Electric Actuator with Motor Specification

GSTK

Stopper Type

CONTENTS

GSTK System Table

Actuator Model No.	Motor Size	Screw Lead (mm)	Max. Thrust (N) Horizontal/ Vertical	Stroke (mm) and Max. Speed (mm/s) 10	20	30	Max. Pushing Force (N)
GSTK-20	□35	6	62	200			100
		9	39	350			70
GSTK-32	□42	6	113	200			220
		12	47	300			90
GSTK-50	□56	6	192		150		590
		12	129		300		425

Electric Actuator Stopper Type

GSTK-20

□35 Stepping Motor

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

Model No. Notation Method

GSTK - M - 20 G E - 06 020 B B N - R01

❶Size

20	20

❷Connected Controller *1

G	ECMG/ECG-A

❸Motor Mounting Direction

E	Inline Mount

❹Screw Lead

06	6 mm
09	9 mm

❺Stroke

010	10 mm
020	20 mm

❻Brake *2

N	None
B	Yes

❼Encoder

B	Absolute Encoder
C	Incremental Encoder

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

*1 For controllers, please refer to P. 529.
*2 Select "Yes" for vertical use.
*3 For the external dimension drawing of the relay cable, please refer to P. 576.

Specifications

Connected Controller		ECMG, ECG-A	
Motor		□35 Stepping Motor	
Encoder Type		Battery-less Absolute Encoder Incremental Encoder	
Drive Method		Sliding screw ø6	
Stroke	mm	10, 20	
Screw lead	mm	6	9
Max. Thrust	N	62	39
Operating Speed Range *2	mm/s	10 to 200	12 to 350
Max. Acceleration/Deceleration Vertical		0.3	0.3
Max. Pushing Force	N	100	70
Pushing Operation Speed Range	mm/s	10 to 20	12 to 20
Repeatability *3	mm	±0.01	
Lost Motion	mm	0.3 or less	
Brake	Type	Non-excitation operating type	
	Holding Force N	140	93
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	

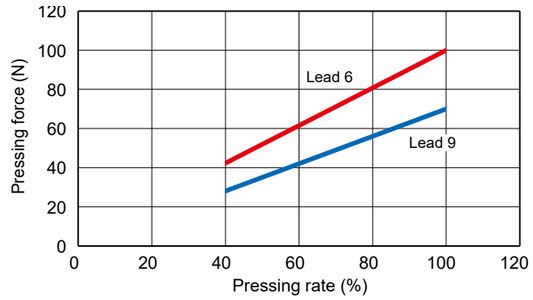
* 1 Thrust varies depending on acceleration/deceleration and speed.
*2 Maximum speed may decrease depending on conditions.
*3 Since there is backlash, if stopping accuracy is required, please use an external stopper, etc., and complete positioning with a pushing motion.

Speed and Thrust

[Horizontal/Vertical Installation] (N)

Speed (mm/s)	Acceleration/deceleration 0.3G	
	Screw Lead (mm)	
	6	9
10	62	
12	62	39
50	62	39
70	39	39
100	39	39
150	15	31
200	7	29
250		7
300		7
350		3

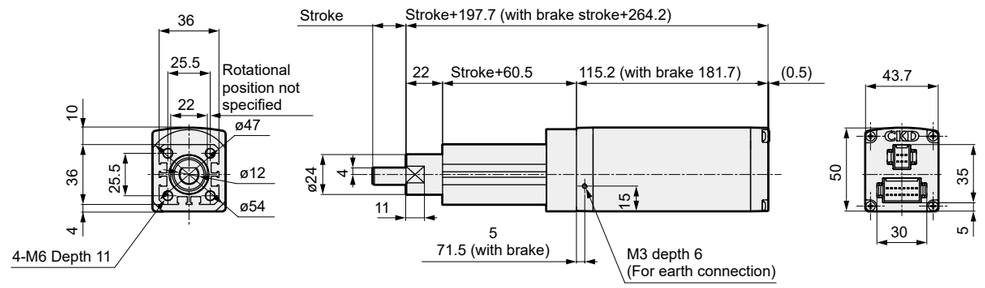
Pushing Force



* The upper pushing force is a reference value. It may vary depending on conditions such as pushing speed.

External Dimension Drawing

● GSTK-20



[Dimension Table by Stroke]

Stroke Code		010	020
Stroke (mm)		10	20
Weight (kg)	Without Brake	0.8	0.8
	With Brake	1.3	1.3

Electric Actuator Stopper Type

GSTK-32

□42 Stepping Motor

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

Model No. Notation Method

GSTK - M - 32 G E - 06 020 B B N - R01

❶Size

32	32

❷Connected Controller *1

G	ECMG/ECG-A

❸Motor Mounting Direction

E	Straight Mount

❹Screw Lead

06	6 mm
12	12 mm

❺Stroke

010	10 mm
020	20 mm

❻Brake *2

N	None
B	Yes

❼Encoder

B	Absolute Encoder
C	Incremental Encoder

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

*1 For controllers, please refer to P. 529.
*2 Select "Yes" for vertical use.
*3 For the external dimension drawing of the relay cable, please refer to P. 576.

Specifications

Connected Controller		ECMG, ECG-A	
Motor		□42 Stepping Motor	
Encoder Type		Battery-less Absolute Encoder Incremental Encoder	
Drive Method		Sliding screw ø8	
Stroke	mm	10, 20	
Screw lead	mm	6	12
Max. Thrust	N	113	47
Operating Speed Range *2	mm/s	10 to 200	15 to 300
Max. Acceleration/Deceleration	Vertical	0.3	0.3
Max. Pushing Force	N	220	90
Pushing Operation Speed Range	mm/s	10 to 20	15 to 20
Repeatability	*3 mm	±0.01	
Lost Motion	mm	0.3 or less	
Brake	Type	Non-excitation operating type	
	Holding Force N	140	70
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	

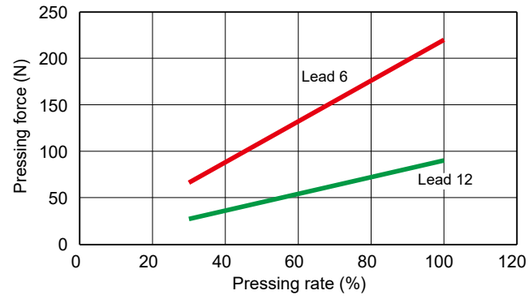
*1 Thrust varies depending on acceleration/deceleration and speed.
*2 Maximum speed may decrease depending on conditions.
*3 Since there is backlash, if stopping accuracy is required, please use an external stopper, etc., and complete positioning with a pushing motion.

Speed and Thrust

[Horizontal/Vertical Installation] (N)

Speed (mm/s)	Acceleration/deceleration 0.3G	
	Screw Lead (mm)	
	6	12
10	86	
15	86	43
50	113	47
70	50	47
100	50	47
150	19	47
200	7	44
250		11
300		11

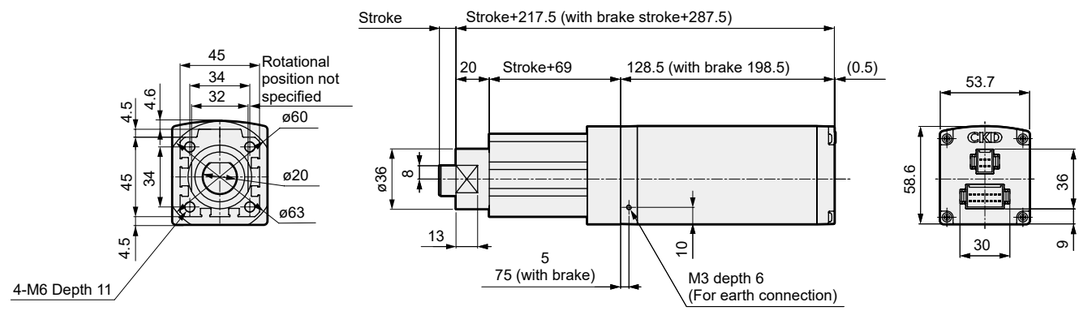
Pushing Force



* The upper pushing force is a reference value. It may vary depending on conditions such as pushing speed.

External Dimension Drawing

● GSTK-32



[Dimension Table by Stroke]

Stroke Code		010	020
Stroke (mm)		10	20
Weight (kg)	Without Brake	1.4	1.4
	With Brake	2	2

Electric Actuator Stopper Type

GSTK-50

□56 Stepping Motor

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

Model No. Notation Method

GSTK - M - 50 G E - 06 020 B B N - R01

❶Size

50	50

❷Connected Controller *1

G	ECMG/ECG-A

❸Motor Mounting Direction

E	Inline Mount

❹Screw Lead

06	6 mm
12	12 mm

❺Stroke

020	20 mm
030	30 mm

❻Brake *2

N	None
B	Yes

❼Encoder

B	Absolute Encoder
C	Incremental Encoder

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

*1 For controllers, please refer to P. 529.
*2 Select "Yes" for vertical use.
*3 For the external dimension drawing of the relay cable, please refer to P. 576.

Specifications

Connected Controller		ECMG, ECG-A	
Motor		□56 Stepping Motor	
Encoder Type		Battery-less Absolute Encoder Incremental Encoder	
Drive Method		Sliding screw ø12	
Stroke mm		20, 30	
Screw lead mm		6	12
Max. Thrust N		192	129
Operating Speed Range *2 mm/s		20 to 150	20 to 300
Max. Acceleration/Deceleration Vertical		0.3	0.3
Max. Pushing Force N		590	425
Pushing Operation Speed Range mm/s		20	20
Repeatability *3 mm		±0.01	
Lost Motion mm		0.3 or less	
Brake	Type	Non-excitation operating type	
	Holding Force N	640	320
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	

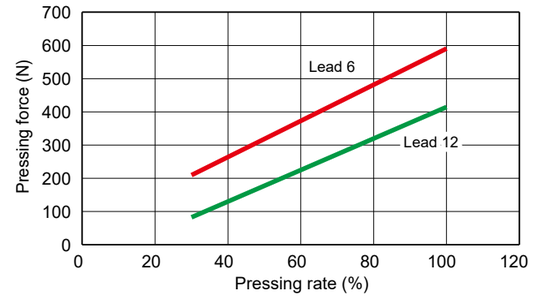
*1 Thrust varies depending on acceleration/deceleration and speed.
*2 Maximum speed may decrease depending on conditions.
*3 Since there is backlash, if stopping accuracy is required, please use an external stopper, etc., and complete positioning with a pushing motion.

Speed and Thrust

[Horizontal/Vertical Installation] (N)

Speed (mm/s)	Acceleration/deceleration 0.3G	
	Screw Lead (mm)	
	6	12
20	192	35
50	137	129
70	47	117
100	47	102
150	7	39
200		39
250		19
300		6

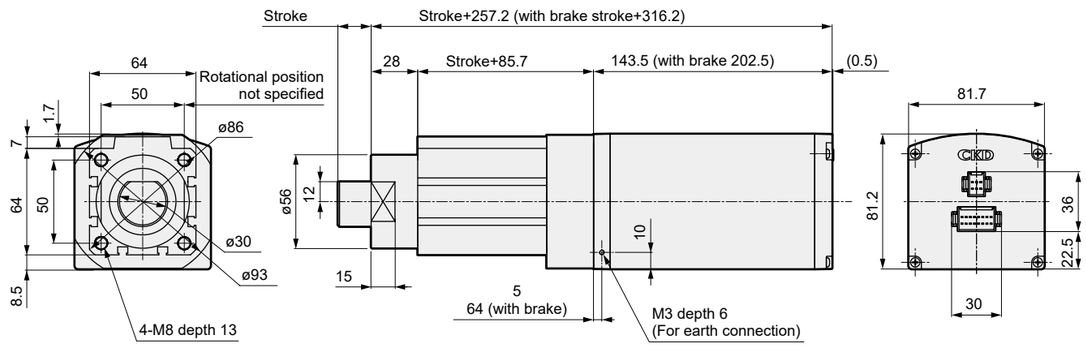
Pushing Force



* The upper pushing force is a reference value. It may vary depending on conditions such as pushing speed.

External Dimension Drawing

● GSTK-50



[Dimension Table by Stroke]

Stroke Code		020	030
Stroke (mm)		20	30
Weight (kg)	Without Brake	3	3.1
	With Brake	4.3	4.4

Model Selection

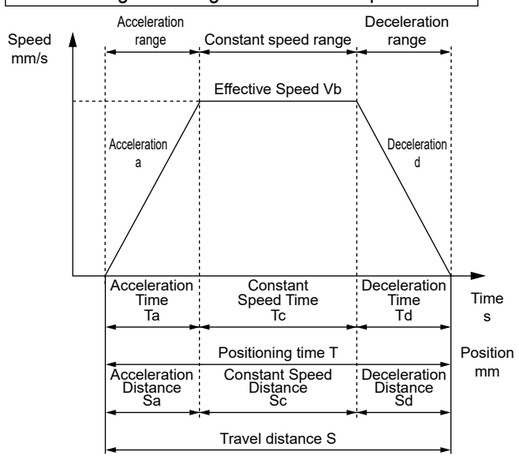
STEP1 Confirmation of thrust

Thrust varies with size, screw lead, operation speed and acceleration/deceleration. Refer to System Table (page 341), the specification table for each model and the thrust table by speed and acceleration/deceleration to select the size and screw lead.

STEP2 Confirmation of Positioning Time

Calculate the positioning time for the selected product according to the example below and check if it meets the required tact time.

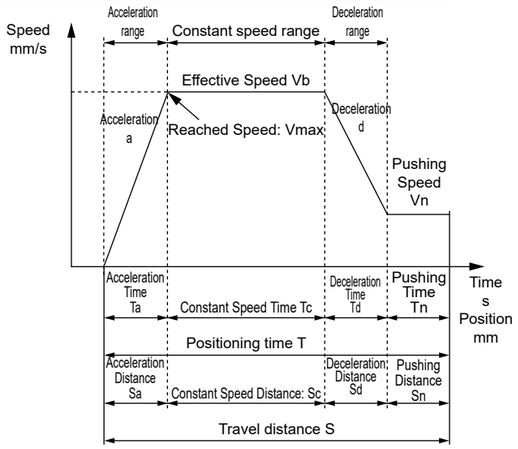
Positioning time for general transfer operations



	Content	Code	Unit	Remarks
Setting Value	Set Speed	V	mm/s	
	Set Acceleration	a	mm/s²	
	Set Deceleration	d	mm/s²	
	Travel Distance	S	mm	
Calculated Value	Reached Speed	Vmax	mm/s	$= [2\times a\times d\times S / (a+d)]^{1/2}$
	Effective Speed	Vb	mm/s	The smaller of V and Vmax
	Acceleration Time	Ta	s	= Vb / a
	Deceleration Time	Td	s	= Vb / d
	Constant Speed Time	Tc	s	= Sc / Vb
	Acceleration Distance	Sa	mm	$= (a\times Ta^2) / 2$
	Deceleration Distance	Sd	mm	$= (d\times Td^2) / 2$
	Constant Speed Distance	Sc	mm	= S - (Sa+Sd)
	Positioning Time	T	s	= Ta+Tc+Td

* Do not use at speeds exceeding the specifications.
* Depending on the acceleration/deceleration and stroke, a trapezoidal velocity waveform may not be formed (the set speed may not be reached). In that case, select the smaller of the set speed (V) and the reached speed (Vmax) as the effective speed (Vb).
* Acceleration and deceleration vary depending on the product and usage conditions. Refer to P. 342, 334 and 336 for details.
* Settling time varies depending on the usage conditions, but it may take about 0.2 s.
* 1G ≈ 9.8 m/s².

Positioning time for pushing operations



	Content	Code	Unit	Remarks
Setting Value	Set Speed	V	mm/s	
	Set Acceleration	a	mm/s²	
	Set Deceleration	d	mm/s²	
	Travel Distance	S	mm	
	Pushing Speed	Vn	mm/s	
	Pushing Distance	Sn	mm	
Calculated Value	Reached Speed	Vmax	mm/s	$= [2\times a\times d\times (S - Sn+Vn^2 / 2 / d) / (a+d)]^{1/2}$
	Effective Speed	Vb	mm/s	The smaller of V and Vmax
	Acceleration Time	Ta	s	= Vb / a
	Deceleration Time	Td	s	= (Vb - Vn) / d
	Constant Speed Time	Tc	s	= Sc / Vb
	Pushing Time	Tn	s	= Sn / Vn
	Acceleration Distance	Sa	mm	$= (a\times Ta^2) / 2$
	Deceleration Distance	Sd	mm	$= ((Vb+Vn)\times Td) / 2$
	Constant Speed Distance	Sc	mm	= S - (Sa+Sd+Sn)
	Positioning Time	T	s	= Ta+Tc+Td+Tn

* Do not use at speeds exceeding the specifications.
* Pushing speed varies depending on the product.
* Depending on the acceleration/deceleration and stroke, a trapezoidal velocity waveform may not be formed (the set speed may not be reached). In that case, select the smaller of the set speed (V) and the reached speed (Vmax) as the effective speed (Vb).
* Acceleration and deceleration vary depending on the product and usage conditions. Refer to P. 342, 334 and 336 for details.
* Settling time varies depending on the usage conditions, but it may take about 0.2 s.
* 1G ≈ 9.8 m/s².

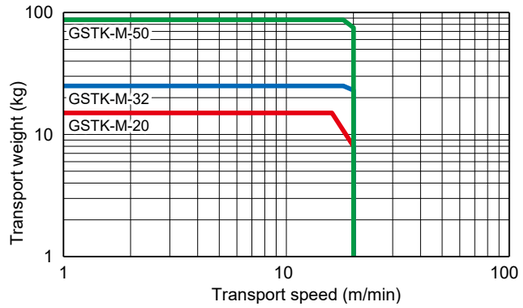
STEP3 Operating range

Select a model from the conveying weight (m) and conveying speed (V) so that the allowable absorption energy in the graph on the right is not exceeded.

(Example) Transport speed 15 m/min, Transport weight 20 kg

[How to Read the Graph]
For the selection method of the specifications above, obtain the intersection point of 15 m/min on the horizontal axis and 20 kg on the vertical axis and then select GSTK-32 within the allowable absorbed energy range.

Figure 1 Allowable absorbed energy



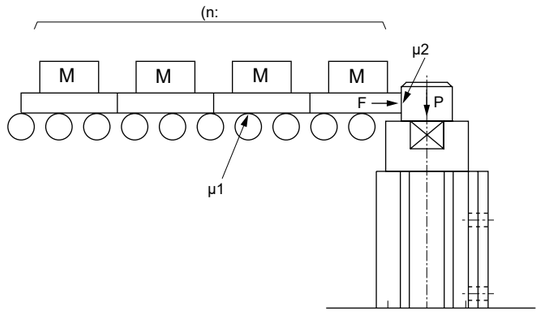
STEP4 Lateral Load and Thrust

The thrust during rod retraction varies depending on the magnitude of the lateral load applied to the rod tip, so check the required operating thrust.

1. Determine the lateral load (F) applied to the rod tip.
$F = 10 \cdot m \cdot n \cdot \mu_1$
F: Lateral load (N)
M: Transport weight: kg
n: Quantity of transported items
μ1: Coefficient of friction between transport pallet and conveyor

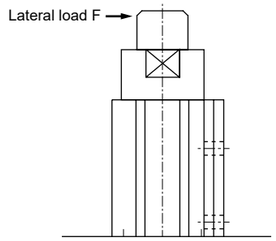
2. Determine the required thrust (P) during rod retraction.
$P = F \cdot \mu_2$
P: Required thrust (N)
μ2: Coefficient of friction between transported item and rod
(Note) The coefficient of friction differs depending on the material of the transported item, so please refer to the coefficients in the table below.

Material of transported item	Steel	Aluminum	Urethane
μ2	0.5	0.8	2.0



Allowable Lateral Load

Size	Stroke (mm)		
	10	20	30
GSTK-20	106.5	93.2	-
GSTK-32	272.8	238.7	-
GSTK-50	-	582.8	525.8



MEMO

G Series
GSSD2
GSTK
GSTG
GSTS
GSTL
GCKW
Ending