

DMSDG

Compact Guided Type

Electric Actuator with
Motor Specification



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DMSDG System Table

Actuator Model No.	Motor Size	Spring lead (mm)	Stroke (mm) and Max. Speed (mm/s)			Max. Pushing Force (N)
			10	20	30	
DMSDG-08	□20	3.3	50			10
DMSDG-16	□28	5.1	77			30



Electric Actuator Compact Guided Type

DMSDG-08

□20 Stepping Motor



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

Model No. Notation Method

DMSDG - 08 S H3 10 F3PH - T R1 A 1

①Size
08 8

②Connected Controller *1
S ESC4

③Spring Lead
H3 3.3 mm

④Stroke
10 10 mm
20 20 mm
30 30 mm

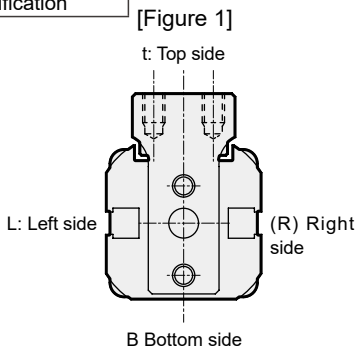
⑤Switch
NNNN None
F3PH F-type straight type
F3PV F-type L-shape type

⑦Relay Cable *3
N0 None
R1 Flexible 1 m
R3 Flexible 3 m
R5 Flexible 5 m
RX Flexible 10 m

⑥Connector Outlet Direction *2
T Top side
B Bottom side
R Right side
L Left side

⑧Controller Attached
N None
A DIN rail mounting specification
B Panel mounting specification

⑨IO Cable Length
N None
1 1 m
3 3 m
5 5 m
X 10 m



Connector Outlet Direction Diagram

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

Specifications

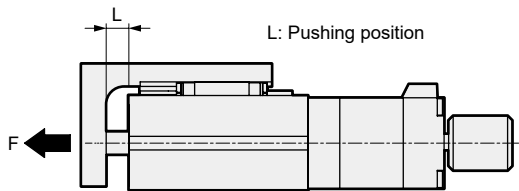
Connected Controller	ESC4		
Motor	□20 Stepping Motor		
Drive Method	Cylindrical spring		
Stroke mm	10	20	30
Effective Pushing Range (L) mm	5	5 to 15	5 to 25
Spring Lead	H3 (3.3 mm)		
Max. Pushing Force *1*2 N	10		
Static Allowable Moment N·m	MP=0.16, MY=0.16, MR=0.24		
Max. Payload g	Horizontal		270
	Vertical		80
Operating Speed Range mm/s	8 to 50		
Max. Acceleration/Deceleration mm/s ²	982 (setting 9)		
Pushing Speed Range *1 mm/s	8 to 50		
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 Pushing operation is only possible during PUSH. Performing a pushing operation during PULL may lead to damage to the internal parts of the actuator.
*2 Pushing position L=5 mm
*3 When installed vertically, the pushing force, positioning time, and stop position will change compared to horizontal installation. Please contact us for details.

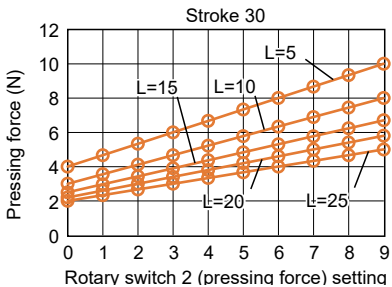
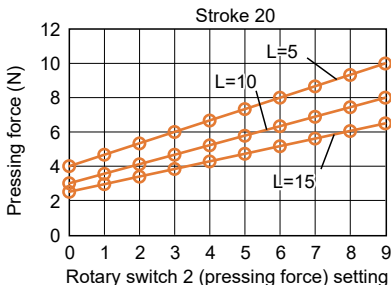
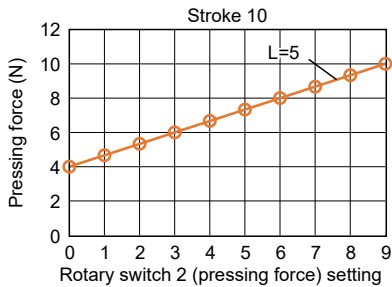
DMSDG-08 Series

Pushing Force and Rotary Switch Setting / External Dimension Drawing

Pushing force and rotary switch setting

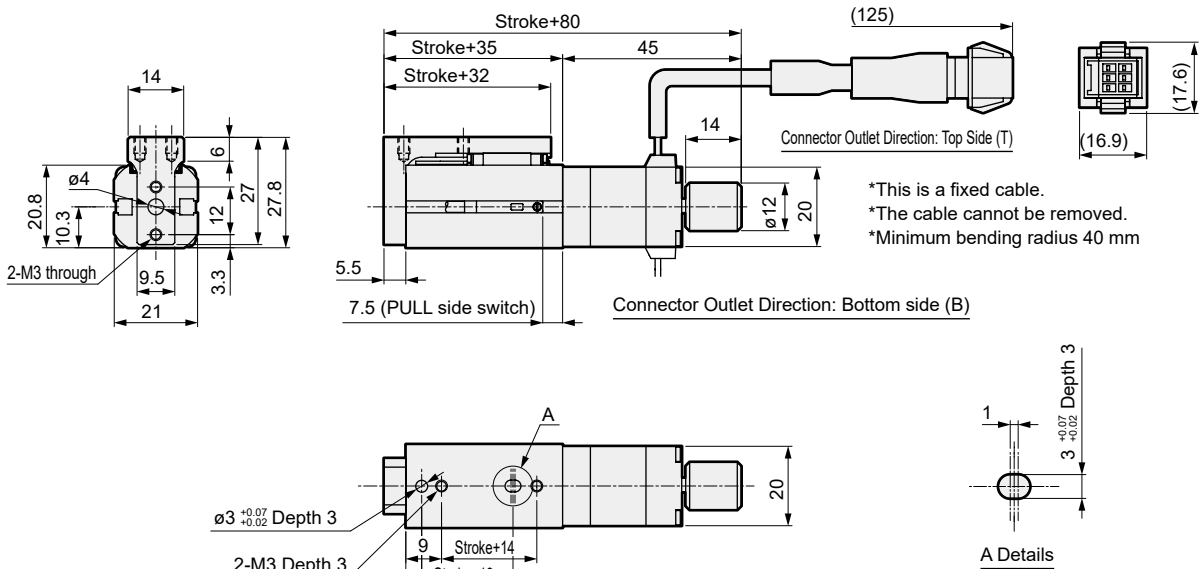
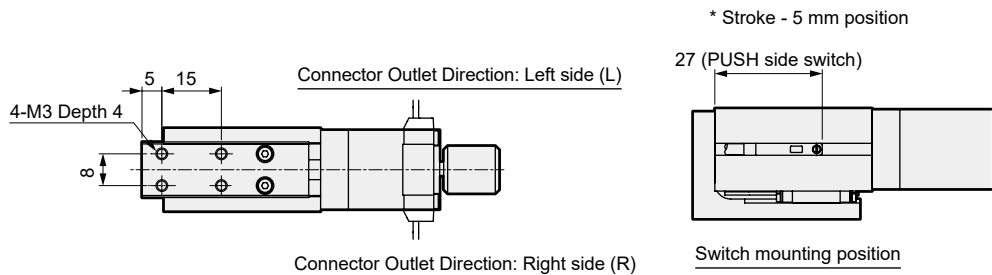


*1 The pushing force is a guideline. Errors will occur due to pushing position and cylinder switch adjustment.
*2 This product does not support self-locking. Please contact us if you require self-locking.



External Dimension Drawing

● DMSDG-08



Stroke (mm)	10	20	30
Weight (g)	110	130	140



Electric Actuator Compact Guided Type

DMSDG-16

□28 Stepping Motor



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

Model No. Notation Method

DMSDG - 16 S H5 10 F3PH - T R1 A 1

①Size
16 16

②Connected Controller *1
S ESC4

③Spring Lead
H5 5.1 mm

④Stroke
10 10 mm
20 20 mm
30 30 mm

⑤Switch
NNNN None
F3PH F-type straight type
F3PV F-type L-shape type

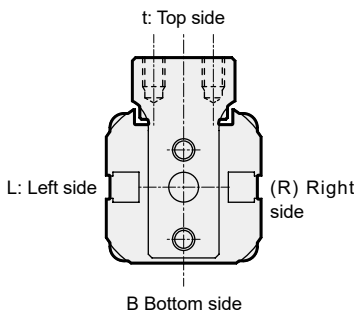
⑦Relay Cable*3
N0 None
R1 Flexible 1 m
R3 Flexible 3 m
R5 Flexible 5 m
RX Flexible 10 m

⑥Connector Outlet Direction*2
T Top side
B Bottom side
R Right side
L Left side

⑧Controller Attached
N None
A DIN rail mounting specification
B Panel mounting specification

⑨IO Cable Length
N None
1 1 m
3 3 m
5 5 m
X 10 m

[Figure 1]



Connector Outlet Direction Diagram

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

Specifications

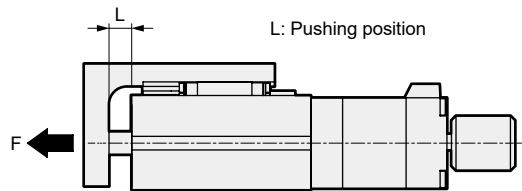
Connected Controller	ESC4		
Motor	□28 Stepping Motor		
Drive Method	Cylindrical spring		
Stroke mm	10	20	30
Pressing effective range (L) mm	5	5 to 15	5 to 25
Spring Lead	H5 (5.1 mm)		
Max. Pushing Force	*1*2 N 30		
Static Allowable Moment	N·m MP=0.57, MY=0.57, MR=1.16		
Max. Payload g	Horizontal		800
	Vertical		800
Operating Speed Range	mm/s 13 to 77		
Max. Acceleration/Deceleration	mm/s ² 2259 (setting 9)		
Pushing Speed Range	*1 mm/s 13 to 77		
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 Pushing operation is only possible during PUSH. Performing a pushing operation during PULL may lead to damage to the internal parts of the actuator.
*2 Pushing position L=5 mm
*3 When installed vertically, the pushing force, positioning time, and stop position will change compared to horizontal installation. Please contact us for details.

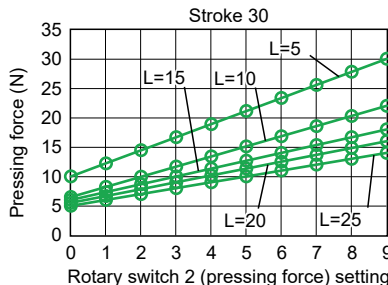
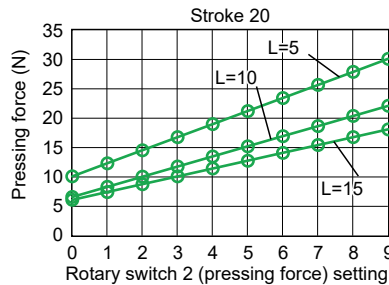
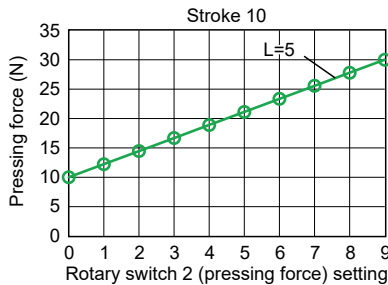
DMSDG-16 Series

Pushing Force and Rotary Switch Setting / External Dimension Drawing

Pushing force and rotary switch setting

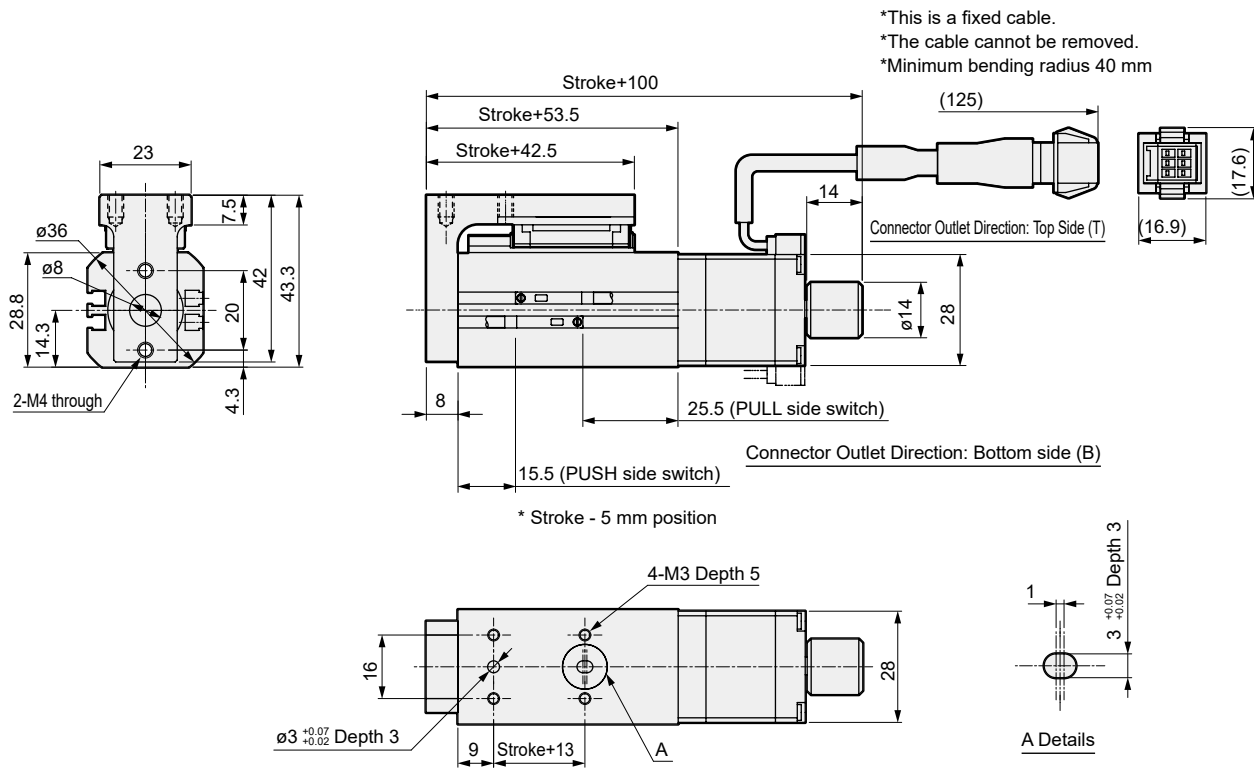
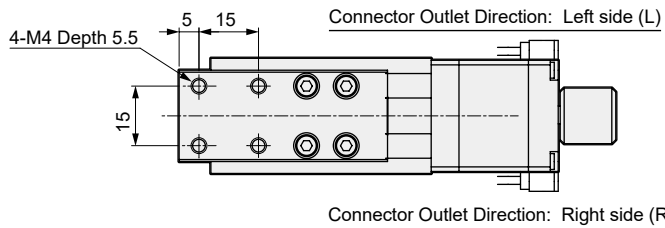


*1 The pushing force is a guideline. Errors will occur due to pushing position and cylinder switch adjustment.
*2 This product does not support self-locking. Please contact us if you require self-locking.



External Dimension Drawing

● DMSDG-16

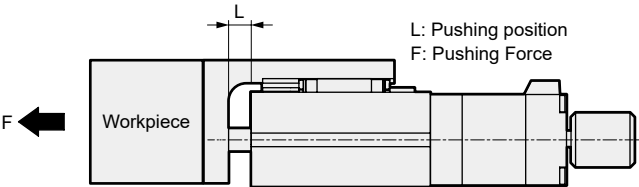


Stroke (mm)	10	20	30
Weight (g)	290	310	330

Model Selection

STEP1 Confirmation of Conditions

Confirm the conditions of ① pushing force and ② pushing position.



STEP2 Model Selection

Select a model from the table below based on the necessity of ① pushing force and ② pushing position.

Model Selection List

	Model	①Max. Pushing Force F	②Pushing Position L (Effective Pushing Range)		
			5 mm	5 to 15 mm	5 to 25 mm
DSSD2	DMSDG-08SH3	10 N	Stroke: 10 mm	Stroke: 20 mm	Stroke: 30 mm
DSTK	DMSDG-16SH5	30 N	Stroke: 10 mm	Stroke: 20 mm	Stroke: 30 mm
DSTG					
DSTS					
DSTL					
DMSDG					
DLSH					
DCKW					

STEP3 Confirmation of Pushing Force and Rotary Switch Setting

Select the graph for the selected model and check the rotary switch setting from ① pushing force and ② pushing position.

[Model Selection Example]

STEP1

- ①Required pushing force 15 N
- ②Pushing position L15 mm

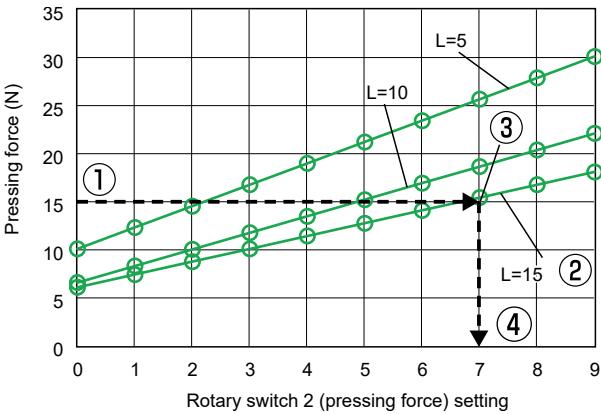
STEP2

From the model selection list, the model that satisfies ① and ② is DMSDG-16SH5 stroke 20 mm

STEP3

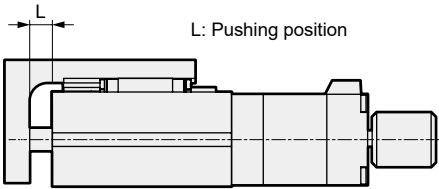
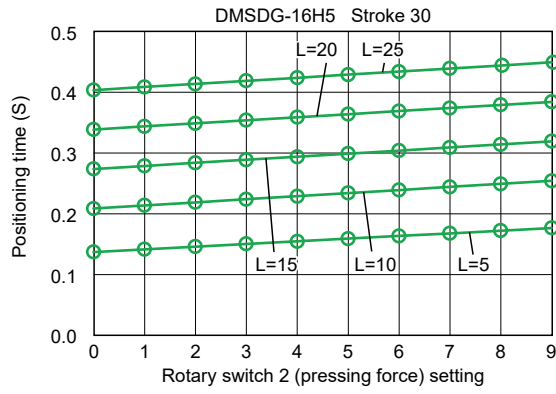
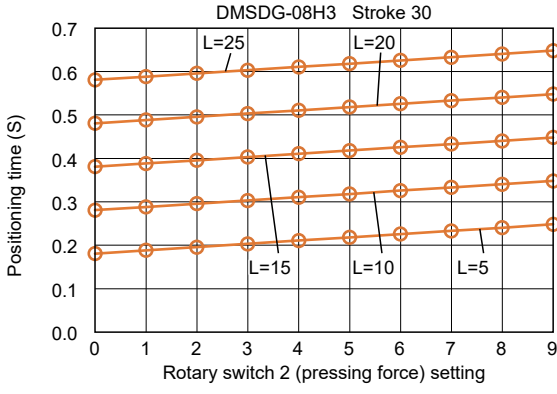
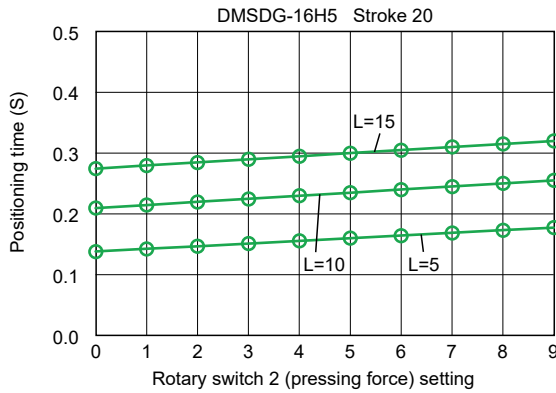
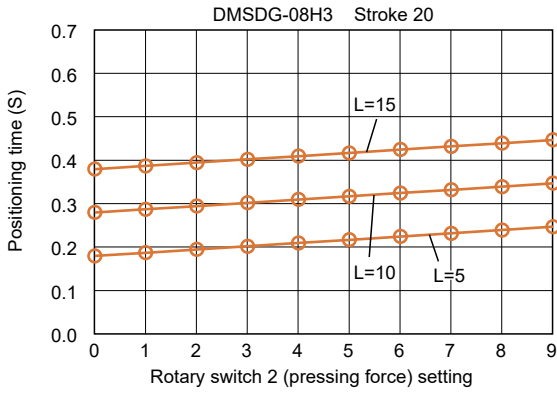
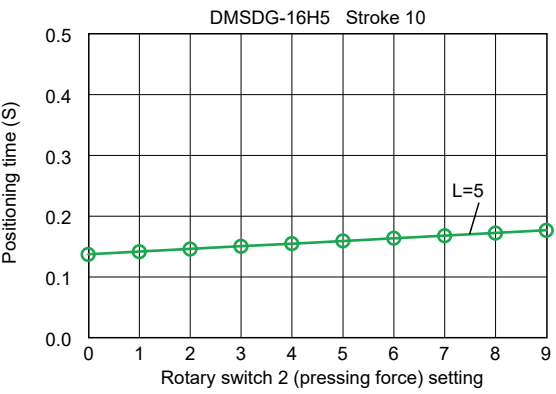
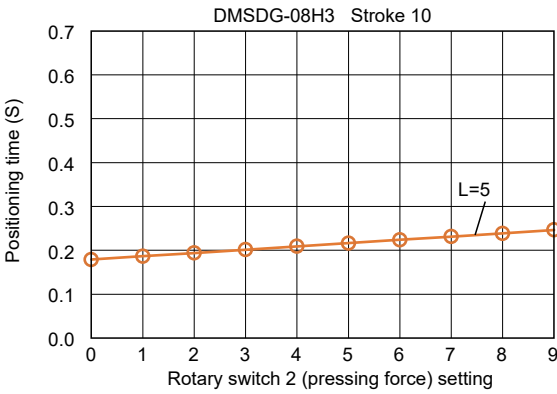
On the graph(s) of pushing force and rotary switch settings (P. 487, P. 489) for the model selected in STEP 2, check in the order of ①, ②, ③, and ④ to confirm that the required pushing force is met with a rotary switch setting of 7 or higher.

From the above, **DMSDG-16SH520*** can be selected.



Confirmation of Positioning Time

Please check from the graph whether the positioning time of the selected product meets the required tact time.



*1 Positioning time is the time from when the motor starts rotating until it stops.
*2 This is the value when rotary switch 1 (speed) = 9.
The starting position is the value when L=0.
For other conditions, please refer to the instruction manual.

Model Selection

STEP4 Confirmation of Static Moment

Calculate the load and moment that occur when the table stops.

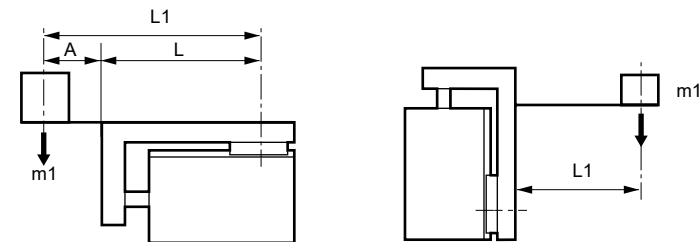
- When the load is mounted in only one direction
Check if the calculated value is less than or equal to the allowable moment value (Table 1).
- When the load mounting direction is two or more directions (in the case of a composite moment)
Following the formula below, confirm that the resultant moment (MT) is as follows (satisfies the following expression).

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

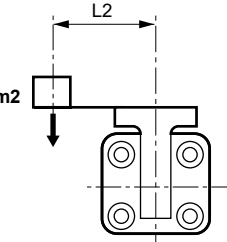
Table 1 Allowable moment during operation (N·m)

Size	MP	MR	MY
08	0.16	0.24	0.16
16	0.57	1.16	0.57

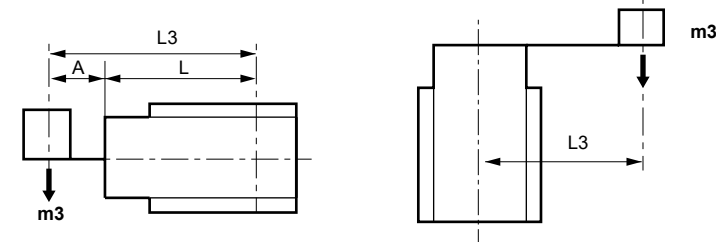
- Bending moment: MP
 $MP (N \cdot m) = 10 \times m1 (kg) \times L1 (m)$



- Lateral bending moment: MR
 $MR (N \cdot m) = 10 \times m2 (kg) \times L2 (m)$



- Torsional moment: MY
 $MY (N \cdot m) = 10 \times m3 (kg) \times L3 (m)$



L Value

Size	Stroke (mm)		
	10	20	30
08	0.033	0.043	0.053
16	0.038	0.048	0.058

STEP5 Confirmation of Moment due to Inertial Load

Depending on the mounting direction of the load, a moment due to inertial load may be applied.
Calculate the moment due to inertial load and check if it is below the allowable value.

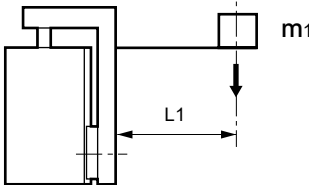
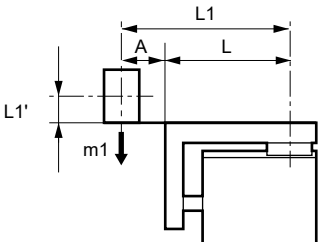
Table 2 Allowable moment when inertial load is acting (N·m)

Size	MP'	MR'	MY'
08	0.33	-	0.33
16	1.11	-	1.11

* No inertial load is applied in the MR' direction.

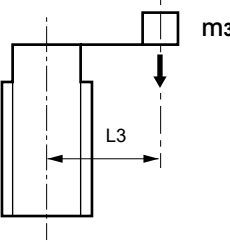
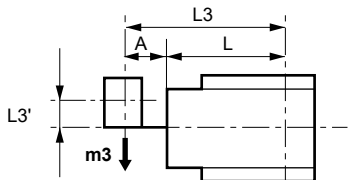
- Bending moment: MP'
 $MP' = 10 \times m1 \times (L1 + G \times L1')$

$MP' = 10 \times m1 \times L1 \times (1 + G)$

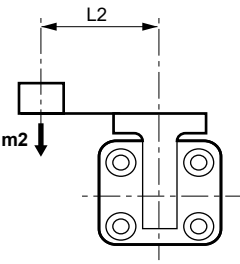


- Torsional moment: MY'
 $MY' = 10 \times m3 \times (L3 + G \times L3')$

$MY' = 10 \times m3 \times L3 \times (1 + G)$



$MY' = 10 \times m2 \times G \times L2$



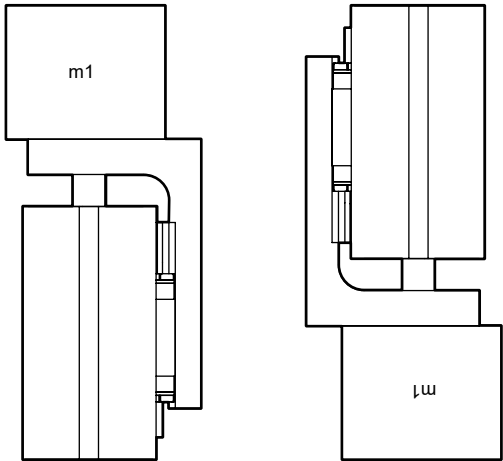
[Switch Setting and Acceleration]

Speed setting (switch 1)	Size 08		Size 16	
	Speed (mm/s)	Acceleration (G)	Speed (mm/s)	Acceleration (G)
0	8	0.00	13	0.00
1	13	0.01	20	0.01
2	18	0.01	27	0.03
3	22	0.02	34	0.05
4	27	0.03	41	0.07
5	31	0.04	49	0.09
6	36	0.06	56	0.12
7	41	0.07	63	0.16
8	45	0.09	70	0.20
9	50	0.11	77	0.23

* When gripping setting (switch 2) is 9

STEP6 Confirmation of Allowable Load

When mounting vertically, confirm that the load is below the following allowable load.



Size	[N]	
	Vertically upward	Vertically downward
08	10	8
16	20	10

Table Tilt Amount (Reference Value)

● Table displacement at point A due to bending moment MP

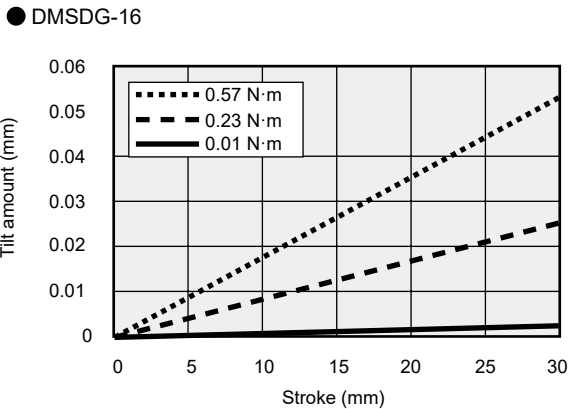
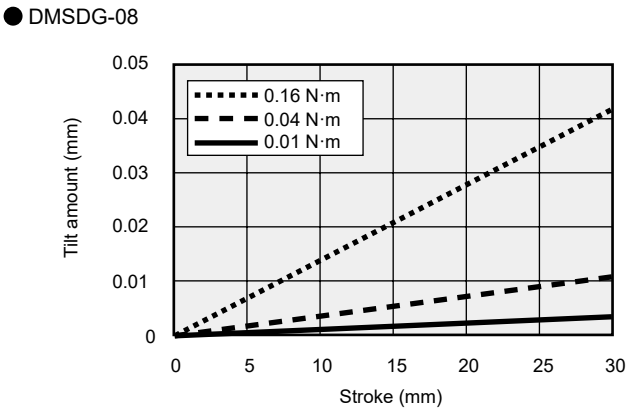
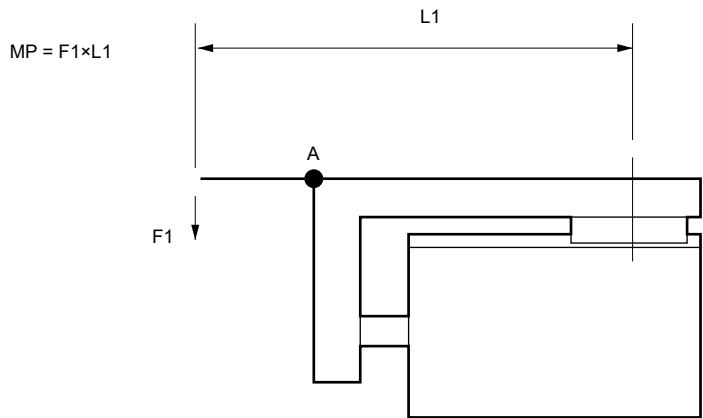
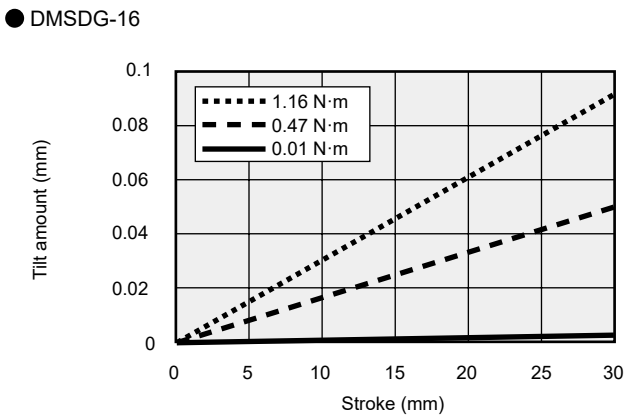
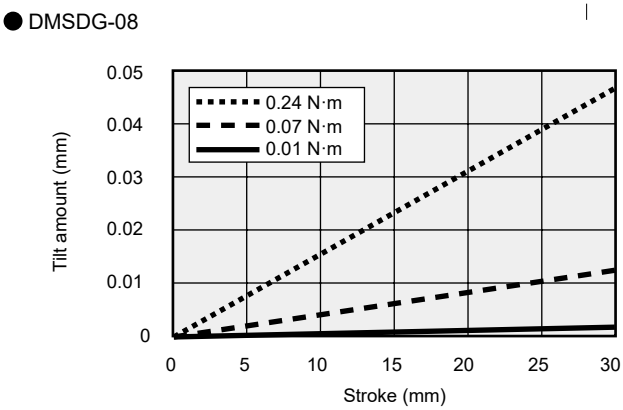
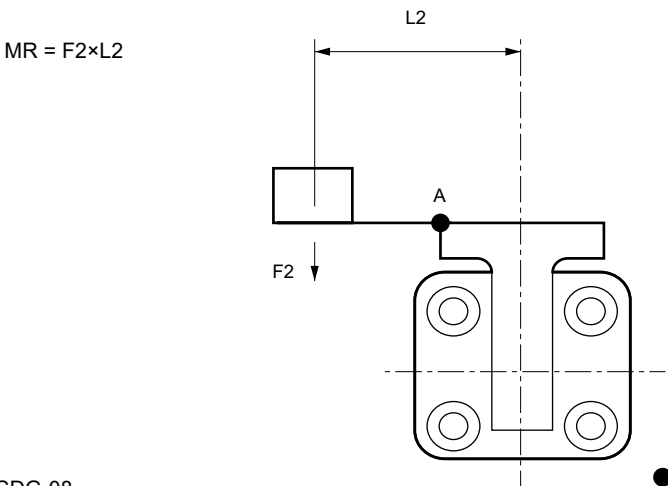
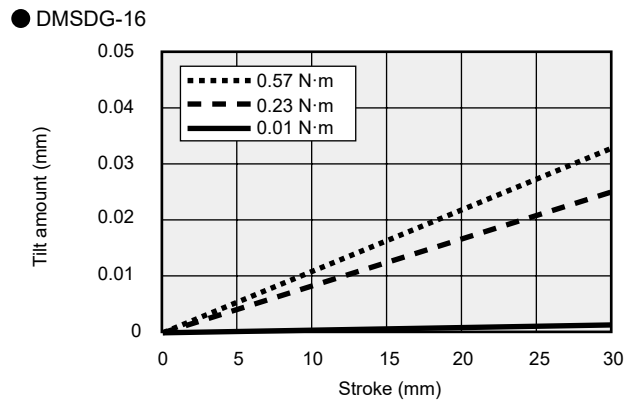
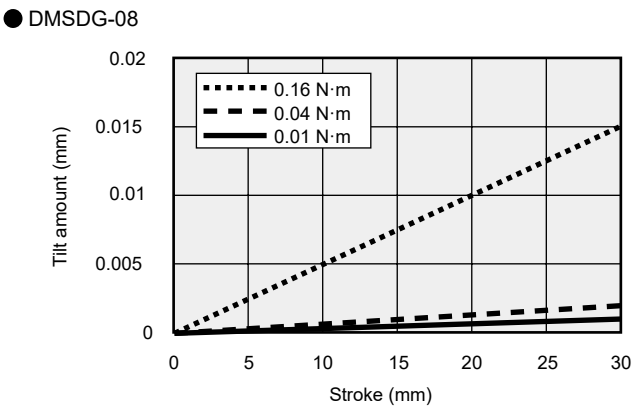
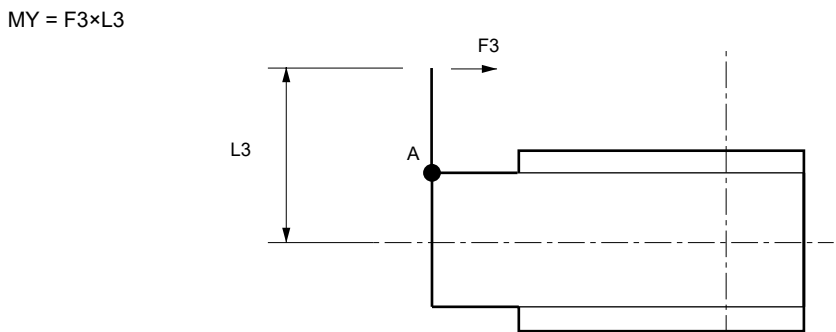


Table Tilt Amount (Reference Value)

● Table displacement at point A due to lateral bending moment MR



● Table displacement at point A due to swinging moment MY



D Series

DSSD2

DSTK

DSTG

DSTS

DSTL

DMSDG

DLSH

DCKW

Ending

D Series

DSSD2

DSTK

DSTG

DSTS

DSTL

DMSDG

DLSH

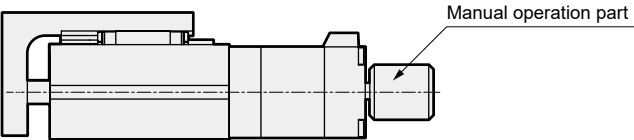
DCKW

Ending

Special Order Product*

● 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.

MEMO

D Series

DSSD2

DSTK

DSTG

DSTS

DSTL

DMSDG

DLSH

DCKW

Ending

D Series

DSSD2

DSTK

DSTG

DSTS

DSTL

DMSDG

DLSH

DCKW

Ending