GCKW

3-Finger Gripper

Electric actuator
Motor specification

CONTENTS

GCKW Series variation

Actuator model No.	Motor Size	Screw lead (mm)	Strokeand Max. speed(mm/s)		Max. Gripping force (N)
			4	6	
GCKW-16	□20	1.5	50		7
GCKW-20	□25	1.5	50		16
GCKW-25	□25L	1.5		50	29

Electric actuator 3-Finger Gripper

GCKW-16

□20 Stepper motor

RoHS

How to order

GCKW - 16 ❶ G ❷ H1 ❸ 04 ❹ N ❺ C ❻ N - F ❼ R01 ❽

❶Size

16	16

❷Applicable controller *1

G	ECG-B

❸Screw lead

H1	1.5 mm

❹Stroke

04	4 mm (2 mm on one side)

❺Rubber cover

N	None

❻Encoder

C	Incremental encoder

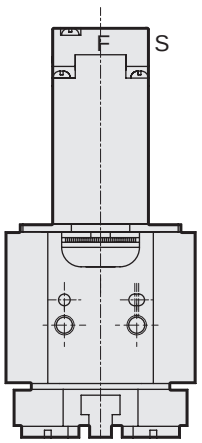
❼Connector leadout direction *2

F	Front
S	Side

❽Relay cable *3

N00	None
R01	Movable 1 m
R03	Movable 3 m
R05	Movable 5 m
R10	Movable 10 m
S01	Fixed 1 m
S03	Fixed 3 m
S05	Fixed 5 m
S10	Fixed 10 m

[Fig. 1]



Connector leadout direction diagram

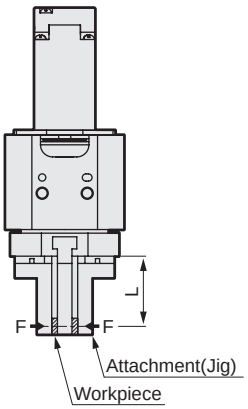
*1 For the controller, refer to page 203.
*2 Refer to Fig. 1.
*3 Refer to page 214 for relay cable dimensions.

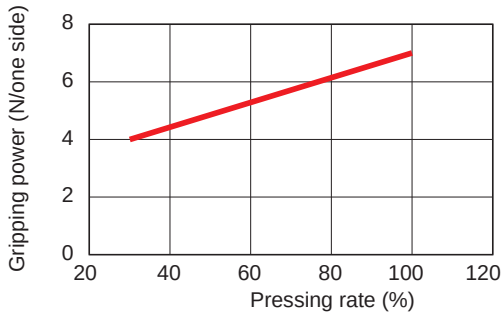
Specifications

Motor		□20 Stepper motor
Drive method		Sliding screw
Stroke	mm	4 (2 per side)
Screw lead	mm	1.5
Max. gripping force *1	N	7
Open/close speed range	mm/s	5 to 50 (per side)
Gripping speed range *1	mm/s	5 to 15 (per side)
Repeatability *2	mm	±0.02
Positioning repeatability *3	mm	±0.05 (per side)
Lost motion	mm	0.3 or less (per side)
Motor section power supply voltage		24 VDC ±10%
Power current consumption	A	1.1
Insulation resistance		10 MΩ, 500 VDC
Withstand voltage		500 VAC for 1 minute
Operating ambient temperature, humidity		0 to 40 °C (no freezing) 35 to 80% RH (no condensation)
Storage ambient temperature, humidity		-10 to 50°C (no freezing) 35 to 80% RH (no condensation)
Atmosphere		No corrosive gas, explosive gas, or dust
Degree of protection		IP40
Weight	g	250

*1 Gripping is done with pressing operation. If pressing operation is performed in positioning mode, the actuator internal parts may be damaged.
*2 Repeatability indicates variation when the same workpieces are gripped repeatedly with the same operating conditions.
*3 This may cause inconsistent stopping positions when positioning is repeatedly performed to the same point.

Gripping force and adjustment switch

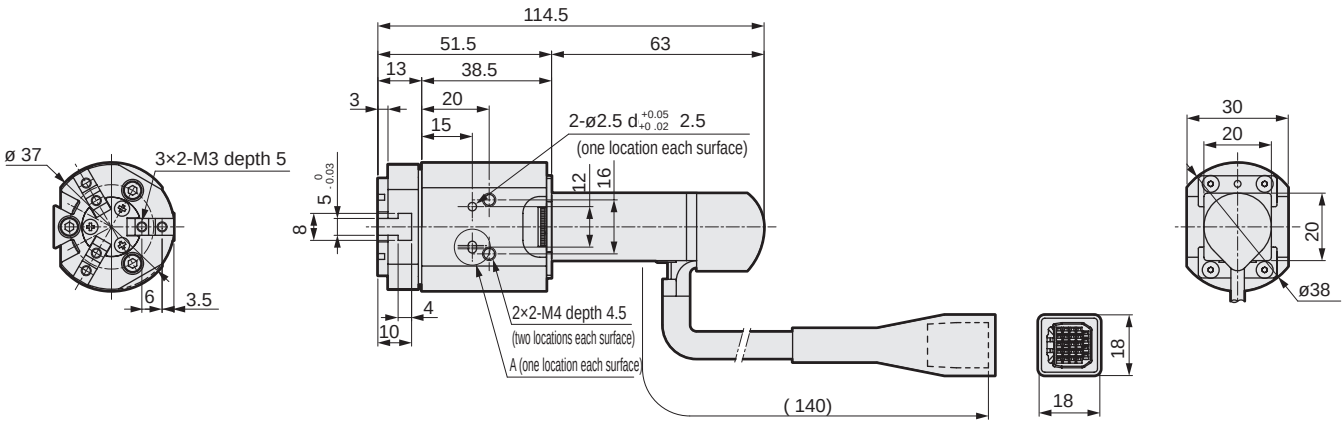




*1 The gripping force and pressing rate are a guide. Power supply voltages, individual motor differences and variations in mechanical efficiency may result in differing actual values, even at the same pressing ratio.
*2 Speed during gripping operation is for 15mm/s. (L=20)

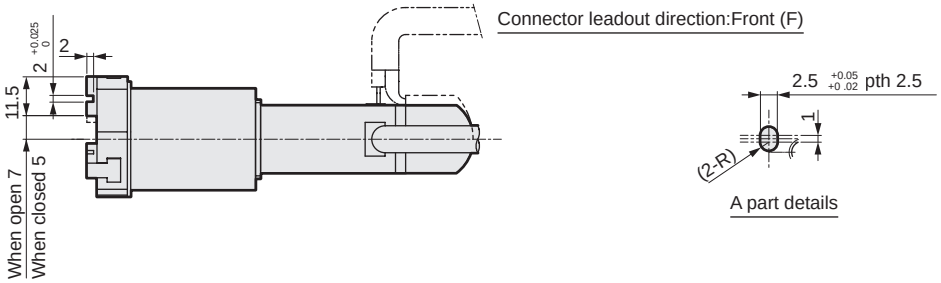
Dimensions

● GCKW-16



* Fixed cable.
* The cable cannot be removed.
*Min. bending radius 40 mm

Connector leadout direction:Side (S)



Electric actuator 3-Finger Gripper

GCKW-20

□25 Stepper motor

RoHS

How to order

GCKW - 20 G H1 04 N C N - F R01

❶Size

20	20

❷Applicable controller *1

G	ECG-B

❸Screw lead

H1	1.5 mm

❹Stroke

04	4 mm(Single side 2 mm)

❺Rubber cover

N	None

❻Encoder

C	Incremental encoder

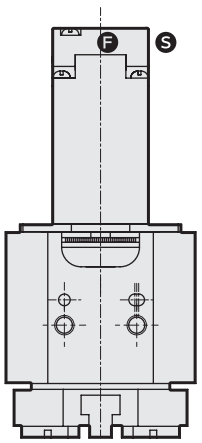
❼Connector leadout direction *2

F	Front
S	Side

❽Relay cable *3

N00	None
R01	Movable 1 m
R03	Movable 3 m
R05	Movable 5 m
R10	Movable 10 m
S01	Fixed 1 m
S03	Fixed 3 m
S05	Fixed 5 m
S10	Fixed 10 m

[Fig. 1]



Connector leadout direction diagram

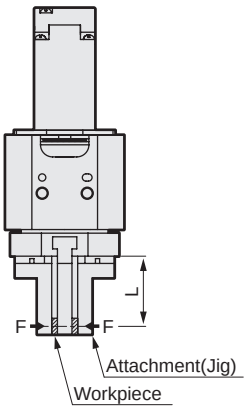
*1 For the controller, refer to page 203.
*2 Refer to Fig. 1.
*3 Refer to page 214 for relay cable dimensions.

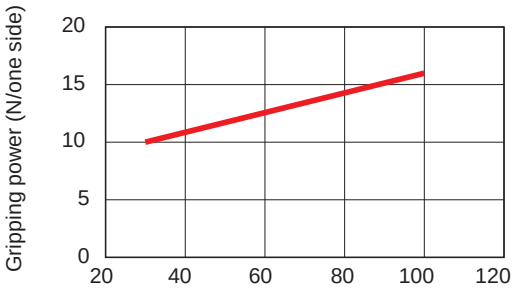
Specifications

Motor		□25 Stepper motor
Drive method		Sliding screw
Stroke	mm	4 (2 per side)
Screw lead	mm	1.5
Max. gripping force *1	N	16
Open/close speed range	mm/s	5 to 50 (per side)
Gripping speed range *1	mm/s	5 to 15 (per side)
Repeatability *2	mm	±0.02
Positioning repeatability *3	mm	±0.05 (per side)
Lost motion	mm	0.3 or less (per side)
Motor section power supply voltage		24 VDC ±10%
Power current consumption	A	2.1
Insulation resistance		10 MΩ, 500 VDC
Withstand voltage		500 VAC for 1 minute
Operating ambient temperature, humidity		0 to 40 °C (no freezing) 35 to 80% RH (no condensation)
Storage ambient temperature, humidity		-10 to 50°C (no freezing) 35 to 80% RH (no condensation)
Atmosphere		No corrosive gas, explosive gas, or dust
Degree of protection		IP40
Weight	g	390

*1 Gripping is done with pressing operation. If pressing operation is performed in positioning mode, the actuator internal parts may be damaged.
*2 Repeatability indicates variation when the same workpieces are gripped repeatedly with the same operating conditions.
*3 This may cause inconsistent stopping positions when positioning is repeatedly performed to the same point.

Gripping force and adjustment switch

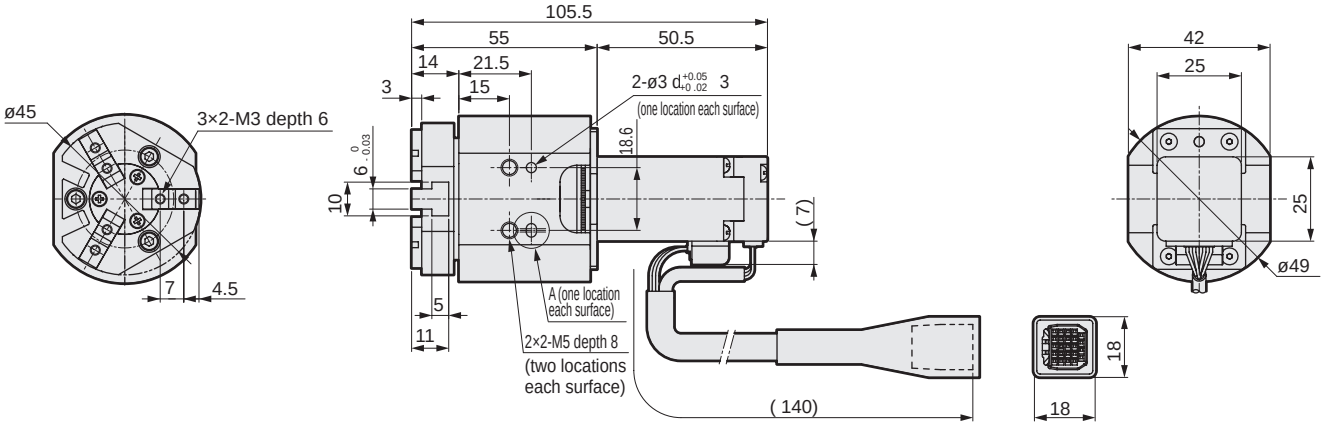




*1 The gripping force and pressing rate are a guide. Power supply voltages, individual motor differences and variations in mechanical efficiency may result in differing actual values, even at the same pressing ratio.
*2 Speed during gripping operation is for 15mm/s. (L=20)

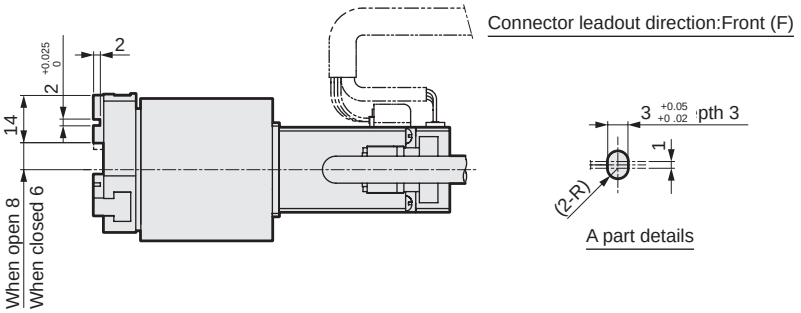
Dimensions

● GCKW-20



* Fixed cable.
* The cable cannot be removed.
*Min. bending radius 40 mm

Connector leadout direction:Side (S)



Electric actuator 3-Finger Gripper

GCKW-25

□25L stepping motor

RoHS

How to order

GCKW - 25 G H1 06 N C N - F R01

❶Size

25	25

❷Applicable controller *1

G	ECG-B

❸Screw lead

H1	1.5 mm

❹Stroke

06	6 mm(Single side 3 mm)

❺Rubber cover

N	None

❻Encoder

C	Incremental encoder

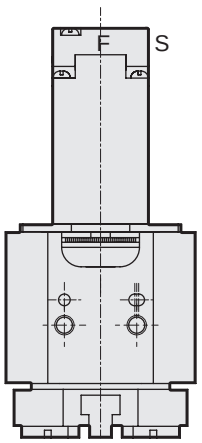
❼Connector leadout direction *2

F	Front
S	Side

❽Relay cable *3

N00	None
R01	Movable 1 m
R03	Movable 3 m
R05	Movable 5 m
R10	Movable 10 m
S01	Fixed 1 m
S03	Fixed 3 m
S05	Fixed 5 m
S10	Fixed 10 m

[Fig. 1]



Connector leadout direction diagram

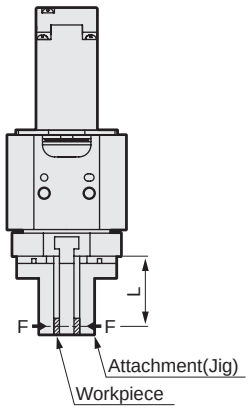
*1 For the controller, refer to page 203.
*2 Refer to Fig. 1.
*3 Refer to page 214 for relay cable dimensions.

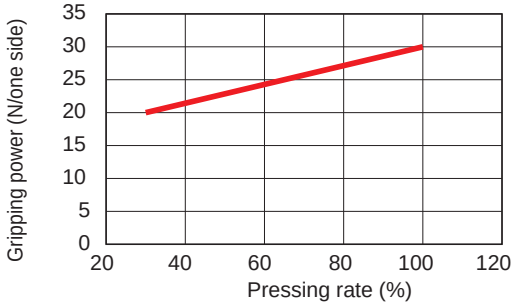
Specifications

Motor		□25L stepping motor
Drive method		Sliding screw
Stroke	mm	6 (3 per side)
Screw lead	mm	1.5
Max. gripping force *1	N	29
Open/close speed range	mm/s	5 to 50 (per side)
Gripping speed range *1	mm/s	5 to 15 (per side)
Repeatability *2	mm	±0.02
Positioning repeatability *3	mm	±0.05 (per side)
Lost motion	mm	0.3 or less (per side)
Motor section power supply voltage		24 VDC ±10%
Power current consumption	A	3.2
Insulation resistance		10 MΩ, 500 VDC
Withstand voltage		500 VAC for 1 minute
Operating ambient temperature, humidity		0 to 40 °C (no freezing) 35 to 80% RH (no condensation)
Storage ambient temperature, humidity		-10 to 50°C (no freezing) 35 to 80% RH (no condensation)
Atmosphere		No corrosive gas, explosive gas, or dust
Degree of protection		IP40
Weight	g	580

*1 Gripping is done with pressing operation. If pressing operation is performed in positioning mode, the actuator internal parts may be damaged.
*2 Repeatability indicates variation when the same workpieces are gripped repeatedly with the same operating conditions.
*3 This may cause inconsistent stopping positions when positioning is repeatedly performed to the same point.

Gripping force and adjustment switch

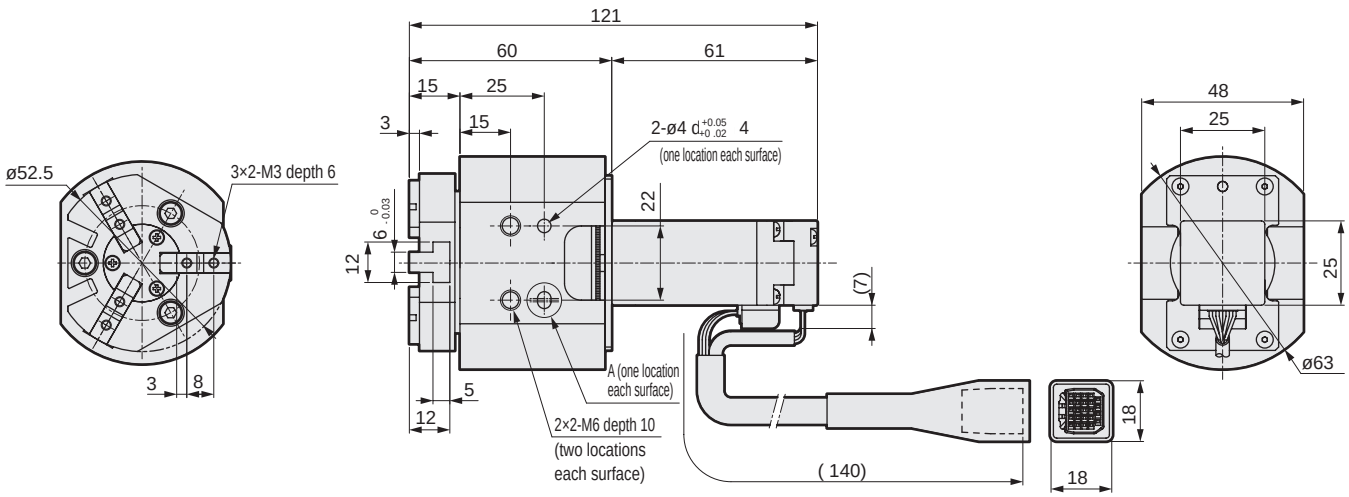




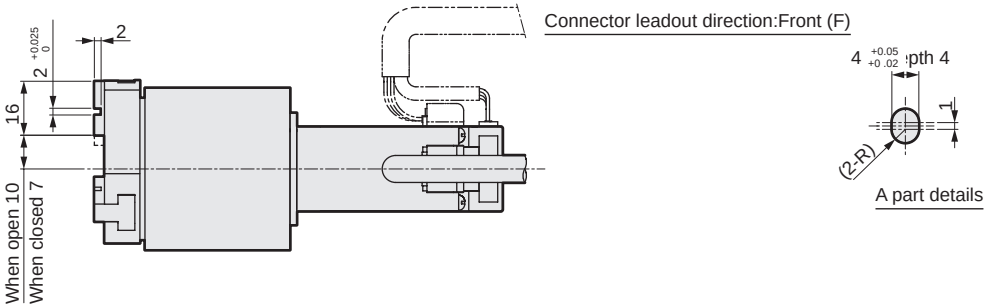
*1 The gripping force and pressing rate are a guide. Power supply voltages, individual motor differences and variations in mechanical efficiency may result in differing actual values, even at the same pressing ratio.
*2 Speed during gripping operation is for 15mm/s. (L=20)

Dimensions

● GCKW-25



* Fixed cable.
* The cable cannot be removed.
*Min. bending radius 40 mm
Connector leadout direction:Side (S)



Model selection

STEP 1 Calculating the required gripping force

To transport the workpiece (weight WL), a gripping force FW satisfying the following equation is required.

$$F_W] \quad \frac{W_L \times g \times K}{n}$$

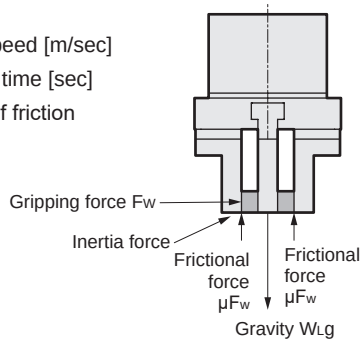
F_W : Required gripping force [N]
n : Number of attachments = 3
W_L : Weight of workpiece [kg]
g : Gravitational acceleration = 9.8[m/s^2]
K : Transport coefficient
5 [holding only]
10 [normal transport]
20 [suddenly accelerated transport]

Transport coefficient K

Calculation example: When decelerating and stopping in 0.1 second from transport speed of V = 0.75 m/s with friction coefficient μ of workpiece and jaw as 0.1, see below.

Obtain the transport coefficient K from the force applied to the workpiece

V: Transport speed [m/sec]
t: Deceleration time [sec]
μ: Coefficient of friction



• Inertial force = $W_L(V/t)$

• Gravity = $W_L g$

• Required gripping force F_W] $\frac{W_L(V/t)+W_L g}{n\mu} = \frac{W_L(V/t+g)}{n\mu} = \frac{17.3\,W_L}{3 \times 0.1} = 57.7W_L$

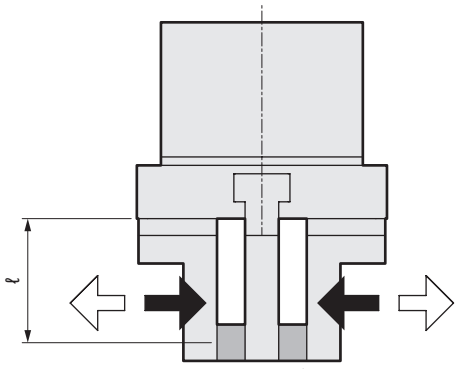
∴ Here, the transport coefficient K is calculated from the above equation: $\frac{V/t+g}{\mu g} = \frac{0.75/0.1+9.8}{0.1 \times 9.8} \approx 20$

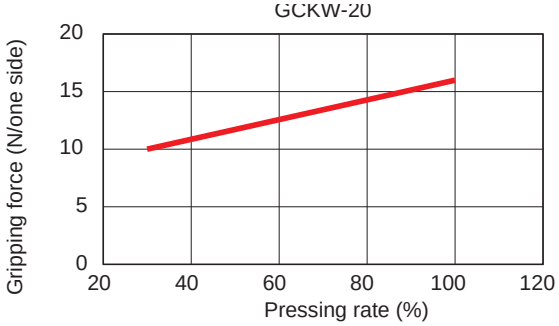
Note)Allowance is required for transport coefficient K due to impacts during transportation, etc. Coefficient of friction μ even when μ is higher than μ = 0.1, set transport coefficient K from 10 to 20 or more for safety.

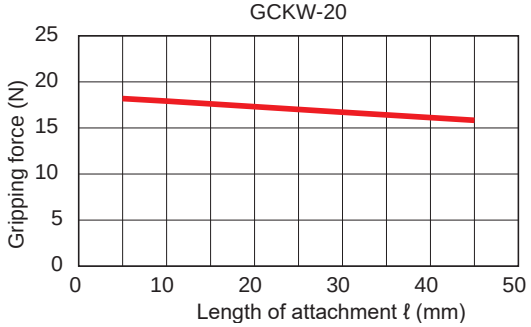
STEP 2 Temporarily select a model from the gripping force graph

Check the conditions at right and temporarily select a model from the gripping force graph.Gripping force is the gripping point distanceℓVaries according to the and current limit values.Confirm on the graph that sufficient force can be obtained under the working conditions.

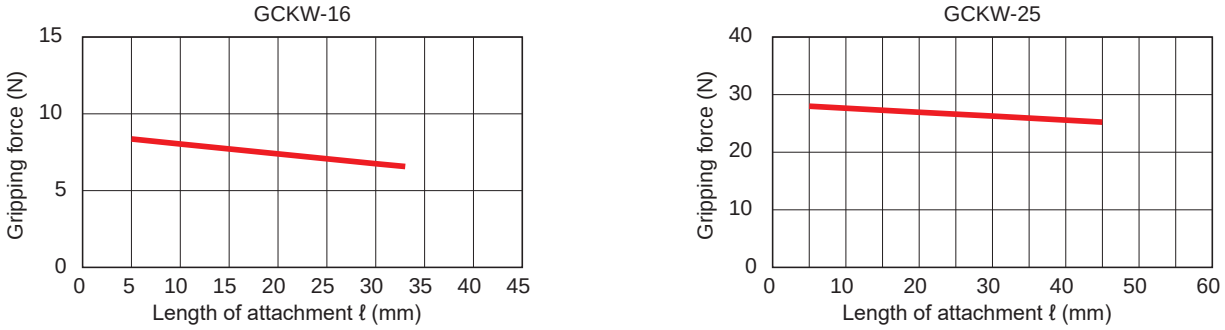
Grip direction



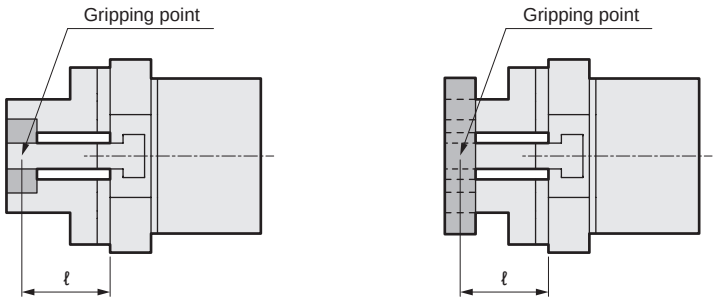




Gripping force and gripping point distance



STEP 3 Confirmation of attachment shape



- Use attachments as short and lightweight as possible.
  If the attachment is long and heavy, inertia increases when opening and closing. This may cause play in the finger, and adversely affect durability.
  - Even if the attachment shape is within the performance data, by making it as small as possible enables the product to have a longer service life. Also, if ℓ is long, unexpected vibration, etc., could cause erroneous gripping and falling during transport.
  - The weight of the attachment affects the service life, so check that the weight is less than the following value.
    W < 1/4 H (1 pc.)W: Weight of attachment
    H: Product weight of gripper