DSSD2
DSTK
DSTG
DSTS
DSTL
DMSDG
DLSH
DCKW
D Series (Screw drive)
D Series (Spring drive)
ESC3 (Controller)
GSSD2
GSTK
GSTG
GSTS
GSTL
GCKW
G Series
ECG-A (Controller)
ECG-B (Controller)
Safety Caution
Model selection Check sheet

DSTS
Guided

Electric actuator
Motor specifications

CONTENTS

DSTS Series variation

Actuator model No.	Motor Size	Screw lead (mm)	Max. payload (kg)		Stroke (mm) and Max. speed (mm/s)	
			Horizontal	Vertical	25	50
DSTS-20	□35	6	4.4	6.4	90	
		9	4.4	4.8	135	
DSTS-32	□42	6	10	14	90	
		12	4	4.8	180	
DSTS-50	□56	6	14.8	13.2	72	
		12	9.2	7.2	144	

D Series (Screw drive)

DSSD2 · DSTK · DSTG · DSTS · DSTL

D Series (Spring drive)

DMSDG · DLSH · DCKW

ESC3 (Controller)

GSSD2

G Series

GSTK · GSTG · GSTS · GSTL · GCKW

ECG-A (Controller)

ECG-B (Controller)

Safety Caution

Model selection Check sheet

Electric actuator Guided

DSTS-20

□35 Stepping motor

RoHS

How to order

DSTS	-M-	20	S	E-	06	025	T3PH	R1	A	1	-F
❶	❷	❸	❹		❺	❻	❼	❽	❾	❿	⓫

❶ Bearing

M	Metal bush bearing

❷ Size

20	20

❸ Applicable controller * 1

S	ESC4

❹ Motor mounting direction

E	Straight mounting

❺ Lead

06	6 mm
09	9 mm

❻ Stroke

025	25 mm
050	50 mm

❼ Switch

NNNN	None
T3PH	T-type straight
T3PV	T-shaped L-type

❽ Relay cable   * 2

N0	None
R1	Movable 1 m
R3	Movable 3 m
R5	Movable 5 m
RX	Movable 10 m

❾ Controller included

N	None
A	DIN rail mounting specifications
B	Panel mounting specifications

❿ IO cable length

N	None
1	1 m
3	3 m
5	5 m
X	10 m

⓫ Option

Blank	End plate material: aluminum
F	End plate material: steel

*1 For controller, refer to CC-1635A.
*2 Refer to page 104 for relay cable dimensions.

Specifications

Motor	□35 Stepping motor	
Drive method	Sliding screw ø6	
Stroke mm	25, 50	
Screw lead mm	6	9
Max. payload kg Horizontal	4.4	4.4
*1 Vertical	6.4	4.8
Operation speed range * 2 mm/s	15 to 90	22 to 135
Max. acceleration/deceleration * 3 mm/s²	1312 (setting: 9)	2938 (setting: 9)
Insulation resistance	10MΩ, 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	

*1 Load capacity varies depending on the speed. Refer to the speed and payload table for details. If the operation sounds are loud at low speed, increase the speed.
*2 The maximum speed may decrease depending on the conditions.
*3 Refer to the speed and payload table for the acceleration/deceleration speed at other settings.
*4 Pressing operation is not supported. Collision with the mechanical end, etc., may lead to damage of parts inside the actuator.

Speed and payload

[When installed horizontally]

Switch Setting	Screw lead			
	6 mm		9 mm	
	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less
0	15	4.4	22	4.4
1	23	4.4	35	4.4
2	31	4.4	47	4.0
3	40	4.4	60	3.6
4	48	3.6	72	3.6
5	56	3.6	85	3.2
6	65	2.8	97	2.8
7	73	2.8	110	2.4
8	81	2	122	2.4
9	90	2	135	2

[When installed vertically]

Switch Setting	Screw lead			
	6 mm		9 mm	
	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less
0	15	6.4	22	4.8
1	23	6.4	35	4.8
2	31	6.4	47	4.8
3	40	6.4	60	4.8
4	48	6.4	72	4.4
5	56	6.4	85	4.4
6	65	6.4	97	4
7	73	4.8	110	3.6
8	81	4.8	122	3.3
9	90	4.8	135	3

* The speed setting is for reference. The actual values may differ due to switch adjustment, power supply voltage, individual motor differences, variations in mechanical efficiency and/or temperature.
* This value is for when no moment is applied to the end plate. Refer to the instruction manual for details on mounting surface flatness, etc.
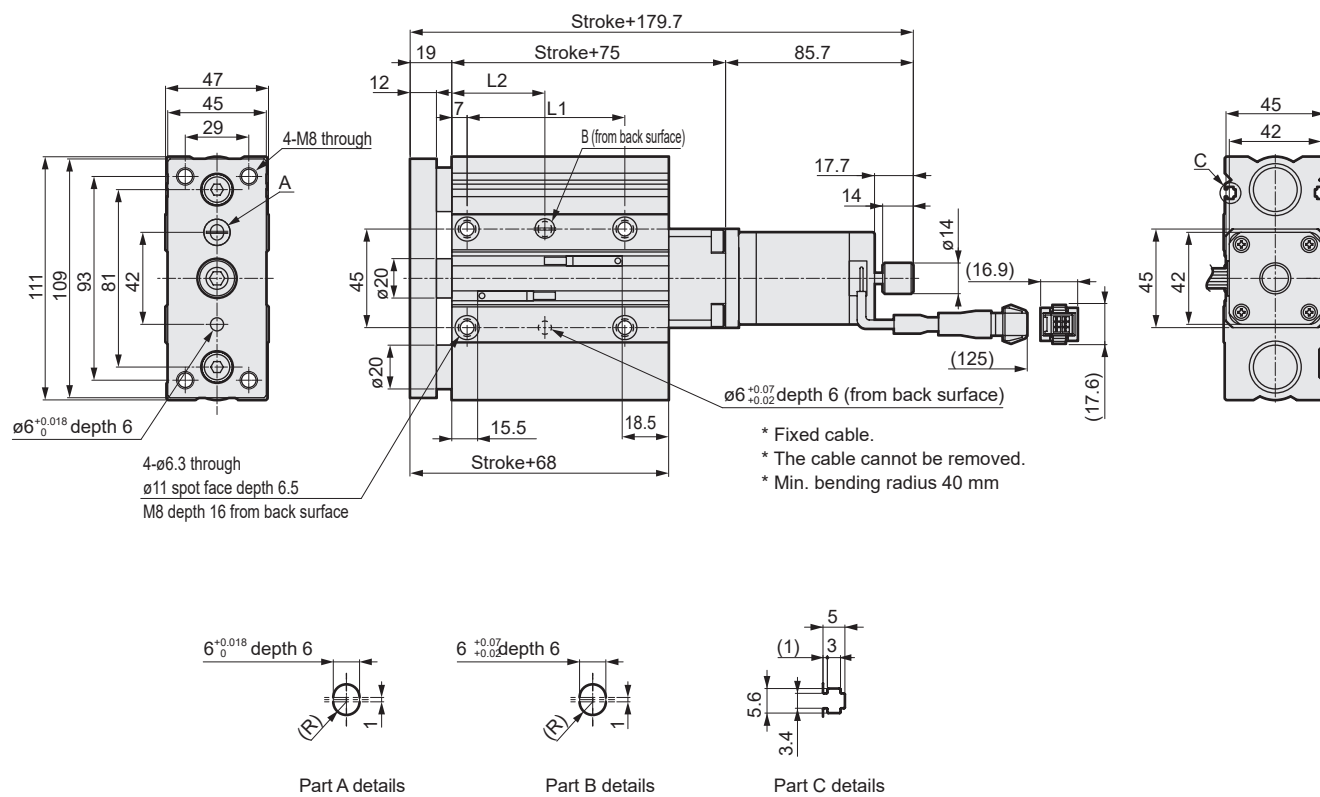
Dimensions

● DSTS-20

Stroke + 149.2
Stroke + 61
75.2
13
9
6
L2
L1
B (from back surface)
17.7
14
ø14
(16.9)
38
36
24
4-M6 through
A
83 81 69 59 30
ø6 +0.018 0 depth 6
31
ø16
ø14
15.5
9.5
Stroke +53
(125)
(17.6)
35
C
35

4-ø 5.2 through
ø9.5 spot face depth 5.4
M6 depth 12 from back surface

ø6 +0.07 +0.02 depth 6 (from back surface)

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

$6^{+0.018}_{0}$ depth 6

Part A details

$6^{+0.07}_{+0.02}$ depth 6

Part B details

5
3
(1)
5.6
3.4

Part C details
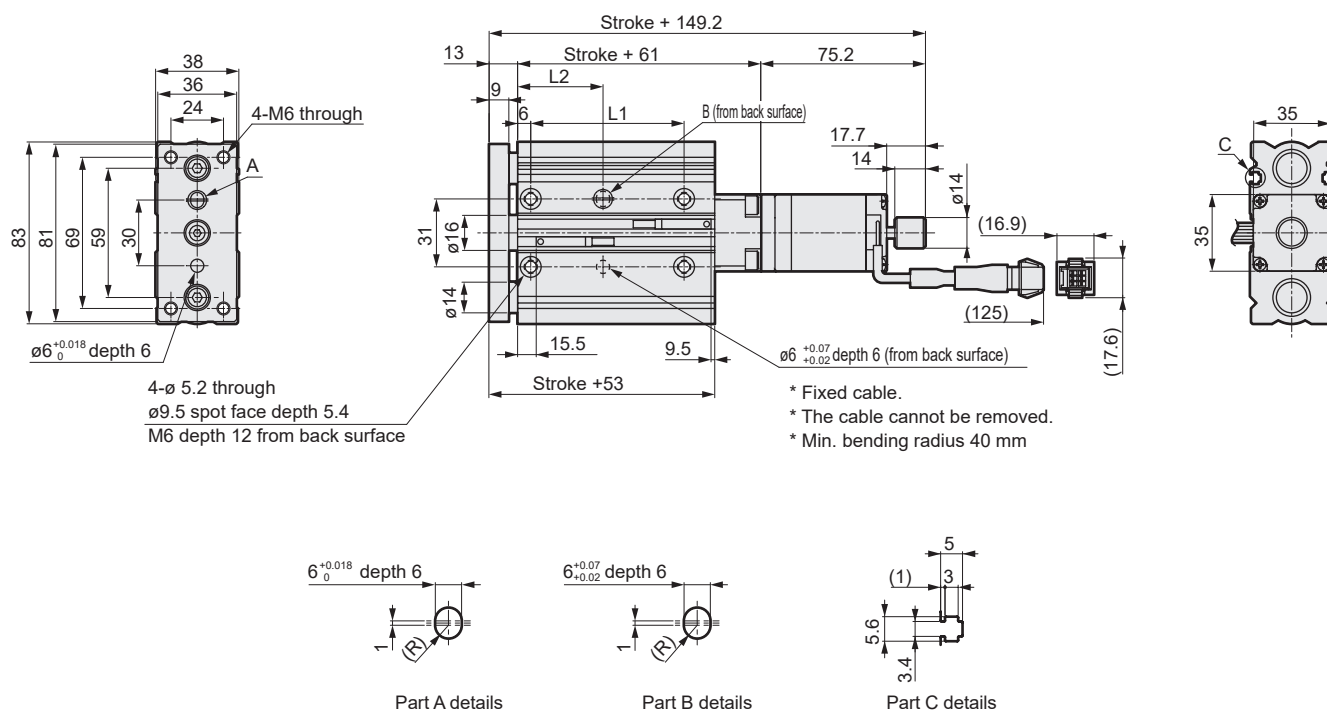
[Dimensions by stroke]

Stroke code	025	050
Stroke (mm)	25	50
L1	45	70
L2	26.5	39
Weight (kg)	1.1	1.3

CKD 41

D Series (Screw drive) | DSSD2 | DSTK | DSTG | DSTS | DSTL
D Series (Spring drive) | DMSDG | DLSH | DCKW
ESC3 (Controller)
G Series | GSSD2 | GSTK | GSTG | GSTS | GSTL | GCKW
ECG-A (Controller)
ECG-B (Controller)
Safety Caution
Model selection Check sheet

Electric actuator Guided

DSTS-32

☐42 Stepping motor

RoHS

How to order

DSTS - M - 32 S E - 06 025 T3PH R1 A 1 - F

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫

❶Bearing

| M | Metal bush bearing |

❷Size

| 32 | 32 |

❸Applicable controller * 1

| S | ESC4 |

❹Motor mounting direction

| E | Straight mounting |

❺Lead

| 06 | 6 mm |
| 12 | 12 mm |

❻Stroke

| 025 | 25 mm |
| 050 | 50 mm |

❼Switch

NNNN	None
T3PH	T-type straight
T3PV	T-shaped L-type

❽Relay cable　* 2

N0	None
R1	Movable 1 m
R3	Movable 3 m
R5	Movable 5 m
RX	Movable 10 m

❾Controller included

N	None
A	DIN rail mounting specifications
B	Panel mounting specifications

❿IO cable length

N	None
1	1 m
3	3 m
5	5 m
X	10 m

⓫Option

| Blank | End plate material: aluminum |
| F | End plate material: steel |

*1 For controller, refer to CC-1635A.
*2 Refer to page 104 for relay cable dimensions.

Specifications

Motor	☐42 Stepping motor	
Drive method	Sliding screw ø8	
Stroke mm	25, 50	
Screw lead　　　mm	6	12
Max. payload kg *1 Horizontal	10	4
Vertical	14	4.8
Operation speed range　*2　mm/s	15 to 90	30 to 180
Max. acceleration/deceleration*3　mm/s²	1312 (setting: 9)	5250 (Setting: 9)
Insulation resistance	10MΩ, 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	

*1 Load capacity varies depending on the speed. Refer to the speed and payload table for details. If the operation sounds are loud at low speed, increase the speed.
*2 The maximum speed may decrease depending on the conditions.
*3 Refer to the speed and payload table for the acceleration/deceleration speed at other settings.
*4 Pressing operation is not supported. Collision with the mechanical end, etc., may lead to damage of parts inside the actuator.

Speed and payload

[When installed horizontally]

Switch Setting	Screw lead			
	6 mm		12 mm	
	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less
0	15	10.0	30	4.0
1	23	9.2	46	3.2
2	31	6.0	63	2.8
3	40	6.0	80	2.4
4	48	4.0	96	2.4
5	56	3.6	113	2.4
6	65	3.6	130	2.4
7	73	3.2	146	2.0
8	81	2.4	163	1.6
9	90	2.0	180	1.2

[When installed vertically]

Switch Setting	Screw lead			
	6 mm		12 mm	
	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less
0	15	14	30	4.8
1	23	13.2	46	4
2	31	12.4	63	4
3	40	11.6	80	4
4	48	11.6	96	3.6
5	56	11.6	113	3.2
6	65	10.8	130	2.8
7	73	10.8	146	2.4
8	81	10	163	2.0
9	90	9.2	180	1.6

* The speed and acceleration/deceleration settings are guidelines. The actual values may differ due to switch adjustment, power supply voltage, individual motor differences, variations in mechanical efficiency and/or temperature.
* This value is for when no moment is applied to the end plate.
Refer to the instruction manual for details on mounting surface flatness, etc.

CKD

Dimensions

● DSTS-32

Stroke+179.7
Stroke+75
85.7
19
12
L2
7
L1
B (from back surface)
17.7
14
ø14
(16.9)
45
ø20
ø20
(125)
15.5
18.5
Stroke+68
ø6 +0.07 +0.02 depth 6 (from back surface)

47
45
29
4-M8 through
A
111
109
93
81
42
ø6 +0.018 0 depth 6
4-ø6.3 through
ø11 spot face depth 6.5
M8 depth 16 from back surface

45
42
C
45
42

(17.6)

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

6 +0.018 0 depth 6

Part A details

6 +0.07 +0.02 depth 6

Part B details

5
(1) 3
5.6
3.4

Part C details

[Dimensions by stroke]

Stroke code	025	050
Stroke (mm)	25	50
L1	47	72
L2	30	42.5
Weight (kg)	2.2	2.6

D Series (Screw drive) · DSSD2 · DSTK · DSTG · DSTS · DSTL · DMSDG · DLSH · DCKW

D Series (Spring drive)

ESC3 (Controller) · GSSD2 · GSTK · GSTG · GSTS · GSTL · GCKW

G Series

ECG-A (Controller) · ECG-B (Controller)

Safety Caution · Model selection · Check sheet
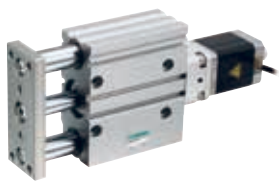
Electric actuator Guided

DSTS-50

□56 Stepping motor

RoHS

How to order

DSTS	-M-	50	S	E-	06	025	T3PH	R1	A	1	-F
❶	❷	❸	❹		❺	❻	❼	❽	❾	❿	⓫

❶ Bearing

M	Metal bush bearing

❷ Size

50	50

❸ Applicable controller * 1

S	ESC4

❹ Motor mounting direction

E	Straight mounting

❺ Lead

06	6 mm
12	12 mm

❻ Stroke

025	25 mm
050	50 mm

❼ Switch

NNNN	None
T3PH	T-type straight
T3PV	T-shaped L-type

❽ Relay cable　* 2

N0	None
R1	Movable 1 m
R3	Movable 3 m
R5	Movable 5 m
RX	Movable 10 m

❾ Controller included

N	None
A	DIN rail mounting specifications
B	Panel mounting specifications

❿ IO cable length

N	None
1	1 m
3	3 m
5	5 m
X	10 m

⓫ Option

Blank	End plate material: aluminum
F	End plate material: steel

*1 For controller, refer to CC-1635A.
*2 Refer to page 104 for relay cable dimensions.

Specifications

Motor	□56 Stepping motor	
Drive method	Sliding screw ø12	
Stroke mm	25, 50	
Screw lead　　　mm	6	12
Max. payload kg *1 Horizontal	14.8	9.2
Vertical	13.2	7.2
Operation speed range *2 mm/s	15 to 72	30 to 144
Max. acceleration/deceleration *3 mm/s²	827 (Setting: 9)	3306 (setting: 9)
Insulation resistance	10MΩ, 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	

*1 Load capacity varies depending on the speed. Refer to the speed and payload table for
　details. If the operation sounds are loud at low speed, increase the speed.
*2 The maximum speed may decrease depending on the conditions.
*3 Refer to the speed and payload table for the acceleration/deceleration speed at other settings.
*4 Pressing operation is not supported. Collision with the mechanical end, etc., may lead to
　damage of parts inside the actuator.

Speed and payload

[When installed horizontally]

Switch Setting	Screw lead			
	6 mm		12 mm	
	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less
0	15	14.8	30	9.2
1	21	11.6	42	9.2
2	27	10.0	55	9.2
3	34	8.4	68	9.2
4	40	8.4	80	8.8
5	46	8.4	93	8.8
6	53	8.4	106	8.4
7	59	6.8	118	7.6
8	65	6.8	131	6.0
9	72	6.8	144	4.4

[When installed vertically]

Switch Setting	Screw lead			
	6 mm		12 mm	
	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less	Speed (mm/s)	Payload (kg) Stroke (mm) 50 or less
0	15	13.2	30	7.2
1	21	13.2	42	7.2
2	27	13.2	55	7.2
3	34	13.2	68	7.2
4	40	12.8	80	7.2
5	46	12.4	93	6.8
6	53	12	106	6.4
7	59	9.6	118	6
8	65	7.6	131	4.4
9	72	6	144	2.4

* The speed setting is for reference. The actual values may differ due to
　switch adjustment, power supply voltage, individual motor differences,
　variations in mechanical efficiency and/or temperature.
* This value is for when no moment is applied to the end plate. Refer to
　the instruction manual for details on mounting surface flatness, etc.

CKD

● DSTS-50

Stroke+206
22
Stroke+84
100
16
8
L2
L1
66
64
44
4-M10 through
A
147
145
125
110
55
ø20
ø20
66
ø25
B (from back surface)
14
ø14
(16.9)
(125)
(17.6)
64
56.4
64
56.4
C
ø6 +0.018/0 depth 6
4-ø8.6 through
ø14 depth 8.6
M10 depth 20 from back surface
24
16
Stroke+77
ø6 +0.07/+0.02 depth 6 (from back surface)

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

6 +0.018/0 depth 6
6 +0.07/+0.02 depth 6
5
(1) 3
5.6
3.4

Part A details

Part B details

Part C details

[Dimensions by stroke]
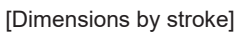
Stroke code	025	050
Stroke (mm)	25	50
L1	51	76
L2	32	44.5
Weight (kg)	4.2	4.8

CKD

45

D Series (Screw drive) | DSSD2 DSTK DSTG DSTS DSTL
D Series (Spring drive) | DMSDG DLSH DCKW
ESC3 (Controller)
G Series | GSSD2 GSTK GSTG GSTS GSTL GCKW
ECG-A (Controller)
ECG-B (Controller)
Safety Caution
Model selection Check sheet

DSTS Series

Model selection

STEP 1 — Confirming payload

Payload varies with mounting orientation, screw lead and transport speed. Refer to the Series Variation (page 39), the specification table for each model and the Table of Load Capacity by Speed Setting to select the size and screw lead.

STEP 2 — Confirming positioning time

Calculate the positioning time with the selected product according to the following example and confirm that the required tact is achievable.

Positioning time for general transport operation
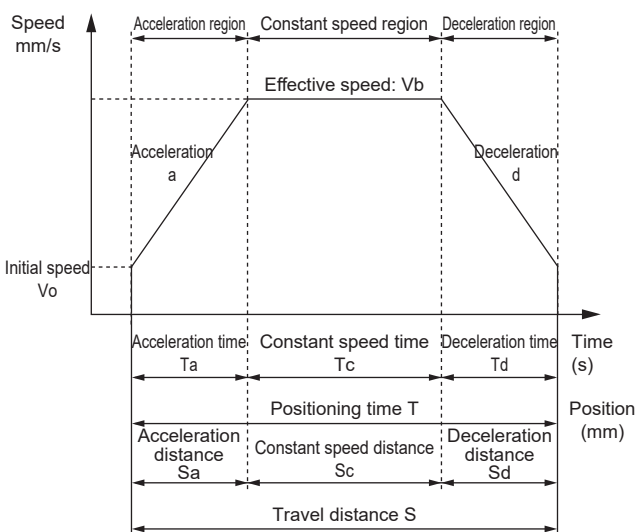
	Description	Code	Unit	Formula
Set value	Initial speed	V0	mm/s	According to the table below (= value of switch setting 0)
	Speed setting	V	mm/s	Refer to the table below
	Acceleration	a	mm/s^2	According to the table below (fixed value)
	Deceleration			
	Travel distance	S	mm	*
Calculated value	Achieved speed	Vmax	mm/s	$=(S \times a + V0^2)^{1/2}$
	Effective speed	Vb	mm/s	The lesser value of V and Vmax
	Acceleration time	Ta	s	$=(Vb - V0) / a$
	Deceleration time			
	Constant speed time	Tc	s	$=Sc/Vb$
	Acceleration distance	Sa	mm	$=V0 \times Ta + (a \times Ta^2) / 2$
	Deceleration distance			
	Constant speed distance	Sc	mm	$=S - 2 \times Sa$
	Positioning time	T	s	$=2 \times Ta + Tc$

* Depending on the speed setting and stroke, the trapezoid speed waveform may not be formed (the set speed may not be achieved). In this case, select the execution speed (Vb) from the set speed (V) and the achieved speed (Vmax), whichever is smaller.
* Acceleration/deceleration depends on the speed setting.
* Speed is determined by the settings of rotary switches 1 and 2.
* The stabilization time differs depending on the working conditions, but it may take approximately 0.2s.

[Speed setting] (mm/s)

Switch Setting	Size 20		Size 32		Size 50	
	L6	L9	L6	L12	L6	L12
0	15	22	15	30	15	30
1	23	35	23	46	21	42
2	31	47	31	63	27	55
3	40	60	40	80	34	68
4	48	72	48	96	40	80
5	56	85	56	113	46	93
6	65	97	65	130	53	106
7	73	110	73	146	59	118
8	81	122	81	163	65	131
9	90	135	90	180	72	144

[Acceleration, deceleration] (mm/s^2)

Switch Setting	Size 20		Size 32		Size 50	
	L6	L9	L6	L12	L6	L12
0	0	0	0	0	0	0
1	53	119	53	212	38	153
2	129	290	129	518	90	360
3	229	513	229	916	155	620
4	351	787	351	1407	234	934
5	497	1114	497	1990	325	1301
6	666	1492	666	2666	431	1722
7	858	1922	858	3435	549	2196
8	1074	2404	1074	4296	681	2724
9	1312	2938	1312	5250	827	3306

CKD

STEP 3 — Confirming static allowable load and moment

Calculate the load and moment that are generated when the end plate is stopped. Confirm that the lateral load (W) and torsion moment (MY) are as follows. Make sure that the resultant moment (MT) satisfies the following formula according to the formula below.

Resultant moment

$$M_T = \frac{MP}{MP_{max}} + \frac{MR}{MR_{max}} \leq 1.0$$

Static allowable load and moment

Model No.	Stroke (mm)	Lateral load W (N)	Bending moment MP max (N·m)	Torsion moment MY max (N·m)	Radial moment MR max (N·m)
DSTS-M-20	25	48	32.6	0.71	32.6
	50	35		0.52	
DSTS-M-32	25	141	107.4	2.86	107.4
	50	109		2.21	
DSTS-M-50	25	213	201.7	5.86	201.7
	50	170		4.68	

When operating the unit under a load, calculate the allowable load using the following formula.
Catalog allowable lateral load × 0.9

● Lateral load W (N)   *When installed vertically
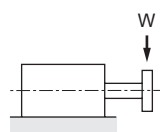
$$\frac{m_1 \times \ell_1 \times 10}{L} \leq W$$

Size	L
20	0.016+st
32	0.022+st
50	0.025+st

● Bending moment MP (N·m)

$$MP = F_1 \times \ell_1 = 10 \times m_1 \times G \times \ell_1$$
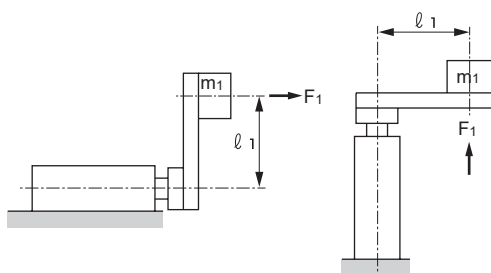
● Radial moment MR (N·m)

$$MR = F_2 \times \ell_2 = 10 \times m_2 \times G \times \ell_2$$
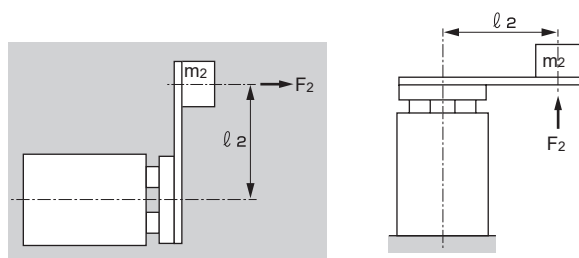
● Torsion moment MY (N·m)

$$MY = F_3 \times \ell_3 = 10 \times m_3 \times \ell_3$$
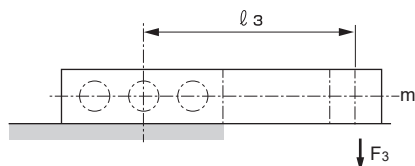
m_1:
m_2: } Load (kg)
m_3:

ℓ_1:
ℓ_2: } Eccentric distance (m)
ℓ_3:

G: Inertia force coefficient

Fig. 1 Trend of inertia force coefficient for guided type
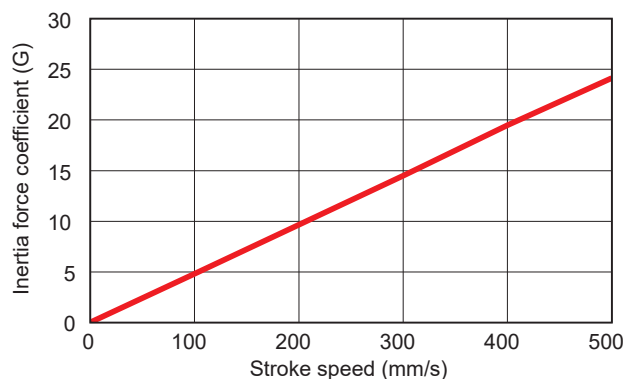
Model selection

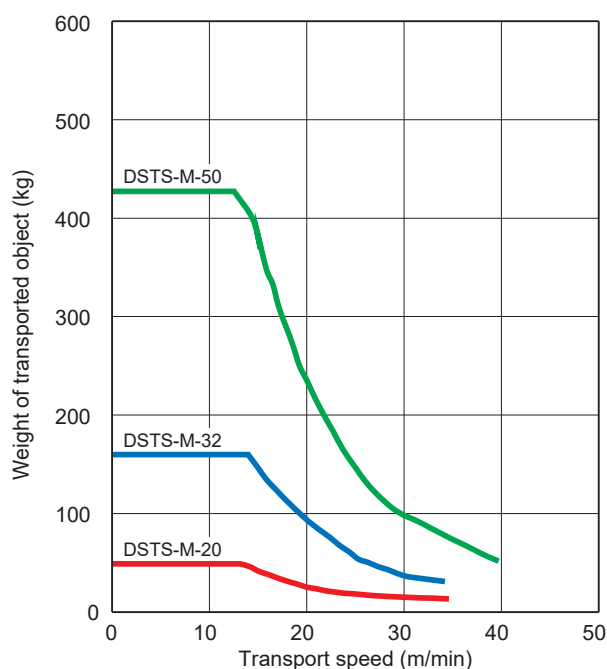| Deflection | For the inclination that is produced at the end of the end plate when no load is applied, the value in the graph below is used as a guide. (Excluding sag of guide rod) |

+δ (mm)

−δ (mm)

Rod projection

±0.5

±0.4

±0.3

DSTS-M-20 to 50

±0.2

Inclination ϗ (mm)

±0.1

±0

0   25   50

Stroke (mm)
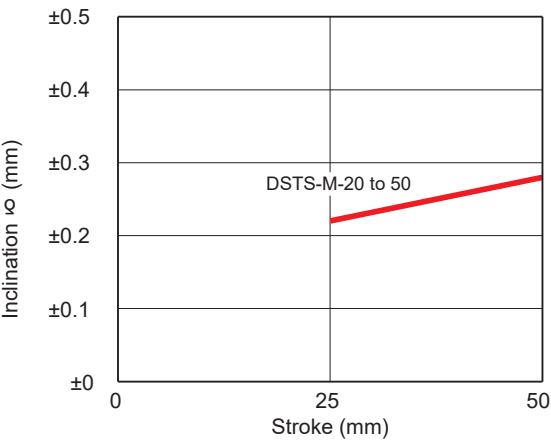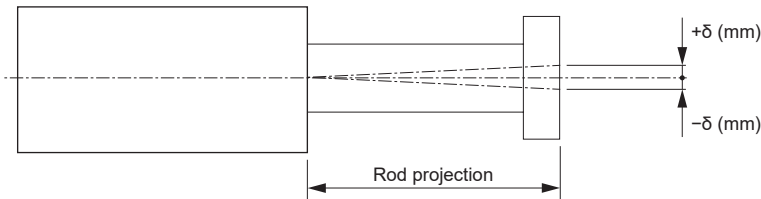
| Non-rotating accuracy | (reference value) |

+θ

−θ
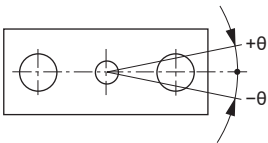
Size	Non-rotating accuracy θ (degrees)
DSTS-M-20	±0.10
DSTS-M-32	±0.08
DSTS-M-50	±0.07

CKD

Specified range when using the product as a stopper
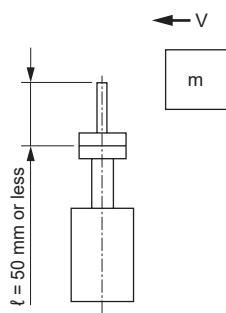
*1 Make sure that the total length of the stopper section is ℓ=50 mm or less.
*2 Make sure that the screw insertion depth of the bolt is 2d and over when fixing the actuator and consider countermeasures for preventing looseness (adhesive, spring washer, etc.).
*3 Refer to page 22 for the calculation of the required operational thrust.
*4 Calculate the actuator thrust with the following formula.
Thrust = vertical load capacity ×10 (N)

Impact load

DSSD2
DSTK
DSTG
DSTS
DSTL
DMSDG
DLSH
DCKW

D Series (Screw drive)
D Series (Spring drive)

ESC3 (Controller)

GSSD2
GSTK
GSTG
GSTS
GSTL
GCKW

G Series

ECG-A (Controller)
ECG-B (Controller)

Safety Caution
Model selection Check sheet

Allowable lateral load	Metal bush bearing
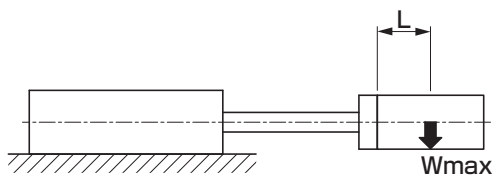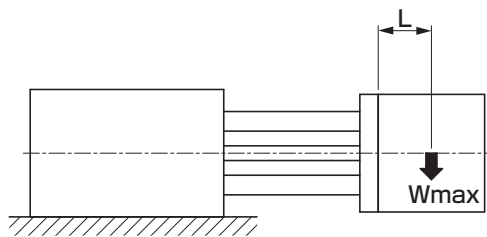
Wmax : Lateral load (N)
L : Load center of gravity position (mm)
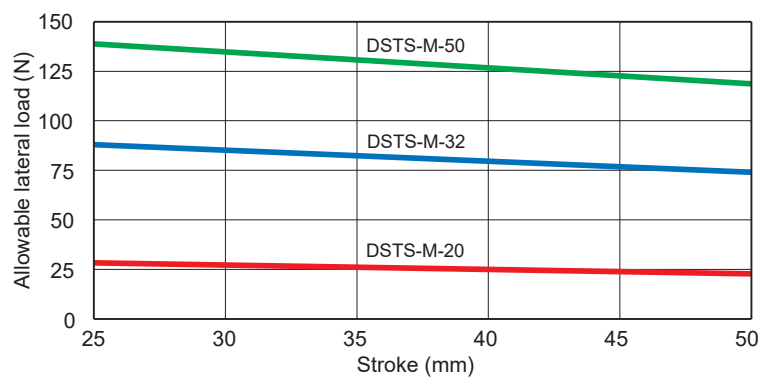
*1 When operating the unit under a load, calculate the allowable lateral load using the following formula. Catalog allowable lateral load value × 0.9
*2 When designing, be sure to consider the safety factor according to the operating conditions.

CKD