

Electric Actuator/Rod Type

Easy setting

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

Data	Axis 1
Step No.	0
Posn	50.00 mm
Speed	500 mm/s

Teaching box screen



- Long stroke: Max. 500 mm
- Mounting variations (LEY32)
 - 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.



Series Variations

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	

* The size corresponds to the bore of the air cylinder with an equivalent thrust.

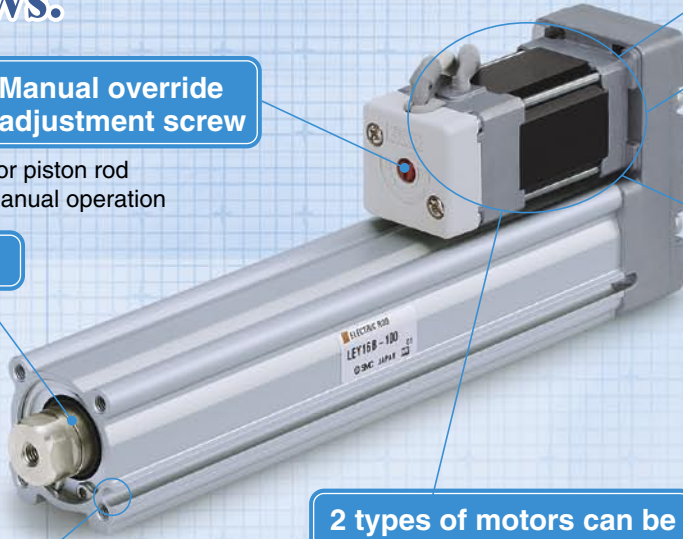
Series **LEY**



CAT.ES100-83A

Series LEY/Body Size: 16, 25, 32

Intermediate positioning control and pushing control can be achieved. Highly accurate operation with ball screws.



Motor cover is available.
(Option)

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

Motor mounting position can be selected.

Manual override adjustment screw
For piston rod manual operation

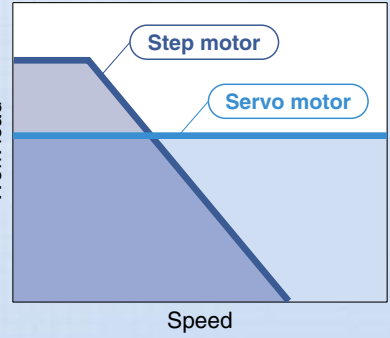
Scraper
Prevents foreign matter intrusion.

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)**
High speed and silent operation

Auto switch groove
For checking the limit and intermediate signal
Applicable to the D-M9□ and D-M9□W (2-color display)
* The auto switches should be ordered separately. Refer to pages 13 and 14 for details.

Right side parallel type **Left side parallel type**
Top mounting type is the standard product.



The graph shows Work load on the y-axis and Speed on the x-axis. A horizontal line represents the Servo motor's constant torque region. A diagonal line represents the Step motor's torque-speed characteristic, showing high torque at low speeds and decreasing torque as speed increases.

Series Variations

● Electric Actuator/Rod Type

Model	Screw lead	Pushing force [N]		Vertical work load [kg]		Max. speed [mm/s]	Stroke [mm]	Reference page
		Step motor	Servo motor	Step motor	Servo motor			
LEY16□A	10	38	30	2	2	500	50 to 300	P. 4
	5	74	58	4	4	250		
	2.5	141	111	8	8	125		
LEY25□A	12	122	35	8	3	500	50 to 400	P. 4
	6	238	72	16	6	250		
	3	452	130	30	12	125		
LEY32□A	16	189	/	11	/	500	50 to 500	P. 4
	8	370		22		250		
	4	707		43		125		

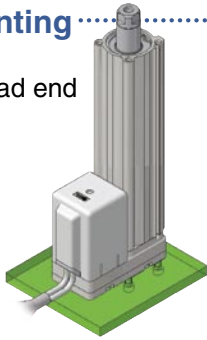
● Controller

Series	Applicable motor	Power supply voltage	Parallel I/O		Positioning pattern points	Reference page
			Input	Output		
LECP	Step motor (Servo/24 VDC)	24 VDC ±10%	11 inputs (Photo-coupler isolation)	13 outputs (Photo-coupler isolation)	64 points	P. 17
LECA	Servo motor (24 VDC)					

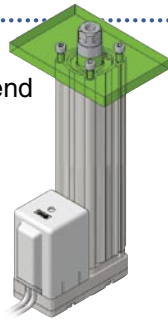
Mounting Variations

● Direct Mounting

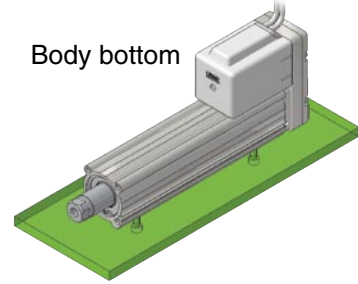
Head end



Rod end



Body bottom



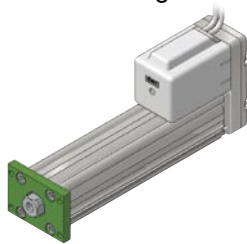
* Body bottom tapped: When "U" is selected

● Bracket Mounting

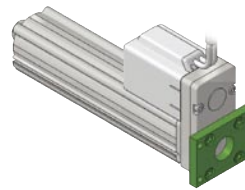
Foot



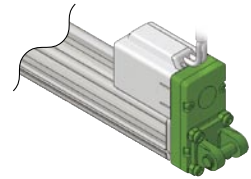
Rod flange



Head flange

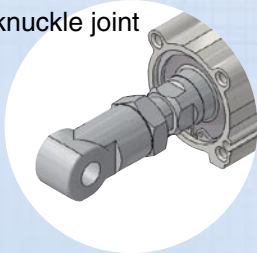


Double clevis

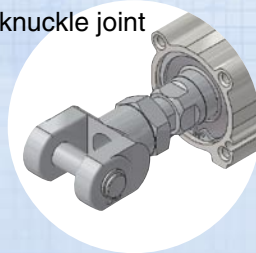


Rod End Brackets

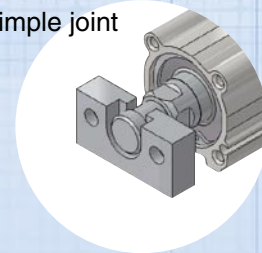
Single knuckle joint



Double knuckle joint

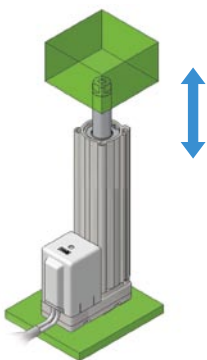


Simple joint

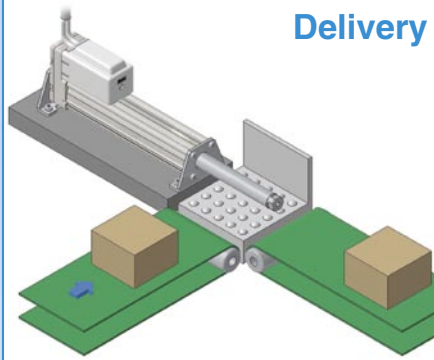


Application Examples

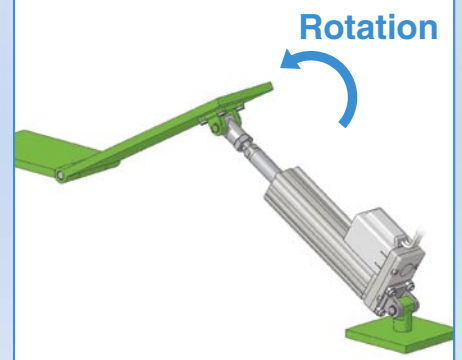
Lifter



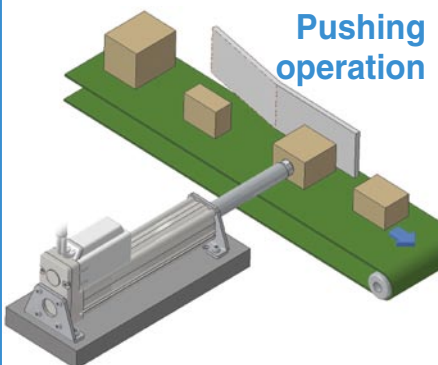
Delivery



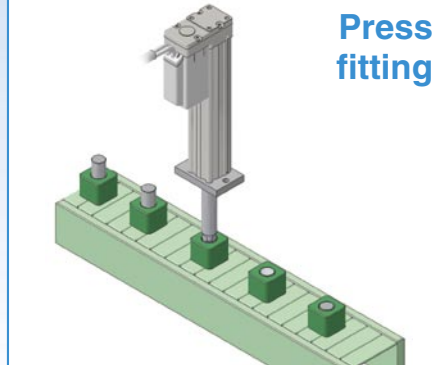
Rotation



Pushing operation



Press fitting



Simple Setting to Use Straight Away Start-up Time Shortened

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

Refer to page 18 for details of the controller.

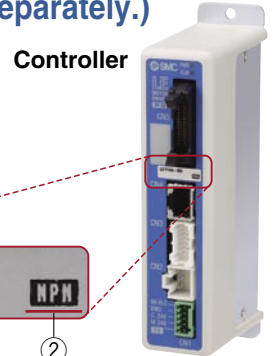
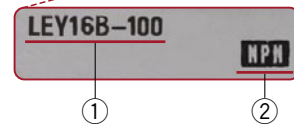
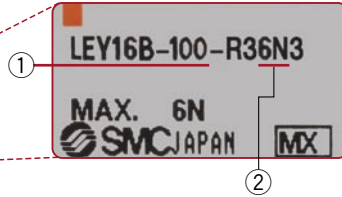
Initial parameters are already set when the controller is shipped.
Possible to start up the controller in a short time with easy mode.

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



Simple Setting Easy Mode

Easy operation and simple setting

<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

1st screen

2nd screen

Data Axis 1

Step No.	0
Posn	123.45 mm
Speed	100 mm/s

It can be registered by "SET" after entering the values.

Example of checking the monitor

1st screen

2nd screen

Data Axis 1

Step No.	1
Posn	12.34 mm
Speed	10 mm/s

Operation status can be checked.

Teaching box screen

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

Data	Axis 1
Step No.	0
Posn	50.00 mm
Speed	500 mm/s



Data	Axis 1
Step No.	0
Posn	80.00 mm
Speed	300 mm/s

<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.



File(E) Edit Comm Setting

ID: 01

Step No. 0, Position 0.50 mm, Speed 0 mm/s, Force 30 %

Status: ALARM, SVRE, BUSY, INP, SETON

No.	Move M	Spee mm/s	Position mm	PushingF %	PushingSp %	In pos mm
0	Absolute	100	5.00	0	0	1.00
1	Absolute	100	10.00	0	0	1.00
2	Absolute	100	20.00	0	0	1.00
3	Absolute	200	30.00	0	0	1.00
4	Absolute	200	40.00	0	0	1.00
5	Absolute	300	50.00	0	0	1.00
6	Absolute	300	60.00	0	0	1.00
7	Absolute	400	70.00	0	0	1.00
8	Absolute	400	80.00	0	0	1.00
9	Absolute	500	30.00	0	0	1.00

Move Speed: 20 [mm/sec], Move distance: 0.50

Move jog

Start testing

Step data setting

Move for the constant rate

Detail Setting Normal Mode

Select normal mode when detail setting is required.

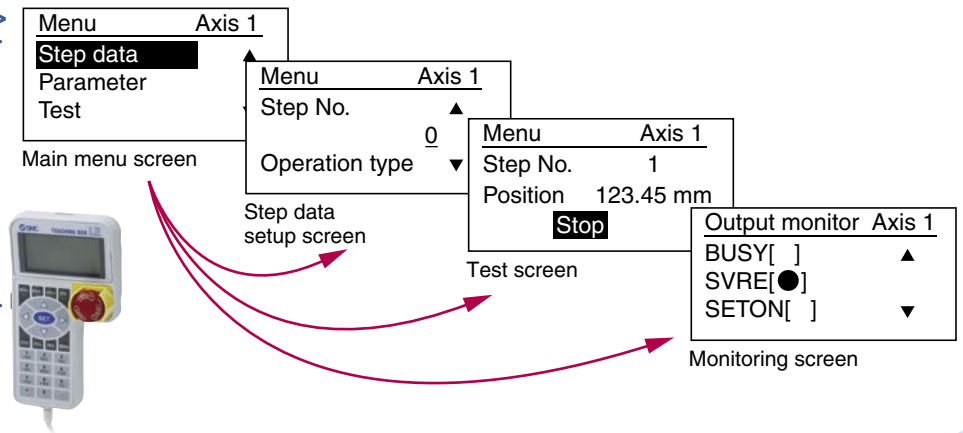
- Step data can be set in detail.
- Signals and terminal status can be monitored.
- Parameters can be set.
- JOG and constant rate movement, return to origin, test operation and testing of compulsory output can be performed.

<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.

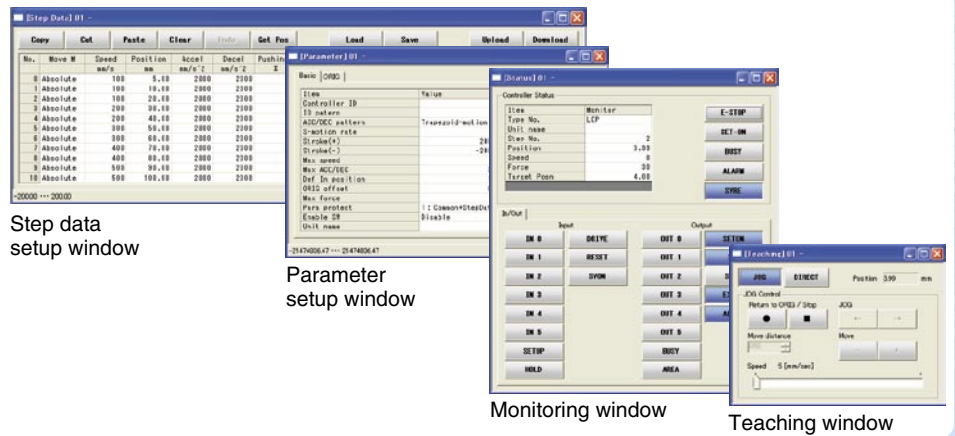
Teaching box screen

- 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

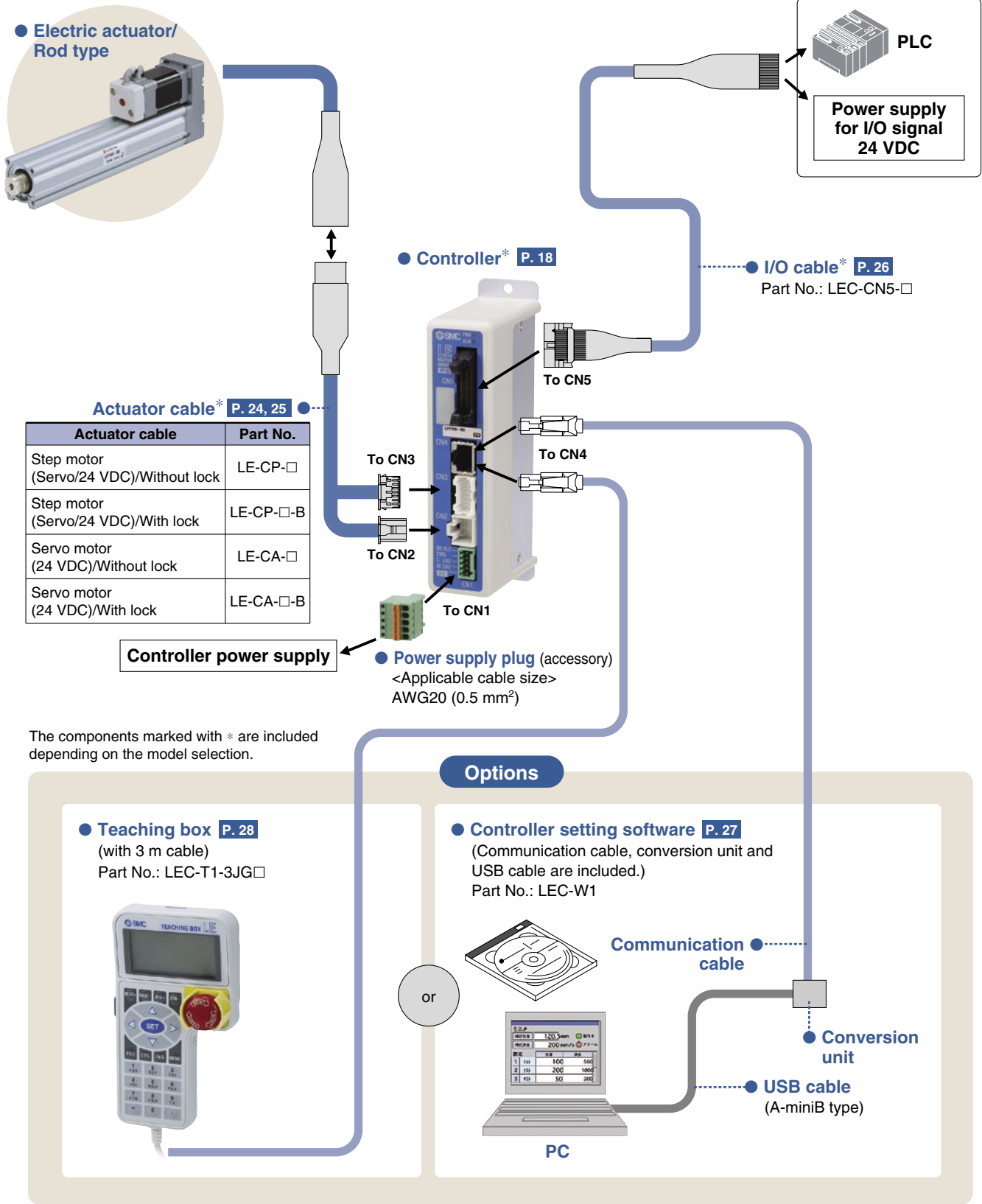
Function		Contents	Easy mode		Normal mode
			TB	PC	TB, PC
Step data setting (Excerpt)	Speed	Can be set in units of 1 mm/s.	○	○	○
	Position	Can be set in units of 0.01 mm. (During pushing: Pushing start position)	○	○	○
	Acceleration/Deceleration	Can be set in units of 1 mm/s ² .	○	○	○
	Pushing force	Positioning operation: Set to 0%. (Refer to the specifications on page 5.)	○	○	○
	Trigger LV	Trigger LV of target force during pushing operation (Refer to the specifications on page 5.)	×	○	○
	Pushing speed	Can be set to pushing speed. Minimum speed to 20 mm/s (Refer to the specifications on page 5.)	×	○	○
Parameter setting (Excerpt)	Positioning force	Positioning force should be set to 100%.	×	○	○
	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	×	○	○
	Stroke (+)	+ side limit of position (Unit: 0.01 mm)	×	×	○
Test	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.	×	×	○
Monitor	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.	○	○	○
ALM	Compulsory output	ON/OFF of the output terminal can be tested.	×	×	○
	DRV mon	Current position, current speed, current force and the specified step data No. can be monitored.	○	○	○
Other	In/Out mon	Current ON/OFF status of the input and output terminal can be monitored.	×	×	○
	Active ALM	Alarm currently being generated can be confirmed.	○	○	○
File	ALM Log record	Alarm generated in the past can be confirmed.	×	×	○
	Save/Load	Step data and parameter of the objective controller can be saved, forwarded and deleted.	×	×	○
Language	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



Series LEY

Model Selection 1

Model Selection

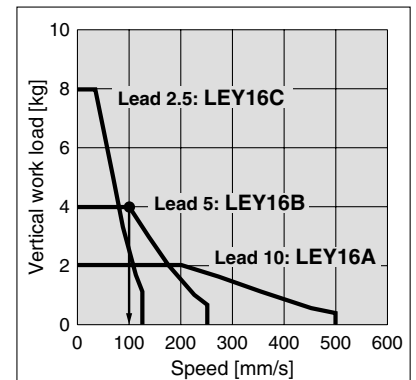
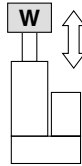
Positioning Control Selection Procedure



Selection Example

Operating Conditions

- Workpiece mass: 4 [kg] • Speed: 100 [mm/s]
- Acceleration/Deceleration: 3000 [mm/s²]
- Stroke: 200 [mm]
- Workpiece mounting condition: Vertical upward downward transfer



<Speed-Vertical work load graph>
(LEY16/Step motor)

Step 1 Confirmation of work load-speed <Speed-Vertical work load graph>
Select the target model based on the work weight and speed with reference to the (Speed-Vertical work load graph).
The **LEY16B** is temporarily selected based on the graph shown on the right side.

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

Step 2 Confirmation of cycle time

Calculate the cycle time using the following calculation method.

Cycle time:

T can be found from the following equation.

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

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

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

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

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

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

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

Calculation example

T1 to T4 can be calculated as follows.

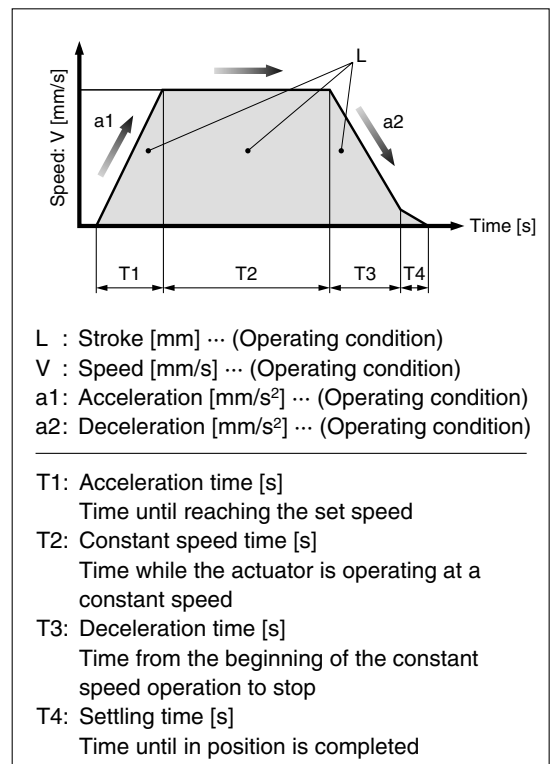
$$T1 = V/a1 = 100/3000 = 0.033 \text{ [s]}, \quad T3 = V/a2 = 100/3000 = 0.033 \text{ [s]}$$

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{200 - 0.5 \cdot 100 \cdot (0.033 + 0.033)}{100} = 1.97 \text{ [s]}$$

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

Therefore, the cycle time can be obtained as follows.

$$T = T1 + T2 + T3 + T4 = 0.033 + 1.967 + 0.033 + 0.2 = 2.233 \text{ [s]}$$



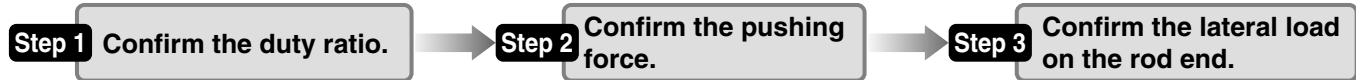
Based on the above calculation result, the **LEY16B-200** is selected.

Series LEY

Model Selection 2

Model Selection

Pushing Control Selection Procedure

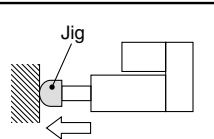


* The duty ratio is a ratio at the time that can keep being pushed.

Selection Example

Operating Conditions

- Mounting condition: Horizontal (pushing)
- Duty ratio: 20 [%]
- Jig mass: 0.2 [kg]
- Speed: 100 [mm/s]
- Pushing force: 60 [N]
- Stroke: 200 [mm]



Step 1 Confirmation of duty ratio <Conversion table of pushing force-duty ratio>

Select the [Pushing force] from the duty ratio with reference to the (Conversion table of pushing force-duty ratio).

Selection example

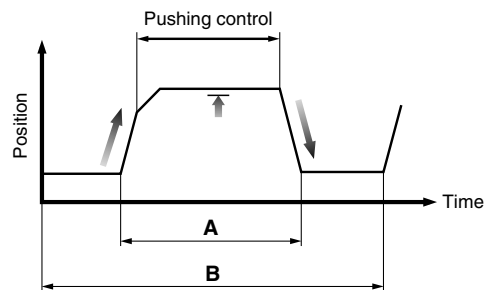
As shown in the below table, the duty ratio is 20 [%], so the set value of pushing force will be 70 [%].

<Conversion table of pushing force-duty ratio> (LEY16/Step motor)

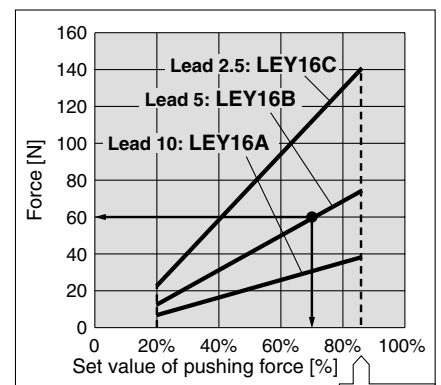
Set value of pushing force [%]	Duty ratio (%)	Continuous pushing time (min.)
40 or less	100	—
50	70	12
70	20	1.3
85	15	0.8

* [Set value of pushing force] is one of the step data input to the controller.

* [Continuous pushing time] is the time that the actuator can continuously keep pushing.



$$\text{Duty ratio} = A/B \times 100 [\%]$$



<Force conversion graph> (LEY16/Step motor)

Step 2 Confirmation of pushing force <Force conversion graph>

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

Selection example

Based on the graph shown on the right side,

- Set value of pushing force: 70 [%]
- Pushing force: 60 [N]

Therefore, the LEY16B is temporarily selected.

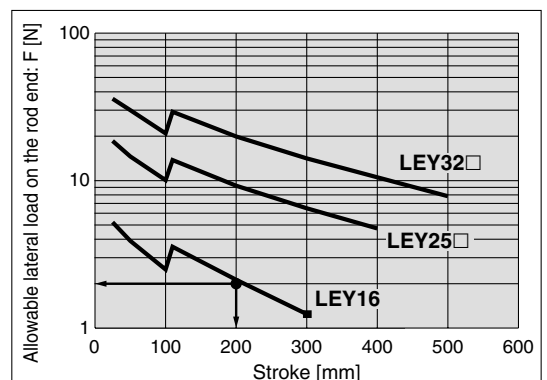
Step 3 Confirmation of the lateral load on the rod end <Graph of allowable lateral load on the rod end>

Confirm the allowable lateral load on the rod end of the actuator: LEY16□, which has been selected temporarily with reference to the (Graph of allowable lateral load on the rod end).

Selection example

Based on the graph shown on the right side,

- Jig mass: 0.2 [kg] ≈ 2 [N]
- Since the product stroke is 200 [mm], the lateral load is in the allowable range.



<Graph of allowable lateral load on the rod end>

Based on the above calculation result, the LEY16B-200 is selected.

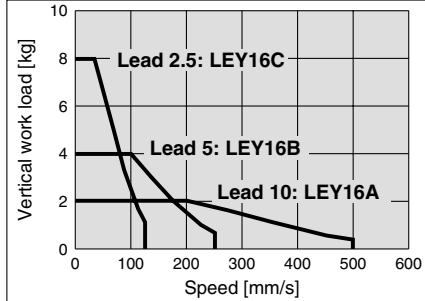
Series LEY

Model Selection 3

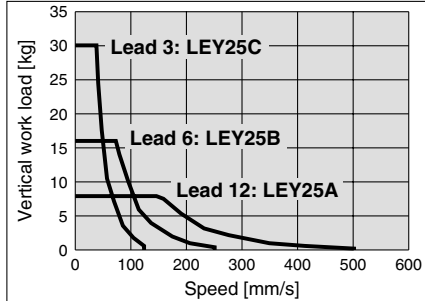
Speed-Vertical Work Load Graph (Guide)

Step Motor (Servo/24 VDC)

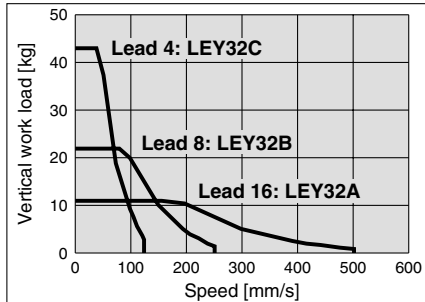
LEY16



LEY25

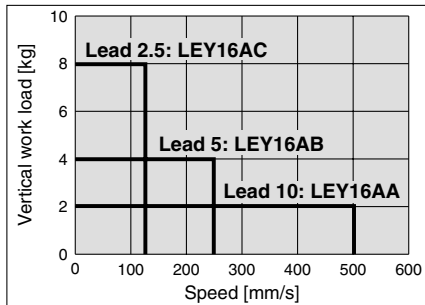


LEY32

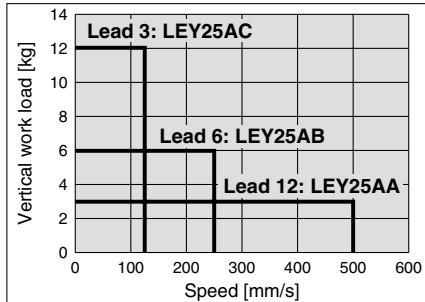


Servo Motor (24 VDC)

LEY16



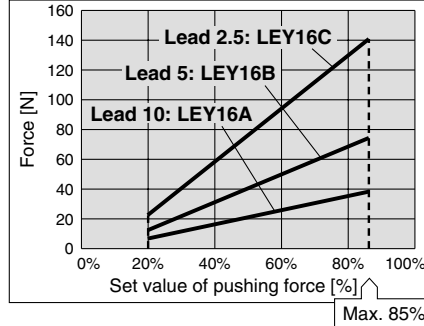
LEY25



Force Conversion Graph (Guide)

Step Motor (Servo/24 VDC)

LEY16



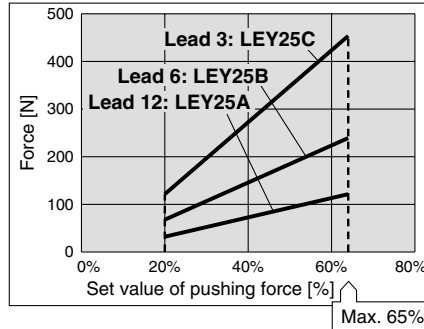
● Ambient Temperature: 25°C or less

Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
85 or less	100	—

● Ambient Temperature: 40°C

Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
40 or less	100	—
50	70	12
70	20	1.3
85	15	0.8

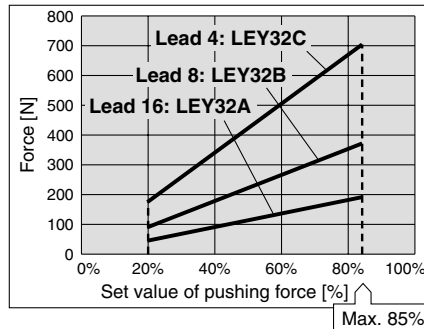
LEY25



● Ambient Temperature: 40°C or less

Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
65 or less	100	—

LEY32



● Ambient Temperature: 25°C or less

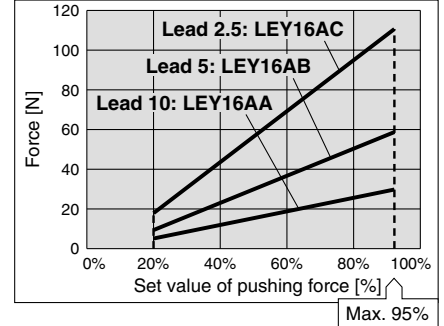
Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
85 or less	100	—

● Ambient Temperature: 40°C

Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
65 or less	100	—
85	50	15

Servo Motor (24 VDC)

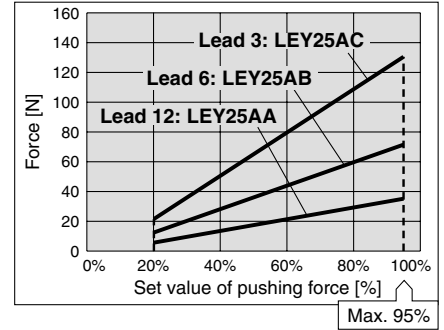
LEY16



● Ambient Temperature: 40°C or less

Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
95 or less	100	—

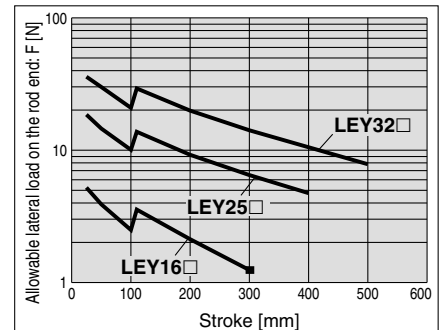
LEY25



● Ambient Temperature: 40°C or less

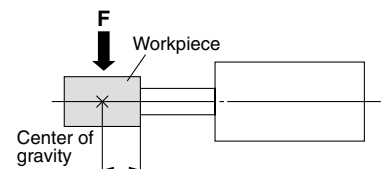
Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
95 or less	100	—

Allowable Lateral Load on the Rod End (Guide)



[Stroke]

= [Product stroke] + [Distance from the rod end to the center of gravity of the workpiece]



Electric Actuator/Rod Type

Series LEY

LEY16, 25, 32



How to Order

LEY 16 **B** - **50** - **1** **6P** **1**

Size

16	Motor mounting position	
25	Nil	Top mounting type
32	R	Right side parallel type
	L	Left side parallel type

Motor type

Symbol	Type	Size		
		LEY16	LEY25	LEY32
Nil	Step motor (Servo/24 VDC)	●	●	●
A	Servo motor ^{Note 1)} (24 VDC)	●	●	—

Lead

Symbol	LEY16	LEY25	LEY32
A	10 mm	12 mm	16 mm
B	5 mm	6 mm	8 mm
C	2.5 mm	3 mm	4 mm

Stroke

50	50 mm
500	500 mm

* Refer to the below table for details.

Motor option ^{Note 2)}

Nil	Without option
C	With motor cover
B	With lock ^{Note 3)}

Note 2) When [with lock] specification is selected, [with motor cover] specification cannot be selected.
 Note 3) When selecting body 16, it is not possible to select strokes shorter than 50.

Refer to pages 13 and 14 for auto switches.

Controller mounting

Nil	Screw mounting
D	DIN rail mounting

I/O cable length

Nil	Without cable
1	1.5 m
3	3 m
5	5 m

Controller type

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

Actuator cable length

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

* Produced upon receipt of order

Actuator cable type

Nil	Without cable
R	Robotic cable (Flexible cable)

Mounting

Nil	Ends tapped (Standard)	F	Rod flange
U	Body bottom tapped	G	Head flange
L	Foot	D	Double clevis

* Mounting bracket is included, (but not assembled).
 * When mounting styles are [Rod flange], [Head flange] or [Ends tapped] with one end fixed and mounted in a horizontal direction, use it within the following stroke.
 • LEY25: 200 or less • LEY32: 100 or less
 * In case of [Double clevis], use the actuator within the following stroke limit.
 • LEY16: 100 or less • LEY25: 200 or less • LEY32: 200 or less

Rod end thread

Nil	Rod end female thread
M	Rod end male thread (1 rod end nut is included.)

Caution

Note 1) CE-compliant products
 ① EMC compliance was tested by combining the electric actuator LEY 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 (LECNFA). Refer to page 26 for the noise filter set. Refer to the LECA Operation Manual for installation.

* Stroke table ● Standard/○ Produced upon receipt of order

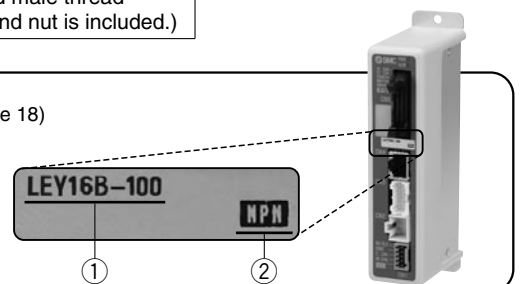
Model	Stroke	50	100	200	300	400	500
LEY16		●	●	●	●	—	—
LEY25		●	●	●	●	○	—
LEY32		●	●	●	●	○	○

The actuator and controller are sold as a package. (Controller → Page 18)

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

<Be sure to check the following before use.>

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



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

Specifications

- Note 1) Strokes shown in () and the intermediate strokes are produced upon receipt of order.
- Note 2) Horizontal: The maximum value of the work load for the positioning operation. For the pushing operation, the maximum work load is equal to the "Vertical work load". An external guide is necessary to support the load. The actual work load and transfer speed will depend on the condition of the external guide. Vertical: Speed is dependent on the work load. Check "Model Selection" on page 1. The figures shown in () are the maximum acceleration/deceleration values. Set these values to be 3000 [mm/s²] or less.
- Note 3) Pushing force accuracy is ±20% (F.S.).
- Note 4) Setting range of "Pushing force" for LEY16 is from 35% to 85%, for LEY25 is from 35% to 65%, and for LEY32 is from 35% to 85%. It is possible that "Pushing force" and "Duty ratio" changes dependent on the set value. Check "Model Selection" on page 2.
- Note 5) Pushing speed is the allowable speed for the pushing operation.
- Note 6) 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 actuator in the initial state.) Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
- Note 7) Power consumption (including the controller) is for when the actuator is operating.
- Note 8) 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 9) 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 10) With lock only
- Note 11) For an actuator with lock, add the power consumption for the lock.

- Note 1) Strokes shown in () and the intermediate strokes are produced upon receipt of order.
- Note 2) Horizontal: The maximum value of the work load for the positioning operation. For the pushing operation, the maximum work load is equal to the "Vertical work load". An external guide is necessary to support the load. The actual work load and transfer speed will depend on the condition of the external guide. Vertical: Speed is dependent on the work load. Check "Model Selection" on page 1. The figures shown in () are the maximum acceleration/deceleration values. Set these values to be 3000 [mm/s²] or less.
- Note 3) Pushing force accuracy is ±20% (F.S.).
- Note 4) Setting range of "Pushing force" for LEY16A is from 50% to 95% and for LEY25A is from 50% to 95%. It is possible that "Pushing force" and "Duty ratio" changes dependent on the set value. Check "Model Selection" on page 2.
- Note 5) Pushing speed is the allowable speed for the pushing operation.
- Note 6) 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 actuator in the initial state.) Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
- Note 7) Power consumption (including the controller) is for when the actuator is operating.
- Note 8) 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 9) 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 10) With lock only
- Note 11) For an actuator with lock, add the power consumption for the lock.

Additional Weight (kg)

Size	16	25	32
Lock	0.12	0.19	0.35
Motor cover	0.02	0.03	0.04
Rod end male thread	Male thread	0.01	0.03
	Nut	0.01	0.02
Foot (2 sets including mounting bolts)	0.06	0.08	0.14
Rod flange (including mounting bolts)	0.13	0.17	0.20
Head flange (including mounting bolts)			
Double clevis (including pin, retaining ring and mounting bolts)	0.08	0.16	0.22

Step Motor (Servo/24 VDC)

Model		LEY16			LEY25			LEY32			
Actuator specifications	Stroke [mm] ^{Note 1)}	50, 100, 200, 300			50, 100, 200, 300, (400)			50, 100, 200, 300, (400, 500)			
	Work load [kg] ^{Note 2)}	Horizontal (3000 [mm/s])	4	11	20	12	30	30	20	40	40
		Vertical (2000 [mm/s])	6	17	30	18	50	50	30	60	60
	Pushing force [N] ^{Note 3) 4)}	Horizontal (3000 [mm/s])	2	4	8	8	16	30	11	22	43
		Vertical (3000 [mm/s])	14 to 38	27 to 74	51 to 141	63 to 122	126 to 238	232 to 452	80 to 189	156 to 370	296 to 707
	Speed [mm/s]	15 to 500			8 to 250			4 to 125			
	Pushing speed [mm/s] ^{Note 5)}	50 or less			35 or less			30 or less			
	Positioning repeatability [mm]	±0.02									
	Screw lead [mm]	10	5	2.5	12	6	3	16	8	4	
	Impact/Vibration resistance [m/s ²] ^{Note 6)}	50/20									
Actuation type	Ball screw + Belt										
Guide type	Sliding bushing (Piston rod)										
Operating temp. range [°C]	5 to 40 (No condensation and freezing)										
Operating humidity range [%]	35 to 85 (No condensation and freezing)										
Electric specifications	Motor size	□28			□42			□56.4			
	Motor type	Step motor (Servo 24 VDC)									
	Encoder	Incremental A/B phase (800 pulse/rotation)									
	Rated voltage [V]	24 VDC ±10%									
	Power consumption [W] ^{Note 7)}	23			40			50			
	Standby power consumption when operating [W] ^{Note 8)}	16			15			48			
	Momentary max. power consumption [W] ^{Note 9)}	43			48			104			
	Controller weight [kg]	0.15 (Screw mounting), 0.17 (DIN rail mounting)									
	Type ^{Note 10)}	Non-energizing operation type									
	Lock unit specifications	Holding force (N)	20	39	78	78	157	294	108	216	421
Power consumption [W] ^{Note 11)}		3.6			5			5			
Rated voltage [V]		24 VDC ±10%									

Servo Motor (24 VDC)

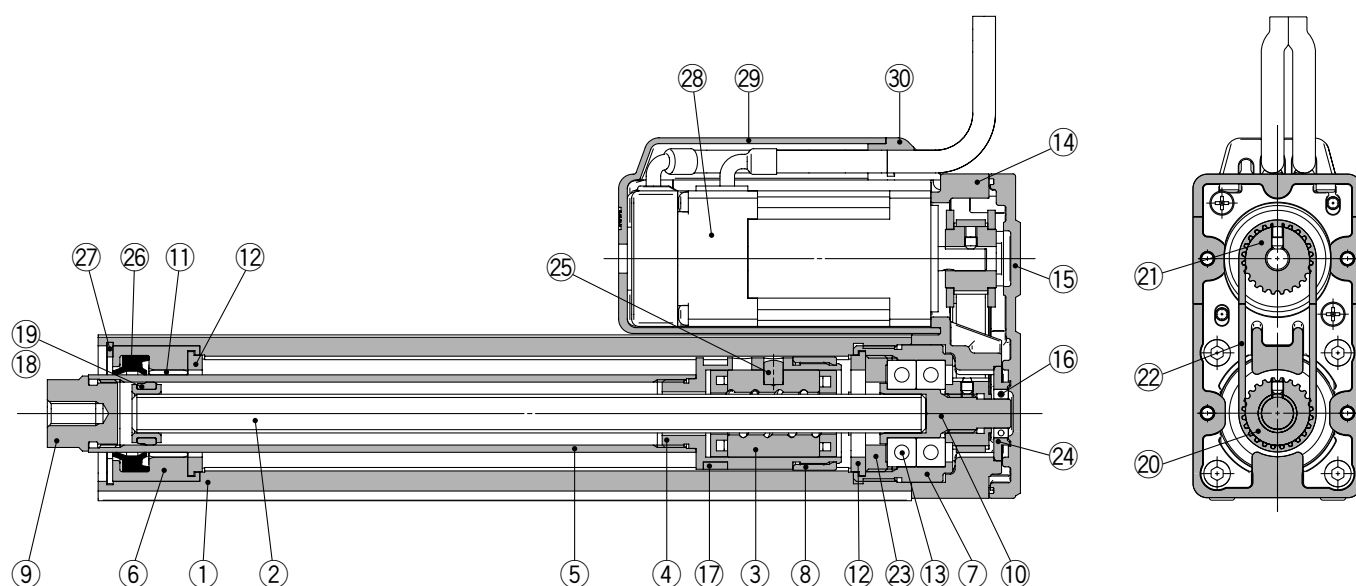
Model		LEY16A			LEY25A			
Actuator specifications	Stroke [mm] ^{Note 1)}	50, 100, 200, 300			50, 100, 200, 300, (400)			
	Work load [kg] ^{Note 2)}	Horizontal (3000 [mm/s])	3	6	12	7	15	30
		Vertical (3000 [mm/s])	2	4	8	3	6	12
	Pushing force [N] ^{Note 3) 4)}	Horizontal (3000 [mm/s])	16 to 30	30 to 58	57 to 111	18 to 35	37 to 72	66 to 130
		Vertical (3000 [mm/s])	15 to 500	8 to 250	4 to 125	18 to 500	9 to 250	5 to 125
	Speed [mm/s]	15 to 500			8 to 250			4 to 125
	Pushing speed [mm/s] ^{Note 5)}	50 or less			35 or less			
	Positioning repeatability [mm]	±0.02						
	Screw lead [mm]	10	5	2.5	12	6	3	
	Impact/Vibration resistance [m/s ²] ^{Note 6)}	50/20						
Actuation type	Ball screw + Belt							
Guide type	Sliding bushing (Piston rod)							
Operating temp. range [°C]	5 to 40 (No condensation and freezing)							
Operating humidity range [%]	35 to 85 (No condensation and freezing)							
Electric specifications	Motor size	□28			□42			
	Motor output [W]	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 7)}	40			86			
	Standby power consumption when operating [W] ^{Note 8)}	4 (Horizontal)/6 (Vertical)			4 (Horizontal)/12 (Vertical)			
	Momentary max. power consumption [W] ^{Note 9)}	59			96			
	Controller weight [kg]	0.15 (Screw mounting), 0.17 (DIN rail mounting)						
	Type ^{Note 10)}	Non-energizing operation type						
Lock unit specifications	Holding force (N)	20	39	78	78	157	294	
	Power consumption [W] ^{Note 11)}	3.6			5			
	Rated voltage [V]	24 VDC ±10%						

Weight

Model		LEY16				LEY25				LEY32						
Stroke [mm]		50	100	200	300	50	100	200	300	400	50	100	200	300	400	500
Product weight [kg]	Step motor	0.62	0.73	0.98	1.20	1.25	1.42	1.86	2.21	2.56	2.20	2.49	3.17	3.74	4.32	4.89
	Servo motor	0.62	0.73	0.98	1.20	1.21	1.38	1.52	2.17	2.52	—	—	—	—	—	—

Series LEY

Construction



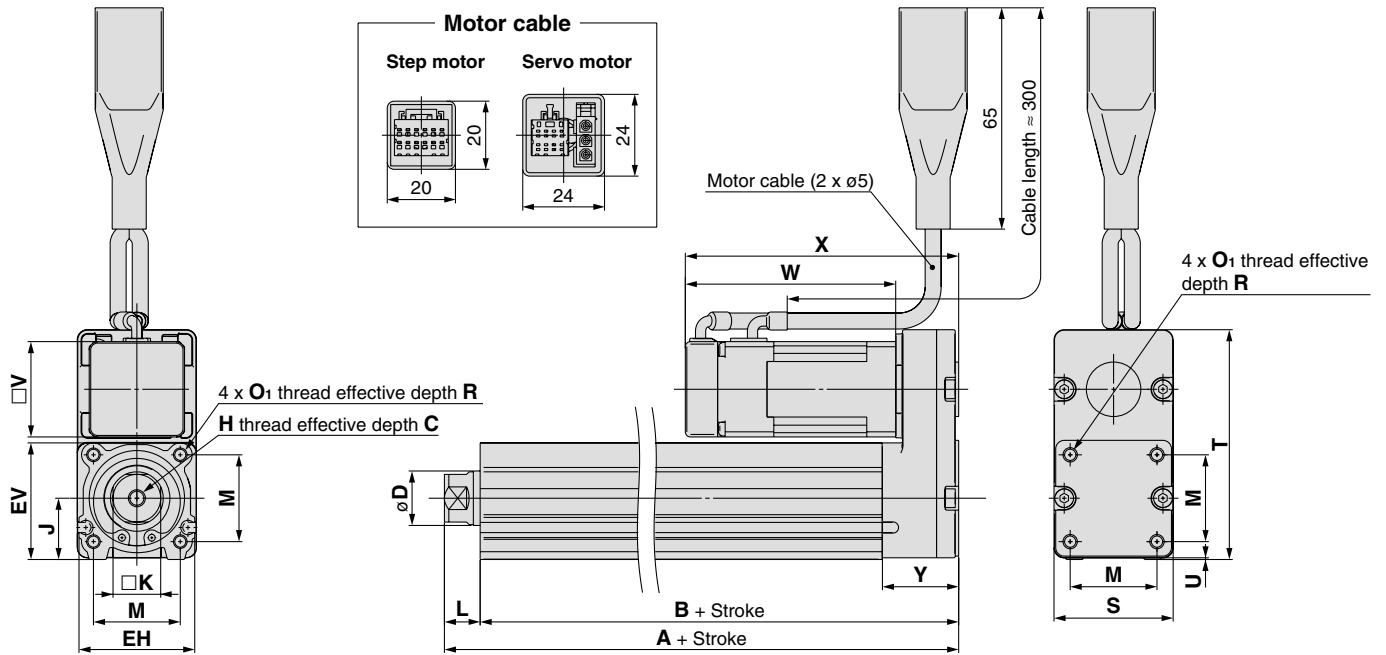
Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Anodized
2	Ball screw (shaft)	Alloy steel	
3	Ball screw nut	Resin/Alloy steel	
4	Piston	Aluminum alloy	
5	Piston rod	Stainless steel	Hard chrome anodized
6	Rod cover	Aluminum alloy	
7	Housing	Aluminum alloy	
8	Rotation stopper	POM	
9	Socket	Free cutting carbon steel	Nickel plated
10	Connected shaft	Free cutting carbon steel	Nickel plated
11	Bushing	Lead bronze cast	
12	Bumper	Urethane	
13	Bearing	—	
14	Return box	Aluminum die-cast	
15	Return plate	Aluminum die-cast	
16	Bearing	—	
17	Magnet	—	
18	Wear ring holder	Stainless steel	Stroke 101 mm or more
19	Wear ring	POM	Stroke 101 mm or more
20	Pulley for screw shaft	Aluminum alloy	
21	Pulley for motor	Aluminum alloy	
22	Belt	—	
23	Bearing stopper	Aluminum alloy	Nickel plated
24	Bearing support	Stainless steel	
25	Parallel pin	Carbon steel	
26	Rod seal	NBR	
27	Retaining ring	Steel for spring	
28	Step servo motor	—	
29	Motor cover	Synthetic resin	Only "With motor cover"
30	Grommet	Synthetic resin	Only "With motor cover"

Replacement Parts/Belt

No.	Size	Order no.
22	16	LE-D-2-1
	25	LE-D-2-2
	32	LE-D-2-3

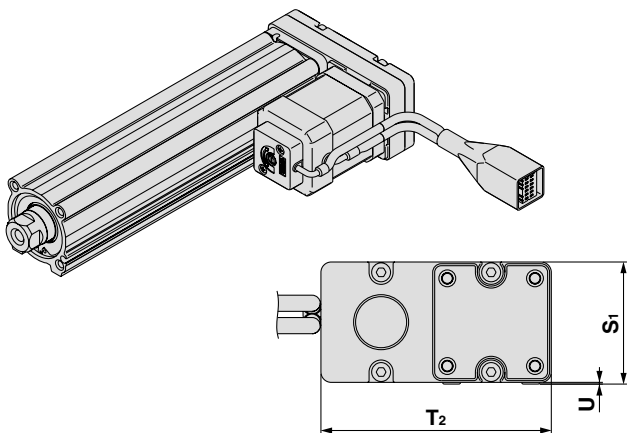
Dimensions



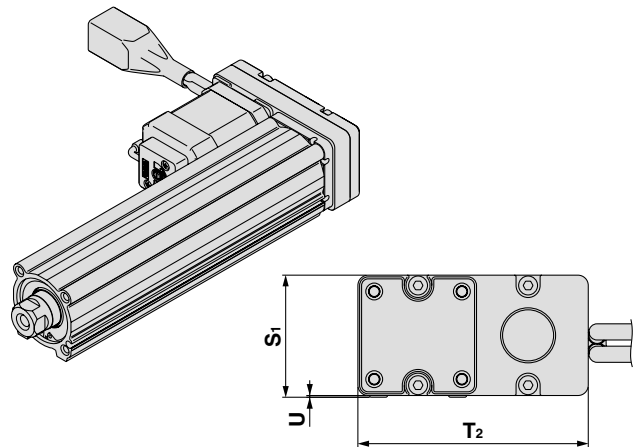
Size	Stroke range (mm)	A	B	C	D	EH	EV	H	J	K	L	M	O_1	R	S	T	U	V	Step motor		Servo motor		Y
																			W	X	W	X	
16	10 to 100	101	90.5	10	16	34	34.3	M5 x 0.8	18	14	10.5	25.5	M4 x 0.7	7	35	67.5	0.5	28	61.8	80.3	62.5	81	22.5
	101 to 300	121	110.5																61.8	80.3	62.5	81	22.5
25	15 to 100	130.5	116	13	20	44	45.5	M8 x 1.25	24	17	14.5	34	M5 x 0.8	8	46	92	1	42	63.4	85.4	59.6	81.6	26.5
	101 to 400	155.5	141																63.4	85.4	59.6	81.6	26.5
32	20 to 100	148.5	130	13	25	51	56.5	M8 x 1.25	31	22	18.5	40	M6 x 1.0	10	60	118	1	56.4	68.4	95.4	—	—	34
	101 to 500	178.5	160																68.4	95.4	—	—	34

* For A and L, the position 2 mm from the rod end is set as the return to original position.

16
Motor left side parallel type/LEY25L
32



16
Motor right side parallel type/LEY25R
32



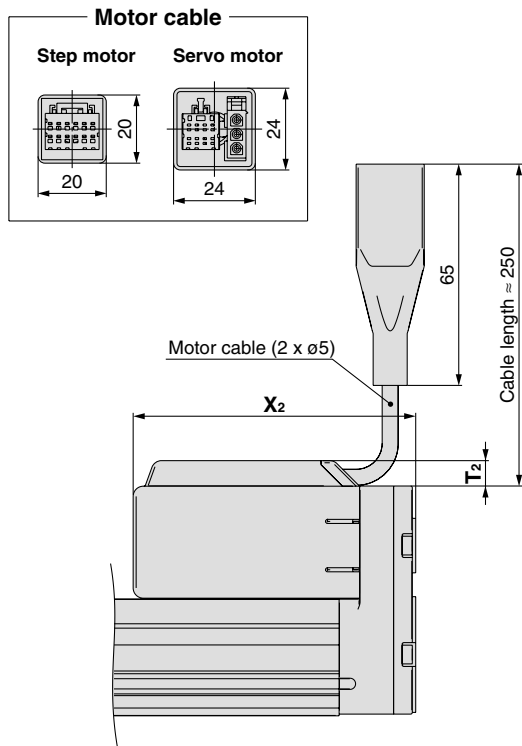
Size	S_1	T_2	U
16	35.5	67	0.5
25	47	91	1
32	61	117	1

Note) When the motor is mounted on the left or right side in parallel, the auto switch groove on the side to which the motor is mounted is hidden.

Series LEY

Dimensions

With motor cover/LEY25 B- C
 16 A
 32 C

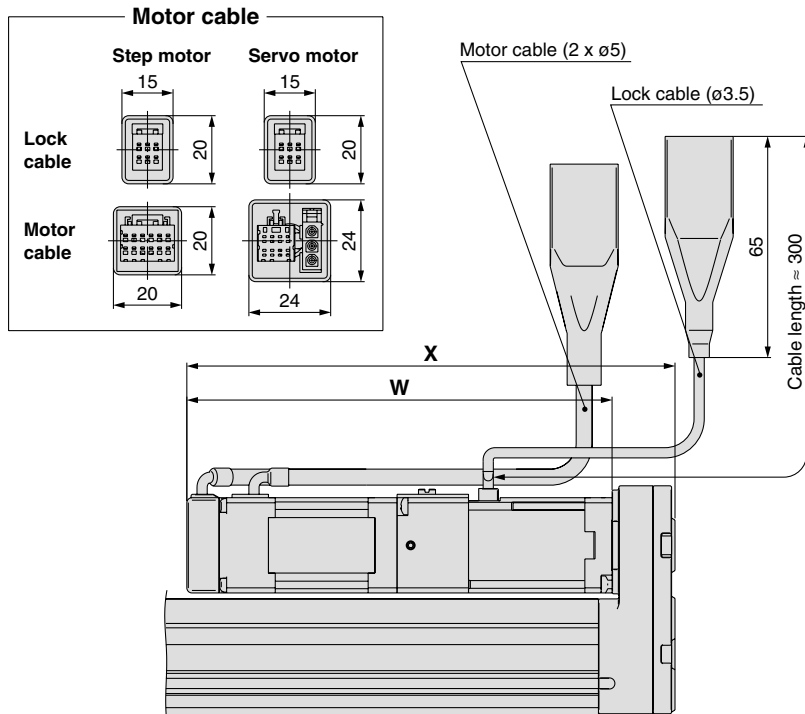


(mm)

Size	T ₂	X ₂
16	7.5	83
25	7.5	88.5
32	7.5	98.5

Motor cover material: Synthetic resin

With lock/LEY25 B- B
 16 A
 32 C

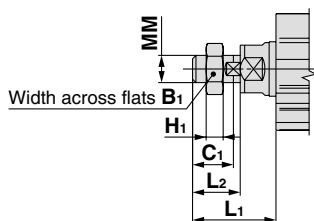


(mm)

Size	Step motor		Servo motor	
	W	X	W	X
16	125	143.5	125.7	144.2
25	103.9	125.9	100.1	122.1
32	115.4	142.4	—	—

End male thread/LEY25 B- M
 16 A
 32 C

* Refer to page 11 for details of the rod end nut and mounting bracket.
 Note) Refer to the cautions [cautions for handling] on page 16 when mounting end brackets such as knuckle joint or work pieces.



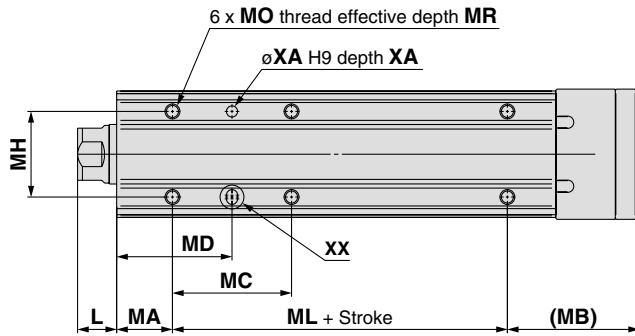
(mm)

Size	B ₁	C ₁	H ₁	L ₁	L ₂	MM
16	13	12	5	24.5	14	M8 x 1.25
25	22	20.5	8	38	23.5	M14 x 1.5
32	22	20.5	8	41.5	23.5	M14 x 1.5

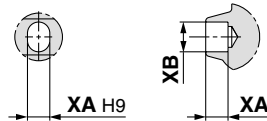
* For L₁, the position 2 mm from the rod end is set as the return to original position.

Dimensions

Body bottom tapped/LEY25 **A** **B** - **C**
 16 **A**
 32 **C**



Detailed figure of section XX



Body Bottom Tapped

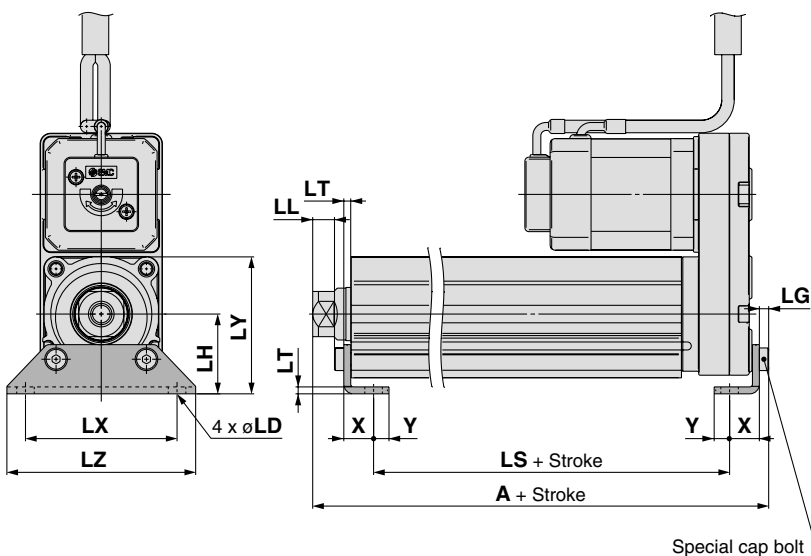
(mm)

Size	Stroke range (mm)	L	MA	MB	MC	MD	MH	ML
16	10 to 39	10.5	15	35.5	17	23.5	23	40
	40 to 100				32	31		
	101 to 300				62	46		
25	15 to 39	14.5	20	46	24	32	29	50
	40 to 100				42	41		
	101 to 124				59	49.5		75
	125 to 200				76	58		
	201 to 400				76	58		
32	20 to 39	18.5	25	55	22	36	30	50
	40 to 100				36	43		
	101 to 124				53	51.5		80
	125 to 200				53	51.5		
	201 to 500				70	60		

Size	Stroke range (mm)	MO	MR	XA	XB
16	10 to 39	M4 x 0.7	5.5	3	4
	40 to 100				
	101 to 300				
25	15 to 39	M5 x 0.8	6.5	4	5
	40 to 100				
	101 to 124				
	125 to 200				
	201 to 400				
32	20 to 39	M6 x 1	8.5	5	6
	40 to 100				
	101 to 124				
	125 to 200				
	201 to 500				

Foot/LEY25 **A** **L**
 16 **A**
 32 **C**

Enclosed parts
 • Foot
 • Body mounting bolt



Foot

(mm)

Size	Stroke range (mm)	A	LS	LL	LD	LG
16	10 to 100	106.1	76.5	4.5	6.6	2.8
	101 to 300	126.1	96.5			
25	15 to 100	136.6	99	7.8	6.6	3.5
	101 to 400	161.6	124			
32	20 to 100	155.7	114	11.3	6.6	4
	101 to 500	185.7	145			

Size	Stroke range (mm)	LH	LT	LX	LY	LZ	X	Y
16	10 to 100	24	2.3	48	40.3	62	9.2	5.8
	101 to 300							
25	15 to 100	30	2.6	57	51.5	71	11.2	5.8
	101 to 400							
32	20 to 100	36	3.2	76	61.5	90	11.2	7
	101 to 500							

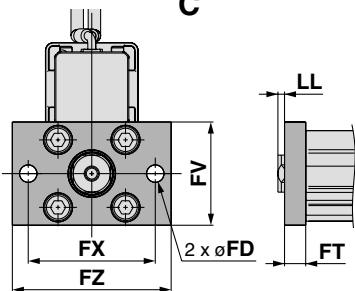
Material: Carbon steel (Chromated)

* For A and LS, the position 2 mm from the rod end is set as the return to original position.

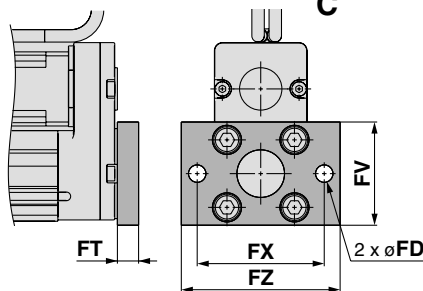
Series LEY

Dimensions

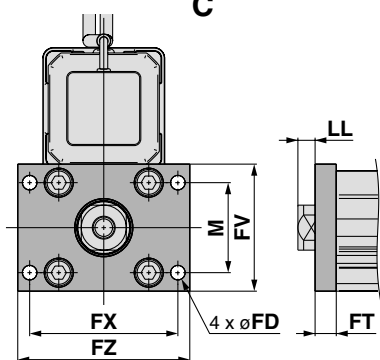
Rod flange/LEY16 □□ B-□□□ F
A
C



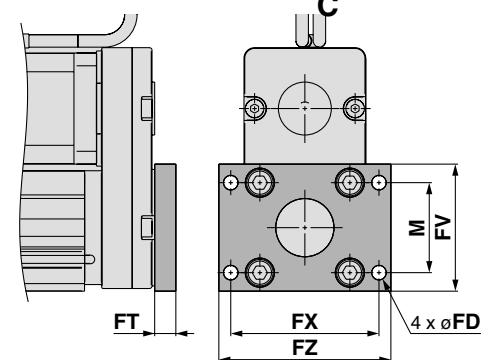
Head flange/LEY16 □□ B-□□□ G
A
C



Rod flange/LEY²⁵/₃₂ □□ B-□□□ F
A
C



Head flange/LEY²⁵/₃₂ □□ B-□□□ G
A
C



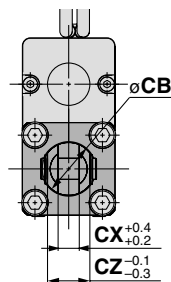
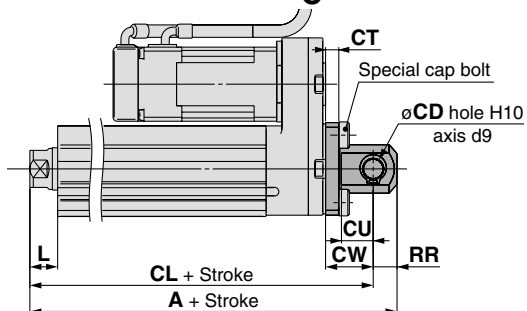
Enclosed parts
• Flange
• Body mounting bolt

Rod/Head Flange (mm)

Size	FD	FT	FV	FX	FZ	LL	M
16	6.6	8	39	48	60	2.5	—
25	5.5	8	48	56	65	6.5	34
32	5.5	8	54	62	72	10.5	40

Material: Carbon steel (Nickel plated)

Double clevis/LEY16 □□ B-□□□ D
A
C



Enclosed parts
• Double clevis
• Body mounting bolt
• Clevis pin
• Retaining ring

* Refer to page 11 for details of the rod end nut and mounting bracket.

Double Clevis (mm)

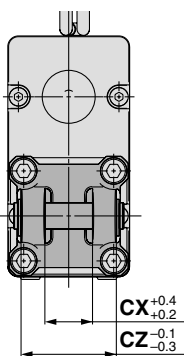
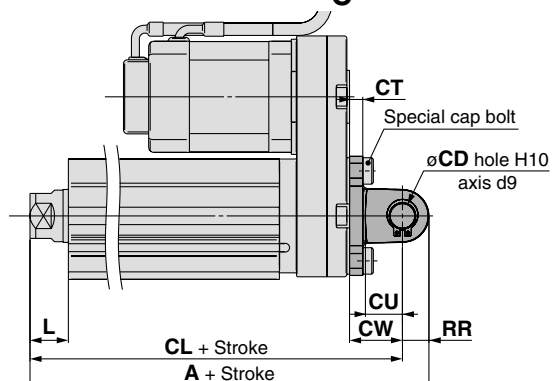
Size	Stroke range (mm)	A	CL	CB	CD	CT
16	10 to 100	128	119	20	8	5
	101 to 200	160.5	150.5	—	10	5
25	10 to 100	185.5	175.5	—	10	6
	101 to 200	210.5	200.5	—	10	6

Size	Stroke range (mm)	CU	CW	CX	CZ	L	RR
16	10 to 100	12	18	8	16	10.5	9
	101 to 200	14	20	18	36	14.5	10
25	10 to 100	14	22	18	36	18.5	10
	101 to 200	14	22	18	36	18.5	10

Material: Cast iron (Painted)

* For A and CL, the position 2 mm from the rod end is set as the return to original position.

Double clevis/LEY²⁵/₃₂ □□ B-□□□ D
A
C

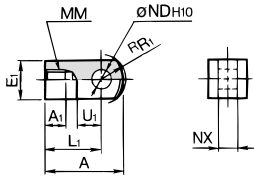


Accessory Brackets/Support Brackets

Single Knuckle Joint

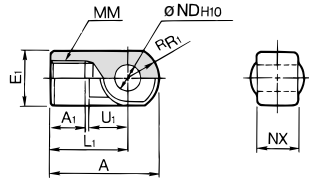
* If a knuckle joint is used, select the body option [end male thread].

I-G02



Material: Carbon steel
Surface treatment: Nickel plated

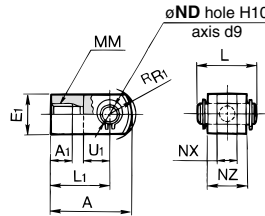
I-G04



Material: Cast iron
Surface treatment: Nickel plated

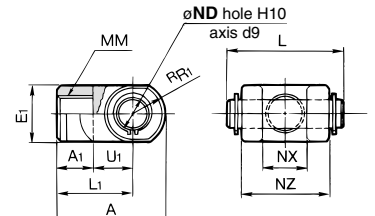
Double Knuckle Joint

Y-G02



Material: Carbon steel
Surface treatment: Nickel plated

Y-G04



Material: Cast iron
Surface treatment: Nickel plated

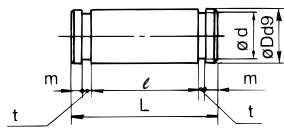
(mm)

Part no.	Applicable size	A	A ₁	E ₁	L ₁	MM	R ₁	U ₁	ND _{H10}	NX
I-G02	16	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 ^{+0.058} ₀	8 ^{-0.2} _{-0.4}
I-G04	25, 32	42	14	∅22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	8 ^{-0.3} _{-0.5}

* Knuckle pin and retaining ring are included. (mm)

Part no.	Applicable size	A	A ₁	E ₁	L ₁	MM	R ₁	U ₁	ND _{H10}	NX	NZ	L	Applicable pin part no.
Y-G02	16	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 ^{+0.058} ₀	8 ^{-0.2} _{-0.4}	16	21	IY-G02
Y-G04	25, 32	42	14	∅22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	8 ^{-0.3} _{-0.5}	36	41.6	IY-G04

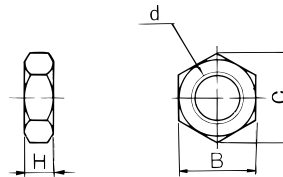
Knuckle Pin (Common with double clevis pin)



Material: Carbon steel
(mm)

Part no.	Applicable size	Dd ₉	L	d	ℓ	m	t	Retaining ring
IY-G02	16	8 ^{-0.040} _{-0.076}	21	7.6	16.2	1.5	0.9	Type C retaining ring 8
IY-G04	25, 32	10 ^{-0.040} _{-0.076}	41.6	9.6	36.2	1.55	1.15	Type C retaining ring 10

Rod End Nut



Material: Carbon steel (Nickel plated)
(mm)

Part no.	Applicable size	d	H	B	C
NT-02	16	M8 x 1.25	5	13	15.0
NT-04	25, 32	M14 x 1.5	8	22	25.4

Mounting Bracket/Part No.

Applicable size	Foot	Flange	Double clevis
16	LEY-L016	LEY-F016	LEY-D016
25	LEY-L025	LEY-F025	LEY-D025
32	LEY-L032	LEY-F032	LEY-D032

* When ordering foot brackets, order 2 brackets for one cylinder.

* The following parts will be included with each type of bracket.

Foot: Body mounting bolt

Flange: Body mounting bolt

Double clevis: Clevis pin, Type C retaining ring for axis, Body mounting bolt

Series LEY

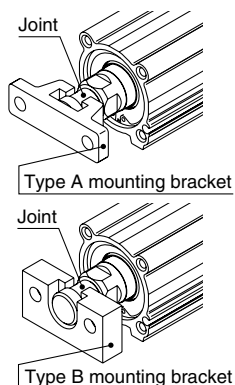
Simple Joint Brackets * The joint is not included in type A and type B mounting brackets. Therefore, it must be ordered separately.

Joint and Mounting Bracket (Type A/B)/Part No.

YA-03

- Applicable size
03 25, 32
- Mounting bracket

YA	Type A mounting bracket
YB	Type B mounting bracket
YU	Joint



Allowable Eccentricity (mm)

Applicable size	25	32
Eccentricity tolerance	±1	
Backlash	0.5	

<How to Order>

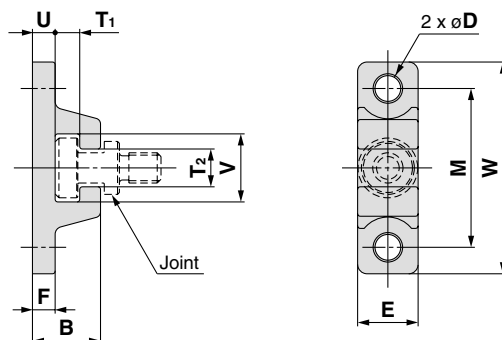
• The joint is not included in type A and type B mounting brackets. Therefore, it must be ordered separately.

Example) Order no.
 • Type A mounting bracket YA-03
 • Joint YU-03

Joint and Mounting Bracket (Type A/B)/Part No.

Applicable size	Joint part no.	Applicable mounting bracket part no.	
		Type A mounting bracket	Type B mounting bracket
25, 32	YU-03	YA-03	YB-03

Type A Mounting Bracket

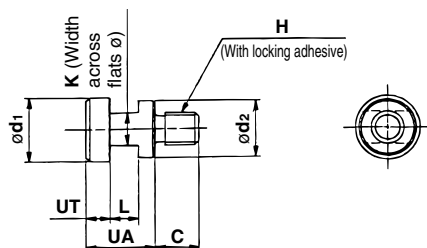


Material: Chromium molybdenum steel (Nickel plated)

Part no.	Applicable size	B	D	E	F	M	T ₁	T ₂
YA-03	25, 32	18	6.8	16	6	42	6.5	10

Part no.	Applicable size	U	V	W	Weight (g)
YA-03	25, 32	6	18	56	55

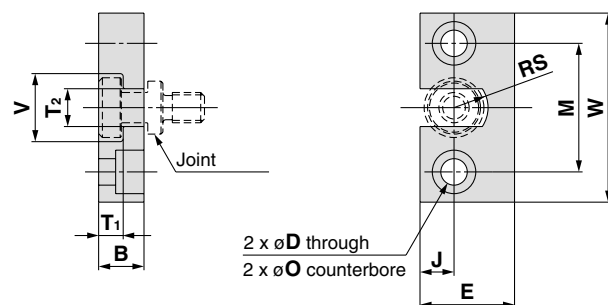
Joint



Material: Chromium molybdenum steel (Nickel plated) (mm)

Part no.	Applicable size	UA	C	d ₁	d ₂	H	K	L	UT	Weight (g)
YU-03	25, 32	17	11	15.8	14	M8 x 1.25	8	7	6	25

Type B Mounting Bracket



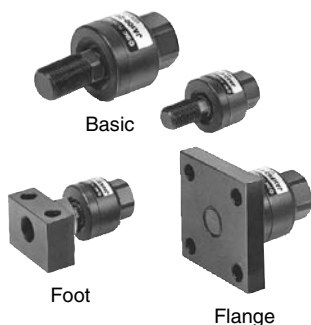
Material: Stainless steel (mm)

Part no.	Applicable size	B	D	E	J	M	øO
YB-03	25, 32	12	7	25	9	34	11.5 depth 7.5

Part no.	Applicable size	T ₁	T ₂	V	W	RS	Weight (g)
YB-03	25, 32	6.5	10	18	50	9	80

Floating Joints (Refer to Best Pneumatics No. 2 for details.)

● For Male Thread/JA



● For Male Thread/JS (Stainless steel)

- Stainless steel 304 (Appearance)
- Dust cover
Fluoro rubber/Silicone rubber




Applicable size	Thread size
16	M8 x 1.25
25, 32	M14 x 1.5

● For Female Thread/JB



Applicable size	Thread size
16	M5 x 0.8
25, 32	M8 x 1.25

Solid State Auto Switch Direct Mounting Style D-M9N(V)/D-M9P(V)/D-M9B(V)

 Refer to SMC website for the details of the products conforming to the international standards.

Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□, D-M9□V (With indicator light)						
Auto switch model	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)				4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Red LED illuminates when turned ON.					
Standard	CE marking					

● Lead wires — Oilproof flexible heavy-duty vinyl cord: $\phi 2.7 \times 3.2$ ellipse, 0.15 mm², 2 cores (D-M9B(V)), 3 cores (D-M9N(V)/D-M9P(V))

Note) Refer to Best Pneumatics No. 2 for solid state auto switch common specifications.

Grommet

- 2-wire load current is reduced (2.5 to 40 mA).
- Flexibility is 1.5 times greater than the conventional model (SMC comparison).
- Using flexible cable as standard specification.



Caution

Precautions

Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

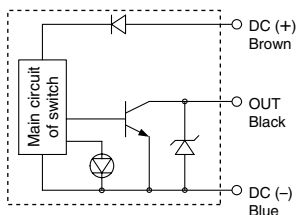
Weight

(g)

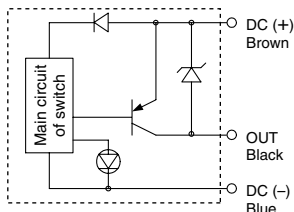
Auto switch model	D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length (m)	0.5	8	7
	1	14	13
	3	41	38
	5	68	63

Auto Switch Internal Circuit

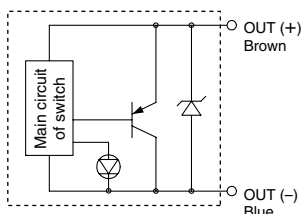
D-M9N(V)



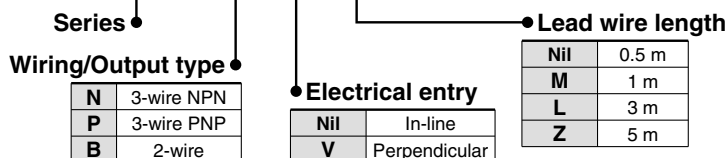
D-M9P(V)



D-M9B(V)



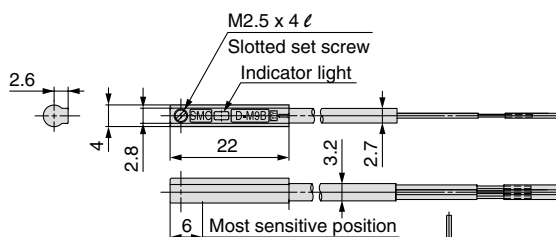
D-M9 N



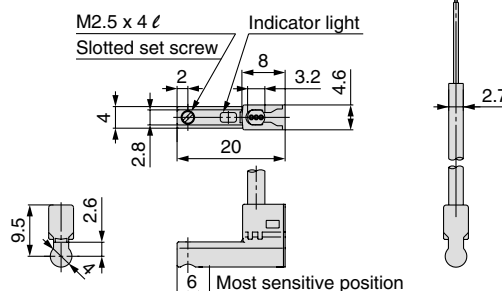
Dimensions

(mm)

D-M9□



D-M9□V



2-Color Indication Solid State Auto Switch Direct Mounting Style D-M9NW(V)/D-M9PW(V)/D-M9BW(V) C €



Refer to SMC website for the details of the products conforming to the international standards.

Grommet

- 2-wire load current is reduced (2.5 to 40 mA).
- Flexibility is 1.5 times greater than the conventional model (SMC comparison).
- Using flexible cable as standard spec.
- The proper operating range can be determined by the color of the light. (Red → Green ← Red)



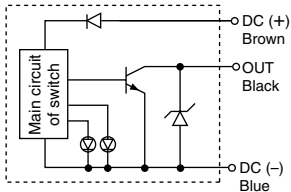
Caution

Precautions

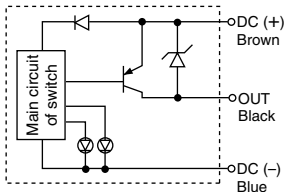
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

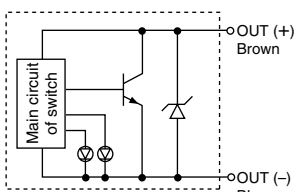
D-M9NW(V)



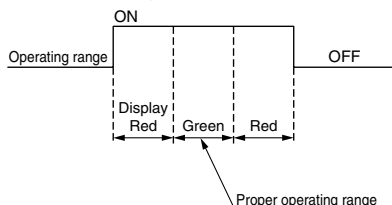
D-M9PW(V)



D-M9BW(V)



Indicator light/Display method



Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□W, D-M9□WV (With indicator light)						
Auto switch model	D-M9NW	D-M9NWV	D-M9PW	D-M9PWV	D-M9BW	D-M9BWV
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)				4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Operating range Red LED illuminates. Proper operating range Green LED illuminates.					
Standard	CE marking					

- Lead wires — Oilproof flexible heavy-duty vinyl cord: $\phi 2.7 \times 3.2$ ellipse, 0.15 mm², 2 cores (D-M9BW(V)), 3 cores (D-M9NW(V)/D-M9PW(V))

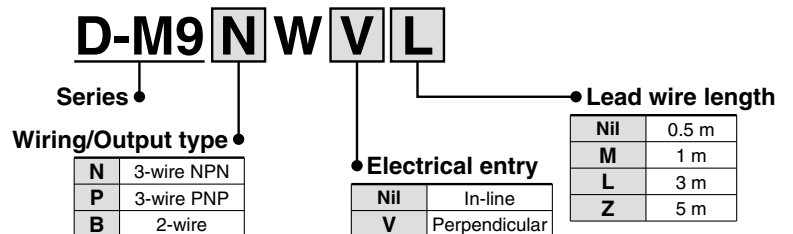
Note) Refer to Best Pneumatics No. 2 for solid state auto switch common specifications.

Weight

(g)

Auto switch model	D-M9NW(V)	D-M9PW(V)	D-M9BW(V)
Lead wire length (m)	0.5	8	7
	1	14	13
	3	41	38
	5	68	63

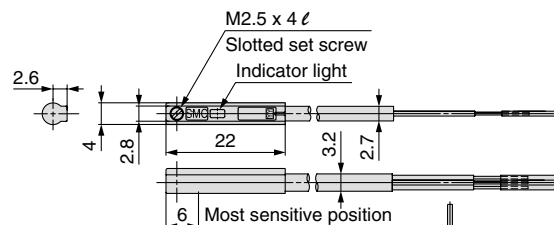
How to Order



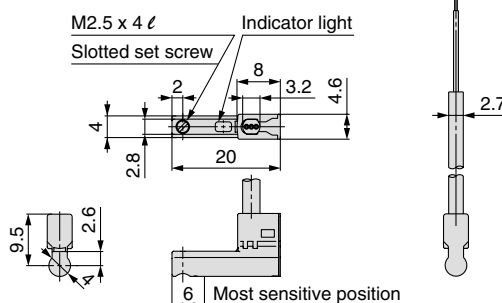
Dimensions

(mm)

D-M9□W



D-M9□WV





Series LEY Electric Actuator/Rod Type 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

Warning

- Do not apply a load in excess of the operating limit.**
A product should be selected based on the maximum load and allowable moment. If the product is used outside of the operating limit, eccentric load applied to the guide will become excessive and have adverse effects such as creating play on the sliding parts of the piston rod, degraded accuracy, operation and shortened product life.
- Do not use the product in applications where excessive external force or impact force is applied to it.**
This can cause failure.

Handling

Caution

- INP output signal**
 - Positioning operation
When the product comes within the set range by step data [In pos], the INP (In position) output signal is turned on. Initial value: Set to [0.50] or higher.
 - Pushing operation
When the actual thrust exceeds step data (Trigger LV), the INP (In position) output signal is outputted. Set the [Pushing force] and the [Trigger LV] within the limitation range.
 - To ensure that the gripper holds the workpiece with the set [pushing force], it is recommended that the [Trigger LV] is set to the same value as the [pushing force].
 - When the [Trigger LV] and [pushing force] are set to be less than the lower limit of the limitation range, there is a possibility that the INP output signal will be switched on from the pushing operation start position.

Pushing force and trigger level range (Without load/With lateral load on rod end)

Model	Pushing speed [mm/sec]	Pushing force (Setting input value)	Model	Pushing speed [mm/sec]	Pushing force (Setting input value)
LEY16□	5 to 10	35% to 85%	LEY16A□	5 to 10	50% to 95%
	11 to 20	50% to 85%		11 to 20	70% to 95%
	21 to 50	60% to 85%		21 to 50	80% to 95%
LEY25□	5 to 10	35% to 65%	LEY25A□	5 to 10	50% to 95%
	11 to 20	35% to 65%		11 to 20	70% to 95%
	21 to 35	50% to 65%		21 to 35	80% to 95%
LEY32□	5 to 10	35% to 85%			
	11 to 20	50% to 85%			
	21 to 30	60% to 85%			

- When the pushing operation is used, be sure to set to [pushing operation].**
Also, do not hit the workpiece in positioning operation or in the range of positioning operation. It causes malfunction.
- When hitting the stroke end, select the [pushing operation] and keep the [pushing speed] within the speed specified for each series.**
The lead screw, bearing and internal stopper might be damaged.
- The positioning force should be set to 100%.**
If the positioning force is set below 100%, it can displace the cycle time, which causes an alarm.

Handling

Caution

- Actual speed of the product can be changed by load.**
When selecting a product, check the catalog for the instructions regarding model selection and specifications.
- Do not apply a load, impact or resistance in addition to a transferred load during returning to the original position.**
Otherwise, the origin can be displaced since it is based on detected motor torque.
- In pushing operation, set the product to a position of at least 2 mm away from a workpiece. (This position is referred to as a pushing start position.)**
If the product is set to the same position as a workpiece, the following alarm and unstable operation can occur.
 - “Posn failed” alarm**
The product cannot reach a pushing start position due to the deviation of work pieces in width.
 - “Pushing ALM” alarm**
The product is pushed back from a pushing start position after starting to push.
- Do not scratch or gouge the surface on the piston rod.**
It causes defective operation and the longevity decrease.
- It is not possible to use it as a stopper.**
Use the guide outside when using it as a stopper.
- Connect it so that the impact and load should not be applied when an external guide is provided.**
Use a freely moving connector (such as a floating joint).
- Do not operate body itself by the piston rod fixing.**
An excessive load joins the piston rod, and it causes defective operation and the longevity decrease.
- When an actuator is operated while it is fixed at one end and free at the other end (basic style, flange style), bending moment may be applied to the actuator by vibration generated at the stroke end and it can damage the actuator. In such a case, install a support bracket to suppress the vibration of the actuator body or decrease the piston speed until the actuator body does not vibrate at the stroke end.**
Also, install a support bracket when moving the actuator body or mounting a long stroke actuator horizontally with one end fixed in place.



Series LEY Electric Actuator/Rod Type 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

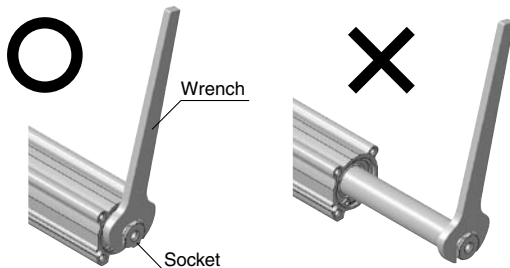
⚠ Caution

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

If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy. Refer to the below table for the approximate values of the allowable range of rotational torque.

Allowable rotational torque (N·m) or less	LEY16□	LEY25□	LEY32
	0.8	1.1	1.4

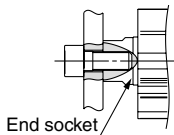
To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes. Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



14. Fix 'End socket' square part of the piston rod with a wrench, etc., to prevent the piston rod from rotating. Tighten the screws properly by the torque within the range of the limitation when mounting a workpiece or jig, etc.

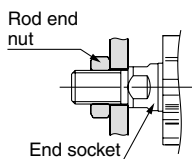
It causes the abnormal reaction of an auto switch, the space of an internal guide, and an increase of the sliding resistance, etc.

Body Fixed/Rod End Female Thread

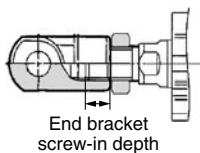


Model	Bolt	Max. tightening torque (N·m)	Max. screw-in depth L (mm)	End socket width across flats (mm)
LEY16	M5 x 0.8	3.0	10	14
LEY25	M8 x 1.25	12.5	13	17
LEY32	M8 x 1.25	12.5	13	22

Body Fixed/Rod End Male Thread (When "Rod end male thread" is selected)



Model	Thread size	Max. tightening torque (N·m)	Effective thread length L (mm)	End socket width across flats (mm)
LEY25	M14 x 1.5	65.0	20.5	17
LEY32	M14 x 1.5	65.0	20.5	22



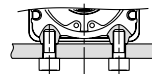
Model	Rod end nut		End bracket screw-in depth (mm)
	Width across flats (mm)	Length (mm)	
LEY16	13	5	5 or more
LEY25	22	8	8 or more
LEY32	22	8	8 or more

* Rod end nuts are included.

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

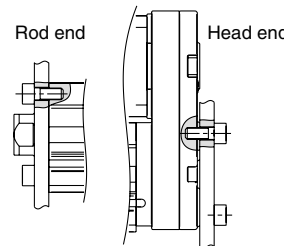
Tightening with higher torque than the specified range may cause malfunction while the tightening with lower torque can cause the displacement of gripping position or dropping a workpiece.

Body Fixed/Body Bottom Screw Mounting (When "Body bottom tapped" is selected)



Model	Bolt	Max. tightening torque (N·m)	Max. screw-in depth L (mm)
LEY16	M4 x 0.7	1.5	5.5
LEY25	M5 x 0.8	3.0	6.5
LEY32	M6 x 1.0	5.2	8.8

Body Fixed/Rod/Head End Screw Mounting



Model	Bolt	Max. tightening torque (N·m)	Max. screw-in depth L (mm)
LEY16	M4 x 0.7	1.5	7
LEY25	M5 x 0.8	3.0	8
LEY32	M6 x 1.0	5.2	10

Maintenance

⚠ Warning

1. Cut the power supply during maintenance and replacement of the product.

• Maintenance frequency

Perform maintenance according to the below table.

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

* Select whichever comes sooner.

• Items for visual appearance check

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

• Items for belt check

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

a. Tooth shape canvas is worn out.

Canvas fiber becomes fuzzy. Rubber is removed and the fiber becomes whitish. Lines of fibers become unclear.

b. Peeling off or wearing of the side of the belt

Belt corner becomes round and frayed thread sticks out.

c. Belt partially cut

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

d. Vertical line of belt teeth

Flaw which is made when the belt runs on the flange.

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

f. Crack on the back of the belt



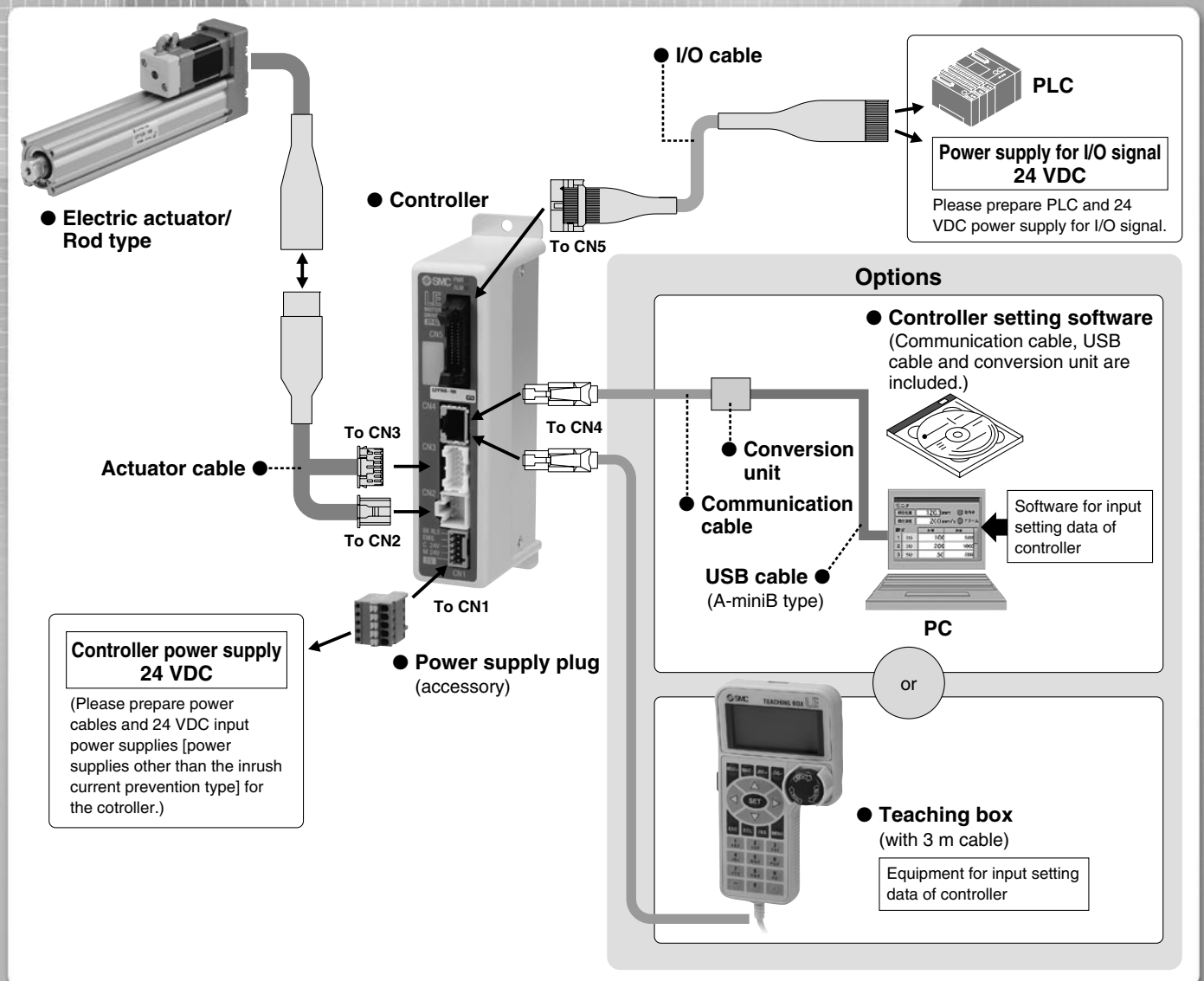
**Step Motor Controller
(Servo/24 VDC)**

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**

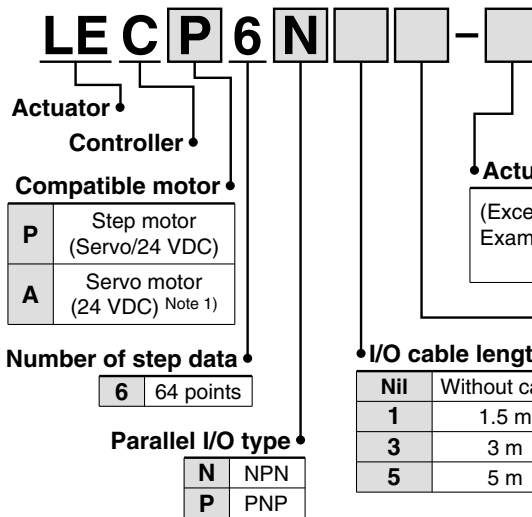
How to Order

⚠ Caution

Note 1) CE-compliant products

① EMC compliance was tested by combining the electric actuator LEY 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 26 for the noise filter set. Refer to the LECA Operation Manual for installation.



Compatible motor

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

Number of step data

6	64 points
----------	-----------

Parallel I/O type

N	NPN
P	PNP

Actuator part number
(Except cable specifications and actuator options)
Example: Enter [LEY16B-100] for LEY16B-100-R16N1

I/O cable length

	Without cable
Nil	
1	1.5 m
3	3 m
5	5 m

Option

Nil	Screw mounting
D <small>Note 2)</small>	DIN rail mounting

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

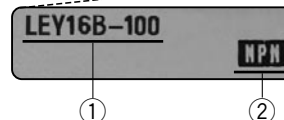
* When controller equipped type (-P6□□) is selected when ordering the LE series, you do not need to order this controller.

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



Specifications

Basic Specifications

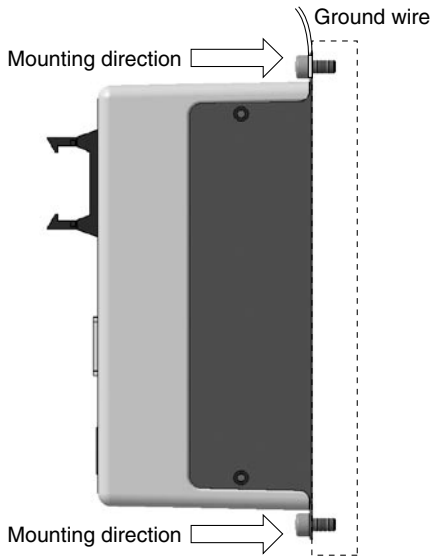
Item	LECP6	LECA6
Compatible motor	Unipolar connection type 2-phase HB step motor	AC servo motor
Power supply <small>Note 1)</small>	Power voltage: 24 VDC ±10% Current consumption: 3 A (Peak 5 A) <small>Note 2)</small> [Including motor drive power, control power, stop, lock release]	Power voltage: 24 VDC ±10% Current consumption: 3 A (Peak 10 A) <small>Note 2)</small> [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.

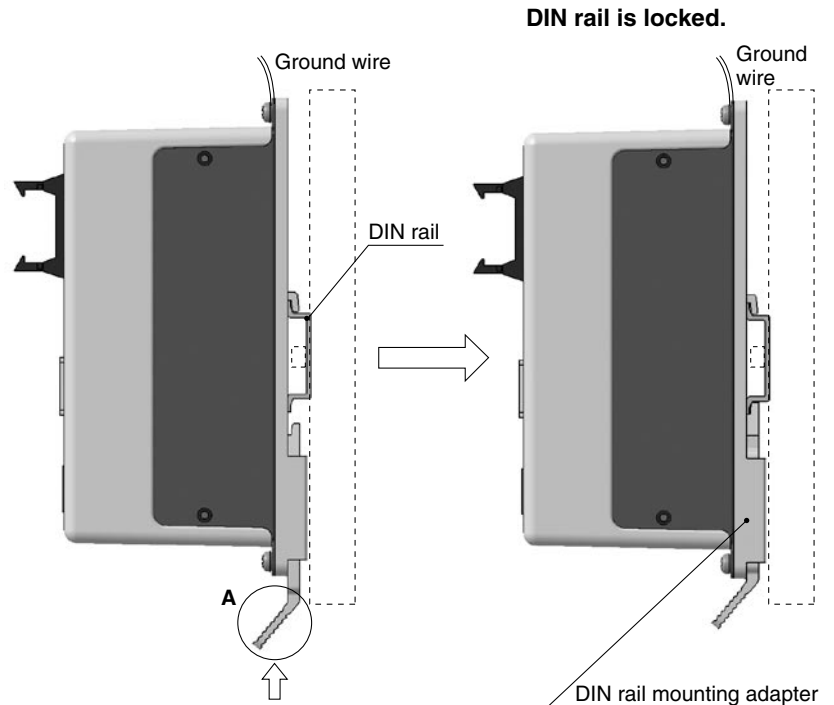
Note 2) The power consumption changes depending on the actuator model. Refer to the specifications of actuator for more details.

How to Mount

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



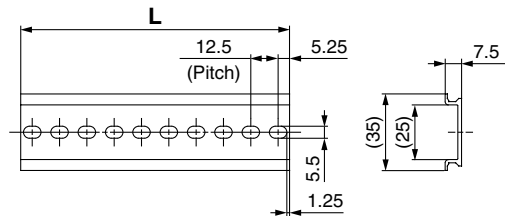
b) DIN rail mounting (LEC□6□□D-□) (Installation with the DIN rail)



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 20 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)

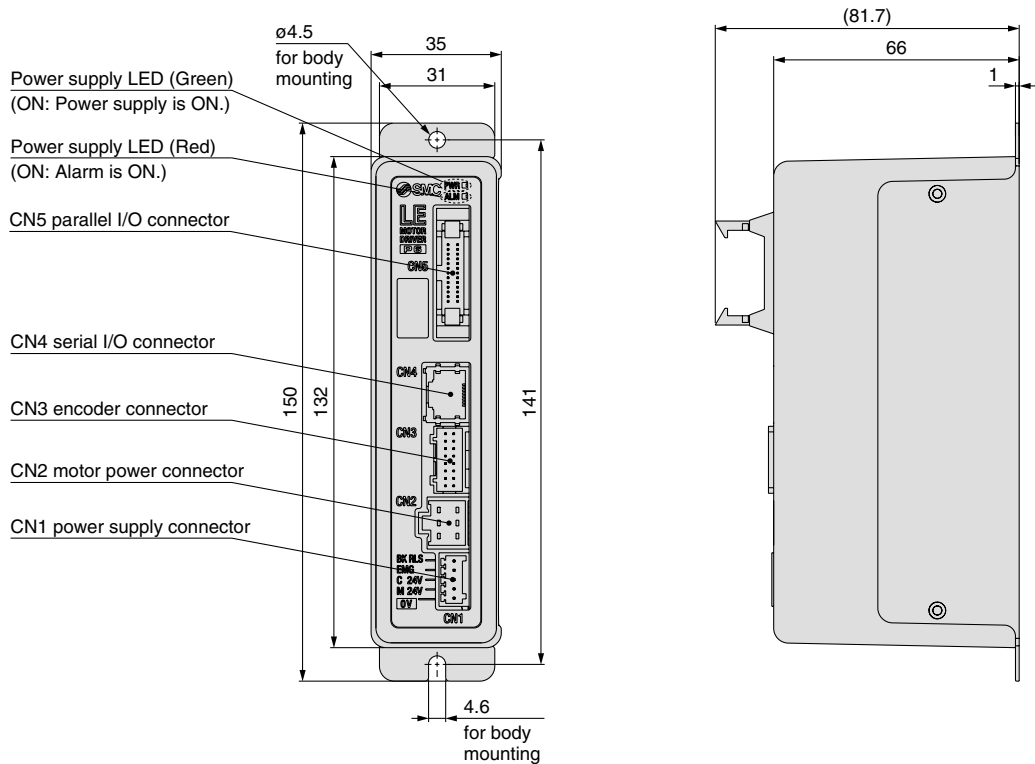
This should be used when the DIN rail mounting adapter is mounted onto the screw mounting type controller afterwards.

Series LECP6

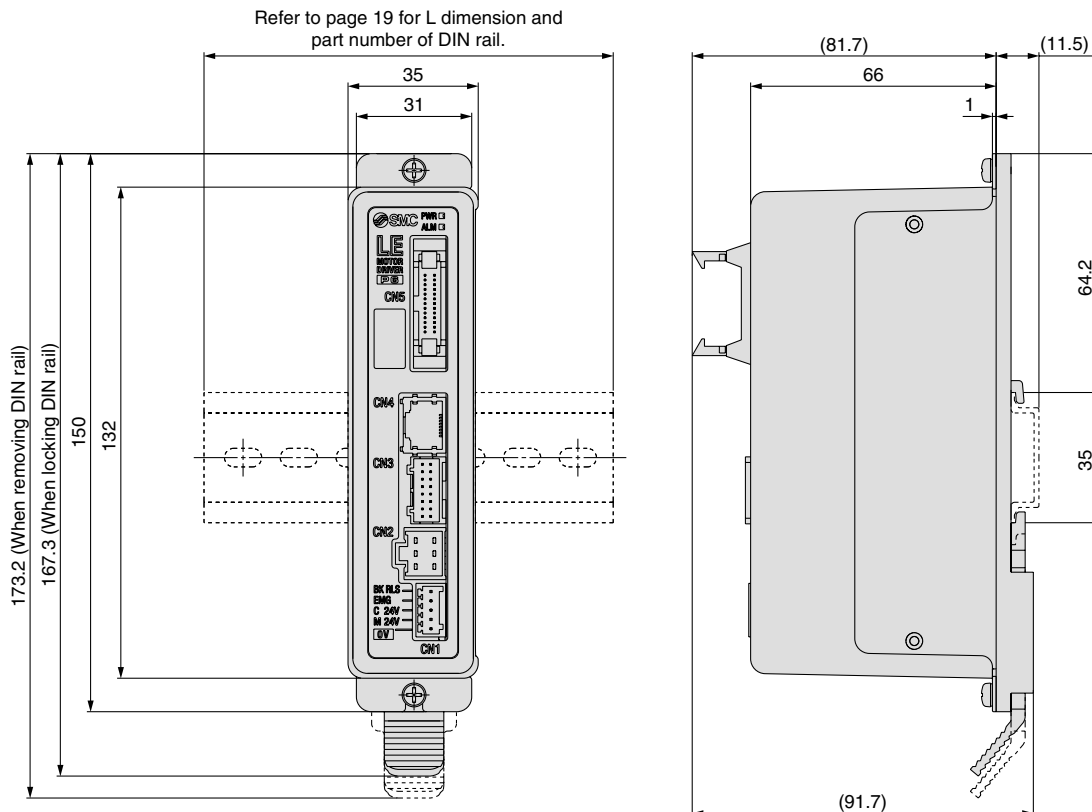
Series LECA6

Dimensions

a) Screw mounting (LECP6□□□□)



b) DIN rail mounting (LECP6□□□□D□)



Note) When two or more controllers are used, keep the interval between them 10 mm or more (when the LEY25, 32 are used).

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

Servo Motor Controller (24 VDC) **Series LECA6**

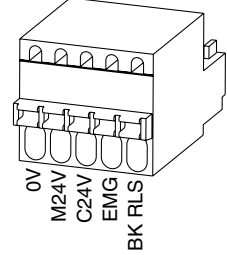
Wiring Example 1

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

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

Terminal name	Function	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.

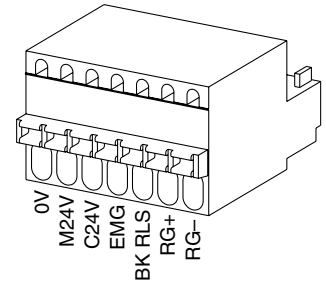
Power supply plug for LECP6



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

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

Power supply plug for LECA6

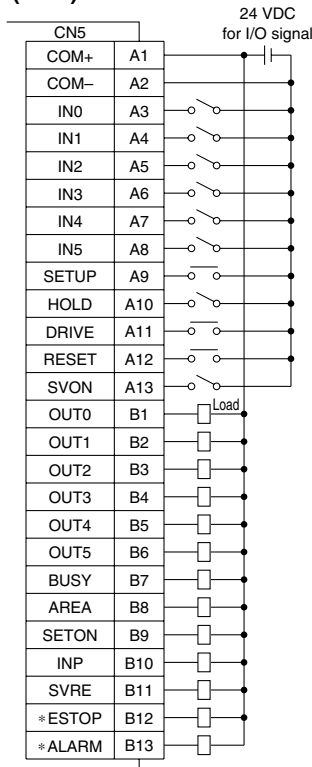


Wiring Example 2

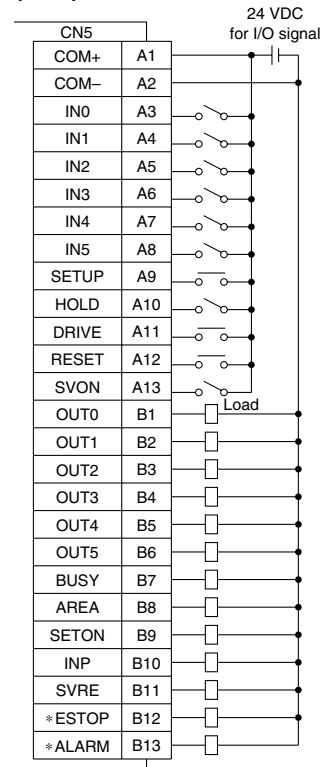
Parallel I/O Connector: CN5 * When you connect a PLC, etc., to the CN5 parallel I/O connector, please use the I/O cable (LEC-CN5-□).
 * The wiring should be changed depending on the type of the parallel I/O (NPN or PNP). Please wire referring to the following diagram.

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.)

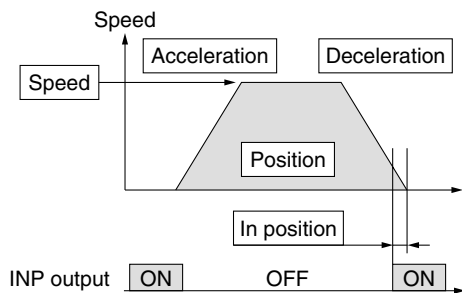
Series LECP6

Series LECA6

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.



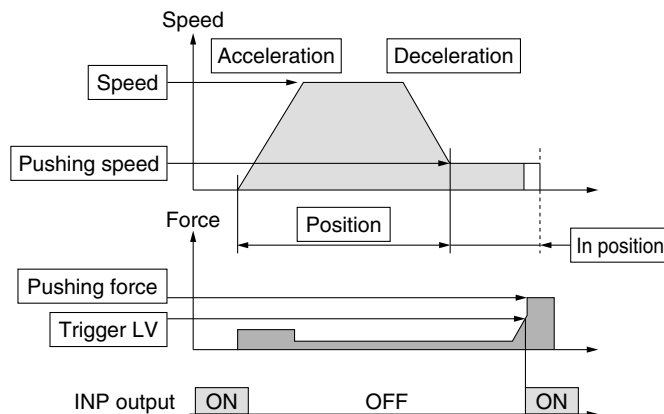
- ⊙: Need to be set.
- : Need to be adjusted as required.
- : Setting is not required.

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.



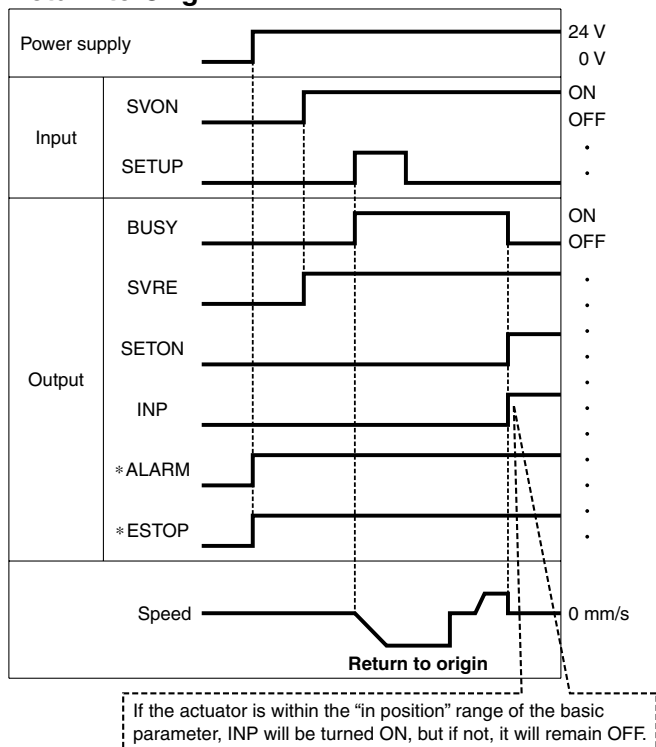
- ⊙: Need to be set.
- : Need to be adjusted as required.

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.

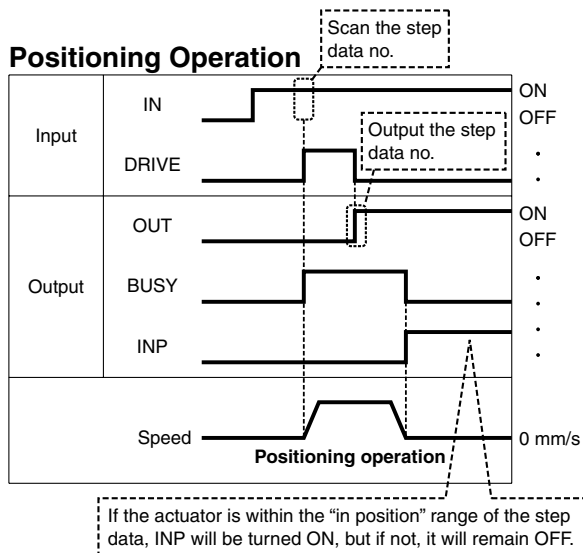
Signal Timing

Return to Origin



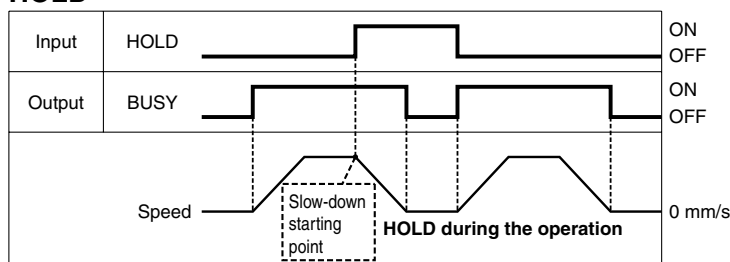
* *ALARM" and *ESTOP" are expressed as negative-logic circuit.

Positioning Operation



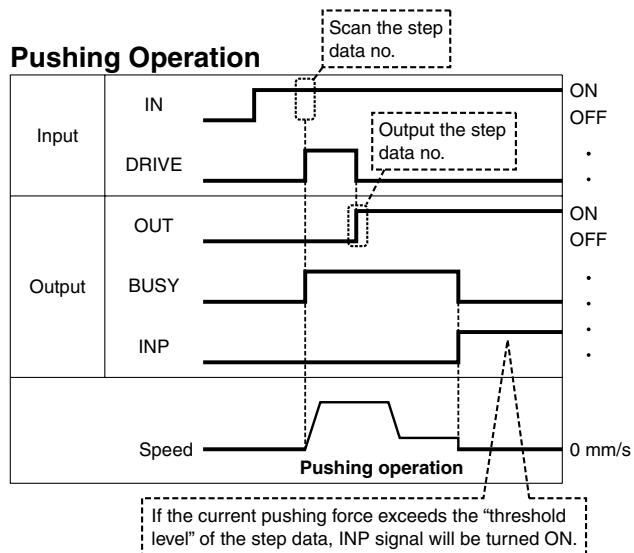
* "OUT" is output when "DRIVE" is changed from ON to OFF.
 (When power supply is applied, "DRIVE" or "RESET" is turned ON or *ESTOP" is turned OFF, all of the "OUT" outputs are turned OFF.)

HOLD

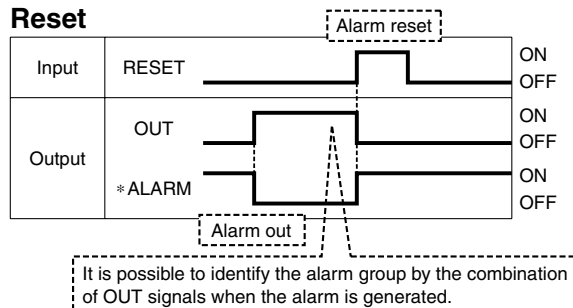


* When the actuator is in the positioning range in the pushing operation, it does not stop even if HOLD signal is input.

Pushing Operation



Reset



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

Series LECP6

Series LECA6

Options

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

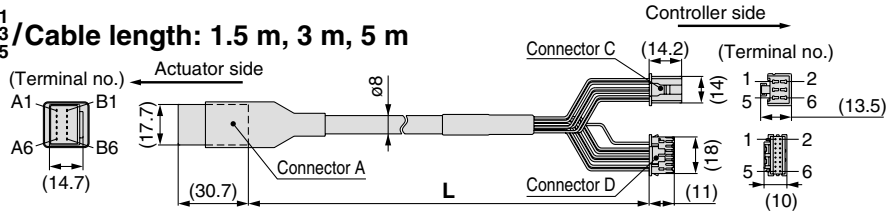
LE-CP-1

Cable length (L)

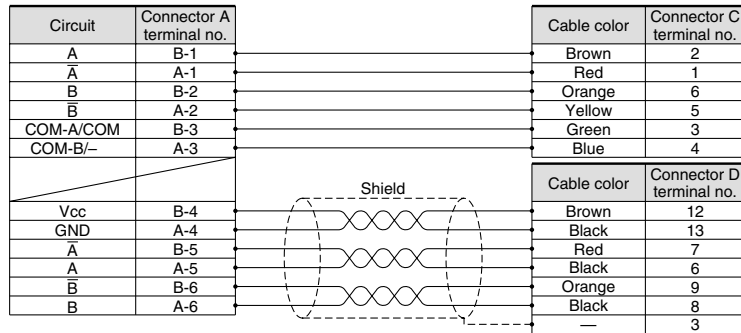
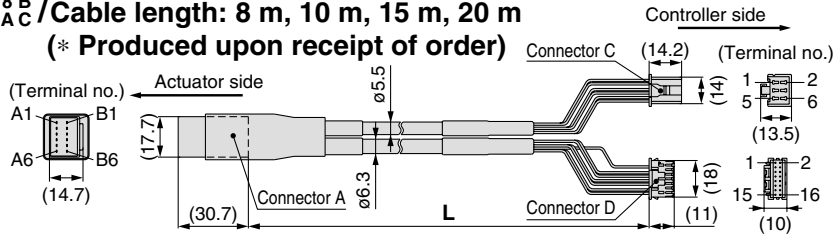
1	1.5 m
3	3 m
5	5 m
8	8 m*
A	10 m*
B	15 m*
C	20 m*

* Produced upon receipt of order

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



LE-CP-^{8 B}/_{AC} / Cable length: 8 m, 10 m, 15 m, 20 m
(* Produced upon receipt of order)



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

LE-CP-1-B

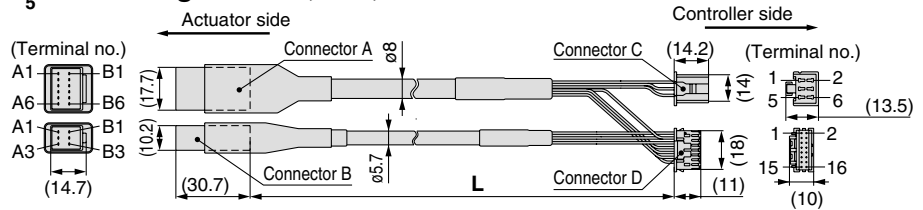
Cable length (L)

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

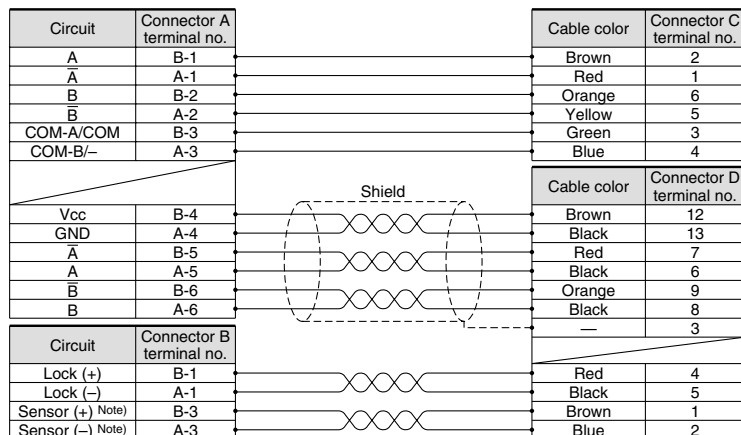
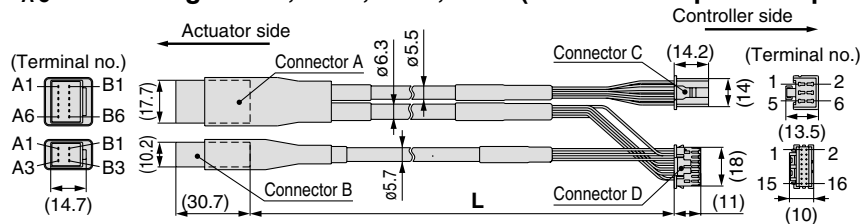
* Produced upon receipt of order

With lock and sensor

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



LE-CP-^{8 B}/_{AC} / Cable length: 8 m, 10 m, 15 m, 20 m (* Produced upon receipt of order)



Note) This is not used for the LEY series.

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

Servo Motor Controller (24 VDC) **Series LECA6**

[Actuator cable for servo motor (24 VDC)]

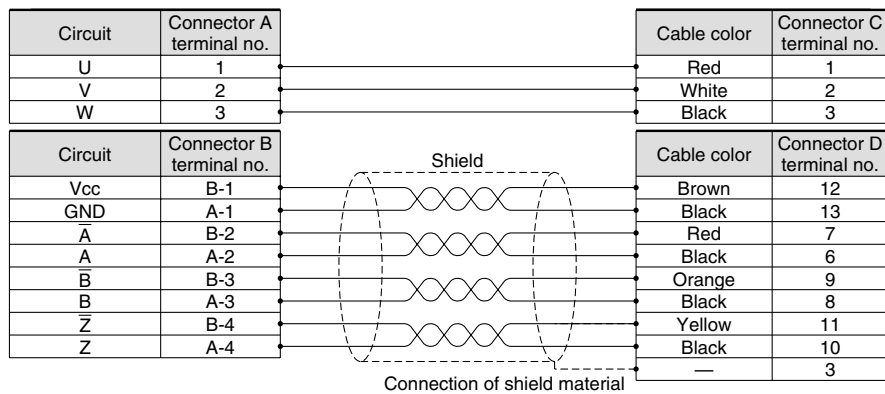
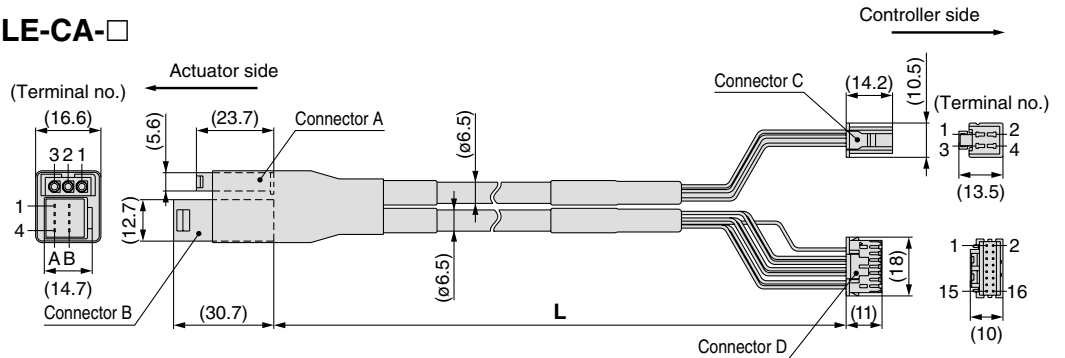
LE-CA-1

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-□



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

LE-CA-1-B

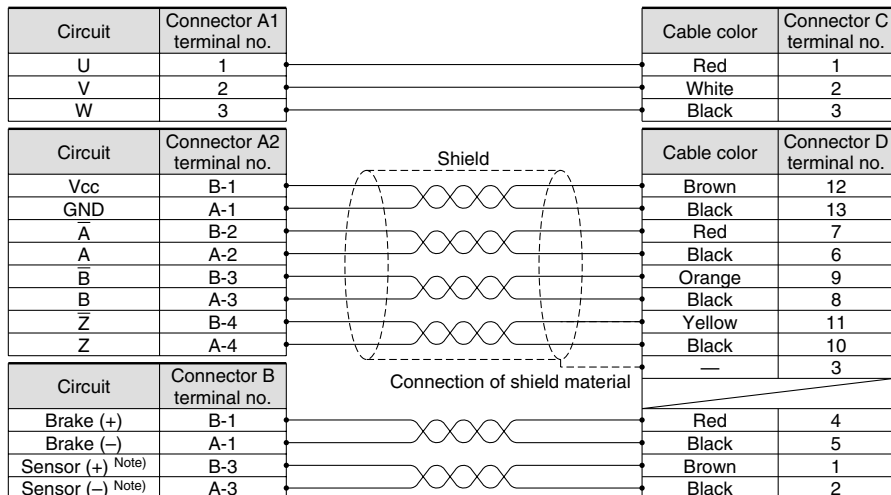
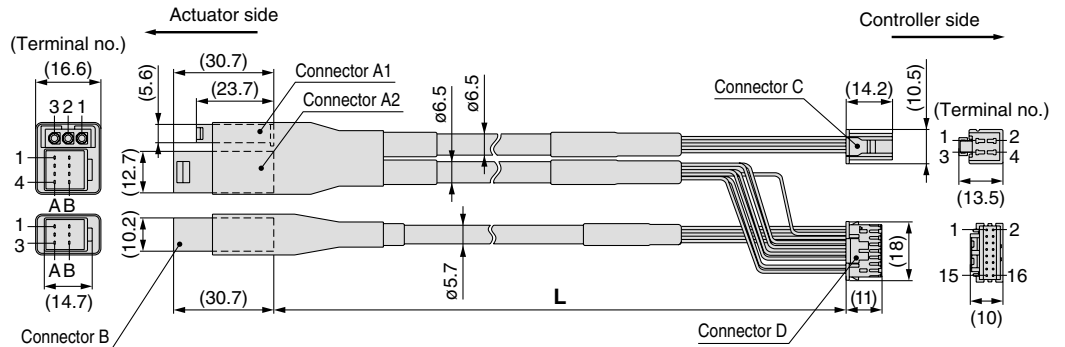
Cable length (L)

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



Note) This is not used for the LEY series.

Series LECP6

Series LECA6

Options

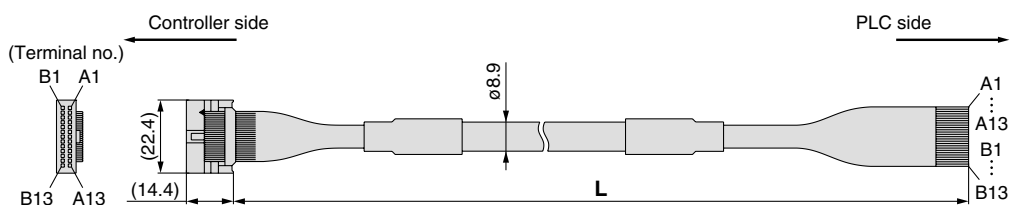
[I/O cable]

LEC-CN5-1

Cable length (L)

1	1.5 m
3	3 m
5	5 m

* Conductor size: AWG28



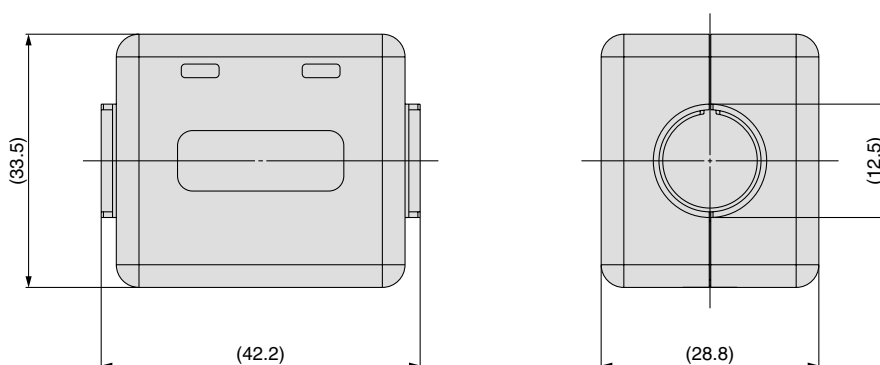
Connector pin No.	Cable color	Dot mark	Dot color
A1	Light brown	■	Black
A2	Light brown	■	Red
A3	Yellow	■	Black
A4	Yellow	■	Red
A5	Light green	■	Black
A6	Light green	■	Red
A7	Gray	■	Black
A8	Gray	■	Red
A9	White	■	Black
A10	White	■	Red
A11	Light brown	■ ■	Black
A12	Light brown	■ ■	Red
A13	Yellow	■ ■	Black

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

[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

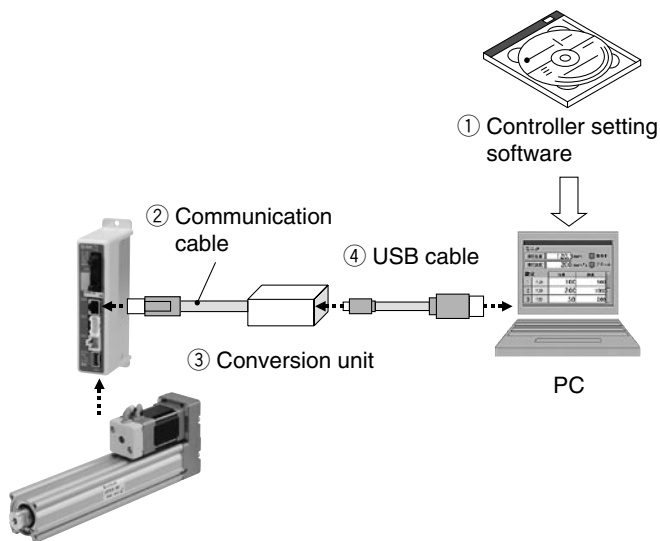
How to Order

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)



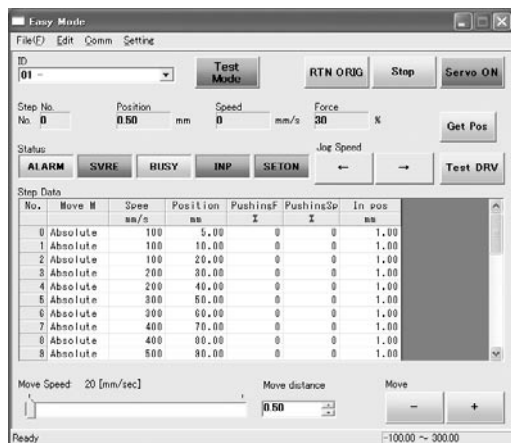
Hardware Requirements

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

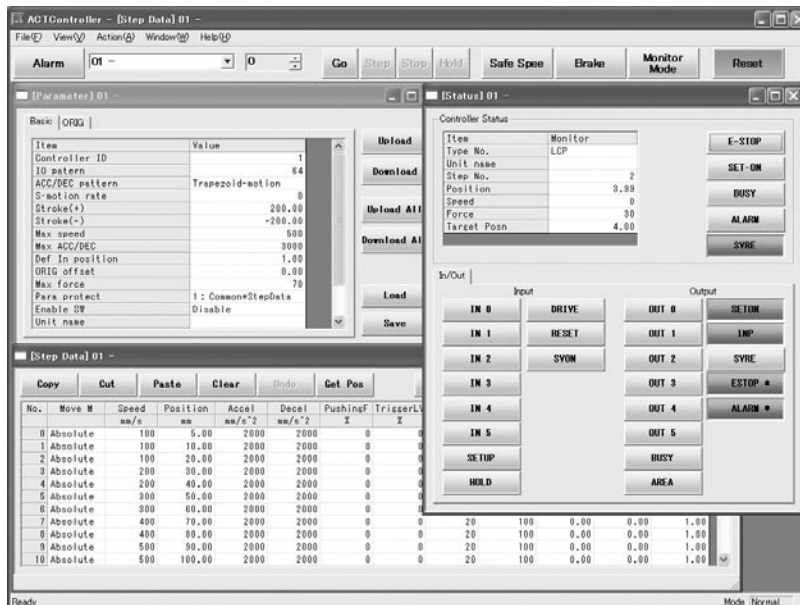
Easy mode screen example



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



How to Order



LEC-T1-3 J G

Teaching box

Cable length

3 3 m

Initial language

J Japanese
E English

Enable switch

Nil	None
S	Equipped with enable switch

* Interlock switch for jog test function

Stop switch

G Equipped with stop switch

Specifications

Standard functions

- Chinese character display
- Stop switch is provided.

Option

- Enable switch is provided.

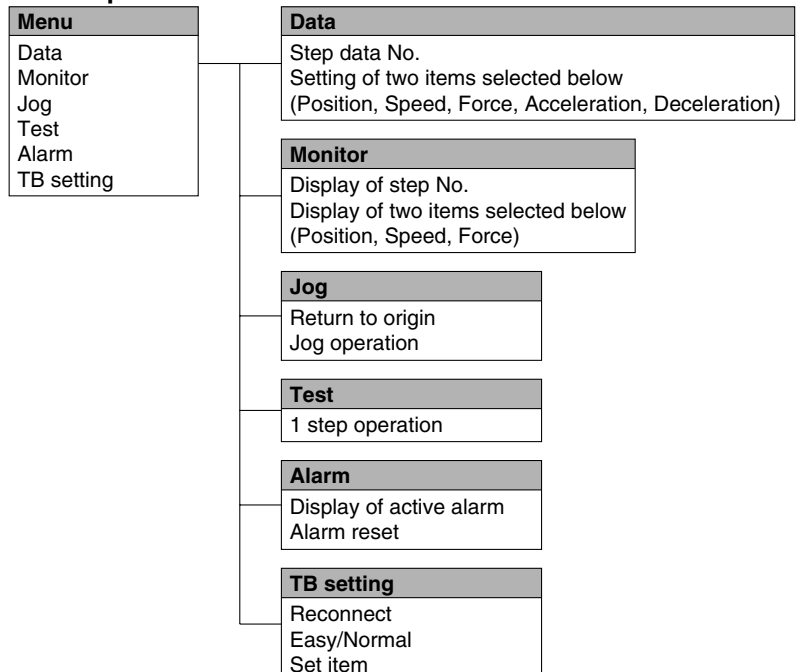
Item	Description
Switch	Stop switch, Enable switch (Option)
Cable length	3 m
Enclosure	IP64 (Except connector)
Operating temperature range (°C)	5 to 50 (No condensation)
Operating humidity range (%)	35 to 85
Weight (g)	350 (Except cable)

* 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

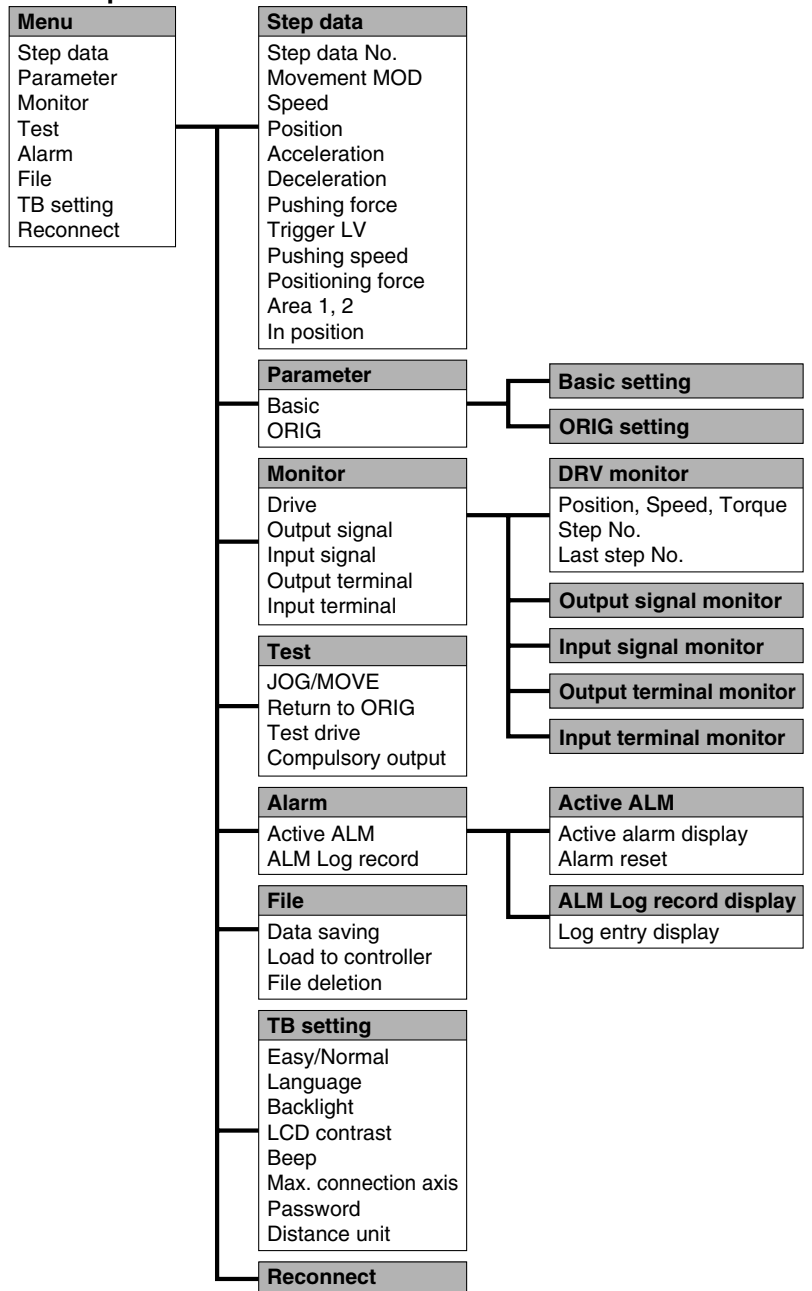
Menu Operations Flowchart



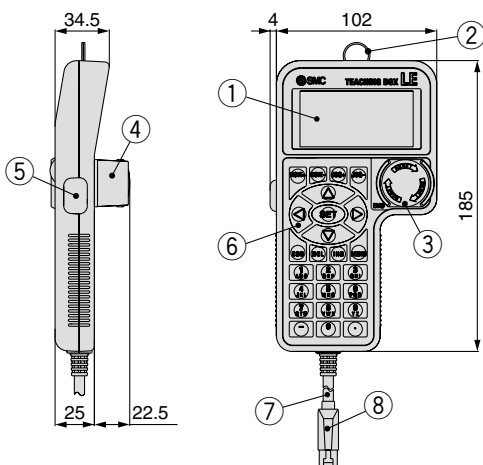
Normal Mode

Function	Description
Step data	• Step data setting
Parameter	• Parameters setting
Test	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Drive monitor • Output signal monitor • Input signal monitor • Output terminal monitor • Input terminal monitor
Alarm	<ul style="list-style-type: none"> • Active alarm display (Alarm reset) • Alarm log record display
File	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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.
Refer to the operation manual for using the products.
Please download it via our website. <http://www.smcworld.com/>

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

Power Supply

Caution

- 1. Use a power supply that has low noise between lines and between power and ground.**
In cases where noise is high, an isolation transformer should be used.
- 2. 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.

Safety Instructions

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

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

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

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

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

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

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

Caution

1. The product is provided for use in manufacturing industries.

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

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

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

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

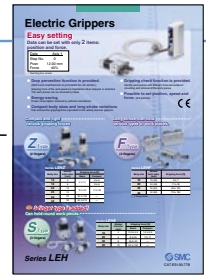
1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

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

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

Related Products



CAT.ES100-77

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

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 Slide Table

Series LES

- 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**
Positioning pattern points: **64 points**
- Mounting in 2 directions is available.



CAT.ES100-78

Model	Stroke (mm)	Work load (kg)				Speed (mm/s)	Screw lead (mm)
		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
		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

SMC Corporation