Electric Actuator
Slider Type

New

CE RoHS

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

Ball Screw Drive *Series LEFS*

Size: 16, 25, 32, 40

Max. work load: **60** kg
Positioning repeatability: **±0.02** mm
New Size **40** added!

Belt Drive *Series LEFB*

Size: 16, 25, 32

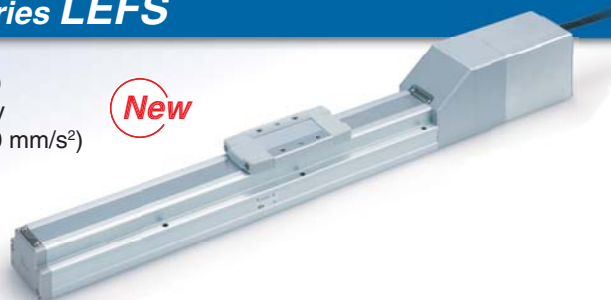Max. stroke: **2000** mm
Transfer speed: **2000** mm/s

AC Servo Motor (100/200/400 W)   **Type**

Ball Screw Drive *Series LEFS*

Size: 25, 32, 40

• High output motor (100/200/400 W)
• Improved high speed transfer ability
• High acceleration compatible (5000 mm/s²)
• Pulse input type
• With internal absolute encoder
  (LECSB specifications)

New

Step Motor (Servo/24 VDC)   **Servo Motor** (24 VDC)   Controller

▶ **Step Data Input Type**
  Series LECP6/LECA6
  • 64 positioning points
  • Teaching box, controller
    setting kit input

New ▶ **Programless Type**
  Series LECP1
  • 14 positioning points
  • Control panel setting

AC Servo Motor   Controller

New ▶ **AC Servo Motor Controller**
  Series LECSA/LECSB
  • Pulse input type
  • Absolute encoder
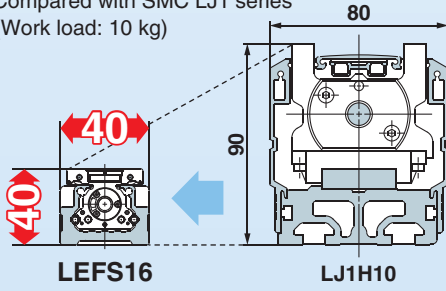   (LECSB)
  • Built-in positioning function
    (LECSA)

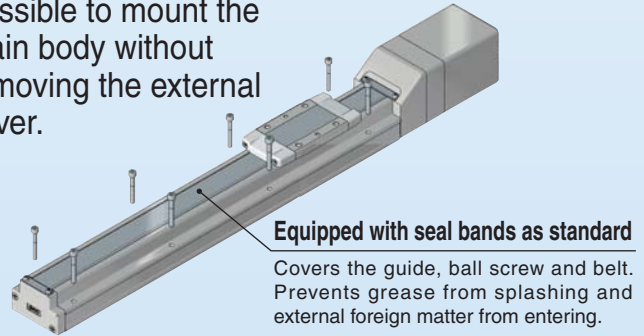# Series *LEF*

SMC

CAT.EUS100-87C-UK

Series *LEF*

●Compact

Height/width dimensions reduced by approx. **50**%

∗Compared with SMC LJ1 series
(Work load: 10 kg)

40
40

80
90

LEFS16   **LJ1H10**

●Easy mounting of the body/Reduction of the installation labour

Possible to mount the main body without removing the external cover.

Equipped with seal bands as standard
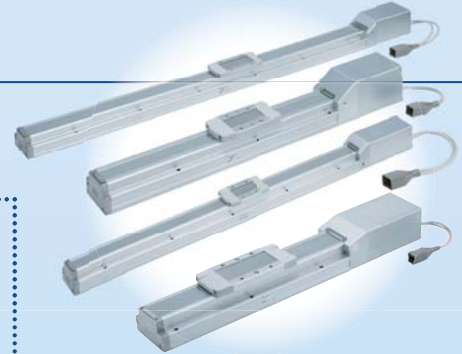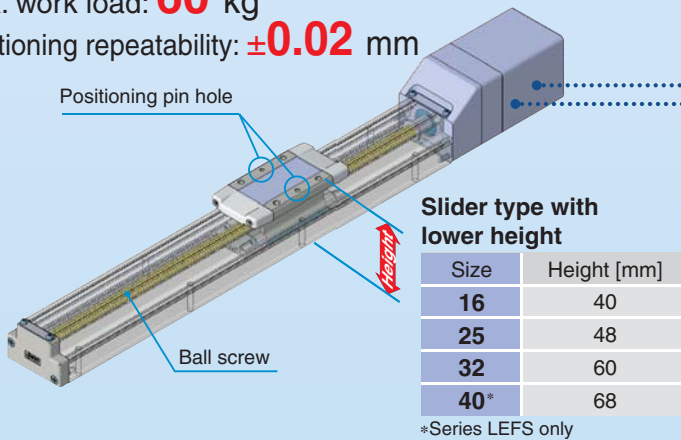Covers the guide, ball screw and belt. Prevents grease from splashing and external foreign matter from entering.

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

Ball Screw Drive/*Series LEFS*   Size: 16, 25, 32, 40

Max. work load: **60** kg
Positioning repeatability: **±0.02** mm

Positioning pin hole

Ball screw

Height

Slider type with lower height

Size	Height [mm]
16	40
25	48
32	60
40∗	68

∗Series LEFS only

### Compatible motors

● Step Motor (Servo/24 VDC)
Ideal for transfer of high loads at a low speed
● Servo Motor (24 VDC)
Stable at a high speed and silent operation
● AC Servo Motor (100/200/400 W)
Ideal for high speed transfer and compatible with high acceleration (5000 mm/s^2).
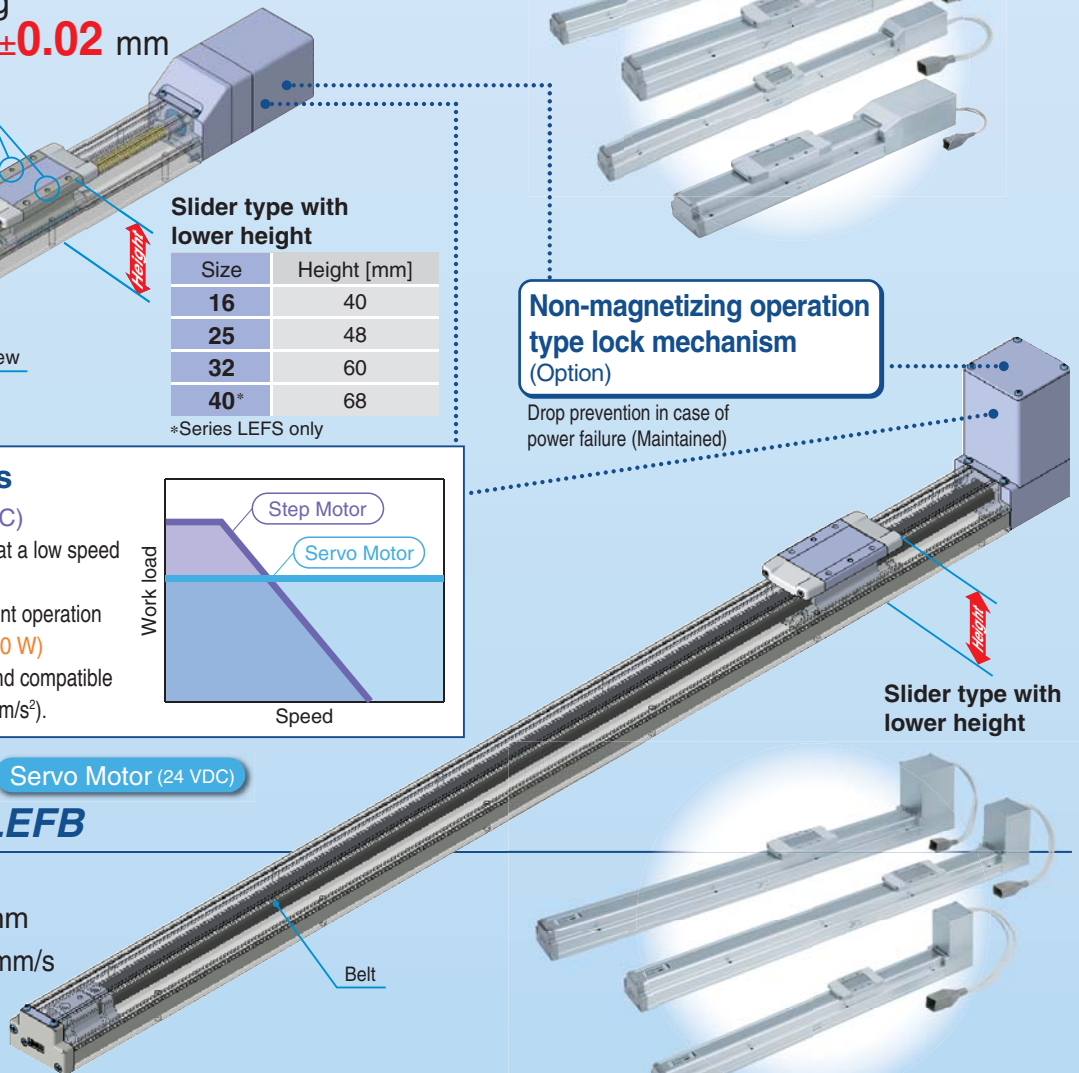
Work load

Step Motor

Servo Motor

Speed

Non-magnetizing operation type lock mechanism
(Option)

Drop prevention in case of power failure (Maintained)

Height

Slider type with lower height
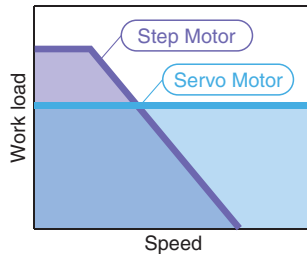
Step Motor (Servo/24 VDC)	Servo Motor (24 VDC)

Belt Drive/*Series LEFB*

Size: 16, 25, 32
Max. stroke: **2000** mm
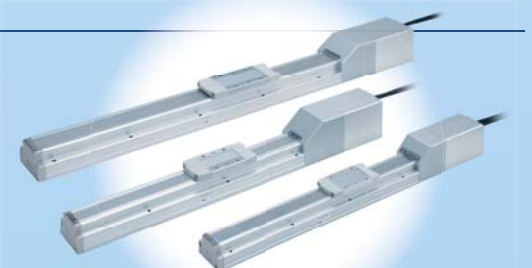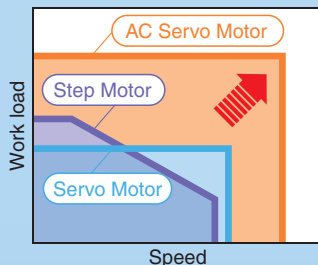Transfer speed: **2000** mm/s

Belt

(New)   AC Servo Motor (100/200/400 W)
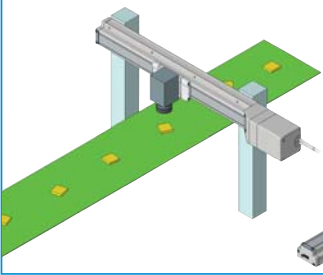
Ball Screw Drive/*Series LEFS*   Size: 25, 32, 40

• High output motor (100/200/400 W)
• Improved high speed transfer ability
• High acceleration compatible (5000 mm/s^2)
• Pulse input type
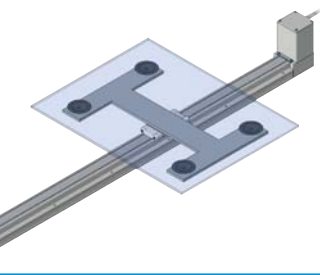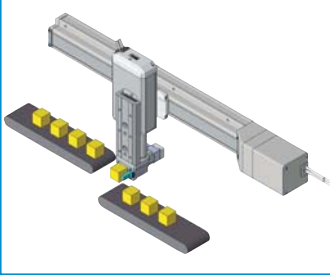• With internal absolute encoder (LECSB specifications)

Work load

AC Servo Motor

Step Motor

Servo Motor

Speed

SMC

Application Examples
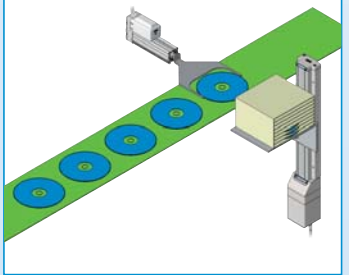
Precise positioning of work pieces

Load and unload transfer of work pieces

Pick and place

Vertical transfer

Series Variations

Ball Screw Drive/Series LEFS

Type	Size *1	Lead [mm]	Stroke [mm]*2	Work load: Horizontal [kg]	Work load: Vertical [kg]	Speed [mm/s]	Page
Step motor (Servo/24 VDC)	16	5	100, 200, 300, (400)				1
		10					
	25	6	100, 200, 300, (400) 500, (600)				
		12					
	32	8	100, 200, 300, (400) 500, (600), (700), (800)				
		16					
	New 40	10	200, 300, (400) 500, (600) (700), 800, (900), (1000)				
		20					
Servo motor (24 VDC)	16	5	100, 200, 300, (400)				
		10					
	25	6	100, 200, 300, (400) 500, (600)				
		12					
New AC Servo motor (100/200/400 W)	25	6	100, 200, 300, (400) 500, (600)				45
		12					
	32	8	100, 200, 300, (400) 500, (600), (700), (800)				
		16					
	40	10	200, 300, (400) 500, (600) (700), 800, (900), (1000)				
		20					

∗1 The size corresponds to the bore of the air cylinder with an equivalent thrust (for the operation using ball screws).
∗2 Strokes shown in ( ) are produced upon receipt of order. Strokes other than those mentioned above are available as a special order.

Belt Drive/Series LEFB

Type	Size *1	Equivalent lead [mm]	Stroke [mm]*2	Work load: Horizontal [kg]*3	Speed [mm/s]	Page
Step motor (Servo/24 VDC)	16	48	(300), 500, (600), (700) 800, (900), 1000			15
	25	48	(300), 500, (600), (700), 800, (900) 1000, (1200), (1500), (1800), (2000)			
	32	48	(300), 500, (600), (700), 800, (900) 1000, (1200), (1500), (1800), (2000)			
Servo motor (24 VDC)	16	48	(300), 500, (600), (700) 800, (900), 1000			
	25	48	(300), 500, (600), (700), 800, (900) 1000, (1200), (1500), (1800), (2000)			

∗1 The size corresponds to the bore of the air cylinder with an equivalent thrust (for the operation using ball screws).
∗2 Strokes shown in ( ) are produced upon receipt of order. Strokes other than those mentioned above are available as a special order.
∗3 Belt drive actuator cannot be used for vertically mounted applications.

SMC

Offering 2 Types of Controller

Step Data Input Type Series LECP6/LECA6

Simple Setting to Use Straight Away

◎ Simple Setting Easy Mode

If you want to use it right away, select "Easy Mode."

Step Motor
(Servo/24 VDC)
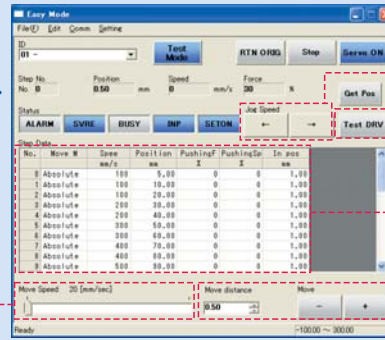**LECP6**

Servo Motor
(24 VDC)
LECA6

<When using a PC>
Controller setting software

● Step data setting, test operation, move jog and move for the constant rate can be set and operated on one screen.

Move jog

Start testing

Step data setting

Setting of jog and speed of the constant rate

Move for the constant rate

<When using a TB (teaching box)>

● The simple screen without scrolling promotes ease of setting and operating.
● Pick up an icon from the first screen and select a function.
● Set up the step data and check the monitor on the second screen.

Example of setting the step data

1st screen

データ DATA / モニタ MONITOR / テスト TEST / アラーム ALARM / ジョグ JOG / 設定 SETTIN

2nd screen

Data	Axis 1
Step No.	0
Posn	123.45 mm
Speed	100 mm/s
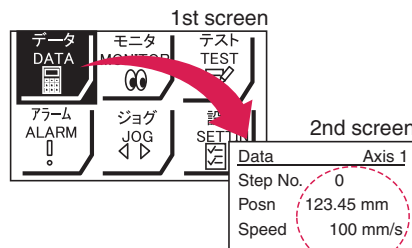
It can be registered by "SET" after entering the values.

Example of checking the monitor

1st screen

データ DATA / モニタ MONITOR / テスト TEST / アラーム ALARM / ジョグ JOG / 設定 SETTIN

2nd screen

Monitor	Axis 1
Step No.	1
Posn	12.34 mm
Speed	10 mm/s
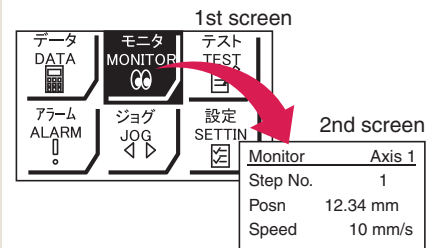
Operation status can be checked.

Teaching box screen

● **Data can be set with position and speed.** (Other conditions are already set.)

Data	Axis 1
Step No.	0
Posn	50.00 mm
Speed	200 mm/s

Data	Axis 1
Step No.	1
Posn	80.00 mm
Speed	100 mm/s

Programless Type Series LECP1

No programming

Capable of setting up an electric actuator operation without using a PC or teaching box

Step Motor
(Servo/24 VDC)
LECP1

① Setting position number

Setting a registered number for the stop position
Maximum 14 points

Position number display

Position selecting switch
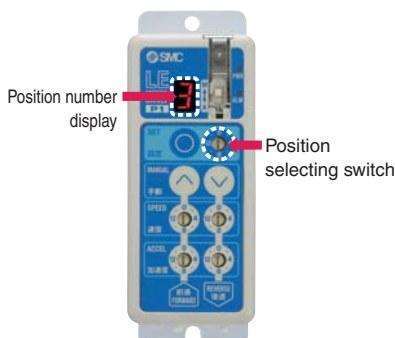
② Setting a stop position

Moving the actuator to a stop position using FORWARD and REVERSE buttons

FOWARD and REVERSE buttons

③ Registration

Registering the stop position using SET button

SET button

Speed/acceleration
16-level adjustment

Speed adjustment switches
Acceleration adjustment switches

SMC
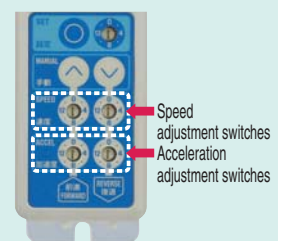
◎Detail Setting Normal Mode

Select normal mode when detail setting is required.
- Step data can be set in detail.
- Signals and terminal status can be monitored.
- Parameters can be set.
- JOG and constant rate movement, return to origin, test operation and testing of compulsory output can be performed.

<When using a PC> Controller setting software

- Step data setting, parameter setting, monitor, teaching, etc., are indicated in different windows.

Step data setup window

Parameter setup window

Monitoring window

Teaching window

<When using a TB (teaching box)>

- Multiple step data can be stored in the teaching box, and transferred to the controller.
- Continuous test operation by up to 5 step data.

Teaching box screen

- Each function (step data setting, test, monitor, etc.) can be selected from the main menu.

| Menu | Axis 1 |
| Step data |
| Parameter |
| Test |

Main menu screen

Menu	Axis 1
Step No.	▲
	0
Operation type	▼

Step data setup screen

Menu	Axis 1
Step No.	1
Position	123.45 mm
Stop

Test screen

Output monitor	Axis 1
BUSY[ ]	▲
SVRE[●]	
SETON[ ]	▼

Monitoring screen

The actuator and controller are provided as a set. (They can be ordered separately.)

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

<Check the following before use.>

① Check that actuator label for model number. Matches the controller label.

② Check that the Parallel I/O configuration matches (NPN or PNP).

Actuator

Controller

LEFS16A-400
①
SMC JAPAN   MS

LEFS16A-400   NPN
①   ②

SMC
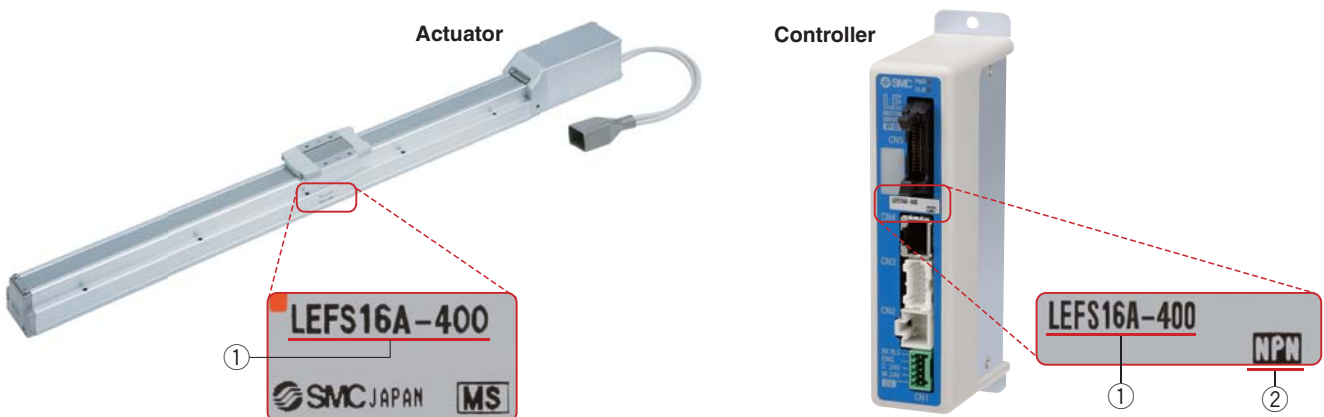
Function

Item	Step data input type LECP6/LECA6	Programless type LECP1
Step data and parameter setting	• Input the numerical value from controller setting software (PC) • Input the numerical value from teaching box	• Select using controller operation buttons
Step data "position" setting	• Input the numerical value from controller setting software (PC) • Input the numerical value from teaching box • Direct teaching • JOG teaching	• Direct teaching • JOG teaching
Number of step data	64 points	14 points
Operation command (I/O signal)	Step No. [IN*] input ⇒ [DRIVE] input	Step No. [IN*] input only
Completion signal	[INP] output	[OUT*] output

Setting Items

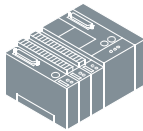TB: Teaching box   PC: Controller setting software

Item		Contents	Step data input type LECP6/LECA6	Easy mode		Normal mode	Programless type LECP1
				TB	PC	TB, PC	
Step data setting (Excerpt)	**Movement MOD**	Selection of "absolute position" and "relative position"	Set at ABS/INC.	×	●	●	Fixed value (ABS)
	Speed	**Transfer speed**	Set in units of 1 mm/s.	●	●	●	Select from 16-level
	Position	[Position]: Target position [Pushing]: Pushing start position	Set in units of 0.01 mm.	●	●	●	Direct teaching JOG teaching
	Acceleration/Deceleration	Acceleration/deceleration during movement	Set in units of 1 mm/s².	●	●	●	Select from 16-level
	Pushing force	Rate of force during pushing operation	Set in units of 1%.	●	●	●	Select from 3-level (weak, medium, strong)
	Trigger LV	Target force during pushing operation	Set in units of 1%.	×	●	●	No setting required (same value as pushing force)
	Pushing speed	Speed during pushing operation	Set in units of 1 mm/s.	×	●	●	Fixed value
	Positioning force	Force during positioning operation	Set to 100%.	×	●	●	Fixed value
	Area output	Conditions for area output signal to turn ON	Set in units of 0.01 mm.	×	●	●	—
	In position	[Position]: Width to the target position [Pushing]: How much it moves during pushing	Set to 0.5 mm or more. (Units: 0.01 mm)	×	●	●	Fixed value
Parameter setting (Excerpt)	**Stroke (+)**	**+ side limit of position**	Set in units of 0.01 mm.	×	×	●	Fixed value
	Stroke (−)	**− side limit of position**	Set in units of 0.01 mm.	×	×	●	Fixed value
	ORIG direction	Direction of the return to the original position can be set.	Compatible	×	×	●	Compatible
	ORIG speed	Speed when returning to the original position	Set in units of 1 mm/s.	×	×	●	Fixed value
	ORIG ACC	Acceleration when returning to the original position	Set in units of 1 mm/s².	×	×	●	Fixed value
Test	**JOG**	Continuous operation at the set speed can be tested while the switch is being pressed.		●	●	●	Hold down MANUAL button (⋀⋁) for uniform sending (speed is specified value)
	MOVE	Operation at the set distance and speed from the current position can be tested.		×	●	●	Press MANUAL button (⋀⋁) once for sizing operation (speed, sizing amount are specified values)
	Return to ORIG		Compatible	●	●	●	Compatible
	Test drive	Operation of the specified step data	Compatible	●	●	● (Continuous operation)	Compatible
	Compulsory output	ON/OFF of the output terminal can be tested.	Compatible	×	×	●	—
Monitor	**DRV mon**	Current position, speed, force and the specified step data can be monitored.	Compatible	●	●	●	—
	In/Out mon	Current ON/OFF status of the input and output terminal can be monitored.	Compatible	×	×	●	—
ALM	**Active ALM**	Alarm currently being generated can be confirmed.	Compatible	●	●	●	Compatible (display alarm group)
	ALM Log record	Alarm generated in the past can be confirmed.	Compatible	×	×	●	—
File	**Save/Load**	Step data and parameter can be saved, forwarded and deleted.	Compatible	×	×	●	—
Other	**Language**	Can be changed to Japanese or English.	Compatible	●	●	●	—

SMC

System Construction

Supplied by customer

PLC

Power supply for I/O signal 24 VDC

● **I/O cable** Pages 33, 43

Controller type	Part No.
LECP6/LECA6	**LEC-CN5-□**
LECP1 (Programless)	**LEC-CK4-□**

● **Controller**

Step data input type
LECP6/LECA6
Page 25

Programless type
LECP1
Page 37

Supplied by customer

Controller power supply 24 VDC
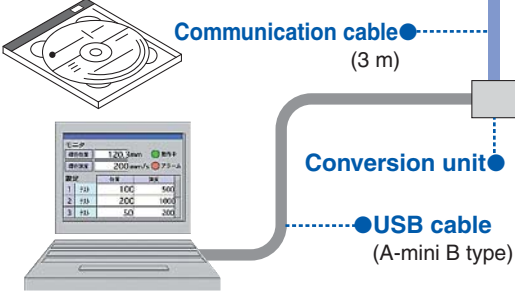
● **Power supply connection** Pages 28, 40

Controller type	Connection
LECP6/LECA6 (Step data input type)	Power supply plug (accessory)
LECP1 (Programless type)	Power supply cable (1.5m) (accessory)

● **Controller setting kit (Option)** Page 34

Controller setting kit
(Communication cable, conversion unit and USB cable are included.)
Part No.: LEC-W2

Communication cable ●
(3 m)

Conversion unit ●

USB cable ●
(A-mini B type)

PC

Or

● **Actuator cable** Pages 31, 32, 42

Controller type	Standard cable	Robotic cable
LECP6 (Step data input type)	**LE-CP-□-S**	**LE-CP-□**
LECA6 (Step data input type)	—	**LE-CA-□**
LECP1 (Programless type)	**LE-CP-□-S**	**LE-CP-□**

Motor cable (Fixed) ●

● **Teaching box (Option)** Page 35

Part No.: LEC-T1-3EG□

with 3 m cable

● **Electric actuator**

Slider Type

Series **LEFS** Page 7
Series **LEFB** Page 15

AC Servo Motor Controller — Series LECS

- **Pulse input type motor controller**
- **Compatible motor capacity: 100 W, 200 W, 400 W**
- **Compatible encoder** : Incremental type
  Absolute type
- **Power supply voltage** : 100 to 120 VAC (50/60 Hz)
  200 to 230 VAC (50/60 Hz)

LECSA   LECSB

Servo adjustment using auto gain tuning

Auto resonant filter function

- Controls the difference in movement between command value and actual movement

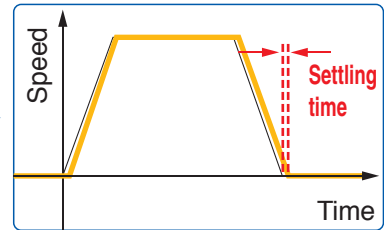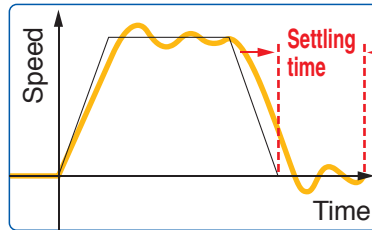Speed / Settling time / Time

Speed / Settling time / Time

Auto damping control function

- Automatically controls machine's low frequency vibrations (up to 100 Hz)
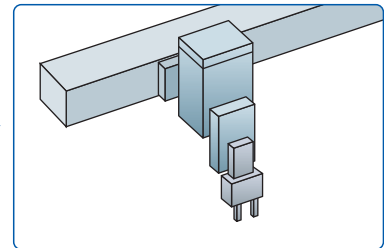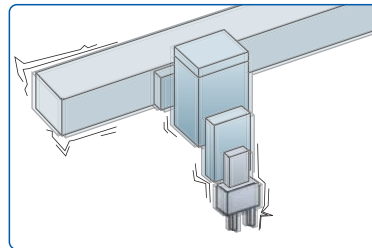
With display setting function

One touch adjustment button
One touch servo adjustment

Display
Display monitor, parameter, alarm

Settings
Control of parameter settings, monitor display etc. using push buttons
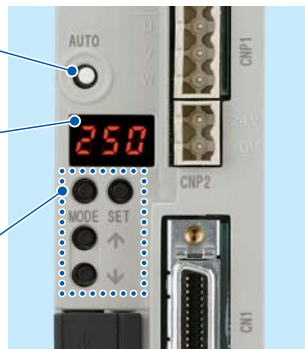
LECSA

Display
Display monitor, parameter, alarm

Settings
Control of parameter settings, monitor display etc. using push buttons
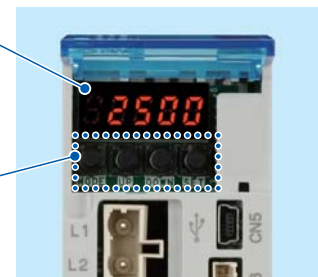
(With the front cover opened)
LECSB

Compatible control mode list (○: recommended setting, △: can be used, x: cannot be used, –: cannot be set)

Controller type	Control mode Note 1)				
	Position control	Speed control Note 2)	Torque control Note 3)	Positioning	
				Point table method	Program method
LECSA (Incremental)	○	△	△	○ 3 points (Max.: 7 points) Note 4)	△ 4 programs (Max.: 8 programs) Note 4) Note 5)
LECSB (Absolute)	○	△	△	–	–
Command method	[Pulse-train]	[ON/OFF signal]			
Operation method	Positioning operation	Setting speed operation	Setting torque operation	Specify point table No. Positioning operation	Specify program No. Positioning operation

Note 1) Control switching mode cannot be used.
Note 2) Make sure that has a limit on the external sensor etc. for avoiding collision with stroke end or workpiece.
Note 3) Can only use for the actuator (Series LEY) compatible with pushing operation.
Note 4) The settings must be changed in order to use various constant settings at maximum when using the point table method and program method.
Refer to the "Operation Manual" for required setting changes.
Note 5) To control with the program method, order MR Configurator (setup software) LEC-MR-SETUP221 separately.

SMC

System Construction

Incremental encoder compatible *Series* **LECSA**

Supplied by customer

Power supply
Single phase 100 to 120 VAC (50/60 Hz)
200 to 230 VAC (50/60 Hz)

● **Main circuit** Page 59
power supply connector
∗Accessory

Controller

Supplied by customer

Control circuit power supply
24 VDC

● **Control circuit** Page 59
power supply connector
∗Accessory

MR Configurator Page 64
Setup software
Part no.: LEC-MR-SETUP221

PC

Regeneration Page 63
option
Part no.: LEC-MR-RB-□

● **Motor cable** Page 63

Part no.: Standard cable	Part no.: Robotic cable
LE-CSM-S□□	LE-CSM-R□□

● **Lock cable** Page 63

Part no.: Standard cable	Part no.: Robotic cable
LE-CSB-S□□	LE-CSB-R□□

Electric actuator
Series **LEFS** Page 45

● **USB cable** Page 64
Part no.: LEC-MR-J3USB

● **I/O connector** Page 63
Part no.: LE-CSNA

Supplied by customer

PLC
Power supply for I/O signal
24 VDC

● **Encoder cable** Page 63

Part no.: Standard cable	Part no.: Robotic cable
LE-CSE-S□□	LE-CSE-R□□

Absolute encoder compatible *Series* **LECSB**

Controller

● **USB cable** Page 64
Part no.: LEC-MR-J3USB

Supplied by customer

Power supply
Single phase 100 to 120 VAC (50/60 Hz)
200 to 230 VAC (50/60 Hz)
Three phase 200 to 230 VAC (50/60 Hz)

● **Main circuit** Page 60
power supply connector
∗Accessory

MR Configurator Page 64
Setup software
Part no.: LEC-MR-SETUP221

PC

Regeneration Page 63
option
Part no.: LEC-MR-RB-□
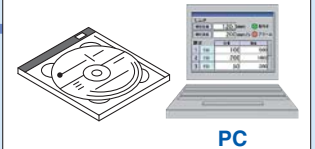
Analogue monitor output
RS-422 communication

● **Motor cable** Page 63

Part no.: Standard cable	Part no.: Robotic cable
LE-CSM-S□□	LE-CSM-R□□

● **Lock cable** Page 63

Part no.: Standard cable	Part no.: Robotic cable
LE-CSB-S□□	LE-CSB-R□□

● **Control circuit**
power supply connector Page 60
∗Accessory

● **I/O connector** Page 63
Part no.: LE-CSNB

Electric actuator
Series **LEFS** Page 45

● **Motor** Page 60
connector
∗Accessory

Supplied by customer

PLC
Power supply for I/O signal
24 VDC

● **Encoder cable** Page 63

Part no.: Standard cable	Part no.: Robotic cable
LE-CSE-S□□	LE-CSE-R□□

Battery (included)

SMC Electric Actuators

Rod Type — Step Motor (Servo/24 VDC) | Servo Motor (24 VDC) | AC Servo Motor (100/200 W)

CAT.ES100-83

Basic Type
Series LEY

Size	Stroke
16	30 to 300
25	30 to 400
32	30 to 500

In-line Motor Type
Series LEY□D

Size	Stroke
16	30 to 300
25	30 to 400
32	30 to 500

Guide Rod Type
Series LEYG

Size	Stroke
16	30 to 200
25	30 to 300
32	30 to 300

In-line Motor Type /Guide Rod Type
Series LEYG□D

Size	Stroke
16	30 to 200
25	30 to 300
32	30 to 300

Basic Type
Series LEY

Size	Stroke
25	30 to 400
32	30 to 500

In-line Motor Type
Series LEY□D

Size	Stroke
25	30 to 400
32	30 to 500

Slider Type — Step Motor (Servo/24 VDC) | Servo Motor (24 VDC) | AC Servo Motor (100/200/400 W)
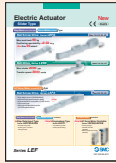
CAT.ES100-87

Ball Screw Drive
Series LEFS

Size	Stroke
16	100 to 400
25	100 to 600
32	100 to 800
40	200 to 1000

Belt Drive
Series LEFB

Size	Stroke
16	300 to 1000
25	300 to 2000
32	300 to 2000

Ball Screw Drive
Series LEFS

Size	Stroke
25	100 to 600
32	100 to 800
40	200 to 1000

Rotary Table — Step Motor (Servo/24 VDC)
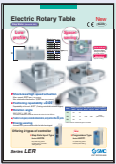
CAT.ES100-94

Basic Type
Series LER

Size	Rotation angle [°]
10	310, 180, 90
30	320, 180, 90
50	320, 180, 90

High Precision Type
Series LERH

Size	Rotation angle [°]
10	310, 180, 90
30	320, 180, 90
50	320, 180, 90

Slide Table — Step Motor (Servo/24 VDC) | Servo Motor (24 VDC)

CAT.ES100-78

Basic Type (R Type)
Series LESH□R

Size	Stroke
8	50, 75
16	50, 100
25	50, 100, 150

Symmetrical Type (L Type)
Series LESH□L

Size	Stroke
8	50, 75
16	50, 100
25	50, 100, 150

In-line Motor Type (D Type)
Series LESH□D

Size	Stroke
8	50, 75
16	50, 100
25	50, 100, 150

Gripper — Step Motor (Servo/24 VDC)

CAT.ES100-77

Z Type (2 Fingers)
Series LEHZ

Size	Opening/closing stroke
10	4
16	6
20	10
25	14
32	22
40	30
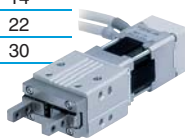
With Dust Cover
Series LEHZJ

Size	Opening/closing stroke
10	4
16	6
20	10
25	14

F Type (2 Fingers)
Series LEHF

Size	Opening/closing stroke
10	16 (32)
20	24 (48)
32	32 (64)
40	40 (80)

S Type (3 Fingers)
Series LEHS

Size	Opening/closing stroke
10	4
20	6
32	8
40	12
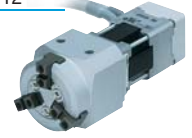
Controller

Step Data Input Type For Step Motor
Series LECP6

Control motor
Step motor (Servo/24 VDC)

Step Data Input Type For Servo Motor
Series LECA6

Control motor
Servo motor (24 VDC)

Programless Type
Series LECP1

Control motor
Step motor (Servo/24 VDC)

AC Servo Motor Controller Incremental Type
Series LECSA

Control motor
AC servo motor (100/200 VAC)

AC Servo Motor Controller Absolute Type
Series LECSB

Control motor
AC servo motor (100/200 VAC)

SMC

Series Variations

Electric Actuator Slider Type Series *LEF*

Drive method	Specifications	Series	Stroke [mm]	Work load [kg] Horizontal	Work load [kg] Vertical	Speed [mm/s]	Screw lead [mm]	Positioning repeatability [mm]	Controller series	Page
Ball screw drive	Step motor (Servo/24 VDC)	LEFS16	100 to 400	9	2	10 to 500	10	±0.02	Series LECP6 Series LECP1	Page 1
				10	4	5 to 250	5			
		LEFS25	100 to 600	20	7.5	12 to 500	12			
				20	15	6 to 250	6			
		LEFS32	100 to 800	40	10	16 to 500	16			
				45	20	8 to 250	8			
		LEFS40	200 to 1000	50	—	20 to 500	20			
				60	23	10 to 250	10			
	Servo motor (24 VDC)	LEFS16A	100 to 400	7	2	10 to 500	10		Series LECA6	
				10	4	5 to 250	5			
		LEFS25A	100 to 600	11	2.5	12 to 500	12			
				18	5	6 to 250	6			
Belt drive	Step motor (Servo/24 VDC)	LEFB16	300 to 1000	1	—	48 to 1100	48	±0.1	Series LECP6 Series LECP1	Page 15
		LEFB25	300 to 2000	5		48 to 1400				
		LEFB32	300 to 2000	14		48 to 1500				
	Servo motor (24 VDC)	LEFB16A	300 to 1000	1	—	48 to 2000	48		Series LECA6	
		LEFB25A	300 to 2000	2						
Ball screw drive	AC servo motor (100/200/400 W)	LEFS25S	100 to 600	20	8	Max.900	12	±0.02	Series LECSA Series LECSB	Page 45
				20	15	Max.450	6			
		LEFS32S	100 to 800	40	10	Max.1000	16			
				45	20	Max.500	8			
		LEFS40S	200 to 1000	50	15	Max.1000	20			
				60	30	Max.500	10			

Controller *LEC*

LECP6 LECA6   Teaching Box

LECP1

LECSA LECSB

Type	Series	Compatible motor	Power supply voltage	Parallel input/output Input	Parallel input/output Output	Number of positioning pattern points	Page
Step data input type	LECP6	Step motor (Servo/24 VDC)	24 VDC ±10%	11 inputs (Photo-coupler isolation)	13 outputs (Photo-coupler isolation)	64	Page 25
	LECA6	Servo motor (24 VDC)					
Programless type	LECP1	Step motor (Servo/24 VDC)	24 VDC ±10%	6 inputs (Photo-coupler isolation)	6 outputs (Photo-coupler isolation)	14	Page 37
Pulse input type (For incremental encoder)	LECSA	AC servo motor (100/200 VAC)	100 to 120 VAC (50/60 Hz)	6 inputs	4 outputs	0 to ±65535 (Pulse command unit)	Page 57
Pulse input type (For absolute encoder)	LECSB		200 to 230 VAC (50/60 Hz)	10 inputs	6 outputs	0 to ±10000 (Pulse command unit)	

INDEX

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

AC Servo Motor (100/200/400 W) Type

Electric Actuator/Slider Type

Ball Screw Drive/*Series* **LEFS** Belt Drive/*Series* **LEFB**

Model Selection

Selection Procedure

| Step 1 | Confirm the work load – speed. | → | Step 2 | Confirm the cycle time. | → | Step 3 | Confirm the allowable moment. |

Selection Example

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:

W

100
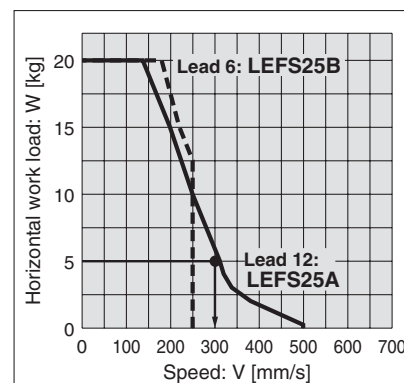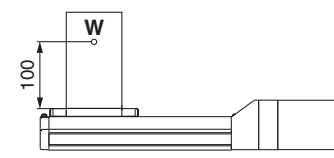
Step 1 Confirmation of work load–speed <Speed–Work load graph> (Pages 2 and 3)

Select the target model based on the workpiece mass and speed with reference to the (Speed–Work load graph).

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

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

Step 2 Confirmation of 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.

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

- **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.

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

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

$$= \textbf{0.97 [s]}$$
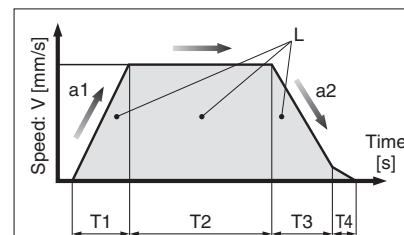
L : Stroke [mm]
··· (Operating condition)
V : Speed [mm/s]
··· (Operating condition)
a1 : Acceleration [mm/s²]
··· (Operating condition)
a2 : Deceleration [mm/s²]
··· (Operating condition)

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 Confirmation of guide moment

Mep

m

L1

1000 mm/s²

3000 mm/s²

5000 mm/s²
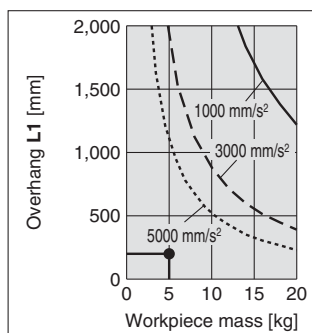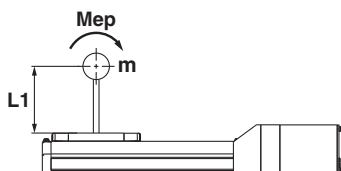
Based on the above calculation result, the LEFS25A-200 is selected.

SMC

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

∗ The following graph shows the values when positioning force is 100%.

LEFS16/Ball Screw Drive

Horizontal
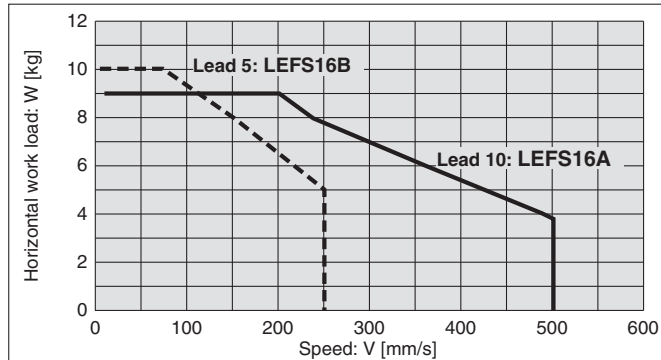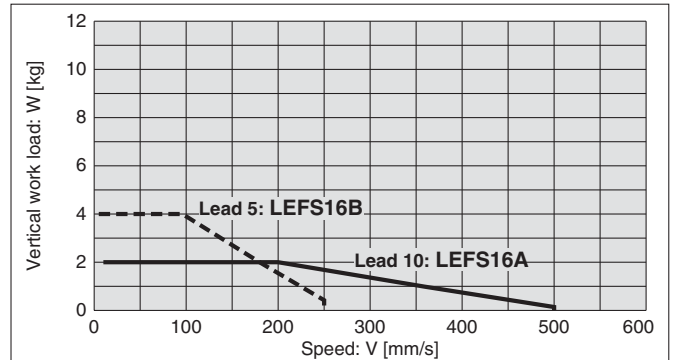
Vertical

LEFS25/Ball Screw Drive
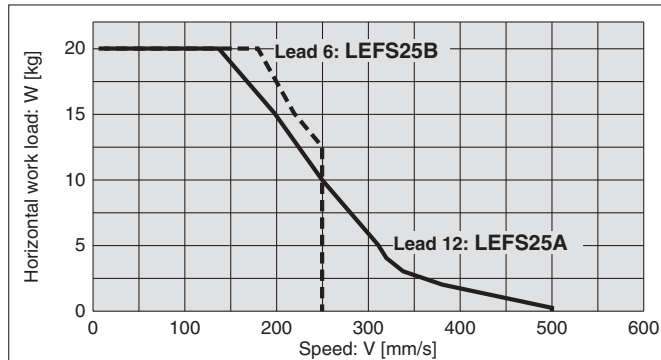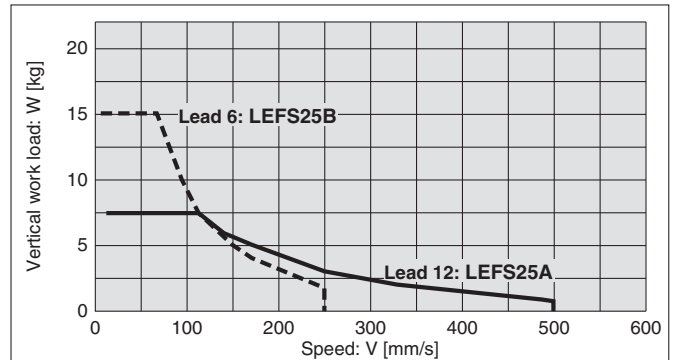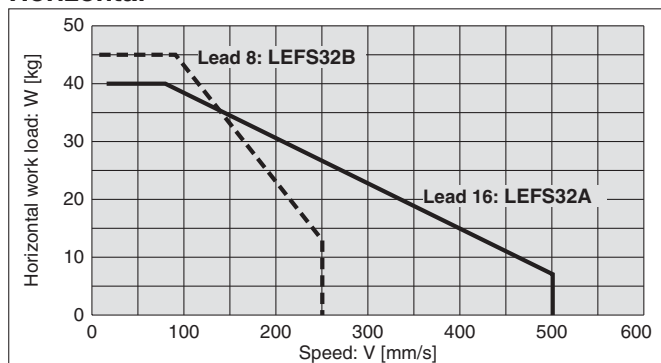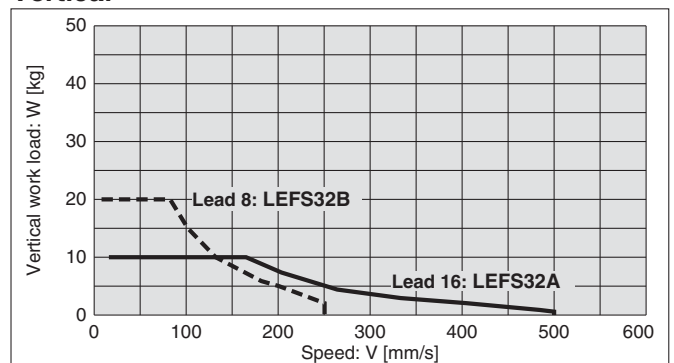
Horizontal

Vertical

LEFS32/Ball Screw Drive

Horizontal

Vertical

LEFS40/Ball Screw Drive

Horizontal
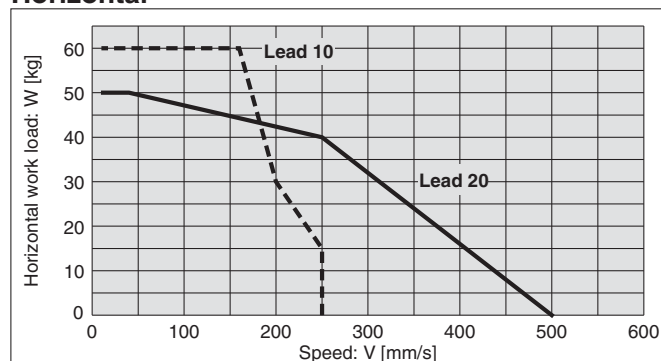
Vertical
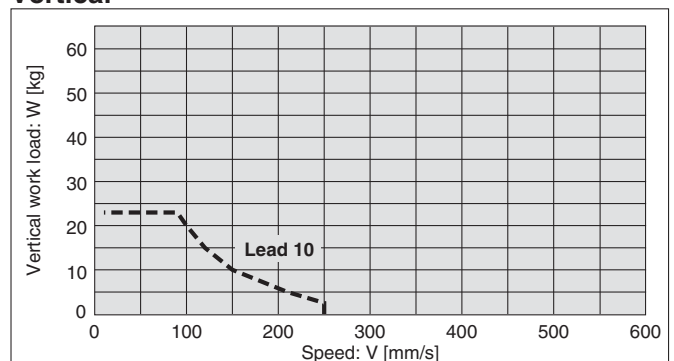
Series *LEF*

Speed–Work Load Graph (Guide)
Servo Motor (24 VDC)

∗ The following graph shows the values when positioning force is 250%.

LEFS16A/Ball Screw Drive

Horizontal

Lead 5: LEFS16AB
Lead 10: LEFS16AA

Vertical

Lead 5: LEFS16AB
Lead 10: LEFS16AA
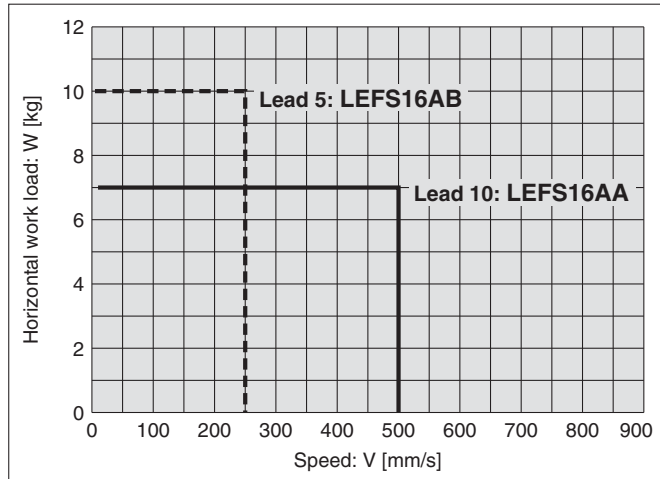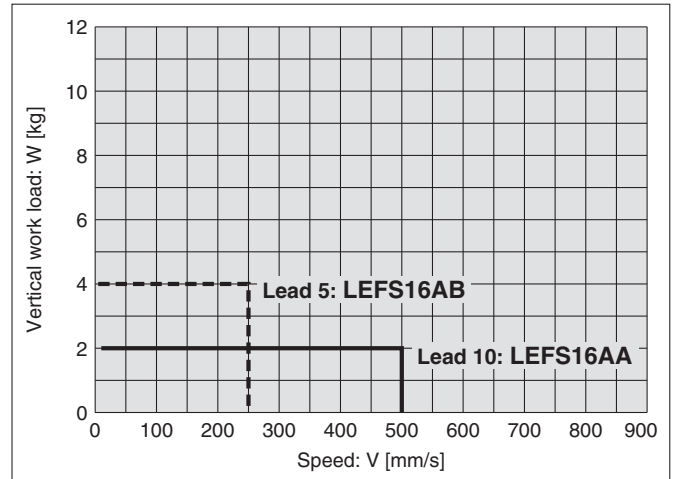
LEFS25A/Ball Screw Drive

Horizontal

Lead 6: LEFS25AB
Lead 12: LEFS25AA

Vertical

Lead 6: LEFS25AB
Lead 12: LEFS25AA
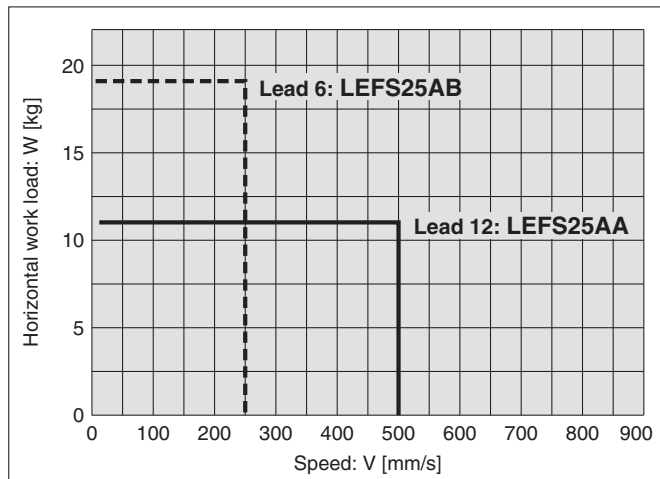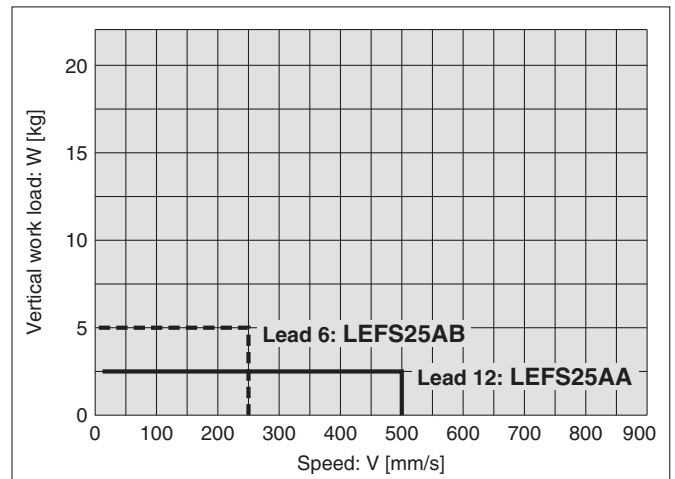
Step Motor (Servo/24 VDC)

LEFB/Belt Drive
∗ When positioning force is 100%

Horizontal

LEFB32
LEFB25
LEFB16
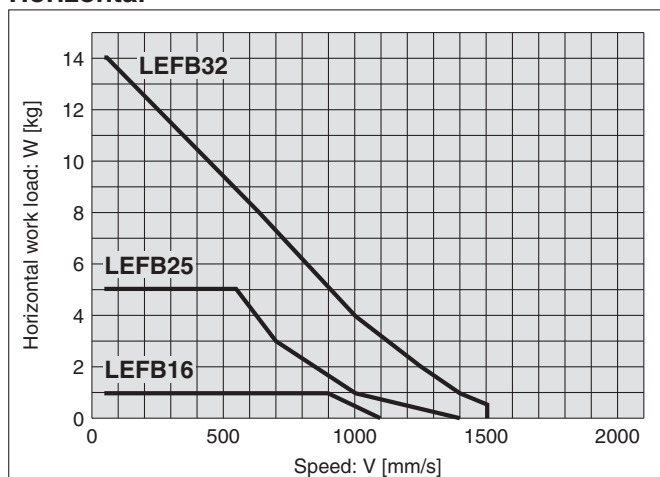
Servo Motor (24 VDC)

LEFB/Belt Drive
∗ When positioning force is 250%

Horizontal
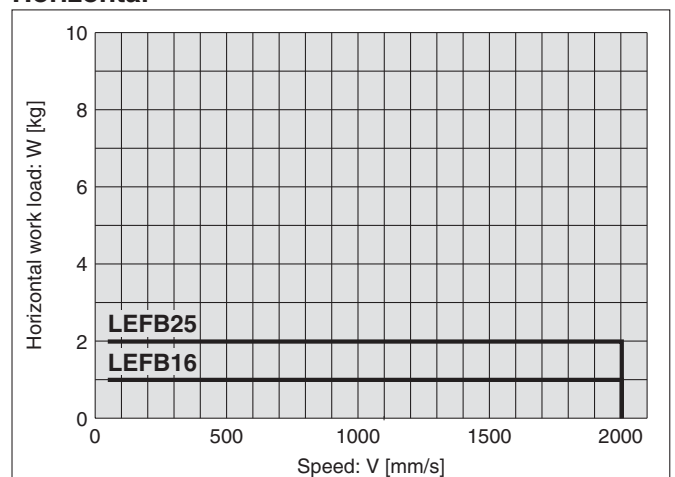
LEFB25
LEFB16

SMC

Dynamic Allowable Moment

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

Acceleration —— 1000 mm/s² – – – 3000 mm/s² ········ 5000 mm/s²

Orientation	Load overhanging direction m : Work load [kg] Me: Dynamic allowable moment [N·m] L : Amount of overhang to the centre of gravity of the workpiece [mm]	Model			
		LEF16	**LEF25**	**LEF32**	**LEFS40**
Horizontal	Pitching Mep m L1	Overhang L1 [mm] Workpiece mass [kg]	Overhang L1 [mm] Workpiece mass [kg]	Overhang L1 [mm] Workpiece mass [kg]	Overhang L1 [mm] Workpiece mass [kg]
Horizontal	Yawing Mey m L2	Overhang L2 [mm] Workpiece mass [kg]	Overhang L2 [mm] Workpiece mass [kg]	Overhang L2 [mm] Workpiece mass [kg]	Overhang L2 [mm] Workpiece mass [kg]
Horizontal	Rolling L3 Mer m	Overhang L3 [mm] Workpiece mass [kg]	Overhang L3 [mm] Workpiece mass [kg]	Overhang L3 [mm] Workpiece mass [kg]	Overhang L3 [mm] Workpiece mass [kg]
Vertical	Pitching m Mep L4	Overhang L4 [mm] Workpiece mass [kg]	Overhang L4 [mm] Workpiece mass [kg]	Overhang L4 [mm] Workpiece mass [kg]	Overhang L4 [mm] Workpiece mass [kg]
Vertical	Yawing m Mey L5	Overhang L5 [mm] Workpiece mass [kg]	Overhang L5 [mm] Workpiece mass [kg]	Overhang L5 [mm] Workpiece mass [kg]	Overhang L5 [mm] Workpiece mass [kg]

Side tabs:

Model Selection

LEFS

LEFB

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

LECA6 / LECP6

LECP1

LEFS□S

AC Servo Motor

LECSA / LECSB

Specific Product Precautions

Series *LEF*

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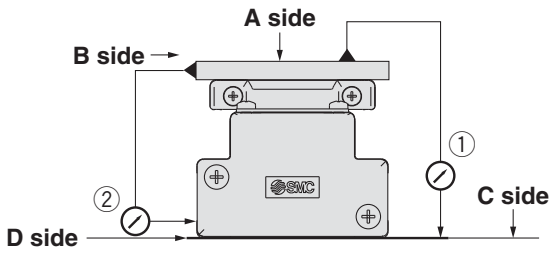
| Model | Traveling parallelism [mm] (Every 300 mm) | |
	① C side traveling parallelism to A side	② D side traveling parallelism to B side
LEF16	0.05	0.03
LEF25	0.05	0.03
LEF32	0.05	0.03
LEF40	0.05	0.03

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

Table Displacement (Reference Value)
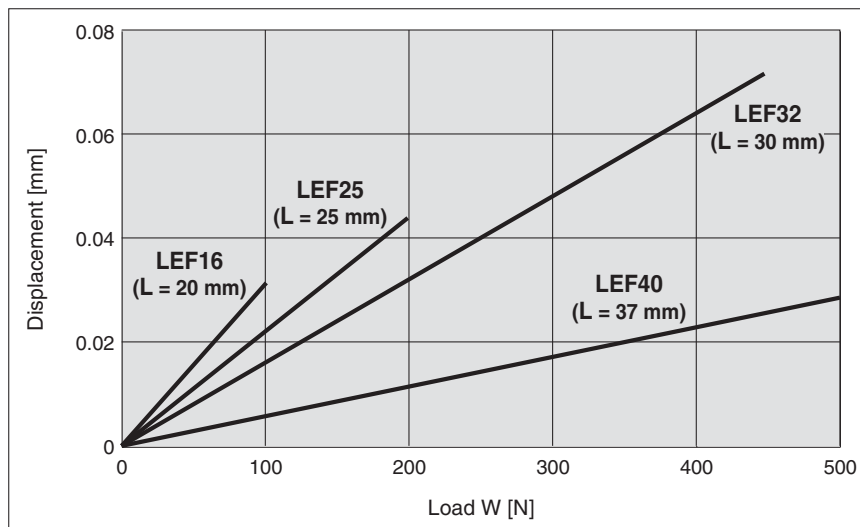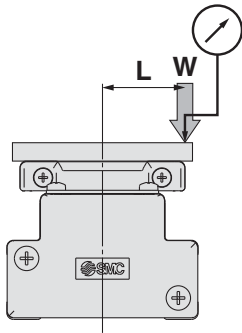
Note) This displacement is measured when a 15 mm aluminum plate is mounted and fixed on the table.

SMC

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor

LEFS□S

LECSA / LECSB

Specific Product Precautions

6

Electric Actuator/Slider Type
Ball Screw Drive

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

Series LEFS
LEFS16, 25, 32, 40

CE RoHS

How to Order

LEFS 16 ☐ B – 100 ☐ – S 1 6P 1 ☐

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Size

16	
25	
32	
40	
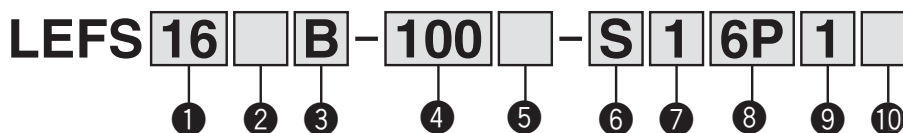
❷ Motor type

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

❸ Lead [mm]

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

⚠ **Caution**

Note) 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 33 for the noise filter set. Refer to the LECA Operation Manual for installation.

❹ Stroke [mm]

100	100
~	~
1000	1000

∗ Refer to the applicable stroke table.

Applicable stroke table

●Standard/○ Produced upon receipt of order

Model \ Stroke	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

∗ Manufacturable in 1 mm stroke increments. Refer to the manufacturable stroke range.
Strokes other than those above are available as special order. Consult with SMC for lead times and prices.

The actuator and controller are sold as a package. (Controller → Pages 25 and 37)

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

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

LEFS16A-400

NPN

① ②

∗ Refer to the operation manual for using the products. Please download it via our website. http://www.smcworld.com

SMC

❺ Motor option

—	Without lock
B	With lock

❻ Actuator cable type[*1]

—	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."

❼ Actuator cable length [m]

—	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.

❽ Controller type[*1]

—	Without controller	
6N	**LECP6/LECA6**	NPN
6P	(Step data input type)	PNP
1N	**LECP1**[*2]	NPN
1P	(Programless type)	PNP

*1 For details of controllers and compatible motors, refer to the compatible controllers below.
*2 Only available for the motor type "Step motor."

❾ I/O cable length [m]

—	Without cable
1	1.5*
3	3*
5	5*

* If "Without controller" is selected for controller types, I/O cable is not included. Refer to page 33 (LECP6/LECA6) or page 43 (LECP1) if I/O cable is required.

❿ Controller mounting

—	Screw mounting
D	DIN rail mounting*

*1 Only available for the controller types "6N" and "6P."
*2 DIN rail is not included. Order it separately.

Compatible controllers

Type	Step data input type	Step data input type	Programless type
Series	**LECP6**	**LECA6**	**LECP1**
Feature(s)	Value input Standard controller		Capable of setting up operation without using a PC or teaching box
Compatible motor	Step motor (Servo/24 VDC)	Servo motor (24 VDC)	Step motor (Servo/24 VDC)
Maximum number of step data	64 points		14 points
Power supply voltage	24 VDC		
Reference page	Page 25	Page 25	Page 37

Series *LEFS*

Specifications

Step Motor (Servo/24 VDC)

<table>
<tr><td colspan="3">Model</td><td colspan="2">LEFS16</td><td colspan="2">LEFS25</td><td colspan="2">LEFS32</td><td colspan="2">LEFS40</td></tr>
<tr><td rowspan="12">Actuator specifications</td><td colspan="2">Stroke [mm] Note 1)</td><td colspan="2">100, 200, 300 (400)</td><td colspan="2">100, 200, 300 (400), 500, (600)</td><td colspan="2">100, 200, 300, (400) 500, (600) 700, 800)</td><td colspan="2">200, 300, (400), 500, (600) (700), 800, (900), (1000)</td></tr>
<tr><td rowspan="2">Work load [kg] Note 2)</td><td>Horizontal</td><td>9</td><td>10</td><td>20</td><td>20</td><td>40</td><td>45</td><td>50</td><td>60</td></tr>
<tr><td>Vertical</td><td>2</td><td>4</td><td>7.5</td><td>15</td><td>10</td><td>20</td><td>—</td><td>23</td></tr>
<tr><td colspan="2">Speed [mm/s] Note 2)</td><td>10 to 500</td><td>5 to 250</td><td>12 to 500</td><td>6 to 250</td><td>16 to 500</td><td>8 to 250</td><td>20 to 500</td><td>10 to 250</td></tr>
<tr><td colspan="2">Max. acceleration/deceleration [mm/s²]</td><td colspan="8">3000</td></tr>
<tr><td colspan="2">Positioning repeatability [mm]</td><td colspan="8">±0.02</td></tr>
<tr><td colspan="2">Lead [mm]</td><td>10</td><td>5</td><td>12</td><td>6</td><td>16</td><td>8</td><td>20</td><td>10</td></tr>
<tr><td colspan="2">Impact/Vibration resistance [m/s²] Note 3)</td><td colspan="8">50/20</td></tr>
<tr><td colspan="2">Actuation type</td><td colspan="8">Ball screw</td></tr>
<tr><td colspan="2">Guide type</td><td colspan="8">Linear guide</td></tr>
<tr><td colspan="2">Operating temp. range [°C]</td><td colspan="8">5 to 40</td></tr>
<tr><td colspan="2">Operating humidity range [%RH]</td><td colspan="8">90 or less (No condensation)</td></tr>
<tr><td rowspan="9">Electric specifications</td><td colspan="2">Motor size</td><td colspan="2">□28</td><td colspan="2">□42</td><td colspan="4">□56.4</td></tr>
<tr><td colspan="2">Motor type</td><td colspan="8">Step motor (Servo/24 VDC)</td></tr>
<tr><td colspan="2">Encoder</td><td colspan="8">Incremental A/B phase (800 pulse/rotation)</td></tr>
<tr><td colspan="2">Rated voltage [V]</td><td colspan="8">24 VDC ±10%</td></tr>
<tr><td colspan="2">Power consumption [W] Note 4)</td><td colspan="2">22</td><td colspan="2">38</td><td colspan="2">50</td><td colspan="2">100</td></tr>
<tr><td colspan="2">Standby power consumption when operating [W] Note 5)</td><td colspan="2">18</td><td colspan="2">16</td><td colspan="2">44</td><td colspan="2">43</td></tr>
<tr><td colspan="2">Momentary max. power consumption [W] Note 6)</td><td colspan="2">51</td><td colspan="2">57</td><td colspan="2">123</td><td colspan="2">141</td></tr>
<tr><td colspan="2">Controller weight [kg]</td><td colspan="8">0.15 (Screw mounting), 0.17 (DIN rail mounting)</td></tr>
<tr><td rowspan="4">Lock unit specifications</td><td colspan="2">Type Note 7)</td><td colspan="8">Non-magnetizing operation type</td></tr>
<tr><td colspan="2">Holding force [N]</td><td>20</td><td>39</td><td>78</td><td>157</td><td>108</td><td>216</td><td>113</td><td>225</td></tr>
<tr><td colspan="2">Power consumption [W] Note 8)</td><td colspan="2">2.9</td><td colspan="2">5</td><td colspan="2">5</td><td colspan="2">5</td></tr>
<tr><td colspan="2">Rated voltage [V]</td><td colspan="8">24 VDC ±10%</td></tr>
</table>

Note 1) Strokes shown in ( ) are produced upon receipt of order.
Note 2) Speed is dependent on 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) Power consumption (including the controller) is for when the actuator is operating.
Note 5) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation.
Note 6) Momentary max. 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.

SMC

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/s²]		3000			
	Positioning repeatability [mm]		±0.02			
	Lead [mm]		10	5	12	6
	Impact/Vibration resistance [m/s²] Note 3)		50/20			
	Actuation type		Ball screw			
	Guide type		Linear guide			
	Operating temp. range [°C]		5 to 40			
	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	
	Momentary max. power consumption [W] Note 6)		70		113	
	Controller weight [kg]		0.15 (Screw mounting), 0.17 (DIN rail mounting)			
Lock unit specifications	Type Note 7)		Non-magnetizing operation type			
	Holding force [N]		20	39	78	157
	Power consumption [W] Note 8)		2.9		5	
	Rated voltage [V]		24 VDC ±10%			

Note 1) Strokes shown in ( ) are produced upon receipt of order.
Note 2) 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) Power consumption (including the controller) is for when the actuator is operating.
Note 5) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation.
Note 6) Momentary max. 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]	0.90	1.05	1.20	1.35
Additional weight with lock [kg]	0.12			

Model	LEFS25					
Stroke [mm]	100	200	300	(400)	500	(600)
Product weight [kg]	1.84	2.12	2.40	2.68	2.96	3.24
Additional weight with lock [kg]	0.26					

Model	LEFS32							
Stroke [mm]	100	200	300	(400)	500	(600)	(700)	(800)
Product weight [kg]	3.35	3.75	4.15	4.55	4.95	5.35	5.75	6.15
Additional weight with lock [kg]	0.53							

Model	LEFS40								
Stroke [mm]	200	300	(400)	500	(600)	(700)	800	(900)	(1000)
Product weight [kg]	5.65	6.21	6.77	7.33	7.89	8.45	9.01	9.57	10.13
Additional weight with lock [kg]	0.53								

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor LEFS□S

LECSA / LECSB

Specific Product Precautions

Series *LEFS*

Construction

LEFS16, 25, 32
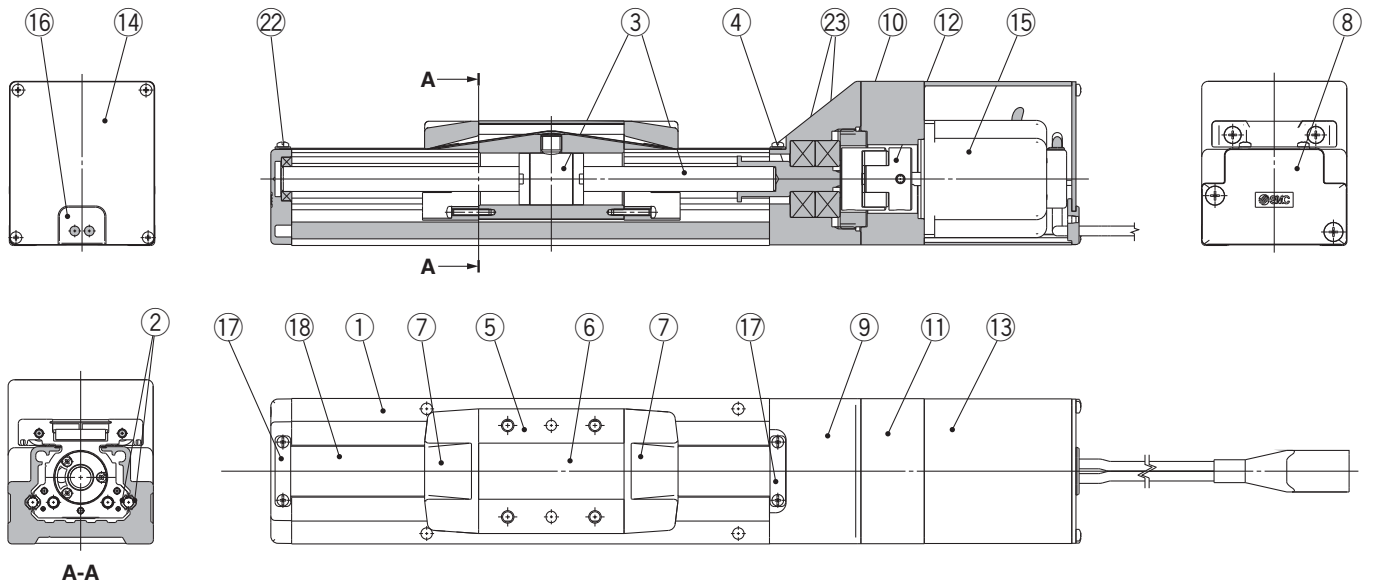
LEFS40
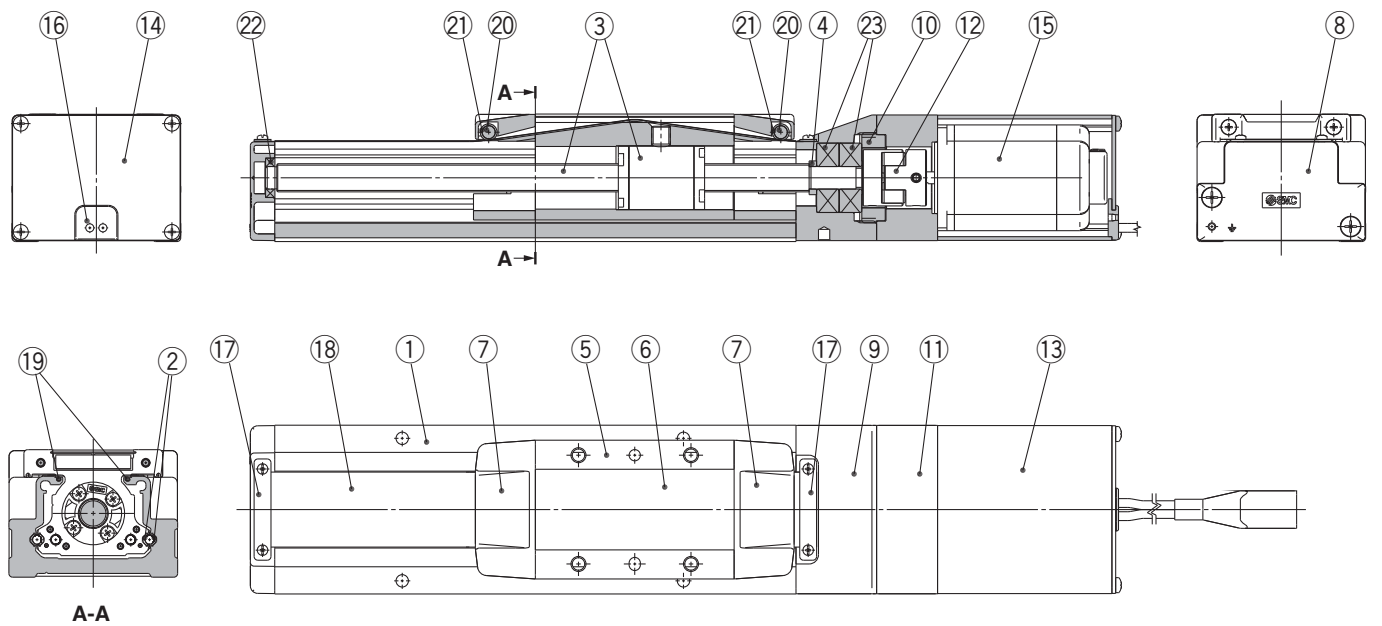
No.	Description		Material	Note
1	**Body**		Aluminium alloy	Anodised
2	**Rail guide**		—	
3	**Ball screw assembly**		—	
4	**Connected shaft**	LEFS16, 25, 32	—	
	Spacer	LEFS40		
5	**Table**		Aluminium alloy	Anodised
6	**Blanking plate**		Aluminium alloy	Anodised
7	**Seal band stopper**		Synthetic resin	
8	**Housing A**		Aluminium die-casted	Coating
9	**Housing B**		Aluminium alloy	Coating
10	**Bearing stopper**		Aluminium alloy	
11	**Motor mount**		Aluminium alloy	Coating

No.	Description	Material	Note
12	**Coupling**	—	
13	**Motor cover**	Aluminium alloy	Anodised
14	**End cover**	Aluminium alloy	Anodised
15	**Motor**	—	
16	**Rubber bushing**	NBR	
17	**Band stopper**	Stainless steel	
18	**Dust seal band**	Stainless steel	
19	**Seal magnet**	—	
20	**Roller shaft**	Aluminium alloy	
21	**Wiper**	—	
22	**Bearing**	—	
23	**Bearing**	—	

Dimensions: Ball Screw Drive

LEFS16

n x ø3.4
3H9 $\left(^{+0.025}_{0}\right)$ depth 3
100
8
40
D x 100 (= **E**)
B
34

(L)
Cable length 250
(37)
A (Table travel distance) Note 2)
37
Stroke
39 [(41)]
(113.5)
(2.4)
65
7
(41) [39]
4 [2]
[Origin] Note 4)
Origin Note 3)
2 [4]
Motor cable (2 x ø5)
33
40

M4 x 0.7 thread depth 7 (F.G. terminal)
40
27
6
46
20
5.5

Step motor **Servo motor** **Motor option: With lock**
15   15   (155.5)   Cable length 250
20   20   65
20   24
20   24
Lock cable (ø3.5)

Body mounting Note 1) reference plane
ø3H9 $\left(^{+0.025}_{0}\right)$ depth 3
(72)
40
24
28
4 x M4 x 0.7 thread depth 6.4
39.4
3.5
3H9 $\left(^{+0.025}_{0}\right)$ depth 3

Note 1) When mounting the electric actuator using the body mounting reference plane, set the height of the opposite surface or pin to 2 mm or more because of R 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 work pieces 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.

[mm]

Model	L	A	B	n	D	E
LEFS16□-100	300.5	106	180	4	—	—
LEFS16□-100B	342.5					
LEFS16□-200	400.5	206	280	6	2	200
LEFS16□-200B	442.5					
LEFS16□-300	500.5	306	380	8	3	300
LEFS16□-300B	542.5					
LEFS16□-400	600.5	406	480	10	4	400
LEFS16□-400B	642.5					

LEFS25

n x ø4.5
3H9 $\left(^{+0.025}_{0}\right)$ depth 3
120
10
35
D x 120 (= **E**)
B
48

(L)
Cable length 250
(52)
A (Table travel distance) Note 2)
52
Stroke
54 [(56)]
(121.5)
(2.4)
65
10
(56) [54]
4 [2]
[Origin] Note 4)
Origin Note 3)
2 [4]
Motor cable (2 x ø5)
38.5
48

M4 x 0.7 thread depth 7 (F.G. terminal)
58
38
6.5
57.5
24
6

Step motor **Servo motor** **Motor option: With lock**
15   15   (166.5)   Cable length 250
20   20   65
20   24
20   24
Lock cable (ø3.5)

Body mounting Note 1) reference plane
ø3H9 $\left(^{+0.025}_{0}\right)$ depth 3
(102)
64
45
38
4 x M5 x 0.8 thread depth 8.5
50
3.5
3H9 $\left(^{+0.025}_{0}\right)$ depth 3
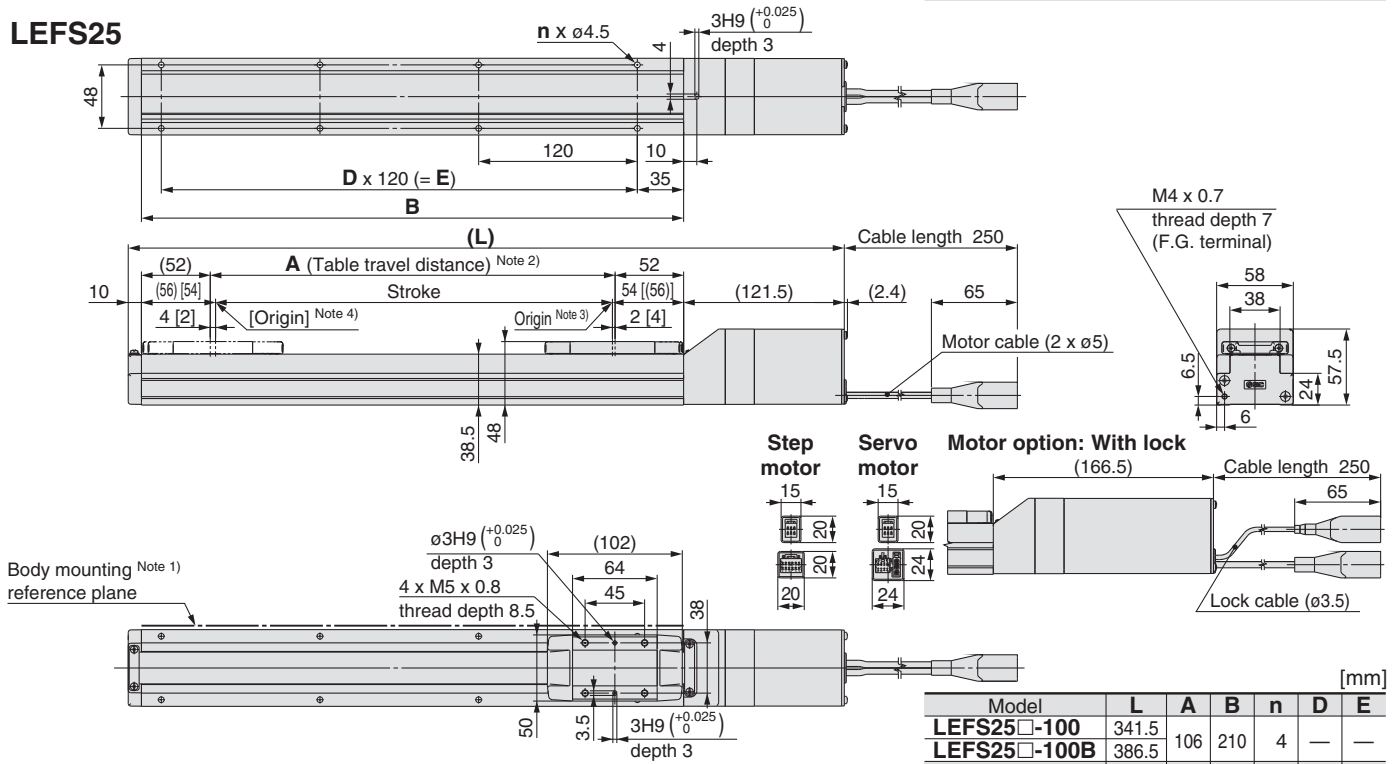
Note 1) When mounting the electric actuator using the body mounting reference plane, set the height of the opposite surface or pin to 3 mm or more because of R chamfering. (Recommended height: 5 mm)
Note 2) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere with the work pieces 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.

[mm]

Model	L	A	B	n	D	E
LEFS25□-100	341.5	106	210	4	—	—
LEFS25□-100B	386.5					
LEFS25□-200	441.5	206	310	6	2	240
LEFS25□-200B	486.5					
LEFS25□-300	541.5	306	410	8	3	360
LEFS25□-300B	586.5					
LEFS25□-400	641.5	406	510	8	3	360
LEFS25□-400B	686.5					
LEFS25□-500	741.5	506	610	10	4	480
LEFS25□-500B	786.5					
LEFS25□-600	841.5	606	710	12	5	600
LEFS25□-600B	886.5					

SMC

Series *LEFS*

Dimensions: Ball Screw Drive

LEFS32

Motor option: With lock

[mm]

Model	L	A	B	n	D	E
LEFS32□-300	587.5	306	430	6	2	300
LEFS32□-300B	639.5					
LEFS32□-400	687.5	406	530	8	3	450
LEFS32□-400B	739.5					
LEFS32□-500	787.5	506	630	10	4	600
LEFS32□-500B	839.5					
LEFS32□-600	887.5	606	730	10	4	600
LEFS32□-600B	939.5					
LEFS32□-700	987.5	706	830	12	5	750
LEFS32□-700B	1039.5					
LEFS32□-800	1087.5	806	930	14	6	900
LEFS32□-800B	1139.5					

[mm]
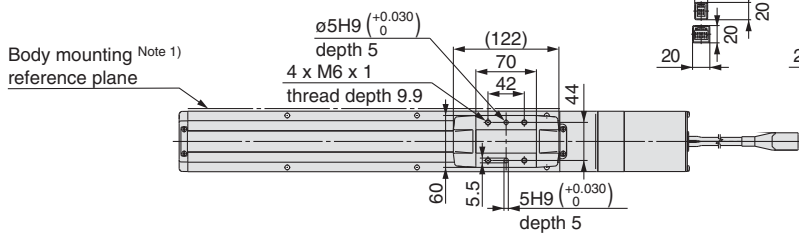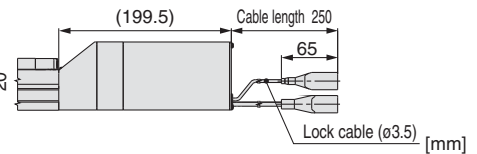
Model	L	A	B	n	D	E
LEFS32□-100	387.5	106	230	4	—	—
LEFS32□-100B	439.5					
LEFS32□-200	487.5	206	330	6	2	300
LEFS32□-200B	539.5					

LEFS40

Motor option: With lock

[mm]

Model	L	A	B	n	D	E
LEFS40□-500	861.5	506	678	10	4	600
LEFS40□-500B	910.5					
LEFS40□-600	961.5	606	778	10	4	600
LEFS40□-600B	1010.5					
LEFS40□-700	1061.5	706	878	12	5	750
LEFS40□-700B	1110.5					
LEFS40□-800	1161.5	806	978	14	6	900
LEFS40□-800B	1210.5					
LEFS40□-900	1261.5	906	1078	14	6	900
LEFS40□-900B	1310.5					
LEFS40□-1000	1361.5	1006	1178	16	7	1050
LEFS40□-1000B	1410.5					

[mm]

Model	L	A	B	n	D	E
LEFS40□-200	561.5	206	378	6	2	300
LEFS40□-200B	610.5					
LEFS40□-300	661.5	306	478	6	2	300
LEFS40□-300B	710.5					
LEFS40□-400	761.5	406	578	8	3	450
LEFS40□-400B	810.5					

SMC

Model Selection

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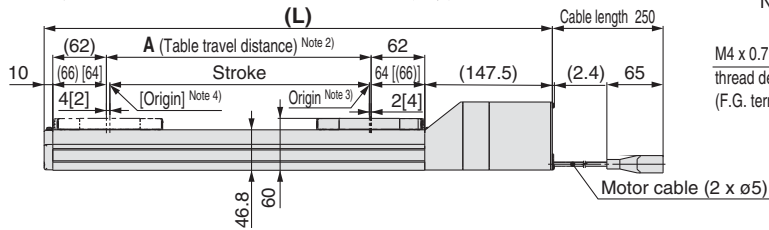
LEFS

LEFB

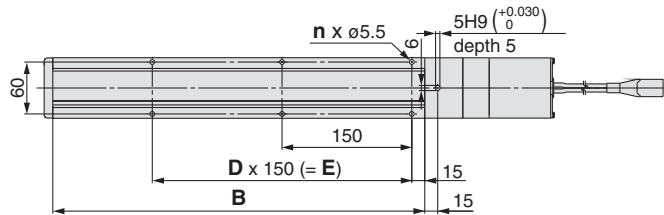LECA6 / LECP6

LECP1

AC Servo Motor
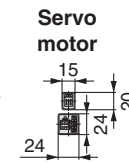
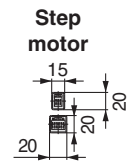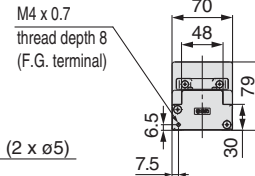LEFS□S

LECSA / LECSB

Specific Product Precautions

Electric Actuator/Slider Type
Belt Drive
Series LEFB
LEFB16, 25, 32

CE RoHS

How to Order

LEFB **16** [] **T** – **500** [] – **R 1 6P 1** []

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Size

16
25
32
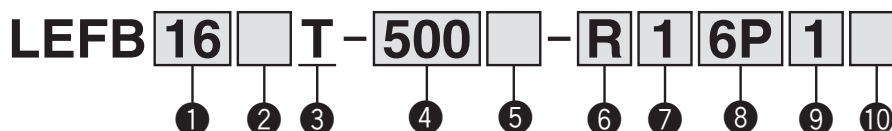
❷ Motor type

Symbol	Type	Applicable size			Compatible controller
		LEFB16	**LEFB25**	**LEFB32**	
—	Step motor (Servo/24 VDC)	●	●	●	LECP6 LECP1
A	Servo motor [Note] (24 VDC)	●	●	—	LECA6

❸ Equivalent lead [mm]

T	48

⚠ Caution

Note) 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 33 for the noise filter set. Refer to the LECA Operation Manual for installation.

❹ Stroke [mm]

300	300
~	~
2000	2000

∗ Refer to the applicable stroke table.

Applicable stroke table

●Standard/○Produced upon receipt of order

Model \ Stroke	300	500	600	700	800	900	1000	1200	1500	1800	2000
LEFB16	○	●	○	○	●	○	●	—	—	—	—
LEFB25	○	●	○	○	●	○	●	○	○	○	○
LEFB32	○	●	○	○	●	○	●	○	○	○	○

∗ Strokes other than those above are available as a special order.

∗ Belt drive actuator cannot be used for vertically mounted applications.

The actuator and controller are sold as a package. (Controller → Pages 25 and 37)

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

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

LEFB16T–500

NPN

① ②

∗ Refer to the operation manual for using the products. Please download it via our website. http://www.smcworld.com

SMC

Electric Actuator/Slider Type
Belt Drive *Series LEFB*

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor **LEFS□S**

LECSA / LECSB

Specific Product Precautions

❺ Motor option

—	Without lock
B	With lock

❻ Actuator cable type[*1]

—	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."

❼ Actuator cable length [m]

—	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 17 and 18.

❽ Controller type[*1]

—	Without controller	
6N	LECP6/LECA6	NPN
6P	(Step data input type)	PNP
1N	LECP1[*2]	NPN
1P	(Programless type)	PNP

*1 For details of controllers and compatible motors, refer to the compatible controllers below.
*2 Only available for the motor type "Step motor."

❾ I/O cable length [m]

—	Without cable
1	1.5*
3	3*
5	5*

*If "Without controller" is selected for controller types, I/O cable is not included. Refer to page 33 (LECP6/LECA6) or page 43 (LECP1) if I/O cable is required.

❿ Controller mounting

—	Screw mounting
D	DIN rail mounting*

*1 Only available for the controller types "6N" and "6P."
*2 DIN rail is not included. Order it separately.

Compatible controllers

Type	Step data input type	Step data input type	Programless type
Series	**LECP6**	**LECA6**	**LECP1**
Feature(s)	Value input Standard controller		Capable of seting up operation without using a PC or teaching box
Compatible motor	Step motor (Servo/24 VDC)	Servo motor (24 VDC)	Step motor (Servo/24 VDC)
Maximum number of step data	64 points		14 points
Power supply voltage	24 VDC		
Reference page	Page 25	Page 25	Page 37

SMC

16

Series *LEFB*

Specifications

Step Motor (Servo/24 VDC)

	Model	LEFB16	LEFB25	LEFB32
Actuator specifications	**Stroke [mm]** [Note 1]	(300), 500, (600, 700) 800, (900), 1000	(300), 500, (600, 700), 800, (900) 1000, (1200, 1500, 1800, 2000)	(300), 500, (600, 700), 800, (900) 1000, (1200, 1500, 1800, 2000)
	Work load [kg] [Note 2] Horizontal	1	5	14
	Speed [mm/s] [Note 2]	48 to 1100	48 to 1400	48 to 1500
	Max. acceleration/deceleration [mm/s²]	3000		
	Positioning repeatability [mm]	±0.1		
	Equivalent lead [mm]	48	48	48
	Impact/Vibration resistance [m/s²] [Note 3]	50/20		
	Actuation type	Belt		
	Guide type	Linear guide		
	Operating temp. range [°C]	5 to 40		
	Operating humidity range [%RH]	90 or less (No condensation)		
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] [Note 4]	24	32	52
	Standby power consumption when operating [W] [Note 5]	18	16	44
	Momentary max. power consumption [W] [Note 6]	51	60	127
	Controller weight [kg]	0.15 (Screw mounting), 0.17 (DIN rail mounting)		
Lock unit specifications	**Type** [Note 7]	Non-magnetizing operation type		
	Holding force [N]	4	19	36
	Power consumption [W] [Note 8]	2.9	5	5
	Rated voltage [V]	24 VDC ±10%		

Note 1) Strokes shown in ( ) are produced upon receipt of order.
Note 2) Speed is dependent on the work load. 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) Power consumption (including the controller) is for when the actuator is operating.
Note 5) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation.
Note 6) Momentary max. 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.

⚡SMC

Specifications

Servo Motor (24 VDC)

	Model	LEFB16A	LEFB25A
Actuator specifications	Stroke [mm] Note 1)	(300), 500, (600, 700) 800, (900), 1000	(300), 500, (600, 700), 800, (900) 1000, (1200, 1500, 1800, 2000)
	Work load [kg] Note 2) Horizontal	1	2
	Speed [mm/s] Note 2)	48 to 2000	48 to 2000
	Max. acceleration/deceleration [mm/s²]	3000	
	Positioning repeatability [mm]	±0.1	
	Equivalent lead [mm]	48	48
	Impact/Vibration resistance [m/s²] Note 3)	50/20	
	Actuation type	Belt	
	Guide type	Linear guide	
	Operating temp. range [°C]	5 to 40	
	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)	78	69
	Standby power consumption when operating [W] Note 5)	Horizontal 4	Horizontal 5
	Momentary max. power consumption [W] Note 6)	87	120
	Controller weight [kg]	0.15 (Screw mounting), 0.17 (DIN rail mounting)	
Lock unit specifications	Type Note 7)	Non-magnetizing operation type	
	Holding force [N]	4	19
	Power consumption [W] Note 8)	2.9	5
	Rated voltage [V]	24 VDC ±10%	

Note 1) Strokes shown in ( ) are produced upon receipt of order.
Note 2) 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) Power consumption (including the controller) is for when the actuator is operating.
Note 5) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation.
Note 6) Momentary max. 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	LEFB16						
Stroke [mm]	(300)	500	(600)	(700)	800	(900)	1000
Product weight [kg]	1.19	1.45	1.58	1.71	1.84	1.97	2.10
Additional weight with lock [kg]	0.12						

Model	LEFB25										
Stroke [mm]	(300)	500	(600)	(700)	800	(900)	1000	(1200)	(1500)	(1800)	(2000)
Product weight [kg]	2.39	2.85	3.08	3.31	3.54	3.77	4.00	4.46	5.15	5.84	6.30
Additional weight with lock [kg]	0.26										

Model	LEFB32										
Stroke [mm]	(300)	500	(600)	(700)	800	(900)	1000	(1200)	(1500)	(1800)	(2000)
Product weight [kg]	4.12	4.80	5.14	5.48	5.82	6.16	6.50	7.18	8.20	9.22	9.90
Additional weight with lock [kg]	0.53										

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor LEFS□S

LECSA / LECSB

Specific Product Precautions

Construction

Series LEFB
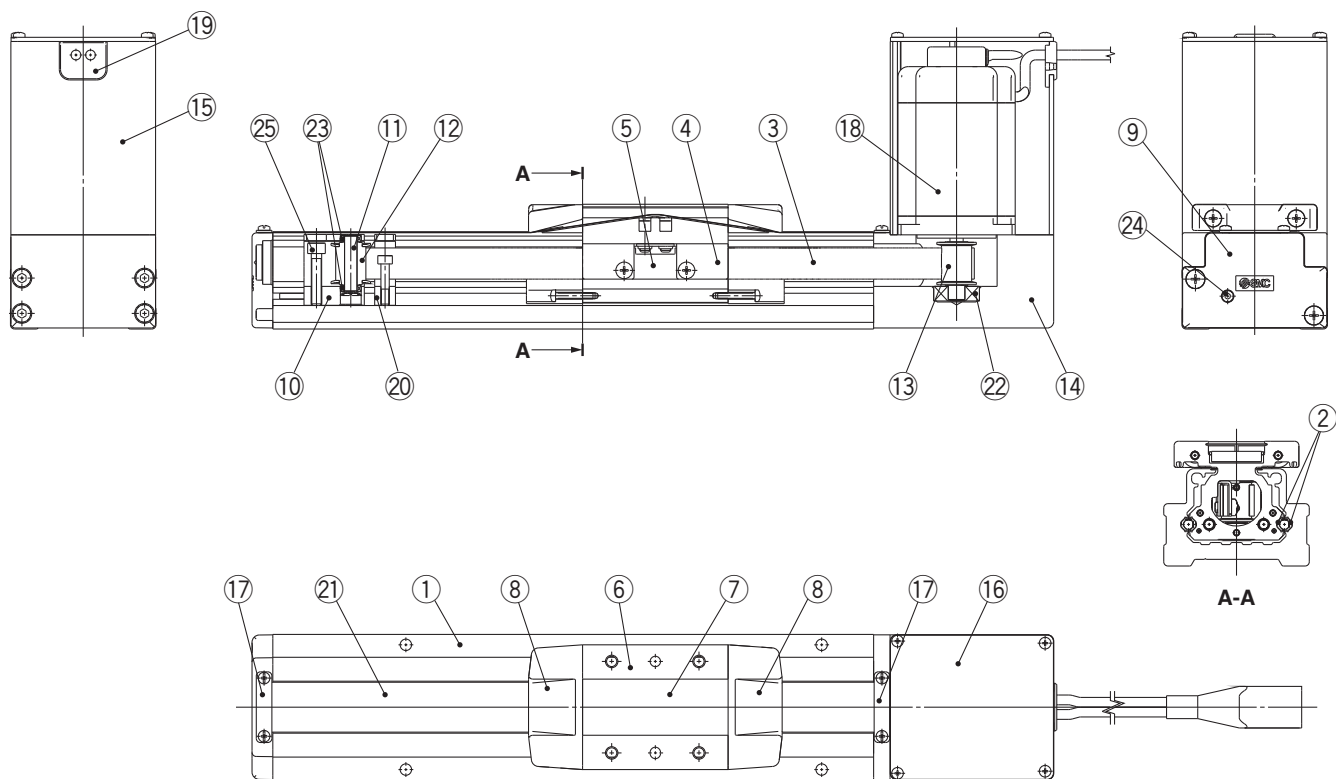
No.	Description	Material	Note
1	**Body**	Aluminium alloy	Anodised
2	**Rail guide**	—	
3	**Belt**	—	
4	**Belt holder**	Carbon steel	Chromated
5	**Belt stopper**	Aluminium alloy	Anodised
6	**Table**	Aluminium alloy	Anodised
7	**Blanking plate**	Aluminium alloy	Anodised
8	**Seal band stopper**	Synthetic resin	
9	**Housing A**	Aluminium die-casted	Coating
10	**Pulley holder**	Aluminium alloy	
11	**Pulley shaft**	Stainless steel	
12	**End pulley**	Aluminium alloy	Anodised
13	**Motor pulley**	Aluminium alloy	Anodised
14	**Motor mount**	Aluminium alloy	Coating
15	**Motor cover**	Aluminium alloy	Anodised
16	**End cover**	Aluminium alloy	Anodised
17	**Band stopper**	Stainless steel	
18	**Motor**	—	
19	**Rubber bushing**	NBR	
20	**Stopper**	Aluminium alloy	
21	**Dust seal band**	Stainless steel	
22	**Bearing**	—	
23	**Bearing**	—	
24	**Tension adjustment bolt**	Chromium molybdenum steel	Nickel plated
25	**Pulley fixing bolt**	Chromium molybdenum steel	Nickel plated

SMC

Dimensions: Belt Drive

LEFB16

Note 1) When mounting the electric actuator using the body mounting reference plane, set the height of the opposite surface or pin to 2 mm or more because of R 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 work pieces 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.

[mm]

Model	L	A	B	n	D	E
LEFB16□T-300□	495.5	306	435	6	2	300
LEFB16□T-500□	695.5	506	635	10	4	600
LEFB16□T-600□	795.5	606	735	10	4	600
LEFB16□T-700□	895.5	706	835	12	5	750
LEFB16□T-800□	995.5	806	935	14	6	900
LEFB16□T-900□	1095.5	906	1035	14	6	900
LEFB16□T-1000□	1195.5	1006	1135	16	7	1050

LEFB25

Note 1) When mounting the electric actuator using the body mounting reference plane, set the height of the opposite surface or pin to 3 mm or more because of R 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 work pieces 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.

[mm]

Model	H
LEFB25T-ST	115.8
LEFB25T-ST B	158.8
LEFB25AT-ST	98.8
LEFB25AT-ST B	139.8

Model	L	A	B	n	D	E
LEFB25□T-300□	541.8	306	467	6	2	340
LEFB25□T-500□	741.8	506	667	8	3	510
LEFB25□T-600□	841.8	606	767	10	4	680
LEFB25□T-700□	941.8	706	867	10	4	680
LEFB25□T-800□	1041.8	806	967	12	5	850
LEFB25□T-900□	1141.8	906	1067	14	6	1020
LEFB25□T-1000□	1241.8	1006	1167	14	6	1020
LEFB25□T-1200□	1441.8	1206	1367	16	7	1190
LEFB25□T-1500□	1741.8	1506	1667	20	9	1530
LEFB25□T-1800□	2041.8	1806	1967	24	11	1870
LEFB25□T-2000□	2241.8	2006	2167	26	12	2040

Model Selection

LEFS

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

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor   LEFS□S

LECSA / LECSB

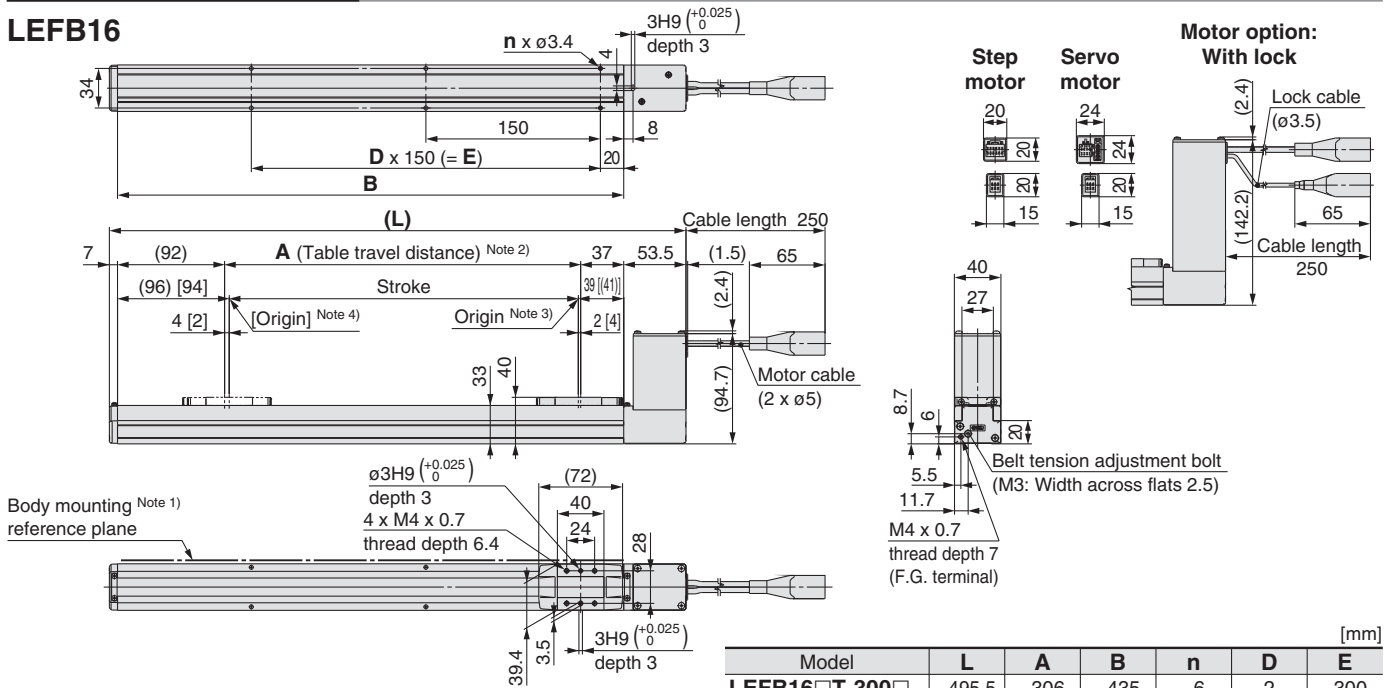Specific Product Precautions

Dimensions: Belt Drive

LEFB32

Motor option: With lock

Step motor / Servo motor

Body mounting Note 1) reference plane

ø5H9 ($^{+0.030}_{0}$) depth 5
4 x M6 x 1 thread depth 8.5

Belt tension adjustment bolt (M3: Width across flats 2.5)
M4 x 0.7 thread depth 8 (F.G. terminal)

5H9 ($^{+0.030}_{0}$) depth 5
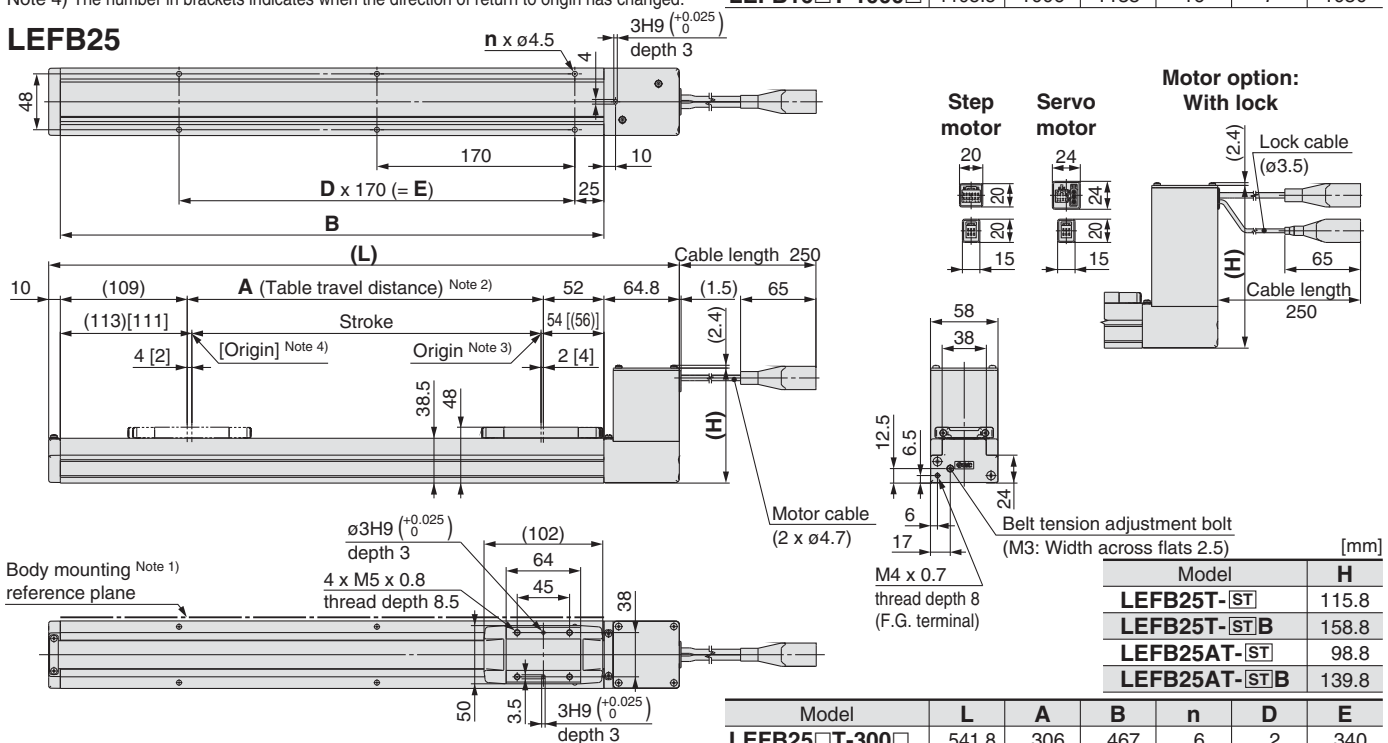
Note 1) When mounting the electric actuator using the body mounting reference plane, set the height of the opposite surface or pin to 3 mm or more because of R chamfering. (Recommended height: 5 mm)
Note 2) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere with the work pieces 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.

[mm]

Model	L	A	B	n	D	E
LEFB32□T-300□	585.6	306	489	6	2	400
LEFB32□T-500□	785.6	506	689	8	3	600
LEFB32□T-600□	885.6	606	789	8	3	600
LEFB32□T-700□	985.6	706	889	10	4	800
LEFB32□T-800□	1085.6	806	989	10	4	800
LEFB32□T-900□	1185.6	906	1089	12	5	1000
LEFB32□T-1000□	1285.6	1006	1189	12	5	1000
LEFB32□T-1200□	1485.6	1206	1389	14	6	1200
LEFB32□T-1500□	1785.6	1506	1689	18	8	1600
LEFB32□T-1800□	2085.6	1806	1989	20	9	1800
LEFB32□T-2000□	2285.6	2006	2189	22	10	2000

SMC

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor
LEFS□S
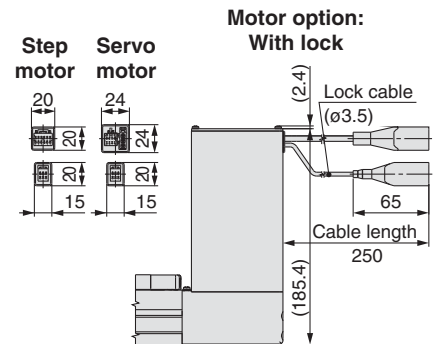
LECSA / LECSB

Specific Product Precautions

Series *LEF*
Electric Actuator/
Specific Product Precautions 1

Be sure to read before handling. Refer to back cover for Safety Instructions and the Operation Manual for Electric Actuator Precautions.
Please download it via our website. http://www.smcworld.com

Design

⚠Caution

1. Do not apply a load in excess of the operating limit.

A product should be selected based on the maximum load and allowable moment. If the product is used outside of the operating limit, eccentric load applied to the guide will become excessive and have adverse effects such as creating play at the guide, degraded accuracy and shortened product life.

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

This can cause failure.

Handling

## ⚠Caution

1. Please set the position determination width in the step data to at least 0.5 (at least 1 for the belt type).

If in position is 0.5 or less, completion signal of in position may not be output.

2. INP output signal

1) Positioning operation
When the product comes within the set range by step data [In position], the INP output signal will be turned on.
Initial value: Set to [0.50] or higher.

Handling

⚠Caution

3. Never hit at the stroke end other than returning to the original position.

The internal stopper can be broken.
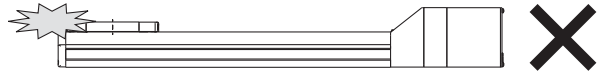
Handle the actuator with care especially when it is used in the vertical direction.

4. The positioning force should be the initial value.

If the positioning force is set below the initial value, it may cause an alarm.

5. Actual speed of the product can be changed by load.

When selecting a product, check the catalogue for the instructions regarding selection and specifications.

6. Do not apply a load, impact or resistance in addition to a transferred load during returning to the original position.

Otherwise, the original position can be displaced since it is based on detected motor torque.

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

It may cause a loss of parallelism in the mounting surfaces, looseness in the guide unit, an increase in sliding resistance or other problems.

8. When attaching a workpiece, do not apply strong impact or large moment.

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

9. Keep the flatness of mounting surface 0.1 mm or less.

Insufficient flatness of a workpiece or base mounted on the body of the product can cause play at the guide and increased sliding resistance.

10. When mounting the product, keep the 40 mm or more for bending the cable.

11. Do not hit the table with the workpiece in the positioning operation and positioning range.

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Handling

⚠Caution

12. When mounting the product, use screws with adequate length and tighten them with adequate torque.
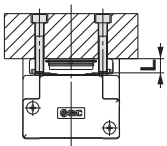
Tightening the screws with a higher torque than recommended may malfunction, whilst the tightening with a lower torque can cause the displacement of the mounting position or in extreme conditions the actuator could become detached from its mounting position.

Body fixed
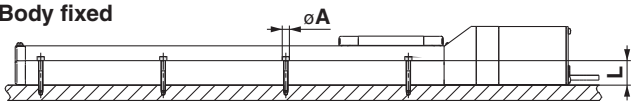
Model	Bolt	øA [mm]	L [mm]
LEF□16	M3	3.5	20
LEF□25	M4	4.5	24
LEF□32	M5	5.5	30
LEFS40	M6	6.6	31

Workpiece fixed

Model	Bolt	Max. tightening torque [N·m]	L (Max. screw-in depth mm)
LEF□16	M4 x 0.7	1.5	6
LEF□25	M5 x 0.8	3.0	8
LEF□32	M6 x 1	5.2	9
LEFS40	M8 x 1.25	12.5	14

To prevent the workpiece fixing bolts from touching the body, use bolts that are 0.5 mm or shorter than the maximum screw-in depth. If long bolts are used, they can touch the body and cause malfunction, etc.

13. Do not operate by fixing the table and moving the actuator body.

14. Belt drive actuator cannot be used for vertically mounted applications.

15. Check the specifications for the minimum speed of each actuator.

Otherwise, unexpected malfunctions, such as knocking, may occur.

16. In the case of the belt driven actuator, vibration may occur during operation at speeds within the actuator specification, this could be caused by the operating conditions. Change the speed setting to a speed that does not cause vibration.

Maintenance

⚠Warning

Maintenance frequency

Perform maintenance according to the table below.

Frequency	Appearance check	Internal check	Check belt
Inspection before daily operation	○	—	—
Inspection every 6 months/1000 km/ 5 million cycles*	○	○	○

∗ Select whichever comes sooner.

- **Items for visual appearance check**
  1. Loose set screws, Abnormal dirt
  2. Check of flaw and cable joint
  3. Vibration, Noise

- **Items for internal check**
  1. Lubricant condition on moving parts.
  2. Loose or mechanical play in fixed parts or fixing screws.

- **Items for belt check**

  Stop operation immediately and replace the belt when belt appear to be below. Further, ensure your operating environment and conditions satisfy the requirements specified for the product.

  a. Tooth shape canvas is worn out.
  Canvas fiber becomes fuzzy. Rubber is removed and the fiber becomes whitish. Lines of fibers become unclear.

  b. Peeling off or wearing of the side of the belt
  Belt corner becomes round and frayed thread sticks out.

  c. Belt partially cut
  Belt is partially cut. Foreign matter caught in teeth other than cut part causes flaw.

  d. Vertical line of belt teeth
  Flaw which is made when the belt runs on the flange.

  e. Rubber back of the belt is softened and sticky.

  f. Crack on the back of the belt

SMC

Controller

Step Motor
(Servo/24 VDC)

Series **LECP6**

Servo Motor
(24 VDC)

Series **LECA6**

Step Motor
(Servo/24 VDC)

Series **LECP1**

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor

LEFS□S

LECSA / LECSB

Specific Product Precautions

Controller (Step Data Input Type)
Step Motor (Servo/24 VDC)
Series *LECP6*
Servo Motor (24 VDC)
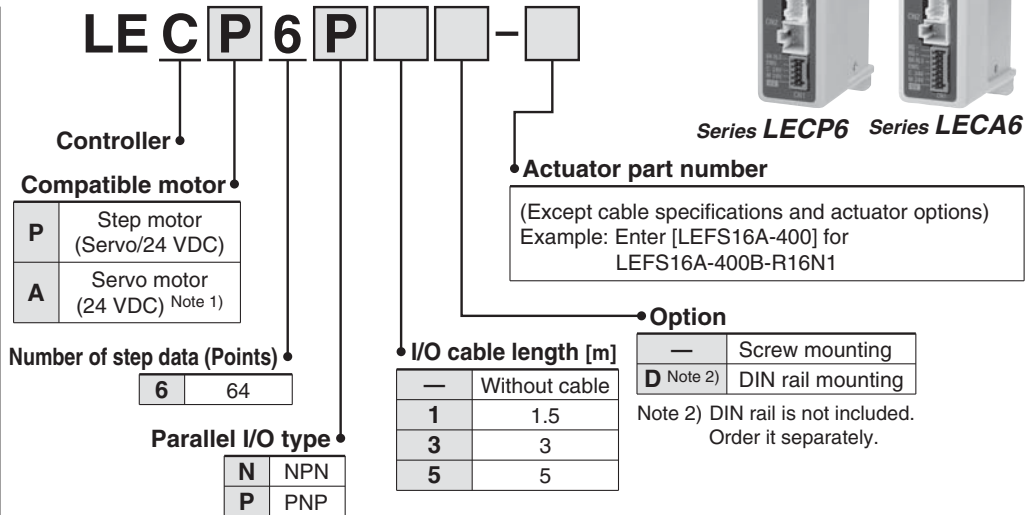# *Series* *LECA6*

CE RoHS

Series LECP6   *Series LECA6*

How to Order

⚠ Caution

Note 1) 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 LECA6 series (servo motor controller), EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 33 for the noise filter set. Refer to the LECA Operation Manual for installation.
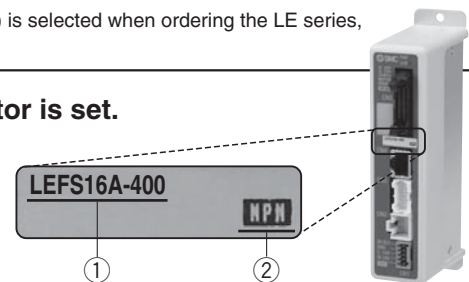
LE C P 6 P □□ – □

Controller

Compatible motor

P	Step motor (Servo/24 VDC)
A	Servo motor (24 VDC) Note 1)

Number of step data (Points)

6	64

Parallel I/O type

N	NPN
P	PNP

I/O cable length [m]

—	Without cable
1	1.5
3	3
5	5

Actuator part number

(Except cable specifications and actuator options)
Example: Enter [LEFS16A-400] for LEFS16A-400B-R16N1

Option

—	Screw mounting
D Note 2)	DIN rail mounting

Note 2) DIN rail is not included. Order it separately.

∗ When controller equipped type (-□6N□/-□6P□) is selected when ordering the LE series, you do not need to order this controller.

The controller is sold as single unit after the compatible actuator is set.

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

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

LEFS16A-400

① ②

∗ Refer to the operation manual for using the products. Please download it via our website. http://www.smcworld.com

Specifications

Basic Specifications

| Item	LECP6	LECA6
Compatible motor	Step motor (Servo/24 VDC)	Servo motor (24 VDC)
Power supply Note 1)	Power voltage: 24 VDC 10% Current consumption: 3 A (Peak 5 A) Note 2) [Including motor drive power, control power, stop, lock release]	Power voltage: 24 VDC 10% Current consumption: 3 A (Peak 10 A) Note 2) [Including motor drive power, control power, stop, lock release]
Parallel input	11 inputs (Photo-coupler isolation)	
Parallel output	13 outputs (Photo-coupler isolation)	
Compatible encoder	Incremental A/B phase (800 pulse/rotation)	Incremental A/B/Z phase (800 pulse/rotation)
Serial communication	RS485 (Modbus protocol compliant)	
Memory	EEPROM	
LED indicator	LED (Green/Red) one of each	
Lock control	Forced-lock release terminal Note 3)	
Cable length [m]	I/O cable: 5 or less Actuator cable: 20 or less	
Cooling system	Natural air cooling	
Operating temperature range [°C]	0 to 40 (No freezing)	
Operating humidity range [%RH]	90 or less (No condensation)	
Storage temperature range [°C]	−10 to 60 (No freezing)	
Storage humidity range [%RH]	90 or less (No condensation)	
Insulation resistance [M]	Between the housing (radiation fin) and SG terminal 50 (500 VDC)	
Weight [g]	150 (Screw mounting) 170 (DIN rail mounting)	

Note 1) Do not use the power supply of "inrush current prevention type" for the controller power supply.
Note 2) The power consumption changes depending on the actuator model. Refer to the specifications of actuator for more details.
Note 3) Applicable to non-magnetizing lock.

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How to Mount

a) Screw mounting (LEC□6□□-□)
(Installation with two M4 screws)

Ground wire

Mounting direction

Mounting direction
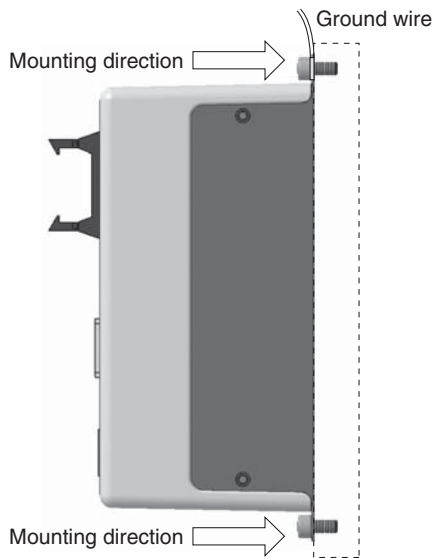
b) DIN rail mounting (LEC□6□□D-□)
(Installation with the DIN rail)

DIN rail is locked.

Ground wire

Ground wire

DIN rail

A

DIN rail mounting adapter
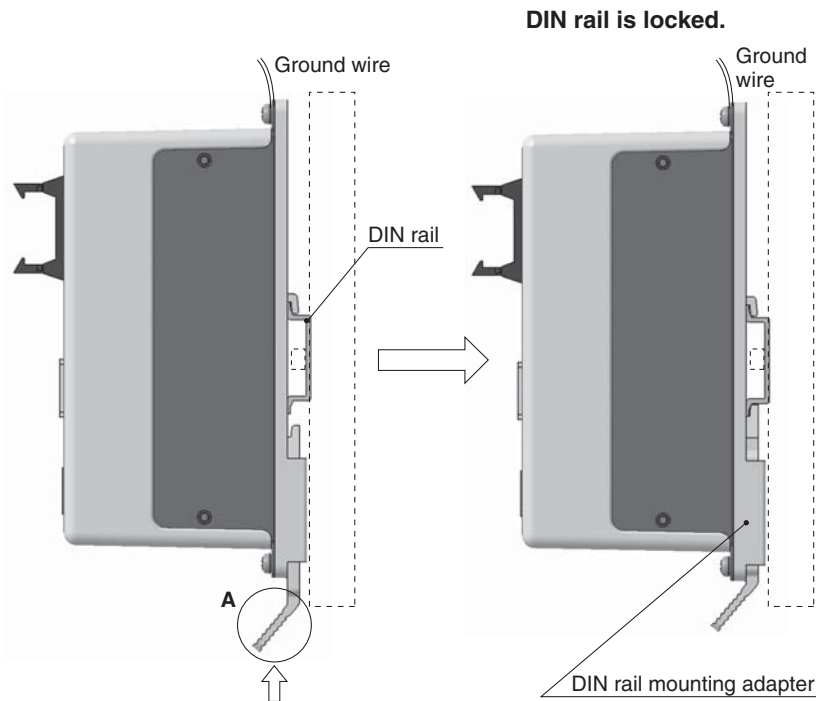
Hook the controller on the DIN rail and press the lever of section **A** in the arrow direction to lock it.

DIN rail
AXT100-DR-□

∗ For □, enter a number from the "No." line in the table below.
Refer to the dimensions on page 27 for the mounting dimensions.

L

12.5 (Pitch)   5.25   7.5

(35) (25)

5.5

1.25
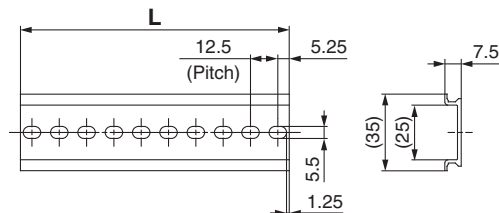
L Dimension [mm]

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L	23	35.5	48	60.5	73	85.5	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5

No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
L	273	285.5	298	310.5	323	335.5	348	360.5	373	385.5	398	410.5	423	435.5	448	460.5	473	485.5	498	510.5

DIN rail mounting adapter
LEC-D0 (with 2 mounting screws)

This should be used when the DIN rail mounting adapter is mounted onto the screw mounting type controller afterwards.

Dimensions

a) Screw mounting (LEC□6□□-□)

(81.7)
66
1

Power supply LED (Green)
(ON: Power supply is ON.)

Power supply LED (Red)
(ON: Alarm is ON.)

CN5 parallel I/O connector

CN4 serial I/O connector

CN3 encoder connector

CN2 motor power connector

CN1 power supply connector

ø4.5
for body
mounting

35
31

150
132
141

4.6
for body
mounting

b) DIN rail mounting (LEC□6□□D-□)

(81.7)
(11.5)
66
1

64.2

35

(91.7)

Refer to page 26 for L dimension and
part number of DIN rail.

35
31

173.2 (When removing DIN rail)
167.3 (When locking DIN rail)
150
132

SMC

Wiring Example 1

Power Supply Connector: CN1 * Power supply plug is an accessory.

Power supply plug for LECP6

CN1 Power Supply Connector Terminal for LECP6 (PHOENIX CONTACT FK-MC0.5/5-ST-2.5)

Terminal name	Function	Function details
0V	Common supply (−)	M24V terminal/C24V terminal/EMG terminal/BK RLS terminal are common (−).
M24V	Motor power supply (+)	This is the motor power supply (+) that is supplied to the controller.
C24V	Control power supply (+)	This is the control power supply (+) that is supplied to the controller.
EMG	Stop (+)	This is the input (+) that releases the stop.
BK RLS	Lock release (+)	This is the input (+) that releases the lock.

0V M24V C24V EMG BK RLS

Power supply plug for LECA6

CN1 Power Supply Connector Terminal for LECA6 (PHOENIX CONTACT FK-MC0.5/7-ST-2.5)

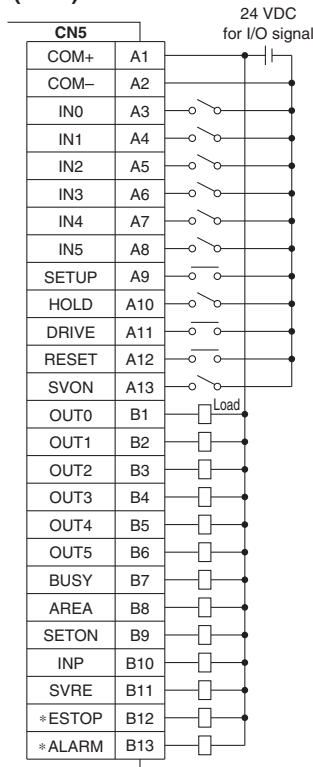| Terminal name	Function	Function details
0V	Common supply (−)	M24V terminal/C24V terminal/EMG terminal/BK RLS terminal are common (−).
M24V	Motor power supply (+)	This is the motor power supply (+) that is supplied to the controller.
C24V	Control power supply (+)	This is the control power supply (+) that is supplied to the controller.
EMG	Stop (+)	This is the input (+) that releases the stop.
BK RLS	Lock release (+)	This is the input (+) that releases the lock.
RG+	Regenerative output 1	These are the regenerative output terminals for external connection. (It is not necessary to connect them in the combination with standard specification LE series.)
RG−	Regenerative output 2	

0V M24V C24V EMG BK RLS RG+ RG−
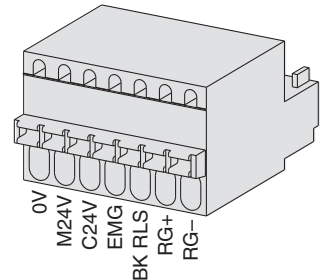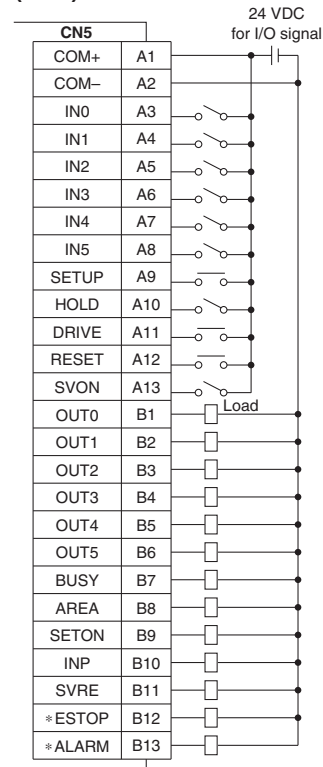
Wiring Example 2

Parallel I/O Connector: CN5

* When you connect a PLC, etc., to the CN5 parallel I/O connector, please use the I/O cable (LEC-CN5-□).
* The wiring should be changed depending on the type of the parallel I/O (NPN or PNP). Please wire referring to the following diagram.

Wiring diagram

LEC□6N□□-□ (NPN)

CN5		
COM+	A1	24 VDC for I/O signal
COM−	A2	
IN0	A3	
IN1	A4	
IN2	A5	
IN3	A6	
IN4	A7	
IN5	A8	
SETUP	A9	
HOLD	A10	
DRIVE	A11	
RESET	A12	
SVON	A13	
OUT0	B1	Load
OUT1	B2	
OUT2	B3	
OUT3	B4	
OUT4	B5	
OUT5	B6	
BUSY	B7	
AREA	B8	
SETON	B9	
INP	B10	
SVRE	B11	
*ESTOP	B12	
*ALARM	B13	

LEC□6P□□-□ (PNP)

CN5		
COM+	A1	24 VDC for I/O signal
COM−	A2	
IN0	A3	
IN1	A4	
IN2	A5	
IN3	A6	
IN4	A7	
IN5	A8	
SETUP	A9	
HOLD	A10	
DRIVE	A11	
RESET	A12	
SVON	A13	
OUT0	B1	Load
OUT1	B2	
OUT2	B3	
OUT3	B4	
OUT4	B5	
OUT5	B6	
BUSY	B7	
AREA	B8	
SETON	B9	
INP	B10	
SVRE	B11	
*ESTOP	B12	
*ALARM	B13	

Input Signal

Name	Contents
COM +	Connects the power supply 24 V for input/output signal
COM −	Connects the power supply 0 V for input/output signal
IN0 to IN5	Step data specified Bit No. (Input is instructed in the combination of IN0 to 5.)
SETUP	Instruction to return to the original position
HOLD	Operation is temporarily stopped
DRIVE	Instruction to drive
RESET	Alarm reset and operation interruption
SVON	Servo ON instruction

Output Signal

Name	Contents
OUT0 to OUT5	Outputs the step data No. during operation
BUSY	Outputs when the actuator is moving
AREA	Outputs within the step data area output setting range
SETON	Outputs when returning to the original position
INP	Outputs when target position or target force is reached (Turns on when the positioning or pushing is completed.)
SVRE	Outputs when servo is on
*ESTOP Note)	Not output when EMG stop is instructed
*ALARM Note)	Not output when alarm is generated

Note) These signals are output when the power supply of the controller is ON. (N.C.)

Model Selection | Servo Motor (24 VDC)/Step Motor (Servo/24 VDC) **LEFS** **LEFB** | **LECA6 / LECP6** | **LECP1** | AC Servo Motor **LEFS□S** | **LECSA / LECSB** | Specific Product Precautions

28

SMC

Step Data Setting

1. Step data setting for positioning

In this setting, the actuator moves toward and stops at the target position. The following diagram shows the setting items and operation. The setting items and set values for this operation are stated below.
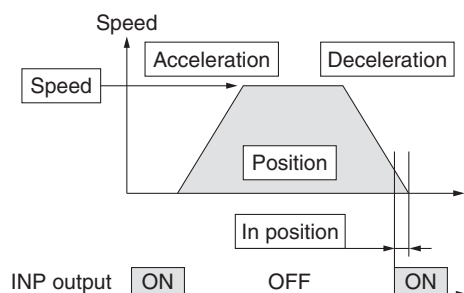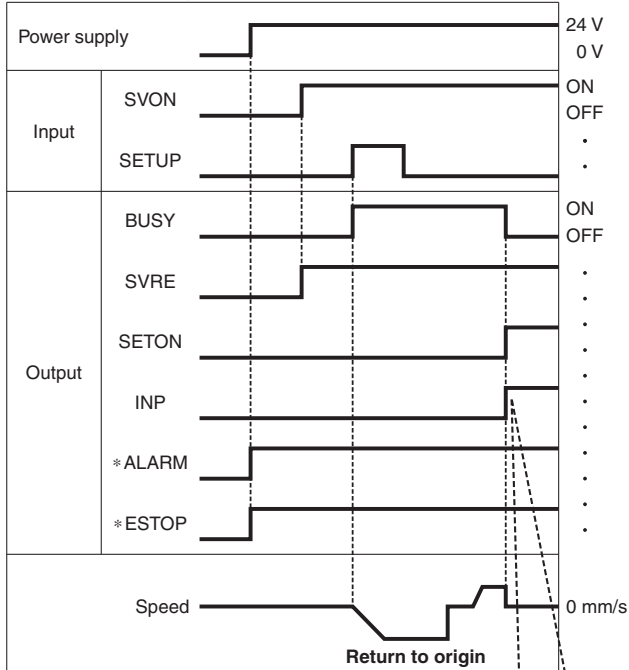

◎: Need to be set.
○: Need to be adjusted as required.
—: Setting is not required.

Step Data (Positioning)

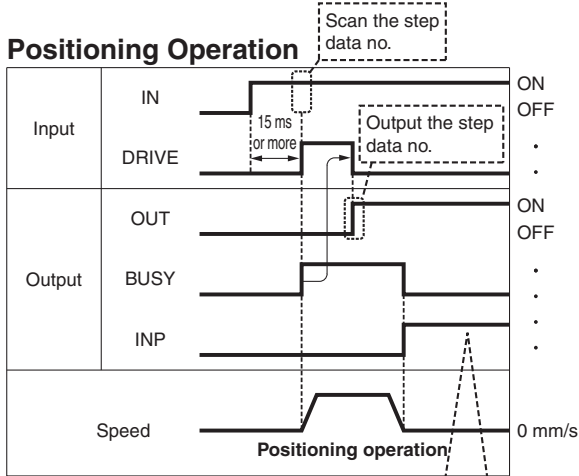| Necessity	Item	Description
◎	Movement MOD	When the absolute position is required, set Absolute. When the relative position is required, set Relative.
◎	Speed	Transfer speed to the target position
◎	Position	Target position
○	Acceleration	Parameter which defines how rapidly the actuator reaches the speed set. The higher the set value, the faster it reaches the speed set.
○	Deceleration	Parameter which defines how rapidly the actuator comes to stop. The higher the set value, the quicker it stops.
◎	Pushing force	Set 0. (If values 1 to 100 are set, the operation will be changed to the pushing operation.)
—	Trigger LV	Setting is not required.
—	Pushing speed	Setting is not required.
○	Positioning force	Max. torque during the positioning operation (No specific change is required.)
○	Area 1, Area 2	Condition that turns on the AREA output signal.
○	In position	Condition that turns on the INP output signal. When the actuator enters the range of [in position], the INP output signal turns on. (It is unnecessary to change this from the initial value.) When it is necessary to output the arrival signal before the operation is completed, make the value larger.

SMC

Signal Timing

Return to Origin

Power supply			24 V / 0 V
Input	SVON		ON / OFF
	SETUP		
Output	BUSY		ON / OFF
	SVRE		
	SETON		
	INP		
	*ALARM		
	*ESTOP		
	Speed	Return to origin	0 mm/s

If the actuator is within the "in position" range of the basic parameter, INP will be turned ON, but if not, it will remain OFF.

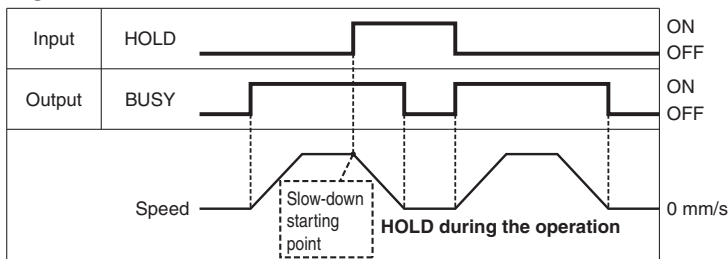* "*ALARM" and "*ESTOP" are expressed as negative-logic circuit.

Positioning Operation

Scan the step data no.

Input	IN		ON / OFF
	DRIVE	15 ms or more	
Output	OUT		ON / OFF
	BUSY		
	INP		
	Speed	Positioning operation	0 mm/s

Output the step data no.

If the actuator is within the "in position" range of the step data, INP will be turned ON, but if not, it will remain OFF.

* "OUT" is output when "DRIVE" is changed from ON to OFF.
 (When power supply is applied, "DRIVE" or "RESET" is turned ON or "*ESTOP" is turned OFF, all of the "OUT" outputs are turned OFF.)

HOLD

Input	HOLD		ON / OFF
Output	BUSY		ON / OFF
	Speed	Slow-down starting point / HOLD during the operation	0 mm/s

* When the actuator is in the positioning range in the pushing operation, it does not stop even if HOLD signal is input.

Reset

Alarm reset

Input	RESET		ON / OFF
Output	OUT		ON / OFF
	*ALARM		ON / OFF

Alarm out
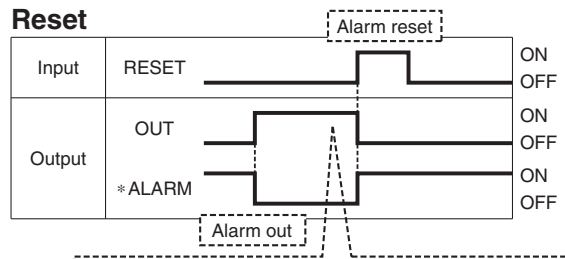
It is possible to identify the alarm group by the combination of OUT signals when the alarm is generated.

* "*ALARM" is expressed as negative-logic circuit.

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor

LEFS☐S

LECSA / LECSB

Specific Product Precautions

Options: Actuator Cable

[Robotic cable for step motor (Servo/24 VDC), standard cable]

LE−CP−**1**−☐

Cable length (L)[m]

1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

∗ Produced upon receipt of order
(Robotic cable only)

Cable type

—	Robotic cable (Flexible cable)
S	Standard cable

LE-CP-$\frac{1}{5}$$\frac{3}{}$/Cable length: 1.5 m, 3 m, 5 m

LE-CP-$\frac{8\,B}{A\,C}$/Cable length: 8 m, 10 m, 15 m, 20 m
(∗ Produced upon receipt of order)

Circuit	Connector A terminal no.		Cable colour	Connector C terminal no.
A	B-1		Brown	2
$\overline{A}$	A-1		Red	1
B	B-2		Orange	6
$\overline{B}$	A-2		Yellow	5
COM-A/COM	B-3		Green	3
COM-B/–	A-3		Blue	4
			Cable colour	**Connector D terminal no.**
Vcc	B-4		Brown	12
GND	A-4		Black	13
$\overline{A}$	B-5		Red	7
A	A-5		Black	6
$\overline{B}$	B-6		Orange	9
B	A-6		Black	8
			—	3

Shield

[Robotic cable with lock and sensor for step motor (Servo/24 VDC), standard cable]

LE−CP−**1**−B−☐

Cable length (L)[m]

1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

∗ Produced upon receipt of order
(Robotic cable only)

With lock and sensor

Cable type

—	Robotic cable (Flexible cable)
S	Standard cable

LE-CP-$\frac{1}{5}$$\frac{3}{}$/Cable length: 1.5 m, 3 m, 5 m

LE-CP-$\frac{8\,B}{A\,C}$/Cable length: 8 m, 10 m, 15 m, 20 m
(∗ Produced upon receipt of order)

Circuit	Connector A terminal no.		Cable colour	Connector C terminal no.
A	B-1		Brown	2
$\overline{A}$	A-1		Red	1
B	B-2		Orange	6
$\overline{B}$	A-2		Yellow	5
COM-A/COM	B-3		Green	3
COM-B/–	A-3		Blue	4
			Cable colour	**Connector D terminal no.**
Vcc	B-4		Brown	12
GND	A-4		Black	13
$\overline{A}$	B-5		Red	7
A	A-5		Black	6
$\overline{B}$	B-6		Orange	9
B	A-6		Black	8
			—	3

Shield

Circuit	Connector B terminal no.		Cable colour	Connector D terminal no.
Lock (+)	B-1		Red	4
Lock (–)	A-1		Black	5
Sensor (+) Note)	B-3		Brown	1
Sensor (–) Note)	A-3		Blue	2

Note) This is not used for the LEF series.

⊜SMC

[Robot cable for servo motor (24 VDC)]

LE－CA－ 1   LE-CA-□

Cable length (L)[m]

1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

∗ Produced upon receipt of order

Circuit	Connector A terminal no.		Cable colour	Connector C terminal no.
U	1		Red	1
V	2		White	2
W	3		Black	3

Circuit	Connector B terminal no.		Cable colour	Connector D terminal no.
Vcc	B-1		Brown	12
GND	A-1		Black	13
$\overline{A}$	B-2		Red	7
A	A-2		Black	6
$\overline{B}$	B-3		Orange	9
B	A-3		Black	8
$\overline{Z}$	B-4		Yellow	11
Z	A-4		Black	10
			—	3

Connection of shield material

[Robot cable with lock and sensor for servo motor (24 VDC)]

LE－CA－ 1 －B   LE-CA-□-B

Cable length (L)[m]

1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

∗ Produced upon receipt of order
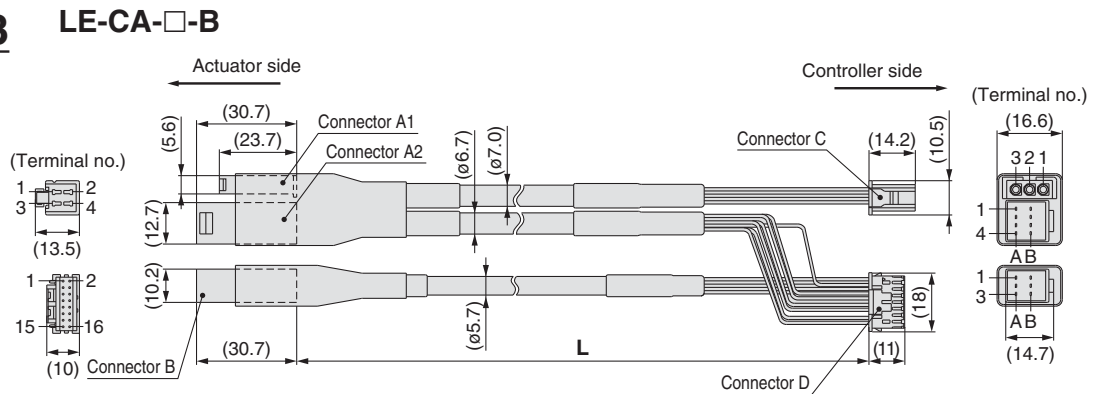
With lock and sensor

Circuit	Connector A1 terminal no.		Cable colour	Connector C terminal no.
U	1		Red	1
V	2		White	2
W	3		Black	3

Circuit	Connector A2 terminal no.		Cable colour	Connector D terminal no.
Vcc	B-1		Brown	12
GND	A-1		Black	13
$\overline{A}$	B-2		Red	7
A	A-2		Black	6
$\overline{B}$	B-3		Orange	9
B	A-3		Black	8
$\overline{Z}$	B-4		Yellow	11
Z	A-4		Black	10
			—	3

Connection of shield material

Circuit	Connector B terminal no.		Cable colour	
Lock (+)	B-1		Red	4
Lock (−)	A-1		Black	5
Sensor (+) Note)	B-3		Brown	1
Sensor (−) Note)	A-3		Black	2

Note) This is not used for the LEF series.

Series *LECP6*
Series *LECA6*

Option: I/O Cable

LEC−CN5−1

Cable length (L) [m]

1	1.5
3	3
5	5

∗ Conductor size: AWG28

Controller side → PLC side

(22.4) (14.4) (ø8.9) **L**

A1 ⋮ A13 B1 ⋮ B13

(Terminal no.) B1 A1 / B13 A13
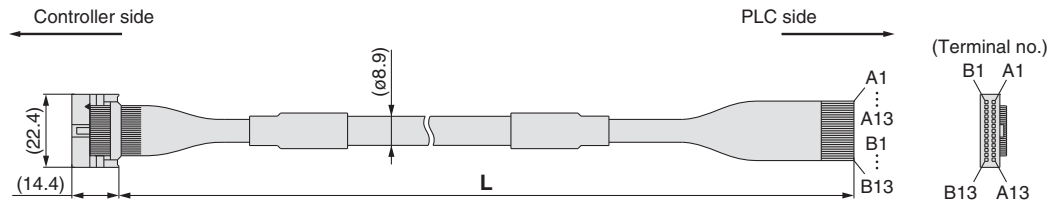
Connector pin No.	Insulation colour	Dot mark	Dot colour
A1	Light brown	■	Black
A2	Light brown	■	Red
A3	Yellow	■	Black
A4	Yellow	■	Red
A5	Light green	■	Black
A6	Light green	■	Red
A7	Grey	■	Black
A8	Grey	■	Red
A9	White	■	Black
A10	White	■	Red
A11	Light brown	■ ■	Black
A12	Light brown	■ ■	Red
A13	Yellow	■ ■	Black

Connector pin No.	Insulation colour	Dot mark	Dot colour
B1	Yellow	■ ■	Red
B2	Light green	■ ■	Black
B3	Light green	■ ■	Red
B4	Grey	■ ■	Black
B5	Grey	■ ■	Red
B6	White	■ ■	Black
B7	White	■ ■	Red
B8	Light brown	■ ■ ■	Black
B9	Light brown	■ ■ ■	Red
B10	Yellow	■ ■ ■	Black
B11	Yellow	■ ■ ■	Red
B12	Light green	■ ■ ■	Black
B13	Light green	■ ■ ■	Red
—	Shield		

Option: Noise Filter Set for Servo Motor (24 VDC)

LEC−NFA

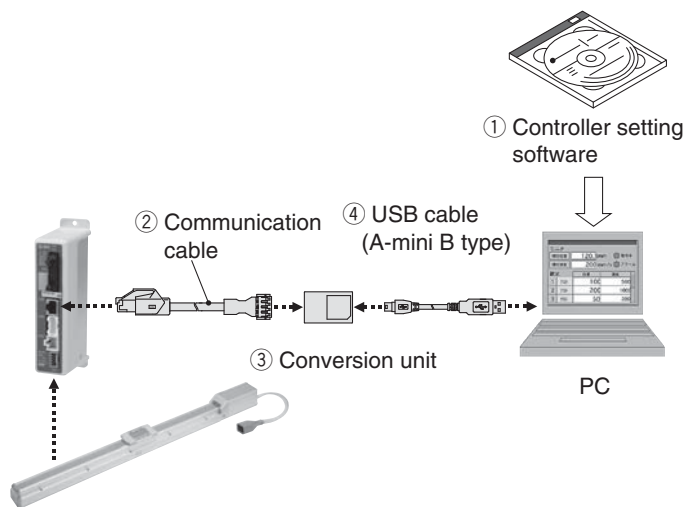Contents of the set: 2 noise filters (Produced by WURTH ELEKTRONIK: 74271222)

(28.8) (12.5) (33.5) (42.2)
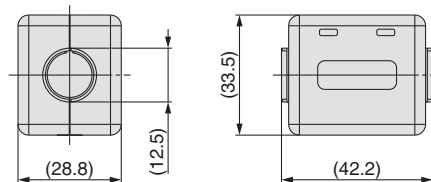
∗ Refer to the LECA6 series Operation Manual for installation.

33

SMC

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor LEFS☐S

LECSA / LECSB

Specific Product Precautions

Series *LEC*
Controller Setting Kit/LEC-W2

How to Order

① Controller setting software

② Communication cable

④ USB cable (A-mini B type)

③ Conversion unit

PC

LEC–W2

Controller setting kit
(Japanese and English are available.)

Contents

① **Controller setting software (CD-ROM)**
② **Communication cable (Cable between the controller and the conversion unit)**
③ **Conversion unit**
④ **USB cable (Cable between the PC and the conversion unit)**
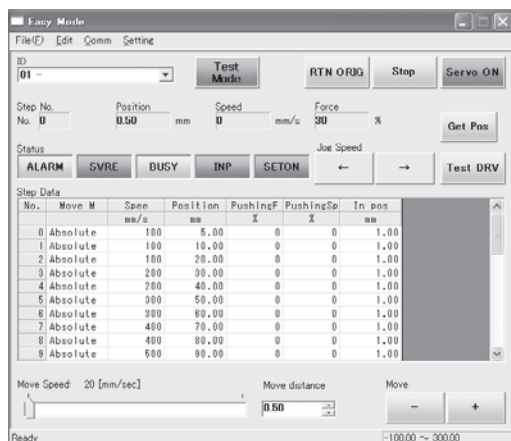
Hardware Requirements

PC/AT compatible machine installed with Windows XP and equipped with USB1.1 or USB2.0 ports.

∗ Windows® and Windows XP® are registered trademarks of Microsoft Corporation.
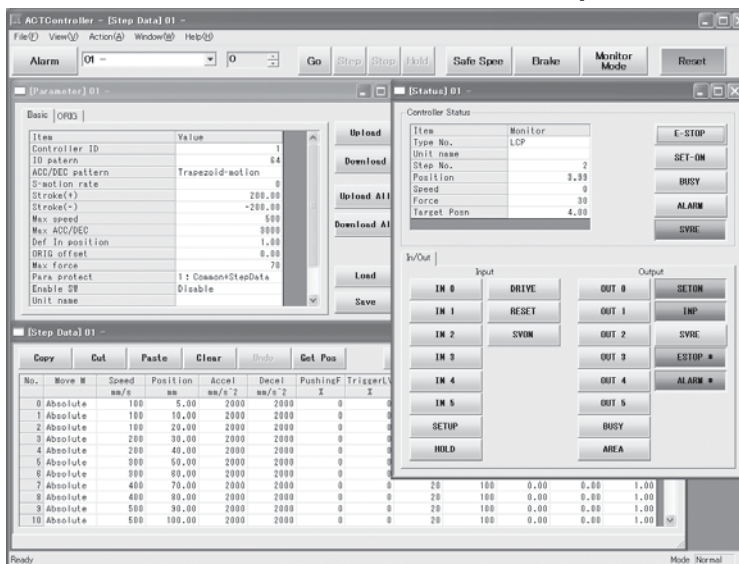
Screen Example

Easy mode screen example

Normal mode screen example

Easy operation and simple setting
● Allowing to set and display actuator step data such as position, speed, force, etc.
● Setting of step data and testing of the drive can be performed on the same page.
● Can be used to jog and move at a constant rate.

Detail setting
● Step data can be set in detail.
● Signals and terminal status can be monitored.
● Parameters can be set.
● JOG and constant rate movement, return to origin, test operation and testing of compulsory output can be performed.

SMC

34

Series *LEC*
Teaching Box/LEC-T1

CE RoHS

How to Order

Enable switch (Option)

Stop switch

LEC-T1-3 E G ☐

Teaching box

Cable length [m]

3	3

Initial language

J	Japanese
E	English

Enable switch

—	None
S	Equipped with enable switch

∗ Interlock switch for jog test function

Stop switch

G	Equipped with stop switch

Standard functions
- **Chinese character display**
- **Stop switch is provided.**

Option
- **Enable switch is provided.**

Specifications

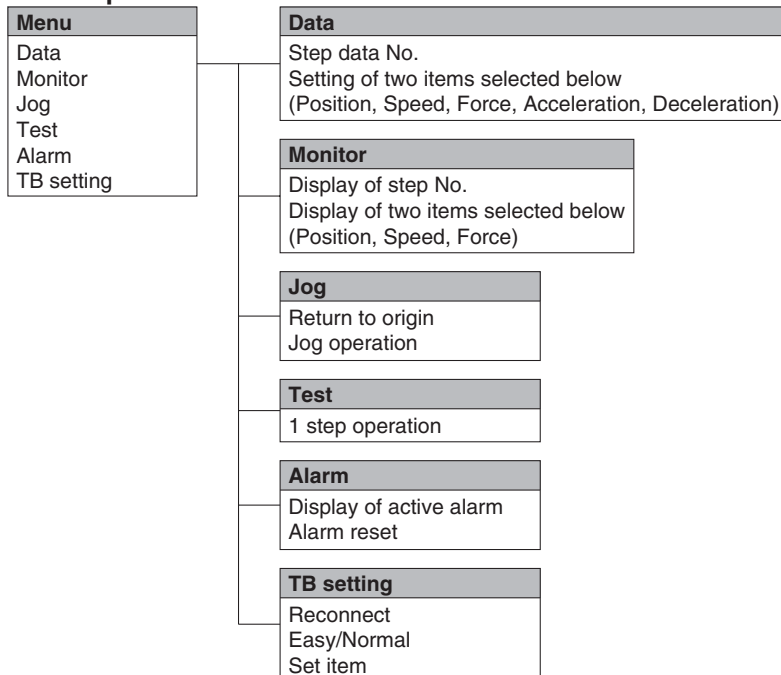| Item	Description
Switch	Stop switch, Enable switch (Option)
Cable length [m]	3
Enclosure	IP64 (Except connector)
Operating temperature range [°C]	5 to 50
Operating humidity range [%RH]	90 or less (No condensation)
Weight [g]	350 (Except cable)

Note) CE-compliance
The EMC compliance of the teaching box was tested with the LECP6 series step motor controller (servo/24 VDC) and an applicable actuator.

Easy Mode

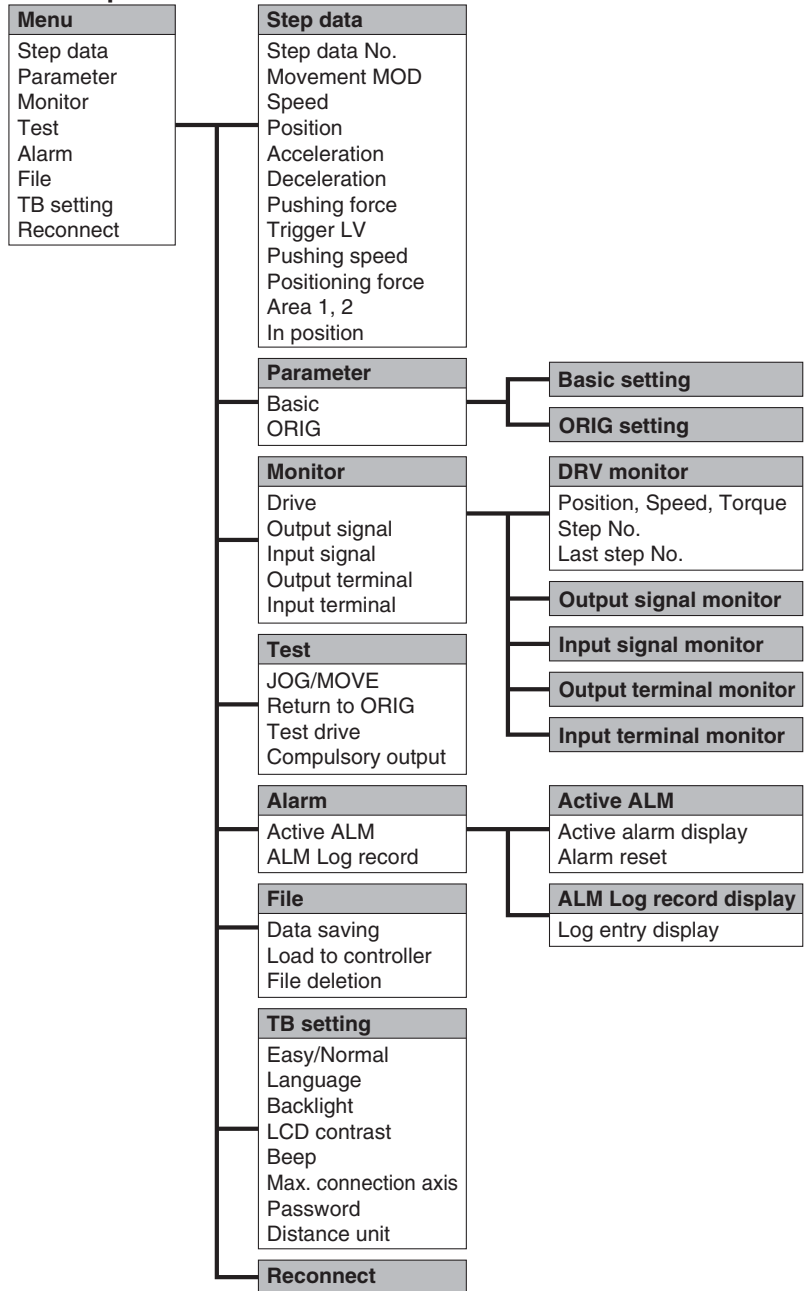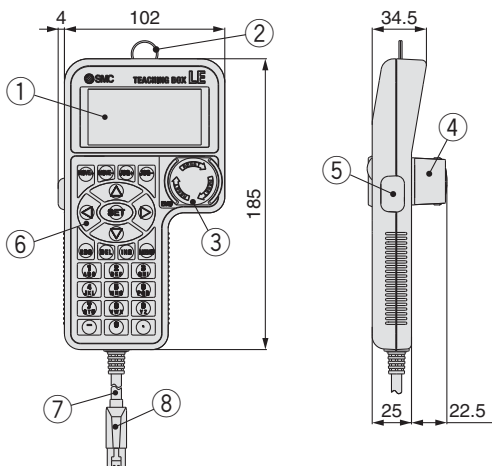| Function	Description
Step data	• Setting of step data
Jog	• Jog operation • Return to origin
Test	• 1 step operation • Return to origin
Monitor	• Display of axis and step data No. • Display of two items selected from Position, Speed, Force.
Alarm	• Display of active alarm • Alarm reset
TB setting	• Reconnection of axis • Setting of easy/normal mode • Setting step data and selection of items from easy mode monitor

Menu Operations Flowchart

Menu
Data Monitor Jog Test Alarm TB setting

Data
Step data No. Setting of two items selected below (Position, Speed, Force, Acceleration, Deceleration)

Monitor
Display of step No. Display of two items selected below (Position, Speed, Force)

Jog
Return to origin Jog operation

Test
1 step operation

Alarm
Display of active alarm Alarm reset

TB setting
Reconnect Easy/Normal Set item

SMC

Normal Mode

Function	Description
Step data	• Step data setting
Parameter	• Parameters setting
Test	• Jog operation/Constant rate movement • Return to origin • Test drive (Specify a maximum of 5 step data and operate.) • Compulsory output (Compulsory signal output, Compulsory terminal output)
Monitor	• Drive monitor • Output signal monitor • Input signal monitor • Output terminal monitor • Input terminal monitor
Alarm	• Active alarm display (Alarm reset) • Alarm log record display
File	• Data saving Save the step data and parameters of the controller which is being used for communication (it is possible to save four files, with one set of step data and parameters defined as one file). • Load to controller Loads the data which is saved in the teaching box to the controller which is being used for communication. • Delete the saved data.
TB setting	• Display setting (Easy/Normal mode) • Language setting (Japanese/English) • Backlight setting • LCD contrast setting • Beep sound setting • Max. connection axis • Distance unit (mm/inch)
Reconnect	• Reconnection of axis

Menu Operations Flowchart

Menu
Step data
Parameter
Monitor
Test
Alarm
File
TB setting
Reconnect

Step data
Step data No.
Movement MOD
Speed
Position
Acceleration
Deceleration
Pushing force
Trigger LV
Pushing speed
Positioning force
Area 1, 2
In position

Parameter
Basic
ORIG

Basic setting

ORIG setting

Monitor
Drive
Output signal
Input signal
Output terminal
Input terminal

DRV monitor
Position, Speed, Torque
Step No.
Last step No.

Output signal monitor

Input signal monitor

Output terminal monitor

Input terminal monitor

Test
JOG/MOVE
Return to ORIG
Test drive
Compulsory output

Alarm
Active ALM
ALM Log record

Active ALM
Active alarm display
Alarm reset

ALM Log record display
Log entry display

File
Data saving
Load to controller
File deletion

TB setting
Easy/Normal
Language
Backlight
LCD contrast
Beep
Max. connection axis
Password
Distance unit

Reconnect

Dimensions

No.	Description	Function
1	**LCD**	A screen of liquid crystal display (with backlight)
2	**Ring**	A ring for hanging the teaching box
3	**Stop switch**	When switch is pushed in, the switch locks and stops. The lock is released when it is turned to the right.
4	**Stop switch guard**	A guard for the stop switch
5	**Enable switch (Option)**	Prevents unintentional operation (unexpected operation) of the jog test function. Other functions such as data change are not covered.
6	**Key switch**	Switch for each input
7	**Cable**	Length: 3 meters
8	**Connector**	A connector connected to CN4 of the controller

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor

LEFS□S

LECSA / LECSB

Specific Product Precautions

Programless Controller
Series *LECP1*

CE RoHS

How to Order

| LE | C | P 1 | P | 1 | – | LEFS16A-400 |

Controller

Compatible motor

| P | Step motor (Servo/24 VDC) |

Number of step data (Points)

| 1 | 14 (Programless) |

Parallel I/O type

| N | NPN |
| P | PNP |

I/O cable length [m]

—	Without cable
1	1.5
3	3
5	5

Actuator part number

(Except cable specifications and actuator options)
Example: Enter [LEFS16A-400] for LEFS16A-400B-R16N1

∗ **When placing an order for the controller with an actuator, this part number is not necessary.**

> **The controller is sold as single unit after the compatible actuator is set.**
>
> Confirm that the combination of the controller and the actuator is correct.

∗ Refer to the operation manual for using the products. Please download it via our website. http://www.smcworld.com

Specifications

Basic Specifications

Item	LECP1
Compatible motor	Step motor (Servo/24 VDC)
Power supply Note 1)	Power supply voltage: 24 VDC 10% Max. current consumption: 3A (Peak 5A) Note 2) [Including the motor drive power, control power supply, stop, lock release]
Parallel input	6 inputs (Photo-coupler isolation)
Parallel output	6 outputs (Photo-coupler isolation)
Stop points	14 points (Position number 1 to 14(E))
Compatible encoder	Incremental A/B phase (800 pulse/rotation)
Serial communication	RS485 (Modbus protocol compliant)
Memory	EEPROM
LED indicator	LED (Green/Red) one of each
7-segment LED display Note 3)	1 digit, 7-segment display (red) Figures are expressed in hexadecimal ("10" to "15" in decimal number are expressed as "A" to "F")
Lock control	Forced-lock release terminal Note 4)
Cable length [m]	I/O cable: 5 or less Actuator cable: 20 or less
Cooling system	Natural air cooling
Operating temperature range [°C]	0 to 40 (No freezing)
Operating humidity range [%RH]	90 or less (No condensation)
Storage temperature range [°C]	−10 to 60 (No freezing)
Storage humidity range [%RH]	90 or less (No condensation)
Insulation resistance [M]	Between the housing (radiation fin) and SG terminal 50 (500 VDC)
Weight [g]	130

Note 1) Do not use the power supply of "inrush current prevention type" for the controller input power supply.
Note 2) The power consumption changes depending on the actuator model. Refer to the each actuator's operation manual etc. for details.
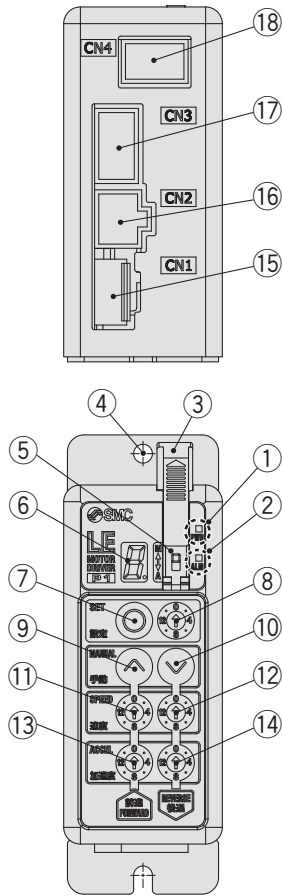Note 3) "10" to "15" in decimal number are displayed as follows in the 7-segment LED.

Decimal display	10	11	12	13	14	15
Hexadecimal display	A	b	c	d	E	F

Note 4) Applicable to non-magnetizing lock.

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Details of The Controller

No.	Display	Description	Details
①	**PWR**	Power supply LED	Power supply ON/servo ON :Green turns on
			Power supply ON/servo OFF :Green flashes
②	**ALM**	Alarm LED	With alarm : Red turns on
			Parameter setting : Red flashes
③	—	Cover	Change and protection of the mode SW (Close the cover after changing SW)
④	—	FG	Frame ground (Tighten the bolt with the nut when mounting the controller. Connect the ground wire.)
⑤	—	Mode swith	Switch the mode between manual and auto.
⑥	—	7-segment LED	Stop position, the value set by ⑧ and alarm information are displayed.
⑦	**SET**	Set button	Decide the settings or drive operation in Manual mode.
⑧	—	Position selecting switch	Assign the position to drive (1 to 14), and the origin position (15).
⑨	**MANUAL**	Manual forward button	Perform forward jog and inching.
⑩		Manual reverse button	Perform reverse jog and inching.
⑪	**SPEED**	Forward speed switch	16 forward speeds are available.
⑫		Reverse speed switch	16 reverse speeds are available.
⑬	**ACCEL**	Forward acceleration switch	16 forward acceleration steps are available.
⑭		Reverse acceleration switch	16 reverse acceleration steps are available.
⑮	**CN1**	Power supply connector	Connect the power supply cable.
⑯	**CN2**	Motor connector	Connect the motor connector.
⑰	**CN3**	Encoder connector	Connect the encoder connector.
⑱	**CN4**	I/O connector	Connect I/O cable.

How to Mount

Controller mounting shown below.

1. Mounting screw (LECP1□□-□)
(Installation with two M4 screws)

Ground wire

Mounting direction

Mounting direction
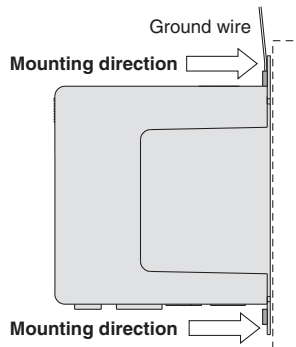
2. Grounding

Tighten the bolt with the nut when mounting the ground wire as shown below.

M4 screw

Cable with crimping terminal

Tooth lock washer

Controller
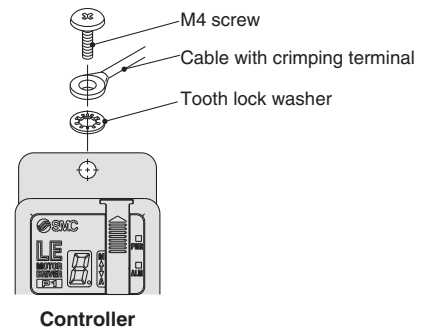
⚠**Caution**

• M4 screws, cable with crimping terminal and tooth lock washer are not included.
  Be sure to carry out grounding earth in order to ensure the noise tolerance.

• Use a watchmaker's screwdriver of the size shown below when changing
  position switch ⑧ and the set value of the speed/acceleration switch ⑪ to ⑭.
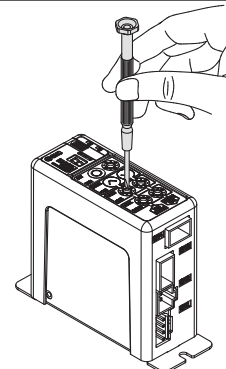 **Size**
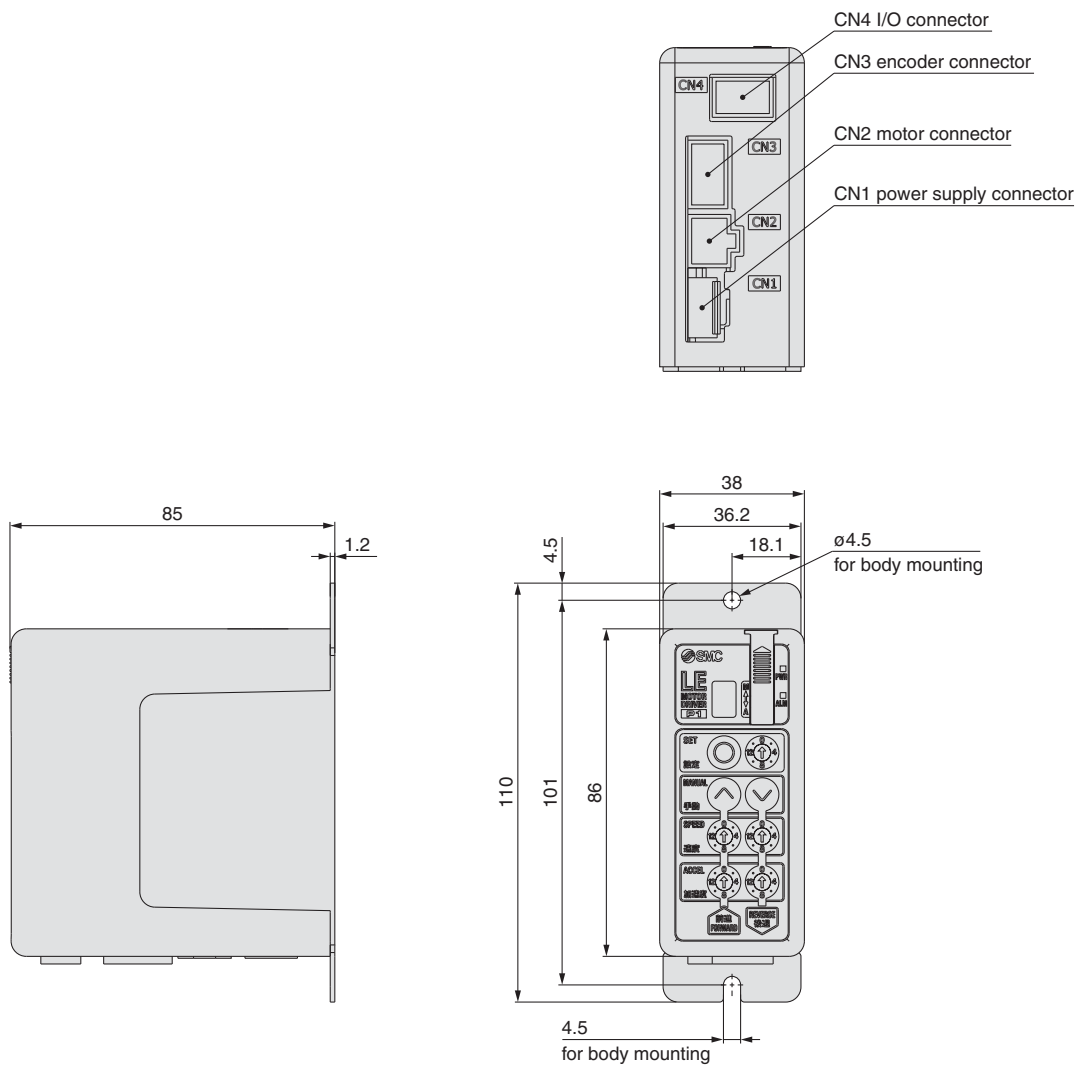 End width **L** :2.0 to 2.4 [mm]
  End thickness **W** :0.5 to 0.6 [mm]

W

L
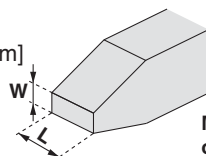
**Magnified view of the end of the screwdriver**

Series *LECP1*

Dimensions

CN4 I/O connector

CN3 encoder connector

CN2 motor connector

CN1 power supply connector

85

1.2

38

36.2

18.1

4.5

ø4.5
for body mounting

110

101

86

4.5
for body mounting

SMC

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor

LEFS□S

LECSA / LECSB

Specific Product Precautions

Wiring Example 1

Power Supply Connector: CN1

∗ When you connect a CN1 power supply connector, please use the power supply cable (LEC-CK1-1).
∗ Power supply cable (LEC-CK1-1) is an accessory.

CN1 Power Supply Connector Terminal for LECP1

Terminal name	Cable colour	Function	Function details
0V	Blue	Common supply (−)	M24V terminal/C24V terminal/BK RLS terminal are common (−).
M24V	White	Motor power supply (+)	This is the motor power supply (+) that is supplied to the controller.
C24V	Brown	Control power supply (+)	This is the control power supply (+) that is supplied to the controller.
BK RLS	Black	Lock release (+)	This is the input (+) that releases the lock.

Power supply cable for LECP1 (LEC-CK1-1)
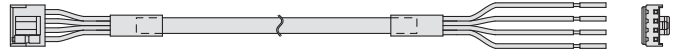
Wiring Example 2

Parallel I/O Connector: CN4

∗ When you connect a PLC, etc., to the CN4 parallel I/O connector, please use the I/O cable (LEC-CK4-□).
∗ The wiring should be changed depending on the type of the parallel I/O (NPN or PNP). Please wire referring to the following diagram.

■NPN

CN4		
COM+	1	
COM−	2	
IN0	9	
IN1	10	
IN2	11	
IN3	12	
RESET	13	
STOP	14	
OUT0	3	Load
OUT1	4	
OUT2	5	
OUT3	6	
BUSY	7	
ALARM	8	

Power supply 24 VDC for I/O signal

■PNP

CN4		
COM+	1	
COM−	2	
IN0	9	
IN1	10	
IN2	11	
IN3	12	
RESET	13	
STOP	14	
OUT0	3	Load
OUT1	4	
OUT2	5	
OUT3	6	
BUSY	7	
ALARM	8	

Power supply 24 VDC for I/O signal

Input Signal

Name	Contents
COM+	Connects the power supply 24 V for input/output signal
COM−	Connects the power supply 0 V for input/output signal
IN0 to IN3	• Instruction to drive (input as a combination of IN0 to IN3) • Instruction to return to the origin position (IN0 to IN3 all ON simultaneously) Example - (instruction to drive for position no. 5) IN3: OFF, IN2: ON, IN1: OFF, IN0: ON
RESET	Alarm reset and operation interruption During operation : deceleration stop from position at which signal is input (servo ON maintained) While alarm is active : alarm reset
STOP	Instruction to stop (after maximum deceleration stop, servo OFF)

Example - (instruction to drive for position no. 5)

IN3	IN2	IN1	IN0
OFF	ON	OFF	ON

Output Signal

Name	Contents
OUT0 to OUT3	Turns on when the positioning or pushing is completed. (Output is instructed in the combination of OUT0 to 3.) Example - (operation complete for position no. 3)
BUSY	Outputs when the actuator is moving
*ALARM Note)	Not output when alarm is active or servo OFF

Example - (operation complete for position no. 3)

OUT3	OUT2	OUT1	OUT0
OFF	OFF	ON	ON

Note) These signals are output when the power supply of the controller is ON. (N.C.)

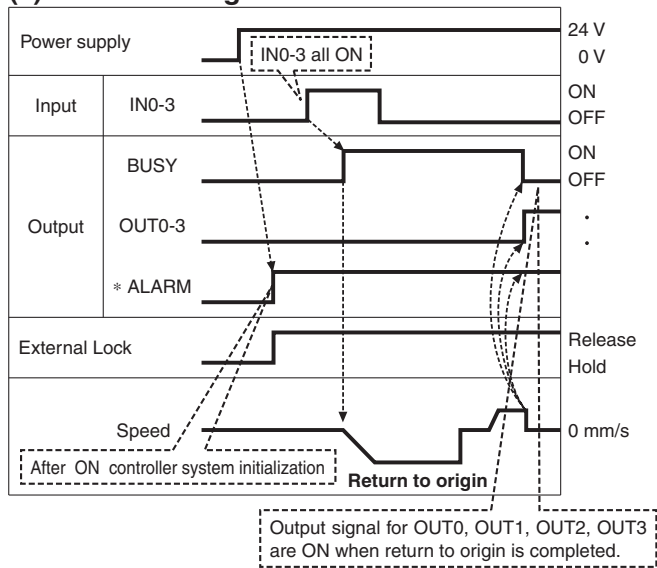**Input Signal [IN0 - IN3] Position Number Chart** ○: OFF ●: ON

Position number	IN3	IN2	IN1	IN0
1	○	○	○	●
2	○	○	●	○
3	○	○	●	●
4	○	●	○	○
5	○	●	○	●
6	○	●	●	○
7	○	●	●	●
8	●	○	○	○
9	●	○	○	●
10 (A)	●	○	●	○
11 (B)	●	○	●	●
12 (C)	●	●	○	○
13 (D)	●	●	○	●
14 (E)	●	●	●	○
Retun to origin	●	●	●	●

Output Signal [OUT0 - OUT3] Position Number Chart ○: OFF ●: ON

Position number	OUT3	OUT2	OUT1	OUT0
1	○	○	○	●
2	○	○	●	○
3	○	○	●	●
4	○	●	○	○
5	○	●	○	●
6	○	●	●	○
7	○	●	●	●
8	●	○	○	○
9	●	○	○	●
10 (A)	●	○	●	○
11 (B)	●	○	●	●
12 (C)	●	●	○	○
13 (D)	●	●	○	●
14 (E)	●	●	●	○
Retun to origin	●	●	●	●

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Series *LECP1*

Signal Timing

(1) Return to Origin

		24 V / 0 V
Power supply		
Input	IN0-3	ON / OFF
Output	BUSY	ON / OFF
	OUT0-3	
	∗ ALARM	
External Lock		Release / Hold
	Speed	0 mm/s

IN0-3 all ON

After ON controller system initialization

Return to origin

Output signal for OUT0, OUT1, OUT2, OUT3 are ON when return to origin is completed.

∗ "∗ALARM" is expressed as negative-logic circuit.

(2) Positioning Operation

		24 V / 0 V
Power supply		
Input	IN0-3	ON / OFF
Output	OUT0-3	ON / OFF
	BUSY	
External Lock		Release / Hold
	Speed	0 mm/s

Positioning operation

OUT0-3 output signal are ON in the same state as the input IN0-3 when positioning is completed.

(3) Cut-off Stop (Reset Stop)

		24 V / 0 V
Power supply		
Input	IN0-3	ON / OFF
	RESET	
Output	OUT0-3	ON / OFF
	BUSY	
External Lock		Release / Hold
	Speed	0 mm/s

Cut-off stop during positioning operation.

(4) Stop by The STOP Signal

		24 V / 0 V
Power supply		
Input	IN0-3	ON / OFF
	STOP	
Output	OUT0-3	ON / OFF
	BUSY	
	∗ ALARM	
External Lock		Release / Hold
	Speed	0 mm/s

Stop by the STOP signal during positioning operation.

(5) Alarm Reset

Input	RESET	ON / OFF
Output	∗ ALARM	ON / OFF

Alarm reset

Alarm out

∗ "∗ALARM" is expressed as negative-logic circuit.

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Options: Actuator Cable

[Robotic cable for step motor (Servo/24 VDC), standard cable]

LE − CP − [1] − [ ]

Cable length (L)[m]

1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order
(Robotic cable only)

Cable type

—	Robotic cable (Flexible cable)
S	Standard cable

LE-CP-$\frac{1}{3}$/Cable length: 1.5 m, 3 m, 5 m

LE-CP-$\frac{8\ B}{A\ C}$/Cable length: 8 m, 10 m, 15 m, 20 m
(* Produced upon receipt of order)

Circuit	Connector A terminal no.		Cable colour	Connector C terminal no.
A	B-1		Brown	2
Ā	A-1		Red	1
B	B-2		Orange	6
B̄	A-2		Yellow	5
COM-A/COM	B-3		Green	3
COM-B/–	A-3		Blue	4

Circuit	Connector A terminal no.	Shield	Cable colour	Connector D terminal no.
Vcc	B-4		Brown	12
GND	A-4		Black	13
Ā	B-5		Red	7
A	A-5		Black	6
B̄	B-6		Orange	9
B	A-6		Black	8
			—	3

[Robotic cable with lock and sensor for step motor (Servo/24 VDC), standard cable]

LE − CP − [1] − B − [ ]

Cable length (L)[m]

1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order
(Robotic cable only)

With lock and sensor

Cable type

—	Robotic cable (Flexible cable)
S	Standard cable

LE-CP-$\frac{1}{3}$/Cable length: 1.5 m, 3 m, 5 m

LE-CP-$\frac{8\ B}{A\ C}$/Cable length: 8 m, 10 m, 15 m, 20 m
(* Produced upon receipt of order)

Circuit	Connector A terminal no.		Cable colour	Connector C terminal no.
A	B-1		Brown	2
Ā	A-1		Red	1
B	B-2		Orange	6
B̄	A-2		Yellow	5
COM-A/COM	B-3		Green	3
COM-B/–	A-3		Blue	4

Circuit	Connector A terminal no.	Shield	Cable colour	Connector D terminal no.
Vcc	B-4		Brown	12
GND	A-4		Black	13
Ā	B-5		Red	7
A	A-5		Black	6
B̄	B-6		Orange	9
B	A-6		Black	8
			—	3

Circuit	Connector B terminal no.		Cable colour	
Lock (+)	B-1		Red	4
Lock (–)	A-1		Black	5
Sensor (+) Note)	B-3		Brown	1
Sensor (–) Note)	A-3		Blue	2

Note) This is not used for the LEF series.

Model Selection

Servo Motor (24 VDC)/Step Motor (Servo/24 VDC) — LEFS / LEFB

LECA6 / LECP6

LECP1

AC Servo Motor — LEFS□S

LECSA / LECSB

Specific Product Precautions

SMC

42

Series *LECP1*

Options

[Power supply cable]

LEC－CK1－1

(13.3)   (35)   (ø6)   (60)   (15.8)   (10.5)

(1500)

∗ Conductor size: AWG20
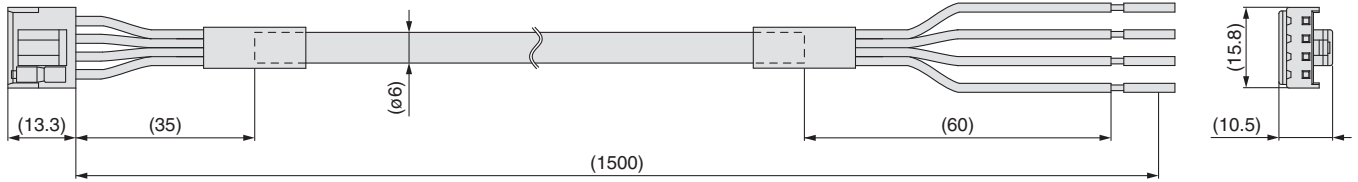
Terminal name	Covered colour	Function
0V	Blue	Common supply (−)
M24V	White	Motor power supply (+)
C24V	Brown	Control power supply (+)
BK RLS	Black	Lock release (+)

[I/O cable]

LEC－CK4－☐

Cable length (L) [m]

1	1.5
3	3
5	5

Controller side   PLC side

(11)   (30)   (ø7.9)   (60)   (16)   (10)

(L)

∗ Conductor size: AWG26
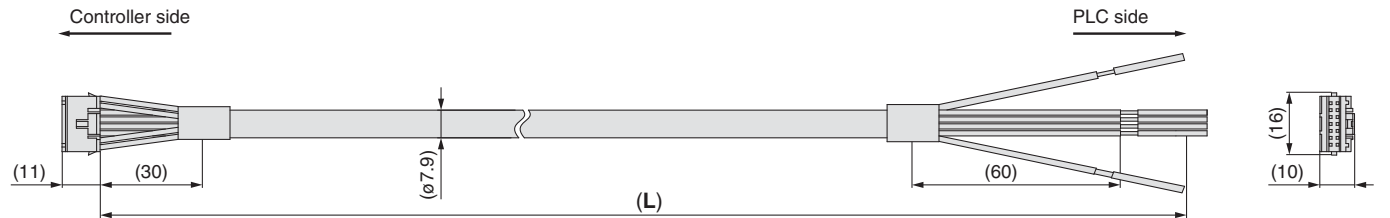
Terminal no.	Insulation colour	Dot mark	Dot colour	Function
1	Light brown	■	Black	COM +
2	Light brown	■	Red	COM −
3	Yellow	■	Black	OUT0
4	Yellow	■	Red	OUT1
5	Light green	■	Black	OUT2
6	Light green	■	Red	OUT3
7	Grey	■	Black	BUSY
8	Grey	■	Red	ALARM
9	White	■	Black	IN0
10	White	■	Red	IN1
11	Light brown	■ ■	Black	IN2
12	Light brown	■ ■	Red	IN3
13	Yellow	■ ■	Black	RESET
14	Yellow	■ ■	Red	STOP

∗ Parallel I/O signal is valid in auto mode. While the test function operates at manual mode, only the output is valid.

SMC

44

Ball Screw Drive/*Series LEFS*
Model Selection

Selection Procedure

| Step 1 | Confirm the work load – speed. | → | Step 2 | Confirm the cycle time. | → | Step 3 | Confirm the allowable moment. |
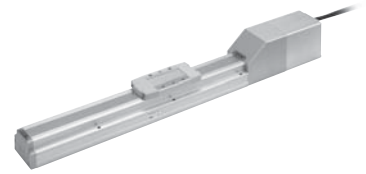
Selection Example

Operating conditions

• Workpiece mass: 45 [kg]

• Speed: 300 [mm/s]

• Acceleration/Deceleration: 3000 [mm/s^2]

• Stroke: 200 [mm]

• Mounting orientation: Horizontal upward

• Workpiece mounting condition:

W
100
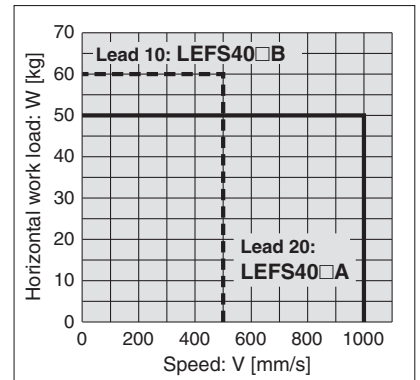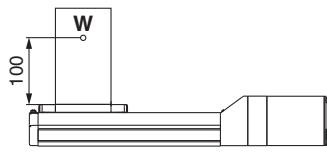
Step 1 Confirmation of work load–speed <Speed–Work load graph> (Page 46)

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.

Lead 10: LEFS40□B
Lead 20: LEFS40□A

Horizontal work load: W [kg]
Speed: V [mm/s]

<Speed–Work load graph>
(LEFS40)

Step 2 Confirmation of 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.

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

● 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 [s]**
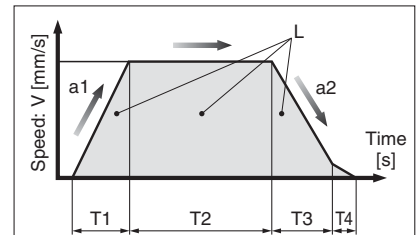
Speed: V [mm/s]
Time [s]
L
a1
a2
T1   T2   T3 T4

L : Stroke [mm]
··· (Operating condition)

V : Speed [mm/s]
··· (Operating condition)

a1 : Acceleration [mm/s^2]
··· (Operating condition)

a2 : Deceleration [mm/s^2]
··· (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 Confirmation of guide moment**

Mep
m
L1

Overhang L1 [mm]
1,500
1,000
500
0
1000 mm/s^2
3000 mm/s^2
5000 mm/s^2
0 10 20 30 40 50 60
Workpiece mass [kg]
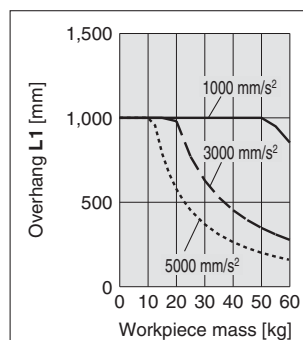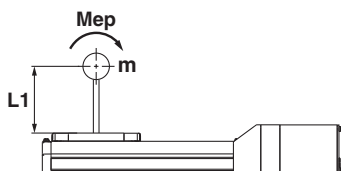
Based on the above calculation result, the LEFS40S4B-200 is selected.
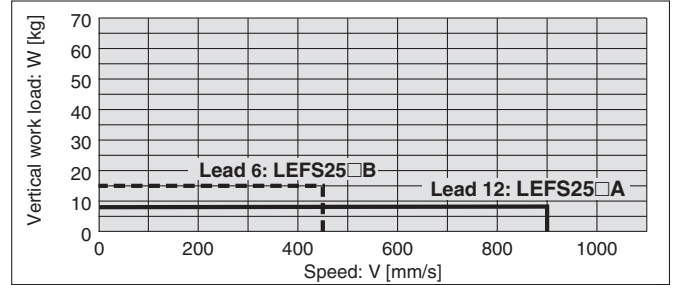
SMC

Speed–Work Load Graph (Guide)

∗ The allowable speed is limited depending on the stroke. Select it referring to "Allowable Stroke Speed" below.
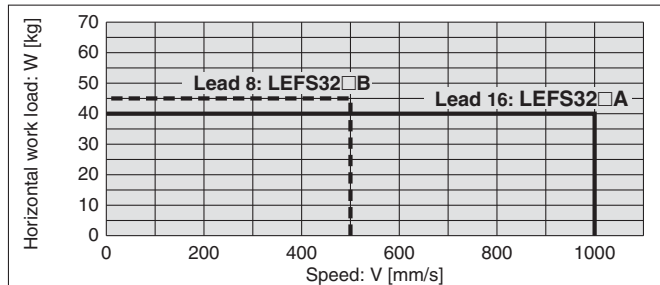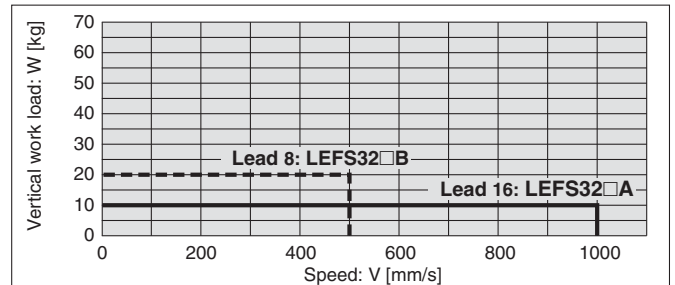
LEFS25/Ball Screw Drive
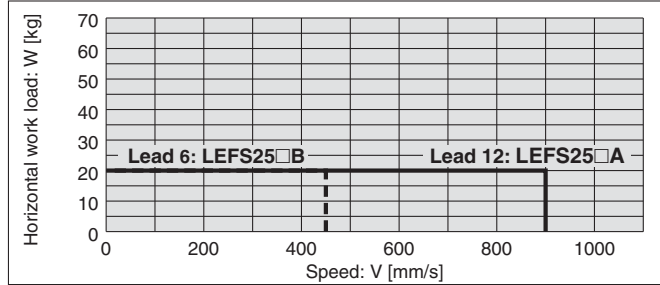
Horizontal

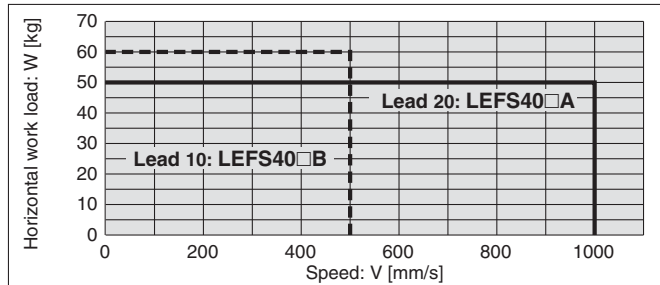**Vertical**

LEFS32/Ball Screw Drive

Horizontal

Vertical

LEFS40/Ball Screw Drive

Horizontal

Vertical
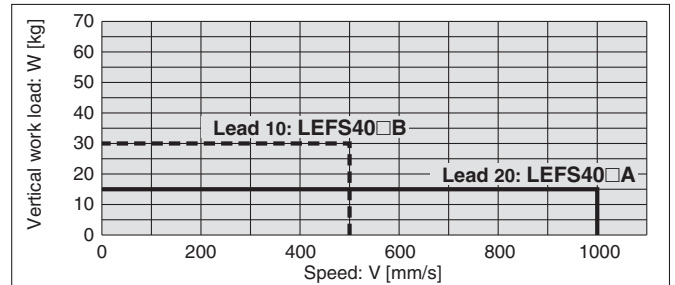
Allowable Stroke Speed

[mm/s]

Model	AC servo motor	Lead						Stroke [mm]					
		Symbol	[mm]	to 100	to 200	to 300	to 400	to 500	to 600	to 700	to 800	to 900	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)	

∗ When transferring load mass vertically, "Regeneration option" is required under the work load conditions shown below. Order "Regeneration option" separately. (Refer to page 63)

Required Conditions for "Regeneration Option"

Model	LEFS25S$_6^2$		LEFS32S$_7^3$		LEFS40S$_8^4$	
Lead	A	B	A	B	A	B
Vertical work load [kg]	8	15	10	20	15	30
Vertical work load conditions [kg]	Required Note)		Not required		Not required	20 or more

Note) For vertical transfer, "Regeneration option" is required regardless of load mass.

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46

Series *LEFS*

Dynamic Allowable Moment

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

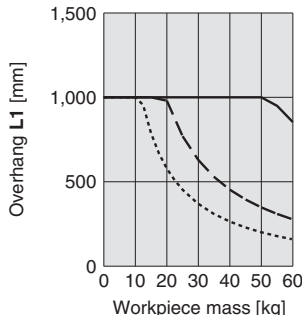**Acceleration**　——— 1000 mm/s²　－ － 3000 mm/s²　······· 5000 mm/s²
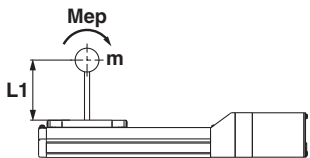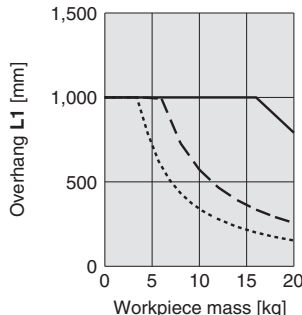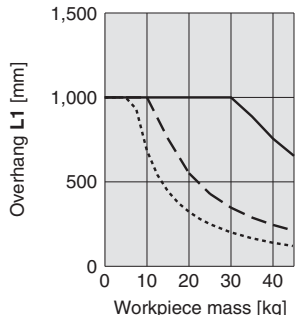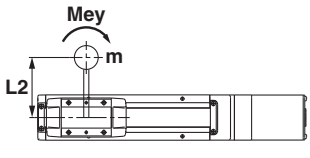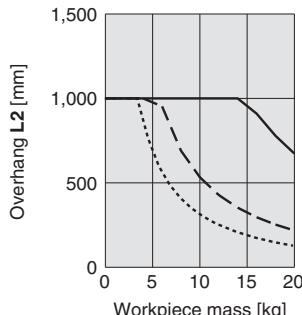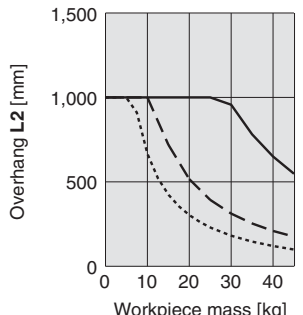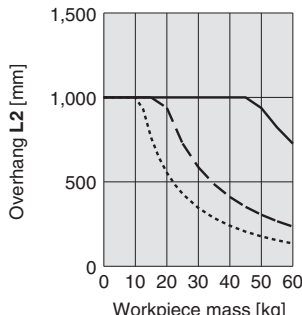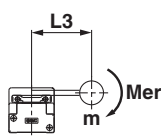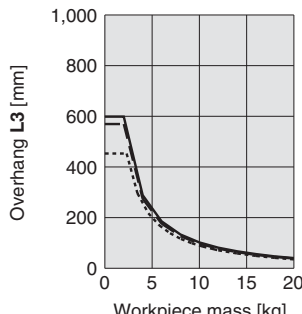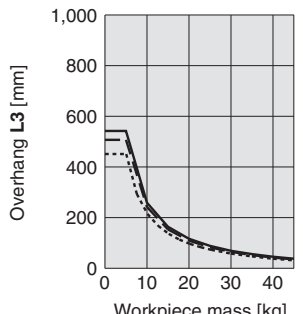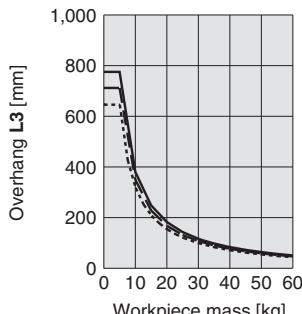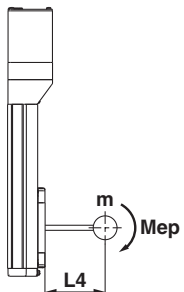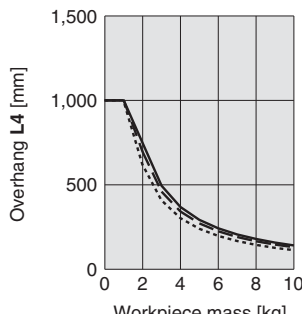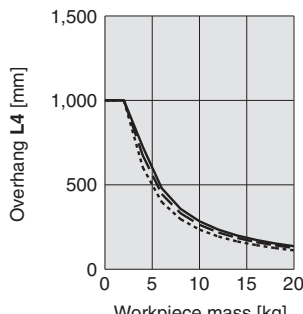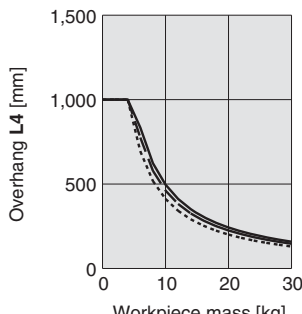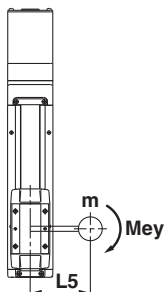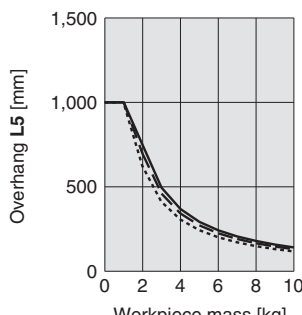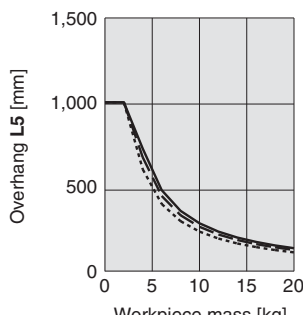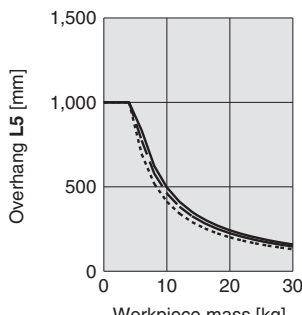
Orientation	Load overhanging direction		Model		
	m : Work load [kg]　Me: Dynamic allowable moment [N·m]　L : Amount of overhang to the centre of gravity of the workpiece [mm]		LEFS25S□	LEFS32S□	LEFS40S□
Horizontal	Mep　m　L1	Pitching			
Horizontal	Mey　m　L2	Yawing			
Horizontal	L3　Mer　m	Rolling			
Vertical	m　Mep　L4	Pitching			
Vertical	m　Mey　L5	Yawing			

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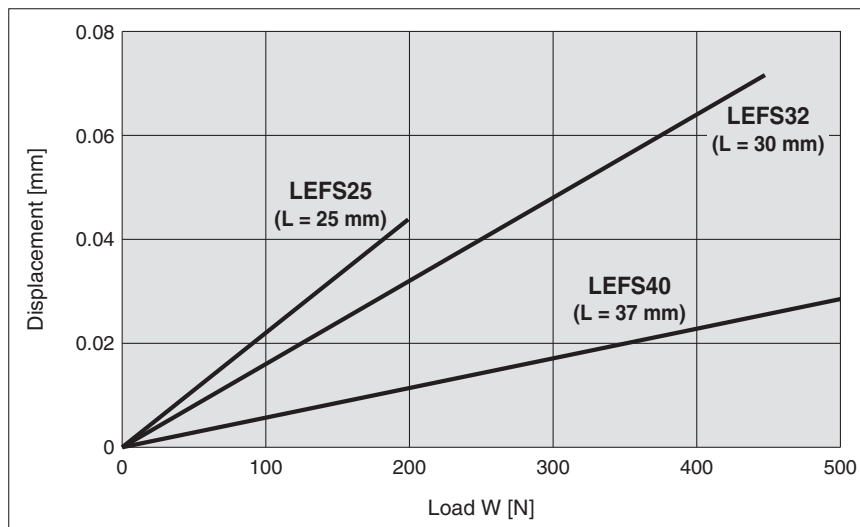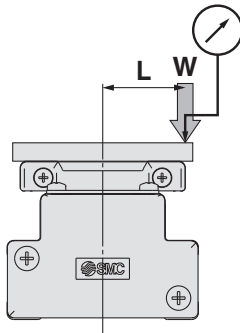
Note) This displacement is measured when a 15 mm aluminum plate is mounted and fixed on the table.

Electric Actuator/Slider Type
Ball Screw Drive

AC Servo Motor (100/200/400 W)

Series LEFS
LEFS25, 32, 40

CE RoHS

How to Order

LEFS **25** **S2** **B** – **100** □ – **S** **2** **A1** □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

❶ Size

25	
32	
40	
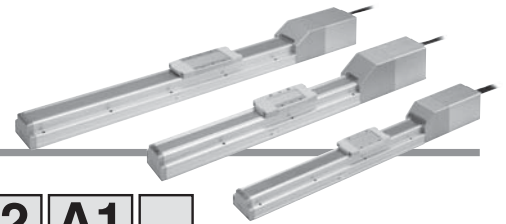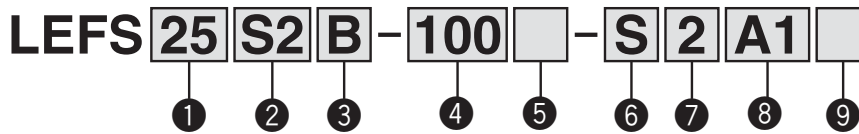
❷ Motor type

Symbol	Type	Output [W]	Actuator size	Compatible controllers
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
S7		200	32	LECSB□-S7
S8		400	40	LECSB2-S8

∗ Motor types: For S2 and S6 only, the compatible controller part number suffix will be S1 and S5.

❸ Lead [mm]

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

❹ Stroke [mm]

100	
to	
1000	

∗ Refer to the table below for details.

❺ Motor option

—	Without lock
B	With lock

❻ Actuator cable type Note 1)

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

Note 1) Motor cable and encoder cable are included. (Lock cable is also included if motor option "With lock" is selected.)

❼ Cable length Note 2) [m]

—	Without cable
2	2
5	5
A	10

Note 2) Common to encoder/ motor/lock cable

❽ Controller type

	Compatible controllers	Power supply voltage
—	Without controller	
A1	LECSA1	100V to 120V
A2	LECSA2	200V to 230V
B1	LECSB1	100V to 120V
B2	LECSB2	200V to 230V

❾ I/O connector

—	Without connector
H	With connector

∗ **Applicable stroke table** ●Standard/○ Produced upon receipt of order

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

Note) Consult with SMC for the manufacture of intermediate strokes.

Compatible controllers

Type	Pulse input type (For incremental encoder)	Pulse input type (For absolute encoder)
Series	LECSA1, LECSA2	LECSB1, LECSB2
Feature(s)	• 17-bit incremental encoder compatible • Positioning function (Max. 7 inputs) • Servo adjustment switch	• 18-bit absolute encoder compatible • With RS422 communication port (compatible with Mitsubishi Electric's touch panel) • Analogue input for speed and torque command
Compatible motor	AC servo motor (Incremental encoder) S2, S3, S4	AC servo motor (Absolute encoder) S6, S7, S8
Power supply voltage	100 to 120 VAC (50/60 Hz), 200 to 230 VAC (50/60 Hz)	100 to 120 VAC (50/60 Hz), 200 to 230 VAC (50/60 Hz)
Reference page	Page 57	Page 57

SMC

Specifications

LEFS25, 32, 40 AC Servo Motor (100/200/400 W)

	Model		LEFS25S$_6^2$		LEFS32S$_7^3$		LEFS40S$_8^4$	
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 Note 3) [mm/s]	Stroke range	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]		5000					
	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 [°C]		5 to 40					
	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)					
Lock unit specifications	Type Note 5)		Non-magnetizing operation type					
	Holding force [N]		131	255	197	385	330	660
	Power consumption at 20C [W] Note 6)		6.3		7.9		7.9	
	Rated voltage [V]		24 VDC$_{-10\%}^0$					

Note 1) Consult with SMC for the manufacture of intermediate strokes other than those specified on the above.
Note 2) For details, refer to "Speed–Work Load Graph (Guide)" on page 46.
Note 3) The allowable speed will change depending on 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) Only when motor option "With lock" is selected.
Note 6) For an actuator with lock, add the power consumption for the lock.

Weight

Model	LEFS25					
Stroke [mm]	100	200	300	(400)	500	(600)
Product weight [kg]	2.20	2.50	2.75	3.05	3.30	3.60
Additional weight with lock [kg]	0.35					

Model	LEFS32							
Stroke [mm]	100	200	300	(400)	500	(600)	(700)	(800)
Product weight [kg]	3.60	4.00	4.40	4.80	5.20	5.60	6.00	6.40
Additional weight with lock [kg]	0.70							

Model	LEFS40								
Stroke [mm]	200	300	(400)	500	(600)	(700)	800	(900)	(1000)
Product weight [kg]	6.20	6.75	7.35	7.90	8.35	9.00	9.55	10.15	10.70
Additional weight with lock [kg]	0.70								

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor LEFS□S

LECSA / LECSB

Specific Product Precautions

Series *LEFS*

Construction
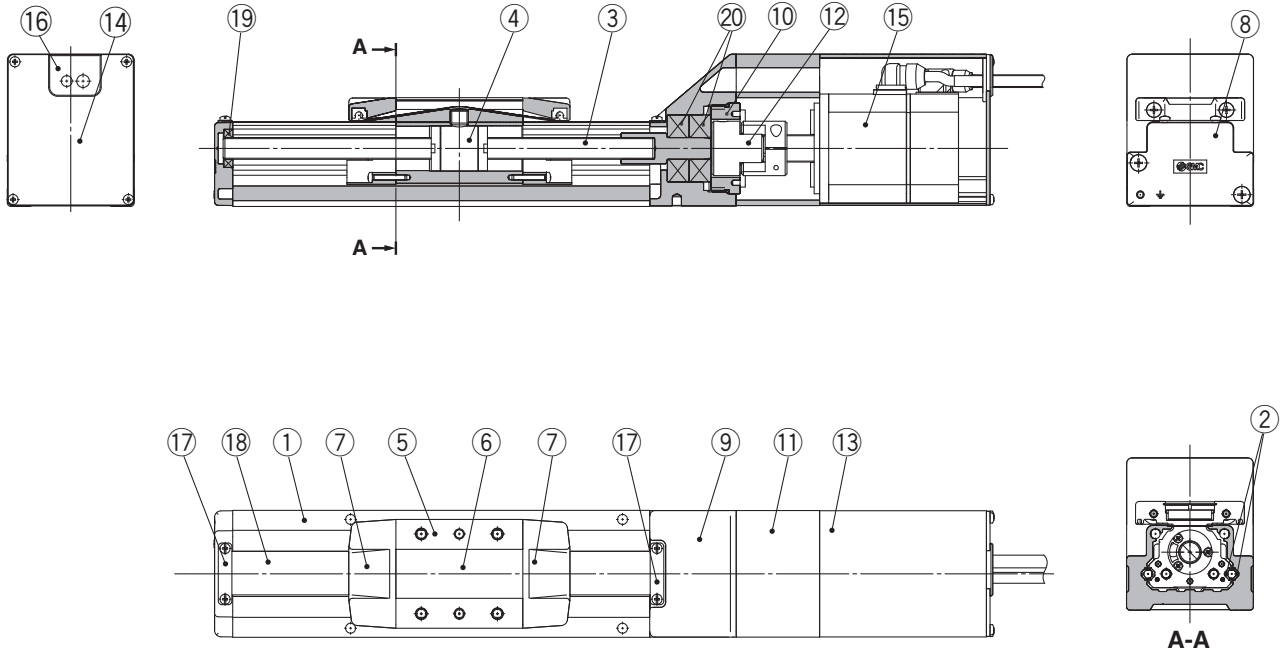
Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodised
2	**Rail guide**	—	
3	**Ball screw shaft**	—	
4	**Ball screw nut**	—	
5	**Table**	Aluminum alloy	Anodised
6	**Blanking plate**	Aluminum alloy	Anodised
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	

No.	Description	Material	Note
11	**Motor mount**	Aluminum alloy	Coating
12	**Coupling**	—	
13	**Motor cover**	Aluminum alloy	Anodised
14	**Motor end cover**	Aluminum alloy	Anodised
15	**Motor**	—	
16	**Grommet**	NBR	
17	**Band stopper**	Stainless steel	
18	**Dust seal band**	Stainless steel	
19	**Bearing**	—	
20	**Bearing**	—	

Dimensions: Ball Screw Drive

LEFS25

Note 1) When mounting the electric actuator using the body mounting reference plane, set the height of the opposite surface or pin to 3 mm or more because of R 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 work pieces and facilities around the table.
Note 3) The Z phase first detecting position from the stroke end of the motor side.

[mm]

Model	L	A	B	n	D	E
LEFS25□□-100-□□□□	389	106	210	4	—	—
LEFS25□□-100B-□□□□	429					
LEFS25□□-200-□□□□	489	206	310	6	2	240
LEFS25□□-200B-□□□□	529					
LEFS25□□-300-□□□□	589	306	410	8	3	360
LEFS25□□-300B-□□□□	629					

[mm]

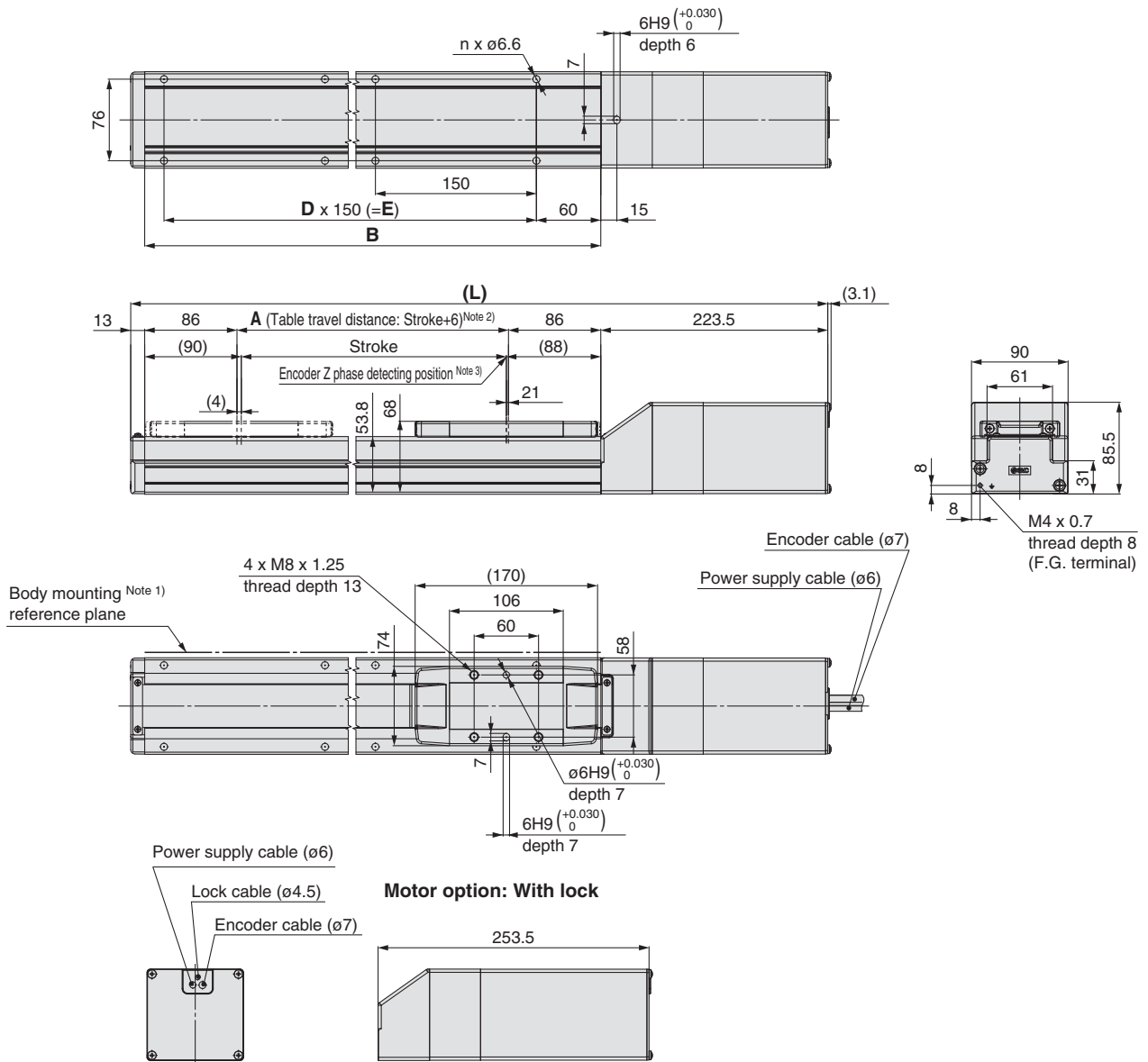| Model	L	A	B	n	D	E
LEFS25□□-400-□□□□	689	406	510	8	3	360
LEFS25□□-400B-□□□□	729					
LEFS25□□-500-□□□□	789	506	610	10	4	480
LEFS25□□-500B-□□□□	829					
LEFS25□□-600-□□□□	889	606	710	12	5	600
LEFS25□□-600B-□□□□	929					

LEFS32

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

[mm]

Model	L	A	B	n	D	E
LEFS32□□-100-□□□□	441	106	230	4	—	—
LEFS32□□-100B-□□□□	471					
LEFS32□□-200-□□□□	541	206	330	6	2	300
LEFS32□□-200B-□□□□	571					
LEFS32□□-300-□□□□	641	306	430	6	2	300
LEFS32□□-300B-□□□□	671					
LEFS32□□-400-□□□□	741	406	530	8	3	450
LEFS32□□-400B-□□□□	771					

[mm]

Model	L	A	B	n	D	E
LEFS32□□-500-□□□□	841	506	630	10	4	600
LEFS32□□-500B-□□□□	871					
LEFS32□□-600-□□□□	941	606	730	10	4	600
LEFS32□□-600B-□□□□	971					
LEFS32□□-700-□□□□	1041	706	830	12	5	750
LEFS32□□-700B-□□□□	1071					
LEFS32□□-800-□□□□	1141	806	930	14	6	900
LEFS32□□-800B-□□□□	1171					

SMC

52

Dimensions: Ball Screw Drive

LEFS40

6H9 $\left(^{+0.030}_{0}\right)$ depth 6

n x ø6.6

76

150

60

15

D x 150 (=**E**)

B

(L)

(3.1)

13

86

A (Table travel distance: Stroke+6)[Note 2]

86

223.5

(90)

Stroke

(88)

Encoder Z phase detecting position [Note 3]

21

(4)

53.8

68

90

61

85.5

8

31

8

M4 x 0.7 thread depth 8 (F.G. terminal)

Encoder cable (ø7)

Power supply cable (ø6)

Body mounting [Note 1] reference plane

4 x M8 x 1.25 thread depth 13

(170)

106

60

74

58

7

ø6H9 $\left(^{+0.030}_{0}\right)$ depth 7

6H9 $\left(^{+0.030}_{0}\right)$ depth 7

Power supply cable (ø6)

Lock cable (ø4.5)

Encoder cable (ø7)

Motor option: With lock

253.5

Note 1) When mounting the electric actuator using the body mounting reference plane, set the height of the opposite surface or pin to 3 mm or more because of R 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 work pieces and facilities around the table.

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

[mm]

Model	L	A	B	n	D	E
LEFS40☐☐-200-☐☐☐☐	614.5	206	378	6	2	300
LEFS40☐☐-200B-☐☐☐☐	644.5					
LEFS40☐☐-300-☐☐☐☐	714.5	306	478	6	2	300
LEFS40☐☐-300B-☐☐☐☐	744.5					
LEFS40☐☐-400-☐☐☐☐	814.5	406	578	8	3	450
LEFS40☐☐-400B-☐☐☐☐	844.5					
LEFS40☐☐-500-☐☐☐☐	914.5	506	678	10	4	600
LEFS40☐☐-500B-☐☐☐☐	944.5					
LEFS40☐☐-600-☐☐☐☐	1014.5	606	778	10	4	600
LEFS40☐☐-600B-☐☐☐☐	1044.5					
LEFS40☐☐-700-☐☐☐☐	1114.5	706	878	12	5	750
LEFS40☐☐-700B-☐☐☐☐	1144.5					
LEFS40☐☐-800-☐☐☐☐	1214.5	806	978	14	6	900
LEFS40☐☐-800B-☐☐☐☐	1244.5					
LEFS40☐☐-900-☐☐☐☐	1314.5	906	1078	14	6	900
LEFS40☐☐-900B-☐☐☐☐	1344.5					
LEFS40☐☐-1000-☐☐☐☐	1414.5	1006	1178	16	7	1050
LEFS40☐☐-1000B-☐☐☐☐	1444.5					

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Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor

LEFS☐S

LECSA / LECSB

Specific Product Precautions

Series *LEFS*
Electric Actuator/
Specific Product Precautions 1

**Be sure to read before handling. Refer to back cover for Safety Instructions and the Operation Manual for Electric Actuator Precautions.
Please download it via our website. http://www.smcworld.com**

Design

⚠Caution

1. Do not apply a load in excess of the operating limit.

A product should be selected based on the maximum load and allowable moment. If the product is used outside of the operating limit, eccentric load applied to the guide will become excessive and have adverse effects such as creating play at the guide, degraded accuracy and shortened product life.

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

This can cause failure.

Selection

⚠Warning

1. Do not exceed the speed limit of the actuator specification.

Model selection should be performed from relation between work load and transfer speed, and the allowable stroke speed. Noise or reduction of accuracy may occur if the actuator is operated in excess of its specification and could lead to reduced accuracy and reduced product file.

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

This can lead to premature failure of the product.

3. When the product repeatedly cycles with partial strokes (see the table below), operate it at a full stroke at least once every 10 strokes.

Otherwise, lubrication can run out.

Model	Partial stroke
LEFS25	65 mm or less
LEFS32	70 mm or less
LEFS40	105 mm or less

4. Actuator sizing is necessary with the total workload including the external force if external force is applied on the actuator table.

When mounting cable-duct to actuator, the resistance of actuator table may increase. It causes an overload alarm, so pay attention to the resistance.

5. The initial value of forward/reverse rotation torque limit is set at 100% (3 times the motor rated torque.)

It will be the maximum torque (limit value) for "Position control mode", "Speed control mode" and "Positioning mode". The acceleration during operation may decrease if using at a smaller value than the initial value, so please set the value after confirming with the actual device.

Handling

⚠Caution

1. Never hit at the stroke end.

The internal stopper can be broken.
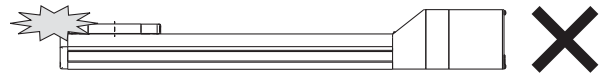
Handle the actuator with care especially when it is used in the vertical direction.

2. Actual speed of this actuator can be changed by load and stroke.

When selecting a product, check the catalogue for the instructions regarding selection and specifications.

3. Do not apply a load, impact or resistance in addition to a transferred load during returning to the original position.

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

It may cause a loss of parallelism in the mounting surfaces, looseness in the guide unit, an increase in sliding resistance or other problems.

5. When attaching a workpiece, do not apply strong impact or large moment.

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

6. Keep the flatness of mounting surface 0.1 mm or less.

Insufficient flatness of a workpiece or base mounted on the body of the product can cause play at the guide and increased sliding resistance.

7. When mounting the product, keep the 40 mm or more for bending the cable.

8. Do not hit the table with the workpiece in the positioning operation and positioning range.

Handling

## ⚠ Caution

**9. When mounting the product, use screws with adequate length and tighten them with adequate torque.**

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

Body fixed
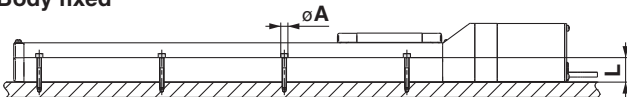
Model	Bolt	ø**A** (mm)	**L** (mm)
LEFS25	M4	4.5	24
LEFS32	M5	5.5	30
LEFS40	M6	6.6	31
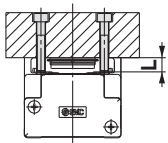
Workpiece fixed

Model	Bolt	Max. tightening torque (N·m)	**L** (Max. screw-in depth mm)
LEFS25	M5 x 0.8	3.0	8
LEFS32	M6 x 1	5.2	9
LEFS40	M8 x 1.25	12.5	14

To prevent the workpiece fixing bolts from touching the body, use bolts that are 0.5 mm or shorter than the maximum screw-in depth. If long bolts are used, they can touch the body and malfunction, etc.

10. Do not operate by fixing the table and moving the actuator body.

11. Check the specifications for the minimum speed of each actuator.

Otherwise, unexpected malfunctions, such as knocking, may occur.

Maintenance

⚠ Warning

Maintenance frequency

Perform maintenance according to the table below.

Frequency	Appearance check	Internal check
Inspection before daily operation	○	—
Inspection every 6 months/1000 km/ 5 million cycles*	○	○

∗ Select whichever comes sooner.

● **Items for visual appearance check**
1. Loose set screws, Abnormal dirt
2. Check of flaw and cable joint
3. Vibration, Noise

● **Items for internal check**
1. Lubricant condition on moving parts.
2. Loose or mechanical play in fixed parts or fixing screws.

⬡SMC

AC Servo Motor Controller
(Pulse Input Type)

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor

LEFS□S

LECSA / LECSB

Specific Product Precautions

Incremental Type
Series **LECSA**

Absolute Type
Series **LECSB**

Incremental encoder compatible *Series* **LECSA**

Supplied by customer

Power supply
Single phase
100 to 120 VAC (50/60 Hz)
200 to 230 VAC (50/60 Hz)

Control circuit power supply
24 VDC

Controller

Regeneration
option

Electric actuator

USB cable

Supplied by customer

PLC
**Power supply
for I/O signal
24 VDC**

MR Configurator
Setup software

PC

Absolute encoder compatible *Series* **LECSB**

MR Configurator
Setup software

PC

Supplied by customer

Power supply
Single phase
100 to 120 VAC (50/60 Hz)
200 to 230 VAC (50/60 Hz)

Three phase
200 to 230 VAC (50/60 Hz)

Controller

USB cable

Analog monitor output
RS-422 communication

Regeneration
option

Electric actuator

Battery (included)

Supplied by customer

PLC
**Power supply
for I/O signal
24 VDC**

AC Servo Motor Controller (Pulse Input Type)

Incremental Type
Series *LECSA*

Absolute Type
Series *LECSB*

CE RoHS

LECSA **LECSB**

How to Order

LECS **A** **1** – **S1**

Controller type

A	Pulse input type (For incremental encoder)
B	Pulse input type (For absolute encoder)

Power supply voltage

1	100 to 120 VAC, 50/60 Hz
2	200 to 230 VAC, 50/60 Hz

Motor type

Symbol	Type	Capacity	Encoder
S1	AC servo motor (S2)	100 W	Incremental
S3	AC servo motor (S3)	200 W	
S4	AC servo motor (S4)	400 W	
S5	AC servo motor (S6)	100 W	Absolute
S7	AC servo motor (S7)	200 W	
S8	AC servo motor (S8)	400 W	

Part no. list Select controller type and compatible motor from the combinations in the table below.

Controller part no.	Controller type	Motor type	Power supply voltage
LECSA1-S1	Pulse input type (For incremental encoder)	AC servo motor (S2)	100 to 120 VAC 50/60 Hz
LECSA1-S3		AC servo motor (S3)	
LECSA2-S1		AC servo motor (S2)	200 to 230 VAC 50/60 Hz
LECSA2-S3		AC servo motor (S3)	
LECSA2-S4		AC servo motor (S4)	
LECSB1-S5	Pulse input type (For absolute encoder)	AC servo motor (S6)	100 to 120 VAC 50/60 Hz
LECSB1-S7		AC servo motor (S7)	
LECSB2-S5		AC servo motor (S6)	200 to 230 VAC 50/60 Hz
LECSB2-S7		AC servo motor (S7)	
LECSB2-S8		AC servo motor (S8)	

Dimensions

LECSA□

135

2 x ø6 Mounting hole
(Bearing surface thickness 5) 40

130 120

CNP1
CNP2
CN1
CN2

CN3

5 6
5.5

2 x ø6 Mounting hole 50

130 120

CNP1
CNP2
CN1
CN2

CN3

5 6
6

LECSA□-S4

LECSB□

135 (170: LECSB□-S8)

ø6 Mounting hole
(Bearing surface thickness 4) 40

6
6

156

161 168

CN5
CN6
CN3

CNP1

CNP2

CN1

CNP3

CN2

CN4

6
6

Battery*1

(14)
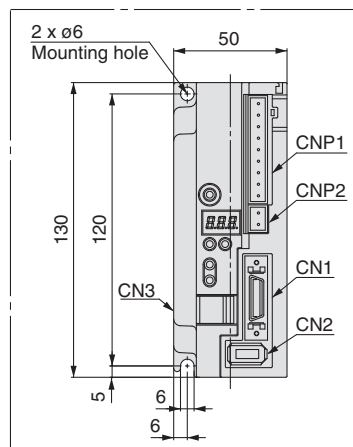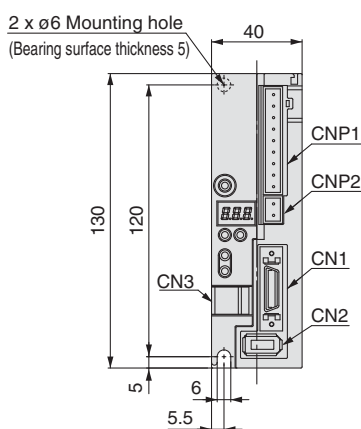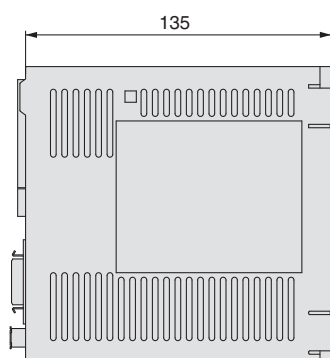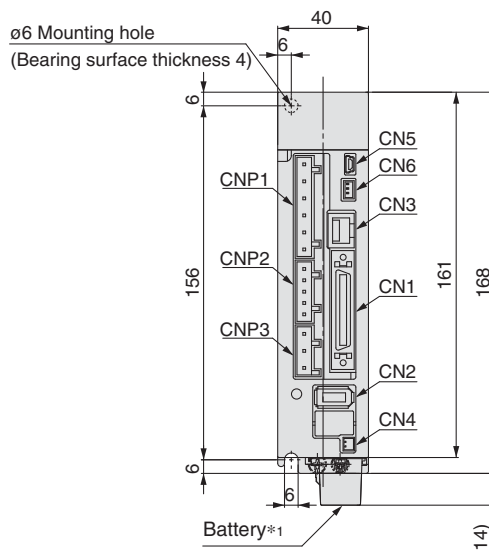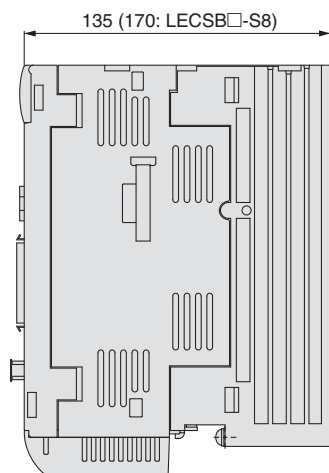
*1 Battery included.

57

SMC

Specifications

Model		LECSA1-S1	LECSA1-S3	LECSA2-S1	LECSA2-S3	LECSA2-S4
Compatible motor capacity [W]		100	200	100	200	400
Compatible encoder		Incremental 17-bit encoder (Resolution: 131072 p/rev)				
Main power supply	**Power voltage [V]**	Single phase 100 to 120 VAC (50/60 Hz)		Single phase 200 to 230 VAC (50/60 Hz)		
	Allowable voltage range [V]	Single phase 85 to 132 VAC		Single phase 170 to 253 VAC		
	Rated voltage [A]	3.0	5.0	1.5	2.4	4.5
Control power supply	**Control power supply voltage [V]**	24 VDC				
	Allowable voltage range for control power supply [V]	21.6 to 26.4 VDC				
	Rated voltage [A]	0.5				
Parallel input		6 inputs				
Parallel output		4 outputs				
Max. input pulse frequency [pps]		1 M (when differential receiver), 200 k (when open collector)				
Function	**Positioning completion width setting range [pulse]**	0 to 65535 (Pulse command unit)				
	Error excessive	±3 rotations				
	Torque limit	Parameter setting				
	Communication	USB communication				
Operating temperature range [°C]		0 to 40 (No freezing)				
Operating humidity range [%RH]		90 or less (No condensation)				
Storage temperature range [°C]		−20 to 65 (No freezing)				
Storage humidity range [%RH]		90 or less (No condensation)				
Insulation resistance [MΩ]		Between case and SG: 10 (500 VDC)				
Weight [g]		600				700

Model		LECSB1-S5	LECSB1-S7	LECSB2-S5	LECSB2-S7	LECSB2-S8
Compatible motor capacity [W]		100	200	100	200	400
Compatible encoder		Absolute 18-bit encoder (Resolution: 262144 p/rev)				
Main power supply	**Power voltage [V]**	Single phase 100 to 120 VAC (50/60 Hz)		Three phase 200 to 230 VAC (50/60 Hz) / Single phase 200 to 230 VAC (50/60 Hz)		
	Allowable voltage range [V]	Single phase 85 to 132 VAC		Three phase 170 to 253 VAC / Single phase 170 to 253 VAC		
	Rated voltage [A]	3.0	5.0	0.9	1.5	2.6
Control power supply	**Control power supply voltage [V]**	Single phase 100 to 120 VAC (50/60 Hz)		Single phase 200 to 230 VAC (50/60 Hz)		
	Allowable voltage range for control power supply [V]	Single phase 85 to 132 VAC		Single phase 170 to 253 VAC		
	Rated voltage [A]	0.4		0.2		
Parallel input		10 inputs				
Parallel output		6 outputs				
Max. input pulse frequency [pps]		1 M (when differential receiver), 200 k (when open collector)				
Function	**Positioning completion width setting range [pulse]**	0 to 10000 (Pulse command unit)				
	Error excessive	±3 rotations				
	Torque limit	Parameter setup or external analog input setup (0 to 10 VDC)				
	Communication	USB communication, RS422 communication*1				
Operating temperature range [°C]		0 to 40 (No freezing)				
Operating humidity range [%RH]		90 or less (No condensation)				
Storage temperature range [°C]		−20 to 65 (No freezing)				
Storage humidity range [%RH]		90 or less (No condensation)				
Insulation resistance [MΩ]		Between case and SG: 10 (500 VDC)				
Weight [g]		800				1000

∗1 USB communication and RS422 communication cannot be performed at the same time.

Model Selection

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

LEFS

LEFB

LECA6 / LECP6
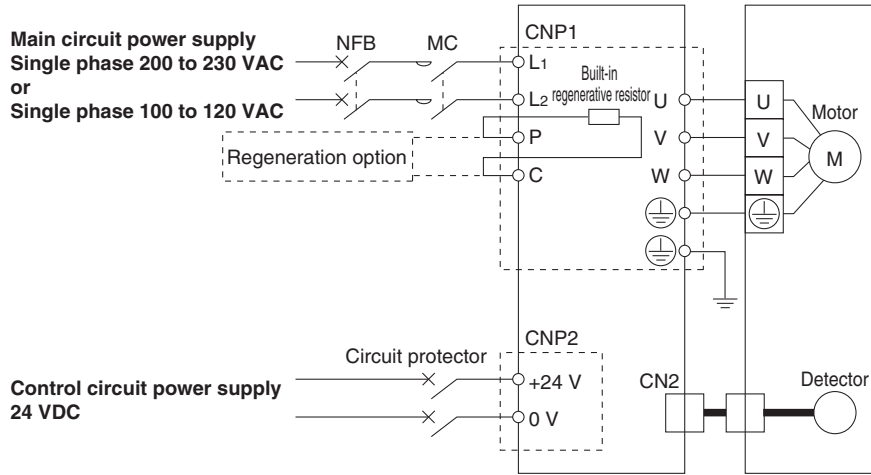
LECP1

AC Servo Motor

LEFS☐S

LECSA / LECSB

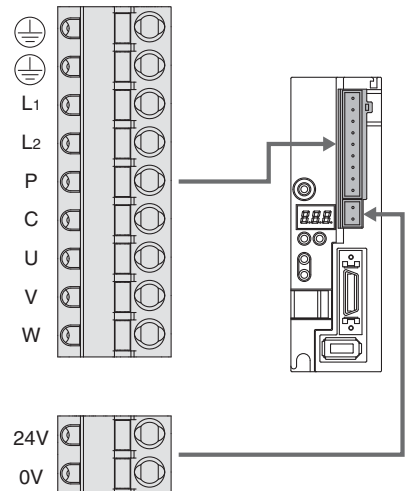Specific Product Precautions

Series *LECSA*
Series *LECSB*

Power Supply Wiring Example: LECSA

LECSA□-□

Main Circuit Power Supply Connector: CNP1 ∗Accessory

| Terminal name	Function	Function details
⏚	Protective earth (PE)	Should be grounded via servo motor's earth terminal and control panel's protective earth (PE) after connecting them.
L₁	Main circuit power supply	Connect the main circuit power supply. LECSA1: Single phase 100 to 120 VAC, 50/60 Hz LECSA2: Single phase 200 to 230 VAC, 50/60 Hz
L₂		
P	Regeneration option	Terminal to connect regeneration option LECSA□-S1: No need for connection LECSA□-S3, S4: Connected at time of shipping. ∗ If regeneration option is required for "Model Selection", connect to this terminal.
C		
U	Servo motor power (U)	Connect to motor cable (U, V, W)
V	Servo motor power (V)	
W	Servo motor power (W)	

Control Circuit Power Supply Connector: CNP2 ∗Accessory

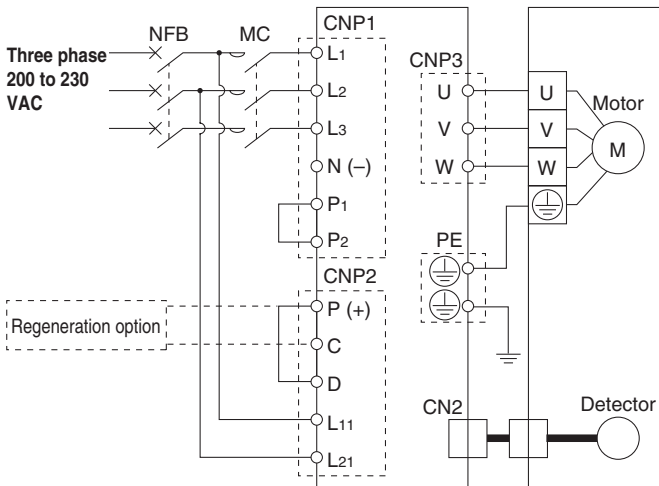| Terminal name	Function	Function details
24V	Control circuit power supply (24V)	24V side of the control circuit power supply (24 VDC) which supplies the controller.
0V	Control circuit power supply (0V)	0V side of the control circuit power supply (24 VDC) which supplies the controller.

⊕SMC

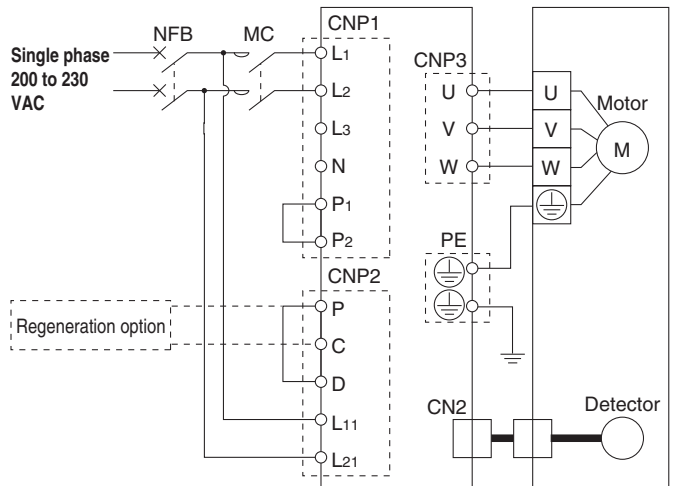## Power Supply Wiring Example: LECSB

LECSB1-□
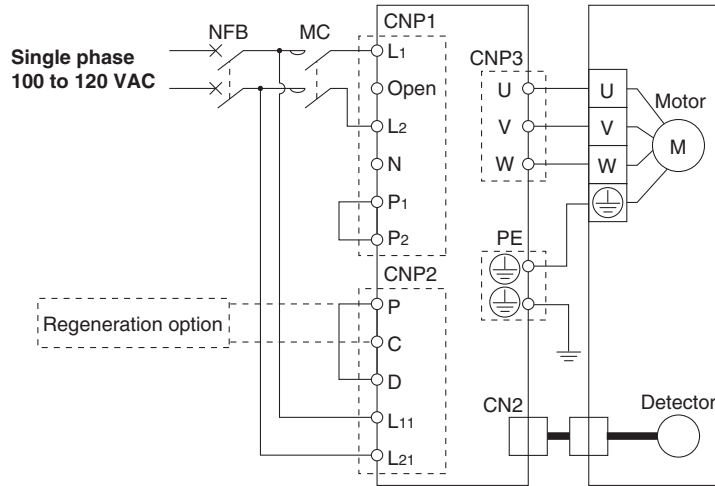
LECSB2-□

For three phase 200 VAC

For single phase 200 VAC

Note) For single phase 200 to 230 VAC, power supply should be connected to L1 and L2 terminals, with nothing connected to L3.

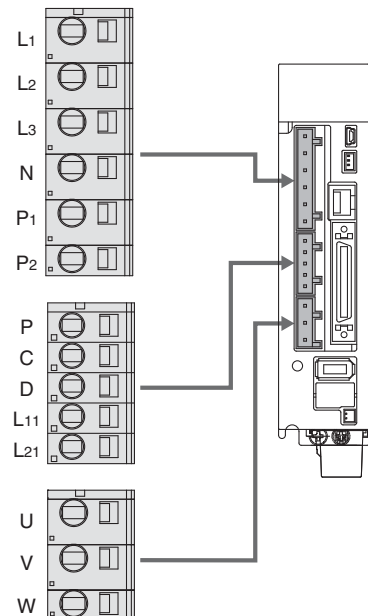### Main Circuit Power Supply Connector: CNP1   *Accessory

Terminal name	Function	Function details
L1	Main circuit power supply	Connect the main circuit power supply. LECSB1: Single phase 100 to 120 VAC, 50/60 Hz Connection terminal: L1,L2 LECSB2: Single phase 200 to 230 VAC, 50/60 Hz Connection terminal: L1,L2 Three phase 200 to 230 VAC, 50/60 Hz Connection terminal: L1,L2,L3
L2		
L3		
N	Regenerative converter	Do not connect.
P1	DC reactor	Connect between P1 and P2. (Connected at time of shipping.)
P2		

Control Circuit Power Supply Connector: CNP2   *Accessory

Terminal name	Function	Function details
P	Regeneration option	Connect between P and D. (Connected at time of shipping.) * If regeneration option is required for "Model Selection", connect to this terminal.
C		
D		
L11	Control circuit power supply (24 V)	24V side of the control circuit power supply (24 VDC) which supplies the controller.
L21	Control circuit power supply (0 V)	0V side of the control circuit power supply (24 VDC) which supplies the controller.

Motor Connector: CNP3   *Accessory

Terminal name	Function	Function details
U	Servo motor power (U)	
V	Servo motor power (V)	Connect to motor cable (U, V, W)
W	Servo motor power (W)	

SMC

Control Signal Wiring Example: LECSA

LECSA□-□

Note 1) For preventing electric shock, be sure to connect the main circuit power supply connector for the servo amplifier (CNP1)'s protective earth (PE) terminal to the control panel's protective earth (PE).
Note 2) For interface use, supply 24 VDC ±10% 200 mA using an external source. 200 mA is the value when all I/O command signals are used and reducing the number of inputs/outputs can decrease current capacity. Refer to "Operation Manual" for required current for interface.
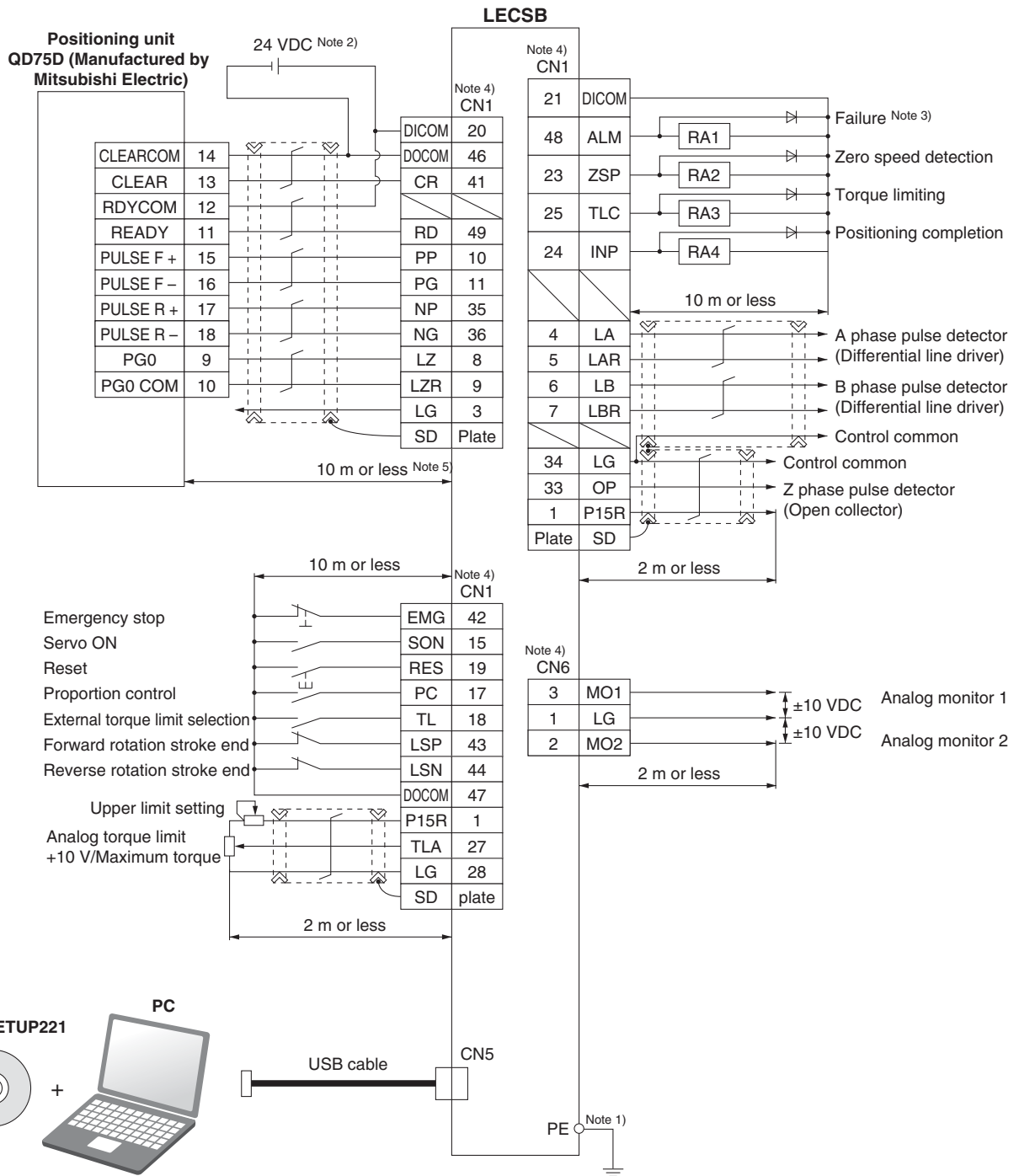Note 3) The failure (ALM) is ON during normal conditions. When it is OFF (alarm occurs), stop the sequencer signal using the sequence program.
Note 4) The same name signals are connected inside the servo amplifier.
Note 5) For command pulse input with an open collector method. When a positioning unit loaded with a differential line driver method is used, it is 10 m or less.

SMC

Control Signal Wiring Example: LECSB
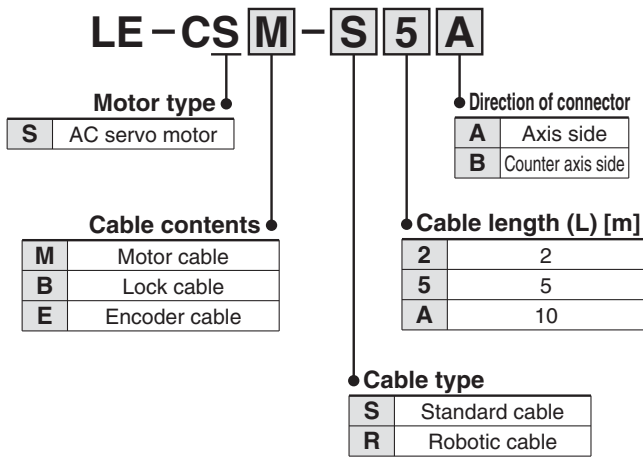
LECSB□-□

Note 1) For preventing electric shock, be sure to connect the servo amplifier's protective earth (PE) terminal to the control panel's protective earth (PE).
Note 2) For interface use, supply 24 VDC ±10% 300 mA using an external source.
Note 3) The failure (ALM) is ON during normal conditions. When it is OFF (alarm occurs), stop the sequencer signal using the sequence program.
Note 4) The same name signals are connected inside the servo amplifier.
Note 5) For command pulse input with a differential line driver method. For open collector method, it is 2 m or less.
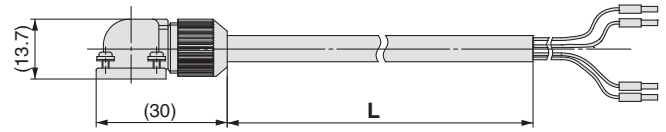
Model Selection

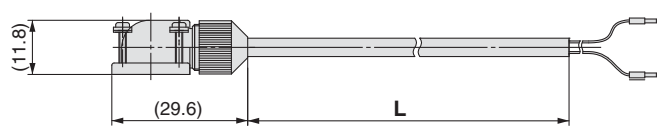Servo Motor (24 VDC)/Step Motor (Servo/24 VDC)

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor

LEFS□S

LECSA / LECSB

Specific Product Precautions

Options

Motor cable, Lock cable, Encoder cable

LE‒CS M ‒ S 5 A

Motor type

S	AC servo motor

Direction of connector

A	Axis side
B	Counter axis side

Cable contents

M	Motor cable
B	Lock cable
E	Encoder cable

Cable length (L) [m]

2	2
5	5
A	10

Cable type

S	Standard cable
R	Robotic cable

LE-CSM-□□: Motor cable

(13.7) (30) L

LE-CSB-□□: Lock cable

(11.8) (29.6) L

LE-CSE-□□: Encoder cable

(13) (30) L (37.4) (18.8)

I/O connector

LE‒C SNA

Controller type

SNA	I/O connector (LECSA□)
SNB	I/O connector (LECSB□)

LE-CSNA

37.2   39

LE-CSNB

52.4   39
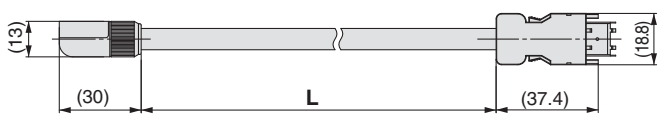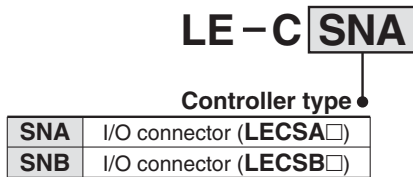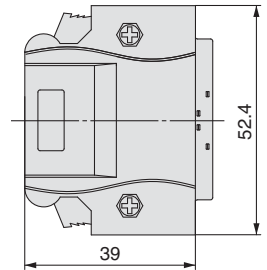
Regeneration option

LEC‒MR‒RB‒□

Regeneration option type

032	Allowable regenerative power 30 W
12	Allowable regenerative power 100 W

∗ Confirm regeneration option to be used in "Model Selection".

Dimensions [mm]

Model	LA	LB	LC	LD
LEC-MR-RB-032	30	119	99	1.6
LEC-MR-RB-12	40	169	149	2

(12) 144 5 12 (20) LC LB LD

LA ø6 Mounting hole 15 (6) 156 168 6 6

SMC
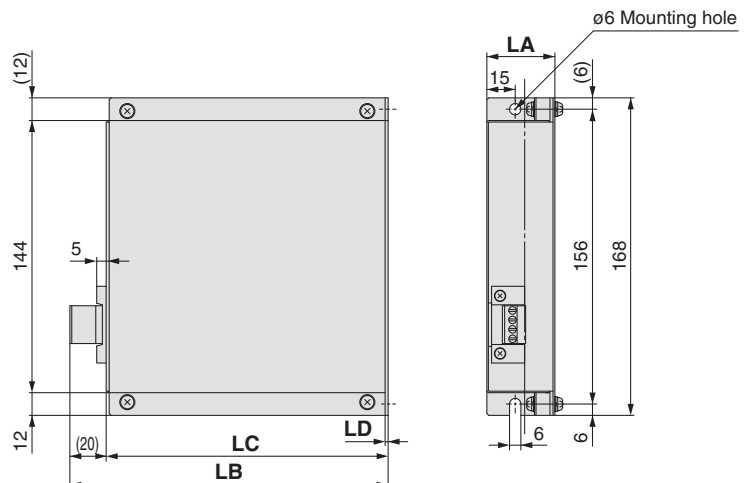
Options

MR Configurator (setup software Japanese version)

LEC‒MR‒SETUP221

∗ MRZJW3-SETUP221 manufactured by Mitsubishi Electric.
  Refer to Mitsubishi Electric's website for operating environment and update information.

Compatible PC

When using MR Configurator (setup software), use an IBM PC/AT compatible PC that meets the following operating conditions.

Hardware Requirements

Equipment		MR Configurator (setup software) **LEC-MR-SETUP221**
Note 1) Note 2) Note 3) PC	OS	Windows®98, Windows®Me, Windows®2000 Professional, Windows®XP Professional/Home Edition, Windows Vista® Home Basic/Home Premium, Business/Ultimate/Enterprise Windows®7 Starter/Home Premium/Professional/ Ultimate/Enterprise IBM PC/AT compatible PC (Japanese version)
	Available HD space	130 MB or more
	Communication interface	Use USB port
Display		Resolution 1024 x 768 or more Must be capable of high color (16 bits) display. The connectable with the above PC
Keyboard		The connectable with the above PC
Mouse		The connectable with the above PC
Printer		The connectable with the above PC
Communication cable		LEC-MR-J3USB

Note 1) Windows, Windows Vista, Windows 7 are registered trademarks of Microsoft Corporation in the United States and/or other countries.
Note 2) This software may not run correctly depending on the PC that you are using.
Note 3) Not compatible with 64-bit Windows® XP and 64-bit Windows Vista®.

For MR Configurator (setup software English version), contact your nearest sales branch.

USB cable (3 m) for setup software

LEC‒MR‒J3USB

Battery

LEC‒MR‒J3BAT

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor

LEFS□S

LECSA / LECSB

Specific Product Precautions

Design/Selection

⚠Warning

1. Be sure to apply the specified voltage.
Otherwise, malfunction and breakage may be caused. If the applied voltage is lower than the specified, it is possible that the load cannot be moved due to an internal voltage drop of the controller. Please check the operating voltage before use.

2. Do not operate the product beyond the specifications.
Otherwise, a fire, malfunction or actuator damage can result. Please check the specifications before use.

3. Install an emergency stop circuit outside of the enclosure.
Please install an emergency stop outside of the enclosure so that it can stop the system operation immediately and intercept the power supply.

4. In order to prevent damage due to the breakdown and the malfunction of the controller and its peripheral devices, a backup system should be established previously by giving a multiple-layered structure or a fail-safe design to the equipment, etc.

5. If a danger against the personnel is expected due to an abnormal heat generation, smoking, ignition, etc., of the controller and its peripheral devices, cut off the power supply for the product and the system immediately.

Handling

⚠Warning

1. Do not touch the inside of the controller and its peripheral devices.
It may cause an electric shock or damage to the controller.

2. Do not perform the operation or setting of the product with wet hands.
It may cause an electric shock.

3. Product with damage or the one lacking of any components should not be used.
It may cause an electric shock, fire, or injury.

4. Use only the specified combination between the electric actuator and controller.
It may cause damage to the actuator or the controller.

5. Be careful not to be caught or hit by the workpiece while the actuator is moving.
It may cause an injury.

6. Do not connect the power supply or power on the product before confirming the area to which the workpiece moves is safe.
The movement of the workpiece may cause an accident.

7. Do not touch the product when it is energized and for some time after power has been disconnected, as it is very hot.
It may lead to a burn due to the high temperature.

8. Check the voltage using a tester for more than 5 minutes after power-off in case of installation, wiring and maintenance.
It may cause an electric shock, fire, or injury.

Handling

⚠Warning

9. Static electricity may cause malfunction or break the controller. Do not touch the controller while power is supplied.
When touching the controller for maintenance, take sufficient measures to eliminate static electricity.

10. Do not use the product in an area where dust, powder dust, water, chemicals or oil is in the air.
It will cause failure or malfunction.

11. Do not use the product in an area where a magnetic field is generated.
It will cause failure or malfunction.

12. Do not install the product in the environment of flammable gas, explosive gas and corrosive gas.
It could lead to fire, explosion and corrosion.

13. Radiant heat from strong heat supplies such as a furnace, direct sunlight, etc., should not be applied to the product.
It will cause failure of the controller or its peripheral devices.

14. Do not use the product in an environment subject to a temperature cycle.
It will cause failure of the controller or its peripheral devices.

15. Do not use the product in a place where surges are generated.
When there are units that generate a large amount of surge around the product (e.g., solenoid type lifters, high frequency induction furnaces, motors, etc.), this may cause deterioration or damage to the product's internal circuit. Avoid supplies of surge generation and crossed lines.

16. Do not install the product in an environment under the effect of vibrations and impacts.
It will cause failure or malfunction.

17. When a surge generating load such as a relay or solenoid valve is directly driven, use a product that incorporates a surge absorption element.

Installation

⚠Warning

1. Install the controller and its peripheral devices on a fire-proof material.
A direct installation on or near a flammable material may cause fire.

2. Do not install the product in a place subject to vibrations and impacts.
It will cause failure or malfunction.

3. The controller should be affixed vertically to a vertical wall.
Do not cover the controller's exhaust opening.

4. Install the controller and its peripheral devices on a flat surface.
If the mounting surface is distorted or not flat, an unacceptable force may be added to the housing, etc., to cause troubles.

SMC

Model Selection

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

LEFS

LEFB

LECA6 / LECP6

LECP1

AC Servo Motor

LEFS□S

LECSA / LECSB

Specific Product Precautions

Series *LECSA/LECSB*
Specific Product Precautions 2

Be sure to read before handling. Refer to back cover for Safety Instructions and the Operation Manual for Electric Actuator Precautions.
Please download it via our website. http://www.smcworld.com

Power Supply

⚠ Caution

1. **Use a power supply that has low noise between lines and between power and ground.**
   In cases where noise is high, an isolation transformer should be used.

2. **To prevent surges from lightning, an appropriate measure should be taken. Ground the surge absorber for lightning separately from the grounding of the controller and its peripheral devices.**
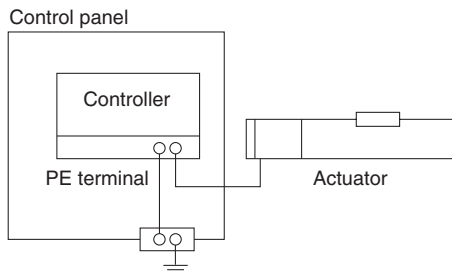

Wiring

⚠ Warning

1. **The controller will be damaged if a commercial power supply (100V/200V) is added to the controller's servo motor power (U, V, W). Be sure to check wiring such as wiring mistakes when the power supply is turned on.**

2. **Connect the ends of the U, V, W wires from the motor cable correctly to the phases (U, V, W) of the servo motor power.**
   If these wires do not match up, it is unable to control the servo motor.

Grounding

⚠ Warning

1. **Be sure to carry out grounding in order to ensure the noise tolerance.**
   For grounding actuator, connect the copper wire of the actuator to the controller's protective earth (PE) terminal and connect the copper wire of the controller to the earth via the control panel's protective earth (PE) terminal. Do not connect them directly to the control panel's protective earth (PE) terminal.

2. **In the unlikely event that malfunction is caused by ground, please disconnect the unit from ground.**

Maintenance

⚠ Warning

1. **Perform a maintenance check periodically.**
   Confirm wiring and screws are not loose.
   Loose screws or wires may cause unintentional malfunction.

2. **Conduct an appropriate functional inspection after completing the maintenance.**
   At times where the equipment or machinery does not operate properly, conduct an emergency stop of the system. Otherwise, an unexpected malfunction may occur and it will become impossible to secure the safety. Conduct a test of the emergency stop in order to confirm the safety of the equipment.

3. **Do not disassemble, modify or repair the controller and its peripheral devices.**

4. **Do not put anything conductive or flammable inside of the controller.**
   It may cause a fire.

5. **Do not conduct an insulation resistance test and withstand voltage test on this product.**

6. **Ensure sufficient space for maintenance activities.**
   Design the system that allows required space for maintenance.

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)∗1), and other safety regulations.

⚠ **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

∗1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
          (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

⚠Warning

1. **The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
   Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. **Only personnel with appropriate training should operate machinery and equipment.**
   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. **Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. **Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠Caution

1. **The product is provided for use in manufacturing industries.**
   The product herein described is basically provided for peaceful use in manufacturing industries.
   If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
   If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.∗2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

   ∗2) **Vacuum pads are excluded from this 1 year warranty.**
   A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
   Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ **Safety Instructions** | Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

SMC Corporation (Europe)

Country	Phone	Website	Email
Austria	☎ +43 (0)2262622800	www.smc.at	office@smc.at
Belgium	☎ +32 (0)33551464	www.smcpneumatics.be	info@smcpneumatics.be
Bulgaria	☎ +359 (0)2807670	www.smc.bg	office@smc.bg
Croatia	☎ +385 (0)13707288	www.smc.hr	office@smc.hr
Czech Republic	☎ +420 541424611	www.smc.cz	office@smc.cz
Denmark	☎ +45 70252900	www.smcdk.com	smc@smcdk.com
Estonia	☎ +372 6510370	www.smcpneumatics.ee	smc@smcpneumatics.ee
Finland	☎ +358 207513513	www.smc.fi	smcfi@smc.fi
France	☎ +33 (0)164761000	www.smc-france.fr	promotion@smc-france.fr
Germany	☎ +49 (0)61034020	www.smc-pneumatik.de	info@smc-pneumatik.de
Greece	☎ +30 210 2717265	www.smchellas.gr	sales@smchellas.gr
Hungary	☎ +36 23511390	www.smc.hu	office@smc.hu
Ireland	☎ +353 (0)14039000	www.smcpneumatics.ie	sales@smcpneumatics.ie
Italy	☎ +39 0292711	www.smcitalia.it	mailbox@smcitalia.it
Latvia	☎ +371 67817700	www.smclv.lv	info@smclv.lv
Lithuania	☎ +370 5 2308118	www.smclt.lt	info@smclt.lt
Netherlands	☎ +31 (0)205318888	www.smcpneumatics.nl	info@smcpneumatics.nl
Norway	☎ +47 67129020	www.smc-norge.no	post@smc-norge.no
Poland	☎ +48 (0)222119616	www.smc.pl	office@smc.pl
Portugal	☎ +351 226166570	www.smc.eu	postpt@smc.smces.es
Romania	☎ +40 213205111	www.smcromania.ro	smcromania@smcromania.ro
Russia	☎ +7 8127185445	www.smc-pneumatik.ru	info@smc-pneumatik.ru
Slovakia	☎ +421 (0)413213212	www.smc.sk	office@smc.sk
Slovenia	☎ +386 (0)73885412	www.smc.si	office@smc.si
Spain	☎ +34 902184100	www.smc.eu	post@smc.smces.es
Sweden	☎ +46 (0)86031200	www.smc.nu	post@smc.nu
Switzerland	☎ +41 (0)523963131	www.smc.ch	info@smc.ch
Turkey	☎ +90 212 489 0 440	www.smcpnomatik.com.tr	info@smcpnomatik.com.tr
UK	☎ +44 (0)845 121 5122	www.smcpneumatics.co.uk	sales@smcpneumatics.co.uk

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