Electric Actuators

Miniature Rod Type | Miniature Slide Table Type

Step Motor (Servo/24 VDC)

New

CE RoHS

Compact and lightweight

- Maximum pushing force: **11 lbf** (50N)
- Positioning repeatability: **±0.05** mm
- Possible to set position, speed and force. (64 points)

Rod Type *Series LEPY*

Size: 6, 10

Weight **8.5 oz**

□LEPY6□-25

Slide Table Type *Series LEPS*

Size: 6, 10

Weight **10 oz**

□LEPS6□-25

Linear guide integrated

Offering 2 types of controller

▶Step data input type
Series LECP6
- 64 points positioning
- Input using controller setting kit or teaching box

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

Series LEPY/LEPS

SMC

CAT.NAS100-92A

Compact and lightweight

Rod Type *Series LEPY*

Weight **8.5 oz**

(LEPY6□-25)

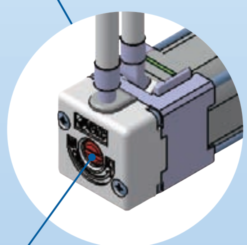
Slide Table Type *Series LEPS*

Weight **10 oz**

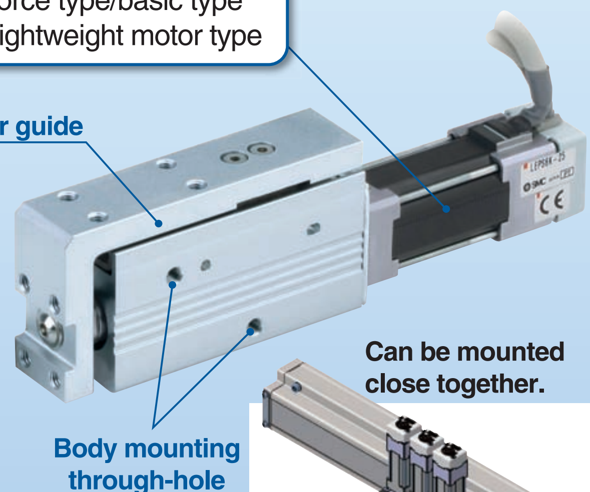
(LEPS6□-25)

Motor type can be selected to suit the application.
(Size 10 only)

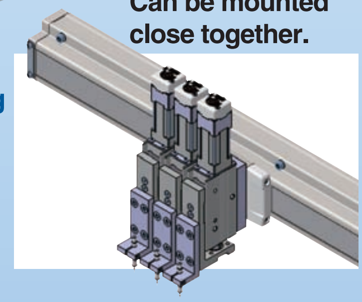
- High pushing force type/basic type
- Compact and lightweight motor type



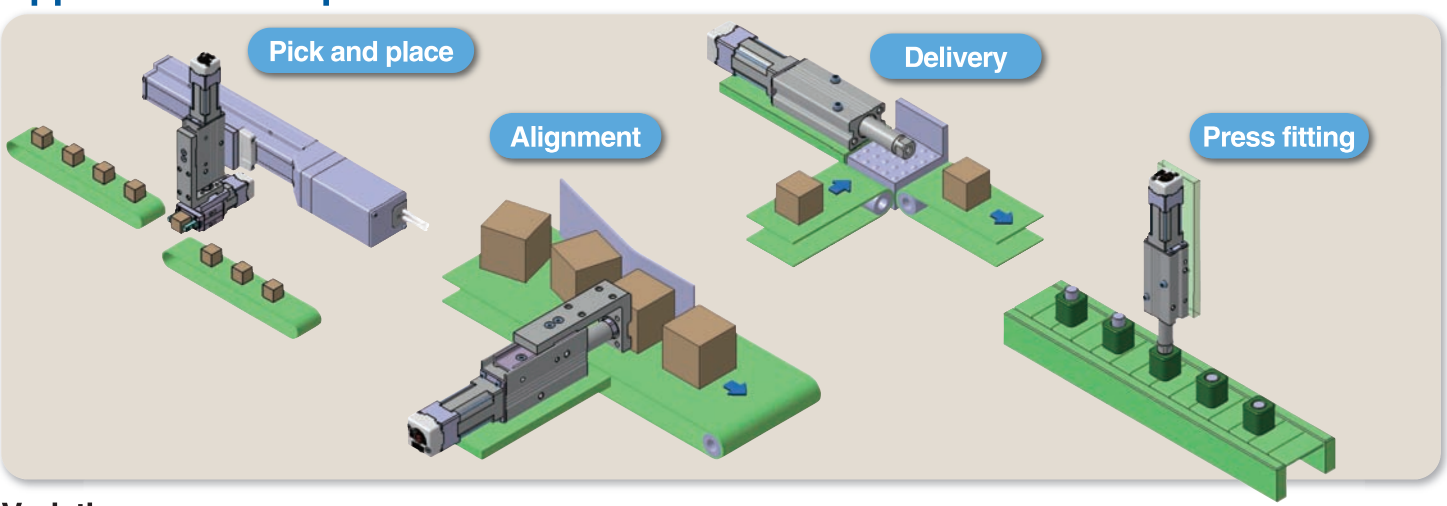
Manual override screw
For rod/table operation.
Adjustment operation possible when power OFF



Can be mounted close together.



Application Examples



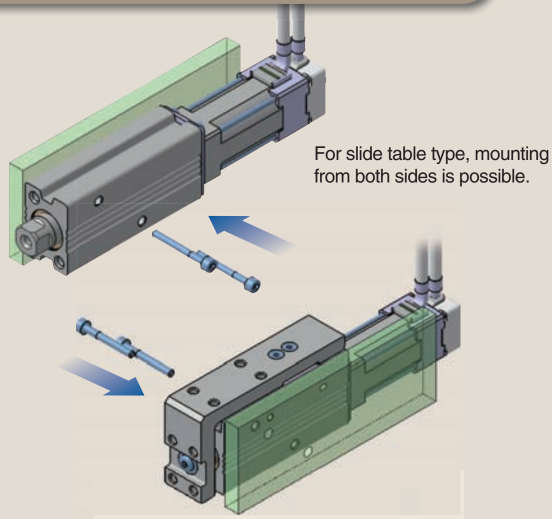
Variations

Type	Size	Screw lead	Pushing force [lbf]		Max. work load [lb] (Horizontal)		Max. work load [lb] (Vertical)		Max. speed [mm/s] (Horizontal)		Stroke [mm]
			Basic	Compact	Basic	Compact	Basic	Compact	Basic	Compact	
Rod type Series LEPY	6	4	3.14 to 4.5	—	2.2	—	1.1	—	150	—	25 50 75
		8	1.6 to 2.2	—	1.7	—	0.55	—	300	—	
	10	5	5.6 to 11.2	5.4 to 9.0	4.4	4.4	3.3	3.3	200	200	
		10	2.8 to 5.6	2.7 to 4.5	3.3	3.3	2.2	2.2	350	350	
Slide table type Series LEPS	6	4	3.14 to 4.5	—	2.2	—	1.1	—	150	—	25 50
		8	1.6 to 2.2	—	1.7	—	0.55	—	300	—	
	10	5	5.6 to 11.2	5.4 to 9.0	4.4	4.4	3.3	3.3	200	200	
		10	2.8 to 5.6	2.7 to 4.5	3.3	3.3	2.2	2.2	350	350	

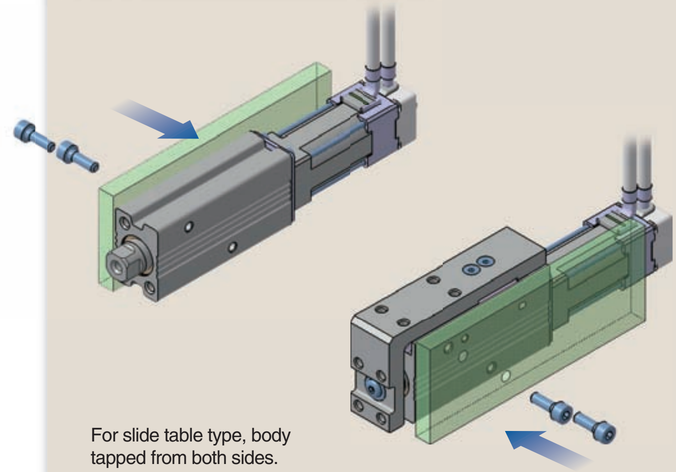
Mounting Variations

Mounting from various directions

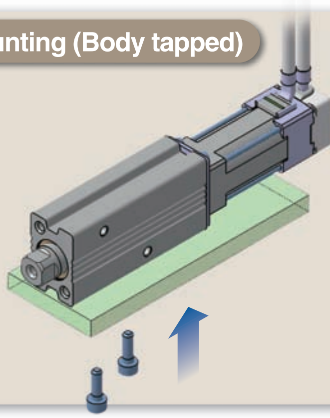
Side mounting (Body mounting through-hole)



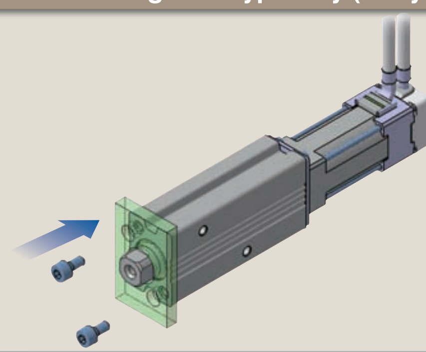
Side mounting (Body tapped)



Bottom mounting (Body tapped)



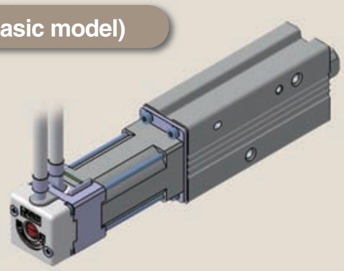
Axial mounting *Rod type only (Body tapped)



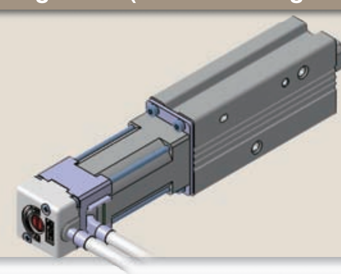
Motor Cable Entry Direction

Can be selected from 4 directions.

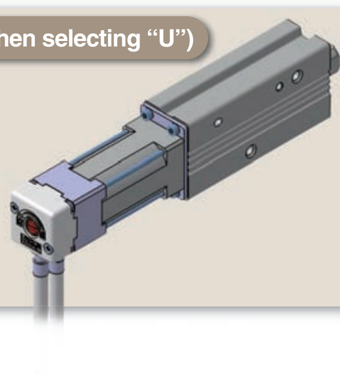
Top entry (Basic model)



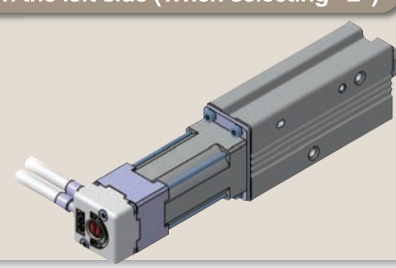
Entry on the right side (When selecting “R”)



Bottom entry (When selecting “U”)



Entry on the left side (When selecting “L”)



Offering 2 Types of Controller

Step data input type Series LECP6

Simple Setting to Use Straight Away

◎Easy Mode for Simple Setting

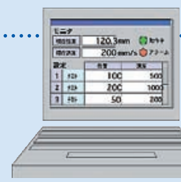
If you want to use it right away, select “Easy Mode.”

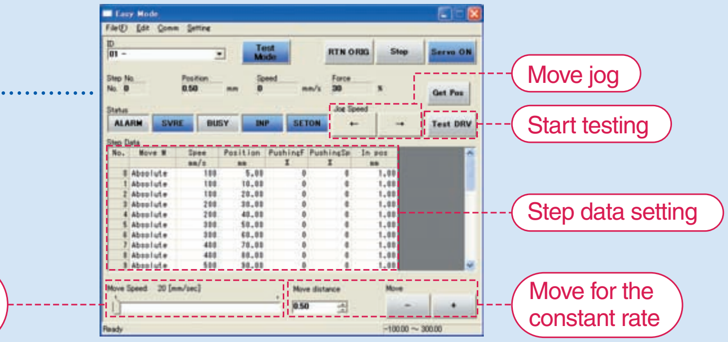
Step Motor
(Servo/24 VDC)
LECP6

<When a PC is used>

Controller setting software

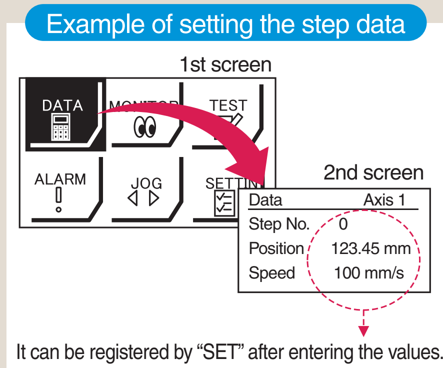
- Step data setting, test operation, move jog and move for the constant rate can be set and operated on one screen.

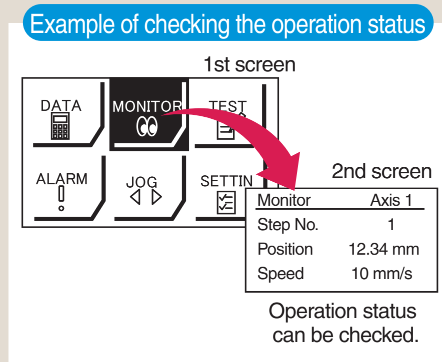




<When a TB (teaching box) is used>

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





Teaching box screen

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

Data	Axis 1
Step No.	0
Position	40.00 mm
Speed	200 mm/s

→

Data	Axis 1
Step No.	1
Position	30.00 mm
Speed	150 mm/s

Programless type Series LECP1

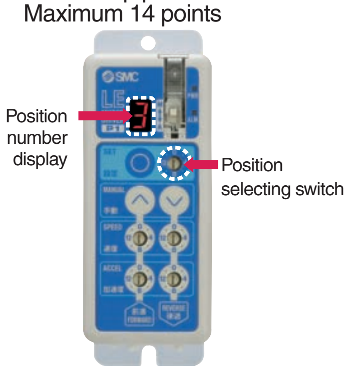
No Programming

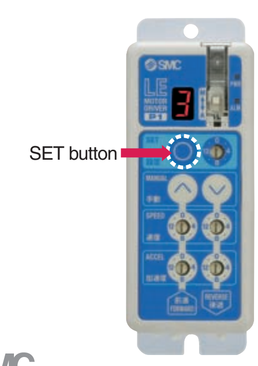
Capable of setting up an electric actuator operation without using a PC or teaching box

Step Motor
(Servo/24 VDC)
LECP1

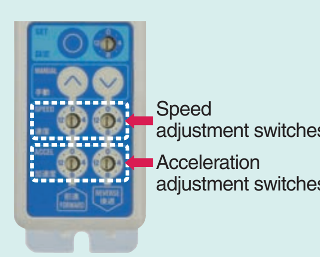
1 Setting position number → **2 Setting a stop position** → **3 Registration**

1. Setting a registered number for the stop position
Maximum 14 points
2. Moving the actuator to a stop position using FORWARD and REVERSE buttons
3. Registering the stop position using SET button





Speed/Acceleration 16-level adjustment



SMC

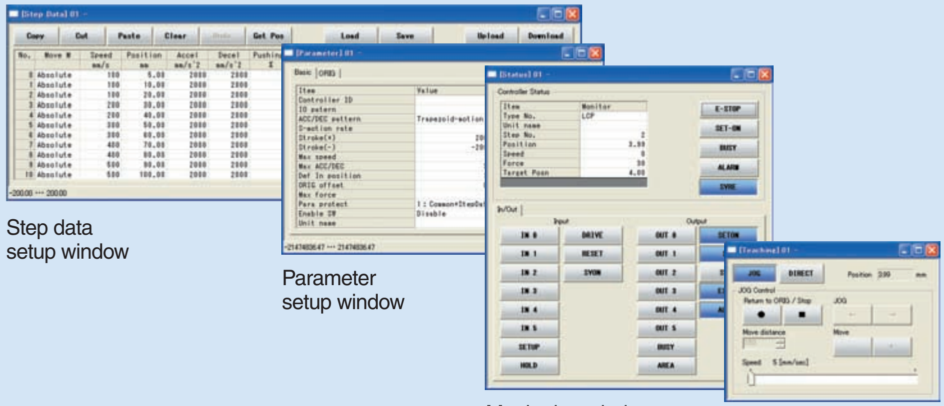
◎Normal Mode for Detailed Setting

Select normal mode when detailed 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 forced output can be performed.

<When a PC is used>
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

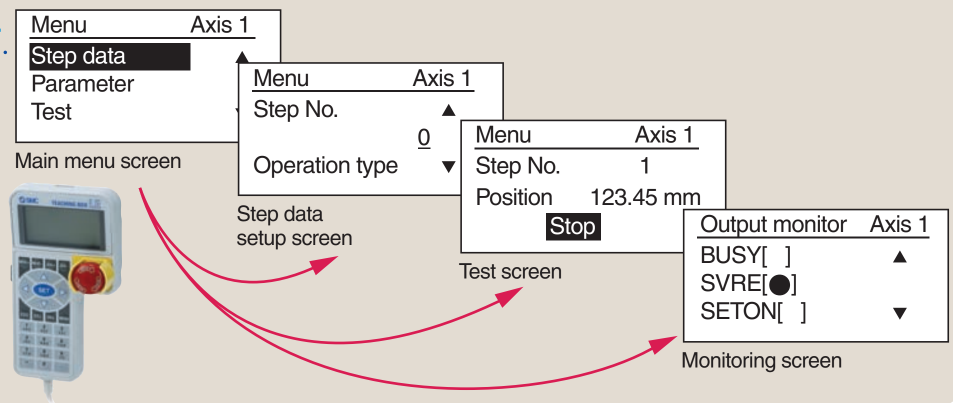
Teaching window

<When a TB (teaching box) is used>

- 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.



Main menu screen

Step data setup screen

Test screen

Monitoring screen

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

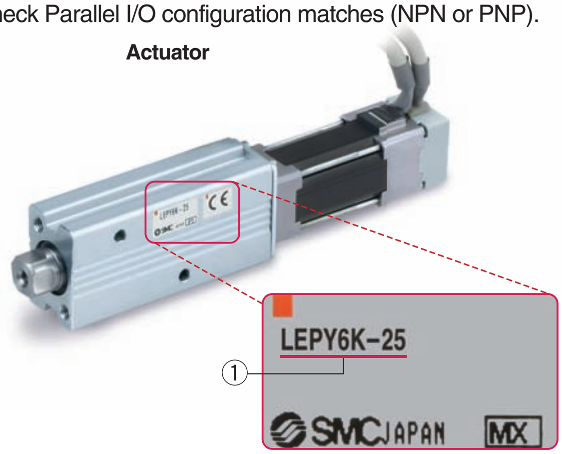
Confirm that the combination of the controller and the actuator is correct.

<Check the following before use.>

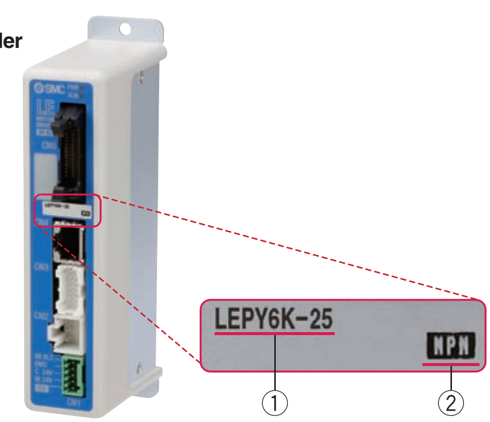
① Check the actuator label for model number. This matches the controller.

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

Actuator



Controller



Function

Item	Step data input type LECP6	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

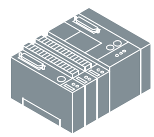
Item		Details	Step data input type LECP6	Easy mode		Normal mode	Programless type LECP1
				TB	PC	TB, PC	
Step data setting (Excerpt)	Movement method	Selection of "absolute position" and "relative position"	Set at ABS/INC	×	●	●	Fixed value (ABS)
	Speed	Transfer speed	Set in units of 1 mm/s	●	●	●	Select 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/s^2	●	●	●	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/s^2	×	×	●	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
	Forced 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	Status	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	●	●	●	—

System Construction

Supplied by customer

PLC

Power supply for I/O signal 24 VDC



● I/O cable Pages 31, 40

Controller type	Part no.
LECP6	LEC-CN5-□
LECP1 (Programless type)	LEC-CK4-□

● Controller

Step data input type
LECP6
Page 25

Programless type
LECP1
Page 35

Supplied by customer

Controller power supply 24 VDC

●Power supply connection Pages 28, 40

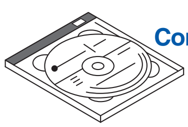
Controller type	Connection
LECP6 (Step data input type)	Power supply plug (accessory)
LECP1 (Programless type)	Power supply cable (1.5 m) (accessory)

●Actuator cable Pages 31, 40

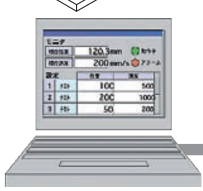
Controller type	Standard cable	Robotic cable
LECP6 (Step data input type)	LE-CP-□-S	LE-CP-□
LECP1 (Programless type)	LE-CP-□-S	LE-CP-□

●Controller setting kit (Option) Page 32

Controller setting kit
(Communication cable and USB cable are included.)
Part no.: LEC-W1



Communication cable ●
(3 m)



●USB cable
(A-mini B type)

PC

Or

●Teaching box (Option) Page 33

Part no.: LEC-T1-3JG□

with 3 m cable

Motor cable (Fixed) ●

● Electric actuator

Series LEPY Page 5
Series LEPS Page 15

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

CAT.NAS100-83

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

Guide rod type/In-line motor type
Series **LEYG□D**

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

Rod Type
AC Servo Motor (100/200 W)

CAT.NAS100-83

Basic type
Series **LEY**

Size	Stroke
25	30 to 400
32	30 to 500

In-line motor type
Series **LEY□D**

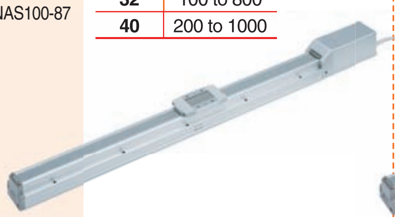
Size	Stroke
25	30 to 400
32	30 to 500

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

CAT.NAS100-87

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

AC Servo Motor (100/200/400 W)

Ball screw drive
Series **LEFS**

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

Guide Rod Slider
Step Motor (Servo/24 VDC)

CAT.NAS100-101

Belt drive
Series **LEL**

Size	Stroke
25	100 to 1000

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

CAT.NAS100-78

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

Actuators

Miniature Step Motor (Servo/24 VDC)


CAT.NAS100-92

Rod type
Series **LEPY**

Size	Stroke
6	25, 50, 75
10	

Slide table type
Series **LEPS**

Size	Stroke
6	25, 50
10	

Rotary Table Step Motor (Servo/24 VDC)


CAT.NAS100-94

Basic type
Series **LER**

Size	Rotation angle(°)
10	310, 180, 90
30	320, 180, 90
50	

High precision type
Series **LERH**

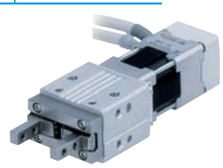
Size	Rotation angle(°)
10	310, 180, 90
30	320, 180, 90
50	

Gripper Step Motor (Servo/24 VDC)


CAT.NAS100-77

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**

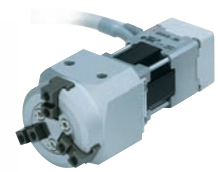
Size	Opening/closing stroke
10	4
16	6
20	10
25	14

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)

Driver

AC Servo Motor Driver Incremental type
Series **LECSA**

Control motor
AC servo motor (100/200 VAC)

AC Servo Motor Driver Absolute type
Series **LECSB**

Control motor
AC servo motor (100/200 VAC)

Series Variations

Electric Actuators *Series LEPY/LEPS*

LEPY

LEPS

Type	Size	Stroke (mm)	Screw lead	Pushing force [lbf]		Max. work load [lb] (Horizontal)		Speed (Horizontal)		Controller series	Reference page
				Basic	Compact	Basic	Compact	Basic	Compact		
Miniature rod type **LEPY**	6	25, 50 75	4	3.14 to 4.5	—	2.2	—	10 to 150	—	Series LECP6 · Series LECP1	Page 5
			8	1.6 to 2.2		1.7		20 to 300			
	10		5	5.6 to 11.2	5.4 to 9.0	4.4		10 to 200			
			10	2.8 to 5.6	2.7 to 4.5	3.3		20 to 350			
Miniature slide table type **LEPS**	6	25, 50	4	3.14 to 4.5	—	2.2	—	10 to 150	—		Page 15
			8	1.6 to 2.2		1.7		20 to 300			
	10		5	5.6 to 11.2	5.4 to 9.0	4.4		10 to 200			
			10	2.8 to 5.6	2.7 to 4.5	3.3		20 to 350			

Controller *LEC*

LECP6

Teaching Box

LECP1

Type	Series	Compatible motor	Power supply voltage	Parallel input/output		Number of positioning pattern points	Reference page
				Input	Output		
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
Programless type	**LECP1**	Step motor (Servo/24 VDC)	24 VDC ±10%	6 inputs (Photo-coupler isolation)	6 outputs (Photo-coupler isolation)	14	Page 35

INDEX

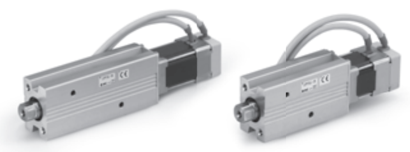
Step Motor (Servo/24 VDC) Type

◎Electric Actuator/Miniature Rod Type Series LEPY

◎Electric Actuator/Miniature Slide Table Type Series LEPS

◎Step Motor (Servo/24 VDC) Controller

Series LEPY Model Selection



Selection Procedure

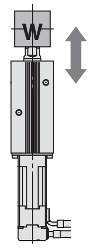
Positioning Control Selection Procedure

Step 1 Check the work load – speed. (Vertical transfer) → **Step 2** Check the cycle time.

Selection Example

Operating conditions

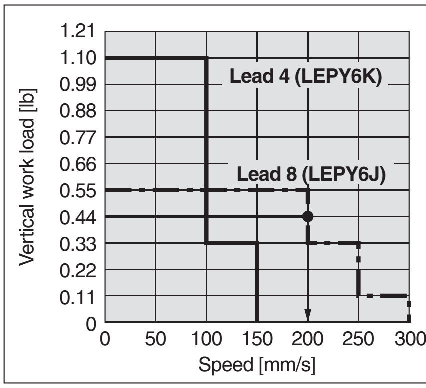
- Workpiece mass: 0.44 lbs (0.2kg)
- Speed: 200 [mm/s]
- Acceleration/Deceleration: 3000 [mm/s²]
- Stroke: 40 [mm]
- Workpiece mounting condition: Vertical upward downward transfer



Step 1 **Check the work load–speed. <Speed–Vertical work load graph>**

Select the target model based on the workpiece mass and speed with reference to the <Speed–Vertical work load graph>.
Selection example) The **LEPY6J** is temporarily selected based on the graph shown on the right side.

* It is necessary to mount a guide outside the actuator when using for horizontal transfer. When selecting the target model, please refer to the horizontal work load and cautions specified in [Specifications] on page 5.



<Speed–Vertical work load graph>
(LEPY6/Step motor)

Step 2 **Check the cycle time.**

Calculate the cycle time using the following calculation method.

Cycle time:
T can be found from the following equation.

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

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

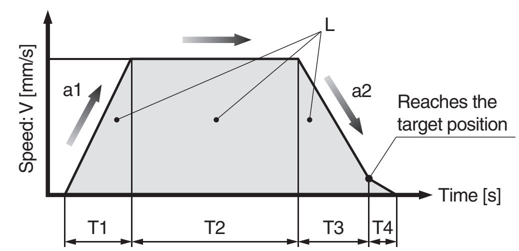
  $\boxed{T1 = V/a1\ [s]}$ $\boxed{T3 = V/a2\ [s]}$

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

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

- T4:
  Settling time varies depending on the conditions such as motor types, load and in positioning of the step data. Therefore, please calculate the settling time with reference to the following value.

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



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

Calculation example)
T1 to T4 can be calculated as follows.

$T1 = V/a1 = 200/3000 = 0.067\ [s]$, $T3 = V/a2 = 200/3000 = 0.067\ [s]$

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{40 - 0.5 \cdot 200 \cdot (0.067 + 0.067)}{200} = 0.133\ [s]$$

$T4 = 0.2\ [s]$

Therefore, the cycle time can be obtained as follows.
$T = T1 + T2 + T3 + T4 = 0.067 + 0.133 + 0.067 + 0.2 =$ **0.467 [s]**

Based on the above calculation result, the LEPY6J-50 is selected.

Selection Procedure

Pushing Control Selection Procedure

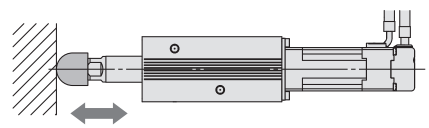
Step 1 Check the duty ratio. → **Step 2** Check the pushing force. → **Step 3** Check the lateral load on the rod end.

∗ The duty ratio is a ratio at the time that can keep being pushed.

Selection Example

Operating conditions

- Mounting condition: Horizontal (pushing)
- Jig weight: 0.44 lbs (0.2 kg)
- Pushing force: 6.7lbf (30 N)
- Duty ratio: 70 [%]
- Speed: 150 [mm/s]
- Stroke: 40 [mm]



Step 1 **Check the duty ratio. <Conversion table of pushing force-duty ratio>**

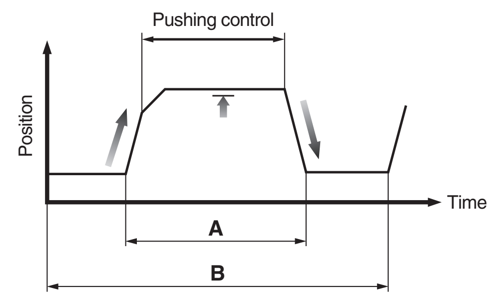
Select the [Pushing force] from the duty ratio with reference to the <Conversion table of pushing force–duty ratio>.

Selection example)
As shown in the below table, the duty ratio is 70 [%],
so the set value of pushing force will be = Can be used up to 80 [%]

<Conversion table of pushing force–duty ratio>
(LEPY10L)

Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
70 or less	100	—
80	70	10
100	50	5

∗ [Set value of pushing force] is one of the step data input to the controller.
∗ [Continuous pushing time] is the time that the actuator can continuously keep pushing.



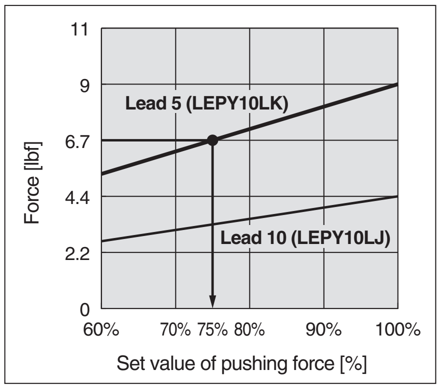
Duty ratio = A/B x 100 [%]

Step 2 **Check the pushing force. <Force conversion graph>**

Select the target model based on the set value of pushing force and pushing force with reference to the (Speed–Vertical work load graph).

Selection example)
Based on the graph shown on the right side,
- Set value of pushing force: 75 [%]
- Pushing force: 6.7 lbf (30N)

Therefore, the **LEPY10LK** is temporarily selected.



<Force conversion graph>
(LEPY10L)

Step 3 **Check the lateral load on the rod end. <Graph of allowable lateral load on the rod end>**

Confirm the allowable lateral load on the rod end of the actuator:
LEPY10L, which has been selected temporarily with reference to the <Graph of allowable lateral load on the rod end>.

Selection example)
The jig weight is 1.1 lbs (0.05 kg) ≈ 0.11 lbf (0.5 N) from the table below,
so that lateral load on the rod end is allowable.

<Allowable lateral load on the rod end>

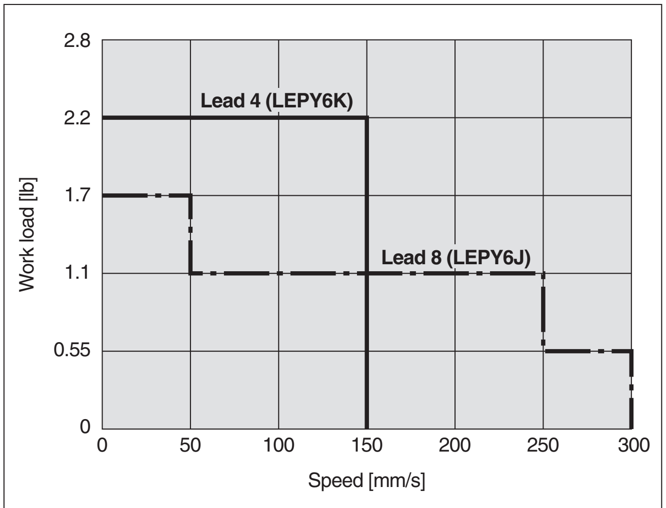
Model	Allowable lateral load on the rod end lbf [N]
LEPY6 (Basic)	0.11 (0.50)
LEPY10 (Basic)	0.22 (1.0)
LEPY10L (Compact)	0.22 (1.0)

Based on the above calculation result, the LEPY10LK-50 is selected.

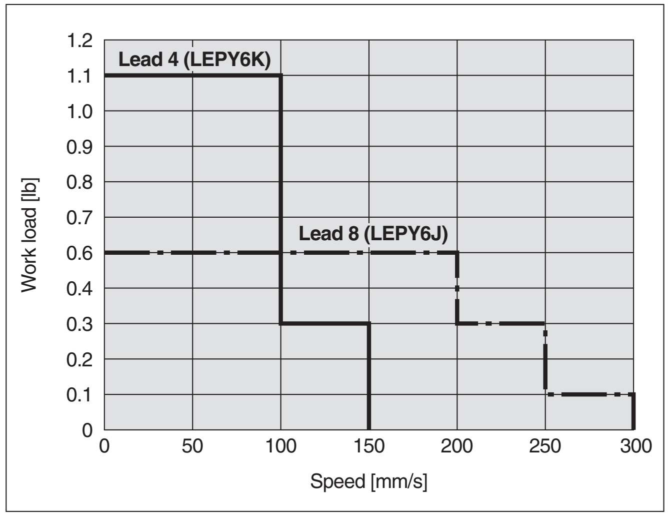
Speed–Work Load Graph (Guide)

LEPY6 (Basic)

Horizontal

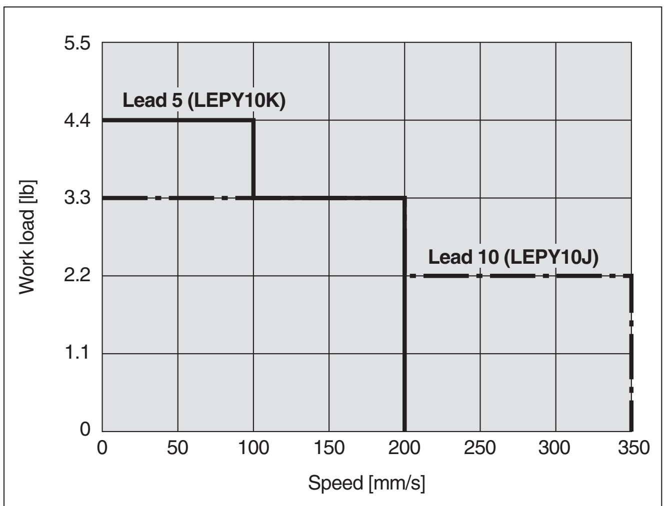


Vertical

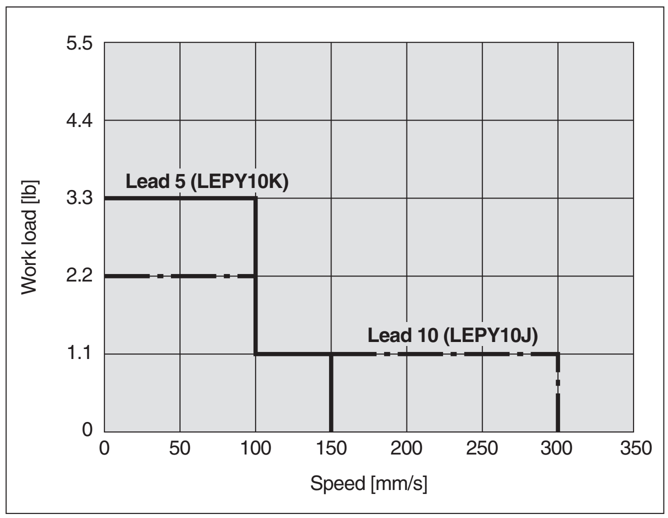


LEPY10(L) (Basic/Compact)

Horizontal

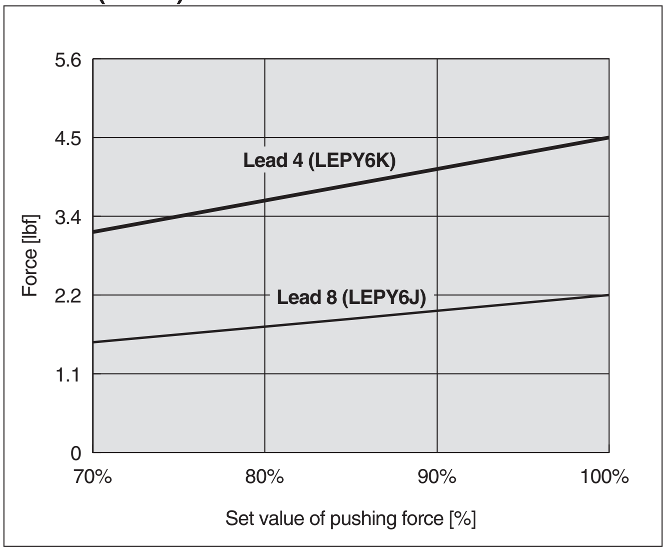


Vertical



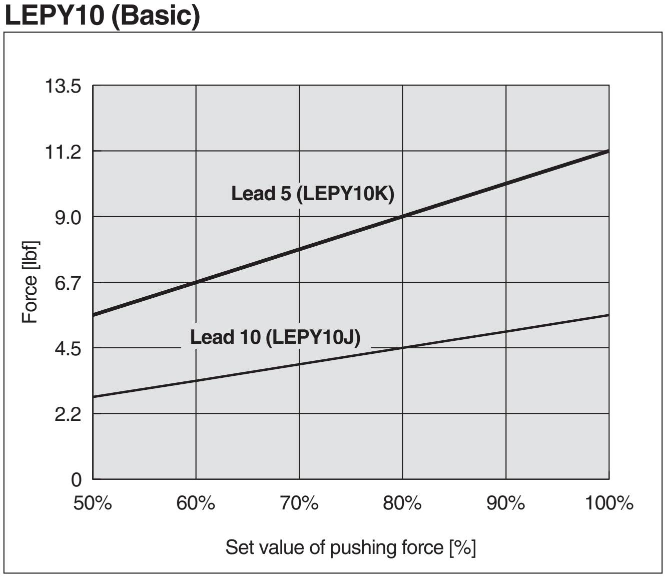
Force Conversion Graph (Guide)

LEPY6 (Basic)



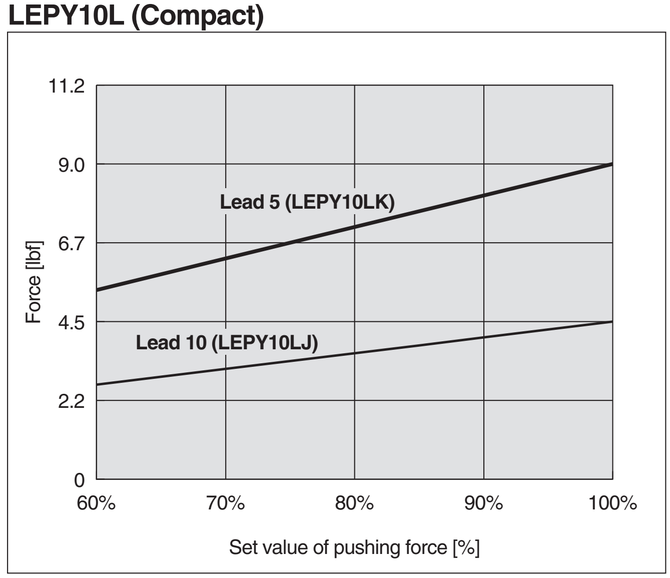
Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
70	100	—
80	70	10
100	50	5

LEPY10 (Basic)



Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
60 or less	100	—
70	30	3
100	15	1

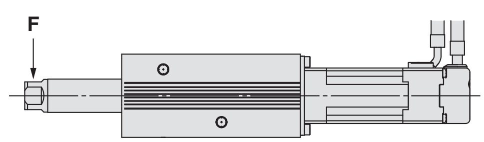
LEPY10L (Compact)



Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
70 or less	100	—
80	70	10
100	50	5

Allowable Lateral Load on the Rod End

Model	Allowable lateral load on the rod end lbf [N]
LEPY6 (Basic)	0.11 (0.50)
LEPY10 (Basic)	0.22 (1.0)
LEPY10L (Compact)	0.22 (1.0)



Electric Actuator
Miniature Rod Type
Step Motor (Servo/24 VDC)
Series LEPY
LEPY6, 10

CE RoHS

How to Order

LEPY 10 [ ] K – 50 [ ] – R 1 6N 1 [ ]

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Size

6
10

❷ Motor size

Symbol	Motor size	Applicable size
Nil	Basic type	6, 10
L	Compact type	10

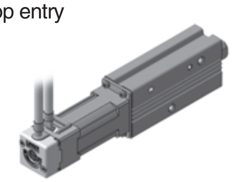
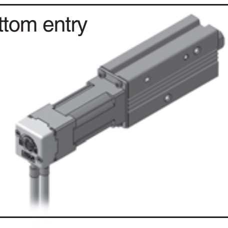
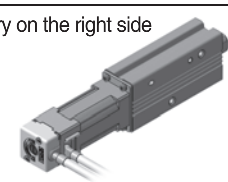
❸ Lead screw type [mm]

Symbol	Screw lead	
	LEPY6	**LEPY10**
K	4	5
J	8	10

❹ Stroke [mm]

Symbol	Stroke
25	25
50	50
75	75

❺ Motor cable mounting direction

Nil	Top entry 	**L**	Entry on the left side 
U	Bottom entry 	**R**	Entry on the right side 

❻ Actuator cable type*

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

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

⚠Caution

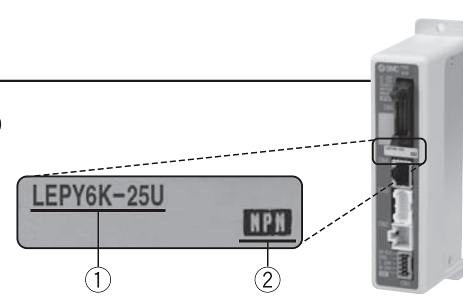
Note) CE-compliant products
EMC compliance was tested by combining the electric actuator LEP series and the controller LEC series. The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore conformity to the EMC directive 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.

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

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

<Check the following before use.>

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



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

❼ Actuator cable length [m]

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

* Produced upon receipt of order (Robotic cable only)
Refer to the specifications Note 6) on page 7.

❽ Controller type

Nil	Without controller	
6N	**LECP6** (Step data input type)	NPN
6P		PNP
1N	**LECP1** (Programless type)	NPN
1P		PNP

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

❾ I/O cable length [m]

Nil	Without cable
1	1.5*
3	3*
5	5*

* When "Without controller" is selected for controller types, I/O cable length cannot be selected.

❿ Controller mounting

Nil	Screw mounting
D	DIN rail mounting*

* Only available for the controller types “6N” and “6P”
DIN rail is not included. Order it separately.
(Refer to page 26.)

Compatible Controllers

Type	**Step data input type** 	**Programless type** 
Series	**LECP6**	**LECP1**
Features	Value input Standard controller	Capable of setting up operation without using a PC or teaching box
Compatible motor	Step motor (Servo/24 VDC)	
Maximum number of step data	64 points	14 points
Power supply voltage	24 VDC	
Reference page	Page 25	Page 35

Specifications

	Model			LEPY6		LEPY10	
Actuator specifications	Stroke [mm]			25, 50, 75			
	Screw lead [mm]			4	8	5	10
	Pushing force [lbf] Note 1)		Basic	3.1 to 4.5	1.6 to 2.2	5.5 to 11.2	2.8 to 5.6
			Compact	—	—	5.4 to 9.0	2.7 to 4.5
	Max. work load [lb] Note 2) Note 3)	Horizontal	Basic	2.2	1.6	4.4	3.3
			Compact	—	—	4.4	3.3
		Vertical	Basic	1.1	0.55	3.3	2.2
			Compact	—	—	3.3	2.2
	Speed [mm/s] Note 3) Note 6)	Horizontal	Basic	10 to 150	20 to 300 Note 4)	10 to 200	20 to 350 Note 4)
			Compact	—	—	10 to 200	20 to 350 Note 4)
		Vertical	Basic	10 to 150	20 to 300 Note 4)	10 to 150	20 to 300 Note 4)
			Compact	—	—	10 to 150	20 to 300 Note 4)
	Pushing speed [mm/s] Note 5)			10	20	10	20
	Acceleration/Deceleration [mm/s²]			3000			
	Positioning repeatability [mm]			±0.05			
	Backlash [mm]			±0.1			
	Impact/Vibration resistance [m/s²] Note 7)			50/20			
	Actuation type			Slide screw			
	Guide type			Sliding bushing			
	Max. operating frequency [c.p.m]			60			
	Operating temperature range			41 to 104°F (5 to 40°C)			
	Operating humidity range [%RH]			90 or less (No condensation)			
Electric specifications	Motor size			□20		□28	
	Motor type			Step motor (Servo/24 VDC)			
	Encoder			Incremental A/B phase (800 pulse/rotation)			
	Rated voltage [V]			DC 24 ±10%			
	Power consumption [W] Note 8)		Basic	12		28	
			Compact	—		22	
	Standby power consumption when operating [W] Note 9)		Basic	11		22	
			Compact	—		16	
	Momentary max. power consumption [W] Note 10)		Basic	22		55	
			Compact	—		45	
	Controller weight lb [kg]			0.33 [0.15] (Screw mounting), 0.37 [0.17] (DIN rail mounting)			

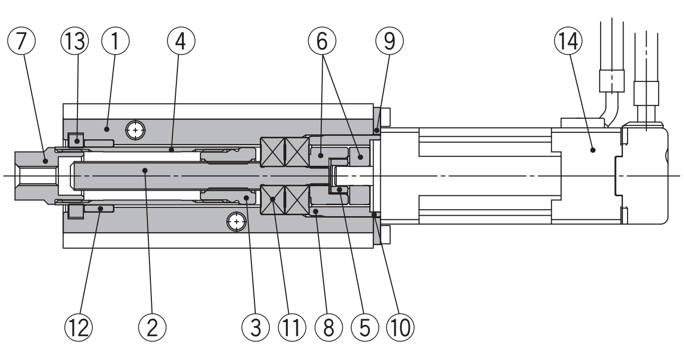
Weight

Model		LEPY6		
Stroke [mm]		25	50	75
Product weight [lb]	Basic	0.5	0.6	0.7

Model		LEPY10		
Stroke [mm]		25	50	75
Product weight [lb]	Basic	1.04	1.2	1.37
	Compact	0.9	1.08	1.3

Note 1) Pushing force accuracy is LEPY6: ±30% (F.S.), LEPY10: ±25% (F.S.).
Refer to page 22 for the detailed setting range and precautions.
The pushing force and the duty ratio are changed by the set value. Check “Force Conversion Graph (Guide)” on page 4 and [14] on page 22.
Note 2) The maximum value of the work load for the positioning operation. An external guide is necessary to support the load. The actual work load and transfer speed are changed by the condition of the external guide.
Note 3) Speed is changed by the work load. Check “Speed–Work Load Graph (Guide)” on page 3.
Note 4) When the stroke is 25 mm, the maximum speed will be 250 mm/sec.
Note 5) Set to the pushing force when pushing.
Note 6) The speed and force may change depending on the cable length, load and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)
Note 7) 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 8) Power consumption (including the controller) is for when the actuator is operating.
Note 9) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation. Except during pushing operation.
Note 10) 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.

Construction

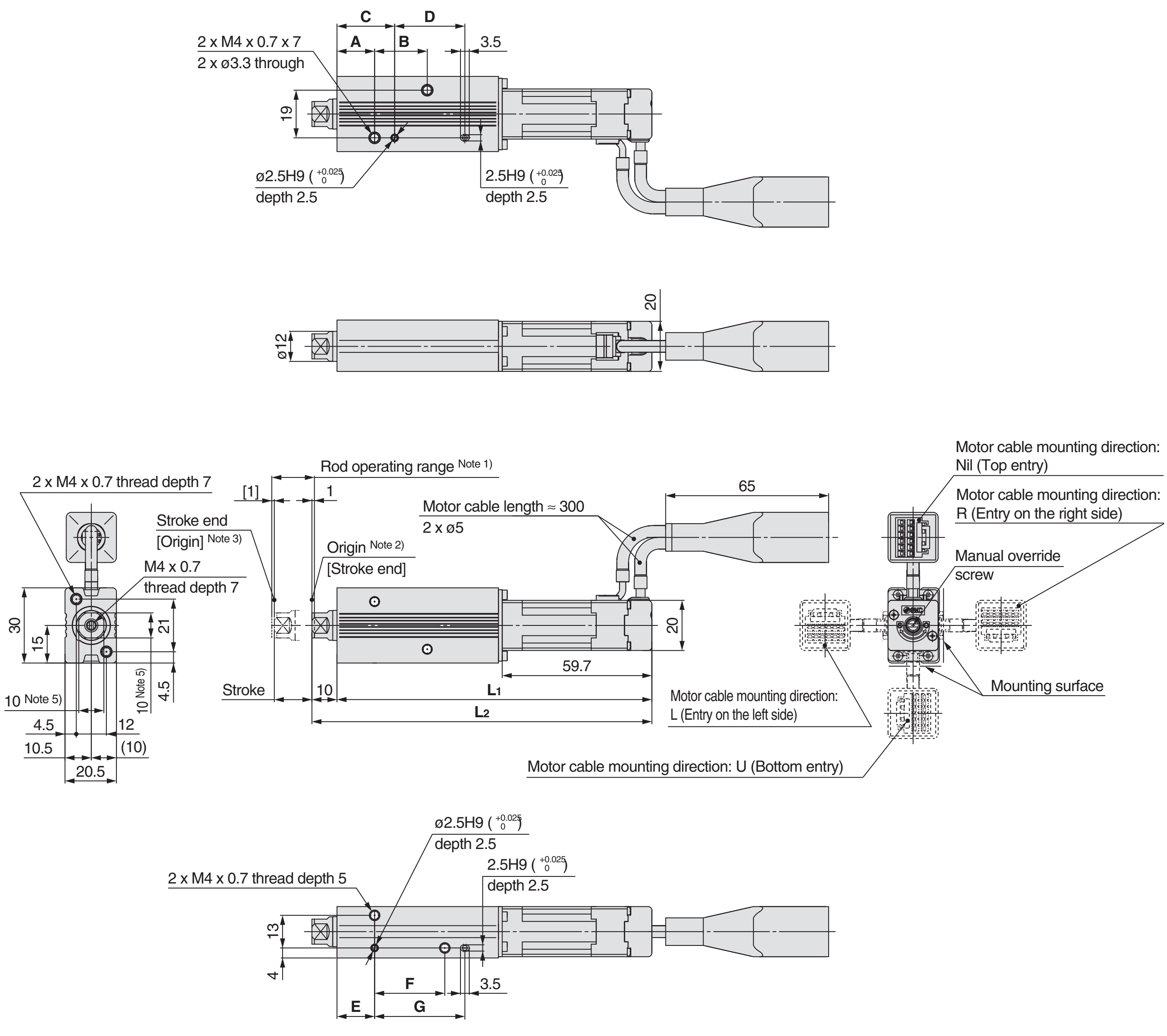


Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Anodized
2	Screw shaft	Stainless steel	Heat treatment + Specially treated
3	Screw nut	Stainless steel	Heat treatment + Specially treated
4	Rod	Stainless steel	
5	Spider	NBR	
6	Hub	Aluminum alloy	
7	Socket	Free cutting carbon steel	Nickel plated
8	Bearing stopper	Size 6: Aluminum alloy Size 10: Carbon steel	
9	Motor plate	Aluminum alloy	Anodized
10	Guide ring	Aluminum alloy	Size 10 only
11	Bearing	—	
12	Bushing	Oil impregnated sintered copper alloy	
13	Soft wiper	—	
14	Step motor (Servo/24 VDC)	—	

Dimensions

LEPY6



Note 1) Range within which the rod can move when it returns to origin. Make sure a workpiece mounted on the rod does not interfere with the workpieces and facilities around the rod.
Note 2) Position after return to origin.
Note 3) The number in brackets indicates when the direction of return to origin has changed.
Note 4) Do not apply rotational torque to the rod end.
Note 5) The direction of rod end width across flats (□10) differs depending on the products.

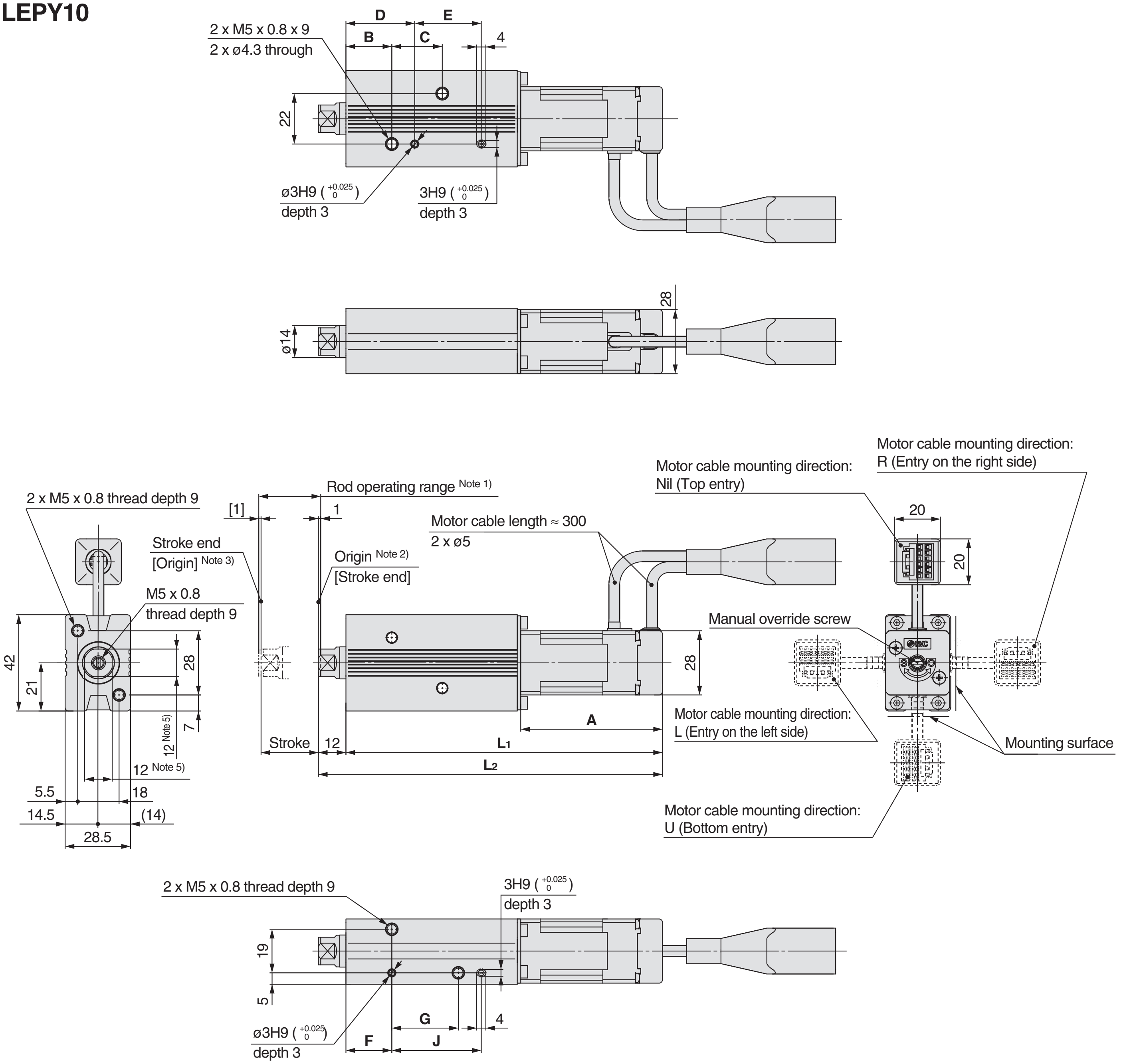
Dimensions

[mm]

Model	L1	L2	A	B	C	D	E	F	G
LEPY6□-25□	125.6	135.6	15	21	23	28	15	28	36
LEPY6□-50□	156.6	166.6	22	45	30	52	22	52	60
LEPY6□-75□	188.6	198.6	29	70	37	77	29	77	85

Dimensions

LEPY10



Note 1) Range within which the rod can move when it returns to origin. Make sure a workpiece mounted on the rod does not interfere with the workpieces and facilities around the rod.
Note 2) Position after return to origin.
Note 3) The number in brackets indicates when the direction of return to origin has changed.
Note 4) Do not apply rotational torque to the rod end.
Note 5) The direction of rod end width across flats (□12) differs depending on the products.

Dimensions

[mm]

Model	L_1	L_2	A	B	C	D	E	F	G	J
LEPY10□-25□	138	150	61.8	20	22	30	29	20	29	39
LEPY10□-50□	163	175		24	43	34	50	24	50	60
LEPY10□-75□	198	210		30	72	40	79	30	79	89
LEPY10L□-25□	124	136	47.8	20	22	30	29	20	29	39
LEPY10L□-50□	149	161		24	43	34	50	24	50	60
LEPY10L□-75□	184	196		30	72	40	79	30	79	89

Series LEPS Model Selection

Selection Procedure

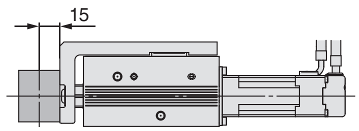
Positioning Control Selection Procedure

Step 1 Check the work load – speed. (Horizontal transfer) → **Step 2** Check the cycle time. → **Step 3** Check the guide allowable moment.

Selection Example

Operating conditions

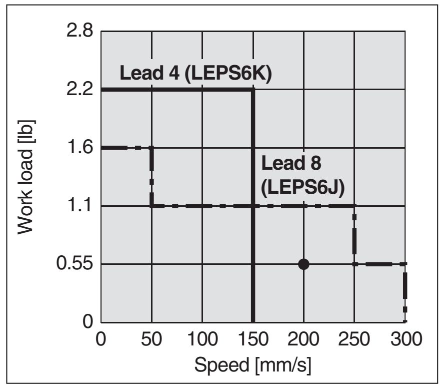
- Workpiece mass: 0.55 lb (0.25 kg)
- Speed: 200 [mm/s]
- Acceleration/Deceleration: 3000 [mm/s²]
- Stroke: 20 [mm]
- Workpiece mounting condition: Horizontal transfer



Step 1 Check the work load–speed. <Speed–Horizontal work load graph>

Select the target model based on the workpiece mass and speed with reference to the <Speed–Horizontal work load graph>.
Selection example) The **LEPS6J** is temporarily selected based on the graph shown on the right side.

LEPS6 (Basic)



**<Speed–Horizontal work load graph>
(LEPS6/Step motor)**

Step 2 Check the cycle time.

Calculate the cycle time using the following calculation method.
Cycle time: T can be found from the following equation.

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

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

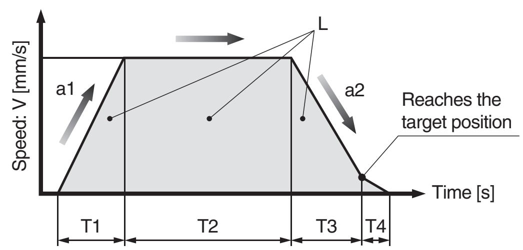
$$T1 = V/a1 \text{ [s]} \qquad T3 = V/a2 \text{ [s]}$$

- 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.

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



L : Stroke [mm] ··· (Operating condition)
V : Speed [mm/s] ··· (Operating condition)
a1 : Acceleration [mm/s²] ··· (Operating condition)
a2 : Deceleration [mm/s²] ··· (Operating condition)

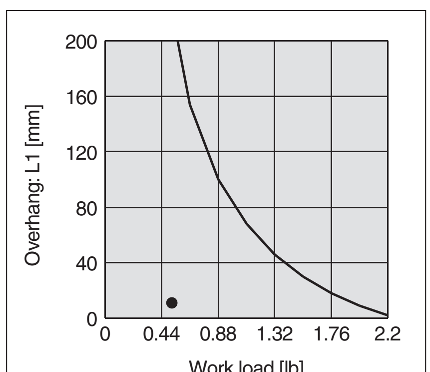
T1: Acceleration time [s] ··· Time until reaching the set speed
T2: Constant speed time [s] ··· Time while the actuator is operating at a constant speed
T3: Deceleration time [s] ··· Time from the beginning of the constant speed operation to stop
T4: Settling time [s] ··· Time until in position is completed

Calculation example)
T1 to T4 can be calculated as follows.
$T1 = V/a1 = 200/3000 = 0.067$ [s], $T3 = V/a2 = 200/3000 = 0.067$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{20 - 0.5 \cdot 200 \cdot (0.067 + 0.067)}{200} = 0.033 \text{ [s]}$$

$T4 = 0.2$ [s]
Therefore, the cycle time can be obtained as follows.
$T = T1 + T2 + T3 + T4 = 0.067 + 0.033 + 0.067 + 0.2 + 0.367$ [s]

Step 3 Check the guide allowable moment.



Check the guide allowable moment

Based on the above calculation result, the LEPS6J-25 is selected.

Selection Procedure

Pushing Control Selection Procedure

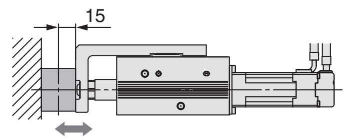
Step 1 Check the duty ratio. → **Step 2** Check the pushing force. → **Step 3** Check the guide allowable moment.

∗ The duty ratio is a ratio at the time that can keep being pushed.

Selection Example

Operating conditions

- Mounting condition: Horizontal (pushing)
- Jig weight: 0.88 lbf (0.4kg)
- Pushing force: 6.7 lbf (30 N)
- Duty ratio: 70 [%]
- Speed: 150 [mm/s]
- Stroke: 40 [mm]



Step 1 **Check the duty ratio. <Conversion table of pushing force-duty ratio>**

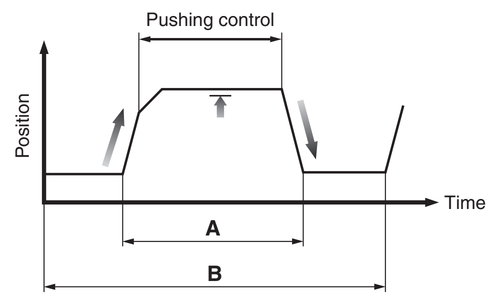
Select the [Pushing force] from the duty ratio with reference to the <Conversion table of pushing force–duty ratio>.

Selection example)
As shown in the below table, the duty ratio is : 70 [%]
so the set value of pushing force will be = Can be used up to 80 [%]

<Conversion table of pushing force–duty ratio>
(LEPS10L)

Set value of pushing force [%]	Duty ratio (%)	Continuous pushing time [minute]
70 or less	100	—
80	70	10
100	50	5

∗ [Set value of pushing force] is one of the step data input to the controller.
∗ [Continuous pushing time] is the time that the actuator can continuously keep pushing.



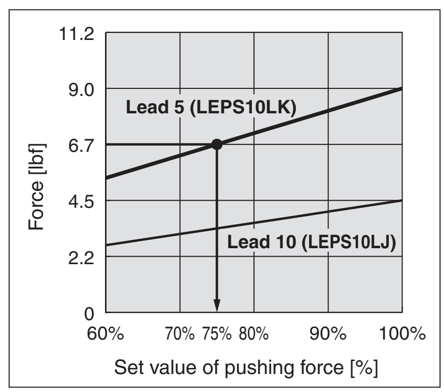
Duty ratio = A/B x 100 [%]

Step 2 **Check the pushing force. <Force conversion graph>**

Select the target model based on the set value of pushing force and pushing force with reference to the <Speed–Vertical work load graph>.

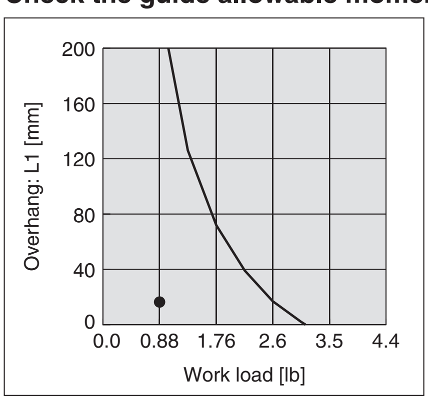
Selection example)
Based on the graph shown on the right side,
- Set value of pushing force: 75 [%]
- Pushing force: 6.7 lbf (30 N)

Therefore, the **LEPS10LK** is temporarily selected.



<Force conversion graph>
(LEPS10L)

Step 3 **Check the guide allowable moment.**

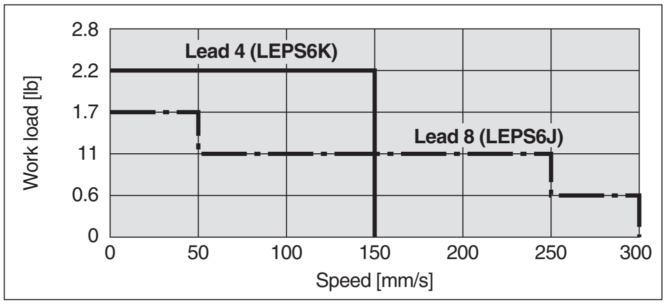


Based on the above calculation result, the LEPS10LK-50 is selected.

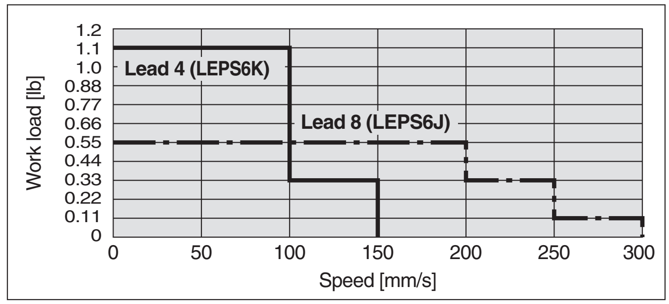
Speed–Work Load Graph (Guide)

LEPS6 (Basic)

Horizontal

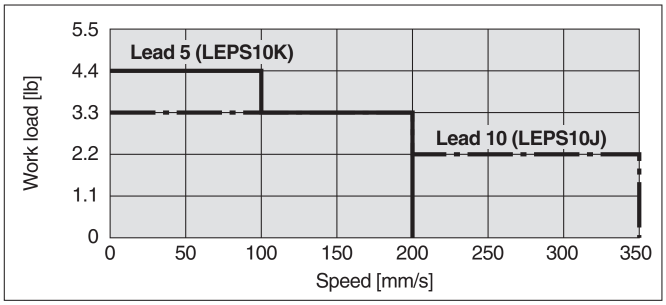


Vertical

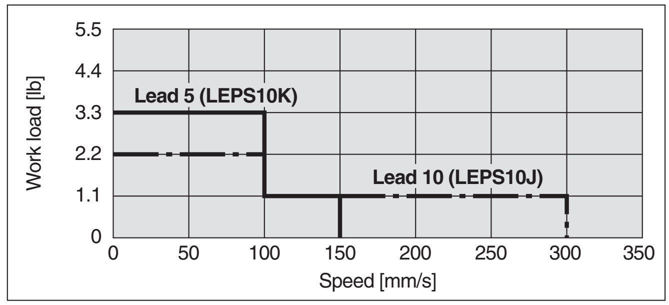


LEPS10(L) (Basic/Compact)

Horizontal

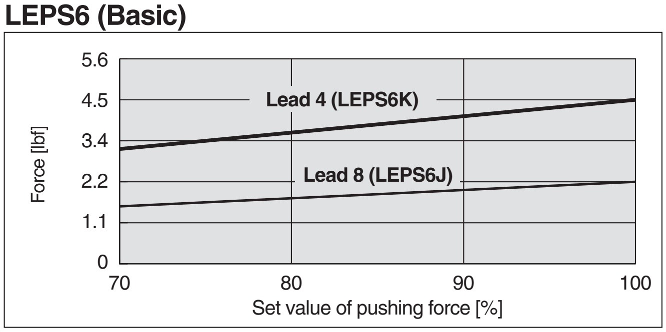


Vertical



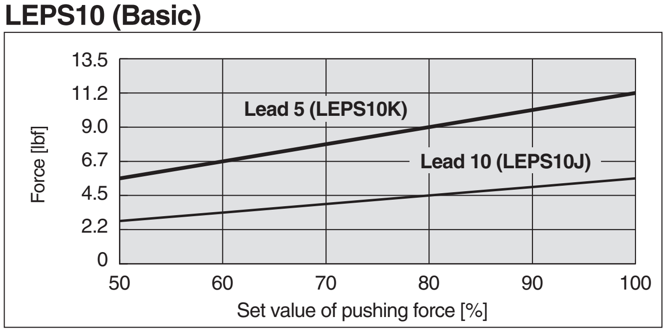
Force Conversion Graph (Guide)

LEPS6 (Basic)



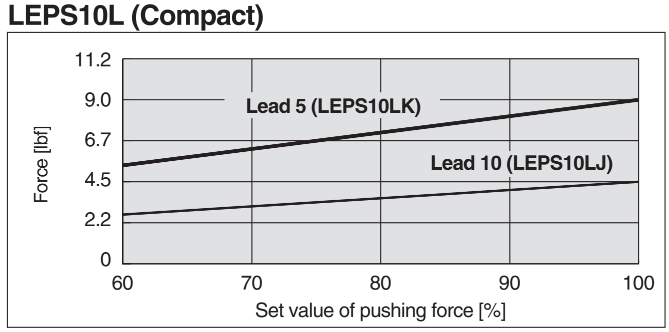
Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
70	100	—
80	70	10
100	50	5

LEPS10 (Basic)



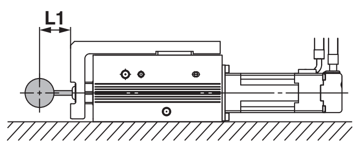
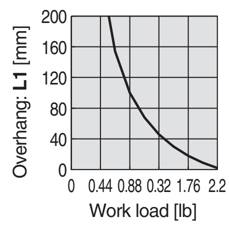
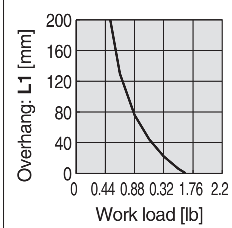
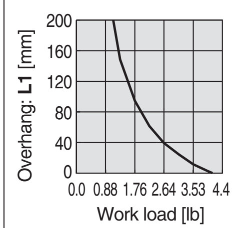
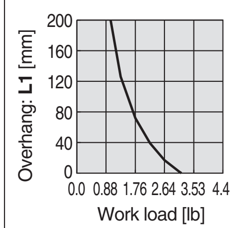
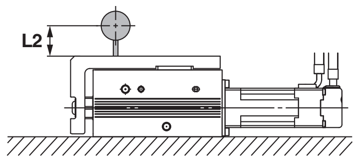
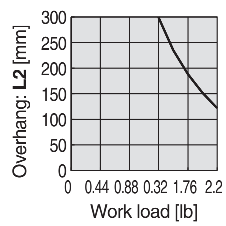
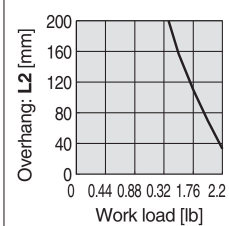
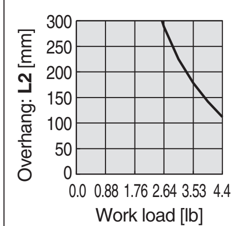
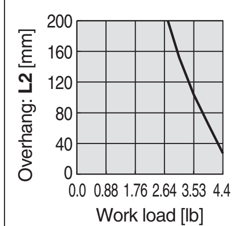
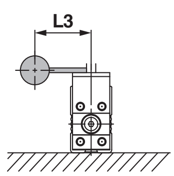
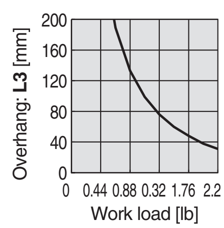
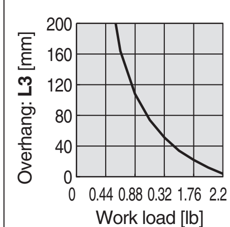
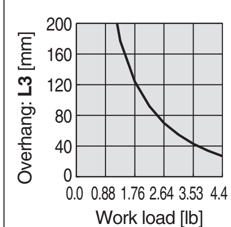
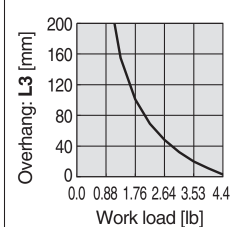
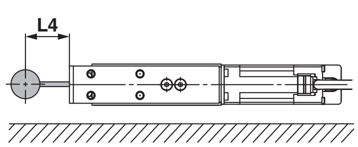
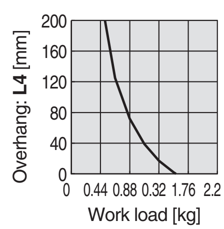
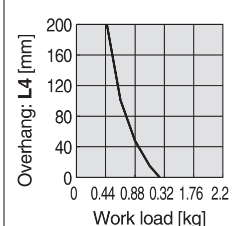
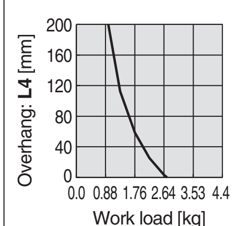
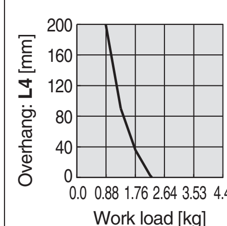
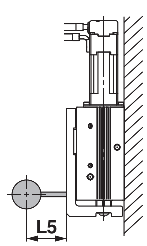
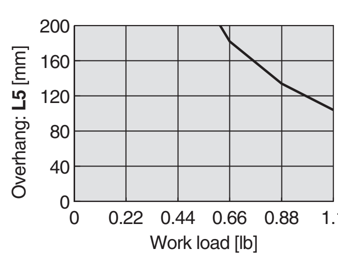
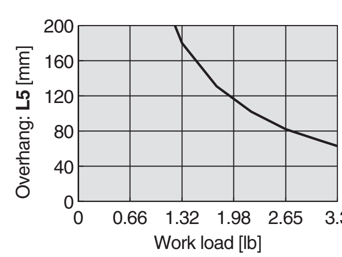
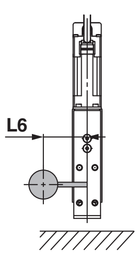
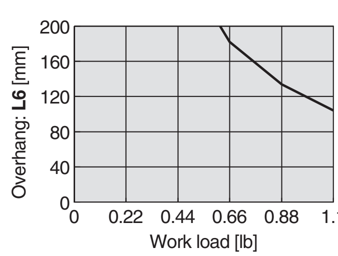
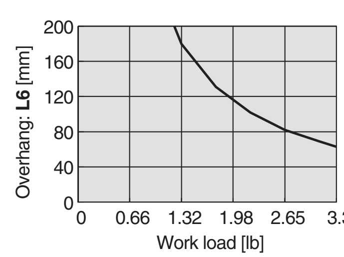
Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
60 or less	100	—
70	30	3
100	15	1

LEPS10L (Compact)



Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
70 or less	100	—
80	70	10
100	50	5

Dynamic Allowable Moment

Mounting orientation	Load overhanging direction m: Work load L: Overhang to the work load center of gravity [mm]	Model			
		LEPS6		LEPS10	
		LEPS6□-25	LEPS6□-50	LEPS10□-25	LEPS10□-50
Horizontal mounting					
					
					
					
Wall mounting					
					

Note) This graph shows the amount of allowable overhang when the center of gravity of the workpiece overhangs in one direction.

Static Allowable Moment

Model	Allowable moment lbf·ft [N·m]		
	Pitch moment	Yaw moment	Roll moment
	Mp	**My**	**Mr**
LEPS6	0.79	0.79	1.85
LEPS10	1.88	1.88	4.03

Static Allowable Moment

Traveling parallelism	Stroke (st)	
	25	50
	0.05 mm or less	0.1 mm or less

Table Deflection (Reference Value)

∗ These values are initial guideline values.

Table displacement due to pitch moment load (marked with the arrow)

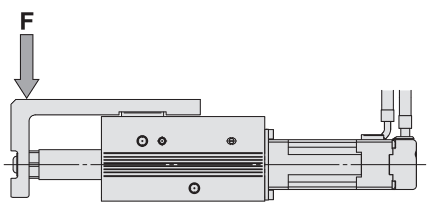


Table displacement due to yaw moment load (marked with the arrow)

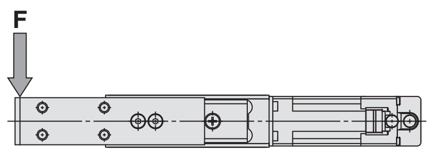
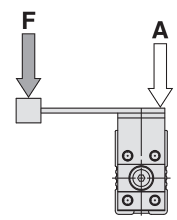
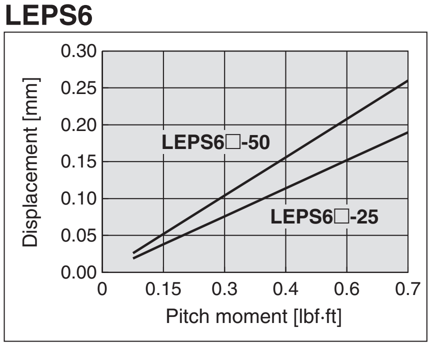


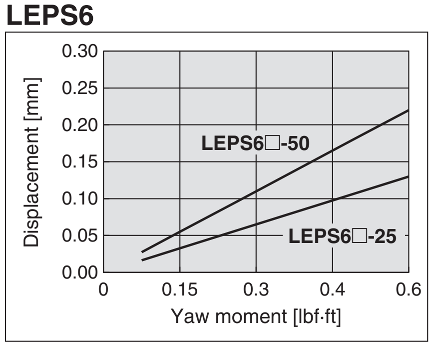
Table displacement due to roll moment load (marked with A)



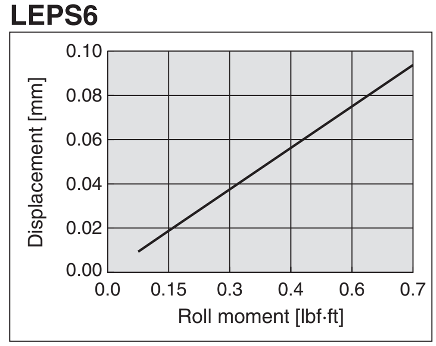
LEPS6



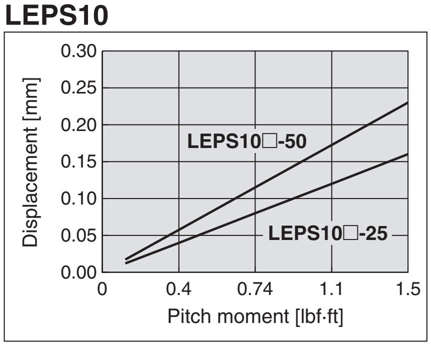
LEPS6



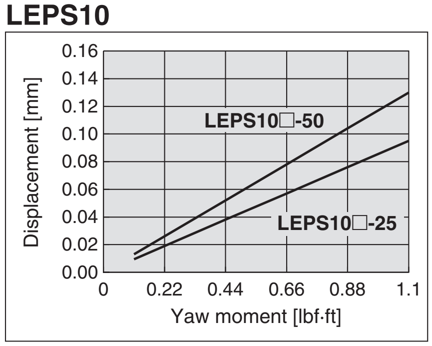
LEPS6



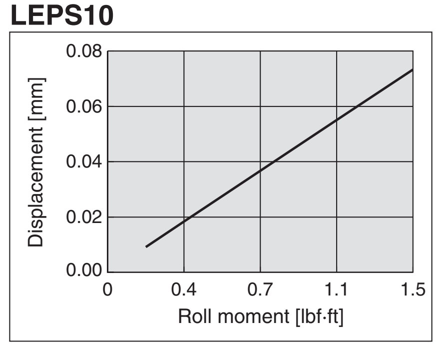
LEPS10



LEPS10



LEPS10



Electric Actuator
Miniature Slide Table Type
Step Motor (Servo/24 VDC)

Series LEPS
LEPS6, 10

RoHS

How to Order

LEPS 10 ☐ K – 50 ☐ – R 1 6N 1 ☐

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Size

6
10

❷ Motor size

Symbol	Motor size	Applicable size
Nil	Basic type	6, 10
L	Compact type	10

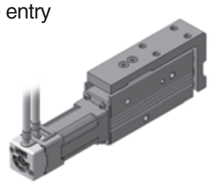
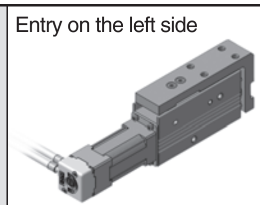
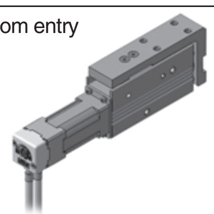
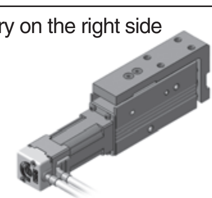
❸ Lead screw type [mm]

Symbol	Screw lead	
	LEPS6	LEPS10
K	4	5
J	8	10

❹ Stroke [mm]

Symbol	Stroke
25	25
50	50

❺ Motor cable mounting direction

Nil	Top entry 	L	Entry on the left side 
U	Bottom entry 	R	Entry on the right side 

❻ Actuator cable type*

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

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

⚠Caution

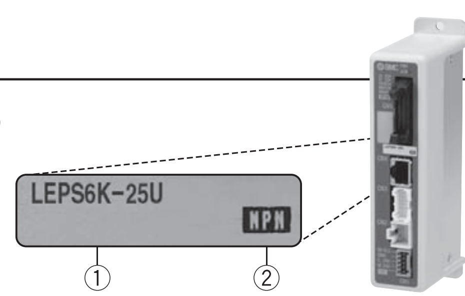
Note) CE-compliant products
EMC compliance was tested by combining the electric actuator LEP series and the controller LEC series. The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore conformity to the EMC directive 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.

The actuator and controller are sold as a package. (Controller → Page 24)

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

<Check the following before use.>

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



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

❼ Actuator cable length [m]

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

* Produced upon receipt of order (Robotic cable only)
Refer to the specifications Note 6) on page 17.

❽ Controller type

Nil	Without controller	
6N	**LECP6** (Step data input type)	NPN
6P		PNP
1N	**LECP1** (Programless type)	NPN
1P		PNP

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

❾ I/O cable length [m]

Nil	Without cable
1	1.5*
3	3*
5	5*

* When "Without controller" is selected for controller types, I/O cable length cannot be selected.

❿ Controller mounting

Nil	Screw mounting
D	DIN rail mounting*

* Only available for the controller types "6N" and "6P"
DIN rail is not included. Order it separately.
(Refer to page 26.)

Compatible Controllers

Type	**Step data input type** 	**Programless type** 
Series	**LECP6**	**LECP1**
Features	Value input Standard controller	Capable of setting up operation without using a PC or teaching box
Compatible motor	Step motor (Servo/24 VDC)	
Max. number of step data	64 points	14 points
Power supply voltage	24 VDC	
Reference page	Page 25	Page 35

Specifications

	Model			LEPS6		LEPS10	
Actuator specifications	Stroke [mm]			25, 50			
	Screw lead [mm]			4	8	5	10
	Pushing force [lbf] Note 1)		Basic	3.1to 4.5	1.6 to 2.2	5.6 to 11.2	2.8 to 5.6
			Compact	—	—	5.4 to 9.0	2.7 to 4.5
	Max. work load [lb] Note 2) Note 3)	Horizontal	Basic	2.2	1.6	4.4	3.3
			Compact	—	—	4.4	3.3
		Vertical	Basic	1.1	0.55	3.3	2.2
			Compact	—	—	3.3	2.2
	Speed [mm/s] Note 3) Note 6)	Horizontal	Basic	10 to 150	20 to 300 Note 4)	10 to 200	20 to 350 Note 4)
			Compact	—	—	10 to 200	20 to 350 Note 4)
		Vertical	Basic	10 to 150	20 to 300 Note 4)	10 to 150	20 to 300 Note 4)
			Compact	—	—	10 to 150	20 to 300 Note 4)
	Pushing speed [mm/s] Note 5) Note 6)			10	20	10	20
	Acceleration/Deceleration [mm/s^2]			3000			
	Positioning repeatability [mm]			±0.05			
	Backlash [mm]			±0.1			
	Impact/Vibration resistance [m/s^2] Note 7)			50/20			
	Actuation type			Slide screw			
	Guide type			Linear guide			
	Max. operating frequency [c.p.m]			60			
	Operating temperature range			41 to 104°F (5 to 40°C)			
	Operating humidity range [%RH]			90 or less (No condensation)			
Electric specifications	Motor size			□20		□28	
	Motor type			Step motor (Servo/24 VDC)			
	Encoder (Angular displacement sensor)			Incremental A/B phase (800 pulse/rotation)			
	Rated voltage [V]			DC 24 ±10%			
	Power consumption [W] Note 8)		Basic	12		28	
			Compact	—		22	
	Standby power consumption when operating [W] Note 9)		Basic	11		22	
			Compact	—		16	
	Momentary max. power consumption [W] Note 10)		Basic	22		55	
			Compact	—		45	
	Controller weight lbs [kg]			0.33 (0.15) (Screw mounting), 0.37 (0.17) (DIN rail mounting)			

Weight

Model		LEPS6	
Stroke [mm]		25	50
Product weight [lb]	Basic	0.64	0.77

Model		LEPS10	
Stroke [mm]		25	50
Product weight [lb]	Basic	1.23	1.37
	Compact	1.1	1.30

Note 1) Pushing force accuracy is LEPS6: ±30% (F.S.), LEPS10: ±25%(F.S.).
Refer to page 22 for the detailed setting range and precautions. The pushing force and the duty ratio are changed by the set value. Check "Force Conversion Graph (Gulde)" on page 12 and [14] on page 22.

Note 2) The maximum value of the workload for the positioning operation. Chcek "Dynamic Allowable Moment" graph for the allowable moment of the guide on page 13.

Note 3) Speed is changed by the work load. Check "Speed–Work Load Graph (Guide)" on page 12.

Note 4) When the stroke is 25 mm, the maximum speed will be 250 mm/sec.

Note 5) Set to the pushing force when pushing.

Note 6) The speed and force may change depending on the cable length, load and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)

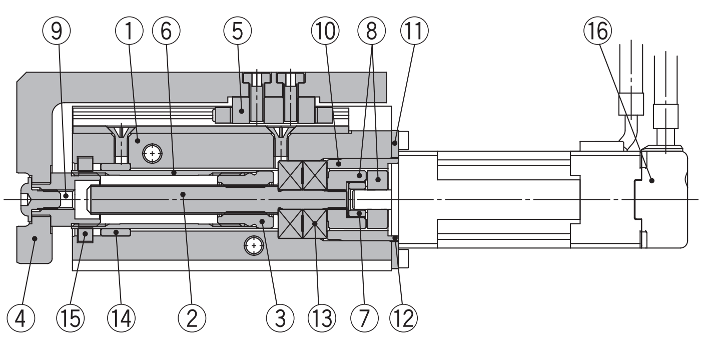
Note 7) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 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 8) Power consumption (including the controller) is for when the actuator is operating.

Note 9) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation. Except during pushing operation.

Note 10) 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.

Construction

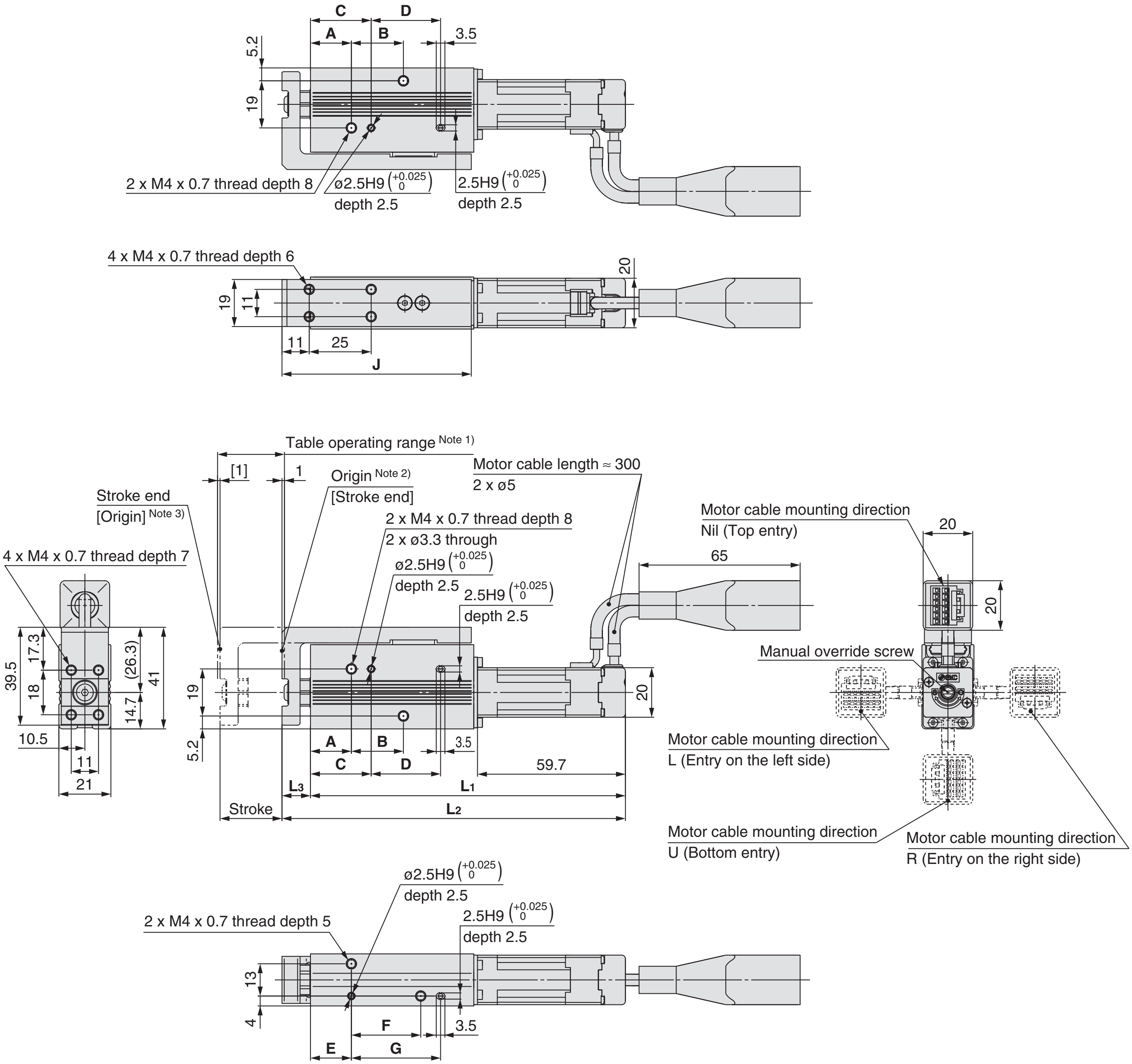


Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Screw shaft**	Stainless steel	Heat treatment + Specially treated
3	**Screw nut**	Stainless steel	Heat treatment + Specially treated
4	**Table**	Aluminum alloy	Anodized
5	**Linear guide**	—	
6	**Rod**	Stainless steel	
7	**Spider**	NBR	
8	**Hub**	Aluminum alloy	
9	**Socket**	Free cutting carbon steel	Nickel plated
10	**Bearing stopper**	Size 6: Aluminum alloy Size 10: Carbon steel	
11	**Motor plate**	Aluminum alloy	Anodized
12	**Guide ring**	Aluminum alloy	Size 10 only
13	**Bearing**	—	
14	**Bushing**	Oil impregnated sintered copper alloy	
15	**Soft wiper**	—	
16	**Step motor (Servo/24 VDC)**	—	

Dimensions

LEPS6



Note 1) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere with the workpieces and facilities around the table.
Note 2) Position after return to origin.
Note 3) The number in brackets indicates when the direction of return to origin has changed.

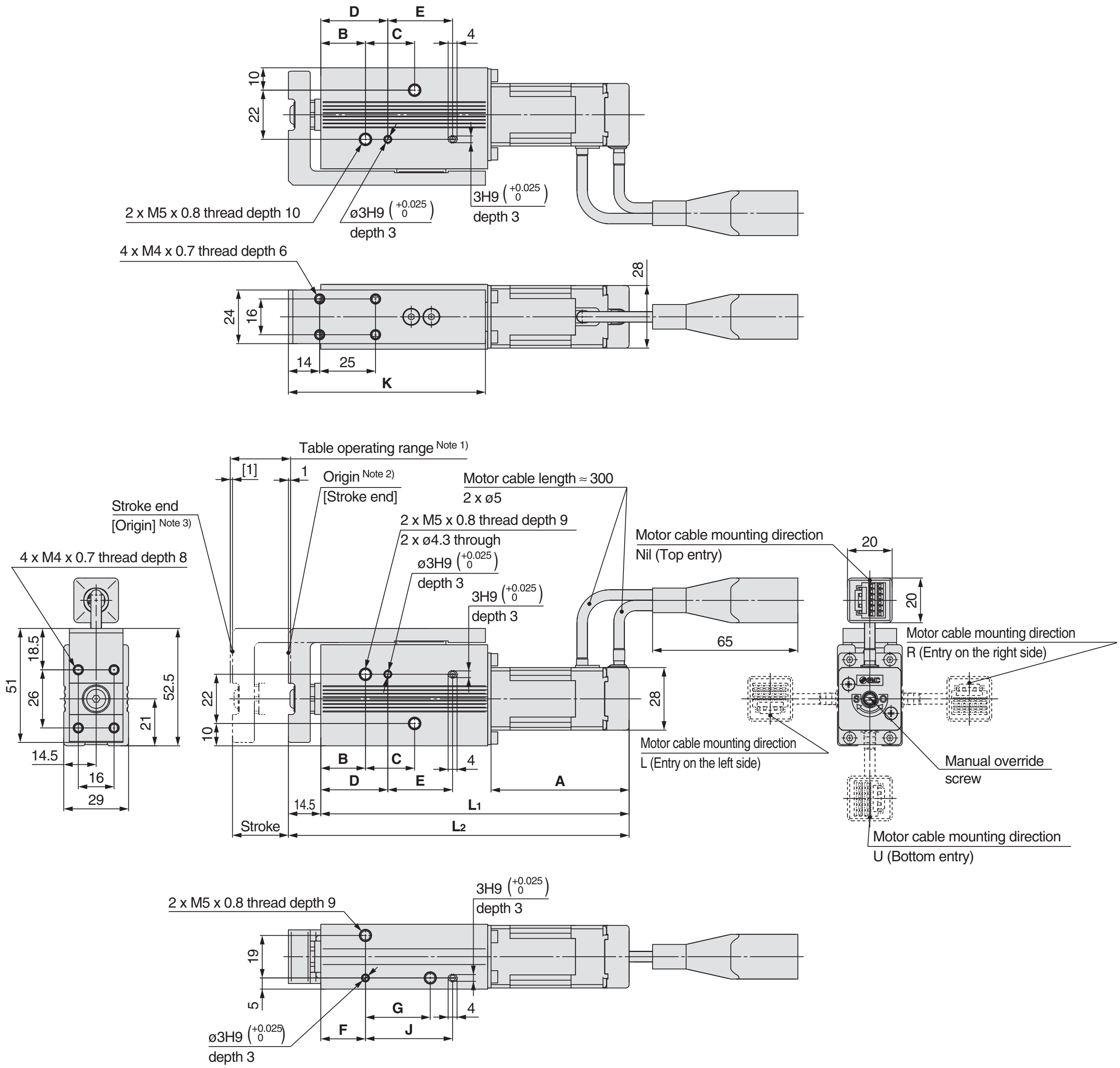
Dimensions

[mm]

Model	L_1	L_2	L_3	A	B	C	D	E	F	G	J
LEPS6□-25□	127.1	138.6	11.5	16.5	21	24.5	28	16.5	28	36	76.4
LEPS6□-50□	156.6	169.6	13	22	45	30	52	22	52	60	107.4

Dimensions

LEPS10



Note 1) Distance within which the table can move when it returns to origin. Make sure a workpiece mounted on the table does not interfere with the workpieces and facilities around the table.
Note 2) Position after return to origin.
Note 3) The number in brackets indicates when the direction of return to origin has changed.

Dimensions

[mm]

Model	L_1	L_2	A	B	C	D	E	F	G	J	K
LEPS10□-25□	138	152.5	61.8	20	22	30	29	20	29	39	88.2
LEPS10□-50□	163	177.5		24	43	34	50	24	50	60	113.2
LEPS10L□-25□	124	138.5	47.8	20	22	30	29	20	29	39	88.2
LEPS10L□-50□	149	163.5		24	43	34	50	24	50	60	113.2

Series LEPY/LEPS
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/Selection

⚠Warning

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 on the sliding parts of the piston rod, degraded accuracy, operation and shortened product life.

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

Do not apply impact and vibration outside of the specifications; it may lead to a malfunction.

3. If gravity acts on the workpiece due to vertical mounting, it may drop due to its own weight depending on the conditions when the product is not energized (SVON signal is OFF) or stopped (EMG is not energized).

4. Power failure may result in a decrease in the pushing force; ensure that safety measures are in place to prevent injury to the operator or damage to the equipment.

When the product is used for clamping, the clamping force could be decreased due to power failure, potentially creating a hazardous situation in which the workpiece is released.

5. This product cannot be used as a stopper.

Excessive load acts on the actuator, which adversely affects the operation and the life.

Mounting

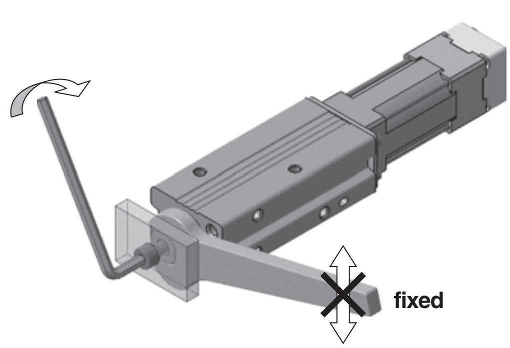
⚠Warning

1. Do not drop or hit the actuator to avoid scratching and denting the mounting surfaces.

Even slight deformation can cause the deterioration of accuracy and operation failure.

2. When mounting workpieces or jigs to the rod end, hold the flats of the rod end with a wrench so that the rod does not rotate (Rod type only).

When attaching a bolt or workpiece to the end of the rod, hold the flats of the rod end with a wrench (the rod should be fully retracted). Do not apply tightening torque to the rod non-rotating mechanism. The rod is manufactured to precise tolerances, so even a slight deformation may cause a malfunction and damage (Rod type only).

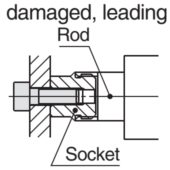


Mounting

⚠Warning

3. When mounting a bolt, workpiece or jig to the rod end, the bolt should be tightened to a torque within the specified range (Rod type only).

Tightening to a torque higher than the specified value may cause a malfunction due to deformation of the component, whilst under-tightening can cause displacement of the mounting position or in extreme conditions detaching of the workpiece. If the bolt is screwed in more than the maximum depth, the slide screw will be damaged, leading to operation failure (Rod type only).



Model	Bolt	Max. tightening torque [lbf·ft]	Max. screw-in depth [mm]	Rod end width across flats [mm]
LEPY6	M4 x 0.7	1.03	7	10
LEPY10	M5 x 0.8	2.21	9	12

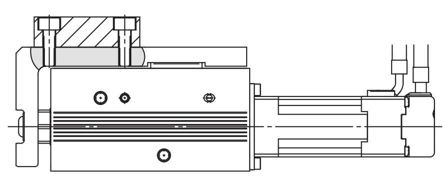
4. The angular position of the rod end flats cannot be changed because the rod has a non-rotating mechanism inside (Rod type only).

The angular position of the rod end flats is not specified; it depends on the actuator type (Rod type only).
The rod rotates slightly due to the clearance of the non-rotating mechanism: Install the bolt or workpiece with consideration to the rotation (Rod type only).

5. When attaching the workpiece to the table, hold the table and tighten the bolts to a torque within the specified range (Slide table only).

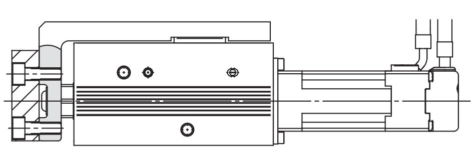
The table is supported by a linear guide, do not apply impact or moment when mounting the workload.
If the bolts are screwed to more than the maximum thread depth, it may lead to a malfunction due to damage of the linear guide or body.

Top mounting



Model	Bolt	Max. tightening torque [lbf·ft]	Max. screw-in depth [mm]
LEPS6	M4 x 0.7	1.03	6
LEPS10	M4 x 0.7	1.03	6

Front mounting



Model	Bolt	Max. tightening torque [lbf·ft]	Max. screw-in depth [mm]
LEPS6	M4 x 0.7	1.03	7
LEPS10	M4 x 0.7	1.03	8

Series LEPY/LEPS
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

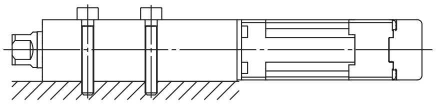
Mounting

⚠ Warning

6. Tighten the mounting screws within the specified torque range.

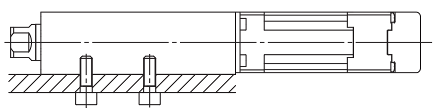
Tightening with higher torque than the specified range may cause malfunction while the tightening with lower torque can cause the displacement of gripping position or dropping a workpiece.

Side mounting (Body mounting through-hole)



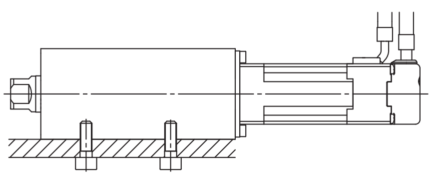
Model	Bolt	Max. tightening torque [lbf·ft]
LEPY6	M3 x 0.5	0.66
LEPS6		
LEPY10	M4 x 0.7	1.03
LEPS10		

Side mounting (Body tapped)



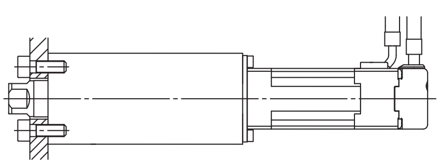
Model	Bolt	Max. tightening torque [lbf·ft]	Max. screw-in depth [mm]
LEPY6	M4 x 0.7	1.03	7
LEPS6			
LEPY10	M5 x 0.8	2.21	9
LEPS10			

Bottom mounting (Body tapped)



Model	Bolt	Max. tightening torque [lbf·ft]	Max. screw-in depth [mm]
LEPY6	M4 x 0.7	1.03	5
LEPS6			
LEPY10	M5 x 0.8	2.21	9
LEPS10			

Rod side mounting (Rod type only)



Model	Bolt	Max. tightening torque [lbf·ft]	Max. screw-in depth [mm]
LEPY6	M4 x 0.7	1.03	7
LEPY10	M5 x 0.8	2.21	9

7. When it is necessary to operate the product by the manual override screw, check the position of the manual override and leave necessary space for access.

Do not apply excessive torque to the manual override screw. This may lead to damage and malfunction.

8. When an external guide is used, connect it in such a way that no impact or load is applied to it.

This may cause a malfunction due to an increase in sliding resistance, or use a freely moving connector (such as a floating joint).

Handling

⚠ Caution

1. When the pushing operation is used, be sure to set to [Pushing operation].

Also, do not hit the workpiece in positioning operation or in the range of positioning operation.

It may damage and malfunction. If the operation is interrupted or stopped during the cycle: When the pushing operation command is output immediately after restarting the operation, the direction of movement depends on the position of restart.

2. Use within the specified pushing speed range for the pushing operation.

It may lead to damage and malfunction.

Model	Lead	Pushing speed [mm/sec]
LEPY6	4	10
LEPS6	8	20
LEPY10	5	10
LEPS10	10	20

3. For the pushing operation, ensure that the force is applied in the direction of the rod axis.

4. The positioning force should be the initial value.

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

Model	Motor size	Positioning force [%]
LEPY6	Basic	150
LEPY10	Basic	150
	Compact	

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

When selecting a product, check the catalog for the instructions regarding selection.

6. Do not scratch or dent the sliding parts of the piston rod, by striking or attaching objects.

The rod is manufactured to precise tolerances, even a slight deformation may cause malfunction.

7. Avoid using the electric actuator in such a way that rotational torque would be applied to the rod.

It may cause deformation of the non-rotating sliding part, leading to clearance in the internal guide or an increase in the sliding resistance. Refer to the table below for the approximate values of the allowable range of rotational torque.

	LEPY6□	LEPY10□
Allowable rotational torque [lbf·ft] or less	0.03	0.04

Series LEPY/LEPS
Specific Product Precautions 3

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

Handling

⚠Caution

8. Do not operate by fixing the piston rod and moving the actuator body Excessive load will be applied to the rod, leading to damage to the actuator and reduced lifetime.

9. Return to origin

1) Do not apply a load, impact or resistance in addition to the transferred load during return to origin.
Additional force will cause the displacement of the origin position since it is based on detected motor torque.
2) When the return to origin is set with <Basic parameter> [Origin offset], it is necessary to change the current position of the product. Recheck the value of step data.
3) It is recommended to set the directions of return to origin and pushing in the same direction in order to enhance the measurement accuracy during pushing operation.

10. There is no backlash effect in pushing operation.
The return to origin is done by the pushing operation.
The position can be displaced by the effect of the backlash during the positioning operation.
Take the backlash into consideration when setting the position.

<Backlash>

Model	Backlash [mm]
LEPY6	±0.1
LEPS6	±0.1
LEPY10	±0.1
LEPS10	±0.1

11. Do not hit the stroke end except for during the return to origin.
This may damage the inner parts.

12. 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.
2) Pushing operation
When the effective pushing force exceeds the step data (trigger LV), the INP (In position) output signal is outputted.
When [pushing force] setting and [trigger LV] are set below [pushing force], use the product within the specified range of [pushing force and trigger LV].
a) To ensure that the product pushes the workpiece with the set [pushing force], it is recommended that the [Trigger LV] is set to the same value as the [pushing force].
b) If the [trigger LV] is set lower than the [operation pushing force (current pushing force) for the pushing operation], the pushing force will exceed the trigger LV from the pushing start position and the INP output signal will be outputted before pushing the workpiece. Increase the pushing force, or change the workload so that the current pushing force becomes smaller than the Trigger LV.

<Pushing force and trigger LV range>

Model	Motor size	Set value of pushing force [%]
LEPY6 **LEPS6**	Basic	70 to 100
LEPY10 **LEPS10**	Basic	50 to 100
	Compact	60 to 100

13. In pushing operation, set the product to a position of at least 0.5 mm away from a workpiece. (This position is referred to as a pushing start position.)
The following alarms may be generated and operation may become unstable.
a. "Posn failed" alarm is generated.
The product cannot reach a pushing start position due to variation in the width of workpieces.
b. "Pushing ALM" alarm is generated.
The product is pushed back from a pushing start position after starting to push.
c. "Deviation over flow" alarm is generated.
Displacement exceeding the specified value is generated at the pushing operation start position.

14. When pushing operating, operate within duty ratio range.
The duty ratio is a ratio at the time that can keep being pushed.

Model	Motor size	Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
LEPY6 **LEPS6**	Basic	70	100	—
		80	70	10
		100	50	5

Model	Motor size	Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
LEPY10 **LEPS10**	Basic	60 or less	100	—
		70	30	3
		100	15	1

Model	Motor size	Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
LEPY10 **LEPS10**	Compact	70 or less	100	—
		80	70	10
		100	50	5

Maintenance

⚠Warning

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

Controller

Step data input type ······ Page 25

Step Motor
(Servo/24 VDC)

Series LECP6

Programless type ······ Page 35

Step Motor
(Servo/24 VDC)

Series LECP1

Controller (Step data input type)
Step Motor (Servo/24 VDC)
Series LECP6

CE
RoHS

How to Order

LE C P 6 N □ □ – □

Controller (C)

Compatible motor

P	Step motor (Servo/24 VDC)

Number of step data (Points)

6	64

Parallel I/O type

N	NPN
P	PNP

I/O cable length [m]

Nil	Without cable
1	1.5
3	3
5	5

Option

Nil	Screw mounting
D Note)	DIN rail mounting

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

Actuator part number

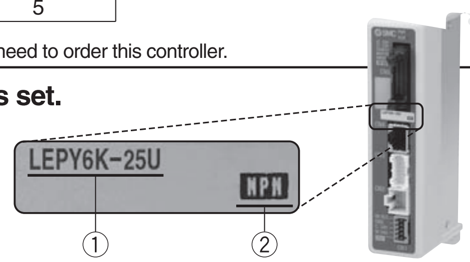
(Except cable specifications and actuator options)
Example: Enter “LEPY10K-50” for the LEPY10K-50U-R16NI.

∗ 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 the actuator label for model number. This matches the controller.
② Check Parallel I/O configuration matches (NPN or PNP).



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

Specifications

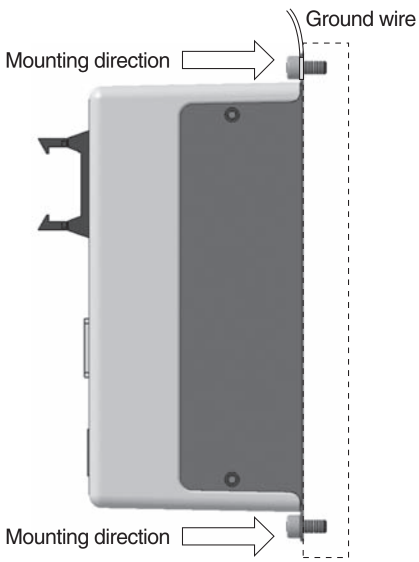
Basic Specifications

Item	Specifications
Compatible motor	Step motor (Servo/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]
Parallel input	11 inputs (Photo-coupler isolation)
Parallel output	13 outputs (Photo-coupler isolation)
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
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	32 to 104°F (0 to 40°C) (No freezing)
Operating humidity range [%RH]	90 or less (No condensation)
Storage temperature range	14 to 140°F (–10 to 60°C) (No freezing)
Storage humidity range [%RH]	90 or less (No condensation)
Insulation resistance [MΩ]	Between the housing (radiation fin) and SG terminal 50 (500 VDC)
Weight [g]	5.3 oz (150 g) (Screw mounting) 6.0oz (170 g) (DIN rail mounting)

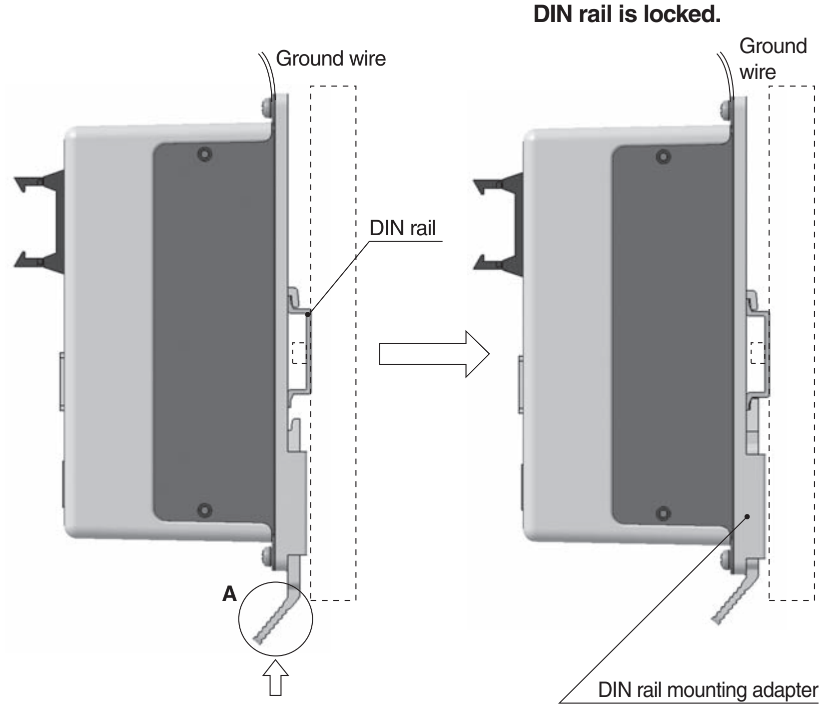
Note 1) Do not use the power supply of “inrush current prevention type” for the controller power supply.
Note 2) The power consumption changes depending on the actuator model. Refer to the specifications of actuator for more details.
Note 3) Applicable to non-magnetizing lock.

How to Mount

a) Screw mounting (LECP6□□-□)
(Installation with two M4 screws)



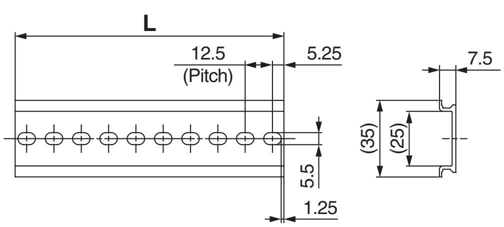
b) DIN rail mounting (LECP6□□D-□)
(Installation with the DIN rail)



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 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

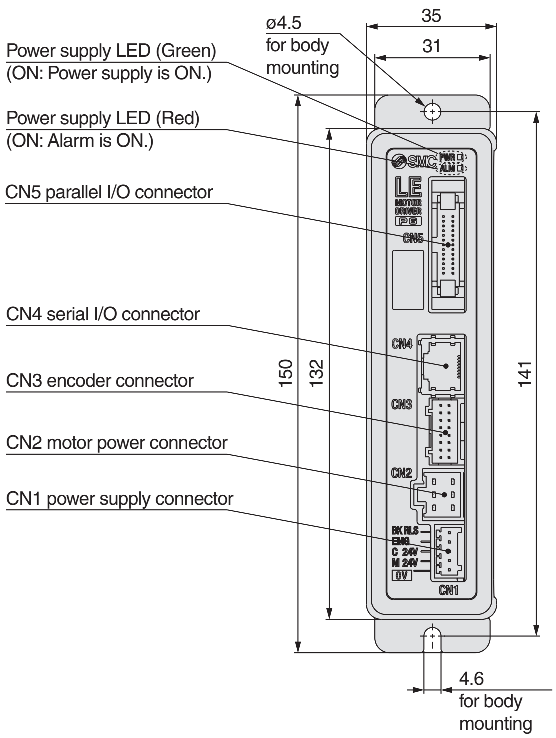
DIN rail mounting adapter
LEC-D0 (with 2 mounting screws)

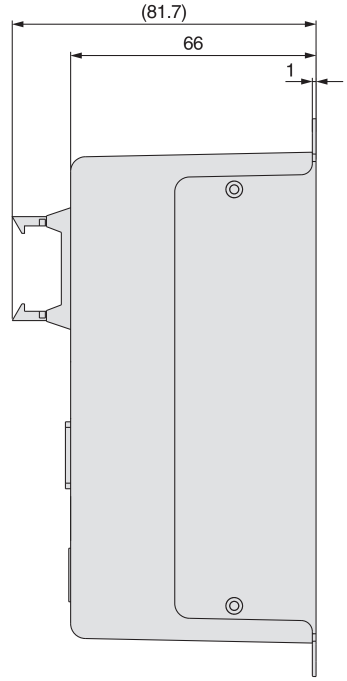
This should be used when the DIN rail mounting adapter is mounted onto the screw mounting type controller afterwards.

Model Selection
Step Motor (Servo/24 VDC)
LEPY
LEPS
LECP6
LECP1
Specific Product Precautions

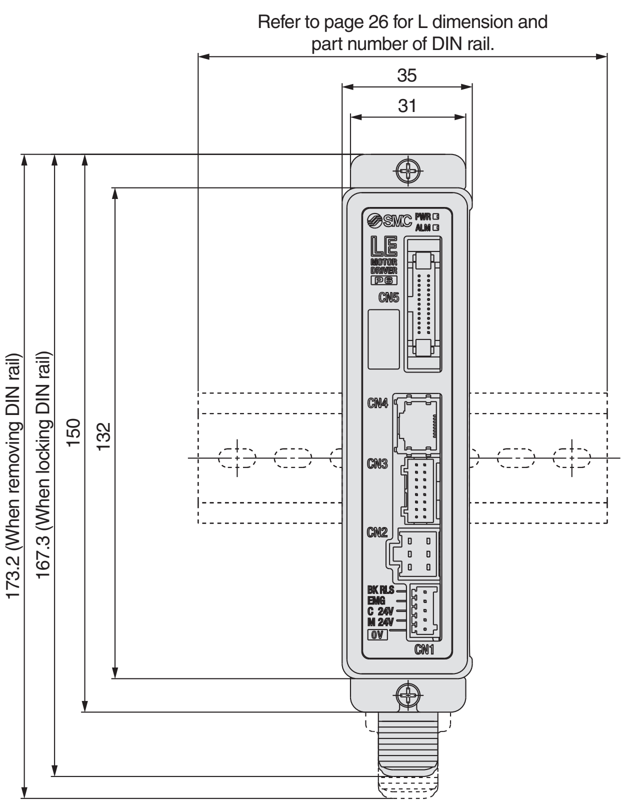
Dimensions

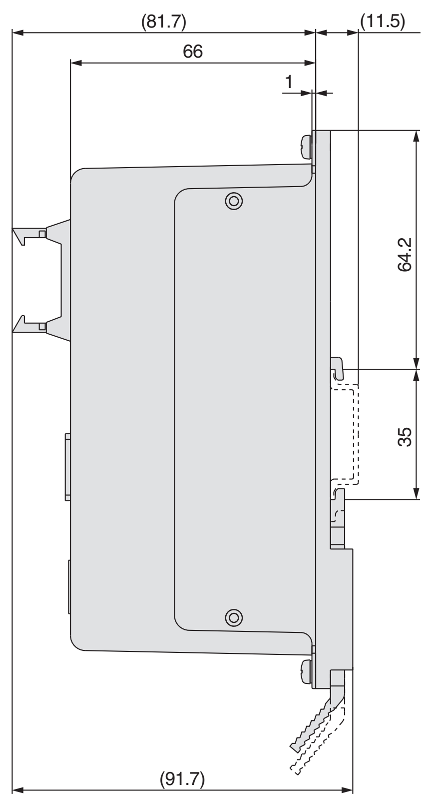
a) Screw mounting (LECP6□□-□)





b) DIN rail mounting (LECP6□□D-□)





Wiring Example 1

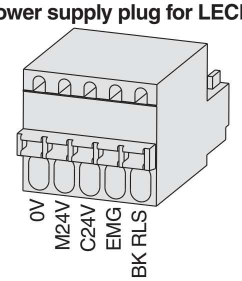
Power Supply Connector: CN1

∗ Power supply plug is an accessory.

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

Terminal name	Function	Details
0V	Common supply (–)	M24V terminal/C24V terminal/EMG terminal/BK RLS terminal are common (–).
M24V	Motor power supply (+)	Motor power supply (+) supplied to the controller
C24V	Control power supply (+)	Control power supply (+) supplied to the controller
EMG	Stop (+)	Input (+) for releasing the stop
BK RLS	Lock release (+)	Input (+) for releasing the lock

Power supply plug for LECP6



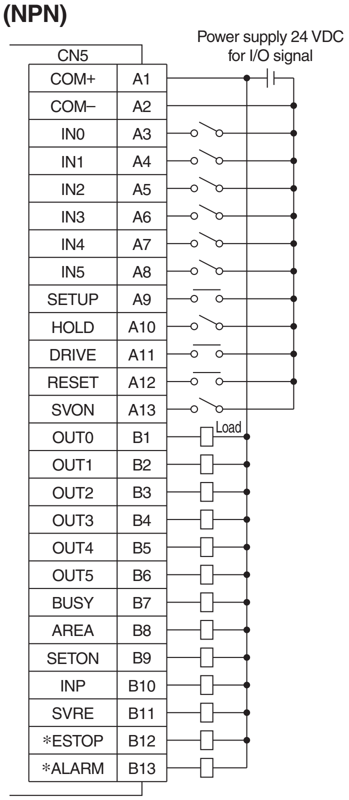
Wiring Example 2

Parallel I/O Connector: CN5

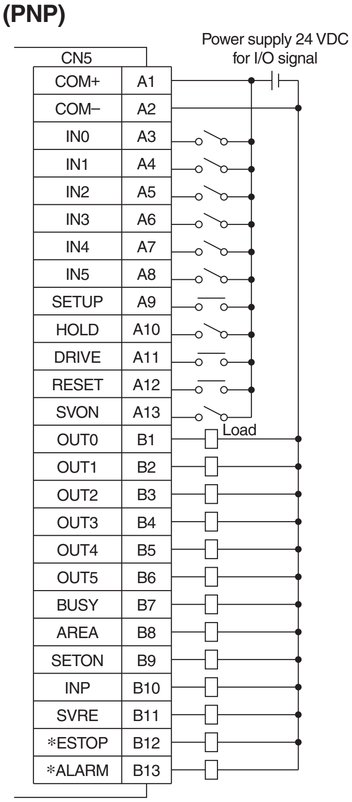
∗ When you connect a PLC, etc., to the CN5 parallel I/O connector, please use the I/O cable (LEC-CN5-□).
∗ The wiring should be changed depending on the type of the parallel I/O (NPN or PNP).

Wiring diagram

LECP6N□□-□ (NPN)



LECP6P□□-□ (PNP)



Input Signal

Name	Details
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

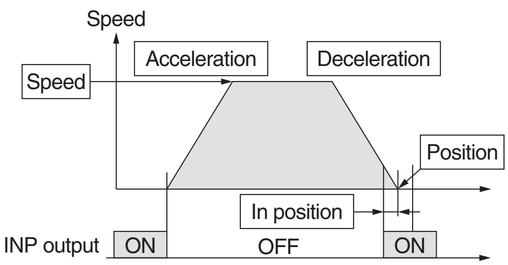
Name	Details
OUT0 to OUT5	Outputs the step data no. during operation
BUSY	Outputs when the actuator is moving
AREA	Outputs within the step data area output setting range
SETON	Outputs when returning to the original position
INP	Outputs when target position or target force is reached (Turns on when the 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) Signal of negative-logic circuit (N.C.)

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.



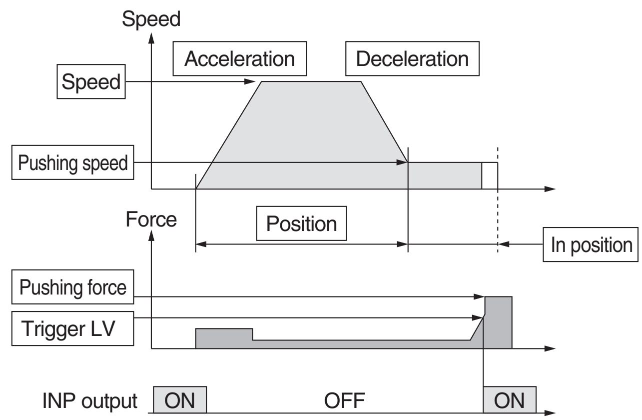
◎: Need to be set.
○: Need to be adjusted as required.
—: Setting is not required.

Step Data (Positioning)

Necessity	Item	Details
◎	Movement method	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.

2. Step data setting for pushing

The actuator moves toward the pushing start position, and when it reaches that position, it starts pushing with less than the set force. The following diagram shows the setting items and operation. The setting items and set values for this operation are stated below.



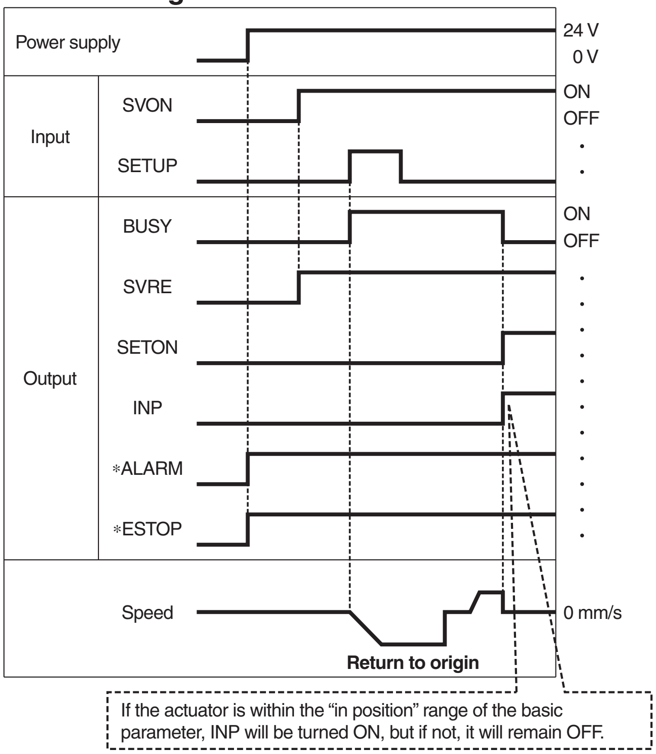
◎: Need to be set.
○: Need to be adjusted as required.

Step Data (Pushing)

Necessity	Item	Details
◎	Movement method	When the absolute position is required, set Absolute. When the relative position is required, set Relative.
◎	Speed	Transfer speed to the pushing start position
◎	Position	Pushing start 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	Pushing force ratio is defined. The setting range differs depending on the electric actuator type. Refer to the operation manual for the electric actuator.
◎	Trigger LV	Condition that turns on the INP output signal. The INP output signal is turned on when the generated force exceeds the value. Threshold level should be less than the pushing force.
○	Pushing speed	Pushing speed When the speed is set fast, the electric actuator and work pieces might be damaged due to the impact when they hit the end, so this set value should be smaller. Refer to the operation manual of the electric actuator.
○	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	Transfer distance during pushing. If the transferred distance exceeds the setting, it stops even if it is not pushing. If the transfer distance is exceeded, the INP output signal will not be turned on.

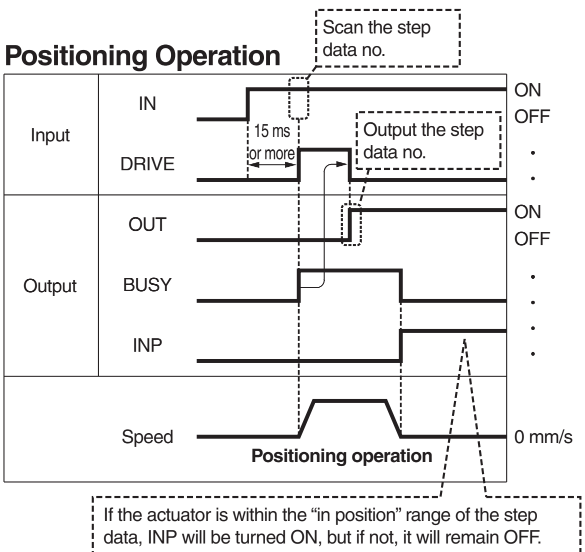
Signal Timing

Return to Origin

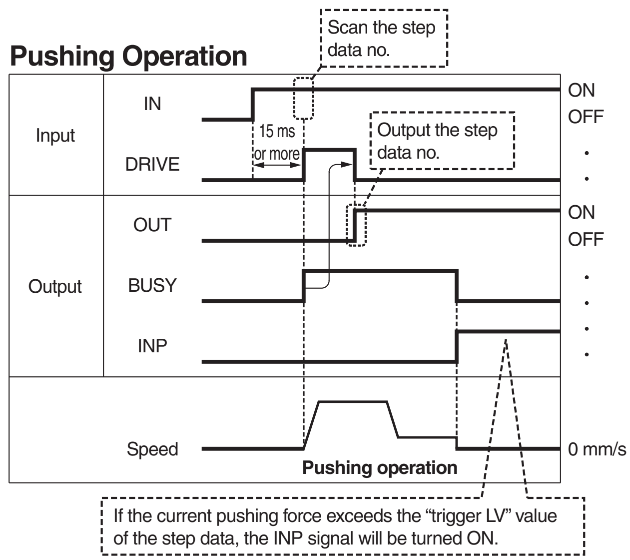


"∗ALARM" and "∗ESTOP" are expressed as negative-logic circuit.

Positioning Operation

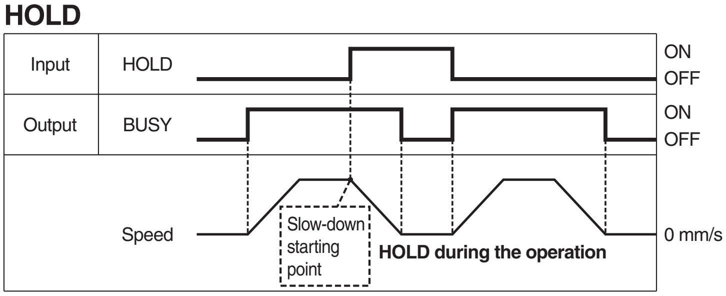


Pushing Operation



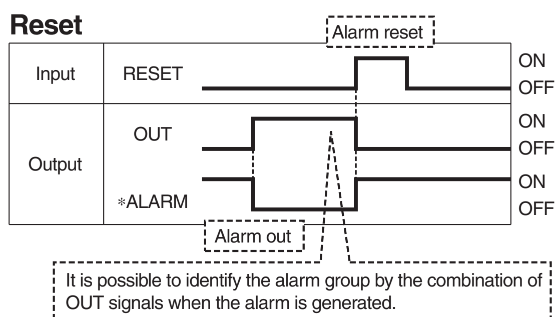
∗ "OUT" is output when "DRIVE" is changed from ON to OFF.
(When power supply is applied, "DRIVE" or "RESET" is turned ON or "∗ESTOP" is turned OFF, all of the "OUT" outputs are turned OFF.)

HOLD



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

Reset



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

Options: Actuator Cable, I/O Cable

Actuator cable

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

LE – CP – [1] – [ ]

Cable length(L)[m]

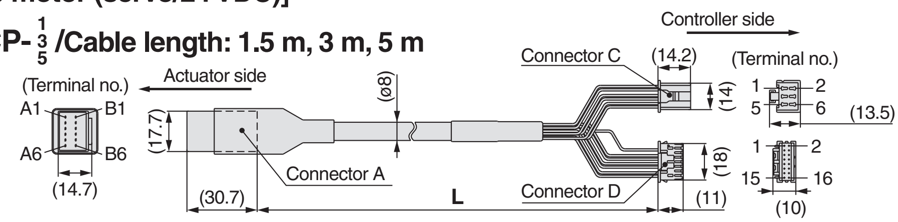
1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order (Robotic cable only)

Cable type

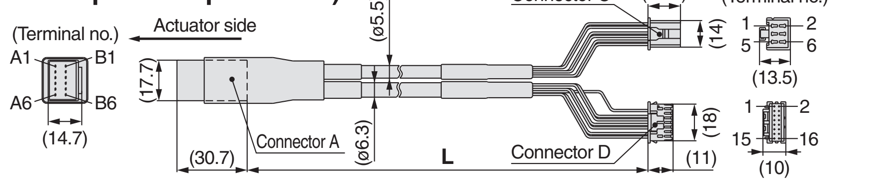
Nil	Robotic cable (Flexible cable)
S	Standard cable

LE-CP-1/3/5 /Cable length: 1.5 m, 3 m, 5 m



LE-CP-8/A/B/C /Cable length: 8 m, 10 m, 15 m, 20 m

(* Produced upon receipt of order)



Signal	Connector A terminal no.	Cable color	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

Shield

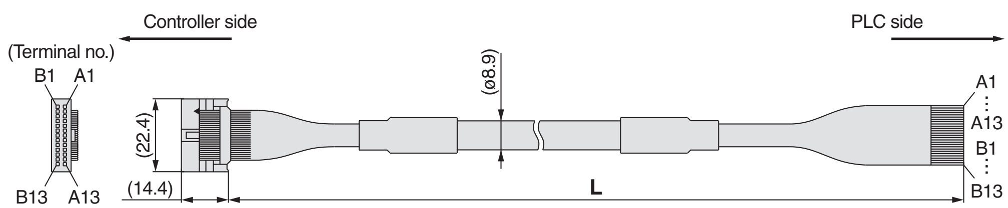
Signal	Connector A terminal no.	Cable color	Connector D terminal no.
Vcc	B-4	Brown	12
GND	A-4	Black	13
$\overline{A}$	B-5	Red	7
A	A-5	Black	6
$\overline{B}$	B-6	Orange	9
B	A-6	Black	8
		—	3

I/O cable

LEC – CN5 – [1]

Cable length(L)[m]

1	1.5
3	3
5	5



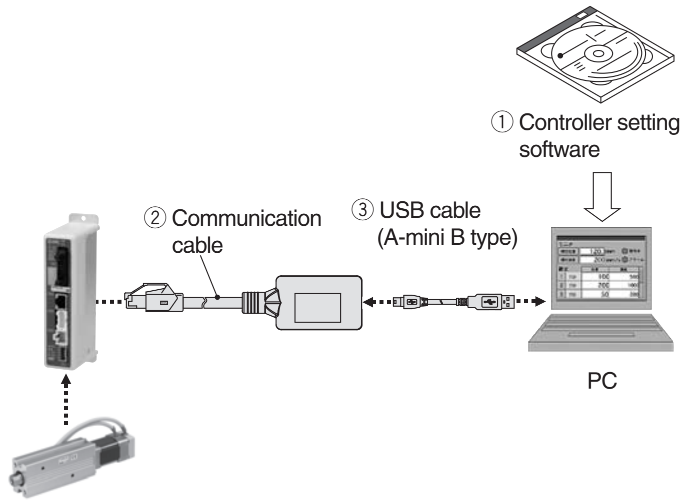
* Conductor size: AWG28

Connector pin no.	Insulation color	Dot mark	Dot color
A1	Light brown	■	Black
A2	Light brown	■	Red
A3	Yellow	■	Black
A4	Yellow	■	Red
A5	Light green	■	Black
A6	Light green	■	Red
A7	Gray	■	Black
A8	Gray	■	Red
A9	White	■	Black
A10	White	■	Red
A11	Light brown	■ ■	Black
A12	Light brown	■ ■	Red
A13	Yellow	■ ■	Black

Connector pin no.	Insulation color	Dot mark	Dot color
B1	Yellow	■ ■	Red
B2	Light green	■ ■	Black
B3	Light green	■ ■	Red
B4	Gray	■ ■	Black
B5	Gray	■ ■	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		

Series **LEC**

Controller Setting Kit/LEC-W1



How to Order

LEC – W1

Controller setting kit
(Japanese and English are available.)

Contents

① Controller setting software (CD-ROM)
② Communication cable
③ USB cable
(Cable between the PC and the conversion unit)

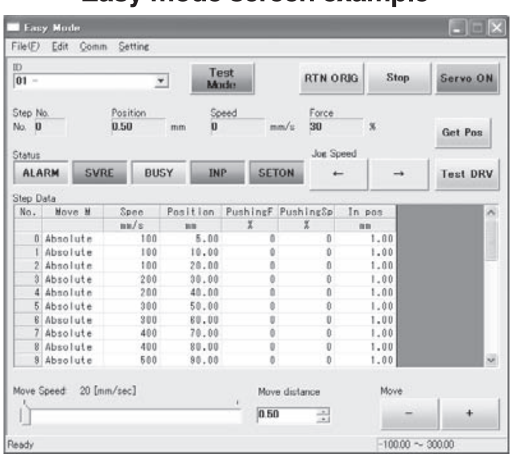
Hardware Requirements

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

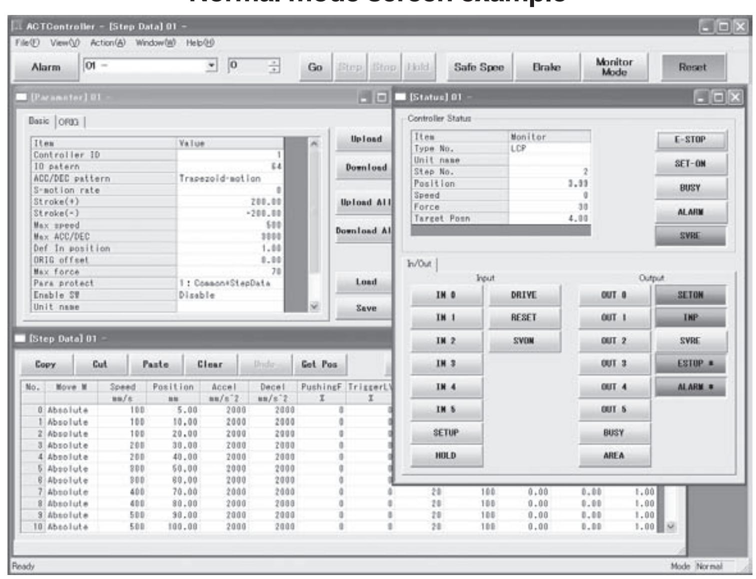
Easy mode screen example



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.

Normal mode screen example



Detailed 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 forced output can be performed.

Teaching Box/LEC-T1

How to Order

LEC – T1 – 3 J G [ ]

Teaching box (T1)

Cable length [m]

3	3

Initial language

J	Japanese
E	English

Stop switch

G	Equipped with stop switch

Enable switch

Nil	None
S	Equipped with enable switch

* Interlock switch for jog and test function

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	41 to 122°F (5 to 50°C)
Operating humidity range [%RH]	90 or less (No condensation)
Weight	12.3 oz (350 g) (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	Details
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.
ALM	• Active alarm display • Alarm reset
TB setting	• Reconnection of axis • Setting of easy/normal mode • Setting of step data and selection of items from easy mode monitor

Menu Operations Flowchart

Menu
Data
Monitor
Jog
Test
ALM
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

ALM
Active alarm display
Alarm reset

TB setting
Reconnect
Easy/Normal
Set item

Normal Mode

Function	Details
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.) • Forced output (Forced signal output, Forced terminal output)
Monitor	• Drive monitor • Output signal monitor • Input signal monitor • Output terminal monitor • Input terminal monitor
ALM	• 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
- ALM
- File
- TB setting
- Reconnect

Step data
- Step data no.
- Movement method
- 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
- Forced output

ALM
- Status
- ALM Log record

→ **Status**
- Active alarm display
- Alarm reset

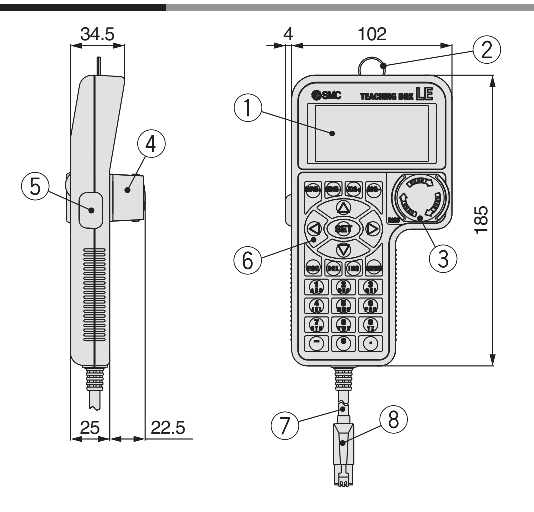
→ **ALM Log record display**
- Log entry display

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

Programless Controller

Series LECP1

How to Order

LE C P 1 N 1 – LEPY10-50

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]

Nil	Without cable
1	1.5
3	3
5	5

Actuator part number

(Except cable specifications and actuator options)
Example: Enter "LEPY10K-50" for the LEPY10K-50U-R16NI.

∗ **When controller equipped type (-□1N□/-□1P□) 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.

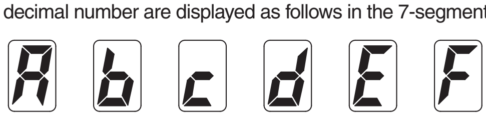
∗ Refer to the operation manual for using the products. Please download it via our website, http://www.smcworld.com

Specifications

Basic Specifications

Item	Specifications
Compatible motor	Step motor (Servo/24 VDC)
Power supply Note 1)	Power supply voltage: 24 VDC ±10% Max. current consumption: 3 A (Peak 5 A) 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	32 to 104°F (0 to 40°C) (No freezing)
Operating humidity range [%RH]	90 or less (No condensation)
Storage temperature range	14 to 140°F (–10 to 60°C) (No freezing)
Storage humidity range [%RH]	90 or less (No condensation)
Insulation resistance [MΩ]	Between the housing (radiation fin) and SG terminal 50 (500 VDC)
Weight	4.6 oz (130 g)

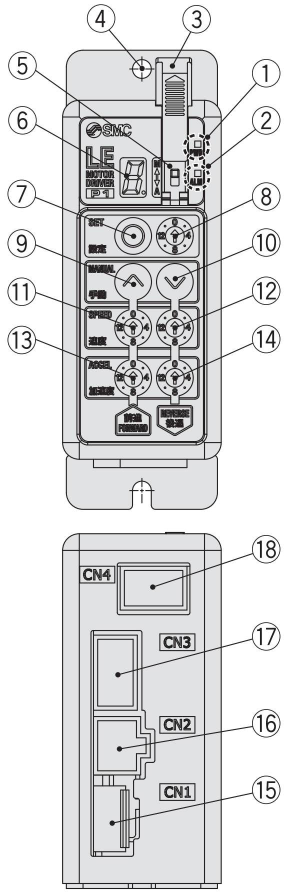
Note 1) Do not use the power supply of "inrush current prevention type" for the controller input power supply.
Note 2) The power consumption changes depending on the actuator model. Refer to the each actuator's operation manual etc. for details.
Note 3) "10" to "15" in decimal number are displayed as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

Controller Details



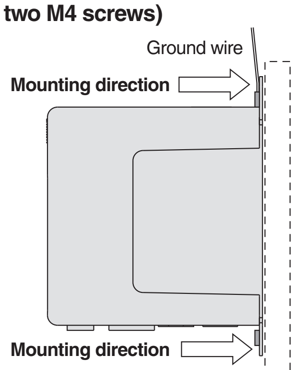
No.	Display	Description	Details
①	**PWR**	Power supply LED	Power supply ON/Servo ON : Green turns on Power supply ON/Servo OFF : Green flashes
②	**ALM**	Alarm LED	With alarm : Red turns on Parameter setting : Red flashes
③	—	Cover	Change and protection of the mode SW (Close the cover after changing SW)
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.

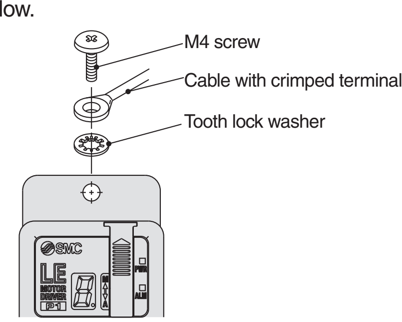
1. Mounting screw (LECP1□□-□)

(Installation with two M4 screws)



2. Grounding

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

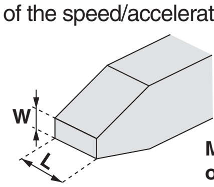


Controller

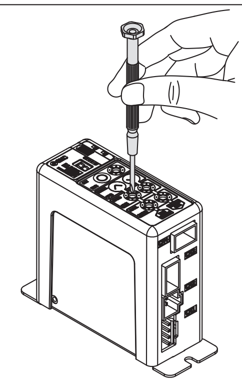
⚠Caution

- 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.

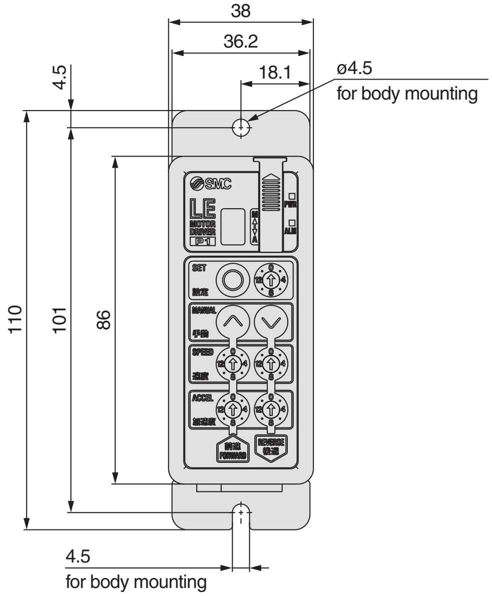
Size
End width **L**: 2.0 to 2.4 [mm]
End thickness **W**: 0.5 to 0.6 [mm]



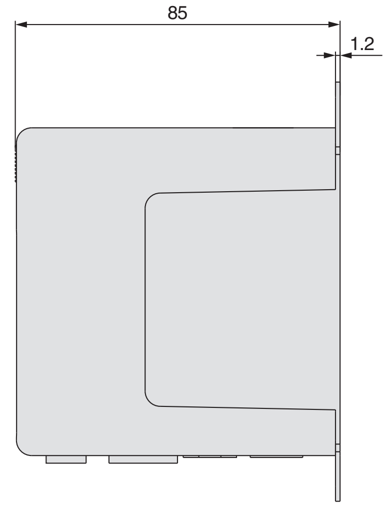
Magnified view of the end of the screwdriver



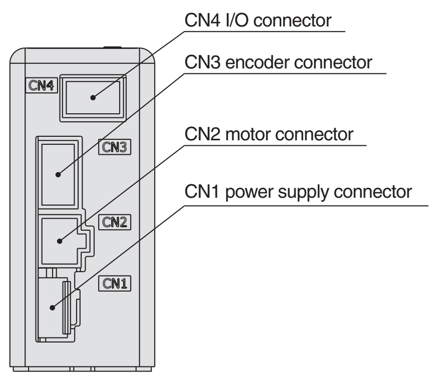
Dimensions



38
36.2
18.1
ø4.5
for body mounting
4.5
110
101
86
4.5
for body mounting



85
1.2



CN4 I/O connector
CN3 encoder connector
CN2 motor connector
CN1 power supply connector
CN4
CN3
CN2
CN1

Wiring Example 1

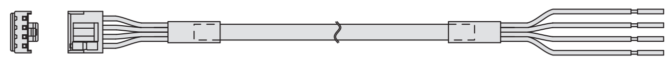
Power Supply Connector: CN1

∗ 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 color	Function	Details
0V	Blue	Common supply (–)	M24V terminal/C24V terminal/BK RLS terminal are common (–).
M24V	White	Motor power supply (+)	Motor power supply (+) supplied to the controller
C24V	Brown	Control power supply (+)	Control power supply (+) supplied to the controller
BK RLS	Black	Lock release (+)	Input (+) for releasing the lock

Power supply cable for LECP1 (LEC-CK1-1)

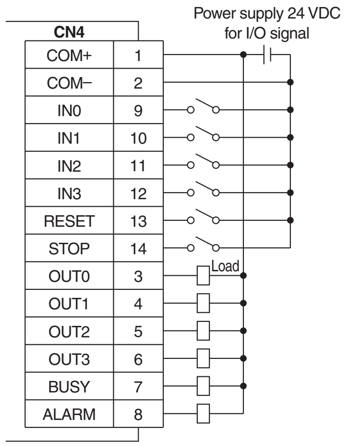


Wiring Example 2

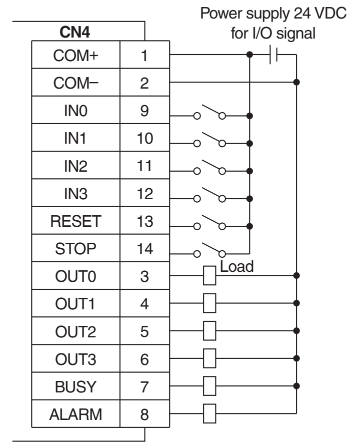
Parallel I/O Connector: CN4

∗ 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).

■ NPN



■ PNP



Input Signal

Name	Details
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)

Output Signal

Name	Details
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) OUT3: OFF, OUT2: OFF, OUT1: ON, OUT0: ON
BUSY	Outputs when the actuator is moving
∗ALARM Note)	Not output when alarm is active or servo OFF

Note) Signal of negative-logic circuit (N.C.)

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

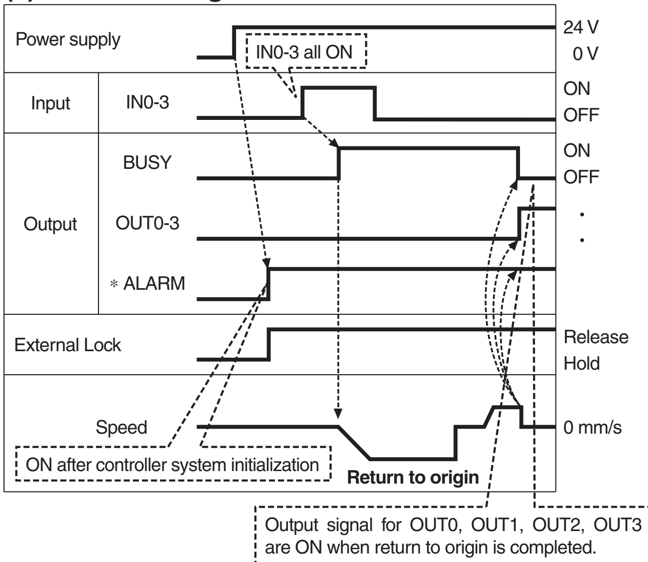
Position number	IN3	IN2	IN1	IN0
1	○	○	○	●
2	○	○	●	○
3	○	○	●	●
4	○	●	○	○
5	○	●	○	●
6	○	●	●	○
7	○	●	●	●
8	●	○	○	○
9	●	○	○	●
10 (A)	●	○	●	○
11 (B)	●	○	●	●
12 (C)	●	●	○	○
13 (D)	●	●	○	●
14 (E)	●	●	●	○
Retun to origin	●	●	●	●

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	●	●	●	●

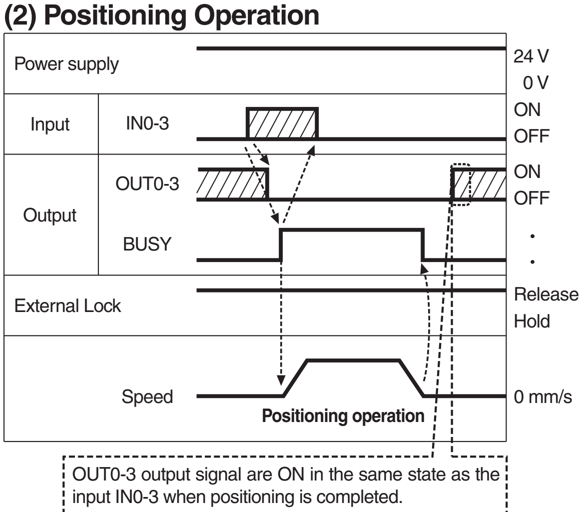
Signal Timing

(1) Return to Origin

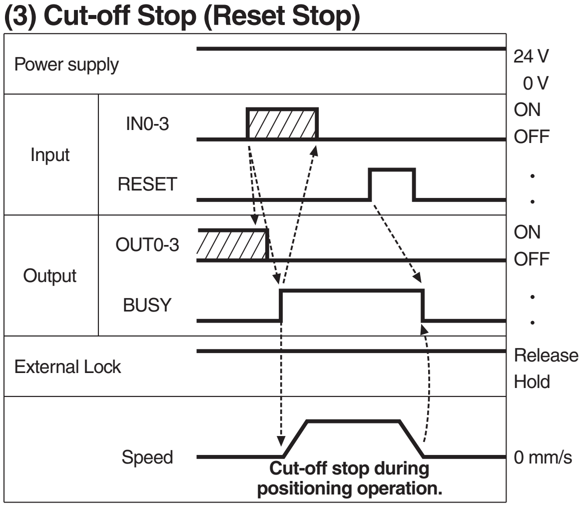


"*ALARM" is expressed as negative-logic circuit.

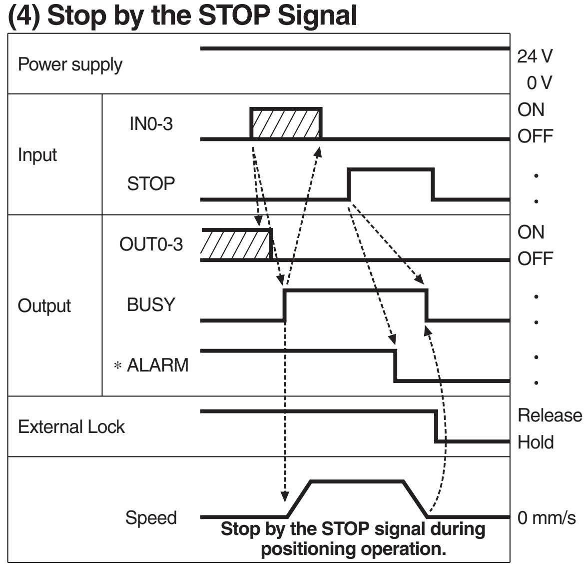
(2) Positioning Operation



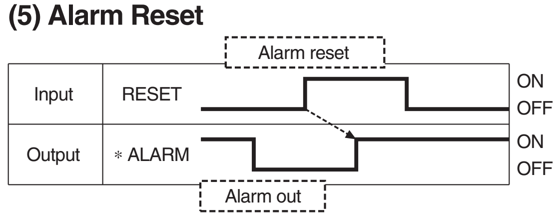
(3) Cut-off Stop (Reset Stop)



(4) Stop by the STOP Signal



(5) Alarm Reset



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

Options: Actuator Cable

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

LE – CP – 1 – □

Cable length(L)[m]

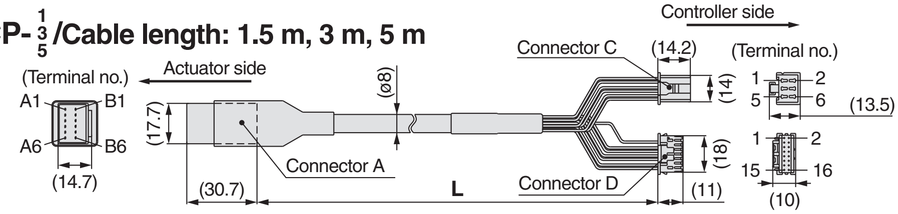
1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order (Robotic cable only)

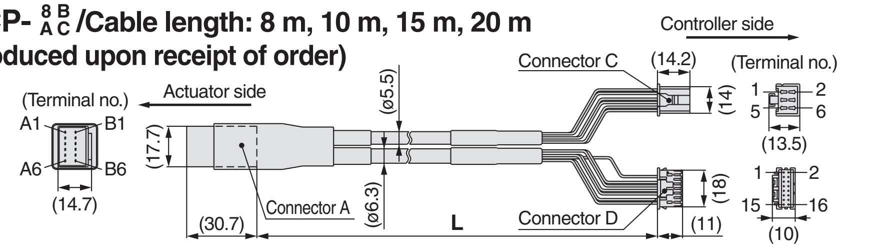
Cable type

Nil	Robotic cable (Flexible cable)
S	Standard cable

LE-CP-1/3/5/Cable length: 1.5 m, 3 m, 5 m



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



Signal	Connector A terminal no.	Cable color	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

Shield

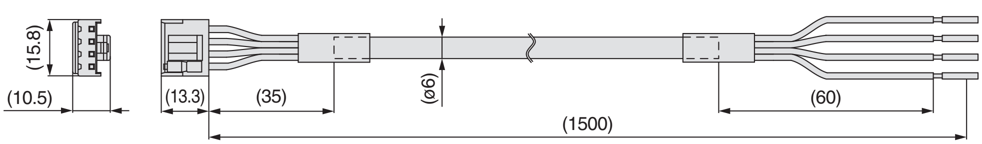
Signal	Connector A terminal no.	Cable color	Connector D terminal no.
Vcc	B-4	Brown	12
GND	A-4	Black	13
$\overline{A}$	B-5	Red	7
A	A-5	Black	6
$\overline{B}$	B-6	Orange	9
B	A-6	Black	8
		—	3

Options

[Power supply cable]

LEC – CK1 – 1

Terminal name	Covered color	Function
0V	Blue	Common supply (–)
M24V	White	Motor power supply (+)
C24V	Brown	Control power supply (+)
BK RLS	Black	Lock release (+)



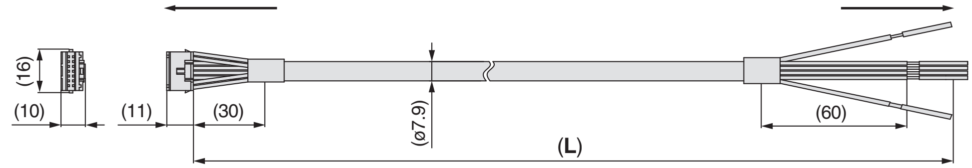
* Conductor size: AWG20

[I/O cable]

LEC – CK4 – □

Cable length(L)[m]

1	1.5
3	3
5	5



* Conductor size: AWG26

Terminal no.	Insulation color	Dot mark	Dot color	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	Gray	■	Black	BUSY

Terminal no.	Insulation color	Dot mark	Dot color	Function
8	Gray	■	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.

⚠ 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 catalog 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 catalog.
   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 catalog 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.

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