

## ●ISO Class 4\*1 (ISO14644-1)

- Built-in vacuum piping
- Possible to mount the main body without removing the external cover etc.
- Body-integrated linear guide specification

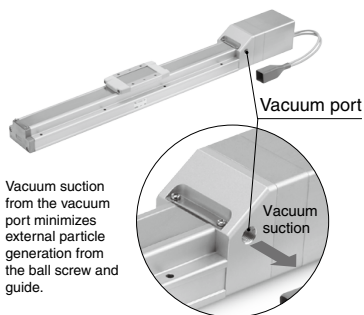
\*1 Changes depending on the suction flow rate.

### Slider Type Ball Screw Drive/11-LEFS Series

Step Motor (Servo/24 VDC) Servo Motor (24 VDC) Type

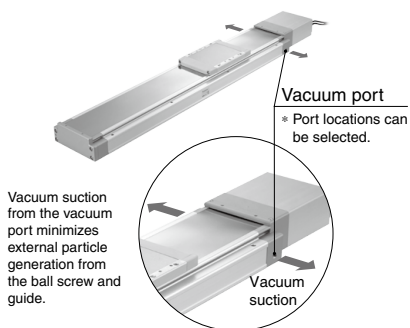
Page 514

AC Servo Motor Type Page 522



### High Rigidity Slider Type Ball Screw Drive/11-LEJS Series

AC Servo Motor Type Page 533



### Support Guide/11-LEFG Series Page 527

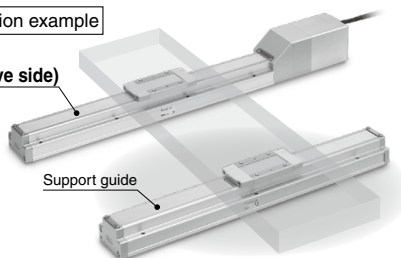
A support guide is designed to support workpieces with significant overhang.

- As the dimensions are the same as the LEF series body, installation is simple and contributes to a reduction in installation and assembly labor.
- The standard equipped seal bands prevent grease from splashing and external foreign matter from entering.

Application example

LEF (Drive side)

Support guide



#### ⚠ Caution

After installing the actuator on the drive side, perform the alignment of the support guide. However, when the mounting flatness exceeds 0.1, install a floating mechanism separately on the workpiece installation surface (table).

LEF
LEJ
LEL
LEM
LEY
LES
LEPY
LEPS
LER
LEH
LEY-X5
11-LEFS
11-LEJS
25A-
LEC□
LEC S□
LEC SS-T
LEC Y□
Motor-less
LAT
LZ□
LC3F2

## Electric Actuator/Slider Type

Ball Screw Drive/11-LEFS Series Clean Room Specification

# Particle Generation Characteristics

11-LEFS Series ▶ Pages 514, 522

## Particle Generation Measuring Method

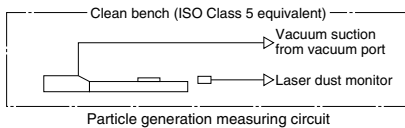
The particle generation data for SMC Clean Series are measured in the following test method.

### ■ Test Method (Example)

Operate the specimen that is placed in an ISO Class 5 equivalent clean bench, and measure the changes of the particle concentration over time until the number of cycles reaches the specified point.

### ■ Measuring Conditions

Measuring instrument	Description	Laser dust monitor (Automatic particle counter by lightscattering method)
	Minimum measurable particle diameter	
Suction flow rate		28.3 L/min (ANR)
Setting conditions	Sampling time	5 min
	Interval time	55 min
	Sampling air flow	141.5 L (ANR)



### ■ Evaluation Method

To obtain the measured values of particle concentration, the accumulated value <sup>Note 1)</sup> of particles captured every 5 minutes, by the laser dust monitor, is converted into the particle concentration in every 1 m<sup>3</sup>.

When determining particle generation grades, the 95% upper confidence limit of the average particle concentration (average value), when each specimen is operated at a specified number of cycles <sup>Note 2)</sup> is considered.

The plots in the graphs indicate the 95% upper confidence limit of the average particle concentration of particles with a diameter within the horizontal axis range.

Note 1) Sampling air flow rate: Number of particles contained in 141.5 L (ANR) of air

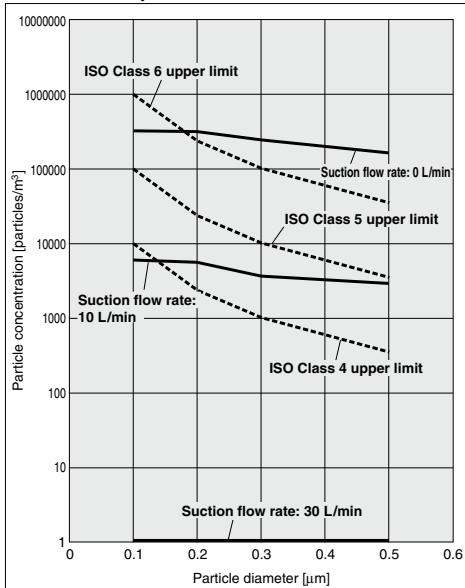
Note 2) Actuator: 1 million cycles

Note 3) The particle generation characteristics (Page 532) provide a guide for selection but is not guaranteed.

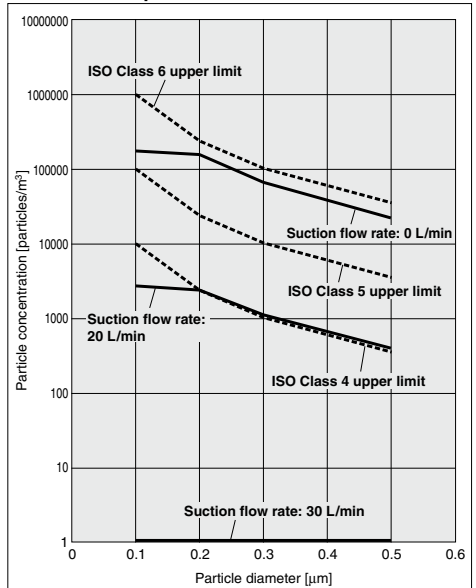
Note 4) When the suction flow rate is 0 L/min, the particle concentration is measured during operation without suction.

## Particle Generation Characteristics Step Motor (Servo/24 VDC), Servo Motor (24 VDC)

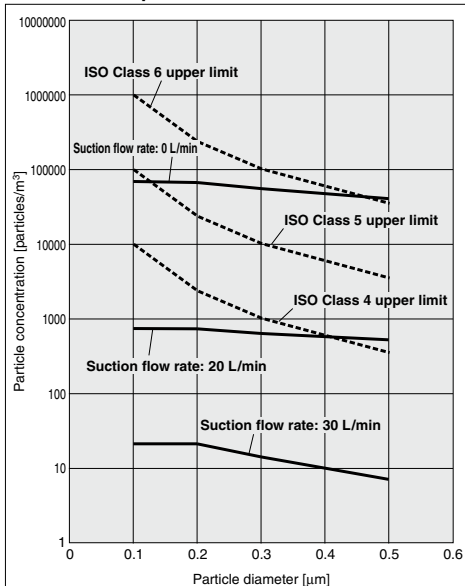
**11-LEFS16 Speed 500 mm/s**



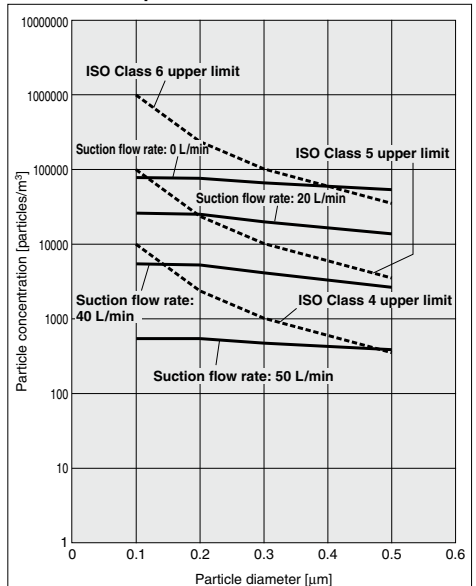
**11-LEFS25 Speed 500 mm/s**



**11-LEFS32 Speed 500 mm/s**



**11-LEFS40 Speed 500 mm/s**



LEF

LEJ

LEL

LEM

LEY

LES

LEPY

LEPS

LER

LEH

LEY-X5

11-LEFS

11-LEJS

25A-

LEC

LEC

LEC SS-T

LEC Y

Motor-less

LAT

LZ

LC3F2

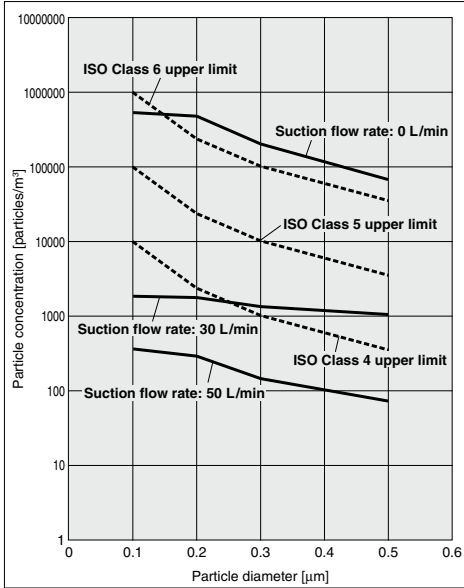
# 11-LEFS Series

AC Servo Motor

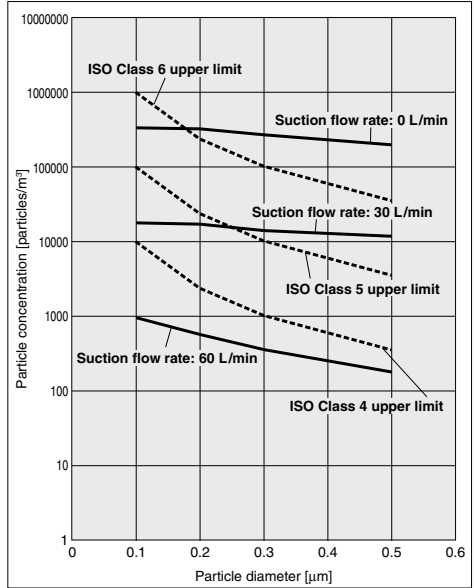
Clean Room Specification

## Particle Generation Characteristics AC Servo Motor (100/200/400 W)

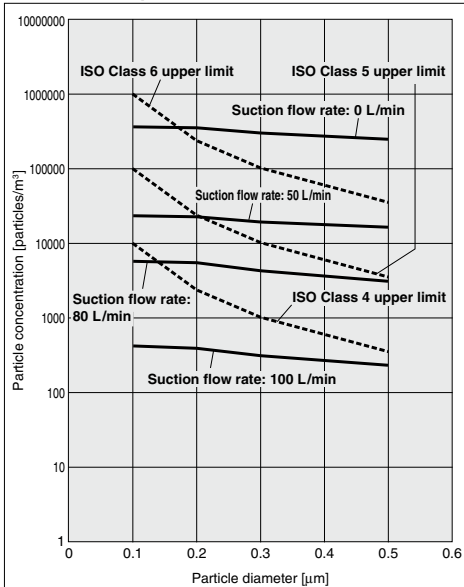
11-LEFS25 Speed 900 mm/s



11-LEFS32 Speed 1000 mm/s



11-LEFS40 Speed 1000 mm/s



# Model Selection



LEFS Series ▶ Page 62

LEFB Series ▶ Page 90

11-LEFS Series ▶ Page 514

## Selection Procedure

**Step 1** Check the work load-speed.

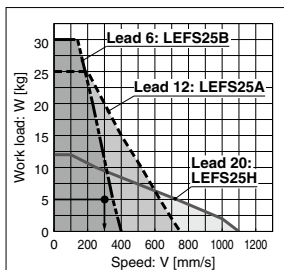
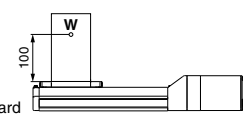
**Step 2** Check the cycle time.

**Step 3** Check the allowable moment.

## Selection Example

### Operating conditions

- Workpiece mass: 5 [kg]
- Speed: 300 [mm/s]
- Acceleration/Deceleration: 3000 [mm/s<sup>2</sup>]
- Stroke: 200 [mm]
- Mounting orientation: Horizontal upward
- Workpiece mounting condition:



<Speed-Work load graph>  
(LEFS25/Step motor)

**Step 1** Check the work load-speed. <Speed-Work load graph> (Pages 39 to 42)

Select the target model based on the workpiece mass and speed with reference to the <Speed-Work load graph>.

Selection example) The **LEFS25A-200** is temporarily selected based on the graph shown on the right side.

**Step 2** Check the cycle time.

Calculate the cycle time using the following calculation method.

**Cycle time:**

T can be found from the following equation.

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

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

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

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

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

- 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 with reference to the following value.

$$T4 = 0.2 \text{ [s]}$$

Calculation example)

T1 to T4 can be calculated as follows.

$$T1 = V/a1 = 300/3000 = 0.1 \text{ [s]}$$

$$T3 = V/a2 = 300/3000 = 0.1 \text{ [s]}$$

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

$$= \frac{200 - 0.5 \cdot 300 \cdot (0.1 + 0.1)}{300}$$

$$= 0.57 \text{ [s]}$$

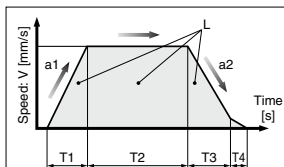
$$T4 = 0.2 \text{ [s]}$$

Therefore, the cycle time can be obtained as follows.

$$T = T1 + T2 + T3 + T4$$

$$= 0.1 + 0.57 + 0.1 + 0.2$$

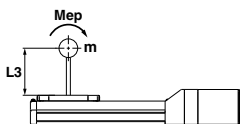
$$= 0.97 \text{ [s]}$$



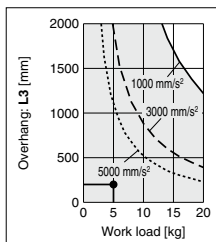
- L: Stroke [mm]
- ... (Operating condition)
- V: Speed [mm/s]
- ... (Operating condition)
- a1: Acceleration [mm/s<sup>2</sup>]
- ... (Operating condition)
- a2: Deceleration [mm/s<sup>2</sup>]
- ... (Operating condition)

- T1: Acceleration time [s]  
Time until reaching the set speed
- T2: Constant speed time [s]  
Time while the actuator is operating at a constant speed
- T3: Deceleration time [s]  
Time from the beginning of the constant speed operation to stop
- T4: Settling time [s]  
Time until positioning is completed

**Step 3** Check the guide moment.



Based on the above calculation result, the **LEFS25A-200** is selected.



\* If the step motor and servo motors do not meet your specifications, also consider the AC servo specification (Page 46).

For the LECPA, refer to page 40.

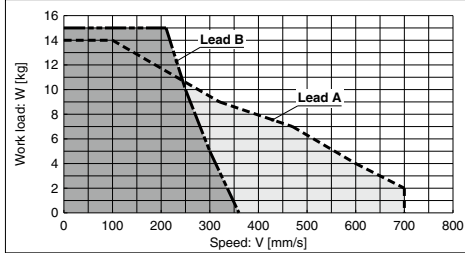
## Speed-Work Load Graph (Guide)

### For Step Motor (Servo/24 VDC) LECP6, LECP1, LECPMJ

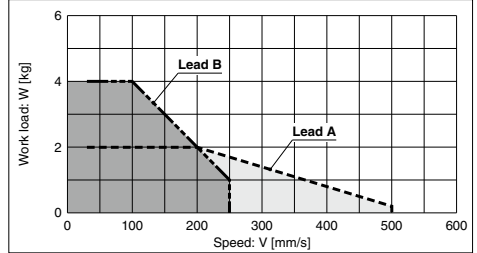
\* The following graph shows the values when moving force is 100%.

#### LEFS16/Ball Screw Drive

##### Horizontal

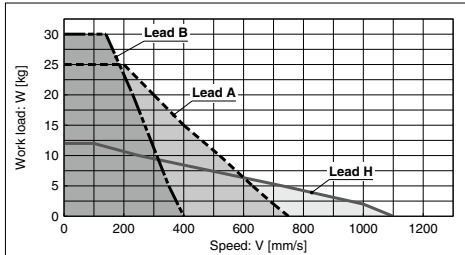


##### Vertical

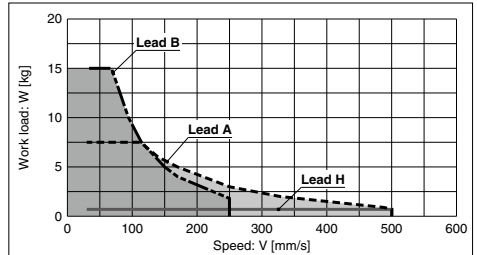


#### LEFS25/Ball Screw Drive

##### Horizontal

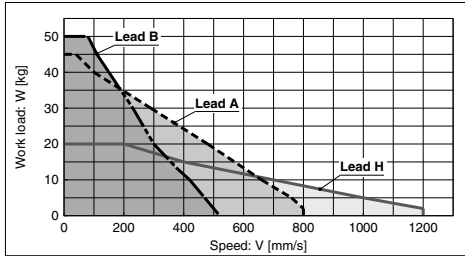


##### Vertical

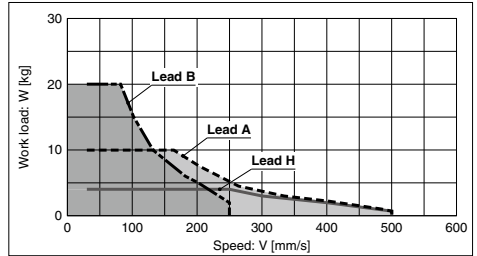


#### LEFS32/Ball Screw Drive

##### Horizontal

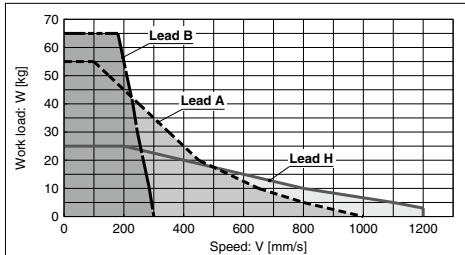


##### Vertical

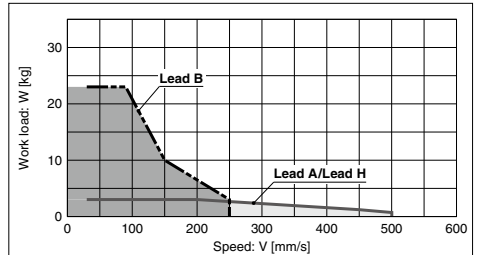


#### LEFS40/Ball Screw Drive

##### Horizontal



##### Vertical



LEF

LEJ

LEL

LEM

LEY

LES

LEPY

LEPS

LER

LEH

LEY-X5

11-LEFS

11-LEJS

25A-

LEC

LEC

SS-T

LEC

Y

Motor-less

LAT

LZ

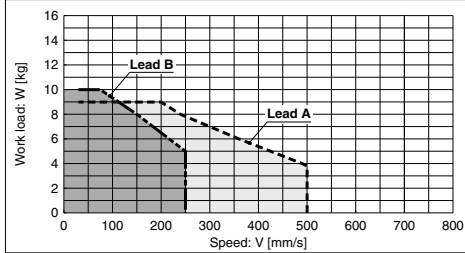
LC3F2

## Speed-Work Load Graph (Guide) For Step Motor (Servo/24 VDC) LECPA

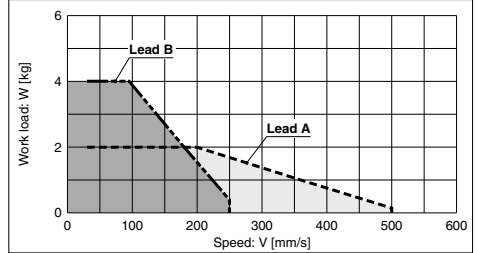
\* The following graph shows the values when moving force is 100%.

### LEFS16/Ball Screw Drive

#### Horizontal

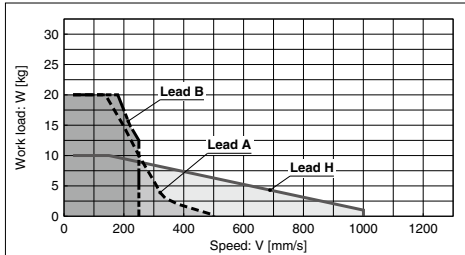


#### Vertical

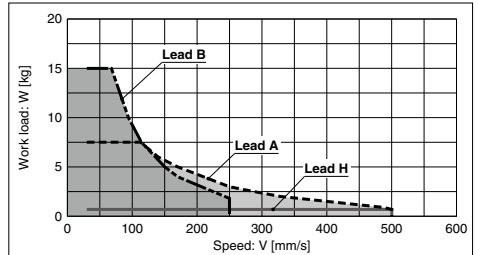


### LEFS25/Ball Screw Drive

#### Horizontal

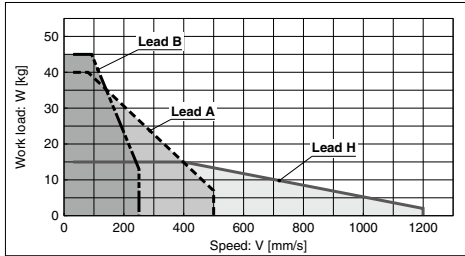


#### Vertical

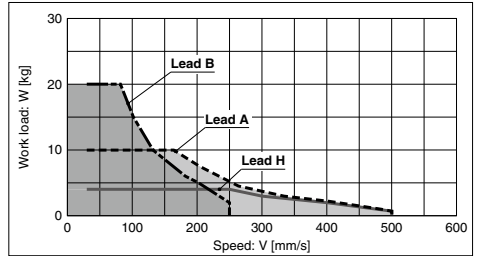


### LEFS32/Ball Screw Drive

#### Horizontal

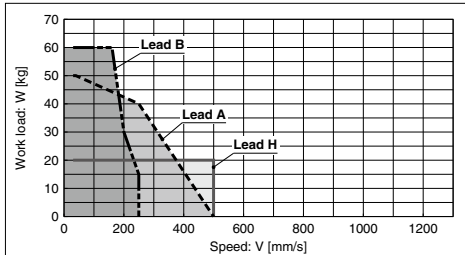


#### Vertical

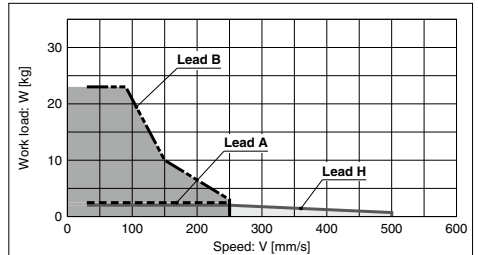


### LEFS40/Ball Screw Drive

#### Horizontal



#### Vertical



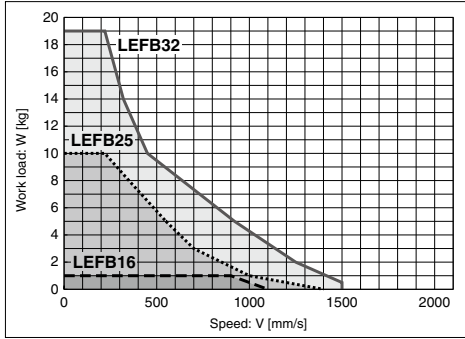
**Speed-Work Load Graph (Guide)**

**For Step Motor (Servo/24 VDC) LECP6, LECP1, LECPMJ**

\* The following graph shows the values when moving force is 100%.

**LEFB/Belt Drive**

**Horizontal**

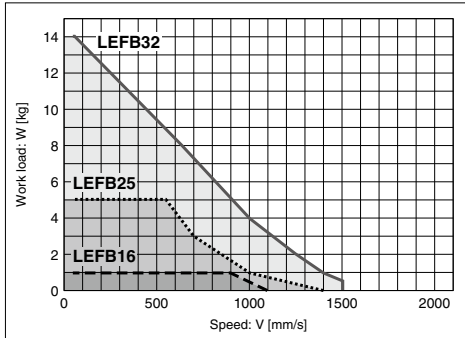


**For Step Motor (Servo/24 VDC) LECPA**

\* The following graph shows the values when moving force is 100%.

**LEFB/Belt Drive**

**Horizontal**



LEF
LEJ
LEL
LEM
LEY
LES
LEPY
LEPS
LER
LEH
LEY-X5
11-LEFS
11-LEJS
25A-
LEC□
LEC S□
LEC SS-T
LEC Y□
Motor-less
LAT
LZ□
LC3F2



# LEF Series

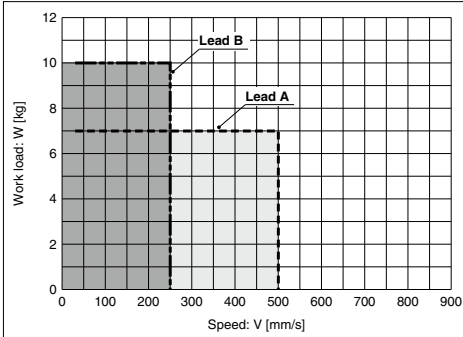
Step Motor (Servo/24 VDC)    Servo Motor (24 VDC)    Clean Room Specification

## Speed-Work Load Graph (Guide) Servo Motor (24 VDC)

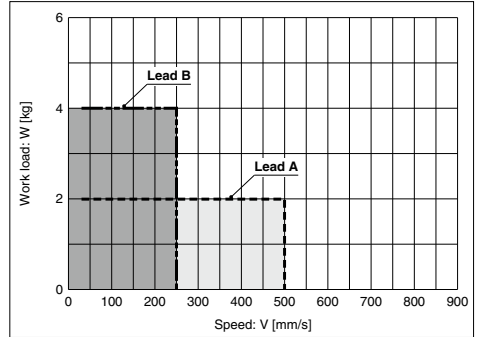
\* The following graph shows the values when moving force is 250%.

### LEFS16A/Ball Screw Drive

#### Horizontal

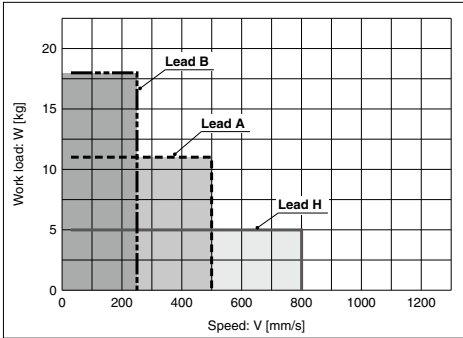


#### Vertical

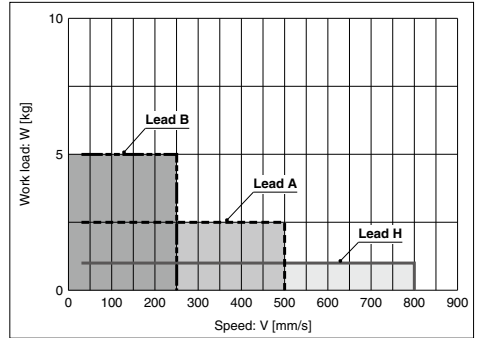


### LEFS25A/Ball Screw Drive

#### Horizontal



#### Vertical

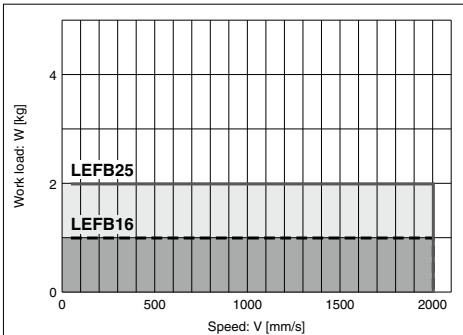


## Servo Motor (24 VDC)

\* The following graph shows the values when moving force is 250%.

### LEFB/Belt Drive

#### Horizontal



\* This graph shows 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 "Calculation of Guide Load Factor" or the Electric Actuator Selection Software for confirmation, <http://www.smcworld.com>

## Dynamic Allowable Moment

Acceleration/Deceleration ——— 1000 mm/s<sup>2</sup>    - - - 3000 mm/s<sup>2</sup>    ..... 5000 mm/s<sup>2</sup>

Orientation	Load overhanging direction m : Work load [kg] Me: Dynamic allowable moment [N·m] L : Overhang to the work load center of gravity [mm]	Model			
		LEF16	LEF25	LEF32	LEF40
Horizontal/Bottom	X 				
	Y 				
	Z 				
Wall	X 				
	Y 				
	Z 				

LEF

LEJ

LEL

LEM

LEY

LES

LEPY

LEPS

LER

LEH

LEY

-X5

11-

LEFS

11-

LEJS

25A-

LEC

LEC

SS-T

LEC

Y

Motor-

less

LAT

LZ

LC3F2

\* This graph shows 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 "Calculation of Guide Load Factor" or the Electric Actuator Selection Software for confirmation, <http://www.smcworld.com>

## Dynamic Allowable Moment

Acceleration/Deceleration ——— 1000 mm/s<sup>2</sup>    - - - 3000 mm/s<sup>2</sup>    .....5000 mm/s<sup>2</sup>

Orientation	Load overhanging direction m : Work load [kg] Me: Dynamic allowable moment [N·m] L : Overhang to the work load center of gravity [mm]	Model			
		LEF16	LEF25	LEF32	LEF40
Vertical					

## Calculation of Guide Load Factor

- Decide operating conditions.

Model: LEFS/LEFB

Size: 16/25/32/40

Mounting orientation: Horizontal/Bottom/Wall/Vertical

Acceleration [mm/s<sup>2</sup>]: a

Work load [kg]: m

Work load center position [mm]: Xc/Yc/Zc

- Select the target graph with reference to the model, size and mounting orientation.

- Based on the acceleration and work load, obtain the overhang [mm]: Lx/Ly/Lz from the graph.

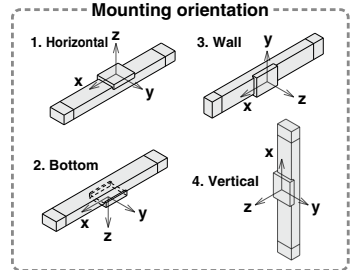
- Calculate the load factor for each direction.

$$\alpha_x = Xc/L_x, \alpha_y = Yc/L_y, \alpha_z = Zc/L_z$$

- Confirm the total of  $\alpha_x$ ,  $\alpha_y$  and  $\alpha_z$  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.



### Example

- Operating conditions

Model: LEFS40

Size: 40

Mounting orientation: Horizontal

Acceleration [mm/s<sup>2</sup>]: 3000

Work load [kg]: 20

Work load center position [mm]: Xc = 0, Yc = 50, Zc = 200

- Select the graphs for horizontal of the LEF40 on page 43.

- Lx = 400 mm, Ly = 250 mm, Lz = 1500 mm

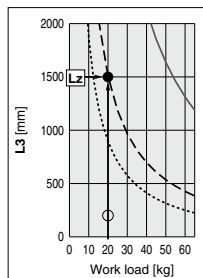
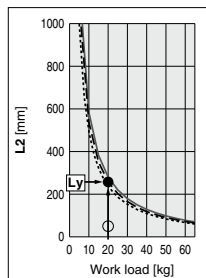
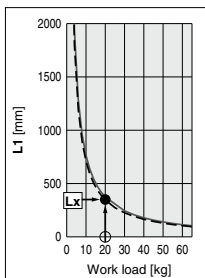
- The load factor for each direction can be obtained as follows.

$$\alpha_x = 0/400 = 0$$

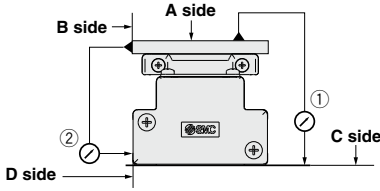
$$\alpha_y = 50/250 = 0.2$$

$$\alpha_z = 200/1500 = 0.13$$

- $\alpha_x + \alpha_y + \alpha_z = 0.33 \leq 1$



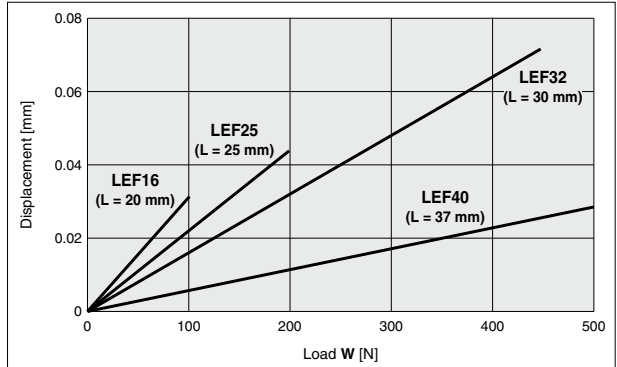
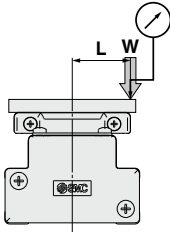
**Table Accuracy**



Model	Traveling parallelism [mm] (Every 300 mm)	
	① C side traveling parallelism to A side	② D side traveling parallelism to B side
LEF16	0.05	0.03
LEF25	0.05	0.03
LEF32	0.05	0.03
LEF40	0.05	0.03

Note) Traveling parallelism does not include the mounting surface accuracy.

**Table Displacement (Reference Value)**

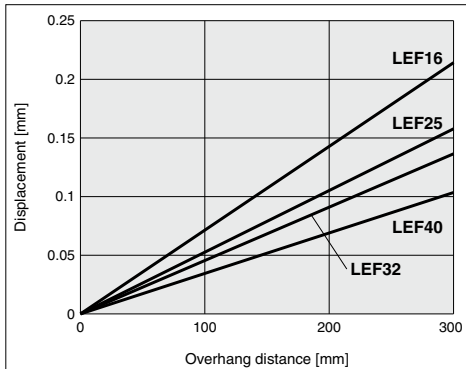


Note 1) This displacement is measured when a 15 mm aluminum plate is mounted and fixed on the table.

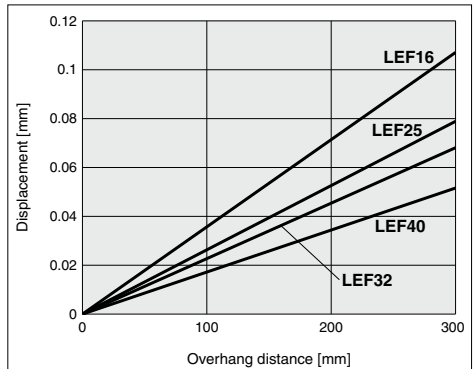
Note 2) Check the clearance and play of the guide separately.

**Overhang Displacement Due to Table Clearance (Reference Value)**

**Basic type**



**High precision type**



LEF

LEJ

LEL

LEM

LEY

LES

LEPY  
LEPS

LEK

LEH

LEY  
-X5

11-  
LEFS

11-  
LEJS

25A-

LEC□

LEC  
S□

LEC  
SS-T

LEC  
Y□

Motor-  
less

LAT

LZ□

LC3F2

# Model Selection



LEFS Series ▶ Page 76

11-LEFS Series ▶ Page 522

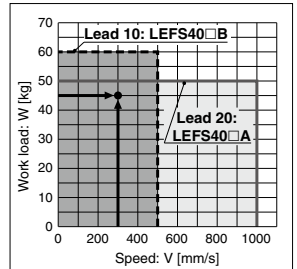
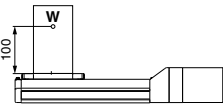
## Selection Procedure



## Selection Example

### Operating conditions

- Workpiece mass: 45 [kg]
- Speed: 300 [mm/s]
- Acceleration/Deceleration: 3000 [mm/s<sup>2</sup>]
- Stroke: 200 [mm]
- Mounting position: Horizontal upward
- Workpiece mounting condition:



<Speed-Work load graph>  
(LEFS40)

**Step 1 Check the work load-speed.** <Speed-Work load graph> (Page 47)  
Select the target model based on the workpiece mass and speed with reference to the <Speed-Work load graph>.

Selection example) The LEFS40S4B-200 is temporarily selected based on the graph shown on the right side.

### Step 2 Check the cycle time.

Calculate the cycle time using the following calculation method.

#### Cycle time:

T can be found from the following equation.

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

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

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

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

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

- T4: Settling time varies depending on the motor type and load. The value below is recommended.

$$T4 = 0.05 \text{ [s]}$$

Calculation example)

T1 to T4 can be calculated as follows.

$$T1 = V/a1 = 300/3000 = 0.1 \text{ [s]}$$

$$T3 = V/a2 = 300/3000 = 0.1 \text{ [s]}$$

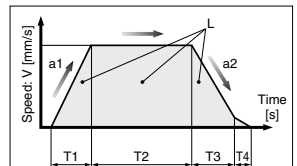
$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V}$$

$$= \frac{200 - 0.5 \cdot 300 \cdot (0.1 + 0.1)}{300} = 0.57 \text{ [s]}$$

$$T4 = 0.05 \text{ [s]}$$

Therefore, the cycle time can be obtained as follows.

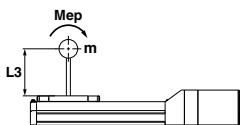
$$T = T1 + T2 + T3 + T4 = 0.1 + 0.57 + 0.1 + 0.05 = 0.82 \text{ [s]}$$



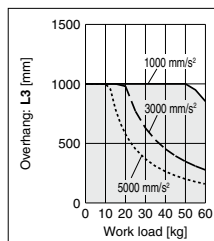
- L: Stroke [mm] ... (Operating condition)
- V: Speed [mm/s] ... (Operating condition)
- a1: Acceleration [mm/s<sup>2</sup>] ... (Operating condition)
- a2: Deceleration [mm/s<sup>2</sup>] ... (Operating condition)

- T1: Acceleration time [s]  
Time until reaching the set speed
- T2: Constant speed time [s]  
Time while the actuator is operating at a constant speed
- T3: Deceleration time [s]  
Time from the beginning of the constant speed operation to stop
- T4: Settling time [s]  
Time until positioning is completed

### Step 3 Check the guide moment.



Based on the above calculation result, the LEFS40S4B-200 is selected.

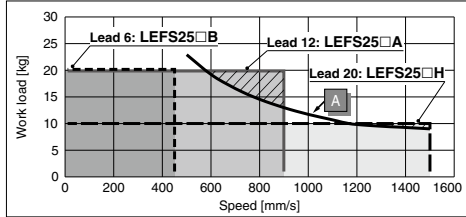


**Speed-Work Load Graph/Required Conditions for "Regeneration Option"(Guide)**

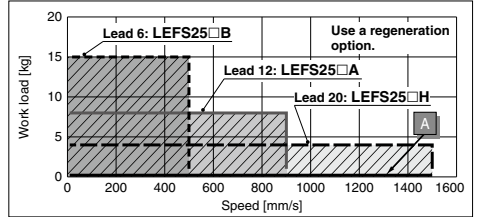
\* The allowable speed is restricted depending on the stroke.  
 Select it by referring to "Allowable Stroke Speed" below.

**LEFS25/Ball Screw Drive**

**Horizontal**

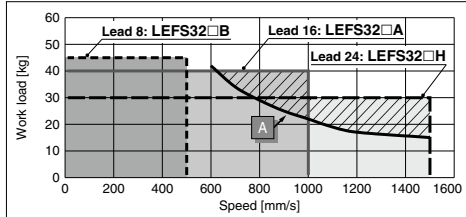


**Vertical**

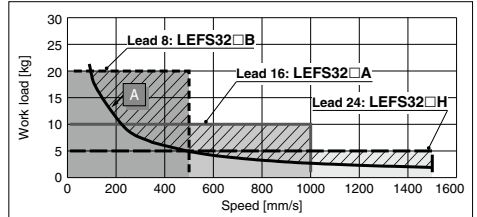


**LEFS32/Ball Screw Drive**

**Horizontal**

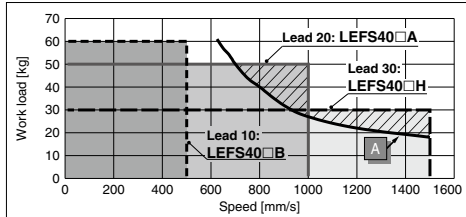


**Vertical**

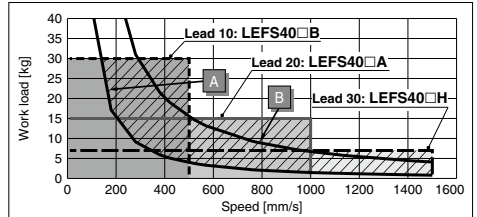


**LEFS40/Ball Screw Drive**

**Horizontal**



**Vertical**



**Required conditions for "Regeneration option"**

\* Regeneration option is required when using product above regeneration line in graph.  
 (Order separately.)

**"Regeneration Option" Models**

Operating condition	Model
A	LEC-MR-RB-032
B	LEC-MR-RB-12

**Allowable Stroke Speed**

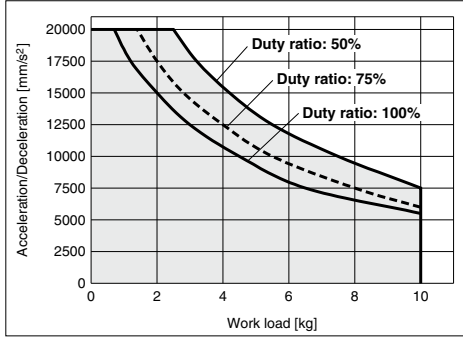
Model	AC servo motor	Lead		Stroke [mm]											
		Symbol	[mm]	Up to 100	Up to 200	Up to 300	Up to 400	Up to 500	Up to 600	Up to 700	Up to 800	Up to 900	Up to 1000	Up to 1100	Up to 1200
LEFS25	100 W □40	H	20	—	1500	1200	900	700	550	—	—	—	—	—	—
		A	12	—	900	720	540	420	330	—	—	—	—	—	
		B	6	—	450	360	270	210	160	—	—	—	—	—	
		(Motor rotation speed)	—	—	(4500 rpm)	(3650 rpm)	(2700 rpm)	(2100 rpm)	(1650 rpm)	—	—	—	—	—	
LEFS32	200 W □60	H	24	—	1500	1200	930	750	610	510	—	—	—		
		A	16	—	1000	800	620	500	410	340	—	—	—		
		B	8	—	500	400	310	250	200	170	—	—	—		
		(Motor rotation speed)	—	—	(3750 rpm)	(3000 rpm)	(2325 rpm)	(1875 rpm)	(1537 rpm)	(1275 rpm)	—	—	—		
LEFS40	400 W □60	H	30	—	1500	1410	1140	930	780	500	500	—	—		
		A	20	—	1000	940	760	620	520	440	380	—	—		
		B	10	—	500	470	380	310	260	220	190	—	—		
		(Motor rotation speed)	—	—	(3000 rpm)	(2820 rpm)	(2280 rpm)	(1860 rpm)	(1560 rpm)	(1320 rpm)	(1140 rpm)	—	—		

- LEF
- LEJ
- LEL
- LEM
- LEY
- LES
- LEPY
- LEPS
- LER
- LEH
- LEY-X5
- 11-LEFS
- 11-LEJS
- 25A-
- LEC□
- LEC
- 
- LEC
- SS-T
- LEC
- Y□
- Motor-less
- LAT
- LZ□
- LC3F2

## Work Load–Acceleration/Deceleration Graph (Guide)

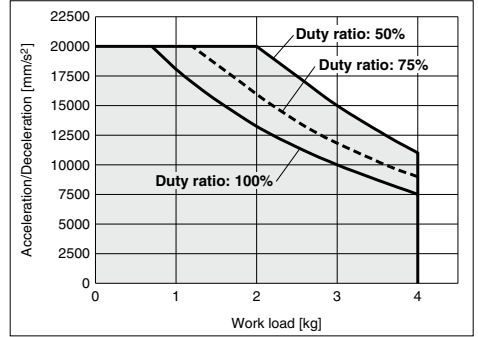
### LEFS25S□H/Ball Screw Drive

Horizontal



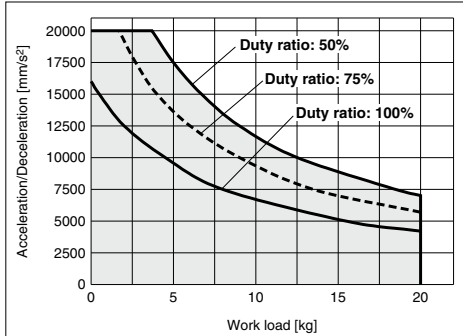
### LEFS25S□H/Ball Screw Drive

Vertical



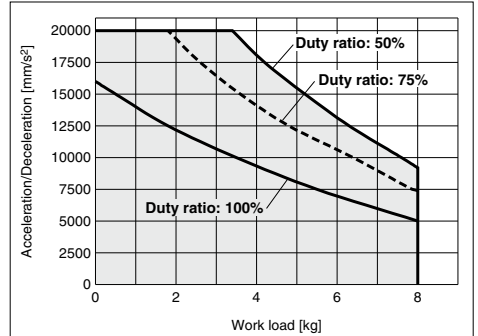
### LEFS25S□A/Ball Screw Drive

Horizontal



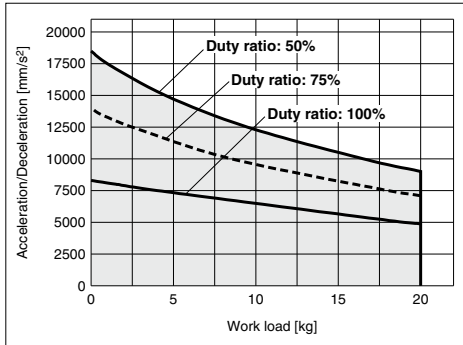
### LEFS25S□A/Ball Screw Drive

Vertical



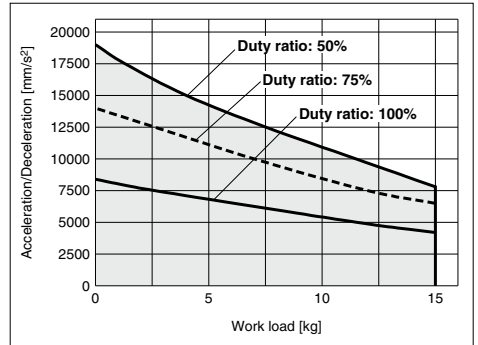
### LEFS25S□B/Ball Screw Drive

Horizontal



### LEFS25S□B/Ball Screw Drive

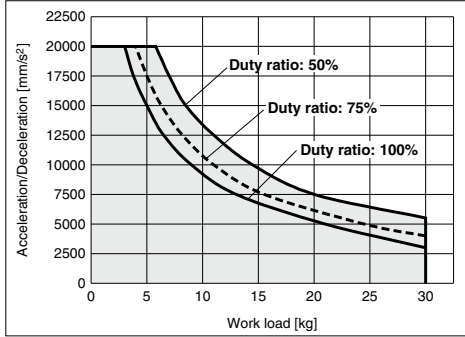
Vertical



### Work Load–Acceleration/Deceleration Graph (Guide)

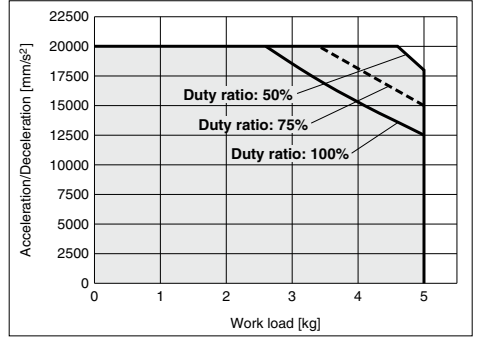
#### LEFS32S□H/Ball Screw Drive

Horizontal



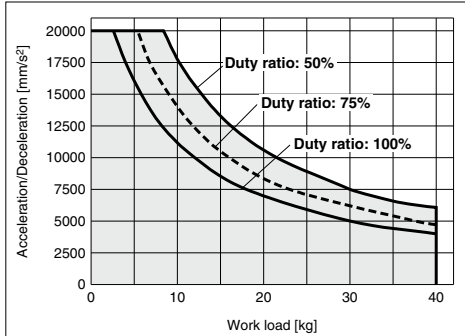
#### LEFS32S□H/Ball Screw Drive

Vertical



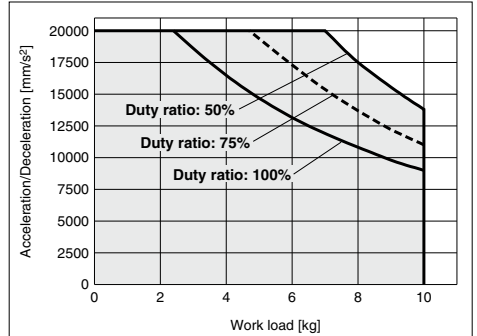
#### LEFS32S□A/Ball Screw Drive

Horizontal



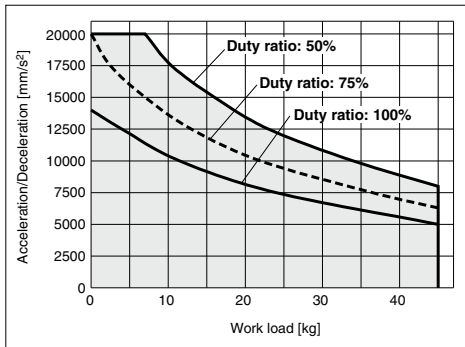
#### LEFS32S□A/Ball Screw Drive

Vertical



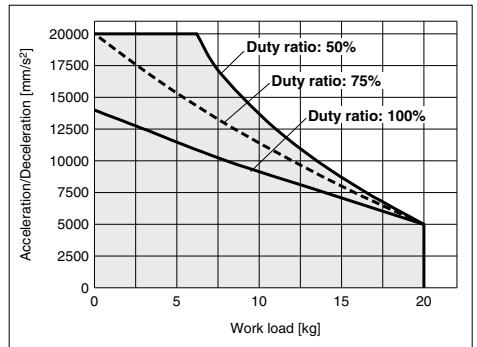
#### LEFS32S□B/Ball Screw Drive

Horizontal



#### LEFS32S□B/Ball Screw Drive

Vertical



LEF

LEJ

LEL

LEM

LEY

LES

LEPY

LEPS

LER

LEH

LEY

-X5

11-LEFS

11-LEJS

25A-

LEC□

LEC

S□

LEC

SS-T

LEC

Y□

Motorless

LAT

LZ□

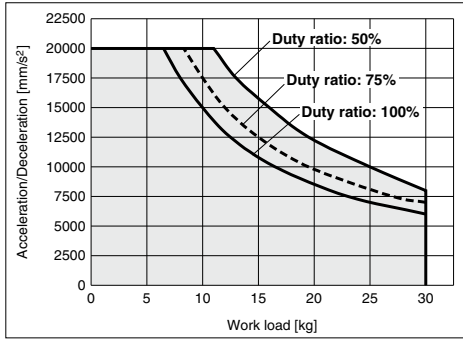
LC3F2



## Work Load–Acceleration/Deceleration Graph (Guide)

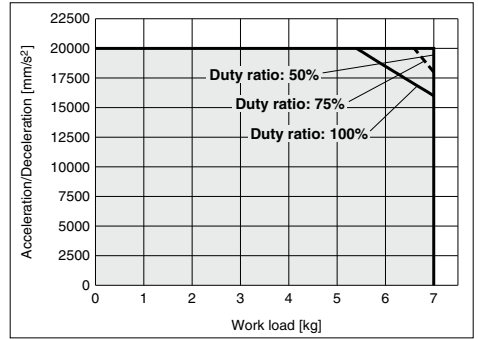
### LEFS40S□H/Ball Screw Drive

Horizontal



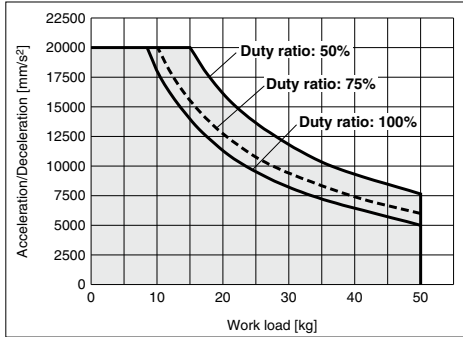
### LEFS40S□H/Ball Screw Drive

Vertical



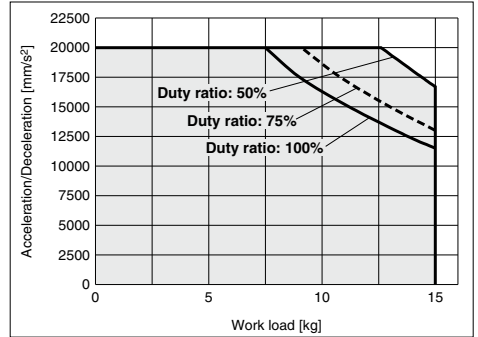
### LEFS40S□A/Ball Screw Drive

Horizontal



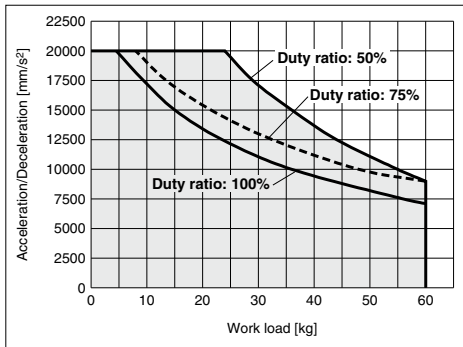
### LEFS40S□A/Ball Screw Drive

Vertical



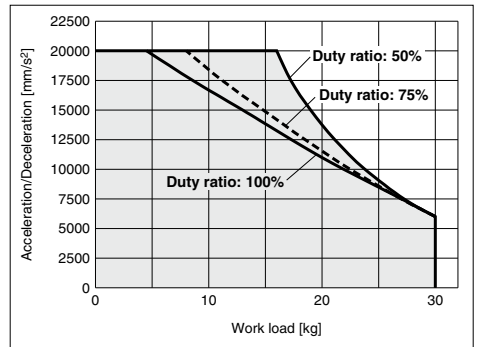
### LEFS40S□B/Ball Screw Drive

Horizontal



### LEFS40S□B/Ball Screw Drive

Vertical



\* This graph shows 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 "Calculation of Guide Load Factor" or the Electric Actuator Selection Software for confirmation, <http://www.smworld.com>

### Dynamic Allowable Moment

Acceleration/Deceleration ——— 1000 mm/s<sup>2</sup>    - - - 3000 mm/s<sup>2</sup>    ····· 5000 mm/s<sup>2</sup>    - · - · 10000 mm/s<sup>2</sup>    - - - - 20000 mm/s<sup>2</sup>

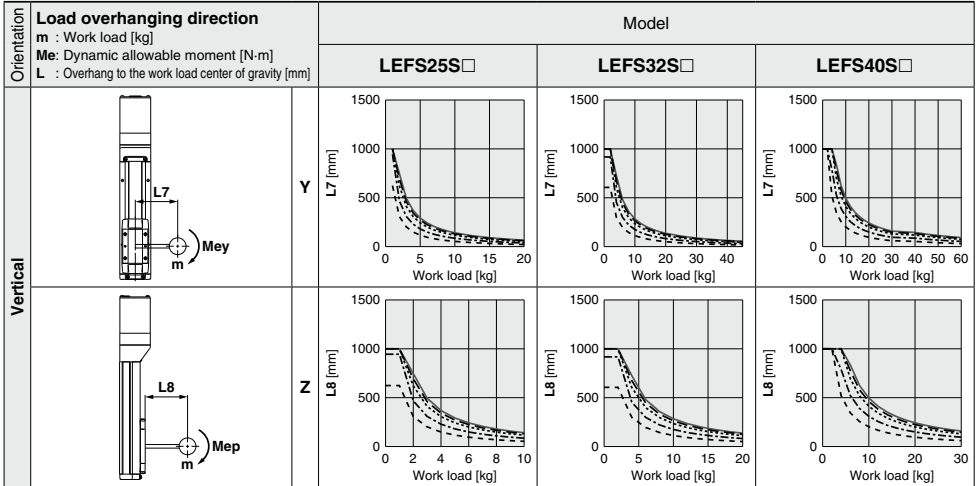
Orientation		Load overhanging direction m : Work load [kg] Me: Dynamic allowable moment [N-m] L : Overhang to the work load center of gravity [mm]	Model		
			LEFS25S□	LEFS32S□	LEFS40S□
Horizontal/Bottom	X				
	Y				
	Z				
Wall	X				
	Y				
	Z				

- LEF**
- LEJ
- LEL
- LEM
- LEY
- LES
- LEPY
- LEPS
- LER
- LEH
- LEY-X5
- 11-LEFS
- 11-LEJS
- 25A-
- LEC□
- LEC
- S□
- LEC
- SS-T
- LEC
- Y□
- Motor-less
- LAT
- LZ□
- LC3F2

\* This graph shows 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 "Calculation of Guide Load Factor" or the Electric Actuator Selection Software for confirmation, <http://www.smcworld.com>

## Dynamic Allowable Moment

Acceleration/Deceleration ——— 1000 mm/s<sup>2</sup>    - - - 3000 mm/s<sup>2</sup>    .....5000 mm/s<sup>2</sup>    - · - · - 10000 mm/s<sup>2</sup>    - - - - 20000 mm/s<sup>2</sup>



## Calculation of Guide Load Factor

1. Decide operating conditions.

Model: LEFS  
Size: 25/32/40

Mounting orientation: Horizontal/Bottom/Wall/Vertical

2. Select the target graph with reference to the model, size and mounting orientation.

3. Based on the acceleration and work load, obtain the overhang [mm]: Lx/Ly/Lz from the graph.

4. Calculate the load factor for each direction.

$$\alpha x = Xc/Lx, \alpha y = Yc/Ly, \alpha z = Zc/Lz$$

5. Confirm the total of  $\alpha x$ ,  $\alpha y$  and  $\alpha z$  is 1 or less.

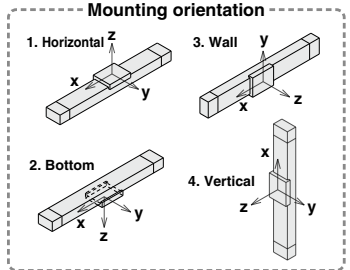
$$\alpha x + \alpha y + \alpha z \leq 1$$

When 1 is exceeded, please consider a reduction of acceleration and work load, or a change of the work load center position and series.

Acceleration [mm/s<sup>2</sup>]: a

Work load [kg]: m

Work load center position [mm]: Xc/Yc/Zc



### Example

1. Operating conditions

Model: LEFS40

Size: 40

Mounting orientation: Horizontal

Acceleration [mm/s<sup>2</sup>]: 3000

Work load [kg]: 20

Work load center position [mm]: Xc = 0, Yc = 50, Zc = 200

2. Select the graphs for horizontal of the LEFS40 on page 51.

3. Lx = 250 mm, Ly = 180 mm, Lz = 1000 mm

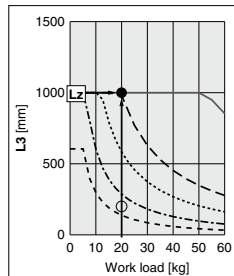
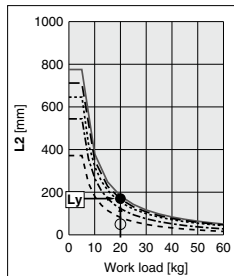
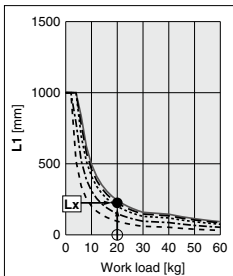
4. The load factor for each direction can be obtained as follows.

$$\alpha x = 0/250 = 0$$

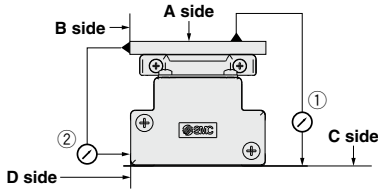
$$\alpha y = 50/180 = 0.27$$

$$\alpha z = 200/1000 = 0.2$$

5.  $\alpha x + \alpha y + \alpha z = 0.47 \leq 1$



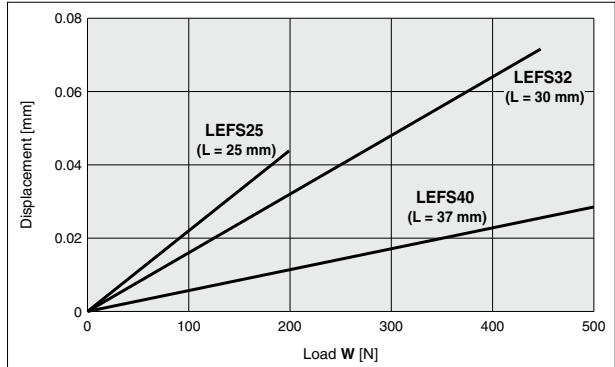
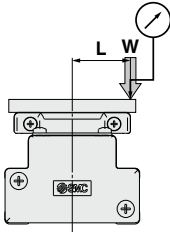
### Table Accuracy



Model	Traveling parallelism [mm] (Every 300 mm)	
	① C side traveling parallelism to A side	② D side traveling parallelism to B side
LEFS25	0.05	0.03
LEFS32	0.05	0.03
LEFS40	0.05	0.03

Note) Traveling parallelism does not include the mounting surface accuracy.

### Table Displacement (Reference Value)

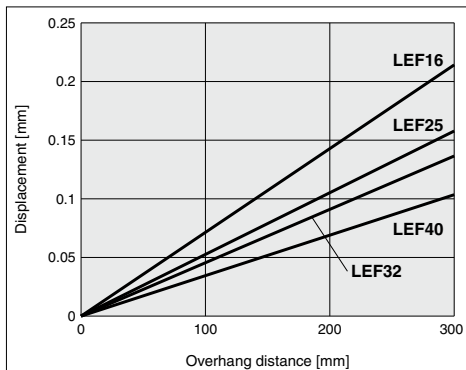


Note 1) This displacement is measured when a 15 mm aluminum plate is mounted and fixed on the table.

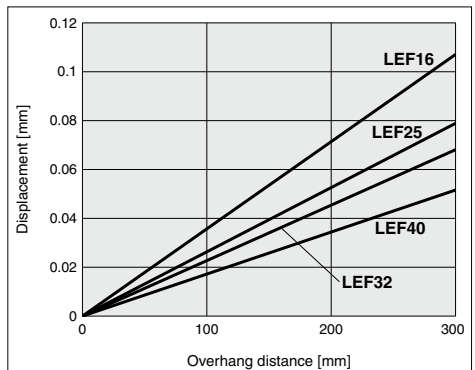
Note 2) Check the clearance and play of the guide separately.

### Overhang Displacement Due to Table Clearance (Reference Value)

#### Basic type



#### High precision type



- LEF
- LEJ
- LEL
- LEM
- LEY
- LES
- LEPY
- LEPS
- LEK
- LEH
- LEY-X5
- 11-LEFS
- 11-LEJS
- 25A-
- LEC
- LEC
- SS-T
- LEC
- Y
- Motorless
- LAT
- LZ
- LC3F2

# Electric Actuator/Slider Type Ball Screw Drive

Clean Room Specification

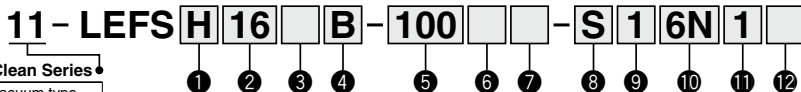


## 11-LEFS Series LEFS16, 25, 32, 40

RoHS

Refer to page 38 for model selection and page 510 for particle generation characteristics.

### How to Order



Clean Series

11	Vacuum type
----	-------------

#### ① Accuracy

NII	Basic type
H	High precision type

#### ② Size

16
25
32
40

#### ③ Motor type

Symbol	Type	Applicable size				Compatible controller/driver
		11-LEFS16	11-LEFS25	11-LEFS32	11-LEFS40	
NII	Step motor (Servo/24 VDC)	●	●	●	●	LECP6 LECP1 LECPA LECPMJ
A	Servo motor (24 VDC)	●	●	—	—	LECA6

#### ④ Lead [mm]

Symbol	11-LEFS16	11-LEFS25	11-LEFS32	11-LEFS40
A	10	12	16	20
B	5	6	8	10

#### ⑤ Stroke [mm]

50	50
to	to
1000	1000

\* Refer to the applicable stroke table.

### ⚠ Caution

#### [CE-compliant products]

① EMC compliance was tested by combining the electric actuator LEF series and the controller LEC series.

The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, conformity to 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 conformity to the EMC directive for the machinery and equipment as a whole.

② For the servo motor (24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 568 for the noise filter set. Refer to the LECA series Operation Manual for installation.

③ CC-Link direct input type (LECPMJ) is not CE-compliant.

#### [UL-compliant products]

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

### Applicable Stroke Table

Model	Stroke [mm]														Manufacturable stroke range [mm]						
	50	100	150	200	250	300	350	400	450	500	550	600	650	700		750	800	850	900	950	1000
11-LEFS16	●	●	●	●	●	●	●	●	●	●	—	—	—	—	—	—	—	—	—	—	50 to 500
11-LEFS25	●	●	●	●	●	●	●	●	●	●	●	●	—	—	—	—	—	—	—	—	50 to 600
11-LEFS32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	—	—	—	—	50 to 800
11-LEFS40	—	—	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	150 to 1000

\* Please consult with SMC for non-standard strokes as they are produced as special orders.

#### Support Guide/LEFG Series

A support guide is designed to support workpieces with significant overhang.

Page 527

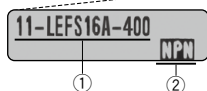


### The actuator and controller/driver are sold as a package.

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

<Check the following before use.>

- Check the actuator label for model number. This matches the controller/driver.
- Check Parallel I/O configuration matches (NPN or PNP).



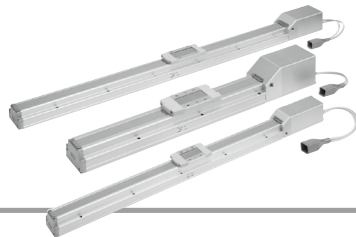
\* Refer to the Operation Manual for using the products. Please download it via our website, <http://www.smcworld.com>

# Electric Actuator/Slider Type Ball Screw Drive **11-LEFS Series**

Step Motor (Servo/24 VDC)

Servo Motor (24 VDC)

Clean Room Specification



## 6 Motor option

<b>NII</b>	Without option
<b>B</b>	With lock

## 9 Actuator cable length

<b>NII</b>	Without cable
<b>1</b>	1.5 m
<b>3</b>	3 m
<b>5</b>	5 m
<b>8</b>	8 m*
<b>A</b>	10 m*
<b>B</b>	15 m*
<b>C</b>	20 m*

\* Produced upon receipt of order (Robotic cable only)  
Refer to the specifications Note 2) on pages 516 and 517.

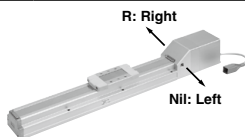
## 12 Controller/Driver mounting

<b>NII</b>	Screw mounting
<b>D</b>	DIN rail mounting*

\* DIN rail is not included. Order it separately.

## 7 Vacuum port

<b>NII</b>	Left
<b>R</b>	Right



## 10 Controller/Driver type\*1

<b>NII</b>	Without controller/driver	
<b>6N</b>	<b>LECP6/LECA6</b> (Step data input type)	NPN
<b>6P</b>		PNP
<b>1N</b>	<b>LECP1</b> *2 (Programless type)	NPN
<b>1P</b>		PNP
<b>MJ</b>	<b>LECPMJ</b> *2 *3 (CC-Link direct input type)	—
<b>AN</b>	<b>LECPA</b> *2 *4 (Pulse input type)	NPN
<b>AP</b>		PNP

\*1 For details about controller/driver and compatible motor, refer to the compatible controller/driver below.

\*2 Only available for the motor type "Step motor."

\*3 Not applicable to CE.

\*4 When pulse signals are open collector, order the current limiting resistor (LEC-PA-R-□) on page 596 separately.

## 8 Actuator cable type\*1

<b>NII</b>	Without cable
<b>S</b>	Standard cable*2
<b>R</b>	Robotic cable (Flexible cable)*3

\*1 The standard cable should be used on fixed parts. For using on moving parts, select the robotic cable.

\*2 Only available for the motor type "Step motor."

\*3 Fix the motor cable protruding from the actuator to keep it unmovable. For details about fixing method, refer to Wiring/Cables in the Electric Actuators Precautions.

## 11 I/O cable length\*1, Communication plug

<b>NII</b>	Without cable (Without communication plug connector)*3
<b>1</b>	1.5 m
<b>3</b>	3 m*2
<b>5</b>	5 m*2
<b>S</b>	Straight type communication plug connector*3
<b>T</b>	T-branch type communication plug connector*3

\*1 When "Without controller/driver" is selected for controller/driver types, I/O cable cannot be selected. Refer to page 568 (For LECP6/LECA6), page 582 (For LECP1) or page 596 (For LECPA) if I/O cable is required.

\*2 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.

\*3 For the LECPMJ, only "NII", "S" and "T" are selectable since I/O cable is not included.

## Compatible Controller/Driver

Type	Step data input type	Step data input type	CC-Link direct input type	Programless type	Pulse input type
<b>Series</b>	<b>LECP6</b>	<b>LECA6</b>	<b>LECPMJ</b>	<b>LECP1</b>	<b>LECPA</b>
<b>Features</b>	Value (Step data) input Standard controller		CC-Link direct input	Capable of setting up operation (step data) without using a PC or teaching box	Operation by pulse signals
<b>Compatible motor</b>	Step motor (Servo/24 VDC)	Servo motor (24 VDC)		Step motor (Servo/24 VDC)	
<b>Max. number of step data</b>	64 points			14 points	—
<b>Power supply voltage</b>	24 VDC				
<b>Reference page</b>	Page 560	Page 560	Page 600	Page 576	Page 590

LEF  
LEJ  
LEL  
LEM  
LEY  
LES  
LEPY  
LEPS  
LER  
LEH  
LEY  
-X5  
11-  
LEFS  
25A-  
LEC□  
LEC  
□  
LEC  
SS-T  
LEC  
Y□  
Motor-  
less  
LAT  
LZ□  
LC3F2

# 11-LEFS Series

Step Motor (Servo/24 VDC)

Servo Motor (24 VDC)

Clean Room Specification

## Specifications

### Step Motor (Servo/24 VDC)

Model		11-LEFS16		11-LEFS25		11-LEFS32		11-LEFS40				
Actuator specifications	Stroke [mm] <sup>Note 1)</sup>	50 to 500										
	Work load [kg] <sup>Note 2)</sup>	Horizontal	LECP6/LECP1/LECPM/J		14	15	25	30	45	50	55	65
		Vertical	LECPA		9	10	20	20	40	45	50	60
					2	4	7.5	15	10	20	2	23
	Speed [mm/s] <sup>Note 2)</sup>	10 to 500	5 to 250	12 to 500	6 to 250	16 to 500	8 to 250	20 to 500	10 to 250			
	Max. acceleration/deceleration [mm/s <sup>2</sup> ]	3000										
	Positioning repeatability [mm]	Basic type		±0.02								
		High precision type		±0.015								
	Lost motion [mm] <sup>Note 3)</sup>	Basic type		0.1 or less								
		High precision type		0.05 or less								
Lead [mm]	10	5	12	6	16	8	20	10				
Impact/Vibration resistance [m/s <sup>2</sup> ] <sup>Note 4)</sup>	50/20											
Actuation type	Ball screw											
Guide type	Linear guide											
Operating temperature range [°C]	5 to 40											
Operating humidity range [%RH]	90 or less (No condensation)											
Cleanliness class <sup>Note 5)</sup>	ISO Class 4 (ISO 14644-1)											
Grease	Ball screw /Linear guide portion		Low particle generation grease									
Electric specifications	Motor size	□28		□42		□56.4						
	Motor type	Step motor (Servo/24 VDC)										
	Encoder	Incremental A/B phase (800 pulse/rotation)										
	Rated voltage [V]	24 VDC ±10%										
	Power consumption [W] <sup>Note 6)</sup>	22		38		50		100				
	Standby power consumption when operating [W] <sup>Note 7)</sup>	18		16		44		43				
	Max. instantaneous power consumption [W] <sup>Note 8)</sup>	51		57		123		141				
Lock unit specifications	Type <sup>Note 9)</sup>	Non-magnetizing lock										
	Holding force [N]	20	39	78	157	108	216	113	225			
	Power consumption [W] <sup>Note 10)</sup>	2.9		5		5		5				
	Rated voltage [V]	24 VDC ±10%										

Note 1) Please consult with SMC for non-standard strokes as they are produced as special orders.

Note 2) Speed changes according to the controller/driver type and work load. Check "Speed-Work Load Graph (Guide)" on pages 39 and 40.

Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m.

Note 3) A reference value for correcting an error in reciprocal operation.

Note 4) 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. (Test was performed with the actuator in the initial state.)

Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)

Note 5) The amount of particle generation changes according to the operating conditions and suction flow rate. Refer to the particle generation characteristics for details.

Note 6) The power consumption (including the controller) is for when the actuator is operating.

Note 7) The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation.

Note 8) The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.

Note 9) With lock only

Note 10) For an actuator with lock, add the power consumption for the lock.

## Specifications

### Servo Motor (24 VDC)

Model		11-LEFS16A		11-LEFS25A			
Actuator specifications	Stroke [mm] <sup>Note 1)</sup>	50 to 500				50 to 600	
	Work load <sup>Note 2)</sup> [kg]	Horizontal	7	10	11	18	
		Vertical	2	4	2.5	5	
	Speed [mm/s] <sup>Note 2)</sup>	1 to 500	1 to 250	2 to 500	1 to 250		
	Max. acceleration/deceleration [mm/s <sup>2</sup> ]	3000					
	Positioning repeatability [mm]	Basic type	±0.02				
		High precision type	±0.015				
	Lost motion <sup>Note 3)</sup> [mm]	Basic type	0.1 or less				
		High precision type	0.05 or less				
	Lead [mm]	10	5	12	6		
Impact/Vibration resistance [m/s <sup>2</sup> ] <sup>Note 4)</sup>	50/20						
Actuation type	Ball screw						
Guide type	Linear guide						
Operating temperature range [°C]	5 to 40						
Operating humidity range [%RH]	90 or less (No condensation)						
Cleanliness class <sup>Note 5)</sup>	ISO Class 4 (ISO 14644-1)						
Grease <sup>Note 6)</sup>	Ball screw /Linear guide portion Low particle generation grease						
Electric specifications	Motor size	□28		□42			
	Motor output [W]	30		36			
	Motor type	Servo motor (24 VDC)					
	Encoder	Incremental A/B (800 pulse/rotation)/Z phase					
	Rated voltage [V]	24 VDC ±10%					
	Power consumption [W] <sup>Note 6)</sup>	63		102			
	Standby power consumption when operating [W] <sup>Note 7)</sup>	Horizontal 4/Vertical 9		Horizontal 4/Vertical 9			
Max. instantaneous power consumption [W] <sup>Note 8)</sup>	70		113				
Load unit specifications	Type <sup>Note 9)</sup>	Non-magnetizing lock					
	Holding force [N]	20	39	78	157		
	Power consumption [W] <sup>Note 10)</sup>	2.9			5		
	Rated voltage [V]	24 VDC ±10%					

Note 1) Please consult with SMC for non-standard strokes as they are produced as special orders.

Note 2) Check "Speed-Work Load Graph (Guide)" on page 42 for details. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m.

Note 3) A reference value for correcting an error in reciprocal operation.

Note 4) 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.

(Test was performed with the actuator in the initial state.)

Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)

Note 5) The amount of particle generation changes according to the operating conditions and suction flow rate. Refer to the particle generation characteristics for details.

Note 6) The power consumption (including the controller) is for when the actuator is operating.

Note 7) The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation.

Note 8) The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.

Note 9) With lock only

Note 10) For an actuator with lock, add the power consumption for the lock.

## Weight

Series	11-LEFS16									
Stroke [mm]	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	0.83	0.90	0.98	1.05	1.13	1.20	1.28	1.35	1.43	1.50
Additional weight with lock [kg]	0.12									

Series	11-LEFS25											
Stroke [mm]	50	100	150	200	250	300	350	400	450	500	550	600
Product weight [kg]	1.70	1.84	1.98	2.12	2.26	2.40	2.54	2.68	2.82	2.96	3.10	3.24
Additional weight with lock [kg]	0.26											

Series	11-LEFS32															
Stroke [mm]	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Product weight [kg]	3.15	3.35	3.55	3.75	3.95	4.15	4.35	4.55	4.75	4.95	5.15	5.35	5.55	5.75	5.95	6.15
Additional weight with lock [kg]	0.53															

Series	11-LEFS40																	
Stroke [mm]	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Product weight [kg]	5.37	5.65	5.93	6.21	6.49	6.77	7.15	7.33	7.61	7.89	8.17	8.45	8.75	9.01	9.29	9.57	9.85	10.13
Additional weight with lock [kg]	0.53																	

LEF  
LEJ  
LEL  
LEM  
LEY  
LES  
LEPY  
LEPS  
LER  
LEH  
LEY  
-X5  
11-  
LEFS  
11-  
LEJS  
25A-  
LEC□  
LEC  
□  
LEC  
SS-T  
LEC  
Y□  
Motor-  
less  
LAT  
LZ□  
LC3F2



# 11-LEFS Series

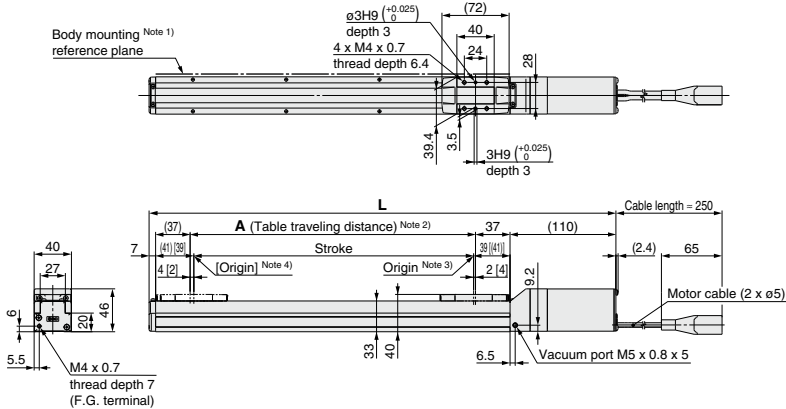
Step Motor (Servo/24 VDC)

Servo Motor (24 VDC)

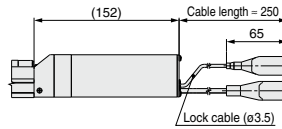
Clean Room Specification

## Dimensions: Ball Screw Drive

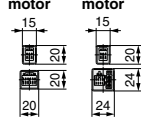
### 11-LEFS16



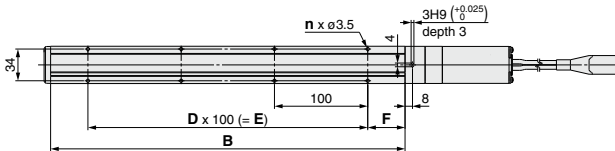
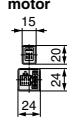
#### Motor option: With lock



#### Step motor



#### Servo motor



Note 1) When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 2 mm or more because of round chamfering. (Recommended height 5 mm)

Note 2) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere with the workpieces and facilities around the table.

Note 3) Position after return to origin

Note 4) [ ] for when the direction of return to origin has changed.

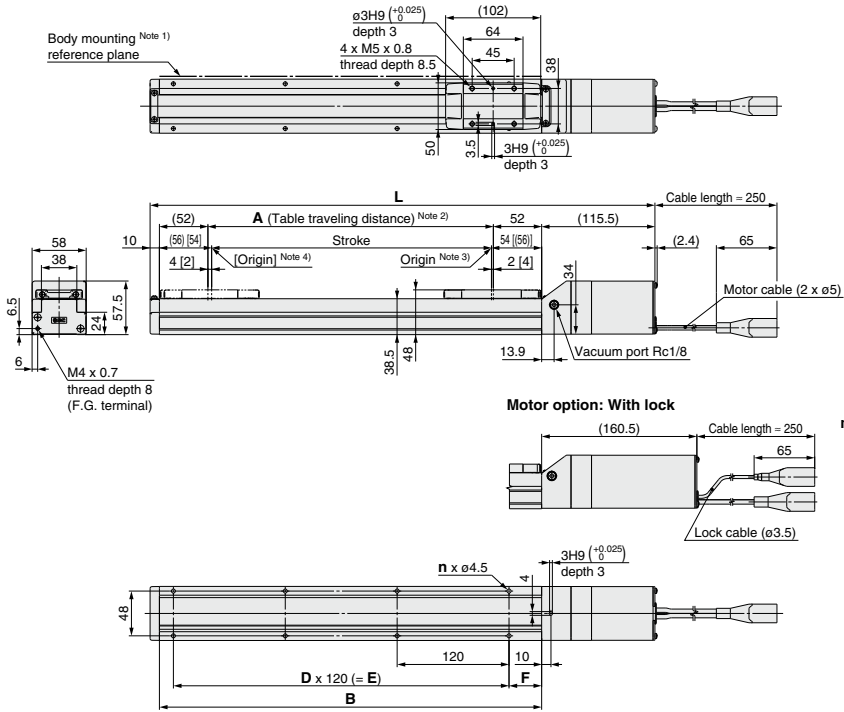
### Dimensions

[mm]

Model	L		A	B	n	D	E	F
	Without lock	With lock						
11-LEFS16□-50□	247	289	56	130	4	—	—	15
11-LEFS16□-100□	297	339	106	180	4	—	—	40
11-LEFS16□-150□	347	389	156	230	4	—	—	
11-LEFS16□-200□	397	439	206	280	6	2	200	
11-LEFS16□-250□	447	489	256	330	6	2	200	
11-LEFS16□-300□	497	539	306	380	8	3	300	
11-LEFS16□-350□	547	589	356	430	8	3	300	
11-LEFS16□-400□	597	639	406	480	10	4	400	
11-LEFS16□-450□	647	689	456	530	10	4	400	
11-LEFS16□-500□	697	739	506	580	12	5	500	

**Dimensions: Ball Screw Drive**

**11-LEFS25**



- Note 1) When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more because of round chamfering. (Recommended height 5 mm)
- Note 2) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere with the workpieces and facilities around the table.
- Note 3) Position after return to origin
- Note 4) [ ] for when the direction of return to origin has changed.

**Dimensions**

Model	L		A	B	n	D	E	F
	Without lock	With lock						
11-LEFS25□-50□	285.5	330.5	56	160	4	—	—	20
11-LEFS25□-100□	335.5	380.5	106	210	4	—	—	35
11-LEFS25□-150□	385.5	430.5	156	260	4	—	—	
11-LEFS25□-200□	435.5	480.5	206	310	6	2	240	
11-LEFS25□-250□	485.5	530.5	256	360	6	2	240	
11-LEFS25□-300□	535.5	580.5	306	410	8	3	360	
11-LEFS25□-350□	585.5	630.5	356	460	8	3	360	
11-LEFS25□-400□	635.5	680.5	406	510	8	3	360	
11-LEFS25□-450□	685.5	730.5	456	560	10	4	480	
11-LEFS25□-500□	735.5	780.5	506	610	10	4	480	
11-LEFS25□-550□	785.5	830.5	556	660	12	5	600	
11-LEFS25□-600□	835.5	880.5	606	710	12	5	600	

- LEF
- LEJ
- LEL
- LEM
- LEY
- LES
- LEPY LEPS
- LER
- LEH
- LEY -X5
- 11-LEFS**
- 11-LEJS
- 25A-
- LEC□
- LEC □
- LEC SS-T
- LEC Y□
- Motor-less
- LAT
- LZ□
- LC3F2

# 11-LEFS Series

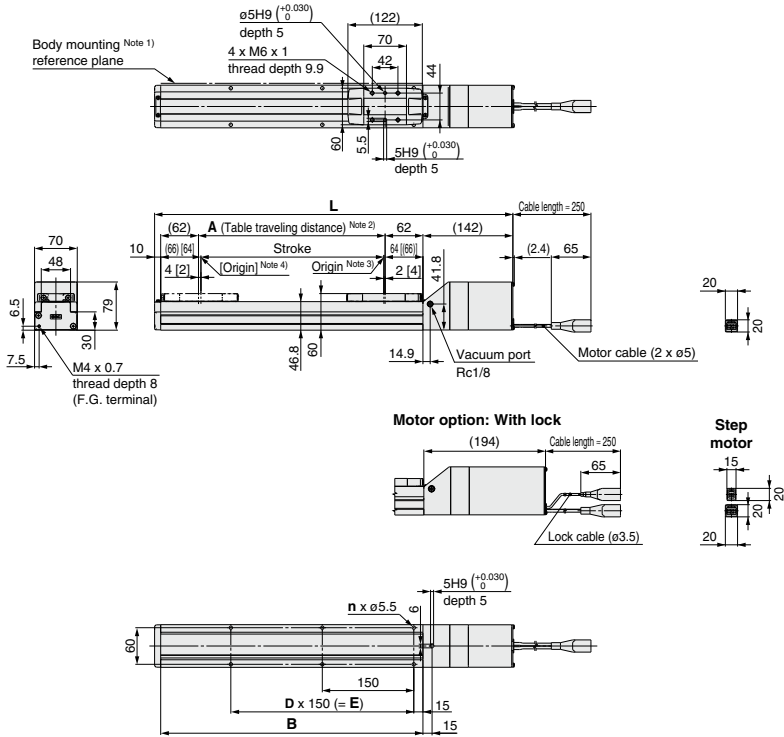
Step Motor (Servo/24 VDC)

Servo Motor (24 VDC)

Clean Room Specification

## Dimensions: Ball Screw Drive

### 11-LEFS32



Note 1) When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more because of round chamfering. (Recommended height 5 mm)

Note 2) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere with the workpieces and facilities around the table.

Note 3) Position after return to origin

Note 4) [ ] for when the direction of return to origin has changed.

### Dimensions

Model	L		A	B	n	D	E
	Without lock	With lock					
11-LEFS32□-50□	332	384	56	180	4	—	—
11-LEFS32□-100□	382	434	106	230	4	—	—
11-LEFS32□-150□	432	484	156	280	4	—	—
11-LEFS32□-200□	482	534	206	330	6	2	300
11-LEFS32□-250□	532	584	256	380	6	2	300
11-LEFS32□-300□	582	634	306	430	6	2	300
11-LEFS32□-350□	632	684	356	480	8	3	450
11-LEFS32□-400□	682	734	406	530	8	3	450
11-LEFS32□-450□	732	784	456	580	8	3	450
11-LEFS32□-500□	782	834	506	630	10	4	600
11-LEFS32□-550□	832	884	556	680	10	4	600
11-LEFS32□-600□	882	934	606	730	10	4	600
11-LEFS32□-650□	932	984	656	780	12	5	750
11-LEFS32□-700□	982	1034	706	830	12	5	750
11-LEFS32□-750□	1032	1084	756	880	12	5	750
11-LEFS32□-800□	1082	1134	806	930	14	6	900



# Electric Actuator/Slider Type Ball Screw Drive

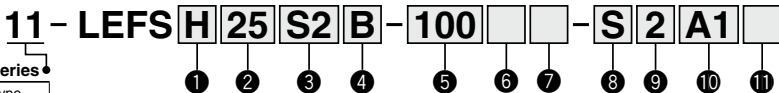
Clean Room Specification

## 11-LEFS Series LEFS25, 32, 40



Refer to page 46 for model selection and page 510 for particle generation characteristics.

### How to Order



Clean Series

11	Vacuum type
----	-------------

#### ① Accuracy

Nil	Basic type
H	High precision type

#### ③ Motor type

Symbol	Type	Output [W]	Actuator size	Compatible driver
S2*	AC servo motor (Incremental encoder)	100	25	LECSA□-S1
S3		200	32	LECSA□-S3
S4		400	40	LECSA2-S4
S6*	AC servo motor (Absolute encoder)	100	25	LECSB□-S5 LECS□□-S5 LECS□□-S5
S7		200	32	LECSB□-S7 LECS□□-S7 LECS□□-S7
S8		400	40	LECSB2-S8 LECS2-S8 LECS2-S8

\* For motor type S2 and S6, the compatible driver part number suffixes are S1 and S5 respectively.

#### ④ Lead [mm]

Symbol	11-LEFS25	11-LEFS32	11-LEFS40
A	12	16	20
B	6	8	10

#### ⑤ Stroke [mm]

50	50
to	to
1000	1000

\* Refer to the applicable stroke table.

#### ② Size

25
32
40

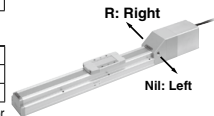
#### ⑥ Motor option

Nil	Without option
B	With lock

#### ⑦ Vacuum port\*

Nil	Left
R	Right
D	Both left and right

\* Select "D" for the vacuum port for suction of 50 L/min (ANR) or more.



#### ⑧ Cable type

Nil	Without cable
S	Standard cable
R	Robotic cable (Flexible cable)

Note 1) The motor and encoder cables are included. (The lock cable is also included when the motor with lock option is selected.)

Note 2) Standard cable entry direction is "(B) Counter axis side". (Refer to page 623 for details.)

#### ⑨ Cable length

Nil	Without cable
2	2 m
5	5 m
A	10 m

Note 3) The length of the encoder, motor and lock cables are the same.

#### ⑩ I/O cable length [m]

Nil	Without cable
H	Without cable (Connector only)
1	1.5

Note 4) When "Without driver" is selected for driver type, only "Nil: Without cable" can be selected. Refer to page 624 if I/O cable is required. (Options are shown on page 624.)

#### ⑪ Driver type

Nil	Compatible driver	Power supply voltage [V]	Size		
			25	32	40
A1	LECSA1-S□	100 to 120	●	●	—
B1	LECSA2-S□	200 to 230	●	●	—
A2	LECSB1-S□	100 to 120	●	—	—
B2	LECSB2-S□	200 to 230	●	●	●
C1	LECS□1-S□	100 to 120	●	●	—
C2	LECS□2-S□	200 to 230	●	●	—
S1	LECSS1-S□	100 to 120	●	—	—
S2	LECSS2-S□	200 to 230	●	●	●

\* When the driver type is selected, the cable is included. Select cable type and cable length.

Example)  
S2S2: Standard cable (2 m) + Driver (LECSS2)  
S2: Standard cable (2 m)  
Nil: Without cable and driver

#### Applicable Stroke Table

Model	Stroke [mm]																			
	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
11-LEFS25	●	●	●	●	●	●	●	●	●	●	●	●	●	—	—	—	—	—	—	—
11-LEFS32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	—	—
11-LEFS40	—	—	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

\* Please consult with SMC for non-standard strokes as they are produced as special orders.

#### Compatible Driver

Driver type	Pulse input type/ Positioning type	Pulse input type	CC-Link direct input type	SSCNET III type
Series	LECSA	LECSB	LECS□	LECSS
Number of point tables	Up to 7	—	Up to 255 (2 stations occupied)	—
Pulse input	○	○	—	—
Applicable network	—	—	CC-Link	SSCNET III
Control encoder	Incremental 17-bit encoder	Absolute 18-bit encoder	Absolute 18-bit encoder	Absolute 18-bit encoder
Communication function	USB communication	USB communication, RS422 communication	USB communication, RS422 communication	USB communication
Power supply voltage [V]	100 to 120 VAC (50/60 Hz), 200 to 230 VAC (50/60 Hz)			
Reference page	Page 607			

**Specifications**

**11-LEFS25, 32, 40 AC Servo Motor**

Model		11-LEFS25S <sup>2</sup>			11-LEFS32S <sup>3</sup>			11-LEFS40S <sup>4</sup>			
Actuator specifications	Stroke [mm] <sup>Note 1)</sup>	50 to 600			50 to 800			150 to 1000			
	Work load [kg] <sup>Note 2)</sup>	Horizontal	20	20	40	45	50	60			
		Vertical	8	15	10	20	15	30			
	Max. speed [mm/s] <sup>Note 3)</sup>	Stroke range	Up to 400	900	450	1000	500	1000	500		
			401 to 500	720	360	1000	500	1000	500		
			501 to 600	540	270	800	400	1000	500		
			601 to 700	—	—	620	310	940	470		
			701 to 800	—	—	500	250	760	380		
			801 to 900	—	—	—	—	620	310		
	901 to 1000	—	—	—	—	520	260				
Max. acceleration/deceleration [mm/s <sup>2</sup> ]	5000 (Refer to pages 48 to 50 for limit according to work load and duty ratio.)										
Positioning repeatability [mm]	Basic type	±0.02									
	High precision type	±0.01									
Lost motion [mm] <sup>Note 4)</sup>	Basic type	0.1 or less									
	High precision type	0.05 or less									
Lead [mm]		12	6	16	8	20	10				
Impact/Vibration resistance [m/s <sup>2</sup> ] <sup>Note 5)</sup>		50/20									
Actuation type		Ball screw									
Guide type		Linear guide									
Operating temperature range [°C]		5 to 40									
Operating humidity range [%RH]		90 or less (No condensation)									
Cleanliness class <sup>Note 6)</sup>		ISO Class 4 (ISO 14644-1)									
		Class 10 (Fed.Std.209E)									
Grease	Ball screw /Linear guide portion	Low particle generation grease									
Motor output/Size		100 W/□40			200 W/□60			400 W/□60			
Motor type		AC servo motor (100/200 VAC)									
Encoder		Motor type S2, S3, S4: Incremental 17-bit encoder (Resolution: 131072 p/rev) Motor type S6, S7, S8: Absolute 18-bit encoder (Resolution: 262144 p/rev)									
Power consumption [W] <sup>Note 7)</sup>	Horizontal	45		65		210					
	Vertical	145		175		230					
Standby power consumption when operating [W] <sup>Note 8)</sup>	Horizontal	2		2		2					
	Vertical	8		8		18					
Max. instantaneous power consumption [W] <sup>Note 9)</sup>		445		725		1275					
Type <sup>Note 10)</sup>		Non-magnetizing lock									
Holding force [N]		131	255	197	385	330	660				
Power consumption at 20°C [W] <sup>Note 11)</sup>		6.3			7.9			7.9			
Rated voltage [V]		24 VDC <sup>±10%</sup>									

Note 1) Please consult with SMC for non-standard strokes as they are produced as special orders.

Note 2) For details, refer to "Speed-Work Load Graph (Guide)" on page 47.

Note 3) The allowable speed changes according to the stroke.

Note 4) A reference value for correcting an error in reciprocal operation.

Note 5) 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. (Test was performed with the actuator in the initial state.)

Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test

was performed with the actuator in the initial state.)

Note 6) The amount of particle generation changes according to the operating conditions and suction flow rate. Refer to the particle generation characteristics for details.

Note 7) The power consumption (including the driver) is for when the actuator is operating.

Note 8) The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.

Note 9) The maximum instantaneous power consumption (including the driver) is for when the actuator is operating.

Note 10) Only when motor option "With lock" is selected.

Note 11) For an actuator with lock, add the power consumption for the lock.

**Weight**

Series		11-LEFS25S□											
Stroke [mm]		50	100	150	200	250	300	350	400	450	500	550	600
Motor type	S2	2.00	2.14	2.28	2.44	2.56	2.69	2.84	2.99	3.12	3.24	3.40	3.54
	S6	2.06	2.20	2.34	2.50	2.62	2.75	2.90	3.05	3.18	3.30	3.46	3.60
Additional weight with lock [kg]		S2: 0.2/S6: 0.3											

Series		11-LEFS32S□															
Stroke [mm]		50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Motor type	S3	3.40	3.60	3.80	4.00	4.20	4.40	4.60	4.80	5.00	5.20	5.40	5.60	5.80	6.00	6.20	6.40
	S7	3.34	3.54	3.74	3.94	4.14	4.34	4.54	4.74	4.94	5.14	5.34	5.54	5.74	5.94	6.14	6.34
Additional weight with lock [kg]		S3: 0.4/S7: 0.7															

Series		11-LEFS40S□																	
Stroke [mm]		150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Motor type	S4	5.82	6.10	6.38	6.65	6.95	7.25	7.51	7.80	8.07	8.25	8.63	8.90	9.20	9.45	9.76	10.05	10.32	10.60
	S8	5.92	6.20	6.48	6.75	7.05	7.35	7.61	7.90	8.17	8.35	8.73	9.00	9.30	9.55	9.86	10.15	10.42	10.70
Additional weight with lock [kg]		S4: 0.7/S8: 0.7																	

LEF

LEJ

LEL

LEM

LEY

LES

LEPY

LEPS

LER

LEH

LEY

X-5

11-LEFS

11-LEJS

25A-

LEC□

LEC

S□

LEC

SS-T

LEC

Y□

Motor-less

LAT

LZ□

LC3F2

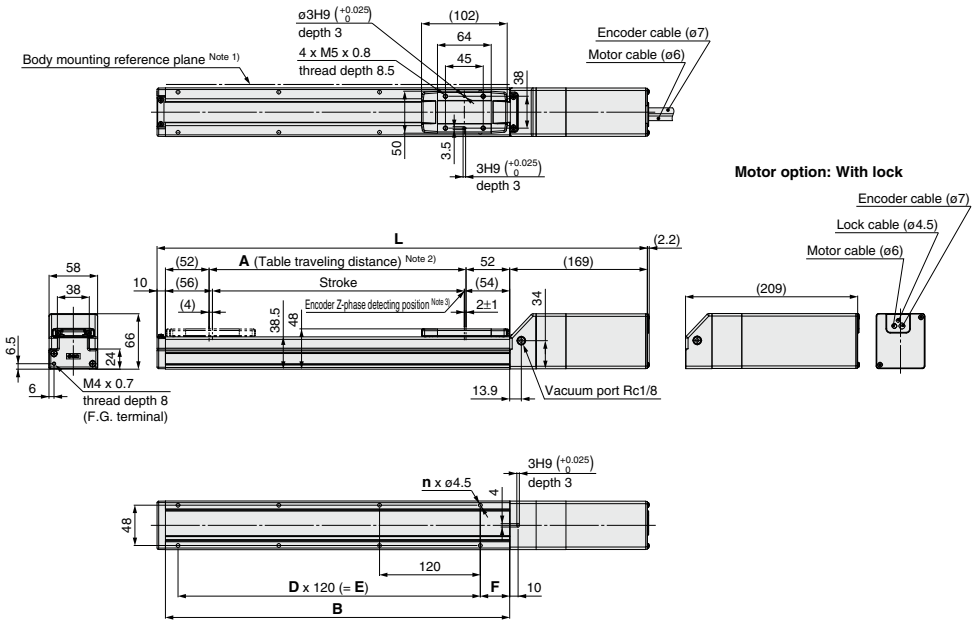
# 11-LEFS Series

AC Servo Motor

Clean Room Specification

## Dimensions: Ball Screw Drive

### 11-LEFS25



- Note 1) When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more because of round chamfering. (Recommended height 5 mm)
- Note 2) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere with the workpieces and facilities around the table.
- Note 3) The Z-phase first detecting position from the stroke end of the motor side.

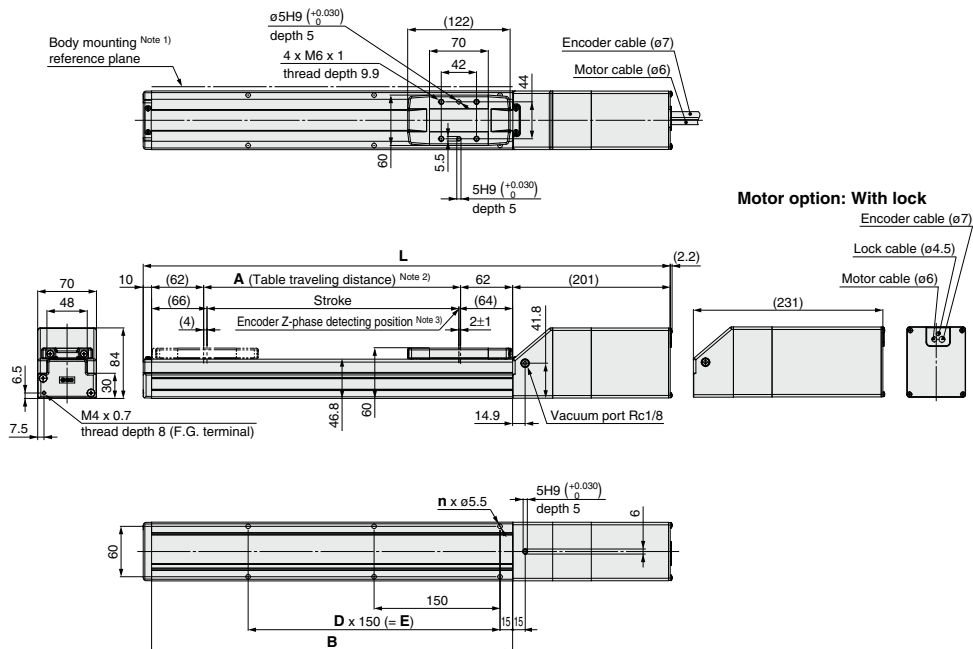
### Dimensions

[mm]

Model	L		A	B	n	D	E	F
	Without lock	With lock						
11-LEFS25□□-50□	339	379	56	160	4	—	—	20
11-LEFS25□□-100□	389	429	106	210	4	—	—	35
11-LEFS25□□-150□	439	479	156	260	4	—	—	
11-LEFS25□□-200□	489	529	206	310	6	2	240	
11-LEFS25□□-250□	539	579	256	360	6	2	240	
11-LEFS25□□-300□	589	629	306	410	8	3	360	
11-LEFS25□□-350□	639	679	356	460	8	3	360	
11-LEFS25□□-400□	689	729	406	510	8	3	360	
11-LEFS25□□-450□	739	779	456	560	10	4	480	
11-LEFS25□□-500□	789	829	506	610	10	4	480	
11-LEFS25□□-550□	839	879	556	660	12	5	600	
11-LEFS25□□-600□	889	929	606	710	12	5	600	

**Dimensions: Ball Screw Drive**

**11-LEFS32**



Note 1) When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more because of round chamfering. (Recommended height 5 mm)

Note 2) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere with the workpieces and facilities around the table.

Note 3) The Z-phase first detecting position from the stroke end of the motor side.

**Dimensions**

Model	L		A	B	n	D	E
	Without lock	With lock					
11-LEFS32□□-50□	391	421	56	180	4	—	—
11-LEFS32□□-100□	441	471	106	230	4	—	—
11-LEFS32□□-150□	491	521	156	280	4	—	—
11-LEFS32□□-200□	541	571	206	330	6	2	300
11-LEFS32□□-250□	591	621	256	380	6	2	300
11-LEFS32□□-300□	641	671	306	430	6	2	300
11-LEFS32□□-350□	691	721	356	480	8	3	450
11-LEFS32□□-400□	741	771	406	530	8	3	450
11-LEFS32□□-450□	791	821	456	580	8	3	450
11-LEFS32□□-500□	841	871	506	630	10	4	600
11-LEFS32□□-550□	891	921	556	680	10	4	600
11-LEFS32□□-600□	941	971	606	730	10	4	600
11-LEFS32□□-650□	991	1021	656	780	12	5	750
11-LEFS32□□-700□	1041	1071	706	830	12	5	750
11-LEFS32□□-750□	1091	1121	756	880	12	5	750
11-LEFS32□□-800□	1141	1171	806	930	14	6	900

- LEF
- LEJ
- LEL
- LEM
- LEY
- LES
- LEPY LEPS
- LER
- LEH
- LEY -X5
- 11-LEFS**
- 11-LEJS
- 25A-
- LEC□
- LEC S□
- LEC SS-T
- LEC Y□
- Motor-less
- LAT
- LZ□
- LC3F2



