G Series

GSSD2

GSTK

GSTG

GSTS

GSTL

GCKW

Ending

GCKW

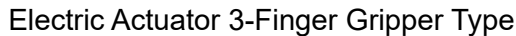**Electric Actuator with Motor Specification**

3-Finger Gripper Type

CONTENTS

GCKW System Table

Actuator Model No.	Motor Size	Screw Lead (mm)	Stroke and 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

G Series

GSSD2

GSTK

GSTG

GSTS

GSTL

GCKW

Ending

Electric Actuator 3-Finger Gripper Type

GCKW-16

□20 Stepping Motor

CE UKCA RoHS

For compatible detailed model Nos., please see our website.

Model No. Notation Method

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

❶ Size

16	16

❷ Connected Controller*1

G	ECMG/ECG-B

❸ Screw Lead

H1	1.5 mm

❹ Stroke

04	4 mm (2 mm one side)

❺ Rubber Cover

N	None

❻ Encoder

C	Incremental Encoder

❼ Connector Outlet Direction *2

F	Front
S	Side

❽ Relay Cable *3

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

[Figure 1]

Connector Outlet Direction Diagram

*1 For controllers, please refer to P. 529.
*2 Please refer to Figure 1.
*3 For the external dimension drawing of the relay cable, please refer to P. 576.

Specifications

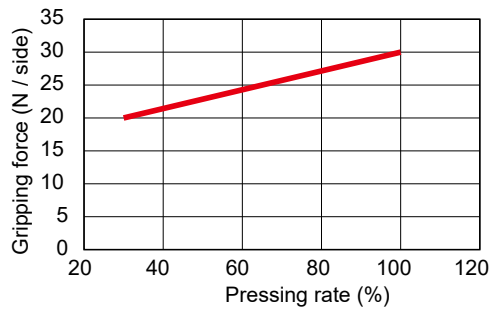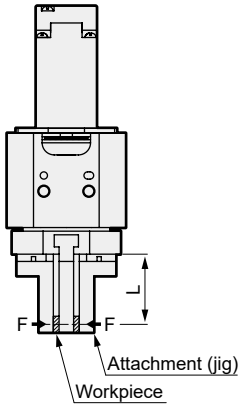| Connected Controller	ECMG, ECG-B
Motor	□20 Stepping Motor
Drive Method	Sliding screw
Stroke mm	4 (one side 2)
Screw lead mm	1.5
Max. Gripping Force *1 N	7 (one side)
Opening/Closing Speed Range mm/s	5 to 50 (one side)
Gripping Speed Range *1 mm/s	5 to 15 (one side)
Repeatability *2 mm	±0.02
Repeat Positioning Accuracy *3 mm	±0.05 (one side)
Lost Motion mm	0.3 or less (one side)
Insulation Resistance	10 MΩ, 500 VDC
Withstanding 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
Protection Structure	IP40
Weight g	250

*1 Gripping is performed by pushing motion. Performing a pushing operation in positioning mode may lead to damage to the internal parts of the actuator.
*2 Repeatability indicates the variation when the same workpiece is repeatedly gripped under the same operating conditions.
*3 This is the variation in the stop position when repeatedly positioning to the same point.

Gripping Force and Pushing Rate

F F

Attachment (jig)

Workpiece

Gripping force (N / side) vs Pressing rate (%)

*1 The gripping force and pushing rate are for reference only. Even with the same pushing rate, errors will occur with the actual numbers due to differences in power supply voltage, individual differences in motors, and variations in mechanical efficiency.
*2 The speed during gripping operation is 15 mm/s. (L=20)

External Dimension Drawing

● GCKW-16

ø37   3×2-M3 Depth 5

102.5
51.5   51
13   38.5
3
20
15
2-ø2.5 $^{+0.05}_{+0.02}$ Depth 2.5 (1 on each side)
8
5 $^{0}_{-0.03}$
12
16
4
10
2×2-M4 Depth 4.5 (2 on each side)
A (1 on each side)
6   3.5
(4)
(140)

30
20
(4)
18
ø38
20
18

*This is a fixed cable.
*The cable cannot be removed.
*Minimum bending radius 40 mm
Connector Outlet Direction: Side (S)

At open, 7
At closed, 5
11.5
2 $^{+0.025}_{0}$
2

Connector Outlet Direction: Side (F)

2.5 $^{+0.05}_{+0.02}$ Depth 2.5

(2-R)

A Details

G Series
GSSD2
GSTK
GSTG
GSTS
GSTL
GCKW
Ending

□25 Stepping Motor

CE UK CA RoHS

For compatible detailed model Nos., please see our website.

Model No. Notation Method

GCKW - 20 G H1 04 N C N - F R01
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶Size

20	20

❷Connected Controller *1

G	ECMG/ECG-B

❸Screw Lead

H1	1.5 mm

❹Stroke

04	4 mm (2 mm one side)

❺Rubber Cover

N	None

❻Encoder

C	Incremental Encoder

❼Connector Outlet Direction *2

F	Front
S	Side

❽Relay Cable *3

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

[Figure 1]

Connector Outlet Direction Diagram

*1 For controllers, please refer to P. 529.
*2 Please refer to Figure 1.
*3 For the external dimension drawing of the relay cable, please refer to P. 576.

Specifications

Connected Controller	ECMG, ECG-B
Motor	□25 Stepping Motor
Drive Method	Sliding screw
Stroke mm	4 (one side 2)
Screw lead mm	1.5
Max. Gripping Force *1 N	16 (one side)
Opening/Closing Speed Range mm/s	5 to 50 (one side)
Gripping Speed Range *1 mm/s	5 to 15 (one side)
Repeatability *2 mm	±0.02
Repeat Positioning Accuracy *3 mm	±0.05 (one side)
Lost Motion mm	0.3 or less (one side)
Insulation Resistance	10 MΩ, 500 VDC
Withstanding 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
Protection Structure	IP40
Weight g	390

*1 Gripping is performed by pushing motion. Performing a pushing operation in positioning mode may lead to damage to the internal parts of the actuator.
*2 Repeatability indicates the variation when the same workpiece is repeatedly gripped under the same operating conditions.
*3 This is the variation in the stop position when repeatedly positioning to the same point.

Gripping Force and Pushing Rate

F F
Attachment (jig)
Workpiece

Gripping force (N / side) vs Pressing rate (%)

*1 The gripping force and pushing rate are for reference only. Even with the same pushing rate, errors will occur with the actual numbers due to differences in power supply voltage, individual differences in motors, and variations in mechanical efficiency.
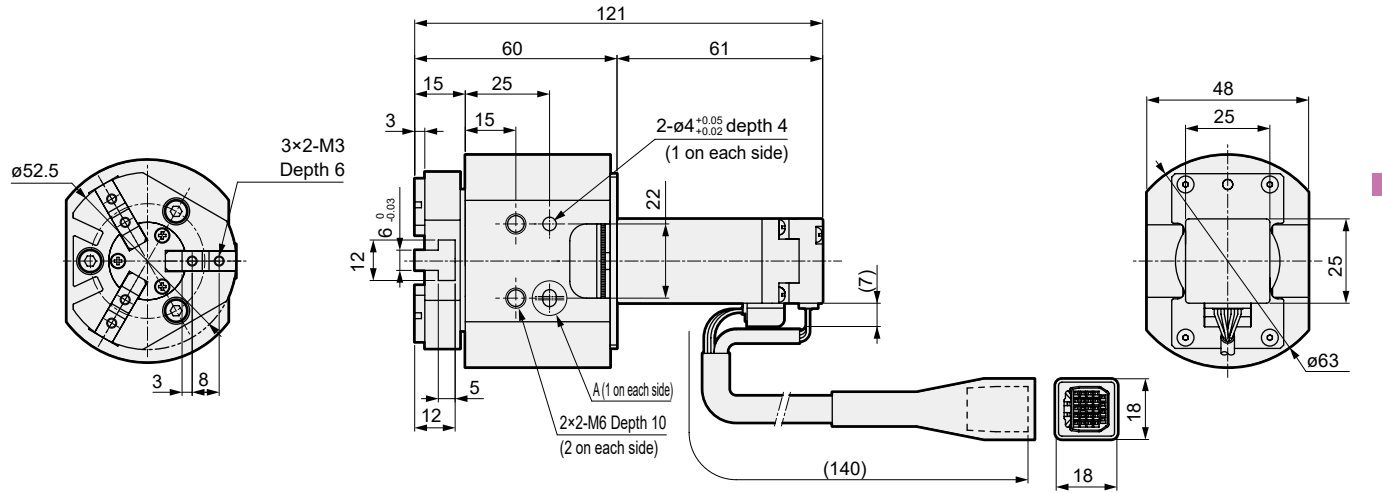*2 The speed during gripping operation is 15 mm/s. (L=20)

External Dimension Drawing

● GCKW-20

ø45
3×2-M3 Depth 6
7
4.5

105.5
55
50.5
14
21.5
3
15
2-ø3 +0.05/+0.02 depth 3 (1 on each side)
10
18.6
(7)
5
A (1 on each side)
11
2×2-M5 Depth 8 (2 on each side)
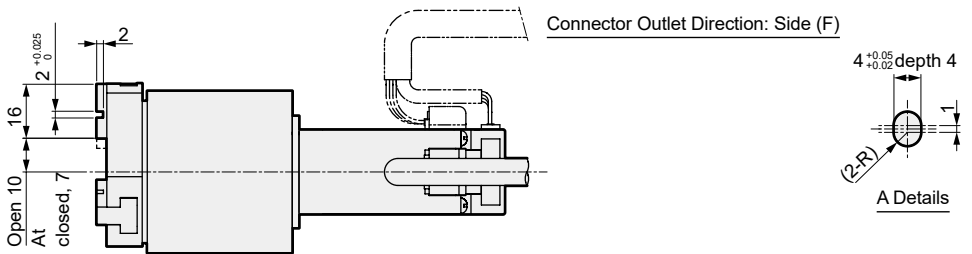(140)

42
25
25
ø49
18
18

*This is a fixed cable.
*The cable cannot be removed.
*Minimum bending radius 40 mm
Connector Outlet Direction: Side (S)

Connector Outlet Direction: Side (F)

14
At open, 8
At closed, 6
2 +0.025/0
2
3 +0.05/+0.02
(2-R)
A Details

G Series
GSSD2
GSTK
GSTG
GSTS
GSTL
GCKW

Ending

Electric Actuator 3-Finger Gripper Type

GCKW-25

□25L Stepping Motor

For compatible detailed model Nos., please see our website.

Model No. Notation Method

GCKW - 25 G H1 06 N C N - F R01
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶Size	
25	25

❷Connected Controller *1	
G	ECMG/ECG-B

❸Screw Lead	
H1	1.5 mm

❹Stroke	
06	6 mm (3 mm one side)

❺Rubber Cover	
N	None

❻Encoder	
C	Incremental Encoder

❼Connector Outlet Direction *2	
F	Front
S	Side

❽Relay Cable *3	
N00	None
R01	Flexible 1 m
R03	Flexible 3 m
R05	Flexible 5 m
R10	Flexible 10 m
S01	Fixed 1 m
S03	Fixed 3 m
S05	Fixed 5 m
S10	Fixed 10 m
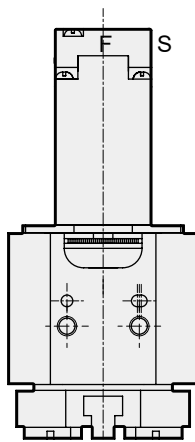
[Figure 1]

Connector Outlet Direction Diagram

*1 For controllers, please refer to P. 529.
*2 Please refer to Figure 1.
*3 For the external dimension drawing of the relay cable, please refer to P. 576.

Specifications

Connected Controller	ECMG, ECG-B
Motor	□25L Stepping Motor
Drive Method	Sliding screw
Stroke mm	6 (one side 3)
Screw lead mm	1.5
Max. Gripping Force *1 N	29 (one side)
Opening/Closing Speed Range mm/s	5 to 50 (one side)
Gripping Speed Range *1 mm/s	5 to 15 (one side)
Repeatability *2 mm	±0.02
Repeat Positioning Accuracy *3 mm	±0.05 (one side)
Lost Motion mm	0.3 or less (one side)
Insulation Resistance	10 MΩ, 500 VDC
Withstanding 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
Protection Structure	IP40
Weight g	580

*1 Gripping is performed by pushing motion. Performing a pushing operation in positioning mode may lead to damage to the internal parts of the actuator.
*2 Repeatability indicates the variation when the same workpiece is repeatedly gripped under the same operating conditions.
*3 This is the variation in the stop position when repeatedly positioning to the same point.

Gripping Force and Pushing Rate

F   F
Attachment (jig)
Workpiece

Gripping force (N / side) vs Pressing rate (%)

*1 The gripping force and pushing rate are for reference only. Even with the same pushing rate, errors will occur with the actual numbers due to differences in power supply voltage, individual differences in motors, and variations in mechanical efficiency.
*2 The speed during gripping operation is 15 mm/s. (L=20)

External Dimension Drawing

● GCKW-25

ø52.5

3×2-M3 Depth 6

121
60   61
15   25
3   15
2-ø4 +0.05 +0.02 depth 4 (1 on each side)
22
6 0 -0.03
12
5
A (1 on each side)
12
2×2-M6 Depth 10 (2 on each side)
(7)

48
25
25
ø63
18
(140)   18

*This is a fixed cable.
*The cable cannot be removed.
*Minimum bending radius 40 mm
Connector Outlet Direction: Side (S)

Open 10 At closed, 7
16
2 +1.025 0
2

Connector Outlet Direction: Side (F)
4 +0.05 +0.02 depth 4
(2-R)
A Details

Model Selection

| STEP1 | **Calculation of Required Gripping Force** |

To transport a workpiece (weight WL), a gripping force FW that satisfies the following formula is required.

$$F_W > \frac{W_L \times g \times K}{n}$$

FW: Required gripping force [N]
n: Number of attachments = 3
W_L: Workpiece weight [kg]
g: Gravitational acceleration = 9.8 [m/s²]
K: Transport coefficient
　　5 [Holding only]
　　10 [Normal transport]
　　20 [Rapid acceleration transport]

─ About Conveyance Factor K ─

Calculation Example) When decelerating from a conveyance speed V = 0.75 m/s to stop in 0.1 seconds, with a friction coefficient μ of 0.1 between the workpiece and finger, it is as follows.

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

• Inertial force = W_L (V/t)
• Gravity = W_Lg
• Required gripping force $F_W > \dfrac{W_L(V/t)+W_Lg}{n\mu} = \dfrac{W_L(V/t+g)}{n\mu} = \dfrac{17.3\ W_L}{3 \times 0.1} = 57.7\ W_L$

∴ The transport coefficient K at this time is, from the above formula $\dfrac{V/t+g}{\mu g} = \dfrac{0.75/0.1+9.8}{0.1 \times 9.8} \approx 20$

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

Gripping force FW
Inertial force
Friction force μFw
Friction force μFw
Gravity W_L g

Note) The transport coefficient K needs to allow a margin for impacts during transport, etc. Even if the friction coefficient μ is higher than μ=0.1, for safety, please set the transport coefficient K to 10 to 20 or more.
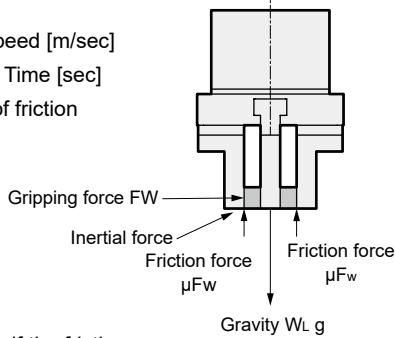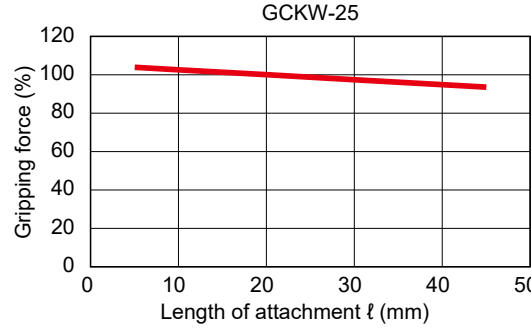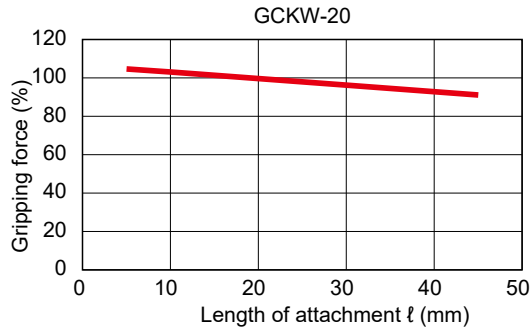
| STEP2 | **Provisional selection of model from gripping force graph** |

Confirm the conditions on the right and provisionally select a model from the gripping force graph. The gripping force changes depending on the gripping point distance ℓ and the current limit value. Please confirm that sufficient gripping force can be obtained under your conditions of use from the graph.
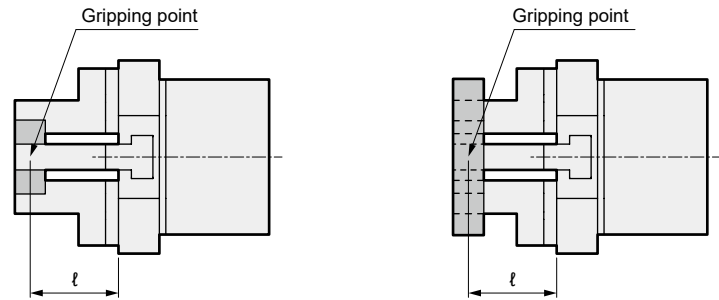
Gripping Direction

●Opening direction (⇦)
●Closing direction (➡)

GCKW-20

Gripping force (N / side)
Pressing rate (%)

GCKW-16

Gripping force (%)
Length of attachment ℓ (mm)
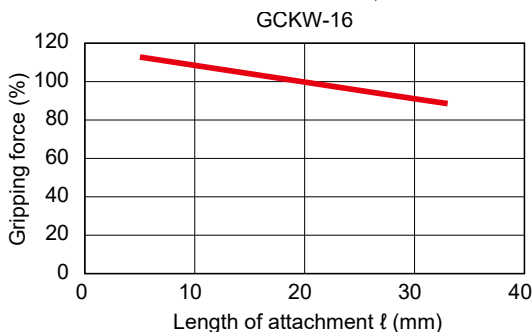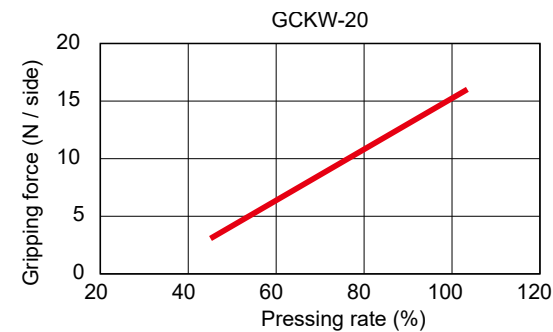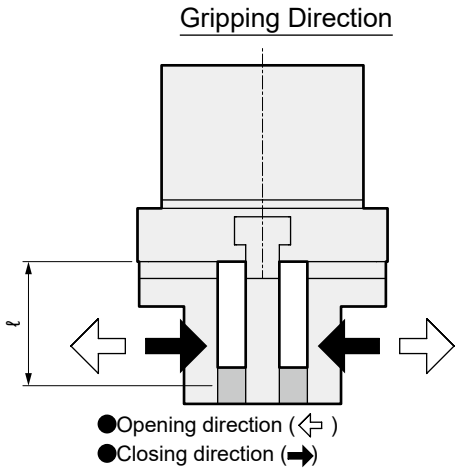
Gripping force and gripping point distance

GCKW-20

Gripping force (%)
Length of attachment ℓ (mm)

GCKW-25

Gripping force (%)
Length of attachment ℓ (mm)

| STEP3 | **Confirmation of Attachment Shape** |

Gripping point
Gripping point
ℓ
ℓ

● Please use attachments that are as light and short as possible.

If they are long and heavy, the inertial force during opening and closing will be large, which may cause play in the fingers or accelerate wear on the finger sliding parts, adversely affecting the service life.

● Even if the attachment shape is within the performance data, making it as small as possible will allow the product to be used for a long time. Also, if ℓ is long, there is a risk of gripping errors, dropping during transport, etc., due to unexpected vibrations.

● The weight of the attachments affects the service life, so please keep it below the following.

W < 1/4H (1 piece)　　W: W < 1/4H (1 piece) W: Weight of attachment
　　　　　　　　　　　H: Product Weight-Finger Gripper

G Series

GSSD2
GSTK
GSTG
GSTS
GSTL
GCKW
Ending

402　**CKD**

G Series

GSSD2
GSTK
GSTG
GSTS
GSTL
GCKW
Ending

CKD　403