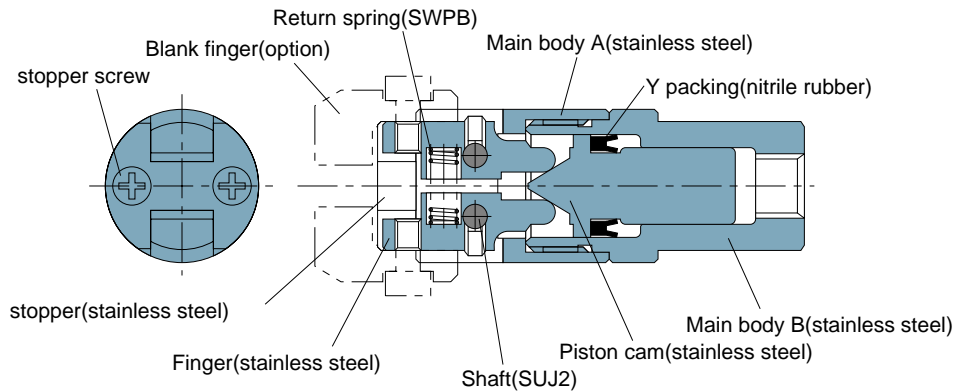


Normally Open, Single Acting Lever Gripper Closing Gripper Series

Features

- These are stainless steel air finger models featuring light weight and miniature size.
- Blank fingers are provided for the K type fingers. R adjustment leaves no possibility of misalignment. The blank finger can be attached to the K type finger with a single screw.
- Stable gripping is assured by a work stopper. The floating type makes more effective use of the work stopper, and prevents damage due to bumping. (finger type: K)

Construction



Specification

Cylinder bore	φ8mm	φ11mm
Gripping force at *7.1psi fingers in parallel	0.022lbf (0.1N)	0.061lbf (0.27N)
Service pressure range	28.4~100psi (0.2~0.7MPa)	
Service temperature range	32~140°F(0~60°C) (No freezing)	
Lubrication	Not required	

*500kPa

Model Designation(Example)

CHM (1) **08** (2) **A** (3) **A** (4) **K** (5)

(1) Type

(2) Cylinder bore

Code	08	11
Bore	φ8mm (0.31in.)	φ11mm (0.43in.)

(3) Gripper action
A : Single-action closing gripper(normally open)

(4) Holder type

A shank type	B panel mount type	C Floating panel mount type Fingers in parallel	D Floating panel mount type Fingers at right angle	E Floating block type Fingers in parallel	F Floating block type Fingers at right angle

(5) Finger type
K : R-adjustment single screw installation type(Blank fingers provided)
*Work stopper is provided as a standard feature.
Remove it if it is not necessary.
S : Two screw installation type

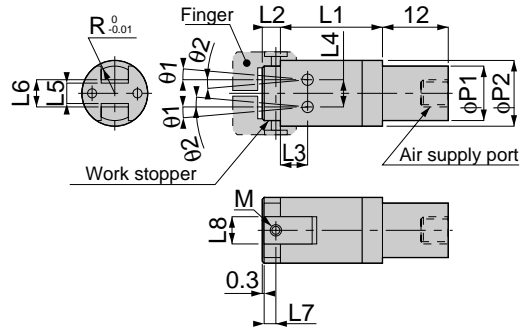
 Detailed Safety Instructions

Before using the PISCO device, be sure to read the "Safety Instructions", "Common Safety Instructions for Products Listed in This Manual" on pages 23~24 and "Common Safety Instructions for Actuators" on page 518 and "Common Safety Instructions for Lever Grippers" on page 519.

Actuator Series Closing Gripper Series



Shank Type



unit:mm

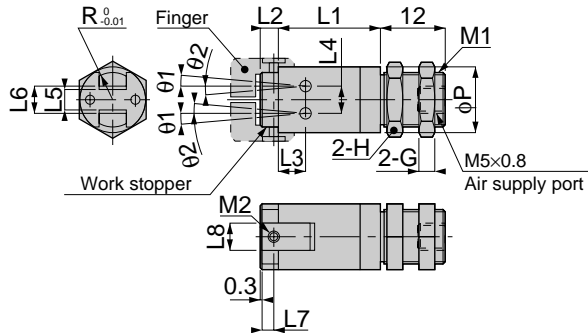
Model	M	R	L1	L2	L3	L4	L5	L6	L7	L8	φP1	φP2	θ1	θ2	Mass (g)
CHM 08AAK	M2×0.4	R5	19.5	3	5	5	4	5	2	5	10	12	10°	4.5°	21.5
CHM 11AAK	M2.5×0.45	R6.5	23.5	4	5.5	6	4.5	6	2.5	7	12	16	8°	4.5°	41



1



Panel Mount Type



unit:mm

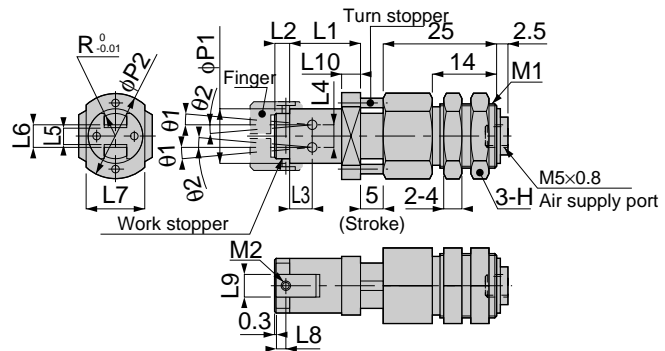
Model	M1	M2	R	L1	L2	L3	L4	L5	L6	L7	L8	φP	θ1	θ2	H	G	Mass (g)
CHM 08ABK	M10×1	M2×0.4	R5	19.5	3	5	5	4	5	2	5	12	10°	4.5°	12	3	22
CHM 11ABK	M12×1	M2.5×0.45	R6.5	23.5	4	5.5	6	4.5	6	2.5	7	16	8°	4.5°	14	4	43.5



1



Floating Panel Mount Type Fingers in Parallel



unit:mm

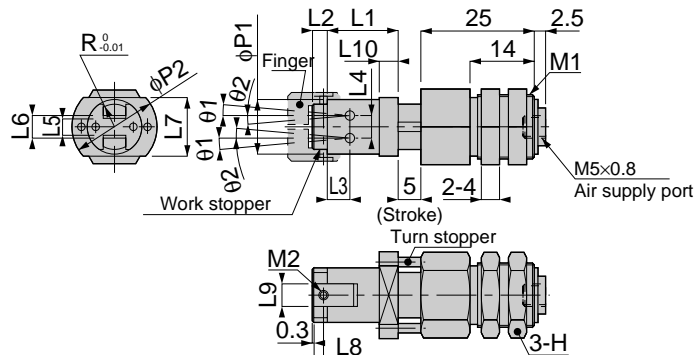
Model	M1	M2	R	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	φP1	φP2	θ1	θ2	H	Mass (g)
CHM 08ACK	M14×1	M2×0.4	R5	15.5	3	5	5	4	5	13	2	5	4	12	19	10°	4.5°	17	58
CHM 11ACK	M18×1	M2.5×0.45	R6.5	18.5	4	5.5	6	4.5	6	17	2.5	7	5	16	24	8°	4.5°	22	104.5



1



Floating Panel Mount Type Fingers at Right Angle



unit:mm

Model	M1	M2	R	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	φP1	φP2	θ1	θ2	H	Mass (g)
CHM 08ADK	M14×1	M2×0.4	R5	15.5	3	5	5	4	5	13	2	5	4	12	19	10°	4.5°	17	58
CHM 11ADK	M18×1	M2.5×0.45	R6.5	18.5	4	5.5	6	4.5	6	17	2.5	7	5	16	24	8°	4.5°	22	104.5

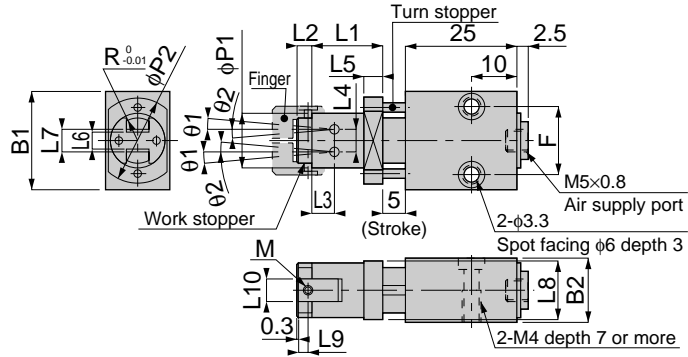


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Actuator Series Closing Gripper Series

CHM A K

Floating Block Type
Fingers in Parallel



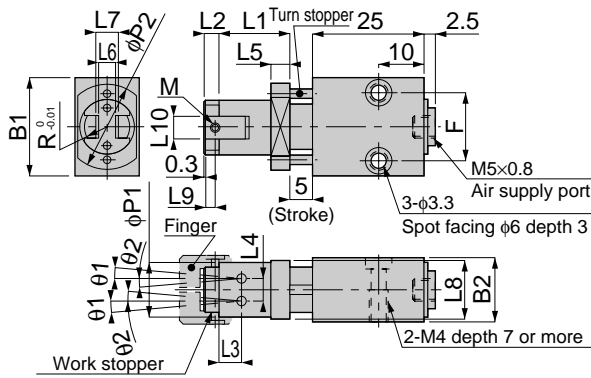
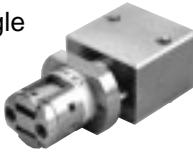
Model	M	R	B1	B2	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	$\phi P1$	$\phi P2$	$\theta 1$	$\theta 2$	F	Mass (g)
CHM 08AEK	M2x0.4	R5	22	14	15.5	3	5	5	4	4	5	13	2	5	12	19	10°	4.5°	15	73
CHM 11AEK	M2.5x0.45	R6.5	25	18	18.5	4	5.5	6	5	4.5	6	17	2.5	7	16	24	8°	4.5°	18	117

unit:mm



CHM A K

Floating Block Type
Fingers at Right Angle



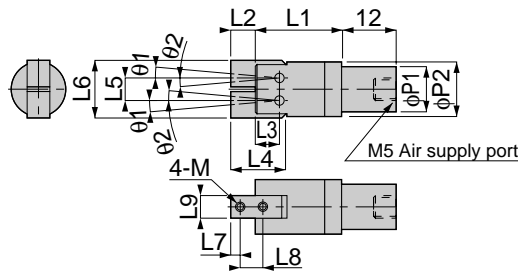
Model	M	R	B1	B2	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	$\phi P1$	$\phi P2$	$\theta 1$	$\theta 2$	F	Mass (g)
CHM 08AFK	M2x0.4	R5	22	14	15.5	3	5	5	4	4	5	13	2	5	12	19	10°	4.5°	15	73
CHM 11AFK	M2.5x0.45	R6.5	25	18	18.5	4	5.5	6	5	4.5	6	17	2.5	7	16	24	8°	4.5°	18	117

unit:mm



CHM A

Shank Type



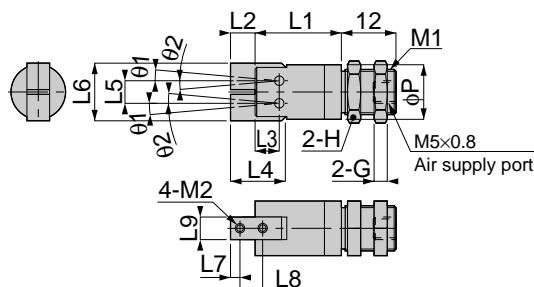
Model	M	L1	L2	L3	L4	L5	L6	L7	L8	L9	$\phi P1$	$\phi P2$	$\theta 1$	$\theta 2$	Mass (g)
CHM 08AAS	M2x0.4	19.5	5.5	5	12	5	13	2.5	5	5	10	12	10°	4.5°	22
CHM 11AAS	M2.5x0.45	23.5	7	5.5	14	6	17	3	6	7	12	16	8°	4.5°	43

unit:mm



CHM A

Panel Mount Type




Model	M1	M2	L1	L2	L3	L4	L5	L6	L7	L8	L9	ϕP	$\theta 1$	$\theta 2$	H	G	Mass (g)
CHM 08ABS	M10x1	M2x0.4	19.5	5.5	5	12	5	13	2.5	5	5	12	10°	4.5°	12	3	23.5
CHM 11ABS	M12x1	M2.5x0.45	23.5	7	5.5	14	6	17	3	6	7	16	8°	4.5°	14	4	45.5

unit:mm



Blank Finger

 Finger blank specifically designed for K type finger

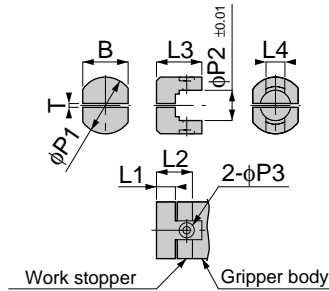
Features

- Accurate centering is realized by the R combination of the finger blank and the master fingers.
- Use the finger blank by forming it according to the shape of your work.
- Remove the work stopper when it is not necessary.
- Nitriding proves effective if the wear of the fingers is to be prevented.

*Finger material: SF20T (Cr19~21%, Mo5~2.5%)

CHM

Blank Finger



Unit : mm

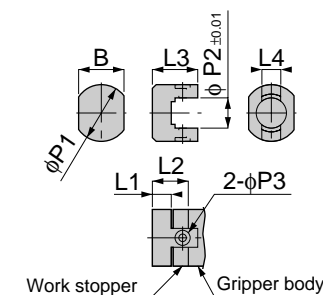
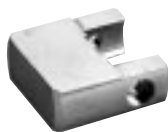
Type	B	L1	L2	L3	L4	T	φP1	φP2	φP3	Mounting screw (provided)	Applicable Gripper	Mass (g)
CHM 08AK11	6	5	8	11.5	5	1	15	10	2.1	Hex Socket Head Cap Screws M2×4/2pieces	CHM 08A□K Type	4
CHM 08AK12		10	13	16.5								7
CHM 08AK13	12	5	8	11.5								6.5
CHM 08AK14		10	13	16.5								12
CHM 08AK15	16	5	8	11.5								11.5
CHM 08AK16		10	13	16.5								22
CHM 11AK11	8	6	10	14.5	7	2	20	13	2.6	Hex Socket Head Cap Screws M2.5×5/2pieces	CHM 11A□K Type	8
CHM 11AK12	12	16	20.5	14.5								
CHM 11AK13	16	6	10	14.5								12.5
CHM 11AK14		12	16	20.5								24



1

CHM

Slotless Solid Blank



Unit : mm

Type	B	L1	L2	L3	L4	φP1	φP2	φP3	Mounting screw (provided)	Applicable Gripper	Mass (g)
CHM 08AK01	6	5	8	11.5	5	15	10	2.1	Hex Socket Head Cap Screws M2×4/2pieces	CHM 08A□K Type	4.5
CHM 08AK02		10	13	16.5							7.5
CHM 08AK03	12	5	8	11.5							7
CHM 08AK04		10	13	16.5							13
CHM 08AK05	16	5	8	11.5							12.5
CHM 08AK06		10	13	16.5							23
CHM 11AK01	8	6	10	14.5	7	20	13	2.6	Hex Socket Head Cap Screws M2.5×5/2pieces	CHM 11A□K Type	8.5
CHM 11AK02	12	16	20.5	16							
CHM 11AK03	16	6	10	14.5							14
CHM 11AK04		12	16	20.5							29



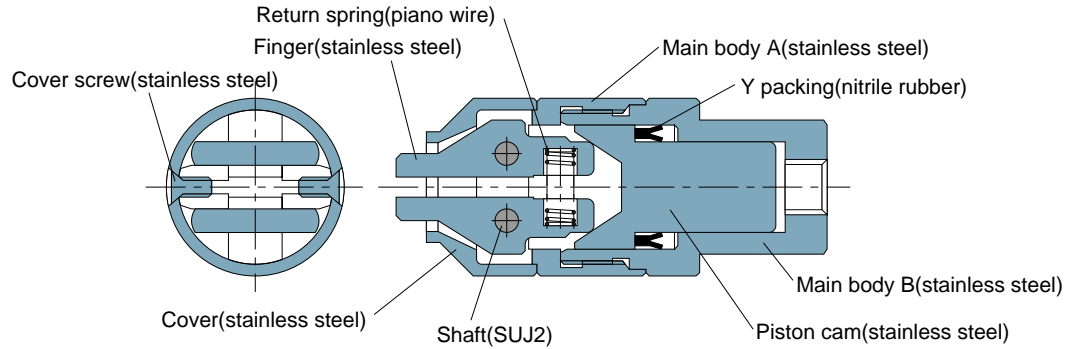
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Normally Closed, Single Acting Lever Gripper Opening Gripper Series

Features

- This is another series of stainless steel air gripper models featuring light weight and miniature size.
- No dedicated fingers are necessary for works of simple shapes.
- The work stopper assures stable gripping.
- The floating type makes more effective use of the work stopper, and prevents damage due to bumping.

Construction



Specification

Cylinder bore	φ8mm(0.31in.)	φ11mm(0.43in.)
Gripping force at 0.5MPa fingers in parallel	0.022lbf (0.1N)	0.061lbf (0.27N)
Service pressure range	28.4~100psi (0.2~0.7MPa)	
Service temperature range	32~140°F(0~60°C) (No freezing)	
Lubrication	Not required	

Model Designation(Example)

Model Designation: **CHM 08 B A 06 H**

(1) Type
(2) Cylinder bore
(3) Gripper action
(4) Holder type
(5) Finger size
(5) Finger type

Code	08	11
Bore	φ8mm(0.31in.)	φ11mm(0.43in.)

B : Single-acting opening Gripper(normally closed)

H : For work with round hole
C : For work with groove

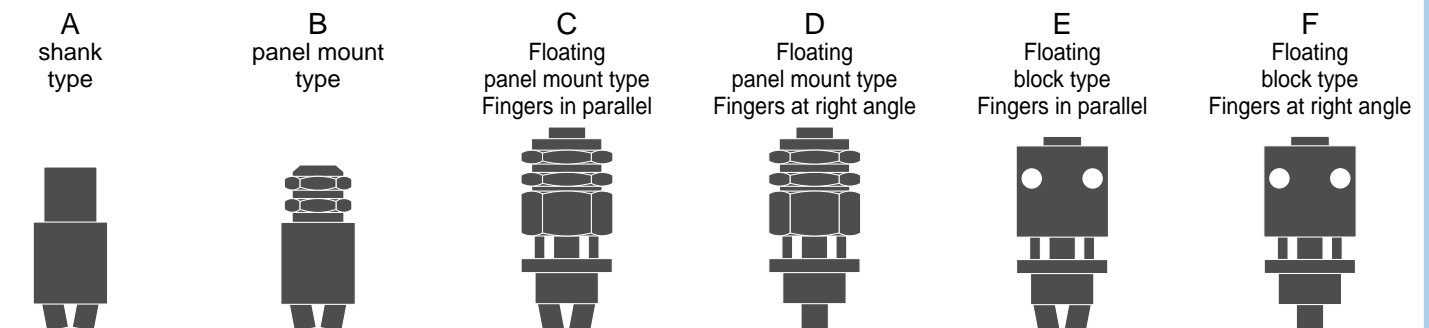
*Seeing the table below, select fingers of form and size appropriate to work.

■ Finger H Type (Work with round hole)

Code	02	03	04	06	08	10	12
Hole dia.	(mm)	φ2~3	φ3~4	φ4~6	φ6~8	φ8~10	φ10~12
	(inch)	0.08-0.12	0.12-5/32	5/32-0.24	0.24-0.31	0.31-0.39	0.39-0.47

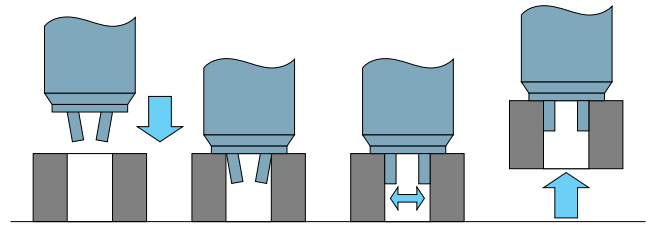
■ Finger C Type (Work with Groove hole)

Code	03	05	06	07	08	10	12
Groove dimension	(mm)	3~5	5~7	6~8	7~9	8~10	10~12
	(inch)	0.12-0.2	0.2-0.28	0.24-0.31	0.28-0.35	0.31-0.39	0.39-0.47



Application example of work stopper

- For stable work transport, grip the work with the work stopper held in contact with it. In this state, light press-fitting can also be accomplished.
- When the cylinder thrust is too large or unstable, use of the floating-type holder will achieve stable gripping.

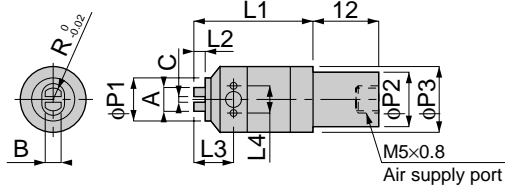


⚠ Detailed Safety Instructions

Before using the PISCO device, be sure to read the "Safety Instructions", "Common Safety Instructions for Products Listed in This Manual" on pages 23~24 and "Common Safety Instructions for Actuators" on page 518 and "Common Safety Instructions for Lever Grippers" on page 519.

CHM B

Shank Type

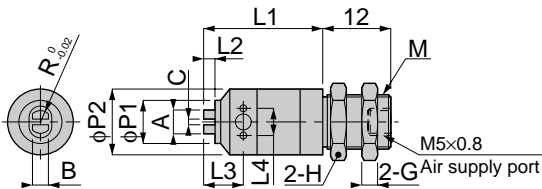


unit:mm

Model	Work size	R	A	B	L1	L2	L3	L4	φP1	φP2	φP3	C	Mass (g)	
CHM 08BA03C	Groove width 3-5	-	3	3	22	2	7.5	5	8	10	12	1	18	
CHM 08BA05C	Groove width 5-7		5	4		3			10				18.5	
CHM 08BA07C	Groove width 7-9		7	4		4			12				18.5	
CHM 08BA02H	Hole φ2~3	R1	2	1.6	22	1	7.5	5	5	10	12	0.5	18	
CHM 08BA03H	Hole φ3~4	R1.5	3	2		1.5			6				18.5	
CHM 08BA04H	Hole φ4~6	R2	4	3		2			8				18	
CHM 08BA06H	Hole φ6~8	R3	6	4	22	3	7.5	5	10	10	12	1	18	
CHM 08BA08H	Hole φ8~10	R4	8			4			12				18.5	
CHM 11BA06C	Groove width 6-8	-	6			6			28				4	10
CHM 11BA08C	Groove width 8-10		8	6	5		14	37.5						
CHM 11BA10C	Groove width 10-12		10	6	6		16	38						
CHM 11BA12C	Groove width 12-14		12	6	28	6	10	6	16	12	16	1.5	38	
CHM 11BA06H	Hole φ6~8	R3	6	4	28	3	10	6	10	12	16	1.5	37	
CHM 11BA08H	Hole φ8~10	R4	8	4		12			37					
CHM 11BA10H	Hole φ10~12	R5	10	6		5			14				37.5	
CHM 11BA12H	Hole φ12~14	R6	12	6	28	6	10	6	16	12	16	1.5	38	

CHM B

Panel Mount Type



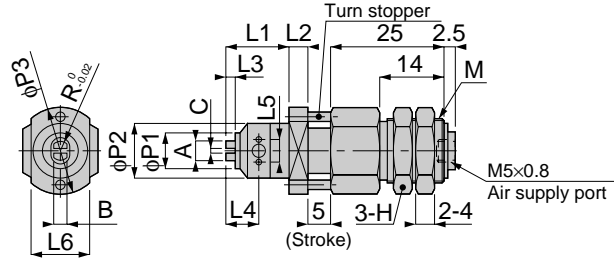
unit:mm

Model	Work size	M	R	A	B	L1	L2	L3	L4	φP1	φP2	C	H	G	Mass (g)	
CHM 08BB03C	Groove width 3-5	M10×1	-	3	3	22	2	7.5	5	8	12	1	12	3	19.5	
CHM 08BB05C	Groove width 5-7			5	4		3			10						
CHM 08BB07C	Groove width 7-9			7	4		4			12						
CHM 08BB02H	Hole φ2~3	M10×1	R1	2	1.6	22	1	7.5	5	5	12	0.5	12	3	19.5	
CHM 08BB03H	Hole φ3~4		R1.5	3	2		1.5			6						
CHM 08BB04H	Hole φ4~6		R2	4	3		2			8						
CHM 08BB06H	Hole φ6~8	M10×1	R3	6	4	22	3	7.5	5	10	12	1	12	3	20	
CHM 08BB08H	Hole φ8~10		R4	8			4			12						20
CHM 11BB06C	Groove width 6-8		M12×1	-			6			6						28
CHM 11BB08C	Groove width 8-10	8			6	5	14	40								
CHM 11BB10C	Groove width 10-12	10			6	6	16	40.5								
CHM 11BB12C	Groove width 12-14		12	6	28	6	10	6	16	16	1.5	14	4	40.5		
CHM 11BB06H	Hole φ6~8	M12×1	R3	6	4	28	3	10	6	10	16	1.5	14	4	39.5	
CHM 11BB08H	Hole φ8~10		R4	8	6		4			12					40	
CHM 11BB10H	Hole φ10~12		R5	10	6		5			14					40.5	
CHM 11BB12H	Hole φ12~14	R6	12	6	28	6	10	6	16	16	1.5	14	4	40.5		

Actuator Series Opening Gripper Series

CHM B

Floating Panel Mount Type
Fingers in Parallel



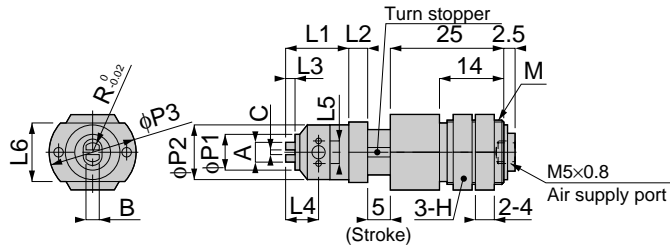
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Model	Work size	M	R	A	B	L1	L2	L3	L4	L5	L6	φP1	φP2	φP3	C	H	Mass (g)	
CHM 08BC03C	Groove width 3-5	M14x1	-	3	3	14	4	2	7.5	5	13	8	12	19	1	17	70.5	
CHM 08BC05C	Groove width 5-7			5	4			3				10						
CHM 08BC07C	Groove width 7-9			7	4			4				12						
CHM 08BC02H	Hole φ2~3		R1	2	1.6			5				0.5						
CHM 08BC03H	Hole φ3~4		R1.5	3	2			6				1						
CHM 08BC04H	Hole φ4~6		R2	4	3			8				1						
CHM 08BC06H	Hole φ6~8		R3	6	4			10				1						
CHM 08BC08H	Hole φ8~10		R4	8	4			12				1						
CHM 11BC06C	Groove width 6-8	M18x1	-	6	6	18	5	4	10	6	17	12	16	24	1.5	22	113	
CHM 11BC08C	Groove width 8-10			8				6				5					14	113.5
CHM 11BC10C	Groove width 10-12			10				6				6					16	114
CHM 11BC12C	Groove width 12-14		12	6				6				16					114	
CHM 11BC06H	Hole φ6~8		R3	6				4				10					113	
CHM 11BC08H	Hole φ8~10		R4	8				4				12					113	
CHM 11BC10H	Hole φ10~12		R5	10				6				14					113.5	
CHM 11BC12H	Hole φ12~14		R6	12				6				16					114	



CHM B

Floating Panel Mount Type
Fingers at Right Angle



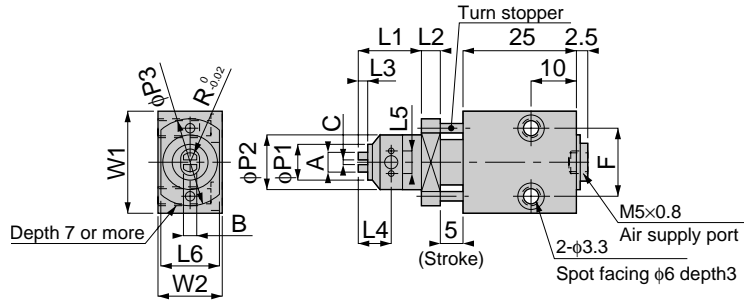
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Model	Work size	M	R	A	B	L1	L2	L3	L4	L5	L6	φP1	φP2	φP3	C	H	Mass (g)	
CHM 08BD03C	Groove width 3-5	M14x1	-	3	3	14	4	2	7.5	5	13	8	12	19	1	17	70.5	
CHM 08BD05C	Groove width 5-7			5	4			3				10						
CHM 08BD07C	Groove width 7-9			7	4			4				12						
CHM 08BD02H	Hole φ2~3		R1	2	1.6			5				0.5						
CHM 08BD03H	Hole φ3~4		R1.5	3	2			6				1						
CHM 08BD04H	Hole φ4~6		R2	4	3			8				1						
CHM 08BD06H	Hole φ6~8		R3	6	4			10				1						
CHM 08BD08H	Hole φ8~10		R4	8	4			12				1						
CHM 11BD06C	Groove width 6-8	M18x1	-	6	6	18	5	4	10	6	17	12	16	24	1.5	22	113	
CHM 11BD08C	Groove width 8-10			8				6				5					14	113.5
CHM 11BD10C	Groove width 10-12			10				6				6					16	114
CHM 11BD12C	Groove width 12-14		12	6				6				16					114	
CHM 11BD06H	Hole φ6~8		R3	6				4				10					113	
CHM 11BD08H	Hole φ8~10		R4	8				4				12					113	
CHM 11BD10H	Hole φ10~12		R5	10				6				14					113.5	
CHM 11BD12H	Hole φ12~14		R6	12				6				16					114	



CHM_B

Floating Block Type
Fingers in Parallel



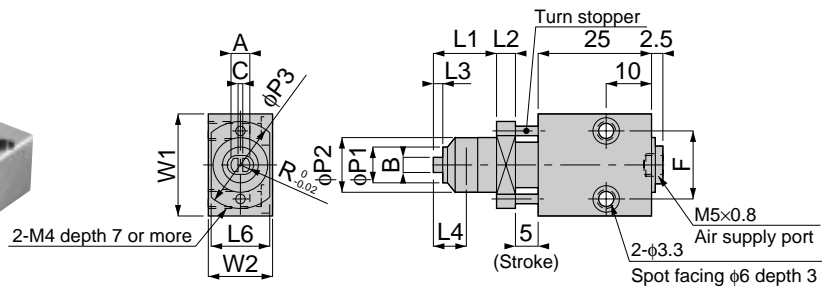
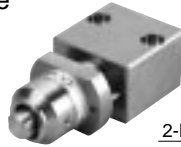
unit:mm

Model	Work size	R	A	B	L1	L2	L3	L4	L5	L6	W1	W2	φP1	φP2	φP3	C	F	Mass (g)
CHM 08BE03C	Groove width 3-5	-	3	3	14	4	2	7.5	5	13	22	14	8	12	19	0.5	15	48.5
CHM 08BE05C	Groove width 5-7		5	4			3						10					
CHM 08BE07C	Groove width 7-9		7	4			4						12					
CHM 08BE02H	Hole φ2~3	R1	2	1.6	14	4	1	7.5	5	13	22	14	5	12	19	0.5	15	48.5
CHM 08BE03H	Hole φ3~4	R1.5	3	2			1.5						6					
CHM 08BE04H	Hole φ4~6	R2	4	3			2						8					
CHM 08BE06H	Hole φ6~8	R3	6	4	14	4	3	7.5	5	13	22	14	10	12	19	1	15	48.5
CHM 08BE08H	Hole φ8~10	R4	8				4						12					
CHM 11BE06C	Groove width 6-8	-	6	6			18						5					
CHM 11BE08C	Groove width 8-10		8		5	14		100.5										
CHM 11BE10C	Groove width 10-12		10		6	16		101										
CHM 11BE12C	Groove width 12-14		12		6	18		100.5										
CHM 11BE06H	Hole φ6~8	R3	6	4	18	5	3	10	6	17	25	18	10	16	24	1.5	18	100.5
CHM 11BE08H	Hole φ8~10	R4	8	4			12											
CHM 11BE10H	Hole φ10~12	R5	10	6			14						101					
CHM 11BE12H	Hole φ12~14	R6	12	6	18	5	6	17	25	18	25	18	16	24	1.5	18	101	



CHM_B

Floating Block Type
Fingers at Right Angle



unit:mm

Model	Work size	R	A	B	L1	L2	L3	L4	L5	L6	W1	W2	φP1	φP2	φP3	C	F	Mass (g)
CHM 08BF03C	Groove width 3-5	-	3	3	14	4	2	7.5	5	13	22	14	8	12	19	0.5	15	48.5
CHM 08BF05C	Groove width 5-7		5	4			3						10					
CHM 08BF07C	Groove width 7-9		7	4			4						12					
CHM 08BF02H	Hole φ2~3	R1	2	1.6	14	4	1	7.5	5	13	22	14	5	12	19	0.5	15	48.5
CHM 08BF03H	Hole φ3~4	R1.5	3	2			1.5						6					
CHM 08BF04H	Hole φ4~6	R2	4	3			2						8					
CHM 08BF06H	Hole φ6~8	R3	6	4	14	4	3	7.5	5	13	22	14	10	12	19	1	15	48.5
CHM 08BF08H	Hole φ8~10	R4	8				4						12					
CHM 11BF06C	Groove width 6-8	-	6	6			18						5					
CHM 11BF08C	Groove width 8-10		8		5	14		100.5										
CHM 11BF10C	Groove width 10-12		10		6	16		101										
CHM 11BF12C	Groove width 12-14		12		6	18		100.5										
CHM 11BF06H	Hole φ6~8	R3	6	4	18	5	3	10	6	17	25	18	10	16	24	1.5	18	100.5
CHM 11BF08H	Hole φ8~10	R4	8	4			12											
CHM 11BF10H	Hole φ10~12	R5	10	6			14						101					
CHM 11BF12H	Hole φ12~14	R6	12	6	18	5	6	17	25	18	25	18	16	24	1.5	18	101.5	

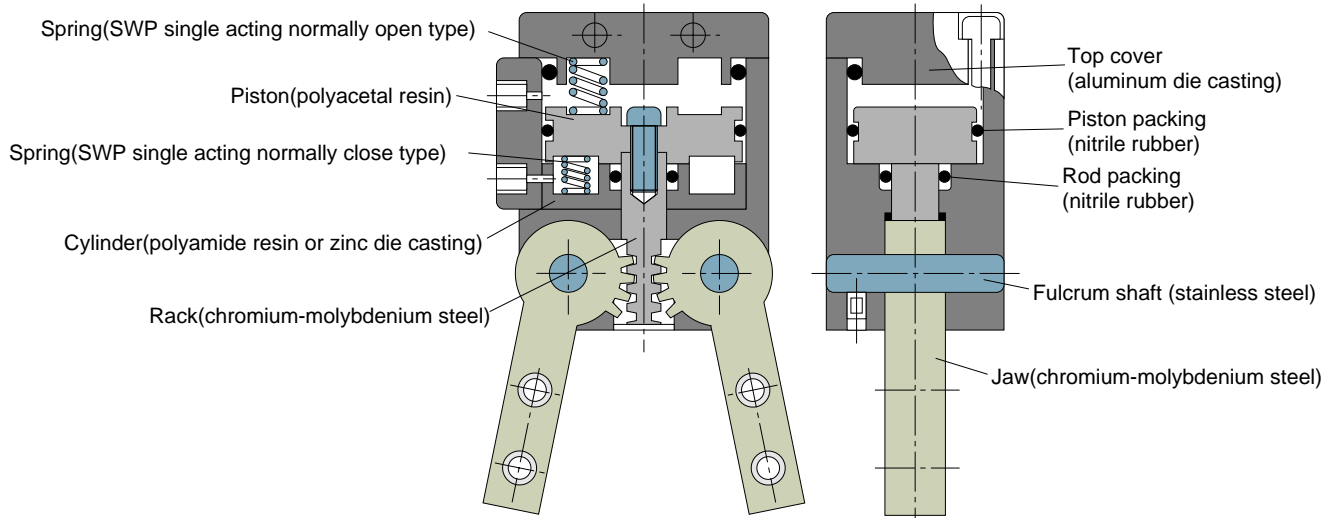


Lever Type Gripper

Features

- Space saving, light-weight, and high cycling are achieved by compact oval cylinder.
- Plastic type is light-weight and die casting type is superior in durability.
- Due to side-sliding of proximity switch, adjustment to work piece enables operation or clamping to be confirmed by LED lightening (sensor type).
- Production of attachment is not necessary since finger tool is provided (finger tool type).

Construction



Gripper specification

Type	HC 15□P	HC 20□P	HC 20□D	HC 30□D
Operation type	Double acting, single acting			
Fluid admitted	compressed air (no lubrication)			
Service pressure range	28.4~85.2psi (0.2~0.6MPa)		28.4~100psi (0.2~0.7MPa)	
Service temperature range	14~140°F (-10~60°C)			
Port size	M5×0.8			
Cylinder cross sectional area	0.33in. ² (2.1cm ²)	0.67in. ² (4.3cm ²)	1.36in. ² (8.8cm ²)	
Repeated accuracy	±0.1 (Center of Jaw)			
Max-operation cycle	100 C.P.M.			

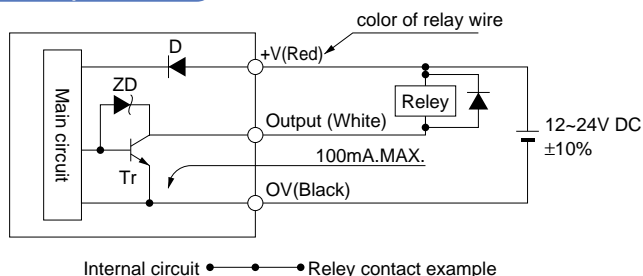
Option

Type	HC 15□P	HC 20□P	HC 20□D	HC 30□D
Mounting bracket (B)	○	○	—	—
Sensor (S)	○	○	○	○

Sensor specification

Power supply	12~24V DC
Power consumption	15mA or below
Output	NPN Transistor Open collector Max. input current 100mA Input voltage 30V DC or below
Operation indicator	Red LED (light up when Output is ON)
Operation ambient temperature	14~131°F (-10~+55°C)
Cable	0.08SQ 3 wire 1m

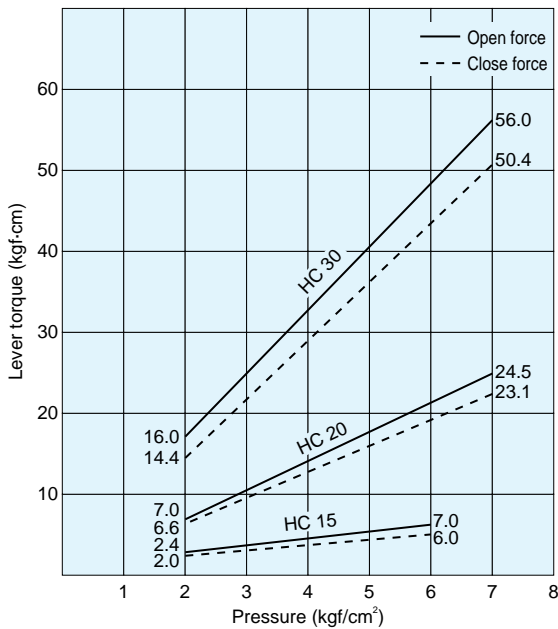
Input / Output circuit



Code

- D : protection diode for reversed power supply
- ZD : Zener diode for surge voltage absorption
- Tr : output transistor

Selection



Lever torque (theoretical value)

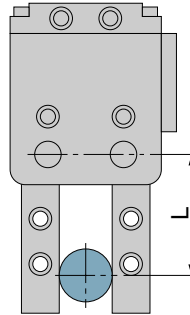
Theoretical grip force can be calculated by the following formula.

$$F = \frac{M}{L}$$

F : Theoretical grip force (kgf)

M : Lever torque(kgf-cm)

L : Distance between jaw fulcrum to grip point (cm)



Caution) The graph represents theoretical calculations. Actual grip force varies according to the material and shapes of work pieces and fingers. The standard grip force is 40 to 60% of the theoretical value.

Model designation (Example)

HC 15 A P -S
(1) (2) (3) (4)

(1) Cylinder cross sectional area

Code	15	20	30
Cylinder cross sectional area	0.33in. ² (2.1cm ²)	0.67in. ² (4.3cm ²)	1.36in. ² (8.8cm ²)

(2) Operation type

Code	A	B	C
Operation type	Double acting	Single acting normally open	Single acting normally closed

(3) Body material

Code	P	D
Body material	Plastic	Die casting

(4) Option

Code	B	S
Option	With bracket	With sensor

*Enter only when necessary.

Model designation of finger tool type (Example)

HC 20B P -S
(1) (2)

(1) Body material

Code	P	D
Body material	Plastic	Die casting

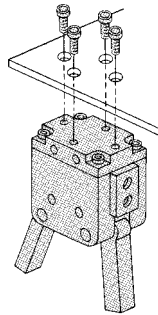
(2) Option

Code	B	S
Option	With bracket	With sensor

*Enter only when necessary.

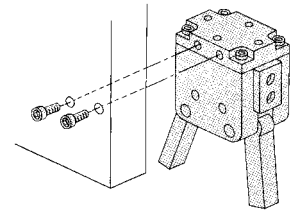
Mounting of gripper

(1) Mount on the top of gripper



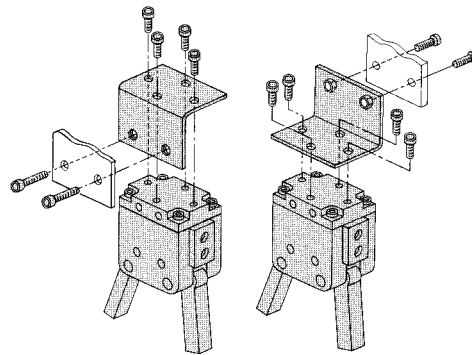
possible for all types

(2) Mount from the side of plastic body type gripper



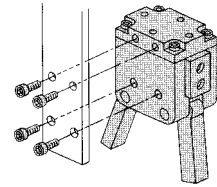
HC 15□P-HC 20□P

(3) Use of mounting bracket (option)



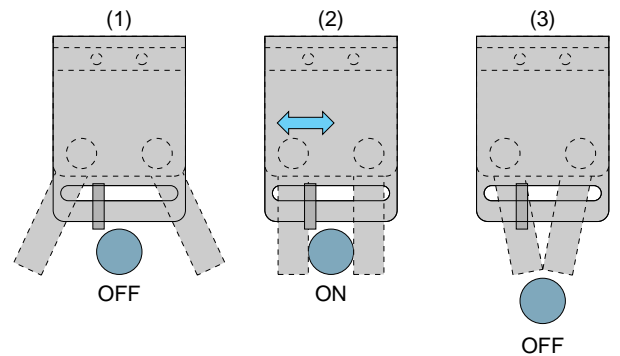
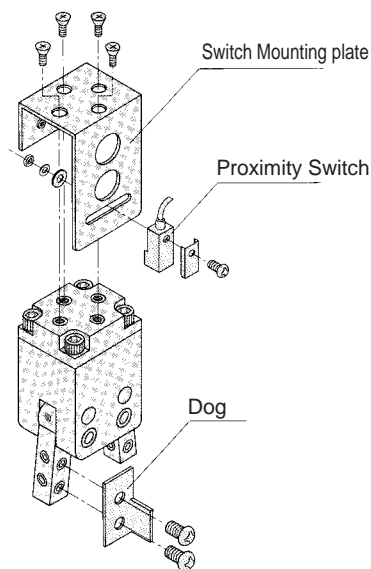
HC 15□P-HC 20□P

(4) Mount from the side of die casting body type gripper



HC 20□D-HC 30□D

Mounting and adjustment of sensor



The sensor can be slid in the direction of the arrow. Adjust the location of the sensor so that the sensor is turned OFF in the state (1) and (3) and turned ON in the state (2)

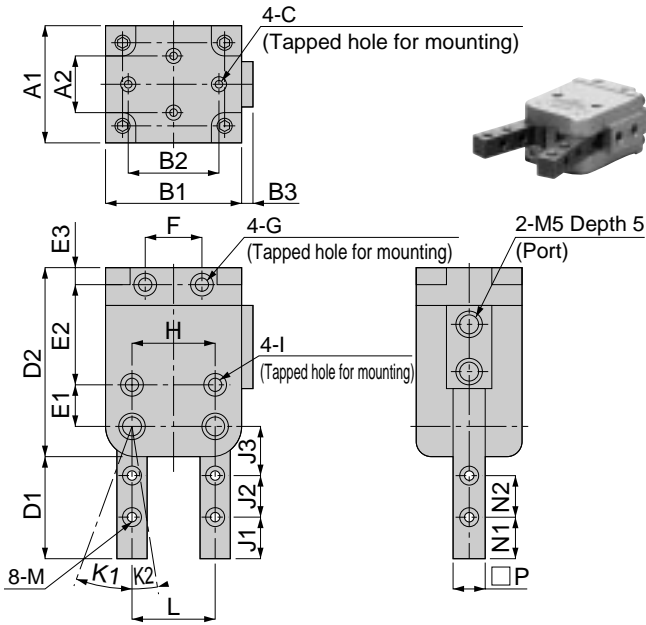
⚠ Safety instruction

1. Use clean and low moisture air as supply air to the grippers.
2. Making clamping of gripper as slow and gentle as possible yields accurate motion and stable cycling.
3. Avoid lateral loading to the jaw during operation.
4. Attach light-weight and short finger tool to the jaw.

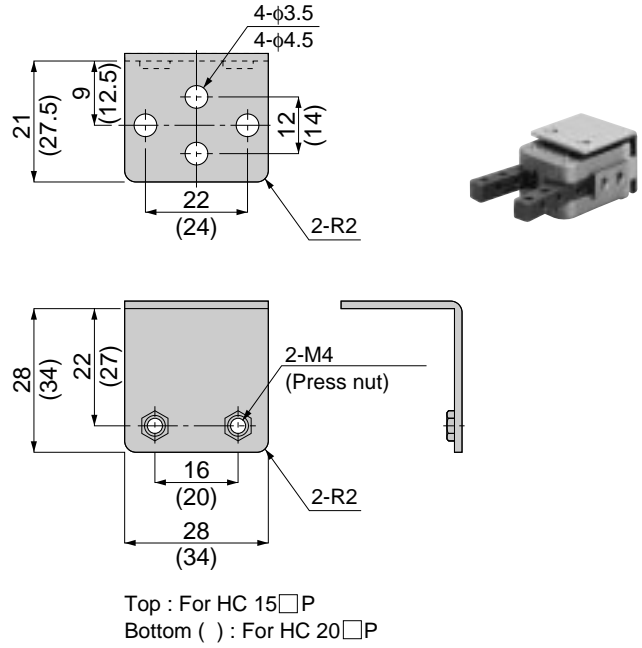
HC 15-20-30

Lever Type Gripper

Main body



Bracket

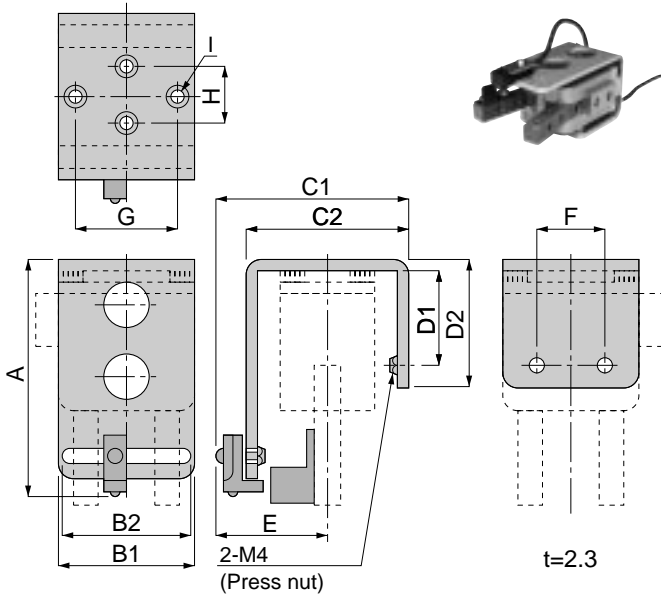


unit:mm

Model	A1	A2	B1	B2	B3	C	D1	D2	E1	E2	E3	F	G	H	I	J1	J2	J3	K1	K2	L	M	N1	N2	□P	Mass (g)
HC 15□P	19	12	28	22	5	M3(Depth5)	20	35.5	8.5	19	3	12	M3(Depth8)	16	-	3	8	14	15°	10°	16	M3(Through)	7	8	6 ^{-0.05} _{-0.10}	50
HC 20□P	25	14	34	24	3	M4(Depth6)	24.5	45	10	23.5	4	14	M4(Depth8)	20	-	5	10	17	8°	8°	23	M4(Through)	10	10	8 ^{-0.05} _{-0.10}	105
HC 20□D	24														M4(Depth15)											180
HC 30□D	32	22	52	42	2	M5(Depth6.5)	34	55	12	28	4	22	M5(Depth15)	30	M5(Depth6)	6	16	23	19°	10°	30	M6(Through)	12	16	12 ^{-0.05} _{-0.10}	450

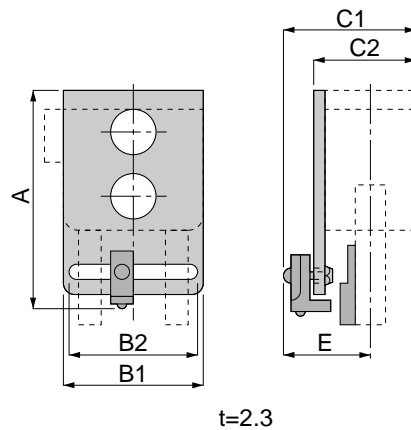
HC 15-20

Lever Type Gripper with Sensor 15-20 Type



HC 30

Lever Type Gripper with Sensor 30 Type



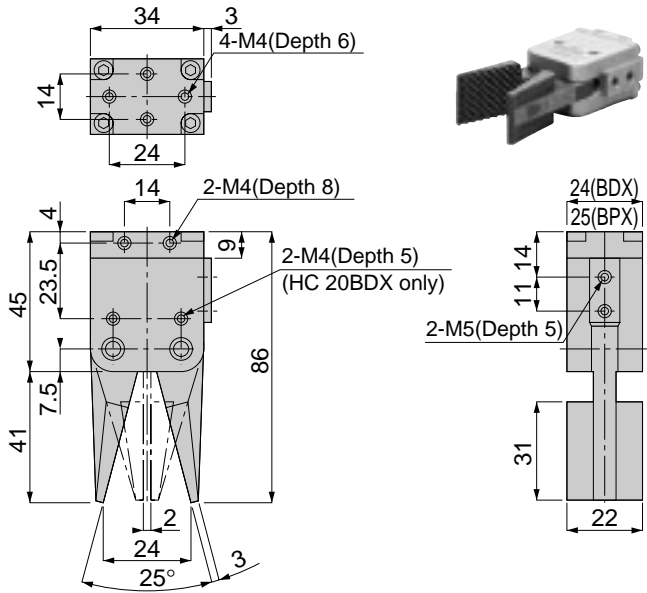
unit:mm

Model	A	B1	B2	C1	C2	D1	D2	E	F	G	H	I
HC 15□P-S	59	28	21	37	30	22	30	22	16	22	12	4-φ3.2 φ6 Counter sinking
HC 20□P-S	70	34	25	43	36	27	35	25	20	24	14	4-φ4.2 φ8 Counter sinking
HC 20□D-S	68			33	26	-	-					
HC 30□D-S	86	52	45	51	34	-	-	26	-	-	-	-

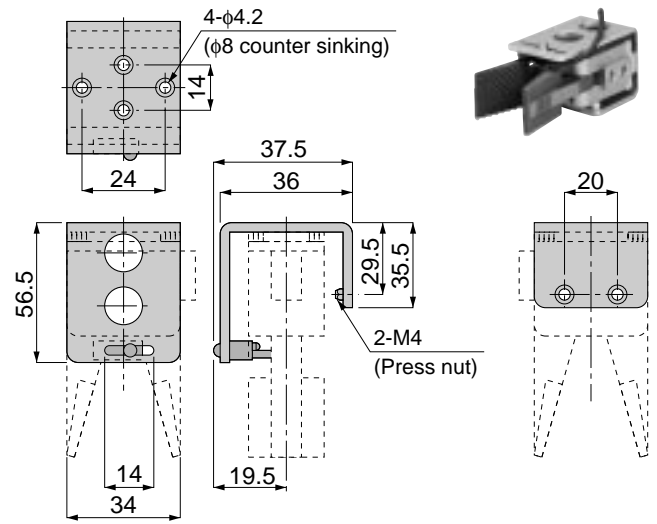
HC
20

Lever Type Gripper
with Figer Tool 20 Type

Main body



With Sensor



Note 1. Mounting bracket is available for only HC20BPX as option.

Note 2. Weight: HC20BPX 150g, HC20BPX 225g

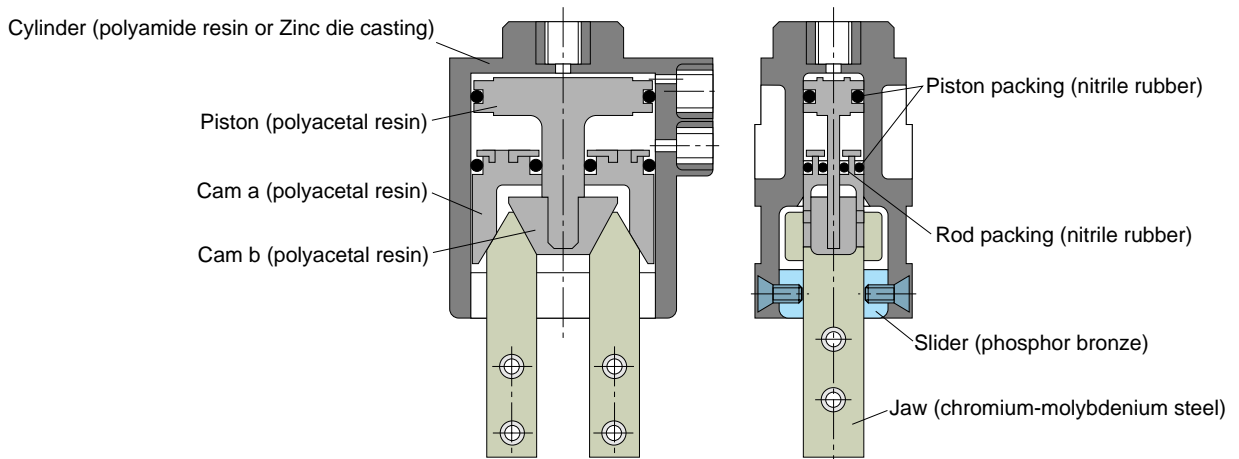
Note 3. The specifications, the internal structure,
and the measure with the sensor are the same as those of HC20BP and HC20BD.

Parallel Type Gripper

Features

- Space saving, light-weight, and high cycling are achieved by compact oval cylinder.
- Plastic type is light-weight and die casting type is superior in durability.
- Due to side-sliding of proximity switch, adjustment to work piece enables operation or clamping to be confirmed by LED lightening (sensor type).

Construction



Gripper specification

Type	HP 15P	HP 20P	HP 20D	HP 30D
Operation type	Double acting			
Fluid admitted	compressed air (no lubrication)			
Service pressure range	42.6~100psi (0.3~0.7MPa)	35.5~127.8psi (0.25~0.9MPa)		
Service temperature range	14~140°F (-10~60°C) (No freezing)			
Port size	M5×0.8			
Cylinder cross sectional area	0.26in. ² (1.7cm ²)	0.51in. ² (3.3cm ²)	1.12in. ² (7.2cm ²)	
Jaw opening range	0.11in. (1.7mm)	0.20in. (5mm)	0.35in. (8.8mm)	
Repeated accuracy	±0.05 (Center of Jaw)			
Max-operation cycle	100 C.P.M.			

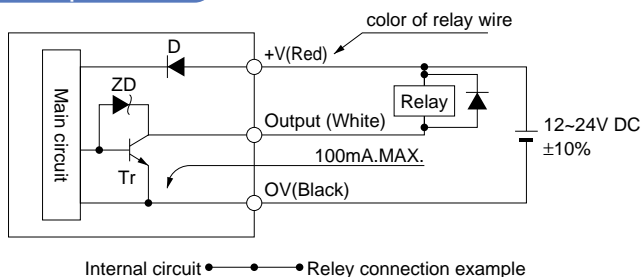
Option

Type	HC 15P	HC 20P	HC 20D	HC 30D
Mounting bracket (B)	○	○	—	—
Sensor (S)	○	○	○	○

Sensor specification

Power supply	12~24V DC
Power consumption	15mA or below
Output	NPN Transistor Open collector Max. input current 100mA Input voltage 30V DC or below
Operation indicator	Red LED(light up when Output is ON)
Operation ambient temperature	14~131°F (-10~+55°C)
Cable	0.08SQ 3 wire 1m

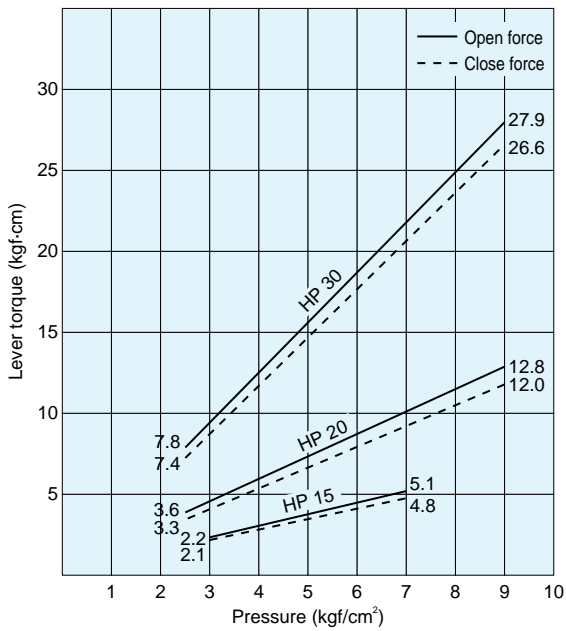
Input / Output circuit



Code

- D : protection diode for reversed power supply
- ZD : Zener diode for surge voltage absorption
- Tr : output transistor

Selection



Lever torque (theoretical value)

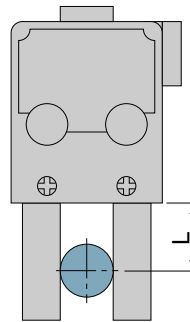
Theoretical grip force can be calculated by the following formula.

$$F = \frac{M}{L}$$

F : Theoretical grip force (kgf)

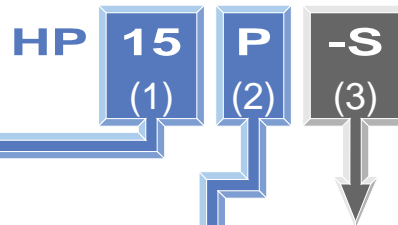
M : Lever torque(kgf-cm)

L : Distance between jaw fulcrum to grip point (cm)



Caution) The graph represents theoretical calculations. Actual grip force varies according to the material and shapes of work pieces and fingers. The standard grip force is 40 to 60% of the theoretical value.

Model designation (Example)



(1)Cylinder cross sectional area

Code	15	20	30
Cylinder cross sectional area	0.26in ² (1.7cm ²)	0.51in ² (3.3cm ²)	1.12in ² (7.2cm ²)

(3)Option

Code	B	S
Option	With bracket	With sensor

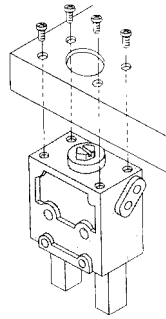
(2)Body material

Code	P	D
Body material	Plastic	Die casting

*Enter only when necessary.

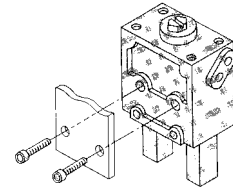
Mounting of gripper

(1) Mount on the top of gripper



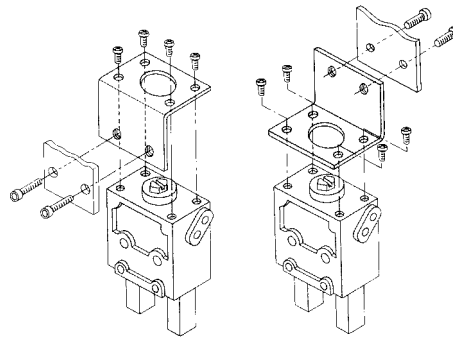
possible for all Grippers

(2) Mount from the side of die casting body type gripper



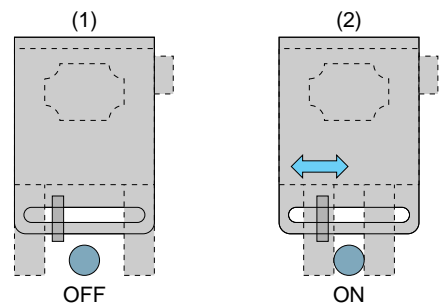
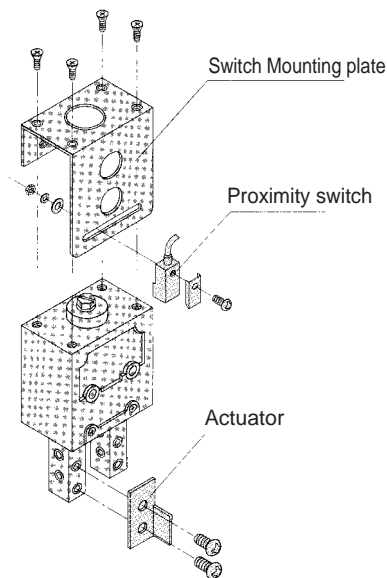
HC 20D-HC 30D

(3) Use of mounting bracket (option)



HC 15P-HC 20D

Mounting and adjustment of sensor



The sensor can be slid in the direction of the arrow. Adjust the location of the sensor so that the sensor is turned OFF in the state (1) and turned ON in the state (2).

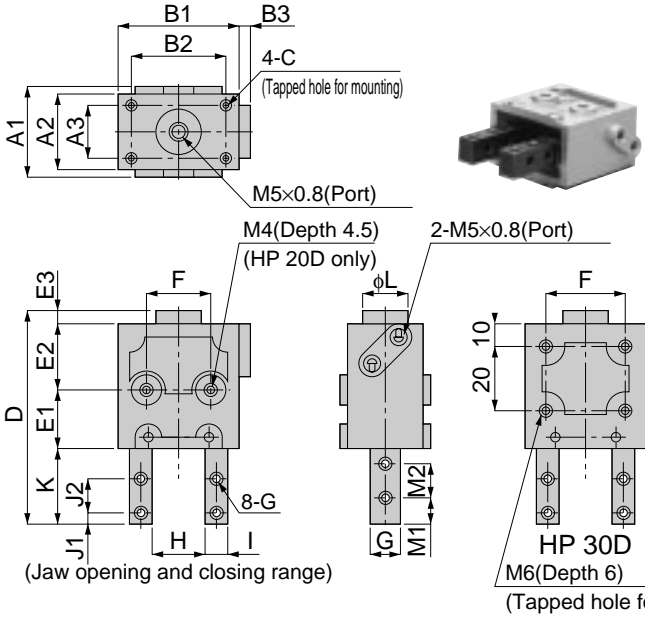
⚠ Safety instruction

1. Use clean and low moisture air as supply air to the grippers.
2. Making clamping of gripper as slow and gentle as possible yields accurate motion and stable cycling.
3. Avoid lateral loading to the jaw during operation.
4. Attach light-weight and short finger tool to the jaw.

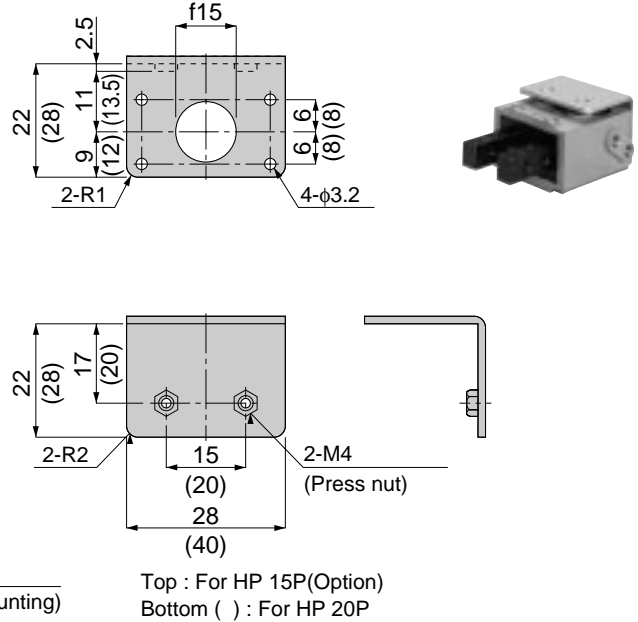
HP 15-20-30

Parallel Type Gripper

Main body



Bracket

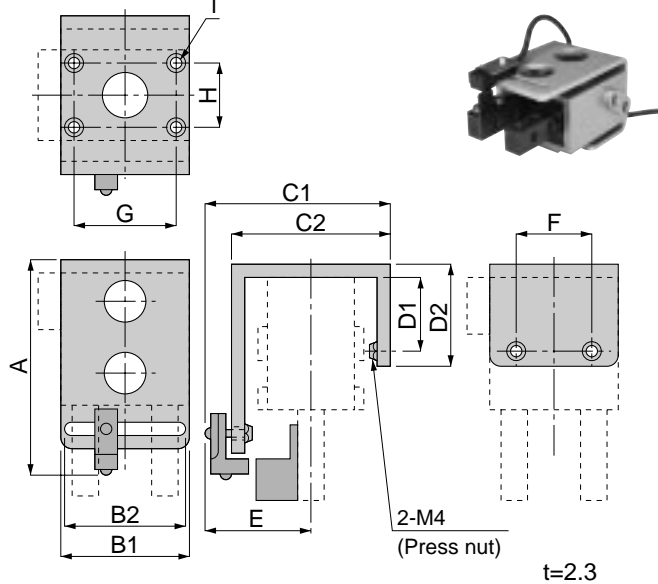


unit:mm

Model	A1	A2	A3	B1	B2	B3	C	D	E1	E2	E3	F	G	H	I	J1	J2	K	fL	M1	M2	N	Mass (g)
HP 15P	22	18	12	28.5	22	5	M3(Depth4.5)	54.5	17.5	17	4	15	M3(Through)	8~11	6 ^{-0.05} _{-0.10}	2.5	7	16	15	6	7	8 ^{-0.05} _{-0.10}	55
HP 20P	27	24	16	40.5	32	3	M3(Depth4.5)	67.5	20.5	20	4	20	M4(Through)	12.5~17.5	8 ^{-0.05} _{-0.10}	4	10	23	15	9	10	10 ^{-0.05} _{-0.10}	110
HP 20D	-	-	-	-	-	3.5	M4(Depth8)	68	20	20	4.5	20	M4(Through)	12.5~17.5	8 ^{-0.05} _{-0.10}	4	10	23	15	9	10	10 ^{-0.05} _{-0.10}	180
HP 30D	-	32	22	60	50	5	M6(Depth12)	95	29.5	30	4.5	32	M5(Through)	20~28	12 ^{-0.05} _{-0.10}	6	12	31	20	12	12	14 ^{-0.05} _{-0.10}	525

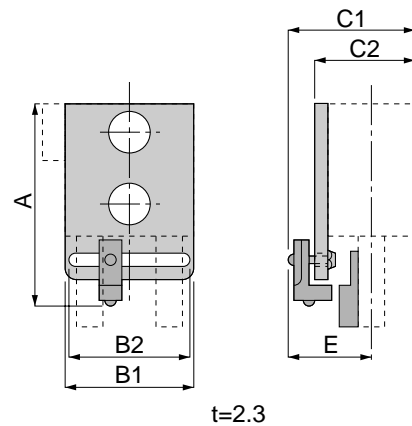
HP 15-20

Parallel Type Gripper with Sensor 15 · 20 Type



HP 30

Parallel Type Gripper with Sensor 30 Type



unit:mm

Model	A	B1	B2	C1	C2	D1	D2	E	F	G	H	I
HP 15P-S	51	28	20	39	32	19	24	25.5	15	22	12	4-φ3.2 φcounter sinking
HP 20P-S	67	40	32	43	36	22	27	25	20	32	16	4-φ3.2 φcounter sinking
HP 20D-S	65	-	-	36	29	-	-	-	-	-	-	-
HP 30D-S	86	60	50	41	34	-	-	28	-	-	-	-

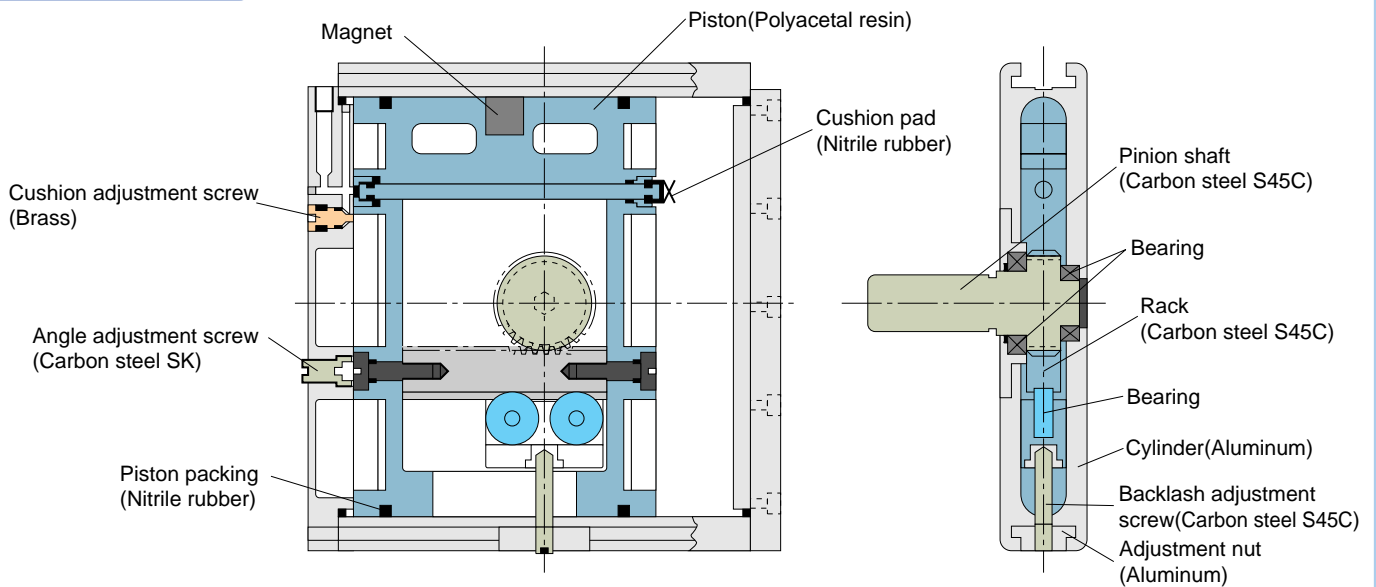
Harmo Robot Parts

Rotary Actuator

Features

- Small thickness and high power are achieved by oval cylinder.
- Backlash can be avoided by adjustment of angle, air cushion, and rack pinion.
- System can be controled by magnetic sensor(option).
- Flat back side is convenient for layout.
- Rotary disk type takes an advantage of small thickness and optimal for compact design. (rotary disk type)

Construction



Specifications

Type	HR 200-90(D)	HR 400-90(D)	HR 400-180(D)	HR 600-90(D)	HR 600-180(D)
Operation type	Double acting(Rack pinion type)				
Fluid admitted	Compressed air(no lubrication)				
Service pressure range	42.6~113.6psi (0.3~0.8MPa)				
Service temperature range	41~140°F (5~60°C)				
Effective torque	196N · cm	588N · cm		932N · cm	
Rotational angle	90°	90°	180°	90°	180°
Angle adjustment range	0~+5°				
Cushion	Air cushion type				
Port size	M5×0.8mm				
Cylinder cross sectional area	1.07in. ² (6.9cm ²)	2.00in. ² (12.9cm ²)		3.04in. ² (19.6cm ²)	
Stroke	0.55in. (1.4cm)	0.87in. (2.2cm)	1.65in. (4.2cm)	0.90in. (2.3cm)	1.69in. (4.3cm)
Shaft dia.(pinion shaft type)	0.39in. (10mm)	0.59in. (15mm)		0.67in. (17mm)	
Allowable radial loading	26.5N	45.1N		64.7N	
Allowable thrust loading	26.5N	26.5N		56.9N	
Allowable motion energy	0.98N · cm	1.47N · cm		1.96N · cm	

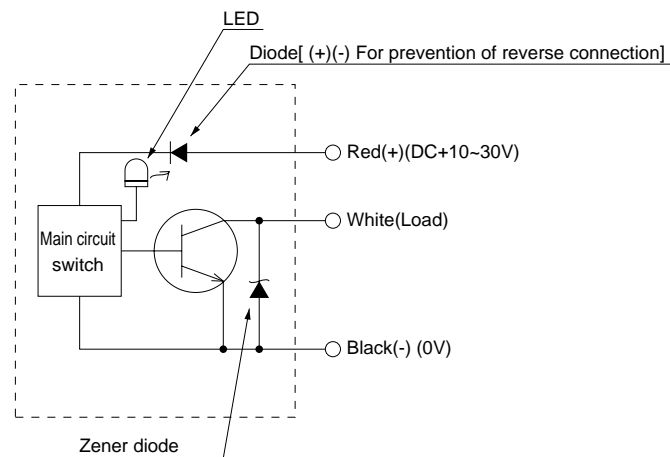
Option

Model	HR 200-90(D)	HR 400-90(D)	HR 400-180(D)	HR 600-90(D)	HR 600-180(D)
A : Magnetic sensor(CS7G)	○	-	○	○	○
B : Mounting holder	-	○	○	○	○
C : Speed controller	○	○	○	○	○

Sensor specification

Operation type	Direct current magnetic induction type
Operation voltage range	DC 10~30V
Operation current range	200mA. MAX.
Current consumption(inactivated state)	2.5mA. MAX(DC 24V)
Current consumption(activated state)	15mA. MAX(DC 24V)
Delay time	12~24V DC
Insulation resistance	Activated 1.5m sec .MAX. Inactivated 10m sec. MAX.
Proof voltage	50MΩ. MIN(Between cable and case)
Impact resistance	AC 500V. MIN(Between cable and case)
Vibration resistance	30G
Service temperature range	32~140°F (0~60°C)
Storage temperature range	-4~158°F (-20~70°C)
Protection structure	IEC Standard. IP 67
Operation indicator	LED indicator lights up during ON
Lead wire	PVC cabtyre cable 0.3SQ × 3 wire × 3000
Mass	39g

Circuit



Model selection

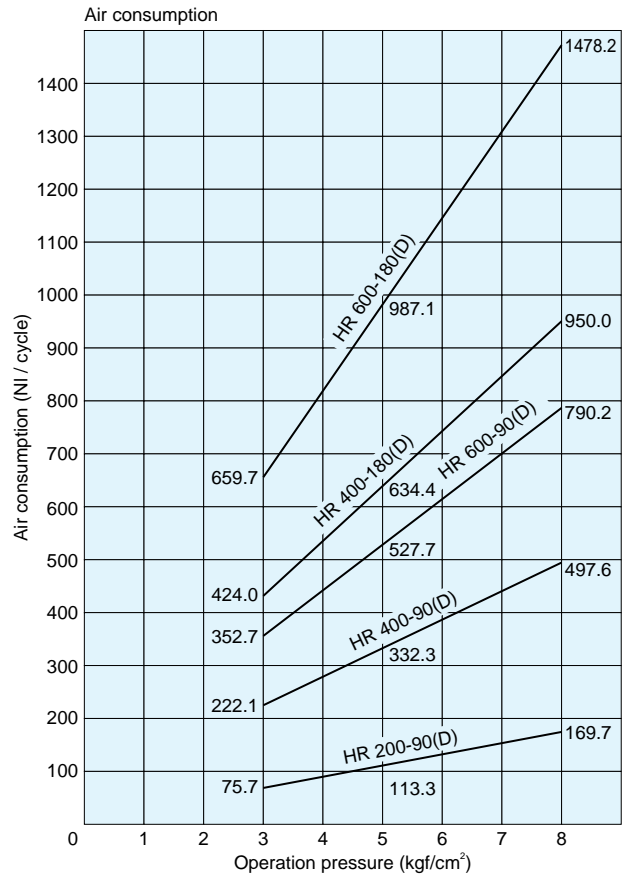
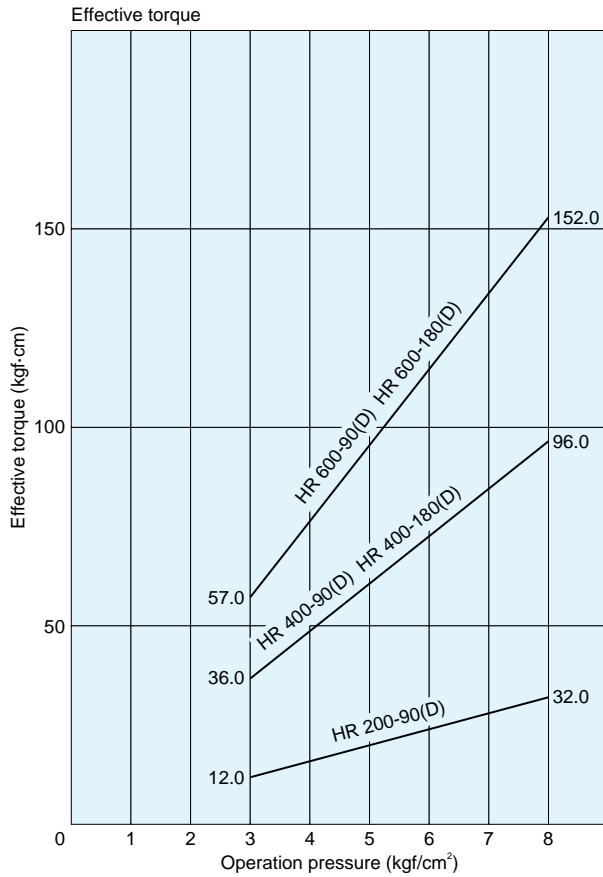


Table 1. Allowable motion energy

Type	Allowable motion energy
HR 200-90(D)	0.98N-cm
HR 400-90(D)	1.47N-cm
HR 400-180(D)	1.47N-cm
HR 600-90(D)	1.96N-cm
HR 600-180(D)	1.96N-cm

Table 2. Allowable load

Type	Allowable radial load	Allowable thrust load
HR 200-90(D)	26.5N	26.5N
HR 400-90(D)	45.1N	26.5N
HR 400-180(D)	45.1N	26.5N
HR 600-90(D)	64.7N	56.9N
HR 600-180(D)	64.7N	56.9N

Note 1 : Please use it within the maximum torque on each usage.

Note 2 : Force of inertia with too heavy load may cause failures. Set the rotation time within the range of the kinetic energy given in Table 1 by giving consideration to the moment of inertia and the kinetic energy of the load shown on page 16.

Note 3 : Keep the shaft and the disk away from direct loads. When no dynamic load is generated, the loads given in Table 2 can be applied.

Note 4 : The air consumption per cycle is given in the graph "Air consumption".

Calculation of motion energy

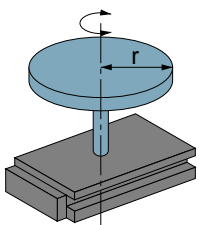
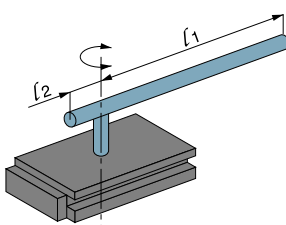
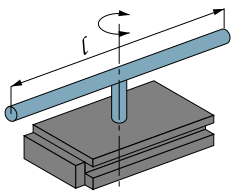
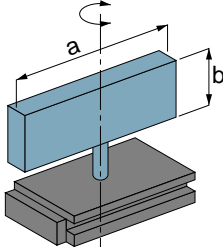
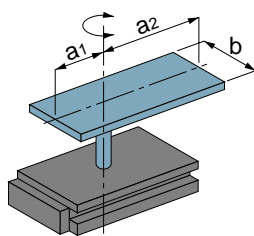
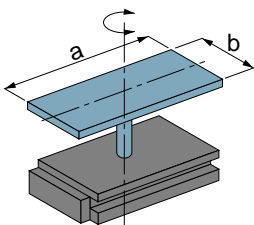
$$E = \frac{1}{2} J \omega^2$$

E : Motion energy (N-cm)
 J : Inertial moment (N-cm-sec²)
 ω : Angular velocity (rad/sec)
 θ : Rotational angle (rad)
 t : Rotational time (sec.)

$$\omega = \frac{\theta}{t}$$

Calculation of inertial moment

I : Inertial moment (N-cm-sec²) W : Load (N) g : Gravitational acceleration (980cm/sec²)

Cylinder(Including disk)	Slender rod I	Slender rod II
Position of center of rotation:Center shaft  $I = \frac{W}{g} \cdot \frac{r^2}{2}$	Position of center of rotation: Perpendicular to the either end of rod  $I = \frac{W_1}{g} \cdot \frac{l_1^2}{3} + \frac{W_2}{g} \cdot \frac{l_2^2}{3}$	Position of center of rotation: Perpendicular to the center of mass of rod  $I = \frac{W}{g} \cdot \frac{l^2}{12}$
Block I	Block II	Block III
Position of center of rotation: Parallel to side b and through the center of mass  $I = \frac{W}{g} \cdot \frac{a^2}{12}$	Position of center of rotation: Perpendicular to the either end of block  $I = \frac{W_1}{g} \cdot \frac{4a_1^2 + b^2}{12} + \frac{W_2}{g} \cdot \frac{4a_2^2 + b^2}{12}$	Position of center of rotation: Perpendicular to the block and through the center of mass  $I = \frac{W}{g} \cdot \frac{a^2 + b^2}{12}$

Model designation (Example)



(1)Cylinder cross sectional area

Code	200	400	600
Cylinder cross sectional area	1.07in. ² (6.9cm ²)	2.00in. ² (12.9cm ²)	3.04in. ² (19.6cm ²)

(2)Rotational angle

Code	90	180
Rotational angle	90°	180°

(3)Rotation type

Code	No code	D
Rotation type	Pinion shaft type	Rotatory disk type

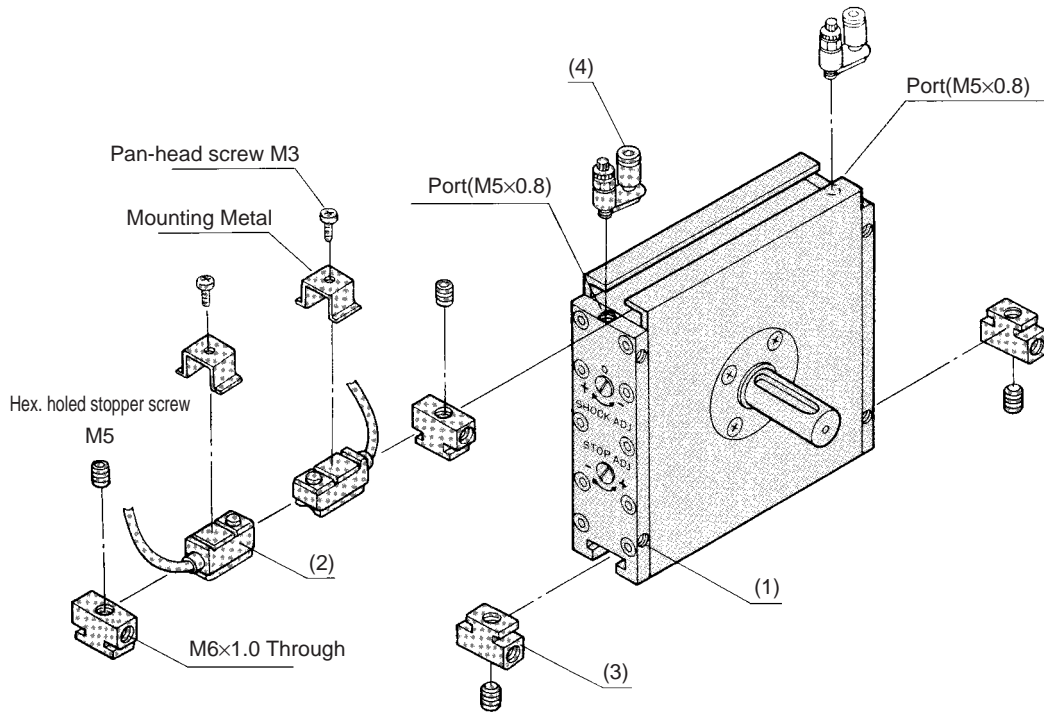
(4)Option

Code	A	B	C
Option	Magnetic sensor	Mounting holder	Speed controller

*Enter only when necessary

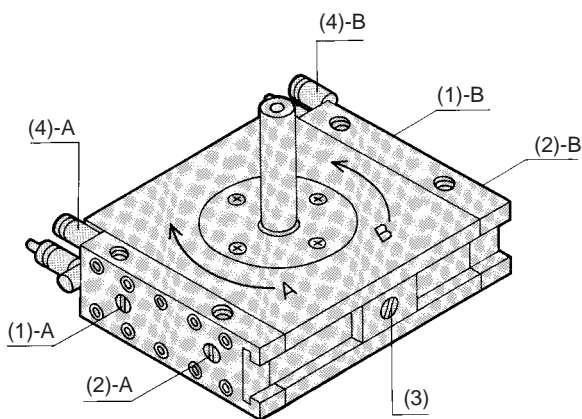
*Any combination of A, B, and C is possible

Mounting of sensor



1. Use M4 screw to secure the unit. For the mounting pitch, see the dimensional drawing on-page 18.
2. Fix two sensor switches (option a) on the mounting slot on the unit each in the opposite direction, and secure them middle of the slot width.
3. The mounting holder (option b) is available when strong fixation is needed.
4. Attach the speed controller (option c) after attachment of the sensor switch and the mounting holder.

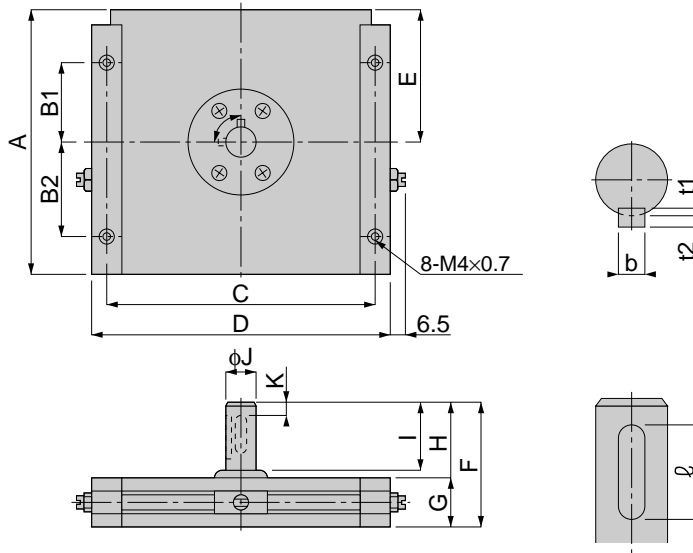
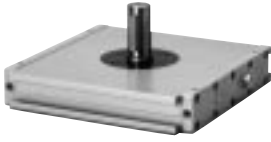
Adjustment



1. Cushion adjustment screw
The air cushion is to be controlled by the screw adjusting the flow rate.
(1)-A : Cushion adjustment for rotation A
(1)-B : Cushion adjustment for rotation B
2. Angle adjustment screw
The rotational angle should be adjusted between 0° and 5° in each case of 90° and 180°.
(2)-A : Angle adjustment for rotation A
(2)-B : Angle adjustment for rotation B
3. Backlash adjustment screw
When backlash occurs in the shaft or the disk, tighten the screw to eliminate the backlash.
4. Speed controller
(4)-A : Speed adjustment for rotation A
(4)-B : Speed adjustment for rotation B

HR 200-400-600

Rotary Actuator
Pinion Shaft Type

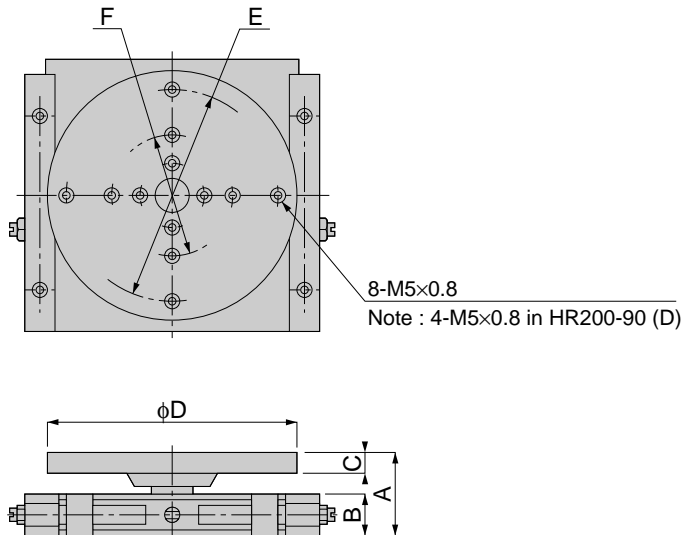


unit:mm

Model	A	B1	B2	C	D	E	F	G	H	I	J (g6)	K	b	t1	t2	ℓ	Mass (g)
HR 200-90	80	18.5	31.5	72	81	33.5	56.5	27	29.5	28	10	7.5	3	1.8	1.2	13	400
HR 400-90	130	45	45	122	130	65	59	24	35	35.5	15	5.0	5	3	3	25	850
HR 400-180				162	170												1050
HR 600-90	130	45	45	122	130	65	75	34	41	38.5	17	5.0	6	3.5	2.5	30	1200
HR 600-180				162	170												1450

HR 200-400-600

Rotary Actuator
Disk Type

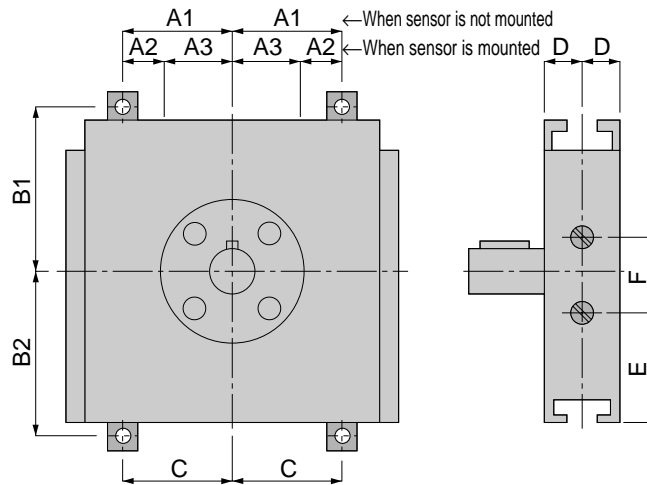


unit:mm

Model	A	B	C	φD	E	F	Mass (g)
HR 200-90D	44	27	8	64	50	-	600
HR 400-90D	44	24	8	120	106	60	1600
HR 400-180D							1800
HR 600-90D	54	34	8	120	106	60	1900
HR 600-180D							2200

HR
200-400-600

Rotary Actuator
Sensor Switch



unit:mm

Model	Without sensor	With sensor		B1	B2	C	D	E	F
	A1	A2	A3						
HR 200-90(D)	5~25.5		0~4	38.5	51.5	17.5~25.5	12	35	18
HR 400-90(D)	5~50	37.5~50	0~1	70	70	17.5~50	11.5	47.5	40.5
HR 400-180(D)	5~70		0~10.5			17.5~70			47.5
HR 600-90(D)	5~50	37.5~50	0~1	70	70	17.5~50	16.5	47.5	40
HR 600-180(D)	5~70		0~10.5			17.5~70			47.5