# Electric Actuator

**Rod Type** **Guide Rod Type**

**NEW**

- Intermediate strokes have been added to the LEY63.
- Normally-closed solid state auto switches have been added.
- The JXC series step motor controller has been added.

RoHS

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

### Rod Type *LEY* Series

Size: 16, 25, 32, 40 ▸p. 35

**Long stroke:**

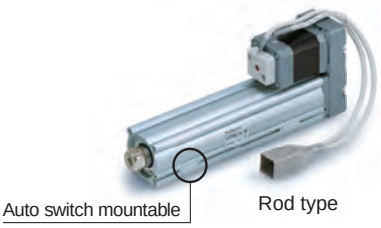
**Max. 500 mm (LEY32, 40)**

**Mounting variations**

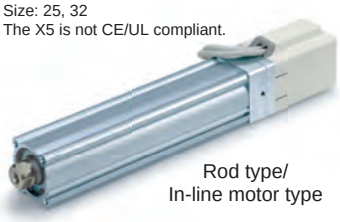
- Direct mounting: 3 directions, Bracket mounting: 3 types
- Either positioning or pushing control can be selected.
  It is possible to hold the actuator with the rod pushing a workpiece, etc.

Dust-tight/Water-jet-proof (IP65 Equivalent): **-X5** ▸p. 151

＊ Size: 25, 32
＊ The X5 is not CE/UL compliant.




Rod type



Rod type/
In-line motor type

### Guide Rod Type *LEYG* Series

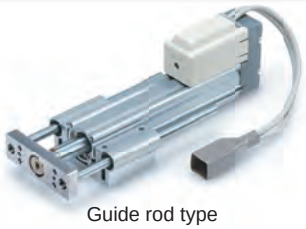
Size: 16, 25, 32, 40 ▸p. 105

**Lateral end load: 5 times more**[*1]

＊1 Compared with the rod type, size 25, and 100 mm stroke

**Compatible with sliding bearings and ball bushing bearings**
**Compatible with moment loads and stoppers (sliding bearings)**

- Either positioning or pushing control can be selected.
  It is possible to hold the actuator with the rod pushing a workpiece, etc.



Guide rod type

Guide rod type/
In-line motor type

## AC Servo Motor Type

＊ Refer to "How to Order."

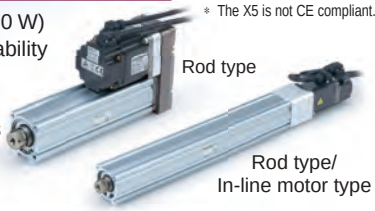
### Rod Type *LEY* Series

Size: 25, 32, 63

Dust-tight/Water-jet-proof (IP65 Equivalent): **-X5** ▸p. 41, 48

＊ The X5 is not CE compliant.

- High-output motor (100/200/400 W)
- Improved high-speed transfer ability
- High acceleration/deceleration compatible (5000 mm/s²)
- Pulse input/CC-Link/SSCNETⅢ types
- With internal absolute encoder (For the LECSB/C/S)




Rod type/
In-line motor type

### Guide Rod Type *LEYG* Series

Size: 25, 32

▸p. 111, 116


Guide rod type/
In-line motor type

## Step Motor (Servo/24 VDC) Servo Motor (24 VDC) Controller/Driver

▸p. 190

- **Step data input type**
  ***LECA6* Series** (64 positioning points)
- **EtherCAT®/EtherNet/IP™/PROFINET/DeviceNet™/IO-Link direct input type**
  ***JXCE1/91/P1/D1/L1* Series**
- **Programless type**
  ***LECP1* Series** (14 positioning points)
- **Pulse input type**
  ***LECPA* Series**

## AC Servo Motor Driver

▸p. 246

**For incremental encoder**

- Pulse input type/
  Positioning type
  ***LECSA* Series**

**For absolute encoder**

- Pulse input type
  ***LECSB* Series**
- CC-Link direct input type
  ***LECSC* Series**
- SSCNETⅢ type
  ***LECSS* Series**
- SSCNETⅢ/H type
  ***LECSS-T* Series**
- MECHATROLINK type
  ***LECY□* Series**

＊ LECSS-T only

# *LEY* Series

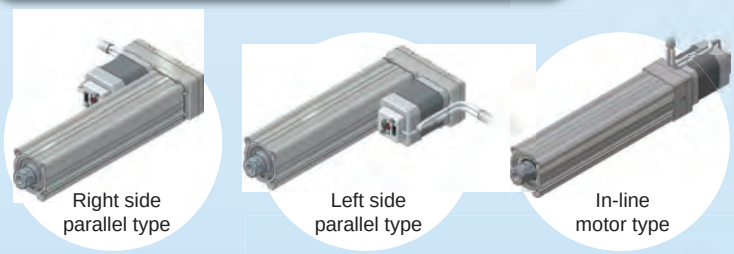
CAT.EUS100-83E-UK

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

**Rod Type** **LEY Series/Size: 16, 25, 32, 40**

# Control of intermediate positioning and pushing is possible.
# High precision with ball screws
## (Positioning repeatability: ±0.02 mm)

### Selectable motor mounting position



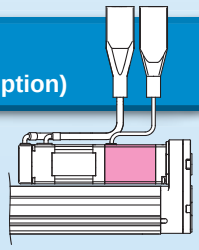
Right side parallel type

Left side parallel type

In-line motor type

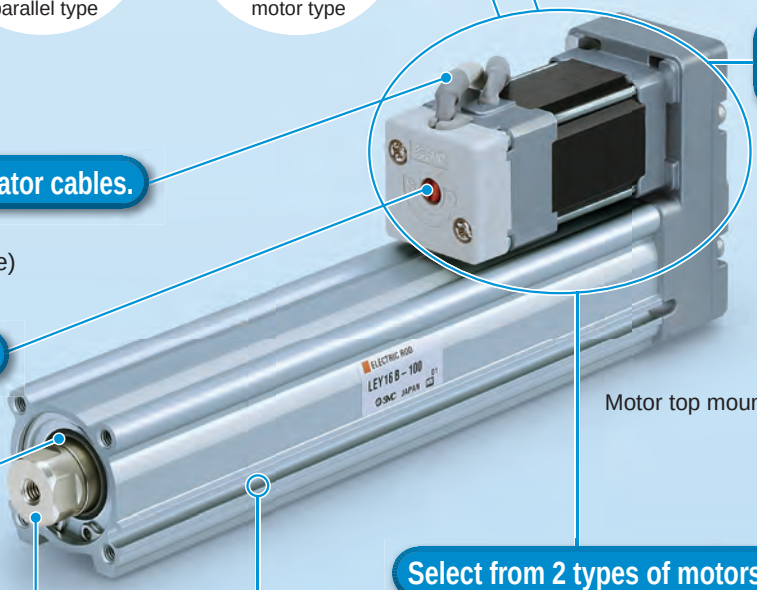
### Non-magnetizing lock mechanism (Option)

Prevents workpieces from dropping (Holding)



### Motor cover available (Option)

＊ The cover has an opening.



Motor top mounting type

### Select from 2 types of actuator cables.

- Standard cable
- Robotic cable (Flexible cable)

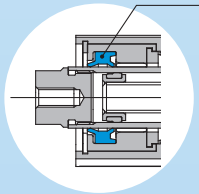
### Manual override screw

For manual piston rod operation
Adjustment operation is possible when the power is OFF.

### Scraper

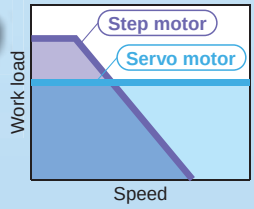
Prevents foreign matter from entering the device

Equipped with scrapers as standard



### Select from 2 types of motors.

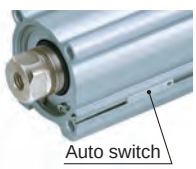
- **Step motor (Servo/24 VDC)**
  Ideal for the low-speed transfer of heavy loads and pushing operations
- **Servo motor (24 VDC)**
  Stable at high speeds
  Silent operation




### Mounting groove for auto switches

For checking the limit and the intermediate signal
Applicable to the D-M9□, D-M9□E, and D-M9□W (2-color indicator)

＊ The auto switches should be ordered separately. Refer to pages 101 to 103 for details.

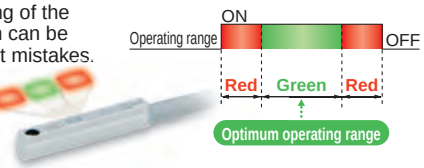


Auto switch

**2-color indicator solid state auto switch**

Appropriate setting of the mounting position can be performed without mistakes.

A **green** light **lights up at the optimum operating range.**

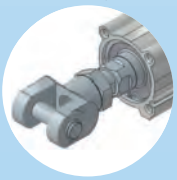



p. 97, 98

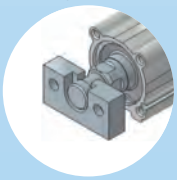
### Rod end brackets

Single knuckle joint

Double knuckle joint



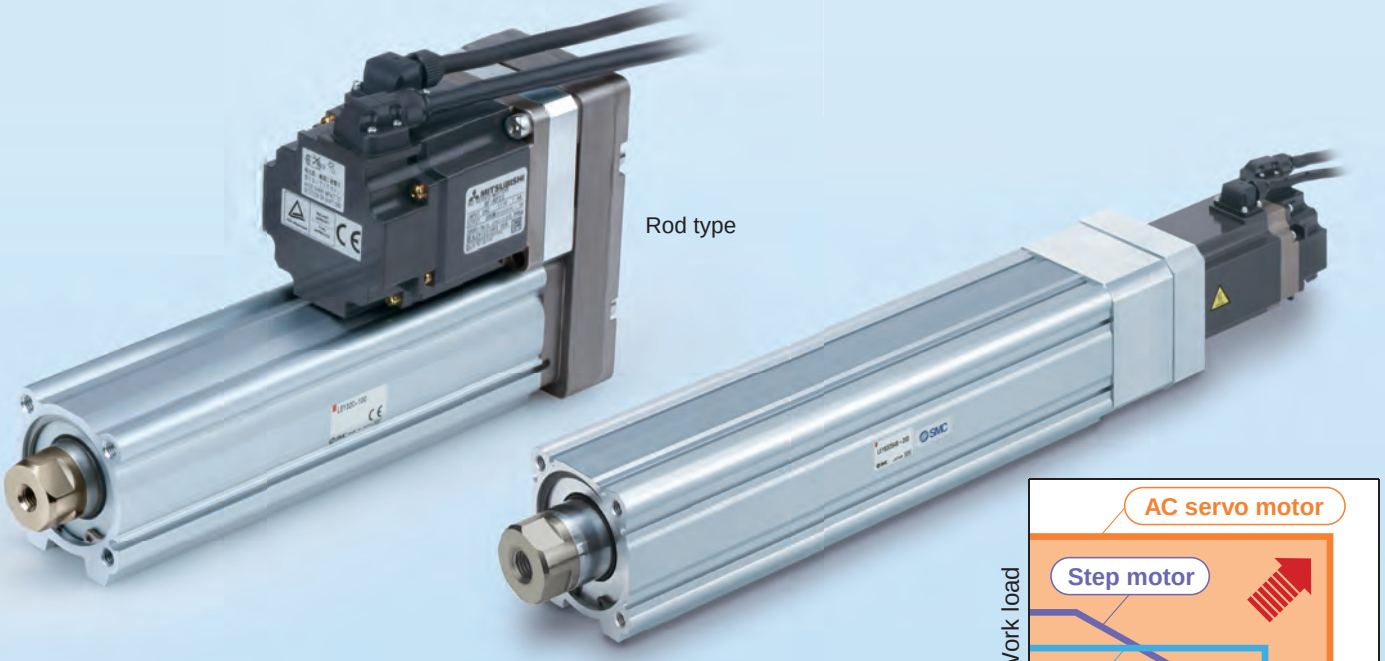
Simple joint



**AC Servo Motor** Type

## Rod Type *LEY* Series/Size: 25, 32, 63

- High-output motor (100/200/400 W)
- Improved high-speed transfer ability
- High acceleration/deceleration compatible (5000 mm/s$^2$)
- Pulse input/CC-Link direct input/SSCNET Ⅲ types
- With internal absolute encoder
  ＊ An incremental encoder can also be selected.
- Positioning repeatability: ±0.01 mm (High-precision type)



Rod type

Rod type/In-line motor type

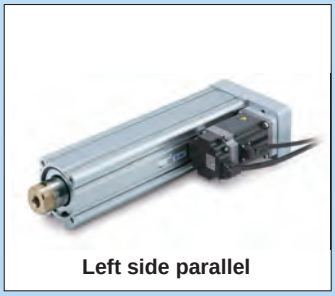



# Large bore size 63

## Selectable motor mounting position (4 directions)

**Top mounting**

**Right side parallel**



**Left side parallel**

**In-line**

- Max. work load [kg]

| | Top/Parallel | In-line |
|---|---|---|
| **Horizontal** | **200** | 80 |
| **Vertical** | **115** | 72 |

- Max. force [N]

| | |
|---|---|
| Top/Parallel | 3343 |
| In-line | 1910 |

- High-output motor: **400 w**
- Max. speed: **1000 mm/s**
  ＊ 500 mm stroke
- Dust-tight/Water-jet-proof specification (IP65 equivalent)
  ＊ Option

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

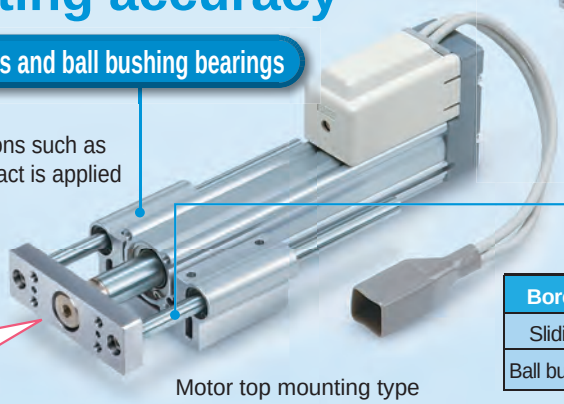
## Guide Rod Type *LEYG Series*/Size: 16, 25, 32, 40

# Compact, integrated guide rods Lateral load resistance and high non-rotating accuracy

In-line motor type

**Compatible with sliding bearings and ball bushing bearings**

- **Sliding bearings**
  Suitable for lateral load applications such as when using a stopper where impact is applied
- **Ball bushing bearings**
  Smooth operation suitable for pushers and lifters



Motor top mounting type

**Improved rigidity**

Lateral end load: 5 times more*1

*1 Compared with the rod type, size 25, and 100 mm stroke

**Non-rotating accuracy improved by using two guide rods**

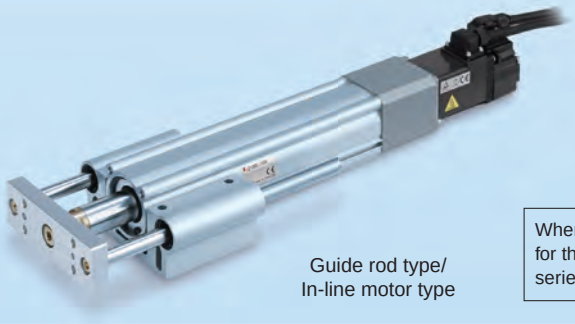
| Bore size [mm] | 16 | 25 | 32 | 40 |
|---|---|---|---|---|
| Sliding bearings | ±0.06° | | ±0.05° | |
| Ball bushing bearings | ±0.05° | ±0.04° | | |

When the cylinder is retracted (initial value), the non-rotating accuracy without a load and without deflection of the guide rods will be below the values shown in the table above.

**AC Servo Motor Type**

## Guide Rod Type *LEYG Series*/Size: 25, 32

Guide rod type

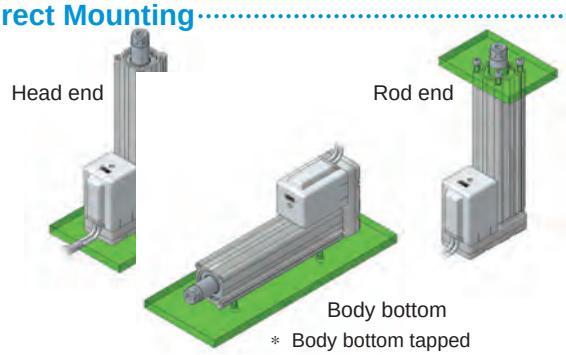


Guide rod type/
In-line motor type

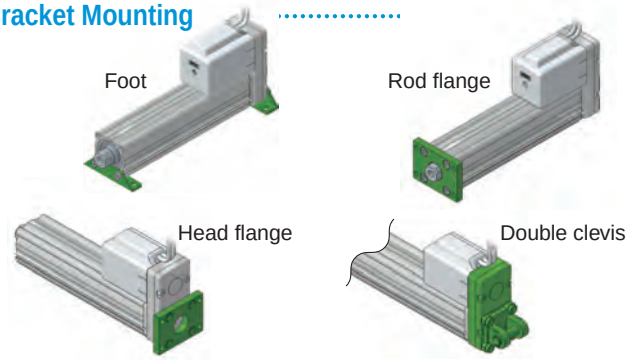
When using auto switches for the guide rod type LEYG series, refer to page 187.

## Mounting Variations

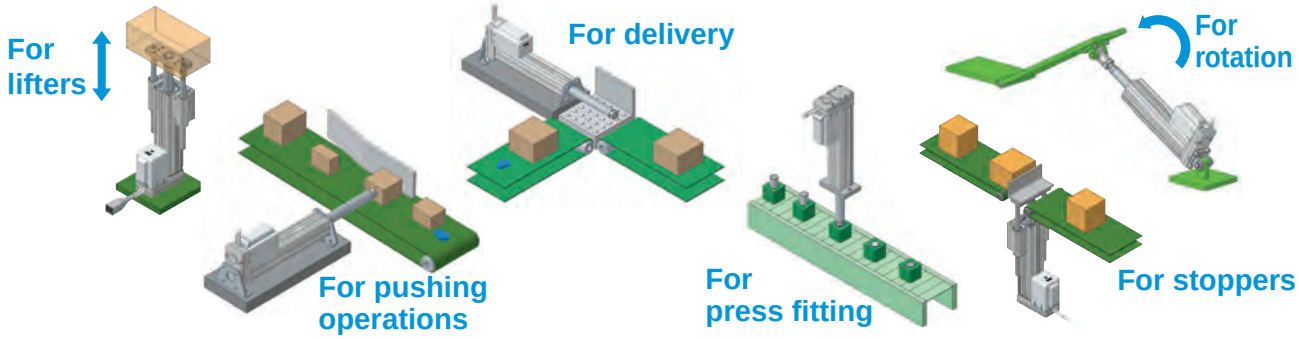
### Direct Mounting




### Bracket Mounting




## Application Examples



Dust-tight/Water-jet-proof (IP65 Equivalent)

## ●Enclosure: IP65 equivalent

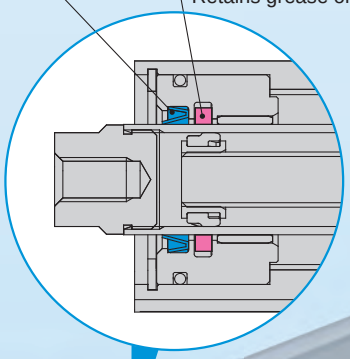
(Refer to page 150.)

## ●Max. stroke: 500 mm*1

*1 For size 32

**Scraper**

**Lube-retainer** (Excludes the LEY63)
Retains grease oil film



**Seal connector**
Prevents dust and water droplets from entering between the cable and motor cover

**Aluminum cover**
Protects the motor

**Tubing**
* Order the tubing separately.

**Vent hole**
Reduces internal pressure fluctuations in order to prevent dust and water droplets from entering the device
* Be sure to attach tubing and place the end of the tubing so it is not exposed to dust or water.
* For size 63, order a fitting separately.

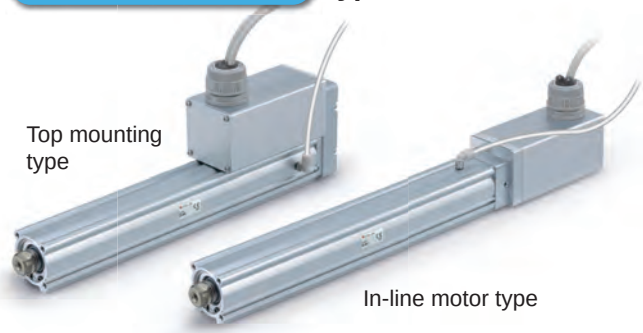
**Mounting groove for auto switches**
Water-resistant type
For checking the limit and the intermediate signal
* Order the water-resistant 2-color indicator solid state auto switch separately. (Refer to page 176.)

### LEY-X5 (Refer to page 151.)

Size: 25, 32

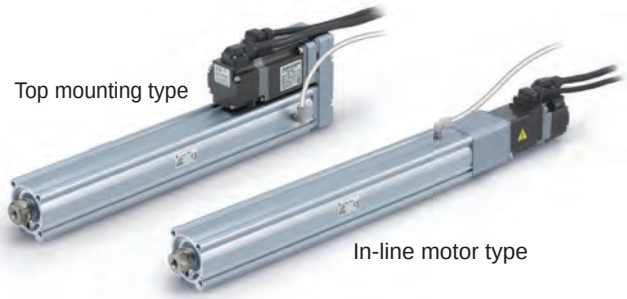
Step Motor (Servo/24 VDC) Type

Servo Motor (24 VDC) Type




### LEY-X5 (Refer to page 41.)

AC Servo Motor (100/200 W) Type

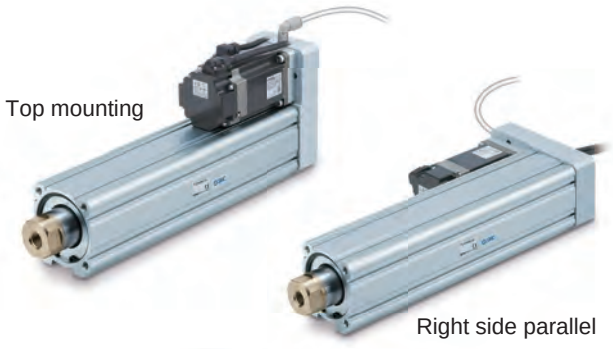



### LEY63□□□-□P

(Refer to page 41./Option)

Size: 63

AC Servo Motor (400 W) Type




▶p. 191

# Simple setting allows for immediate use!

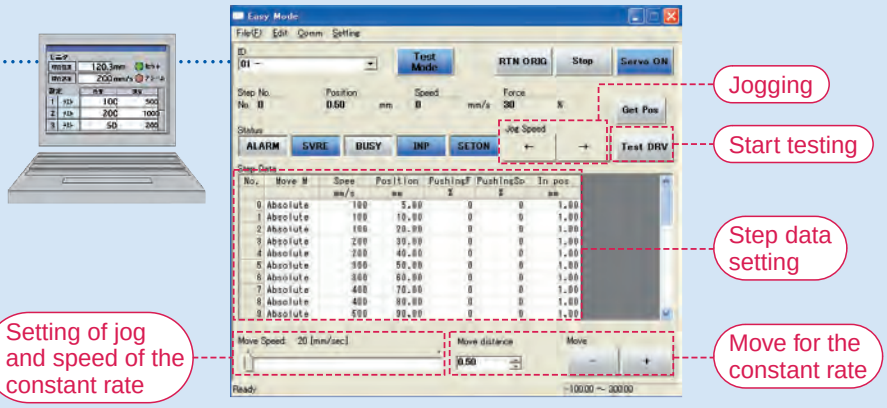
## ◎"Easy Mode" for simple setting

**For immediate use, select "Easy Mode."**

Servo motor
(24 VDC)
**LECA6**

### <When a PC is used>
### Controller setting software

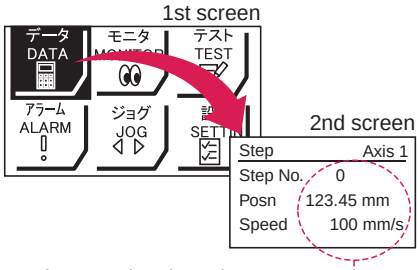
- Step data setting, test drive, jogging, and move for the constant rate can be set and operated on one screen.




### <When a TB (teaching box) is used>

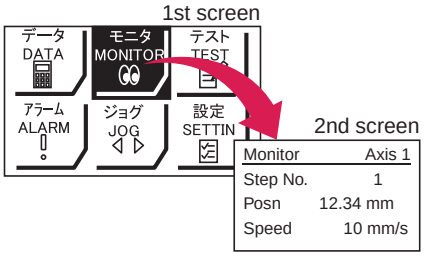
- The simple screen without scrolling promotes ease of setting and operation.
- Choose an icon from the first screen to select a function.
- Set the step data and check the monitor on the second screen.

**Example of setting the step data**




After entering the values, they can be registered by pressing "SET."

**Example of checking the operation status**




The operation status can be checked.

### Teaching box screen

- **Data can be set by inputting only the position and speed.** (Other conditions are preset.)

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

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

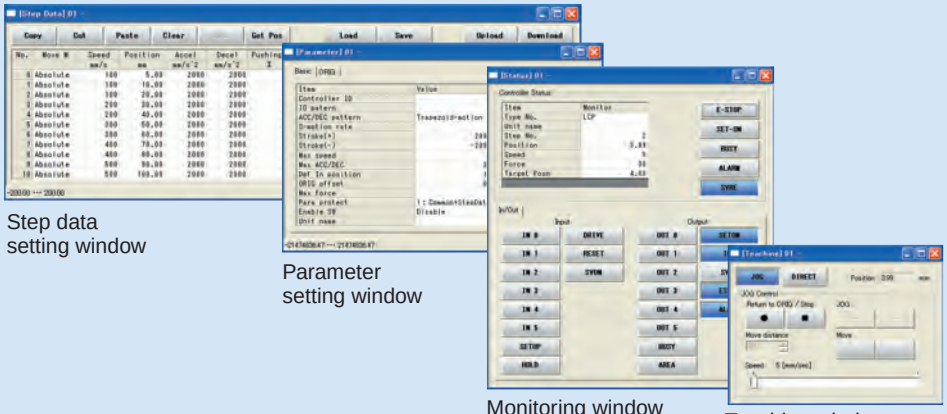
# ◎“Normal Mode” for detailed setting

**Select “Normal Mode” when detailed setting is required.**

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

## <When a PC is used> Controller setting software

- Step data setting, parameter setting, monitoring, teaching, etc., are displayed in different windows.



Step data setting window

Parameter setting window

Monitoring window

Teaching window

## <When a TB (teaching box) is used>

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

## Teaching box screen

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




Main menu screen

Step data setting screen

Test screen

Monitoring screen

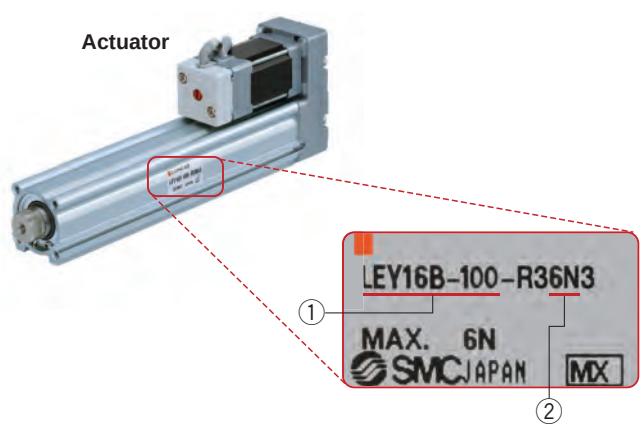
## The actuator and controller are provided as a set. (They can be ordered separately as well.)

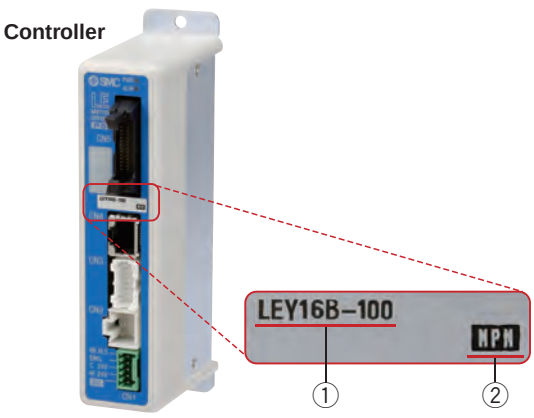
Confirm that the combination of the controller and actuator is correct.

**<Check the following before use.>**

① Check the actuator label for the model number. This number should match that of the controller.

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



# Fieldbus-compatible Gateway (GW) Unit

## *LEC-G Series* ▶p. 203

◎ **Conversion unit for Fieldbus network and LEC serial communication**

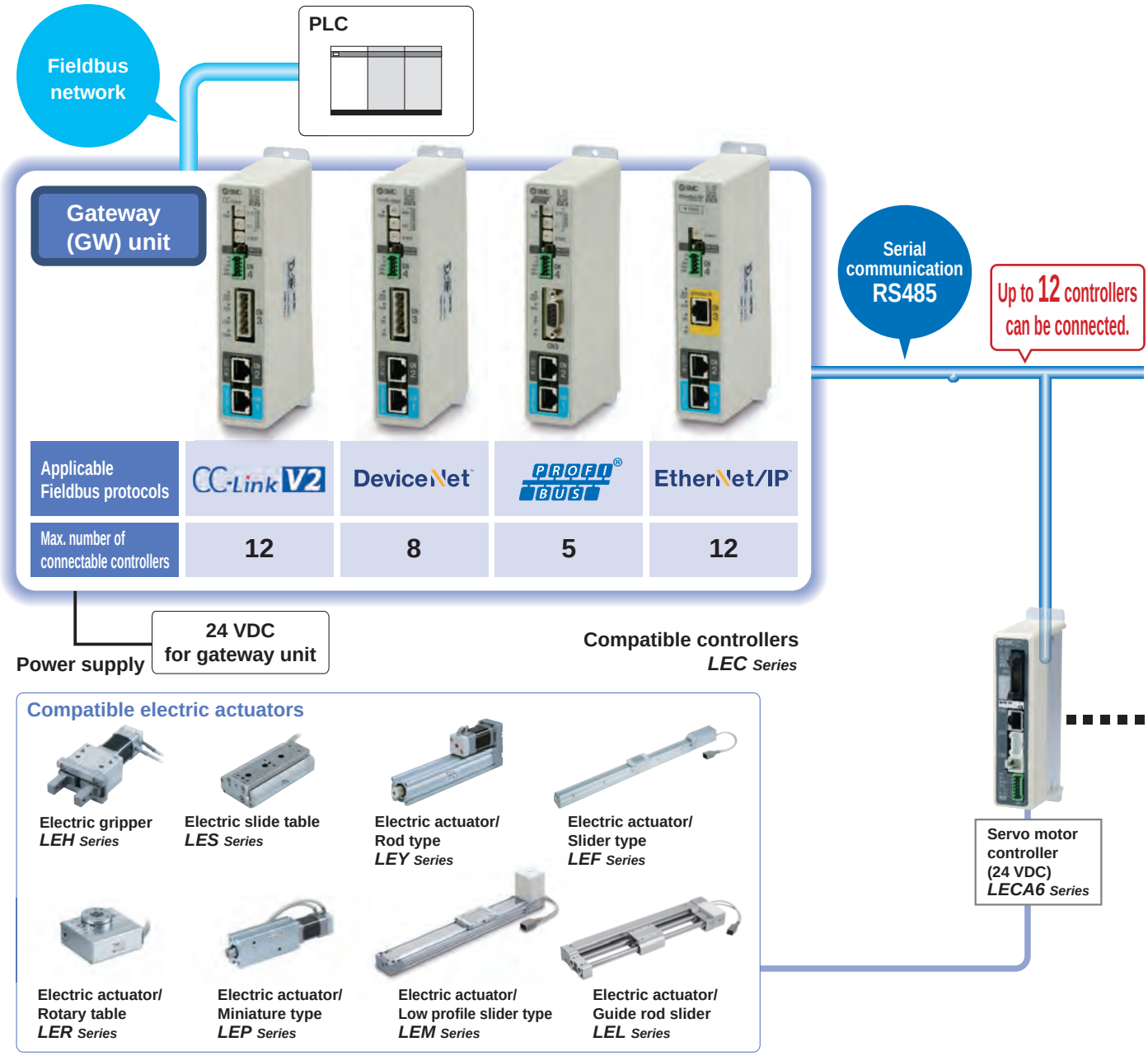
Applicable Fieldbus protocols: CC-Link V2 DeviceNet PROFIBUS EtherNet/IP

◎ **Two methods of operation**

**Step data input: Operate using preset step data in the controller.**

**Numerical data input: The actuator operates using values such as position and speed from the PLC.**

◎ **Values such as position and speed can be checked on the PLC.**



## Programless Type *LECP1* Series ▶p. 207

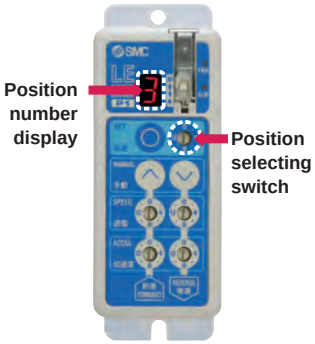
Step motor
(Servo/24 VDC)
**LECP1**

# No programming required!

**Allows for the setting up of electric actuator operation without using a PC or teaching box**

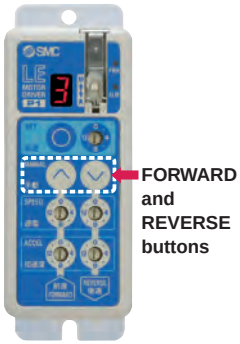
**1 Setting the position number**

Set a registered number for the stop position.
Max. 14 points




**2 Setting the stop position**

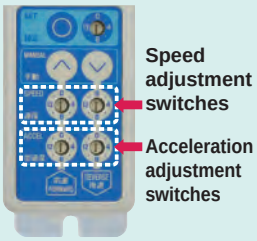
Move the actuator to the desired stop position using the FORWARD and REVERSE buttons.




**3 Registration**

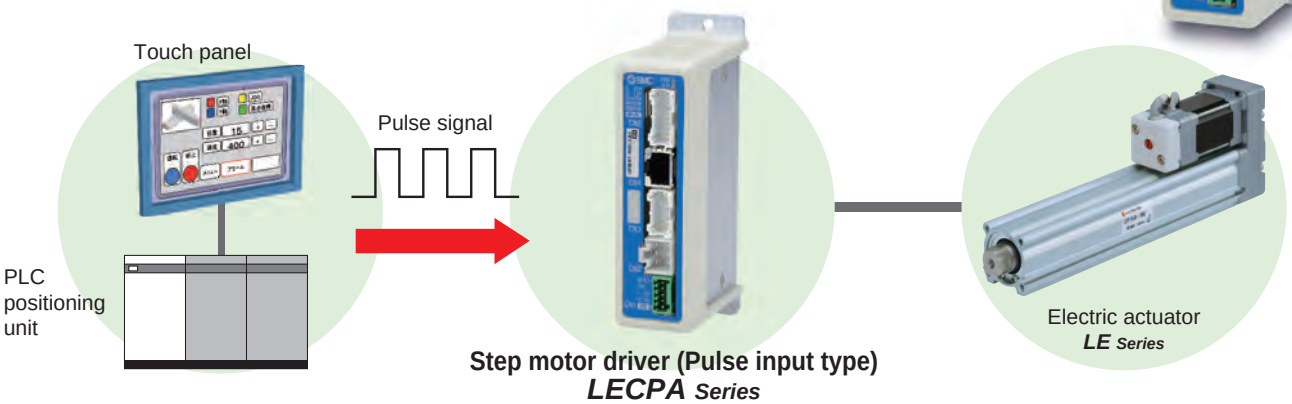
Register the stop position using the SET button.


**Speed/Acceleration 16-level adjustment**




## Pulse Input Type *LECPA* Series ▶p. 214

- **This driver uses pulse signals to allow positioning at any position. The actuator can be controlled from the customers' positioning unit.**




- **Return-to-origin command signal**
  Enables automatic return-to-origin action

- **With force limit function (Pushing force/Gripping force operation available)**
  Pushing force/Positioning operation is possible by switching signals.

# Function

| Item | Step data input type LECA6 | Programless type LECP1 | Pulse input type LECPA |
|---|---|---|---|
| **Step data and parameter setting** | • Input from controller setting software (PC)<br>• Input from teaching box | • Selected using controller operation buttons | • Input from controller setting software (PC)<br>• Input from teaching box |
| **Step data "position" setting** | • Numerical value input from controller setting software (PC) or teaching box<br>• Input numerical value<br>• Direct teaching<br>• JOG teaching | • Direct teaching<br>• JOG teaching | • No "Position" setting required<br>Position and speed set by pulse signal |
| **Number of step data** | 64 points | 14 points | — |
| **Operation command (I/O signal)** | Step No. [IN*] input ⇒ [DRIVE] input | Step No. [IN*] input only | Pulse signal |
| **Completion signal** | [INP] output | [OUT*] output | [INP] output |

# Setting Items

TB: Teaching box PC: Controller setting software

| Item | | Contents | Easy Mode | | Normal Mode | Programless type LECP1*1 | Pulse input type LECPA |
|---|---|---|---|---|---|---|---|
| | | | TB | PC | TB/PC | | |
| Step data setting (Excerpt) | Movement MOD | Selection of "absolute position" and "relative position" | △ | ● | ● | Fixed value (ABS) | No setting required |
| | Speed | Transfer speed | ● | ● | ● | Select from 16 levels | |
| | Position | [Position]: Target position<br>[Pushing]: Pushing start position | ● | ● | ● | Direct teaching<br>JOG teaching | |
| | Acceleration/Deceleration | Acceleration/deceleration during movement | ● | ● | ● | Select from 16 levels | |
| | Pushing force | Rate of force during pushing operation | ● | ● | ● | Select from 3 levels (weak, medium, and strong) | Set in units of 1 % |
| | Trigger LV | Target force during pushing operation | △ | ● | ● | No setting required (same value as pushing force) | Set in units of 1 % |
| | Pushing speed | Speed during pushing operation | △ | ● | ● | No setting required | Set in units of 1 mm/s |
| | Moving force | Force during positioning operation | △ | ● | ● | | Set to (Different values for each actuator) % |
| | Area output | Conditions for area output signal to turn ON | △ | ● | ● | | Set in units of 0.01 mm |
| | In position | [Position]: Width to the target position<br>[Pushing]: How much it moves during pushing | △ | ● | ● | | Set to (Different values for each actuator) or more (Units: 0.01 mm) |
| Parameter setting (Excerpt) | Stroke (+) | + side position limit | × | × | ● | | Set in units of 0.01 mm |
| | Stroke (−) | − side position limit | × | × | ● | | Set in units of 0.01 mm |
| | ORIG direction | Direction of the return to origin can be set. | × | × | ● | Compatible | Compatible |
| | ORIG speed | Speed during return to origin | × | × | ● | No setting required | Set in units of 1 mm/s |
| | ORIG ACC | Acceleration during return to origin | × | × | ● | | Set in units of 1 mm/s² |
| Test | JOG | | ● | ● | ● | Hold down the MANUAL button (⏶⏷) for uniform sending (speed is a specified value). | Continuous operation at the set speed can be tested while the switch is being pressed. |
| | MOVE | | × | ● | ● | Press the MANUAL button (⏶⏷) once for sizing operation (speed and sizing amount are specified values). | Operation at the set distance and speed from the current position can be tested. |
| | Return to ORIG | | ● | ● | ● | Compatible | Compatible |
| | Test drive | Operation of the specified step data | ● | ● | ● (Continuous operation) | Compatible | Not compatible |
| | Forced output | ON/OFF of the output terminal can be tested. | × | × | ● | Not compatible | Compatible |
| Monitor | DRV mon | Current position, speed, force, and the specified step data can be monitored. | ● | ● | ● | | Compatible |
| | In/Out mon | Current ON/OFF status of the input and output terminal can be monitored. | × | × | ● | | Compatible |
| ALM | Status | Alarm currently being generated can be confirmed. | ● | ● | ● | Compatible (display alarm group) | Compatible |
| | ALM Log record | Alarms generated in the past can be confirmed. | × | × | ● | Not compatible | Compatible |
| File | Save/Load | Step data and parameters can be saved, forwarded, and deleted. | × | × | ● | | Compatible |
| Other | Language | Can be changed to Japanese or English | ● | ● | ● | | Compatible |

△: Can be set from TB Ver. 2.** (The version information is displayed on the initial screen.)

*1 The LECP1 programless type cannot be used with the teaching box and controller setting kit.

# EtherCAT®/EtherNet/IP™/PROFINET/ DeviceNet™/IO-Link Direct Input Type Step Motor Controller/JXC□ Series ▶p. 224

IO-Link EtherCAT PROFINET DeviceNet EtherNet/IP

## ◎Two types of operation command

**Step no. defined operation**: Operate using the preset step data in the controller.
**Numerical data defined operation**: The actuator operates using values such as position and speed from the PLC.

## ◎Numerical monitoring available

Numerical information, such as the current speed, current position, and alarm codes, can be monitored on the PLC.

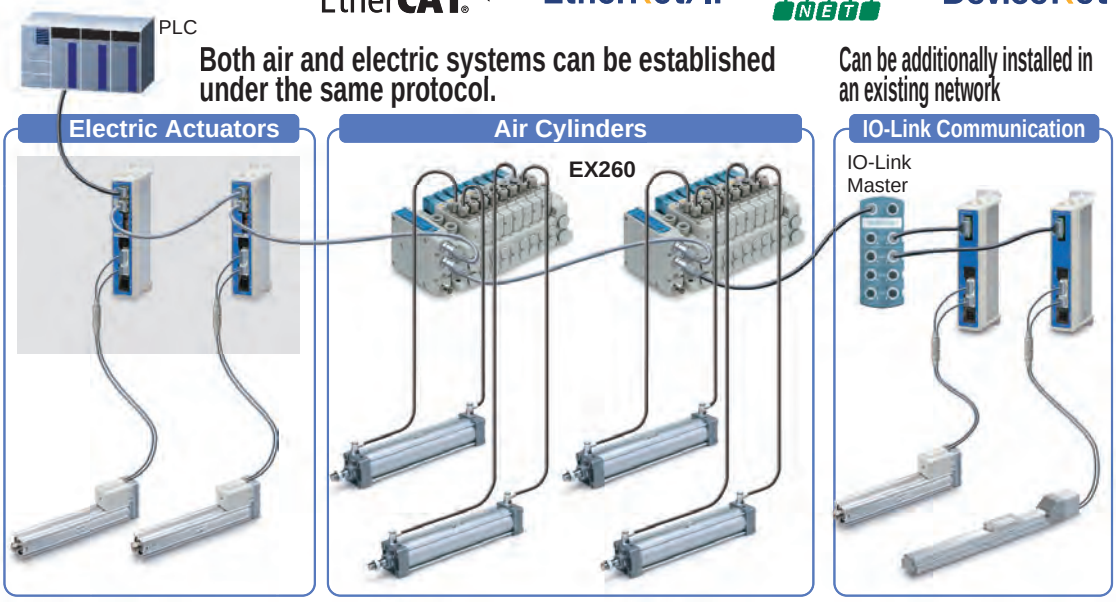
## ◎Transition wiring of communication cables

Two communication ports are provided.

* For the DeviceNet™ type, transition wiring is possible using a branch connector.
* 1 to 1 in the case of IO-Link


## Application

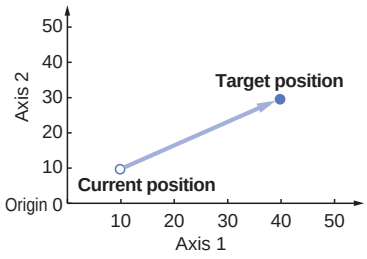
Communication protocols: EtherCAT EtherNet/IP PROFINET DeviceNet IO-Link



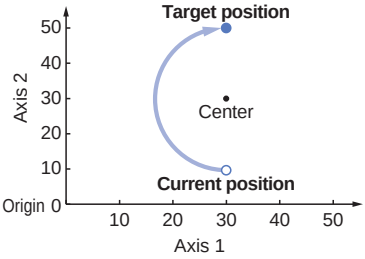
# Multi-Axis Step Motor Controller

- Speed tuning control*1
  (3 Axes: JXC92  4 Axes: JXC73/83/93)
- Linear/circular interpolation

Linear interpolation




Circular interpolation



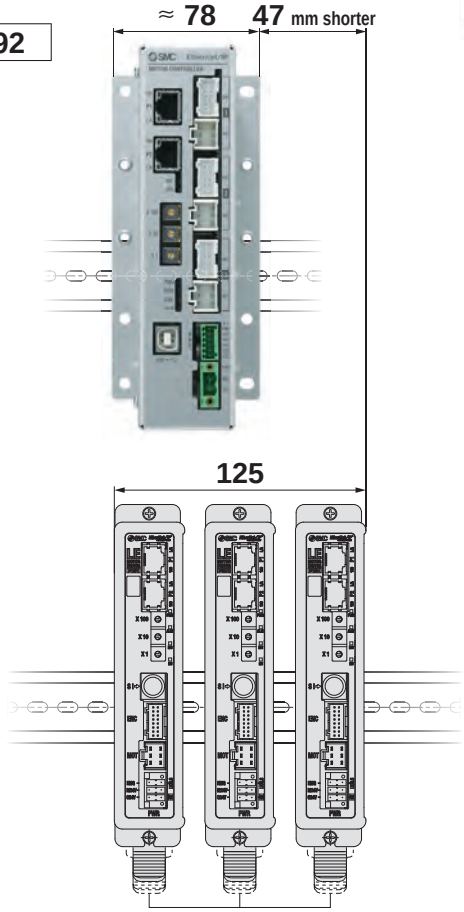

- Positioning/pushing operation
- Step data input
  (Max. 2048 points)
- Space saving, reduced wiring
- Absolute/relative position
  coordinate instructions

*1 This controls the speed of the following axis when the speed of the primary axis drops due to the effects of an external force and when a speed difference with the following axis occurs. This control is not for synchronizing the position of the primary axis and following axis.

## For 3 Axes *JXC92 Series*

- EtherNet/IP™ Type
- Width: Approx. 38 % reduction

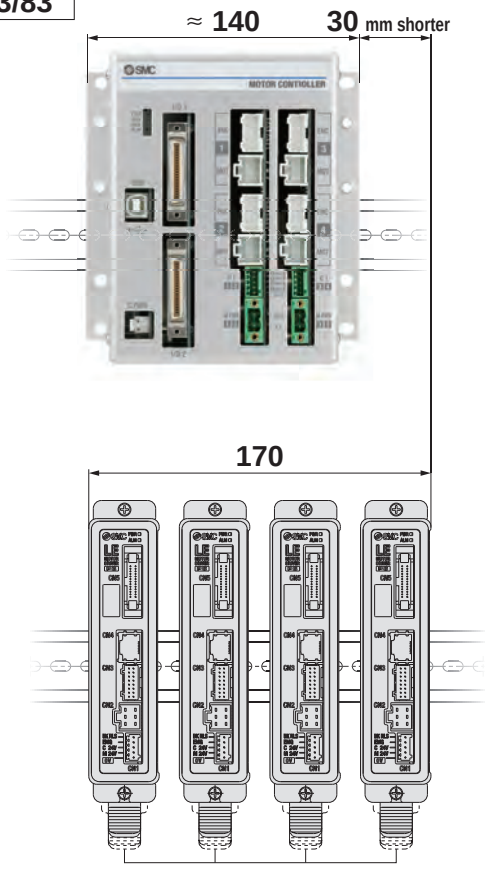
JXC92




## For 4 Axes *JXC73/83/93 Series*

- Parallel I/O/
  EtherNet/IP™ Type
- Width: Approx. 18 % reduction

JXC73/83




* For LE□, size 25 or larger

# Step Data Input: Max. 2048 points

## For 3 Axes

**3-axis operation can be set collectively in one step.**

| Step | Axis | Movement mode | Speed | Position | Acceleration | Deceleration | Pushing force | Trigger LV | Pushing speed | Moving force | Area 1 | Area 2 | In position | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mm/s | mm | mm/s² | mm/s² | | | | | mm | mm | mm | |
| 0 | Axis 1 | ABS | 500 | 100.00 | 3000 | 3000 | 0 | 85.0 | 50 | 100.0 | 10.0 | 30.0 | 0.5 | |
| | Axis 2 | ABS | 500 | 100.00 | 3000 | 3000 | 0 | 85.0 | 50 | 100.0 | 10.0 | 30.0 | 0.5 | |
| | Axis 3 | ABS | 500 | 100.00 | 3000 | 3000 | 0 | 85.0 | 50 | 100.0 | 10.0 | 30.0 | 0.5 | |
| 1 | Axis 1 | INC | 500 | 200.00 | 3000 | 3000 | 0 | 85.0 | 50 | 100.0 | 0 | 0 | 0.5 | |
| | Axis 2 | INC | 500 | 200.00 | 3000 | 3000 | 0 | 85.0 | 50 | 100.0 | 0 | 0 | 0.5 | |
| | Axis 3 | INC | 500 | 200.00 | 3000 | 3000 | 0 | 85.0 | 50 | 100.0 | 0 | 0 | 0.5 | |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | |
| 2046 | Axis 1 | SYN-I | 500 | 100.00 | 3000 | 3000 | 0 | 0 | 0 | 100.0 | 0 | 0 | 0.5 | |
| | Axis 2 | SYN-I | 0 | 0.00 | 0 | 0 | 0 | 0 | 0 | 100.0 | 0 | 0 | 0.5 | |
| | Axis 3 | SYN-I | 0 | 0.00 | 0 | 0 | 0 | 0 | 0 | 100.0 | 0 | 0 | 0.5 | |
| 2047 | Axis 1 | CIR-R | 500 | 0.00 | 3000 | 3000 | 0 | 0 | 0 | 100.0 | 0 | 0 | 0.5 | |
| | Axis 2 | CIR-R | 0 | 50.00 | 0 | 0 | 0 | 0 | 0 | 100.0 | 0 | 0 | 0.5 | |
| | Axis 3∗1 | | 0 | 0.00 | 0 | 0 | 0 | 0 | 0 | 100.0 | 0 | 0 | 0.5 | |
| | Axis 4∗1 | | 0 | 25.00 | 0 | 0 | 0 | 0 | 0 | 100.0 | 0 | 0 | 0.5 | |

∗1 When circular interpolation (CIR-R, CIR-L, CIR-3) is selected in the movement mode, input the X and Y coordinates in the rotation centre position or input the X and Y coordinates in the passing position.

| Movement mode | Pushing operation | Details |
|---|---|---|
| Blank | × | Invalid data (Invalid process) |
| ABS | ○ | Moves to the absolute coordinate position based on the origin of the actuator |
| INC | ○ | Moves to the relative coordinate position based on the current position |
| LIN-A | × | Moves to the absolute coordinate position based on the origin of the actuator by linear interpolation |
| LIN-I | × | Moves to the relative coordinate position based on the current position by linear interpolation |
| CIR-R∗2 | × | With Axis 1 assigned to the X-axis and Axis 2 to the Y-axis, it moves in the clockwise direction by circular interpolation. The target position and rotation centre position are specified according to the relative coordinates from the current position. The position data is assigned as follows.<br>Axis 1: Target position X<br>Axis 2: Target position Y<br>Axis 3∗1: Rotation centre position X<br>Axis 4∗1: Rotation centre position Y |
| CIR-L∗2 | × | With Axis 1 assigned to the X-axis and Axis 2 to the Y-axis, it moves in the counter-clockwise direction by circular interpolation. The target position and rotation centre position are specified according to the relative coordinates from the current position. The position data is assigned as follows.<br>Axis 1: Target position X<br>Axis 2: Target position Y<br>Axis 3∗1: Rotation centre position X<br>Axis 4∗1: Rotation centre position Y |
| SYN-I | × | Moves to the relative coordinate position based on the current position by speed tuning control∗3 |
| CIR-3∗2 | × | With Axis 1 assigned to the X-axis and Axis 2 to the Y-axis, it moves based on the three specified points by circular interpolation. The target position and passing position are specified according to the relative coordinates from the current position. The position data is assigned as follows.<br>Axis 1: Target position X<br>Axis 2: Target position Y<br>Axis 3∗1: Passing position X<br>Axis 4∗1: Passing position Y |

∗2 Performs a circular operation on a plane using Axis 1 and Axis 2

∗3 This controls the speed of the following axis when the speed of the primary axis drops due to the effects of an external force and when a speed difference with the following axis occurs. This control is not for synchronizing the position of the primary axis and following axis.

## For 4 Axes

**4-axis operation can be set collectively in one step.**

| Step | Axis | Movement mode | Speed | Position | Acceleration | Deceleration | Positioning/ Pushing | Area 1 | Area 2 | In position | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | mm/s | mm | mm/s² | mm/s² | | mm | mm | mm | |
| 0 | Axis 1 | ABS | 100 | 200.00 | 1000 | 1000 | 0 | 6.0 | 12.0 | 0.5 | |
| | Axis 2 | ABS | 50 | 100.00 | 1000 | 1000 | 0 | 6.0 | 12.0 | 0.5 | |
| | Axis 3 | ABS | 50 | 100.00 | 1000 | 1000 | 0 | 6.0 | 12.0 | 0.5 | |
| | Axis 4 | ABS | 50 | 100.00 | 1000 | 1000 | 0 | 6.0 | 12.0 | 0.5 | |
| 1 | Axis 1 | INC | 500 | 250.00 | 1000 | 1000 | 1 | 0 | 0 | 20.0 | |
| | Axis 2 | INC | 500 | 250.00 | 1000 | 1000 | 1 | 0 | 0 | 20.0 | |
| | Axis 3 | INC | 500 | 250.00 | 1000 | 1000 | 1 | 0 | 0 | 20.0 | |
| | Axis 4 | INC | 500 | 250.00 | 1000 | 1000 | 1 | 0 | 0 | 20.0 | |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| 2046 | Axis 4 | ABS | 200 | 700 | 500 | 500 | 0 | 0 | 0 | 0.5 | |
| 2047 | Axis 1 | ABS | 500 | 0.00 | 3000 | 3000 | 0 | 0 | 0 | 0.5 | |
| | Axis 2 | ABS | 500 | 0.00 | 3000 | 3000 | 0 | 0 | 0 | 0.5 | |
| | Axis 3 | ABS | 500 | 0.00 | 3000 | 3000 | 0 | 0 | 0 | 0.5 | |
| | Axis 4 | ABS | 500 | 0.00 | 3000 | 3000 | 0 | 0 | 0 | 0.5 | |

| Movement mode | Pushing operation | Details |
|---|---|---|
| Blank | × | Invalid data (Invalid process) |
| ABS | ○ | Moves to the absolute coordinate position based on the origin of the actuator |
| INC | ○ | Moves to the relative coordinate position based on the current position |
| LIN-A | × | Moves to the absolute coordinate position based on the origin of the actuator by linear interpolation |
| LIN-I | × | Moves to the relative coordinate position based on the current position by linear interpolation |
| CIR-R*1 | × | With Axis 1 assigned to the X-axis and Axis 2 to the Y-axis, it moves in the clockwise direction by circular interpolation. The target position and rotation centre position are specified according to the relative coordinates from the current position. The position data is assigned as follows.<br>Axis 1: Target position X<br>Axis 2: Target position Y<br>Axis 3: Rotation centre position X<br>Axis 4: Rotation centre position Y |
| CIR-L*1 | × | With Axis 1 assigned to the X-axis and Axis 2 to the Y-axis, it moves in the counter-clockwise direction by circular interpolation. The target position and rotation centre position are specified according to the relative coordinates from the current position. The position data is assigned as follows.<br>Axis 1: Target position X<br>Axis 2: Target position Y<br>Axis 3: Rotation centre position X<br>Axis 4: Rotation centre position Y |
| SYN-I | × | Moves to the relative coordinate position based on the current position by speed tuning control*2 |

*1 Performs a circular operation on a plane using Axis 1 and Axis 2

*2 This controls the speed of the following axis when the speed of the primary axis drops due to the effects of an external force and when a speed difference with the following axis occurs. This control is not for synchronizing the position of the primary axis and following axis.

# ● Controller Setting Software (Connection with a PC)

| For 3 Axes | For 4 Axes |
|---|---|
| JXC92 | JXC73/83/93 |

### Easy file management

| | |
|---|---|
| Load | The step data is loaded from the file. |
| Save | The step data is saved in a file. |
| Upload | The step data is loaded from the controller. |
| Download | The step data is written in the controller. |

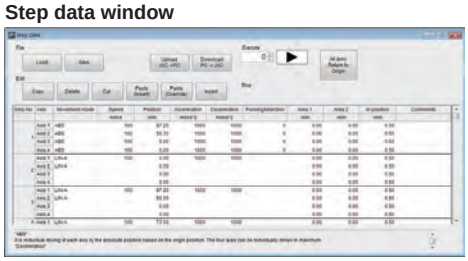
### Abundant edit functions

| | |
|---|---|
| Copy | The selected step data is copied to the clipboard. |
| Delete | The selected step data is deleted. |
| Cut | The selected step data is cut. |
| Paste (Insert) | The step data copied to the clipboard is inserted into the cursor's position. |
| Paste (Overwrite) | The step data copied to the clipboard overwrites the data at the cursor position. |
| Insert | A blank line is inserted in the selected step data line. |

### Operation confirmation of entered step data

| | |
|---|---|
| 0 | Enter the step number to be executed. |
| ▶ | Executes the specified step number. |
| Stop | Displays whether the step number is being executed or stopped. |
| All axes return to origin | Performs a return to origin of all the valid axes. |

**Step data window**



# System Construction/General Purpose I/O

● Electric actuator/ Rod type

Provided by the customer

PLC

Power supply for I/O signal 24 VDC*1

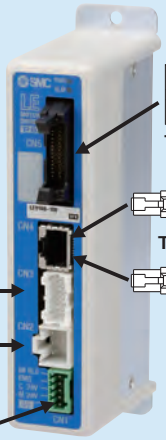
● I/O cable p. 199, 213

| Controller type | Part no. |
|---|---|
| LECA6 | LEC-CN5-□ |
| LECP1 (Programless) | LEC-CK4-□ |

Programless type
LECP1
p. 207

* The teaching box, controller setting kit, and Touch Operator Interface/Human-Machine Interface cannot be connected.

● Controller*2



To CN5

To CN4

To CN3

To CN2

To CN1

Provided by the customer

Power supply for controller 24 VDC*1

*1 When compliance with UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

● Power supply plug (Accessory)
<Applicable cable size>
AWG20 (0.5 mm²)

Step data input type
LECA6
p. 191

● Actuator cable*2 p. 197, 212

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

*2 Can be included as an option. Refer to the "How to Order" page of the actuator.

● Touch Operator Interface/Human-Machine Interface (Provided by the customer)

GP4501T/GP3500T
Schneider Electric Japan Holdings Ltd.

Pro-face for the best interface

Cockpit parts can be downloaded for free via the Pro-face web-site.
By using the cockpit parts, adjustments can be made from the Touch Operator Interface.

GOT2000 Series
Mitsubishi Electric Corporation

GOT2000 Graphic Operation Terminal

Sample screens for monitoring and changing the current value and set value of the electric actuator can be downloaded for free via the Mitsubishi Electric website.

## Options

● Teaching box p. 201
(With 3 m cable)
LEC-T1-3JG□

or

● Communication cable for controller setting p. 200
Communication cable: LEC-W2A-C
USB cable: LEC-W2-U
Controller setting software
USB driver
* Download from SMC's website:
https://www.smc.eu

Communication cable ● (3 m)

● USB cable

PC

* Cannot be used with the programless type (LECP1)

# System Construction/Fieldbus Network

PLC
(Provided by the customer)

Power supply for gateway unit
24 VDC*1

Power supply

Fieldbus network

## Gateway (GW) unit p. 203

**Applicable Fieldbus protocols**
CC-Link Ver. 2.0
DeviceNet™
PROFIBUS DP
EtherNet/IP™

● Power supply connector (Accessory) — To CN4

● Communication connector (Accessory)*2 — To CN3

*2 CC-Link Ver. 2.0
DeviceNet™

To CN2

To CN1

● Communication cable p. 203
LEC-CG1-□

## Options

● Communication cable p. 200 for controller setting
Communication cable: LEC-W2A-C
USB cable: LEC-W2-U

Controller setting software
USB driver
* Download from SMC's website:
https://www.smc.eu

● Communication cable
USB cable ●

PC
(Provided by the customer)

or

● Teaching box p. 200
(With 3 m cable)
LEC-T1-3JG□

● Cable between branches p. 203
LEC-CG2-□

● Terminating resistor connector 120 Ω
LEC-CGR

● Branch connector p. 203
LEC-CGD

● Communication cable p. 203
LEC-CG1-□

● Controller p. 191

To CN4

● Power supply connector (Accessory)

To CN1

Controller input power supply*1

● Controller p. 191

● Power supply connector (Accessory)

To CN1

Controller input power supply*1

● Electric actuator/ Rod type

| Applicable Fieldbus protocols | Max. number of connectable controllers |
|---|---|
| CC-Link Ver. 2.0 | 12 |
| DeviceNet™ | 8 |
| PROFIBUS DP | 5 |
| EtherNet/IP™ | 12 |

### Compatible Controllers

| | |
|---|---|
| Servo motor controller (24 VDC) | **LECA6** Series |

*1 Connect the 0 V terminals for both the controller input power supply and the gateway unit power supply.
When compliance with UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

# System Construction/Pulse Signal

● Electric actuator/
Rod type

● Current limiting resistor p. 220
LEC-PA-R-□

＊ The current limiting resistor is used when the pulse signal output of the positioning unit is open collector output. For details, refer to page 215.

Provided by the customer

PLC

Power supply for I/O signal
24 VDC*1

*1 When compliance with UL is required, the electric actuator and driver should be used with a UL1310 Class 2 power supply.

● Driver*2

● I/O cable p. 220

| Driver type | Part no. |
|---|---|
| LECPA | LEC-CL5-□ |

To CN5

To CN4

To CN3

To CN2

To CN1

Pulse input type
LECPA
p. 214

Provided by the customer

Power supply for driver
24 VDC*1

● Power supply plug (Accessory)
<Applicable cable size>
AWG20 (0.5 mm²)

*1 When compliance with UL is required, the electric actuator and driver should be used with a UL1310 Class 2 power supply.

● Actuator cable*2 p. 219

| Driver type | Standard cable | Robotic cable |
|---|---|---|
| LECPA (Pulse input type) | LE-CP-□-S | LE-CP-□ |

*2 Can be included as an option. Refer to the "How to Order" page of the actuator.

## Options

● Teaching box p. 222
(With 3 m cable)
LEC-T1-3JG□

or

● Communication cable for controller setting p. 221
Communication cable: LEC-W2A-C
USB cable: LEC-W2-U

Controller setting software
USB driver
＊ Download from SMC's website:
https://www.smcworld.com

Communication cable

● USB cable

PC

# System Construction/Fieldbus Network
## (EtherCAT®/EtherNet/IP™/PROFINET/DeviceNet™/IO-Link Direct Input Type)

● Electric actuator

● Actuator cable

| Standard cable | Robotic cable |
|---|---|
| LE-CP-□-S | LE-CP-□ |

Provided by the customer
PLC

Provided by the customer
PLC

Provided by the customer
PLC

Provided by the customer
PLC

Provided by the customer
IO-Link master

● Communication plug connector for DeviceNet™ p. 229

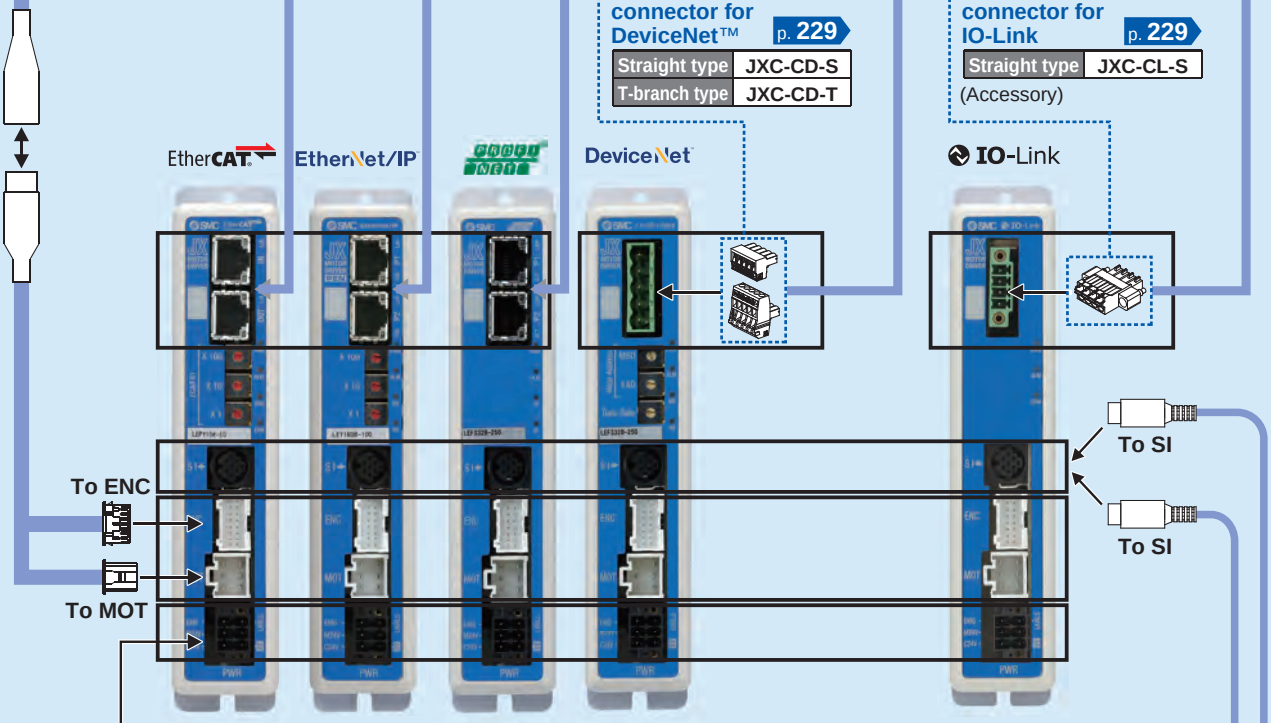
| | |
|---|---|
| Straight type | JXC-CD-S |
| T-branch type | JXC-CD-T |

● Communication plug connector for IO-Link p. 229

| | |
|---|---|
| Straight type | JXC-CL-S |

(Accessory)

EtherCAT EtherNet/IP DeviceNet IO-Link




Provided by the customer
Power supply for controller 24 VDC

● Power supply plug p. 229
(Accessory)

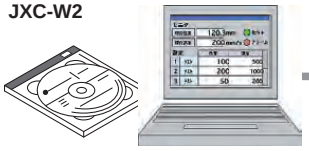
● Communication cable p. 229
(3 m)

## Options

● Teaching box p. 231
(With 3 m cable)
**LEC-T1-3□G□**

or

● Controller setting kit p. 229
Controller setting kit
(A communication cable, USB cable, and controller setting software (CD-ROM) are included.)
**JXC-W2**



PC

● USB cable
(A-mini B type)
(0.8 m)

● Conversion cable*1 p. 229
P5062-5
(0.3 m)
The conversion cable can be used for connecting this controller to the optional teaching box [LEC-T1] offered with the LEC series.

● Conversion cable
p. 229

*1 A conversion cable is also required for connecting the controller to the LEC-W2. (A conversion cable is not required for the JXC-W2.)

# System Construction/EtherNet/IP™ Type (JXC92)

Provided by the customer

PLC

Provided by the customer
Ethernet cable
(With shield, Category 5 or higher)

Provided by the customer
The connected actuators should be ordered separately.

● Electric actuator

● Controller/JXC92

To P1 or P2

To ENC

To MOT

● Actuator cable p. 244

| Robotic cable | Standard cable |
|---|---|
| LE-CP-□-□ | LE-CP-□-□-S |

To USB

To CI

● Control power supply connector p. 239
(Accessory)
<Applicable cable size>
AWG20 (0.5 mm²)

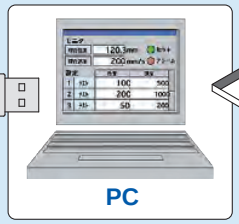
To M PWR

Provided by the customer
Control power supply/
Motor power supply
24 VDC

● Motor power supply connector p. 239
(Accessory)
<Applicable cable size>
AWG16 (1.25 mm²)

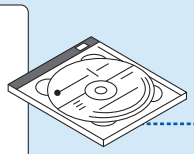
● Controller setting kit p. 243
(Controller setting software and USB cable are included.)
(Option)
**JXC-MA1**

● USB cable p. 243
(Option)
**JXC-MA1-2**
Cable length: 3 m



PC

Provided by the customer



● Controller setting software p. 243
(Option)
**JXC-MA1-1**

# System Construction/Parallel I/O (JXC73/83)

Provided by the customer

PLC

Power supply for I/O signal 24 VDC

● I/O cable p. 242
(Option)

| Part no. |
|---|
| JXC-C2-□ |

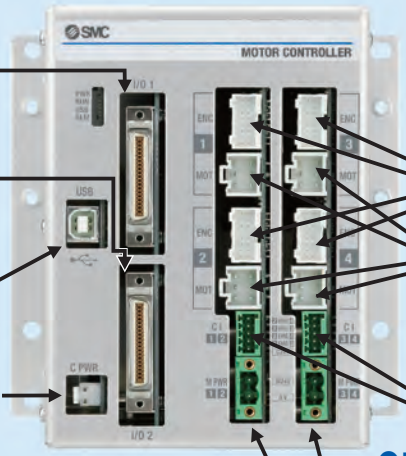
Provided by the customer
The connected actuators should be ordered separately.

● Electric actuator

● Actuator cable p. 244

| Robotic cable | Standard cable |
|---|---|
| LE-CP-□ | LE-CP-□-S |

● Controller/JXC73/83




To I/O

To USB

To C PWR

To ENC

To MOT

To CI

● Motor control power supply connector p. 239
(Accessory)
<Applicable cable size>
AWG20 (0.5 mm²)

● Cable with main control power supply connector p. 242
Cable length: 1.5 m (Accessory)

| Part no. |
|---|
| JXC-C1 |

Provided by the customer

Motor control power supply/
Motor power supply
24 VDC

To M PWR

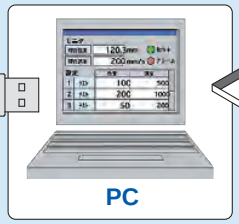
Provided by the customer

Main control power supply
24 VDC

● Motor power supply connector p. 239
(Accessory)
<Applicable cable size>
AWG16 (1.25 mm²)

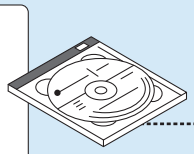
● Controller setting kit p. 243
(Controller setting software and USB cable are included.)
(Option)
**JXC-W1**

● USB cable p. 243
(Option)
**JXC-W1-2**
Cable length: 3 m



PC

Provided by the customer



● Controller setting software p. 243
(Option)
**JXC-W1-1**

# System Construction/EtherNet/IP™ Type (JXC93)

Provided by the customer

PLC

Provided by the customer
Ethernet cable
(Category 5 or higher)

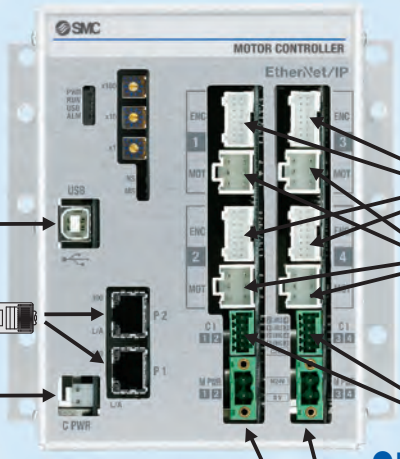
Provided by the customer
The connected actuators should be ordered separately.

● Electric actuator

● Actuator cable p. 244

| Robotic cable | Standard cable |
|---|---|
| LE-CP-□ | LE-CP-□-S |

● Controller/JXC93




To USB

To P1 or P2

To C PWR

To ENC

To MOT

To CI

● Cable with main control power supply connector p. 242
Cable length: 1.5 m (Accessory)

| Part no. |
|---|
| JXC-C1 |

● Motor control power supply connector p. 239
(Accessory)
<Applicable cable size>
AWG20 (0.5 mm²)

Provided by the customer
Main control power supply 24 VDC

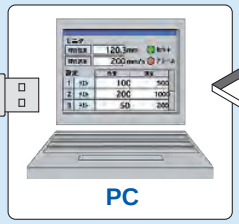
To M PWR

Provided by the customer
Motor control power supply/ Motor power supply 24 VDC

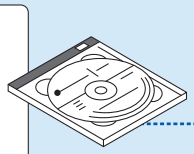
● Motor power supply connector p. 239
(Accessory)
<Applicable cable size>
AWG16 (1.25 mm²)

● Controller setting kit p. 243
(Controller setting software and USB cable are included.)
(Option)
**JXC-W1**

● USB cable p. 243
(Option)
**JXC-W1-2**
Cable length: 3 m




Provided by the customer



● Controller setting software p. 243
(Option)
**JXC-W1-1**

# AC Servo Motor Driver

## LECS□/LECSS-T/LECY□ Series List

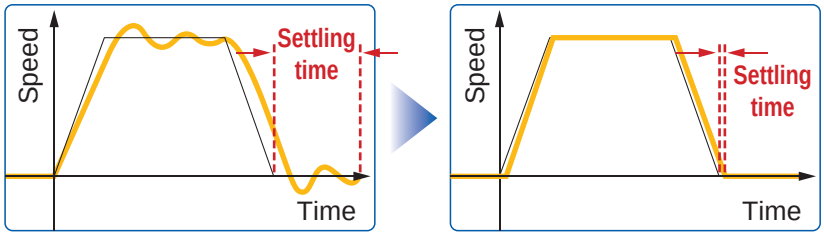
| Series | | Compatible motor | | | Control method | | | Application/ Function | Compatible option |
|---|---|---|---|---|---|---|---|---|---|
| | | 100 W | 200 W | 400 W | Positioning *1 | Pulse | Network direct input | Synchronous *2 | Setup software |
| Incremental Type | **LECSA** (Pulse input type/ Positioning type) | ● | ● | ● | Up to 7 points ● | ● | | | LEC-MRC2 ○ |
| Absolute Type | **LECSB** (Pulse input type) | ● | ● | ● | | ● | | | LEC-MRC2 ○ |
| | CC-Link **LECSC** (CC-Link direct input type) | ● | ● | ● | Up to 255 points ● | | CC-Link Ver. 1.10 ● | | LEC-MRC2 ○ |
| | SSCNETⅢ **LECSS** (SSCNET Ⅲ type) Compatible with Mitsubishi Electric's servo system controller network | ● | ● | ● | | | SSCNETⅢ ● | *2 ● | LEC-MRC2 ○ |
| | SSCNETⅢ/H **LECSS-T** (SSCNET Ⅲ/H type) Compatible with Mitsubishi Electric's servo system controller network | ● | ● | ● | | | SSCNETⅢ/H ● | *2 ● | LEC-MRC2 ○ |
| | MECHATROLINK-Ⅱ **LECYM** | ● | ● | ● | | | MECHATROLINK-Ⅱ ● | *3 ● | SigmaWin+™ ○ |
| | MECHATROLINK-Ⅲ **LECYU** | ● | ● | ● | | | MECHATROLINK-Ⅲ ● | *3 ● | SigmaWin+™ ○ |

∗1 For positioning types, the settings need to be changed in order to use the max. set values. Setup software (MR Configurator2™) LEC-MRC2 is required.
∗2 Available when a Mitsubishi motion controller is used as the master
∗3 Available when a motion controller is used as the master
∗ For customer-provided PLC and motion controller setting and usage instructions, confirm with the retailer or manufacturer.

## Gain adjustment using auto tuning

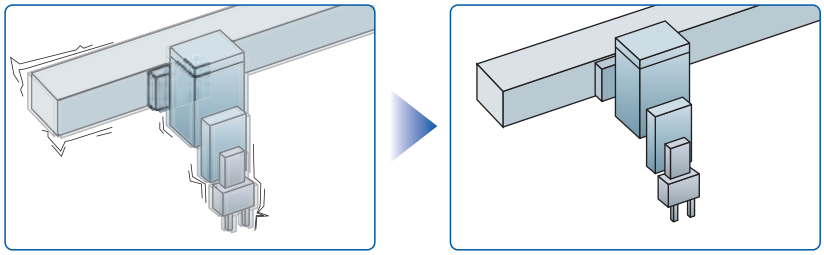
### Auto-tuning function

- Controls the difference between the command value and the actual action




### Vibration suppression control function

- Automatically suppresses low-frequency machine vibrations (1 to 100 Hz)



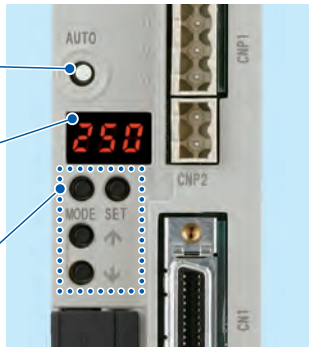
# AC Servo Motor Driver

## With display setting function

**One-touch adjustment button**
One-touch servo adjustment

**Display**
Display the monitor, parameters, and alarm.

**Settings**
Set the parameters, monitor display, etc., with push buttons.




**LECSA**

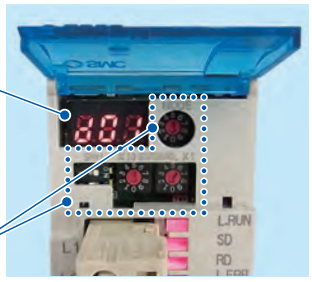
**Display**
Display the monitor, parameters, and alarm.

**Settings**
Set the parameters, monitor display, etc., with push buttons.


(With the front cover opened)
**LECSB**

**Display**
Display the communication status with the driver, the alarm, and the point table no.

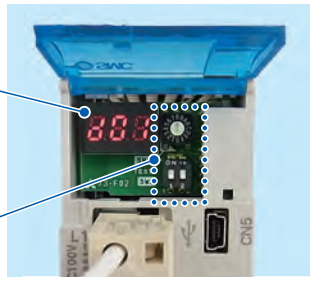
**Settings**
Control the Baud rate, station number, and the occupied station count.




(With the front cover opened)
**LECSC**

**Display**
Display the communication status with the driver and the alarm.

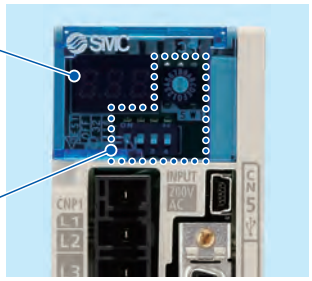
**Settings**
Switches for selecting the axis and switching to the test operation




(With the front cover opened)
**LECSS**

**Display**
Display the communication status with the driver and the alarm.

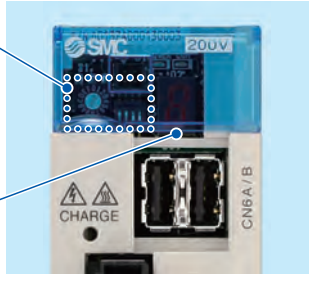
**Settings**
Switches for axis setting, control axis deactivation, switching to the test operation, etc.




**LECSS2-T**

**Settings**
Switches for station address, communication speed, number of transmission bytes, etc.

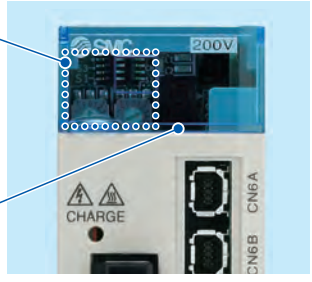
**Display**
Display the driver status and alarm.




**LECYM**

**Settings**
Switches for station address, number of transmission bytes, etc.

**Display**
Display the driver status and alarm.




**LECYU**

# System Construction

## Incremental encoder compatible *LECSA Series*
(Pulse input type/Positioning type)

**Provided by the customer**

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

◎Option
**Regeneration option** p. 266
Part no.: **LEC-MR-RB-□**

**Main circuit power supply connector** p. 256
(Accessory)

**Driver**

**Provided by the customer**
**Control circuit power supply**
24 VDC

**Control circuit power supply connector** p. 256
(Accessory)

◎Option
**Setup software** p. 267
(MR Configurator2™)
Part no.: **LEC-MRC2□**
PC

**USB cable** p. 268
Part no.: **LEC-MR-J3USB**

**Motor cable** p. 264

| Standard cable | Robotic cable |
|---|---|
| LE-CSM-S□□ | LE-CSM-R□□ |

**Lock cable** p. 264

| Standard cable | Robotic cable |
|---|---|
| LE-CSB-S□□ | LE-CSB-R□□ |

**Provided by the customer**
**Power supply for lock**
24 VDC

**Electric actuator**
Rod type
***LEY Series***
Guide rod type
***LEYG Series***

◎Option p. 264
**I/O connector**
Part no.: **LE-CSNA**
or
**I/O cable** p. 265
Part no.: **LEC-CSNA-1**

**Provided by the customer**
**PLC** (Positioning unit)
**Power supply for I/O signal 24 VDC**

**Encoder cable** p. 264

| Standard cable | Robotic cable |
|---|---|
| LE-CSE-S□□ | LE-CSE-R□□ |

## Absolute encoder compatible *LECSB Series*
(Pulse input type)

**Provided by the customer**

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

◎Option
**Regeneration option** p. 266
Part no.: **LEC-MR-RB-□**

**Main circuit power supply connector** p. 257
(Accessory)

**Driver**

**USB cable** p. 268
Part no.: **LEC-MR-J3USB**

◎Option
**Setup software** p. 267
(MR Configurator2™)
Part no.: **LEC-MRC2□**
PC

**Analog monitor output**
**RS-422 communication**

**Motor cable** p. 264

| Standard cable | Robotic cable |
|---|---|
| LE-CSM-S□□ | LE-CSM-R□□ |

**Lock cable** p. 264

| Standard cable | Robotic cable |
|---|---|
| LE-CSB-S□□ | LE-CSB-R□□ |

**Control circuit power supply connector** p. 257
(Accessory)

**Provided by the customer**
**Power supply for lock**
24 VDC

**Electric actuator**
Rod type
***LEY Series***
Guide rod type
***LEYG Series***

**Motor connector** p. 257
(Accessory)

◎Option p. 264
**I/O connector**
Part no.: **LE-CSNB**
or
**I/O cable** p. 265
Part no.: **LEC-CSNB-1**

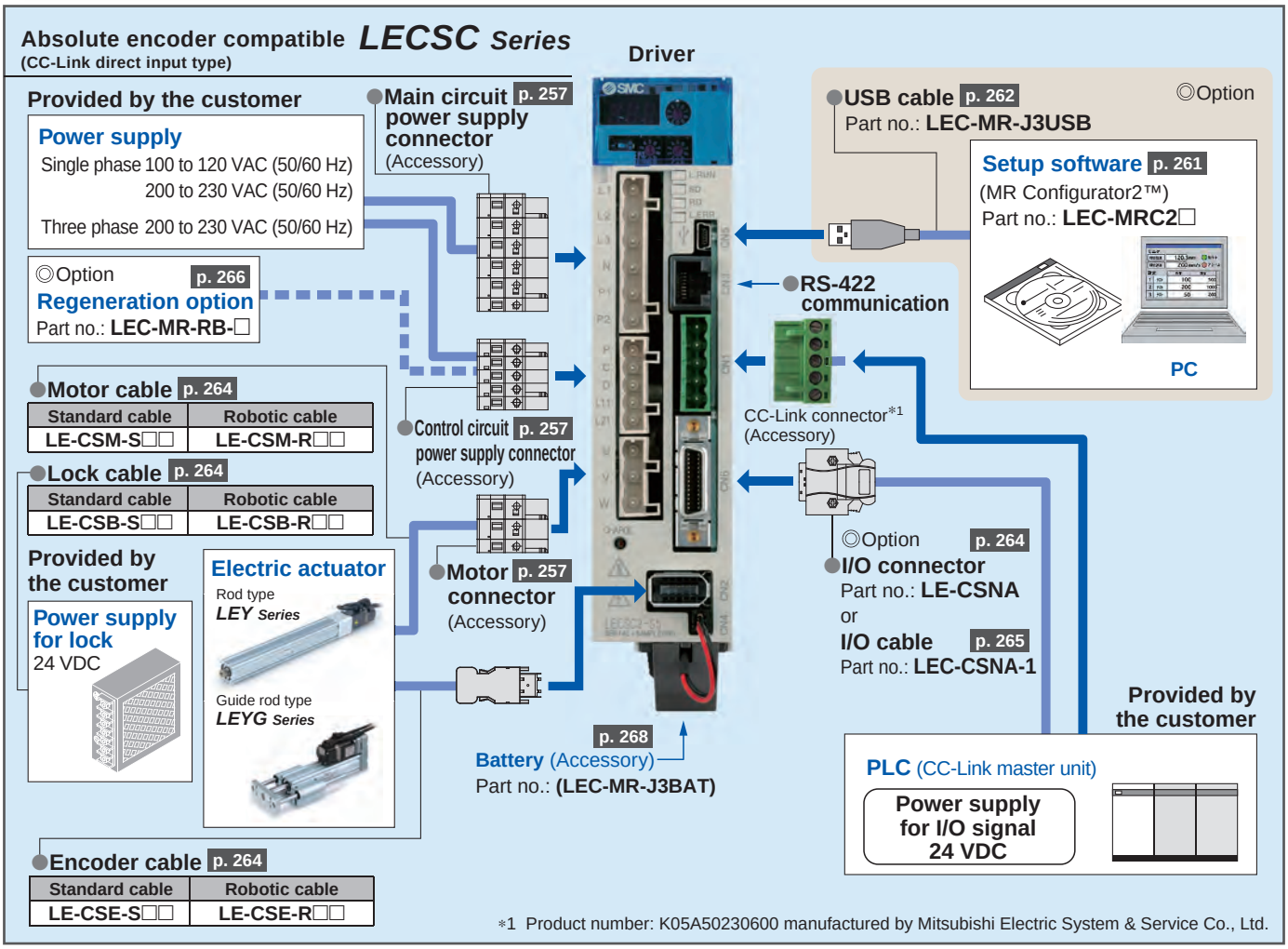
**Provided by the customer**
**PLC** (Positioning unit)
**Power supply for I/O signal 24 VDC**

**Encoder cable** p. 264

| Standard cable | Robotic cable |
|---|---|
| LE-CSE-S□□ | LE-CSE-R□□ |

**Battery** (Accessory) p. 268
Part no.: **(LEC-MR-J3BAT)**

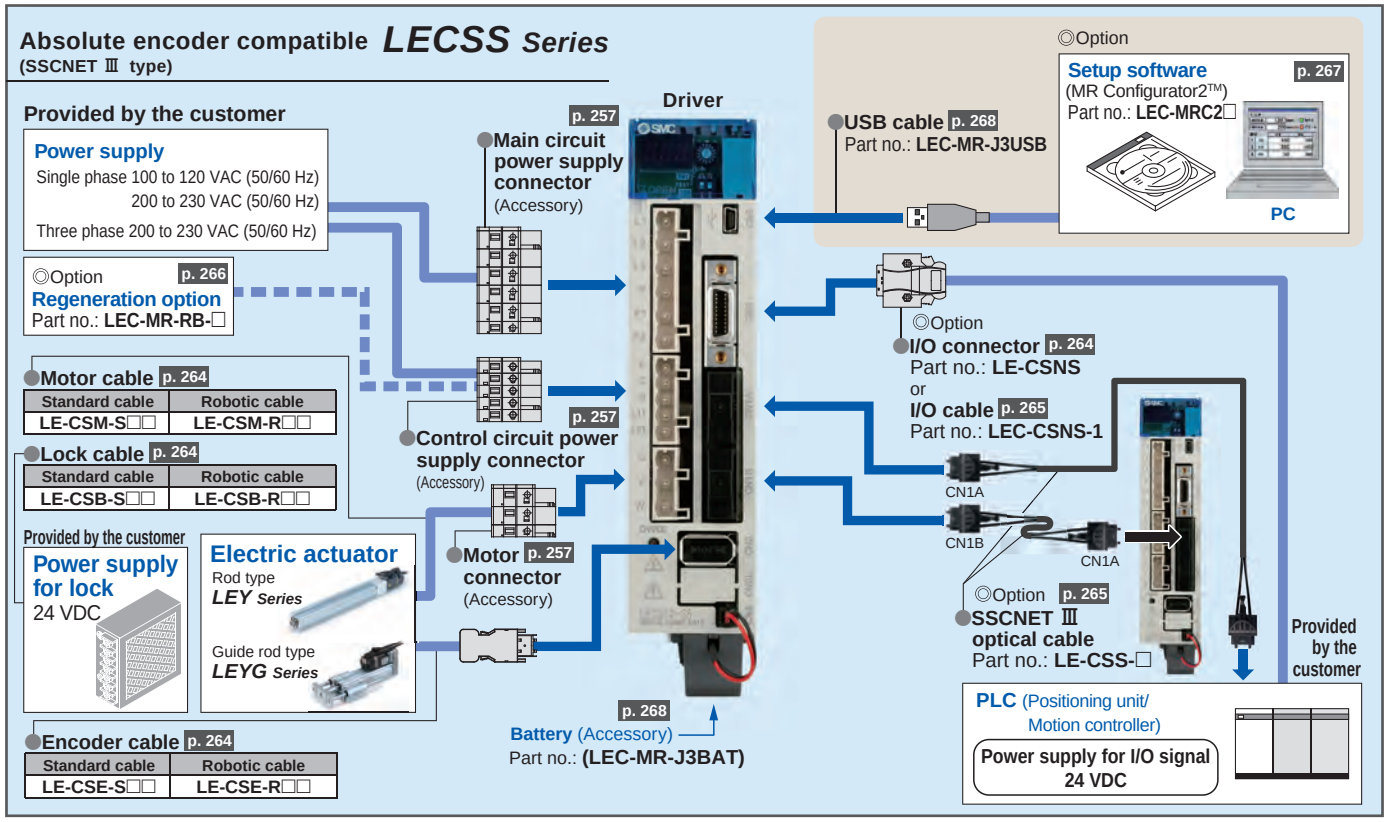
# System Construction



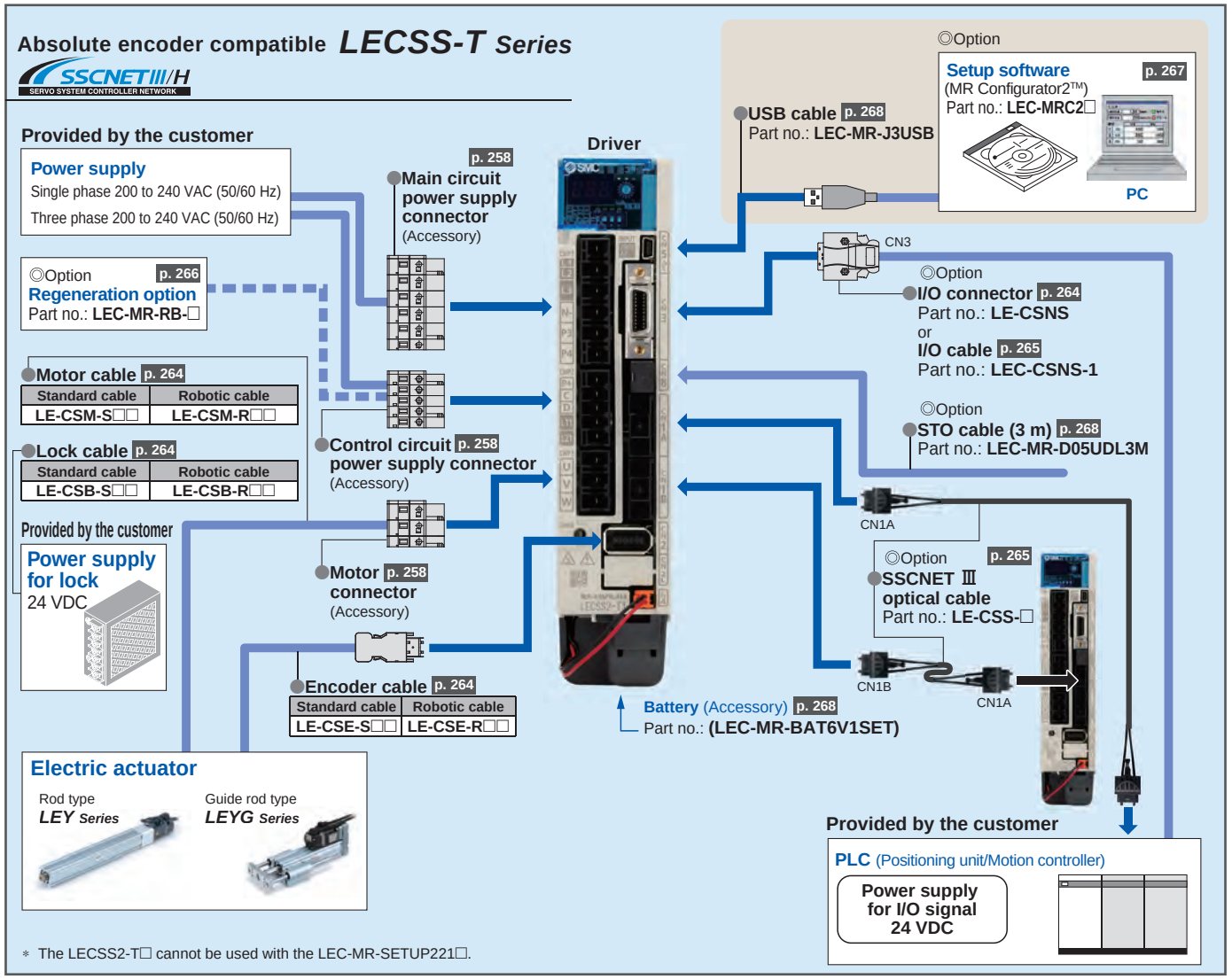

*1 Product number: K05A50230600 manufactured by Mitsubishi Electric System & Service Co., Ltd.

# System Construction

## Absolute encoder compatible *LECSS* Series
(SSCNET Ⅲ type)




## Absolute encoder compatible *LECSS-T* Series
SSCNET Ⅲ/H
SERVO SYSTEM CONTROLLER NETWORK




∗ The LECSS2-T□ cannot be used with the LEC-MR-SETUP221□.

# System Construction

## Absolute encoder compatible *LECYM* Series

MECHATROLINK-Ⅱ type

Provided by the customer

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

Provided by the customer

**External regenerative resistor** p. 274

∗ If an external regenerative resistor is required, it should be provided by the customer. For external regenerative resistor selection, refer to the compatible actuator catalog.

Driver

Main circuit power supply connector (Accessory) p. 274

2nd driver

Provided by the customer

**PLC** (Positioning unit/Motion controller)
Power supply for I/O signal 24 VDC

◎Option

**USB cable** p. 280
Part no.: **LEC-JZ-CVUSB**

**Setup software** p. 280
(SigmaWin+™)
Please download it via our website.

PC

∗ Order the USB cable (Part no.: **LEC-JZ-CVUSB**) separately to use this software.

**Motor cable** p. 277

| Standard cable | Robotic cable |
|---|---|
| LE-CYM-S□A-□ | LE-CYM-R□A-□ |

**Motor cable for lock option** p. 277

| Standard cable | Robotic cable |
|---|---|
| LE-CYB-S□A-□ | LE-CYB-R□A-□ |

Provided by the customer

**Power supply for lock**
24 VDC

**Electric actuator**
Rod type
***LEY* Series**
Guide rod type
***LEYG* Series**

Motor connector (Accessory) p. 274

◎Option

**I/O connector** p. 278
Part no.: **LE-CYNA**
or
**I/O cable** p. 278
Part no.: **LEC-CSNA-1**

**Encoder cable** p. 277

| Standard cable | Robotic cable |
|---|---|
| LE-CYE-S□A | LE-CYE-R□A |

**Cable for safety function device (3 m)** p. 280
Part no.: **LEC-JZ-CVSAF**

## Absolute encoder compatible *LECYU* Series

MECHATROLINK-Ⅲ type

Provided by the customer

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

Provided by the customer

**External regenerative resistor** p. 274

∗ If an external regenerative resistor is required, it should be provided by the customer. For external regenerative resistor selection, refer to the compatible actuator catalog.

Driver

Main circuit power supply connector (Accessory) p. 274

2nd driver

Provided by the customer

**PLC** (Positioning unit/Motion controller)
Power supply for I/O signal 24 VDC

◎Option

**USB cable** p. 280
Part no.: **LEC-JZ-CVUSB**

**Setup software** p. 280
(SigmaWin+™)
Please download it via our website.

PC

∗ Order the USB cable (Part no.: **LEC-JZ-CVUSB**) separately to use this software.

**Motor cable** p. 277

| Standard cable | Robotic cable |
|---|---|
| LE-CYM-S□A-□ | LE-CYM-R□A-□ |

**Motor cable for lock option** p. 277

| Standard cable | Robotic cable |
|---|---|
| LE-CYB-S□A-□ | LE-CYB-R□A-□ |

Provided by the customer

**Power supply for lock**
24 VDC

**Electric actuator**
Rod type
***LEY* Series**
Guide rod type
***LEYG* Series**

Motor connector (Accessory) p. 274

◎Option

**I/O connector** p. 278
Part no.: **LE-CYNA**
or
**I/O cable** p. 278
Part no.: **LEC-CSNA-1**

**Encoder cable** p. 277

| Standard cable | Robotic cable |
|---|---|
| LE-CYE-S□A | LE-CYE-R□A |

**Cable for safety function device (3 m)** p. 280
Part no.: **LEC-JZ-CVSAF**

# SMC Electric Actuator

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

### Ball screw drive
***LEFS* Series**

Clean room compatible

**LEFS Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **16** | 15 | Up to 500 |
| **25** | 30 | Up to 800 |
| **32** | 50 | Up to 1000 |
| **40** | 65 | Up to 1200 |

### Belt drive
***LEFB* Series**

**LEFB Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **16** | 1 | Up to 1000 |
| **25** | 10 | Up to 2000 |
| **32** | 19 | Up to 2000 |

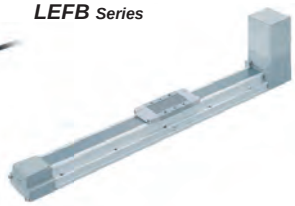
### Ball screw drive
***LEFS* Series**

Clean room compatible

**LEFS Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **25** | 20 | Up to 800 |
| **32** | 45 | Up to 1000 |
| **40** | 60 | Up to 1200 |

### Belt drive
***LEFB* Series**



**LEFB Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **25** | 5 | Up to 2000 |
| **32** | 15 | Up to 2500 |
| **40** | 25 | Up to 3000 |

## High Rigidity Slider Type
AC Servo Motor

### Ball screw drive
***LEJS* Series**

**LEJS Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **40** | 55 | 200 to 1200 |
| **63** | 85 | 300 to 1500 |

### Belt drive
***LEJB* Series**

**LEJB Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **40** | 20 | 200 to 2000 |
| **63** | 30 | 300 to 3000 |

## Guide Rod Slider
Step Motor (Servo/24 VDC)

### Belt drive
***LEL* Series**

**LEL25M Series**
**Sliding bearing**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **25** | 3 | Up to 1000 |

**LEL25L Series**
**Ball bushing bearing**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **25** | 5 | Up to 1000 |

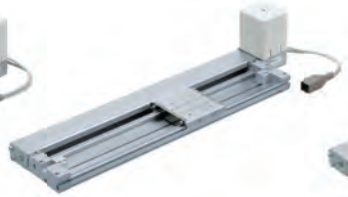
## Low Profile Slider Type
Step Motor (Servo/24 VDC)

### Basic type
***LEMB* Series**

**LEMB Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **25** | 6 | Up to 2000 |
| **32** | 11 | Up to 2000 |

### Cam follower guide type
***LEMC* Series**



**LEMC Series**

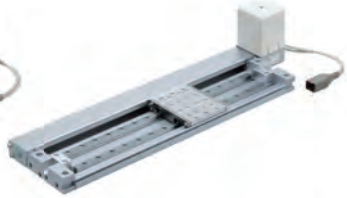
| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **25** | 10 | Up to 2000 |
| **32** | 20 | Up to 2000 |

### Linear guide single axis type
***LEMH* Series**

**LEMH Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **25** | 10 | Up to 1000 |
| **32** | 20 | Up to 1500 |

### Linear guide double axis type
***LEMHT* Series**



**LEMHT Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| **25** | 10 | Up to 1000 |
| **32** | 20 | Up to 1500 |

# SMC Electric Actuator

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

p. 34, 104

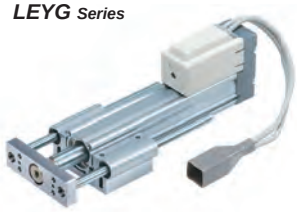
### Basic type
***LEY* Series**

Dust-tight/Water-jet-proof

### In-line motor type
***LEY□D* Series**

Dust-tight/Water-jet-proof

### Guide rod type
***LEYG* Series**



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

**LEY Series**

| Size | Pushing force [N] | Stroke [mm] |
|---|---|---|
| 16 | 141 | Up to 300 |
| 25 | 452 | Up to 400 |
| 32 | 707 | Up to 500 |
| 40 | 1058 | Up to 500 |

**LEYG Series**

| Size | Pushing force [N] | Stroke [mm] |
|---|---|---|
| 16 | 141 | Up to 200 |
| 25 | 452 | Up to 300 |
| 32 | 707 | Up to 300 |
| 40 | 1058 | Up to 300 |

## AC Servo Motor

p. 34, 104

### Basic type
***LEY* Series**

Dust-tight/Water-jet-proof

### In-line motor type
***LEY□D* Series**

Dust-tight/Water-jet-proof

### Guide rod type
***LEYG* Series**

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

**LEY Series**

| Size | Pushing force [N] | Stroke [mm] |
|---|---|---|
| 25 | 485 | Up to 400 |
| 32 | 588 | Up to 500 |
| 63 | 3343 | Up to 800 |

**LEY Series**

| Size | Pushing force [N] | Stroke [mm] |
|---|---|---|
| 25 | 485 | Up to 400 |
| 32 | 736 | Up to 500 |
| 63 | 1910 | Up to 800 |

**LEYG Series**

| Size | Pushing force [N] | Stroke [mm] |
|---|---|---|
| 25 | 485 | Up to 300 |
| 32 | 588 | |

**LEYG Series**

| Size | Pushing force [N] | Stroke [mm] |
|---|---|---|
| 25 | 485 | Up to 300 |
| 32 | 736 | |

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

**LES Series**

### Basic type/R type
***LES□R* Series**

### Symmetrical type/L type
***LES□L* Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| 8 | 1 | 30, 50, 75 |
| 16 | 3 | 30, 50<br>75, 100 |
| 25 | 5 | 30, 50, 75<br>100, 125, 150 |

### In-line motor type/D type
***LES□D* Series**

**LESH Series**

### Basic type/R type
***LESH□R* Series**

### Symmetrical type/L type
***LESH□L* Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| 8 | 2 | 50, 75 |
| 16 | 6 | 50, 100 |
| 25 | 9 | 50, 100<br>150 |

### In-line motor type/D type
***LESH□D* Series**

## Miniature Step Motor (Servo/24 VDC)

### Rod type
***LEPY* Series**

### Slide table type
***LEPS* Series**

**LEPY Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| 6 | 1 | 25, 50, 75 |
| 10 | 2 | |

**LEPS Series**

| Size | Max. work load [kg] | Stroke [mm] |
|---|---|---|
| 6 | 1 | 25 |
| 10 | 2 | 50 |

## Rotary Table Step Motor (Servo/24 VDC)

### Basic type
***LER* Series**

### High-precision type
***LERH* Series**

**LER Series**

| Size | Rotating torque [N·m] | | Max. speed [°/s] | |
|---|---|---|---|---|
| | Basic | High torque | Basic | High torque |
| 10 | 0.2 | 0.3 | 420 | 280 |
| 30 | 0.8 | 1.2 | | |
| 50 | 6.6 | 10 | | |

# SMC Electric Actuator

## Gripper Step Motor (Servo/24 VDC)

**2-finger type**
***LEHZ* Series**

**LEHZ Series**

| Size | Max. gripping force [N] | | Stroke/both sides [mm] |
|---|---|---|---|
| | Basic | Compact | |
| **10** | 14 | 6 | 4 |
| **16** | | 8 | 6 |
| **20** | 40 | 28 | 10 |
| **25** | | | 14 |
| **32** | 130 | — | 22 |
| **40** | 210 | — | 30 |

**2-finger type**
**With dust cover**
***LEHZJ* Series**

**LEHZJ Series**

| Size | Max. gripping force [N] | | Stroke/both sides [mm] |
|---|---|---|---|
| | Basic | Compact | |
| **10** | 14 | 6 | 4 |
| **16** | | 8 | 6 |
| **20** | 40 | 28 | 10 |
| **25** | | | 14 |

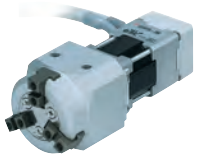
**2-finger type**
**Long stroke**
***LEHF* Series**

**LEHF Series**

| Size | Max. gripping force [N] | Stroke/both sides [mm] |
|---|---|---|
| **10** | 7 | 16 (32) |
| **20** | 28 | 24 (48) |
| **32** | 120 | 32 (64) |
| **40** | 180 | 40 (80) |

∗ ( ): Long stroke

**3-finger type**
***LEHS* Series**



**LEHS Series**

| Size | Max. gripping force [N] | | Stroke/ diameter [mm] |
|---|---|---|---|
| | Basic | Compact | |
| **10** | 5.5 | 3.5 | 4 |
| **20** | 22 | 17 | 6 |
| **32** | 90 | — | 8 |
| **40** | 130 | — | 12 |

# Controller/Driver p. 190

## Single Axis Controller

**Step data input type**
**Servo motor**
**(24 VDC)**
***LECA6* Series**

**Gateway unit**
***LEC-G* Series**

**Programless type**
**Step motor**
**(Servo/24 VDC)**
***LECP1* Series**

**Pulse input type**
**Step motor**
**(Servo/24 VDC)**
***LECPA* Series**

**EtherCAT®/EtherNet/IP™/PROFINET/DeviceNet™/IO-Link direct input type**
***JXC□* Series**

EtherCAT®

EtherNet/IP™

PROFINET®

DeviceNet™

IO-Link

## Multi-Axis Controller

**EtherNet/IP™ direct input type**

**For 3 axes** ***JXC92* Series**

**Parallel I/O/EtherNet/IP™ direct input type**

**For 4 axes** ***JXC73* Series**
***JXC83* Series**

***JXC93* Series**
EtherNet/IP™

# Driver p. 246

## AC Servo Motor Driver

**Pulse input type**
***LECSA* Series**
***LECSB* Series**
- Absolute encoder (LECSB)
- Built-in positioning function (LECSA)

***LECSA* Series** ***LECSB* Series**

**CC-Link**
**direct input type**
***LECSC* Series**

CC-Link

**SSCNET Ⅲ type**
***LECSS* Series**

SSCNETⅢ SERVO SYSTEM CONTROLLER NETWORK

**SSCNET Ⅲ/H type**
***LECSS-T* Series**

SSCNETⅢ/H SERVO SYSTEM CONTROLLER NETWORK

**MECHATROLINK-Ⅱ type**
***LECYM* Series**

MECHATROLINK-Ⅱ

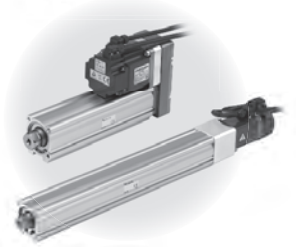
**MECHATROLINK-Ⅲ type**
***LECYU* Series**

MECHATROLINK-Ⅲ

## Electric Actuator/Rod Type *LEY* Series

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





AC Servo Motor

***LECS□* Series**

◎**Rod Type *LEY* Series** Size 25, 32



◎**Rod Type *LEY* Series** Size 63 Dust-tight/Water-jet-proof (IP65 Equivalent) * Option

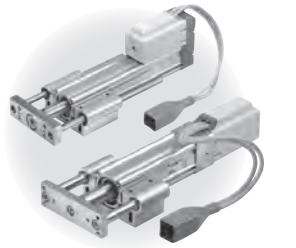


***LECY□* Series**

◎**Rod Type *LEY* Series**

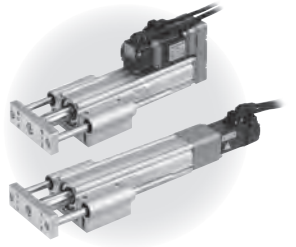


## Electric Actuator/Guide Rod Type *LEYG* Series



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





AC Servo Motor

***LECS□* Series**

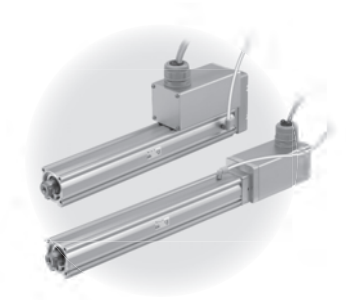
◎**Guide Rod Type *LEYG* Series**



***LECY□* Series**

◎**Guide Rod Type *LEYG* Series**

## Environment



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

**◎Rod Type *LEY-X5* (Made to Order)** Dust-tight/Water-jet-proof (IP65 Equivalent)



AC Servo Motor

***LECS□* Series**

**◎Rod Type *LEY-X5* (Made to Order)** Dust-tight/Water-jet-proof (IP65 Equivalent)



AC Servo Motor

***LECY□* Series**

**◎Rod Type *LEY-X5* (Made to Order)** Dust-tight/Water-jet-proof (IP65 Equivalent)



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



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



**◎3-Axis Step Motor (Servo/24 VDC) Controller**



**◎4-Axis Step Motor (Servo/24 VDC) Controller**



**◎AC Servo Motor Driver**

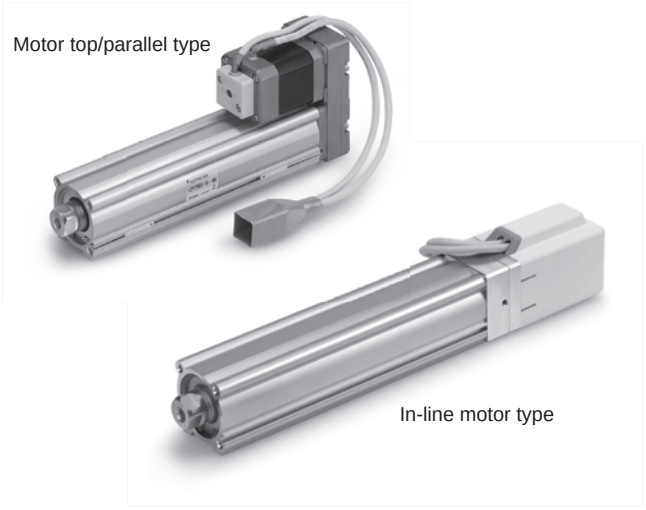


# Rod Type LEY Series

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

p. 55

Motor top/parallel type

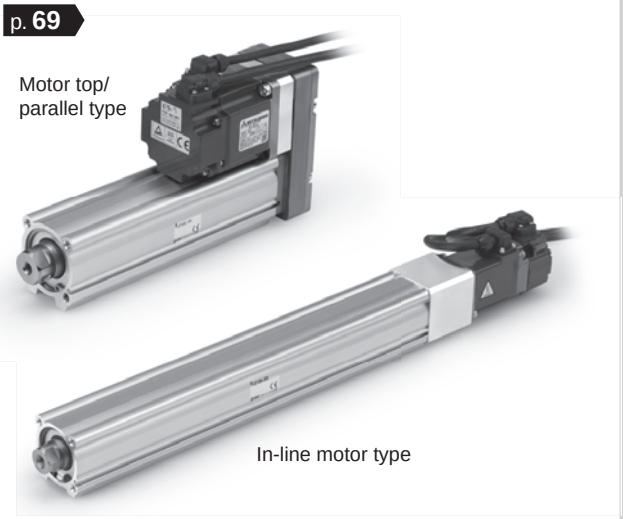


In-line motor type

AC Servo Motor

p. 69

Motor top/
parallel type



In-line motor type

## Environment

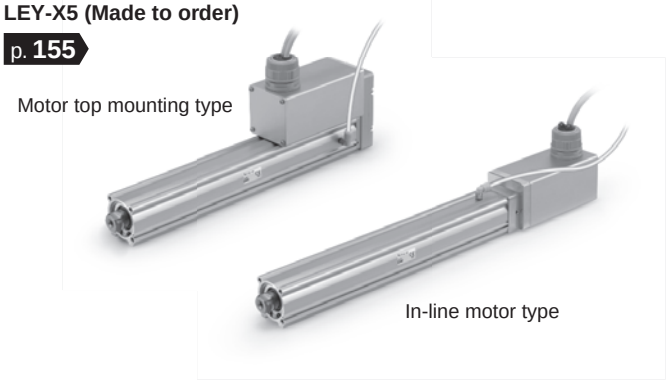
Step Motor (Servo/24 VDC) Servo Motor (24 VDC)

Dust-tight/Water-jet-proof (IP65 Equivalent)

**LEY-X5 (Made to order)**

p. 155

Motor top mounting type



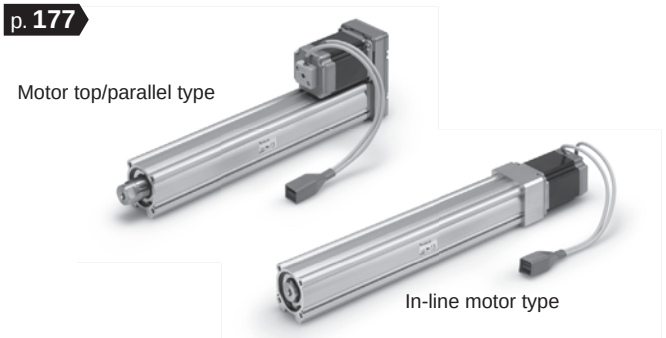
In-line motor type

Secondary Battery Compatible

**25A-LEY**

p. 177

Motor top/parallel type



In-line motor type

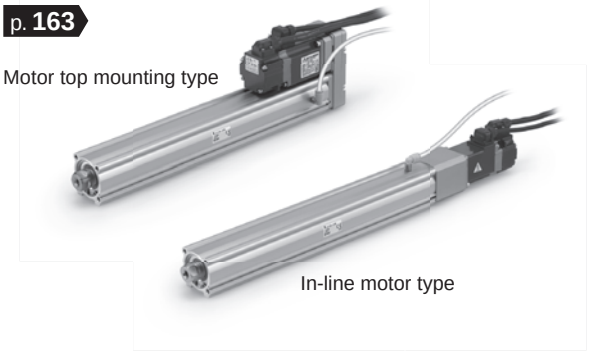
AC Servo Motor

Dust-tight/Water-jet-proof (IP65 Equivalent)

**LEY-X5 (Made to order)**

p. 163

Motor top mounting type



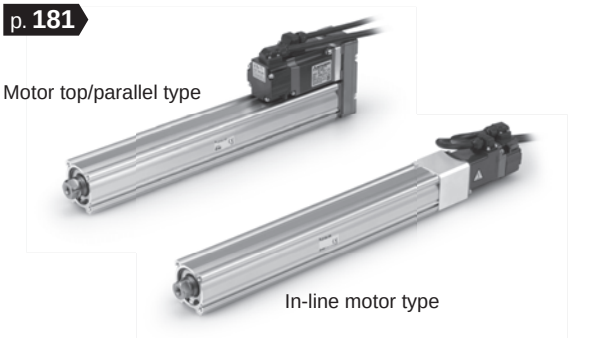
In-line motor type

Secondary Battery Compatible

**25A-LEY**

p. 181

Motor top/parallel type



In-line motor type

**Step Motor/Servo Motor Controller/Driver** p. 200

**AC Servo Motor Driver** p. 246

Electric Actuator/Rod Type Secondary Battery Compatible

*LEY/25A-LEY Series*

# Model Selection

LEY Series ▶p. 55 25A-LEY Series ▶p. 177

## Selection Procedure

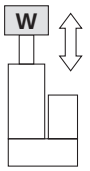
### Positioning Control Selection Procedure

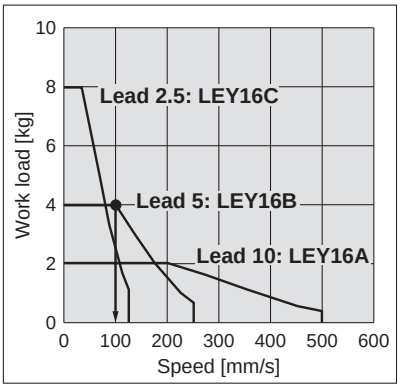
**Step 1** Check the work load–speed. (Vertical transfer) → **Step 2** Check the cycle time.

### Selection Example

**Operating conditions**

- Workpiece mass: 4 [kg]
- Speed: 100 [mm/s]
- Acceleration/Deceleration: 3000 [mm/s$^2$]
- Stroke: 200 [mm]
- Workpiece mounting condition: Vertical upward downward transfer




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

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

Select the target model based on the workpiece mass and speed with reference to the <Speed–Vertical work load graph>.

Selection example) The **LEY16B** is temporarily selected based on the graph shown on the right side.

* It is necessary to mount a guide outside the actuator when used for horizontal transfer. When selecting the target model, refer to the horizontal work load in the specifications on page 59 and the precautions.

**Step 2** **Check the cycle time.**

Calculate the cycle time using the following calculation method.

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

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

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

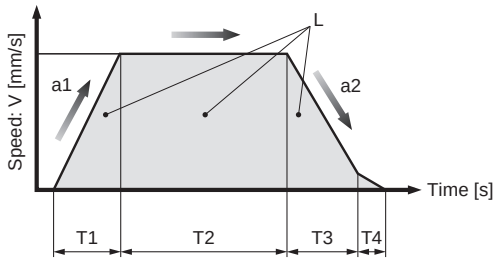
$$T1 = V/a1 \text{ [s]} \qquad T3 = V/a2 \text{ [s]}$$

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

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

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

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




L : Stroke [mm] ··· (Operating condition)
V : Speed [mm/s] ··· (Operating condition)
a1: Acceleration [mm/s$^2$] ··· (Operating condition)
a2: Deceleration [mm/s$^2$] ··· (Operating condition)

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

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 [s]**

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

## Selection Procedure

### Pushing Control Selection Procedure

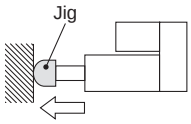
**Step 1** Check the duty ratio. → **Step 2** Check the pushing force. → **Step 3** Check the lateral load on the rod end.

∗ The duty ratio is a ratio of the operation time in one cycle.

### Selection Example

**Operating conditions**

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




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

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

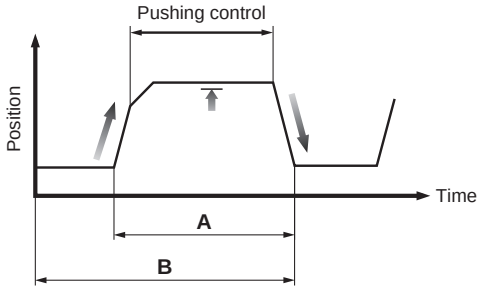
Selection example)
Based on the table below,
- Duty ratio: 20 [%]

Therefore, 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 [minute] |
|---|---|---|
| 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.



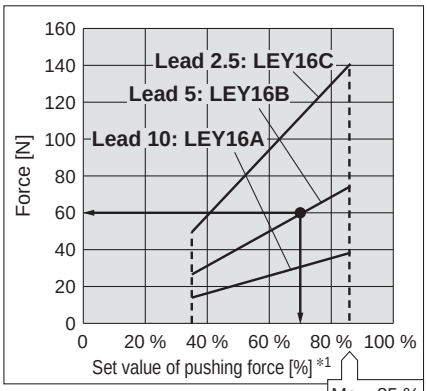

**Duty ratio = A/B x 100 [%]**

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

Select the target model based on the set value of pushing force and force with reference to the <Force conversion 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.




**<Force conversion graph>**
**(LEY16/Step motor)**

∗1 Set values for the controller.

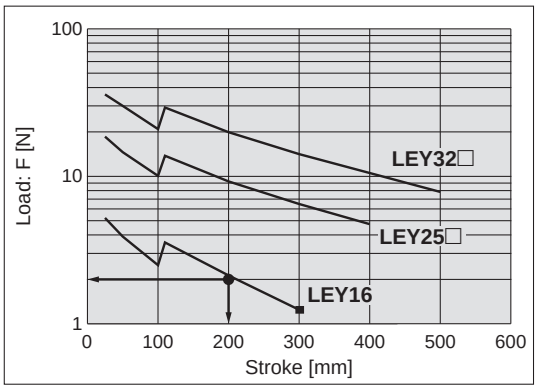
**Step 3** **Check the lateral load on the rod end.**
**<Graph of allowable lateral load on the rod end>**

Confirm the allowable lateral load on the rod end of the actuator: 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 weight: 0.2 [kg] ≈ 2 [N]
- Product stroke: 200 [mm]

Therefore, the lateral load on the rod end is in the allowable range.

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



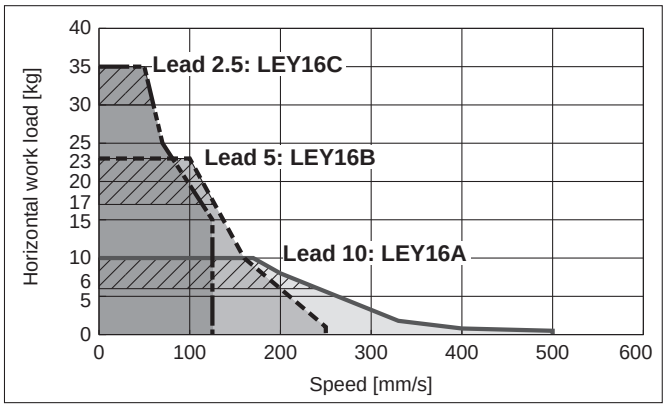

**<Graph of allowable lateral load on the rod end>**

Refer to page 38 for the LECPA, JXC□2/3 and page 39 for the LECA6.

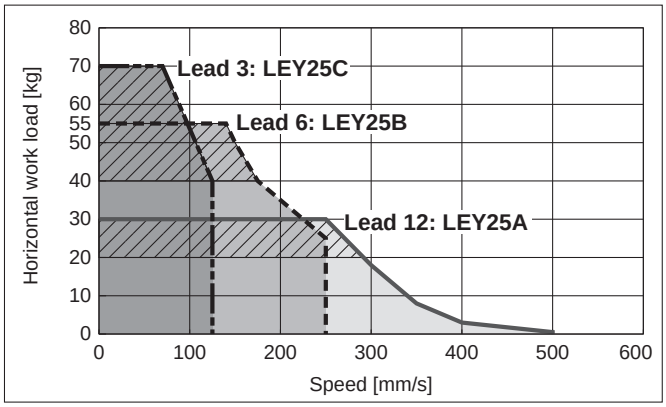
## Speed–Work Load Graph (Guide)
## For Step Motor (Servo/24 VDC) LECP1, LECPMJ, JXC□1

### Horizontal

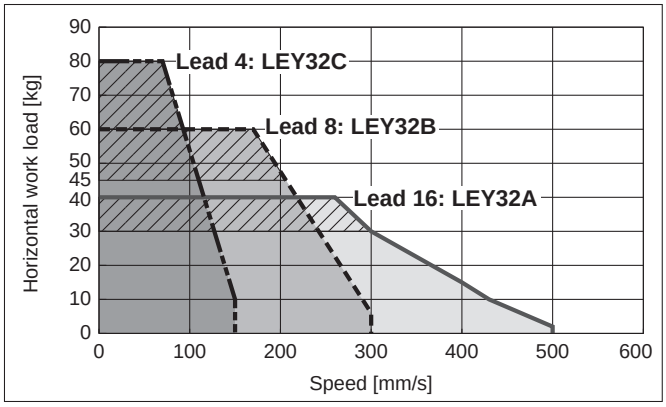
#### LEY16□



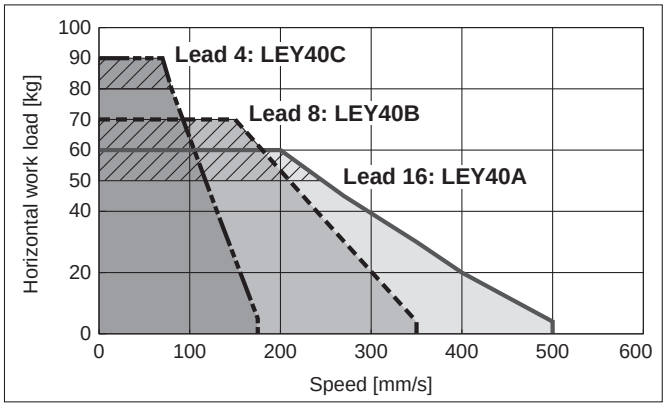

#### LEY25□




#### LEY32□

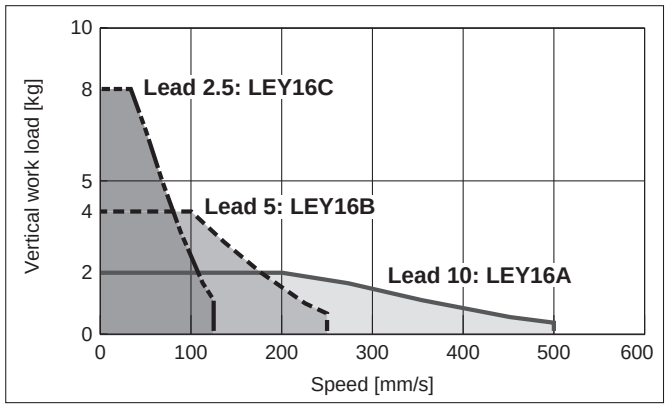



#### LEY40□

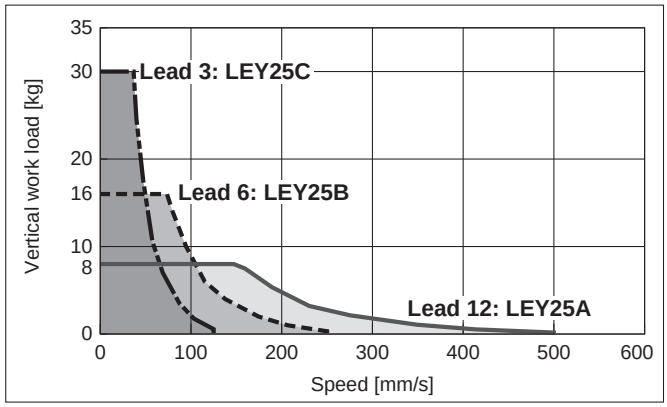



### Vertical

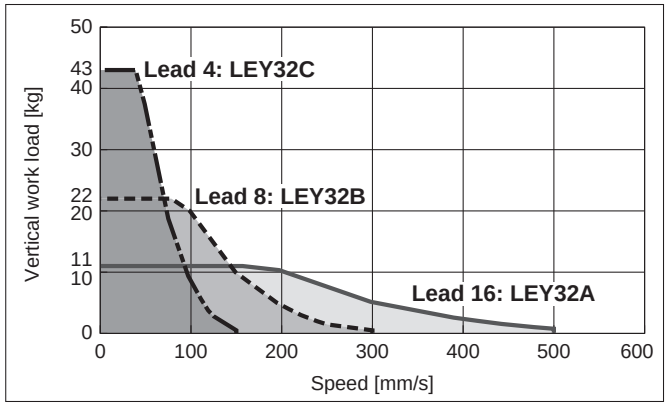
#### LEY16□



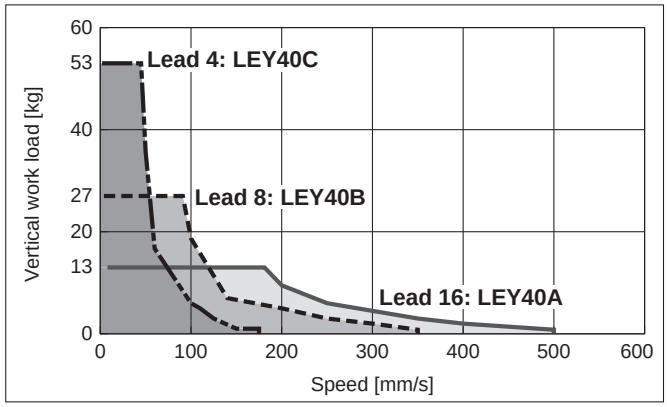

#### LEY25□




#### LEY32□




#### LEY40□

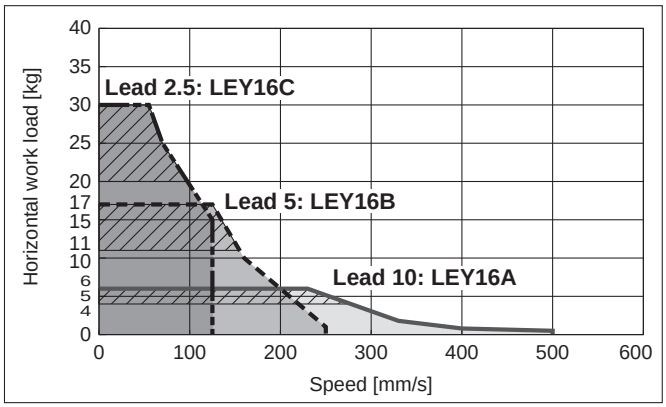


Refer to page 37 for the LECP1, LECPMJ, JXC□1 and page 39 for the LECA6.

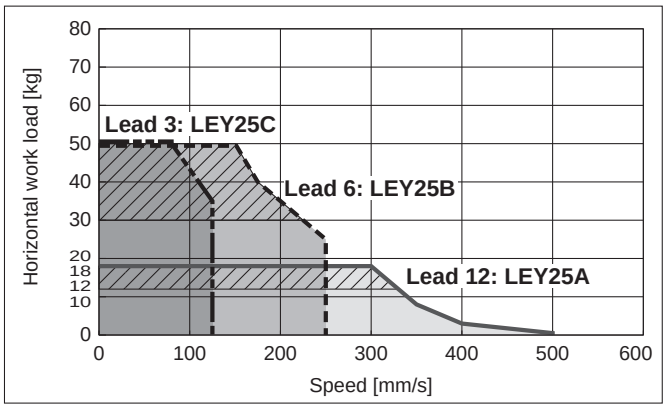
## Speed–Work Load Graph (Guide)
## For Step Motor (Servo/24 VDC) LECPA, JXC□2 3

### Horizontal

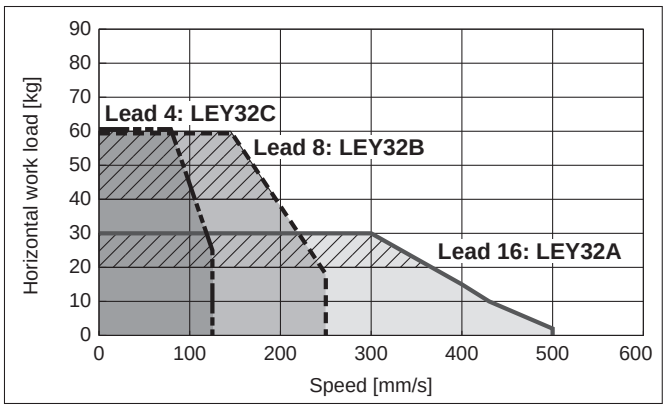
#### LEY16□



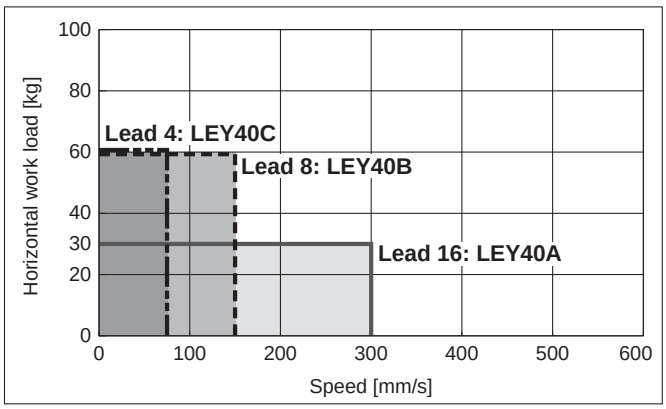

#### LEY25□




#### LEY32□

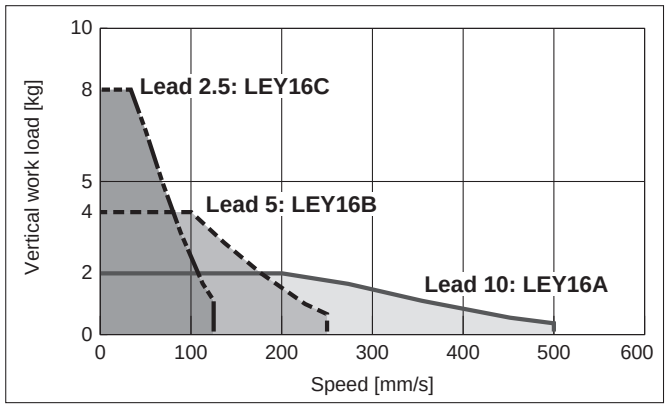



#### LEY40□

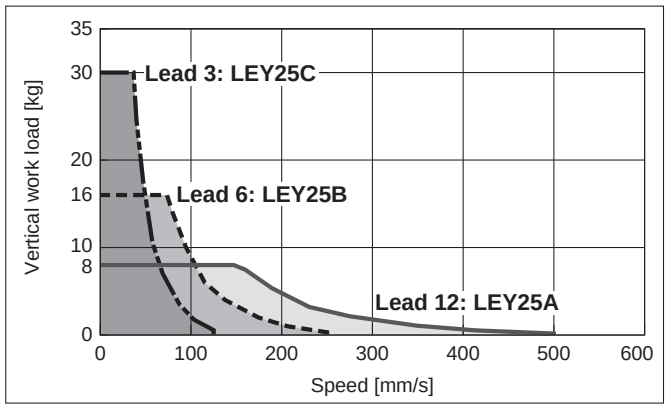



### Vertical

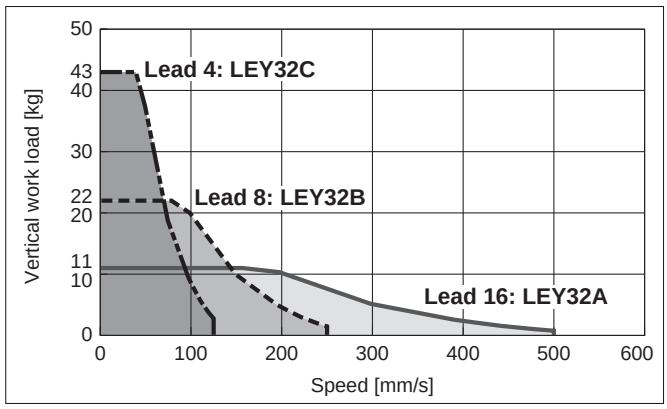
#### LEY16□



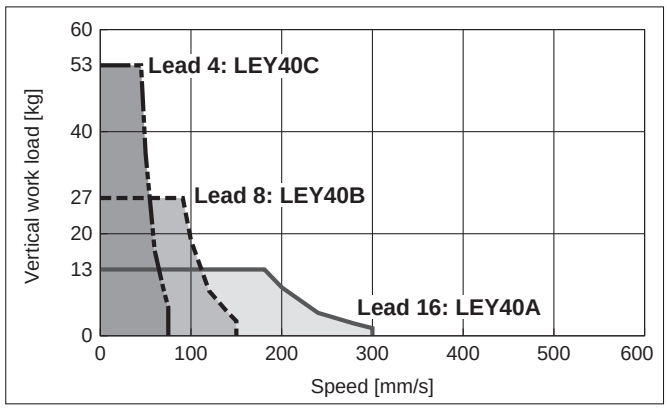

#### LEY25□




#### LEY32□




#### LEY40□

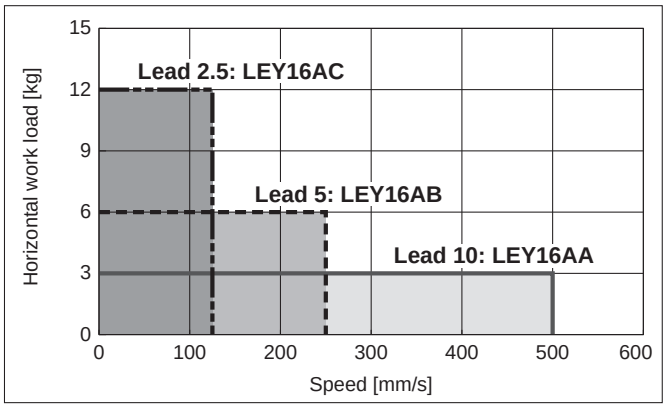


**Refer to page 37 for the LECP1, LECPMJ, JXC□1 and page 39 for the LECPA, JXC□$^{2}_{3}$.**

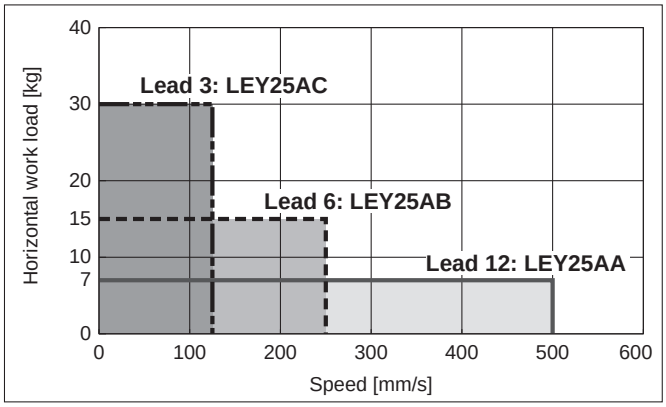
## Speed–Work Load Graph (Guide) For Servo Motor (24 VDC) LECA6

### Horizontal

#### LEY16□A

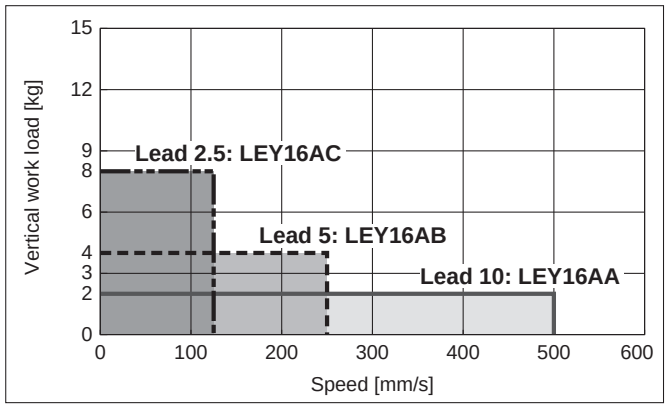



#### LEY25□A

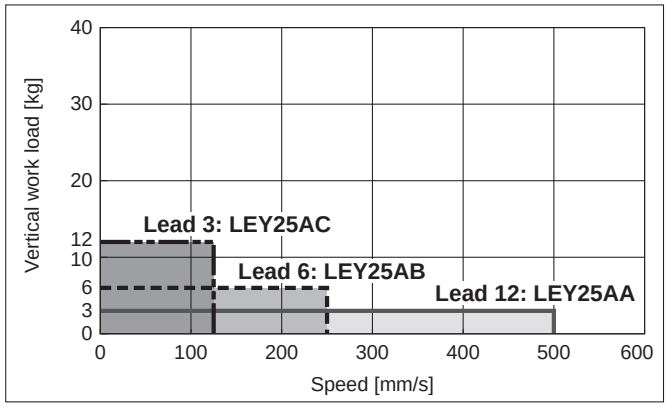



### Vertical

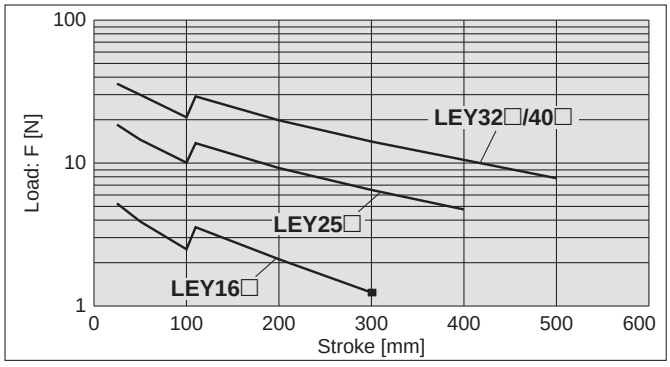
#### LEY16□A



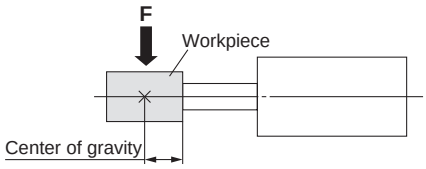

#### LEY25□A




## Graph of Allowable Lateral Load on the Rod End (Guide)

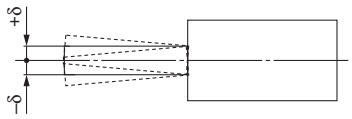



**[Stroke] = [Product stroke] + [Distance from the rod end to the centre of gravity of the workpiece]**

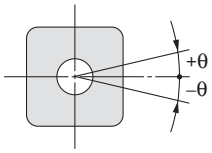



## Rod Displacement: δ [mm]

| Size \ Stroke | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **16** | ±0.4 | ±0.5 | ±0.9 | ±0.8 | ±1.1 | ±1.3 | ±1.5 | — | — | — | — |
| **25** | ±0.3 | ±0.4 | ±0.7 | ±0.7 | ±0.9 | ±1.1 | ±1.3 | ±1.5 | ±1.7 | — | — |
| **32, 40** | ±0.3 | ±0.4 | ±0.7 | ±0.6 | ±0.8 | ±1.0 | ±1.1 | ±1.3 | ±1.5 | ±1.7 | ±1.8 |




## Non-rotating Accuracy of Rod



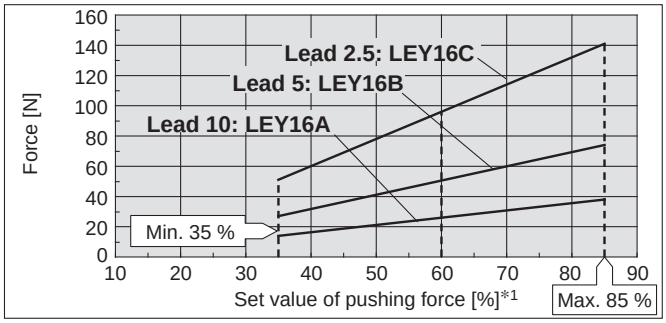

| Size | Non-rotating accuracy θ |
|---|---|
| **16** | ±1.1° |
| **25** | ±0.8° |
| **32** | ±0.7° |
| **40** | |

* Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod.
This may cause the deformation of the non-rotating guide, abnormal auto switch responses, play in the internal guide, or an increase in the sliding resistance.

## Force Conversion Graph (Guide)

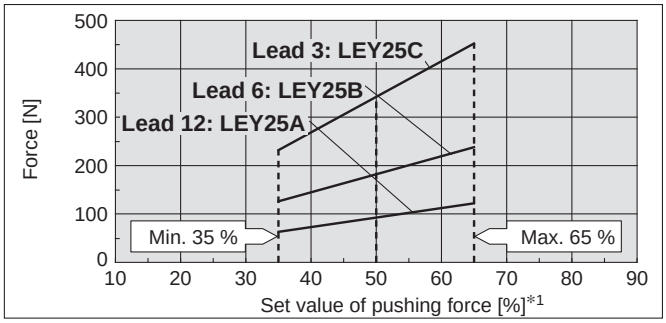
### Step Motor (Servo/24 VDC)

#### LEY16



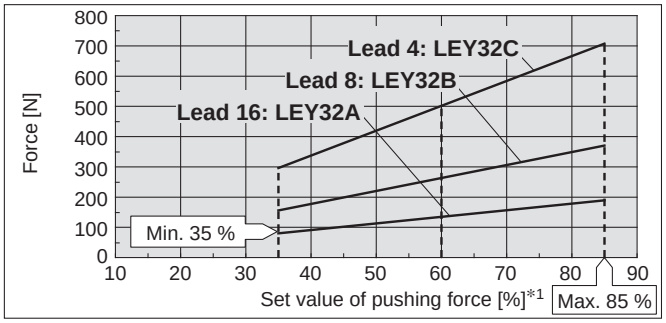

| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **25 °C or less** | 85 or less | 100 | — |
| **40 °C** | 40 or less | 100 | — |
| | 50 | 70 | 12 |
| | 70 | 20 | 1.3 |
| | 85 | 15 | 0.8 |

#### LEY25



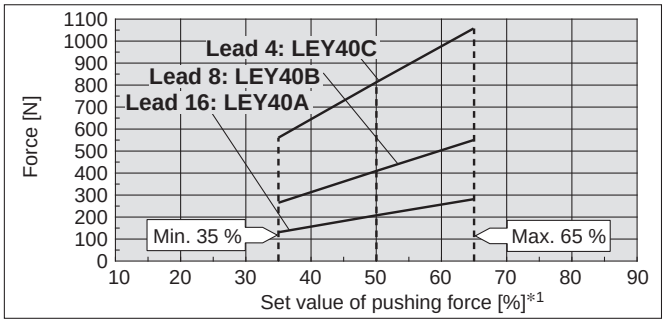

| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **40 °C or less** | 65 or less | 100 | — |

#### LEY32




| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **25 °C or less** | 85 or less | 100 | — |
| **40 °C** | 65 or less | 100 | — |
| | 85 | 50 | 15 |

#### LEY40

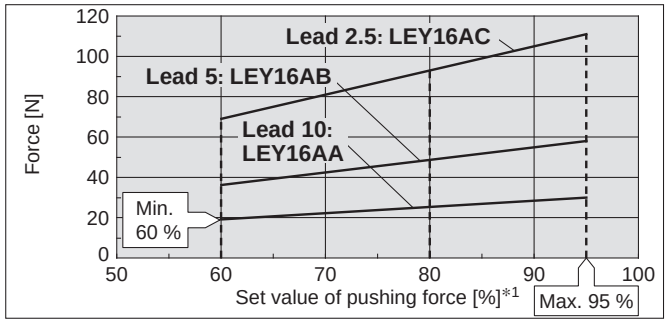



| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **40 °C or less** | 65 or less | 100 | — |

*1 Set values for the controller

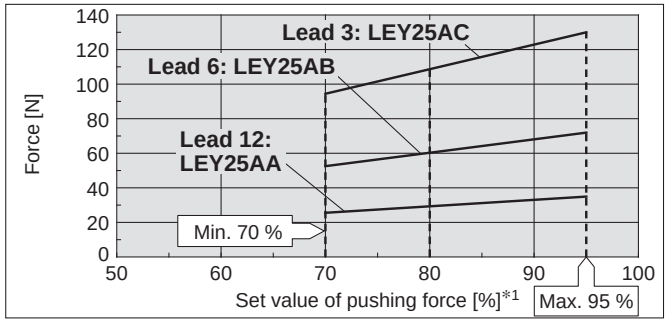
### Servo Motor (24 VDC)

#### LEY16□A




| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **40 °C or less** | 95 or less | 100 | — |

#### LEY25□A




| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **40 °C or less** | 95 or less | 100 | — |

#### <Limit Values for Pushing Force and Trigger Level in Relation to Pushing Speed>

**Without Load**

| Model | Lead | Pushing speed [mm/s] | Pushing force (Setting input value) |
|---|---|---|---|
| **LEY16** | A/B/C | 21 to 50 | 60 to 85 % |
| **LEY25** | A/B/C | 21 to 35 | 50 to 65 % |
| **LEY32** | A | 24 to 30 | 60 to 85 % |
| | B/C | 21 to 30 | |
| **LEY40** | A | 24 to 30 | 50 to 65 % |
| | B/C | 21 to 30 | |

| Model | Lead | Pushing speed [mm/s] | Pushing force (Setting input value) |
|---|---|---|---|
| **LEY16□A** | A/B/C | 21 to 50 | 80 to 95 % |
| **LEY25□A** | A/B/C | 21 to 35 | 80 to 95 % |

There is a limit to the pushing force in relation to the pushing speed. If the product is operated outside of the range (low pushing force), the completion signal [INP] may be output before the pushing operation has been completed (during the moving operation). If operating with the pushing speed below the min. speed, please check for operating problems before using the product.

#### <Set Values for Vertical Upward Transfer Pushing Operations>

For vertical loads (upward), set the pushing force to the max. value shown below and operate at the work load or less.

| Model | LEY16□ | | | LEY25□ | | | LEY32□ | | | LEY40□ | | | LEY16□A | | | LEY25□A | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C |
| Work load [kg] | 1 | 1.5 | 3 | 2.5 | 5 | 10 | 4.5 | 9 | 18 | 7 | 14 | 28 | 1 | 1.5 | 3 | 1.2 | 2.5 | 5 |
| Pushing force | 85 % | | | 65 % | | | 85 % | | | 65 % | | | 95 % | | | 95 % | | |

# Model Selection

Size 25, 32, 63

LEY Series ▶p. 69, 79 LECY□ Series ▶p. 87
LEY-X5 Series ▶p. 163 25A-LEY Series ▶p. 181

## Selection Procedure

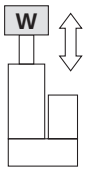
### Positioning Control Selection Procedure

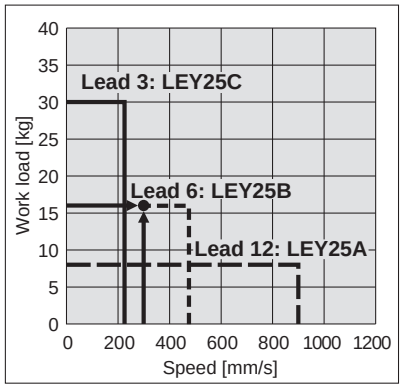
**Step 1** Check the work load–speed. (Vertical transfer) → **Step 2** Check the cycle time.

### Selection Example

**Operating conditions**

- Workpiece mass: 16 [kg]
- Speed: 300 [mm/s]
- Acceleration/Deceleration: 5000 [mm/s²]
- Stroke: 300 [mm]
- Workpiece mounting condition: Vertical upward downward transfer




**<Speed–Vertical work load graph> (LEY25)**

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

Select the target model based on the workpiece mass and speed with reference to the <Speed–Vertical work load graph>.

Selection example) The **LEY25B** is temporarily selected based on the graph shown on the right side.

* It is necessary to mount a guide outside the actuator when used for horizontal transfer. When selecting the target model, refer to the horizontal work load in the specifications on pages 71, 72, 80, 89, 90, and 164 and the precautions.

The regeneration option may be necessary. Refer to pages 43 and 44 for "Required Conditions for Regeneration Option."

**Step 2** **Check the cycle time.**

Calculate the cycle time using the following calculation method.

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

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

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

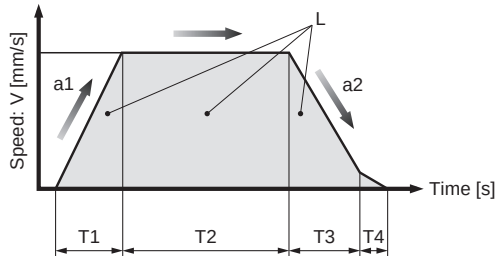
$$T1 = V/a1 \ [s] \qquad T3 = V/a2 \ [s]$$

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

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

- T4: Settling time varies depending on the motor type and load. The value below is recommended.

$$T4 = 0.05 \ [s]$$




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

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

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

$T1 = V/a1 = 300/5000 = 0.06$ [s], $T3 = V/a2 = 300/5000 = 0.06$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{300 - 0.5 \cdot 300 \cdot (0.06 + 0.06)}{300} = 0.94 \ [s]$$

$T4 = 0.05$ [s]

Therefore, the cycle time can be obtained as follows.
$T = T1 + T2 + T3 + T4 = 0.06 + 0.94 + 0.06 + 0.05 =$ **1.11 [s]**

**Based on the above calculation result, the LEY25S2B-300 is selected.**

## Selection Procedure

### Force Control Selection Procedure

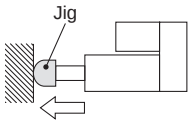
**Step 1** Check the duty ratio. → **Step 2** Check the force. → **Step 3** Check the lateral load on the rod end.

∗ The duty ratio is a ratio of the operation time in one cycle.

### Selection Example

**Operating conditions**

- Mounting condition: Horizontal (pushing)
- Jig weight: 0.5 [kg]
- Force: 255 [N]
- Duty ratio: 60 [%]
- Speed: 100 [mm/s]
- Stroke: 300 [mm]




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

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

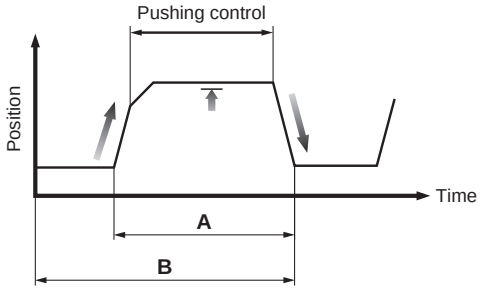
Selection example)
Based on the table below,
- Duty ratio: 60 [%]

Therefore, Torque limit/Command value will be 30 [%].

**<Conversion table of force–duty ratio>**
**(LEY25/AC Servo motor)**

| Torque limit/ Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 25 or less | 100 | — |
| 30 | 60 | 1.5 |

∗ [Torque limit/Command value [%]] is the set value for the driver.
∗ [Continuous pushing time] is the time that the actuator can continuously keep pushing.



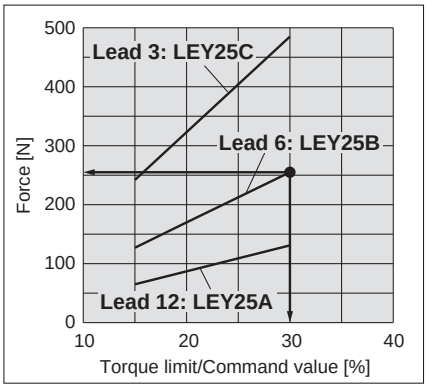

**Duty ratio = A/B x 100 [%]**

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

Select the target model based on the torque limit/command value and pushing force with reference to the <Force conversion graph>.

Selection example)
Based on the graph shown on the right side,
- Torque limit/Command value: 30 [%]
- Force: 255 [N]

Therefore, the **LEY25B** is temporarily selected.



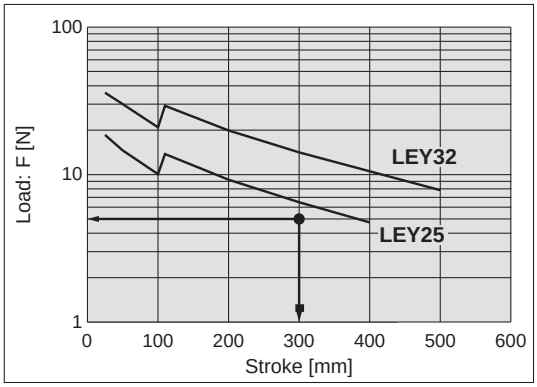

**<Force conversion graph>**
**(LEY25)**

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

Confirm the allowable lateral load on the rod end of the actuator: LEY25B, 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 weight: 0.5 [kg] ≈ 5 [N]
- Product stroke: 300 [mm]

Therefore, the lateral load on the rod end is in the allowable range.

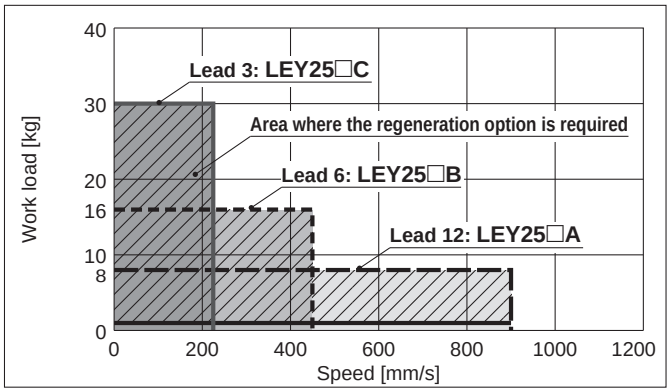



**<Graph of allowable lateral load on the rod end>**

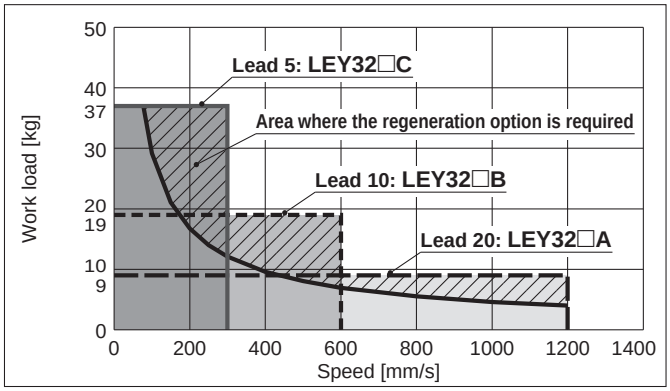
**Based on the above calculation result, the LEY25S2B-300 is selected.**

## Speed–Vertical Work Load Graph/Required Conditions for “Regeneration Option”

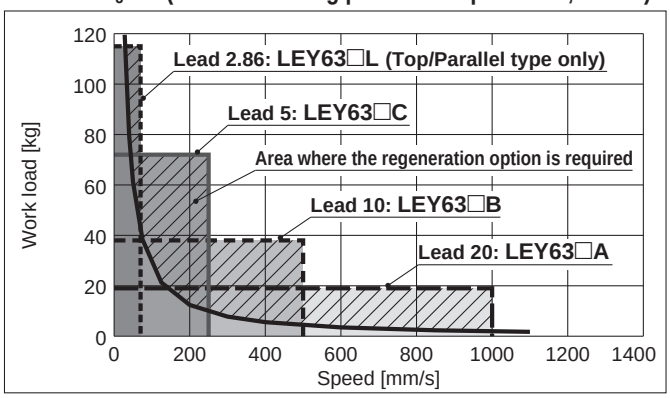
### LEY25□S$^{2}_{6}$/T6 (Motor mounting position: Top/Parallel, In-line)




### LEY32□S$^{3}_{7}$/T7 (Motor mounting position: Top/Parallel)




### LEY63□S$^{4}_{8}$/T8 (Motor mounting position: Top/Parallel, In-line)



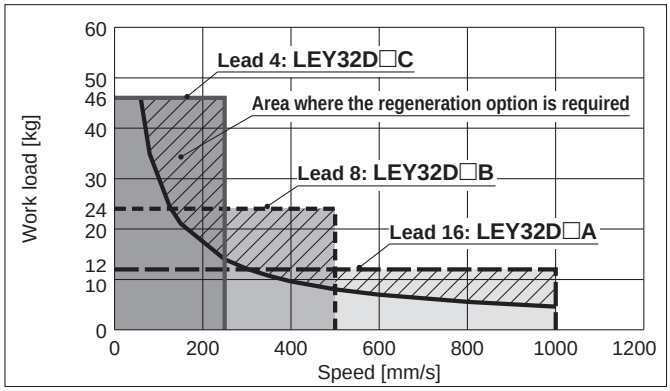

### Required conditions for “Regeneration option”

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

### “Regeneration Option” Models

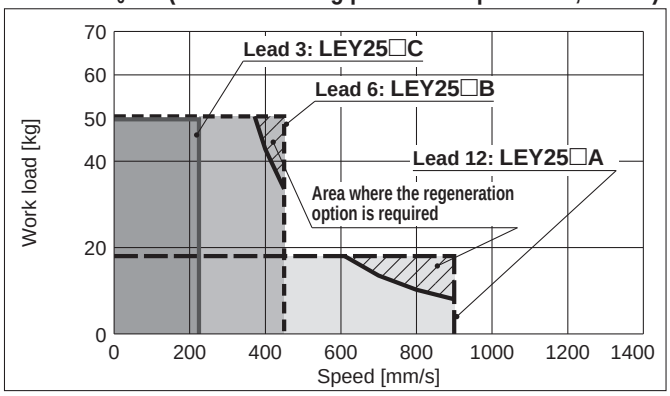
| Size | Model |
|---|---|
| **LEY25□** | LEC-MR-RB-032 |
| **LEY32□** | LEC-MR-RB-032 |
| **LEY63□** | LEC-MR-RB-12 |

### LEY32DS$^{3}_{7}$/T7 (Motor mounting position: In-line)



## Speed–Horizontal Work Load Graph/Required Conditions for "Regeneration Option"

### LEY25□S$^{2}_{6}$/T6 (Motor mounting position: Top/Parallel, In-line)



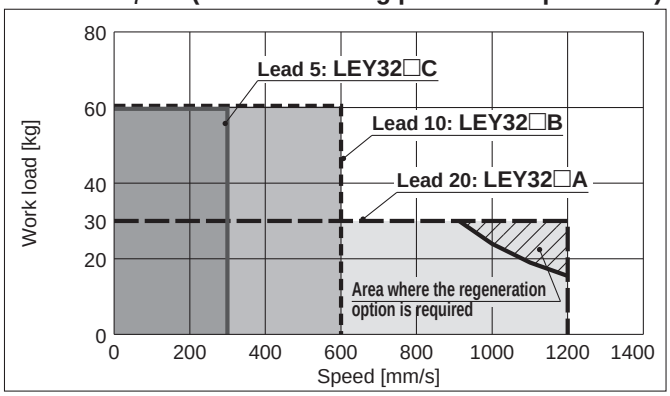

### Required conditions for "Regeneration option"

∗ Regeneration option is required when using product above regeneration line in graph. (Order separately.)

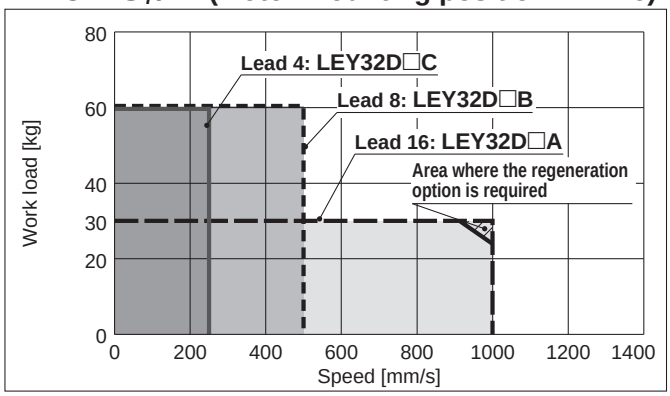
### "Regeneration Option" Models

| Size | Model |
|---|---|
| **LEY25□** | LEC-MR-RB-032 |
| **LEY32□** | LEC-MR-RB-032 |
| **LEY63□** | — |

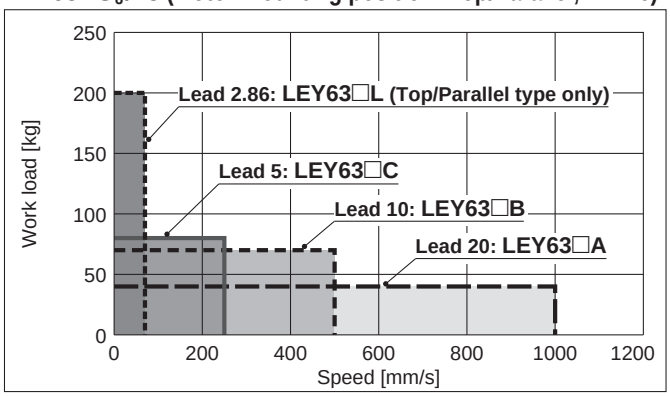
### LEY32□S$^{3}_{7}$/T7 (Motor mounting position: Top/Parallel)




### LEY32DS$^{3}_{7}$/T7 (Motor mounting position: In-line)




### LEY63□S$^{4}_{8}$/T8 (Motor mounting position: Top/Parallel, In-line)




### Allowable Stroke Speed

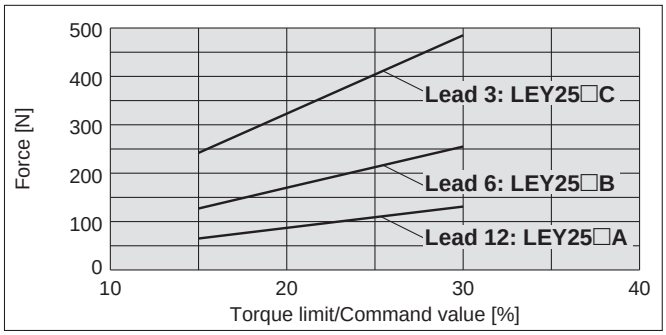
[mm/s]

| Model | AC servo motor | Lead Symbol | Lead [mm] | Stroke [mm] 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LEY25□S$^{2}_{6}$/T6** Motor mounting position: Top/Parallel, In-line | 100 W /□40 | **A** | 12 | 900 | | | | | | | 600 | | — | — | — | | |
| | | **B** | 6 | 450 | | | | | | | 300 | | — | — | — | | |
| | | **C** | 3 | 225 | | | | | | | 150 | | — | — | — | | |
| | | (Motor rotation speed) | | (4500 rpm) | | | | | | | (3000 rpm) | | — | — | — | | |
| **LEY32□S$^{3}_{7}$/T7** Motor mounting position: Top/Parallel | 200 W /□60 | **A** | 20 | 1200 | | | | | | | | | 800 | | — | | |
| | | **B** | 10 | 600 | | | | | | | | | 400 | | — | | |
| | | **C** | 5 | 300 | | | | | | | | | 200 | | — | | |
| | | (Motor rotation speed) | | (3600 rpm) | | | | | | | | | (2400 rpm) | | — | | |
| **LEY32DS$^{3}_{7}$/T7** Motor mounting position: In-line | 200 W /□60 | **A** | 16 | 1000 | | | | | | | | | 640 | | — | | |
| | | **B** | 8 | 500 | | | | | | | | | 320 | | — | | |
| | | **C** | 4 | 250 | | | | | | | | | 160 | | — | | |
| | | (Motor rotation speed) | | (3750 rpm) | | | | | | | | | (2400 rpm) | | — | | |
| **LEY63□S$^{4}_{8}$/T8** Motor mounting position: Top/Parallel, In-line | 400 W /□60 | **A** | 20 | 1000 | | | | | | | | | | | 800 | 600 | 500 |
| | | **B** | 10 | 500 | | | | | | | | | | | 400 | 300 | 250 |
| | | **C** | 5 | 250 | | | | | | | | | | | 200 | 150 | 125 |
| | | (Motor rotation speed) | | (3000 rpm) | | | | | | | | | | | (2400 rpm) | (1800 rpm) | (1500 rpm) |
| | | **L**∗1 | 2.86 | 70 | | | | | | | | | | | | | |
| | | (Motor rotation speed) | | (1470 rpm) | | | | | | | | | | | | | |

∗1 Top/Parallel type only

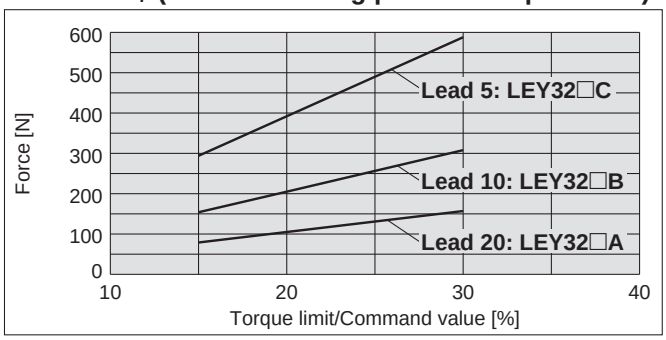
## Force Conversion Graph (Guide)
## For LECSA, LECSB, LECSC, LECSS

### LEY25□S$^{2}_{6}$ (Motor mounting position: Top/Parallel, In-line)



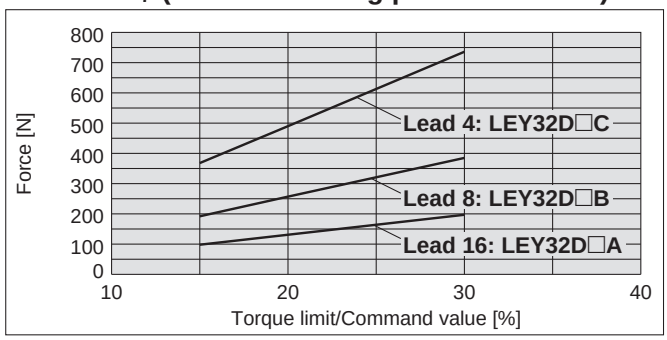

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 25 or less | 100 | — |
| 30 | 60 | 1.5 |

### LEY32□S$^{3}_{7}$ (Motor mounting position: Top/Parallel)



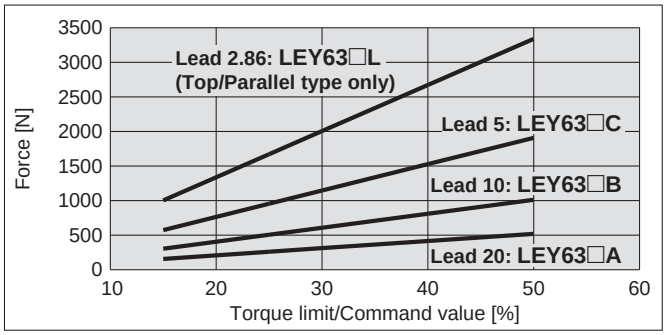

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 25 or less | 100 | — |
| 30 | 60 | 1.5 |

### LEY32DS$^{3}_{7}$ (Motor mounting position: In-line)




| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 25 or less | 100 | — |
| 30 | 60 | 1.5 |

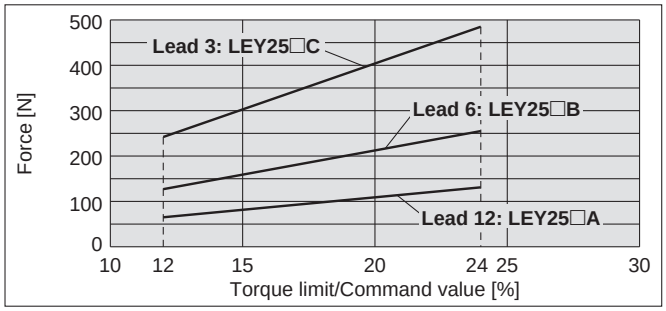
### LEY63□S$^{4}_{8}$ (Motor mounting position: Top/Parallel, In-line)




| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 25 or less | 100 | — |
| 30 | 60 | 1.5 |
| 40 | 30 | 0.5 |
| 50 | 20 | 0.16 |

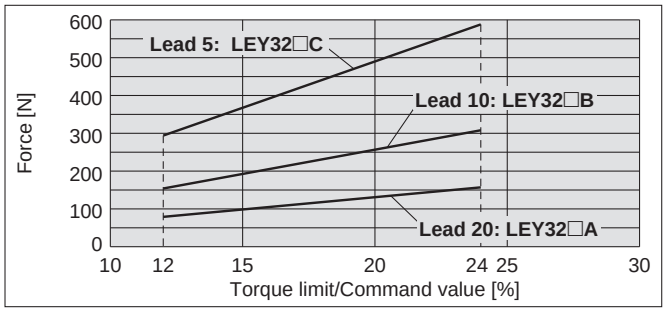
## Force Conversion Graph (Guide)
## For LECSS-T

### LEY25□T6 (Motor mounting position: Top/Parallel, In-line)



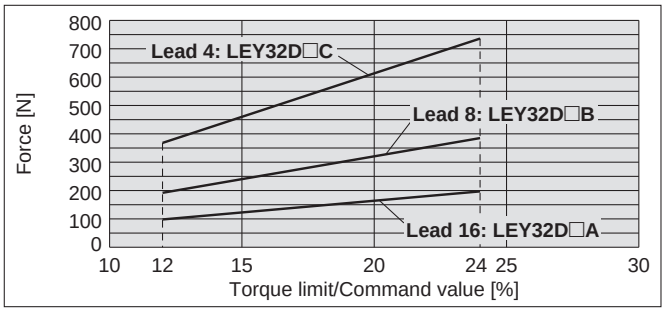

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 20 or less | 100 | — |
| 24 | 60 | 1.5 |

### LEY32□T7 (Motor mounting position: Top/Parallel)



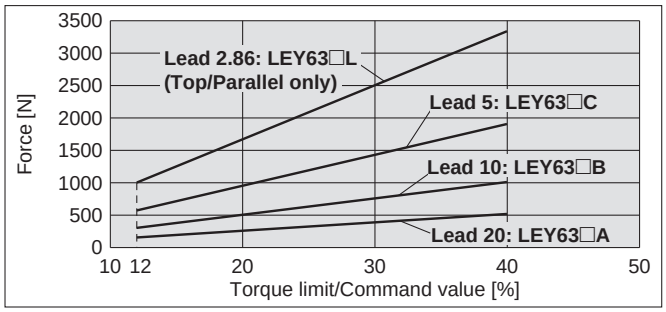

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 20 or less | 100 | — |
| 24 | 60 | 1.5 |

### LEY32DT7 (Motor mounting position: In-line)



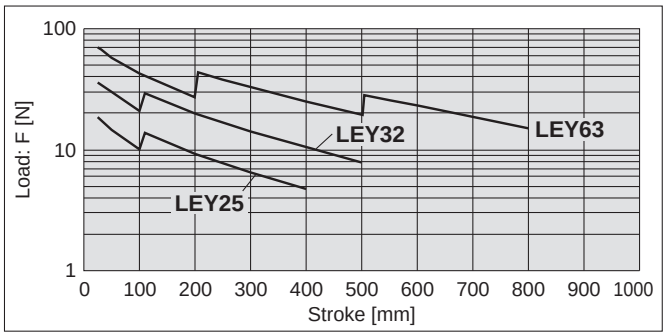

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 20 or less | 100 | — |
| 24 | 60 | 1.5 |

### LEY63□T8 (Motor mounting position: Top/Parallel, In-line)

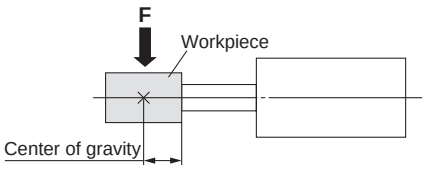



| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 20 or less | 100 | — |
| 24 | 60 | 1.5 |
| 32 | 30 | 0.5 |
| 40 | 20 | 0.16 |

## Graph of Allowable Lateral Load on the Rod End (Guide)

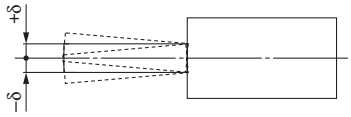



**[Stroke] = [Product stroke] + [Distance from the rod end to the centre of gravity of the workpiece]**

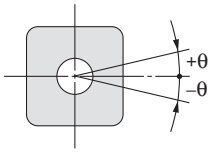



## Rod Displacement: δ [mm]

| Size \ Stroke | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **25** | ±0.3 | ±0.4 | ±0.7 | ±0.7 | ±0.9 | ±1.1 | ±1.3 | ±1.5 | ±1.7 | — | — | — | — | — |
| **32** | ±0.3 | ±0.4 | ±0.7 | ±0.6 | ±0.8 | ±1.0 | ±1.1 | ±1.3 | ±1.5 | ±1.7 | ±1.8 | — | — | — |
| **63** | — | ±0.5 | ±0.7 | ±0.9 | ±1.2 | ±1.1 | ±1.3 | ±1.5 | ±1.7 | ±1.9 | ±2.1 | ±1.7 | ±2.0 | ±2.2 |




## Non-rotating Accuracy of Rod




| Size | Non-rotating accuracy θ |
|---|---|
| **25** | ±0.8° |
| **32** | ±0.7° |
| **63** | ±0.6° |

* Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod.
This may cause the deformation of the non-rotating guide, abnormal auto switch responses, play in the internal guide, or an increase in the sliding resistance.

# Model Selection

Size **25, 32, 63**

**LEY Series** ▶p. **87** **LECS□ Series** ▶p. **69, 79**
**LEY-X5 Series** ▶p. **169** **25A-LEY Series** ▶p. **183**

## Selection Procedure

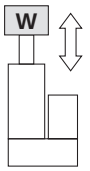
### Positioning Control Selection Procedure

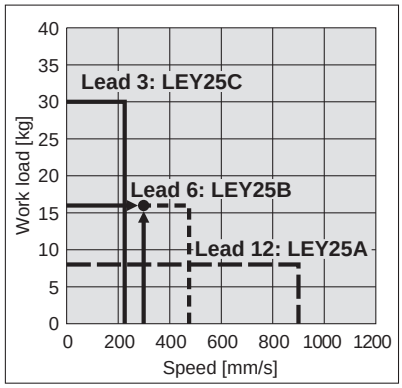
**Step 1** Check the work load–speed. (Vertical transfer) → **Step 2** Check the cycle time.

### Selection Example

**Operating conditions**

- Workpiece mass: 16 [kg]
- Speed: 300 [mm/s]
- Acceleration/Deceleration: 5000 [mm/s²]
- Stroke: 300 [mm]
- Workpiece mounting condition: Vertical upward / downward transfer




**<Speed–Vertical work load graph> (LEY25)**

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

Select the target model based on the workpiece mass and speed with reference to the <Speed–Vertical work load graph>.

Selection example) The **LEY25B** is temporarily selected based on the graph shown on the right side.

* It is necessary to mount a guide outside the actuator when used for horizontal transfer. When selecting the target model, refer to the horizontal work load in the specifications on pages 89 and 90 and the precautions.

The regenerative resistor may be necessary. Refer to pages 50 and 51 for "Conditions for Regenerative Resistor (Guide)."

**Step 2** **Check the cycle time.**

Calculate the cycle time using the following calculation method.

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

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

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

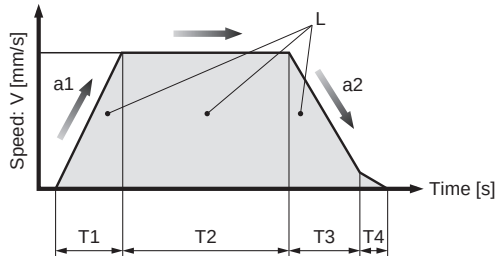
$$T1 = V/a1 \ [s] \qquad T3 = V/a2 \ [s]$$

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

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

- T4: Settling time varies depending on the motor type and load. The value below is recommended.

$$T4 = 0.05 \ [s]$$




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

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

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

T1 = V/a1 = 300/5000 = 0.06 [s], T3 = V/a2 = 300/5000 = 0.06 [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{300 - 0.5 \cdot 300 \cdot (0.06 + 0.06)}{300} = 0.94 \ [s]$$

T4 = 0.05 [s]

Therefore, the cycle time can be obtained as follows.
T = T1 + T2 + T3 + T4 = 0.06 + 0.94 + 0.06 + 0.05 = **1.11 [s]**

**Based on the above calculation result, the LEY25V6B-300 is selected.**

## Selection Procedure

### Pushing Control Selection Procedure

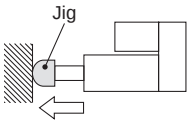
**Step 1** Check the duty ratio. → **Step 2** Check the force. → **Step 3** Check the lateral load on the rod end.

∗ The duty ratio is a ratio of the operation time in one cycle.

### Selection Example

**Operating conditions**

- Mounting condition: Horizontal (pushing)
- Jig weight: 0.5 [kg]
- Force: 255 [N]
- Duty ratio: 60 [%]
- Pushing speed: 35 [mm/s]
- Stroke: 300 [mm]




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

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

Selection example)
Based on the table below,
- Duty ratio: 60 [%]

Therefore, Torque limit/command value will be 90 [%].

**<Conversion table of pushing force–duty ratio>**
**(LEY25/AC Servo motor)**

| Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 75 or less | 100 | — |
| 90 | 60 | 1.5 |

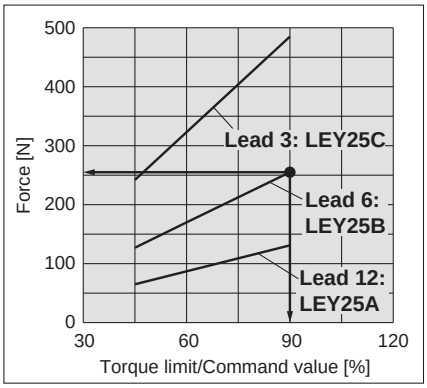
∗ [Set value of pushing force] is one of the data input to the driver.
∗ [Continuous pushing time] is the time that the actuator can continuously keep pushing.

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

Select the target model based on the torque limit/command value and pushing force with reference to the <Force conversion graph>.

Selection example)
Based on the graph shown on the right side,
- Torque limit/Command value: 90 [%]
- Pushing force: 255 [N]

Therefore, the **LEY25B** is temporarily selected.




**<Force conversion graph>**
**(LEY25)**

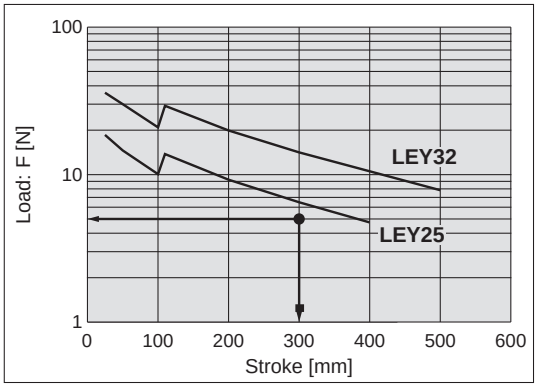
**Step 3** **Check the lateral load on the rod end.**
**<Graph of allowable lateral load on the rod end>**

Confirm the allowable lateral load on the rod end of the actuator: LEY25B, 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 weight: 0.5 [kg] ≈ 5 [N]
- Product stroke: 300 [mm]

Therefore, the lateral load on the rod end is in the allowable range.

**Based on the above calculation result, the LEY25V6B-300 is selected.**

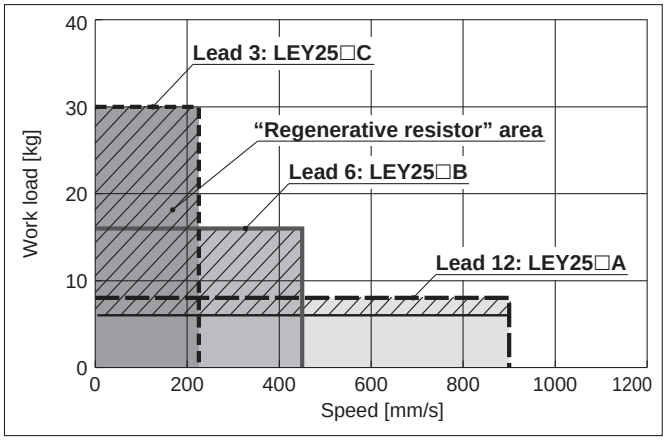



**<Graph of allowable lateral load on the rod end>**

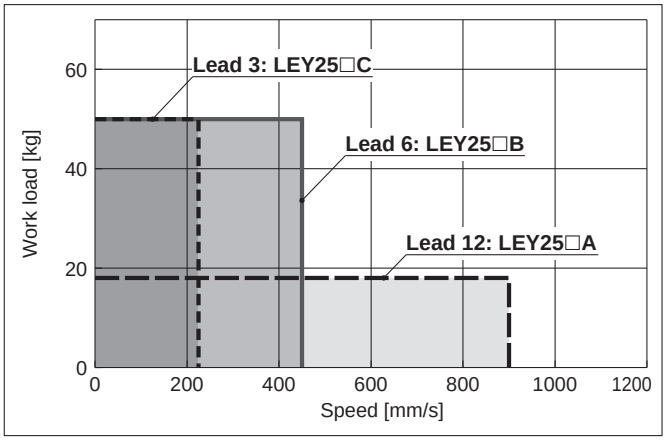
## Speed–Work Load Graph/Conditions for “Regenerative Resistor” (Guide)

### LEY25□V6 (Motor mounting position: Top/Parallel, In-line)

**Vertical**

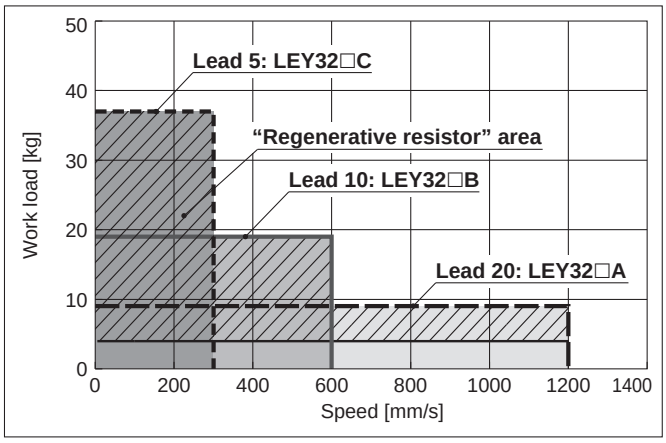



**Horizontal**

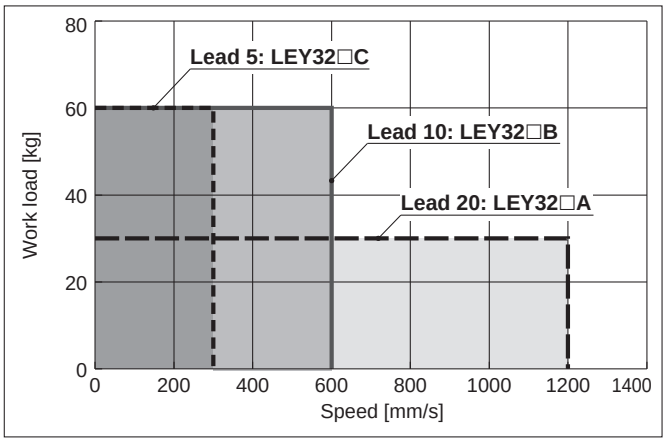



### LEY32□V7 (Motor mounting position: Top/Parallel)

**Vertical**

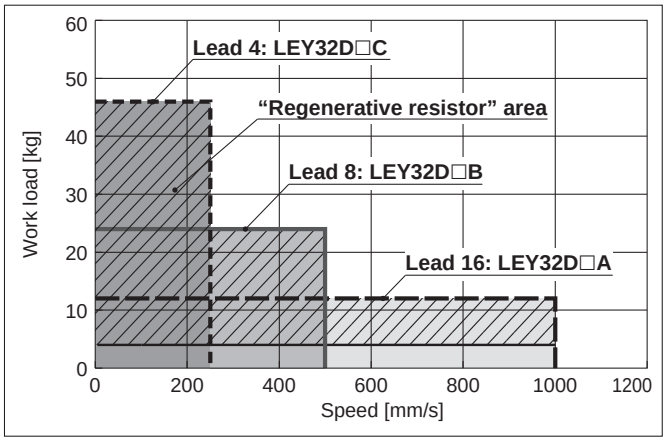



**Horizontal**

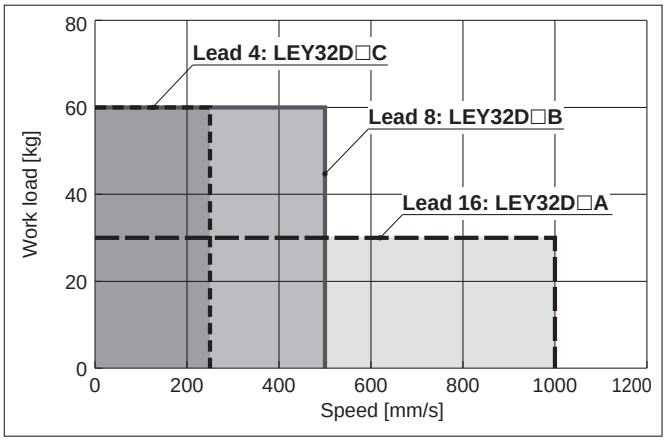



### LEY32DV7 (Motor mounting position: In-line)

**Vertical**




**Horizontal**




**“Regenerative resistor” area**

* When using the actuator in the “Regenerative resistor” area, download the “AC servo drive capacity selection program/SigmaJunmaSize+” from the SMC website. Then, calculate the necessary regenerative resistor capacity to prepare an appropriate external regenerative resistor.
* Regenerative resistor should be provided by the customer.

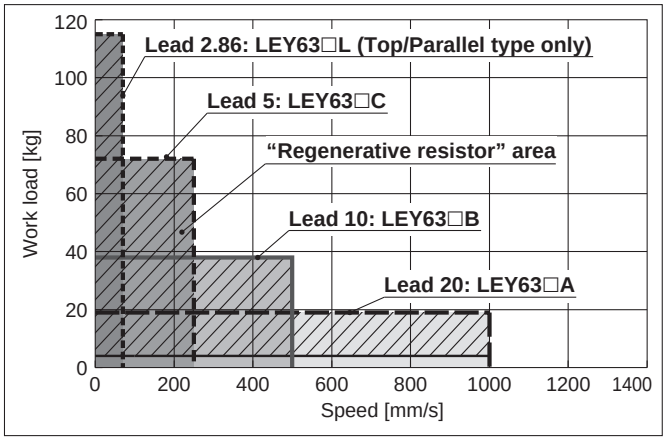
### Applicable Motor/Driver

| Model | Applicable model | |
|---|---|---|
| | Motor | Servopack (SMC driver) |
| **LEY25□** | SGMJV-01A3A | SGDV-R90A11□ (LECYM2-V5)<br>SGDV-R90A21□ (LECYU2-V5) |
| **LEY32□** | SGMJV-02A3A | SGDV-1R6A11□ (LECYM2-V7)<br>SGDV-1R6A21□ (LECYU2-V7) |

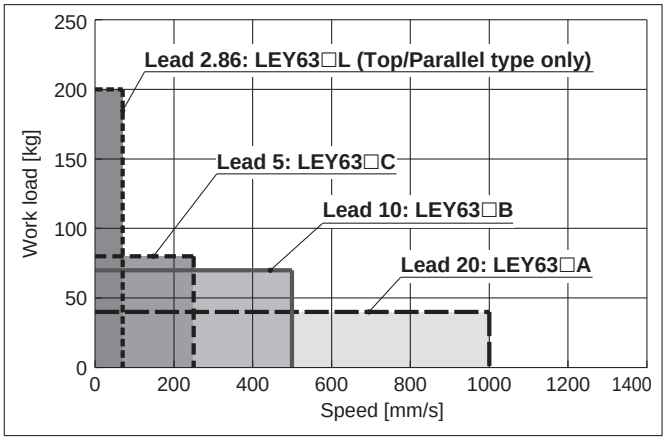
## Speed–Work Load Graph/Conditions for "Regenerative Resistor" (Guide)

### LEY63□V8 (Motor mounting position: Top/Parallel, In-line)

**Vertical**




**Horizontal**




**"Regenerative resistor" area**

* When using the actuator in the "Regenerative resistor" area, download the "AC servo drive capacity selection program/SigmaJunmaSize+" from the SMC website. Then, calculate the necessary regenerative resistor capacity to prepare an appropriate external regenerative resistor.
* Regenerative resistor should be provided by the customer.

### Applicable Motor/Driver

| Product no. | Applicable model | |
|---|---|---|
| | Motor | Servopack (SMC driver) |
| **LEY63□** | SGMJV-04A3A | SGDV-2R8A11□ (LECYM2-V8)<br>SGDV-2R8A21□ (LECYU2-V8) |

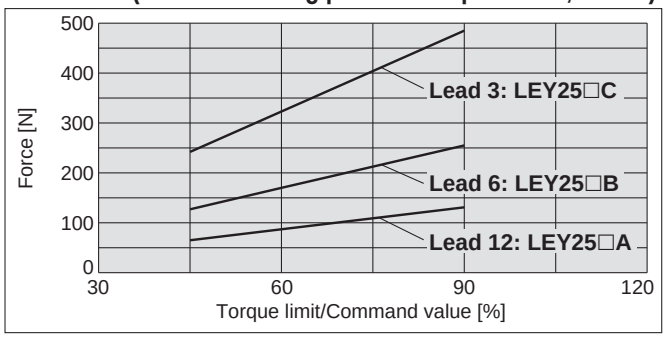
### Allowable Stroke Speed

[mm/s]

| Model | AC servo motor | Lead | | Stroke [mm] | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Symbol | [mm] | Up to 30 | Up to 50 | Up to 100 | Up to 150 | Up to 200 | Up to 250 | Up to 300 | Up to 350 | Up to 400 | Up to 450 | Up to 500 | Up to 600 | Up to 700 | Up to 800 |
| **LEY25□V6** Motor mounting position: Top/Parallel, In-line | 100 W /□40 | **A** | 12 | 900 | | | | | | | 600 | | — | — | — | — | — |
| | | **B** | 6 | 450 | | | | | | | 300 | | — | — | — | — | — |
| | | **C** | 3 | 225 | | | | | | | 150 | | — | — | — | — | — |
| | | (Motor rotation speed) | | (4500 rpm) | | | | | | | (3000 rpm) | | — | — | — | — | — |
| **LEY32□V7** Motor mounting position: Top/Parallel | 200 W /□60 | **A** | 20 | 1200 | | | | | | | | | 800 | | — | — | — |
| | | **B** | 10 | 600 | | | | | | | | | 400 | | — | — | — |
| | | **C** | 5 | 300 | | | | | | | | | 200 | | — | — | — |
| | | (Motor rotation speed) | | (3600 rpm) | | | | | | | | | (2400 rpm) | | — | — | — |
| **LEY32DV7** Motor mounting position: In-line | 200 W /□60 | **A** | 16 | 1000 | | | | | | | | | 640 | | — | — | — |
| | | **B** | 8 | 500 | | | | | | | | | 320 | | — | — | — |
| | | **C** | 4 | 250 | | | | | | | | | 160 | | — | — | — |
| | | (Motor rotation speed) | | (3750 rpm) | | | | | | | | | (2400 rpm) | | — | — | — |
| **LEY63□V8** Motor mounting position: Top/Parallel, In-line | 400 W /□60 | **A** | 20 | — | 1000 | | | | | | | | | | 800 | 600 | 500 |
| | | **B** | 10 | — | 500 | | | | | | | | | | 400 | 300 | 250 |
| | | **C** | 5 | — | 250 | | | | | | | | | | 200 | 150 | 125 |
| | | (Motor rotation speed) | | — | (3000 rpm) | | | | | | | | | | (2400 rpm) | (1800 rpm) | (1500 rpm) |
| | | **L** | 2.86 | — | 70 | | | | | | | | | | | | |
| | | (Motor rotation speed) | | — | (1470 rpm) | | | | | | | | | | | | |

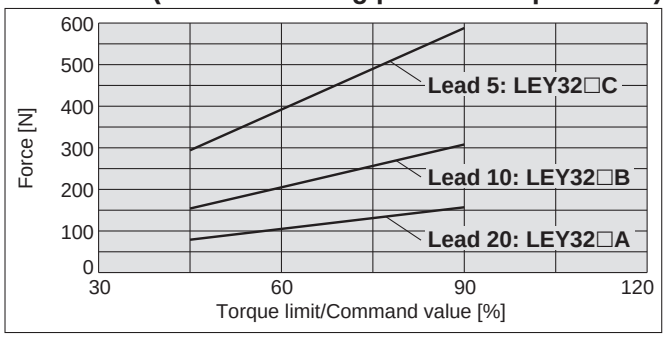
## Force Conversion Graph (Guide)

### LEY25□V6 (Motor mounting position: Top/Parallel, In-line)



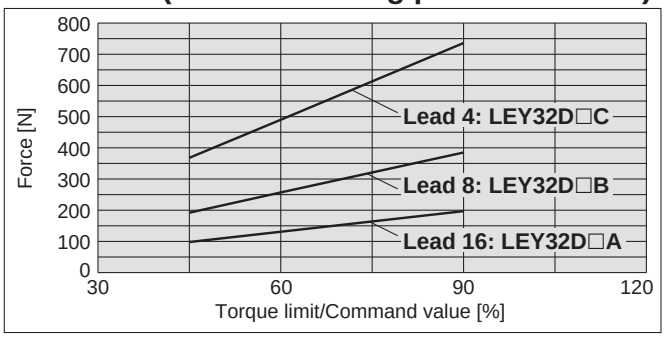

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 75 or less | 100 | — |
| 90 | 60 | 1.5 |

### LEY32□V7 (Motor mounting position: Top/Parallel)



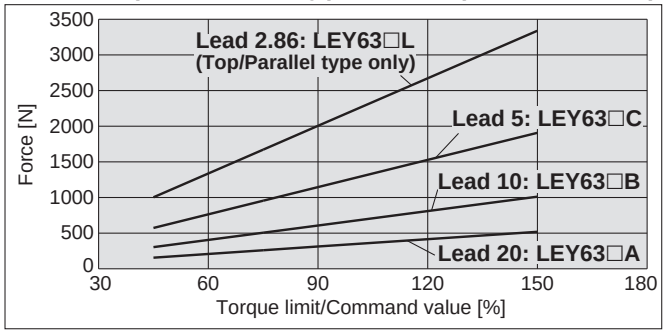

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 75 or less | 100 | — |
| 90 | 60 | 1.5 |

### LEY32DV7 (Motor mounting position: In-line)



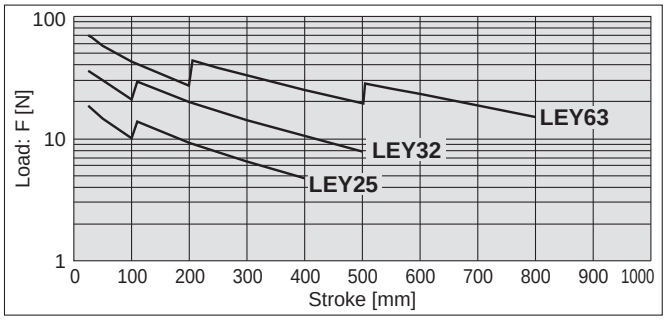

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 75 or less | 100 | — |
| 90 | 60 | 1.5 |

### LEY63□V8 (Motor mounting position: Top/Parallel, In-line)

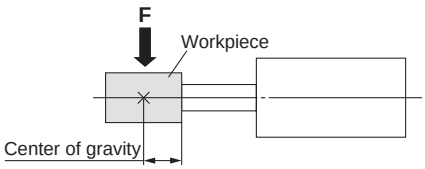



| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 75 or less | 100 | — |
| 90 | 60 | 1.5 |
| 120 | 30 | 0.5 |
| 150 | 20 | 0.16 |

## Graph of Allowable Lateral Load on the Rod End (Guide)

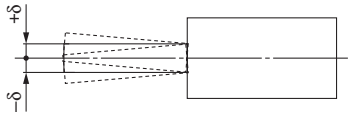



**[Stroke] = [Product stroke] + [Distance from the rod end to the centre of gravity of the workpiece]**

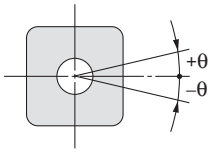



## Rod Displacement: δ [mm]

| Size \ Stroke | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **25** | ±0.3 | ±0.4 | ±0.7 | ±0.7 | ±0.9 | ±1.1 | ±1.3 | ±1.5 | ±1.7 | — | — | — | — | — |
| **32** | ±0.3 | ±0.4 | ±0.7 | ±0.6 | ±0.8 | ±1.0 | ±1.1 | ±1.3 | ±1.5 | ±1.7 | ±1.8 | — | — | — |
| **63** | — | ±0.5 | ±0.7 | ±0.9 | ±1.2 | ±1.1 | ±1.3 | ±1.5 | ±1.7 | ±1.9 | ±2.1 | ±1.7 | ±2.0 | ±2.2 |




## Non-rotating Accuracy of Rod




| Size | Non-rotating accuracy θ |
|---|---|
| **25** | ±0.8° |
| **32** | ±0.7° |
| **63** | ±0.6° |

∗ Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod.
This may cause the deformation of the non-rotating guide, abnormal auto switch responses, play in the internal guide, or an increase in the sliding resistance.

| Specific Product Precautions | AC Servo Motor | | Step Motor (Servo/24 VDC)/Servo Motor (24 VDC) | | | | | Environment | | AC Servo Motor | | Step Motor (Servo/24 VDC)/Servo Motor (24 VDC) | | Model Selection |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LECY□ | LECS□ | JXC□ | LECPA | LECP1 | LEC-G | LECA6 | 25A-LEY | LEY-X5 | LEYG | LEY | LEYG | LEY | |

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

# Electric Actuator/ Rod Type

## *LEY* Series LEY16, 25, 32, 40

RoHS

Dust-tight/Water-jet-proof ▸ p. 155 Secondary Battery Compatible ▸ p. 175

Motor mounting position: Top/Parallel Motor mounting position: In-line

## How to Order

LEY 16 ❶ ❷ ❸ B ❹ – 30 ❺ ❻ ❼ ❽ – S1 ❾

*LEC□ Series* 6P ❿ 1 ⓫ ⓬

*JXC□ Series* CD17T ❿

For details on controllers, refer to page 58.

* Refer to the table below.

RoHS

### ❶ Size

| |
|---|
| 16 |
| 25 |
| 32 |
| 40 |

### ❷ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| R | Right side parallel |
| L | Left side parallel |
| D | In-line |

### ❸ Motor type

| Symbol | Type | Applicable size | | | Compatible controller/driver |
|---|---|---|---|---|---|
| | | LEY16 | LEY25 | LEY32/40 | |
| — | Step motor (Servo/24 VDC) | ● | ● | ● | LECP1, LECPA, JXCE1, JXC91, JXCP1, JXCD1, JXCL1 |
| A | Servo motor (24 VDC) | ● | ● | — | LECA6 |

### ❹ Lead [mm]

| Symbol | LEY16 | LEY25 | LEY32/40 |
|---|---|---|---|
| A | 10 | 12 | 16 |
| B | 5 | 6 | 8 |
| C | 2.5 | 3 | 4 |

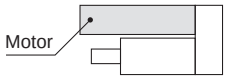
### ❺ Stroke [mm]

| | |
|---|---|
| 30 | 30 |
| to | to |
| 500 | 500 |

* For details, refer to the applicable stroke table below.

### ❻ Motor option*2

| | |
|---|---|
| — | Without option |
| C | With motor cover |
| B | With lock |
| W | With lock/motor cover |




### ❼ Rod end thread

| | |
|---|---|
| — | Rod end female thread |
| M | Rod end male thread (1 rod end nut is included.) |

### ❽ Mounting*3

| Symbol | Type | Motor mounting position | |
|---|---|---|---|
| | | Top/Parallel | In-line |
| — | Ends tapped/Body bottom tapped*4 | ● | ● |
| L | Foot | ● | — |
| F | Rod flange*4 | ●*6 | ● |
| G | Head flange*4 | ●*7 | — |
| D | Double clevis*5 | ● | — |

### ❾ Actuator cable type/length*9

| Standard cable [m] | |
|---|---|
| — | None |
| S1 | 1.5*11 |
| S3 | 3*11 |
| S5 | 5*11 |

| Robotic cable | | | [m] |
|---|---|---|---|
| R1 | 1.5 | RA | 10*8 |
| R3 | 3 | RB | 15*8 |
| R5 | 5 | RC | 20*8 |
| R8 | 8*8 | | |

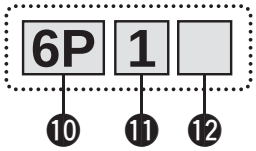
### Applicable Stroke Table*1

●: Standard

| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | Manufacturable stroke range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEY16 | ● | ● | ● | ● | ● | ● | ● | — | — | — | — | 10 to 300 |
| LEY25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | — | — | 15 to 400 |
| LEY32/40 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 to 500 |

For auto switches, refer to pages 101 to 103.

## LEC□ Series (For details, refer to page 57.)




### ⑩ Controller/Driver type*10

| | | |
|---|---|---|
| — | Without controller/driver | |
| 1N | **LECP1***11 (Programless type) | NPN |
| 1P | | PNP |
| AN | **LECPA***11 *13 (Pulse input type) | NPN |
| AP | | PNP |

### ⑪ I/O cable length*14, Communication plug

| | |
|---|---|
| — | Without cable (Without communication plug connector) |
| 1 | 1.5 m |
| 3 | 3 m*15 |
| 5 | 5 m*15 |
| S | Straight type communication plug connector |
| T | T-branch type communication plug connector |

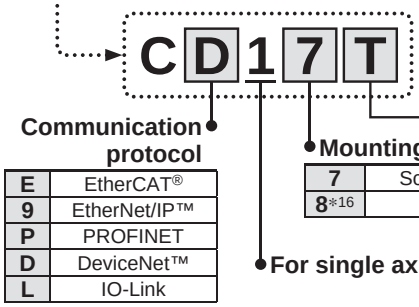
### ⑫ Controller/Driver mounting

| | |
|---|---|
| — | Screw mounting |
| D | DIN rail*16 |

## JXC□ Series (For details, refer to page 57.)

### ⑩ Controller

| | |
|---|---|
| — | Without controller |
| C□1□□ | With controller |




*1 Please consult with SMC for non-standard strokes as they are produced as special orders.
*2 When "With lock" or "With lock/motor cover" is selected for the top mounting and right/left side parallel types, the motor body will stick out from the end of the body for size 16/40 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.
*3 The mounting bracket is shipped together with the product but does not come assembled.
*4 For the horizontal cantilever mounting of the rod flange, head flange, or ends tapped types, use the actuator within the following stroke range.
·LEY25: 200 mm or less ·LEY32/40: 100 mm or less
*5 For the mounting of the double clevis type, use the actuator within the following stroke range.
·LEY16: 100 mm or less ·LEY25: 200 mm or less ·LEY32/40: 200 mm or less
*6 The rod flange type is not available for the LEY16/40 with a 30 mm stroke and motor option "With lock," "With lock/motor cover."
*7 The head flange type is not available for the LEY32/40.
*8 Produced upon receipt of order (Robotic cable only)
*9 The standard cable should only be used on fixed parts. For use on moving parts, select the robotic cable.
*10 For details on controllers/drivers and compatible motors, refer to the compatible controller/driver on the next page.
*11 Only available for the motor type "Step motor"
*12 Not compliant with CE
*13 When pulse signals are open collector, order the current limiting resistor (LEC-PA-R-□) on page 220 separately.
*14 When "Without controller/driver" is selected for controller/driver types, I/O cable cannot be selected. Refer to page 199 (For LECA6), page 213(For LECP1), or page 220 (For LECPA) if I/O cable is required.
*15 When "Pulse input type" is selected for controller/driver types, pulse input usable only with differential. Only 1.5 m cables usable with open collector
*16 The DIN rail is not included. Order it separately.
*17 Select "—" for anything other than DeviceNet™.

### ⚠Caution

**[CE-compliant products]**

① EMC compliance was tested by combining the electric actuator LEY series and the controller LEC/JXC series.
The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with 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 compliance with the EMC directive for the machinery and equipment as a whole.

② For the servo motor (24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 199 for the noise filter set. Refer to the LECA series Operation Manual for installation.

**[UL-compliant products (For the LEC series)]**

When compliance with UL is required, the electric actuator and controller/driver should be used with a UL1310 Class 2 power supply.

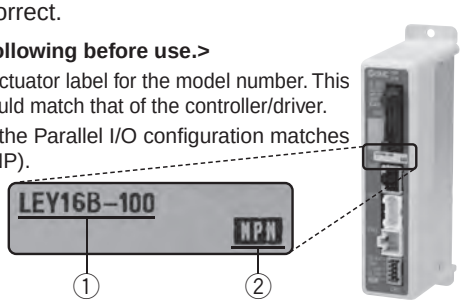
### The actuator and controller/driver are sold as a package.

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

**<Check the following before use.>**

① Check the actuator label for the model number. This number should match that of the controller/driver.

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




* Refer to the Operation Manual for using the products. Please download it via our website, https://www.smc.eu

**Compatible Controller/Driver**

## LEC□ Series

| Type | Step data input type  | Programless type  | Pulse input type  |
|---|---|---|---|
| **Series** | **LECA6** | **LECP1** | **LECPA** |
| **Features** | Value (Step data) input<br>Standard controller | Capable of setting up operation (step data) without using a PC or teaching box | Operation by pulse signals |
| **Compatible motor** | Servo motor (24 VDC) | Servo motor (Servo/24 VDC) | |
| **Max. number of step data** | 64 points | 14 points | — |
| **Power supply voltage** | 24 VDC | | |
| **Reference page** | 191 | 207 | 214 |

## JXC□ Series

| Type | EtherCAT® direct input type  | EtherNet/IP™ direct input type  | PROFINET direct input type  | DeviceNet™ direct input type  | IO-Link direct input type  |
|---|---|---|---|---|---|
| **Series** | **JXCE1** | **JXC91** | **JXCP1** | **JXCD1** | **JXCL1** |
| **Features** | EtherCAT® direct input | EtherNet/IP™ direct input | PROFINET direct input | DeviceNet™ direct input | IO-Link direct input |
| **Compatible motor** | Step motor (Servo/24 VDC) | | | | |
| **Max. number of step data** | 64 points | | | | |
| **Power supply voltage** | 24 VDC | | | | |
| **Reference page** | 224 | | | | |

## Specifications

### Step Motor (Servo/24 VDC)

| Model | | | | LEY16 | | | LEY25 | | | LEY32 | | | LEY40 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg]*1 | Horizontal (LECP1, JXC□1) | (3000 [mm/s²]) | 6 | 17 | 30 | 20 | 40 | 60 | 30 | 45 | 60 | 50 | 60 | 80 |
| | | | (2000 [mm/s²]) | 10 | 23 | 35 | 30 | 55 | 70 | 40 | 60 | 80 | 60 | 70 | 90 |
| | | Horizontal (LECPA, JXC□2/3) | (3000 [mm/s²]) | 4 | 11 | 20 | 12 | 30 | 30 | 20 | 40 | 40 | 30 | 60 | 60 |
| | | | (2000 [mm/s²]) | 6 | 17 | 30 | 18 | 50 | 50 | 30 | 60 | 60 | — | — | — |
| | | Vertical | (3000 [mm/s²]) | 2 | 4 | 8 | 8 | 16 | 30 | 11 | 22 | 43 | 13 | 27 | 53 |
| | Pushing force [N]*2 *3 *4 | | | 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 | 132 to 283 | 266 to 553 | 562 to 1058 |
| | Speed [mm/s]*4 | LECP1/ JXC□1 | | 15 to 500 | 8 to 250 | 4 to 125 | 18 to 500 | 9 to 250 | 5 to 125 | 24 to 500 | 12 to 300 | 6 to 150 | 24 to 500 | 12 to 350 | 6 to 175 |
| | | LECPA/JXC□2/3 | | | | | | | | | 12 to 250 | 6 to 125 | 24 to 300 | 12 to 150 | 6 to 75 |
| | Max. acceleration/deceleration [mm/s²] | | | 3000 | | | | | | | | | | | |
| | Pushing speed [mm/s]*5 | | | 50 or less | | | 35 or less | | | 30 or less | | | 30 or less | | |
| | Positioning repeatability [mm] | | | ±0.02 | | | | | | | | | | | |
| | Lost motion [mm]*6 | | | 0.1 or less | | | | | | | | | | | |
| | Screw lead [mm] | | | 10 | 5 | 2.5 | 12 | 6 | 3 | 16 | 8 | 4 | 16 | 8 | 4 |
| | Impact/Vibration resistance [m/s²]*7 | | | 50/20 | | | | | | | | | | | |
| | Actuation type | | | Ball screw + Belt (LEY□)/Ball screw (LEY□D) | | | | | | | | | | | |
| | Guide type | | | Sliding bushing (Piston rod) | | | | | | | | | | | |
| | Operating temperature range [°C] | | | 5 to 40 | | | | | | | | | | | |
| | Operating humidity range [%RH] | | | 90 or less (No condensation) | | | | | | | | | | | |
| Electric specifications | Motor size | | | □28 | | | □42 | | | □56.4 | | | □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]*8 | | | 23 | | | 40 | | | 50 | | | 50 | | |
| | Standby power consumption when operating [W]*9 | | | 16 | | | 15 | | | 48 | | | 48 | | |
| | Max. instantaneous power consumption [W]*10 | | | 43 | | | 48 | | | 104 | | | 106 | | |
| Lock unit specifications | Type*11 | | | Non-magnetising lock | | | | | | | | | | | |
| | Holding force [N] | | | 20 | 39 | 78 | 78 | 157 | 294 | 108 | 216 | 421 | 127 | 265 | 519 |
| | Power consumption [W]*12 | | | 2.9 | | | 5 | | | 5 | | | 5 | | |
| | Rated voltage [V] | | | 24 VDC ±10 % | | | | | | | | | | | |

∗1 Horizontal: The maximum value of the work load. An external guide is necessary to support the load (Friction coefficient of guide: 0.1 or less). The actual work load and transfer speed change according to the condition of the external guide. Also, speed changes according to the work load. Check "Model Selection" on pages 37 and 38.
Vertical: Speed changes according to the work load. Check "Model Selection" on pages 37 and 38.
The values shown in ( ) are the acceleration/deceleration.
Set these values to be 3000 [mm/s²] or less.

∗2 Pushing force accuracy is ±20 % (F.S.).

∗3 The pushing force values for LEY16□ is 35 % to 85 %, for LEY25□ is 35 % to 65 %, for LEY32□ is 35 % to 85 %, and for LEY40□ is 35 % to 65 %.
The pushing force values change according to the duty ratio and pushing speed. Check "Model Selection" on page 40.

∗4 The speed and force may change depending on the cable length, load, and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10 % for each 5 m. (At 15 m: Reduced by up to 20 %)

∗5 The allowable speed for pushing operation. When push conveying a workpiece, operate at the vertical work load or less.

∗6 A reference value for correcting an error in reciprocal operation

∗7 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)

∗8 The power consumption (including the controller) is for when the actuator is operating.

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

∗10 The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.

∗11 With lock only

∗12 For an actuator with lock, add the power consumption for the lock.

## Specifications

### Servo Motor (24 VDC)

| | Model | | LEY16□A | | | LEY25□A | | |
|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg]*1 | Horizontal (3000 [mm/s²]) | 3 | 6 | 12 | 7 | 15 | 30 |
| | | Vertical (3000 [mm/s²]) | 2 | 4 | 8 | 3 | 6 | 12 |
| | Pushing force [N]*2 *3 | | 16 to 30 | 30 to 58 | 57 to 111 | 18 to 35 | 37 to 72 | 66 to 130 |
| | Speed [mm/s] | | 1 to 500 | 1 to 250 | 1 to 125 | 2 to 500 | 1 to 250 | 1 to 125 |
| | Max. acceleration/deceleration [mm/s²] | | 3000 | | | | | |
| | Pushing speed [mm/s]*4 | | 50 or less | | | 35 or less | | |
| | Positioning repeatability [mm] | | ±0.02 | | | | | |
| | Lost motion [mm]*5 | | 0.1 or less | | | | | |
| | Screw lead [mm] | | 10 | 5 | 2.5 | 12 | 6 | 3 |
| | Impact/Vibration resistance [m/s²]*6 | | 50/20 | | | | | |
| | Actuation type | | Ball screw + Belt (LEY□)/Ball screw (LEY□D) | | | | | |
| | Guide type | | Sliding bushing (Piston rod) | | | | | |
| | Operating temperature range [°C] | | 5 to 40 | | | | | |
| | Operating humidity range [%RH] | | 90 or less (No condensation) | | | | | |
| Electric specifications | Motor size | | □28 | | | □42 | | |
| | Motor output [W] | | 30 | | | 36 | | |
| | Motor type | | Servo motor (24 VDC) | | | | | |
| | Encoder | | Incremental A/B phase (800 pulse/rotation)/Z phase | | | | | |
| | Rated voltage [V] | | 24 VDC ±10 % | | | | | |
| | Power consumption [W]*7 | | 40 | | | 86 | | |
| | Standby power consumption when operating [W]*8 | | 4 (Horizontal)/6 (Vertical) | | | 4 (Horizontal)/12 (Vertical) | | |
| | Max. instantaneous power consumption [W]*9 | | 59 | | | 96 | | |
| Lock unit specifications | Type*10 | | Non-magnetising lock | | | | | |
| | Holding force [N] | | 20 | 39 | 78 | 78 | 157 | 294 |
| | Power consumption [W]*11 | | 2.9 | | | 5 | | |
| | Rated voltage [V] | | 24 VDC ±10 % | | | | | |

*1 Horizontal: The maximum value of the work load. An external guide is necessary to support the load (Friction coefficient of guide: 0.1 or less). The actual work load and transfer speed change according to the condition of the external guide.
Vertical: Check "Model Selection" on page 39 for details.
The values shown in ( ) are the acceleration/deceleration.
Set these values to be 3000 [mm/s²] or less.
*2 Pushing force accuracy is ±20 % (F.S.).
*3 The thrust setting values for LEY16A□ is 60 % to 95 % and for LEY25A□ is 70 % to 95 %. The pushing force values change according to the duty ratio and pushing speed. Check "Model Selection" on page 40.
*4 The allowable speed for pushing operation. When push conveying a workpiece, operate at the vertical work load or less.
*5 A reference value for correcting an error in reciprocal operation
*6 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*7 The power consumption (including the controller) is for when the actuator is operating.
*8 The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation. Except during the pushing operation
*9 The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.
*10 With lock only
*11 For an actuator with lock, add the power consumption for the lock.

## Weight

### Weight: Motor Top/Parallel Type

| Series | | LEY16 | | | | | | | LEY25 | | | | | | | | | LEY32 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Product weight [kg] | Step motor | 0.58 | 0.62 | 0.73 | 0.87 | 0.98 | 1.09 | 1.20 | 1.18 | 1.25 | 1.42 | 1.68 | 1.86 | 2.03 | 2.21 | 2.38 | 2.56 | 2.09 | 2.20 | 2.49 | 2.77 | 3.17 | 3.46 | 3.74 | 4.03 | 4.32 | 4.60 | 4.89 |
| | Servo motor | 0.58 | 0.62 | 0.73 | 0.87 | 0.98 | 1.09 | 1.20 | 1.14 | 1.21 | 1.38 | 1.64 | 1.82 | 1.99 | 2.17 | 2.34 | 2.52 | — | — | — | — | — | — | — | — | — | — | — |

| Series | | LEY40 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Product weight [kg] | Step motor | 2.39 | 2.50 | 2.79 | 3.07 | 3.47 | 3.76 | 4.04 | 4.33 | 4.62 | 4.90 | 5.19 |
| | Servo motor | — | — | — | — | — | — | — | — | — | — | — |

### Weight: In-line Motor Type

| Series | | LEY16D | | | | | | | LEY25D | | | | | | | | | LEY32D | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Product weight [kg] | Step motor | 0.58 | 0.62 | 0.73 | 0.87 | 0.98 | 1.09 | 1.20 | 1.17 | 1.24 | 1.41 | 1.67 | 1.85 | 2.02 | 2.20 | 2.37 | 2.55 | 2.08 | 2.19 | 2.48 | 2.76 | 3.16 | 3.45 | 3.73 | 4.02 | 4.31 | 4.59 | 4.88 |
| | Servo motor | 0.58 | 0.62 | 0.73 | 0.87 | 0.98 | 1.09 | 1.20 | 1.13 | 1.20 | 1.37 | 1.63 | 1.81 | 1.98 | 2.16 | 2.33 | 2.51 | — | — | — | — | — | — | — | — | — | — | — |

| Series | | LEY40D | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Product weight [kg] | Step motor | 2.38 | 2.49 | 2.78 | 3.06 | 3.46 | 3.75 | 4.03 | 4.32 | 4.61 | 4.89 | 5.18 |
| | Servo motor | — | — | — | — | — | — | — | — | — | — | — |

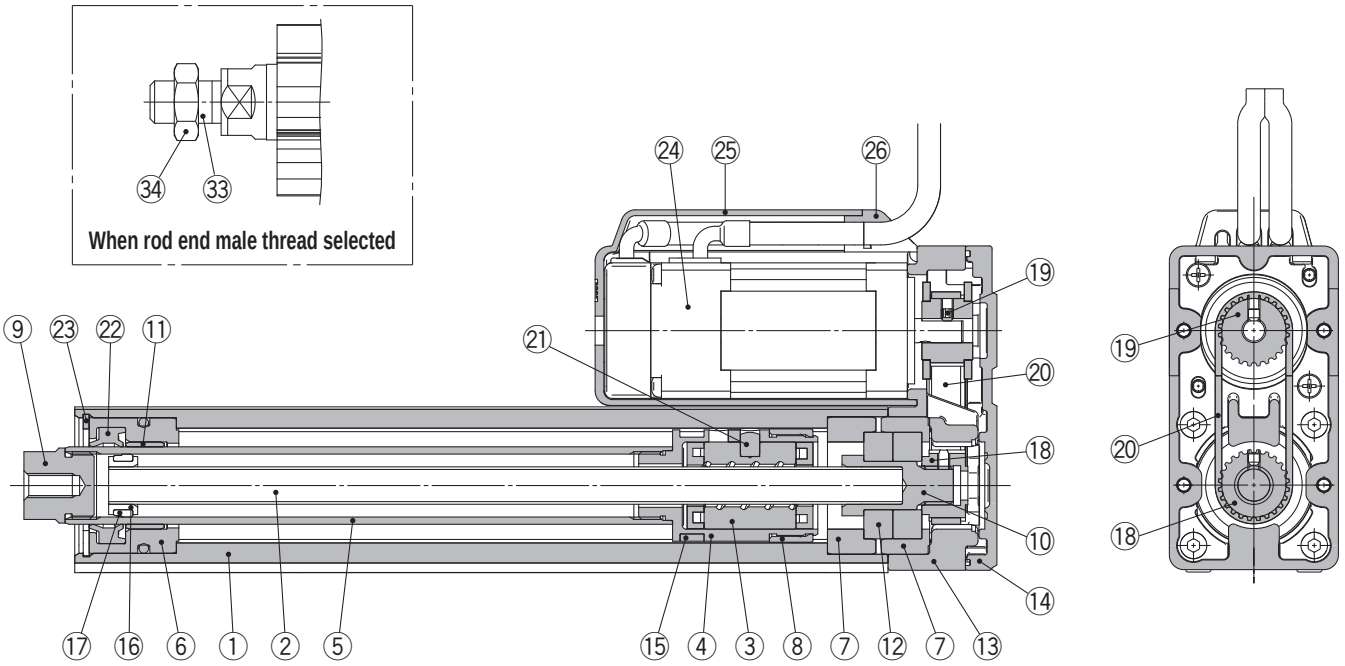
### Additional Weight

[kg]

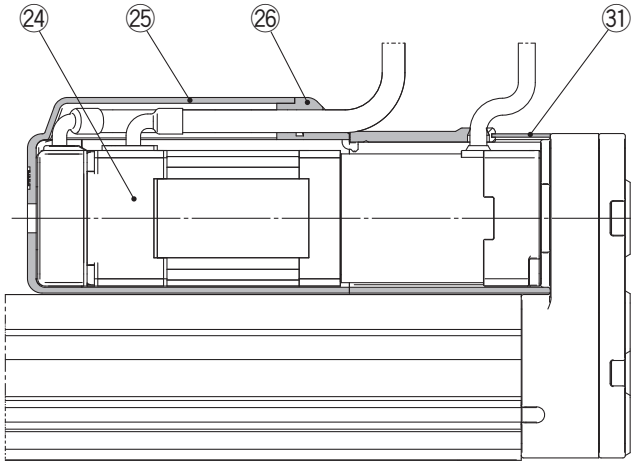
| Size | | 16 | 25 | 32 | 40 |
|---|---|---|---|---|---|
| Lock | | 0.12 | 0.26 | 0.53 | 0.53 |
| Motor cover | | 0.02 | 0.03 | 0.04 | 0.05 |
| Lock/Motor cover | | 0.16 | 0.32 | 0.61 | 0.62 |
| Rod end male thread | Male thread | 0.01 | 0.03 | 0.03 | 0.03 |
| | Nut | 0.01 | 0.02 | 0.02 | 0.02 |
| Foot bracket (2 sets including mounting bolt) | | 0.06 | 0.08 | 0.14 | 0.14 |
| Rod flange (including mounting bolt) | | 0.13 | 0.17 | 0.20 | 0.20 |
| Head flange (including mounting bolt) | | | | | |
| Double clevis (including pin, retaining ring, and mounting bolt) | | 0.08 | 0.16 | 0.22 | 0.22 |

## Construction

**Motor top mounting type: LEY 16 25 32 40**

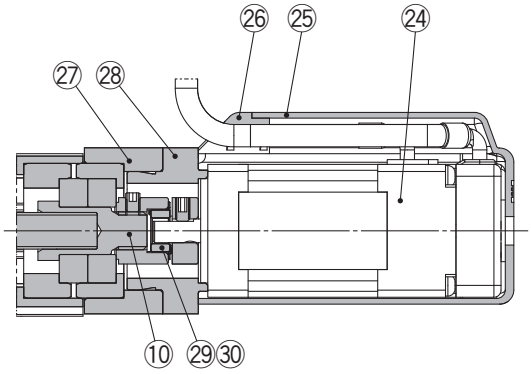



**Motor top/parallel type**
**With lock/motor cover**

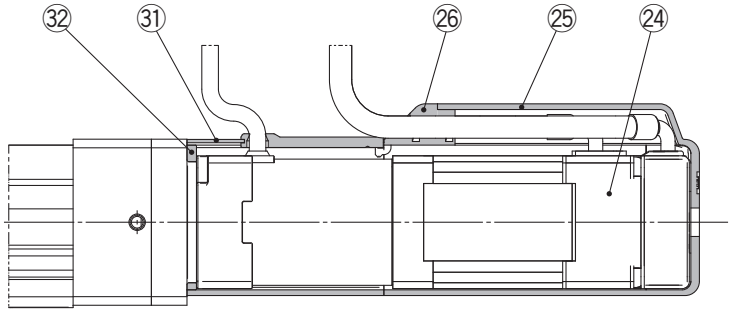


## Construction

### In-line motor type: LEY 16, 25, 32, 40D




### In-line motor type: With lock/motor cover




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Aluminium alloy | Anodised |
| 2 | **Ball screw shaft** | Alloy steel | |
| 3 | **Ball screw nut** | Synthetic resin/Alloy steel | |
| 4 | **Piston** | Aluminium alloy | |
| 5 | **Piston rod** | Stainless steel | Hard chrome plating |
| 6 | **Rod cover** | Aluminium alloy | |
| 7 | **Bearing holder** | Aluminium alloy | |
| 8 | **Rotation stopper** | POM | |
| 9 | **Socket** | Free cutting carbon steel | Nickel plating |
| 10 | **Connected shaft** | Free cutting carbon steel | Nickel plating |
| 11 | **Bushing** | Bearing alloy | |
| 12 | **Bearing** | — | |
| 13 | **Return box** | Aluminium die-cast | Coating |
| 14 | **Return plate** | Aluminium die-cast | Coating |
| 15 | **Magnet** | — | |
| 16 | **Wear ring holder** | Stainless steel | Stroke 101 mm or more |
| 17 | **Wear ring** | POM | Stroke 101 mm or more |
| 18 | **Screw shaft pulley** | Aluminium alloy | |
| 19 | **Motor pulley** | Aluminium alloy | |
| 20 | **Belt** | — | |
| 21 | **Parallel pin** | Stainless steel | |
| 22 | **Seal** | NBR | |
| 23 | **Retaining ring** | Steel for spring | Phosphate coated |
| 24 | **Motor** | — | |
| 25 | **Motor cover** | Synthetic resin | Only "With motor cover" |
| 26 | **Grommet** | Synthetic resin | Only "With motor cover" |
| 27 | **Motor block** | Aluminium alloy | Anodised |
| 28 | **Motor adapter** | Aluminium alloy | Anodised/LEY16, 25 only |
| 29 | **Hub** | Aluminium alloy | |
| 30 | **Spider** | NBR | |
| 31 | **Motor cover with lock** | Aluminium alloy | Only "With lock/motor cover" |
| 32 | **Cover support** | Aluminium alloy | Only "With lock/motor cover" |
| 33 | **Socket (Male thread)** | Free cutting carbon steel | Nickel plating |
| 34 | **Nut** | Alloy steel | Zinc chromated |

### Replacement Parts (Motor top/parallel only)/Belt

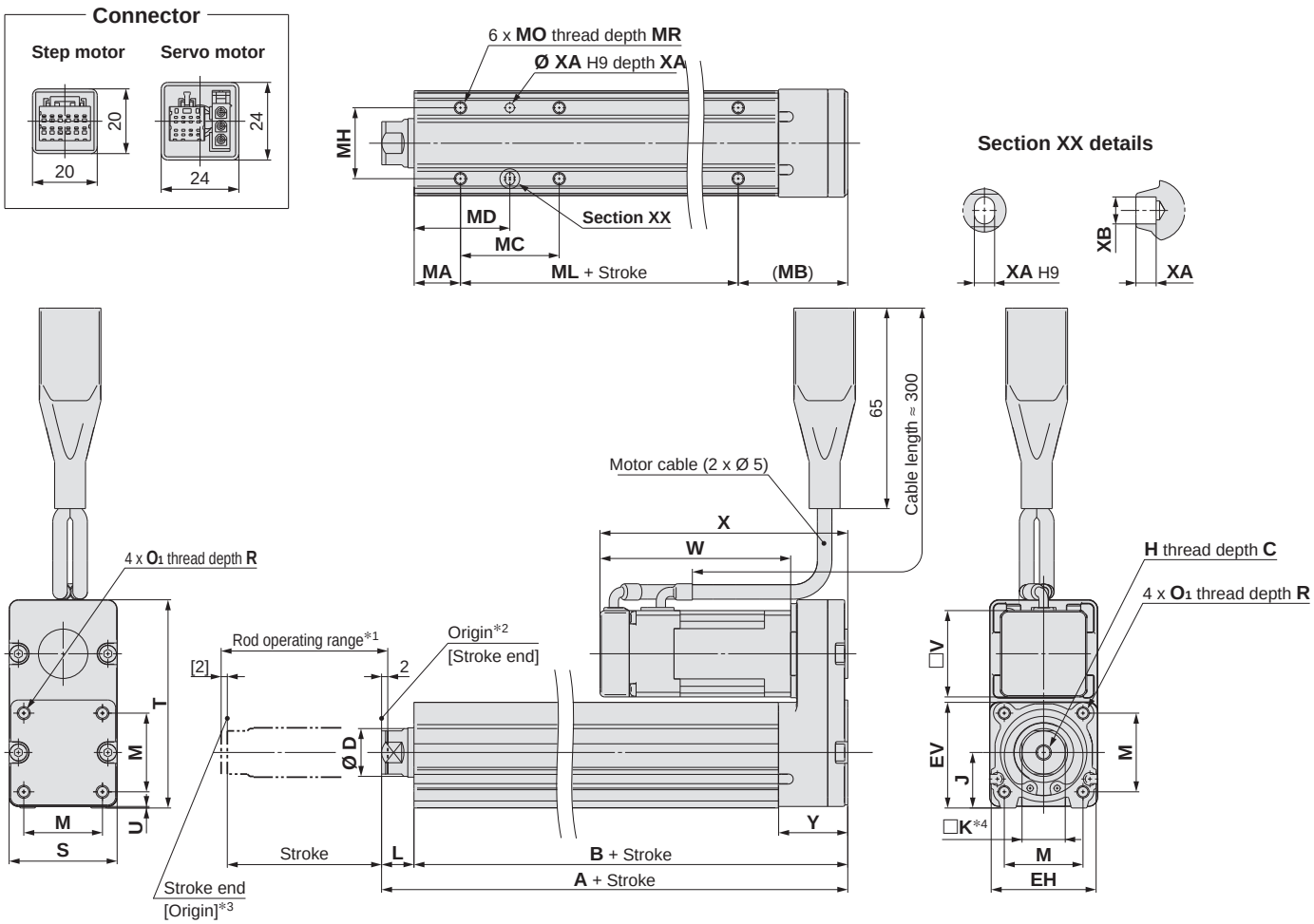
| No. | Size | Order no. |
|---|---|---|
| 21 | **16** | LE-D-2-1 |
| | **25** | LE-D-2-2 |
| | **32, 40** | LE-D-2-3 |

### Replacement Parts/Grease Pack

| Applied portion | Order no. |
|---|---|
| Piston rod | GR-S-010 (10 g)<br>GR-S-020 (20 g) |

* Apply grease on the piston rod periodically.
Grease should be applied at 1 million cycles or 200 km, whichever comes first.

## Dimensions: Motor Top/Parallel




*1 Range within which the rod can move when it returns to origin
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
*2 Position after return to origin
*3 [ ] for when the direction of return to origin has changed
*4 The direction of rod end width across flats (□K) differs depending on the products.

[mm]

| Size | Stroke range [mm] | A | B | C | D | EH | EV | H | J | K | L | M | O1 | R | S | T | U | V | Step motor W | Step motor X | Servo motor W | Servo motor X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **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 | | | | | | | | | | | | | | | | | | | | |
| **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 | | | | | | | | | | | | | | | | | | | | |
| **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 | | | | | | | | | | | | | | | | | | | | |
| **40** | 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 | 90.4 | 117.4 | — | — | 34 |
| | 101 to 500 | 178.5 | 160 | | | | | | | | | | | | | | | | | | | | |

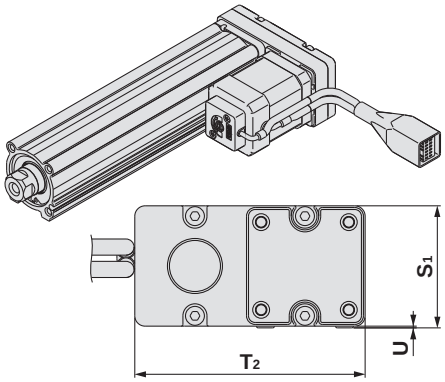
### Body Bottom Tapped

[mm]

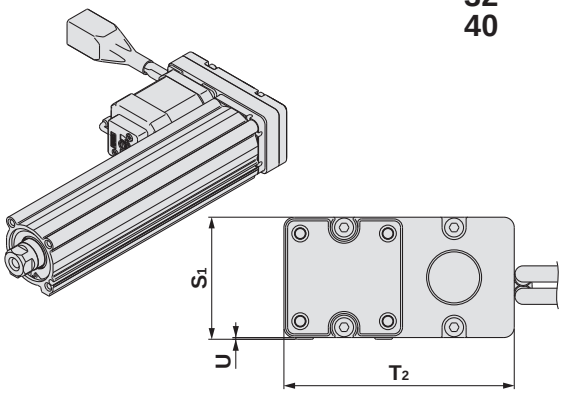
| Size | Stroke range [mm] | MA | MB | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **16** | 10 to 39 | 15 | 35.5 | 17 | 23.5 | 23 | 40 | M4 x 0.7 | 5.5 | 3 | 4 |
| | 40 to 100 | | | 32 | 31 | | | | | | |
| | 101 to 300 | | | 62 | 46 | | 60 | | | | |
| **25** | 15 to 39 | 20 | 46 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | | 42 | 41 | | | | | | |
| | 101 to 124 | | | | | | 75 | | | | |
| | 125 to 200 | | | 59 | 49.5 | | | | | | |
| | 201 to 400 | | | 76 | 58 | | | | | | |
| **32 40** | 20 to 39 | 25 | 55 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | | 36 | 43 | | | | | | |
| | 101 to 124 | | | | | | 80 | | | | |
| | 125 to 200 | | | 53 | 51.5 | | | | | | |
| | 201 to 500 | | | 70 | 60 | | | | | | |

## Dimensions: Motor Top/Parallel

### Motor left side parallel type: LEY16/25/32/40L




### Motor right side parallel type: LEY16/25/32/40R

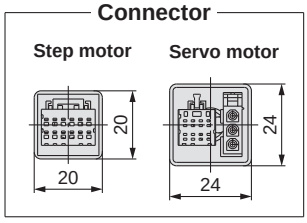


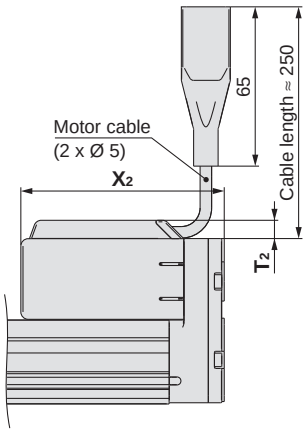

[mm]

| Size | $S_1$ | $T_2$ | U |
|---|---|---|---|
| **16** | 35.5 | 67 | 0.5 |
| **25** | 47 | 91 | 1 |
| **32, 40** | 61 | 117 | 1 |

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

### With motor cover: LEY16/25/32/40□□A/B/C-□C



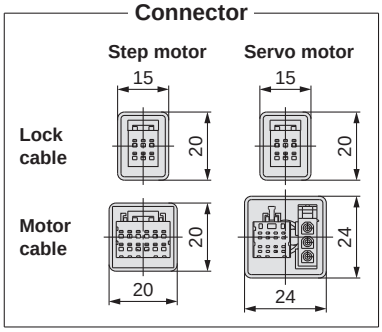



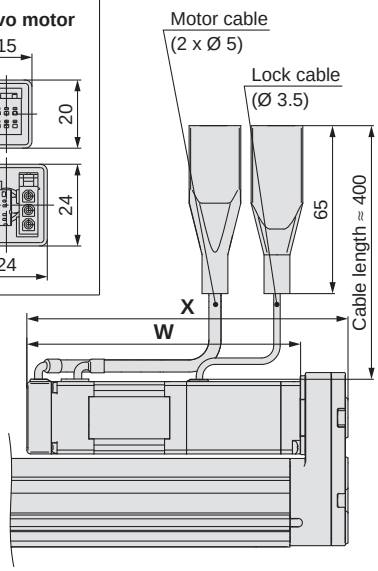

[mm]

| Size | $T_2$ | $X_2$ |
|---|---|---|
| **16** | 7.5 | 83 |
| **25** | 7.5 | 88.5 |
| **32** | 7.5 | 98.5 |
| **40** | 7.5 | 120.5 |

Motor cover material: Synthetic resin

### With lock: LEY16/25/32/40□□A/B/C-□B

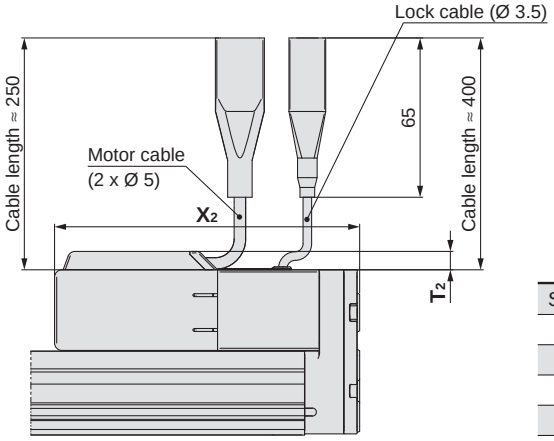



[mm]

| Size | Step motor | | Servo motor | |
|---|---|---|---|---|
| | **W** | **X** | **W** | **X** |
| **16** | 103.3 | 121.8 | 104.0 | 122.5 |
| **25** | 103.9 | 125.9 | 100.1 | 122.1 |
| **32** | 111.4 | 138.4 | — | — |
| **40** | 133.4 | 160.4 | — | — |

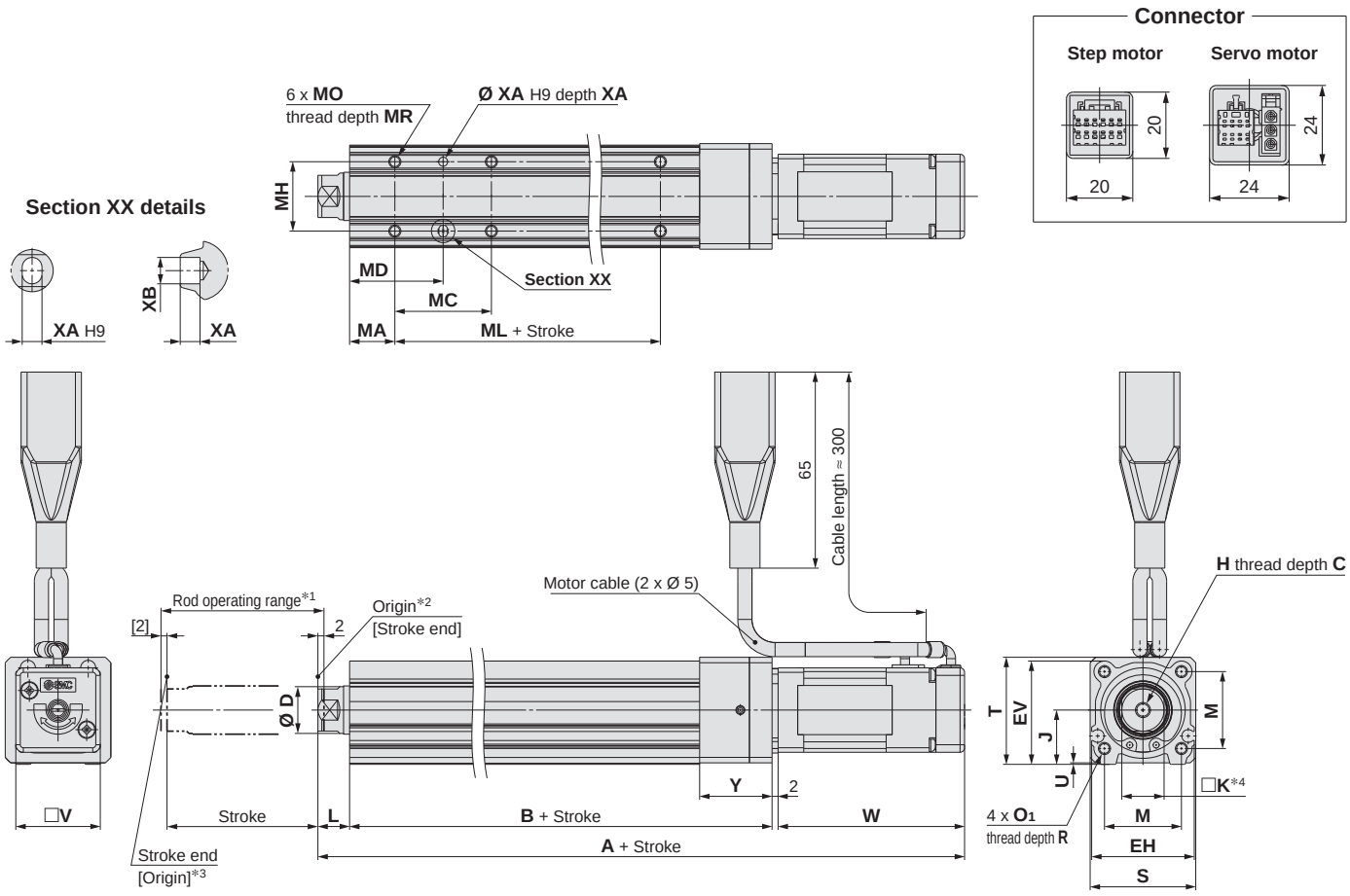
### With lock/motor cover: LEY16/25/32/40□□A/B/C-□W




[mm]

| Size | $T_2$ | $X_2$ |
|---|---|---|
| **16** | 7.5 | 124.5 |
| **25** | 7.5 | 129 |
| **32** | 7.5 | 141.5 |
| **40** | 7.5 | 163.5 |

## Dimensions: In-line Motor




∗1 Range within which the rod can move when it returns to origin
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 Position after return to origin
∗3 [ ] for when the direction of return to origin has changed
∗4 The direction of rod end width across flats (□K) differs depending on the products.

[mm]

| Size | Stroke range [mm] | A: Step motor | A: Servo motor | B | C | D | EH | EV | H | J | K | L | M | O1 | R | S | T | U | V | W: Step motor | W: Servo motor | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 10 to 100 | 166.3 | 167 | 92 | 10 | 16 | 34 | 34.3 | M5 x 0.8 | 18 | 14 | 10.5 | 25.5 | M4 x 0.7 | 7 | 35 | 35.5 | 0.5 | 28 | 61.8 | 62.5 | 24 |
| | 101 to 300 | 186.3 | 187 | 112 | | | | | | | | | | | | | | | | | | |
| 25 | 15 to 100 | 195.4 | 191.6 | 115.5 | 13 | 20 | 44 | 45.5 | M8 x 1.25 | 24 | 17 | 14.5 | 34 | M5 x 0.8 | 8 | 45 | 46.5 | 1.5 | 42 | 63.4 | 59.6 | 26 |
| | 101 to 400 | 220.4 | 216.6 | 140.5 | | | | | | | | | | | | | | | | | | |
| 32 | 20 to 100 | 216.9 | — | 128 | 13 | 25 | 51 | 56.5 | M8 x 1.25 | 31 | 22 | 18.5 | 40 | M6 x 1 | 10 | 60 | 61 | 1 | 56.4 | 68.4 | — | 32 |
| | 101 to 500 | 246.9 | — | 158 | | | | | | | | | | | | | | | | | | |
| 40 | 20 to 100 | 238.9 | — | 128 | 13 | 25 | 51 | 56.5 | M8 x 1.25 | 31 | 22 | 18.5 | 40 | M6 x 1 | 10 | 60 | 61 | 1 | 56.4 | 90.4 | — | 32 |
| | 101 to 500 | 268.9 | — | 158 | | | | | | | | | | | | | | | | | | |

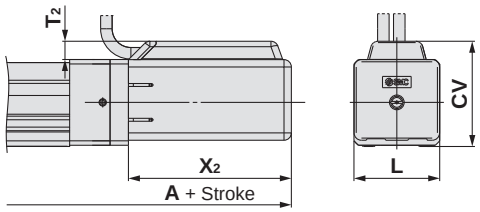
### Body Bottom Tapped

[mm]

| Size | Stroke range [mm] | MA | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 10 to 39 | 15 | 17 | 23.5 | 23 | 40 | M4 x 0.7 | 5.5 | 3 | 4 |
| | 40 to 100 | | 32 | 31 | | | | | | |
| | 101 to 300 | | 62 | 46 | | 60 | | | | |
| 25 | 15 to 39 | 20 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | 42 | 41 | | | | | | |
| | 101 to 124 | | | | | 75 | | | | |
| | 125 to 200 | | 59 | 49.5 | | | | | | |
| | 201 to 400 | | 76 | 58 | | | | | | |
| 32 40 | 20 to 39 | 25 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | 36 | 43 | | | | | | |
| | 101 to 124 | | | | | 80 | | | | |
| | 125 to 200 | | 53 | 51.5 | | | | | | |
| | 201 to 500 | | 70 | 60 | | | | | | |

## Dimensions: In-line Motor

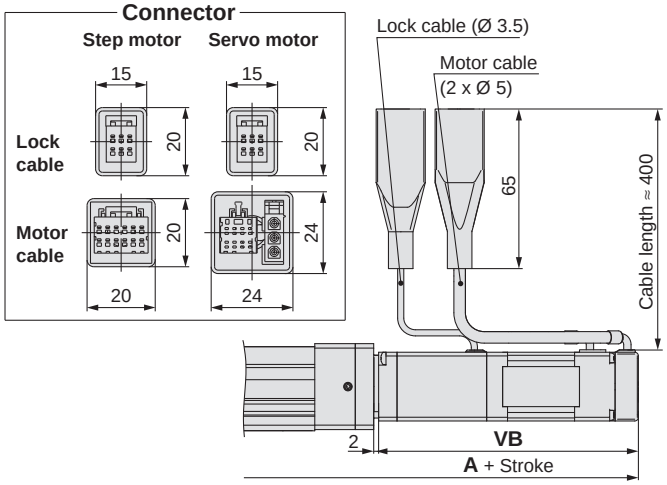
### With motor cover: LEY16/25/32/40D□A/B/C-□C




[mm]

| Size | Stroke range | A | T2 | X2 | L | CV |
|---|---|---|---|---|---|---|
| 16 | 100st or less | 169 | 7.5 | 66.5 | 35 | 43 |
| | 101st or more, 200st or less | 189 | | | | |
| 25 | 100st or less | 198.5 | 7.5 | 68.5 | 46 | 54.5 |
| | 101st or more, 400st or less | 223.5 | | | | |
| 32 | 100st or less | 220 | 7.5 | 73.5 | 60 | 68.5 |
| | 101st or more, 500st or less | 250 | | | | |
| 40 | 100st or less | 242 | 7.5 | 95.5 | 60 | 68.5 |
| | 101st or more, 500st or less | 272 | | | | |

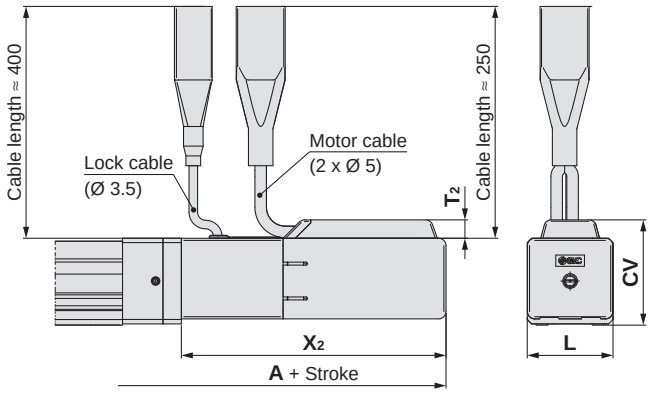
### With lock: LEY16/25/32/40D□A/B/C-□B




[mm]

| Size | Stroke range | Step motor A | Servo motor A | Step motor VB | Servo motor VB |
|---|---|---|---|---|---|
| 16 | 100st or less | 207.8 | 208.5 | 103.3 | 104 |
| | 101st or more, 200st or less | 227.8 | 228.5 | | |
| 25 | 100st or less | 235.9 | 232.1 | 103.9 | 100.1 |
| | 101st or more, 400st or less | 260.9 | 257.1 | | |
| 32 | 100st or less | 259.9 | — | 111.4 | — |
| | 101st or more, 500st or less | 289.9 | — | | |
| 40 | 100st or less | 281.9 | — | 133.4 | — |
| | 101st or more, 500st or less | 311.9 | — | | |

### With lock/motor cover: LEY16/25/32/40D□A/B/C-□W

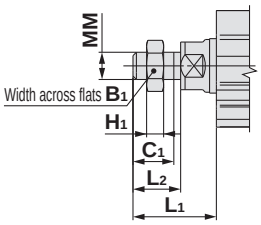



[mm]

| Size | Stroke range | A | T2 | X2 | L | CV |
|---|---|---|---|---|---|---|
| 16 | 100st or less | 210.5 | 7.5 | 108 | 35 | 43 |
| | 101st or more, 300st or less | 230.5 | | | | |
| 25 | 100st or less | 239 | 7.5 | 109 | 46 | 54.4 |
| | 101st or more, 400st or less | 264 | | | | |
| 32 | 100st or less | 263 | 7.5 | 116.5 | 60 | 68.5 |
| | 101st or more, 500st or less | 293 | | | | |
| 40 | 100st or less | 285 | 7.5 | 138.5 | 60 | 68.5 |
| | 101st or more, 500st or less | 315 | | | | |

## Dimensions

### End male thread: LEY 16/25/32/40 □□ A/B/C -□□M



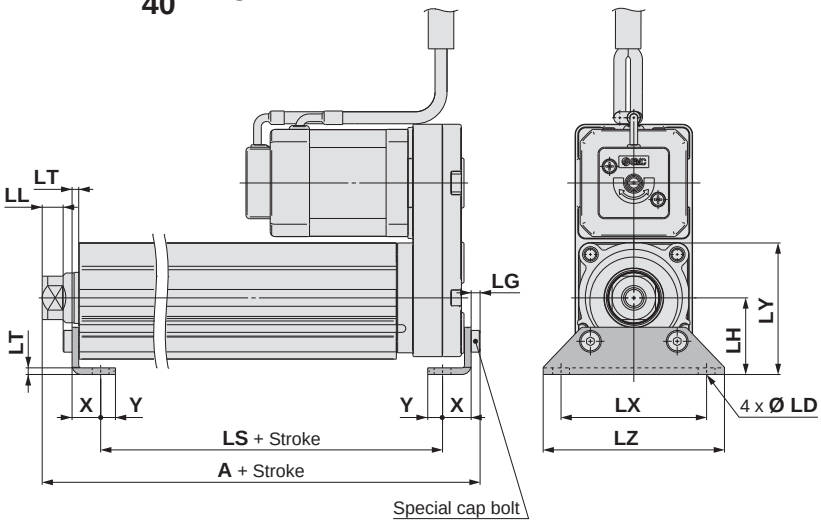

[mm]

| 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, 40** | 22 | 20.5 | 8 | 42.0 | 23.5 | M14 x 1.5 |

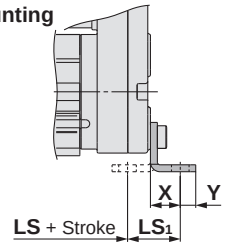
∗ The $L_1$ measurement is when the unit is in the original position. At this position, 2 mm at the end.

∗ Refer to page 97 for details on the rod end nut and mounting bracket.
∗ Refer to the “Handling” precautions on pages 185 to 187 when mounting end brackets such as knuckle joint or workpieces.

### Foot: LEY 16/25/32/40 □□ A/B/C -□□□L




**Outward mounting**




Included parts
- Foot bracket
- Body mounting bolt

### Foot

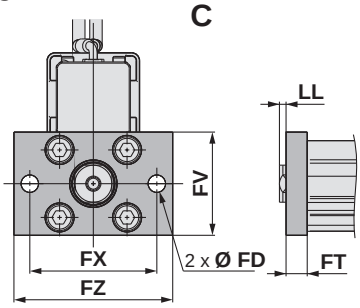
[mm]

| Size | Stroke range [mm] | A | LS | $LS_1$ | LL | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **16** | 10 to 100 | 106.1 | 76.7 | 16.1 | 5.4 | 6.6 | 2.8 | 24 | 2.3 | 48 | 40.3 | 62 | 9.2 | 5.8 |
| | 101 to 300 | 126.1 | 96.7 | | | | | | | | | | | |
| **25** | 15 to 100 | 136.6 | 98.8 | 19.8 | 8.4 | 6.6 | 3.5 | 30 | 2.6 | 57 | 51.5 | 71 | 11.2 | 5.8 |
| | 101 to 400 | 161.6 | 123.8 | | | | | | | | | | | |
| **32** **40** | 20 to 100 | 155.7 | 114 | 19.2 | 11.3 | 6.6 | 4 | 36 | 3.2 | 76 | 61.5 | 90 | 11.2 | 7 |
| | 101 to 500 | 185.7 | 144 | | | | | | | | | | | |

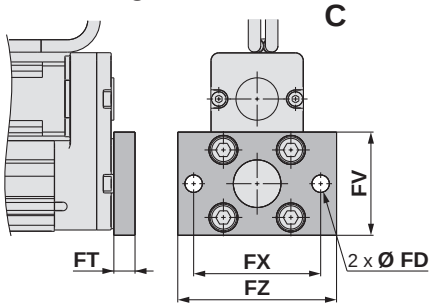
Material: Carbon steel (Chromate treated)
∗ The A measurement is when the unit is in the original position. At this position, 2 mm at the end.
∗ When the motor mounting is the right or left side parallel type, the head side foot bracket should be mounted outward.

## Dimensions

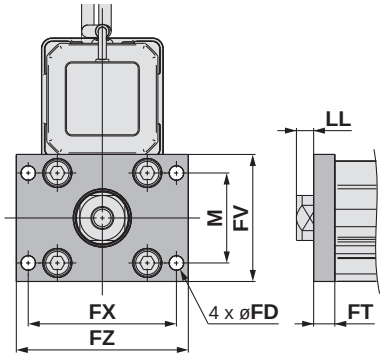
### Rod flange: LEY16□□$^{A}_{C}$B-□□□F



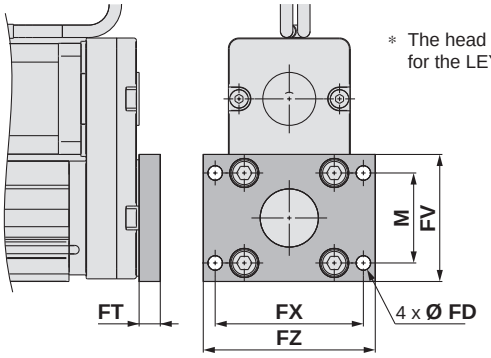

### Head flange: LEY16□□$^{A}_{C}$B-□□□G




### Rod flange: LEY$^{25}_{40}$□□$^{A}_{C}$B-□□□F




### Head flange: LEY25□□$^{A}_{C}$B-□□□G




∗ The head flange type is not available for the LEY32/40.

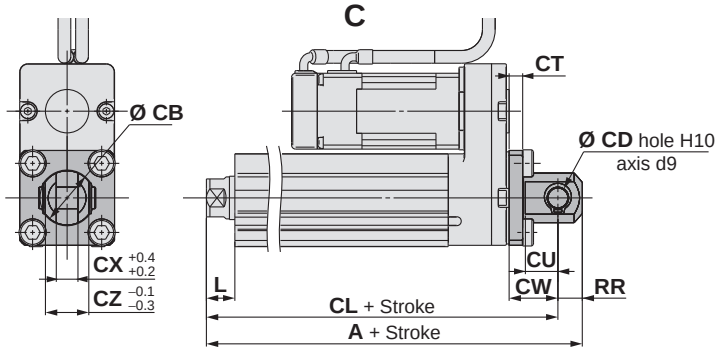
Included parts
- Flange
- Body mounting bolt

**Rod/Head Flange** [mm]

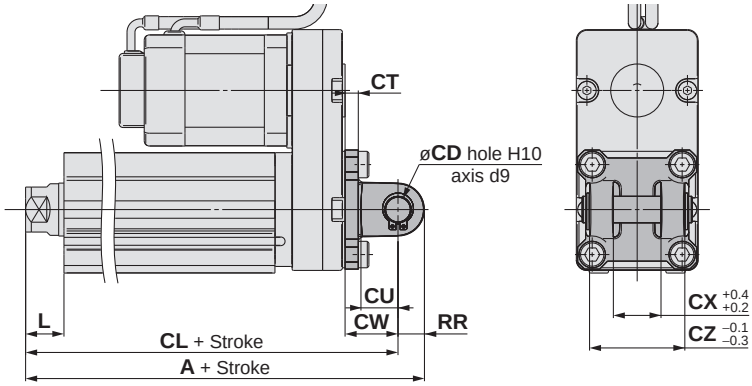
| Size | FD | FT | FV | FX | FZ | LL | M |
|---|---|---|---|---|---|---|---|
| **16** | 6.6 | 8 | 39 | 48 | 60 | 2.5 | — |
| **25** | 5.5 | 8 | 48 | 56 | 65 | 6.5 | 34 |
| **32, 40** | 5.5 | 8 | 54 | 62 | 72 | 10.5 | 40 |

Material: Carbon steel (Nickel plating)

### Double clevis: LEY16□□$^{A}_{C}$B-□□□D




### Double clevis: LEY$^{25}_{40}$□□$^{A}_{C}$B-□□□D




Included parts
- Double clevis
- Body mounting bolt
- Clevis pin
- Retaining ring

∗ Refer to page 97 for details on 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 |
| **25** | 15 to 100 | 160.5 | 150.5 | — | 10 | 5 |
| | 101 to 200 | 185.5 | 175.5 | | | |
| **32** | 20 to 100 | 180.5 | 170.5 | — | 10 | 6 |
| **40** | 101 to 200 | 210.5 | 200.5 | | | |

| Size | Stroke range [mm] | CU | CW | CX | CZ | L | RR |
|---|---|---|---|---|---|---|---|
| **16** | 10 to 100 | 12 | 18 | 8 | 16 | 10.5 | 9 |
| **25** | 15 to 100 | 14 | 20 | 18 | 36 | 14.5 | 10 |
| | 101 to 200 | | | | | | |
| **32** | 20 to 100 | 14 | 22 | 18 | 36 | 18.5 | 10 |
| **40** | 101 to 200 | | | | | | |

Material: Cast iron (Coating)

∗ The A and CL measurements are when the unit is in the original position. At this position, 2 mm at the end.

# Electric Actuator/ Rod Type

## *LEY Series* LEY25, 32

Size 25, 32

* Refer to the table below.

Dust-tight/Water-jet-proof ▶ p. 163 | Secondary Battery Compatible ▶ p. 181 | LECY□ Series ▶ p. 87

## How to Order

LEY H 25 □ S2 B – 100 □ □ □ – S 2 A1 □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭

### ❶ Accuracy

| | |
|---|---|
| — | Basic type |
| H | High-precision type |

### ❷ Size

| |
|---|
| 25 |
| 32 |

### ❸ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| R | Right side parallel |
| L | Left side parallel |
| D | In-line |

### ❹ Motor type

| Symbol | Type | Output [W] | Actuator size | Compatible drivers*3 | UL-compliant |
|---|---|---|---|---|---|
| S2*1 | AC servo motor (Incremental encoder) | 100 | 25 | LECSA□-S1 | — |
| S3 | AC servo motor (Incremental encoder) | 200 | 32 | LECSA□-S3 | — |
| S6*1 | AC servo motor (Absolute encoder) | 100 | 25 | LECSB□-S5<br>LECSC□-S5<br>LECSS□-S5 | — |
| S7 | AC servo motor (Absolute encoder) | 200 | 32 | LECSB□-S7<br>LECSC□-S7<br>LECSS□-S7 | — |
| T6*2 | AC servo motor (Absolute encoder) | 100 | 25 | LECSS2-T5 | ● |
| T7 | | 200 | 32 | LECSS2-T7 | ● |

*1 For motor type S2 and S6, the compatible driver part number suffixes are S1 and S5 respectively.
*2 For motor type T6, the compatible driver part number suffix is T5.
*3 For details on the driver, refer to page 246.

### ❺ Lead [mm]

| Symbol | LEY25 | LEY32*1 |
|---|---|---|
| A | 12 | 16 (20) |
| B | 6 | 8 (10) |
| C | 3 | 4 (5) |

*1 The values shown in ( ) are the leads for the size 32 top mounting, right/left side parallel types.
(Equivalent leads which include the pulley ratio [1.25:1])

### ❻ Stroke [mm]

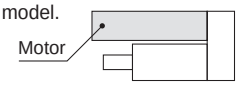
| | |
|---|---|
| 30 | 30 |
| to | to |
| 500 | 500 |

* For details, refer to the applicable stroke table below.

### ❼ Motor option

| | |
|---|---|
| — | Without option |
| B | With lock*1 |

*1 When "With lock" is selected for the top mounting and right/left side parallel types, the motor body will stick out from the end of the body for size 25 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.




### ❽ Rod end thread

| | |
|---|---|
| — | Rod end female thread |
| M | Rod end male thread (1 rod end nut is included.) |

### ❾ Mounting*1

| Symbol | Type | Motor mounting position | |
|---|---|---|---|
| | | Top/Parallel | In-line |
| — | Ends tapped/ Body bottom tapped *2 | ● | ● |
| L | Foot | ● | — |
| F | Rod flange*2 | ●*4 | ● |
| G | Head flange*2 | ●*5 | — |
| D | Double clevis*3 | ● | — |

*1 The mounting bracket is shipped together with the product but does not come assembled.
*2 For the horizontal cantilever mounting of the rod flange, head flange, or ends tapped types, use the actuator within the following stroke range.
・LEY25: 200 mm or less ・LEY32: 100 mm or less
*3 For the mounting of the double clevis type, use the actuator within the following stroke range.
・LEY25: 200 mm or less ・LEY32: 200 mm or less
*4 The rod flange type is not available for the LEY25 with a 30 mm stroke and motor option "With lock."
*5 The head flange type is not available for the LEY32.

### Applicable Stroke Table

●: Standard

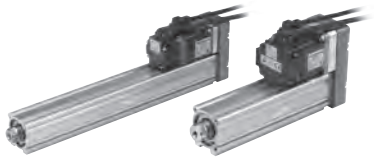
| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | Manufacturable stroke range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEY25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | — | — | 15 to 400 |
| LEY32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 to 500 |

* Please consult with SMC for non-standard strokes as they are produced as special orders.

For auto switches, refer to pages 101 to 103.



SMC



Motor mounting position: Top/Parallel

Motor mounting position: In-line

### ⑩ Cable type*1 *2

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

*1 The motor and encoder cables are included. (The lock cable is also included when the motor with lock option is selected.)
*2 Standard cable entry direction is
• Top/Parallel: (A) Axis side
• In-line: (B) Counter axis side
(Refer to page 264 for details.)

### ⑪ Cable length*1 [m]

| | |
|---|---|
| — | Without cable |
| 2 | 2 |
| 5 | 5 |
| A | 10 |

*1 The length of the motor, encoder, and lock cables are the same.

### ⑫ Driver type*1

| | Compatible driver | Power supply voltage [V] | UL-compliant |
|---|---|---|---|
| — | Without driver | — | — |
| A1 | LECSA1-S□ | 100 to 120 | — |
| A2 | LECSA2-S□ | 200 to 230 | — |
| B1 | LECSB1-S□ | 100 to 120 | — |
| B2 | LECSB2-S□ | 200 to 230 | — |
| C1 | LECSC1-S□ | 100 to 120 | — |
| C2 | LECSC2-S□ | 200 to 230 | — |
| S1 | LECSS1-S□ | 100 to 120 | — |
| S2 | LECSS2-S□ | 200 to 230 | — |
| | LECSS2-T□ | 200 to 240 | ● |

*1 When a driver type is selected, a cable is included. Select the cable type and cable length.
Example)
S2S2: Standard cable (2 m) + Driver (LECSS2)
S2 : Standard cable (2 m)
— : Without cable and driver

### ⑬ I/O cable length [m]*1

| | |
|---|---|
| — | Without cable |
| H | Without cable (Connector only) |
| 1 | 1.5 |

*1 When "Without driver" is selected for driver type, only "—: Without cable" can be selected.
Refer to page 265 if I/O cable is required.
(Options are shown on page 265.)

### Compatible Driver

| Driver type | Pulse input type /Positioning type | Pulse input type | CC-Link direct input type | SSCNET Ⅲ type | SSCNETⅢ/H type |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| **Series** | **LECSA** | **LECSB** | **LECSC** | **LECSS** | **LECSS-T** |
| Number of point tables | Up to 7 | — | Up to 255 (2 stations occupied) | — | — |
| **Pulse input** | ○ | ○ | — | — | — |
| Applicable network | — | — | CC-Link | SSCNET Ⅲ | SSCNET Ⅲ/H |
| **Control encoder** | Incremental 17-bit encoder | Absolute 18-bit encoder | Absolute 18-bit encoder | Absolute 18-bit encoder | Absolute 22-bit encoder |
| Communication function | USB communication | USB communication, RS422 communication | | USB communication | |
| Power supply voltage [V] | 100 to 120 VAC (50/60 Hz)<br>200 to 230 VAC (50/60 Hz) | | | | 200 to 240 VAC (50/60 Hz) |
| **Reference page** | 246 | | | | |

## Specifications: LECSA/LECSB/LECSC/LECSS

∗ Refer to the next page for the LECSS-T.

| Model | | | LEY25S$^{2}_{6}$ (Top/Parallel)/LEY25DS$^{2}_{6}$ (In-line) | | | LEY32S$^{3}_{7}$ (Top/Parallel) | | | LEY32DS$^{3}_{7}$ (In-line) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg] | Horizontal∗1 | 18 | 50 | 50 | 30 | 60 | 60 | 30 | 60 | 60 |
| | | Vertical | 8 | 16 | 30 | 9 | 19 | 37 | 12 | 24 | 46 |
| | Force [N]∗2 (Set value: 15 to 30 %) | | 65 to 131 | 127 to 255 | 242 to 485 | 79 to 157 | 154 to 308 | 294 to 588 | 98 to 197 | 192 to 385 | 368 to 736 |
| | Max.∗3 speed [mm/s] — Stroke range | Up to 300 | 900 | 450 | 225 | 1200 | 600 | 300 | 1000 | 500 | 250 |
| | | 305 to 400 | 600 | 300 | 150 | | | | | | |
| | | 405 to 500 | — | — | — | 800 | 400 | 200 | 640 | 320 | 160 |
| | Pushing speed [mm/s]∗4 | | 35 or less | | | 30 or less | | | 30 or less | | |
| | Max. acceleration/deceleration [mm/s²] | | 5000 | | | 5000 | | | | | |
| | Positioning repeatability [mm] | Basic type | ±0.02 | | | | | | | | |
| | | High-precision type | ±0.01 | | | | | | | | |
| | Lost motion [mm]∗5 | Basic type | 0.1 or less | | | | | | | | |
| | | High-precision type | 0.05 or less | | | | | | | | |
| | Lead [mm] (including pulley ratio) | | 12 | 6 | 3 | 20 | 10 | 5 | 16 | 8 | 4 |
| | Impact/Vibration resistance [m/s²]∗6 | | 50/20 | | | 50/20 | | | | | |
| | Actuation type | | Ball screw + Belt (LEY□)/Ball screw (LEY□D) | | | Ball screw + Belt [1.25:1] | | | Ball screw | | |
| | Guide type | | Sliding bushing (Piston rod) | | | Sliding bushing (Piston rod) | | | | | |
| | Operating temperature range [°C] | | 5 to 40 | | | 5 to 40 | | | | | |
| | Operating humidity range [%RH] | | 90 or less (No condensation) | | | 90 or less (No condensation) | | | | | |
| | Regeneration option | | May be required depending on speed and work load (Refer to pages 43 and 44.) | | | | | | | | |
| Electric specifications | Motor output/Size | | 100 W/□40 | | | 200 W/□60 | | | | | |
| | Motor type | | AC servo motor (100/200 VAC) | | | AC servo motor (100/200 VAC) | | | | | |
| | Encoder | | Motor type S2, S3: Incremental 17-bit encoder (Resolution: 131072 p/rev)<br>Motor type S6, S7: Absolute 18-bit encoder (Resolution: 262144 p/rev) | | | | | | | | |
| | Power consumption [W]∗7 | Horizontal | 45 | | | 65 | | | 65 | | |
| | | Vertical | 145 | | | 175 | | | 175 | | |
| | Standby power consumption when operating [W]∗8 | Horizontal | 2 | | | 2 | | | 2 | | |
| | | Vertical | 8 | | | 8 | | | 8 | | |
| | Max. instantaneous power consumption [W]∗9 | | 445 | | | 724 | | | 724 | | |
| Lock unit specifications | Type∗10 | | Non-magnetising lock | | | | | | | | |
| | Holding force [N] | | 131 | 255 | 485 | 157 | 308 | 588 | 197 | 385 | 736 |
| | Power consumption [W] at 20 °C∗11 | | 6.3 | | | 7.9 | | | 7.9 | | |
| | Rated voltage [V] | | 24 VDC $^{0}_{-10\ \%}$ | | | | | | | | |

∗1 This is the maximum value of the horizontal work load. An external guide is necessary to support the load. The actual work load changes according to the condition of the external guide. Confirm the load using the actual device.

∗2 The force setting range (set values for the driver) for the force control with the torque control mode. Set it with reference to "Force Conversion Graph" on page 45. When the control equivalent to the pushing operation of the controller LECP series is performed, select the LECSS driver and combine it with the Simple Motion (manufactured by Mitsubishi Electric Corporation) which has a pushing operation function.

∗3 The allowable speed changes according to the stroke. Set the number of rotations according to speed.

∗4 The allowable collision speed for collision with the workpiece with the torque control mode

∗5 A reference value for correcting an error in reciprocal operation

∗6 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)

∗7 The power consumption (including the driver) is for when the actuator is operating.

∗8 The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.

∗9 The maximum instantaneous power consumption (including the driver) is for when the actuator is operating.

∗10 Only when motor option "With lock" is selected

∗11 For an actuator with lock, add the power consumption for the lock.

## Weight

### Product Weight

[kg]

| Series | | LEY25S$^{2}_{6}$ (Motor mounting position: Top/Parallel) | | | | | | | | | LEY32S$^{3}_{7}$ (Motor mounting position: Top/Parallel) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Motor type | Incremental encoder | 1.31 | 1.38 | 1.55 | 1.81 | 1.99 | 2.16 | 2.34 | 2.51 | 2.69 | 2.42 | 2.53 | 2.82 | 3.29 | 3.57 | 3.85 | 4.14 | 4.42 | 4.70 | 4.98 | 5.26 |
| | Absolute encoder | 1.37 | 1.44 | 1.61 | 1.87 | 2.05 | 2.22 | 2.40 | 2.57 | 2.75 | 2.36 | 2.47 | 2.76 | 3.23 | 3.51 | 3.79 | 4.08 | 4.36 | 4.64 | 4.92 | 5.20 |

| Series | | LEY25DS$^{2}_{6}$ (Motor mounting position: In-line) | | | | | | | | | LEY32DS$^{3}_{7}$ (Motor mounting position: In-line) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Motor type | Incremental encoder | 1.34 | 1.41 | 1.58 | 1.84 | 2.02 | 2.19 | 2.37 | 2.54 | 2.72 | 2.44 | 2.55 | 2.84 | 3.31 | 3.59 | 3.87 | 4.16 | 4.44 | 4.72 | 5.00 | 5.28 |
| | Absolute encoder | 1.40 | 1.47 | 1.64 | 1.90 | 2.08 | 2.25 | 2.43 | 2.60 | 2.78 | 2.38 | 2.49 | 2.78 | 3.25 | 3.53 | 3.81 | 4.10 | 4.38 | 4.66 | 4.94 | 5.22 |

### Additional Weight

[kg]

| Size | | 25 | 32 |
|---|---|---|---|
| Lock | Incremental encoder | 0.20 | 0.40 |
| | Absolute encoder [S6/S7] | 0.30 | 0.66 |
| Rod end male thread | Male thread | 0.03 | 0.03 |
| | Nut | 0.02 | 0.02 |
| Foot bracket (2 sets including mounting bolt) | | 0.08 | 0.14 |
| Rod flange (including mounting bolt) | | 0.17 | 0.20 |
| Head flange (including mounting bolt) | | | |
| Double clevis (including pin, retaining ring, and mounting bolt) | | 0.16 | 0.22 |

## Specifications: LECSS-T

| Model | | | LEY25T6 (Top/Parallel)/LEY25DT6 (In-line) | | | LEY32T7 (Top/Parallel) | | | LEY32DT7 (In-line) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg] | Horizontal*1 | 18 | 50 | 50 | 30 | 60 | 60 | 30 | 60 | 60 |
| | | Vertical | 8 | 16 | 30 | 9 | 19 | 37 | 12 | 24 | 46 |
| | Force [N]*2 (Set value: 15 to 30 %) | | 65 to 131 | 127 to 255 | 242 to 485 | 79 to 157 | 154 to 308 | 294 to 588 | 98 to 197 | 192 to 385 | 368 to 736 |
| | Max.*3 speed [mm/s] — Stroke range | Up to 300 | 900 | 450 | 225 | 1200 | 600 | 300 | 1000 | 500 | 250 |
| | | 305 to 400 | 600 | 300 | 150 | | | | | | |
| | | 405 to 500 | — | — | — | 800 | 400 | 200 | 640 | 320 | 160 |
| | Pushing speed [mm/s]*4 | | 35 or less | | | 30 or less | | | 30 or less | | |
| | Max. acceleration/deceleration [mm/s²] | | 5000 | | | 5000 | | | | | |
| | Positioning repeatability [mm] | Basic type | ±0.02 | | | ±0.02 | | | | | |
| | | High-precision type | ±0.01 | | | ±0.01 | | | | | |
| | Lost motion [mm]*5 | Basic type | 0.1 or less | | | | | | | | |
| | | High-precision type | 0.05 or less | | | | | | | | |
| | Lead [mm] (including pulley ratio) | | 12 | 6 | 3 | 20 | 10 | 5 | 16 | 8 | 4 |
| | Impact/Vibration resistance [m/s²]*6 | | 50/20 | | | 50/20 | | | | | |
| | Actuation type | | Ball screw + Belt (LEY□)/Ball screw (LEY□D) | | | Ball screw + Belt [1.25:1] | | | Ball screw | | |
| | Guide type | | Sliding bushing (Piston rod) | | | Sliding bushing (Piston rod) | | | | | |
| | Operating temperature range [°C] | | 5 to 40 | | | 5 to 40 | | | | | |
| | Operating humidity range [%RH] | | 90 or less (No condensation) | | | 90 or less (No condensation) | | | | | |
| | Regeneration option | | May be required depending on speed and work load (Refer to pages 45 and 46.) | | | | | | | | |
| Electric specifications | Motor output/Size | | 100 W/□40 | | | 200 W/□60 | | | | | |
| | Motor type | | AC servo motor (200 VAC) | | | AC servo motor (200 VAC) | | | | | |
| | Encoder | | Motor type T6, T7: Absolute 22-bit encoder (Resolution: 4194304 p/rev) | | | | | | | | |
| | Power consumption [W]*7 | Horizontal | 45 | | | 65 | | | 65 | | |
| | | Vertical | 145 | | | 175 | | | 175 | | |
| | Standby power consumption when operating [W]*8 | Horizontal | 2 | | | 2 | | | 2 | | |
| | | Vertical | 8 | | | 8 | | | 8 | | |
| | Max. instantaneous power consumption [W]*9 | | 445 | | | 724 | | | 724 | | |
| Lock unit specifications | Type*10 | | Non-magnetising lock | | | | | | | | |
| | Holding force [N] | | 131 | 255 | 485 | 157 | 308 | 588 | 197 | 385 | 736 |
| | Power consumption [W] at 20 °C*11 | | 6.3 | | | 7.9 | | | 7.9 | | |
| | Rated voltage [V] | | 24 VDC $^{0}_{-10\ \%}$ | | | | | | | | |

*1 This is the maximum value of the horizontal work load. An external guide is necessary to support the load. The actual work load changes according to the condition of the external guide. Confirm the load using the actual device.
*2 The force setting range (set values for the driver) for the force control with the torque control mode. Set it with reference to "Force Conversion Graph (Guide)" on page 48. When the control equivalent to the pushing operation of the controller LECP series is performed, combine the Simple Motion (manufactured by Mitsubishi Electric Corporation) which has a pushing operation function.
*3 The allowable speed changes according to the stroke.
*4 The allowable collision speed for collision with the workpiece with the torque control mode
*5 A reference value for correcting an error in reciprocal operation
*6 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*7 The power consumption (including the driver) is for when the actuator is operating.
*8 The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.
*9 The maximum instantaneous power consumption (including the driver) is for when the actuator is operating.
*10 Only when motor option "With lock" is selected
*11 For an actuator with lock, add the power consumption for the lock.

## Weight

### Product Weight

| Series | | LEY25T6 (Motor mounting position: Top/Parallel) | | | | | | | | | LEY32T7 (Motor mounting position: Top/Parallel) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Motor type | Absolute encoder | 1.4 | 1.5 | 1.6 | 1.9 | 2.0 | 2.2 | 2.4 | 2.6 | 2.7 | 2.3 | 2.4 | 2.7 | 3.2 | 3.5 | 3.8 | 4.1 | 4.3 | 4.6 | 4.9 | 5.2 |

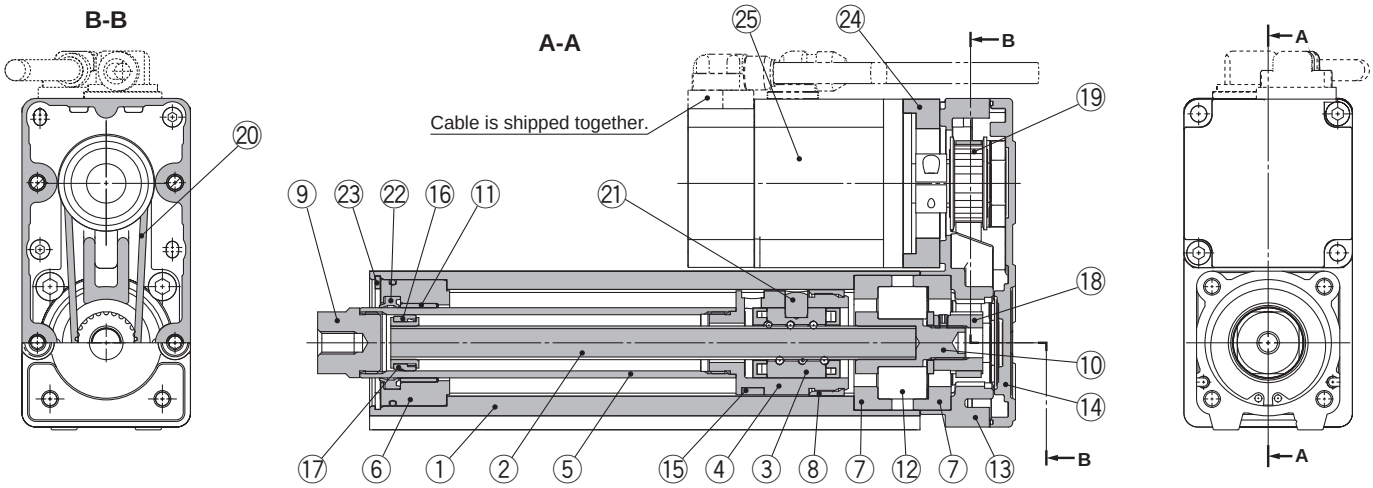
| Series | | LEY25DT6 (Motor mounting position: In-line) | | | | | | | | | LEY32DT7 (Motor mounting position: In-line) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Motor type | Absolute encoder | 1.4 | 1.5 | 1.6 | 1.9 | 2.1 | 2.2 | 2.4 | 2.6 | 2.8 | 2.4 | 2.5 | 2.8 | 3.2 | 3.5 | 3.8 | 4.1 | 4.4 | 4.6 | 4.9 | 5.2 |

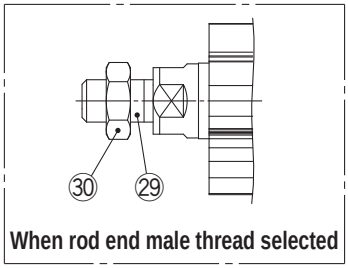
### Additional Weight

| Size | | 25 | 32 |
|---|---|---|---|
| Lock | Absolute encoder [T6/T7] | 0.3 | 0.4 |
| Rod end male thread | Male thread | 0.03 | 0.03 |
| | Nut | 0.02 | 0.02 |
| Foot bracket (2 sets including mounting bolt) | | 0.08 | 0.14 |
| Rod flange (including mounting bolt) | | 0.17 | 0.20 |
| Head flange (including mounting bolt) | | | |
| Double clevis (including pin, retaining ring, and mounting bolt) | | 0.16 | 0.22 |

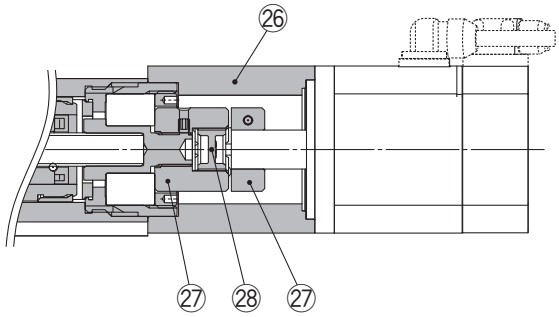
## Construction

### Motor top mounting type: LEY$^{25}_{32}$




### In-line motor type: LEY$^{25}_{32}$D




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Aluminium alloy | Anodised |
| 2 | **Ball screw shaft** | Alloy steel | |
| 3 | **Ball screw nut** | Synthetic resin/Alloy steel | |
| 4 | **Piston** | Aluminium alloy | |
| 5 | **Piston rod** | Stainless steel | Hard chrome plating |
| 6 | **Rod cover** | Aluminium alloy | |
| 7 | **Bearing holder** | Aluminium alloy | |
| 8 | **Rotation stopper** | POM | |
| 9 | **Socket** | Free cutting carbon steel | Nickel plating |
| 10 | **Connected shaft** | Free cutting carbon steel | Nickel plating |
| 11 | **Bushing** | Bearing alloy | |
| 12 | **Bearing** | — | |
| 13 | **Return box** | Aluminium die-cast | Coating |
| 14 | **Return plate** | Aluminium die-cast | Coating |
| 15 | **Magnet** | — | |
| 16 | **Wear ring holder** | Stainless steel | Stroke 101 mm or more |
| 17 | **Wear ring** | POM | Stroke 101 mm or more |
| 18 | **Screw shaft pulley** | Aluminium alloy | |
| 19 | **Motor pulley** | Aluminium alloy | |
| 20 | **Belt** | — | |
| 21 | **Parallel pin** | Stainless steel | |
| 22 | **Seal** | NBR | |
| 23 | **Retaining ring** | Steel for spring | |
| 24 | **Motor adapter** | Aluminium alloy | Coating |
| 25 | **Motor** | — | |
| 26 | **Motor block** | Aluminium alloy | Coating |
| 27 | **Hub** | Aluminium alloy | |
| 28 | **Spider** | Urethane | |
| 29 | **Socket (Male thread)** | Free cutting carbon steel | Nickel plating |
| 30 | **Nut** | Alloy steel | Zinc chromated |

### Replacement Parts (Motor top/parallel only)/Belt

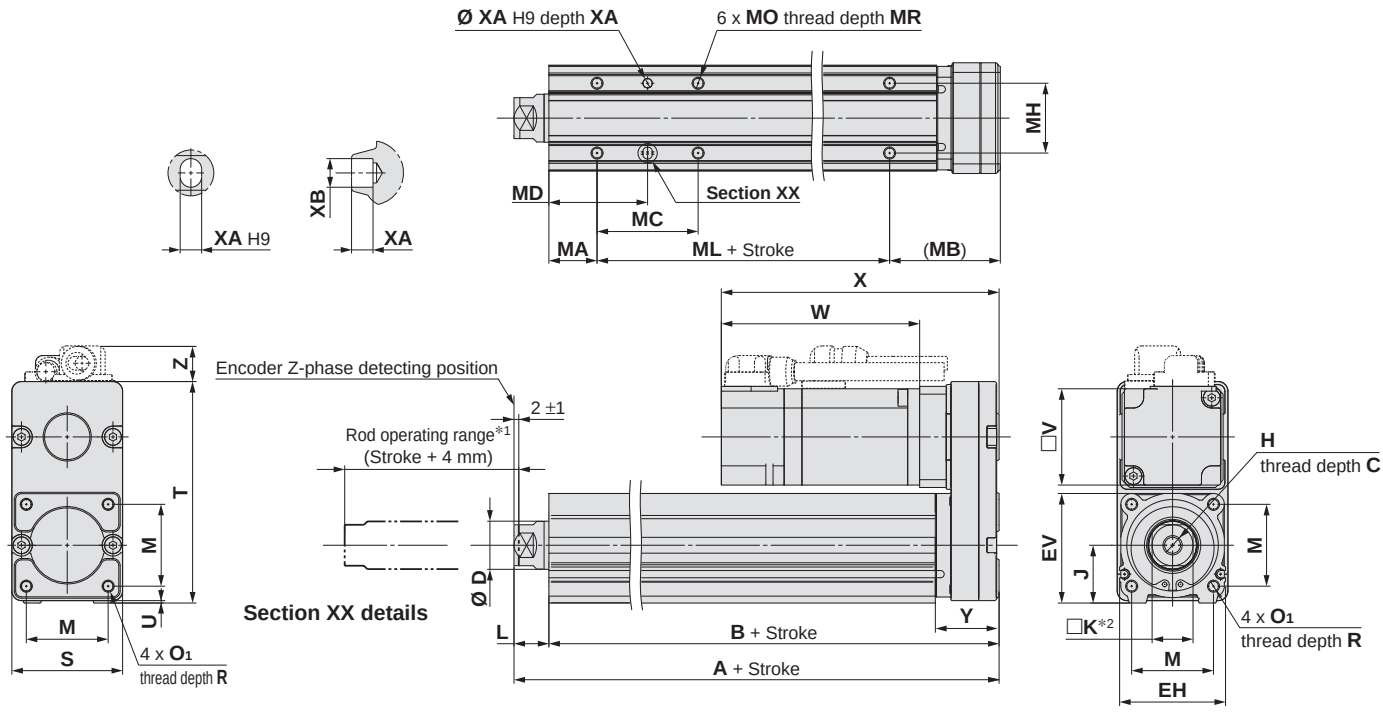
| No. | Size | Order no. |
|---|---|---|
| 20 | **25** | LE-D-2-2 |
| | **32** | LE-D-2-4 |

### Replacement Parts/Grease Pack

| Applied portion | Order no. |
|---|---|
| Piston rod | GR-S-010 (10 g)<br>GR-S-020 (20 g) |

∗ Apply grease on the piston rod periodically.
Grease should be applied at 1 million cycles or 200 km, whichever comes first.

## Dimensions: Motor Top/Parallel




∗1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 The direction of rod end width across flats (□K) differs depending on the products.

[mm]

| Size | Stroke range [mm] | A | B | C | D | EH | EV | H | J | K | L | M | $O_1$ | R | S | T | U | Y | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 26.5 | 40 |
| | 105 to 400 | 155.5 | 141 | | | | | | | | | | | | | | | | |
| 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 | 34 | 60 |
| | 105 to 500 | 178.5 | 160 | | | | | | | | | | | | | | | | |

| Size | Stroke range [mm] | Incremental encoder | | | | | | Absolute encoder [S6/S7] | | | | | | Absolute encoder [T6/T7] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Without lock | | | With lock | | | Without lock | | | With lock | | | Without lock | | | With lock | | |
| | | W | X | Z | W | X | Z | W | X | Z | W | X | Z | W | X | Z | W | X | Z |
| 25 | 15 to 100 | 87 | 120 | 14.1 | 123.9 | 156.9 | 15.8 | 82.4 | 115.4 | 14.1 | 123.5 | 156.5 | 15.8 | 82.4 | 115.4 | 14.1 | 123 | 156 | 15.8 |
| | 105 to 400 | | | | | | | | | | | | | | | | | | |
| 32 | 20 to 100 | 88.2 | 128.2 | 17.1 | 116.8 | 156.8 | 17.1 | 76.6 | 116.6 | 17.1 | 116.1 | 156.1 | 17.1 | 76.6 | 116.6 | 17.1 | 113.4 | 153.4 | 17.1 |
| | 105 to 500 | | | | | | | | | | | | | | | | | | |

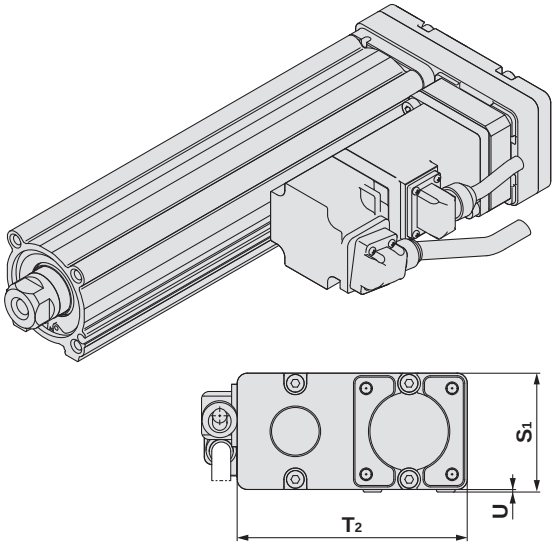
### Body Bottom Tapped

[mm]

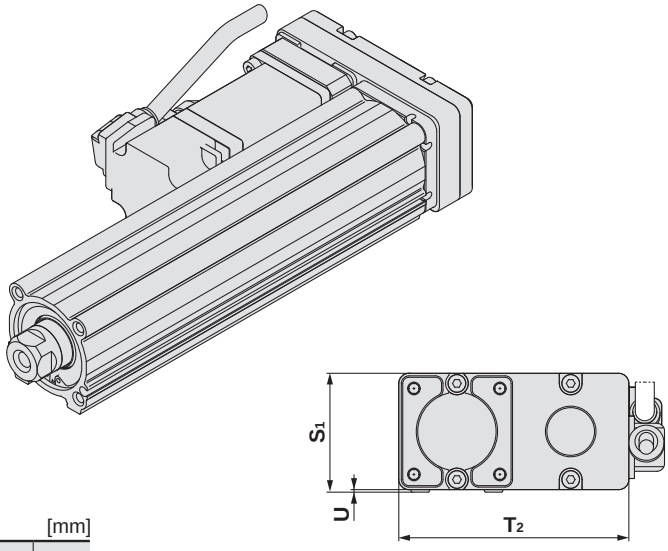
| Size | Stroke range [mm] | MA | MB | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 39 | 20 | 46 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | | 42 | 41 | | | | | | |
| | 101 to 124 | | | | | | 75 | | | | |
| | 125 to 200 | | | 59 | 49.5 | | | | | | |
| | 201 to 400 | | | 76 | 58 | | | | | | |
| 32 | 20 to 39 | 25 | 55 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | | 36 | 43 | | | | | | |
| | 101 to 124 | | | | | | 80 | | | | |
| | 125 to 200 | | | 53 | 51.5 | | | | | | |
| | 201 to 500 | | | 70 | 60 | | | | | | |

## Dimensions: Motor Top/Parallel

### Motor left side parallel type: LEY$^{25}_{32}$L




### Motor right side parallel type: LEY$^{25}_{32}$R

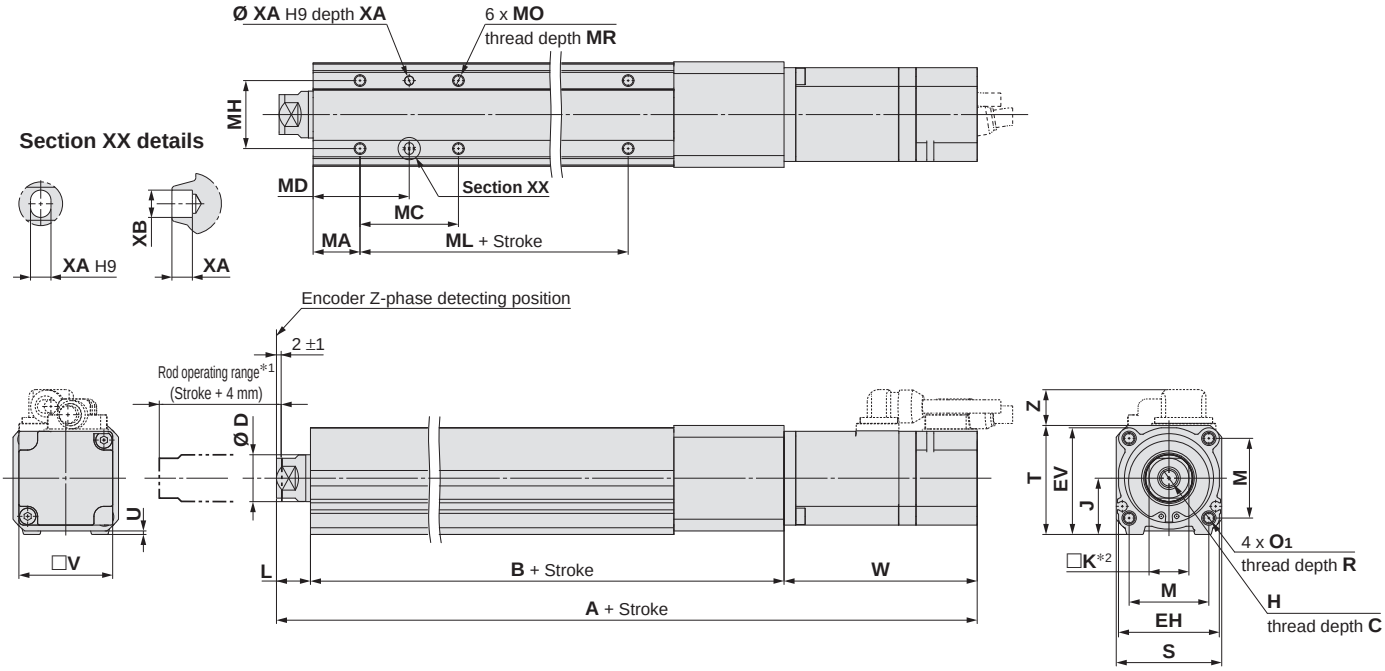



[mm]

| Size | $S_1$ | $T_2$ | U |
|---|---|---|---|
| **25** | 47 | 91 | 1 |
| **32** | 61 | 117 | 1 |

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

## Dimensions: In-line Motor




*1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
*2 The direction of rod end width across flats (□K) differs depending on the products.

[mm]

| Size | Stroke range [mm] | C | D | EH | EV | H | J | K | L | M | O1 | R | S | T | U | B | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 100 | 13 | 20 | 44 | 45.5 | M8 x 1.25 | 24 | 17 | 14.5 | 34 | M5 x 0.8 | 8 | 45 | 46.5 | 1.5 | 136.5 | 40 |
| | 105 to 400 | | | | | | | | | | | | | | | 161.5 | |
| 32 | 20 to 100 | 13 | 25 | 51 | 56.5 | M8 x 1.25 | 31 | 22 | 18.5 | 40 | M6 x 1.0 | 10 | 60 | 61 | 1 | 156 | 60 |
| | 105 to 500 | | | | | | | | | | | | | | | 186 | |

| Size | Stroke range [mm] | Incremental encoder | | | | | | Absolute encoder [S6/S7] | | | | | | Absolute encoder [T6/T7] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Without lock | | | With lock | | | Without lock | | | With lock | | | Without lock | | | With lock | | |
| | | A | W | Z | A | W | Z | A | W | Z | A | W | Z | A | VB | VC | A | VB | VC |
| 25 | 15 to 100 | 238 | 87 | 14.6 | 274.9 | 123.9 | 16.3 | 233.4 | 82.4 | 14.6 | 274.5 | 123.5 | 16.3 | 233.4 | 82.4 | 14.6 | 274 | 123 | 16.3 |
| | 105 to 400 | 263 | | | 299.9 | | | 258.4 | | | 299.5 | | | 258.4 | | | 299 | | |
| 32 | 20 to 100 | 262.7 | 88.2 | 17.1 | 291.3 | 116.8 | 17.1 | 251.1 | 76.6 | 17.1 | 290.6 | 116.1 | 17.1 | 251.1 | 76.6 | 17.1 | 287.9 | 113.4 | 17.1 |
| | 105 to 500 | 292.7 | | | 321.3 | | | 281.1 | | | 320.6 | | | 281.1 | | | 317.9 | | |

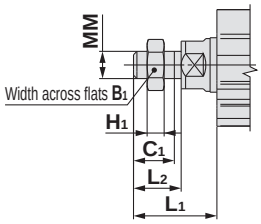
### Body Bottom Tapped

[mm]

| Size | Stroke range [mm] | MA | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 39 | 20 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | 42 | 41 | | | | | | |
| | 101 to 124 | | | | | 75 | | | | |
| | 125 to 200 | | 59 | 49.5 | | | | | | |
| | 201 to 400 | | 76 | 58 | | | | | | |
| 32 | 20 to 39 | 25 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | 36 | 43 | | | | | | |
| | 101 to 124 | | | | | 80 | | | | |
| | 125 to 200 | | 53 | 51.5 | | | | | | |
| | 201 to 500 | | 70 | 60 | | | | | | |

## Dimensions

### End male thread: LEY 25/32 □□ A/B/C -□□M




* Refer to page 97 for details on the rod end nut and mounting bracket.
* Refer to the precautions on page 187 when mounting end brackets such as knuckle joint or workpieces.

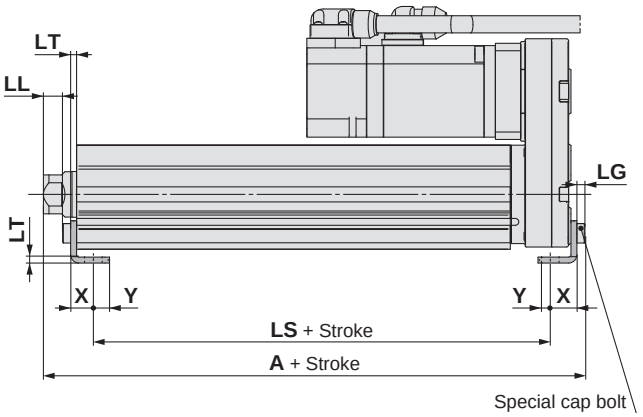
[mm]

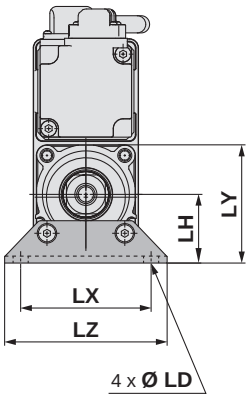
| Size | B1 | C1 | H1 | L1 | L2 | MM |
|---|---|---|---|---|---|---|
| **25** | 22 | 20.5 | 8 | 38 | 23.5 | M14 x 1.5 |
| **32** | 22 | 20.5 | 8 | 42.0 | 23.5 | M14 x 1.5 |

* The L1 measurement is when the unit is in the original position. At this position, 2 mm at the end.

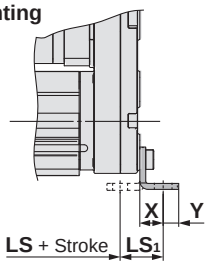
### Foot: LEY 25/32 □□ A/B/C -□□□L

Included parts
・Foot bracket
・Body mounting bolt




**Outward mounting**




### Foot

[mm]

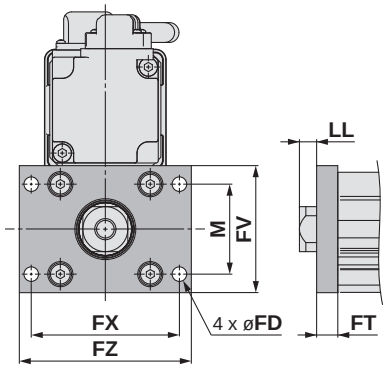
| Size | Stroke range [mm] | A | LS | LS1 | LL | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **25** | 15 to 100 | 136.6 | 98.8 | 19.8 | 8.4 | 6.6 | 3.5 | 30 | 2.6 | 57 | 51.5 | 71 | 11.2 | 5.8 |
| | 101 to 400 | 161.6 | 123.8 | | | | | | | | | | | |
| **32** | 20 to 100 | 155.7 | 114 | 19.2 | 11.3 | 6.6 | 4 | 36 | 3.2 | 76 | 61.5 | 90 | 11.2 | 7 |
| | 101 to 500 | 185.7 | 144 | | | | | | | | | | | |

Material: Carbon steel (Chromate treated)

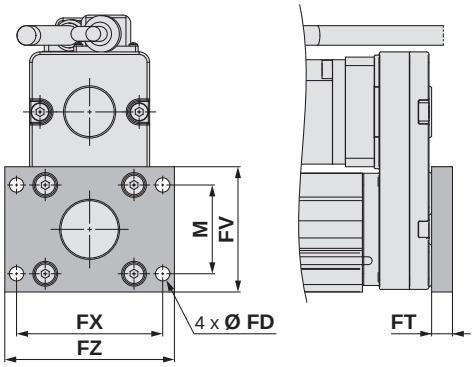
* The A measurement is when the unit is in the Z-phase first detecting position. At this position, 2 mm at the end.
* When the motor mounting is the right or left side parallel type, the head side foot bracket should be mounted outward.

## Dimensions

### Rod flange: LEY25/32□□A/B/C-□□□F




### Head flange: LEY25□□A/B/C-□□□G




* The head flange type is not available for the LEY32.

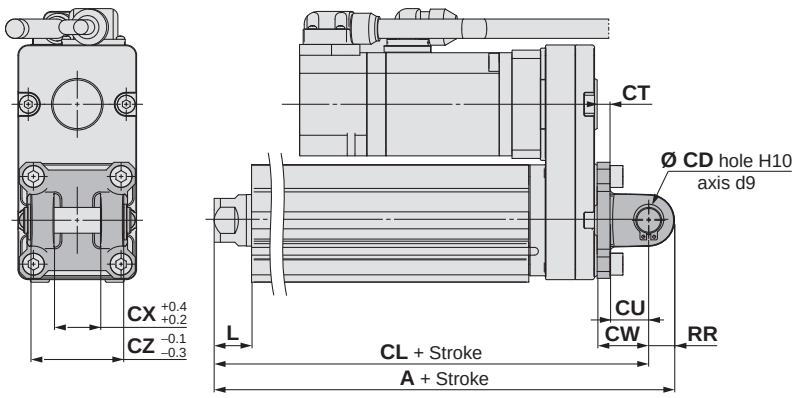
Included parts
- Flange
- Body mounting bolt

**Rod/Head Flange** [mm]

| Size | FD | FT | FV | FX | FZ | LL | M |
|---|---|---|---|---|---|---|---|
| **25** | 5.5 | 8 | 48 | 56 | 65 | 6.5 | 34 |
| **32** | 5.5 | 8 | 54 | 62 | 72 | 10.5 | 40 |

Material: Carbon steel (Nickel plating)

### Double clevis: LEY25/32□□A/B/C-□□□D




Included parts
- Double clevis
- Body mounting bolt
- Clevis pin
- Retaining ring

* Refer to page 97 for details on the rod end nut and mounting bracket.

**Double Clevis** [mm]

| Size | Stroke range [mm] | A | CL | CD | CT |
|---|---|---|---|---|---|
| **25** | 15 to 100 | 160.5 | 150.5 | 10 | 5 |
| | 101 to 200 | 185.5 | 175.5 | | |
| **32** | 20 to 100 | 180.5 | 170.5 | 10 | 6 |
| | 101 to 200 | 210.5 | 200.5 | | |

| Size | Stroke range [mm] | CU | CW | CX | CZ | L | RR |
|---|---|---|---|---|---|---|---|
| **25** | 15 to 100 | 14 | 20 | 18 | 36 | 14.5 | 10 |
| | 101 to 200 | | | | | | |
| **32** | 20 to 100 | 14 | 22 | 18 | 36 | 18.5 | 10 |
| | 101 to 200 | | | | | | |

Material: Cast iron (Coating)

* The A and CL measurements are when the unit is in the Z-phase first detecting position. At this position, 2 mm at the end.

# Electric Actuator/ Rod Type

Dust-tight/Water-jet-proof (IP65 Equivalent)

∗ Option

## *LEY Series* LEY63 Size 63

∗ Refer to tables ❹ and ⓭ below.

RoHS

LECY□ Series ▶ p. 87

Refer to page 41 for model selection.

## How to Order

LEY H 63 □ S4 B – 200 □ □ □ □ – S 2 A2 □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭ ⓮

### ❶ Accuracy

| | |
|---|---|
| — | Basic type |
| H | High-precision type |

### ❷ Size

| |
|---|
| 63 |

### ❸ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| R | Right side parallel |
| L | Left side parallel |
| D | In-line |

### ❹ Motor type

| Symbol | Type | Output [W] | Actuator size | Compatible driver | UL-compliant |
|---|---|---|---|---|---|
| S4 | AC servo motor (Incremental encoder) | 400 | 63 | LECSA2-S4 | — |
| S8 | AC servo motor (Absolute encoder) | 400 | 63 | LECSB2-S8<br>LECSC2-S8<br>LECSS2-S8 | — |
| T8 | | | | LECSS2-T8 | ● |

### ❺ Lead [mm]

| Symbol | LEY63 |
|---|---|
| A | 20 |
| B | 10 |
| C | 5 |
| L | 2.86∗1 ∗2 |

∗1 Screw lead 5 mm, Pulley ratio [4:7] equivalent lead

∗2 Only available for top mounting and right/left side parallel types

### ❻ Stroke [mm]

| | |
|---|---|
| 50 | 50 |
| to | to |
| 800 | 800 |

∗ For details, refer to the applicable stroke table below.

### ❼ Dust-tight/Water-jet-proof

| | |
|---|---|
| — | IP5x equivalent (Dust-protected) |
| P | IP65 equivalent (Dust-tight/Water-jet-proof)/ With vent hole tap |

∗ When using the dust-tight/water-jet-proof (IP65 equivalent), correctly mount the fitting and tubing to the vent hole tap, and then place the end of the tubing in an area not exposed to dust or water.

∗ The fitting and tubing should be provided separately by the customer. Select [Applicable tubing O.D.: Ø 4 or more, Connection thread: Rc1/8].

∗ Cannot be used in an environment where oil such as cutting oil splashes or it is constantly exposed to water. Take appropriate protective measures. For details on enclosure, refer to "Enclosure" on page 188.

### ❽ Motor option

| | |
|---|---|
| — | Without option |
| B | With lock |

### ❾ Rod end thread

| | |
|---|---|
| — | Rod end female thread |
| M | Rod end male thread (1 rod end nut is included.) |

### ❿ Mounting∗1

| Symbol | Type | Motor mounting position | |
|---|---|---|---|
| | | Top/Parallel | In-line |
| — | Ends tapped/ Body bottom tapped∗2 | ● | ● |
| L | Foot | ● | — |
| F | Rod flange∗2 | ● | ● |
| D | Double clevis∗3 | ● | — |

∗1 The mounting bracket is shipped together with the product but does not come assembled.

∗2 For the horizontal cantilever mounting of the rod flange or ends tapped types, use the actuator within the following stroke range.
• LEY63: 400 mm or less

∗3 For the mounting of the double clevis type, use the actuator within the following stroke range.
• LEY63: 300 mm or less

### ⓫ Cable type∗1

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

∗1 The motor and encoder cables are included. (The lock cable is also included when the motor with lock option is selected.)

∗ Standard cable entry direction is
• Top/Parallel: (A) Axis side
• In-line: (B) Counter axis side
(Refer to page 264 for details.)

### ⓬ Cable length∗2 [m]

| | |
|---|---|
| — | Without cable |
| 2 | 2 |
| 5 | 5 |
| A | 10 |

∗2 The length of the encoder, motor, and lock cables are the same.

### ⓭ Driver type

| | Compatible driver | Power supply voltage | UL-compliant |
|---|---|---|---|
| — | Without driver | | — |
| A2 | LECSA2/Pulse input (Incremental encoder) | 200 V to 230 V | — |
| B2 | LECSB2/Pulse input (Absolute encoder) | 200 V to 230 V | — |
| C2 | LECSC2/CC-Link (Absolute encoder) | 200 V to 230 V | — |
| S2 | LECSS2-S/SSCNET Ⅲ (Absolute encoder) | 200 V to 230 V | — |
| | LECSS2-T/SSCNET Ⅲ/H (Absolute encoder) | 200 V to 240 V | ● |

∗ When a driver type is selected, a cable is included. Select the cable type and cable length.

Example) S2S2: Standard cable (2 m) + Driver (LECSS2)
S2 : Standard cable (2 m)
—: Without cable and driver

### ⓮ I/O cable length [m]∗1

| | |
|---|---|
| — | Without cable |
| H | Without cable (Connector only) |
| 1 | 1.5 |

∗1 When "Without driver" is selected for driver type, only "—: Without cable" can be selected. Refer to page 265 if I/O cable is required. (Options are shown on page 265.)

### Applicable Stroke Table

| Model \ Stroke [mm] | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 | Manufacturable stroke range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEY63 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 50 to 800 |

∗ Please consult with SMC for non-standard strokes as they are produced as special orders.

## Specifications

| Model | | | LEY63S$^{4}_{8}$/T8 (Top/Parallel) | | | | LEY63DS$^{4}_{8}$/T8 (In-line) | | |
|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg] | Horizontal∗1 | 40 | 70 | 80 | 200 | 40 | 70 | 80 |
| | | Vertical∗14 | 19 | 38 | 72 | 115 | 19 | 38 | 72 |
| | Force [N]/Set value∗2 : 15 to 50 %∗3 ∗4 | | 156 to 521 | 304 to 1012 | 573 to 1910 | 1003 to 3343 | 156 to 521 | 304 to 1012 | 573 to 1910 |
| | Max. speed∗5 [mm/s] Stroke range | Up to 500 | 1000 | 500 | 250 | 70 | 1000 | 500 | 250 |
| | | 505 to 600 | 800 | 400 | 200 | | 800 | 400 | 200 |
| | | 605 to 700 | 600 | 300 | 150 | | 600 | 300 | 150 |
| | | 705 to 800 | 500 | 250 | 125 | | 500 | 250 | 125 |
| | Pushing speed [mm/s]∗6 | | 30 or less | | | | | | |
| | Max. acceleration/deceleration [mm/s²] | | 5000 | | | 3000 | 5000 | | |
| | Positioning repeatability [mm] | Basic type | ±0.02 | | | | | | |
| | | High-precision type | ±0.01 | | | | | | |
| | Lost motion [mm]∗7 | Basic type | 0.1 or less | | | | | | |
| | | High-precision type | 0.05 or less | | | | | | |
| | Screw lead [mm] (including pulley ratio) | | 20 | 10 | 5 | 5 (2.86) | 20 | 10 | 5 |
| | Impact/Vibration resistance [m/s²]∗8 | | 50/20 | | | | | | |
| | Actuation type | | Ball screw + Belt | | | Ball screw + Belt [Pulley ratio 4:7] | Ball screw | | |
| | Guide type | | Sliding bushing (Piston rod) | | | | | | |
| | Operating temperature range [°C] | | 5 to 40 | | | | | | |
| | Operating humidity range [%RH] | | 90 or less (No condensation) | | | | | | |
| | Regeneration option | | May be required depending on speed and work load (Refer to pages 43 and 44.) | | | | | | |
| Electric specifications | Motor output/Size | | 400 W/□60 | | | | | | |
| | Motor type | | AC servo motor (200 VAC) | | | | | | |
| | Encoder | | Motor type S4: Incremental 17-bit encoder (Resolution: 131072 p/rev)<br>Motor type S8: Absolute 18-bit encoder (Resolution: 262144 p/rev)<br>Motor type T8: Absolute 22-bit encoder (Resolution: 4194304 p/rev) | | | | | | |
| | Power consumption [W]∗9 | Horizontal | 210 | | | | | | |
| | | Vertical | 230 | | | | | | |
| | Standby power consumption when operating [W]∗10 | Horizontal | 2 | | | | | | |
| | | Vertical | 18 | | | | | | |
| | Max. instantaneous power consumption [W]∗11 | | 1275 | | | | | | |
| Lock unit specifications | Type∗12 | | Non-magnetising lock | | | | | | |
| | Holding force [N] | | 313 | 607 | 1146 | 2006 | 313 | 607 | 1146 |
| | Power consumption [W] at 20 °C∗13 | | 7.9 | | | | | | |
| | Rated voltage [V] | | 24 VDC $^{0}_{-10}$ % | | | | | | |

∗1 This is the maximum value of the horizontal work load. An external guide is necessary to support the load. The actual work load changes according to the condition of the external guide. Confirm the load using the actual device.
∗2 Set values for the driver
∗3 The force setting range (set values for the driver) for the force control with the torque control mode. The force and duty ratio change according to the set value. Set it with reference to "Force Conversion Graph" on page 45. When the control equivalent to the pushing operation of the controller LECP series is performed, select the LECSS driver and combine it with the Simple Motion (manufactured by Mitsubishi Electric Corporation) which has a pushing operation function.
∗4 For the motor type T8, the set value is from 12 to 40 %.
∗5 The allowable speed changes according to the stroke. Set the number of rotations according to speed.
∗6 The allowable collision speed for collision with the workpiece with the torque control mode
∗7 A reference value for correcting an error in reciprocal operation
∗8 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
∗9 The power consumption (including the driver) is for when the actuator is operating.
∗10 The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.
∗11 The maximum instantaneous power consumption (including the driver) is for when the actuator is operating.
∗12 Only when motor option "With lock" is selected
∗13 For an actuator with lock, add the power consumption for the lock.
∗14 When mounting vertically and using the product facing upwards in an environment where water is present, take necessary measures to prevent water from splashing on the rod cover, because water will accumulate on the rod seal due to the structure of the product.

## Weight

### Product Weight

[kg]

| Series | | LEY63S$^{4}_{8}$ (Motor mounting position: Top/Parallel) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |
| Motor type | Incremental encoder | 4.9 | 5.4 | 6.0 | 6.6 | 7.8 | 8.3 | 8.9 | 9.4 | 10.0 | 10.5 | 12.2 | 13.4 | 14.5 |
| | Absolute encoder (Motor type S8) | 5.0 | 5.5 | 6.1 | 6.7 | 7.9 | 8.4 | 9.0 | 9.5 | 10.1 | 10.6 | 12.3 | 13.5 | 14.6 |
| | Absolute encoder (Motor type T8) | 4.9 | 5.4 | 6.0 | 6.6 | 7.8 | 8.3 | 8.9 | 9.4 | 10.0 | 10.5 | 12.2 | 13.4 | 14.5 |

| Series | | LEY63DS$^{4}_{8}$ (Motor mounting position: In-line) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |
| Motor type | Incremental encoder | 5.1 | 5.6 | 6.2 | 6.7 | 7.9 | 8.4 | 9.0 | 9.6 | 10.2 | 10.7 | 12.4 | 13.5 | 14.7 |
| | Absolute encoder (Motor type S8) | 5.2 | 5.7 | 6.3 | 6.8 | 8.0 | 8.5 | 9.1 | 9.7 | 10.3 | 10.8 | 12.5 | 13.6 | 14.8 |
| | Absolute encoder (Motor type T8) | 5.1 | 5.6 | 6.2 | 6.7 | 7.9 | 8.4 | 9.0 | 9.6 | 10.2 | 10.7 | 12.4 | 13.5 | 14.7 |

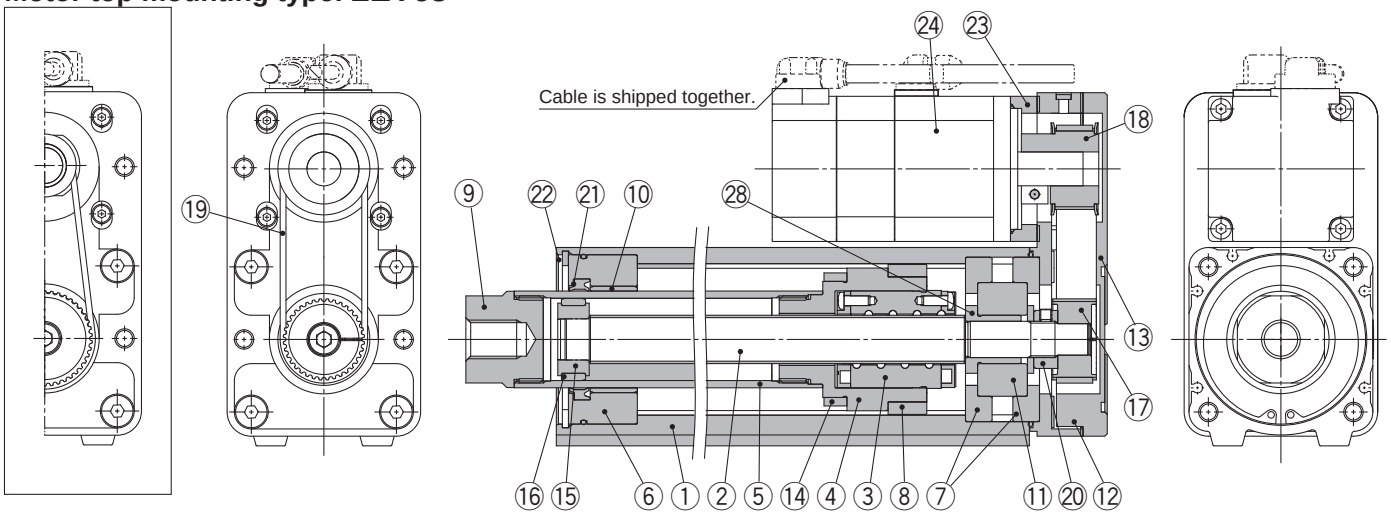
### Additional Weight

[kg]

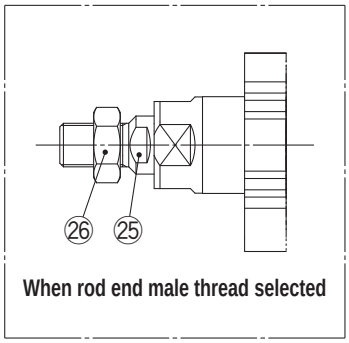
| Size | | 63 |
|---|---|---|
| Lock | Incremental encoder | 0.4 |
| | Absolute encoder (Motor type S8) | 0.6 |
| | Absolute encoder (Motor type T8) | 0.4 |
| Rod end male thread | Male thread | 0.12 |
| | Nut | 0.04 |
| Foot bracket (2 sets including mounting bolt) | | 0.26 |
| Rod flange (including mounting bolt) | | 0.51 |
| Double clevis (including pin, retaining ring, and mounting bolt) | | 0.58 |

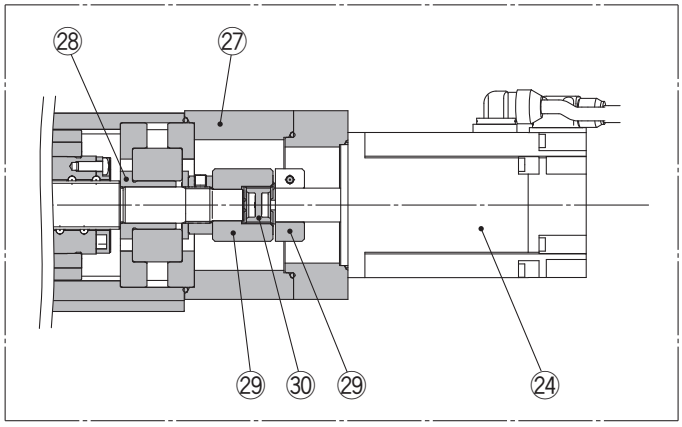
## Construction

### Motor top mounting type: LEY63




### In-line motor type: LEY63D




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Aluminium alloy | Anodised |
| 2 | **Ball screw shaft** | Alloy steel | |
| 3 | **Ball screw nut** | Resin/Alloy steel | |
| 4 | **Piston** | Aluminium alloy | |
| 5 | **Piston rod** | Stainless steel | Hard chrome plating |
| 6 | **Rod cover** | Aluminium alloy | |
| 7 | **Bearing holder** | Aluminium alloy | |
| 8 | **Rotation stopper** | Resin | |
| 9 | **Socket** | Free cutting carbon steel | Nickel plating |
| 10 | **Bushing** | Lead bronze cast | |
| 11 | **Bearing** | — | |
| 12 | **Return box** | Aluminium alloy | Coating |
| 13 | **Return plate** | Aluminium alloy | Coating |
| 14 | **Magnet** | — | |
| 15 | **Wear ring holder** | Stainless steel | |

| No. | Description | Material | Note |
|---|---|---|---|
| 16 | **Wear ring** | Resin | |
| 17 | **Screw shaft pulley** | Aluminium alloy | |
| 18 | **Motor pulley** | Aluminium alloy | |
| 19 | **Belt** | — | |
| 20 | **Lock nut** | Alloy steel | Black dyed |
| 21 | **Seal** | NBR | |
| 22 | **Retaining ring** | Steel for spring | |
| 23 | **Motor adapter** | Aluminium alloy | Coating |
| 24 | **Motor** | — | |
| 25 | **Socket (Male thread)** | Free cutting carbon steel | Nickel plating |
| 26 | **Nut** | Alloy steel | Trivalent chromated |
| 27 | **Motor block** | Aluminium alloy | Coating |
| 28 | **Spacer A** | Stainless steel | |
| 29 | **Hub** | Aluminium alloy | |
| 30 | **Spider** | Urethane | |

### Replacement Parts (Motor top/parallel only)/Belt

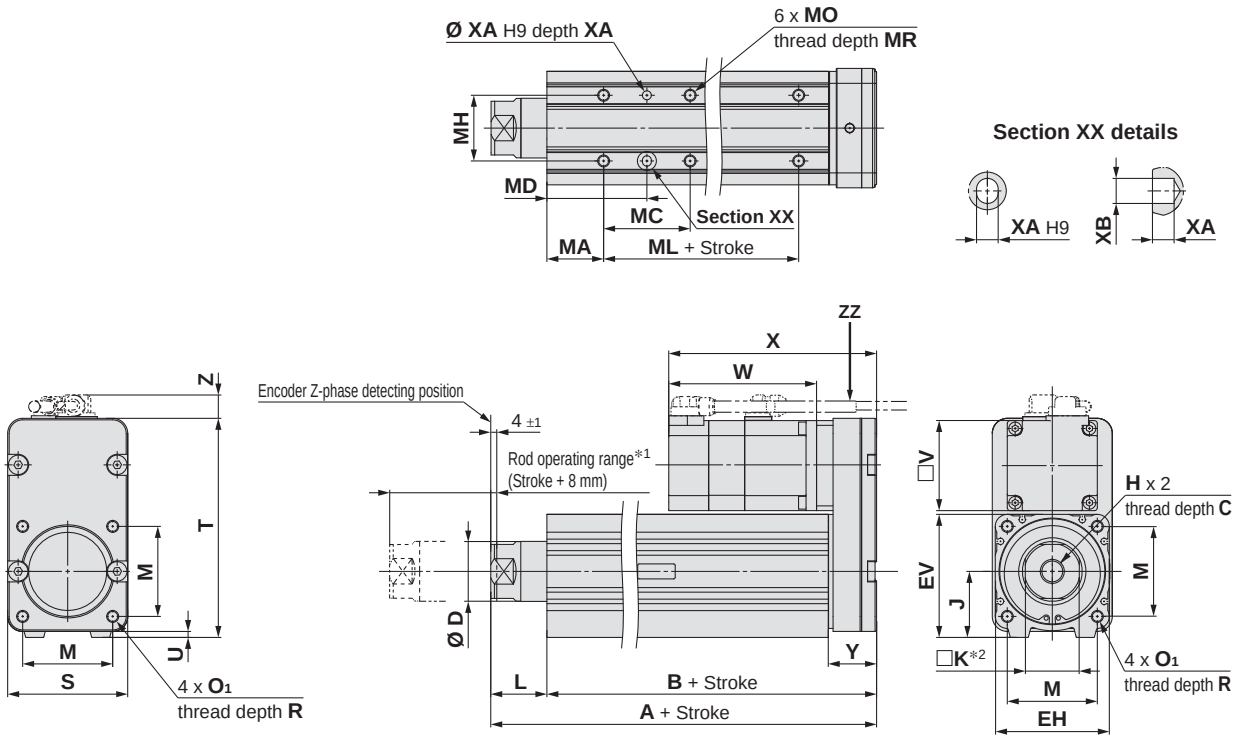
| No. | Size | Lead | Order no. |
|---|---|---|---|
| **19** | **63** | A/B/C | LE-D-2-5 |
| | | L | LE-D-2-6 |

### Replacement Parts/Grease Pack

| Applied portion | Order no. |
|---|---|
| Piston rod | GR-S-010 (10 g)<br>GR-S-020 (20 g) |

* Apply grease on the piston rod periodically.
Grease should be applied at 1 million cycles or 200 km, whichever comes first.

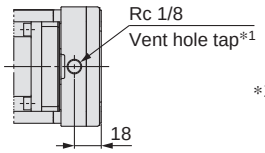
## Dimensions: Motor Top/Parallel




*1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
*2 The direction of rod end width across flats (□K) differs depending on the products.

### IP65 equivalent (Dust-tight/Water-jet-proof): LEY63□□□-□P

**(View ZZ)**




∗1 When using the dust-tight/water-jet-proof (IP65 equivalent), correctly mount the fitting and tubing to the vent hole tap, and then place the end of the tubing in an area not exposed to dust or water. The fitting and tubing should be provided separately by the customer.
Select [Applicable tubing O.D.: Ø 4 or more, Connection thread: Rc1/8].

[mm]

| Size | Stroke range [mm] | A | B | C | D | EH | EV | H | J | K | L | M | O1 | R | S | Y | T | U | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | Up to 200 | 192.6 | 155.2 | 21 | 40 | 76 | 82 | M16 x 2 | 44 | 36 | 37.4 | 60 | M8 x 1.25 | 16 | 80 | 32.2 | 146 | 4 | 60 |
| | 205 to 500 | 227.6 | 190.2 | | | | | | | | | | | | | | | | |
| | 505 to 800 | 262.6 | 225.2 | | | | | | | | | | | | | | | | |

| Size | Stroke range [mm] | Incremental encoder | | | | | | Absolute encoder [S8] | | | | | | Absolute encoder [T8] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Without lock | | | With lock | | | Without lock | | | With lock | | | Without lock | | | With lock | | |
| | | W | X | Z | W | X | Z | W | X | Z | W | X | Z | W | X | Z | W | X | Z |
| 63 | Up to 200 | 110.2 | 150.2 | 15.6 (16.6)*1 | 138.8 | 178.8 | 15.6 (16.6)*1 | 98.5 | 138.5 | 15.6 (16.6)*1 | 138 | 178 | 15.6 (16.6)*1 | 98.3 | 138.3 | 15.6 (16.6)*1 | 135.1 | 175.1 | 15.6 (16.6)*1 |
| | 205 to 500 | | | | | | | | | | | | | | | | | | |
| | 505 to 800 | | | | | | | | | | | | | | | | | | |

∗1 The values in ( ) are the dimensions when L is selected for screw lead.

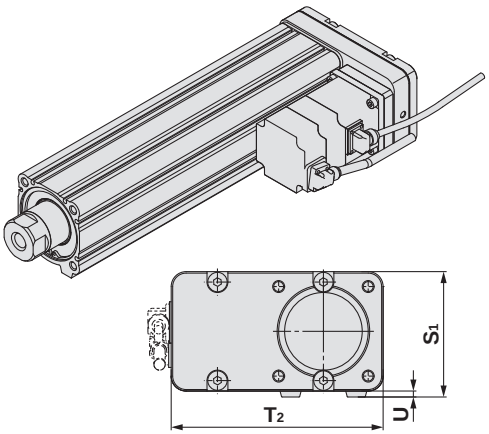
### Body Bottom Tapped

[mm]

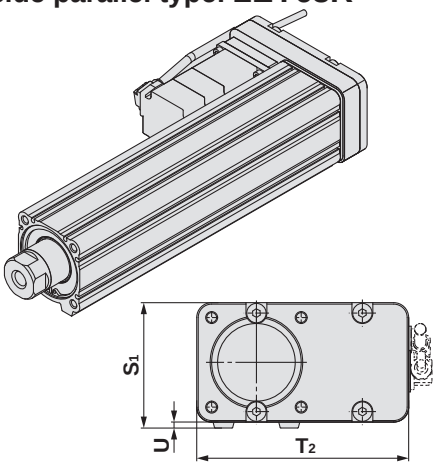
| Size | Stroke range [mm] | MA | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|
| 63 | 50 to 74 | 38 | 24 | 50 | 44 | 65 | M8 x 1.25 | 10 | 6 | 7 |
| | 75 to 124 | | 45 | 60.5 | | | | | | |
| | 125 to 200 | | 58 | 67 | | | | | | |
| | 201 to 500 | | 86 | 81 | | 100 | | | | |
| | 501 to 800 | | | | | 135 | | | | |

## Dimensions: Motor Top/Parallel

### Motor left side parallel type: LEY63L




### Motor right side parallel type: LEY63R



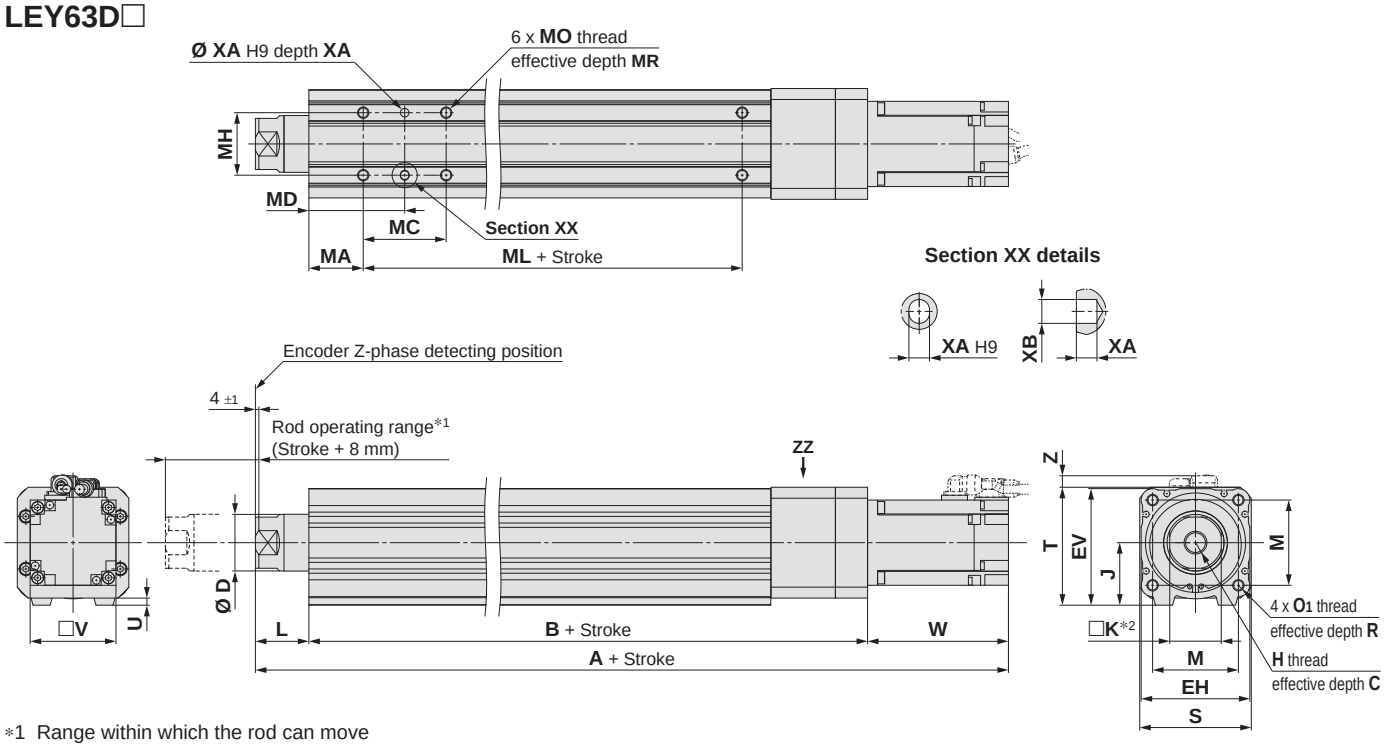

[mm]

| Size | $S_1$ | $T_2$ | U |
|---|---|---|---|
| **63** | 84 | 142 | 4 |

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

## Dimensions: In-line Motor

### LEY63D□




∗1 Range within the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 The direction of rod end width across flats (□K) differs depending on the products.

[mm]

| Size | Stroke range [mm] | C | D | EH | EV | H | J | K | L | M | O1 | R | S | T | U | B | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | Up to 200 | 21 | 40 | 76 | 82 | M16 x 2 | 44 | 36 | 37.4 | 60 | M8 x 1.25 | 16 | 78 | 83 | 5 | 190.7 | 60 |
| | 205 to 500 | | | | | | | | | | | | | | | 225.7 | |
| | 505 to 800 | | | | | | | | | | | | | | | 260.7 | |

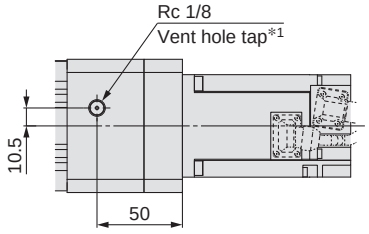
| Size | Stroke range [mm] | Incremental encoder | | | | | | Absolute encoder [S8] | | | | | | Absolute encoder [T8] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Without lock | | | With lock | | | Without lock | | | With lock | | | Without lock | | | With lock | | |
| | | A | W | Z | A | W | Z | A | W | Z | A | W | Z | A | W | Z | A | W | Z |
| 63 | Up to 200 | 338.3 | 110.2 | 8.1 | 366.9 | 138.8 | 8.1 | 326.6 | 98.5 | 8.1 | 366.1 | 138 | 8.1 | 326.4 | 98.3 | 8.1 | 363.2 | 135.1 | 8.1 |
| | 205 to 500 | 373.3 | | | 401.9 | | | 361.6 | | | 401.1 | | | 361.4 | | | 398.2 | | |
| | 505 to 800 | 408.3 | | | 436.9 | | | 396.6 | | | 436.1 | | | 396.4 | | | 433.2 | | |

### Body Bottom Tapped

[mm]

| Size | Stroke range [mm] | MA | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|
| 63 | 50 to 74 | 38 | 24 | 50 | 44 | 65 | M8 x 1.25 | 10 | 6 | 7 |
| | 75 to 124 | | 45 | 60.5 | | | | | | |
| | 125 to 200 | | 58 | 67 | | | | | | |
| | 201 to 500 | | 86 | 81 | | 100 | | | | |
| | 501 to 800 | | | | | 135 | | | | |

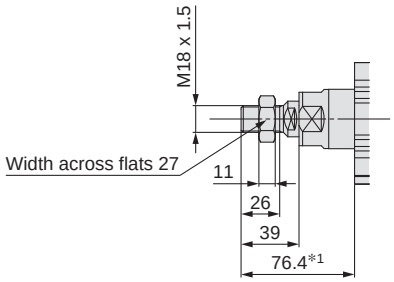
### IP65 equivalent (Dust-tight/Water-jet-proof): LEY63D□□-□P
### (View ZZ)




∗1 When using the dust-tight/water-jet-proof (IP65 equivalent), correctly mount the fitting and tubing to the vent hole tap, and then place the end of the tubing in an area not exposed to dust or water. The fitting and tubing should be provided separately by the customer.
Select [Applicable tubing O.D.: Ø 4 or more, Connection thread: Rc1/8].

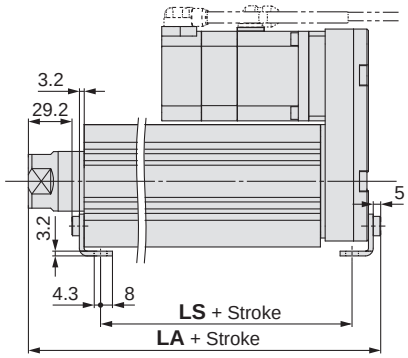
## Dimensions

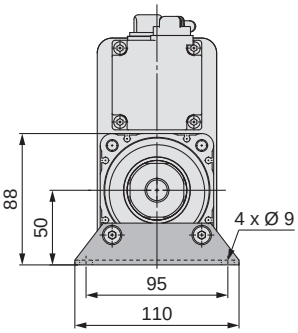
### End male thread: LEY63□□□-□□M



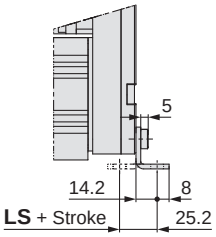

∗1 The measurement 76.4 is when the unit is in the Z-phase detecting position. At this position, 4 mm from the end of the operating range.

### Foot: LEY63□□□-□□L




**Outward mounting**



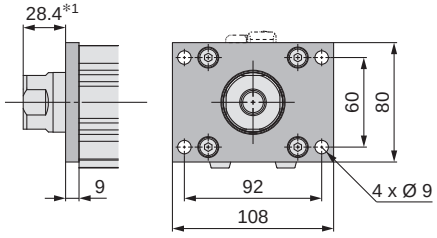

Included parts
• Foot bracket
• Body mounting bolt

Material: Carbon steel (Chromate treated)
∗ The overall length is when the unit is in the Z-phase detecting position. At this position, 4 mm from the end of the operating range.
∗ When the motor mounting is the right or left side parallel type, the head side foot bracket should be mounted outward.

[mm]

| Stroke range [mm] | LA | LS |
|---|---|---|
| 50 to 200 | 200.8 | 133.2 |
| 201 to 500 | 235.8 | 168.2 |
| 501 to 800 | 270.8 | 203.2 |

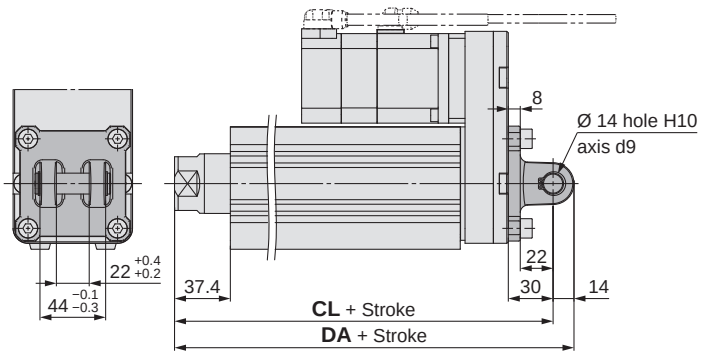
### Rod flange: LEY63□□□-□□F




Included parts
• Flange
• Body mounting bolt

Material: Carbon steel (Nickel plating)
∗1 When the unit is in the Z-phase detecting position. At this position, 4 mm from the end of the operating range.

### Double clevis: LEY63□□□-□□D




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

Material: Cast iron (Coating)
∗ The overall length is when the unit is in the Z-phase detecting position. At this position, 4 mm from the end of the operating range.

[mm]

| Stroke range [mm] | DA | CL |
|---|---|---|
| 50 to 200 | 236.6 | 222.6 |
| 201 to 500 | 271.6 | 257.6 |
| 501 to 800 | 306.6 | 292.6 |

# Electric Actuator/ Rod Type

## *LEY Series* LEY25, 32, 63

Dust-tight/Water-jet-proof (IP65 Equivalent) ▸p. 169 Secondary Battery Compatible ▸p. 183
LECS□ Series ▸p. 69, 79

## How to Order

LEY H 25 □ V6 B – 200 □ □ □ □ – S 3 M2 □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭ ⓮

### ❶ Accuracy

| | |
|---|---|
| — | Basic type |
| H | High-precision type |

### ❷ Size

| |
|---|
| 25 |
| 32 |
| 63 |

### ❸ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| R | Right side parallel |
| L | Left side parallel |
| D | In-line |

### ❹ Motor type

| Symbol | Type | Output [W] | Size | Compatible driver |
|---|---|---|---|---|
| V6*1 | AC servo motor (Absolute encoder) | 100 | 25 | LECYM2-V5 LECYU2-V5 |
| V7 | | 200 | 32 | LECYM2-V7 LECYU2-V7 |
| V8 | | 400 | 63 | LECYM2-V8 LECYU2-V8 |

*1 For motor type V6, the compatible driver part number suffix is V5.

### ❺ Lead [mm]

| Symbol | LEY25 | LEY32*1 | LEY63 |
|---|---|---|---|
| A | 12 | 16 (20) | 20 |
| B | 6 | 8 (10) | 10 |
| C | 3 | 4 (5) | 5 |
| L | — | — | 2.86*2 |

*1 The values shown in ( ) are the leads for the top mounting, right/left side parallel types. (Equivalent leads which include the pulley ratio [1.25:1])
*2 Only available for top mounting and right/left side parallel types (Equivalent leads which include the pulley ratio [4:7])

### ❻ Stroke [mm]

| | |
|---|---|
| 30 | 30 |
| to | to |
| 800 | 800 |

* For details, refer to the applicable stroke table below.

### ❼ Dust-tight/Water-jet-proof (Only available for LEY63)

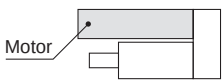
| Symbol | LEY25/32 | LEY63 |
|---|---|---|
| — | IP4x equivalent | IP5x equivalent (Dust-protected) |
| P | — | IP65 equivalent (Dust-tight/ Water-jet-proof)/With vent hole tap |

* When using the dust-tight/water-jet-proof (IP65 equivalent), correctly mount the fitting and tubing to the vent hole tap, and then place the end of the tubing in an area not exposed to dust or water.
* The fitting and tubing should be provided separately by the customer. Select [Applicable tubing O.D.: Ø 4 or more, Connection thread: Rc1/8].
* Cannot be used in environments exposed to cutting oil, etc. Take appropriate protective measures. For details on enclosure, refer to "Enclosure" on page 188.

### ❽ Motor option

| | |
|---|---|
| — | Without option |
| B | With lock |

* When "With lock" is selected for the top mounting and right/left side parallel types, the motor body will stick out from the end of the body for size 25 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.




### ❾ Rod end thread

| | |
|---|---|
| — | Rod end female thread |
| M | Rod end male thread (1 rod end nut is included.) |

### Applicable Stroke Table

●: Standard

| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 | Manufacturable stroke range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEY25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | — | — | — | — | — | 15 to 400 |
| LEY32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | — | — | — | 20 to 500 |
| LEY63 | — | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 50 to 800 |

* Please consult with SMC for non-standard strokes as they are produced as special orders.

**For auto switches, refer to pages 101 to 103.**

Motor mounting position: Top/Parallel

Motor mounting position: In-line

## ⑩ Mounting*1

| Symbol | Type | Motor mounting position | |
|---|---|---|---|
| | | Top/Parallel | In-line |
| — | Ends tapped/ Body bottom tapped*2 | ● | ● |
| L | Foot | ● | — |
| F | Rod flange*2 | ●*4 | ● |
| G | Head flange*2 | ●*5 | — |
| D | Double clevis*3 | ● | — |

*1 The mounting bracket is shipped together with the product but does not come assembled.
*2 For the horizontal cantilever mounting of the ends tapped, rod flange, or head flange types, use the actuator within the following stroke range.
· LEY25: 200 mm or less · LEY32: 100 mm or less · LEY63: 400 mm or less
*3 For the mounting of the double clevis type, use the actuator within the following stroke range.
· LEY25: 200 mm or less · LEY32: 200 mm or less · LEY63: 300 mm or less
*4 The rod flange type is not available for the LEY25 with a 30 mm stroke and motor option "With lock."
*5 The head flange type is not available for the LEY32/LEY63.

## ⑪ Cable type*1

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

*1 The motor and encoder cables are included. The motor cable for lock option is included when the motor with lock option is selected.

## ⑫ Cable length [m]*1

| | |
|---|---|
| — | Without cable |
| 3 | 3 |
| 5 | 5 |
| A | 10 |
| C | 20 |

*1 The length of the motor and encoder cables are the same. (For with lock)

## ⑬ Driver type

| | Compatible driver | Power supply voltage [V] |
|---|---|---|
| — | Without driver | — |
| M2 | LECYM2-V□ | 200 to 230 |
| U2 | LECYU2-V□ | 200 to 230 |

* When a driver type is selected, a cable is included. Select the cable type and cable length.

## ⑭ I/O cable length [m]*1

| | |
|---|---|
| — | Without cable |
| H | Without cable (Connector only) |
| 1 | 1.5 |

*1 When "Without driver" is selected for driver type, only "—: Without cable" can be selected. Refer to page 278 if I/O cable is required. (Options are shown on page 278.)

## Compatible Driver

| Driver type | MECHATROLINK-Ⅱ type  | MECHATROLINK-Ⅲ type  |
|---|---|---|
| Series | LECYM | LECYU |
| Applicable network | MECHATROLINK-Ⅱ | MECHATROLINK-Ⅲ |
| Control encoder | Absolute 20-bit encoder | |
| Communication device | USB communication, RS-422 communication | |
| Power supply voltage [V] | 200 to 230 VAC (50/60 Hz) | |
| Reference page | 271 | |

## Specifications

| Model | | | LEY25V6 (Top/Parallel)/LEY25DV6 (In-line) | | | LEY32V7 (Top/Parallel) | | | LEY32DV7 (In-line) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg] | Horizontal*1 | 18 | 50 | 50 | 30 | 60 | 60 | 30 | 60 | 60 |
| | | Vertical | 8 | 16 | 30 | 9 | 19 | 37 | 12 | 24 | 46 |
| | Force [N]*2 (Set value: 45 to 90 %) | | 65 to 131 | 127 to 255 | 242 to 485 | 79 to 157 | 154 to 308 | 294 to 588 | 98 to 197 | 192 to 385 | 368 to 736 |
| | Max.*3 speed [mm/s] | Stroke range: Up to 300 | 900 | 450 | 225 | 1200 | 600 | 300 | 1000 | 500 | 250 |
| | | 305 to 400 | 600 | 300 | 150 | | | | | | |
| | | 405 to 500 | — | — | — | 800 | 400 | 200 | 640 | 320 | 160 |
| | Pushing speed [mm/s]*4 | | 35 or less | | | 30 or less | | | 30 or less | | |
| | Max. acceleration/deceleration [mm/s²] | | 5000 | | | 5000 | | | | | |
| | Positioning repeatability [mm] | Basic type | ±0.02 | | | ±0.02 | | | | | |
| | | High-precision type | ±0.01 | | | ±0.01 | | | | | |
| | Lost motion*5 [mm] | Basic type | 0.1 or less | | | 0.1 or less | | | | | |
| | | High-precision type | 0.05 or less | | | 0.05 or less | | | | | |
| | Lead [mm] (including pulley ratio) | | 12 | 6 | 3 | 20 | 10 | 5 | 16 | 8 | 4 |
| | Impact/Vibration resistance [m/s²]*6 | | 50/20 | | | 50/20 | | | | | |
| | Actuation type | | Ball screw + Belt (LEY□)/Ball screw (LEY□D) | | | Ball screw + Belt [1.25:1] | | | Ball screw | | |
| | Guide type | | Sliding bushing (Piston rod) | | | Sliding bushing (Piston rod) | | | | | |
| | Operating temperature range [°C] | | 5 to 40 | | | 5 to 40 | | | | | |
| | Operating humidity range [%RH] | | 90 or less (No condensation) | | | 90 or less (No condensation) | | | | | |
| | Conditions for*7 "Regenerative resistor" [kg] | Horizontal | Not required | | | Not required | | | | | |
| | | Vertical | 6 or more | | | 4 or more | | | | | |
| Electric specifications | Motor output/Size | | 100 W/□40 | | | 200 W/□60 | | | | | |
| | Motor type | | AC servo motor (200 VAC) | | | AC servo motor (200 VAC) | | | | | |
| | Encoder | | Absolute 20-bit encoder (Resolution: 1048576 p/rev) | | | | | | | | |
| | Power consumption [W]*8 | Horizontal | 45 | | | 65 | | | 65 | | |
| | | Vertical | 145 | | | 175 | | | 175 | | |
| | Standby power consumption when operating [W]*9 | Horizontal | 2 | | | 2 | | | 2 | | |
| | | Vertical | 8 | | | 8 | | | 8 | | |
| | Max. instantaneous power consumption [W]*10 | | 445 | | | 724 | | | 724 | | |
| Lock unit specifications | Type*11 | | Non-magnetising lock | | | | | | | | |
| | Holding force [N] | | 131 | 255 | 485 | 157 | 308 | 588 | 197 | 385 | 736 |
| | Power consumption [W] at 20 °C*12 | | 5.5 | | | 6 | | | 6 | | |
| | Rated voltage [V] | | 24 VDC $^{+10\ \%}_{0}$ | | | | | | | | |

*1 This is the maximum value of the horizontal work load. An external guide is necessary to support the load. The actual work load changes according to the condition of the external guide. Confirm the load using the actual device.
*2 The force setting range (set values for the driver) for the force control with the torque control mode. Set it with reference to "Force Conversion Graph (Guide)" on page 52.
*3 The allowable speed changes according to the stroke.
*4 The allowable collision speed for collision with the workpiece with the torque control mode
*5 A reference value for correcting an error in reciprocal operation
*6 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*7 The work load conditions which require "Regenerative resistor" when operating at the maximum speed (Duty ratio: 100 %). Order the regenerative resistor separately. For details, refer to "Conditions for Regenerative Resistor (Guide)" on pages 50 and 51.
*8 The power consumption (including the driver) is for when the actuator is operating.
*9 The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.
*10 The maximum instantaneous power consumption (including the driver) is for when the actuator is operating.
*11 Only when motor option "With lock" is selected
*12 For an actuator with lock, add the power consumption for the lock.

## Weight

### Product Weight

[kg]

| Series | LEY25V6 (Motor mounting position: Top/Parallel) | | | | | | | | | LEY32V7 (Motor mounting position: Top/Parallel) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Weight [kg] | 1.2 | 1.3 | 1.6 | 1.7 | 1.9 | 2.1 | 2.2 | 2.4 | 2.6 | 2.3 | 2.4 | 2.7 | 3.2 | 3.5 | 3.8 | 4.0 | 4.3 | 4.6 | 4.9 | 5.2 |

| Series | LEY25DV6 (Motor mounting position: In-line) | | | | | | | | | LEY32DV7 (Motor mounting position: In-line) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Weight [kg] | 1.2 | 1.3 | 1.5 | 1.7 | 1.9 | 2.1 | 2.3 | 2.4 | 2.6 | 2.3 | 2.4 | 2.7 | 3.2 | 3.5 | 3.8 | 4.1 | 4.3 | 4.6 | 4.9 | 5.2 |

### Additional Weight

[kg]

| Size | | 25 | 32 |
|---|---|---|---|
| Lock | | 0.30 | 0.60 |
| Rod end male thread | Male thread | 0.03 | 0.03 |
| | Nut | 0.02 | 0.02 |
| Foot bracket (2 sets including mounting bolt) | | 0.08 | 0.14 |
| Rod flange (including mounting bolt) | | 0.17 | 0.20 |
| Head flange (including mounting bolt) | | | |
| Double clevis (including pin, retaining ring, and mounting bolt) | | 0.16 | 0.22 |

## Specifications

| Model | | | LEY63V8 (Top/Parallel) | | | | LEY63DV8 (In-line) | | |
|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg] | Horizontal*1 | 40 | 70 | 80 | 200 | 40 | 70 | 80 |
| | | Vertical | 19 | 38 | 72 | 115 | 19 | 38 | 72 |
| | Force [N]/Set value*2 : 45 to 150 %*3 | | 156 to 521 | 304 to 1012 | 573 to 1910 | 1003 to 3343 | 156 to 521 | 304 to 1012 | 573 to 1910 |
| | Max. speed*4 [mm/s] / Stroke range | Up to 500 | 1000 | 500 | 250 | 70 | 1000 | 500 | 250 |
| | | 505 to 600 | 800 | 400 | 200 | | 800 | 400 | 200 |
| | | 605 to 700 | 600 | 300 | 150 | | 600 | 300 | 150 |
| | | 705 to 800 | 500 | 250 | 125 | | 500 | 250 | 125 |
| | Pushing speed [mm/s]*5 | | 30 or less | | | | | | |
| | Max. acceleration/deceleration [mm/s²] | | 5000 | | | 3000 | 5000 | | |
| | Positioning repeatability [mm] | Basic type | ±0.02 | | | | | | |
| | | High-precision type | ±0.01 | | | | | | |
| | Lost motion [mm]*6 | Basic type | 0.1 or less | | | | | | |
| | | High-precision type | 0.05 or less | | | | | | |
| | Screw lead [mm] (including pulley ratio) | | 20 | 10 | 5 | 5 (2.86) | 20 | 10 | 5 |
| | Impact/Vibration resistance [m/s²]*7 | | 50/20 | | | | | | |
| | Actuation type | | Ball screw | | | Ball screw + Belt (Pulley ratio 4.7) | Ball screw | | |
| | Guide type | | Sliding bushing (Piston rod) | | | | | | |
| | Operating temperature range [°C] | | 5 to 40 | | | | | | |
| | Operating humidity range [%RH] | | 90 or less (No condensation) | | | | | | |
| | Conditions for "Regenerative resistor" [kg]*8 | Horizontal | Not required | | | | | | |
| | | Vertical | 2.5 or more | | | | | | |
| Electric specifications | Motor output/Size | | 400 W/□60 | | | | | | |
| | Motor type | | AC servo motor (200 VAC) | | | | | | |
| | Encoder | | Absolute 20-bit encoder (Resolution: 1048576 p/rev) | | | | | | |
| | Power consumption [W]*9 | Horizontal | 210 | | | | | | |
| | | Vertical | 230 | | | | | | |
| | Standby power consumption when operating [W]*10 | Horizontal | 2 | | | | | | |
| | | Vertical | 18 | | | | | | |
| | Max. instantaneous power consumption [W]*11 | | 1275 | | | | | | |
| Lock unit specifications | Type*12 | | Non-magnetising lock | | | | | | |
| | Holding force [N] | | 313 | 607 | 1146 | 2006 | 313 | 607 | 1146 |
| | Power consumption [W] at 20 °C*13 | | 6 | | | | | | |
| | Rated voltage [V] | | 24 VDC $^{+10\ \%}_{0}$ | | | | | | |

*1 This is the maximum value of the horizontal work load. An external guide is necessary to support the load. The actual work load changes according to the condition of the external guide. Confirm the load using the actual device.
*2 Set values for the driver
*3 The force setting range (set values for the driver) for the force control with the torque control mode. The force and duty ratio change according to the set value. Set it with reference to "Force Conversion Graph (Guide)" on page 52.
*4 The allowable speed changes according to the stroke.
*5 The allowable collision speed for collision with the workpiece with the torque control mode
*6 A reference value for correcting an error in reciprocal operation
*7 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*8 The work load conditions which require "Regenerative resistor" when operating at the maximum speed (Duty ratio: 100 %)
*9 The power consumption (including the driver) is for when the actuator is operating.
*10 The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.
*11 The maximum instantaneous power consumption (including the driver) is for when the actuator is operating.
*12 Only when motor option "With lock" is selected
*13 For an actuator with lock, add the power consumption for the lock.

## Weight

### Product Weight

[kg]

| Series | LEY63V8 (Motor mounting position: Top/Parallel) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |
| Weight [kg] | 4.8 | 5.3 | 6.0 | 6.5 | 7.7 | 8.2 | 8.8 | 9.3 | 9.9 | 10.4 | 12.1 | 13.3 | 14.4 |

| Series | LEY63DV8 (Motor mounting position: In-line) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |
| Weight [kg] | 5.0 | 5.5 | 6.1 | 6.6 | 7.8 | 8.3 | 9.0 | 9.5 | 10.1 | 10.6 | 12.3 | 13.4 | 14.6 |

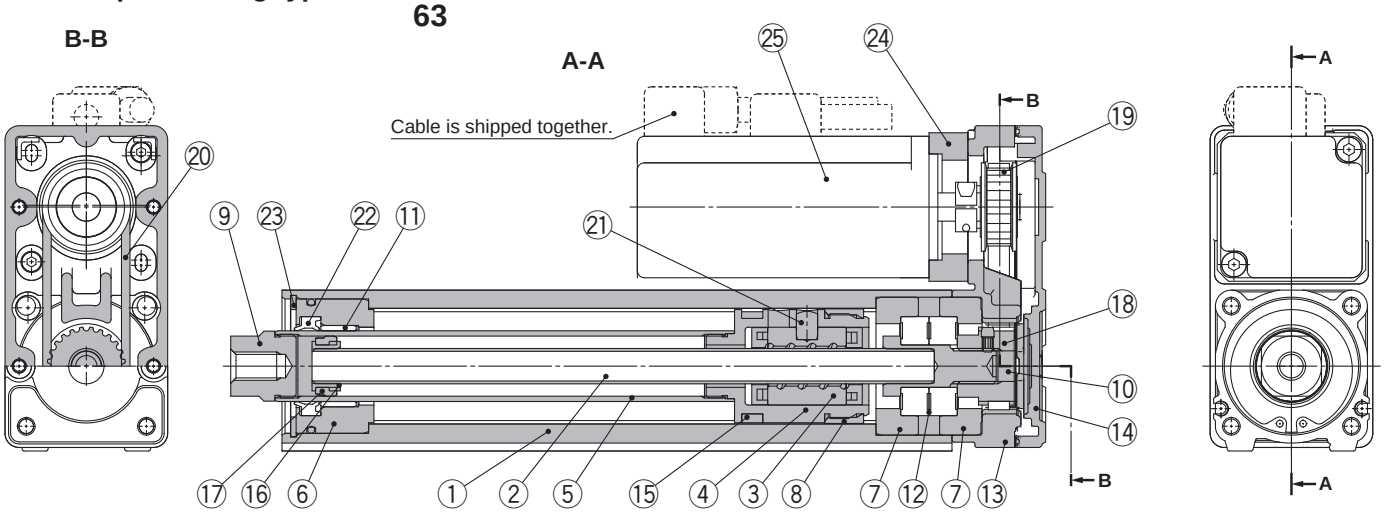
### Additional Weight

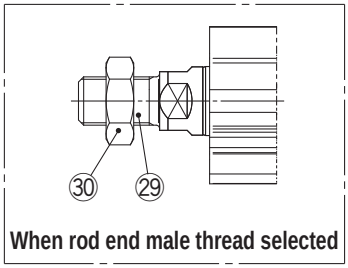
[kg]

| Size | | 63 |
|---|---|---|
| Lock | | 0.6 |
| Rod end male thread | Male thread | 0.12 |
| | Nut | 0.04 |
| Foot bracket (2 sets including mounting bolt) | | 0.26 |
| Rod flange (including mounting bolt) | | 0.51 |
| Double clevis (including pin, retaining ring, and mounting bolt) | | 0.58 |

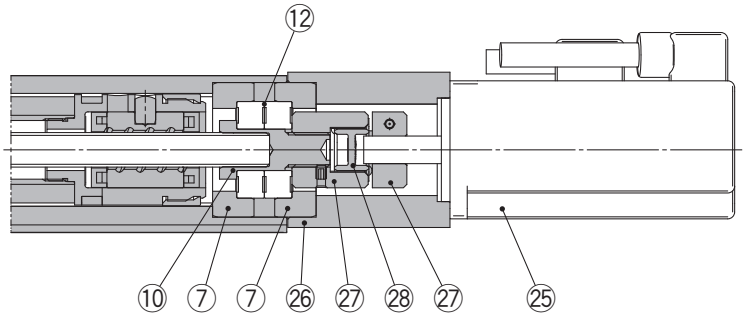
## Construction

### Motor top mounting type: LEY 25 / 32 / 63




### In-line motor type: LEY 25 / 32D / 63




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Aluminium alloy | Anodised |
| 2 | **Ball screw shaft** | Alloy steel | |
| 3 | **Ball screw nut** | Resin/Alloy steel | |
| 4 | **Piston** | Aluminium alloy | |
| 5 | **Piston rod** | Stainless steel | Hard chrome plating |
| 6 | **Rod cover** | Aluminium alloy | |
| 7 | **Bearing holder** | Aluminium alloy | |
| 8 | **Rotation stopper** | POM | |
| 9 | **Socket** | Free cutting carbon steel | Nickel plating |
| 10 | **Connected shaft** | Free cutting carbon steel | Nickel plating |
| 11 | **Bushing** | Bearing alloy | |
| 12 | **Bearing** | — | |
| 13 | **Return box** | Aluminium die-cast | Coating |
| 14 | **Return plate** | Aluminium die-cast | Coating |
| 15 | **Magnet** | — | |
| 16 | **Wear ring holder** | Stainless steel | Stroke 101 mm or more |
| 17 | **Wear ring** | POM | Stroke 101 mm or more |
| 18 | **Screw shaft pulley** | Aluminium alloy | |

| No. | Description | Material | Note |
|---|---|---|---|
| 19 | **Motor pulley** | Aluminium alloy | |
| 20 | **Belt** | — | |
| 21 | **Parallel pin** | Stainless steel | |
| 22 | **Seal** | NBR | |
| 23 | **Retaining ring** | Steel for spring | Phosphate coated |
| 24 | **Motor adapter** | Aluminium alloy | Coating |
| 25 | **Motor** | — | |
| 26 | **Motor block** | Aluminium alloy | Coating |
| 27 | **Hub** | Aluminium alloy | |
| 28 | **Spider** | Urethane | |
| 29 | **Socket (Male thread)** | Free cutting carbon steel | Nickel plating |
| 30 | **Nut** | Alloy steel | Zinc chromated |

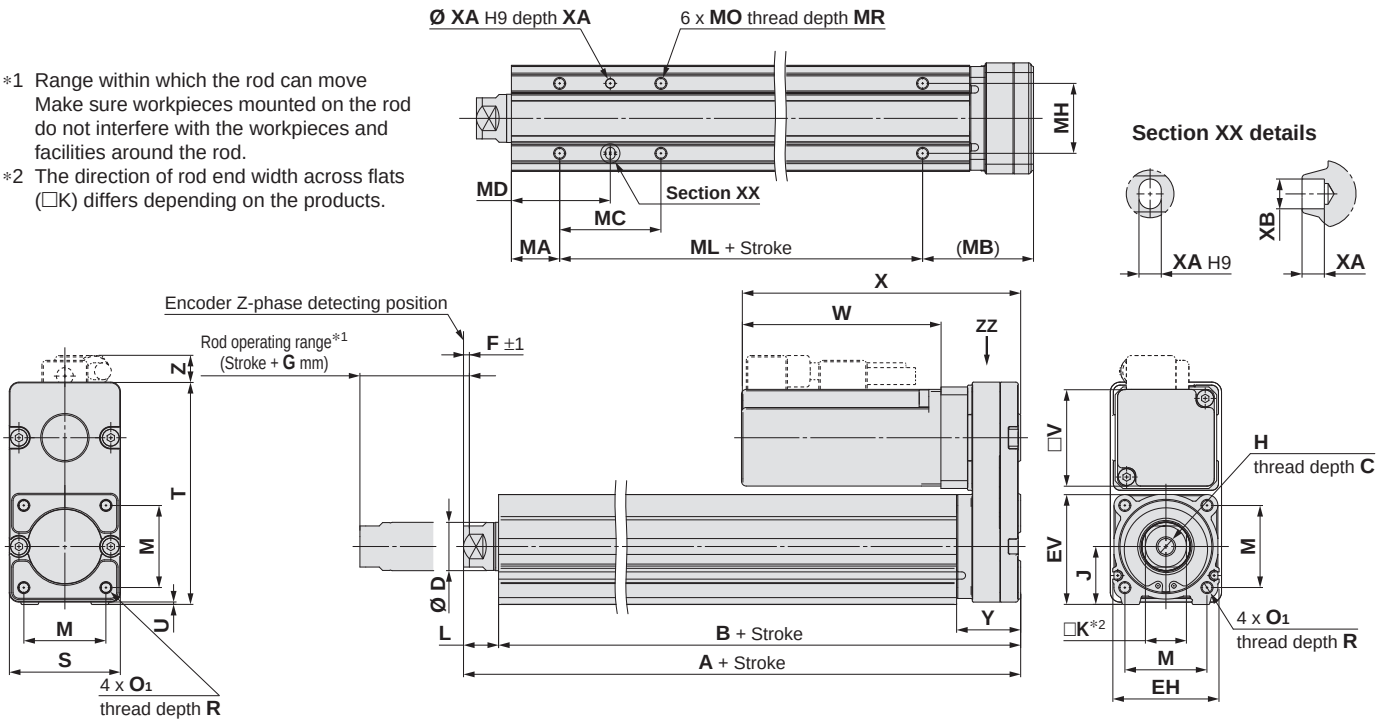
### Replacement Parts (Motor top/parallel only)/Belt

| No. | Size | Order no. |
|---|---|---|
| 20 | **25** | LE-D-2-2 |
| | **32** | LE-D-2-4 |

| No. | Size | Lead | Order no. |
|---|---|---|---|
| 20 | **63** | A/B/C | LE-D-2-5 |
| | | L | LE-D-2-6 |

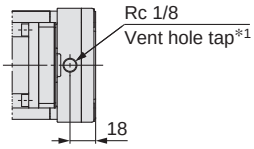
## Dimensions: Motor Top/Parallel

∗1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 The direction of rod end width across flats (□K) differs depending on the products.




## IP65 equivalent (Dust-tight/Water-jet-proof): LEY63□□□-□P

**(View ZZ)**




∗1 When using the dust-tight/water-jet-proof (IP65 equivalent), correctly mount the fitting and tubing to the vent hole tap, and then place the end of the tubing in an area not exposed to dust or water. The fitting and tubing should be provided separately by the customer.
Select [Applicable tubing O.D.: Ø 4 or more, Connection thread: Rc1/8].

[mm]

| Size | Stroke range [mm] | A | B | C | D | EH | EV | H | J | K | L | M | O1 | R | S | T | U | Y | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **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 | 26.5 | 40 |
| | 105 to 400 | 155.5 | 141 | | | | | | | | | | | | | | | | |
| **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 | 34 | 60 |
| | 105 to 500 | 178.5 | 160 | | | | | | | | | | | | | | | | |
| **63** | Up to 200 | 192.6 | 155.2 | 21 | 40 | 76 | 82 | M16 x 2 | 44 | 36 | 37.4 | 60 | M8 x 1.25 | 16 | 80 | 146 | 4 | 32.2 | 60 |
| | 205 to 500 | 227.6 | 190.2 | | | | | | | | | | | | | | | | |
| | 505 to 800 | 262.6 | 225.2 | | | | | | | | | | | | | | | | |

| Size | Stroke range [mm] | Without lock | | | With lock | | | F | G |
|---|---|---|---|---|---|---|---|---|---|
| | | W | X | Z | W | X | Z | | |
| **25** | 15 to 100 | 82.5 | 115.5 | 11 | 127.5 | 160.5 | 11 | 2 | 4 |
| | 105 to 400 | | | | | | | | |
| **32** | 20 to 100 | 80 | 120 | 14 | 120 | 160 | 14 | 2 | 4 |
| | 105 to 500 | | | | | | | | |
| **63** | 50 to 200 | 98.5 | 138.5 | 12.5 (13.5)∗1 | 138.5 | 178.5 | 12.5 (13.5)∗1 | 4 | 8 |
| | 205 to 500 | | | | | | | | |
| | 505 to 800 | | | | | | | | |

∗1 L lead

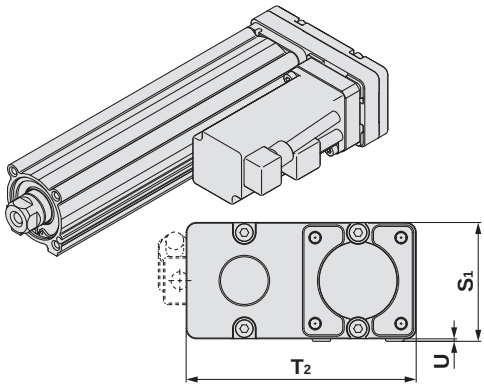
### Body Bottom Tapped

[mm]

| Size | Stroke range [mm] | MA | MB | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **25** | 15 to 35 | 20 | 46 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | | 42 | 41 | | | | | | |
| | 105 to 120 | | | | | | 75 | | | | |
| | 125 to 200 | | | 59 | 49.5 | | | | | | |
| | 205 to 400 | | | 76 | 58 | | | | | | |
| **32** | 20 to 35 | 25 | 55 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | | 36 | 43 | | | | | | |
| | 105 to 120 | | | | | | 80 | | | | |
| | 125 to 200 | | | 53 | 51.5 | | | | | | |
| | 205 to 500 | | | 70 | 60 | | | | | | |
| **63** | 50 to 70 | 38 | 52.2 | 24 | 50 | 44 | 65 | M8 x 1.25 | 10 | 6 | 7 |
| | 75 to 120 | | | 45 | 60.5 | | | | | | |
| | 125 to 200 | | | 58 | 67 | | | | | | |
| | 205 to 500 | | | 86 | 81 | | 100 | | | | |
| | 505 to 800 | | | | | | 135 | | | | |

## Dimensions: Motor Top/Parallel

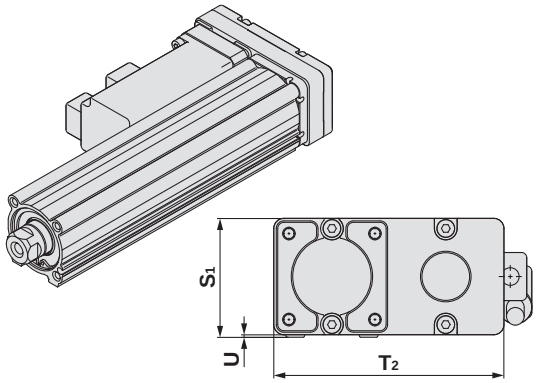
### Motor left side parallel type: LEY25/32/63L




[mm]

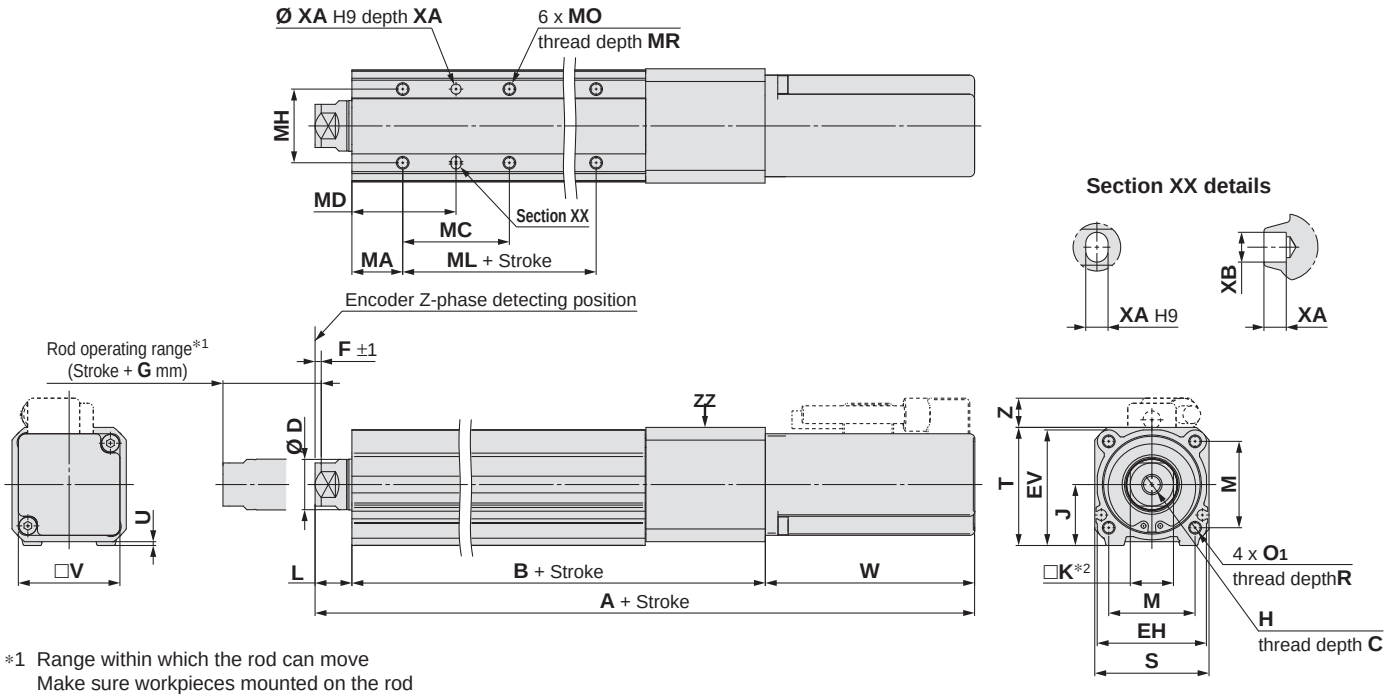
| Size | $S_1$ | $T_2$ | U |
|---|---|---|---|
| **25** | 47 | 91 | 1 |
| **32** | 61 | 117 | 1 |
| **63** | 84 | 142 | 4 |

### Motor right side parallel type: LEY25/32/63R




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

## Dimensions: In-line Motor




∗1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.

∗2 The direction of rod end width across flats (□K) differs depending on the products.

[mm]

| Size | Stroke range [mm] | C | D | EH | EV | H | J | K | L | M | O1 | R | S | T | U | B | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 100 | 13 | 20 | 44 | 45.5 | M8 x 1.25 | 24 | 17 | 14.5 | 34 | M5 x 0.8 | 8 | 45 | 46.5 | 1.5 | 136.5 | 40 |
| | 105 to 400 | | | | | | | | | | | | | | | 161.5 | |
| 32 | 20 to 100 | 13 | 25 | 51 | 56.5 | M8 x 1.25 | 31 | 22 | 18.5 | 40 | M6 x 1.0 | 10 | 60 | 61 | 1 | 156 | 60 |
| | 105 to 500 | | | | | | | | | | | | | | | 186 | |
| 63 | 50 to 200 | 21 | 40 | 76 | 82 | M16 x 2 | 44 | 36 | 37.4 | 60 | M8 x 1.25 | 16 | 78 | 83 | 5 | 190.7 | 60 |
| | 205 to 500 | | | | | | | | | | | | | | | 225.7 | |
| | 505 to 800 | | | | | | | | | | | | | | | 260.7 | |

| Size | Stroke range [mm] | Without lock | | | With lock | | | F | G |
|---|---|---|---|---|---|---|---|---|---|
| | | A | W | Z | A | W | Z | | |
| 25 | 15 to 100 | 233.5 | 82.5 | 11.5 | 278.5 | 127.5 | 11.5 | 2 | 4 |
| | 105 to 400 | 258.5 | | | 303.5 | | | | |
| 32 | 20 to 100 | 254.5 | 80 | 14 | 294.5 | 120 | 14 | 2 | 4 |
| | 105 to 500 | 284.5 | | | 324.5 | | | | |
| 63 | 50 to 200 | 326.6 | 98.5 | 5 | 366.6 | 138.5 | 5 | 4 | 8 |
| | 205 to 500 | 361.6 | | | 401.6 | | | | |
| | 505 to 800 | 396.6 | | | 436.6 | | | | |

### Body Bottom Tapped

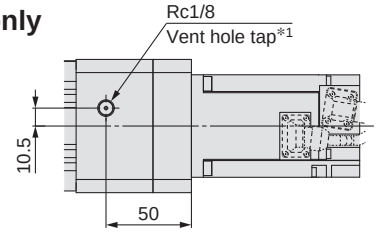
[mm]

| Size | Stroke range [mm] | MA | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 35 | 20 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | 42 | 41 | | | | | | |
| | 105 to 120 | | | | | 75 | | | | |
| | 125 to 200 | | 59 | 49.5 | | | | | | |
| | 205 to 400 | | 76 | 58 | | | | | | |
| 32 | 20 to 35 | 25 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | 36 | 43 | | | | | | |
| | 105 to 120 | | | | | 80 | | | | |
| | 125 to 200 | | 53 | 51.5 | | | | | | |
| | 205 to 500 | | 70 | 60 | | | | | | |
| 63 | 50 to 70 | 38 | 24 | 50 | 44 | 65 | M8 x 1.25 | 10 | 6 | 7 |
| | 75 to 120 | | 45 | 60.5 | | | | | | |
| | 125 to 200 | | 58 | 67 | | | | | | |
| | 205 to 500 | | 86 | 81 | | 100 | | | | |
| | 505 to 800 | | | | | 135 | | | | |

### IP65 equivalent (Dust-tight/Water-jet-proof): LEY63D□□-□P

**(View ZZ)**

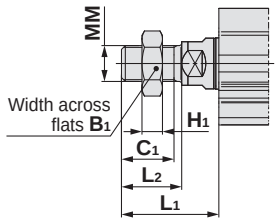
∗ **LEY63 only**




∗1 When using the dust-tight/water-jet-proof (IP65 equivalent), correctly mount the fitting and tubing to the vent hole tap, and then place the end of the tubing in an area not exposed to dust or water. The fitting and tubing should be provided separately by the customer.
Select [Applicable tubing O.D.: Ø 4 or more, Connection thread: Rc1/8].

## Dimensions

### End male thread: LEY 25/32/63 □□ A/B/C/L -□□M




∗ Refer to page 97 for details on the rod end nut and mounting bracket.
∗ Refer to the precautions on page 187 when mounting end brackets such as knuckle joint or workpieces.

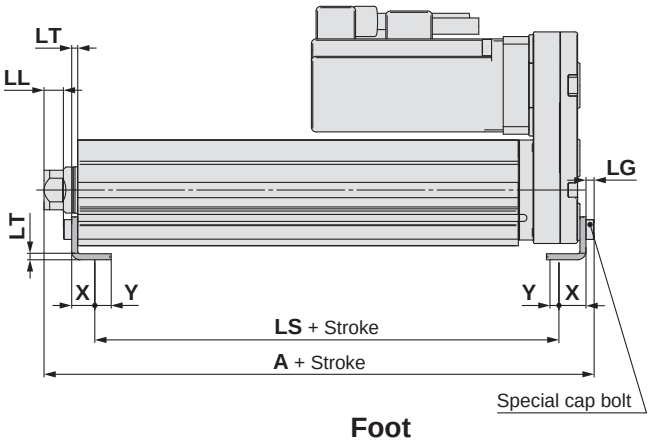
[mm]

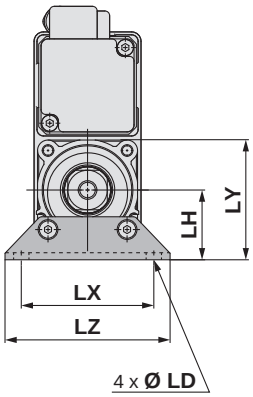
| Size | $B_1$ | $C_1$ | $H_1$ | $L_1$*1 | $L_2$ | MM |
|---|---|---|---|---|---|---|
| **25** | 22 | 20.5 | 8 | 38 | 23.5 | M14 x 1.5 |
| **32** | 22 | 20.5 | 8 | 42.0 | 23.5 | M14 x 1.5 |
| **63** | 27 | 26 | 11 | 76.4 | 39 | M18 x 1.5 |

∗1 The $L_1$ measurement is when the unit is in the Z-phase first detecting position. At this position, 2 mm at the end (size 25, 32) and 4 mm at the end (size 63).

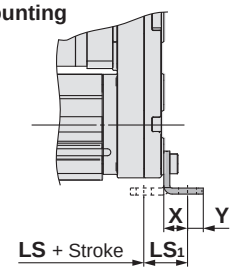
### Foot: LEY 25/32/63 □□ A/B/C/L -□□□L

Included parts
·Foot bracket
·Body mounting bolt




**Outward mounting**



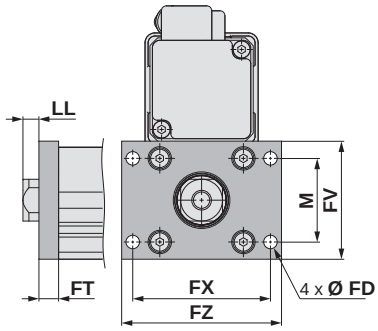

**Foot** [mm]

| Size | Stroke range [mm] | A | LS | $LS_1$ | LL | LD | LG | LH | LT | LX | LY | LZ | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **25** | 15 to 100 | 136.6 | 98.8 | 19.8 | 8.4 | 6.6 | 3.5 | 30 | 2.6 | 57 | 51.5 | 71 | 11.2 | 5.8 |
| | 105 to 400 | 161.6 | 123.8 | | | | | | | | | | | |
| **32** | 20 to 100 | 155.7 | 114 | 19.2 | 11.3 | 6.6 | 4 | 36 | 3.2 | 76 | 61.5 | 90 | 11.2 | 7 |
| | 105 to 500 | 185.7 | 144 | | | | | | | | | | | |
| **63** | 50 to 200 | 200.8 | 133.2 | 25.2 | 29.2 | 8.6 | 5 | 50 | 3.2 | 95 | 88 | 110 | 14.2 | 8 |
| | 205 to 500 | 235.8 | 168.2 | | | | | | | | | | | |
| | 505 to 800 | 270.8 | 203.2 | | | | | | | | | | | |

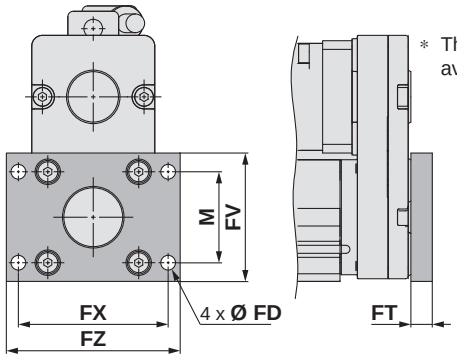
Material: Carbon steel (Chromate treated)
∗ The A measurement is when the unit is in the Z-phase first detecting position. At this position, 2 mm at the end (size 25, 32) and 4 mm at the end (size 63).
∗ When the motor mounting is the right or left side parallel type, the head side foot bracket should be mounted outward.

## Dimensions

### Rod flange: LEY 25/32/63 □□ A/B/C/L -□□□F




### Head flange: LEY 25/32/63 □□ A/B/C/L -□□□G




∗ The head flange type is not available for the LEY32/LEY63.

Included parts
·Flange
·Body mounting bolt

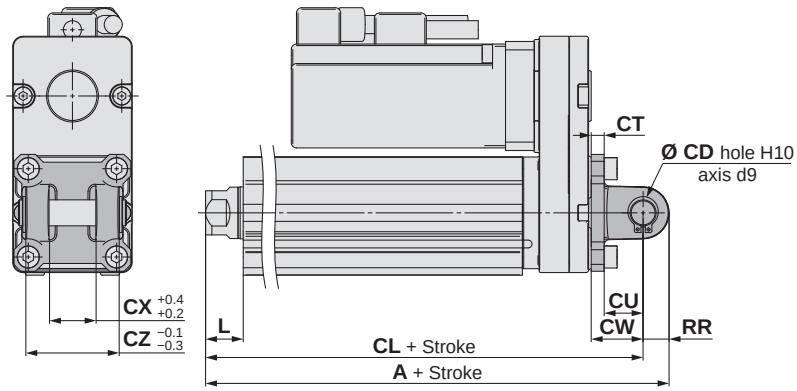
**Rod/Head Flange** [mm]

| Size | FD | FT | FV | FX | FZ | LL | M |
|---|---|---|---|---|---|---|---|
| **25** | 5.5 | 8 | 48 | 56 | 65 | 6.5 | 34 |
| **32** | 5.5 | 8 | 54 | 62 | 72 | 10.5 | 40 |
| **63** | 9 | 9 | 80 | 92 | 108 | 28.4 | 60 |

Material: Carbon steel (Nickel plating)

∗ The LL measurement is when the unit is in the Z-phase first detecting position. At this position, 2 mm at the end (size 25, 32) and 4 mm at the end (size 63).

### Double clevis: LEY 25/32/63 □□ A/B/C/L -□□□D




∗ Refer to page 97 for details on the rod end nut and mounting bracket.

Included parts
· Double clevis
· Body mounting bolt
· Clevis pin
· Retaining ring

**Double Clevis** [mm]

| Size | Stroke range [mm] | A | CL | CD | CT | CU | CW | CX | CZ | L | RR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **25** | 15 to 100 | 160.5 | 150.5 | 10 | 5 | 14 | 20 | 18 | 36 | 14.5 | 10 |
| | 105 to 200 | 185.5 | 175.5 | | | | | | | | |
| **32** | 20 to 100 | 180.5 | 170.5 | 10 | 6 | 14 | 22 | 18 | 36 | 18.5 | 10 |
| | 105 to 200 | 210.5 | 200.5 | | | | | | | | |
| **63** | 50 to 200 | 236.6 | 222.6 | 14 | 8 | 22 | 30 | 22 | 44 | 37.4 | 14 |
| | 205 to 500 | 271.6 | 257.6 | — | — | | | | | | |
| | 505 to 800 | 306.6 | 292.6 | — | — | | | | | | |

Material: Cast iron (Coating)

∗ The A and CL measurements are when the unit is in the Z-phase first detecting position. At this position, 2 mm at the end (size 25, 32) and 4 mm at the end (size 63).

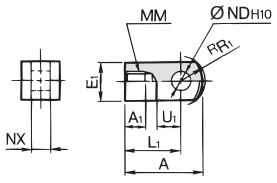
# Accessory Mounting Brackets

## Accessory Brackets/Support Brackets

### Single Knuckle Joint

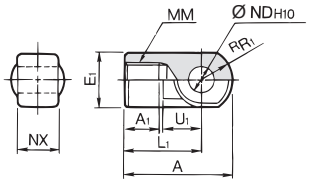
∗ If a knuckle joint is used, select the body option [end male thread].

**I-G02**




Material: Carbon steel

**I-G04**



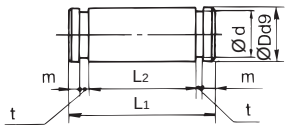

Material: Cast iron

[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, 40** | 42 | 14 | Ø 22 | 30 | M14 x 1.5 | 12 | 14 | $10^{+0.058}_{0}$ | $18^{-0.3}_{-0.5}$ |
| **I-G05** | **63** | 56 | 18 | Ø 28 | 40 | M18 x 1.5 | 16 | 20 | $14^{+0.070}_{0}$ | $22^{-0.3}_{-0.5}$ |

### Knuckle Pin

∗ Common with double clevis pin




Material: Carbon steel

[mm]

| Part no. | Applicable size | Dd9 | $L_1$ | $L_2$ | d | m | t | Retaining ring |
|---|---|---|---|---|---|---|---|---|
| **IY-G02** | **16** | $8^{-0.040}_{-0.076}$ | 21 | 16.2 | 7.6 | 1.5 | 0.9 | Type C retaining ring 8 |
| **IY-G04** | **25, 32, 40** | $10^{-0.040}_{-0.076}$ | 41.6 | 36.2 | 9.6 | 1.55 | 1.15 | Type C retaining ring 10 |
| **IY-G05** | **63** | $14^{-0.050}_{-0.093}$ | 50.6 | 44.2 | 13.4 | 2.05 | 1.15 | Type C retaining ring 14 |

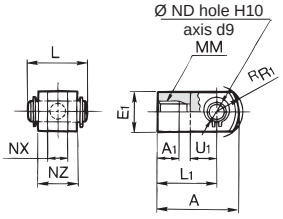
### Mounting Bracket Part Nos.

| Mounting bracket | Order qty. | Applicable size | | | | Contents |
|---|---|---|---|---|---|---|
| | | **16** | **25** | **32, 40** | **63** | |
| **Foot** | 2∗1 | LEY-L016 | LEY-L025 | LEY-L032 | LEY-L063 | Foot bracket x 2<br>Mounting bolt x 4 |
| **Flange** | 1 | LEY-F016 | LEY-F025 | LEY-F032 | LEY-F063 | Flange x 1<br>Mounting bolt x 4 |
| **Double clevis** | 1 | LEY-D016 | LEY-D025 | LEY-D032 | LEY-D063 | Clevis x 1<br>Mounting bolt x 4<br>Clevis pin x 1<br>Type C retaining ring for axis x 2 |

∗1 When ordering foot brackets, order 2 pieces per actuator.

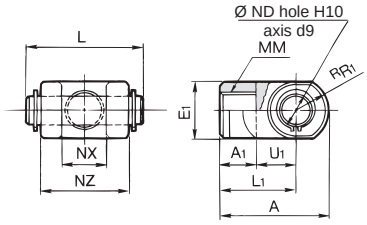
### Double Knuckle Joint

**Y-G02**




Material: Carbon steel

**Y-G04**



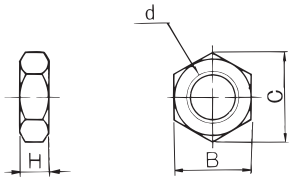

Material: Cast iron

∗ Knuckle pin and retaining ring are included. [mm]

| Part no. | Applicable size | A | $A_1$ | $E_1$ | $L_1$ | MM | $R_1$ |
|---|---|---|---|---|---|---|---|
| **Y-G02** | **16** | 34 | 8.5 | □16 | 25 | M8 x 1.25 | 10.3 |
| **Y-G04** | **25, 32, 40** | 42 | 16 | Ø 22 | 30 | M14 x 1.5 | 12 |
| **Y-G05** | **63** | 56 | 20 | Ø 28 | 40 | M18 x 1.5 | 16 |

| Part no. | Applicable size | $U_1$ | $ND_{H10}$ | NX | NZ | L | Applicable pin part no. |
|---|---|---|---|---|---|---|---|
| **Y-G02** | **16** | 11.5 | $8^{+0.058}_{0}$ | $8^{+0.4}_{+0.2}$ | 16 | 21 | **IY-G02** |
| **Y-G04** | **25, 32, 40** | 14 | $10^{+0.058}_{0}$ | $18^{+0.5}_{+0.3}$ | 36 | 41.6 | **IY-G04** |
| **Y-G05** | **63** | 20 | $14^{+0.070}_{0}$ | $22^{+0.5}_{+0.3}$ | 44 | 50.6 | **IY-G05** |

### Rod End Nut




Material: Carbon steel

[mm]

| Part no. | Applicable size | d | H | B | C |
|---|---|---|---|---|---|
| **NT-02** | **16** | M8 x 1.25 | 5 | 13 | 15.0 |
| **NT-04** | **25, 32, 40** | M14 x 1.5 | 8 | 22 | 25.4 |
| **NT-05** | **63** | M18 x 1.5 | 11 | 27 | 31.2 |

## Simple Joint Brackets

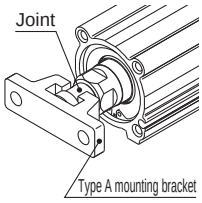
* The joint is not included in type A and type B mounting brackets. Therefore, it must be ordered separately.

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

**Joint** **LEY-U025**

**Applicable size**

| | |
|---|---|
| **025** | 25, 32, 40 |



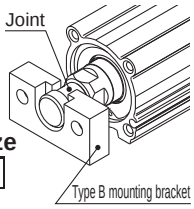

**Mounting bracket** **YA-03**

**Mounting bracket**

| | |
|---|---|
| **YA** | Type A mounting bracket |
| **YB** | Type B mounting bracket |

**Applicable size**

| | |
|---|---|
| **03** | 25, 32, 40 |




**Allowable Eccentricity** [mm]

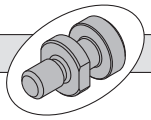
| Applicable size | 25 | 32 | 40 |
|---|---|---|---|
| Eccentricity tolerance | ±1 | | |
| Backlash | 0.5 | | |

<How to Order>
- The joint is not included in type A and type B mounting brackets. Therefore, it must be ordered separately.

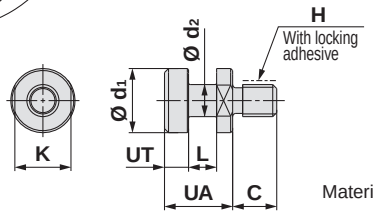
Example) Order no.
- Joint..... LEY-U025
- Type A mounting bracket ..... YA-03

### 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, 40** | LEY-U025 | YA-03 | YB-03 |



### Joint

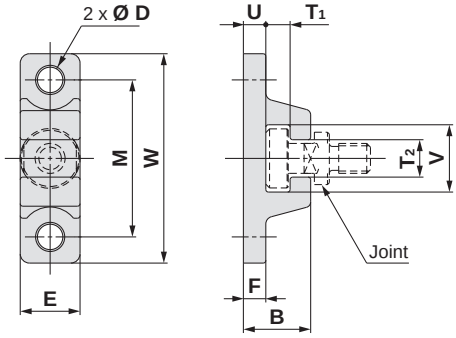



Material: Stainless steel

[mm]

| Part no. | Applicable size | UA | C | $d_1$ | $d_2$ | H | K | L | UT | Weight [g] |
|---|---|---|---|---|---|---|---|---|---|---|
| **LEY-U025** | **25, 32, 40** | 17 | 11 | 16 | 8 | M8 x 1.25 | 14 | 7 | 6 | 22 |

### Type A Mounting Bracket



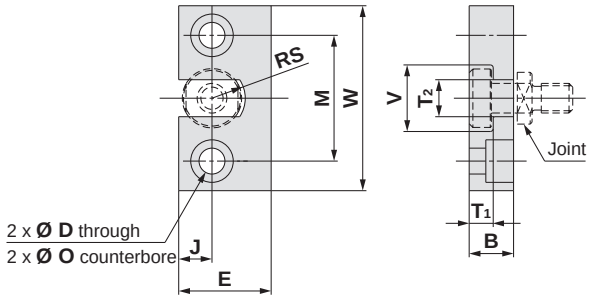

Material: Chromium molybdenum steel

[mm]

| Part no. | Applicable size | B | D | E | F | M | $T_1$ | $T_2$ | U |
|---|---|---|---|---|---|---|---|---|---|
| **YA-03** | **25, 32, 40** | 18 | 6.8 | 16 | 6 | 42 | 6.5 | 10 | 6 |

| Part no. | Applicable size | V | W | Weight [g] |
|---|---|---|---|---|
| **YA-03** | **25, 32, 40** | 18 | 56 | 55 |

### Type B Mounting Bracket




Material: Stainless steel

[mm]

| Part no. | Applicable size | B | D | E | J | M | Ø O |
|---|---|---|---|---|---|---|---|
| **YB-03** | **25, 32, 40** | 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, 40** | 6.5 | 10 | 18 | 50 | 9 | 80 |

## Floating Joints (Refer to the **Web Catalogue** for details.)

### ●For Male Thread/JC (Light weight type)

- **With the aluminium case**

### ●For Male Thread/JA


### ●For Male Thread/JS (Stainless steel)

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

| Applicable size | Thread size |
|---|---|
| **16** | M8 x 1.25 |
| **25, 32, 40** | M14 x 1.5 |
| **63** | M18 x 1.5 |

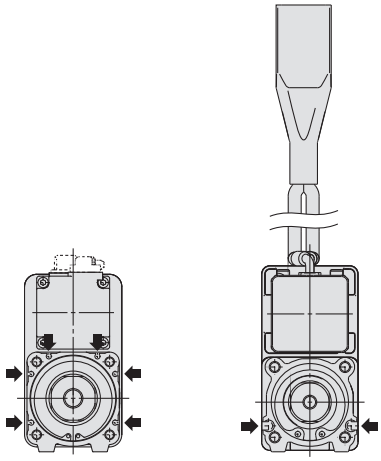
### ●For Female Thread/JB

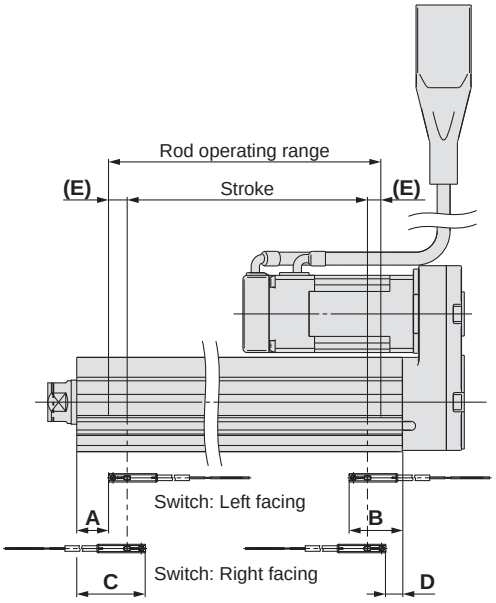
| Applicable size | Thread size |
|---|---|
| **16** | M5 x 0.8 |
| **25, 32, 40** | M8 x 1.25 |
| **63** | M16 x 2 |

# Auto Switch Mounting

## Proper Auto Switch Mounting Position

### Applicable auto switches: D-M9□(V), D-M9□E(V), D-M9□W(V), D-M9□A(V)



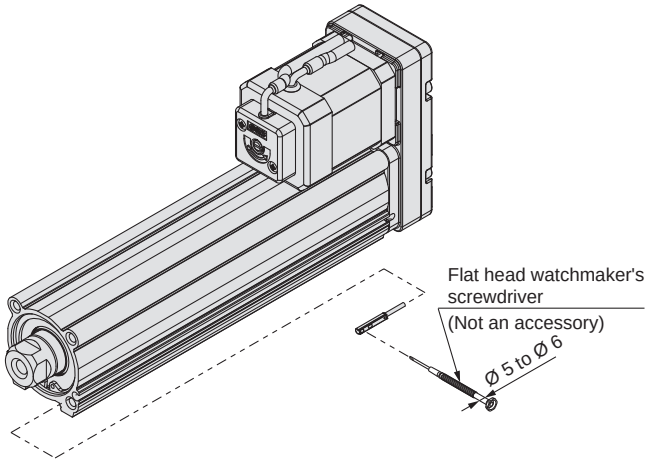




[mm]

| Size | Stroke range | Auto switch position | | | | Return to origin distance | Operating range |
|---|---|---|---|---|---|---|---|
| | | Mounting: Left facing | | Mounting: Right facing | | | |
| | | A | B | C | D | E | — |
| **16** | 10 to 100 | 21.5 | 46.5 | 33.5 | 34.5 | (2) | 2.9 |
| | 105 to 300 | 41.5 | | 53.5 | | | |
| **25** | 15 to 100 | 27 | 62.5 | 39 | 50.5 | (2) | 4.2 |
| | 105 to 400 | 52 | | 64 | | | |
| **32/40** | 20 to 100 | 30.5 | 65.5 | 42.5 | 53.5 | (2) | 4.9 |
| | 105 to 500 | 60.5 | | 72.5 | | | |
| **63** | 50 to 200 | 37 | 86 | 49 | 74 | (4) | 9.8 |
| | 205 to 500 | 72 | | 84 | | | |
| | 505 to 800 | 107 | | 119 | | | |

∗1 Figures in the table above are used as a reference when mounting the auto switches for stroke end detection. Adjust the auto switch after confirming the operating condition in the actual setting.
∗2 Switches cannot be mounted on the motor mounting side surface.
∗3 For the LEYG with a guide, switches cannot be mounted on the guide attachment side (rod side).
∗4 Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may change substantially depending on the ambient environment.

## Auto Switch Mounting




### Auto Switch Mounting Screw Tightening Torque

[N·m]

| Auto switch model | Tightening torque |
|---|---|
| **D-M9□(V)**<br>**D-M9□E(V)**<br>**D-M9□W(V)** | 0.05 to 0.15 |
| **D-M9□A(V)** | 0.05 to 0.10 |

∗ When tightening the auto switch mounting screw (included with auto switch), use a watchmaker's screwdriver with a handle diameter of about 5 to 6 mm.

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

Refer to the SMC website for details on products that are compliant with international standards.

## Grommet

- **2-wire load current is reduced (2.5 to 40 mA).**
- **Using flexible cable as standard spec.**

## ⚠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 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 direction | 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, RoHS | | | | | |

### Oilproof Heavy-duty Lead Wire Specifications

| Auto switch model | | D-M9N(V) | D-M9P(V) | D-M9B(V) |
|---|---|---|---|---|
| Sheath | Outside diameter [mm] | 2.6 | | |
| Insulator | Number of cores | 3 cores (Brown/Blue/Black) | | 2 cores (Brown/Blue) |
| | Outside diameter [mm] | 0.88 | | |
| Conductor | Effective area [mm²] | 0.15 | | |
| | Strand diameter [mm] | 0.05 | | |
| Minimum bending radius [mm] (Reference values) | | 17 | | |

∗ Refer to the **Web Catalogue** for solid state auto switch common specifications.
∗ Refer to the **Web Catalogue** for lead wire lengths.

## Weight

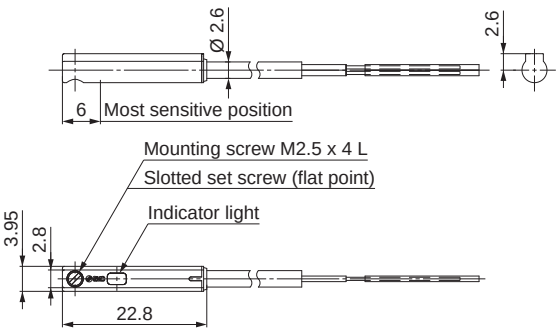
[g]

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

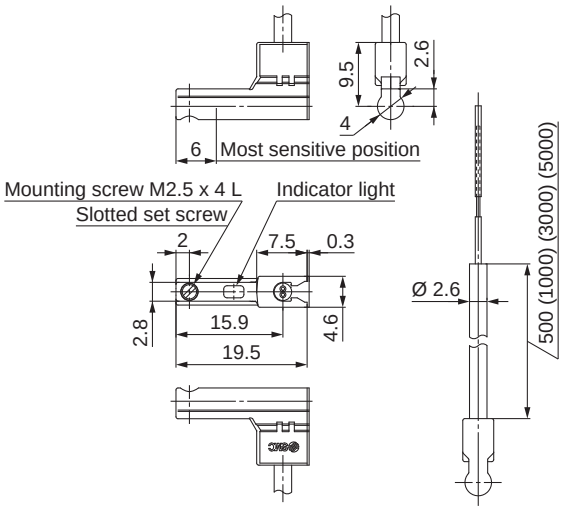
## Dimensions

[mm]

**D-M9□**




**D-M9□V**






SMC

# Normally Closed Solid State Auto Switch Direct Mounting Type

# D-M9NE(V)/D-M9PE(V)/D-M9BE(V)

Refer to the SMC website for details on products that are compliant with international standards.

**Grommet**

- **Output signal turns on when no magnetic force is detected.**
- **Can be used for the actuator adopted by the solid state auto switch D-M9 series (excluding special order products)**

## ⚠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 Specifications

PLC: Programmable Logic Controller

| D-M9□E, D-M9□EV (With indicator light) | | | | | | |
|---|---|---|---|---|---|---|
| Auto switch model | D-M9NE | D-M9NEV | D-M9PE | D-M9PEV | D-M9BE | D-M9BEV |
| Electrical entry direction | 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, RoHS | | | | | |

### Oilproof Heavy-duty Lead Wire Specifications

| Auto switch model | | D-M9NE(V) | D-M9PE(V) | D-M9BE(V) |
|---|---|---|---|---|
| Sheath | Outside diameter [mm] | 2.6 | | |
| Insulator | Number of cores | 3 cores (Brown/Blue/Black) | | 2 cores (Brown/Blue) |
| | Outside diameter [mm] | 0.88 | | |
| Conductor | Effective area [mm²] | 0.15 | | |
| | Strand diameter [mm] | 0.05 | | |
| Minimum bending radius [mm] (Reference values) | | 17 | | |

∗ Refer to the **Web Catalogue** for solid state auto switch common specifications.
∗ Refer to the **Web Catalogue** for lead wire lengths.

## Weight

[g]

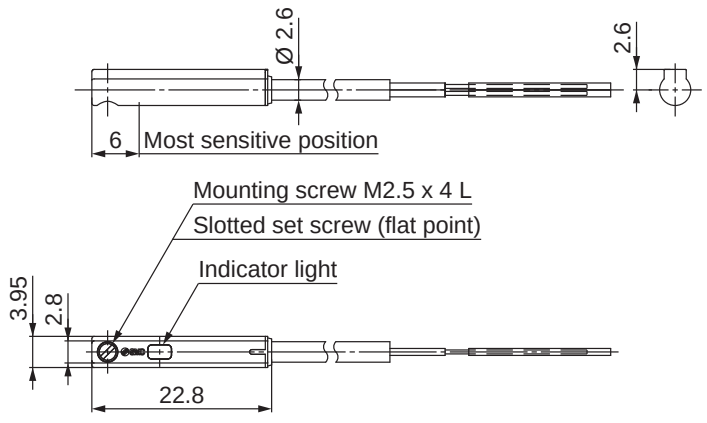
| Auto switch model | | D-M9NE(V) | D-M9PE(V) | D-M9BE(V) |
|---|---|---|---|---|
| Lead wire length | 0.5 m (—) | 8 | | 7 |
| | 1 m (**M**)∗1 | 14 | | 13 |
| | 3 m (**L**) | 41 | | 38 |
| | 5 m (**Z**)∗1 | 68 | | 63 |

∗1 The 1 m and 5 m options are produced upon receipt of order.

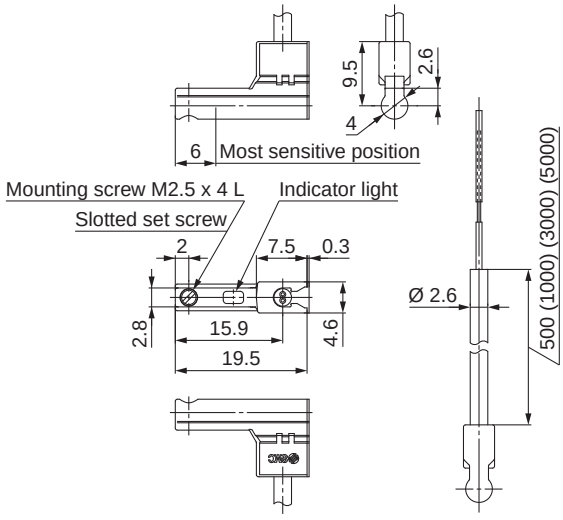
## Dimensions

[mm]

**D-M9□E**




**D-M9□EV**



# 2-Colour Indicator Solid State Auto Switch Direct Mounting Type

# D-M9NW(V)/D-M9PW(V)/D-M9BW(V)

Refer to the SMC website for details on products that are compliant with international standards.

## Grommet

- **2-wire load current is reduced (2.5 to 40 mA).**
- **Using flexible cable as standard spec.**
- **The proper operating range can be determined by the colour 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 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 direction | 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.<br>Proper operating range ····· Green LED illuminates. | | | | | |
| Standard | CE marking, RoHS | | | | | |

### Oilproof Flexible Heavy-duty Lead Wire Specifications

| Auto switch model | | D-M9NW(V) | D-M9PW(V) | D-M9BW(V) |
|---|---|---|---|---|
| Sheath | Outside diameter [mm] | 2.6 | | |
| Insulator | Number of cores | 3 cores (Brown/Blue/Black) | | 2 cores (Brown/Blue) |
| | Outside diameter [mm] | 0.88 | | |
| Conductor | Effective area [mm²] | 0.15 | | |
| | Strand diameter [mm] | 0.05 | | |
| Minimum bending radius [mm] (Reference values) | | 17 | | |

* Refer to the **Web Catalogue** for solid state auto switch common specifications.
* Refer to the **Web Catalogue** for lead wire lengths.

## Weight

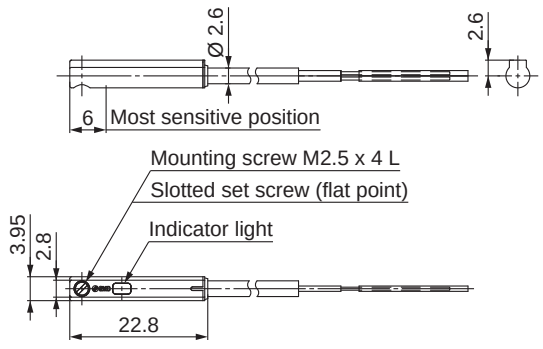
[g]

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

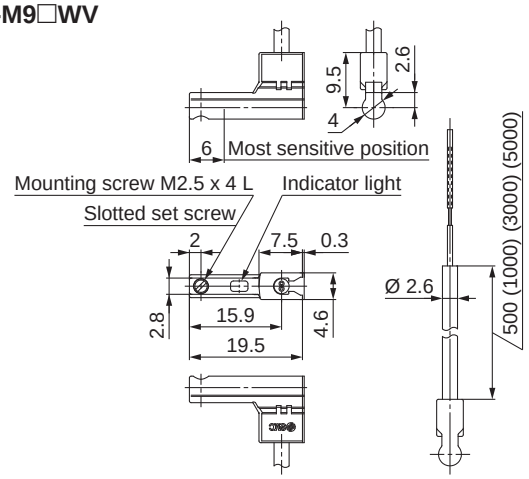
## Dimensions

[mm]

**D-M9□W**




**D-M9□WV**





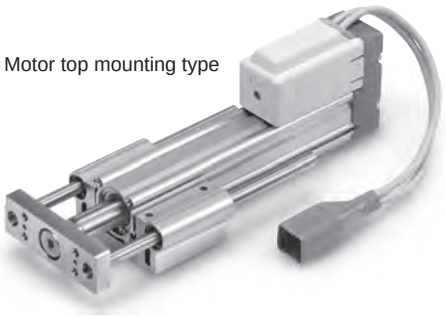

SMC

# Guide Rod Type LEYG Series

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

p. 121

Motor top mounting type

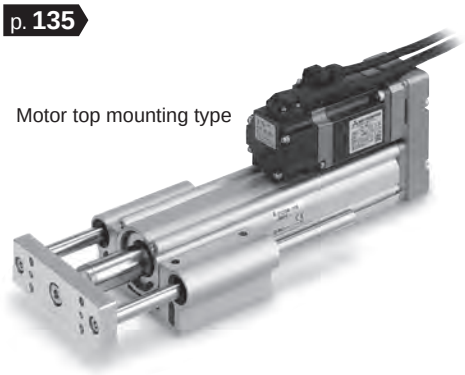


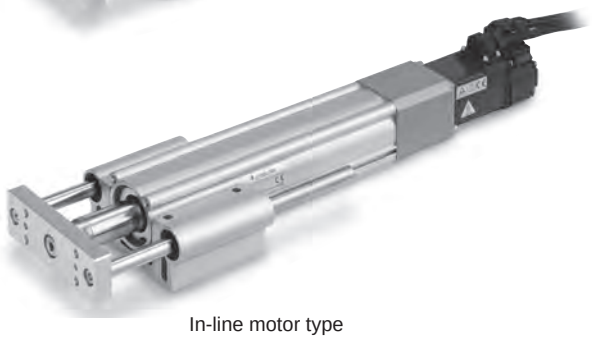
In-line motor type

AC Servo Motor

p. 135

Motor top mounting type



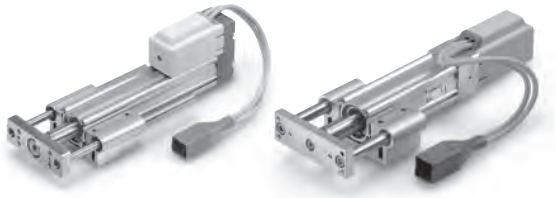


In-line motor type

## Step Motor/Servo Motor Controller/Driver p. 190

## AC Servo Motor Driver p. 246

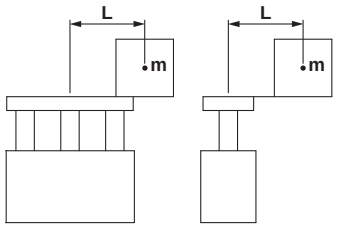
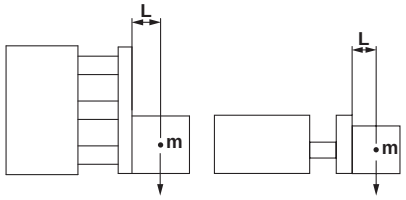
# Model Selection



LEYG Series ▶ p. 121

## Moment Load Graph

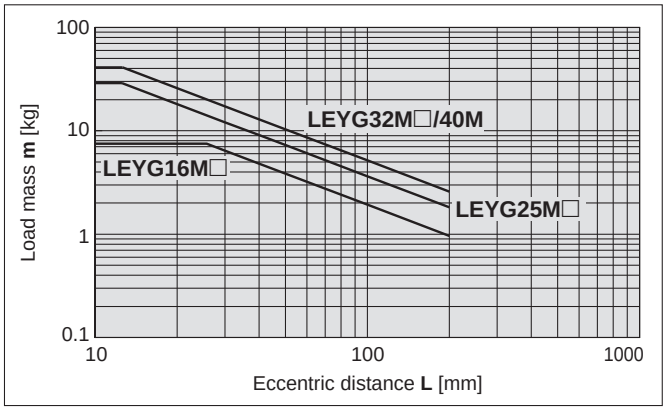
### Selection conditions

| | | Vertical | Horizontal | |
|---|---|---|---|---|
| Mounting position | |  |  | |
| Max. speed [mm/s] | | "Speed–Work Load Graph" | 200 or less | Over 200 |
| Bearing | Sliding bearing | Graphs ①, ② | Graphs ⑤, ⑥*1 | — |
| | Ball bushing bearing | Graphs ③, ④ | Graphs ⑦, ⑧ | Graphs ⑨, ⑩ |

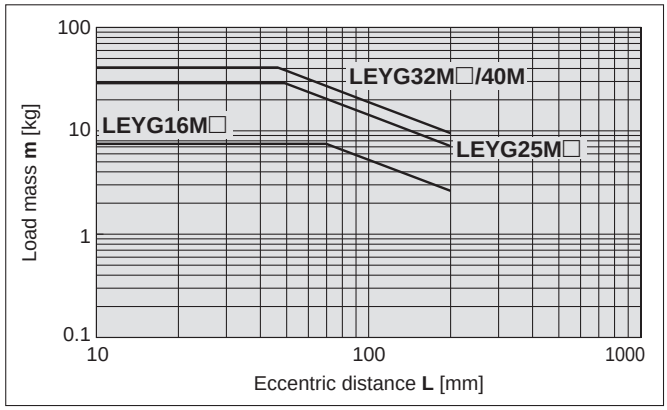
*1 For the sliding bearing type, the speed is restricted with a horizontal/moment load.

### Vertical Mounting, Sliding Bearing

① **70 mm stroke or less**



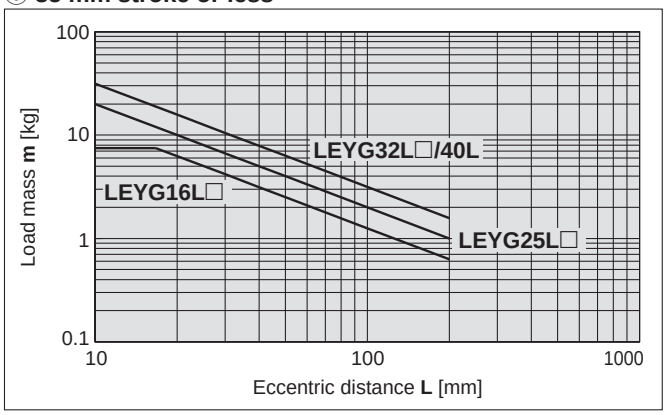

② **Over 75 mm stroke**



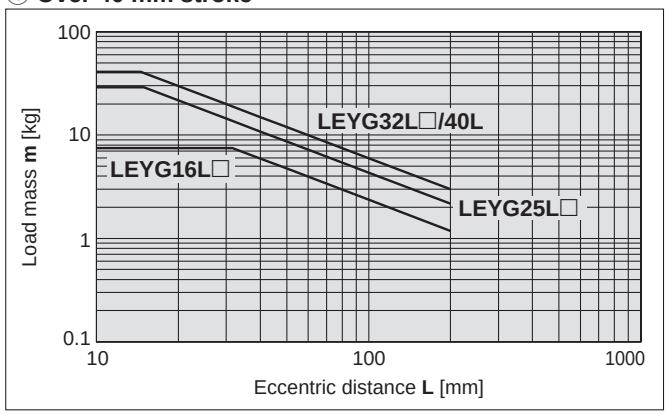

∗ The limit of vertical load mass varies depending on "lead" and "speed."
Check "Speed–Work Load Graph" on pages 107 to 109.

### Vertical Mounting, Ball Bushing Bearing

③ **35 mm stroke or less**




④ **Over 40 mm stroke**

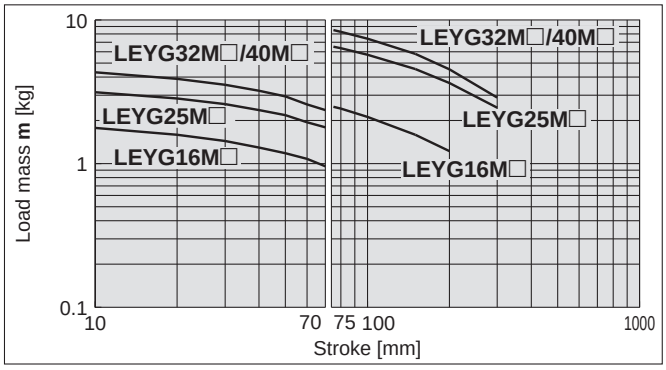



∗ The limit of vertical load mass varies depending on "lead" and "speed."
Check "Speed–Work Load Graph" on pages 107 to 109.

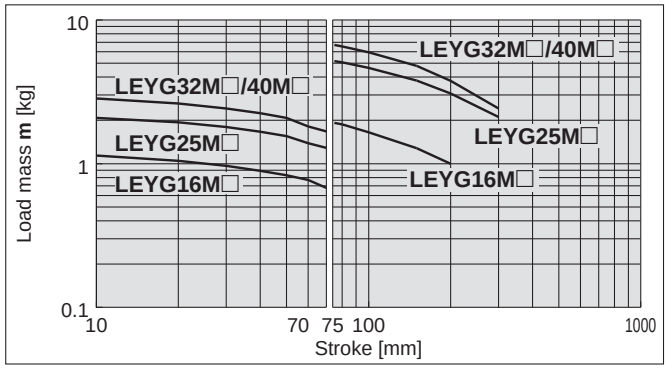
## Moment Load Graph

### Horizontal Mounting, Sliding Bearing

⑤ **L = 50 mm**




⑥ **L = 100 mm**



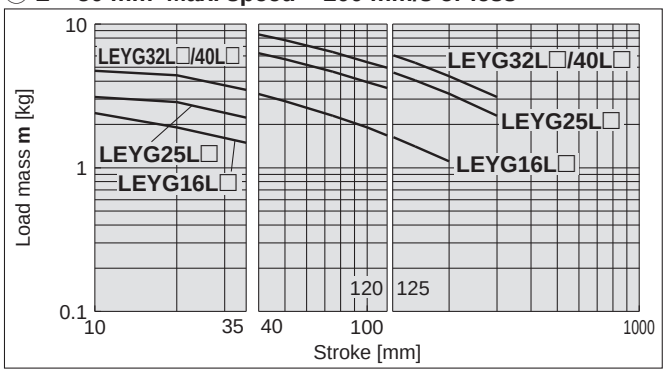

∗ Set the speed to less than or equal to the values shown below.

| Motor type | LEYG□M□A | LEYG□M□B | LEYG□M□C |
|---|---|---|---|
| Step motor (Servo/24 VDC) | 200 mm/s | 125 mm/s | 75 mm/s |
| Servo motor (24 VDC) | 200 mm/s | 200 mm/s | 125 mm/s |

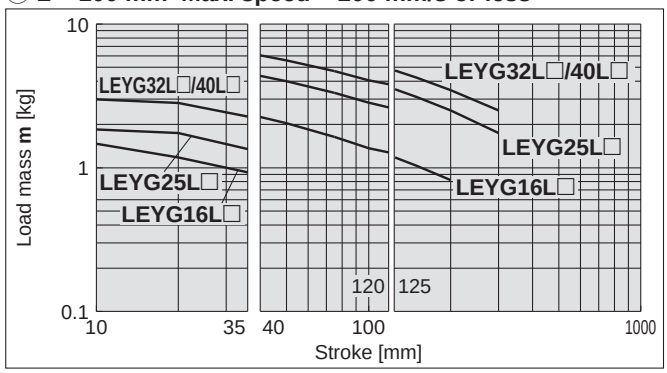
∗ For the specifications below, operate the system at the "load mass" shown in the graph x 80 %.
- LEYG25MAA/Servo motor (24 VDC), Lead 12

### Horizontal Mounting, Ball Bushing Bearing

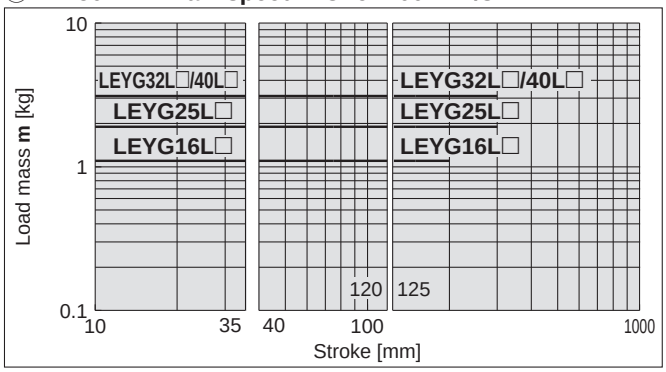
⑦ **L = 50 mm Max. speed = 200 mm/s or less**



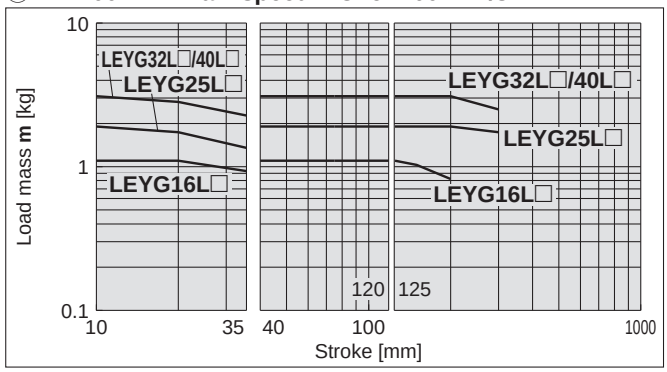

⑧ **L = 100 mm Max. speed = 200 mm/s or less**




⑨ **L = 50 mm Max. speed = Over 200 mm/s**

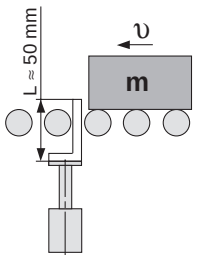



⑩ **L = 100 mm Max. speed = Over 200 mm/s**




## Operating Range when Used as a Stopper

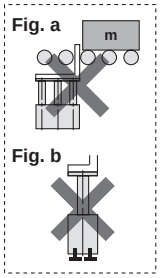
### LEYG□M (Sliding bearing)

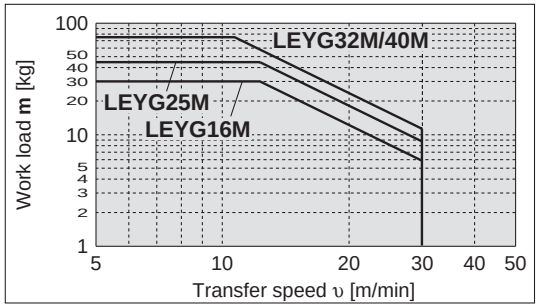



**⚠Caution**

**Handling Precautions**

- When used as a stopper, select a model with a stroke of 30 mm or less.
- LEYG□L (ball bushing bearing) cannot be used as a stopper.
- Workpiece collision in series with guide rod cannot be permitted (**Fig. a**).
- The body should not be mounted on the end. It must be mounted on the top or bottom (**Fig. b**).



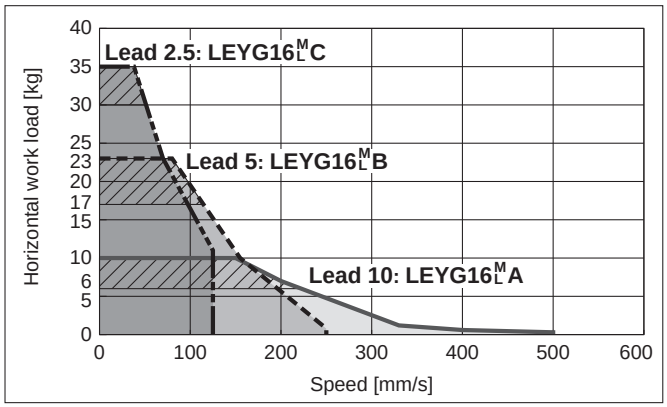
## Speed–Work Load Graph (Guide)
## For Step Motor (Servo/24 VDC) LECP1, LECPMJ, JXC□1

* These graphs show the work load when the external guide is used together. When using the LEYG alone, refer to pages 105 and 106.

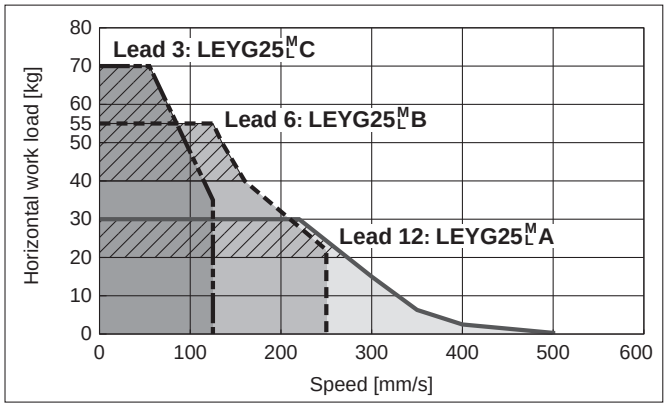

**Refer to page 108 for the LECPA, JXC□$^{2}_{3}$ and page 109 for the LECA6.**


### Horizontal

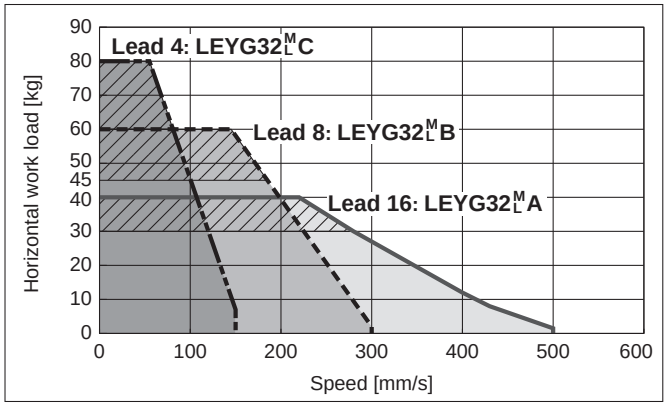
#### LEYG16$^{M}_{L}$□



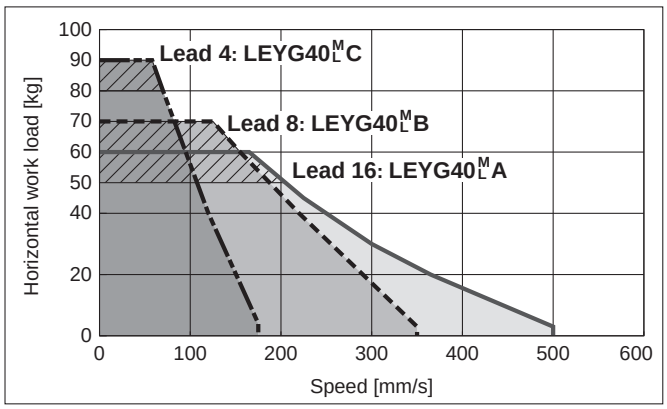

#### LEYG25$^{M}_{L}$□




#### LEYG32$^{M}_{L}$□

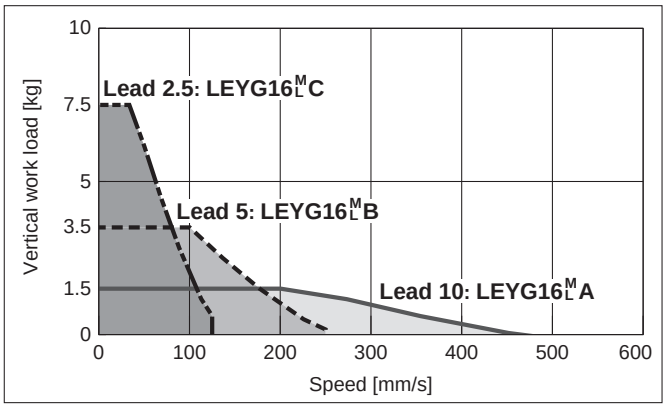



#### LEYG40$^{M}_{L}$□

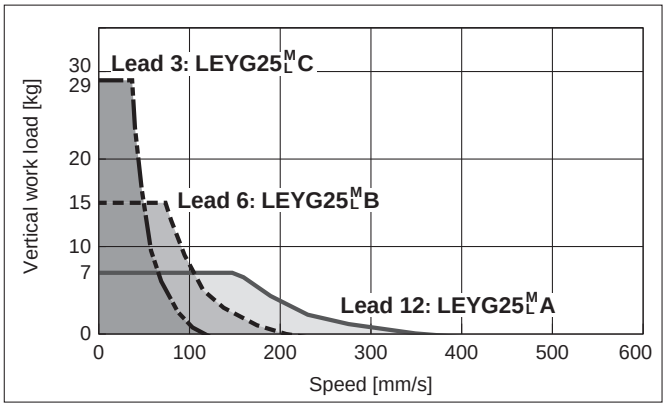



### Vertical

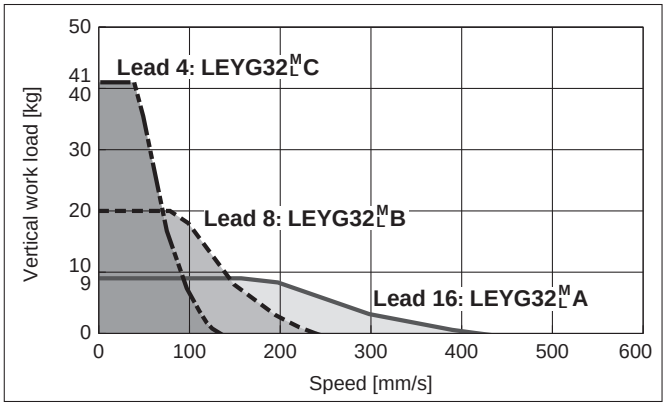
#### LEYG16$^{M}_{L}$□



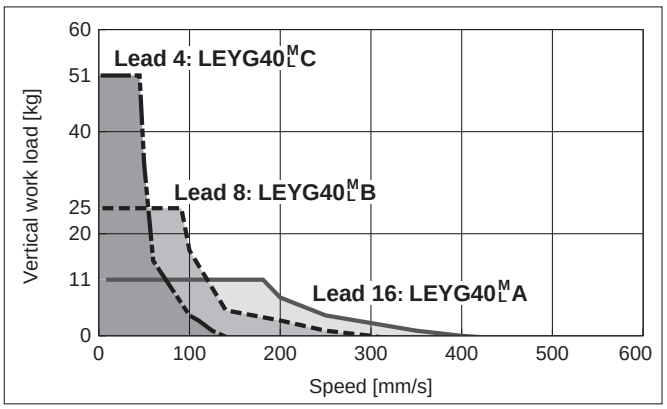

#### LEYG25$^{M}_{L}$□




#### LEYG32$^{M}_{L}$□




#### LEYG40$^{M}_{L}$□



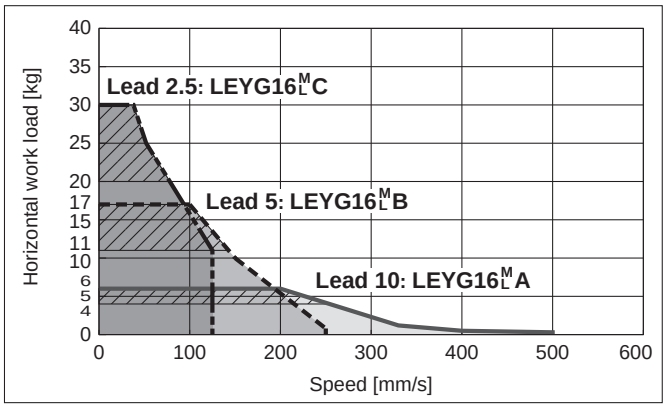
## Speed–Work Load Graph (Guide) For Step Motor (Servo/24 VDC) LECPA, JXC□$^{2}_{3}$

* These graphs show the work load when the external guide is used together. When using the LEYG alone, refer to pages 105 and 106.

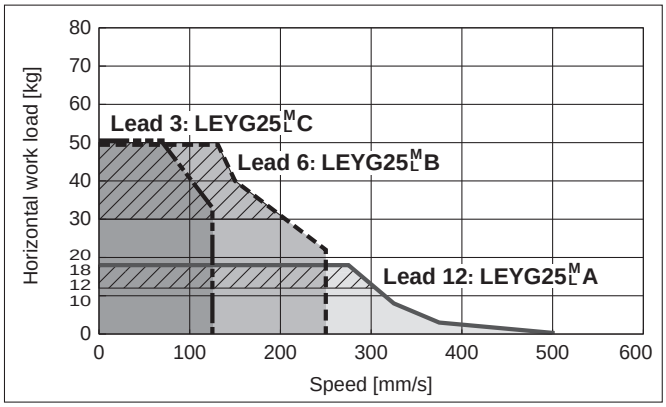
**Refer to page 107 for the LECP6, JXC□1 and page 109 for the LECA6.**

### Horizontal

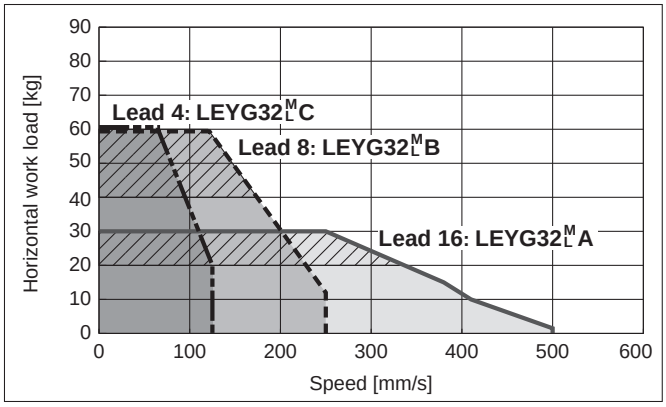
#### LEYG16$^{M}_{L}$□



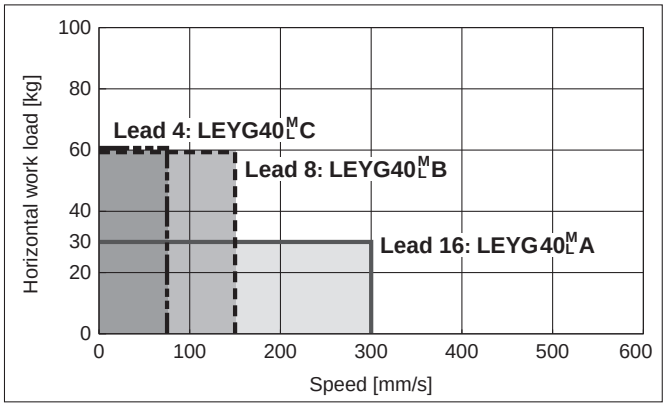

#### LEYG25$^{M}_{L}$□




#### LEYG32$^{M}_{L}$□

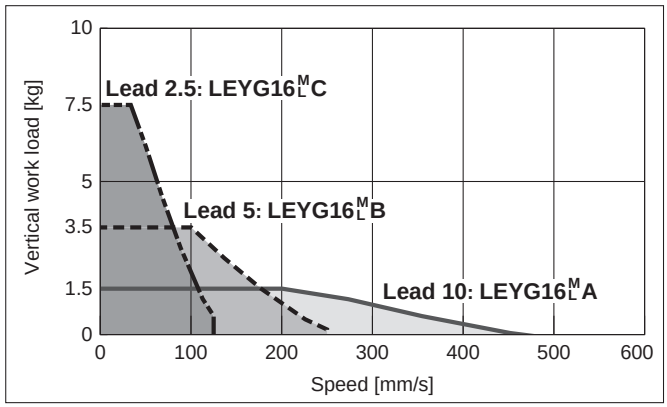



#### LEYG40$^{M}_{L}$□

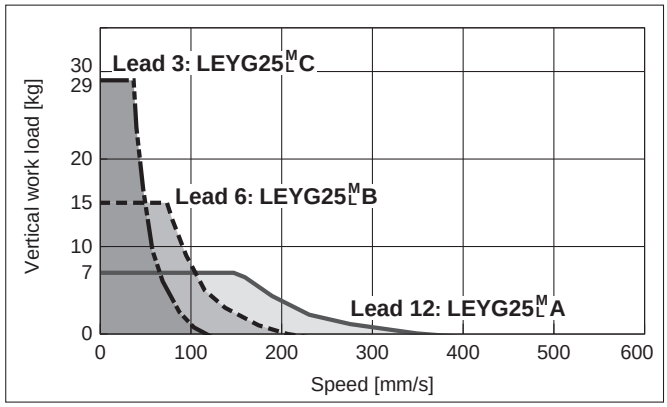



### Vertical

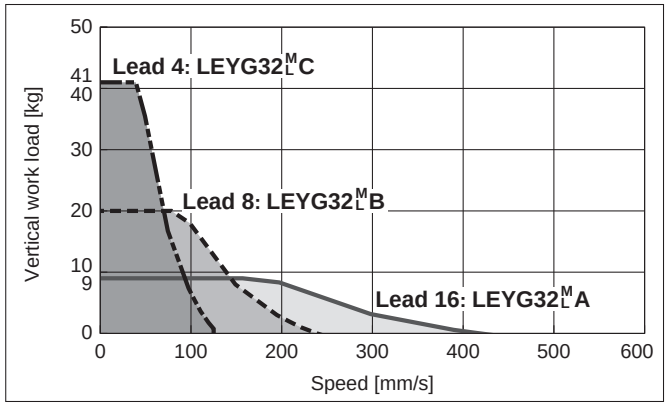
#### LEYG16$^{M}_{L}$□



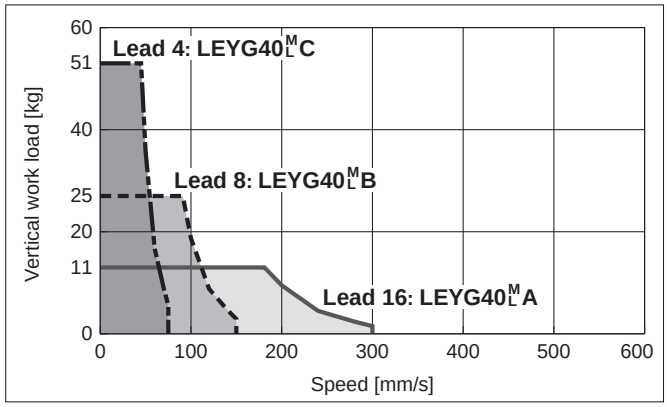

#### LEYG25$^{M}_{L}$□




#### LEYG32$^{M}_{L}$□




#### LEYG40$^{M}_{L}$□

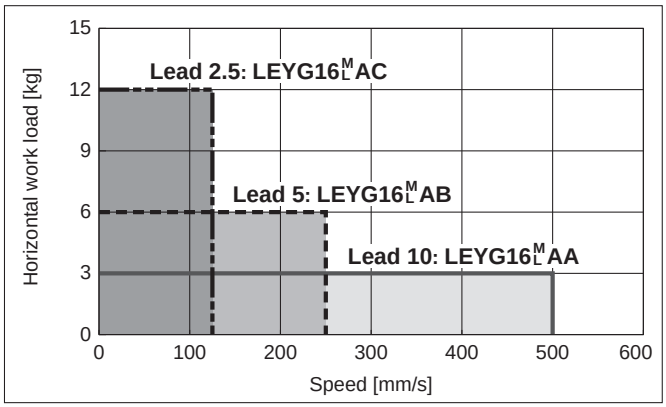


## Speed–Work Load Graph (Guide)
## For Servo Motor (24 VDC) LECA6

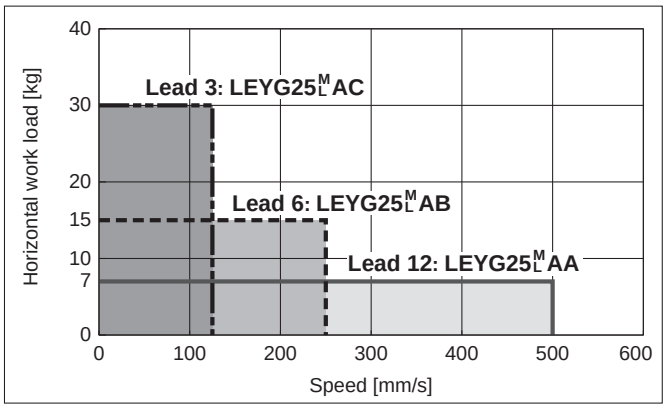
Refer to page 107 for the LECP1, JXC□1 and page 108 for the LECPA, JXC□$^{2}_{3}$.

### Horizontal

#### LEYG16$^{M}_{L}$□A

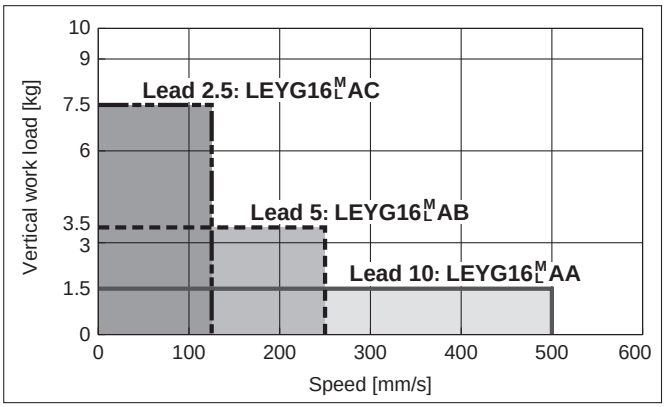



#### LEYG25$^{M}_{L}$□A

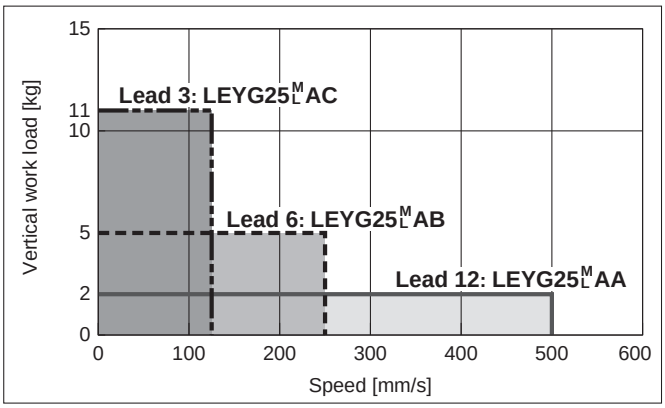



### Vertical

#### LEYG16$^{M}_{L}$□A



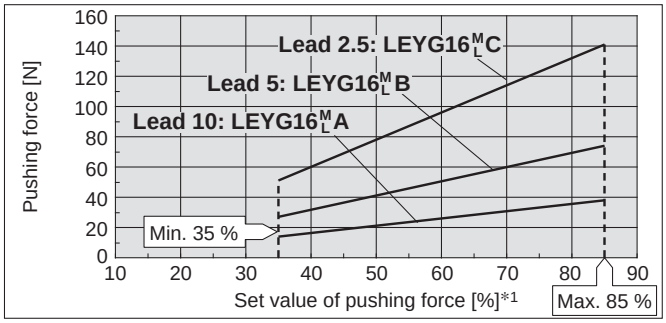

#### LEYG25$^{M}_{L}$□A



## Force Conversion Graph (Guide)

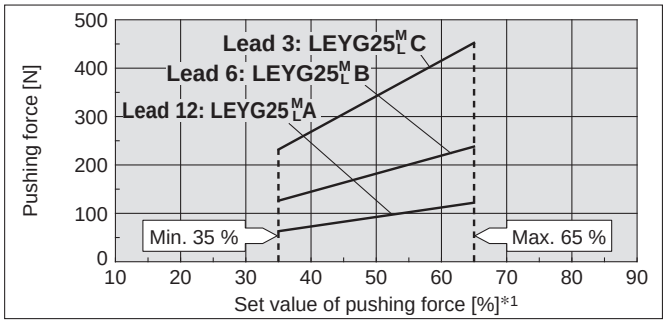
### Step Motor (Servo/24 VDC)

#### LEYG16$^{M}_{L}$□



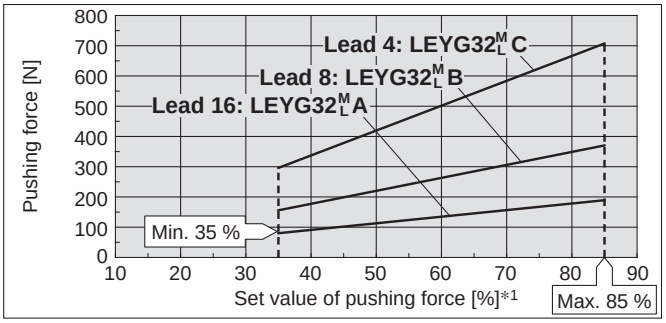

| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **25 °C or less** | 85 or less | 100 | — |
| **40 °C** | 40 or less | 100 | — |
| | 50 | 70 | 12 |
| | 70 | 20 | 1.3 |
| | 85 | 15 | 0.8 |

#### LEYG25$^{M}_{L}$□



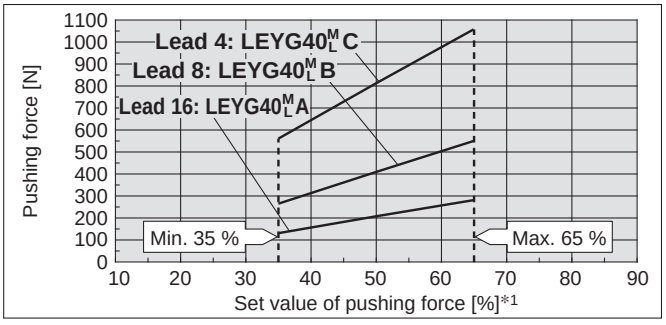

| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **40 °C or less** | 65 or less | 100 | — |

#### LEYG32$^{M}_{L}$□




| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **25 °C or less** | 85 or less | 100 | — |
| **40 °C** | 65 or less | 100 | — |
| | 85 | 50 | 15 |

#### LEYG40$^{M}_{L}$□

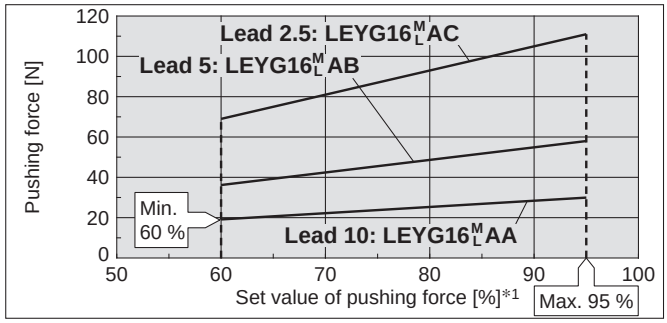



| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **40 °C or less** | 65 or less | 100 | — |

*1 Set values for the controller

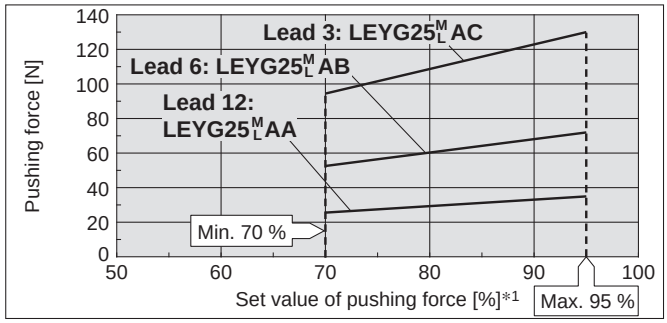
### Servo Motor (24 VDC)

#### LEYG16$^{M}_{L}$A□




| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **40 °C or less** | 95 or less | 100 | — |

#### LEYG25$^{M}_{L}$A□




| Ambient temperature | Set value of pushing force [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **40 °C or less** | 95 or less | 100 | — |

### <Limit Values for Pushing Force and Trigger Level in Relation to Pushing Speed>
### Without Load

| Model | Lead | Pushing speed [mm/s] | Pushing force (Setting input value) |
|---|---|---|---|
| LEYG16$^{M}_{L}$ | A/B/C | 21 to 50 | 60 to 85 % |
| LEYG25$^{M}_{L}$ | A/B/C | 21 to 35 | 50 to 65 % |
| LEYG32$^{M}_{L}$ | A | 24 to 30 | 60 to 85 % |
| | B/C | 21 to 30 | |
| LEYG40$^{M}_{L}$ | A | 24 to 30 | 50 to 65 % |
| | B/C | 21 to 30 | |

| Model | Lead | Pushing speed [mm/s] | Pushing force (Setting input value) |
|---|---|---|---|
| LEYG16$^{M}_{L}$□A | A/B/C | 21 to 50 | 80 to 95 % |
| LEYG25$^{M}_{L}$□A | A/B/C | 21 to 35 | 80 to 95 % |

There is a limit to the pushing force in relation to the pushing speed. If the product is operated outside of the range (low pushing force), the completion signal [INP] may be output before the pushing operation has been completed (during the moving operation).
If operating with the pushing speed below the min. speed, please check for operating problems before using the product.

### <Set Values for Vertical Upward Transfer Pushing Operations>

For vertical loads (upward), set the pushing force to the max. value shown below and operate at the work load or less.

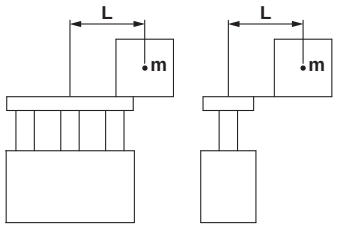
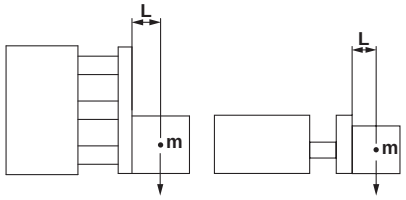
| Model | LEYG16$^{M}_{L}$□ | | | LEYG25$^{M}_{L}$□ | | | LEYG32$^{M}_{L}$□ | | | LEYG40$^{M}_{L}$□ | | | LEYG16$^{M}_{L}$□A | | | LEYG25$^{M}_{L}$□A | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C | A | B | C |
| Work load [kg] | 0.5 | 1 | 2.5 | 1.5 | 4 | 9 | 2.5 | 7 | 16 | 5 | 12 | 26 | 0.5 | 1 | 2.5 | 0.5 | 1.5 | 4 |
| Pushing force | 85 % | | | 65 % | | | 85 % | | | 65 % | | | 95 % | | | 95 % | | |

# Model Selection

**LEYG Series** ▶ p. **135** **LECY□ Series** ▶ p. **143**

## Moment Load Graph

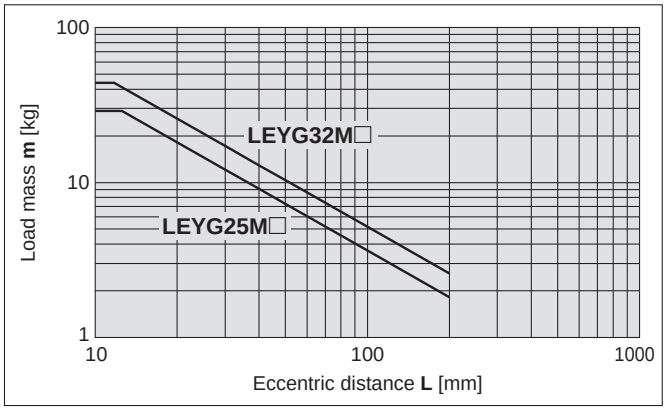
### Selection conditions

| | | Vertical | Horizontal | |
|---|---|---|---|---|
| Mounting position | |  |  | |
| Max. speed [mm/s] | | "Speed–Vertical Work Load Graph" | 200 or less | Over 200 |
| Bearing | Sliding bearing | Graphs ①, ② | Graphs ⑤, ⑥*1 | Graphs ⑦, ⑧ |
| | Ball bushing bearing | Graphs ③, ④ | Graphs ⑨, ⑩ | Graphs ⑪, ⑫ |

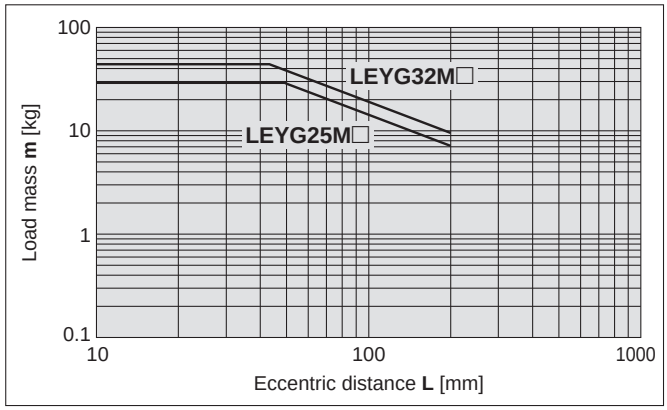
*1 For the sliding bearing type, the speed is restricted with a horizontal/moment load.

### Vertical Mounting, Sliding Bearing

**① 70 mm stroke or less**



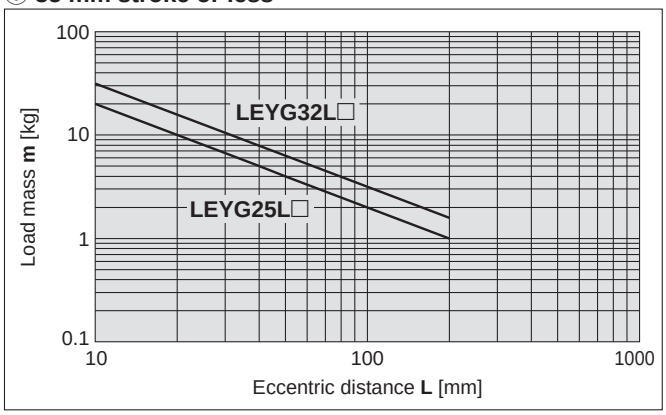

**② Over 75 mm stroke**



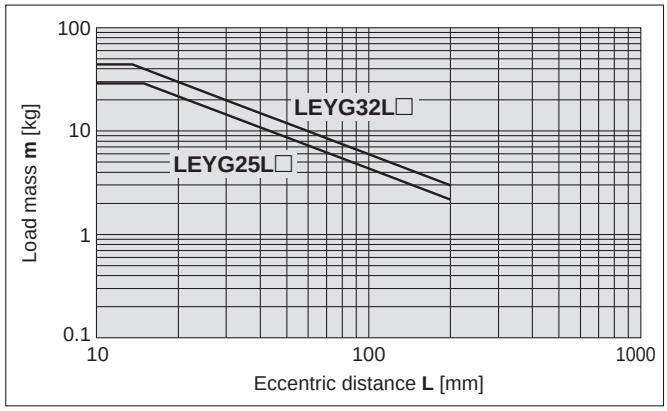

∗ The limit of vertical load mass varies depending on "lead" and "speed."
Check "Speed–Vertical Work Load Graph" on page 113.

### Vertical Mounting, Ball Bushing Bearing

**③ 35 mm stroke or less**




**④ Over 40 mm stroke**

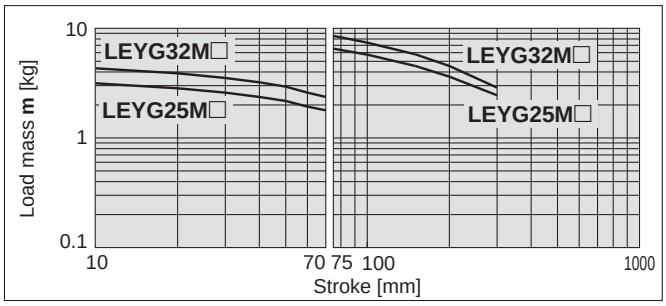



∗ The limit of vertical load mass varies depending on "lead" and "speed."
Check "Speed–Vertical Work Load Graph" on page 113.

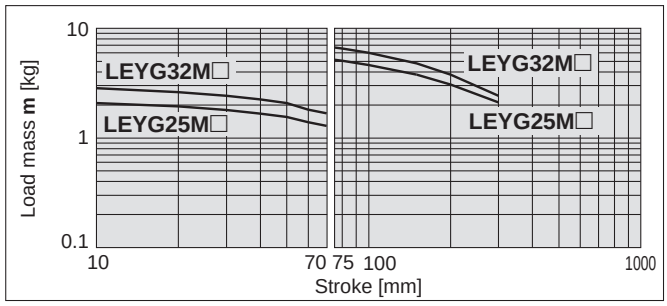
## Moment Load Graph

### Horizontal Mounting, Sliding Bearing

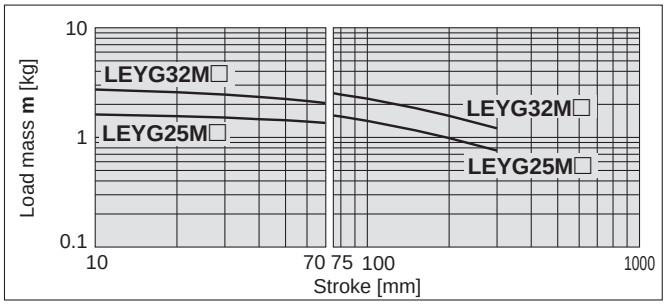
⑤ **L = 50 mm Max. speed = 200 mm/s or less**



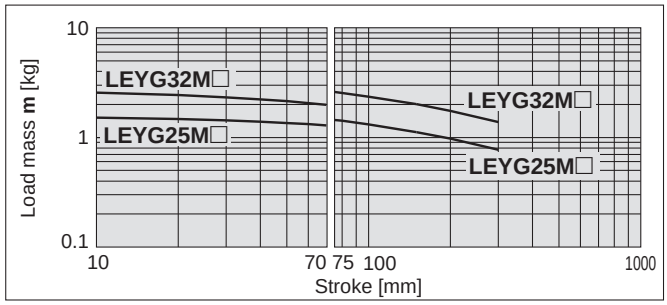

⑥ **L = 100 mm Max. speed = 200 mm/s or less**




⑦ **L = 50 mm Max. speed = Over 200 mm/s**

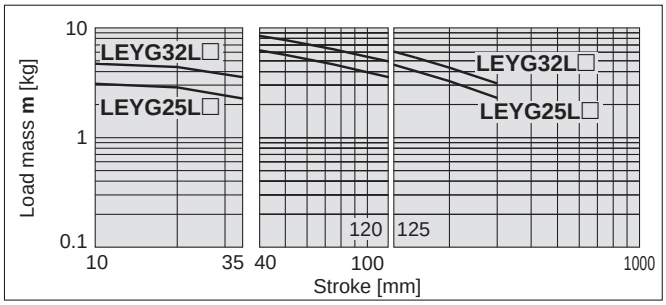



⑧ **L = 100 mm Max. speed = Over 200 mm/s**

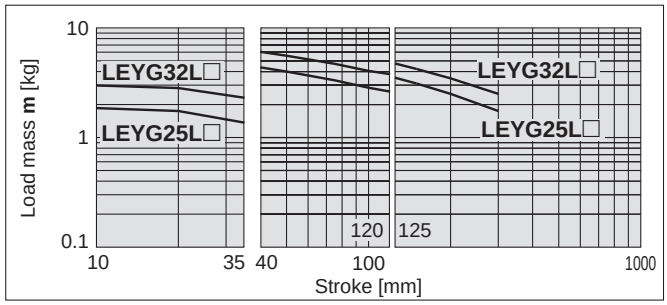



### Horizontal Mounting, Ball Bushing Bearing

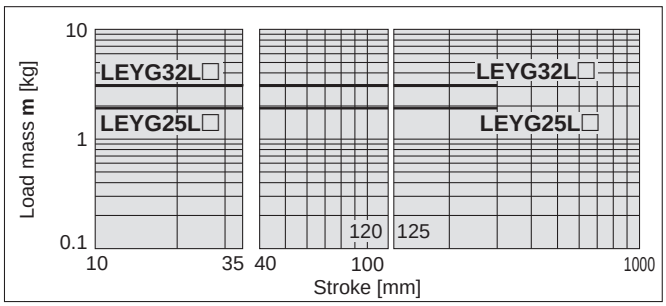
⑨ **L = 50 mm Max. speed = 200 mm/s or less**



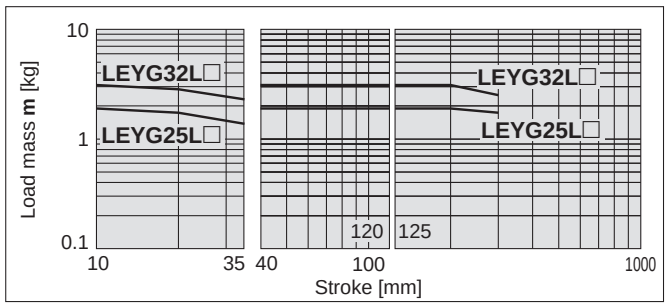

⑩ **L = 100 mm Max. speed = 200 mm/s or less**




⑪ **L = 50 mm Max. speed = Over 200 mm/s**

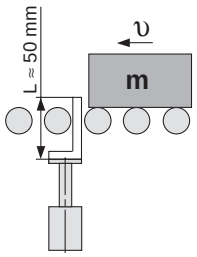



⑫ **L = 100 mm Max. speed = Over 200 mm/s**




## Operating Range when Used as a Stopper

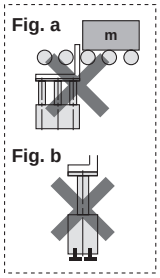
### LEYG□M (Sliding bearing)

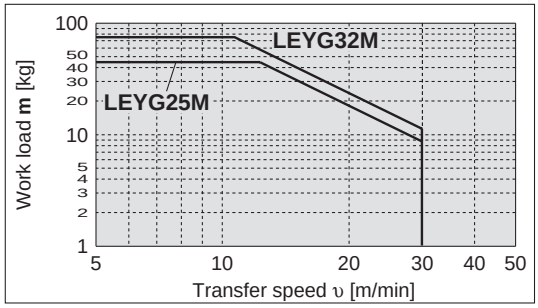



**⚠Caution**

**Handling Precautions**

* When used as a stopper, select a model with a stroke of 30 mm or less.
* LEYG□L (ball bushing bearing) cannot be used as a stopper.
* Workpiece collision in series with guide rod cannot be permitted (**Fig. a**).
* The body should not be mounted on the end. It must be mounted on the top or bottom (**Fig. b**).

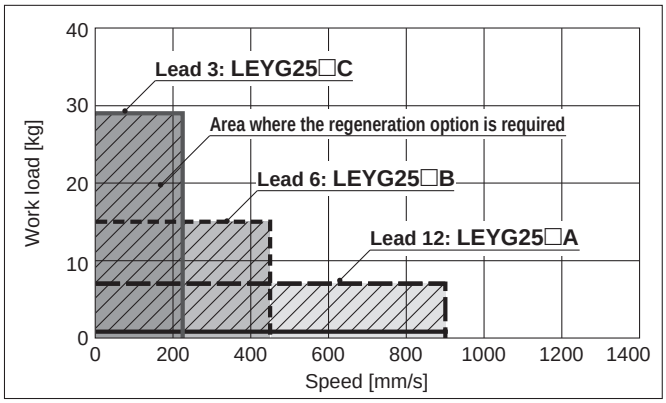


## Speed–Vertical Work Load Graph/Required Conditions for "Regeneration Option"

* These graphs show the work load when the external guide is used together. When using the LEYG alone, refer to pages 111 and 112.

### LEYG25□S$^{2}_{6}$/T6 (Motor mounting position: Top mounting/In-line)



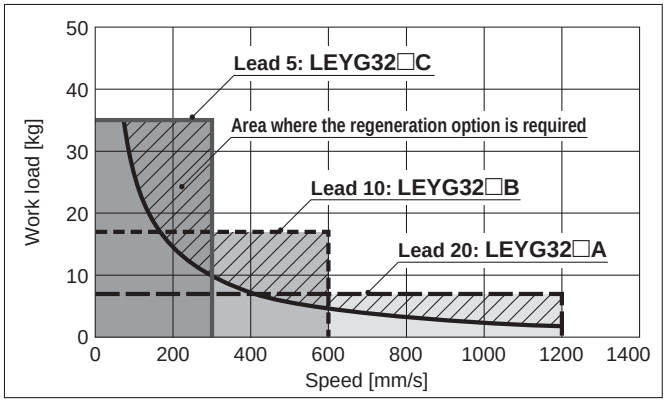

**Required conditions for "Regeneration option"**

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

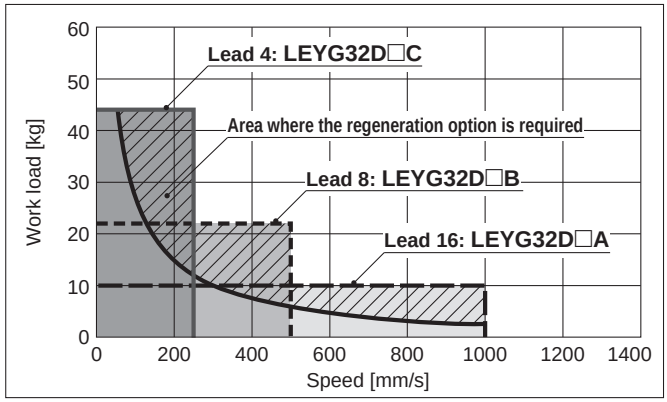
**"Regeneration Option" Models**

| Size | Model |
|---|---|
| **LEYG25□** | LEC-MR-RB-032 |
| **LEYG32□** | LEC-MR-RB-032 |

### LEYG32S$^{3}_{7}$/T7 (Motor mounting position: Top mounting)



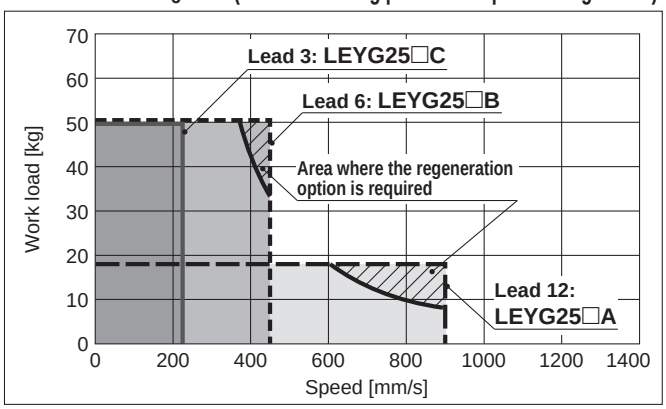

### LEYG32DS$^{3}_{7}$/T7 (Motor mounting position: In-line)




## Speed–Horizontal Work Load Graph/Required Conditions for "Regeneration Option"

* These graphs show the work load when the external guide is used together. When using the LEYG alone, refer to pages 111 and 112.

### LEYG25□S$^{2}_{6}$/T6 (Motor mounting position: Top mounting/In-line)



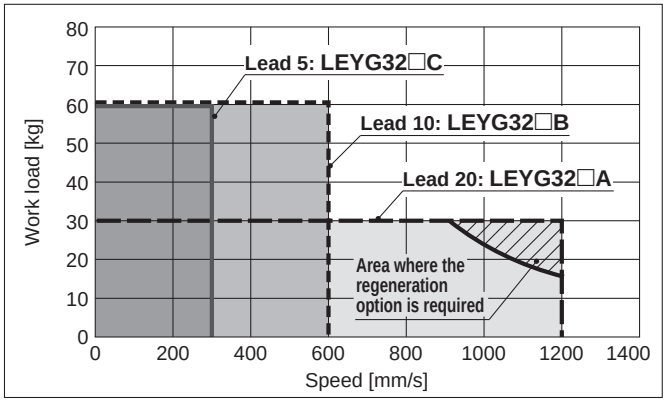

**Required conditions for "Regeneration option"**

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

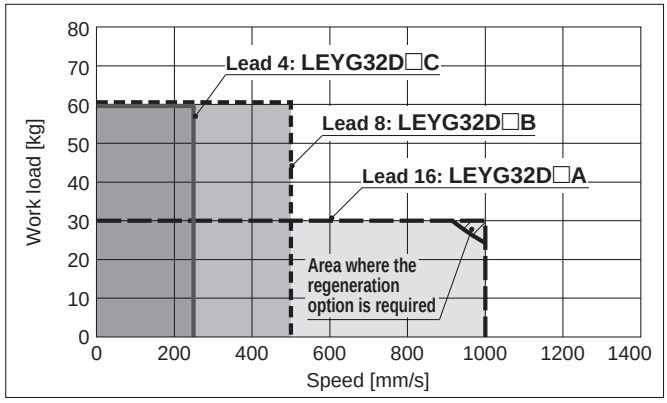
**"Regeneration Option" Models**

| Size | Model |
|---|---|
| **LEYG25□** | LEC-MR-RB-032 |
| **LEYG32□** | LEC-MR-RB-032 |

### LEYG32S$^{3}_{7}$/T7 (Motor mounting position: Top mounting)

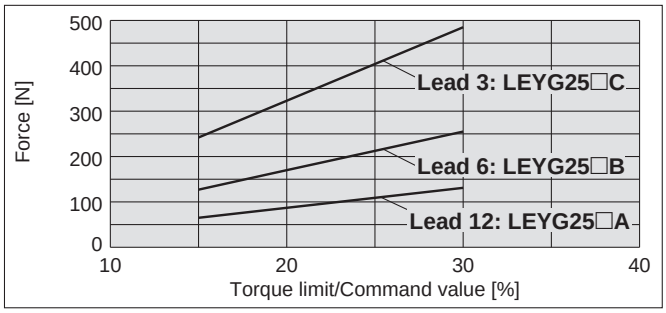



### LEYG32DS$^{3}_{7}$/T7 (Motor mounting position: In-line)



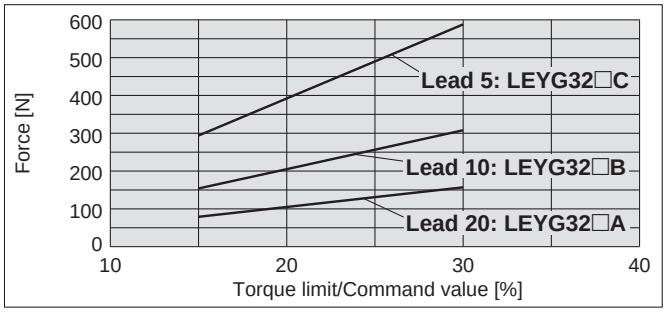
## Force Conversion Graph: LECSA, LECSB, LECSC, LECSS

### LEYG25□S$^{2}_{6}$ (Motor mounting position: Top mounting/In-line)



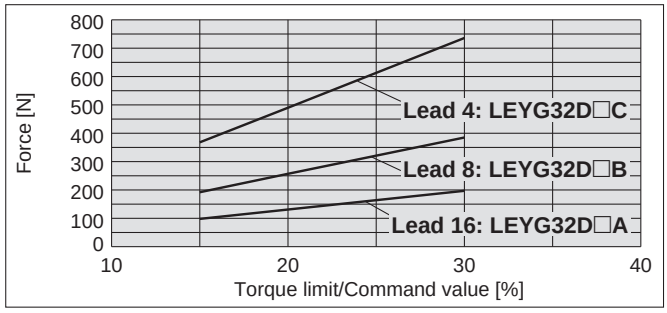

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 25 or less | 100 | — |
| 30 | 60 | 1.5 |

### LEYG32S$^{3}_{7}$ (Motor mounting position: Top mounting)




| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 25 or less | 100 | — |
| 30 | 60 | 1.5 |

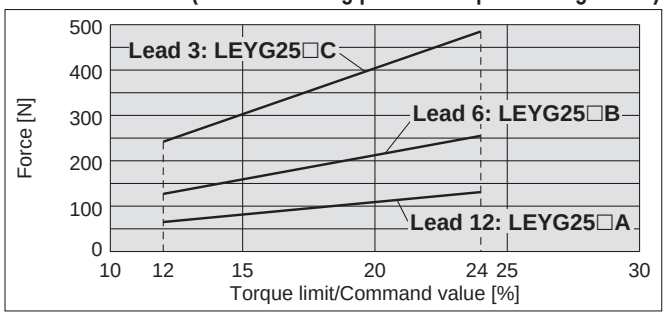
### LEYG32DS$^{3}_{7}$ (Motor mounting position: In-line)




| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 25 or less | 100 | — |
| 30 | 60 | 1.5 |

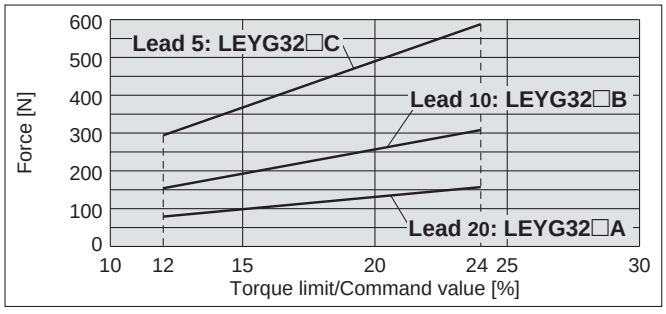
## Force Conversion Graph: LECSS-T

### LEYG25□T6 (Motor mounting position: Top mounting/In-line)



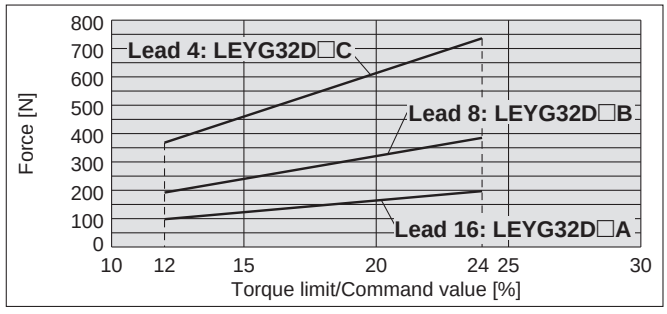

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 20 or less | 100 | — |
| 24 | 60 | 1.5 |

### LEYG32T7 (Motor mounting position: Top mounting)



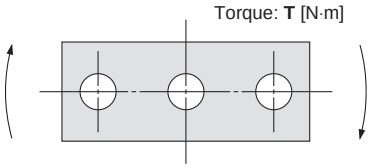

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 20 or less | 100 | — |
| 24 | 60 | 1.5 |

### LEYG32DT7 (Motor mounting position: In-line)




| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 20 or less | 100 | — |
| 24 | 60 | 1.5 |

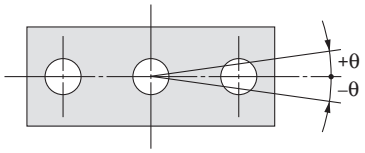
## Allowable Rotational Torque of Plate




**T** [N·m]

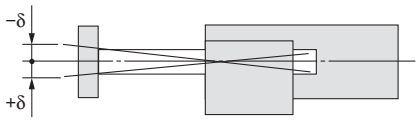
| Model | Stroke [mm] | | | | |
|---|---|---|---|---|---|
| | 30 | 50 | 100 | 200 | 300 |
| **LEYG16M** | 0.70 | 0.57 | 1.05 | 0.56 | — |
| **LEYG16L** | 0.82 | 1.48 | 0.97 | 0.57 | — |
| **LEYG25M** | 1.56 | 1.29 | 3.50 | 2.18 | 1.36 |
| **LEYG25L** | 1.52 | 3.57 | 2.47 | 2.05 | 1.44 |
| **LEYG32M** | 2.55 | 2.09 | 5.39 | 3.26 | 1.88 |
| **LEYG32L** | 2.80 | 5.76 | 4.05 | 3.23 | 2.32 |
| **LEYG40M** | 2.55 | 2.09 | 5.39 | 3.26 | 1.88 |
| **LEYG40L** | 2.80 | 5.76 | 4.05 | 3.23 | 2.32 |

## Non-rotating Accuracy of Plate




| Size | Non-rotating accuracy θ | |
|---|---|---|
| | **LEYG□M** | **LEYG□L** |
| **16** | 0.06° | 0.05° |
| **25** | | 0.04° |
| **32** | 0.05° | |
| **40** | | |

## Plate Displacement: δ




[mm]

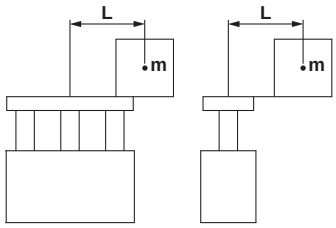
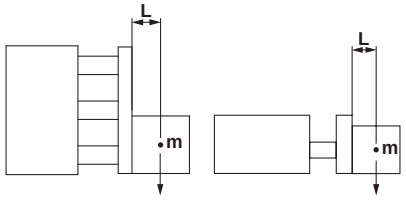
| Model | Stroke [mm] | | | | |
|---|---|---|---|---|---|
| | **30** | **50** | **100** | **200** | **300** |
| **LEYG16M** | ±0.20 | ±0.25 | ±0.24 | ±0.27 | — |
| **LEYG16L** | ±0.13 | ±0.12 | ±0.17 | ±0.19 | — |
| **LEYG25M** | ±0.26 | ±0.31 | ±0.25 | ±0.38 | ±0.36 |
| **LEYG25L** | ±0.13 | ±0.13 | ±0.17 | ±0.20 | ±0.23 |
| **LEYG32M** | ±0.23 | ±0.29 | ±0.23 | ±0.36 | ±0.34 |
| **LEYG32L** | ±0.11 | ±0.11 | ±0.15 | ±0.19 | ±0.22 |

# Model Selection

LEYG Series ▸ p. 143 LECS□ Series ▸ p. 135

## Moment Load Graph

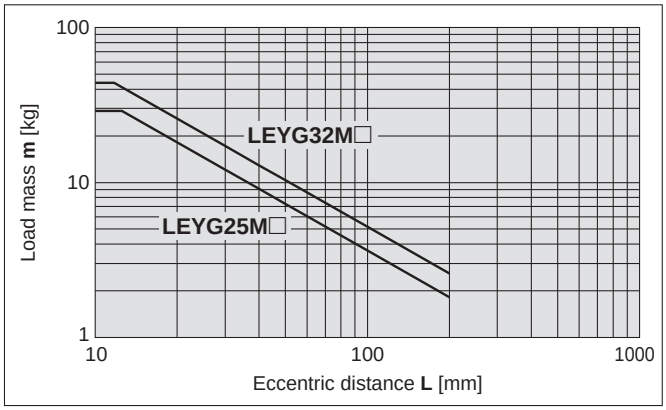
### Selection conditions

| | | Vertical | Horizontal | |
|---|---|---|---|---|
| Mounting position | |  |  | |
| Max. speed [mm/s] | | "Speed–Work Load Graph" | 200 or less | Over 200 |
| Bearing | Sliding bearing | Graphs ①, ② | Graphs ⑤, ⑥*1 | Graphs ⑦, ⑧ |
| | Ball bushing bearing | Graphs ③, ④ | Graphs ⑨, ⑩ | Graphs ⑪, ⑫ |

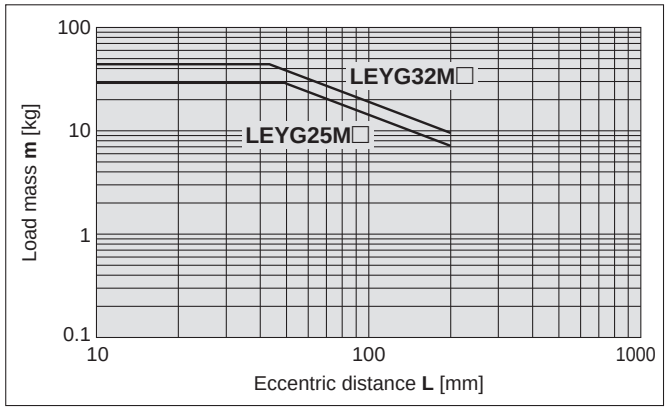
*1 For the sliding bearing type, the speed is restricted with a horizontal/moment load.

### Vertical Mounting, Sliding Bearing

**① 70 mm stroke or less**



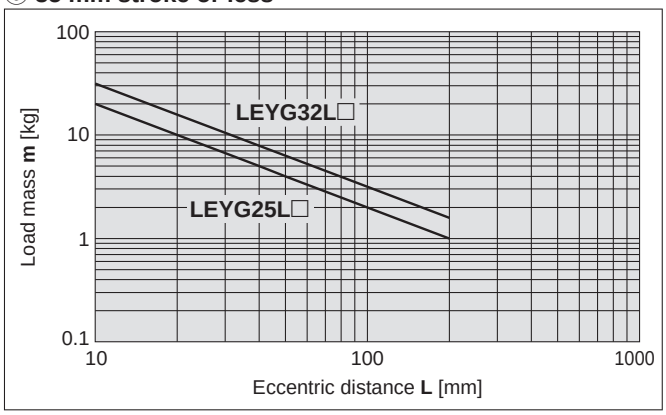

**② Over 75 mm stroke**



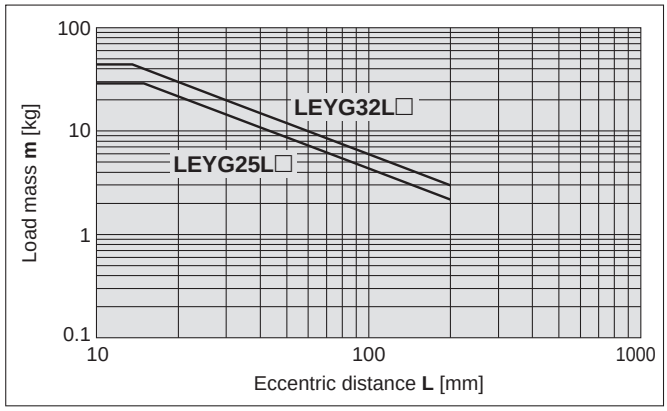

∗ The limit of vertical load mass varies depending on "lead" and "speed."
Check "Speed–Work Load Graph" on page 118.

### Vertical Mounting, Ball Bushing Bearing

**③ 35 mm stroke or less**




**④ Over 40 mm stroke**

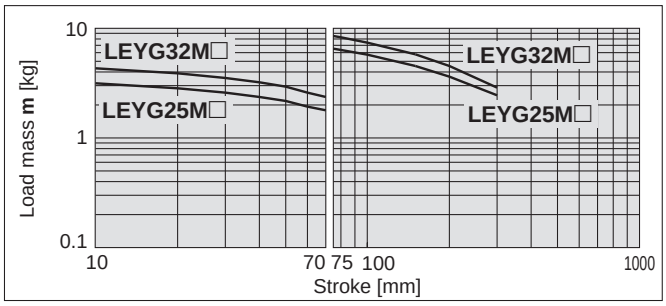



∗ The limit of vertical load mass varies depending on "lead" and "speed."
Check "Speed–Work Load Graph" on page 118.

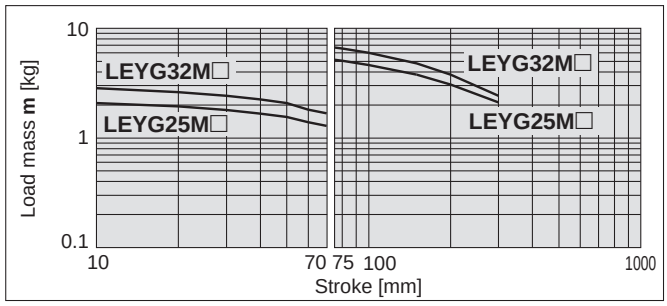
## Moment Load Graph

### Horizontal Mounting, Sliding Bearing

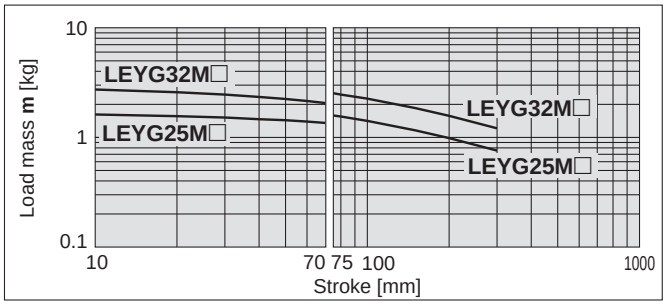
⑤ **L = 50 mm Max. speed = 200 mm/s or less**



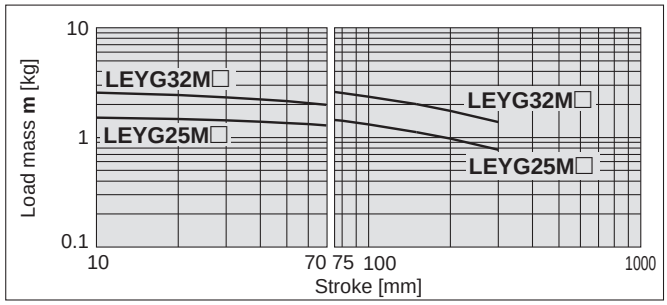

⑥ **L = 100 mm Max. speed = 200 mm/s or less**




⑦ **L = 50 mm Max. speed = Over 200 mm/s**

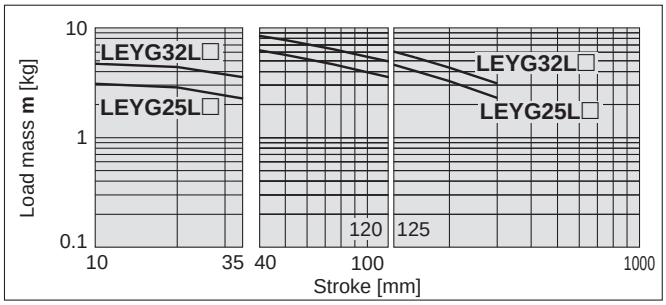



⑧ **L = 100 mm Max. speed = Over 200 mm/s**

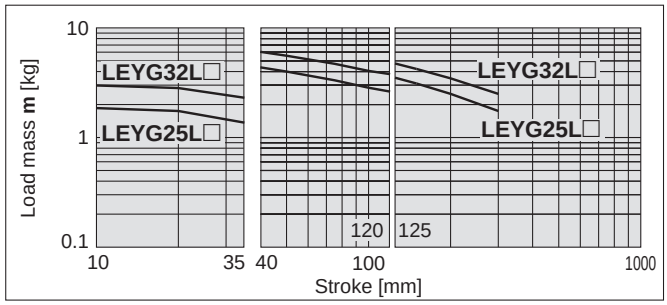



### Horizontal Mounting, Ball Bushing Bearing

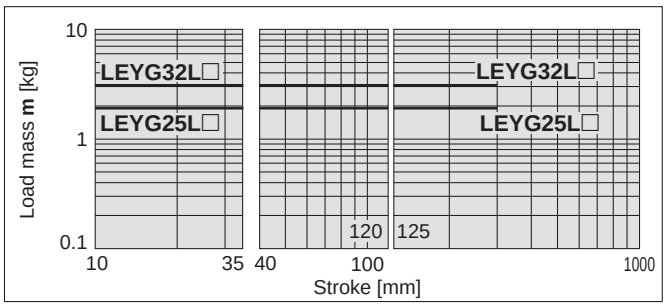
⑨ **L = 50 mm Max. speed = 200 mm/s or less**



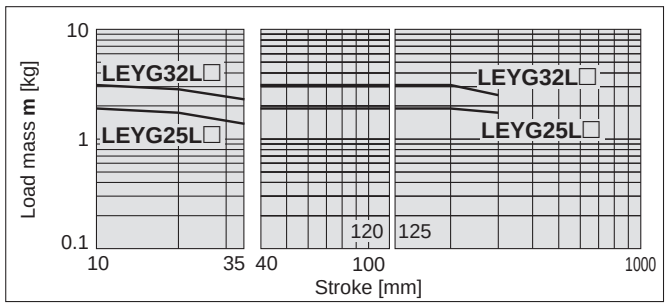

⑩ **L = 100 mm Max. speed = 200 mm/s or less**




⑪ **L = 50 mm Max. speed = Over 200 mm/s**

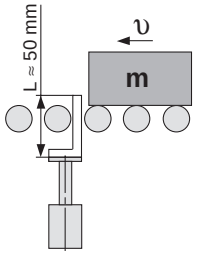



⑫ **L = 100 mm Max. speed = Over 200 mm/s**




## Operating Range when Used as a Stopper

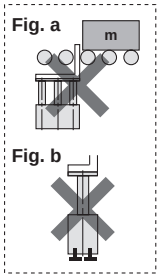
### LEYG□M (Sliding bearing)

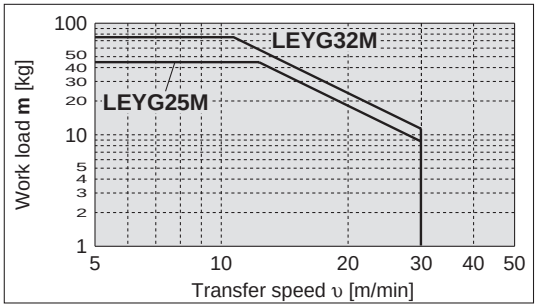



**⚠Caution**

**Handling Precautions**

* When used as a stopper, select a model with a stroke of 30 mm or less.
* LEYG□L (ball bushing bearing) cannot be used as a stopper.
* Workpiece collision in series with guide rod cannot be permitted (**Fig. a**).
* The body should not be mounted on the end. It must be mounted on the top or bottom (**Fig. b**).



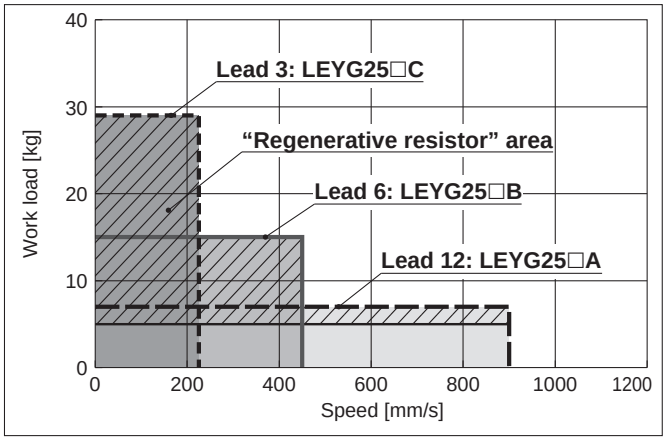



## Speed–Work Load Graph/Conditions for "Regenerative Resistor" (Guide)

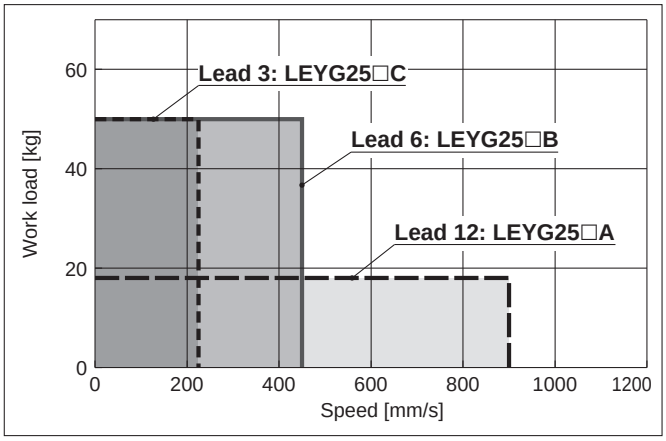
∗ These graphs show the work load when the external guide is used together. When using the LEYG alone, refer to pages 116 and 117.

### LEYG25□V6 (Motor mounting position: Top mounting/In-line)

**Vertical**

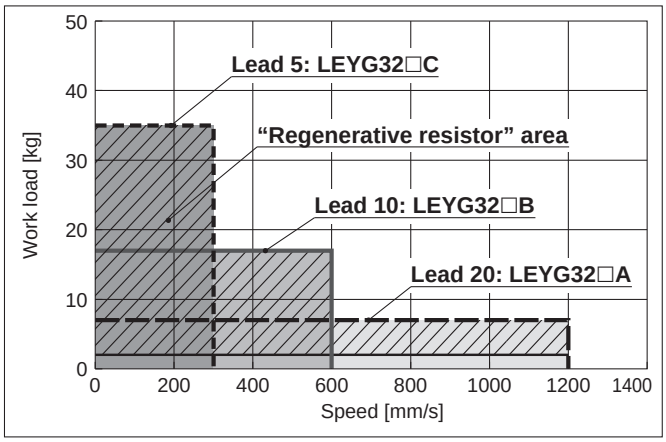



**Horizontal**

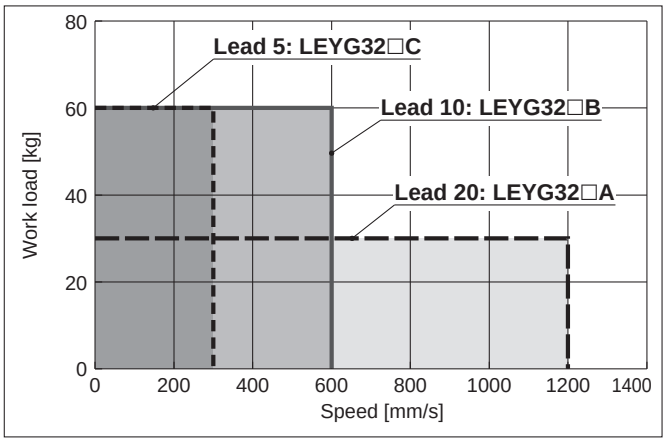



### LEYG32V7 (Motor mounting position: Top mounting)

**Vertical**

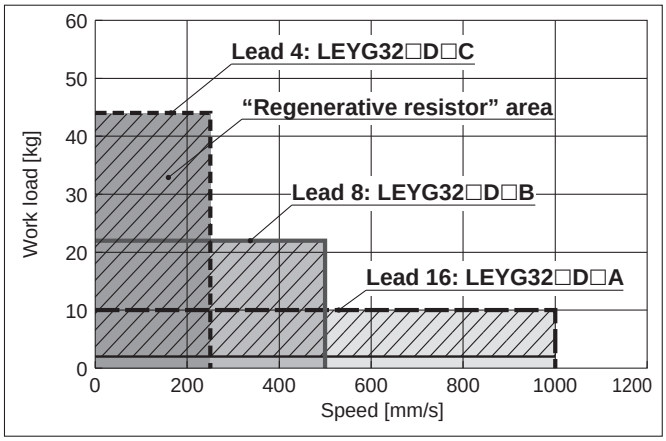



**Horizontal**

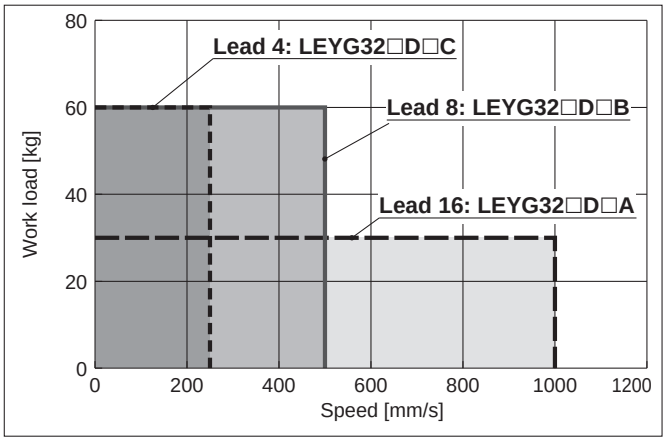



### LEYG32DV7 (Motor mounting position: In-line)

**Vertical**




**Horizontal**




**"Regenerative resistor" area**

∗ When using the actuator in the "Regenerative resistor" area, download the "AC servo drive capacity selection program/SigmaJunmaSize+" from the SMC website. Then, calculate the necessary regenerative resistor capacity to prepare an appropriate external regenerative resistor.

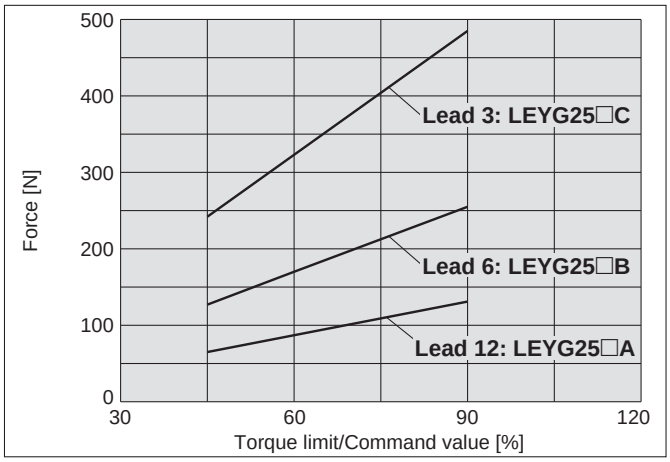
∗ Regenerative resistor should be provided by the customer.

### Applicable Motor/Driver

| Model | Applicable model | |
|---|---|---|
| | Motor | Servopack (SMC driver) |
| **LEYG25□** | SGMJV-01A3A | SGDV-R90A11□ (LECYM2-V5)<br>SGDV-R90A21□ (LECYU2-V5) |
| **LEYG32□** | SGMJV-02A3A | SGDV-1R6A11□ (LECYM2-V7)<br>SGDV-1R6A21□ (LECYU2-V7) |

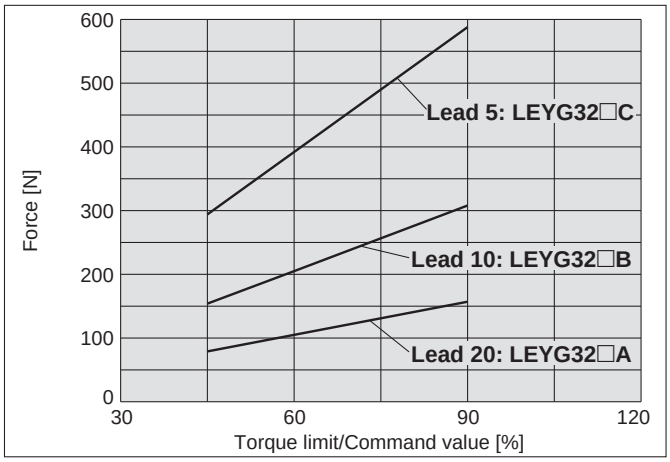
## Force Conversion Graph

### LEYG25□V6 (Motor mounting position: Top mounting/In-line)



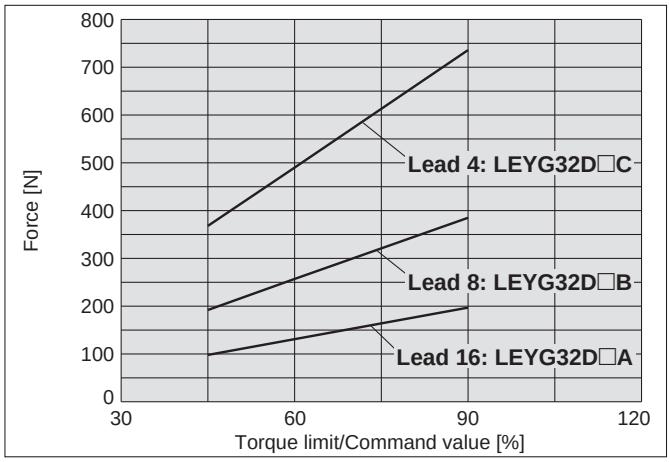

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 75 or less | 100 | — |
| 90 | 60 | 1.5 |

### LEYG32□V7 (Motor mounting position: Top mounting)



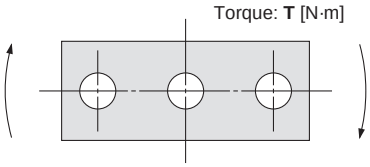

| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 75 or less | 100 | — |
| 90 | 60 | 1.5 |

### LEYG32DV7 (Motor mounting position: In-line)




| Torque limit/Command value [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|
| 75 or less | 100 | — |
| 90 | 60 | 1.5 |

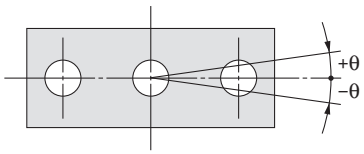
## Allowable Rotational Torque of Plate: T




T [N·m]

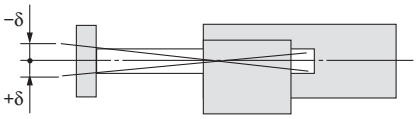
| Model | Stroke [mm] | | | | |
|---|---|---|---|---|---|
| | **30** | **50** | **100** | **200** | **300** |
| **LEYG25M** | 1.56 | 1.29 | 3.50 | 2.18 | 1.36 |
| **LEYG25L** | 1.52 | 3.57 | 2.47 | 2.05 | 1.44 |
| **LEYG32M** | 2.55 | 2.09 | 5.39 | 3.26 | 1.88 |
| **LEYG32L** | 2.80 | 5.76 | 4.05 | 3.23 | 2.32 |

## Non-rotating Accuracy of Plate: θ




| Size | **LEYG□M** | **LEYG□L** |
|---|---|---|
| **25** | ±0.06° | ±0.04° |
| **32** | ±0.05° | |

## Plate Displacement: δ



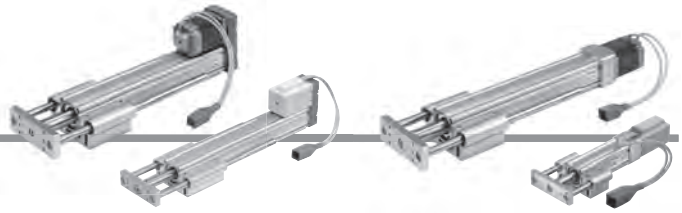

[mm]

| Model | Stroke [mm] | | | | |
|---|---|---|---|---|---|
| | **30** | **50** | **100** | **200** | **300** |
| **LEYG25M** | ±0.26 | ±0.31 | ±0.25 | ±0.38 | ±0.36 |
| **LEYG25L** | ±0.13 | ±0.13 | ±0.17 | ±0.20 | ±0.23 |
| **LEYG32M** | ±0.23 | ±0.29 | ±0.23 | ±0.36 | ±0.34 |
| **LEYG32L** | ±0.11 | ±0.11 | ±0.15 | ±0.19 | ±0.22 |

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

# Electric Actuator/ Guide Rod Type

## *LEYG* Series LEYG16, 25, 32, 40



Motor mounting position: Top mounting

Motor mounting position: In-line

## How to Order

LEYG 16 M □ □ B – 50 □ □ – S1

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

*LEC*□ *Series* 6P 1 □

*JXC*□ *Series* CD17T

❿ ⓫ ⓬

For details on controllers, refer to page 122.

### ❶ Size

| |
|---|
| 16 |
| 25 |
| 32 |
| 40 |

### ❷ Bearing type*1

| | |
|---|---|
| M | Sliding bearing |
| L | Ball bushing bearing |

### ❸ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| D | In-line |

### ❹ Motor type

| Symbol | Type | Applicable size | | | Compatible controller/ driver |
|---|---|---|---|---|---|
| | | LEYG16 | LEYG25 | LEYG32/40 | |
| — | Step motor (Servo/24 VDC) | ● | ● | ● | LECP1, LECPA, JXCE1, JXC91, JXCP1, JXCD1, JXCL1 |
| A | Servo motor (24 VDC) | ● | ● | — | LECA6 |

### ❺ Lead [mm]

| Symbol | LEYG16 | LEYG25 | LEYG32/40 |
|---|---|---|---|
| A | 10 | 12 | 16 |
| B | 5 | 6 | 8 |
| C | 2.5 | 3 | 4 |

### ❻ Stroke*2 *3 [mm]

| | |
|---|---|
| 30 | 30 |
| to | to |
| 300 | 300 |

* For details, refer to the applicable stroke table below.

### ❼ Motor option*4

| | |
|---|---|
| — | Without option |
| C | With motor cover |
| B | With lock |
| W | With lock/motor cover |

### ❽ Guide option*5

| | |
|---|---|
| — | Without option |
| F | With grease retaining function |

### ❾ Actuator cable type/length*7

Standard cable [m]

| | |
|---|---|
| — | None |
| S1 | 1.5*9 |
| S3 | 3*9 |
| S5 | 5*9 |

Robotic cable [m]

| | | | |
|---|---|---|---|
| R1 | 1.5 | RA | 10*6 |
| R3 | 3 | RB | 15*6 |
| R5 | 5 | RC | 20*6 |
| R8 | 8*6 | | |

### Applicable Stroke Table*2

●: Standard

| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | Manufacturable stroke range [mm] |
|---|---|---|---|---|---|---|---|---|
| LEYG16 | ● | ● | ● | ● | ● | — | — | 10 to 200 |
| LEYG25 | ● | ● | ● | ● | ● | ● | ● | 15 to 300 |
| LEYG32/40 | ● | ● | ● | ● | ● | ● | ● | 20 to 300 |

**For auto switches, refer to pages 101 to 103.**

**Use of auto switches for the guide rod type LEYG series**

· Auto switches must be inserted from the front side with the rod (plate) sticking out.
· Auto switches cannot be fixed with the parts hidden behind the guide attachment (the side of the rod that sticks out).
· Please consult with SMC when using auto switches on the side of the rod that sticks out, as it is produced as a special order.

## LEC□ Series (For details, refer to page 123.)

| 6P | 1 | |
|---|---|---|
| ⑩ | ⑪ | ⑫ |

### ⑩ Controller/Driver type*8

| | | |
|---|---|---|
| — | Without controller/driver | |
| 6N | LECA6 (Step data input type) | NPN |
| 6P | | PNP |
| 1N | LECP1*9 (Programless type) | NPN |
| 1P | | PNP |
| AN | LECPA*9 *11 (Pulse input type) | NPN |
| AP | | PNP |

### ⑪ I/O cable length*12, Communication plug

| | |
|---|---|
| — | Without cable (Without communication plug connector) |
| 1 | 1.5 m |
| 3 | 3 m*13 |
| 5 | 5 m*13 |
| S | Straight type communication plug connector |
| T | T-branch type communication plug connector |

### ⑫ Controller/Driver mounting

| | |
|---|---|
| — | Screw mounting |
| D | DIN rail*14 |

## JXC□ Series (For details, refer to page 123.)

### ⑩ Controller

| | |
|---|---|
| — | Without controller |
| C□1□□ | With controller |

| C | D | 1 | 7 | T |
|---|---|---|---|---|

**Communication protocol**

| | |
|---|---|
| E | EtherCAT® |
| 9 | EtherNet/IP™ |
| P | PROFINET |
| D | DeviceNet™ |
| L | IO-Link |

**For single axis**

**Mounting**

| | |
|---|---|
| 7 | Screw mounting |
| 8*14 | DIN rail |

**Communication plug connector for DeviceNet™*15**

| | |
|---|---|
| — | Without plug connector |
| S | Straight type |
| T | T-branch type |

*1 When [M: Sliding bearing] is selected, the maximum speed of lead [A] is 400 mm/s (at no-load, horizontal mounting). The speed is also restricted with a horizontal/moment load. Refer to "Model Selection" on page 105.
*2 Please consult with SMC for non-standard strokes as they are produced as special orders.
*3 There is a limit for mounting the size 32/40 top mounting types and strokes of 50 mm or less. Refer to the dimensions.
*4 When "With lock" or "With lock/motor cover" is selected for the top mounting type, the motor body will stick out from the end of the body for size 16/40 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.
*5 Only available for size 25, 32, and 40 sliding bearings (Refer to "Construction" on page 128.)
*6 Produced upon receipt of order (Robotic cable only)
*7 The standard cable should only be used on fixed parts. For use on moving parts, select the robotic cable.
*8 For details on controllers/drivers and compatible motors, refer to the compatible controller/driver on the next page.
*9 Only available for the motor type "Step motor"
*10 Not compliant with CE
*11 When pulse signals are open collector, order the current limiting resistor (LEC-PA-R-□) on page 220 separately.
*12 When "Without controller/driver" is selected for controller/driver types, I/O cable cannot be selected. Refer to page 199 (For LECA6), page 213 (For LECP1), or page 220 (For LECPA) if I/O cable is required.
*13 When "Pulse input type" is selected for controller/driver types, pulse input usable only with differential. Only 1.5 m cables usable with open collector
*14 The DIN rail is not included. Order it separately.
*15 Select "—" for anything other than DeviceNet™.

### ⚠Caution

**[CE-compliant products]**

① EMC compliance was tested by combining the electric actuator LEY series and the controller LEC/JXC series.
The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with 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 compliance with the EMC directive for the machinery and equipment as a whole.

② For the servo motor (24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 199 for the noise filter set. Refer to the LECA series Operation Manual for installation.

**[UL-compliant products (For the LEC series)]**

When compliance with UL is required, the electric actuator and controller/driver should be used with a UL1310 Class 2 power supply.

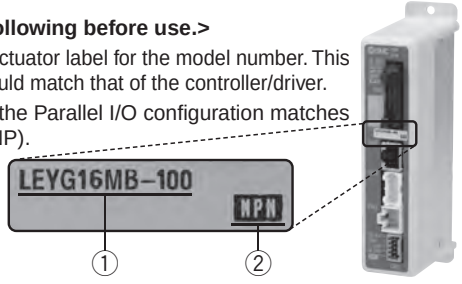
### The actuator and controller/driver are sold as a package.

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

**<Check the following before use.>**

① Check the actuator label for the model number. This number should match that of the controller/driver.

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




* Refer to the Operation Manual for using the products. Please download it via our website, https://www.smc.eu

**Compatible Controller/Driver**

## LEC□ Series

| Type | Step data input type | Programless type | Pulse input type |
|---|---|---|---|
| |  |  |  |
| **Series** | **LECA6** | **LECP1** | **LECPA** |
| **Features** | Value (Step data) input<br>Standard controller | Capable of setting up operation (step data) without using a PC or teaching box | Operation by pulse signals |
| **Compatible motor** | Servo motor (24 VDC) | Step motor (Servo/24 VDC) | |
| **Max. number of step data** | 64 points | 14 points | — |
| **Power supply voltage** | | | |
| **Reference page** | 191 | 207 | 214 |

## JXC□ Series

| Type | EtherCAT® direct input type | EtherNet/IP™ direct input type | PROFINET direct input type | DeviceNet™ direct input type | IO-Link direct input type |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| **Series** | **JXCE1** | **JXC91** | **JXCP1** | **JXCD1** | **JXCL1** |
| **Features** | EtherCAT® direct input | EtherNet/IP™ direct input | PROFINET direct input | DeviceNet™ direct input | IO-Link direct input |
| **Compatible motor** | Step motor (Servo/24 VDC) | | | | |
| **Max. number of step data** | 64 points | | | | |
| **Power supply voltage** | 24 VDC | | | | |
| **Reference page** | 224 | | | | |

## Specifications

### Step Motor (Servo/24 VDC)

| Model | | | | LEYG16 M/L | | | LEYG25 M/L | | | LEYG32 M/L | | | LEYG40 M/L | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg]*1 | Horizontal (LECP1, JXC□1) | Acceleration/Deceleration at 3000 [mm/s²] | 6 | 17 | 30 | 20 | 40 | 60 | 30 | 45 | 60 | 50 | 60 | 80 |
| | | | Acceleration/Deceleration at 2000 [mm/s²] | 10 | 23 | 35 | 30 | 55 | 70 | 40 | 60 | 80 | 60 | 70 | 90 |
| | | Horizontal (LECPA, JXC□2/3) | Acceleration/Deceleration at 3000 [mm/s²] | 4 | 11 | 20 | 12 | 30 | 30 | 20 | 40 | 40 | 30 | 60 | 60 |
| | | | Acceleration/Deceleration at 2000 [mm/s²] | 6 | 17 | 30 | 18 | 50 | 50 | 30 | 60 | 60 | — | — | — |
| | | Vertical | Acceleration/Deceleration at 3000 [mm/s²] | 1.5 | 3.5 | 7.5 | 7 | 15 | 29 | 9 | 20 | 41 | 11 | 25 | 51 |
| | Pushing force [N]*2 *3 *4 | | | 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 | 132 to 283 | 266 to 553 | 562 to 1058 |
| | Speed [mm/s]*4 | LECP1/JXC□1 | | 15 to 500 | 8 to 250 | 4 to 125 | 18 to 500 | 9 to 250 | 5 to 125 | 24 to 500 | 12 to 300 | 6 to 150 | 24 to 500 | 12 to 350 | 6 to 175 |
| | | LECPA/JXC□2/3 | | | | | | | | | 12 to 250 | 6 to 125 | 24 to 300 | 12 to 150 | 6 to 75 |
| | Max. acceleration/deceleration [mm/s²] | | | 3000 | | | | | | | | | | | |
| | Pushing speed [mm/s]*5 | | | 50 or less | | | 35 or less | | | 30 or less | | | 30 or less | | |
| | Positioning repeatability [mm] | | | ±0.02 | | | | | | | | | | | |
| | Lost motion [mm]*6 | | | 0.1 or less | | | | | | | | | | | |
| | Screw lead [mm] | | | 10 | 5 | 2.5 | 12 | 6 | 3 | 16 | 8 | 4 | 16 | 8 | 4 |
| | Impact/Vibration resistance [m/s²]*7 | | | 50/20 | | | | | | | | | | | |
| | Actuation type | | | Ball screw + Belt (LEYG□□), Ball screw (LEYG□□D) | | | | | | | | | | | |
| | Guide type | | | Sliding bearing (LEYG□M), Ball bushing bearing (LEYG□L) | | | | | | | | | | | |
| | Operating temp. range [°C] | | | 5 to 40 | | | | | | | | | | | |
| | Operating humidity range [%RH] | | | 90 or less (No condensation) | | | | | | | | | | | |
| Electric specifications | Motor size | | | □28 | | | □42 | | | □56.4 | | | □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]*8 | | | 23 | | | 40 | | | 50 | | | 50 | | |
| | Standby power consumption when operating [W]*9 | | | 16 | | | 15 | | | 48 | | | 48 | | |
| | Max. instantaneous power consumption [W]*10 | | | 43 | | | 48 | | | 104 | | | 106 | | |
| Lock unit specifications | Type*11 | | | Non-magnetising lock | | | | | | | | | | | |
| | Holding force [N] | | | 20 | 39 | 78 | 78 | 157 | 294 | 108 | 216 | 421 | 127 | 265 | 519 |
| | Power consumption [W]*12 | | | 2.9 | | | 5 | | | 5 | | | 5 | | |
| | Rated voltage [V] | | | 24 VDC ±10 % | | | | | | | | | | | |

∗1 Horizontal: An external guide is necessary to support the load (Friction coefficient of guide: 0.1 or less). The actual work load and transfer speed change according to the condition of the external guide. Also, speed changes according to the work load. Check “Model Selection” on pages 107 and 108.
Vertical: Speed changes according to the work load. Check “Model Selection” on pages 107 and 108.
Set the acceleration/deceleration values to be 3000 [mm/s²] or less.

∗2 Pushing force accuracy is ±20 % (F.S.).

∗3 The pushing force values for LEYG16□□ is 35 % to 85 %, for LEYG25□□ is 35 % to 65 %, for LEYG32□□ is 35 % to 85 %, and for LEYG40□□ is 35 % to 65 %. The pushing force values change according to the duty ratio and pushing speed. Check “Model Selection” on page 110.

∗4 The speed and force may change depending on the cable length, load and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10 % for each 5 m. (At 15 m: Reduced by up to 20 %)
When [M: Sliding bearing] is selected, the maximum speed of lead [A] is 400 mm/s (at no-load, horizontal mounting).
The speed is also restricted with a horizontal/moment load. Refer to “Model Selection” on page 105.

∗5 The allowable speed for the pushing operation

∗6 A reference value for correcting an error in reciprocal operation

∗7 Impact resistance: No malfunction occurred when it was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)

∗8 The power consumption (including the controller) is for when the actuator is operating.

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

∗10 The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.

∗11 With lock only

∗12 For an actuator with lock, add the power consumption for the lock.

## Specifications

### Servo Motor (24 VDC)

| Model | | | | LEYG16$^{M}_{L}$□A | | | LEYG25$^{M}_{L}$□A | | |
|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg]*1 | Horizontal | Acceleration/Deceleration at 3000 [mm/s²] | 3 | 6 | 12 | 7 | 15 | 30 |
| | | Vertical | Acceleration/Deceleration at 3000 [mm/s²] | 1.5 | 3.5 | 7.5 | 2 | 5 | 11 |
| | Pushing force [N]*2 *3 | | | 16 to 30 | 30 to 58 | 57 to 111 | 18 to 35 | 37 to 72 | 66 to 130 |
| | Speed [mm/s] | | | 1 to 500 | 1 to 250 | 1 to 125 | 2 to 500 | 1 to 250 | 1 to 125 |
| | Max. acceleration/deceleration [mm/s²] | | | 3000 | | | | | |
| | Pushing speed [mm/s]*4 | | | 50 or less | | | 35 or less | | |
| | Positioning repeatability [mm] | | | ±0.02 | | | | | |
| | Lost motion [mm]*5 | | | 0.1 or less | | | | | |
| | Screw lead [mm] | | | 10 | 5 | 2.5 | 12 | 6 | 3 |
| | Impact/Vibration resistance [m/s²]*6 | | | 50/20 | | | | | |
| | Actuation type | | | Ball screw + Belt (LEYG□□), Ball screw (LEYG□□D) | | | | | |
| | Guide type | | | Sliding bearing (LEYG□M), Ball bushing bearing (LEYG□L) | | | | | |
| | Operating temp. range [°C] | | | 5 to 40 | | | | | |
| | Operating humidity range [%RH] | | | 90 or less (No condensation) | | | | | |
| Electric specifications | Motor size | | | □28 | | | □42 | | |
| | Motor output [W] | | | 30 | | | 36 | | |
| | Motor type | | | Servo motor (24 VDC) | | | | | |
| | Encoder | | | Incremental A/B (800 pulse/rotation)/Z phase | | | | | |
| | Rated voltage [V] | | | 24 VDC ±10 % | | | | | |
| | Power consumption [W]*7 | | | 40 | | | 86 | | |
| | Standby power consumption when operating [W]*8 | | | 4 (Horizontal)/6 (Vertical) | | | 4 (Horizontal)/12 (Vertical) | | |
| | Max. instantaneous power consumption [W]*9 | | | 59 | | | 96 | | |
| Lock unit specifications | Type*10 | | | Non-magnetising lock | | | | | |
| | Holding force [N] | | | 20 | 39 | 78 | 78 | 157 | 294 |
| | Power consumption [W]*11 | | | 2.9 | | | 5 | | |
| | Rated voltage [V] | | | 24 VDC ±10 % | | | | | |

*1 Horizontal: An external guide is necessary to support the load (Friction coefficient of guide: 0.1 or less). The actual work load and transfer speed change according to the condition of the external guide. Vertical: Check "Model Selection" on page 109 for details.
Set the acceleration/deceleration values to be 3000 [mm/s²] or less.
*2 Pushing force accuracy is ±20 % (F.S.).
*3 The thrust setting values for LEYG16□A□ is 60 % to 95 % and for LEYG25□A□ is 70 % to 95 %. The pushing force values change according to the duty ratio and pushing speed. Check "Model Selection" on page 110.
*4 The allowable speed for the pushing operation
*5 A reference value for correcting an error in reciprocal operation
*6 Impact resistance: No malfunction occurred when it was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*7 The power consumption (including the controller) is for when the actuator is operating.
*8 The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation. Except during the pushing operation
*9 The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.
*10 With lock only
*11 For an actuator with lock, add the power consumption for the lock.

## Weight

### Weight: Motor Top Mounting Type

| Model | | LEYG16M | | | | | LEYG25M | | | | | | | LEYG32M | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Product weight [kg] | Step motor | 0.83 | 0.97 | 1.20 | 1.49 | 1.66 | 1.67 | 1.86 | 2.18 | 2.60 | 2.94 | 3.28 | 3.54 | 2.91 | 3.17 | 3.72 | 4.28 | 4.95 | 5.44 | 5.88 |
| | Servo motor | 0.83 | 0.97 | 1.20 | 1.49 | 1.66 | 1.63 | 1.82 | 2.14 | 2.56 | 2.90 | 3.24 | 3.50 | — | — | — | — | — | — | — |

| Model | | LEYG16L | | | | | LEYG25L | | | | | | | LEYG32L | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Product weight [kg] | Step motor | 0.84 | 0.97 | 1.14 | 1.43 | 1.58 | 1.68 | 1.89 | 2.13 | 2.56 | 2.82 | 3.14 | 3.38 | 2.91 | 3.18 | 3.57 | 4.12 | 4.66 | 5.17 | 5.56 |
| | Servo motor | 0.84 | 0.97 | 1.14 | 1.43 | 1.58 | 1.64 | 1.85 | 2.09 | 2.52 | 2.78 | 3.10 | 3.34 | — | — | — | — | — | — | — |

| Model | | LEYG40M | | | | | | | LEYG40L | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Product weight [kg] | Step motor | 3.21 | 3.47 | 4.02 | 4.58 | 5.25 | 5.74 | 6.18 | 3.21 | 3.48 | 3.87 | 4.42 | 4.96 | 5.47 | 5.86 |
| | Servo motor | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

### Weight: In-line Motor Type

| Model | | LEYG16M | | | | | LEYG25M | | | | | | | LEYG32M | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Product weight [kg] | Step motor | 0.83 | 0.97 | 1.20 | 1.49 | 1.66 | 1.66 | 1.85 | 2.17 | 2.59 | 2.93 | 3.27 | 3.53 | 2.90 | 3.16 | 3.71 | 4.27 | 4.94 | 5.43 | 5.87 |
| | Servo motor | 0.83 | 0.97 | 1.20 | 1.49 | 1.66 | 1.62 | 1.81 | 2.13 | 2.55 | 2.89 | 3.23 | 3.49 | — | — | — | — | — | — | — |

| Model | | LEYG16L | | | | | LEYG25L | | | | | | | LEYG32L | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Product weight [kg] | Step motor | 0.84 | 0.97 | 1.14 | 1.43 | 1.58 | 1.67 | 1.88 | 2.12 | 2.55 | 2.81 | 3.13 | 3.37 | 2.90 | 3.17 | 3.56 | 4.11 | 4.65 | 5.16 | 5.55 |
| | Servo motor | 0.84 | 0.97 | 1.14 | 1.43 | 1.58 | 1.63 | 1.84 | 2.08 | 2.51 | 2.77 | 3.09 | 3.33 | — | — | — | — | — | — | — |

| Model | | LEYG40M | | | | | | | LEYG40L | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Product weight [kg] | Step motor | 3.20 | 3.46 | 4.01 | 4.57 | 5.24 | 5.73 | 6.17 | 3.20 | 3.47 | 3.86 | 4.41 | 4.95 | 5.46 | 5.85 |
| | Servo motor | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

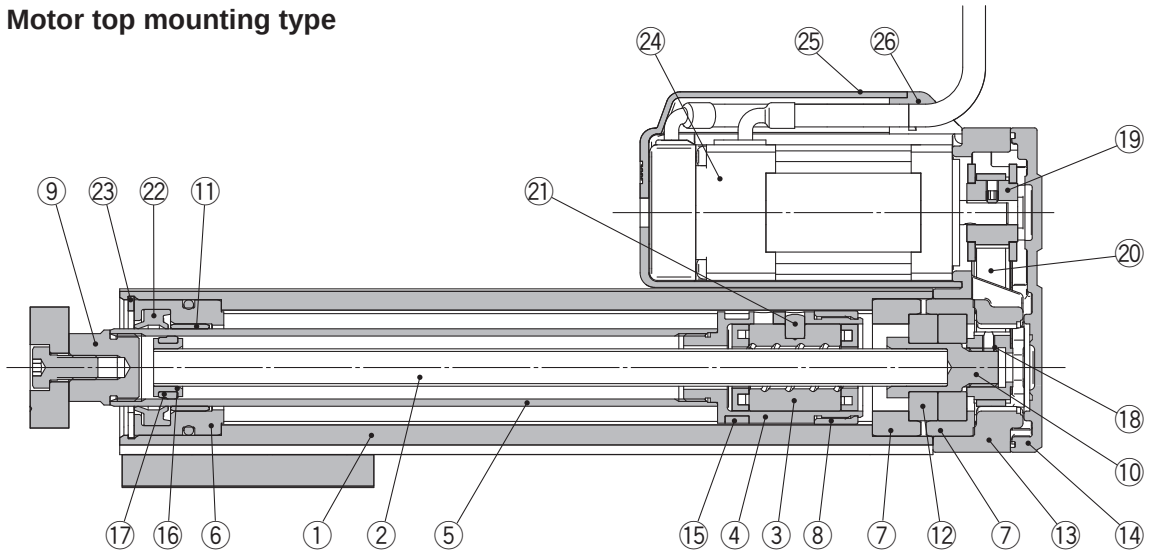
### Additional Weight

[kg]

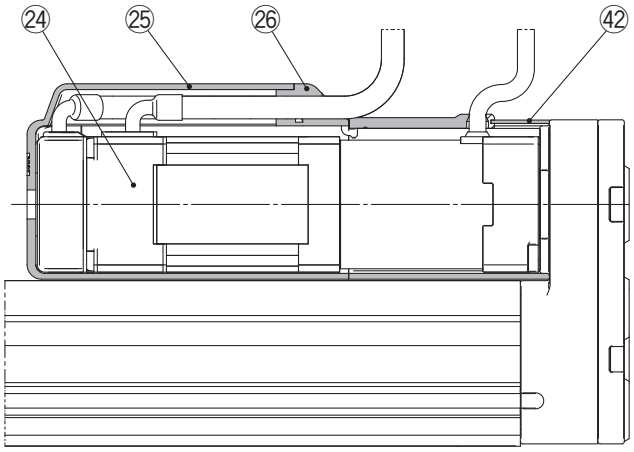
| Size | 16 | 25 | 32 | 40 |
|---|---|---|---|---|
| Lock | 0.12 | 0.26 | 0.53 | 0.53 |
| Motor cover | 0.02 | 0.03 | 0.04 | 0.05 |
| Lock/Motor cover | 0.16 | 0.32 | 0.61 | 0.62 |

## Construction

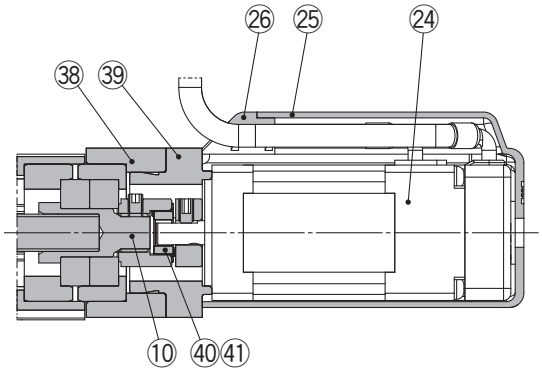
**Motor top mounting type**



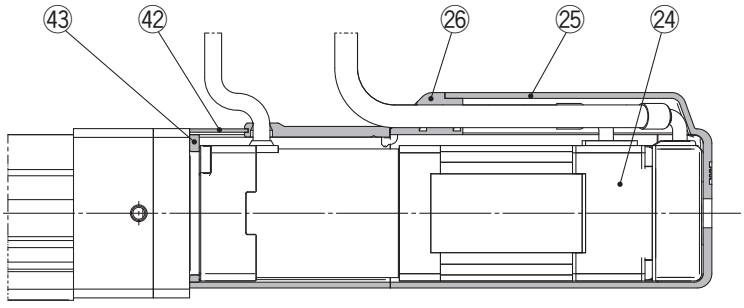

**Motor top mounting type**
**With lock/motor cover**




**In-line motor type**

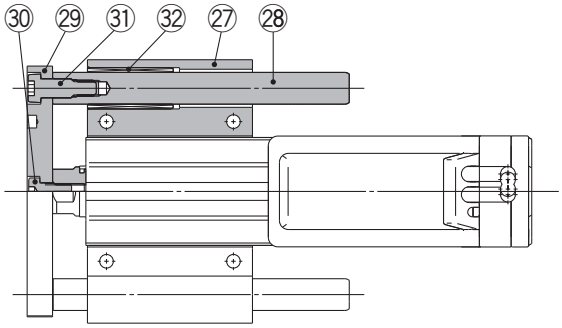



**In-line motor type**
**With lock/motor cover**

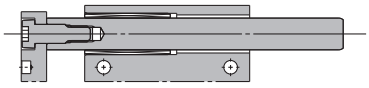


## Construction

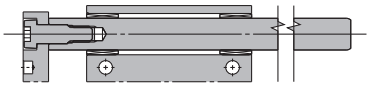
### LEYG□M




**LEYG$^{16}_{25}_{32}_{40}$M: 50st or less**

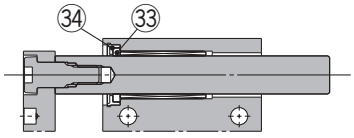


**LEYG$^{16}_{25}_{32}_{40}$M: Over 50st**



**When grease retaining function selected**

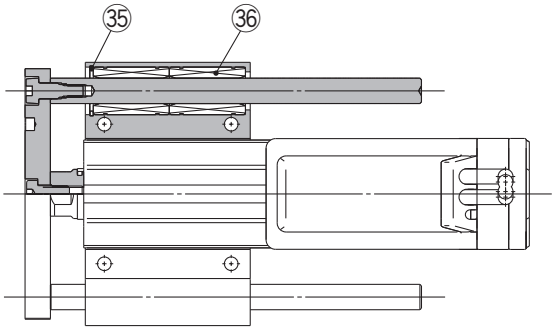
**LEYG$^{25}_{32}_{40}$M□□$^{A}_{B}_{C}$-□□F: 50st or less**



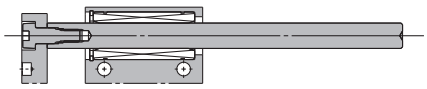

**LEYG$^{25}_{32}_{40}$M□□$^{A}_{B}_{C}$-□□F: Over 50st**

∗ Felt material is inserted to retain grease at the sliding part of the sliding bearing. This lengthens the life of the sliding part, but does not guarantee it permanently.

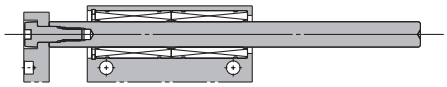
### LEYG□L



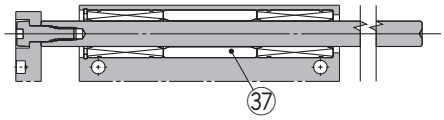

**LEYG16L: 30st or less**
**LEYG$^{25}_{32}_{40}$L: 100st or less**



**LEYG16L: Over 30st, 100st or less**



**LEYG$^{16}_{25}_{32}_{40}$L: Over 100st**




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Aluminium alloy | Anodised |
| 2 | **Ball screw shaft** | Alloy steel | |
| 3 | **Ball screw nut** | Synthetic resin/Alloy steel | |
| 4 | **Piston** | Aluminium alloy | |
| 5 | **Piston rod** | Stainless steel | Hard chrome plating |
| 6 | **Rod cover** | Aluminium alloy | |
| 7 | **Bearing holder** | Aluminium alloy | |
| 8 | **Rotation stopper** | POM | |
| 9 | **Socket** | Free cutting carbon steel | Nickel plating |
| 10 | **Connected shaft** | Free cutting carbon steel | Nickel plating |
| 11 | **Bushing** | Bearing alloy | |
| 12 | **Bearing** | — | |
| 13 | **Return box** | Aluminium die-cast | Coating |
| 14 | **Return plate** | Aluminium die-cast | Coating |
| 15 | **Magnet** | — | |
| 16 | **Wear ring holder** | Stainless steel | Stroke 101 mm or more |
| 17 | **Wear ring** | POM | Stroke 101 mm or more |
| 18 | **Screw shaft pulley** | Aluminium alloy | |
| 19 | **Motor pulley** | Aluminium alloy | |
| 20 | **Belt** | — | |
| 21 | **Parallel pin** | Stainless steel | |
| 22 | **Seal** | NBR | |
| 23 | **Retaining ring** | Steel for spring | Phosphate coated |
| 24 | **Motor** | — | |
| 25 | **Motor cover** | Synthetic resin | Only "With motor cover" |
| 26 | **Grommet** | Synthetic resin | Only "With motor cover" |
| 27 | **Guide attachment** | Aluminium alloy | Anodised |

| No. | Description | Material | Note |
|---|---|---|---|
| 28 | **Guide rod** | Carbon steel | |
| 29 | **Plate** | Aluminium alloy | Anodised |
| 30 | **Plate mounting cap screw** | Carbon steel | Nickel plating |
| 31 | **Guide cap screw** | Carbon steel | Nickel plating |
| 32 | **Sliding bearing** | Bearing alloy | |
| 33 | **Lube-retainer** | Felt | |
| 34 | **Holder** | Resin | |
| 35 | **Retaining ring** | Steel for spring | Phosphate coated |
| 36 | **Ball bushing** | — | |
| 37 | **Spacer** | Aluminium alloy | Chromated |
| 38 | **Motor block** | Aluminium alloy | Anodised |
| 39 | **Motor adapter** | Aluminium alloy | Anodised/LEY16, 25 only |
| 40 | **Hub** | Aluminium alloy | |
| 41 | **Spider** | NBR | |
| 42 | **Motor cover with lock** | Aluminium alloy | Only "With lock/motor cover" |
| 43 | **Cover support** | Aluminium alloy | Only "With lock/motor cover" |

### Replacement Parts/Belt

| No. | Size | Order no. |
|---|---|---|
| 20 | **16** | LE-D-2-1 |
| | **25** | LE-D-2-2 |
| | **32, 40** | LE-D-2-3 |

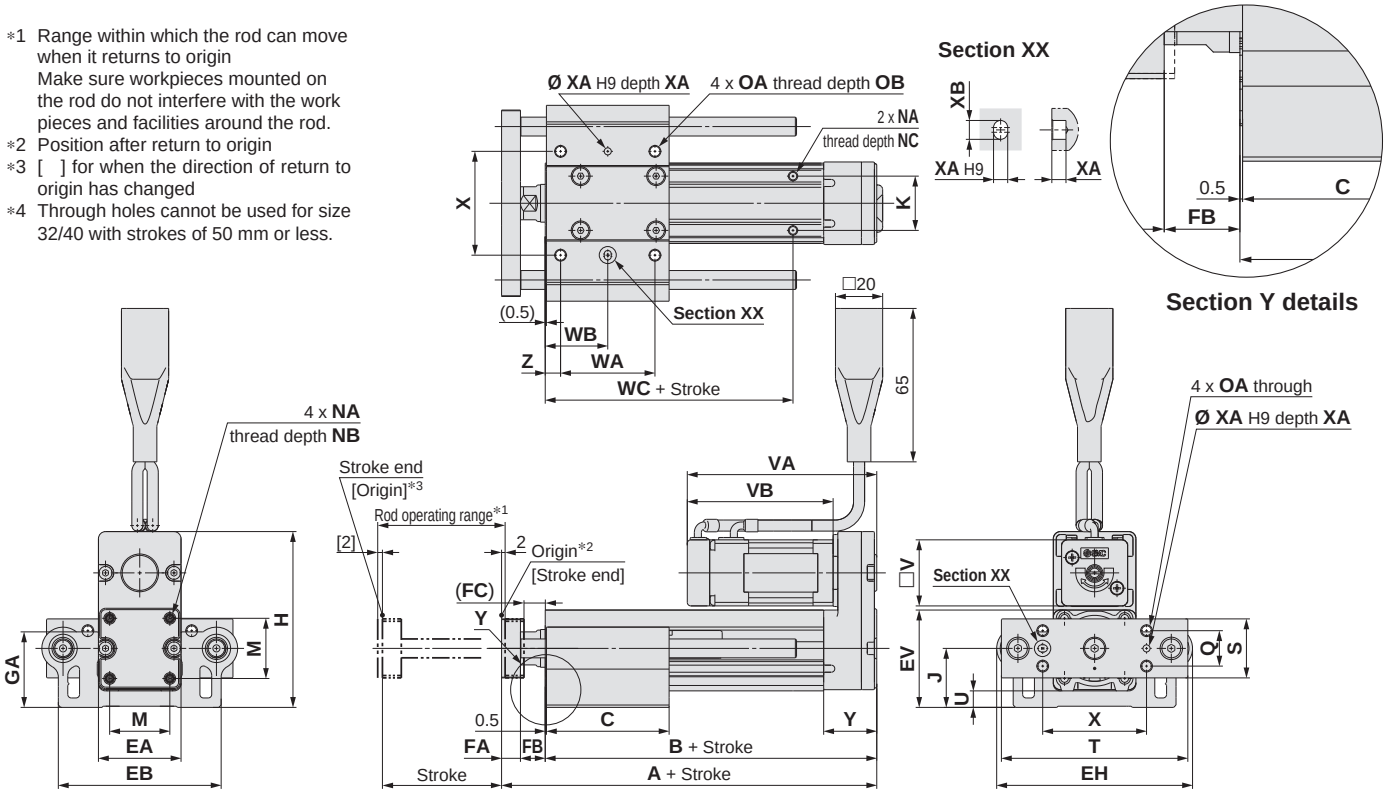
### Replacement Parts/Grease Pack

| Applied portion | Order no. |
|---|---|
| Piston rod<br>Guide rod | GR-S-010 (10 g)<br>GR-S-020 (20 g) |

∗ Apply grease on the piston rod periodically.
Grease should be applied at 1 million cycles or 200 km, whichever comes first.

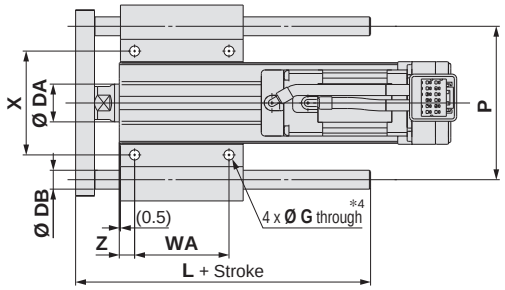
## Dimensions: Motor Top Mounting

∗1 Range within which the rod can move when it returns to origin
Make sure workpieces mounted on the rod do not interfere with the work pieces and facilities around the rod.
∗2 Position after return to origin
∗3 [ ] for when the direction of return to origin has changed
∗4 Through holes cannot be used for size 32/40 with strokes of 50 mm or less.




### LEYG□L (Ball bushing bearing) [mm]

| Size | Stroke range | L | DB |
|---|---|---|---|
| 16 | 90st or less | 75 | 8 |
| | 91st or more, 200st or less | 105 | |
| 25 | 114st or less | 91 | 10 |
| | 115st or more, 190st or less | 115 | |
| | 191st or more, 300st or less | 133 | |
| 32 40 | 114st or less | 97.5 | 13 |
| | 115st or more, 190st or less | 116.5 | |
| | 191st or more, 300st or less | 134 | |




### LEYG□M (Sliding bearing) [mm]

| Size | Stroke range | L | DB |
|---|---|---|---|
| 16 | 64st or less | 51.5 | 10 |
| | 65st or more, 90st or less | 74.5 | |
| | 91st or more, 200st or less | 105 | |
| 25 | 59st or less | 67.5 | 12 |
| | 60st or more, 185st or less | 100.5 | |
| | 186st or more, 300st or less | 138 | |
| 32 40 | 54st or less | 74 | 16 |
| | 55st or more, 180st or less | 107 | |
| | 181st or more, 300st or less | 144 | |

### LEYG□M, LEYG□L Common

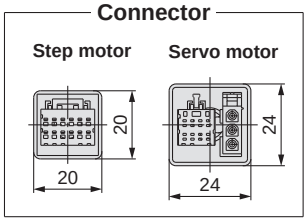
[mm]

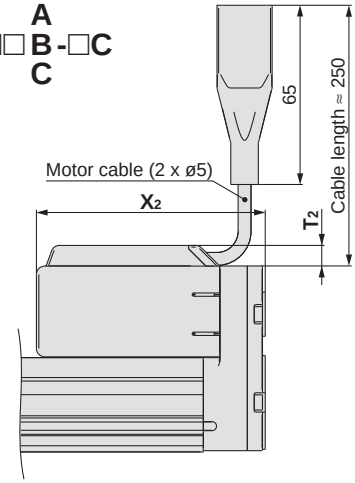
| Size | Stroke range | A | B | C | DA | EA | EB | EH | EV | FA | FB | FC | G | GA | H | J | K | M | NA | NB | NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 39st or less | 109 | 90.5 | 37 | 16 | 35 | 69 | 83 | 41.1 | 8 | 10.5 | 8.5 | 4.3 | 31.8 | 74.3 | 24.8 | 23 | 25.5 | M4 x 0.7 | 7 | 5.5 |
| | 40st or more, 100st or less | | | 52 | | | | | | | | | | | | | | | | | |
| | 101st or more, 200st or less | 129 | 110.5 | 82 | | | | | | | | | | | | | | | | | |
| 25 | 39st or less | 141.5 | 116 | 50 | 20 | 46 | 85 | 103 | 52.3 | 11 | 14.5 | 12.5 | 5.4 | 40.3 | 98.8 | 30.8 | 29 | 34 | M5 x 0.8 | 8 | 6.5 |
| | 40st or more, 100st or less | | | 67.5 | | | | | | | | | | | | | | | | | |
| | 101st or more, 124st or less | 166.5 | 141 | | | | | | | | | | | | | | | | | | |
| | 125st or more, 200st or less | | | 84.5 | | | | | | | | | | | | | | | | | |
| | 201st or more, 300st or less | | | 102 | | | | | | | | | | | | | | | | | |
| 32 40 | 39st or less | 160.5 | 130 | 55 | 25 | 60 | 101 | 123 | 63.8 | 12 | 18.5 | 16.5 | 5.4 | 50.3 | 125.3 | 38.3 | 30 | 40 | M6 x 1.0 | 10 | 8.5 |
| | 40st or more, 100st or less | | | 68 | | | | | | | | | | | | | | | | | |
| | 101st or more, 124st or less | 190.5 | 160 | | | | | | | | | | | | | | | | | | |
| | 125st or more, 200st or less | | | 85 | | | | | | | | | | | | | | | | | |
| | 201st or more, 300st or less | | | 102 | | | | | | | | | | | | | | | | | |

| Size | Stroke range | OA | OB | P | Q | S | T | U | V | Step motor VA | Step motor VB | Servo motor VA | Servo motor VB | WA | WB | WC | X | XA | XB | Y | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 39st or less | M5 x 0.8 | 10 | 65 | 15 | 25 | 79 | 6.8 | 28 | 80.3 | 61.8 | 81 | 62.5 | 25 | 19 | 55 | 44 | 3 | 4 | 22.5 | 6.5 |
| | 40st or more, 100st or less | | | | | | | | | | | | | 40 | 26.5 | | | | | | |
| | 101st or more, 200st or less | | | | | | | | | | | | | 70 | 41.5 | 75 | | | | | |
| 25 | 39st or less | M6 x 1.0 | 12 | 80 | 18 | 30 | 95 | 6.8 | 42 | 85.4 | 63.4 | 81.6 | 59.6 | 35 | 26 | 70 | 54 | 4 | 5 | 26.5 | 8.5 |
| | 40st or more, 100st or less | | | | | | | | | | | | | 50 | 33.5 | | | | | | |
| | 101st or more, 124st or less | | | | | | | | | | | | | | | 95 | | | | | |
| | 125st or more, 200st or less | | | | | | | | | | | | | 70 | 43.5 | | | | | | |
| | 201st or more, 300st or less | | | | | | | | | | | | | 85 | 51 | | | | | | |
| 32 | 39st or less | M6 x 1.0 | 12 | 95 | 28 | 40 | 117 | 7.3 | 56.4 | 95.4 | 68.4 | — | — | 40 | 28.5 | 75 | 64 | 5 | 6 | 34 | 8.5 |
| | 40st or more, 100st or less | | | | | | | | | | | | | 50 | 33.5 | | | | | | |
| | 101st or more, 124st or less | | | | | | | | | | | | | | | 105 | | | | | |
| | 125st or more, 200st or less | | | | | | | | | | | | | 70 | 43.5 | | | | | | |
| | 201st or more, 300st or less | | | | | | | | | | | | | 85 | 51 | | | | | | |
| 40 | 39st or less | M6 x 1.0 | 12 | 95 | 28 | 40 | 117 | 7.3 | 56.4 | 117.4 | 90.4 | — | — | 40 | 28.5 | 75 | 64 | 5 | 6 | 34 | 8.5 |
| | 40st or more, 100st or less | | | | | | | | | | | | | 50 | 33.5 | | | | | | |
| | 101st or more, 124st or less | | | | | | | | | | | | | | | 105 | | | | | |
| | 125st or more, 200st or less | | | | | | | | | | | | | 70 | 43.5 | | | | | | |
| | 201st or more, 300st or less | | | | | | | | | | | | | 85 | 51 | | | | | | |

## Dimensions: Motor Top Mounting

### With motor cover: LEYG 16/25/32/40 □□ A/B/C -□C



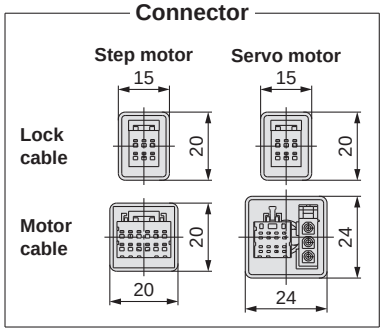



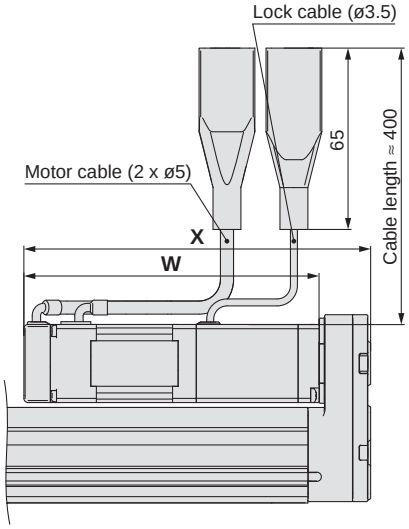

[mm]

| Size | T2 | X2 |
|---|---|---|
| **16** | 7.5 | 83 |
| **25** | 7.5 | 88.5 |
| **32** | 7.5 | 98.5 |
| **40** | 7.5 | 120.5 |

Motor cover material: Synthetic resin

### With lock: LEYG 16/25/32/40 □□ A/B/C -□B

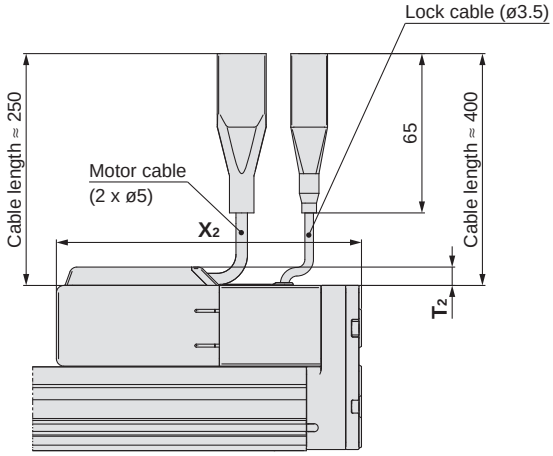



[mm]

| Size | Step motor | | Servo motor | |
|---|---|---|---|---|
| | W | X | W | X |
| **16** | 103.3 | 121.8 | 104.0 | 122.5 |
| **25** | 103.9 | 125.9 | 100.1 | 122.1 |
| **32** | 111.4 | 138.4 | — | — |
| **40** | 133.4 | 160.4 | — | — |

### With lock/motor cover: LEYG 16/25/32/40 □□ A/B/C -□W

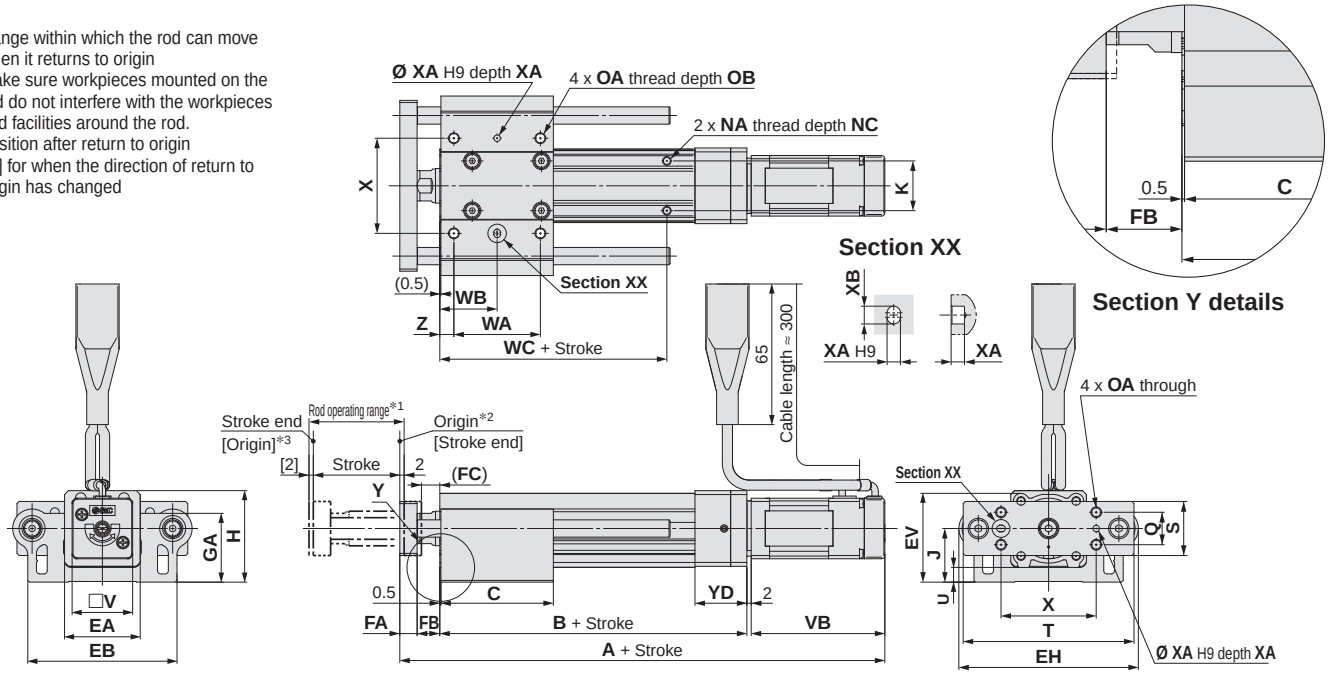


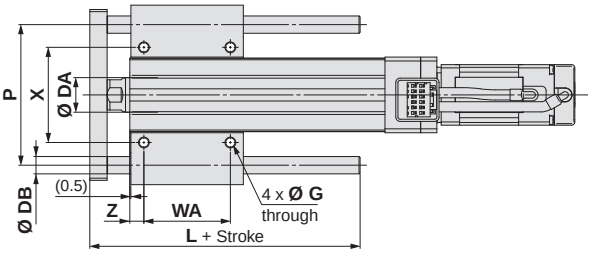

[mm]

| Size | T2 | X2 |
|---|---|---|
| **16** | 7.5 | 124.5 |
| **25** | 7.5 | 129 |
| **32** | 7.5 | 141.5 |
| **40** | 7.5 | 163.5 |

## Dimensions: In-line Motor

∗1 Range within which the rod can move when it returns to origin
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 Position after return to origin
∗3 [ ] for when the direction of return to origin has changed




### LEYG□L (Ball bushing bearing) [mm]

| Size | Stroke range | L | DB |
|---|---|---|---|
| 16 | 90st or less | 75 | 8 |
| | 91st or more, 200st or less | 105 | |
| 25 | 114st or less | 91 | 10 |
| | 115st or more, 190st or less | 115 | |
| | 191st or more, 300st or less | 133 | |
| 32 40 | 114st or less | 97.5 | 13 |
| | 115st or more, 190st or less | 116.5 | |
| | 191st or more, 300st or less | 134 | |

### LEYG□M (Sliding bearing) [mm]

| Size | Stroke range | L | DB |
|---|---|---|---|
| 16 | 64st or less | 51.5 | 10 |
| | 65st or more, 90st or less | 74.5 | |
| | 91st or more, 200st or less | 105 | |
| 25 | 59st or less | 67.5 | 12 |
| | 60st or more, 185st or less | 100.5 | |
| | 186st or more, 300st or less | 138 | |
| 32 40 | 54st or less | 74 | 16 |
| | 55st or more, 180st or less | 107 | |
| | 181st or more, 300st or less | 144 | |

### LEYG□M, LEYG□L Common

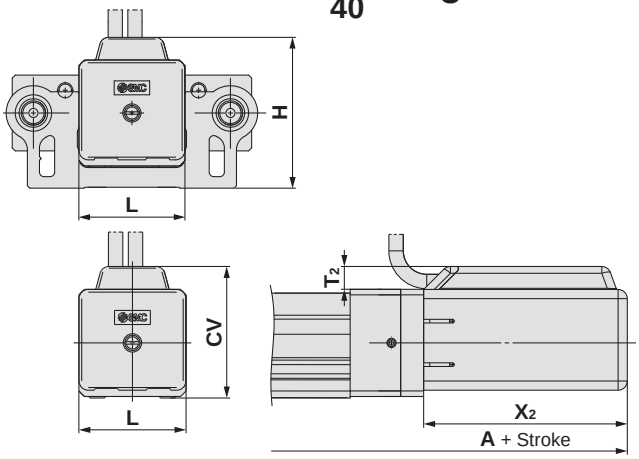
[mm]

| Size | Stroke range | A: Step motor | A: Servo motor | B | C | DA | EA | EB | EH | EV | FA | FB | FC | G | GA | H | J | K | NA | NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 39st or less | 174.3 | 175 | 92 | 37 | 16 | 35 | 69 | 83 | 41.1 | 8 | 10.5 | 8.5 | 4.3 | 31.8 | 42.3 | 24.8 | 23 | M4 x 0.7 | 5.5 |
| | 40st or more, 100st or less | | | | 52 | | | | | | | | | | | | | | | |
| | 101st or more, 200st or less | 194.3 | 195 | 112 | 82 | | | | | | | | | | | | | | | |
| 25 | 39st or less | 206.4 | 202.6 | 115.5 | 50 | 20 | 45 | 85 | 103 | 52.3 | 11 | 14.5 | 12.5 | 5.4 | 40.3 | 53.3 | 30.8 | 29 | M5 x 0.8 | 6.5 |
| | 40st or more, 100st or less | | | | 67.5 | | | | | | | | | | | | | | | |
| | 101st or more, 124st or less | 231.4 | 227.6 | 140.5 | | | | | | | | | | | | | | | | |
| | 125st or more, 200st or less | | | | 84.5 | | | | | | | | | | | | | | | |
| | 201st or more, 300st or less | | | | 102 | | | | | | | | | | | | | | | |
| 32 | 39st or less | 228.9 | — | 128 | 55 | 25 | 60 | 101 | 123 | 63.8 | 12 | 18.5 | 16.5 | 5.4 | 50.3 | 68.3 | 38.3 | 30 | M6 x 1.0 | 8.5 |
| | 40st or more, 100st or less | | | | 68 | | | | | | | | | | | | | | | |
| | 101st or more, 124st or less | 258.9 | — | 158 | | | | | | | | | | | | | | | | |
| | 125st or more, 200st or less | | | | 85 | | | | | | | | | | | | | | | |
| | 201st or more, 300st or less | | | | 102 | | | | | | | | | | | | | | | |
| 40 | 39st or less | 250.9 | — | 128 | 55 | 25 | 60 | 101 | 123 | 63.8 | 12 | 18.5 | 16.5 | 5.4 | 50.3 | 68.3 | 38.3 | 30 | M6 x 1.0 | 8.5 |
| | 40st or more, 100st or less | | | | 68 | | | | | | | | | | | | | | | |
| | 101st or more, 124st or less | 280.9 | — | 158 | | | | | | | | | | | | | | | | |
| | 125st or more, 200st or less | | | | 85 | | | | | | | | | | | | | | | |
| | 201st or more, 300st or less | | | | 102 | | | | | | | | | | | | | | | |

| Size | Stroke range | OA | OB | P | Q | S | T | U | V | VB: Step motor | VB: Servo motor | WA | WB | WC | X | XA | XB | YD | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 39st or less | M5 x 0.8 | 10 | 65 | 15 | 25 | 79 | 6.8 | 28 | 61.8 | 62.5 | 25 | 19 | 55 | 44 | 3 | 4 | 24 | 6.5 |
| | 40st or more, 100st or less | | | | | | | | | | | 40 | 26.5 | | | | | | |
| | 101st or more, 200st or less | | | | | | | | | | | 70 | 41.5 | 75 | | | | | |
| 25 | 39st or less | M6 x 1.0 | 12 | 80 | 18 | 30 | 95 | 6.8 | 42 | 63.4 | 59.6 | 35 | 26 | 70 | 54 | 4 | 5 | 26 | 8.5 |
| | 40st or more, 100st or less | | | | | | | | | | | 50 | 33.5 | | | | | | |
| | 101st or more, 124st or less | | | | | | | | | | | | | 95 | | | | | |
| | 125st or more, 200st or less | | | | | | | | | | | 70 | 43.5 | | | | | | |
| | 201st or more, 300st or less | | | | | | | | | | | 85 | 51 | | | | | | |
| 32 | 39st or less | M6 x 1.0 | 12 | 95 | 28 | 40 | 117 | 7.3 | 56.4 | 68.4 | — | 40 | 28.5 | 75 | 64 | 5 | 6 | 32 | 8.5 |
| | 40st or more, 100st or less | | | | | | | | | | | 50 | 33.5 | | | | | | |
| | 101st or more, 124st or less | | | | | | | | | | | | | 105 | | | | | |
| | 125st or more, 200st or less | | | | | | | | | | | 70 | 43.5 | | | | | | |
| | 201st or more, 300st or less | | | | | | | | | | | 85 | 51 | | | | | | |
| 40 | 39st or less | M6 x 1.0 | 12 | 95 | 28 | 40 | 117 | 7.3 | 56.4 | 90.4 | — | 40 | 28.5 | 75 | 64 | 5 | 6 | 32 | 8.5 |
| | 40st or more, 100st or less | | | | | | | | | | | 50 | 33.5 | | | | | | |
| | 101st or more, 124st or less | | | | | | | | | | | | | 105 | | | | | |
| | 125st or more, 200st or less | | | | | | | | | | | 70 | 43.5 | | | | | | |
| | 201st or more, 300st or less | | | | | | | | | | | 85 | 51 | | | | | | |

## Dimensions: In-line Motor

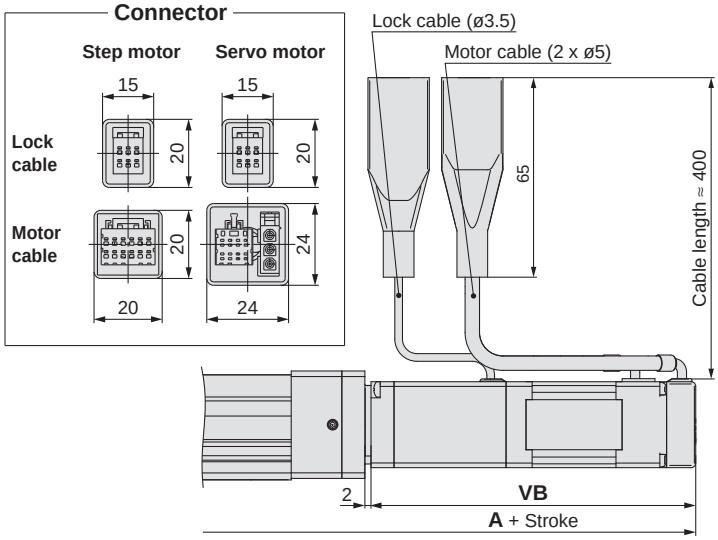
### With motor cover: LEYG 16/25/32/40 □D□ A/B/C -□C




[mm]

| Size | Stroke range | A | T2 | X2 | L | H | CV |
|---|---|---|---|---|---|---|---|
| 16 | 100st or less | 177 | 7.5 | 66.5 | 35 | 49.8 | 43 |
| | 101st or more, 200st or less | 197 | | | | | |
| 25 | 100st or less | 209.5 | 7.5 | 68.5 | 46 | 61.3 | 54.5 |
| | 101st or more, 300st or less | 234.5 | | | | | |
| 32 | 100st or less | 232 | 7.5 | 73.5 | 60 | 75.8 | 68.5 |
| | 101st or more, 300st or less | 262 | | | | | |
| 40 | 100st or less | 254 | 7.5 | 95.5 | 60 | 75.8 | 68.5 |
| | 101st or more, 300st or less | 284 | | | | | |

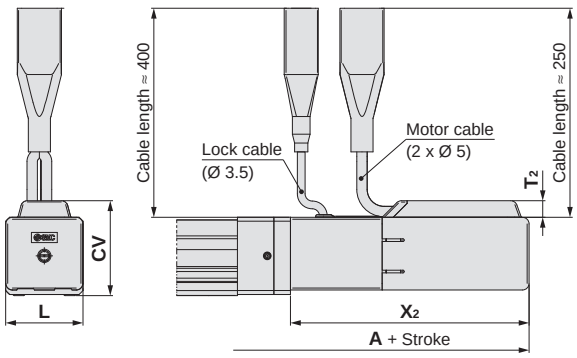
### With lock: LEYG 16/25/32/40 □D□ A/B/C -□B




[mm]

| Size | Stroke range | Step motor A | Servo motor A | Step motor VB | Servo motor VB |
|---|---|---|---|---|---|
| 16 | 100st or less | 215.8 | 216.5 | 103.3 | 104 |
| | 101st or more, 200st or less | 235.8 | 236.5 | | |
| 25 | 100st or less | 246.9 | 243.1 | 103.9 | 100.1 |
| | 101st or more, 300st or less | 271.9 | 268.1 | | |
| 32 | 100st or less | 271.9 | — | 111.4 | — |
| | 101st or more, 300st or less | 301.9 | — | | |
| 40 | 100st or less | 293.9 | — | 133.4 | — |
| | 101st or more, 300st or less | 323.9 | — | | |

### With lock/motor cover: LEYG 16/25/32/40 D□ A/B/C -□W



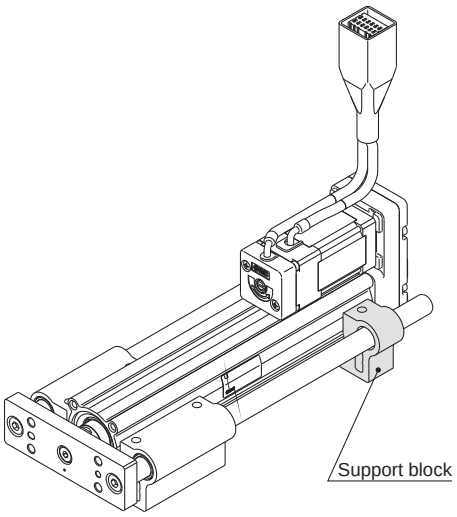

[mm]

| Size | Stroke range | A | T2 | X2 | L | H | CV |
|---|---|---|---|---|---|---|---|
| 16 | 100st or less | 218.5 | 7.5 | 108 | 35 | 49.8 | 43 |
| | 101st or more, 300st or less | 238.5 | | | | | |
| 25 | 100st or less | 250 | 7.5 | 109 | 46 | 61.3 | 54.4 |
| | 101st or more, 300st or less | 275 | | | | | |
| 32 | 100st or less | 275 | 7.5 | 116.5 | 60 | 75.8 | 68.5 |
| | 101st or more, 300st or less | 305 | | | | | |
| 40 | 100st or less | 297 | 7.5 | 138.5 | 60 | 75.8 | 68.5 |
| | 101st or more, 300st or less | 327 | | | | | |

## Support Block

### ●Guide for support block application

When the stroke exceeds 100 mm and the mounting orientation is horizontal, the body will be bent. Mounting the support block is recommended. (Please order it separately from the models shown below.)

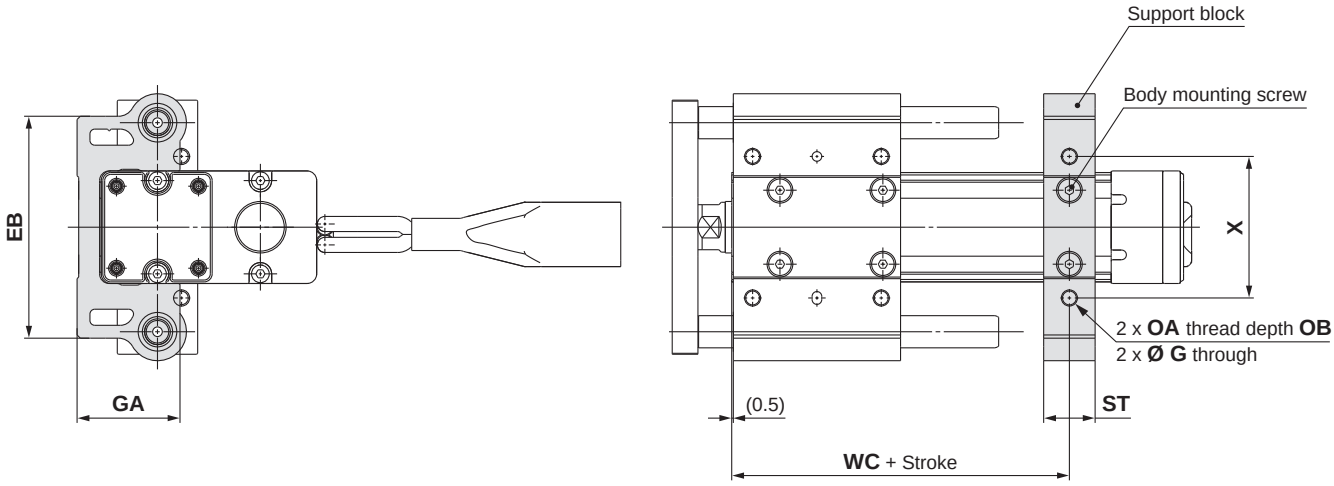



### Support Block Model

**LEYG−S016**

●**Size**

| | |
|---|---|
| **016** | For size 16 |
| **025** | For size 25 |
| **032** | For size 32, 40 |




### ⚠Caution

Do not install the body using only a support block.
The support block should be used only for support.

[mm]

| Size | Model | Stroke range | EB | G | GA | OA | OB | ST | WC | X |
|---|---|---|---|---|---|---|---|---|---|---|
| **16** | **LEYG-S016** | 100st or less | 69 | 4.3 | 31.8 | M5 x 0.8 | 10 | 16 | 55 | 44 |
| | | 101st or more, 200st or less | | | | | | | 75 | |
| **25** | **LEYG-S025** | 100st or less | 85 | 5.4 | 40.3 | M6 x 1.0 | 12 | 20 | 70 | 54 |
| | | 101st or more, 300st or less | | | | | | | 95 | |
| **32**<br>**40** | **LEYG-S032** | 100st or less | 101 | (5.4) | (50.3) | M6 x 1.0 | 12 | 22 | 75 | 64 |
| | | 101st or more, 300st or less | | | | | | | 105 | |

∗ Two body mounting screws are included with the support block.
∗ The through holes of the LEYG-S032 cannot be used for the motor top mounting type. Use taps on the bottom.

# Electric Actuator/ Guide Rod Type

## *LEYG Series* LEYG25, 32

LECY□ Series ▶ p. 143

∗ Refer to tables ❺ and ⓬ below.

## How to Order

LEY H G 25 M □ S2 B – 100 □ □ – S 2 A1 □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭

### ❶ Accuracy

| | |
|---|---|
| — | Basic type |
| H | High-precision type |

### ❷ Size

| |
|---|
| 25 |
| 32 |

### ❸ Bearing type

| | |
|---|---|
| M | Sliding bearing |
| L | Ball bushing bearing |

### ❹ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| D | In-line |

### ❺ Motor type∗1

| Symbol | Type | Output [W] | Actuator size | Compatible driver∗3 | UL-compliant |
|---|---|---|---|---|---|
| S2 | AC servo motor (Incremental encoder) | 100 | 25 | LECSA□-S1 | — |
| S3 | AC servo motor (Incremental encoder) | 200 | 32 | LECSA□-S3 | — |
| S6 | AC servo motor (Absolute encoder) | 100 | 25 | LECSB□-S5<br>LECSC□-S5<br>LECSS□-S5 | — |
| S7 | AC servo motor (Absolute encoder) | 200 | 32 | LECSB□-S7<br>LECSC□-S7<br>LECSS□-S7 | — |
| T6∗2 | AC servo motor (Absolute encoder) | 100 | 25 | LECSS2-T5 | ● |
| T7 | | 200 | 32 | LECSS2-T7 | ● |

∗1 For motor type S2 and S6, the compatible driver part number suffixes are S1 and S5 respectively.
∗2 For motor type T6, the compatible driver part number suffix is T5.
∗3 For details on the driver, refer to page 246.

### ❻ Lead [mm]

| Symbol | LEYG25 | LEYG32∗1 |
|---|---|---|
| A | 12 | 16 (20) |
| B | 6 | 8 (10) |
| C | 3 | 4 (5) |

∗1 The values shown in ( ) are the leads for the size 32 top mounting type. (Equivalent leads which include the pulley ratio [1.25:1])

### ❼ Stroke [mm]

| | |
|---|---|
| 30 | 30 |
| to | to |
| 300 | 300 |

∗ For details, refer to the applicable stroke table below.
∗ There is a limit for mounting the size 3 2 top mounting type and strokes of 5 0 mm or less. Refer to the dimensions.

### ❽ Motor option

| | |
|---|---|
| — | Without option |
| B | With lock |

### ❾ Guide option

| | |
|---|---|
| — | Without option |
| F | With grease retaining function |

∗ Only available for size 25 and 32 sliding bearings (Refer to “Construction” on page 138.)

### ❿ Cable type∗1 ∗2

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

∗1 The motor and encoder cables are included. (The lock cable is also included when the motor with lock option is selected.)
∗2 Standard cable entry direction is
• Top mounting: (A) Axis side
• In-line: (B) Counter axis side
(Refer to page 264 for details.)

### ⓫ Cable length∗1 [m]

| | |
|---|---|
| — | Without cable |
| 2 | 2 |
| 5 | 5 |
| A | 10 |

∗1 The length of the motor, encoder, and lock cables are the same.

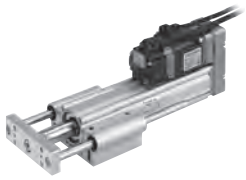
### Applicable Stroke Table

●: Standard

| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | Manufacturable stroke range |
|---|---|---|---|---|---|---|---|---|
| LEYG25 | ● | ● | ● | ● | ● | ● | ● | 15 to 300 |
| LEYG32 | ● | ● | ● | ● | ● | ● | ● | 20 to 300 |

∗ Please consult with SMC for non-standard strokes as they are produced as special orders.

For auto switches, refer to pages 101 to 103.



Motor mounting position: Top mounting

Motor mounting position: In-line

### ⓬ Driver type*1

| | Compatible driver | Power supply voltage [V] | UL-compliant |
|---|---|---|---|
| — | Without driver | — | — |
| A1 | LECSA1-S□ | 100 to 120 | — |
| A2 | LECSA2-S□ | 200 to 230 | — |
| B1 | LECSB1-S□ | 100 to 120 | — |
| B2 | LECSB2-S□ | 200 to 230 | — |
| C1 | LECSC1-S□ | 100 to 120 | — |
| C2 | LECSC2-S□ | 200 to 230 | — |
| S1 | LECSS1-S□ | 100 to 120 | — |
| S2 | LECSS2-S□ | 200 to 230 | — |
| | LECSS2-T□ | 200 to 240 | ● |

*1 When a driver type is selected, a cable is included. Select the cable type and cable length.
Example)
S2S2: Standard cable (2 m) + Driver (LECSS2)
S2 : Standard cable (2 m)
— : Without cable and driver

### ⓭ I/O cable length [m]*1

| | |
|---|---|
| — | Without cable |
| H | Without cable (Connector only) |
| 1 | 1.5 |

*1 When "Without driver" is selected for driver type, only "—: Without cable" can be selected. Refer to page 265 if I/O cable is required. (Options are shown on page 265.)

**Use of auto switches for the guide rod type LEYG series**
· Auto switches must be inserted from the front side with the rod (plate) sticking out.
· Auto switches cannot be fixed with the parts hidden behind the guide attachment (the side of the rod that sticks out).
· Please consult with SMC when using auto switches on the side of the rod that sticks out, as it is produced as a special order.

### Compatible Driver

| Driver type | Pulse input type /Positioning type | Pulse input type | CC-Link direct input type | SSCNET Ⅲ type | SSCNET Ⅲ/H type |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| **Series** | **LECSA** | **LECSB** | **LECSC** | **LECSS** | **LECSS-T** |
| Number of point tables | Up to 7 | — | Up to 255 (2 stations occupied) | — | — |
| Pulse input | ○ | ○ | — | — | — |
| Applicable network | — | — | CC-Link | SSCNET Ⅲ | SSCNET Ⅲ/H |
| Control encoder | Incremental 17-bit encoder | Absolute 18-bit encoder | Absolute 18-bit encoder | Absolute 18-bit encoder | Absolute 22-bit encoder |
| Communication function | USB communication | USB communication, RS422 communication | | USB communication | |
| Power supply voltage [V] | 100 to 120 VAC (50/60 Hz)<br>200 to 230 VAC (50/60 Hz) | | | | 200 to 240 VAC (50/60 Hz) |
| Reference page | 246 | | | | |

## Specifications

| Model | | | LEYG25□S$^{2}_{6}$/T6 (Top mounting) LEYG25□DS$^{2}_{6}$/T6 (In-line) | | | LEYG32□S$^{3}_{7}$/T7 (Top mounting) | | | LEYG32□DS$^{3}_{7}$/T7 (In-line) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg] | Horizontal*1 | 18 | 50 | 50 | 30 | 60 | 60 | 30 | 60 | 60 |
| | | Vertical | 7 | 15 | 29 | 7 | 17 | 35 | 10 | 22 | 44 |
| | Force [N]*2 (Set value: 15 to 30 %)*11 | | 65 to 131 | 127 to 255 | 242 to 485 | 79 to 157 | 154 to 308 | 294 to 588 | 98 to 197 | 192 to 385 | 368 to 736 |
| | Max. speed [mm/s] | | 900 | 450 | 225 | 1200 | 600 | 300 | 1000 | 500 | 250 |
| | Pushing speed [mm/s]*3 | | 35 or less | | | 30 or less | | | 30 or less | | |
| | Max. acceleration/deceleration [mm/s²] | | 5000 | | | 5000 | | | | | |
| | Positioning repeatability [mm] | Basic type | ±0.02 | | | | | | | | |
| | | High-precision type | ±0.01 | | | | | | | | |
| | Lost motion [mm]*4 | Basic type | 0.1 or less | | | | | | | | |
| | | High-precision type | 0.05 or less | | | | | | | | |
| | Lead [mm] (including pulley ratio) | | 12 | 6 | 3 | 20 | 10 | 5 | 16 | 8 | 4 |
| | Impact/Vibration resistance [m/s²]*5 | | 50/20 | | | 50/20 | | | | | |
| | Actuation type | | Ball screw + Belt [1:1]/Ball screw | | | Ball screw + Belt [1:1.25] | | | Ball screw | | |
| | Guide type | | Sliding bearing (LEYG□M), Ball bushing bearing (LEYG□L) | | | | | | | | |
| | Operating temperature range [°C] | | 5 to 40 | | | 5 to 40 | | | | | |
| | Operating humidity range [%RH] | | 90 or less (No condensation) | | | 90 or less (No condensation) | | | | | |
| | Regeneration option | | May be required depending on speed and work load (Refer to page 113.) | | | | | | | | |
| Electric specifications | Motor output/Size | | 100 W/□40 | | | 200 W/□60 | | | | | |
| | Motor type | | AC servo motor (100/200 VAC) | | | AC servo motor (100/200 VAC) | | | | | |
| | Encoder | | Motor type S2, S3: Incremental 17-bit encoder (Resolution: 131072 p/rev)<br>Motor type S6, S7: Absolute 18-bit encoder (Resolution: 262144 p/rev)<br>Motor type T6,T7: Absolute 22-bit encoder (Resolution: 4194304 p/rev) | | | | | | | | |
| | Power consumption [W]*6 | Horizontal | 45 | | | 65 | | | 65 | | |
| | | Vertical | 145 | | | 175 | | | 175 | | |
| | Standby power consumption when operating [W]*7 | Horizontal | 2 | | | 2 | | | 2 | | |
| | | Vertical | 8 | | | 8 | | | 8 | | |
| | Max. instantaneous power consumption [W]*8 | | 445 | | | 724 | | | 724 | | |
| Lock unit specifications | Type*9 | | Non-magnetising lock | | | Non-magnetising lock | | | | | |
| | Holding force [N] | | 131 | 255 | 485 | 157 | 308 | 588 | 197 | 385 | 736 |
| | Power consumption at 20 °C [W]*10 | | 6.3 | | | 7.9 | | | 7.9 | | |
| | Rated voltage [V] | | 24 VDC $^{0}_{-10\ \%}$ | | | | | | | | |

*1 This is the maximum value of the horizontal work load. An external guide is necessary to support the load. The actual work load changes according to the condition of the external guide. Confirm the load using the actual device.
*2 The force setting range (set values for the driver) for the force control with the torque control mode. Set it with reference to "Force Conversion Graph" on page 114. When the control equivalent to the pushing operation of the controller LECP series is performed, select the LECSS driver and combine it with the Simple Motion (manufactured by Mitsubishi Electric Corporation) which has a pushing operation function.
*3 The allowable collision speed for collision with the workpiece with the torque control mode
*4 A reference value for correcting an error in reciprocal operation
*5 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*6 The power consumption (including the driver) is for when the actuator is operating.
*7 The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during operation.
*8 The maximum instantaneous power consumption (including the driver) is for when the actuator is operating.
*9 Only when motor option "With lock" is selected
*10 For an actuator with lock, add the power consumption for the lock.
*11 For motor type T6 and T7, the set value is from 12 to 24 %.

## Weight

### Weight: Motor Top Mounting Type

[kg]

| Series | | LEYG25MS$^{2}_{6}$/T6 | | | | | | | LEYG32MS$^{3}_{7}$/T7 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Motor type | Incremental encoder | 1.80 | 1.99 | 2.31 | 2.73 | 3.07 | 3.41 | 3.67 | 3.24 | 3.50 | 4.05 | 4.80 | 5.35 | 5.83 | 6.28 |
| | Absolute encoder [S$^{6}_{7}$] | 1.86 | 2.05 | 2.37 | 2.79 | 3.13 | 3.47 | 3.73 | 3.18 | 3.44 | 3.99 | 4.74 | 5.29 | 5.77 | 6.22 |
| | Absolute encoder [T$^{6}_{7}$] | 1.8 | 2.0 | 2.4 | 2.8 | 3.1 | 3.5 | 3.7 | 3.2 | 3.4 | 4.0 | 4.7 | 5.3 | 5.7 | 6.2 |

| Series | | LEYG25LS$^{2}_{6}$/T6 | | | | | | | LEYG32LS$^{3}_{7}$/T7 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Motor type | Incremental encoder | 1.81 | 2.02 | 2.26 | 2.69 | 2.95 | 3.27 | 3.51 | 3.24 | 3.51 | 3.9 | 4.64 | 5.06 | 5.56 | 5.96 |
| | Absolute encoder [S$^{6}_{7}$] | 1.87 | 2.08 | 2.32 | 2.75 | 3.01 | 3.33 | 3.57 | 3.18 | 3.45 | 3.84 | 4.58 | 5.00 | 5.50 | 5.90 |
| | Absolute encoder [T$^{6}_{7}$] | 1.9 | 2.1 | 2.3 | 2.7 | 3.0 | 3.3 | 3.6 | 3.2 | 3.4 | 3.8 | 4.6 | 5.0 | 5.5 | 5.9 |

### Weight: In-line Motor Type

[kg]

| Series | | LEYG25MDS$^{2}_{6}$/T6 | | | | | | | LEYG32MDS$^{3}_{7}$/T7 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Motor type | Incremental encoder | 1.83 | 2.02 | 2.34 | 2.76 | 3.10 | 3.44 | 3.70 | 3.26 | 3.52 | 4.07 | 4.82 | 5.37 | 5.85 | 6.30 |
| | Absolute encoder [S$^{6}_{7}$] | 1.89 | 2.08 | 2.40 | 2.82 | 3.16 | 3.50 | 3.76 | 3.20 | 3.46 | 4.01 | 4.76 | 5.31 | 5.79 | 6.24 |
| | Absolute encoder [T$^{6}_{7}$] | 1.9 | 2.1 | 2.4 | 2.8 | 3.1 | 3.5 | 3.7 | 3.2 | 3.4 | 4.0 | 4.7 | 5.3 | 5.8 | 6.2 |

| Series | | LEYG25LDS$^{2}_{6}$/T6 | | | | | | | LEYG32LDS$^{3}_{7}$/T7 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Motor type | Incremental encoder | 1.84 | 2.05 | 2.29 | 2.72 | 2.98 | 3.30 | 3.54 | 3.26 | 3.53 | 3.92 | 4.66 | 5.08 | 5.58 | 5.98 |
| | Absolute encoder [S$^{6}_{7}$] | 1.90 | 2.11 | 2.35 | 2.78 | 3.04 | 3.36 | 3.60 | 3.20 | 3.47 | 3.86 | 4.60 | 5.02 | 5.52 | 5.92 |
| | Absolute encoder [T$^{6}_{7}$] | 1.9 | 2.1 | 2.3 | 2.8 | 3.0 | 3.3 | 3.6 | 3.2 | 3.4 | 3.8 | 4.6 | 5.0 | 5.5 | 5.9 |

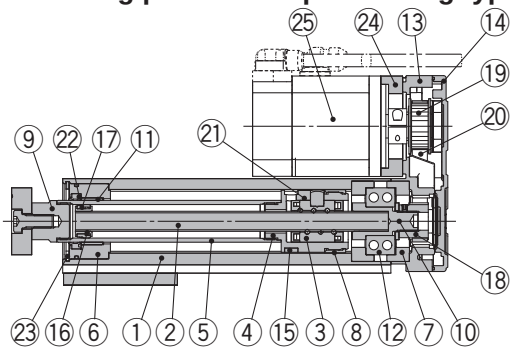
### Additional Weight

[kg]

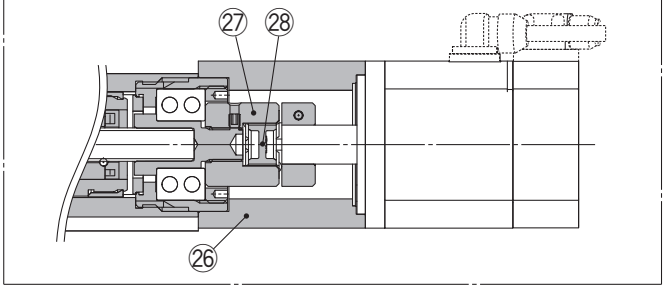
| Size | | 25 | 32 |
|---|---|---|---|
| Lock | Incremental encoder | 0.20 | 0.40 |
| | Absolute encoder [S$^{6}_{7}$] | 0.30 | 0.66 |
| | Absolute encoder [T$^{6}_{7}$] | 0.3 | 0.7 |

## Construction

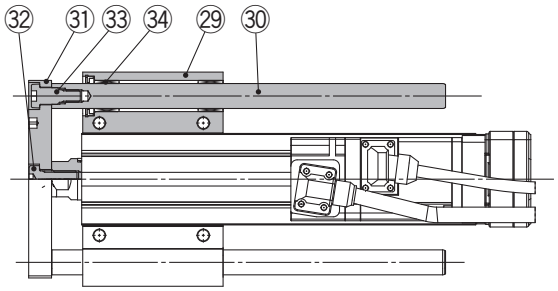
### Motor mounting position: Top mounting type



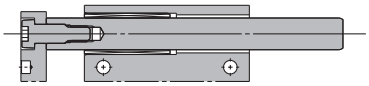

### Motor mounting position: In-line type




### LEYG□M



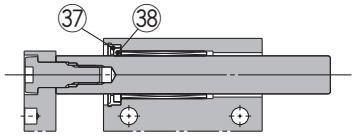

**LEYG25/32M: 50st or less**



**LEYG25/32M: Over 50st**

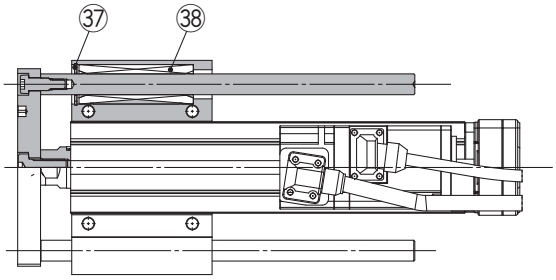
**When grease retaining function selected**

**LEYG25/32M: 50st or less**

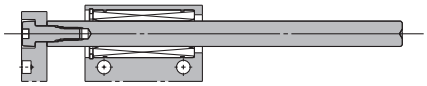



**LEYG25/32M: Over 50st**

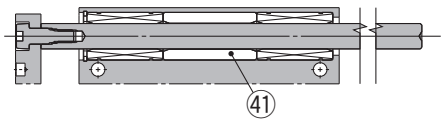
### LEYG□L




**LEYG25/32L: 100st or less**



**LEYG25/32L: Over 100st**




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Aluminium alloy | Anodised |
| 2 | **Ball screw shaft** | Alloy steel | |
| 3 | **Ball screw nut** | Synthetic resin/Alloy steel | |
| 4 | **Piston** | Aluminium alloy | |
| 5 | **Piston rod** | Stainless steel | Hard chrome plating |
| 6 | **Rod cover** | Aluminium alloy | |
| 7 | **Bearing holder** | Aluminium alloy | |
| 8 | **Rotation stopper** | POM | |
| 9 | **Socket** | Free cutting carbon steel | Nickel plating |
| 10 | **Connected shaft** | Free cutting carbon steel | Nickel plating |
| 11 | **Bushing** | Bearing alloy | |
| 12 | **Bearing** | — | |
| 13 | **Return box** | Aluminium die-cast | Coating |
| 14 | **Return plate** | Aluminium die-cast | Coating |
| 15 | **Magnet** | — | |
| 16 | **Wear ring holder** | Stainless steel | Stroke 101 mm or more |
| 17 | **Wear ring** | POM | Stroke 101 mm or more |
| 18 | **Screw shaft pulley** | Aluminium alloy | |
| 19 | **Motor pulley** | Aluminium alloy | |
| 20 | **Belt** | — | |
| 21 | **Parallel pin** | Stainless steel | |
| 22 | **Seal** | NBR | |
| 23 | **Retaining ring** | Steel for spring | Phosphate coated |
| 24 | **Motor adapter** | Aluminium alloy | Coating |
| 25 | **Motor** | — | |
| 26 | **Motor block** | Aluminium alloy | Coating |

| No. | Description | Material | Note |
|---|---|---|---|
| 27 | **Hub** | Aluminium alloy | |
| 28 | **Spider** | Urethane | |
| 29 | **Guide attachment** | Aluminium alloy | Anodised |
| 30 | **Guide rod** | Carbon steel | |
| 31 | **Plate** | Aluminium alloy | Anodised |
| 32 | **Plate mounting cap screw** | Carbon steel | Nickel plating |
| 33 | **Guide cap screw** | Carbon steel | Nickel plating |
| 34 | **Sliding bearing** | Bearing alloy | |
| 35 | **Felt** | Felt | |
| 36 | **Holder** | Synthetic resin | |
| 37 | **Retaining ring** | Steel for spring | Phosphate coated |
| 38 | **Ball bushing** | — | |
| 39 | **Spacer** | Aluminium alloy | Chromated |

### Support Block

| Size | Order no. |
|---|---|
| **25** | LEYG-S025 |
| **32** | LEYG-S032 |

* Two body mounting screws are included with the support block.

### Replacement Parts/Belt

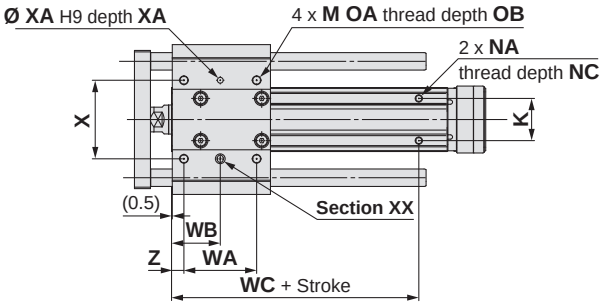
| Size | Order no. |
|---|---|
| **25** | LE-D-2-2 |
| **32** | LE-D-2-4 |

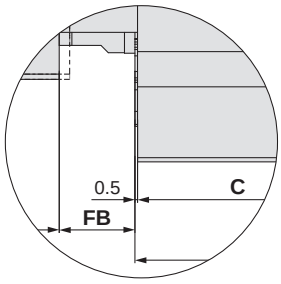
### Replacement Parts/Grease Pack

| Applied portion | Order no. |
|---|---|
| Piston rod<br>Guide rod | GR-S-010 (10 g)<br>GR-S-020 (20 g) |

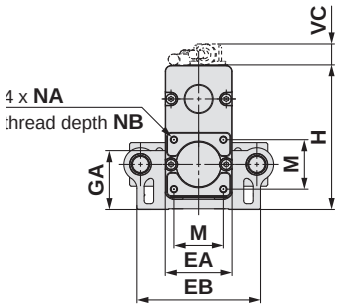
* Apply grease on the piston rod periodically.
Grease should be applied at 1 million cycles or 200 km, whichever comes first.

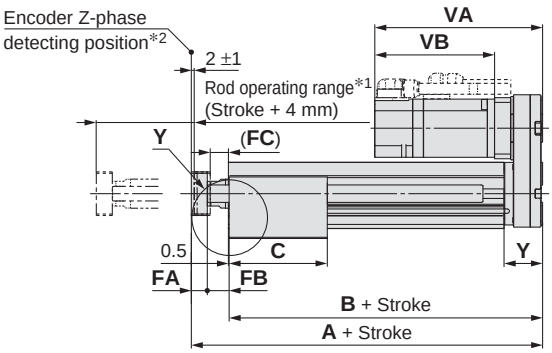
## Dimensions: Motor Top Mounting

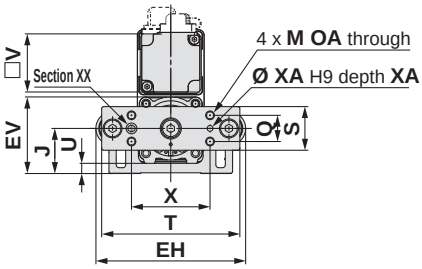


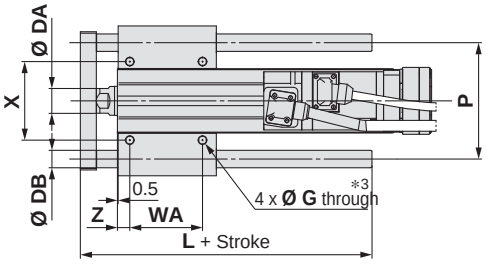

**Section Y details**

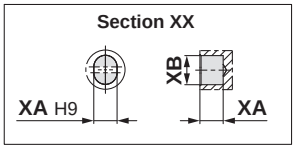



*1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
*2 The Z-phase first detecting position from the stroke end of the motor side
*3 Through holes cannot be used for size 32 with strokes of 50 mm or less.




### LEYG□L (Ball bushing bearing) [mm]

| Size | Stroke range [mm] | L | DB |
|---|---|---|---|
| 25 | Up to 114 | 91 | 10 |
| | 115 to 190 | 115 | |
| | 191 to 300 | 133 | |
| 32 | Up to 114 | 97.5 | 13 |
| | 115 to 190 | 116.5 | |
| | 191 to 300 | 134 | |

### LEYG□M (Sliding bearing) [mm]

| Size | Stroke range [mm] | L | DB |
|---|---|---|---|
| 25 | Up to 59 | 67.5 | 12 |
| | 60 to 185 | 100.5 | |
| | 186 to 300 | 138 | |
| 32 | Up to 59 | 74 | 16 |
| | 60 to 185 | 107 | |
| | 186 to 300 | 144 | |

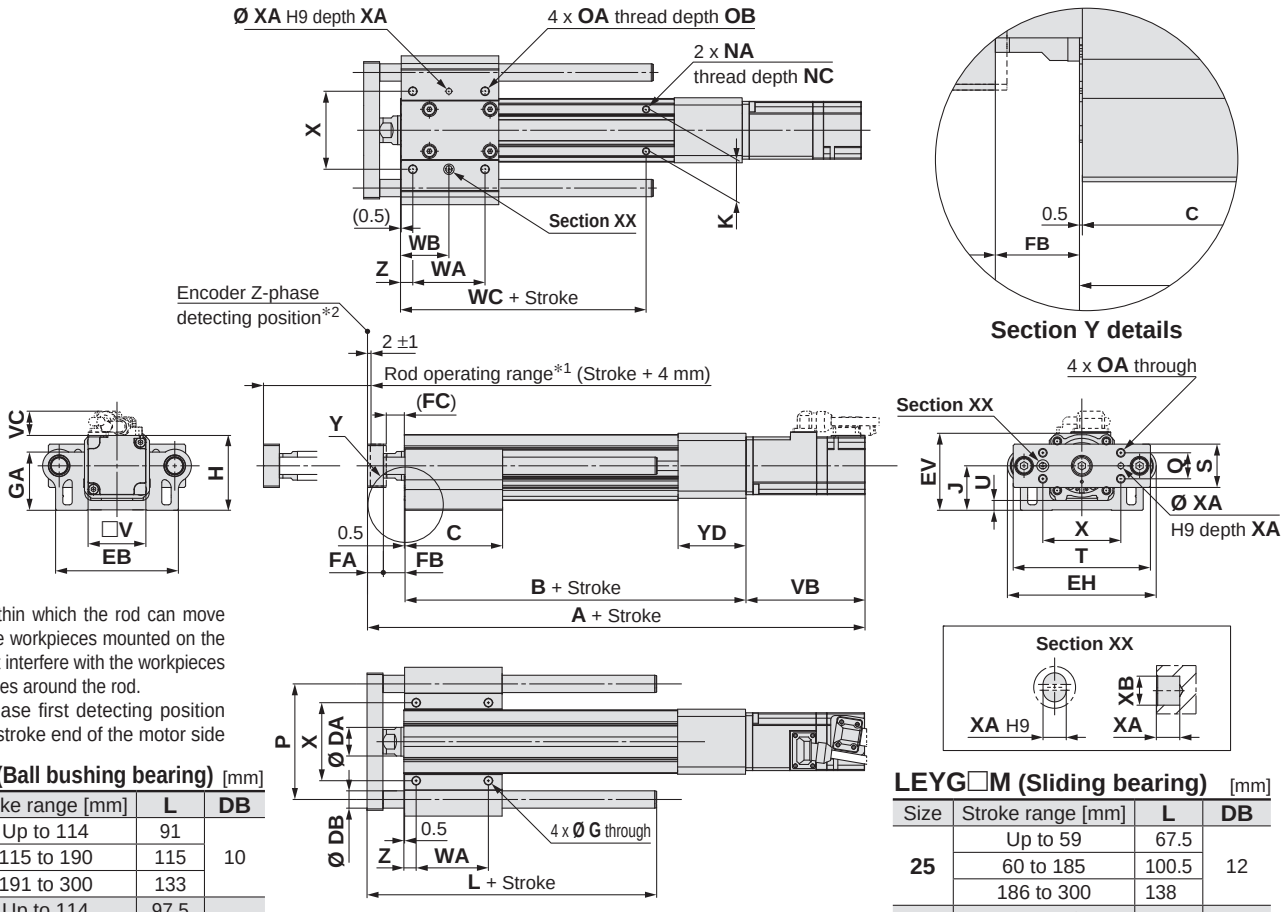
### LEYG□M, LEYG□L Common [mm]

| Size | Stroke range [mm] | A | B | C | DA | EA | EB | EH | EV | FA | FB | FC | G | GA | H | J | K | M | NA | NB | NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | Up to 39 | 141.5 | 116 | 50 | 20 | 46 | 85 | 103 | 52.3 | 11 | 14.5 | 12.5 | 5.4 | 40.3 | 98.8 | 30.8 | 29 | 34 | M5 x 0.8 | 8 | 6.5 |
| | 40 to 100 | | | 67.5 | | | | | | | | | | | | | | | | | |
| | 101 to 124 | 166.5 | 141 | | | | | | | | | | | | | | | | | | |
| | 125 to 200 | | | 84.5 | | | | | | | | | | | | | | | | | |
| | 201 to 300 | | | 102 | | | | | | | | | | | | | | | | | |
| 32 | Up to 39 | 160.5 | 130 | 55 | 25 | 60 | 101 | 123 | 63.8 | 12 | 18.5 | 16.5 | 5.4 | 50.3 | 125.3 | 38.3 | 30 | 40 | M6 x 1.0 | 10 | 8.5 |
| | 40 to 100 | | | 68 | | | | | | | | | | | | | | | | | |
| | 101 to 124 | 190.5 | 160 | | | | | | | | | | | | | | | | | | |
| | 125 to 200 | | | 85 | | | | | | | | | | | | | | | | | |
| | 201 to 300 | | | 102 | | | | | | | | | | | | | | | | | |

| Size | Stroke range [mm] | OA | OB | P | Q | S | T | U | V | WA | WB | WC | X | XA | XB | Y | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | Up to 39 | M6 x 1.0 | 12 | 80 | 18 | 30 | 95 | 6.8 | 40 | 35 | 26 | 70 | 54 | 4 | 5 | 26.5 | 8.5 |
| | 40 to 100 | | | | | | | | | 50 | 33.5 | | | | | | |
| | 101 to 124 | | | | | | | | | | | 95 | | | | | |
| | 125 to 200 | | | | | | | | | 70 | 43.5 | | | | | | |
| | 201 to 300 | | | | | | | | | 85 | 51 | | | | | | |
| 32 | Up to 39 | M6 x 1.0 | 12 | 95 | 28 | 40 | 117 | 7.3 | 60 | 40 | 28.5 | 75 | 64 | 5 | 6 | 34 | 8.5 |
| | 40 to 100 | | | | | | | | | 50 | 33.5 | | | | | | |
| | 101 to 124 | | | | | | | | | | | 105 | | | | | |
| | 125 to 200 | | | | | | | | | 70 | 43.5 | | | | | | |
| | 201 to 300 | | | | | | | | | 85 | 51 | | | | | | |

| Size | Incremental encoder | | | | | | Absolute encoder [S6/S7] | | | | | | Absolute encoder [T6/T7] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Without lock | | | With lock | | | Without lock | | | With lock | | | Without lock | | | With lock | | |
| | VA | VB | VC | VA | VB | VC | VA | VB | VC | VA | VB | VC | VA | VB | VC | VA | VB | VC |
| 25 | 120 | 87 | 14.1 | 156.9 | 123.9 | 15.8 | 115.4 | 82.4 | 14.1 | 156.5 | 123.5 | 15.8 | 115.4 | 82.4 | 14.1 | 156 | 123 | 15.8 |
| 32 | 128.2 | 88.2 | 17.1 | 156.8 | 116.8 | 17.1 | 116.6 | 76.6 | 17.1 | 156.1 | 116.1 | 17.1 | 116.6 | 76.6 | 17.1 | 153.4 | 113.4 | 17.1 |

## Dimensions: In-line Motor




*1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.

*2 The Z-phase first detecting position from the stroke end of the motor side

### LEYG□L (Ball bushing bearing) [mm]

| Size | Stroke range [mm] | L | DB |
|---|---|---|---|
| 25 | Up to 114 | 91 | 10 |
| | 115 to 190 | 115 | |
| | 191 to 300 | 133 | |
| 32 | Up to 114 | 97.5 | 13 |
| | 115 to 190 | 116.5 | |
| | 191 to 300 | 134 | |

### LEYG□M (Sliding bearing) [mm]

| Size | Stroke range [mm] | L | DB |
|---|---|---|---|
| 25 | Up to 59 | 67.5 | 12 |
| | 60 to 185 | 100.5 | |
| | 186 to 300 | 138 | |
| 32 | Up to 59 | 74 | 16 |
| | 60 to 185 | 107 | |
| | 186 to 300 | 144 | |

### LEYG□M, LEYG□L Common

[mm]

| Size | Stroke range [mm] | B | C | DA | EB | EH | EV | FA | FB | FC | G | GA | H | J | K | NA | NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | Up to 39 | 136.5 | 50 | 20 | 85 | 103 | 52.3 | 11 | 14.5 | 12.5 | 5.4 | 40.3 | 53.3 | 30.8 | 29 | M5 x 0.8 | 6.5 |
| | 40 to 100 | | 67.5 | | | | | | | | | | | | | | |
| | 101 to 124 | 161.5 | | | | | | | | | | | | | | | |
| | 125 to 200 | | 84.5 | | | | | | | | | | | | | | |
| | 201 to 300 | | 102 | | | | | | | | | | | | | | |
| 32 | Up to 39 | 156 | 55 | 25 | 101 | 123 | 63.8 | 12 | 18.5 | 16.5 | 5.4 | 50.3 | 68.3 | 38.3 | 30 | M6 x 1.0 | 8.5 |
| | 40 to 100 | | 68 | | | | | | | | | | | | | | |
| | 101 to 124 | 186 | | | | | | | | | | | | | | | |
| | 125 to 200 | | 85 | | | | | | | | | | | | | | |
| | 201 to 300 | | 102 | | | | | | | | | | | | | | |

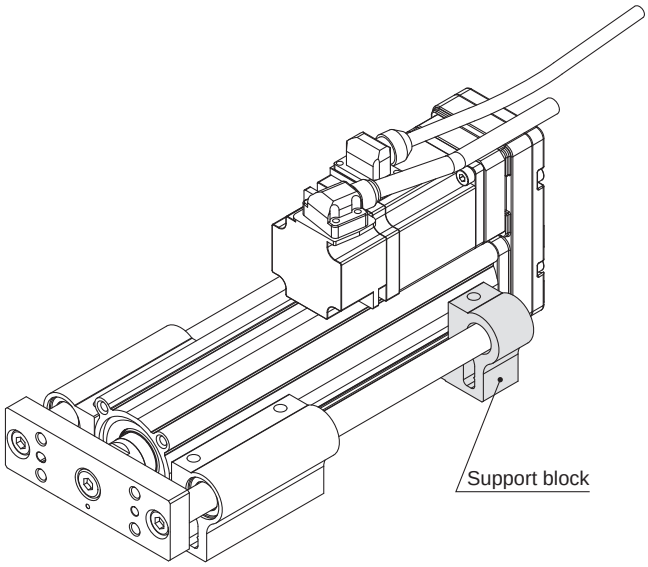
| Size | Stroke range [mm] | OA | OB | P | Q | S | T | U | V | WA | WB | WC | X | XA | XB | YD | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | Up to 39 | M6 x 1.0 | 12 | 80 | 18 | 30 | 95 | 6.8 | 40 | 35 | 26 | 70 | 54 | 4 | 5 | 47 | 8.5 |
| | 40 to 100 | | | | | | | | | 50 | 33.5 | | | | | | |
| | 101 to 124 | | | | | | | | | | | 95 | | | | | |
| | 125 to 200 | | | | | | | | | 70 | 43.5 | | | | | | |
| | 201 to 300 | | | | | | | | | 85 | 51 | | | | | | |
| 32 | Up to 39 | M6 x 1.0 | 12 | 95 | 28 | 40 | 117 | 7.3 | 60 | 40 | 28.5 | 75 | 64 | 5 | 6 | 60 | 8.5 |
| | 40 to 100 | | | | | | | | | 50 | 33.5 | | | | | | |
| | 101 to 124 | | | | | | | | | | | 105 | | | | | |
| | 125 to 200 | | | | | | | | | 70 | 43.5 | | | | | | |
| | 201 to 300 | | | | | | | | | 85 | 51 | | | | | | |

| Size | Stroke range [mm] | Incremental encoder | | | | | | Absolute encoder [S6/S7] | | | | | | Absolute encoder [T6/T7] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Without lock | | | With lock | | | Without lock | | | With lock | | | Without lock | | | With lock | | |
| | | A | VB | VC | A | VB | VC | A | VB | VC | A | VB | VC | A | VB | VC | A | VB | VC |
| 25 | 15 to 100 | 249 | 87 | 14.6 | 285.9 | 123.9 | 16.3 | 244.4 | 82.4 | 14.6 | 285.5 | 123.5 | 16.3 | 244.4 | 82.4 | 14.6 | 285 | 123 | 16.3 |
| | 105 to 300 | 274 | | | 310.9 | | | 269.4 | | | 310.5 | | | 269.4 | | | 310 | | |
| 32 | 15 to 100 | 274.7 | 88.2 | 17.1 | 303.3 | 116.8 | 17.1 | 263.1 | 76.6 | 17.1 | 302.6 | 116.1 | 17.1 | 263.1 | 76.6 | 17.1 | 299.9 | 113.4 | 17.1 |
| | 105 to 300 | 304.7 | | | 333.3 | | | 293.1 | | | 332.6 | | | 293.1 | | | 329.9 | | |

## Support Block

### ●Guide for support block application

When the stroke exceeds 100 mm and the mounting orientation is horizontal, the body will be bent. Mounting the support block is recommended. (Please order it separately from the models shown below.)

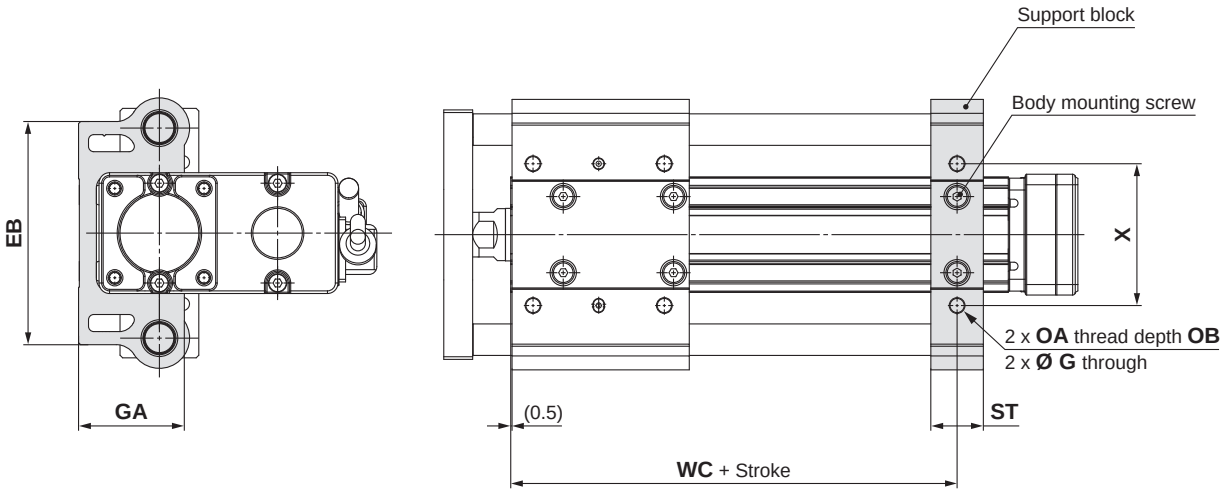



### Support Block Model

**LEYG−S025**

**Size**

| | |
|---|---|
| **025** | For size 25 |
| **032** | For size 32 |




### ⚠Caution

Do not install the body using only a support block.
The support block should be used only for support.

[mm]

| Size | Model | Stroke range | EB | G | GA | OA | OB | ST | WC | X |
|---|---|---|---|---|---|---|---|---|---|---|
| **25** | **LEYG-S025** | 100st or less | 85 | 5.4 | 40.3 | M6 x 1.0 | 12 | 20 | 70 | 54 |
| | | 101st or more, 300st or less | | | | | | | 95 | |
| **32** | **LEYG-S032** | 100st or less | 101 | (5.4) | (50.3) | M6 x 1.0 | 12 | 22 | 75 | 64 |
| | | 101st or more, 300st or less | | | | | | | 105 | |

* Two body mounting screws are included with the support block.
* The through holes of the LEYG-S032 cannot be used for the motor top mounting type. Use taps on the bottom.

# Electric Actuator/ Guide Rod Type

## *LEYG Series* LEYG25, 32

LECS□ Series ▶ p. 135

### How to Order

LEY H G 25 M □ V6 B – 200 □ □ – S 3 M2 □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭

**❶ Accuracy**

| | |
|---|---|
| — | Basic type |
| H | High-precision type |

**❷ Size**

| | |
|---|---|
| 25 | |
| 32 | |

**❸ Bearing type**

| | |
|---|---|
| M | Sliding bearing |
| L | Ball bushing bearing |

**❹ Motor mounting position**

| | |
|---|---|
| — | Top mounting |
| D | In-line |

**❺ Motor type**

| Symbol | Type | Output [W] | Actuator size | Compatible driver |
|---|---|---|---|---|
| V6*1 | AC servo motor (Absolute encoder) | 100 | 25 | LECYM2-V5 LECYU2-V5 |
| V7 | | 200 | 32 | LECYM2-V7 LECYU2-V7 |

*1 For motor type V6, the compatible driver part number suffix is V5.

**❻ Lead [mm]**

| Symbol | LEYG25 | LEYG32*1 |
|---|---|---|
| A | 12 | 16 (20) |
| B | 6 | 8 (10) |
| C | 3 | 4 (5) |

*1 The values shown in ( ) are the leads for the top mounting type. (Equivalent leads which include the pulley ratio [1.25:1])

**❼ Stroke [mm]**

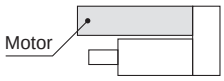
| | |
|---|---|
| 30 | 30 |
| to | to |
| 300 | 300 |

* For details, refer to the applicable stroke table below.
* There is a limit for mounting the size 3 2 top mounting type and strokes of 5 0 mm or less. Refer to the dimensions.

**❽ Motor option**

| | |
|---|---|
| — | Without option |
| B | With lock |

* When "With lock" is selected for the top mounting type, the motor body will stick out from the end of the body for size 25 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.




**❾ Guide option**

| | |
|---|---|
| — | Without option |
| F | With grease retaining function |

* Only available for the sliding bearing

**❿ Cable type*1**

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

*1 The motor and encoder cables are included. The motor cable for lock option is included when the motor with lock option is selected.

**⓫ Cable length [m]*1**

| | |
|---|---|
| — | Without cable |
| 3 | 3 |
| 5 | 5 |
| A | 10 |
| C | 20 |

*1 The length of the motor and encoder cables are the same. (For with lock)

**Applicable Stroke Table**

●: Standard

| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | Manufacturable stroke range |
|---|---|---|---|---|---|---|---|---|
| LEYG25 | ● | ● | ● | ● | ● | ● | ● | 15 to 300 |
| LEYG32 | ● | ● | ● | ● | ● | ● | ● | 20 to 300 |

* Please consult with SMC for non-standard strokes as they are produced as special orders.

**For auto switches, refer to pages 101 to 103.**

Motor mounting position: Top mounting

Motor mounting position: In-line

### ⓬ Driver type

| | Compatible driver | Power supply voltage [V] |
|---|---|---|
| **—** | Without driver | — |
| **M2** | LECYM2-V□ | 200 to 230 |
| **U2** | LECYU2-V□ | 200 to 230 |

∗ When a driver type is selected, a cable is included.
Select the cable type and cable length.

### ⓭ I/O cable length [m]∗1

| | |
|---|---|
| **—** | Without cable |
| **H** | Without cable (Connector only) |
| **1** | 1.5 |

∗1 When "Without driver" is selected for driver type, only "—: Without cable" can be selected.
Refer to page 278 if I/O cable is required.
(Options are shown on page 278.)

**Use of auto switches for the guide rod type LEYG series**
· Auto switches must be inserted from the front side with the rod (plate) sticking out.
· Auto switches cannot be fixed with the parts hidden behind the guide attachment (the side of the rod that sticks out).
· Please consult with SMC when using auto switches on the side of the rod that sticks out, as it is produced as a special order.

## Compatible Driver

| **Driver type** | MECHATROLINK-Ⅱ type  | MECHATROLINK-Ⅲ type  |
|---|---|---|
| **Series** | **LECYM** | **LECYU** |
| **Applicable network** | MECHATROLINK-Ⅱ | MECHATROLINK-Ⅲ |
| **Control encoder** | Absolute<br>20-bit encoder | |
| **Communication device** | USB communication, RS-422 communication | |
| **Power supply voltage [V]** | 200 to 230 VAC (50/60 Hz) | |
| **Reference page** | 271 | |

## Specifications

| Model | | | LEYG25$^{M}_{L}$V6 (Top mounting) LEYG25$^{M}_{L}$DV6 (In-line) | | | LEYG32$^{M}_{L}$V7 (Top mounting) | | | LEYG32$^{M}_{L}$DV7 (In-line) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg] | Horizontal*1 | 18 | 50 | 50 | 30 | 60 | 60 | 30 | 60 | 60 |
| | | Vertical | 7 | 15 | 29 | 7 | 17 | 35 | 10 | 22 | 44 |
| | Force [N]*2 (Set value: 45 to 90 %) | | 65 to 131 | 127 to 255 | 242 to 485 | 79 to 157 | 154 to 308 | 294 to 588 | 98 to 197 | 192 to 385 | 368 to 736 |
| | Max. speed [mm/s] | | 900 | 450 | 225 | 1200 | 600 | 300 | 1000 | 500 | 250 |
| | Pushing speed [mm/s]*3 | | 35 or less | | | 30 or less | | | 30 or less | | |
| | Max. acceleration/deceleration [mm/s²] | | 5000 | | | 5000 | | | | | |
| | Positioning repeatability [mm] | Basic type | ±0.02 | | | ±0.02 | | | | | |
| | | High-precision type | ±0.01 | | | ±0.01 | | | | | |
| | Lost motion [mm] | Basic type | 0.1 or less | | | 0.1 or less | | | | | |
| | | High-precision type | 0.05 or less | | | 0.05 or less | | | | | |
| | Lead [mm] (including pulley ratio) | | 12 | 6 | 3 | 20 | 10 | 5 | 16 | 8 | 4 |
| | Impact/Vibration resistance [m/s²]*4 | | 50/20 | | | 50/20 | | | | | |
| | Actuation type | | Ball screw + Belt [1:1]/Ball screw | | | Ball screw + Belt [1:1.25] | | | Ball screw | | |
| | Guide type | | Sliding bearing (LEYG□M), Ball bushing bearing (LEYG□L) | | | | | | | | |
| | Operating temperature range [°C] | | 5 to 40 | | | 5 to 40 | | | | | |
| | Operating humidity range [%RH] | | 90 or less (No condensation) | | | 90 or less (No condensation) | | | | | |
| | Conditions for*5 "Regenerative resistor" [kg] | Horizontal | Not required | | | Not required | | | | | |
| | | Vertical | 5 or more | | | 2 or more | | | | | |
| Electric specifications | Motor output/Size | | 100 W/□40 | | | 200 W/□60 | | | | | |
| | Motor type | | AC servo motor (200 VAC) | | | AC servo motor (200 VAC) | | | | | |
| | Encoder | | Absolute 20-bit encoder (Resolution: 1048576 p/rev) | | | | | | | | |
| | Power consumption [W]*6 | Horizontal | 45 | | | 65 | | | 65 | | |
| | | Vertical | 145 | | | 175 | | | 175 | | |
| | Standby power consumption when operating [W]*7 | Horizontal | 2 | | | 2 | | | 2 | | |
| | | Vertical | 8 | | | 8 | | | 8 | | |
| | Max. instantaneous power consumption [W]*8 | | 445 | | | 724 | | | 724 | | |
| Lock unit specifications | Type*9 | | Non-magnetising lock | | | Non-magnetising lock | | | | | |
| | Holding force [N] | | 131 | 255 | 485 | 157 | 308 | 588 | 197 | 385 | 736 |
| | Power consumption at 20 °C [W]*10 | | 5.5 | | | 6 | | | 6 | | |
| | Rated voltage [V] | | 24 VDC $^{+10}_{0}$ % | | | | | | | | |

*1 This is the maximum value of the horizontal work load. An external guide is necessary to support the load. The actual work load changes according to the condition of the external guide. Confirm the load using the actual device.
*2 The force setting range (set values for the driver) for the force control with the torque control mode
Set it with reference to "Force Conversion Graph" on page 119.
*3 The allowable collision speed for collision with the workpiece with the torque control mode
*4 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*5 The work load conditions which require "Regenerative resistor" when operating at the maximum speed (Duty ratio: 100 %)
Order the regenerative resistor separately. For details, refer to "Conditions for Regenerative Resistor (Guide)" on page 118.
*6 The power consumption (including the driver) is for when the actuator is operating.
*7 The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during operation.
*8 The maximum instantaneous power consumption (including the driver) is for when the actuator is operating.
*9 Only when motor option "With lock" is selected
*10 For an actuator with lock, add the power consumption for the lock.

## Weight

### Product Weight: Motor Top Mounting Type

[kg]

| Series | LEYG25MV6 | | | | | | | LEYG32MV7 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Weight [kg] | 1.7 | 1.9 | 2.2 | 2.6 | 3.0 | 3.3 | 3.6 | 3.1 | 3.4 | 4.0 | 4.7 | 5.3 | 5.7 | 6.2 |

| Series | LEYG25LV6 | | | | | | | LEYG32LV7 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Weight [kg] | 1.7 | 1.9 | 2.2 | 2.6 | 2.9 | 3.2 | 3.4 | 3.1 | 3.4 | 3.8 | 4.5 | 5.0 | 5.5 | 5.9 |

### Product Weight: In-line Motor Type

[kg]

| Series | LEYG25MDV6 | | | | | | | LEYG32MDV7 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Weight [kg] | 1.7 | 1.9 | 2.2 | 2.6 | 3.0 | 3.3 | 3.6 | 3.2 | 3.4 | 4.0 | 4.7 | 5.3 | 5.8 | 6.2 |

| Series | LEYG25LDV6 | | | | | | | LEYG32LDV7 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 30 | 50 | 100 | 150 | 200 | 250 | 300 |
| Weight [kg] | 1.7 | 2.0 | 2.2 | 2.6 | 2.9 | 3.2 | 3.4 | 3.2 | 3.4 | 3.8 | 4.6 | 5.0 | 5.5 | 5.9 |

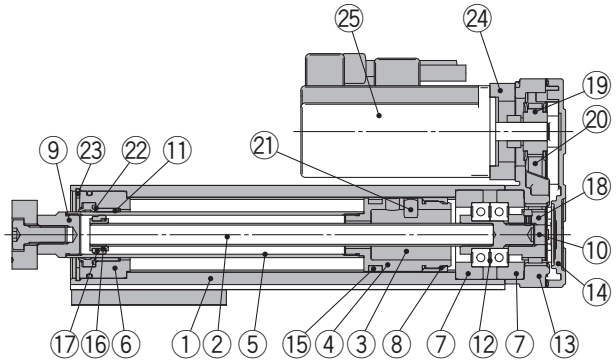
### Additional Weight

[kg]

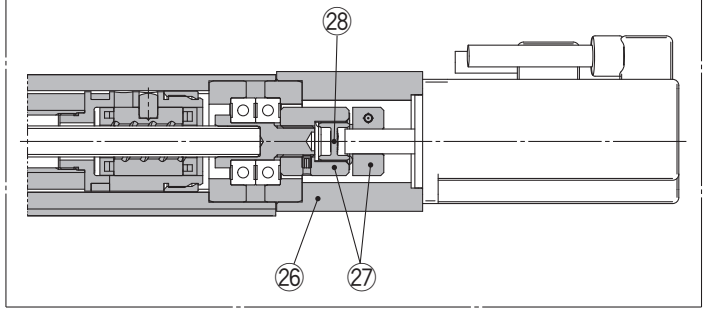
| Size | 25 | 32 |
|---|---|---|
| Lock | 0.3 | 0.6 |

## Construction

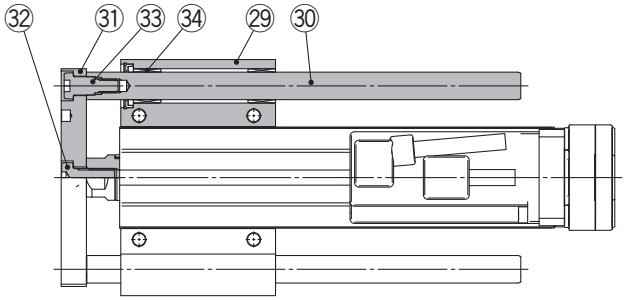
### Motor mounting position: Top mounting type



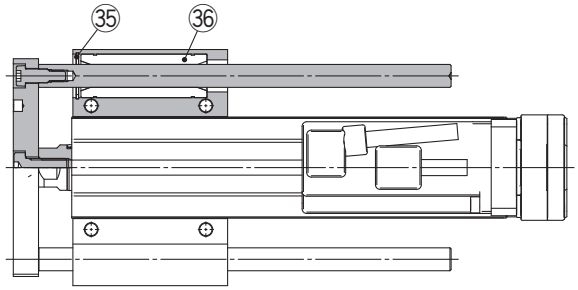

### Motor mounting position: In-line type




### LEYG□M




### LEYG□L




### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Aluminium alloy | Anodised |
| 2 | **Ball screw shaft** | Alloy steel | |
| 3 | **Ball screw nut** | — | |
| 4 | **Piston** | Aluminium alloy | |
| 5 | **Piston rod** | Stainless steel | Hard chrome plating |
| 6 | **Rod cover** | Aluminium alloy | |
| 7 | **Bearing holder** | Aluminium alloy | |
| 8 | **Rotation stopper** | POM | |
| 9 | **Socket** | Free cutting carbon steel | Nickel plating |
| 10 | **Connected shaft** | Free cutting carbon steel | Nickel plating |
| 11 | **Bushing** | Bearing alloy | |
| 12 | **Bearing** | — | |
| 13 | **Return box** | Aluminium die-cast | Coating |
| 14 | **Return plate** | Aluminium die-cast | Coating |
| 15 | **Magnet** | — | |
| 16 | **Wear ring holder** | Stainless steel | Stroke 101 mm or more |
| 17 | **Wear ring** | POM | Stroke 101 mm or more |
| 18 | **Screw shaft pulley** | Aluminium alloy | |

| No. | Description | Material | Note |
|---|---|---|---|
| 19 | **Motor pulley** | Aluminium alloy | |
| 20 | **Belt** | — | |
| 21 | **Parallel pin** | Stainless steel | |
| 22 | **Seal** | NBR | |
| 23 | **Retaining ring** | Steel for spring | Phosphate coated |
| 24 | **Motor adapter** | Aluminium alloy | Coating |
| 25 | **Motor** | — | |
| 26 | **Motor block** | Aluminium alloy | Coating |
| 27 | **Hub** | Aluminium alloy | |
| 28 | **Spider** | Urethane | |
| 29 | **Guide attachment** | Aluminium alloy | Anodised |
| 30 | **Guide rod** | Carbon steel | |
| 31 | **Plate** | Aluminium alloy | Anodised |
| 32 | **Plate mounting cap screw** | Carbon steel | Nickel plating |
| 33 | **Guide cap screw** | Carbon steel | Nickel plating |
| 34 | **Sliding bearing** | Bearing alloy | |
| 35 | **Retaining ring** | Steel for spring | Phosphate coated |
| 36 | **Ball bushing** | — | |

### Support Block

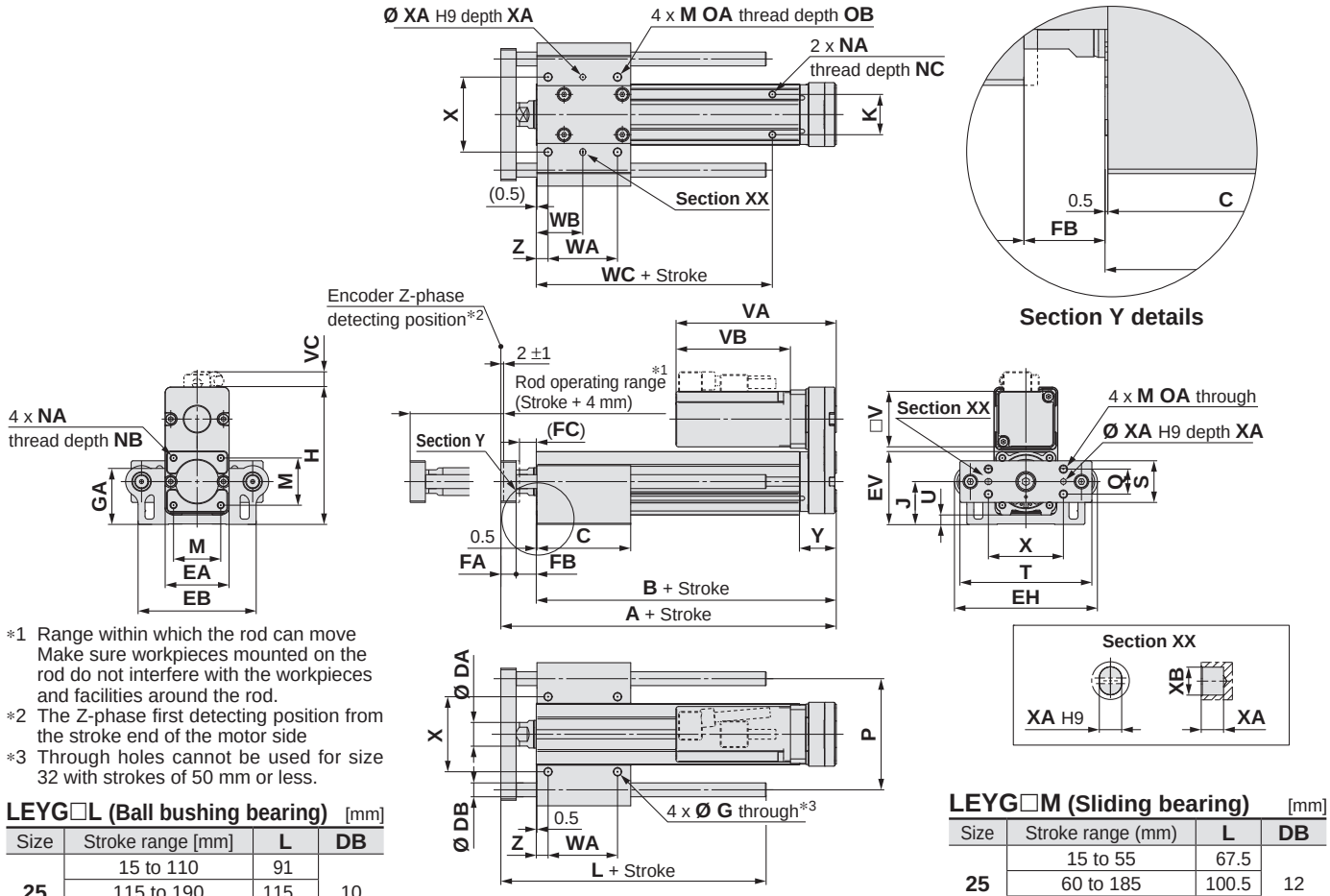
| Size | Order no. |
|---|---|
| **25** | LEYG-S025 |
| **32** | LEYG-S032 |

* Two body mounting screws are included with the support block.

### Replacement Parts/Belt

| Size | Order no. |
|---|---|
| **25** | LE-D-2-2 |
| **32** | LE-D-2-4 |

## Dimensions: Motor Top Mounting




*1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
*2 The Z-phase first detecting position from the stroke end of the motor side
*3 Through holes cannot be used for size 32 with strokes of 50 mm or less.

### LEYG□L (Ball bushing bearing) [mm]

| Size | Stroke range [mm] | L | DB |
|---|---|---|---|
| 25 | 15 to 110 | 91 | 10 |
| | 115 to 190 | 115 | |
| | 195 to 300 | 133 | |
| 32 | 20 to 110 | 97.5 | 13 |
| | 115 to 190 | 116.5 | |
| | 195 to 300 | 134 | |

### LEYG□M (Sliding bearing) [mm]

| Size | Stroke range (mm) | L | DB |
|---|---|---|---|
| 25 | 15 to 55 | 67.5 | 12 |
| | 60 to 185 | 100.5 | |
| | 190 to 300 | 138 | |
| 32 | 20 to 55 | 74 | 16 |
| | 60 to 185 | 107 | |
| | 190 to 300 | 144 | |

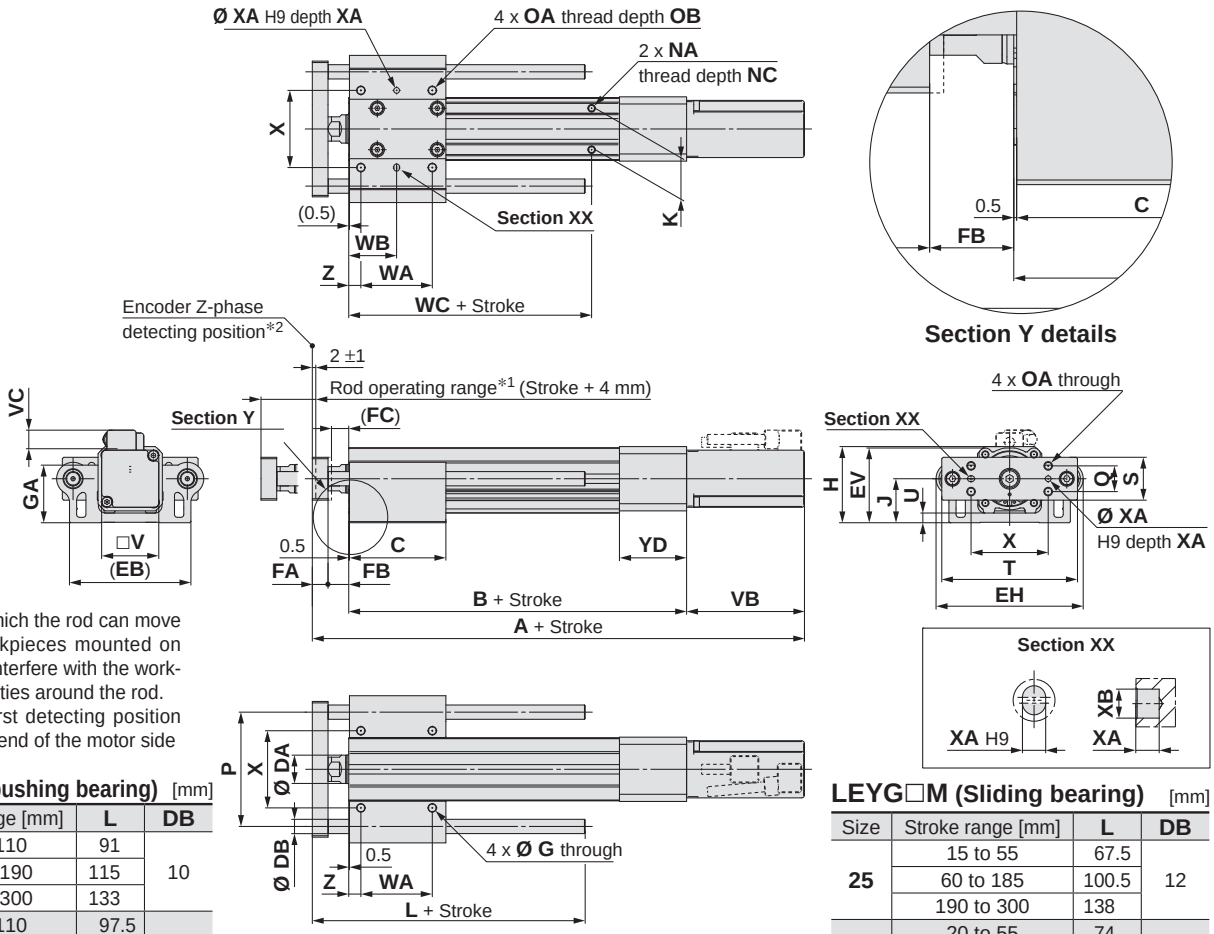
### LEYG□M, LEYG□L Common [mm]

| Size | Stroke range [mm] | A | B | C | DA | EA | EB | EH | EV | FA | FB | FC | G | GA | H | J | K | M | NA | NB | NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 35 | 141.5 | 116 | 50 | 20 | 46 | 85 | 103 | 52.3 | 11 | 14.5 | 12.5 | 5.4 | 40.3 | 98.8 | 30.8 | 29 | 34 | M5 x 0.8 | 8 | 6.5 |
| | 40 to 100 | | | 67.5 | | | | | | | | | | | | | | | | | |
| | 105 to 120 | 166.5 | 141 | | | | | | | | | | | | | | | | | | |
| | 125 to 200 | | | 84.5 | | | | | | | | | | | | | | | | | |
| | 205 to 300 | | | 102 | | | | | | | | | | | | | | | | | |
| 32 | 20 to 35 | 160.5 | 130 | 55 | 25 | 60 | 101 | 123 | 63.8 | 12 | 18.5 | 16.5 | 5.4 | 50.3 | 125.3 | 38.3 | 30 | 40 | M6 x 1.0 | 10 | 8.5 |
| | 40 to 100 | | | 68 | | | | | | | | | | | | | | | | | |
| | 105 to 120 | 190.5 | 160 | | | | | | | | | | | | | | | | | | |
| | 125 to 200 | | | 85 | | | | | | | | | | | | | | | | | |
| | 205 to 300 | | | 102 | | | | | | | | | | | | | | | | | |

| Size | Stroke range [mm] | OA | OB | P | Q | S | T | U | V | WA | WB | WC | X | XA | XB | Y | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 35 | M6 x 1.0 | 12 | 80 | 18 | 30 | 95 | 6.8 | 40 | 35 | 26 | 70 | 54 | 4 | 5 | 26.5 | 8.5 |
| | 40 to 100 | | | | | | | | | 50 | 33.5 | | | | | | |
| | 105 to 120 | | | | | | | | | | | 95 | | | | | |
| | 125 to 200 | | | | | | | | | 70 | 43.5 | | | | | | |
| | 205 to 300 | | | | | | | | | 85 | 51 | | | | | | |
| 32 | 20 to 35 | M6 x 1.0 | 12 | 95 | 28 | 40 | 117 | 7.3 | 60 | 40 | 28.5 | 75 | 64 | 5 | 6 | 34 | 8.5 |
| | 40 to 100 | | | | | | | | | 50 | 33.5 | | | | | | |
| | 105 to 120 | | | | | | | | | | | 105 | | | | | |
| | 125 to 200 | | | | | | | | | 70 | 43.5 | | | | | | |
| | 205 to 300 | | | | | | | | | 85 | 51 | | | | | | |

| Size | Without lock | | | With lock | | |
|---|---|---|---|---|---|---|
| | VA | VB | VC | VA | VB | VC |
| 25 | 115.5 | 82.5 | 11 | 160.5 | 127.5 | 11 |
| 32 | 120 | 80 | 14 | 160 | 120 | 14 |

## Dimensions: In-line Motor




*1 Range within which the rod can move Make sure workpieces mounted on the rod do not interfere with the work-pieces and facilities around the rod.
*2 The Z-phase first detecting position from the stroke end of the motor side

### LEYG□L (Ball bushing bearing) [mm]

| Size | Stroke range [mm] | L | DB |
|---|---|---|---|
| 25 | 15 to 110 | 91 | 10 |
| | 115 to 190 | 115 | |
| | 195 to 300 | 133 | |
| 32 | 20 to 110 | 97.5 | 13 |
| | 115 to 190 | 116.5 | |
| | 195 to 300 | 134 | |

### LEYG□M (Sliding bearing) [mm]

| Size | Stroke range [mm] | L | DB |
|---|---|---|---|
| 25 | 15 to 55 | 67.5 | 12 |
| | 60 to 185 | 100.5 | |
| | 190 to 300 | 138 | |
| 32 | 20 to 55 | 74 | 16 |
| | 60 to 185 | 107 | |
| | 190 to 300 | 144 | |

### LEYG□M, LEYG□L Common [mm]

| Size | Stroke range [mm] | B | C | DA | EB | EH | EV | FA | FB | FC | G | GA | H | J | K | NA | NC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 35 | 136.5 | 50 | 20 | 85 | 103 | 52.3 | 11 | 14.5 | 12.5 | 5.4 | 40.3 | 53.3 | 30.8 | 29 | M5 x 0.8 | 6.5 |
| | 40 to 100 | | 67.5 | | | | | | | | | | | | | | |
| | 105 to 120 | 161.5 | | | | | | | | | | | | | | | |
| | 125 to 200 | | 84.5 | | | | | | | | | | | | | | |
| | 205 to 300 | | 102 | | | | | | | | | | | | | | |
| 32 | 20 to 35 | 156 | 55 | 25 | 101 | 123 | 63.8 | 12 | 18.5 | 16.5 | 5.4 | 50.3 | 68.3 | 38.3 | 30 | M6 x 1.0 | 8.5 |
| | 40 to 100 | | 68 | | | | | | | | | | | | | | |
| | 105 to 120 | 186 | | | | | | | | | | | | | | | |
| | 125 to 200 | | 85 | | | | | | | | | | | | | | |
| | 205 to 300 | | 102 | | | | | | | | | | | | | | |

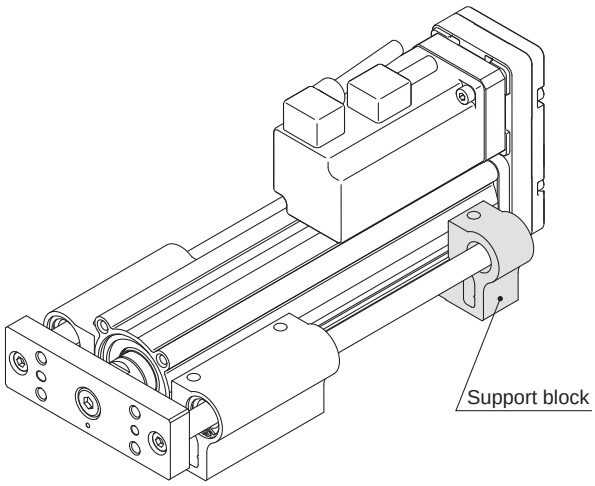
| Size | Stroke range [mm] | OA | OB | P | Q | S | T | U | V | WA | WB | WC | X | XA | XB | YD | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 35 | M6 x 1.0 | 12 | 80 | 18 | 30 | 95 | 6.8 | 40 | 35 | 26 | 70 | 54 | 4 | 5 | 47 | 8.5 |
| | 40 to 100 | | | | | | | | | 50 | 33.5 | | | | | | |
| | 105 to 120 | | | | | | | | | | | 95 | | | | | |
| | 125 to 200 | | | | | | | | | 70 | 43.5 | | | | | | |
| | 205 to 300 | | | | | | | | | 85 | 51 | | | | | | |
| 32 | 20 to 35 | M6 x 1.0 | 12 | 95 | 28 | 40 | 117 | 7.3 | 60 | 40 | 28.5 | 75 | 64 | 5 | 6 | 60 | 8.5 |
| | 40 to 100 | | | | | | | | | 50 | 33.5 | | | | | | |
| | 105 to 120 | | | | | | | | | | | 105 | | | | | |
| | 125 to 200 | | | | | | | | | 70 | 43.5 | | | | | | |
| | 205 to 300 | | | | | | | | | 85 | 51 | | | | | | |

| Size | Stroke range [mm] | Without lock | | | With lock | | |
|---|---|---|---|---|---|---|---|
| | | A | VB | VC | A | VB | VC |
| 25 | 15 to 100 | 255.5 | 82.5 | 11.5 | 300.5 | 127.5 | 11.5 |
| | 105 to 300 | 280.5 | | | 325.5 | | |
| 32 | 15 to 100 | 266.5 | 80 | 14 | 306.5 | 120 | 14 |
| | 105 to 300 | 296.5 | | | 336.5 | | |

## Support Block

### ●Guide for support block application

When the stroke exceeds 100 mm and the mounting orientation is horizontal, the body will be bent. Mounting the support block is recommended. (Please order it separately from the models shown below.)

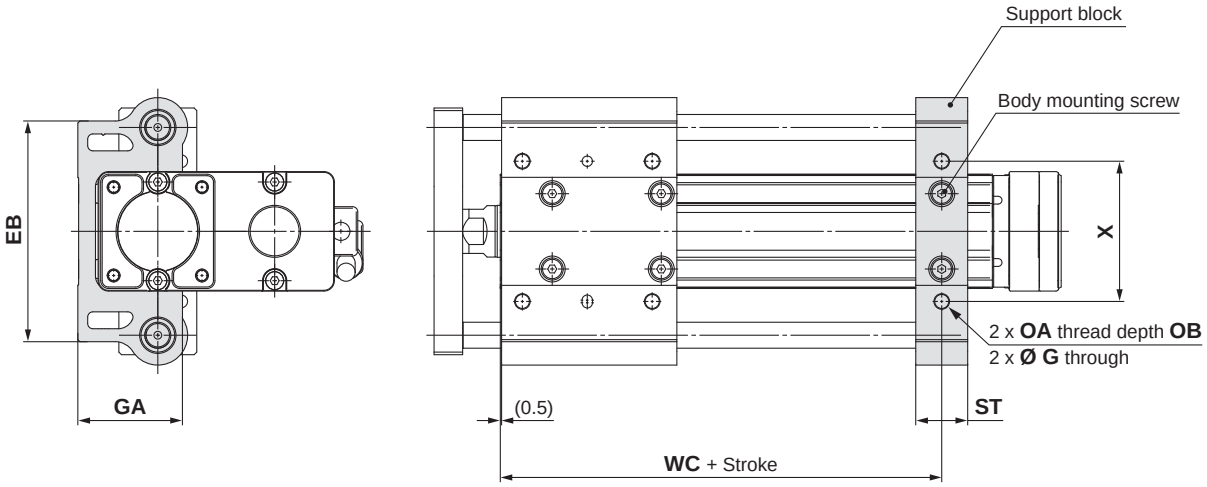



### Support Block Model

**LEYG−S025**

●**Size**

| | |
|---|---|
| **025** | For size 25 |
| **032** | For size 32 |




### ⚠Caution

Do not install the body using only a support block.
The support block should be used only for support.

[mm]

| Size | Model | Stroke range | EB | G | GA | OA | OB | ST | WC | X |
|---|---|---|---|---|---|---|---|---|---|---|
| **25** | **LEYG-S025** | 15 to 100 | 85 | 5.4 | 40.3 | M6 x 1.0 | 12 | 20 | 70 | 54 |
| | | 105 to 300 | | | | | | | 95 | |
| **32** | **LEYG-S032** | 20 to 100 | 101 | 5.4 | 50.3 | M6 x 1.0 | 12 | 22 | 75 | 64 |
| | | 105 to 300 | | | | | | | 105 | |

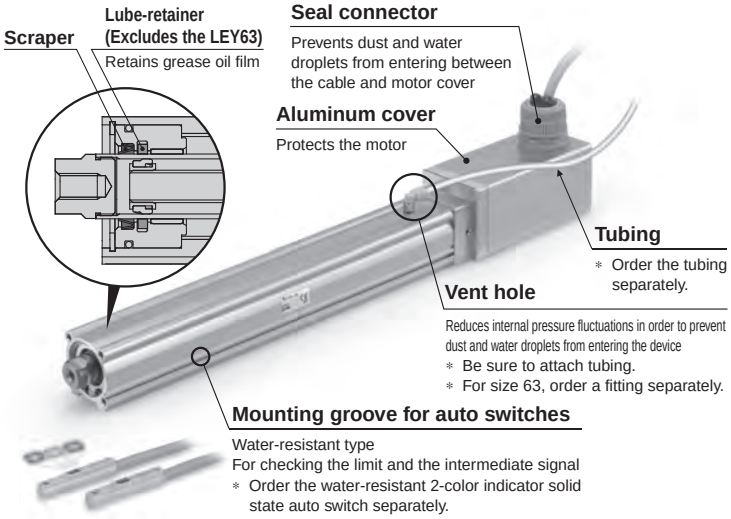
∗ Two body mounting screws are included with the support block.
∗ The through holes of the LEYG-S032 cannot be used for the motor top mounting type. Use taps on the bottom.

# Environment

## Dust-tight/Water-jet-proof (IP65 Equivalent)

- **Enclosure: IP65 equivalent**[*1]
- **Max. stroke: 500 mm**[*2]

*2 For size 32




*1 IP65 enclosure: The protection structure against solid foreign objects is dust-tight type and the protection structure against water is water-jet-proof type.
Dust-tight means that no dust can enter the inside of the equipment.
Water-jet-proof means that the product is not adversely affected by direct water jets from any direction. That is, even when direct water jets are applied to the product for 3 minutes by means of the pre-determined method, there is no water entry that hinders the correct operation inside the equipment. Be sure to take appropriate protective measures if the product is to be used in an environment where it will be constantly exposed to water or fluids other than water splash. In particular, the product cannot be used in environments where oils, such as cutting oil or cutting fluid, are present.

### LEY-X5 (Made to Order)

Size 25, 32

Step Motor (Servo/24 VDC)
Servo Motor (24 VDC) Type
p. 155

AC Servo Motor (100/200 W) Type
p. 163, 169

### LEY63□□□-□P

Size 63

AC Servo Motor (400 W) Type p. 79

* Option

## Secondary Battery Compatible

- **Copper (Cu) and zinc (Zn) free**[*1]

*1 Excludes motors, cables, controllers/drivers

- **Compatible with dew points as low as −70 °C**

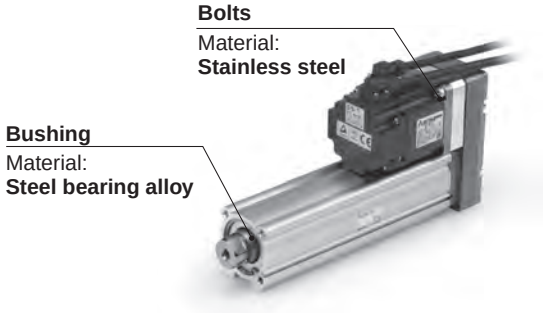
Uses grease compatible with low dew points

### Rod Type/25A-LEY

Step Motor (Servo/24 VDC) Servo Motor (24 VDC) Type
p. 177


| Motor type | Size 16 | 25 | 32 | 40 |
|---|---|---|---|---|
| Step motor (Servo/24 VDC) | ● | ● | ● | ● |
| Servo motor (24 VDC) | ● | ● | ● | |

AC Servo Motor Type p. 181, 183




| Motor type | Size 25 | 32 |
|---|---|---|
| AC servo motor | ● | ● |

* Copper and zinc materials are used for the motors, cables, controllers/drivers.

# Model Selection

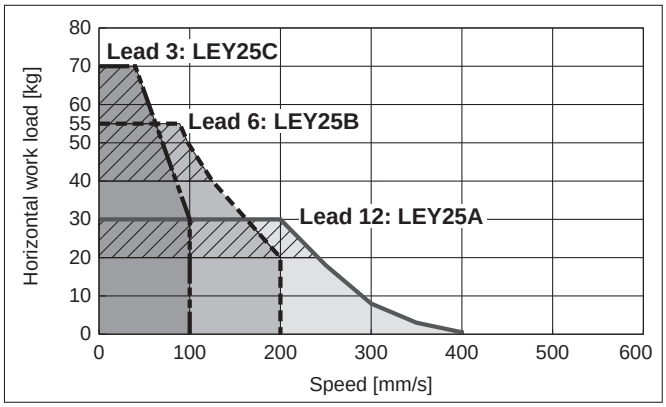
LEY-X5 Series ▶ p. 155

Refer to page 108 for the LECPA, JXC□$^{2}_{3}$ and page 109 for the LECA6.

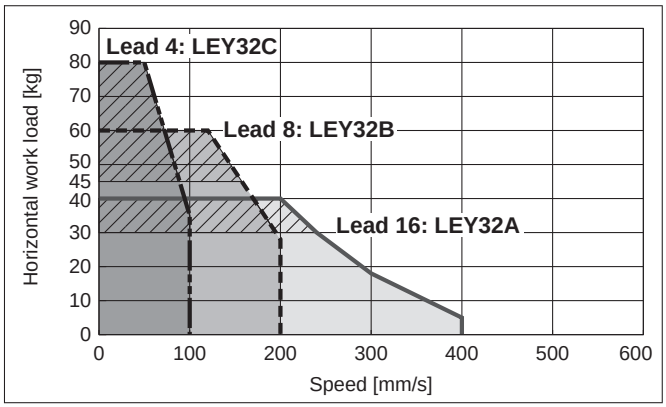
## Speed–Work Load Graph (Guide) for Step Motor (Servo/24 VDC) LECP1, JXC□1

### Horizontal

**LEY25□-X5** ▨ for acceleration/deceleration: 2000 mm/s²

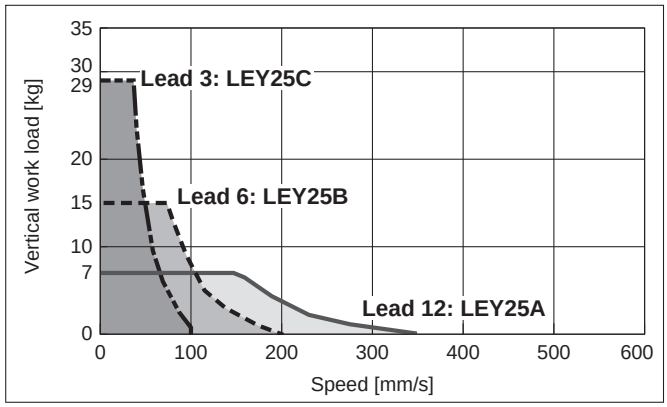



**LEY32□-X5** ▨ for acceleration/deceleration: 2000 mm/s²

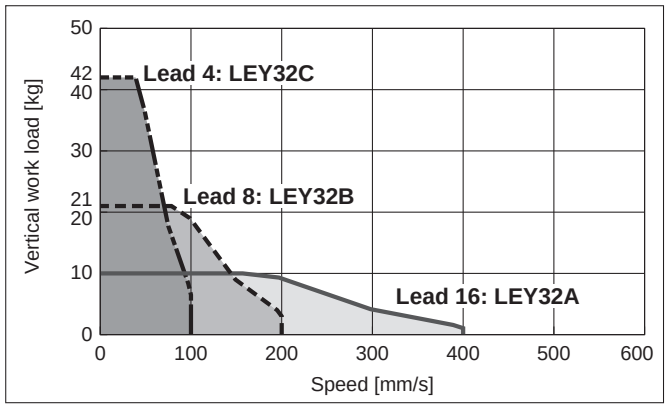



### Vertical

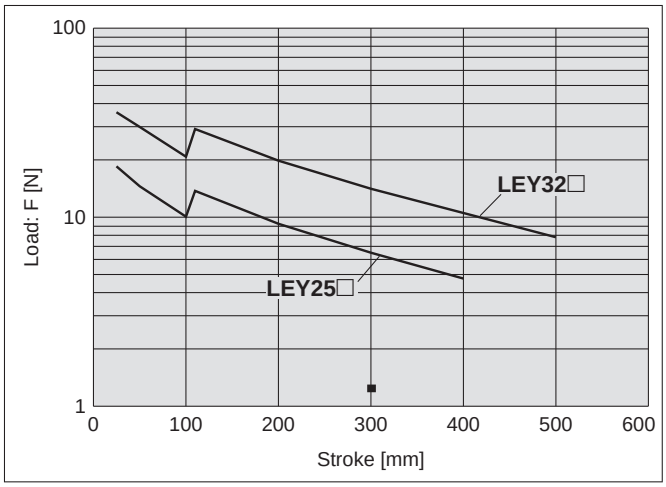
**LEY25□-X5**



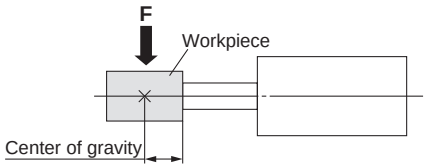

**LEY32□-X5**




## Graph of Allowable Lateral Load on the Rod End (Guide)

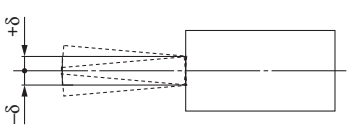



**[Stroke] = [Product stroke] + [Distance from the rod end to the centre of gravity of the workpiece]**




## Rod Displacement: δ [mm]

| Size \ Stroke | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **25** | ±0.3 | ±0.4 | ±0.7 | ±0.7 | ±0.9 | ±1.1 | ±1.3 | ±1.5 | ±1.7 | — | — |
| **32** | ±0.3 | ±0.4 | ±0.7 | ±0.6 | ±0.8 | ±1.0 | ±1.1 | ±1.3 | ±1.5 | ±1.7 | ±1.8 |

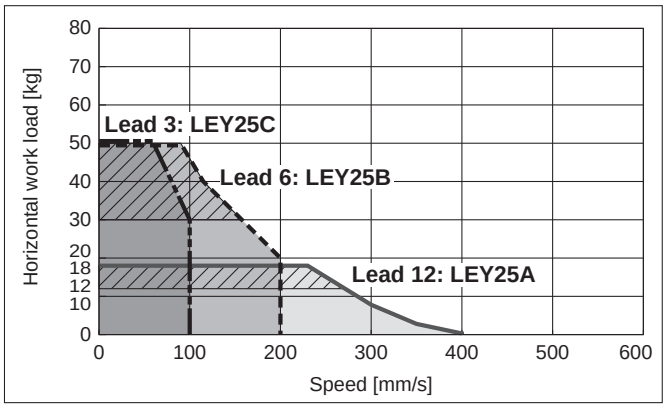


Refer to page 107 for the LECP1, JXC□1 and page 109 for the LECA6.

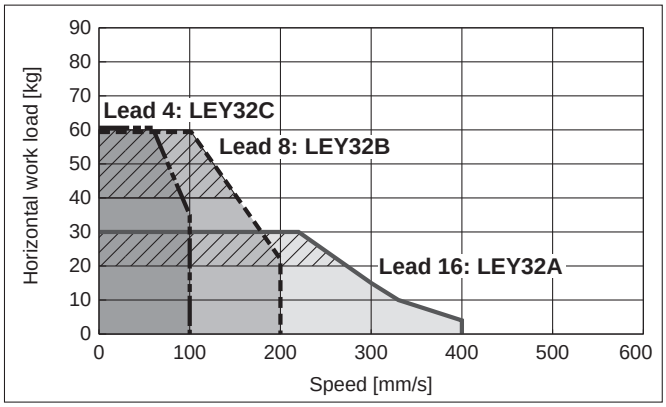
## Speed–Work Load Graph (Guide)
## For Step Motor (Servo/24 VDC) LECPA, JXC□ 2 3

### Horizontal

#### LEY25□-X5

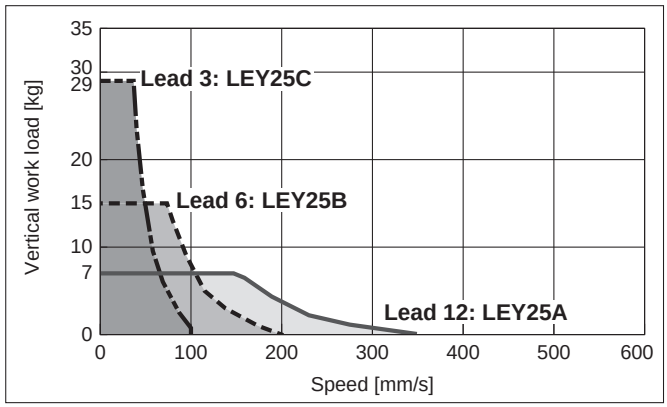



#### LEY32□-X5

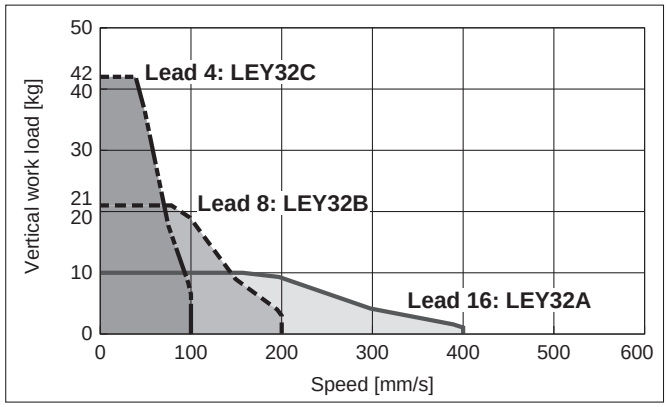



### Vertical

#### LEY25□-X5



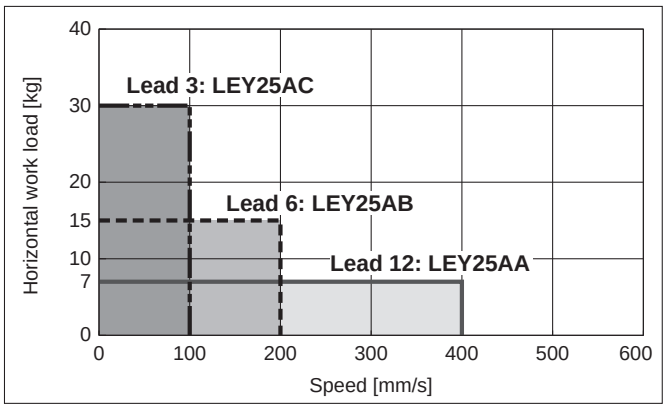

#### LEY32□-X5




## For Servo Motor (24 VDC) LECA6

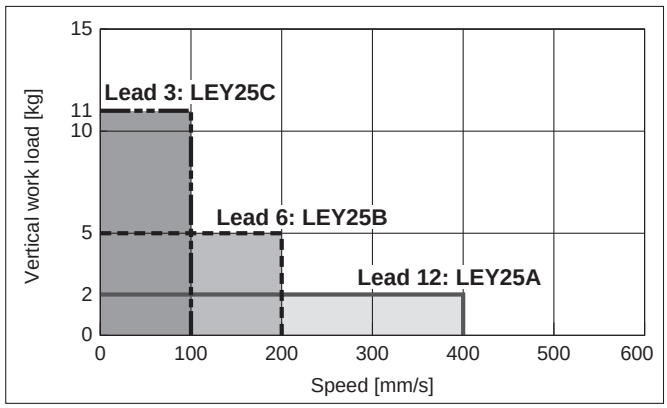
### Horizontal

#### LEY25□A-X5




### Vertical

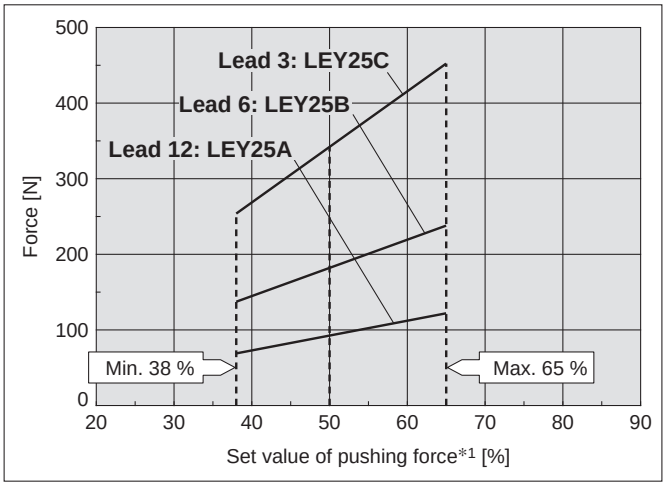
#### LEY25□A-X5



## Force Conversion Graph

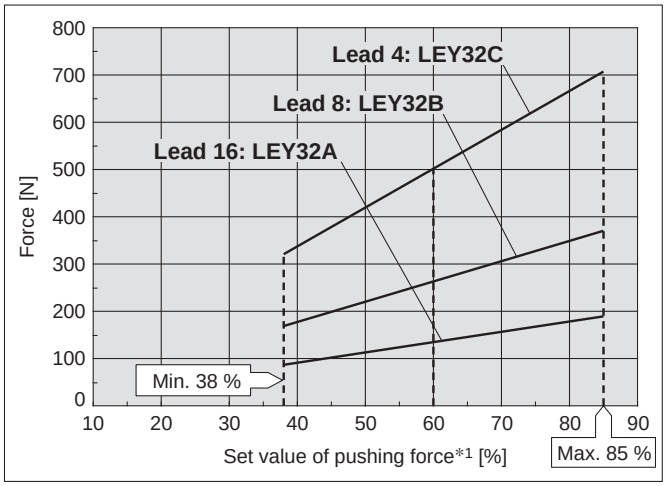
### Step Motor (Servo/24 VDC)

#### LEY25□-X5




| Ambient temperature | Set value of pushing force*1 [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **40 °C or less** | 65 or less | 100 | — |

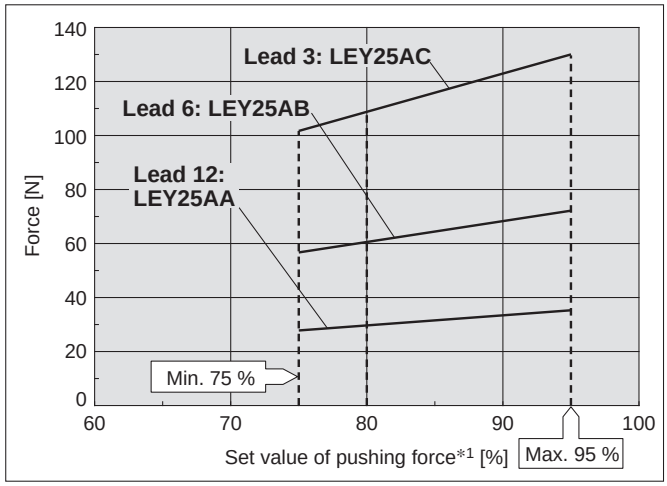
#### LEY32□-X5




| Ambient temperature | Set value of pushing force*1 [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **25 °C or less** | 85 or less | 100 | — |
| **40 °C** | 65 or less | 100 | — |
| | 85 | 50 | 15 |

### Servo Motor (24 VDC)

#### LEY25□A-X5




| Ambient temperature | Set value of pushing force*1 [%] | Duty ratio [%] | Continuous pushing time [minute] |
|---|---|---|---|
| **40 °C or less** | 95 or less | 100 | — |

#### <Limit Values for Pushing Force and Trigger Level in Relation to Pushing Speed>
#### Without Load

| Model | Lead | Pushing speed [mm/s] | Pushing force (Setting input value) |
|---|---|---|---|
| **LEY25** | A/B/C | 21 to 35 | 50 to 65 % |
| **LEY32** | A | 24 to 30 | 60 to 85 % |
| | B/C | 21 to 30 | |

| Model | Lead | Pushing speed [mm/s] | Pushing force (Setting input value) |
|---|---|---|---|
| **LEY25□A** | A/B/C | 21 to 35 | 80 to 95 % |

There is a limit to the pushing force in relation to the pushing speed. If the product is operated outside of the range (low pushing force), the completion signal [INP] may be output before the pushing operation has been completed (during the moving operation).
If operating with the pushing speed below the min. speed, please check for operating problems before using the product.

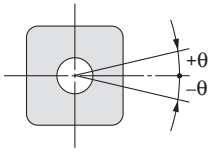
#### <Set Values for Vertical Upward Transfer Pushing Operations>

For vertical loads (upward), set the pushing force to the max. value shown below and operate at the work load or less.

| Model | LEY25□ | | | LEY32□ | | | LEY25□A | | |
|---|---|---|---|---|---|---|---|---|---|
| Lead | A | B | C | A | B | C | A | B | C |
| Work load [kg] | 2.5 | 5 | 10 | 4.5 | 9 | 18 | 1.2 | 2.5 | 5 |
| Pushing force | 65 % | | | 85 % | | | 95 % | | |

∗1 Set values for the controller

## Non-rotating Accuracy of Rod




| Size | Non-rotating accuracy θ |
|---|---|
| **25** | ±0.8° |
| **32** | ±0.7° |

∗ Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod.
This may cause the deformation of the non-rotating guide, abnormal auto switch responses, play in the internal guide, or an increase in the sliding resistance.

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

# Electric Actuator/ Rod Type

Dust-tight/Water-jet-proof (IP65 Equivalent)

(Only applicable to the JXC□)

## *LEY-X5* (Made to Order) *Series* LEY25, 32

RoHS

Refer to page 151 for model selection.

## How to Order

LEY 25 D □ B – 50 □ □ □ – R1 – X5

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

*LEC*□ *Series* 6P

*JXC*□ *Series* CD17T

❿ ⓫ ⓬

For details on controllers, refer to page 156.

● Made to order: Dust-tight/ Water-jet-proof

### ❶ Size

| |
|---|
| 25 |
| 32 |

### ❷ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| D | In-line |

### ❸ Motor type

| Symbol | Type | Size 25 | Size 32 | Compatible controller/driver |
|---|---|---|---|---|
| — | Step motor (Servo/24 VDC) | ● | ● | LECP1, LECPA, JXCE1, JXC91, JXCP1, JXCD1, JXCL1 |
| A | Servo motor (24 VDC) | ● | — | LECA6 |

### ❹ Lead [mm]

| Symbol | LEY25 | LEY32 |
|---|---|---|
| A | 12 | 16 |
| B | 6 | 8 |
| C | 3 | 4 |

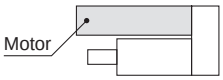
### ❺ Stroke [mm]

| | |
|---|---|
| 30 | 30 |
| to | to |
| 500 | 500 |

∗ For details, refer to the applicable stroke table below.

### ❻ Motor option∗2

| | |
|---|---|
| — | Without option |
| B | With lock |




### ❼ Rod end thread

| | |
|---|---|
| — | Rod end female thread |
| M | Rod end male thread (1 rod end nut is included.) |

### ❽ Mounting∗3

| Symbol | Type | Motor mounting position: Top mounting | Motor mounting position: In-line |
|---|---|---|---|
| — | Ends tapped/Body bottom tapped∗4 | ● | ● |
| L | Foot | ● | — |
| F | Rod flange∗4 | ●∗5 | ● |
| G | Head flange∗4 | ●∗6 | — |

### ❾ Actuator cable type/length

Robotic cable [m]

| | | | |
|---|---|---|---|
| R1 | 1.5 | RA | 10∗7 |
| R3 | 3 | RB | 15∗7 |
| R5 | 5 | RC | 20∗7 |
| R8 | 8∗7 | | |

### Applicable Stroke Table∗1

●: Standard

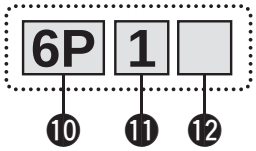
| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | Manufacturable stroke range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEY25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | — | — | 15 to 400 |
| LEY32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 to 500 |

∗ For auto switches, refer to page 176.
∗ "-X5" is not added to an actuator model with a controller/driver part number suffix.
Example) "LEY25DB-100" for the LEY25DB-100BMU-R16N1D-X5



SMC

## LEC□ Series (For details, refer to page 157.)




### ⑩ Controller/Driver type*8

| | | |
|---|---|---|
| — | Without controller/driver | |
| 6N | **LECA6** (Step data input type) | NPN |
| 6P | | PNP |
| 1N | **LECP1***9 (Programless type) | NPN |
| 1P | | PNP |
| AN | **LECPA***9 *11 (Pulse input type) | NPN |
| AP | | PNP |

### ⑪ I/O cable length*12, Communication plug

| | |
|---|---|
| — | Without cable |
| 1 | 1.5 m |
| 3 | 3 m*13 |
| 5 | 5 m*13 |
| S | Straight type communication plug connector |
| T | T-branch type communication plug connector |

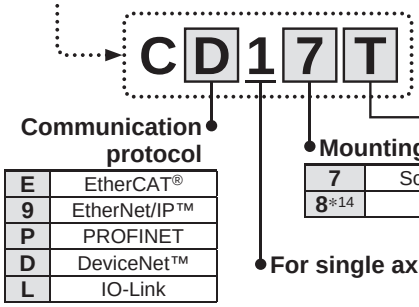
### ⑫ Controller/Driver mounting

| | |
|---|---|
| — | Screw mounting |
| D | DIN rail*14 |

## JXC□ Series (For details, refer to page 157.)

### ⑩ Controller

| | |
|---|---|
| — | Without controller |
| C□1□□ | With controller |




*1 Please consult with SMC for non-standard strokes as they are produced as special orders.
*2 When "With lock" is selected for the top mounting type, the motor body will stick out from the end of the body for strokes of 5 0 mm or less. Check for interference with workpieces before selecting a model.
*3 The mounting bracket is shipped together with the product but does not come assembled.
*4 For the horizontal cantilever mounting of the rod flange, head flange, or ends tapped types, use the actuator within the following stroke range.
·LEY25: 200 mm or less ·LEY32: 100 mm or less
*5 The rod flange type is not available for the LEY 2 5 / 3 2 with strokes of 50 mm or less and motor option "With lock."
*6 The head flange type is not available for the LEY32.
*7 Produced upon receipt of order (Robotic cable only)
*8 For details on controllers/drivers and compatible motors, refer to the compatible controller/driver on the next page.
*9 Only available for the motor type "Step motor"
*10 Not compliant with CE
*11 When pulse signals are open collector, order the current limiting resistor (LEC-PA-R-□) on page 220 separately.
*12 When "Without controller/driver" is selected for controller/driver types, I/O cable cannot be selected. Refer to page 199 (For LECA6), page 213 (For LECP1), or page 220 (For LECPA) if I/O cable is required.
*13 When "Pulse input type" is selected for controller/driver types, pulse input usable only with differential. Only 1.5 m cables usable with open collector
*14 The DIN rail is not included. Order it separately.
*15 Select "—" for anything other than DeviceNet™.

### ⚠Caution

**[CE-compliant products]**

① EMC compliance was tested by combining the electric actuator LEY series and the controller LEC/JXC series.
The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with 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 compliance with the EMC directive for the machinery and equipment as a whole.

② For the servo motor (24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 199 for the noise filter set. Refer to the LECA series Operation Manual for installation.

**[UL-compliant products (For the LEC series)]**

When compliance with UL is required, the electric actuator and controller/driver should be used with a UL1310 Class 2 power supply.

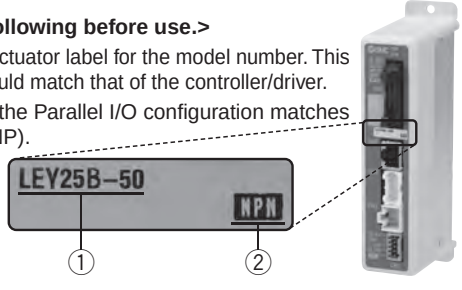
### The actuator and controller/driver are sold as a package.

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

**<Check the following before use.>**

① Check the actuator label for the model number. This number should match that of the controller/driver.

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




* Refer to the Operation Manual for using the products. Please download it via our website, https://www.smc.eu

**Compatible Controller/Driver**

## *LEC□* Series

| Type | Step data input type  | Programless type  | Pulse input type  |
|---|---|---|---|
| **Series** | **LECA6** | **LECP1** | **LECPA** |
| **Features** | Value (Step data) input Standard controller | Capable of setting up operation (step data) without using a PC or teaching box | Operation by pulse signals |
| **Compatible motor** | Servo motor (24 VDC) | Servo motor (Servo/24 VDC) | |
| **Max. number of step data** | 64 points | 14 points | — |
| **Power supply voltage** | | | |
| **Reference page** | 191 | 207 | 214 |

## *JXC□* Series

| Type | EtherCAT® direct input type  | EtherNet/IP™ direct input type  | PROFINET direct input type  | DeviceNet™ direct input type  | IO-Link direct input type  |
|---|---|---|---|---|---|
| **Series** | **JXCE1** | **JXC91** | **JXCP1** | **JXCD1** | **JXCL1** |
| **Features** | EtherCAT® direct input | EtherNet/IP™ direct input | PROFINET direct input | DeviceNet™ direct input | IO-Link direct input |
| **Compatible motor** | Step motor (Servo/24 VDC) | | | | |
| **Max. number of step data** | 64 points | | | | |
| **Power supply voltage** | 24 VDC | | | | |
| **Reference page** | 224 | | | | |

## Specifications

### Step Motor (Servo/24 VDC)

| Model | | | | | LEY25□-X5 | | | LEY32□-X5 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg]*1 | Horizontal | For LECP1 JXC□1 | (3000 [mm/s²]) | 20 | 40 | 60 | 30 | 45 | 60 |
| | | | | (2000 [mm/s²]) | 30 | 60 | 70 | 40 | 60 | 80 |
| | | | For LECPA JXC□2/3 | (3000 [mm/s²]) | 12 | 30 | 30 | 20 | 40 | 40 |
| | | | | (2000 [mm/s²]) | 18 | 50 | 50 | 30 | 60 | 60 |
| | | Vertical*14 | | (3000 [mm/s²]) | 7 | 15 | 29 | 10 | 21 | 42 |
| | Pushing force [N]*2 *3 *4 | | | | 63 to 122 | 126 to 238 | 232 to 452 | 80 to 189 | 156 to 370 | 296 to 707 |
| | Speed [mm/s]*4 | | | | 18 to 400 | 9 to 200 | 5 to 100 | 24 to 400 | 12 to 200 | 6 to 100 |
| | Max. acceleration/deceleration [mm/s²] | | | | 3000 | | | | | |
| | Pushing speed [mm/s]*5 | | | | 35 or less | | | 30 or less | | |
| | Positioning repeatability [mm] | | | | ±0.02 | | | | | |
| | Lost motion [mm]*6 | | | | 0.1 or less | | | | | |
| | Screw lead [mm] | | | | 12 | 6 | 3 | 16 | 8 | 4 |
| | Impact/Vibration resistance [m/s²]*7 | | | | 50/20 | | | | | |
| | Actuation type | | | | Ball screw + Belt (LEY□)<br>Ball screw (LEY□D) | | | | | |
| | Guide type | | | | Sliding bushing (Piston rod) | | | | | |
| | Enclosure*8 | | | | IP65 equivalent | | | | | |
| | Operating temperature range [°C] | | | | 5 to 40 | | | | | |
| | Operating humidity range [%RH] | | | | 90 or less (No condensation) | | | | | |
| Electric specifications | Motor size | | | | □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]*9 | | | | 40 | | | 50 | | |
| | Standby power consumption when operating [W]*10 | | | | 15 | | | 48 | | |
| | Max. instantaneous power consumption [W]*11 | | | | 48 | | | 104 | | |
| Lock unit specifications | Type*12 | | | | Non-magnetising lock | | | | | |
| | Holding force [N] | | | | 78 | 157 | 294 | 108 | 216 | 421 |
| | Power consumption [W]*13 | | | | 5 | | | 5 | | |
| | Rated voltage [V] | | | | 24 VDC ±10 % | | | | | |

*1 Horizontal: The maximum value of the work load. An external guide is necessary to support the load. (Friction coefficient of guide: 0.1 or less) The actual work load and transfer speed change according to the condition of the external guide. Also, speed changes according to the work load. Check "Model Selection" on pages 151 and 152.
Vertical: Speed changes according to the work load. Check "Model Selection" on pages 151 and 152.
The values shown in ( ) are the acceleration/deceleration. Set these values to be 3000 [mm/s²] or less.
*2 Pushing force accuracy is ±20 % (F.S.).
*3 The thrust setting values for LEY25□ is 38 % to 65 % and for LEY32□ is 38 % to 85 %. The pushing force values change according to the duty ratio and pushing speed. Check "Model Selection" on page 153.
*4 The speed and force may change depending on the cable length, load, and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10 % for each 5 m. (At 15 m: Reduced by up to 20 %)
*5 The allowable speed for pushing operation. When push conveying a workpiece, operate at the vertical work load or less.
*6 A reference value for correcting an error in reciprocal operation
*7 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*8 Cannot be used in an environment where oil such as cutting oil splashes or it is constantly exposed to water
Take appropriate protective measures. For details on enclosure, refer to "Enclosure" on page 188.
*9 The power consumption (including the controller) is for when the actuator is operating.
*10 The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation. Except during the pushing operation
*11 The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.
*12 With lock only
*13 For an actuator with lock, add the power consumption for the lock.
*14 When mounting vertically and using the product facing upwards in an environment where water is present, take necessary measures to prevent water from splashing on the rod cover, because water will accumulate on the rod seal due to the structure of the product.

## Specifications

### Servo Motor (24 VDC)

| | Model | | | LEY25□A-X5 | | |
|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg]*1 | Horizontal | (3000 [mm/s²]) | 7 | 15 | 30 |
| | | Vertical*13 | (3000 [mm/s²]) | 2 | 5 | 11 |
| | Pushing force [N]*2 *3 | | | 18 to 35 | 37 to 72 | 66 to 130 |
| | Speed [mm/s] | | | 2 to 400 | 1 to 200 | 1 to 100 |
| | Max. acceleration/deceleration [mm/s²] | | | 3000 | | |
| | Pushing speed [mm/s]*4 | | | 35 or less | | |
| | Positioning repeatability [mm] | | | ±0.02 | | |
| | Lost motion [mm]*5 | | | 0.1 or less | | |
| | Screw lead [mm] | | | 12 | 6 | 3 |
| | Impact/Vibration resistance [m/s²]*6 | | | 50/20 | | |
| | Actuation type | | | Ball screw + Belt (LEY□)<br>Ball screw (LEY□D) | | |
| | Guide type | | | Sliding bushing (Piston rod) | | |
| | Enclosure*7 | | | IP65 equivalent | | |
| | Operating temperature range [°C] | | | 5 to 40 | | |
| | Operating humidity range [%RH] | | | 90 or less (No condensation) | | |
| Electric specifications | Motor size | | | □42 | | |
| | 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]*8 | | | 86 | | |
| | Standby power consumption when operating [W]*9 | | | 4 (Horizontal)/12 (Vertical) | | |
| | Max. instantaneous power consumption [W]*10 | | | 96 | | |
| Lock unit specifications | Type*11 | | | Non-magnetising lock | | |
| | Holding force [N] | | | 78 | 157 | 294 |
| | Power consumption [W]*12 | | | 5 | | |
| | Rated voltage [V] | | | 24 VDC ±10 % | | |

*1 Horizontal: The maximum value of the work load. An external guide is necessary to support the load. (Friction coefficient of guide: 0.1 or less) The actual work load and transfer speed change according to the condition of the external guide. Vertical: Speed changes according to the work load. Check "Model Selection" on page 152. The values shown in ( ) are the acceleration/deceleration.
Set these values to be 3000 [mm/s²] or less.

*2 Pushing force accuracy is ±20 % (F.S.).

*3 The thrust setting values for LEY25A□ is 75 % to 95 %. The pushing force values change according to the duty ratio and pushing speed. Check "Model Selection" on page 153.

*4 The allowable speed for pushing operation
When push conveying a workpiece, operate at the vertical work load or less.

*5 A reference value for correcting an error in reciprocal operation

*6 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)

*7 Cannot be used in an environment where oil such as cutting oil splashes or it is constantly exposed to water
Take appropriate protective measures. For details on enclosure, refer to "Enclosure" on page 188.

*8 The power consumption (including the controller) is for when the actuator is operating.

*9 The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation with the maximum work load. Except during the pushing operation

*10 The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.

*11 With lock only

*12 For an actuator with lock, add the power consumption for the lock.

*13 When mounting vertically and using the product facing upwards in an environment where water is present, take necessary measures to prevent water from splashing on the rod cover, because water will accumulate on the rod seal due to the structure of the product.

## Weight

### Weight: Motor Top Mounting Type

| Model | | LEY25-X5 | | | | | | | | | LEY32-X5 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Product weight [kg] | Step motor | 1.45 | 1.52 | 1.69 | 1.95 | 2.13 | 2.30 | 2.48 | 2.65 | 2.83 | 2.48 | 2.59 | 2.88 | 3.35 | 3.64 | 3.91 | 4.21 | 4.49 | 4.76 | 5.04 | 5.32 |
| | Servo motor | 1.41 | 1.48 | 1.65 | 1.91 | 2.09 | 2.26 | 2.44 | 2.61 | 2.79 | — | — | — | — | — | — | — | — | — | — | — |

### Weight: In-line Motor Type

| Model | | LEY25D-X5 | | | | | | | | | LEY32D-X5 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Product weight [kg] | Step motor | 1.46 | 1.53 | 1.70 | 1.96 | 2.14 | 2.31 | 2.49 | 2.66 | 2.84 | 2.49 | 2.60 | 2.89 | 3.36 | 3.65 | 3.92 | 4.22 | 4.50 | 4.77 | 5.05 | 5.33 |
| | Servo motor | 1.42 | 1.49 | 1.66 | 1.92 | 2.10 | 2.27 | 2.45 | 2.62 | 2.80 | — | — | — | — | — | — | — | — | — | — | — |

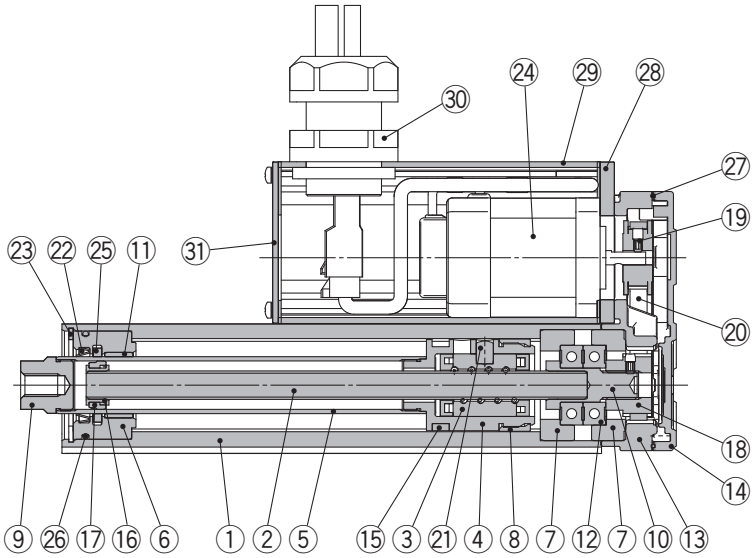
### Additional Weight

[kg]

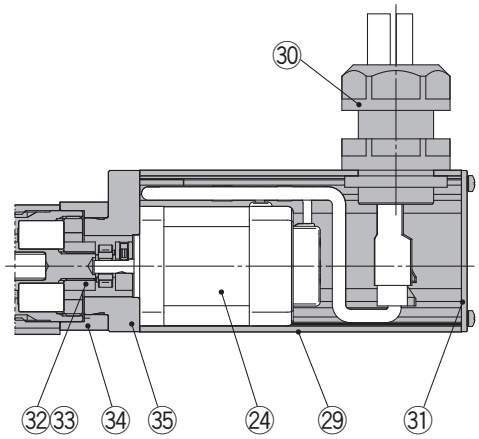
| Size | | 25 | 32 |
|---|---|---|---|
| Lock | | 0.33 | 0.63 |
| Rod end male thread | Male thread | 0.03 | 0.03 |
| | Nut | 0.02 | 0.02 |
| Foot bracket (2 sets including mounting bolt) | | 0.08 | 0.14 |
| Rod flange (including mounting bolt) | | 0.17 | 0.20 |
| Head flange (including mounting bolt) | | | |

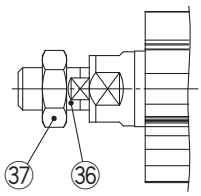
## Construction

### Motor top mounting type: LEY$^{25}_{32}$




### In-line motor type: LEY$^{25}_{32}$D




When rod end male thread selected

### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Aluminium alloy | Anodised |
| 2 | **Ball screw shaft** | Alloy steel | |
| 3 | **Ball screw nut** | Synthetic resin/Alloy steel | |
| 4 | **Piston** | Aluminium alloy | |
| 5 | **Piston rod** | Stainless steel | Hard chrome plating |
| 6 | **Rod cover** | Aluminium alloy | |
| 7 | **Bearing holder** | Aluminium alloy | |
| 8 | **Rotation stopper** | POM | |
| 9 | **Socket** | Free cutting carbon steel | Nickel plating |
| 10 | **Connected shaft** | Free cutting carbon steel | Nickel plating |
| 11 | **Bushing** | Bearing alloy | |
| 12 | **Bearing** | — | |
| 13 | **Return box** | Aluminium die-cast | Coating |
| 14 | **Return plate** | Aluminium die-cast | Coating |
| 15 | **Magnet** | — | |
| 16 | **Wear ring holder** | Stainless steel | Stroke 101 mm or more |
| 17 | **Wear ring** | POM | Stroke 101 mm or more |
| 18 | **Screw shaft pulley** | Aluminium alloy | |
| 19 | **Motor pulley** | Aluminium alloy | |

| No. | Description | Material | Note |
|---|---|---|---|
| 20 | **Belt** | — | |
| 21 | **Parallel pin** | Stainless steel | |
| 22 | **Scraper** | Nylon | |
| 23 | **Retaining ring** | Steel for spring | Phosphate coated |
| 24 | **Motor** | — | |
| 25 | **Lube-retainer** | Felt | |
| 26 | **O-ring** | NBR | |
| 27 | **Gasket** | NBR | |
| 28 | **Motor adapter** | Aluminium alloy | Anodised |
| 29 | **Motor cover** | Aluminium alloy | Anodised |
| 30 | **Seal connector** | — | |
| 31 | **End cover** | Aluminium alloy | Anodised |
| 32 | **Hub** | Aluminium alloy | |
| 33 | **Spider** | NBR | |
| 34 | **Motor block** | Aluminium alloy | Anodised |
| 35 | **Motor adapter** | Aluminium alloy | LEY25 only |
| 36 | **Socket (Male thread)** | Free cutting carbon steel | Nickel plating |
| 37 | **Nut** | Alloy steel | Zinc chromated |

### Replacement Parts (Motor top mounting only)/Belt

| No. | Size | Order no. |
|---|---|---|
| 20 | **25** | LE-D-2-2 |
| | **32** | LE-D-2-3 |

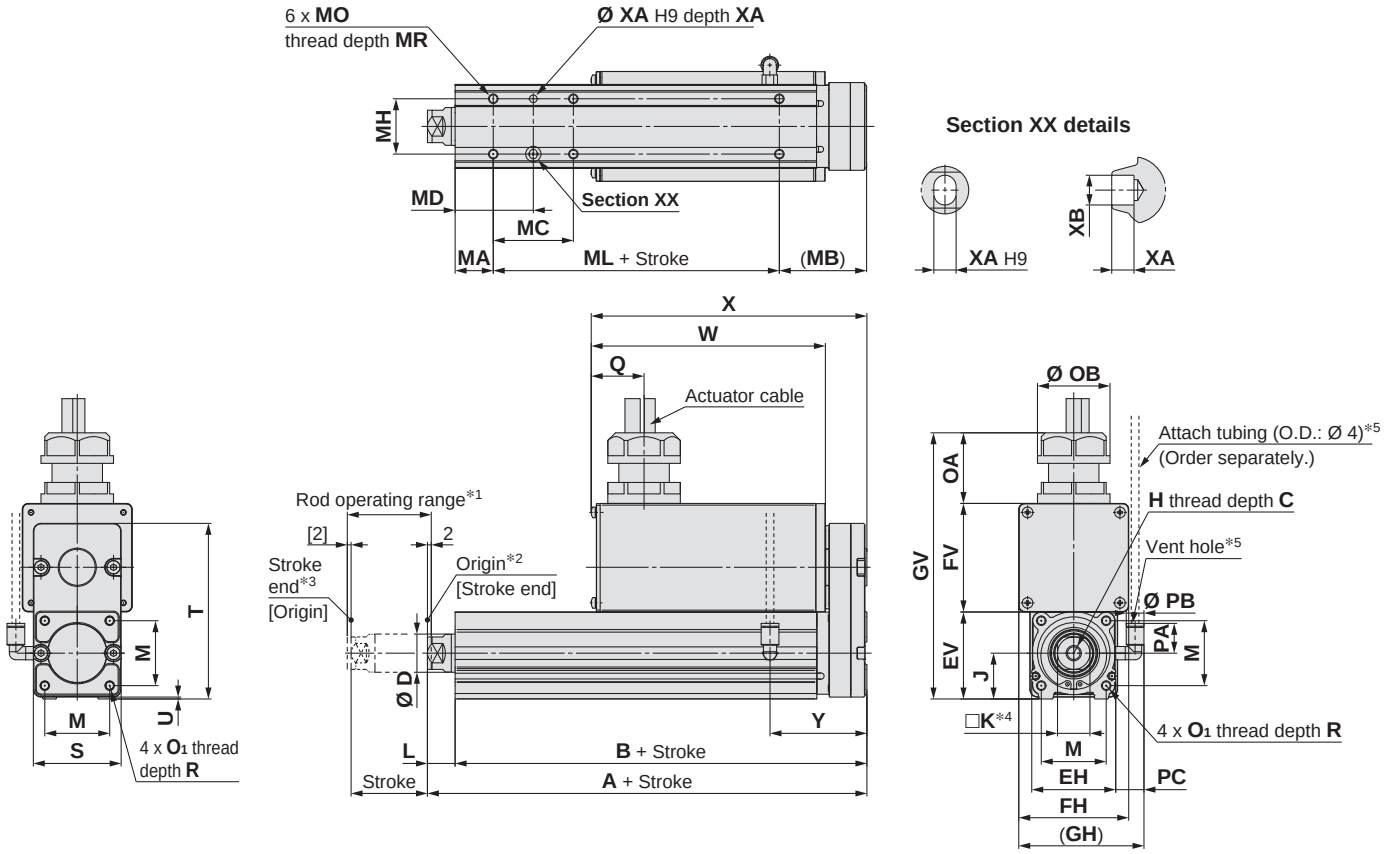
### Replacement Parts/Grease Pack

| Applied portion | Order no. |
|---|---|
| Piston rod | GR-S-010 (10 g)<br>GR-S-020 (20 g) |

∗ Apply grease on the piston rod periodically.
Grease should be applied at 1 million cycles or 200 km, whichever comes first.

## Dimensions

### Motor top mounting type




[mm]

| Size | Stroke range [mm] | A | B | C | D | EH | EV | FH | FV | GH | GV | H | J | K | L | M | O1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 100 | 130.5 | 116 | 13 | 20 | 44 | 45.5 | 57.6 | 56.8 | 66.2 | 139.5 | M8 x 1.25 | 24 | 17 | 14.5 | 34 | M5 x 0.8 |
| | 101 to 400 | 155.5 | 141 | | | | | | | | | | | | | | |
| 32 | 20 to 100 | 148.5 | 130 | 13 | 25 | 51 | 56.5 | 69.6 | 78.6 | 76.2 | 173.5 | M8 x 1.25 | 31 | 22 | 18.5 | 40 | M6 x 1.0 |
| | 101 to 500 | 178.5 | 160 | | | | | | | | | | | | | | |

| Size | Stroke range [mm] | R | OA | OB | PA | PB | Q | S | T | U | PC | W | | X | | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Without lock | With lock | Without lock | With lock | |
| 25 | 15 to 100 | 8 | 37 | 38 | 15.4 | 8.2 | 28 | 46 | 92 | 1 | 15.4 | 123 | 173 | 145 | 195 | 51 |
| | 101 to 400 | | | | | | | | | | | | | | | |
| 32 | 20 to 100 | 10 | 37 | 38 | 15.4 | 8.2 | 28 | 60 | 118 | 1 | 15.9 | 123 | 173 | 150 | 200 | 61 |
| | 101 to 500 | | | | | | | | | | | | | | | |

### Body Bottom Tapped

[mm]

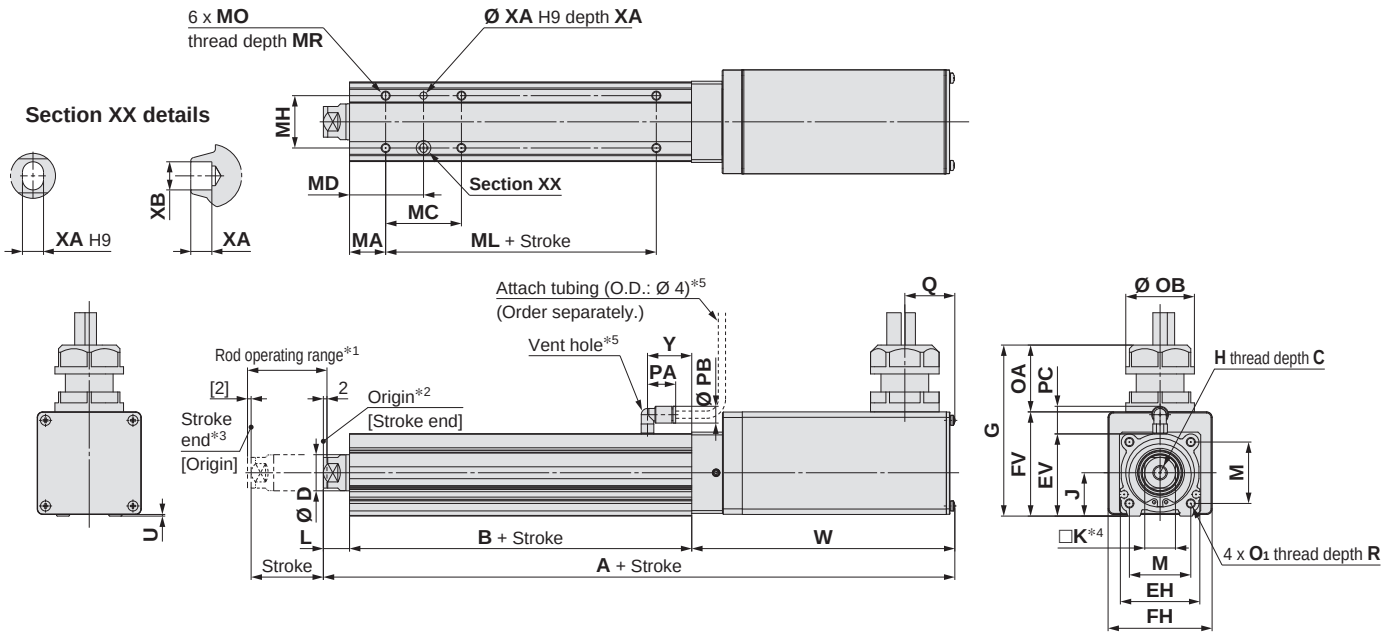
| Size | Stroke range [mm] | MA | MB | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 39 | 20 | 46 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | | 42 | 41 | | | | | | |
| | 101 to 124 | | | | | | 75 | | | | |
| | 125 to 200 | | | 59 | 49.5 | | | | | | |
| | 201 to 400 | | | 76 | 58 | | | | | | |
| 32 | 20 to 39 | 25 | 55 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | | 36 | 43 | | | | | | |
| | 101 to 124 | | | | | | 80 | | | | |
| | 125 to 200 | | | 53 | 51.5 | | | | | | |
| | 201 to 500 | | | 70 | 60 | | | | | | |

∗1 Range within which the rod can move when it returns to origin
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 Position after return to origin
∗3 [ ] for when the direction of return to origin has changed
∗4 The direction of rod end width across flats (□K) differs depending on the products.
∗5 The vent hole is the port for releasing to atmosphere. Do not apply pressure to this hole.
Attach tubing to the vent hole and place the end of the tubing so it is not exposed to dust or water.


For the rod end male thread, refer to page 67. For the mounting bracket dimensions, refer to page 97.

## Dimensions

### In-line motor type




[mm]

| Size | Stroke range [mm] | A | | B | C | D | EH | EV | FH | FV | G | H | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Without lock | With lock | | | | | | | | | | | | |
| **25** | 15 to 100 | 250 | 300 | 89.5 | 13 | 20 | 44 | 45.5 | 57.6 | 57.7 | 94.7 | M8 x 1.25 | 24 | 17 | 14.5 |
| | 101 to 400 | 275 | 325 | 114.5 | | | | | | | | | | | |
| **32** | 20 to 100 | 265.5 | 315.5 | 96 | 13 | 25 | 51 | 56.5 | 69.6 | 79.6 | 116.6 | M8 x 1.25 | 31 | 22 | 18.5 |
| | 101 to 500 | 295.5 | 345.5 | 126 | | | | | | | | | | | |

| Size | Stroke range [mm] | M | $O_1$ | R | OA | OB | PA | PB | Q | U | PC | W | | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | Without lock | With lock | |
| **25** | 15 to 100 | 34 | M5 x 0.8 | 8 | 37 | 38 | 15.4 | 8.2 | 28 | 0.9 | 15.9 | 146 | 196 | 24.5 |
| | 101 to 400 | | | | | | | | | | | | | |
| **32** | 20 to 100 | 40 | M6 x 1.0 | 10 | 37 | 38 | 15.4 | 8.2 | 28 | 1 | 15.9 | 151 | 201 | 27 |
| | 101 to 500 | | | | | | | | | | | | | |

### Body Bottom Tapped

[mm]

| Size | Stroke range [mm] | MA | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|
| **25** | 15 to 39 | 20 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | 42 | 41 | | | | | | |
| | 101 to 124 | | | | | 75 | | | | |
| | 125 to 200 | | 59 | 49.5 | | | | | | |
| | 201 to 400 | | 76 | 58 | | | | | | |
| **32** | 20 to 39 | 25 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | 36 | 43 | | | | | | |
| | 101 to 124 | | | | | 80 | | | | |
| | 125 to 200 | | 53 | 51.5 | | | | | | |
| | 201 to 500 | | 70 | 60 | | | | | | |

∗1 Range within which the rod can move when it returns to origin
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 Position after return to origin
∗3 [ ] for when the direction of return to origin has changed
∗4 The direction of rod end width across flats (□K) differs depending on the products.
∗5 The vent hole is the port for releasing to atmosphere. Do not apply pressure to this hole.
Attach tubing to the vent hole and place the end of the tubing so it is not exposed to dust or water.

For the rod end male thread, refer to page 67. For the mounting bracket dimensions, refer to page 97.

# Electric Actuator/ Rod Type

Dust-tight/Water-jet-proof (IP65 Equivalent)

## *LEY-X5* (Made to Order) *Series* LEY25, 32

Refer to page 41 for model selection.

Size 63 is available by selecting option P. Refer to page 79.

LECY□ Series ▶ p. 169

## How to Order

LEY **H** **25** **□** **S2** **B** – **100** **□** **□** **□** – **S** **2** **A1** **□** – **X5**

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭

● Made to order: Dust-tight/ Water-jet-proof

### ❶ Accuracy

| | |
|---|---|
| — | Basic type |
| H | High-precision type |

### ❷ Size

| |
|---|
| 25 |
| 32 |

### ❸ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| D | In-line |

### ❺ Lead [mm]

| Symbol | LEY25□ | LEY32□*1 |
|---|---|---|
| A | 12 | 16 (20) |
| B | 6 | 8 (10) |
| C | 3 | 4 (5) |

*1 The values shown in ( ) are the equivalent leads which include the pulley ratio for the size 32 top mounting type.

### ❹ Motor type

| Symbol | Type | Output [W] | Actuator size | Compatible driver |
|---|---|---|---|---|
| S2*1 | AC servo motor (Incremental encoder) | 100 | 25 | LECSA□-S1 |
| S3 | | 200 | 32 | LECSA□-S3 |
| S6*1 | AC servo motor (Absolute encoder) | 100 | 25 | LECSB□-S5<br>LECSC□-S5<br>LECSS□-S5 |
| S7 | | 200 | 32 | LECSB□-S7<br>LECSC□-S7<br>LECSS□-S7 |
| T6*2 | AC servo motor (Absolute encoder) | 100 | 25 | LECSS2-T5 |
| T7 | | 200 | 32 | LECSS2-T7 |

*1 For motor type S2 and S6, the compatible driver part number suffixes are S1 and S5 respectively.
*2 For motor type T6, the compatible driver part number suffix is T5.

### ❻ Stroke [mm]

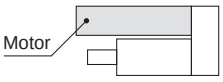
| | |
|---|---|
| 30 | 30 |
| to | to |
| 500 | 500 |

* For details, refer to the applicable stroke table below.

### ❼ Motor option

| | |
|---|---|
| — | Without option |
| B | With lock*1 |

*1 When "With lock" is selected for the top mounting type, the motor body will stick out from the end of the body for size 25 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.




### ❽ Rod end thread

| | |
|---|---|
| — | Rod end female thread |
| M | Rod end male thread (1 rod end nut is included.) |

### ❾ Mounting*1

| Symbol | Type | Motor mounting position: Top mounting | Motor mounting position: In-line |
|---|---|---|---|
| — | Ends tapped/ Body bottom tapped*2 | ● | ● |
| L | Foot | ● | — |
| F | Rod flange*2 | ●*3 | ● |
| G | Head flange*2 | ●*4 | — |

*1 The mounting bracket is shipped together with the product but does not come assembled.
*2 For the horizontal cantilever mounting of the rod flange, head flange, or ends tapped types, use the actuator within the following stroke range.
• LEY25: 200 mm or less
• LEY32: 100 mm or less
*3 The rod flange type is not available for the LEY25 with a 30 mm stroke and motor option "With lock."
*4 The head flange type is not available for the LEY32.

### ❿ Cable type*1 *2

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

*1 The motor and encoder cables are included. (The lock cable is also included when the motor with lock option is selected.)
*2 Standard cable entry direction is
• Top mounting: (A) Axis side
• In-line: (B) Counter axis side
(Refer to page 264 for details.)

### ⓫ Cable length [m]*1

| | |
|---|---|
| — | Without cable |
| 2 | 2 |
| 5 | 5 |
| A | 10 |

*1 The length of the encoder, motor, and lock cables are the same.

### ⓬ Driver type*1

| | Compatible driver | Power supply voltage [V] |
|---|---|---|
| — | Without driver | — |
| A1 | LECSA1-S□ | 100 to 120 |
| A2 | LECSA2-S□ | 200 to 230 |
| B1 | LECSB1-S□ | 100 to 120 |
| B2 | LECSB2-S□ | 200 to 230 |
| C1 | LECSC1-S□ | 100 to 120 |
| C2 | LECSC2-S□ | 200 to 230 |
| S1 | LECSS1-S□ | 100 to 120 |
| S2 | LECSS2-S□ | 200 to 230 |
| | LECSS2-T□ | 200 to 240 |

*1 When a driver type is selected, a cable is included. Select the cable type and cable length.
Example)
S2S2: Standard cable (2 m) + Driver (LECSS2)
S2 : Standard cable (2 m)
— : Without cable and driver

### ⓭ I/O cable length [m]*1

| | |
|---|---|
| — | Without cable |
| H | Without cable (Connector only) |
| 1 | 1.5 |

*1 When "Without driver" is selected for driver type, only "—: Without cable" can be selected. Refer to page 265 if I/O cable is required. (Options are shown on page 265.)

### Applicable Stroke Table

●: Standard

| Model \ Stroke | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | Manufacturable stroke range [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEY25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | — | — | 15 to 400 |
| LEY32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 to 500 |

* Please consult with SMC for non-standard strokes as they are produced as special orders.

* For auto switches, refer to page 176.



SMC

## Specifications: LECSA/LECSB/LECSC/LECSS

| Model | | | LEY25S$^{2}_{6}$/T6-X5 /LEY25DS$^{2}_{6}$/T6-X5 | | | LEY32S$^{3}_{7}$/T7-X5 (Top mounting) | | | LEY32DS$^{3}_{7}$/T7-X5 (In-line) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg] | Horizontal*1 | 18 | 50 | 50 | 30 | 60 | 60 | 30 | 60 | 60 |
| | | Vertical*8 | 8 | 16 | 30 | 9 | 19 | 37 | 12 | 24 | 46 |
| | Force [N]*2 (Set value: 15 to 30%)*15 | | 65 to 131 | 127 to 255 | 242 to 485 | 79 to 157 | 154 to 308 | 294 to 588 | 98 to 197 | 192 to 385 | 368 to 736 |
| | Max. speed [mm/s]*3 | Stroke range: Up to 300 | 900 | 450 | 225 | 1200 | 600 | 300 | 1000 | 500 | 250 |
| | | 305 to 400 | 600 | 300 | 150 | | | | | | |
| | | 405 to 500 | — | — | — | 800 | 400 | 200 | 640 | 320 | 160 |
| | Pushing speed [mm/s]*4 | | 35 or less | | | 30 or less | | | 30 or less | | |
| | Max. acceleration/deceleration [mm/s²] | | 5000 | | | 5000 | | | | | |
| | Positioning repeatability [mm] | Basic type | ±0.02 | | | | | | | | |
| | | High-precision type | ±0.01 | | | | | | | | |
| | Lost motion [mm]*5 | Basic type | 0.1 or less | | | | | | | | |
| | | High-precision type | 0.05 or less | | | | | | | | |
| | Lead [mm] | | 12 | 6 | 3 | 20 | 10 | 5 | 16 | 8 | 4 |
| | Impact/Vibration resistance [m/s²]*6 | | 50/20 | | | 50/20 | | | | | |
| | Actuation type | | Ball screw + Belt/Ball screw | | | Ball screw + Belt [1.25:1] | | | Ball screw | | |
| | Guide type | | Sliding bushing (Piston rod) | | | Sliding bushing (Piston rod) | | | | | |
| | Enclosure*7 | | IP65 equivalent | | | | | | | | |
| | Operating temperature range [°C] | | 5 to 40 | | | 5 to 40 | | | | | |
| | Operating humidity range [%RH] | | 90 or less (No condensation) | | | 90 or less (No condensation) | | | | | |
| | Regeneration option | | May be required depending on speed and work load (Refer to pages 45 and 46.) | | | | | | | | |
| Electric specifications | Motor output/Size | | 100 W/□40 | | | 200 W/□60 | | | | | |
| | Motor type | | AC servo motor (100/200 VAC) | | | AC servo motor (100/200 VAC) | | | | | |
| | Encoder | | Motor type S2, S3: Incremental 17-bit encoder (Resolution: 131072 p/rev)<br>Motor type S6, S7: Absolute 18-bit encoder (Resolution: 262144 p/rev)<br>Motor type T6, T7: Absolute 22-bit encoder (Resolution: 4194304 p/rev) | | | | | | | | |
| | Power consumption [W]*9 | Horizontal | 45 | | | 65 | | | 65 | | |
| | | Vertical | 145 | | | 175 | | | 175 | | |
| | Standby power consumption when operating [W]*10 | Horizontal | 2 | | | 2 | | | 2 | | |
| | | Vertical | 8 | | | 8 | | | 8 | | |
| | Max. instantaneous power consumption [W]*11 | | 445 | | | 724 | | | 724 | | |
| Lock unit specifications | Type*12 | | Non-magnetizing lock | | | | | | | | |
| | Holding force [N] | | 131 | 255 | 485 | 157 | 308 | 588 | 197 | 385 | 736 |
| | Power consumption [W] at 20°C*13 | | 6.3 | | | 7.9 | | | 7.9 | | |
| | Rated voltage [V] | | 24 VDC $^{0}_{-10\ \%}$ | | | | | | | | |

*1 This is the maximum value of the horizontal work load. An external guide is necessary to support the load. The actual work load changes according to the condition of the external guide. Confirm the load using the actual device.
*2 The force setting range (set values for the driver) for the force control with the torque control mode
Set it with reference to "Force Conversion Graph" on pages 45 and 46. When the control equivalent to the pushing operation of the controller LECP6 series is performed, combine the Simple Motion module (manufactured by Mitsubishi Electric Corporation) which has a pushing operation function.
*3 The allowable speed changes according to the stroke.
*4 The allowable collision speed for collision with the workpiece with the torque control mode
*5 A reference value for correcting an error in reciprocal operation
*6 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*7 Cannot be used in an environment where oil such as cutting oil splashes or it is constantly exposed to water Take appropriate protective measures. For details on enclosure, refer to "Enclosure" on page 188.
*8 When mounting vertically and using the product facing upwards in an environment where water is present, take necessary measures to prevent water from splashing on the rod cover, because water will accumulate on the rod seal due to the structure of the product.
*9 The power consumption (including the driver) is for when the actuator is operating.
*10 The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.
*11 The maximum instantaneous power consumption (including the driver) is for when the actuator is operating.
*12 Only when motor option "With lock" is selected
*13 For an actuator with lock, add the power consumption for the lock.
*14 The resolution will change depending on the driver type.
*15 For motor type T6 and T7, the set value is from 12 to 24 %.

## Weight

### Product Weight

| Series | | | LEY25S$^{2}_{6}$/T6-X5 (Motor mounting position: Top mounting) | | | | | | | | | LEY32S$^{3}_{7}$/T7-X5 (Motor mounting position: Top mounting) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Motor type | Incremental encoder | | 1.31 | 1.38 | 1.55 | 1.81 | 1.99 | 2.16 | 2.34 | 2.51 | 2.69 | 2.42 | 2.53 | 2.82 | 3.29 | 3.57 | 3.85 | 4.14 | 4.42 | 4.70 | 4.98 | 5.26 |
| | Absolute encoder | S6/S7 | 1.37 | 1.44 | 1.61 | 1.87 | 2.05 | 2.22 | 2.40 | 2.57 | 2.75 | 2.36 | 2.47 | 2.76 | 3.23 | 3.51 | 3.79 | 4.08 | 4.36 | 4.64 | 4.92 | 5.20 |
| | | T6/T7 | 1.4 | 1.5 | 1.6 | 1.9 | 2.0 | 2.2 | 2.4 | 2.6 | 2.7 | 2.3 | 2.4 | 2.7 | 3.2 | 3.5 | 3.8 | 4.1 | 4.3 | 4.6 | 4.9 | 5.2 |

| Series | | | LEY25DS$^{2}_{6}$/T6-X5 (Motor mounting position: In-line) | | | | | | | | | LEY32DS$^{3}_{7}$/T7-X5 (Motor mounting position: In-line) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | | | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Motor type | Incremental encoder | | 1.34 | 1.41 | 1.58 | 1.84 | 2.02 | 2.19 | 2.37 | 2.54 | 2.72 | 2.44 | 2.55 | 2.84 | 3.31 | 3.59 | 3.87 | 4.16 | 4.44 | 4.72 | 5.00 | 5.28 |
| | Absolute encoder | S6/S7 | 1.40 | 1.47 | 1.64 | 1.90 | 2.08 | 2.25 | 2.43 | 2.60 | 2.78 | 2.38 | 2.49 | 2.78 | 3.25 | 3.53 | 3.81 | 4.10 | 4.38 | 4.66 | 4.94 | 5.22 |
| | | T6/T7 | 1.4 | 1.5 | 1.6 | 1.9 | 2.1 | 2.2 | 2.4 | 2.6 | 2.8 | 2.4 | 2.5 | 2.8 | 3.2 | 3.5 | 3.8 | 4.1 | 4.4 | 4.6 | 4.9 | 5.2 |

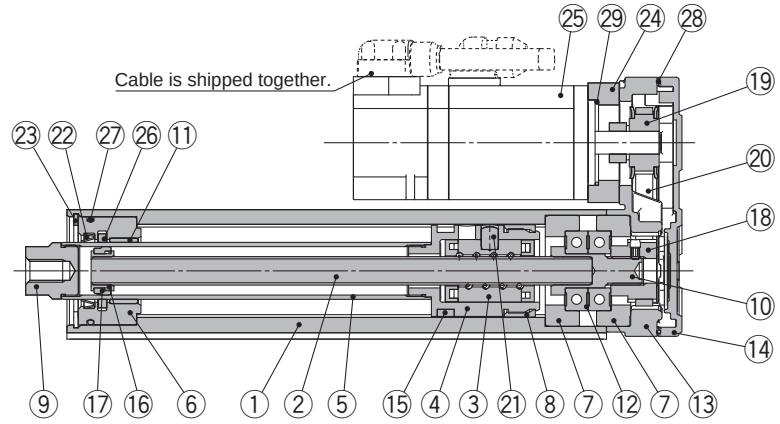
### Additional Weight

[kg]

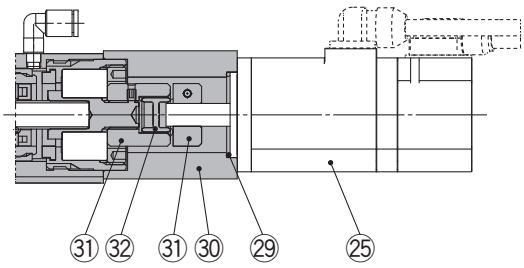
| Size | | 25 | 32 |
|---|---|---|---|
| Lock | Incremental encoder | 0.20 | 0.40 |
| | Absolute encoder | 0.30 | 0.66 |
| Rod end male thread | Male thread | 0.03 | 0.03 |
| | Nut | 0.02 | 0.02 |
| Foot bracket (2 sets including mounting bolt) | | 0.08 | 0.14 |
| Rod flange (including mounting bolt) | | 0.17 | 0.20 |
| Head flange (including mounting bolt) | | | |
| Double clevis (including pin, retaining ring, and mounting bolt) | | 0.16 | 0.22 |

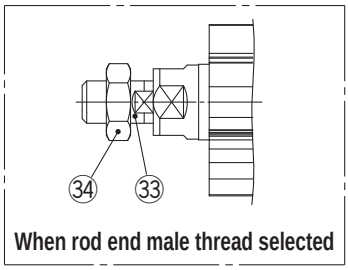
## Construction

### Motor top mounting type: LEY$^{25}_{32}$




### In-line motor type: LEY$^{25}_{32}$D




When rod end male thread selected

### Component Parts

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Body** | Aluminium alloy | Anodised |
| 2 | **Ball screw shaft** | Alloy steel | |
| 3 | **Ball screw nut** | Synthetic resin/Alloy steel | |
| 4 | **Piston** | Aluminium alloy | |
| 5 | **Piston rod** | Stainless steel | Hard chrome plating |
| 6 | **Rod cover** | Aluminium alloy | |
| 7 | **Bearing holder** | Aluminium alloy | |
| 8 | **Rotation stopper** | POM | |
| 9 | **Socket** | Free cutting carbon steel | Nickel plating |
| 10 | **Connected shaft** | Free cutting carbon steel | Nickel plating |
| 11 | **Bushing** | Bearing alloy | |
| 12 | **Bearing** | — | |
| 13 | **Return box** | Aluminium die-cast | Coating |
| 14 | **Return plate** | Aluminium die-cast | Coating |
| 15 | **Magnet** | — | |
| 16 | **Wear ring holder** | Stainless steel | Stroke 101 mm or more |
| 17 | **Wear ring** | POM | Stroke 101 mm or more |

| No. | Description | Material | Note |
|---|---|---|---|
| 18 | **Screw shaft pulley** | Aluminium alloy | |
| 19 | **Motor pulley** | Aluminium alloy | |
| 20 | **Belt** | — | |
| 21 | **Parallel pin** | Stainless steel | |
| 22 | **Scraper** | Nylon | |
| 23 | **Retaining ring** | Steel for spring | Phosphate coated |
| 24 | **Motor adapter** | Aluminium alloy | Coating |
| 25 | **Motor** | — | |
| 26 | **Lube-retainer** | Felt | |
| 27 | **O-ring** | NBR | |
| 28 | **Gasket** | NBR | |
| 29 | **O-ring** | NBR | |
| 30 | **Motor block** | Aluminium alloy | Coating |
| 31 | **Hub** | Aluminium alloy | |
| 32 | **Spider** | Urethane | |
| 33 | **Socket (Male thread)** | Free cutting carbon steel | Nickel plating |
| 34 | **Nut** | Alloy steel | Trivalent chromated |

### Replacement Parts (Motor top mounting only)/Belt

| No. | Size | Order no. |
|---|---|---|
| 20 | **25** | LE-D-2-2 |
| | **32** | LE-D-2-4 |

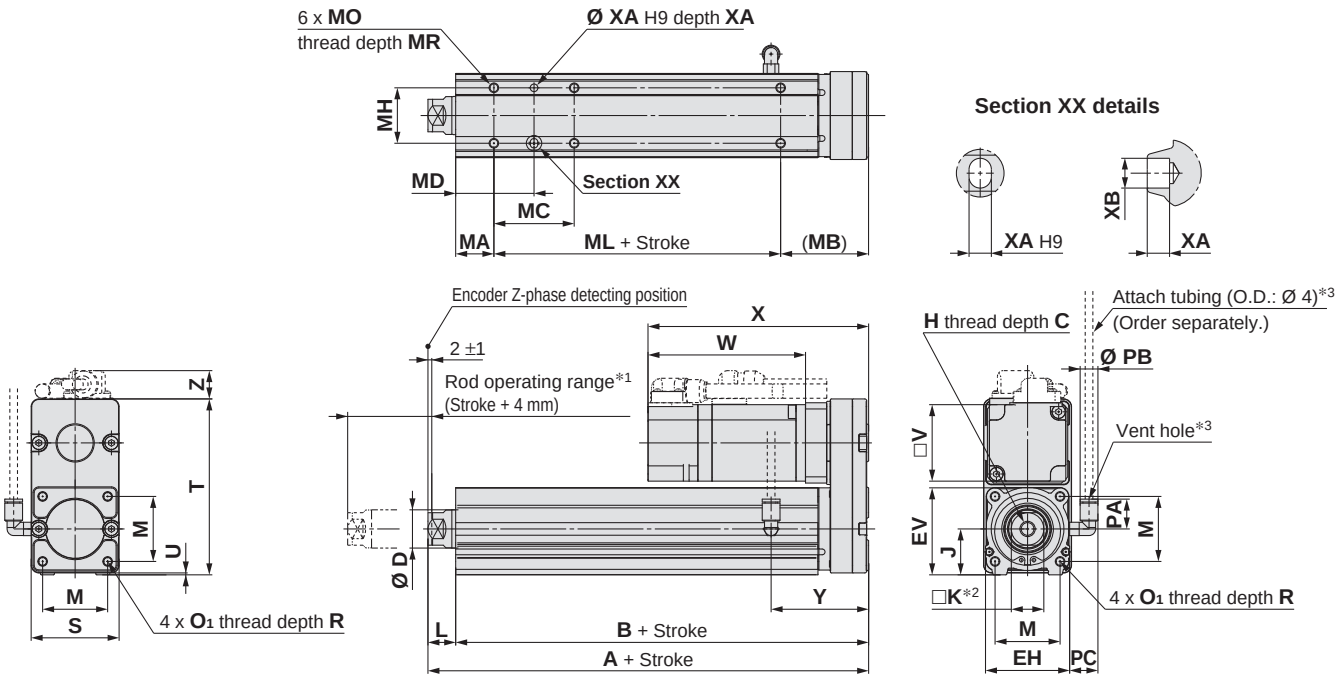
### Replacement Parts/Grease Pack

| Applied portion | Order no. |
|---|---|
| Piston rod | GR-S-010 (10 g)<br>GR-S-020 (20 g) |

∗ Apply grease on the piston rod periodically.
Grease should be applied at 1 million cycles or 200 km, whichever comes first.

## Dimensions

### Motor top mounting type: LEY$^{25}_{32}$




[mm]

| Size | Stroke range [mm] | A | B | C | D | EH | EV | H | J | K | L | M | $O_1$ | R | PA | PB | V | S | T | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **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 | 15.4 | 8.2 | 40 | 46 | 92 | 1 |
| | 101 to 400 | 155.5 | 141 | | | | | | | | | | | | | | | | | |
| **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 | 15.4 | 8.2 | 60 | 60 | 118 | 1 |
| | 101 to 500 | 178.5 | 160 | | | | | | | | | | | | | | | | | |

| Size | Stroke range [mm] | PC | Incremental encoder | | | | | | Absolute encoder [S6/S7] | | | | | | Absolute encoder [T6/T7] | | | | | | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Without lock | | | With lock | | | Without lock | | | With lock | | | Without lock | | | With lock | | | |
| | | | W | X | Z | W | X | Z | W | X | Z | W | X | Z | W | X | Z | W | X | Z | |
| **25** | 15 to 100 | 15.4 | 87 | 120 | 14.1 | 123.9 | 156.9 | 15.8 | 82.4 | 115.4 | 14.1 | 123.5 | 156.5 | 15.8 | 82.4 | 115.4 | 14.1 | 123 | 156 | 15.8 | 51 |
| | 101 to 400 | | | | | | | | | | | | | | | | | | | | |
| **32** | 20 to 100 | 15.9 | 88.2 | 128.2 | 17.1 | 116.8 | 156.8 | 17.1 | 76.6 | 116.6 | 17.1 | 116.1 | 156.1 | 17.1 | 76.6 | 116.6 | 17.1 | 113.4 | 153.4 | 17.1 | 61 |
| | 101 to 500 | | | | | | | | | | | | | | | | | | | | |

### Body Bottom Tapped

[mm]

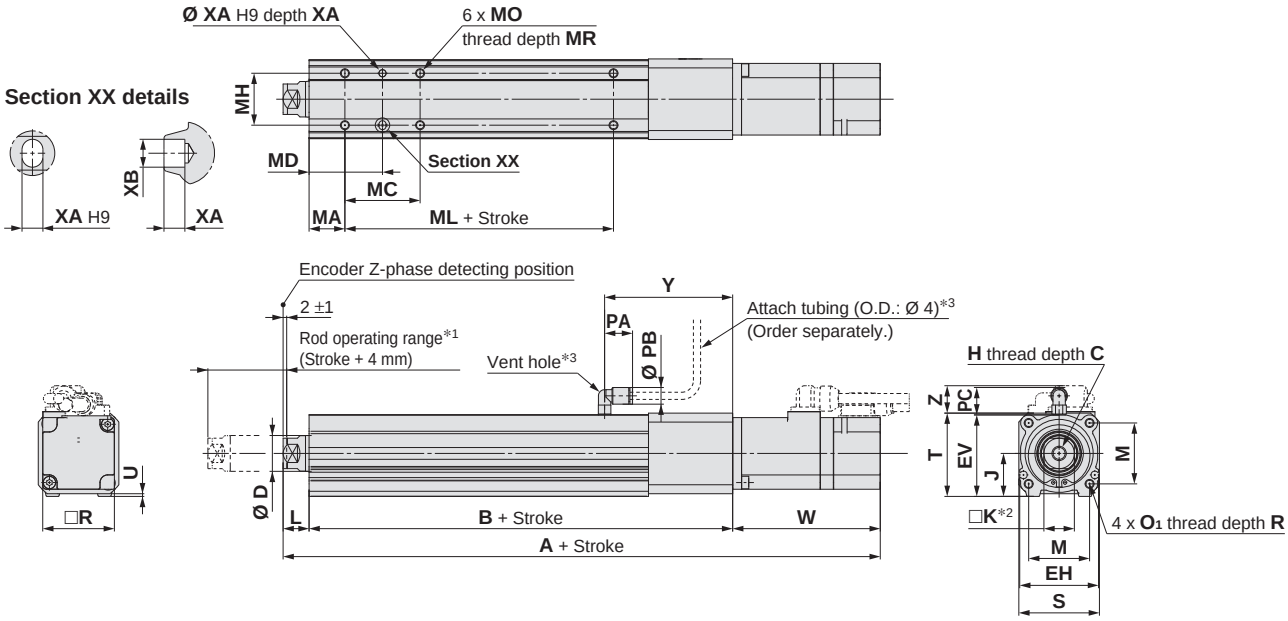
| Size | Stroke range [mm] | MA | MB | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **25** | 15 to 39 | 20 | 46 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | | 42 | 41 | | | | | | |
| | 101 to 124 | | | | | | 75 | | | | |
| | 125 to 200 | | | 59 | 49.5 | | | | | | |
| | 201 to 400 | | | 76 | 58 | | | | | | |
| **32** | 20 to 39 | 25 | 55 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | | 36 | 43 | | | | | | |
| | 101 to 124 | | | | | | 80 | | | | |
| | 125 to 200 | | | 53 | 51.5 | | | | | | |
| | 201 to 500 | | | 70 | 60 | | | | | | |

∗1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 The direction of rod end width across flats (□K) differs depending on the products.
∗3 The vent hole is the port for releasing to atmosphere. Do not apply pressure to this hole.
Attach tubing to the vent hole and place the end of the tubing so it is not exposed to dust or water.

For the rod end male thread, refer to page 77. For the mounting bracket dimensions, refer to page 97.

## Dimensions

### In-line motor type: LEY$^{25}_{32}$D




[mm]

| Size | Stroke range [mm] | Incremental encoder | | | | | | Absolute encoder [S6/S7] | | | | | | Absolute encoder [T6/T7] | | | | | | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Without lock | | | With lock | | | Without lock | | | With lock | | | Without lock | | | With lock | | | |
| | | A | W | Z | A | W | Z | A | W | Z | A | W | Z | A | VB | VC | A | VB | VC | |
| 25 | 15 to 100 | 238 | 87 | 14.6 | 274.9 | 123.9 | 16.3 | 233.4 | 82.4 | 14.6 | 274.5 | 123.5 | 16.3 | 233.4 | 82.4 | 14.6 | 274 | 123 | 16.3 | 136.5 |
| | 101 to 400 | 263 | | | 299.9 | | | 258.4 | | | 299.5 | | | 258.4 | | | 299 | | | 161.5 |
| 32 | 20 to 100 | 262.7 | 88.2 | 17.1 | 291.3 | 116.8 | 17.1 | 251.1 | 76.6 | 17.1 | 290.6 | 116.1 | 17.1 | 251.1 | 76.6 | 17.1 | 287.9 | 113.4 | 17.1 | 156 |
| | 101 to 500 | 292.7 | | | 321.3 | | | 281.1 | | | 320.6 | | | 281.1 | | | 317.9 | | | 186 |

| Size | Stroke range [mm] | C | D | EH | EV | H | J | K | L | M | O1 | R | PA | PB | V | S | T | U | PC | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 100 | 13 | 20 | 44 | 45.5 | M8 x 1.25 | 24 | 17 | 14.5 | 34 | M5 x 0.8 | 8 | 15.4 | 8.2 | 40 | 45 | 46.5 | 1.5 | 15.9 | 71.5 |
| | 101 to 400 | | | | | | | | | | | | | | | | | | | |
| 32 | 20 to 100 | 13 | 25 | 51 | 56.5 | M8 x 1.25 | 31 | 22 | 18.5 | 40 | M6 x 1.0 | 10 | 15.4 | 8.2 | 60 | 60 | 61 | 1 | 15.9 | 87 |
| | 101 to 500 | | | | | | | | | | | | | | | | | | | |

### Body Bottom Tapped

[mm]

| Size | Stroke range [mm] | MA | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|
| 25 | 15 to 39 | 20 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | 42 | 41 | | | | | | |
| | 101 to 124 | | | | | 75 | | | | |
| | 125 to 200 | | 59 | 49.5 | | | | | | |
| | 201 to 400 | | 76 | 58 | | | | | | |
| 32 | 20 to 39 | 25 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | 36 | 43 | | | | | | |
| | 101 to 124 | | | | | 80 | | | | |
| | 125 to 200 | | 53 | 51.5 | | | | | | |
| | 201 to 500 | | 70 | 60 | | | | | | |

∗1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 The direction of rod end width across flats (□K) differs depending on the products.
∗3 The vent hole is the port for releasing to atmosphere. Do not apply pressure to this hole.
Attach tubing to the vent hole and place the end of the tubing so it is not exposed to dust or water.

For the rod end male thread, refer to page 77. For the mounting bracket dimensions, refer to page 97.

# Electric Actuator/ Rod Type

Dust-tight/Water-jet-proof (IP65 Equivalent)

## *LEY-X5* (Made to Order) *Series* LEY25, 32

Refer to page 48 for model selection.

Size 63 is available by selecting option P. Refer to page 87.

CE RoHS

LECS□ Series ▶ p. 163

### How to Order

LEY H 25 □ V6 B – 200 □ □ □ – S 3 M2 □ – X5

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭

● Made to order: Dust-tight/ Water-jet-proof

**❶ Accuracy**

| | |
|---|---|
| — | Basic type |
| H | High-precision type |

**❷ Size**

| |
|---|
| 25 |
| 32 |

**❸ Motor mounting position**

| | |
|---|---|
| — | Top mounting |
| D | In-line |

**❹ Motor type**

| Symbol | Type | Output [W] | Size | Compatible driver |
|---|---|---|---|---|
| V6*1 | AC servo motor (Absolute encoder) | 100 | 25 | LECYM2-V5 LECYU2-V5 |
| V7 | | 200 | 32 | LECYM2-V7 LECYU2-V7 |

*1 For motor type V6, the compatible driver part number suffix is V5.

**❺ Lead [mm]**

| Symbol | LEY25 | LEY32 |
|---|---|---|
| A | 12 | 16 (20) |
| B | 6 | 8 (10) |
| C | 3 | 4 (5) |

* The values shown in ( ) are the leads for the top mounting type. (Equivalent leads which include the pulley ratio [1.25:1])

**❻ Stroke [mm]**

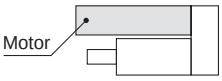
| | |
|---|---|
| 30 | 30 |
| to | to |
| 500 | 500 |

* For details, refer to the applicable stroke table below.

**❼ Motor option**

| | |
|---|---|
| — | Without option |
| B | With lock |

* When "With lock" is selected for the top mounting type, the motor body will stick out from the end of the body for size 25 with strokes of 30 mm or less.
Check for interference with workpieces before selecting a model.




**❽ Rod end thread**

| | |
|---|---|
| — | Rod end female thread |
| M | Rod end male thread (1 rod end nut is included.) |

**Applicable Stroke Table**

●: Standard

| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | Manufacturable stroke range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEY25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | — | — | 15 to 400 |
| LEY32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 to 500 |

* Please consult with SMC for non-standard strokes as they are produced as special orders.

For auto switches, refer to page 176.

Motor mounting position: Top mounting

Motor mounting position: In-line

### ⑨ Mounting*1

| Symbol | Type | Motor mounting position | |
|---|---|---|---|
| | | Top mounting | In-line |
| — | Ends tapped/ Body bottom tapped*2 | ● | ● |
| L | Foot | ● | — |
| F | Rod flange*2 | ●*3 | ● |
| G | Head flange*2 | ●*4 | — |

*1 The mounting bracket is shipped together with the product but does not come assembled.
*2 For the horizontal cantilever mounting of the ends tapped, rod flange, or head flange types, use the actuator within the following stroke range.
· LEY25: 200 mm or less · LEY32: 100 mm or less
*3 The rod flange type is not available for the LEY25 with a 30 mm stroke and motor option "With lock."
*4 The head flange type is not available for the LEY32.

### ⑩ Cable type*1

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

*1 The motor and encoder cables are included. The motor cable for lock option is included when the motor with lock option is selected.

### ⑪ Cable length [m]*1

| | |
|---|---|
| — | Without cable |
| 3 | 3 |
| 5 | 5 |
| A | 10 |
| C | 20 |

*1 The length of the motor and encoder cables are the same. (For with lock)

### ⑫ Driver type

| | Compatible driver | Power supply voltage [V] |
|---|---|---|
| — | Without driver | — |
| M2 | LECYM2-V□ | 200 to 230 |
| U2 | LECYU2-V□ | 200 to 230 |

* When a driver type is selected, a cable is included. Select the cable type and cable length.

### ⑬ I/O cable length [m]*1

| | |
|---|---|
| — | Without cable |
| H | Without cable (Connector only) |
| 1 | 1.5 |

*1 When "Without driver" is selected for driver type, only "—: Without cable" can be selected. Refer to page 278 if I/O cable is required. (Options are shown on page 278.)

## Compatible Driver

| Driver type | MECHATROLINK-Ⅱ type  | MECHATROLINK-Ⅲ type  |
|---|---|---|
| Series | LECYM | LECYU |
| Applicable network | MECHATROLINK-Ⅱ | MECHATROLINK-Ⅲ |
| Control encoder | Absolute 20-bit encoder | |
| Communication device | USB communication, RS-422 communication | |
| Power supply voltage [V] | 200 to 230 VAC (50/60 Hz) | |
| Reference page | 271 | |

## Specifications: LECY

| | Model | | LEY25V6-X5/LEY25DV6-X5 | | | LEY32V7-X5 (Top mounting) | | | LEY32DV7-X5 (In-line) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Actuator specifications | Work load [kg] | Horizontal*1 | 18 | 50 | 50 | 30 | 60 | 60 | 30 | 60 | 60 |
| | | Vertical*9 | 8 | 16 | 30 | 9 | 19 | 37 | 12 | 24 | 46 |
| | Force [N]*2 (Set value: 45 to 90 %) | | 65 to 131 | 127 to 255 | 242 to 485 | 79 to 157 | 154 to 308 | 294 to 588 | 98 to 197 | 192 to 385 | 368 to 736 |
| | Max.*3 speed [mm/s] — Stroke range | Up to 300 | 900 | 450 | 225 | 1200 | 600 | 300 | 1000 | 500 | 250 |
| | | 305 to 400 | 600 | 300 | 150 | | | | | | |
| | | 405 to 500 | — | — | — | 800 | 400 | 200 | 640 | 320 | 160 |
| | Pushing speed [mm/s]*4 | | 35 or less | | | 30 or less | | | 30 or less | | |
| | Max. acceleration/deceleration [mm/s²] | | 5000 | | | 5000 | | | | | |
| | Positioning repeatability [mm] | Basic type | ±0.02 | | | ±0.02 | | | | | |
| | | High-precision type | ±0.01 | | | ±0.01 | | | | | |
| | Lost motion [mm]*5 | Basic type | 0.1 or less | | | 0.1 or less | | | | | |
| | | High-precision type | 0.05 or less | | | 0.05 or less | | | | | |
| | Lead [mm] (including pulley ratio) | | 12 | 6 | 3 | 20*6 | 10*6 | 5*6 | 16 | 8 | 4 |
| | Impact/Vibration resistance [m/s²]*7 | | 50/20 | | | 50/20 | | | | | |
| | Actuation type | | Ball screw + Belt (LEY□)/Ball screw (LEY□D) | | | Ball screw + Belt [1.25:1] | | | Ball screw | | |
| | Guide type | | Sliding bushing (Piston rod) | | | Sliding bushing (Piston rod) | | | | | |
| | Enclosure*8 | | IP65 equivalent | | | | | | | | |
| | Operating temperature range [°C] | | 5 to 40 | | | 5 to 40 | | | | | |
| | Operating humidity range [%RH] | | 90 or less (No condensation) | | | 90 or less (No condensation) | | | | | |
| | Conditions for*10 "Regenerative resistor" [kg] | Horizontal | Not required | | | Not required | | | | | |
| | | Vertical | 6 or more | | | 4 or more | | | | | |
| Electric specifications | Motor output/Size | | 100 W/□40 | | | 200 W/□60 | | | | | |
| | Motor type | | AC servo motor (200 VAC) | | | AC servo motor (200 VAC) | | | | | |
| | Encoder | | Absolute 20-bit encoder (Resolution: 1048576 p/rev) | | | | | | | | |
| | Power consumption [W]*11 | Horizontal | 45 | | | 65 | | | 65 | | |
| | | Vertical | 145 | | | 175 | | | 175 | | |
| | Standby power consumption when operating [W]*12 | Horizontal | 2 | | | 2 | | | 2 | | |
| | | Vertical | 8 | | | 8 | | | 8 | | |
| | Max. instantaneous power consumption [W]*13 | | 445 | | | 724 | | | 724 | | |
| Lock unit specifications | Type*14 | | Non-magnetising lock | | | | | | | | |
| | Holding force [N] | | 131 | 255 | 485 | 157 | 308 | 588 | 197 | 385 | 736 |
| | Power consumption [W] at 20 °C*15 | | 5.5 | | | 6 | | | 6 | | |
| | Rated voltage [V] | | 24 VDC $^{+10\ \%}_{0}$ | | | | | | | | |

*1 This is the maximum value of the horizontal work load. An external guide is necessary to support the load. The actual work load changes according to the condition of the external guide. Confirm the load using the actual device.
*2 The force setting range (set values for the driver) for the force control with the torque control mode
Set it with reference to "Force Conversion Graph (Guide)" on page 52.
*3 The allowable speed changes according to the stroke.
*4 The allowable collision speed for collision with the workpiece with the torque control mode
*5 A reference value for correcting an error in reciprocal operation
*6 Equivalent leads which include the pulley ratio [1.25:1]
*7 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*8 Cannot be used in an environment where oil such as cutting oil splashes or it is constantly exposed to water Take appropriate protective measures. For details on enclosure, refer to "Enclosure" on page 188.
*9 When mounting vertically and using the product facing upwards in an environment where water is present, take necessary measures to prevent water from splashing on the rod cover, because water will accumulate on the rod seal due to the structure of the product.
*10 The work load conditions which require "Regenerative resistor" when operating at the maximum speed (Duty ratio: 100 %)
Order the regenerative resistor separately. For details, refer to "Conditions for Regenerative Resistor (Guide)" on pages 51 and 52.
*11 The power consumption (including the driver) is for when the actuator is operating.
*12 The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.
*13 The maximum instantaneous power consumption (including the driver) is for when the actuator is operating.
*14 Only when motor option "With lock" is selected
*15 For an actuator with lock, add the power consumption for the lock.

## Weight

### Product Weight

[kg]

| Series | LEY25V6 (Motor mounting position: Top mounting) | | | | | | | | | LEY32V7 (Motor mounting position: Top mounting) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Weight [kg] | 1.2 | 1.3 | 1.6 | 1.7 | 1.9 | 2.1 | 2.2 | 2.4 | 2.6 | 2.3 | 2.4 | 2.7 | 3.2 | 3.5 | 3.8 | 4.0 | 4.3 | 4.6 | 4.9 | 5.2 |

| Series | LEY25DV6 (Motor mounting position: In-line) | | | | | | | | | LEY32DV7 (Motor mounting position: In-line) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
| Weight [kg] | 1.2 | 1.3 | 1.5 | 1.7 | 1.9 | 2.1 | 2.3 | 2.4 | 2.6 | 2.3 | 2.4 | 2.7 | 3.2 | 3.5 | 3.8 | 4.1 | 4.3 | 4.6 | 4.9 | 5.2 |

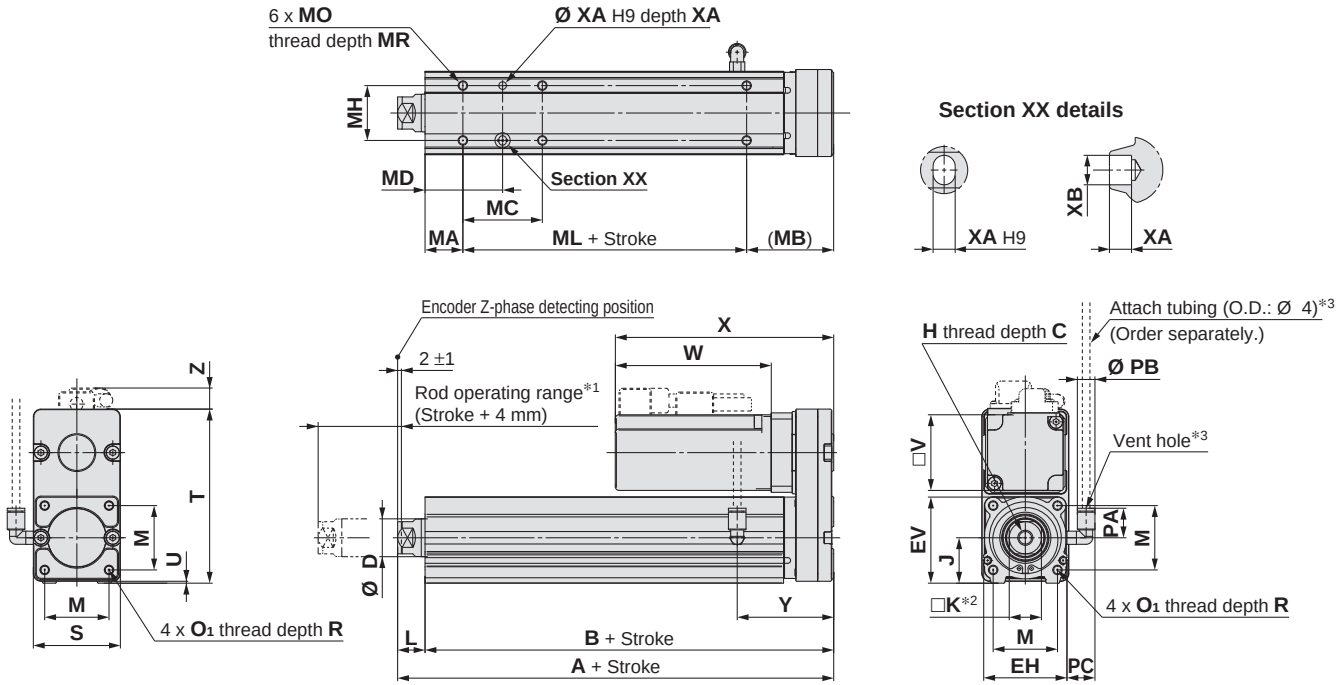
### Additional Weight

[kg]

| Size | | 25 | 32 |
|---|---|---|---|
| Lock | | 0.30 | 0.60 |
| Rod end male thread | Male thread | 0.03 | 0.03 |
| | Nut | 0.02 | 0.02 |
| Foot bracket (2 sets including mounting bolt) | | 0.08 | 0.14 |
| Rod flange (including mounting bolt) | | 0.17 | 0.20 |
| Head flange (including mounting bolt) | | | |

## Dimensions

### Motor top mounting type: LEY$^{25}_{32}$




[mm]

| Size | Stroke range [mm] | A | B | C | D | EH | EV | H | J | K | L | M | $O_1$ | R | PA | PB | V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **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 | 15.4 | 8.2 | 40 |
| | 101 to 400 | 155.5 | 141 | | | | | | | | | | | | | | |
| **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 | 15.4 | 8.2 | 60 |
| | 101 to 500 | 178.5 | 160 | | | | | | | | | | | | | | |

| Size | Stroke range [mm] | S | T | U | PC | Without lock | | | With lock | | | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | W | X | Z | W | X | Z | |
| **25** | 15 to 100 | 46 | 92 | 1 | 15.4 | 82.5 | 115.5 | 11 | 127.5 | 160.5 | 11 | 51 |
| | 101 to 400 | | | | | | | | | | | |
| **32** | 20 to 100 | 60 | 118 | 1 | 15.9 | 80 | 120 | 14 | 120 | 160 | 14 | 61 |
| | 101 to 500 | | | | | | | | | | | |

### Body Bottom Tapped

[mm]

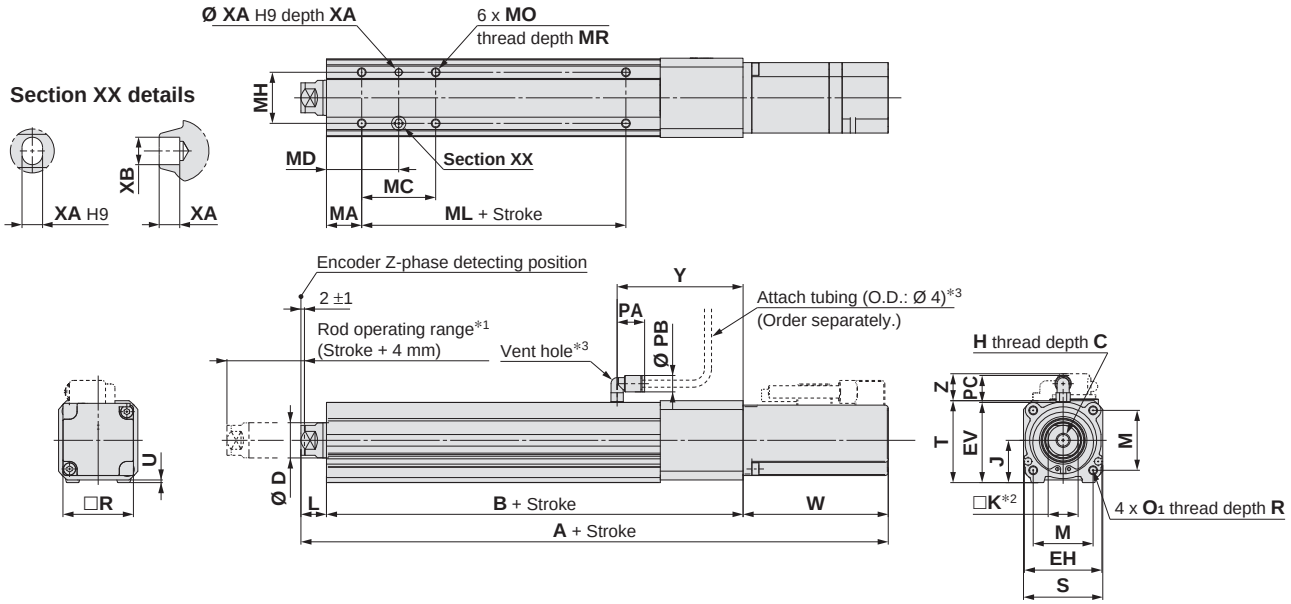
| Size | Stroke range [mm] | MA | MB | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **25** | 15 to 39 | 20 | 46 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | | 42 | 41 | | | | | | |
| | 101 to 124 | | | | | | 75 | | | | |
| | 125 to 200 | | | 59 | 49.5 | | | | | | |
| | 201 to 400 | | | 76 | 58 | | | | | | |
| **32** | 20 to 39 | 25 | 55 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | | 36 | 43 | | | | | | |
| | 101 to 124 | | | | | | 80 | | | | |
| | 125 to 200 | | | 53 | 51.5 | | | | | | |
| | 201 to 500 | | | 70 | 60 | | | | | | |

∗1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 The direction of rod end width across flats (□K) differs depending on the products.
∗3 The vent hole is the port for releasing to atmosphere. Do not apply pressure to this hole.
Attach tubing to the vent hole and place the end of the tubing so it is not exposed to dust or water.

For the rod end male thread, refer to page 77. For the mounting bracket dimensions, refer to page 97.

## Dimensions

### In-line motor type: LEY$^{25}_{32}$D




[mm]

| Size | Stroke range [mm] | Without lock | | | With lock | | | B | C | D | EH | EV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | W | Z | A | W | Z | | | | | |
| **25** | 15 to 100 | 233.5 | 82.5 | 11.5 | 278.5 | 127.5 | 11.5 | 136.5 | 13 | 20 | 44 | 45.5 |
| | 101 to 400 | 258.5 | | | 303.5 | | | 161.5 | | | | |
| **32** | 20 to 100 | 254.5 | 80 | 14 | 294.5 | 120 | 14 | 156 | 13 | 25 | 51 | 56.5 |
| | 101 to 500 | 284.5 | | | 324.5 | | | 186 | | | | |

| Size | Stroke range [mm] | H | J | K | L | M | O1 | R | PA | PB | V | S | T | U | PC | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **25** | 15 to 100 | M8 x 1.25 | 24 | 17 | 14.5 | 34 | M5 x 0.8 | 8 | 15.4 | 8.2 | 40 | 45 | 46.5 | 1.5 | 15.9 | 71.5 |
| | 101 to 400 | | | | | | | | | | | | | | | |
| **32** | 20 to 100 | M8 x 1.25 | 31 | 22 | 18.5 | 40 | M6 x 1.0 | 10 | 15.4 | 8.2 | 60 | 60 | 61 | 1 | 15.9 | 87 |
| | 101 to 500 | | | | | | | | | | | | | | | |

### Body Bottom Tapped

[mm]

| Size | Stroke range [mm] | MA | MC | MD | MH | ML | MO | MR | XA | XB |
|---|---|---|---|---|---|---|---|---|---|---|
| **25** | 15 to 39 | 20 | 24 | 32 | 29 | 50 | M5 x 0.8 | 6.5 | 4 | 5 |
| | 40 to 100 | | 42 | 41 | | | | | | |
| | 101 to 124 | | | | | 75 | | | | |
| | 125 to 200 | | 59 | 49.5 | | | | | | |
| | 201 to 400 | | 76 | 58 | | | | | | |
| **32** | 20 to 39 | 25 | 22 | 36 | 30 | 50 | M6 x 1 | 8.5 | 5 | 6 |
| | 40 to 100 | | 36 | 43 | | | | | | |
| | 101 to 124 | | | | | 80 | | | | |
| | 125 to 200 | | 53 | 51.5 | | | | | | |
| | 201 to 500 | | 70 | 60 | | | | | | |

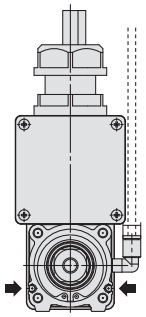
∗1 Range within which the rod can move
Make sure workpieces mounted on the rod do not interfere with the workpieces and facilities around the rod.
∗2 The direction of rod end width across flats (□K) differs depending on the products.
∗3 The vent hole is the port for releasing to atmosphere. Do not apply pressure to this hole.
Attach tubing to the vent hole and place the end of the tubing so it is not exposed to dust or water.

For the rod end male thread, refer to page 77. For the mounting bracket dimensions, refer to page 97.

# *LEY-X5 Series*
# Auto Switch Mounting

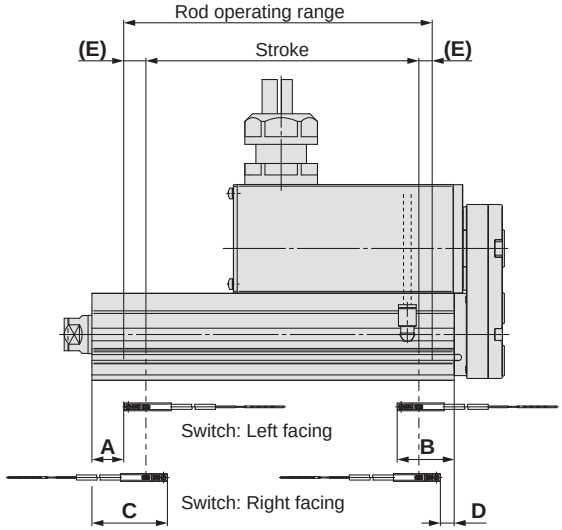
## Proper Auto Switch Mounting Position

### Applicable auto switches: D-M9□A(V)



**LEY25, 32**

➡ Auto switch groove

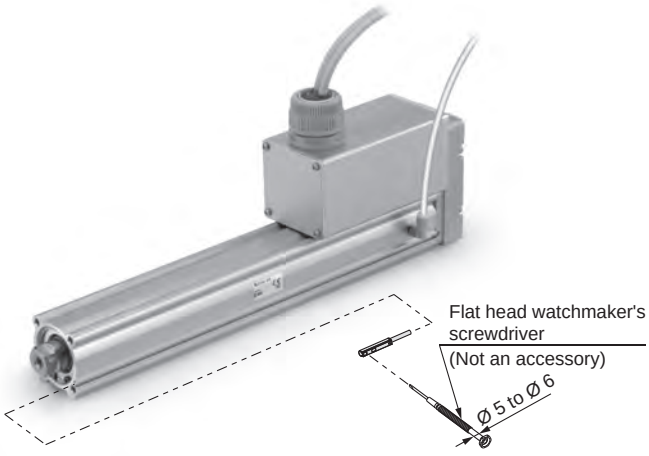



[mm]

| Size | Stroke range | Auto switch position | | | | Return to origin distance | Operating range |
|---|---|---|---|---|---|---|---|
| | | Mounting: Left facing | | Mounting: Right facing | | | |
| | | A | B | C | D | E | — |
| **25** | 15 to 100 | 27 | 62.5 | 39 | 50.5 | (2) | 4.2 |
| | 105 to 400 | 52 | | 64 | | | |
| **32** | 20 to 100 | 30.5 | 85.5 | 42.5 | 53.5 | (2) | 4.9 |
| | 105 to 500 | 90.5 | | 102.5 | | | |

∗1 Figures in the table above are used as a reference when mounting the auto switches for stroke end detection. Adjust the auto switch after confirming the operating condition in the actual setting.
∗2 Switches cannot be mounted on the motor mounting side surface.
∗3 For the LEYG with a guide, switches cannot be mounted on the guide attachment side (rod side).
∗4 Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30 % dispersion). It may change substantially depending on the ambient environment.

## Auto Switch Mounting




### Auto Switch Mounting Screw Tightening Torque

[N·m]

| Auto switch model | Tightening torque |
|---|---|
| **D-M9□A(V)** | 0.05 to 0.10 |

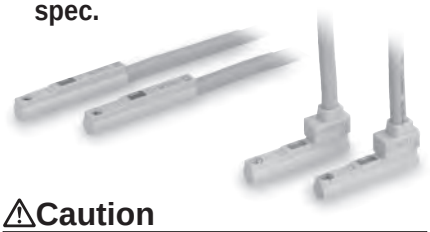
∗ When tightening the auto switch mounting screw (included with auto switch), use a watchmaker's screwdriver with a handle diameter of about 5 to 6 mm.

# Water Resistant 2-Colour Indicator
# Solid State Auto Switch: Direct Mounting Type
# D-M9NA(V)/D-M9PA(V)/D-M9BA(V)

CE RoHS

## Grommet

- Water (coolant) resistant type
- 2-wire load current is reduced (2.5 to 40 mA).
- The proper operating range can be determined by the colour of the light. (Red → Green ← Red)
- Using flexible cable as standard spec.



## ⚠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.
Please consult with SMC if using coolant liquid other than water based solution.

## Weight

[g]

| Auto switch model | | D-M9NA(V) | D-M9PA(V) | D-M9BA(V) |
|---|---|---|---|---|
| Lead wire length | 0.5 m (—) | 8 | 8 | 7 |
| | 1 m (**M**) | 14 | 14 | 13 |
| | 3 m (**L**) | 41 | 38 | 38 |
| | 5 m (**Z**) | 68 | 63 | 63 |

## Auto Switch Specifications

PLC: Programmable Logic Controller

| D-M9□A, D-M9□AV (With indicator light) | | | | | | |
|---|---|---|---|---|---|---|
| Auto switch model | D-M9NA | D-M9NAV | D-M9PA | D-M9PAV | D-M9BA | D-M9BAV |
| Electrical entry direction | 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.<br>Proper operating range ····· Green LED illuminates. | | | | | |
| Standard | CE marking (EMC directive/RoHS directive) | | | | | |

### Oilproof Flexible Heavy-duty Lead Wire Specifications

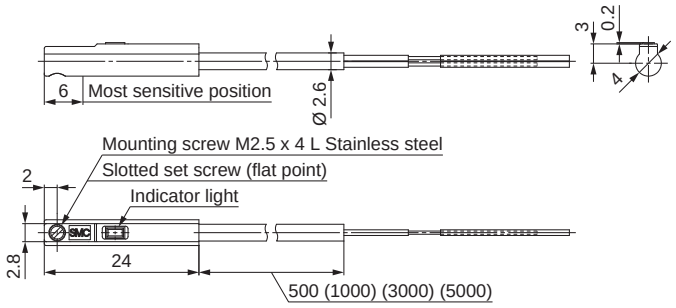
| Auto switch model | | D-M9NA□ | D-M9NAV□ | D-M9PA□ | D-M9PAV□ | D-M9BA□ | D-M9BAV□ |
|---|---|---|---|---|---|---|---|
| Sheath | Outside diameter [mm] | 2.6 | | | | | |
| Insulator | Number of cores | 3 cores (Brown/Blue/Black) | | | | 2 cores (Brown/Blue) | |
| | Outside diameter [mm] | 0.88 | | | | | |
| Conductor | Effective area [mm²] | 0.15 | | | | | |
| | Strand diameter [mm] | 0.05 | | | | | |
| Minimum bending radius [mm] | | 17 | | | | | |

∗ Refer to the **Web Catalogue** for solid state auto switch common specifications.
∗ Refer to the **Web Catalogue** for lead wire lengths.

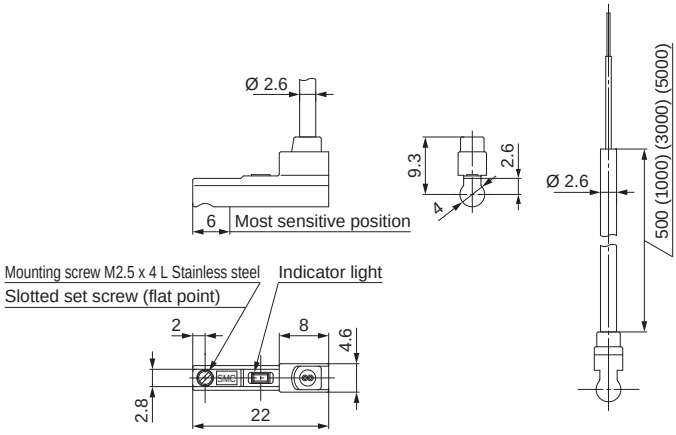
## Dimensions

[mm]

### D-M9□A




### D-M9□AV



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

# Electric Actuator/ Rod Type

Secondary Battery Compatible

## *25A-LEY* Series LEY16, 25, 32, 40

Dust -tight/Water-jet-proof ▸ p. 151

Motor mounting position: Top/Parallel  Motor mounting position: In-line

## How to Order

**25A-LEY** **16** □ □ **B** – **30** □ □ □ – **S1**

Series compatible with secondary batteries

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

*LEC*□ Series **6P** **1** □

*JXC*□ Series **CD17T**

❿ ⓫ ⓬

For details on controllers, refer to page 178.

### ❶ Size

| |
|---|
| 16 |
| 25 |
| 32 |
| 40 |

### ❷ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| R | Right side parallel |
| L | Left side parallel |
| D | In-line |

### ❸ Motor type

| Symbol | Type | Applicable size | | | Compatible controller/driver |
|---|---|---|---|---|---|
| | | LEY16 | LEY25 | LEY32/40 | |
| — | Step motor (Servo/24 VDC) | ● | ● | ● | LECP1, LECPA, JXCE1, JXC91, JXCP1, JXCD1, JXCL1 |
| A | Servo motor (24 VDC) | ● | ● | — | LECA6 |

### ❹ Lead [mm]

| Symbol | LEY16 | LEY25 | LEY32/40 |
|---|---|---|---|
| A | 10 | 12 | 16 |
| B | 5 | 6 | 8 |
| C | 2.5 | 3 | 4 |

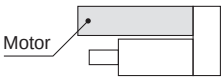
### ❺ Stroke [mm]

| | |
|---|---|
| 30 | 30 |
| to | to |
| 500 | 500 |

∗ For details, refer to the applicable stroke table below.

### ❻ Motor option*2

| | |
|---|---|
| — | Without option |
| C | With motor cover |
| W | With lock/motor cover |




### ❼ Rod end thread

| | |
|---|---|
| — | Rod end female thread |
| M | Rod end male thread (1 rod end nut is included.) |

### ❽ Mounting*5

| Symbol | Type | Motor mounting position | |
|---|---|---|---|
| | | Top/Parallel | In-line |
| — | Ends tapped/Body bottom tapped*6 | ● | ● |
| L | Foot | ● | — |
| F | Rod flange*6 | ●*8 | ● |
| G | Head flange*6 | ●*9 | — |
| D | Double clevis*7 | ● | — |

### ❾ Actuator cable type/length*11

Standard cable [m]

| | |
|---|---|
| — | None |
| S1 | 1.5*12 |
| S3 | 3*12 |
| S5 | 5*12 |

Robotic cable [m]

| | | | |
|---|---|---|---|
| R1 | 1.5 | RA | 10*10 |
| R3 | 3 | RB | 15*10 |
| R5 | 5 | RC | 20*10 |
| R8 | 8*10 | | |

### Mounting Bracket Part Nos. for the 25A- Series*4

| Applicable size | Foot*3 | Flange | Double clevis |
|---|---|---|---|
| 16 | 25-LEY-L016 | 25-LEY-F016 | 25-LEY-D016 |
| 25 | 25-LEY-L025 | 25-LEY-F025 | 25-LEY-D025 |
| 32, 40 | 25-LEY-L032 | 25-LEY-F032 | 25-LEY-D032 |
| Surface treatment | RAYDENT® | RAYDENT® | Coating (Size 16: Electroless nickel plating) |

**Solid state auto switches should be ordered separately. For details on auto switches, refer to the Web Catalogue.**

**Applicable auto switches**

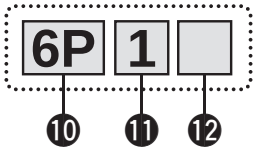
D-M9N(V)-900, D-M9P(V)-900, D-M9B(V)-900
D-M9NW(V)-900, D-M9PW(V)-900, D-M9BW(V)-900

### Applicable Stroke Table*1

●: Standard

| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | Manufacturable stroke range |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25A-LEY16 | ● | ● | ● | ● | ● | ● | ● | — | — | — | — | 10 to 300 |
| 25A-LEY25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | — | — | 15 to 400 |
| 25A-LEY32/40 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 to 500 |

## LEC□ Series (For details, refer to page 179.)




### ⑩ Controller/Driver type*12

| | | |
|---|---|---|
| — | Without controller/driver | |
| 6N | **LECA6** (Step data input type) | NPN |
| 6P | | PNP |
| 1N | **LECP1***13 (Programless type) | NPN |
| 1P | | PNP |
| AN | **LECPA***13 *15 (Pulse input type) | NPN |
| AP | | PNP |

### ⑪ I/O cable length*16, Communication plug

| | |
|---|---|
| — | Without cable (Without communication plug connector) |
| 1 | 1.5 m |
| 3 | 3 m*17 |
| 5 | 5 m*17 |
| S | Straight type communication plug connector |
| T | T-branch type communication plug connector |

### ⑫ Controller/Driver mounting

| | |
|---|---|
| — | Screw mounting |
| D | DIN rail*18 |

## JXC□ Series (For details, refer to page 179.)

### ⑩ Controller

| | |
|---|---|
| — | Without controller |
| C□1□□ | With controller |


**Communication protocol**

| | |
|---|---|
| E | EtherCAT® |
| 9 | EtherNet/IP™ |
| P | PROFINET |
| D | DeviceNet™ |
| L | IO-Link |

**For single axis**

**Mounting**

| | |
|---|---|
| 7 | Screw mounting |
| 8*18 | DIN rail |

**Communication plug connector for DeviceNet™***19

| | |
|---|---|
| — | Without plug connector |
| S | Straight type |
| T | T-branch type |

*1 Please consult with SMC for non-standard strokes as they are produced as special orders.
*2 When "With lock" or "With lock/motor cover" is selected for the top mounting and right/left side parallel types, the motor body will stick out from the end of the body for size 16/40 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.
*3 When ordering foot brackets, order 2 pieces per actuator.
*4 Parts belonging to each bracket are as follows.
Foot, Flange: Body mounting bolt, Double clevis: Clevis pin, Type C retaining ring for axis, Body mounting bolt
*5 The mounting bracket is shipped together with the product but does not come assembled.
*6 For the horizontal cantilever mounting of the rod flange, head flange, or ends tapped types, use the actuator within the following stroke range.
·LEY25: 200 mm or less ·LEY32/40: 100 mm or less
*7 For the mounting of the double clevis type, use the actuator within the following stroke range.
·LEY16: 100 mm or less ·LEY25: 200 mm or less ·LEY32/40: 200 mm or less
*8 The rod flange type is not available for the LEY16/40 with a 30 mm stroke and motor option "With lock," "With lock/motor cover."
*9 The head flange type is not available for the LEY32/40.
*10 Produced upon receipt of order (Robotic cable only)
*11 The standard cable should only be used on fixed parts.
For use on moving parts, select the robotic cable.
*12 For details on controllers/drivers and compatible motors, refer to the compatible controller/driver on the next page.
*13 Only available for the motor type "Step motor"
*14 Not compliant with CE
*15 When pulse signals are open collector, order the current limiting resistor (LEC-PA-R-□) on page 220 separately.
*16 When "Without controller/driver" is selected for controller/driver types, I/O cable cannot be selected. Refer to page 199 (For LECA6), page 213(For LECP1), or page 220 (For LECPA) if I/O cable is required.
*17 When "Pulse input type" is selected for controller/driver types, pulse input usable only with differential. Only 1.5 m cables usable with open collector
*18 The DIN rail is not included. Order it separately.
*19 Select "—" for anything other than DeviceNet™.

### ⚠Caution

**[CE-compliant products]**

① EMC compliance was tested by combining the electric actuator LEY series and the controller LEC/JXC series.
The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with 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 compliance with the EMC directive for the machinery and equipment as a whole.

② For the servo motor (24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 199 for the noise filter set. Refer to the LECA series Operation Manual for installation.

**[UL-compliant products (For the LEC series)]**

When compliance with UL is required, the electric actuator and controller/driver should be used with a UL1310 Class 2 power supply.

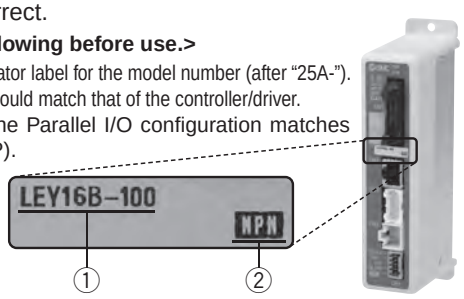
**The actuator and controller/driver are sold as a package.**

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

**<Check the following before use.>**

① Check the actuator label for the model number (after "25A-").
This number should match that of the controller/driver.

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




* Refer to the Operation Manual for using the products. Please download it via our website, https://www.smc.eu

**Compatible Controller/Driver**

## LEC□ Series

| Type | Step data input type  | Programless type  | Pulse input type  |
|---|---|---|---|
| **Series** | **LECA6** | **LECP1** | **LECPA** |
| **Features** | Value (Step data) input Standard controller | Capable of setting up operation (step data) without using a PC or teaching box | Operation by pulse signals |
| **Compatible motor** | Servo motor (24 VDC) | Step motor (Servo/24 VDC) | |
| **Max. number of step data** | 64 points | 14 points | — |
| **Power supply voltage** | | | |
| **Reference page** | 191 | 207 | 214 |

## JXC□ Series

| Type | EtherCAT® direct input type  | EtherNet/IP™ direct input type  | PROFINET direct input type  | DeviceNet™ direct input type  | IO-Link direct input type  |
|---|---|---|---|---|---|
| **Series** | **JXCE1** | **JXC91** | **JXCP1** | **JXCD1** | **JXCL1** |
| **Features** | EtherCAT® direct input | EtherNet/IP™ direct input | PROFINET direct input | DeviceNet™ direct input | IO-Link direct input |
| **Compatible motor** | Step motor (Servo/24 VDC) | | | | |
| **Max. number of step data** | 64 points | | | | |
| **Power supply voltage** | 24 VDC | | | | |
| **Reference page** | 224 | | | | |

# Electric Actuator/ Rod Type

Secondary Battery Compatible

## *25A-LEY Series* LEY25, 32

Size 25, 32

∗ Refer to the table below.

RoHS

LECY□ Series ▶ p. 183

Refer to page 41 for model selection.

## How to Order

**25A-LEY H 25 □ S2 B – 100 □ □ □ – S 2 A1 □**

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭

**Series compatible with secondary batteries**

### ❶ Accuracy

| | |
|---|---|
| — | Basic type |
| H | High-precision type |

### ❷ Size

| |
|---|
| 25 |
| 32 |

### ❸ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| R | Right side parallel |
| L | Left side parallel |
| D | In-line |

### ❹ Motor type

| Symbol | Type | Output [W] | Actuator size | Compatible driver∗3 | UL-compliant |
|---|---|---|---|---|---|
| S2∗1 | AC servo motor (Incremental encoder) | 100 | 25 | LECSA□-S1 | — |
| S3 | | 200 | 32 | LECSA□-S3 | — |
| S6∗1 | AC servo motor (Absolute encoder) | 100 | 25 | LECSB□-S5<br>LECSC□-S5<br>LECSS□-S5 | — |
| S7 | | 200 | 32 | LECSB□-S7<br>LECSC□-S7<br>LECSS□-S7 | — |
| T6∗2 | AC servo motor (Absolute encoder) | 100 | 25 | LECSS2-T5 | ● |
| T7 | | 200 | 32 | LECSS2-T7 | ● |

∗1 For motor type S2 and S6, the compatible driver part number suffixes are S1 and S5 respectively.
∗2 For motor type T6, the compatible driver part number suffix is T5.
∗3 For details on the driver, refer to the **Web Catalogue**.

### ❺ Lead [mm]

| Symbol | LEY25 | LEY32∗1 |
|---|---|---|
| A | 12 | 16 (20) |
| B | 6 | 8 (10) |
| C | 3 | 4 (5) |

∗1 The values shown in ( ) are the leads for the size 32 top mounting, right/left side parallel types. (Equivalent leads which include the pulley ratio [1.25:1])

### ❻ Stroke [mm]

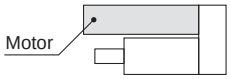
| | |
|---|---|
| 30 | 30 |
| to | to |
| 500 | 500 |

∗ For details, refer to the applicable stroke table below.

### ❼ Motor option

| | |
|---|---|
| — | Without option |
| B | With lock∗1 |

∗1 When "With lock" is selected for the top mounting and right/left side parallel types, the motor body will stick out from the end of the body for size 25 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.




### ❽ Rod end thread

| | |
|---|---|
| — | Rod end female thread |
| M | Rod end male thread (1 rod end nut is included.) |

### ❾ Mounting∗1

| Symbol | Type | Motor mounting position: Top/Parallel | Motor mounting position: In-line |
|---|---|---|---|
| — | Ends tapped/ Body bottom tapped∗2 | ● | ● |
| L | Foot | ● | — |
| F | Rod flange∗2 | ●∗4 | ● |
| G | Head flange∗2 | ●∗5 | — |
| D | Double clevis∗3 | ● | — |

∗1 The mounting bracket is shipped together with the product but does not come assembled.
∗2 For the horizontal cantilever mounting of the rod flange, head flange, or ends tapped types, use the actuator within the following stroke range.
· 25A-LEY25: 200 mm or less
· 25A-LEY32: 100 mm or less
∗3 For the mounting of the double clevis type, use the actuator within the following stroke range.
· 25A-LEY25: 200 mm or less
· 25A-LEY32: 200 mm or less
∗4 The rod flange type is not available for the 25A-LEY25 with a 30 mm stroke and motor option "With lock."
∗5 The head flange type is not available for the 25A-LEY32.

### Mounting Bracket Part Nos. for the 25A- Series

| Applicable size | Foot∗1 | Flange | Double clevis |
|---|---|---|---|
| 25 | 25-LEY-L025 | 25-LEY-F025 | 25-LEY-D025 |
| 32 | 25-LEY-L032 | 25-LEY-F032 | 25-LEY-D032 |
| Surface treatment | RAYDENT® | RAYDENT® | Coating (Size 16: Electroless nickel plating) |

∗1 When ordering foot brackets, order 2 pieces per actuator.
∗ Parts belonging to each bracket are as follows.
Foot, Flange: Body mounting bolt, Double clevis: Clevis pin, Type C retaining ring for axis, Body mounting bolt

### Applicable Stroke Table

●: Standard

| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | Manufacturable stroke range [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25A-LEY25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | — | — | 15 to 400 |
| 25A-LEY32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 to 500 |

∗ Please consult with SMC for non-standard strokes as they are produced as special orders.

**Solid state auto switches should be ordered separately. For details on auto switches, refer to the Web Catalogue.**

**Applicable auto switches**
D-M9N(V)-900, D-M9P(V)-900, D-M9B(V)-900
D-M9NW(V)-900, D-M9PW(V)-900, D-M9BW(V)-900



SMC

**Motor mounting position: Top/Parallel**

**Motor mounting position: In-line**

### ⑩ Cable type*1 *2

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

*1 The motor and encoder cables are included. (The lock cable is also included when the motor with lock option is selected.)
*2 Standard cable entry direction is
· Top/Parallel: (A) Axis side
· In-line: (B) Counter axis side

### ⑪ Cable length*1 [m]

| | |
|---|---|
| — | Without cable |
| 2 | 2 |
| 5 | 5 |
| A | 10 |

*1 The length of the encoder, motor, and lock cables are the same.

### ⑫ Driver type*1

| | Compatible driver | Power supply voltage [V] | UL-compliant |
|---|---|---|---|
| — | Without driver | — | — |
| A1 | LECSA1-S□ | 100 to 120 | — |
| A2 | LECSA2-S□ | 200 to 230 | — |
| B1 | LECSB1-S□ | 100 to 120 | — |
| B2 | LECSB2-S□ | 200 to 230 | — |
| C1 | LECSC1-S□ | 100 to 120 | — |
| C2 | LECSC2-S□ | 200 to 230 | — |
| S1 | LECSS1-S□ | 100 to 120 | — |
| S2 | LECSS2-S□ | 200 to 230 | — |
| | LECSS2-T□ | 200 to 240 | ● |

*1 When a driver type is selected, a cable is included. Select the cable type and cable length.
Example)
S2S2: Standard cable (2 m) + Driver (LECSS2)
S2 : Standard cable (2 m)
— : Without cable and driver

### ⑬ I/O cable length [m]*1

| | |
|---|---|
| — | Without cable |
| H | Without cable (Connector only) |
| 1 | 1.5 |

*1 When "Without driver" is selected for driver type, only "—: Without cable" can be selected.
Refer to page 265 if I/O cable is required.

* The 25A- series specifications and dimensions are the same as those of the standard model.

### Compatible Driver

| Driver type | Pulse input type/ Positioning type | Pulse input type | CC-Link direct input type | SSCNETⅢ type | SSCNETⅢ/H type |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| **Series** | **LECSA** | **LECSB** | **LECSC** | **LECSS** | **LECSS-T** |
| Number of point tables | Up to 7 | — | Up to 255 (2 stations occupied) | — | — |
| **Pulse input** | ○ | ○ | — | — | — |
| Applicable network | — | — | CC-Link | SSCNETⅢ | SSCNETⅢ/H |
| **Control encoder** | Incremental 17-bit encoder | Absolute 18-bit encoder | Absolute 18-bit encoder | Absolute 18-bit encoder | Absolute 22-bit encoder |
| Communication function | USB communication | USB communication, RS422 communication | | USB communication | |
| **Power supply voltage [V]** | 100 to 120 VAC (50/60 Hz), 200 to 230 VAC (50/60 Hz) | | | | 200 to 240 VAC (50/60 Hz) |
| **Reference page** | 246 | | | | |

* Copper and zinc materials are used for the motors, cables, controllers/drivers.

# Electric Actuator/ Rod Type

Secondary Battery Compatible

## *25A-LEY Series* LEY25, 32

Size 25, 32

RoHS

LECS□ Series ▶ p. 181

Refer to page 48 for model selection.

## How to Order

**25A-LEY** **H** **25** **□** **V6** **B** – **100** **□** **□** **□** – **S** **2** **M2** **□**

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭

**Series compatible with secondary batteries**

### ❶ Accuracy

| | |
|---|---|
| — | Basic type |
| **H** | High-precision type |

### ❷ Size

| |
|---|
| **25** |
| **32** |

### ❸ Motor mounting position

| | |
|---|---|
| — | Top mounting |
| **R** | Right side parallel |
| **L** | Left side parallel |
| **D** | In-line |

### ❹ Motor type

| Symbol | Type | Output [W] | Size | Compatible driver |
|---|---|---|---|---|
| **V6**∗1 | AC servo motor (Absolute encoder) | 100 | 25 | LECYM2-V5 LECYU2-V5 |
| **V7** | | 200 | 32 | LECYM2-V7 LECYU2-V7 |

∗1 For motor type V6, the compatible driver part number suffix is V5.

### ❺ Lead [mm]

| Symbol | 25A-LEY25 | 25A-LEY32∗1 |
|---|---|---|
| **A** | 12 | 16 (20) |
| **B** | 6 | 8 (10) |
| **C** | 3 | 4 (5) |

∗1 The values shown in ( ) are the leads for the size 32 top mounting, right/left side parallel types. (Equivalent leads which include the pulley ratio [1.25:1])

### ❻ Stroke [mm]

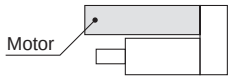
| | |
|---|---|
| **30** | 30 |
| **to** | to |
| **500** | 500 |

∗ For details, refer to the applicable stroke table below.

### ❼ Motor option

| | |
|---|---|
| — | Without option |
| **B** | With lock∗1 |

∗1 When "With lock" is selected for the top mounting and right/left side parallel types, the motor body will stick out from the end of the body for size 25 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.




### ❽ Rod end thread

| | |
|---|---|
| — | Rod end female thread |
| **M** | Rod end male thread (1 rod end nut is included.) |

### ❾ Mounting∗1

| Symbol | Type | Motor mounting position | |
|---|---|---|---|
| | | Top/Parallel | In-line |
| — | Ends tapped/ Body bottom tapped∗2 | ● | ● |
| **L** | Foot | ● | — |
| **F** | Rod flange∗2 | ●∗4 | ● |
| **G** | Head flange∗2 | ●∗5 | — |
| **D** | Double clevis∗3 | ● | — |

∗1 The mounting bracket is shipped together with the product but does not come assembled.
∗2 For the horizontal cantilever mounting of the rod flange, head flange, or ends tapped types, use the actuator within the following stroke range.
· LEY25: 200 mm or less · LEY32: 100 mm or less
∗3 For the mounting of the double clevis type, use the actuator within the following stroke range.
· LEY25: 200 mm or less · LEY32: 200 mm or less
∗4 The rod flange type is not available for the LEY25 with a 30 mm stroke and motor option "With lock."
∗5 The head flange type is not available for the LEY32.

### Mounting Bracket Part Nos. for the 25A- Series

| Applicable size | Foot∗1 | Flange | Double clevis |
|---|---|---|---|
| **25** | 25-LEY-L025 | 25-LEY-F025 | 25-LEY-D025 |
| **32** | 25-LEY-L032 | 25-LEY-F032 | 25-LEY-D032 |
| **Surface treatment** | RAYDENT® | RAYDENT® | Coating (Size 16: Electroless nickel plating) |

∗1 When ordering foot brackets, order 2 pieces per actuator.
∗ Parts belonging to each bracket are as follows.
Foot, Flange: Body mounting bolt, Double clevis: Clevis pin, Type C retaining ring for axis, Body mounting bolt

**Solid state auto switches should be ordered separately.**
**For details on auto switches, refer to the** Web Catalogue**.**

**Applicable auto switches**
D-M9N(V)-900, D-M9P(V)-900, D-M9B(V)-900
D-M9NW(V)-900, D-M9PW(V)-900, D-M9BW(V)-900

### Applicable Stroke Table

●: Standard

| Model \ Stroke [mm] | 30 | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | Manufacturable stroke range [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **25A-LEY25** | ● | ● | ● | ● | ● | ● | ● | ● | ● | — | — | 15 to 400 |
| **25A-LEY32** | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | 20 to 500 |

∗ Please consult with SMC for non-standard strokes as they are produced as special orders.

**Motor mounting position: Top/Parallel**

**Motor mounting position: In-line**

### ⑩ Cable type*1 *2

| | |
|---|---|
| **—** | Without cable |
| **S** | Standard cable |
| **R** | Robotic cable (Flexible cable) |

*1 The motor and encoder cables are included. (The lock cable is also included when the motor with lock option is selected.)
*2 Standard cable entry direction is
· Top/Parallel: (A) Axis side
· In-line: (B) Counter axis side

### ⑪ Cable length [m]*1

| | |
|---|---|
| **—** | Without cable |
| **3** | 3 |
| **5** | 5 |
| **A** | 10 |
| **C** | 20 |

*1 The length of the motor and encoder cables are the same. (For with lock)

### ⑫ Driver type

| | Compatible driver | Power supply voltage [V] |
|---|---|---|
| **—** | Without driver | — |
| **M2** | LECYM2-V□ | 200 to 230 |
| **U2** | LECYU2-V□ | 200 to 230 |

* When a driver type is selected, a cable is included. Select the cable type and cable length.

### ⑬ I/O cable length [m]*1

| | |
|---|---|
| **—** | Without cable |
| **H** | Without cable (Connector only) |
| **1** | 1.5 |

*1 When "Without driver" is selected for driver type, only "—: Without cable" can be selected. Refer to page 278 if I/O cable is required.

* The 25A- series specifications and dimensions are the same as those of the standard model.

## Compatible Driver

| **Driver type** | MECHATROLINK-Ⅱ type  | MECHATROLINK-Ⅲ type  |
|---|---|---|
| **Series** | **LECYM** | **LECYU** |
| **Applicable network** | MECHATROLINK-Ⅱ | MECHATROLINK-Ⅲ |
| **Control encoder** | Absolute 20-bit encoder | |
| **Communication device** | USB communication, RS-422 communication | |
| **Power supply voltage [V]** | 200 to 230 VAC (50/60 Hz) | |
| **Reference page** | 271 | |

* Copper and zinc materials are used for the motors, cables, controllers/drivers.

# *LEY/LEYG Series*
# Electric Actuators
# Specific Product Precautions 1

**Be sure to read this before handling the products. Refer to the back cover for safety instructions. For electric actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu**

## Design/Selection

## ⚠Warning

**1. Do not apply a load in excess of the specification limits.**

Select a suitable actuator by work load and allowable lateral load on the rod end. If a load in excess of the specification limits is applied to the piston rod, the generation of play in the piston rod sliding parts, reduced accuracy, etc., may occur and adversely affect the operation and service life of the product.

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

This can cause a malfunction.

**3. When used as a stopper, select the LEYG series "Sliding bearing" for strokes of 30 mm or less.**

**4. When used as a stopper, fix the main body with a guide attachment ("Top mounting" or "Bottom mounting").**

If the end of the actuator is used to fix the main body (end mounting), the excessive load acts on the actuator, which may adversely affect the operation and service life of the product.

## Handling

## ⚠Caution

**1. INP output signal**

1) Positioning operation

When the product comes within the set range of the step data [In position], the INP output signal will turn ON.

Initial value: Set to [0.50] or higher.

2) Pushing operation

When the effective force exceeds the step data [Trigger LV], the INP output signal will turn ON.

Use the product within the specified range of the [Pushing force] and [Trigger LV].

a) To ensure that the actuator pushes the workpieces with the set [Pushing force], it is recommended that the [Trigger LV] be set to the same value as the [Pushing force].

b) When the [Pushing force] and the [Trigger LV] are set below the specified range, the INP output signal will turn ON from the pushing start position.

**<Limit Values for Pushing Force and Trigger Level in Relation to Pushing Speed>**
**Without Load**

| Model | Lead | Pushing speed [mm/s] | Pushing force (Setting input value) |
|---|---|---|---|
| LEY□16□ | A/B/C | 21 to 50 | 60 to 85 % |
| LEY□25□ | A/B/C | 21 to 35 | 50 to 65 % |
| LEY□32□ | A | 24 to 30 | 60 to 85 % |
| | B/C | 21 to 30 | |
| LEY□40□ | A | 24 to 30 | 50 to 65 % |
| | B/C | 21 to 30 | |

| Model | Lead | Pushing speed [mm/s] | Pushing force (Setting input value) |
|---|---|---|---|
| LEY□16□A | A/B/C | 21 to 50 | 80 to 95 % |
| LEY□25□A | A/B/C | 21 to 35 | 80 to 95 % |

There is a limit to the pushing force in relation to the pushing speed. If the product is operated outside of the range (low pushing force), the completion signal [INP] may be output before the pushing operation has been completed (during the moving operation).
If operating with the pushing speed below the min. speed, please check for operating problems before using the product.

## Handling

## ⚠Caution

**<Set Values for Vertical Upward Transfer Pushing Operations>**

For vertical loads (upward), set the pushing force to the max. value shown below and operate at the work load or less.

| Model | LEY16□ | | | LEY25□ | | | LEY32□ | | | LEY40□ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | A | B | C | A | B | C | A | B | C | A | B | C |
| Work load [kg] | 1 | 1.5 | 3 | 2.5 | 5 | 10 | 4.5 | 9 | 18 | 7 | 14 | 28 |
| Pushing force | 85 % | | | 65 % | | | 85 % | | | 65 % | | |

| Model | LEY16□A | | | LEY25□A | | |
|---|---|---|---|---|---|---|
| Lead | A | B | C | A | B | C |
| Work load [kg] | 1 | 1.5 | 3 | 1.2 | 2.5 | 5 |
| Pushing force | 95 % | | | 95 % | | |

| Model | LEYG16$^{M}_{L}$□ | | | LEYG25$^{M}_{L}$□ | | | LEYG32$^{M}_{L}$□ | | | LEYG40$^{M}_{L}$□ | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | A | B | C | A | B | C | A | B | C | A | B | C |
| Work load [kg] | 0.5 | 1 | 2.5 | 1.5 | 4 | 9 | 2.5 | 7 | 16 | 5 | 12 | 26 |
| Pushing force | 85 % | | | 65 % | | | 85 % | | | 65 % | | |

| Model | LEYG16$^{M}_{L}$□A | | | LEYG25$^{M}_{L}$□A | | |
|---|---|---|---|---|---|---|
| Lead | A | B | C | A | B | C |
| Work load [kg] | 0.5 | 1 | 2.5 | 0.5 | 1.5 | 4 |
| Pushing force | 95 % | | | 95 % | | |

**2. To conduct a pushing operation, be sure to set the product to [Pushing operation].**

Also, refrain from bumping the workpiece during a positioning operation or when in the range of the positioning operation. Failure to do so may result in a malfunction.

**3. Use the product within the specified pushing speed range for the pushing operation.**

Failure to do so may result in damage or malfunction.

**4. The moving force should be the initial value (LEY16□/25□/32□/40□: 100 %, LEY16A□: 150 %, and LEY25A□: 200 %).**

If the moving force is set below the initial value, it may cause the generation of an alarm.

**5. The actual speed of this actuator is affected by the load.**

Check the model selection section of the catalogue.

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

Additional force will cause the displacement of the origin position since it is based on the detected motor torque.

**7. For pushing operations, set the product to a position at least 2 mm away from a workpiece. (This position is referred to as the pushing start position.)**

The following alarms may be generated and operation may become unstable if setting is not done correctly.

**a. "Posn failed"**

The product cannot reach the pushing start position due to variations in the target positions.

**b. "Pushing ALM"**

The product is pushed back from the pushing start position after starting to push.

# Electric Actuators Specific Product Precautions 2

**Be sure to read this before handling the products. Refer to the back cover for safety instructions. For electric actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu**

## Handling

## ⚠Caution

**8. Do not scratch or dent the sliding parts of the piston rod by bumping them or placing objects on them.**

The piston rod and guide rod are manufactured to precise tolerances, so even a slight deformation may cause a malfunction.

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

Use a freely moving connector (such as a floating joint).

**10. Do not operate by fixing the piston rod and moving the actuator body.**

Excessive load will be applied to the piston rod, resulting in damage to the actuator and a reduced service life of the product.

**11. When an actuator is operated with one end fixed and the other free (ends tapped or flange), a bending moment may act on the actuator due to vibration generated at the stroke end, which can damage the actuator. In such cases, install a mounting bracket to suppress the vibration of the actuator body or reduce the speed so that the actuator does not vibrate at the stroke end.**

Also, use a mounting bracket when moving the actuator body or when a long stroke actuator is mounted horizontally and fixed at one end.

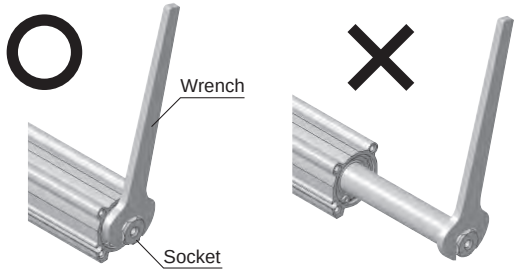
**12. Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod.**

This may cause the deformation of the non-rotating guide, abnormal auto switch responses, play in the internal guide, or an increase in the sliding resistance.

Refer to the table below for the approximate values of the allowable range of rotational torque.

| Allowable rotational torque [N·m] or less | LEY16□□ | LEY25□□ | LEY32/40□□ | LEY63 |
|---|---|---|---|---|
| | 0.8 | 1.1 | 1.4 | 2.8 |

When screwing a bracket or nut into the piston rod end, hold the flats of the end of the "socket" with a wrench (the piston rod should be fully retracted). Do not apply tightening torque to the non-rotating mechanism.




**13. When rotational torque is applied to the end of the plate, use it within the allowable range. [LEYG series]**

Failure to do so may cause the deformation of the guide rod and bushing, play in the guide, or an increase in the sliding resistance.

**14. For pushing operations, use the product within the duty ratio range below.**

The duty ratio is the fraction of time that the product can keep pushing.

**• Step motor (Servo/24 VDC)**

**LEY16□**

| Pushing force [%] | Ambient temperature: 25 °C or less | | Ambient temperature: 40 °C | |
|---|---|---|---|---|
| | Duty ratio [%] | Continuous pushing time [minute] | Duty ratio [%] | Continuous pushing time [minute] |
| 40 or less | 100 | — | 100 | — |
| 50 | | | 70 | 12 |
| 70 | | | 20 | 1.3 |
| 85 | | | 15 | 0.8 |

**LEY25□/40□**

| Pushing force [%] | Ambient temperature: 25 °C or less | | Ambient temperature: 40 °C | |
|---|---|---|---|---|
| | Duty ratio [%] | Continuous pushing time [minute] | Duty ratio [%] | Continuous pushing time [minute] |
| 65 or less | 100 | — | 100 | — |

**LEY32□**

| Pushing force [%] | Ambient temperature: 25 °C or less | | Ambient temperature: 40 °C | |
|---|---|---|---|---|
| | Duty ratio [%] | Continuous pushing time [minute] | Duty ratio [%] | Continuous pushing time [minute] |
| 65 or less | 100 | — | 100 | — |
| 85 | | | 50 | 15 |

**• Servo motor (24 VDC)**

**LEY16A□**

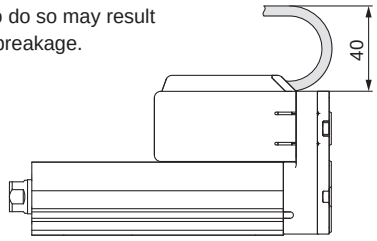
| Pushing force [%] | Ambient temperature: 25 °C or less | | Ambient temperature: 40 °C | |
|---|---|---|---|---|
| | Duty ratio [%] | Continuous pushing time [minute] | Duty ratio [%] | Continuous pushing time [minute] |
| 95 or less | 100 | — | 100 | — |

**LEY25A□**

| Pushing force [%] | Ambient temperature: 25 °C or less | | Ambient temperature: 40 °C | |
|---|---|---|---|---|
| | Duty ratio [%] | Continuous pushing time [minute] | Duty ratio [%] | Continuous pushing time [minute] |
| 95 or less | 100 | — | 100 | — |

**15. When mounting the product, secure a space of 40 mm or more to allow for bends in the cable.**

* Failure to do so may result in cable breakage.




**16. When mounting a bolt, workpiece, or jig, hold the flats of the piston rod end with a wrench so that the piston rod does not rotate. The bolt should be tightened within the specified torque range.**

Failure to do so may cause abnormal auto switch responses, play in the internal guide, or an increase in the sliding resistance.

**Be sure to read this before handling the products. Refer to the back cover for safety instructions. For electric actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu**

## Handling

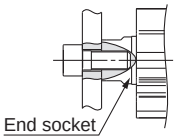
# ⚠Caution

**17. When mounting the product and/or a workpiece, tighten the mounting screws within the specified torque range.**

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

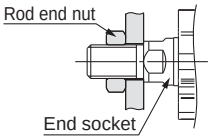
**<LEY series>**

### Workpiece fixed/Rod end female thread

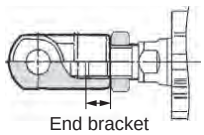



| Model | Screw size | Max. tightening torque [N·m] | Max. screw-in depth [mm] | End socket width across flats [mm] |
|---|---|---|---|---|
| **LEY16** | M5 x 0.8 | 3.0 | 10 | 14 |
| **LEY25** | M8 x 1.25 | 12.5 | 13 | 17 |
| **LEY32/40** | M8 x 1.25 | 12.5 | 13 | 22 |
| **LEY63** | M16 x 2 | 106 | 21 | 36 |

### Workpiece fixed/Rod end male thread (When "Rod end male thread" is selected)



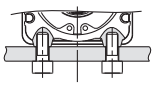

| Model | Thread size | Max. tightening torque [N·m] | Effective thread length [mm] | End socket width across flats [mm] |
|---|---|---|---|---|
| **LEY16** | M8 x 1.25 | 12.5 | 12 | 14 |
| **LEY25** | M14 x 1.5 | 65.0 | 20.5 | 17 |
| **LEY32/40** | M14 x 1.5 | 65.0 | 20.5 | 22 |
| **LEY63** | M18 x 1.5 | 97.0 | 26 | 36 |




| Model | Rod end nut | | End bracket |
|---|---|---|---|
| | Width across flats [mm] | Length [mm] | screw-in depth [mm] |
| **LEY16** | 13 | 5 | 5 or more |
| **LEY25** | 22 | 8 | 8 or more |
| **LEY32/40** | 22 | 8 | 8 or more |
| **LEY63** | 27 | 11 | 18 |

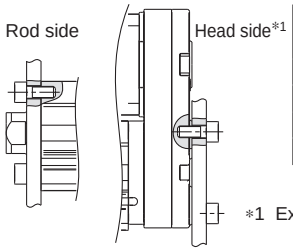
∗ The rod end nut is an accessary.

### Body fixed/Body bottom tapped type (When "Body bottom tapped" is selected)



| Model | Screw size | Max. tightening torque [N·m] | Max. screw-in depth [mm] |
|---|---|---|---|
| **LEY16** | M4 x 0.7 | 1.5 | 5.5 |
| **LEY25** | M5 x 0.8 | 3.0 | 6.5 |
| **LEY32/40** | M6 x 1.0 | 5.2 | 8.8 |
| **LEY63** | M8 x 1.25 | 12.5 | 10 |

### Body fixed/Rod side/Head side tapped type

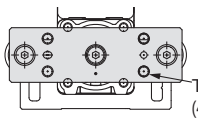



| Model | Screw size | Max. tightening torque [N·m] | Max. screw-in depth [mm] |
|---|---|---|---|
| **LEY16** | M4 x 0.7 | 1.5 | 7 |
| **LEY25** | M5 x 0.8 | 3.0 | 8 |
| **LEY32/40** | M6 x 1.0 | 5.2 | 10 |
| **LEY63** | M8 x 1.25 | 12.5 | 16 |

∗1 Excludes the LEY□D

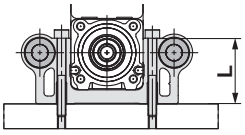
**<LEYG series>**

### Workpiece fixed/Plate tapped type



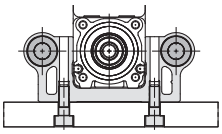

| Model | Screw size | Max. tightening torque [N·m] | Max. screw-in depth [mm] |
|---|---|---|---|
| **LEYG16$^{M}_{L}$** | M5 x 0.8 | 3.0 | 8 |
| **LEYG25$^{M}_{L}$** | M6 x 1.0 | 5.2 | 11 |
| **LEYG$^{32M}_{40L}$** | M6 x 1.0 | 5.2 | 12 |

### Body fixed/Top mounting



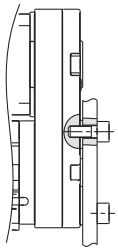

| Model | Screw size | Max. tightening torque [N·m] | Length: L [mm] |
|---|---|---|---|
| **LEYG16$^{M}_{L}$** | M4 x 0.7 | 1.5 | 32 |
| **LEYG25$^{M}_{L}$** | M5 x 0.8 | 3.0 | 40.3 |
| **LEYG$^{32M}_{40L}$** | M5 x 0.8 | 3.0 | 50.3 |

### Body fixed/Bottom mounting



| Model | Screw size | Max. tightening torque [N·m] | Max. screw-in depth [mm] |
|---|---|---|---|
| **LEYG16$^{M}_{L}$** | M5 x 0.8 | 3.0 | 10 |
| **LEYG25$^{M}_{L}$** | M6 x 1.0 | 5.2 | 12 |
| **LEYG$^{32M}_{40L}$** | M6 x 1.0 | 5.2 | 12 |

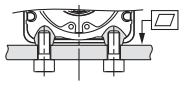
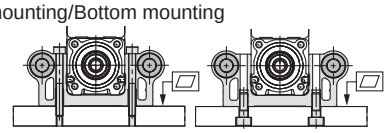
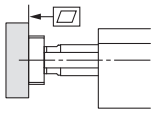
### Body fixed/Head side tapped type



| Model | Screw size | Max. tightening torque [N·m] | Max. screw-in depth [mm] |
|---|---|---|---|
| **LEYG16$^{M}_{L}$** | M4 x 0.7 | 1.5 | 7 |
| **LEYG25$^{M}_{L}$** | M5 x 0.8 | 3.0 | 8 |
| **LEYG$^{32M}_{40L}$** | M6 x 1.0 | 5.2 | 10 |

**18. Keep the flatness of the mounting surface within the following ranges when mounting the actuator body and workpiece.**

Mounting the product on an uneven workpiece or base may cause an increase in the sliding resistance.

| Model | Mounting position | Flatness |
|---|---|---|
| **LEY□** | Body/Body bottom  | 0.1 mm or less |
| **LEYG□** | Top mounting/Bottom mounting  | 0.02 mm or less |
| | Workpiece/Plate mounting  | 0.02 mm or less |

**19. When using auto switches with the guide rod type LEYG series, the following limits apply. Please consider the following before selecting the product.**

- Auto switches must be inserted from the front side with the rod (plate) sticking out.
- Auto switches with perpendicular electrical entries cannot be used.
- Auto switches cannot be fixed with the parts hidden behind the guide attachment (the side of the rod that sticks out).
- Please consult with SMC when using auto switches on the side of the rod that sticks out.

# Electric Actuators Specific Product Precautions 4

**Be sure to read this before handling the products. Refer to the back cover for safety instructions. For electric actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu**

## Handling

### ⚠Caution

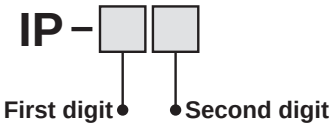
**20. When using the product with the IP65 or equivalent specifications, be sure to mount the tubing to the vent hole, and then place the end of the tubing in an area where it is not exposed to dust or water. When the actuator is used without mounting the fitting and tubing to the vent hole, water or dust may enter the inside of the actuator, causing a malfunction.**

**21. When fluctuations in the load are caused during operation, malfunction, noise, or alarm generation may occur. (In the case of the AC servo motor)**

The gain tuning may not be suitable for fluctuating loads.

Adjust the gain properly by following the instructions in the driver manual.

## Enclosure




- **First Digit:**
  **Degree of protection against solid foreign objects**

| | |
|---|---|
| **0** | Not protected |
| **1** | Protected against solid foreign objects of 50 mmØ and larger |
| **2** | Protected against solid foreign objects of 12 mmØ and larger |
| **3** | Protected against solid foreign objects of 2.5 mmØ and larger |
| **4** | Protected against solid foreign objects of 1.0 mmØ and larger |
| **5** | Dust protected |
| **6** | Dust-tight |

- **Second Digit:**
  **Degree of protection against water**

| | | |
|---|---|---|
| **0** | Not protected | — |
| **1** | Protected against vertically falling water droplets | Dripproof type 1 |
| **2** | Protected against vertically falling water droplets when enclosure is tilted up to 15° | Dripproof type 2 |
| **3** | Protected against rainfall when enclosure is tilted up to 60° | Rainproof type |
| **4** | Protected against splashing water | Splashproof type |
| **5** | Protected against water jets | Water-jet-proof type |
| **6** | Protected against powerful water jets | Powerful water-jet-proof type |
| **7** | Protected against the effects of temporary immersion in water | Immersible type |
| **8** | Protected against the effects of continuous immersion in water | Submersible type |

Example) IP65: Dust-tight, Water-jet-proof type
"Water-jet-proof" means that no water enters the equipment that could hinder it from operating normally when water is applied for 3 minutes in the prescribed manner. Take appropriate protective measures as the device is not usable in environments where droplets of water are splashed constantly.

## Maintenance

### ⚠Warning

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

- **Maintenance frequency**
  Perform maintenance according to the table below.

| Frequency | Appearance check | Belt check |
|---|---|---|
| Inspection before daily operation | ○ | — |
| Inspection every 6 months/ 250 km/5 million cycles*1 | ○ | ○ |

*1 Select whichever comes first.

- **Items for visual appearance check**
  1. Loose set screws, Abnormal amount of dirt, etc.
  2. Check for visible damage, Check of cable joint
  3. Vibration, Noise

- **Items for belt check**
  Stop operation immediately and replace the belt when any of the following occur. In addition, 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 coming off and the fiber has become whitish, Lines of fibers have become unclear

  **b. Peeling off or wearing of the side of the belt**
  Belt corner has become rounded and frayed threads stick out

  **c. Belt is partially cut**
  Belt is partially cut, Foreign matter caught in the teeth of other parts is causing damage

  **d. A vertical line on belt teeth is visible**
  Damage which is made when the belt runs on the flange

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

  **f. Cracks on the back of the belt are visible**

# Controller/Driver
## *LEC□/JXC□ Series*



### <Single Axis Controllers>

**Step Data Input Type** ..... p. 191

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

**Gateway Unit** ..... p. 203

**LEC-G Series**

**Programless Type** ..... p. 207

**Step Motor (Servo/24 VDC)**
**LECP1 Series**

**Pulse Input Type** ..... p. 214

**Step Motor (Servo/24 VDC)**
**LECPA Series**

**EtherCAT®/EtherNet/IP™/PROFINET/DeviceNet™/IO-Link Direct Input Type** ..... p. 2224

**JXC□ Series**

EtherCAT® EtherNet/IP™ PROFINET DeviceNet™ IO-Link





### <Multi-Axis Controllers>

**EtherNet/IP™ Direct Input Type** ..... p. 233

**For 3 axes** **JXC92 Series**

**Parallel I/O/EtherNet/IP™ Direct Input Type** ..... p. 235

**For 4 axes**

**JXC73 Series**
**JXC83 Series**

**JXC93 Series**
EtherNet/IP™

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

*LECA6 Series*

CE cULus RoHS

## How to Order

**⚠Caution**

**[CE-compliant products]**

① EMC compliance was tested by combining the electric actuator LE 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, compliance with 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 compliance with 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 199 for the noise filter set. Refer to the LECA Operation Manual for installation.

**[UL-compliant products]**

When compliance with UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

**LE C A 6 P □ □ – □**

**Controller**

**Compatible motor**

| | |
|---|---|
| **A** | Servo motor (24 VDC) |

**Number of step data (Points)**

| | |
|---|---|
| **6** | 64 |

**Parallel I/O type**

| | |
|---|---|
| **N** | NPN |
| **P** | PNP |

**I/O cable length [m]**

| | |
|---|---|
| **—** | Without cable |
| **1** | 1.5 |
| **3** | 3 |
| **5** | 5 |

**Option**

| | |
|---|---|
| **—** | Screw mounting |
| **D**∗1 | DIN rail mounting |

∗1 The DIN rail is not included. Order it separately.

**Actuator part number**

| | |
|---|---|
| | Without cable specifications and actuator options<br>Example: Enter "LEY16B-100" for the LEY16B-100B-R16N1. |
| **BC** | Blank controller∗1 |

∗1 Requires dedicated software (LEC-BCW)

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

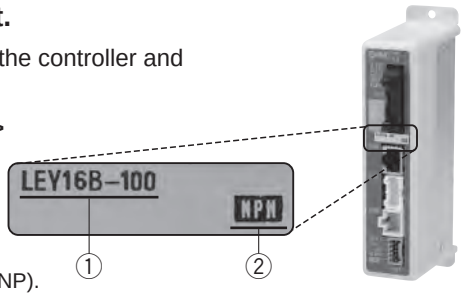
### The controller is sold as single unit after the compatible actuator is set.

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

**<Check the following before use.>**

① Check the actuator label for the model number. This number should match that of the controller.

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




∗ Refer to the operation manual for using the products. Please download it via our website, https://www.smc.eu

### Precautions for blank controllers (LEC□6□□-BC)

A blank controller is a controller to which the customer can write the data of the actuator it is to be combined and used with. Use the dedicated software (LEC-BCW) for data writing.

- Please download the dedicated software (LEC-BCW) via our website.
- Order the communication cable for controller setting (LEC-W2A-C) separately to use this software.

**SMC website**
**https://www.smc.eu**

## Specifications

### Basic Specifications

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

∗1 Do not use the power supply of "inrush current prevention type" for the controller power supply. When compliance with UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

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

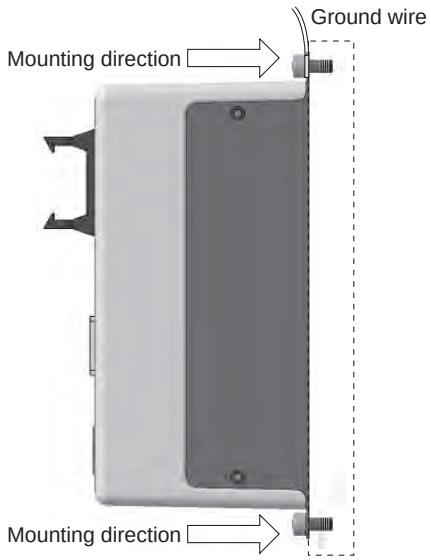
∗3 Applicable to non-magnetising locks



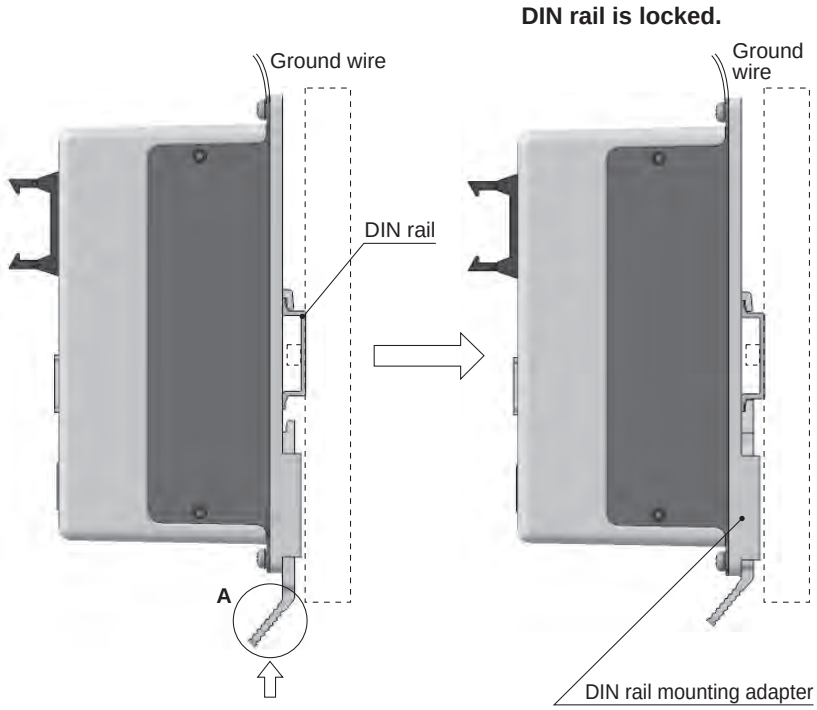
SMC

## 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)**

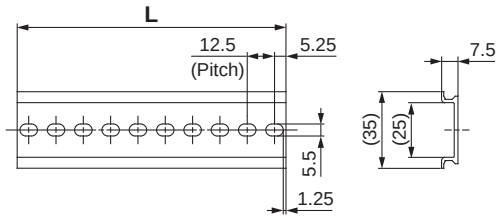



Hook the controller on the DIN rail and press the lever of section **A** in the arrow direction to lock it.

∗ When size 25 or more of the LE series are used, the space between the controllers should be 10 mm or more.

### DIN rail
### AXT100-DR-□

∗ For □, enter a number from the No. line in the table below.
Refer to the dimension drawings on page 193 for the mounting dimensions.




**L Dimensions [mm]**

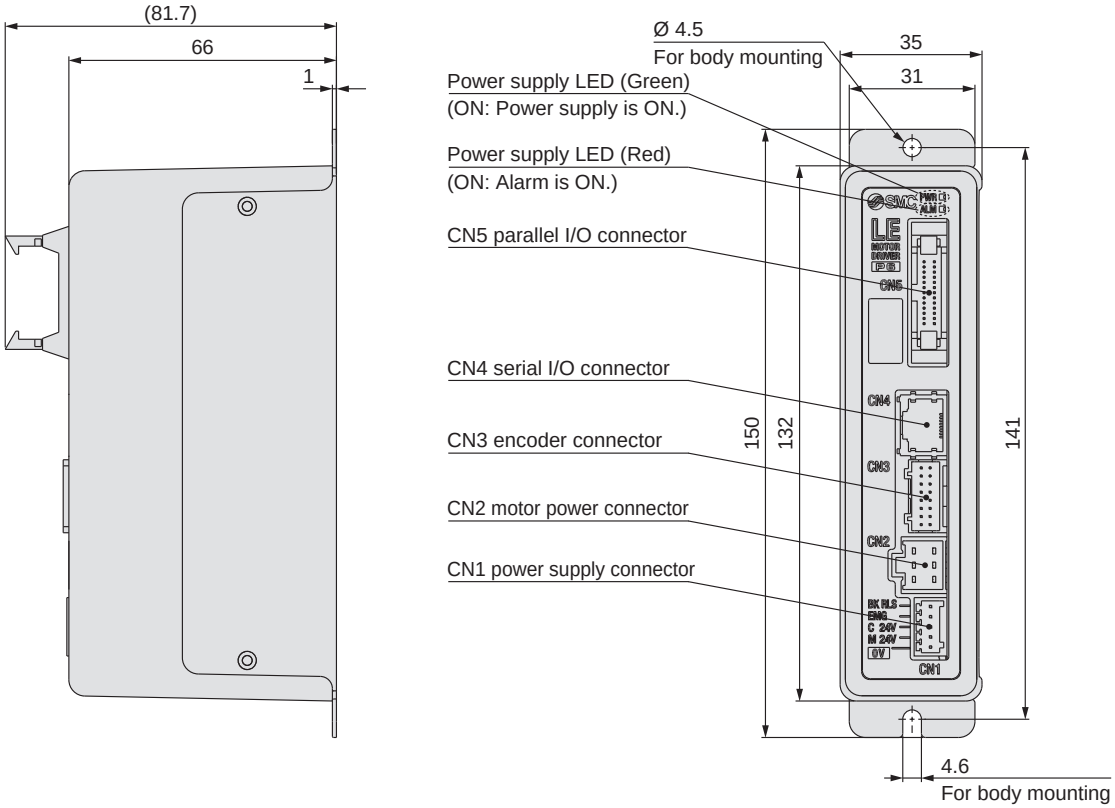
| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L** | 23 | 35.5 | 48 | 60.5 | 73 | 85.5 | 98 | 110.5 | 123 | 135.5 | 148 | 160.5 | 173 | 185.5 | 198 | 210.5 | 223 | 235.5 | 248 | 260.5 |
| No. | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| **L** | 273 | 285.5 | 298 | 310.5 | 323 | 335.5 | 348 | 360.5 | 373 | 385.5 | 398 | 410.5 | 423 | 435.5 | 448 | 460.5 | 473 | 485.5 | 498 | 510.5 |

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

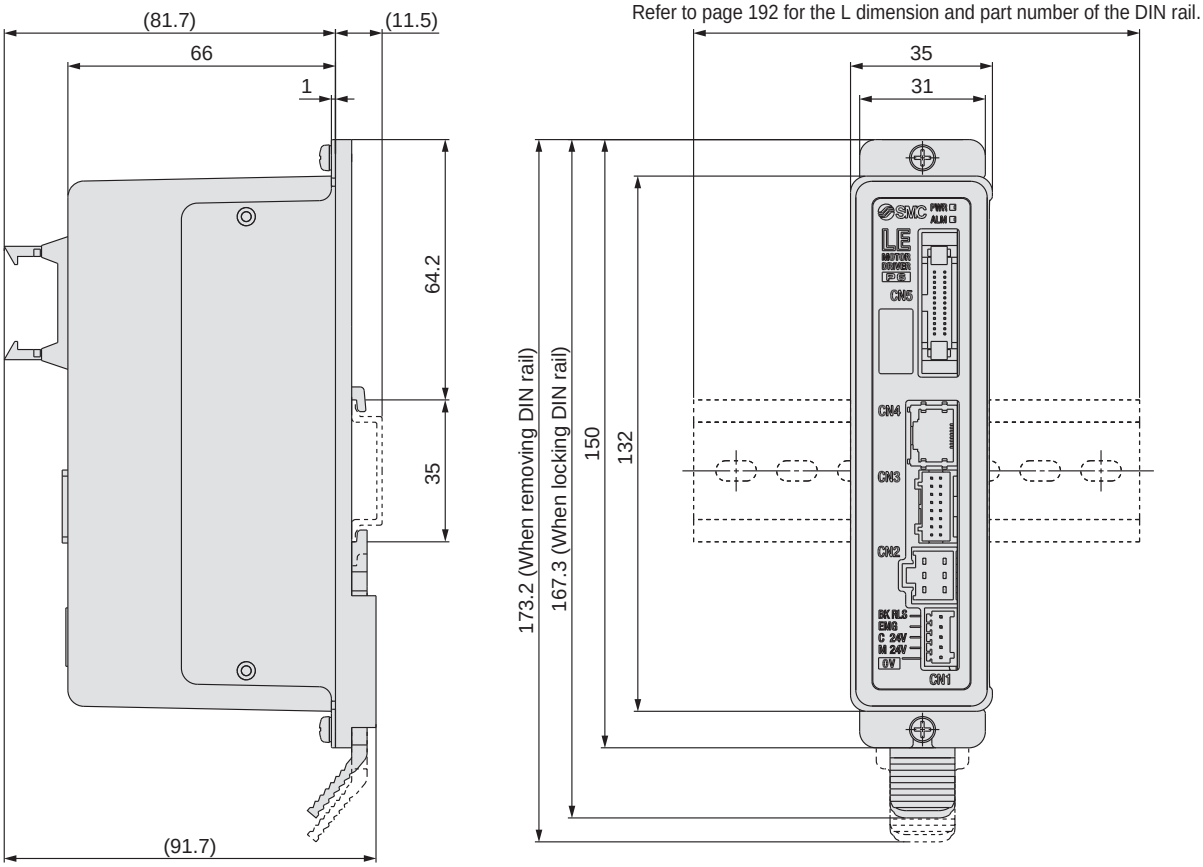
This should be used when the DIN rail mounting adapter is mounted onto a screw mounting type controller afterward.

## Dimensions

### a) Screw mounting (LEC□6□□-□)




### b) DIN rail mounting (LEC□6□□D-□)



## Wiring Example 1

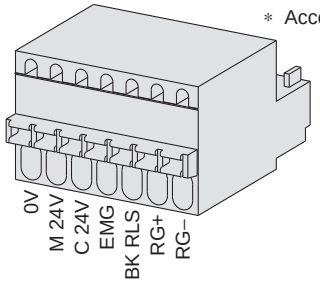
### Power Supply Connector: CN1

∗ The power supply plug is an accessory.
<Applicable cable size> AWG20 (0.5 mm$^2$), cover diameter 2.0 mm or less

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

| Terminal name | Function | Details |
|---|---|---|
| 0V | Common supply (–) | M 24V terminal/C 24V terminal/EMG terminal/BK RLS terminal are common (–). |
| M 24V | Motor power supply (+) | Motor power supply (+) supplied to the controller |
| C 24V | Control power supply (+) | Control power supply (+) supplied to the controller |
| EMG | Stop (+) | Input (+) for releasing the stop |
| BK RLS | Lock release (+) | Input (+) for releasing the lock |
| RG+ | Regenerative output 1 | Regenerative output terminals for external connection (Not necessary to connect them in the combination with the LE series standard specifications.) |
| RG– | Regenerative output 2 | |

**Power supply plug for LECA6: LEC-D-1-2**
∗ Accessory



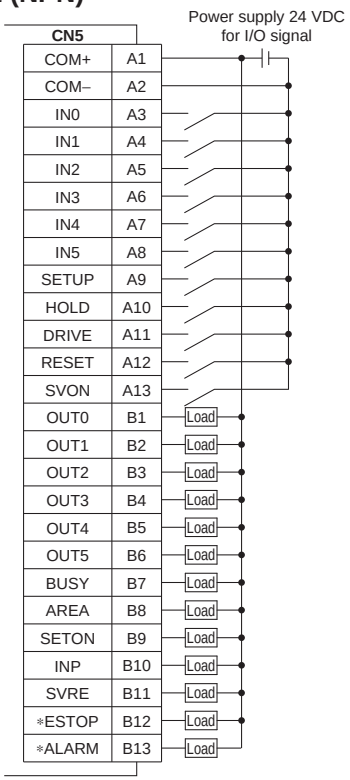

## Wiring Example 2

### Parallel I/O Connector: CN5

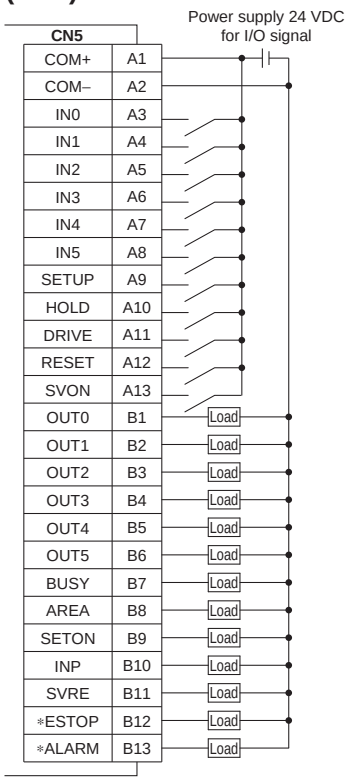
∗ When you connect a PLC to the CN5 parallel I/O connector, use the I/O cable (LEC-CN5-□).
∗ The wiring changes depending on the type of parallel I/O (NPN or PNP).

**Wiring diagram**

**LEC□6N□□-□ (NPN)**




**LEC□6P□□-□ (PNP)**




**Input Signal**

| Name | Details |
|---|---|
| COM+ | Connects the power supply 24 V for input/output signal |
| COM– | Connects the power supply 0 V for input/output signal |
| IN0 to IN5 | Step data specified bit no. (Input is instructed by combining IN0 to 5.) |
| SETUP | Instruction to return to origin |
| HOLD | Temporarily stops operation |
| DRIVE | Instruction to drive |
| RESET | Resets alarm and interrupts operation |
| SVON | Servo ON instruction |

**Output Signal**

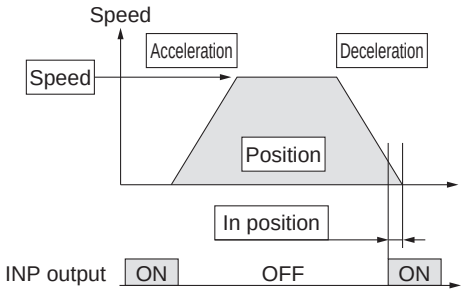
| Name | Details |
|---|---|
| OUT0 to OUT5 | Outputs the step data no. during operation |
| BUSY | Outputs when the actuator is moving |
| AREA | Outputs within the step data area output setting range |
| SETON | Outputs when returning to origin |
| INP | Outputs when target position or target force is reached (Turns on when the positioning or pushing is completed.) |
| SVRE | Outputs when servo is on |
| ∗ESTOP∗1 | OFF when EMG stop is instructed |
| ∗ALARM∗1 | OFF when alarm is generated |

∗1 Signal of negative-logic circuit (N.C.)

## Step Data Setting

### 1. Step data setting for positioning

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



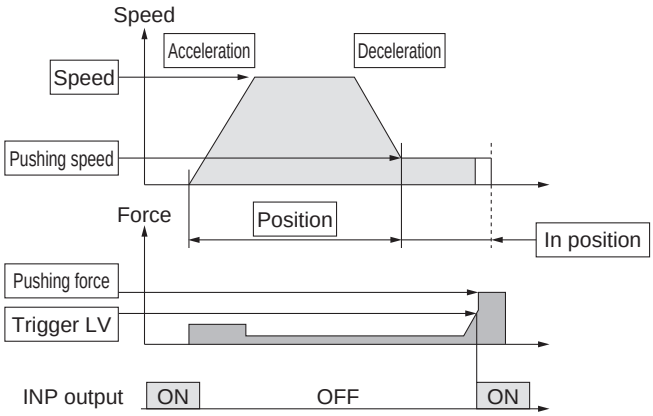

◎: Need to be set.
○: Need to be adjusted as required.
—: Setting is not required.

**Step Data (Positioning)**

| Necessity | Item | Details |
|---|---|---|
| ◎ | Movement 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.<br>(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. |
| ○ | Moving 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 the set force or less.
The following diagram shows the setting items and operation.
The setting items and set values for this operation are stated below.



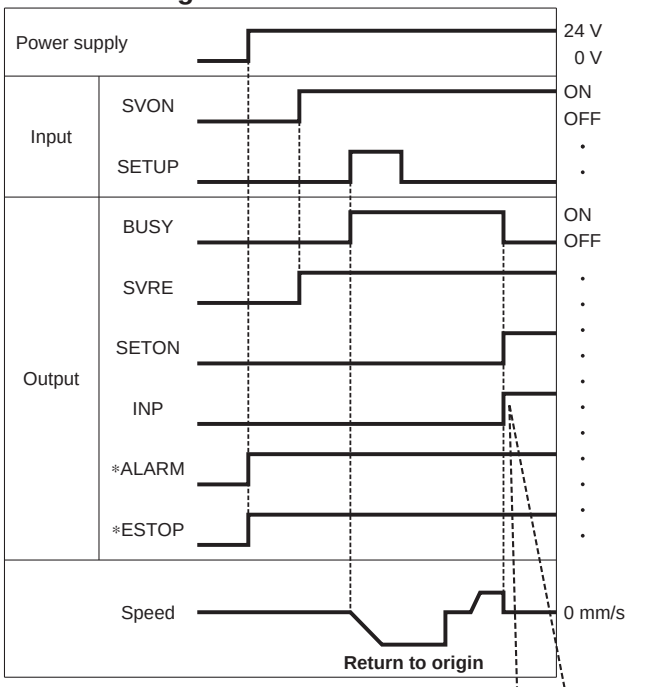

◎: Need to be set.
○: Need to be adjusted as required.

**Step Data (Pushing)**

| Necessity | Item | Details |
|---|---|---|
| ◎ | Movement 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.<br>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 turns on when the generated force exceeds the value. Trigger level should be the pushing force or less. |
| ○ | Pushing speed | Pushing speed during pushing.<br>When the speed is set fast, the electric actuator and workpieces might be damaged due to the impact when they hit the end, so this set value should be smaller. Refer to the operation manual for the electric actuator. |
| ○ | Moving 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 turn on. |

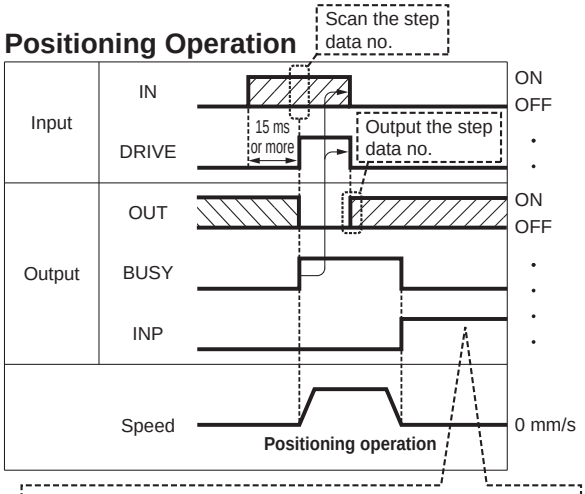
## Signal Timing

### Return to Origin



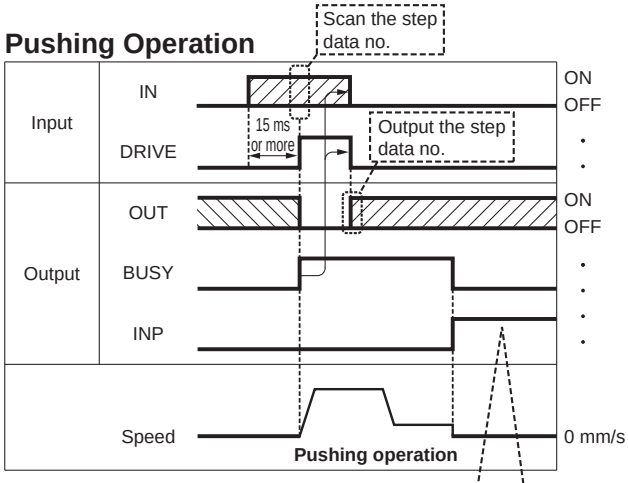

∗ "∗ALARM" and "∗ESTOP" are expressed as negative-logic circuits.

### Positioning Operation

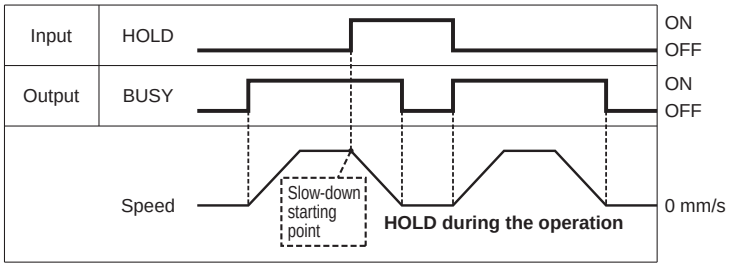



∗ "OUT" is output when "DRIVE" is changed from ON to OFF.
Refer to the operation manual for details on the controller for the LEM series.
(When power supply is applied, "DRIVE" or "RESET" is turned ON or "∗ESTOP" is turned OFF, all of the "OUT" outputs are OFF.)

### Pushing Operation

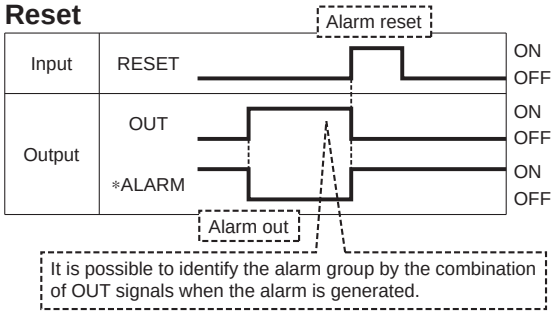



### HOLD




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

### Reset




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

## Options: Actuator Cable

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

**LE − CP − 1 − ☐**

**Cable length (L) [m]**

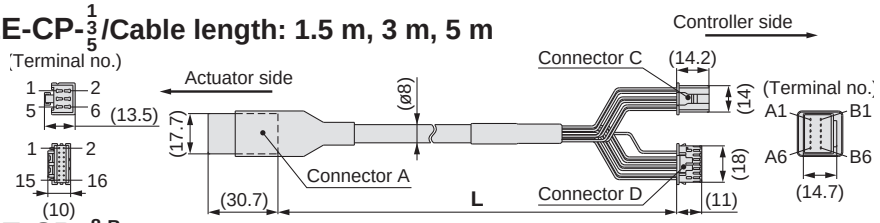
| | |
|---|---|
| **1** | 1.5 |
| **3** | 3 |
| **5** | 5 |
| **8** | 8*1 |
| **A** | 10*1 |
| **B** | 15*1 |
| **C** | 20*1 |

*1 Produced upon receipt of order (Robotic cable only)

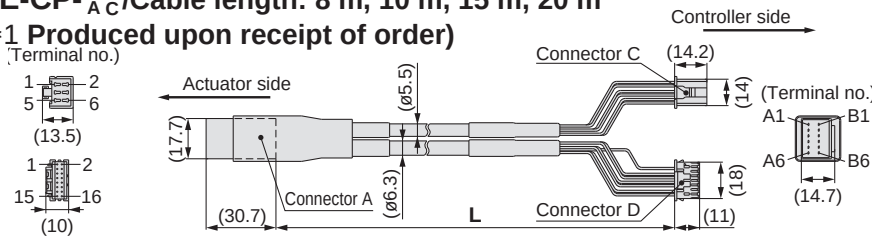
**Cable type**

| | |
|---|---|
| **—** | Robotic cable (Flexible cable) |
| **S** | Standard cable |

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

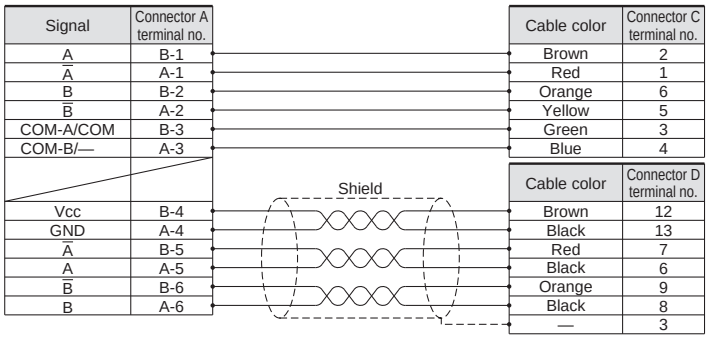



**LE-CP-8/A/B/C/Cable length: 8 m, 10 m, 15 m, 20 m**
**(*1 Produced upon receipt of order)**




**Weight**

| Product no. | Weight [g] | Note |
|---|---|---|
| **LE-CP-1-S** | 190 | Standard cable |
| **LE-CP-3-S** | 280 | |
| **LE-CP-5-S** | 460 | |
| **LE-CP-1** | 140 | Robotic cable |
| **LE-CP-3** | 260 | |
| **LE-CP-5** | 420 | |
| **LE-CP-8** | 790 | |
| **LE-CP-A** | 980 | |
| **LE-CP-B** | 1460 | |
| **LE-CP-C** | 1940 | |




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

**LE − CP − 1 − B − ☐**

**Cable length (L) [m]**

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

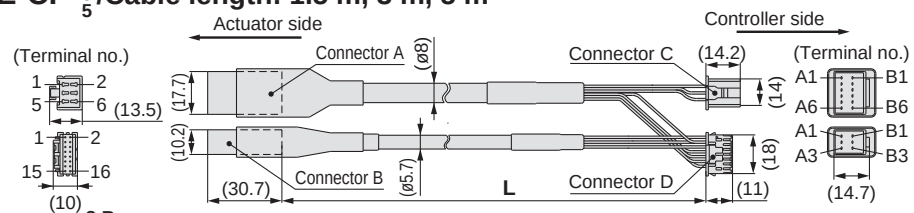
*1 Produced upon receipt of order (Robotic cable only)

**With lock and sensor**

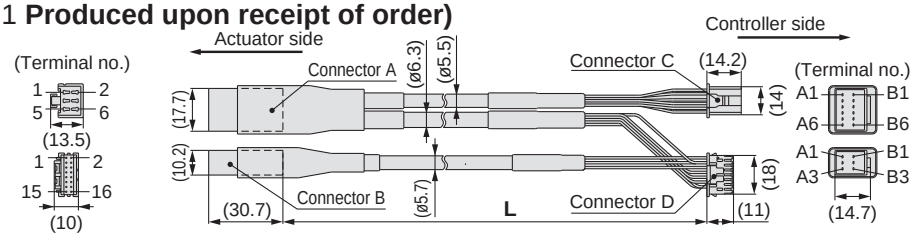
**Cable type**

| | |
|---|---|
| **—** | Robotic cable (Flexible cable) |
| **S** | Standard cable |

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

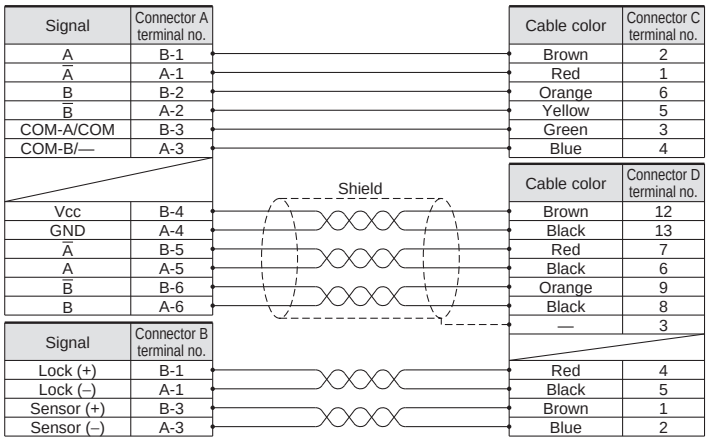



**LE-CP-8/A/B/C/Cable length: 8 m, 10 m, 15 m, 20 m**
**(*1 Produced upon receipt of order)**




**Weight**

| Product no. | Weight [g] | Note |
|---|---|---|
| **LE-CP-1-B-S** | 240 | Standard cable |
| **LE-CP-3-B-S** | 380 | |
| **LE-CP-5-B-S** | 630 | |
| **LE-CP-1-B** | 190 | Robotic cable |
| **LE-CP-3-B** | 360 | |
| **LE-CP-5-B** | 590 | |
| **LE-CP-8-B** | 1060 | |
| **LE-CP-A-B** | 1320 | |
| **LE-CP-B-B** | 1920 | |
| **LE-CP-C-B** | 2620 | |



## [Robotic cable for servo motor (24 VDC)]

**LE−CA−1**

**Cable length (L) [m]**

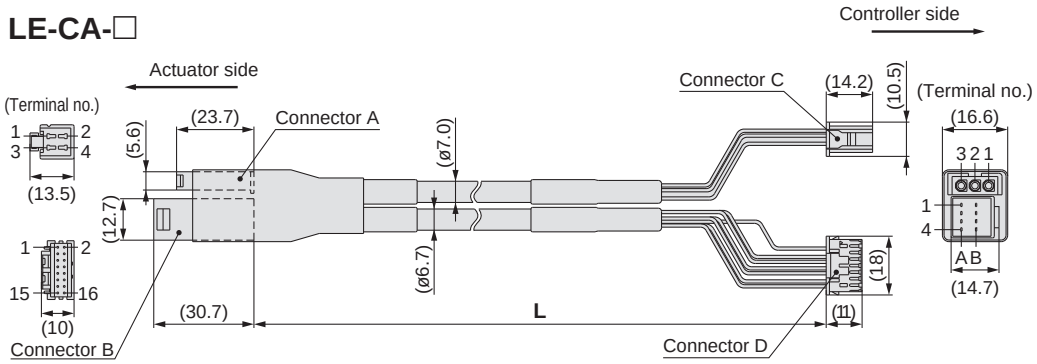
| | |
|---|---|
| **1** | 1.5 |
| **3** | 3 |
| **5** | 5 |
| **8** | 8*1 |
| **A** | 10*1 |
| **B** | 15*1 |
| **C** | 20*1 |

*1 Produced upon receipt of order

**Weight**

| Product no. | Weight [g] |
|---|---|
| **LE-CA-1** | 220 |
| **LE-CA-3** | 420 |
| **LE-CA-5** | 700 |
| **LE-CA-8** | 1100 |
| **LE-CA-A** | 1370 |
| **LE-CA-B** | 2050 |
| **LE-CA-C** | 2720 |

**LE-CA-□**




| Signal | Connector A terminal no. | Cable color | Connector C terminal no. |
|---|---|---|---|
| U | 1 | Red | 1 |
| V | 2 | White | 2 |
| W | 3 | Black | 3 |

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

Shield

Connection of shield material

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

**LE−CA−1−B**

**Cable length (L) [m]**

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

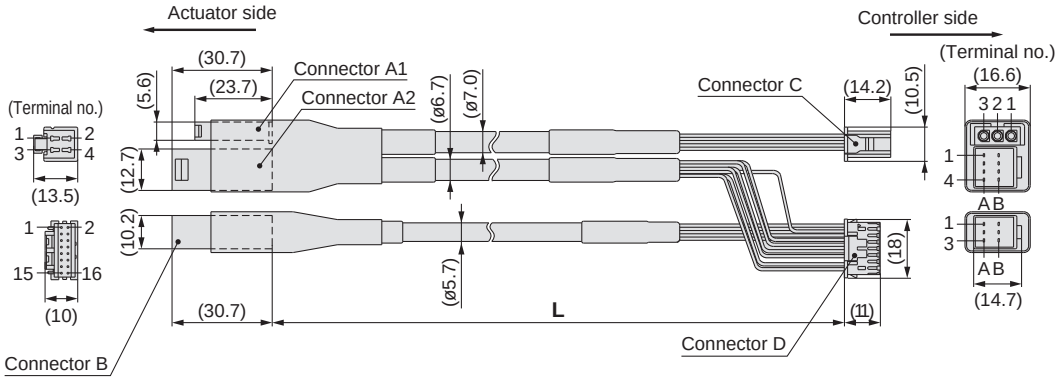
*1 Produced upon receipt of order

**With lock and sensor**

**Weight**

| Product no. | Weight [g] |
|---|---|
| **LE-CA-1-B** | 270 |
| **LE-CA-3-B** | 520 |
| **LE-CA-5-B** | 870 |
| **LE-CA-8-B** | 1370 |
| **LE-CA-A-B** | 1710 |
| **LE-CA-B-B** | 2560 |
| **LE-CA-C-B** | 3400 |

**LE-CA-□-B**




| Signal | Connector A1 terminal no. | Cable color | Connector C terminal no. |
|---|---|---|---|
| U | 1 | Red | 1 |
| V | 2 | White | 2 |
| W | 3 | Black | 3 |

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

Shield

Connection of shield material

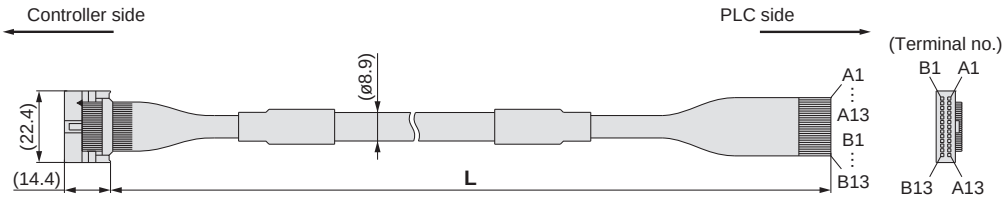
| Signal | Connector B terminal no. | | |
|---|---|---|---|
| Lock (+) | B-1 | Red | 4 |
| Lock (–) | A-1 | Black | 5 |
| Sensor (+) | B-3 | Brown | 1 |
| Sensor (–) | A-3 | Black | 2 |

## Option: I/O Cable

**LEC−CN5−1**

**Cable length (L) [m]**

| | |
|---|---|
| **1** | 1.5 |
| **3** | 3 |
| **5** | 5 |




∗ Conductor size: AWG28

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

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

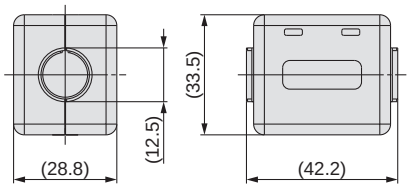
**Weight**

| Product no. | Weight [g] |
|---|---|
| **LEC-CN5-1** | 170 |
| **LEC-CN5-3** | 320 |
| **LEC-CN5-5** | 520 |

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

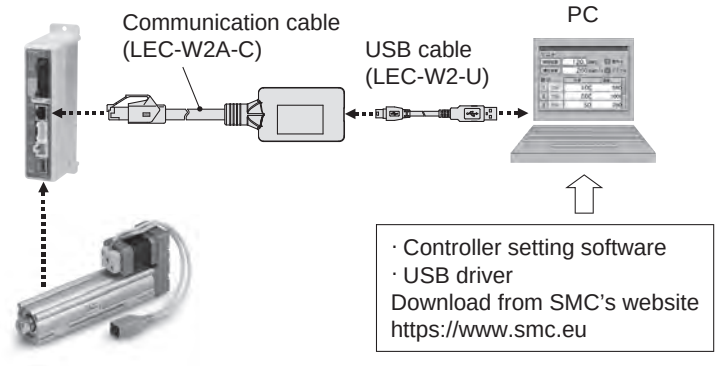
**LEC−NFA**

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




∗ Refer to the LECA6 series Operation Manual for installation.

# *LEC* Series
# Communication Cable for Controller Setting/LEC-W2A-□




## How to Order

**LEC-W2A-C**
- C: Communication cable

**LEC-W2-U**
- U: USB cable

## Compatible Controller/Driver

| | |
|---|---|
| **Step data input type** | **LECA6 Series** |
| **Pulse input type** | **LECPA Series** |
| **Step Motor Controller** | **JXCE1/91/P1/D1/L1 Series** |

∗ When connecting to a JXCE1/91/P1/D1/L1 series product, use a conversion cable (P5062-5) as a relay.

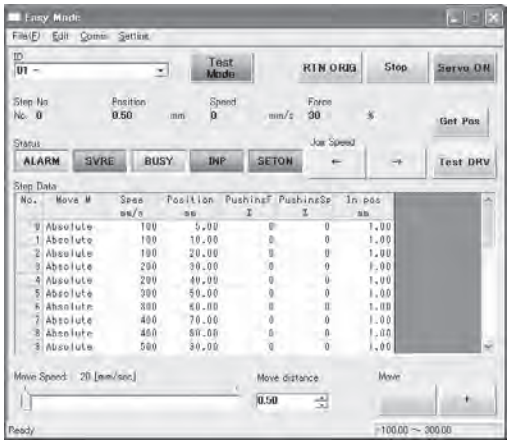
## Hardware Requirements

| | |
|---|---|
| OS | Windows®7, Windows®8.1, Windows®10 |
| Communication interface | USB 1.1 or USB 2.0 ports |
| Display | 1024 x 768 or more |

∗ Windows®7, Windows®8.1 and Windows®10 are registered trademarks of Microsoft Corporation in the United States.

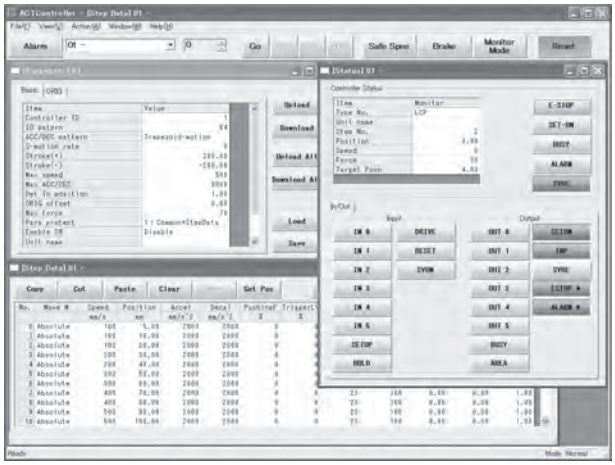
## Screen Example

### 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 test drive can be performed on the same page.
- Can be used to jog and move at a constant rate

### Normal mode screen example



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

# *LEC Series*
# Teaching Box/LEC-T1


## How to Order

**LEC – T1 – 3 E G □**

**Teaching box**

**Cable length [m]**

| | |
|---|---|
| **3** | 3 |

**Initial language**

| | |
|---|---|
| **J** | Japanese |
| **E** | English |

∗ The displayed language can be changed to English or Japanese.

**Stop switch**

| | |
|---|---|
| **G** | Equipped with stop switch |

**Enable switch**

| | |
|---|---|
| **—** | None |
| **S** | Equipped with enable switch |

∗ Interlock switch for jog and test function

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

**Option**
- **Enable switch is provided.**

## Specifications

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

**[CE-compliant products]**
The EMC compliance of the teaching box was tested with a step motor controller (servo/24 VDC) and an applicable actuator.
**[UL-compliant products]**
When compliance with UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

## Easy Mode

| Function | Details |
|---|---|
| Step data | • Setting of step data |
| Jog | • Jog operation<br>• Return to origin |
| Test | • 1 step operation<br>• Return to origin |
| Monitor | • Display of axis and step data no.<br>• Display of two items selected from Position, Speed, Force. |
| ALM | • Active alarm display<br>• Alarm reset |
| TB setting | • Reconnection of axis (Ver. 1.∗∗)<br>• Displayed language setting (Ver. 2.∗∗)<br>• Setting of easy/normal mode<br>• Setting step data and selection of items from easy mode monitor |

### Menu Operations Flowchart

**Menu**
Data
Monitor
Jog
Test
ALM
TB setting

**Data**
Step data no.
Setting of two items selected below
Ver. 1.∗∗:
Position, Speed, Force, Acceleration, Deceleration
Ver. 2.∗∗:
Position, Speed, Pushing force, Acceleration, Deceleration, Movement MOD, Trigger LV, Pushing speed, Moving force, Area 1, Area 2, In position

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

**Jog**
Return to origin
Jog operation

**Test**
1 step operation

**ALM**
Active alarm display
Alarm reset

**TB setting**
Reconnect (Ver. 1.∗∗)
Japanese/English (Ver. 2.∗∗)
Easy/Normal
Set item

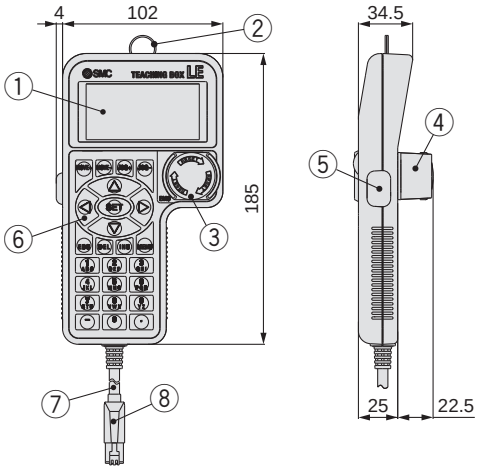
## Normal Mode

| Function | Details |
|---|---|
| Step data | • Step data setting |
| Parameter | • Parameters setting |
| Test | • Jog operation/Constant rate movement<br>• Return to origin<br>• Test drive<br>(Specify a maximum of 5 step data and operate.)<br>• Forced output<br>(Forced signal output, Forced terminal output) |
| Monitor | • Drive monitor<br>• Output signal monitor<br>• Input signal monitor<br>• Output terminal monitor<br>• Input terminal monitor |
| ALM | • Active alarm display<br>(Alarm reset)<br>• Alarm log record display |
| File | • Data saving<br>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).<br>• Load to controller<br>Loads the data which is saved in the teaching box to the controller which is being used for communication.<br>• Delete the saved data.<br>• File protection (Ver. 2.**) |
| TB setting | • Display setting<br>(Easy/Normal mode)<br>• Language setting<br>(Japanese/English)<br>• Backlight setting<br>• LCD contrast setting<br>• Beep sound setting<br>• Max. connection axis<br>• Distance unit (mm/inch) |
| Reconnect | • Reconnection of axis |

### Menu Operations Flowchart

- **Menu**: Step data, Parameter, Monitor, Test, ALM, File, TB setting, Reconnect
- **Step data**: Step data no., Movement MOD, Speed, Position, Acceleration, Deceleration, Pushing force, Trigger LV, Pushing speed, Moving force, Area 1, 2, In position
- **Parameter**: Basic, ORIG
  - **Basic setting**
  - **ORIG setting**
- **Monitor**: Drive, Output signal, Input signal, Output terminal, Input terminal
  - **DRV monitor**: Position, Speed, Torque, Step no., Last step no.
  - **Output signal monitor**
  - **Input signal monitor**
  - **Output terminal monitor**
  - **Input terminal monitor**
- **Test**: JOG/MOVE, Return to ORIG, Test drive, Forced output
- **ALM**: Status, ALM Log record
  - **Status**: Active alarm display, Alarm reset
  - **ALM Log record display**: Log entry display
- **File**: Data saving, Load to controller, File deletion, File protection (Ver. 2.**)
- **TB setting**: Easy/Normal, Language, Backlight, LCD contrast, Beep, Max. connection axis, Password, Distance unit
- **Reconnect**

## Dimensions




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

# Gateway Unit
## *LEC-G Series*

## How to Order

**⚠Caution**

**[CE-compliant products]**
EMC compliance was tested by combining the electric actuator LE 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, compliance with 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 compliance with the EMC directive for the machinery and equipment as a whole.

**[UL-compliant products]**
When compliance with UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

**Gateway unit** **LEC-G MJ2 □**

Applicable Fieldbus protocols

| | |
|---|---|
| MJ2 | CC-Link Ver. 2.0 |
| DN1 | DeviceNet™ |
| PR1 | PROFIBUS DP |
| EN1 | EtherNet/IP™ |

Mounting

| | |
|---|---|
| — | Screw mounting |
| D*1 | DIN rail |

*1 The DIN rail is not included. Order it separately.


**Cable** **LEC-CG 1 - L**

Cable type

| | |
|---|---|
| 1 | Communication cable |
| 2 | Cable between branches |

Cable length

| | |
|---|---|
| K | 0.3 m |
| L | 0.5 m |
| 1 | 1 m |


Communication cable


Cable between branches

**Branch connector** **LEC-CGD**

Branch connector

**Terminating resistor** **LEC-CGR**

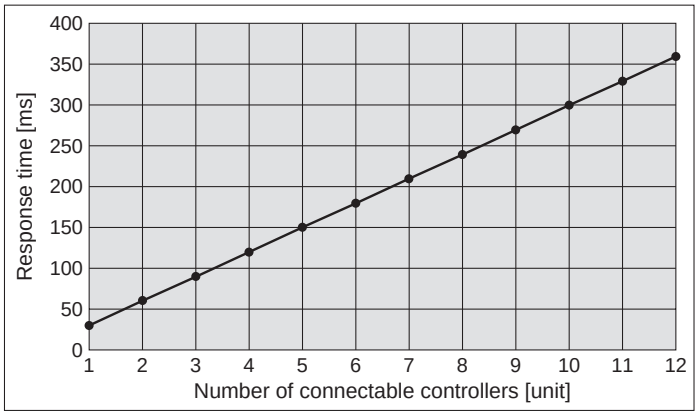
## Specifications

| Model | | | LEC-GMJ2□ | LEC-GDN1□ | LEC-GPR1□ | LEC-GEN1□ |
|---|---|---|---|---|---|---|
| Communication specifications | Applicable system | Fieldbus | CC-Link | DeviceNet™ | PROFIBUS DP | EtherNet/IP™ |
| | | Version*1 | Ver. 2.0 | Release 2.0 | V1 | Release 1.0 |
| | Communication speed [bps] | | 156 k/625 k/2.5 M /5 M/10 M | 125 k/250 k/500 k | 9.6 k/19.2 k/45.45 k/ 93.75 k/187.5 k/500 k/ 1.5 M/3 M/6 M/12 M | 10 M/100 M |
| | Configuration file*2 | | — | EDS file | GSD file | EDS file |
| | I/O occupation area | | 4 stations occupied (8 times setting) Input 896 points 108 words Output 896 points 108 words | Input 200 bytes Output 200 bytes | Input 57 words Output 57 words | Input 256 bytes Output 256 bytes |
| | Power supply for communication | Power supply voltage [V]*6 | — | 11 to 25 VDC | — | — |
| | | Internal current consumption [mA] | — | 100 | — | — |
| | Communication connector specifications | | Connector (Accessory) | Connector (Accessory) | D-sub | RJ45 |
| | Terminating resistor | | Not included | Not included | Not included | Not included |
| Power supply voltage [V]*6 | | | 24 VDC ±10 % | | | |
| Current consumption [mA] | Not connected to teaching box | | 200 | | | |
| | Connected to teaching box | | 300 | | | |
| EMG output terminal | | | 30 VDC 1 A | | | |
| Controller specifications | Applicable controllers | | LECA6 Series | | | |
| | Communication speed [bps]*3 | | 115.2 k/230.4 k | | | |
| | Max. number of connectable controllers*4 | | 12 | 8*5 | 5 | 12 |
| Accessories | | | Power supply connector, communication connector | | Power supply connector | |
| Operating temperature range [°C] | | | 0 to 40 (No freezing) | | | |
| Operating humidity range [%RH] | | | 90 or less (No condensation) | | | |
| Storage temperature range [°C] | | | –10 to 60 (No freezing) | | | |
| Storage humidity range [%RH] | | | 90 or less (No condensation) | | | |
| Weight [g] | | | 200 (Screw mounting), 220 (DIN rail mounting) | | | |

*1 Please note that versions are subject to change.
*2 Each file can be downloaded from the SMC website.
*3 When using a teaching box (LEC-T1-□), set the communication speed to 115.2 kbps.
*4 A communication response time for 1 controller is approximately 30 ms.
Refer to "Communication Response Time Guideline" for response times when several controllers are connected.
*5 For step data input, up to 12 controllers connectable.
*6 When compliance with UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

## Communication Response Time Guideline

Response time between gateway unit and controllers depends on the number of controllers connected to the gateway unit. For response time, refer to the graph below.

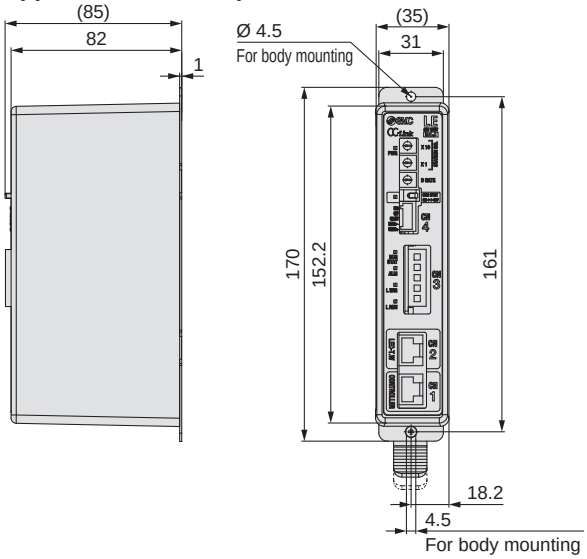



* This graph shows delay times between gateway unit and controllers. Fieldbus network delay time is not included.

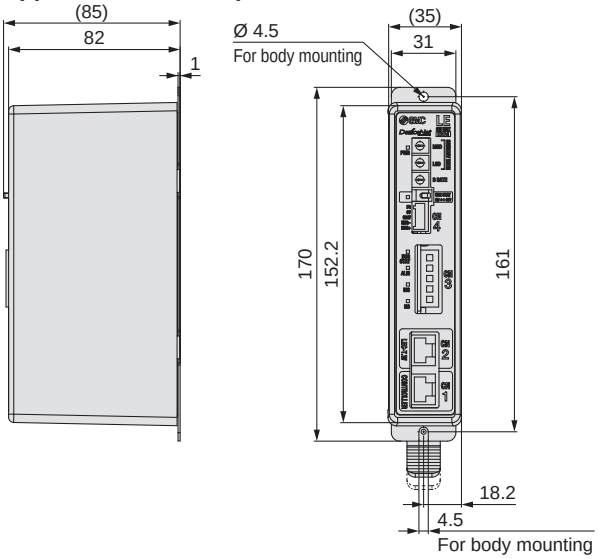
## Dimensions

### Screw mounting (LEC-G□□□)

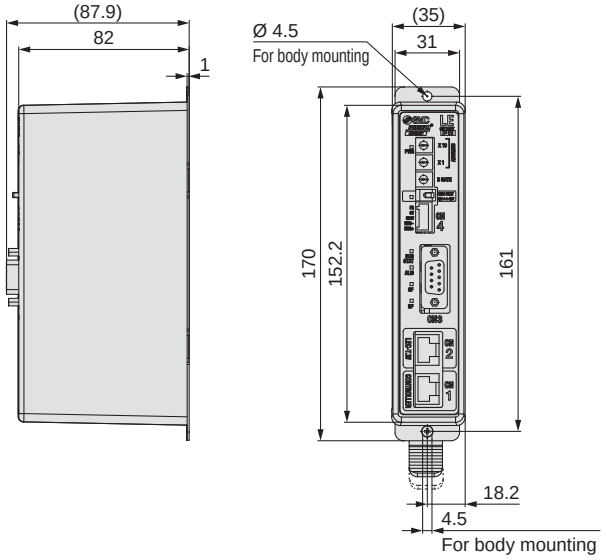
**Applicable Fieldbus protocol: CC-Link Ver. 2.0**



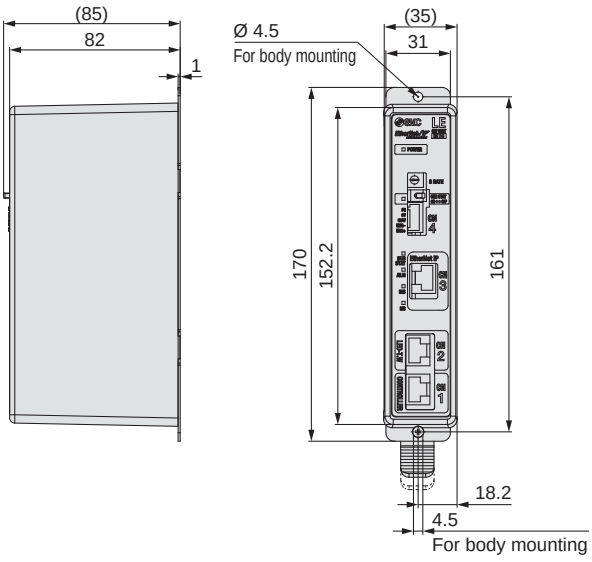

**Applicable Fieldbus protocol: DeviceNet™**




**Applicable Fieldbus protocol: PROFIBUS DP**




**Applicable Fieldbus protocol: EtherNet/IP™**

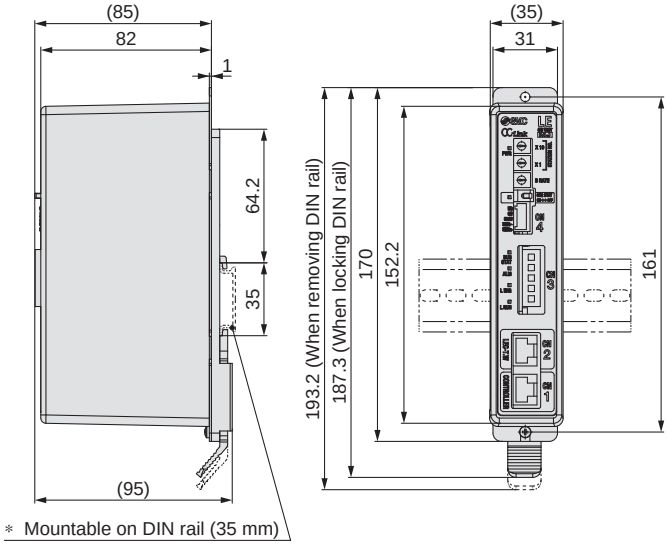



■**Trademark** DeviceNet™ is a trademark of ODVA. EtherNet/IP™ is a trademark of ODVA.

## Dimensions

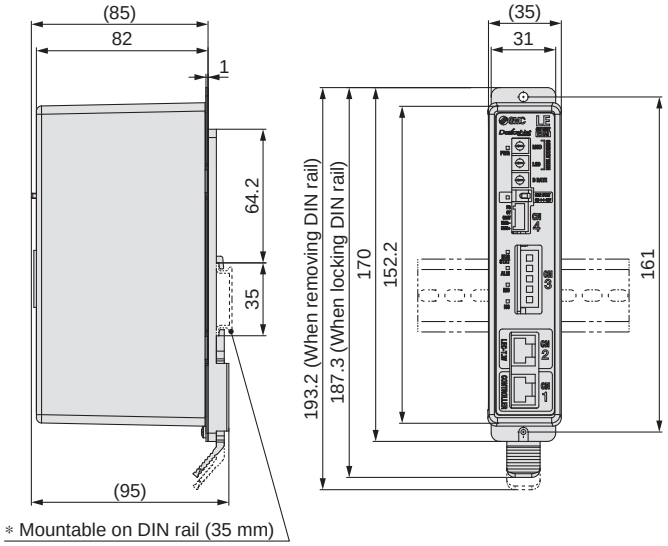
### DIN rail mounting (LEC-G□□□D)

**Applicable Fieldbus protocol: CC-Link Ver. 2.0**



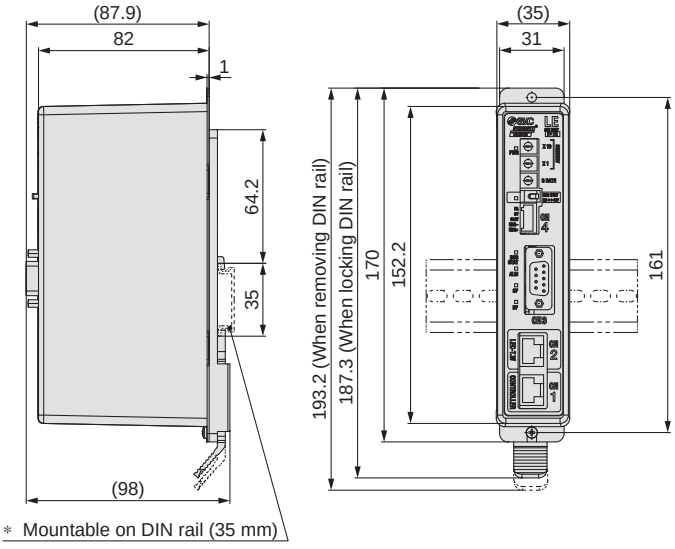

∗ Mountable on DIN rail (35 mm)

**Applicable Fieldbus protocol: DeviceNet™**



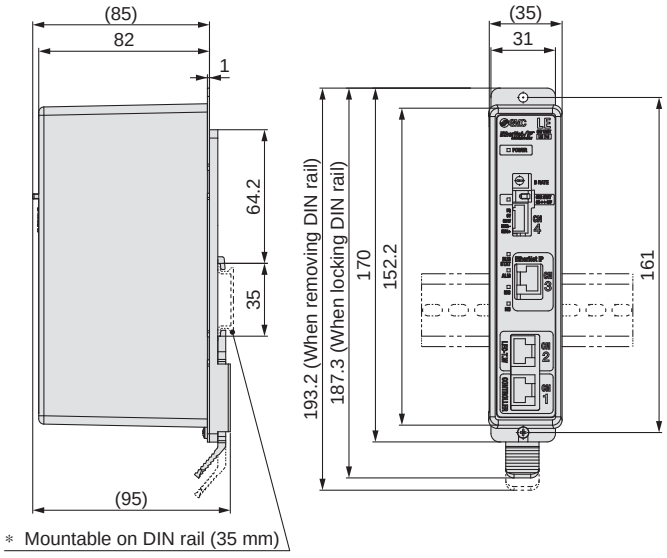

∗ Mountable on DIN rail (35 mm)

**Applicable Fieldbus protocol: PROFIBUS DP**




∗ Mountable on DIN rail (35 mm)

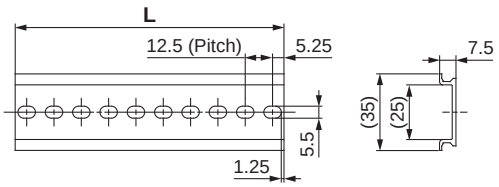
**Applicable Fieldbus protocol: EtherNet/IP™**




∗ Mountable on DIN rail (35 mm)

### DIN rail
### AXT100-DR-□

∗ For □, enter a number from the No. line in the table below.
Refer to the dimension drawings above for the mounting dimensions.




**L Dimensions [mm]**

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

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

## Wiring Example

### Power Supply Connector: CN1

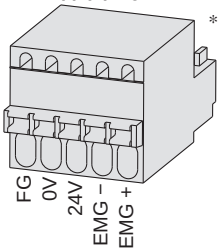
* The power supply plug is an accessory.
<Applicable cable size> AWG20 (0.5 mm$^2$), cover diameter 2.0 mm or less

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

| Terminal name | Function | Details |
|---|---|---|
| EMG + | EMG signal output + | Output terminal of the emergency stop switch of the teaching box |
| EMG − | EMG signal output – | |
| 24V | Power supply + terminal | Power supply terminal of the Gateway unit (Power to the teaching box is supplied from this terminal) |
| 0V | Power supply − terminal | |
| FG | FG terminal | Grounding terminal |

**Power supply plug for LEC-G: LEC-D-1-1**

* Accessory



# Programless Controller

## *LECP1 Series*

## How to Order

**LE C P 1 P 1 ☐ – LEY16B-100**

**Controller**

**Compatible motor**

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

**Number of step data (Points)**

| | |
|---|---|
| **1** | 14 (Programless) |

**Parallel I/O type**

| | |
|---|---|
| **N** | NPN |
| **P** | PNP |

**I/O cable length [m]**

| | |
|---|---|
| **—** | Without cable |
| **1** | 1.5 |
| **3** | 3 |
| **5** | 5 |

**Option**

| | |
|---|---|
| **—** | Screw mounting |
| **D**∗1 | DIN rail mounting |

∗1 The DIN rail is not included. Order it separately.

**Actuator part number**

Without cable specifications and actuator options
Example: Enter "LEY16B-100"
for the LEY16B-100B-R16N1.

∗ **When controller equipped type is selected when ordering the LE series, you do not need to order this controller.**

### ⚠Caution

**[CE-compliant products]**
EMC compliance was tested by combining the electric actuator LE 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, compliance with 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 compliance with the EMC directive for the machinery and equipment as a whole.
**[UL-compliant products]**
When compliance with UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

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

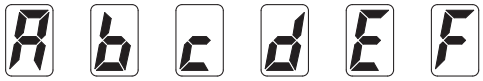
∗ Refer to the operation manual for using the products. Please download it via our website, https://www.smc.eu

## Specifications

### Basic Specifications

| Item | LECP1 |
|---|---|
| **Compatible motor** | Step motor (Servo/24 VDC) |
| **Power supply**∗1 | Power supply voltage: 24 VDC ±10 %∗2<br>[Including the motor drive power, control power supply, stop, lock release] |
| **Parallel input** | 6 inputs (Photo-coupler isolation) |
| **Parallel output** | 6 outputs (Photo-coupler isolation) |
| **Stop points** | 14 points (Position number 1 to 14(E)) |
| **Compatible encoder** | Incremental A/B phase (800 pulse/rotation) |
| **Memory** | EEPROM |
| **LED indicator** | LED (Green/Red) one of each |
| **7-segment LED display**∗3 | 1 digit, 7-segment display (Red) Figures are expressed in hexadecimal ("10" to "15" in decimal number are expressed as "A" to "F") |
| **Lock control** | Forced-lock release terminal∗4 |
| **Cable length [m]** | I/O cable: 5 or less, Actuator cable: 20 or less |
| **Cooling system** | Natural air cooling |
| **Operating temperature range [°C]** | 0 to 40 (No freezing) |
| **Operating humidity range [%RH]** | 90 or less (No condensation) |
| **Storage temperature range [°C]** | –10 to 60 (No freezing) |
| **Storage humidity range [%RH]** | 90 or less (No condensation) |
| **Insulation resistance [MΩ]** | Between the housing and SG terminal: 50 (500 VDC) |
| **Weight [g]** | 130 (Screw mounting), 150 (DIN rail mounting) |

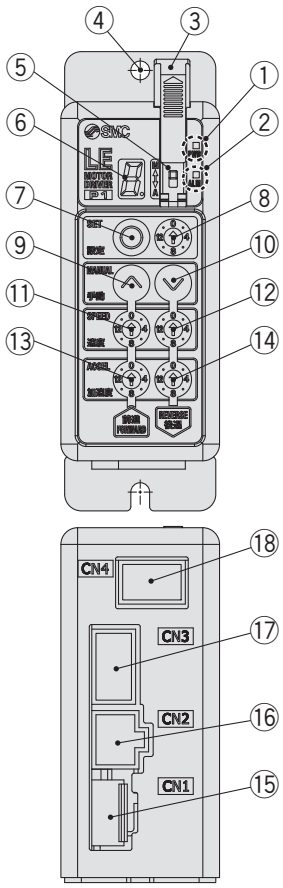
∗1 Do not use the power supply of "inrush current prevention type" for the controller input power supply. When compliance with UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.
∗2 The power consumption changes depending on the actuator model. Refer to the each actuator's operation manual, etc., for details.
∗3 "10" to "15" in decimal number are displayed as follows in the 7-segment LED.



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

∗4 Applicable to non-magnetising locks

## Controller Details



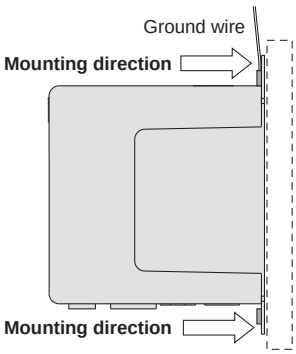

| No. | Display | Description | Details |
|---|---|---|---|
| ① | **PWR** | Power supply LED | Power supply ON/Servo ON : Green turns on<br>Power supply ON/Servo OFF: Green flashes |
| ② | **ALM** | Alarm LED | With alarm : Red turns on<br>Parameter setting : Red flashes |
| ③ | — | Cover | Change and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

## How to Mount

Controller mounting shown below.

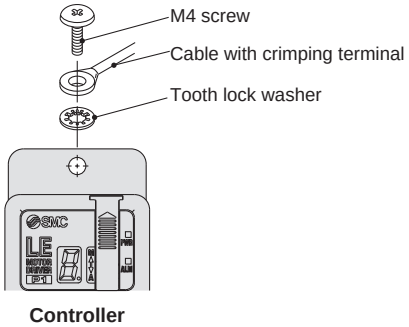
### 1. Mounting screw (LECP1□□-□)

(Installation with two M4 screws)




### 2. Grounding

Tighten the screw with the washer when mounting the ground wire as shown below.



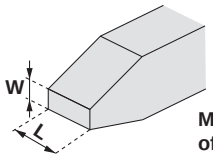

**Controller**

∗ When size 25 or more of the LE series are used, the space between the controllers should be 10 mm or more.

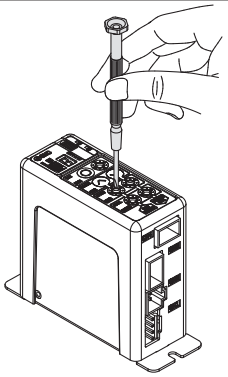
### ⚠Caution

- M4 screws, cable with crimping terminal and tooth lock washer are not included. Be sure to carry out grounding earth in order to ensure the noise tolerance.
- Use a watchmaker's screwdriver of the size shown below when changing position switch ⑧ and the set value of the speed/acceleration switch ⑪ to ⑭.

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

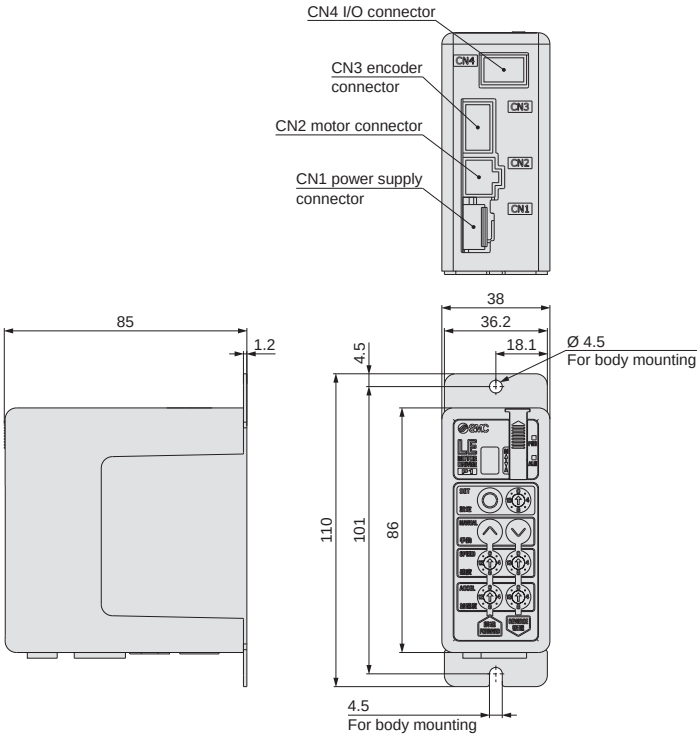



**Magnified view of the end of the screwdriver**

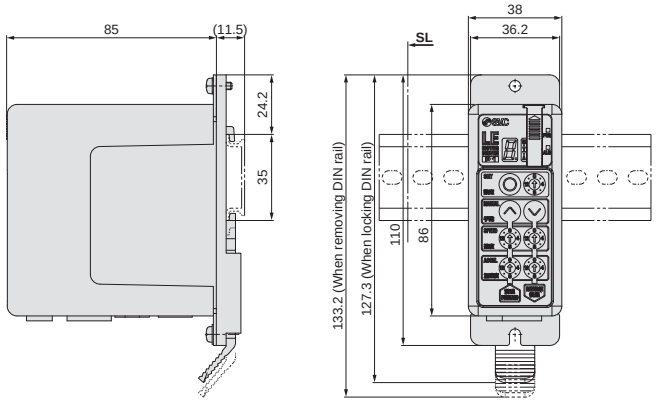


## Dimensions

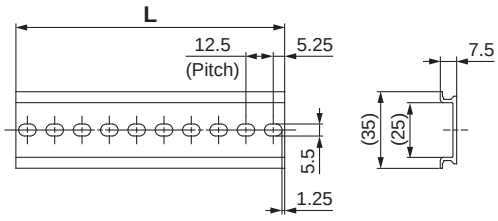
### Screw mounting (LEC□1□□-□)




### DIN rail mounting (LEC□1□□D-□)




### DIN rail
### AXT100-DR-□




∗ For □, enter a number from the No. line in the table below.
Refer to the dimension drawings above for the mounting dimensions.

**L Dimensions [mm]**

| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L** | 23 | 35.5 | 48 | 60.5 | 73 | 85.5 | 98 | 110.5 | 123 | 135.5 | 148 | 160.5 | 173 | 185.5 |
| No. | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| **L** | 198 | 210.5 | 223 | 235.5 | 248 | 260.5 | 273 | 285.5 | 298 | 310.5 | 323 | 335.5 | 348 | 360.5 |
| No. | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | | |
| **L** | 373 | 385.5 | 398 | 410.5 | 423 | 435.5 | 448 | 460.5 | 473 | 485.5 | 498 | 510.5 | | |

### DIN rail mounting adapter
### LEC-1-D0 (with 2 mounting screws)

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

## Wiring Example 1

### Power Supply Connector: CN1

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

**CN1 Power Supply Connector Terminal for LECP1**

| Terminal name | Cable colour | Function | Details |
|---|---|---|---|
| 0V | Blue | Common supply (–) | M 24V terminal/C 24V terminal/BK RLS terminal are common (–). |
| M 24V | White | Motor power supply (+) | Motor power supply (+) supplied to the controller |
| C 24V | Brown | Control power supply (+) | Control power supply (+) supplied to the controller |
| BK RLS | Black | Lock release (+) | Input (+) for releasing the lock |

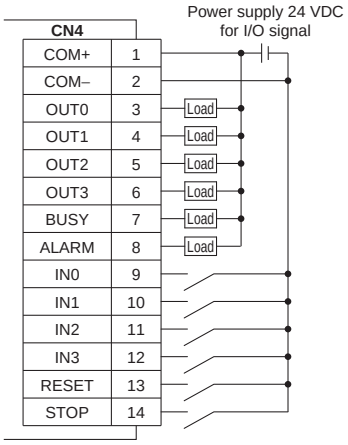
**Power supply cable for LECP1 (LEC-CK1-1)**

## Wiring Example 2

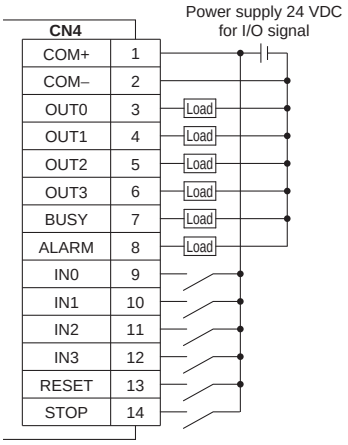
### Parallel I/O Connector: CN4

* When you connect a PLC to the CN4 parallel I/O connector, use the I/O cable (LEC-CK4-□).
* The wiring changes depending on the type of parallel I/O (NPN or PNP).

**■NPN**




**■PNP**




**Input Signal**

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

**Output Signal**

| Name | Details |
|---|---|
| OUT0 to OUT3 | Turns on when the positioning or pushing is completed. (Output is instructed in the combination of OUT0 to 3.)<br>Example - (operation complete for position no. 3)<br>OUT3: OFF / OUT2: OFF / OUT1: ON / OUT0: ON |
| BUSY | Outputs when the actuator is moving |
| *ALARM*1 | Not output when alarm is active or servo OFF |

*1 Signal of negative-logic circuit (N.C.)

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

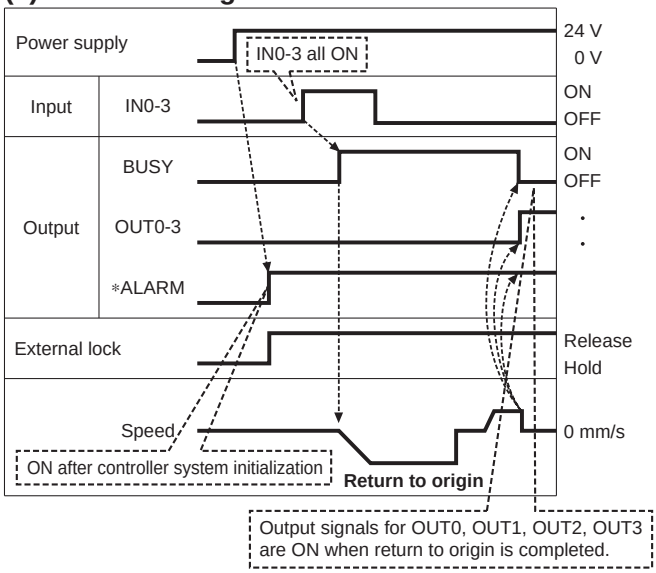
| Position number | IN3 | IN2 | IN1 | IN0 |
|---|---|---|---|---|
| 1 | ○ | ○ | ○ | ● |
| 2 | ○ | ○ | ● | ○ |
| 3 | ○ | ○ | ● | ● |
| 4 | ○ | ● | ○ | ○ |
| 5 | ○ | ● | ○ | ● |
| 6 | ○ | ● | ● | ○ |
| 7 | ○ | ● | ● | ● |
| 8 | ● | ○ | ○ | ○ |
| 9 | ● | ○ | ○ | ● |
| 10 (A) | ● | ○ | ● | ○ |
| 11 (B) |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

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

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

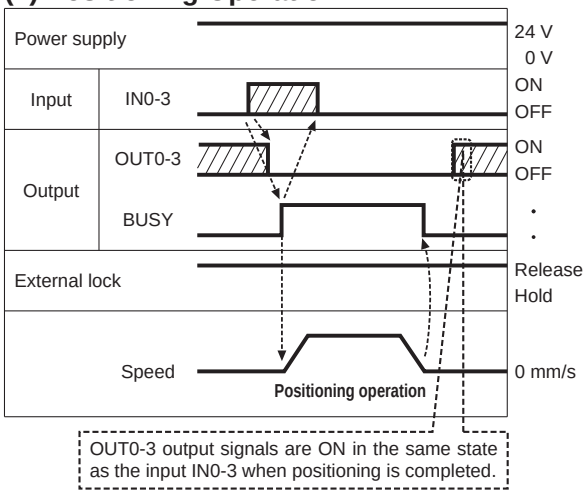
## Signal Timing

### (1) Return to Origin

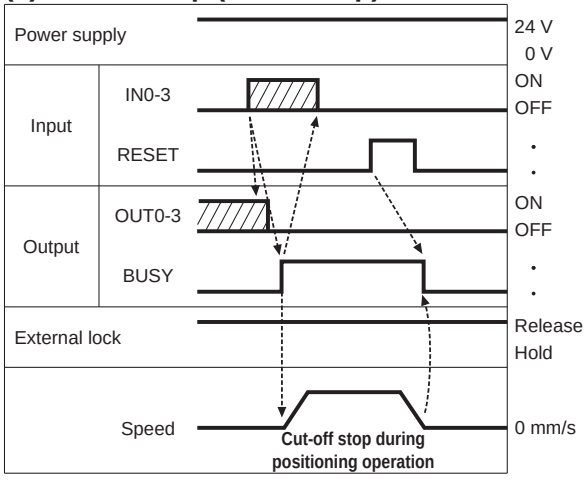



∗ "∗ALARM" is expressed as a negative-logic circuit.

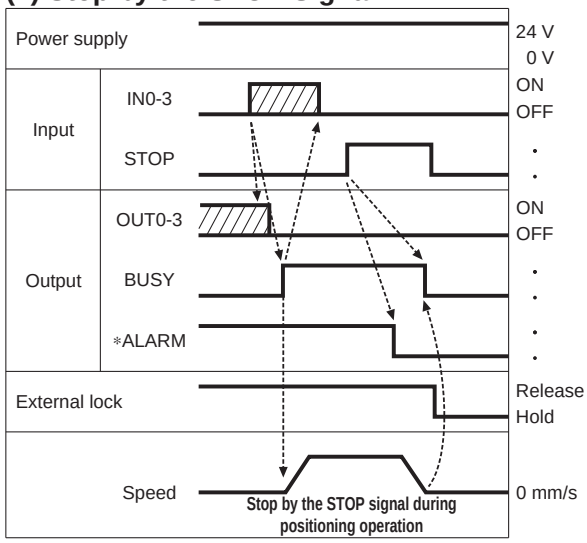
### (2) Positioning Operation



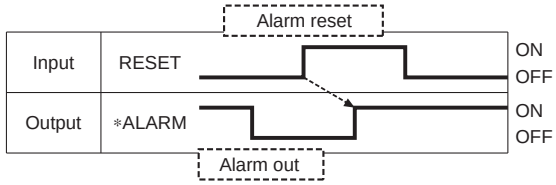

### (3) Cut-off Stop (Reset Stop)




### (4) Stop by the STOP Signal




### (5) Alarm Reset




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

## Options: Actuator Cable

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

**LE – CP – 1 – ☐**

**Cable length (L) [m]**

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

*1 Produced upon receipt of order (Robotic cable only)

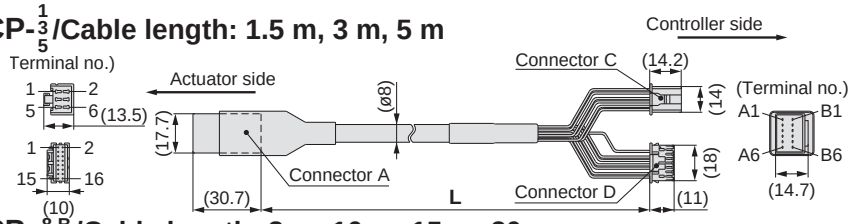
**Cable type**

| | |
|---|---|
| **—** | Robotic cable (Flexible cable) |
| **S** | Standard cable |

**Weight**

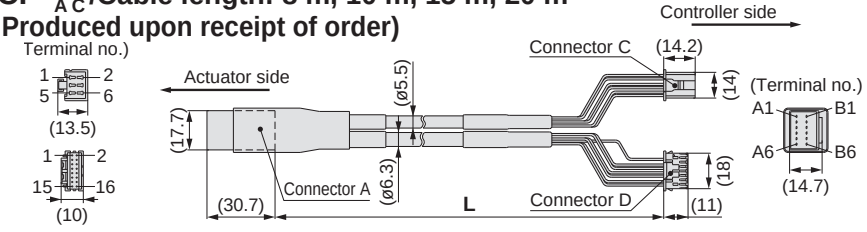
| Product no. | Weight [g] | Note |
|---|---|---|
| **LE-CP-1-S** | 190 | Standard cable |
| **LE-CP-3-S** | 280 | |
| **LE-CP-5-S** | 460 | |
| **LE-CP-1** | 140 | Robotic cable |
| **LE-CP-3** | 260 | |
| **LE-CP-5** | 420 | |
| **LE-CP-8** | 790 | |
| **LE-CP-A** | 980 | |
| **LE-CP-B** | 1460 | |
| **LE-CP-C** | 1940 | |

**LE-CP-$^{1}_{3}_{5}$/Cable length: 1.5 m, 3 m, 5 m**




**LE-CP-$^{8}_{A}$ $^{B}_{C}$/Cable length: 8 m, 10 m, 15 m, 20 m**

**(*1 Produced upon receipt of order)**




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

| Cable color | Connector D terminal no. |
|---|---|
| Brown | 12 |
| Black | 13 |
| Red | 7 |
| Black | 6 |
| Orange | 9 |
| Black | 8 |
| — | 3 |

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

**LE – CP – 1 – B – ☐**

**Cable length (L) [m]**

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

*1 Produced upon receipt of order (Robotic cable only)

**With lock and sensor**

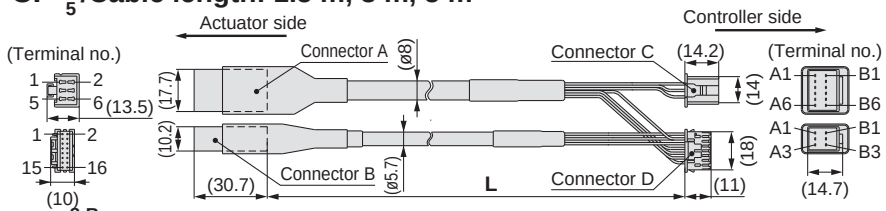
**Cable type**

| | |
|---|---|
| **—** | Robotic cable (Flexible cable) |
| **S** | Standard cable |

**Weight**

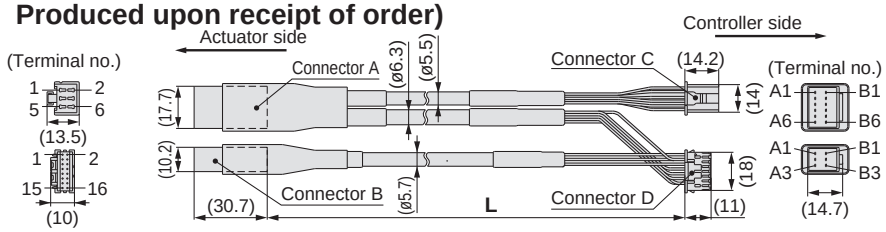
| Product no. | Weight [g] | Note |
|---|---|---|
| **LE-CP-1-B-S** | 240 | Standard cable |
| **LE-CP-3-B-S** | 380 | |
| **LE-CP-5-B-S** | 630 | |
| **LE-CP-1-B** | 190 | Robotic cable |
| **LE-CP-3-B** | 360 | |
| **LE-CP-5-B** | 590 | |
| **LE-CP-8-B** | 1060 | |
| **LE-CP-A-B** | 1320 | |
| **LE-CP-B-B** | 1920 | |
| **LE-CP-C-B** | 2620 | |

**LE-CP-$^{1}_{3}_{5}$/Cable length: 1.5 m, 3 m, 5 m**




**LE-CP-$^{8}_{A}$ $^{B}_{C}$/Cable length: 8 m, 10 m, 15 m, 20 m**

**(*1 Produced upon receipt of order)**



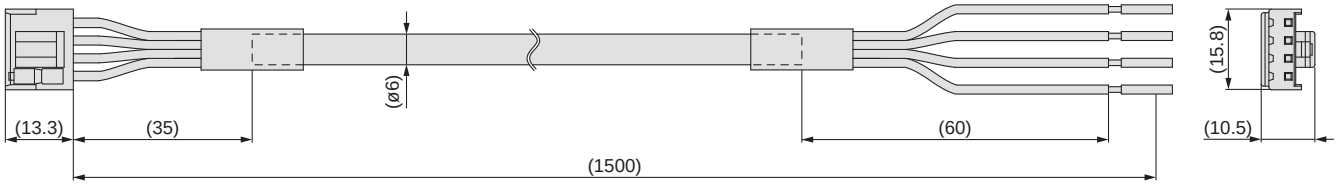

| Signal | Connector A terminal no. | Cable color | Connector C terminal no. |
|---|---|---|---|
| A | B-1 | Brown | 2 |
| $\overline{A}$ | A-1 | Red | 1 |
| B | B-2 | Orange | 6 |
| $\overline{B}$ | A-2 | Yellow | 5 |
| COM-A/COM | B-3 | Green | 3 |
| COM-B/— | A-3 | Blue | 4 |
| | | Shield | |
| Vcc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

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

## Options

### [Power supply cable]

## LEC−CK1−1




| Terminal name | Covered colour | Function |
|---|---|---|
| 0V | Blue | Common supply (–) |
| M 24V | White | Motor power supply (+) |
| C 24V | Brown | Control power supply (+) |
| BK RLS | Black | Lock release (+) |

∗ Conductor size: AWG20

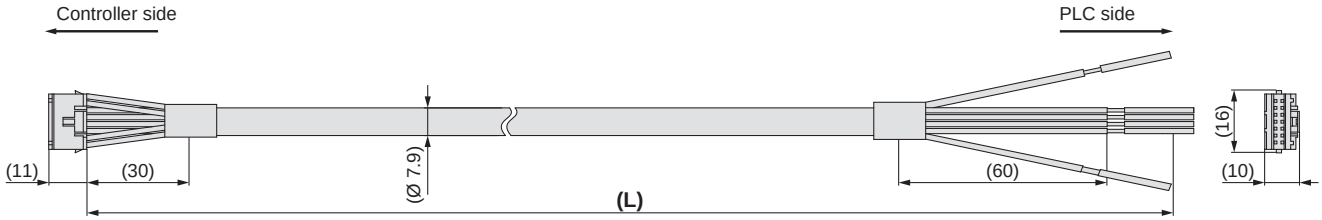
Weight: 90 g

### [I/O cable]

## LEC−CK4−□

**Cable length (L) [m]**

| | |
|---|---|
| **1** | 1.5 |
| **3** | 3 |
| **5** | 5 |




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

∗ Conductor size: AWG26

**Weight**

| Product no. | Weight [g] |
|---|---|
| **LEC-CK4-1** | 100 |
| **LEC-CK4-3** | 200 |
| **LEC-CK4-5** | 330 |

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

# Step Motor Driver
## *LECPA* Series

## How to Order

**⚠Caution**

**[CE-compliant products]**

① EMC compliance was tested by combining the electric actuator LE series and the LECPA series. The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with 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 compliance with the EMC directive for the machinery and equipment as a whole.

② For the LECPA series (step motor driver), EMC compliance was tested by installing a noise filter set (LEC-NFA).
Refer to page 220 for the noise filter set. Refer to the LECPA Operation Manual for installation.

**[UL-compliant products]**

When compliance with UL is required, the electric actuator and driver should be used with a UL1310 Class 2 power supply.

**LECP AP 1 □ – LEY16B-100**

**Driver type**

| | |
|---|---|
| **AN** | Pulse input type (NPN) |
| **AP** | Pulse input type (PNP) |

**I/O cable length [m]**

| | |
|---|---|
| **—** | None |
| **1** | 1.5 |
| **3** | 3*1 |
| **5** | 5*1 |

*1 Pulse input usable only with differential. Only 1.5 m cables usable with open collector.

**Driver mounting**

| | |
|---|---|
| **—** | Screw mounting |
| **D*1** | DIN rail |

*1 The DIN rail is not included. Order it separately.

**Actuator part number**

Without cable specifications and actuator options
Example: Enter "LEY16B-100"
for the LEY16B-100B-R16N1.

| | |
|---|---|
| **BC** | Blank controller*1 |

*1 Requires dedicated software (LEC-BCW)

* When controller equipped type is selected when ordering the LE series, you do not need to order this driver.
* When pulse signals are open collector, order the current limiting resistor (LEC-PA-R-□) separately.

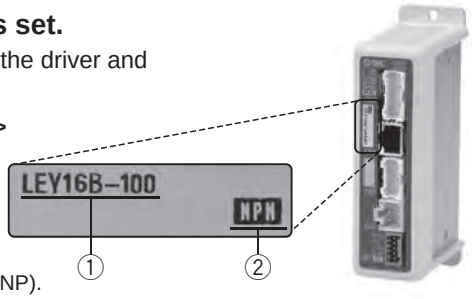
**The driver is sold as single unit after the compatible actuator is set.**

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

**<Check the following before use.>**

① Check the actuator label for the model number. This number should match that of the driver.

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




* Refer to the operation manual for using the products. Please download it via our website, https://www.smc.eu

**Precautions for blank controllers (LECPA□□-BC)**

A blank controller is a controller to which the customer can write the data of the actuator it is to be combined and used with. Use the dedicated software (LEC-BCW) for data writing.

- Please download the dedicated software (LEC-BCW) via our website.
- Order the communication cable for controller setting (LEC-W2A-C) separately to use this software.

**SMC website**
**https://www.smc.eu**

## Specifications

| Item | LECPA |
|---|---|
| **Compatible motor** | Step motor (Servo/24 VDC) |
| **Power supply*1** | Power voltage: 24 VDC ±10 %*2<br>[Including motor drive power, control power, stop, lock release] |
| **Parallel input** | 5 inputs (Except photo-coupler isolation, pulse input terminal, COM terminal) |
| **Parallel output** | 9 outputs (Photo-coupler isolation) |
| **Pulse signal input** | Maximum frequency: 60 kpps (Open collector), 200 kpps (Differential)<br>Input method: 1 pulse mode (Pulse input in direction), 2 pulse mode (Pulse input in differing directions) |
| **Compatible encoder** | Incremental A/B phase (Encoder resolution: 800 pulse/rotation) |
| **Serial communication** | RS485 (Modbus protocol compliant) |
| **Memory** | EEPROM |
| **LED indicator** | LED (Green/Red) one of each |
| **Lock control** | Forced-lock release terminal*3 |
| **Cable length [m]** | I/O cable: 1.5 or less (Open collector), 5 or less (Differential), Actuator cable: 20 or less |
| **Cooling system** | Natural air cooling |
| **Operating temperature range [°C]** | 0 to 40 (No freezing) |
| **Operating humidity range [%RH]** | 90 or less (No condensation) |
| **Storage temperature range [°C]** | –10 to 60 (No freezing) |
| **Storage humidity range [%RH]** | 90 or less (No condensation) |
| **Insulation resistance [MΩ]** | Between the housing and SG terminal: 50 (500 VDC) |
| **Weight [g]** | 120 (Screw mounting), 140 (DIN rail mounting) |

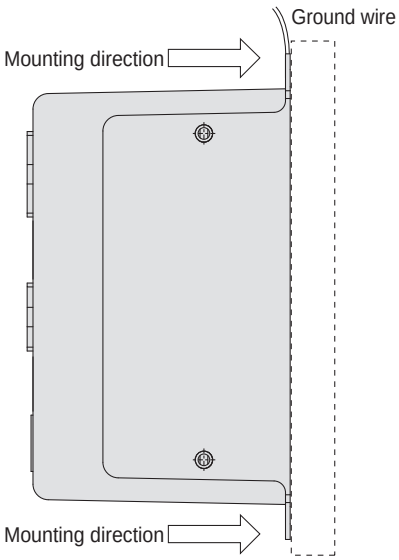
*1 Do not use the power supply of "inrush current prevention type" for the driver power supply. When compliance with UL is required, the electric actuator and driver should be used with a UL1310 Class 2 power supply.

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

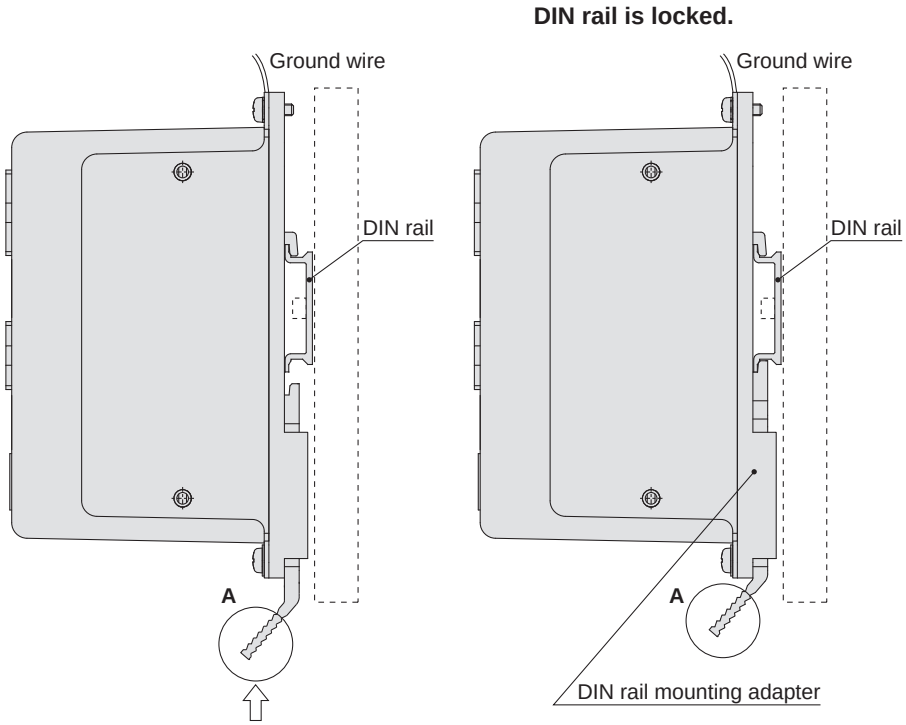
*3 Applicable to non-magnetising locks

## How to Mount

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




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

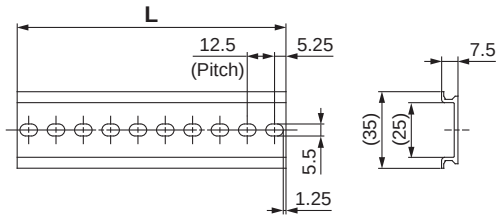



Hook the driver on the DIN rail and press the lever of section **A** in the arrow direction to lock it.

∗ The space between the drivers should be 10 mm or more.

### DIN rail
### AXT100-DR-□

∗ For □, enter a number from the No. line in the table below.
Refer to the dimension drawings on page 216 for the mounting dimensions.




**L Dimensions [mm]**

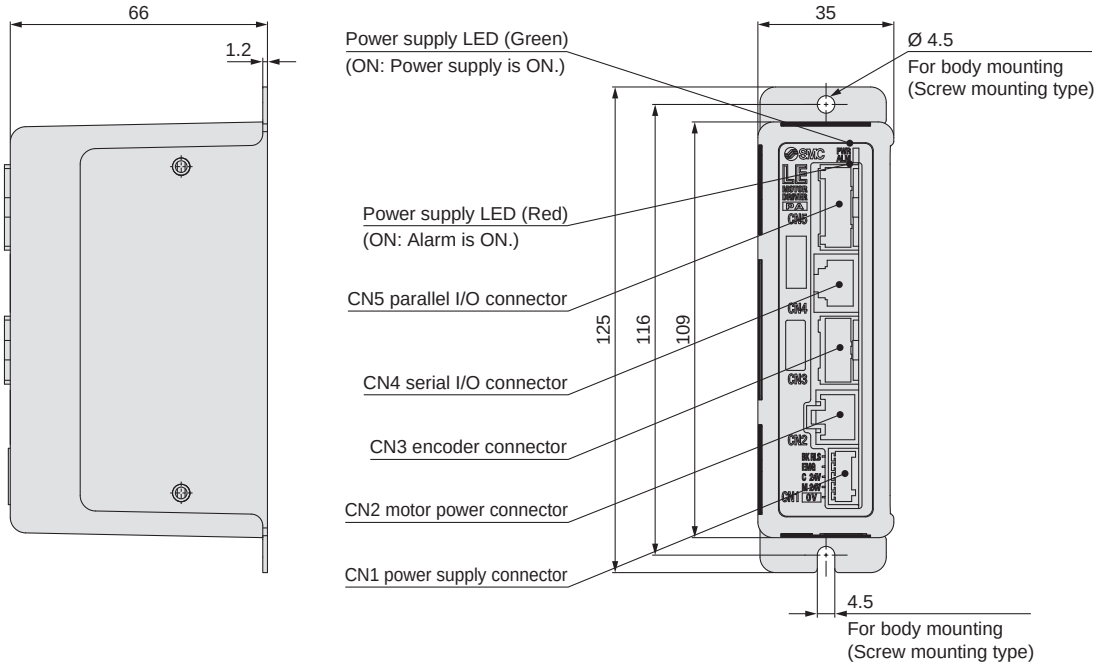
| No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L** | 23 | 35.5 | 48 | 60.5 | 73 | 85.5 | 98 | 110.5 | 123 | 135.5 | 148 | 160.5 | 173 | 185.5 | 198 | 210.5 | 223 | 235.5 | 248 | 260.5 |
| No. | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| **L** | 273 | 285.5 | 298 | 310.5 | 323 | 335.5 | 348 | 360.5 | 373 | 385.5 | 398 | 410.5 | 423 | 435.5 | 448 | 460.5 | 473 | 485.5 | 498 | 510.5 |

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

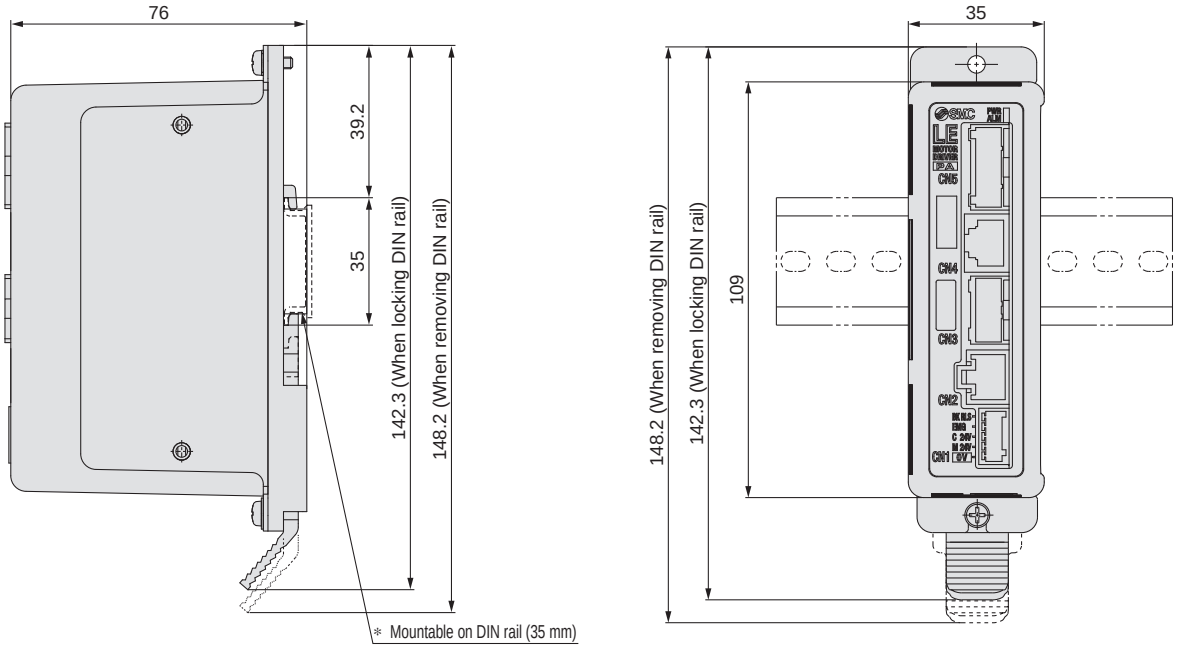
This should be used when the DIN rail mounting adapter is mounted onto a screw mounting type driver afterward.

## Dimensions

### a) Screw mounting (LECPA□□-□)




### b) DIN rail mounting (LECPA□□D-□)




## Wiring Example 1

**Power Supply Connector: CN1**

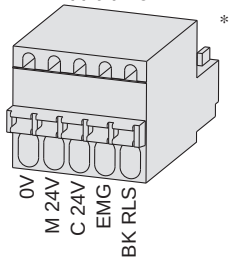
* The power supply plug is an accessory.
<Applicable cable size> AWG20 (0.5 mm$^2$), cover diameter 2.0 mm or less

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

| Terminal name | Function | Details |
|---|---|---|
| 0V | Common supply (–) | M 24V terminal/C 24V terminal/EMG terminal/BK RLS terminal are common (–). |
| M 24V | Motor power supply (+) | Motor power supply (+) supplied to the driver |
| C 24V | Control power supply (+) | Control power supply (+) supplied to the driver |
| EMG | Stop (+) | Input (+) for releasing the stop |
| BK RLS | Lock release (+) | Input (+) for releasing the lock |

**Power supply plug for LECPA: LEC-D-1-1**

* Accessory



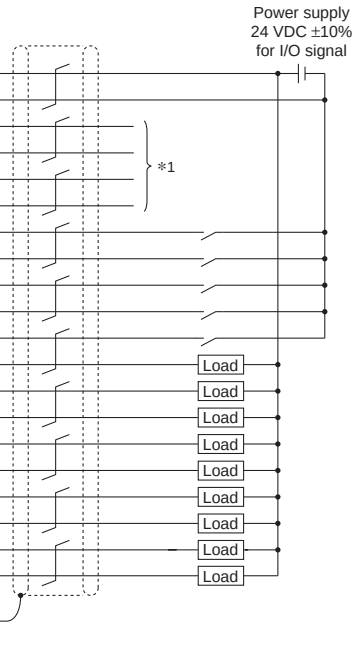
## Wiring Example 2

**Parallel I/O Connector: CN5**

* When you connect a PLC to the CN5 parallel I/O connector, use the I/O cable (LEC-CL5-□).
* The wiring changes depending on the type of parallel I/O (NPN or PNP).

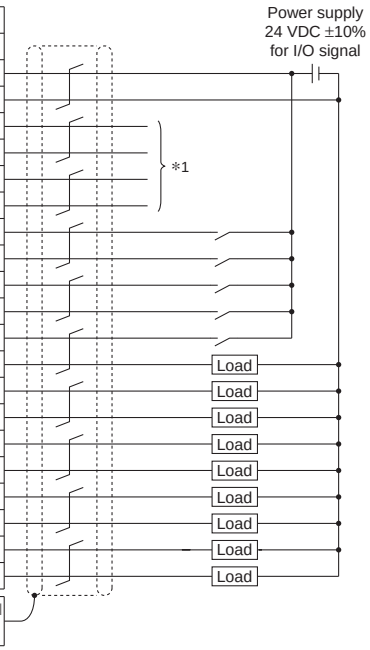
### LECPAN□□-□ (NPN)

| CN5 | | |
|---|---|---|
| Terminal name | Function | Pin no. |
| COM+ | 24 V | 1 |
| COM– | 0 V | 2 |
| NP+ | Pulse signal | 3 |
| NP– | Pulse signal | 4 |
| PP+ | Pulse signal | 5 |
| PP– | Pulse signal | 6 |
| SETUP | Input | 7 |
| RESET | Input | 8 |
| SVON | Input | 9 |
| CLR | Input | 10 |
| TL | Input | 11 |
| TLOUT | Output | 12 |
| WAREA | Output | 13 |
| BUSY | Output | 14 |
| SETON | Output | 15 |
| INP | Output | 16 |
| SVRE | Output | 17 |
| *ESTOP*2 | Output | 18 |
| *ALARM*2 | Output | 19 |
| AREA | Output | 20 |
| FG | Round terminal 0.5-5 | |




### LECPAP□□-□ (PNP)

| CN5 | | |
|---|---|---|
| Terminal name | Function | Pin no. |
| COM+ | 24 V | 1 |
| COM– | 0 V | 2 |
| NP+ | Pulse signal | 3 |
| NP– | Pulse signal | 4 |
| PP+ | Pulse signal | 5 |
| PP– | Pulse signal | 6 |
| SETUP | Input | 7 |
| RESET | Input | 8 |
| SVON | Input | 9 |
| CLR | Input | 10 |
| TL | Input | 11 |
| TLOUT | Output | 12 |
| WAREA | Output | 13 |
| BUSY | Output | 14 |
| SETON | Output | 15 |
| INP | Output | 16 |
| SVRE | Output | 17 |
| *ESTOP*2 | Output | 18 |
| *ALARM*2 | Output | 19 |
| AREA | Output | 20 |
| FG | Round terminal 0.5-5 | |




*1 For pulse signal wiring method, refer to "Pulse Signal Wiring Details".
*2 Output when the power supply of the driver is ON. (N.C.)

### Input Signal

| Name | Details |
|---|---|
| COM+ | Connects the power supply 24 V for input/output signal |
| COM– | Connects the power supply 0 V for input/output signal |
| SETUP | Instruction to return to origin |
| RESET | Alarm reset |
| SVON | Servo ON instruction |
| CLR | Deviation reset |
| TL | Instruction to pushing operation |

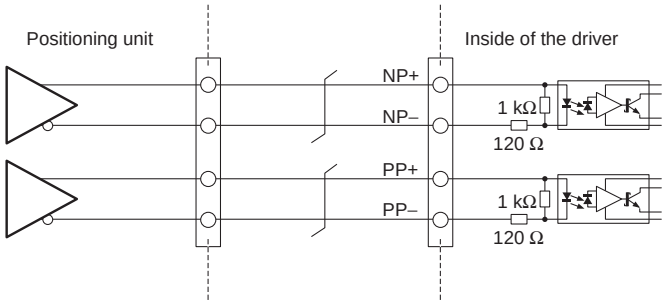
### Output Signal

| Name | Details |
|---|---|
| BUSY | Outputs when the actuator is operating |
| SETON | Outputs when returning to origin |
| INP | Outputs when target position is reached |
| SVRE | Outputs when servo is on |
| *ESTOP*3 | Not output when EMG stop is instructed |
| *ALARM*3 | Not output when alarm is generated |
| AREA | Outputs within the area output setting range |
| WAREA | Outputs within W-AREA output setting range |
| TLOUT | Outputs during pushing operation |

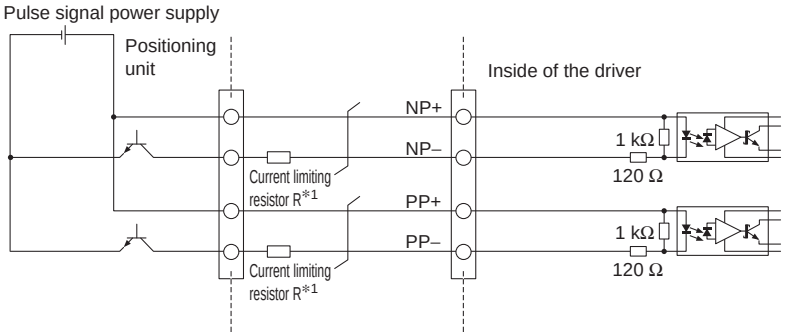
*3 Signal of negative-logic circuit ON (N.C.)

## Pulse Signal Wiring Details

**•Pulse signal output of positioning unit is differential output**




**•Pulse signal output of positioning unit is open collector output**

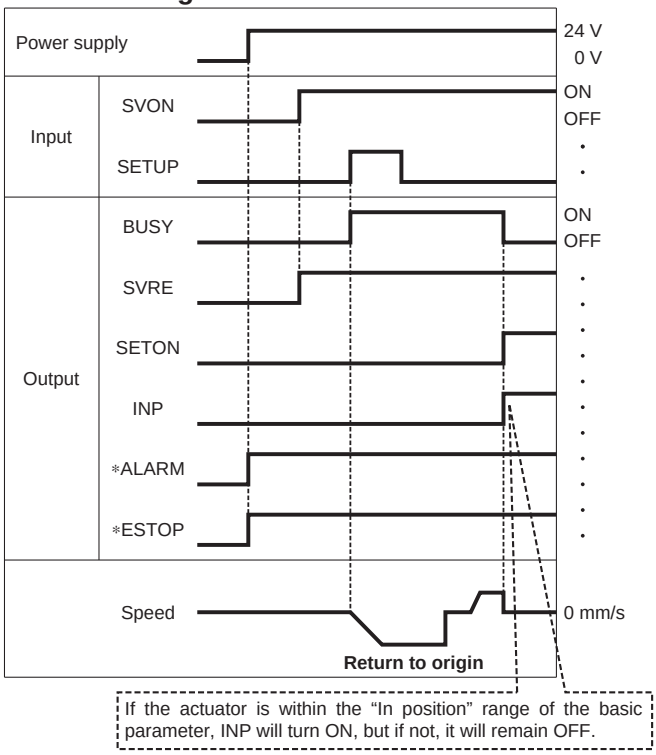



*1 Connect the current limiting resistor R in series to correspond to the pulse signal voltage.

| Pulse signal power supply voltage | Current limiting resistor R specifications | Current limiting resistor part no. |
|---|---|---|
| 24 VDC ±10 % | 3.3 kΩ ±5 % (0.5 W or more) | LEC-PA-R-332 |
| 5 VDC ±5 % | 390 Ω ±5 % (0.1 W or more) | LEC-PA-R-391 |

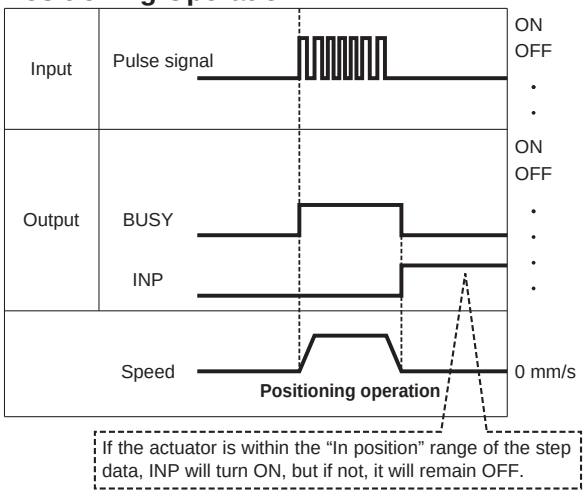
## Signal Timing

### Return to Origin

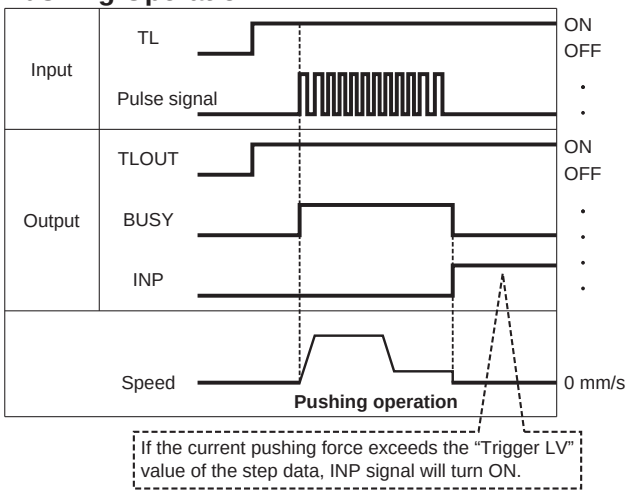



∗ "∗ALARM" and "∗ESTOP" are expressed as negative-logic circuits.

### Positioning Operation

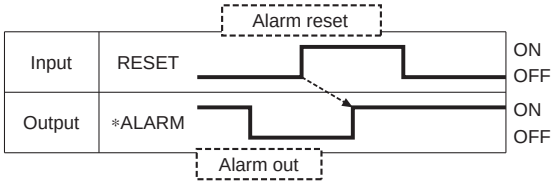



### Pushing Operation




∗ If pushing operation is stopped when there is no pulse deviation, the moving part of the actuator may pulsate.

### Alarm Reset




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

## Options: Actuator Cable

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

**LE − CP − 1 − ☐**

**Cable length (L) [m]**

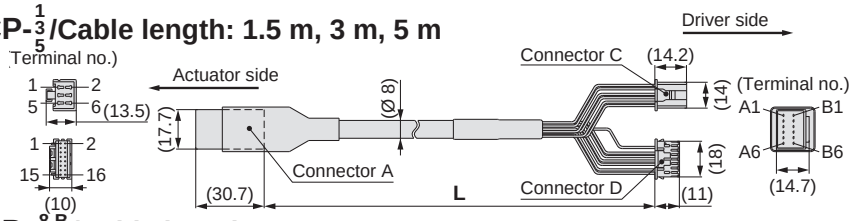
| | |
|---|---|
| **1** | 1.5 |
| **3** | 3 |
| **5** | 5 |
| **8** | 8*1 |
| **A** | 10*1 |
| **B** | 15*1 |
| **C** | 20*1 |

*1 Produced upon receipt of order (Robotic cable only)

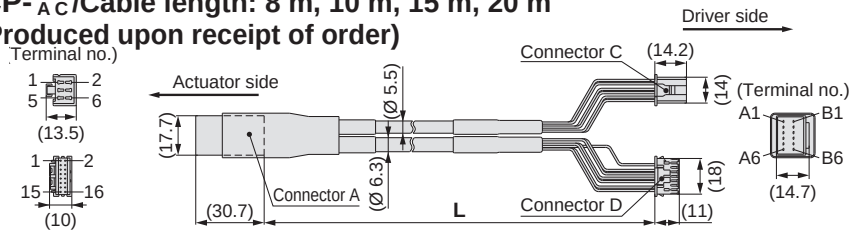
**Cable type**

| | |
|---|---|
| **—** | Robotic cable (Flexible cable) |
| **S** | Standard cable |

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




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




**Weight**

| Product no. | Weight [g] | Note |
|---|---|---|
| **LE-CP-1-S** | 190 | Standard cable |
| **LE-CP-3-S** | 280 | |
| **LE-CP-5-S** | 460 | |
| **LE-CP-1** | 140 | Robotic cable |
| **LE-CP-3** | 260 | |
| **LE-CP-5** | 420 | |
| **LE-CP-8** | 790 | |
| **LE-CP-A** | 980 | |
| **LE-CP-B** | 1460 | |
| **LE-CP-C** | 1940 | |

| Signal | Connector A terminal no. |
|---|---|
| A | B-1 |
| $\overline{A}$ | A-1 |
| B | B-2 |
| $\overline{B}$ | A-2 |
| COM-A/COM | B-3 |
| COM-B/— | A-3 |
| Vcc | B-4 |
| GND | A-4 |
| $\overline{A}$ | B-5 |
| A | A-5 |
| $\overline{B}$ | B-6 |
| B | A-6 |

Shield

| Cable color | Connector C terminal no. |
|---|---|
| Brown | 2 |
| Red | 1 |
| Orange | 6 |
| Yellow | 5 |
| Green | 3 |
| Blue | 4 |

| Cable color | Connector D terminal no. |
|---|---|
| Brown | 12 |
| Black | 13 |
| Red | 7 |
| Black | 6 |
| Orange | 9 |
| Black | 8 |
| — | 3 |

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

**LE − CP − 1 − B − ☐**

**Cable length (L) [m]**

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

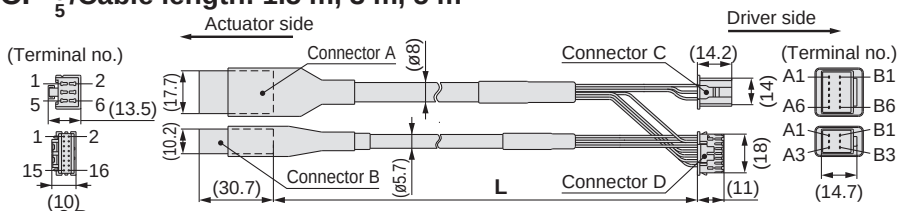
*1 Produced upon receipt of order (Robotic cable only)

**With lock and sensor**

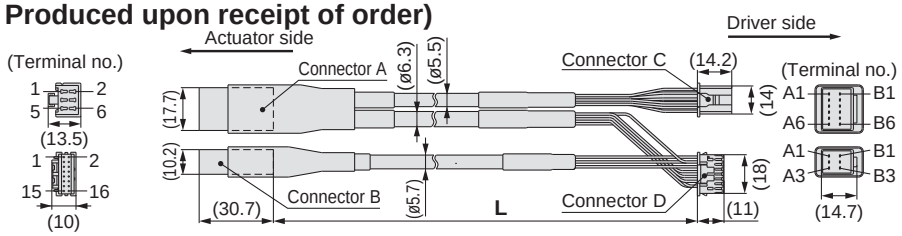
**Cable type**

| | |
|---|---|
| **—** | Robotic cable (Flexible cable) |
| **S** | Standard cable |

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




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




**Weight**

| Product no. | Weight [g] | Note |
|---|---|---|
| **LE-CP-1-B-S** | 240 | Standard cable |
| **LE-CP-3-B-S** | 380 | |
| **LE-CP-5-B-S** | 630 | |
| **LE-CP-1-B** | 190 | Robotic cable |
| **LE-CP-3-B** | 360 | |
| **LE-CP-5-B** | 590 | |
| **LE-CP-8-B** | 1060 | |
| **LE-CP-A-B** | 1320 | |
| **LE-CP-B-B** | 1920 | |
| **LE-CP-C-B** | 2620 | |

| Signal | Connector A terminal no. |
|---|---|
| A | B-1 |
| $\overline{A}$ | A-1 |
| B | B-2 |
| $\overline{B}$ | A-2 |
| COM-A/COM | B-3 |
| COM-B/— | A-3 |
| Vcc | B-4 |
| GND | A-4 |
| $\overline{A}$ | B-5 |
| A | A-5 |
| $\overline{B}$ | B-6 |
| B | A-6 |

Shield

| Cable color | Connector C terminal no. |
|---|---|
| Brown | 2 |
| Red | 1 |
| Orange | 6 |
| Yellow | 5 |
| Green | 3 |
| Blue | 4 |

| Cable color | Connector D terminal no. |
|---|---|
| Brown | 12 |
| Black | 13 |
| Red | 7 |
| Black | 6 |
| Orange | 9 |
| Black | 8 |
| — | 3 |

| Signal | Connector B terminal no. |
|---|---|
| Lock (+) | B-1 |
| Lock (–) | A-1 |
| Sensor (+) | B-3 |
| Sensor (–) | A-3 |

| Cable color | Connector C terminal no. |
|---|---|
| Red | 4 |
| Black | 5 |
| Brown | 1 |
| Blue | 2 |

## Options

### [I/O cable]

**LEC-C L5-1**

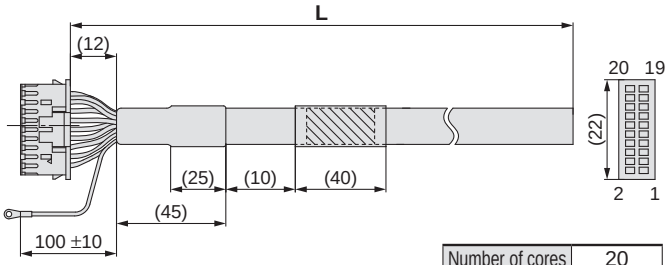
**I/O cable type**

| | |
|---|---|
| **L5** | For LECPA |

**I/O cable length (L)**

| | |
|---|---|
| **1** | 1.5 m |
| **3** | 3 m*1 |
| **5** | 5 m*1 |

*1 Pulse input usable only with differential. Only 1.5 m cables usable with open collector




| | |
|---|---|
| Number of cores | 20 |
| AWG size | 24 |

| Pin no. | Insulation colour | Dot mark | Dot colour |
|---|---|---|---|
| 1 | Light brown | ■ | Black |
| 2 | Light brown | ■ | Red |
| 3 | Yellow | ■ | Black |
| 4 | Yellow | ■ | Red |
| 5 | Light green | ■ | Black |
| 6 | Light green | ■ | Red |
| 7 | Gray | ■ | Black |
| 8 | Gray | ■ | Red |
| 9 | White | ■ | Black |
| 10 | White | ■ | Red |
| 11 | Light brown | ■■ | Black |

| Pin no. | Insulation colour | Dot mark | Dot colour |
|---|---|---|---|
| 12 | Light brown | ■■ | Red |
| 13 | Yellow | ■■ | Black |
| 14 | Yellow | ■■ | Red |
| 15 | Light green | ■■ | Black |
| 16 | Light green | ■■ | Red |
| 17 | Gray | ■■ | Black |
| 18 | Gray | ■■ | Red |
| 19 | White | ■■ | Black |
| 20 | White | ■■ | Red |
| Round terminal 0.5-5 | Green | | |

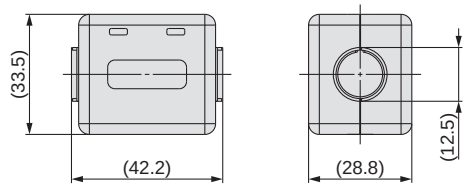
**Weight**

| Product no. | Weight [g] |
|---|---|
| **LEC-CL5-1** | 190 |
| **LEC-CL5-3** | 370 |
| **LEC-CL5-5** | 610 |

### [Noise filter set]
### Step Motor Driver (Pulse Input Type)

# LEC-NFA

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




* Refer to the LECPA series Operation Manual for installation.

### [Current limiting resistor]

This optional resistor (LEC-PA-R-□) is used when the pulse signal output of the positioning unit is open collector output.

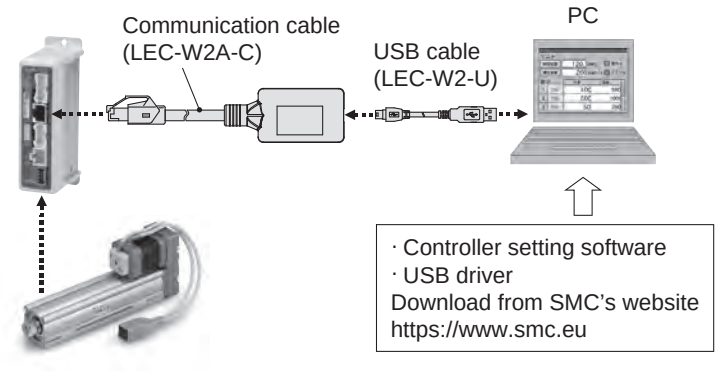
**LEC-PA-R-□**

**Current limiting resistor**

| Symbol | Resistance | Pulse signal power supply voltage |
|---|---|---|
| **332** | 3.3 kΩ ±5 % | 24 VDC ±10 % |
| **391** | 390 Ω ±5 % | 5 VDC ±5 % |

* Select a current limiting resistor that corresponds to the pulse signal power supply voltage.
* For the LEC-PA-R-□, two pieces are shipped as a set.
* For pulse signal wiring details, refer to page 217.

# *LEC* Series
# Communication Cable for Controller Setting/LEC-W2A-□




## How to Order

**LEC-W2A-C**
- C: Communication cable

**LEC-W2-U**
- U: USB cable

## Compatible Controller/Driver

| | |
|---|---|
| **Step data input type** | **PLECA6 Series** |
| **Pulse input type** | **LECPA Series** |
| **PStep Motor Controller** | **JXCE1/91/P1/D1/L1 Series** |

∗ When connecting to a JXCE1/91/P1/D1/L1 series product, use a conversion cable (P5062-5) as a relay.

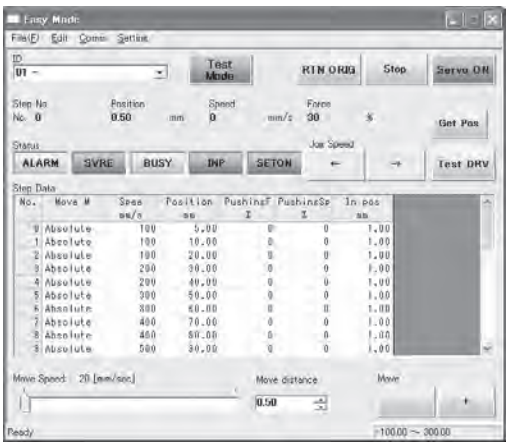
## Hardware Requirements

| | |
|---|---|
| OS | Windows®7, Windows®8.1, Windows®10 |
| Communication interface | USB 1.1 or USB 2.0 ports |
| Display | 1024 x 768 or more |

∗ Windows®7, Windows®8.1 and Windows®10 are registered trademarks of Microsoft Corporation in the United States.

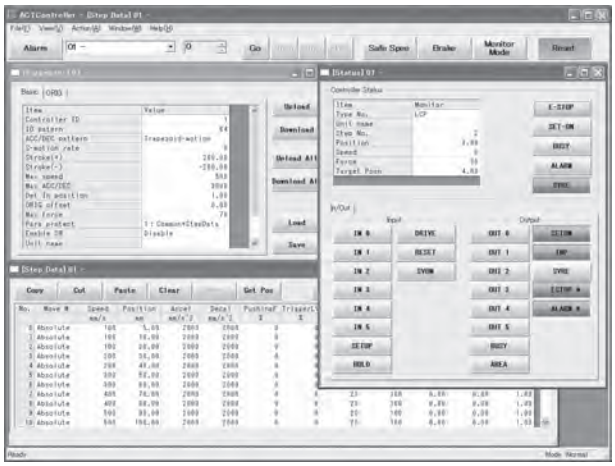
## Screen Example

### 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 test drive can be performed on the same page.
- Can be used to jog and move at a constant rate

### Normal mode screen example



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

# *LEC Series*
# Teaching Box/LEC-T1


## How to Order

**LEC-T1-3EG□**

**Teaching box**

**Cable length [m]**

| | |
|---|---|
| **3** | 3 |

**Initial language**

| | |
|---|---|
| **J** | Japanese |
| **E** | English |

∗ The displayed language can be changed to English or Japanese.

**Stop switch**

| | |
|---|---|
| **G** | Equipped with stop switch |

**Enable switch**

| | |
|---|---|
| **—** | None |
| **S** | Equipped with enable switch |

∗ Interlock switch for jog and test function

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

**Option**
- **Enable switch is provided.**

## Specifications

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

**[CE-compliant products]**
The EMC compliance of the teaching box was tested with a step motor controller (servo/24 VDC) and an applicable actuator.
**[UL-compliant products]**
When compliance with UL is required, the electric actuator and driver should be used with a UL1310 Class 2 power supply.

## Easy Mode

| Function | Details |
|---|---|
| Step data | • Setting of step data |
| Jog | • Jog operation<br>• Return to origin |
| Test | • 1 step operation*1<br>• Return to origin |
| Monitor | • Display of axis and step data no.<br>• Display of two items selected from Position, Speed, Force. |
| ALM | • Active alarm display<br>• Alarm reset |
| TB setting | • Reconnection of axis (Ver. 1.∗∗)<br>• Displayed language setting (Ver. 2.∗∗)<br>• Setting of easy/normal mode<br>• Setting step data and selection of items from easy mode monitor |

### Menu Operations Flowchart

**Menu**
- Data
- Monitor
- Jog
- Test
- ALM
- TB setting

**Data**
Step data no.
Setting of two items selected below
Ver. 1.∗∗:
Position, Speed, Force, Acceleration, Deceleration
Ver. 2.∗∗:
Position, Speed, Pushing force, Acceleration, Deceleration, Movement MOD, Trigger LV, Pushing speed, Moving force, Area 1, Area 2, In position

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

**Jog**
Return to origin
Jog operation

**Test***1
1 step operation

**ALM**
Active alarm display
Alarm reset

**TB setting**
Reconnect (Ver. 1.∗∗)
Japanese/English (Ver. 2.∗∗)
Easy/Normal
Set item

∗1 Not compatible with the LECPA

## Normal Mode

| Function | Details |
|---|---|
| Step data | • Step data setting |
| Parameter | • Parameters setting |
| Test | • Jog operation/Constant rate movement<br>• Return to origin<br>• Test drive*1<br>(Specify a maximum of 5 step data and operate.)<br>• Forced output<br>(Forced signal output, Forced terminal output)*2 |
| Monitor | • Drive monitor<br>• Output signal monitor*2<br>• Input signal monitor*2<br>• Output terminal monitor<br>• Input terminal monitor |
| ALM | • Active alarm display<br>(Alarm reset)<br>• Alarm log record display |
| File | • Data saving<br>Save the step data and parameters of the driver 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).<br>• Load to driver<br>Loads the data which is saved in the teaching box to the driver which is being used for communication.<br>• Delete the saved data.<br>• File protection (Ver. 2.**) |
| TB setting | • Display setting<br>(Easy/Normal mode)<br>• Language setting<br>(Japanese/English)<br>• Backlight setting<br>• LCD contrast setting<br>• Beep sound setting<br>• Max. connection axis<br>• Distance unit (mm/inch) |
| Reconnect | • Reconnection of axis |

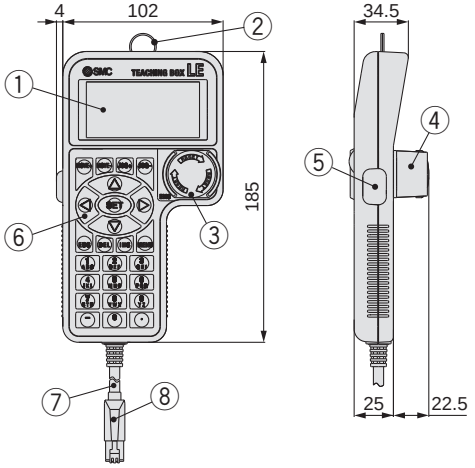
### Menu Operations Flowchart

- **Menu**: Step data, Parameter, Monitor, Test, ALM, File, TB setting, Reconnect
- **Step data**: Step data no., Movement MOD, Speed, Position, Acceleration, Deceleration, Pushing force, Trigger LV, Pushing speed, Moving force, Area 1, 2, In position
- **Parameter**: Basic, ORIG
  - **Basic setting**
  - **ORIG setting**
- **Monitor**: Drive, Output signal*2, Input signal*2, Output terminal, Input terminal
  - **DRV monitor**: Position, Speed, Torque, Step no., Last step no.
  - **Output signal monitor**
  - **Input signal monitor**
  - **Output terminal monitor**
  - **Input terminal monitor**
- **Test**: JOG/MOVE, Return to ORIG, Test drive*1, Forced output*2
- **ALM**: Status, ALM Log record
  - **Status**: Active alarm display, Alarm reset
  - **ALM Log record display**: Log entry display
- **File**: Data saving, Load to driver, File deletion, File protection (Ver. 2.**)
- **TB setting**: Easy/Normal, Language, Backlight, LCD contrast, Beep, Max. connection axis, Password, Distance unit
- **Reconnect**

*1 Not compatible with the LECPA

*2 The following signals are compatible with LECPA with TB Ver. 2.10 or newer.
Input: CLR, TL
Output: TLOUT

## Dimensions




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

# Step Motor Controller

## *JXCE1/91/P1/D1/L1 Series*

## How to Order

**JXC D 1 7 T –**

**Communication protocol**

| | |
|---|---|
| **E** | EtherCAT® |
| **9** | EtherNet/IP™ |
| **P** | PROFINET |
| **D** | DeviceNet™ |
| **L** | IO-Link |

**For single axis**

**Mounting**

| | |
|---|---|
| **7** | Screw mounting |
| **8**∗1 | DIN rail |

∗1 The DIN rail is not included. It must be ordered separately. (Refer to page 229.)

**Option**

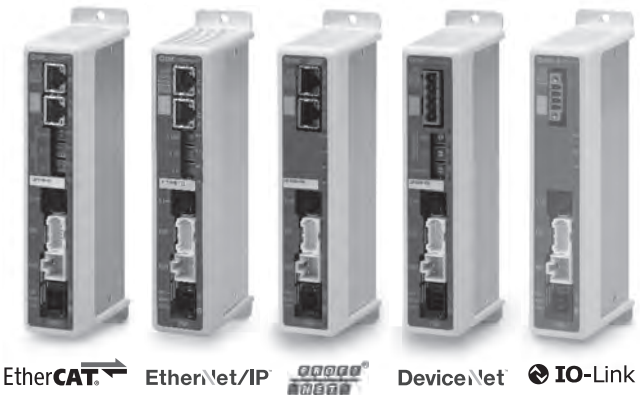
| | |
|---|---|
| **—** | Without option |
| **S** | With straight type DeviceNet™ communication plug for JXCD1 |
| **T** | With T-branch type DeviceNet™ communication plug for JXCD1 |

∗ Select "—" for anything other than JXCD1.

**Actuator part number**

| | |
|---|---|
| Without cable specifications and actuator options<br>Example: Enter "LEY16B-100"<br>for the LEY16B-100B-R16N1. | |
| **BC** | Blank controller∗1 |

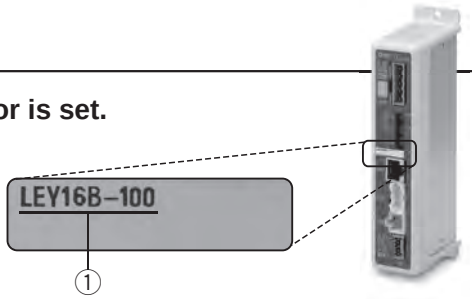
∗1 Requires dedicated software (JXC-BCW)




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

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

① Check the actuator label for the model number. This number should match that of the controller.




∗ Refer to the operation manual for using the products. Please download it via our website, https://www.smc.eu

**Precautions for blank controllers (JXC□1□□-BC)**

A blank controller is a controller to which the customer can write the data of the actuator it is to be combined and used with. Use the dedicated software (JXC-BCW) for data writing.

- Please download the dedicated software (JXC-BCW) via our website.
- Order the controller setting kit (JXC-W2) separately to use this software.

**SMC website: https://www.smc.eu**

## Specifications

| Model | | | JXCE1 | JXC91 | JXCP1 | JXCD1 | JXCL1 |
|---|---|---|---|---|---|---|---|
| Network | | | EtherCAT® | EtherNet/IP™ | PROFINET | DeviceNet™ | IO-Link |
| Compatible motor | | | Step motor (Servo/24 VDC) | | | | |
| Power supply | | | Power voltage: 24 VDC ±10 % | | | | |
| Current consumption (Controller) | | | 200 mA or less | 130 mA or less | 200 mA or less | 100 mA or less | 100 mA or less |
| Compatible encoder | | | Incremental A/B phase (800 pulse/rotation) | | | | |
| Communication specifications | Applicable system | Protocol | EtherCAT®*2 | EtherNet/IP™*2 | PROFINET*2 | DeviceNet™ | IO-Link |
| | | Version*1 | Conformance Test Record V.1.2.6 | Volume 1 (Edition 3.14)<br>Volume 2 (Edition 1.15) | Specification Version 2.32 | Volume 1 (Edition 3.14)<br>Volume 3 (Edition 1.13) | Version 1.1<br>Port Class A |
| | Communication speed | | 100 Mbps*2 | 10/100 Mbps*2 (Automatic negotiation) | 100 Mbps*2 | 125/250/500 kbps | 230.4 kbps (COM3) |
| | Configuration file*3 | | ESI file | EDS file | GSDML file | EDS file | IODD file |
| | I/O occupation area | | Input 20 bytes<br>Output 36 bytes | Input 36 bytes<br>Output 36 bytes | Input 36 bytes<br>Output 36 bytes | Input 4, 10, 20 bytes<br>Output 4, 12, 20, 36 bytes | Input 14 bytes<br>Output 22 bytes |
| | Terminating resistor | | Not included | | | | |
| Memory | | | EEPROM | | | | |
| LED indicator | | | PWR, RUN, ALM, ERR | PWR, ALM, MS, NS | PWR, ALM, SF, BF | PWR, ALM, MS, NS | PWR, ALM, COM |
| Cable length [m] | | | Actuator cable: 20 or less | | | | |
| Cooling system | | | Natural air cooling | | | | |
| Operating temperature range [°C] | | | 0 to 40 (No freezing) | | | | |
| Operating humidity range [%RH] | | | 90 or less (No condensation) | | | | |
| Insulation resistance [MΩ] | | | Between all external terminals and the case: 50 (500 VDC) | | | | |
| Weight [g] | | | 220 (Screw mounting)<br>240 (DIN rail mounting) | 210 (Screw mounting)<br>230 (DIN rail mounting) | 220 (Screw mounting)<br>240 (DIN rail mounting) | 210 (Screw mounting)<br>230 (DIN rail mounting) | 190 (Screw mounting)<br>210 (DIN rail mounting) |

∗1 Please note that versions are subject to change.
∗2 Use a shielded communication cable with CAT5 or higher for the PROFINET, EtherNet/IP™, and EtherCAT®.
∗3 The files can be downloaded from the SMC website.

**■Trademark**
EtherNet/IP™ is a trademark of ODVA.
DeviceNet™ is a trademark of ODVA.
EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

## Example of Operation Command

In addition to the step data input of 64 points maximum in each communication protocol, the changing of each parameter can be performed in real time via numerical data defined operation.
∗ Numerical values other than “Moving force,” “Area 1,” and “Area 2” can be used to perform operation under numerical instructions from JXCL1.

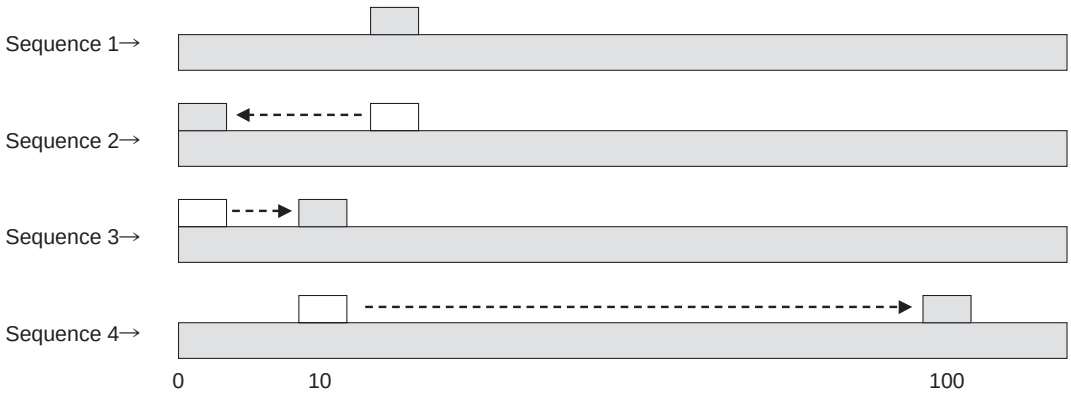
### <Application example> Movement between 2 points

| No. | Movement mode | Speed | Position | Acceleration | Deceleration | Pushing force | Trigger LV | Pushing speed | Moving force | Area 1 | Area 2 | In position |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1: Absolute | 100 | 10 | 3000 | 3000 | 0 | 0 | 0 | 100 | 0 | 0 | 0.50 |
| 1 | 1: Absolute | 100 | 100 | 3000 | 3000 | 0 | 0 | 0 | 100 | 0 | 0 | 0.50 |

### <Step no. defined operation>
Sequence 1: Servo ON instruction
Sequence 2: Instruction to return to origin
Sequence 3: Specify step data No. 0 to input the DRIVE signal.
Sequence 4: Specify step data No. 1 after the DRIVE signal has been temporarily turned OFF to input the DRIVE signal.

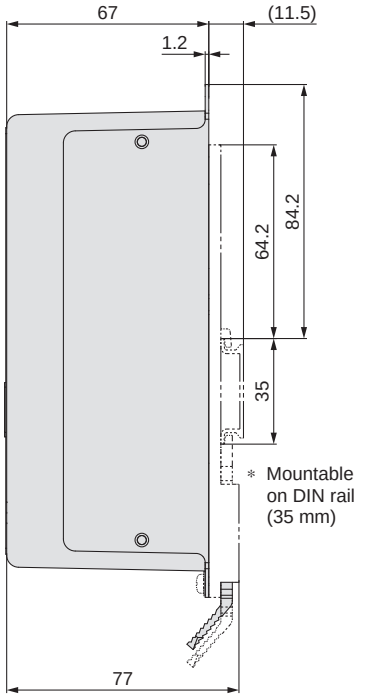
### <Numerical data defined operation>
Sequence 1: Servo ON instruction
Sequence 2: Instruction to return to origin
Sequence 3: Specify step data No. 0 and turn ON the input instruction flag (position). Input 10 in the target position. Subsequently the start flag turns ON.
Sequence 4: Turn ON step data No. 0 and the input instruction flag (position) to change the target position to 100 while the start flag is ON.

The same operation can be performed with any operation command.

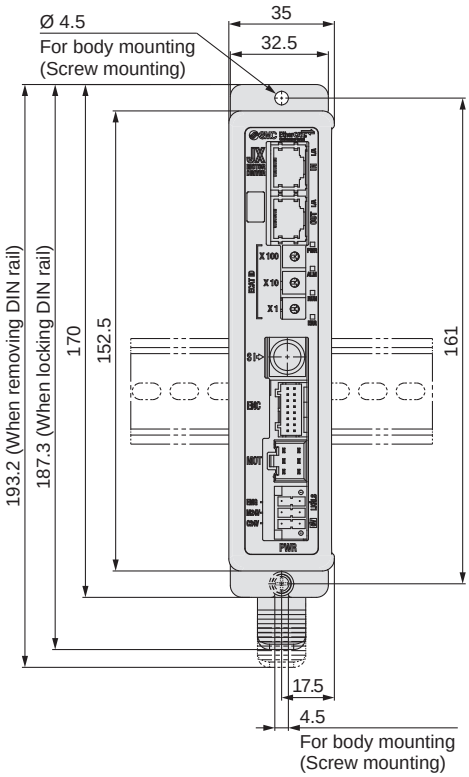


## Dimensions

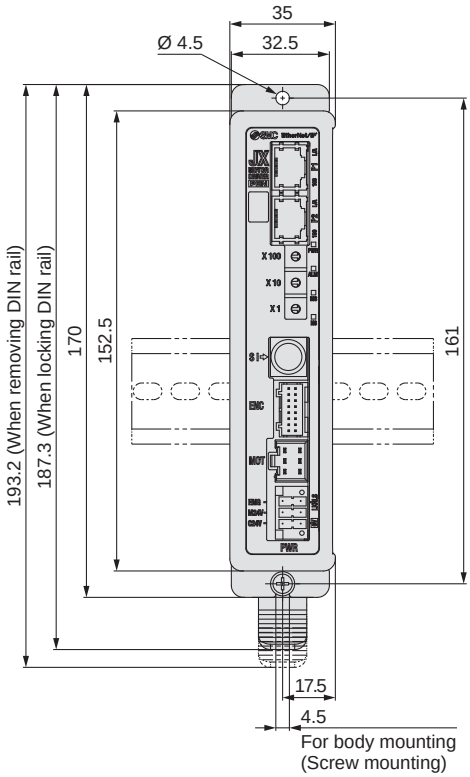
### JXCE1/JXC91



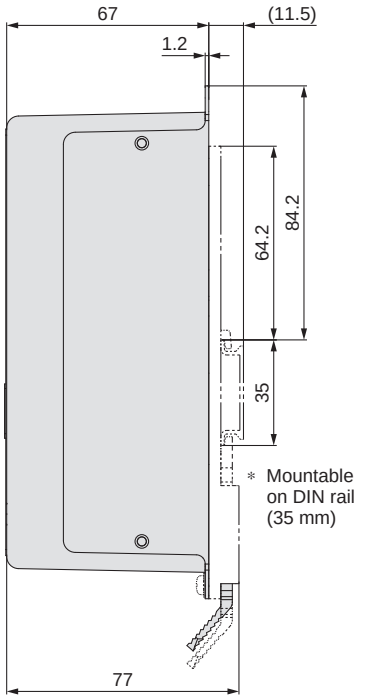

### JXCE1



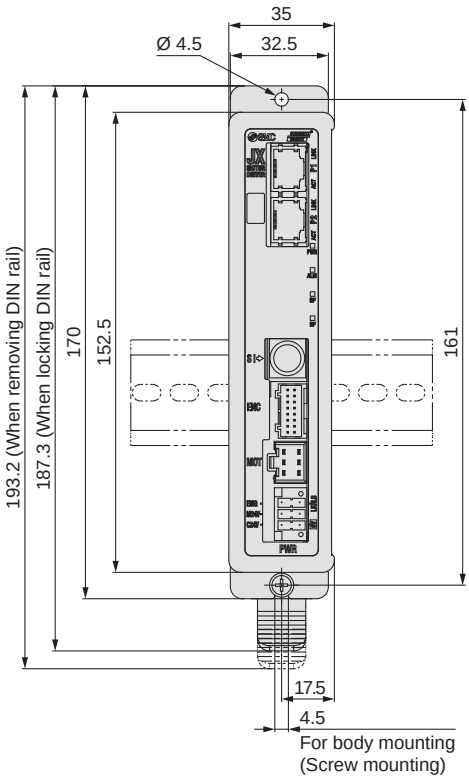

### JXC91



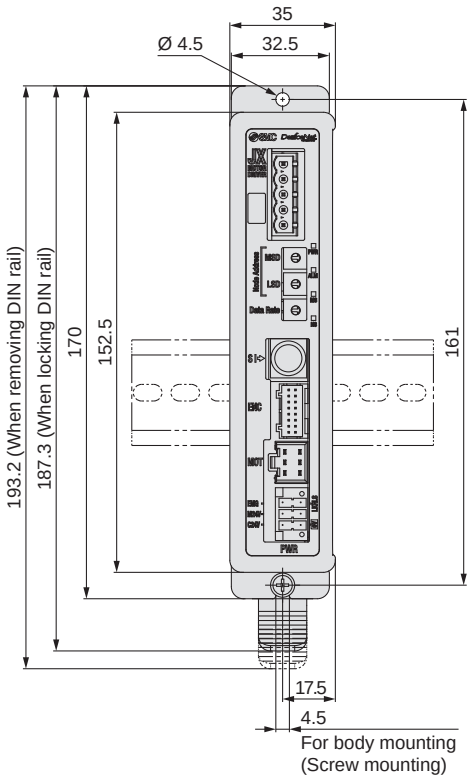

### JXCP1/JXCD1



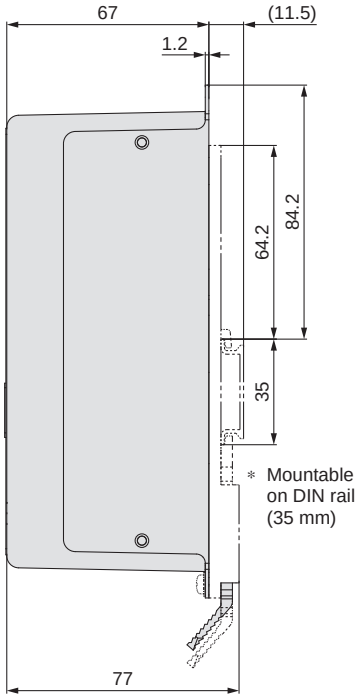

### JXCP1



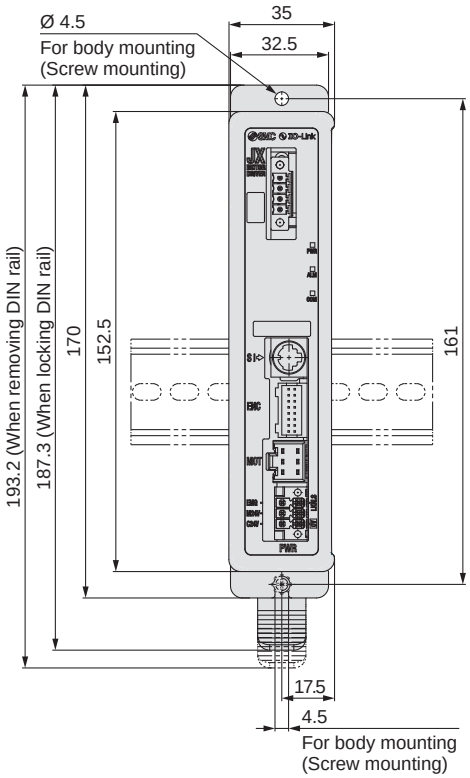

### JXCD1

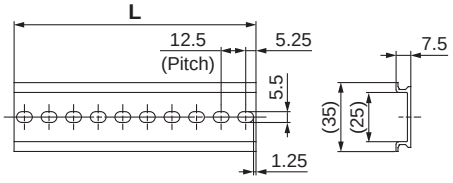


## Dimensions




**JXCL1**




**L Dimensions [mm]**

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

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

## Options: Actuator Cable

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

**LE – CP – 1 – ☐**

**Cable length (L) [m]**

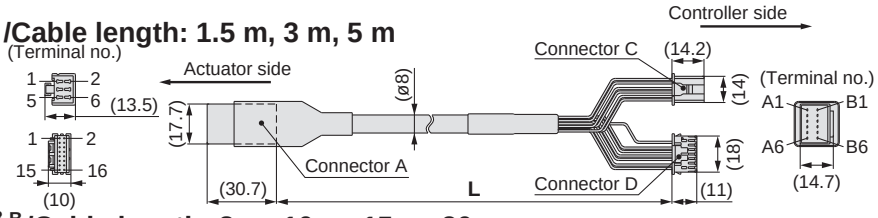
| | |
|---|---|
| **1** | 1.5 |
| **3** | 3 |
| **5** | 5 |
| **8** | 8*1 |
| **A** | 10*1 |
| **B** | 15*1 |
| **C** | 20*1 |

*1 Produced upon receipt of order (Robotic cable only)

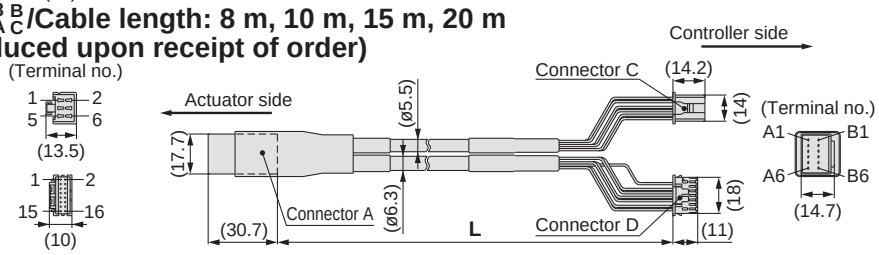
**Cable type**

| | |
|---|---|
| **—** | Robotic cable (Flexible cable) |
| **S** | Standard cable |

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

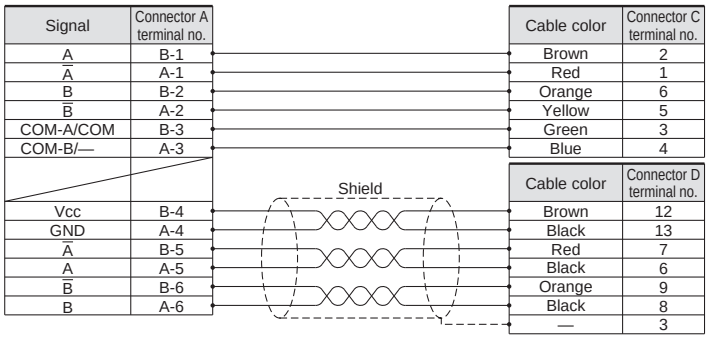



**LE-CP-$\frac{8}{A}\frac{B}{C}$/Cable length: 8 m, 10 m, 15 m, 20 m**
**(*1 Produced upon receipt of order)**




**Weight**

| Product no. | Weight [g] | Note |
|---|---|---|
| **LE-CP-1-S** | 190 | Standard cable |
| **LE-CP-3-S** | 280 | |
| **LE-CP-5-S** | 460 | |
| **LE-CP-1** | 140 | Robotic cable |
| **LE-CP-3** | 260 | |
| **LE-CP-5** | 420 | |
| **LE-CP-8** | 790 | |
| **LE-CP-A** | 980 | |
| **LE-CP-B** | 1460 | |
| **LE-CP-C** | 1940 | |




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

**LE – CP – 1 – B – ☐**

**Cable length (L) [m]**

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

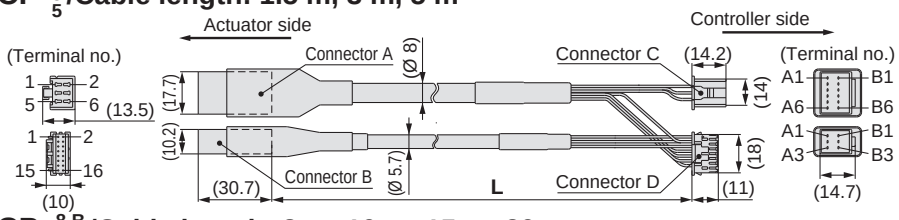
*1 Produced upon receipt of order (Robotic cable only)

**With lock and sensor**

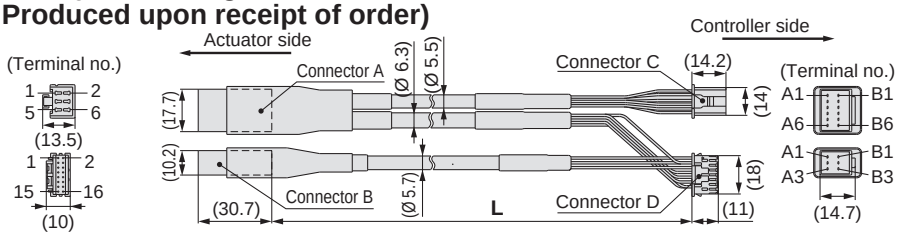
**Cable type**

| | |
|---|---|
| **—** | Robotic cable (Flexible cable) |
| **S** | Standard cable |

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

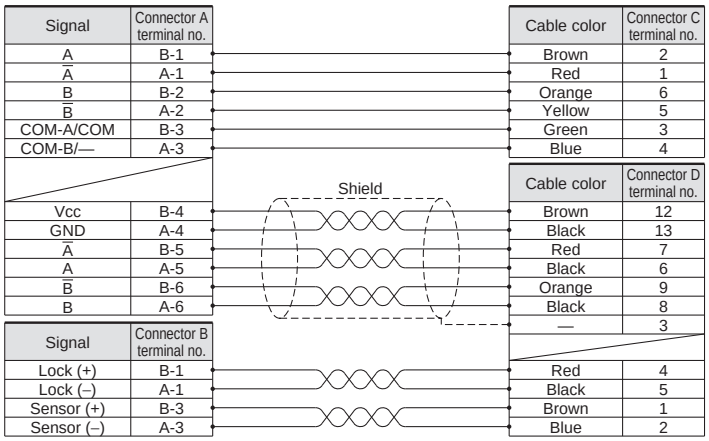



**LE-CP-$\frac{8}{A}\frac{B}{C}$/Cable length: 8 m, 10 m, 15 m, 20 m**
**(*1 Produced upon receipt of order)**




**Weight**

| Product no. | Weight [g] | Note |
|---|---|---|
| **LE-CP-1-B-S** | 240 | Standard cable |
| **LE-CP-3-B-S** | 380 | |
| **LE-CP-5-B-S** | 630 | |
| **LE-CP-1-B** | 190 | Robotic cable |
| **LE-CP-3-B** | 360 | |
| **LE-CP-5-B** | 590 | |
| **LE-CP-8-B** | 1060 | |
| **LE-CP-A-B** | 1320 | |
| **LE-CP-B-B** | 1920 | |
| **LE-CP-C-B** | 2620 | |



## Options

### ■Controller setting kit JXC-W2

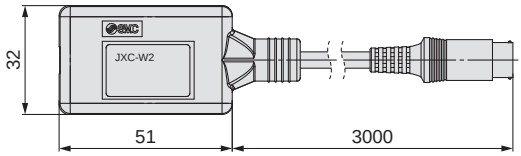
**[Contents]**
① Communication cable
② USB cable
③ Controller setting software
∗ A conversion cable (P5062-5) is not required.

**JXC−W2−□**

**Contents**

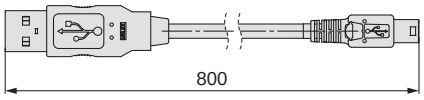
| | |
|---|---|
| — | A kit includes: Communication cable, USB cable, Controller setting software |
| C | Communication cable |
| U | USB cable |
| S | Controller setting software (CD-ROM) |

#### ① Communication cable JXC-W2-C

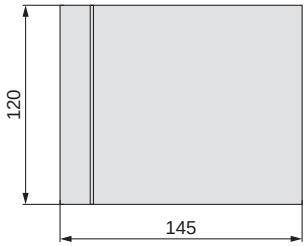



∗ It can be connected to the controller directly.

#### ② USB cable JXC-W2-U




#### ③ Controller setting software (CD-ROM) JXC-W2-S




### ■DIN rail mounting adapter LEC-3-D0

∗ With 2 mounting screws

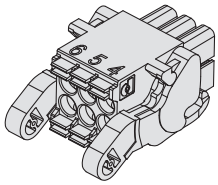
This should be used when the DIN rail mounting adapter is mounted onto a screw mounting type controller afterward.

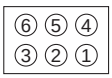
### ■DIN rail AXT100-DR-□

∗ For □, enter a number from the No. line in the table on page 227. Refer to the dimension drawings on pages 226 and 227 for the mounting dimensions.

### ■Power supply plug JXC-CPW

∗ The power supply plug is an accessory.




① C24V ④ 0V
② M24V ⑤ N.C.
③ EMG ⑥ LK RLS

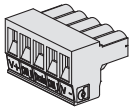
**Power supply plug**

| Terminal name | Function | Details |
|---|---|---|
| 0V | Common supply (–) | M24V terminal/C24V terminal/EMG terminal/ LK RLS terminal are common (–). |
| M24V | Motor power supply (+) | Motor power supply (+) of the controller |
| C24V | Control power supply (+) | Control power supply (+) of the controller |
| EMG | Stop (+) | Connection terminal of the external stop circuit |
| LK RLS | Lock release (+) | Connection terminal of the lock release switch |

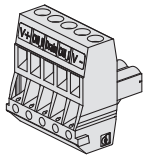
### ■Communication plug connector

**For DeviceNet™**

**Straight type JXC-CD-S**



**T-branch type JXC-CD-T**



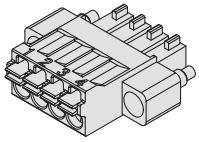
**Communication plug connector for DeviceNet™**

| Terminal name | Details |
|---|---|
| V+ | Power supply (+) for DeviceNet™ |
| CAN_H | Communication wire (High) |
| Drain | Grounding wire/Shielded wire |
| CAN_L | Communication wire (Low) |
| V– | Power supply (–) for DeviceNet™ |

**For IO-Link**

**Straight type JXC-CL-S**

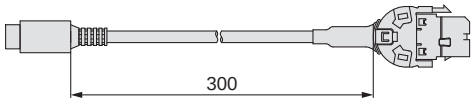
∗ The communication plug connector for IO-Link is an accessory.



**Communication plug connector for IO-Link**

| Terminal no. | Terminal name | Details |
|---|---|---|
| 1 | L+ | +24 V |
| 2 | NC | N/A |
| 3 | L− | 0 V |
| 4 | C/Q | IO-Link signal |

### ■Conversion cable P5062-5 (Cable length: 300 mm)




∗ To connect the teaching box (LEC-T1-3□G□) or controller setting kit (LEC-W2) to the controller, a conversion cable is required.

# *JXCE1/91/P1/D1/L1 Series*
# Precautions Related to Differences in Controller Versions

**As the controller version of the JXC series differs, the internal parameters are not compatible.**

■ If using the JXC□1□-BC, please use the latest version of the JXC-BCW (parameter writing tool).

■ There are currently 3 versions available: version 1 products (V1.□ or S1.□), version 2 products (V2.□ or S2.□), and version 3 products (V3.□ or S3.□). Keep in mind that in order to write a backup file (.bkp) to another controller with the JXC-BCW, it needs to be the same version as the controller that created the file. (For example, a backup file created by a version 1 product can only be written to another version 1 product, and so on.)

## Identifying Version Symbols


### JXC□1 Series Version V3.□ or S3.□ Products

XR V3.0

**Applicable models**

**JXC91□ Series**

XR S3.0 T1.0

**Applicable models**

**JXCD1□ Series**
**JXCE1□ Series**
**JXCP1□ Series**
**JXCL1□ Series**

### JXC□1 Series Version V2.□ or S2.□ Products

WP V2.1

**Applicable models**

**JXC91□ Series**

WP S2.2 T1.1

**Applicable models**

**JXCD1□ Series**
**JXCE1□ Series**
**JXCP1□ Series**
**JXCL1□ Series**

### JXC□1 Series Version V1.□ or S1.□ Products

XR V1.0

**Applicable models**

**JXC91□ Series**

XR S1.0 T1.0

**Applicable models**

**JXCD1□ Series**
**JXCE1□ Series**
**JXCP1□ Series**
**JXCL1□ Series**

# *LEC Series*
# Teaching Box/LEC-T1


## How to Order

**LEC – T1 – 3 E G □**

**Teaching box**

**Cable length [m]**

| | |
|---|---|
| **3** | 3 |

**Initial language**

| | |
|---|---|
| **J** | Japanese |
| **E** | English |

∗ The displayed language can be changed to English or Japanese.

**Stop switch**

| | |
|---|---|
| **G** | Equipped with stop switch |

**Enable switch**

| | |
|---|---|
| **—** | None |
| **S** | Equipped with enable switch |

∗ Interlock switch for jog and test function

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

**Option**
- **Enable switch is provided.**

## Specifications

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

**[CE-compliant products]**
The EMC compliance of the teaching box was tested with a step motor controller (servo/24 VDC) and an applicable actuator.
**[UL-compliant products]**
When compliance with UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

## Easy Mode

| Function | Details |
|---|---|
| Step data | • Setting of step data |
| Jog | • Jog operation<br>• Return to origin |
| Test | • 1 step operation<br>• Return to origin |
| Monitor | • Display of axis and step data no.<br>• Display of two items selected from Position, Speed, Force. |
| ALM | • Active alarm display<br>• Alarm reset |
| TB setting | • Reconnection of axis (Ver. 1.∗∗)<br>• Displayed language setting (Ver. 2.∗∗)<br>• Setting of easy/normal mode<br>• Setting step data and selection of items from easy mode monitor |

### Menu Operations Flowchart

**Menu**
- Data
- Monitor
- Jog
- Test
- ALM
- TB setting

**Data**
Step data no.
Setting of two items selected below
Ver. 1.∗∗:
Position, Speed, Force, Acceleration, Deceleration
Ver. 2.∗∗:
Position, Speed, Pushing force, Acceleration, Deceleration, Movement MOD, Trigger LV, Pushing speed, Moving force, Area 1, Area 2, In position

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

**Jog**
Return to origin
Jog operation

**Test**
1 step operation

**ALM**
Active alarm display
Alarm reset

**TB setting**
Reconnect (Ver. 1.∗∗)
Japanese/English (Ver. 2.∗∗)
Easy/Normal
Set item

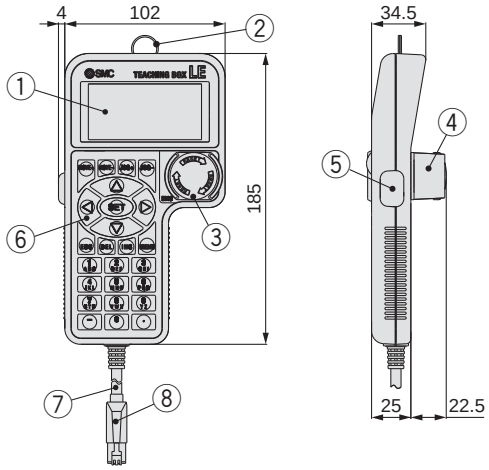
## Normal Mode

| Function | Details |
|---|---|
| Step data | • Step data setting |
| Parameter | • Parameters setting |
| Test | • Jog operation/Constant rate movement<br>• Return to origin<br>• Test drive<br>(Specify a maximum of 5 step data and operate.)<br>• Forced output<br>(Forced signal output, Forced terminal output) |
| Monitor | • Drive monitor<br>• Output signal monitor<br>• Input signal monitor<br>• Output terminal monitor<br>• Input terminal monitor |
| ALM | • Active alarm display<br>(Alarm reset)<br>• Alarm log record display |
| File | • Data saving<br>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).<br>• Load to controller<br>Loads the data which is saved in the teaching box to the controller which is being used for communication.<br>• Delete the saved data.<br>• File protection (Ver. 2.**) |
| TB setting | • Display setting<br>(Easy/Normal mode)<br>• Language setting<br>(Japanese/English)<br>• Backlight setting<br>• LCD contrast setting<br>• Beep sound setting<br>• Max. connection axis<br>• Distance unit (mm/inch) |
| Reconnect | • Reconnection of axis |

### Menu Operations Flowchart

- **Menu**: Step data, Parameter, Monitor, Test, ALM, File, TB setting, Reconnect
- **Step data**: Step data no., Movement MOD, Speed, Position, Acceleration, Deceleration, Pushing force, Trigger LV, Pushing speed, Moving force, Area 1, 2, In position
- **Parameter**: Basic, ORIG
  - **Basic setting**
  - **ORIG setting**
- **Monitor**: Drive, Output signal, Input signal, Output terminal, Input terminal
  - **DRV monitor**: Position, Speed, Torque, Step no., Last step no.
  - **Output signal monitor**
  - **Input signal monitor**
  - **Output terminal monitor**
  - **Input terminal monitor**
- **Test**: JOG/MOVE, Return to ORIG, Test drive, Forced output
- **ALM**: Status, ALM Log record
  - **Status**: Active alarm display, Alarm reset
  - **ALM Log record display**: Log entry display
- **File**: Data saving, Load to controller, File deletion, File protection (Ver. 2.**)
- **TB setting**: Easy/Normal, Language, Backlight, LCD contrast, Beep, Max. connection axis, Password, Distance unit
- **Reconnect**

## Dimensions




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

# 3-Axis Step Motor Controller
## (EtherNet/IP™ Type)
## *JXC92 Series*

## How to Order

### ■ EtherNet/IP™ Type (JXC92)

**Controller**

**JXC 9 2 7**

**EtherNet/IP™ type**

**3-axis type**

**Mounting**

| Symbol | Mounting |
|---|---|
| 7 | Screw mounting |
| 8 | DIN rail |

∗ Order the actuator separately, including the actuator cable.
(Example: LEY16B-100-S1)
∗ For the “Speed–Work Load” graph of the actuator, refer to page 38.

## Specifications

**For the setting of functions and operation methods, refer to the operation manual on the SMC website. (Documents/Download --> Instruction Manuals)**

### EtherNet/IP™ Type (JXC92)

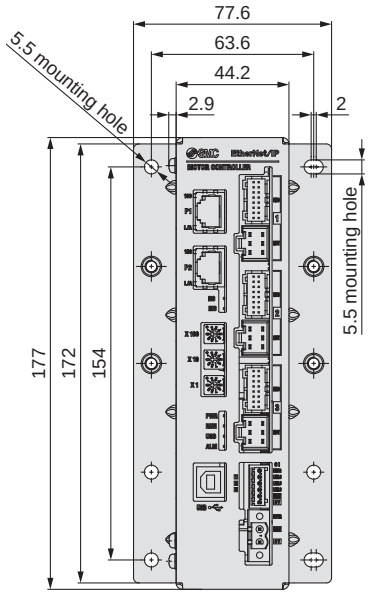
| Item | | Specifications |
|---|---|---|
| **Number of axes** | | Max. 3 axes |
| **Compatible motor** | | Step motor (Servo/24 VDC) |
| **Compatible encoder** | | Incremental A/B phase (Encoder resolution: 800 pulse/rotation) |
| **Power supply**∗1 | | Control power supply Power voltage: 24 VDC ±10 %<br>Max. current consumption: 500 mA<br>Motor power supply Power voltage: 24 VDC ±10 %<br>Max. current consumption: Based on the connected actuator∗2 |
| **Communication** | **Protocol** | EtherNet/IP™∗3 |
| | **Communication speed** | 10 Mbps/100 Mbps (automatic negotiation) |
| | **Communication method** | Full duplex/Half duplex (automatic negotiation) |
| | **Configuration file** | EDS file |
| | **Occupied area** | Input 16 bytes/Output 16 bytes |
| | **IP address setting range** | Manual setting by switches: From 192.168.1.1 to 254, Via DHCP server: Arbitrary address |
| | **Vendor ID** | 7 h (SMC Corporation) |
| | **Product type** | 2 Bh (Generic Device) |
| | **Product code** | DEh |
| **Serial communication** | | USB2.0 (Full Speed 12 Mbps) |
| **Memory** | | Flash-ROM |
| **LED indicator** | | PWR, RUN, USB, ALM, NS, MS, L/A, 100 |
| **Lock control** | | Forced-lock release terminal∗4 |
| **Cable length** | | Actuator cable: 20 m or less |
| **Cooling system** | | Natural air cooling |
| **Operating temperature range** | | 0 °C to 40 °C (No freezing) |
| **Operating humidity range** | | 90 % RH or less (No condensation) |
| **Storage temperature range** | | –10 °C to 60 °C (No freezing) |
| **Storage humidity range** | | 90 % RH or less (No condensation) |
| **Insulation resistance** | | Between all external terminals and the case: 50 MΩ (500 VDC) |
| **Weight** | | 600 g (Screw mounting), 650 g (DIN rail mounting) |

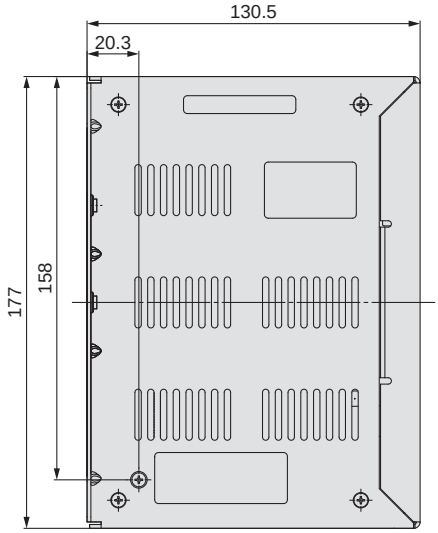
∗1 Do not use a power supply with inrush current protection for the motor drive power supply.
∗2 Power consumption depends on the actuator connected. Refer to the actuator specifications for further details.
∗3 EtherNet/IP™ is a trademark of ODVA.
∗4 Applicable to non-magnetising locks

## Dimensions

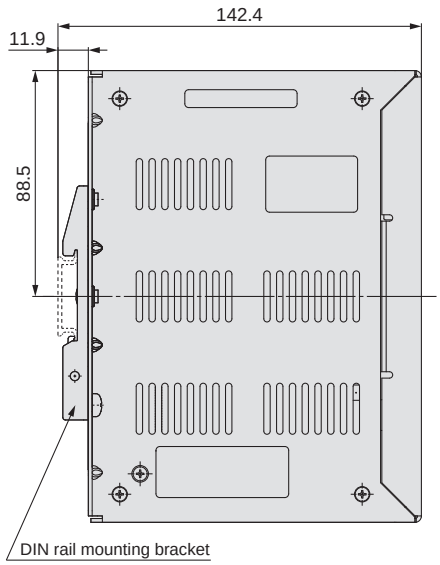
### EtherNet/IP™ Type JXC92

#### Screw mounting



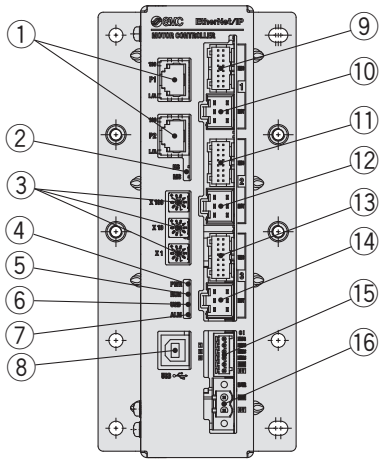




#### DIN rail mounting




## Controller Details

### EtherNet/IP™ Type JXC92




| No. | Name | Description | Details |
|---|---|---|---|
| ① | **P1, P2** | EtherNet/IP™ communication connector | Connect Ethernet cable. |
| ② | **NS, MS** | Communication status LED | Displays the status of the EtherNet/IP™ communication |
| ③ | **X100**<br>**X10**<br>**X1** | IP address setting switches | Switch to set the 4th byte of the IP address by X1, X10 and X100. |
| ④ | **PWR** | Power supply LED (Green) | Power supply ON: Green turns on Power supply OFF: Green turns off |
| ⑤ | **RUN** | Operation LED (Green) | Running in EtherNet/IP™: Green turns on Running via USB communication: Green flashes Stopped: Green turns off |
| ⑥ | **USB** | USB connection LED (Green) | USB connected: Green turns on USB not connected: Green turns off |
| ⑦ | **ALM** | Alarm LED (Red) | With alarm: Red turns on Without alarm: Red turns off |
| ⑧ | **USB** | Serial communication connector | Connect to a PC via the USB cable. |
| ⑨ | **ENC** 1 | Encoder connector (16 pins) | Axis 1: Connect the actuator cable. |
| ⑩ | **MOT** 1 | Motor power connector (6 pins) | |
| ⑪ | **ENC** 2 | Encoder connector (16 pins) | Axis 2: Connect the actuator cable. |
| ⑫ | **MOT** 2 | Motor power connector (6 pins) | |
| ⑬ | **ENC** 3 | Encoder connector (16 pins) | Axis 3: Connect the actuator cable. |
| ⑭ | **MOT** 3 | Motor power connector (6 pins) | |
| ⑮ | **CI** | Control power supply connector∗1 | Control power supply (+), All axes stop (+), Axis 1 lock release (+), Axis 2 lock release (+), Axis 3 lock release (+), Common (−) |
| ⑯ | **M PWR** | Motor power supply connector∗1 | Motor power supply (+), Motor power supply (−) |

∗1 Connectors are included. (Refer to page 239.)

# 4-Axis Step Motor Controller
## (Parallel I/O/EtherNet/IP™ Type)
## *JXC73/83/93 Series*

CE RoHS

### How to Order

■ **Parallel I/O (JXC73/83)**

**Controller**

**JXC 8 3 2**

**I/O type**

| Symbol | I/O type |
|---|---|
| 7 | NPN |
| 8 | PNP |

**4-axis type**

**I/O cable, mounting**

| Symbol | I/O cable | Mounting |
|---|---|---|
| 1 | 1.5 m | Screw mounting |
| 2 | 1.5 m | DIN rail |
| 3 | 3 m | Screw mounting |
| 4 | 3 m | DIN rail |
| 5 | 5 m | Screw mounting |
| 6 | 5 m | DIN rail |
| 7 | None | Screw mounting |
| 8 | None | DIN rail |

∗ Two I/O cables are included.

■ **EtherNet/IP™ Type (JXC93)**

**Controller**

**JXC 9 3 7**

**EtherNet/IP™ type**

**4-axis type**

**Mounting**

| Symbol | Mounting |
|---|---|
| 7 | Screw mounting |
| 8 | DIN rail |

∗ Order the actuator separately, including the actuator cable.
(Example: LEY16B-100-S1)

∗ For the “Speed–Work Load” graph of the actuator, refer to page 38.

## Specifications

**For the setting of functions and operation methods, refer to the operation manual on the SMC website. (Documents/Download --> Instruction Manuals)**

### Parallel I/O (JXC73/83)

| Item | Specifications |
|---|---|
| **Number of axes** | Max. 4 axes |
| **Compatible motor** | Step motor (Servo/24 VDC) |
| **Compatible encoder** | Incremental A/B phase (Encoder resolution: 800 pulse/rotation) |
| **Power supply**∗1 | Main control power supply Power voltage: 24 VDC ±10 %<br>Max. current consumption: 300 mA<br>Motor power supply, Motor control power supply (Common)<br>Power voltage: 24 VDC ±10 %<br>Max. current consumption: Based on the connected actuator∗2 |
| **Parallel input** | 16 inputs (Photo-coupler isolation) |
| **Parallel output** | 32 outputs (Photo-coupler isolation) |
| **Serial communication** | USB2.0 (Full Speed 12 Mbps) |
| **Memory** | Flash-ROM/EEPROM |
| **LED indicator** | PWR, RUN, USB, ALM |
| **Lock control** | Forced-lock release terminal∗3 |
| **Cable length** | I/O cable: 5 m or less, Actuator cable: 20 m or less |
| **Cooling system** | Natural air cooling |
| **Operating temperature range** | 0 °C to 40 °C (No freezing) |
| **Operating humidity range** | 90 % RH or less (No condensation) |
| **Storage temperature range** | –10 °C to 60 °C (No freezing) |
| **Storage humidity range** | 90 % RH or less (No condensation) |
| **Insulation resistance** | Between all external terminals and the case: 50 MΩ (500 VDC) |
| **Weight** | 1050 g (Screw mounting), 1100 g (DIN rail mounting) |

∗1 Do not use a power supply with inrush current protection for the motor drive power and motor control power supply.
∗2 Power consumption depends on the actuator connected. Refer to the actuator specifications for further details.
∗3 Applicable to non-magnetising locks

**For the setting of functions and operation methods, refer to the operation manual on the SMC website. (Documents/Download --> Instruction Manuals)**

### EtherNet/IP™ Type (JXC93)

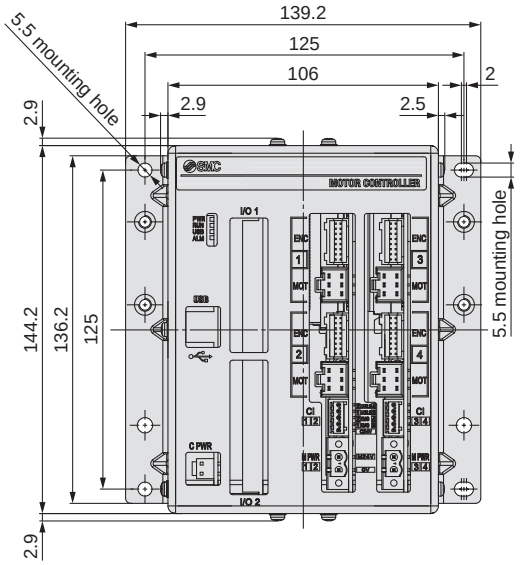
| Item | | Specifications |
|---|---|---|
| **Number of axes** | | Max. 4 axes |
| **Compatible motor** | | Step motor (Servo/24 VDC) |
| **Compatible encoder** | | Incremental A/B phase (Encoder resolution: 800 pulse/rotation) |
| **Power supply**∗1 | | Main control power supply Power voltage: 24 VDC ±10 %<br>Max. current consumption: 350 mA<br>Motor power supply, Motor control power supply (Common)<br>Power voltage: 24 VDC ±10 %<br>Max. current consumption: Based on the connected actuator∗2 |
| **Communication** | **Protocol** | EtherNet/IP™∗4 |
| | **Communication speed** | 10 Mbps/100 Mbps (automatic negotiation) |
| | **Communication method** | Full duplex/Half duplex (automatic negotiation) |
| | **Configuration file** | EDS file |
| | **Occupied area** | Input 16 bytes/Output 16 bytes |
| | **IP address setting range** | Manual setting by switches: From 192.168.1.1 to 254, Via DHCP server: Arbitrary address |
| | **Vendor ID** | 7 h (SMC Corporation) |
| | **Product type** | 2 Bh (Generic Device) |
| | **Product code** | DCh |
| **Serial communication** | | USB2.0 (Full Speed 12 Mbps) |
| **Memory** | | Flash-ROM/EEPROM |
| **LED indicator** | | PWR, RUN, USB, ALM, NS, MS, L/A, 100 |
| **Lock control** | | Forced-lock release terminal∗3 |
| **Cable length** | | Actuator cable: 20 m or less |
| **Cooling system** | | Natural air cooling |
| **Operating temperature range** | | 0 °C to 40 °C (No freezing) |
| **Operating humidity range** | | 90 % RH or less (No condensation) |
| **Storage temperature range** | | –10 °C to 60 °C (No freezing) |
| **Storage humidity range** | | 90 % RH or less (No condensation) |
| **Insulation resistance** | | Between all external terminals and the case: 50 MΩ (500 VDC) |
| **Weight** | | 1050 g (Screw mounting), 1100 g (DIN rail mounting) |

∗1 Do not use a power supply with inrush current protection for the motor drive power and motor control power supply.
∗2 Power consumption depends on the actuator connected. Refer to the actuator specifications for further details.
∗3 Applicable to non-magnetising locks
∗4 EtherNet/IP™ is a trademark of ODVA.

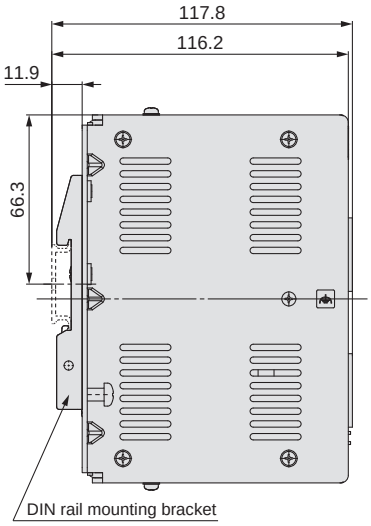
## Dimensions

### Parallel I/O JXC73/83

**Screw mounting**

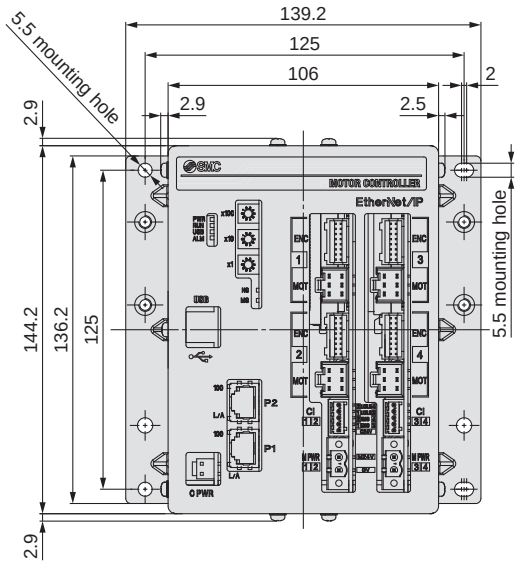



**DIN rail mounting**

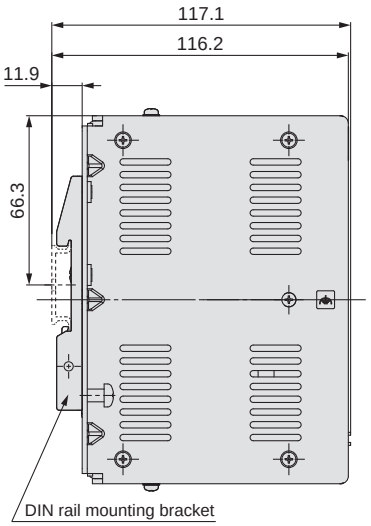



### EtherNet/IP™ Type JXC93

**Screw mounting**

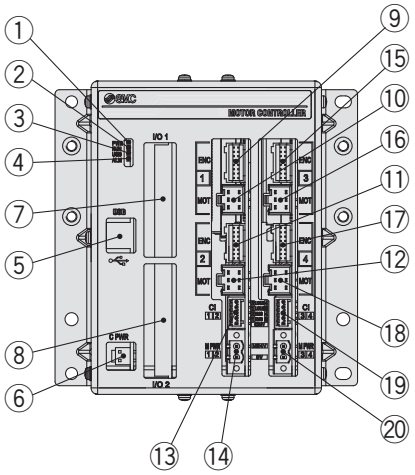



**DIN rail mounting**



## Controller Details

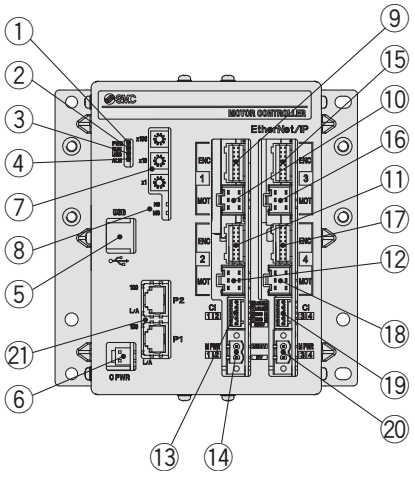
### Parallel I/O JXC73/83




| No. | Name | Description | Details |
|---|---|---|---|
| ① | **PWR** | Power supply LED (Green) | Power supply ON: Green turns on Power supply OFF: Green turns off |
| ② | **RUN** | Operation LED (Green) | Running in parallel I/O: Green turns on Running via USB communication: Green flashes Stopped: Green turns off |
| ③ | **USB** | USB connection LED (Green) | USB connected: Green turns on USB not connected: Green turns off |
| ④ | **ALM** | Alarm LED (Red) | With alarm: Red turns on Without alarm: Red turns off |
| ⑤ | **USB** | Serial communication | Connect to a PC via the USB cable. |
| ⑥ | **C PWR** | Main control power supply connector (2 pins)*1 | Main control power supply (+) (−) |
| ⑦ | **I/O 1** | Parallel I/O connector (40 pins) | Connect to a PLC via the I/O cable. |
| ⑧ | **I/O 2** | Parallel I/O connector (40 pins) | Connect to a PLC via the I/O cable. |
| ⑨ | **ENC** 1 | Encoder connector (16 pins) | Axis 1: Connect the actuator cable. |
| ⑩ | **MOT** 1 | Motor power connector (6 pins) | |
| ⑪ | **ENC** 2 | Encoder connector (16 pins) | Axis 2: Connect the actuator cable. |
| ⑫ | **MOT** 2 | Motor power connector (6 pins) | |
| ⑬ | **CI** 1 2 | Motor control power supply connector*1 | Motor control power supply (+), Axis 1 stop (+), Axis 1 lock release (+), Axis 2 stop (+), Axis 2 lock release (+) |
| ⑭ | **M PWR** 1 2 | Motor power supply connector*1 | For Axis 1, 2. Motor power supply (+), Common (−) |
| ⑮ | **ENC** 3 | Encoder connector (16 pins) | Axis 3: Connect the actuator cable. |
| ⑯ | **MOT** 3 | Motor power connector (6 pins) | |
| ⑰ | **ENC** 4 | Encoder connector (16 pins) | Axis 4: Connect the actuator cable. |
| ⑱ | **MOT** 4 | Motor power connector (6 pins) | |
| ⑲ | **CI** 3 4 | Motor control power supply connector*1 | Motor control power supply (+), Axis 3 stop (+), Axis 3 lock release (+), Axis 4 stop (+), Axis 4 lock release (+) |
| ⑳ | **M PWR** 3 4 | Motor power supply connector*1 | For Axis 3, 4. Motor power supply (+), Common (−) |

*1 Connectors are included. (Refer to page 239.)

### EtherNet/IP™ Type JXC93




| No. | Name | Description | Details |
|---|---|---|---|
| ① | **PWR** | Power supply LED (Green) | Power supply ON: Green turns on Power supply OFF: Green turns off |
| ② | **RUN** | Operation LED (Green) | Running in EtherNet/IP™: Green turns on Running via USB communication: Green flashes Stopped: Green turns off |
| ③ | **USB** | USB connection LED (Green) | USB connected: Green turns on USB not connected: Green turns off |
| ④ | **ALM** | Alarm LED (Red) | With alarm: Red turns on Without alarm: Red turns off |
| ⑤ | **USB** | Serial communication | Connect to a PC via the USB cable. |
| ⑥ | **C PWR** | Main control power supply connector (2 pins)*1 | Main control power supply (+) (−) |
| ⑦ | **x100**<br>**x10**<br>**x1** | IP address setting switches | Switch to set the 4th byte of the IP address by X1, X10 and X100. |
| ⑧ | **MS, NS** | Communication status LED | Displays the status of the EtherNet/IP™ communication |
| ⑨ | **ENC** 1 | Encoder connector (16 pins) | Axis 1: Connect the actuator cable. |
| ⑩ | **MOT** 1 | Motor power connector (6 pins) | |
| ⑪ | **ENC** 2 | Encoder connector (16 pins) | Axis 2: Connect the actuator cable. |
| ⑫ | **MOT** 2 | Motor power connector (6 pins) | |
| ⑬ | **CI** 1 2 | Motor control power supply connector*1 | Motor control power supply (+), Axis 1 stop (+), Axis 1 lock release (+), Axis 2 stop (+), Axis 2 lock release (+) |
| ⑭ | **M PWR** 1 2 | Motor power supply connector*1 | For Axis 1, 2. Motor power supply (+), Common (−) |
| ⑮ | **ENC** 3 | Encoder connector (16 pins) | Axis 3: Connect the actuator cable. |
| ⑯ | **MOT** 3 | Motor power connector (6 pins) | |
| ⑰ | **ENC** 4 | Encoder connector (16 pins) | Axis 4: Connect the actuator cable. |
| ⑱ | **MOT** 4 | Motor power connector (6 pins) | |
| ⑲ | **CI** 3 4 | Motor control power supply connector*1 | Motor control power supply (+), Axis 3 stop (+), Axis 3 lock release (+), Axis 4 stop (+), Axis 4 lock release (+) |
| ⑳ | **M PWR** 3 4 | Motor power supply connector*1 | For Axis 3, 4. Motor power supply (+), Common (−) |
| ㉑ | **P1, P2** | EtherNet/IP™ communication connector | Connect Ethernet cable. |

*1 Connectors are included. (Refer to page 239.)

## Wiring Example 1

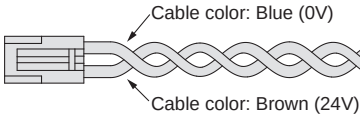
### Cable with Main Control Power Supply Connector (For 4 Axes)*1: C PWR 1 pc.

For 4 Axes
JXC73/83/93

| Terminal name | Function | Details |
|---|---|---|
| +24V | Main control power supply (+) | Power supply (+) supplied to the main control |
| 24−0V | Main control power supply (−) | Power supply (−) supplied to the main control |

*1 Part no.: JXC-C1 (Cable length: 1.5 m)

**Cable with main control power supply connector**




### Motor Power Supply Connector (For 3/4 Axes)*2: M PWR 2 pcs.*3

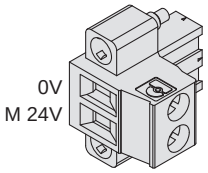
For 3 Axes
JXC92

For 4 Axes
JXC73/83/93

| Terminal name | Function | Details | Note |
|---|---|---|---|
| 0V | Motor power supply (−) | Power supply (−) supplied to the motor power | For 3 axes JXC92 |
| | | The M 24V terminal, C 24V terminal, EMG terminal, and LKRLS terminal are common (−). | For 4 axes JXC73/83/93 |
| M 24V | Motor power supply (+) | Power supply (+) supplied to the motor power | |

*2 Manufactured by PHOENIX CONTACT (Part no.: MSTB2, 5/2-STF-5, 08)
*3 1 pc. for 3 axes (JXC92)

**Motor power supply connector**



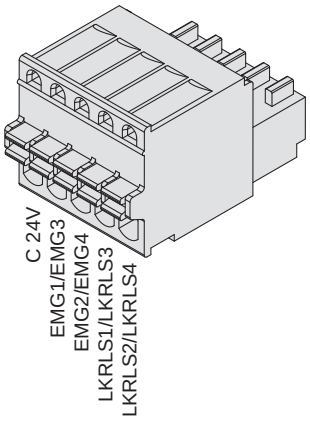

### Motor Control Power Supply Connector (For 4 Axes)*4: CI 2 pcs.

For 4 Axes
JXC73/83/93

| Terminal name | Function | Details |
|---|---|---|
| C 24V | Motor control power supply (+) | Power supply (+) supplied to the motor control |
| EMG1/EMG3 | Stop (+) | Axis 1/Axis 3: Input (+) for releasing the stop |
| EMG2/EMG4 | Stop (+) | Axis 2/Axis 4: Input (+) for releasing the stop |
| LKRLS1/LKRLS3 | Lock release (+) | Axis 1/Axis 3: Input (+) for releasing the lock |
| LKRLS2/LKRLS4 | Lock release (+) | Axis 2/Axis 4: Input (+) for releasing the lock |

*4 Manufactured by PHOENIX CONTACT (Part no.: FK-MC0, 5/5-ST-2, 5)

**Motor control power supply connector**



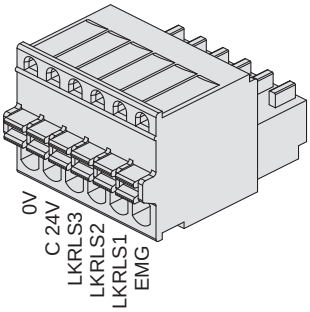

### Control Power Supply Connector (For 3 Axes)*5: CI 1 pc.

For 3 Axes
JXC92

| Terminal name | Function | Details |
|---|---|---|
| 0V | Control power supply (−) | The C 24V terminal, LKRLS terminal, and EMG terminal are common (−). |
| C 24V | Control power supply (+) | Power supply (+) supplied to the control |
| LKRLS3 | Lock release (+) | Axis 3: Input (+) for releasing the lock |
| LKRLS2 | Lock release (+) | Axis 2: Input (+) for releasing the lock |
| LKRLS1 | Lock release (+) | Axis 1: Input (+) for releasing the lock |
| EMG | Stop (+) | All axes: Input (+) for releasing the stop |

*5 Manufactured by PHOENIX CONTACT (Part no.: FK-MC0, 5/6-ST-2, 5)

**Control power supply connector**



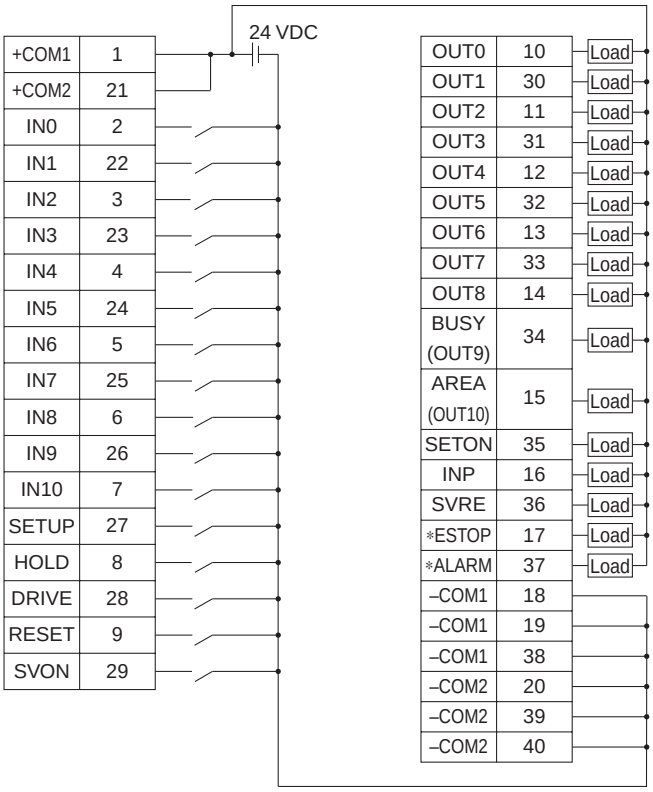
## Wiring Example 2

**Parallel I/O Connector**

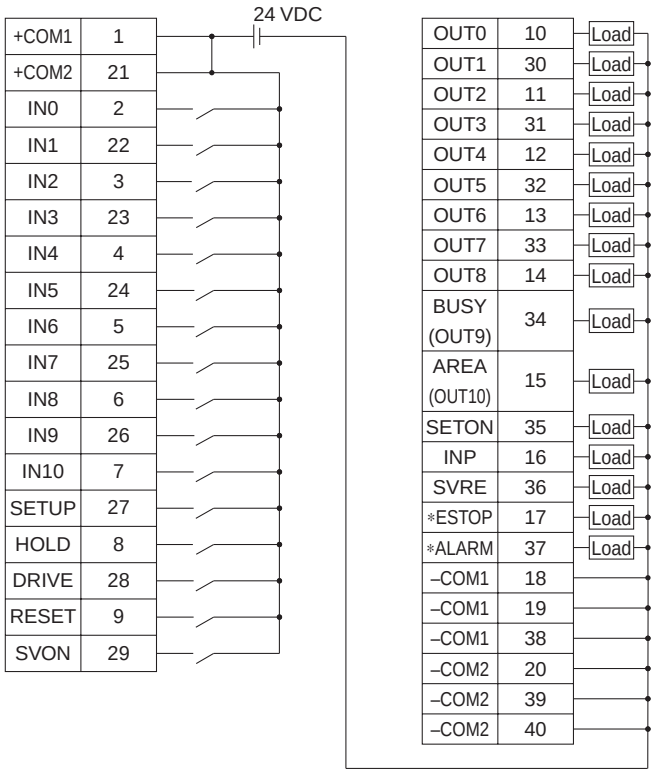
* When you connect a PLC to the I/O 1 or I/O 2 parallel I/O connector, use the I/O cable (JXC-C2-□).
* The wiring changes depending on the type of parallel I/O (NPN or PNP).

### I/O 1 Wiring example

**NPN JXC73**




**PNP JXC83**




### I/O 1 Input Signal

| Name | Details |
|---|---|
| +COM1<br>+COM2 | Connects the power supply 24 V for input/output signal |
| IN0<br>to<br>IN8 | Step data specified bit no.<br>(Standard: When 512 points are used) |
| IN9<br>IN10 | Step data specified extension bit no.<br>(Extension: When 2048 points are used) |
| SETUP | Instruction to return to origin |
| HOLD | Temporarily stops operation |
| DRIVE | Instruction to drive |
| RESET | Resets alarm and interrupts operation |
| SVON | Servo ON instruction |

### I/O 1 Output Signal

| Name | Details |
|---|---|
| OUT0<br>to<br>OUT8 | Outputs the step data no. during operation |
| BUSY<br>(OUT9) | Outputs when the operation of the actuator is in progress |
| AREA<br>(OUT10) | Outputs when all actuators are within the area output range |
| SETON | Outputs when the return to origin of all actuators is completed |
| INP | Outputs when the positioning or pushing of all actuators is completed |
| SVRE | Outputs when servo is ON |
| ∗ESTOP∗1 | OFF when EMG stop is instructed |
| ∗ALARM∗1 | OFF when alarm is generated |
| –COM1<br>–COM2 | Connects the power supply 0 V for input/output signal |

∗1 Negative-logic circuit signal

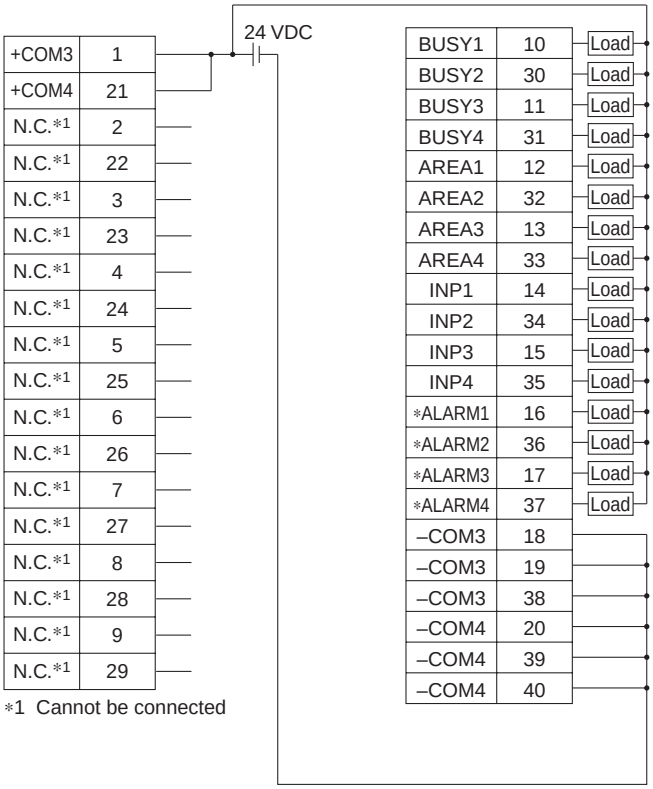
## Wiring Example 2

**Parallel I/O Connector**

* When you connect a PLC to the I/O 1 or I/O 2 parallel I/O connector, use the I/O cable (JXC-C2-□).
* The wiring changes depending on the type of parallel I/O (NPN or PNP).

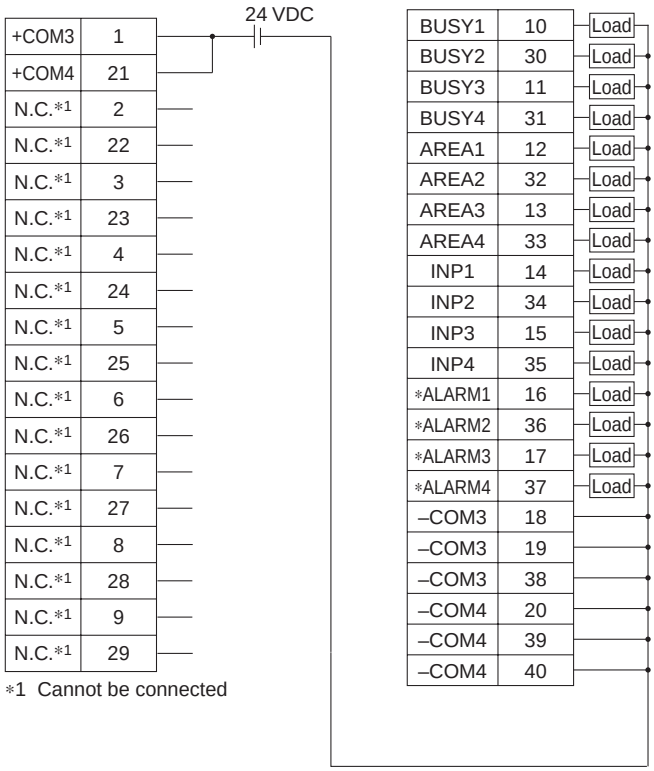
### I/O 2 Wiring example

**NPN JXC73**




*1 Cannot be connected

**PNP JXC83**




*1 Cannot be connected

### I/O 2 Input Signal

| Name | Details |
|---|---|
| +COM3<br>+COM4 | Connects the power supply 24 V for input/output signal |
| N.C. | Cannot be connected |

### I/O 2 Output Signal

| Name | Details |
|---|---|
| BUSY1 | Busy signal for axis 1 |
| BUSY2 | Busy signal for axis 2 |
| BUSY3 | Busy signal for axis 3 |
| BUSY4 | Busy signal for axis 4 |
| AREA1 | Area signal for axis 1 |
| AREA2 | Area signal for axis 2 |
| AREA3 | Area signal for axis 3 |
| AREA4 | Area signal for axis 4 |
| INP1 | Positioning or pushing completion signal for axis 1 |
| INP2 | Positioning or pushing completion signal for axis 2 |
| INP3 | Positioning or pushing completion signal for axis 3 |
| INP4 | Positioning or pushing completion signal for axis 4 |
| *ALARM1*2 | Alarm signal for axis 1 |
| *ALARM2*2 | Alarm signal for axis 2 |
| *ALARM3*2 | Alarm signal for axis 3 |
| *ALARM4*2 | Alarm signal for axis 4 |
| –COM3<br>–COM4 | Connects the power supply 0 V for input/output signal |

*2 Negative-logic circuit signal

## Options

### Cable with main control power supply connector

For 4 Axes
JXC73/83/93

# JXC − C1

**Cable length: 1.5 m (Accessory)**

| | |
|---|---|
| Number of cores | 2 |
| AWG size | AWG20 |


### I/O cable (1 pc.)

For 4 Axes
JXC73/83

# JXC − C2 − □

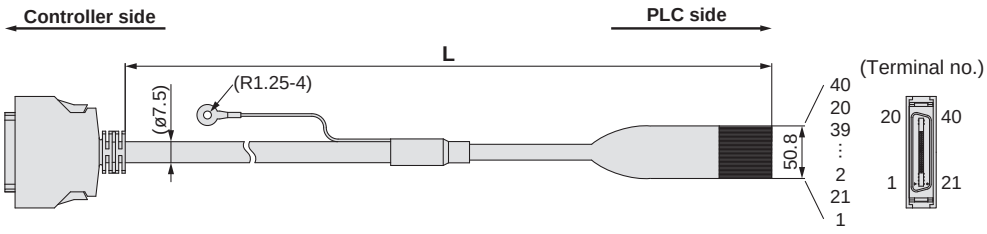
**Cable length (L) [m]**

| | |
|---|---|
| **1** | 1.5 |
| **3** | 3 |
| **5** | 5 |

| | |
|---|---|
| Number of cores | 40 |
| AWG size | AWG28 |

**Weight**

| Product no. | Weight [g] |
|---|---|
| **JXC-C2-1** | 160 |
| **JXC-C2-3** | 300 |
| **JXC-C2-5** | 480 |




| Pin no. | Wire colour | Pin no. | Wire colour | Pin no. | Wire colour | Pin no. | Wire colour |
|---|---|---|---|---|---|---|---|
| 1 | Orange (Black 1) | 6 | Orange (Black 2) | 11 | Orange (Black 3) | 16 | Orange (Black 4) |
| 21 | Orange (Red 1) | 26 | Orange (Red 2) | 31 | Orange (Red 3) | 36 | Orange (Red 4) |
| 2 | Gray (Black 1) | 7 | Gray (Black 2) | 12 | Gray (Black 3) | 17 | Gray (Black 4) |
| 22 | Gray (Red 1) | 27 | Gray (Red 2) | 32 | Gray (Red 3) | 37 | Gray (Red 4) |
| 3 | White (Black 1) | 8 | White (Black 2) | 13 | White (Black 3) | 18 | White (Black 4) |
| 23 | White (Red 1) | 28 | White (Red 2) | 33 | White (Red 3) | 38 | White (Red 4) |
| 4 | Yellow (Black 1) | 9 | Yellow (Black 2) | 14 | Yellow (Black 3) | 19 | Yellow (Black 4) |
| 24 | Yellow (Red 1) | 29 | Yellow (Red 2) | 34 | Yellow (Red 3) | 39 | Yellow (Red 4) |
| 5 | Pink (Black 1) | 10 | Pink (Black 2) | 15 | Pink (Black 3) | 20 | Pink (Black 4) |
| 25 | Pink (Red 1) | 30 | Pink (Red 2) | 35 | Pink (Red 3) | 40 | Pink (Red 4) |

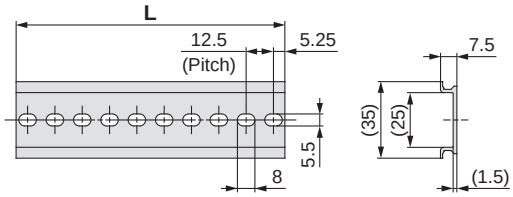
### DIN rail

For 3 Axes
JXC92

For 4 Axes
JXC73/83/93

# AXT100 − DR − □

∗ For □, enter a number from the No. line in the table below. Refer to the dimension drawings on pages 234 and 237 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** | 23 | 35.5 | 48 | 60.5 | 73 | 85.5 | 98 | 110.5 | 123 | 135.5 | 148 | 160.5 | 173 | 185.5 | 198 | 210.5 | 223 | 235.5 | 248 | 260.5 |

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

### DIN rail mounting bracket (with 6 mounting screws)

For 3 Axes
JXC92

For 4 Axes
JXC73/83/93

# JXC − Z1

This should be used when the DIN rail mounting bracket is mounted onto a screw mounting type controller afterward.

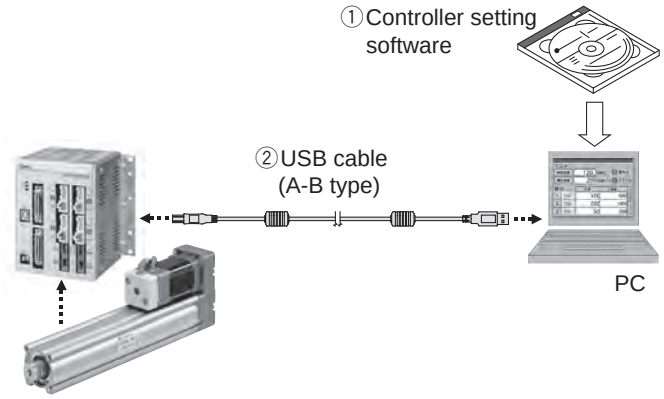
## Options

### Controller setting kit

For 4 Axes
JXC73/83/93

**JXC − W1**

**Controller setting kit**
**(Japanese and English are available.)**




### Contents

**①Controller setting software (CD-ROM)**
**②USB cable (Cable length: 3 m)**

| Description | | Model |
|---|---|---|
| ① | Controller setting software | JXC-W1-1 |
| ② | USB cable | JXC-W1-2 (The same cable as the JXC-MA1-2) |

∗ Can be ordered separately

### Hardware Requirements

**PC/AT compatible machine with Windows 7 or Windows 8.1 and USB1.1 or USB2.0 port**

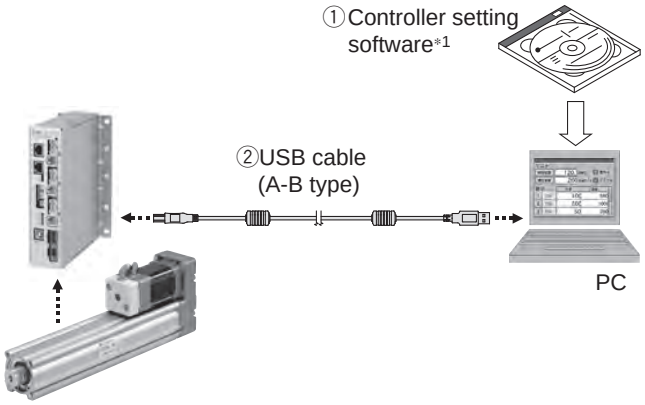
∗ Windows® is a registered trademark of Microsoft Corporation in the United States.

### Controller setting kit

For 3 Axes
JXC92

**JXC − MA1**∗1

**Controller setting kit**
**(Japanese and English are available.)**




### Contents

**①Controller setting software (CD-ROM)**∗1
**②USB cable (Cable length: 3 m)**

| Description | | Model |
|---|---|---|
| ① | Controller setting software | JXC-MA1-1 |
| ② | USB cable | JXC-MA1-2 (The same cable as the JXC-W1-2) |

∗ Can be ordered separately

### Hardware Requirements

**PC/AT compatible machine with Windows 7 or Windows 8.1 and USB1.1 or USB2.0 port**

∗1 The controller setting software also includes software dedicated for 4 axes.
∗ Windows® is a registered trademark of Microsoft Corporation in the United States.

## Options: Actuator Cable

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

| For 3 Axes | For 4 Axes |
|---|---|
| JXC92 | JXC73/83/93 |

**LE − CP − 1 − □**

**Cable length (L) [m]**

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

*1 Produced upon receipt of order (Robotic cable only)

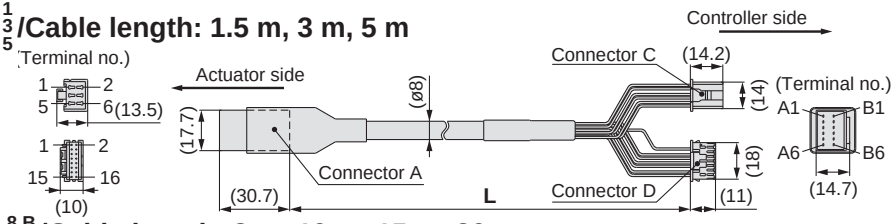
**Cable type**

| | |
|---|---|
| — | Robotic cable (Flexible cable) |
| S | Standard cable |

**Weight**

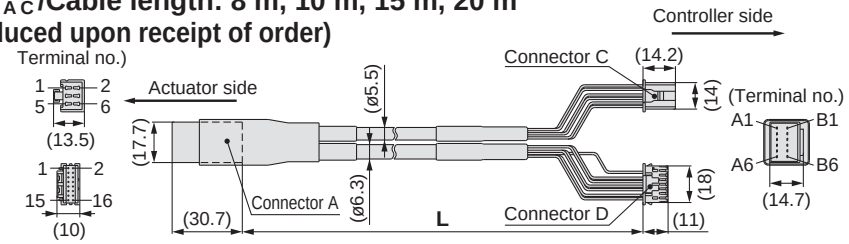
| Product no. | Weight [g] | Note |
|---|---|---|
| LE-CP-1-S | 190 | Standard cable |
| LE-CP-3-S | 280 | |
| LE-CP-5-S | 460 | |
| LE-CP-1 | 140 | Robotic cable |
| LE-CP-3 | 260 | |
| LE-CP-5 | 420 | |
| LE-CP-8 | 790 | |
| LE-CP-A | 980 | |
| LE-CP-B | 1460 | |
| LE-CP-C | 1940 | |

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




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

**(*1 Produced upon receipt of order)**




| Signal | Connector A terminal no. |
|---|---|
| A | B-1 |
| $\overline{A}$ | A-1 |
| B | B-2 |
| $\overline{B}$ | A-2 |
| COM-A/COM | B-3 |
| COM-B/— | A-3 |
| Vcc | B-4 |
| GND | A-4 |
| $\overline{A}$ | B-5 |
| A | A-5 |
| $\overline{B}$ | B-6 |
| B | A-6 |

Shield

| Cable colour | Connector C terminal no. |
|---|---|
| Brown | 2 |
| Red | 1 |
| Orange | 6 |
| Yellow | 5 |
| Green | 3 |
| Blue | 4 |

| Cable colour | Connector D terminal no. |
|---|---|
| Brown | 12 |
| Black | 13 |
| Red | 7 |
| Black | 6 |
| Orange | 9 |
| Black | 8 |
| — | 3 |

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

| For 3 Axes | For 4 Axes |
|---|---|
| JXC92 | JXC73/83/93 |

**LE − CP − 1 − B − □**

**Cable length (L) [m]**

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

*1 Produced upon receipt of order (Robotic cable only)

**With lock and sensor**

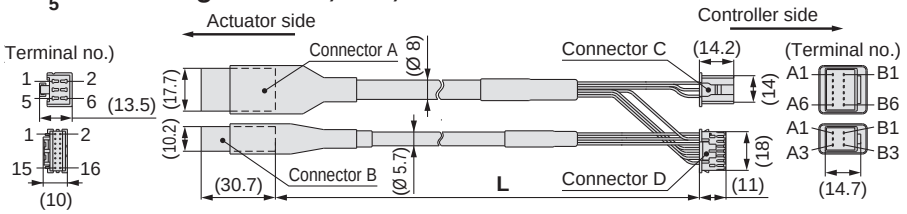
**Cable type**

| | |
|---|---|
| — | Robotic cable (Flexible cable) |
| S | Standard cable |

**Weight**

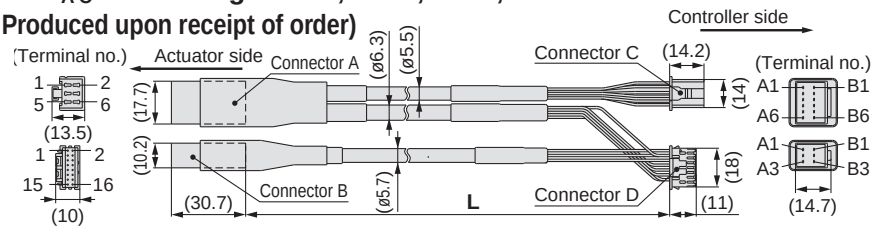
| Product no. | Weight [g] | Note |
|---|---|---|
| LE-CP-1-B-S | 240 | Standard cable |
| LE-CP-3-B-S | 380 | |
| LE-CP-5-B-S | 630 | |
| LE-CP-1-B | 190 | Robotic cable |
| LE-CP-3-B | 360 | |
| LE-CP-5-B | 590 | |
| LE-CP-8-B | 1060 | |
| LE-CP-A-B | 1320 | |
| LE-CP-B-B | 1920 | |
| LE-CP-C-B | 2620 | |

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




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

**(*1 Produced upon receipt of order)**




| Signal | Connector A terminal no. |
|---|---|
| A | B-1 |
| $\overline{A}$ | A-1 |
| B | B-2 |
| $\overline{B}$ | A-2 |
| COM-A/COM | B-3 |
| COM-B/— | A-3 |
| Vcc | B-4 |
| GND | A-4 |
| $\overline{A}$ | B-5 |
| A | A-5 |
| $\overline{B}$ | B-6 |
| B | A-6 |

Shield

| Cable colour | Connector C terminal no. |
|---|---|
| Brown | 2 |
| Red | 1 |
| Orange | 6 |
| Yellow | 5 |
| Green | 3 |
| Blue | 4 |

| Cable colour | Connector D terminal no. |
|---|---|
| Brown | 12 |
| Black | 13 |
| Red | 7 |
| Black | 6 |
| Orange | 9 |
| Black | 8 |
| — | 3 |

| Signal | Connector B terminal no. |
|---|---|
| Lock (+) | B-1 |
| Lock (−) | A-1 |
| Sensor (+) | B-3 |
| Sensor (−) | A-3 |

| Cable colour | |
|---|---|
| Red | 4 |
| Black | 5 |
| Brown | 1 |
| Blue | 2 |

# AC Servo Motor Driver
## *LECS□/LECY□ Series*

### Pulse Input Type/Positioning Type

**Incremental Type**
**LECSA** Series

### Pulse Input Type

**Absolute Type**
**LECSB** Series

### CC-Link Direct Input Type

**Absolute Type**
**LECSC** Series

### SSCNET Ⅲ Type

**Absolute Type**
**LECSS** Series

### SSCNET Ⅲ/H Type

**Absolute Type**
**LECSS-T** Series

### MECHATROLINK-Ⅱ Type

**Absolute Type**
**LECYM** Series

### MECHATROLINK-Ⅲ Type

**Absolute Type**
**LECYU** Series

# AC Servo Motor Driver

## *LECS□ Series*

| | |
|---|---|
| Power supply voltage | 100 to 120 VAC<br>200 to 230 VAC |
| Motor capacity | 100/200/400 W |

**Incremental Type**

### *LECSA Series* (Pulse input type/Positioning type)

- **Up to 7 positioning points by point table**
- **Input type:** Pulse input
- **Control encoder:** Incremental 17-bit encoder (Resolution: 131072 p/rev)
- **Parallel input:** 6 inputs
  **output:** 4 outputs

**Absolute Type**

### *LECSB Series* (Pulse input type)

- **Input type:** Pulse input
- **Control encoder:** Absolute 18-bit encoder (Resolution: 262144 p/rev)
- **Parallel input:** 10 inputs
  **output:** 6 outputs

### *LECSC Series* (CC-Link direct input type)

CC-Link

- **Position data/speed data setting and operation start/stop**
- **Positioning by up to 255 point tables (when 2 stations are occupied)**
- **Up to 32 drivers can be connected (when 2 stations are occupied) with CC-Link communication.**
- **Applicable Fieldbus protocol:** CC-Link (Ver. 1.10, Max. communication speed: 10 Mbps)
- **Control encoder:** Absolute 18-bit encoder (Resolution: 262144 p/rev)

### *LECSS Series* (SSCNET Ⅲ type)

SSCNET III
SERVO SYSTEM CONTROLLER NETWORK

- **Compatible with Mitsubishi Electric's servo system controller network**
- **Reduced wiring and SSCNET Ⅲ optical cable for one-touch connection**
- **The SSCNET Ⅲ optical cable provides enhanced noise resistance.**
- **Up to 16 drivers can be connected with SSCNET Ⅲ communication.**
- **Applicable Fieldbus protocol:** SSCNET Ⅲ
  (High-speed optical communication, Max. bidirectional communication speed: 50 Mbps)
- **Control encoder:** Absolute 18-bit encoder (Resolution: 262144 p/rev)

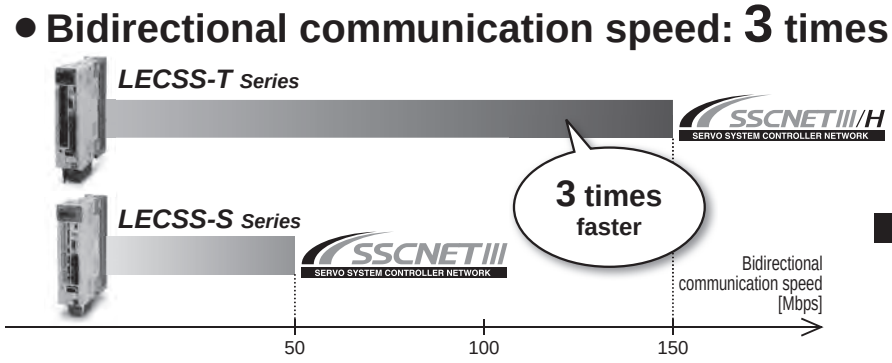
# AC Servo Motor Driver
## *LECSS-T Series*

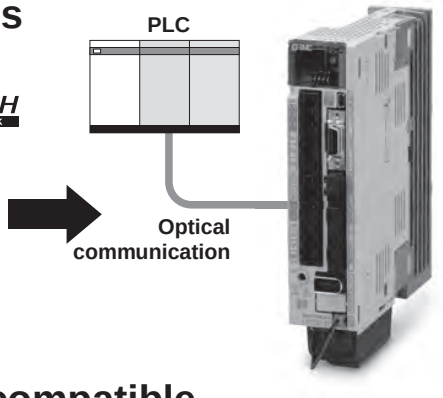
| | |
|---|---|
| Power supply voltage | 200 to 230 VAC |
| Motor capacity | 100/200/400 W |



### SSCNET Ⅲ/H Compatible *LECSS-T Series*

- **Applicable Fieldbus protocol:** SSCNET Ⅲ/H (High-speed optical communication, max. bidirectional communication speed: **150** Mbps)
- **Bidirectional communication speed: 3 times**



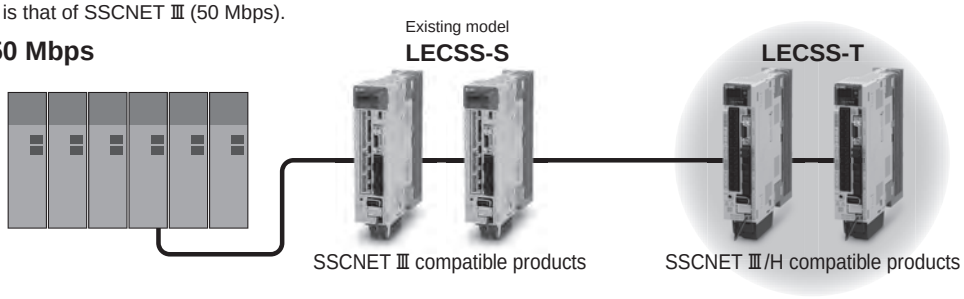

- **SSCNET Ⅲ/H and SSCNET Ⅲ products are compatible.**

SSCNET Ⅲ/H compatible products can be added to existing SSCNET Ⅲ systems for system expansion.
Reassembly of the system (new installation of master PLC) is not required.

＊ Note that the communication speed is that of SSCNET Ⅲ (50 Mbps).

■**Communication speed: 50 Mbps**

SSCNET Ⅲ/H compatible controllers
SSCNET Ⅲ compatible controllers




- **Improved noise resistance**
- **STO (Safe Torque Off) safety function available**
- **Control encoder: Absolute 22-bit encoder (Resolution: 4194304 p/rev)**

**Absolute Type**

### *LECSS-T Series* (SSCNET Ⅲ/H type)

SSCNET Ⅲ/H
SERVO SYSTEM CONTROLLER NETWORK

- **Applicable Fieldbus protocol**: SSCNET Ⅲ/H (High-speed optical communication, max. bidirectional communication speed: 150 Mbps)
- **Bidirectional communication speed**: 3 times
- **SSCNET Ⅲ/H and SSCNET Ⅲ products are compatible.**
- **Improved noise resistance**
- **STO (Safe Torque Off) safety function available**
- **Control encoder**: Absolute 22-bit encoder (Resolution: 4194304 p/rev)

# AC Servo Motor Driver

## *LECY□ Series*

| | |
|---|---|
| Power supply voltage | 200 to 230 VAC |
| Motor capacity | 100/200/400 W |

Absolute Type

### *LECYM Series* (MECHATROLINK-Ⅱ type)

MECHATROLINK-Ⅱ

- **Applicable Fieldbus protocol**: MECHATROLINK-Ⅱ
- **Number of connectable drivers**: 30 units (Transmission distance: Max. 50 m in total)
- **Max. transmission speed**: 10 Mbps
- **Min. transmission cycle**: 250 μs
- **Control encoder**: Absolute 20-bit encoder (Resolution: 1048576 p/rev)
- **STO (Safe Torque Off) safety function available**
- **Compliant with the SEMI F47 Standard (Torque limit for low DC power supply voltage for main circuit)**

### *LECYU Series* (MECHATROLINK-Ⅲ type)

MECHATROLINK-Ⅲ

- **Applicable Fieldbus protocol**: MECHATROLINK-Ⅲ
- **Number of connectable drivers**: 62 units (Transmission distance: Max. 75 m between stations)
- **Max. transmission speed**: 100 Mbps
- **Min. transmission cycle**: 125 μs
- **Control encoder**: Absolute 20-bit encoder (Resolution: 1048576 p/rev)
- **STO (Safe Torque Off) safety function available**
- **Compliant with the SEMI F47 Standard (Torque limit for low DC power supply voltage for main circuit)**

# AC Servo Motor Driver
## Incremental Type
***LECSA* Series** (Pulse Input Type/Positioning Type)
## Absolute Type
***LECSB*** (Pulse Input Type)***/LECSC*** (CC-Link Direct Input Type)
***LECSS*** (SSCNET Ⅲ Type)***/LECSS-T*** (SSCNET Ⅲ/H Type) ***Series***


LECSA LECSB LECSC LECSS LECSS-T

CE c UL us LISTED ＊ LECSS-T only RoHS

## How to Order

### LECSA/LECSB/LECSC/LECSS

**LECS A 1 – S1**

**Driver type**

| | |
|---|---|
| **A** | Pulse input type/Positioning type (For incremental encoder) |
| **B** | Pulse input type (For absolute encoder) |
| **C** | CC-Link direct input type (For absolute encoder) |
| **S** | SSCNET Ⅲ type (For absolute encoder) |

**Power supply voltage**

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

＊ **If an I/O connector (CN1) is required, order the part number "LE-CSN□" separately.**
＊ **If an I/O cable (CN1) is required, order the part number "LEC-CSN□-1" separately.**
**(Since the electric actuator will not operate without emergency stop (EMG) wiring for the LECSB, an I/O connector or an I/O cable is required.)**

**Compatible motor type**

| Symbol | Type | Capacity | Encoder |
|---|---|---|---|
| **S1** | AC servo motor (S2＊1) | 100 W | Incremental |
| **S3** | AC servo motor (S3＊1) | 200 W | |
| **S4** | AC servo motor (S4＊1)＊2 | 400 W | |
| **S5** | AC servo motor (S6＊1) | 100 W | Absolute |
| **S7** | AC servo motor (S7＊1) | 200 W | |
| **S8** | AC servo motor (S8＊1)＊2 | 400 W | |

∗1 The symbol shows the motor type (actuator).
∗2 Only available for power supply voltage "200 to 230 VAC"

### LECSS-T

**LECS S 2 – T5**

**Driver type**

| | |
|---|---|
| **S** | SSCNET Ⅲ/H type (For absolute encoder) |

**Power supply voltage**

| | |
|---|---|
| **2** | 200 to 240 VAC, 50/60 Hz |

＊ **If an I/O connector (CN1) is required, order the part number "LE-CSNS" separately.**
＊ **If an I/O cable (CN1) is required, order the part number "LEC-CSNS-1" separately.**

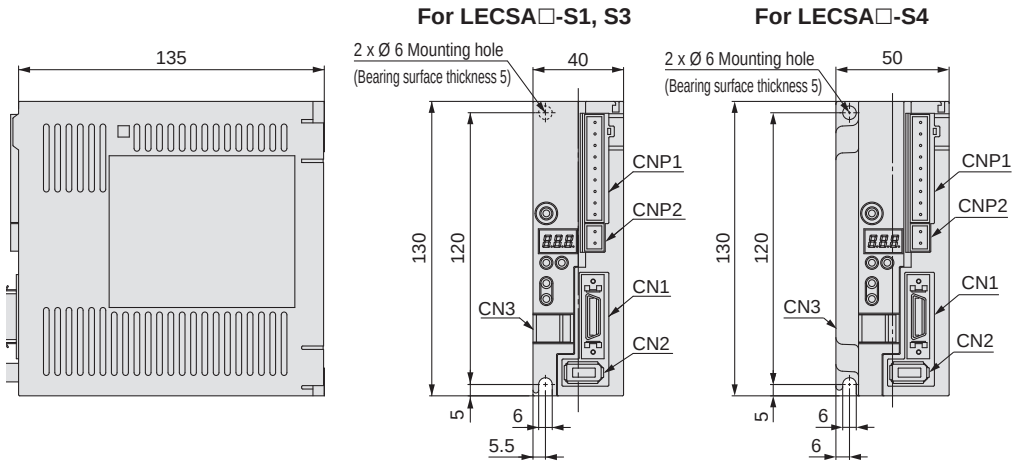
**Compatible motor type**

| Symbol | Type | Capacity | Encoder |
|---|---|---|---|
| **T5** | AC servo motor (T6＊1) | 100 W | Absolute |
| **T7** | AC servo motor (T7＊1) | 200 W | |
| **T8** | AC servo motor (T8＊1) | 400 W | |

∗1 The symbol shows the motor type (actuator).

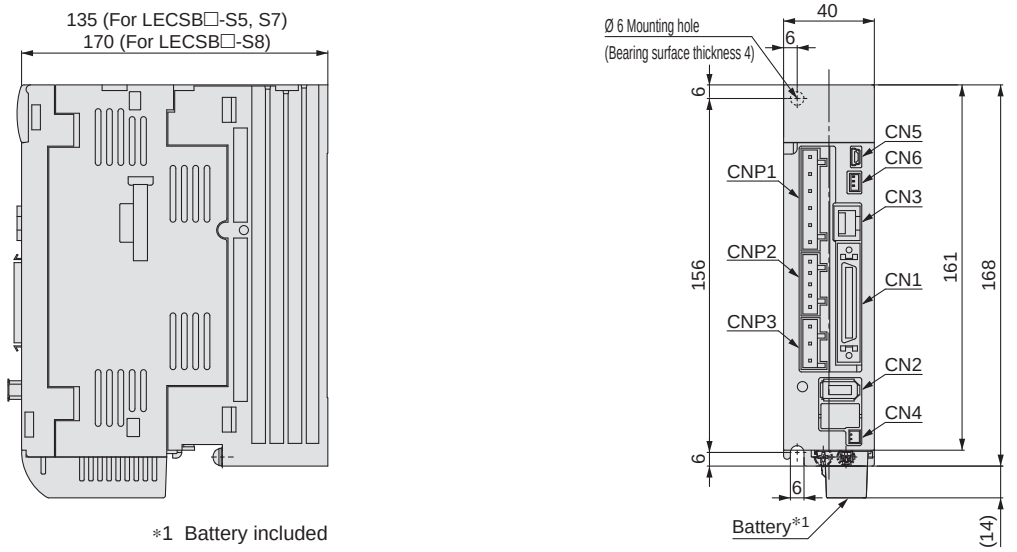
## Dimensions

### LECSA□




| Connector name | Description |
|---|---|
| **CN1** | I/O signal connector |
| **CN2** | Encoder connector |
| **CN3** | USB communication connector |
| **CNP1** | Main circuit power supply connector |
| **CNP2** | Control circuit power supply connector |

### LECSB□

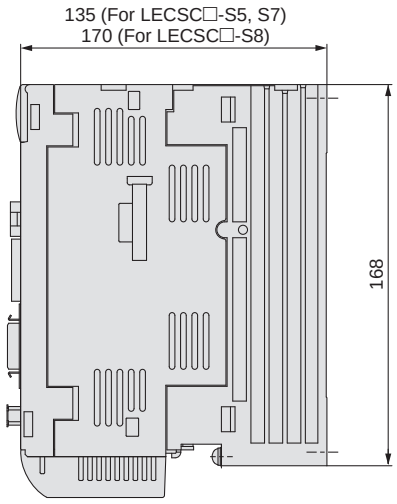


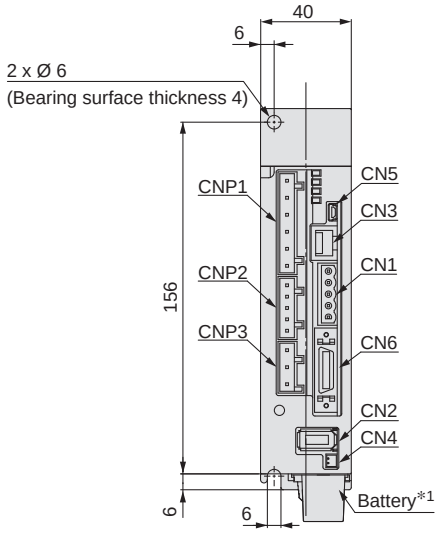

*1 Battery included

| Connector name | Description |
|---|---|
| **CN1** | I/O signal connector |
| **CN2** | Encoder connector |
| **CN3** | RS-422 communication connector |
| **CN4** | Battery connector |
| **CN5** | USB communication connector |
| **CN6** | Analogueue monitor connector |
| **CNP1** | Main circuit power supply connector |
| **CNP2** | Control circuit power supply connector |
| **CNP3** | Servo motor power connector |

## Dimensions

### LECSC□

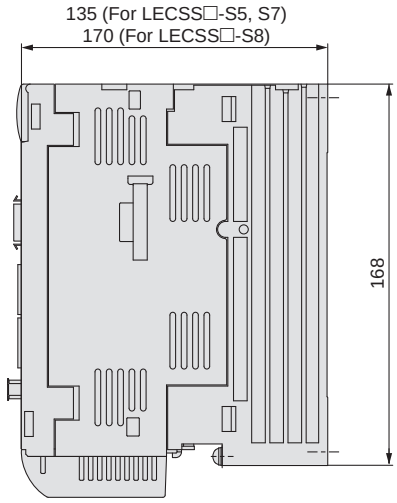


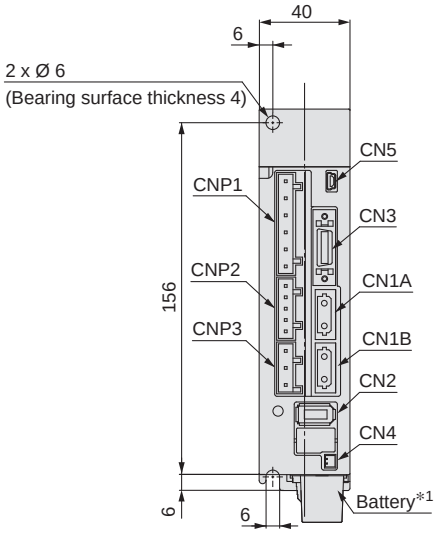




*1 Battery included

| Connector name | Description |
|---|---|
| **CN1** | CC-Link connector |
| **CN2** | Encoder connector |
| **CN3** | RS-422 communication connector |
| **CN4** | Battery connector |
| **CN5** | USB communication connector |
| **CN6** | I/O signal connector |
| **CNP1** | Main circuit power supply connector |
| **CNP2** | Control circuit power supply connector |
| **CNP3** | Servo motor power connector |

### LECSS□

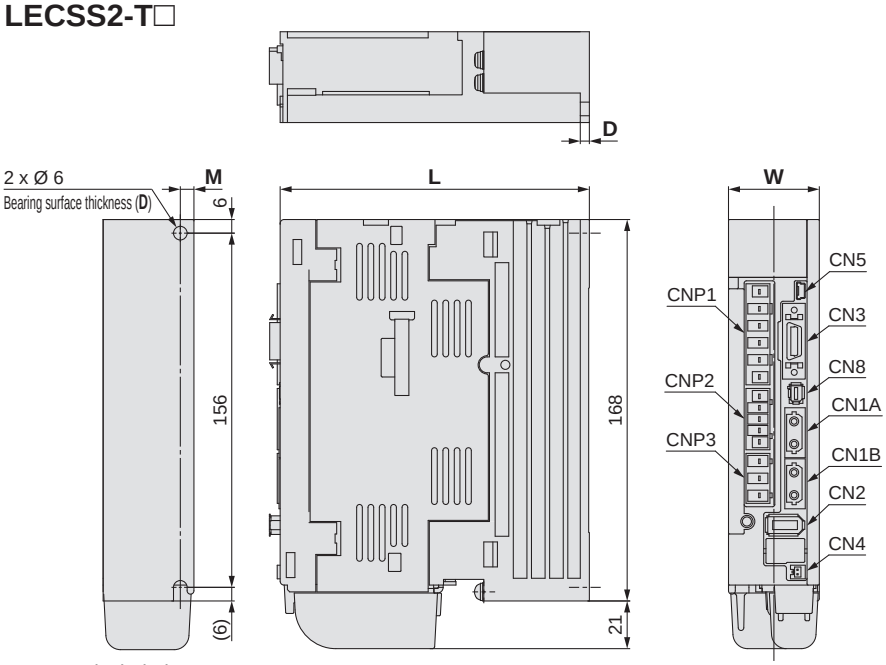



*1 Battery included

| Connector name | Description |
|---|---|
| **CN1A** | Front axis connector for SSCNET Ⅲ optical cable |
| **CN1B** | Rear axis connector for SSCNET Ⅲ optical cable |
| **CN2** | Encoder connector |
| **CN3** | I/O signal connector |
| **CN4** | Battery connector |
| **CN5** | USB communication connector |
| **CNP1** | Main circuit power supply connector |
| **CNP2** | Control circuit power supply connector |
| **CNP3** | Servo motor power connector |

### LECSS2-T□




* Battery included

| Connector name | Description |
|---|---|
| **CN1A** | Front axis connector for SSCNET Ⅲ/H |
| **CN1B** | Rear axis connector for SSCNET Ⅲ/H |
| **CN2** | Encoder connector |
| **CN3** | I/O signal connector |
| **CN4** | Battery connector |
| **CN5** | USB communication connector |
| **CN8** | STO input signal connector |
| **CNP1** | Main circuit power supply connector |
| **CNP2** | Control circuit power supply connector |
| **CNP3** | Servo motor power connector |

**Dimensions** [mm]

| Model | W | L | D | M |
|---|---|---|---|---|
| **LECSS2-T5** | 40 | 135 | 4 | 6 |
| **LECSS2-T7** | | | | |
| **LECSS2-T8** | | 170 | 5 | |

## Specifications

### LECSA Series

| Model | | LECSA1-S1 | LECSA1-S3 | LECSA2-S1 | LECSA2-S3 | LECSA2-S4 |
|---|---|---|---|---|---|---|
| **Compatible motor capacity [W]** | | 100 | 200 | 100 | 200 | 400 |
| **Compatible encoder** | | Incremental 17-bit encoder (Resolution: 131072 p/rev) | | | | |
| **Main power supply** | **Power voltage [V]** | Single phase 100 to 120 VAC (50/60 Hz) | | Single phase 200 to 230 VAC (50/60 Hz) | | |
| | **Allowable voltage fluctuation [V]** | Single phase 85 to 132 VAC | | Single phase 170 to 253 VAC | | |
| | **Rated current [A]** | 3.0 | 5.0 | 1.5 | 2.4 | 4.5 |
| **Control power supply** | **Control power supply voltage [V]** | 24 VDC | | | | |
| | **Allowable voltage fluctuation [V]** | 21.6 to 26.4 VDC | | | | |
| | **Rated current [A]** | 0.5 | | | | |
| **Parallel input** | | 6 inputs | | | | |
| **Parallel output** | | 4 outputs | | | | |
| **Max. input pulse frequency [pps]** | | 1 M (for differential receiver), 200 k (for open collector)*2 | | | | |
| **Function** | **In-position range setting [pulse]** | 0 to ±65535 (Command pulse unit) | | | | |
| | **Error excessive** | ±3 rotations | | | | |
| | **Torque limit** | Parameter setting | | | | |
| | **Communication** | USB communication | | | | |
| **Operating temperature range [°C]** | | 0 to 55 (No freezing) | | | | |
| **Operating humidity range [%RH]** | | 90 or less (No condensation) | | | | |
| **Storage temperature range [°C]** | | –20 to 65 (No freezing) | | | | |
| **Storage humidity range [%RH]** | | 90 or less (No condensation) | | | | |
| **Insulation resistance [MΩ]** | | Between the housing and SG: 10 (500 VDC) | | | | |
| **Weight [g]** | | 600 | | | | 700 |

### LECSB Series

| Model | | LECSB1-S5 | LECSB1-S7 | LECSB2-S5 | LECSB2-S7 | LECSB2-S8 |
|---|---|---|---|---|---|---|
| **Compatible motor capacity [W]** | | 100 | 200 | 100 | 200 | 400 |
| **Compatible encoder** | | Absolute 18-bit encoder (Resolution: 262144 p/rev) | | | | |
| **Main power supply** | **Power voltage [V]** | Single phase 100 to 120 VAC (50/60 Hz) | | Three phase 200 to 230 VAC (50/60 Hz)<br>Single phase 200 to 230 VAC (50/60 Hz) | | |
| | **Allowable voltage fluctuation [V]** | Single phase 85 to 132 VAC | | Three phase 170 to 253 VAC<br>Single phase 170 to 253 VAC | | |
| | **Rated current [A]** | 3.0 | 5.0 | 0.9 | 1.5 | 2.6 |
| **Control power supply** | **Control power supply voltage [V]** | Single phase 100 to 120 VAC (50/60 Hz) | | Single phase 200 to 230 VAC (50/60 Hz) | | |
| | **Allowable voltage fluctuation [V]** | Single phase 85 to 132 VAC | | Single phase 170 to 253 VAC | | |
| | **Rated current [A]** | 0.4 | | 0.2 | | |
| **Parallel input** | | 10 inputs | | | | |
| **Parallel output** | | 6 outputs | | | | |
| **Max. input pulse frequency [pps]** | | 1 M (for differential receiver), 200 k (for open collector)*2 | | | | |
| **Function** | **In-position range setting [pulse]** | 0 to ±10000 (Command pulse unit) | | | | |
| | **Error excessive** | ±3 rotations | | | | |
| | **Torque limit** | Parameter setting or external analogue input setting (0 to 10 VDC) | | | | |
| | **Communication** | USB communication, RS422 communication*1 | | | | |
| **Operating temperature range [°C]** | | 0 to 55 (No freezing) | | | | |
| **Operating humidity range [%RH]** | | 90 or less (No condensation) | | | | |
| **Storage temperature range [°C]** | | –20 to 65 (No freezing) | | | | |
| **Storage humidity range [%RH]** | | 90 or less (No condensation) | | | | |
| **Insulation resistance [MΩ]** | | Between the housing and SG: 10 (500 VDC) | | | | |
| **Weight [g]** | | 800 | | | | 1000 |

*1 USB communication and RS422 communication cannot be performed at the same time.
*2 If the command pulse input is open collector method, it supports only the sink (NPN) type interface. It does not correspond to the source (PNP) type interface.

## Specifications

### LECSC Series

| Model | | | LECSC1-S5 | LECSC1-S7 | LECSC2-S5 | LECSC2-S7 | LECSC2-S8 |
|---|---|---|---|---|---|---|---|
| **Compatible motor capacity [W]** | | | 100 | 200 | 100 | 200 | 400 |
| **Compatible encoder** | | | Absolute 18-bit encoder (Resolution: 262144 p/rev) | | | | |
| **Main power supply** | **Power voltage [V]** | | Single phase 100 to 120 VAC (50/60 Hz) | | Three phase 200 to 230 VAC (50/60 Hz) Single phase 200 to 230 VAC (50/60 Hz) | | |
| | **Allowable voltage fluctuation [V]** | | Single phase 85 to 132 VAC | | Three phase 170 to 253 VAC Single phase 170 to 253 VAC | | |
| | **Rated current [A]** | | 3.0 | 5.0 | 0.9 | 1.5 | 2.6 |
| **Control power supply** | **Control power supply voltage [V]** | | Single phase 100 to 120 VAC (50/60 Hz) | | Single phase 200 to 230 VAC (50/60 Hz) | | |
| | **Allowable voltage fluctuation [V]** | | Single phase 85 to 132 VAC | | Single phase 170 to 253 VAC | | |
| | **Rated current [A]** | | 0.4 | | 0.2 | | |
| **Communication specifications** | **Applicable Fieldbus protocol (Version)** | | CC-Link communication (Ver. 1.10) | | | | |
| | **Connection cable** | | CC-Link Ver. 1.10 compliant cable (Shielded 3-core twisted pair cable)*1 | | | | |
| | **Remote station number** | | 1 to 64 | | | | |
| | **Cable length** | **Communication speed [bps]** | 16 k | 625 k | 2.5 M | 5 M | 10 M |
| | | **Maximum overall cable length [m]** | 1200 | 900 | 400 | 160 | 100 |
| | | **Cable length between stations [m]** | 0.2 or more | | | | |
| | **I/O occupation area (Inputs/Outputs)** | | 1 station occupied (Remote I/O 32 points/32 points)/(Remote register 4 words/4 words) 2 stations occupied (Remote I/O 64 points/64 points)/(Remote register 8 words/8 words) | | | | |
| | **Number of connectable drivers** | | Up to 42 (when 1 station is occupied by 1 driver), Up to 32 (when 2 stations are occupied by 1 driver), when there are only remote device stations. | | | | |
| **Command method** | **Remote register input** | | Available with CC-Link communication (2 stations occupied) | | | | |
| | **Point table No. input** | | Available with CC-Link communication, RS422 communication CC-Link communication (1 station occupied): 31 points CC-Link communication (2 stations occupied): 255 points RS422 communication: 255 points | | | | |
| | **Indexer positioning input** | | Available with CC-Link communication CC-Link communication (1 station occupied): 31 points CC-Link communication (2 stations occupied): 255 points | | | | |
| **Communication function** | | | USB communication, RS-422 communication*2 | | | | |
| **Operating temperature range [°C]** | | | 0 to 55 (No freezing) | | | | |
| **Operating humidity range [%RH]** | | | 90 or less (No condensation) | | | | |
| **Storage temperature range [°C]** | | | –20 to 65 (No freezing) | | | | |
| **Storage humidity range [%RH]** | | | 90 or less (No condensation) | | | | |
| **Insulation resistance [MΩ]** | | | Between the housing and SG: 10 (500 VDC) | | | | |
| **Weight [g]** | | | 800 | | | | 1000 |

*1 If the system comprises of both CC-Link Ver. 1.00 and Ver. 1.10 compliant cables, Ver. 1.00 specifications are applied to the overall cable length and the cable length between stations.
*2 USB communication and RS422 communication cannot be performed at the same time.

### LECSS Series

| Model | | LECSS1-S5 | LECSS1-S7 | LECSS2-S5 | LECSS2-S7 | LECSS2-S8 |
|---|---|---|---|---|---|---|
| **Compatible motor capacity [W]** | | 100 | 200 | 100 | 200 | 400 |
| **Compatible encoder** | | Absolute 18-bit encoder (Resolution: 262144 p/rev) | | | | |
| **Main power supply** | **Power voltage [V]** | Single phase 100 to 120 VAC (50/60 Hz) | | Three phase 200 to 230 VAC (50/60 Hz) Single phase 200 to 230 VAC (50/60 Hz) | | |
| | **Allowable voltage fluctuation [V]** | Single phase 85 to 132 VAC | | Three phase 170 to 253 VAC Single phase 170 to 253 VAC | | |
| | **Rated current [A]** | 3.0 | 5.0 | 0.9 | 1.5 | 2.6 |
| **Control power supply** | **Control power supply voltage [V]** | Single phase 100 to 120 VAC (50/60 Hz) | | Single phase 200 to 230 VAC (50/60 Hz) | | |
| | **Allowable voltage fluctuation [V]** | Single phase 85 to 132 VAC | | Single phase 170 to 253 VAC | | |
| | **Rated current [A]** | 0.4 | | 0.2 | | |
| **Applicable Fieldbus protocol** | | SSCNET Ⅲ (High-speed optical communication) | | | | |
| **Communication function** | | USB communication | | | | |
| **Operating temperature range [°C]** | | 0 to 55 (No freezing) | | | | |
| **Operating humidity range [%RH]** | | 90 or less (No condensation) | | | | |
| **Storage temperature range [°C]** | | –20 to 65 (No freezing) | | | | |
| **Storage humidity range [%RH]** | | 90 or less (No condensation) | | | | |
| **Insulation resistance [MΩ]** | | Between the housing and SG: 10 (500 VDC) | | | | |
| **Weight [g]** | | 800 | | | | 1000 |

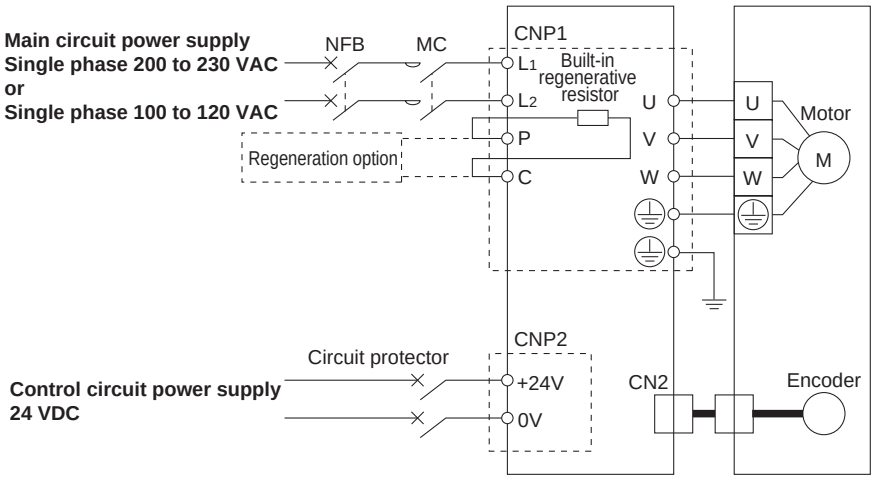
## Specifications

### LECSS-T Series

| Model | | LECSS2-T5 | LECSS2-T7 | LECSS2-T8 |
|---|---|---|---|---|
| Compatible motor capacity [W] | | 100 | 200 | 400 |
| Compatible encoder | | Absolute 22-bit encoder (Resolution: 4194304 p/rev) | | |
| Main power supply | Power voltage [V] | Three phase 200 to 240 VAC (50/60 Hz), Single phase 200 to 240 VAC (50/60 Hz) | | |
| | Allowable voltage fluctuation [V] | Three phase 170 to 264 VAC (50/60 Hz), Single phase 170 to 264 VAC (50/60 Hz) | | |
| | Rated current [A] | 0.9 | 1.5 | 2.6 |
| Control power supply | Control power supply voltage [V] | Single phase 200 to 240 VAC (50/60 Hz) | | |
| | Allowable voltage fluctuation [V] | Single phase 170 to 264 VAC | | |
| | Rated current [A] | 0.2 | | |
| Applicable Fieldbus protocol | | SSCNET Ⅲ/H (High-speed optical communication) | | |
| Communication function | | USB communication | | |
| Operating temperature range [°C] | | 0 to 55 (No freezing) | | |
| Operating humidity range [%RH] | | 90 or less (No condensation) | | |
| Storage temperature range [°C] | | −20 to 65 (No freezing) | | |
| Storage humidity range [%RH] | | 90 or less (No condensation) | | |
| Insulation resistance [MΩ] | | Between the housing and SG: 10 (500 VDC) | | |
| Weight [g] | | 800 | | 1000 |

## Power Supply Wiring Example: LECSA

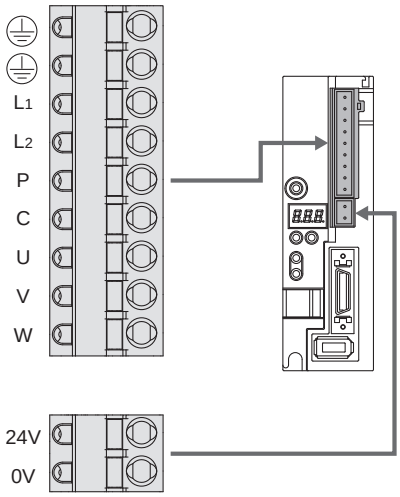
### LECSA□-□




### Main Circuit Power Supply Connector: CNP1

∗ Accessory

| Terminal name | Function | Details |
|---|---|---|
| ⏚ | Protective earth (PE) | Should be grounded by connecting the servo motor's earth terminal and the control panel's protective earth (PE) |
| L1 | Main circuit power supply | Connect the main circuit power supply.<br>LECSA1: Single phase 100 to 120 VAC, 50/60 Hz<br>LECSA2: Single phase 200 to 230 VAC, 50/60 Hz |
| L2 | | |
| P | Regeneration option | Terminal to connect regeneration option<br>LECSA□-S1: Not connected at time of shipping<br>LECSA□-S3, S4: Connected at time of shipping<br>∗ If regeneration option is required for "Model Selection," connect to this terminal. |
| C | | |
| U | Servo motor power (U) | Connect to motor cable (U, V, W). |
| V | Servo motor power (V) | |
| W | Servo motor power (W) | |



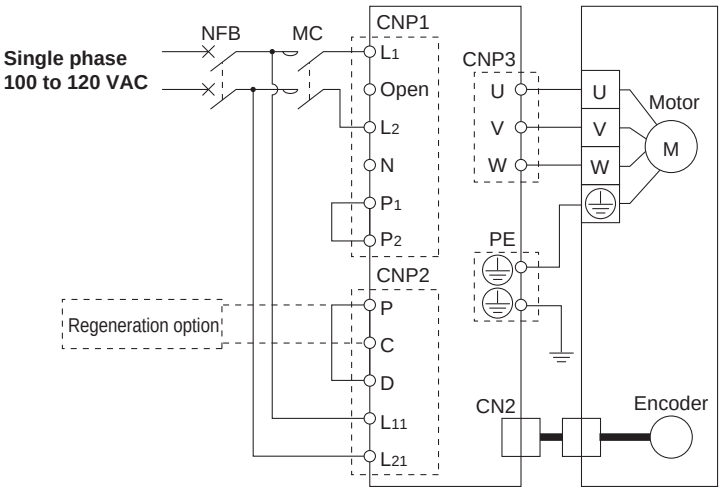

### Control Circuit Power Supply Connector: CNP2

∗ Accessory

| Terminal name | Function | Details |
|---|---|---|
| 24V | Control circuit power supply (24 V) | 24 V side of the control circuit power supply (24 VDC) supplied to the driver |
| 0V | Control circuit power supply (0 V) | 0 V side of the control circuit power supply (24 VDC) supplied to the driver |

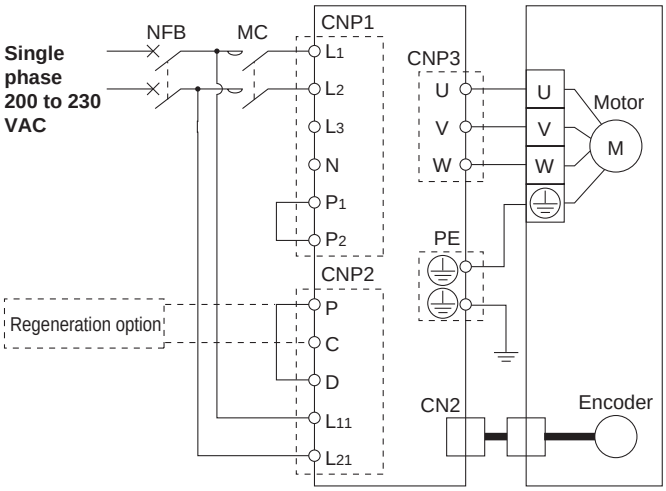
## Power Supply Wiring Example: LECSB, LECSC, LECSS

**LECSB1-□**
**LECSC1-□**
**LECSS1-□**

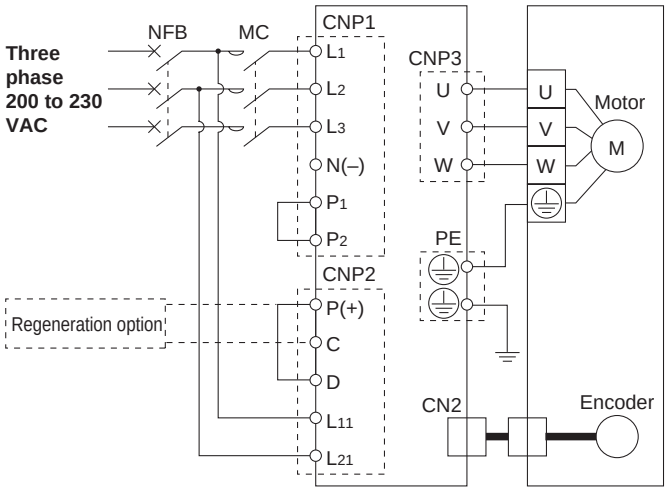



**LECSB2-□**
**LECSC2-□**
**LECSS2-□**

**For single phase 200 VAC**




**For three phase 200 VAC**




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

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

| Terminal name | Function | Details |
|---|---|---|
| L1 | Main circuit power supply | Connect the main circuit power supply.<br>LECSB1/LECSC1/LECSS1: Single phase 100 to 120 VAC, 50/60 Hz Connection terminal: L1, L2<br>LECSB2/LECSC2/LECSS2: Single phase 200 to 230 VAC, 50/60 Hz Connection terminal: L1, L2<br>Three phase 200 to 230 VAC, 50/60 Hz Connection terminal: L1, L2, L3 |
| L2 | | |
| L3 | | |
| N | Do not connect. | |
| P1 | Connect between P1 and P2. (Connected at time of shipping) | |
| P2 | | |

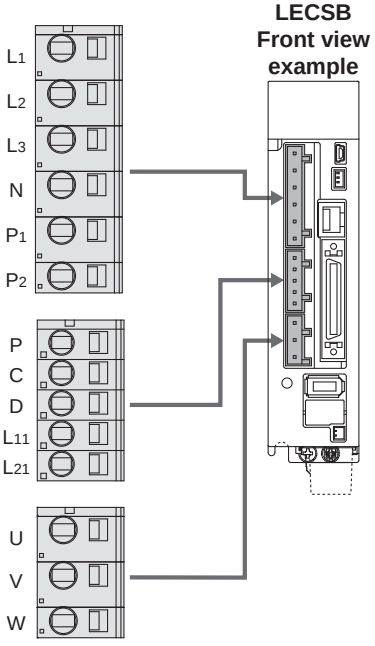
### Control Circuit Power Supply Connector: CNP2 ∗ Accessory

| Terminal name | Function | Details |
|---|---|---|
| P | Regeneration option | Connect between P and D. (Connected at time of shipping)<br>∗ If regeneration option is required for "Model Selection," connect to this terminal. |
| C | | |
| D | | |
| L11 | Control circuit power supply | Connect the control circuit power supply.<br>LECSB1/LECSC1/LECSS1: Single phase 100 to 120 VAC, 50/60 Hz Connection terminal: L11, L21<br>LECSB2/LECSC2/LECSS2: Single phase 200 to 230 VAC, 50/60 Hz Connection terminal: L11, L21<br>Three phase 200 to 230 VAC, 50/60 Hz Connection terminal: L11, L21 |
| L21 | | |

### Motor Connector: CNP3 ∗ Accessory

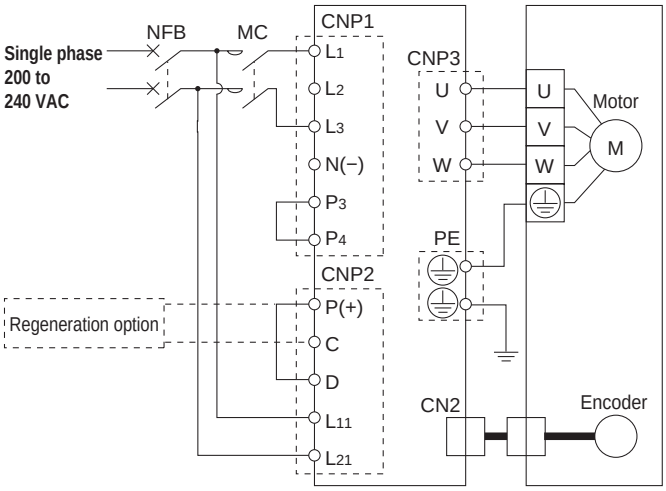
| Terminal name | Function | Details |
|---|---|---|
| U | Servo motor power (U) | Connect to motor cable (U, V, W). |
| V | Servo motor power (V) | |
| W | Servo motor power (W) | |

**LECSB Front view example**

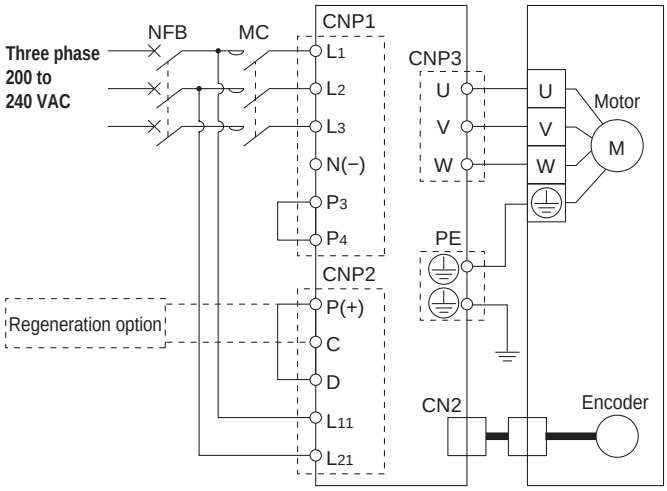


## Power Supply Wiring Example: LECSS2-T□

**For single phase 200 VAC**




**For three phase 200 VAC**




∗ For single phase 200 to 240 VAC, power supply should be connected to L1 and L3 terminals, with nothing connected to L2. Please note that the wiring locations differ from the LECS□.

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

| Terminal name | Function | Details |
|---|---|---|
| L1 | Main circuit power supply | Connect the main circuit power supply.<br>LECSS2: Single phase 200 to 240 VAC, 50/60 Hz Connection terminal: L1, L3<br>Three phase 200 to 240 VAC, 50/60 Hz Connection terminal: L1, L2, L3 |
| L2 | | |
| L3 | | |
| N(−) | Do not connect. | |
| P3 | Connect between P3 and P4. (Connected at time of shipping) | |
| P4 | | |

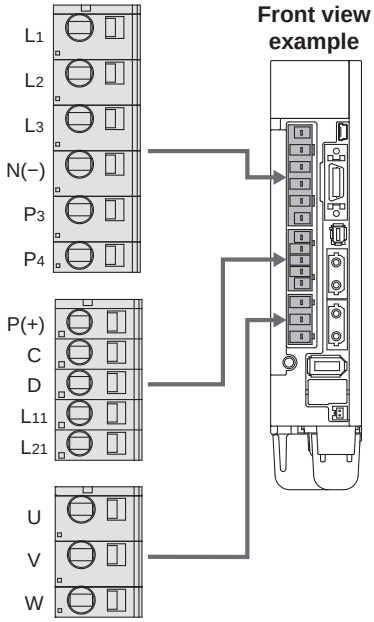
### Control Circuit Power Supply Connector: CNP2 ∗ Accessory

| Terminal name | Function | Details |
|---|---|---|
| P(+) | Regeneration option | Connect between P(+) and D. (Connected at time of shipping)<br>∗ If regeneration option is required for "Model Selection," connect to this terminal. |
| C | | |
| D | | |
| L11 | Control circuit power supply | Connect the control circuit power supply.<br>LECSS2: Single phase 200 to 240 VAC, 50/60 Hz Connection terminal: L11, L21<br>Three phase 200 to 240 VAC, 50/60 Hz Connection terminal: L11, L21 |
| L21 | | |

### Motor Connector: CNP3 ∗ Accessory

| Terminal name | Function | Details |
|---|---|---|
| U | Servo motor power (U) | Connect to motor cable (U, V, W). |
| V | Servo motor power (V) | |
| W | Servo motor power (W) | |

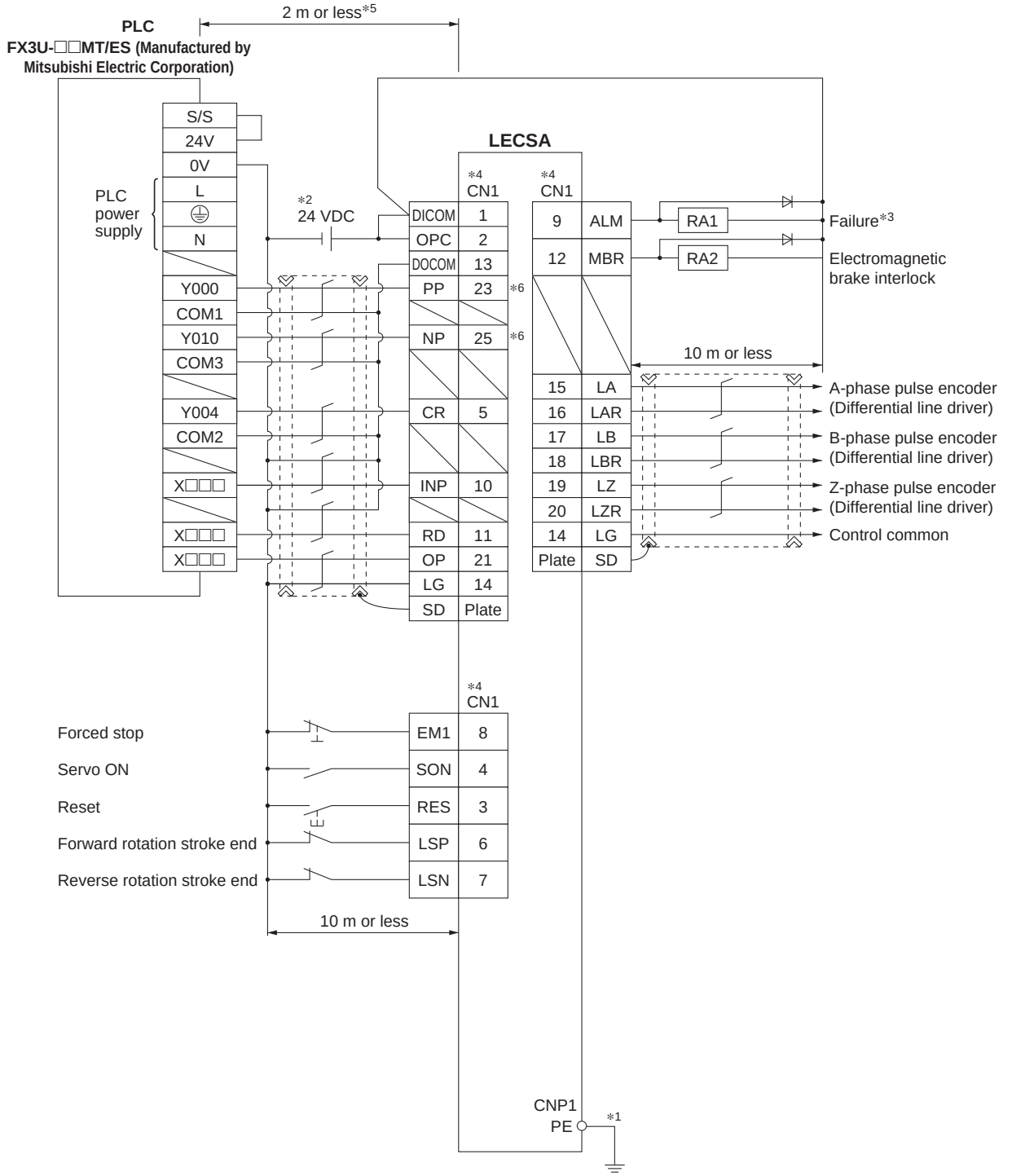
**LECSS2-T□ Front view example**



## Control Signal Wiring Example: LECSA

### LECSA□-□

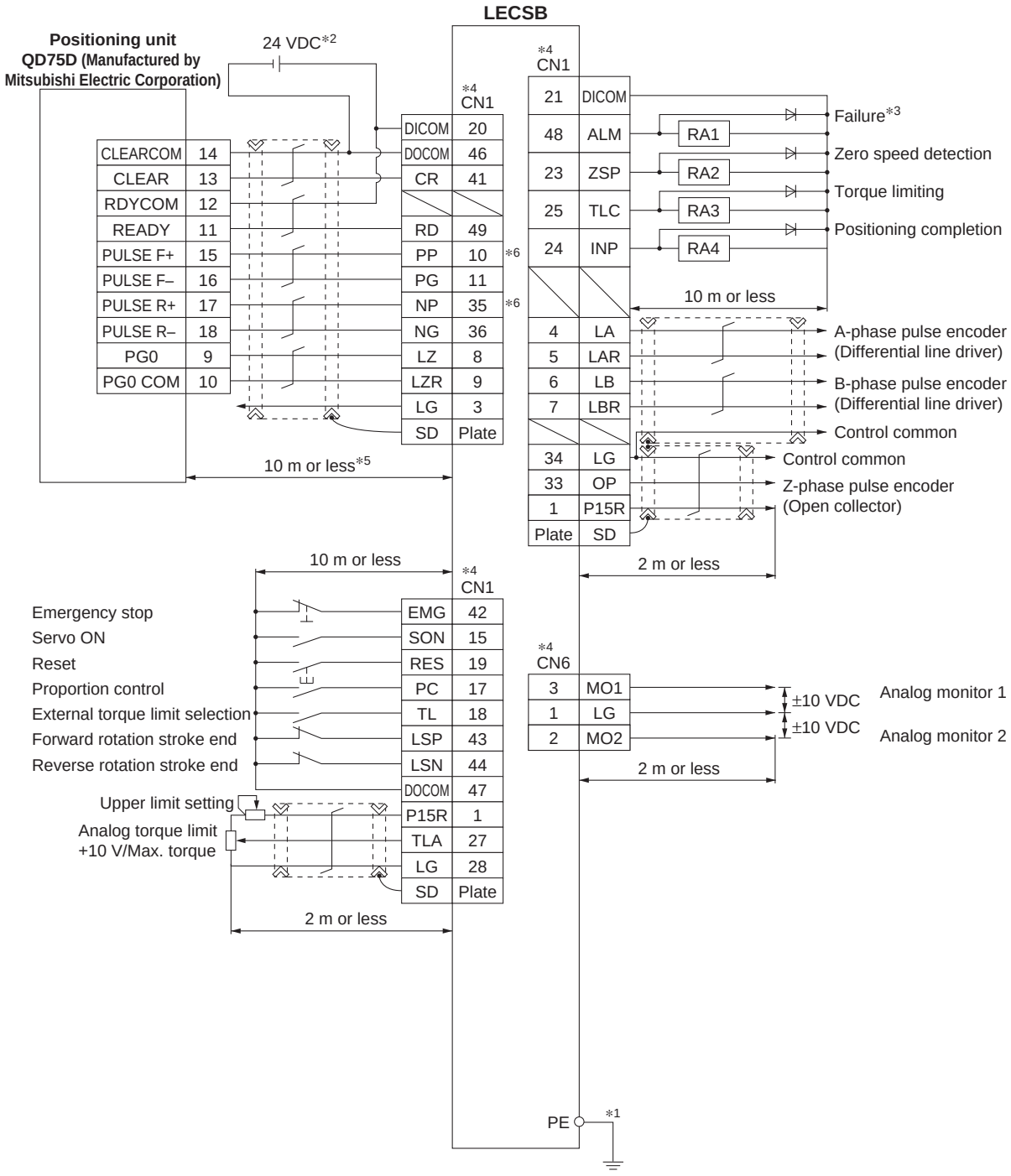
This wiring example shows connection with a PLC (FX3U-□□MT/ES) manufactured by Mitsubishi Electric Corporation as when used in position control mode. Refer to the LECSA series Operation Manual and any technical literature or operation manuals for your PLC and positioning unit before connecting to another PLC or positioning unit.




*1 For preventing electric shock, be sure to connect the driver main circuit power supply connector (CNP1)'s protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).
*2 For interface use, supply 24 VDC ±10 % 200 mA using an external source. 200 mA is the value when all I/O command signals are being used. In addition, reducing the number of inputs/outputs can decrease the current capacity. Refer to the Operation Manual for required current for interface.
*3 The failure (ALM) is normally ON. When it is OFF (alarm occurs), stop the PLC signal using the sequence program.
*4 Signals of the same name are connected inside the driver.
*5 For command pulse input with an open collector method. When a positioning unit loaded with a differential line driver method is used, it is 10 m or less.
*6 If the command pulse input is open collector method, it supports only the sink (NPN) type interface. It does not correspond to the source (PNP) type interface.

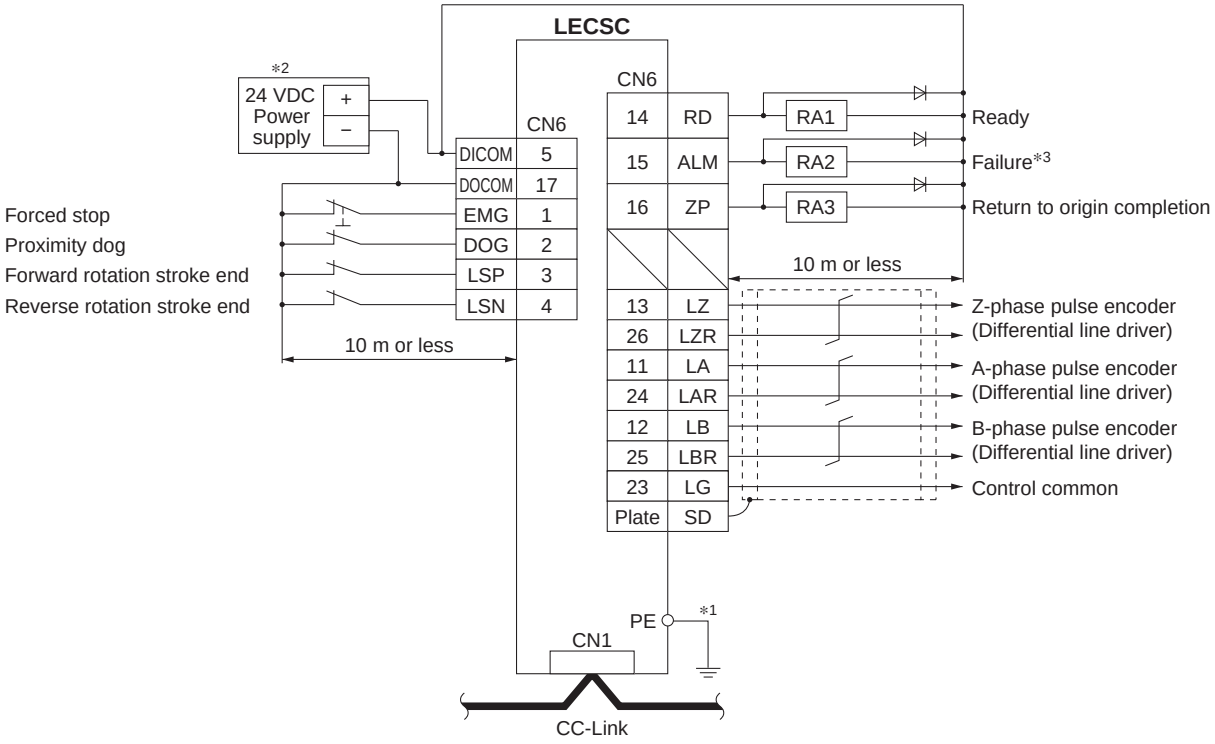
## Control Signal Wiring Example: LECSB

This wiring example shows connection with a positioning unit (QD75D) manufactured by Mitsubishi Electric Corporation as when used in position control mode. Refer to the LECSB series Operation Manual and any technical literature or operation manuals for your PLC and positioning unit before connecting to another PLC or positioning unit.



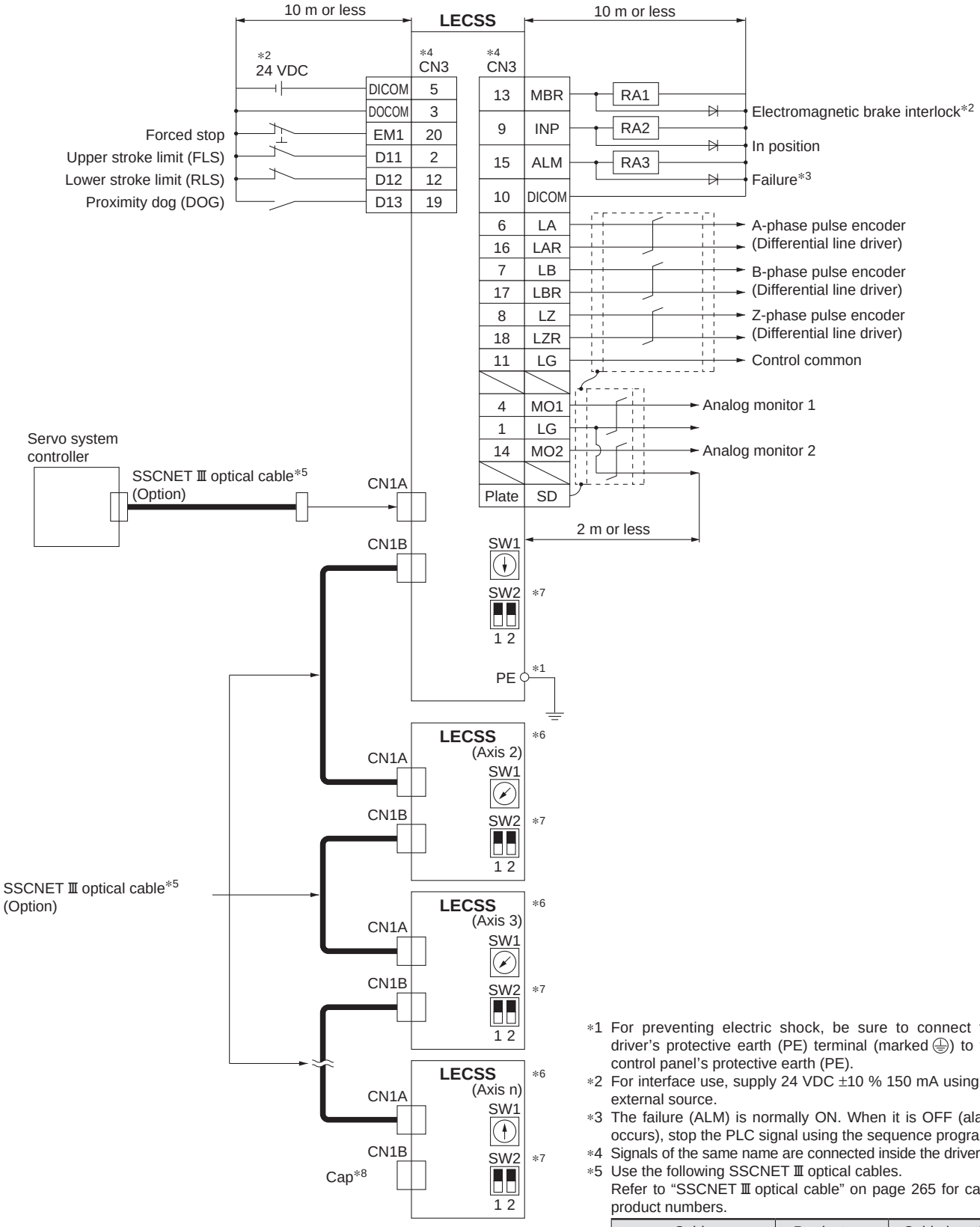

*1 For preventing electric shock, be sure to connect the driver's protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).
*2 For interface use, supply 24 VDC ±10 % 300 mA using an external source.
*3 The failure (ALM) is normally ON. When it is OFF (alarm occurs), stop the PLC signal using the sequence program.
*4 Signals of the same name are connected inside the driver.
*5 For command pulse input with a differential line driver method. For open collector method, it is 2 m or less.
*6 If the command pulse input is open collector method, it supports only the sink (NPN) type interface. It does not correspond to the source (PNP) type interface.

## Control Signal Wiring Example: LECSC




∗1 For preventing electric shock, be sure to connect the driver's protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).
∗2 For interface use, supply 24 VDC ±10 % 150 mA using an external source.
∗3 The failure (ALM) is normally ON. When it is OFF (alarm occurs), stop the PLC signal using the sequence program.

## Control Signal Wiring Example: LECSS



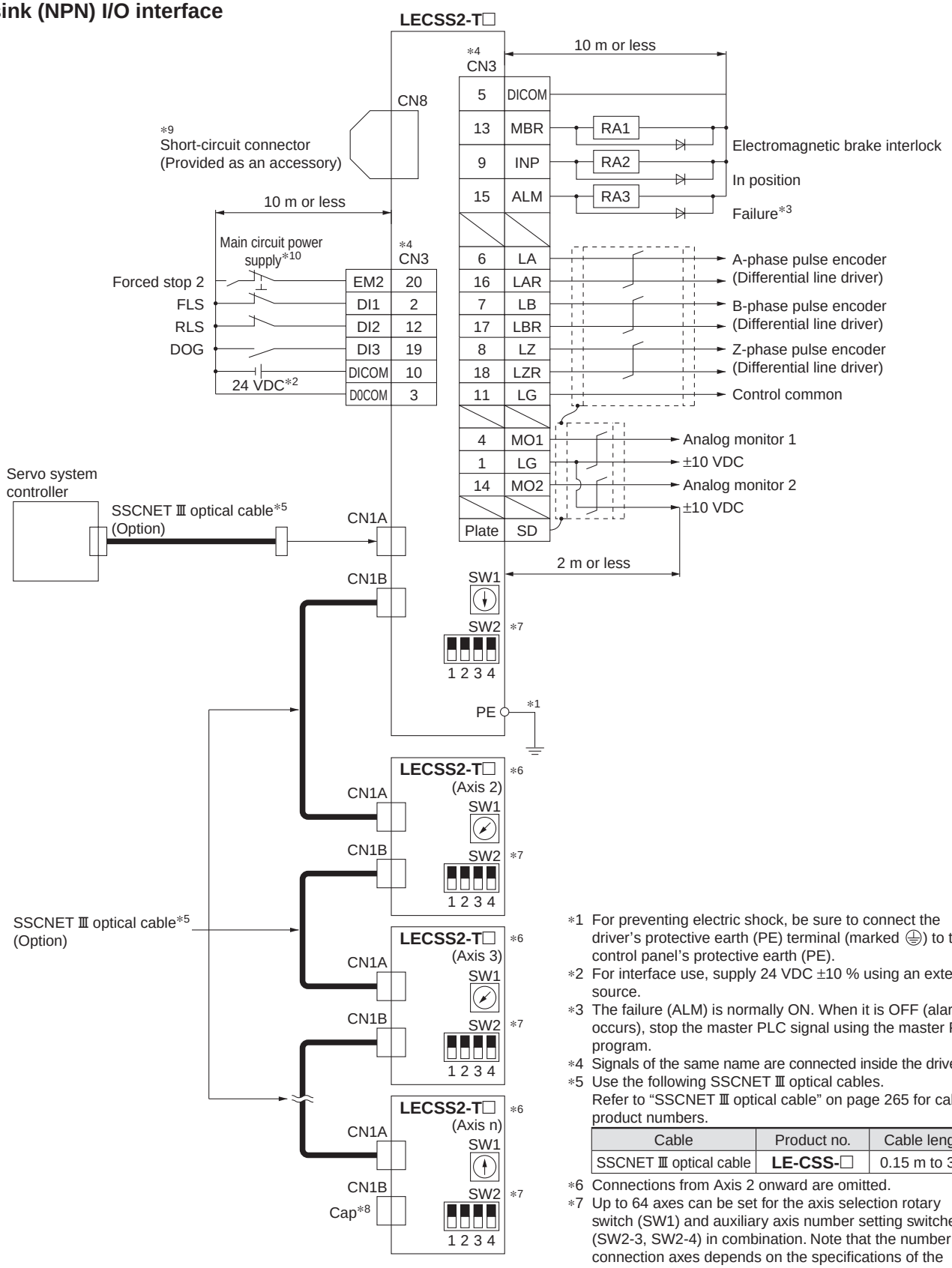

∗1 For preventing electric shock, be sure to connect the driver's protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).
∗2 For interface use, supply 24 VDC ±10 % 150 mA using an external source.
∗3 The failure (ALM) is normally ON. When it is OFF (alarm occurs), stop the PLC signal using the sequence program.
∗4 Signals of the same name are connected inside the driver.
∗5 Use the following SSCNET Ⅲ optical cables.
Refer to "SSCNET Ⅲ optical cable" on page 265 for cable product numbers.

| Cable | Product no. | Cable length |
|---|---|---|
| SSCNET Ⅲ optical cable | **LE-CSS-□** | 0.15 m to 3 m |

∗6 Connections from Axis 2 onward are omitted.
∗7 Up to 16 axes can be set.
∗8 Be sure to place a cap on unused CN1A/CN1B.

## Control Signal Wiring Example: LECSS2-T□

### For sink (NPN) I/O interface




∗1 For preventing electric shock, be sure to connect the driver's protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).

∗2 For interface use, supply 24 VDC ±10 % using an external source.

∗3 The failure (ALM) is normally ON. When it is OFF (alarm occurs), stop the master PLC signal using the master PLC program.

∗4 Signals of the same name are connected inside the driver.

∗5 Use the following SSCNET Ⅲ optical cables.
Refer to "SSCNET Ⅲ optical cable" on page 265 for cable product numbers.

| Cable | Product no. | Cable length |
|---|---|---|
| SSCNET Ⅲ optical cable | **LE-CSS-□** | 0.15 m to 3 m |

∗6 Connections from Axis 2 onward are omitted.

∗7 Up to 64 axes can be set for the axis selection rotary switch (SW1) and auxiliary axis number setting switches (SW2-3, SW2-4) in combination. Note that the number of connection axes depends on the specifications of the master PLC.

∗8 Be sure to place a cap on unused CN1A/CN1B.

∗9 When not using the STO function, use the driver with the short-circuit connector (provided as an accessory) inserted.

∗10 Configure a circuit to turn off EM2 when the main circuit power is turned off to prevent any unexpected restarts of the driver.

## Options

### Motor cable, Lock cable, Encoder cable (LECS□, LECSS-T common)

**LE − CS M − S 5 A**

**Motor type**

| | |
|---|---|
| S | AC servo motor |

**Cable description**

| | |
|---|---|
| M | Motor cable |
| B | Lock cable |
| E | Encoder cable |

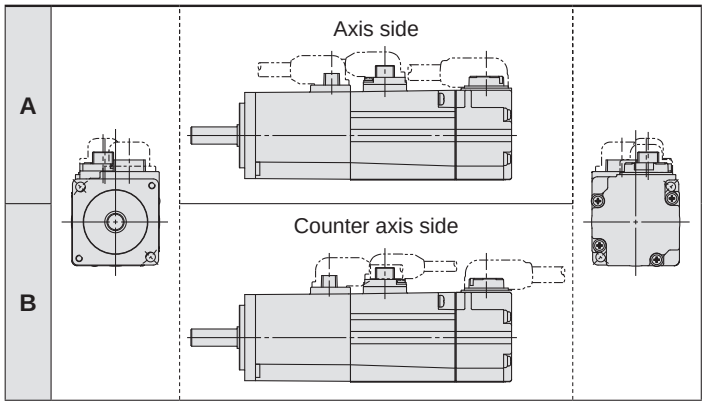
**Cable type**

| | |
|---|---|
| S | Standard cable |
| R | Robotic cable |

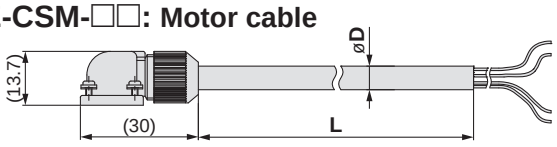
**Cable length (L) [m]**

| | |
|---|---|
| 2 | 2 |
| 5 | 5 |
| A | 10 |

**Direction of connector**




#### LE-CSM-□□: Motor cable

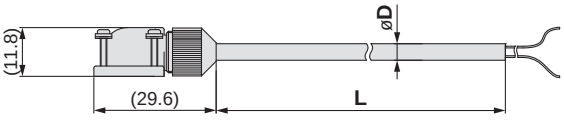



| Product no. | Ø D |
|---|---|
| LE-CSM-S□A | 6.2 |
| LE-CSM-S□B | |
| LE-CSM-R□A | 5.7 |
| LE-CSM-R□B | |

**Weight**

| Product no. | Length [m] | Weight [g] |
|---|---|---|
| LE-CSM-S2□ | 2 | 180 |
| LE-CSM-S5□ | 5 | 400 |
| LE-CSM-SA□ | 10 | 800 |
| LE-CSM-R2□ | 2 | 180 |
| LE-CSM-R5□ | 5 | 400 |
| LE-CSM-RA□ | 10 | 800 |

#### LE-CSB-□□: Lock cable*1

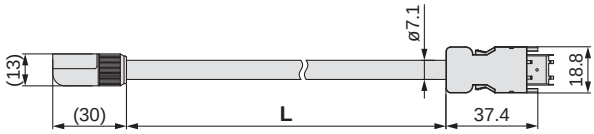



| Product no. | Ø D |
|---|---|
| LE-CSB-S□A | 4.7 |
| LE-CSB-S□B | |
| LE-CSB-R□A | 4.5 |
| LE-CSB-R□B | |

**Weight**

| Product no. | Length [m] | Weight [g] |
|---|---|---|
| LE-CSB-S2□ | 2 | 80 |
| LE-CSB-S5□ | 5 | 200 |
| LE-CSB-SA□ | 10 | 400 |
| LE-CSB-R2□ | 2 | 80 |
| LE-CSB-R5□ | 5 | 200 |
| LE-CSB-RA□ | 10 | 400 |

#### LE-CSE-□□: Encoder cable




**Weight**

| Product no. | Length [m] | Weight [g] |
|---|---|---|
| LE-CSE-S2□ | 2 | 220 |
| LE-CSE-S5□ | 5 | 600 |
| LE-CSE-SA□ | 10 | 1200 |
| LE-CSE-R2□ | 2 | 220 |
| LE-CSE-R5□ | 5 | 600 |
| LE-CSE-RA□ | 10 | 1200 |

*1 If using an actuator with a lock, a lock cable is required.

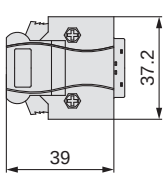
### I/O connector (Without cable, Connector only)

**LE − CSN A**

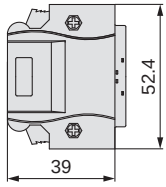
**Driver type**

| | |
|---|---|
| A | LECSA□, LECSC□ |
| B | LECSB□ |
| S | LECSS□-S□/LECSS2-T□ |

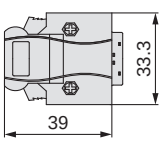
**LE-CSNA**




**LE-CSNB**




**LE-CSNS**




**Weight**

| Product no. | Weight [g] |
|---|---|
| LE-CSNA | 25 |
| LE-CSNB | 30 |
| LE-CSNS | 16 |

* LE-CSNA: 10126-3000PE (connector)/10326-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
  LE-CSNB: 10150-3000PE (connector)/10350-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
  LE-CSNS: 10120-3000PE (connector)/10320-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
* Applicable conductor size: AWG24 to 30
* If using the LECSB, emergency stop (EMG) wiring is required in all cases. (The electric actuator will not operate without the wiring.) Prepare an I/O connector or an I/O cable in advance.

## Options

### SSCNET Ⅲ optical cable (LECSS□-S□, LECSS2-T□)

**LE − CSS − 1**

**Motor type**

| | |
|---|---|
| S | AC servo motor |

**Cable description**

| | |
|---|---|
| S | SSCNET Ⅲ optical cable |

**Cable length**

| | |
|---|---|
| L | 0.15 m |
| K | 0.3 m |
| J | 0.5 m |
| 1 | 1 m |
| 3 | 3 m |

∗ LE-CSS-□ is MR-J3BUS□M manufactured by Mitsubishi Electric Corporation.

**Weight**

| Product no. | Length [m] | Weight [g] |
|---|---|---|
| **LE-CSS-L** | 0.15 | 100 |
| **LE-CSS-K** | 0.3 | 100 |
| **LE-CSS-J** | 0.5 | 200 |
| **LE-CSS-1** | 1 | 200 |
| **LE-CSS-3** | 3 | 200 |

### I/O cable

**LEC − CSN A − 1**

**Driver type**

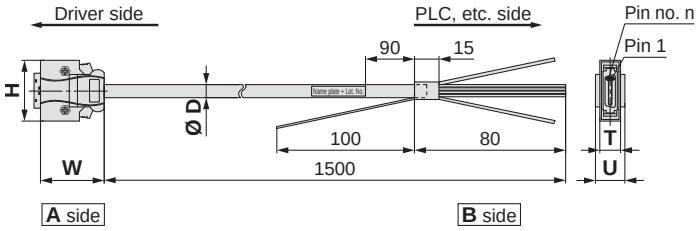
| | |
|---|---|
| A | For LECSA□, LECSC□ |
| B | For LECSB□ |
| S | For LECSS□-S□/LECSS2-T□ |

**Cable length (L) [m]**

| | |
|---|---|
| 1 | 1.5 |

**Weight**

| Product no. | Weight [g] |
|---|---|
| **LEC-CSNA** | 303 |
| **LEC-CSNB** | 472 |
| **LEC-CSNS** | 221 |




∗ LEC-CSNA-1: 10126-3000PE (connector)/10326-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
LEC-CSNB-1: 10150-3000PE (connector)/10350-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
LEC-CSNS-1: 10120-3000PE (connector)/10320-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
∗ Conductor size: AWG24
∗ If using the LECSB, emergency stop (EMG) wiring is required in all cases. (The electric actuator will not operate without the wiring.) Prepare an I/O connector or an I/O cable in advance.

**Cable O.D.**

| Product no. | Ø D |
|---|---|
| **LEC-CSNA-1** | 11.1 |
| **LEC-CSNB-1** | 13.8 |
| **LEC-CSNS-1** | 9.1 |

**Dimensions/Pin Nos.**

| Product no. | W | H | T | U | Pin no. n |
|---|---|---|---|---|---|
| **LEC-CSNA-1** | 39 | 37.2 | 12.7 | 14 | 14 |
| **LEC-CSNB-1** | | 52.4 | | 18 | 26 |
| **LEC-CSNS-1** | | 33.3 | | 14 | 21 |

**Wiring**

LEC-CSNA-1: Pin nos. 1 to 26
LEC-CSNB-1: Pin nos. 1 to 50
LEC-CSNS-1: Pin nos. 1 to 20

| Connector pin no. | | Pair no. of wire | Insulation colour | Dot mark | Dot colour |
|---|---|---|---|---|---|
| A side | 1 | 1 | Orange | ▬ | Red |
| | 2 | | | ▬ | Black |
| | 3 | 2 | Light gray | ▬ | Red |
| | 4 | | | ▬ | Black |
| | 5 | 3 | White | ▬ | Red |
| | 6 | | | ▬ | Black |
| | 7 | 4 | Yellow | ▬ | Red |
| | 8 | | | ▬ | Black |
| | 9 | 5 | Pink | ▬ | Red |
| | 10 | | | ▬ | Black |
| | 11 | 6 | Orange | ▬ ▬ | Red |
| | 12 | | | ▬ ▬ | Black |
| | 13 | 7 | Light gray | ▬ ▬ | Red |
| | 14 | | | ▬ ▬ | Black |
| | 15 | 8 | White | ▬ ▬ | Red |
| | 16 | | | ▬ ▬ | Black |
| | 17 | 9 | Yellow | ▬ ▬ | Red |
| | 18 | | | ▬ ▬ | Black |

| Connector pin no. | | Pair no. of wire | Insulation colour | Dot mark | Dot colour |
|---|---|---|---|---|---|
| A side | 19 | 10 | Pink | ▬ ▬ | Red |
| | 20 | | | ▬ ▬ | Black |
| | 21 | 11 | Orange | ▬ ▬ ▬ | Red |
| | 22 | | | ▬ ▬ ▬ | Black |
| | 23 | 12 | Light gray | ▬ ▬ ▬ | Red |
| | 24 | | | ▬ ▬ ▬ | Black |
| | 25 | 13 | White | ▬ ▬ ▬ | Red |
| | 26 | | | ▬ ▬ ▬ | Black |
| | 27 | 14 | Yellow | ▬ ▬ ▬ | Red |
| | 28 | | | ▬ ▬ ▬ | Black |
| | 29 | 15 | Pink | ▬ ▬ ▬ | Red |
| | 30 | | | ▬ ▬ ▬ | Black |
| | 31 | 16 | Orange | ▬ ▬ ▬ ▬ | Red |
| | 32 | | | ▬ ▬ ▬ ▬ | Black |
| | 33 | 17 | Light gray | ▬ ▬ ▬ ▬ | Red |
| | 34 | | | ▬ ▬ ▬ ▬ | Black |

| Connector pin no. | | Pair no. of wire | Insulation colour | Dot mark | Dot colour |
|---|---|---|---|---|---|
| A side | 35 | 18 | White | ▬ ▬ ▬ ▬ | Red |
| | 36 | | | ▬ ▬ ▬ ▬ | Black |
| | 37 | 19 | Yellow | ▬ ▬ ▬ ▬ | Red |
| | 38 | | | ▬ ▬ ▬ ▬ | Black |
| | 39 | 20 | Pink | ▬ ▬ ▬ ▬ | Red |
| | 40 | | | ▬ ▬ ▬ ▬ | Black |
| | 41 | 21 | Orange | ▬ ▬ ▬ ▬ ▬ | Red |
| | 42 | | | ▬ ▬ ▬ ▬ ▬ | Black |
| | 43 | 22 | Light gray | ▬ ▬ ▬ ▬ ▬ | Red |
| | 44 | | | ▬ ▬ ▬ ▬ ▬ | Black |
| | 45 | 23 | White | ▬ ▬ ▬ ▬ ▬ | Red |
| | 46 | | | ▬ ▬ ▬ ▬ ▬ | Black |
| | 47 | 24 | Yellow | ▬ ▬ ▬ ▬ ▬ | Red |
| | 48 | | | ▬ ▬ ▬ ▬ ▬ | Black |
| | 49 | 25 | Pink | ▬ ▬ ▬ ▬ ▬ | Red |
| | 50 | | | ▬ ▬ ▬ ▬ ▬ | Black |

## Options

### Regeneration option (LECS□, LECSS-T common)

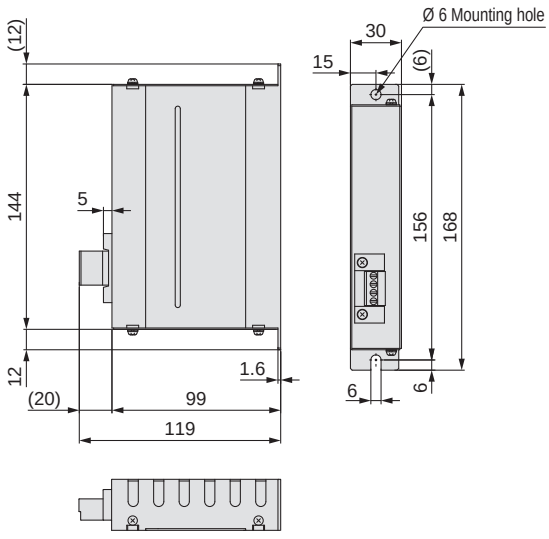
**LEC − MR − RB − 12**

**Regeneration option type**

| | |
|---|---|
| **032** | Allowable regenerative power 30 W |
| **12** | Allowable regenerative power 100 W |

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

**LEC-MR-RB-032**

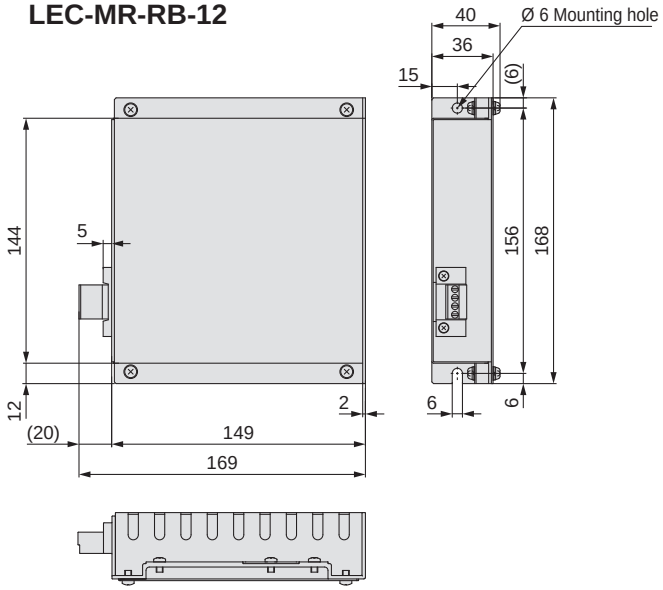



**Weight**

| Product no. | Weight [kg] |
|---|---|
| **LEC-MR-RB-032** | 0.5 |

∗ MR-RB032 manufactured by Mitsubishi Electric Corporation

**LEC-MR-RB-12**




**Weight**

| Product no. | Weight [kg] |
|---|---|
| **LEC-MR-RB-12** | 1.1 |

∗ MR-RB12 manufactured by Mitsubishi Electric Corporation

## Options

LECSA LECSB LECSC LECSS LECSS2-T□
Drivers

USB cable

PC

Setup software
(MR Configurator2™)

### Setup software (MR Configurator2™) (LECSA, LECSB, LECSC, LECSS, LECSS-T common)

**LEC−MRC2□**

**Display language**

| | |
|---|---|
| — | Japanese version |
| E | English version |
| C | Chinese version |

∗ SW1DNC-MRC2-□ manufactured by Mitsubishi Electric Corporation
Refer to Mitsubishi Electric Corporation's website for operating environment and version upgrade information.
MR Configurator2™ is a registered trademark or trademark of Mitsubishi Electric Corporation.

**Adjustment, waveform display, diagnostics, parameter read/write, and test operation can be performed upon a PC.**

### Compatible PC

When using setup software (MR Configurator2™), use an IBM PC/AT compatible PC that meets the following operating conditions.

### Hardware Requirements

| Equipment | | Setup software (MR Configurator2™) **LEC-MRC2□** |
|---|---|---|
| ∗1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PC | OS | Microsoft® Windows® 10 Edition<br>Microsoft® Windows® 10 Enterprise<br>Microsoft® Windows® 10 Pro<br>Microsoft® Windows® 10 Home<br>Microsoft® Windows® 8.1 Enterprise<br>Microsoft® Windows® 8.1 Pro<br>Microsoft® Windows® 8.1<br>Microsoft® Windows® 8 Enterprise<br>Microsoft® Windows® 8 Pro<br>Microsoft® Windows® 8<br>Microsoft® Windows® 7 Ultimate<br>Microsoft® Windows® 7 Enterprise<br>Microsoft® Windows® 7 Professional<br>Microsoft® Windows® 7 Home Premium<br>Microsoft® Windows® 7 Starter<br>Microsoft® Windows Vista® Ultimate<br>Microsoft® Windows Vista® Enterprise<br>Microsoft® Windows Vista® Business<br>Microsoft® Windows Vista® Home Premium<br>Microsoft® Windows Vista® Home Basic<br>Microsoft® Windows® XP Professional, Service Pack 3 or later<br>Microsoft® Windows® XP Home Edition, Service Pack 3 or later |
| | Hard disk | 1 GB or more of free space |
| | Communication interface | Use USB port. |
| Display | | Resolution 1024 x 768 or more<br>Must be capable of high colour (16-bit) display.<br>Connectable with the PC above |
| Keyboard | | Connectable with the PC above |
| Mouse | | Connectable with the PC above |
| Printer | | Connectable with the PC above |
| USB cable∗11 | | LEC-MR-J3USB |

∗1 Before using a PC for setting LECSA point table method/program operation method, upgrade to version 1.18U (Japanese version)/ version 1.19V (English version) or later. Refer to Mitsubishi Electric Corporation's website for version upgrade information.
∗2 Windows® and Windows Vista® are registered trademarks of Microsoft Corporation in the United States and other countries.
∗3 On some PCs, setup software (MR Configurator2™) may not run properly.
∗4 The following functions cannot be used. If any of the following functions is used, this product may not operate normally.
· Start of application in Windows® compatible mode
· Fast User Switching
· Remote Desktop
· Windows XP Mode
· Windows Touch or Touch
· Modern UI
· Client Hyper-V
· Tablet Mode
· Virtual desktop
· 64-bit OSs are not supported, except for Microsoft® Windows®7 or later.
∗5 Multi-display is set, the screen of this product may not operate normally.
∗6 The size of the text or other items on the screen is not changed to the specified value (96 DPI, 100 %, 9 pt, etc.), the screen of this product may not operate normally.
∗7 Changed the resolution of the screen during operating, the screen of this product may not operate normally.
∗8 Please use by "Standard User," "Administrator" in Windows Vista® or later.
∗9 Using a PC for setting Windows® 10, upgrade to version 1.52E or later.
Using a PC for setting Windows® 8.1, upgrade to version 1.25B or later.
Using a PC for setting Windows®8, upgrade to version 1.20W or later.
Refer to Mitsubishi Electric Corporation's website for version upgrade information.
∗10 If .NET Framework 3.5 (including .NET 2.0 and 3.0) have been disabled in Windows® 7 or later, it is necessary to enable it.
∗11 Order USB cable separately.
· This cable is compatible with the setup software (MR Configurator™: LEC-MR-SETUP221□).

### Setup Software Compatible Drivers

| Compatible driver | Setup software | |
|---|---|---|
| | MR Configurator™ | MR Configurator2™ |
| | LEC-MR-SETUP221□ | LEC-MRC2□ |
| **LECSA** | ○ | ○ |
| **LECSB** | ○ | ○ |
| **LECSC** | ○ | ○ |
| **LECSS□-S□** | ○ | ○ |
| **LECSS2-T□** | — | ○ |

## Options

### USB cable (3 m)
### (LECSA, LECSB, LECSC, LECSS, LECSS-T common)

**LEC−MR−J3USB**

* MR-J3USBCBL3M manufactured by Mitsubishi Electric Corporation

Weight: 140 g

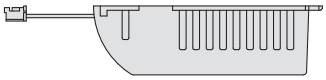
Cable for connecting PC and driver when using the setup software (MR Configurator2™)
Do not use any cable other than this cable.

### Battery (Only for LECSB, LECSC, and LECSS)

**LEC−MR−J3BAT**

* MR-J3BAT manufactured by Mitsubishi Electric Corporation

Battery for replacement
Absolute position data is maintained by installing the battery to the driver.



Weight: 30 g

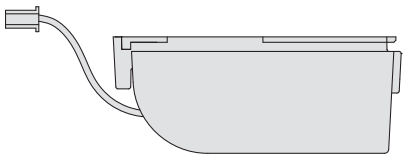
* The LEC-MR-J 3 BAT is a single battery that uses lithium metal battery ER6V.
When transporting lithium metal batteries and devices with built-in lithium metal batteries by a method subject to UN regulations, it is necessary to apply measures according to the regulations stipulated in the United Nations Recommendations on the Transport of Dangerous Goods, the Technical Instructions (ICAO-TI) of the International Civil Aviation Organisation (ICAO), and the International Maritime Dangerous Goods Code (IMDG CODE) of the International Maritime Organisation (IMO). If a customer is transporting products such as shown above, it is necessary to confirm the latest regulations, or the laws and regulations of the country of transport on your own, in order to apply the proper measures. Please contact SMC sales representative for details.

### Battery (Only for LECSS2-T□)

**LEC−MR−BAT6V1SET**

* MR-BAT6V1SET manufactured by Mitsubishi Electric Corporation

Battery for replacement
Absolute position data is maintained by installing the battery to the driver.



Weight: 60 g

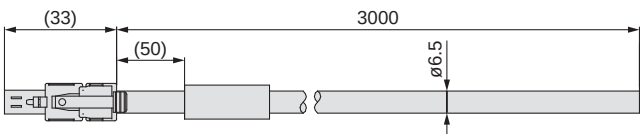
* The LEC-MR-BAT6V1SET is an assembled battery that uses lithium metal battery 2CR17335A.
When transporting lithium metal batteries and devices with built-in lithium metal batteries by a method subject to UN regulations, it is necessary to apply measures according to the regulations stipulated in the United Nations Recommendations on the Transport of Dangerous Goods, the Technical Instructions (ICAO-TI) of the International Civil Aviation Organisation (ICAO), and the International Maritime Dangerous Goods Code (IMDG CODE) of the International Maritime Organisation (IMO). If a customer is transporting products such as shown above, it is necessary to confirm the latest regulations, or the laws and regulations of the country of transport on your own, in order to apply the proper measures. Please contact SMC sales representative for details.

### STO cable (3 m) (Only for LECSS2-T□)

**LEC−MR−D05UDL3M**

* MR-D05UDL3M manufactured by Mitsubishi Electric Corporation

Cable for connecting the driver and device, when using the safety function
Do not use any cable other than this cable.




Weight: 500 g

# *LECS□ Series*
# Specific Product Precautions 1

**Be sure to read this before handling the products. Refer to the back cover for safety instructions. For electric actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu**

## Design / Selection

### ⚠Warning

**1. Be sure to apply the specified voltage.**
Otherwise, malfunction or breakage may occur. If the applied voltage is lower than the specified voltage, it is possible that the load will not be able to be moved due to an internal voltage drop of the driver. Please check the operating voltage before use.

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

**3. Install an emergency stop circuit.**
Please install an emergency stop outside of the enclosure so that the system operation can be stopped immediately and the power supply can be intercepted.

**4. In order to prevent any damage caused by the breakdown or malfunction of the driver and its peripheral devices, a backup system should be established in advance by giving a multiple-layered structure or a fail-safe design to the equipment, etc.**

**5. If a danger of human injury is expected due to abnormal heat generation, smoking, ignition, etc., of the driver and its peripheral devices, cut off the power supply of the product and the system immediately.**

**6. The parameters of the driver are set to initial values. Please change the parameters according to the specifications of the customer's equipment before use. Refer to the operation manual for parameter details.**

## Handling

### ⚠Warning

**1. Do not touch the inside of the driver and its peripheral devices.**
Doing so may cause an electric shock or damage to the driver.

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

**3. Products with damage or those missing any components should not be used.**
An electric shock, fire, or injury may result.

**4. Use only the specified combination between the electric actuator and driver.**
Failure to do so may cause damage to the actuator or the driver.

**5. Be careful not to be hit by workpieces 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 energised and for some time after power has been disconnected, as it is very hot.**
Doing so may lead to a burn due to the high temperature.

**8. Before installation, wiring, and maintenance, the voltage should be checked with a tester 5 minutes after the power supply has been turned off.**
Otherwise, an electric shock, fire, or injury may result.

## Handling

### ⚠Warning

**9. Static electricity may cause malfunction or break the driver. Do not touch the driver while power is supplied.**
When touching the driver 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 an environment containing flammable gas, explosive gas, or corrosive gas.**
It could lead to fire, explosion, or corrosion.

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

**14. Do not use the product in an environment subject to a temperature cycle.**
It will cause failure of the driver 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 sources 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 driven directly, use a product that incorporates a surge absorption element.**

## Installation

### ⚠Warning

**1. Install the driver and its peripheral devices on a fireproof material.**
Direct installation on or near a flammable material may cause a fire.

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

**3. The driver should be mounted on a vertical wall in a vertical direction. Also, be sure not to cover the driver's suction/exhaust ports.**

**4. Install the driver and its peripheral devices on a flat surface.**
If the mounting surface is distorted or uneven, an unacceptable force may be added to the housing, etc., causing problems.

# Specific Product Precautions 2

**Be sure to read this before handling the products. Refer to the back cover for safety instructions. For electric actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu**

### Power Supply

## ⚠Caution

1. **Use a power supply that has low noise between lines and between the power and ground.**
   In cases where noise is high, an isolation transformer should be used.
2. **To prevent lightning surges, appropriate measures should be taken. Ground the surge absorber for lightning separately from the grounding of the driver and its peripheral devices.**

### Wiring

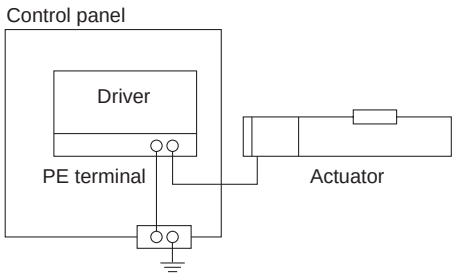
## ⚠Warning

1. **The driver will be damaged if a commercial power supply (100/200 V) is added to the driver's servo motor power (U, V, and W). Be sure to check wiring for mistakes when the power supply is turned on.**
2. **Connect the ends of the U, V, and W wires of the motor cable correctly to the phases (U, V, and W) of the servo motor power. If these wires do not match up, the servo motor cannot be controlled.**

### Grounding

## ⚠Warning

1. **For grounding the actuator, connect the copper wire of the actuator to the driver's protective earth (PE) terminal and connect the copper wire of the driver to the earth via the control panel's protective earth (PE) terminal.**
   **Do not connect them directly to the control panel's protective earth (PE) terminal.**




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

### Maintenance

## ⚠Warning

1. **Perform a maintenance and inspection 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 and inspection.**
   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 ensure 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 driver and its peripheral devices.**
4. **Do not put anything conductive or flammable inside the driver.**
   It may cause a fire.
5. **Do not conduct an insulation resistance test or withstand voltage test on this product.**
6. **Ensure sufficient space for maintenance activities.**
   Design the system allowing the required space for maintenance and inspection.

MECHATROLINK Compatible

# AC Servo Motor Driver
## Absolute Type
## *LECYM/LECYU Series*

(MECHATROLINK-Ⅱ Type) (MECHATROLINK-Ⅲ Type)

LECYM LECYU

CE RoHS

## How to Order

**Driver** **LECY M 2 −** ☐

**Driver type**

| | |
|---|---|
| **M** | MECHATROLINK-Ⅱ type (For absolute encoder) |
| **U** | MECHATROLINK-Ⅲ type (For absolute encoder) |

**Power supply voltage**

| | |
|---|---|
| **2** | 200 to 230 VAC, 50/60 Hz |

∗ **If an I/O connector (CN1) is required, order the part number "LE-CYNA" separately.**
∗ **If an I/O cable (CN1) is required, order the part number "LEC-CSNA-1" separately.**

**Compatible motor type**

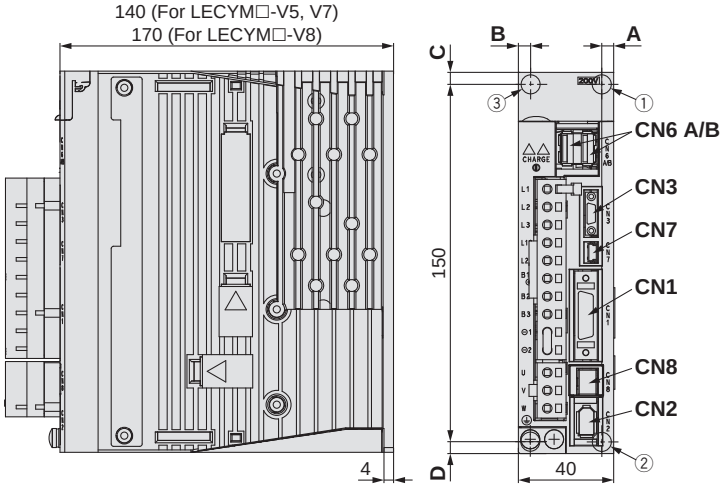
| Symbol | Type | Capacity | Encoder |
|---|---|---|---|
| **V5** | AC servo motor (V6∗1) | 100 W | Absolute |
| **V7** | AC servo motor (V7∗1) | 200 W | |
| **V8** | AC servo motor (V8∗1) | 400 W | |

∗1 The symbol shows the motor type (actuator).

## Dimensions

MECHATROLINK-Ⅱ type

### LECYM2-V☐




| Connector name | Description |
|---|---|
| **CN1** | I/O signal connector |
| **CN2** | Encoder connector |
| **CN3**∗1 | Digital operator connector |
| **CN6A** | MECHATROLINK-Ⅱ communication connector |
| **CN6B** | MECHATROLINK-Ⅱ communication connector |
| **CN7** | PC connector |
| **CN8** | Safety connector |

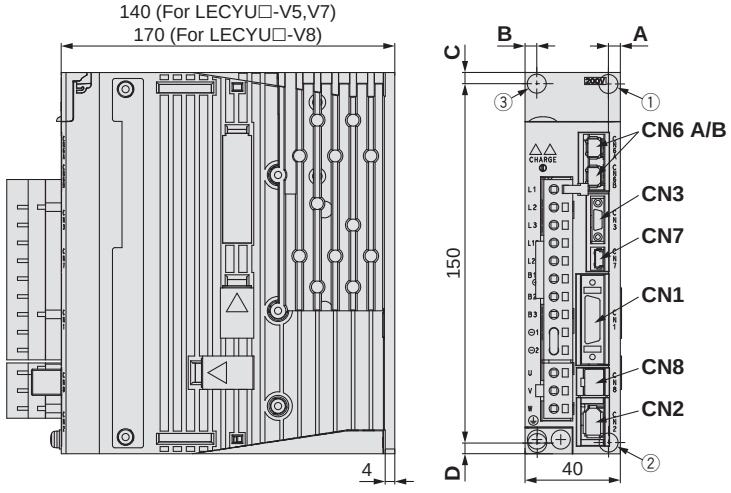
∗1 Digital operator is JUSP-OP05A-1-E manufactured by YASKAWA Electric Corporation. When using the digital operator, it should be provided by the customer.

| Motor capacity | Hole position | Mounting dimensions A | B | C | D | Mounting hole |
|---|---|---|---|---|---|---|
| **V5** (100 W) | ①② | 5 | — | 5 | 5 | Ø 5 |
| **V7** (200 W) | ①② | 5 | — | 5 | 5 | |
| **V8** (400 W) | ②③ | 5 | 5 | 5 | 5 | |

∗ The mounting hole position varies depending on the motor capacity.

MECHATROLINK-Ⅲ type

### LECYU2-V☐




| Connector name | Description |
|---|---|
| **CN1** | I/O signal connector |
| **CN2** | Encoder connector |
| **CN3**∗1 | Digital operator connector |
| **CN6A** | MECHATROLINK-Ⅲ communication connector |
| **CN6B** | MECHATROLINK-Ⅲ communication connector |
| **CN7** | PC connector |
| **CN8** | Safety connector |

∗1 Digital operator is JUSP-OP05A-1-E manufactured by YASKAWA Electric Corporation. When using the digital operator, it should be provided by the customer.

| Motor capacity | Hole position | Mounting dimensions A | B | C | D | Mounting hole |
|---|---|---|---|---|---|---|
| **V5** (100 W) | ①② | 5 | — | 5 | 5 | Ø 5 |
| **V7** (200 W) | ①② | 5 | — | 5 | 5 | |
| **V8** (400 W) | ②③ | 5 | 5 | 5 | 5 | |

∗ The mounting hole position varies depending on the motor capacity.

## Specifications

### MECHATROLINK-Ⅱ Type

| Model | | | LECYM2-V5 | LECYM2-V7 | LECYM2-V8 |
|---|---|---|---|---|---|
| **Compatible motor capacity [W]** | | | 100 | 200 | 400 |
| **Compatible encoder** | | | Absolute 20-bit encoder (Resolution: 1048576 p/rev) | | |
| **Main circuit power supply** | **Power voltage [V]** | | Three phase 200 to 230 VAC (50/60 Hz) | | |
| | **Allowable voltage fluctuation [V]** | | Three phase 170 to 253 VAC | | |
| **Control power supply** | **Power voltage [V]** | | Single phase 200 to 230 VAC (50/60 Hz) | | |
| | **Allowable voltage fluctuation [V]** | | Single phase 170 to 253 VAC | | |
| **Power supply capacity (at rated output) [A]** | | | 0.91 | 1.6 | 2.8 |
| **Input circuit** | | | NPN (Sink circuit)/PNP (Source circuit) | | |
| **Parallel input (7 inputs)** | **Number of optional allocations** | **7 inputs** | [Initial allocation]<br>· Homing deceleration switch (/DEC)<br>· External latch (/EXT 1 to 3)<br>· Forward run prohibited (P-OT), reverse run prohibited (N-OT)<br>[Can be allocated by setting the parameters]<br>· Forward external torque limit (/P-CL), reverse external torque limit (/N-CL)<br>Signal allocations can be performed, and positive and negative logic can be changed. | | |
| **Parallel output (4 outputs)** | Number of fixed allocations | **1 output** | · Servo alarm (ALM) | | |
| | **Number of optional allocations** | **3 outputs** | [Initial allocation]<br>· Lock (/BK)<br>[Can be allocated by setting the parameters]<br>· Positioning completion (/COIN)<br>· Speed limit detection (/VLT)<br>· Speed coincidence detection (/V-CMP)<br>· Rotation detection (/TGON)<br>· Warning (/WARN)<br>· Servo ready (/S-RDY)<br>· Near (/NEAR)<br>· Torque limit detection (/CLT)<br>Signal allocations can be performed, and positive and negative logic can be changed. | | |
| **MECHATROLINK communication** | **Communication protocol** | | MECHATROLINK-Ⅱ | | |
| | **Station address** | | 41H to 5FH | | |
| | **Transmission speed** | | 10 Mbps | | |
| | **Transmission cycle** | | 250 μs, 0.5 ms to 4 ms (Multiples of 0.5 ms) | | |
| | **Number of transmission bytes** | | 17 bytes, 32 bytes | | |
| | **Max. number of stations** | | 30 | | |
| | **Cable length** | | Overall cable length: 50 m or less, Cable length between the stations: 0.5 m or more | | |
| **Command method** | **Control method** | | Position, speed, or torque control with MECHATROLINK-Ⅱ communication | | |
| | **Command input** | | MECHATROLINK-Ⅱ command<br>(Motion, data setting, monitoring, or adjustment) | | |
| **Function** | **Gain adjustment** | | Tuning-less/Advanced auto tuning/One-parameter tuning | | |
| | **Communication setting** | | USB communication, RS-422 communication | | |
| | **Torque limit** | | Internal torque limit, external torque limit, and torque limit by analogue command | | |
| | **Encoder output** | | Phase A, B, Z: Line driver output | | |
| | **Emergency stop** | | CN8 Safety function | | |
| | **Overtravel** | | Dynamic brake stop, deceleration to a stop, or free run to a stop at P-OT or N-OT | | |
| | **Alarm** | | Alarm signal, MECHATROLINK-Ⅱ command | | |
| **Operating temperature range [°C]** | | | 0 to 55 (No freezing) | | |
| **Operating humidity range [%RH]** | | | 90 or less (No condensation) | | |
| **Storage temperature range [°C]** | | | –20 to 85 (No freezing) | | |
| **Storage humidity range [%RH]** | | | 90 or less (No condensation) | | |
| **Insulation resistance [MΩ]** | | | 10 MΩ (500 VDC) | | |
| **Weight [g]** | | | 900 | | 1000 |

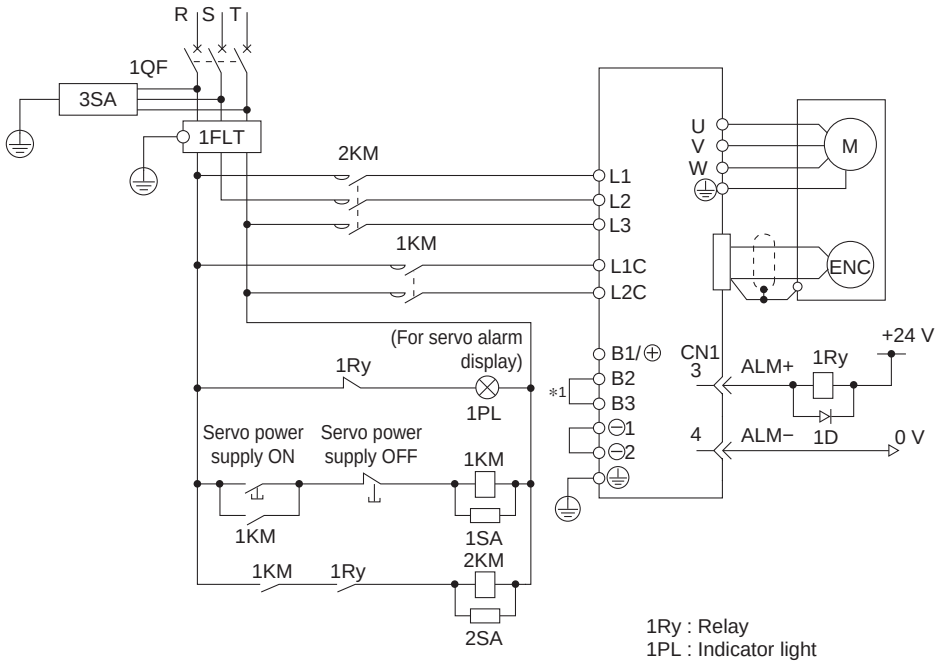
## Specifications

### MECHATROLINK-Ⅲ Type

| Model | | | LECYU2-V5 | LECYU2-V7 | LECYU2-V8 |
|---|---|---|---|---|---|
| Compatible motor capacity [W] | | | 100 | 200 | 400 |
| Compatible encoder | | | Absolute 20-bit encoder (Resolution: 1048576 p/rev) | | |
| Main circuit power supply | Power voltage [V] | | Three phase 200 to 230 VAC (50/60 Hz) | | |
| | Allowable voltage fluctuation [V] | | Three phase 170 to 253 VAC | | |
| Control power supply | Power voltage [V] | | Single phase 200 to 230 VAC (50/60 Hz) | | |
| | Allowable voltage fluctuation [V] | | Single phase 170 to 253 VAC | | |
| Power supply capacity (at rated output) [A] | | | 0.91 | 1.6 | 2.8 |
| Input circuit | | | NPN (Sink circuit)/PNP (Source circuit) | | |
| Parallel input (7 inputs) | Number of optional allocations | 7 inputs | [Initial allocation]<br>· Homing deceleration switch (/DEC)<br>· External latch (/EXT 1 to 3)<br>· Forward run prohibited (P-OT), reverse run prohibited (N-OT)<br>[Can be allocated by setting the parameters]<br>· Forward external torque limit (/P-CL), reverse external torque limit (/N-CL)<br><br>Signal allocations can be performed, and positive and negative logic can be changed. | | |
| Parallel output (4 outputs) | Number of fixed allocations | 1 output | · Servo alarm (ALM) | | |
| | Number of optional allocations | 3 outputs | [Initial allocation]<br>· Lock (/BK)<br>[Can be allocated by setting the parameters]<br>· Positioning completion (/COIN)<br>· Speed limit detection (/VLT)<br>· Speed coincidence detection (/V-CMP)<br>· Rotation detection (/TGON)<br>· Warning (/WARN)<br>· Servo ready (/S-RDY)<br>· Near (/NEAR)<br>· Torque limit detection (/CLT)<br><br>Signal allocations can be performed, and positive and negative logic can be changed. | | |
| MECHATROLINK communication | Communication protocol | | MECHATROLINK-Ⅲ | | |
| | Station address | | 03H to EFH | | |
| | Transmission speed | | 100 Mbps | | |
| | Transmission cycle | | 125 µs, 250 µs, 500 µs, 750 µs, 1 ms to 4 ms (Multiples of 0.5 ms) | | |
| | Number of transmission bytes | | 16 bytes, 32 bytes, 48 bytes | | |
| | Max. number of stations | | 62 | | |
| | Cable length | | Cable length between the stations: 0.5 m or more, 75 m or less | | |
| Command method | Control method | | Position, speed, or torque control with MECHATROLINK-Ⅲ communication | | |
| | Command input | | MECHATROLINK-Ⅲ command<br>(Motion, data setting, monitoring, or adjustment) | | |
| Function | Gain adjustment | | Tuning-less/Advanced auto tuning/One-parameter tuning | | |
| | Communication setting | | USB communication, RS-422 communication | | |
| | Torque limit | | Internal torque limit, external torque limit, and torque limit by analogue command | | |
| | Encoder output | | Phase A, B, Z: Line driver output | | |
| | Emergency stop | | CN8 Safety function | | |
| | Overtravel | | Dynamic brake stop, deceleration to a stop, or free run to a stop at P-OT or N-OT | | |
| | Alarm | | Alarm signal, MECHATROLINK-Ⅲ command | | |
| Operating temperature range [°C] | | | 0 to 55 (No freezing) | | |
| Operating humidity range [%RH] | | | 90 or less (No condensation) | | |
| Storage temperature range [°C] | | | –20 to 85 (No freezing) | | |
| Storage humidity range [%RH] | | | 90 or less (No condensation) | | |
| Insulation resistance [MΩ] | | | 10 MΩ (500 VDC) | | |
| Weight [g] | | | 900 | | 1000 |

## Power Supply Wiring Example: LECY□

### ■Three phase 200 V LECYM2-□ LECYU2-□




1QF : Molded-case circuit breaker
1FLT: Noise filter
1KM : Magnetic contactor (for control power supply)
2KM : Magnetic contactor (for main circuit power supply)

1Ry : Relay
1PL : Indicator light
1SA : Surge absorber
2SA : Surge absorber
3SA : Surge absorber
1D : Flywheel diode

∗1 For the LECY□2-V5, LECY□2-V7 and LECY□2-V8, terminals B2 and B3 are not short-circuited. Do not short-circuit these terminals.

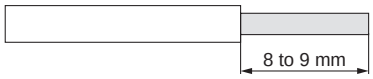
### Main Circuit Power Supply Connector ∗ Accessory

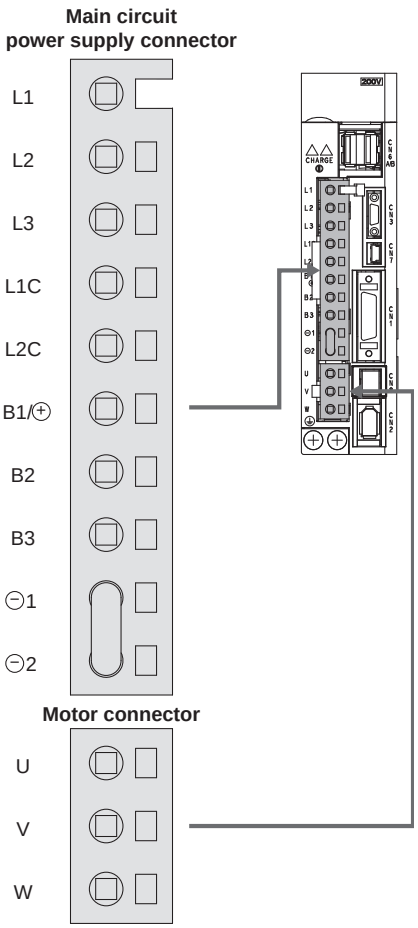
| Terminal name | Function | Details |
|---|---|---|
| L1 | Main circuit power supply | Connect the main circuit power supply.<br>Single phase 200 to 230 VAC, 50/60 Hz Connection terminal: L1, L2<br>Three phase 200 to 230 VAC, 50/60 Hz Connection terminal: L1, L2, L3 |
| L2 | | |
| L3 | | |
| L1C | Control power supply | Connect the control power supply.<br>Single phase 200 to 230 VAC, 50/60 Hz Connection terminal: L1C, L2C |
| L2C | | |
| B1/⊕ | External regenerative resistor connection terminal | When the regenerative resistor is required, connect it between terminals B1⊕ and B2. |
| B2 | | |
| B3 | | |
| ⊖1 | Main circuit negative terminal | ⊖1 and ⊖2 are connected at shipment. |
| ⊖2 | | |

### Motor Connector ∗ Accessory

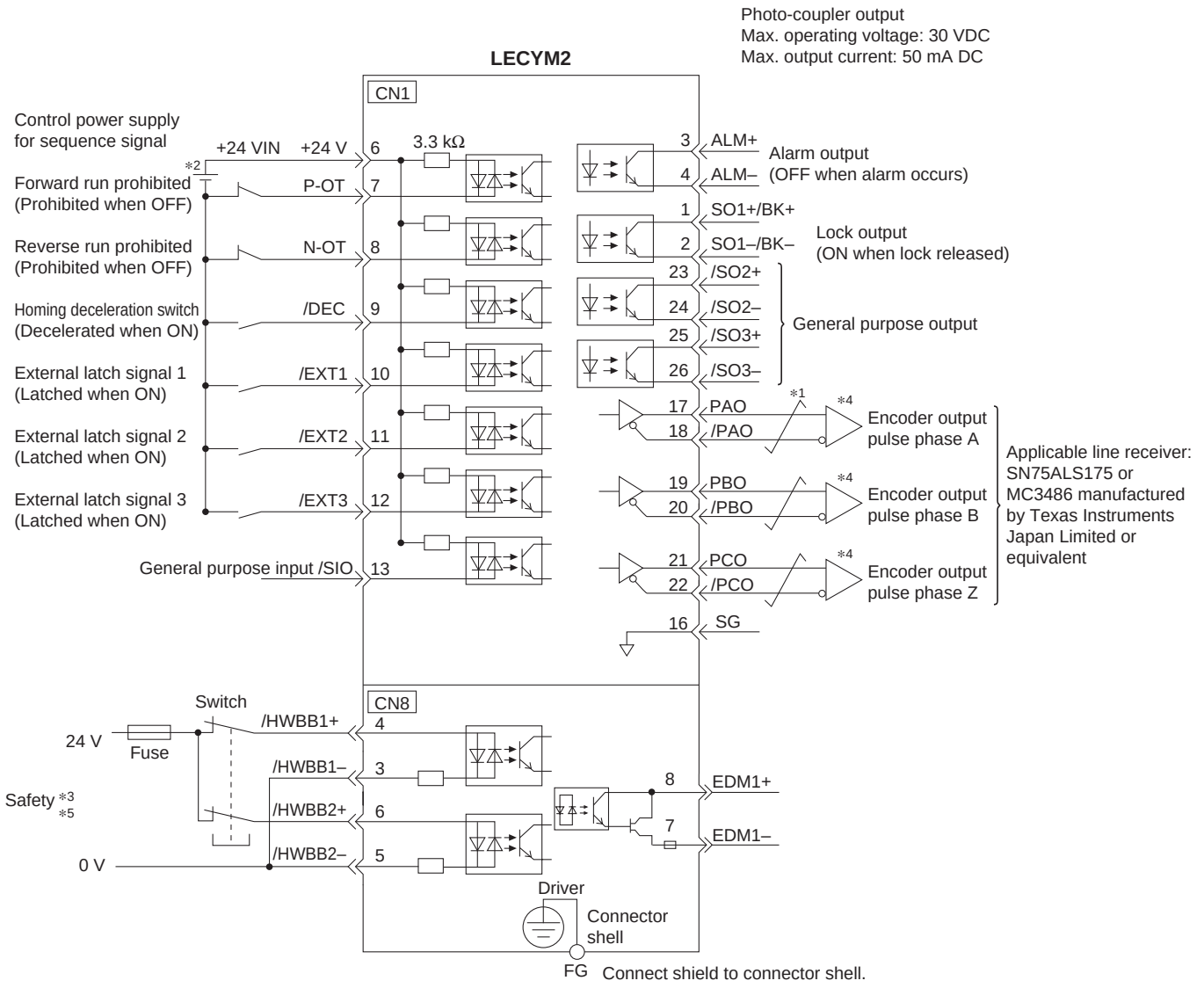
| Terminal name | Function | Details |
|---|---|---|
| U | Servo motor power (U) | Connect to motor cable (U, V, W). |
| V | Servo motor power (V) | |
| W | Servo motor power (W) | |

### Power Supply Wire Specifications

| Item | Specifications |
|---|---|
| Applicable wire size | L1, L2, L3, L1C, L2C<br>Single wire, Twisted wire, AWG14 (2.0 mm$^2$) |
| Stripped wire length |  |



## Control Signal Wiring Example: LECYM




∗1 ⫽ shows twisted-pair wires.

∗2 The 24 VDC power supply is not included. Use a 24 VDC power supply with double insulation or reinforced insulation.

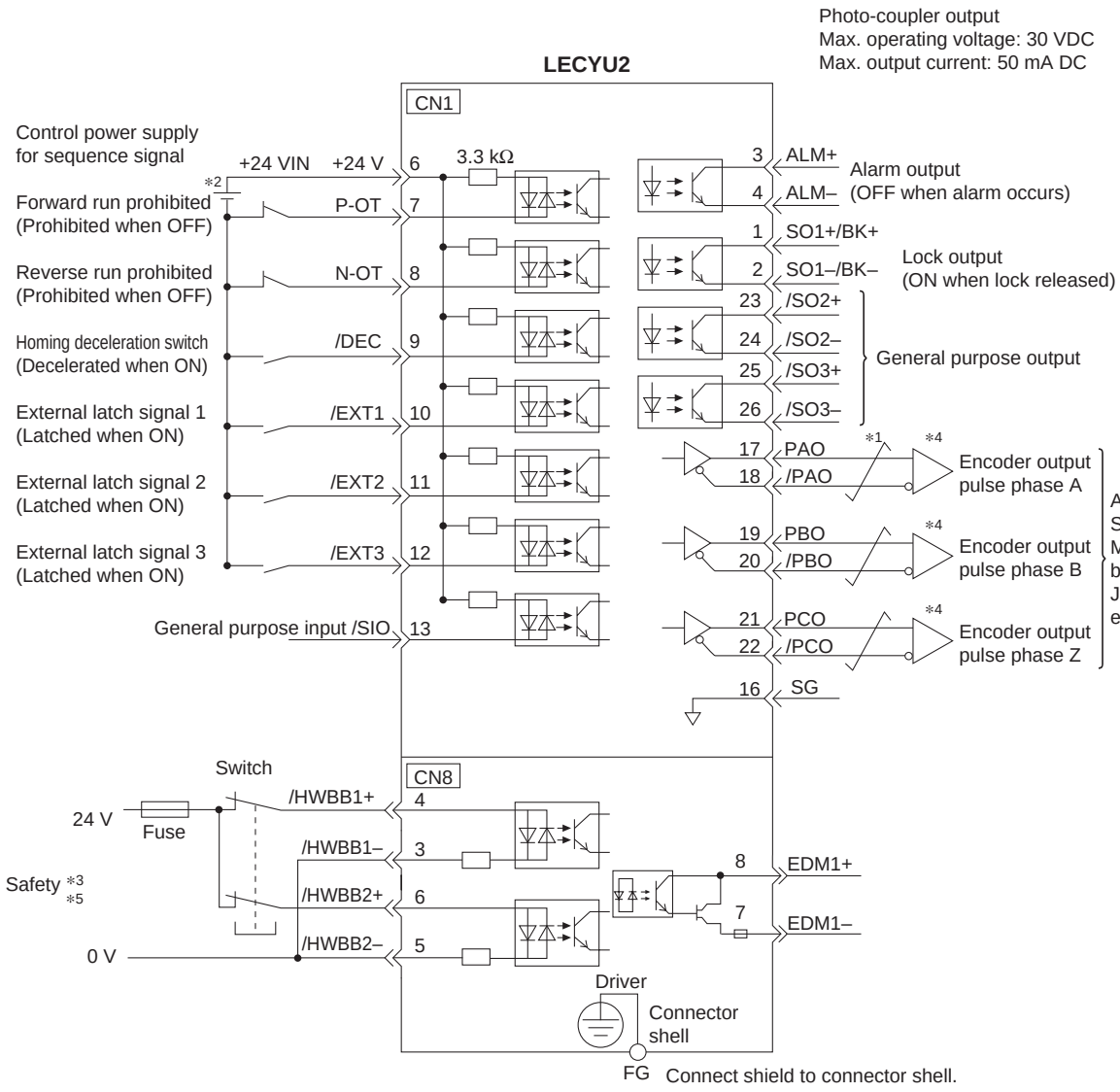
∗3 When using the safety function, a safety function device must be connected to the wiring that is necessary to activate the safety function. Otherwise, the servo motor is not turned ON. When not using the safety function, use the driver with the Safety Jumper Connector (provided as an accessory) inserted into the CN8.

∗4 Always use line receivers to receive the output signals.

∗∗ The functions allocated to the input signals /DEC, P-OT, N-OT, /EXT 1 , /EXT 2 and /EXT 3 , and the output signals /SO 1 , /SO 2 and /SO 3 can be changed by setting the parameters.

∗5 It is a safety function equivalent to the STO function (IEC 61800-5-2) using the hard wire base block function (HWBB).

## Control Signal Wiring Example: LECYU




∗1 ⫽ shows twisted-pair wires.
∗2 The 24 VDC power supply is not included. Use a 24 VDC power supply with double insulation or reinforced insulation.
∗3 When using the safety function, a safety function device must be connected to the wiring that is necessary to activate the safety function. Otherwise, the servo motor is not turned ON. When not using the safety function, use the driver with the Safety Jumper Connector (provided as an accessory) inserted into the CN8.
∗4 Always use line receivers to receive the output signals.
∗∗ The functions allocated to the input signals /DEC, P-OT, N-OT, /EXT 1 , /EXT 2 and /EXT 3 , and the output signals /SO 1 , /SO 2 and /SO 3 can be changed by setting the parameters.
∗5 It is a safety function equivalent to the STO function (IEC 61800-5-2) using the hard wire base block function (HWBB).

## Options

### Motor cable, Motor cable for lock option, Encoder cable (LECYM/LECYU common)

**LE − CY M − S 5 A − 5**

**Motor type**

| | |
|---|---|
| Y | AC servo motor |

**Cable description**

| | |
|---|---|
| M | Motor cable |
| B | Motor cable for lock option |
| E | Encoder cable (With battery case) |

**Cable type**

| | |
|---|---|
| S | Standard cable |
| R | Robotic cable |

**Cable length (L) [m]**

| | |
|---|---|
| 3 | 3 |
| 5 | 5 |
| A | 10 |
| C | 20 |

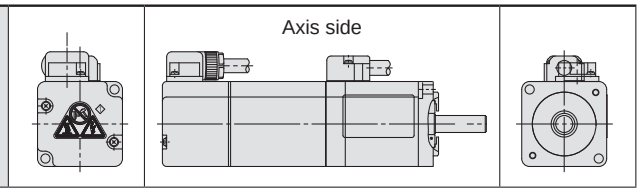
**Motor capacity**

| | |
|---|---|
| 5 | 100 W |
| 7 | 200/400 W |

∗ For encoder cable, the suffix "–□" (Motor capacity) is not necessary.

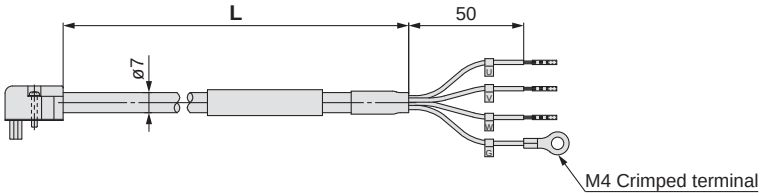
**Direction of connector**

A




∗ The cable entry direction is axis side only.

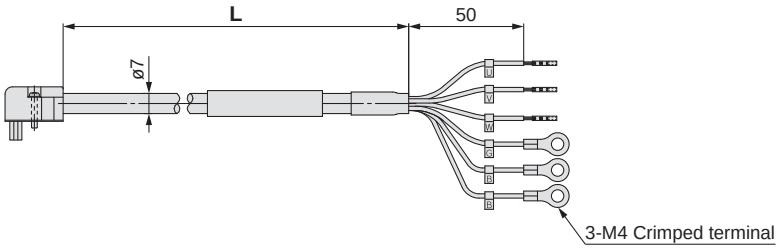
### LE-CYM-□□A-□: Motor cable




**Weight**

| Product no. | Length [m] | Weight [g] | Note |
|---|---|---|---|
| **LE-CYM-S3A-5** | 3 | 250 | 100 W |
| **LE-CYM-S5A-5** | 5 | 390 | |
| **LE-CYM-SAA-5** | 10 | 750 | |
| **LE-CYM-SCA-5** | 20 | 1500 | |
| **LE-CYM-S3A-7** | 3 | 250 | 200/ 400 W |
| **LE-CYM-S5A-7** | 5 | 390 | |
| **LE-CYM-SAA-7** | 10 | 750 | |
| **LE-CYM-SCA-7** | 20 | 1500 | |
| **LE-CYM-R3A-5** | 3 | 220 | 100 W |
| **LE-CYM-R5A-5** | 5 | 350 | |
| **LE-CYM-RAA-5** | 10 | 670 | |
| **LE-CYM-RCA-5** | 20 | 1300 | |
| **LE-CYM-R3A-7** | 3 | 220 | 200/ 400 W |
| **LE-CYM-R5A-7** | 5 | 350 | |
| **LE-CYM-RAA-7** | 10 | 670 | |
| **LE-CYM-RCA-7** | 20 | 1300 | |

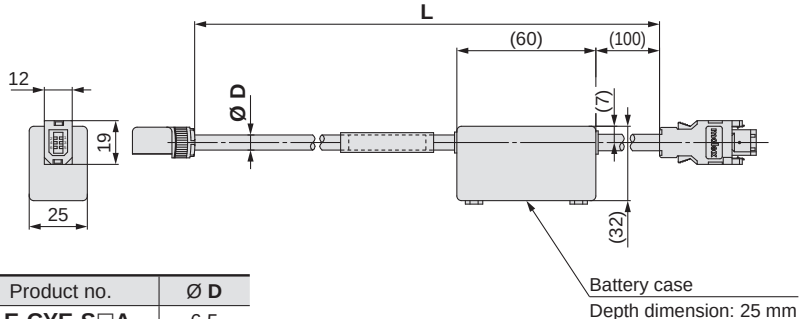
### LE-CYB-□□A-□: Motor cable for lock option




**Weight**

| Product no. | Length [m] | Weight [g] | Note |
|---|---|---|---|
| **LE-CYB-S3A-5** | 3 | 240 | 100 W |
| **LE-CYB-S5A-5** | 5 | 390 | |
| **LE-CYB-SAA-5** | 10 | 750 | |
| **LE-CYB-SCA-5** | 20 | 1490 | |
| **LE-CYB-S3A-7** | 3 | 240 | 200/ 400 W |
| **LE-CYB-S5A-7** | 5 | 390 | |
| **LE-CYB-SAA-7** | 10 | 750 | |
| **LE-CYB-SCA-7** | 20 | 1490 | |
| **LE-CYB-R3A-5** | 3 | 220 | 100 W |
| **LE-CYB-R5A-5** | 5 | 350 | |
| **LE-CYB-RAA-5** | 10 | 670 | |
| **LE-CYB-RCA-5** | 20 | 1300 | |
| **LE-CYB-R3A-7** | 3 | 220 | 200/ 400 W |
| **LE-CYB-R5A-7** | 5 | 350 | |
| **LE-CYB-RAA-7** | 10 | 670 | |
| **LE-CYB-RCA-7** | 20 | 1300 | |

### LE-CYE-□□A: Encoder cable




| Product no. | Ø D |
|---|---|
| **LE-CYE-S□A** | 6.5 |
| **LE-CYE-R□A** | 6.8 |

**Weight**

| Product no. | Length [m] | Weight [g] |
|---|---|---|
| **LE-CYE-S3A** | 3 | 230 |
| **LE-CYE-S5A** | 5 | 360 |
| **LE-CYE-SAA** | 10 | 680 |
| **LE-CYE-SCA** | 20 | 1250 |
| **LE-CYE-R3A** | 3 | 220 |
| **LE-CYE-R5A** | 5 | 330 |
| **LE-CYE-RAA** | 10 | 660 |
| **LE-CYE-RCA** | 20 | 1240 |

∗ LE-CYM-S□A-□ is JZSP-CSM0□-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
LE-CYB-S□A-□ is JZSP-CSM1□-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
LE-CYE-S□A is JZSP-CSP05-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
LE-CYM-R□A-□ is JZSP-CSM2□-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
LE-CYB-R□A-□ is JZSP-CSM3□-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
LE-CYE-R□A is JZSP-CSP25-□□-E manufactured by YASKAWA CONTROLS CO., LTD.

## Options

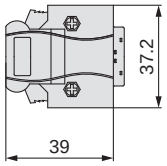
### I/O connector (Without cable, Connector only)

**LE − CYN A**

**Driver type**

| | |
|---|---|
| A | For LECYM2, LECYU2 |

**LE-CYNA**




∗ LE-CYNA: 10126-3000PE (connector)/10326-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
∗ Conductor size: AWG24 to 30

### I/O cable

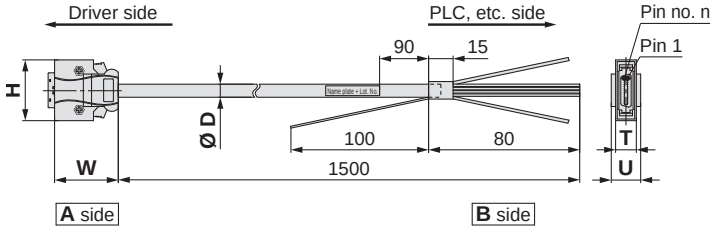
**LEC − CSN A − 1**

**Driver type**

| | |
|---|---|
| A | For LECYM2, LECYU2 |

**Cable length (L) [m]**

| | |
|---|---|
| 1 | 1.5 |




∗ LEC-CSNA-1: 10126-3000PE (connector)/10326-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
∗ Conductor size: AWG24

**Wiring**

LEC-CSNA-1: Pin nos. 1 to 26

| Connector pin no. | | Pair no. of wire | Insulation colour | Dot mark | Dot colour |
|---|---|---|---|---|---|
| A side | 1 | 1 | Orange | ▬ | Red |
| | 2 | | | ▬ | Black |
| | 3 | 2 | Light gray | ▬ | Red |
| | 4 | | | ▬ | Black |
| | 5 | 3 | White | ▬ | Red |
| | 6 | | | ▬ | Black |
| | 7 | 4 | Yellow | ▬ | Red |
| | 8 | | | ▬ | Black |
| | 9 | 5 | Pink | ▬ | Red |
| | 10 | | | ▬ | Black |

| Connector pin no. | | Pair no. of wire | Insulation colour | Dot mark | Dot colour |
|---|---|---|---|---|---|
| A side | 11 | 6 | Orange | ▬ ▬ | Red |
| | 12 | | | ▬ ▬ | Black |
| | 13 | 7 | Light gray | ▬ ▬ | Red |
| | 14 | | | ▬ ▬ | Black |
| | 15 | 8 | White | ▬ ▬ | Red |
| | 16 | | | ▬ ▬ | Black |
| | 17 | 9 | Yellow | ▬ ▬ | Red |
| | 18 | | | ▬ ▬ | Black |
| | 19 | 10 | Pink | ▬ ▬ | Red |
| | 20 | | | ▬ ▬ | Black |

| Connector pin no. | | Pair no. of wire | Insulation colour | Dot mark | Dot colour |
|---|---|---|---|---|---|
| A side | 21 | 11 | Orange | ▬ ▬ ▬ | Red |
| | 22 | | | ▬ ▬ ▬ | Black |
| | 23 | 12 | Light gray | ▬ ▬ ▬ | Red |
| | 24 | | | ▬ ▬ ▬ | Black |
| | 25 | 13 | White | ▬ ▬ ▬ | Red |
| | 26 | | | ▬ ▬ ▬ | Black |

**Cable O.D.**

| Product no. | Ø D |
|---|---|
| LEC-CSNA-1 | 11.1 |

**Dimensions/Pin No.**

| Product no. | W | H | T | U | Pin no. n |
|---|---|---|---|---|---|
| LEC-CSNA-1 | 39 | 37.2 | 12.7 | 14 | 14 |

## Options

### MECHATROLINK cable type

**LEC−CY M − 1**

**Motor type**

| | |
|---|---|
| Y | AC servo motor |

**Cable description**

| | |
|---|---|
| M | MECHATROLINK-Ⅱ cable |
| U | MECHATROLINK-Ⅲ cable |

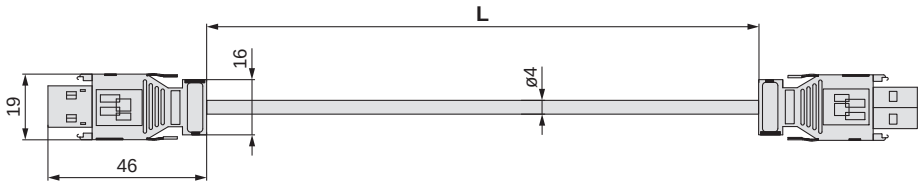
**Cable length (L)**

| | |
|---|---|
| L*1 | 0.2 m |
| J | 0.5 m |
| 1 | 1 m |
| 3 | 3 m |

*1 Not available for the MECHATROLINK-Ⅱ cable

* LEC-CYM-□ is JEPMC-W6002-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
* LEC-CYU-□ is JEPMC-W6012-□□-E manufactured by YASKAWA CONTROLS CO., LTD.

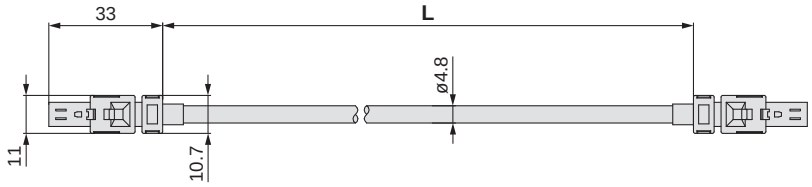
### MECHATROLINK-Ⅱ cable




**Weight**

| Product no. | Length [m] | Weight [g] |
|---|---|---|
| **LE-CYM-J** | 0.5 | 50 |
| **LE-CYM-1** | 1 | 80 |
| **LE-CYM-3** | 3 | 200 |

### MECHATROLINK-Ⅲ cable



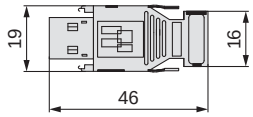

**Weight**

| Product no. | Length [m] | Weight [g] |
|---|---|---|
| **LE-CYU-L** | 0.2 | 21 |
| **LE-CYU-J** | 0.5 | 41 |
| **LE-CYU-1** | 1 | 75 |
| **LE-CYU-3** | 3 | 205 |

### Terminating connector for MECHATROLINK-Ⅱ

**LEC−CYRM**

* LEC-CYRM is JEPMC-W6022-E manufactured by YASKAWA CONTROLS CO., LTD.




Weight: 10 g

## Options

**LECYM2 LECYU2**
Drivers

USB cable

PC

### Setup software (SigmaWin+™) (LECYM/LECYU common)

∗ Please download the SigmaWin+™ via our website.
SigmaWin+™ is a registered trademark or trademark of YASKAWA Electric Corporation.

**Adjustment, waveform display, parameter read/write, and test operation can be performed upon a PC.**

### Compatible PC

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

### Hardware Requirements

| Equipment | | Setup software (SigmaWin+™) |
|---|---|---|
| PC ∗1, 2, 3, 4 | OS | Windows® XP∗5, Windows Vista®, Windows® 7 (32-bit/64-bit) |
| | Available HD space | 350 MB or more (When the software is installed, 400 MB or more is recommended.) |
| | Communication interface | Use USB port. |
| Display | | XVGA monitor (1024 x 768 or more, "The small font is used.")<br>256 colour or more (65536 colour or more is recommended.)<br>Connectable with the PC above |
| Keyboard | | Connectable with the PC above |
| Mouse | | Connectable with the PC above |
| Printer | | Connectable with the PC above |
| USB cable | | LEC-JZ-CVUSB∗6 |
| Other | | Adobe Reader Ver. 5.0 or higher (∗ Except Ver. 6.0) |

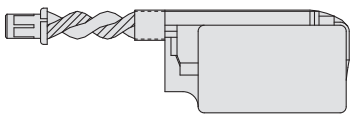
∗1 Windows, Windows Vista®, Windows® 7 are registered trademarks of Microsoft Corporation in the United States and/or other countries.
∗2 On some PCs, this software may not run properly.
∗3 Not compatible with 64-bit Windows® XP and 64-bit Windows Vista®
∗4 For Windows® XP, please use it by the administrator authority (When installing and using it.).
∗5 In PC that uses the program to correct the problem of HotfixQ328310, it is likely to fail in the installation. In that case, please use the program to correct the problem of HotfixQ329623.
∗6 Order USB cable separately.

### Battery (LECYM/LECYU common)

## LEC−JZ−CVBAT

∗ JZSP-BA01 manufactured by YASKAWA CONTROLS CO., LTD.

Battery for replacement
Absolute position data is maintained by installing the battery to the battery case of the encoder cable.



Weight: 10 g

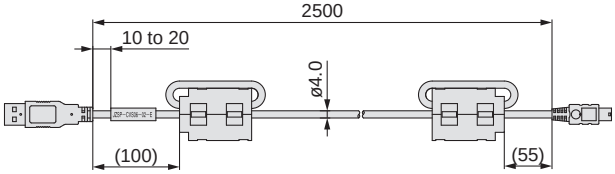
∗ The LEC-JZ-CVBAT is a single battery that uses lithium metal battery ER3V.
When transporting lithium metal batteries and devices with built-in lithium metal batteries by a method subject to UN regulations, it is necessary to apply measures according to the regulations stipulated in the United Nations Recommendations on the Transport of Dangerous Goods, the Technical Instructions (ICAO-TI) of the International Civil Aviation Organisation (ICAO), and the International Maritime Dangerous Goods Code (IMDG CODE) of the International Maritime Organisation (IMO). If a customer is transporting products such as shown above, it is necessary to confirm the latest regulations, or the laws and regulations of the country of transport on your own, in order to apply the proper measures. Please contact SMC sales representative for details.

### USB cable (2.5 m)

## LEC−JZ−CVUSB

∗ JZSP-CVS06-02-E manufactured by YASKAWA CONTROLS CO., LTD.

Cable for connecting PC and driver when using the setup software (SigmaWin+™)
Do not use any cable other than this cable.



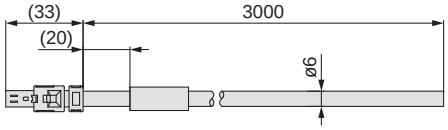

Weight: 150 g

### Cable for safety function device (3 m)

## LEC−JZ−CVSAF

∗ JZSP-CVH03-03-E manufactured by YASKAWA CONTROLS CO., LTD.

Cable for connecting the driver and device when using the safety function
Do not use any cable other than this cable.




Weight: 160 g

# *LECYM/LECYU Series*
# AC Servo Motor Driver
# Specific Product Precautions 1

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For electric actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu

## Design / Selection

### ⚠Warning

**1. Be sure to apply the specified voltage.**
Otherwise, malfunction or breakage may occur. If the applied voltage is lower than the specified voltage, it is possible that the load will not be able to be moved due to an internal voltage drop of the driver. Please check the operating voltage before use.

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

**3. Install an emergency stop circuit.**
Please install an emergency stop outside of the enclosure so that the system operation can be stopped immediately and the power supply can be intercepted.

**4. In order to prevent any damage caused by the breakdown or malfunction of the driver and its peripheral devices, a backup system should be established in advance by giving a multiple-layered structure or a fail-safe design to the equipment, etc.**

**5. If a danger of human injury is expected due to abnormal heat generation, smoking, ignition, etc., of the driver and its peripheral devices, cut off the power supply of the product and the system immediately.**

## Handling

### ⚠Warning

**1. Do not touch the inside of the driver and its peripheral devices.**
Doing so may cause an electric shock or damage to the driver.

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

**3. Products with damage or those missing any components should not be used.**
An electric shock, fire, or injury may result.

**4. Use only the specified combination between the electric actuator and driver.**
Failure to do so may cause damage to the actuator or the driver.

**5. Be careful not to be hit by workpieces 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 energised and for some time after power has been disconnected, as it is very hot.**
Doing so may lead to a burn due to the high temperature.

**8. Before installation, wiring, and maintenance, the voltage should be checked with a tester 5 minutes after the power supply has been turned off.**
Otherwise, an electric shock, fire, or injury may result.

## Handling

### ⚠Warning

**9. Static electricity may cause malfunction or break the driver. Do not touch the driver while power is supplied.**
When touching the driver 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 an environment containing flammable gas, explosive gas, or corrosive gas.**
It could lead to fire, explosion, or corrosion.

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

**14. Do not use the product in an environment subject to a temperature cycle.**
It will cause failure of the driver 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 sources 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 driven directly, use a product that incorporates a surge absorption element.**

## Installation

### ⚠Warning

**1. Install the driver and its peripheral devices on a fireproof material.**
Direct installation on or near a flammable material may cause a fire.

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

**3. The driver should be mounted on a vertical wall in a vertical direction. Also, be sure not to cover the driver's suction/exhaust ports.**

**4. Install the driver and its peripheral devices on a flat surface.**
If the mounting surface is distorted or uneven, an unacceptable force may be added to the housing, etc., causing problems.

# *LECYM/LECYU Series*
# AC Servo Motor Driver
# Specific Product Precautions 2

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For electric actuator and auto switch precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smc.eu

### Power Supply

## ⚠Caution

1. **Use a power supply that has low noise between lines and between the power and ground.**
   In cases where noise is high, an isolation transformer should be used.
2. **To prevent lightning surges, appropriate measures should be taken. Ground the surge absorber for lightning separately from the grounding of the driver and its peripheral devices.**

### Wiring

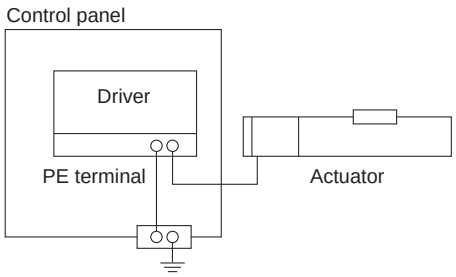
## ⚠Warning

1. **The driver will be damaged if a commercial power supply (100/200 V) is added to the driver's servo motor power (U, V, and W). Be sure to check wiring for mistakes when the power supply is turned on.**
2. **Connect the ends of the U, V, and W wires of the motor cable correctly to the phases (U, V, and W) of the servo motor power. If these wires do not match up, the servo motor cannot be controlled.**

### Grounding

## ⚠Warning

1. **For grounding the actuator, connect the copper wire of the actuator to the driver's protective earth (PE) terminal and connect the copper wire of the driver to the earth via the control panel's protective earth (PE) terminal.**
   **Do not connect them directly to the control panel's protective earth (PE) terminal.**




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

### Maintenance

## ⚠Warning

1. **Perform a maintenance and inspection 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 and inspection.**
   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 ensure 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 driver and its peripheral devices.**
4. **Do not put anything conductive or flammable inside the driver.**
   It may cause a fire.
5. **Do not conduct an insulation resistance test or withstand voltage test on this product.**
6. **Ensure sufficient space for maintenance activities.**
   Design the system allowing the required space for maintenance and inspection.

## ⚠ Safety Instructions

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

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

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

## ⚠ Warning

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

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

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

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

## ⚠ Caution

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

# Limited warranty and Disclaimer/Compliance Requirements

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

## Limited warranty and Disclaimer

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

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

## Compliance Requirements

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

## ⚠ Caution

**SMC products are not intended for use as instruments for legal metrology.**
Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.
Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

## Revision History

| | | |
|---|---|---|
| **Edition C** | - The in-line motor type LEYD series has been added.<br>- The guide rod type LEYG series has been added.<br>- The guide rod type/in-line motor type LEYGD series has been added.<br>- The LECP1 series programless controller has been added.<br>- A standard cable has been added to the actuator cable types.<br>- The AC servo motor (100/200 W) type LEYS series has been added.<br>- The LECSA/LECSB series AC servo motor driver has been added.<br>- Number of pages has been increased from 38 to 94. | PY |
| **Edition D** | - Size 40 has been added to the LEY/LEYG series step motor (servo/24 VDC).<br>- Size 63 has been added to the AC servo motor rod type LEY series.<br>- The dust-tight/water-jet-proof specification has been added to the rod type.<br>- Sizes 25 and 32 have been added to the AC servo motor guide rod type LEYG series.<br>- The LECPA series step motor driver has been added.<br>- The LEC-G series gateway unit has been added.<br>- The LECSC/LECSS series AC servo motor driver has been added.<br>- UL-compliant products have been added.<br>- The controller setting kit (LEC-W2) has been changed.<br>- Number of pages has been increased from 94 to 160. | RP |
| **Edition E** | - Intermediate strokes have been added to the LEY63.<br>- Normally-closed solid state auto switches have been added.<br>- The JXC series step motor controller has been added.<br>- The controller setting kit has been changed to the communication cable for controller setting (LEC-W2A).<br>- Errors in text have been corrected.<br>- Number of pages has been increased from 160 to 286. | YR |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