

# Electric Actuator

## High Performance Slide Table/ High Precision Type

Battery-less Absolute (Step Motor 24 VDC)

**New**

CE UK  
CA

\* For details, refer to page 47 and onward.

RoHS

## Reduces cycle time

### Cycle time

Reduced by **39%** (0.37 s ← 0.61 s)  
compared with the existing model<sup>\*1</sup>

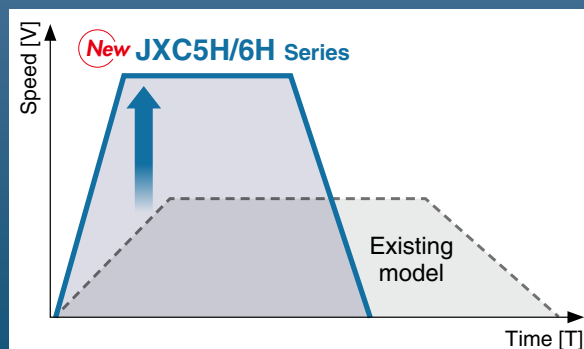
<sup>\*1</sup> When LESYH25DGA-150 is operated from 0 to 150 mm

### Acceleration/ Deceleration

**10000 mm/s<sup>2</sup>**  
(200% increase compared with the existing model)

### Max. speed

**800 mm/s**  
(Improved by 200% compared with the existing model)



Improved positioning repeatability due to the adoption of a ball screw drive.

Positioning repeatability **±0.01 mm**

Lost motion **0.1 mm or less**

Battery-less absolute encoder compatible

### High Performance Step Motor Controller

Higher acceleration and max. speed can be set with the special controller.

Parallel I/O

JXC5H/6H Series p. 33



EtherCAT/EtherNet/IP™/  
PROFINET

JXCEH/9H/PH Series p. 40



**LESYH□G Series**

**SMC**

CAT.ES100-149A

# Battery-less Absolute Encoder Type

## Restart from the last stop position is possible after recovery of the power supply.

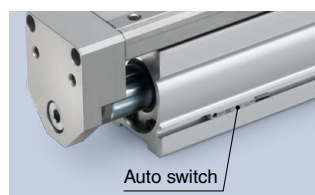
The position information is held by the encoder even when the power supply is turned off. A return to origin operation is not necessary when the power supply is recovered.

### Auto switches are mountable.

#### 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. For details, refer to pages 25 to 27.



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

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

A **green** light lights up when within the optimum operating range.

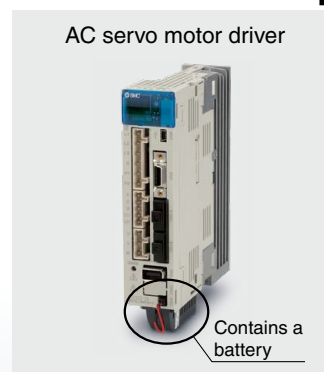


### Maintenance labor can be reduced as the product does not require the use of batteries.

Batteries are not required to store the position information.  
Therefore, there is no need to store spare batteries or to recycle and replace dead batteries.



Does not contain a battery



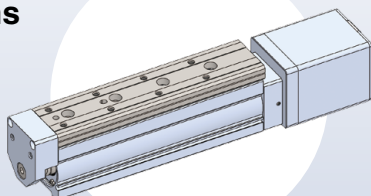
AC servo motor driver

Contains a battery

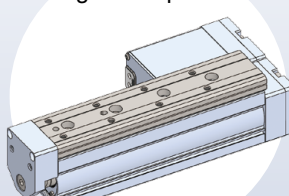
### Motor mounting position

Select from 3 directions

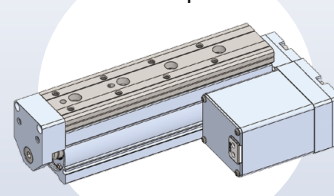
In-line



Right side parallel

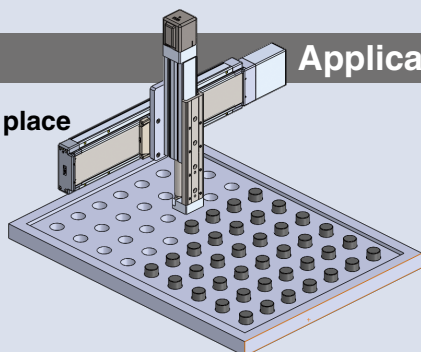


Left side parallel

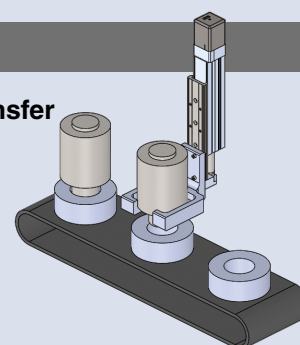


### Application examples

• For pick and place operations



• For vertical transfer (Z axis)



# Step Data Input Type **JXC5H/6H Series** p. 33

## Simple setting allows for immediate use!

### ◎ “Easy Mode” for simple setting

For immediate use, select “Easy Mode.”

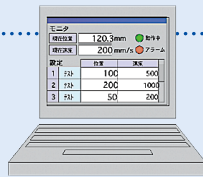
Step motor  
(Servo/24 VDC)

**JXC5H/6H**



#### <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.



The screenshot shows the 'Easy Mode' window with various tabs like 'Test Mode', 'RTN ORG', 'Stop', and 'Servo ON'. It includes fields for 'Step No.', 'Position', 'Speed', and 'Force'. A table lists step data with columns for 'No.', 'Move M', 'Speed', 'Position', 'PushingF', 'PushingSp', and 'In Pos'. At the bottom, there are controls for 'Move Speed' and 'Move distance'.

Setting of jog and speed of the constant rate

Jogging

Start testing

Step data setting

Move for the constant rate

#### <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

1st screen

|            |             |            |
|------------|-------------|------------|
| データ DATA   | モニタ MONITOR | テスト TEST   |
| アラーム ALARM | ジョグ JOG     | 設定 SETTING |

2nd screen

|          |           |
|----------|-----------|
| Step     | Axis 1    |
| Step No. | 0         |
| Posn     | 123.45 mm |
| Speed    | 100 mm/s  |

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

#### Example of checking the operation status

1st screen

|            |             |            |
|------------|-------------|------------|
| データ DATA   | モニタ MONITOR | テスト TEST   |
| アラーム ALARM | ジョグ JOG     | 設定 SETTING |

2nd screen

|          |          |
|----------|----------|
| Monitor  | Axis 1   |
| Step No. | 1        |
| Posn     | 12.34 mm |
| Speed    | 10 mm/s  |

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 |

## Step Data Input Type **JXC5H/6H** Series

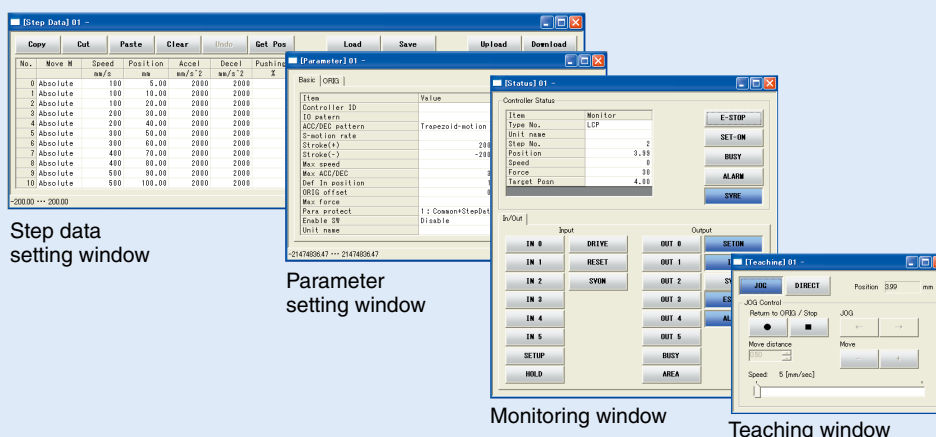
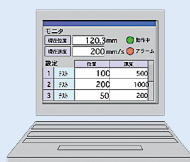
### “Normal Mode” for detailed setting

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.

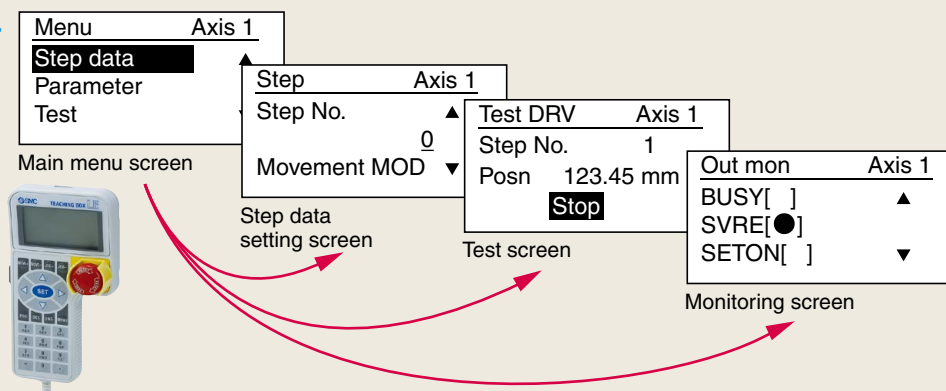


#### <When a TB (teaching box) is used>

- 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.

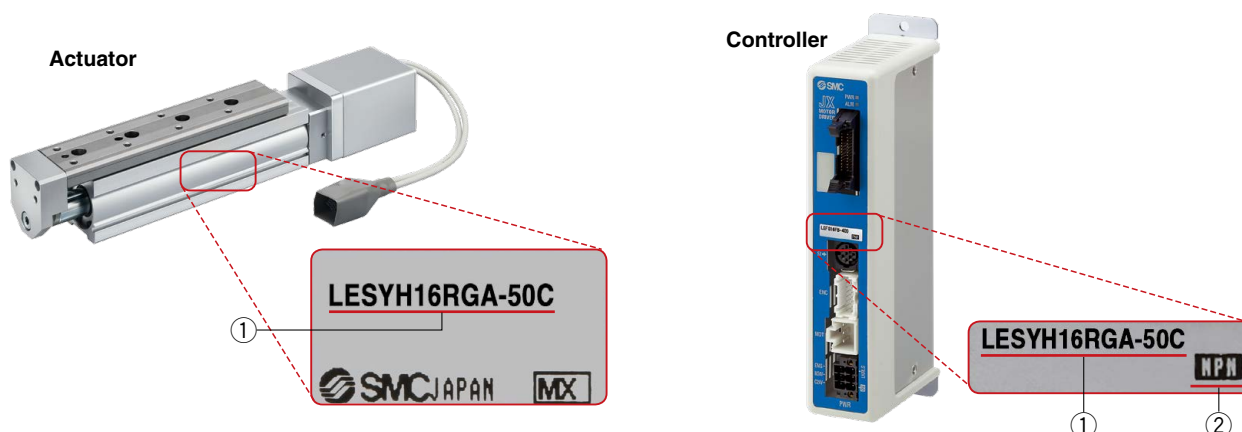


### The actuator and controller are provided as a set. (They can be ordered separately as well.)

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).



## Function

| Item                            | Step data input type<br>JXC5H/6H                                                                                                                                                                            |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step data and parameter setting | <ul style="list-style-type: none"> <li>Input from controller setting software (PC)</li> <li>Input from teaching box</li> </ul>                                                                              |
| Step data “position” setting    | <ul style="list-style-type: none"> <li>Numerical value input from controller setting software (PC) or teaching box</li> <li>Input numerical value</li> <li>Direct teaching</li> <li>JOG teaching</li> </ul> |
| Number of step data             | 64 points                                                                                                                                                                                                   |
| Operation command (I/O signal)  | Step No. [IN <sup>+</sup> ] input ⇒ [DRIVE] input                                                                                                                                                           |
| Completion signal               | [INP] output                                                                                                                                                                                                |

## Setting Items

TB: Teaching box PC: Controller setting software

| Item                           |                           |                                                                                         | Easy Mode |    | Normal Mode                 | Step data input type<br>JXC5H/6H                                                       |
|--------------------------------|---------------------------|-----------------------------------------------------------------------------------------|-----------|----|-----------------------------|----------------------------------------------------------------------------------------|
|                                |                           |                                                                                         | TB        | PC | TB/PC                       |                                                                                        |
| Step data setting<br>(Excerpt) | Movement MOD              | Selection of “absolute position” and “relative position”                                | △         | ●  | ●                           | Set at ABS/INC                                                                         |
|                                | Speed                     | Transfer speed                                                                          | ●         | ●  | ●                           | Set in units of 1 mm/s                                                                 |
|                                | Position                  | [Position]: Target position<br>[Pushing]: Pushing start position                        | ●         | ●  | ●                           | Set in units of 0.01 mm                                                                |
|                                | Acceleration/Deceleration | Acceleration/deceleration during movement                                               | ●         | ●  | ●                           | Set in units of 1 mm/s <sup>2</sup>                                                    |
|                                | Pushing force             | Rate of force during pushing operation                                                  | ●         | ●  | ●                           | Set in units of 1%                                                                     |
|                                | Trigger LV                | Target force during pushing operation                                                   | △         | ●  | ●                           | Set in units of 1%                                                                     |
|                                | Pushing speed             | Speed during pushing operation                                                          | △         | ●  | ●                           | Set in units of 1 mm/s                                                                 |
|                                | Moving force              | Force during positioning operation                                                      | △         | ●  | ●                           | Set to 100%                                                                            |
|                                | 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 0.5 mm or more<br>(Units: 0.01 mm)                                              |
| Parameter setting<br>(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                                                                             |
|                                | ORIG speed                | Speed during return to origin                                                           | ×         | ×  | ●                           | Set in units of 1 mm/s                                                                 |
|                                | ORIG ACC                  | Acceleration during return to origin                                                    | ×         | ×  | ●                           | Set in units of 1 mm/s <sup>2</sup>                                                    |
| Test                           | JOG                       |                                                                                         | ●         | ●  | ●                           | Continuous operation at the set speed can be tested while the switch is being pressed. |
|                                | MOVE                      |                                                                                         | ×         | ●  | ●                           | Operation at the set distance and speed from the current position can be tested.       |
|                                | Return to ORIG            |                                                                                         | ●         | ●  | ●                           | Compatible                                                                             |
|                                | Test drive                | Operation of the specified step data                                                    | ●         | ●  | ●<br>(Continuous operation) | Compatible                                                                             |
|                                | Forced output             | ON/OFF of the output terminal can be tested.                                            | ×         | ×  | ●                           | Compatible                                                                             |
| Monitor                        | DRV mon                   | Current position, speed, force, and the specified step data can be monitored.           | ●         | ●  | ●                           | Compatible                                                                             |
|                                | In/Out mon                | Current ON/OFF status of the input and output terminal can be monitored.                | ×         | ×  | ●                           | Compatible                                                                             |
| ALM                            | Status                    | Alarm currently being generated can be confirmed.                                       | ●         | ●  | ●                           | Compatible                                                                             |
|                                | ALM Log record            | Alarms generated in the past can be confirmed.                                          | ×         | ×  | ●                           | 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.)

## Fieldbus Network

### EtherCAT/EtherNet/IP™/PROFINET

### Direct Input Type

### Step Motor Controller/JXC□ Series p. 40

Ether**CAT**®



Ether**Net/IP**™



**PROFI**  
**NET**®



#### 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.

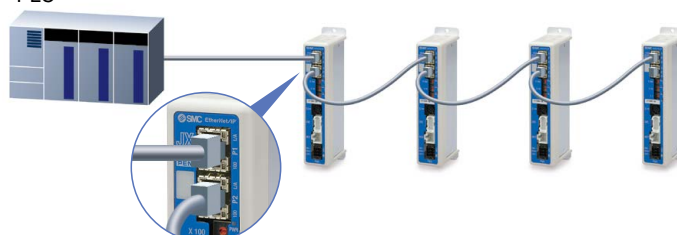
#### Numerical monitoring available

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.

PLC



## Application

Communication protocols

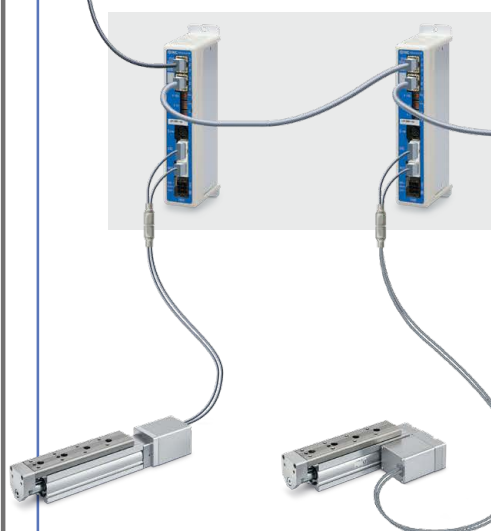
Ether**CAT**®

Ether**Net/IP**™

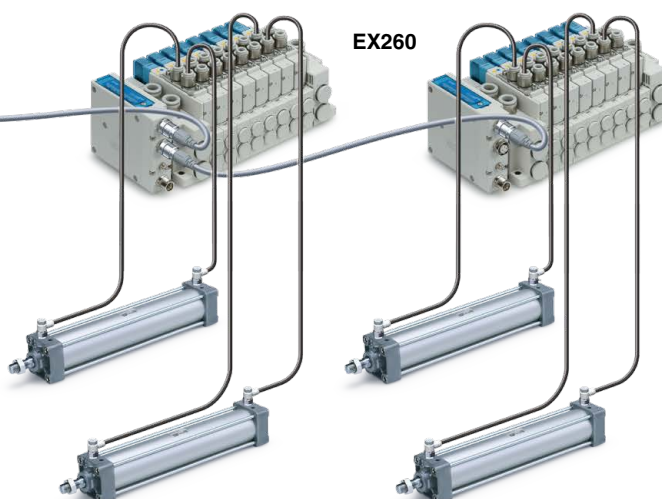
**PROFI**  
**NET**®

**Both air and electric systems can be established under the same protocol.**

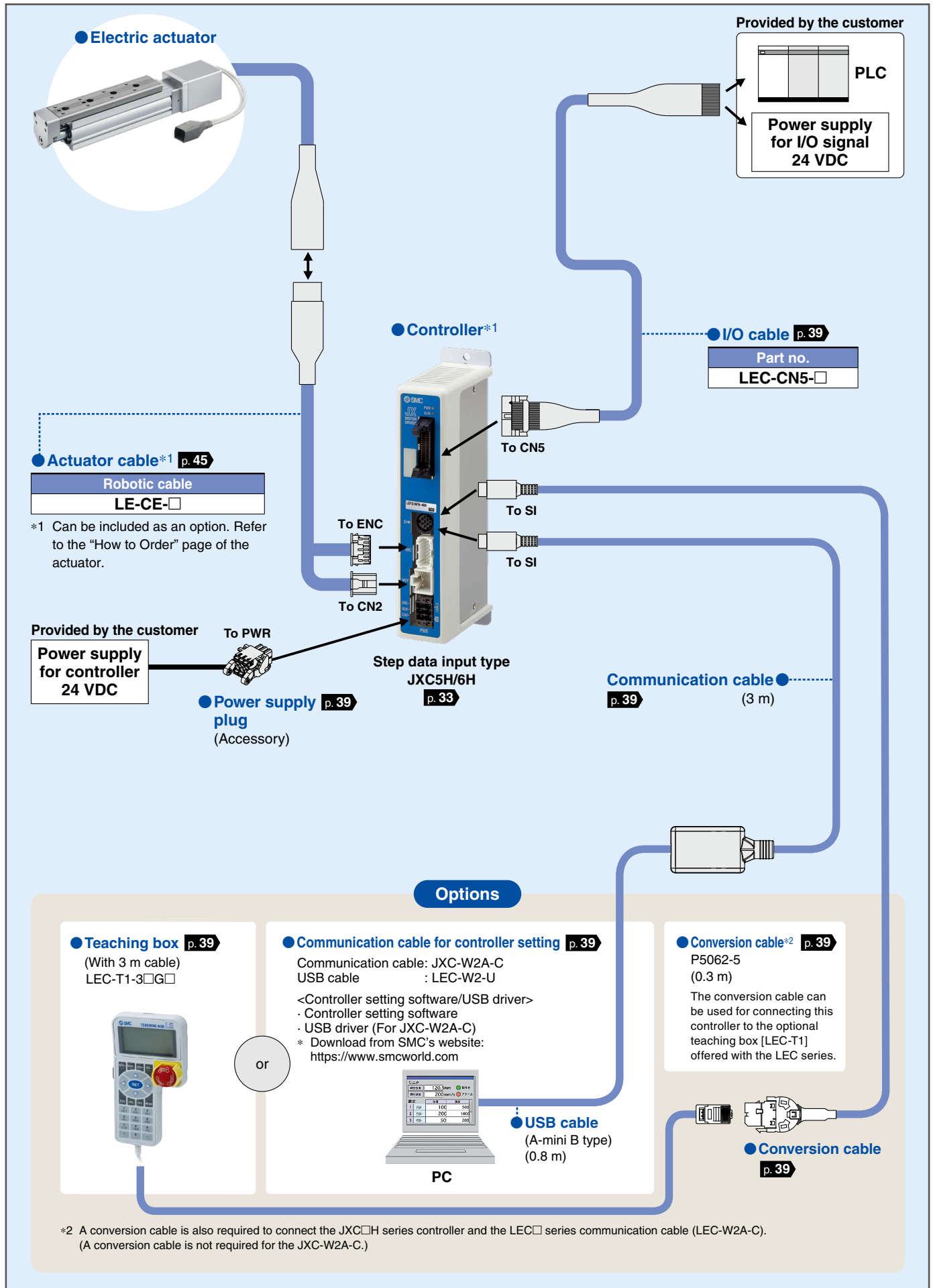
#### Electric Actuators



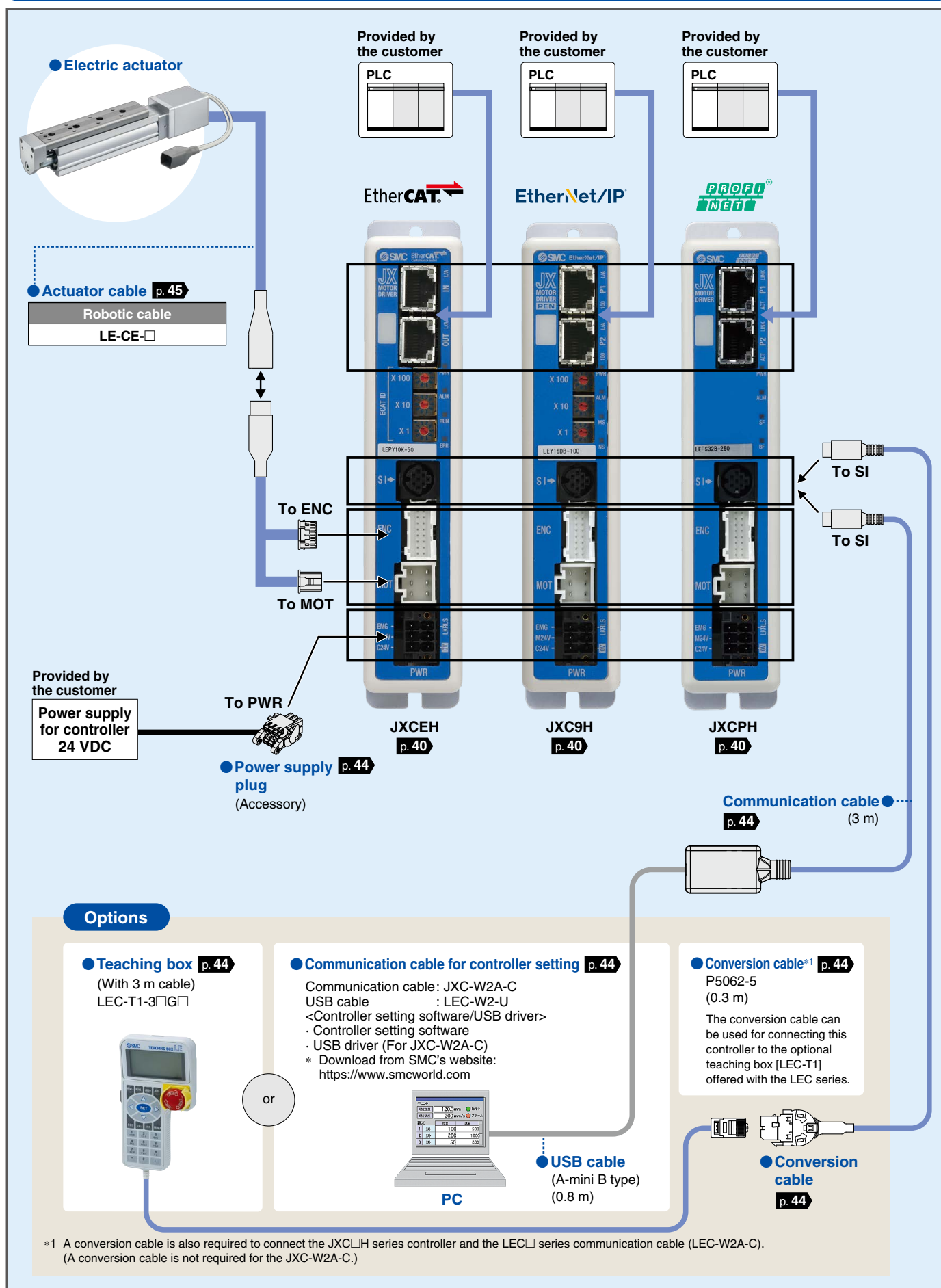
#### Air Cylinders



## System Construction/General Purpose I/O



## System Construction/Fieldbus Network (EtherCAT/EtherNet/IP™/PROFINET Direct Input Type)

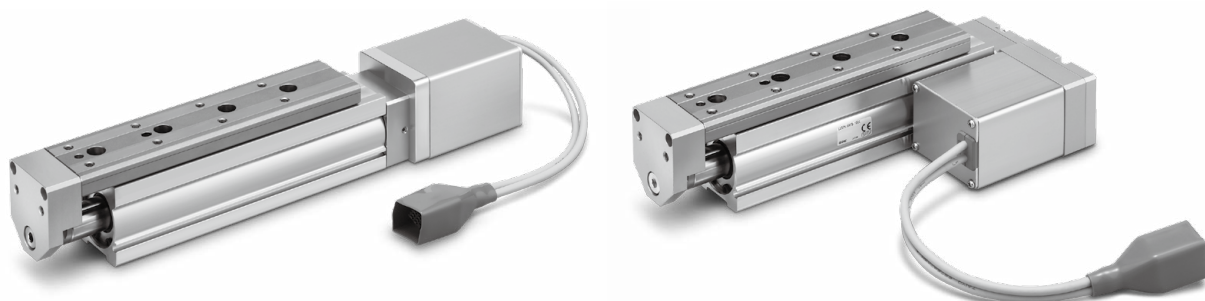


# Electric Actuator

## High Performance Slide Table/High Precision Type

### Slide Table/High Precision Type *LESYH□G Series*

Battery-less Absolute (Step Motor 24 VDC)



Model Selection

*LESYH□G Series*

Auto Switch

*JXC5H/6H Series*

*JXCEH/9H/PH Series*

Specific Product  
Precautions

## CONTENTS

### High Performance Slide Table/High Precision Type *LESYH□G Series* p. 8

Battery-less Absolute (Step Motor 24 VDC)



|                                    |       |
|------------------------------------|-------|
| Model Selection .....              | p. 9  |
| How to Order .....                 | p. 17 |
| Specifications .....               | p. 19 |
| Construction .....                 | p. 20 |
| Dimensions .....                   | p. 21 |
| Auto Switch Mounting .....         | p. 24 |
| Specific Product Precautions ..... | p. 28 |

### Controllers *JXC□ Series* p. 32

High Performance Controller (Step Data Input Type) *JXC5H/6H Series* Battery-less Absolute (Step Motor 24 VDC)



|                      |       |
|----------------------|-------|
| How to Order .....   | p. 33 |
| Specifications ..... | p. 33 |
| Dimensions .....     | p. 35 |
| Options .....        | p. 39 |
| Actuator Cable ..... | p. 45 |

High Performance Step Motor Controller *JXCEH/9H/PH Series* Battery-less Absolute (Step Motor 24 VDC)



|                      |       |
|----------------------|-------|
| How to Order .....   | p. 40 |
| Specifications ..... | p. 41 |
| Dimensions .....     | p. 42 |
| Options .....        | p. 44 |
| Actuator Cable ..... | p. 45 |

Battery-less Absolute Encoder Type Specific Product Precautions .....

CE/UKCA/UL-compliance List .....

# Model Selection



## Selection Procedure

### Positioning Control Selection Procedure



### Selection Example

#### Step 1 Check the work load-speed. <Speed-Work load graph> (pages 11 to 13)

Select a model based on the workpiece mass and speed while referencing the speed-work load graph. Selection example) The LESYH16□GA-100 can be temporarily selected as a possible candidate based on the graph shown on the right side.

#### 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 found by the following equation.

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

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

- 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 while referencing the following value.

$$T4 = 0.1 \text{ [s]}$$

Calculation example)

T1 to T4 can be calculated as follows.

$$T1 = V/a1 = 600/5000 = 0.12 \text{ [s]}$$

$$T3 = V/a2 = 600/5000 = 0.12 \text{ [s]}$$

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{100 - 0.5 \cdot 600 \cdot (0.12 + 0.12)}{600} = 0.05 \text{ [s]}$$

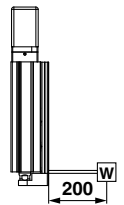
$$T4 = 0.1 \text{ [s]}$$

The cycle time can be found as follows.

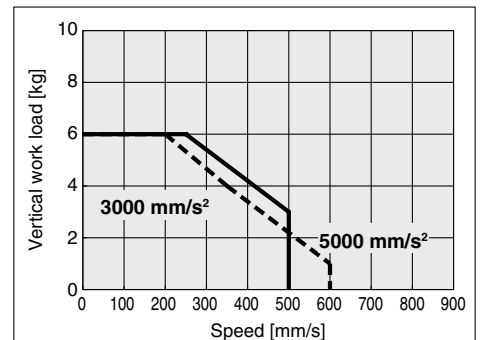
$$T = T1 + T2 + T3 + T4 = 0.12 + 0.05 + 0.12 + 0.1 = 0.39 \text{ [s]}$$

#### Operating conditions

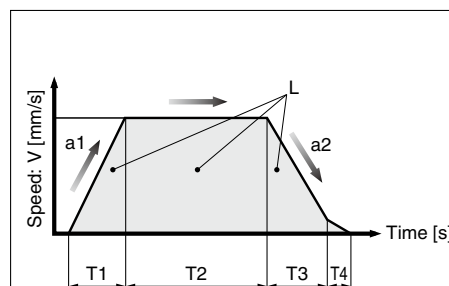
- Workpiece mass: 1 [kg]
- Speed: 600 [mm/s]
- Mounting orientation: Vertical
- Stroke: 100 [mm]
- Acceleration/Deceleration: 5000 [mm/s<sup>2</sup>]
- Cycle time: 0.4 s



#### LESYH16□G/Step Motor Vertical Lead 12



<Speed-Work load graph>



- L : Stroke [mm] ..... (Operating condition)
- V : Speed [mm/s] ..... (Operating condition)
- a1: Acceleration [mm/s<sup>2</sup>] ... (Operating condition)
- a2: Deceleration [mm/s<sup>2</sup>] ... (Operating condition)

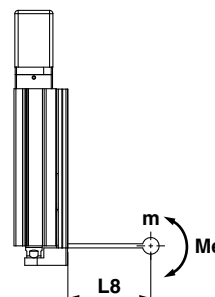
- T1: Acceleration time [s] ... Time until reaching the set speed
- T2: Constant speed time [s] ... Time while the actuator is operating at a constant speed
- T3: Deceleration time [s] ... Time from the beginning of the constant speed operation to stop
- T4: Settling time [s] ... Time until positioning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

#### Step 3 Check the allowable moment.

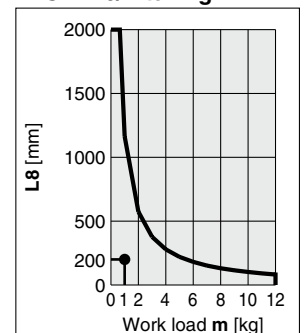
<Static allowable moment> (page 13)

<Dynamic allowable moment> (pages 15, 16)

Confirm the moment that applies to the actuator is within the allowable range for both static and dynamic conditions.



#### LESYH16/Pitching



<Dynamic allowable moment>

Based on the above calculation result, the LESYH16□GA-100 should be selected.

## Selection Procedure

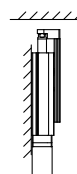
### Pushing Control Selection Procedure



### Selection Example

#### Operating conditions

- Pushing force: 100 N
- Workpiece mass: 1 kg
- Speed: 100 mm/s
- Stroke: 100 mm
- Mounting position: Vertical upward
- Pushing time + Operation (A): 1.5 s
- Full cycle time (B): 10 s



#### Step 1 Check the required force.

Calculate the approximate required force for a pushing operation.  
 Selection example) • Pushing force: 100 [N]  
 • Workpiece mass: 1 [kg]

The approximate required force can be found to be  $100 + 10 = 110$  [N].

Select a model based on the approximate required force while referencing the specifications (page 19).

Selection example based on the specifications)

- Approximate required force: 110 [N]
- Speed: 100 [mm/s]

The **LESYH16□GA** can be temporarily selected as a possible candidate.

Then, calculate the required force for a pushing operation. If the mounting position is vertical upward, add the actuator table weight.

Selection example based on the table weight)

- **LESYH16□GA** table weight: 0.7 [kg]

The required force can be found to be  $110 + 7 = 117$  [N].

#### Step 2 Check the pushing force.

<Pushing force set value–Force graph> (page 14)

Select a model based on the required force while referencing the pushing force set value–force graph, and confirm the pushing force set value.

Selection example based on the graph shown on the right side)

- Required force: 117 [N]

The **LESYH16□GA** can be temporarily selected as a possible candidate.

The pushing force set value is 64 [%].

#### Step 3 Check the duty ratio.

Confirm the allowable duty ratio based on the pushing force set value while referencing the allowable duty ratio.

Selection example based on the allowable duty ratio)

- Pushing force set value: 64 [%]

The allowable duty ratio can be found to be 20 [%].

Calculate the duty ratio for the operating conditions, and confirm it does not exceed the allowable duty ratio.

Selection example) • Pushing time + Operation (A): 1.5 s

- Full cycle time (B): 10 s

The duty ratio can be found to be  $1.5/10 \times 100 = 15$  [%], and this is within the allowable range.

#### Step 4 Check the allowable moment.

<Static allowable moment> (page 13)

<Dynamic allowable moment> (pages 15, 16)

Confirm the moment that applies to the actuator is within the allowable range for both static and dynamic conditions.

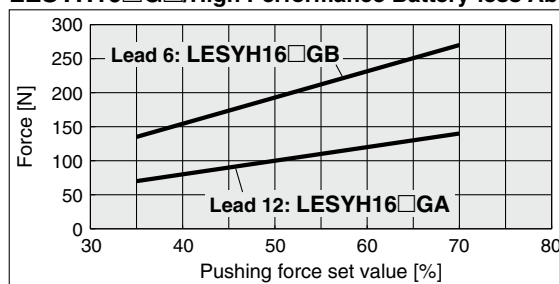
Table Weight

Unit [kg]

| Model          | Stroke [mm] |     |     |     |
|----------------|-------------|-----|-----|-----|
|                | 50          | 75  | 100 | 150 |
| <b>LESYH8</b>  | 0.2         | 0.3 | —   | —   |
| <b>LESYH16</b> | 0.4         | —   | 0.7 | —   |
| <b>LESYH25</b> | 0.9         | —   | 1.3 | 1.7 |

\* If the mounting position is vertical upward, add the table weight.

#### LESYH16□G□/High Performance Battery-less Absolute

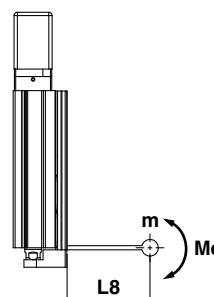
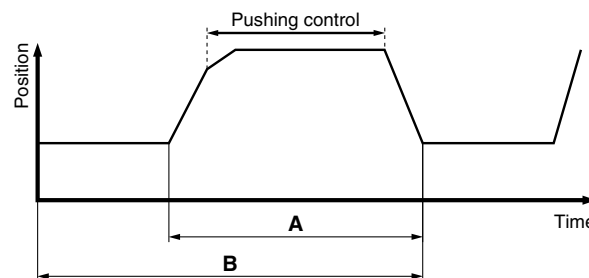


<Pushing force set value–Force graph>

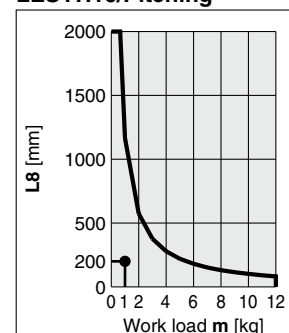
#### Allowable Duty Ratio

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

| Pushing force set value [%] | Duty ratio [%] | Continuous pushing time [min] |
|-----------------------------|----------------|-------------------------------|
| 35                          | —              | —                             |
| 50 or less                  | 30 or less     | 5 or less                     |
| 70 or less                  | 20 or less     | 3 or less                     |

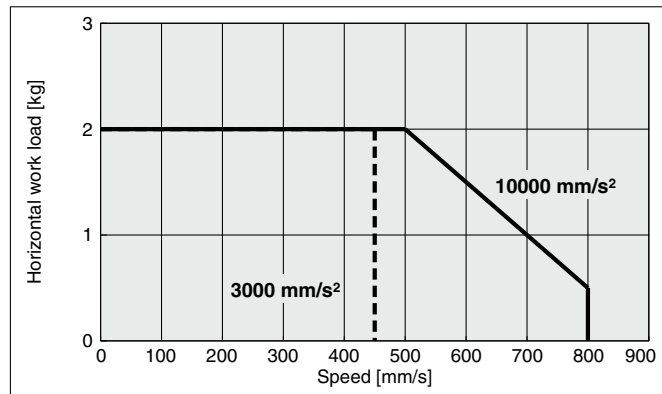
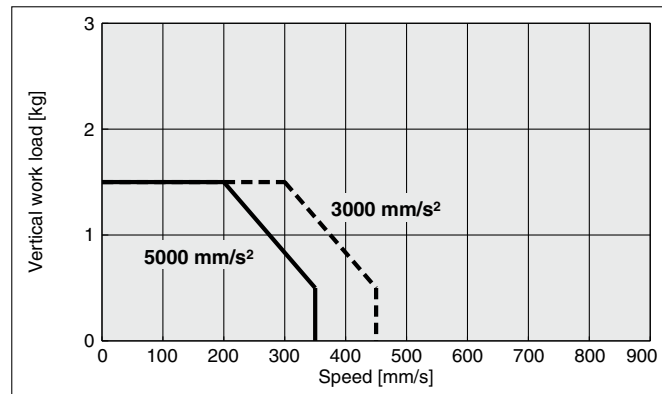
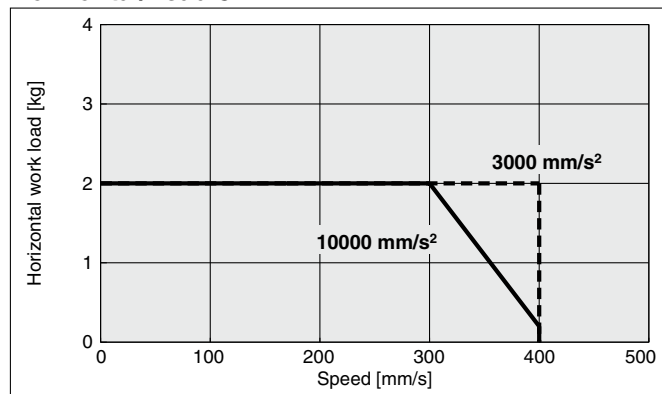
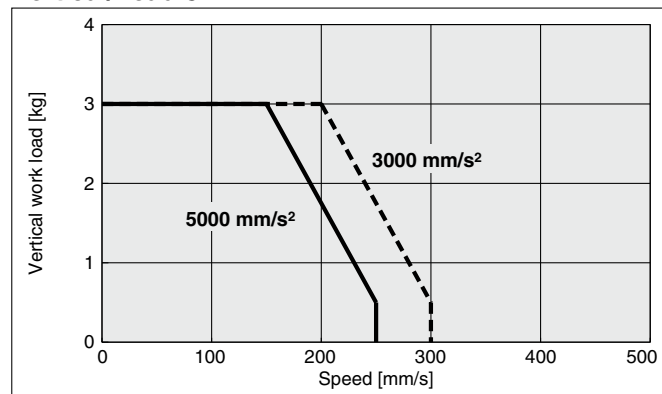
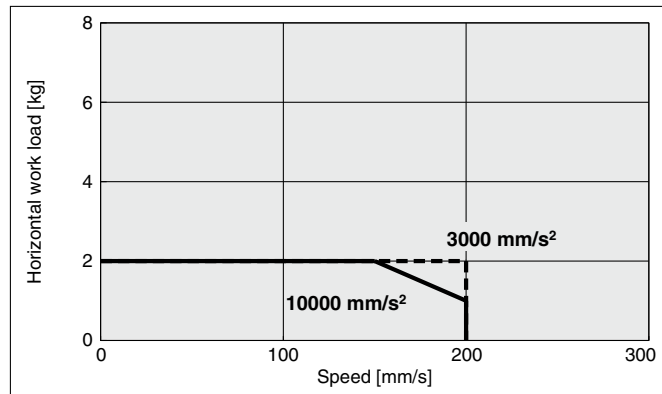
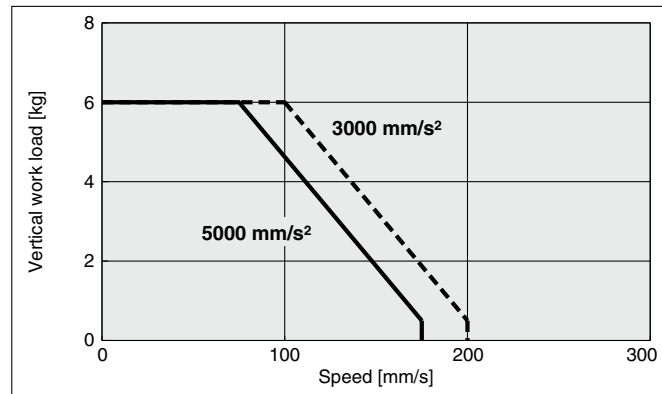


#### LESYH16/Pitching



<Dynamic allowable moment>

Based on the above calculation result, the **LESYH16□GA-100** should be selected.

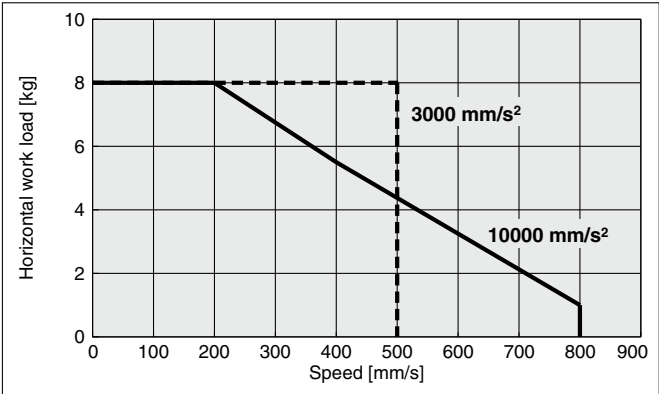
**Speed–Work Load Graph (Guide)****LESYH8□G****Horizontal/Lead 10****Vertical/Lead 10****Horizontal/Lead 5****Vertical/Lead 5****Horizontal/Lead 2.5****Vertical/Lead 2.5**

**Operating temperature:** Use products with a duty ratio of 100% or less when the temperature is below 30°C and with a duty ratio of 40% or less when the temperature exceeds 30°C.

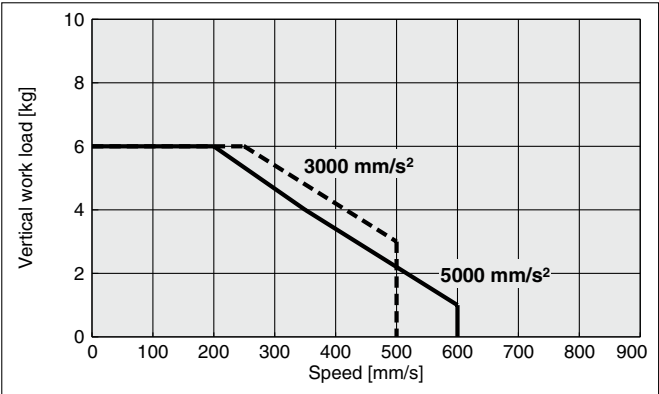
Speed–Work Load Graph (Guide)

LESYH16□G

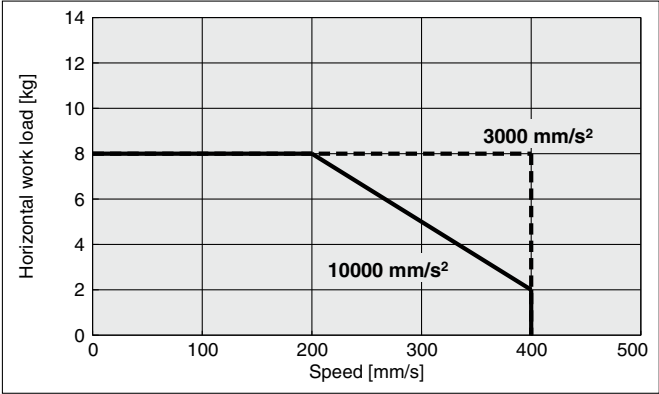
Horizontal/Lead 12



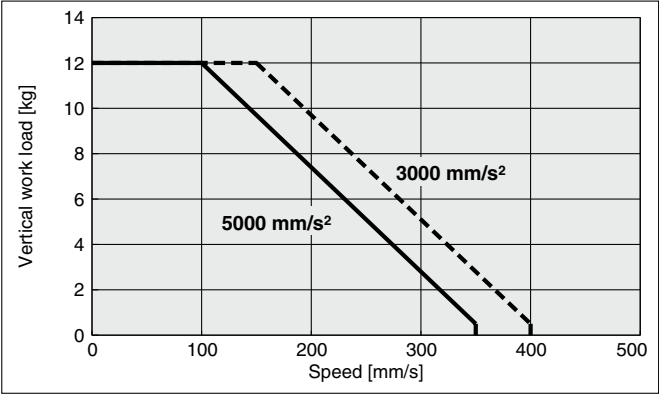
Vertical/Lead 12



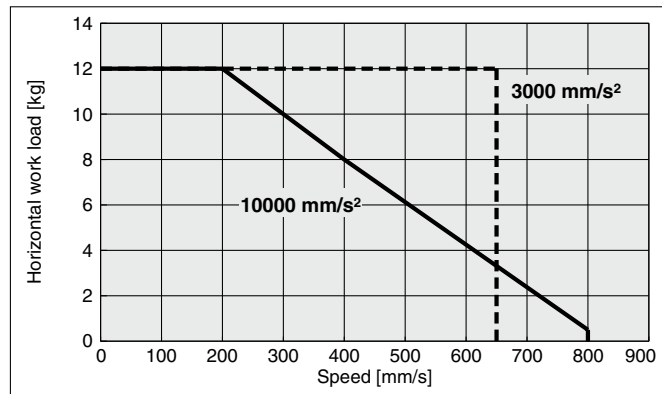
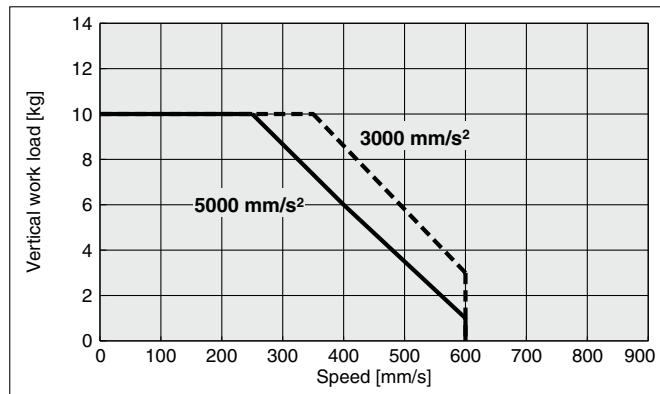
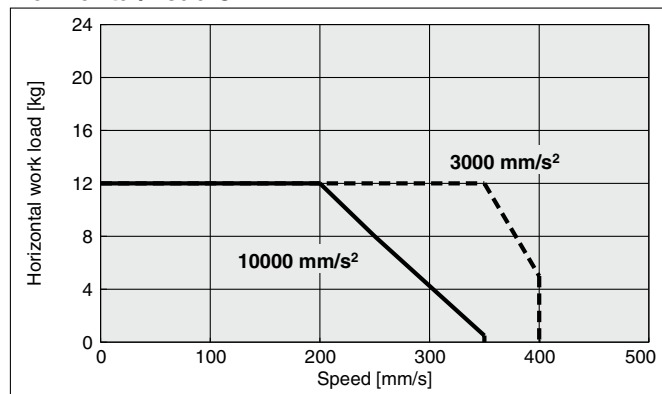
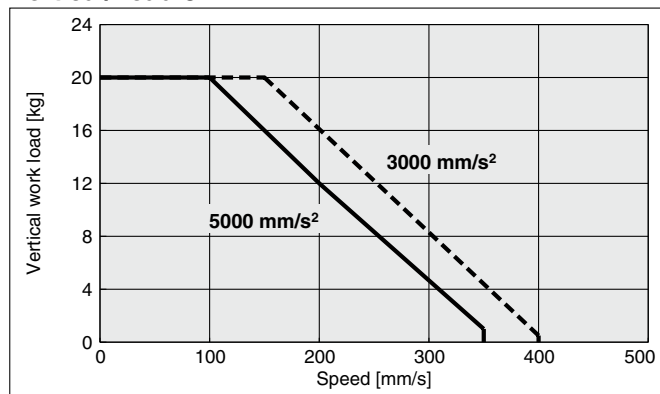
Horizontal/Lead 6



Vertical/Lead 6



Operating temperature: Use products with a duty ratio of 100% or less when the temperature is below 30°C and with a duty ratio of 40% or less when the temperature exceeds 30°C.

**Speed-Work Load Graph (Guide)****LESYH25□G****Horizontal/Lead 16****Vertical/Lead 16****Horizontal/Lead 8****Vertical/Lead 8**

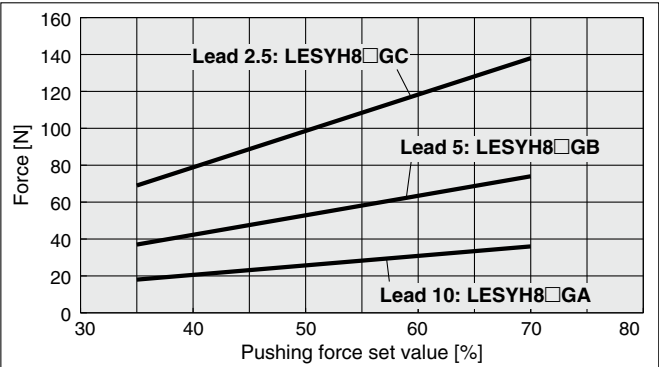
Operating temperature: Use products with a duty ratio of 100% or less when the temperature is below 30°C and with a duty ratio of 40% or less when the temperature exceeds 30°C.

**Static Allowable Moment**

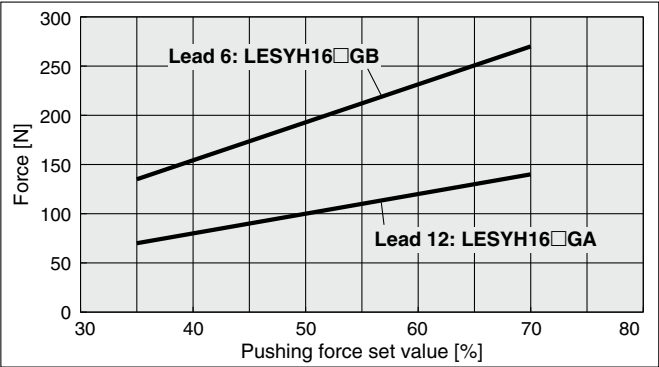
| Model          | LESYH8 |    | LESYH16 |     | LESYH25 |     |     |
|----------------|--------|----|---------|-----|---------|-----|-----|
| Stroke [mm]    | 50     | 75 | 50      | 100 | 50      | 100 | 150 |
| Pitching [N·m] | 11     |    | 26      | 43  | 77      | 112 | 155 |
| Yawing [N·m]   |        |    |         |     |         |     |     |
| Rolling [N·m]  | 12     |    | 48      |     | 146     | 177 | 152 |

Pushing Force Set Value–Force Graph

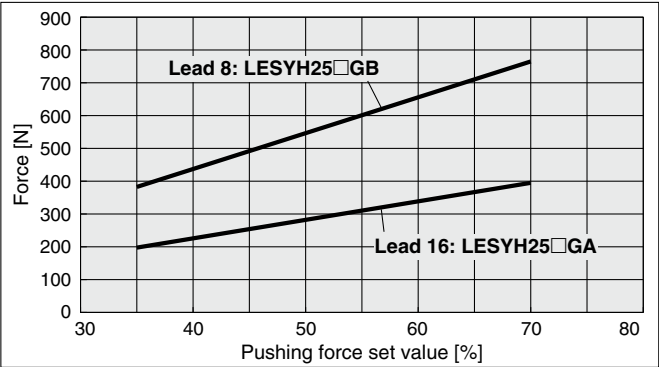
LESYH8□G□



LESYH16□G□



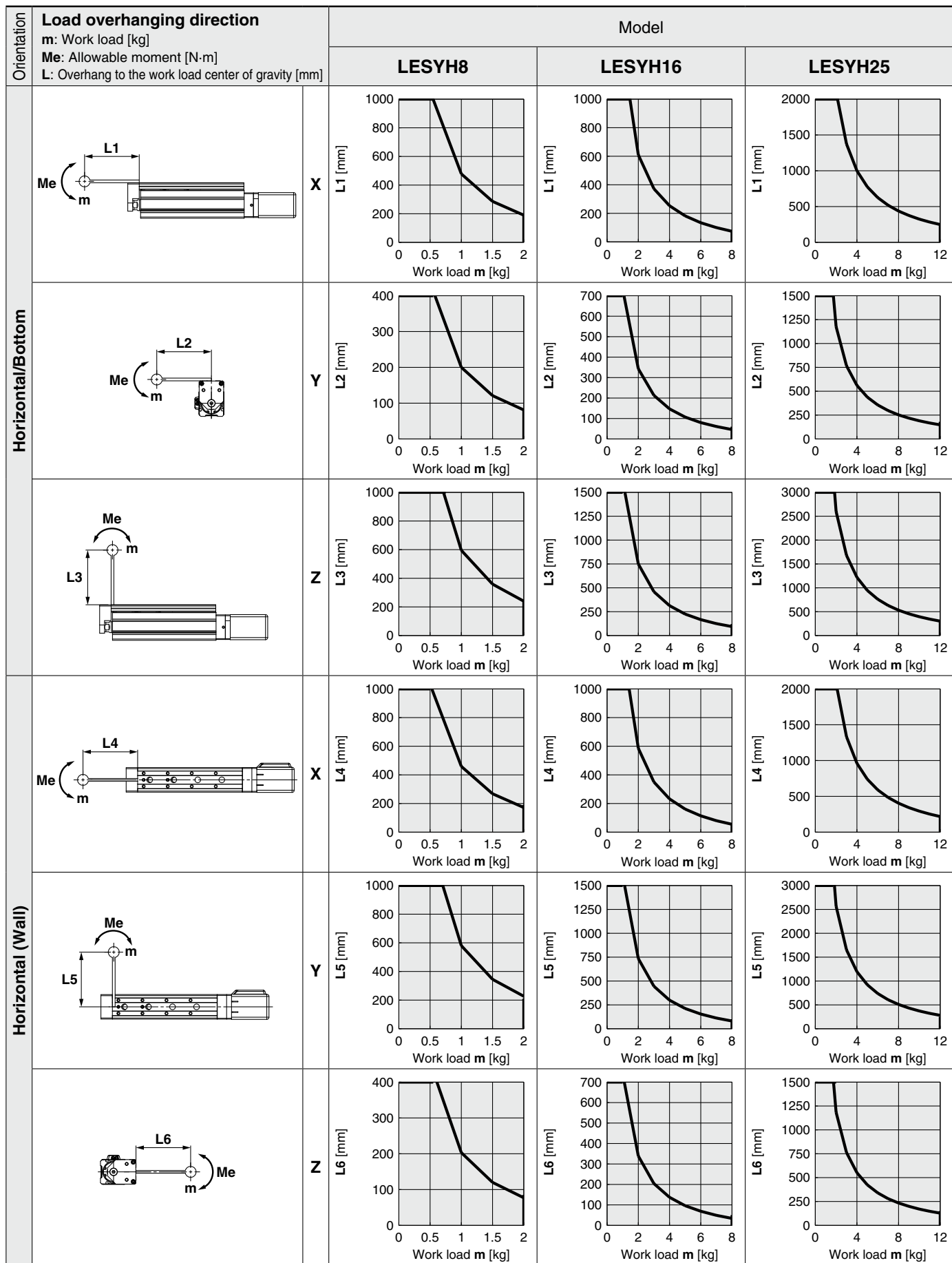
LESYH25□G□



\* These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the work-piece overhangs in one direction. When selecting the overhang, refer to the "Calculation of Guide Load Factor" or the Electric Actuator Model Selection Software for confirmation: <https://www.smcworld.com>

**Dynamic Allowable Moment**

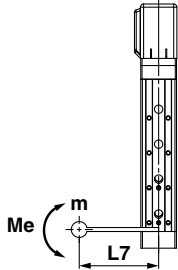
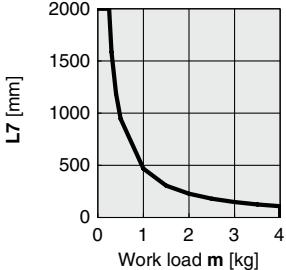
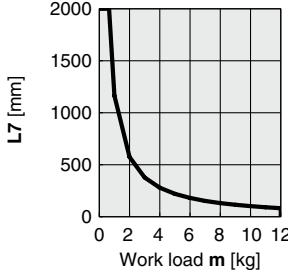
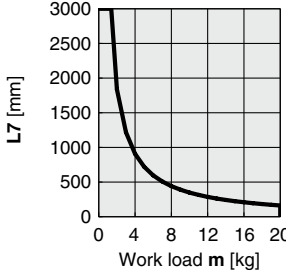
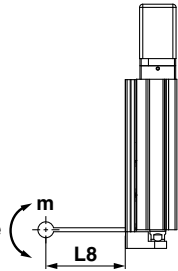
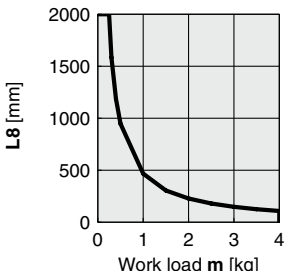
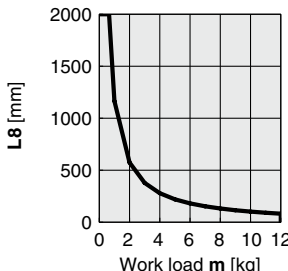
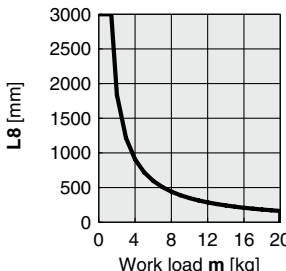
**Acceleration/Deceleration** Horizontal: 10000 mm/s<sup>2</sup> Vertical: 5000 mm/s<sup>2</sup>



## Dynamic Allowable Moment

\* These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the work-piece overhangs in one direction. When selecting the overhang, refer to the "Calculation of Guide Load Factor" or the Electric Actuator Model Selection Software for confirmation: <https://www.smcworld.com>

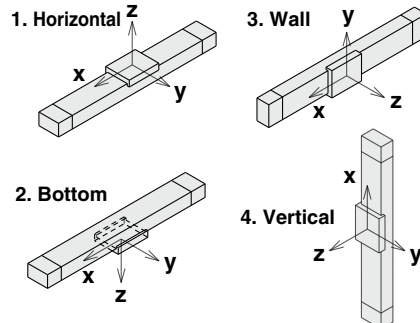
Acceleration/Deceleration Horizontal: 10000 mm/s<sup>2</sup> Vertical: 5000 mm/s<sup>2</sup>

| Orientation | Load overhanging direction<br>m: Work load [kg]<br>Me: Allowable moment [N·m]<br>L: Overhang to the work load center of gravity [mm] | Model                                                                             |                                                                                    |                                                                                     |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|             |                                                                                                                                      | LESYH8                                                                            | LESYH16                                                                            | LESYH25                                                                             |
| Vertical    | Y<br>                                               |  |  |  |
|             | Z<br>                                               |  |  |  |

## Calculation of Guide Load Factor

- Decide operating conditions.  
Model: LESYH  
Size: 16  
Mounting orientation: Horizontal/Bottom/Wall/Vertical  
Acceleration [mm/s<sup>2</sup>]: a  
Work load [kg]: m  
Work load center position [mm]: Xc/Yc/Zc
- Select the target graph while referencing the model, size, and mounting orientation.
- Based on the acceleration and work load, find the overhang [mm]: Lx/Ly/Lz from the graph.
- Calculate the load factor for each direction.  
 $\alpha x = Xc/Lx$ ,  $\alpha y = Yc/Ly$ ,  $\alpha z = Zc/Lz$
- Confirm the total of  $\alpha x$ ,  $\alpha y$ , and  $\alpha z$  is 1 or less.  
 $\alpha x + \alpha y + \alpha z \leq 1$   
When 1 is exceeded, consider a reduction of acceleration and work load, or a change of the work load center position and series.

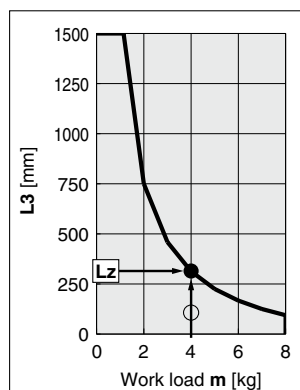
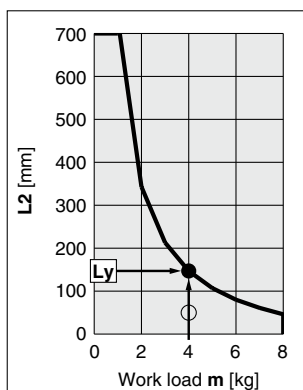
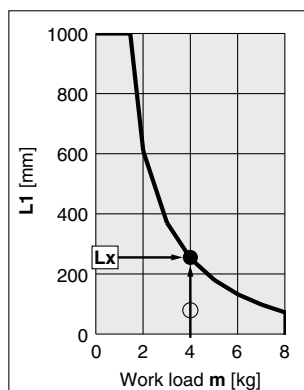
### Mounting orientation



### Example

- Operating conditions  
Model: LESYH  
Size: 16  
Mounting orientation: Horizontal  
Acceleration [mm/s<sup>2</sup>]: 5000  
Work load [kg]: 4.0  
Work load center position [mm]: Xc = 80, Yc = 50, Zc = 60
- Select three graphs from the top of the second row on page 15.

- Lx = 250 mm, Ly = 160 mm, Lz = 700 mm
- The load factor for each direction can be found as follows.  
 $\alpha x = 80/250 = 0.32$   
 $\alpha y = 50/160 = 0.32$   
 $\alpha z = 60/700 = 0.09$
- $\alpha x + \alpha y + \alpha z = 0.73 \leq 1$



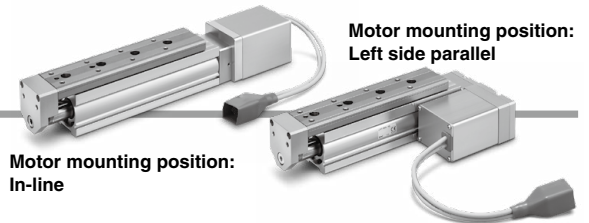
Battery-less Absolute (Step Motor 24 VDC)

# High Performance Slide Table/ High Precision Type **LESYH□G Series**



\* For details, refer to page 47 and onward.

## How to Order



**LESYH** **16** **D** **G** **A** - **50** **C** - **R1** **C5H73**

For details on controllers, refer to the next page.

### ① Size

|    |
|----|
| 8  |
| 16 |
| 25 |

### ② Motor mounting position/Motor cover direction (For size 8)

| Symbol | Motor mounting position | Motor cover direction |
|--------|-------------------------|-----------------------|
| D1     | In-line                 | Left side             |
| D2     |                         | Right side            |
| D3     |                         | Top side              |
| D4     |                         | Bottom side           |
| R      | Right side parallel     | —                     |
| L      | Left side parallel      | —                     |

### ② Motor mounting position (For sizes 16 and 25)

|   |                     |
|---|---------------------|
| D | In-line             |
| R | Right side parallel |
| L | Left side parallel  |

### ③ Motor type

| Symbol | Type                                     | Compatible controllers                    |
|--------|------------------------------------------|-------------------------------------------|
| G      | High performance (Battery-less absolute) | JXC5H<br>JXC6H<br>JXCEH<br>JXC9H<br>JXCPH |

### ④ Lead [mm]

|   | Size |    |    |
|---|------|----|----|
|   | 8    | 16 | 25 |
| A | 10   | 12 | 16 |
| B | 5    | 6  | 8  |
| C | 2.5  | —  | —  |

### ⑤ Stroke [mm]

|     | Size |    |    |
|-----|------|----|----|
|     | 8    | 16 | 25 |
| 50  | ●    | ●  | ●  |
| 75  | ●    | —  | —  |
| 100 | —    | ●  | ●  |
| 150 | —    | —  | ●  |

### ⑥ Motor option

|   |              |
|---|--------------|
| C | Without lock |
| W | With lock    |

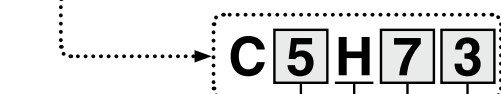
### ⑦ Connector/Actuator cable type/length

| Robotic cable [m] |               |    |      |
|-------------------|---------------|----|------|
| Nil               | Without cable | R8 | 8*1  |
| R1                | 1.5           | RA | 10*1 |
| R3                | 3             | RB | 15*1 |
| R5                | 5             | RC | 20*1 |

For details on auto switches, refer to pages 24 to 27.

## 8 Controller

|       |                    |
|-------|--------------------|
| Nil   | Without controller |
| C□H□□ | With controller    |



### Interface (Communication protocol/Input/Output)

|   |                      |
|---|----------------------|
| 5 | Parallel input (NPN) |
| 6 | Parallel input (PNP) |
| E | EtherCAT             |
| 9 | EtherNet/IP™         |
| P | PROFINET             |

### Mounting

|     |                |
|-----|----------------|
| 7   | Screw mounting |
| 8*2 | DIN rail       |

### Number of axes/Special specification

|   |                              |
|---|------------------------------|
| H | 1 axis/High performance type |
|---|------------------------------|

### I/O cable

| Symbol | Type              | Applicable interface                         |
|--------|-------------------|----------------------------------------------|
| Nil    | Without accessory | —                                            |
| 1      | I/O cable (1.5 m) | Parallel input (NPN)<br>Parallel input (PNP) |
| 3      | I/O cable (3 m)   |                                              |
| 5      | I/O cable (5 m)   |                                              |

\*1 Produced upon receipt of order

\*2 The DIN rail is not included. It must be ordered separately.

## ⚠ Caution

### [CE/UKCA-compliant products]

EMC compliance was tested by combining the electric actuator LES series and the controller 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.

## ■ Trademark

EtherNet/IP® is a registered trademark of ODVA, Inc.

EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

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

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.

LESYH16RGA-50

\*1



\* Refer to the Operation Manual for using the products.  
 Please download it via our website: <https://www.smcworld.com>

| Type                     | Step data input type                      | EtherCAT direct input type | EtherNet/IP™ direct input type | PROFINET direct input type |
|--------------------------|-------------------------------------------|----------------------------|--------------------------------|----------------------------|
|                          |                                           |                            |                                |                            |
| Series                   | JXC5H<br>JXC6H                            | JXCEH                      | JXC9H                          | JXCPH                      |
| Features                 | Parallel I/O                              | EtherCAT direct input      | EtherNet/IP™ direct input      | PROFINET direct input      |
| Compatible motor         | Battery-less absolute (Step motor 24 VDC) |                            |                                |                            |
| Max. number of step data | 64 points                                 |                            |                                |                            |
| Power supply voltage     | 24 VDC                                    |                            |                                |                            |
| Reference page           | 33                                        | 40                         |                                |                            |

## Specifications

| Model                    |                                                         |            | LESYH8□GA                                              | LESYH8□GB | LESYH8□GC | LESYH16□GA | LESYH16□GB | LESYH25□GA   | LESYH25□GB |
|--------------------------|---------------------------------------------------------|------------|--------------------------------------------------------|-----------|-----------|------------|------------|--------------|------------|
| Actuator specifications  | Stroke [mm]                                             |            | 50, 75                                                 |           |           | 50, 100    |            | 50, 100, 150 |            |
|                          | Max. work load [kg]*1 *3                                | Horizontal | 2                                                      |           |           | 8          |            | 12           |            |
|                          |                                                         | Vertical   | 1.5                                                    | 3         | 6         | 6          | 12         | 10           | 20         |
|                          | Pushing force 35% to 70% [N]*2 *3                       |            | 18 to 36                                               | 37 to 74  | 69 to 138 | 70 to 140  | 135 to 270 | 197 to 395   | 382 to 765 |
|                          | Speed [mm/s]*1 *3                                       |            | 20 to 800                                              | 10 to 400 | 5 to 200  | 20 to 800  | 10 to 400  | 20 to 800    | 10 to 400  |
|                          | Pushing speed [mm/s]                                    |            | 20 to 30                                               | 10 to 30  | 5 to 30   | 20 to 30   | 10 to 30   | 20 to 30     | 10 to 30   |
|                          | Max. acceleration/<br>deceleration [mm/s <sup>2</sup> ] | Horizontal | 10000                                                  |           |           |            |            |              |            |
|                          |                                                         | Vertical   | 5000                                                   |           |           |            |            |              |            |
|                          | Positioning repeatability [mm]                          |            | ±0.01                                                  |           |           |            |            |              |            |
|                          | Lost motion [mm]*4                                      |            | 0.1 or less                                            |           |           |            |            |              |            |
|                          | Screw lead [mm]                                         |            | 10                                                     | 5         | 2.5       | 12         | 6          | 16           | 8          |
|                          | Impact/Vibration resistance [m/s <sup>2</sup> ]*5       |            | 50/20                                                  |           |           |            |            |              |            |
|                          | Actuation type                                          |            | Ball screw: LESYH□D<br>Ball screw + Belt: LESYH□(R, L) |           |           |            |            |              |            |
|                          | Guide type                                              |            | Linear guide (Circulating type)                        |           |           |            |            |              |            |
|                          | Operating temperature range [°C]                        |            | 5 to 40                                                |           |           |            |            |              |            |
|                          | Operating humidity range [%RH]                          |            | 90 or less (No condensation)                           |           |           |            |            |              |            |
| Electric specifications  | Motor size                                              |            | □28                                                    |           |           | □42        |            | □56          |            |
|                          | Motor type                                              |            | Step motor (Servo/24 VDC)                              |           |           |            |            |              |            |
|                          | Encoder (Angular displacement sensor)                   |            | Battery-less absolute                                  |           |           |            |            |              |            |
|                          | Rated voltage [V]                                       |            | 24 VDC ±10%                                            |           |           |            |            |              |            |
|                          | Power [W]*6                                             |            | Max. 116                                               |           |           | Max. 126   |            | Max. 222     |            |
| Lock unit specifications | Type                                                    |            | Non-magnetizing lock                                   |           |           |            |            |              |            |
|                          | Holding force [N]                                       | *7         | 20                                                     | 39        | 78        | 78         | 157        | 108          | 216        |
|                          | Power consumption [W]*8                                 |            | 2.9                                                    |           |           | 5          |            |              |            |
|                          | Rated voltage [V]                                       |            | 24 VDC ±10%                                            |           |           |            |            |              |            |

\*1 For the speed, acceleration, and duty ratio according to the work load, check the "Speed-Work Load Graph" on pages 11 to 13.

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

\*3 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%)

\*4 A reference value for correcting errors in reciprocal operation

\*5 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.)

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.)

\*6 Indicates the max. power during operation (including the controller)

This value can be used for the selection of the power supply.

\*7 With lock only

\*8 For an actuator with lock, add the power for the lock.

## Weight

### Product Weight

[kg]

| Model     | Stroke |      |      |      |
|-----------|--------|------|------|------|
|           | 50     | 75   | 100  | 150  |
| LESYH8□G  | 1.06   | 1.23 | —    | —    |
| LESYH16□G | 2.39   | —    | 2.78 | —    |
| LESYH25□G | 4.82   | —    | 5.42 | 6.22 |

### Additional Weight

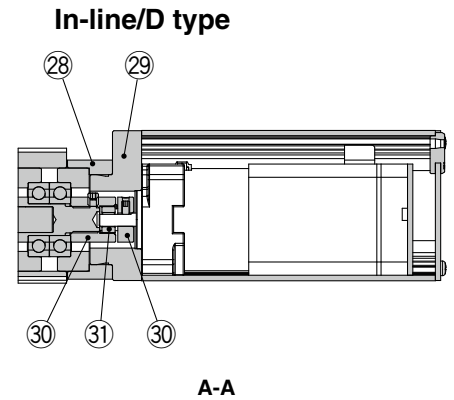
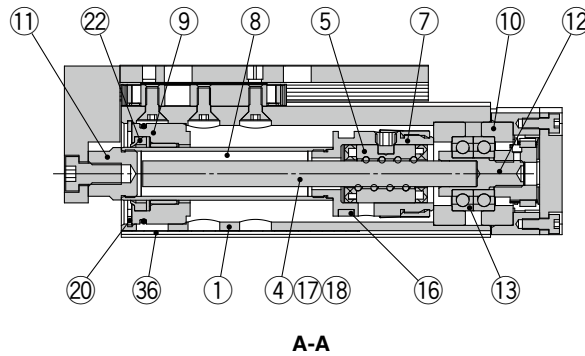
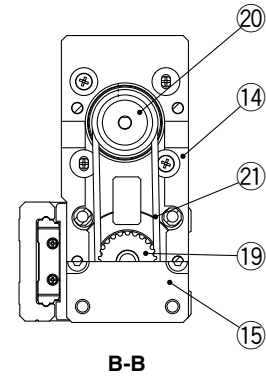
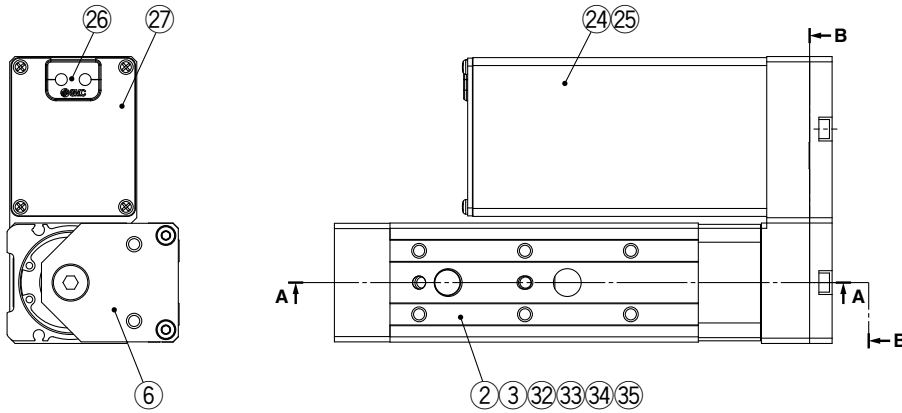
[kg]

| Size      | 8    | 16   | 25   |
|-----------|------|------|------|
| With lock | 0.16 | 0.32 | 0.61 |

## Construction

### Right side parallel/R type, Left side parallel/L type

\* The figures show the R type.



### Component Parts

| No. | Description             | Material           | Note                                  |
|-----|-------------------------|--------------------|---------------------------------------|
| 1   | <b>Body</b>             | Aluminum alloy     | Anodized                              |
| 2   | <b>Table</b>            | Stainless steel    | —                                     |
| 3   | <b>Guide block</b>      | Alloy steel        | —                                     |
| 4   | <b>Ball screw shaft</b> | Alloy steel        | —                                     |
| 5   | <b>Ball screw nut</b>   | Resin/Alloy steel  | —                                     |
| 6   | <b>End plate</b>        | Aluminum alloy     | Anodized                              |
| 7   | <b>Piston</b>           | Aluminum alloy     | —                                     |
| 8   | <b>Piston rod</b>       | Stainless steel    | Hard chrome plating                   |
| 9   | <b>Rod cover</b>        | Aluminum alloy     | —                                     |
| 10  | <b>Bearing holder</b>   | Aluminum alloy     | —                                     |
| 11  | <b>Socket</b>           | Free cutting steel | Electroless nickel plating            |
| 12  | <b>Connected shaft</b>  | Free cutting steel | Electroless nickel plating            |
| 13  | <b>Rolling bearing</b>  | —                  | —                                     |
| 14  | <b>Return box</b>       | Aluminum alloy     | Anodized                              |
| 15  | <b>Return plate</b>     | Aluminum alloy     | Anodized                              |
| 16  | <b>Magnet</b>           | —                  | —                                     |
| 17  | <b>Wear ring holder</b> | Stainless steel    | Only for size 25 with a 150 mm stroke |
| 18  | <b>Wear ring</b>        | Resin              | Only for size 25 with a 150 mm stroke |

| No. | Description                           | Material         | Note                       |
|-----|---------------------------------------|------------------|----------------------------|
| 19  | <b>Screw shaft pulley</b>             | Aluminum alloy   | —                          |
| 20  | <b>Motor pulley</b>                   | Aluminum alloy   | —                          |
| 21  | <b>Belt</b>                           | —                | —                          |
| 22  | <b>Scraper</b>                        | NBR              | —                          |
| 23  | <b>Type C retaining ring for hole</b> | Steel for spring | Phosphate coating          |
| 24  | <b>Motor/Motor with lock</b>          | —                | Depends on the part number |
| 25  | <b>Motor cover</b>                    | Aluminum alloy   | Anodized                   |
| 26  | <b>Grommet</b>                        | NBR              | —                          |
| 27  | <b>Motor end cover</b>                | Aluminum alloy   | Anodized                   |
| 28  | <b>Motor block</b>                    | Aluminum alloy   | Anodized                   |
| 29  | <b>Motor adapter</b>                  | Aluminum alloy   | Anodized                   |
| 30  | <b>Hub</b>                            | Aluminum alloy   | —                          |
| 31  | <b>Spider</b>                         | NBR              | —                          |
| 32  | <b>Cover</b>                          | Resin            | —                          |
| 33  | <b>Return guide</b>                   | Resin            | —                          |
| 34  | <b>Scraper</b>                        | NBR              | —                          |
| 35  | <b>Steel ball</b>                     | Special steel    | —                          |
| 36  | <b>Masking tape</b>                   | —                | —                          |

Model Selection

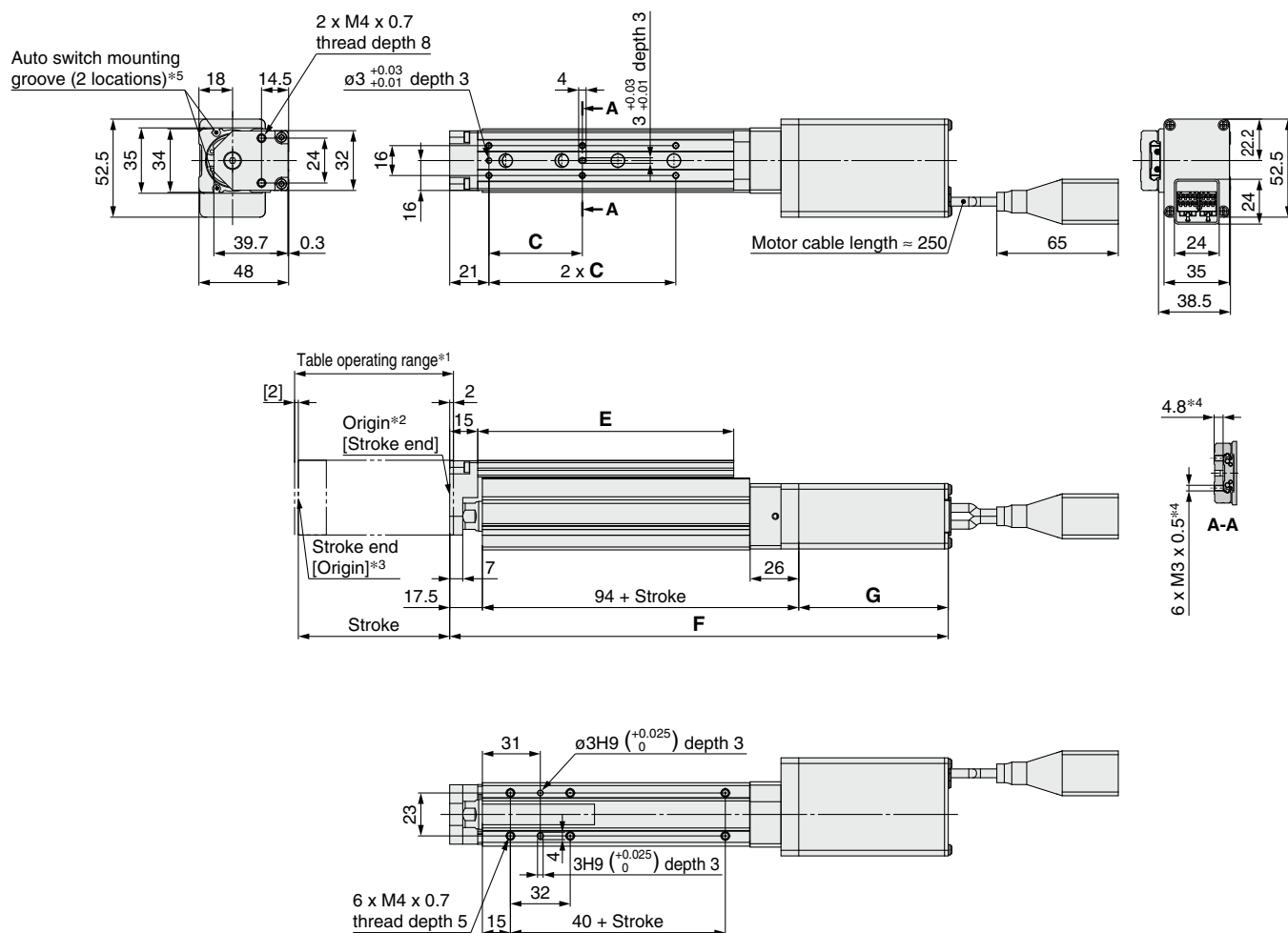
LESYH□G Series

Auto Switch

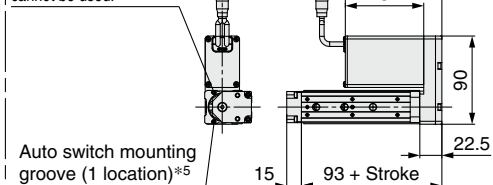
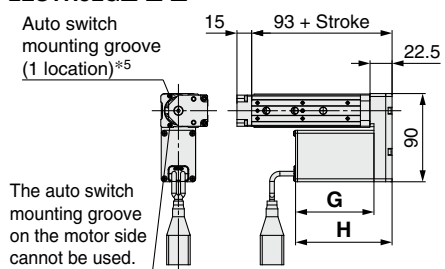
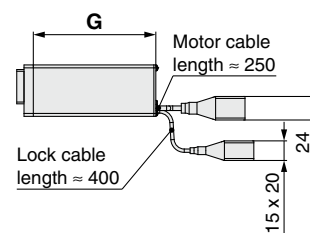
JXC5H/6H Series

JXCEH/9H/PH Series

Specific Product Precautions

**Dimensions****LESYH8D□G□-□****Motor mounting position: Right side parallel  
LESYH8RG□-□-□**

The auto switch mounting groove on the motor side cannot be used.

**Motor mounting position: Left side parallel  
LESYH8LG□-□-□****Motor option: With lock  
LESYH8□G□-□W-□**

- \*1 This is the range within which the table can move when it returns to origin.  
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
- \*2 Position after returning to origin
- \*3 [ ] for when the direction of return to origin has changed
- \*4 If the workpiece retaining screws are too long, they may come in contact with the guide block, resulting in a malfunction.  
Use screws of a length equal to or shorter than the thread length.
- \*5 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 25 to 27 for details.

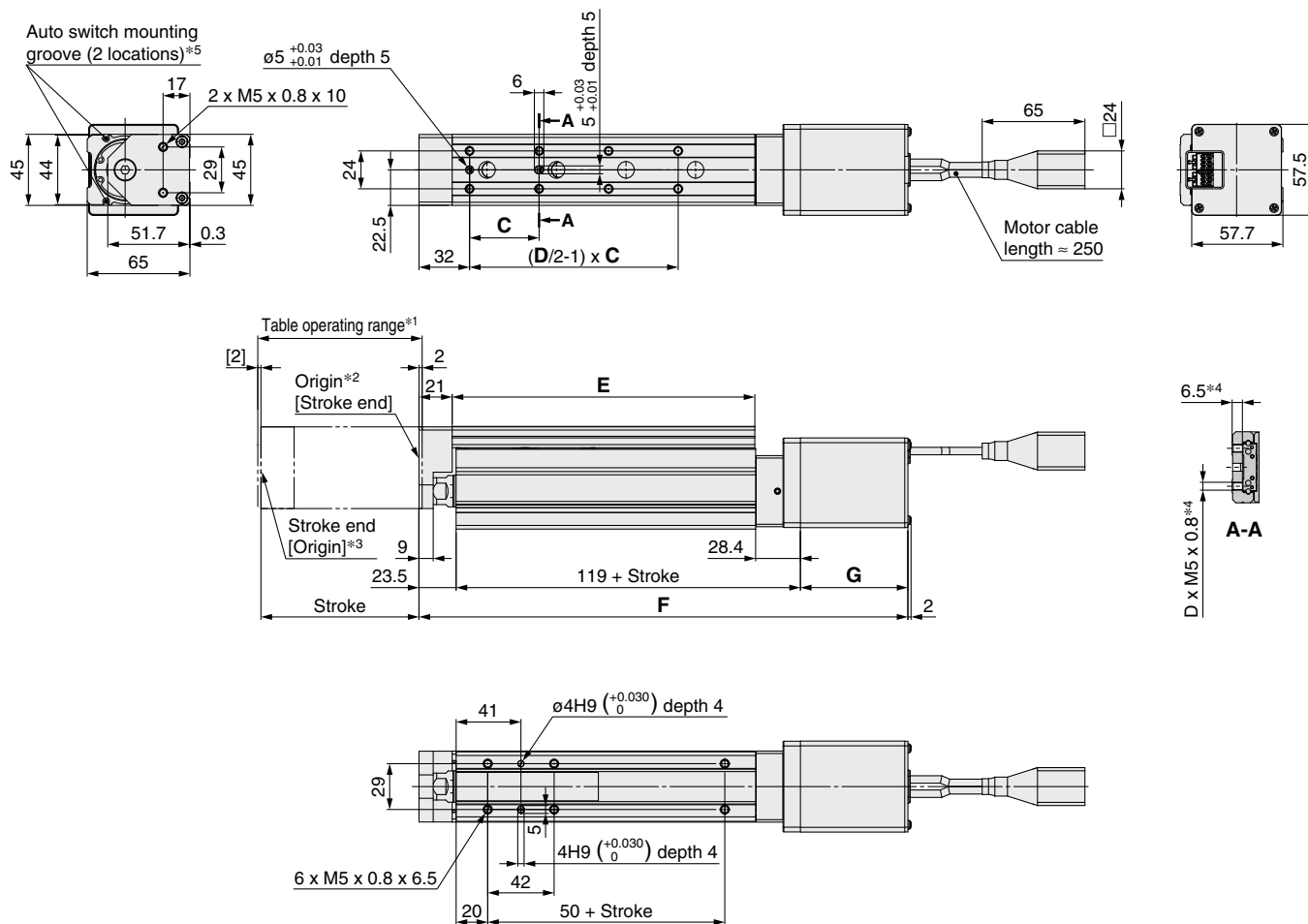
**Dimensions**

[mm]

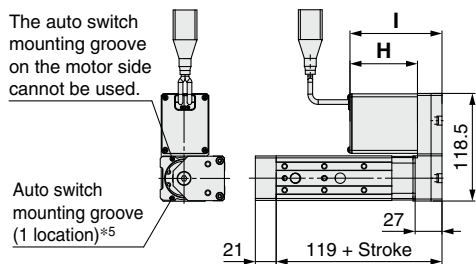
| Model     | Stroke | C  | E   | With motor cover |    |      | With lock/motor cover |     |       |
|-----------|--------|----|-----|------------------|----|------|-----------------------|-----|-------|
|           |        |    |     | F                | G  | H    | F                     | G   | H     |
| LESYH8□G□ | 50     | 46 | 111 | 241.5            | 80 | 98.5 | 286.5                 | 125 | 143.5 |
|           | 75     | 50 | 137 | 266.5            |    |      | 311.5                 |     |       |

## Dimensions

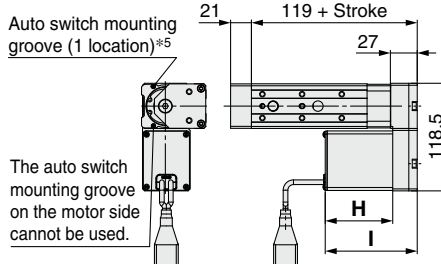
### LESYH16DG□-□



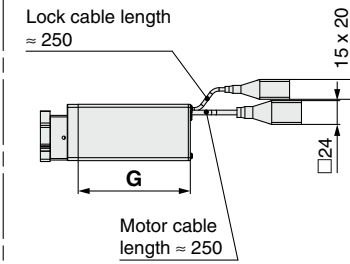
#### Motor mounting position: Right side parallel LESYH16RG□-□C



#### Motor mounting position: Left side parallel LESYH16LG□-□C



#### Motor option: With lock LESYH16□G□-□W

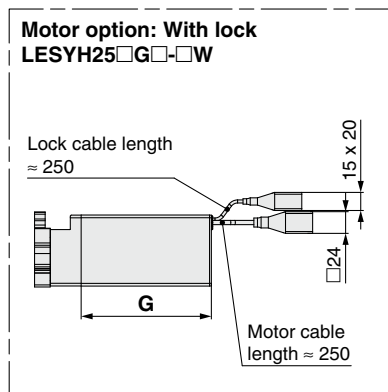
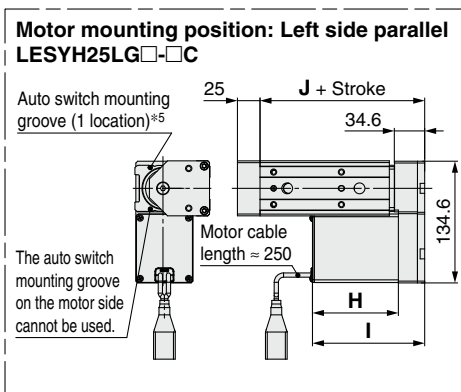
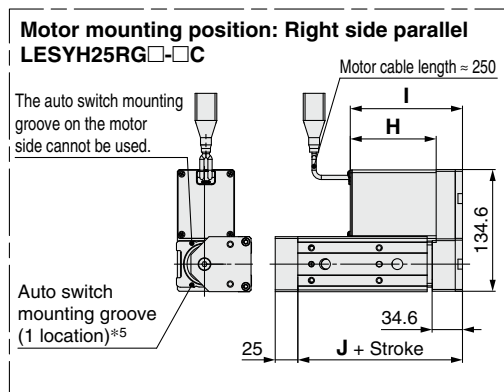
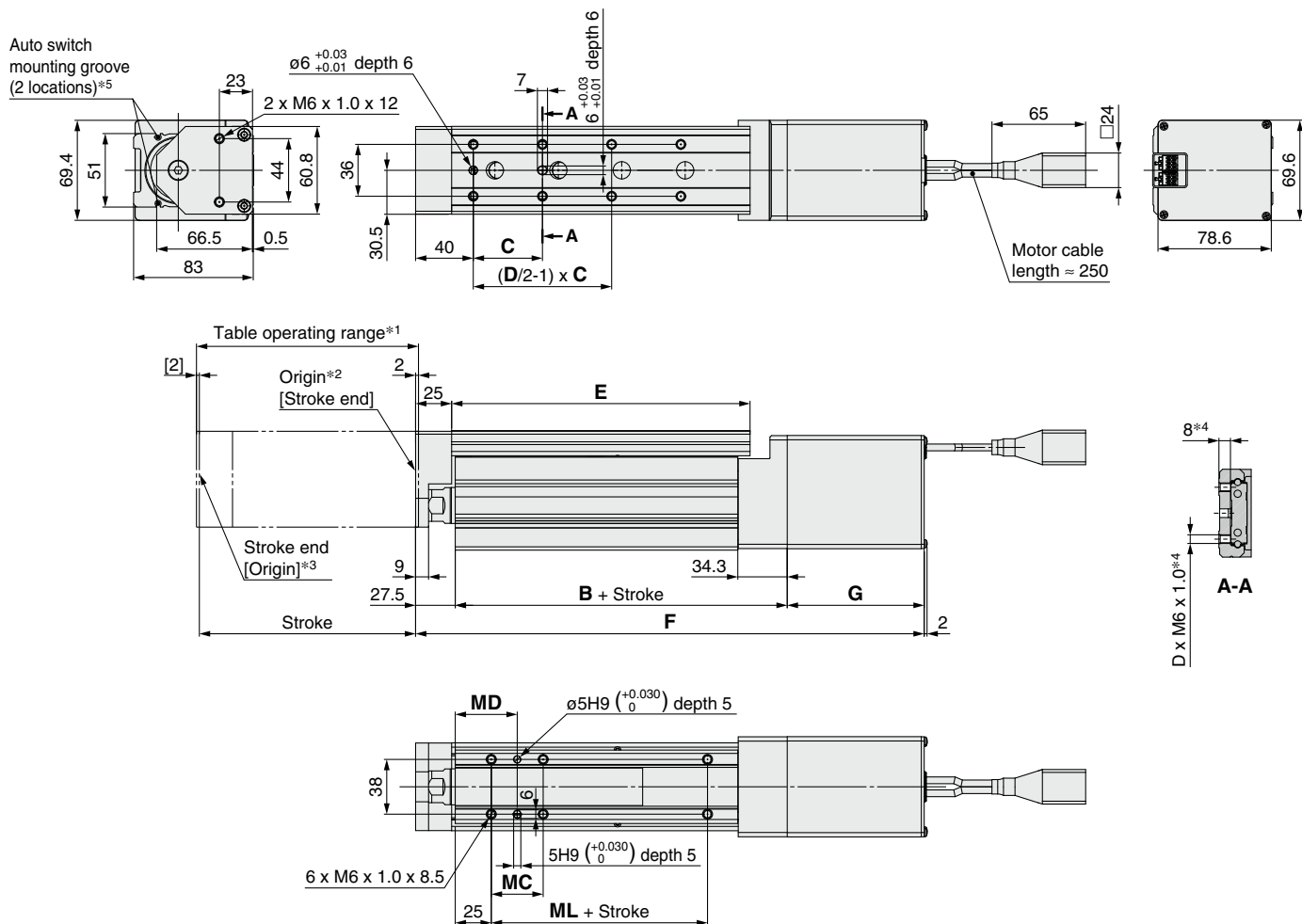


- \*1 This is the range within which the table can move when it returns to origin.  
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
- \*2 Position after returning to origin
- \*3 [ ] for when the direction of return to origin has changed
- \*4 If the workpiece retaining screws are too long, they may come in contact with the guide block, resulting in a malfunction.  
Use screws of a length equal to or shorter than the thread length.
- \*5 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 25 to 27 for details.

## Dimensions

[mm]

| Model      | Stroke | C  | D | E     | With motor cover |    |    |      | With lock/motor cover |     |     |       |
|------------|--------|----|---|-------|------------------|----|----|------|-----------------------|-----|-----|-------|
|            |        |    |   |       | F                | G  | H  | I    | F                     | G   | H   | I     |
| LESYH16□G□ | 50     | 40 | 6 | 116.5 | 266.4            | 75 | 68 | 92.7 | 311.4                 | 120 | 113 | 137.7 |
|            | 100    | 44 | 8 | 191.5 | 316.4            |    |    |      | 361.4                 |     |     |       |

**Dimensions****LESYH25DG□-□**

- \*1 This is the range within which the table can move when it returns to origin.  
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
- \*2 Position after returning to origin
- \*3 [ ] for when the direction of return to origin has changed
- \*4 If the workpiece retaining screws are too long, they may come in contact with the guide block, resulting in a malfunction.  
Use screws of a length equal to or shorter than the thread length.
- \*5 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 25 to 27 for details.

**Dimensions**

[mm]

| Model      | Stroke | B     | C  | D | E   | With motor cover |     |    |       | With lock/motor cover |     |     |       | J     | MC | MD   | ML |
|------------|--------|-------|----|---|-----|------------------|-----|----|-------|-----------------------|-----|-----|-------|-------|----|------|----|
|            |        |       |    |   |     | F                | G   | H  | I     | F                     | G   | H   | I     |       |    |      |    |
| LESYH25□G□ | 50     | 130.3 | 75 | 4 | 143 | 307.8            | 100 | 95 | 125.1 | 347.8                 | 140 | 144 | 174.1 | 133.1 | 36 | 43   | 50 |
|            | 100    |       | 48 |   | 207 | 357.8            |     |    |       | 397.8                 |     |     |       | 163.1 |    |      |    |
|            | 150    | 160.3 | 65 | 8 | 285 | 437.8            |     |    |       | 477.8                 |     |     |       | 163.1 | 53 | 51.5 | 80 |

# LESYH□G Series Auto Switch Mounting

## Auto Switch Mounting Position



[mm]

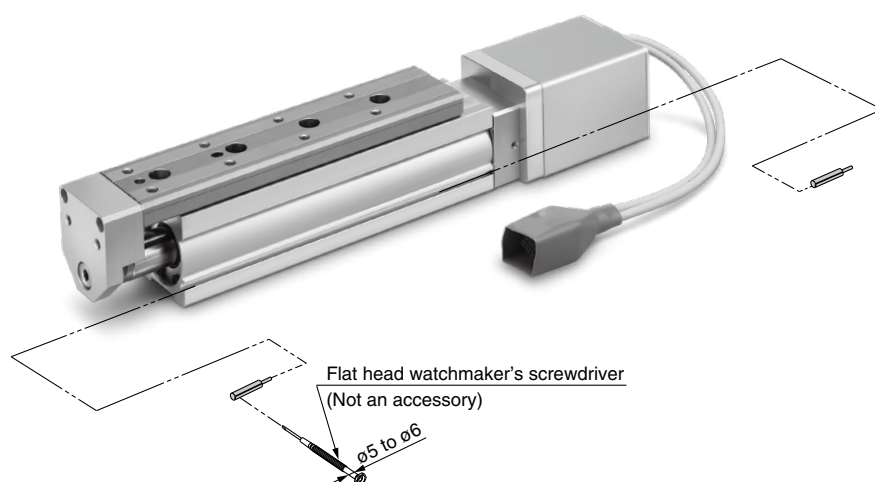
| Size | Stroke | A     | B     |
|------|--------|-------|-------|
| 8    | 50     | 89    | 126   |
|      | 75     | 114   | 152   |
| 16   | 50     | 100.5 | 137.5 |
|      | 100    | 150.5 | 212.5 |
| 25   | 50     | 108   | 168   |
|      | 100    | 158   | 232   |
|      | 150    | 238   | 310   |

## Auto Switch Mounting

When mounting the auto switches, they should be inserted into the actuator's auto switch mounting groove as shown in the drawing below. After setting in the mounting position, use a flat head watchmaker's screwdriver to tighten the auto switch mounting screw that is included.

### Auto Switch Mounting Screw Tightening Torque [N·m]

| Auto switch model               | Tightening torque |
|---------------------------------|-------------------|
| D-M9□(V)<br>D-M9□W(V)<br>D-M9□E | 0.05 to 0.15      |



\* When tightening the auto switch mounting screw (included with the auto switch), use a watchmaker's screwdriver with a handle diameter of about 5 to 6 mm.

Model Selection

LESYH□G Series

Auto Switch

JXC5H/6H Series

JXCEH/9H/PH Series

Specific Product  
Precautions

# 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.

## 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 Flexible 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 [mm <sup>2</sup> ] | 0.15                       |          |                      |
|                                             | Strand diameter [mm]              | 0.05                       |          |                      |
| Min. bending radius [mm] (Reference values) |                                   | 17                         |          |                      |

\* Refer to the **Web Catalog** for solid state auto switch common specifications.

\* Refer to the **Web Catalog** for lead wire lengths.

## 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.

## Weight

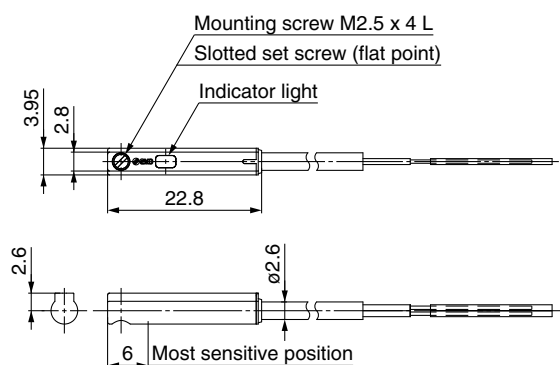
[g]

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

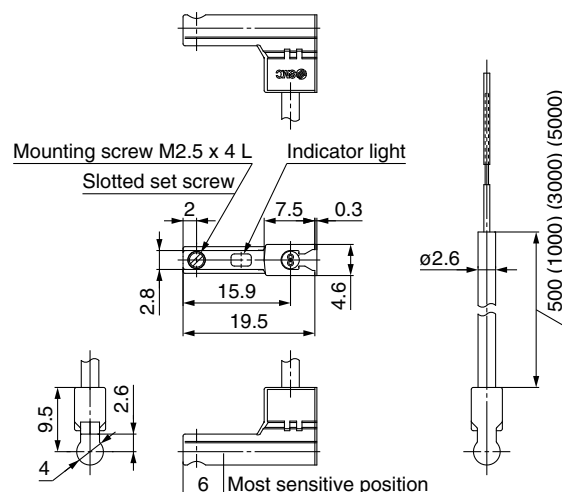
## Dimensions

[mm]

### D-M9□



### D-M9□V



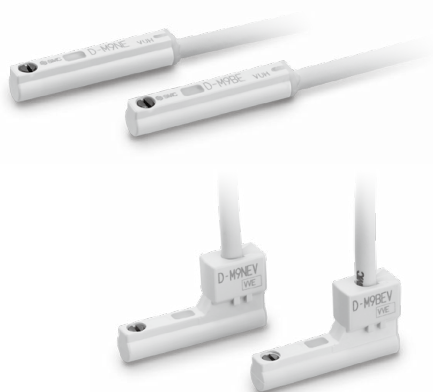
# Normally Closed Solid State Auto Switch Direct Mounting Type D-M9NE(V)/D-M9PE(V)/D-M9BE(V)

Refer to the SMC website for details on products that are compliant with international standards.

PLC: Programmable Logic Controller

## 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

| 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 Flexible 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                   |           | 2 cores (Brown/Blue) |
|                                             | Outside diameter [mm]             |           | 0.88                 |
| Conductor                                   | Effective area [mm <sup>2</sup> ] |           | 0.15                 |
|                                             | Strand diameter [mm]              |           | 0.05                 |
| Min. bending radius [mm] (Reference values) |                                   | 17        |                      |

\* Refer to the **Web Catalog** for solid state auto switch common specifications.

\* Refer to the **Web Catalog** for lead wire lengths.

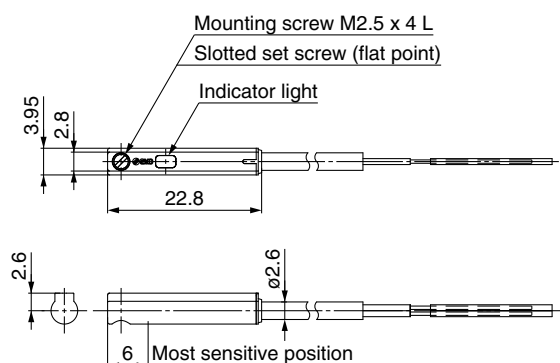
## Weight

| Auto switch model | D-M9NE(V)   | D-M9PE(V) | D-M9BE(V) |
|-------------------|-------------|-----------|-----------|
| Lead wire length  | 0.5 m (Nil) | 8         | 7         |
|                   | 1 m (M)*1   | 14        | 13        |
|                   | 3 m (L)     | 41        | 38        |
|                   | 5 m (Z)*1   | 68        | 63        |

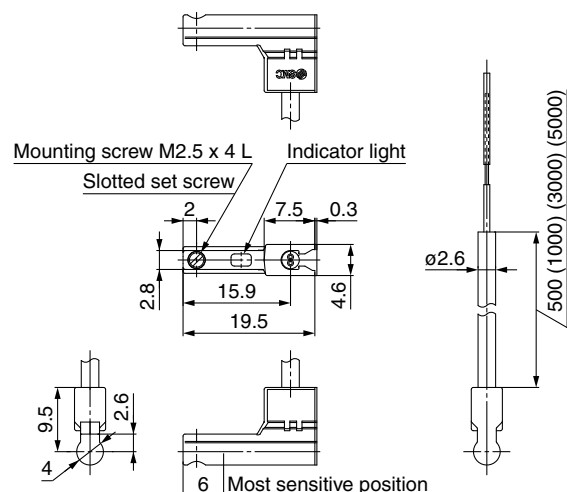
\*1 The 1 m and 5 m options are produced upon receipt of order.

## Dimensions

### D-M9□E



### D-M9□EV



# 2-Color 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.

PLC: Programmable Logic Controller

## 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 color of the light. (Red → Green ← Red)



## Caution

### Precautions

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

## Auto Switch Specifications

| 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 [mm <sup>2</sup> ] | 0.15                       |           |                      |
|                                             | Strand diameter [mm]              | 0.05                       |           |                      |
| Min. bending radius [mm] (Reference values) |                                   | 17                         |           |                      |

- \* Refer to the **Web Catalog** for solid state auto switch common specifications.
- \* Refer to the **Web Catalog** for lead wire lengths.

## Weight

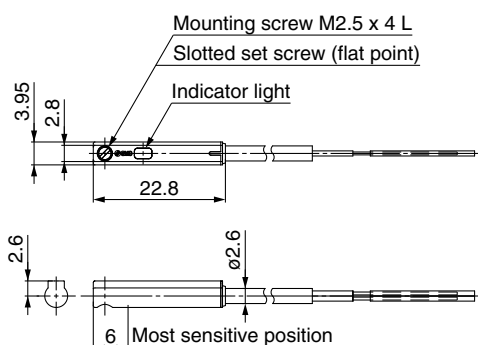
[g]

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

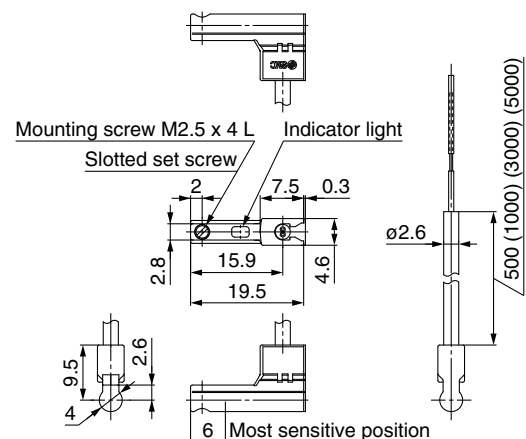
## Dimensions

[mm]

### D-M9□W



### D-M9□WV





# LESYH□G 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.smcworld.com>

## Design

### Warning

#### 1. Do not apply a load in excess of the specification limits.

Select a suitable actuator by work load and allowable moment. If the product is used outside of the specification limits, the eccentric load applied to the guide will be excessive and have adverse effects such as the generation of play on the guide, reduced accuracy, reduced service life of the product.

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

Doing so may result in a malfunction.

## 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]. 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].

#### 2. The moving force should be 100%.

If the moving force is set below the values above, it may cause the generation of an alarm.

#### 3. For pushing operations, set the product to a position at least 0.5 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 the product is set to the same position as a workpiece.

##### a. “Posn failed”

The product cannot reach the pushing start position due to variations in the width of workpieces.

##### b. “Pushing ALM”

The product is pushed back from the pushing start position after starting to push.

## Handling

### Caution

#### 4. Absolute encoder ID mismatch error at the first connection

In the following cases, an “ID mismatch error” alarm occurs after the power is turned ON. Perform a return to origin operation after resetting the alarm before use.

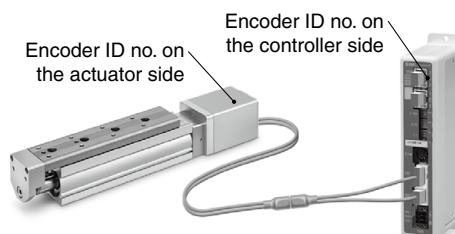
- When an electric actuator is connected and the power is turned ON for the first time after purchase\*1
- When the actuator or motor is replaced
- When the controller is replaced

\*1 If you have purchased an electric actuator and controller with the set part number, the pairing may have already been completed and the alarm may not be generated.

##### “ID mismatch error”

Operation is enabled by matching the encoder ID on the electric actuator side with the ID registered in the controller. This alarm occurs when the encoder ID is different from the registered contents of the controller. By resetting this alarm, the encoder ID is registered (paired) to the controller again.

| When a controller is changed after pairing is completed |                                                |       |               |       |
|---------------------------------------------------------|------------------------------------------------|-------|---------------|-------|
|                                                         | Encoder ID no. (* Numbers below are examples.) |       |               |       |
| Actuator                                                | 17623                                          | 17623 | 17623         | 17623 |
| Controller                                              | 17623                                          | 17699 | 17699         | 17623 |
| ID mismatch error occurred?                             | No                                             | Yes   | Error reset ⇒ | No    |



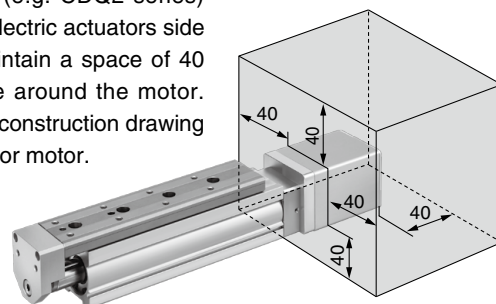
The ID number is automatically checked when the control power supply is turned ON. An error is output if the ID number does not match.

#### 5. In environments where strong magnetic fields are present, use may be limited.

A magnetic sensor is used in the encoder. Therefore, if the actuator motor is used in an environment where strong magnetic fields are present, malfunction or failure may occur.

Do not expose the actuator motor to magnetic fields with a magnetic flux density of 1 mT or more.

When installing an electric actuator and an air cylinder with an auto switch (e.g. CDQ2 series) or multiple electric actuators side by side, maintain a space of 40 mm or more around the motor. Refer to the construction drawing of the actuator motor.



An air cylinder with an auto switch cannot be installed in the shaded area.



# LESYH□G Series 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.smcworld.com>

## Handling

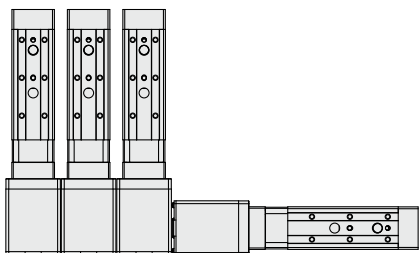
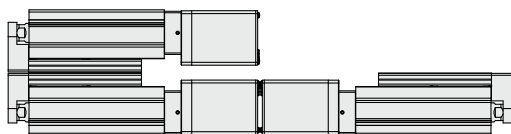
### ⚠ Caution

#### • When lining up actuators

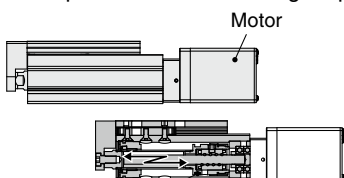
SMC actuators can be used with their motors adjacent to each other. However, for actuators with a built-in auto switch magnet, maintain a space of 40 mm or more between the motors and the position where the magnet passes.

Refer to the construction drawings in the catalog for the magnet position.

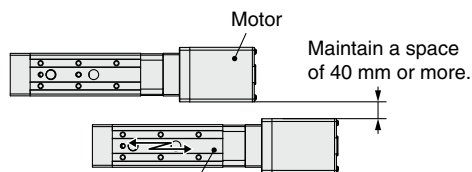
○ Can be used with their motors adjacent to each other



✗ Do not allow the motors to be in close proximity to the position where the magnet passes.



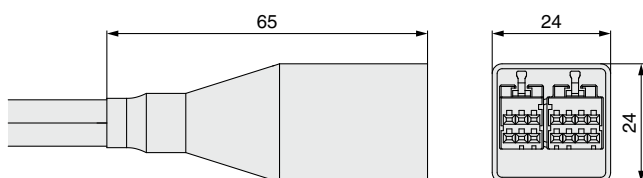
Electric actuator built-in magnet portion (Screw nut)



Electric actuator built-in magnet portion (Table unit)

#### 6. The connector size of the motor cable is different from that of the electric actuator with an incremental encoder.

The motor cable connector of an electric actuator with a battery-less absolute encoder is different from that of an electric actuator with an incremental encoder. As the connector cover dimensions are different, take the dimensions below into consideration during the design process.



Battery-less absolute encoder connector cover dimensions

#### 7. To conduct a pushing operation, be sure to set the product to [Pushing operation]. Never allow the table to collide with the stroke end except during return to origin.

When incorrect instructions are inputted, such as those which cause the product to operate outside of the specification limits or outside of the actual stroke through changes in the controller/driver settings and/or origin position, the table may collide with the stroke end of the actuator. Be sure to check these points before use.

If the table collides with the stroke end of the actuator, the guide, belt, or internal stopper may break. This can result in abnormal operation.



Handle the actuator with care when it is used in the vertical direction as the workpiece will fall freely from its own weight.

#### 8. The actual speed of this actuator is affected by the load.

Check the model selection section of the catalog.

#### 9. 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.

#### 10. The table and guide block are made of special stainless steel, but can rust in an environment where droplets of water adhere to it.

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

Doing so may cause unevenness in the mounting surface, play in the guide, or an increase in the sliding resistance.

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

Doing so may cause play or an increase in the sliding resistance.

#### 13. Do not apply strong impact or an excessive moment while mounting a workpiece.

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

#### 14. Keep the flatness of mounting surface within 0.02 mm.

If a workpiece or base does not sit evenly on the body of the product, play in the guide or an increase in the sliding resistance may occur. Do not deform the mounting surface by mounting with workpieces tucked in.

#### 15. Do not drive the main body with the table fixed.



# LESYH□G Series Specific Product Precautions 3

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.smcworld.com>

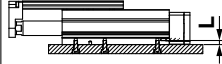
## Handling

### ⚠ Caution

- 16. When mounting the product, use screws of adequate length and tighten them to the max. torque or less.**

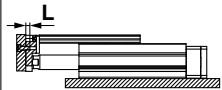
Tightening the screws with a higher torque than recommended may result in a malfunction, while tightening with a lower torque can result in the displacement of the mounting position or, in extreme conditions, the actuator could become detached from its mounting position.

#### Body fixed/ Side mounting (Body tapped)



| Size | Screw size | Max. tightening torque [N·m] | L (Max. screw-in depth [mm]) |
|------|------------|------------------------------|------------------------------|
| 8    | M4 x 0.7   | 1.5                          | 5                            |
| 16   | M5 x 0.8   | 3                            | 6.5                          |
| 25   | M6 x 1     | 5.2                          | 8.5                          |

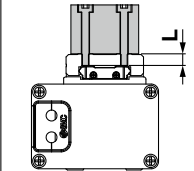
#### Workpiece fixed/Front mounting



| Size | Screw size | Max. tightening torque [N·m] | L [mm] |
|------|------------|------------------------------|--------|
| 8    | M4 x 0.7   | 1.5                          | 8      |
| 16   | M5 x 0.8   | 3                            | 10     |
| 25   | M6 x 1     | 5.2                          | 12     |

To prevent the workpiece retaining screws from penetrating the end plate, use screws that are 0.5 mm or shorter than the max. screw-in depth. If long screws are used, they may touch the end plate and cause a malfunction.

#### Workpiece fixed/Top mounting



| Size | Screw size | Max. tightening torque [N·m] | L [mm]     |
|------|------------|------------------------------|------------|
| 8    | M3 x 0.5   | 0.63                         | 4.8 (Max.) |
| 16   | M5 x 0.8   | 3                            | 6.5 (Max.) |
| 25   | M6 x 1     | 5.2                          | 8 (Max.)   |

To prevent the workpiece retaining screws from touching the guide block, use screws that are the max. screw-in depth or less. If long screws are used, they may touch the guide block and cause a malfunction.

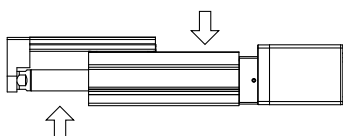
- 17. When external force is to be applied to the table, it is necessary to reduce the work load for the sizing.**

When a cable duct or flexible moving tube is attached to the actuator, the sliding resistance of the table will increase, which may lead to the malfunction of the product.

- 18. Do not grasp or peel off a masking tape on the bottom of the body.**

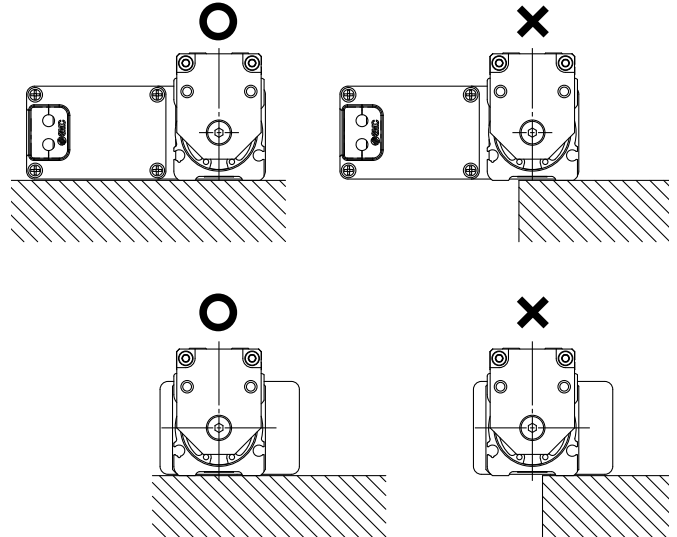
The masking tape may peel off and foreign matter may get inside the actuator.

- 19. When the table operates, the gap can be done between actuator (marked with the arrow below). Be careful to prevent your hands or fingers from getting caught in the gap.**



- 20. Install the body as shown below with the ○.**

Since the product support becomes unstable, it may cause a malfunction, noise or an increase in the deflection.



- 21. Even with the same product number, the table of some products can be moved by hand and the table of some products cannot be moved by hand. However, there is no abnormality with these products. (Without lock)**

This difference is caused because there is a little variation with the positive efficiency (when the table is moved by the motor) and there is a large variation with the reverse efficiency (when the table is moved manually) due to the product characteristics. There is hardly any difference among products when they are operated by the motor.



# LESYH□G Series

## 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.smcworld.com>

### Maintenance

#### Warning

1. Ensure that the power supply is stopped before starting maintenance work or replacing the product.
2. For lubrication, wear protective glasses.
3. Perform maintenance according to the following requirements.

#### Maintenance frequency

Perform maintenance according to the table below.

| Frequency                           | Appearance check | Belt check |
|-------------------------------------|------------------|------------|
| Inspection before daily operation   | ○                | —          |
| Inspection every 6 months*1         | —                | ○          |
| Inspection every 250 km*1           | —                | ○          |
| Inspection every 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 (R/L type only)

Stop operation immediately and replace the belt when any of the following occur.

##### 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 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

# Controllers

## JXC□ Series



Step Data Input Type ..... p. 33

### High Performance

Battery-less Absolute (Step Motor 24 VDC)

JXC5H/6H Series



EtherCAT/EtherNet/IP™/PROFINET Direct Input Type ..... p. 40

### High Performance

Battery-less Absolute (Step Motor 24 VDC)

JXC□H Series

EtherCAT®

EtherNet/IP®

PROFINET®



• Actuator Cable p. 45

Model Selection

LESYH□G Series

Auto Switch

JXC5H/6H Series

JXCEH/9H/PH Series

Specific Product  
Precautions

# High Performance Controller (Step Data Input Type)

## JXC5H/6H Series

CE UK CA cULus  
— For details, refer to page 47 and onward. —

RoHS

### How to Order

JXC **5** H **7** **3** -

① ② ③ ④ ⑤

#### ① Controller type

|   |                         |
|---|-------------------------|
| 5 | Parallel I/O (NPN) type |
| 6 | Parallel I/O (PNP) type |

#### ② Specification

|   |                       |
|---|-----------------------|
| H | High performance type |
|---|-----------------------|

#### ③ Mounting

|   |                |
|---|----------------|
| 7 | Screw mounting |
| 8 | DIN rail       |

#### ④ I/O cable length

|     |       |
|-----|-------|
| Nil | None  |
| 1   | 1.5 m |
| 3   | 3 m   |
| 5   | 5 m   |

#### ⑤ Actuator part number

Without cable specifications and actuator options  
Example: Enter "LESYH16RGA-50" for the  
LESYH16RGA-50C-R1□.

|    |                    |
|----|--------------------|
| BC | Blank controller*1 |
|----|--------------------|

\*1 Requires dedicated software (JXC-BCW)



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

Connect to an actuator (LESYH□G) designated for a high performance controller. Confirm that the combination of the controller and actuator is correct.

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

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

LESYH16RGA-50



#### ⚠ Caution

##### [CE/UKCA-compliant products]

EMC compliance was tested by combining the electric actuator LE series and the JXC5H/6H 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.

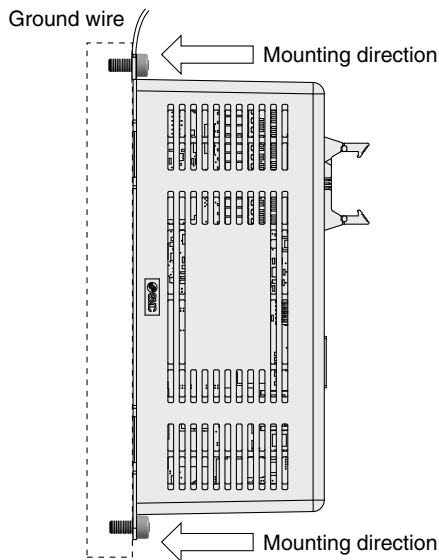
\* Refer to the operation manual for using the products. Please download it via our website:  
<https://www.smcworld.com>

## Specifications

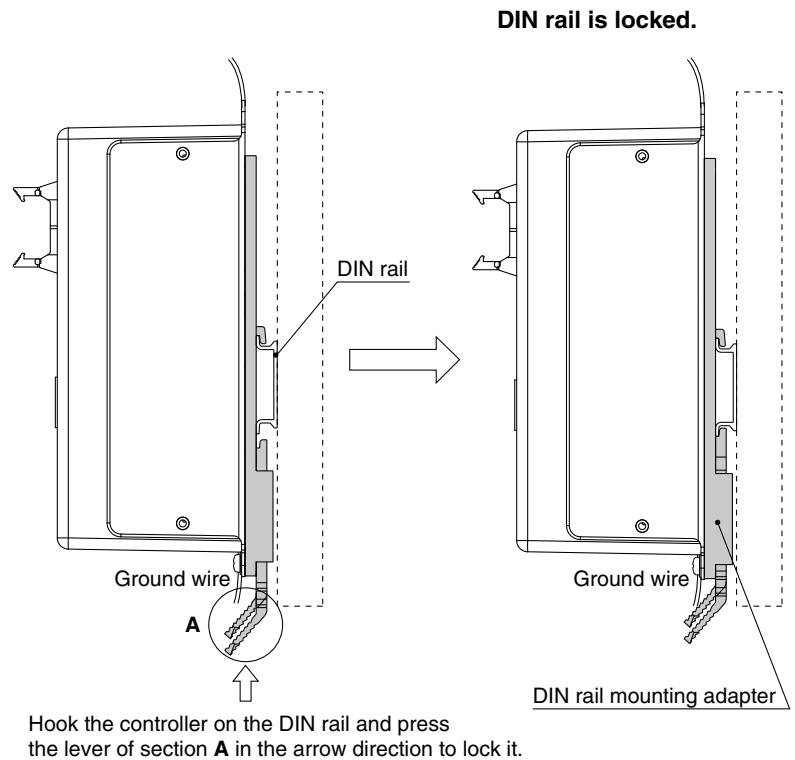
| Model                            | JXC5H<br>JXC6H                                            |
|----------------------------------|-----------------------------------------------------------|
| Compatible motor                 | Step motor (Servo/24 VDC)                                 |
| Power supply                     | Power supply voltage: 24 VDC ±10%                         |
| Current consumption (Controller) | 100 mA or less                                            |
| Compatible encoder               | Battery-less absolute encoder                             |
| Parallel input                   | 11 inputs (Photo-coupler isolation)                       |
| Parallel output                  | 13 outputs (Photo-coupler isolation)                      |
| Serial communication             | RS485 (Only for the LEC-T1 and JXC-W2)                    |
| Memory                           | EEPROM                                                    |
| LED indicator                    | PWR, ALM                                                  |
| Cable length [m]                 | Actuator cable: 20 or less                                |
| Cooling system                   | Natural air cooling                                       |
| Operating temperature range [°C] | 0 to 40                                                   |
| Operating humidity range [%RH]   | 90 or less (No condensation)                              |
| Insulation resistance [MΩ]       | Between all external terminals and the case: 50 (500 VDC) |
| Weight [g]                       | 150 (Screw mounting), 170 (DIN rail mounting)             |

## How to Mount

### a) Screw mounting (JXC□H7□) (Installation with two M4 screws)



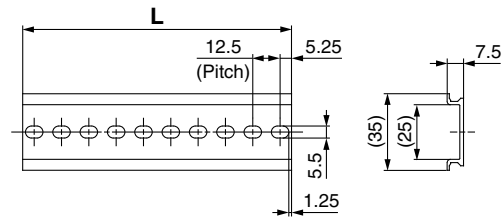
### b) DIN rail mounting (JXC□H8□) (Installation with the DIN rail)



\* 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 35 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.

Model Selection

LESYH□G Series

Auto Switch

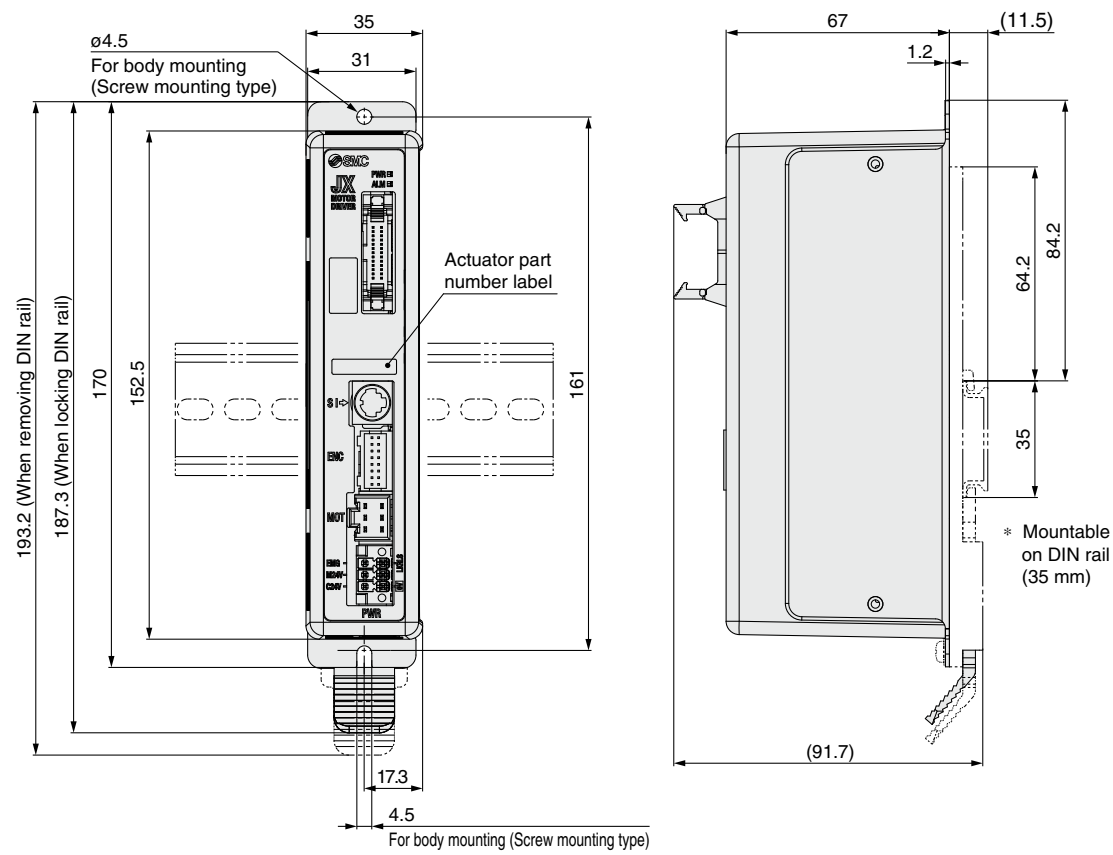
JXC5H/6H Series

JXCEH/9H/PH Series

Specific Product  
Precautions

# JXC5H/6H Series

## Dimensions



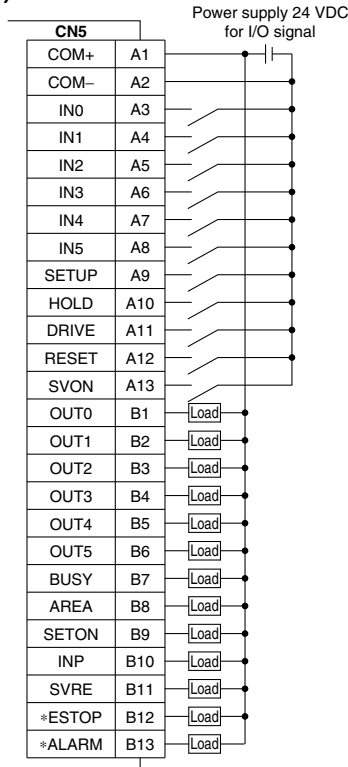
## Wiring Example 1

### Parallel I/O Connector

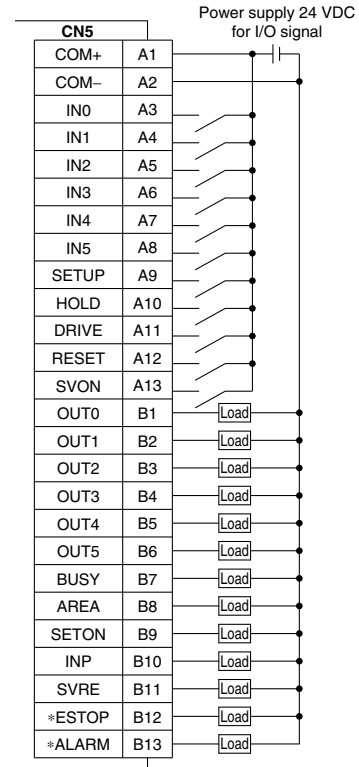
- \* When you connect a PLC to the parallel I/O connector, use the I/O cable (LEC-CN5-□).
- \* The wiring changes depending on the type of parallel I/O (NPN or PNP).

#### Wiring diagram

##### JXC5H□□ (NPN)



##### JXC6H□□ (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.<br>(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<br>(Turns on when the positioning or pushing is completed.) |
| SVRE                 | Outputs when servo is on                                                                                            |
| *ESTOP* <sup>1</sup> | OFF when EMG stop is instructed                                                                                     |
| *ALARM* <sup>1</sup> | OFF when alarm is generated                                                                                         |

\*<sup>1</sup> Signal of negative-logic circuit (N.C.)

Model Selection

LESYH□G Series

Auto Switch

JXC5H/6H Series

JXCEH/9H/PH Series

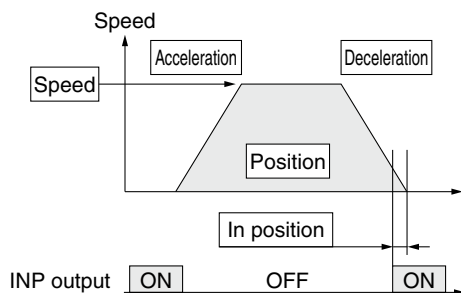
Specific Product  
Precautions

## 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.

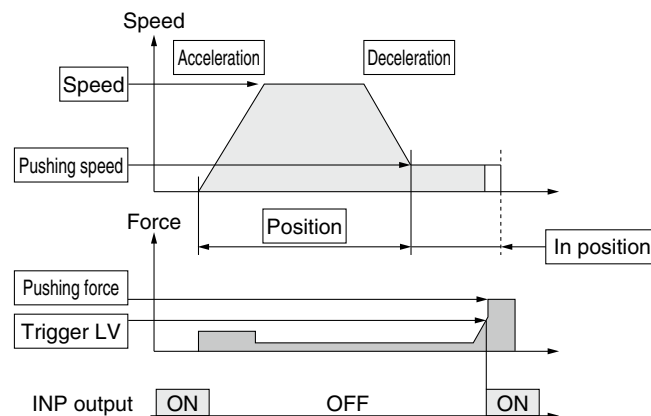
#### Step Data (Positioning)

| 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<br>(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.



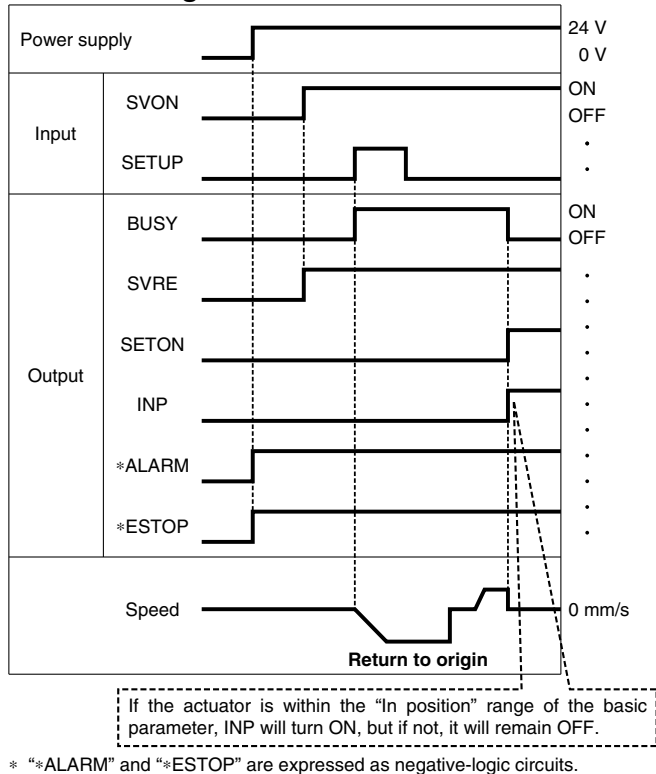
◎ : Need to be set.  
○ : Need to be adjusted as required.

#### Step Data (Pushing)

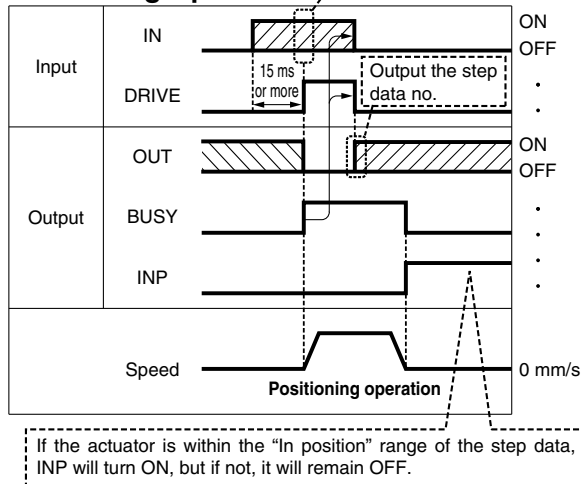
| Necessity | Item           | Details                                                                                                                                                                                                                                                   |
|-----------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ◎         | 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<br>(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

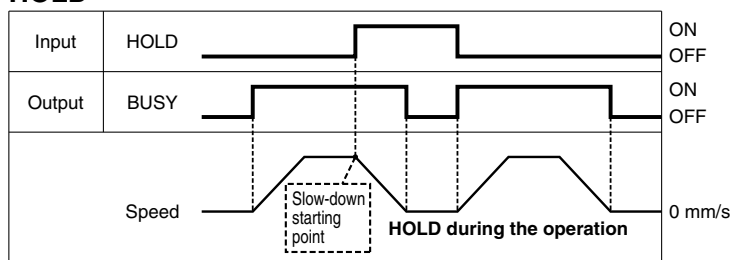


### Positioning Operation



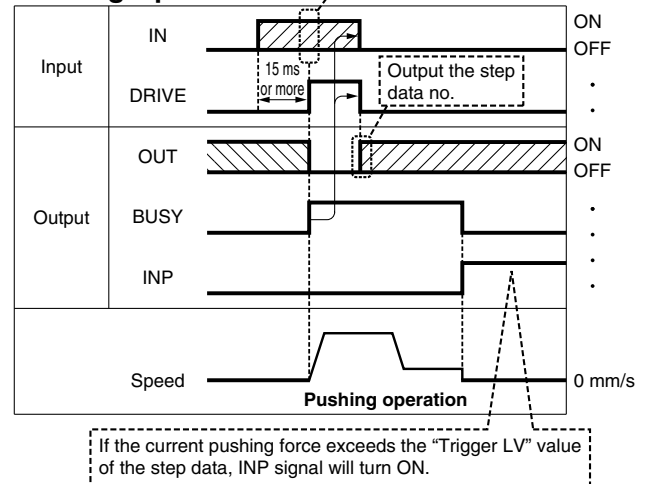
\* "OUT" is output when "DRIVE" is changed from ON to OFF.  
Refer to the operation manual for details on the controller for the LEM series.  
(When power supply is applied, "DRIVE" or "RESET" is turned ON or \*ESTOP is turned OFF, all of the "OUT" outputs are OFF.)

### HOLD

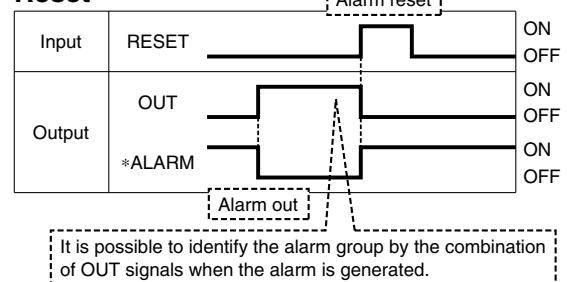


\* When the actuator is within the "In position" range in the pushing operation, it does not stop even if HOLD signal is input.

### Pushing Operation



### Reset



\* \*ALARM is expressed as a negative-logic circuit.

Model Selection

LESYH□G Series

Auto Switch

JXC5H/6H Series

JXCEH/9H/PH Series

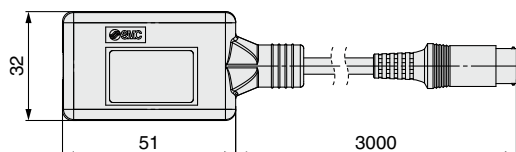
Specific Product Precautions

# JXC5H/6H Series

## Options

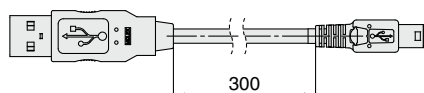
### ■ Communication cable for controller setting

#### ① Communication cable JXC-W2A-C



\* It can be connected to the controller directly.

#### ② USB cable LEC-W2-U



#### ③ Controller setting kit JXC-W2A

A set which includes a communication cable (JXC-W2A-C) and a USB cable (LEC-W2-U)

##### <Controller setting software/USB driver>

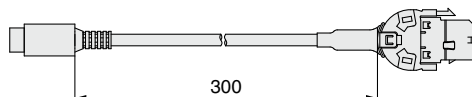
- Controller setting software
  - USB driver (For JXC-W2A-C)
- Download from SMC's website:  
<https://www.smcworld.com>

##### 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.

### ■ 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.

### ■ I/O cable

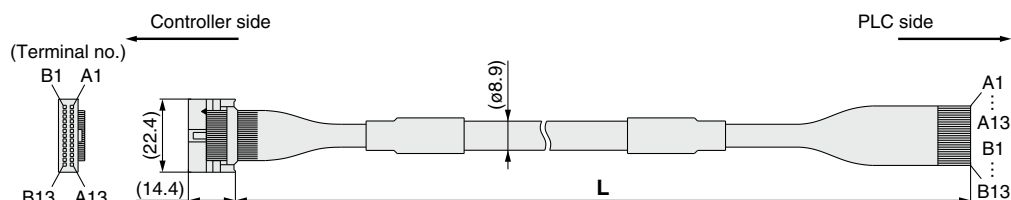
#### LEC-CN5-1

| Cable length (L) [m] |     |
|----------------------|-----|
| 1                    | 1.5 |
| 3                    | 3   |
| 5                    | 5   |

\* Conductor size: AWG28

##### Weight

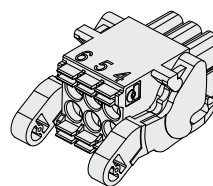
| Product no. | Weight [g] |
|-------------|------------|
| LEC-CN5-1   | 170        |
| LEC-CN5-3   | 320        |
| LEC-CN5-5   | 520        |



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

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

### ■ Power supply plug JXC-CPW



\* The power supply plug is an accessory.  
 <Applicable cable size> AWG20 (0.5 mm<sup>2</sup>), cover diameter 2.0 mm or less

|        |          |
|--------|----------|
| ① C24V | ④ 0V     |
| ② M24V | ⑤ N.C.   |
| ③ EMG  | ⑥ LK RLS |

#### Power supply plug

| Terminal name | Function                 | Details                                                                             |
|---------------|--------------------------|-------------------------------------------------------------------------------------|
| 0V            | Common supply (-)        | The M24V terminal, C24V terminal, EMG terminal, and 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                                      |

### ■ Teaching box

LEC-T1-3□J□G□

Teaching box

Cable length [m]

Initial language

Enable switch (Option)

Stop switch

Enable switch

Stop switch

\* The displayed language can be changed to English or Japanese.

#### 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)                  |

# High Performance Step Motor Controller

## JXCEH/9H/PH Series

CE UKCA cULus  
— For details, refer to page 47 and onward. —

RoHS

### How to Order

#### ⚠ Caution

##### [CE/UKCA-compliant products]

- ① EMC compliance was tested by combining the electric actuator LE series and the JXCEH/PH 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 JXCEH/PH series (step motor controller), EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 44 for the noise filter set. Refer to the JXCEH/PH Operation Manual for installation.

JXC P H 7 -

#### Communication protocol

|   |              |
|---|--------------|
| E | EtherCAT     |
| 9 | EtherNet/IP™ |
| P | PROFINET     |

#### High performance

#### Mounting

|     |                |
|-----|----------------|
| 7   | Screw mounting |
| 8*1 | DIN rail       |

\*1 The DIN rail is not included. It must be ordered separately. (Refer to page 44.)



EtherCAT EtherNet/IP PROFINET

#### Actuator part number

Without cable specifications and actuator options  
Example: Enter "LESYH16RGA-50C"  
for the LESYH16RGA-50C-S1□□.

BC Blank controller\*1

\*1 Requires dedicated software (JXC-BCW)

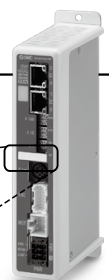
#### The controller is sold as single unit after the compatible actuator is set.

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.

LESYH16RGA-50

①



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

#### Precautions for blank controllers (JXC□H□-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 communication cable for controller setting (JXC-W2A-C) and USB cable (LEC-W2-U) separately to use this software.

SMC website: <https://www.smcworld.com>

Model Selection

LESYH□G Series

Auto Switch

JXC5H/6H Series

JXCEH/9H/PH Series

Specific Product Precautions

# JXCEH/9H/PH Series

## Specifications

| Model                            |                      |           | JXCEH                                                     | JXC9H                                              | JXCPH                                           |
|----------------------------------|----------------------|-----------|-----------------------------------------------------------|----------------------------------------------------|-------------------------------------------------|
| Network                          |                      |           | EtherCAT                                                  | EtherNet/IP™                                       | PROFINET                                        |
| Compatible motor                 |                      |           | Step motor (Servo/24 VDC)                                 |                                                    |                                                 |
| Power supply                     |                      |           | Power voltage: 24 VDC ±10%                                |                                                    |                                                 |
| Current consumption (Controller) |                      |           | 200 mA or less                                            | 200 mA or less                                     | 200 mA or less                                  |
| Compatible encoder               |                      |           | Battery-less absolute encoder                             |                                                    |                                                 |
| Communication specifications     | Applicable system    | Protocol  | EtherCAT*2                                                | EtherNet/IP™*2                                     | PROFINET*2                                      |
|                                  |                      | Version*1 | Conformance Test Record V.1.2.6                           | Volume 1 (Edition 3.14)<br>Volume 2 (Edition 1.15) | Specification Version 2.32                      |
|                                  | Communication speed  |           | 100 Mbps*2                                                | 10/100 Mbps*2<br>(Automatic negotiation)           | 100 Mbps*2                                      |
|                                  | Configuration file*3 |           | ESI file                                                  | EDS file                                           | GSDML 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               |
|                                  | Terminating resistor |           | Not included                                              |                                                    |                                                 |
|                                  | Memory               |           | EEPROM                                                    |                                                    |                                                 |
| LED indicator                    |                      |           | PWR, RUN, ALM, ERR                                        | PWR, ALM, MS, NS                                   | PWR, ALM, SF, BF                                |
| Cable length [m]                 |                      |           | Actuator cable: 20 or less                                |                                                    |                                                 |
| Cooling system                   |                      |           | Natural air cooling                                       |                                                    |                                                 |
| Operating temperature range [°C] |                      |           | 0 to 40 (No freezing)*4                                   |                                                    |                                                 |
| Operating humidity range [%RH]   |                      |           | 90 or less (No condensation)                              |                                                    |                                                 |
| Insulation resistance [MΩ]       |                      |           | Between all external terminals and the case: 50 (500 VDC) |                                                    |                                                 |
| Weight [g]                       |                      |           | 260 (Screw mounting)<br>280 (DIN rail mounting)           | 250 (Screw mounting)<br>270 (DIN rail mounting)    | 260 (Screw mounting)<br>280 (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.

\*4 The operating temperature range for both controller version 1 products and controller version 2 products is 0 to 40°C. Refer to the **Web Catalog** for details on identifying controller version symbols.

### ■ Trademark

EtherNet/IP® is a registered trademark of ODVA, Inc.

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 max. 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>

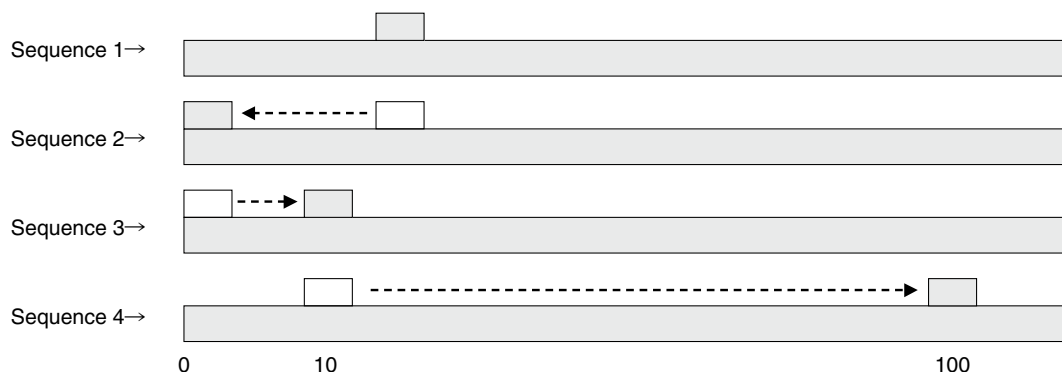
Sequence 1: Servo ON instruction

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.

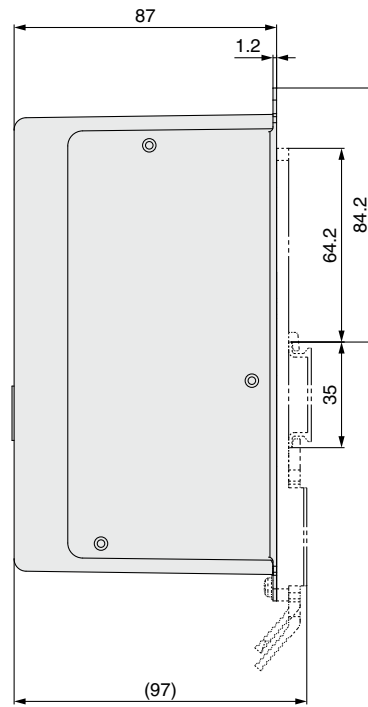
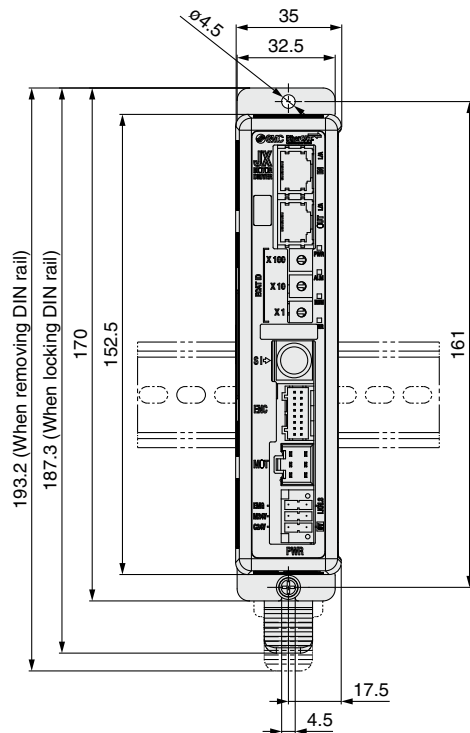
Sequence 4: Turn ON step data No. 0 and the input instruction flag (position) to change the target position to 100 while the start flag is ON.

The same operation can be performed with any operation command.

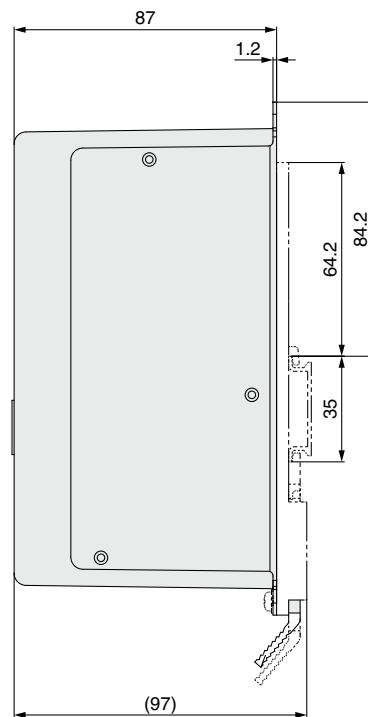
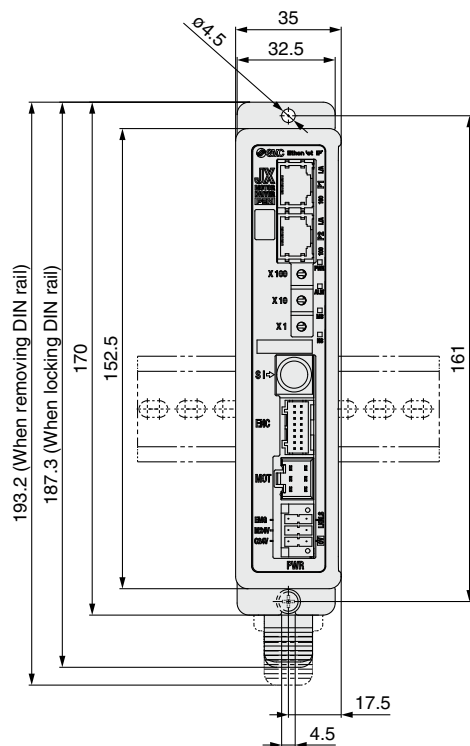


## Dimensions

### JXCEH



### JXC9H



Model Selection

LESYH ☐ G Series

Auto Switch

JXC5H/6H Series

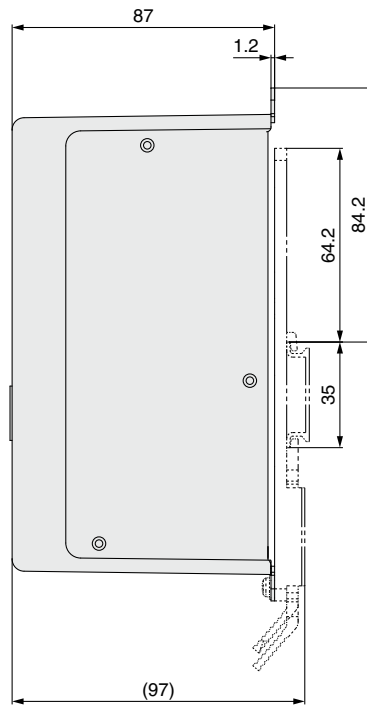
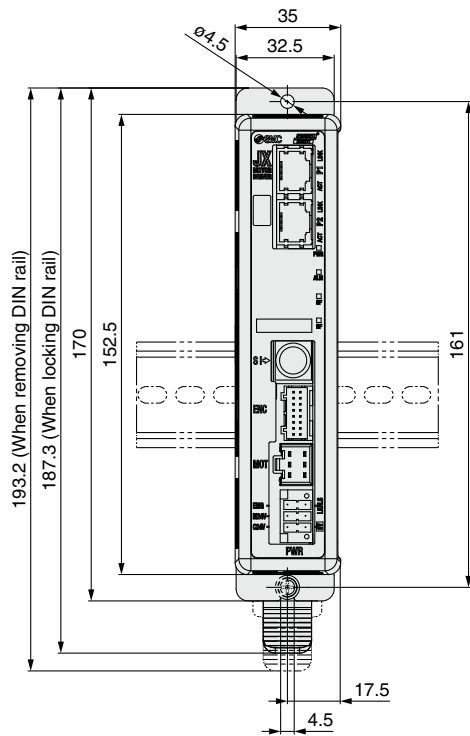
JXCEH/9H/PH Series

Specific Product  
Precautions

## ***JXCEH/9H/PH Series***

## Dimensions

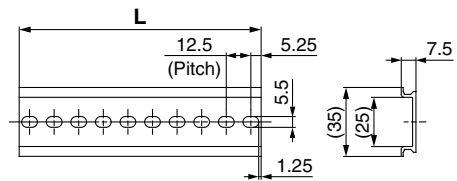
**JXCPH**



## DIN rail

**AXT100-DR-□**

\* For ☐, enter a number from the No. line in the table below.



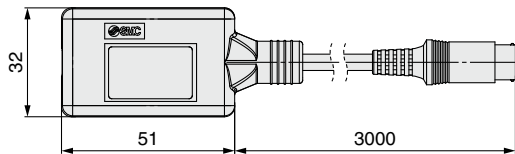
**L Dimensions [mm]**

|     |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |     |       |
|-----|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|
| 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

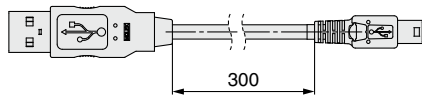
### ■ Communication cable for controller setting

#### ① Communication cable JXC-W2A-C



\* It can be connected to the controller directly.

#### ② USB cable LEC-W2-U



#### <Controller setting software/USB driver>

- Controller setting software
- USB driver (For JXC-W2A-C)

Download from SMC's website: <https://www.smcworld.com>

#### 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.

### ■ 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 43.  
Refer to the dimension drawings on pages 42 and 43 for the mounting dimensions.

### ■ Teaching box

**LEC-T1-3JG□**

Teaching box

Cable length [m]  
3 3

Initial language

|   |          |
|---|----------|
| J | Japanese |
| E | English  |

\* The displayed language can be changed to English or Japanese.

Enable switch (Option)



● Enable switch

|     |                             |
|-----|-----------------------------|
| Nil | None                        |
| S   | Equipped with enable switch |

\* Interlock switch for jog and test function

● Stop switch

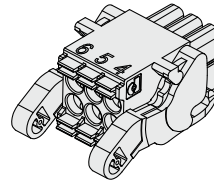
|   |                           |
|---|---------------------------|
| G | Equipped with stop switch |
|---|---------------------------|

#### 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)                  |

### ■ Power supply plug JXC-CPW

\* The power supply plug is an accessory.



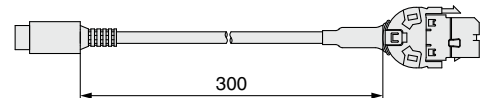
|   |   |   |
|---|---|---|
| 6 | 5 | 4 |
| 3 | 2 | 1 |

- |        |          |
|--------|----------|
| ① C24V | ④ 0V     |
| ② M24V | ⑤ N.C.   |
| ③ EMG  | ⑥ LK RLS |

#### Power supply plug

| Terminal name | Function                 | Details                                                                             |
|---------------|--------------------------|-------------------------------------------------------------------------------------|
| 0V            | Common supply (-)        | The M24V terminal, C24V terminal, EMG terminal, and 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                                      |

### ■ Conversion cable P5062-5 (Cable length: 300 mm)



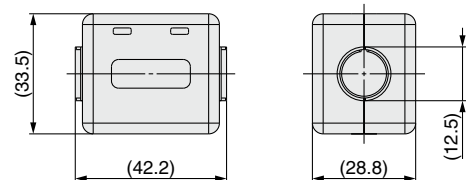
\* To connect the teaching box (LEC-T1-3□G□) or controller setting kit (LEC-W2) to the controller, a conversion cable is required.

### ■ Noise filter set

#### LEC-NFA

Contents of the set: 2 noise filters

(Manufactured by WURTH ELEKTRONIK: 74271222)



\* Refer to the JXCEH/PH series Operation Manual for installation.

**JXC5H/6H Series**  
**JXCEH/9H/PH Series**

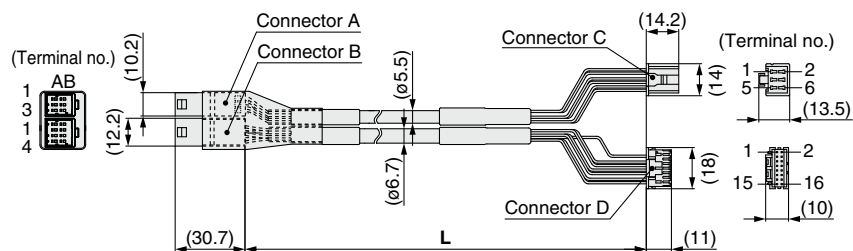
**[Robotic cable for battery-less absolute (Step motor 24 VDC)]**

## LE - CE - 1

**Cable length (L) [m]**

|          |                  |
|----------|------------------|
| <b>1</b> | 1.5              |
| <b>3</b> | 3                |
| <b>5</b> | 5                |
| <b>8</b> | 8* <sup>1</sup>  |
| <b>A</b> | 10* <sup>1</sup> |
| <b>B</b> | 15* <sup>1</sup> |
| <b>C</b> | 20* <sup>1</sup> |

\*1 Produced upon receipt of order



## Weight

| Product no.    | Weight [g] | Note          |
|----------------|------------|---------------|
| <b>LE-CE-1</b> | 190        | Robotic cable |
| <b>LE-CE-3</b> | 360        |               |
| <b>LE-CE-5</b> | 570        |               |
| <b>LE-CE-8</b> | 900        |               |
| <b>LE-CE-A</b> | 1120       |               |
| <b>LE-CE-B</b> | 1680       |               |
| <b>LE-CE-C</b> | 2210       |               |

| Signal    | Connector A terminal no. |  | Cable color | Connector C terminal no. |
|-----------|--------------------------|--|-------------|--------------------------|
| A         | B-1                      |  | Brown       | 2                        |
| $\bar{A}$ | A-1                      |  | Red         | 1                        |
| B         | B-2                      |  | Orange      | 6                        |
| $\bar{B}$ | A-2                      |  | Yellow      | 5                        |
| COM-A/COM | B-3                      |  | Green       | 3                        |
| COM-B/—   | A-3                      |  | Blue        | 4                        |

| Signal    | Connector B terminal no. |  | Cable color | Connector D terminal no. |
|-----------|--------------------------|--|-------------|--------------------------|
| Vcc       | B-1                      |  | Brown       | 12                       |
| GND       | A-1                      |  | Black       | 13                       |
| $\bar{A}$ | B-2                      |  | Red         | 7                        |
| A         | A-2                      |  | Black       | 6                        |
| $\bar{B}$ | B-3                      |  | Orange      | 9                        |
| B         | A-3                      |  | Black       | 8                        |
| SD+ (RX)  | B-4                      |  | Yellow      | 11                       |
| SD- (TX)  | A-4                      |  | Black       | 10                       |
|           |                          |  | Black       | 3                        |

**[Robotic cable with lock for battery-less absolute (Step motor 24 VDC)]**

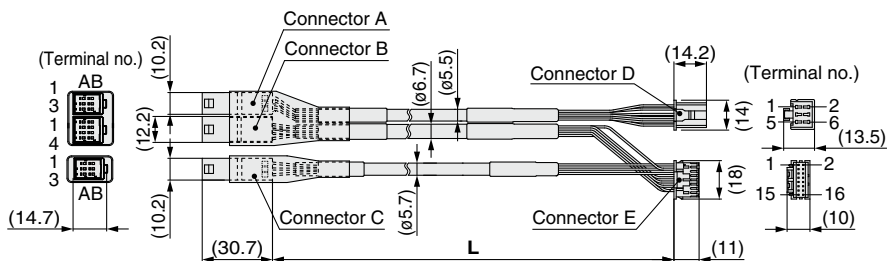
**LE-CE-1-B**

**Cable length (L) [m]**

|          |      |
|----------|------|
| <b>1</b> | 1.5  |
| <b>3</b> | 3    |
| <b>5</b> | 5    |
| <b>8</b> | 8*1  |
| <b>A</b> | 10*1 |
| <b>B</b> | 15*1 |
| <b>C</b> | 20*1 |

\*1 Produced upon receipt of order

**With lock and sensor** ●



## Weight

| Product no.      | Weight [g] | Note          |
|------------------|------------|---------------|
| <b>LE-CE-1-B</b> | 240        | Robotic cable |
| <b>LE-CE-3-B</b> | 460        |               |
| <b>LE-CE-5-B</b> | 740        |               |
| <b>LE-CE-8-B</b> | 1170       |               |
| <b>LE-CE-A-B</b> | 1460       |               |
| <b>LE-CE-B-B</b> | 2120       |               |
| <b>LE-CE-C-B</b> | 2890       |               |

| Signal     | Connector A terminal no. |  | Cable color | Connector D terminal no. |
|------------|--------------------------|--|-------------|--------------------------|
| A          | B-1                      |  | Brown       | 2                        |
| $\bar{A}$  | A-1                      |  | Red         | 1                        |
| B          | B-2                      |  | Orange      | 6                        |
| $\bar{B}$  | A-2                      |  | Yellow      | 5                        |
| COM-A/COM  | B-3                      |  | Green       | 3                        |
| COM-B/—    | A-3                      |  | Blue        | 4                        |
| Signal     | Connector B terminal no. |  | Cable color | Connector E terminal no. |
| Vcc        | B-1                      |  | Brown       | 12                       |
| GND        | A-1                      |  | Black       | 13                       |
| $\bar{A}$  | B-2                      |  | Red         | 7                        |
| A          | A-2                      |  | Black       | 6                        |
| $\bar{B}$  | B-3                      |  | Orange      | 9                        |
| B          | A-3                      |  | Black       | 8                        |
| SD+ (RX)   | B-4                      |  | Yellow      | 11                       |
| SD- (TX)   | A-4                      |  | Black       | 10                       |
| Signal     | Connector C terminal no. |  | Cable color | Connector F terminal no. |
| Lock (+)   | B-1                      |  | Red         | 4                        |
| Lock (-)   | A-1                      |  | Black       | 5                        |
| Sensor (+) | B-3                      |  | Brown       | 1                        |
| Sensor (-) | A-3                      |  | Blue        | 2                        |



# Battery-less Absolute Encoder Type Specific Product Precautions

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For electric actuator precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

## Handling

### ⚠ Caution

#### 1. Absolute encoder ID mismatch error at the first connection

In the following cases, an “ID mismatch error” alarm occurs after the power is turned ON. Perform a return to origin operation after resetting the alarm before use.

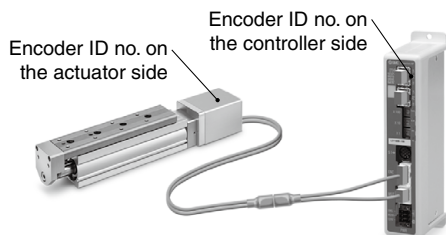
- When an electric actuator is connected and the power is turned ON for the first time after purchase\*1
- When the actuator or motor is replaced
- When the controller is replaced

\*1 If you have purchased an electric actuator and controller with the set part number, the pairing may have already been completed and the alarm may not be generated.

##### “ID mismatch error”

Operation is enabled by matching the encoder ID on the electric actuator side with the ID registered in the controller. This alarm occurs when the encoder ID is different from the registered contents of the controller. By resetting this alarm, the encoder ID is registered (paired) to the controller again.

| When a controller is changed after pairing is completed |                                                |       |               |       |
|---------------------------------------------------------|------------------------------------------------|-------|---------------|-------|
|                                                         | Encoder ID no. (* Numbers below are examples.) |       |               |       |
| Actuator                                                | 17623                                          | 17623 | 17623         | 17623 |
| Controller                                              | 17623                                          | 17699 | 17699         | 17623 |
| ID mismatch error occurred?                             | No                                             | Yes   | Error reset ⇒ | No    |

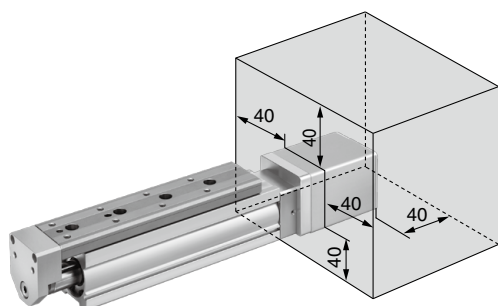


The ID number is automatically checked when the control power supply is turned ON. An error is output if the ID number does not match.

#### 2. In environments where strong magnetic fields are present, use may be limited.

A magnetic sensor is used in the encoder. Therefore, if the actuator motor is used in an environment where strong magnetic fields are present, malfunction or failure may occur. Do not expose the actuator motor to magnetic fields with a magnetic flux density of 1 mT or more.

When installing an electric actuator and an air cylinder with an auto switch (e.g. CDQ2 series) or multiple electric actuators side by side, maintain a space of 40 mm or more around the motor. Refer to the construction drawing of the actuator motor.

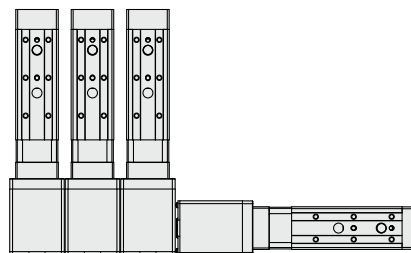
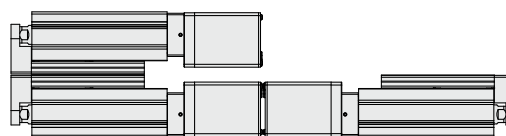


An air cylinder with an auto switch cannot be installed in the shaded area.

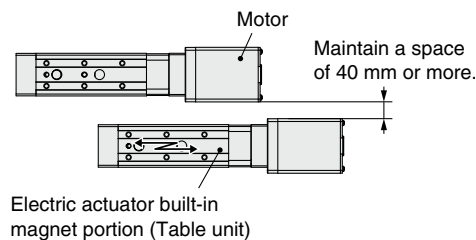
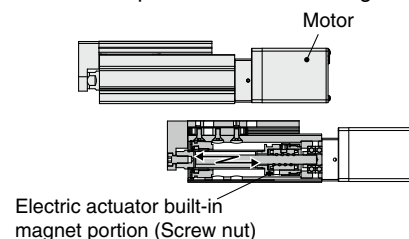
#### • When lining up actuators

SMC actuators can be used with their motors adjacent to each other. However, for actuators with a built-in auto switch magnet, maintain a space of 40 mm or more between the motors and the position where the magnet passes. Refer to the construction drawings in the catalog for the magnet position.

○ Can be used with their motors adjacent to each other

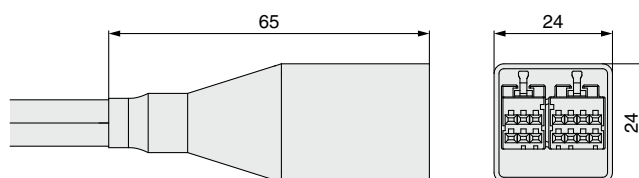


✗ Do not allow the motors to be in close proximity to the position where the magnet passes.



#### 3. The connector size of the motor cable is different from that of the electric actuator with an incremental encoder.

The motor cable connector of an electric actuator with a battery-less absolute encoder is different from that of an electric actuator with an incremental encoder. As the connector cover dimensions are different, take the dimensions below into consideration during the design process.



Battery-less absolute encoder connector cover dimensions

# CE/UKCA/UL-compliance List

\* For CE, UKCA, and UL-compliant products, refer to the tables below and the following pages.

## ■ Controllers “○”: Compliant “x”: Not compliant

As of February 2022

| Compatible motor                             | Series   | CE<br>UK<br>CA | cULus      |                              | Compatible motor | Series  | CE<br>UK<br>CA | cULus<br>LISTED |                              |
|----------------------------------------------|----------|----------------|------------|------------------------------|------------------|---------|----------------|-----------------|------------------------------|
|                                              |          |                | Compliance | Certification No. (File No.) |                  |         |                | Compliance      | Certification No. (File No.) |
| Step motor<br>(Servo/24 VDC)                 | JXCE1    | ○              | ○          | E480340                      | AC servo motor   | LECSA   | ○              | ○               | E466261                      |
|                                              | JXC91    | ○              | ○          | E480340                      |                  | LECSB-T | ○              | ○               | E466261                      |
|                                              | JXCP1    | ○              | ○          | E480340                      |                  | LECSC-T | ○              | ○               | E466261                      |
|                                              | JXCD1    | ○              | ○          | E480340                      |                  | LECSN-T | ○              | ○*1             | E466261                      |
|                                              | JXCL1    | ○              | ○          | E480340                      |                  | LECSS-T | ○              | ○               | E466261                      |
|                                              | JXCM1    | ○              | ○          | E480340                      |                  | LECYM   | ○              | x               | —                            |
|                                              | LECP1    | ○              | ○          | E339743                      |                  | LECYU   | ○              | x               | —                            |
| Battery-less absolute<br>(Step motor 24 VDC) | LECP2    | ○              | ○          | E339743                      |                  |         |                |                 |                              |
|                                              | LECPA    | ○              | ○          | E339743                      |                  |         |                |                 |                              |
|                                              | JXC51/61 | ○              | ○          | E480340                      |                  |         |                |                 |                              |
|                                              | JXCE1    | ○              | ○          | E480340                      |                  |         |                |                 |                              |
|                                              | JXC91    | ○              | ○          | E480340                      |                  |         |                |                 |                              |
|                                              | JXCP1    | ○              | ○          | E480340                      |                  |         |                |                 |                              |
|                                              | JXCD1    | ○              | ○          | E480340                      |                  |         |                |                 |                              |
| High performance<br>(Step motor 24 VDC)      | JXCL1    | ○              | ○          | E480340                      |                  |         |                |                 |                              |
|                                              | JXCM1    | ○              | ○          | E480340                      |                  |         |                |                 |                              |
|                                              | JXC5H/6H | ○              | ○          | E480340                      |                  |         |                |                 |                              |
|                                              | JXCEH    | ○              | ○          | E480340                      |                  |         |                |                 |                              |
| Servo motor<br>(24 VDC)                      | JXC9H    | ○              | ○          | E480340                      |                  |         |                |                 |                              |
|                                              | JXCPH    | ○              | ○          | E480340                      |                  |         |                |                 |                              |
| Step motor<br>(Servo/24 VDC)                 | LECA6    | ○              | ○          | E339743                      |                  |         |                |                 |                              |
|                                              | JXC73    | ○              | x          | —                            |                  |         |                |                 |                              |
|                                              | JXC83    | ○              | x          | —                            |                  |         |                |                 |                              |
|                                              | JXC93    | ○              | x          | —                            |                  |         |                |                 |                              |
|                                              | JXC92    | ○              | x          | —                            |                  |         |                |                 |                              |

\*1 Only the “Without network card” option is UL compliant.

## ■ Actuators “○”: Compliant “x”: Not compliant

As of February 2022

| Compatible motor                                                 | Series    | CE<br>UK<br>CA | cULus      |                              | Compatible motor        | Series      | CE<br>UK<br>CA | cULus      |                              |
|------------------------------------------------------------------|-----------|----------------|------------|------------------------------|-------------------------|-------------|----------------|------------|------------------------------|
|                                                                  |           |                | Compliance | Certification No. (File No.) |                         |             |                | Compliance | Certification No. (File No.) |
| Step motor<br>(Servo/24 VDC)                                     | LEFS      | ○              | x          | —                            | Servo motor<br>(24 VDC) | LEFS        | ○              | x          | —                            |
|                                                                  | 11-LEFS   | ○              | x          | —                            |                         | 11-LEFS     | ○              | x          | —                            |
|                                                                  | 25A-LEFS  | ○              | x          | —                            |                         | 25A-LEFS    | ○              | x          | —                            |
|                                                                  | LEFB      | ○              | x          | —                            |                         | LEFB        | ○              | x          | —                            |
|                                                                  | LEL       | ○              | x          | —                            |                         | LEY         | ○              | x          | —                            |
|                                                                  | LEM       | ○              | x          | —                            |                         | LEY-X5/X7   | ○              | x          | —                            |
|                                                                  | LEY       | ○              | x          | —                            |                         | LEYG        | ○              | x          | —                            |
|                                                                  | 25A-LEY   | ○              | x          | —                            |                         | LES         | ○              | x          | —                            |
|                                                                  | LEY-X5/X7 | ○              | x          | —                            |                         | LESH        | ○              | x          | —                            |
|                                                                  | LEYG      | ○              | x          | —                            | AC servo motor          | LEFS        | ○              | x          | —                            |
| Battery-less absolute<br>(Step motor 24 VDC)                     | LES       | ○              | x          | —                            |                         | 11-LEFS     | ○              | x          | —                            |
|                                                                  | LESH      | ○              | x          | —                            |                         | 25A-LEFS    | ○              | x          | —                            |
|                                                                  | LEPY      | ○              | x          | —                            |                         | LEKFS       | ○              | x          | —                            |
|                                                                  | LEPS      | ○              | x          | —                            |                         | LEFB        | ○              | x          | —                            |
|                                                                  | LER       | ○              | x          | —                            |                         | LEJS        | ○              | x          | —                            |
|                                                                  | LEHZ      | ○              | x          | —                            |                         | 11-LEJS     | ○              | x          | —                            |
|                                                                  | LEHZJ     | ○              | x          | —                            |                         | 25A-LEJS    | ○              | x          | —                            |
|                                                                  | LEHF      | ○              | x          | —                            |                         | LEJB        | ○              | x          | —                            |
|                                                                  | LEHS      | ○              | x          | —                            |                         | LEY25/32/63 | ○              | x          | —                            |
|                                                                  | LEFS      | ○              | x          | —                            |                         | LEY100      | ○              | x          | —                            |
|                                                                  | LEFB      | ○              | x          | —                            |                         | LEYG        | ○              | x          | —                            |
|                                                                  | LEKFS     | ○              | x          | —                            |                         | LESYH       | ○              | x          | —                            |
| High performance<br>(Step motor 24 VDC)                          | LEY       | ○              | x          | —                            |                         |             |                |            |                              |
|                                                                  | LEY-X8    | ○              | x          | —                            |                         |             |                |            |                              |
|                                                                  | LEYG      | ○              | x          | —                            |                         |             |                |            |                              |
|                                                                  | LES       | ○              | x          | —                            |                         |             |                |            |                              |
|                                                                  | LESH      | ○              | x          | —                            |                         |             |                |            |                              |
|                                                                  | LESYH     | ○              | x          | —                            |                         |             |                |            |                              |
| High performance<br>battery-less absolute<br>(Step motor 24 VDC) | LER       | ○              | x          | —                            |                         |             |                |            |                              |
|                                                                  | LEHF      | ○              | x          | —                            |                         |             |                |            |                              |
|                                                                  | LEFS      | ○              | x          | —                            |                         |             |                |            |                              |
|                                                                  | LEKFS     | ○              | x          | —                            |                         |             |                |            |                              |
|                                                                  | LEG       | ○              | x          | —                            |                         |             |                |            |                              |
|                                                                  | LESYH     | ○              | x          | —                            |                         |             |                |            |                              |

\* Actuators ordered as single units are not UL compliant.

■ **Actuators (When ordered with a controller)** “○”: Compliant “x”: Not compliant “—”: Not applicable As of February 2022

| Compatible motor             | Series    | JXC51/61       |            |                              | JXCE1          |            |                              | JXC91          |            |                              | JXCP1          |            |                              | JXCD1          |            |                              |
|------------------------------|-----------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|
|                              |           | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              |
|                              |           |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |
| Step motor<br>(Servo/24 VDC) | LEFS      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | 11-LEFS   | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | 25A-LEFS  | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEFB      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEL       | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEM       | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEY       | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | 25A-LEY   | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEY-X5/X7 | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                              | LEYG      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LES       | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LESH      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEPY      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEPS      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LER       | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEHZ      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEHZJ     | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEHF      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEHS      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
| Compatible motor             | Series    | JXCL1          |            |                              | JXCM1          |            |                              | LECP1          |            |                              | LECP2          |            |                              | LECPA          |            |                              |
|                              |           | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              |
|                              |           |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |
| Step motor<br>(Servo/24 VDC) | LEFS      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | 11-LEFS   | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | 25A-LEFS  | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LEFB      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LEL       | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LEM       | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
|                              | LEY       | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | 25A-LEY   | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LEY-X5/X7 | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | —              | —          | —                            | ○              | x          | —                            |
|                              | LEYG      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LES       | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LESH      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LEPY      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LEPS      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LER       | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LEHZ      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LEHZJ     | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LEHF      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |
|                              | LEHS      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | —              | —          | —                            | ○              | ○          | E339743                      |

# CE/UKCA/UL-compliance List

■ **Actuators (When ordered with a controller)** “○”: Compliant “x”: Not compliant “—”: Not applicable As of February 2022

| Compatible motor                             | Series | JXC51/61       |            |                              | JXCE1          |            |                              | JXC91          |            |                              | JXCP1          |            |                              | JXCD1          |            |                              |
|----------------------------------------------|--------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|
|                                              |        | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              |
|                                              |        |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |
| Battery-less absolute<br>(Step motor 24 VDC) | LEFS   | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEFB   | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEKFS  | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEY    | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEY-X8 | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEYG   | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LES    | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LESH   | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LESYH  | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LER    | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEHF   | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |

| Compatible motor                             | Series | JXCL1          |            |                              | JXCM1          |            |                              |
|----------------------------------------------|--------|----------------|------------|------------------------------|----------------|------------|------------------------------|
|                                              |        | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              |
|                                              |        |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |
| Battery-less absolute<br>(Step motor 24 VDC) | LEFS   | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEFB   | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEKFS  | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEY    | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEY-X8 | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEYG   | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LES    | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LESH   | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LESYH  | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LER    | ○              | x          | —                            | ○              | x          | —                            |
|                                              | LEHF   | ○              | x          | —                            | ○              | x          | —                            |

## ■ Actuators (When ordered with a controller) “○”: Compliant “x”: Not compliant “—”: Not applicable As of February 2022

| Compatible motor                                                 | Series | JXC5H/6H       |            |                              | JXCEH          |            |                              | JXC9H          |            |                              | JXCPH          |            |                              |
|------------------------------------------------------------------|--------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|
|                                                                  |        | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              |
|                                                                  |        |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |
| High performance<br>(Step motor 24 VDC)                          | LEF    | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      | ○              | ○          | E339743                      |
| High performance<br>battery-less absolute<br>(Step motor 24 VDC) | LEFS   | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                                                  | LEKFS  | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                                                  | LEG    | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                                                                  | LESYH  | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |

| Compatible motor        | Series    | LECA6          |            |                              |
|-------------------------|-----------|----------------|------------|------------------------------|
|                         |           | CE<br>UK<br>CA | cULus      |                              |
|                         |           |                | Compliance | Certification No. (File No.) |
| Servo motor<br>(24 VDC) | LEFS      | ○              | ○          | E339743                      |
|                         | 11-LEFS   | ○              | ○          | E339743                      |
|                         | 25A-LEFS  | ○              | ○          | E339743                      |
|                         | LEFB      | ○              | ○          | E339743                      |
|                         | LEY       | ○              | ○          | E339743                      |
|                         | LEY-X5/X7 | ○              | x          | —                            |
|                         | LEYG      | ○              | ○          | E339743                      |
|                         | LES       | ○              | ○          | E339743                      |
|                         | LESH      | ○              | ○          | E339743                      |

| Compatible motor | Series      | LECSA*1        |            |                              | LECSB-T*1      |            |                              | LECS-C-T*1     |            |                              | LECSN-T*1      |            |                              | LECSS-T*1      |            |                              |
|------------------|-------------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|----------------|------------|------------------------------|
|                  |             | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              |
|                  |             |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |
| AC servo motor   | LEFS        | ○              | ○          | E339743                      | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | ○          | E339743                      |
|                  | 11-LEFS     | ○              | ○          | E339743                      | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | ○          | E339743                      |
|                  | 25A-LEFS    | ○              | ○          | E339743                      | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | ○          | E339743                      |
|                  | LEKFS       | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                  | LEFB        | ○              | ○          | E339743                      | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | ○          | E339743                      |
|                  | LEJS        | ○              | ○          | E339743                      | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | ○          | E339743                      |
|                  | 11-LEJS     | ○              | ○          | E339743                      | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | ○          | E339743                      |
|                  | 25A-LEJS    | ○              | ○          | E339743                      | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | ○          | E339743                      |
|                  | LEJB        | ○              | ○          | E339743                      | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | ○          | E339743                      |
|                  | LEY25/32/63 | ○              | ○          | E339743                      | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | ○          | E339743                      |
|                  | LEY100      | —              | —          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |
|                  | LEYG        | ○              | ○          | E339743                      | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | ○          | E339743                      |
|                  | LESYH       | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            | ○              | x          | —                            |

| Compatible motor | Series      | LECYM-V        |            |                              | LECYU-V        |            |                              |
|------------------|-------------|----------------|------------|------------------------------|----------------|------------|------------------------------|
|                  |             | CE<br>UK<br>CA | cULus      |                              | CE<br>UK<br>CA | cULus      |                              |
|                  |             |                | Compliance | Certification No. (File No.) |                | Compliance | Certification No. (File No.) |
| AC servo motor   | LEFS        | ○              | x          | —                            | ○              | x          | —                            |
|                  | 11-LEFS     | ○              | x          | —                            | ○              | x          | —                            |
|                  | 25A-LEFS    | ○              | x          | —                            | ○              | x          | —                            |
|                  | LEKFS       | ○              | x          | —                            | ○              | x          | —                            |
|                  | LEFB        | ○              | x          | —                            | ○              | x          | —                            |
|                  | LEJS        | ○              | x          | —                            | ○              | x          | —                            |
|                  | 11-LEJS     | ○              | x          | —                            | ○              | x          | —                            |
|                  | 25A-LEJS    | ○              | x          | —                            | ○              | x          | —                            |
|                  | LEJB        | ○              | x          | —                            | ○              | x          | —                            |
|                  | LEY25/32/63 | ○              | x          | —                            | ○              | x          | —                            |
|                  | LEY100      | ○              | x          | —                            | ○              | x          | —                            |
|                  | LEYG        | ○              | x          | —                            | ○              | x          | —                            |
|                  | LESYH       | ○              | x          | —                            | ○              | x          | —                            |

\*1 There is a “UL Listed” mark on the AC servo motor driver body.

## Safety Instructions

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

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

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

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

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

### Warning

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

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

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

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

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

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

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

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

### Caution

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

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

## Limited warranty and Disclaimer/ Compliance Requirements

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

Read and accept them before using the product.

### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, 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 catalog for the particular products.

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

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

### Compliance Requirements

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

### 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.

 **Safety Instructions** Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.

## SMC Corporation

Akihabara UDX 15F,  
4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN  
Phone: 03-5207-8249 Fax: 03-5298-5362  
<https://www.smcworld.com>  
© 2022 SMC Corporation All Rights Reserved

Specifications are subject to change without prior notice  
and any obligation on the part of the manufacturer.

D-G