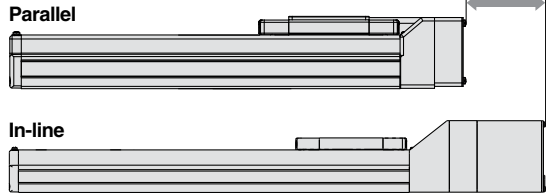


Electric Actuator/Slider Type Motor Parallel Type



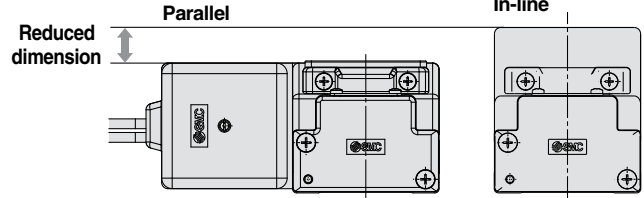
Reduced in overall length



Size	Length reduction (mm)	Motor mounting position (mm)	
		Parallel	In-line
16	80.5	416.5	497
25	75	460.5	535.5
32	87	495	582
40	102.6	553.4	656

* Step motor, Stroke: 300 mm

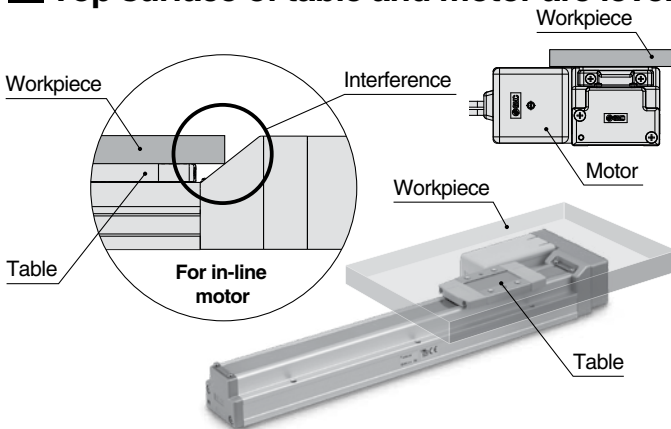
Reduced in height



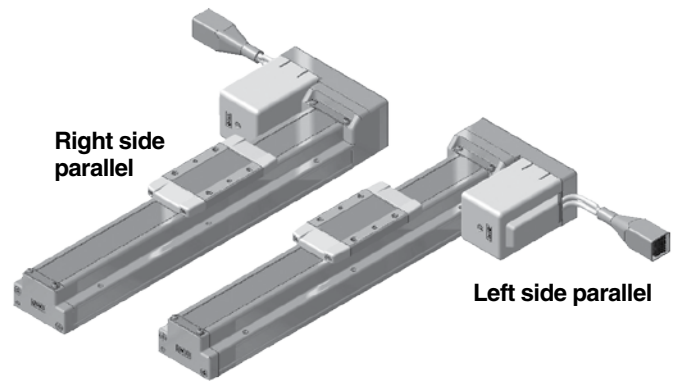
Size	Length reduction (mm)	Motor mounting position (mm)	
		Parallel	In-line
16	6	40	46
25	9.5	48	57.5
32	16	63	79
40	0	68	68

* Step motor

Top surface of table and motor are level.



Motor mounting position can be selected from two directions.



Ball Screw Drive Series LEFS

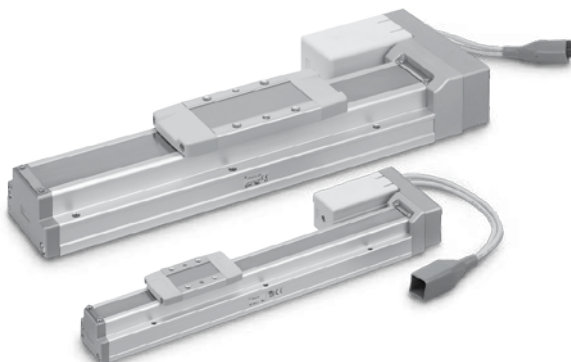
Size: 16, 25, 32, 40

Step Motor (Servo/24 VDC) Type

Servo Motor (24 VDC) Type

Max. work load: 132.3 lb (60 kg)

Positioning repeatability: ± 0.02 mm



Size: 25, 32, 40

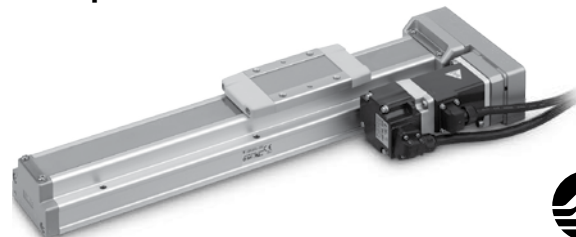
AC Servo Motor Type

* Not applicable to UL.

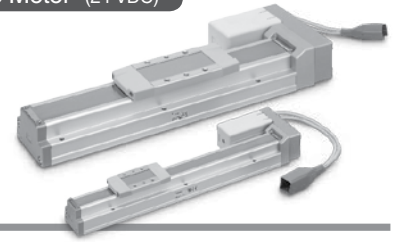
Improved high speed transfer ability Max. speed: 1,000mm/s

High acceleration/deceleration: 20,000mm/s²

- Pulse input type (For LECSA/B)
- With internal absolute encoder (For LECSB/C/S)
- Compatible with CC-Link and SSCNET III.



Electric Actuator/Slider Type Ball Screw Drive/Series **LEFS** Model Selection



Selection Procedure

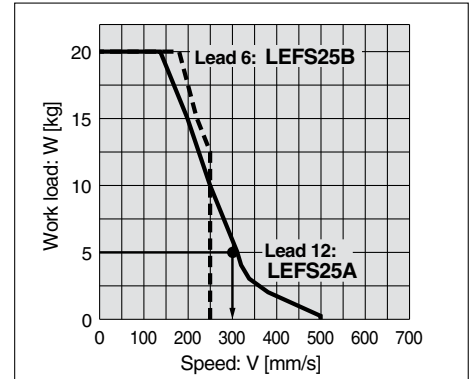
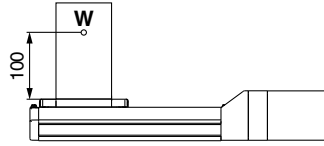


Selection Example

(1 kg = 2.2 lb)

Operating conditions

- Workpiece mass: 5 [kg]
- Speed: 300 [mm/s]
- Acceleration/Deceleration: 3000 [mm/s²]
- 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 2 and 3)

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

Selection example) The **LEFS25RA-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 positioning of the step data. Therefore, please 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.

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

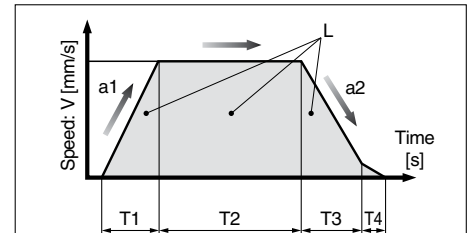
$$T3 = V/a2 = 300/3000 = 0.1 \text{ [s]}$$

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{200 - 0.5 \cdot 300 \cdot (0.1 + 0.1)}{300} = 0.57 \text{ [s]}$$

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

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/s²] ... (Operating condition)
- a2: Deceleration [mm/s²] ... (Operating condition)

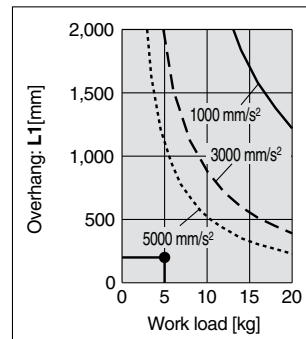
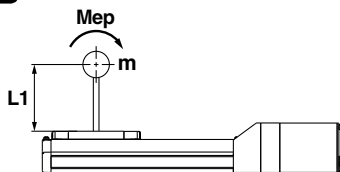
T1: Acceleration time [s]
Time until reaching the set speed

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 in position is completed

Step 3 Check the guide moment.



Based on the above calculation result, the **LEFS25RA-200** is selected.

* If the step motor and servo motors do not meet your specifications, please also consider the AC servo specifications (Page 16).

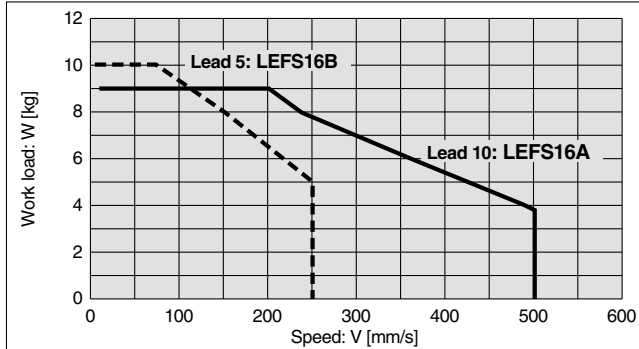
Speed-Work Load Graph (Guide) Step Motor (Servo/24 VDC)

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

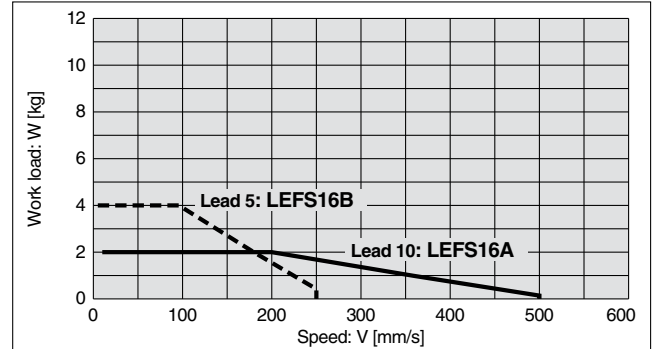
LEFS16/Ball Screw Drive

(1 kg = 2.2 lb)

Horizontal

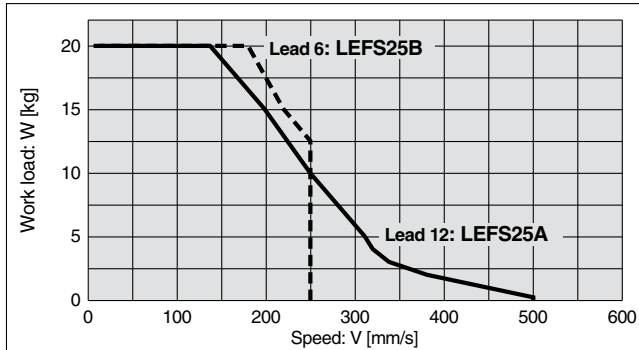


Vertical

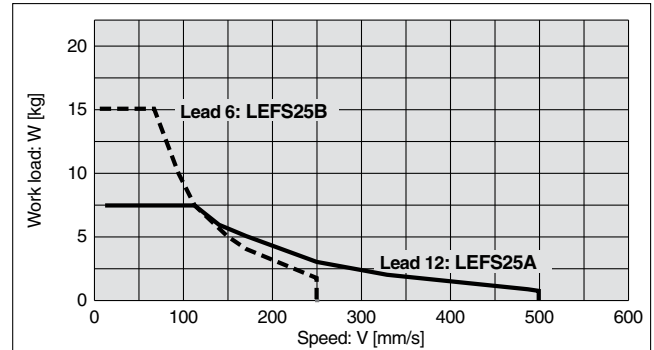


LEFS25/Ball Screw Drive

Horizontal

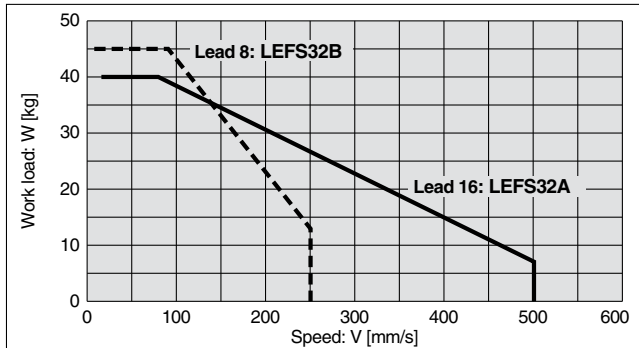


Vertical

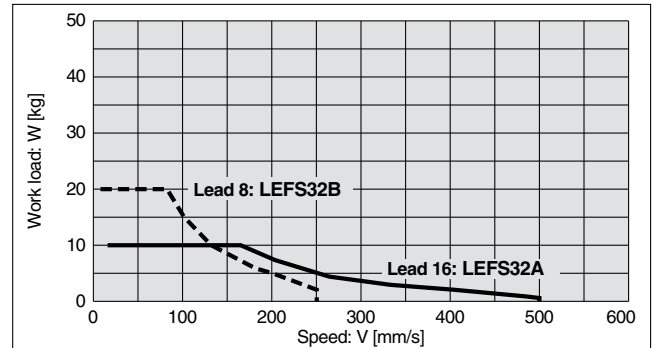


LEFS32/Ball Screw Drive

Horizontal

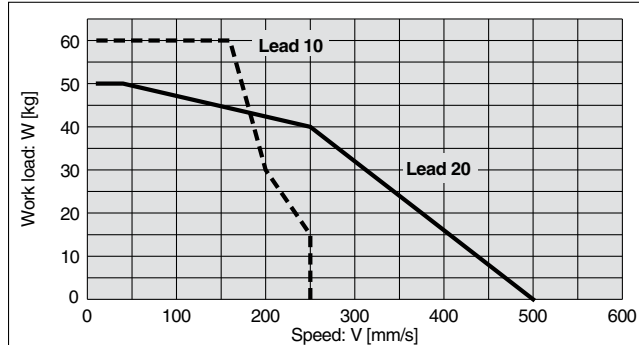


Vertical

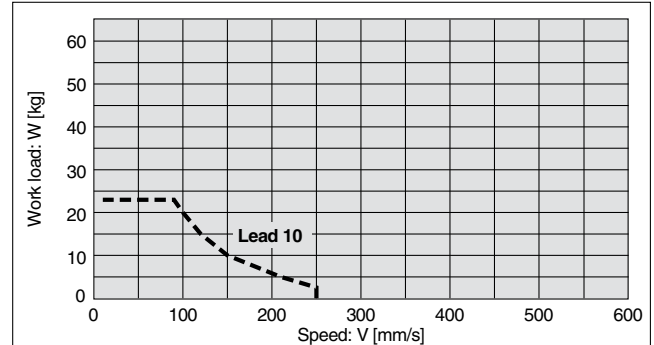


LEFS40/Ball Screw Drive

Horizontal



Vertical



Series LEFS

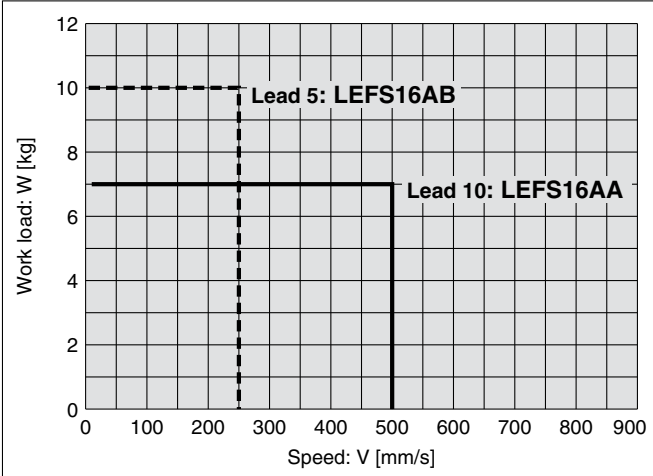
Speed-Work Load Graph (Guide) Step Motor (Servo/24 VDC)

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

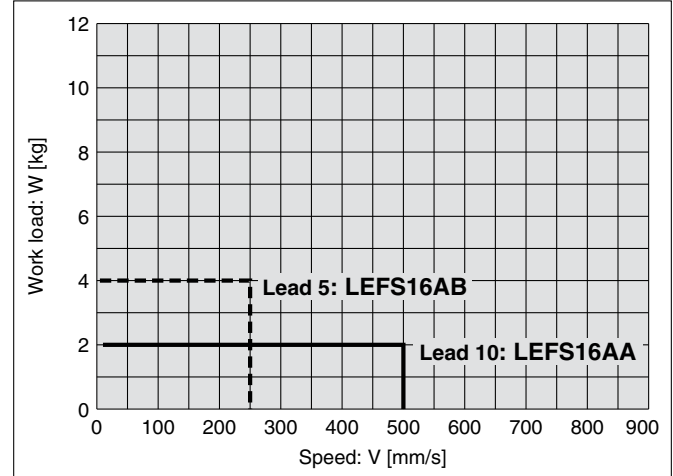
LEFS16A/Ball Screw Drive

(1 kg = 2.2 lb)

Horizontal

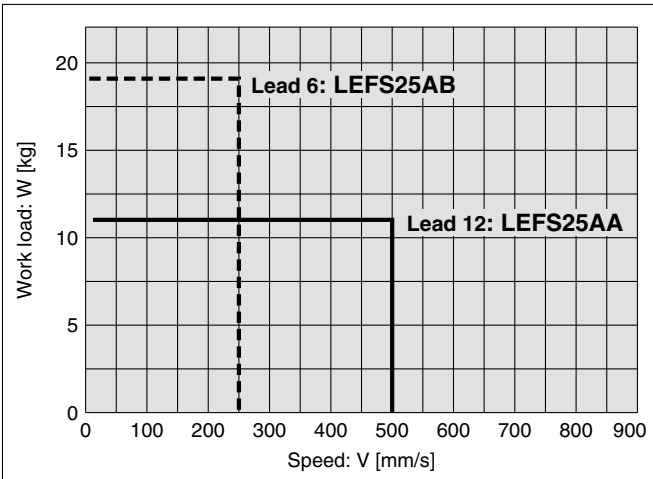


Vertical

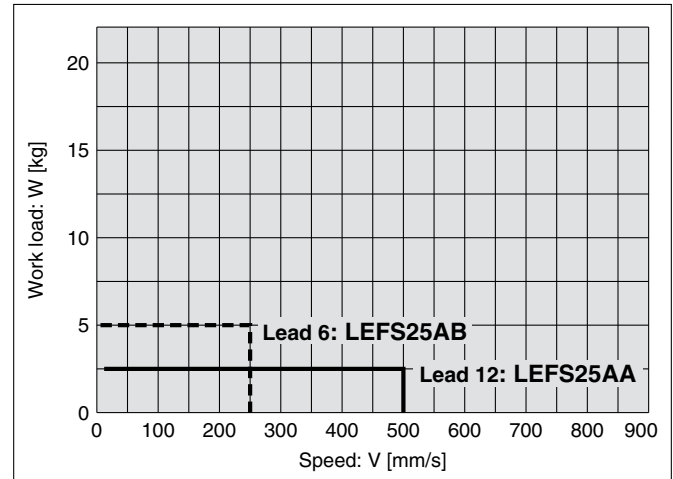


LEFS25A/Ball Screw Drive

Horizontal



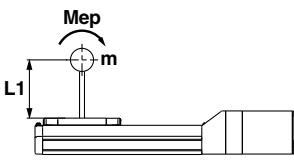
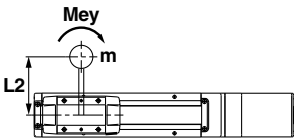
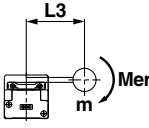
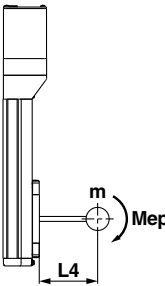
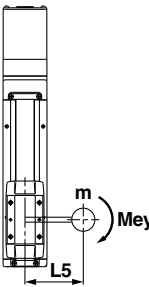
Vertical



* This graph shows the amount of allowable overhang when the center of gravity of the workpiece overhangs in one direction. When the center of gravity of the workpiece overhangs in two directions, refer to the Electric Actuator Selection Software for confirmation. <http://www.smcworld.com>

Dynamic Allowable Moment

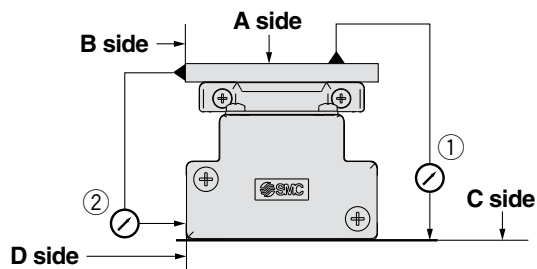
Acceleration/Deceleration — 1,000 mm/s² - - - 3,000 mm/s² 5,000 mm/s²

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			
		LEFS16	LEFS25	LEFS32	LEFS40
Horizontal	 Pitching L1 [mm]				
	 Yawing L2 [mm]				
	 Rolling L3 [mm]				
Vertical	 Pitching L4 [mm]				
	 Yawing L5 [mm]				

(1 kg = 2.2 lbs)

Series LEFS

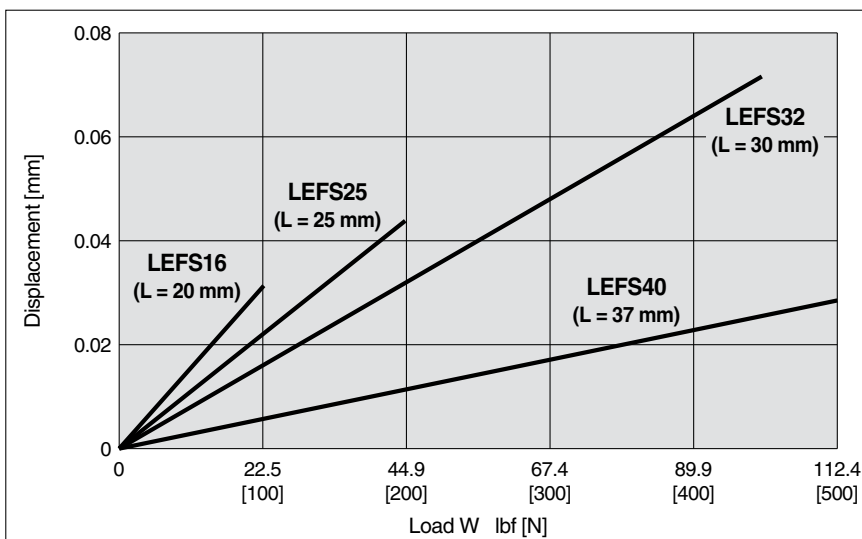
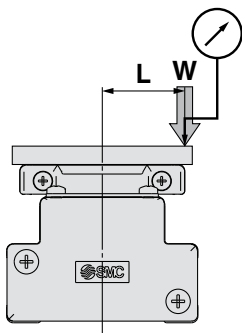
Table Accuracy



Model	Traveling parallelism [mm] (Every 300 mm)	
	① C side traveling parallelism to A	② D side traveling parallelism to B
LEFS16	0.05	0.03
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) Please confirm the clearance and play of the guide separately.

Electric Actuator/Slider Type Motor Parallel Type

Step Motor (Servo/24 VDC)

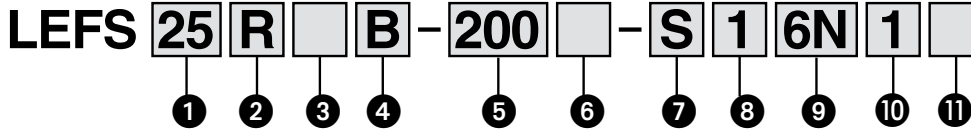
Servo Motor (24 VDC)

Series LEFS

LEFS16, 25, 32, 40



How to Order



① Size

16
25
32
40

② Motor mounting position

R	Right side parallel
L	Left side parallel

③ Motor type

Symbol	Type	Applicable size				Compatible controllers/ driver
		LEFS16	LEFS25	LEFS32	LEFS40	
Nil	Step motor (Servo/24 VDC)	●	●	●	●	LECP6 LECP1 LECPA
A	Servo motor (24 VDC)	●	●	—	—	LECA6

④ Lead [mm]

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

⑤ Stroke [mm]

100	100
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 the catalog CAT.ES100-87 for the noise filter set. Refer to the LECA Operation Manual for installation.

[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

● Standard

Model \ Stroke (mm)	100	200	300	400	500	600	700	800	900	1000	Manufacturable stroke range [mm]
LEFS16	●	●	●	●	—	—	—	—	—	—	100 to 400
LEFS25	●	●	●	●	●	●	—	—	—	—	100 to 600
LEFS32	●	●	●	●	●	●	●	●	—	—	100 to 800
LEFS40	—	●	●	●	●	●	●	●	●	●	200 to 1000

* Strokes are manufacturable in 1 mm increments. Refer to the manufacturable stroke range.

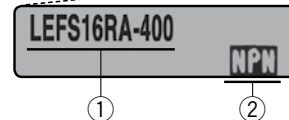
However, strokes other than those shown above are produced as special orders. Consult with SMC for lead times and prices.

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

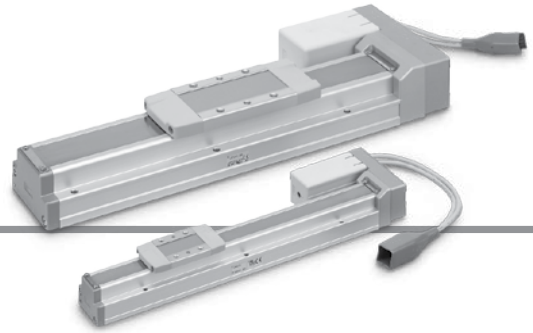
Confirm that the combination of the controller/driver and the actuator is correct.

<Check the following before use.>

- ① Check the actuator label for model number. This matches the controller/driver.
- ② 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>



6 Motor option

Nil	Without option
B	With lock

7 Actuator cable type¹

Nil	Without cable
S	Standard cable ^{*2}
R	Robotic cable (Flexible cable)

*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."

8 Actuator cable length [m]

Nil	Without cable
1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order (Robotic cable only)
Refer to the specifications Note 2) on pages 9 and 10.

9 Controller/Driver type^{*1}

Nil	Without controller/driver	
6N	LECP6/LECA6 (Step data input type)	NPN
6P		PNP
1N	LECP1 ^{*2} (Programless type)	NPN
1P		PNP
AN	LECPA ^{*2} (Pulse input type)	NPN
AP		PNP

* 1 For details about controllers/driver and compatible motors, refer to the compatible controllers/driver below.

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

10 I/O cable length [m]^{*1}

Nil	Without cable
1	1.5
3	3 ^{*2}
5	5 ^{*2}

*1 When "Without controller/driver" is selected for controller/driver types, I/O cable cannot be selected. When the I/O cable is required, order it separately.





*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.

11 Controller/Driver mounting

Nil	Screw mounting
D	DIN rail mounting*

* DIN rail is not included. Order it separately.

Compatible Controllers/Driver

Type	Step data input type 	Step data input type 	Programless type 	Pulse input type 
Series	LECP6	LECA6	LECP1	LECPA
Features	Value (Step data) input Standard controller		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			

Specifications

(1 kg = 2.2 lbs)

Step Motor (Servo/24 VDC)

Model		LEFS16		LEFS25		LEFS32		LEFS40			
Actuator specifications	Stroke [mm] ^{Note 1)}	100, 200, 300, 400		100, 200, 300 400, 500, 600		100, 200, 300, 400 500, 600, 700, 800		200, 300, 400, 500, 600 700, 800, 900, 1000			
	Work load [kg] ^{Note 2)}	Horizontal		9	10	20	20	40	45	50	60
		Vertical		2	4	7.5	15	10	20	—	23
	Speed [mm/s] ^{Note 2)}	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 ²]	3,000									
	Positioning repeatability [mm]	±0.02									
	Lead [mm]	10	5	12	6	16	8	20	10		
	Impact/Vibration resistance [m/s ²] ^{Note 3)}	50/20									
	Actuation type	Ball screw									
	Guide type	Linear guide									
	Operating temperature range	41 to 104°F (5 to 40°C)									
Operating humidity range [%RH]	90 or less (No condensation)										
Electric	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] ^{Note 4)}	22		38		50		100			
	Standby power consumption ^{Note 5)} when operating [W]	18		16		44		43			
	Max. instantaneous ^{Note 6)} power consumption [W]	51		57		123		141			
Lock unit specifications	Type ^{Note 7)}	Non-magnetizing lock									
	Holding force lbf [N]	4.5 [20]	8.8 [39]	17.5 [78]	35.3 [157]	24.3 [108]	48.6 [216]	25.4 [113]	50.6 [225]		
	Power consumption [W] ^{Note 8)}	2.9		5		5		5			
	Rated voltage [V]	24 VDC ±10%									

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

Note 2) Speed changes according to the work load. Check "Speed-Work Load Graph (Guide)" on page 2.

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

Note 3) 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 4) The power consumption (including the controller) is for when the actuator is operating.

Note 5) The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation.

Note 6) 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 7) With lock only

Note 8) For an actuator with lock, add the power consumption for the lock.

Specifications

Servo Motor (24 VDC)

Model		LEFS16A		LEFS25A			
Actuator specifications	Stroke [mm] ^{Note 1)}	100, 200, 300, 400		100, 200, 300 400, 500, 600			
	Work load [kg] ^{Note 2)}	Horizontal		7	10	11	18
		Vertical		2	4	2.5	5
	Speed [mm/s] ^{Note 2)}	10 to 500	5 to 250	12 to 500	6 to 250		
	Max. acceleration/deceleration [mm/s ²]	3,000					
	Positioning repeatability [mm]	±0.02					
	Lead [mm]	10	5	12	6		
	Impact/Vibration resistance [m/s ²] ^{Note 3)}	50/20					
	Actuation type	Ball screw					
	Guide type	Linear guide					
	Operating temperature range	41 to 104°F (5 to 40°C)					
Operating humidity range [%RH]	90 or less (No condensation)						
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] ^{Note 4)}	63		102			
	Standby power consumption when operating [W] ^{Note 5)}	Horizontal 4/Vertical 9		Horizontal 4/Vertical 9			
Lock unit specifications	Max. instantaneous power consumption [W] ^{Note 6)}	70		113			
	Type ^{Note 7)}	Non-magnetizing lock					
	Holding force lbf [N]	4.5 [20]	8.8 [39]	17.5 [78]	35.3 [157]		
Power consumption [W] ^{Note 8)}	2.9		5				
Rated voltage [V]	24 VDC ±10%						

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

Note 2) For details, check "Speed-Work Load Graph (Guide)" on page 3.

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

Note 3) 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 4) The power consumption (including the controller) is for when the actuator is operating.

Note 5) The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation.

Note 6) 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 7) With lock only

Note 8) For an actuator with lock, add the power consumption for the lock.

Weight

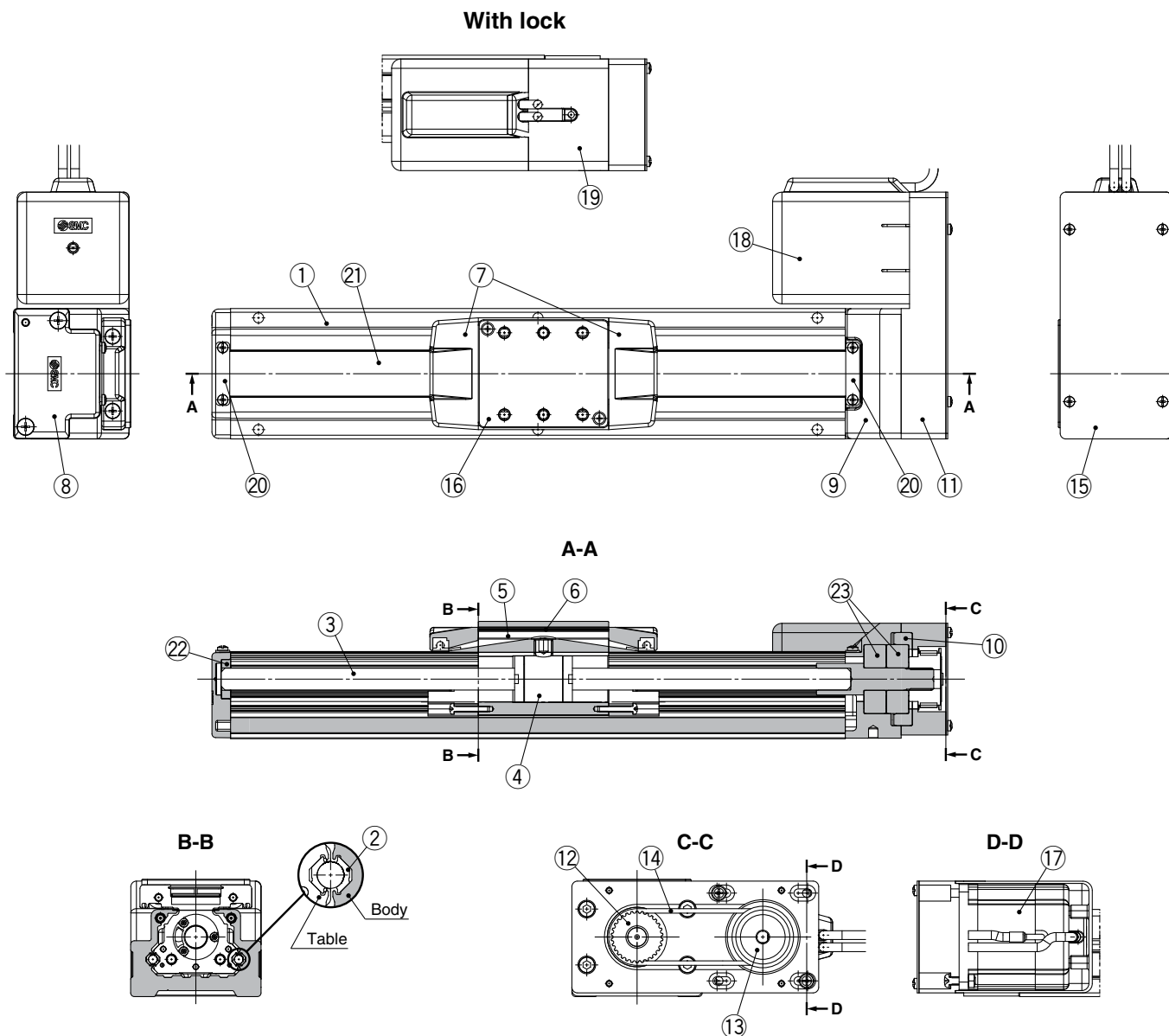
Model	LEFS16			
Stroke [mm]	100	200	300	400
Product weight [kg]	0.85	1.00	1.15	1.30
Additional weight with lock [kg]	0.09			

Model	LEFS25					
Stroke [mm]	100	200	300	400	500	600
Product weight [kg]	1.79	2.07	2.35	2.63	2.91	3.19
Additional weight with lock [kg]	0.22					

Model	LEFS32							
Stroke [mm]	100	200	300	400	500	600	700	800
Product weight [kg]	3.23	3.63	4.03	4.43	4.83	5.23	5.63	6.03
Additional weight with lock [kg]	0.46							

Model	LEFS40									
Stroke [mm]	200	300	400	500	600	700	800	900	1000	
Product weight [kg]	5.50	6.06	6.62	7.18	7.74	8.30	8.86	9.42	9.98	
Additional weight with lock [kg]	0.47									

(1 kg = 2.2 lbs)



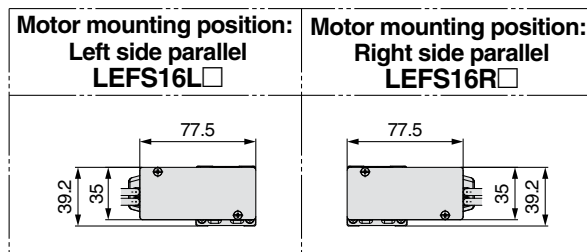
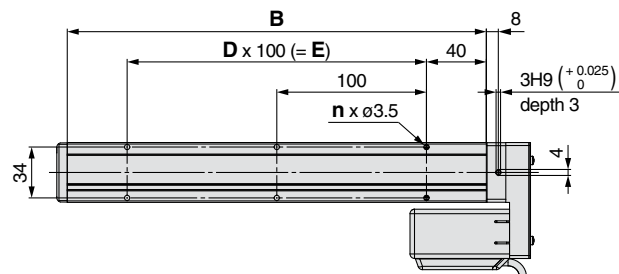
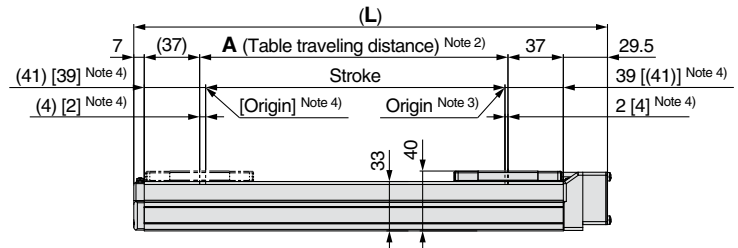
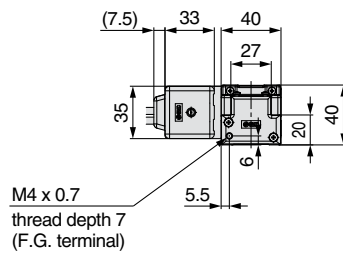
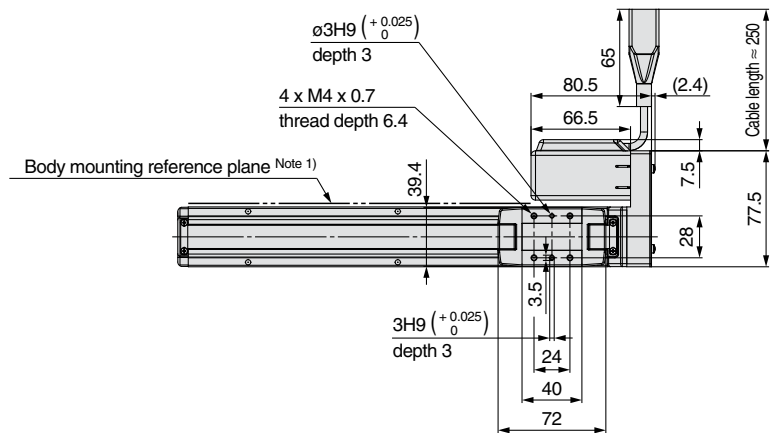
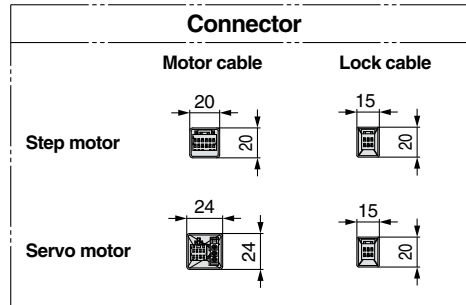
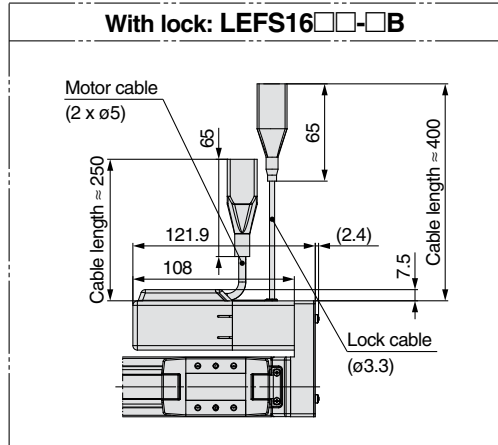
Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Anodized
2	Rail guide	—	
3	Ball screw shaft	—	
4	Ball screw nut	—	
5	Table	Aluminum alloy	Anodized
6	Blanking plate	Aluminum alloy	Anodized
7	Seal band stopper	Synthetic resin	
8	Housing A	Aluminum die-casted	Coating
9	Housing B	Aluminum die-casted	Coating
10	Bearing stopper	Aluminum alloy	
11	Return plate	Aluminum alloy	Coating
12	Pulley	Aluminum alloy	
13	Pulley	Aluminum alloy	

No.	Description	Material	Note
15	Cover plate	Aluminum alloy	Coating
16	Table spacer	Aluminum alloy	Coating
17	Motor	—	
18	Motor cover	Synthetic resin	
19	Motor cover with lock	Aluminum alloy	Anodized
20	Band stopper	Stainless steel	
21	Dust seal band	Stainless steel	
22	Bearing	—	
23	Bearing	—	

Dimensions: Ball Screw Drive

LEFS16



- 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. (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) The number in brackets indicates when the direction of return to origin has changed.

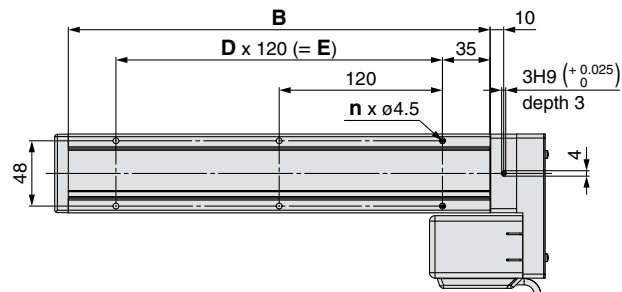
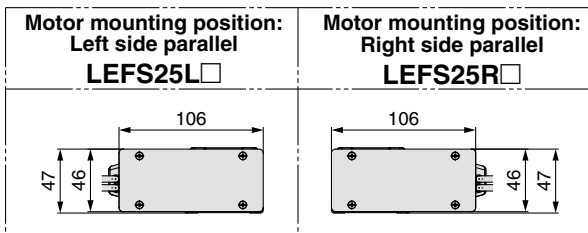
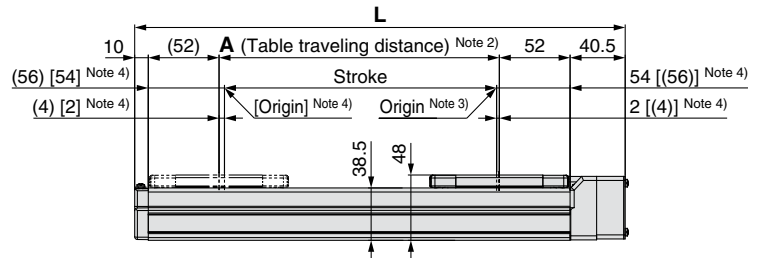
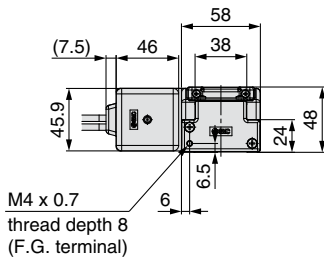
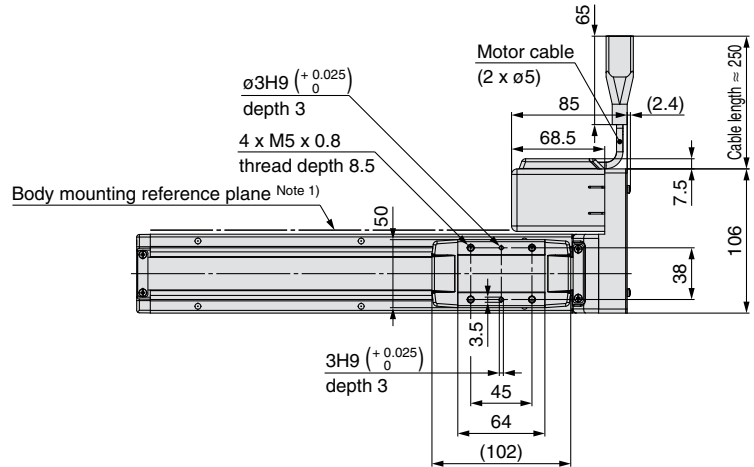
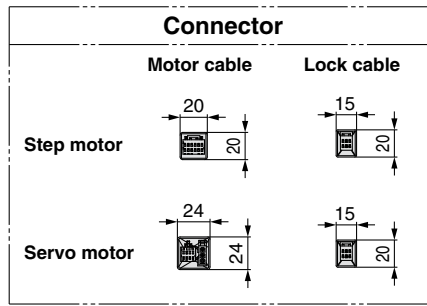
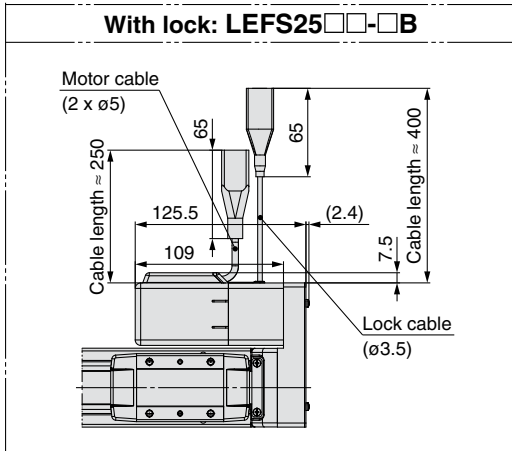
Model	L	A	B	n	D	E
LEFS16□□-100□-□□□□□□	216.5	106	180	4	—	—
LEFS16□□-200□-□□□□□□	316.5	206	280	6	2	200
LEFS16□□-300□-□□□□□□	406.5	306	380	8	3	300
LEFS16□□-400□-□□□□□□	516.4	406	480	10	4	400

(mm)

Series LEFS

Dimensions: Ball Screw Drive

Motor right side parallel type: LEFS25R

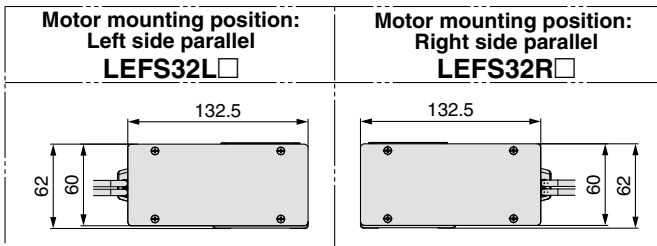
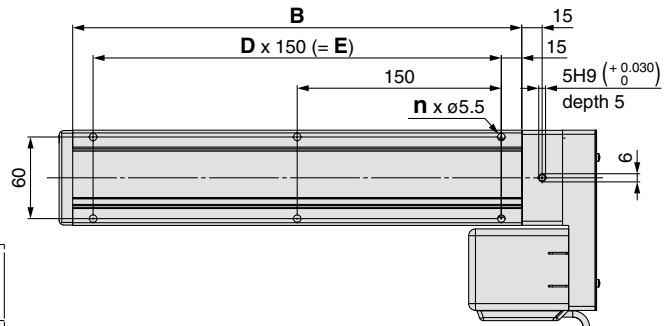
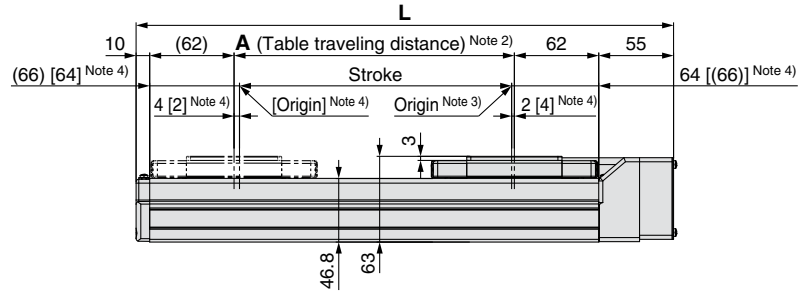
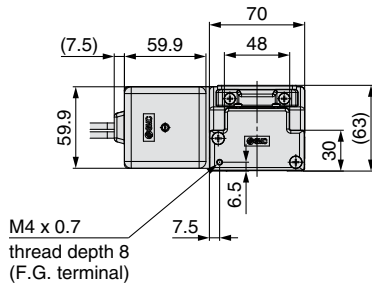
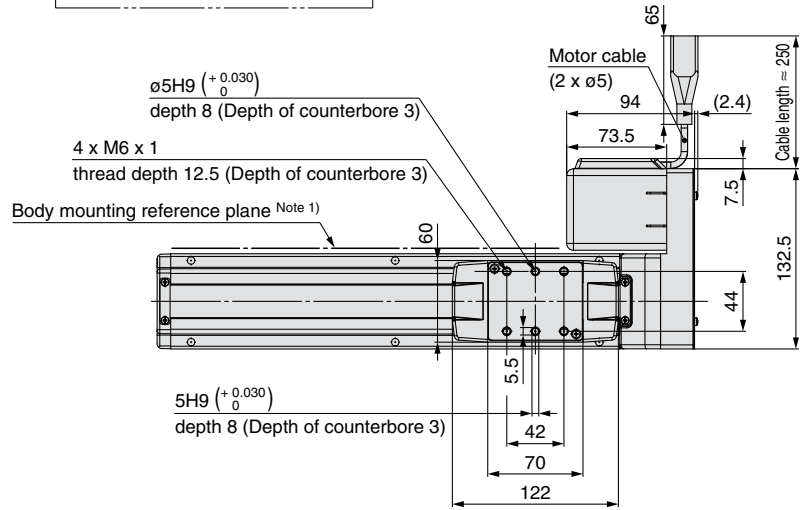
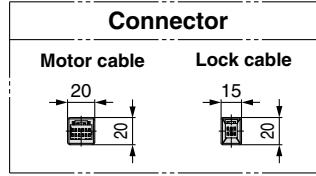
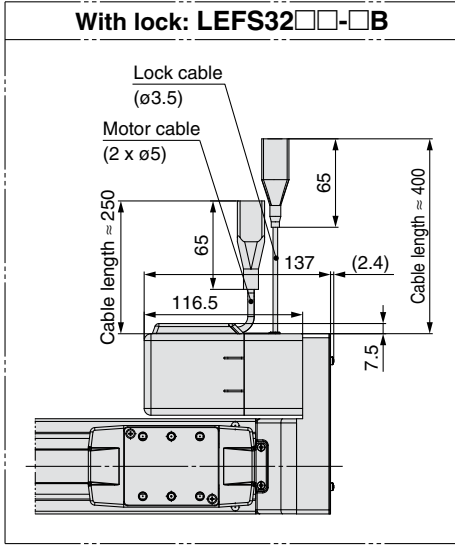


- Note 1) When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height 5 mm)
- Note 2) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere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

Model	L	A	B	n	D	E
LEFS25□□-100□-□□□□	260.5	106	210	4	—	—
LEFS25□□-200□-□□□□	360.5	206	310	6	2	240
LEFS25□□-300□-□□□□	460.5	306	410	8	3	360
LEFS25□□-400□-□□□□	560.5	406	510	8	3	360
LEFS25□□-500□-□□□□	660.5	506	610	10	4	480
LEFS25□□-600□-□□□□	760.5	606	710	12	5	600

Dimensions: Ball Screw Drive

Motor right side parallel type: LEFS32R



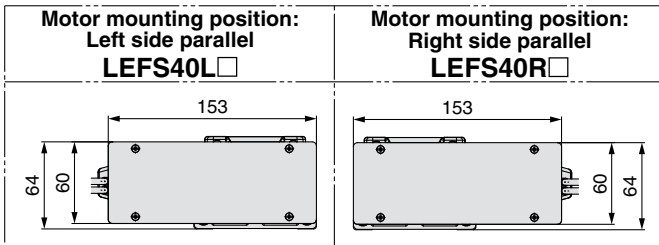
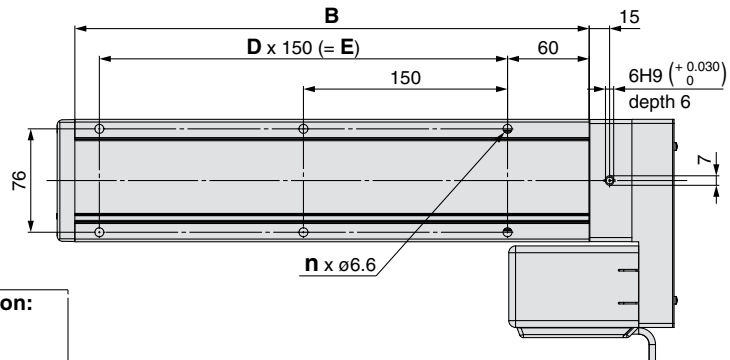
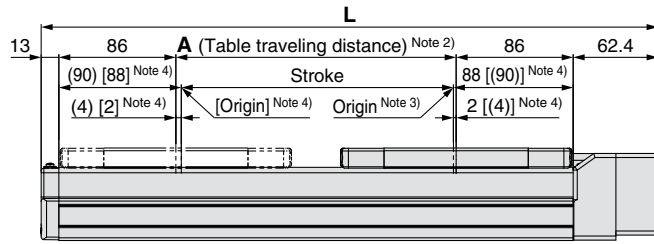
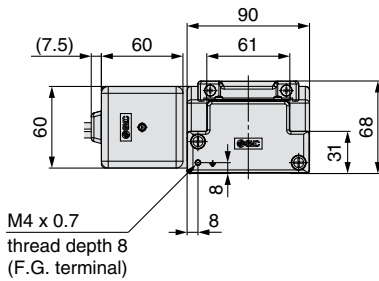
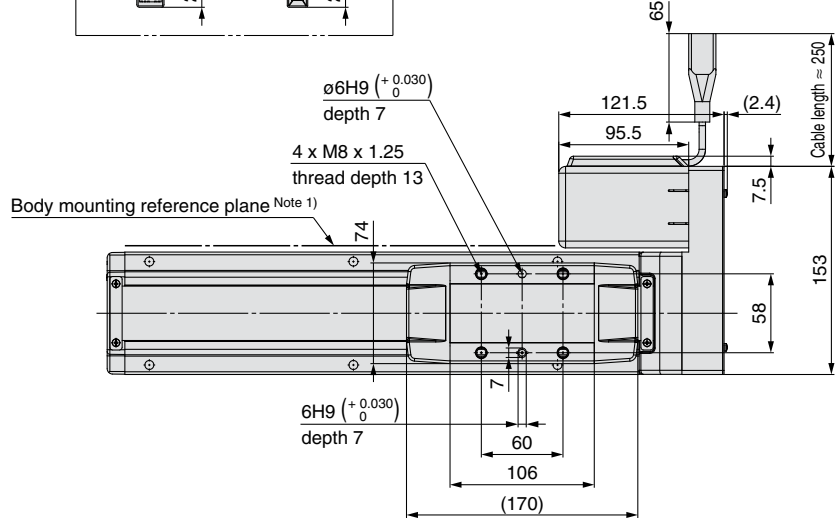
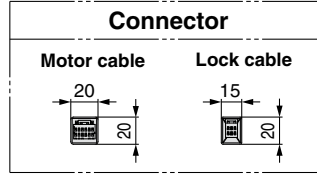
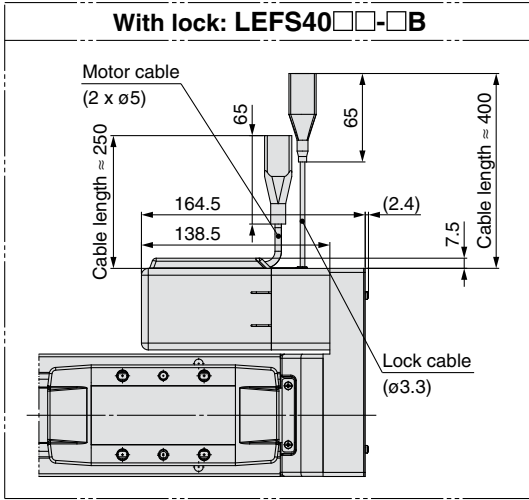
- Note 1) When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height 5 mm)
- Note 2) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere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

Model	L	A	B	n	D	E
LEFS32□□-100□-□□□□□□	295	106	230	4	—	—
LEFS32□□-200□-□□□□□□	395	206	330	6	2	300
LEFS32□□-300□-□□□□□□	495	306	430	6	2	300
LEFS32□□-400□-□□□□□□	595	406	530	8	3	450
LEFS32□□-500□-□□□□□□	695	506	630	10	4	600
LEFS32□□-600□-□□□□□□	795	606	730	10	4	600
LEFS32□□-700□-□□□□□□	895	706	830	12	5	750
LEFS32□□-800□-□□□□□□	995	806	930	14	6	900

Series LEFS

Dimensions: Ball Screw Drive

Motor right side parallel type: LEFS40R



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. (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) The number in brackets indicates when the direction of return to origin has changed.

Model	L	A	B	n	D	E
LEFS40□□-200-□□□□□	453.4	206	378	6	2	300
LEFS40□□-300-□□□□□	553.4	306	478	6	2	300
LEFS40□□-400-□□□□□	653.4	406	578	8	3	450
LEFS40□□-500-□□□□□	753.4	506	678	10	4	600
LEFS40□□-600-□□□□□	853.4	606	778	10	4	600
LEFS40□□-700-□□□□□	953.4	706	876	12	5	750
LEFS40□□-800-□□□□□	1053.4	806	976	14	6	900
LEFS40□□-900-□□□□□	1153.4	906	1078	14	6	900
LEFS40□□-1000-□□□□□	1253.4	1006	1178	16	7	1050

Electric Actuator/Slider Type AC Servo Motor Ball Screw Drive/Series **LEFS** Model Selection

Selection Procedure

Step 1 Check the work load–speed.

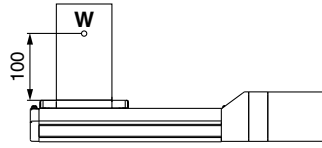
Step 2 Check the cycle time.

Step 3 Check the allowable moment.

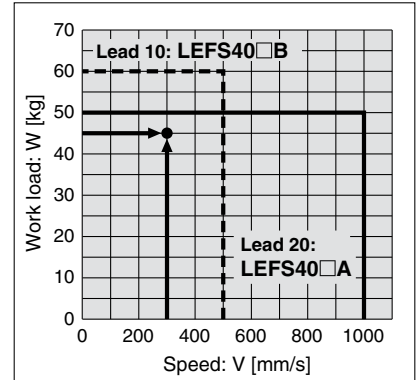
Selection Example

Operating conditions

- Workpiece mass: 45 [kg]
 - Speed: 300 [mm/s]
 - Acceleration/Deceleration: 3000 [mm/s²]
 - Stroke: 200 [mm]
 - Mounting orientation: Horizontal upward
- Workpiece mounting condition:



(1 kg = 2.2 lb)



<Speed-Work load graph>
(LEFS40)

Step 1 Check the work load–speed. <Speed-Work load graph> (Page 17)

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

Selection example) **LEFS40RS4B-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 positioning of the step data. Therefore, please calculate the settling time with reference to the following value.

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

Calculation example)

T1 to T4 can be calculated as follows.

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

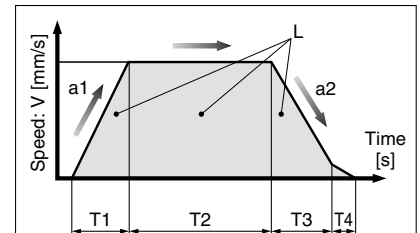
$$T3 = V/a2 = 300/3000 = 0.1 \text{ [s]}$$

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} \\ = \frac{200 - 0.5 \cdot 300 \cdot (0.1 + 0.1)}{300} \\ = 0.57 \text{ [s]}$$

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

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/s²] ... (Operating condition)
- a2 : Deceleration [mm/s²] ... (Operating condition)

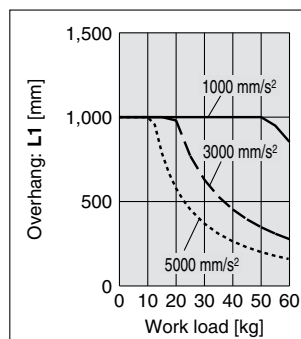
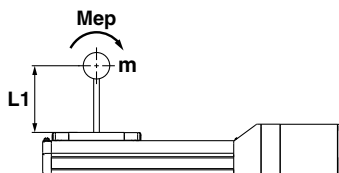
T1: Acceleration time [s]
Time until reaching the set speed

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 in position is completed

Step 3 Check the guide moment.



Based on the above calculation result, the **LEFS40RS4B-200** is selected.

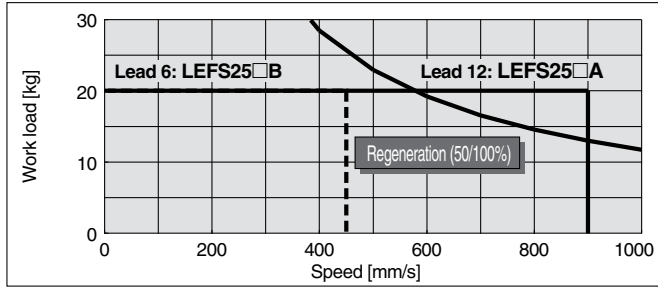
Series LEFS

Speed-Work Load Graph (Guide)

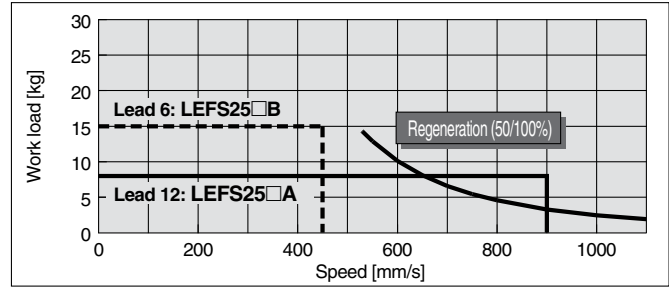
LEFS25/Ball Screw Drive

(1 kg = 2.2 lb)

Horizontal

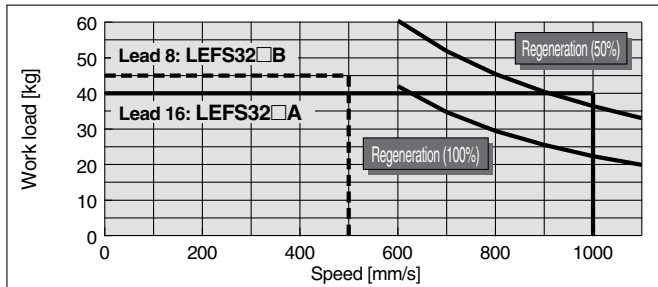


Vertical

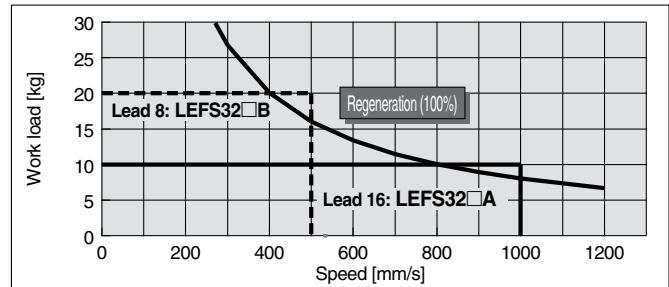


LEFS32/Ball Screw Drive

Horizontal

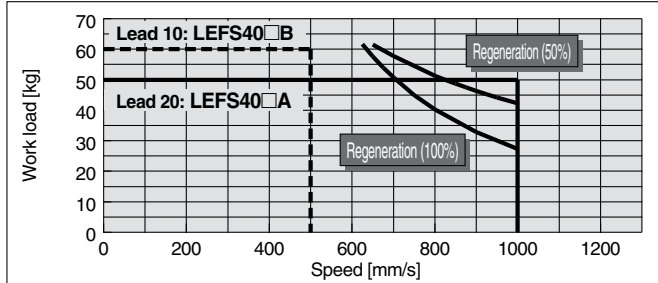


Vertical

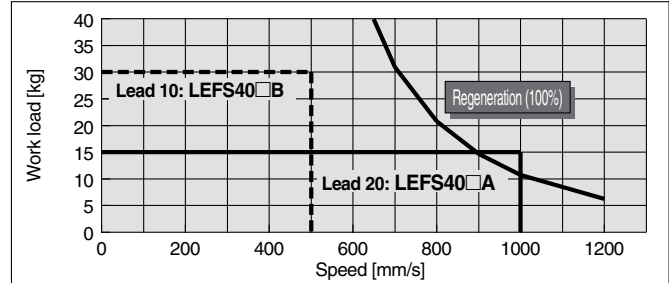


LEFS40/Ball Screw Drive

Horizontal



Vertical



Required conditions for "Regeneration option"

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

[How to read the graph]

Required conditions change depending on the operating conditions.

Regeneration (50%): Duty ratio 50% or more

Regeneration (100%): Duty ratio 100%

"Regeneration Option" Models

Size	Model
LEFS25 □	LEC-MR-RB-032
LEFS32 □	LEC-MR-RB-032
LEFS40 □	LEC-MR-RB-032

Allowable Stroke Speed

[mm/s]

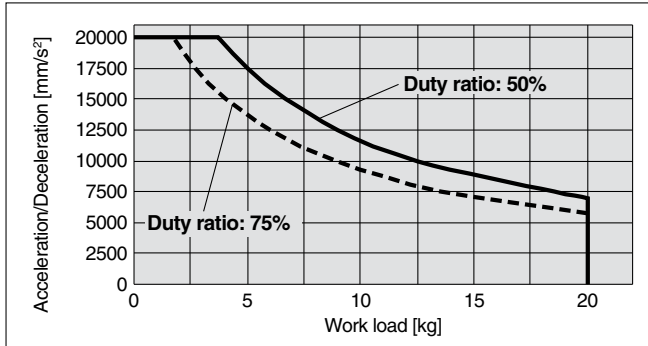
Model	AC servo	Lead		Stroke [mm]									
		Symbol	[mm]	Up to 100	Up to 200	Up to 300	Up to 400	Up to 500	Up to 600	Up to 700	Up to 800	Up to 900	Up to 1000
LEFS25	100 W / □40	A	12	900				720	540	—	—	—	—
		B	6	450				360	270	—	—	—	—
		(Motor rotation speed)		(4500 rpm)				(3650 rpm)	(2700 rpm)	—	—	—	—
LEFS32	200 W / □60	A	16	1000	1000	1000	1000	1000	800	620	500	—	—
		B	8	500	500	500	500	500	400	310	250	—	—
		(Motor rotation speed)		(3750 rpm)				(3000 rpm)	(2325 rpm)	(1875 rpm)	—	—	—
LEFS40	400 W / □60	A	20	—	1000			—	940	760	620	520	
		B	10	—	500			—	470	380	310	260	
		(Motor rotation speed)		—	(3000 rpm)				(2820 rpm)	(2280 rpm)	(1860 rpm)	(1560 rpm)	

Work Load–Acceleration/Deceleration Graph (Guide)

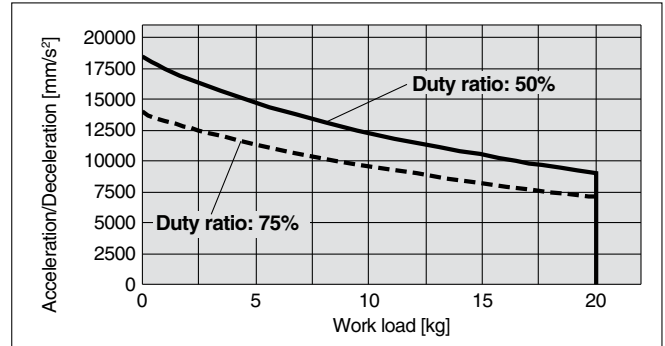
LEFS25/Ball Screw Drive: Horizontal

(1 kg = 2.2 lb)

LEFS25S□A

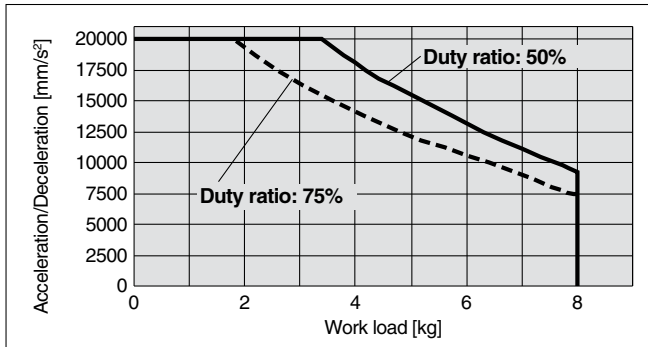


LEFS25S□B

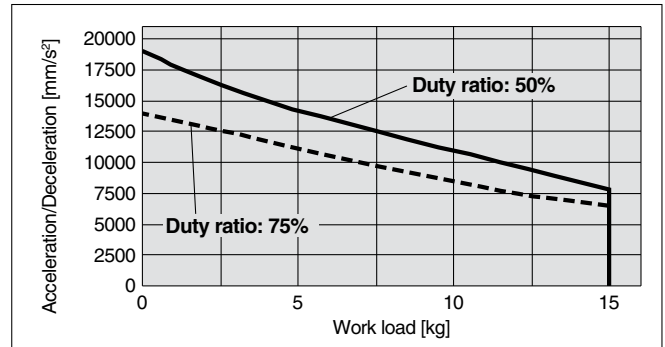


LEFS25/Ball Screw Drive: Vertical

LEFS25S□A

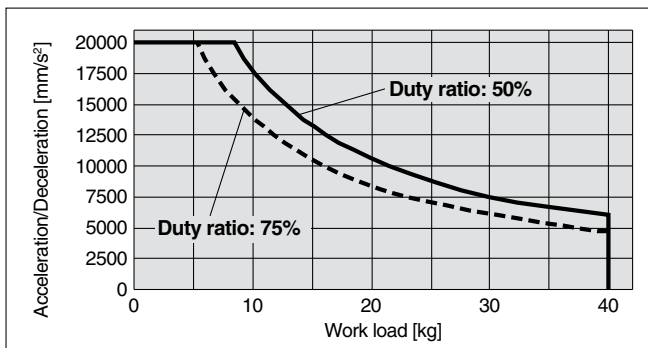


LEFS25S□B

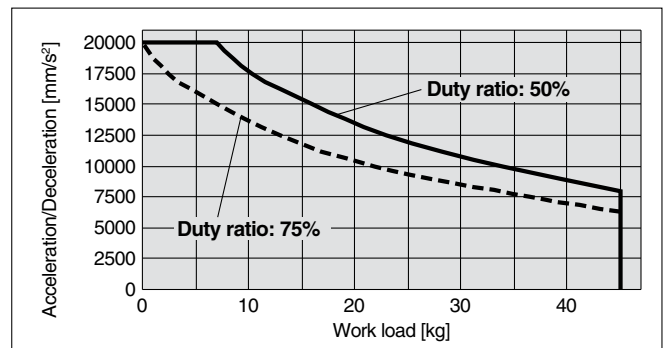


LEFS32/Ball Screw Drive: Horizontal

LEFS32S□A

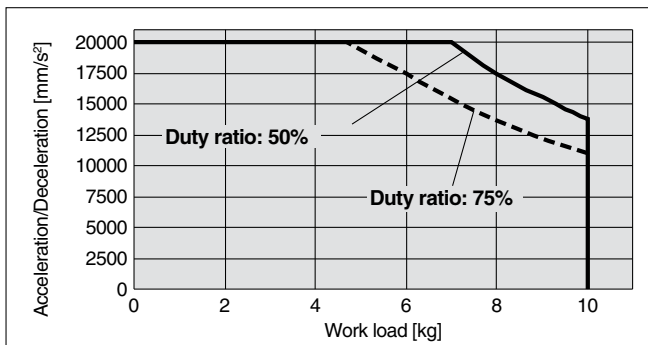


LEFS32S□B

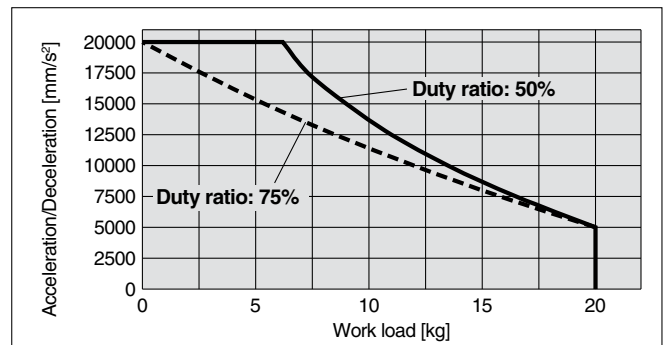


LEFS32/Ball Screw Drive: Vertical

LEFS32S□A



LEFS32S□B



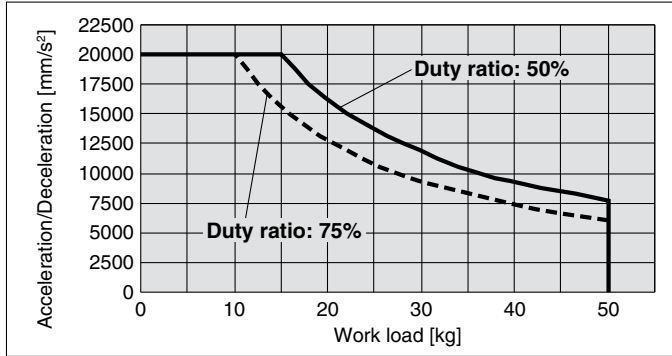
Series LEFS

Work Load–Acceleration/Deceleration Graph (Guide)

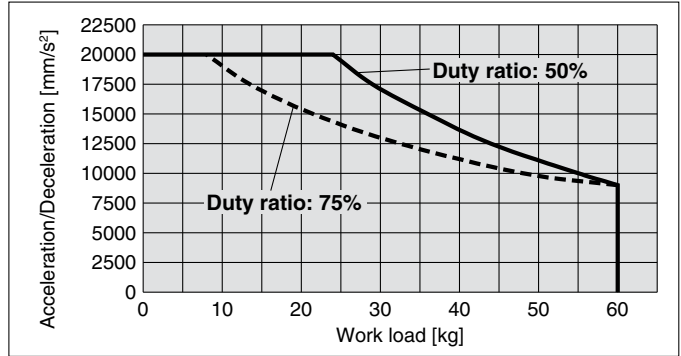
LEFS40/Ball Screw Drive: Horizontal

(1kg = 2.2 lb)

LEFS40S□A

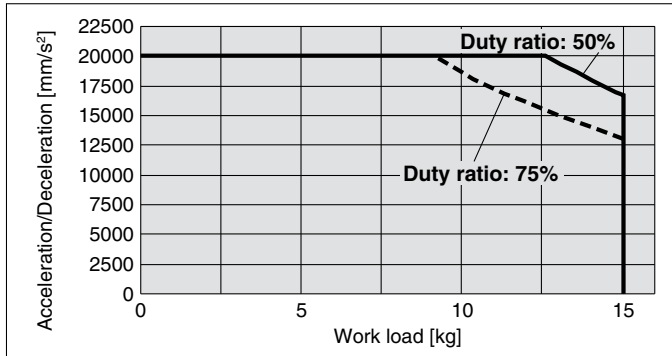


LEFS40S□B

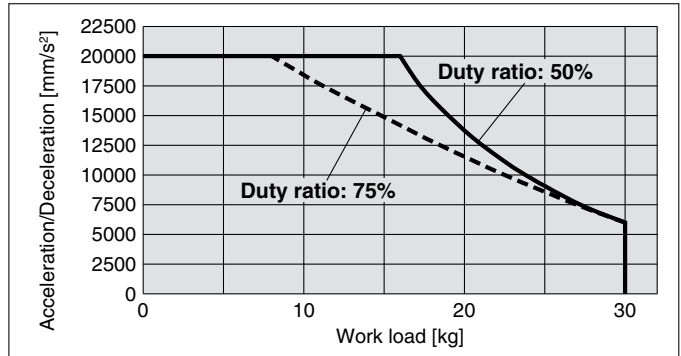


LEFS40/Ball Screw Drive: Vertical

LEFS40S□A



LEFS40S□B



Dynamic Allowable Moment

* This graph shows the amount of allowable overhang when the center of gravity of the workpiece overhangs in one direction. When the center of gravity of the workpiece overhangs in two directions, refer to the Electric Actuator Selection Software for confirmation. <http://www.smcworld.com>

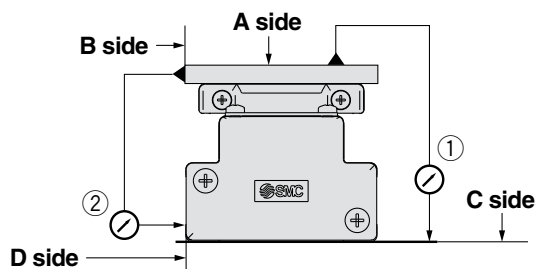
Acceleration/Deceleration

— 1,000 mm/s² - - - 3,000 mm/s² ····· 5,000 mm/s² - - - - 10,000 mm/s² - - - - 20,000 mm/s²

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	<p>Pitching L1 [mm]</p>			
	<p>Yawing L2 [mm]</p>			
	<p>Rolling L3 [mm]</p>			
Vertical	<p>Pitching L4 [mm]</p>			
	<p>Yawing L5 [mm]</p>			

Series LEFS

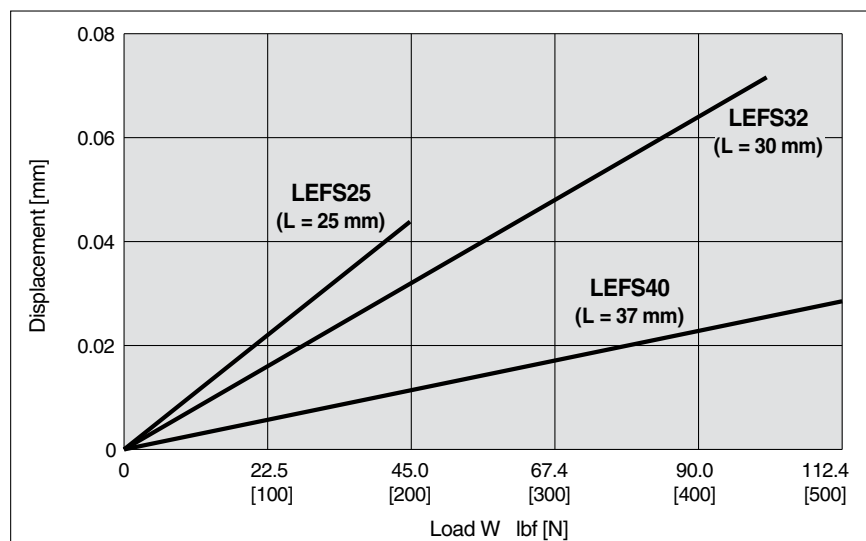
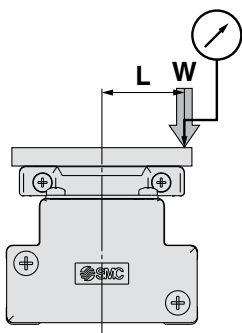
Table Accuracy



Model	Traveling parallelism [mm] (Every 300 mm)	
	① C side traveling parallelism to A	② D side traveling parallelism to B
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.

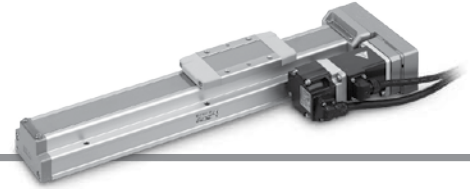
Note 2) Please confirm the clearance and play of the guide separately.

Electric Actuator/Slider Type Motor Parallel Type AC Servo Motor



Series **LEFS**

LEFS25, 32, 40



How to Order

LEFS **32** **R** **S3** **B** - **200** - **S** **2** **A2**

1 2 3 4 5 6 7 8 9 10

1 Size

25
32
40

2 Motor mounting position

R	Right side parallel
L	Left side parallel

3 Motor type

Symbol	Type	Output (W)	Actuator size	Compatible drivers
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 LECSC□-S5 LECSS□-S5
S7				200
S8		400	40	

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

4 Lead [mm]

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

5 Stroke [mm]

100	100
to	to
1000	1000

* Refer to the applicable stroke table.

6 Motor option

Nil	Without option
B	With lock

Note 3)

9 Driver type

	Compatible drivers	Power supply voltage (V)	Size		
			25	32	40
Nil	Without driver	—	●	●	●
A1	LECSA1-S□	100 to 120	●	●	—
A2	LECSA2-S□	200 to 230	●	●	●
B1	LECSB1-S□	100 to 120	●	●	—
B2	LECSB2-S□	200 to 230	●	●	●
C1	LECSC1-S□	100 to 120	●	●	—
C2	LECSC2-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

10 I/O connector

Nil	Without connector
H	With connector

7 Cable type Note 1) Note 2)

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".

8 Cable length [m]

Nil	Without cable
2	2
5	5
A	10

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

Applicable stroke table

● Standard

Model	Stroke (mm)	100	200	300	400	500	600	700	800	900	1000
LEFS25		●	●	●	●	●	●	—	—	—	—
LEFS32		●	●	●	●	●	●	●	●	—	—
LEFS40		—	●	●	●	●	●	●	●	●	●

* Strokes are manufacturable in 1 mm increments. Refer to the manufacturable stroke range. However, strokes other than those shown above are produced as special orders. Consult with SMC for lead times and prices.

Compatible Drivers

Driver type	Pulse input type/ Positioning type	Pulse input type	CC-Link direct input type	SSCNET III type
Series	LECSA	LECSB	LECSC	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)			

Specifications

LEFS25, 32, 40 AC Servo Motor

Model		LEFS25S $\frac{2}{6}$		LEFS32S $\frac{3}{7}$		LEFS40S $\frac{4}{8}$			
Actuator specifications	Stroke [mm] ^{Note 1)}	100, 200, 300, 400 500, 600		100, 200, 300, 400 500, 600, 700, 800		200, 300, 400, 500 600, 700, 800, 900 1000			
	Work load [kg] ^{Note 2)}	Horizontal	20	20	40	45	50	60	
		Vertical	8	15	10	20	15	30	
	Max. speed [mm/s] ^{Note 3)}	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 ²]		20,000 (Refer to page 17 for limit according to work load and duty ratio.)							
Positioning repeatability [mm]		±0.02							
Lead [mm]		12	6	16	8	20	10		
Impact/Vibration resistance [m/s ²] ^{Note 4)}		50/20							
Actuation type		Ball screw							
Guide type		Linear guide							
Operating temperature range		41 to 104°F (5 to 40°C)							
Operating humidity range [%RH]		90 or less (No condensation)							
Electric specifications	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] ^{Note 5)}	Horizontal	45		65		210		
		Vertical	145		175		230		
	Standby power consumption when operating [W] ^{Note 6)}	Horizontal	2		2		2		
		Vertical	8		8		18		
Max. instantaneous power consumption [W] ^{Note 7)}		445		725		1275			
Type ^{Note 8)}		Non-magnetizing lock							
Holding force lbf [N]		29.4 [131]	57.3 [255]	44.3 [197]	86.8 [385]	74.2 [330]	148 [660]		
Power consumption [W] at 68°F (20°C) ^{Note 9)}		6.3		7.9		7.9			
Rated voltage [V]		24 VDC $\frac{0}{-10\%}$							

Note 1) 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 17.

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

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

Note 6) The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.

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

Note 8) Only when motor option "With lock" is selected.

Note 9) For an actuator with lock, add the power consumption for the lock.

Weight

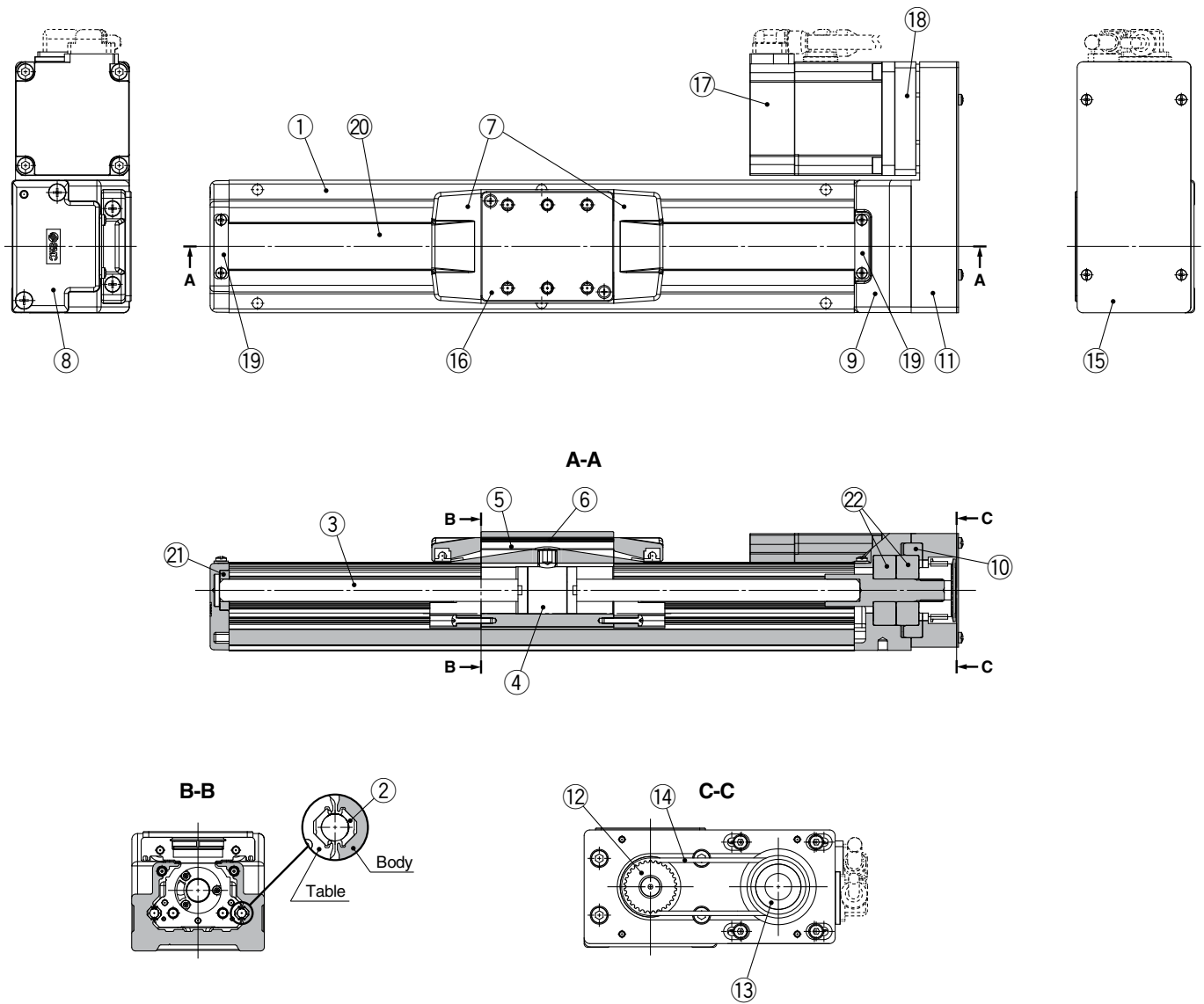
(1 kg = 2.2 lb)

Model	LEFS25					
Stroke [mm]	100	200	300	400	500	600
Product weight [kg]	1.79	2.07	2.35	2.63	2.91	3.19
Additional weight with lock [kg]	0.29					

Model	LEFS32							
Stroke [mm]	100	200	300	400	500	600	700	800
Product weight [kg]	3.25	3.65	4.05	4.45	4.85	5.25	5.65	6.05
Additional weight with lock [kg]	0.64							

Model	LEFS40									
Stroke [mm]	200	300	400	500	600	700	800	900	1000	
Product weight [kg]	5.15	5.71	6.27	6.83	7.39	7.95	8.51	9.07	9.63	
Additional weight with lock [kg]	0.61									

Construction



Component Parts

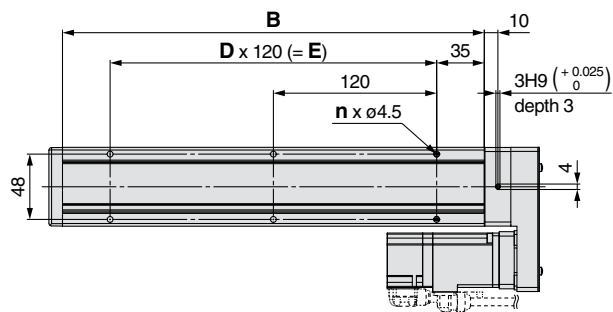
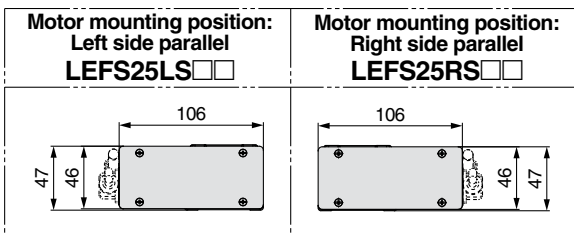
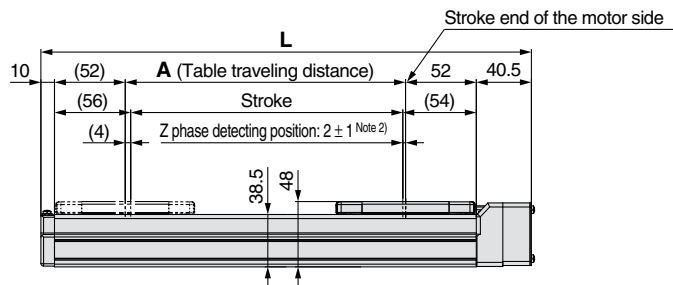
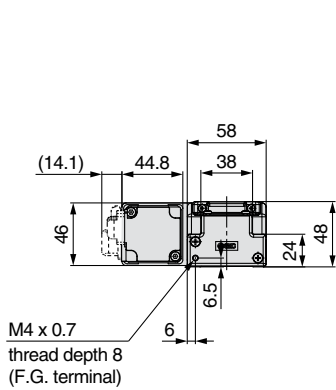
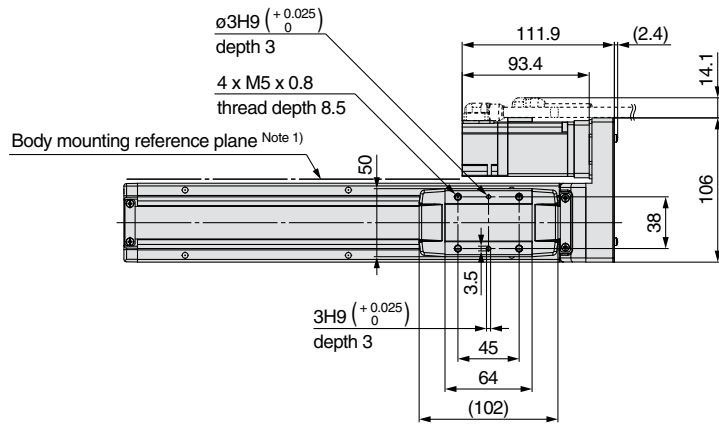
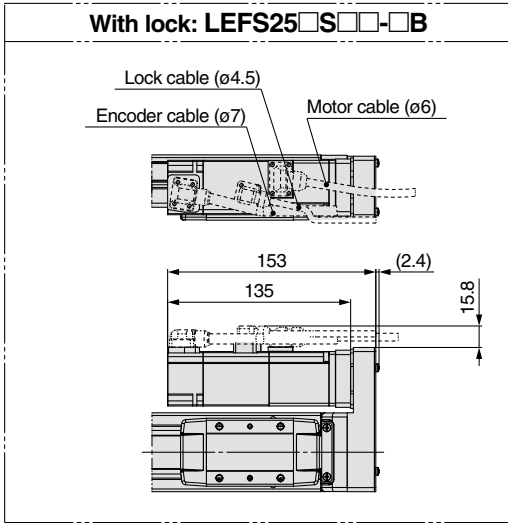
No.	Description	Material	Note
1	Body	Aluminum alloy	Anodized
2	Rail guide	—	
3	Ball screw shaft	—	
4	Ball screw nut	—	
5	Table	Aluminum alloy	Anodized
6	Blanking plate	Aluminum alloy	Anodized
7	Seal band stopper	Synthetic resin	
8	Housing A	Aluminum die-casted	Coating
9	Housing B	Aluminum die-casted	Coating
10	Bearing stopper	Aluminum alloy	
11	Return plate	Aluminum alloy	Coating
12	Pulley	Aluminum alloy	
13	Pulley	Aluminum alloy	
14	Timing belt	—	
15	Cover plate	Aluminum alloy	Coating

No.	Description	Material	Note
17	Motor (Absolute encoder)	—	
	Motor (Incremental encoder)	—	
18	Motor adapter	Aluminum alloy	Anodized
19	Band stopper	Stainless steel	
20	Dust seal band	Stainless steel	
21	Bearing	—	
22	Bearing	—	

Series LEFS

Dimensions: Ball Screw Drive

Motor right side parallel type: LEFS25R



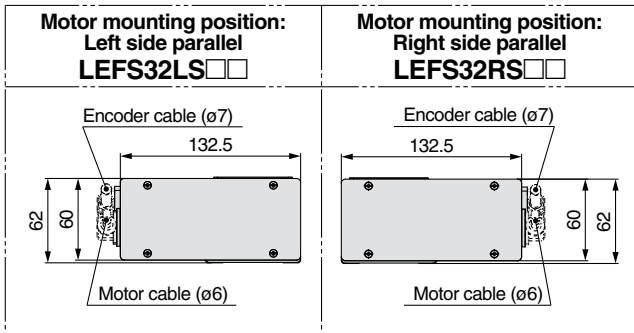
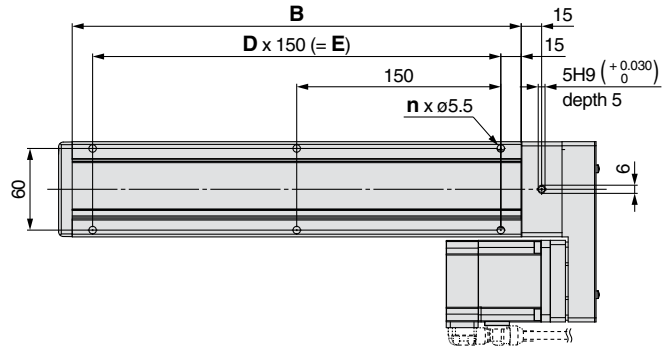
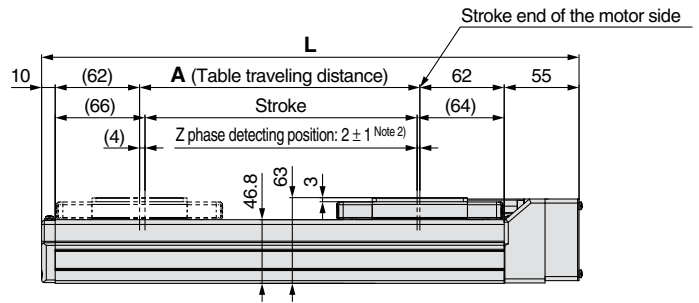
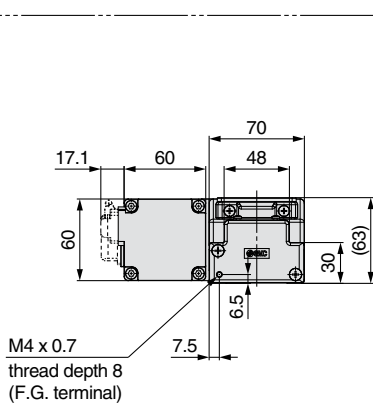
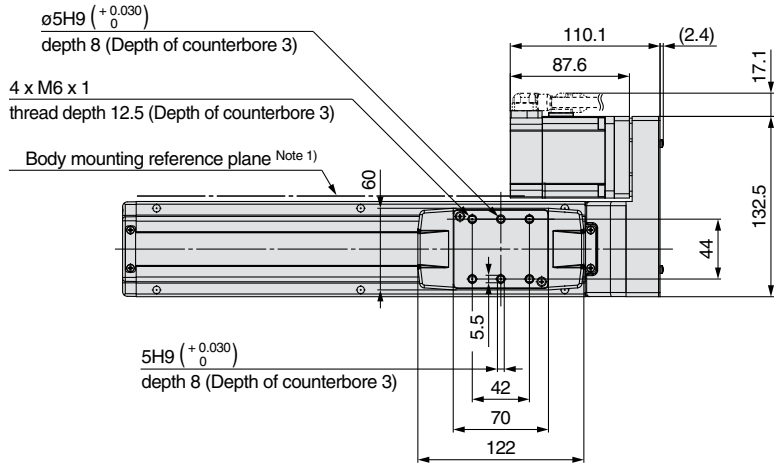
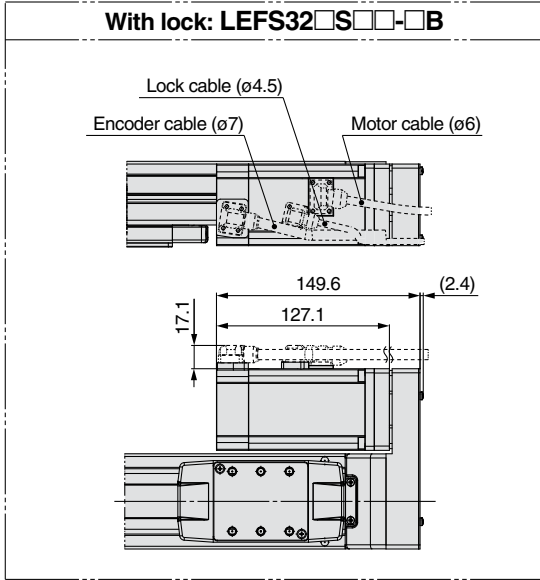
Note 1) When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more.
(Recommended height 5 mm)

Note 2) The Z phase first detecting position from the stroke end of the motor side. Consult with SMC for adjusting the Z phase detecting position at the stroke end of the end side.

Model	L	A	B	n	D	E
LEFS25□S□□-100□-□□□□□□	260.5	106	210	4	—	—
LEFS25□S□□-200□-□□□□□□	360.5	206	310	6	2	240
LEFS25□S□□-300□-□□□□□□	460.5	306	410	8	3	360
LEFS25□S□□-400□-□□□□□□	560.5	406	510	8	3	360
LEFS25□S□□-500□-□□□□□□	660.5	506	610	10	4	480
LEFS25□S□□-600□-□□□□□□	760.5	606	710	12	5	600

Dimensions: Ball Screw Drive

Motor right side parallel type: LEFS32R



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. (Recommended height 5 mm)

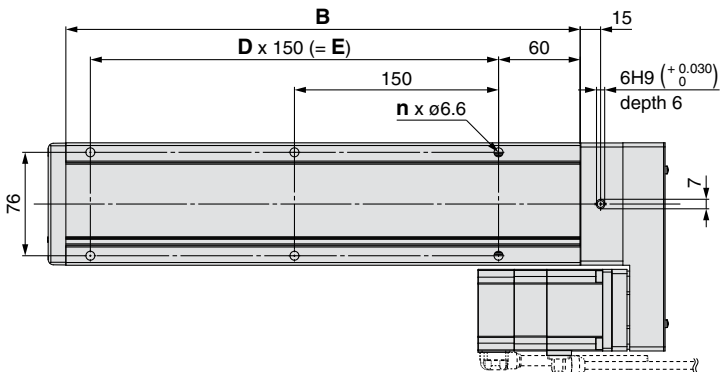
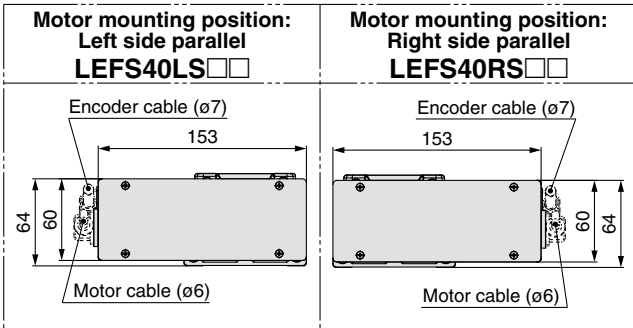
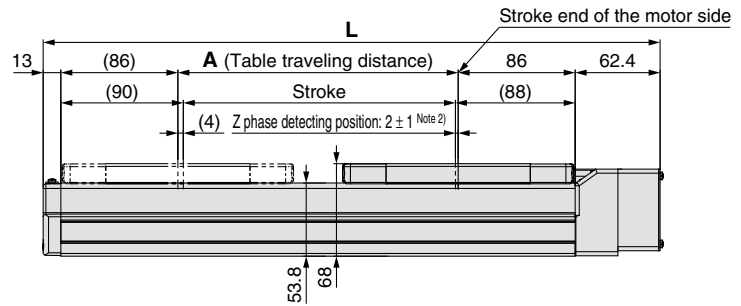
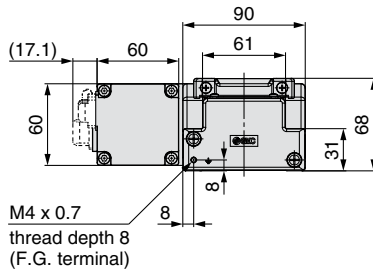
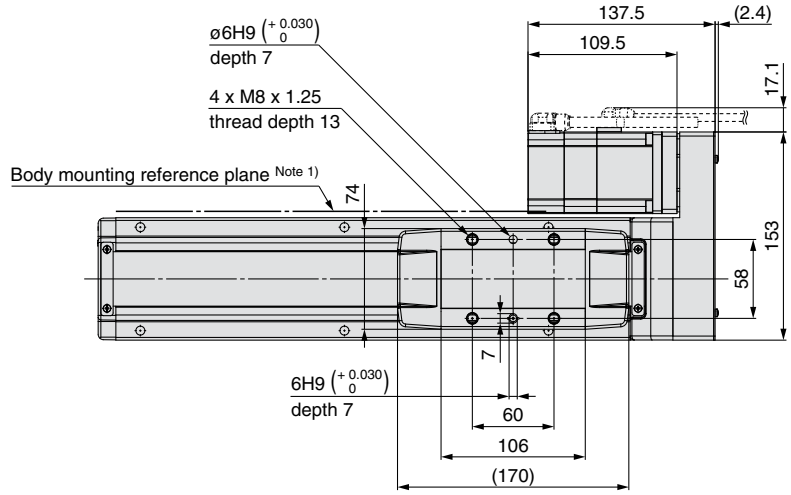
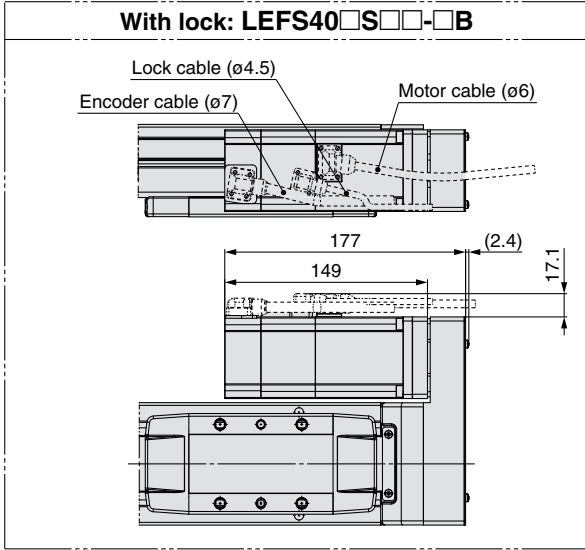
Note 2) The Z phase first detecting position from the stroke end of the motor side. Consult with SMC for adjusting the Z phase detecting position at the stroke end of the end side.

Model	L	A	B	n	D	E
LEFS32□S□□-100□-□□□□	295	106	230	4	—	—
LEFS32□S□□-200□-□□□□	395	206	330	6	2	300
LEFS32□S□□-300□-□□□□	495	306	430	6	2	300
LEFS32□S□□-400□-□□□□	595	406	530	8	3	450
LEFS32□S□□-500□-□□□□	695	506	630	10	4	600
LEFS32□S□□-600□-□□□□	795	606	730	10	4	600
LEFS32□S□□-700□-□□□□	895	706	830	12	5	750
LEFS32□S□□-800□-□□□□	995	806	930	14	6	900

Series LEFS

Dimensions: Ball Screw Drive

Motor right side parallel type: LEFS40R



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.
(Recommended height 5 mm)

Note 2) The Z phase first detecting position from the stroke end of the motor side. Consult with SMC for adjusting the Z phase detecting position at the stroke end of the end side.

Model	L	A	B	n	D	E
LEFS40□S□□-200-□□□□□□	453.4	206	378	6	2	300
LEFS40□S□□-300-□□□□□□	553.4	306	478	6	2	300
LEFS40□S□□-400-□□□□□□	653.4	406	578	8	3	450
LEFS40□S□□-500-□□□□□□	753.4	506	678	10	4	600
LEFS40□S□□-600-□□□□□□	853.4	606	778	10	4	600
LEFS40□S□□-700-□□□□□□	953.4	706	878	12	5	750
LEFS40□S□□-800-□□□□□□	1053.4	806	978	14	6	900
LEFS40□S□□-900-□□□□□□	1153.4	906	1078	14	6	900
LEFS40□S□□-1000-□□□□□□	1253.4	1006	1178	16	7	1050

SMC Corporation of America
10100 SMC Blvd., Noblesville, IN 46060
www.smcusa.com
SMC Pneumatics (Canada) Ltd.
www.smc Pneumatics.ca

(800) SMC.SMC1 (762-7621)
e-mail: sales@smcusa.com
For International inquiries: www.smcworld.com