

DSTG

Guided Type

Electric Actuator with
Motor Specification



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DSTG System Table

Actuator Model No.	Motor Size	Screw Lead (mm)	Max. Payload (kg)		Stroke (mm) and Max. Speed (mm/s)				
			Horizontal	Vertical	20	25	50	75	100
DSTG-20	□35	6	4.4	6.4	90			90	
		9	4.4	4.8	135			135	
DSTG-32	□42	6	10	14			90		
		12	4	4.8			180		
DSTG-50	□56	6	14.8	13.2			72		
		12	9.2	7.2			144		



Electric Actuator Guided Type

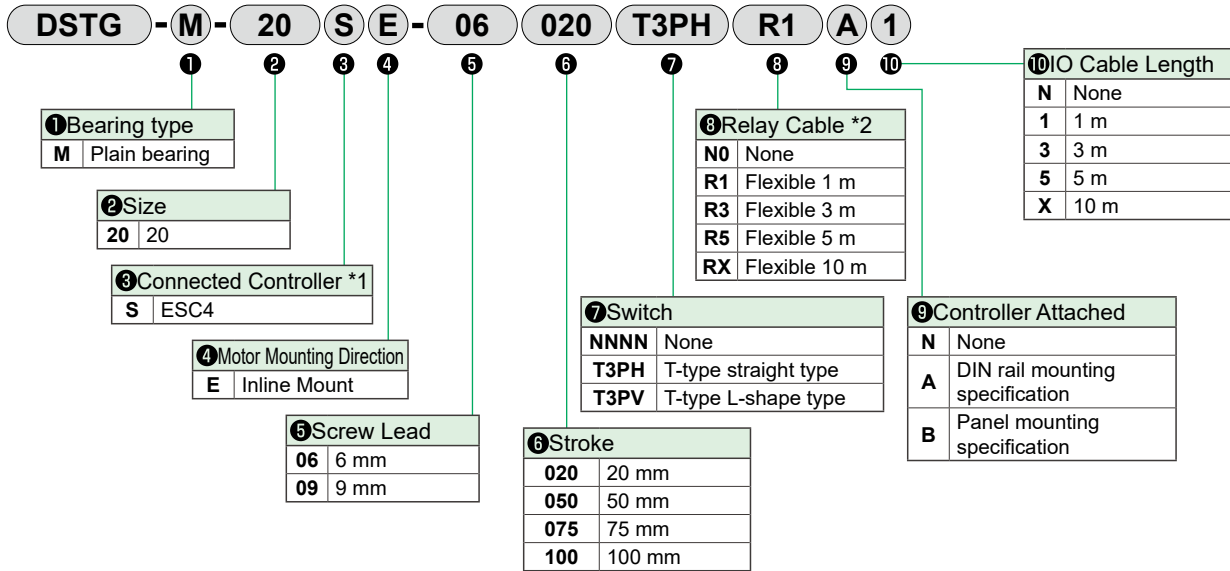
DSTG-20

□35 Stepping Motor



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

Model No. Notation Method



*1 For controllers, please refer to P. 611.
*2 For the external dimension drawing of the relay cable, please refer to P. 618.

Specifications

Connected Controller		ESC4	
Motor		□35 Stepping Motor	
Drive Method		Sliding screw ø6	
Stroke		20 to 100	
Screw lead		6	9
Max. Payload	Horizontal	4.4	4.4
	Vertical	6.4	4.8
Operating Speed Range *2 mm/s		15 to 90	22 to 135
Max. Acceleration/Deceleration *3 mm/s ²		1312 (Setting: 9)	2938 (Setting: 9)
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 Payload varies depending on speed. For details, please refer to the speed and payload table.
*2 Maximum speed may decrease depending on conditions.
*3 For acceleration/deceleration at other settings, please refer to the speed and payload table.
*4 Pushing operation is not supported.

Speed and Payload

[Horizontal Installation]

Switch Setting	Screw Lead					
	6 mm			9 mm		
	Speed (mm/s)	Payload (kg)	Stroke (mm)	Speed (mm/s)	Payload (kg)	Stroke (mm)
0	15	4.4	4.4	22	4.4	3.9
1	23	4.4	4.4	35	4.4	3.9
2	31	4.4	4.4	47	4.0	3.5
3	40	4.4	4.4	60	3.6	3.1
4	48	3.6	3.1	72	3.6	3.1
5	56	3.6	3.1	85	3.2	2.7
6	65	2.8	2.3	97	2.8	2.3
7	73	2.8	2.3	110	2.4	1.9
8	81	2	1.5	122	2.4	1.9
9	90	2	1.5	135	2	1.5

[Vertical Installation]

Switch Setting	Screw Lead					
	6 mm			9 mm		
	Speed (mm/s)	Payload (kg)	Stroke (mm)	Speed (mm/s)	Payload (kg)	Stroke (mm)
0	15	6.4	6.4	22	4.8	4.3
1	23	6.4	6.4	35	4.8	4.3
2	31	6.4	6.4	47	4.8	4.3
3	40	6.4	6.4	60	4.8	4.3
4	48	6.4	6.4	72	4.4	3.9
5	56	6.4	6.4	85	4.4	3.9
6	65	6.4	6.4	97	4	3.5
7	73	4.8	4.3	110	3.6	3.1
8	81	4.8	4.3	122	3.3	2.8
9	90	4.8	4.3	135	3	2.5

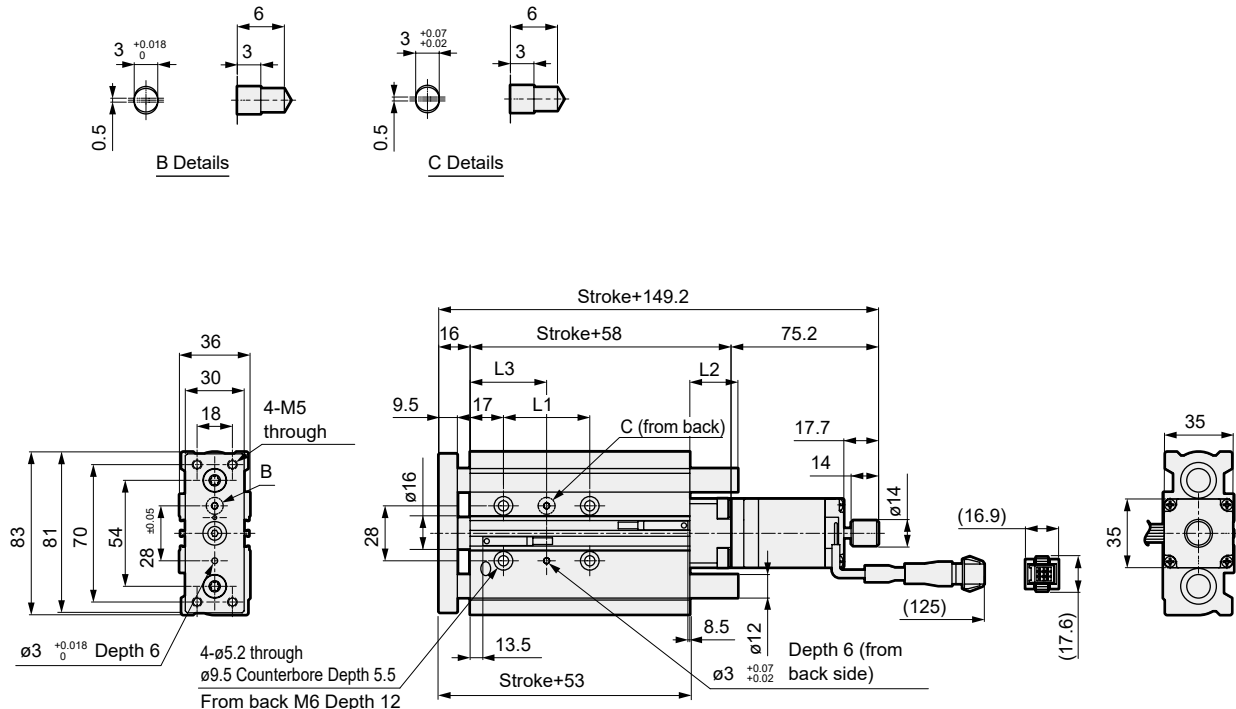
* The speed setting is a guideline. A discrepancy from the actual values may occur due to switch adjustment, power supply voltage, individual differences among motors, variations in mechanical efficiency, and temperature.
* Value when no moment is applied to the end plate section. For details such as flatness of the mounting surface, please refer to the instruction manual.

DSTG-20 Series

External Dimension Drawing

External Dimension Drawing

● DSTG-20



*This is a fixed cable.
*The cable cannot be removed.
* Minimum bending radius 40 mm

[Dimension Table by Stroke]

Stroke Code	020	050	075	100
Stroke (mm)	20	50	75	100
L1	24	44	44	44
L2	0	0	24.5	24.5
L3	29	39	39	39
Weight (kg)	1.1	1.4	1.6	1.8



Electric Actuator Guided Type

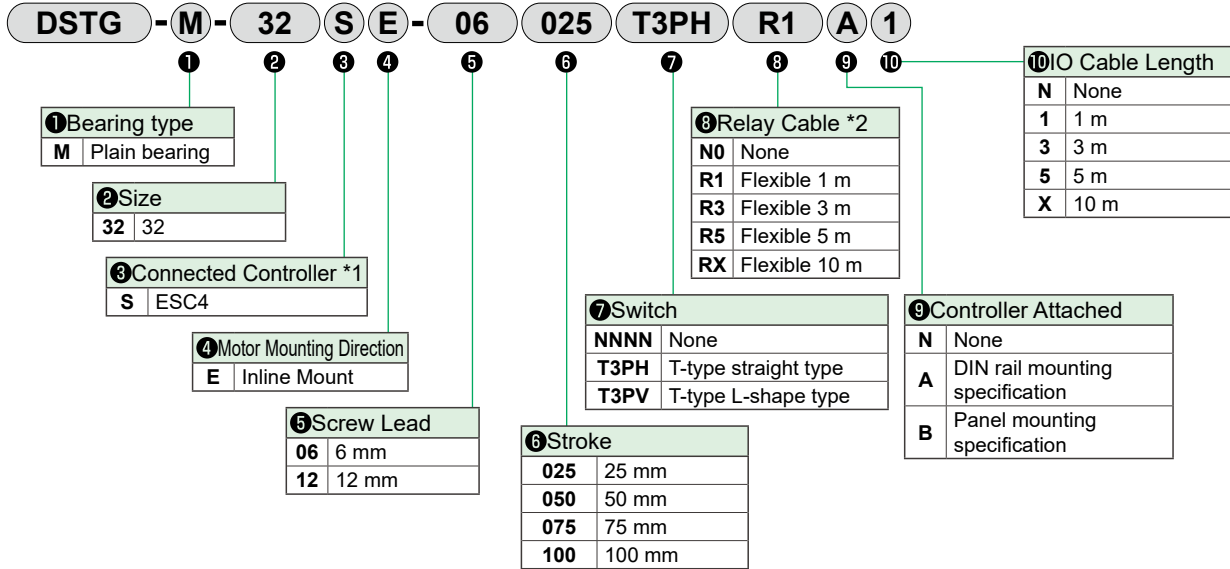
DSTG-32

□42 Stepping Motor



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

Model No. Notation Method



*1 For controllers, please refer to P. 611.
*2 For the external dimension drawing of the relay cable, please refer to P. 618.

Specifications

Connected Controller	ESC4	
Motor	□42 Stepping Motor	
Drive Method	Sliding screw ø8	
Stroke mm	25 to 100	
Screw lead mm	6	12
Max. Payload kg *1	Horizontal 10 Vertical 14	4 4.8
Operating Speed Range *2 mm/s	15 to 90	30 to 180
Max. Acceleration/Deceleration *3 mm/s ²	1312 (Setting: 9)	5250 (Setting: 9)
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 Payload varies depending on speed. For details, please refer to the speed and payload table.
*2 Maximum speed may decrease depending on conditions.
*3 For acceleration/deceleration at other settings, please refer to the speed and payload table.
*4 Pushing operation is not supported.

Speed and Payload

[Horizontal Installation]

Switch Setting	Screw Lead					
	6 mm			12 mm		
	Speed (mm/s)	Payload (kg)	Stroke (mm)	Speed (mm/s)	Payload (kg)	Stroke (mm)
0	15	10.0	9.5	30	4.0	3.5
1	23	9.2	8.7	46	3.2	1.9
2	31	6.0	5.5	63	2.8	2.3
3	40	6.0	5.5	80	2.4	2.7
4	48	4.0	3.5	96	2.4	1.9
5	56	3.6	3.1	113	2.4	1.9
6	65	3.6	3.1	130	2.4	1.9
7	73	3.2	2.7	146	2.0	1.5
8	81	2.4	1.9	163	1.6	1.1
9	90	2.0	1.5	180	1.2	0.7

[Vertical Installation]

Switch Setting	Screw Lead					
	6 mm			12 mm		
	Speed (mm/s)	Payload (kg)	Stroke (mm)	Speed (mm/s)	Payload (kg)	Stroke (mm)
0	15	14	13.5	30	4.8	4.3
1	23	13.2	12.7	46	4	3.5
2	31	12.4	11.9	63	4	3.5
3	40	11.6	11.1	80	4	3.5
4	48	11.6	11.1	96	3.6	3.1
5	56	11.6	11.1	113	3.2	2.7
6	65	10.8	10.3	130	2.8	2.3
7	73	10.8	10.3	146	2.4	1.9
8	81	10	9.5	163	2.0	1.5
9	90	9.2	8.7	180	1.6	1.1

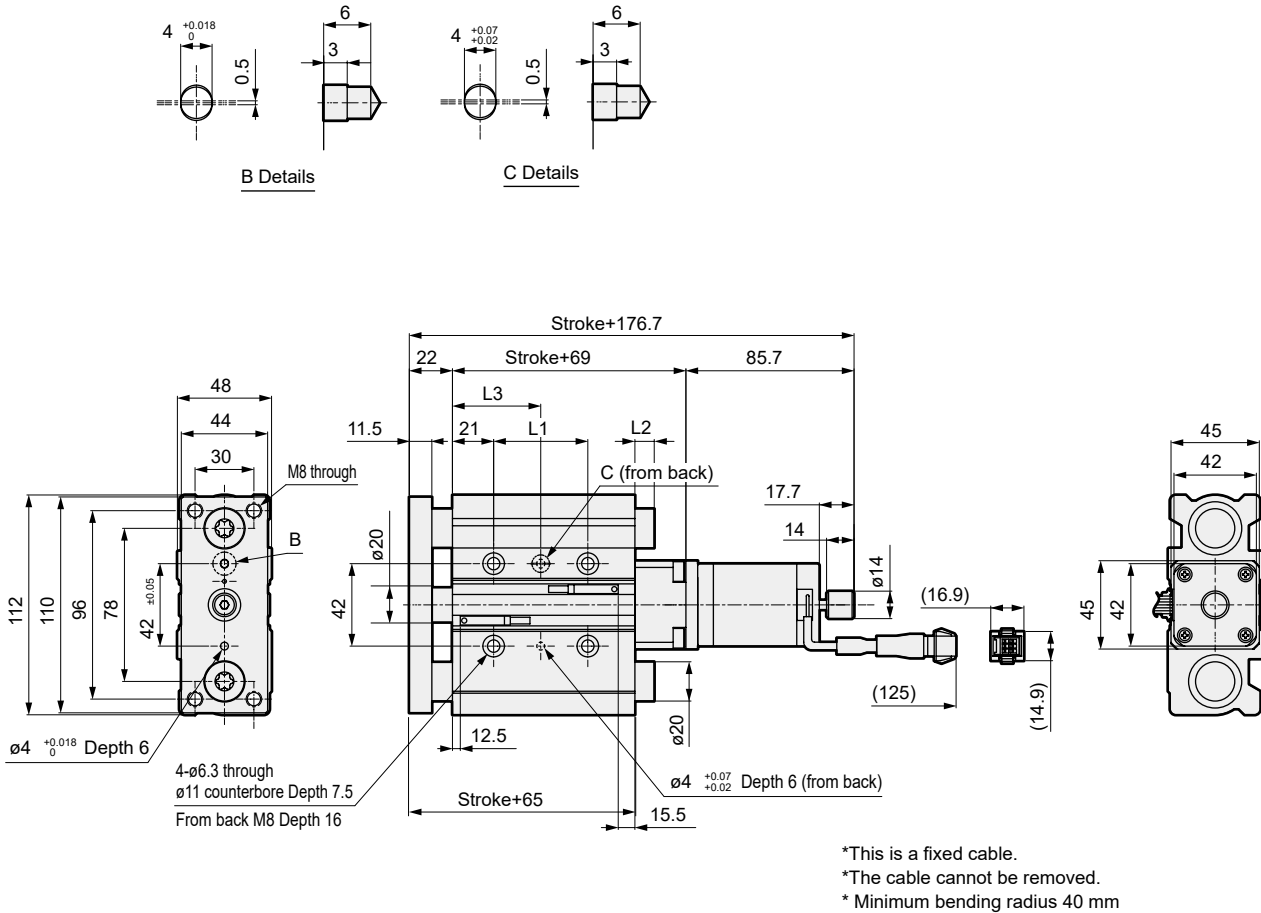
* The speed setting is a guideline. A discrepancy from the actual values may occur due to switch adjustment, power supply voltage, individual differences among motors, variations in mechanical efficiency, and temperature.
* Value when no moment is applied to the end plate section. For details such as flatness of the mounting surface, please refer to the instruction manual.

DSTG-32 Series

External Dimension Drawing

External Dimension Drawing

● DSTG-32



[Dimension Table by Stroke]

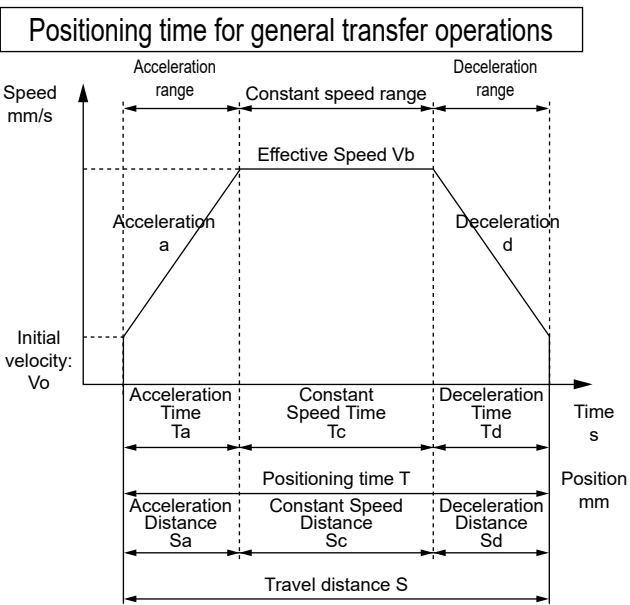
Stroke Code	025	050	075	100
Stroke (mm)	25	50	75	100
L1	24	48	48	48
L2	13.5	13.5	34.5	34.5
L3	33	45	45	45
Weight (kg)	2.4	2.8	3.2	3.6

STEP1 Confirmation of Payload

Payload changes depending on mounting orientation, screw lead, and transport speed. Select the size and screw lead by referring to the system table (P. 439), the specification table for each model, and the payload table by speed setting.

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.



	Content	Code	Unit	Remarks
Setting Value	Initial velocity	V0	mm/s	According to the table below (= value of switch setting 0)
	Speed Setting	V	mm/s	According to the table below
	Acceleration	a	mm/s²	According to the table below (fixed value)
	Deceleration			
	Travel Distance	S	mm	*
Calculated Value	Reached Speed	Vmax	mm/s	= (S×a+V0²) ^{1/2}
	Effective Speed	Vb	mm/s	The smaller 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×Ta+(a×Ta²) / 2
	Deceleration Distance			
	Constant Speed Distance	Sc	mm	=S-2×Sa
	Positioning Time	T	s	=2×Ta+Tc

* Depending on the speed setting 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/deceleration is determined by the speed setting.

* The speed is determined by the settings of rotary switches 1 and 2.

* Settling time varies depending on the usage conditions, but it may take about 0.2 s.

[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/s²)

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

STEP3 Confirmation of Static Allowable Load and Static Allowable Moment

Calculate the load and moment that occur when the end plate stops. Confirm that the lateral load (W) and torsional moment (MY) are as follows. Following the formula below, confirm that the resultant moment (MT) satisfies the following expression.

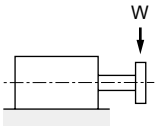
Resultant moment

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

Static Allowable Load and Static Allowable Moment

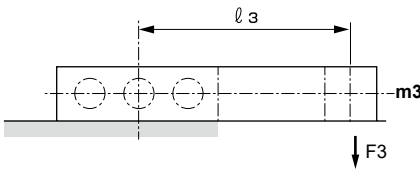
Model No.	Stroke (mm)	Lateral Load W (N)	Bending moment MPmax (N·m)	Torsional moment MYmax (N·m)	Lateral bending moment MRmax (N·m)
DSTG-20	20	67	35.3	0.9	35.3
	50	46		0.62	
	75	60		0.8	
	100	51		0.69	
DSTG-32	25	223	171.5	4.35	171.5
	50	180		3.5	
	75	179		3.48	
	100	156		3.04	
DSTG-50	25	348	294	9.56	294
	50	296		7.86	
	75	292		8.02	
	100	257		7.07	

● Lateral load W (N)



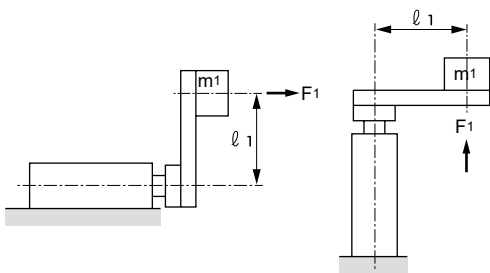
● Torsional moment MY (N·m)

$$MY = F3 \times \ell_3 = 10 \times m3 \times \ell_3$$



● Bending moment MP (N·m)

$$MP = F1 \times \ell_1 = 10 \times m1 \times G \times \ell_1$$



m1: } Load weight (kg)
m2: }
m3: }

ℓ1: } Eccentricity (m)
ℓ2: }
ℓ3: }

G: Inertial force coefficient

● Lateral bending moment MR (N·m)

$$MR = F2 \times \ell_2 = 10 \times m2 \times G \times \ell_2$$

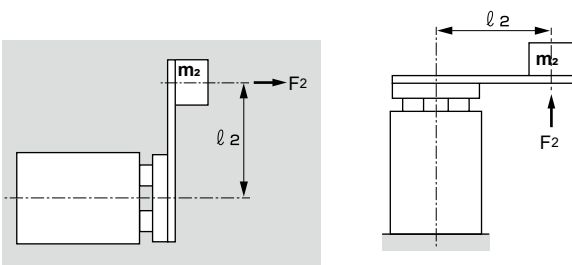
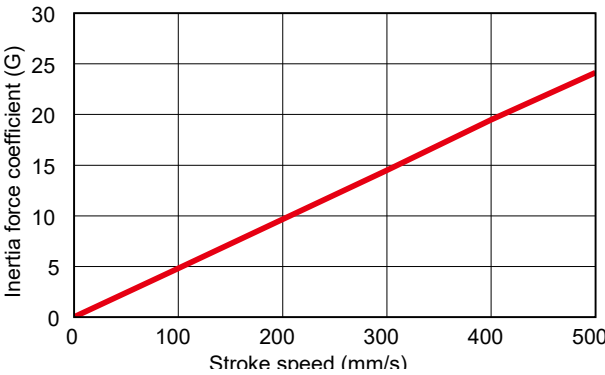


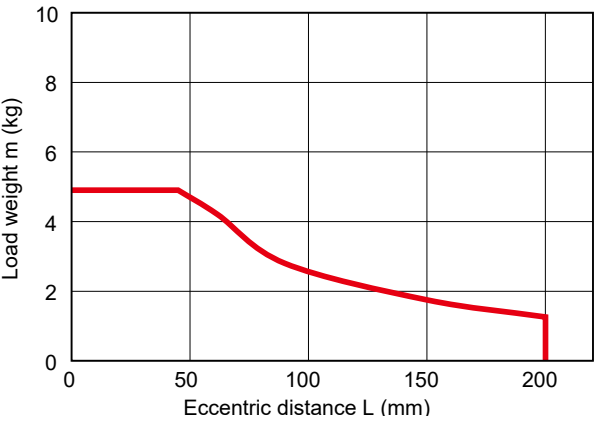
Figure 1 Trend of inertial force coefficient for guided type



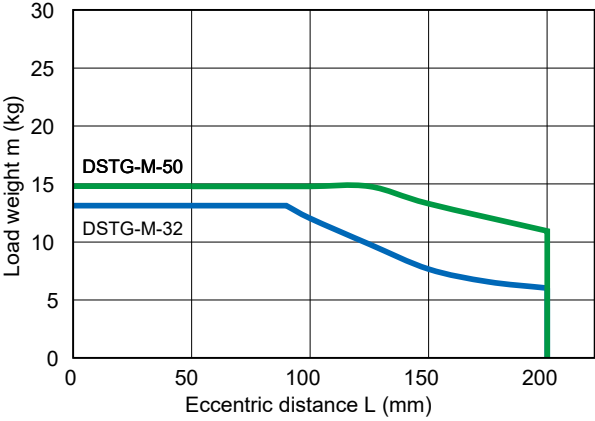
STEP4 Confirmation of Allowable Overhang Length

Confirm that the overhang length during operation is within the allowable overhang length range.

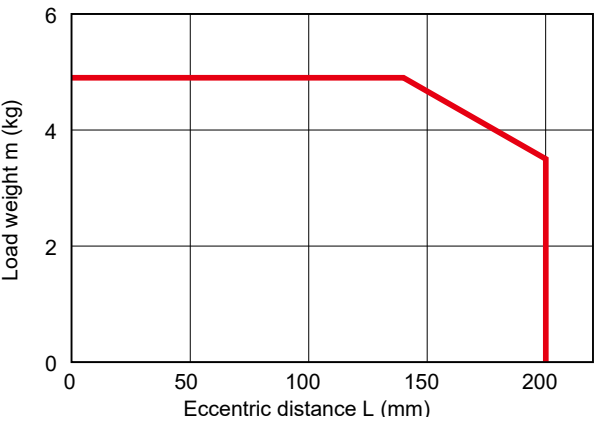
● DSTG-M-20
· Stroke 50 mm or less



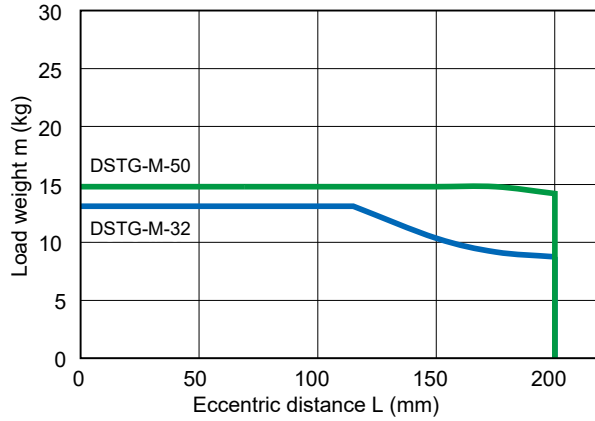
● DSTG-M-32, 50
· Stroke 50 mm or less



● DSTG-M-20
· Stroke exceeds 50 mm

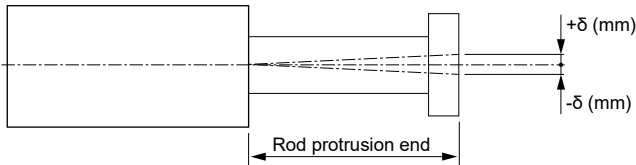


● DSTG-M-32, 50
· Stroke exceeds 50 mm

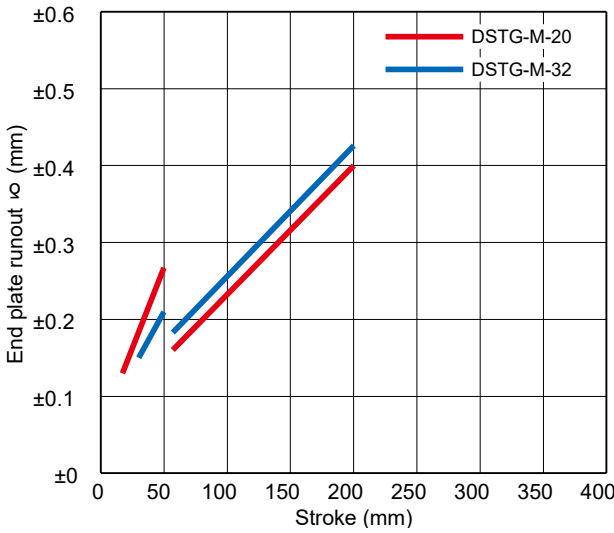


Runout accuracy

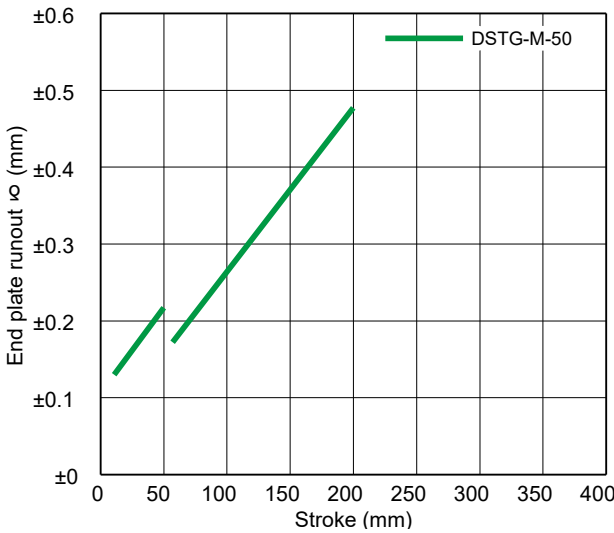
The amount of runout δ that occurs at the tip of the end plate when there is no load is estimated by the values in the graph below. (Excluding the amount of deflection of the guide rod)



● DSTG-M-20, 32

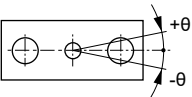


● DSTG-M-50



Non-rotation accuracy

(Reference value)



Size	Non-rotation accuracy θ (degrees)
DSTG-20	± 0.07
DSTG-32	± 0.06
DSTG-50	± 0.05

D Series

DSSD2

DSTK

DSTG

DSTS

DSTL

DMSDG

DLSH

DCKW

Ending

D Series

DSSD2

DSTK

DSTG

DSTS

DSTL

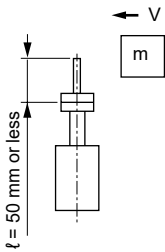
DMSDG

DLSH

DCKW

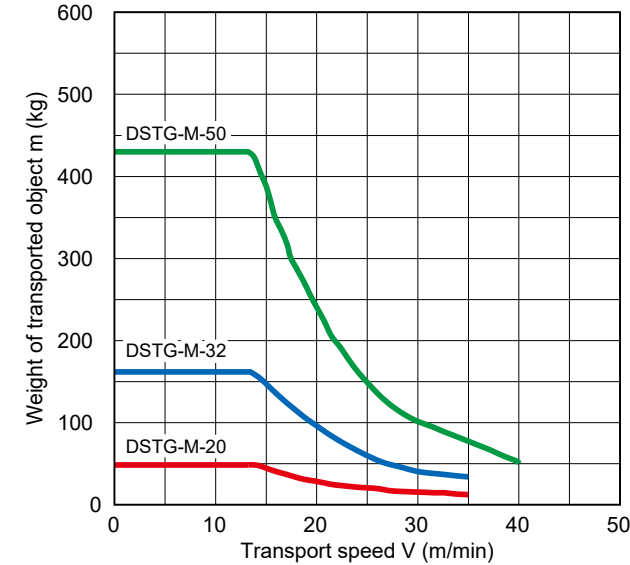
Ending

Operating range when used as a stopper

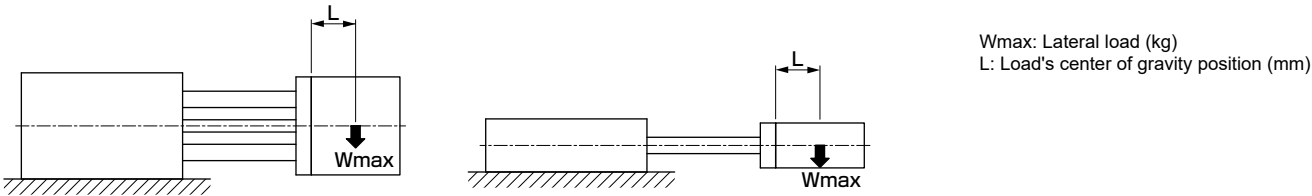


- *1 When using as a stopper, please select a model with a stroke of 50 or less.
- *2 The total length of the stopper part should be $l = 50$ mm or less.
- *3 When fixing the actuator body, ensure the bolt screwing depth is $2d$ or more and consider measures to prevent loosening (adhesive, spring washer, etc.).
- *4 For calculation of required operating thrust, please refer to P. 436.
- *5 Please calculate the actuator thrust using the formula below.
Thrust = Vertical payload $\times 10$ (N)

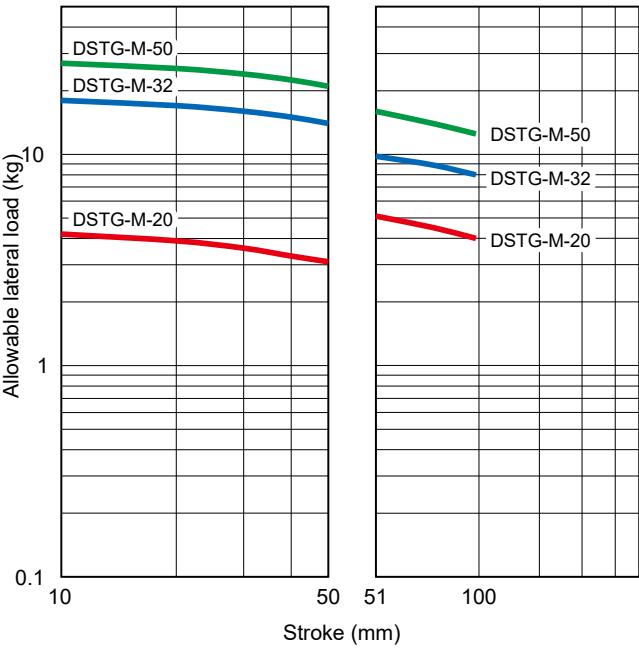
Impact load
DSTG-M (Plain bearing)



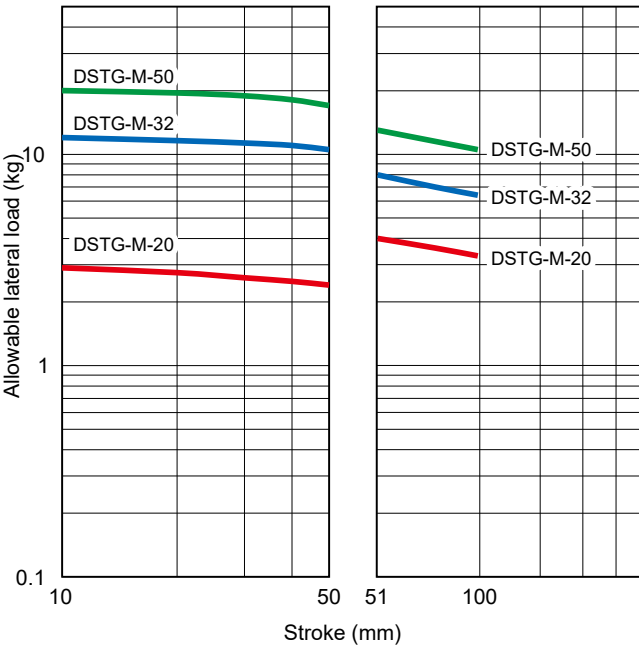
Allowable Lateral Load Plain bearing



● When L=50 mm



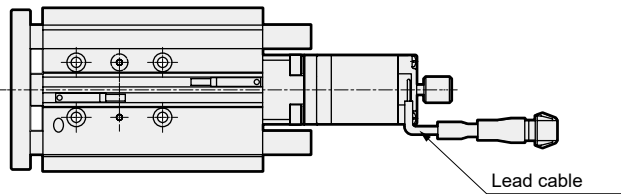
● When L=100 mm



Special Order Product*

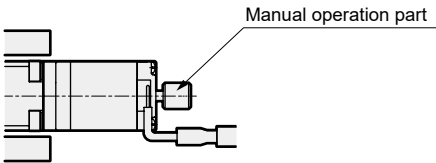
● Change of cable outlet direction

It is possible to change the outlet direction of the lead cable coming out of the motor.



● Add cover to manual operation part

A rubber cover can be included to the manual operation part at the rear of the motor.



*For details on special order products, please contact our sales office.