Slide Tables
LES/LESH Series

* For details, refer to page 1343 and onward.

RoHS

Size: **8, 16, 25**

Battery-less Absolute (Step Motor 24 VDC)

Incremental (Step Motor 24 VDC) **Incremental** (Servo Motor 24 VDC)

- **Reduced cycle time**
- **Positioning repeatability: ±0.05 mm**
- **Max. pushing force: 180 N**

  Max. acceleration/deceleration: **5000 mm/s²**

  Max. speed: **400 mm/s**

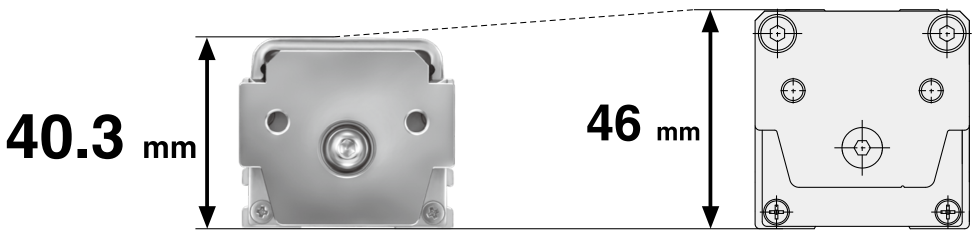
Compact Type *LES□E/LES* Series

Size*1: 8, 16, 25 ▶p. **641, 649**

*1 Only size 25 is available for the battery-less absolute.

Compact

Compared with the LESH, Workpiece mounting surface height: Reduced by up to 12%



Compact type
LES16D

LESH16D

Basic type/R type	Symmetrical type/L type	In-line motor type/D type
		

High Rigidity Type *LESH□E/LESH* Series

Size*1: 8, 16, 25 ▶p. **687, 695**

*1 Only size 25 is available for the battery-less absolute.

High rigidity

Deflection: 0.016 mm*2

*2 LESH16-50 Load: 25 N

Basic type/R type	Symmetrical type/L type	In-line motor type/D type
LESH□R Series	*LESH□L* Series	*LESH□D* Series
		

Battery-less Absolute (Step Motor 24 VDC) **Incremental** (Step Motor 24 VDC) **Incremental** (Servo Motor 24 VDC) **Controllers/Drivers** ▶p. **994**

▶Step data input type
***JXC51/61/ LECA6* Series**
- 64 positioning points
- Input using controller setting kit or teaching box

▶EtherCAT/EtherNet/IP™/ PROFINET/DeviceNet®/ IO-Link/CC-Link direct input type
***JXCE□/91/P1/D1/L□/M1* Series**

▶Programless type
***LECP1**1 Series**
- 14 positioning points
- Control panel setting

▶Pulse input type
***LECPA**1 Series**

*1 Excludes the battery-less absolute

Battery-less Absolute (Step Motor 24 VDC)

Compact Type *LES25E Series* High Rigidity Type *LESH25E Series*

Restart from the last stop position is possible after recovery of the power supply.

Easy operation restart after recovery of the power supply

The position information is held by the encoder even when the power supply is turned off. A return to origin operation is not necessary when the power supply is recovered.

Does not require the use of batteries. Reduced maintenance

Batteries are not used to store the position information. Therefore, there is no need to store spare batteries or replace dead batteries.

	Compact Type LES25E Series
Max. speed [mm/s]	400
Positioning repeatability [mm]	±0.05
Max. work load [kg] ( ): For when mounted vertically	5 (5)
Max. pushing force [N]	180
Max. stroke [mm]	150
Motor mounting position	In-line, Parallel (Right/Left)

	High Rigidity Type LESH25E Series
Max. speed [mm/s]	400
Positioning repeatability [mm]	±0.05
Max. work load [kg] ( ): For when mounted vertically	12 (4)
Max. pushing force [N]	180
Max. stroke [mm]	150
Motor mounting position	In-line, Parallel (Right/Left)

Incremental (Step Motor 24 VDC) Incremental (Servo Motor 24 VDC)

Compact Type *LES* Series

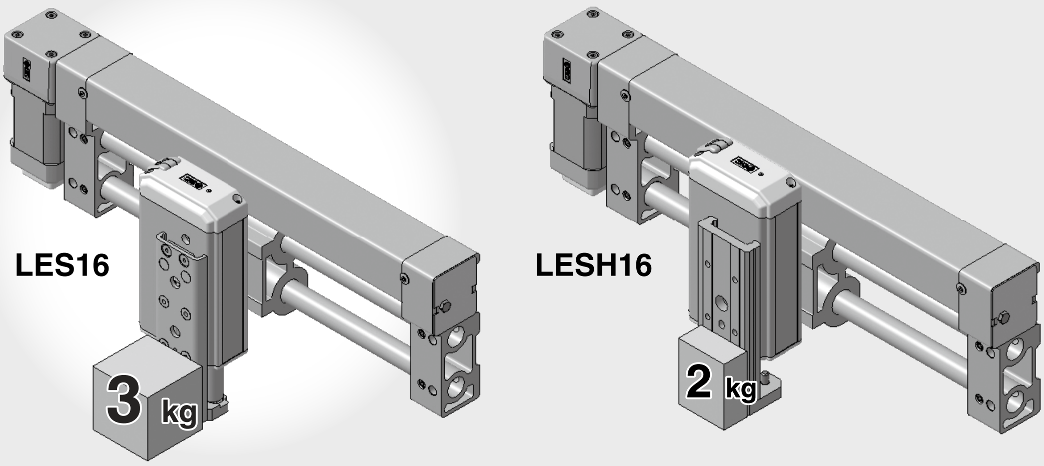
Vertical work load

Increased by up to 50% *1 *2

*1 By reducing the weight of moving parts
*2 Compared with the LESH16

Model	Vertical work load [kg]
LES16	3.0
LESH16	2.0

Applications



Light weight

Reduced by up to 29%

Model	Weight [kg]	Reduction amount
LES16D-100	1.20	Reduced by 0.50 kg
LESH16D-100	1.70	

- **Max. pushing force: 180 N**
- **Positioning repeatability: ±0.05 mm**
- **Can reduce cycle time**
  Max. acceleration/deceleration: 5000 mm/s^2
  Max. speed: 400 mm/s
- **2 types of motors selectable: Incremental (Step motor 24 VDC), Incremental (Servo motor 24 VDC)**

Basic type/R type
LES□R Series

Symmetrical type/L type
LES□L Series

In-line motor type/D type
LES□D Series

Incremental (Step Motor 24 VDC) | Incremental (Servo Motor 24 VDC)

High Rigidity Type ***LESH*** *Series*

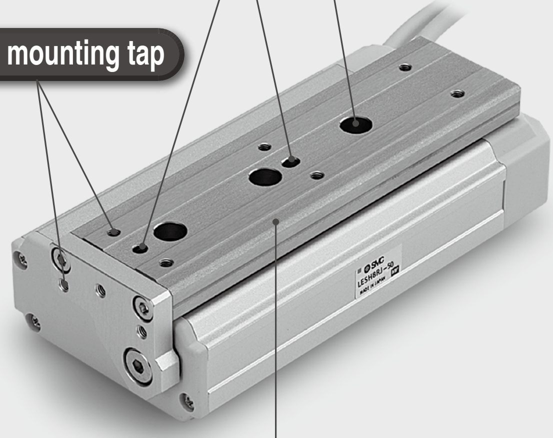
High rigidity **Deflection: 0.016 mm***1 *1 LESH16-50 Load: 25 N

Integration of the guide rail and the table
Uses a circulating linear guide.

Positioning pin hole
Improved workpiece mounting reproducibility

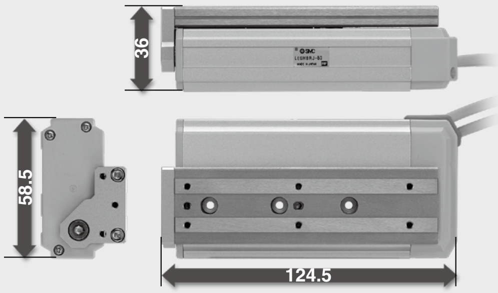
Body mounting through-hole
Can be mounted from the top

Workpiece mounting tap



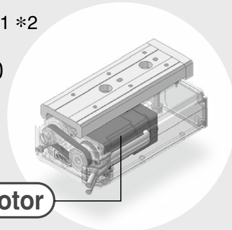
Integration of the guide rail and the table

◎Compact, Space-saving
For LESH8 R/L, 50 mm stroke



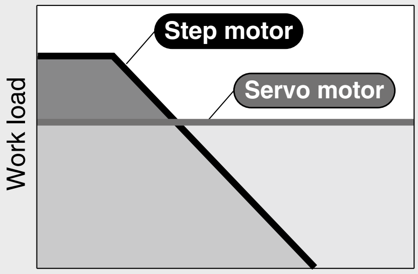
◎Reduced by 61% in volume*1 *2
*1 Compared with the LESH16-50/LXSH-50
*2 For R/L type

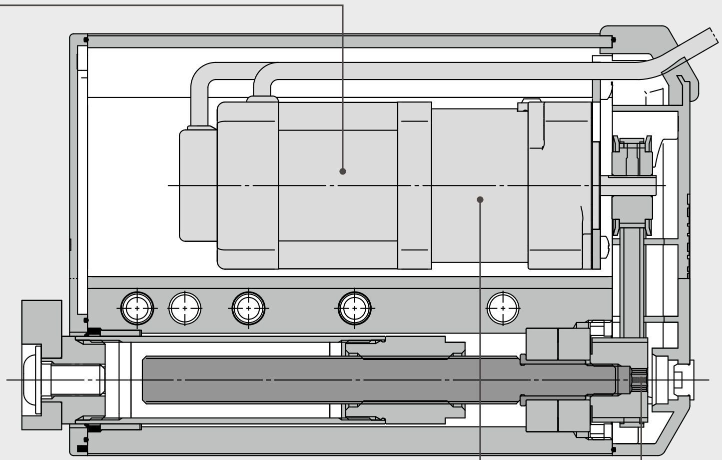
◎Motor integrated into the body
Built-in motor



Select from 2 types of motors.

- **Incremental (Step motor 24 VDC)**
  Ideal for the low-speed transfer of heavy loads and pushing operations
- **Incremental (Servo motor 24 VDC)**
  Stable at high speeds
  Silent operation



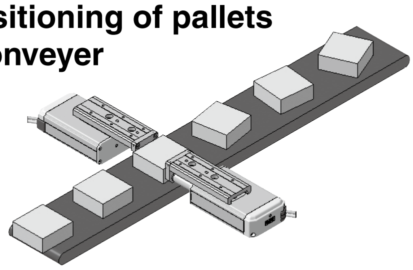


Non-magnetizing lock mechanism (Option)
Prevents workpieces from dropping (Holding)

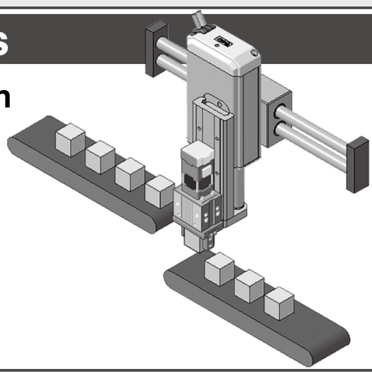
Manual override screw
Adjustment operation is possible when the power is OFF.

Application Examples

For positioning of pallets on a conveyer



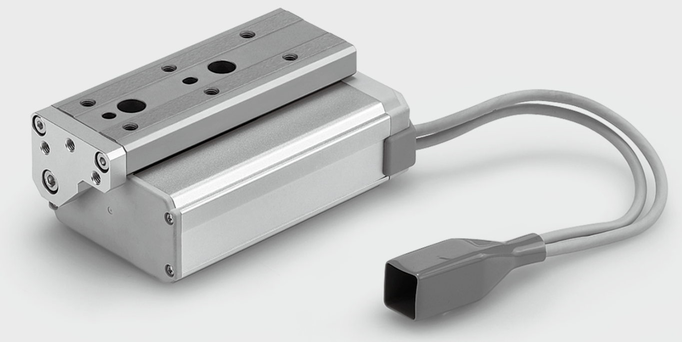
For Z motion for pick and place operations

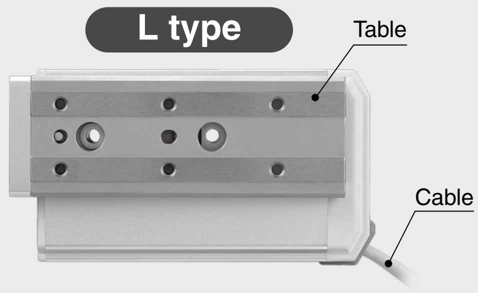


SMC

Symmetrical Type/L Type

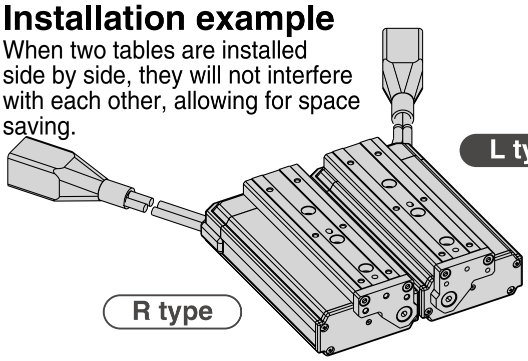
The locations of the table and cable are opposite those of the basic type (R type), expanding design applications.

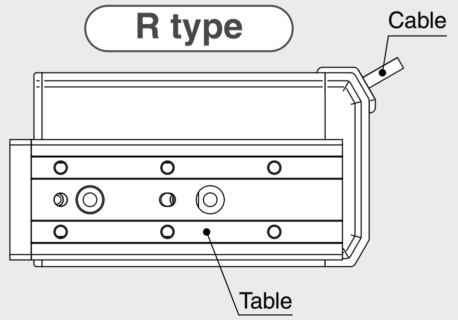




Installation example

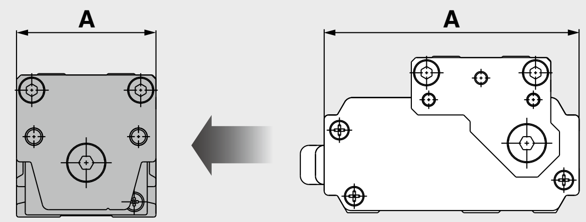
When two tables are installed side by side, they will not interfere with each other, allowing for space saving.





In-line Motor Type/D Type

Width dimension shortened by up to 45%

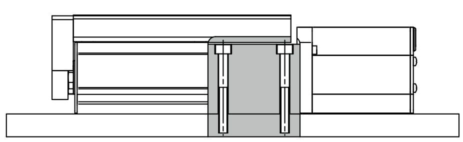


A Dimension [mm]

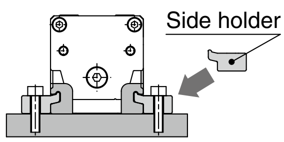
Size	D type	R/L type
8	**32**	58.5
16	**45**	72.5
25	**61**	106

How to Mount

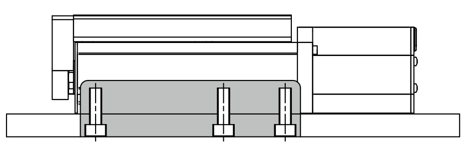
Through-hole mounting
(R/L/D type)



Side holder mounting
(D type)



Body tapped mounting
(R/L/D type)



CONTENTS

Slide Table/Compact Type *LES* Series

Battery-less Absolute (Step Motor 24 VDC)

Incremental (Step Motor 24 VDC) Incremental (Servo Motor 24 VDC)

Slide Table/High Rigidity Type *LESH* Series

Battery-less Absolute (Step Motor 24 VDC)

Incremental (Step Motor 24 VDC) Incremental (Servo Motor 24 VDC)

Incremental (Step Motor 24 VDC)/ Incremental (Servo Motor 24 VDC) Controllers

3-Axis Step Motor Controller

4-Axis Step Motor (Servo/24 VDC) Controller

Slide Tables

Compact Type *LES Series*

Battery-less Absolute (Step Motor 24 VDC)

p. 659

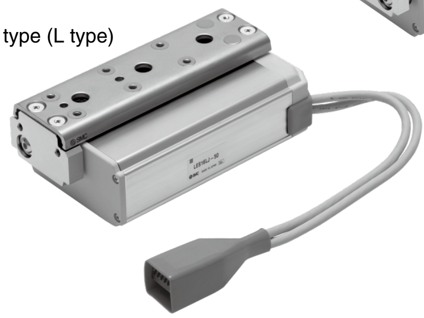
Incremental (Step Motor 24 VDC)

Incremental (Servo Motor 24 VDC)

p. 669

Basic type (R type)

Symmetrical type (L type)



In-line motor type (D type)

High Rigidity Type *LESH Series*

Battery-less Absolute (Step Motor 24 VDC)

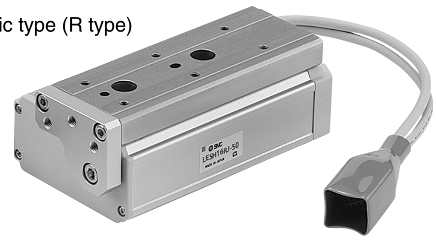
p. 705

Incremental (Step Motor 24 VDC)

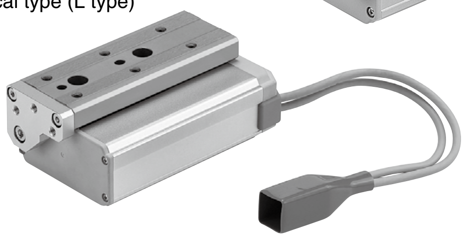
Incremental (Servo Motor 24 VDC)

p. 715

Basic type (R type)



Symmetrical type (L type)



In-line motor type (D type)

Controllers/Drivers p. 994

Slide Table/Compact Type

LES Series

Model Selection 1

LES□E Series ▶p. 659

Selection Procedure

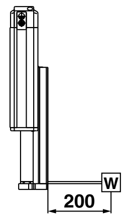
For the high rigidity type LESH series, refer to page 687.

Step 1 Check the work load–speed. → **Step 2** Check the cycle time. → **Step 3** Check the allowable moment.

Selection Example

Operating conditions

- Workpiece mass: 2 [kg]
- Speed: 200 [mm/s]
- Mounting orientation: Vertical
- Stroke: 50 [mm]
- Acceleration/Deceleration: 5000 [mm/s²]
- Cycle time: 0.5 s
- Workpiece mounting condition:

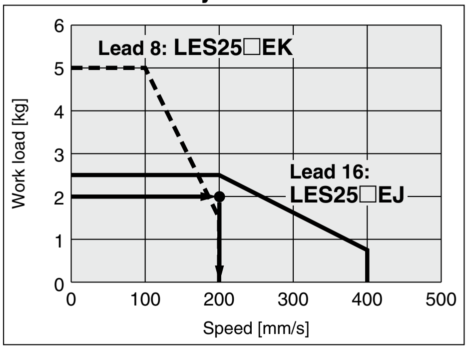


Step 1 Check the work load–speed. <Speed–Work load graph> (page 642)

Select a model based on the workpiece mass and speed while referencing the speed–work load graph.

Selection example) The **LES25□EJ-50** can be temporarily selected as a possible candidate based on the graph shown on the right side.

LES25□E□/Battery-less Absolute Vertical



<Speed–Work load graph>

Step 2 Check the cycle time.

It is possible to find an approximate cycle time by using method 1, but if a more detailed cycle time is required, use method 2.

Method 1: Check the cycle time graph. (page 642)

Method 2: Calculation <Speed–Work load graph> (page 642)

Calculate **the cycle time** using the following calculation method.

Cycle time:

T can be found from the following equation.

$$\boxed{T = T1 + T2 + T3 + T4\ [s]}$$

- T1: Acceleration time and T3: Deceleration time can be found by the following equation.

$$\boxed{T1 = V/a1\ [s]} \quad \boxed{T3 = V/a2\ [s]}$$

- T2: Constant speed time can be found from the following equation.

$$\boxed{T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V}\ [s]}$$

- T4: Settling time varies depending on the conditions such as motor types, load, and in position of the step data. Therefore, calculate the settling time while referencing the following value.

$$\boxed{T4 = 0.15\ [s]}$$

Calculation example)

T1 to T4 can be calculated as follows.

$T1 = V/a1 = 200/5000 = 0.04$ [s],

$T3 = V/a2 = 200/5000 = 0.04$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V}$$

$$= \frac{50 - 0.5 \cdot 200 \cdot (0.04 + 0.04)}{200}$$

$$= 0.21\ [s]$$

$T4 = 0.15$ [s]

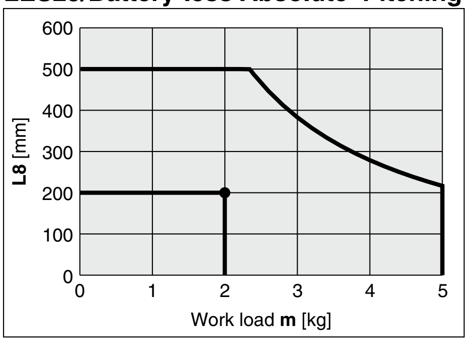
The cycle time can be found as follows.

$T = T1 + T2 + T3 + T4$

$= 0.04 + 0.21 + 0.04 + 0.15$

$= \mathbf{0.44\ [s]}$

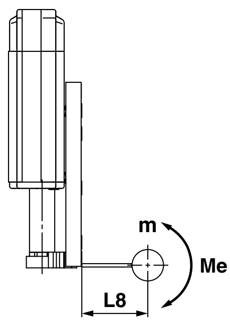
LES25/Battery-less Absolute Pitching



<Dynamic allowable moment>

Step 3 Check the allowable moment. <Static allowable moment> (page 642) <Dynamic allowable moment> (page 643)

Confirm the moment that applies to the actuator is within the allowable range for both static and dynamic conditions.



Based on the above calculation result, the LES25□EJ-50 should be selected.

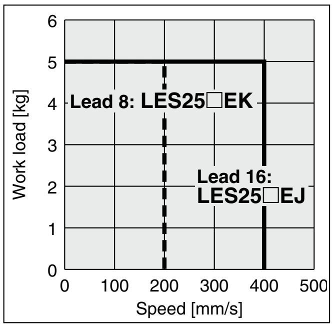
Speed–Work Load Graph (Guide)

Battery-less Absolute (Step Motor 24 VDC)

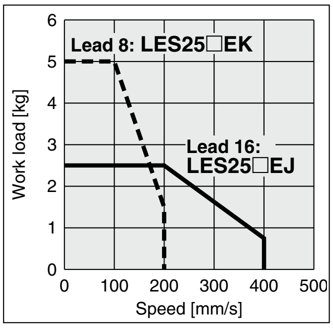
∗ The following graphs show the values when the moving force is 100%.

LES25□E□

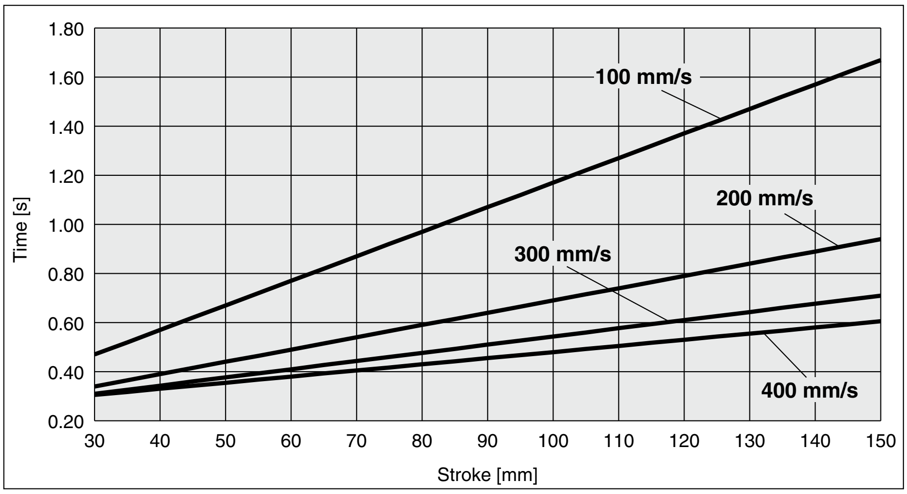
Horizontal



Vertical



Cycle Time Graph (Guide)



Operating Conditions

Acceleration/Deceleration: 5000 mm/s²
In position: 0.5 mm

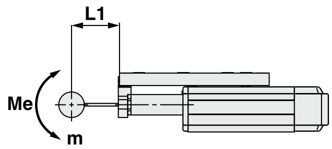
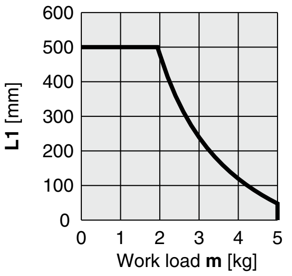
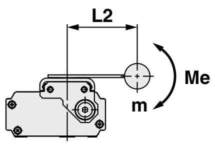
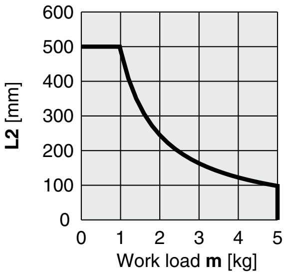
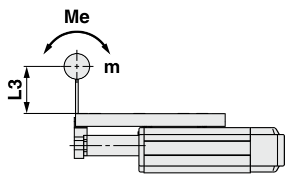
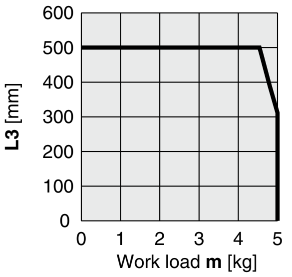
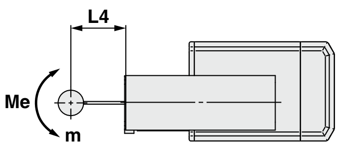
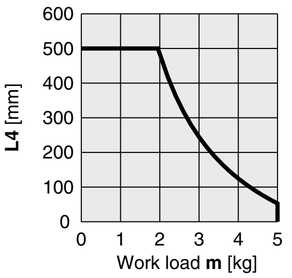
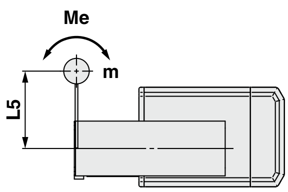
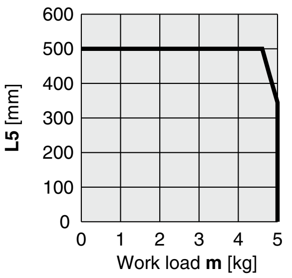
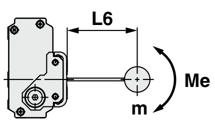
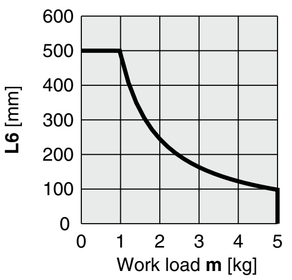
Static Allowable Moment

Model		LES25
Pitching	[N·m]	14.1
Yawing	[N·m]	14.1
Rolling	[N·m]	4.8

Dynamic Allowable Moment

* These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece overhangs in one direction. When selecting the overhang, refer to the "Calculation of Guide Load Factor" or the Electric Actuator Model Selection Software for confirmation: https://www.smcworld.com

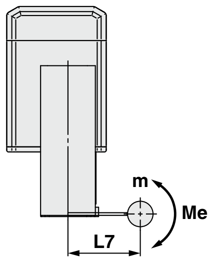
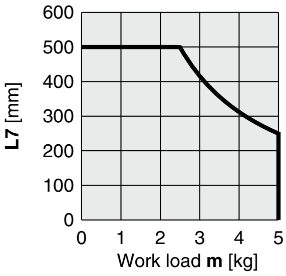
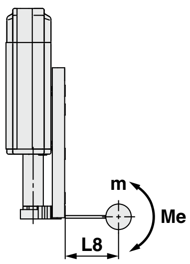
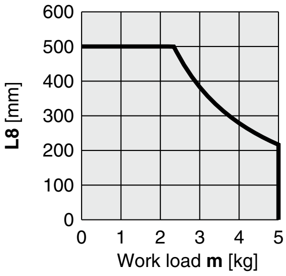
Acceleration/Deceleration —— 5000 mm/s²

Orientation	**Load overhanging direction** **m** : Work load [kg] **Me**: Allowable moment [N·m] **L** : Overhang to the work load center of gravity [mm]		Model **LES25**
Horizontal/Bottom		**X**	
		**Y**	
		**Z**	
Wall		**X**	
		**Y**	
		**Z**	

Dynamic Allowable Moment

※ These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece overhangs in one direction. When selecting the overhang, refer to the “Calculation of Guide Load Factor” or the Electric Actuator Model Selection Software for confirmation: https://www.smcworld.com

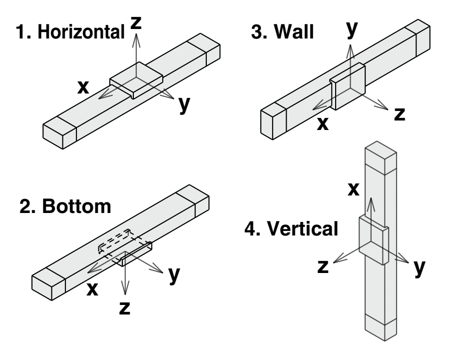
Acceleration/Deceleration ——— 5000 mm/s²

Orientation	**Load overhanging direction** **m** : Work load [kg] **Me**: Allowable moment [N·m] **L** : Overhang to the work load center of gravity [mm]		Model **LES25**
Vertical		**Y**	
		**Z**	

Calculation of Guide Load Factor

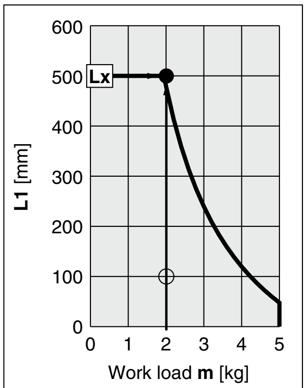
1. Decide operating conditions.
   Model: LES
   Size: 25
   Mounting orientation: Horizontal/Bottom/Wall/Vertical
   Acceleration [mm/s²]: **a**
   Work load [kg]: **m**
   Work load center position [mm]: **Xc/Yc/Zc**
2. Select the target graph while referencing the model, size, and mounting orientation.
3. Based on the acceleration and work load, find the overhang [mm]: **Lx/Ly/Lz** from the graph.
4. Calculate the load factor for each direction.
   α**x = Xc/Lx**, α**y = Yc/Ly**, α**z = Zc/Lz**
5. Confirm the total of α**x**, α**y**, and α**z** is 1 or less.
   α**x +** α**y +** α**z ≤ 1**
   When 1 is exceeded, please consider a reduction of acceleration and work load, or a change of the work load center position and series.

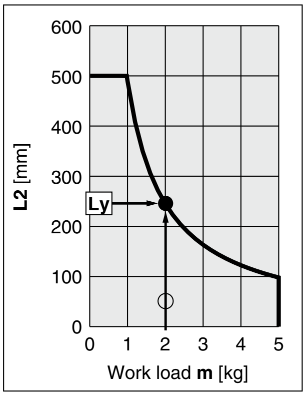
Mounting orientation

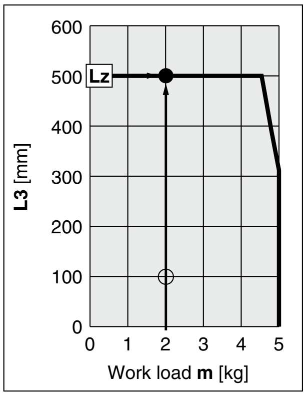


Example

1. Operating conditions
   Model: LES
   Size: 25
   Mounting orientation: Horizontal
   Acceleration [mm/s²]: 5000
   Work load [kg]: 2.0
   Work load center position [mm]: **Xc = 100**, **Yc = 50**, **Zc = 100**
2. Select three graphs from the top on page 643.
3. **Lx = 500 mm**, **Ly = 240 mm**, **Lz = 500 mm**
4. The load factor for each direction can be found as follows.
   α**x = 100/500 = 0.20**
   α**y = 50/240 = 0.21**
   α**z = 100/500 = 0.20**
5. α**x +** α**y +** α**z = 0.61 ≤ 1**







Model Selection 2

Selection Procedure

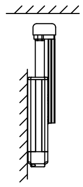
For the high rigidity type LESH series, refer to page 691.

Step 1 Check the required force. → **Step 2** Check the pushing force set value. → **Step 3** Check the duty ratio.

Selection Example

Operating conditions

- Pushing force: 90 [N]
- Workpiece mass: 1 [kg]
- Speed: 100 [mm/s]
- Stroke: 100 [mm]
- Mounting orientation: Vertical upward
- Pushing time + Operation (A): 1.5 s
- Full cycle time (B): 6 s



Step 1 Check the required force.

Calculate the approximate required force for a pushing operation.
Selection example) • Pushing force: 90 [N]
• Workpiece mass: 1 [kg]
The approximate required force can be found to be 90 + 10 = 100 [N].
Select a model based on the approximate required force while referencing the specifications (page 661).
Selection example) Based on the specifications,
• Approximate required force: 100 [N]
• Speed: 100 [mm/s]
The **LES25□E** can be temporarily selected as a possible candidate.
Then, calculate the required force for a pushing operation.
If the mounting position is vertical upward, add the actuator table weight.
Selection example) Based on the table weight,
• **LES25□E** table weight: 0.5 [kg]
The required force can be found to be 100 + 5 = 105 [N].

Step 2 Check the pushing force set value.

<Pushing force set value–Force graph> (page 646)

Select a model based on the required force while referencing the pushing force set value–force graph, and confirm the pushing force set value.
Selection example) Based on the graph shown on the right side,
• Required force: 105 [N]
The **LES25□EK** can be temporarily selected as a possible candidate.
This pushing force set value is 40 [%].

Step 3 Check the duty ratio.

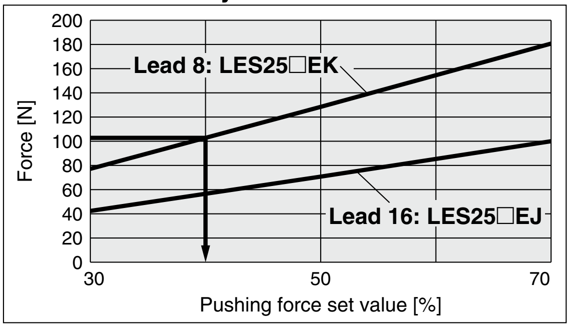
Confirm the allowable duty ratio based on the pushing force set value while referencing the allowable duty ratio.
Selection example) Based on the allowable duty ratio,
• Pushing force set value: 40 [%]
The allowable duty ratio can be found to be 30 [%].
Calculate the duty ratio for the operating conditions, and confirm it does not exceed the allowable duty ratio.
Selection example) • Pushing time + Operation (A): 1.5 s
• Full cycle time (B): 6 s
The duty ratio can be found to be 1.5/6 x 100 = 25 [%], and this is within the allowable range.

Table Weight [kg]

Model	Stroke [mm]					
	30	50	75	100	125	150
LES25	0.25	0.30	0.36	0.50	0.55	0.59

∗ If the mounting position is vertical upward, add the table weight.

LES25□E□/Battery-less Absolute

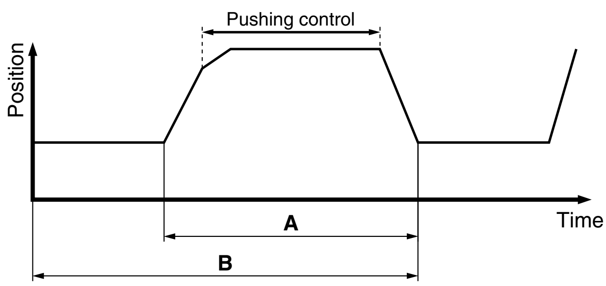


<Pushing force set value–Force graph>

Allowable Duty Ratio

Battery-less Absolute

Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
30	—	—
50 or less	30 or less	5 or less
70 or less	20 or less	3 or less



Based on the above calculation result, the LES25□EK-100 should be selected.
For allowable moment, the selection procedure is the same as that for the positioning control.

Pushing Force Set Value–Force Graph

Battery-less Absolute (Step Motor 24 VDC)

LES25□E□

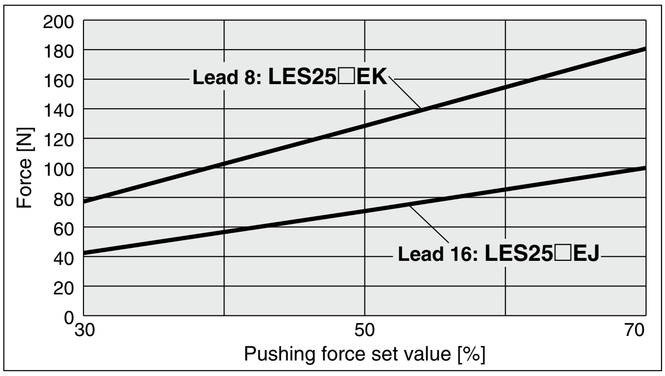
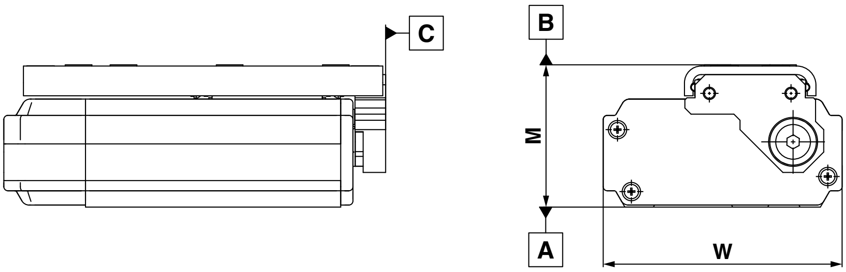


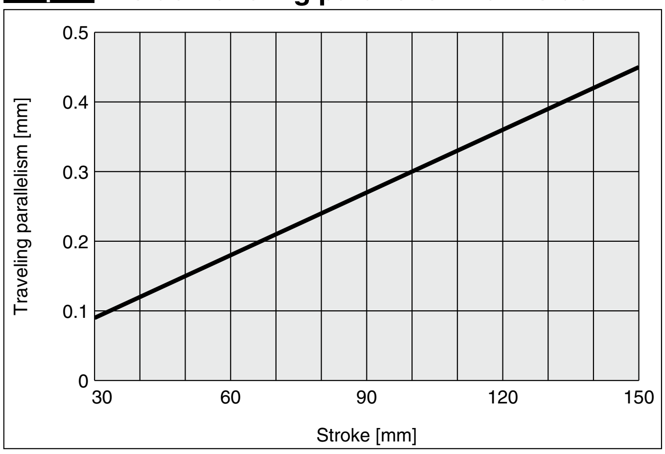
Table Accuracy

∗ These values are initial guideline values.



Model	LES25
B side parallelism to A side	0.4 mm
B side traveling parallelism to A side	Refer to Graph 1.
C side perpendicularity to A side	0.2 mm
M dimension tolerance	±0.3 mm
W dimension tolerance	±0.2 mm

Graph 1 B side traveling parallelism to A side



Traveling parallelism:
The amount of deflection on a dial gauge when the table travels a full stroke with the body secured on a reference base surface

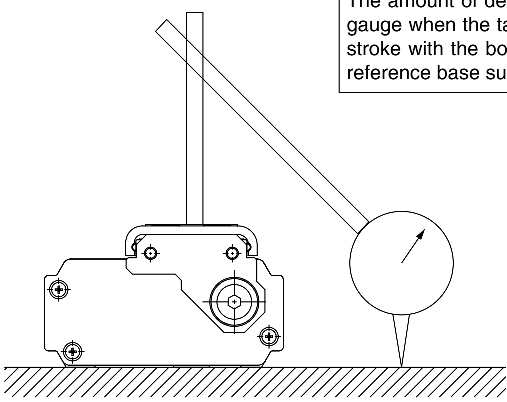
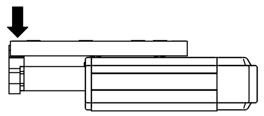


Table Deflection (Reference Value)

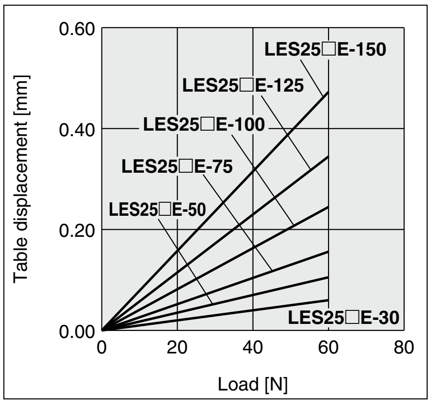
∗ These values are initial guideline values.

Pitching moment

Table displacement due to pitch moment load
Table displacement when loads are applied to the section marked with the arrow with the slide table stuck out.

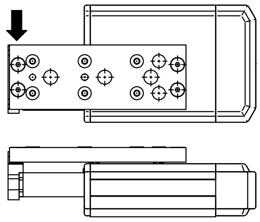


LES25

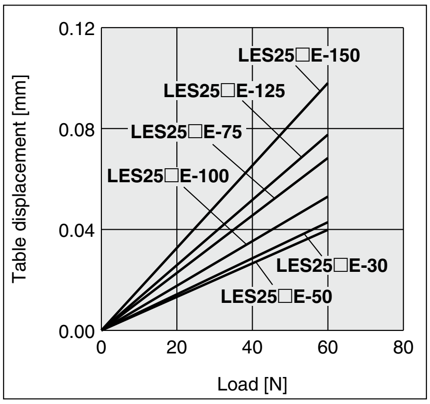


Yawing moment

Table displacement due to yaw moment load
Table displacement when loads are applied to the section marked with the arrow with the slide table stuck out.

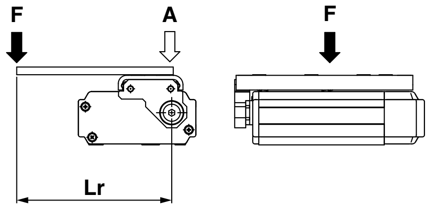


LES25



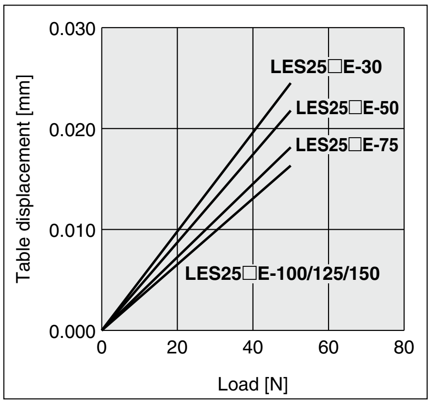
Rolling moment

Table displacement due to roll moment load
Table displacement of section A when loads are applied to the section F with the slide table retracted.



LES25

Lr = 100 mm



Incremental (Step Motor 24 VDC) Incremental (Servo Motor 24 VDC)

Slide Table/Compact Type

LES Series

Model Selection 1

LES Series ▶p. 669

Selection Procedure

For the high rigidity type LESH series, refer to page 695.

Step 1 Check the work load–speed. → **Step 2** Check the cycle time. → **Step 3** Check the allowable moment.

Selection Example

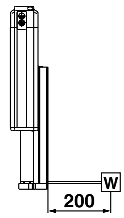
Step 1 Check the work load–speed. <Speed–Work load graph> (Page 650)

Select a model based on the workpiece mass and speed while referencing the speed–work load graph.

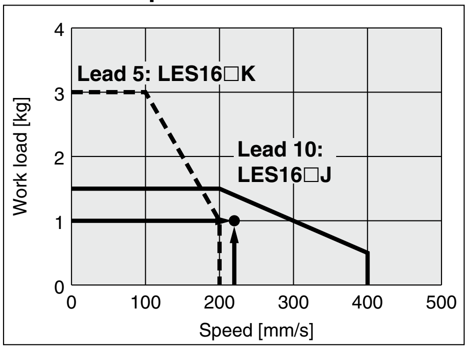
Selection example) The **LES16□J-50** can be temporarily selected as a possible candidate based on the graph shown on the right side.

Operating conditions

- Workpiece mass: 1 [kg]
- Speed: 220 [mm/s]
- Mounting orientation: Vertical
- Stroke: 50 [mm]
- Acceleration/Deceleration: 5000 [mm/s²]
- Cycle time: 0.5 s
- Workpiece mounting condition:



LES16□/Step Motor Vertical



<Speed–Work load graph>

Step 2 Check the cycle time.

It is possible to find an approximate cycle time by using method 1, but if a more detailed cycle time is required, use method 2.

Method 1: Check the cycle time graph. (Page 651)

Method 2: Calculation <Speed–Work load graph> (Page 650)

Calculate **the cycle time** using the following calculation method.

Cycle time:

T can be found from the following equation.

$\boxed{T = T1 + T2 + T3 + T4\ [s]}$

- T1: Acceleration time and T3: Deceleration time can be found by the following equation.

$\boxed{T1 = V/a1\ [s]}$ $\boxed{T3 = V/a2\ [s]}$

- T2: Constant speed time can be found from the following equation.

$$\boxed{T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V}\ [s]}$$

- T4: Settling time varies depending on the conditions such as motor types, load, and in position of the step data. Therefore, calculate the settling time while referencing the following value.

$\boxed{T4 = 0.15\ [s]}$

Calculation example)

T1 to T4 can be calculated as follows.

T1 = V/a1 = 220/5000 = 0.04 [s],

T3 = V/a2 = 220/5000 = 0.04 [s]

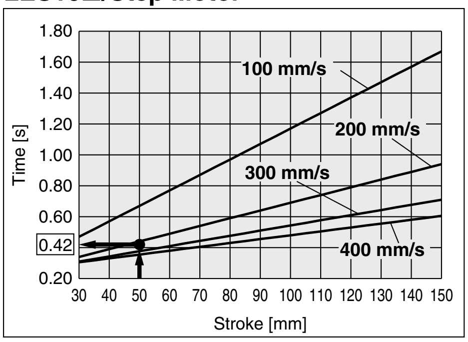
$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{50 - 0.5 \cdot 220 \cdot (0.04 + 0.04)}{220} = 0.19\ [s]$$

T4 = 0.15 [s]

The cycle time can be found as follows.

T = T1 + T2 + T3 + T4
= 0.04 + 0.19 + 0.04 + 0.15
= **0.42 [s]**

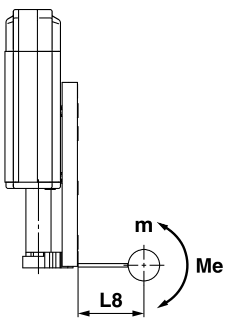
LES16□/Step Motor



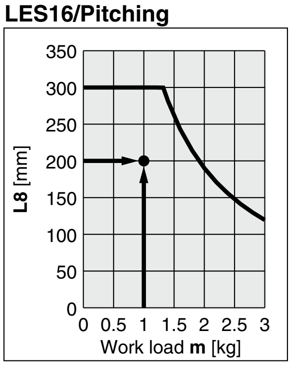
<Cycle time>

Step 3 Check the allowable moment. <Static allowable moment> (Page 651) <Dynamic allowable moment> (Pages 652, 653)

Confirm the moment that applies to the actuator is within the allowable range for both static and dynamic conditions.



LES16/Pitching



<Dynamic allowable moment>

Based on the above calculation result, the LES16□J-50 should be selected.

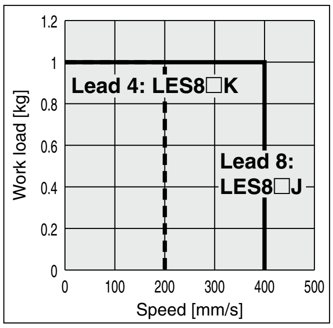
Speed–Work Load Graph (Guide)

Step Motor (Servo/24 VDC)

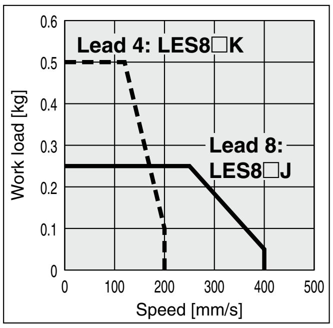
∗ The following graphs show the values when moving force is 100%.

LES8□

Horizontal

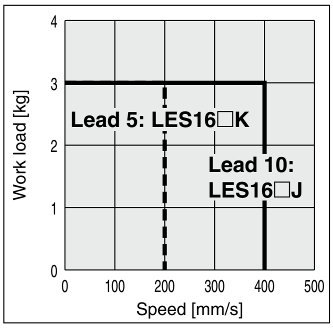


Vertical

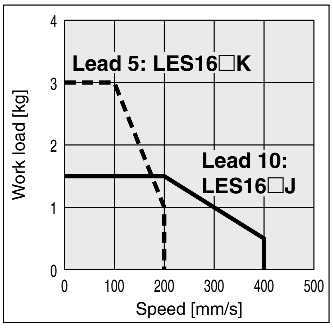


LES16□

Horizontal

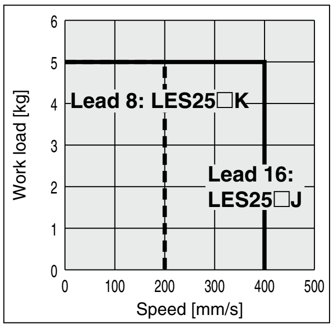


Vertical

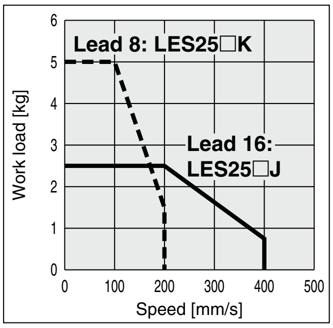


LES25□

Horizontal



Vertical

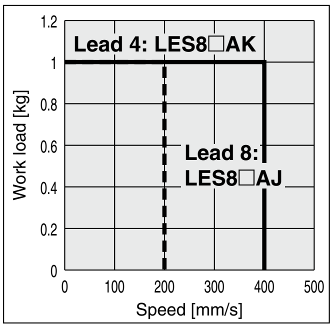


Servo Motor (24 VDC)

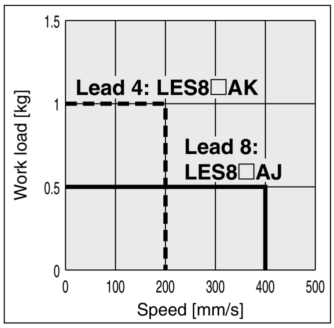
∗ The following graphs show the values when moving force is 250%.

LES8□A

Horizontal

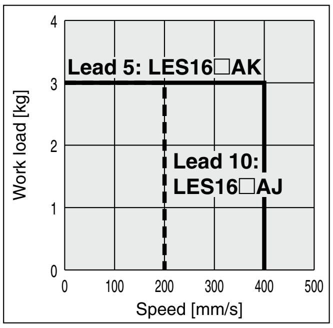


Vertical

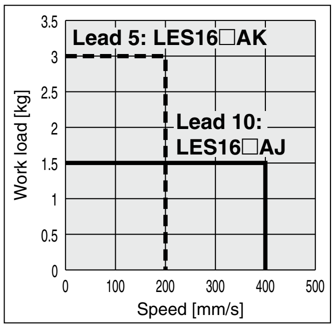


LES16□A

Horizontal

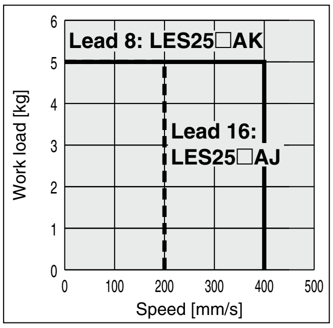


Vertical

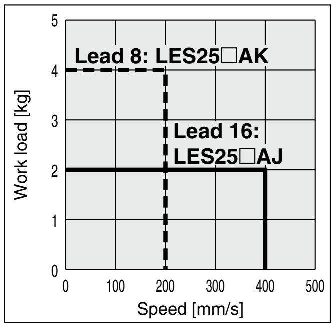


LES25$^{R}_{L}$A

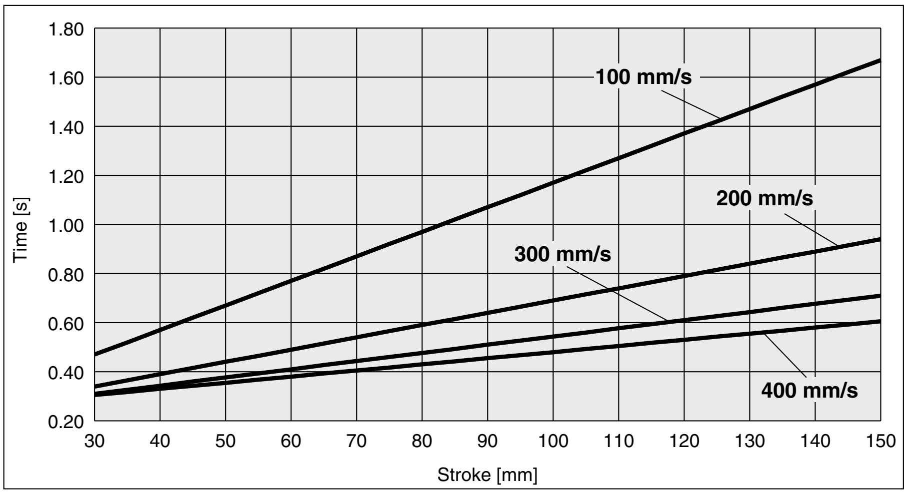
Horizontal



Vertical



Cycle Time Graph (Guide)



Operating Conditions

Acceleration/Deceleration: 5000 mm/s²
In position: 0.5 mm

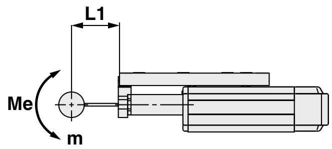
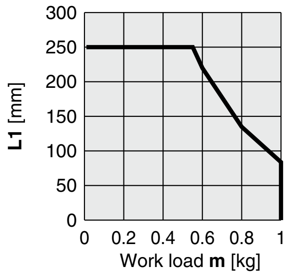
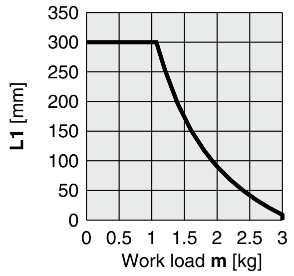
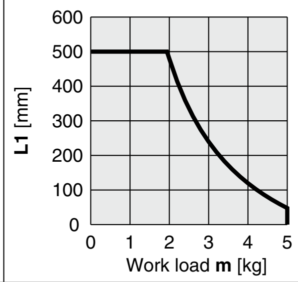
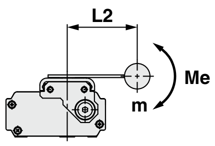
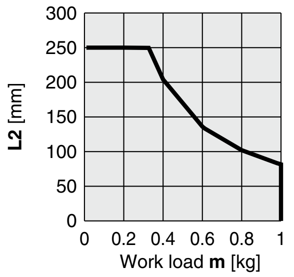
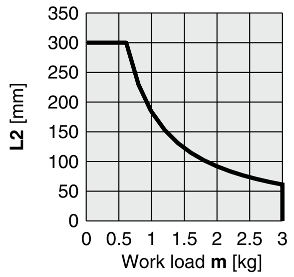
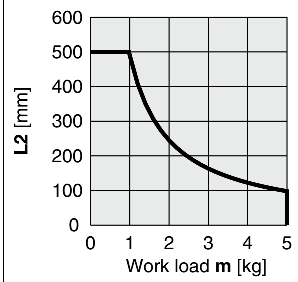
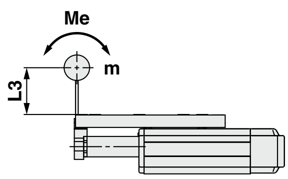
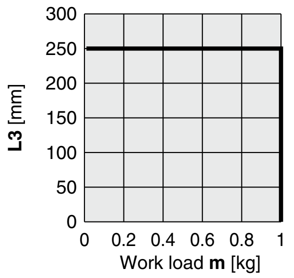
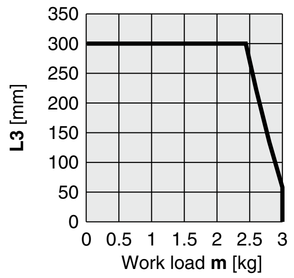
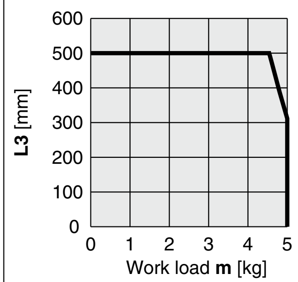
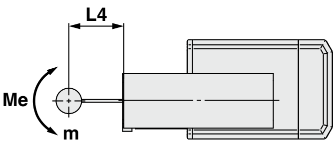
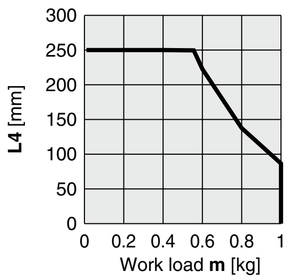
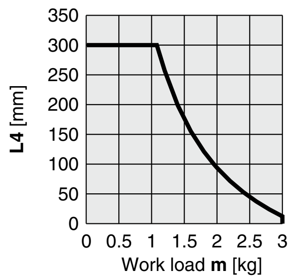
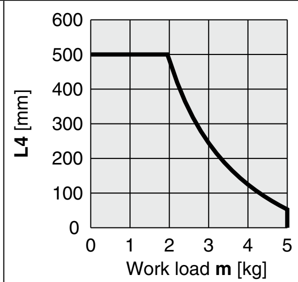
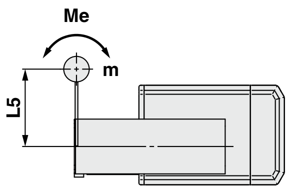
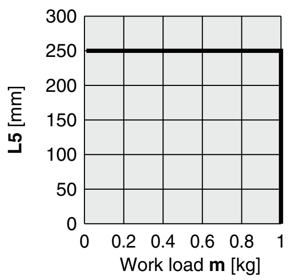
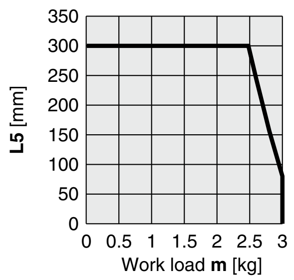
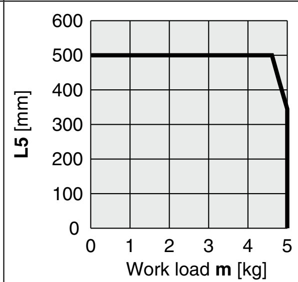
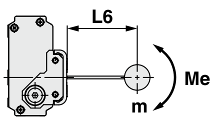
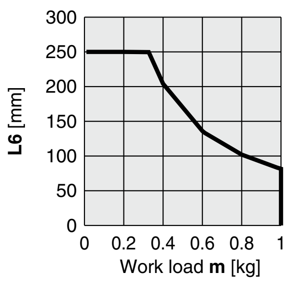
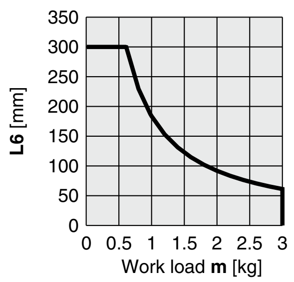
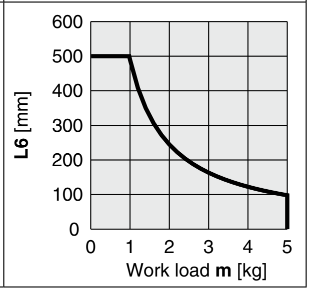
Static Allowable Moment

Model		LES8	LES16	LES25
Pitching	[N·m]	2	4.8	14.1
Yawing	[N·m]	2	4.8	14.1
Rolling	[N·m]	0.8	1.8	4.8

Dynamic Allowable Moment

∗ These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece overhangs in one direction. When selecting the overhang, refer to the “Calculation of Guide Load Factor” or the Electric Actuator Model Selection Software for confirmation: https://www.smcworld.com

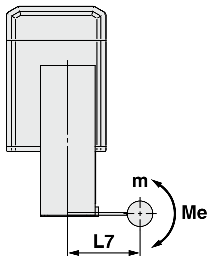
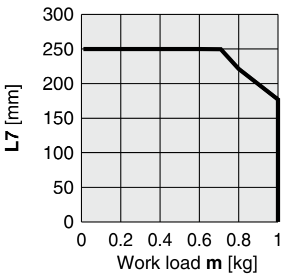
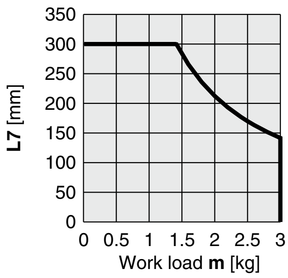
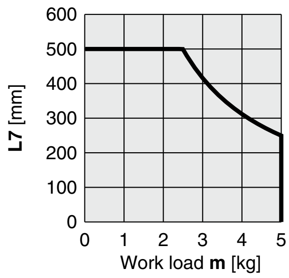
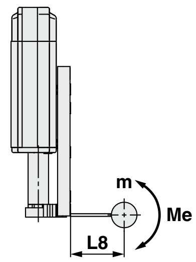
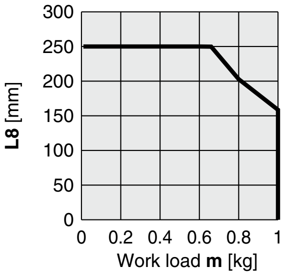
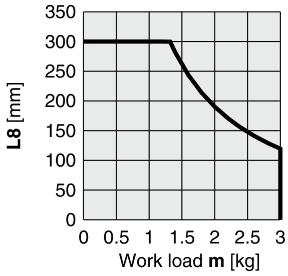
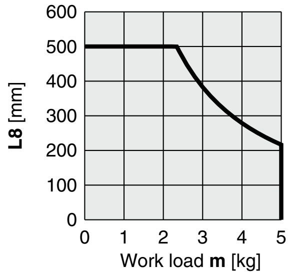
Acceleration/Deceleration ——— 5000 mm/s²

Orientation	Load overhanging direction **m** : Work load [kg] **Me**: Allowable moment [N·m] **L** : Overhang to the work load center of gravity [mm]		Model		
			LES8	**LES16**	**LES25**
Horizontal/Bottom		**X**			
		**Y**			
		**Z**			
Wall		**X**			
		**Y**			
		**Z**			

Dynamic Allowable Moment

* These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece overhangs in one direction. When selecting the overhang, refer to the "Calculation of Guide Load Factor" or the Electric Actuator Model Selection Software for confirmation: https://www.smcworld.com

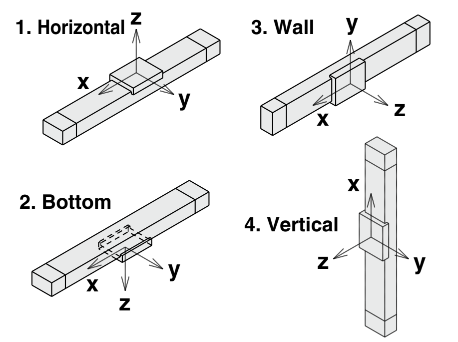
Acceleration/Deceleration —— 5000 mm/s²

Orientation	Load overhanging direction **m** : Work load [kg] **Me**: Allowable moment [N·m] **L** : Overhang to the work load center of gravity [mm]		Model: LES8	Model: LES16	Model: LES25
Vertical		**Y**			
		**Z**			

Calculation of Guide Load Factor

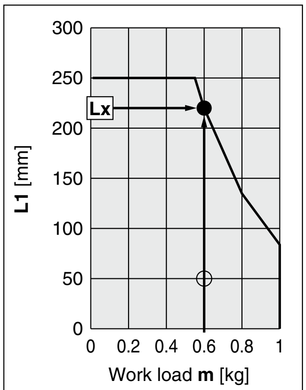
1. Decide operating conditions.
   Model: LES
   Size: 8/16/25
   Mounting orientation: Horizontal/Bottom/Wall/Vertical
   Acceleration [mm/s²]: **a**
   Work load [kg]: **m**
   Work load center position [mm]: **Xc/Yc/Zc**
2. Select the target graph while referencing the model, size, and mounting orientation.
3. Based on the acceleration and work load, find the overhang [mm]: **Lx/Ly/Lz** from the graph.
4. Calculate the load factor for each direction.
   α**x = Xc/Lx**, α**y = Yc/Ly**, α**z = Zc/Lz**
5. Confirm the total of α**x**, α**y**, and α**z** is 1 or less.
   $\alpha x + \alpha y + \alpha z \leq 1$
   When 1 is exceeded, please consider a reduction of acceleration and work load, or a change of the work load center position and series.

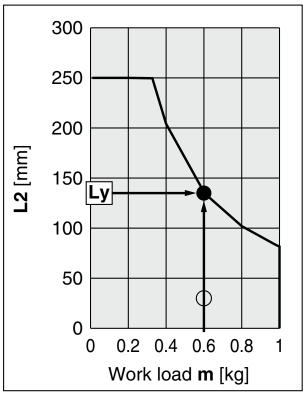
Mounting orientation

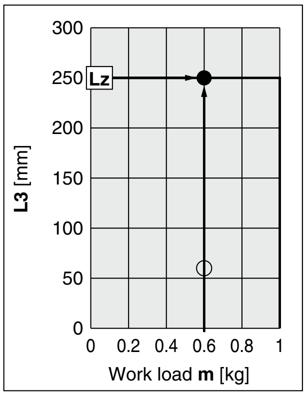


Example

1. Operating conditions
   Model: LES
   Size: 8
   Mounting orientation: Horizontal
   Acceleration [mm/s²]: 5000
   Work load [kg]: 0.6
   Work load center position [mm]: **Xc = 50**, **Yc = 30**, **Zc = 60**
2. Select three graphs from the top of the left side first row on page 652.
3. **Lx = 220 mm**, **Ly = 135 mm**, **Lz = 250 mm**
4. The load factor for each direction can be found as follows.
   α**x = 50/220 = 0.23**
   α**y = 30/135 = 0.22**
   α**z = 60/250 = 0.24**
5. $\alpha x + \alpha y + \alpha z = 0.69 \leq 1$







LES Series

Model Selection 2

LES Series ▶p. 669

Selection Procedure

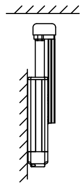
For the high rigidity type LESH series, refer to page 701.

Step 1 Check the required force. → **Step 2** Check the pushing force set value. → **Step 3** Check the duty ratio.

Selection Example

Operating conditions

- Pushing force: 90 [N]
- Workpiece mass: 1 [kg]
- Speed: 100 [mm/s]
- Stroke: 100 [mm]
- Mounting orientation: Vertical upward
- Pushing time + Operation (A): 1.5 s
- Full cycle time (B): 6 s



Step 1 Check the required force.

Calculate the approximate required force for a pushing operation.
Selection example) • Pushing force: 90 [N]
• Workpiece mass: 1 [kg]
The approximate required force can be found to be 90 + 10 = 100 [N].
Select a model based on the approximate required force while referencing the specifications (Pages 672, 673).
Selection example) Based on the specifications,
• Approximate required force: 100 [N]
• Speed: 100 [mm/s]
The **LES25□** can be temporarily selected as a possible candidate.
Then, calculate the required force for a pushing operation.
If the mounting position is vertical upward, add the actuator table weight.
Selection example) Based on the table weight,
• **LES25□** table weight: 0.5 [kg]
The required force can be found to be 100 + 5 = 105 [N].

Step 2 Check the pushing force set value.

<Pushing force set value–Force graph> (Page 656)

Select a model based on the required force while referencing the pushing force set value–force graph, and confirm the pushing force set value.
Selection example) Based on the graph shown on the right side,
• Required force: 105 [N]
The **LES25□K** can be temporarily selected as a possible candidate.
This pushing force set value is 40 [%].

Step 3 Check the duty ratio.

Confirm the allowable duty ratio based on the pushing force set value while referencing the allowable duty ratio.
Selection example) Based on the allowable duty ratio,
• Pushing force set value: 40 [%]
The allowable duty ratio can be found to be 30 [%].
Calculate the duty ratio for the operating conditions, and confirm it does not exceed the allowable duty ratio.
Selection example) • Pushing time + Operation (A): 1.5 s
• Full cycle time (B): 6 s
The duty ratio can be found to be 1.5/6 x 100 = 25 [%], and this is within the allowable range.

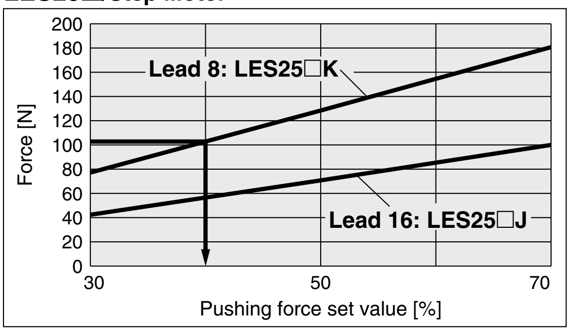
Based on the above calculation result, the LES25□K-100 should be selected. For allowable moment, the selection procedure is the same as that for the positioning control.

Table Weight [kg]

Model	Stroke [mm]					
	30	50	75	100	125	150
LES8	0.06	0.08	0.10	—	—	—
LES16	0.10	0.13	0.18	0.20	—	—
LES25	0.25	0.30	0.36	0.50	0.55	0.59

∗ If the mounting position is vertical upward, add the table weight.

LES25□/Step Motor



<Pushing force set value–Force graph>

Allowable Duty Ratio

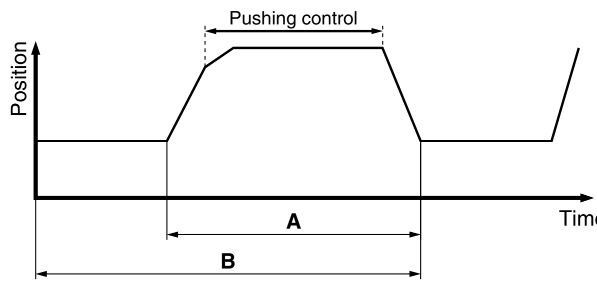
Step Motor (Servo/24 VDC)

Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
30	—	—
50 or less	30 or less	5 or less
70 or less	20 or less	3 or less

Servo Motor (24 VDC)

Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
50	—	—
75 or less	30 or less	5 or less
100 or less	20 or less	3 or less

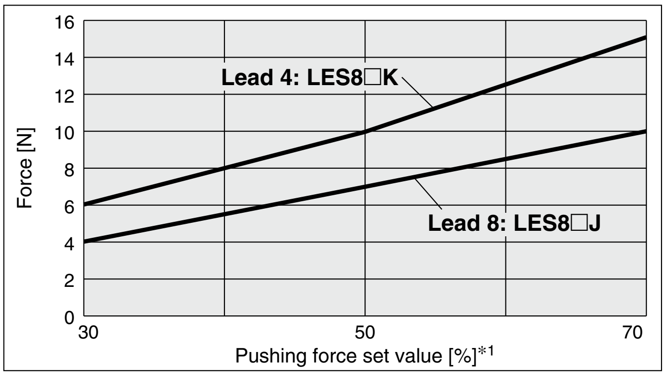
∗ The pushing force of the LES8□A is up to 75%.



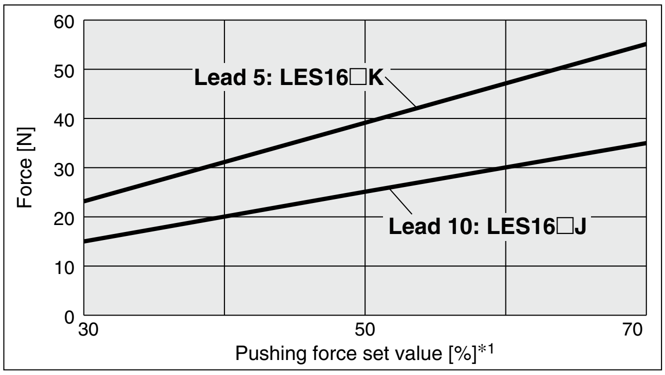
Pushing Force Set Value–Force Graph

Step Motor (Servo/24 VDC)

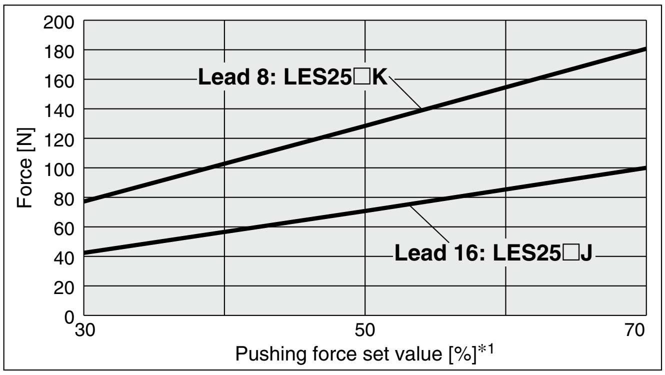
LES8□



LES16□

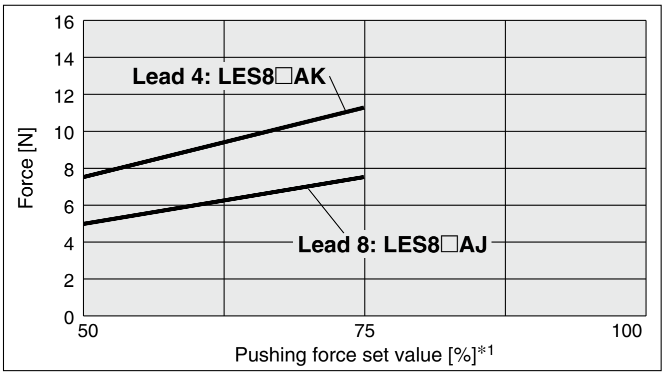


LES25□

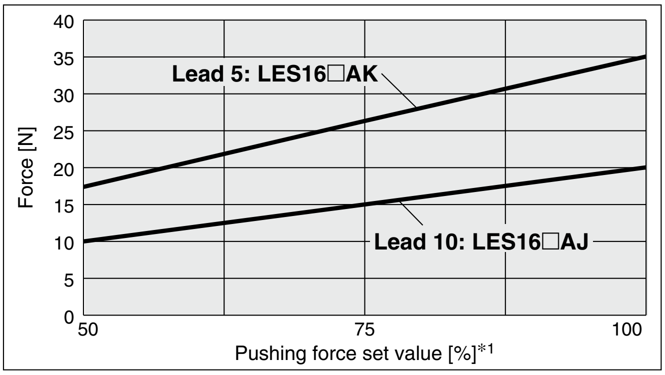


Servo Motor (24 VDC)

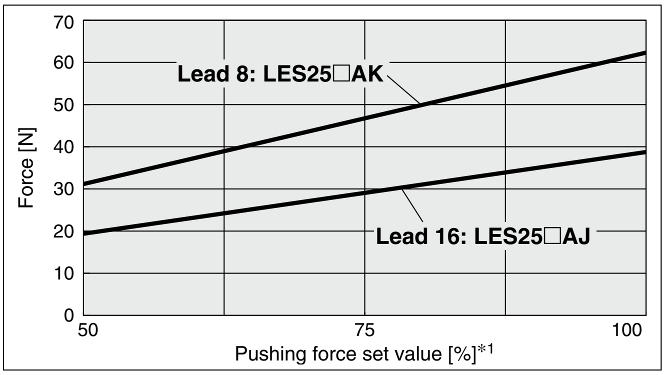
LES8□A



LES16□A



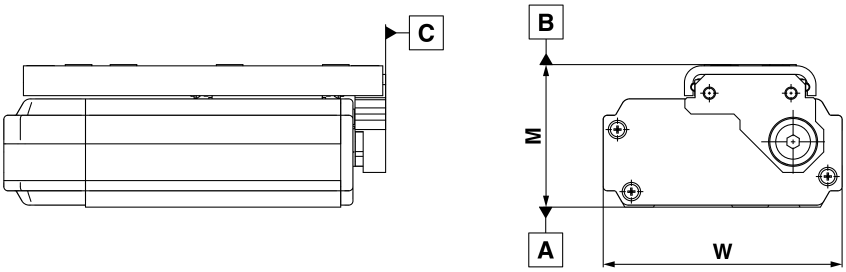
LES25$^{R}_{L}$A



*1 Set values for the controller

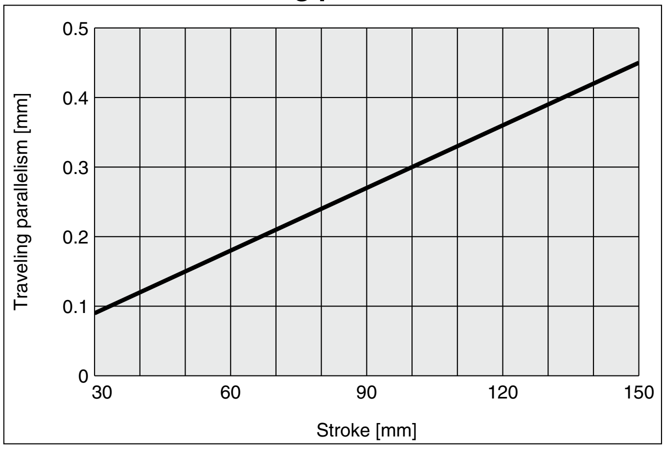
Table Accuracy

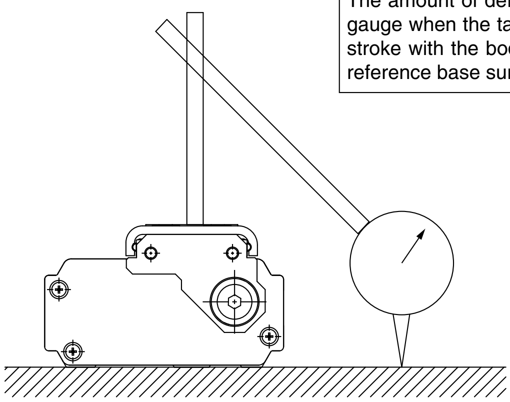
* These values are initial guideline values.



Model	LES8	LES16	LES25
B side parallelism to A side	0.4 mm		
B side traveling parallelism to A side	Refer to Graph 1.		
C side perpendicularity to A side	0.2 mm		
M dimension tolerance	±0.3 mm		
W dimension tolerance	±0.2 mm		

Graph 1 B side traveling parallelism to A side





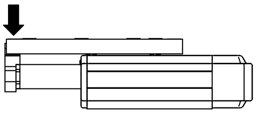
Traveling parallelism:
The amount of deflection on a dial gauge when the table travels a full stroke with the body secured on a reference base surface

Table Deflection (Reference Value)

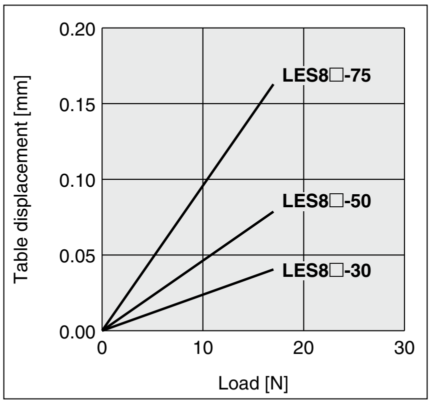
∗ These values are initial guideline values.

Pitching moment

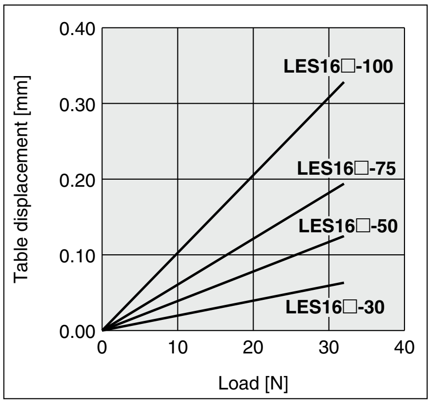
Table displacement due to pitch moment load
Table displacement when loads are applied to the section marked with the arrow with the slide table stuck out.



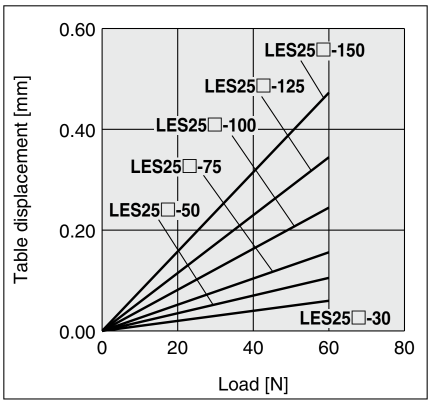
LES8



LES16

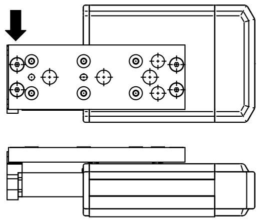


LES25

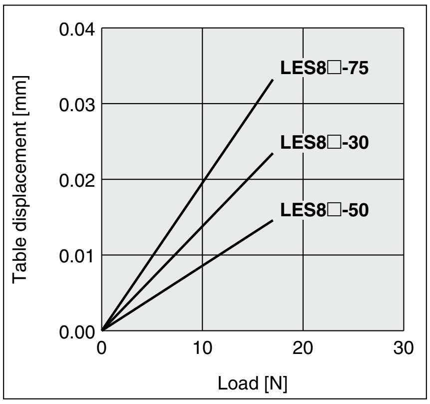


Yawing moment

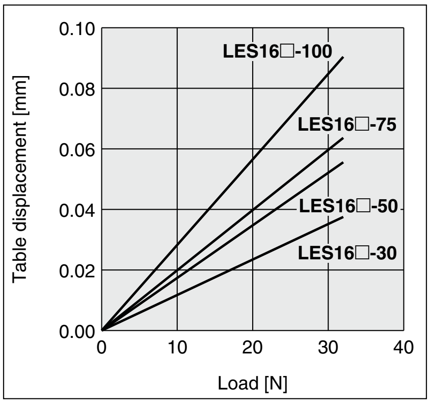
Table displacement due to yaw moment load
Table displacement when loads are applied to the section marked with the arrow with the slide table stuck out.



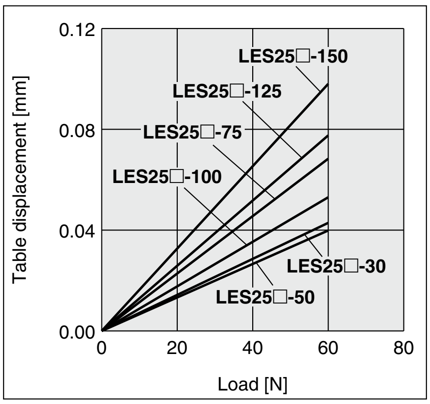
LES8



LES16

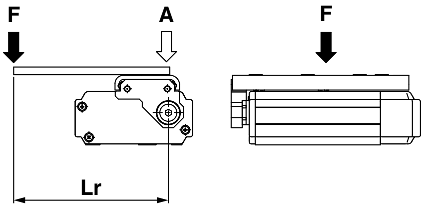


LES25



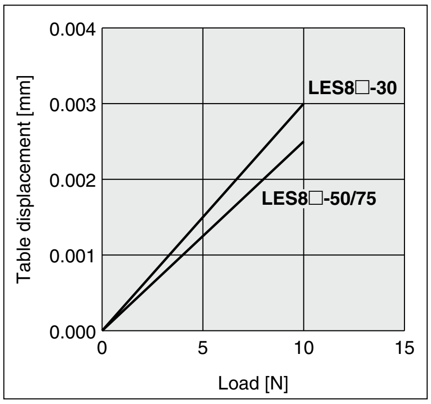
Rolling moment

Table displacement due to roll moment load
Table displacement of section A when loads are applied to the section F with the slide table retracted.



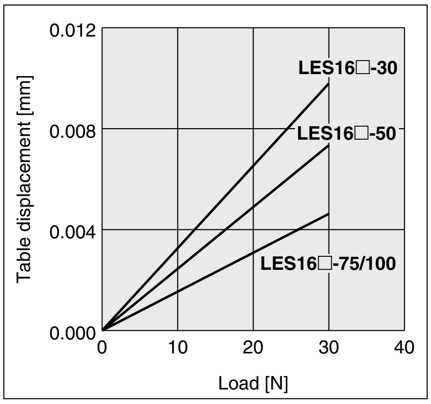
LES8

Lr = 80 mm



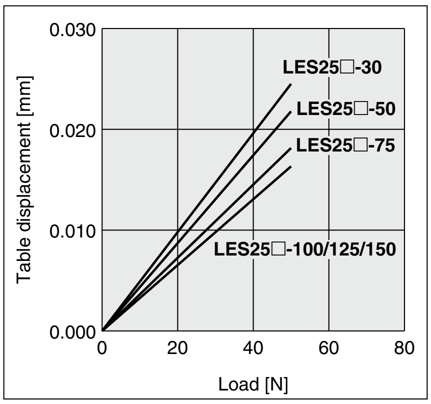
LES16

Lr = 60 mm



LES25

Lr = 100 mm

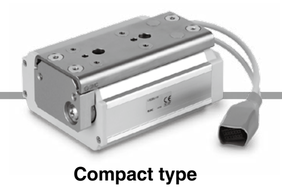


Battery-less Absolute (Step Motor 24 VDC)

Slide Table/Compact Type

LES Series LES25

* For details, refer to page 1343 and onward.



Compact type

How to Order

LES 25 R E J – 30 ☐ ☐ ☐ – R1 CD17T

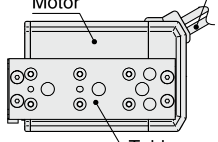
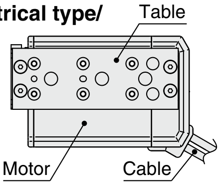
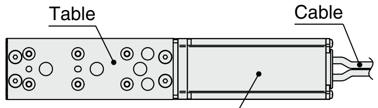
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

For details on controllers, refer to the next page.

❶ Size

25

❷ Motor mounting position

R	Basic type/R type 
L	Symmetrical type/ L type 
D	In-line motor type/D type 

❸ Motor type

Symbol	Type	Compatible controllers/drivers		
E	Battery-less absolute (Step motor 24 VDC)	JXC51	JXCP1	JXCEF
		JXC61	JXCD1	JXC9F
		JXCE1	JXCL1	JXCPF
		JXC91	JXCM1	JXCLF

❹ Lead [mm]

J	16
K	8

❺ Stroke [mm]

Stroke	Applicable stroke
30 to 150	30*1, 50, 75, 100, 125, 150

❻ Motor option

Nil	Without option
B	With lock*1

Applicable motor option chart

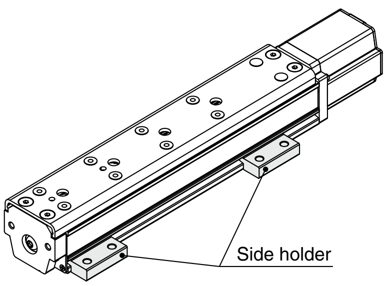
Motor mounting position	Size	Stroke 30	Stroke 50 or more
R/L	25	×	○
D	25	○	○

❼ Body option

Nil	Without option
S	Dust-protected*2

❽ Mounting*3

Symbol	Mounting	R type L type	D type
Nil	Without side holder	●	●
H	With side holder (4 pcs.)	—	●



❾ Actuator cable type/length

Robotic cable [m]

Nil	None	R8	8*4
R1	1.5	RA	10*4
R3	3	RB	15*4
R5	5	RC	20*4

⑩ Controller

Nil	Without controller
C□1□□	With controller

C D 1 7 T

Interface (Communication protocol/Input/Output)

Symbol	Type	Number of axes, Special specification	
		Standard	With STO sub-function
5	Parallel input (NPN)	●	
6	Parallel input (PNP)	●	
E	EtherCAT	●	●
9	EtherNet/IP™	●	●
P	PROFINET	●	●
D	DeviceNet®	●	
L	IO-Link	●	●
M	CC-Link	●	

Mounting

7	Screw mounting
8∗5	DIN rail

Number of axes, Special specification

Symbol	Number of axes	Specification
1	Single axis	Standard
F	Single axis	With STO sub-function

Communication plug connector, I/O cable∗6

Symbol	Type	Applicable interface
Nil	Without accessory	—
S	Straight type communication plug connector	DeviceNet® CC-Link Ver. 1.10
T	T-branch type communication plug connector	
1	I/O cable (1.5 m)	Parallel input (NPN) Parallel input (PNP)
3	I/O cable (3 m)	
5	I/O cable (5 m)	

∗1 As the applicable motor mounting positions and motor options vary depending on the stroke, refer to the applicable motor option chart on page 659.
∗2 For R/L type (IP5X equivalent), a scraper is mounted on the rod cover, and gaskets are mounted on both the end covers. For D type, a scraper is mounted on the rod cover.
∗3 For details, refer to page 667.
∗4 Produced upon receipt of order
∗5 The DIN rail is not included. It must be ordered separately.
∗6 Select “Nil” for anything other than DeviceNet®, CC-Link, or parallel input.
Select “Nil,” “S,” or “T” for DeviceNet® or CC-Link.
Select “Nil,” “1,” “3,” or “5” for parallel input.

⚠Caution

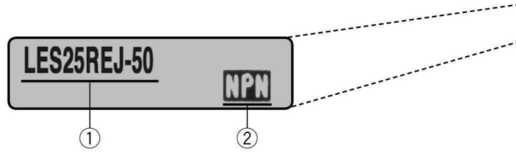
[CE/UKCA-compliant products]
EMC compliance was tested by combining the electric actuator LES series and the controller JXC series.
The EMC depends on the configuration of the customer’s control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with the EMC directive cannot be certified for SMC components incorporated into the customer’s equipment under actual operating conditions. As a result, it is necessary for the customer to verify compliance with the EMC directive for the machinery and equipment as a whole.

[Precautions relating to differences in controller versions]
When the JXC series is to be used in combination with the battery-less absolute encoder, use a controller that is version V3.4 or S3.4 or higher. For details, refer to pages 1077 and 1078.

[UL certification]
The JXC series controllers used in combination with electric actuators are UL certified.

The actuator and controller are sold as a package.
Confirm that the combination of the controller and actuator is correct.

<Check the following before use.>
① Check the actuator label for the model number. This number should match that of the controller.
② Check that the Parallel I/O configuration matches (NPN or PNP).



∗ Refer to the Operation Manual for using the products.
Please download it via our website: https://www.smcworld.com

Type	**Step data input type**	**EtherCAT direct input type**	**EtherCAT direct input type with STO sub-function**	**EtherNet/IP™ direct input type**	**EtherNet/IP™ direct input type with STO sub-function**	**PROFINET direct input type**	**PROFINET direct input type with STO sub-function**	**DeviceNet® direct input type**	**IO-Link direct input type**	**IO-Link direct input type with STO sub-function**	**CC-Link direct input type**
											
Series	JXC51 JXC61	JXCE1	JXCEF	JXC91	JXC9F	JXCP1	JXCPF	JXCD1	JXCL1	JXCLF	JXCM1
Features	Parallel I/O	EtherCAT direct input	EtherCAT direct input with STO sub-function	EtherNet/IP™ direct input	EtherNet/IP™ direct input with STO sub-function	PROFINET direct input	PROFINET direct input with STO sub-function	DeviceNet® direct input	IO-Link direct input	IO-Link direct input with STO sub-function	CC-Link direct input
Compatible motor	Battery-less absolute (Step motor 24 VDC)										
Max. number of step data	64 points										
Power supply voltage	24 VDC										
Reference page	1017	1063									

Specifications

Battery-less Absolute (Step Motor 24 VDC)

	Model		LES25□E	
Actuator specifications	Stroke [mm]		30, 50, 75, 100, 125, 150	
	Work load [kg]*1	Horizontal	5	
		Vertical	5	2.5
	Pushing force 30 to 70% [N]*2 *3		77 to 180	43 to 100
	Speed [mm/s]*1 *3		10 to 200	20 to 400
	Pushing speed [mm/s]		10 to 20	20
	Max. acceleration/deceleration [mm/s²]		5000	
	Positioning repeatability [mm]		±0.05	
	Lost motion [mm]*4		0.3 or less	
	Screw lead [mm]		8	16
	Impact/Vibration resistance [m/s²]*5		50/20	
	Actuation type		Slide screw + Belt (R/L type), Slide screw (D type)	
	Guide type		Linear guide (Circulating type)	
	Operating temperature range [°C]		5 to 40	
	Operating humidity range [%RH]		90 or less (No condensation)	
	Enclosure		IP30	
Electric specifications	Motor size		□42	
	Motor type		Battery-less absolute (Step motor 24 VDC)	
	Encoder		Battery-less absolute	
	Power supply voltage [V]		24 VDC ±10%	
	Power [W]*6 *8		Max. power 67	
Lock unit specifications	Type	*7	Non-magnetizing lock	
	Holding force [N]		500	77
	Power [W]*8		5	
	Rated voltage [V]		24 VDC ±10%	

*1 Speed changes according to the work load. Check the “Speed–Work Load Graph (Guide)” on page 642.
*2 Pushing force accuracy is ±20% (F.S.).
*3 The speed and force may change depending on the cable length, load, and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)
*4 A reference value for correcting errors in reciprocal operation
*5 Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*6 Indicates the max. power during operation (including the controller)
This value can be used for the selection of the power supply.
*7 With lock only
*8 For an actuator with lock, add the power for the lock.

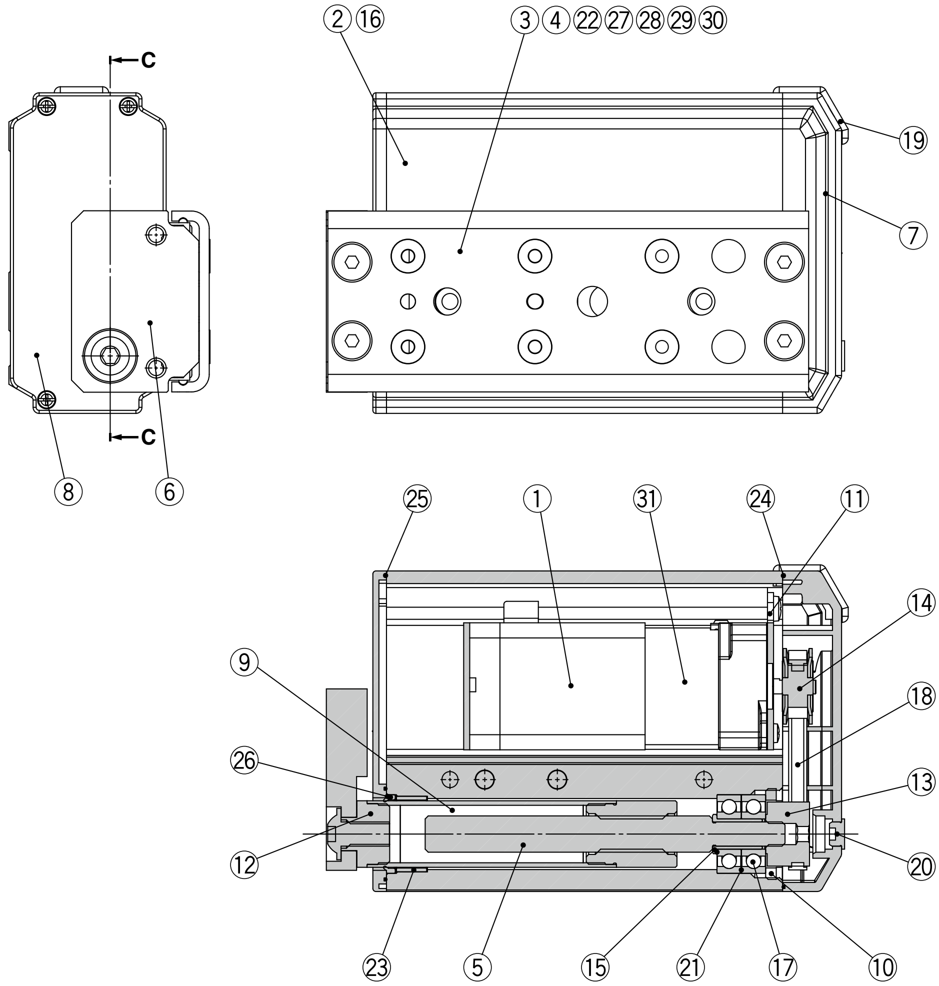
Weight

Battery-less Absolute (Step Motor 24 VDC)

[kg]

		Without lock						With lock					
Stroke [mm]		30	50	75	100	125	150	30	50	75	100	125	150
Model	LES25$^{R}_{L}$	1.81	2.07	2.41	3.21	3.44	3.68	—	2.34	2.68	3.48	3.71	3.95
	LES25D	1.82	2.05	2.35	3.07	3.27	3.47	2.08	2.31	2.61	3.33	3.53	3.74

Construction: Basic Type/R Type, Symmetrical Type/L Type



Component Parts

No.	Description	Material	Note
1	**Motor**	—	—
2	**Body**	Aluminum alloy	Anodized
3	**Table**	Stainless steel	Heat treatment + Electroless nickel plating
4	**Guide block**	Stainless steel	Heat treatment
5	**Lead screw**	Stainless steel	Heat treatment + Special treatment
6	**End plate**	Aluminum alloy	Anodized
7	**Pulley cover**	Synthetic resin	—
8	**End cover**	Synthetic resin	—
9	**Rod**	Stainless steel	—
10	**Bearing stopper**	Structural steel	Electroless nickel plating
		Brass	Electroless nickel plating (LES25R/L□ only)
11	**Motor plate**	Structural steel	—
12	**Socket**	Structural steel	Electroless nickel plating
13	**Lead screw pulley**	Aluminum alloy	—
14	**Motor pulley**	Aluminum alloy	—
15	**Spacer**	Stainless steel	LES25R/L□ only
16	**Origin stopper**	Structural steel	Electroless nickel plating
17	**Bearing**	—	—
18	**Belt**	—	—
19	**Grommet**	Synthetic resin	—
20	**Cap**	Silicone rubber	—
21	**Sim ring**	Structural steel	—

No.	Description	Material	Note
22	**Stopper**	Structural steel	—
23	**Bushing**	—	Dust-protected option only
24	**Pulley gasket**	NBR	Dust-protected option only
25	**End gasket**	NBR	Dust-protected option only
26	**Scraper**	NBR	Dust-protected option only
27	**Cover**	Synthetic resin	—
28	**Return guide**	Synthetic resin	—
29	**Cover support**	Stainless steel	—
30	**Steel ball**	Special steel	—
31	**Lock**	—	With lock only

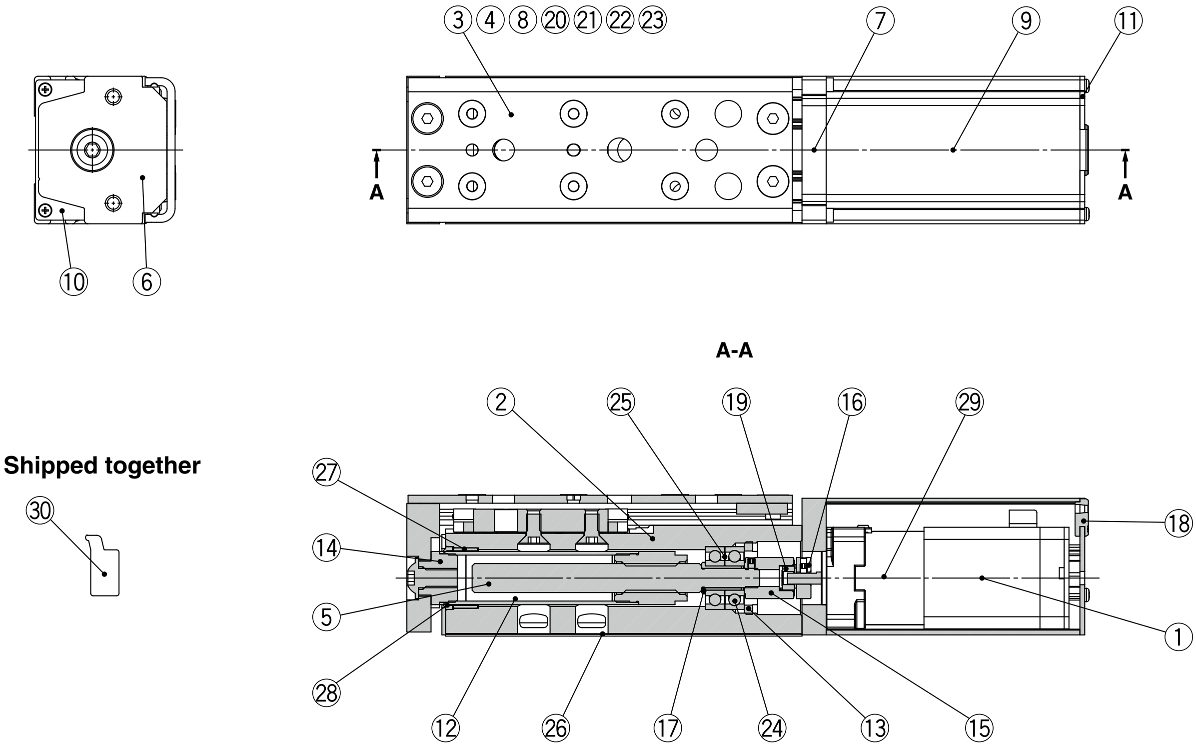
Replacement Parts/Belt

Size	Order no.	Note
LES25□	LE-D-1-3	—

Replacement Parts/Grease Pack

Applied portion	Order no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

Construction: In-line Motor Type/D Type



Component Parts

No.	Description	Material	Note
1	**Motor**	—	—
2	**Body**	Aluminum alloy	Anodized
3	**Table**	Stainless steel	Heat treatment + Electroless nickel plating
4	**Guide block**	Stainless steel	Heat treatment
5	**Lead screw**	Stainless steel	Heat treatment + Special treatment
6	**End plate**	Aluminum alloy	Anodized
7	**Motor flange**	Aluminum alloy	Anodized
8	**Stopper**	Structural steel	—
9	**Motor cover**	Aluminum alloy	Anodized
10	**End cover**	Aluminum alloy	Anodized
11	**Motor end cover**	Aluminum alloy	Anodized
12	**Rod**	Stainless steel	—
13	**Bearing stopper**	Structural steel	Electroless nickel plating
		Brass	Electroless nickel plating (LES25D□ only)
14	**Socket**	Structural steel	Electroless nickel plating
15	**Hub (Lead screw side)**	Aluminum alloy	—
16	**Hub (Motor side)**	Aluminum alloy	—
17	**Spacer**	Stainless steel	LES25D□ only
18	**Grommet**	NBR	—
19	**Spider**	NBR	—
20	**Cover**	Synthetic resin	—

No.	Description	Material	Note
21	**Return guide**	Synthetic resin	—
22	**Cover support**	Stainless steel	—
23	**Steel ball**	Special steel	—
24	**Bearing**	—	—
25	**Sim ring**	Structural steel	—
26	**Masking tape**	—	—
27	**Bushing**	—	Dust-protected option only
28	**Scraper**	NBR	Dust-protected option only
29	**Lock**	—	With lock only
30	**Side holder**	Aluminum alloy	Anodized

Optional Parts/Side Holder

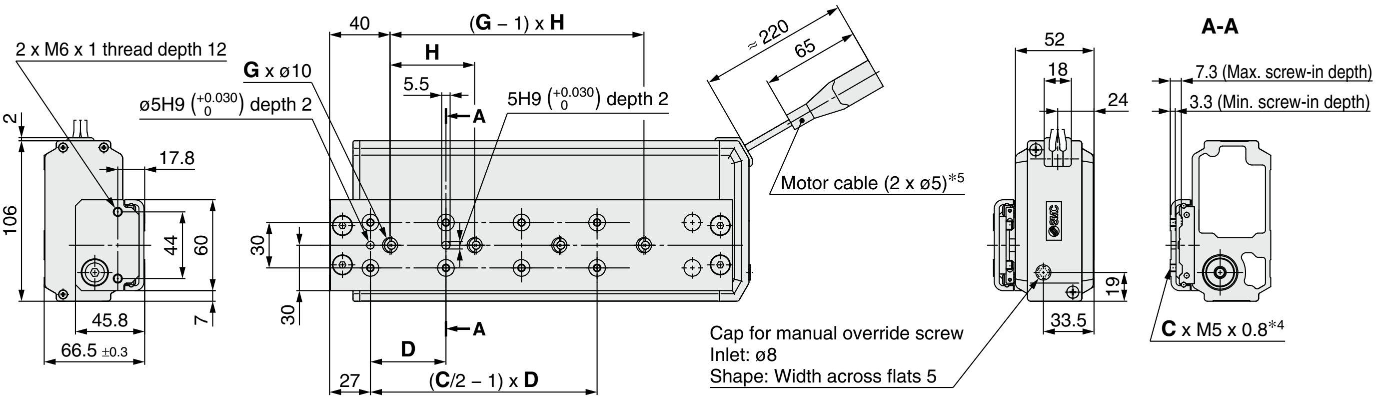
Model	Order no.
LES25D	LE-D-3-3

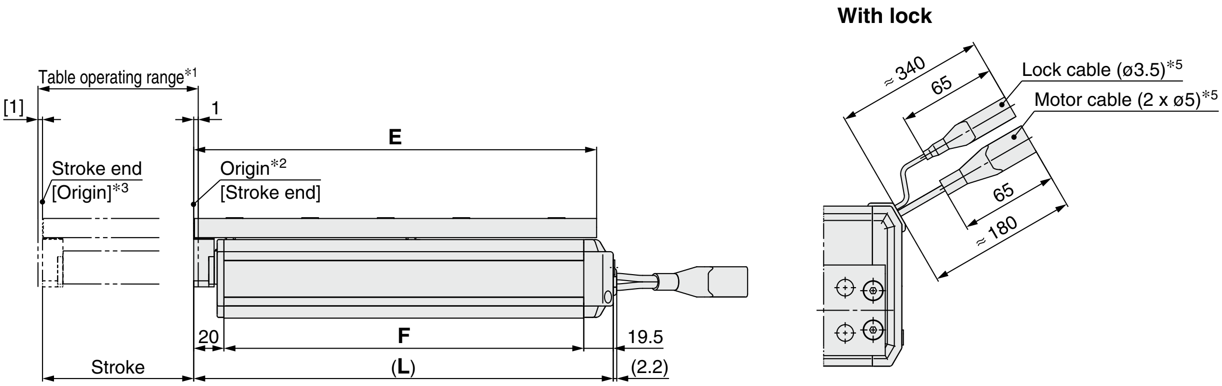
Replacement Parts/Grease Pack

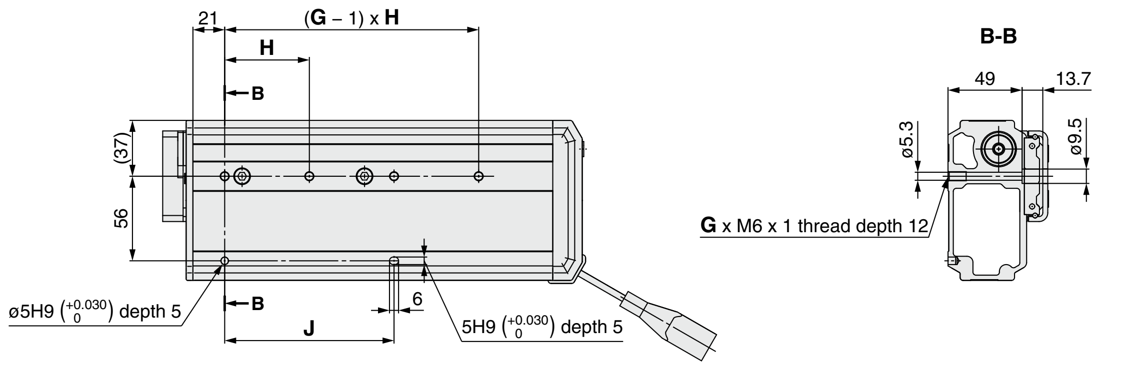
Applied portion	Order no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

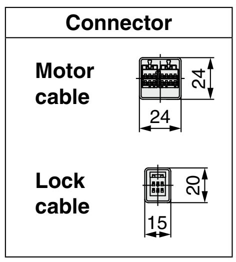
Dimensions: Basic Type/R Type

LES25RE









*1 This is the range within which the table can move when it returns to origin.
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction.
Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

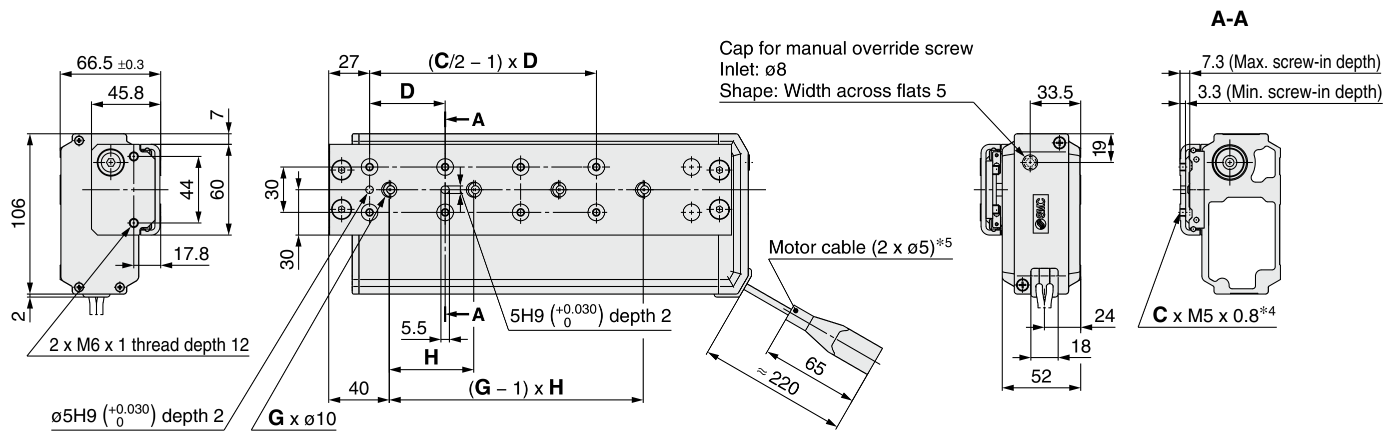
Dimensions

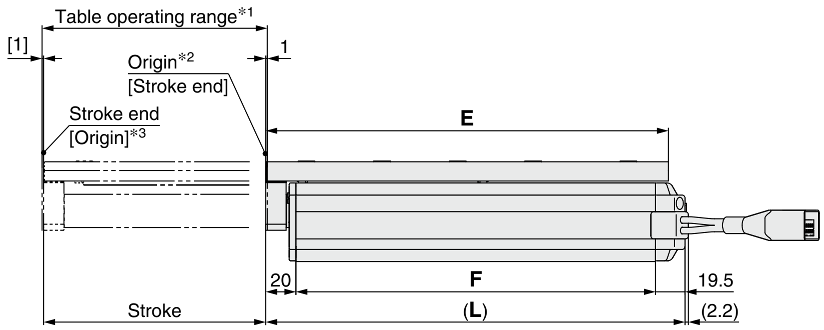
[mm]

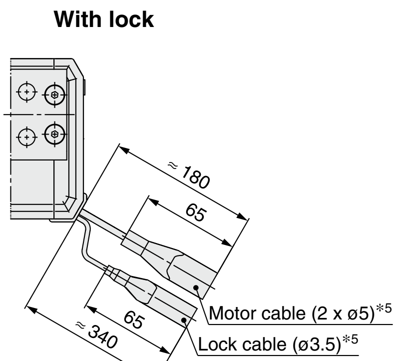
Model	L	C	D	E	F	G	H	J
LES25RE□-30□-□□□□□	144.5	4	48	133.5	105	2	46	46
LES25RE□-50□□-□□□□□	170.5	6	42	159.5	131	2	84	84
LES25RE□-75□□-□□□□□	204.5	6	55	193.5	165	2	112	112
LES25RE□-100□□-□□□□□	277.5	8	50	266.5	238	4	56	112
LES25RE□-125□□-□□□□□	302.5	8	55	291.5	263	4	59	118
LES25RE□-150□□-□□□□□	327.5	8	62	316.5	288	4	62	124

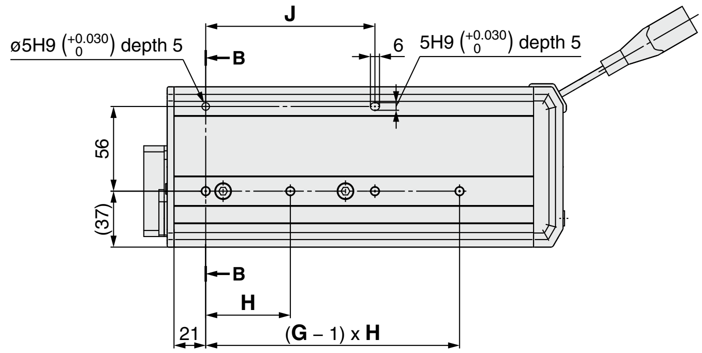
Dimensions: Symmetrical Type/L Type

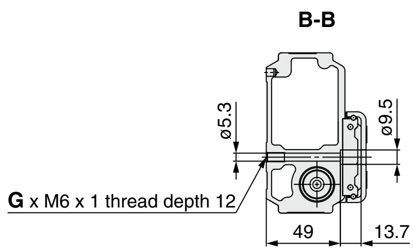
LES25LE

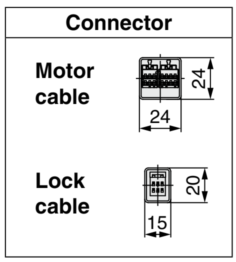












*1 This is the range within which the table can move when it returns to origin.
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction.
Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

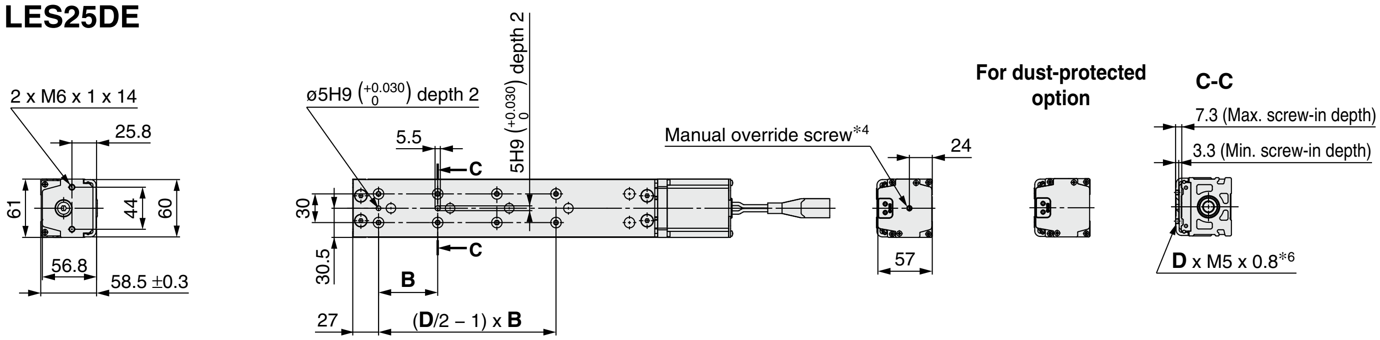
Dimensions

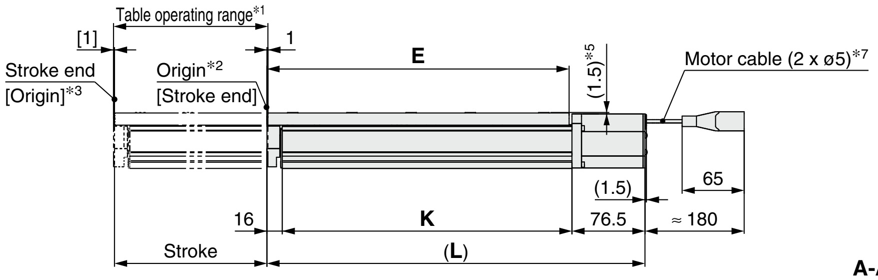
[mm]

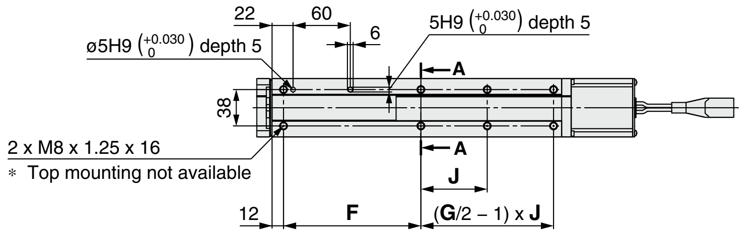
Model	L	C	D	E	F	G	H	J
LES25LE□-30□-□□□□	144.5	4	48	133.5	105	2	46	46
LES25LE□-50□□-□□□□□	170.5	6	42	159.5	131	2	84	84
LES25LE□-75□□-□□□□□	204.5	6	55	193.5	165	2	112	112
LES25LE□-100□□-□□□□□	277.5	8	50	266.5	238	4	56	112
LES25LE□-125□□-□□□□□	302.5	8	55	291.5	263	4	59	118
LES25LE□-150□□-□□□□□	327.5	8	62	316.5	288	4	62	124

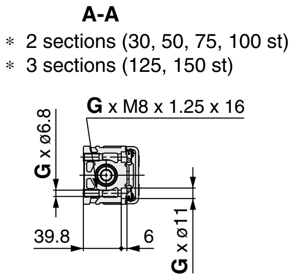
Dimensions: In-line Motor Type/D Type

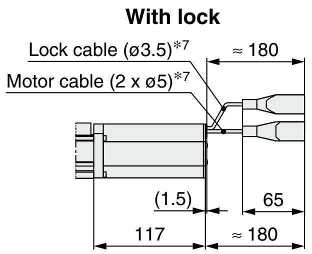
LES25DE

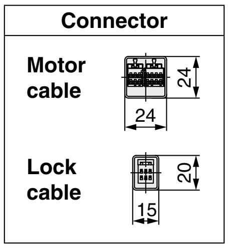












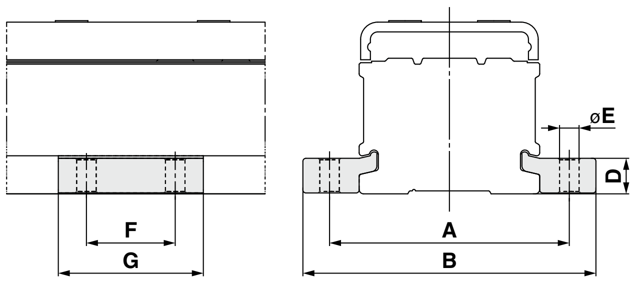
*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 The distance between the motor end cover and the manual override screw is up to 4 mm. The motor end cover hole size is ø5.5.
*5 The table is lower than the motor cover.
*6 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*7 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions

[mm]

Model	(L)	B	D	E	F	G	J	K
LES25DE□-30□□-□□□□□	214	48	4	133.5	81	4	19	121.5
LES25DE□-30B□□-□□□□□	254.5							
LES25DE□-50□□-□□□□□	240	42	6	159.5	87	4	39	147.5
LES25DE□-50B□□-□□□□□	280.5							
LES25DE□-75□□-□□□□□	274	55	6	193.5	96	4	64	181.5
LES25DE□-75B□□-□□□□□	314.5							
LES25DE□-100□□-□□□□□	347	50	8	266.5	144	4	89	254.5
LES25DE□-100B□□-□□□□□	387.5							
LES25DE□-125□□-□□□□□	372	55	8	291.5	144	6	57	279.5
LES25DE□-125B□□-□□□□□	412.5							
LES25DE□-150□□-□□□□□	397	62	8	316.5	144	6	69.5	304.5
LES25DE□-150B□□-□□□□□	437.5							

Side Holder (In-line Motor Type/D Type)



[mm]

Part no.*1	A	B	D	E	F	G	Applicable model
LE-D-3-3	81	99	12	6.6	30	49	**LES25DE**

*1 Part number for 1 side holder

Incremental (Step Motor 24 VDC) Incremental (Servo Motor 24 VDC)

Slide Table Compact Type

LES Series LES8, 16, 25

∗ For details, refer to page 1343 and onward.

RoHS

How to Order

Basic type (R type) Symmetrical type (L type) In-line motor type (D type)

LES 8 R □ J - 30 □ □ □ - S1

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

JXC□ Series CD17T

LEC□ Series AN 1 □

❿ ⓫ ⓬

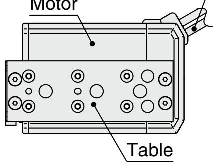
For details on controllers, refer to page 670.

❶ Size

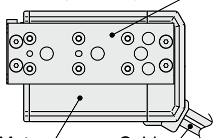
8
16
25

❷ Motor mounting position

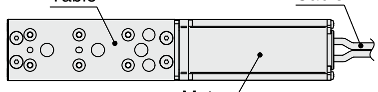
R — **Basic type/R type**



L — **Symmetrical type/L type**



D — **In-line motor type/D type**



❸ Motor type

Symbol	Type	Compatible controllers/drivers
Nil	Step motor (Servo/24 VDC)	JXC51, JXC61, JXCE1, JXC91, JXCP1, JXCD1, JXCL1, JXCM1, JXCEF, JXC9F, JXCPF, JXCLF, LECP1, LECPA
A	Servo motor*1 (24 VDC)	LECA6

❹ Lead [mm]

Symbol	LES8	LES16	LES25
J	8	10	16
K	4	5	8

❺ Stroke [mm]

Stroke	Note	
	Size	Applicable stroke
30 to 75	8	30*2, 50*2, 75
30 to 100	16	30*2, 50*2, 75, 100
30 to 150	25	30*2, 50, 75, 100, 125, 150

❻ Motor option

Nil	Without option
B	With lock*2

Applicable motor option chart

Motor mounting position	Size	Stroke 30	Stroke 50	Stroke 75 or more
R/L	8	×	×	○
	16	×	×	○
	25	×	○	○
D	8	○	○	○
	16	○	○	○
	25	○	○	○

❼ Body option

Nil	Without option
S	Dust protected*3

❾ Actuator cable type/length*6

Standard cable [m]

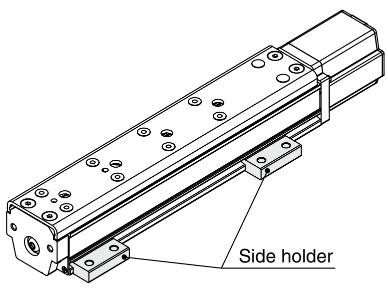
Nil	None
S1	1.5*8
S3	3*8
S5	5*8

Robotic cable [m]

R1	1.5	RA	10*5
R3	3	RB	15*5
R5	5	RC	20*5
R8	8*5		

❽ Mounting*4

Symbol	Mounting	R type L type	D type
Nil	Without side holder	●	●
H	With side holder (4 pcs.)	—	●



JXC□ Series (For details, refer to page 671.)

⑩ Controller

Nil	Without controller
C□1□□	With controller

C D 1 7 T

Interface (Communication protocol/Input/Output)

Symbol	Type	Number of axes, Special specification	
		Standard	With STO sub-function
5	Parallel input (NPN)	●	
6	Parallel input (PNP)	●	
E	EtherCAT	●	●
9	EtherNet/IP™	●	●
P	PROFINET	●	●
D	DeviceNet®	●	
L	IO-Link	●	●
M	CC-Link	●	

Mounting

7	Screw mounting
8*12	DIN rail

Number of axes, Special specification

Symbol	Number of axes	Specification
1	Single axis	Standard
F	Single axis	With STO sub-function

Communication plug connector, I/O cable*13

Symbol	Type	Applicable interface
Nil	Without accessory	—
S	Straight type communication plug connector	DeviceNet® CC-Link Ver. 1.10
T	T-branch type communication plug connector	DeviceNet® CC-Link Ver. 1.10
1	I/O cable (1.5 m)	Parallel input (NPN) Parallel input (PNP)
3	I/O cable (3 m)	Parallel input (NPN) Parallel input (PNP)
5	I/O cable (5 m)	Parallel input (NPN) Parallel input (PNP)

LEC□ Series (For details, refer to page 671.)

AN 1 □

⑩ ⑪ ⑫

⑩ Controller/Driver type*7

Nil	Without controller/driver	
6N	**LECA6** (Step data input type)	NPN
6P	**LECA6** (Step data input type)	PNP
1N	**LECP1*8** (Programless type)	NPN
1P	**LECP1*8** (Programless type)	PNP
AN	**LECPA*8 *9** (Pulse input type)	NPN
AP	**LECPA*8 *9** (Pulse input type)	PNP

⑪ I/O cable length*10

Nil	Without cable (Without communication plug connector)
1	1.5 m
3	3 m*11
5	5 m*11

⑫ Controller/Driver mounting

Nil	Screw mounting
D	DIN rail*12

*1 LES25DA is not available.
*2 As the applicable motor mounting positions and motor options vary depending on the stroke, refer to the applicable motor option chart on page 669.
*3 For R/L type (IP5X equivalent), a scraper is mounted on the rod cover, and gaskets are mounted on both the end covers. For D type, a scraper is mounted on the rod cover.
*4 Refer to page 685 for details.
*5 Produced upon receipt of order (Robotic cable only)
*6 The standard cable should only be used on fixed parts.
For use on moving parts, select the robotic cable.
Refer to pages 1092 and 1093 if only the actuator cable is required.
*7 For details on controllers/drivers and compatible motors, refer to the compatible controllers/drivers on the next page.
*8 Only available for the motor type "Step motor"
*9 When pulse signals are open collector, order the current limiting resistor (LEC-PA-R-□) on page 1062 separately.
*10 When "Without controller/driver" is selected for controller/driver types, I/O cable cannot be selected. Refer to page 1037 (For LECA6), page 1047 (For LECP1), or page 1062 (For LECPA) if an I/O cable is required.
*11 When "Pulse input type" is selected for controller/driver types, pulse input usable only with differential. Only 1.5 m cables usable with open collector
*12 The DIN rail is not included. It must be ordered separately.
*13 Select "Nil" for anything other than DeviceNet®, CC-Link, or parallel input.
Select "Nil," "S," or "T" for DeviceNet® or CC-Link.
Select "Nil," "1," "3," or "5" for parallel input.

⚠Caution

[CE/UKCA-compliant products]

① EMC compliance was tested by combining the electric actuator LES series and the controller LEC/JXC series.
The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with the EMC directive cannot be certified for SMC components incorporated into the customer's equipment under actual operating conditions. As a result, it is necessary for the customer to verify compliance with the EMC directive for the machinery and equipment as a whole.
② For the incremental (servo motor 24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 1037 for the noise filter set. Refer to the LECA series Operation Manual for installation.

[UL-compliant products (For the LEC series)]

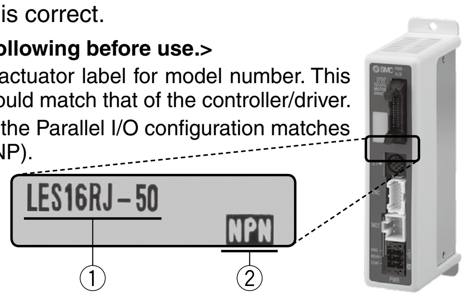
When compliance with UL is required, the electric actuator and controller/driver should be used with a UL1310 Class 2 power supply.

The actuator and controller/driver are sold as a package.

Confirm that the combination of the controller/driver and the actuator is correct.

<Check the following before use.>

① Check the actuator label for model number. This number should match that of the controller/driver.
② Check that the Parallel I/O configuration matches (NPN or PNP).



* Refer to the Operation Manual for using the products. Please download it via our website: https://www.smcworld.com

Compatible Controllers/Drivers

Type	Step data input type	Step data input type	Programless type	Pulse input type
				
Series	JXC51 JXC61	LECA6	LECP1	LECPA
Features	Parallel I/O	Parallel I/O	Capable of setting up operation (step data) without using a PC or teaching box	Operation by pulse signals
Compatible motor	Step motor (Servo/24 VDC)	Servo motor (24 VDC)	Step motor (Servo/24 VDC)	
Max. number of step data	64 points		14 points	—
Power supply voltage	24 VDC			
Reference page	1017	1031	1042	1057

Type	EtherCAT direct input type	EtherCAT direct input type with STO sub-function	EtherNet/IP™ direct input type	EtherNet/IP™ direct input type with STO sub-function	PROFINET direct input type	PROFINET direct input type with STO sub-function	DeviceNet® direct input type	IO-Link direct input type	IO-Link direct input type with STO sub-function	CC-Link direct input type
										
Series	JXCE1	JXCEF	JXC91	JXC9F	JXCP1	JXCPF	JXCD1	JXCL1	JXCLF	JXCM1
Features	EtherCAT direct input	EtherCAT direct input with STO sub-function	EtherNet/IP™ direct input	EtherNet/IP™ direct input with STO sub-function	PROFINET direct input	PROFINET direct input with STO sub-function	DeviceNet® direct input	IO-Link direct input	IO-Link direct input with STO sub-function	CC-Link direct input
Compatible motor	Step motor (Servo/24 VDC)									
Max. number of step data	64 points									
Power supply voltage	24 VDC									
Reference page	1063									

Specifications

Step Motor (Servo/24 VDC)

Model			LES8□		LES16□		LES25□	
Actuator specifications	**Stroke [mm]**		30, 50, 75		30, 50, 75, 100		30, 50, 75, 100, 125, 150	
	Work load [kg]*1	**Horizontal**	1		3		5	
		Vertical	0.5	0.25	3	1.5	5	2.5
	Pushing force 30 to 70% [N]*2 *3		6 to 15	4 to 10	23.5 to 55	15 to 35	77 to 180	43 to 100
	Speed [mm/s]*1 *3		10 to 200	20 to 400	10 to 200	20 to 400	10 to 200	20 to 400
	Pushing speed [mm/s]		10 to 20	20	10 to 20	20	10 to 20	20
	Max. acceleration/deceleration [mm/s^2]		5000					
	Positioning repeatability [mm]		±0.05					
	Lost motion [mm]*4		0.3 or less					
	Screw lead [mm]		4	8	5	10	8	16
	Impact/Vibration resistance [m/s^2]*5		50/20					
	Actuation type		Slide screw + Belt (R/L type), Slide screw (D type)					
	Guide type		Linear guide (Circulating type)					
	Operating temperature range [°C]		5 to 40					
	Operating humidity range [%RH]		90 or less (No condensation)					
	Enclosure		IP30					
Electric specifications	**Motor size**		□20		□28		□42	
	Motor type		Step motor (Servo/24 VDC)					
	Encoder		Incremental					
	Power supply voltage [V]		24 VDC ±10%					
	Power [W]*6 *8		Max. power 35		Max. power 69		Max. power 67	
Lock unit specifications	**Type**	*7	Non-magnetizing lock					
	Holding force [N]		24	2.5	300	48	500	77
	Power [W]*8		3.5		2.9		5	
	Rated voltage [V]		24 VDC ±10%					

*1 Speed changes according to the work load. Check the "Speed–Work Load Graph (Guide)" on page 650.
*2 Pushing force accuracy is ±20% (F.S.).
*3 The speed and force may change depending on the cable length, load, and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)
*4 A reference value for correcting errors in reciprocal operation
*5 Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*6 Indicates the max. power during operation (including the controller)
This value can be used for the selection of the power supply.
*7 With lock only
*8 For an actuator with lock, add the power for the lock.

Specifications

Servo Motor (24 VDC)

Model			LES8□A		LES16□A		LES25$^{R}_{L}$A*1	
Actuator specifications	Stroke [mm]		30, 50, 75		30, 50, 75, 100		30, 50, 75, 100, 125, 150	
	Work load [kg]	Horizontal	1		3		5	
		Vertical	1	0.5	3	1.5	4	2
	Pushing force 50 to 100% [N]*2		7.5 to 11	5 to 7.5	17.5 to 35	10 to 20	31 to 62	19 to 38
	Speed [mm/s]		1 to 200	1 to 400	1 to 200	1 to 400	1 to 200	1 to 400
	Pushing speed [mm/s]		1 to 20					
	Max. acceleration/deceleration [mm/s^2]		5000					
	Positioning repeatability [mm]		±0.05					
	Lost motion [mm]*3		0.3 or less					
	Screw lead [mm]		4	8	5	10	8	16
	Impact/Vibration resistance [m/s^2]*4		50/20					
	Actuation type		Slide screw + Belt (R/L type), Slide screw (D type)					
	Guide type		Linear guide (Circulating type)					
	Operating temperature range [°C]		5 to 40					
	Operating humidity range [%RH]		90 or less (No condensation)					
	Enclosure		IP30					
Electric specifications	Motor size		□20		□28		□42	
	Motor output [W]		10		30		36	
	Motor type		Servo motor (24 VDC)					
	Encoder (Angular displacement sensor)		Incremental					
	Power supply voltage [V]		24 VDC ±10%					
	Power [W]*5 *7		Max. power 71		Max. power 102		Max. power 111	
Lock unit specifications	Type	*6	Non-magnetizing lock					
	Holding force [N]		24	2.5	300	48	500	77
	Power consumption [W]*7		3.5		2.9		5	
	Rated voltage [V]		24 VDC ±10%					

*1 LES25DA is not available.
*2 The pushing force values for LES8□A is 50 to 75%. Pushing force accuracy is ±20% (F.S.).
*3 A reference value for correcting errors in reciprocal operation
*4 Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*5 Indicates the max. power during operation (including the controller)
This value can be used for the selection of the power supply.
*6 With lock only
*7 For an actuator with lock, add the power consumption for the lock.

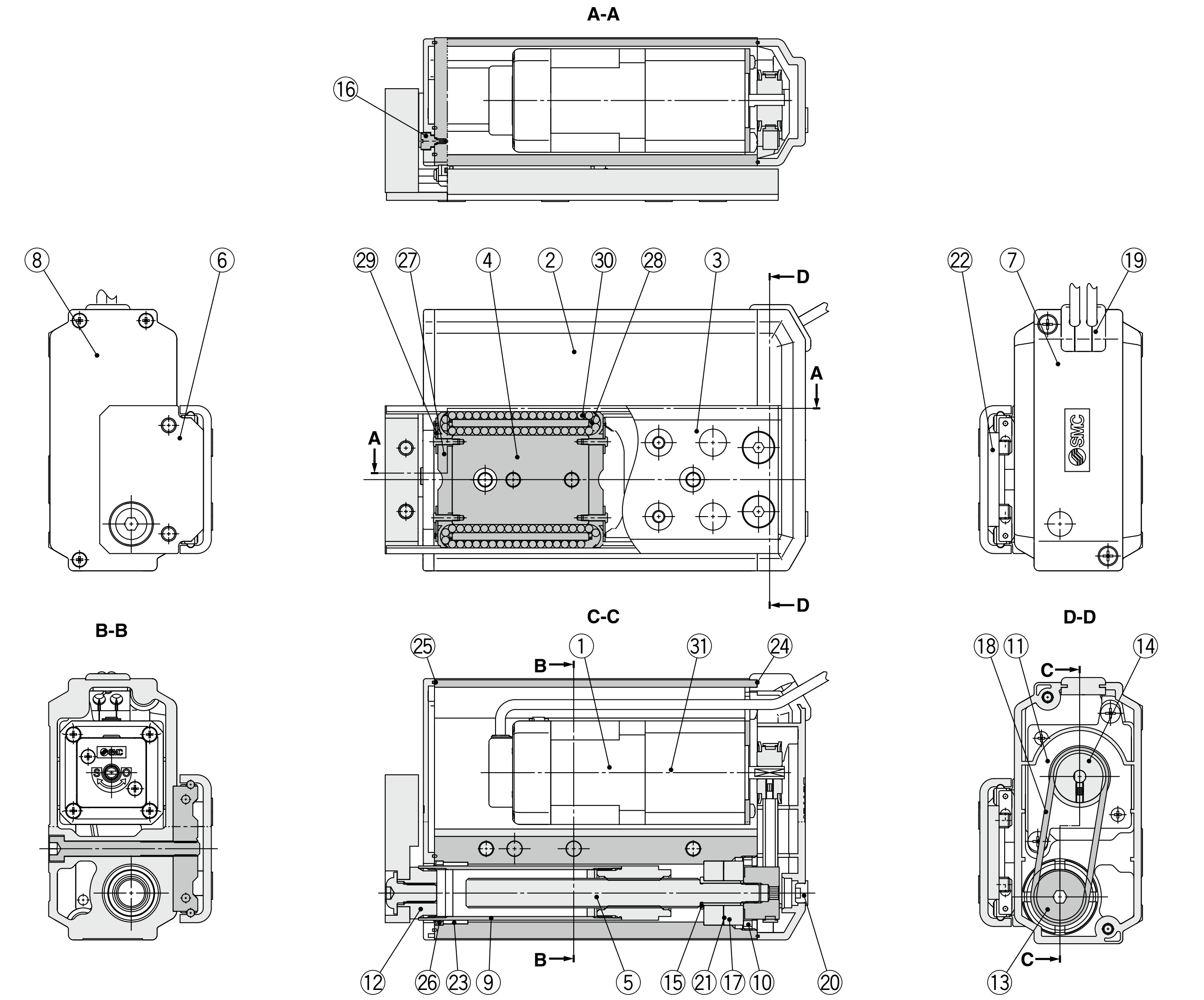
Weight

Step Motor (Servo/24 VDC), Servo Motor (24 VDC) Common

[kg]

		Without lock						With lock					
Stroke [mm]		30	50	75	100	125	150	30	50	75	100	125	150
Model	LES8$^{R}_{L}$(A)	0.45	0.54	0.59	—	—	—	—	—	0.66	—	—	—
	LES16$^{R}_{L}$(A)	0.91	1.00	1.16	1.24	—	—	—	—	1.29	1.37	—	—
	LES25$^{R}_{L}$(A)	1.81	2.07	2.41	3.21	3.44	3.68	—	2.34	2.68	3.48	3.71	3.95
	LES8D(A)	0.40	0.52	0.58	—	—	—	0.47	0.59	0.65	—	—	—
	LES16D(A)	0.77	0.90	1.11	1.20	—	—	0.90	1.03	1.25	1.33	—	—
	LES25D	1.82	2.05	2.35	3.07	3.27	3.47	2.08	2.31	2.61	3.33	3.53	3.74

Construction: Basic Type/R Type, Symmetrical Type/L Type



Component Parts

No.	Description	Material	Note
1	**Motor**	—	—
2	**Body**	Aluminum alloy	Anodized
3	**Table**	Stainless steel	Heat treatment + Electroless nickel plating
4	**Guide block**	Stainless steel	Heat treatment
5	**Lead screw**	Stainless steel	Heat treatment + Special treatment
6	**End plate**	Aluminum alloy	Anodized
7	**Pulley cover**	Synthetic resin	—
8	**End cover**	Synthetic resin	—
9	**Rod**	Stainless steel	—
10	**Bearing stopper**	Structural steel	Electroless nickel plating
		Brass	Electroless nickel plating (LES25R/L□ only)
11	**Motor plate**	Structural steel	—
12	**Socket**	Structural steel	Electroless nickel plating
13	**Lead screw pulley**	Aluminum alloy	—
14	**Motor pulley**	Aluminum alloy	—
15	**Spacer**	Stainless steel	LES25R/L□ only
16	**Origin stopper**	Structural steel	Electroless nickel plating
17	**Bearing**	—	—
18	**Belt**	—	—
19	**Grommet**	Synthetic resin	—
20	**Cap**	Silicone rubber	—
21	**Sim ring**	Structural steel	—
22	**Stopper**	Structural steel	—
23	**Bushing**	—	Dust-protected option only
24	**Pulley gasket**	NBR	Dust-protected option only
25	**End gasket**	NBR	Dust-protected option only
26	**Scraper**	NBR	Dust-protected option only
27	**Cover**	Synthetic resin	—
28	**Return guide**	Synthetic resin	—
29	**Cover support**	Stainless steel	—
30	**Steel ball**	Special steel	—
31	**Lock**	—	With lock only

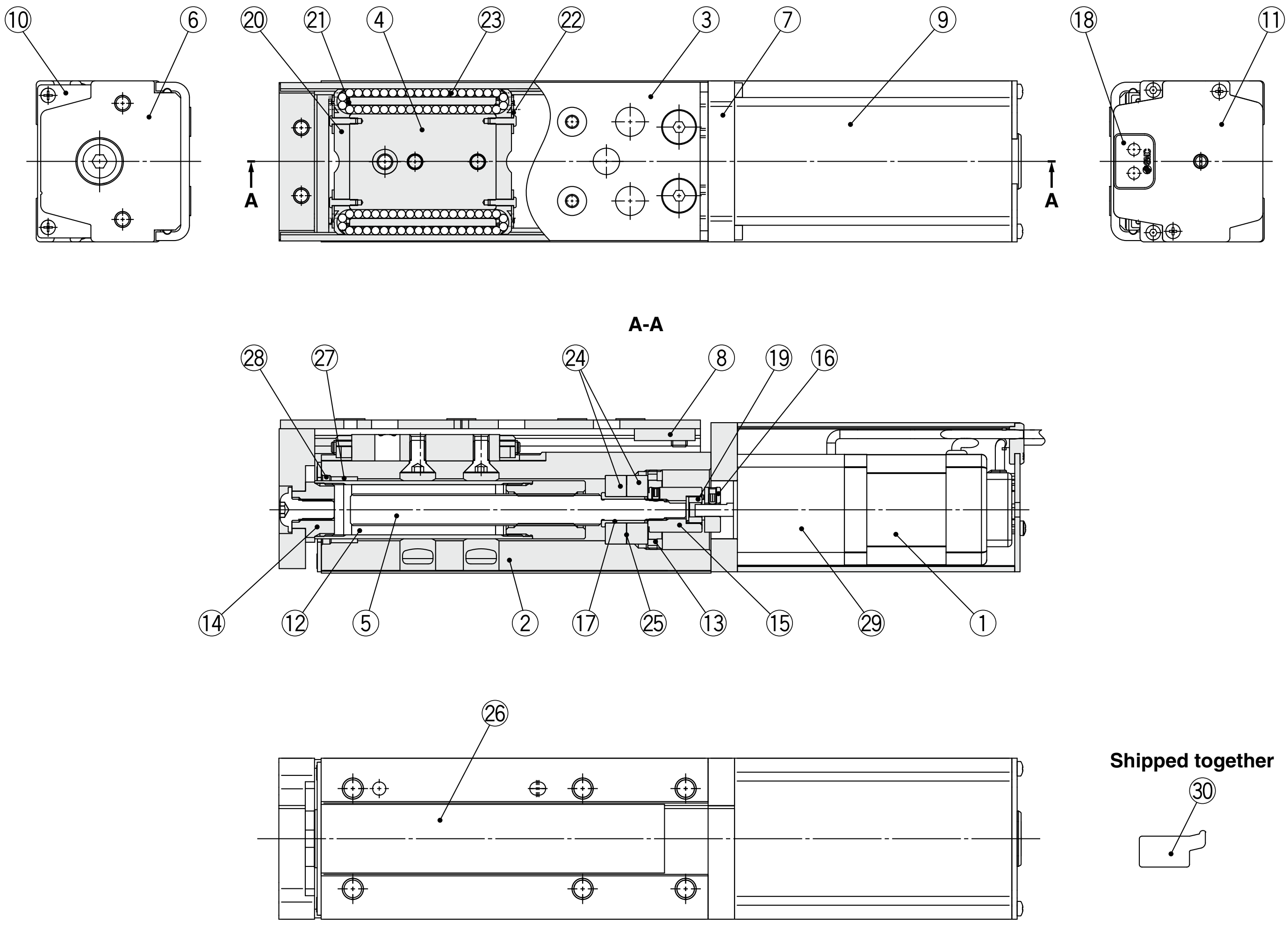
Replacement Parts/Belt

Size	Order no.	Note
LES8□	LE-D-1-1	Without manual override screw
LES16□	LE-D-1-2	—
LES25□	LE-D-1-3	—
LES25□A	LE-D-1-4	—
LES8□	LE-D-1-5	With manual override screw

Replacement Parts/Grease Pack

Applied portion	Order no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

Construction: In-line Motor Type/D Type



Component Parts

No.	Description	Material	Note
1	**Motor**	—	—
2	**Body**	Aluminum alloy	Anodized
3	**Table**	Stainless steel	Heat treatment + Electroless nickel plating
4	**Guide block**	Stainless steel	Heat treatment
5	**Lead screw**	Stainless steel	Heat treatment + Special treatment
6	**End plate**	Aluminum alloy	Anodized
7	**Motor flange**	Aluminum alloy	Anodized
8	**Stopper**	Structural steel	—
9	**Motor cover**	Aluminum alloy	Anodized
10	**End cover**	Aluminum alloy	Anodized
11	**Motor end cover**	Aluminum alloy	Anodized
12	**Rod**	Stainless steel	—
13	**Bearing stopper**	Structural steel	Electroless nickel plating
		Brass	Electroless nickel plating (LES25D☐ only)
14	**Socket**	Structural steel	Electroless nickel plating
15	**Hub (Lead screw side)**	Aluminum alloy	—
16	**Hub (Motor side)**	Aluminum alloy	—
17	**Spacer**	Stainless steel	LES25D☐ only
18	**Grommet**	NBR	—
19	**Spider**	NBR	—
20	**Cover**	Synthetic resin	—

No.	Description	Material	Note
21	**Return guide**	Synthetic resin	—
22	**Cover support**	Stainless steel	—
23	**Steel ball**	Special steel	—
24	**Bearing**	—	—
25	**Sim ring**	Structural steel	—
26	**Masking tape**	—	—
27	**Bushing**	—	Dust-protected option only
28	**Scraper**	NBR	Dust-protected option only
29	**Lock**	—	With lock only
30	**Side holder**	Aluminum alloy	Anodized

Optional Parts/Side Holder

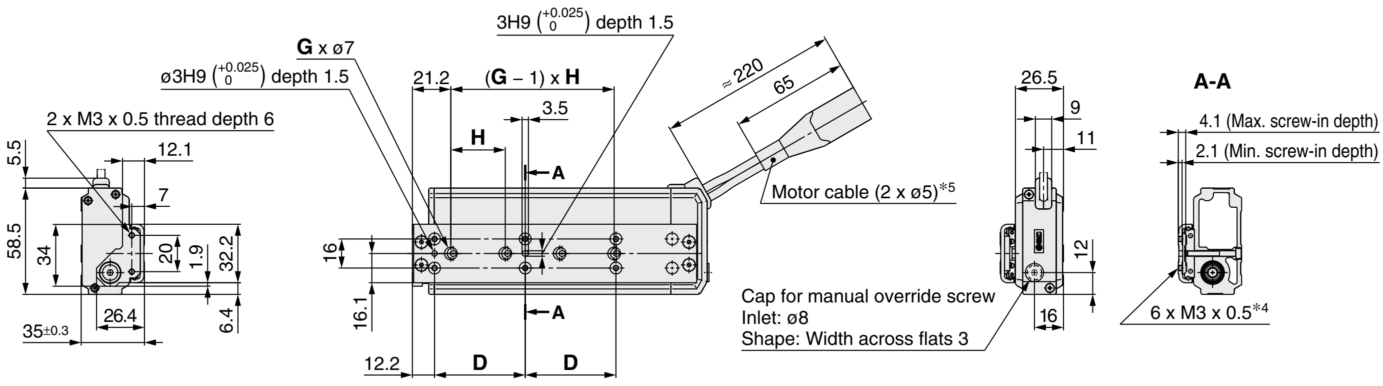
Model	Order no.
LES8D	LE-D-3-1
LES16D	LE-D-3-2
LES25D	LE-D-3-3

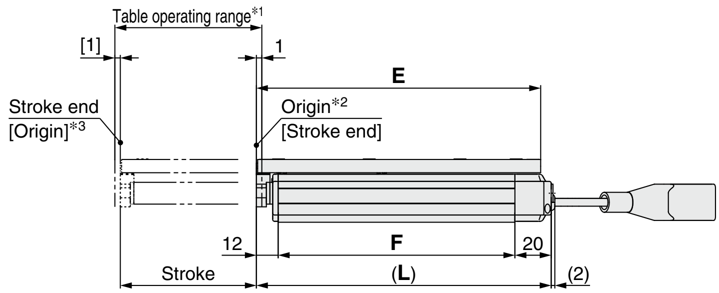
Replacement Parts/Grease Pack

Applied portion	Order no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

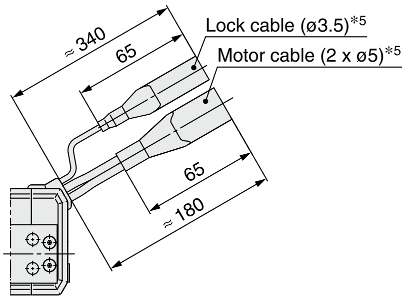
Dimensions: Basic Type/R Type

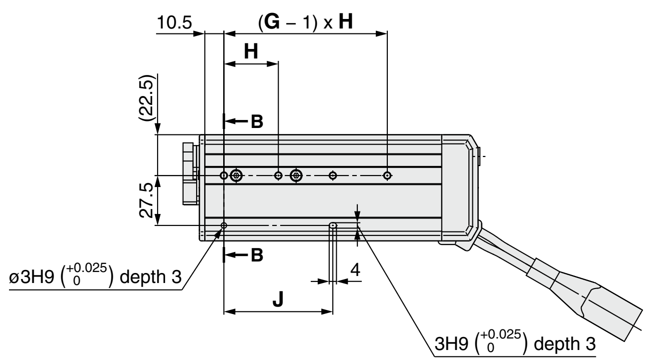
LES8R



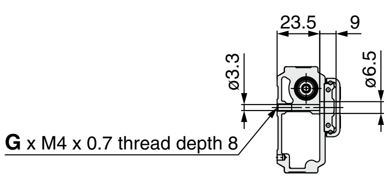


With lock





B-B



Connector	Step motor	Servo motor
Motor cable	20 × 20	24 × 24
Lock cable	15 × 20	15 × 20

*1 This is the range within which the table can move when it returns to origin.
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction.
Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

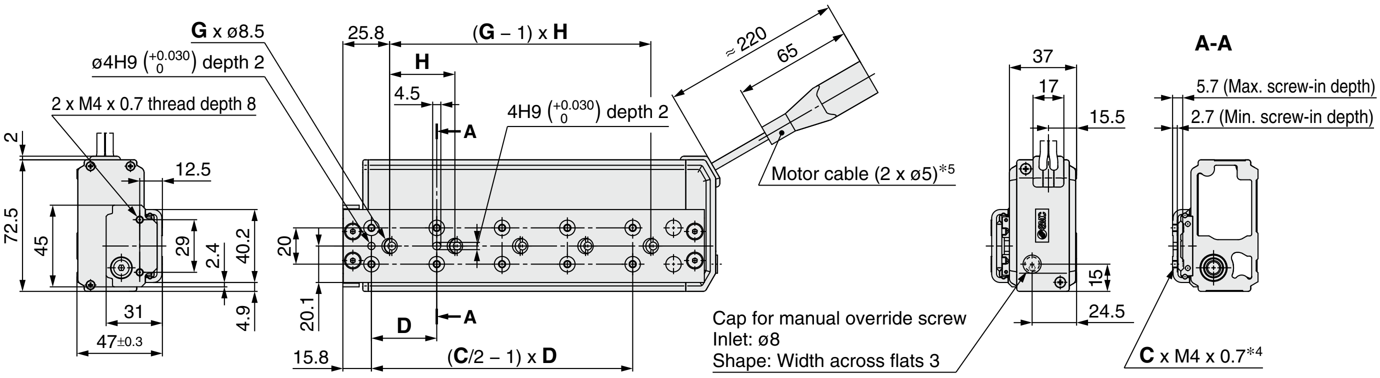
Dimensions

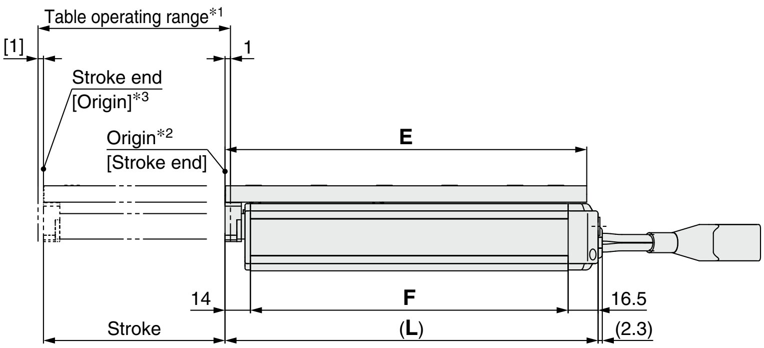
[mm]

Model	L	D	E	F	G	H	J
LES8R□□-30□-□□□□□	94.5	26	88.7	62.5	2	27	27
LES8R□□-50□-□□□□□	137.5	46	131.7	105.5	3	29	58
LES8R□□-75□□-□□□□□	162.5	50	156.7	130.5	4	30	60

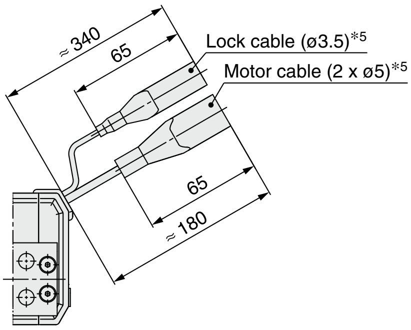
Dimensions: Basic Type/R Type

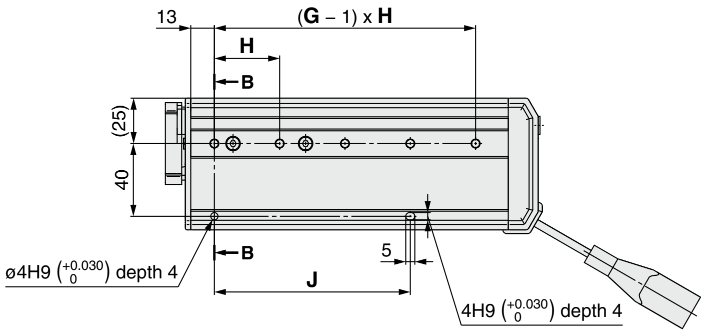
LES16R



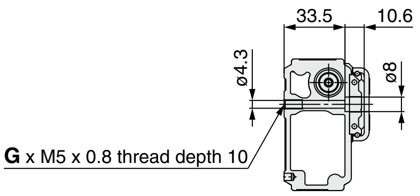


With lock



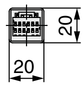
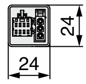
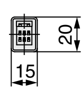
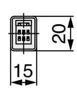


B-B



*1 This is the range within which the table can move when it returns to origin.
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction.
Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Connector

	Step motor	Servo motor
Motor cable		
Lock cable		

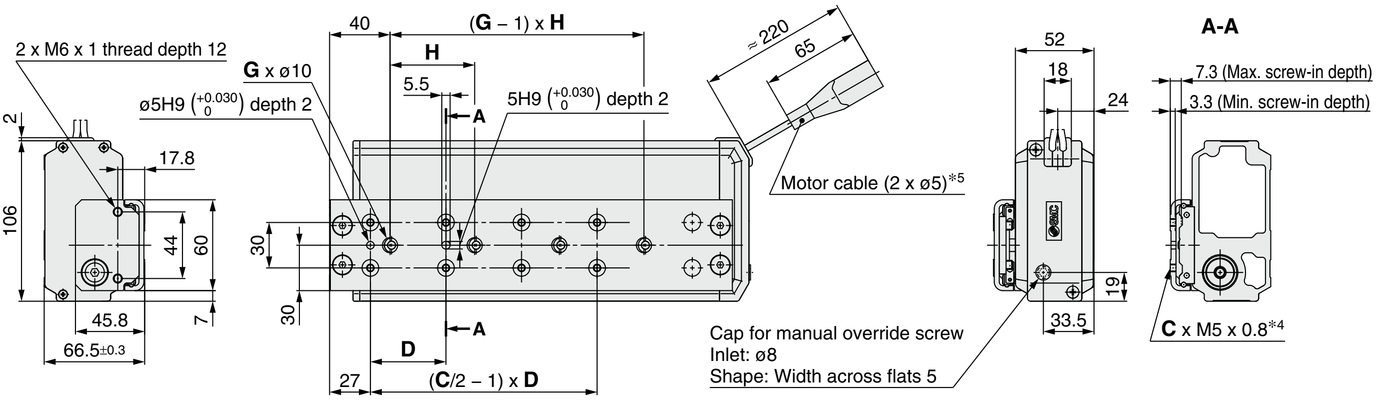
Dimensions

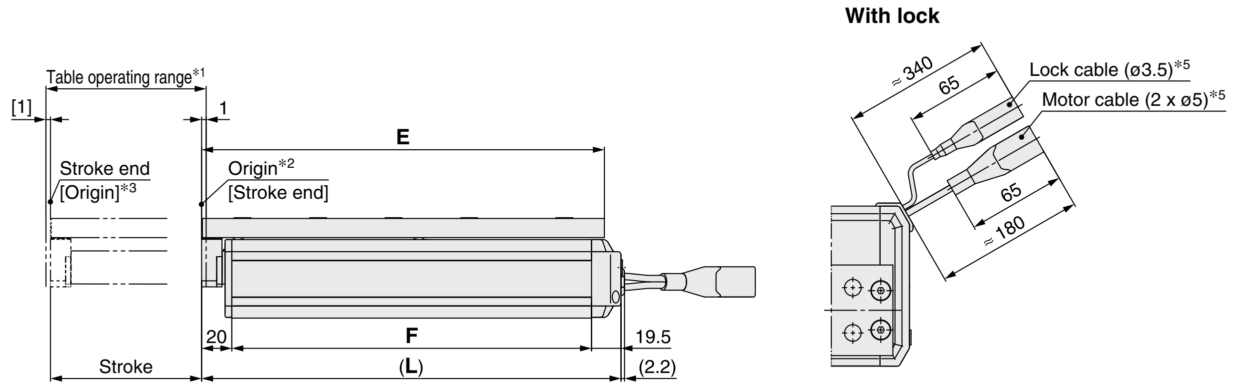
[mm]

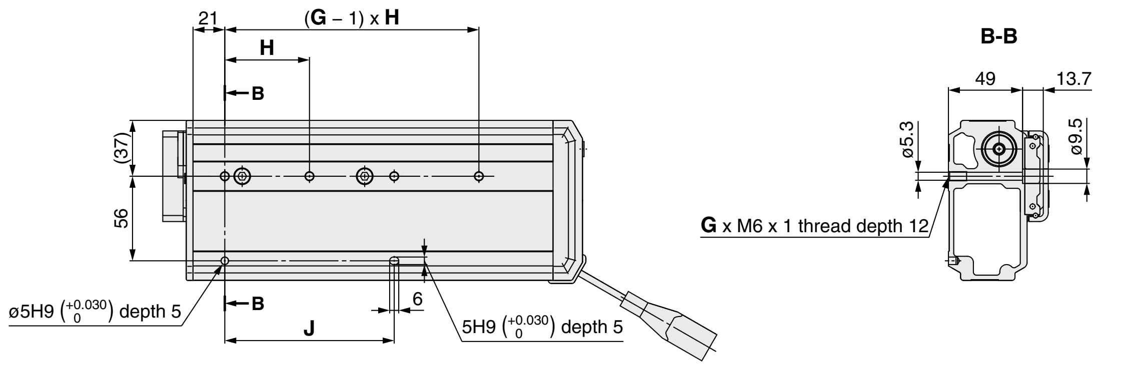
Model	L	C	D	E	F	G	H	J
LES16R□□-30□-□□□□□	108.5	4	38	102.3	78	2	40	40
LES16R□□-50□-□□□□□	136.5	6	34	130.3	106	2	78	78
LES16R□□-75□□-□□□□□	180.5	8	36	174.3	150	4	36	72
LES16R□□-100□□-□□□□□	205.5	10	36	199.3	175	5	36	108

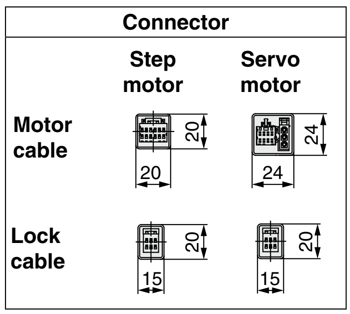
Dimensions: Basic Type/R Type

LES25R









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Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction.
Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

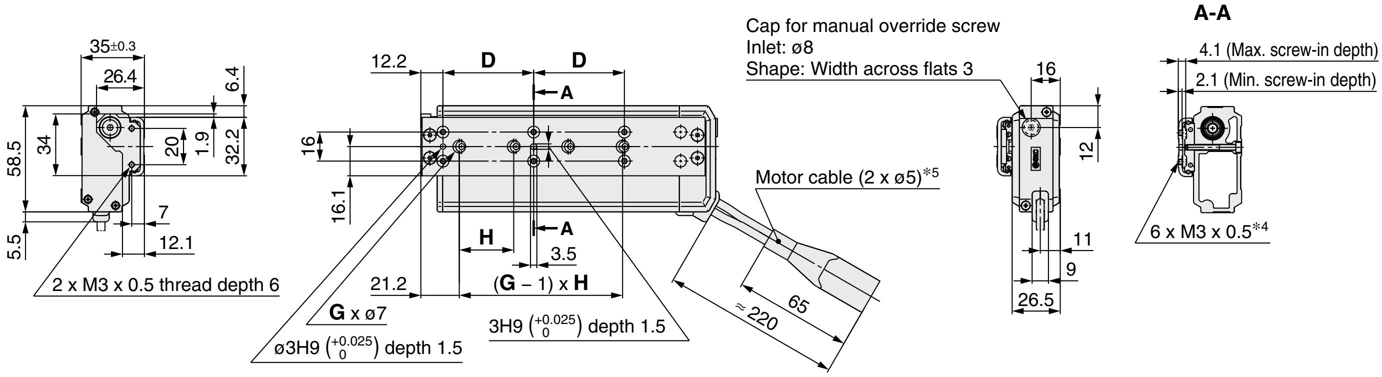
Dimensions

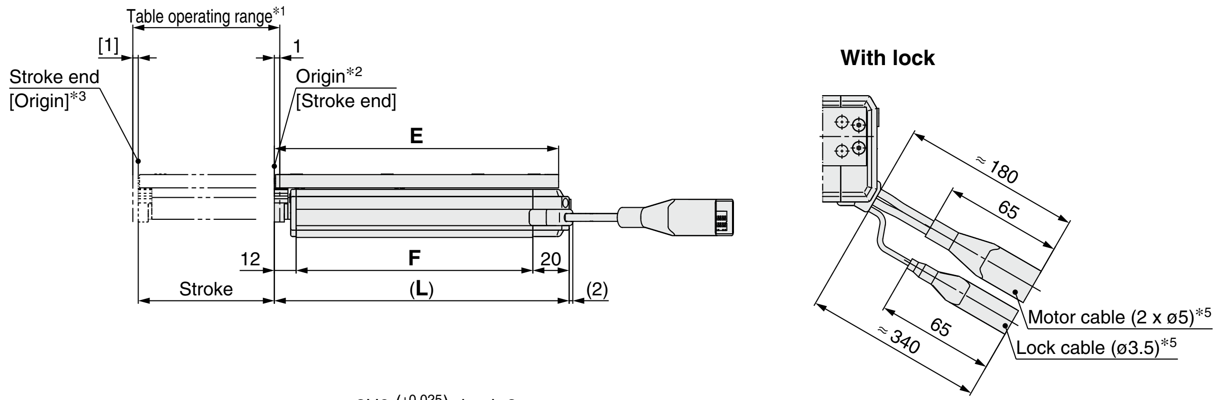
[mm]

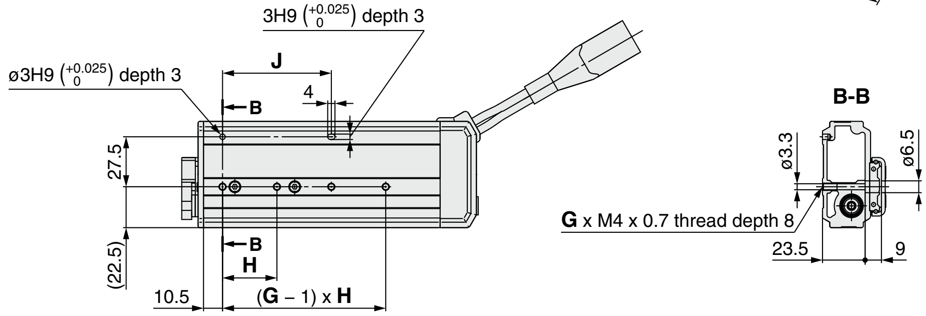
Model	L	C	D	E	F	G	H	J
LES25R□□-30□-□□□□□	144.5	4	48	133.5	105	2	46	46
LES25R□□-50□□-□□□□□	170.5	6	42	159.5	131	2	84	84
LES25R□□-75□□-□□□□□	204.5	6	55	193.5	165	2	112	112
LES25R□□-100□□-□□□□□	277.5	8	50	266.5	238	4	56	112
LES25R□□-125□□-□□□□□	302.5	8	55	291.5	263	4	59	118
LES25R□□-150□□-□□□□□	327.5	8	62	316.5	288	4	62	124

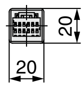
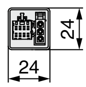
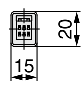
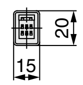
Dimensions: Symmetrical Type/L Type

LES8L







Connector	Step motor	Servo motor
Motor cable		
Lock cable		

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*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction.
Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

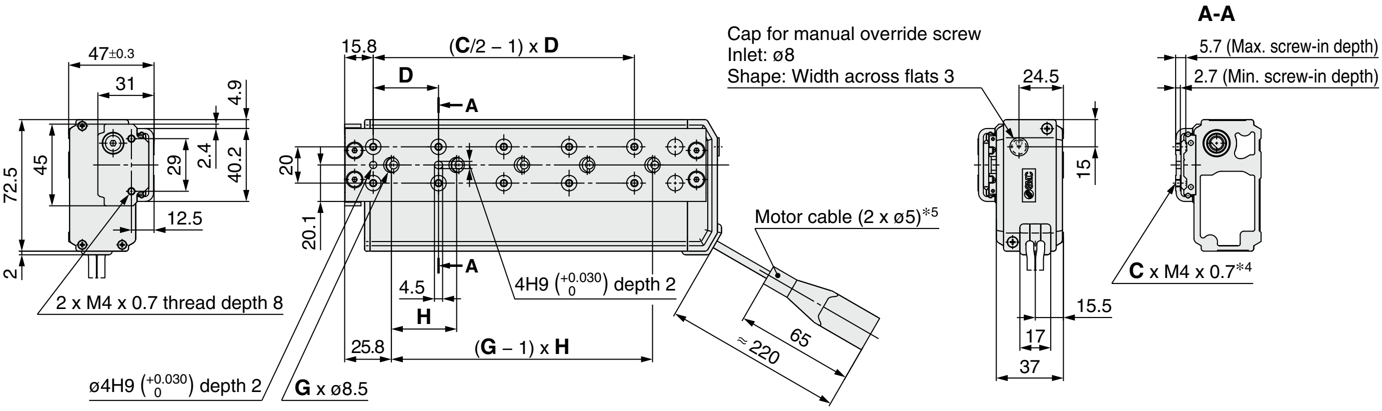
Dimensions

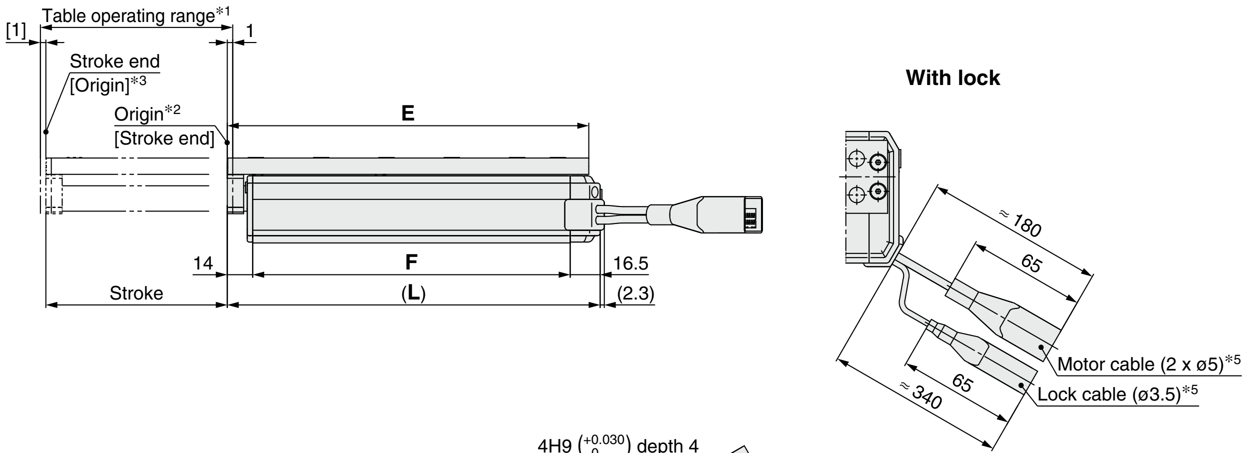
[mm]

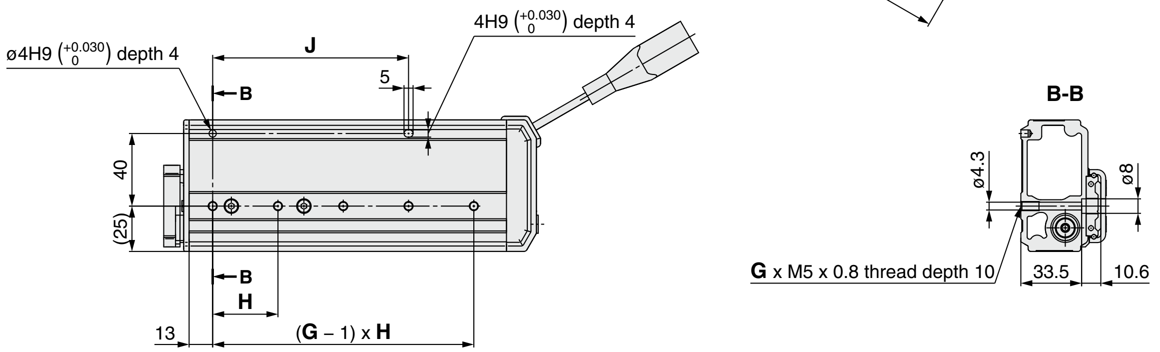
Model	L	D	E	F	G	H	J
LES8L□□-30□-□□□□□	94.5	26	88.7	62.5	2	27	27
LES8L□□-50□-□□□□□	137.5	46	131.7	105.5	3	29	58
LES8L□□-75□□-□□□□□	162.5	50	156.7	130.5	4	30	60

Dimensions: Symmetrical Type/L Type

LES16L







Connector	Step motor	Servo motor
Motor cable	20 × 20	24 × 24
Lock cable	15 × 20	15 × 20

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Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

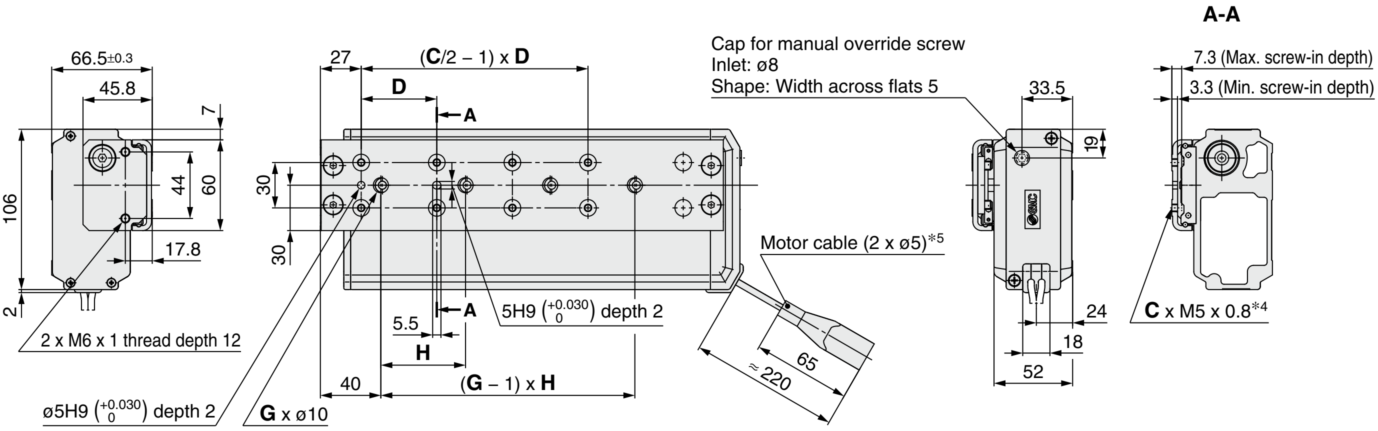
Dimensions

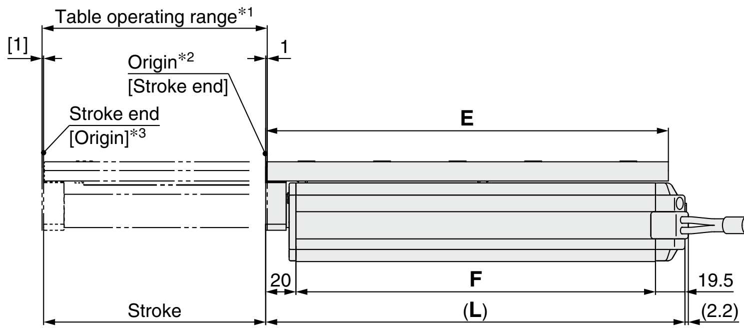
[mm]

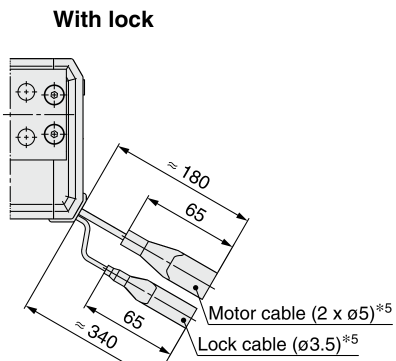
Model	L	C	D	E	F	G	H	J
LES16L□□-30□-□□□□□	108.5	4	38	102.3	78	2	40	40
LES16L□□-50□-□□□□□	136.5	6	34	130.3	106	2	78	78
LES16L□□-75□□-□□□□□	180.5	8	36	174.3	150	4	36	72
LES16L□□-100□□-□□□□□	205.5	10	36	199.3	175	5	36	108

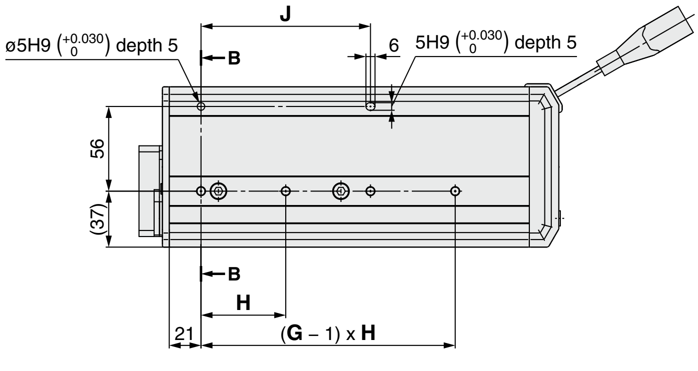
Dimensions: Symmetrical Type/L Type

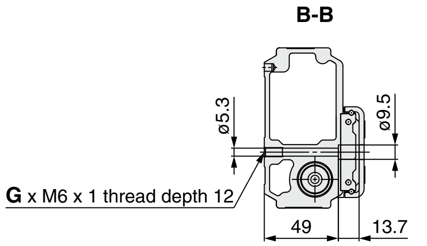
LES25L











Connector	Step motor	Servo motor
Motor cable	20 x 20	24 x 24
Lock cable	15 x 20	15 x 20

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Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

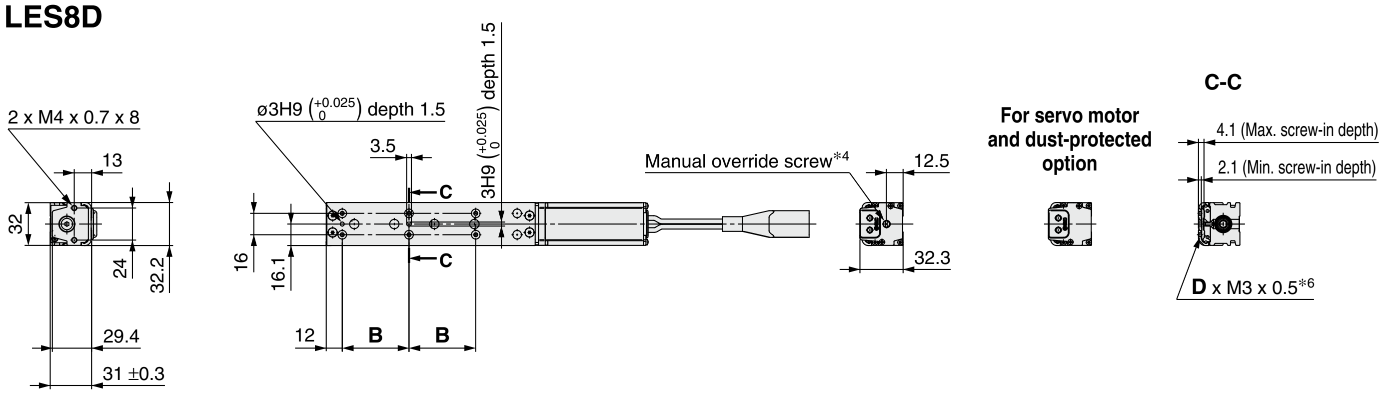
Dimensions

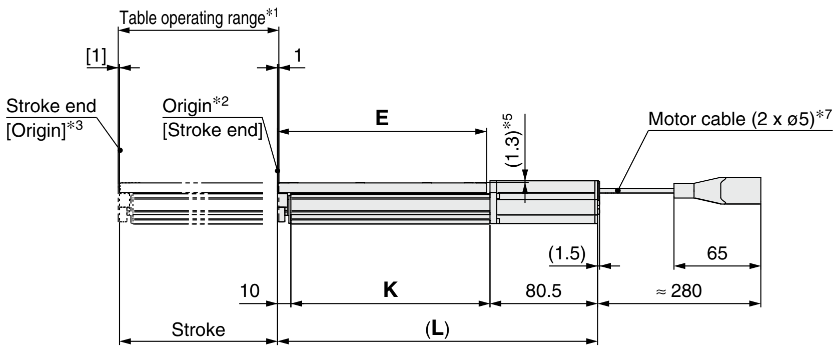
[mm]

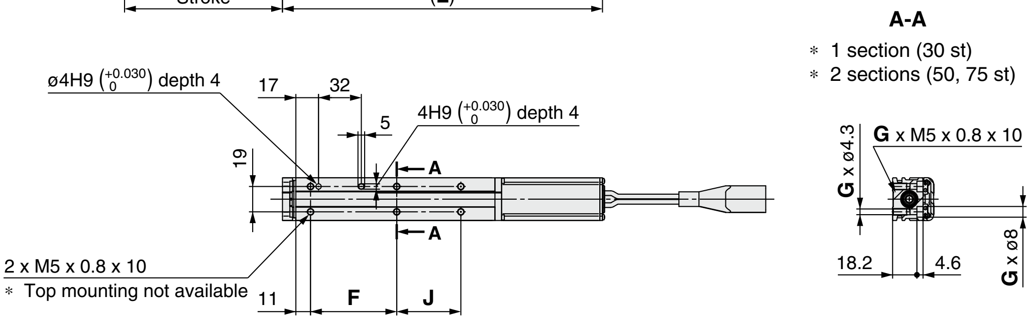
Model	L	C	D	E	F	G	H	J
LES25L□□-30□-□□□□□	144.5	4	48	133.5	105	2	46	46
LES25L□□-50□□-□□□□□	170.5	6	42	159.5	131	2	84	84
LES25L□□-75□□-□□□□□	204.5	6	55	193.5	165	2	112	112
LES25L□□-100□□-□□□□□	277.5	8	50	266.5	238	4	56	112
LES25L□□-125□□-□□□□□	302.5	8	55	291.5	263	4	59	118
LES25L□□-150□□-□□□□□	327.5	8	62	316.5	288	4	62	124

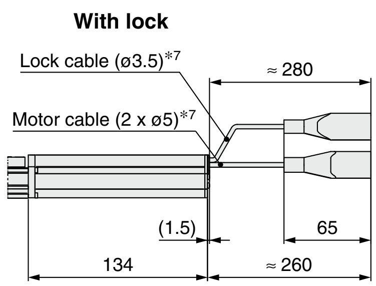
Dimensions: In-line Motor Type/D Type

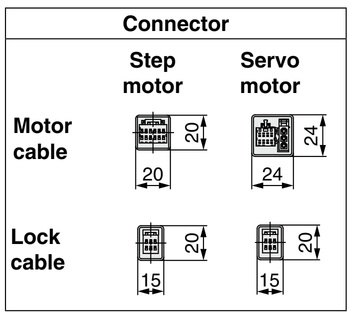
LES8D











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Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 The distance between the motor end cover and the manual override screw is up to 16 mm. The motor end cover hole size is ø5.5.
*5 The table is lower than the motor cover. Make sure it does not interfere with the workpiece.
*6 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction.
Use screws that are between the maximum and minimum screw-in depths in length.
*7 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

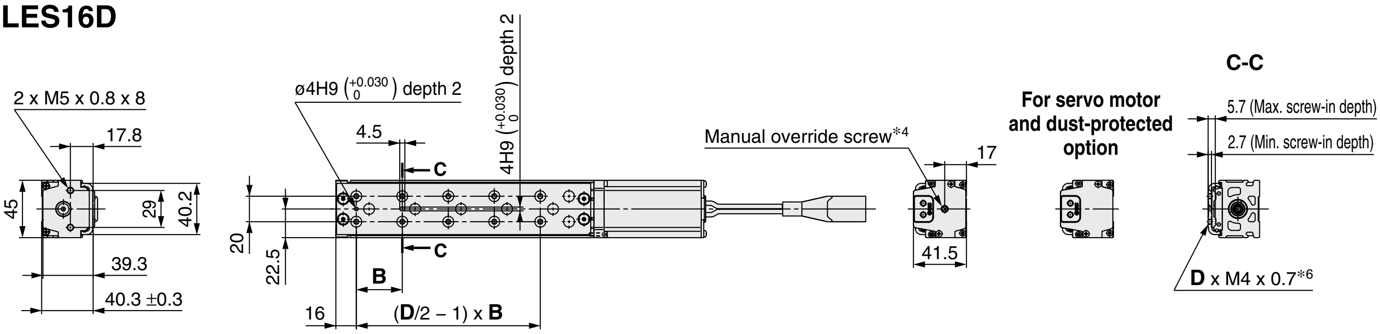
Dimensions

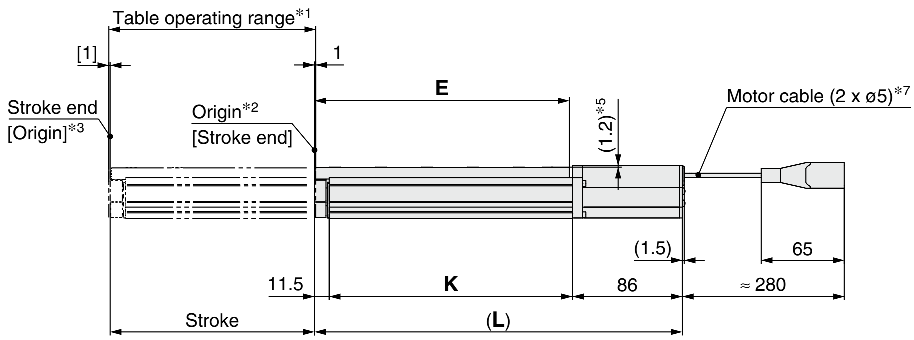
[mm]

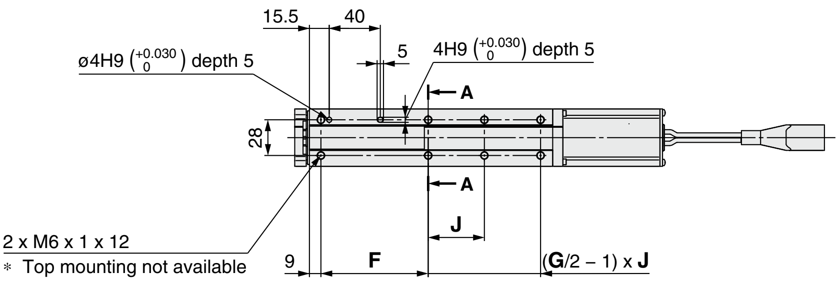
Model	(L)	B	D	E	F	G	J	K
LES8D□□-30□□-□□□□□	171.5	26	6	88.5	44.5	2	—	81
LES8D□□-30B□□-□□□□□	225							
LES8D□□-50□□-□□□□□	214.5	46	6	131.5	64.5	4	23	124
LES8D□□-50B□□-□□□□□	268							
LES8D□□-75□□-□□□□□	239.5	50	6	156.5	64.5	4	48	149
LES8D□□-75B□□-□□□□□	293							

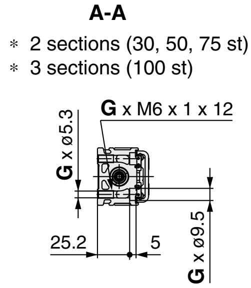
Dimensions: In-line Motor Type/D Type

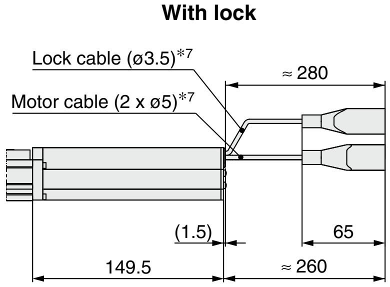
LES16D

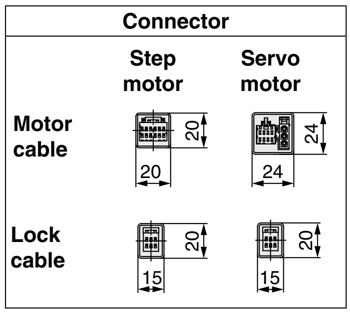












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Use screws that are between the maximum and minimum screw-in depths in length.
*7 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

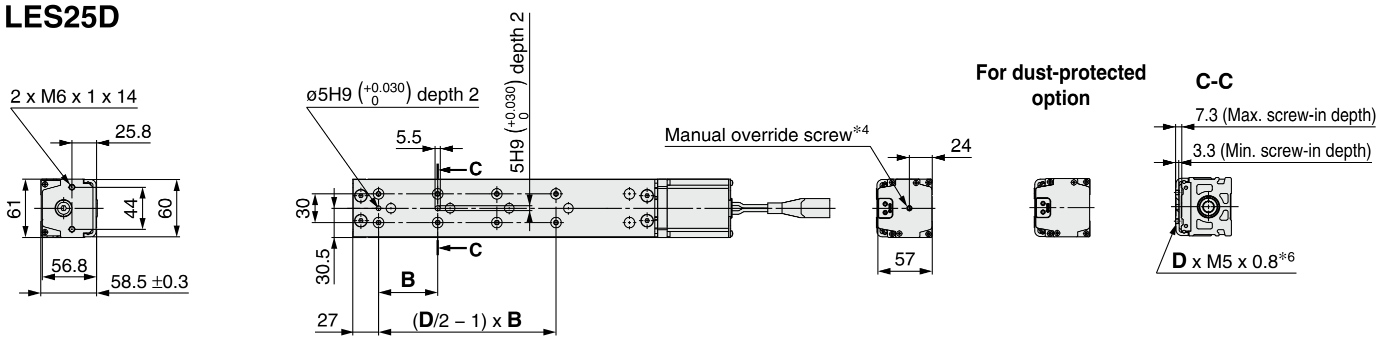
Dimensions

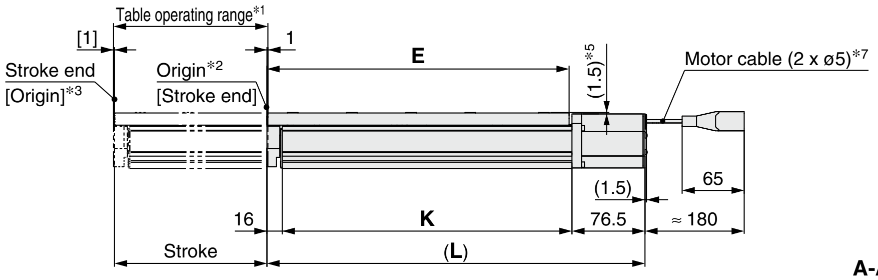
[mm]

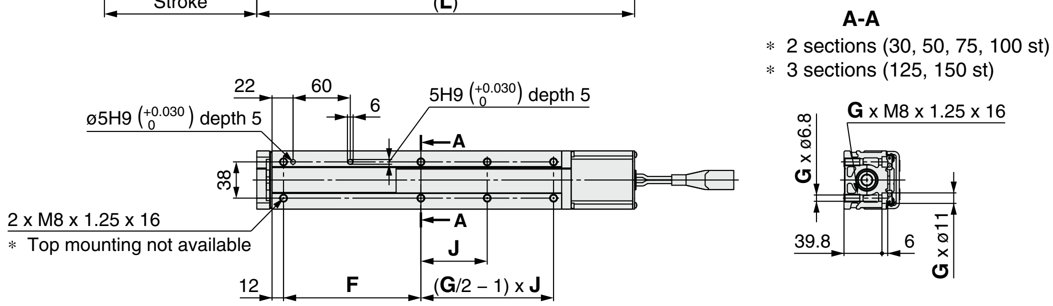
Model	(L)	B	D	E	F	G	J	K
LES16D□□-30□□-□□□□□	193	38	4	102.5	56.5	4	18.5	95.5
LES16D□□-30B□□-□□□□□	256.5							
LES16D□□-50□□-□□□□□	221	34	6	130.5	65	4	38	123.5
LES16D□□-50B□□-□□□□□	284.5							
LES16D□□-75□□-□□□□□	265	36	8	174.5	84	4	63	167.5
LES16D□□-75B□□-□□□□□	328.5							
LES16D□□-100□□-□□□□□	290	36	10	199.5	84	6	44	192.5
LES16D□□-100B□□-□□□□□	353.5							

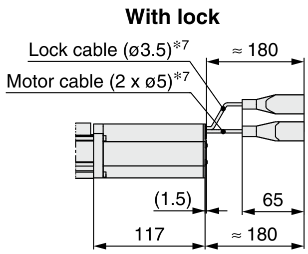
Dimensions: In-line Motor Type/D Type

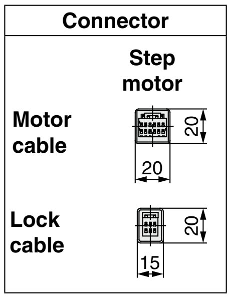
LES25D











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*3 [ ] for when the direction of return to origin has changed
*4 The distance between the motor end cover and the manual override screw is up to 4 mm. The motor end cover hole size is ø5.5.
*5 The table is lower than the motor cover.
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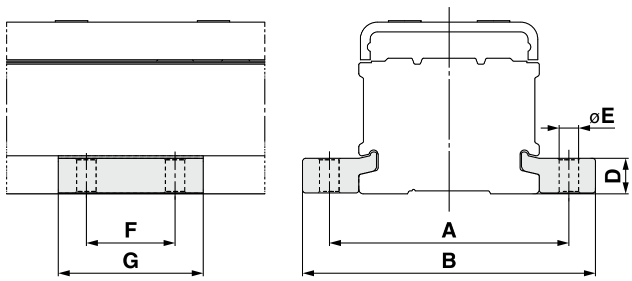
*7 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions [mm]

Model	(L)	B	D	E	F	G	J	K
LES25D□-30□□-□□□□□	214	48	4	133.5	81	4	19	121.5
LES25D□-30B□□-□□□□□	254.5							
LES25D□-50□□-□□□□□	240	42	6	159.5	87	4	39	147.5
LES25D□-50B□□-□□□□□	280.5							
LES25D□-75□□-□□□□□	274	55	6	193.5	96	4	64	181.5
LES25D□-75B□□-□□□□□	314.5							
LES25D□-100□□-□□□□□	347	50	8	266.5	144	4	89	254.5
LES25D□-100B□□-□□□□□	387.5							
LES25D□-125□□-□□□□□	372	55	8	291.5	144	6	57	279.5
LES25D□-125B□□-□□□□□	412.5							
LES25D□-150□□-□□□□□	397	62	8	316.5	144	6	69.5	304.5
LES25D□-150B□□-□□□□□	437.5							

Side Holder (In-line Motor Type/D Type)



[mm]

Part no.*1	A	B	D	E	F	G	Applicable model
LE-D-3-1	45	57.6	6.7	4.5	20	33	**LES8D**
LE-D-3-2	60	74	8.3	5.5	25	40	**LES16D**
LE-D-3-3	81	99	12	6.6	30	49	**LES25D**

*1 Part numbers for 1 side holder

LESH Series

Model Selection 1

LESH□E Series ▶p. 705

Selection Procedure

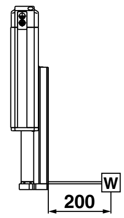
For the compact type LES series, refer to page 641.

Step 1 Check the work load–speed. → **Step 2** Check the cycle time. → **Step 3** Check the allowable moment.

Selection Example

Operating conditions

- Workpiece mass: 2 [kg]
- Speed: 200 [mm/s]
- Mounting orientation: Vertical
- Stroke: 50 [mm]
- Acceleration/Deceleration: 5000 [mm/s²]
- Cycle time: 0.5 s
- Workpiece mounting condition:

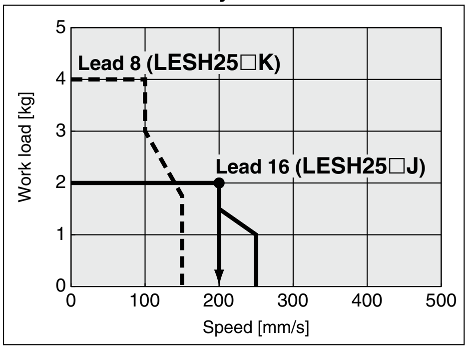


Step 1 Check the work load–speed. <Speed–Work load graph> (page 688)

Select a model based on the workpiece mass and speed while referencing the speed–work load graph.

Selection example) The **LESH25□EJ-50** can be temporarily selected as a possible candidate based on the graph shown on the right side.

LESH25□E□/Battery-less Absolute Vertical



<Speed–Work load graph>

Step 2 Check the cycle time.

It is possible to find an approximate cycle time by using method 1, but if a more detailed cycle time is required, use method 2.

* Although it is possible to make a suitable selection by using method 1, this calculation is based on a maximum load condition. Therefore, if a more detailed selection for each load is required, use method 2.

Method 1: Check the cycle time graph. (page 688)

Method 2: Calculation <Speed–Work load graph> (page 688)

Calculate **the cycle time** using the following calculation method.

Cycle time:

T can be found from the following equation.

$$\boxed{T = T1 + T2 + T3 + T4\ [s]}$$

- T1: Acceleration time and T3: Deceleration time can be found by the following equation.

$$\boxed{T1 = V/a1\ [s]} \quad \boxed{T3 = V/a2\ [s]}$$

- T2: Constant speed time can be found from the following equation.

$$\boxed{T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V}\ [s]}$$

- T4: Settling time varies depending on the conditions such as motor types, load, and in position of the step data. Therefore, calculate the settling time while referencing the following value.

$$\boxed{T4 = 0.15\ [s]}$$

Calculation example)

T1 to T4 can be calculated as follows.

$T1 = V/a1 = 200/5000 = 0.04$ [s],

$T3 = V/a2 = 200/5000 = 0.04$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{50 - 0.5 \cdot 200 \cdot (0.04 + 0.04)}{200} = 0.21\ [s]$$

$T4 = 0.15$ [s]

The cycle time can be found as follows.

$T = T1 + T2 + T3 + T4$

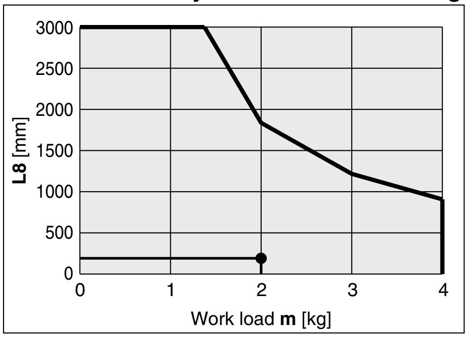
$= 0.04 + 0.21 + 0.04 + 0.15$

$= \mathbf{0.44\ [s]}$

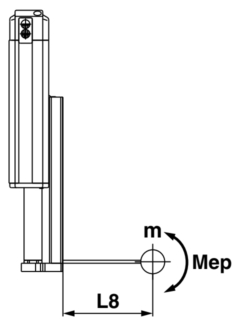
Step 3 Check the allowable moment. <Static allowable moment> (page 688) <Dynamic allowable moment> (page 689)

Confirm the moment that applies to the actuator is within the allowable range for both static and dynamic conditions.

LESH25□/Battery-less Absolute Pitching



<Dynamic allowable moment>



Based on the above calculation result, the LESH25□EJ-50 should be selected.

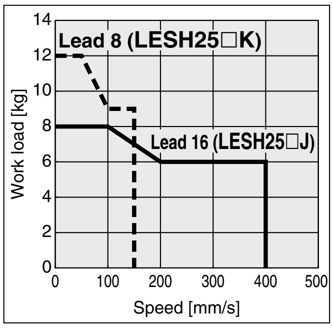
Speed–Work Load Graph (Guide)

Battery-less Absolute (Step Motor 24 VDC)

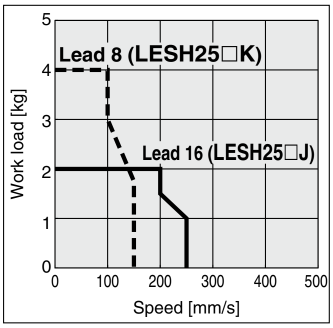
∗ The following graphs show the values when the moving force is 100%.

LESH25□E□

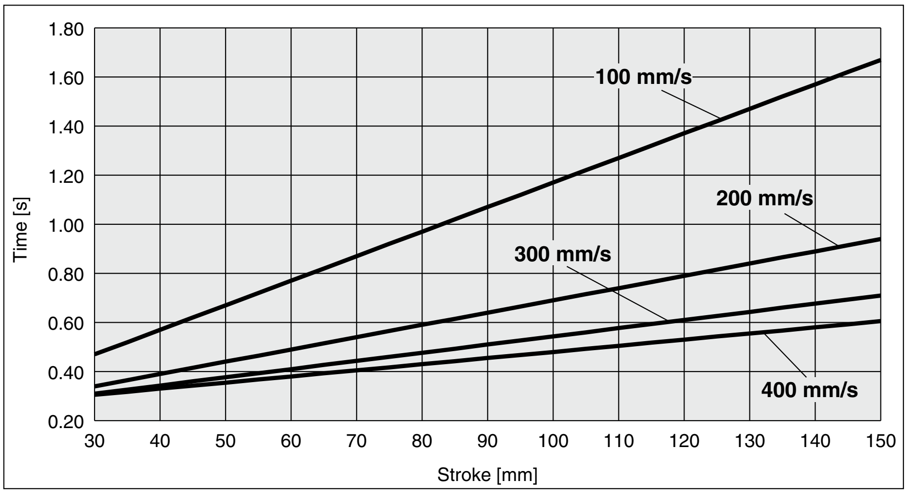
Horizontal



Vertical



Cycle Time Graph (Guide)



Operating Conditions

Acceleration/Deceleration: 5000 mm/s^2
In position: 0.5 mm

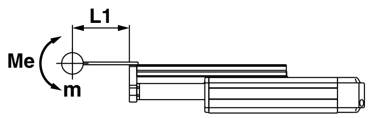
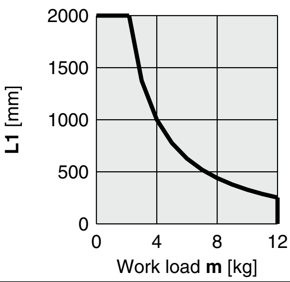
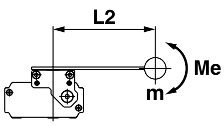
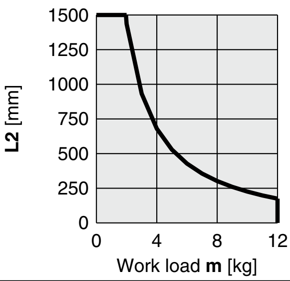
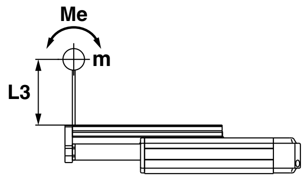
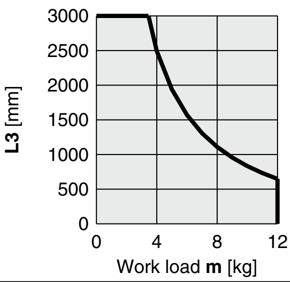
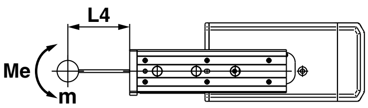
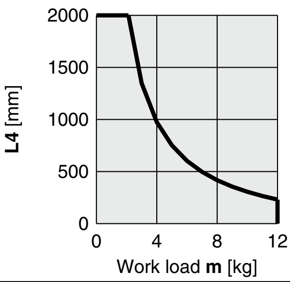
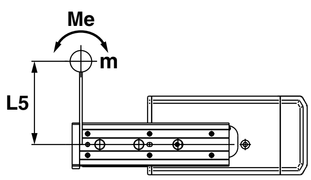
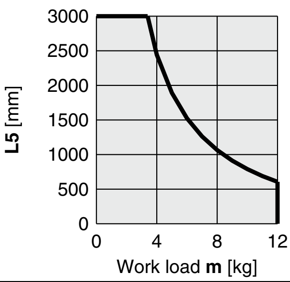
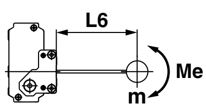
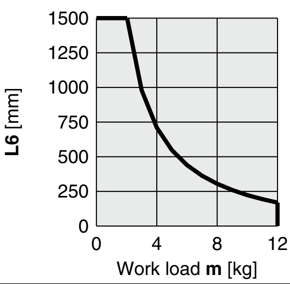
Static Allowable Moment

Model		LESH25		
Stroke	[mm]	**50**	**100**	**150**
Pitching	[N·m]	77	112	155
Yawing	[N·m]			
Rolling	[N·m]	146	177	152

Dynamic Allowable Moment

* These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece overhangs in one direction. When selecting the overhang, refer to the "Calculation of Guide Load Factor" or the Electric Actuator Model Selection Software for confirmation: https://www.smcworld.com

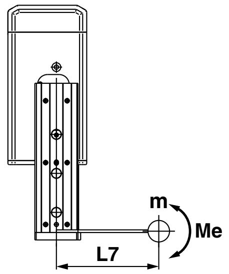
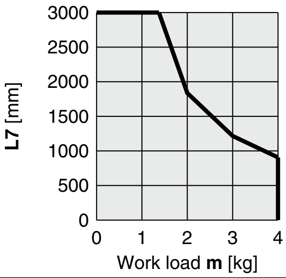
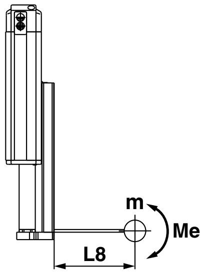
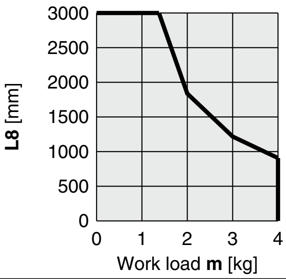
Acceleration/Deceleration —— 5000 mm/s²

Orientation	Load overhanging direction **m** : Work load [kg] **Me**: Allowable moment [N·m] **L** : Overhang to the work load center of gravity [mm]		Model: **LESH25**
Horizontal/Bottom		X	
		Y	
		Z	
Horizontal (Wall)		X	
		Y	
		Z	

Dynamic Allowable Moment

* These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece overhangs in one direction. When selecting the overhang, refer to the “Calculation of Guide Load Factor” or the Electric Actuator Model Selection Software for confirmation: https://www.smcworld.com

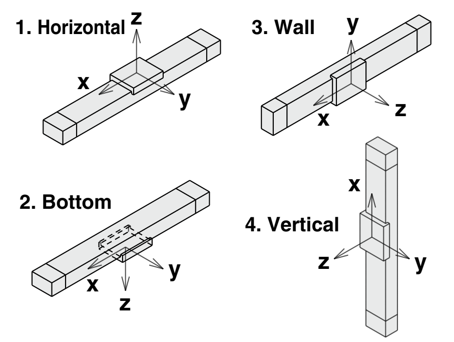
Acceleration/Deceleration —— 5000 mm/s²

Orientation	Load overhanging direction **m** : Work load [kg] **Me**: Allowable moment [N·m] **L** : Overhang to the work load center of gravity [mm]		Model **LESH25**
Vertical		**Y**	
		**Z**	

Calculation of Guide Load Factor

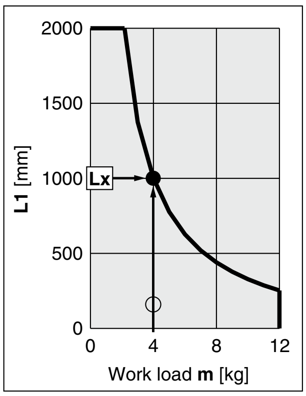
1. Decide operating conditions.
   Model: LESH
   Size: 25
   Mounting orientation: Horizontal/Bottom/Wall/Vertical
   Acceleration [mm/s²]: **a**
   Work load [kg]: **m**
   Work load center position [mm]: **Xc/Yc/Zc**
2. Select the target graph while referencing the model, size, and mounting orientation.
3. Based on the acceleration and work load, find the overhang [mm]: **Lx/Ly/Lz** from the graph.
4. Calculate the load factor for each direction.
   α**x = Xc/Lx**, α**y = Yc/Ly**, α**z = Zc/Lz**
5. Confirm the total of α**x**, α**y**, and α**z** is 1 or less.
   $\alpha x + \alpha y + \alpha z \leq 1$
   When 1 is exceeded, please consider a reduction of acceleration and work load, or a change of the work load center position and series.

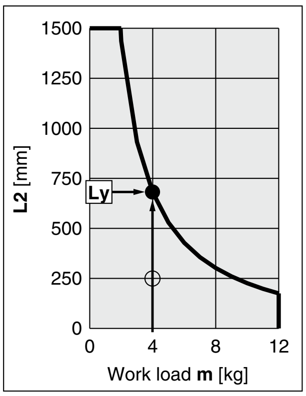
Mounting orientation

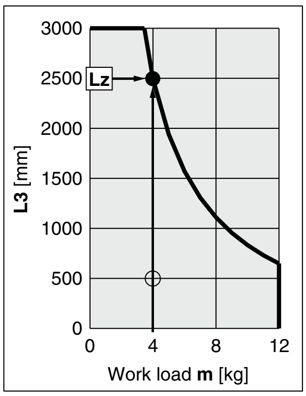


Example

1. Operating conditions
   Model: LESH
   Size: 25
   Mounting orientation: Horizontal
   Acceleration [mm/s²]: 5000
   Work load [kg]: 4.0
   Work load center position [mm]: **Xc = 250**, **Yc = 250**, **Zc = 500**
2. Select three graphs from the top on page 689.
3. **Lx = 1000 mm**, **Ly = 650 mm**, **Lz = 2500 mm**
4. The load factor for each direction can be found as follows.
   α**x = 250/1000 = 0.25**
   α**y = 250/650 = 0.38**
   α**z = 500/2500 = 0.20**
5. $\alpha x + \alpha y + \alpha z = 0.83 \leq 1$







Battery-less Absolute (Step Motor 24 VDC)

Slide Table/High Rigidity Type
LESH Series
Model Selection 2

Selection Procedure

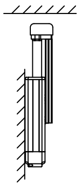
For the compact type LES series, refer to page 645.

Step 1 Check the required force. → **Step 2** Check the pushing force set value. → **Step 3** Check the duty ratio.

Selection Example

Operating conditions

- Pushing force: 90 [N]
- Workpiece mass: 1 [kg]
- Speed: 100 [mm/s]
- Stroke: 100 [mm]
- Mounting orientation: Vertical upward
- Pushing time + Operation (A): 1.5 s
- Full cycle time (B): 6 s



Step 1 Check the required force.

Calculate the approximate required force for a pushing operation.

Selection example)
- Pushing force: 90 [N]
- Workpiece mass: 1 [kg]

The approximate required force can be found to be 90 + 10 = 100 [N].

Select a model based on the approximate required force while referencing the specifications (page 707).

Selection example) Based on the specifications,
- Approximate required force: 100 [N]
- Speed: 100 [mm/s]

The **LESH25□E** can be temporarily selected as a possible candidate.

Then, calculate the required force for a pushing operation.
If the mounting position is vertical upward, add the actuator table weight.

Selection example) Based on the table weight,
- **LESH25□E** table weight: 1.3 [kg]

The required force can be found to be 100 + 13 = 113 [N].

Step 2 Check the pushing force set value.

<Pushing force set value–Force graph> (page 692)

Select a model based on the required force while referencing the pushing force set value–force graph, and confirm the pushing force set value.

Selection example) Based on the graph shown on the right side,
- Required force: 113 [N]

The **LESH25□EK** can be temporarily selected as a possible candidate.
This pushing force set value is 40 [%].

Step 3 Check the duty ratio.

Confirm the allowable duty ratio based on the pushing force set value while referencing the allowable duty ratio,

Selection example) Based on the allowable duty ratio,
- Pushing force set value: 40 [%]

The allowable duty ratio can be found to be 30 [%].

Calculate the duty ratio for the operating conditions, and confirm it does not exceed the allowable duty ratio.

Selection example)
- Pushing time + Operation (A): 1.5 s
- Full cycle time (B): 6 s

The duty ratio can be found to be 1.5/6 x 100 = 25 [%], and this is within the allowable range.

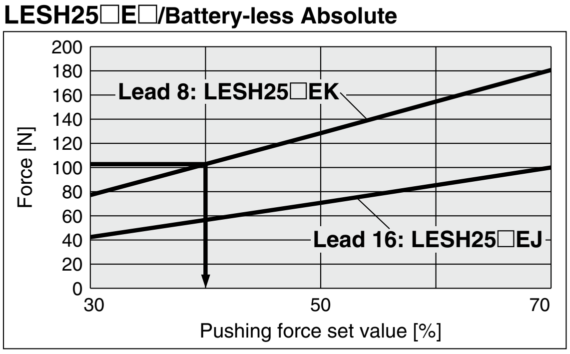
Based on the above calculation result, the LESH25□EK-100 should be selected.
For allowable moment, the selection procedure is the same as that for the positioning control.

Table Weight [kg]

Model	Stroke [mm]			
	50	75	100	150
LESH25	0.9	—	1.3	1.7

∗ If the mounting position is vertical upward, add the table weight.

LESH25□E□/Battery-less Absolute

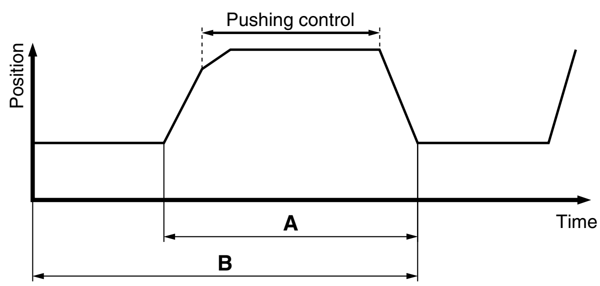


<Pushing force set value–Force graph>

Allowable Duty Ratio

Battery-less Absolute

Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
30	—	—
50 or less	30 or less	5 or less
70 or less	20 or less	3 or less



Pushing Force Set Value–Force Graph

Battery-less Absolute (Step Motor 24 VDC)

LESH25□E□

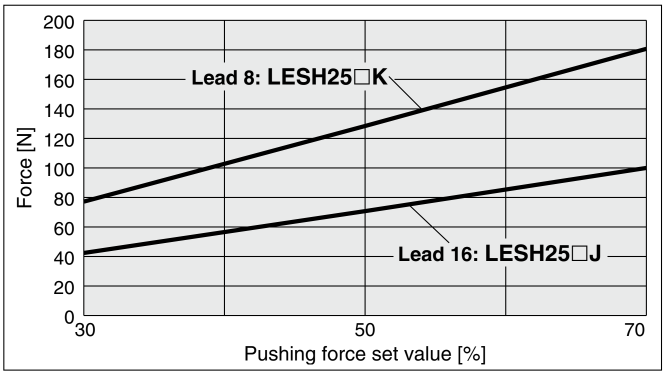
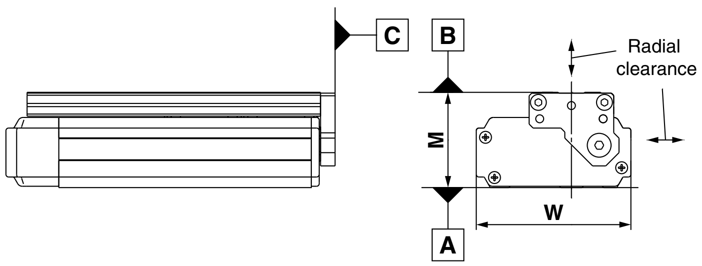


Table Accuracy

∗ These values are initial guideline values.

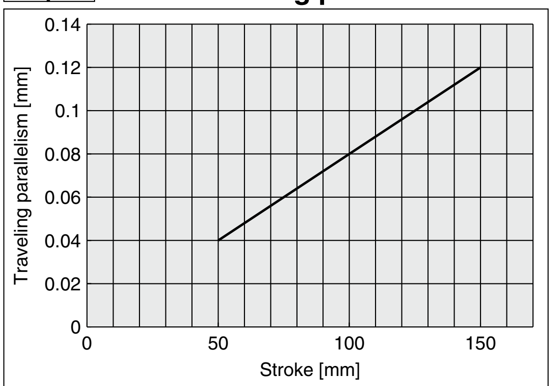


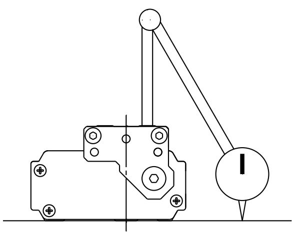
Model	LESH25
B side parallelism to A side [mm]	Refer to Table 1.
B side traveling parallelism to A side [mm]	Refer to Graph 1.
C side perpendicularity to A side [mm]	0.05
M dimension tolerance [mm]	±0.3
W dimension tolerance [mm]	±0.2
Radial clearance [μm]	–14 to 0

Table 1 B side parallelism to A side

Model	Stroke [mm]			
	50	75	100	150
LESH25	0.06	—	0.08	0.125

Graph 1 B side traveling parallelism to A side



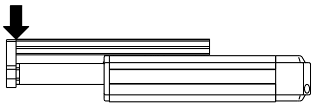


Traveling parallelism:
The amount of deflection on a dial gauge when the table travels a full stroke with the body secured on a reference base surface

Table Deflection (Reference Value)

∗ These values are initial guideline values.

Table displacement due to pitch moment load
Table displacement when loads are applied to the section marked with the arrow with the slide table stuck out.



LESH25

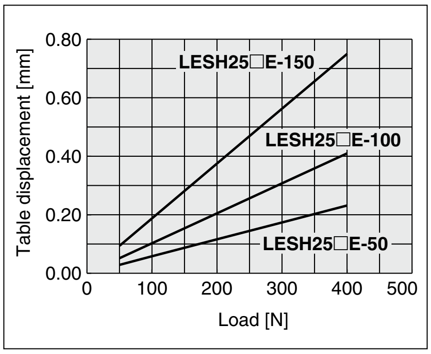
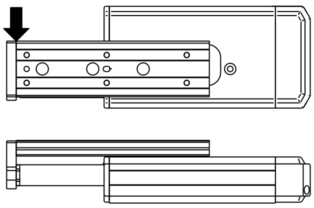


Table displacement due to yaw moment load
Table displacement when loads are applied to the section marked with the arrow with the slide table stuck out.



LESH25

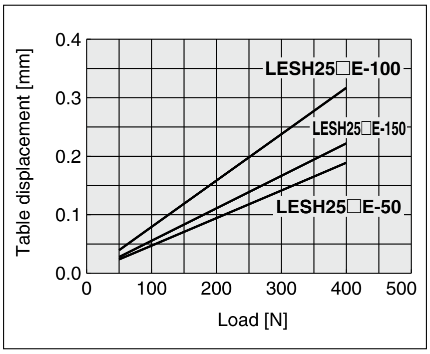
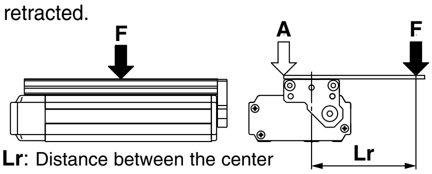


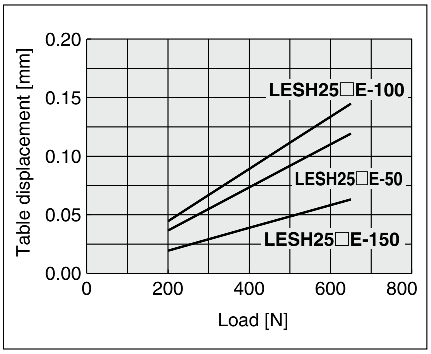
Table displacement due to roll moment load
Table displacement of section A when loads are applied to the section F with the slide table retracted.



Lr: Distance between the center of the table and the work load center of gravity

LESH25

Lr = 200 mm



Slide Table/High Rigidity Type

LESH Series

Model Selection 1

LESH Series ▶p. 715

Selection Procedure

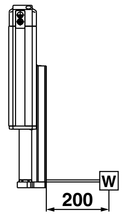
For the compact type LES series, refer to page 649.

Step 1 Check the work load–speed. → **Step 2** Check the cycle time. → **Step 3** Check the allowable moment.

Selection Example

Operating conditions

- Workpiece mass: 1 [kg]
- Speed: 220 [mm/s]
- Mounting orientation: Vertical
- Stroke: 50 [mm]
- Acceleration/Deceleration: 5000 [mm/s²]
- Cycle time: 0.5 s
- Workpiece mounting condition:

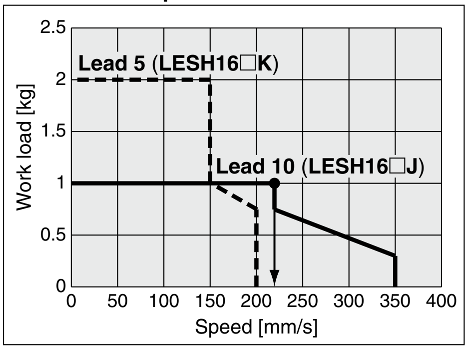


Step 1 Check the work load–speed. <Speed–Work load graph> (Page 696)

Select a model based on the workpiece mass and speed while referencing the speed–work load graph.

Selection example) The **LESH16□J-50** can be temporarily selected as a possible candidate based on the graph shown on the right side.

LESH16□/Step Motor Vertical



<Speed–Work load graph>

Step 2 Check the cycle time.

It is possible to find an approximate cycle time by using method 1, but if a more detailed cycle time is required, use method 2.

* Although it is possible to make a suitable selection by using method 1, this calculation is based on a maximum load condition. Therefore, if a more detailed selection for each load is required, use method 2.

Method 1: Check the cycle time graph. (Page 697)

Method 2: Calculation <Speed–Work load graph> (Page 696)

Calculate **the cycle time** using the following calculation method.

Cycle time:

T can be found from the following equation.

$$\boxed{T = T1 + T2 + T3 + T4\ [s]}$$

- T1: Acceleration time and T3: Deceleration time can be found by the following equation.

$$\boxed{T1 = V/a1\ [s]} \quad \boxed{T3 = V/a2\ [s]}$$

- T2: Constant speed time can be found from the following equation.

$$\boxed{T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V}\ [s]}$$

- T4: Settling time varies depending on the conditions such as motor types, load, and in position of the step data. Therefore, calculate the settling time while referencing the following value.

$$\boxed{T4 = 0.15\ [s]}$$

Calculation example)

T1 to T4 can be calculated as follows.

$T1 = V/a1 = 220/5000 = 0.04$ [s],

$T3 = V/a2 = 220/5000 = 0.04$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V}$$

$$= \frac{50 - 0.5 \cdot 220 \cdot (0.04 + 0.04)}{220}$$

$= 0.19$ [s]

$T4 = 0.15$ [s]

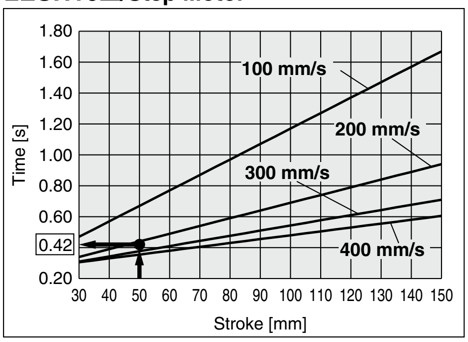
The cycle time can be found as follows.

$T = T1 + T2 + T3 + T4$

$= 0.04 + 0.19 + 0.04 + 0.15$

$= \mathbf{0.42\ [s]}$

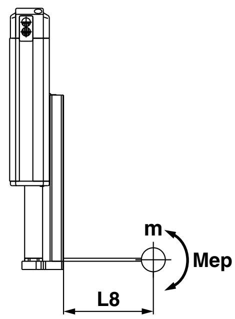
LESH16□/Step Motor



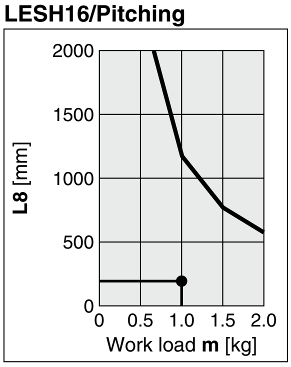
<Cycle time>

Step 3 Check the allowable moment. <Static allowable moment> (Page 697) <Dynamic allowable moment> (Pages 698, 699)

Confirm the moment that applies to the actuator is within the allowable range for both static and dynamic conditions.



LESH16/Pitching



<Dynamic allowable moment>

Based on the above calculation result, the LESH16□J-50 should be selected.

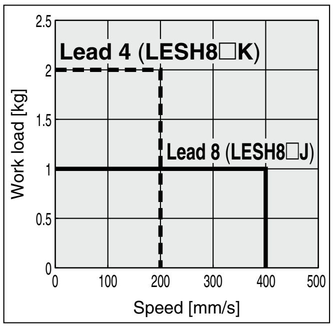
Speed–Work Load Graph (Guide)

Step Motor (Servo/24 VDC)

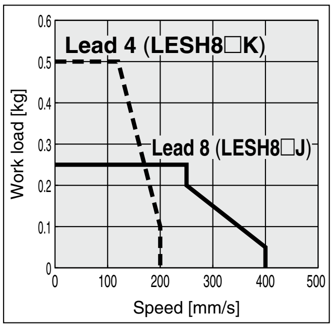
∗ The following graphs show the values when moving force is 100%.

LESH8□

Horizontal

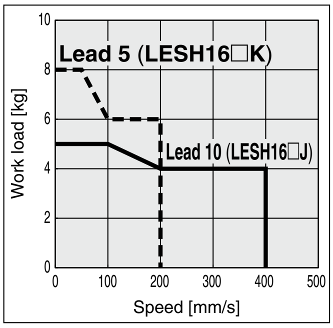


Vertical

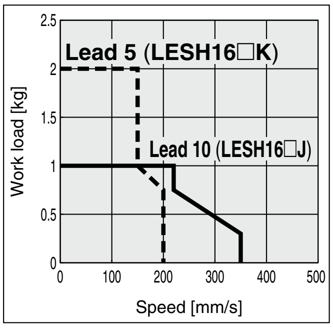


LESH16□

Horizontal

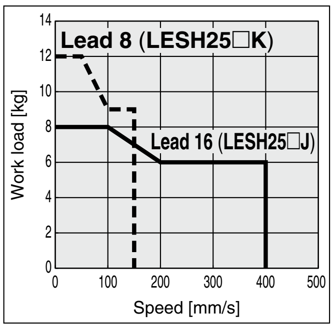


Vertical

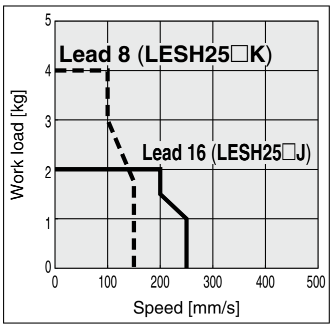


LESH25□

Horizontal



Vertical

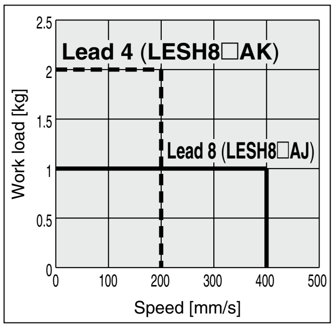


Servo Motor (24 VDC)

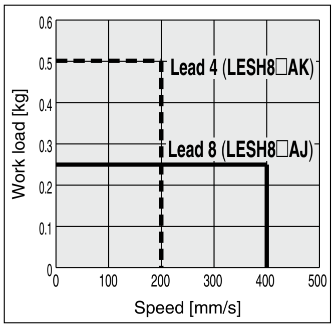
∗ The following graphs show the values when moving force is 250%.

LESH8□A

Horizontal

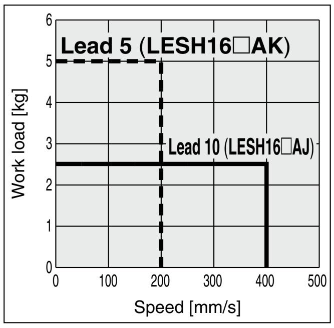


Vertical

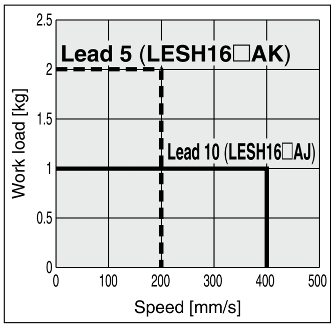


LESH16□A

Horizontal

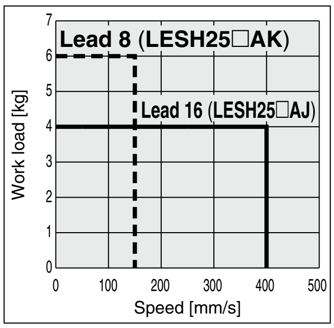


Vertical

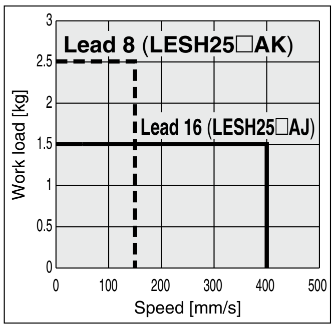


LESH25$^{R}_{L}$A

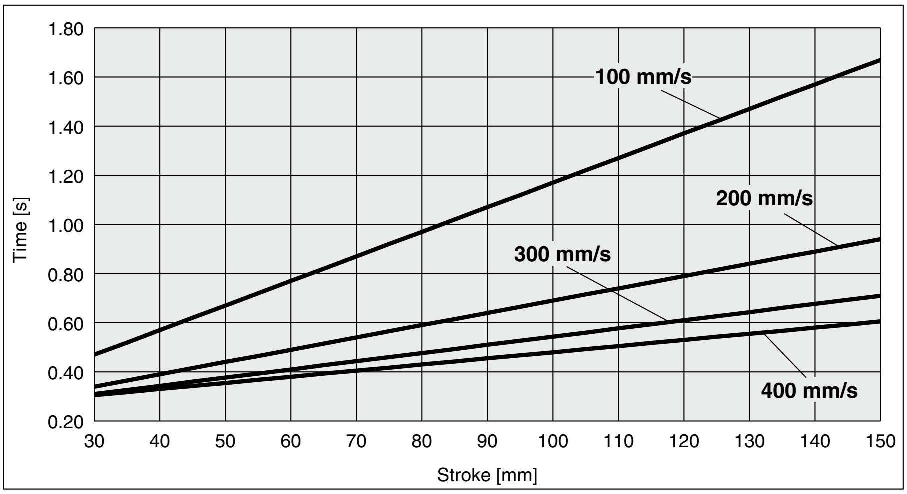
Horizontal



Vertical



Cycle Time Graph (Guide)



Operating Conditions
Acceleration/Deceleration: 5000 mm/s^2
In position: 0.5 mm

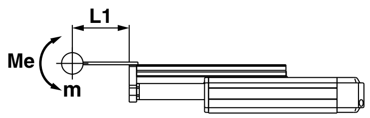
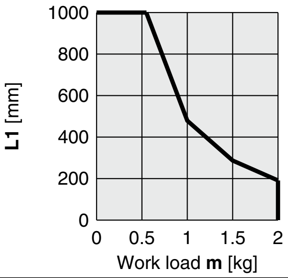
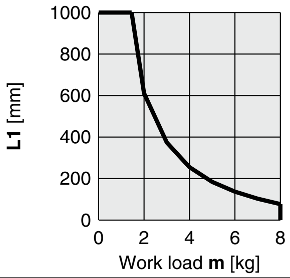
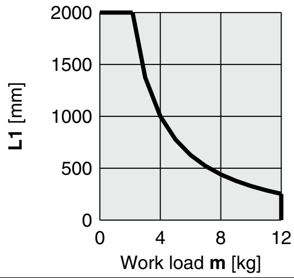
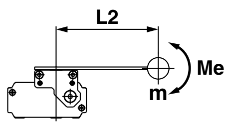
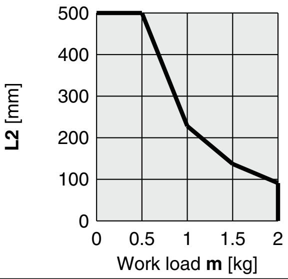
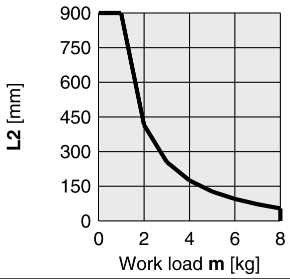
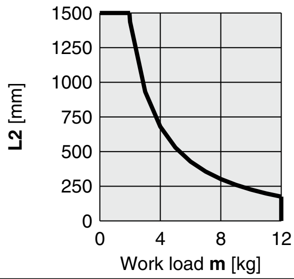
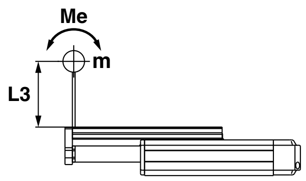
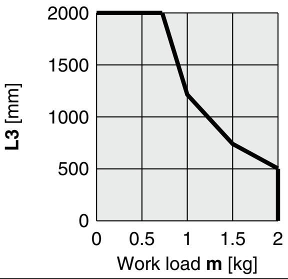
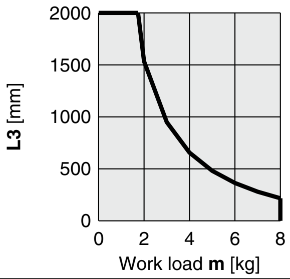
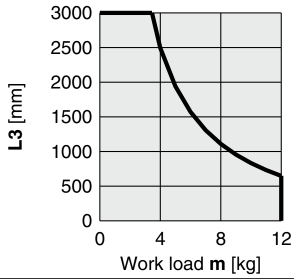
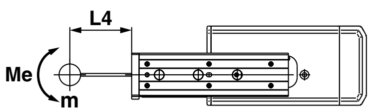
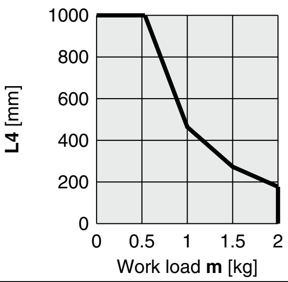
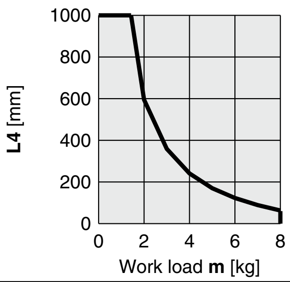
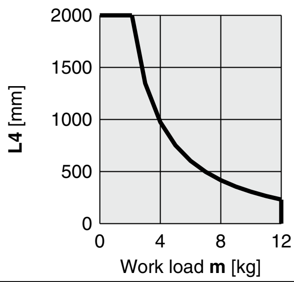
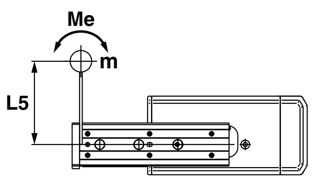
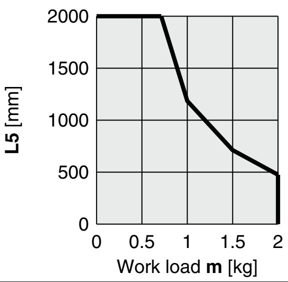
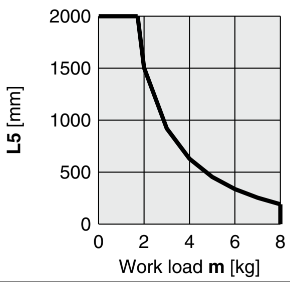
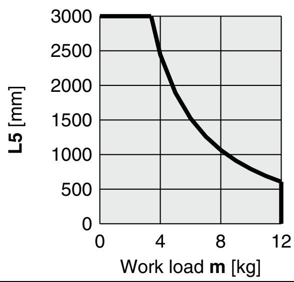
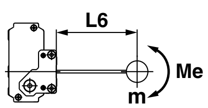
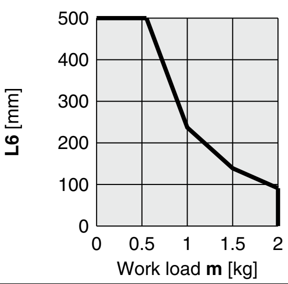
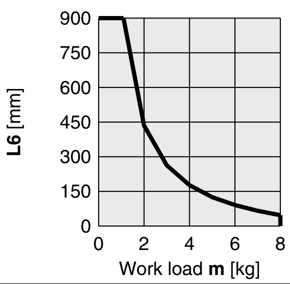
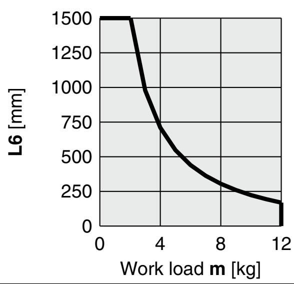
Static Allowable Moment

Model		LESH8		LESH16		LESH25		
Stroke	[mm]	50	75	50	100	50	100	150
Pitching	[N·m]	11		26	43	77	112	155
Yawing	[N·m]	11						
Rolling	[N·m]	12		48		146	177	152

Dynamic Allowable Moment

∗ These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece overhangs in one direction. When selecting the overhang, refer to the “Calculation of Guide Load Factor” or the Electric Actuator Model Selection Software for confirmation: https://www.smcworld.com

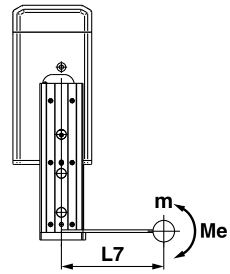
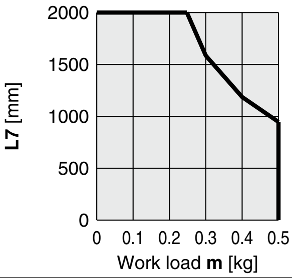
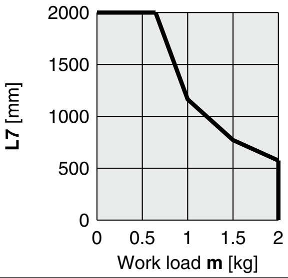
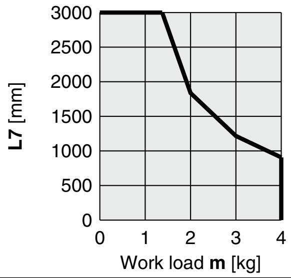
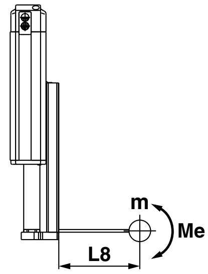
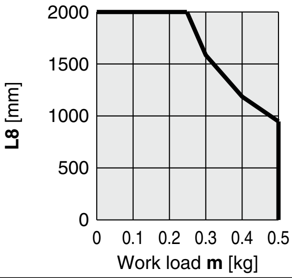
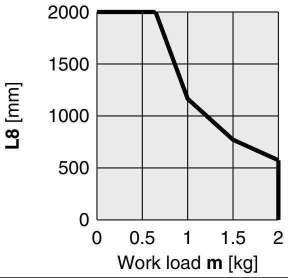
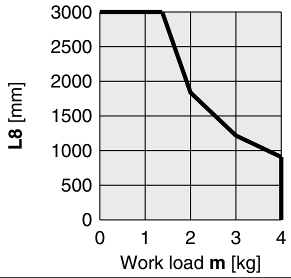
Acceleration/Deceleration —— 5000 mm/s²

Orientation	Load overhanging direction **m** : Work load [kg] **Me**: Allowable moment [N·m] **L** : Overhang to the work load center of gravity [mm]		Model: LESH8	Model: LESH16	Model: LESH25
Horizontal/Bottom		X			
Horizontal/Bottom		Y			
Horizontal/Bottom		Z			
Horizontal (Wall)		X			
Horizontal (Wall)		Y			
Horizontal (Wall)		Z			

Dynamic Allowable Moment

∗ These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece overhangs in one direction. When selecting the overhang, refer to the "Calculation of Guide Load Factor" or the Electric Actuator Model Selection Software for confirmation: https://www.smcworld.com

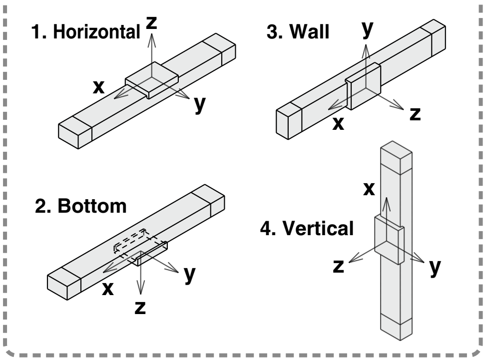
Acceleration/Deceleration ——— 5000 mm/s²

Orientation	**Load overhanging direction** **m** : Work load [kg] **Me**: Allowable moment [N·m] **L** : Overhang to the work load center of gravity [mm]		Model		
			LESH8	**LESH16**	**LESH25**
Vertical		**Y**			
		**Z**			

Calculation of Guide Load Factor

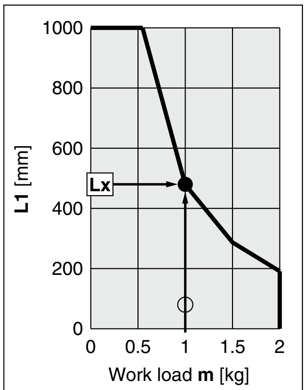
1. Decide operating conditions.
   Model: LESH — Acceleration [mm/s²]: **a**
   Size: 8/16/25 — Work load [kg]: **m**
   Mounting orientation: Horizontal/Bottom/Wall/Vertical — Work load center position [mm]: **Xc/Yc/Zc**
2. Select the target graph while referencing the model, size, and mounting orientation.
3. Based on the acceleration and work load, find the overhang [mm]: **Lx/Ly/Lz** from the graph.
4. Calculate the load factor for each direction.
   α**x = Xc/Lx**, α**y = Yc/Ly**, α**z = Zc/Lz**
5. Confirm the total of α**x**, α**y**, and α**z** is 1 or less.
   $\alpha x + \alpha y + \alpha z \le 1$
   When 1 is exceeded, please consider a reduction of acceleration and work load, or a change of the work load center position and series.

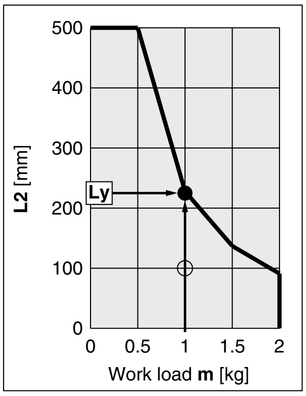
Mounting orientation

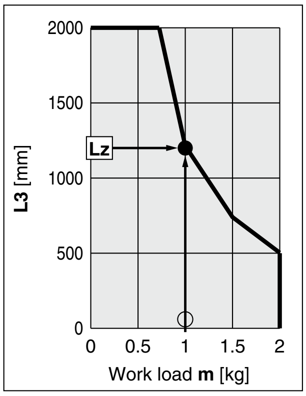


Example

1. Operating conditions
   Model: LESH
   Size: 8
   Mounting orientation: Horizontal
   Acceleration [mm/s²]: 5000
   Work load [kg]: 1.0
   Work load center position [mm]: **Xc = 80**, **Yc = 100**, **Zc = 60**
2. Select three graphs from the top of the left side first row on page 698.
3. **Lx = 480 mm**, **Ly = 225 mm**, **Lz = 1200 mm**
4. The load factor for each direction can be found as follows.
   α**x = 80/480 = 0.17**
   α**y = 100/225 = 0.44**
   α**z = 60/1200 = 0.05**
5. $\alpha x + \alpha y + \alpha z = 0.66 \le 1$







Slide Table/High Rigidity Type

***LESH* Series**

Model Selection 2

LESH Series ▶p. 715

Selection Procedure

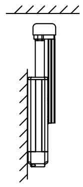
For the compact type LES series, refer to page 655.

Step 1 Check the required force. → **Step 2** Check the pushing force set value. → **Step 3** Check the duty ratio.

Selection Example

Operating conditions

- Pushing force: 90 [N]
- Workpiece mass: 1 [kg]
- Speed: 100 [mm/s]
- Stroke: 100 [mm]
- Mounting orientation: Vertical upward
- Pushing time + Operation (A): 1.5 s
- Full cycle time (B): 6 s



Step 1 Check the required force.

Calculate the approximate required force for a pushing operation.

Selection example) • Pushing force: 90 [N]
• Workpiece mass: 1 [kg]
The approximate required force can be found to be 90 + 10 = 100 [N].

Select a model based on the approximate required force while referencing the specifications (Pages 718, 719).

Selection example) Based on the specifications,
• Approximate required force: 100 [N]
• Speed: 100 [mm/s]
The **LESH25□** can be temporarily selected as a possible candidate.

Then, calculate the required force for a pushing operation.
If the mounting position is vertical upward, add the actuator table weight.

Selection example) Based on the table weight,
• **LESH25□** table weight: 1.3 [kg]
The required force can be found to be 100 + 13 = 113 [N].

Step 2 Check the pushing force set value.

<Pushing force set value–Force graph> (Page 702)

Select a model based on the required force while referencing the pushing force set value–force graph, and confirm the pushing force set value.

Selection example) Based on the graph shown on the right side,
• Required force: 113 [N]
The **LESH25□K** can be temporarily selected as a possible candidate.
This pushing force set value is 40 [%].

Step 3 Check the duty ratio.

Confirm the allowable duty ratio based on the pushing force set value while referencing the allowable duty ratio,

Selection example) Based on the allowable duty ratio,
• Pushing force set value: 40 [%]
The allowable duty ratio can be found to be 30 [%].

Calculate the duty ratio for the operating conditions, and confirm it does not exceed the allowable duty ratio.

Selection example) • Pushing time + Operation (A): 1.5 s
• Full cycle time (B): 6 s
The duty ratio can be found to be 1.5/6 x 100 = 25 [%], and this is within the allowable range.

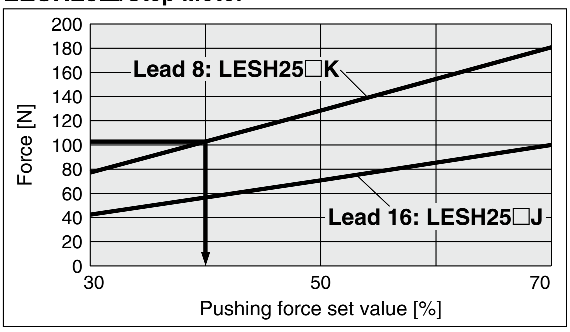
Based on the above calculation result, the LESH25□K-100 should be selected.
For allowable moment, the selection procedure is the same as that for the positioning control.

Table Weight [kg]

Model	Stroke [mm]			
	50	75	100	150
LESH8	0.2	0.3	—	—
LESH16	0.4	—	0.7	—
LESH25	0.9	—	1.3	1.7

∗ If the mounting position is vertical upward, add the table weight.

LESH25□/Step Motor



<Pushing force set value–Force graph>

Allowable Duty Ratio

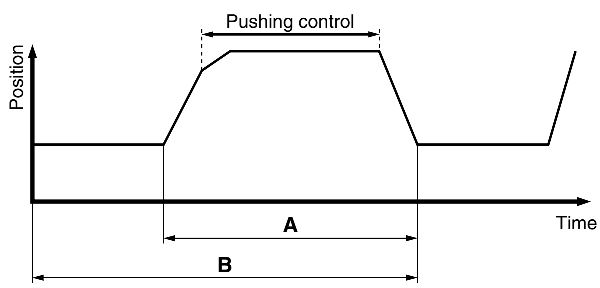
Step Motor (Servo/24 VDC)

Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
30	—	—
50 or less	30 or less	5 or less
70 or less	20 or less	3 or less

Servo Motor (24 VDC)

Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
50	—	—
75 or less	30 or less	5 or less
100 or less	20 or less	3 or less

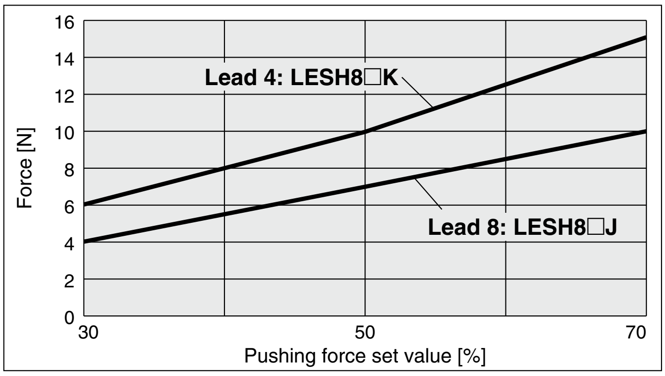
∗ The pushing force of the LESH8□A is up to 75%.



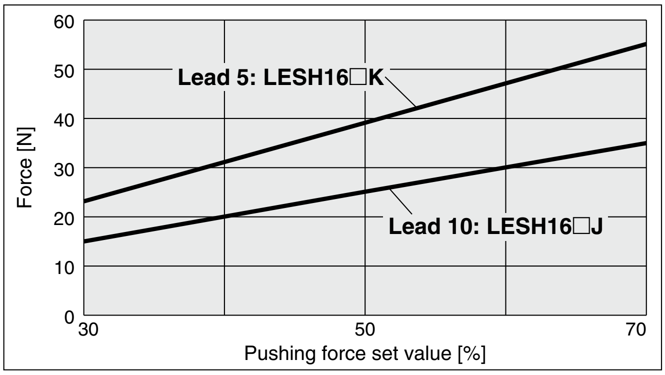
Pushing Force Set Value–Force Graph

Step Motor (Servo/24 VDC)

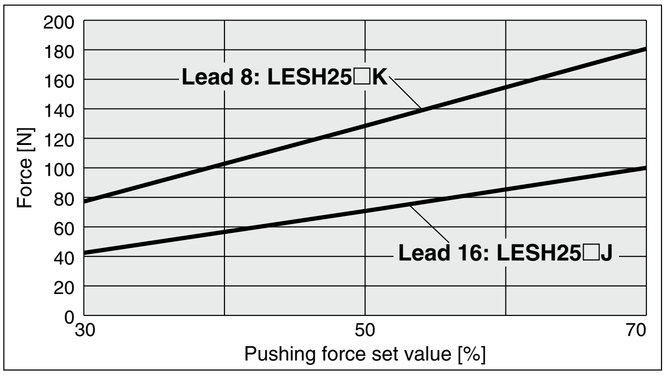
LESH8□



LESH16□

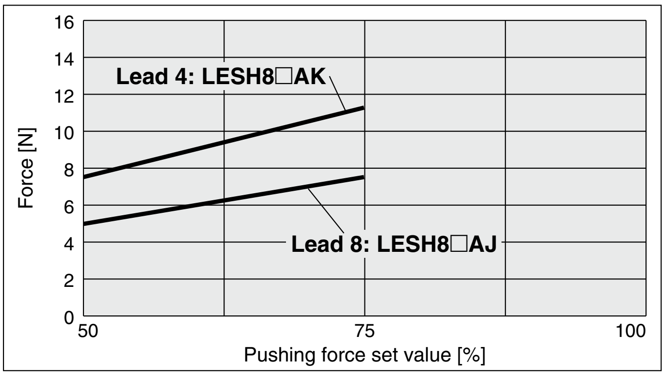


LESH25□

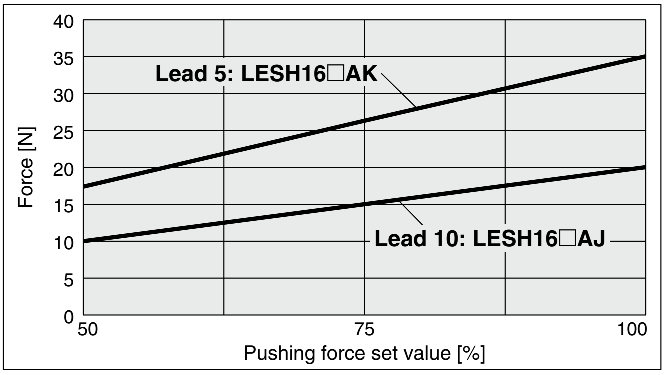


Servo Motor (24 VDC)

LESH8□A



LESH16□A



LESH25$^{R}_{L}$A

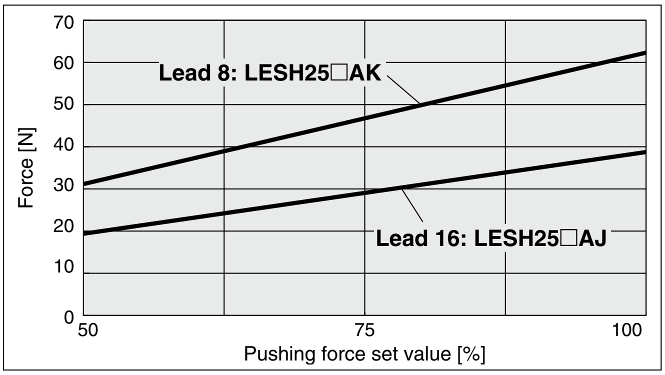
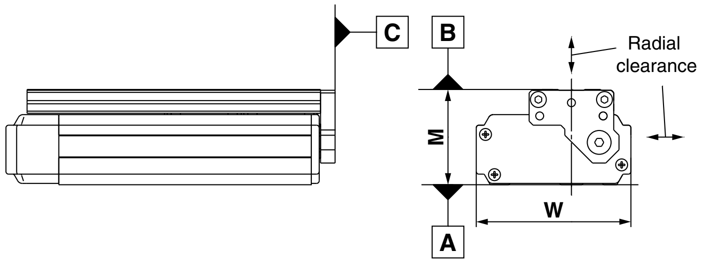


Table Accuracy

∗ These values are initial guideline values.

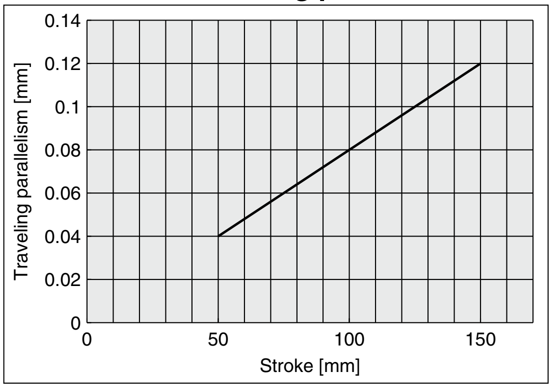


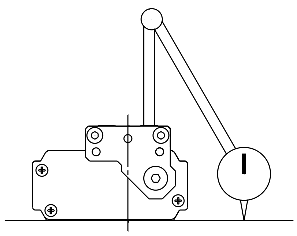
Model	LESH8	LESH16	LESH25
B side parallelism to A side [mm]	Refer to Table 1.		
B side traveling parallelism to A side [mm]	Refer to Graph 1.		
C side perpendicularity to A side [mm]	0.05	0.05	0.05
M dimension tolerance [mm]	±0.3		
W dimension tolerance [mm]	±0.2		
Radial clearance [μm]	–4 to 0	–10 to 0	–14 to 0

Table 1 B side parallelism to A side

Model	Stroke [mm]			
	50	75	100	150
LESH8	0.055	0.065	—	—
LESH16	0.05	—	0.08	—
LESH25	0.06	—	0.08	0.125

Graph 1 B side traveling parallelism to A side



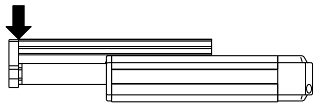


Traveling parallelism:
The amount of deflection on a dial gauge when the table travels a full stroke with the body secured on a reference base surface

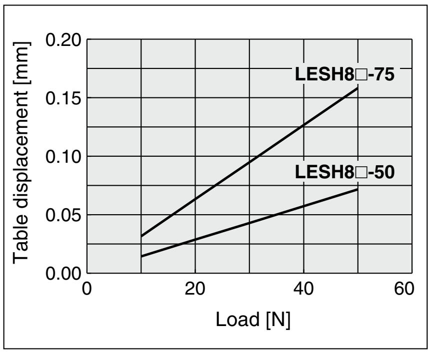
Table Deflection (Reference Value)

∗ These values are initial guideline values.

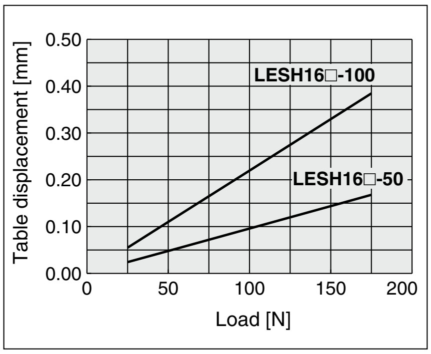
Table displacement due to pitch moment load
Table displacement when loads are applied to the section marked with the arrow with the slide table stuck out.



LESH8



LESH16



LESH25

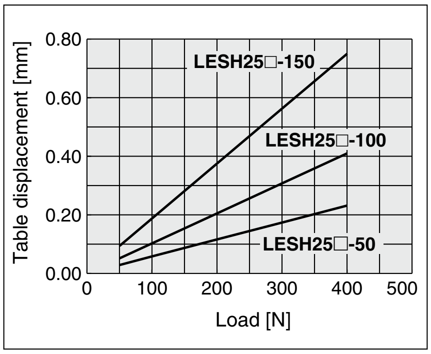
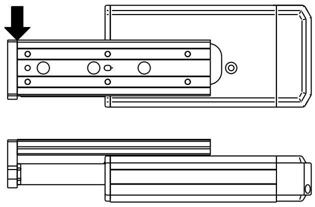
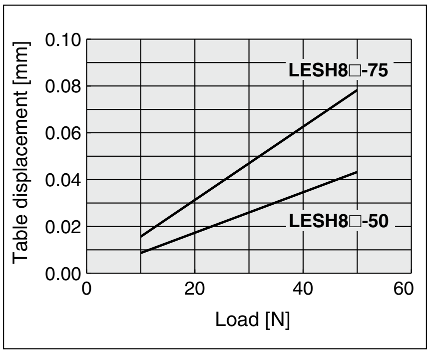


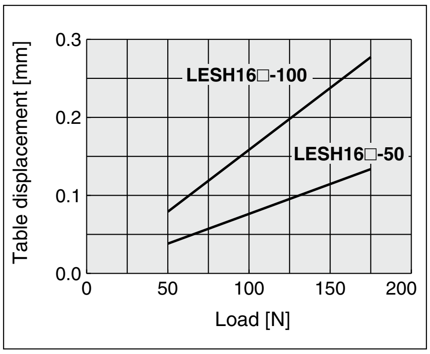
Table displacement due to yaw moment load
Table displacement when loads are applied to the section marked with the arrow with the slide table stuck out.



LESH8



LESH16



LESH25

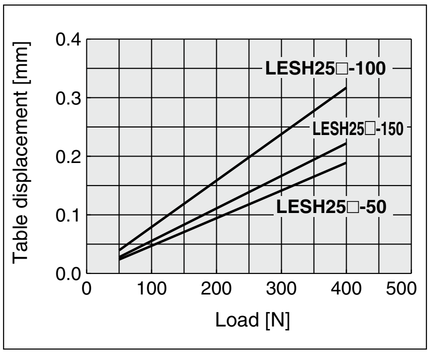
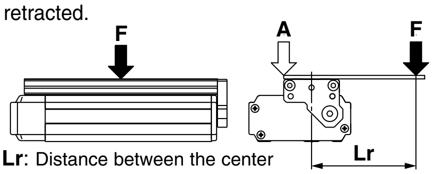


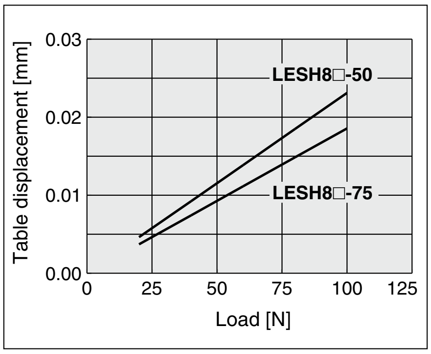
Table displacement due to roll moment load
Table displacement of section A when loads are applied to the section F with the slide table retracted.



Lr: Distance between the center of the table and the work load center of gravity

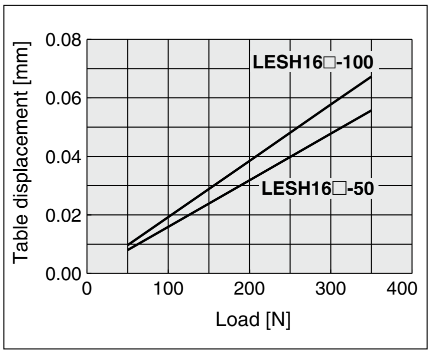
LESH8

Lr = 70 mm



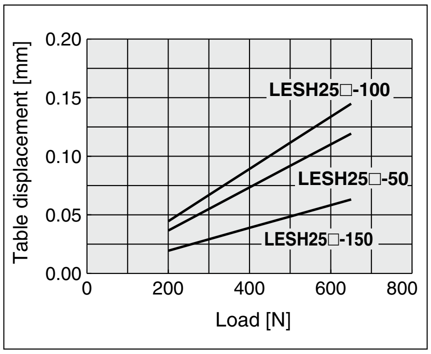
LESH16

Lr = 120 mm



LESH25

Lr = 200 mm



Battery-less Absolute (Step Motor 24 VDC)

Slide Table/High Rigidity Type

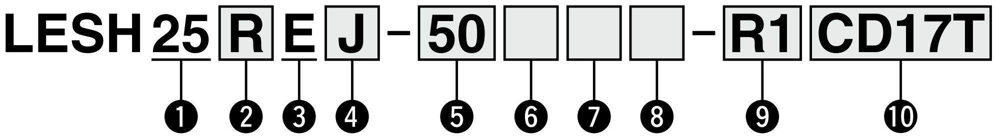
LESH Series LESH25

CE UK CA RoHS

* For details, refer to page 1343 and onward.

High rigidity type

How to Order



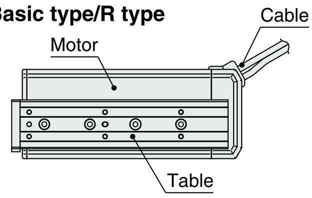
For details on controllers, refer to the next page.

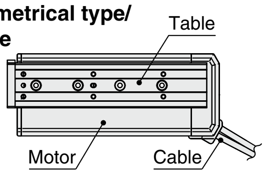
❶ Size

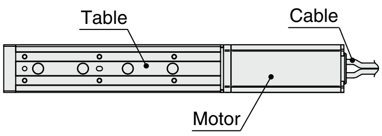
25

❷ Motor mounting position

R	Basic type/R type
L	Symmetrical type/ L type
D	In-line motor type/D type







❸ Motor type

Symbol	Type	Compatible controllers/drivers		
E	Battery-less absolute (Step motor 24 VDC)	JXC51	JXCP1	JXCEF
		JXC61	JXCD1	JXC9F
		JXCE1	JXCL1	JXCPF
		JXC91	JXCM1	JXCLF

❹ Lead [mm]

J	16
K	8

❺ Stroke [mm]

Stroke	Applicable stroke
50 to 150	50, 100, 150

❻ Motor option

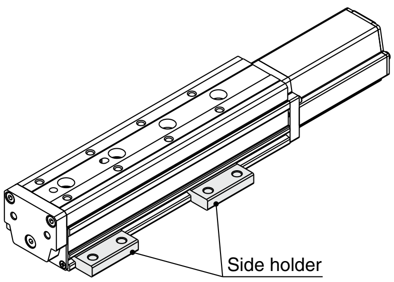
Nil	Without option
B	With lock

❼ Body option

Nil	Without option
S	Dust-protected*1

❽ Mounting*2

Symbol	Mounting	R type L type	D type
Nil	Without side holder	●	●
H	With side holder (4 pcs.)	—	●



❾ Actuator cable type/length

Robotic cable [m]

Nil	None	R8	8*3
R1	1.5	RA	10*3
R3	3	RB	15*3
R5	5	RC	20*3

⑩ Controller

Nil	Without controller
C□1□□	With controller

C D 1 7 T

Interface (Communication protocol/Input/Output)

Symbol	Type	Number of axes, Special specification: Standard	Number of axes, Special specification: With STO sub-function
5	Parallel input (NPN)	●	
6	Parallel input (PNP)	●	
E	EtherCAT	●	●
9	EtherNet/IP™	●	●
P	PROFINET	●	●
D	DeviceNet®	●	
L	IO-Link	●	●
M	CC-Link	●	

Number of axes, Special specification

Symbol	Number of axes	Specification
1	Single axis	Standard
F	Single axis	With STO sub-function

Mounting

7	Screw mounting
8*4	DIN rail

Communication plug connector, I/O cable*5

Symbol	Type	Applicable interface
Nil	Without accessory	—
S	Straight type communication plug connector	DeviceNet® CC-Link Ver. 1.10
T	T-branch type communication plug connector	
1	I/O cable (1.5 m)	Parallel input (NPN) Parallel input (PNP)
3	I/O cable (3 m)	
5	I/O cable (5 m)	

*1 For R/L type (IP5X equivalent), a scraper is mounted on the rod cover, and gaskets are mounted on both the end covers. For D type, a scraper is mounted on the rod cover.
*2 For details, refer to page 713.
*3 Produced upon receipt of order
*4 The DIN rail is not included. It must be ordered separately.
*5 Select "Nil" for anything other than DeviceNet®, CC-Link, or parallel input.
Select "Nil," "S," or "T" for DeviceNet® or CC-Link.
Select "Nil," "1," "3," or "5" for parallel input.

⚠Caution

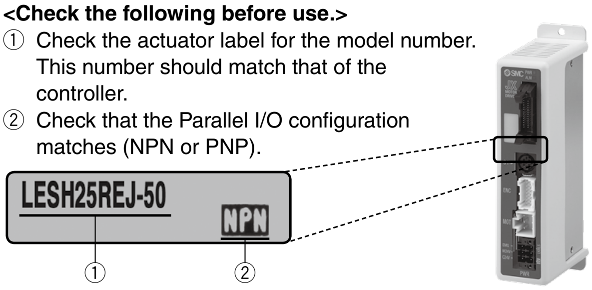
[CE/UKCA-compliant products]
EMC compliance was tested by combining the electric actuator LES series and the controller JXC series.
The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with the EMC directive cannot be certified for SMC components incorporated into the customer's equipment under actual operating conditions. As a result, it is necessary for the customer to verify compliance with the EMC directive for the machinery and equipment as a whole.

[Precautions relating to differences in controller versions]
When the JXC series is to be used in combination with the battery-less absolute encoder, use a controller that is version V3.4 or S3.4 or higher. For details, refer to pages 1077 and 1078.

[UL certification]
The JXC series controllers used in combination with electric actuators are UL certified.

The actuator and controller are sold as a package.
Confirm that the combination of the controller and actuator is correct.

<Check the following before use.>
① Check the actuator label for the model number. This number should match that of the controller.
② Check that the Parallel I/O configuration matches (NPN or PNP).



* Refer to the Operation Manual for using the products. Please download it via our website: https://www.smcworld.com

Type	Step data input type	EtherCAT direct input type	EtherCAT direct input type with STO sub-function	EtherNet/IP™ direct input type	EtherNet/IP™ direct input type with STO sub-function	PROFINET direct input type	PROFINET direct input type with STO sub-function	DeviceNet® direct input type	IO-Link direct input type	IO-Link direct input type with STO sub-function	CC-Link direct input type
											
Series	JXC51 JXC61	JXCE1	JXCEF	JXC91	JXC9F	JXCP1	JXCPF	JXCD1	JXCL1	JXCLF	JXCM1
Features	Parallel I/O	EtherCAT direct input	EtherCAT direct input with STO sub-function	EtherNet/IP™ direct input	EtherNet/IP™ direct input with STO sub-function	PROFINET direct input	PROFINET direct input with STO sub-function	DeviceNet® direct input	IO-Link direct input	IO-Link direct input with STO sub-function	CC-Link direct input
Compatible motor	Battery-less absolute (Step motor 24 VDC)										
Max. number of step data	64 points										
Power supply voltage	24 VDC										
Reference page	1017	1063									

Specifications

Battery-less Absolute (Step Motor 24 VDC)

Model			LESH25□E	
Actuator specifications	Stroke [mm]		50, 100, 150	
	Work load [kg]*1 *3	Horizontal	12	8
		Vertical	4	2
	Pushing force [N] 30% to 70%*2 *3		77 to 180	43 to 100
	Speed [mm/s]*1 *3		10 to 150	20 to 400
	Pushing speed [mm/s]		10 to 20	20
	Max. acceleration/deceleration [mm/s²]		5000	
	Positioning repeatability [mm]		±0.05	
	Lost motion [mm]*4		0.15 or less	
	Screw lead [mm]		8	16
	Impact/Vibration resistance [m/s²]*5		50/20	
	Actuation type		Slide screw + Belt (R/L type), Slide screw (D type)	
	Guide type		Linear guide (Circulating type)	
	Operating temperature range [°C]		5 to 40	
	Operating humidity range [%RH]		90 or less (No condensation)	
	Enclosure		IP30	
Electric specifications	Motor size		□42	
	Motor type		Battery-less absolute (Step motor 24 VDC)	
	Encoder		Battery-less absolute	
	Power supply voltage [V]		24 VDC ±10%	
	Power [W]*6 *8		Max. power 74	
Lock unit specifications	Type	*7	Non-magnetizing lock	
	Holding force [N]		500	77
	Power [W]*8		5	
	Rated voltage [V]		24 VDC ±10%	

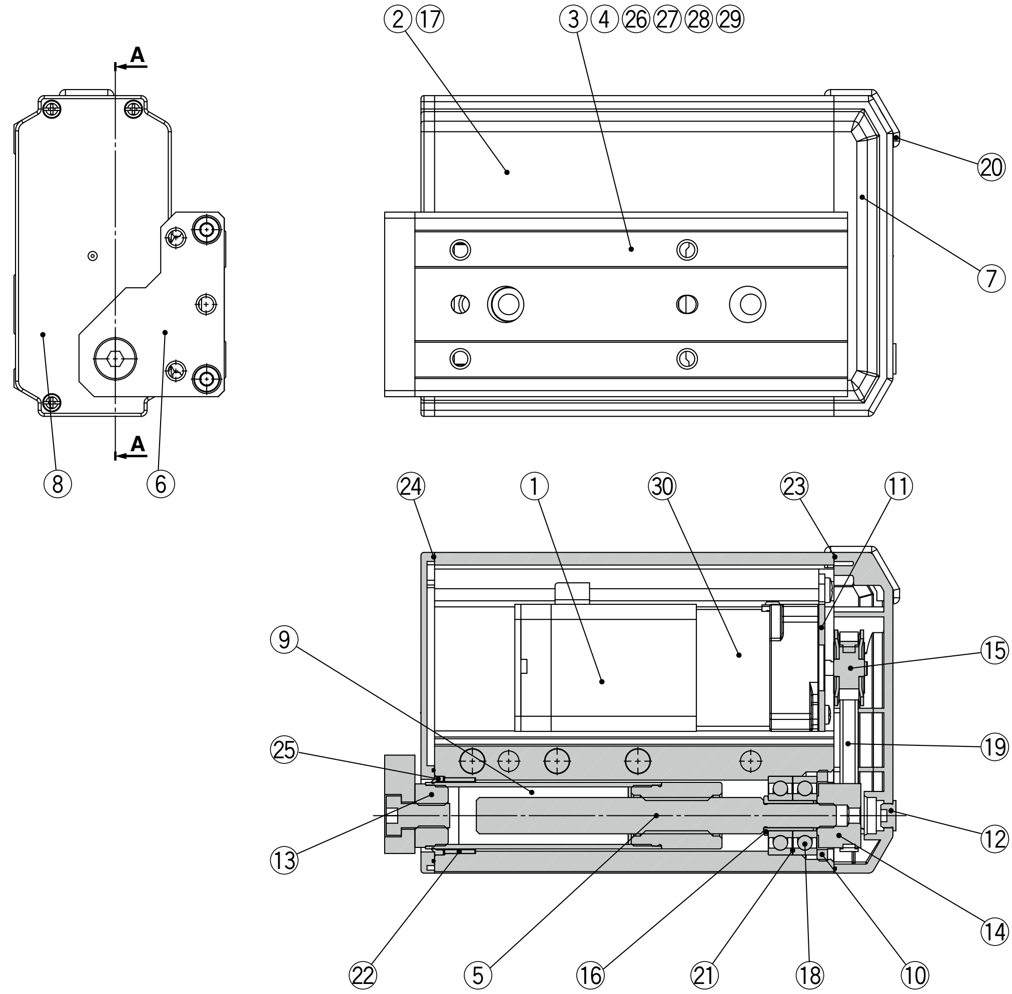
*1 Speed changes according to the work load. Check the "Speed–Work Load Graph (Guide)" on page 688.
*2 Pushing force accuracy is ±20% (F.S.).
*3 The speed and force may change depending on the cable length, load, and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)
*4 A reference value for correcting errors in reciprocal operation
*5 Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*6 Indicates the max. power during operation (including the controller)
This value can be used for the selection of the power supply.
*7 With lock only
*8 For an actuator with lock, add the power for the lock.

Weight

Battery-less Absolute (Step Motor 24 VDC)

Model		Basic type/R type, Symmetrical type/L type			In-line motor type/ D type		
		LESH25$^{R}_{L}$			LESH25D		
Stroke [mm]		50	100	150	50	100	150
Product weight [kg]	Without lock	2.50	3.30	4.26	2.52	3.27	3.60
	With lock	2.84	3.64	4.60	2.86	3.61	3.94

Construction: Basic Type/R Type, Symmetrical Type/L Type



Component Parts

No.	Description	Material	Note
1	**Motor**	—	—
2	**Body**	Aluminum alloy	Anodized
3	**Table**	Stainless steel	Heat treatment + Electroless nickel plating
4	**Guide block**	Stainless steel	Heat treatment
5	**Lead screw**	Stainless steel	Heat treatment + Special treatment
6	**End plate**	Aluminum alloy	Anodized
7	**Pulley cover**	Synthetic resin	—
8	**End cover**	Synthetic resin	—
9	**Rod**	Stainless steel	—
10	**Bearing stopper**	Structural steel	Electroless nickel plating
		Brass	Electroless nickel plating (LESH25R/L□ only)
11	**Motor plate**	Structural steel	
12	**Cap**	Silicone rubber	—
13	**Socket**	Structural steel	Electroless nickel plating
14	**Lead screw pulley**	Aluminum alloy	—
15	**Motor pulley**	Aluminum alloy	—
16	**Spacer**	Stainless steel	LESH25R/L□ only
17	**Origin stopper**	Structural steel	Electroless nickel plating
18	**Bearing**	—	—
19	**Belt**	—	—
20	**Grommet**	Synthetic resin	—
21	**Sim ring**	Structural steel	—
22	**Bushing**	—	Dust-protected option only
23	**Pulley gasket**	NBR	Dust-protected option only
24	**End gasket**	NBR	Dust-protected option only
25	**Scraper**	NBR	Dust-protected option only/Rod
26	**Cover**	Synthetic resin	—
27	**Return guide**	Synthetic resin	—
28	**Scraper**	Stainless steel + NBR	Linear guide
29	**Steel ball**	Special steel	—
30	**Lock**	—	With lock only

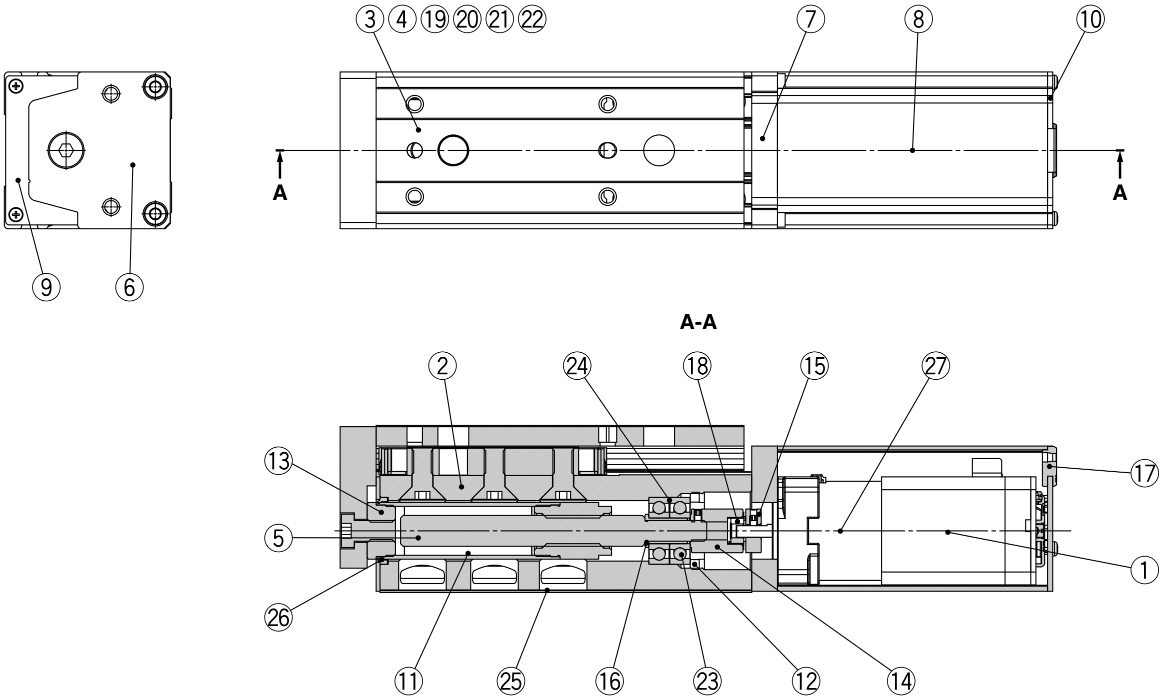
Replacement Parts/Belt

Model	Order no.
LESH25□	LE-D-1-3

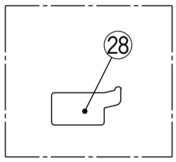
Replacement Parts/Grease Pack

Applied portion	Order no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

Construction: In-line Motor Type/D Type



Shipped together



Component Parts

No.	Description	Material	Note
1	**Motor**	—	—
2	**Body**	Aluminum alloy	Anodized
3	**Table**	Stainless steel	Heat treatment + Electroless nickel plating
4	**Guide block**	Stainless steel	Heat treatment
5	**Lead screw**	Stainless steel	Heat treatment + Special treatment
6	**End plate**	Aluminum alloy	Anodized
7	**Motor flange**	Aluminum alloy	Anodized
8	**Motor cover**	Aluminum alloy	Anodized
9	**End cover**	Aluminum alloy	Anodized
10	**Motor end cover**	Aluminum alloy	Anodized
11	**Rod**	Stainless steel	—
12	**Bearing stopper**	Structural steel	Electroless nickel plating
		Brass	Electroless nickel plating (LESH25D□ only)
13	**Socket**	Structural steel	Electroless nickel plating
14	**Hub (Lead screw side)**	Aluminum alloy	—
15	**Hub (Motor side)**	Aluminum alloy	—
16	**Spacer**	Stainless steel	LESH25D□ only
17	**Grommet**	NBR	—
18	**Spider**	NBR	—
19	**Cover**	Synthetic resin	—
20	**Return guide**	Synthetic resin	—
21	**Scraper**	Stainless steel + NBR	Linear guide

No.	Description	Material	Note
22	**Steel ball**	Special steel	—
23	**Bearing**	—	—
24	**Sim ring**	Structural steel	—
25	**Masking tape**	—	—
26	**Scraper**	NBR	Dust-protected option only/ Rod
27	**Lock**	—	With lock only
28	**Side holder**	Aluminum alloy	Anodized

Optional Parts/Side Holder

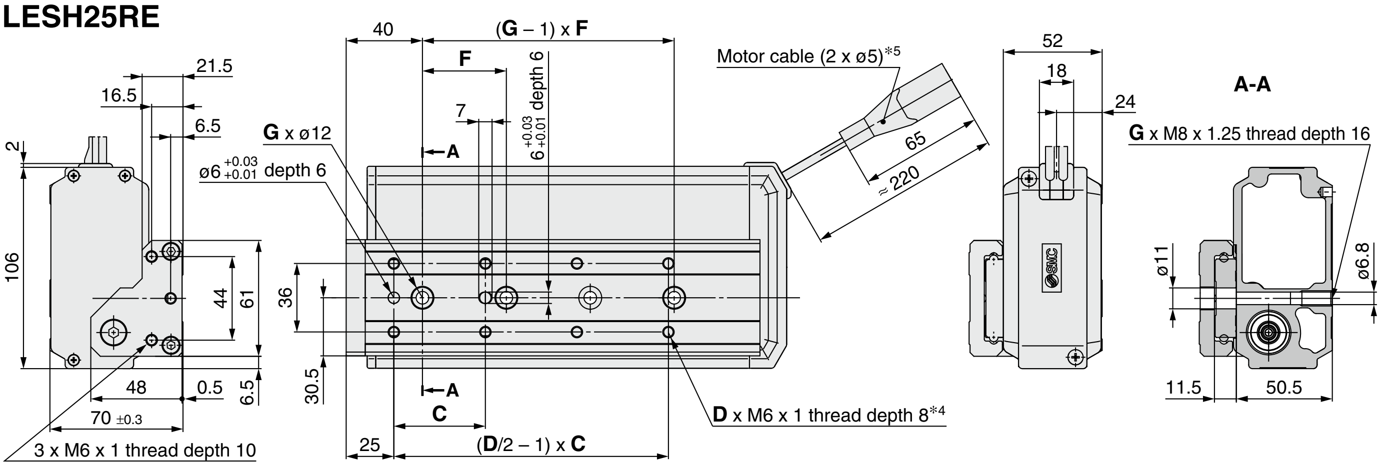
Model	Order no.
LESH25D	LE-D-3-3

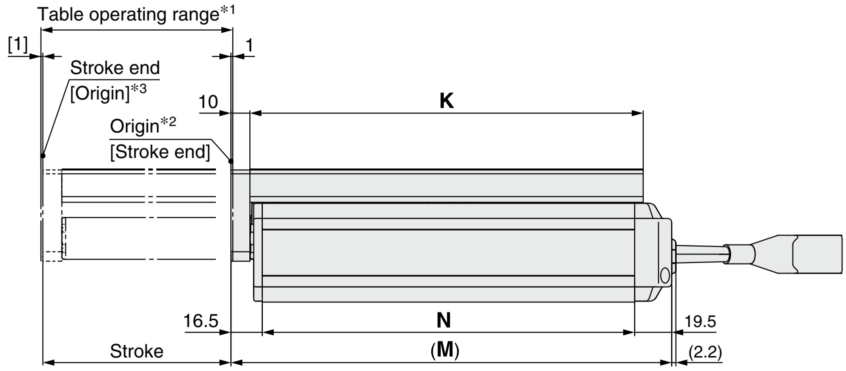
Replacement Parts/Grease Pack

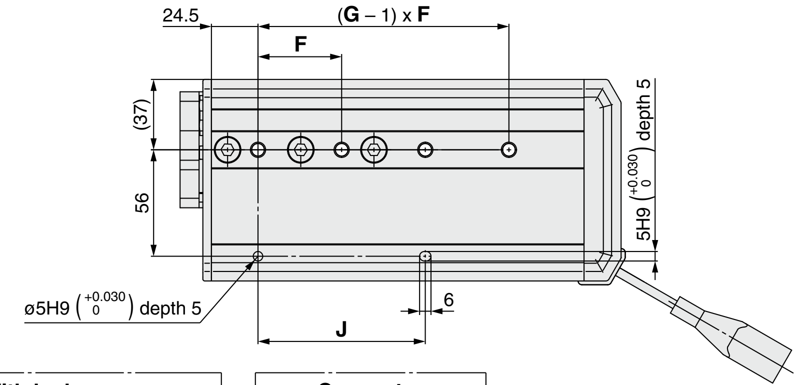
Applied portion	Order no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

Dimensions: Basic Type/R Type

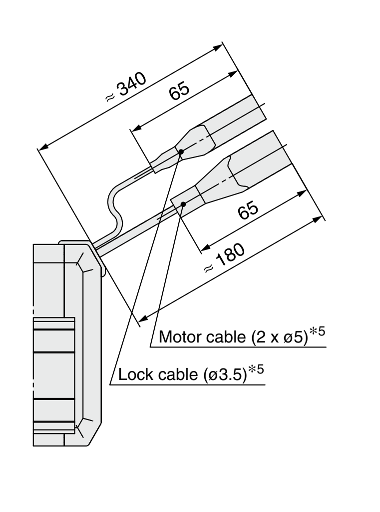
LESH25RE



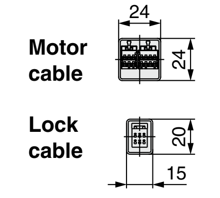




With lock



Connector



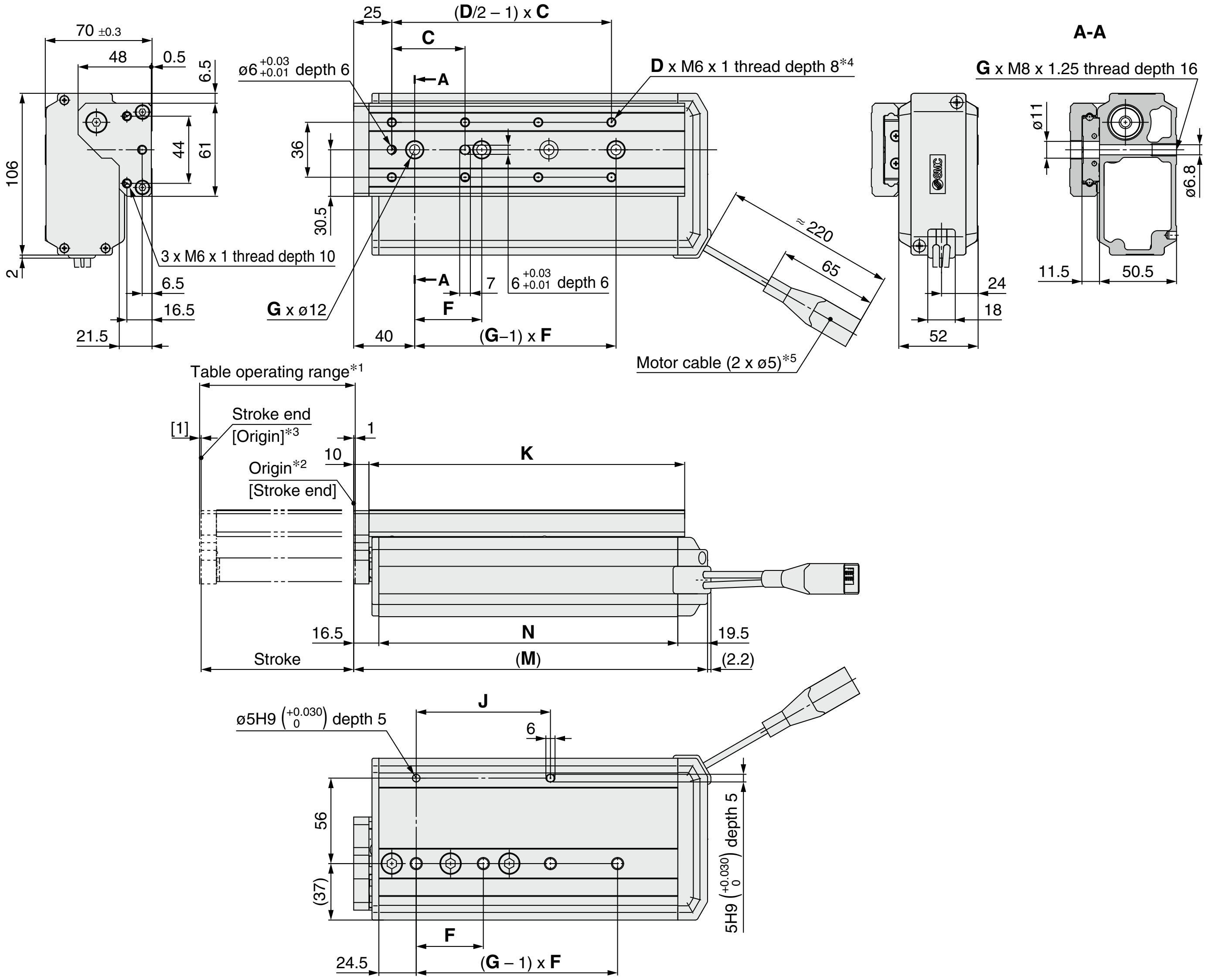
[mm]

Model	C	D	F	G	J	K	M	N
LESH25RE□-50□□-□□□□□	75	4	80	2	80	143	168	132
LESH25RE□-100□□-□□□□□	48	8	44	4	88	207	232	196
LESH25RE□-150□□-□□□□□	65	8	66	4	132	285	310	274

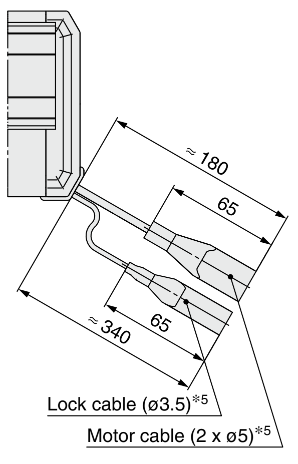
*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions: Symmetrical Type/L Type

LESH25LE

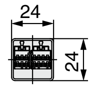


With lock

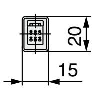


Connector

Motor cable



Lock cable



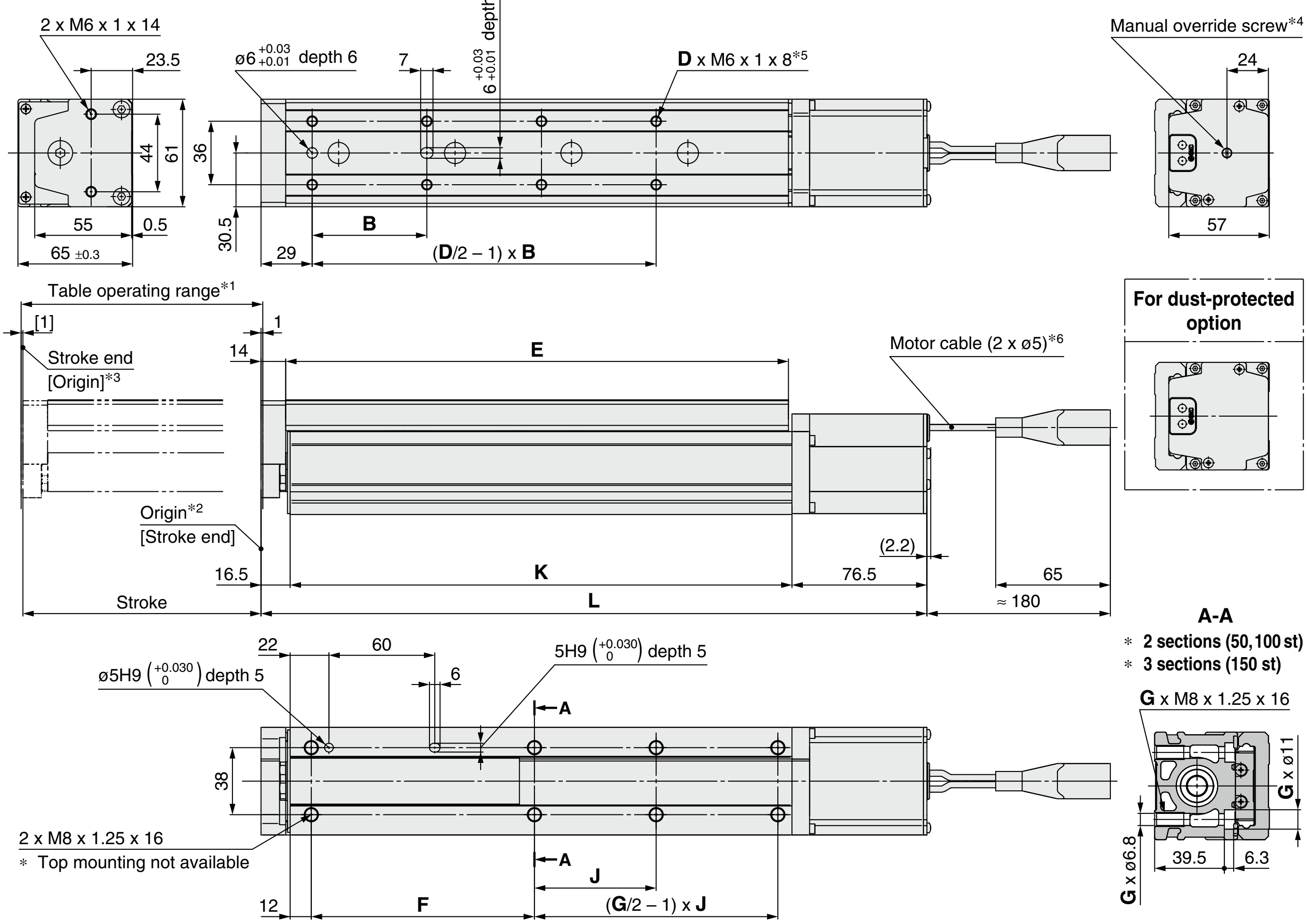
[mm]

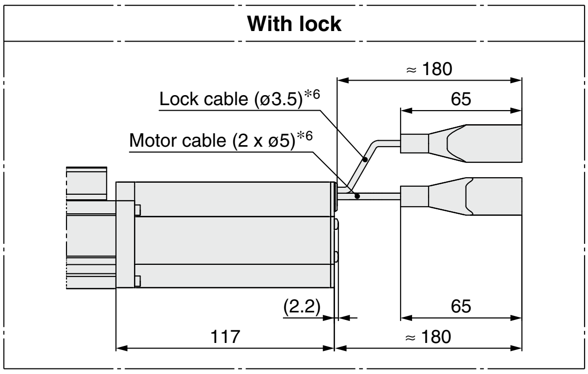
Model	C	D	F	G	J	K	M	N
LESH25LE□-50□□-□□□□□	75	4	80	2	80	143	168	132
LESH25LE□-100□□-□□□□□	48	8	44	4	88	207	232	196
LESH25LE□-150□□-□□□□□	65	8	66	4	132	285	310	274

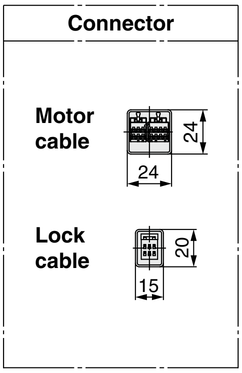
*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions: In-line Motor Type/D Type

LESH25DE





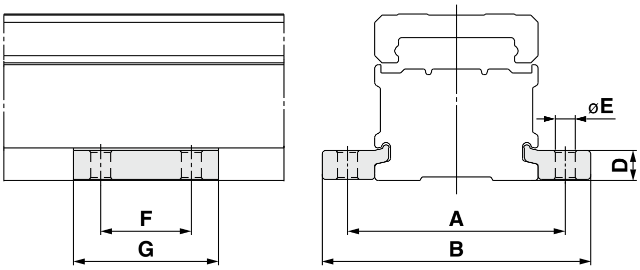


[mm]

Model	L	B	D	E	F	G	J	K
LESH25DE□-50□□-□□□□□	237.5	75	4	143	84	4	40.5	144.5
LESH25DE□-50B□□-□□□□□	278							
LESH25DE□-100□□-□□□□□	299.5	48	8	207	98.5		88	206.5
LESH25DE□-100B□□-□□□□□	340							
LESH25DE□-150□□-□□□□□	377.5	65		285	126.5	6	69	284.5
LESH25DE□-150B□□-□□□□□	418							

*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 The distance between the motor end cover and the manual override screw is up to 4 mm. The motor end cover hole size is ø5.5.
*5 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*6 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Side Holder (In-line Motor Type/D Type)



[mm]

Part no.*1	A	B	D	E	F	G	Applicable model
LE-D-3-3	81	99	12	6.6	30	49	LESH25DE

*1 Part number for 1 side holder

Incremental (Step Motor 24 VDC) Incremental (Servo Motor 24 VDC)

Slide Table High Rigidity Type

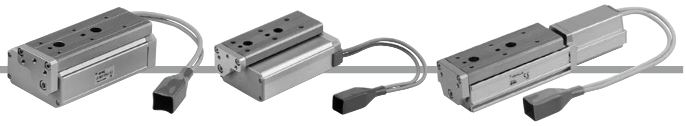
LESH Series LESH8, 16, 25

CE UKCA c UL US

* For details, refer to page 1343 and onward.

RoHS

How to Order



Basic type (R type) Symmetrical type (L type) In-line motor type (D type)

LESH [8] [R] [ ] [J] – [50] [ ] [ ] [ ] – [S1]

JXC□ Series CD17T

LEC□ Series AN 1 [ ]

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬

For details on controllers, refer to page 716.

❶ Size

8
16
25

❹ Lead [mm]

Symbol	LESH8	LESH16	LESH25
J	8	10	16
K	4	5	8

❺ Stroke [mm]

Stroke	Note	
	Size	Applicable stroke
50 to 75	8	50*2, 75
50 to 100	16	50*2, 100
50 to 150	25	50, 100, 150

❻ Motor option

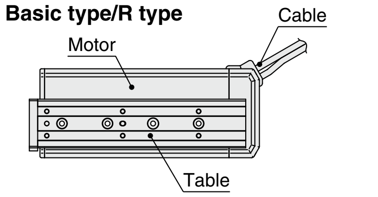
Nil	Without option
B	With lock*2

Applicable motor option chart

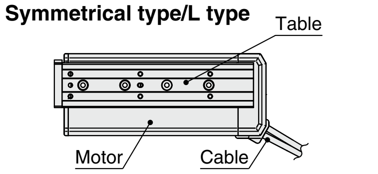
Motor mounting position	Size	Stroke	
		50	75 or more
R/L	8	×	○
	16	×	○
	25	○	○
D	8	○	○
	16	○	○
	25	○	○

❷ Motor mounting position

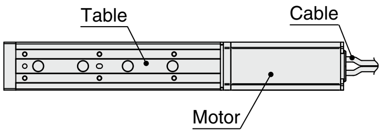
R — **Basic type/R type**



L — **Symmetrical type/L type**



D — **In-line motor type/D type**



❼ Body option

Nil	Without option
S	Dust protected*3

❾ Actuator cable type/length*6

Standard cable [m]

Nil	None
S1	1.5*8
S3	3*8
S5	5*8

Robotic cable [m]

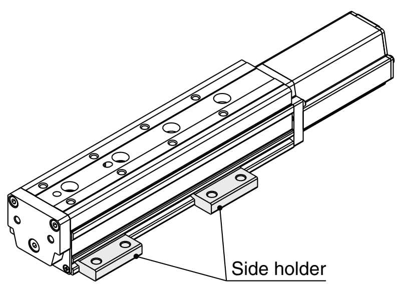
R1	1.5	RA	10*5
R3	3	RB	15*5
R5	5	RC	20*5
R8	8*5		

❸ Motor type

Symbol	Type	Compatible controllers/drivers
Nil	Step motor (Servo/24 VDC)	JXC51 JXCEF JXC61 JXC9F JXCE1 JXCPF JXC91 JXCLF JXCP1 JXCD1 LECP1 JXCL1 LECPA JXCM1
A	Servo motor*1 (24 VDC)	LECA6

❽ Mounting*4

Symbol	Mounting	R type L type	D type
Nil	Without side holder	●	●
H	With side holder (4 pcs.)	—	●



SMC

JXC□ Series (For details, refer to page 717.)

⑩ Controller

Nil	Without controller
C□1□□	With controller

C D 1 7 T

Interface (Communication protocol/Input/Output)

Symbol	Type	Number of axes, Special specification: Standard	With STO sub-function
5	Parallel input (NPN)	●	
6	Parallel input (PNP)	●	
E	EtherCAT	●	●
9	EtherNet/IP™	●	●
P	PROFINET	●	●
D	DeviceNet®	●	
L	IO-Link	●	●
M	CC-Link	●	

Mounting

7	Screw mounting
8*12	DIN rail

Number of axes, Special specification

Symbol	Number of axes	Specification
1	Single axis	Standard
F	Single axis	With STO sub-function

Communication plug connector, I/O cable*13

Symbol	Type	Applicable interface
Nil	Without accessory	—
S	Straight type communication plug connector	DeviceNet® CC-Link Ver. 1.10
T	T-branch type communication plug connector	DeviceNet® CC-Link Ver. 1.10
1	I/O cable (1.5 m)	Parallel input (NPN) Parallel input (PNP)
3	I/O cable (3 m)	Parallel input (NPN) Parallel input (PNP)
5	I/O cable (5 m)	Parallel input (NPN) Parallel input (PNP)

LEC□ Series (For details, refer to page 717.)

AN 1 □

⑩ ⑪ ⑫

⑩ Controller/Driver type*7

Nil	Without controller/driver	
6N	**LECA6** (Step data input type)	NPN
6P	**LECA6** (Step data input type)	PNP
1N	**LECP1***8 (Programless type)	NPN
1P	**LECP1***8 (Programless type)	PNP
AN	**LECPA***8 *9 (Pulse input type)	NPN
AP	**LECPA***8 *9 (Pulse input type)	PNP

⑪ I/O cable length*10

Nil	Without cable (Without communication plug connector)
1	1.5 m
3	3 m*11
5	5 m*11

⑫ Controller/Driver mounting

Nil	Screw mounting
D	DIN rail*12

*1 LESH25DA is not available.
*2 As the applicable motor mounting positions and motor options vary depending on the stroke, refer to the applicable motor option chart on page 715.
*3 For R/L type (IP5X equivalent), a scraper is mounted on the rod cover, and gaskets are mounted on both the end covers. For D type, a scraper is mounted on the rod cover.
*4 Refer to page 731 for details.
*5 Produced upon receipt of order (Robotic cable only)
*6 The standard cable should only be used on fixed parts.
For use on moving parts, select the robotic cable.
Refer to pages 1092 and 1093 if only the actuator cable is required.
*7 For details on controllers/drivers and compatible motors, refer to the compatible controllers/drivers on the next page.
*8 Only available for the motor type “Step motor”
*9 When pulse signals are open collector, order the current limiting resistor (LEC-PA-R-□) on page 1062 separately.
*10 When “Without controller/driver” is selected for controller/driver types, I/O cable cannot be selected. Refer to page 1037 (For LECA6), page 1047 (For LECP1), or page 1062 (For LECPA) if an I/O cable is required.
*11 When “Pulse input type” is selected for controller/driver types, pulse input usable only with differential. Only 1.5 m cables usable with open collector
*12 The DIN rail is not included. It must be ordered separately.
*13 Select “Nil” for anything other than DeviceNet®, CC-Link, or parallel input.
Select “Nil,” “S,” or “T” for DeviceNet® or CC-Link.
Select “Nil,” “1,” “3,” or “5” for parallel input.

⚠Caution

[CE/UKCA-compliant products]

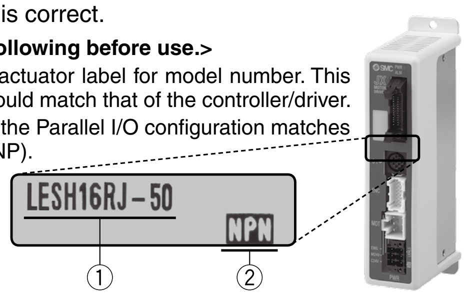
① EMC compliance was tested by combining the electric actuator LES series and the controller LEC/JXC series.
The EMC depends on the configuration of the customer’s control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with the EMC directive cannot be certified for SMC components incorporated into the customer’s equipment under actual operating conditions. As a result, it is necessary for the customer to verify compliance with the EMC directive for the machinery and equipment as a whole.
② For the incremental (servo motor 24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 1037 for the noise filter set. Refer to the LECA series Operation Manual for installation.

[UL-compliant products (For the LEC series)]
When compliance with UL is required, the electric actuator and controller/driver should be used with a UL1310 Class 2 power supply.

The actuator and controller/driver are sold as a package.

Confirm that the combination of the controller/driver and the actuator is correct.

<Check the following before use.>
① Check the actuator label for model number. This number should match that of the controller/driver.
② Check that the Parallel I/O configuration matches (NPN or PNP).



* Refer to the Operation Manual for using the products. Please download it via our website: https://www.smcworld.com

Compatible Controllers/Drivers

Type	Step data input type 	Step data input type 	Programless type 	Pulse input type 
Series	JXC51 JXC61	LECA6	LECP1	LECPA
Features	Parallel I/O	Parallel I/O	Capable of setting up operation (step data) without using a PC or teaching box	Operation by pulse signals
Compatible motor	Step motor (Servo/24 VDC)	Servo motor (24 VDC)	Step motor (Servo/24 VDC)	
Max. number of step data	64 points		14 points	—
Power supply voltage	24 VDC			
Reference page	1017	1031	1042	1057

Type	EtherCAT direct input type 	EtherCAT direct input type with STO sub-function 	EtherNet/IP™ direct input type 	EtherNet/IP™ direct input type with STO sub-function 	PROFINET direct input type 	PROFINET direct input type with STO sub-function 	DeviceNet® direct input type 	IO-Link direct input type 	IO-Link direct input type with STO sub-function 	CC-Link direct input type 
Series	JXCE1	JXCEF	JXC91	JXC9F	JXCP1	JXCPF	JXCD1	JXCL1	JXCLF	JXCM1
Features	EtherCAT direct input	EtherCAT direct input with STO sub-function	EtherNet/IP™ direct input	EtherNet/IP™ direct input with STO sub-function	PROFINET direct input	PROFINET direct input with STO sub-function	DeviceNet® direct input	IO-Link direct input	IO-Link direct input with STO sub-function	CC-Link direct input
Compatible motor	Step motor (Servo/24 VDC)									
Max. number of step data	64 points									
Power supply voltage	24 VDC									
Reference page	1063									

Specifications

Step Motor (Servo/24 VDC)

Model			LESH8□		LESH16□		LESH25□	
Actuator specifications	Stroke [mm]		50, 75		50, 100		50, 100, 150	
	Work load [kg]*1 *3	Horizontal	2	1	8	5	12	8
		Vertical	0.5	0.25	2	1	4	2
	Pushing force [N] 30% to 70%*2 *3		6 to 15	4 to 10	23.5 to 55	15 to 35	77 to 180	43 to 100
	Speed [mm/s]*1 *3		10 to 200	20 to 400	10 to 200	20 to 400	10 to 150	20 to 400
	Pushing speed [mm/s]		10 to 20	20	10 to 20	20	10 to 20	20
	Max. acceleration/deceleration [mm/s²]		5000					
	Positioning repeatability [mm]		±0.05					
	Lost motion [mm]*4		0.15 or less					
	Screw lead [mm]		4	8	5	10	8	16
	Impact/Vibration resistance [m/s²]*5		50/20					
	Actuation type		Slide screw + Belt (R/L type), Slide screw (D type)					
	Guide type		Linear guide (Circulating type)					
	Operating temperature range [°C]		5 to 40					
	Operating humidity range [%RH]		90 or less (No condensation)					
	Enclosure		IP30					
Electric specifications	Motor size		□20		□28		□42	
	Motor type		Step motor (Servo/24 VDC)					
	Encoder		Incremental					
	Power supply voltage [V]		24 VDC ±10%					
	Power [W]*6 *8		Max. power 35		Max. power 60		Max. power 74	
Lock unit specifications	Type	*7	Non-magnetizing lock					
	Holding force [N]		24	2.5	300	48	500	77
	Power [W]*8		3.5		2.9		5	
	Rated voltage [V]		24 VDC ±10%					

*1 Speed changes according to the work load. Check the "Speed–Work Load Graph (Guide)" on page 696.
*2 Pushing force accuracy is ±20% (F.S.).
*3 The speed and force may change depending on the cable length, load, and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)
*4 A reference value for correcting errors in reciprocal operation
*5 Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*6 Indicates the max. power during operation (including the controller)
This value can be used for the selection of the power supply.
*7 With lock only
*8 For an actuator with lock, add the power for the lock.

Specifications

Servo Motor (24 VDC)

	Model		LESH8□A		LESH16□A		LESH25$^{R}_{L}$A*1	
Actuator specifications	Stroke [mm]		50, 75		50, 100		50, 100, 150	
	Work load [kg]	Horizontal	2	1	5	2.5	6	4
		Vertical	0.5	0.25	2	1	2.5	1.5
	Pushing force 50 to 100% [N]*2		7.5 to 11	5 to 7.5	17.5 to 35	10 to 20	31 to 62	19 to 38
	Speed [mm/s]		1 to 200	1 to 400	1 to 200	1 to 400	1 to 150	1 to 400
	Pushing speed [mm/s]*2		1 to 20					
	Max. acceleration/deceleration [mm/s^2]		5000					
	Positioning repeatability [mm]		±0.05					
	Lost motion [mm]*3		0.15 or less					
	Screw lead [mm]		4	8	5	10	8	16
	Impact/Vibration resistance [m/s^2]*4		50/20					
	Actuation type		Slide screw + Belt (R/L type), Slide screw (D type)					
	Guide type		Linear guide (Circulating type)					
	Operating temperature range [°C]		5 to 40					
	Operating humidity range [%RH]		90 or less (No condensation)					
	Enclosure		IP30					
Electric specifications	Motor size		□20		□28		□42	
	Motor output [W]		10		30		36	
	Motor type		Servo motor (24 VDC)					
	Encoder		Incremental					
	Power supply voltage [V]		24 VDC ±10%					
	Power [W]*5 *7		Max. power 84		Max. power 124		Max. power 158	
Lock unit specifications	Type	*6	Non-magnetizing lock					
	Holding force [N]	*6	24	2.5	300	48	500	77
	Power [W]*7	*6	3.5		2.9		5	
	Rated voltage [V]	*6	24 VDC ±10%					

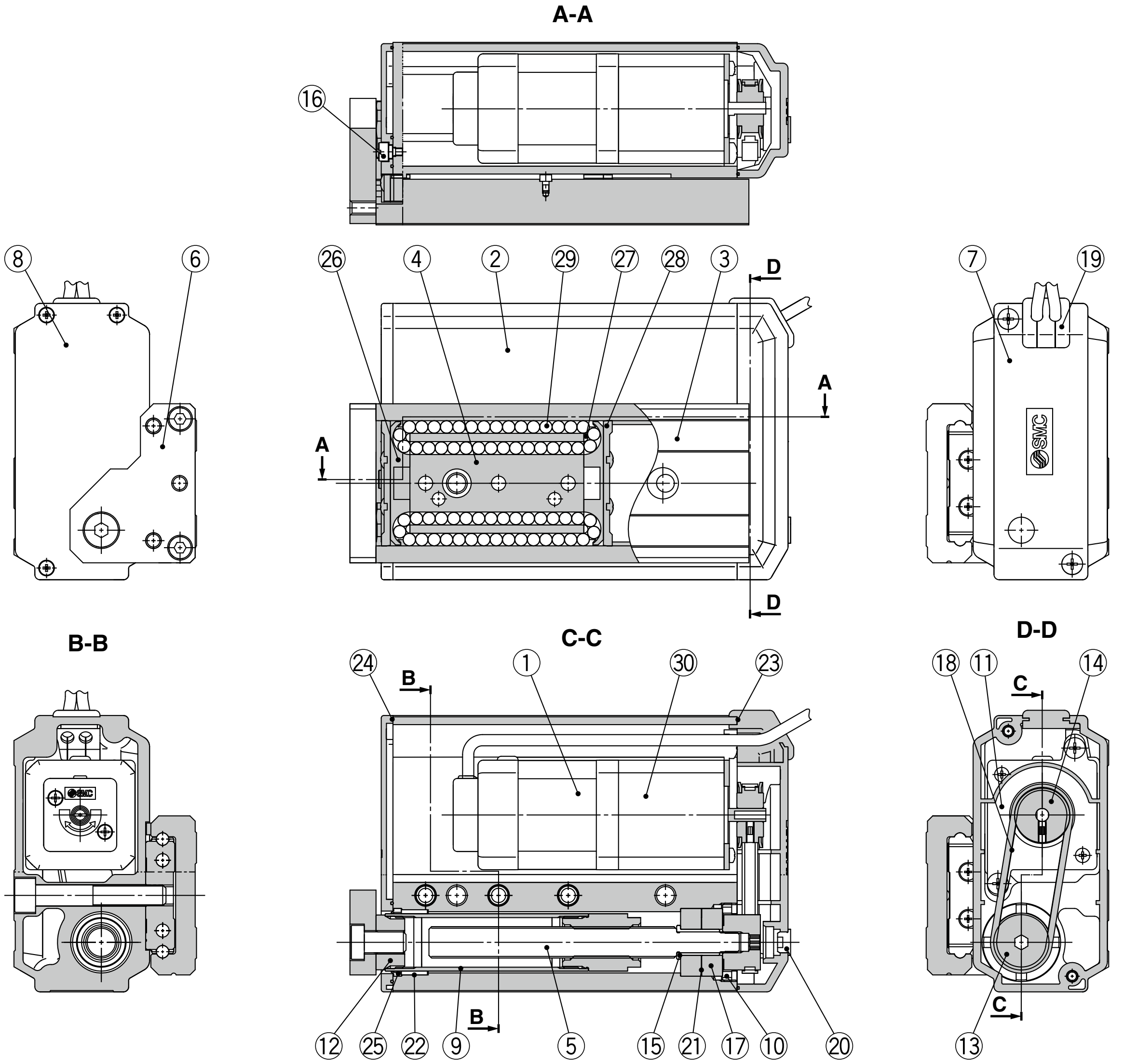
*1 LESH25DA is not available.
*2 The pushing force values for LESH8□A is 50% to 75%. Pushing force accuracy is ±20% (F.S.).
*3 A reference value for correcting errors in reciprocal operation
*4 Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*5 Indicates the max. power during operation (including the controller)
This value can be used for the selection of the power supply.
*6 With lock only
*7 For an actuator with lock, add the power for the lock.

Weight

Step Motor (Servo/24 VDC), Servo Motor (24 VDC) Common

Model		Basic type/R type, Symmetrical type/L type							In-line motor type/D type						
		LESH8$^{R}_{L}$(A)		LESH16$^{R}_{L}$(A)		LESH25$^{R}_{L}$(A)			LESH8D(A)		LESH16D(A)		LESH25D		
Stroke [mm]		50	75	50	100	50	100	150	50	75	50	100	50	100	150
Product weight [kg]	Without lock	0.55	0.70	1.15	1.60	2.50	3.30	4.26	0.57	0.70	1.25	1.70	2.52	3.27	3.60
	With lock	—	0.76	—	1.71	2.84	3.64	4.60	0.63	0.76	1.36	1.81	2.86	3.61	3.94

Construction: Basic Type/R Type, Symmetrical Type/L Type



Component Parts

No.	Description	Material	Note
1	**Motor**	—	—
2	**Body**	Aluminum alloy	Anodized
3	**Table**	Stainless steel	Heat treatment + Electroless nickel plating
4	**Guide block**	Stainless steel	Heat treatment
5	**Lead screw**	Stainless steel	Heat treatment + Special treatment
6	**End plate**	Aluminum alloy	Anodized
7	**Pulley cover**	Synthetic resin	—
8	**End cover**	Synthetic resin	—
9	**Rod**	Stainless steel	—
10	**Bearing stopper**	Structural steel	Electroless nickel plating
		Brass	Electroless nickel plating (LESH25R/L□ only)
11	**Motor plate**	Structural steel	—
12	**Socket**	Structural steel	Electroless nickel plating
13	**Lead screw pulley**	Aluminum alloy	—
14	**Motor pulley**	Aluminum alloy	—
15	**Spacer**	Stainless steel	—
16	**Origin stopper**	Structural steel	Electroless nickel plating
17	**Bearing**	—	—
18	**Belt**	—	—
19	**Grommet**	Synthetic resin	—
20	**Cap**	Silicone rubber	—
21	**Sim ring**	Structural steel	—
22	**Bushing**	—	Dust-protected option only
23	**Pulley gasket**	NBR	Dust-protected option only
24	**End gasket**	NBR	Dust-protected option only
25	**Scraper**	NBR	Dust-protected option only/Rod
26	**Cover**	Synthetic resin	—
27	**Return guide**	Synthetic resin	—
28	**Scraper**	Stainless steel + NBR	Linear guide
29	**Steel ball**	Special steel	—
30	**Lock**	—	With lock only

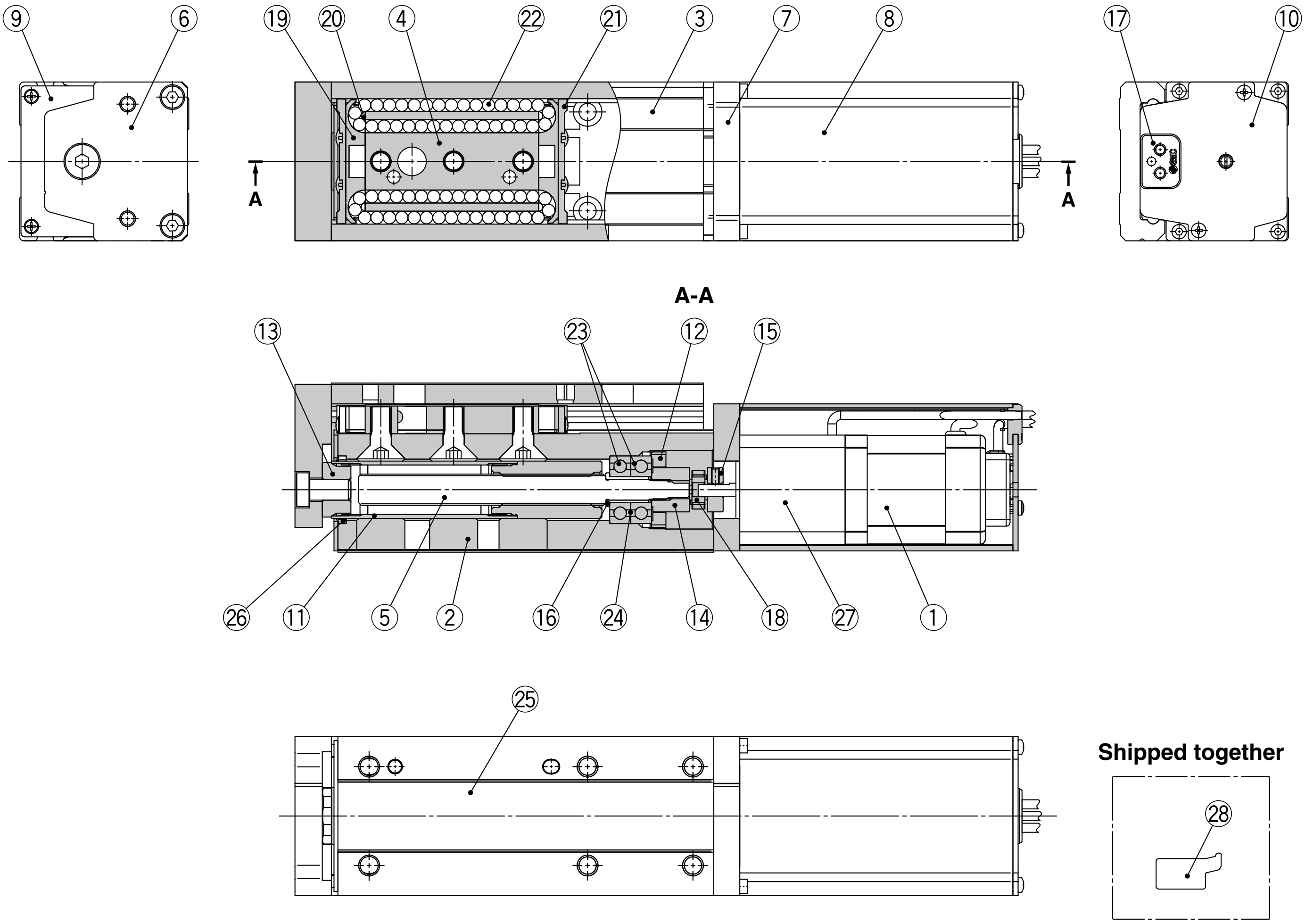
Replacement Parts/Belt

Model	Order no.
LESH8□	LE-D-1-1
LESH16□	LE-D-1-2
LESH25□	LE-D-1-3
LESH25□A	LE-D-1-4

Replacement Parts/Grease Pack

Applied portion	Order no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

Construction: In-line Motor Type/D Type



Component Parts

No.	Description	Material	Note
1	**Motor**	—	—
2	**Body**	Aluminum alloy	Anodized
3	**Table**	Stainless steel	Heat treatment + Electroless nickel plating
4	**Guide block**	Stainless steel	Heat treatment
5	**Lead screw**	Stainless steel	Heat treatment + Special treatment
6	**End plate**	Aluminum alloy	Anodized
7	**Motor flange**	Aluminum alloy	Anodized
8	**Motor cover**	Aluminum alloy	Anodized
9	**End cover**	Aluminum alloy	Anodized
10	**Motor end cover**	Aluminum alloy	Anodized
11	**Rod**	Stainless steel	—
12	**Bearing stopper**	Structural steel	Electroless nickel plating
		Brass	Electroless nickel plating (LESH25D□ only)
13	**Socket**	Structural steel	Electroless nickel plating
14	**Hub (Lead screw side)**	Aluminum alloy	—
15	**Hub (Motor side)**	Aluminum alloy	—
16	**Spacer**	Stainless steel	LESH25D□ only
17	**Grommet**	NBR	—
18	**Spider**	NBR	—
19	**Cover**	Synthetic resin	—
20	**Return guide**	Synthetic resin	—
21	**Scraper**	Stainless steel + NBR	Linear guide
22	**Steel ball**	Special steel	—
23	**Bearing**	—	—
24	**Sim ring**	Structural steel	—
25	**Masking tape**	—	—
26	**Scraper**	NBR	Dust-protected option only/ Rod
27	**Lock**	—	With lock only
28	**Side holder**	Aluminum alloy	Anodized

Optional Parts/Side Holder

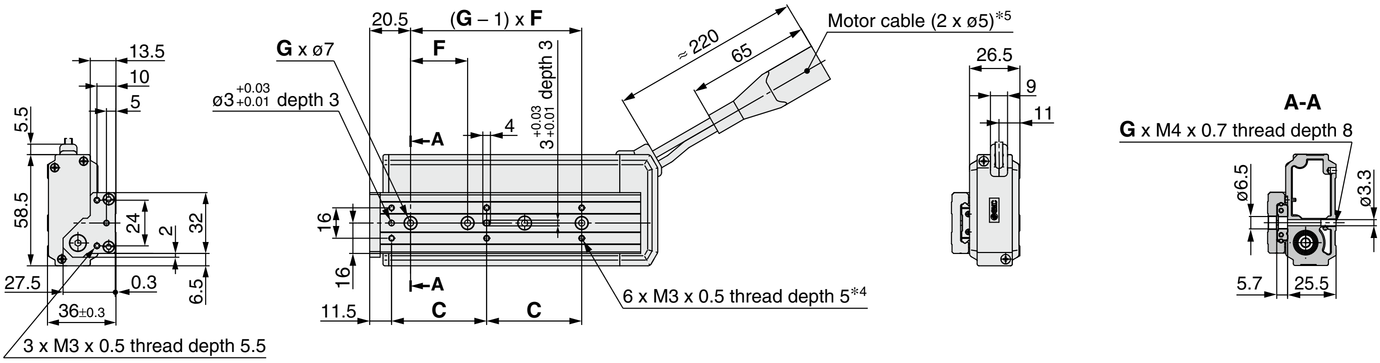
Model	Order no.
LESH8D	LE-D-3-1
LESH16D	LE-D-3-2
LESH25D	LE-D-3-3

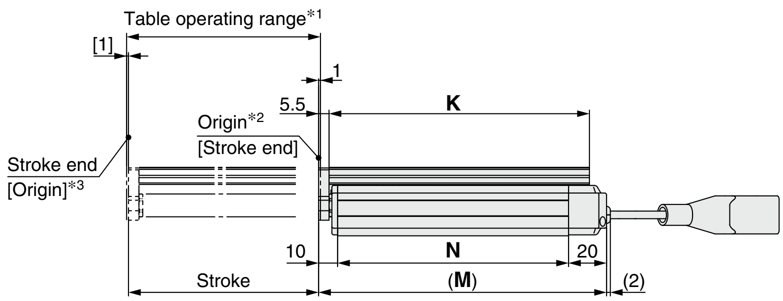
Replacement Parts/Grease Pack

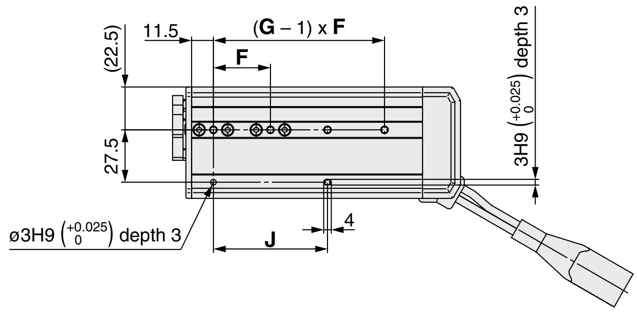
Applied portion	Order no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

Dimensions: Basic Type/R Type

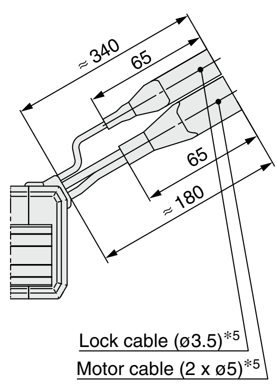
LESH8R



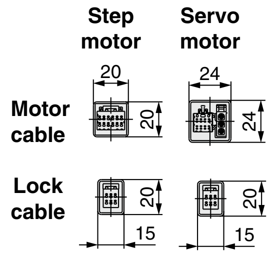




With lock



Connector



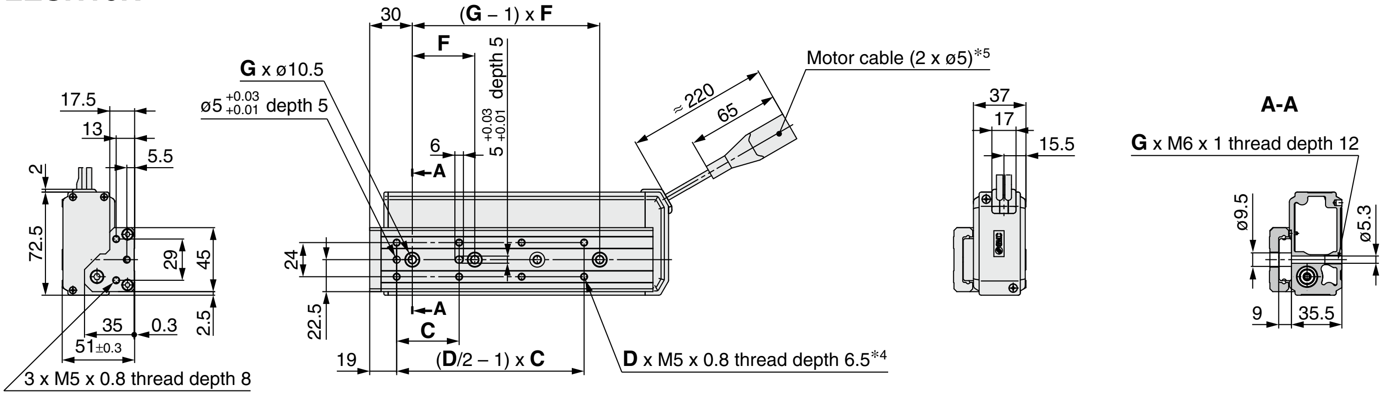
[mm]

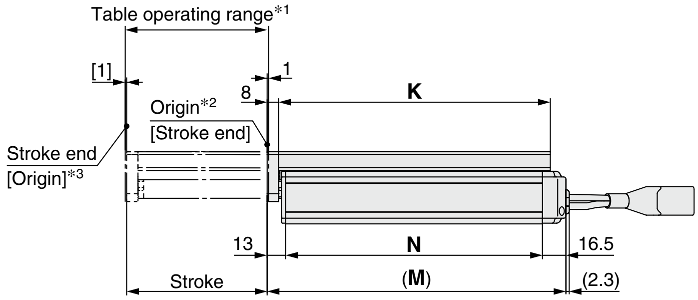
Model	C	F	G	J	K	M	N
LESH8R□□-50□□-□□□□□	46	29	3	58	111	125.5	95.5
LESH8R□□-75□□-□□□□□	50	30	4	60	137	151.5	121.5

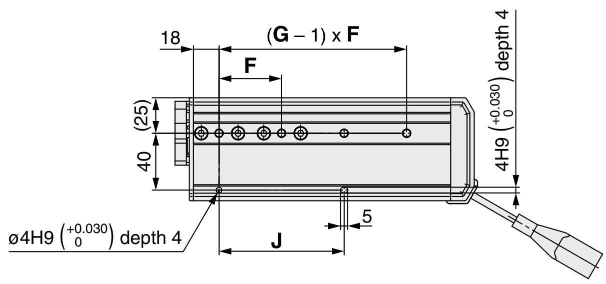
*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions: Basic Type/R Type

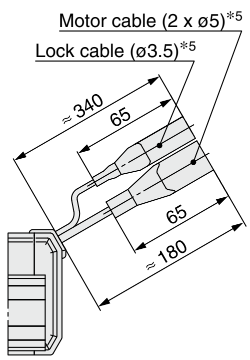
LESH16R







With lock



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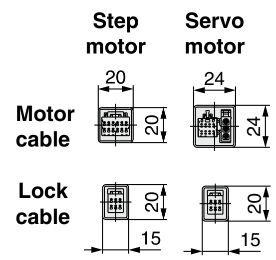


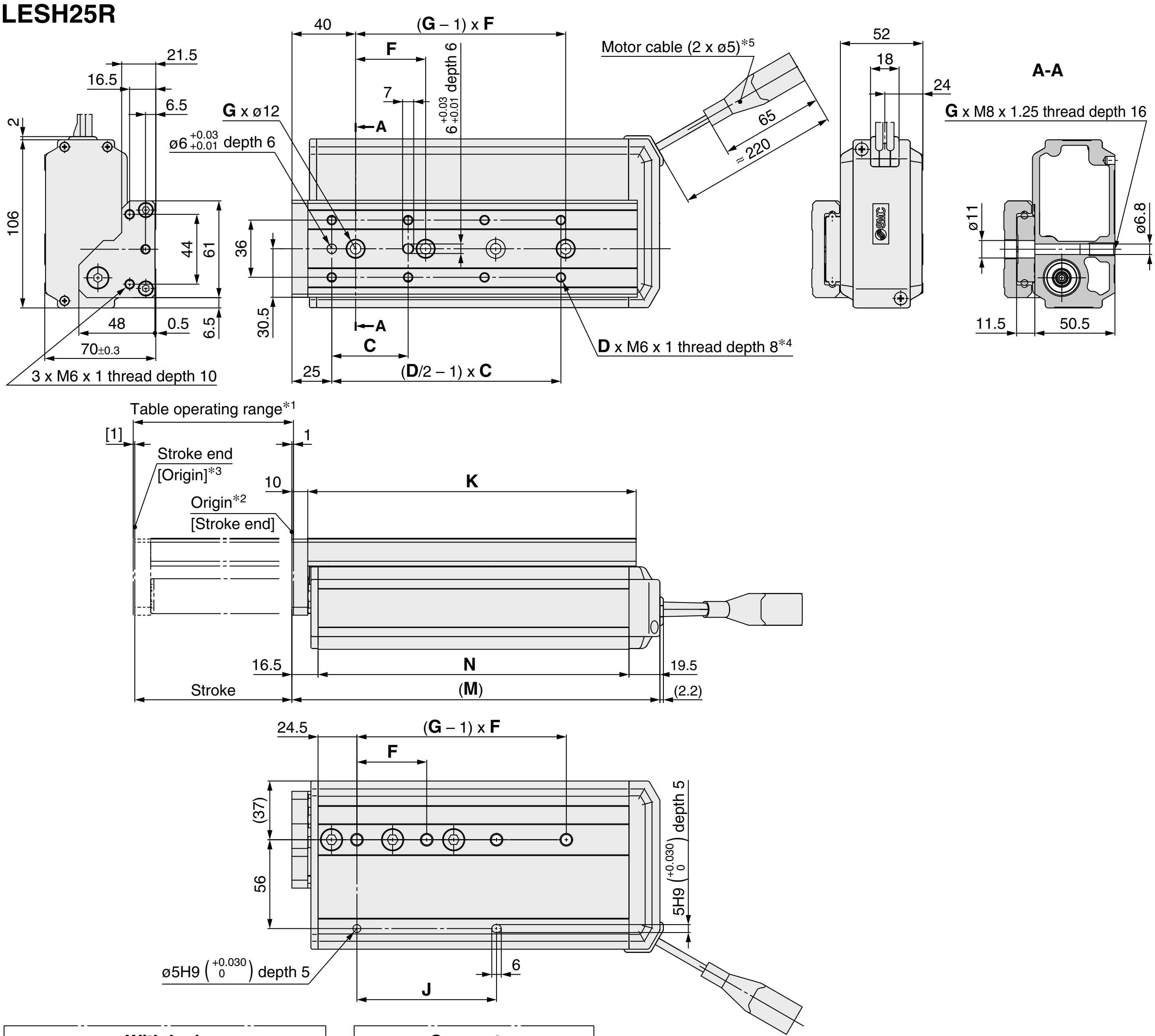
[mm]

Model	C	D	F	G	J	K	M	N
LESH16R□□-50□□-□□□□□	40	6	45	2	45	116.5	135.5	106
LESH16R□□-100□□-□□□□□	44	8	44	4	88	191.5	210.5	181

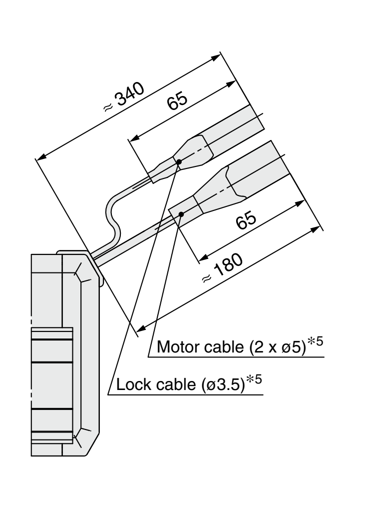
*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions: Basic Type/R Type

LESH25R



With lock



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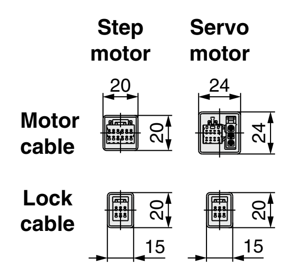


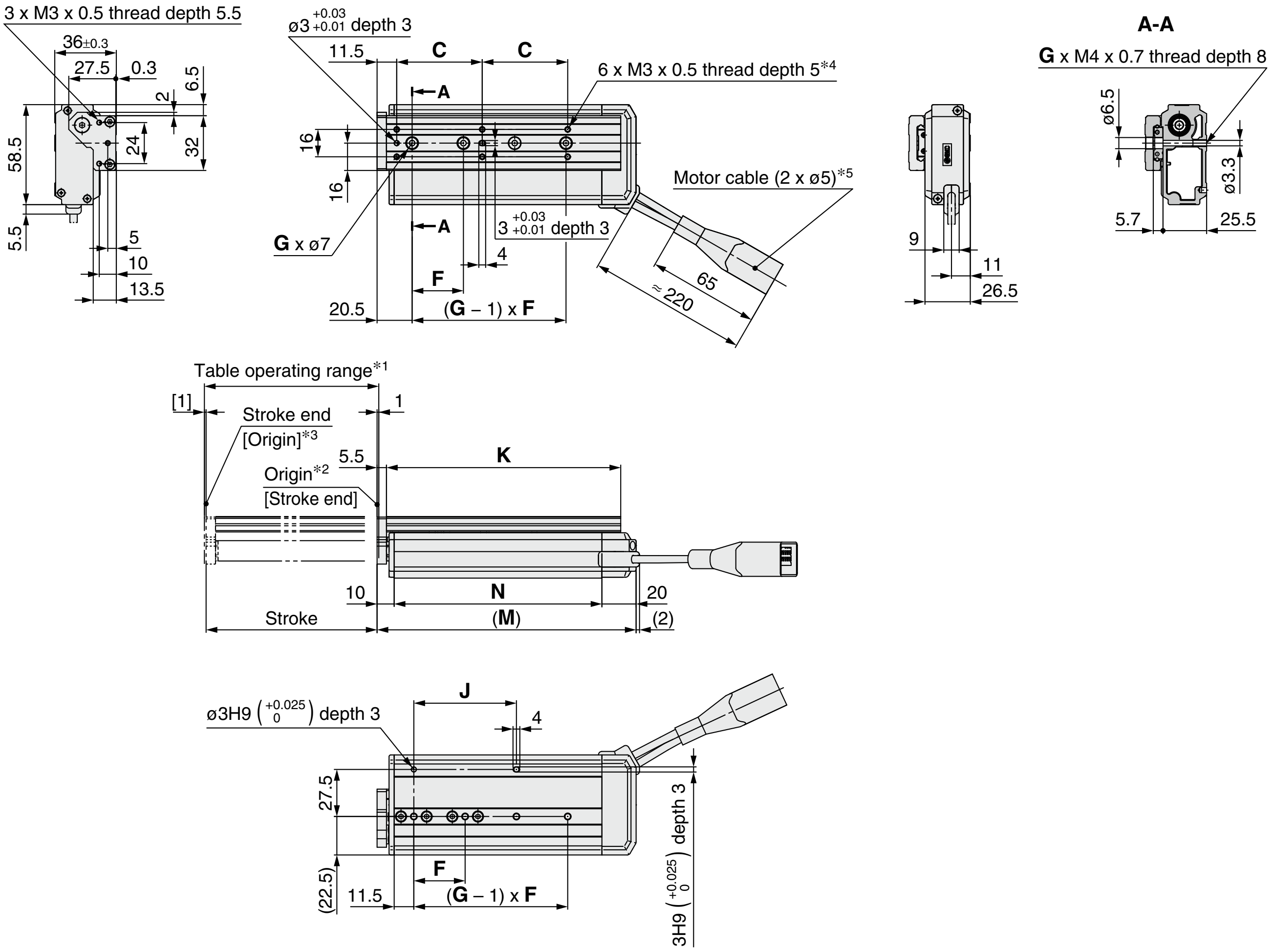
[mm]

Model	C	D	F	G	J	K	M	N
LESH25R□□-50□□-□□□□□	75	4	80	2	80	143	168	132
LESH25R□□-100□□-□□□□□	48	8	44	4	88	207	232	196
LESH25R□□-150□□-□□□□□	65	8	66	4	132	285	310	274

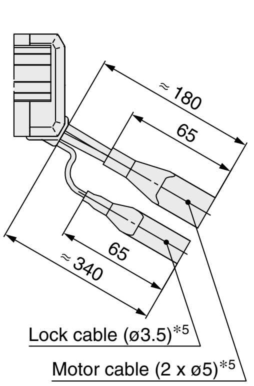
*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions: Symmetrical Type/L Type

LESH8L



With lock



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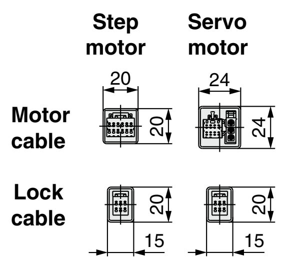


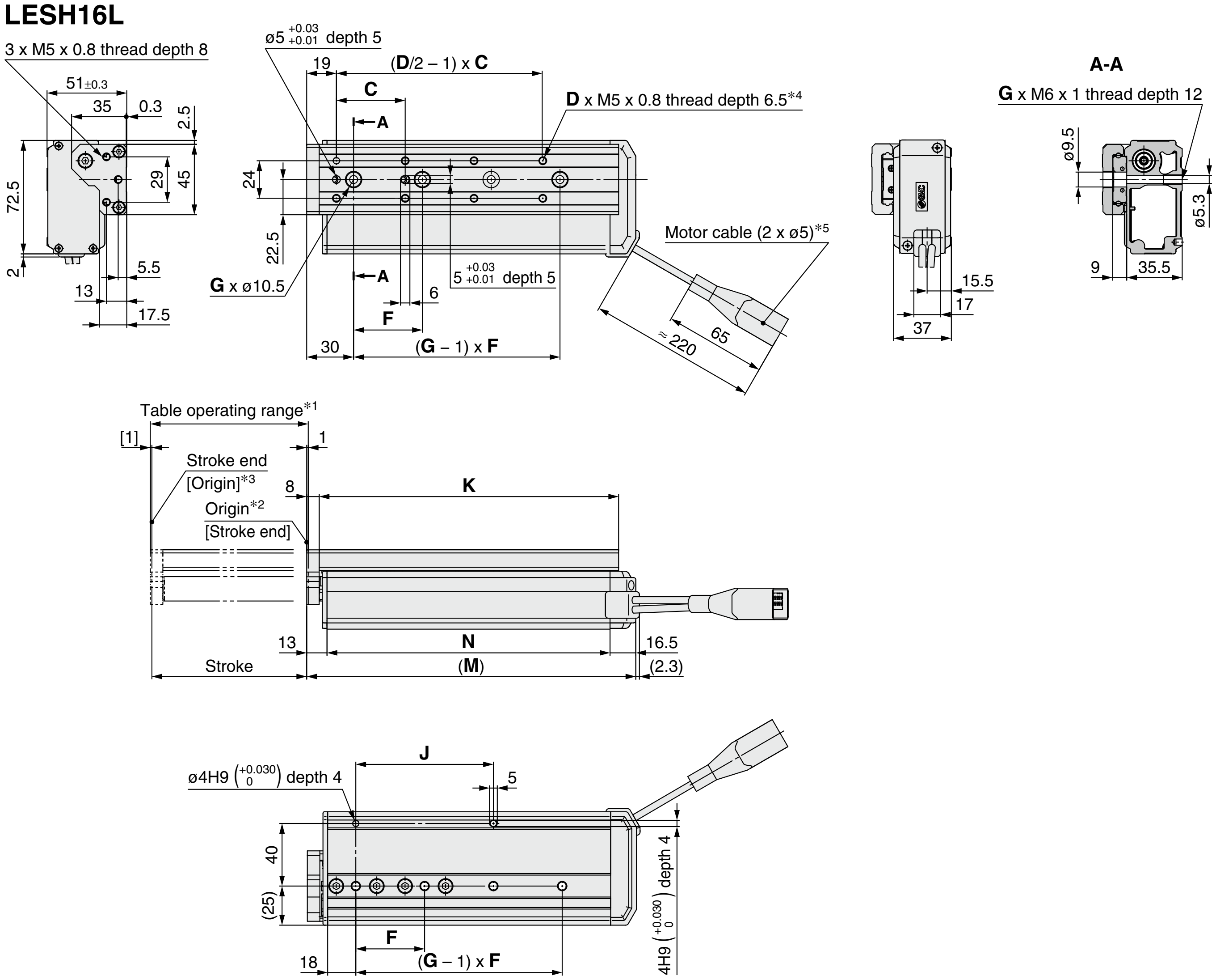
[mm]

Model	C	F	G	J	K	M	N
LESH8L□□-50□□-□□□□□	46	29	3	58	111	125.5	95.5
LESH8L□□-75□□-□□□□□	50	30	4	60	137	151.5	121.5

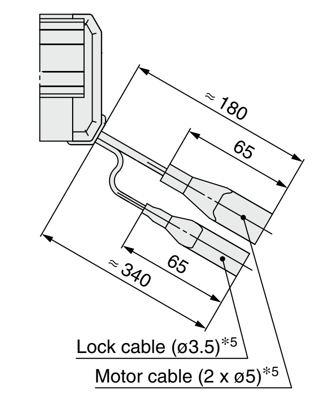
*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions: Symmetrical Type/L Type

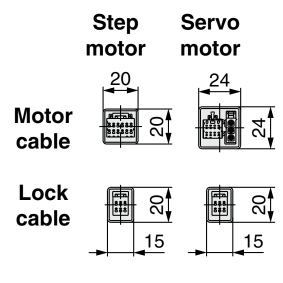
LESH16L



With lock



Connector



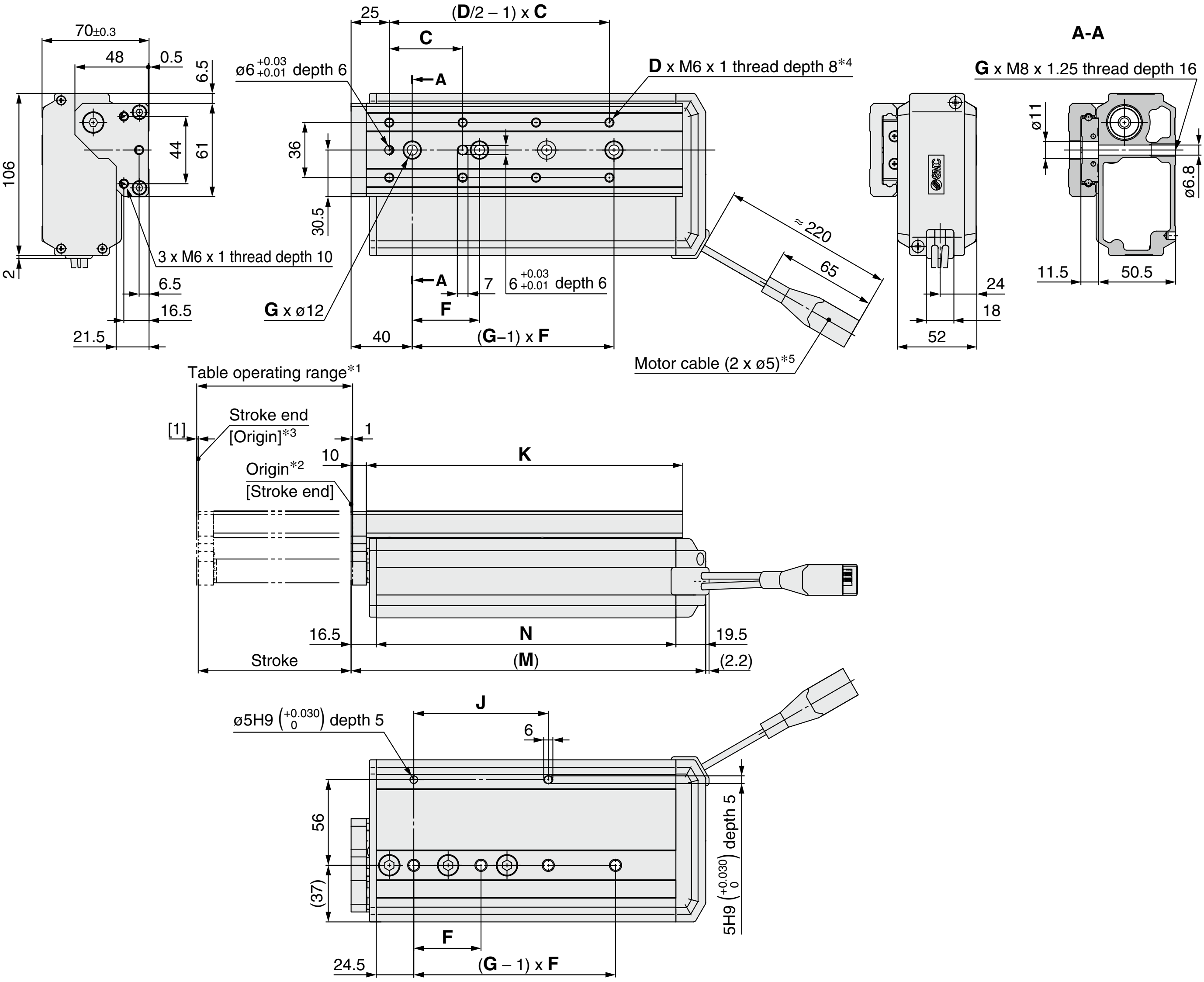
[mm]

Model	C	D	F	G	J	K	M	N
LESH16L□□-50□□-□□□□□	40	6	45	2	45	116.5	135.5	106
LESH16L□□-100□□-□□□□□	44	8	44	4	88	191.5	210.5	181

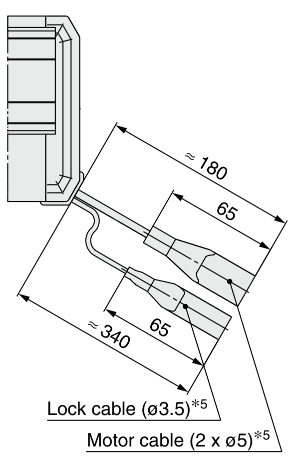
*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions: Symmetrical Type/L Type

LESH25L



With lock



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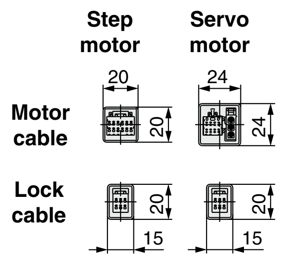


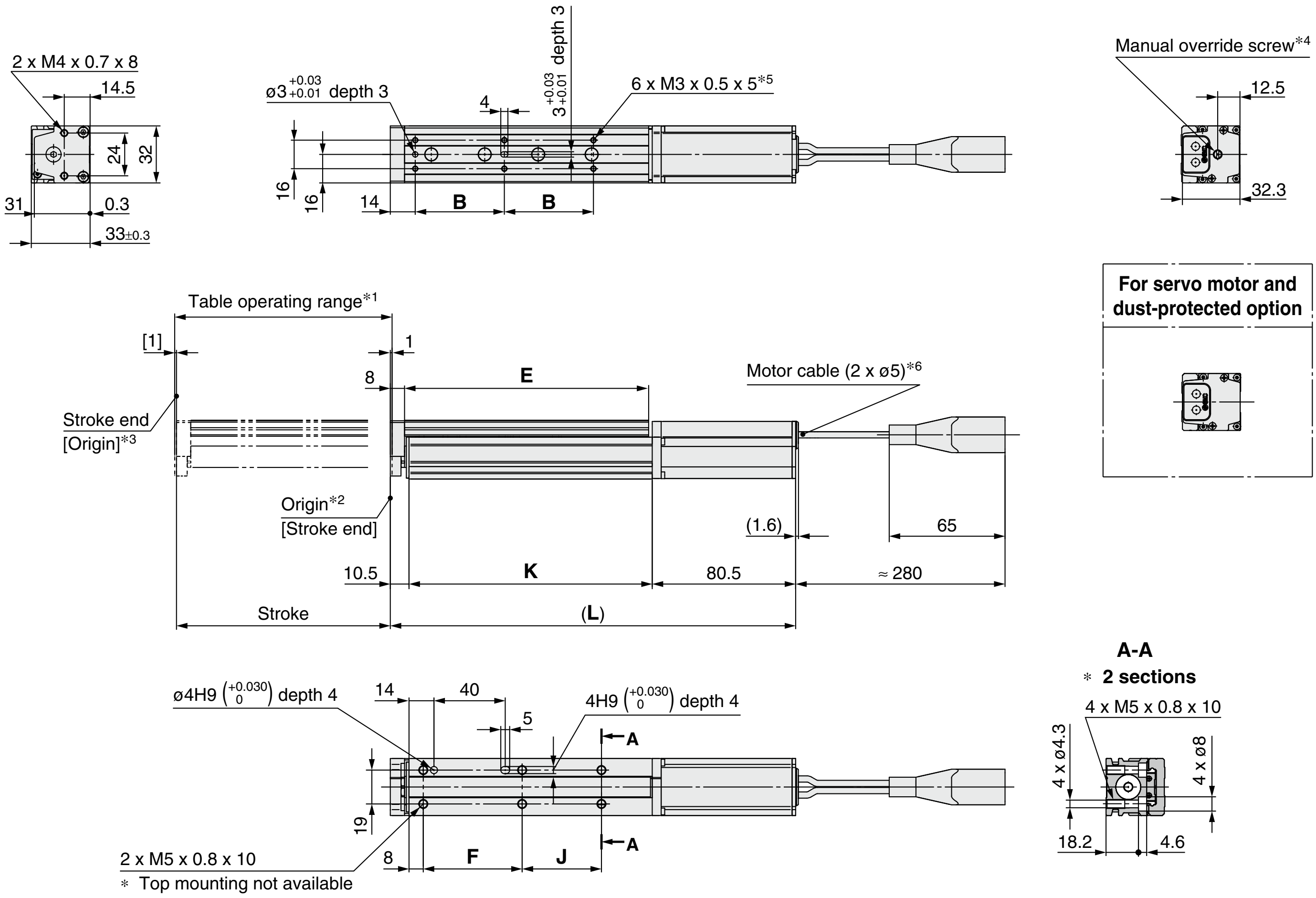
[mm]

Model	C	D	F	G	J	K	M	N
LESH25L□□-50□□-□□□□□	75	4	80	2	80	143	168	132
LESH25L□□-100□□-□□□□□	48	8	44	4	88	207	232	196
LESH25L□□-150□□-□□□□□	65	8	66	4	132	285	310	274

*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*5 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions: In-line Motor Type/D Type

LESH8D



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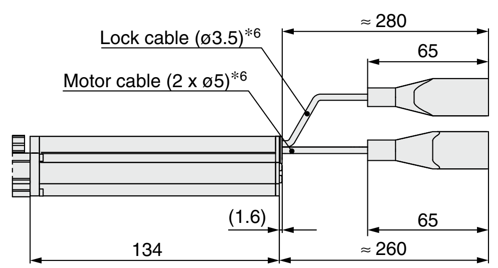

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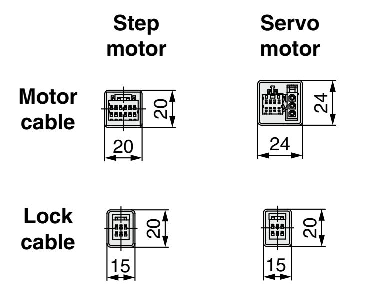


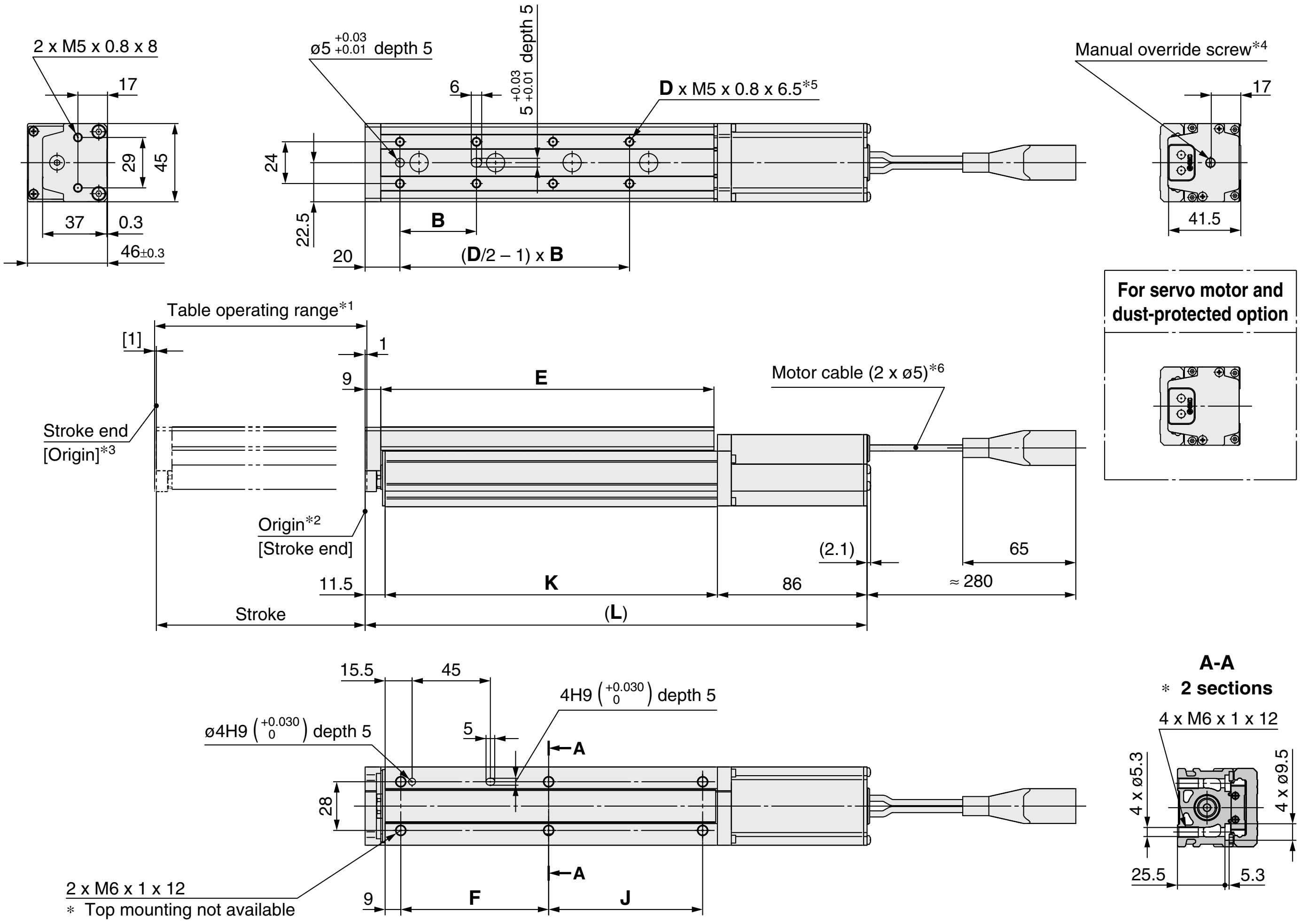
[mm]

Model	L	B	E	F	J	K
LESH8D□□-50□□-□□□□□	201.5	46	111	54.5	19.5	110.5
LESH8D□□-50B□□-□□□□□	255					
LESH8D□□-75□□-□□□□□	227.5	50	137	55.5	44.5	136.5
LESH8D□□-75B□□-□□□□□	281					

*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 The distance between the motor end cover and the manual override screw is up to 16 mm. The motor end cover hole size is ø5.5.
*5 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*6 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions: In-line Motor Type/D Type

LESH16D



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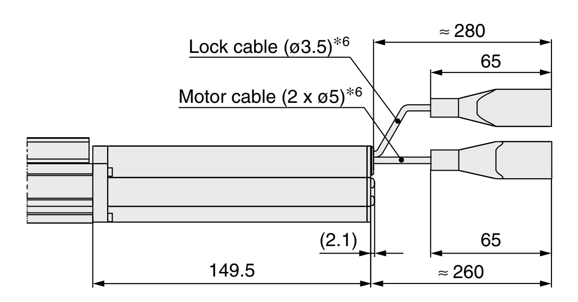

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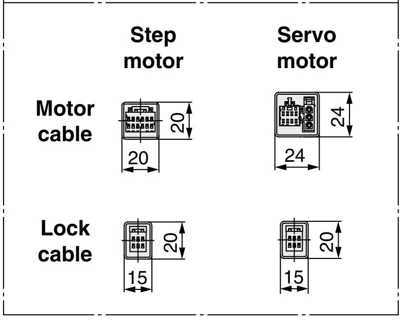


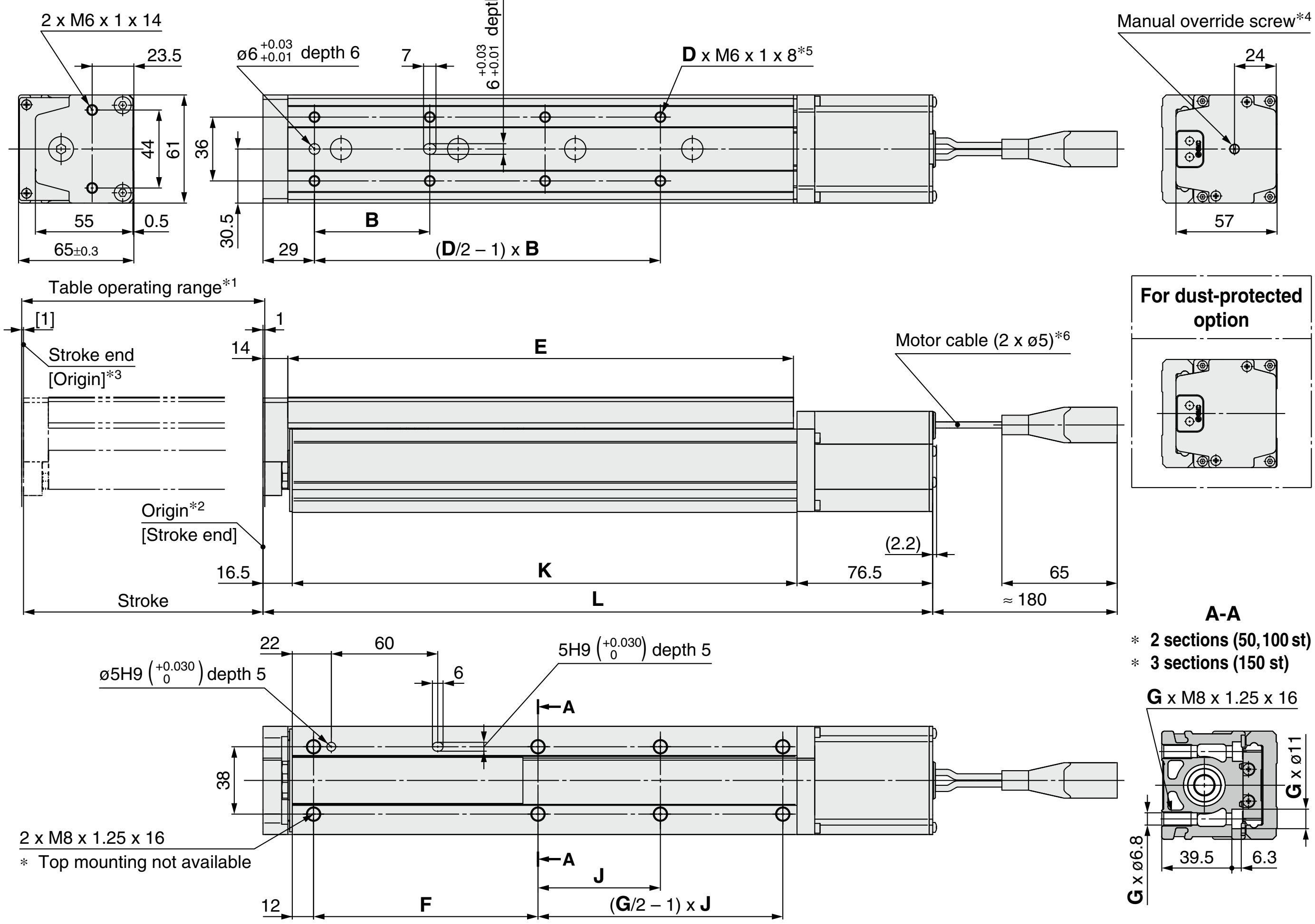
[mm]

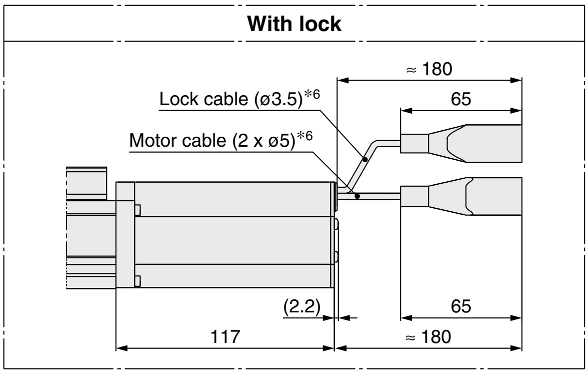
Model	L	B	D	E	F	J	K
LESH16D□□-50□□-□□□□□	219.5	40	6	116.5	65	39.5	122
LESH16D□□-50B□□-□□□□□	283						
LESH16D□□-100□□-□□□□□	288.5	44	8	191.5	85	88.5	191
LESH16D□□-100B□□-□□□□□	352						

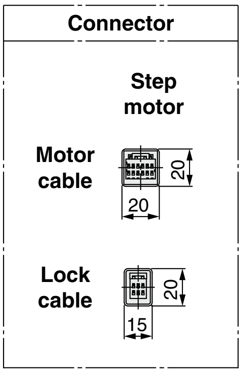
*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 The distance between the motor end cover and the manual override screw is up to 17 mm. The motor end cover hole size is ø5.5.
*5 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*6 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Dimensions: In-line Motor Type/D Type

LESH25D





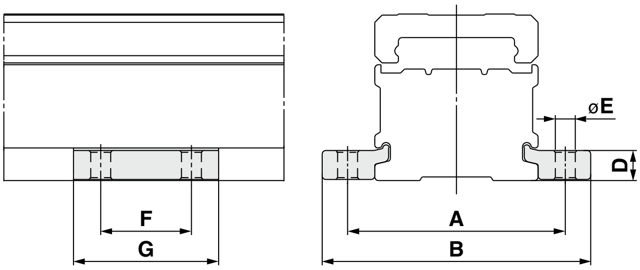


[mm]

Model	L	B	D	E	F	G	J	K
LESH25D□-50□□-□□□□□	237.5	75	4	143	84	4	40.5	144.5
LESH25D□-50B□□-□□□□□	278							
LESH25D□-100□□-□□□□□	299.5	48	8	207	98.5		88	206.5
LESH25D□-100B□□-□□□□□	340							
LESH25D□-150□□-□□□□□	377.5	65		285	126.5	6	69	284.5
LESH25D□-150B□□-□□□□□	418							

*1 This is the range within which the table can move when it returns to origin. Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 The distance between the motor end cover and the manual override screw is up to 4 mm. The motor end cover hole size is ø5.5.
*5 If workpiece retaining screws are too long, they can touch the guide block and cause a malfunction. Use screws that are between the maximum and minimum screw-in depths in length.
*6 Secure the motor cable and lock cable so that the cables are not repeatedly bent.

Side Holder (In-line Motor Type/D Type)



[mm]

Part no.*1	A	B	D	E	F	G	Applicable model
LE-D-3-1	45	57.6	6.7	4.5	20	33	**LESH8D**
LE-D-3-2	60	74	8.3	5.5	25	40	**LESH16D**
LE-D-3-3	81	99	12	6.6	30	49	**LESH25D**

*1 Part numbers for 1 side holder

LES/LESH Series
Specific Product Precautions 1

Be sure to read this before handling the products. Refer to page 1351 for safety instructions and pages 1352 to 1357 for electric actuator precautions.

Design

⚠Caution

1. Do not apply a load in excess of the specification limits.

Select a suitable actuator by work load and allowable moment. If the product is used outside of the specification limits, the eccentric load applied to the guide will be excessive and have adverse effects such as the generation of play on the guide, reduced accuracy, reduced service life of the product.

2. Do not use the product in applications where excessive external force or impact force is applied to it.

This can cause a malfunction.

Handling

⚠Caution

1. INP output signal

1) Positioning operation

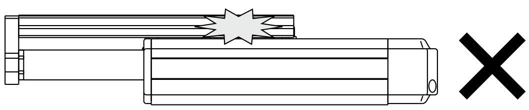
When the product comes within the set range of the step data [In position], the INP output signal will turn ON.
Initial value: Set to [0.50] or higher.

2) Pushing operation

When the effective force exceeds the step data [Trigger LV], the INP output signal will turn ON. Use the product within the specified range of the [Pushing force] and [Trigger LV].
To ensure that the actuator pushes the workpieces with the set [Pushing force], it is recommended that the [Trigger LV] be set to the same value as the [Pushing force].

2. When the pushing operation is used, be sure to set to [Pushing operation]. Never allow the table to collide with the stroke end except during return to origin.

When incorrect instructions are inputted, such as those which cause the product to operate outside of the specification limits or outside of the actual stroke through changes in the controller/driver settings and/or origin position, the table may collide with the stroke end of the actuator. Be sure to check these points before use.
If the table collides with the stroke end of the actuator, the guide, belt, or internal stopper may break. This can result in abnormal operation.



Handle the actuator with care when it is used in the vertical direction as the workpiece will fall freely from its own weight.

3. Use the product with the following moving force.

- Step motor (Servo/24 VDC): 100%
- Servo motor (24 VDC) : 250%

If the moving force is set below the values above, it may cause the generation of an alarm.

Handling

⚠Caution

4. The actual speed of this actuator is affected by the load.

Check the model selection section of the catalog.

5. Do not apply a load, impact, or resistance in addition to the transferred load during return to origin.

Additional force will cause the displacement of the origin position since it is based on the detected motor torque.

6. The table and guide block are made of special stainless steel, but can rust in an environment where droplets of water adhere to it.

7. Do not dent, scratch, or cause other damage to the body, table and end plate mounting surfaces.

Doing so may cause unevenness in the mounting surface, play in the guide, or an increase in the sliding resistance.

8. Do not dent, scratch or cause other damage to the surface over which the rail and guide will move.

Doing so may cause play or an increase in the sliding resistance.

9. Do not apply strong impact or an excessive moment while mounting a workpiece.

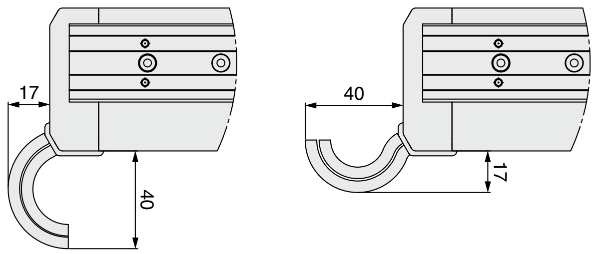
If an external force over the allowable moment is applied, it may cause play in the guide or an increase in the sliding resistance.

10. Keep the flatness of mounting surface within 0.02 mm.

If a workpiece or base does not sit evenly on the body of the product, play in the guide or an increase in the sliding resistance may occur. Do not deform the mounting surface by mounting with workpieces tucked in.

11. Do not drive the main body with the table fixed.

12. When mounting the product, for R/L type fixed cable, keep the following dimension or more for bends in the cable. For D type, keep a 40 mm or longer diameter for bends in the cable.



LES/LESH Series
Specific Product Precautions 2

Be sure to read this before handling the products. Refer to page 1351 for safety instructions and pages 1352 to 1357 for electric actuator precautions.

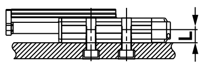
Handling

⚠Caution

13. When mounting the product, use screws of adequate length and tighten them to the maximum torque or less.

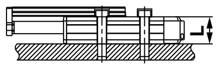
Tightening the screws with a higher torque than recommended may result in a malfunction, while tightening with a lower torque can result in the displacement of the mounting position or, in extreme conditions, the actuator could become detached from its mounting position.

Body fixed/ Side mounting (Body tapped)



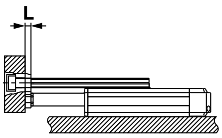
Model	Screw size	Max. tightening torque [N·m]	L (Max. screw-in depth [mm])
LES□8R/L	M4 x 0.7	1.5	8
LES□8D	M5 x 0.8	3	10
LES16R/L			
LES16D	M6 x 1	5.2	12
LESH16□			
LES25R/L			
LES25D	M8 x 1.25	10	16
LESH25□			

Body fixed/ Side mounting (Through-hole)



Model	Screw size	Max. tightening torque [N·m]	L [mm]
LES8R/L	M3 x 0.5	0.63	23.5
LESH8R/L			25.5
LES□8D	M4 x 0.7	1.5	18.2
LES16R/L			33.5
LES16D	M5 x 0.8	3	25.2
LESH16R/L			35.5
LESH16D			25.5
LES25R/L			49
LES25D	M6 x 1	5.2	39.8
LESH25R/L			50.5
LESH25D			39.5

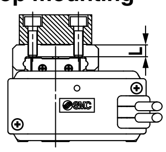
Workpiece fixed/ Front mounting



Model	Screw size	Max. tightening torque [N·m]	L [mm]
LES8R/L	M3 x 0.5	0.63	6
LESH8R/L			5.5
LES□8D	M4 x 0.7	1.5	8
LES16R/L			
LES16D	M5 x 0.8	3	
LESH16□			
LES25R/L	M6 x 1	5.2	12
LESH25R/L			10
LES□25D			14

To prevent the workpiece retaining screws from penetrating the end plate, use screws that are 0.5 mm or shorter than the maximum screw-in depth. If long screws are used, they may touch the end plate and cause a malfunction.

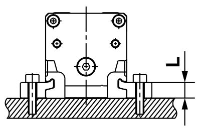
Workpiece fixed/ Top mounting



Model	Screw size	Max. tightening torque [N·m]	L (Min. to Max. screw-in depth [mm])
LES8□	M3 x 0.5	0.63	2.1 to 4.1
LESH8□			5 (Max.)
LES16□	M4 x 0.7	1.5	2.7 to 5.7
LESH16□	M5 x 0.8	3	6.5 (Max.)
LES25□			3.3 to 7.3
LESH25□	M6 x 1	5.2	8 (Max.)

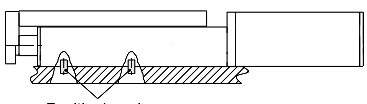
To prevent the workpiece retaining screws from touching the guide block, use screws that are the maximum screw-in depth or less. If long screws are used, they may touch the guide block and cause a malfunction.

Body fixed/Side mounting (Side holder)



Model	Screw size	Max. tightening torque [N·m]	L [mm]
LES□8D	M4 x 0.7	1.5	6.7
LES□16D	M5 x 0.8	3	8.3
LES□25D	M6 x 1	5.2	12

When using the side holders to install the actuator, be sure to use the positioning pin. It can be displaced when vibration or excessive external force is applied.



Positioning pin

14. For pushing operations, set the product to a position at least 0.5 mm away from a workpiece. (This position is referred to as the pushing start position.)

The following alarms may be generated and operation may become unstable if the product is set to the same position as a workpiece.

a. "Posn failed"

The product cannot reach the pushing start position due to variations in the width of workpieces.

b. "Pushing ALM"

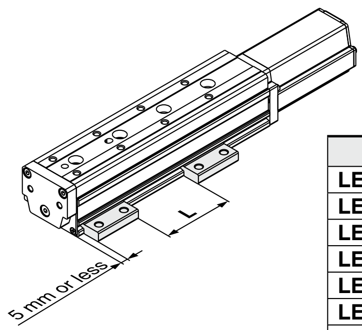
The product is pushed back from the pushing start position after starting to push.

15. When external force is to be applied to the table, it is necessary to reduce the work load for the sizing.

When a cable duct or flexible moving tube is attached to the actuator, the sliding resistance of the table will increase, which may lead to the malfunction of the product.

16. When using the side holders to install the actuator, use within the following dimension range.

Otherwise, installation balance will deteriorate and cause loosening.

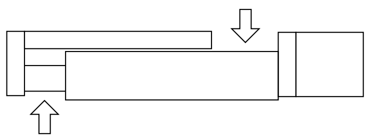


Model	L [mm]
LES□8D□-30	5 to 10
LES□8D□-50	20 to 30
LES□8D□-75	50 to 60
LES□16D□-30	5 to 10
LES□16D□-50	20 to 30
LES□16D□-75	60 to 75
LES□16D□-100	85 to 100
LES□25D□-30	5 to 15
LES□25D□-50	25 to 35
LES□25D□-75	60 to 75
LES□25D□-100	70 to 100
LES□25D□-125	155 to 170
LES□25D□-150	160 to 180

17. For the LES□□D, do not grasp or peel off a masking tape on the bottom of the body.

The masking tape may peel off and foreign matter may get inside the actuator.

18. For the LES□□D, a gap will form between the motor flange and table when the table moves (marked with the arrow below). Be careful not to put hands or fingers in a gap.



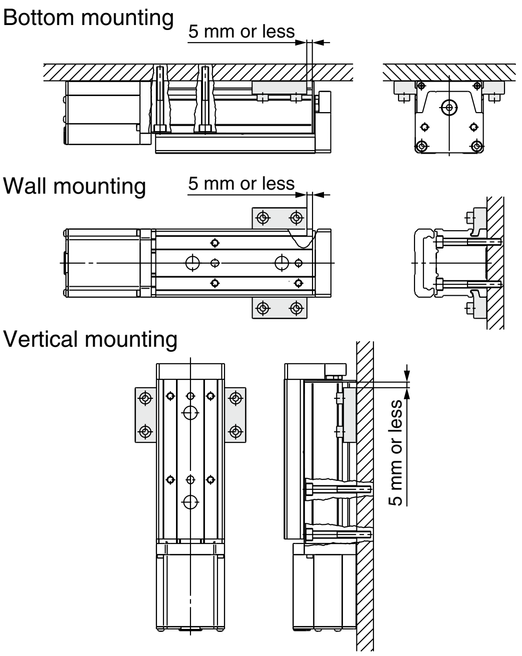
LES/LESH Series
Specific Product Precautions 3

Be sure to read this before handling the products. Refer to page 1351 for safety instructions and pages 1352 to 1357 for electric actuator precautions.

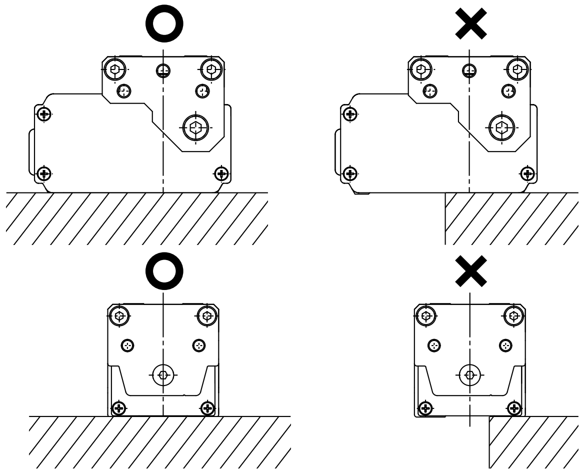
Handling

⚠Caution

19. When mounting the body with through-holes in the following mounting orientations, make sure to use two side holders as shown in the figures.
Otherwise, installation balance will deteriorate and cause loosening.



20. Install the body as shown below with the ○.
Since the product support becomes unstable, it may cause a malfunction, noise or an increase in the deflection.

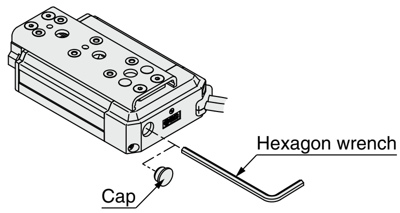


21. Even with the same product number, the table of some products can be moved by hand and the table of some products cannot be moved by hand. However, there is no abnormality with these products. (Without lock)
This difference is caused because there is a little variation with the positive efficiency (when the table is moved by the motor) and there is a large variation with the reverse-efficiency (when the table is moved manually) due to the product characteristics. There is hardly any difference among products when they are operated by the motor.

Handling

⚠Caution

22. For LES□□$^{R}_{L}$, remove the cap and operate the manual override screw with a hexagon wrench.



Maintenance

⚠Warning

1. Ensure that the power supply is stopped before starting maintenance work or replacement of the product.

2. For lubrication, wear protective glasses.

3. Perform maintenance according to the following requirements.

Maintenance frequency

Perform maintenance according to the table below.

Frequency	Appearance check	Belt check
Inspection before daily operation	○	—
Inspection every 6 months*1	—	○
Inspection every 250 km*1	—	○
Inspection every 5 million cycles*1	—	○

*1 Select whichever comes first.

- **Items for visual appearance check**

1. Loose set screws, Abnormal amount of dirt, etc.
2. Check for visible damage, Check of cable joint
3. Vibration, Noise

- **Items for belt check (R/L type only)**

Stop operation immediately and replace the belt when any of the following occur.

a. Tooth shape canvas is worn out
Canvas fiber becomes fuzzy, Rubber is coming off and the fiber has become whitish, Lines of fibers have become unclear

b. Peeling off or wearing of the side of the belt
Belt corner has become rounded and frayed threads stick out

c. Belt partially cut
Belt is partially cut, Foreign matter caught in the teeth of other parts is causing damage

d. A vertical line on belt teeth is visible
Damage which is made when the belt runs on the flange

e. Rubber back of the belt is softened and sticky

f . Cracks on the back of the belt are visible

LES/LESH Series
Battery-less Absolute Encoder Type Specific Product Precautions

Be sure to read this before handling the products. Refer to page 1351 for safety instructions and pages 1352 to 1357 for electric actuator precautions.

Handling

⚠Caution

1. Absolute encoder ID mismatch error at the first connection

In the following cases, an "ID mismatch error" alarm occurs after the power is turned ON. Perform a return to origin operation after resetting the alarm before use.

- When an electric actuator is connected and the power is turned ON for the first time after purchase*1
- When the actuator or motor is replaced
- When the controller is replaced

*1 If you have purchased an electric actuator and controller with the set part number, the pairing may have already been completed and the alarm may not be generated.

"ID mismatch error"

Operation is enabled by matching the encoder ID on the electric actuator side with the ID registered in the controller. This alarm occurs when the encoder ID is different from the registered contents of the controller. By resetting this alarm, the encoder ID is registered (paired) to the controller again.

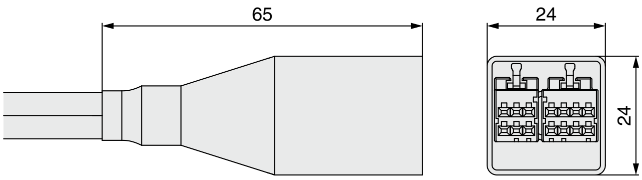
When a controller is changed after pairing is completed				
	Encoder ID no. (* Numbers below are examples.)			
Actuator	17623	17623	17623	17623
Controller	17623	17699	17699	17623
ID mismatch error occurred?	No	Yes	Error reset ⇒ No	

2. In environments where strong magnetic fields are present, use may be limited.

A magnetic sensor is used in the encoder. Therefore, if the actuator motor is used in an environment where strong magnetic fields are present, malfunction or failure may occur.
Do not expose the actuator motor to magnetic fields with a magnetic flux density of 1 mT or more.
When installing an electric actuator and an air cylinder with an auto switch (ex. CDQ2 series) or multiple electric actuators side by side, maintain a space of 40 mm or more around the motor. Refer to the construction drawing of the actuator motor.

3. The connector size of the motor cable is different from that of the electric actuator with an incremental encoder.

The motor cable connector of an electric actuator with a battery-less absolute encoder is different from that of an electric actuator with an incremental encoder. As the connector cover dimensions are different, take the dimensions below into consideration during the design process.



Battery-less absolute encoder connector cover dimensions