Electric Slide Table

Easy setting

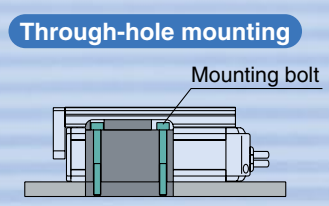
Data can be set with only 2 items: position and speed.

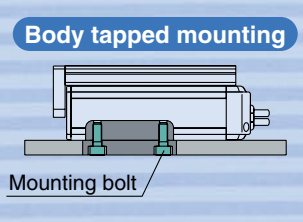
Data	Axis 1
Step No.	0
Posn	50.00 mm
Speed	400 mm/s

* Teaching box screen



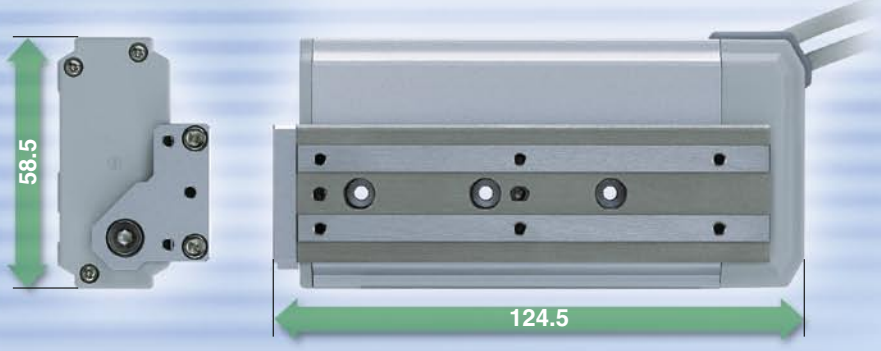
- **Compact, Space-saving**
  (61% reduction in volume compared to the SMC conventional products)
- **Reduced cycle time**
  Max. acceleration and deceleration: **5,000** mm/s²/Max. speed: **400** mm/s
- **Positioning repeatability: ±0.05 mm**
- **Maximum pushing force: 180 N**
- **Mounting in 2 directions is available.**











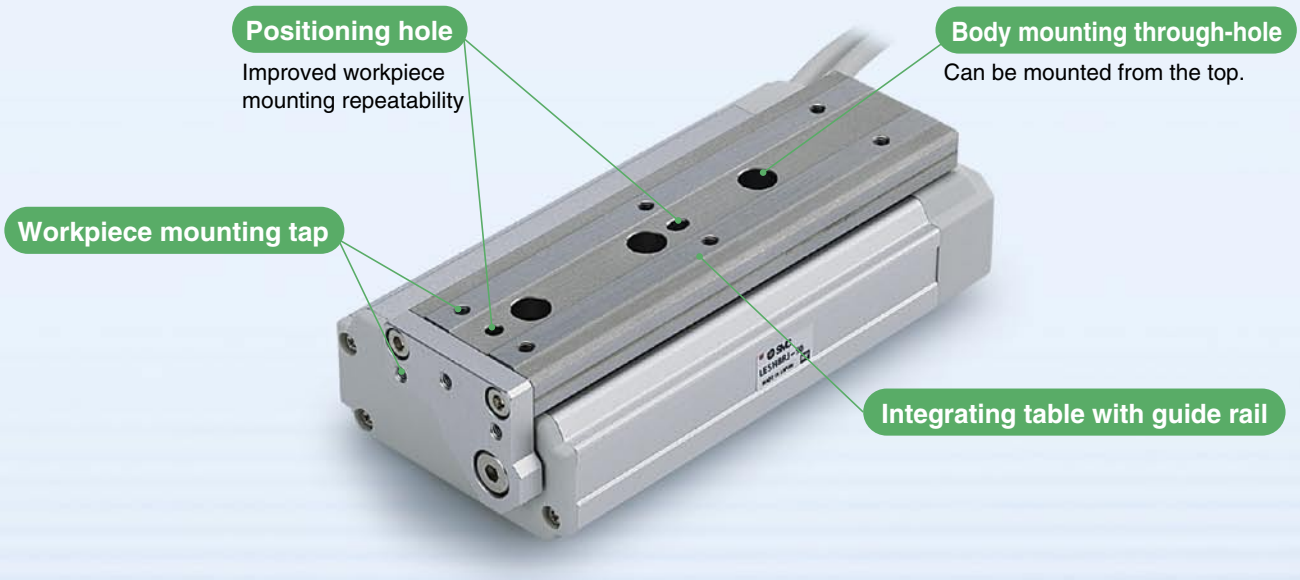
* LESH8 50 mm stroke

Series LES

SMC

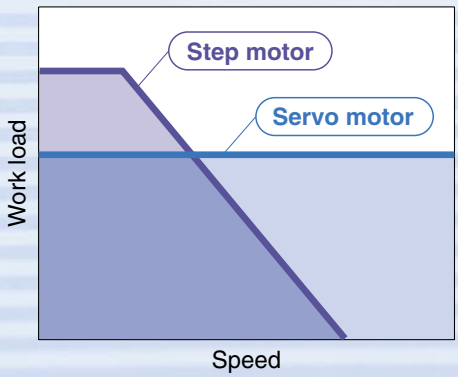
CAT.EUS100-78A-UK

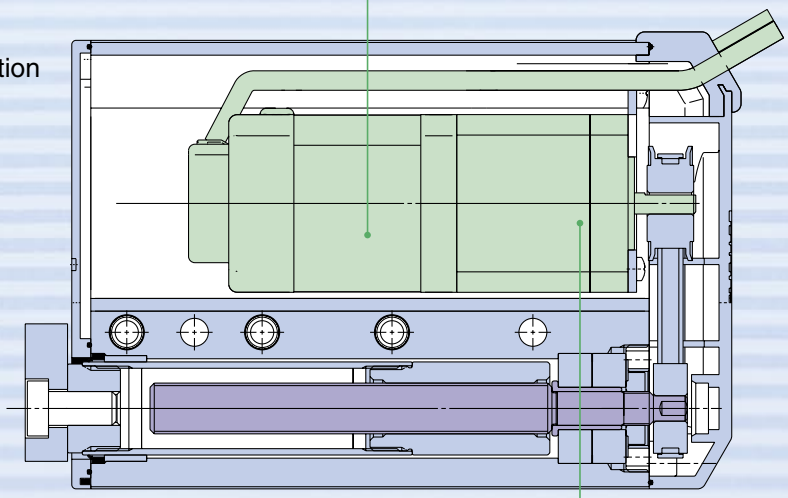
Integration of the guide rail and the table. Uses a recirculating linear guide for high rigidity and high precision. Electric slide table for precision assembly processes.



2 types of motors can be selected

- **Step motor (Servo/24 VDC)**
  Ideal for transfer of high load at a low speed and pushing operation
- **Servo motor (24 VDC)**
  Stable at a high speed and silent operation

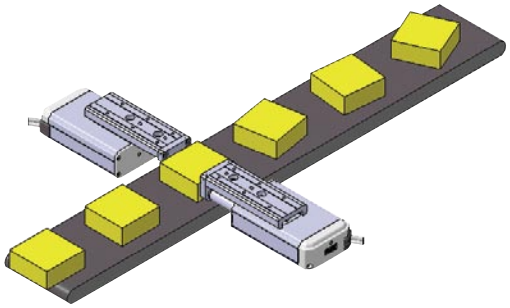




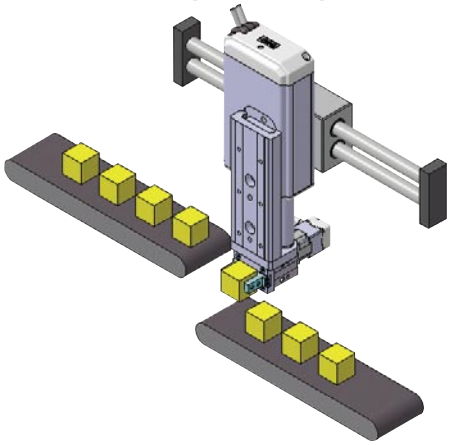
Non-energizing operation type lock mechanism (Option)
Drop prevention in case of power failure

Application Examples

Positioning of pallets on a conveyer



Z motion for pick and place



Series Variations

Step Motor (Servo/24 VDC) Specifications

Model	Stroke (mm)	Work load (kg)		Speed (mm/s)	Screw lead (mm)	Positioning repeatability (mm)	Reference page
		Horizontal	Vertical				
LESH8R	50, 75	2	0.5	10 to 200	4	±0.05	P. 12
		1	0.25	20 to 400	8		
LESH16R	50, 100	6	2	10 to 200	5		
		4	1	20 to 400	10		
LESH25R	50, 100, 150	9	4	10 to 150	8		
		6	2	20 to 400	16		

Servo Motor (24 VDC) Specifications

Model	Stroke (mm)	Work load (kg)		Speed (mm/s)	Screw lead (mm)	Positioning repeatability (mm)	Reference page
		Horizontal	Vertical				
LESH8RA	50, 75	2	0.5	10 to 200	4	±0.05	P. 12
		1	0.25	20 to 400	8		
LESH16RA	50, 100	5	2	10 to 200	5		
		2.5	1	20 to 400	10		
LESH25RA	50, 100, 150	6	2.5	10 to 150	8		
		4	1.5	20 to 400	16		

Controller

Type	Series	Applicable motor	Power supply voltage	Parallel I/O		Positioning pattern points	Reference page
				Input	Output		
Controller	**LECP**	Step motor (Servo/24 VDC)	24 VDC ±10%	11 inputs (Photo-coupler isolation)	13 outputs (Photo-coupler isolation)	64 points	P. 21
	LECA	Servo motor (24 VDC)					

Simple Setting to Use Straight Away
Start-up Time Shortened

■ The controller is already set with the data of the actuator.

Refer to page 22 for details of the controller.

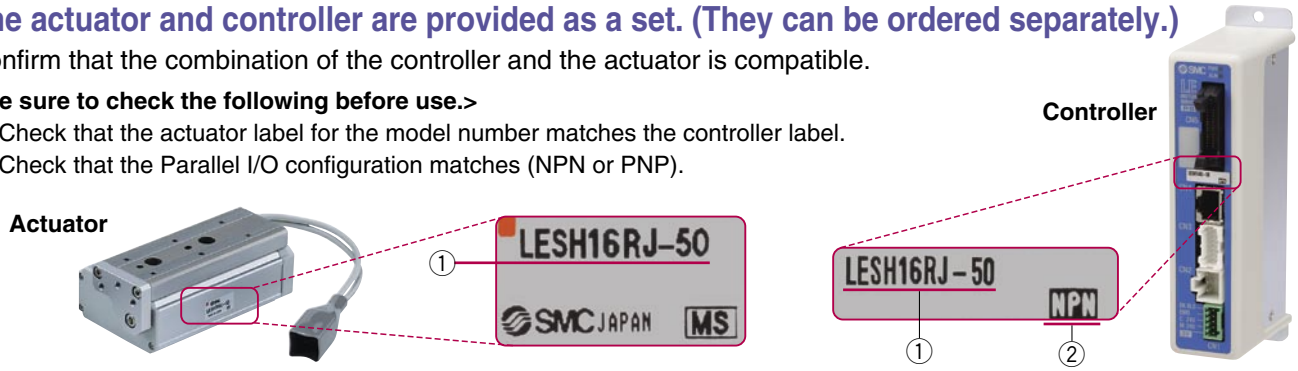
Initial parameters are already set when the controller is shipped.
Possible to start up the controller in a short time with easy mode.

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 compatible.

<Be sure to check the following before use.>

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



Simple Setting Easy Mode

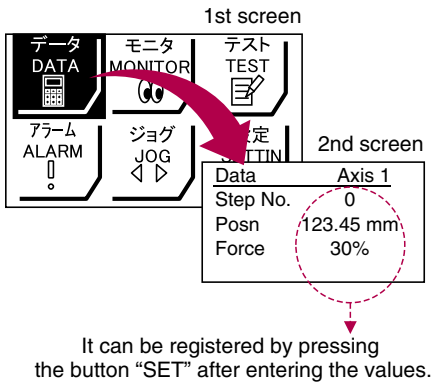
If you want to use it right away, select "Easy Mode."

<When using a Teaching Box>

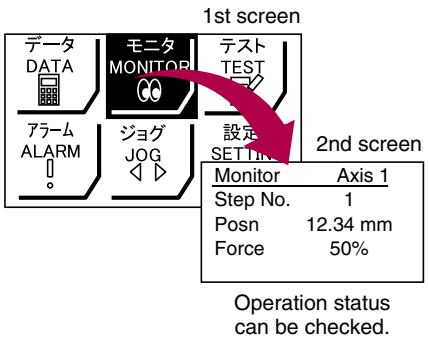
- The simple screen without scrolling promotes ease of setting and operating.
- Pick up an icon from the first screen and select a function.
- Set up the step data and check the monitor on the second screen.



Example of setting the step data

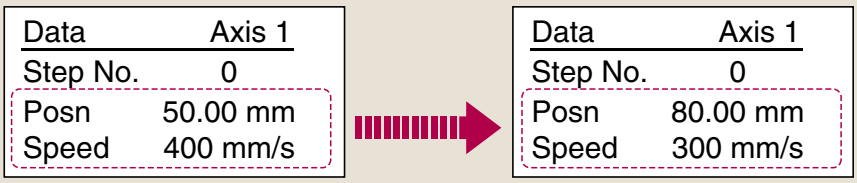


Example of checking the monitor



Teaching box screen

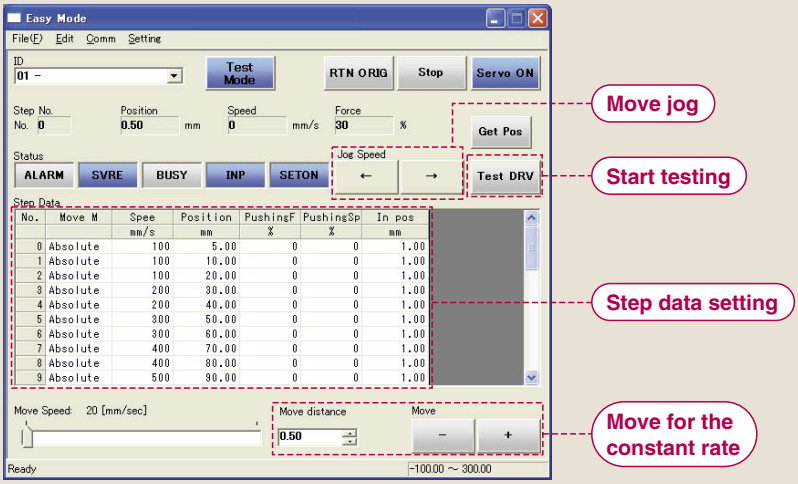
- Data can be set with position and speed.
  (Other conditions are already set.)



<When using a PC>
Controller setting software

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





Detail Setting Normal Mode

Select normal mode when detail setting is required.

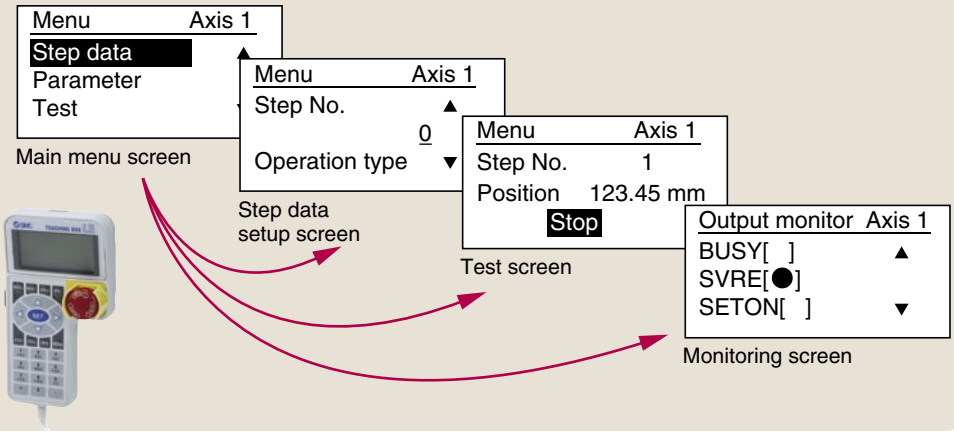
- Step data can be set in detail.
- Signals and terminal status can be monitored.
- Parameters can be set.
- JOG and constant rate movement, return to origin, test operation and testing of compulsory output can be performed.

<When using a Teaching Box>

- In the test operation, the actuator is continuously operated by a maximum of 5 step data.
- Step data can be copied to several controllers by saving the step data in the teaching box.

Teaching box screen

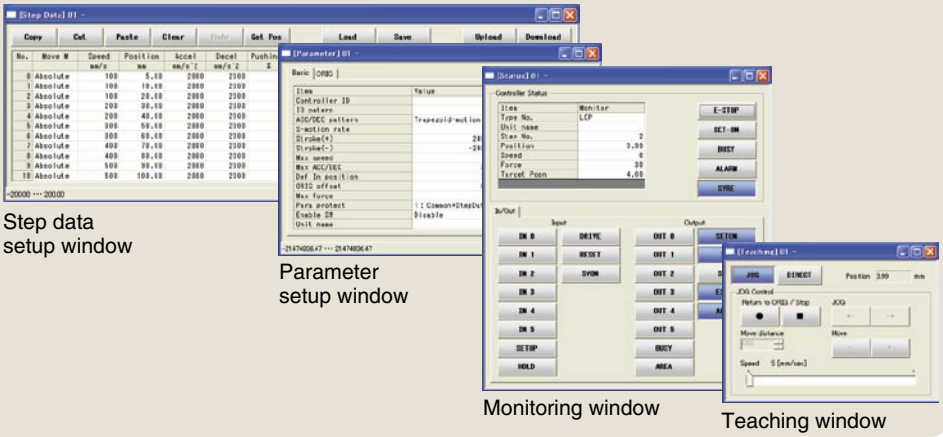
- Each function (step data setting, test, monitor, etc.) can be selected from the main menu.



<When using a PC> Controller setting software

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





Setting Items

TB: Teaching box
PC: Controller setting software

Function		Contents	Easy mode		Normal mode
			TB	PC	TB, PC
Step data setting (Excerpt)	Speed	Can be set in units of 1 mm/s.	○	○	○
	Position	Can be set in units of 0.01 mm. (During pushing: Pushing start position)	○	○	○
	Acceleration/Deceleration	Can be set in units of 1 mm/s².	○	○	○
	Pushing force	Positioning operation: Set to 0%. Step motor can be set from 30 to 70% and servo motor can be set from 50 to 100%, in units of 1%.	○	○	○
	Trigger LV	Trigger LV of target force during pushing operation: Can be set in units of 1% from 30% to 70%.	×	○	○
	Pushing speed	Can be set to pushing speed. Minimum speed to 20 mm/s (Refer to the specifications on page 13.)	×	○	○
	Positioning force	Positioning force: Step motor is set to 100%, and servo motor is set to 250%.	×	○	○
	In position	During positioning operation: Width to the target position. It should be set to 0.5 or more. During pushing operation: How much it moves during pushing	×	○	○
Parameter setting (Excerpt)	Stroke (+)	+ side limit of position (Unit: 0.01 mm)	×	×	○
	Stroke (–)	– side limit of position (Unit: 0.01 mm)	×	×	○
	ORIG speed	Speed when returning to the original position can be set.	×	×	○
	ORIG ACC	Acceleration when returning to the original position can be set.	×	×	○
Test	JOG	Continuous operation at the set speed can be tested while the switch is being pressed.	○	○	○
	MOVE	Operation at the set distance and speed from the current position can be tested.	×	○	○
	Return to ORIG	Returning to the original position can be tested.	○	○	○
	Test drive	Operation of the specified step data can be tested.	○	○	○ (Continuous operation)
	Compulsory output	ON/OFF of the output terminal can be tested.	×	×	○
Monitor	DRV mon	Current position, current speed, current force and the specified step data No. can be monitored.	○	○	○
	In/Out mon	Current ON/OFF status of the input and output terminal can be monitored.	×	×	○
ALM	Active ALM	Alarm currently being generated can be confirmed.	○	○	○
	ALM Log record	Alarm generated in the past can be confirmed.	×	×	○
File	Save/Load	Step data and parameter of the objective controller can be saved, forwarded and deleted.	×	×	○
Other	Language	Can be changed to Japanese or English.	○*2	○*3	○*2, *3

*1 Every parameter is set to the recommended condition before shipment from the factory. Please change the setting of the items which require adjustment.
*2 Teaching box: In the normal mode, the teaching box can be set to work in English or Japanese.
*3 Controller setting software: Can be installed by selecting English or Japanese version.

System Construction

● Electric slide table

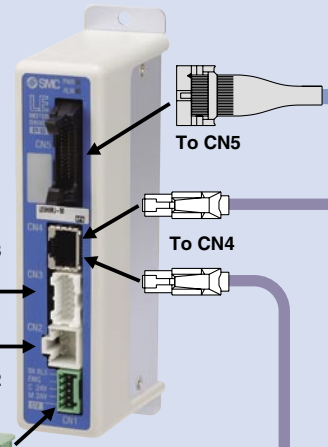


PLC

Power supply for I/O signal 24 VDC

● Controller* P. 22

● I/O cable* P. 30
Part No.: LEC-CN5-□



● Actuator cable* P. 28, 29

Actuator cable	Part No.
Step motor (Servo/24 VDC)/Without lock	LE-CP-□
Step motor (Servo/24 VDC)/With lock	LE-CP-□-B
Servo motor (24 VDC)/Without lock	LE-CA-□
Servo motor (24 VDC)/With lock	LE-CA-□-B

Controller power supply

● Power supply plug (accessory)
<Applicable cable size>
AWG20 (0.5 mm^2)

The components marked with * are included depending on the model selection.

Options

● Teaching box P. 32
(with 3 m cable)
Part No.: LEC-T1-3EG□



or

● Controller setting software P. 31
(Communication cable, conversion unit and USB cable are included.)
Part No.: LEC-W1



Communication cable

● Conversion unit



● USB cable
(A-miniB type)

PC

Electric Slide Table

Series LES

Model		Stroke (mm)	Work load (kg)				Speed (mm/s)	Screw lead (mm)	Motor	Positioning repeatability (mm)	Reference page
			Step motor (Servo/24 VDC)		Servo motor (24 VDC)						
			Horizontal	Vertical	Horizontal	Vertical					
LESH8R		**50,75**	2	0.5	2	0.5	10 to 200	4	Step motor (Servo/24 VDC) Servo motor (24 VDC)	±0.05	**P. 12**
			1	0.25	1	0.25	20 to 400	8			
LESH16R		**50,100**	6	2	5	2	10 to 200	5			
			4	1	2.5	1	20 to 400	10			
LESH25R		**50,100 150**	9	4	6	2.5	10 to 150	8			
			6	2	4	1.5	20 to 400	16			

Type	Series		Rated voltage	Parallel I/O		Positioning pattern points	Reference page
				Input	Output		
Controller	**LEC□6**		24 VDC ±10%	11 inputs (Photo-coupler isolation)	13 outputs (Photo-coupler isolation)	64 points	**P. 21**

Series LES
Model Selection

Model Selection

Positioning Control Selection Procedure

Step 1 **Confirm the transfer load.**
Since the transfer load depends on the mounting orientation, select it from the specification list.

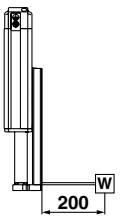
→ **Step 2** **Confirm the transfer speed.**
Confirm that the transfer speed satisfies the conditions by using the speed-work load graph.

→ **Step 3** **Confirm the allowable moment.**
Confirm that the dynamic allowable moment is below the range of the graph.

Selection Example

Operating Conditions

Workpiece mass: 1 kg
Stroke: 50 mm
Workpiece mounting condition:
Mounting orientation: Vertical
Cycle time: 0.5 seconds



Step 1 **Confirmation of the transfer load**

Confirm the weight of work pieces to the orientation with reference to the specifications.
(Example)
The **LESH16RJ** is selected temporarily based on the conditions.

Model		LESH8RK	LESH8RJ	LESH16RK	LESH16RJ	LESH25RK	LESH25RJ
Screw lead (mm)		4	8	5	10	8	16
Work load (kg)	Horizontal	2	1	6	4	9	6
	Vertical	0.5	0.25	2	1	4	2

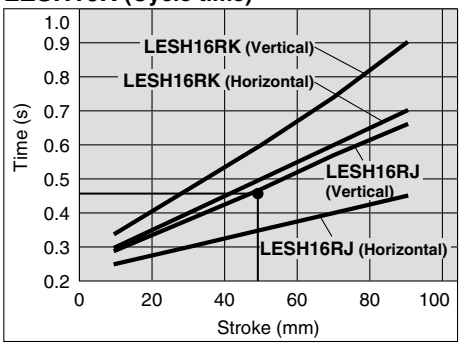
Step 2 **Confirmation of the cycle time for the selected product**

It is possible to roughly calculate the cycle time by using method 1, however, if more detailed cycle time is required, use method 2.

∗ Although it is possible to calculate a guideline cycle time by using method 1, this calculation is based on the condition where the maximum load is mounted. Therefore, if it is necessary to find out a more detailed cycle time for a specific load, use method 2.

Method 1: Confirmation by graph (Refer to the cycle time on page 3 and 4.)
Caution) The operating conditions for the cycle time in the graph are stated below.
Workpiece mass: Max. load of each size (Refer to the specifications.)
Speed: Max. speed of each size
Acceleration/Deceleration: 5000 mm/s²
In position: 0.5

LESH16R (Cycle time)



Method 2: When the cycle time is calculated by the following calculation. (Refer to page 5 and 6 for speed.)

The cycle time is calculated with the following conditions.
Speed: 220 mm/s
Acceleration/Deceleration: 5000 mm/s²
Stroke: 50 mm

Acceleration time = speed / acceleration = 220 / 5000 = 0.044 seconds
Deceleration time = speed / acceleration = 220 / 5000 = 0.044 seconds

Travel distance by acceleration
= 0.5 x acceleration x acceleration time²
= 0.5 x 5000 x 0.044² = 4.84 mm

Travel distance by deceleration
= 0.5 x deceleration x deceleration time²
= 0.5 x 5000 x 0.044² = 4.84 mm

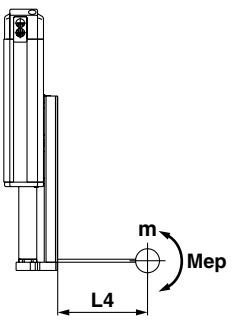
Constant speed travel distance
= travel stroke – acceleration travel distance – deceleration travel distance
= 50 – 4.84 – 4.84 = 40.32 mm

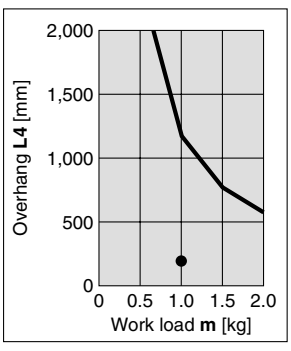
Constant speed time
= constant speed travel distance / speed
= 40.32 / 220 = 0.18 seconds

In addition, settling time is added. The settling time varies depending on the conditions such as load and in positioning of the step data, but in general, 0.15 seconds are added when selecting the actuator.

Total cycle time
= acceleration time + constant speed time + deceleration time + settling time
= 0.044 + 0.18 + 0.044 + 0.15 = 0.418

Step 3 **Confirmation of guide moment**

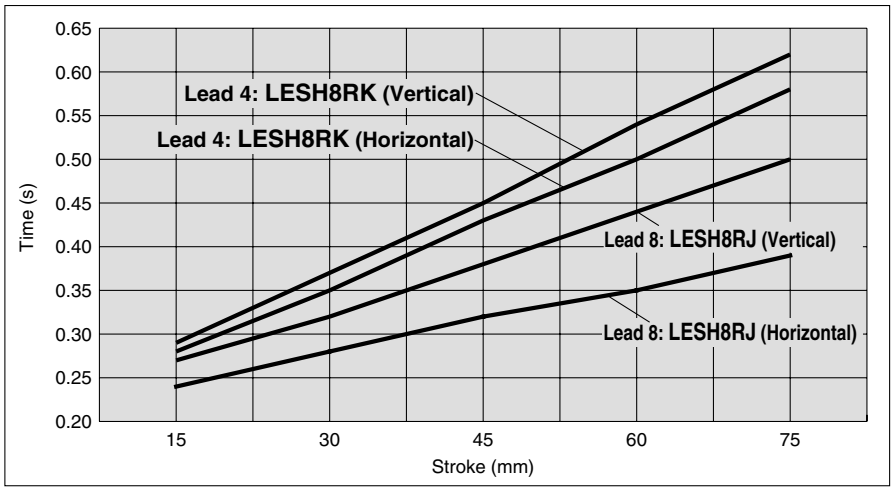




Based on the above calculation result, the LESH16RJ-50 is selected.

Cycle Time (Guide) (Step Motor (Servo/24 VDC))

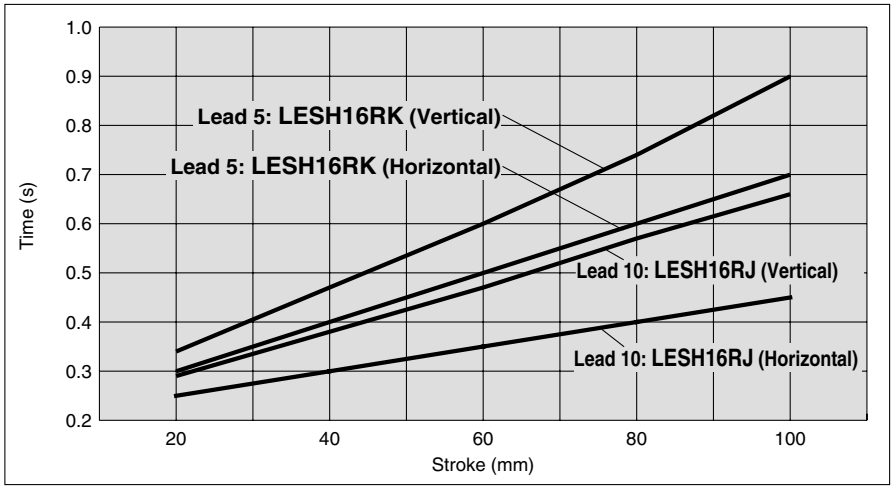
LESH8R



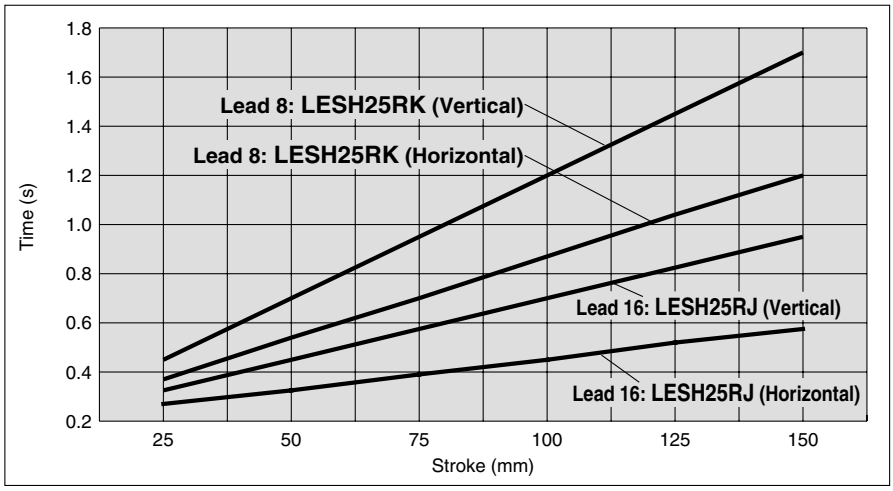
Operating Conditions

Workpiece mass: Max. load of each size
Speed : Max. speed of each size
Acceleration/
Deceleration : 5000 mm/s^2
In position : 0.5

LESH16R



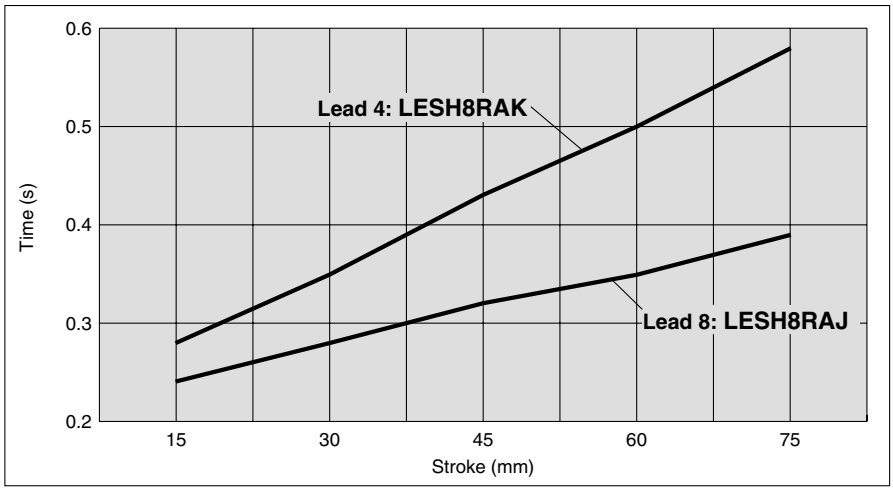
LESH25R



Model Selection

Cycle Time (Guide) (Servo Motor (24 VDC))

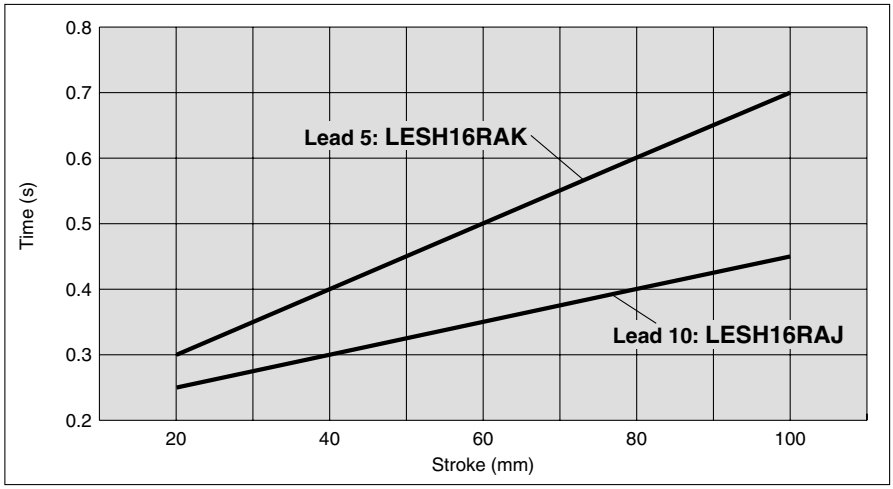
LESH8RA



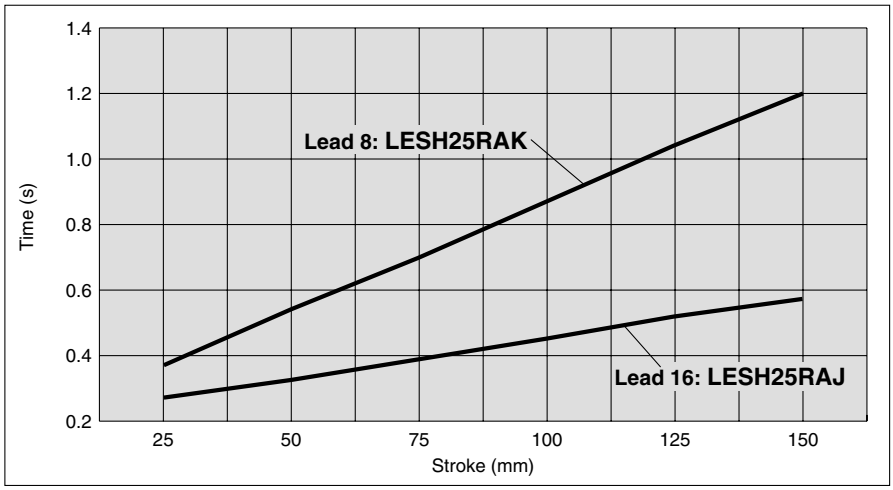
Operating Conditions

Workpiece mass: Max. load of each size
Speed : Max. speed of each size
Acceleration/
Deceleration : 5000 mm/s^2
In position : 0.5

LESH16RA



LESH25RA

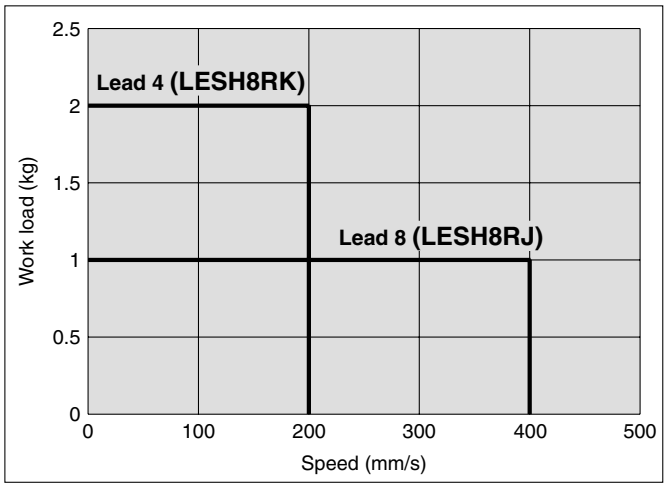


Speed–Work Load Graph (Guide) (Step Motor (Servo/24 VDC))

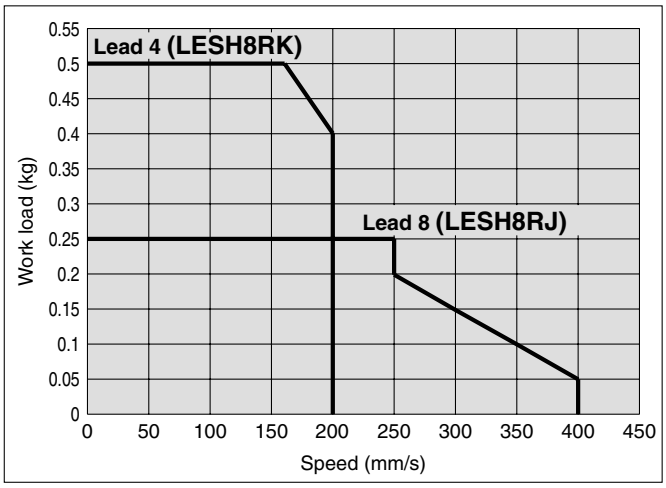
∗ The following graph shows the values when positioning force is 100%.

LESH8R

Horizontal

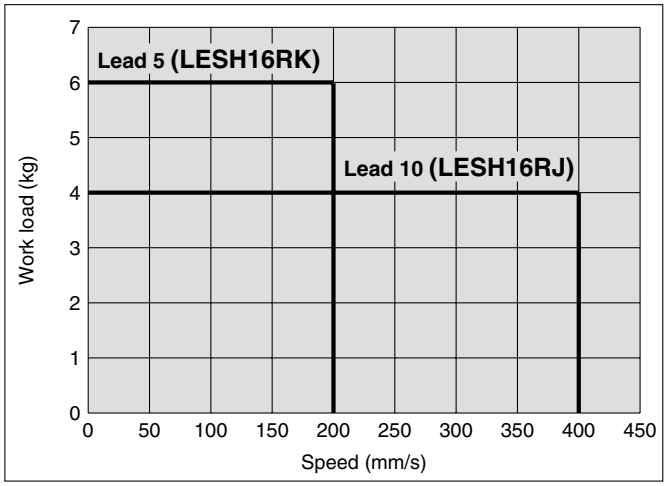


Vertical

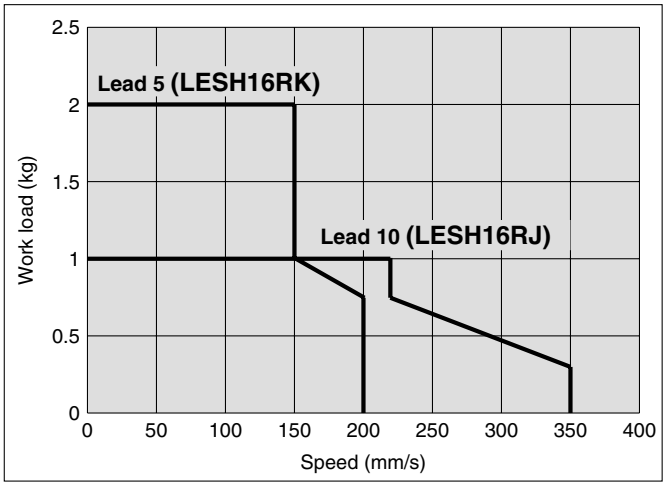


LESH16R

Horizontal

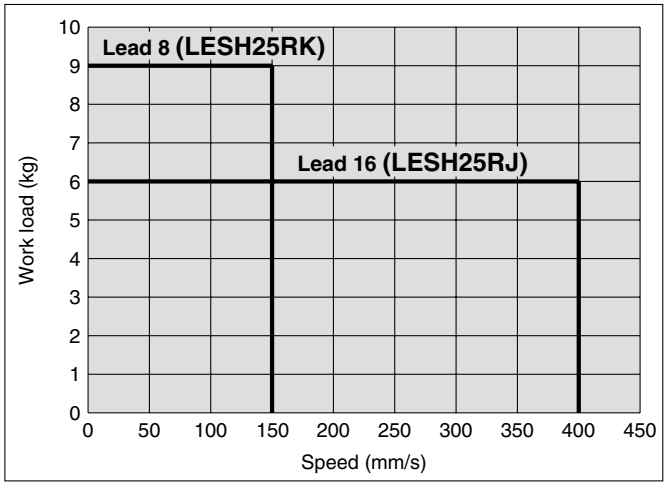


Vertical

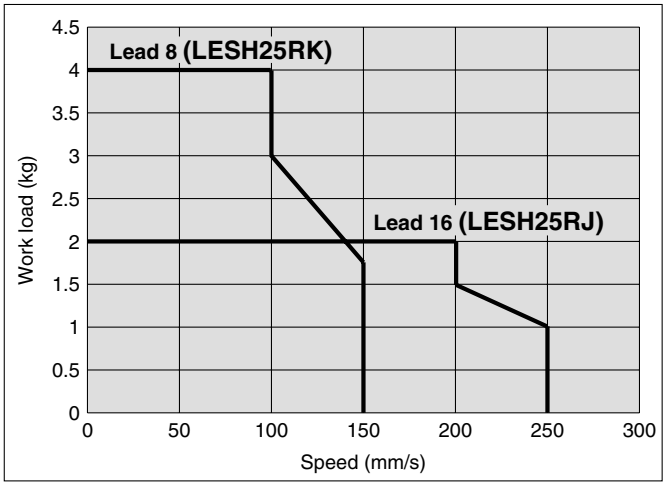


LESH25R

Horizontal



Vertical



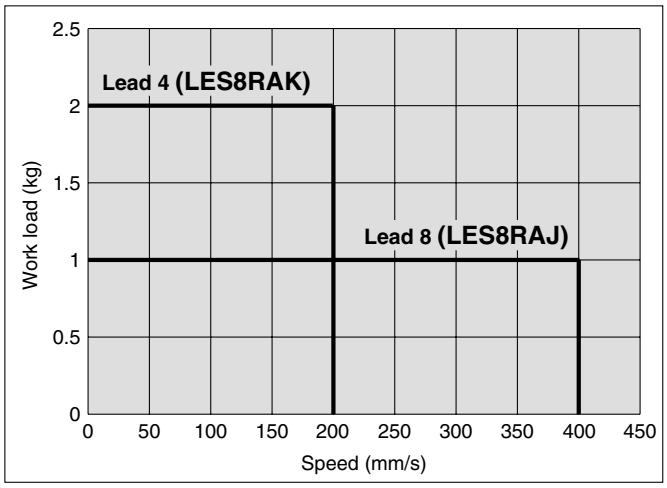
Model Selection

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

∗ The following graph shows the values when positioning force is 250%. The load for vertical mounting is in the range of the specifications on page 13.

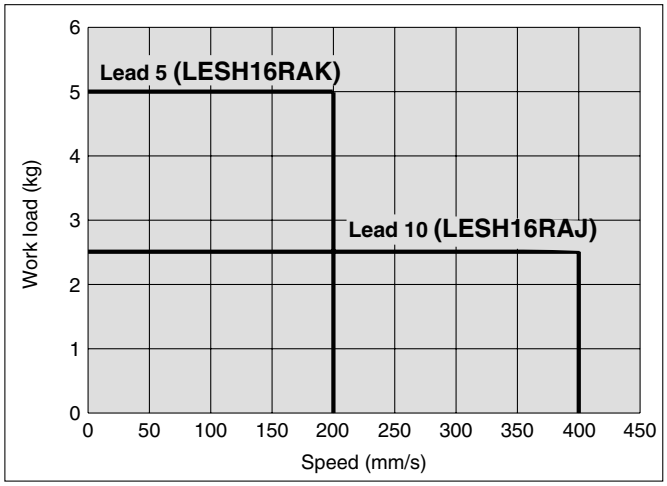
LESH8RA

Horizontal–Vertical



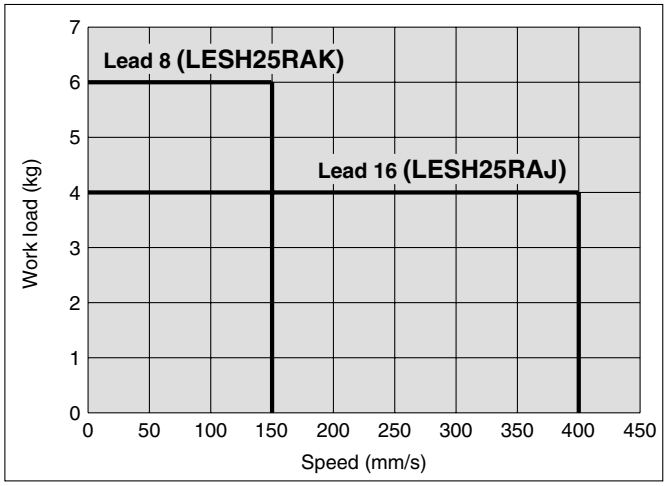
LESH16RA

Horizontal–Vertical

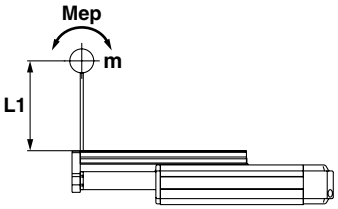
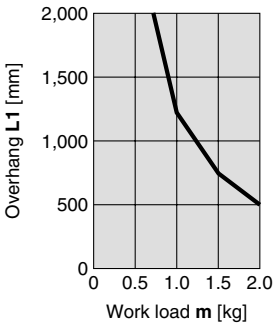
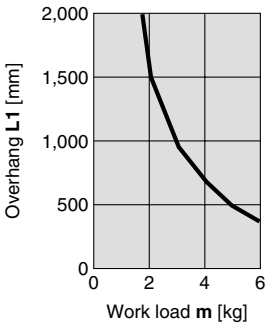
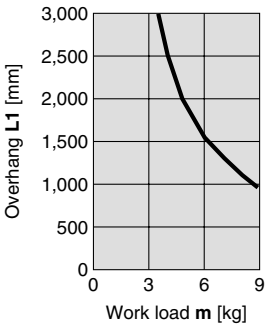
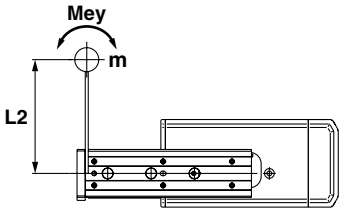
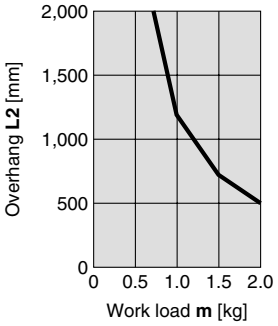
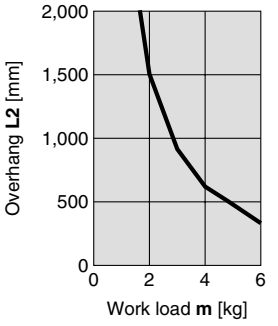
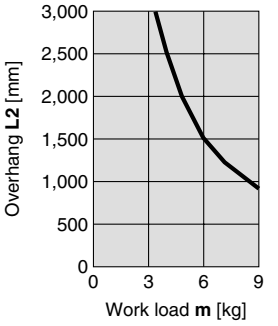
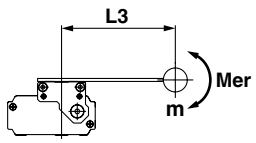
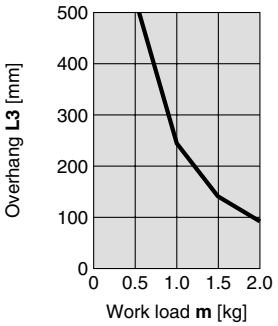
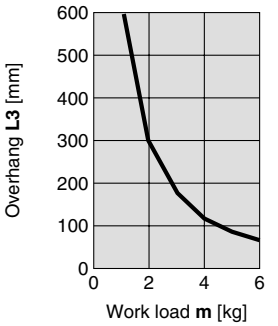
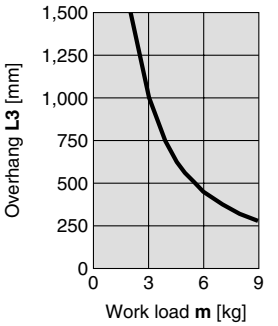
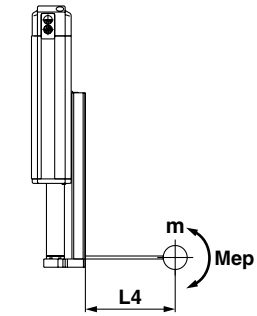
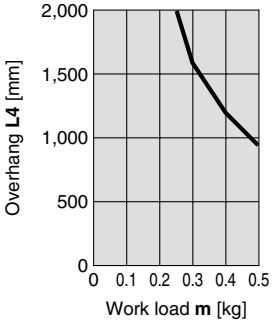
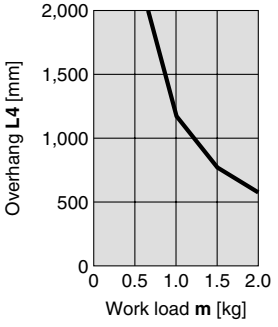
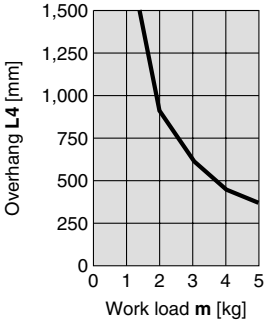
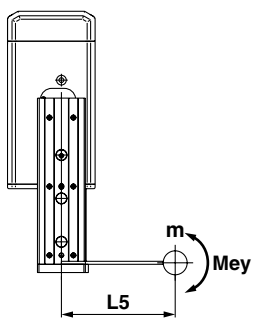
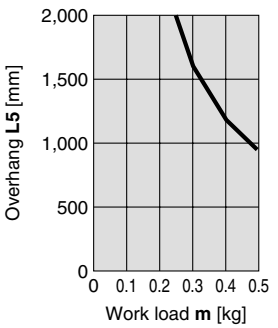
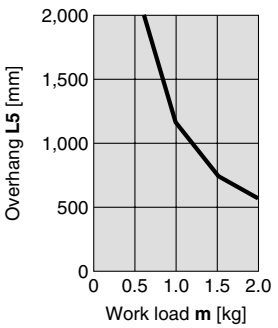
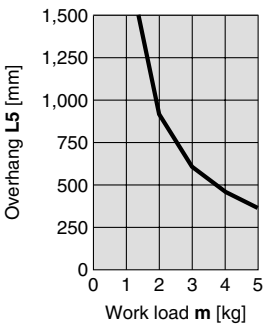


LESH25RA

Horizontal–Vertical



Dynamic Allowable Moment

Orientation	Load overhanging direction **m** : Work load [kg] **Me**: Dynamic allowable moment [N·m] **L** : Amount of overhang to the centre of gravity of the workpiece [mm]		Model		
			LESH8R	**LESH16R**	**LESH25R**
Horizontal		**Pitching Mep**			
		**Yawing Mey**			
		**Rolling Mer**			
Vertical		**Pitching Mep**			
		**Yawing Mey**			

Model Selection

Model Selection

Pushing Control Selection Procedure

Step 1 Confirm the duty ratio. → **Step 2** Confirm the required force. → **Step 3** Select the actuator.

Selection Example

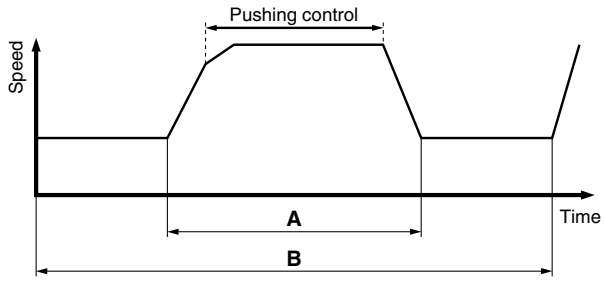
Operating Conditions

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

Caution) It should be set to the **minimum speed**.
If the speed is set to fast, it may break the actuator. Conversely, if it is set to slow, the actuator may have knocking operation.

Step 1 Confirmation of the duty ratio

Confirm the duty ratio with reference to the below example.



Duty ratio = A/B x 100 [%]

Decide the following duty ratio conditions from the below table.

Step Motor (Servo/24 VDC)

Pushing force (%)	Duty ratio (%)	Continuous pushing time (min.)
30	—	—
50 or less	30	5
70 or less	20	3

Servo Motor (24 VDC)

Pushing force (%)	Duty ratio (%)	Continuous pushing time (min.)
50	—	—
75 or less	30	5
100 or less	20	3

∗ The pushing force of the LESH8RA is 75% at a maximum.

Duty ratio = 1.5/6 x 100 = 25%

As a result of the above selection, it is possible to achieve 50% of the pushing force of the step motor specification.

Step 2 Confirmation of the required force

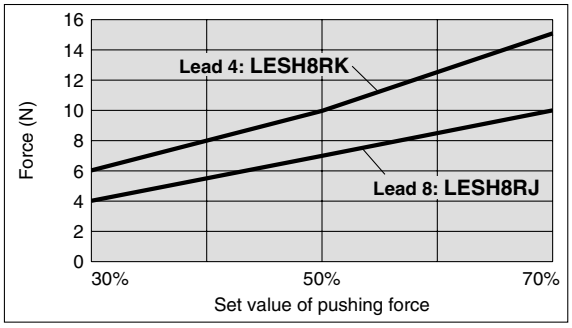
Add the force required to transfer the workpiece to a pushing force of 90 N.
Force required for pushing = 90 + 10 = **100 N**

Step 3 Selection of actuator

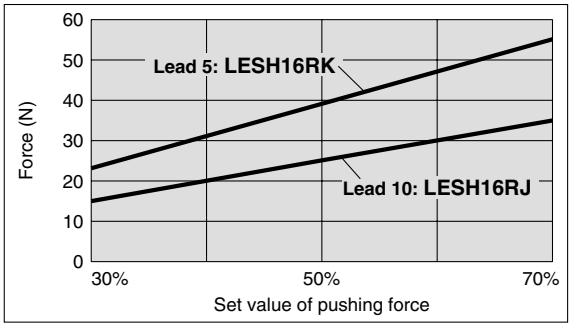
Select an actuator that satisfies a required force of 100 N and duty ratio of 30% from the following graph.

Step Motor (Servo/24 VDC)

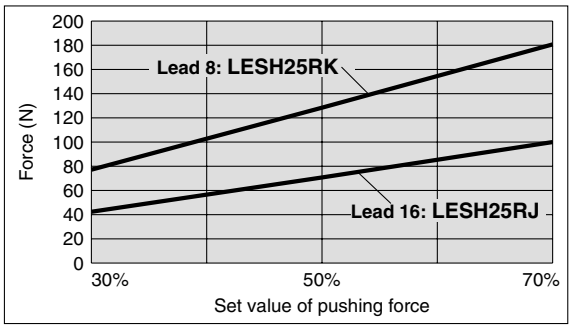
LESH8R



LESH16R

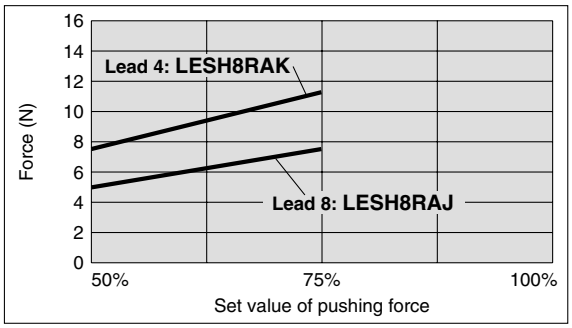


LESH25R

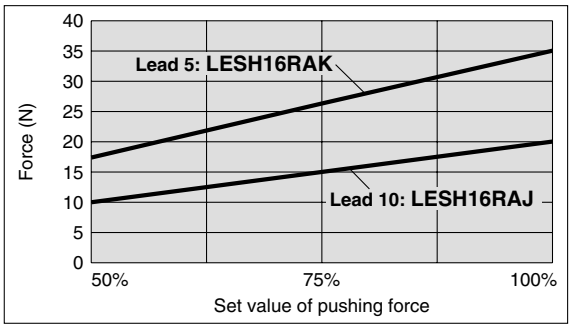


Servo Motor (24 VDC)

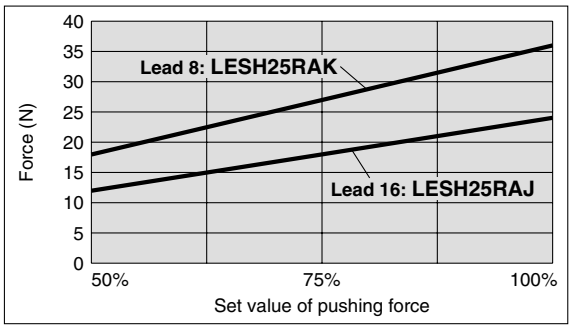
LESH8RA



LESH16RA



LESH25RA



∗ When using the actuator in the vertical direction, consider the table weight.

Model	50st	75st	100st	150st
LESH8R	2 N	3 N	—	—
LESH16R	4 N	—	7 N	—
LESH25R	9 N	—	13 N	17 N

Vertical and downward: Add the table weight to the weight of the workpiece.

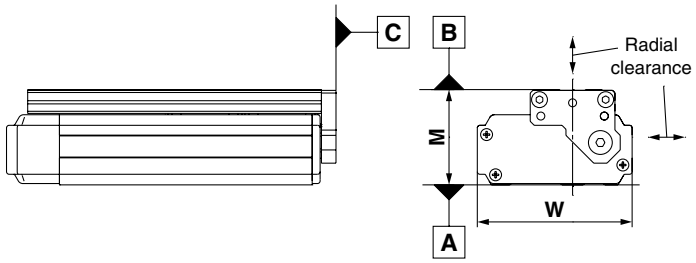
As a result of the above selection, the LESH25RK-100 should be selected.

The guide moment should follow the selection of the positioning control.

Model Selection

Table Accuracy

∗ These values are initial guideline values.

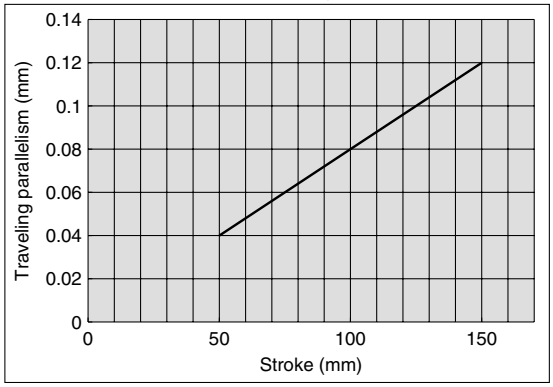


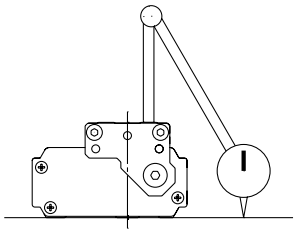
Model	LESH8R	LESH16R	LESH25R
B side parallelism to A side	Refer to Table 1.		
B side traveling parallelism to A side	Refer to Graph 1.		
C side perpendicularity to A side	0.05	0.05	0.05
M dimension tolerance (mm)	±0.3		
W dimension tolerance (mm)	±0.2		
Radial clearance (μm)	−4 to 0	−10 to 0	−14 to 0

Table 1 B Side Parallelism to A Side

Model	Stroke (mm)			
	50	75	100	150
LESH8R	0.055	0.065	—	—
LESH16R	0.05	—	0.08	—
LESH25R	0.06	—	0.08	0.125

Graph 1 B Side Traveling Parallelism to A Side





Static Allowable Moment

Model		LESH8R		LESH16R		LESH25R		
Stroke	[mm]	50	75	50	100	50	100	150
Pitching	[N·m]	11		26	43	77	112	155
Yawing	[N·m]	11						
Rolling	[N·m]	12		48		146	177	152

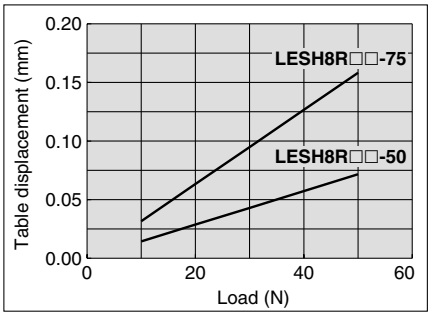
Table Deflection (Reference Values)

∗ These values are initial guideline values.

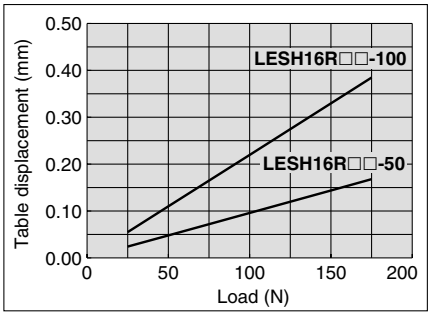
Table displacement due to pitch moment load



LESH8R



LESH16R



LESH25R

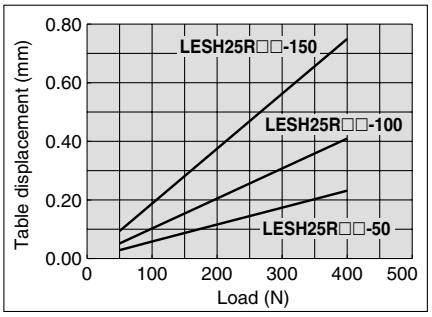
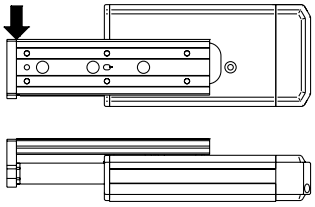
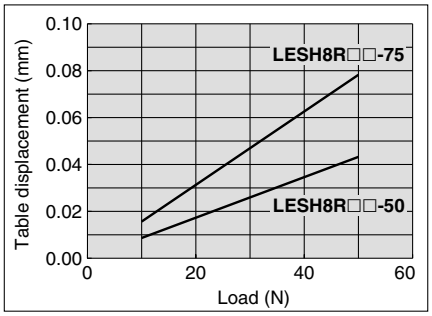


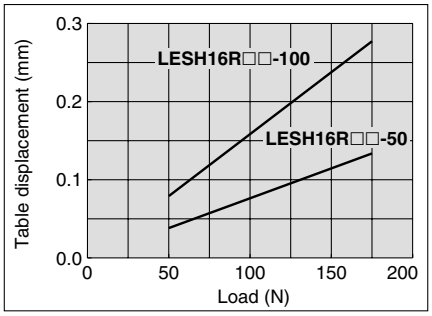
Table displacement due to yaw moment load



LESH8R



LESH16R



LESH25R

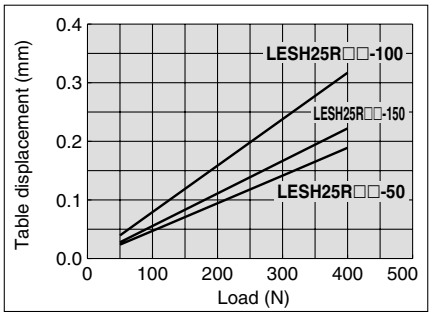
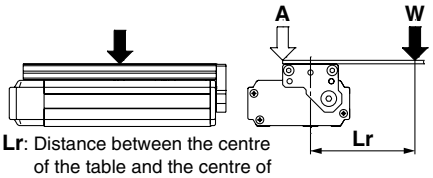
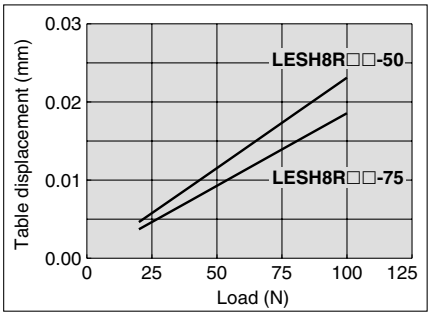


Table displacement due to roll moment load

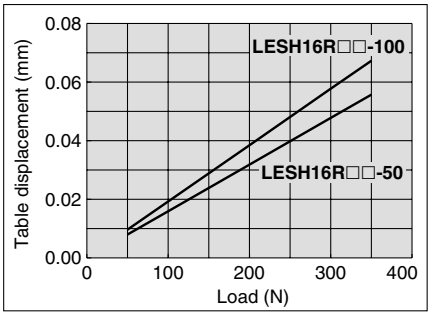


Lr: Distance between the centre of the table and the centre of gravity of the workpiece

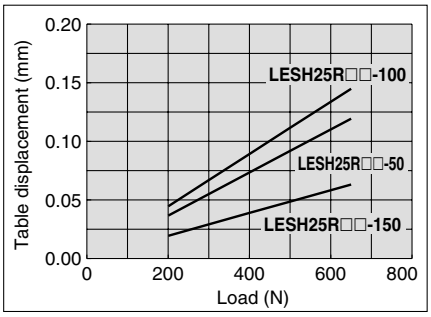
LESH8R **Lr** = 70 mm



LESH16R **Lr** = 120 mm



LESH25R **Lr** = 200 mm



Electric Slide Table

Series LES

LESH8, 16, 25

CE

How to Order

LESH 8 R ☐ J – 50 ☐ ☐ – R 1 6N 1 ☐

Size

8
16
25

Motor type

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

Lead screw type

Symbol	Screw lead (mm)		
	LESH8R	**LESH16R**	**LESH25R**
K	4	5	8
J	8	10	16

Stroke

Stroke (mm)	Body size
50, 75	8
50, 100	16
50, 100, 150	25

Lock

—	Without lock
B	With lock Note 2)

Note 2) Not applicable to a stroke of 50 of body size 8 and 16.

Body option

—	Basic
S	Dustproof specification Note 3)

Note 3) A scraper is mounted onto the rod cover, and gaskets are mounted onto both the end covers.

Actuator cable type

—	Without cable
R	Robotic cable (Flexible cable)

Actuator cable length

—	Without cable	**8**	8 m Note 4)
1	1.5 m	**A**	10 m Note 4)
3	3 m	**B**	15 m Note 4)
5	5 m	**C**	20 m Note 4)

Note 4) Produced upon receipt of order

Controller type Note 5)

—	Without controller
6N	With controller (NPN)
6P	With controller (PNP)

Note 5) Refer to page 22 for the detailed specifications of the controller itself.

I/O cable length

—	Without cable
1	1.5 m
3	3 m
5	5 m

Controller mounting

—	Screw mounting
D Note 6)	DIN rail mounting

Note 6) DIN rail is not included. Order it separately.

⚠Caution

Note 1) CE-compliant products

① EMC compliance was tested by combining the electric actuator LES series and the controller LEC series. The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore conformity to the EMC directive cannot be certified for SMC components incorporated into the customer's equipment under actual operating conditions. As a result it is necessary for the customer to verify conformity to the EMC directive for the machinery and equipment as a whole.

② For the servo motor (24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 30 for the noise filter set. Refer to the LECA Operation Manual for installation.

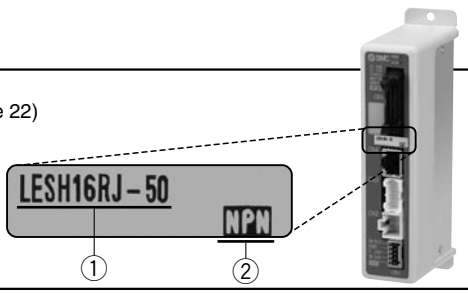
The actuator and controller are sold as a package. (Controller → Page 22)

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

<Be sure to check the following before use.>

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

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



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

Specifications

Step Motor (Servo/24 VDC)

Model			LESH8R		LESH16R		LESH25R	
Actuator specifications	Stroke (mm)		50, 75		50, 100		50, 100, 150	
	Work load (kg)	Horizontal	2	1	6	4	9	6
		Vertical	0.5	0.25	2	1	4	2
	Pushing force (N) 30% to 70% Note 1)		6 to 15	4 to 10	23.5 to 55	15 to 35	77 to 180	43 to 100
	Speed (mm/s)		10 to 200	20 to 400	10 to 200	20 to 400	10 to 150	20 to 400
	Pushing speed (mm/s) Note 2)		10 to 20	20	10 to 20	20	10 to 20	20
	Positioning repeatability (mm)		±0.05					
	Screw lead (mm)		4	8	5	10	8	16
	Impact/Vibration resistance (m/sec²) Note 3)		50/20					
	Actuation type		Slide screw + Belt					
	Guide type		Linear guide (Circulating type)					
	Operating temp. range (°C)		5 to 40 (No condensation and freezing)					
	Operating humidity range (%)		35 to 85 (No condensation and freezing)					
	Weight (kg)	Without lock	50st: 0.55		50st: 1.15		50st: 2.50	
			75st: 0.70		100st: 1.60		100st: 3.30	
							150st: 4.26	
		With lock	75st: 0.93		100st: 1.90		50st: 3.10	
							100st: 3.90	
							150st: 4.86	
Electric specifications	Motor size		□20		□28		□42	
	Motor type		Step motor (Servo 24 VDC)					
	Encoder		Incremental A/B phase (800 pulse/rotation)					
	Rated voltage (V)		24 VDC ±10%					
	Power consumption (W) Note 4)		20		43		67	
	Standby power consumption when operating (W) Note 5)		7		15		13	
	Momentary max. power consumption (W) Note 6)		35		60		74	
	Controller weight (kg)		0.15 (Screw mounting), 0.17 (DIN rail mounting)					
Lock unit specifications	Type	Note 7)	Non-energizing operation type					
	Holding force (N)		24	2.5	300	48	500	77
	Power consumption (W) Note 8)		4		3.6		5	
	Rated voltage (V)		24 VDC ±10%					



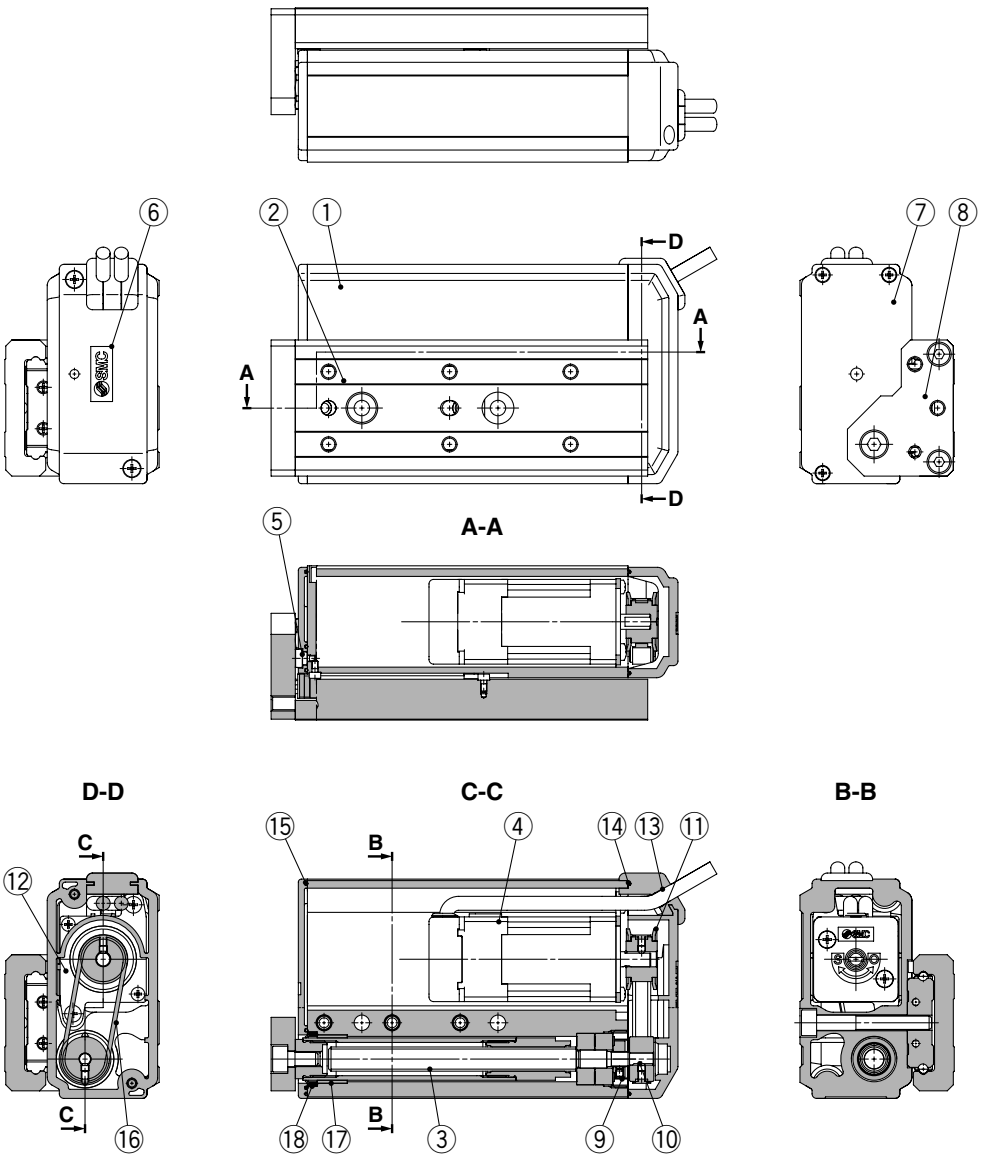
Note 1) Strokes shown in ( ) and the intermediate strokes are produced upon receipt of order.
Note 2) Pushing operation speed is from the minimum speed to 20 mm/s.
Note 3) Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the slide table in the initial state.)
Impact resistance: No malfunction occurred when the slide table was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the slide table in the initial state.)
Note 4) Power consumption (including the controller) is for when the actuator is operating.
Note 5) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation, except during pushing operation.
Note 6) Momentary max. power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.
Note 7) With lock only
Note 8) For an actuator with lock, add the power consumption for the lock.

Servo Motor (24 VDC)

Model			LESH8RA		LESH16RA		LESH25RA	
Actuator specifications	Stroke (mm)		50, 75		50, 100		50, 100, 150	
	Work load (kg)	Horizontal	2	1	5	2.5	6	4
		Vertical	0.5	0.25	2	1	2.5	1.5
	Pushing force (N) 50% to 100% Note 1)		7.5 to 11	5 to 7.5	17.5 to 35	10 to 20	18 to 36	12 to 24
	Speed (mm/s)		10 to 200	20 to 400	10 to 200	20 to 400	10 to 150	20 to 400
	Pushing speed (mm/s) Note 2)		10 to 20	20	10 to 20	20	10 to 20	20
	Positioning repeatability (mm)		±0.05					
	Screw lead (mm)		4	8	5	10	8	16
	Impact/Vibration resistance (m/sec²) Note 3)		50/20					
	Actuation type		Slide screw + Belt					
	Guide type		Linear guide (Circulating type)					
	Operating temp. range (°C)		5 to 40 (No condensation and freezing)					
	Operating humidity range (%)		35 to 85 (No condensation and freezing)					
	Weight (kg)	Without lock	50st: 0.55		50st: 1.15		50st: 2.50	
			75st: 0.70		100st: 1.60		100st: 3.30	
							150st: 4.26	
		With lock	75st: 0.93		100st: 1.90		50st: 3.10	
							100st: 3.90	
							150st: 4.86	
Electric specifications	Motor size		□20		□28		□42	
	Motor output (W)		10		30		36	
	Motor type		Servo motor (24 VDC)					
	Encoder		Incremental A/B phase (800 pulse/rotation)/Z phase					
	Rated voltage (V)		24 VDC ±10%					
	Power consumption (W) Note 4)		58		84		144	
	Standby power consumption when operating (W) Note 5)		4 (Horizontal)/7 (Vertical)		2 (Horizontal)/15 (Vertical)		4 (Horizontal)/43 (Vertical)	
	Momentary max. power consumption (W) Note 6)		84		124		158	
	Controller weight (kg)		0.15 (Screw mounting), 0.17 (DIN rail mounting)					
Lock unit specifications	Type	Note 7)	Non-energizing operation type					
	Holding force (N)		24	2.5	300	48	500	77
	Power consumption (W) Note 8)		4		3.6		5	
	Rated voltage (V)		24 VDC ±10%					

Note 1) Pushing force range for LESH8RA is between 50 and 75%. Pushing force accuracy is ±20% (F.S.).
Note 2) Pushing operation speed is from the minimum speed to 20 mm/s.
Note 3) 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 slide table in the initial state.)
Impact resistance: No malfunction occurred when the slide table was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the slide table in the initial state.)
Note 4) Power consumption (including the controller) is for when the actuator is operating.
Note 5) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation, except during pushing operation.
Note 6) Momentary max. power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.
Note 7) With lock only
Note 8) For an actuator with lock, add the power consumption for the lock.

Construction



Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Hard anodised
2	**Table assembly**	—	
3	**Lead screw assembly**	—	
4	**Motor**	—	
5	**Stopper**	Carbon steel	Electroless nickel plated
6	**Pulley cover**	Synthetic resin	
7	**End cover**	Synthetic resin	
8	**End plate**	Aluminum alloy	Hard anodised
9	**Bearing stopper**	Carbon steel	Electroless nickel plated
10	**Lead screw pulley**	Aluminum alloy	
11	**Motor pulley**	Aluminum alloy	
12	**Motor plate**	Aluminum alloy	
13	**Grommet**	EPDM	
14	**Pulley gasket**	NBR	Dustproof specification only
15	**End gasket**	NBR	Dustproof specification only
16	**Belt**	—	
17	**Bushing**	—	Dustproof specification only
18	**Scraper**	NBR	Dustproof specification only

Replacement Parts/Belt

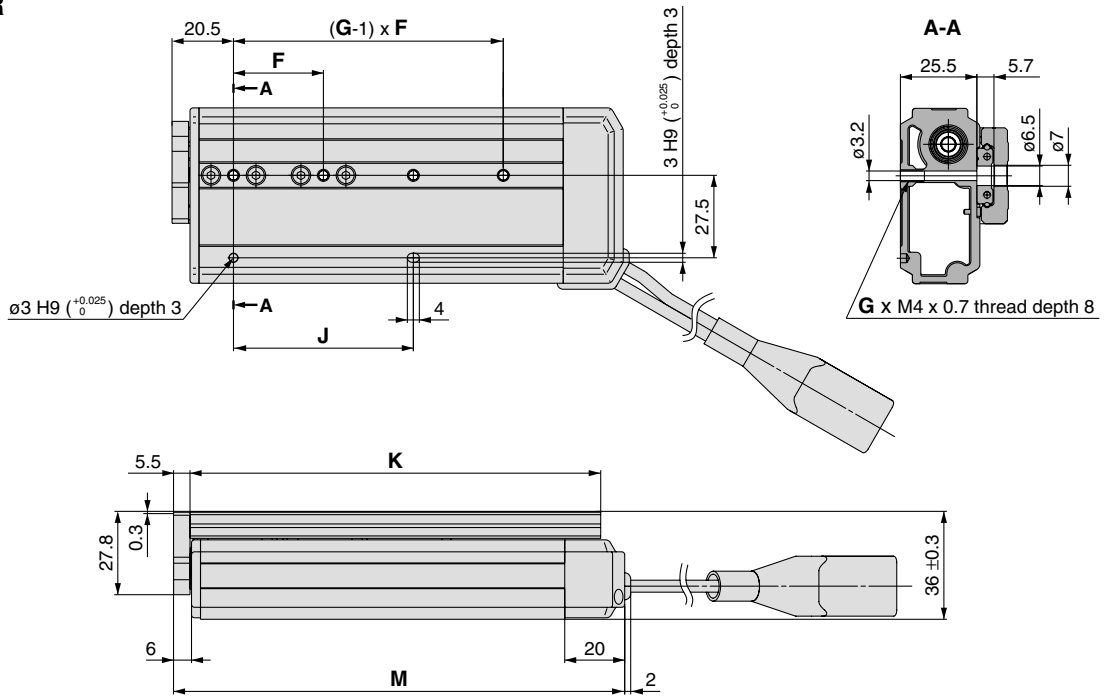
Size	Part no.
LESH8R	LE-D-1-1
LESH16R	LE-D-1-2
LESH25R	LE-D-1-3

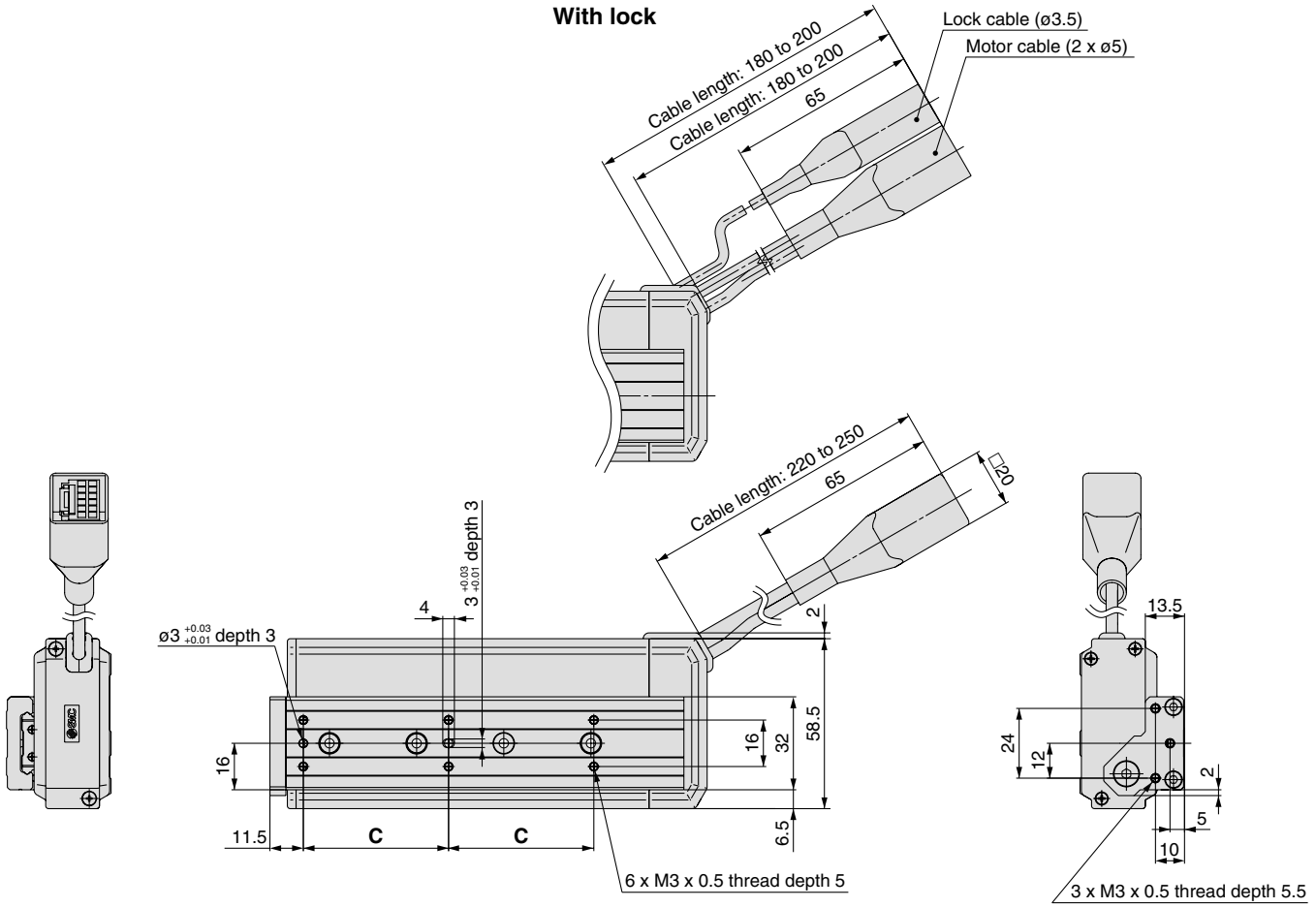
Replacement Parts/Grease Pack

Applied part	Part no.
Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

Dimensions

LESH8R

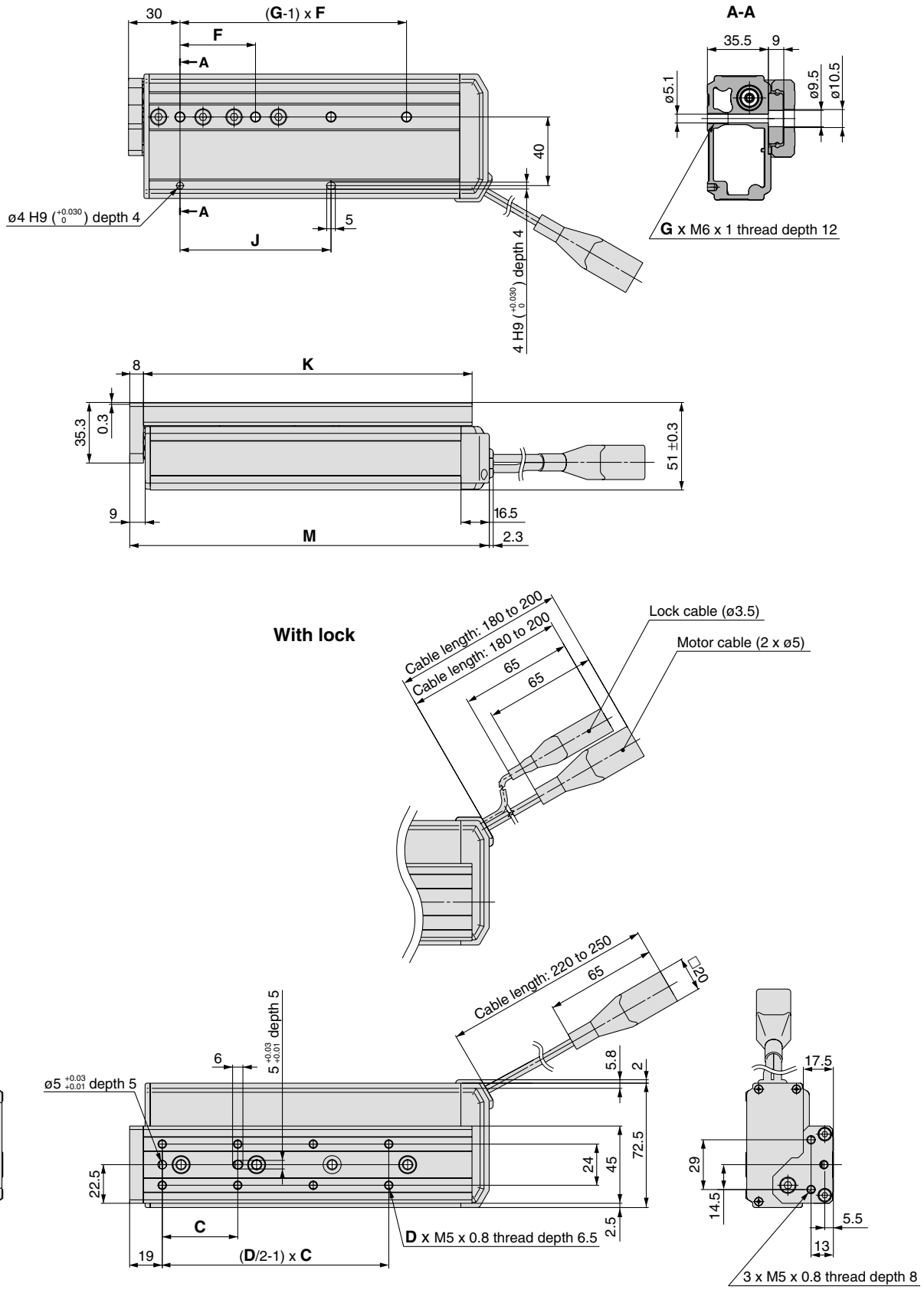




Model	C	F	G	J	K	M
LESH8R□□-50□□-R□□□□	46	29	3	58	111	124.5
LESH8R□□-75□□-R□□□□	50	30	4	60	137	150.5

Dimensions

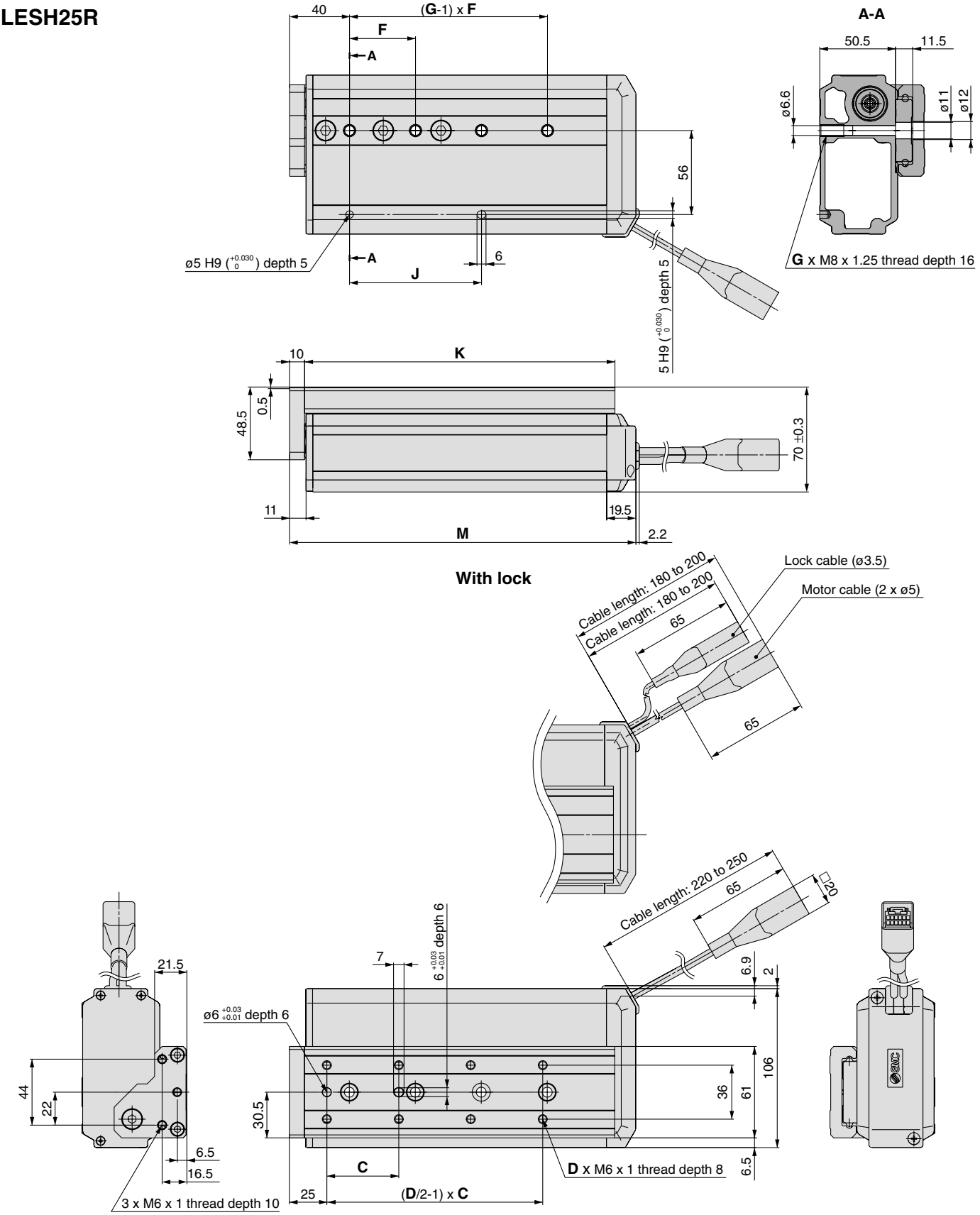
LESH16R



Model	C	D	F	G	J	K	M
LESH16R□□-50□□-R□□□□	40	6	45	2	45	116.5	134.5
LESH16R□□-100□□-R□□□□	44	8	44	4	88	191.5	209.5

Dimensions

LESH25R



Model	C	D	F	G	J	K	M
LESH25R□□-50□□-R□□□□	75	4	80	2	80	143	167
LESH25R□□-100□□-R□□□□	48	8	44	4	88	207	231
LESH25R□□-150□□-R□□□□	65	8	66	4	132	285	309

Series LES
Electric Slide Table/ Specific Product Precautions 1

Be sure to read before handling. Refer to back page 1 for Safety Instructions and the operation manual for Electric Actuators Precautions.
Please download it via our website. http://www.smcworld.com/

Design

⚠Caution

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

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

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

This can cause failure.

Handling

⚠Caution

1.At the in position the step data should be over 0.5.

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

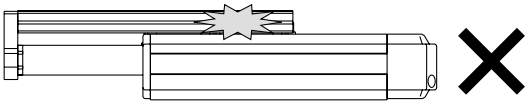
2. INP output signal

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

2) Pushing operation
When the pushing force exceeds the [Trigger LV] threshold value, the INP output signal is turned on. The value of the [Trigger LV] should be set to be less than or equal to the [Pushing force].
To ensure that the [Pushing force] is achieved, it is recommended that the [Trigger LV] is set to the same value as the [Pushing force].

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

The internal stopper can be broken.



4. Do not use the following values for the positioning force.

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

If the positioning force is set below the above-mentioned values, the cycle time will vary, which may cause an alarm.

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

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

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

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

Handling

⚠Caution

7. The table and guide block are made of special stainless steel. There can be rust on the product in an environment exposed to water drops.

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

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

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

Increased sliding resistance and play can result.

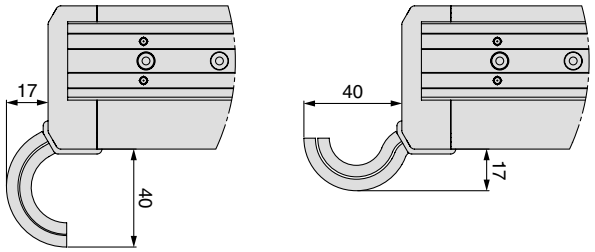
10. When attaching a workpiece, do not apply strong impact or large moment.

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

11. Keep the flatness of mounting surface 0.02 mm or less.

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

12. When mounting the product, keep the following value for bending the cable.



13. When pushing control is used, be sure to set to [pushing operation].

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

14. When the actuator is used for pushing operation, driving speed should be between the minimum speed of each model and 20 mm/s.

If it is operated outside of the specified speed range, it may damage the actuator or cause malfunction.

Series LES
Electric Slide Table/ Specific Product Precautions 2

Be sure to read before handling. Refer to back page 1 for Safety Instructions and the operation manual for Electric Actuators Precautions.
Please download it via our website. http://www.smcworld.com/

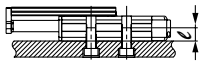
Handling

⚠Caution

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

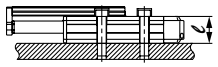
Tightening with higher torque than the specified range may cause malfunction while the tightening with lower torque can cause the displacement of the gripping position or dropping a workpiece.

Body fixed/Side mounting (Body tapped)



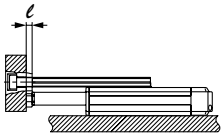
Model	Bolt	Max. tightening torque (N·m)	ℓ (Max. screw-in depth mm)
LESH8R	M4 x 0.7	1.5	8
LESH16R	M6 x 1	5.2	12
LESH25R	M8 x 1.25	10	16

Body fixed/Side mounting (Through-hole)



Model	Bolt	Max. tightening torque (N·m)	ℓ (mm)
LESH8R	M3 x 0.5	0.63	25.5
LESH16R	M5 x 0.8	3	35.5
LESH25R	M6 x 1	5.2	50.5

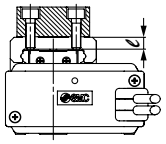
Workpiece fixed/Front mounting



Model	Bolt	Max. tightening torque (N·m)	ℓ (Max. screw-in depth mm)
LESH8R	M3 x 0.5	0.63	5.5
LESH16R	M5 x 0.8	3	8
LESH25R	M6 x 1.0	5.2	10

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

Workpiece fixed/Top mounting



Model	Bolt	Max. tightening torque (N·m)	ℓ (Max. screw-in depth mm)
LESH8R	M3 x 0.5	0.63	5
LESH16R	M5 x 0.8	3	6.5
LESH25R	M6 x 1.0	5.2	8

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

16. In pushing operation, set the product to a position of at least 0.5 mm away from a workpiece.

If the product is set to the same position as a workpiece, the following alarm and unstable operation can occur.

a. "Posn failed" alarm
The product cannot reach a pushing start position due to the deviation of work pieces in width.

b. "Pushing ALM" alarm
The product is pushed back from a pushing start position after starting to push.

Maintenance

⚠Warning

Maintenance frequency

Perform maintenance according to the below table.

Frequency	Appearance check	Check belt
Inspection before daily operation	○	—
Inspection every 6 months*	—	○
Inspection every 250 km*	—	○
Inspection are every 5 million cycles*	—	○

* Select whichever comes sooner.

Items for visual appearance check

1. Loose set screws, Abnormal dirt
2. Check of flaw and cable joint
3. Vibration, Noise

It is recommended that the belt be replaced after 2 years or after following actuator movement distance.
The life of the belt may be reduced due to operating conditions and the environment.
Check the belt regularly as shown in "Maintenance frequency" and replace belt if any abnormality is detected.

LESH8R□K / 500 km
LESH8R□J: Maintenance free
LESH16R□K / 500 km
LESH16R□J: Maintenance free
LESH25R□K: Maintenance free
LESH25R□J: Maintenance free

Items for belt check

Stop operation immediately and replace the belt when any of the events below appears.

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

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

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

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

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

f. Crack on the back of the belt



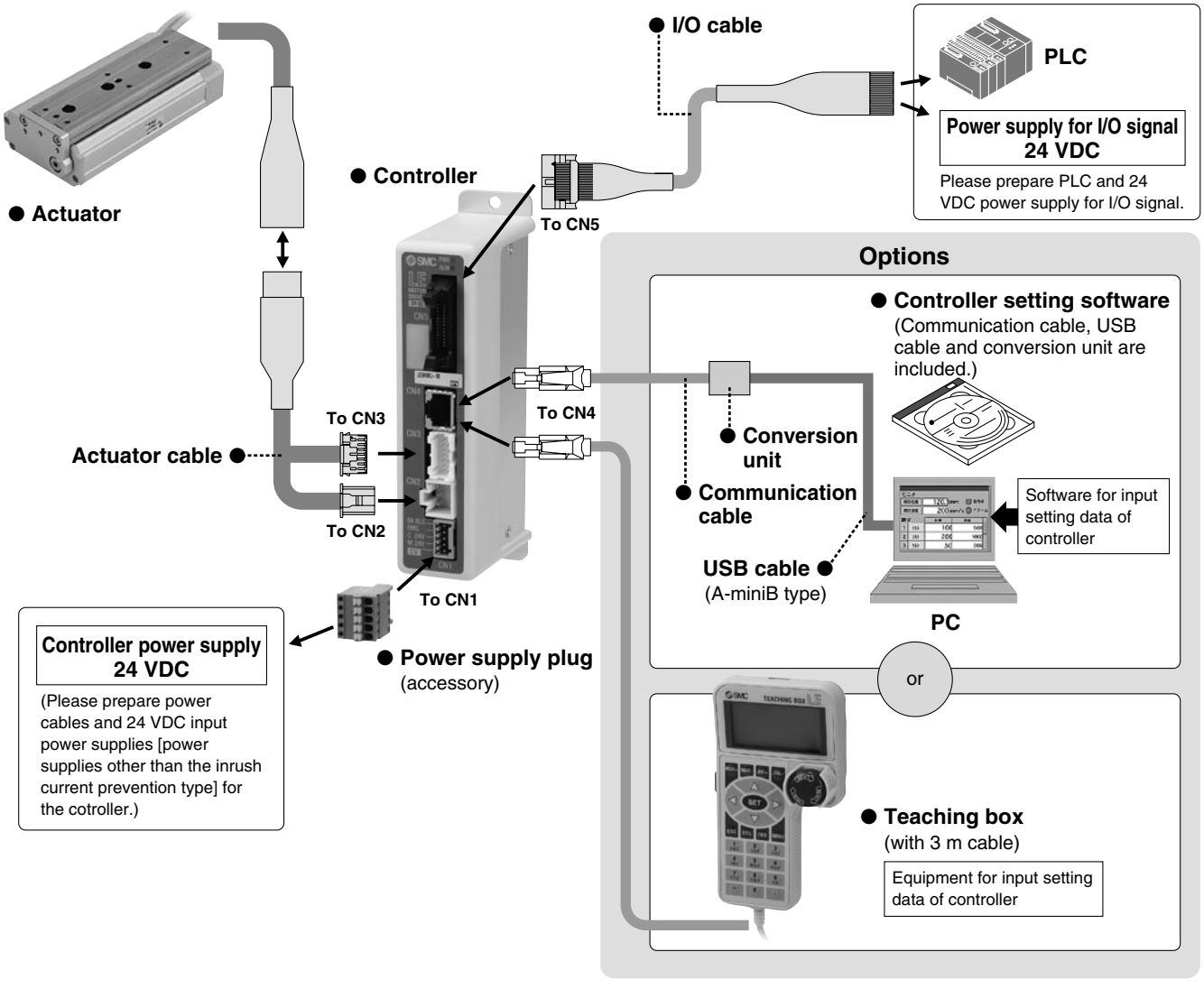


Step Motor Controller
(Servo/24 VDC)

Series LECP6

Servo Motor Controller
(24 VDC)

Series LECA6



Step Motor Controller (Servo/24 VDC)
Series LECP6
Servo Motor Controller (24 VDC)
Series LECA6



Series ***LECP6*** *Series* ***LECA6***

How to Order

⚠Caution

Note 1) CE-compliant products

① EMC compliance was tested by combining the electric actuator LES series and the controller LEC series. The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore conformity to the EMC directive cannot be certified for SMC components incorporated into the customer's equipment under actual operating conditions. As a result it is necessary for the customer to verify conformity to the EMC directive for the machinery and equipment as a whole.

② For the LECA6 series (servo motor controller), EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 30 for the noise filter set. Refer to the LECA Operation Manual for installation.

LE C P 6 N □ □ – □

Actuator

Controller

Compatible motor

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

Number of step data

6	64 points

Parallel I/O type

N	NPN
P	PNP

I/O cable length

—	Without cable
1	1.5 m
3	3 m
5	5 m

Option

—	Screw mounting
D Note 2)	DIN rail mounting

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

Actuator part number

(Except cable specifications and actuator options)
Example: Enter [LESH8RJ-50] for LESH8RJ-50-R16N1

∗ When controller equipped type (-P6□□) is selected when ordering the LE series, you do not need to order this controller.

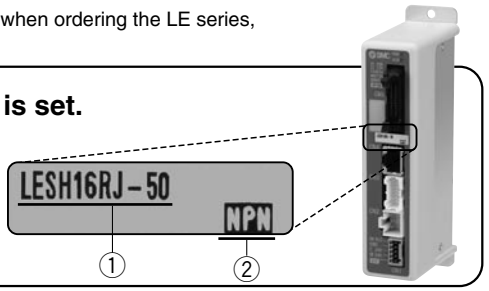
The controller is sold as single unit after the compatible actuator is set.

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

<Be sure to check the following before use.>

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

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



Specifications

Basic Specifications

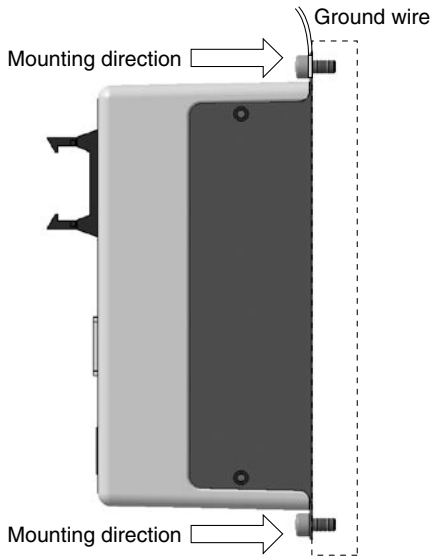
Item	LECP6	LECA6
Compatible motor	Unipolar connection type 2-phase HB step motor	AC servo motor
Power supply Note 1)	Power voltage: 24 VDC ±10% Current consumption: 3 A (Peak 5 A) Note 2) [Including motor drive power, control power, stop, lock release]	Power voltage: 24 VDC ±10% Current consumption: 3 A (Peak 10 A) Note 2) [Including motor drive power, control power, stop, lock release]
Parallel input	11 inputs (Photo-coupler isolation)	
Parallel output	13 outputs (Photo-coupler isolation)	
Compatible encoder	A/B phase, Line receiver input Resolution 800 p/r	A/B/Z phase, Line receiver input Resolution 800 p/r
Serial communication	RS485 (Modbus protocol compliant)	
Memory	EEPROM	
LED indicator	LED (Green/Red) one of each	
Lock control	Forced-lock release terminal	
Cable length (m)	I/O cable: 5 or less Actuator cable: 20 or less	
Cooling system	Natural air cooling	
Operating temperature range (°C)	0 to 40 (No condensation and freezing)	
Operating humidity range (%)	35 to 85 (No condensation and freezing)	
Storage temperature range (°C)	–10 to 60 (No condensation and freezing)	
Storage humidity range (%)	35 to 85 (No condensation and freezing)	
Insulation resistance (MΩ)	Between the housing (radiation fin) and SG terminal 50 (500 VDC)	
Weight (g)	150 (Screw mounting) 170 (DIN rail mounting)	

Note 1) Do not use the power supply of "inrush current prevention type" for the controller power supply.

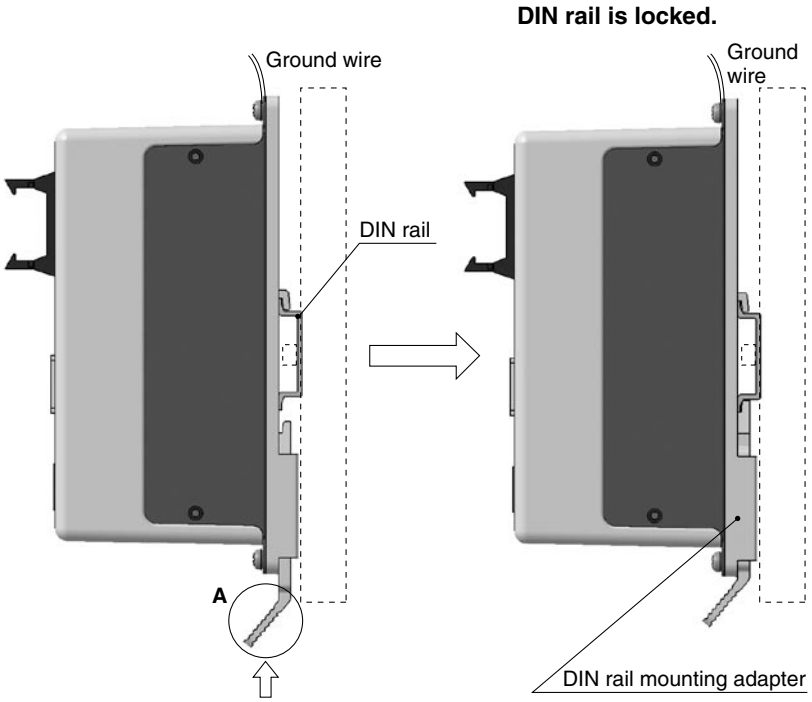
Note 2) The power consumption changes depending on the actuator model. Refer to the specifications of the actuator for more details.

How to Mount

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



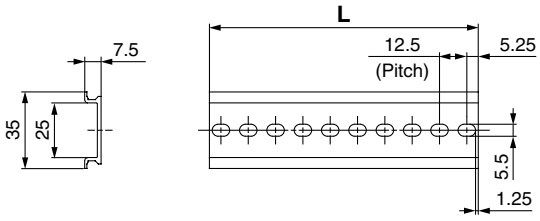
b) DIN rail mounting (LEC□6□□D-□)
(Installation with the DIN rail)



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 below table.
Refer to the dimensions on page 24 for the mounting dimensions.



L Dimensions

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L dimension	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

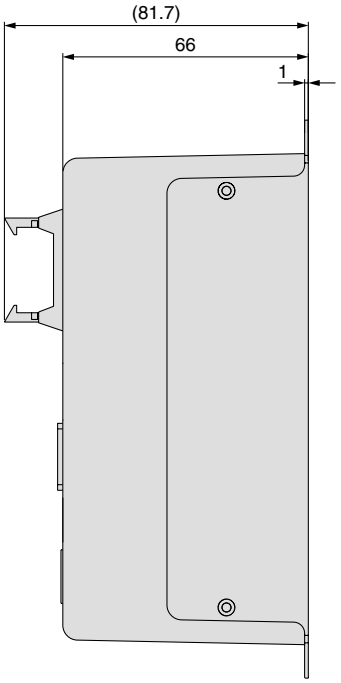
No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
L dimension	273	285.5	298	310.5	323	335.5	348	360.5	373	385.5	398	410.5	423	435.5	448	460.5	473	485.5	498	510.5

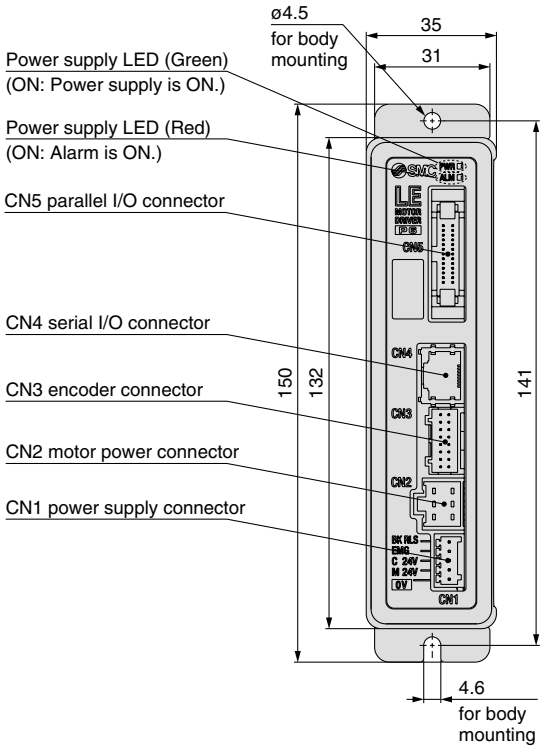
DIN rail mounting adapter
LEC-D0 (with 2 mounting screws)

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

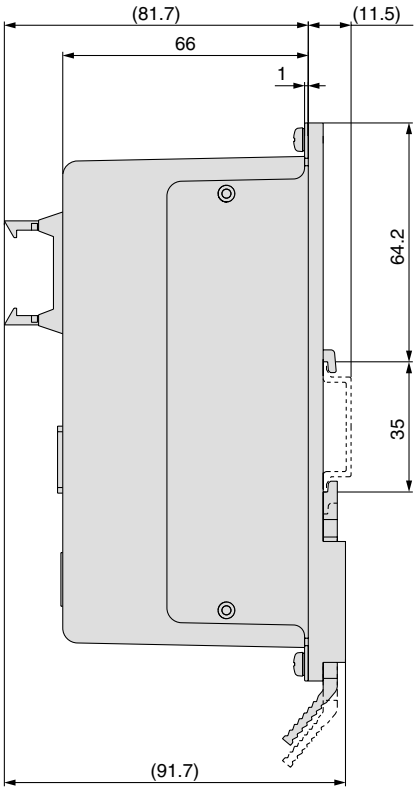
Dimensions

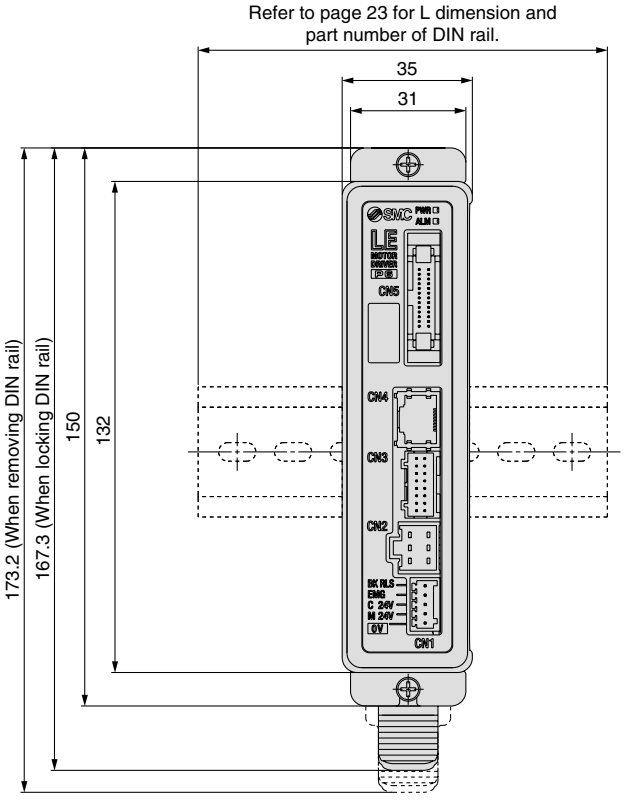
a) Screw mounting (LEC□6□□-□)





b) DIN rail mounting (LEC□6□□D-□)





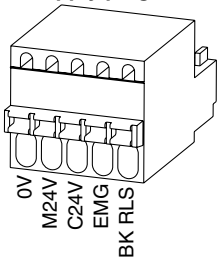
Note) When two or more controllers are used, keep the interval between them by 10 mm or more (when the LESH25 is used).

Wiring Example 1

Power Supply Connector: CN1

∗ Power supply plug is an accessory.

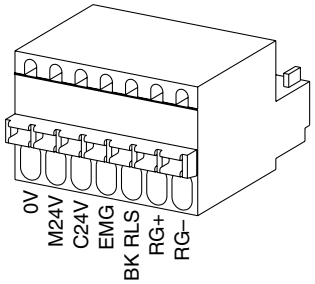
Power supply plug for LECP6



CN1 Power Supply Connector Terminal for LECP6

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

Power supply plug for LECA6



CN1 Power Supply Connector Terminal for LECA6

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

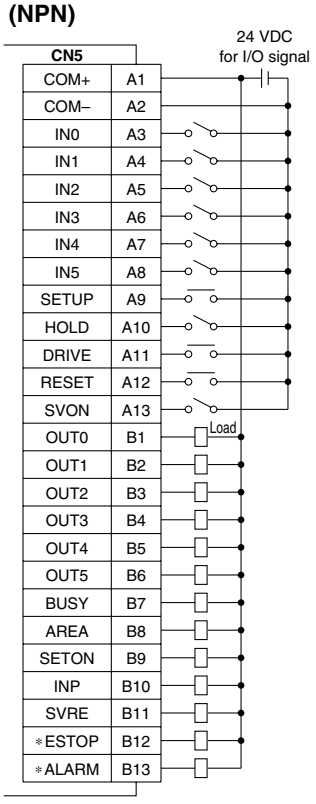
Wiring Example 2

Parallel I/O Connector: CN5

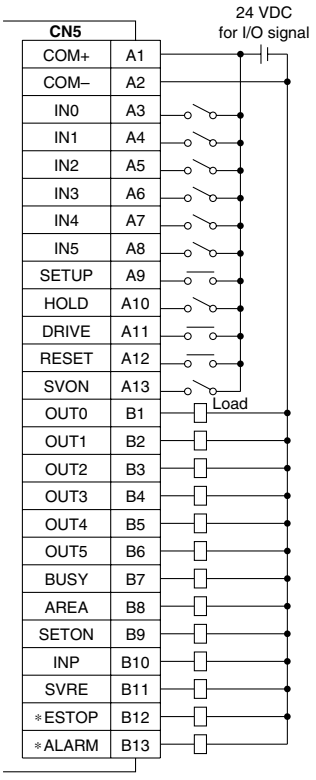
∗ When you connect a PLC, etc., to the CN5 parallel I/O connector, please use the I/O cable (LEC-CN5-□).
∗ The wiring should be changed depending on the type of the parallel I/O (NPN or PNP). Please wire referring to the following diagram.

Wiring diagram

LEC□6N□□-□ (NPN)



LEC□6P□□-□ (PNP)



Input Signal

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

Output Signal

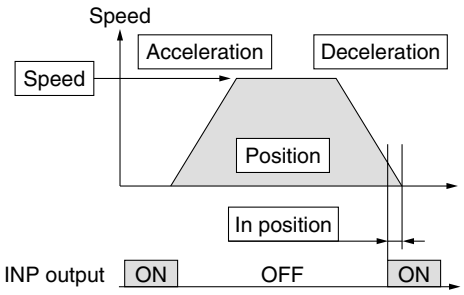
Name	Contents
OUT0 to OUT5	Outputs the step data No. during operation
BUSY	Outputs when the actuator is moving
AREA	Outputs within the step data area output setting range
SETON	Outputs when returning to the original position
INP	Outputs when target position or target force is reached (Turns on when the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

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

Step Data Setting

1. Step data setting for positioning

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



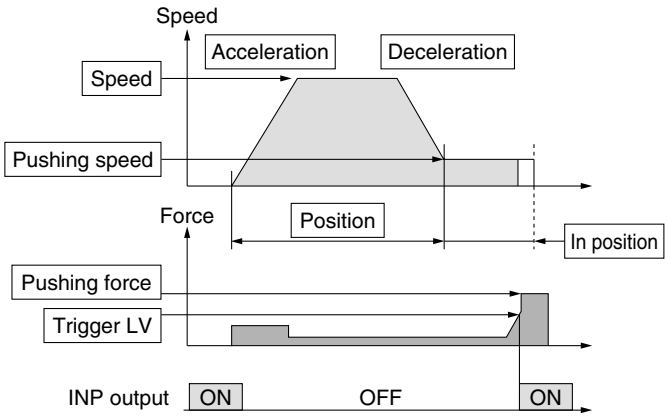
◎: Need to be set.
○: Need to be adjusted as required.
—: Setting is not required.

Step Data (Positioning)

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

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.



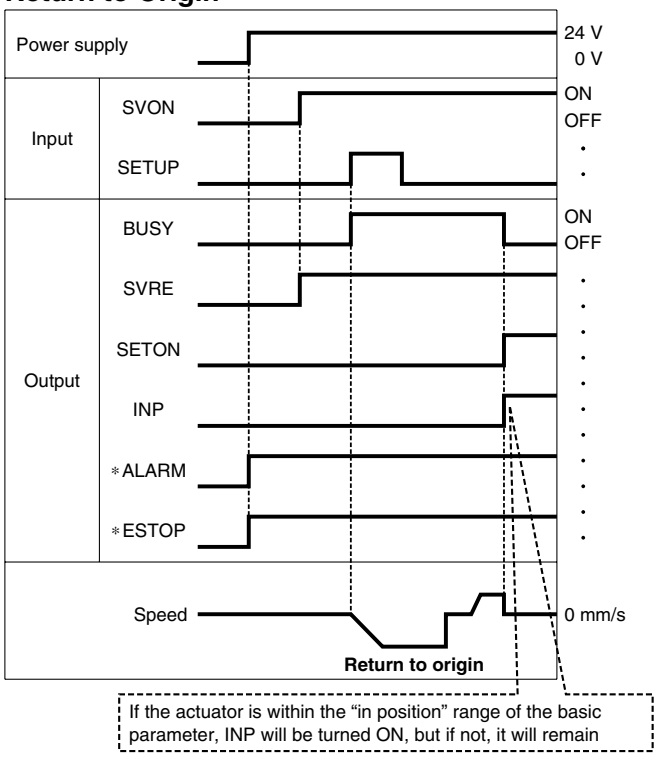
◎: Need to be set.
○: Need to be adjusted as required.

Step Data (Pushing)

Necessity	Item	Description
◎	Movement MOD	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.

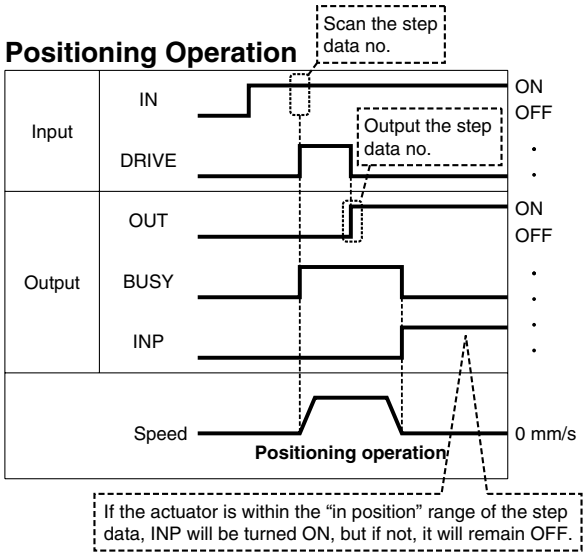
Signal Timing

Return to Origin



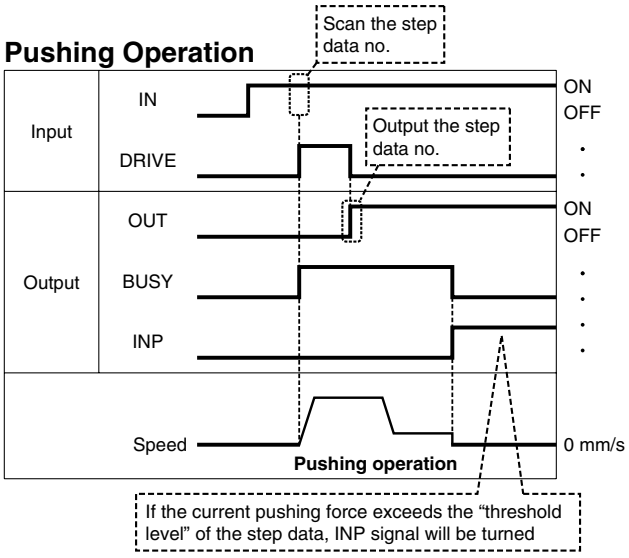
∗ “∗ALARM” and “∗ESTOP” are expressed as negative-logic circuit.

Positioning Operation

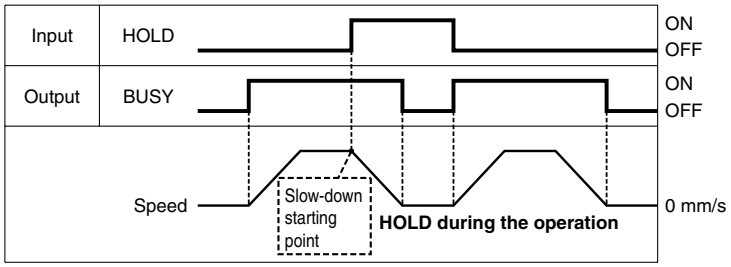


∗ “OUT” is output when “DRIVE” is changed from ON to OFF.
(When power supply is applied, “DRIVE” or “RESET” is turned ON or “∗ESTOP” is turned OFF, all of the “OUT” outputs are turned OFF.)

Pushing Operation

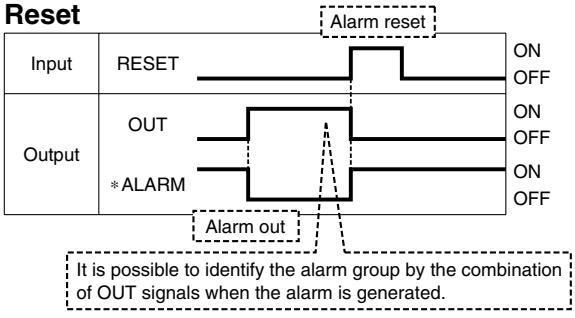


HOLD



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

Reset



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

Options

[Actuator cable for step motor (Servo/24 VDC)]

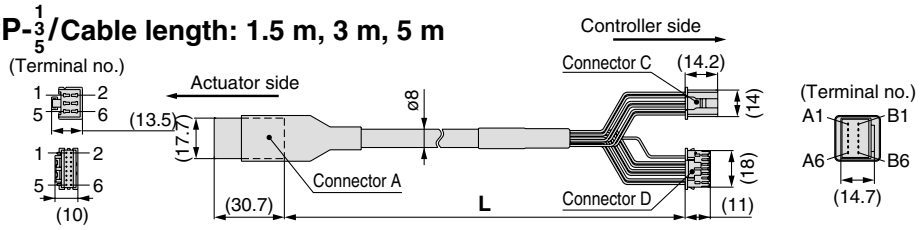
LE – CP – 1

Cable length (L)

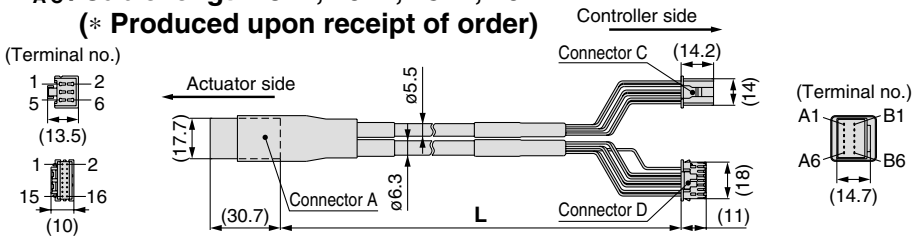
1	1.5 m
3	3 m
5	5 m
8	8 m*
A	10 m*
B	15 m*
C	20 m*

* Produced upon receipt of order

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



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



Circuit	Connector A terminal no.	Cable colour	Connector C terminal no.
A	B-1	Brown	2
$\overline{A}$	A-1	Red	1
B	B-2	Orange	6
$\overline{B}$	A-2	Yellow	5
COM-A/COM	B-3	Green	3
COM-B/–	A-3	Blue	4

Shield

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

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

LE – CP – 1 – B

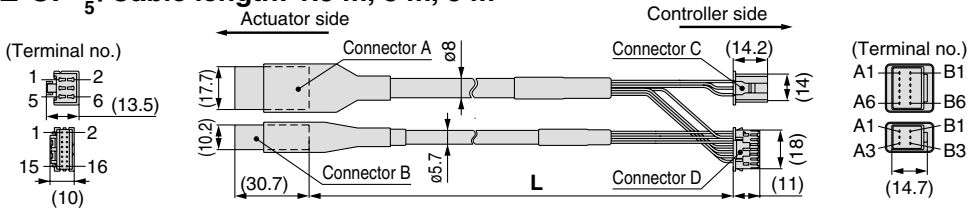
Cable length (L)

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

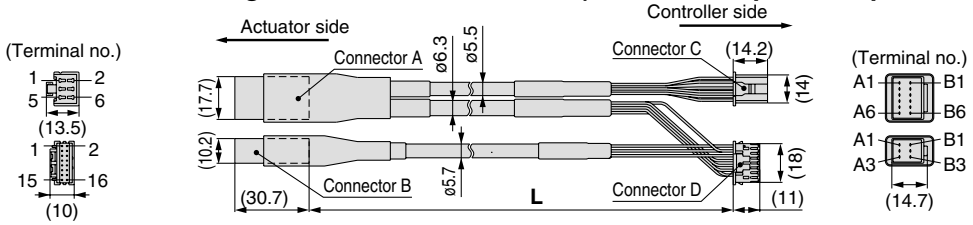
* Produced upon receipt of order

With lock and sensor

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



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



Circuit	Connector A terminal no.	Cable colour	Connector C terminal no.
A	B-1	Brown	2
$\overline{A}$	A-1	Red	1
B	B-2	Orange	6
$\overline{B}$	A-2	Yellow	5
COM-A/COM	B-3	Green	3
COM-B/–	A-3	Blue	4

Shield

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

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

Note) This is not used for the LES series.

[Actuator cable for servo motor (24 VDC)]

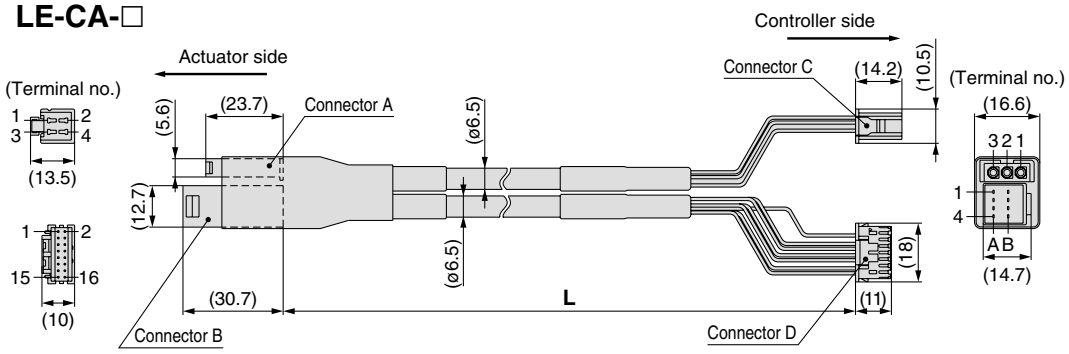
LE − CA − 1

Cable length (L)

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

* Produced upon receipt of order

LE-CA-□



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

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

Shield

Connection of shield material

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

LE − CA − 1 − B

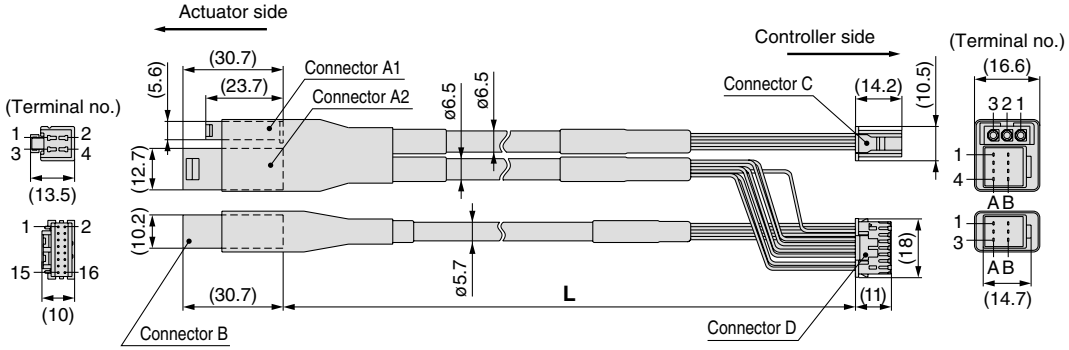
Cable length (L)

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

* Produced upon receipt of order

With lock and sensor

LE-CA-□-B



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

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

Shield

Connection of shield material

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

Note) This is not used for the LES series.

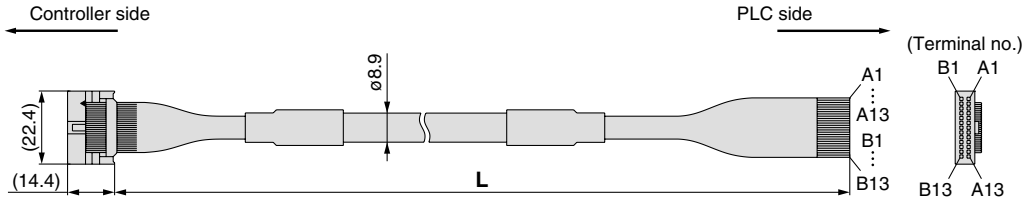
Options

[I/O cable]

LEC − CN5 − 1

Cable length (L)

1	1.5 m
3	3 m
5	5 m



∗ Conductor size: AWG28

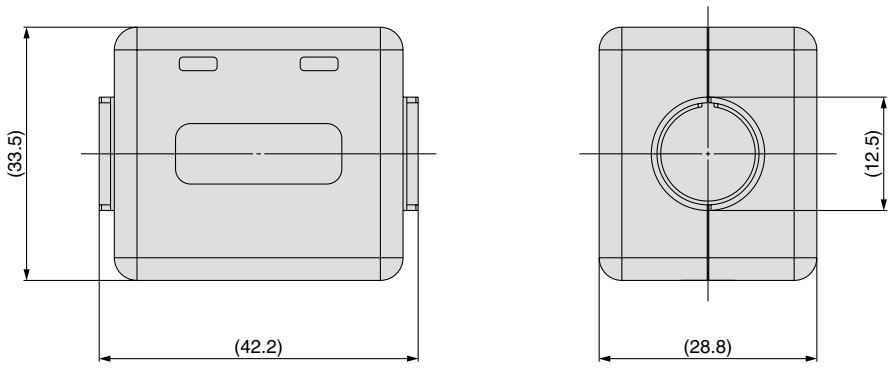
Connector pin No.	Cable colour	Dot mark	Dot colour
A1	Light brown	■	Black
A2	Light brown	■	Red
A3	Yellow	■	Black
A4	Yellow	■	Red
A5	Light green	■	Black
A6	Light green	■	Red
A7	Gray	■	Black
A8	Gray	■	Red
A9	White	■	Black
A10	White	■	Red
A11	Light brown	■ ■	Black
A12	Light brown	■ ■	Red
A13	Yellow	■ ■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

Connector pin No.	Cable colour	Dot mark	Dot colour
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		

[Noise filter set for Servo motor (24 VDC)]

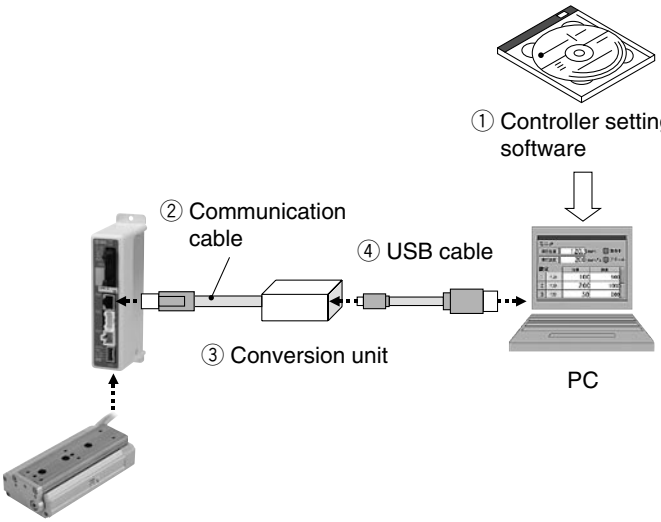
LEC − NFA

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



∗ Refer to the LECA6 series Operation Manual for installation.

Series LEC
Controller Setting Software/LEC-W1



How to Order

LEC – W1

Controller setting software
(Japanese and English are available.)

Contents

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

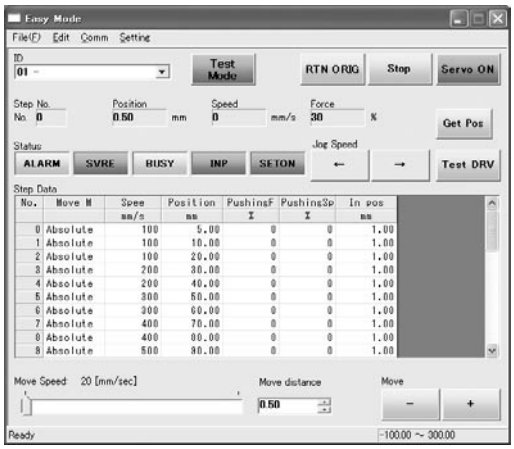
Hardware Requirements

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

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

Screen Example

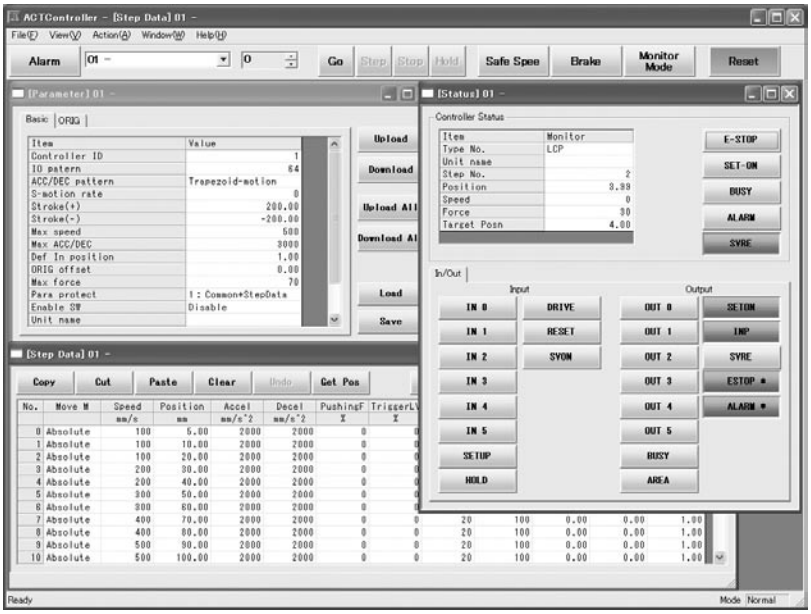
Easy mode screen example



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



Detail setting

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

Series LEC
Teaching Box/LEC-T1



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

Option
- **Enable switch is provided.**

How to Order

LEC – T1 – 3 J G

Teaching box

Cable length

3	3 m

Initial language

J	Japanese
E	English

Stop switch

G	Equipped with stop switch

Enable switch

—	None
S	Equipped with enable switch

∗ Interlock switch for jog test function

Specifications

Item	Description
Switch	Stop switch, Enable switch (Option)
Cable length	3 m
Enclosure	IP64 (Except connector)
Operating temperature range (°C)	5 to 50 (No condensation)
Operating humidity range (%)	35 to 85
Weight (g)	350 (Except cable)

∗ The EMC compliance for the teaching box was tested with LECP6 controller and applicable actuator only.

Easy Mode

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

Menu Operations Flowchart

Menu
- Data
- Monitor
- Jog
- Test
- Alarm
- TB setting

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

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

Jog
Return to origin
Jog operation

Test
1 step operation

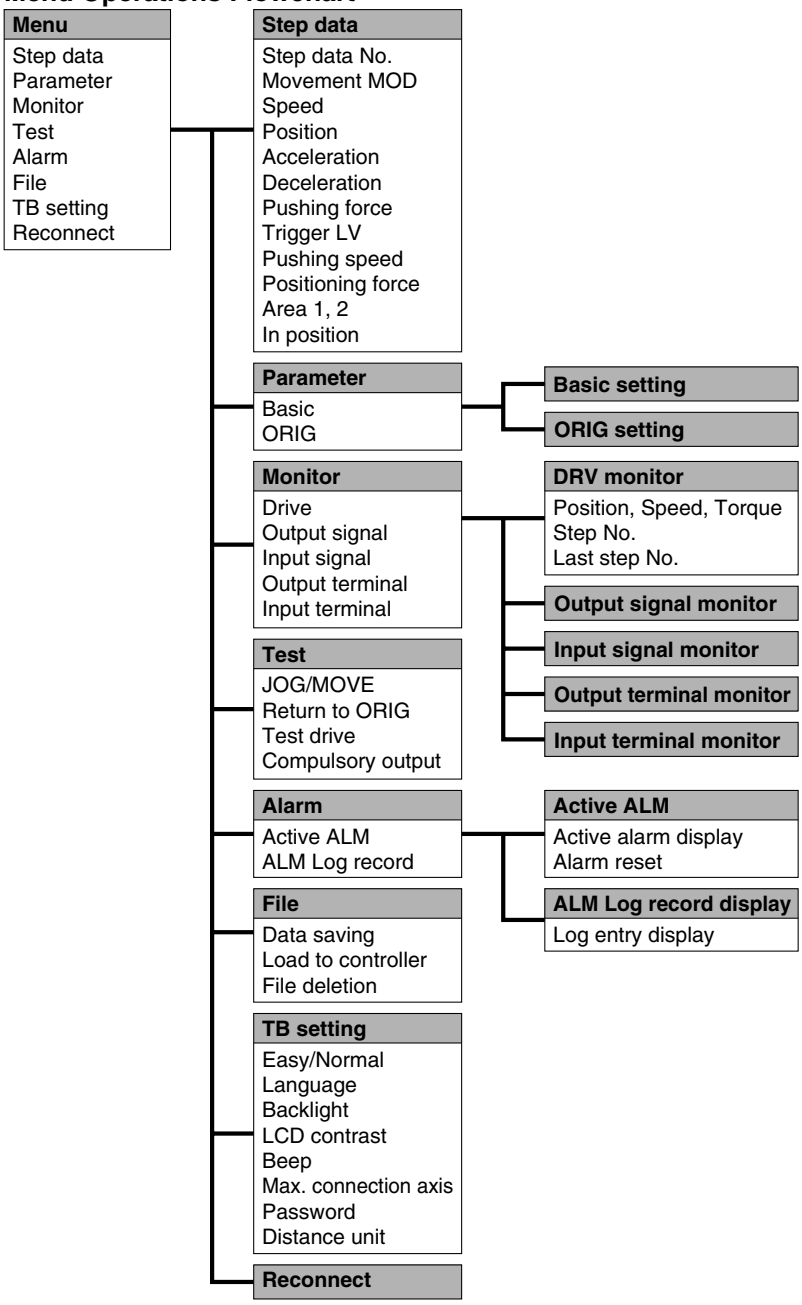
Alarm
Display of active alarm
Alarm reset

TB setting
Reconnect
Easy/Normal
Set item

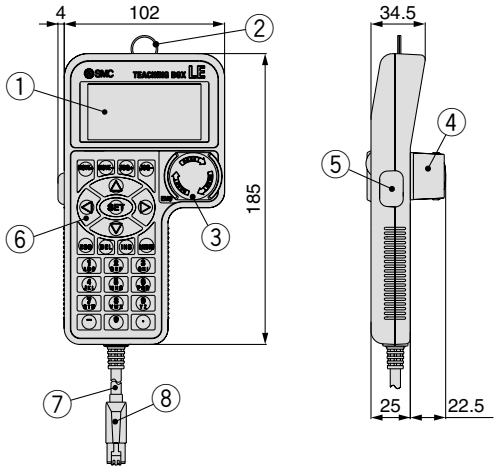
Normal Mode

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

Menu Operations Flowchart



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**	Locks and stops operation when this switch is pressed. 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

Series LEC
Controller and Peripheral Devices/ Specific Product Precautions 1

Be sure to read before handling.
Refer to back page 1 for Safety Instructions.

Design/Selection

⚠Warning

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

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

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

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

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

Handling

⚠Warning

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

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

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

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

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

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

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

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

Handling

⚠Warning

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

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

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

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

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

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

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

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

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

Installation

⚠Warning

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

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

3. Do not mount the controller and its peripheral devices together with a large-sized electromagnetic contactor or no-fuse breaker, which generates vibration, on the same panel. Mount them on different panels, or keep the controller and its peripheral devices away from such a vibration supply.

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

Series LEC
Controller and Peripheral Devices/ Specific Product Precautions 2

Be sure to read before handling.
Refer to back page 1 for Safety Instructions.

Power Supply

⚠Caution

1. **Use a power supply that has low noise between lines and between power and ground.**
   In cases where noise is high, an isolation transformer should be used.
2. **The power supplies should be separated between the controller power and the I/O signal power and both of them do not use the power supply of "inrush current prevention type".**
   If the power supply is "inrush current prevention type", a voltage drop may be caused during the acceleration of the actuator.
3. **To prevent surges from lightning, an appropriate measure should be taken. Ground the surge absorber for lightning separately from the grounding of the controller and its peripheral devices.**

Grounding

⚠Warning

1. **Be sure to carry out grounding in order to ensure the noise tolerance.**
2. **Dedicated grounding should be used.**
   Grounding should be to a D-class ground. (Ground resistance of 100 Ω or less)
3. **Grounding should be performed near the controller and its peripheral devices to shorten the grounding distance.**
4. **In the unlikely event that malfunction is caused by ground, please disconnect the unit from ground.**

Maintenance

⚠Warning

1. **Perform a maintenance check periodically.**
   Confirm wiring and screws are not loose.
   Loose screws or wires may cause unintentional malfunction.
2. **Conduct an appropriate functional inspection after completing the maintenance.**
   At times where the equipment or machinery does not operate properly, conduct an emergency stop of the system. Otherwise, an unexpected malfunction may occur and it will become impossible to secure the safety. Conduct a test of the emergency stop in order to confirm the safety of the equipment.
3. **Do not disassemble, modify or repair the controller and its peripheral devices.**
4. **Do not put anything conductive or flammable inside of the controller.**
   It may cause a fire.
5. **Do not conduct an insulation resistance test and withstand voltage test on this product.**
6. **Ensure sufficient space for maintenance activities.**
   Design the system that allows required space for maintenance.

Related Products

Electric Grippers

2-Finger Type

Series LEHZ

- **Compact and lightweight Various gripping forces**



Body size	Stroke/ both sides [mm]	Gripping force [N]	
		Basic	Compact
10	4	6 to 14	2 to 6
16	6		3 to 8
20	10	16 to 40	11 to 28
25	14		
32	22	52 to 130	—
40	30	84 to 210	—

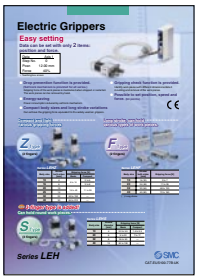
Series LEHF

- **Long stroke, can hold various types of work pieces.**



Body size	Stroke/ both sides [mm]	Gripping force [N]
10	16 (32)	3 to 7
20	24 (48)	11 to 28
32	32 (64)	48 to 120
40	40 (80)	72 to 180

( ): Long stroke



CAT.ES100-77

3-Finger Type

Series LEHS

- **Can hold round work pieces.**



Body size	Stroke/ diameter [mm]	Gripping force [N]	
		Basic	Compact
10	4	2.2 to 5.5	1.4 to 3.5
20	6	9 to 22	7 to 17
32	8	36 to 90	—
40	12	52 to 130	—

Electric Actuator/Rod Type

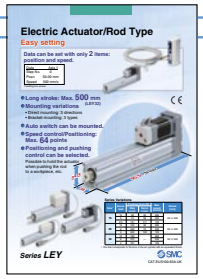
Series LEY

- **Long stroke: Max. 500 mm (LEY32)**
- **Mounting variations**
  - Direct mounting: 3 directions
  - Bracket mounting: 3 types
- **Auto switch can be mounted.**
- **Speed control/Positioning: Max. 64 points**
- **Positioning and pushing control can be selected.**

  Possible to hold the actuator when pushing the rod to a workpiece, etc.







CAT.ES100-83A

Size	Screw lead	Pushing force [N]		Max. speed [mm/s]	Stroke [mm]
		Step motor	Servo motor		
16	10	38	30	500	50 to 300
	5	74	58	250	
	2.5	141	111	125	
25	12	122	35	500	50 to 400
	6	238	72	250	
	3	452	130	125	
32	16	189	—	500	50 to 500
	8	370		250	
	4	707		125	

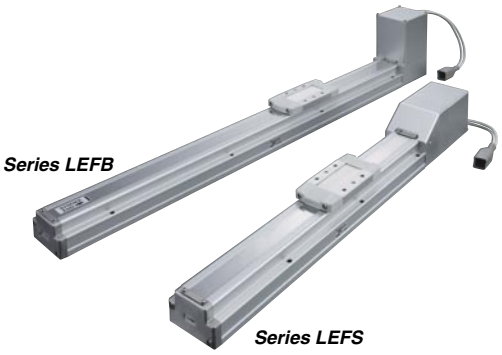
Related Products

Electric Actuator

- **Easy mounting of the body/Reduction of the installation time**
  Possible to mount the main body without removing the external cover, etc.
- **Compact**
  Height and Width: Reduced by approx. 50%



CAT.ES100-87A



Series	Size	Work load (kg)	Stroke (mm)	Speed (mm/s)	Positioning repeatability (mm)
LEFS	16	10	Up to 400	500	±0.02
	25	20	Up to 600	500	
	32	45	Up to 800	500	
LEFB	16	1	Up to 1000	Up to 2000	±0.1
	25	5	Up to 2000	Up to 2000	
	32	14	Up to 2000	Up to 1500	

∗ The size corresponds to the bore of the air cylinder with an equivalent thrust. (For the operation using ball screws)

Ball screw drive

Series LEFS

- **Max. work load: 45 kg**
- **Positioning repeatability: ±0.02 mm**

Belt drive

Series LEFB

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

⚠ Safety Instructions

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

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

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

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

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

⚠ Warning

1. **The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
2. **Only personnel with appropriate training should operate machinery and equipment.**
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
3. **Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
4. **Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

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

Limited warranty and Disclaimer/ Compliance Requirements

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

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

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

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

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

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1st printing OT printing OT 00 Printed in Spain

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