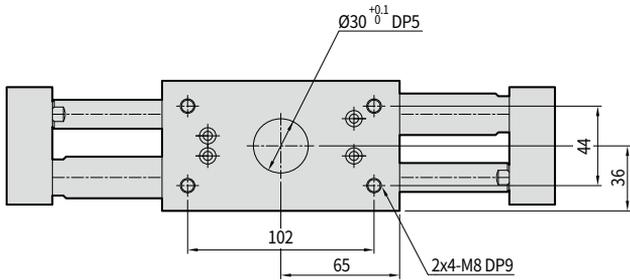


PH06-16L Example of Auto Switch installation



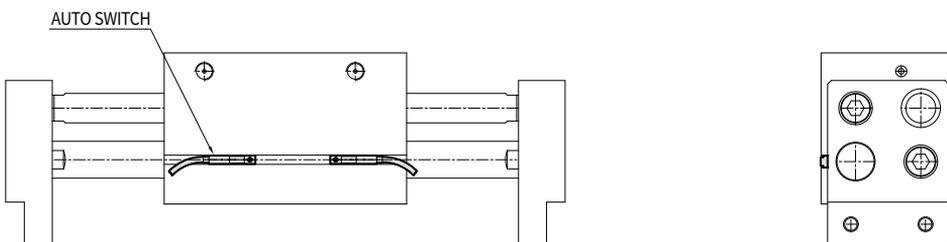
- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L**
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH06-30L

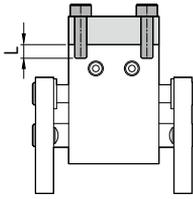


- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L**
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH06-30L Example of Auto Switch installation

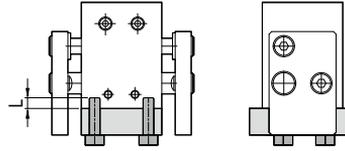


1. Installation by body tap holes



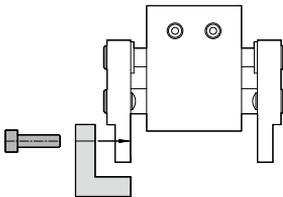
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH06-10L	M4×P0.7	25	5
PH06-12L	M4×P0.7	25	5
PH06-16L	M5×P0.8	51	7
PH06-20L	M6×P1	81	8
PH06-30L	M8×P1.25	157	9

2. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH06-10L	M4×P0.7	25	5
PH06-12L	M4×P0.7	25	5
PH06-16L	M5×P0.8	51	7
PH06-20L	M6×P1	81	8
PH06-30L	M8×P1.25	157	9

3. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)
PH06-10L	M3×P0.5	11
PH06-12L	M4×P0.7	25
PH06-16L	M5×P0.8	51
PH06-20L	M6×P1	81
PH06-30L	M8×P1.25	157

MEMO

Handwriting practice area consisting of 25 horizontal dotted lines.

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

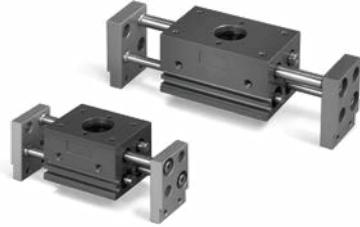
GENERAL HAND / Parallel Operation

PH06-L2 Series

Features

NEW

- Parallel operation by synchronized of Rack and Pinion structure.
- Extended stroke compare with PH06 series.
- Stable gripping force from double cylinders structure.
- Suitable for handling various size workpiece by long stroke operation from centric of body.
- Auto Switch installation. (Optional)



Order Form

PH06 - 16L2 - E - A2 L S

①

②

③

④

⑤

⑥

① Series Name

② Cylinder Bore Size and Stroke

Order	CYL Bore(mm)	Stroke(mm)
10L2	10	40
12L2	12	60
16L2	16	80
20L2	20	100
30L2	30	160

⑤ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

③ Special Option

Order	Special Option
Blank	Standard
E	Secondary battery field

⑥ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

④ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
Blank		No Auto Switch provided							
A2	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2C	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2V	Magnetic reed switch	2-Wire	Ver	100V	24V	5~20mA	5~40mA	IP 67	1ms
B2	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2B	Magnetic solid state	2-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B3B	Magnetic solid state	2-Wire	Ver	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3C	Magnetic solid state	3-Wire	Ver	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms

* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

Specification

HAND

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2**
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

Item Name	PH06-10L2	PH06-12L2	PH06-16L2	PH06-20L2	PH06-30L2
CYL Bore Size(mm)	10	12	16	20	30
Stroke(mm)	40	60	80	100	160
Effective Gripping Force(kgf) Air pressure : 5kgf/cm ² Note 3)	Close	2.9	5.1	9.1	14.2
Fitting Size	M5				PT 1/8
Weight(kgf)	0.27	0.44	0.79	1.63	4.65
Max. Attachment L(mm) Note 4)	30	35	50	60	70
Fluid	Clean Air Note 1)				
Pressure Range(kgf/cm ²)	3 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)				
Lubrication	Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)				
Temperature Range(°C)	5 ~ 60				
Repeat Accuracy(mm)	±0.05				
Max. Cycle Per Minute(C.P.M)	40	40	40	30	20
Operation Type	Double Acting (Structure : Parallel operation by Rack and Pinion structure) (Guide : Metal Guide)				
Tolerance of Stroke(mm)	Open : -0.5 ~ +1.5 Close : -1.5 ~ +0.5				

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3~10µm degree of filtering.

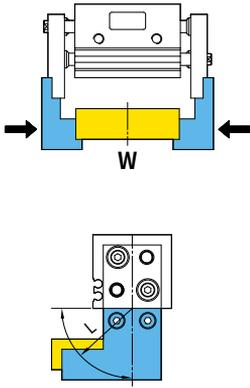
Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Note 4) For Max. Attachment L and H, please refer <GENERAL HAND Model Selection Guide>. (it is permitted length for 5kgf/cm² pressure applied)

Gripping Force Graph (Close)

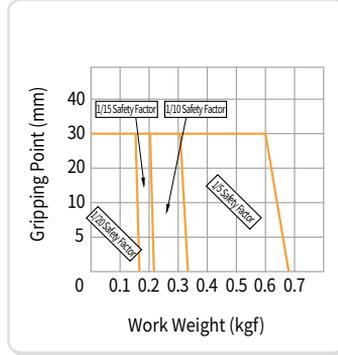
▶ Refer <GENERAL HAND Selection Guide> for how to read below graph.



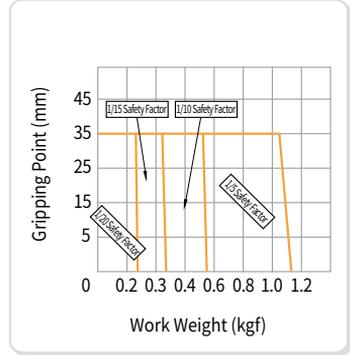
Close Grip State

W: Work Weight
L: Attachment Length

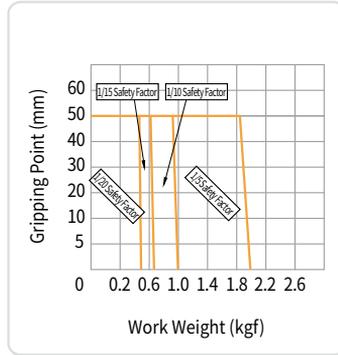
◆ PH06-10L2



◆ PH06-12L2



◆ PH06-16L2



◆ PH06-20L2



◆ PH06-30L2



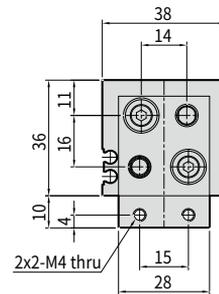
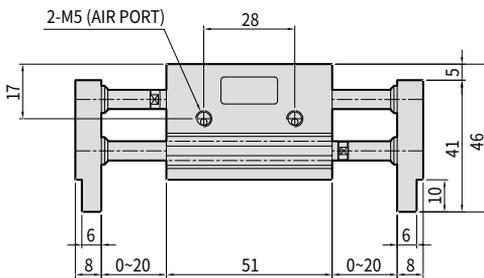
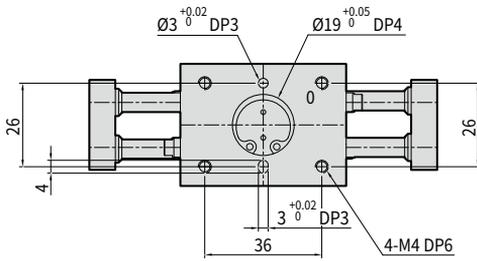
▲ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

PH06-L2 Series

- 10L2
- 12L2
- 16L2
- 20L2
- 30L2

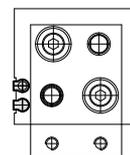
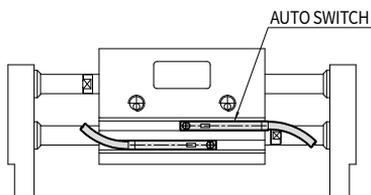
HAND

PH06-10L2



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2**
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH06-10L2 Example of Auto Switch installation



PH06-L2 Series

10L2

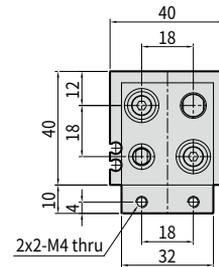
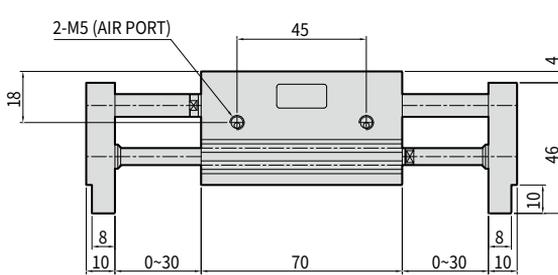
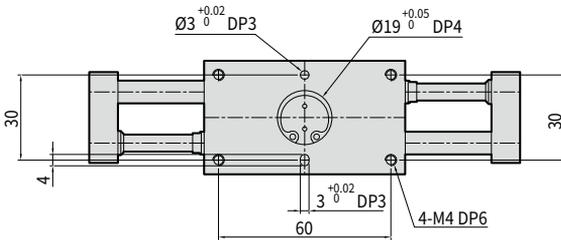
12L2

16L2

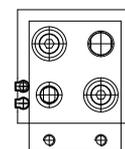
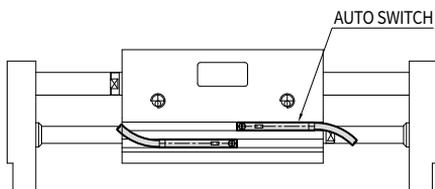
20L2

30L2

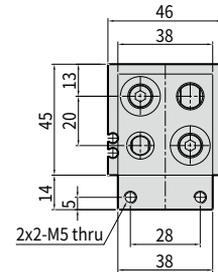
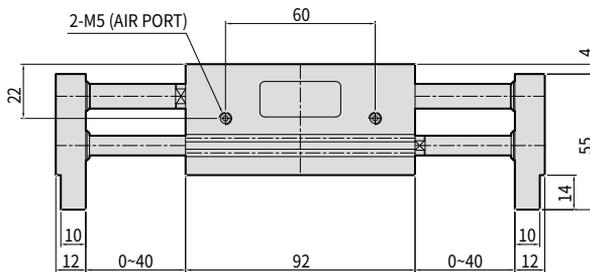
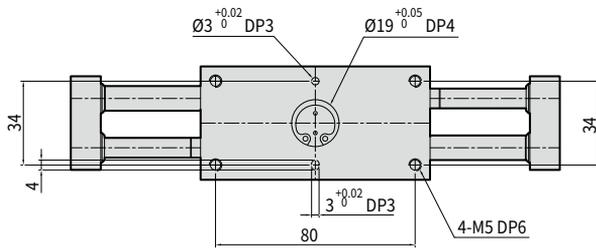
PH06-12L2



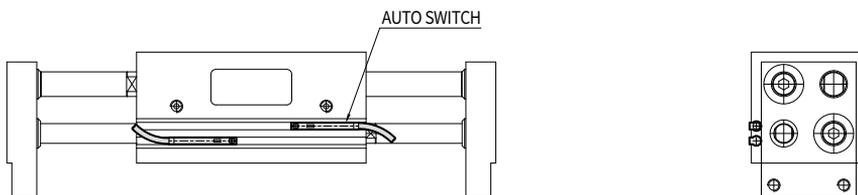
PH06-12L2 Example of Auto Switch installation



PH06-16L2



PH06-16L2 Example of Auto Switch installation



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2**
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH06-L2 Series

10L2

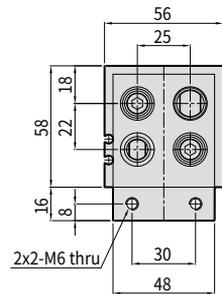
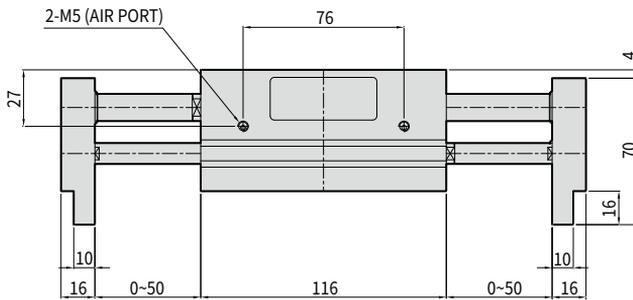
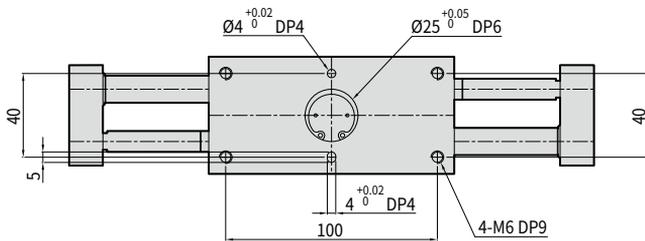
12L2

16L2

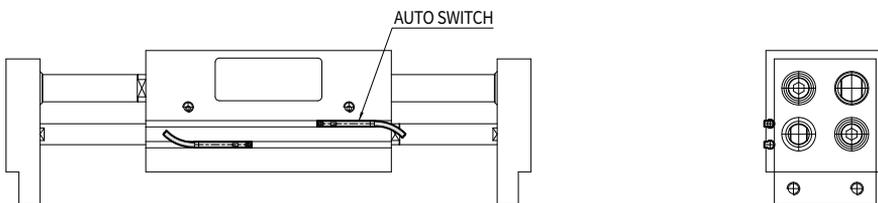
20L2

30L2

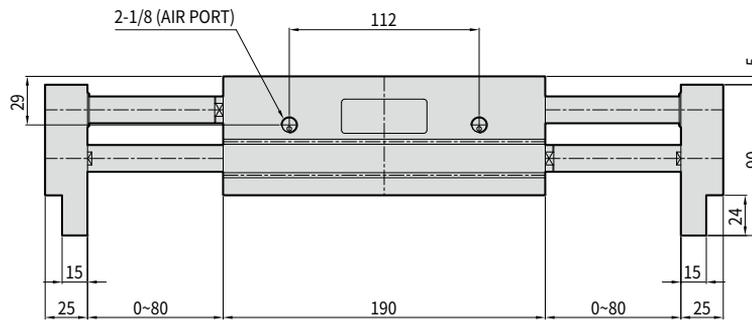
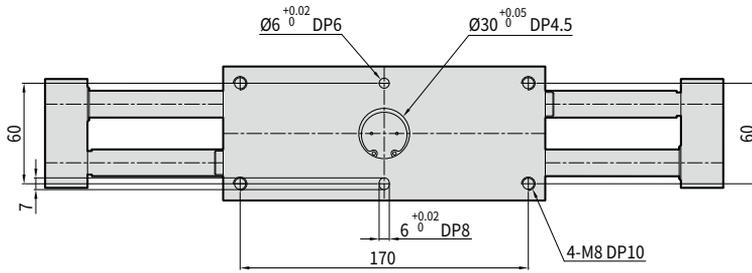
PH06-20L2



PH06-20L2 Example of Auto Switch installation

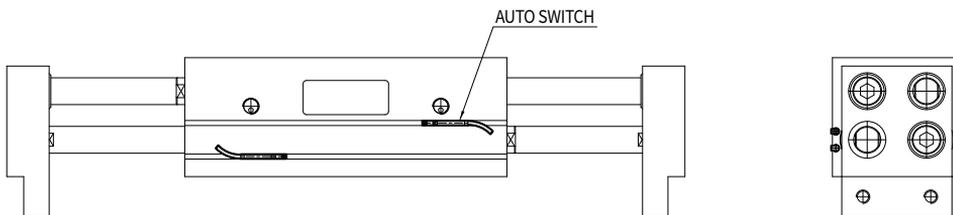


PH06-30L2

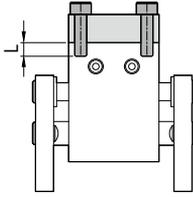


- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2**
- PH07
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH06-30L2 Example of Auto Switch installation

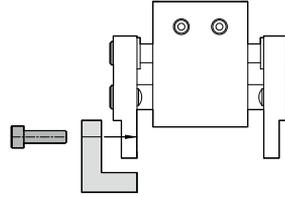


1. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH06-10L2	M4×P0.7	25	5
PH06-12L2	M4×P0.7	25	5
PH06-16L2	M5×P0.8	51	7
PH06-20L2	M6×P1	81	8
PH06-30L2	M8×P1.25	157	9

2. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)
PH06-10L2	M3×P0.5	11
PH06-12L2	M4×P0.7	25
PH06-16L2	M5×P0.8	51
PH06-20L2	M6×P1	81
PH06-30L2	M8×P1.25	157

MEMO

Handwriting practice area with horizontal dotted lines.

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

GENERAL HAND / Parallel Operation

PH07 Series

Features

- Parallel operation by Link Lever structure.
- Suitable for handling various size workpiece by long stroke operation from centric of body.
- High precise cross roller guide application.
(Only for PH07-06 and PH07-10)
- Auto Switch installation. (Optional, Over than PH07-20 model)



Order Form

PH07 - 20 - A1 L S

①

②

③

④

⑤

① Series Name

② Cylinder Bore Size and Stroke

Order	CYL Bore(mm)	Stroke(mm)
06	6	10
10	10	20
20	20	30
30	30	40
40	40	80
50	50	100

③ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
Blank		No Auto Switch provided							
A1	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
B1	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms

* Auto Switch for PH07-06 and PH07-10, please contact to us.

④ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

⑤ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

Specification

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

Item Name		PH07-06	PH07-10	PH07-20	PH07-30	PH07-40	PH07-50	
CYL Bore Size(mm)		6	10	20	30	40	50	
Stroke(mm)		10	20	30	40	80	100	
Effective Gripping Force(kgf)	Close	1.3	2.1	8.8	18.8	28	53	
Air pressure : 5kgf/cm ² Note 3)								
Fitting Size		M5				PT1/8		
Weight(kgf)		0.18	0.3	0.9	2.1	5.2	10.1	
Max. Attachment L(mm)	Note 4)	20	35	50	80	100	130	
Fluid		Clean Air Note 1)						
Pressure Range(kgf/cm ²)		3 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)						
Lubrication		Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)						
Temperature Range(°C)		5 ~ 60						
Max. Cycle Per Minute(C.P.M)		80			60			
Operation Type		Double Acting (Parallel operation by Link Lever structure)						
Guide Type		Cross Roller Bearing			Oilless Bearing Guide			
Repeat Accuracy(mm)		±0.02			±0.1			
Tolerance of Stroke(mm)		Open : -0.5 ~ +1.5 Close : -1.5 ~ +0.5						

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3~10µm degree of filtering.

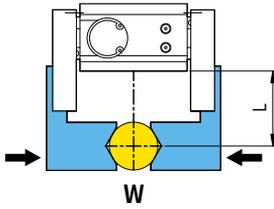
Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Note 4) For Max. Attachment L and H, please refer <GENERAL HAND Model Selection Guide>. (it is permitted length for 5kgf/cm² pressure applied)

Gripping Force Graph (Close)

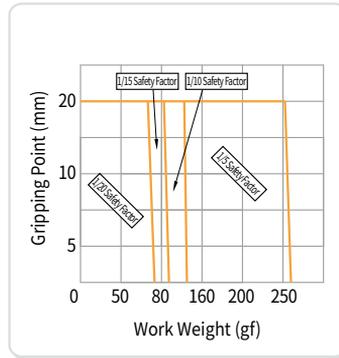
▶ Refer <GENERAL HAND Selection Guide> for how to read below graph.



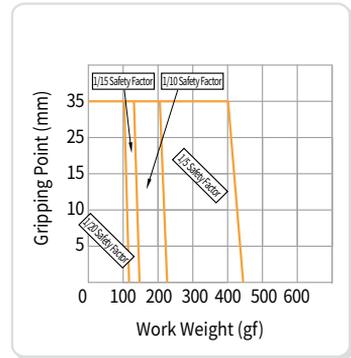
Close Grip State

W: Work Weight
L: Attachment Length

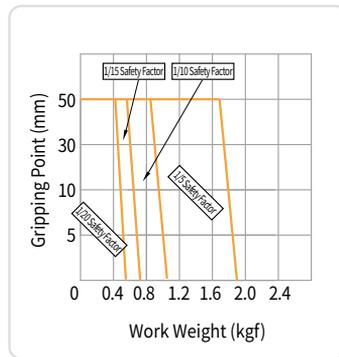
▶ PH07-06



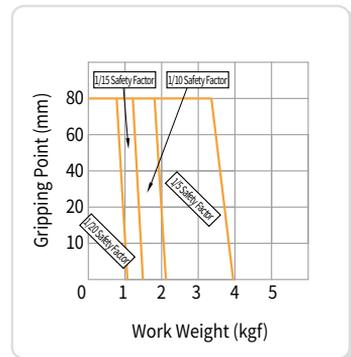
▶ PH07-10



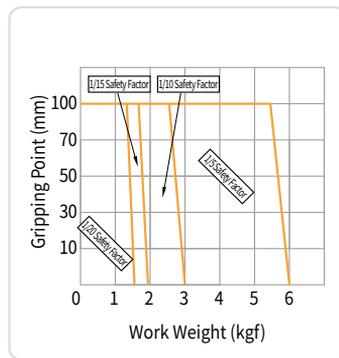
▶ PH07-20



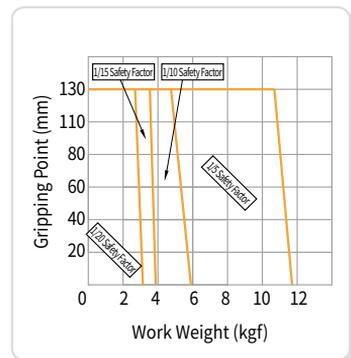
▶ PH07-30



▶ PH07-40



▶ PH07-50



⚠ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

PH07 Series

06

10

20

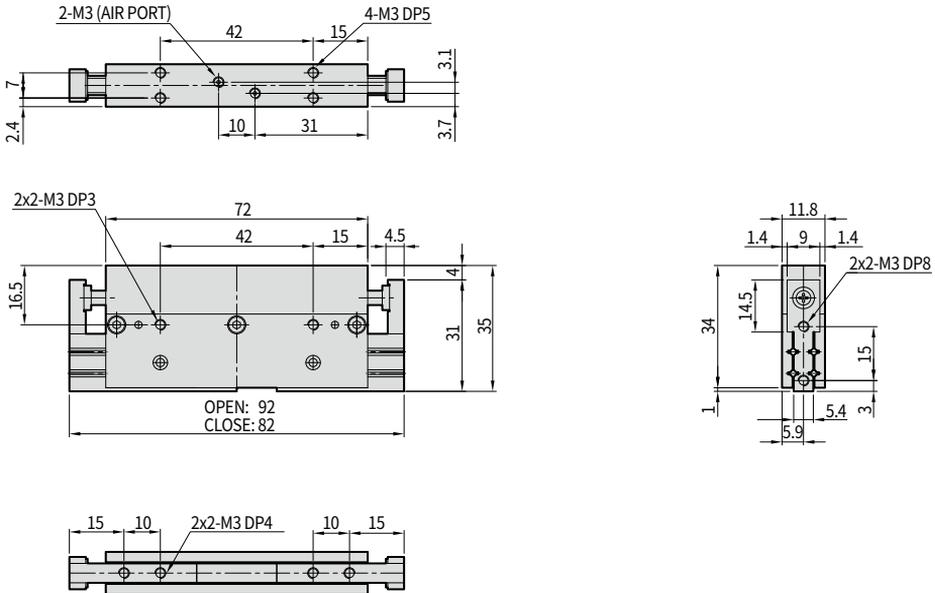
30

40

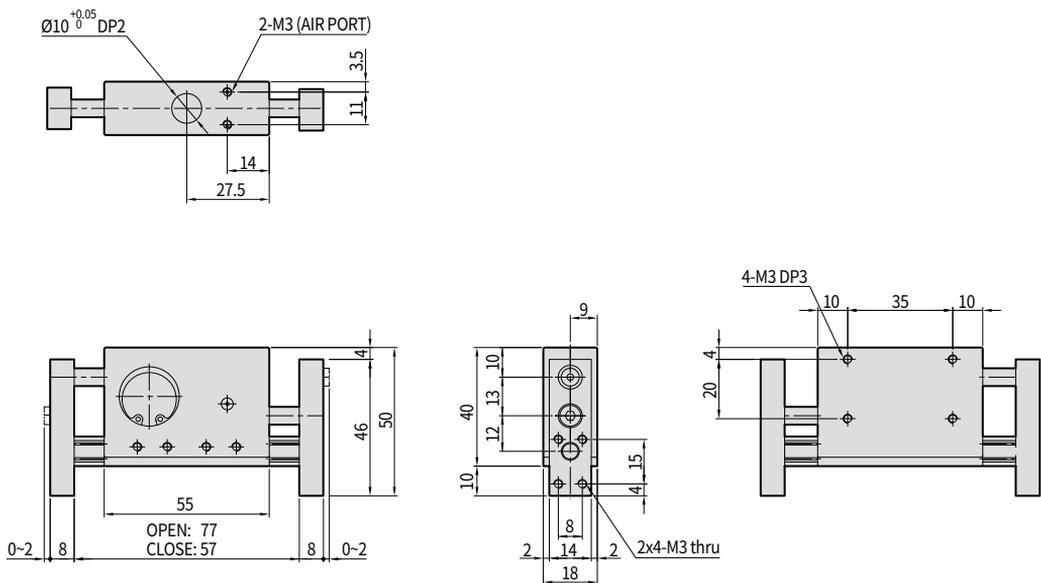
50

HAND

PH07-06



PH07-10



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07**
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH07 Series

06

10

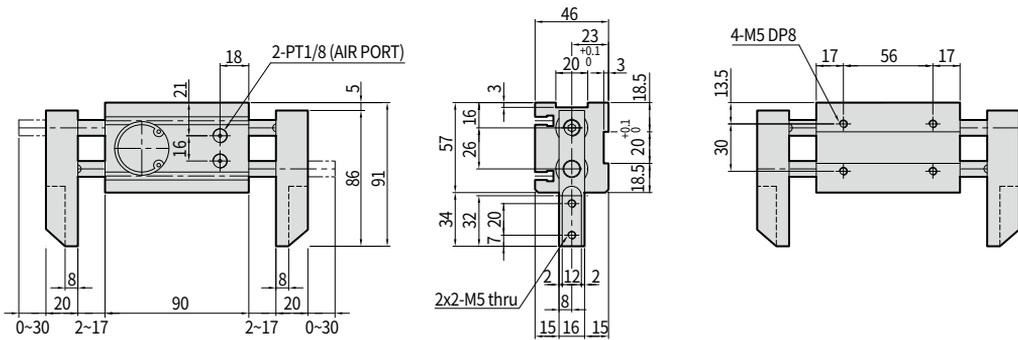
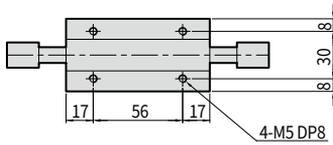
20

30

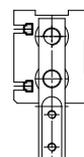
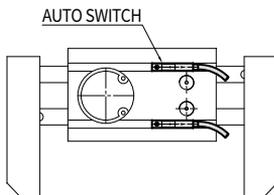
40

50

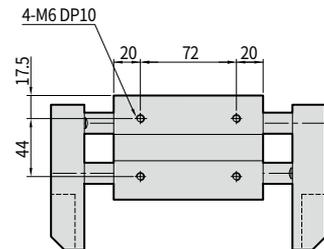
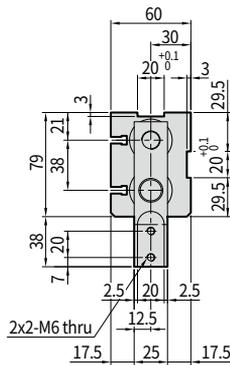
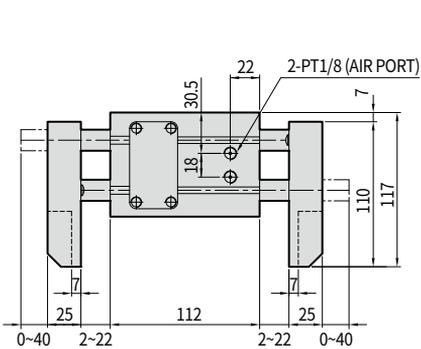
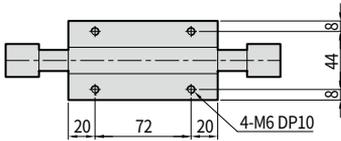
PH07-20



PH07-20 Example of Auto Switch installation

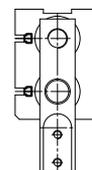
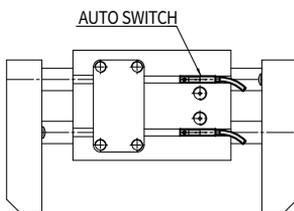


PH07-30



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07**
- PH08
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH07-30 Example of Auto Switch installation



PH07 Series

06

10

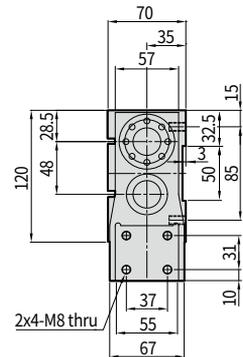
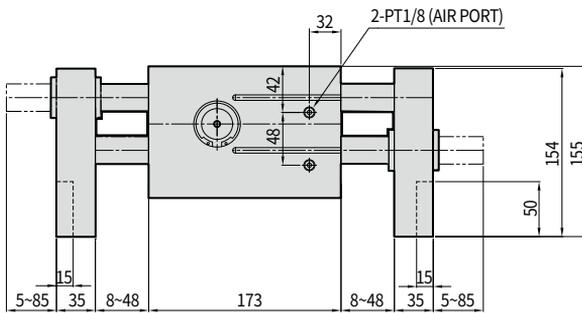
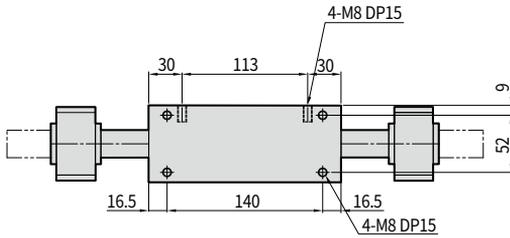
20

30

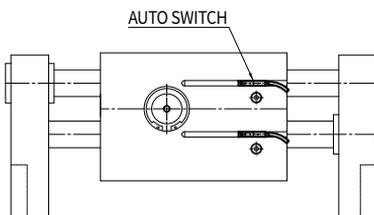
40

50

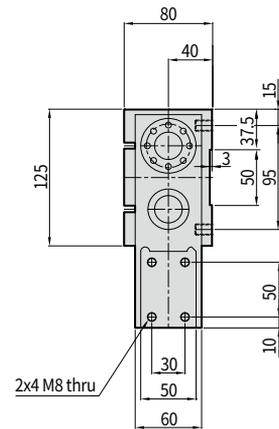
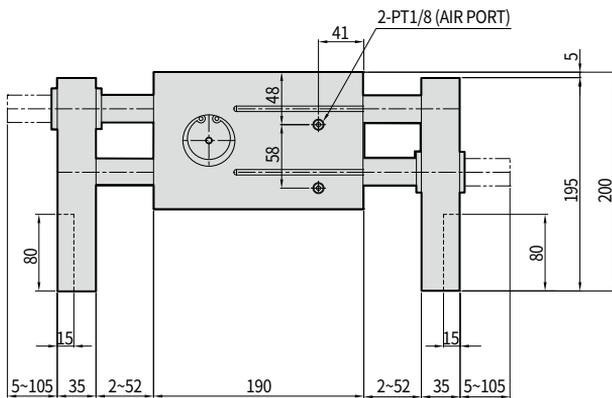
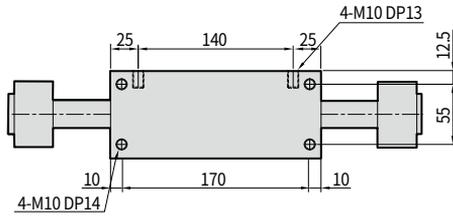
PH07-40



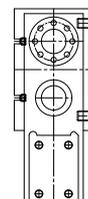
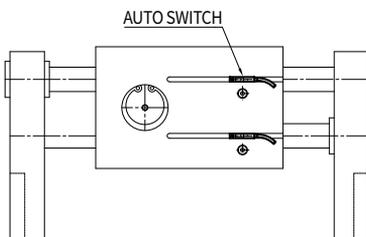
PH07-40 Example of Auto Switch installation



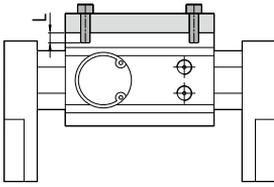
PH07-50



PH07-50 Example of Auto Switch installation

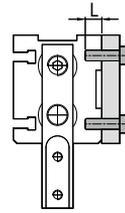


1. Installation by body tap holes



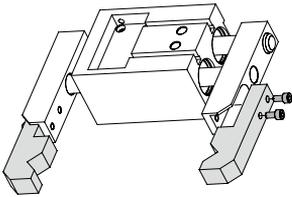
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH07-06	M3×P0.5	11	5
PH07-10	Not usable		
PH07-20	M5×P0.8	51	8
PH07-30	M6×P1	81	10
PH07-40	M8×P1.25	157	15
PH07-50	M10×P1.5	240	15

2. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH07-06	M3×P0.5	11	3
PH07-10	M3×P0.5	11	3
PH07-20	M5×P0.8	51	8
PH07-30	M6×P1	81	10
PH07-40	M8×P1.25	157	15
PH07-50	M10×P1.5	240	15

3. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)
PH07-06	M3×P0.5	11
PH07-10	M3×P0.5	11
PH07-20	M5×P0.8	51
PH07-30	M6×P1	81
PH07-40	M8×P1.25	157
PH07-50	M8×P1.25	157

MEMO

Handwriting practice area with horizontal dotted lines.

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

GENERAL HAND / Parallel Operation

PH08 Series

Features

- Parallel operation by synchronized of Yoke structure.
- High precise cross roller guide application.
- High solidity and precise structure.
- Compact design double cylinder integrated in one body.
- Stable gripping force from double cylinders structure.
- Auto Switch installation. (Optional)



Order Form

PH08 - 10 - A2 L S

① ② ③ ④ ⑤

① Series Name

② Cylinder Bore Size and Stroke

③ Available Auto Switches

Order	CYL Bore(mm)	Stroke(mm)	Order										
			A1	A2	A2C	A2V	B1	B2	B2B	B3B	B3C		
06	6	8	Please contact to office.										
10	10	15		○	○	○		○	○	○	○	○	
16	16	20		○	○	○		○	○	○	○	○	
20	20	20	○					○					
30	30	30		○	○	○			○	○	○	○	

※ For "Blank", no Auto Switch is provided.

④ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

⑤ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

※ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
A1	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2C	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2V	Magnetic reed switch	2-Wire	Ver	100V	24V	5~20mA	5~40mA	IP 67	1ms
B1	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2B	Magnetic solid state	2-Wire	Horiz	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3B	Magnetic solid state	2-Wire	Ver	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3C	Magnetic solid state	3-Wire	Ver	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms

* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

Specification

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

Item Name	PH08-06	PH08-10	PH08-16	PH08-20	PH08-30
CYL Bore Size(mm)	6	10	16	20	30
Stroke(mm)	8	15	20	20	30
Effective Gripping Force(kgf) Air pressure : 5kgf/cm ² Note 3)	Close	1.23	3.4	8.8	13.8
Fitting Size	M3		M5		PT1/8
Weight(kgf)	0.085	0.14	0.32	0.7	2
Max. Attachment L(mm)	30	40	50	60	80
Max. Attachment H(mm) Note 4)	15	20	30	40	50
Fluid	Clean Air Note 1)				
Pressure Range(kgf/cm ²)	1.5 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)				
Lubrication	Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)				
Temperature Range(°C)	5 ~ 60				
Repeat Accuracy(mm)	±0.05				
Max. Cycle Per Minute(C.P.M)	80				
Operation Type	Double Acting (Structure : Parallel operation by synchronized of Link Lever structure) (Guide : Cross Roller Bearing Guide)				
Tolerance of Stroke(mm)	Open : -0.5 ~ +1 Close : -1 ~ +0.5				

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

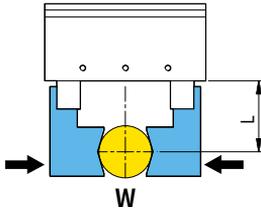
Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Note 4) For Max. Attachment L and H, please refer <GENERAL HAND Model Selection Guide>. (it is permitted length for 5kgf/cm² pressure applied)

Gripping Force Graph (Close)

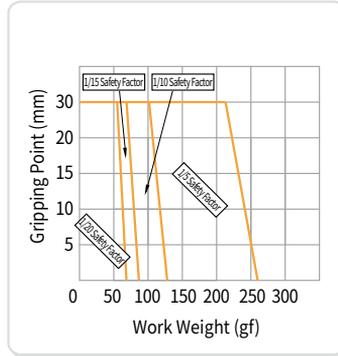
► Refer <GENERAL HAND Selection Guide> for how to read below graph.



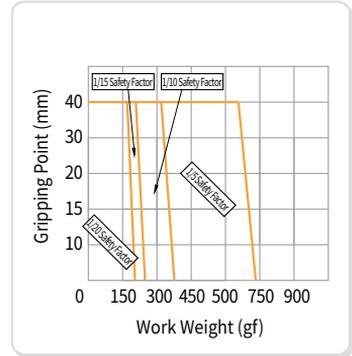
Close Grip State

W: Work Weight
L: Attachment Length

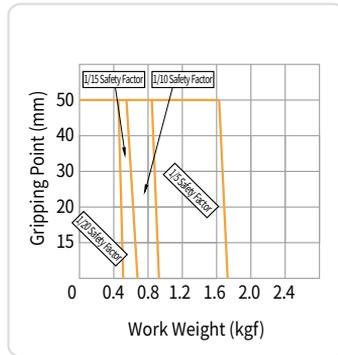
► PH08-06



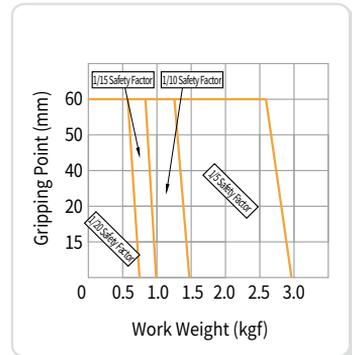
► PH08-10



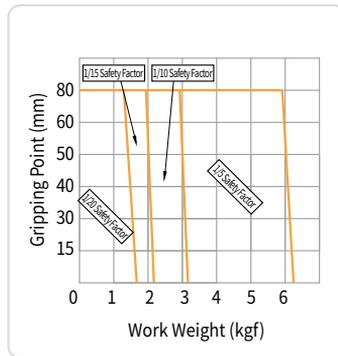
► PH08-16



► PH08-20



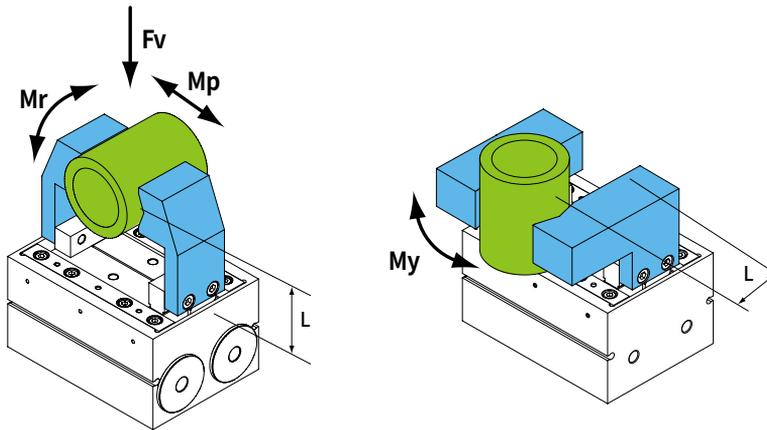
► PH08-30



⚠ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

Check of Allowable Moment and Weight

- ※ L : Distance between the center of guide and gripping point of work.
- ※ The moment center equals with guide center.



HAND

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08**
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

Item	Allowable Weight for Vertical Direction. Fv (kgf)	Maximum Allowable Moment (kgf·cm)		
		Pitching moment Mp	Yawing moment My	Rolling moment Mr
PH08-06	13	2.3	2.3	5.9
PH08-10	32	10	10	29
PH08-16	44	20	20	39
PH08-20	83	58	58	116
PH08-30	106	87	87	163

※ Above listed allowable moment and weight refer static values.

Calculation of allowable weight for moment weight applied.

$$\text{Allowable Weight } F \text{ (kgf)} = \frac{\text{Maximum Allowable Moment } M \text{ (kgf·cm)}}{\text{The point of external load applied } L \text{ (cm)}}$$

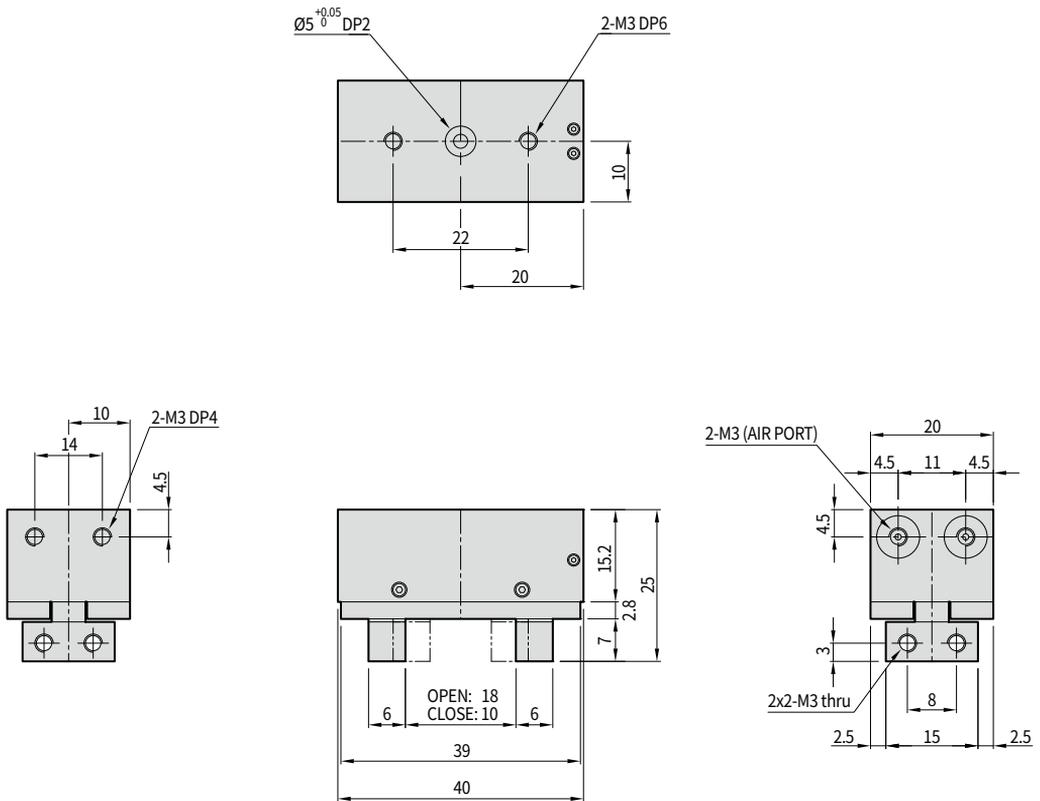
Example)

Checking of 4kgf weight(F) force to pitching moment direction(Mp) at the 50mm attachment point on PH08-20.

$$\Rightarrow \text{Allowable Weight } F \text{ (kgf)} = \frac{\text{Maximum Allowable Moment } M \text{ (kgf·cm)}}{\text{The point of external load applied } L \text{ (cm)}} = \frac{58}{5} = 11.6 \text{ kgf} > 4 \text{ kgf}$$

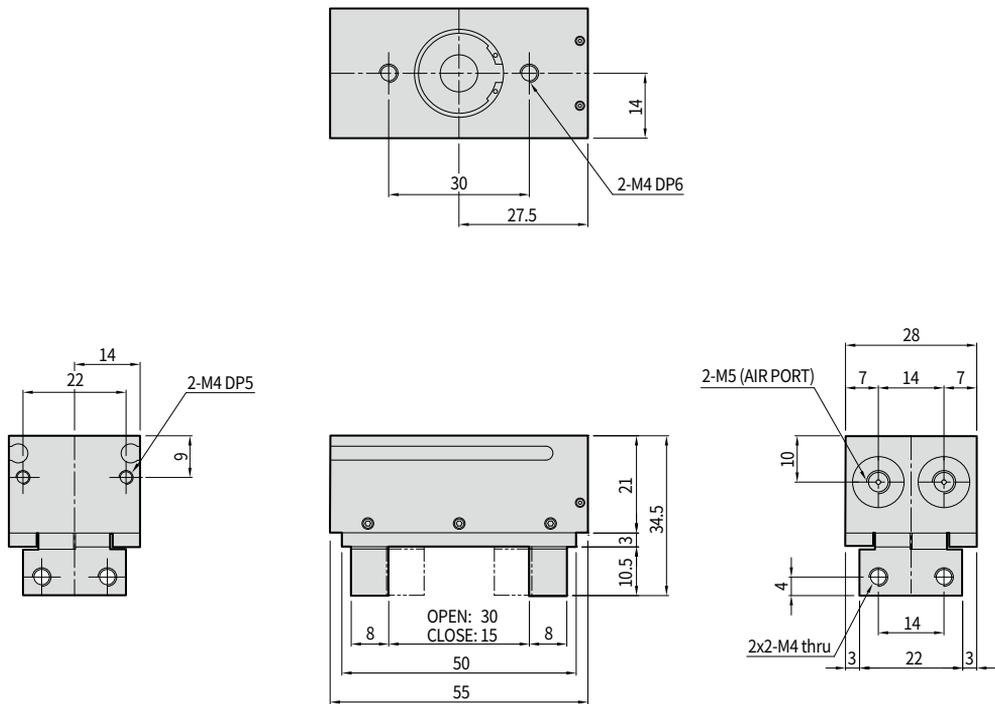
The allowable weight(11.6kgf) is bigger than applied weight (4kgf), so, it is applicable.

PH08-06

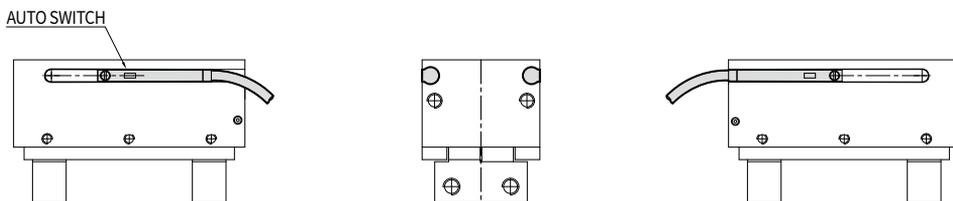


PH08-10

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08**
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC



PH08-10 Example of Auto Switch installation



PH08 Series

06

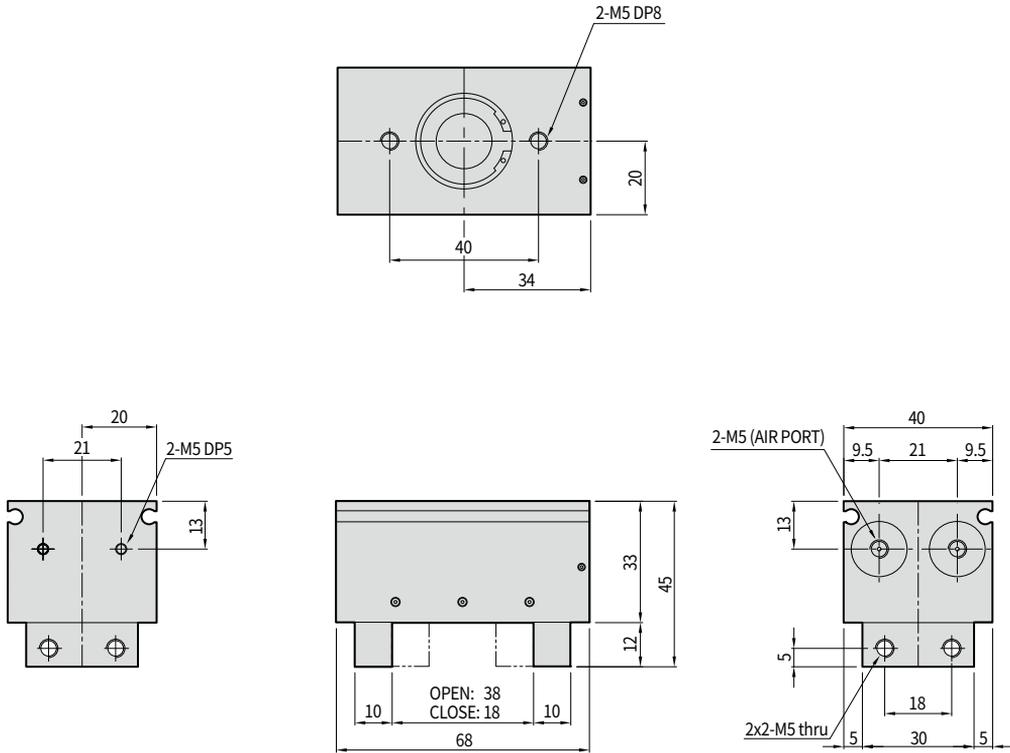
10

16

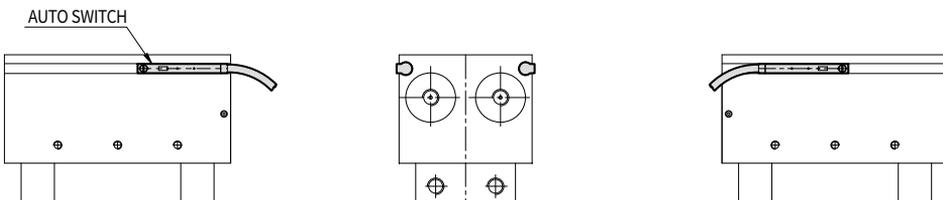
20

30

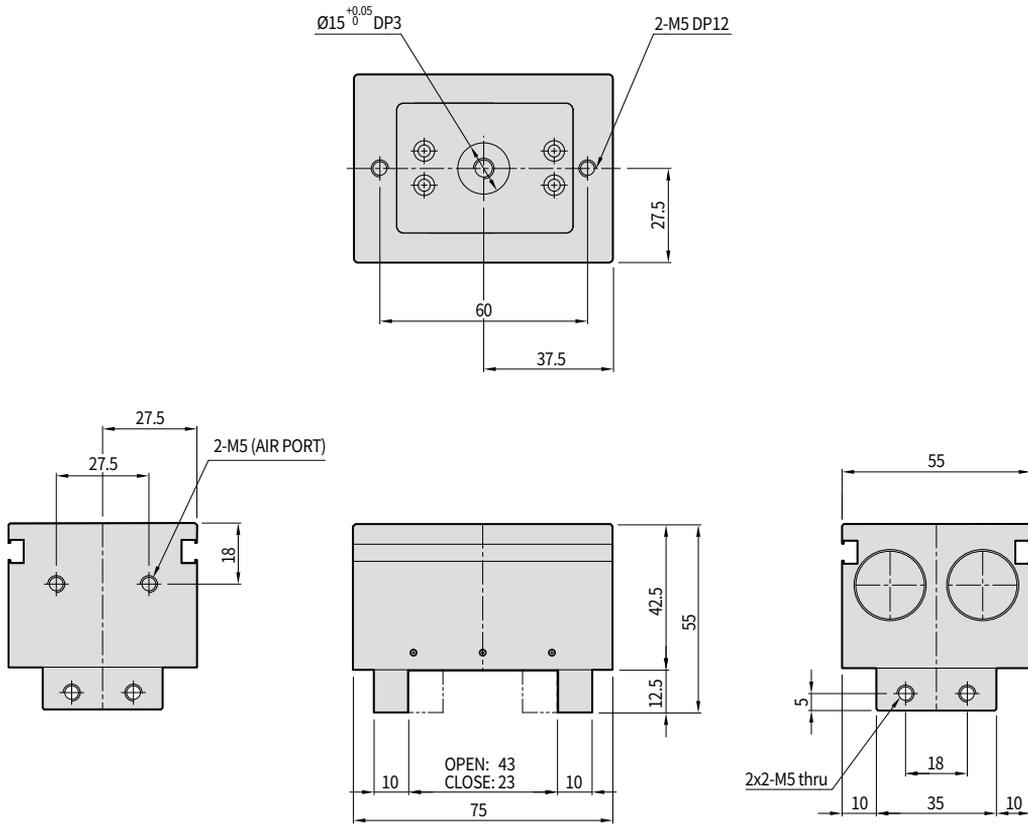
PH08-16



PH08-16 Example of Auto Switch installation

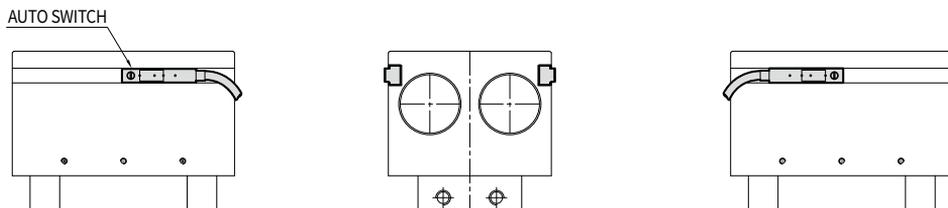


PH08-20

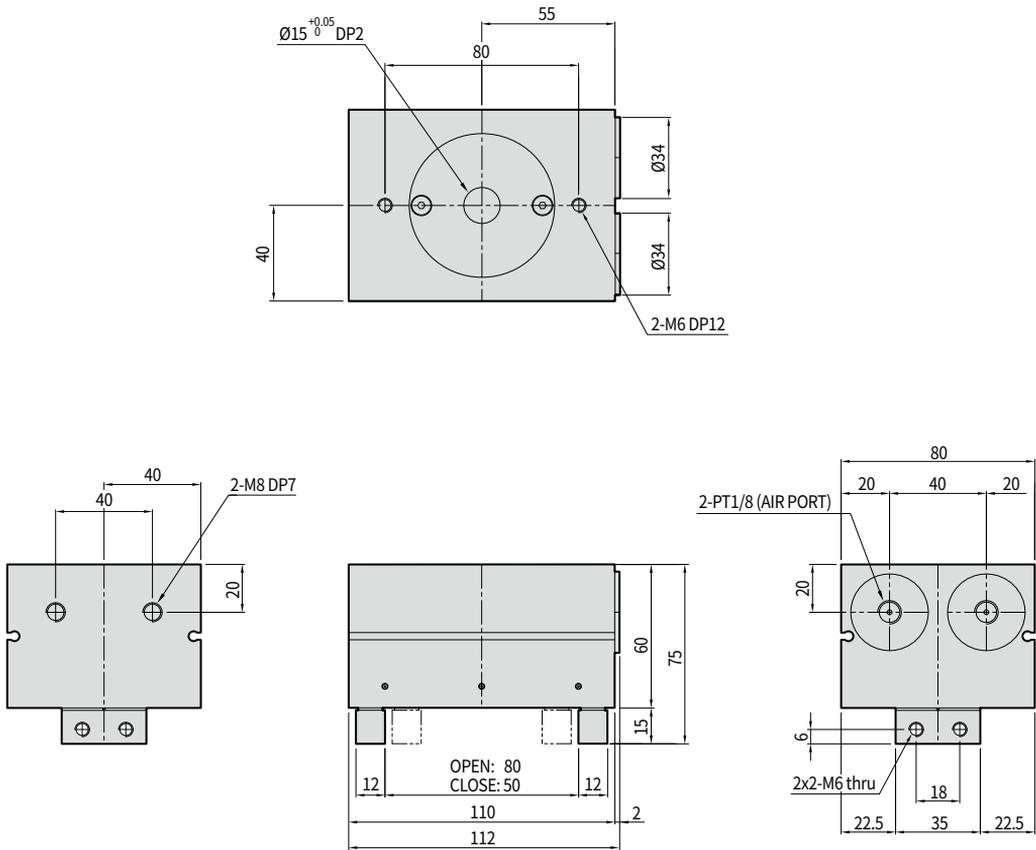


- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08**
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

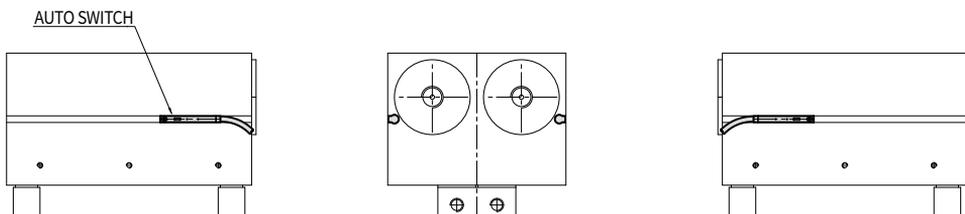
PH08-20 Example of Auto Switch installation



PH08-30

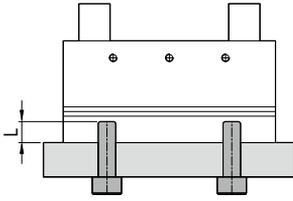


PH08-30 Example of Auto Switch installation



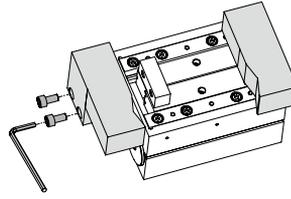
Installation Information

1. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf·cm)	Max Bolt Length L (mm)
PH08-06	M3×P0.5	11	6
PH08-10	M4×P0.7	25	5
PH08-16	M5×P0.8	51	8
PH08-20	M5×P0.8	51	12
PH08-30	M6×P1	81	12

2. Attachment installation



Item	Fastening Bolt	Max Torque (kgf·cm)
PH08-06	M3×P0.5	11
PH08-10	M4×P0.7	25
PH08-16	M5×P0.8	51
PH08-20	M5×P0.8	51
PH08-30	M6×P1	81

HAND

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08**
- PH09
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

GENERAL HAND / Angular Operation

PH09 Series

Features

- Angular operation by Link Lever.
- General structure of unified cylinder in simple body.
- Auto Switch installation. (Optional, Not for PH09-12)



Order Form

PH09 - 20 - A1 L S

①

②

③

④

⑤

① Series Name

② Cylinder Bore Size and Stroke

③ Available Auto Switches

Order	CYL Bore(mm)	Stroke(°)	Order										
			A1	A2	A2C	A2V	B1	B2	B2B	B3B	B3C		
12	12	-14 ~ +30	No Auto Switch provided										
16	16	-5 ~ +15		○		○			○	○	○	○	○
20	20	-5 ~ +20	○					○					
25	25	-5 ~ +20	○					○					
30	30	-5 ~ +20	○					○					
40	40	-5 ~ +25	○					○					

※ For "Blank", no Auto Switch is provided.

④ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

⑤ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

※ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
A1	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2C	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2V	Magnetic reed switch	2-Wire	Ver	100V	24V	5~20mA	5~40mA	IP 67	1ms
B1	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2B	Magnetic solid state	2-Wire	Horiz	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3B	Magnetic solid state	2-Wire	Ver	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3C	Magnetic solid state	3-Wire	Ver	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms

* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

Specification

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

Item Name	PH09-12	PH09-16	PH09-20	PH09-25	PH09-30	PH09-40
CYL Bore Size(mm)	12	16	20	25	30	40
Stroke(°)	-14 ~ +30	-5 ~ +15	-5 ~ +20	-5 ~ +20	-5 ~ +20	-5 ~ +25
Effective Gripping Force(kgf)	Close	0.5	2.8	4.4	7.8	13.2
Air pressure : 5kgf/cm ² Note 3)						
Fitting Size	M5					PT1/8
Weight(kgf)	0.03	0.1	0.25	0.3	0.4	0.74
Max. Attachment L(mm) Note 4)	25	50	80	90	100	120
Fluid	Clean Air Note 1)					
Pressure Range(kgf/cm ²)	5 ~ 7	2 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)				
Lubrication	Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)					
Temperature Range(°C)	5 ~ 60					
Repeat Accuracy(mm)	±0.1					
Max. Cycle Per Minute(C.P.M)	80				60	
Operation Type	Single Acting (Normal Open)	Double Acting (Structure : Angular operation by Link Lever) (Guide : Metal Guide)				
Tolerance of Stroke(°)	Open : -2 ~ +5 Close : -5 ~ +2 (For single side master jaw)					

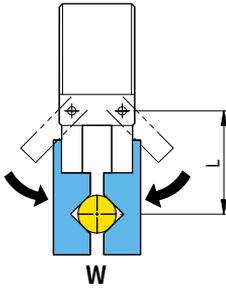
Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Note 4) For Max. Attachment L and H, please refer <GENERAL HAND Model Selection Guide>. (it is permitted length for 5kgf/cm² pressure applied)

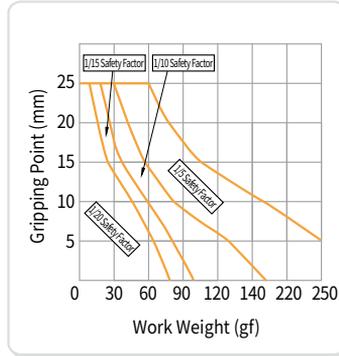
► Refer <GENERAL HAND Selection Guide> for how to read below graph.



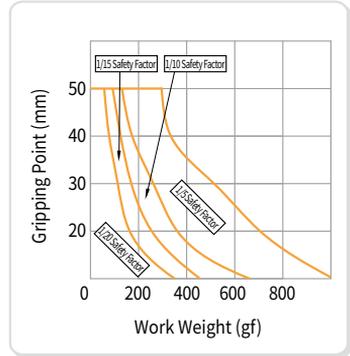
Close Grip State

W: Work Weight
L: Attachment Length

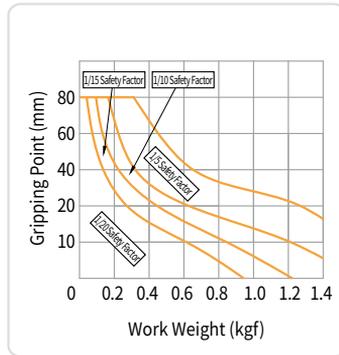
► PH09-12



► PH09-16



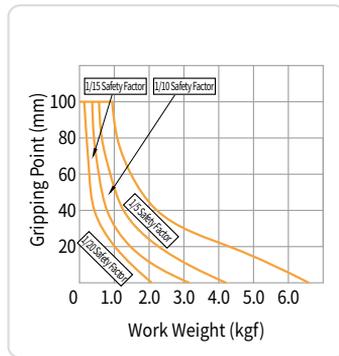
► PH09-20



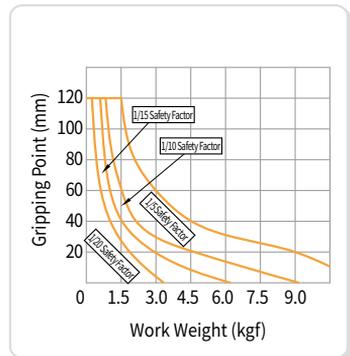
► PH09-25



► PH09-30



► PH09-40



▲ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

PH09 Series

12

16

20

25

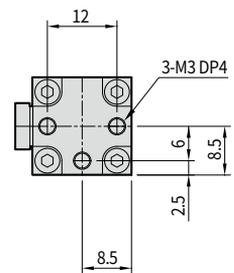
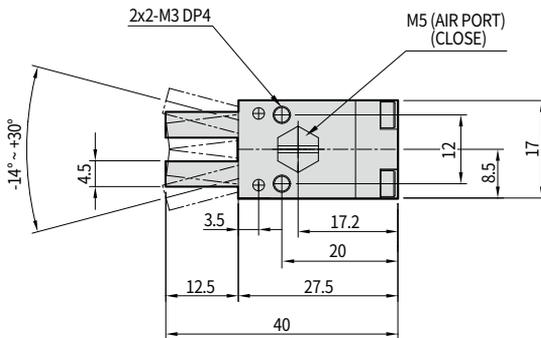
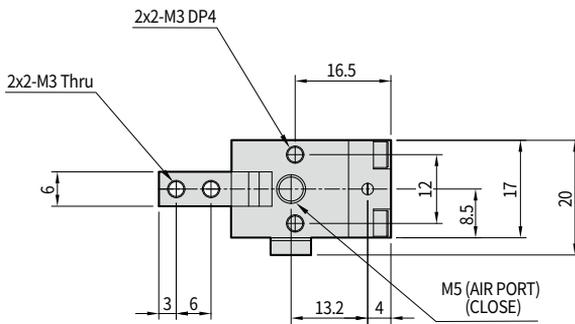
30

40

HAND

PH09-12

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09**
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC



PH09 Series

12

16

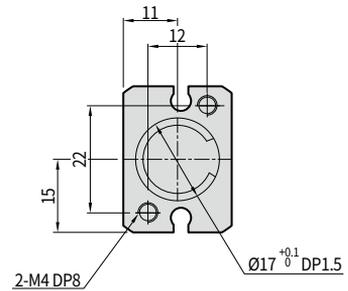
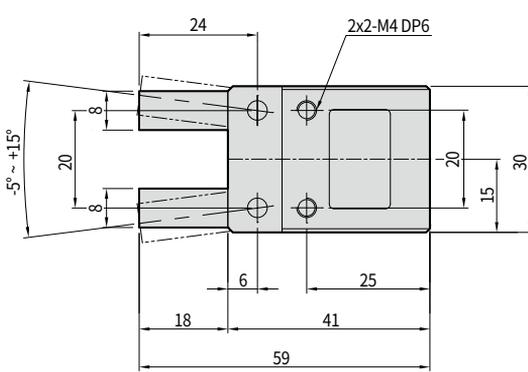
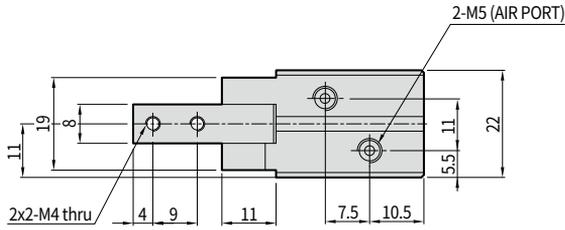
20

25

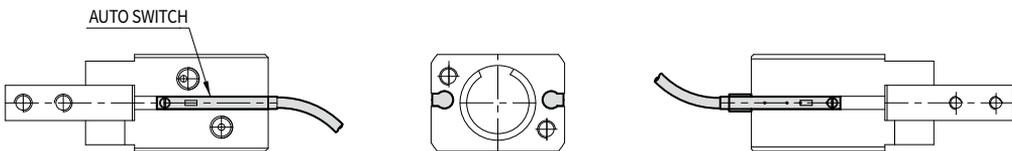
30

40

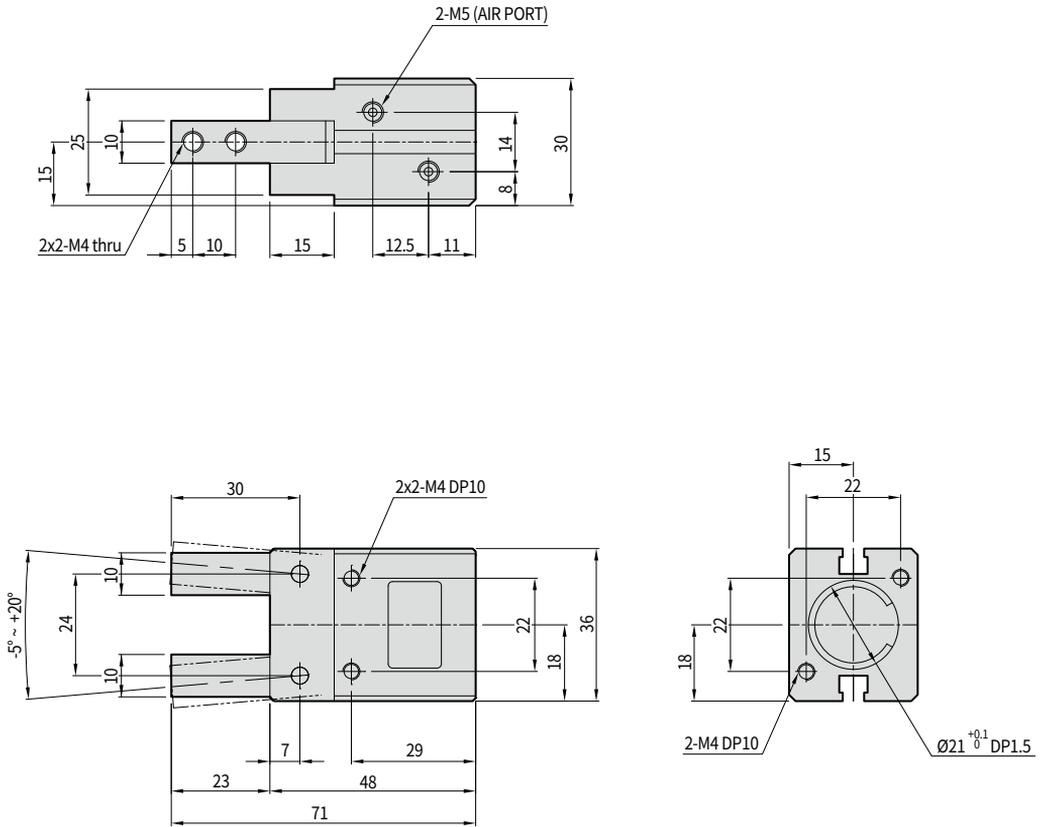
PH09-16



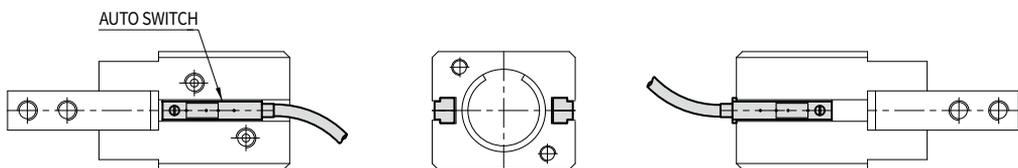
PH09-16 Example of Auto Switch installation



PH09-20



PH09-20 Example of Auto Switch installation



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09**
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH09 Series

12

16

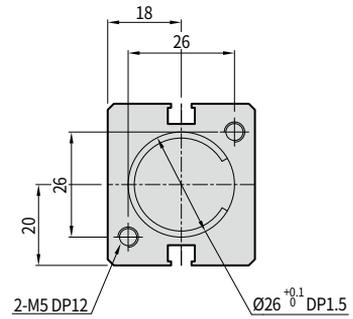
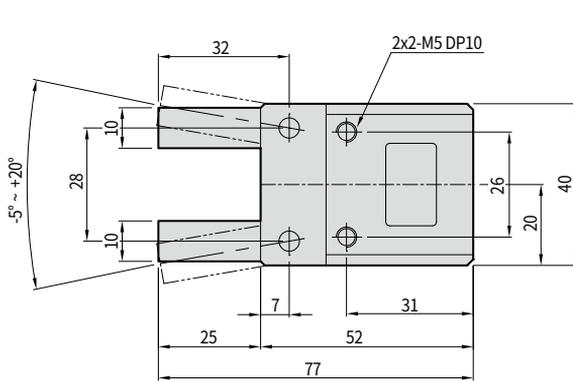
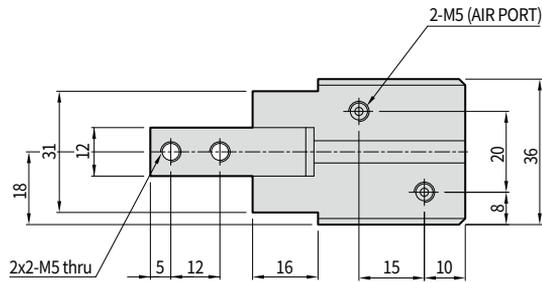
20

25

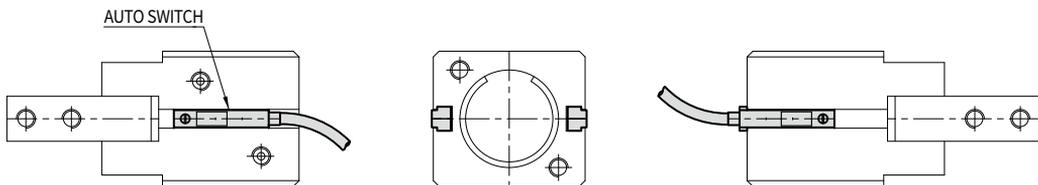
30

40

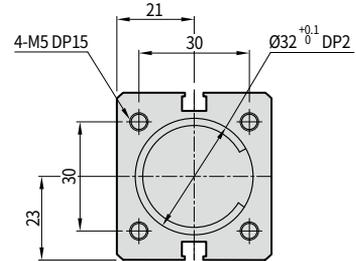
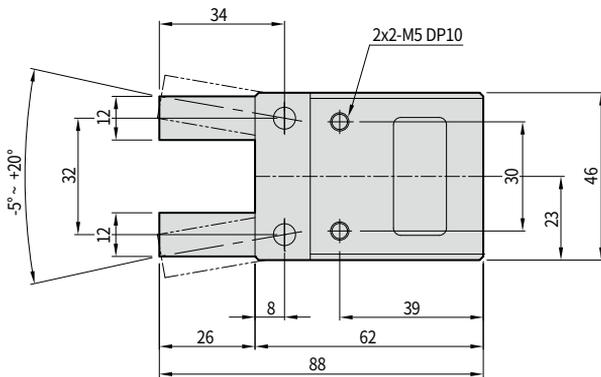
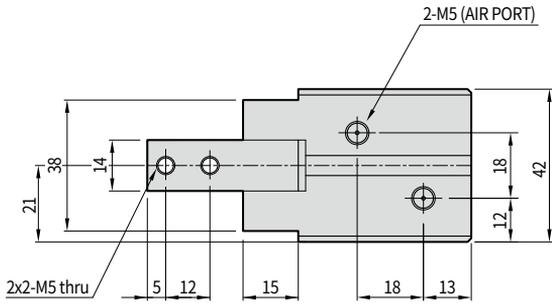
PH09-25



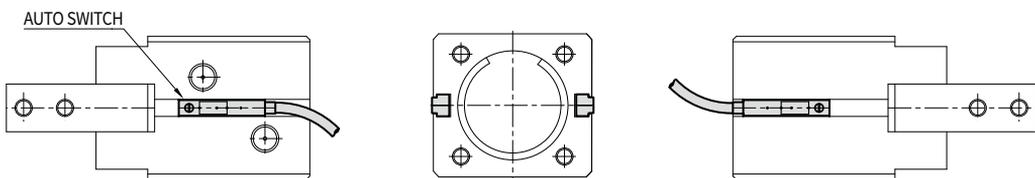
PH09-25 Example of Auto Switch installation



PH09-30



PH09-30 Example of Auto Switch installation



- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09**
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH09 Series

12

16

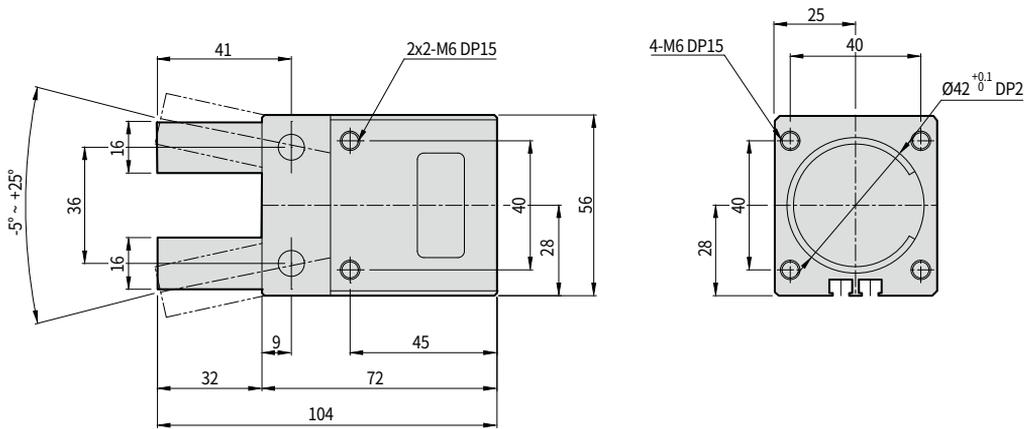
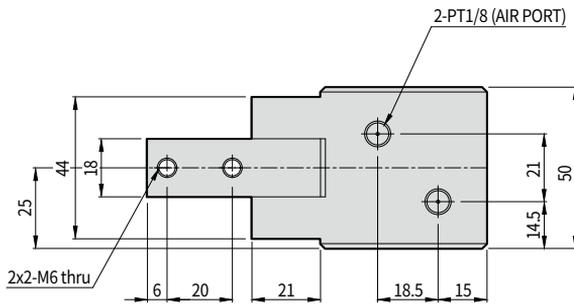
20

25

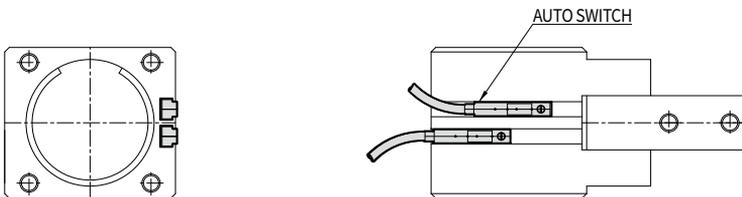
30

40

PH09-40



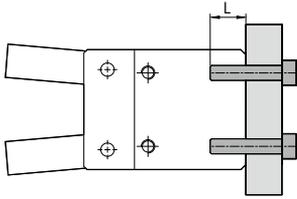
PH09-40 Example of Auto Switch installation



Installation Information

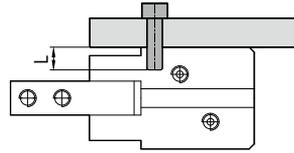
- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09**
- PH10
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

1. Installation by body tap holes



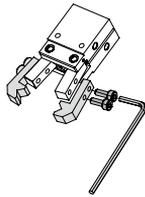
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH09-12	M3×P0.5	11	4
PH09-16	M4×P0.7	25	8
PH09-20	M4×P0.7	25	10
PH09-25	M5×P0.8	51	12
PH09-30	M5×P0.8	51	15
PH09-40	M6×P1	81	15

2. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH09-12	M3×P0.5	11	4
PH09-16	M4×P0.7	25	6
PH09-20	M4×P0.7	25	10
PH09-25	M5×P0.8	51	10
PH09-30	M5×P0.8	51	10
PH09-40	M6×P1	81	15

3. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)
PH09-12	M3×P0.5	11
PH09-16	M4×P0.7	25
PH09-20	M4×P0.7	25
PH09-25	M5×P0.8	51
PH09-30	M5×P0.8	51
PH09-40	M6×P1	81

GENERAL HAND / Parallel Operation

PH10 Series

Features

- Parallel operation by synchronized of Yoke structure.
- Usable to multi parallel position as cross operating motion.
- Various installation options. (3-Direction)
- Auto Switch installation. (Optional)



Order Form

PH10 - 12 - A2 L S

① ② ③ ④ ⑤

① Series Name

② Cylinder Bore Size and Stroke

Order	CYL Bore(mm)	Stroke(mm)
12	12	20
16	16	30
20	20	36

③ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
Blank		No Auto Switch provided							
A2	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2C	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
A2V	Magnetic reed switch	2-Wire	Ver	100V	24V	5~20mA	5~40mA	IP 67	1ms
B2	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms
B2B	Magnetic solid state	2-Wire	Horiz	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3B	Magnetic solid state	2-Wire	Ver	-	24V (10~28V)	-	Less than 50mA	IP 67	1ms
B3C	Magnetic solid state	3-Wire	Ver	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms

* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

④ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

⑤ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

Specification

HAND

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10**
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

Item Name		PH10-12	PH10-16	PH10-20
CYL Bore Size(mm)		12	16	20
Stroke(mm)		20	30	36
Effective Gripping Force(kgf) Air pressure : 5kgf/cm ² Note 3)	Close	3.2	5.5	9.4
	Open			
Fitting Size			M5	
Weight(kgf)		0.41	0.75	1.46
Max. Attachment L(mm)		60	70	90
Fluid		Clean Air Note 1)		
Pressure Range(kgf/cm ²)		3 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)		
Lubrication		Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)		
Temperature Range(°C)		5 ~ 60		
Repeat Accuracy(mm)		±0.1		
Max. Cycle Per Minute(C.P.M)		60		
Operation Type		Double Acting (Structure : Parallel operation by Yoke structure) (Guide : Metal Guide)		

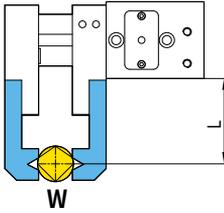
Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Gripping Force Graph (Close)

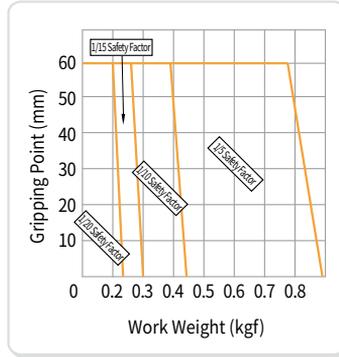
► Refer <GENERAL HAND Selection Guide> for how to read below graph.



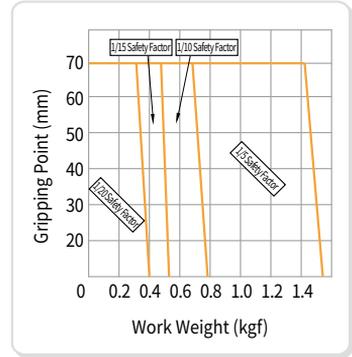
Close Grip State

W: Work Weight
L: Attachment Length

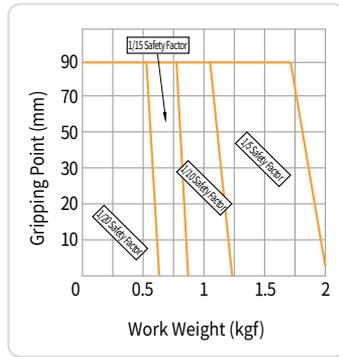
► PH10-12



► PH10-16



► PH10-20



▲ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

PH10 Series

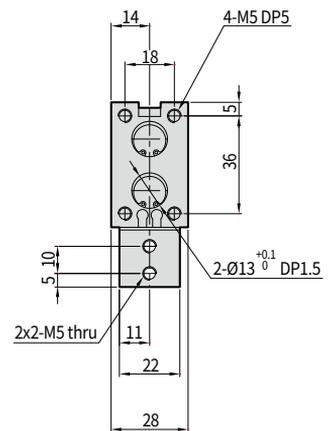
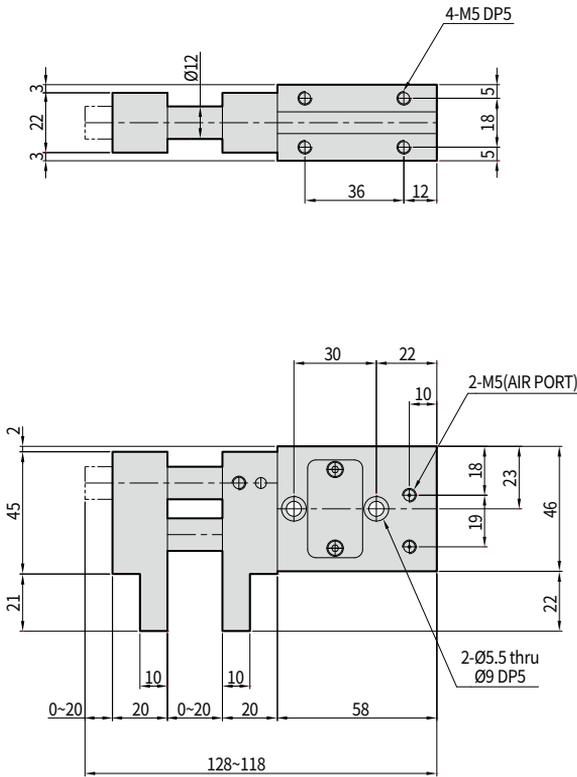
12

16

20

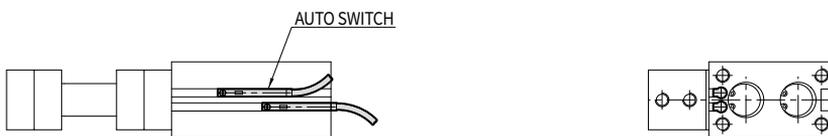
HAND

PH10-12

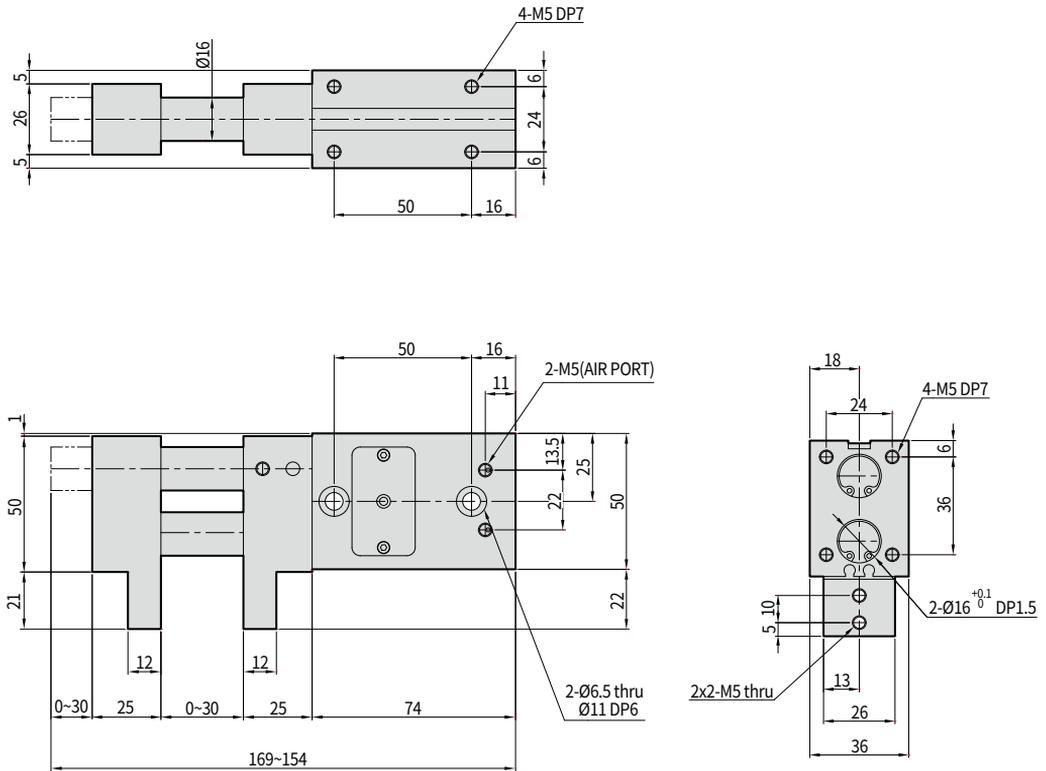


- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10**
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

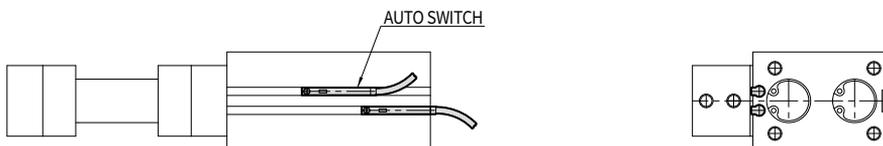
PH10-12 Example of Auto Switch installation



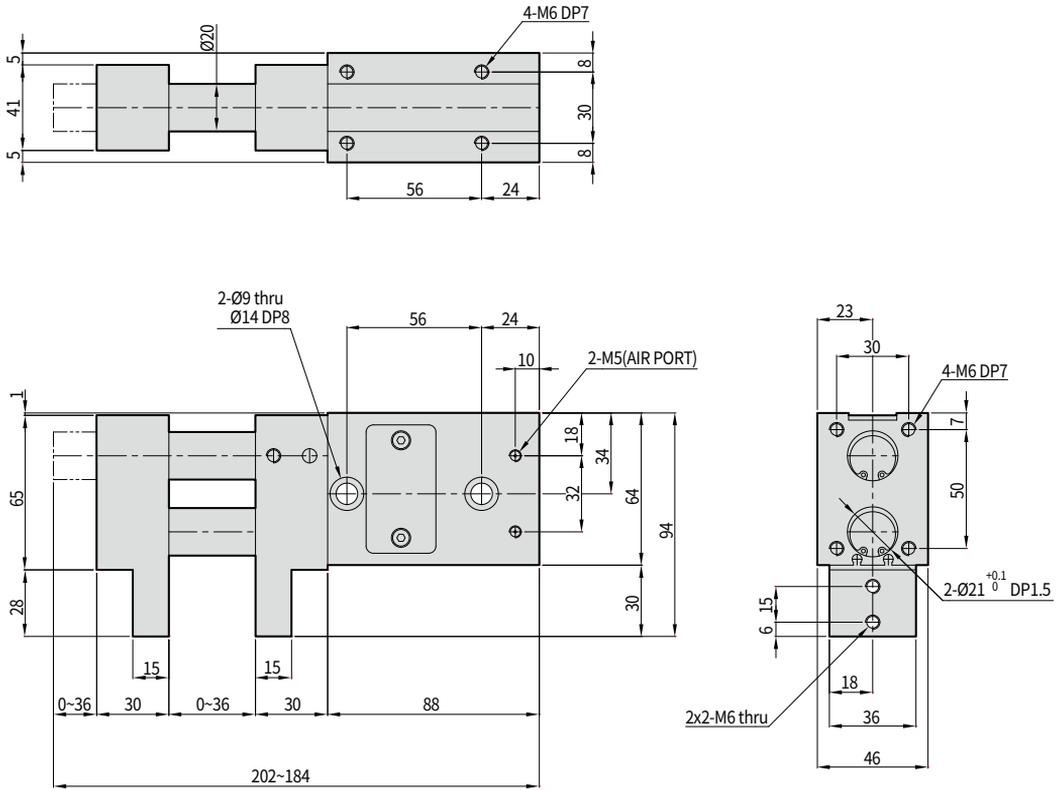
PH10-16



PH10-16 Example of Auto Switch installation

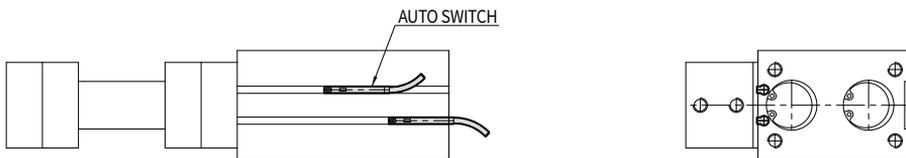


PH10-20

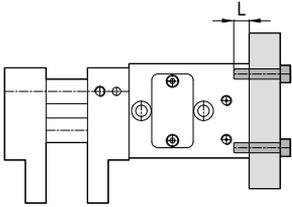


- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10**
- PH12
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

PH10-20 Example of Auto Switch installation

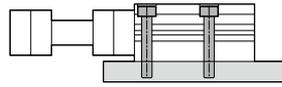


1. Installation by body tap holes



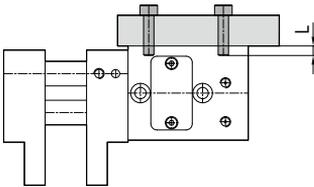
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH10-12	M5×P0.8	51	5
PH10-16	M5×P0.8	51	7
PH10-20	M6×P1	81	7

2. Installation by body through holes



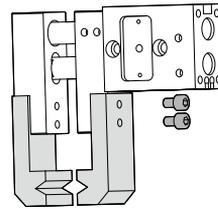
Item	Fastening Bolt	Max Torque (kgf-cm)
PH10-12	M5×P0.8	51
PH10-16	M6×P1	81
PH10-20	M8×P1.25	157

3. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH10-12	M5×P0.8	51	5
PH10-16	M5×P0.8	51	7
PH10-20	M6×P1	81	7

4. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)
PH10-12	M5×P0.8	51
PH10-16	M5×P0.8	51
PH10-20	M6×P1	81

MEMO

Handwriting practice area consisting of 25 horizontal dotted lines.

HAND

PH01-A
PH01-D
PH01-G
PH01J-C
PH01K
PH02
PH02-H
PH04
PH05
PH06
PH06-L
PH06-L2
PH07
PH08
PH09
PH10
PH12
PH14-S
PH14-CL
PH14-CF
PH15-S
PH15-CL
PH15-CF
PH15-W
PH21
PH22
PH23
PH25
PH32
PHC

GENERAL HAND / Parallel Operation

PH12 Series

Features

- Parallel operation by Crank Lever.
- High precise cross roller guide application.
- Extended stroke range.
- Auto Switch installation. (Optional)



Order Form

PH12 - 20 - A1 L S

① ② ③ ④ ⑤

① Series Name

② Cylinder Bore Size and Stroke

Order	CYL Bore(mm)	Stroke(mm)
20	20	16
25	25	30
40	40	41

③ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage		Current		Protect Level	Operation Time
		Wires	Direction	AC	DC	AC	DC		
Blank		No Auto Switch provided							
A1	Magnetic reed switch	2-Wire	Horiz	100V	24V	5~20mA	5~40mA	IP 67	1ms
B1	Magnetic solid state	3-Wire	Horiz	-	24V (5~28V)	-	Less than 50mA	IP 67	1ms

④ Auto Switch Cable Length

Order	Cable Length
Blank	1M
L	3M

⑤ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

Specification

HAND

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12**
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

Item Name		PH12-20	PH12-25	PH12-40
CYL Bore Size(mm)		20	25	40
Stroke(mm)		16	30	41
Effective Gripping Force(kgf)	Close	9.5	13.1	34.2
	Open	11.3	15.6	40.7
Air pressure : 5kgf/cm ² Note 3)				
Fitting Size		M5		PT1/8
Weight(kgf)		0.35	0.7	1.5
Max. Attachment L(mm)		50	60	80
Max. Attachment H(mm) Note 4)		25	30	40
Fluid		Clean Air Note 1)		
Pressure Range(kgf/cm ²)		1.5 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)		
Lubrication		Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)		
Temperature Range(°C)		5 ~ 60		
Repeat Accuracy(mm)		±0.01	±0.03	
Max. Cycle Per Minute(C.P.M)		100	80	
Operation Type		Double Acting (Structure : Parallel operation by Crank Lever) (Guide : Cross Roller Guide)		
Tolerance of Stroke(mm)		Open : -0.5 ~ +1		
		Close : -1 ~ +0.5		

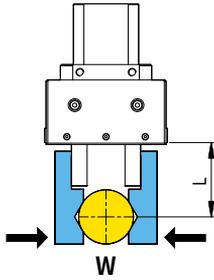
Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) The position of the effective gripping force point is the end point of the Master Jaw.

Note 4) For Max. Attachment L and H, please refer <GENERAL HAND Model Selection Guide>. (it is permitted length for 5kgf/cm² pressure applied)

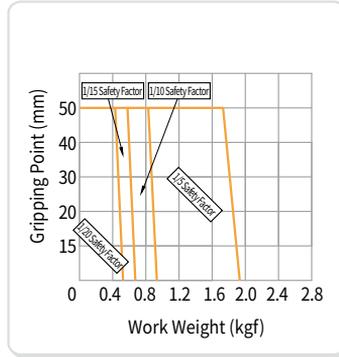
► Refer <GENERAL HAND Selection Guide> for how to read below graph.



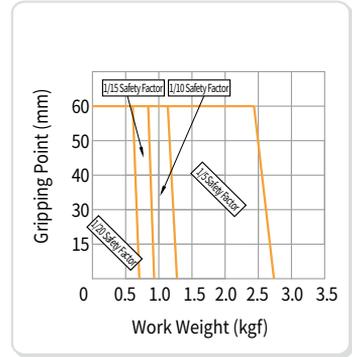
Close Grip State

W: Work Weight
L: Attachment Length

► PH12-20



► PH12-25



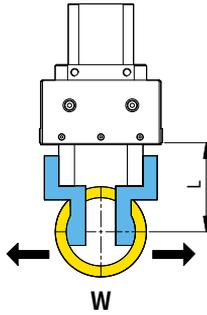
► PH12-40



▲ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it with the maximum attachment length which specified.

Gripping Force Graph (Open)

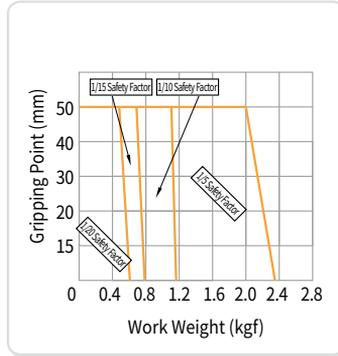
► Refer <GENERAL HAND Selection Guide> for how to read below graph.



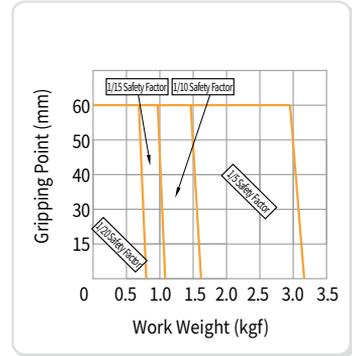
Open Grip State

W: Work Weight
L : Attachment Length

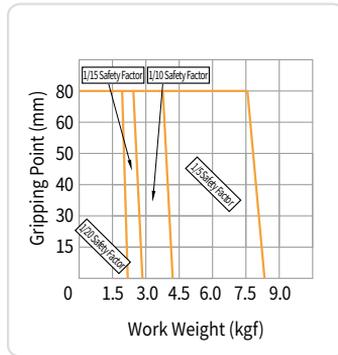
► PH12-20



► PH12-25



► PH12-40



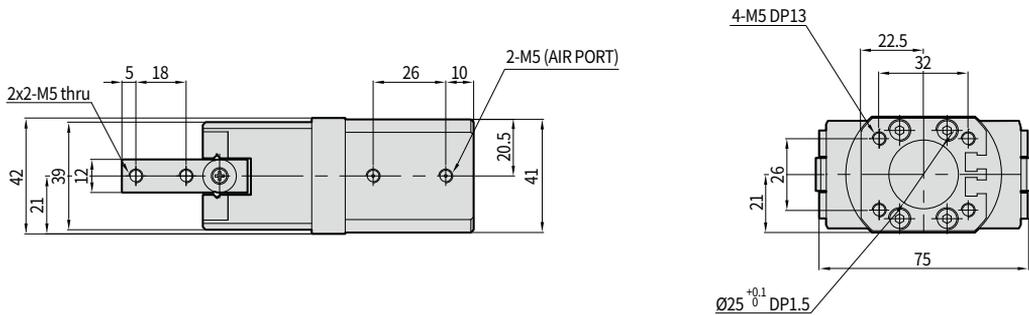
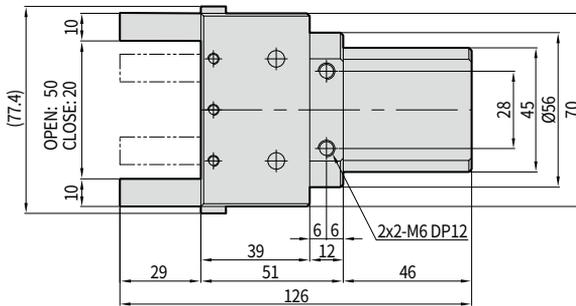
HAND

- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12**
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

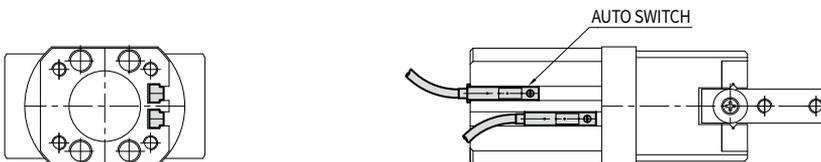
⚠ Caution If using the attachment length longer than maximum length as specified on the graph, it may have an adverse effect on the guide and caused a problem of durability. Please use it within the maximum attachment length which specified.

PH12-25

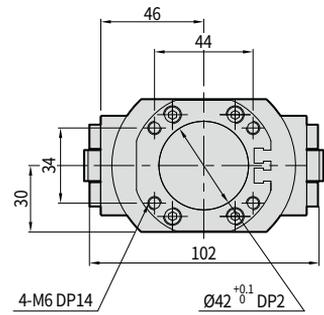
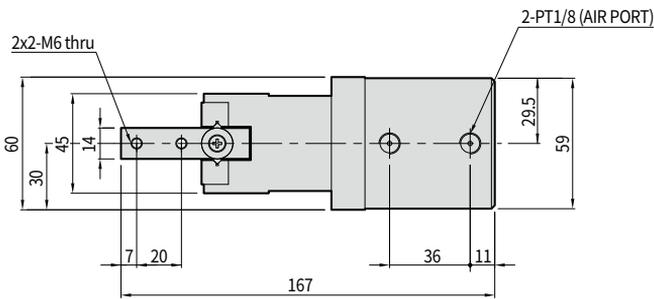
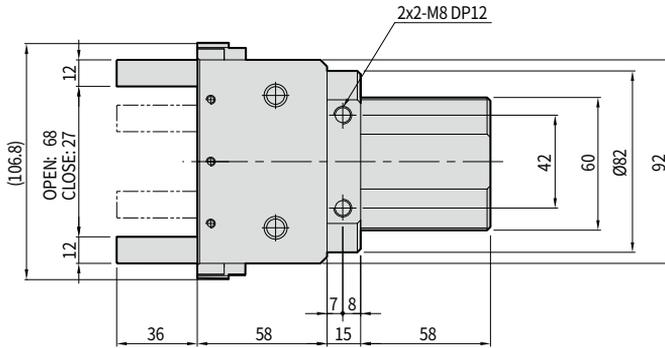
- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12**
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC



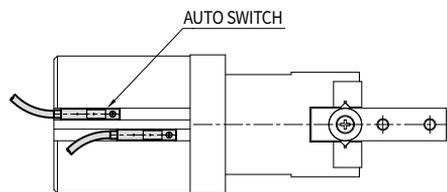
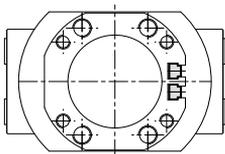
PH12-25 Example of Auto Switch installation



PH12-40



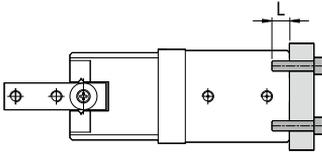
PH12-40 Example of Auto Switch installation



Installation Information

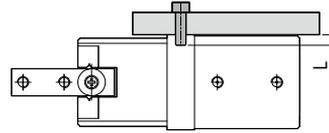
- PH01-A
- PH01-D
- PH01-G
- PH01J-C
- PH01K
- PH02
- PH02-H
- PH04
- PH05
- PH06
- PH06-L
- PH06-L2
- PH07
- PH08
- PH09
- PH10
- PH12**
- PH14-S
- PH14-CL
- PH14-CF
- PH15-S
- PH15-CL
- PH15-CF
- PH15-W
- PH21
- PH22
- PH23
- PH25
- PH32
- PHC

1. Installation by body tap holes



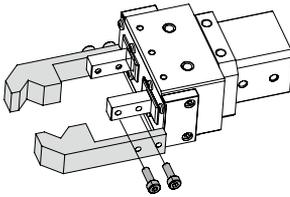
Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH12-20	M5×P0.8	51	10
PH12-25	M5×P0.8	51	13
PH12-40	M6×P1	81	14

2. Installation by body tap holes



Item	Fastening Bolt	Max Torque (kgf-cm)	Max Bolt Length L (mm)
PH12-20	M5×P0.8	51	12
PH12-25	M6×P1	81	12
PH12-40	M8×P1.25	157	12

3. Attachment installation



Item	Fastening Bolt	Max Torque (kgf-cm)
PH12-20	M4×P0.7	25
PH12-25	M5×P0.8	51
PH12-40	M6×P1	81

PH14 Series

**Enlarged products lineup
by release of Family products!**

New Product



**New products line up
PH14-C series!**

PH14-CL Series

Enhanced gripping force and keep on gripping function from spring inside.
(* Optional)

Dual Source

Compressed Air + Spring Force

Spring Inside →



PH14-CF Series

Adjustment of Crank Lever ratio for enhancement of gripping force
41% increased gripping force compare with PH14-S Series

Features of PH14 Series



PH14-S Series

- Solid structure of Wedge Plunger
- Stable gripping status without backlash
- Option for high temperature condition



PH14-CL Series

NEW

- Smooth and stable operation with Crank Lever structure
- Compatible for PH14-S series
- Keep on gripping function by spring inside
- Option for secondary battery manufacturing conditions
- Option for high temperature condition



PH14-CF Series

NEW

- Smooth and stable operation with Crank Lever structure
- Dimensional compatibility with PH14-S
- Average +41% enhanced gripping force compare with PH14-S models
 - ※ Reduced stroke compare with PH14-S models
- Option for secondary battery manufacturing conditions
- Option for high temperature condition

Model	Stroke (mm)			Close Gripping Force (kgf)			Open Gripping Force (kgf)		
	PH14-S	PH14-CL	PH14-CF	PH14-S	PH14-CL	PH14-CF	PH14-S	PH14-CL	PH14-CF
30	8	8	6	19.1	20.5	27.3	21.5	23	30.7
40	12	12	10	34.2	42.9	49.9	38.2	47.2	54.9
50	14	14	12	54.8	68.9	77	59.8	76.7	85.8
60	16	16	14	81.5	103	115	86.5	111	124
80	20	20	17	148	173	208	162	184	221
100	26	26	21	235	261	326	243	278	348
125	32	32	25	369	411	514	378	436	545

Parallel operation General Hand by Wedge Plunger

PH14-S Series

Ultra slim type General Hand overcome the limitation of height



Various options for environmental

- Option for high temperature condition.
- Application of Viton seal for high temperature condition.

+60 °C

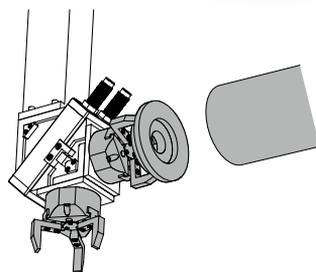
Standard



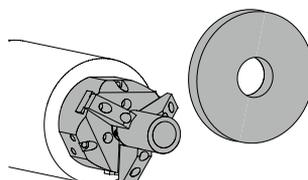
+180 °C

High temperature option

Application 1



Application 2



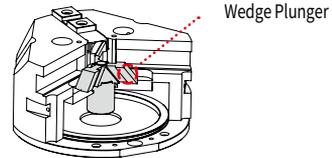
Reduced height → Slim and light

- Superior space utility by dramatically reduced height.
- Stable gripping status.
- Combined with the swivel unit (ASU Series), it is suitable for configuring a loader for CNC lathes.



Wedge Plunger structure

- Compact size and large gripping force.
- Stable workpiece gripping status without backlash of Master Jaw.



Center Pusher (Optional)

- Shock absorption and positioning when gripping workpiece.
- Push to lathe chuck when releasing workpiece.

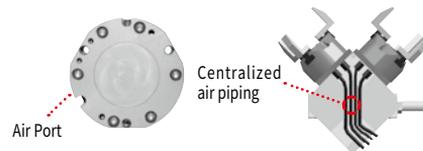


Available for "CP" option

※ The center pusher can be purchased and installed separately.

Bottom Air Port (Optional)

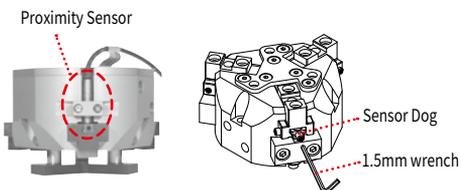
- Convenience on side space by positioning side air port to bottom.
- Suitable for centralized air piping combination with Swivel Unit or Rotary cylinder.



Available for "AP" option

Auto Switch installation (Optional)

- Proximity Sensor applicable.
- Easy sensing position control, even though the product is installed.



High solidity structure with Metal Guide inside

- Sliding type guide with "T-Shape", improved allowable moment.
- Reduced malfunction caused from external dust or cutting oils.



GENERAL HAND / Parallel Operation

PH14-S Series

Features

- Parallel operation circular shape by Wedge Plunger structure.
- Powerful gripping force from stable structure.
- Compact size and light weight.
- Center Pusher for pushing workpiece. (Optional)
- Easy centralized piping with bottom air port. (Optional)
- High temperature condition for heat resistance seals. (Optional)
- Auto Switch installation. (Optional)



Order Form

PH14 - 60S - □ - P S - PNP - AP - CP

①

②

③

④

⑤

⑥

⑦

⑧

① Series Name

② Cylinder Bore Size and Stroke

Order	CYL Bore(mm)	Stroke(mm)
30S	30	8
40S	40	12
50S	50	14
60S	60	16
80S	80	20
100S	100	26
125S	125	32

③ Special Option

Order	Special Option
Blank	Standard
V	High temperature condition

* For high temperature option, normal Auto Switch is not available.

④ Auto Switch Specification

Order	Sensing Type	Cable Spec		Voltage DC	Current	Body Length	Sensing Distance	Frequency	Protect Level
		Wires	Direction						
Blank		No Auto Switch provided							
P	Proximity	3-Wire	Horiz	10~30V	Max 200mA	32mm	1mm ± 10%	800Hz	IP 67
P2	Proximity	3-Wire	Horiz	10~30V	Max 200mA	16mm	1mm ± 10%	800Hz	IP 67

* "P" could be projected from main body. (P2 is recommended)

⑤ Auto Switch Quantity

Order	Quantity
Blank	2PCS
S	1PCS

⑥ Auto Switch Output

Order	Output
Blank	NPN
PNP	PNP

⑦ Air Port Option

Order	Air Port Option
Blank	Standard (Side position)
AP	Additional air port on bottom

* For AP option selection, side air port will be supplied with plugged.

⑧ Center Pusher

Order	Center Pusher
Blank	Non-Mounted
CP	Mounted