Electric Actuator

Slide Table/ High Precision Type

New

CE RoHS

* For details, refer to page 116 and onwards.

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

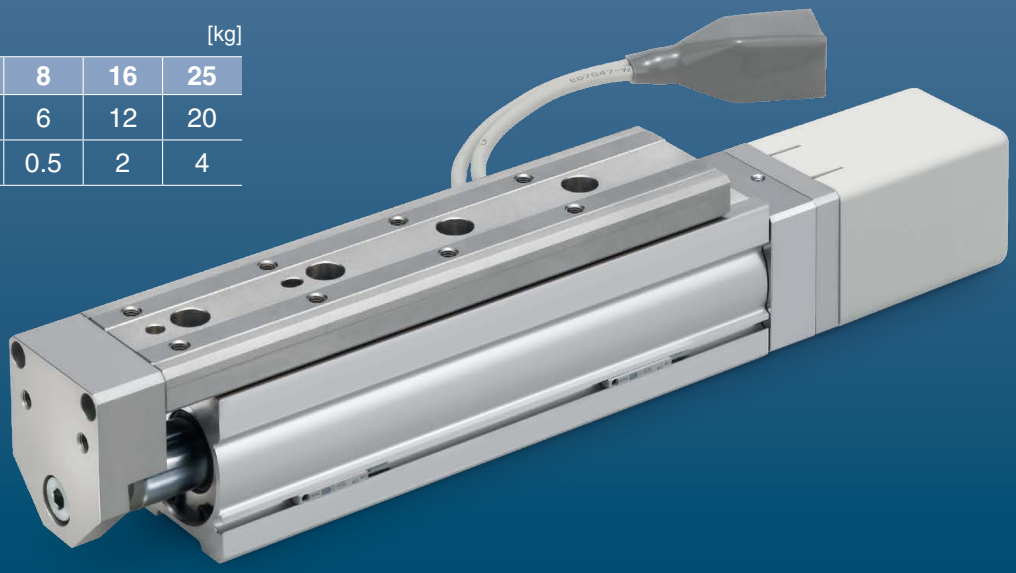
Positioning repeatability **±0.01 mm**

Lost motion 0.1 mm or less

Increased vertical work load 5 times or more

[kg]

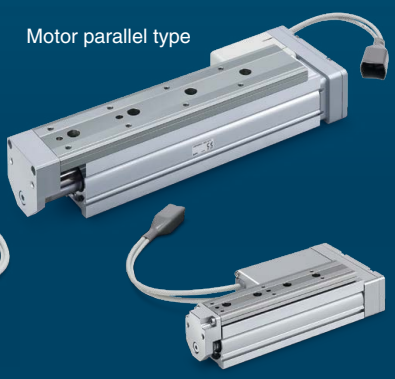
Size	8	16	25
New **LESYH**	6	12	20
Existing model **LESH**	0.5	2	4



Battery-less Absolute (Step Motor 24 VDC)

In-line motor type

Motor parallel type

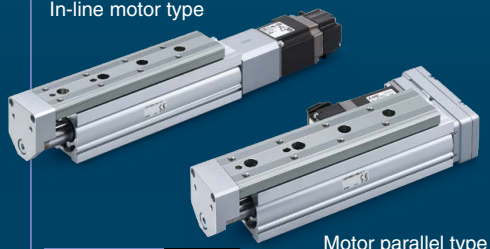


Controllers p. 66

AC Servo Motor

Size	Motor output [W]
16	100
25	200

In-line motor type



Motor parallel type

Drivers p. 82

LESYH Series

SMC

CAT.ES100-142A

Battery-less Absolute Encoder Type

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

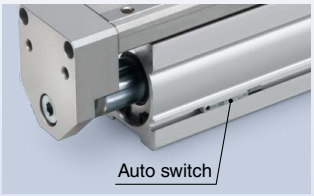
The position information is held by the encoder even when the power supply is turned off. A return to origin operation is not necessary when the power supply is recovered.

■ 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)

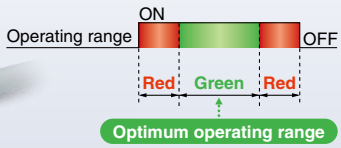
∗ The auto switches should be ordered separately. For details, p. 58



2-color indicator solid state auto switch

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

A green light lights up within the optimum operating range.



Battery-less Absolute
(Step Motor 24 VDC)

Controllers p. 66

- **Step data input type**
  JXC51/61 Series
- **EtherCAT®/EtherNet/IP™/ PROFINET/DeviceNet™/ IO-Link/CC-Link direct input type**
  JXCE1/91/P1/D1/L1/M1 Series

AC Servo Motor

Drivers p. 82

∗ Only the LECSA and LECS□-T are compliant. The LECSN-T is only compliant if the "Without network card" option is selected.

For absolute encoders

- Pulse input type/ Positioning type
  LECSB-T Series
- CC-Link direct input type
  LECSC-T Series
- SSCNETⅢ/H type
  LECSS-T Series
- Network card type
  LECSN-T Series
- MECHATROLINK type
  LECY□ Series

For incremental encoders

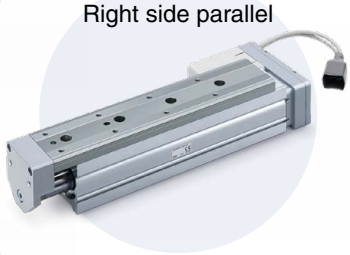
- Pulse input type/ Positioning type
  LECSA Series

Motor mounting position

Select from 3 directions

In-line

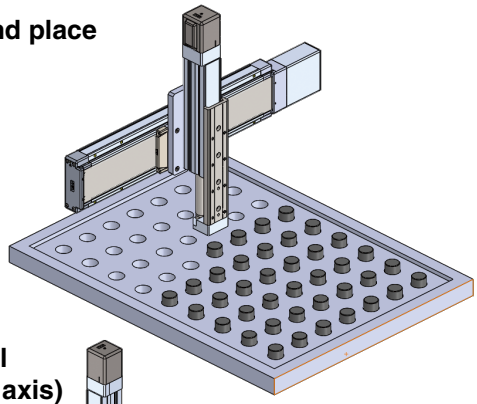
Right side parallel



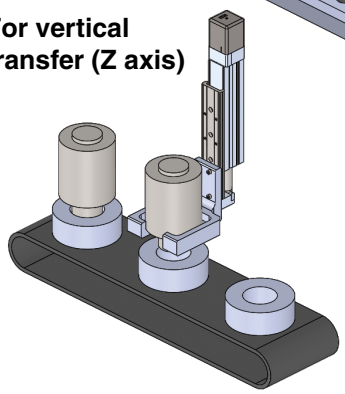
Left side parallel

Application examples

- **For pick and place operations**



- **For vertical transfer (Z axis)**



Variations

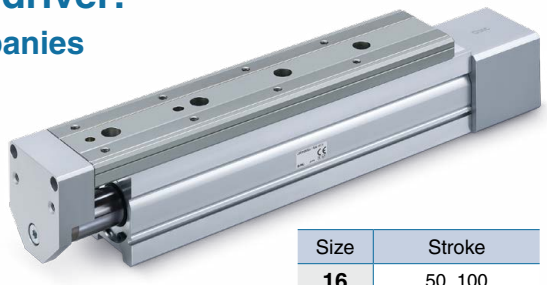
Series	Size		Lead [mm]	Stroke [mm]	Max. work load [kg]		Max. pushing force [N]	Max. speed [mm/s]
					Horizontal	Vertical		
Battery-less absolute (Step motor 24 VDC)	8		10	50, 75	2	1.5	36	400
			5			3	74	200
			2.5			6	138	100
	16		12	50, 100	8	6	182	400
			6			12	348	200
	25		16	50, 100, 150	12	10	218	400
			8			20	420	200
AC servo motor	16		12	50, 100	8	6	131	400
			6			12	255	200
	25	Parallel	20	50, 100, 150	12	10	157	400
			10			20	308	200
		In-line	16			10	197	400
			8			20	385	200

Series Variations Motorless Type

Can be used with your current motor and driver!

Manufacturers of compatible motors: 18 companies

Mitsubishi Electric Corporation	YASKAWA Electric Corporation	SANYO DENKI CO., LTD.
OMRON Corporation	Panasonic Corporation	FANUC CORPORATION
NIDEC SANKYO CORPORATION	KEYENCE CORPORATION	FUJI ELECTRIC CO., LTD.
MinebeaMitsumi Inc.	Shinano Kenshi Co., Ltd.	ORIENTAL MOTOR Co., Ltd.
FASTECH Co., Ltd.	Rockwell Automation, Inc. (Allen-Bradley)	Beckhoff Automation GmbH
Siemens AG	Delta Electronics, Inc.	ANCA Motion



Size	Stroke
16	50, 100
25	50, 100, 150

Step Data Input Type *JXC51/61 Series* p. 67

JXC51/61

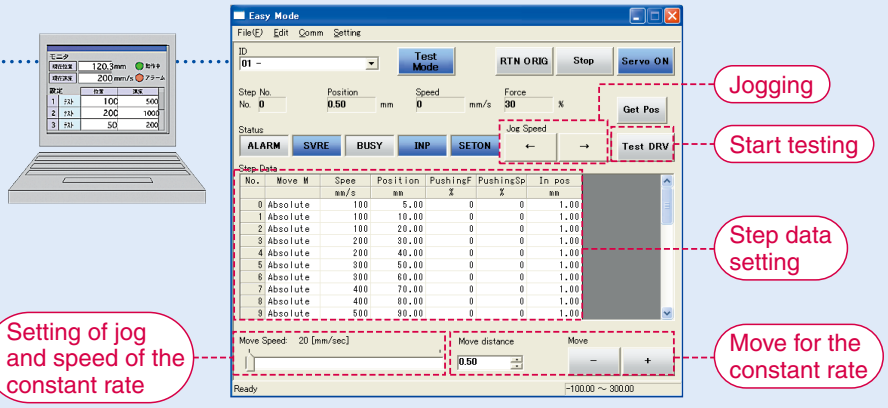
Simple setting allows for immediate use!

◎ "Easy Mode" for simple setting

For immediate use, select "Easy Mode."

<When a PC is used>
Controller setting software

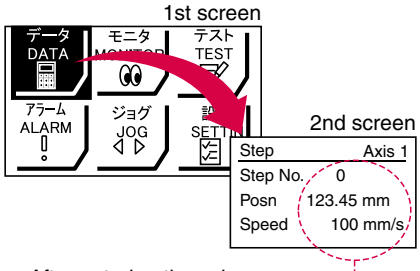
- Step data setting, test drive, jogging, and move for the constant rate can be set and operated on one screen.



<When a TB (teaching box) is used>

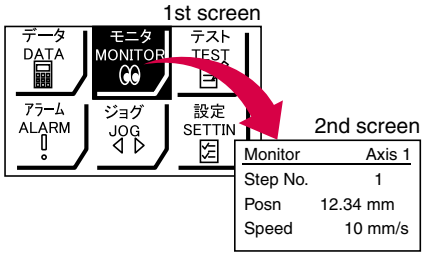
- The simple screen without scrolling promotes ease of setting and operation.
- Choose an icon from the first screen to select a function.
- Set the step data and check the monitor on the second screen.

Example of setting the step data



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

Example of checking the operation status



The operation status can be checked.

Teaching box screen

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

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

→

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

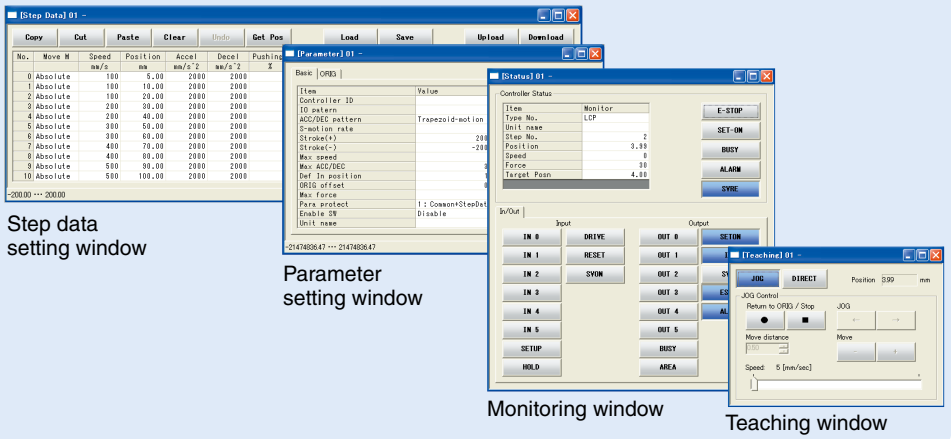
◎"Normal Mode" for detailed setting

Select "Normal Mode" when detailed setting is required.

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

<When a PC is used> Controller setting software

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

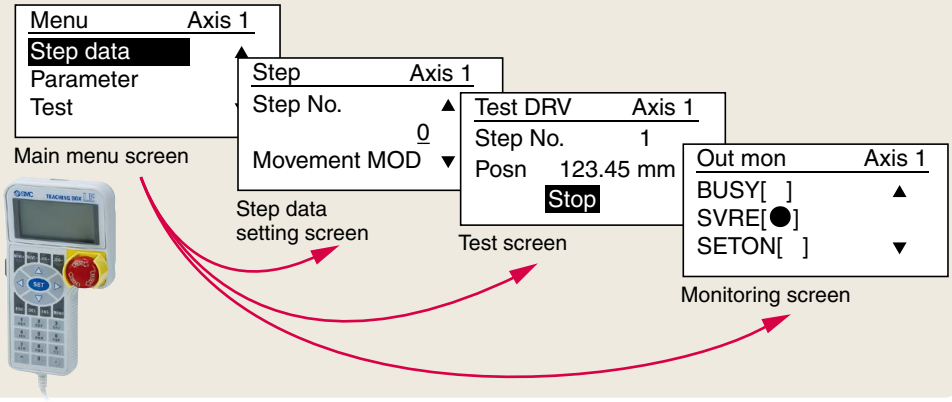


<When a TB (teaching box) is used>

- 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.



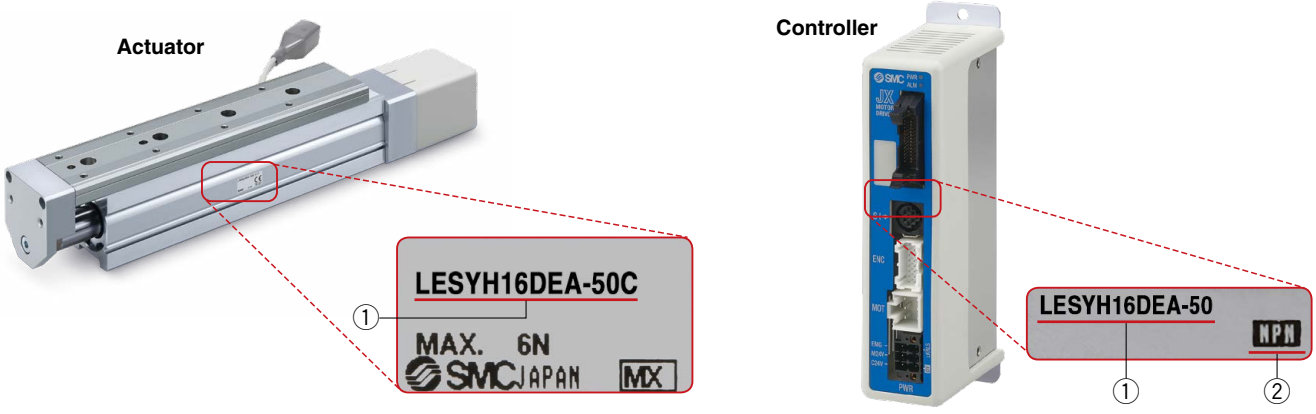
The actuator and controller are provided as a set. (They can be ordered separately as well.)

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 JXC51/61
Step data and parameter setting	• Input from controller setting software (PC) • Input from teaching box
Step data "position" setting	• Numerical value input from controller setting software (PC) or teaching box • Input numerical value • Direct teaching • JOG teaching
Number of step data	64 points
Operation command (I/O signal)	Step No. [IN*] input ⇒ [DRIVE] input
Completion signal	[INP] output

Setting Items

TB: Teaching box PC: Controller setting software

Item		Contents	Easy Mode		Normal Mode	Step data input type JXC51/61
			TB	PC	TB/PC	
Step data setting (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 [Pushing]: Pushing start position	●	●	●	Set in units of 0.01 mm
	Acceleration/Deceleration	Acceleration/deceleration during movement	●	●	●	Set in units of 1 mm/s^2
	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 [Pushing]: How much it moves during pushing	△	●	●	Set to 0.5 mm or more (Units: 0.01 mm)
Parameter setting (Excerpt)	Stroke (+)	+ side position limit	×	×	●	Set in units of 0.01 mm
	Stroke (–)	– side position limit	×	×	●	Set in units of 0.01 mm
	ORIG direction	Direction of the return to origin can be set.	×	×	●	Compatible
	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^2
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	●	●	● (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/ DeviceNet™/IO-Link/CC-Link Direct Input Type Step Motor Controller/JXC□ Series p. 74

EtherCAT® EtherNet/IP™ PROFINET® DeviceNet™ IO-Link CC-Link

◎Two types of operation command

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

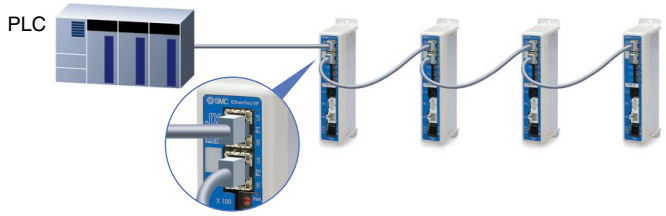
◎Numerical monitoring available

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

◎Transition wiring of communication cables

Two communication ports are provided.

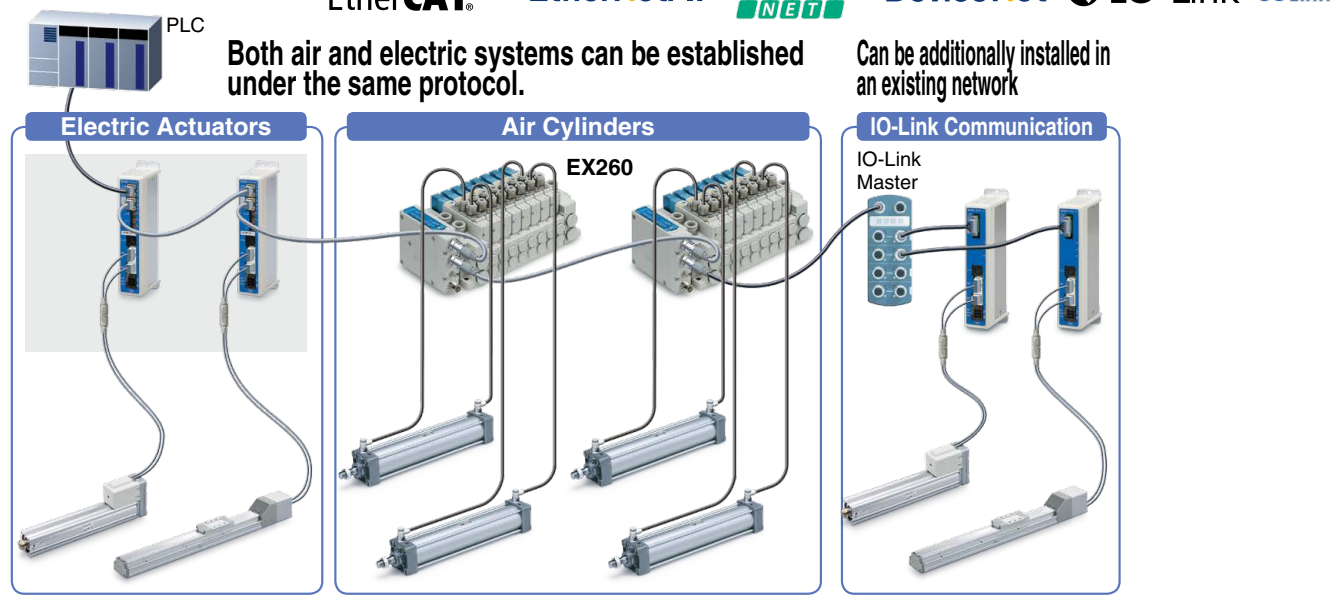
* For the DeviceNet™ type, transition wiring is possible using a branch connector.
* 1 to 1 in the case of IO-Link



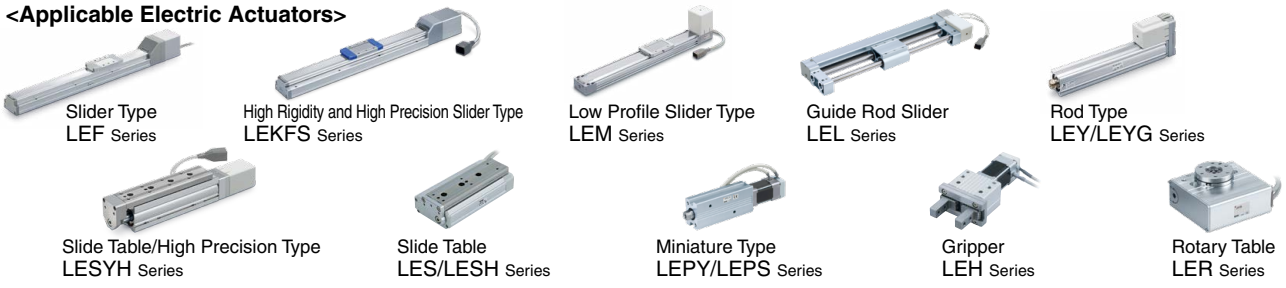
Application

Communication protocols

EtherCAT® EtherNet/IP™ PROFINET® DeviceNet™ IO-Link CC-Link

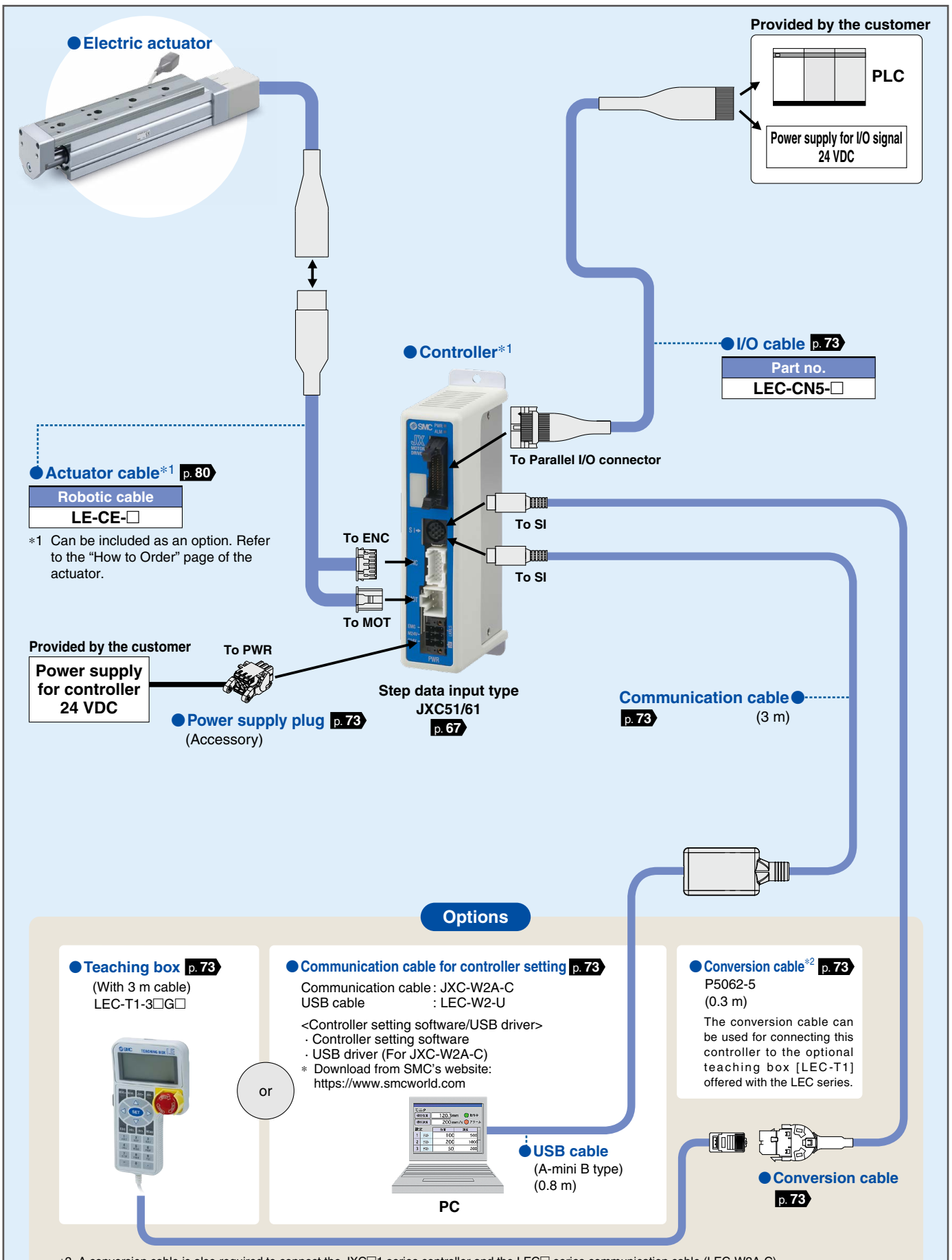


<Applicable Electric Actuators>

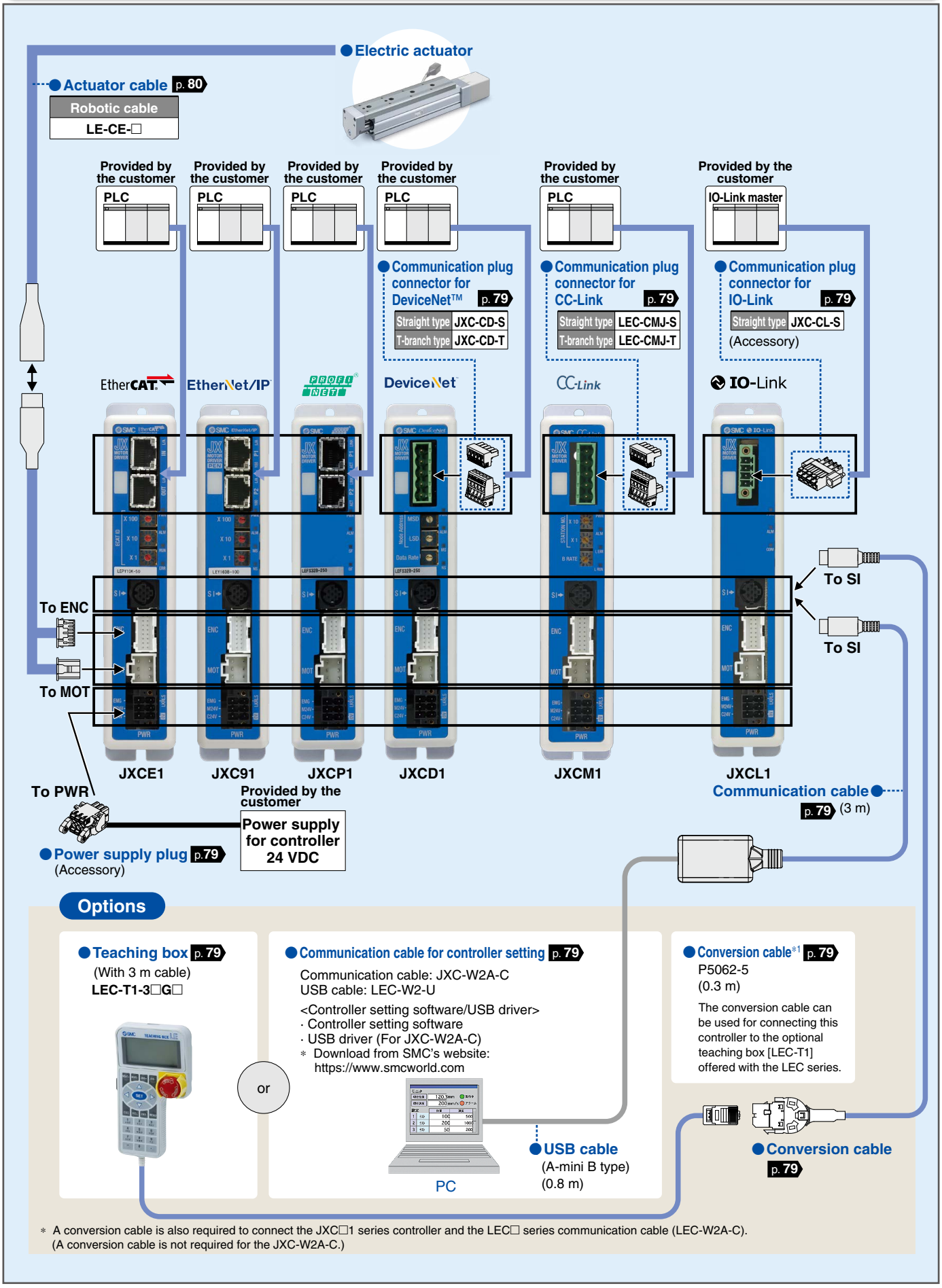


Slider Type LEF Series
High Rigidity and High Precision Slider Type LEKFS Series
Low Profile Slider Type LEM Series
Guide Rod Slider LEL Series
Rod Type LEY/LEYG Series
Slide Table/High Precision Type LESYH Series
Slide Table LES/LESH Series
Miniature Type LEPY/LEPS Series
Gripper LEH Series
Rotary Table LER Series

System Construction/General Purpose I/O



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



Options

Teaching box p. 79
(With 3 m cable)
LEC-T1-3□G□

or

Communication cable for controller setting p. 79
Communication cable: JXC-W2A-C
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

PC

USB cable
(A-mini B type)
(0.8 m)

Conversion cable*1 p. 79
P5062-5
(0.3 m)
The conversion cable can be used for connecting this controller to the optional teaching box [LEC-T1] offered with the LEC series.

Conversion cable p. 79

* A conversion cable is also required to connect the JXC□1 series controller and the LEC□ series communication cable (LEC-W2A-C).
(A conversion cable is not required for the JXC-W2A-C.)

LECSA/LECS□-T/LECY□ Series List p. 82

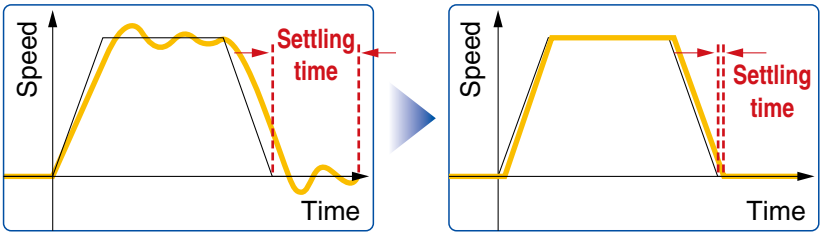
	Series	Compatible motor		Control method			Application/Function			Compatible option
		100 W	200 W	Positioning*1	Pulse	Network direct input	Synchronous*2	Pushing operation*4	Safety function STO	Setup software
Incremental Type	**LECSA** (Pulse input type/ Positioning type)	●	●	Up to 7 points ●	●					LEC-MRC2 ●
Absolute Type	**LECSB-T** (Pulse input type/ Positioning type)	●	●	Up to 255 points ●	●			*4 ○	○	LEC-MRC2 ●
	CC-Link **LECSC-T** (CC-Link direct input type)	●	●	Up to 255 points ●		CC-Link Ver. 1.10 ●				LEC-MRC2 ●
	EtherCAT EtherNet/IP PROFINET **LECSN-T** (Network card type)	●	●	Up to 255 points ● *5		EtherCAT EtherNet/IP™ PROFINET ●			○	LEC-MRC2 ●
	SSCNETⅢ/H **LECSS-T** (SSCNETⅢ/H type) Compatible with Mitsubishi Electric's servo system controller network	●	●			SSCNETⅢ/H ●	*2 ○	*4 ○	○	LEC-MRC2 ●
	MECHATROLINK-Ⅱ **LECYM**	●	●			MECHATRO LINK-Ⅱ ●	*3 ○		○	SigmaWin+™ ●
	MECHATROLINK-Ⅲ **LECYU**	●	●			MECHATRO LINK-Ⅲ ●	*3 ○		○	SigmaWin+™ ●

*1 For positioning types, the settings need to be changed in order to use the max. set values. Setup software (MR Configurator2™) LEC-MRC2 is required.
*2 Available when a Mitsubishi motion controller is used as upper level equipment
*3 Available when a motion controller is used as upper level equipment
*4 The LECSB2-T is only applicable when the control method is positioning. The point table is used to set the pushing operation settings.
To set the pushing operation settings, an additional dedicated file (pushing operation extension file) must be downloaded separately to be used with the setup software (MR Configurator2™: LEC-MRC2□). Please download this dedicated file from the SMC website: https://www.smcworld.com
When selecting the LECSS2-T, combine it with upper level equipment (such as the Simple Motion module manufactured by Mitsubishi Electric Corporation) which has a pushing operation function.
** For customer-provided PLC and motion controller setting and usage instructions, confirm with the retailer or manufacturer.
*5 Only supports PROFINET and EtherCAT

Gain adjustment using auto tuning

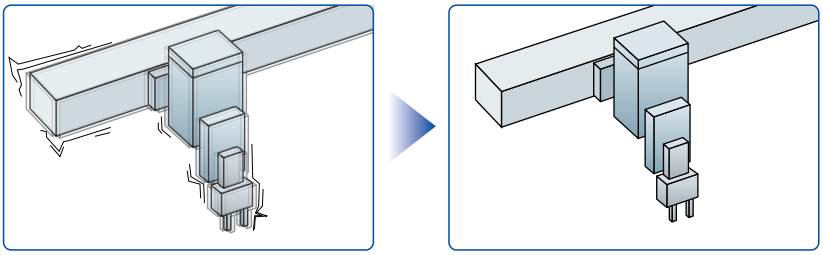
Auto-tuning function

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



Vibration suppression control function

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

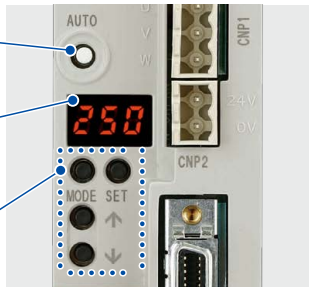


With display setting function

One-touch adjustment button
One-touch servo adjustment

Display
Display the monitor, parameters, and alarm.

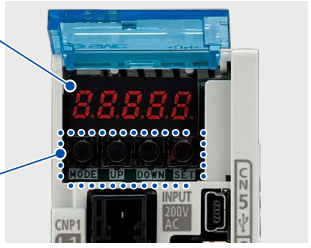
Settings
Set the parameters, monitor display, etc., with push buttons.



LECSA

Display
Display the monitor, parameters, and alarm.

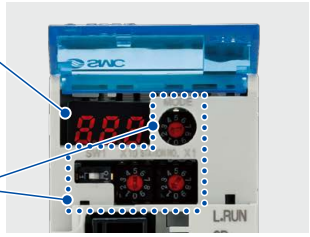
Settings
Set the parameters, monitor display, etc., with push buttons.



(With the front cover opened)
LECSB-T

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

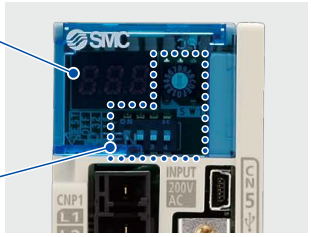
Settings
Control the Baud rate, station number, and the occupied station count.



(With the front cover opened)
LECSC-T

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

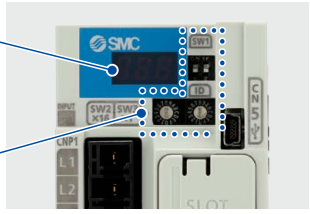
Settings
Switches for axis setting, control axis deactivation, switching to the test operation, etc.



LECSS2-T

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

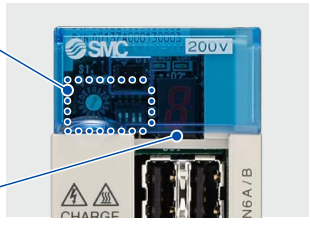
Settings
Switches for axis setting, switching to the test operation, etc.



LECSN-T

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

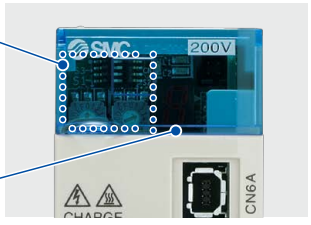
Display
Display the driver status and alarm.



LECYM

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

Display
Display the driver status and alarm.



LECYU

System Construction

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

Provided by the customer

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

◎Option
Regeneration option p. 101
Part no.: **LEC-MR-RB-□**

Main circuit power supply connector p. 89
(Accessory)

Driver

Provided by the customer
Control circuit power supply
24 VDC

◎Option
Setup software p. 102
(MR Configurator2™)
Part no.: **LEC-MRC2□**
PC

Control circuit power supply connector p. 89
(Accessory)

USB cable p. 103
Part no.: **LEC-MR-J3USB**

Motor cable p. 99

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

Lock cable p. 99

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

Provided by the customer

Power supply for lock
24 VDC

Electric actuator
Slider type ***LEF Series***
Guide rod type ***LEYG Series***
High rigidity slider type ***LEJ Series***
Slide table/ High precision type ***LESYH Series***
Rod type ***LEY Series***

◎Option
I/O connector p. 99
Part no.: **LE-CSNA**
or
I/O cable p. 100
Part no.: **LEC-CSNA-1**

Provided by the customer

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

Encoder cable p. 99

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

Absolute encoder compatible *LECSB-T Series*
(Pulse input type/Positioning type)

Provided by the customer

Power supply
Single phase 200 to 240 VAC (50/60 Hz)
Three phase 200 to 240 VAC (50/60 Hz)

◎Option
Regeneration option p. 101
Part no.: **LEC-MR-RB-□**

Main circuit power supply connector p. 90
(Accessory)

Driver

USB cable p. 103
Part no.: **LEC-MR-J3USB**

◎Option
Setup software p. 102
(MR Configurator2™)
Part no.: **LEC-MRC2□**
PC

Analog monitor output
RS-422 communication

Motor cable p. 99

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

Lock cable p. 99

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

Control circuit power supply connector P. 90
(Accessory)

◎Option
STO cable (3 m) p. 103
Part no.: **LEC-MR-D05UDL3M**

Provided by the customer

Power supply for lock
24 VDC

Electric actuator
Slider type ***LEF Series***
Guide rod type ***LEYG Series***
High rigidity slider type ***LEJ Series***
Slide table/ High precision type ***LESYH Series***
Rod type ***LEY Series***

Motor connector P. 90
(Accessory)

◎Option
I/O connector p. 99
Part no.: **LE-CSNB**
or
I/O cable p. 100
Part no.: **LEC-CSNB-1**

Provided by the customer

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

Encoder cable p. 99

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

Battery (Accessory) p. 103
Part no.: **(LEC-MR-BAT6V1SET)**

∗ The LECSB2-T□ cannot be used with the LEC-MR-SETUP221□.

System Construction

Absolute encoder compatible *LECSC-T Series*
(CC-Link direct input type)

Provided by the customer

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

◎Option
Regeneration option p. 101
Part no.: **LEC-MR-RB-□**

Motor cable p. 99

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

Lock cable p. 99

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

Encoder cable p. 99

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

Provided by the customer

Power supply for lock
24 VDC

Electric actuator
Slider type
LEF Series
High rigidity slider type
LEJ Series
Rod type
LEY Series
Guide rod type
LEYG Series
Slide table/High precision type
LESYH Series

Main circuit power supply connector p. 91
(Accessory)

Control circuit power supply connector p. 91
(Accessory)

Motor connector p. 91
(Accessory)

Driver

Battery (Accessory) p. 103
Part no.: **(LEC-MR-J3BAT)**

◎Option
USB cable p. 103
Part no.: **LEC-MR-J3USB**

Setup software p. 102
(MR Configurator2™)
Part no.: **LEC-MRC2□**

PC

RS-422 communication

CC-Link connector*1
(Accessory)

◎Option
I/O connector p. 99
Part no.: **LE-CSNA**
or
I/O cable p. 100
Part no.: **LEC-CSNA-1**

Provided by the customer

PLC (CC-Link master unit)
Power supply for I/O signal 24 VDC

* The LECSC2-T□ cannot be used with the LEC-MR-SETUP221□.
*1 Product number: K05A50230600 manufactured by Mitsubishi Electric System & Service Co., Ltd.

Absolute encoder compatible *LECSN-T Series*
(Network card type)

Provided by the customer

Power supply
Single phase 200 to 240 VAC (50/60 Hz)
Three phase 200 to 240 VAC (50/60 Hz)

◎Option
Regeneration option p. 101
Part no.: **LEC-MR-RB-□**

Motor cable p. 99

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

Lock cable p. 99

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

Encoder cable p. 99

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

Provided by the customer

Power supply for lock
24 VDC

Electric actuator
Slider type
LEF Series
High rigidity slider type
LEJ Series
Rod type
LEY Series
Guide rod type
LEYG Series
Slide table/High precision type
LESYH Series

Main circuit power supply connector p. 90
(Accessory)

Control circuit power supply connector p. 90
(Accessory)

Motor connector
(Accessory)
p. 90

Driver

Battery (Accessory) p. 103
Part no.: **(LEC-MR-BAT6V1SET-A)**

◎Option
USB cable p. 103
Part no.: **LEC-MR-J3USB**

Setup software p. 102
(MR Configurator2™)
Part no.: **LEC-MRC2□**

PC

◎Option
Network card p. 101
Part no.: **LEC-S-N□**

◎Option
STO cable (3 m) p. 103
Part no.: **LEC-MR-D05UDL3M**

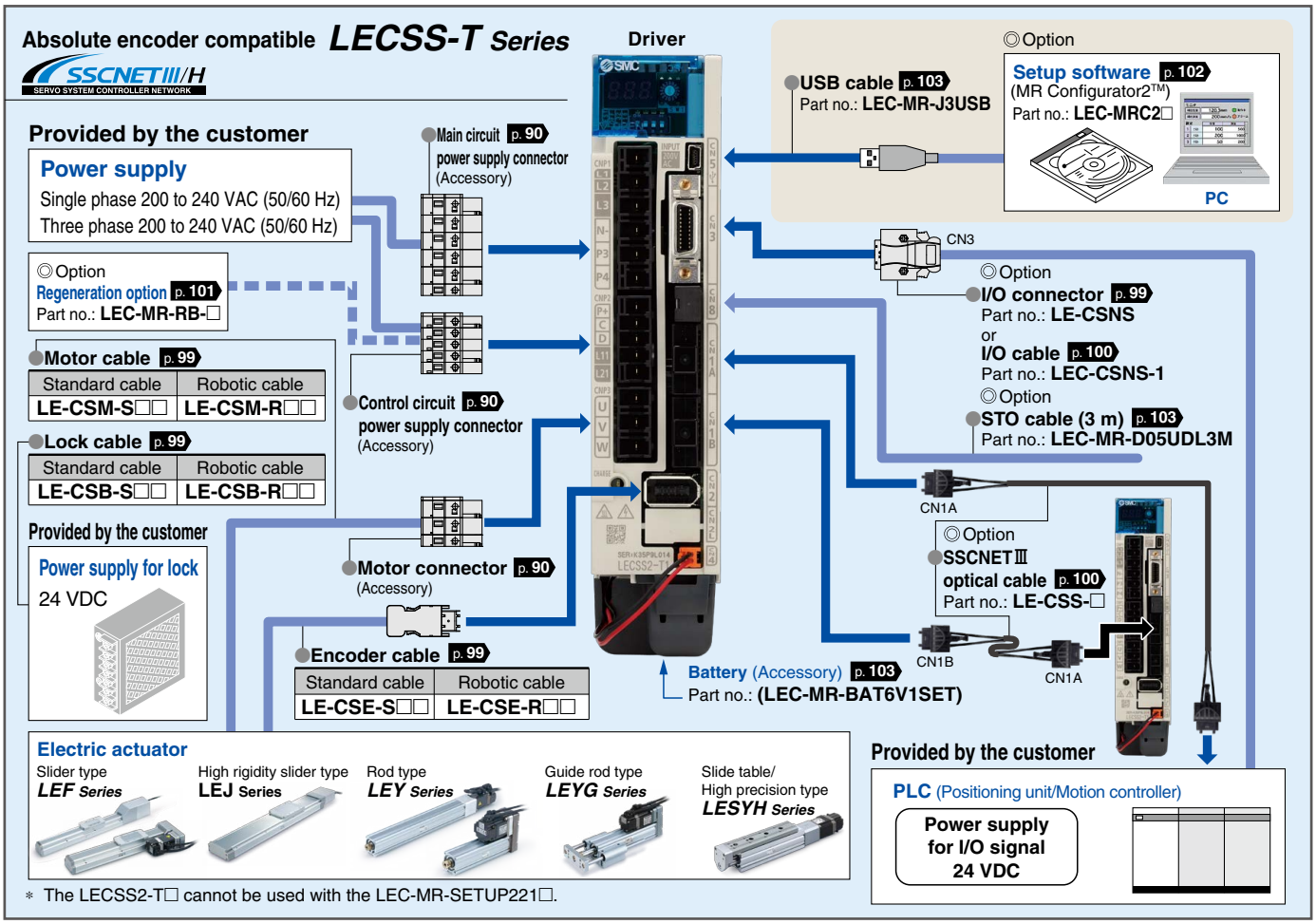
◎Option
I/O connector p. 99
Part no.: **LE-CSNS**
or
I/O cable p. 100
Part no.: **LEC-CSNS-1**

Provided by the customer

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

* The LECSN2-T□ cannot be used with the LEC-MR-SETUP221□.

System Construction



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

System Construction

Absolute encoder compatible *LECYM Series*

MECHATROLINK-Ⅱ type

Provided by the customer

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

Provided by the customer

External regenerative resistor p. 107

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

Main circuit power supply connector (Accessory) p. 107

Driver

◎Option
MECHATROLINK-Ⅱ cable p. 112
Part no.: **LEC-CYM-□**

2nd driver

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

Motor cable p. 110

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

Motor cable for lock option p. 110

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

Provided by the customer
Power supply for lock
24 VDC

Electric actuator
Slider type
LEF Series
High rigidity slider type
LEJ Series
Rod type
LEY/LEYG Series
Slide table/
High precision type
LESYH Series

Motor connector (Accessory) p. 107

◎Option
USB cable p. 113
Part no.: **LEC-JZ-CVUSB**

Setup software p. 113
(SigmaWin+™)
Please download it via our website.
PC

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

◎Option
I/O connector p. 111
Part no.: **LE-CYNA**
or
I/O cable p. 111
Part no.: **LEC-CSNA-1**

Encoder cable p. 110

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

Cable for safety function device (3 m) p. 113
Part no.: **LEC-JZ-CVSAF**

Absolute encoder compatible *LECYU Series*

MECHATROLINK-Ⅲ type

Provided by the customer

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

Provided by the customer

External regenerative resistor p. 107

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

Main circuit power supply connector (Accessory) p. 107

Driver

◎Option
MECHATROLINK-Ⅲ cable p. 112
Part no.: **LEC-CYU-□**

2nd driver

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

Motor cable p. 110

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

Motor cable for lock option p. 110

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

Provided by the customer
Power supply for lock
24 VDC

Electric actuator
Slider type
LEF Series
High rigidity slider type
LEJ Series
Rod type
LEY/LEYG Series
Slide table/
High precision type
LESYH Series

Motor connector (Accessory) p. 107

◎Option
USB cable p. 113
Part no.: **LEC-JZ-CVUSB**

Setup software p. 113
(SigmaWin+™)
Please download it via our website.
PC

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

◎Option
I/O connector p. 111
Part no.: **LE-CYNA**
or
I/O cable p. 111
Part no.: **LEC-CSNA-1**

Encoder cable p. 110

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

Cable for safety function device (3 m) p. 113
Part no.: **LEC-JZ-CVSAF**

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Slide Table/High Precision Type

Battery-less Absolute (Step Motor 24 VDC) LESYH□E Series p. 35

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Model Selection

Selection Procedure

Positioning Control Selection Procedure

Step 1 Check the work load–speed. → **Step 2** Check the cycle time. → **Step 3** Check the allowable moment.

Selection Example

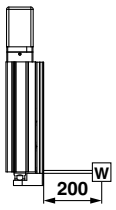
Step 1 **Check the work load–speed. <Speed–Work load graph>** (page 19)

Select a model based on the workpiece mass and speed while referencing the speed–work load graph.

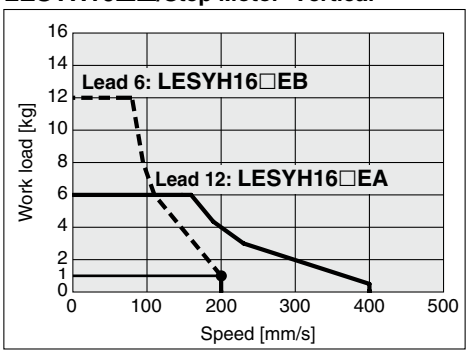
Selection example) The **LESYH16□EB-50** can be temporarily selected as a possible candidate based on the graph shown on the right side.

Operating conditions

- Workpiece mass: 1 [kg]
- Speed: 200 [mm/s]
- Mounting orientation: Vertical
- Stroke: 50 [mm]
- Acceleration/Deceleration: 3000 [mm/s²]
- Cycle time: 0.5 s
- Workpiece mounting condition:



LESYH16□□/Step Motor Vertical



<Speed–Work load graph>

Step 2 **Check the cycle time.**

Calculate **the cycle time** using the following calculation method.

Cycle time:

T can be found from the following equation.

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

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

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

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

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

- 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.

  $T4 = 0.15$ [s]

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

$T1 = V/a1 = 200/3000 = 0.07$ [s],

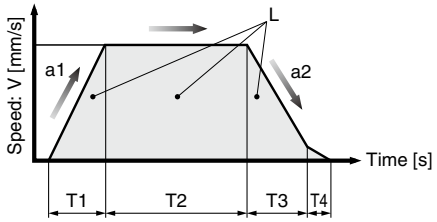
$T3 = V/a2 = 200/3000 = 0.07$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{50 - 0.5 \cdot 200 \cdot (0.07 + 0.07)}{200} = 0.18 \text{ [s]}$$

$T4 = 0.15$ [s]

The cycle time can be found as follows.

$T = T1 + T2 + T3 + T4$
$= 0.07 + 0.18 + 0.07 + 0.15$
$=$ **0.47 [s]**

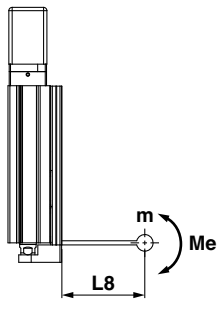


L : Stroke [mm] ····· (Operating condition)
V : Speed [mm/s] ····· (Operating condition)
a1: Acceleration [mm/s²] ··· (Operating condition)
a2: Deceleration [mm/s²] ··· (Operating condition)

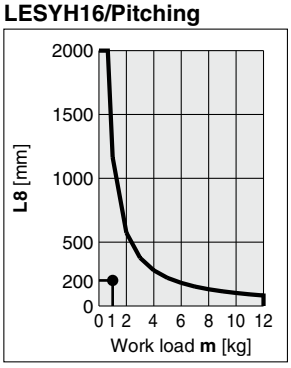
T1: Acceleration time [s] ··· Time until reaching the set speed
T2: Constant speed time [s] ··· Time while the actuator is operating at a constant speed
T3: Deceleration time [s] ··· Time from the beginning of the constant speed operation to stop
T4: Settling time [s] ··· Time until positioning is completed

Step 3 **Check the allowable moment.**
<Static allowable moment> (page 19)
<Dynamic allowable moment> (pages 21, 22)

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□EB-50 should be selected.

Selection Procedure

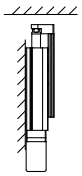
Pushing Control Selection Procedure

Step 1 Check the required force. → **Step 2** Check the pushing force. → **Step 3** Check the duty ratio. → **Step 4** Check the allowable moment.

Selection Example

Operating conditions

- Pushing force: 150 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.**

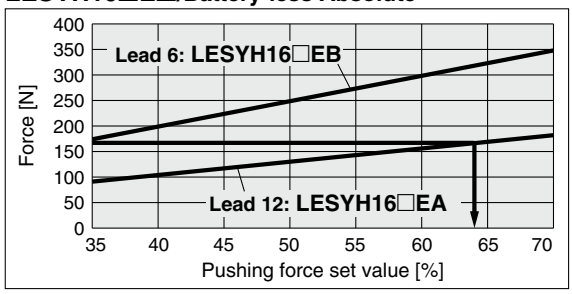
Calculate the approximate required force for a pushing operation.
Selection example) ● Pushing force: 150 [N]
● Workpiece mass: 1 [kg]
The approximate required force can be found to be 150 + 10 = 160 [N].
Select a model based on the approximate required force while referencing the specifications (page 37).
Selection example based on the specifications)
● Approximate required force: 160 [N]
● Speed: 100 [mm/s]
The **LESYH16□EA** 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□EA** table weight: 0.7 [kg]
The required force can be found to be 160 + 7 = 167 [N].

Table Weight Unit [kg]

Model	Stroke [mm]			
	50	75	100	150
LESYH8	0.2	0.3	—	—
LESYH16	0.4	—	0.7	—
LESYH25	0.9	—	1.3	1.7

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

LESYH16□E□/Battery-less Absolute



<Pushing force set value–Force graph>

Step 2 **Check the pushing force.**

<Pushing force set value–Force graph> (page 20)

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: 167 [N]
The **LESYH16□EA** can be temporarily selected as a possible candidate.
The pushing force set value is 64 [%].

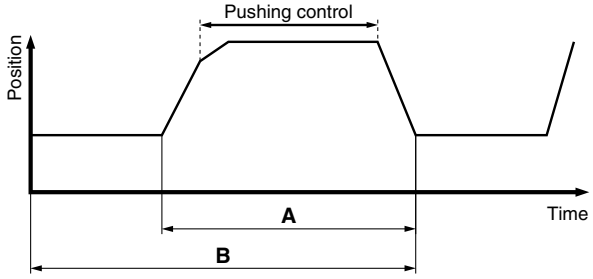
Allowable Duty Ratio

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

Step 3 **Check the duty ratio.**

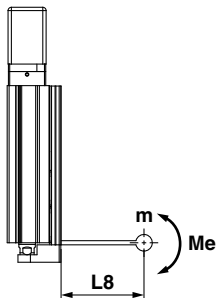
Confirm the allowable duty ratio based on the pushing force set value while referencing the allowable duty ratio.
Selection example based on the allowable duty ratio)
● Pushing force set value: 64 [%]
The allowable duty ratio can be found to be 20 [%].
Calculate the duty ratio for the operating conditions, 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 x 100 = 15 [%], and this is within the allowable range.



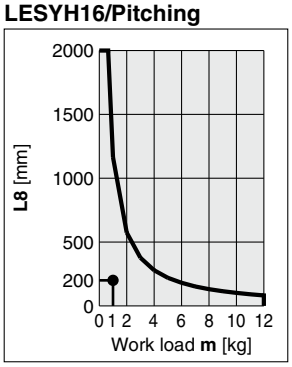
Step 4 **Check the allowable moment.**

<Static allowable moment> (page 19)
<Dynamic allowable moment> (pages 21, 22)

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



LESYH16/Pitching



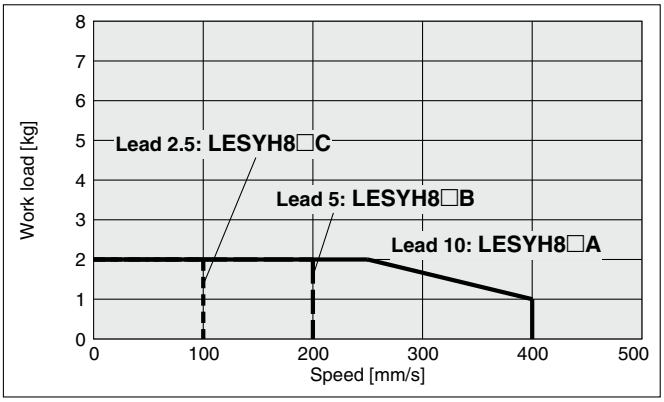
<Dynamic allowable moment>

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

Speed–Work Load Graph (Guide)

LESYH8□E

Horizontal



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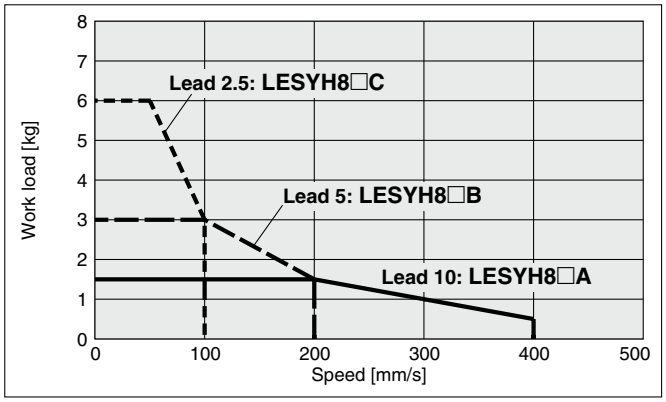

LESYH16□E

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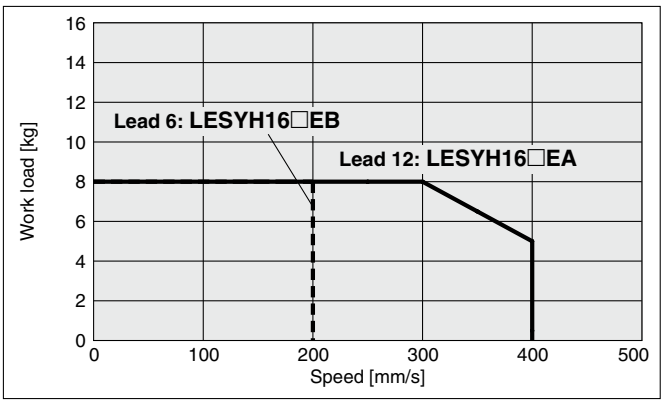

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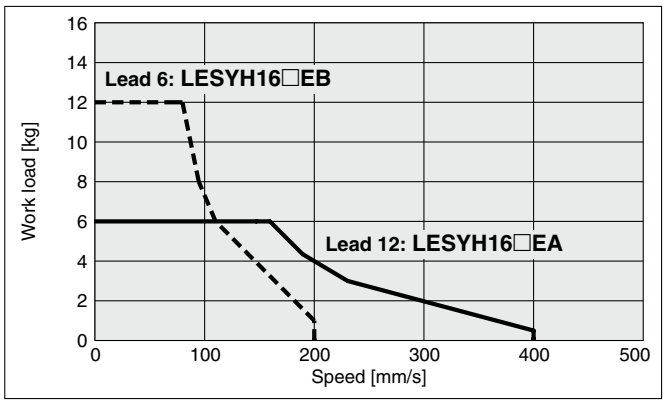

LESYH25□E

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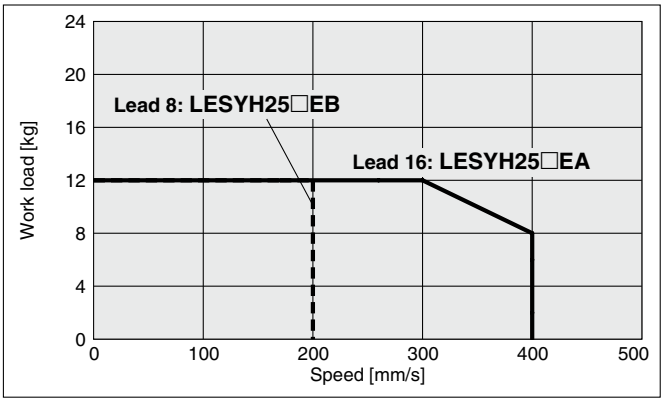

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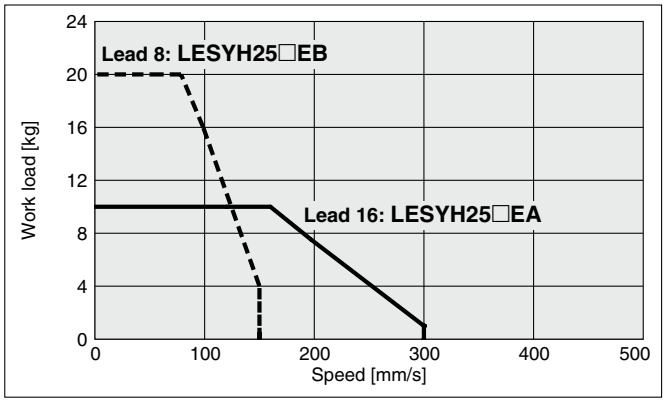
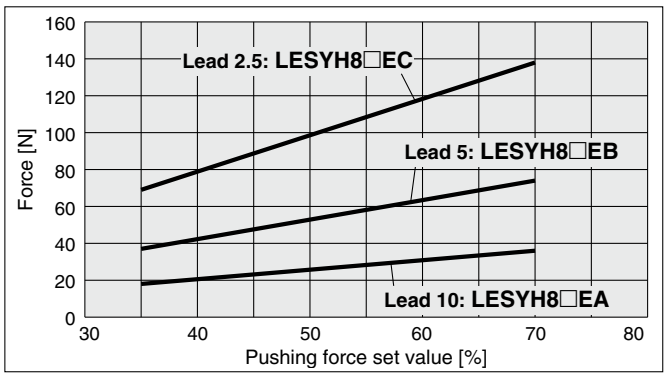


Static Allowable Moment

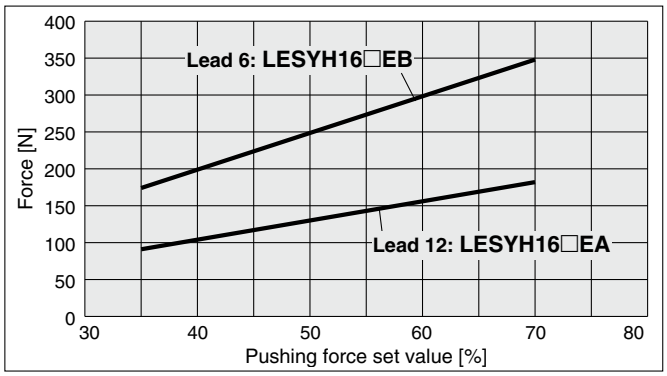
Model	LESYH8		LESYH16		LESYH25		
Stroke [mm]	50	75	50	100	50	100	150
Pitching [N·m]	11		26	43	77	112	155
Yawing [N·m]							
Rolling [N·m]	12		48		146	177	152

Pushing Force Set Value–Force Graph

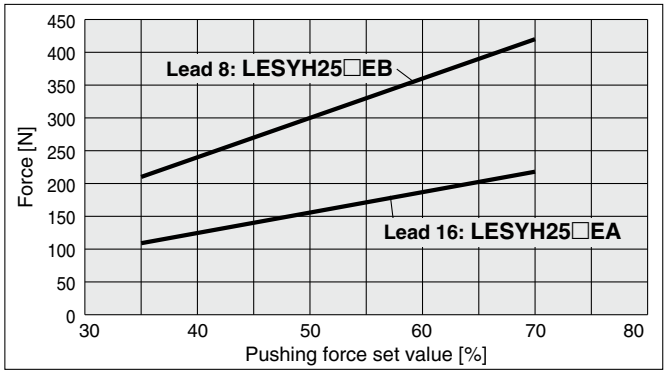
LESYH8□E□



LESYH16□E□



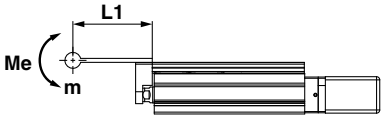
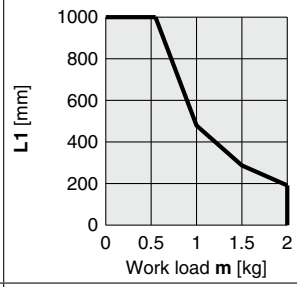
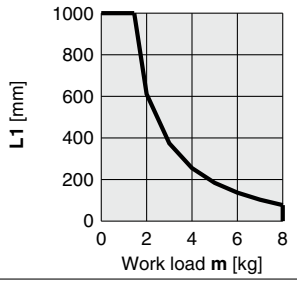
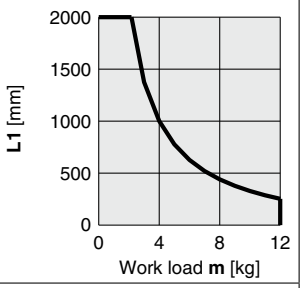
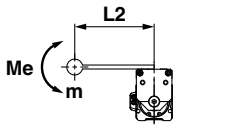
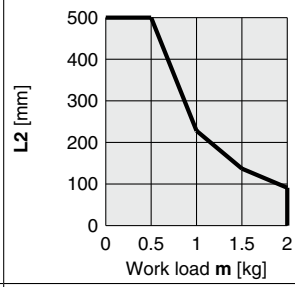
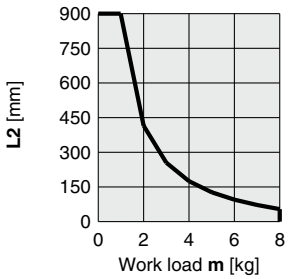
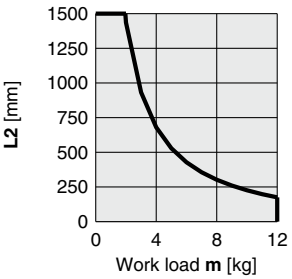
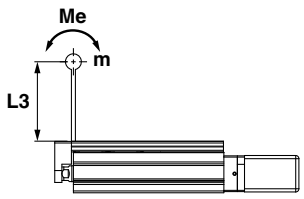
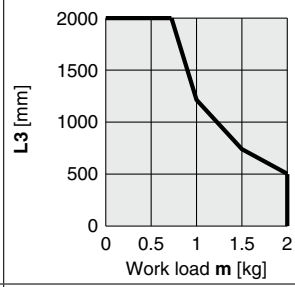
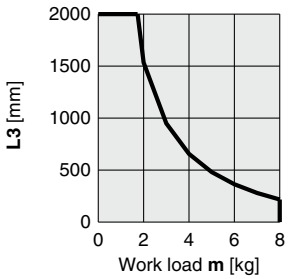
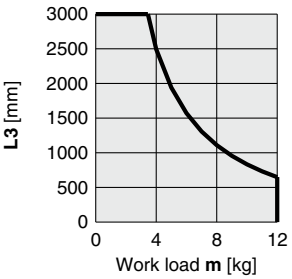
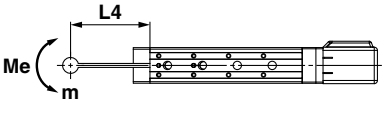
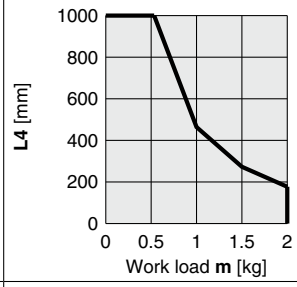
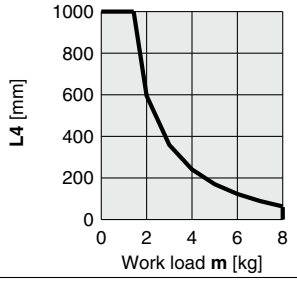
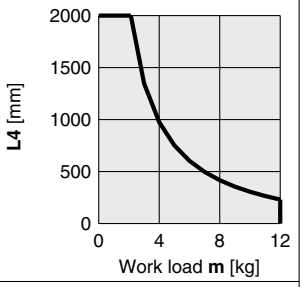
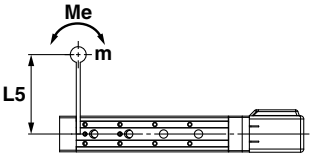
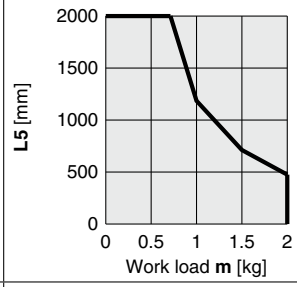
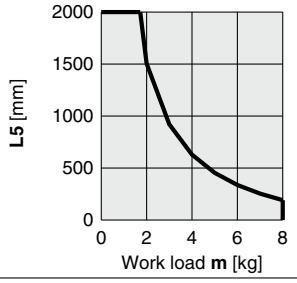
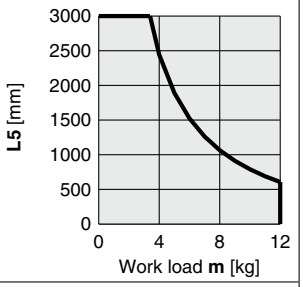
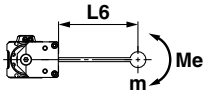
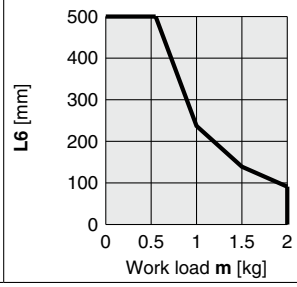
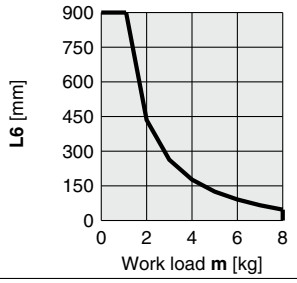
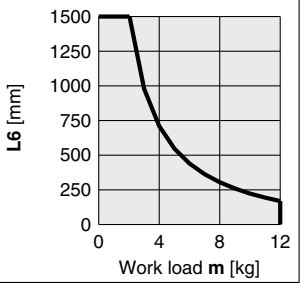
LESYH25□E□



Dynamic Allowable Moment

* These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece 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

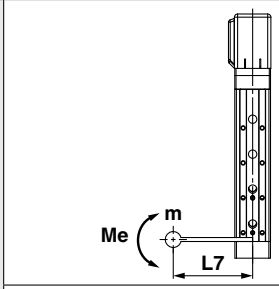
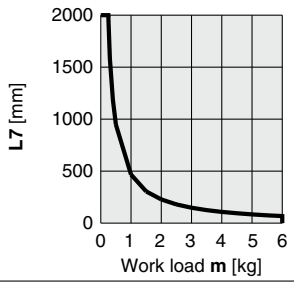
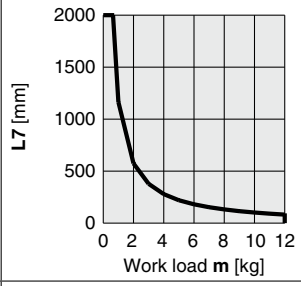
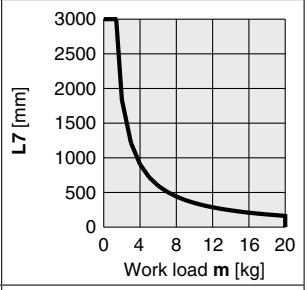
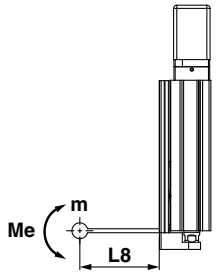
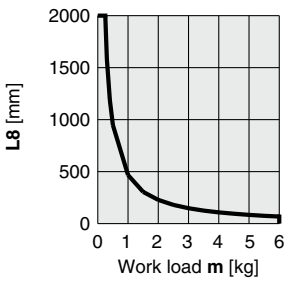
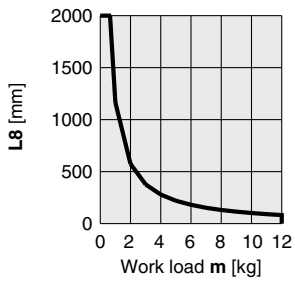
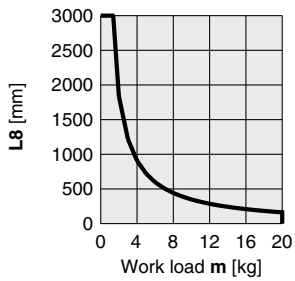
Acceleration/Deceleration —— 5000 mm/s²

Orientation	Load overhanging direction **m**: Work load [kg] **Me**: Allowable moment [N·m] **L**: Overhang to the work load center of gravity [mm]		Model: LESYH8	Model: LESYH16	Model: LESYH25
Horizontal/Bottom		X			
		Y			
		Z			
Horizontal (Wall)		X			
		Y			
		Z			

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

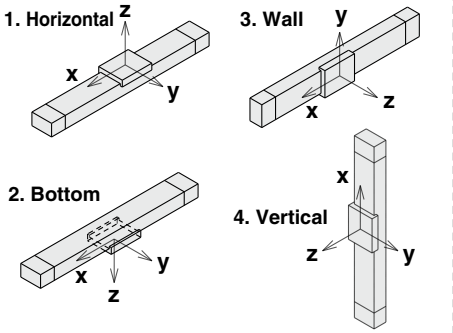
Acceleration/Deceleration —— 5000 mm/s²

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

Calculation of Guide Load Factor

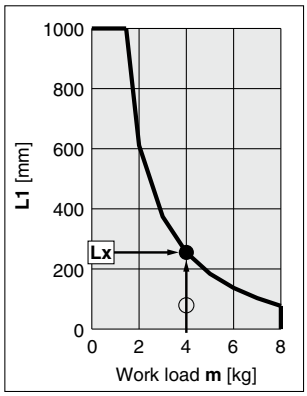
1. Decide operating conditions.
   Model: LESYH
   Size: 16
   Mounting orientation: Horizontal/Bottom/Wall/Vertical
   Acceleration [mm/s²]: **a**
   Work load [kg]: **m**
   Work load center position [mm]: **Xc/Yc/Zc**
2. Select the target graph while referencing the model, size, and mounting orientation.
3. Based on the acceleration and work load, find the overhang [mm]: **Lx/Ly/Lz** from the graph.
4. Calculate the load factor for each direction.
   αx = Xc/Lx, **αy = Yc/Ly**, **αz = Zc/Lz**
5. Confirm the total of **αx**, **αy**, and **αz** is 1 or less.
   αx + αy + αz ≤ 1
   When 1 is exceeded, consider a reduction of acceleration and work load, or a change of the work load center position and series.

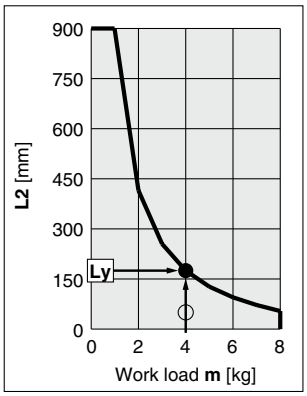
Mounting orientation

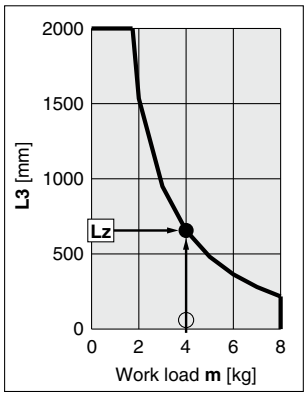


Example

1. Operating conditions
   Model: LESYH
   Size: 16
   Mounting orientation: Horizontal
   Acceleration [mm/s²]: 5000
   Work load [kg]: 4.0
   Work load center position [mm]: **Xc = 80**, **Yc = 50**, **Zc = 60**
2. Select three graphs from the top of the second row on page 21.
3. **Lx = 250 mm**, **Ly = 160 mm**, **Lz = 700 mm**
4. The load factor for each direction can be found as follows.
   αx = 80/250 = 0.32
   αy = 50/160 = 0.32
   αz = 60/700 = 0.09
5. **αx + αy + αz = 0.73 ≤ 1**







Model Selection

Selection Procedure

Positioning Control Selection Procedure

Step 1 Check the work load–speed. → **Step 2** Check the cycle time. → **Step 3** Check the allowable moment.

Selection Example

Step 1 **Check the work load–speed. <Speed–Work load graph>** (page 25)

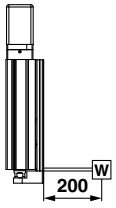
Select a model based on the workpiece mass and speed while referencing the speed–work load graph.

Selection example) The **LESYH16□B-50** can be temporarily selected as a possible candidate based on the graph shown on the right side.

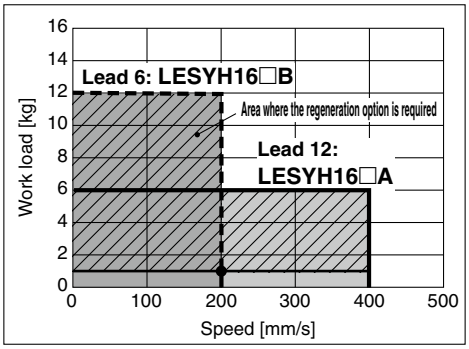
The regeneration option may be necessary. Refer to page 25 for the "Required Conditions for the Regeneration Option."

Operating conditions

- Workpiece mass: 1 [kg]
- Speed: 200 [mm/s]
- Mounting orientation: Vertical
- Stroke: 50 [mm]
- Acceleration/Deceleration: 3000 [mm/s²]
- Cycle time: 0.5 s
- Workpiece mounting condition:



LESYH16□□/AC Servo Motor Vertical



<Speed–Work load graph>

Step 2 **Check the cycle time.**

Calculate **the cycle time** using the following calculation method.

Cycle time:

T can be found from the following equation.

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

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

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

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

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

- 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.

  $T4 = 0.15$ [s]

Calculation example)

T1 to T4 can be calculated as follows.

$T1 = V/a1 = 200/3000 = 0.07$ [s],

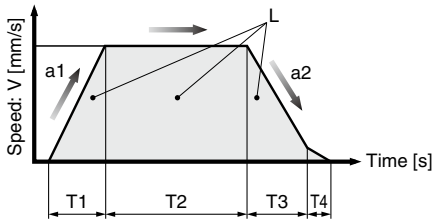
$T3 = V/a2 = 200/3000 = 0.07$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{50 - 0.5 \cdot 200 \cdot (0.07 + 0.07)}{200} = 0.18 \text{ [s]}$$

$T4 = 0.15$ [s]

The cycle time can be found as follows.

$T = T1 + T2 + T3 + T4$
$= 0.07 + 0.18 + 0.07 + 0.15$
$=$ **0.47 [s]**

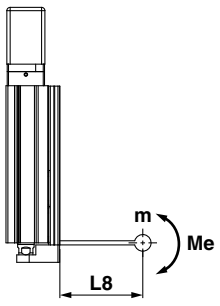


L : Stroke [mm] ····· (Operating condition)
V : Speed [mm/s] ····· (Operating condition)
a1: Acceleration [mm/s²] ··· (Operating condition)
a2: Deceleration [mm/s²] ··· (Operating condition)

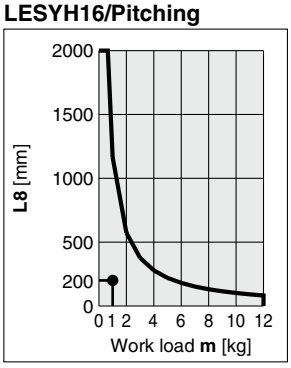
T1: Acceleration time [s] ··· Time until reaching the set speed
T2: Constant speed time [s] ··· Time while the actuator is operating at a constant speed
T3: Deceleration time [s] ··· Time from the beginning of the constant speed operation to stop
T4: Settling time [s] ··· Time until positioning is completed

Step 3 **Check the allowable moment.**
<Static allowable moment> (page 19)
<Dynamic allowable moment> (pages 21, 22)

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□B-50 should be selected.

Selection Procedure

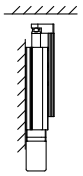
Force Control Selection Procedure

Step 1 Check the required force. → **Step 2** Check the pushing force. → **Step 3** Check the duty ratio. → **Step 4** Check the allowable moment.

Selection Example

Operating conditions

- Pushing force: 210 N
- Workpiece mass: 1 kg
- Speed: 100 mm/s
- Stroke: 100 mm
- Mounting position: Vertical upward
- Pushing time + Operation (A): 5 s
- Full cycle time (B): 10 s



Step 1 Check the required force.

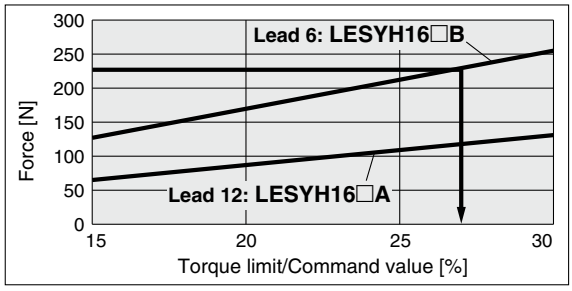
Calculate the approximate required force for a pushing operation.
Selection example) ● Pushing force: 210 [N]
● Workpiece mass: 1 [kg]
The approximate required force can be found to be 210 + 10 = 220 [N].
Select a model based on the approximate required force while referencing the specifications (page 45).
Selection example based on the specifications)
● Approximate required force: 220 [N]
● Speed: 100 [mm/s]
The **LESYH16□B** 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□B** table weight: 0.7 [kg]
The required force can be found to be 220 + 7 = 227 [N].

Table Weight Unit [kg]

Model	Stroke [mm]		
	50	100	150
LESYH16	0.4	0.7	—
LESYH25	0.9	1.3	1.7

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

LESYH16



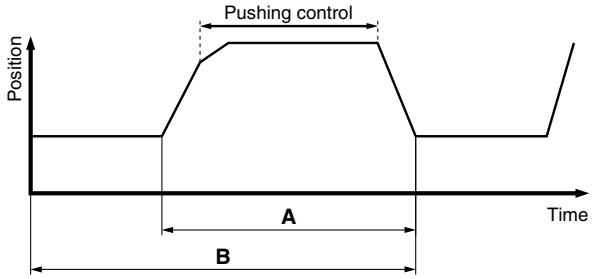
<Force conversion graph>

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

Select a model based on the required force while referencing the force conversion graph, and confirm the torque limit/command value.
Selection example) Based on the graph shown on the right side,
● Required force: 227 [N]
The **LESYH16□B** can be temporarily selected as a possible candidate.
The torque limit/command value is 27 [%].

Allowable Duty Ratio
LESYH16/AC Servo Motor

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

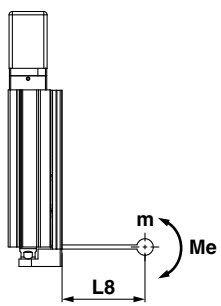


Step 3 Check the duty ratio.

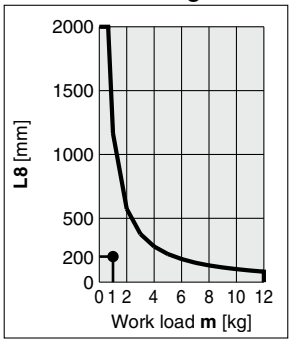
Confirm the allowable duty ratio based on the torque limit/command value while referencing the allowable duty ratio.
Selection example based on the allowable duty ratio)
● Torque limit/Command value: 27 [%]
The allowable duty ratio can be found to be 60 [%].
Calculate the duty ratio for the operating conditions, and confirm it does not exceed the allowable duty ratio.
Selection example) ● Pushing time + Operation (A): 5 s
● Full cycle time (B): 10 s
The duty ratio can be found to be 5/10 x 100 = 50 [%], and this is within the allowable range.

Step 4 Check the allowable moment.
<Static allowable moment> (page 19)
<Dynamic allowable moment> (pages 21, 22)

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



LESYH16/Pitching



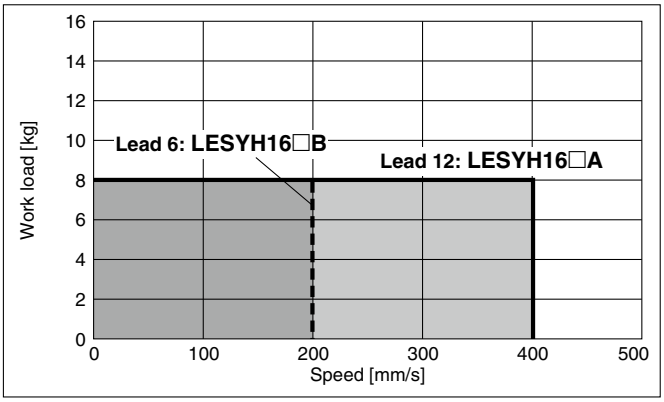
<Dynamic allowable moment>

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

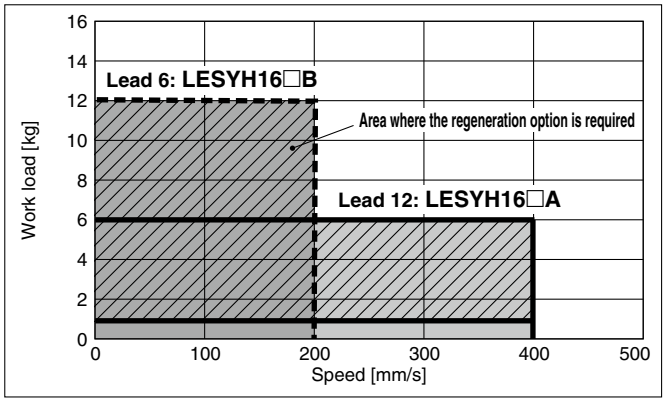
Speed–Work Load Graph/Required Conditions for the Regeneration Option

LESYH16□S2/T6

Horizontal

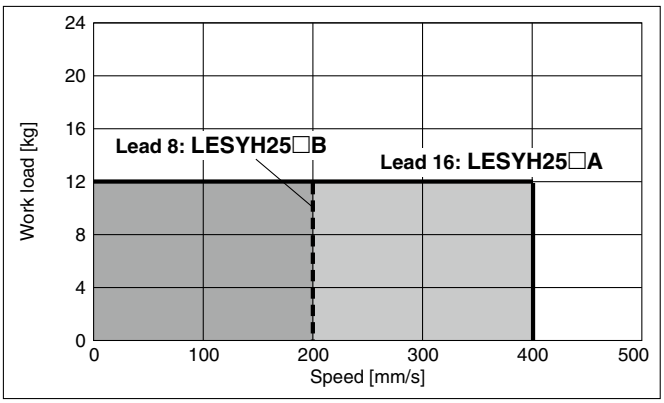


Vertical

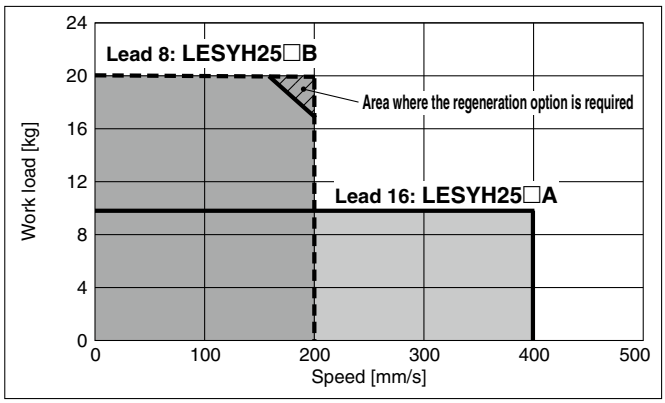


LESYH25□S3/T7

Horizontal



Vertical



Required conditions for the regeneration option

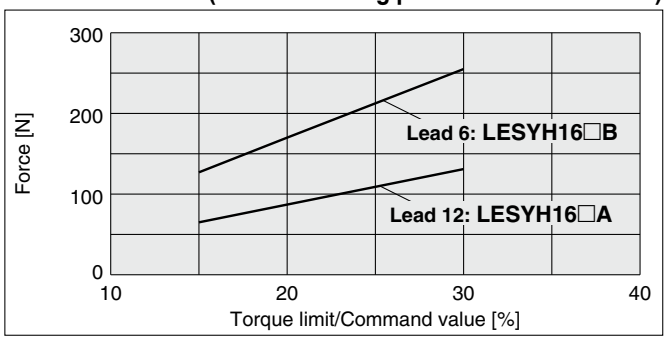
* The regeneration option is required when using the product above the regeneration line in the graph. (It must be ordered separately.)

Regeneration Option Model

Size	Model
16	LEC-MR-RB-032
25	

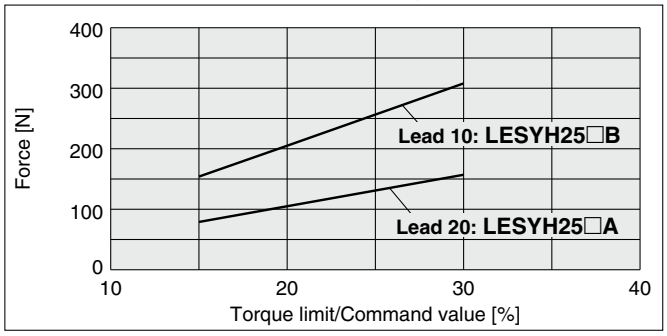
Force Conversion Graph (Guide): LECSA

LESYH16□S2 (Motor mounting position: Parallel/In-line)



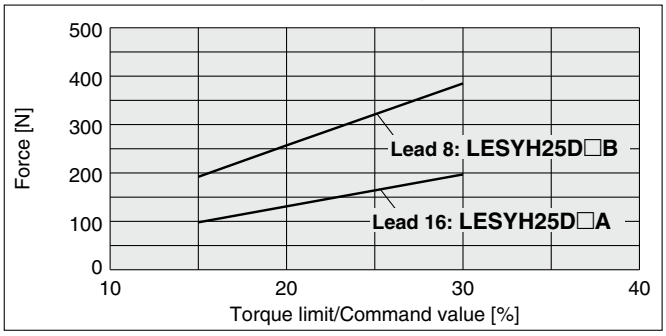
Torque limit/Command value [%]	Duty ratio [%]	Continuous pushing time [min]
25 or less	100	—
30	60	1.5

LESYH25□S3 (Motor mounting position: Parallel)



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

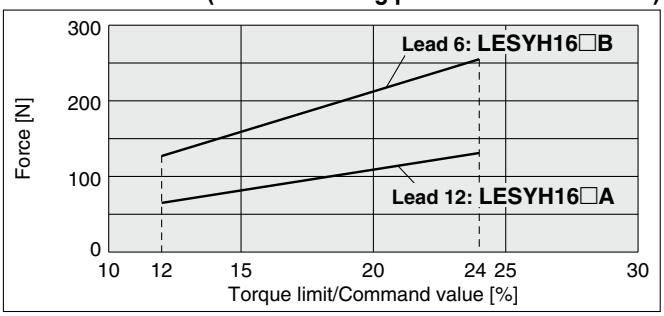
LESYH25DS3 (Motor mounting position: In-line)



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

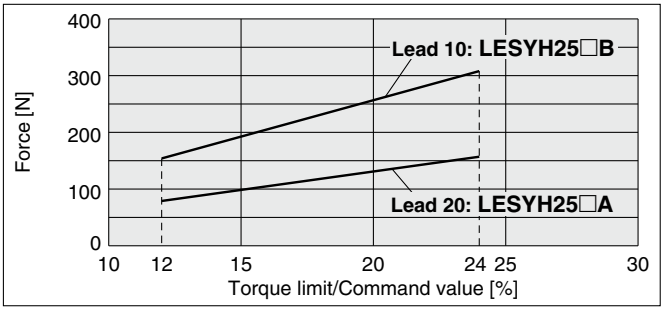
Force Conversion Graph (Guide): LECS□-T

LESYH16□T6 (Motor mounting position: Parallel/In-line)



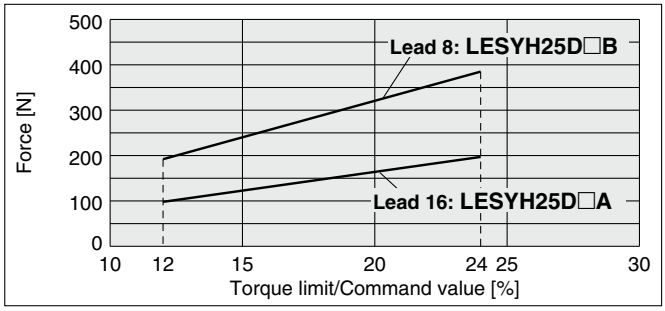
Torque limit/Command value [%]	Duty ratio [%]	Continuous pushing time [min]
20 or less	100	—
24	60	1.5

LESYH25□T7 (Motor mounting position: Parallel)



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

LESYH25DT7 (Motor mounting position: In-line)



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

Model Selection

Selection Procedure

Positioning Control Selection Procedure

Step 1 Check the work load–speed. → **Step 2** Check the cycle time. → **Step 3** Check the allowable moment.

Selection Example

Step 1 **Check the work load–speed. <Speed–Work load graph>** (page 31)

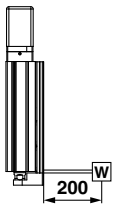
Select a model based on the workpiece mass and speed while referencing the speed–work load graph.

Selection example) The **LESYH16□B-50** can be temporarily selected as a possible candidate based on the graph shown on the right side.

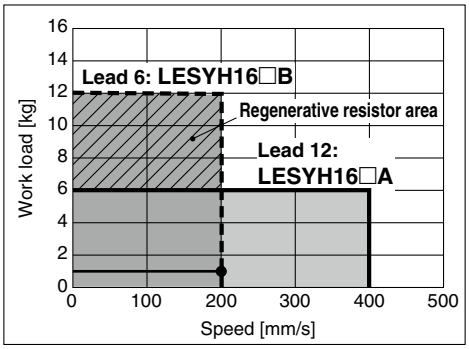
The regenerative resistor may be necessary. Refer to page 31 for the "Required Conditions for the Regenerative Resistor (Guide)."

Operating conditions

- Workpiece mass: 1 [kg]
- Speed: 200 [mm/s]
- Mounting orientation: Vertical
- Stroke: 50 [mm]
- Acceleration/Deceleration: 3000 [mm/s²]
- Cycle time: 0.5 s
- Workpiece mounting condition:



LESYH16□□/AC Servo Motor Vertical



<Speed–Work load graph>

Step 2 **Check the cycle time.**

Calculate **the cycle time** using the following calculation method.

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

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

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

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

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

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

- 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.

$T4 = 0.15$ [s]

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

$T1 = V/a1 = 200/3000 = 0.07$ [s],

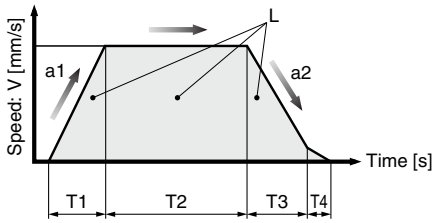
$T3 = V/a2 = 200/3000 = 0.07$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{50 - 0.5 \cdot 200 \cdot (0.07 + 0.07)}{200} = 0.18 \text{ [s]}$$

$T4 = 0.15$ [s]

The cycle time can be found as follows.

$T = T1 + T2 + T3 + T4$
$= 0.07 + 0.18 + 0.07 + 0.15$
$=$ **0.47 [s]**

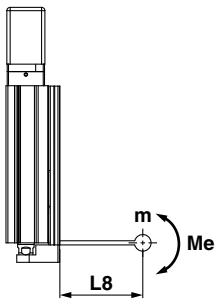


L : Stroke [mm] ····· (Operating condition)
V : Speed [mm/s] ····· (Operating condition)
a1: Acceleration [mm/s²] ··· (Operating condition)
a2: Deceleration [mm/s²] ··· (Operating condition)

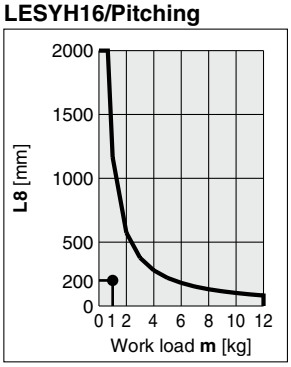
T1: Acceleration time [s] ··· Time until reaching the set speed
T2: Constant speed time [s] ··· Time while the actuator is operating at a constant speed
T3: Deceleration time [s] ··· Time from the beginning of the constant speed operation to stop
T4: Settling time [s] ··· Time until positioning is completed

Step 3 **Check the allowable moment.**
<Static allowable moment> (page 19)
<Dynamic allowable moment> (pages 21, 22)

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□B-50 should be selected.

Selection Procedure

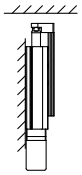
Force Control Selection Procedure

Step 1 Check the required force. → **Step 2** Check the pushing force. → **Step 3** Check the duty ratio. → **Step 4** Check the allowable moment.

Selection Example

Operating conditions

- Pushing force: 210 N
- Workpiece mass: 1 kg
- Speed: 100 mm/s
- Stroke: 100 mm
- Mounting position: Vertical upward
- Pushing time + Operation (A): 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: 210 [N]
● Workpiece mass: 1 [kg]
The approximate required force can be found to be 210 + 10 = 220 [N].
Select a model based on the approximate required force while referencing the specifications (page 53).
Selection example based on the specifications)
● Approximate required force: 220 [N]
● Speed: 100 [mm/s]
The **LESYH16□B** 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□B** table weight: 0.7 [kg]
The required force can be found to be 220 + 7 = 227 [N].

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

Select a model based on the required force while referencing the force conversion graph, and confirm the torque limit/command value.
Selection example) Based on the graph shown on the right side,
● Required force: 227 [N]
The **LESYH16□B** can be temporarily selected as a possible candidate.
The torque limit/command value is 80 [%].

Step 3 Check the duty ratio.

Confirm the allowable duty ratio based on the torque limit/command value while referencing the allowable duty ratio.
Selection example based on the allowable duty ratio)
● Torque limit/Command value: 81 [%]
The allowable duty ratio can be found to be 60 [%].
Calculate the duty ratio for the operating conditions, and confirm it does not exceed the allowable duty ratio.
Selection example) ● Pushing time + Operation (A): 5 s
● Full cycle time (B): 10 s
The duty ratio can be found to be 5/10 x 100 = 50 [%], and this is within the allowable range.

Step 4 Check the allowable moment.
<Static allowable moment> (page 19)
<Dynamic allowable moment> (pages 21, 22)

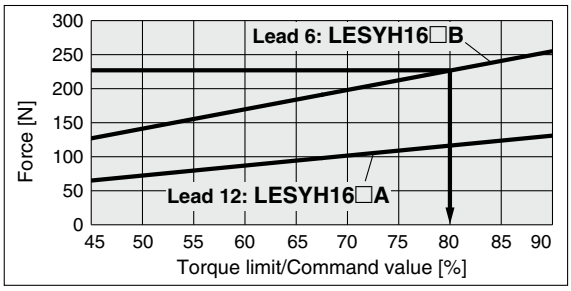
Confirm the moment that applies to the actuator is within the allowable range for both static and dynamic conditions.

Table Weight Unit [kg]

Model	Stroke [mm]		
	50	100	150
LESYH16	0.4	0.7	—
LESYH25	0.9	1.3	1.7

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

LESYH16

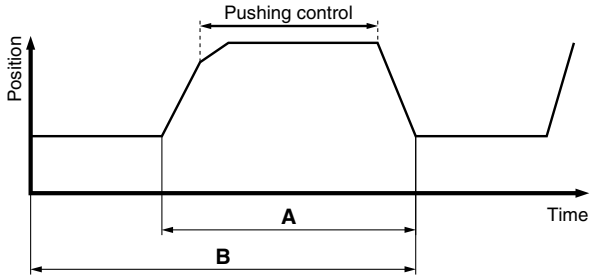


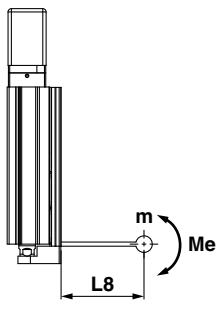
<Force conversion graph>

Allowable Duty Ratio
LESYH16/AC Servo Motor

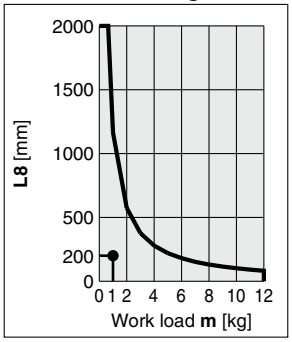
Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
75 or less	100	—
90	60	1.5

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





LESYH16/Pitching



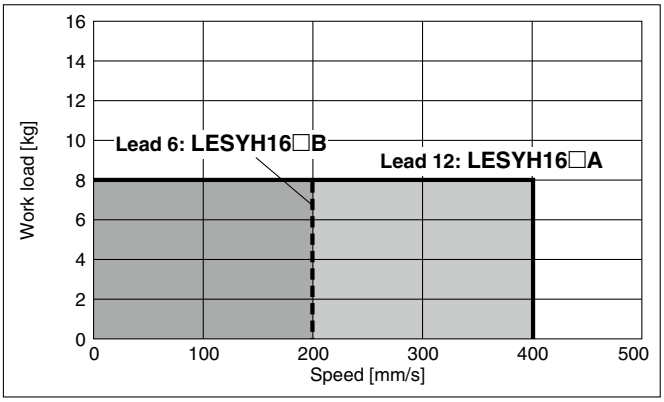
<Dynamic allowable moment>

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

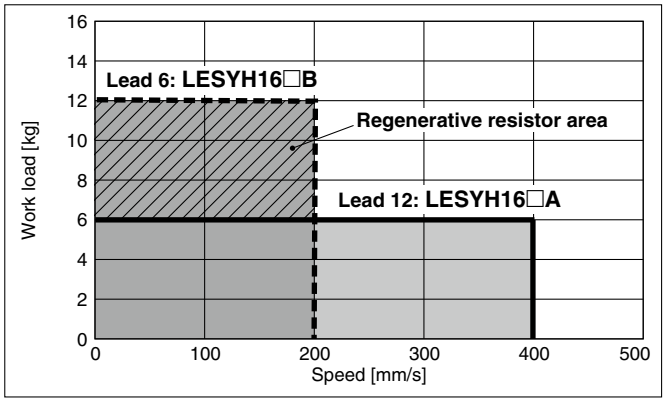
Speed–Work Load Graph/Required Conditions for the Regenerative Resistor (Guide)

LESYH16□V6

Horizontal

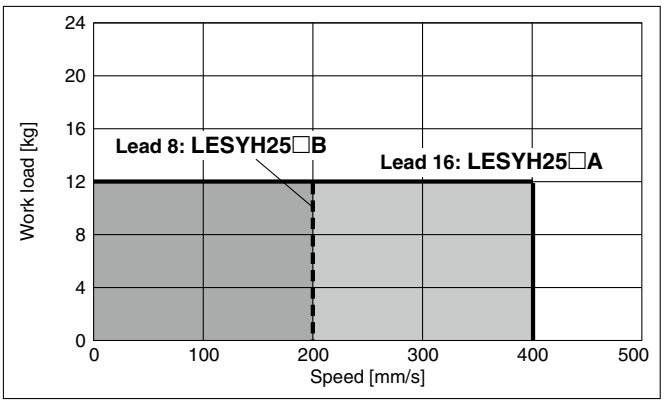


Vertical

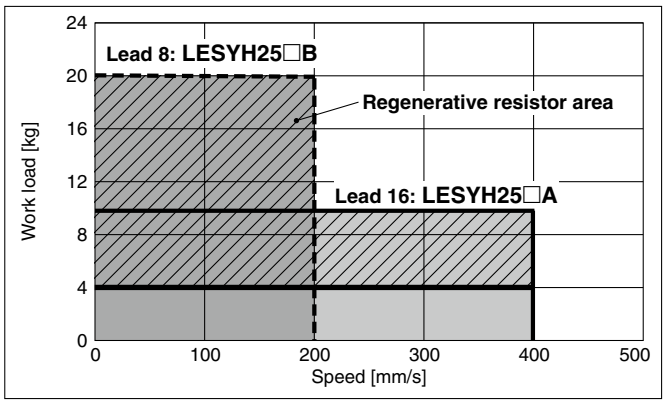


LESYH25□V7

Horizontal



Vertical



Regenerative resistor area

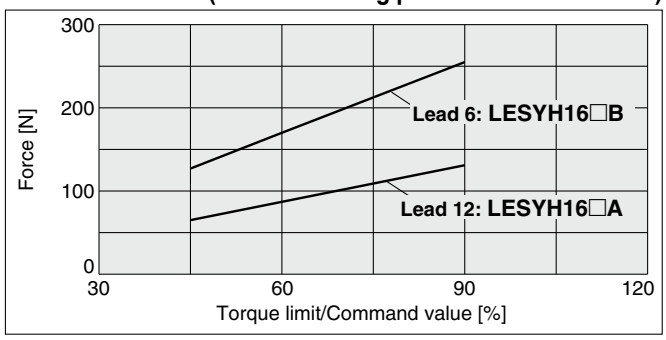
* When using the actuator in the regenerative resistor area, download the "AC servo drive capacity selection program/SigmaJunmaSize+" from the SMC website. Then, calculate the necessary regenerative resistor capacity to prepare an appropriate external regenerative resistor.
* The regenerative resistor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

Applicable Motors/Drivers

Model	Applicable model	
	Motor	Servopack (SMC driver)
LESYH25□	SGMJV-01A3A	SGDV-R90A11□(LECYM2-V5) SGDV-R90A21□(LECYU2-V5)
LESYH32□	SGMJV-02A3A	SGDV-1R6A11□(LECYM2-V7) SGDV-1R6A21□(LECYU2-V7)

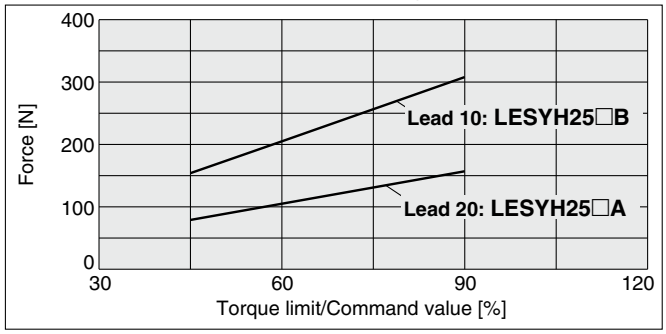
Force Conversion Graph (Guide)

LESYH16□V6 (Motor mounting position: Parallel/In-line)



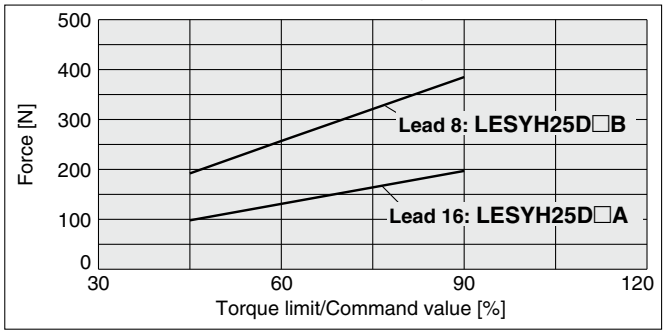
Torque limit/Command value [%]	Duty ratio [%]	Continuous pushing time [min]
75 or less	100	—
90	60	1.5

LESYH25□V7 (Motor mounting position: Parallel)



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

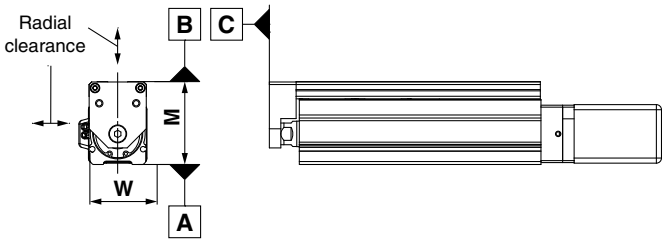
LESYH25DV7 (Motor mounting position: In-line)



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

Table Accuracy

* These values are initial guideline values.

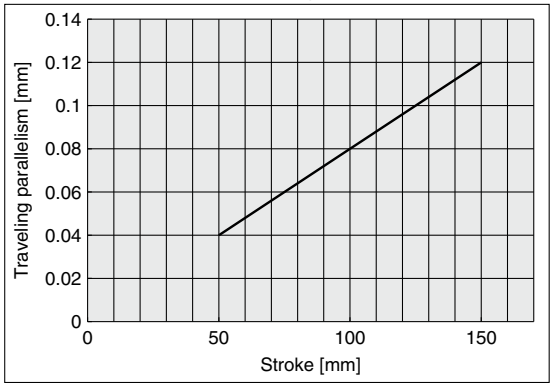


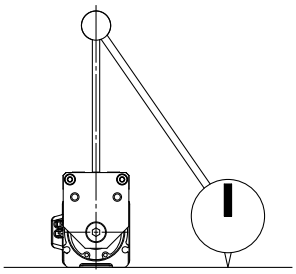
Model	LESYH8	LESYH16	LESYH25
B side parallelism to A side [mm]	Refer to Table 1.		
B side traveling parallelism to A side [mm]	Refer to Graph 1.		
C side perpendicularity to A side [mm]	0.05	0.05	0.05
M dimension tolerance [mm]	±0.3		
W dimension tolerance [mm]	±0.2		
Radial clearance [μm]	−4 to 0	−10 to 0	−14 to 0

Table 1 B side parallelism to A side

Model	Stroke [mm]			
	50	75	100	150
LESYH8	0.055	0.065	—	—
LESYH16	0.05	—	0.08	—
LESYH25	0.06	—	0.08	0.125

Graph 1 B side traveling parallelism to A side





Traveling parallelism:
The amount of deflection on a dial gauge when the table travels a full stroke with the body secured on a reference base surface

Table Deflection (Reference Value)

* These values are initial guideline values.

Table displacement due to pitch moment load
Table displacement when loads are applied to the section marked with the arrow with the slide table stuck out.

Table displacement due to yaw moment load
Table displacement when loads are applied to the section marked with the arrow with the slide table stuck out.

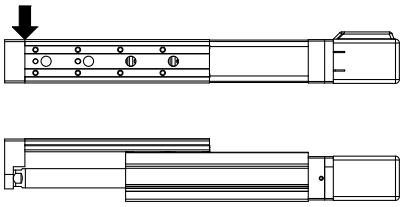
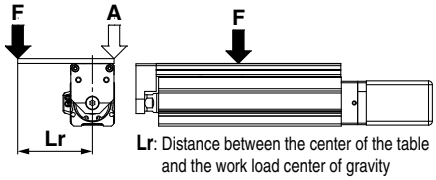
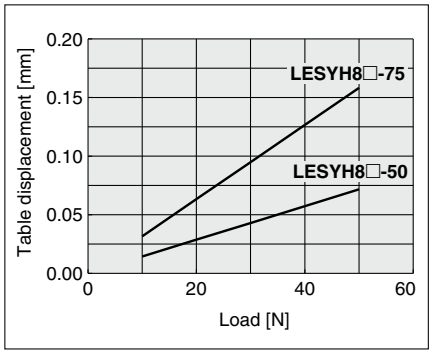


Table displacement due to roll moment load
Table displacement of section A when loads are applied to the section F with the slide table retracted.

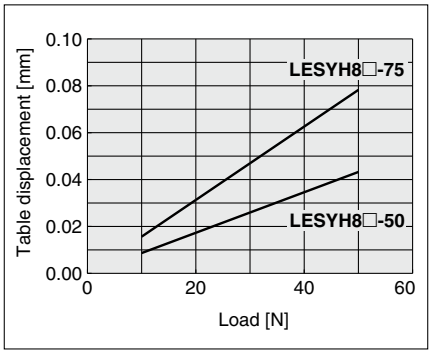


Lr: Distance between the center of the table and the work load center of gravity

LESYH8

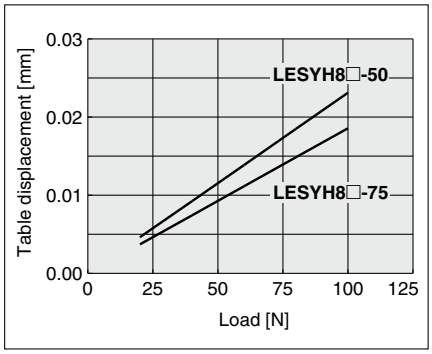


LESYH8

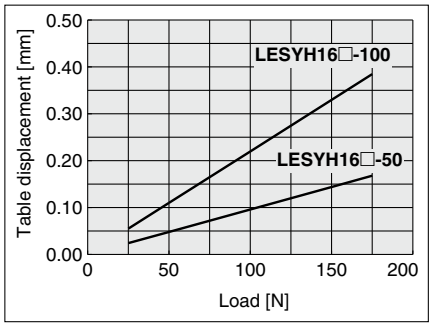


LESYH8

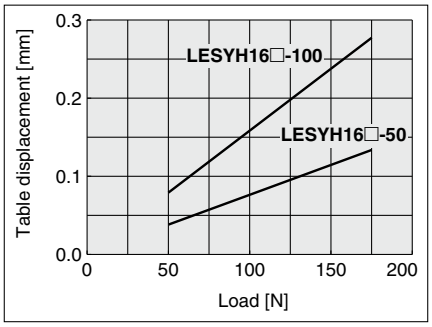
Lr = 70 mm



LESYH16

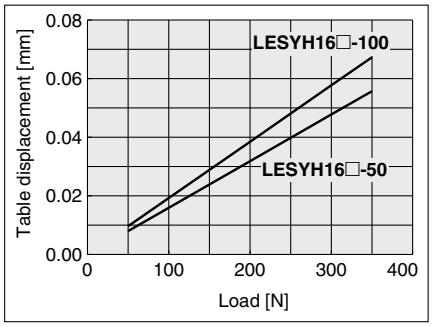


LESYH16

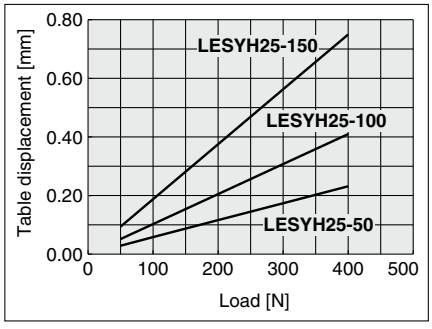


LESYH16

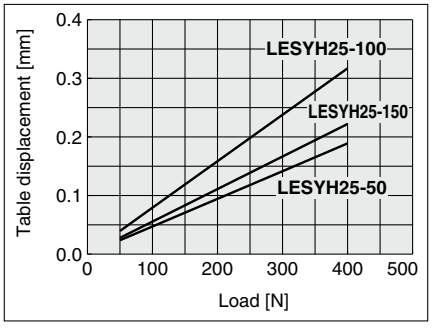
Lr = 120 mm



LESYH25

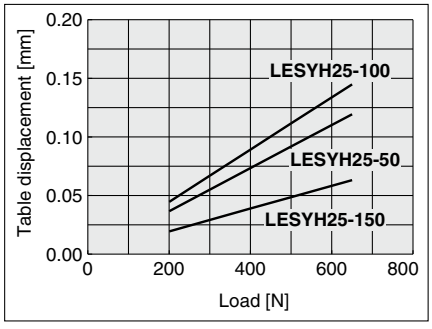


LESYH25



LESYH25

Lr = 200 mm



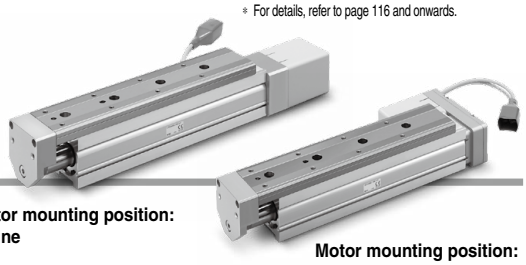
Battery-less Absolute Encoder Type

Slide Table/High Precision Type

LESYH□E Series

CE RoHS

* For details, refer to page 116 and onwards.



Motor mounting position: In-line

Motor mounting position: Right side parallel

How to Order

LESYH 16 D E A – 50 C – R1 CD17T

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

For details on controllers, refer to the next page.

❶ Size

8
16
25

❷ 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	—

❷ Motor mounting position

(For sizes 16 and 25)

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

❸ Motor type

E	Battery-less absolute (Step motor 24 VDC)

❹ Lead [mm]

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

❺ Stroke [mm]

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

❻ Motor option

C	Without lock
W	With lock

❼ 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 57 to 60.

⑧ Controller

Nil	Without controller
C□1□□	With controller

C D 1 7 T

Interface (Communication protocol/Input/Output)

5	Parallel input (NPN)
6	Parallel input (PNP)
E	EtherCAT®
9	EtherNet/IP™
P	PROFINET
D	DeviceNet™
L	IO-Link
M	CC-Link Ver. 1.10

For single axis

Mounting

7	Screw mounting
8∗2	DIN rail

Communication plug connector, I/O cable∗3

Symbol	Type	Applicable interface
Nil	Without accessory	—
S	Straight type communication plug connector	DeviceNet™ CC-Link Ver. 1.10
T	T-branch type communication plug connector	
1	I/O cable (1.5 m)	Parallel input (NPN) 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.
∗3 Select "Nil" for anything other than DeviceNet™, CC-Link, or parallel input.
Select "Nil," "S," or "T" for DeviceNet™ or CC-Link.
Select "Nil," "1," "3," or "5" for parallel input.

⚠Caution

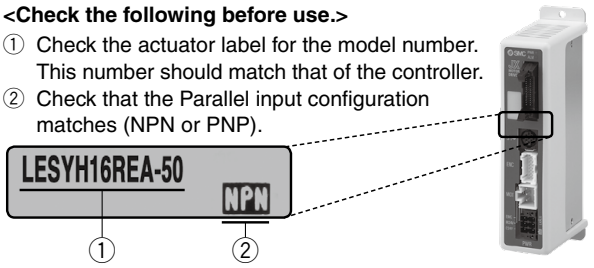
[CE-compliant products]
EMC compliance was tested by combining the electric actuator LES series and the controller JXC series.
The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with the EMC directive 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.

[Precautions relating to differences in controller versions]
When the JXC series is to be used in combination with the battery-less absolute encoder, use a controller that is version V3.4 or S3.4 or higher.
For details, refer to page 81.

[UL certification]
The JXC series controllers used in combination with electric actuators are UL certified.

The controller is sold as single unit after the compatible actuator is set.
Confirm that the combination of the controller and actuator is correct.

<Check the following before use.>
① Check the actuator label for the model number. This number should match that of the controller.
② Check that the Parallel input configuration matches (NPN or PNP).



∗ 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	DeviceNet™ direct input type	IO-Link direct input type	CC-Link direct input type
Series	**JXC51 JXC61**	**JXCE1**	**JXC91**	**JXCP1**	**JXCD1**	**JXCL1**	**JXCM1**
Features	Parallel I/O	EtherCAT® direct input	EtherNet/IP™ direct input	PROFINET direct input	DeviceNet™ direct input	IO-Link direct input	CC-Link 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	67	74					

Specifications

Step Motor (Servo/24 VDC)

Model			LESYH8□EA	LESYH8□EB	LESYH8□EC	LESYH16□EA	LESYH16□EB	LESYH25□EA	LESYH25□EB
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	91 to 182	174 to 348	109 to 218	210 to 420
	Max. speed [mm/s]*1 *3		400	200	100	400	200	400	200
	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/deceleration [mm/s²]		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/s²]*5		50/20						
	Actuation type		Ball screw: LESYH□D 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		Battery-less absolute (Step motor 24 VDC)						
	Encoder (Angular displacement sensor)		Battery-less absolute						
	Power supply voltage [V]		24 VDC ±10%						
	Power [W]*6		Max. power 43			Max. power 48		Max. power 104	
Lock unit specifications	Type	*7	Non-magnetizing lock						
	Holding force [N]		20	39	78	78	157	108	216
	Power [W]*6 *8		2.9			5			
	Rated voltage [V]		24 VDC ±10%						

*1 Speed changes according to the work load. Check the “Speed–Work Load Graph (Guide)” on page 19.
*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□E	1.06	1.23	—	—
LESYH16□E	1.87	—	2.26	—
LESYH25□E	3.50	—	4.10	4.90

Additional Weight

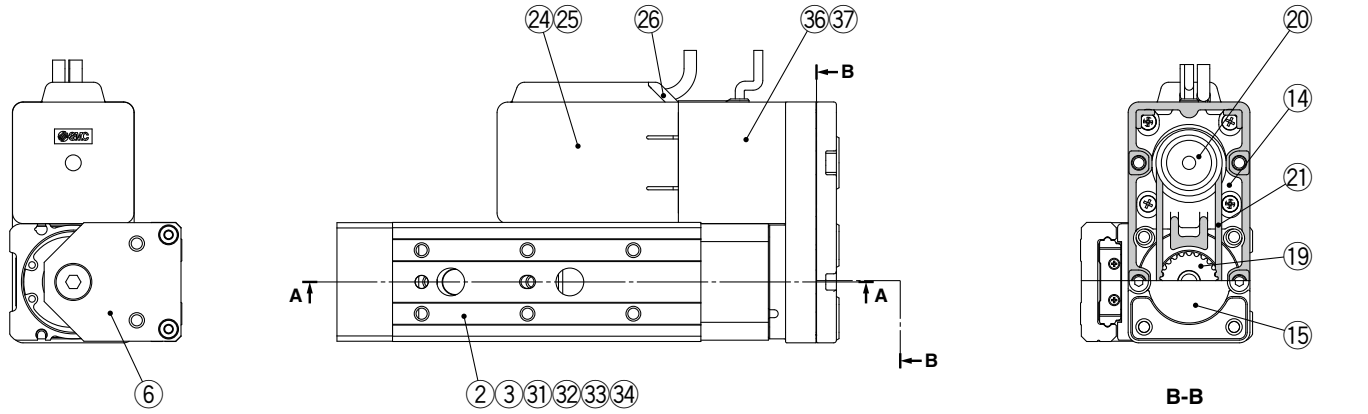
[kg]

Size	8	16	25
With lock	0.16	0.32	0.61

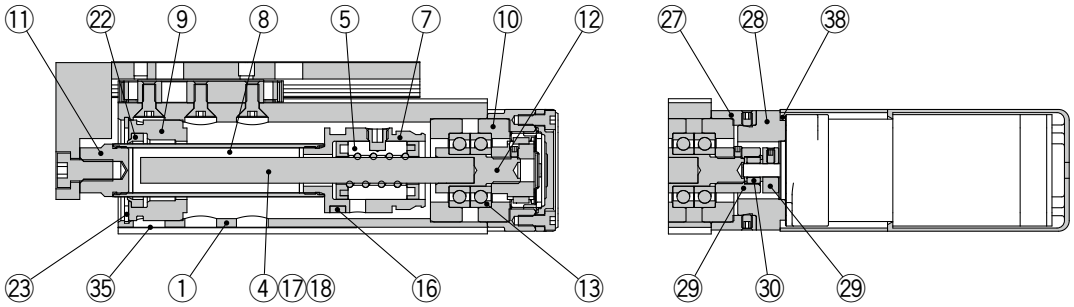
Construction

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

∗ The figures show the R type.



In-line/D type



Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Table**	Stainless steel	—
3	**Guide block**	Stainless steel	—
4	**Ball screw shaft**	Alloy steel	—
5	**Ball screw nut**	Resin/Alloy steel	—
6	**End plate**	Aluminum alloy	Anodized
7	**Piston**	Aluminum alloy	—
8	**Piston rod**	Stainless steel	Hard chrome plating
9	**Rod cover**	Aluminum alloy	—
10	**Bearing holder**	Aluminum alloy	—
11	**Socket**	Free cutting steel	Electroless nickel plating
12	**Connected shaft**	Free cutting steel	Electroless nickel plating
13	**Bearing**	—	—
14	**Return box**	Aluminum die-cast	Coating
15	**Return plate**	Aluminum die-cast	Coating
16	**Magnet**	—	
17	**Wear ring holder**	Stainless steel	Size 25, 150st only
18	**Wear ring**	Resin	Size 25, 150st only
19	**Screw shaft pulley**	Aluminum alloy	—
20	**Motor pulley**	Aluminum alloy	—
21	**Belt**	—	—
22	**Scraper**	NBR	—
23	**Type C retaining ring for hole**	Steel for spring	Phosphate coating
24	**Motor**	—	—
25	**Motor cover**	Resin	—
		Aluminum alloy	Size 8 only
26	**Grommet**	Resin	—

No.	Description	Material	Note
27	**Motor block**	Aluminum alloy	Anodized
28	**Motor adapter**	Aluminum alloy	Anodized
29	**Hub**	Aluminum alloy	—
30	**Spider**	NBR	—
31	**Cover**	Resin	—
32	**Return guide**	Resin	—
33	**Scraper**	NBR	—
34	**Steel ball**	Special steel	—
35	**Masking tape**	—	—
36	**Lock**	—	With lock only
37	**Motor cover with lock**	Aluminum alloy	With lock only
38	**Cover support**	Aluminum alloy	With lock only

Replacement Parts (Motor mounting position: Parallel type only)/Belt

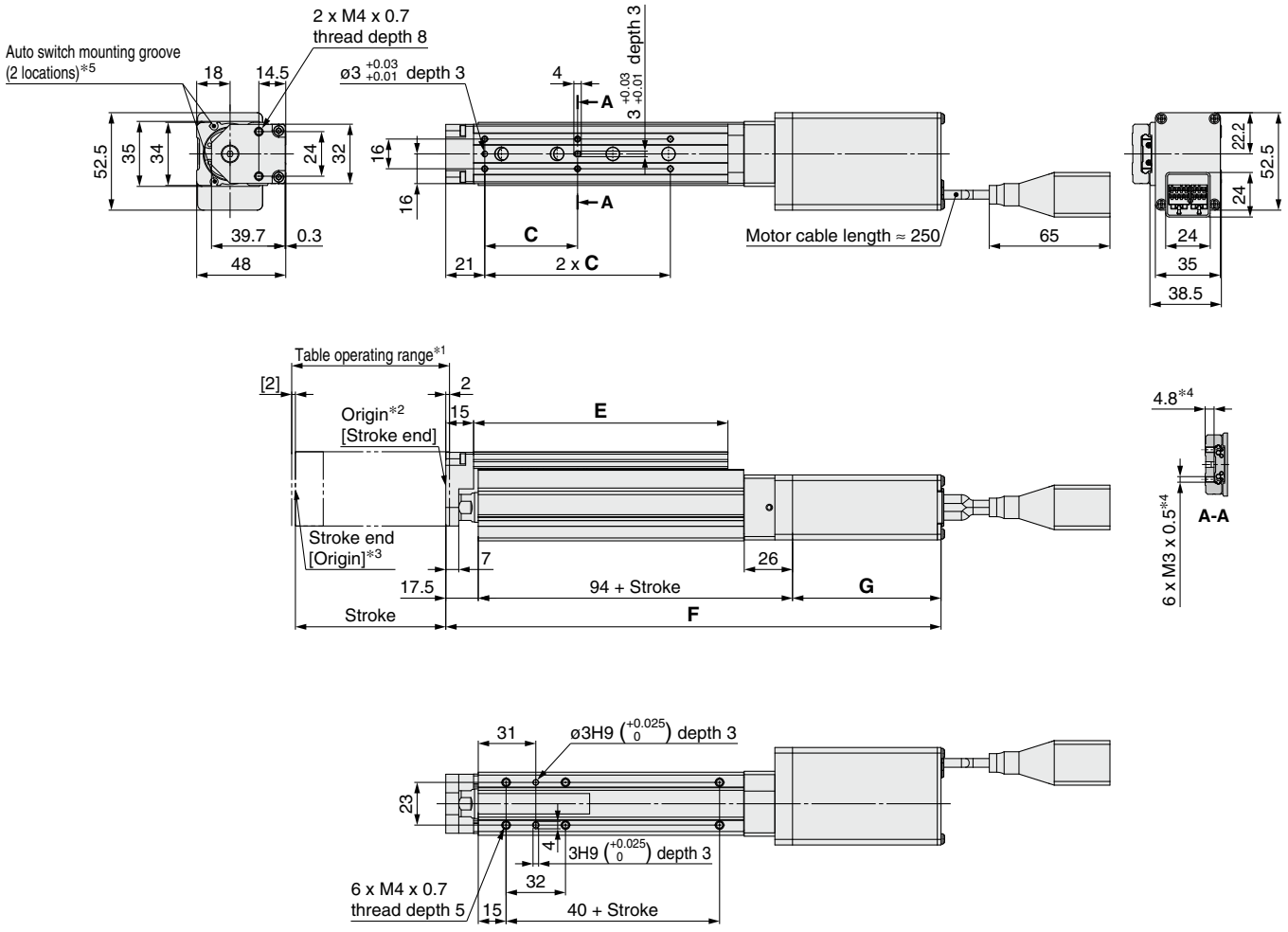
No.	Size	Order no.
21	**8**	LE-D-2-1
	16	LE-D-2-2
	25	LE-D-2-3

Replacement Parts/Grease Pack

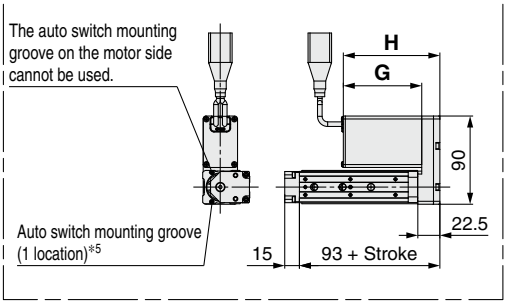
Applied portion	Order no.
Piston rod Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

Dimensions

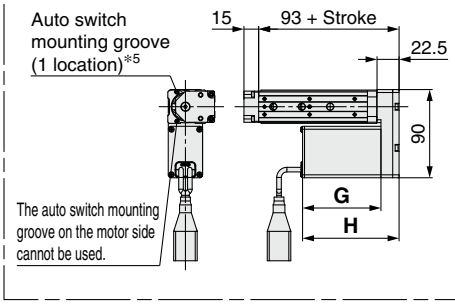
LESYH8D□E□-□



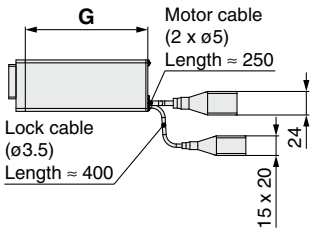
Motor mounting position: Right side parallel
LESYH8RE□-□



Motor mounting position: Left side parallel
LESYH8LE□-□



Motor option: With lock
LESYH8□E□-□W



*1 This is the range within which the table can move when it returns to origin.
Make sure 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 58 to 60 for details.

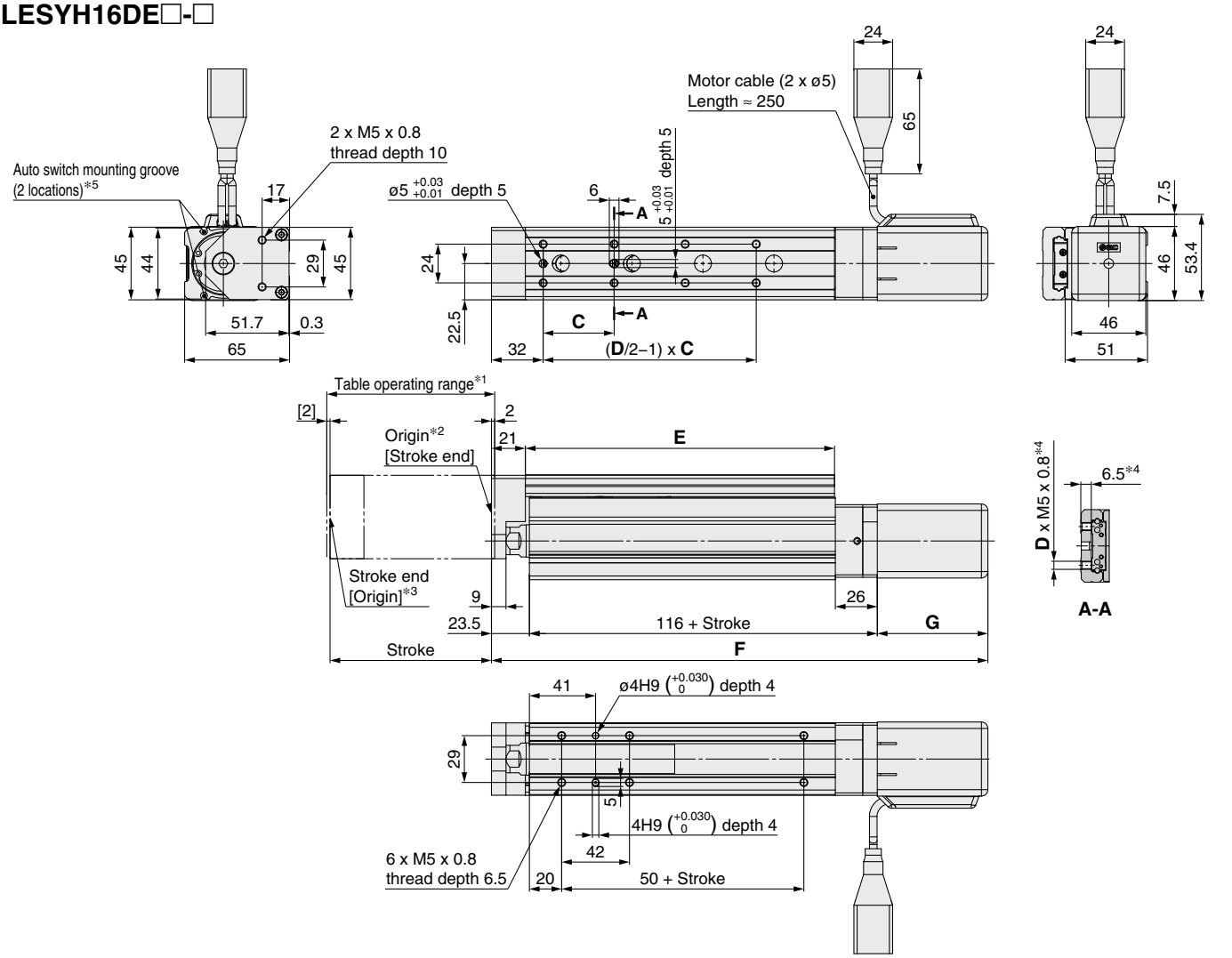
Dimensions

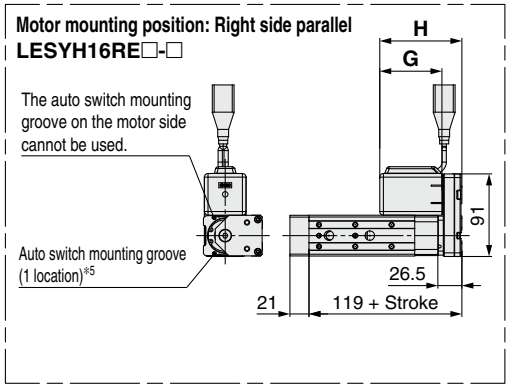
[mm]

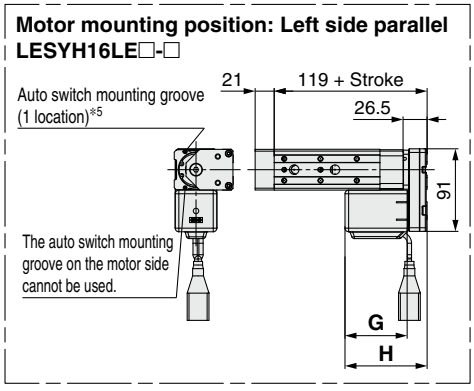
Model	Stroke	C	E	Without lock			With lock		
				F	G	H	F	G	H
LESYH8□E□	50	46	111	241.5	80	98.5	286.5	125	143.5
	75	50	137	266.5			311.5		

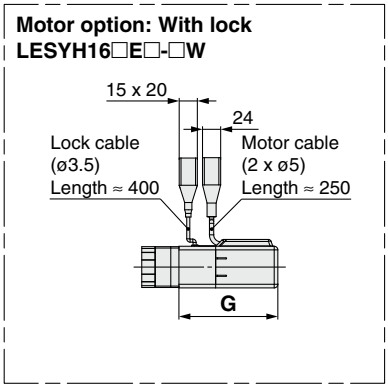
Dimensions

LESYH16DE□-□









*1 This is the range within which the table can move when it returns to origin.
Make sure 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 58 to 60 for details.

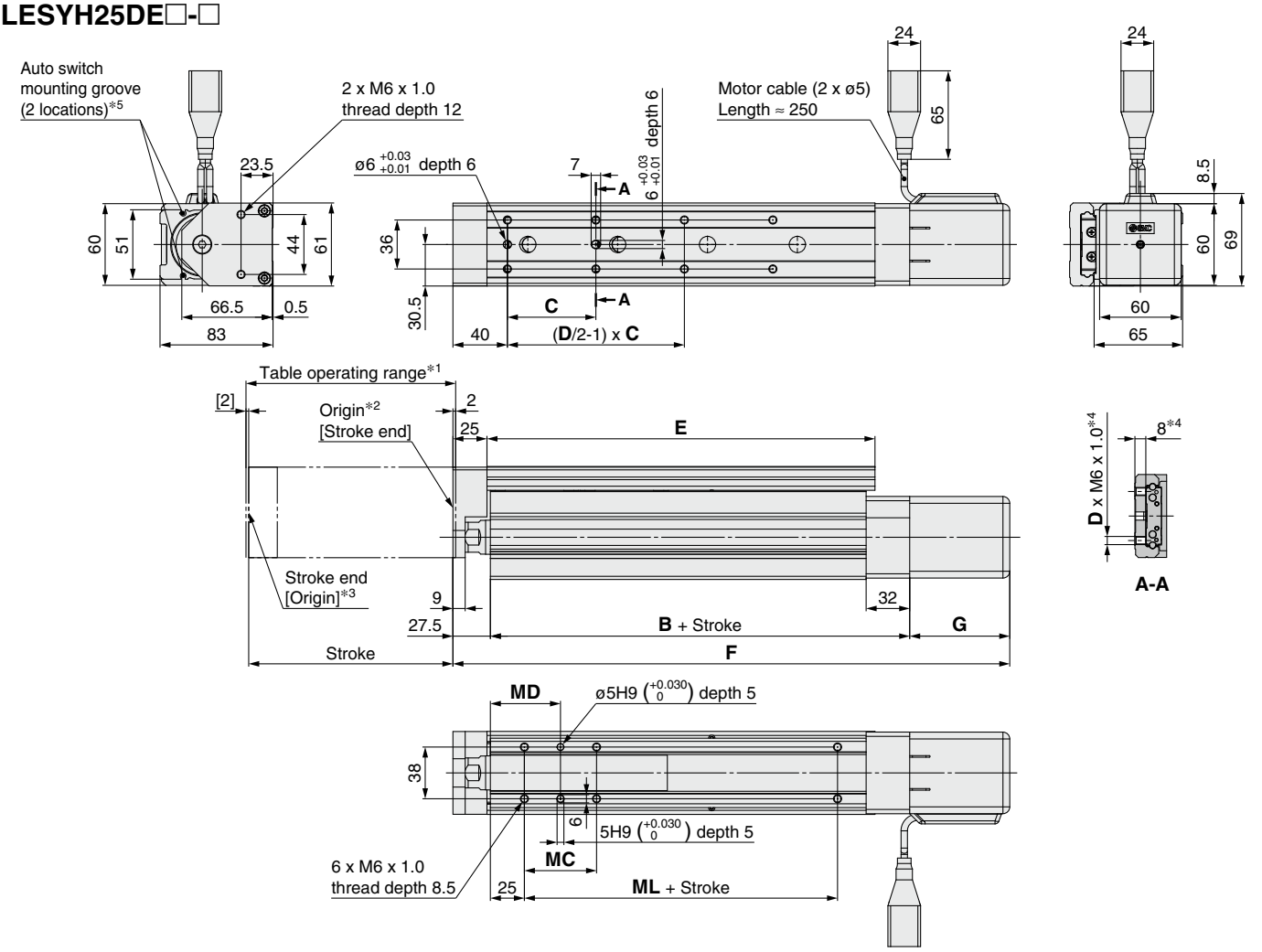
Dimensions

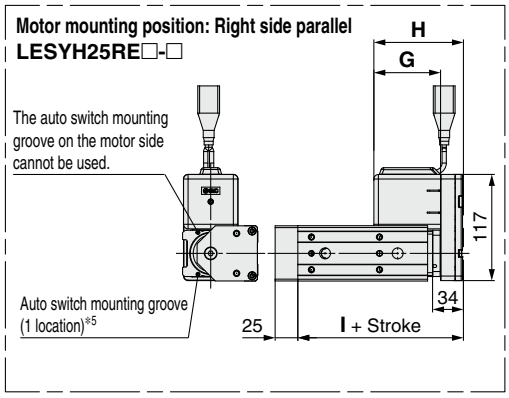
[mm]

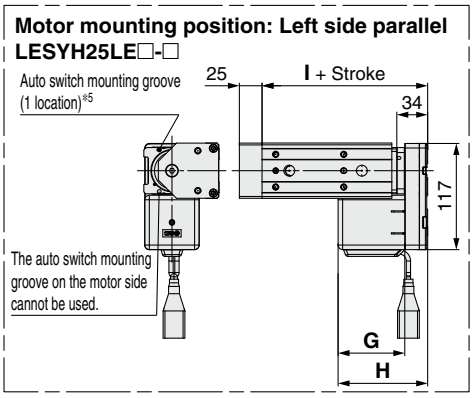
Model	Stroke	C	D	E	Without lock			With lock		
					F	G	H	F	G	H
LESYH16□E□	50	40	6	116.5	258	68.5	88.5	298.5	109	129
	100	44	8	191.5	308			348.5		

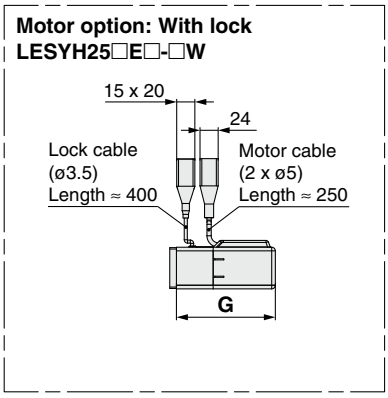
Dimensions

LESYH25DE□-□









*1 This is the range within which the table can move when it returns to origin.
Make sure 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 58 to 60 for details.

Dimensions

[mm]

Model	Stroke	B	C	D	E	Without lock			With lock			I	MC	MD	ML
						F	G	H	F	G	H				
LESYH25□E□	50	128.5	75	4	143	279.5	73.5	98.5	322.5	116.5	141.5	133	36	43	50
	100		48	8	207	329.5			372.5						
	150	158.5	65		285	409.5			452.5			163	53	51.5	80

AC Servo Motor *LECS□ Series*

Slide Table/High Precision Type

LESYH Series

CE RoHS

∗ For details, refer to page 116 and onwards.

How to Order

LESYH 16 D S2 A – 50 □ – S 2 A1 □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Size

16
25

❷ Motor mounting position

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

❸ Motor type

Symbol	Type	Output [W]	Size	Compatible drivers∗3
S2∗1	AC servo motor (Incremental encoder)	100	16	LECSA□-S1
S3		200	25	LECSA□-S3
T6∗2	AC servo motor (Absolute encoder)	100	16	LECSB2-T5 LECSC2-T5 LECSS2-T5 LECSN2-T5-□
T7		200	25	LECSB2-T7 LECSC2-T7 LECSS2-T7 LECSN2-T7-□

∗1 For motor type S2, the compatible driver part number suffix is S1.
∗2 For motor type T6, the compatible driver part number is LECS□2-T5.
∗3 For details on the driver, refer to page 82.

❹ Lead [mm]

	Size	
	16	25∗4
A	12	16 (20)
B	6	8 (10)

∗4 The values shown in ( ) are the leads for the right/left side parallel types. (Equivalent leads which include the pulley ratio [1.25:1])

❺ Stroke [mm]

	Size	
	16	25
50	●	●
100	●	●
150	—	●

❻ Motor option

Nil	Without lock
B	With lock

❼ Cable type∗5 ∗6

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

∗5 A motor cable and encoder cable are included with the product. (A lock cable is also included if motor option "B: With lock" is selected.)
∗6 Standard cable entry direction is
· Parallel: (A) Axis side
· In-line: (B) Counter axis side
(Refer to page 99 for details.)

❽ Cable length [m]

Nil	Without cable
2	2
5	5
A	10

For details on auto switches, refer to pages 57 to 60.

Motor mounting position: Parallel

Motor mounting position: In-line

⑨ Driver type*7

Symbol	Compatible drivers	Power supply voltage [V]
Nil	Without driver	—
A1	LECSA1-S□	100 to 120
A2	LECSA2-S□	200 to 230
B2	LECSB2-T□	200 to 240
C2	LECSC2-T□	200 to 230
S2	LECSS2-T□	200 to 240
N2	LECSN2-T□	200 to 240
E2	LECSN2-T□-E	200 to 240
92	LECSN2-T□-9	200 to 240
P2	LECSN2-T□-P	200 to 240

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

⑩ I/O cable length [m]

Nil	Without cable
H	Without cable (Connector only)
1	1.5

Compatible Drivers

Driver type	**Pulse input type/ Positioning type**	**Pulse input type**	**CC-Link direct input type**	SSCNETⅢ/H type	**Network card type**
Series	**LECSA**	**LECSB-T**	**LECSC-T**	**LECSS-T**	**LECSN-T**
Number of point tables*8	Up to 7	Up to 255	Up to 255 (2 stations occupied)	—	Up to 255
Pulse input	○	○	—	—	—
Applicable network	—	—	CC-Link	SSCNETⅢ/H	PROFINET EtherCAT® EtherNet/IP™
Control encoder	Incremental 17-bit encoder	Absolute 22-bit encoder	Absolute 18-bit encoder	Absolute 22-bit encoder	Absolute 22-bit encoder
Communication function	USB communication	USB communication, RS422 communication		USB communication	USB communication
Power supply voltage [V]	100 to 120 VAC (50/60 Hz) 200 to 230 VAC (50/60 Hz)	200 to 240 VAC (50/60 Hz)	200 to 230 VAC (50/60 Hz)	200 to 240 VAC (50/60 Hz)	200 to 240 VAC (50/60 Hz)
Reference page	83				

*8 The LECSN-T only supports PROFINET and EtherCAT®.

Specifications: LECSA

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

Model			LESYH16□S2		LESYH25□S3 (Parallel)		LESYH25DS3 (In-line)	
Actuator specifications	Stroke [mm]		50, 100		50, 100, 150			
	Max. work load [kg]	Horizontal	8		12		12	
		Vertical	6	12	10	20	10	20
	Force [N]∗1 (Set value: 15 to 30%)		65 to 131	127 to 255	79 to 157	154 to 308	98 to 197	192 to 385
	Max. speed [mm/s]		400	200	400	200	400	200
	Pushing speed [mm/s]∗2		35 or less		30 or less			
	Max. acceleration/deceleration [mm/s²]		5000					
	Positioning repeatability [mm]		±0.01					
	Lost motion∗3 [mm]		0.1 or less					
	Lead [mm] (including pulley ratio)		12	6	20	10	16	8
	Impact/Vibration resistance [m/s²]∗4		50/20					
	Actuation type		Ball screw + Belt (Parallel), Ball screw (In-line)		Ball screw + Belt [1.25:1]		Ball screw	
	Guide type		Linear guide (Circulating type)					
	Operating temperature range [°C]		5 to 40					
	Operating humidity range [%RH]		90 or less (No condensation)					
	Regeneration option		May be required depending on speed and work load (Refer to page 25.)					
Electric specifications	Motor output/Size		100 W/□40		200 W/□60			
	Motor type		AC servo motor (100/200 VAC)					
	Encoder		Incremental 17-bit encoder (Resolution: 131072 p/rev)					
	Power [W]∗5		Max. power 445		Max. power 724			
Lock unit specifications	Type∗6		Non-magnetizing lock					
	Holding force [N]		131	255	157	308	197	385
	Power [W] at 20°C		6.3		7.9			
	Rated voltage [V]		24 VDC $^{0}_{-10\%}$					

∗1 The force setting range (set values for the driver) for the force control with the torque control mode. Set it while referencing the "Force Conversion Graph" on page 26.
∗2 The allowable collision speed for collision with the workpiece with the torque control mode
∗3 A reference value for correcting errors in reciprocal operation
∗4 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
∗5 Indicates the max. power during operation (including the driver)
When selecting the power supply capacity, refer to the power supply capacity in the operation manual of each driver.
∗6 Only when motor option "With lock" is selected

Weight

Product Weight

[kg]

Model	Stroke		
	50	100	150
LESYH16□S2	1.96	2.35	—
LESYH25□S3	3.83	4.43	5.83

Additional Weight

[kg]

Size	16	25
With lock	0.2	0.4

Specifications: LECS□-T

Model			LESYH16□T6		LESYH25□T7 (Parallel)		LESYH25DT7 (In-line)	
Actuator specifications	Stroke [mm]		50, 100		50, 100, 150			
	Max. work load [kg]	Horizontal	8		12		12	
		Vertical	6	12	10	20	10	20
	Force [N]*1 (Set value: 12 to 24%)		65 to 131	127 to 255	79 to 157	154 to 308	98 to 197	192 to 385
	Max. speed [mm/s]		400	200	400	200	400	200
	Pushing speed [mm/s]*2		35 or less		30 or less			
	Max. acceleration/deceleration [mm/s²]		5000					
	Positioning repeatability [mm]		±0.01					
	Lost motion*3 [mm]		0.1 or less					
	Lead [mm] (including pulley ratio)		12	6	20	10	16	8
	Impact/Vibration resistance [m/s²]*4		50/20					
	Actuation type		Ball screw + Belt (Parallel), Ball screw (In-line)		Ball screw + Belt [1.25:1]		Ball screw	
	Guide type		Linear guide (Circulating type)					
	Operating temperature range [°C]		5 to 40					
	Operating humidity range [%RH]		90 or less (No condensation)					
	Regeneration option		May be required depending on speed and work load (Refer to page 25.)					
Electric specifications	Motor output/Size		100 W/□40		200 W/□60			
	Motor type		AC servo motor (200 VAC)					
	Encoder*7		Absolute 22-bit encoder (Resolution: 4194304 p/rev) (For LECSB-T□, LECSS-T□, LECSN-T□) Absolute 18-bit encoder (Resolution: 262144 p/rev) (For LECSC-T□)					
	Power [W]*5		Max. power 445		Max. power 724			
Lock unit specifications	Type*6		Non-magnetizing lock					
	Holding force [N]		131	255	157	308	197	385
	Power [W] at 20°C		6.3		7.9			
	Rated voltage [V]		24 VDC $^{0}_{-10\%}$					

*1 The force setting range (set values for the driver) for the force control with the torque control mode. Set it while referencing the "Force Conversion Graph" on page 27.
When the control equivalent to the pushing operation of the LECP6 series controller is performed, select the LECSS-T or LECSB2-T driver.
The point table no. input method is used for the LECSB2-T.
When selecting the LECSS2-T, combine it with a Simple Motion module (manufactured by Mitsubishi Electric Corporation) which has a pushing operation function.
*2 The allowable collision speed for collision with the workpiece with the torque control mode
*3 A reference value for correcting errors in reciprocal operation
*4 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*5 Indicates the max. power during operation (including the driver)
When selecting the power supply capacity, refer to the power supply capacity in the operation manual of each driver.
*6 Only when motor option "With lock" is selected
*7 The resolution will change depending on the driver type.

Weight

Product Weight

[kg]

Model	Stroke		
	50	100	150
LESYH16□T6	2.02	2.41	—
LESYH25□T7	3.77	4.37	5.77

Additional Weight

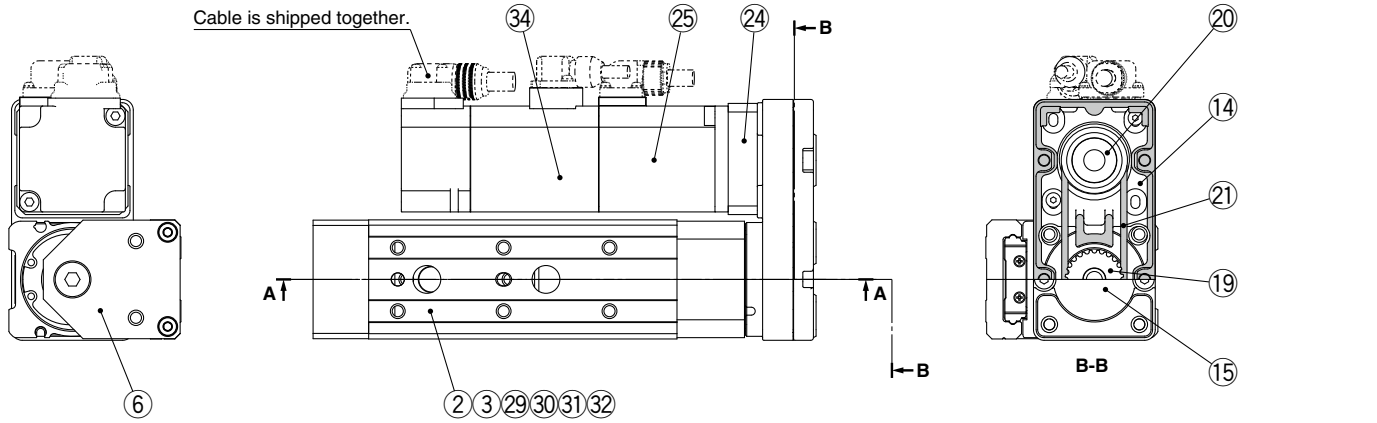
[kg]

Size	16	25
With lock	0.3	0.4

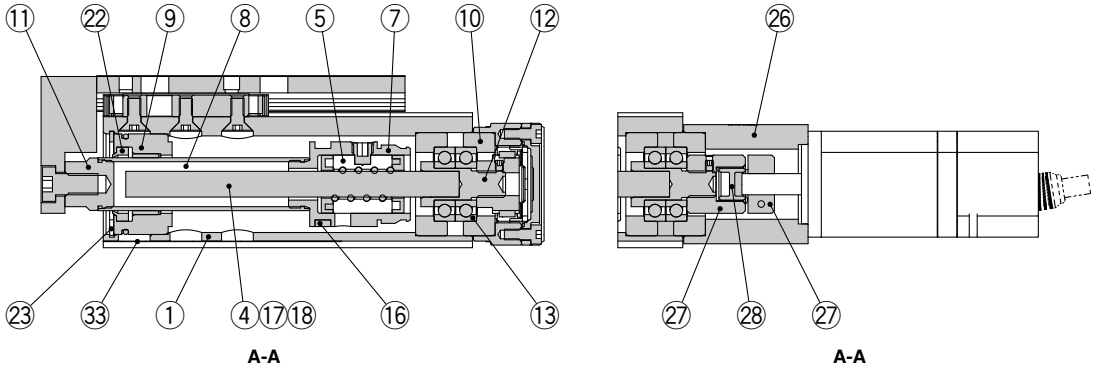
Construction

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

∗ The figures show the R type.



In-line/D type



Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Table**	Stainless steel	—
3	**Guide block**	Stainless steel	—
4	**Ball screw shaft**	Alloy steel	—
5	**Ball screw nut**	Resin/Alloy steel	—
6	**End plate**	Aluminum alloy	Anodized
7	**Piston**	Aluminum alloy	—
8	**Piston rod**	Stainless steel	Hard chrome plating
9	**Rod cover**	Aluminum alloy	—
10	**Bearing holder**	Aluminum alloy	—
11	**Socket**	Free cutting steel	Electroless nickel plating
12	**Connected shaft**	Free cutting steel	Electroless nickel plating
13	**Bearing**	—	—
14	**Return box**	Aluminum die-cast	Coating
15	**Return plate**	Aluminum die-cast	Coating
16	**Magnet**	—	
17	**Wear ring holder**	Stainless steel	Size 25, 150st only
18	**Wear ring**	Resin	Size 25, 150st only
19	**Screw shaft pulley**	Aluminum alloy	—
20	**Motor pulley**	Aluminum alloy	—
21	**Belt**	—	—
22	**Scraper**	NBR	—
23	**Type C retaining ring for hole**	Steel for spring	Phosphate coating
24	**Motor adapter**	Aluminum alloy	Anodized

No.	Description	Material	Note
25	**AC servo motor**	—	—
26	**Motor block**	Aluminum alloy	Anodized
27	**Hub**	Aluminum alloy	—
28	**Spider**	NBR	—
29	**Cover**	Resin	—
30	**Return guide**	Resin	—
31	**Scraper**	NBR	—
32	**Steel ball**	Special steel	—
33	**Masking tape**	—	—
34	**Lock**	—	With lock only

Replacement Parts (Motor mounting position: Parallel type only)/Belt

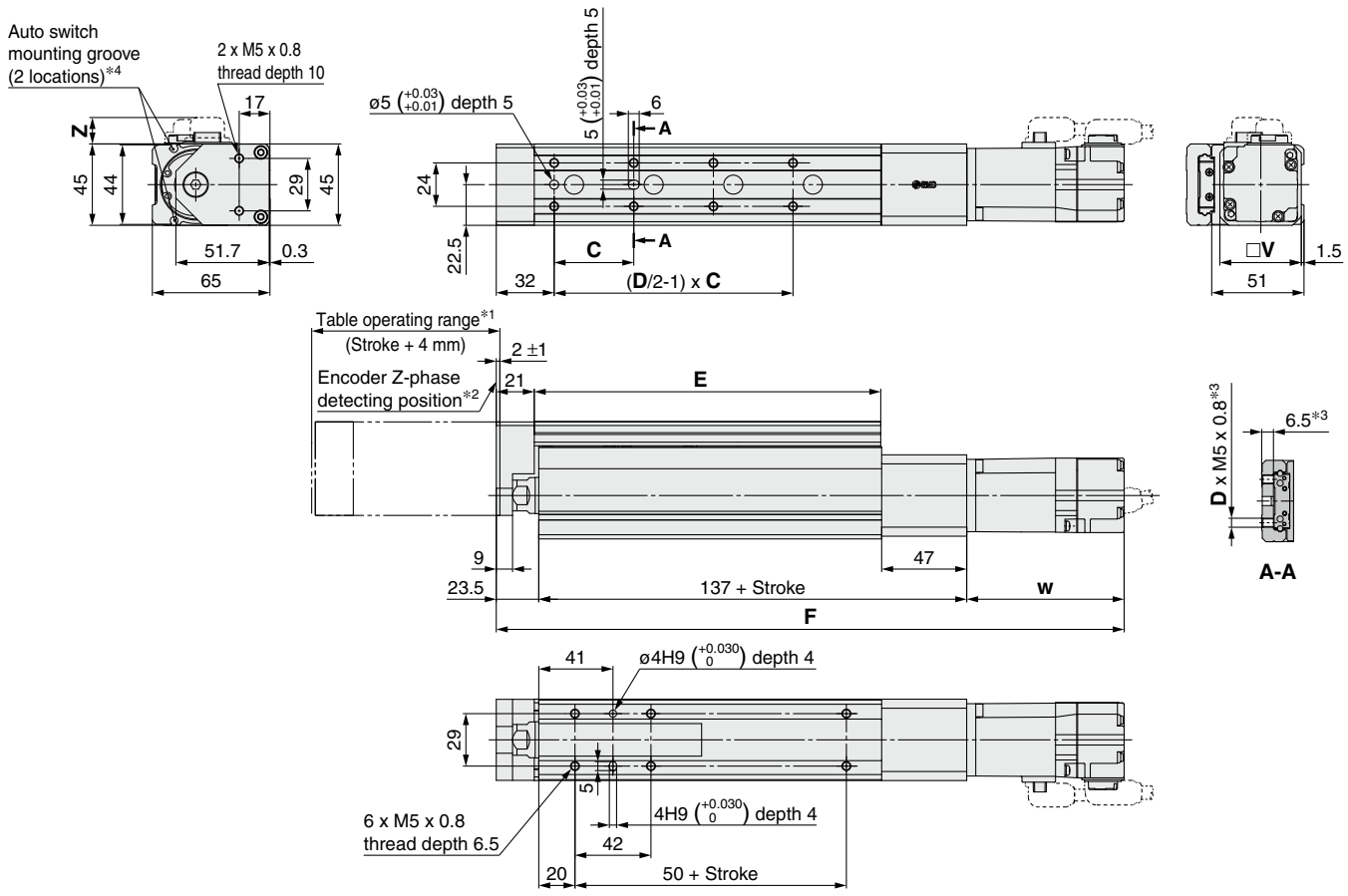
No.	Size	Order no.
21	**8**	LE-D-2-1
	16	LE-D-2-2
	25	LE-D-2-3

Replacement Parts/Grease Pack

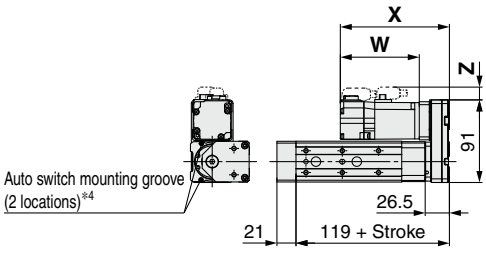
Applied portion	Order no.
Piston rod Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

Dimensions

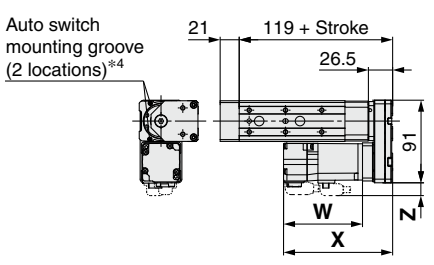
LESYH16D$^{S2}_{T6}$□-□



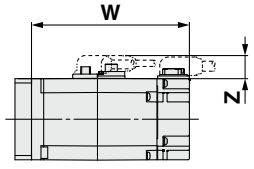
Motor mounting position: Right side parallel
LESYH16R$^{S2}_{T6}$□-□



Motor mounting position: Left side parallel
LESYH16L$^{S2}_{T6}$□-□



Motor option: With lock
LESYH16□$^{S2}_{T6}$□-□B



*1 This is the range within which the table can move when it returns to origin.
Make sure workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 The Z-phase detecting position from the stroke end
*3 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.
*4 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 58 to 60 for details.

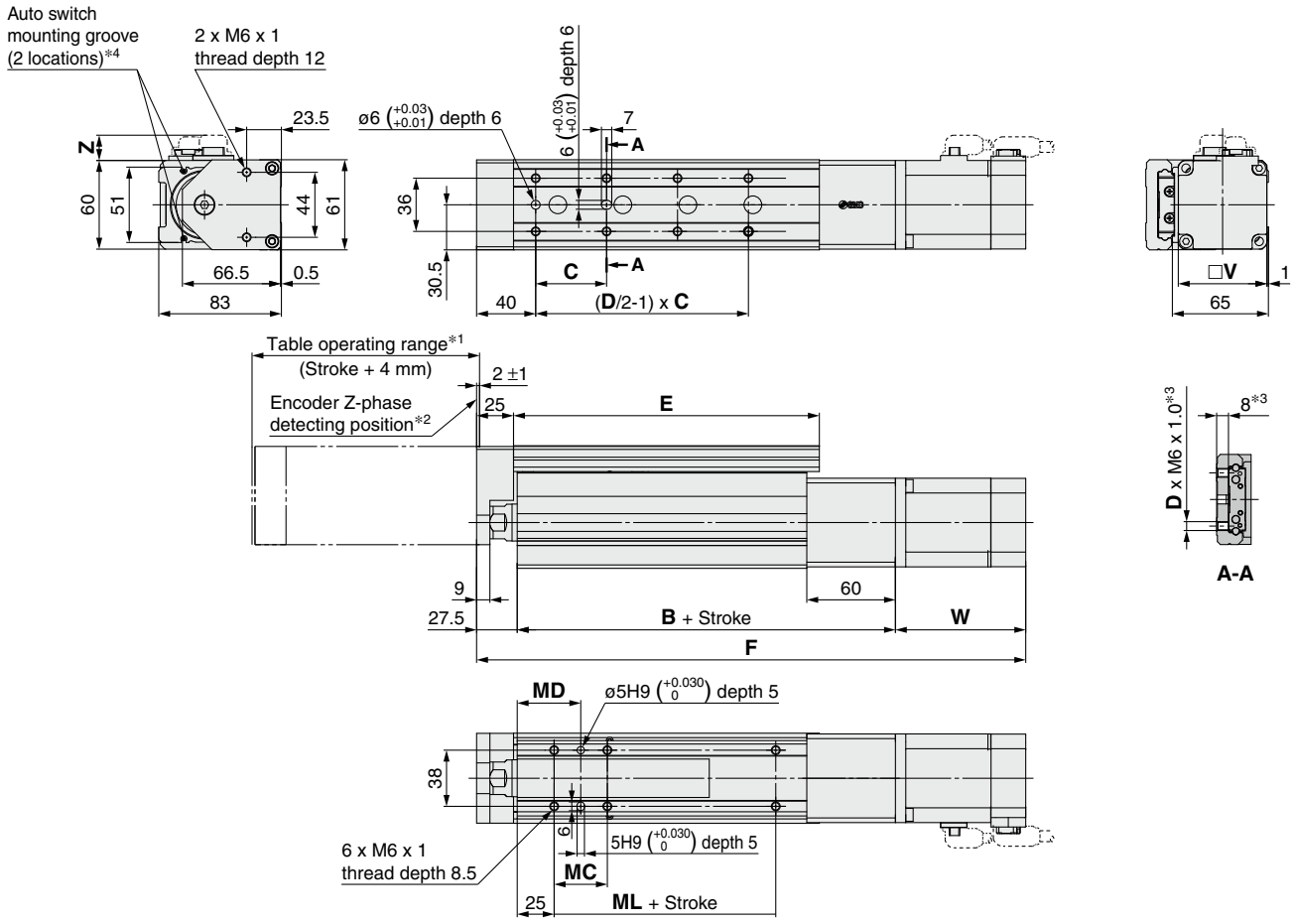
Dimensions

[mm]

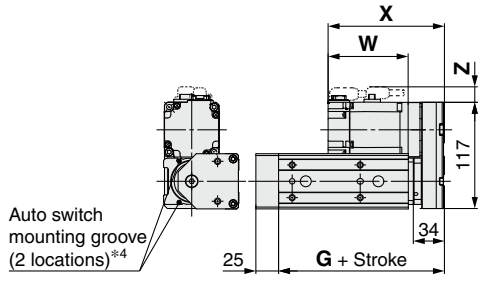
Model	Stroke	C	D	E	Without lock				With lock			
					F	W	X	Z	F	W	X	Z
LESYH16□S2□	50	40	6	116.5	297.5	87	120	14.6	334.4	123.9	156.9	16.3
	100	44	8	191.5	347.5				384.4			
LESYH16□T6□	50	40	6	116.5	292.9	82.4	115.4		334	123.5	156	
	100	44	8	191.5	342.9				384			

Dimensions

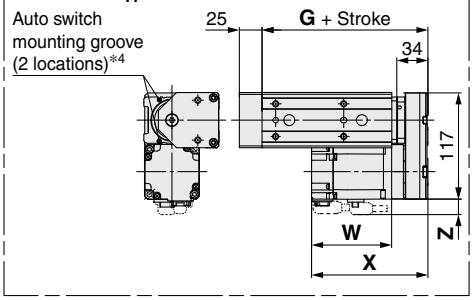
LESYH25D$^{S3}_{T7}$□-□



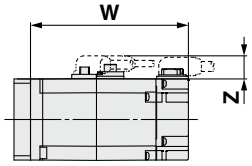
Motor mounting position: Right side parallel
LESYH25R$^{S3}_{T7}$□-□



Motor mounting position: Left side parallel
LESYH25L$^{S3}_{T7}$□-□



Motor option: With lock
LESYH25□$^{S3}_{T7}$□-□B



*1 This is the range within which the table can move when it returns to origin.
Make sure workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 The Z-phase detecting position from the stroke end
*3 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.
*4 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 58 to 60 for details.

Dimensions

[mm]

Model	Stroke	B	C	D	E	G	Without lock				With lock				MC	MD	ML
							F	W	X	Z	F	W	X	Z			
LESYH25□S3□	50	156.5	75	4	143	133	322	88.2	128.2	17.1	350.6	116.8	156.8	17.1	36	43	50
	100		48	8	207		372				400.6						
	150	186.5	65		285	163	452				480.6				53	51.5	80
LESYH25□T7□	50	156.5	75	4	143	133	310.4	76.6	116.6		347.2	113.4	153.4		36	43	50
	100		48	8	207		360.4				397.2						
	150	186.5	65		285	163	440.4				477.2				53	51.5	80

Slide Table/High Precision Type

LESYH Series

CE RoHS

* For details, refer to page 116 and onwards.

How to Order

LESYH **16** **D** **V6** **A** – **50** **□** – **S** **3** **M2** **□**

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❶ Size

16
25

❷ Motor mounting position

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

❸ Motor type

Symbol	Type	Output [W]	Actuator size	Compatible drivers
V6∗1	AC servo motor (Absolute encoder)	100	16	LECYM2-V5 LECYU2-V5
V7		200	25	LECYM2-V7 LECYU2-V7

∗1 For motor type V6, the compatible driver part number suffix is V5.

❹ Lead [mm]

	Size	
	16	**25**∗2
A	12	16 (20)
B	6	8 (10)

∗2 The values shown in ( ) are the leads for the right/left side parallel types. (Equivalent leads which include the pulley ratio [1.25:1])

❺ Stroke [mm]

	Size	
	16	**25**
50	●	●
100	●	●
150	—	●

❻ Motor option

Nil	Without option
B	With lock

❼ Cable type∗3

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

∗3 A motor cable and encoder cable are included with the product.
A motor cable for lock option is included if motor option "B: With lock" is selected.

❽ Cable length [m]∗4

Nil	Without cable
3	3
5	5
A	10

∗4 The length of the motor and encoder cables are the same. (For with lock)

For details on auto switches, refer to pages 57 to 60.

Motor mounting position: Parallel

Motor mounting position: In-line

⑨ Driver type*5

Symbol	Compatible drivers	Power supply voltage [V]
Nil	Without driver	—
M2	LECYM2-V□	200 to 230
U2	LECYU2-V□	200 to 230

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

⑩ I/O cable length [m]*6

Nil	Without cable
H	Without cable (Connector only)
1	1.5

*6 When "Nil: Without driver" is selected for the driver type, only "Nil: Without cable" can be selected. Refer to page 111 if an I/O cable is required.
(Options are shown on page 111.)

Compatible Drivers

Driver type	MECHATROLINK-Ⅲ type	MECHATROLINK-Ⅲ type
Series	**LECYM**	**LECYU**
Applicable network	MECHATROLINK-Ⅱ	MECHATROLINK-Ⅲ
Control encoder	Absolute 20-bit encoder	
Communication device	USB communication, RS-422 communication	
Power supply voltage [V]	200 to 230 VAC (50/60 Hz)	
Reference page	104	

Specifications

Model			LESYH16□V6		LESYH25□V7 (Parallel)		LESYH25DV7 (In-line)	
Actuator specifications	Stroke [mm]		50, 100		50, 100, 150			
	Max. work load [kg]	Horizontal	8		12		12	
		Vertical	6	12	10	20	10	20
	Force [N]*1 (Set value: 45 to 90%)		65 to 131	127 to 255	79 to 157	154 to 308	98 to 197	192 to 385
	Max. speed [mm/s]		400	200	400	200	400	200
	Pushing speed [mm/s]*2		35 or less		30 or less			
	Max. acceleration/deceleration [mm/s²]		5000					
	Positioning repeatability [mm]		±0.01					
	Lost motion*3 [mm]		0.1 or less					
	Lead [mm] (including pulley ratio)		12	6	20	10	16	8
	Impact/Vibration resistance [m/s²]*4		50/20					
	Actuation type		Ball screw + Belt (Parallel), Ball screw (In-line)		Ball screw + Belt [1.25:1]		Ball screw	
	Guide type		Linear guide (Circulating type)					
	Operating temperature range [°C]		5 to 40					
	Operating humidity range [%RH]		90 or less (No condensation)					
	Required conditions for the regenerative resistor*5 [kg]	Horizontal	Not required					
		Vertical	6 or more		4 or more			
Electric specifications	Motor output/Size		100 W/□40		200 W/□60			
	Motor type		AC servo motor (200 VAC)					
	Encoder		Absolute 20-bit encoder (Resolution: 1048576 p/rev)					
	Power [W]*6		Max. power 445		Max. power 724			
Lock unit specifications	Type*7		Non-magnetizing lock					
	Holding force [N]		131	255	157	308	197	385
	Power [W] at 20°C		5.5		6			
	Rated voltage [V]		24 VDC $^{+10\%}_{0}$					

*1 The force setting range (set values for the driver) for the force control with the torque control mode. Set it while referencing the "Force Conversion Graph" on page 32.
*2 The allowable collision speed for collision with the workpiece with the torque control mode
*3 A reference value for correcting errors in reciprocal operation
*4 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
*5 The work load conditions which require the regenerative resistor when operating at the max. speed (Duty ratio: 100%). Order the regenerative resistor separately. For details, refer to the "Required Conditions for the Regenerative Resistor (Guide)" on page 31.
*6 Indicates the max. power during operation (including the driver)
When selecting the power supply capacity, refer to the power supply capacity in the operation manual of each driver.
*7 Only when motor option "With lock" is selected

Weight

Product Weight

[kg]

Model	Stroke		
	50	100	150
LESYH16□V6	1.85	2.24	—
LESYH25□V7	3.68	4.28	5.68

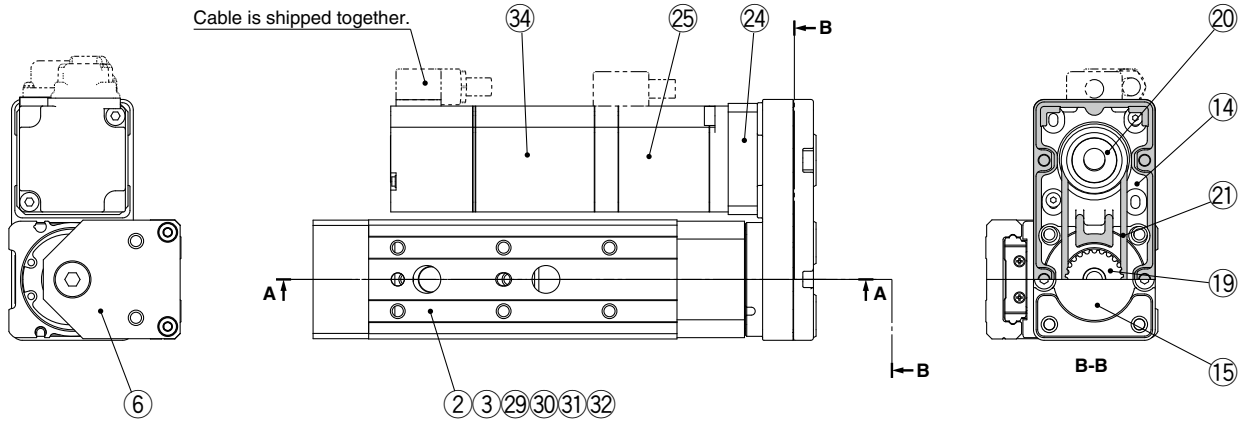
Additional Weight

[kg]

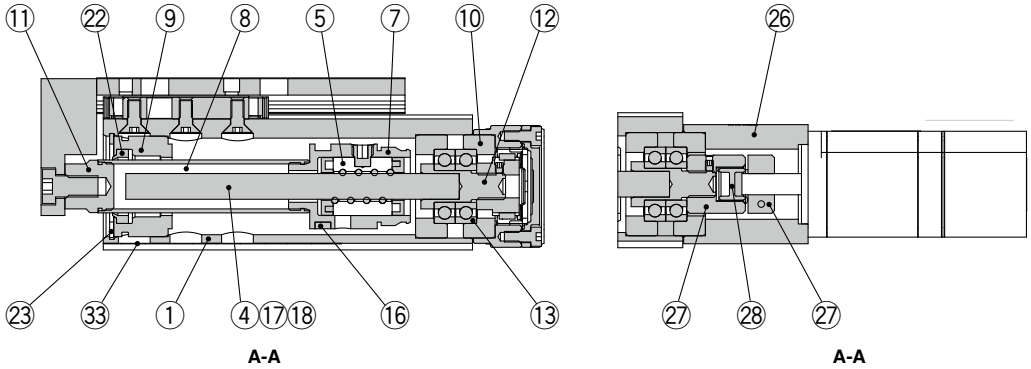
Size	16	25
With lock	0.3	0.6

Construction

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



In-line/D type



Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Table**	Stainless steel	—
3	**Guide block**	Stainless steel	—
4	**Ball screw shaft**	Alloy steel	—
5	**Ball screw nut**	Resin/Alloy steel	—
6	**End plate**	Aluminum alloy	Anodized
7	**Piston**	Aluminum alloy	—
8	**Piston rod**	Stainless steel	Hard chrome plating
9	**Rod cover**	Aluminum alloy	—
10	**Bearing holder**	Aluminum alloy	—
11	**Socket**	Free cutting steel	Electroless nickel plating
12	**Connected shaft**	Free cutting steel	Electroless nickel plating
13	**Bearing**	—	—
14	**Return box**	Aluminum die-cast	Coating
15	**Return plate**	Aluminum die-cast	Coating
16	**Magnet**	—	
17	**Wear ring holder**	Stainless steel	Size 25, 150st only
18	**Wear ring**	Resin	Size 25, 150st only
19	**Screw shaft pulley**	Aluminum alloy	—
20	**Motor pulley**	Aluminum alloy	—
21	**Belt**	—	—
22	**Scraper**	NBR	—
23	**Type C retaining ring for hole**	Steel for spring	Phosphate coating
24	**Motor adapter**	Aluminum alloy	Anodized

No.	Description	Material	Note
25	**AC servo motor**	—	—
26	**Motor block**	Aluminum alloy	Anodized
27	**Hub**	Aluminum alloy	—
28	**Spider**	NBR	—
29	**Cover**	Resin	—
30	**Return guide**	Resin	—
31	**Scraper**	NBR	—
32	**Steel ball**	Special steel	—
33	**Masking tape**	—	—
34	**Lock**	—	With lock only

Replacement Parts (Motor mounting position: Parallel type only)/Belt

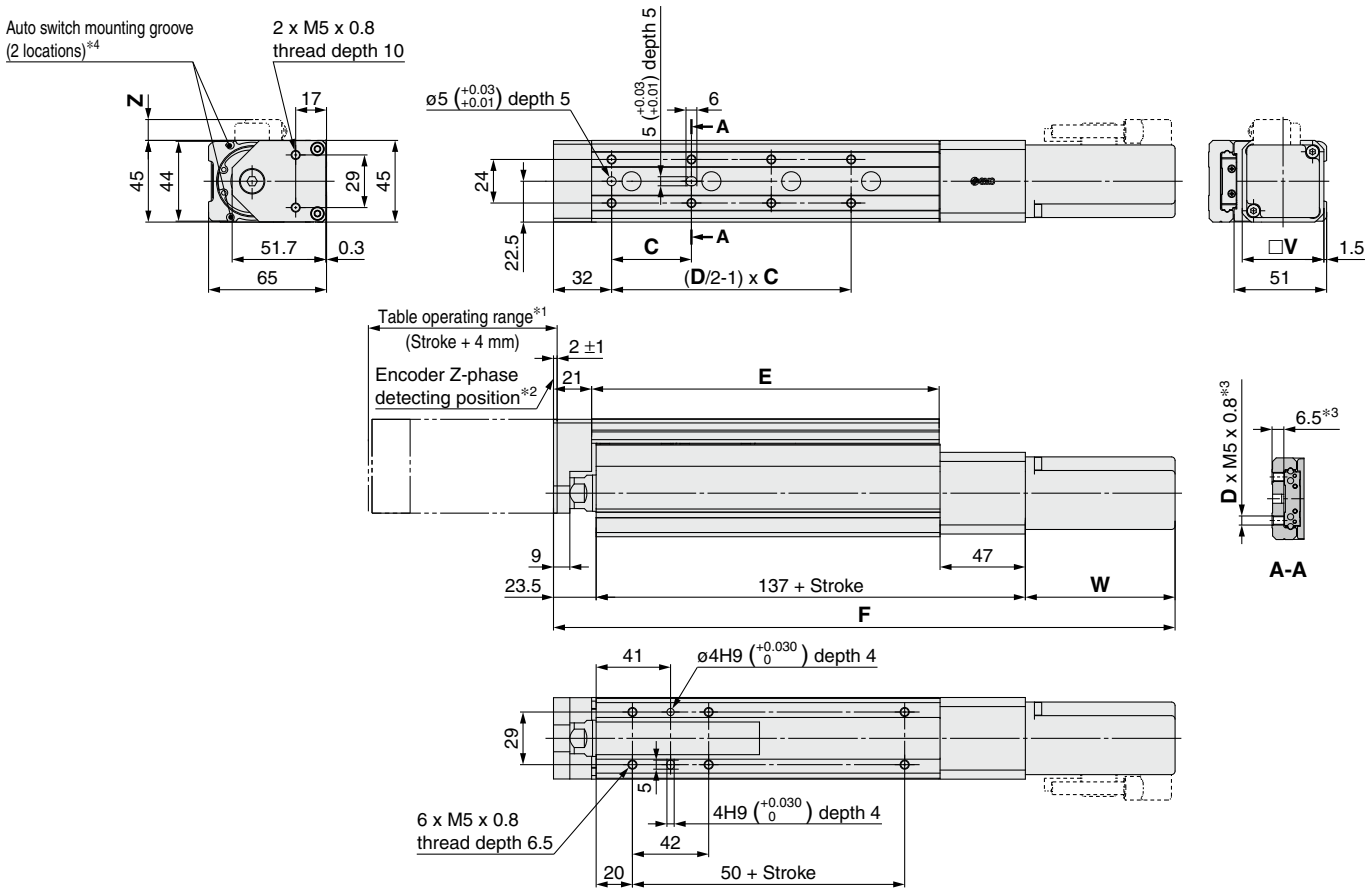
No.	Size	Order no.
21	**8**	LE-D-2-1
	16	LE-D-2-2
	25	LE-D-2-3

Replacement Parts/Grease Pack

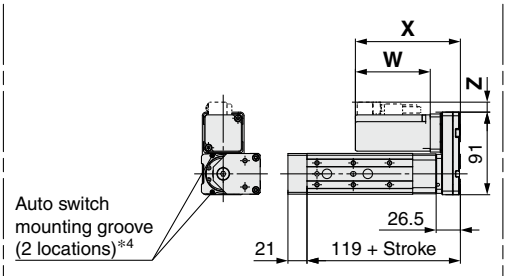
Applied portion	Order no.
Piston rod Guide unit	GR-S-010 (10 g) GR-S-020 (20 g)

Dimensions

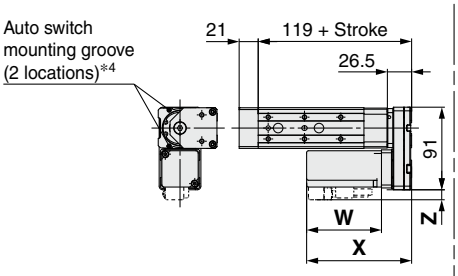
LESYH16DV6□-□



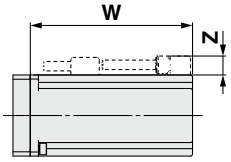
Motor mounting position: Right side parallel
LESYH16RV6□-□



Motor mounting position: Left side parallel
LESYH16LV6□-□



Motor option: With lock
LESYH16□V6□-□B



*1 This is the range within which the table can move when it returns to origin.
Make sure workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*2 The Z-phase detecting position from the stroke end
*3 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.
*4 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 58 to 60 for details.

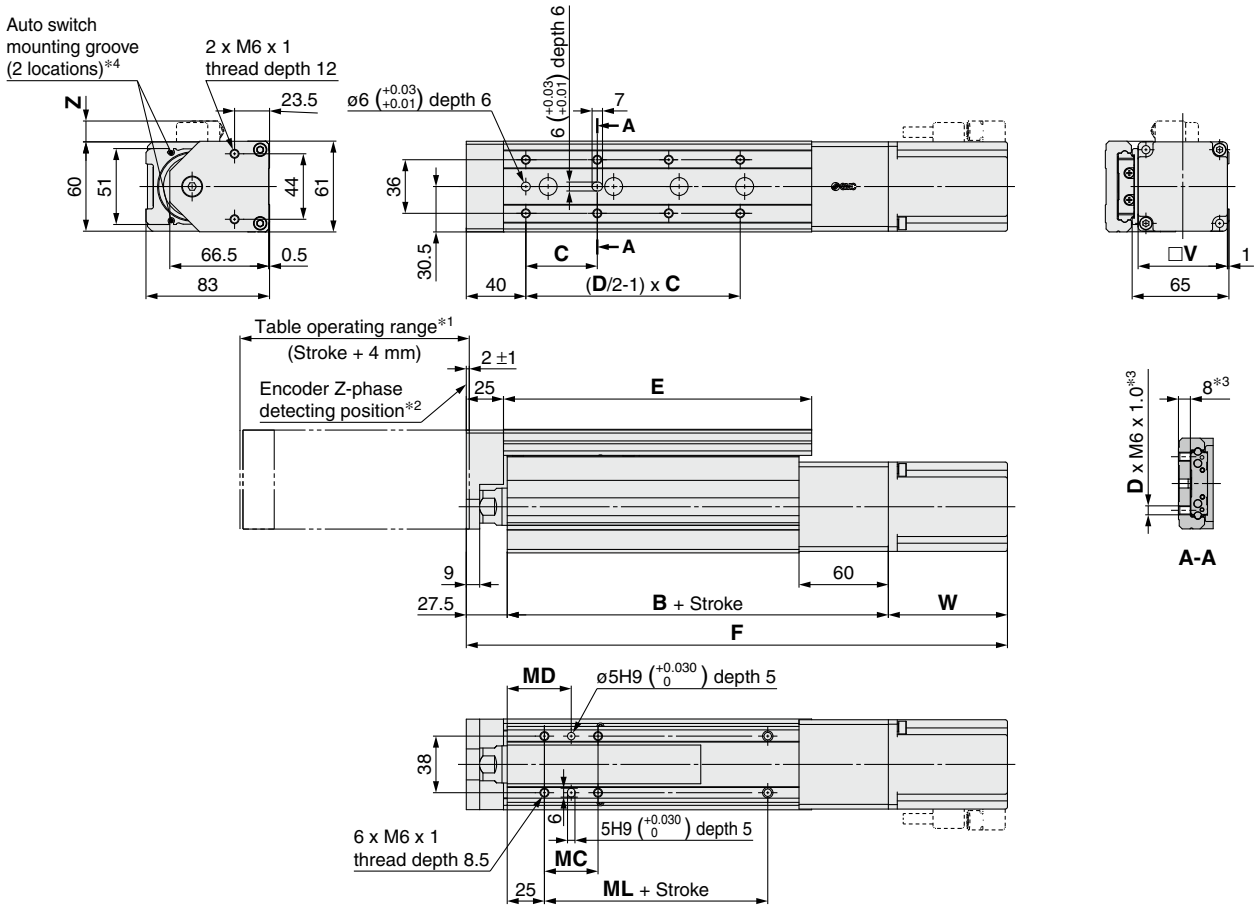
Dimensions

[mm]

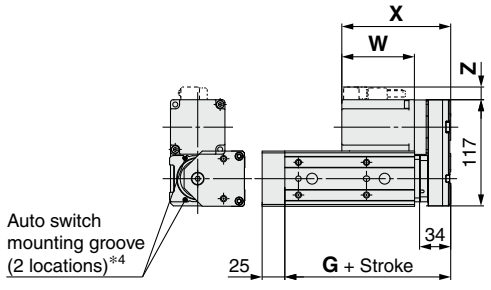
Model	Stroke	C	D	E	Without lock				With lock			
					F	W	X	Z	F	W	X	Z
LESYH16□V6□	50	40	6	116.5	293	82.5	115.5	11.5	338	127.5	160.5	11.5
	100	44	8	191.5	343				388			

Dimensions

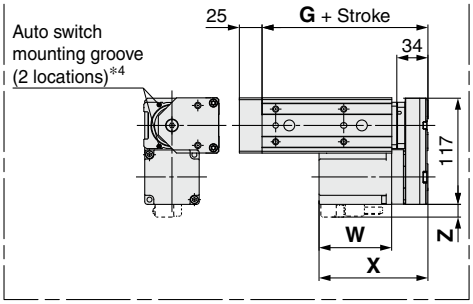
LESYH25DV7□-□



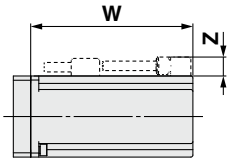
Motor mounting position: Right side parallel
LESYH25RV7□-□



Motor mounting position: Left side parallel
LESYH25LV7□-□



Motor option: With lock
LESYH25□V7□-□B



∗1 This is the range within which the table can move when it returns to origin.
Make sure workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
∗2 The Z-phase detecting position from the stroke end
∗3 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.
∗4 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 58 to 60 for details.

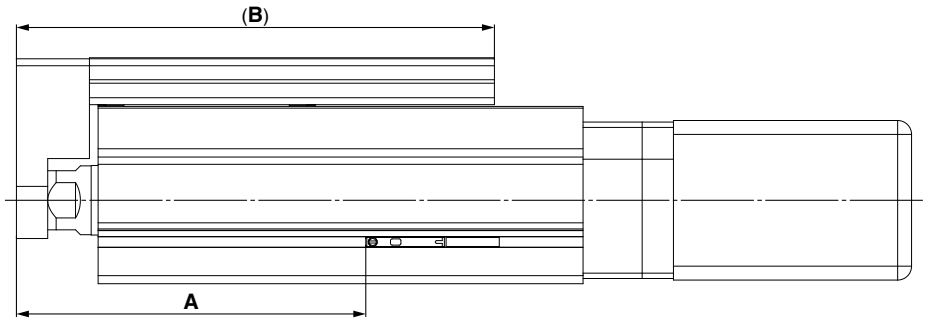
Dimensions

[mm]

Model	Stroke	B	C	D	E	G	Without lock				With lock				MC	MD	ML
							F	W	X	Z	F	W	X	Z			
LESYH25□V7□	50	156.5	75	4	143	133	313.8	80	120	14	353.8	120	160	14	36	43	50
	100		48	8	207		363.8				403.8						
	150	186.5	65		285	163	443.8				483.8				53	51.5	80

LESYH 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

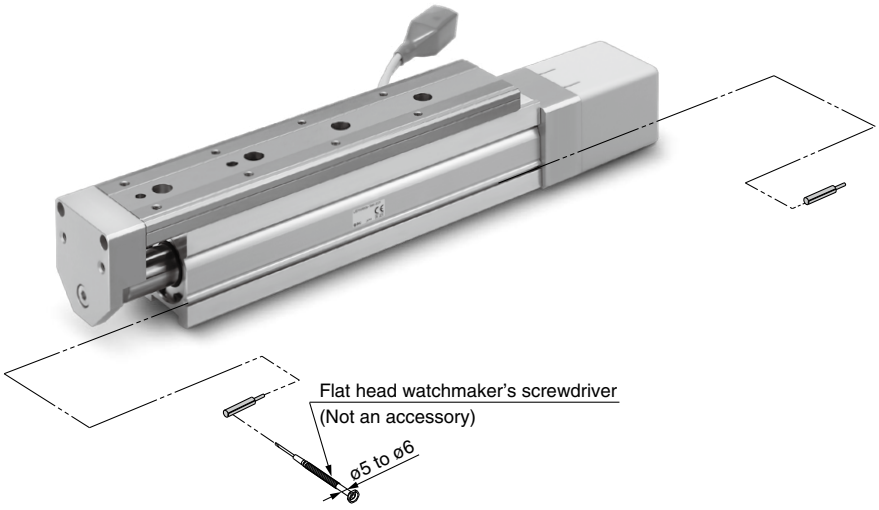
Auto Switch Mounting

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) **D-M9□W(V)** **D-M9□E**	0.05 to 0.15



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

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

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

Grommet

- **2-wire load current is reduced (2.5 to 40 mA).**
- **Using flexible cable as standard spec.**

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 [mm²]	0.15		
	Strand diameter [mm]	0.05		
Minimum 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.

⚠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

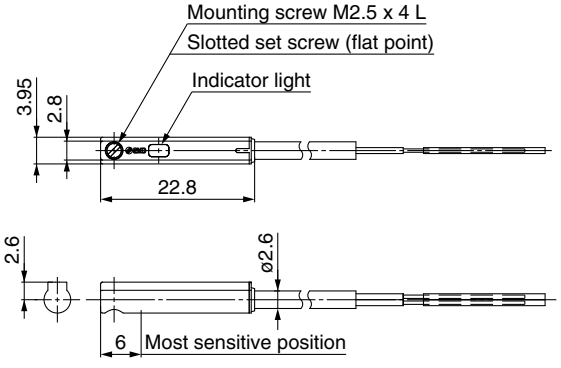
[g]

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

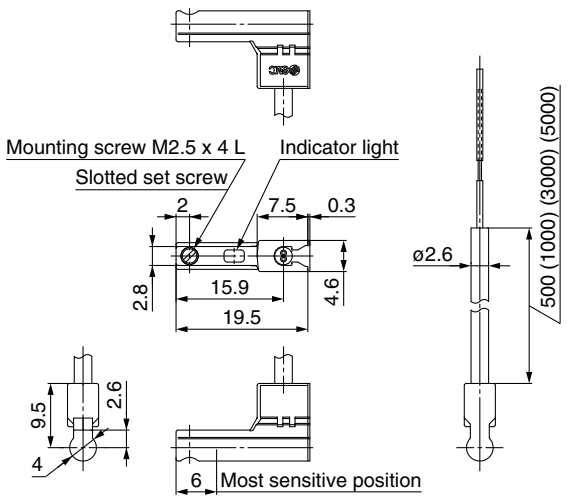
Dimensions

[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.

Grommet

- **Output signal turns on when no magnetic force is detected.**
- **Can be used for the actuator adopted by the solid state auto switch D-M9 series (excluding special order products)**

⚠Caution

Precautions

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

Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□E, D-M9□EV (With indicator light)						
Auto switch model	D-M9NE	D-M9NEV	D-M9PE	D-M9PEV	D-M9BE	D-M9BEV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)				4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Red LED illuminates when turned ON.					
Standard	CE marking, RoHS					

Oilproof 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	3 cores (Brown/Blue/Black)		2 cores (Brown/Blue)
	Outside diameter [mm]	0.88		
Conductor	Effective area [mm²]	0.15		
	Strand diameter [mm]	0.05		
Minimum bending radius [mm] (Reference values)		17		

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

Weight

[g]

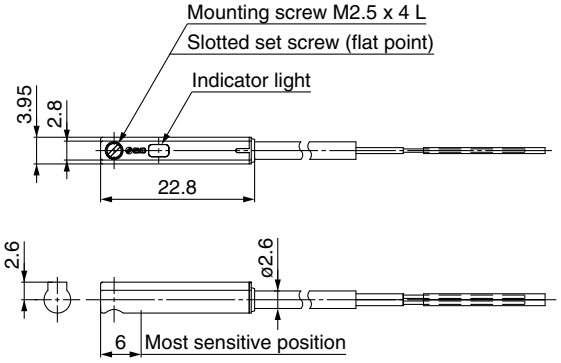
Auto switch model		D-M9NE(V)	D-M9PE(V)	D-M9BE(V)
Lead wire length	0.5 m (**Nil**)	8		7
	1 m (**M**)∗1	14		13
	3 m (**L**)	41		38
	5 m (**Z**)∗1	68		63

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

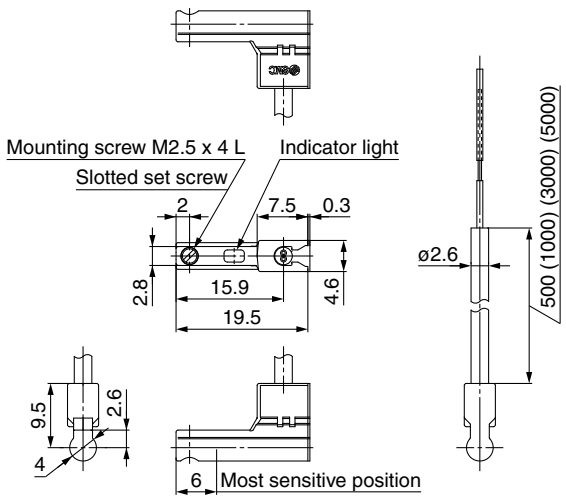
Dimensions

[mm]

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.

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

PLC: Programmable Logic Controller

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

Oilproof Flexible Heavy-duty Lead Wire Specifications

Auto switch model		D-M9NW(V)	D-M9PW(V)	D-M9BW(V)
Sheath	Outside diameter [mm]	2.6		
Insulator	Number of cores	3 cores (Brown/Blue/Black)		2 cores (Brown/Blue)
	Outside diameter [mm]	0.88		
Conductor	Effective area [mm²]	0.15		
	Strand diameter [mm]	0.05		
Minimum bending radius [mm] (Reference values)		17		

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

Weight

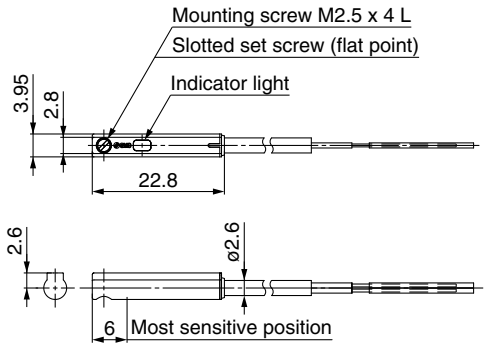
[g]

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

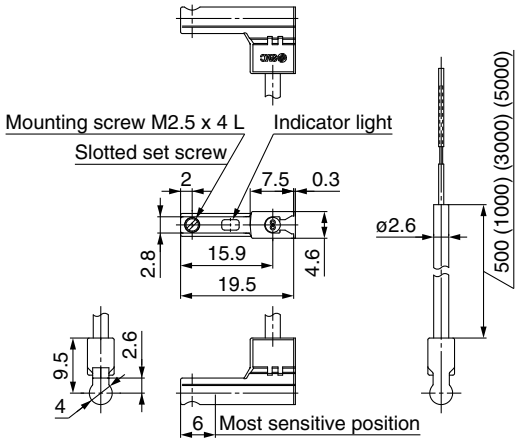
Dimensions

[mm]

D-M9□W



D-M9□WV



LESYH 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.

This can cause a malfunction.

Handling

⚠Caution

Battery-less Absolute (Step Motor 24 VDC)

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.

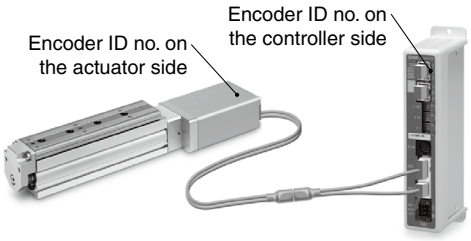
- When an electric actuator is connected and the power is turned ON for the first time after purchase*1
- When the actuator or motor is replaced
- When the controller is replaced

*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 paring 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 (ex. 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.

LESYH 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

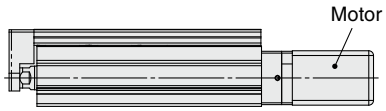
● When lining up actuators

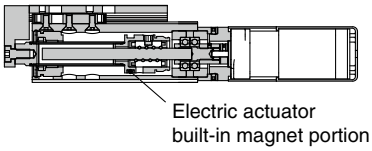
SMC actuators can be used with their motors adjacent to each other. However, for actuators with a built-in auto switch magnet, maintain a space of 40 mm or more between the motors and the position where the magnet passes.

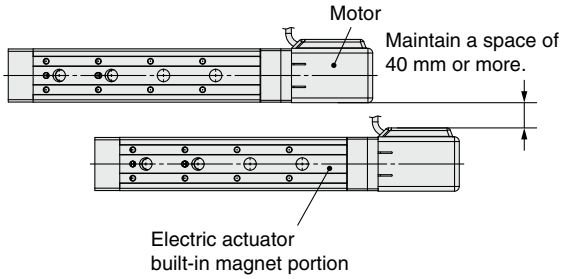
Refer to the construction drawings in the catalog for the magnet position.

○ 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.

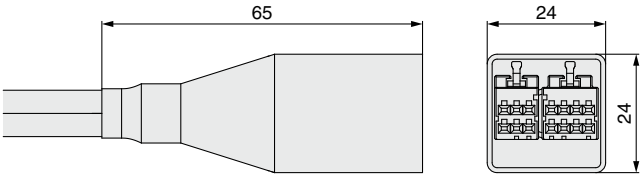






6. The connector size of the motor cable is different from that of the electric actuator with an incremental encoder.

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

AC Servo Motor

7. For thrust control, make sure to set it to "torque control mode," and operate within the "pushing speed" range of each model.

Do not hit the workpiece or the stroke end with the piston in the "position control mode," "speed control mode," or "positioning mode." The lead screw, bearing, and internal stopper may be damaged, causing malfunction.

8. Normal/reverse torque limit value is set to 100% as a default.

It is the maximum torque (the limit value) in the "position control mode," "speed control mode," or "positioning mode." When the product is operated with a smaller value than the default, acceleration when driving can decrease. Set it upon confirmation with the actual equipment used.

9. When fluctuations in the load are caused during operation, malfunction, noise, or alarm generation may occur.

The gain tuning may not be suitable for fluctuating loads.

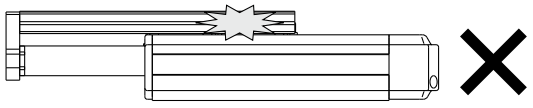
Adjust the gain properly by following the instructions in the driver manual.

Battery-less Absolute (Step Motor 24 VDC) AC Servo Motor

10. When the pushing operation is used, be sure to set 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.

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

Check the model selection section of the catalog.

12. 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.

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

LESYH 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

14. 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.

15. 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.

16. 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.

17. Keep the flatness of mounting surface within 0.02 mm.

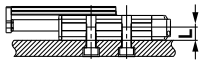
If a workpiece or base does not sit evenly on the body of the product, play in the guide or an increase in the sliding resistance may occur. Do not deform the mounting surface by mounting with workpieces tucked in.

18. Do not drive the main body with the table fixed.

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

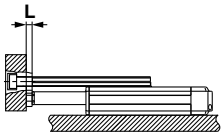
Tightening the screws with a higher torque than recommended may result in a malfunction, while tightening with a lower torque can result in the displacement of the mounting position or, in extreme conditions, the actuator could become detached from its mounting position.

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

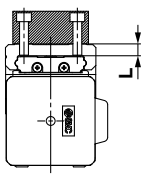
Workpiece fixed/Front mounting



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 maximum 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 maximum screw-in depth or less. If long screws are used, they may touch the guide block and cause a malfunction.

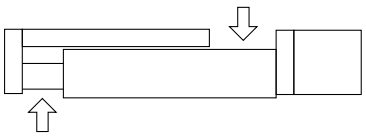
20. When external force is to be applied to the table, it is necessary to reduce the work load for the sizing.

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.

21. Do not grasp or peel off a masking tape on the bottom of the body.

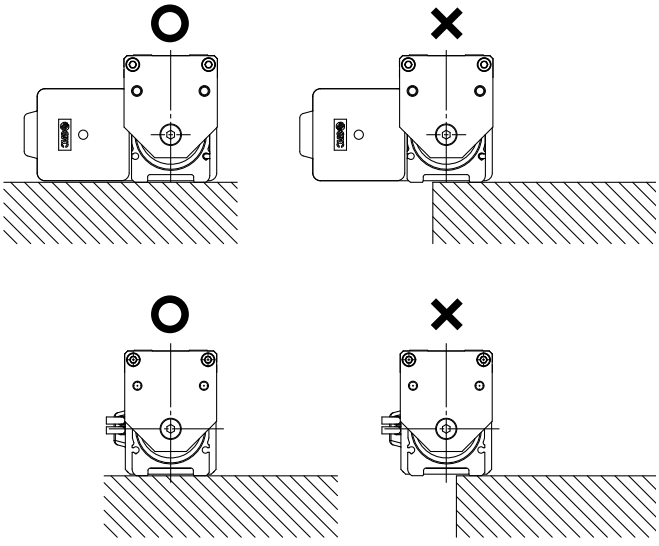
The masking tape may peel off and foreign matter may get inside the actuator.

22. When the table operates, the gap can be done between actuator (marked with the arrow below). Be careful not to put hands or fingers in a gap.



23. 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.



24. 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 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 replacement of 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

* For details, refer to page 116 and onwards.

Step Data Input Type ····· p. 67

Battery-less Absolute (Step Motor 24 VDC)

JXC51/61 Series

EtherCAT®/EtherNet/IP™/PROFINET/DeviceNet™/IO-Link/CC-Link Direct Input Type ····· p. 74

Battery-less Absolute (Step Motor 24 VDC)

JXC□ Series

EtherCAT®

EtherNet/IP™

PROFINET®

DeviceNet™

IO-Link

CC-Link

- **Actuator Cable** p. 80
- **Precautions Relating to Differences in Controller Versions** p. 81

Controller (Step Data Input Type)

JXC51/61 Series

∗ For details, refer to page 116 and onwards.

RoHS

Parallel I/O

How to Order

JXC 5 1 7 1 – □

❶ ❷ ❸ ❹

❶ Parallel I/O type

5	NPN
6	PNP

❷ Mounting

7	Screw mounting
8∗1	DIN rail

∗1 The DIN rail is not included. It must be ordered separately.

❸ I/O cable length [m]

Nil	None
1	1.5
3	3
5	5

❹ Actuator part number

Without cable specifications and actuator options
Example: Enter "**LESYH16REA-50**" for the LESYH16REA-50C.

BC-E	Blank controller∗1

∗1 Requires dedicated software (JXC-BCW)

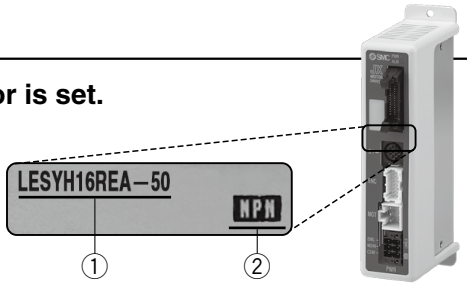
The controller is sold as single unit after the compatible actuator is set.

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

<Check the following before use.>

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

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



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

Precautions for blank controllers (JXC□1□□-BC-E)

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.

- The applicable electric actuator size range differs depending on the controller version. Refer to page 81 for how to confirm the controller version and applicable actuator sizes.
- 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.

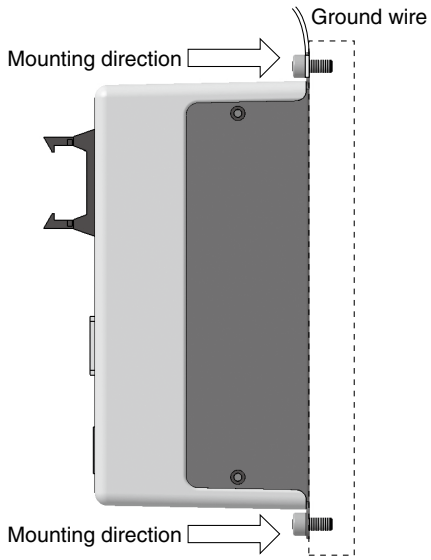
SMC website https://www.smcworld.com

Specifications

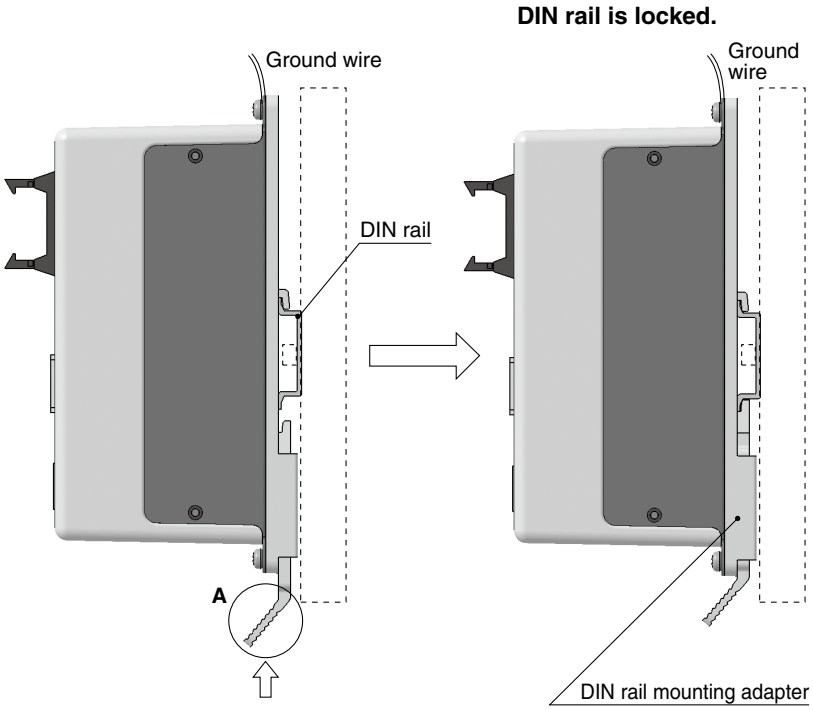
Model	JXC51 JXC61
Compatible motor	Step motor (Servo/24 VDC)
Power supply	Power voltage: 24 VDC ±10%
Current consumption (Controller)	100 mA or less
Compatible encoder	Battery-less absolute
Parallel input	11 inputs (Photo-coupler isolation)
Parallel output	13 outputs (Photo-coupler isolation)
Serial 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 55°C
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□17□-□)
(Installation with two M4 screws)



b) DIN rail mounting (JXC□18□-□)
(Installation with the DIN rail)

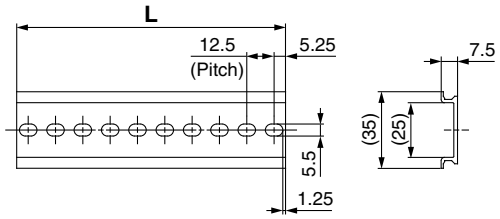


Hook the controller on the DIN rail and press the lever of section **A** in the arrow direction to lock it.

∗ When size 25 or more of the LE series are used, the space between the controllers should be 10 mm or more.

DIN rail
AXT100-DR-□

∗ For □, enter a number from the No. line in the table below.
Refer to the dimension drawings on page 69 for the mounting dimensions.



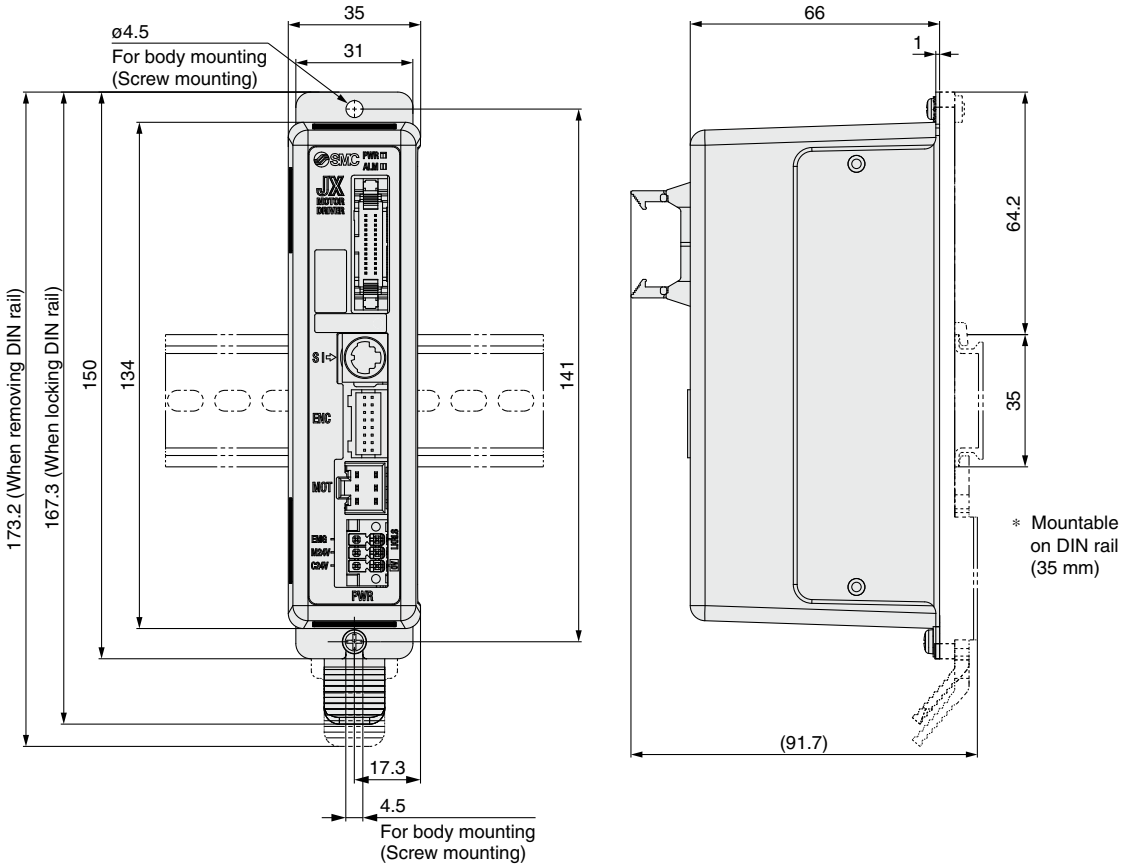
L Dimensions [mm]

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L	23	35.5	48	60.5	73	85.5	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5
No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
L	273	285.5	298	310.5	323	335.5	348	360.5	373	385.5	398	410.5	423	435.5	448	460.5	473	485.5	498	510.5

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

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

Dimensions


35
31
ø4.5
For body mounting
(Screw mounting)
173.2 (When removing DIN rail)
167.3 (When locking DIN rail)
150
134
141
17.3
4.5
For body mounting
(Screw mounting)
66
1
64.2
35
(91.7)
* Mountable
on DIN rail
(35 mm)

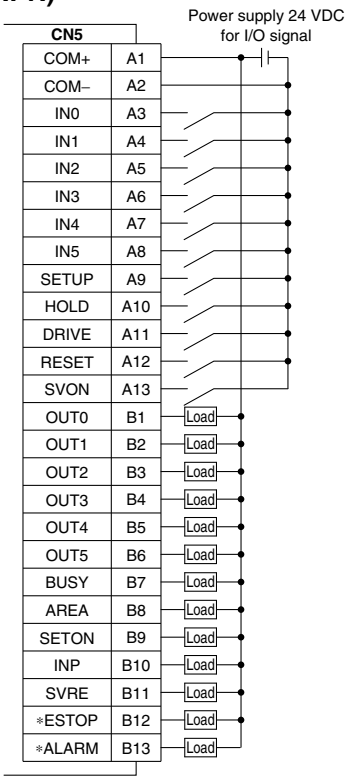
Wiring Example 1

Parallel I/O Connector

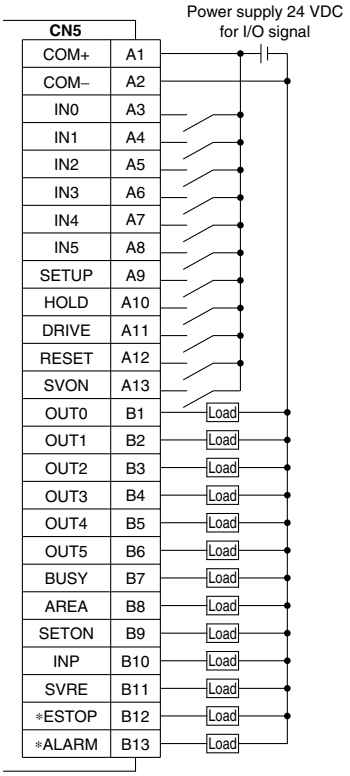
* When you connect a PLC to the parallel I/O connector, use the I/O cable (LEC-CN5-□).
* The wiring changes depending on the type of parallel I/O (NPN or PNP).

Wiring diagram

JXC51□□-□ (NPN)



JXC61□□-□ (PNP)



Input Signal

Name	Details
COM+	Connects the power supply 24 V for input/output signal
COM–	Connects the power supply 0 V for input/output signal
IN0 to IN5	Step data specified bit no. (Input is instructed by combining IN0 to 5.)
SETUP	Instruction to return to origin
HOLD	Temporarily stops operation
DRIVE	Instruction to drive
RESET	Resets alarm and interrupts operation
SVON	Servo ON instruction

Output Signal

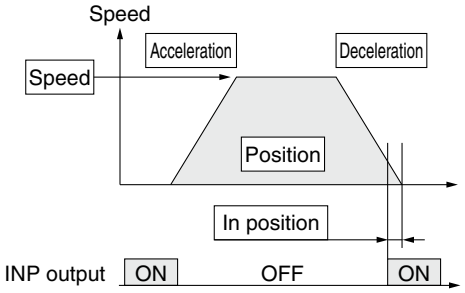
Name	Details
OUT0 to OUT5	Outputs the step data no. during operation
BUSY	Outputs when the actuator is moving
AREA	Outputs within the step data area output setting range
SETON	Outputs when returning to origin
INP	Outputs when target position or target force is reached (Turns on when the positioning or pushing is completed.)
SVRE	Outputs when servo is on
∗ESTOP[∗1]	OFF when EMG stop is instructed
∗ALARM[∗1]	OFF when alarm is generated

∗1 Signal of negative-logic circuit (N.C.)

Step Data Setting

1. Step data setting for positioning

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



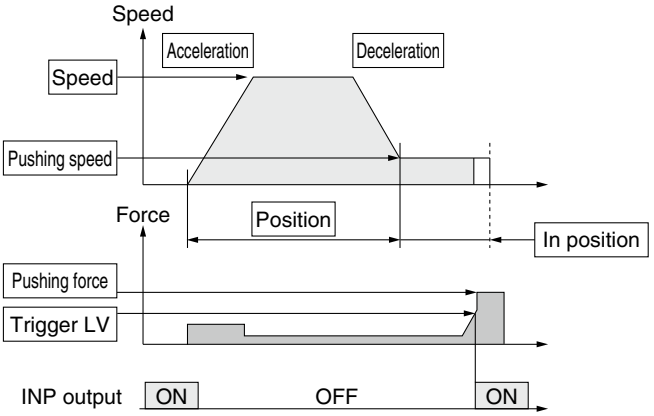
◎: Need to be set.
○: Need to be adjusted as required.
—: Setting is not required.

Step Data (Positioning)

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

2. Step data setting for pushing

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



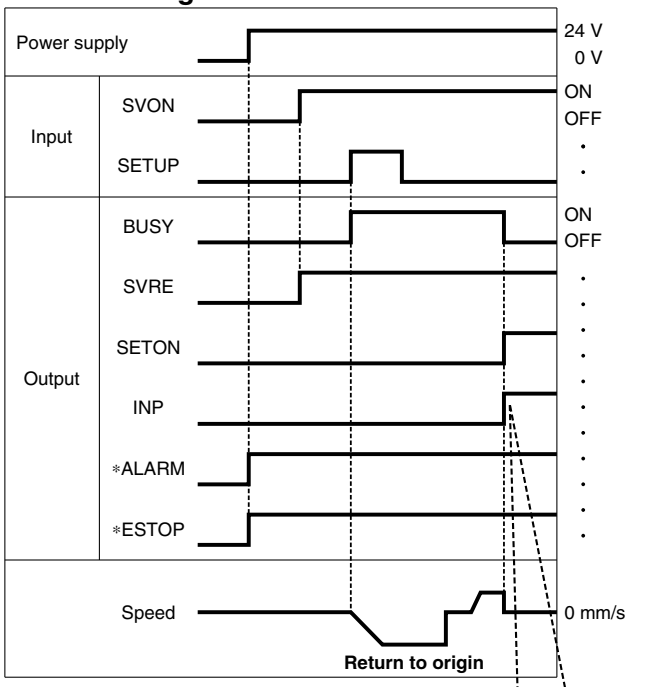
◎: Need to be set.
○: Need to be adjusted as required.

Step Data (Pushing)

Necessity	Item	Details
◎	Movement MOD	When the absolute position is required, set Absolute. When the relative position is required, set Relative.
◎	Speed	Transfer speed to the pushing start position
◎	Position	Pushing start position
○	Acceleration	Parameter which defines how rapidly the actuator reaches the speed set. The higher the set value, the faster it reaches the speed set.
○	Deceleration	Parameter which defines how rapidly the actuator comes to stop. The higher the set value, the quicker it stops.
◎	Pushing force	Pushing force ratio is defined. 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. When the speed is set fast, the electric actuator and workpieces might be damaged due to the impact when they hit the end, so this set value should be smaller. Refer to the operation manual for the electric actuator.
○	Moving force	Max. torque during the positioning operation (No specific change is required.)
○	Area 1, Area 2	Condition that turns on the AREA output signal.
◎	In position	Transfer distance during pushing. If the transferred distance exceeds the setting, it stops even if it is not pushing. If the transfer distance is exceeded, the INP output signal will not turn on.

Signal Timing

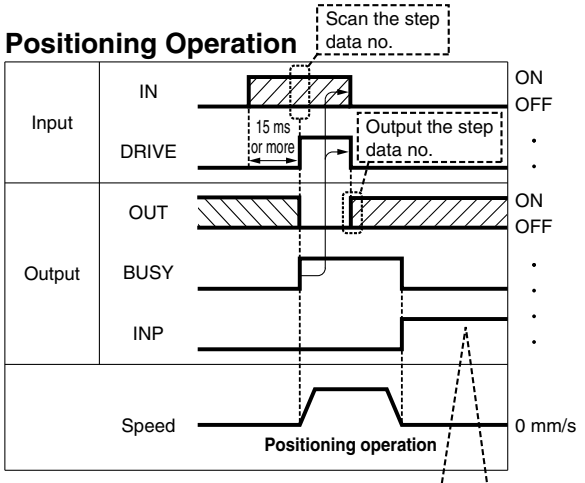
Return to Origin



If the actuator is within the "In position" range of the basic parameter, INP will turn ON, but if not, it will remain OFF.

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

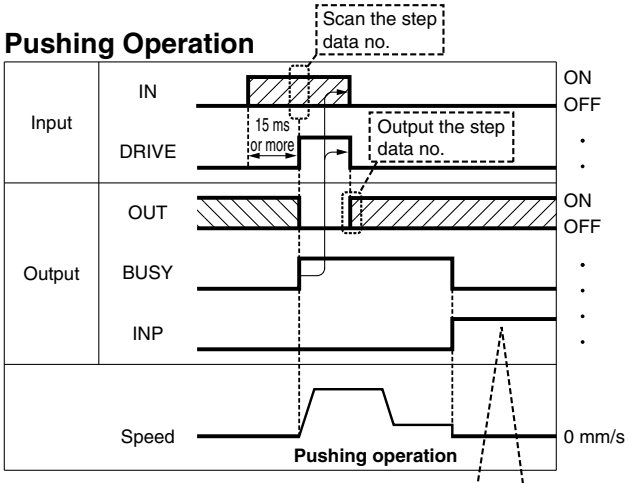
Positioning Operation



If the actuator is within the "In position" range of the step data, INP will turn ON, but if not, it will remain OFF.

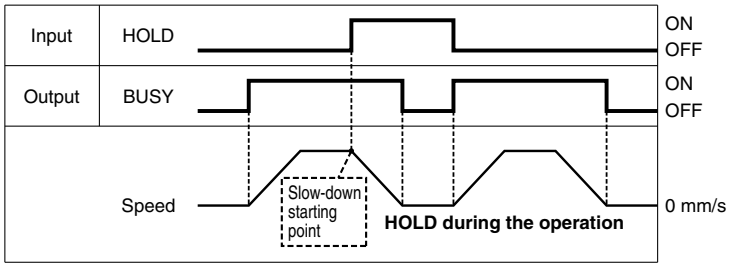
∗ "OUT" is output when "DRIVE" is changed from ON to OFF. (When power supply is applied, "DRIVE" or "RESET" is turned ON or "∗ESTOP" is turned OFF, all of the "OUT" outputs are OFF.)

Pushing Operation



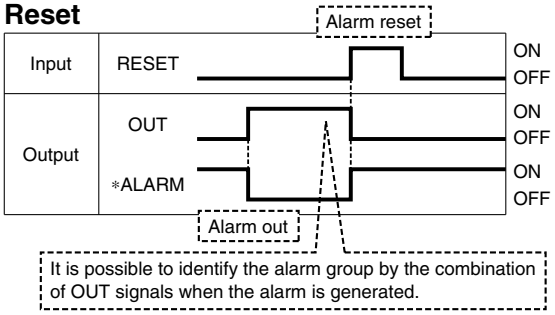
If the current pushing force exceeds the "Trigger LV" value of the step data, INP signal will turn ON.

HOLD



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

Reset



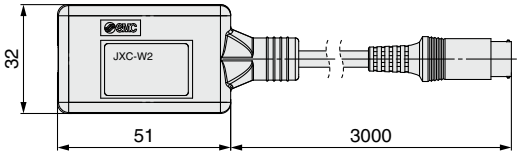
It is possible to identify the alarm group by the combination of OUT signals when the alarm is generated.

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

Options

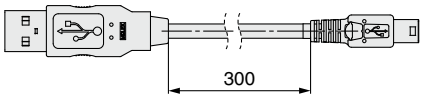
■ Communication cable for controller setting

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)

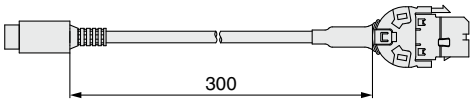
<Controller setting software/USB driver>
• Controller setting software
• USB driver (For JXC-W2A-C)
Download from SMC's website:
https://www.smcworld.com

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)



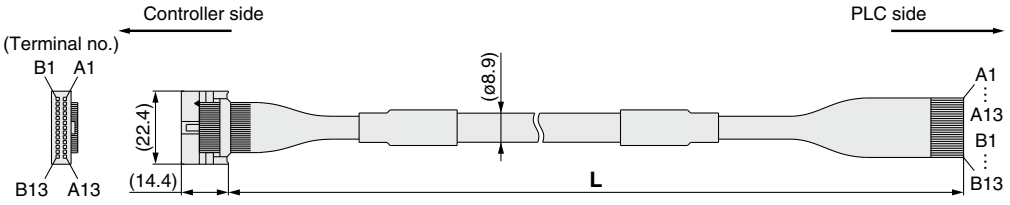
∗ To connect the teaching box (LEC-T1-3□G□) or controller setting kit (LEC-W2□) to the controller, a conversion cable is required.

■ I/O cable

LEC − CN5 − 1

Cable length (L) [m]

1	1.5
3	3
5	5



∗ Conductor size: AWG28

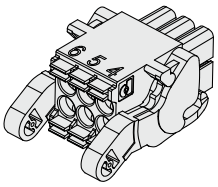
Connector pin no.	Insulation color	Dot mark	Dot color
A1	Light brown	■	Black
A2	Light brown	■	Red
A3	Yellow	■	Black
A4	Yellow	■	Red
A5	Light green	■	Black
A6	Light green	■	Red
A7	Gray	■	Black
A8	Gray	■	Red
A9	White	■	Black
A10	White	■	Red
A11	Light brown	■ ■	Black
A12	Light brown	■ ■	Red
A13	Yellow	■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

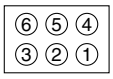
Weight

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

■ Power supply plug JXC-CPW



∗ The power supply plug is an accessory.
<Applicable cable size> AWG20 (0.5 mm²), 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]

3	3

Initial language

J	Japanese
E	English

∗ The displayed language can be changed to English or Japanese.

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)

Step Motor Controller

JXCE1/91/P1/D1/L1/M1 Series

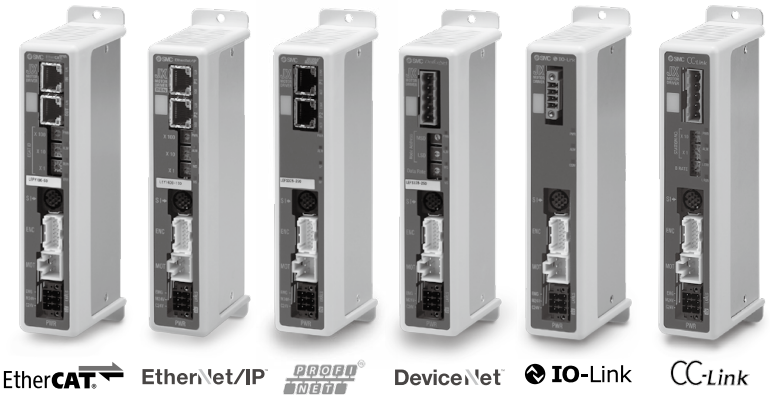
∗ For details, refer to page 116 and onwards.

RoHS

How to Order

JXC D 1 7 T – ❹

❶ For single axis



❶ Communication protocol

E	EtherCAT®
9	EtherNet/IP™
P	PROFINET
D	DeviceNet™
L	IO-Link
M	CC-Link

❷ Mounting

7	Screw mounting
8∗1	DIN rail

∗1 The DIN rail is not included. It must be ordered separately. (Refer to page 79.)

❸ Option

Nil	Without option
S	With straight type communication plug
T	With T-branch type communication plug

∗ Select "Nil" for anything other than JXCD1 and JXCM1.

❹ Actuator part number

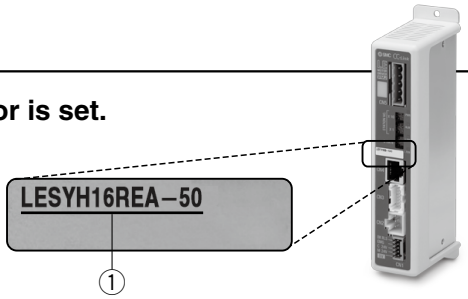
Without cable specifications and actuator options Example: Enter "**LESYH16REA-50**" for the LESYH16REA-50C.	
BC-E	Blank controller∗1

∗1 Requires dedicated software (JXC-BCW)

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

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

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



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

Precautions for blank controllers (JXC□1□□-BC-E)

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.

- The applicable electric actuator size range differs depending on the controller version. Refer to page 81 for how to confirm the controller version and applicable actuator sizes.
- 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

Specifications

Model			JXCE1	JXC91	JXCP1	JXCD1	JXCL1	JXCM1
Network			EtherCAT®	EtherNet/IP™	PROFINET	DeviceNet™	IO-Link	CC-Link
Compatible motor			Step motor (Servo/24 VDC)					
Power supply			Power voltage: 24 VDC ±10%					
Current consumption (Controller)			200 mA or less	130 mA or less	200 mA or less	100 mA or less	100 mA or less	100 mA or less
Compatible encoder			Battery-less absolute					
Communication specifications	Applicable system	Protocol	EtherCAT®*2	EtherNet/IP™*2	PROFINET*2	DeviceNet™	IO-Link	CC-Link
		Version*1	Conformance Test Record V.1.2.6	Volume 1 (Edition 3.14) Volume 2 (Edition 1.15)	Specification Version 2.32	Volume 1 (Edition 3.14) Volume 3 (Edition 1.13)	Version 1.1 Port Class A	Ver. 1.10
	Communication speed		100 Mbps*2	10/100 Mbps*2 (Automatic negotiation)	100 Mbps*2	125/250/500 kbps	230.4 kbps (COM3)	156 kbps, 625 kbps, 2.5 Mbps, 5 Mbps, 10 Mbps
	Configuration file*3		ESI file	EDS file	GSDML file	EDS file	IODD file	CSP+ file
	I/O occupation area		Input 20 bytes Output 36 bytes	Input 36 bytes Output 36 bytes	Input 36 bytes Output 36 bytes	Input 4, 10, 20 bytes Output 4, 12, 20, 36 bytes	Input 14 bytes Output 22 bytes	1 station, 2 stations, 4 stations
	Terminating resistor		Not included					
Memory			EEPROM					
LED indicator			PWR, RUN, ALM, ERR	PWR, ALM, MS, NS	PWR, ALM, SF, BF	PWR, ALM, MS, NS	PWR, ALM, COM	PWR, ALM, L ERR, L RUN
Cable length [m]			Actuator cable: 20 or less					
Cooling system			Natural air cooling					
Operating temperature range [°C]			0 to 55 (No freezing)					
Operating humidity range [%RH]			90 or less (No condensation)					
Insulation resistance [MΩ]			Between all external terminals and the case: 50 (500 VDC)					
Weight [g]			220 (Screw mounting) 240 (DIN rail mounting)	210 (Screw mounting) 230 (DIN rail mounting)	220 (Screw mounting) 240 (DIN rail mounting)	210 (Screw mounting) 230 (DIN rail mounting)	190 (Screw mounting) 210 (DIN rail mounting)	170 (Screw mounting) 190 (DIN rail mounting)

*1 Please note that versions are subject to change.
*2 Use a shielded communication cable with CAT5 or higher for the PROFINET, EtherNet/IP™, and EtherCAT®.
*3 The files can be downloaded from the SMC website.

■Trademark
EtherNet/IP™ is a trademark of ODVA.
DeviceNet™ is a trademark of ODVA.
EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Example of Operation Command

In addition to the step data input of 64 points maximum in each communication protocol, the changing of each parameter can be performed in real time via numerical data defined operation.

* Numerical values other than “Moving force,” “Area 1,” and “Area 2” can be used to perform operation under numerical instructions from JXCL1.

<Application example> Movement between 2 points

No.	Movement mode	Speed	Position	Acceleration	Deceleration	Pushing force	Trigger LV	Pushing speed	Moving force	Area 1	Area 2	In position
0	1: Absolute	100	10	3000	3000	0	0	0	100	0	0	0.50
1	1: Absolute	100	100	3000	3000	0	0	0	100	0	0	0.50

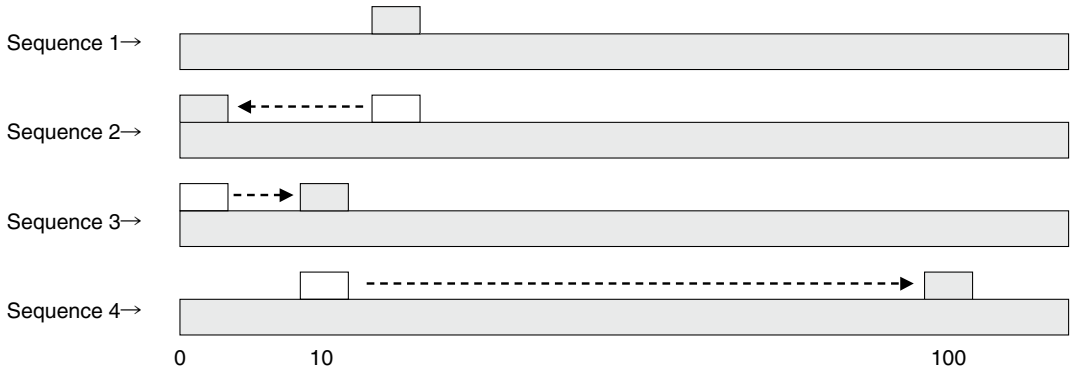
<Step no. defined operation>

Sequence 1: Servo ON instruction
Sequence 2: Instruction to return to origin
Sequence 3: Specify step data No. 0 to input the DRIVE signal.
Sequence 4: Specify step data No. 1 after the DRIVE signal has been temporarily turned OFF to input the DRIVE signal.

<Numerical data defined operation>

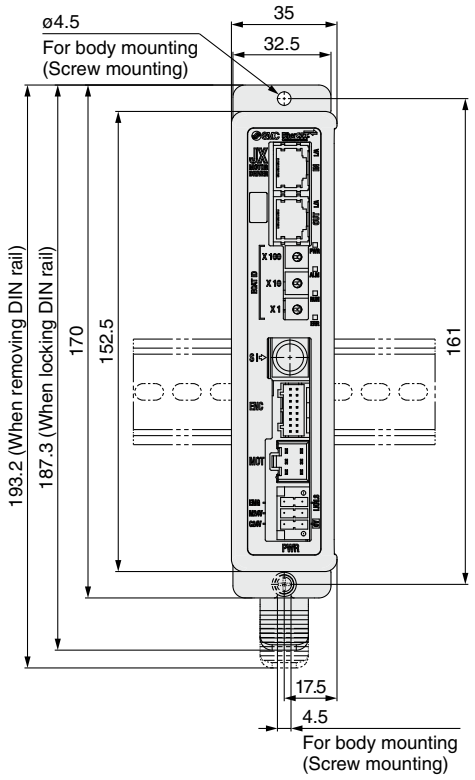
Sequence 1: Servo ON instruction
Sequence 2: Instruction to return to origin
Sequence 3: Specify step data No. 0 and turn ON the input instruction flag (position). Input 10 in the target position. Subsequently the start flag turns ON.
Sequence 4: Turn ON step data No. 0 and the input instruction flag (position) to change the target position to 100 while the start flag is ON.

The same operation can be performed with any operation command.

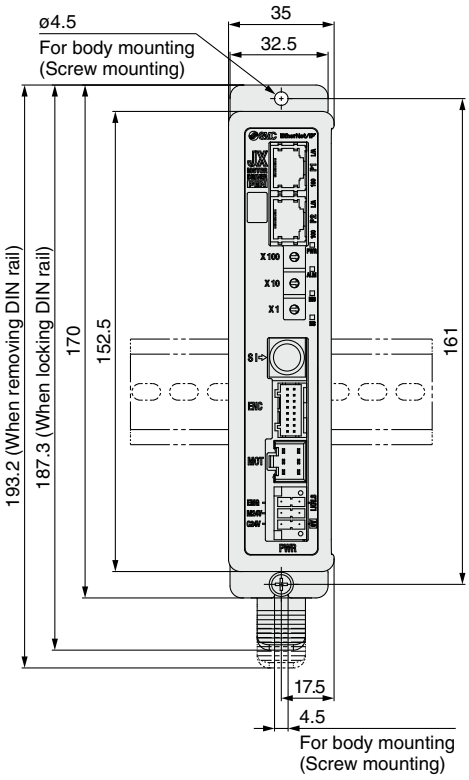


Dimensions

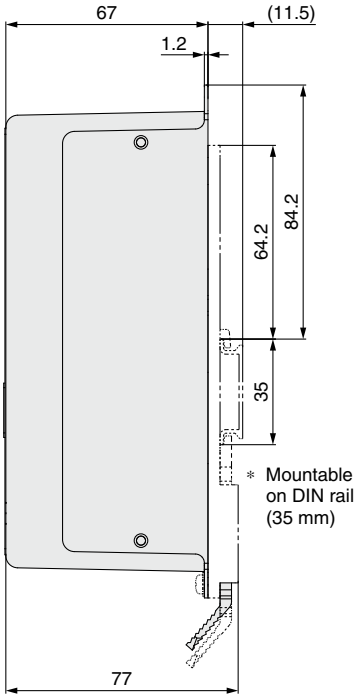
JXCE1



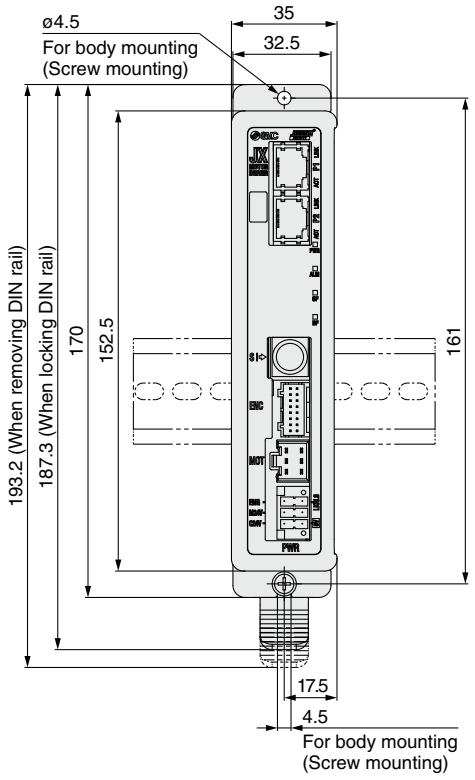
JXC91



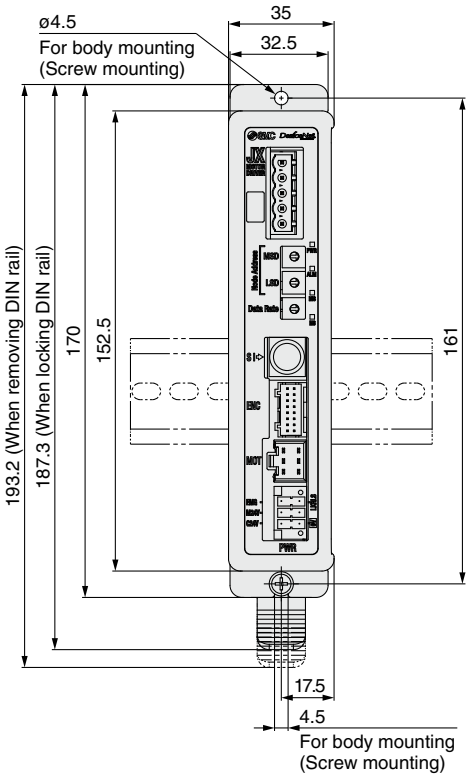
JXCE1/JXC91



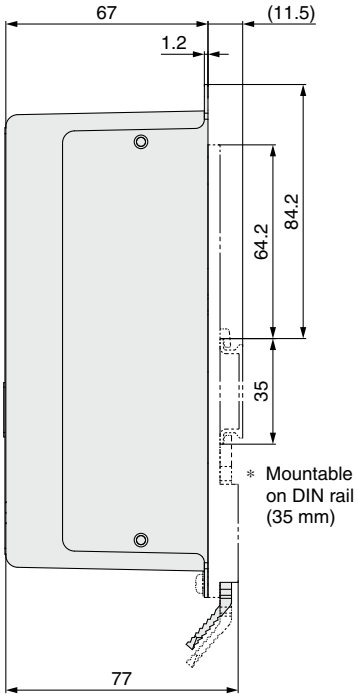
JXCP1



JXCD1

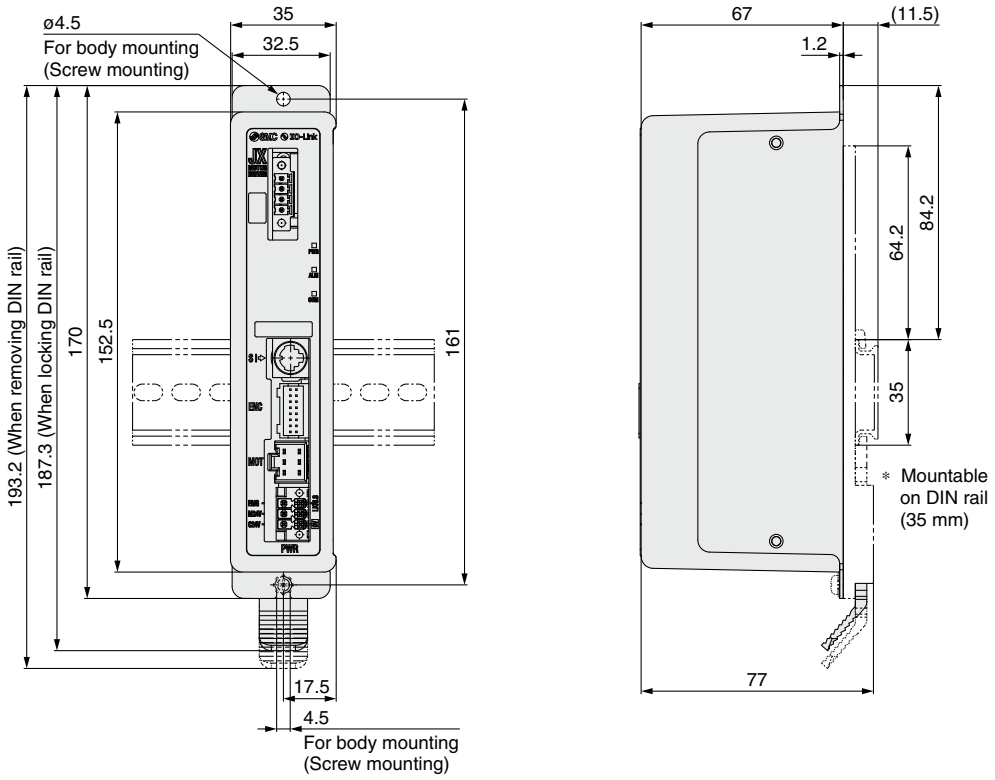


JXCP1/JXCD1

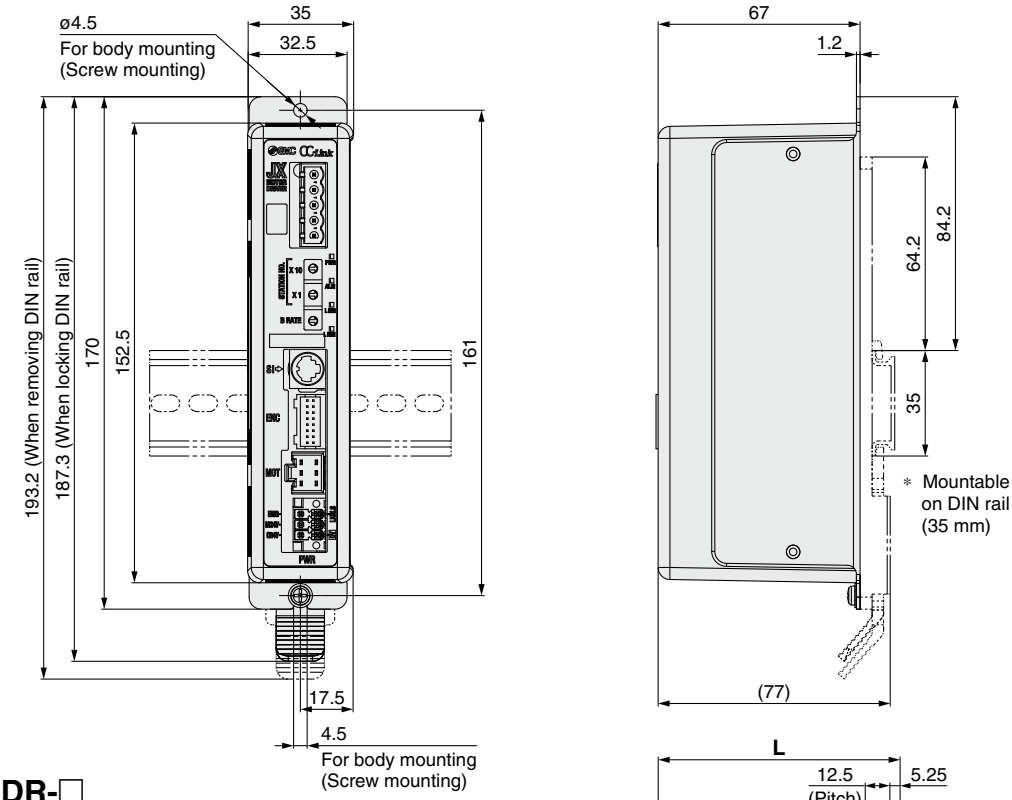


Dimensions

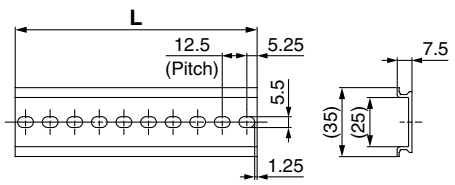
JXCL1



JXCM1



AXT100-DR-□



L Dimensions [mm]

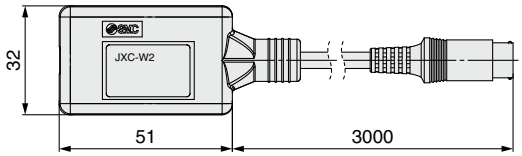
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L	23	35.5	48	60.5	73	85.5	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5

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

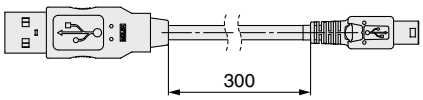
■ Communication cable for controller setting

① Communication cable JXC-W2A-C



∗ It can be connected to the controller directly.

② USB cable LEC-W2-U



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.

■ 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 78. Refer to the dimension drawings on pages 77 and 78 for the mounting dimensions.

■ Teaching box

LEC – T1 – 3 J G □

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

Nil	None
S	Equipped with enable switch

∗ Interlock switch for jog and test function

Stop switch

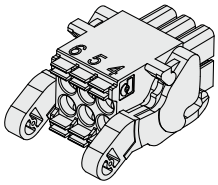
G	Equipped with stop switch

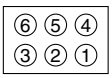
Specifications

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.





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

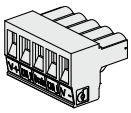
Power supply plug

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

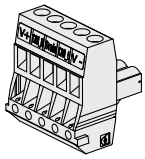
■ Communication plug connector

For DeviceNet™

Straight type JXC-CD-S



T-branch type JXC-CD-T



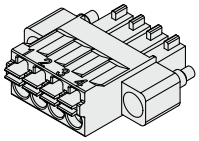
Communication plug connector for DeviceNet™

Terminal name	Details
V+	Power supply (+) for DeviceNet™
CAN_H	Communication wire (High)
Drain	Grounding wire/Shielded wire
CAN_L	Communication wire (Low)
V–	Power supply (–) for DeviceNet™

For IO-Link

Straight type JXC-CL-S

∗ The communication plug connector for IO-Link is an accessory.



Communication plug connector for IO-Link

Terminal no.	Terminal name	Details
1	L+	+24 V
2	NC	N/A
3	L–	0 V
4	C/Q	IO-Link signal

For CC-Link

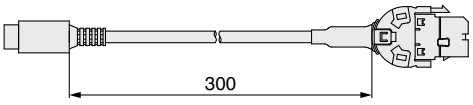
Straight type LEC-CMJ-S

T-branch type LEC-CMJ-T

Communication plug connector for CC-Link

Terminal name	Details
DA	CC-Link communication line A
DB	CC-Link communication line B
DG	CC-Link ground line
SLD	CC-Link shield
FG	Frame ground

■ 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.

JXC51/61 Series
JXCE1/91/P1/D1/L1/M1 Series
Actuator Cable (Option)

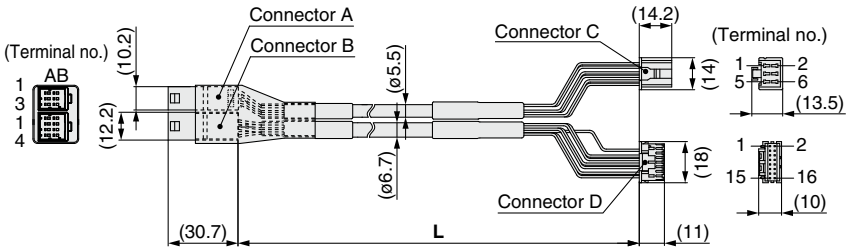
[Robotic cable for battery-less absolute (Step motor 24 VDC)]

LE − CE − 1

Cable length (L) [m]

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

*1 Produced upon receipt of order



Weight

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

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

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

Shield

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

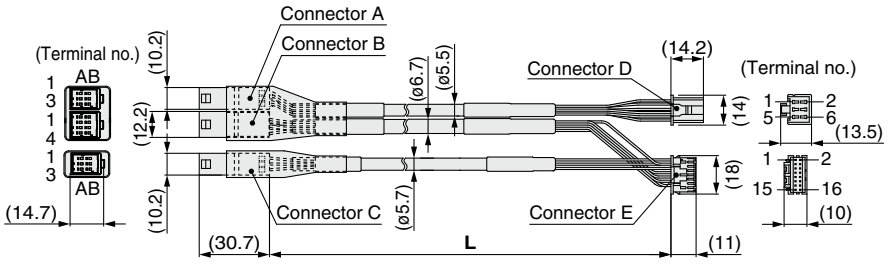
LE − CE − 1 − B

Cable length (L) [m]

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

*1 Produced upon receipt of order

With lock and sensor



Weight

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

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

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

Shield

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

JXC51/61/E1/91/P1/D1/L1/M1 Series
Precautions Relating to Differences in Controller Versions

As the controller version of the JXC series differs, the internal parameters are not compatible.

■ If using the JXC□1□-BC or JXC□1□-BC-E, please use the latest version of the JXC-BCW (parameter writing tool).

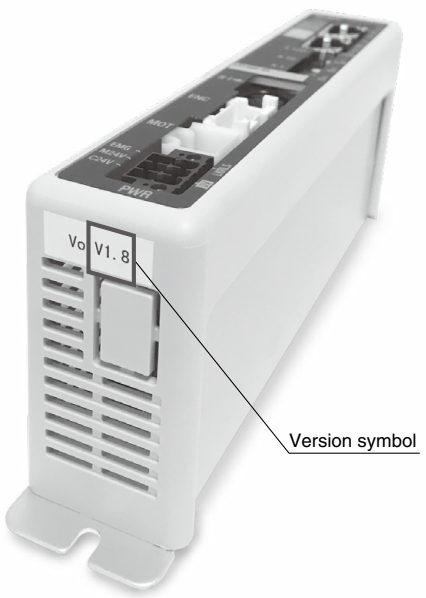
■ There are currently 3 versions available: version 1 products (V1.□ or S1.□), version 2 products (V2.□ or S2.□), and version 3 products (V3.□ or S3.□). Keep in mind that in order to write a backup file (.bkp) to another controller with the JXC-BCW, it needs to be the same version as the controller that created the file. (For example, a backup file created by a version 1 product can only be written to another version 1 product, and so on.) A backup file for the electric actuator with battery-less absolute encoder can only be written between version 3.4 or higher product (the backup file of version 2 or earlier products cannot be written).

■ The applicable electric actuator size range differs depending on the controller version.
Be sure to confirm the controller version before using a blank controller.

Blank Controller Versions and Applicable Actuator Sizes

Blank controller		Applicable electric actuator size
Series	Controller version	**LESY□E**
JXCE1□ series **JXC91□ series** **JXCP1□ series** **JXCD1□ series** **JXCL1□ series**	Version 3.4 (V3.4, S3.4) Version 3.5 (V3.5, S3.5)	16, 25
	Version 3.6 (V3.6, S3.6) or higher	8, 16, 25
JXC51/61 series **JXCM1□ series**	Version 3.4 (V3.4, S3.4)	16, 25
	Version 3.5 (V3.5, S3.5) or higher	8, 16, 25

Identifying Version Symbols



JXC□1 Series Version V3.□ or S3.□ Products

XR V3.0

Applicable models

JXC91□ Series

XR S3.0 T1.0

Applicable models

JXC51/61□ Series
JXCE1□ Series
JXCP1□ Series
JXCD1□ Series
JXCL1□ Series
JXCM1□ Series

JXC□1 Series Version V2.□ or S2.□ Products

WP V2.1

Applicable models

JXC91□ Series

WP S2.2 T1.1

Applicable models

JXCE1□ Series
JXCP1□ Series
JXCD1□ Series
JXCL1□ Series

JXC□1 Series Version V1.□ or S1.□ Products

XR V1.0

Applicable models

JXC91□ Series

XR S1.0 T1.0

Applicable models

JXCE1□ Series
JXCP1□ Series
JXCD1□ Series
JXCL1□ Series

■ **Trademark**
EtherNet/IP™ is a trademark of ODVA.
DeviceNet™ is a trademark of ODVA.
EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

AC Servo Motor Drivers
LECSA/LECS□-T/LECY□ Series

CE

* For details, refer to page 116 and onwards.

RoHS

Pulse Input Type/Positioning Type ..... p. 83

Incremental Type/LECSA Series

c UL us LISTED

Pulse Input Type/Positioning Type ..... p. 83

Absolute Type/LECSB-T Series

c UL us LISTED

Safety function STO available

CC-Link Direct Input Type ..... p. 83

Absolute Type/LECSC-T Series

CC-Link

c UL us LISTED

Network Card Type ..... p. 83

Absolute Type/LECSN-T Series

EtherCAT

EtherNet/IP

PROFINET

c UL us LISTED

Safety function STO available

SSCNET Ⅲ/H Type ..... p. 83

Absolute Type/LECSS-T Series

SSCNET Ⅲ/H
SERVO SYSTEM CONTROLLER NETWORK

e-F@ctory Alliance

c UL us LISTED

Safety function STO available

MECHATROLINK-Ⅱ Type ..... p. 104

Absolute Type/LECYM Series

MECHATROLINK-Ⅱ

Safety function STO available

MECHATROLINK-Ⅲ Type ..... p. 104

Absolute Type/LECYU Series

MECHATROLINK-Ⅲ

Safety function STO available

● **Specific Product Precautions** p. 114

AC Servo Motor Driver
Incremental Type
LECSA Series **(Pulse Input Type/Positioning Type)**

* For details, refer to page 116 and onwards.

* The LECSN-T is only compliant if the "Without network card" option is selected.

Absolute Type
LECSB-T **(Pulse Input Type/Positioning Type)** ***/LECSC-T*** **(CC-Link Direct Input Type)**
LECSN-T **(Network Card Type)** ***/LECSS-T*** **(SSCNET Ⅲ/H Type)** ***Series***

How to Order

For LECSA

LECS A 1 − S1

LECSA

Driver type

A	Pulse input type/Positioning type (For incremental encoder)

Power supply voltage

1	100 to 120 VAC, 50/60 Hz
2	200 to 230 VAC, 50/60 Hz

Compatible motor type

Symbol	Type	Capacity	Encoder
S1	AC servo motor (S2*1)	100 W	Incremental
S3	AC servo motor (S3*1)	200 W	

*1 The symbol shows the motor type (actuator).

* **If an I/O connector is required, order the part number "LE-CSN□" separately.**
* **If an I/O cable is required, order the part number "LEC-CSN□-1" separately.**

For LECSB-T/LECSC-T/LECSS-T

LECS B 2 − T5

LECSB-T LECSC-T LECSS-T

Driver type

B	Pulse input type/Positioning type (For absolute encoder)
C	CC-Link direct input type (For absolute encoder)
S	SSCNET Ⅲ/H type (For absolute encoder)

Power supply voltage

2	200 to 240 VAC, 50/60 Hz (For LECSB2-T/LECSS2-T)
	200 to 230 VAC, 50/60 Hz (For LECSC2-T)

Compatible motor type

Symbol	Type	Capacity	Encoder
T5	AC servo motor (T6*1)	100 W	Absolute
T7	AC servo motor (T7*1)	200 W	

*1 The symbol shows the motor type (actuator).

* **If an I/O connector is required, order the part number "LE-CSN□" separately.**
* **If an I/O cable is required, order the part number "LEC-CSN□-1" separately.**

(Since the electric actuator will not operate without forced stop (EM2) wiring when using the LECSB-T in any mode other than positioning mode, an I/O connector or an I/O cable is required.)

For LECSN-T

LECS N 2 − T5 − 9

LECSN-T

Driver type

N	Network card type (For absolute encoder)

Power supply voltage

2	200 to 240 VAC, 50/60 Hz

Compatible motor type

Symbol	Type	Capacity	Encoder
T5	AC servo motor (T6*1)	100 W	Absolute
T7	AC servo motor (T7*1)	200 W	

*1 The symbol shows the motor type (actuator).

Network card type*1

Nil	Without network card
E	EtherCAT
9	EtherNet/IP™
P	PROFINET

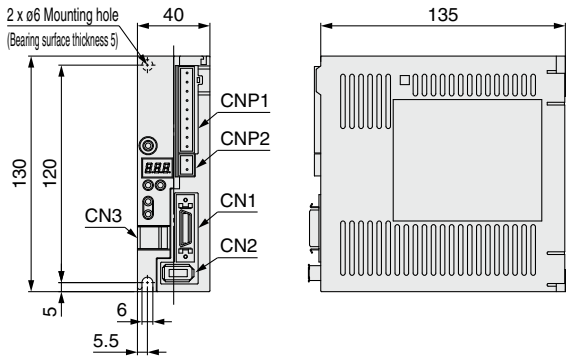
*1 Only the "Without network card" option is UL compliant.

* **If an I/O connector is required, order the part number "LE-CSNS" separately.**
* **If an I/O cable is required, order the part number "LEC-CSNS-1" separately.**

Dimensions

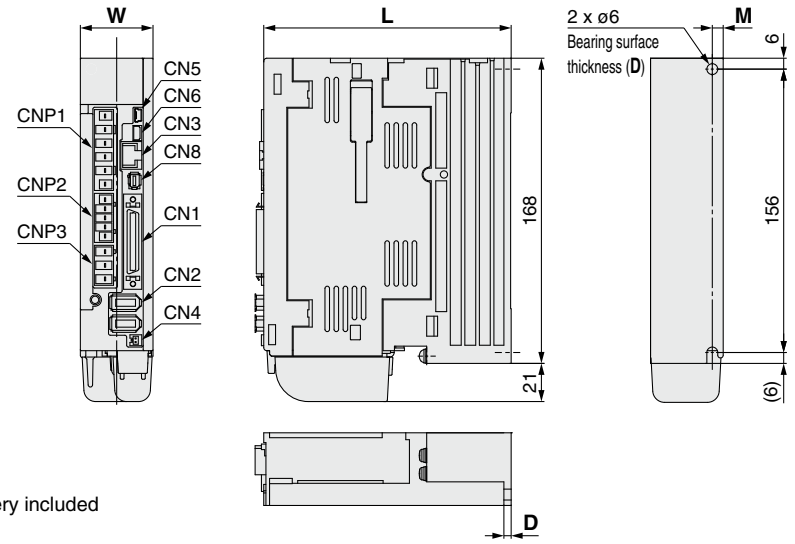
LECSA□

For LECSA□-S1, S3



Connector name	Description
CN1	I/O signal connector
CN2	Encoder connector
CN3	USB communication connector
CNP1	Main circuit power supply connector
CNP2	Control circuit power supply connector

LECSB2-T□



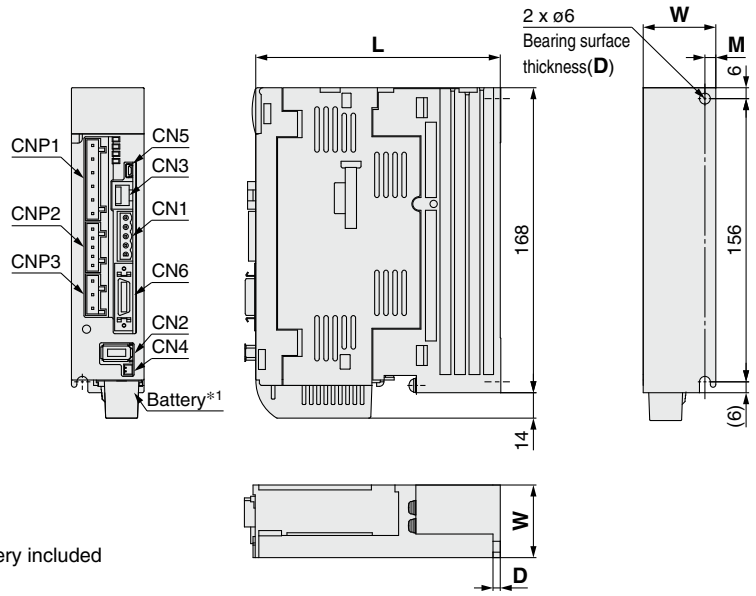
∗ Battery included

Connector name	Description
CN1	I/O signal connector
CN2	Encoder connector
CN3	RS-422 communication connector
CN4	Battery connector
CN5	USB communication connector
CN6	Analog monitor connector
CN8	STO input signal connector
CNP1	Main circuit power supply connector
CNP2	Control circuit power supply connector
CNP3	Servo motor power connector

Dimensions [mm]

Model	W	L	D	M
LECSB2-T5	40	135	4	6
LECSB2-T7				

LECSC2-T□



∗1 Battery included

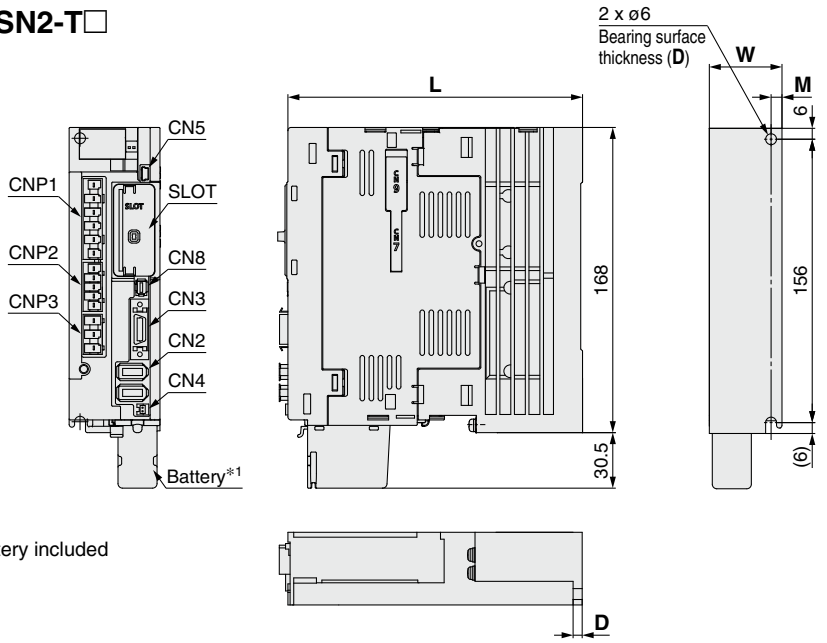
Connector name	Description
CN1	CC-Link connector
CN2	Encoder connector
CN3	RS-422 communication connector
CN4	Battery connector
CN5	USB communication connector
CN6	I/O signal connector
CNP1	Main circuit power supply connector
CNP2	Control circuit power supply connector
CNP3	Servo motor power connector

Dimensions [mm]

Model	W	L	D	M
LECSC2-T5	40	135	4	6
LECSC2-T7				

Dimensions

LECSN2-T□



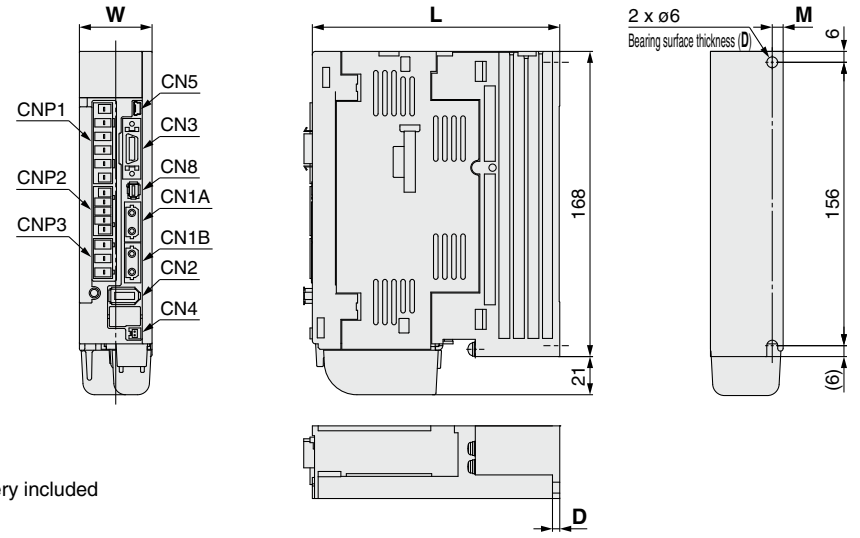
*1 Battery included

Connector name	Description
CN3	I/O signal connector
CN2	Encoder connector
CN4	Battery connector
CN5	USB communication connector
CN8	STO input signal connector
CNP1	Main circuit power supply connector
CNP2	Control circuit power supply connector
CNP3	Servo motor power connector
SLOT	Network card slot

Dimensions [mm]

Model	W	L	D	M
LECSN2-T5	50	161	5	6
LECSN2-T7				

LECSS2-T□



* Battery included

Connector name	Description
CN1A	Front axis connector for SSCNET Ⅲ/H
CN1B	Rear axis connector for SSCNET Ⅲ/H
CN2	Encoder connector
CN3	I/O signal connector
CN4	Battery connector
CN5	USB communication connector
CN8	STO input signal connector
CNP1	Main circuit power supply connector
CNP2	Control circuit power supply connector
CNP3	Servo motor power connector

Dimensions [mm]

Model	W	L	D	M
LECSS2-T5	40	135	4	6
LECSS2-T7				

Specifications

LECSA Series

Model		LECSA1-S1	LECSA1-S3	LECSA2-S1	LECSA2-S3
Compatible motor capacity [W]		100	200	100	200
Compatible encoder		Incremental 17-bit encoder (Resolution: 131072 p/rev)			
Main power supply	**Power voltage [V]**	Single phase 100 to 120 VAC (50/60 Hz)		Single phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]	Single phase 85 to 132 VAC		Single phase 170 to 253 VAC	
	Rated current [A]	3.0	5.0	1.5	2.4
Control power supply	**Control power supply voltage [V]**	24 VDC			
	Allowable voltage fluctuation [V]	21.6 to 26.4 VDC			
	Rated current [A]	0.5			
Parallel input		6 inputs			
Parallel output		4 outputs			
Max. input pulse frequency [pps]		1 M (for differential receiver), 200 k (for open collector)*2			
Function	**In-position range setting [pulse]**	0 to ±65535 (Command pulse unit)			
	Error excessive	±3 rotations			
	Torque limit	Parameter setting			
	Communication	USB communication			
	Point table	Up to 7 points			
Operating temperature range [°C]		0 to 55 (No freezing)			
Operating humidity range [%RH]		90 or less (No condensation)			
Storage temperature range [°C]		–20 to 65 (No freezing)			
Storage humidity range [%RH]		90 or less (No condensation)			
Insulation resistance [MΩ]		Between the housing and SG: 10 (500 VDC)			
Weight [g]		600			

LECSB-T Series

Model		LECSB2-T5	LECSB2-T7
Compatible motor capacity [W]		100	200
Compatible encoder		Absolute 22-bit encoder (Resolution: 4194304 p/rev)	
Main power supply	**Power voltage [V]**	Three phase 200 to 240 VAC (50/60 Hz), Single phase 200 to 240 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]	Three phase 170 to 264 VAC (50/60 Hz), Single phase 170 to 264 VAC (50/60 Hz)	
	Rated current [A]	0.9	1.5
Control power supply	**Control power supply voltage [V]**	Single phase 200 to 240 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]	Single phase 170 to 264 VAC	
	Rated current [A]	0.2	
Parallel input		10 inputs	
Parallel output		6 outputs	
Max. input pulse frequency [pps]		4 M (for differential receiver), 200 k (for open collector)	
Function	**In-position range setting [pulse]**	0 to ±65535 (Command pulse unit)	
	Error excessive	±3 rotations	
	Torque limit	Parameter setting or external analog input setting (0 to 10 VDC)	
	Communication	USB communication, RS422 communication*1	
	Point table	Up to 255 points	
	Pushing operation	Point table no. input method, Up to 127 points	
Operating temperature range [°C]		0 to 55 (No freezing)	
Operating humidity range [%RH]		90 or less (No condensation)	
Storage temperature range [°C]		–20 to 65 (No freezing)	
Storage humidity range [%RH]		90 or less (No condensation)	
Insulation resistance [MΩ]		Between the housing and SG: 10 (500 VDC)	
Safety function		STO (IEC/EN 61800-5-2)	
Safety standards*2		EN ISO 13849-1 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL3, EN 61800-5-2	
Weight [g]		800	

∗1 USB communication and RS422 communication cannot be performed at the same time.
∗2 The safety level depends on the set value of the driver parameter [Pr. PF18 STO diagnosis error detection time] and whether STO input diagnosis by TOFB output is performed or not. Refer to the LECSB-T operation manual for details.

Specifications

LECSC-T Series

Model			LECSC2-T5	LECSC2-T7
Compatible motor capacity [W]			100	200
Compatible encoder			Absolute 18-bit encoder (Resolution: 262144 p/rev)	
Main power supply	Power voltage [V]		Three phase 200 to 230 VAC (50/60 Hz), Single phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]		Three phase 170 to 253 VAC, Single phase 170 to 253 VAC	
	Rated current [A]		0.9	1.5
Control power supply	Control power supply voltage [V]		Single phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]		Single phase 170 to 253 VAC	
	Rated current [A]		0.2	
Communication specifications	Applicable Fieldbus protocol (Version)		CC-Link communication (Ver. 1.10)	
	Connection cable		CC-Link Ver. 1.10 compliant cable (Shielded 3-core twisted pair cable)*1	
	Remote station number		1 to 64	
	Cable length	Communication speed [bps]/ Maximum overall cable length [m]	16 k/1200, 625 k/900, 2.5 M/400, 5 M/160, 10 M/100	
		Cable length between stations [m]	0.2 or more	
	I/O occupation area (Inputs/Outputs)		1 station occupied (Remote I/O 32 points/32 points)/(Remote register 4 words/4 words) 2 stations occupied (Remote I/O 64 points/64 points)/(Remote register 8 words/8 words)	
	Number of connectable drivers		Up to 42 (when 1 station is occupied by 1 driver), Up to 32 (when 2 stations are occupied by 1 driver), when there are only remote device stations.	
Command method	Remote register input		Available with CC-Link communication (2 stations occupied)	
	Point table No. input		Available with CC-Link communication, RS422 communication CC-Link communication (1 station occupied): 31 points, CC-Link communication (2 stations occupied): 255 points RS422 communication: 255 points	
	Indexer positioning input		Available with CC-Link communication CC-Link communication (1 station occupied): 31 points, CC-Link communication (2 stations occupied): 255 points	
Communication function			USB communication, RS-422 communication*2	
Operating temperature range [°C]			0 to 55 (No freezing)	
Operating humidity range [%RH]			90 or less (No condensation)	
Storage temperature range [°C]			–20 to 65 (No freezing)	
Storage humidity range [%RH]			90 or less (No condensation)	
Insulation resistance [MΩ]			Between the housing and SG: 10 (500 VDC)	
Weight [g]			800	

*1 If the system comprises of both CC-Link Ver. 1.00 and Ver. 1.10 compliant cables, Ver. 1.00 specifications are applied to the overall cable length and the cable length between stations.
*2 USB communication and RS422 communication cannot be performed at the same time.

LECSN-T Series

Model		LECSN2-T5	LECSN2-T7
Compatible motor capacity [W]		100	200
Compatible encoder		Absolute 22-bit encoder (Resolution: 4194304 p/rev)	
Main power supply	Power voltage [V]	Three phase 200 to 240 VAC (50/60 Hz), Single phase 200 to 240 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]	Three phase 170 to 264 VAC (50/60 Hz), Single phase 170 to 264 VAC (50/60 Hz)	
	Rated current [A]	0.9	1.5
Control power supply	Control power supply voltage [V]	Single phase 200 to 240 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]	Single phase 170 to 264 VAC	
	Rated current [A]	0.2	
Applicable Fieldbus protocol		PROFINET, EtherCAT, EtherNet/IP™	
Function	Communication	USB communication	
	Point table*1	Up to 255 points	
Operating temperature range [°C]		0 to 55 (No freezing)	
Operating humidity range [%RH]		90 or less (No condensation)	
Storage temperature range [°C]		–20 to 65 (No freezing)	
Storage humidity range [%RH]		90 or less (No condensation)	
Insulation resistance [MΩ]		Between the housing and SG: 10 (500 VDC)	
Safety function		STO (IEC/EN 61800-5-2)	
Safety standards*2		EN ISO 13849-1 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL3, EN 61800-5-2	
Weight [g]		1000	

*1 Only supports PROFINET and EtherCAT
*2 The safety level depends on the set value of the driver parameter [Pr. PF18 STO diagnosis error detection time] and whether STO input diagnosis by TOFB output is performed or not. Refer to the LECSN-T operation manual for details.

Specifications

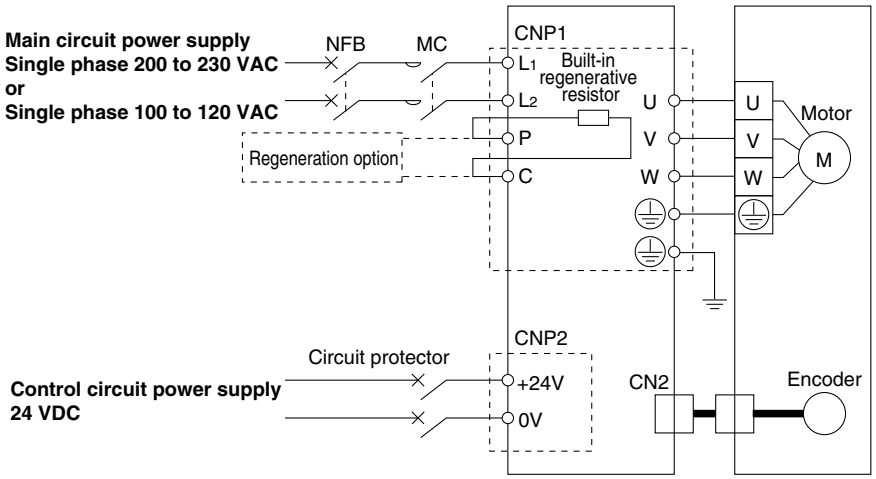
LECSS-T Series

Model		LECSS2-T5	LECSS2-T7
Compatible motor capacity [W]		100	200
Compatible encoder		Absolute 22-bit encoder (Resolution: 4194304 p/rev)	
Main power supply	**Power voltage [V]**	Three phase 200 to 240 VAC (50/60 Hz), Single phase 200 to 240 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]	Three phase 170 to 264 VAC (50/60 Hz), Single phase 170 to 264 VAC (50/60 Hz)	
	Rated current [A]	0.9	1.5
Control power supply	**Control power supply voltage [V]**	Single phase 200 to 240 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]	Single phase 170 to 264 VAC	
	Rated current [A]	0.2	
Applicable Fieldbus protocol		SSCNET Ⅲ/H (High-speed optical communication)	
Communication function		USB communication	
Operating temperature range [°C]		0 to 55 (No freezing)	
Operating humidity range [%RH]		90 or less (No condensation)	
Storage temperature range [°C]		–20 to 65 (No freezing)	
Storage humidity range [%RH]		90 or less (No condensation)	
Insulation resistance [MΩ]		Between the housing and SG: 10 (500 VDC)	
Safety function		STO (IEC/EN 61800-5-2)	
Safety standards∗1		EN ISO 13849-1 Category 3 PL d, EN 61508 SIL 2, EN 62061 SIL CL2, EN 61800-5-2	
Weight [g]		800	

∗1 Refer to the LECSS-T operation manual for details.

Power Supply Wiring Example: LECSA

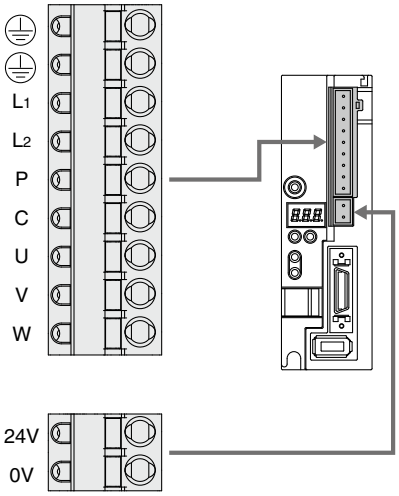
LECSA□-□



Main Circuit Power Supply Connector: CNP1

∗ Accessory

Terminal name	Function	Details
⏚	Protective earth (PE)	Should be grounded by connecting the servo motor's earth terminal and the control panel's protective earth (PE)
L_1	Main circuit power supply	Connect the main circuit power supply. LECSA1: Single phase 100 to 120 VAC, 50/60 Hz LECSA2: Single phase 200 to 230 VAC, 50/60 Hz
L_2		
P	Regeneration option	Terminal to connect regeneration option LECSA□-S1: Not connected at time of shipping LECSA□-S3, S4: Connected at time of shipping ∗ If regeneration option is required for "Model Selection," connect to this terminal.
C		
U	Servo motor power (U)	Connect to motor cable (U, V, W).
V	Servo motor power (V)	
W	Servo motor power (W)	



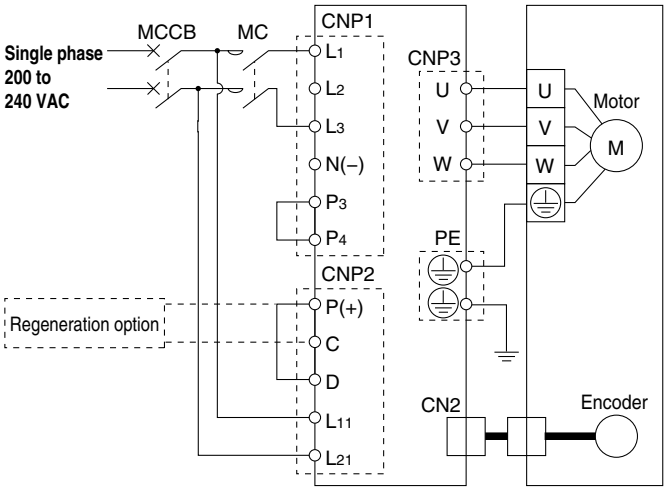
Control Circuit Power Supply Connector: CNP2

∗ Accessory

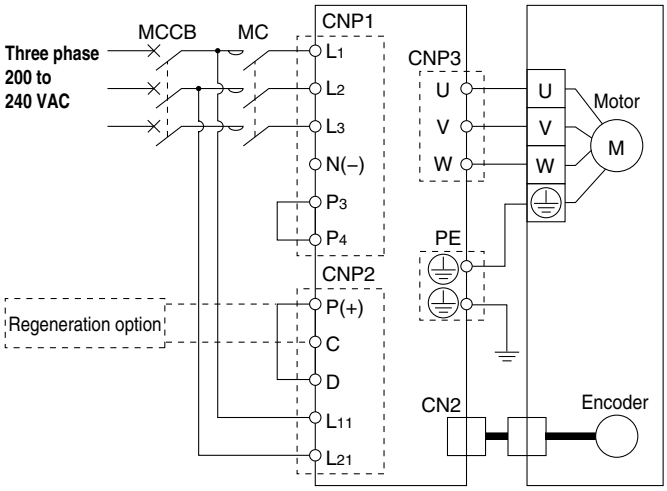
Terminal name	Function	Details
24V	Control circuit power supply (24 V)	24 V side of the control circuit power supply (24 VDC) supplied to the driver
0V	Control circuit power supply (0 V)	0 V side of the control circuit power supply (24 VDC) supplied to the driver

Power Supply Wiring Example: LECSB2-T□, LECSS2-T□, LECSN2-T□

For single phase 200 VAC



For three phase 200 VAC



∗ For single phase 200 to 240 VAC, power supply should be connected to L_1 and L_3 terminals, with nothing connected to L_2. Please note that the wiring locations differ from the LECS□.

Main Circuit Power Supply Connector: CNP1 ∗ Accessory

Terminal name	Function	Details
L_1	Main circuit power supply	Connect the main circuit power supply. LECSB2-T/LECSS2-T/LECSN2-T: Single phase 200 to 240 VAC, 50/60 Hz Connection terminal: L_1, L_3 Three phase 200 to 240 VAC, 50/60 Hz Connection terminal: L_1, L_2, L_3
L_2		
L_3		
N(–)	Do not connect.	
P_3	Connect between P_3 and P_4. (Connected at time of shipping)	
P_4		

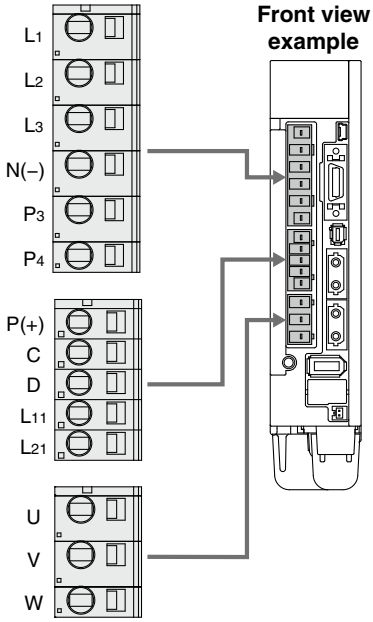
Control Circuit Power Supply Connector: CNP2 ∗ Accessory

Terminal name	Function	Details
P(+)	Regeneration option	Connect between P(+) and D. (Connected at time of shipping) ∗ If regeneration option is required for "Model Selection," connect to this terminal.
C		
D		
L_{11}	Control circuit power supply	Connect the control circuit power supply. LECSB2-T/LECSS2-T/LECSN2-T: Single phase 200 to 240 VAC, 50/60 Hz Connection terminal: L_{11}, L_{21}
L_{21}		

Motor Connector: CNP3 ∗ Accessory

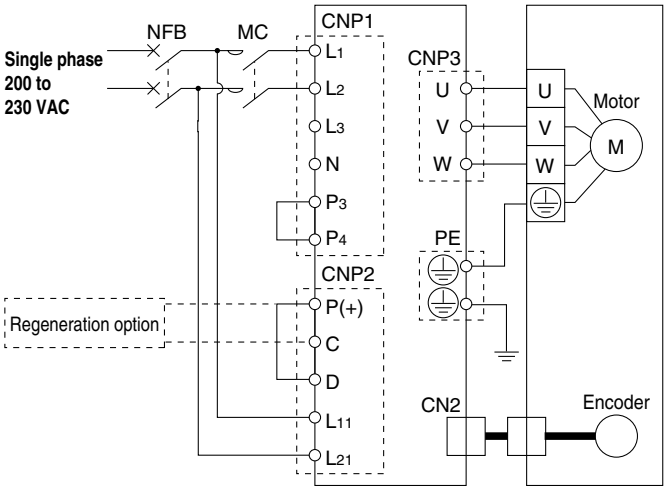
Terminal name	Function	Details
U	Servo motor power (U)	Connect to motor cable (U, V, W).
V	Servo motor power (V)	
W	Servo motor power (W)	

LECSS2-T□ Front view example

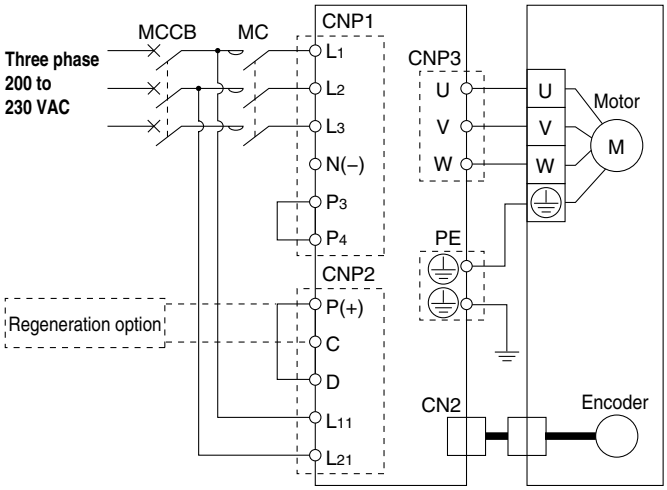


Power Supply Wiring Example: LECSC2-T□

For single phase 200 VAC



For three phase 200 VAC



∗ For single phase 200 to 230 VAC, power supply should be connected to L_1 and L_2 terminals, with nothing connected to L_3.

Main Circuit Power Supply Connector: CNP1 ∗ Accessory

Terminal name	Function	Details
L_1	Main circuit power supply	Connect the main circuit power supply. LECSC2-T: Single phase 200 to 230 VAC, 50/60 Hz Connection terminal: L_1, L_2 Three phase 200 to 230 VAC, 50/60 Hz Connection terminal: L_1, L_2, L_3
L_2		
L_3		
N	Do not connect.	
P_3	Connect between P_3 and P_4. (Connected at time of shipping)	
P_4		

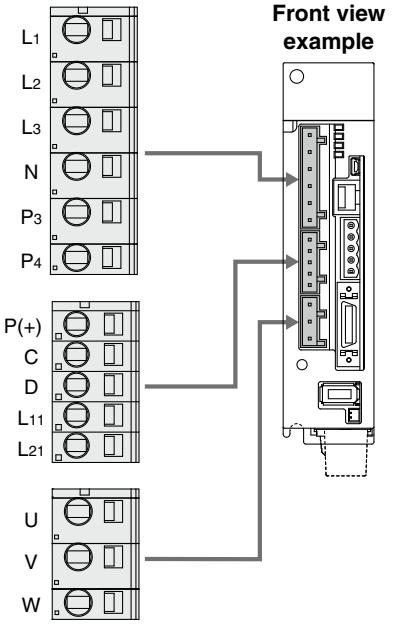
Control Circuit Power Supply Connector: CNP2 ∗ Accessory

Terminal name	Function	Details
P(+)	Regeneration option	Connect between P and D. (Connected at time of shipping) ∗ If regeneration option is required for "Model Selection," connect to this terminal.
C		
D		
L_{11}	Control circuit power supply	Connect the control circuit power supply. LECSC2-T: Single phase 200 to 230 VAC, 50/60 Hz Connection terminal: L_{11}, L_{21}
L_{21}		

Motor Connector: CNP3 ∗ Accessory

Terminal name	Function	Details
U	Servo motor power (U)	Connect to motor cable (U, V, W).
V	Servo motor power (V)	
W	Servo motor power (W)	

LECSC2-T Front view example

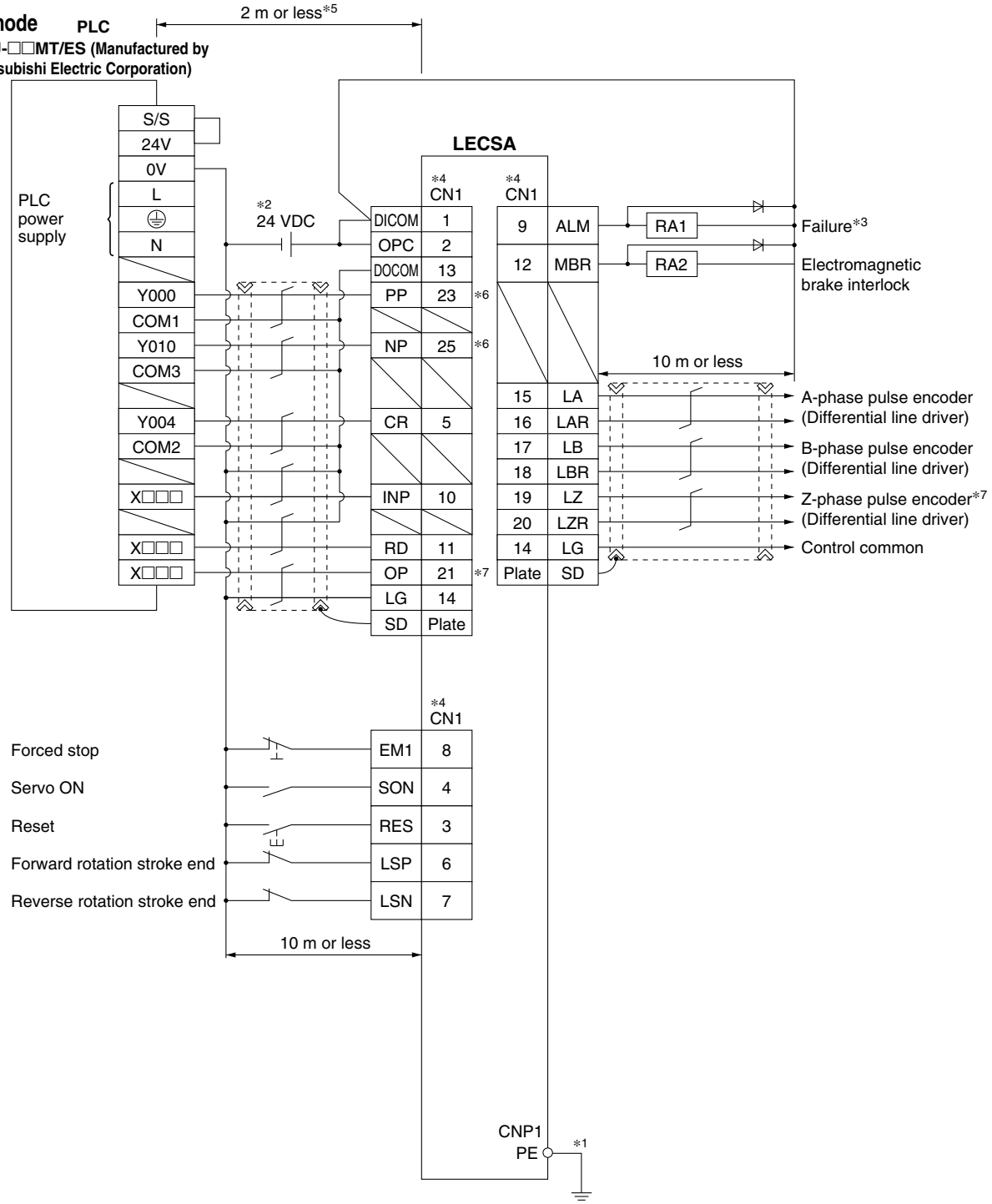


Control Signal Wiring Example: LECSA

LECSA□-□

This wiring example shows connection with a PLC (FX3U-□□MT/ES) manufactured by Mitsubishi Electric Corporation as when used in position control mode. Refer to the LECSA series Operation Manual and any technical literature or operation manuals for your PLC and positioning unit before connecting to another PLC or positioning unit.

Position control mode



*1 For preventing electric shock, be sure to connect the driver main circuit power supply connector (CNP1)'s protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).

*2 For interface use, supply 24 VDC ±10% 200 mA using an external source. 200 mA is the value when all I/O command signals are being used. In addition, reducing the number of inputs/outputs can decrease the current capacity. Refer to the Operation Manual for required current for interface.

*3 The failure (ALM) is normally ON. When it is OFF (alarm occurs), stop the PLC signal using the sequence program.

*4 Signals of the same name are connected inside the driver.

*5 For command pulse input with an open collector method. When a positioning unit loaded with a differential line driver method is used, it is 10 m or less.

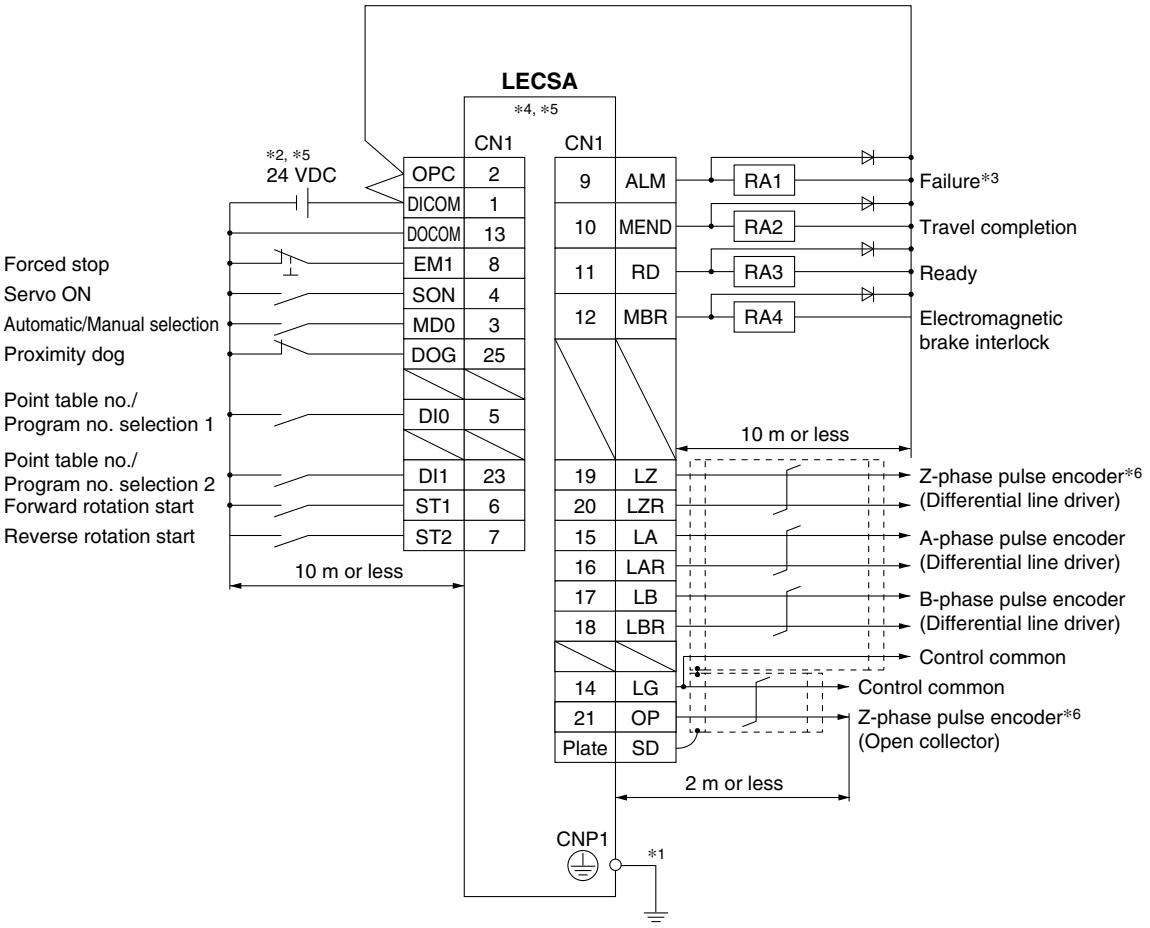
*6 If the command pulse input is open collector method, it supports only the sink (NPN) type interface. It does not correspond to the source (PNP) type interface.

*7 The Z-phase pulse encoder corresponds to the differential line driver method and the open collector method. If the Z-phase pulse encoder is using the open collector method, it supports only the sink (NPN) type interface. It does not correspond to the source (PNP) type interface.

Control Signal Wiring Example: LECSA

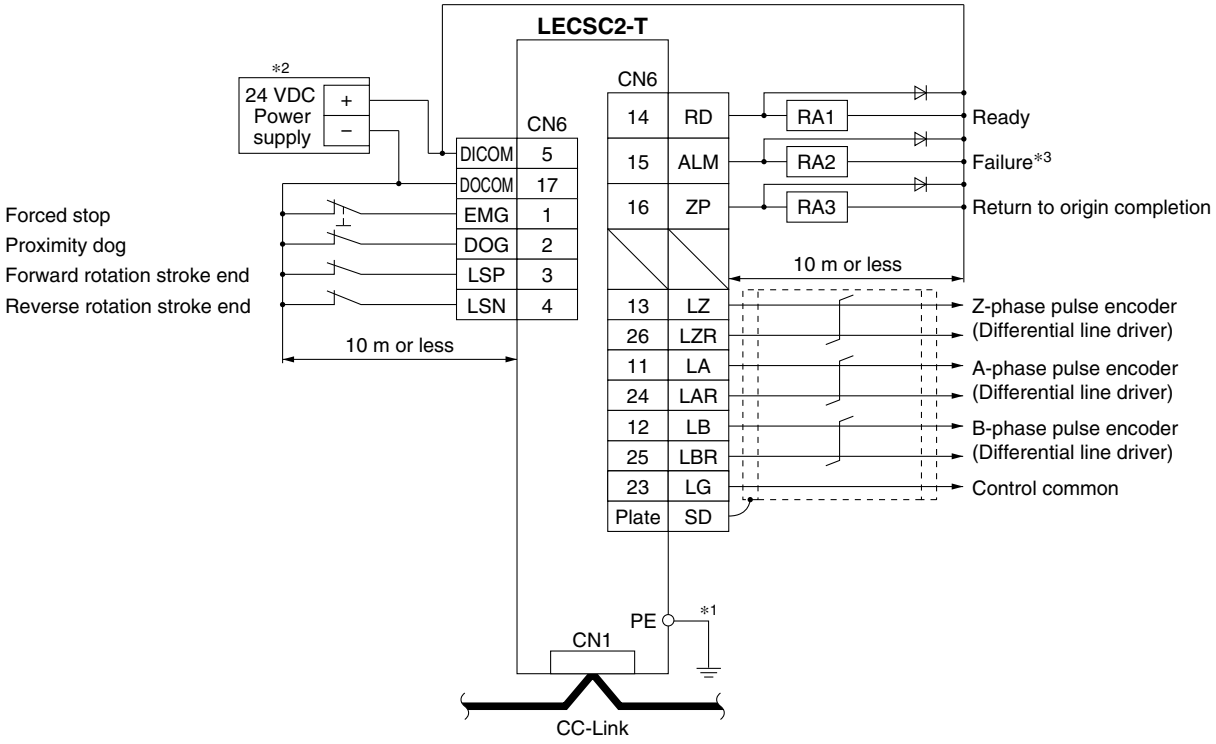
In this wiring example, the device of the CN1-10 pin in the initial status has been changed to the device shown below. For details on the device and changing method, refer to the LECSA series Operation Manual.
CN1-10: MEND (Travel completion)

Positioning mode (Point table method)
For sink (NPN) I/O interface



*1 For preventing electric shock, be sure to connect the driver's protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).
*2 For interface use, supply 24 VDC ±10% 200 mA using an external source. 200 mA is the value when all I/O command signals are being used. In addition, reducing the number of inputs/outputs can decrease the current capacity.
*3 The failure (ALM) is normally ON.
*4 Signals of the same name are connected inside the driver.
*5 The wiring example is for the sink (NPN) type interface. Refer to the LECSA series Operation Manual for the source (PNP) type interface. Note that the 23 pin and 25 pin cannot be used for the source type interface.
*6 The Z-phase pulse encoder corresponds to the differential line driver method and the open collector method. If the Z-phase pulse encoder is using the open collector method, it supports only the sink (NPN) type interface. It does not correspond to the source (PNP) type interface.

Control Signal Wiring Example: LECSC2-T□

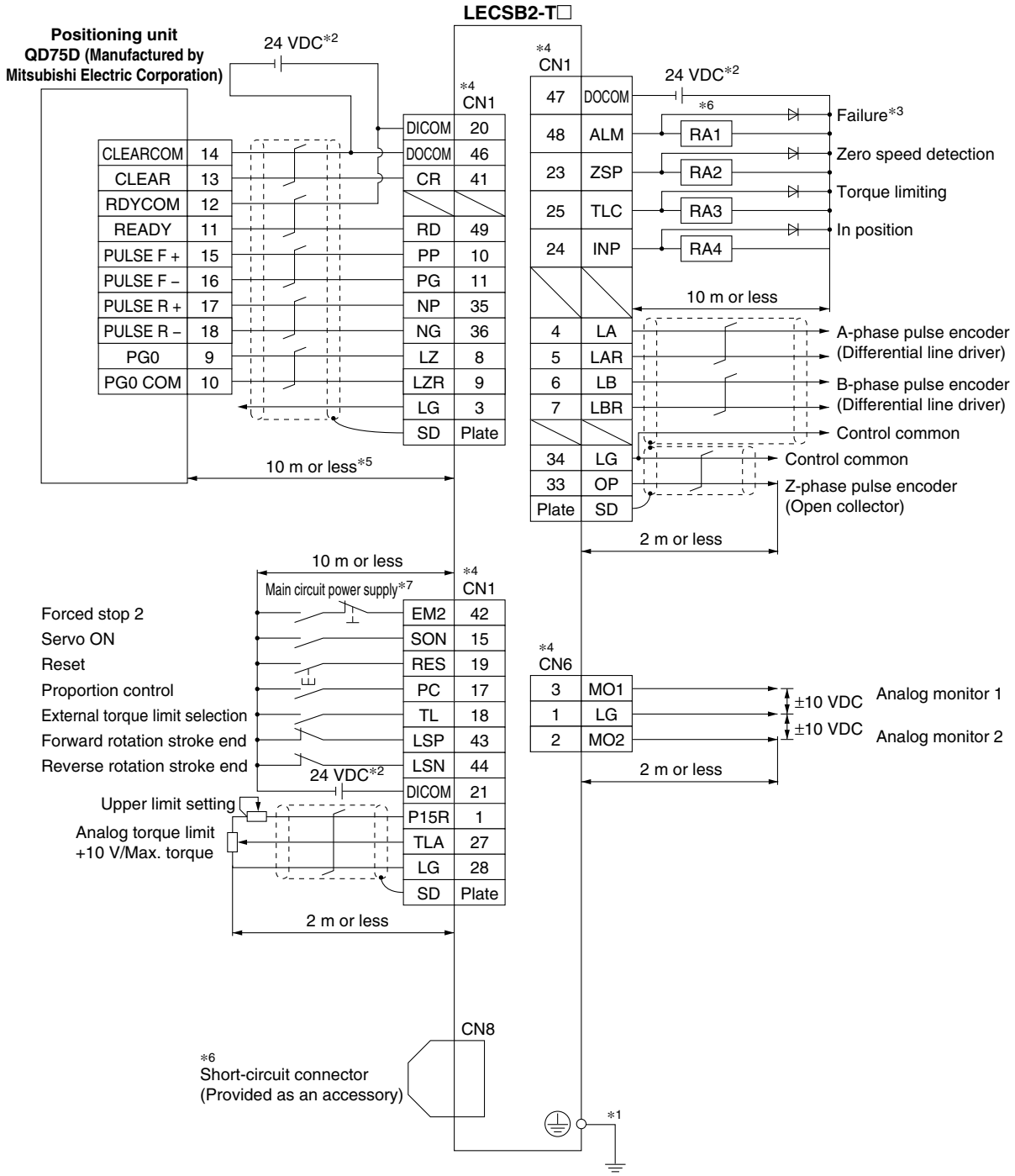


*1 For preventing electric shock, be sure to connect the driver's protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).
*2 For interface use, supply 24 VDC ±10% 150 mA using an external source.
*3 The failure (ALM) is normally ON. When it is OFF (alarm occurs), stop the PLC signal using the sequence program.

Control Signal Wiring Example: LECSB2-T□

This wiring example shows connection with a positioning unit (QD75D) manufactured by Mitsubishi Electric Corporation as when used in position control mode. Refer to the LECSB2-T series Operation Manual and any technical literature or operation manuals for your PLC and positioning unit before connecting to another PLC or positioning unit.

Position control mode
For sink (NPN) I/O interface

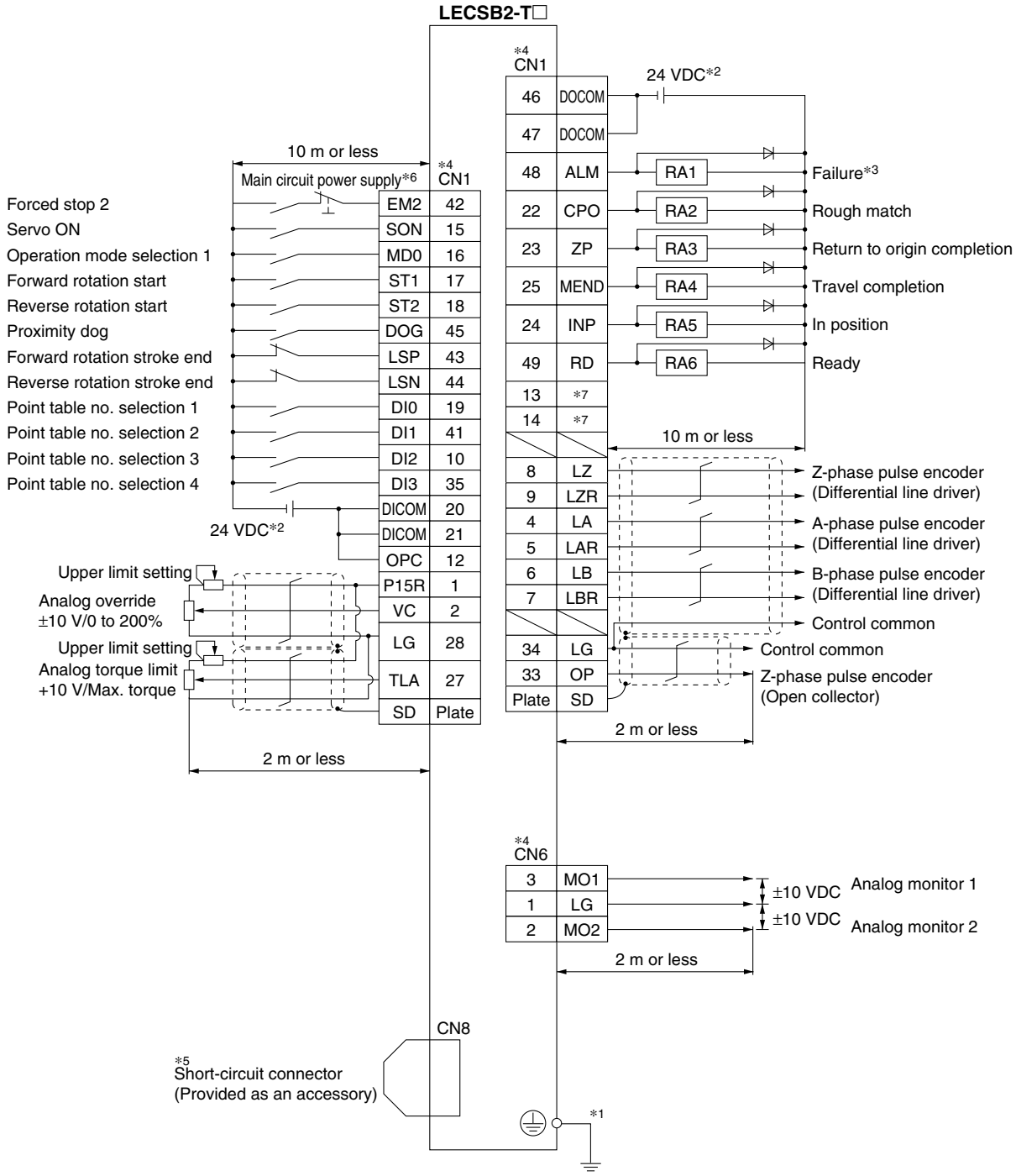


*1 For preventing electric shock, be sure to connect the driver's protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).
*2 For interface use, supply 24 VDC ±10% using an external source. Set the total current capacity to 500 mA. 500 mA is the value when all I/O command signals are being used. In addition, reducing the number of inputs/outputs can decrease the current capacity.
*3 The failure (ALM) is normally ON. When it is OFF (alarm occurs), stop the PLC signal using the sequence program.
*4 Signals of the same name are connected inside the driver.
*5 For command pulse input with a differential line driver method. For open collector method, it is 2 m or less.
*6 When not using the STO function, use the driver with the short-circuit connector (provided as an accessory) inserted.
*7 Configure a circuit to turn off EM2 when the main circuit power is turned off to prevent any unexpected restarts of the driver.

Control Signal Wiring Example: LECSB2-T□

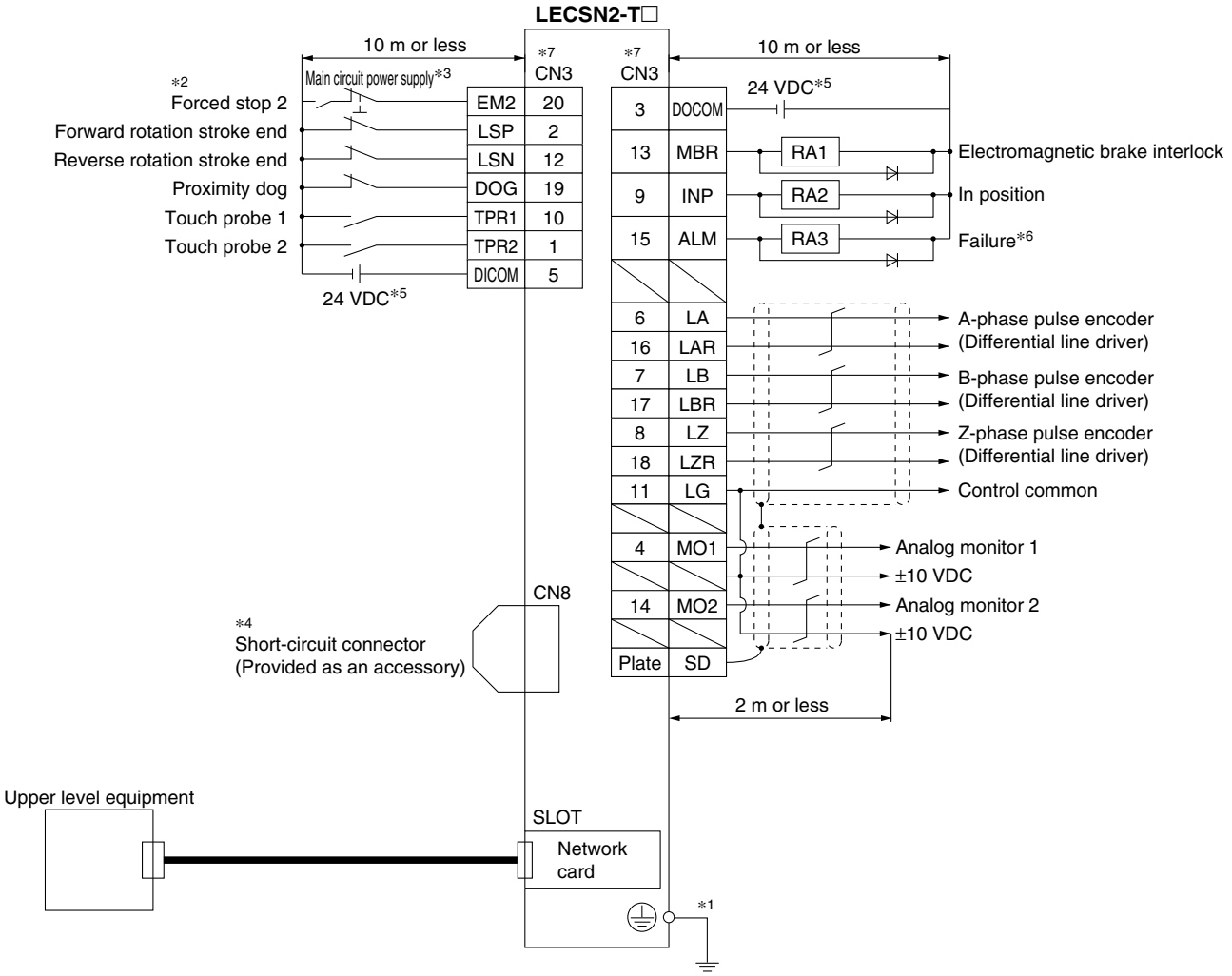
In this wiring example, the devices of the CN1-22 pin, CN1-23 pin, and CN1-25 pin in the initial status have been changed to the devices shown below. For details on the devices and changing method, refer to the LECSB2-T series Operation Manual.
CN1-22: CPO (Rough match)/CN1-23: ZP (Return to origin completion)/CN1-25: MEND (Travel completion)

Positioning mode (Point table method)
For sink (NPN) I/O interface



*1 For preventing electric shock, be sure to connect the servo amplifier's protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).
*2 For interface use, supply 24 VDC ±10% using an external source. Set the total current capacity to 500 mA. 500 mA is the value when all I/O command signals are being used. In addition, reducing the number of inputs/outputs can decrease the current capacity.
*3 The ALM (Failure) is normally ON. (Normally closed contact)
*4 Signals of the same name are connected inside the servo amplifier.
*5 When not using the STO function, use the servo amplifier with the short-circuit connector (provided as an accessory) inserted.
*6 Configure a circuit to turn off EM2 when the main circuit power is turned off to prevent any unexpected restarts of the driver.
*7 Output devices are not assigned in the initial status. Assign the output devices as necessary.

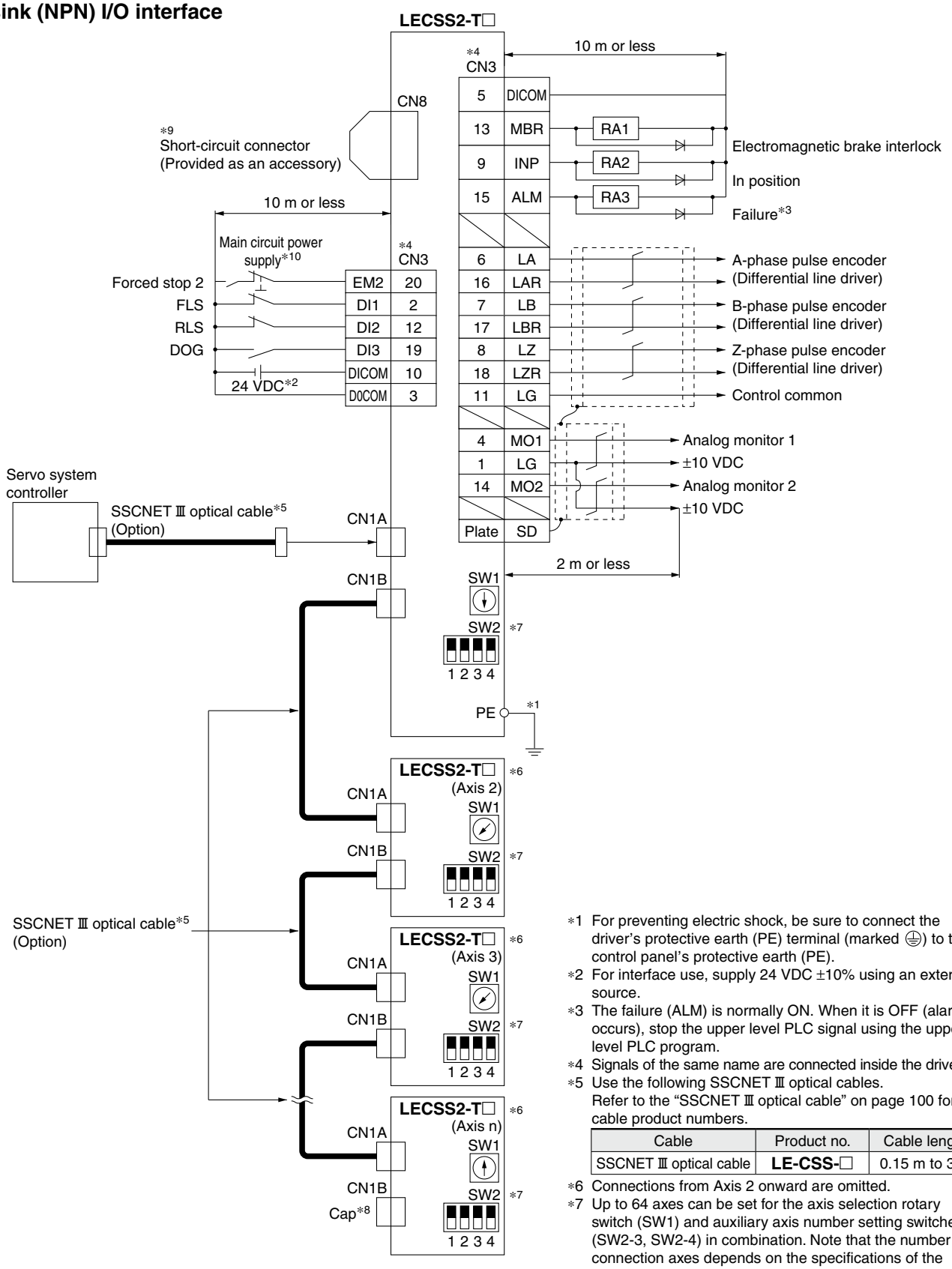
Control Signal Wiring Example: LECSN2-T□



*1 For preventing electric shock, be sure to connect the driver's protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).
*2 If upper level equipment does not have forced stop function, always install the forced stop 2 switch (normally closed contact).
*3 Configure a circuit to turn off EM2 when the main circuit power is turned off to prevent any unexpected restarts of the driver.
*4 When not using the STO function, use the driver with the short-circuit connector (provided as an accessory) inserted.
*5 For interface use, supply 24 VDC ±10% using an external source. Set the total current capacity to 300 mA. 300 mA is the value when all I/O command signals are being used. In addition, reducing the number of inputs/outputs can decrease the current capacity.
*6 The ALM (Failure) is normally ON. (Normally closed contact)
*7 Signals of the same name are connected inside the driver.

Control Signal Wiring Example: LECSS2-T□

For sink (NPN) I/O interface



∗1 For preventing electric shock, be sure to connect the driver's protective earth (PE) terminal (marked ⏚) to the control panel's protective earth (PE).

∗2 For interface use, supply 24 VDC ±10% using an external source.

∗3 The failure (ALM) is normally ON. When it is OFF (alarm occurs), stop the upper level PLC signal using the upper level PLC program.

∗4 Signals of the same name are connected inside the driver.

∗5 Use the following SSCNET Ⅲ optical cables.
Refer to the "SSCNET Ⅲ optical cable" on page 100 for cable product numbers.

Cable	Product no.	Cable length
SSCNET Ⅲ optical cable	**LE-CSS-□**	0.15 m to 3 m

∗6 Connections from Axis 2 onward are omitted.

∗7 Up to 64 axes can be set for the axis selection rotary switch (SW1) and auxiliary axis number setting switches (SW2-3, SW2-4) in combination. Note that the number of connection axes depends on the specifications of the upper level PLC.

∗8 Be sure to place a cap on unused CN1A/CN1B.

∗9 When not using the STO function, use the driver with the short-circuit connector (provided as an accessory) inserted.

∗10 Configure a circuit to turn off EM2 when the main circuit power is turned off to prevent any unexpected restarts of the driver.

Options

Motor cable, Lock cable, Encoder cable (LECSA, LECS□-T common)

LE − CS M − S 5 A

Motor type

S	AC servo motor

Cable description

M	Motor cable
B	Lock cable
E	Encoder cable

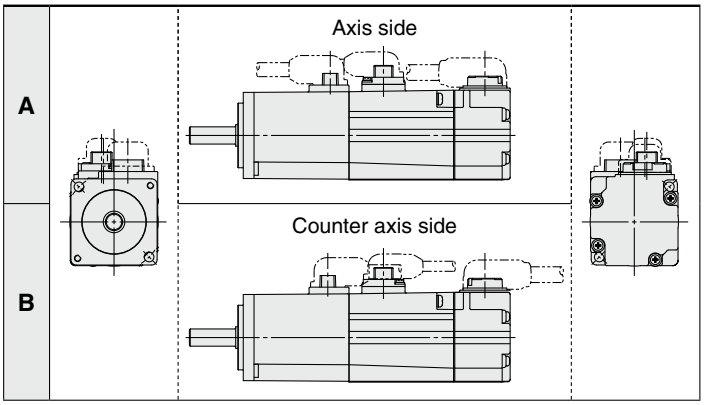
Cable type

S	Standard cable
R	Robotic cable

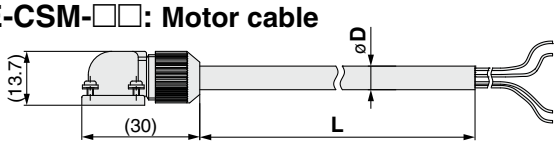
Cable length (L) [m]

2	2
5	5
A	10

Direction of connector



LE-CSM-□□: Motor cable



Product no.	ø D
LE-CSM-S□A	6.2
LE-CSM-S□B	
LE-CSM-R□A	5.7
LE-CSM-R□B	

Weight

Product no.	Length [m]	Weight [g]
LE-CSM-S2□	2	180
LE-CSM-S5□	5	400
LE-CSM-SA□	10	800
LE-CSM-R2□	2	180
LE-CSM-R5□	5	400
LE-CSM-RA□	10	800

LE-CSB-□□: Lock cable*1

Product no.	ø D
LE-CSB-S□A	4.7
LE-CSB-S□B	
LE-CSB-R□A	4.5
LE-CSB-R□B	

Weight

Product no.	Length [m]	Weight [g]
LE-CSB-S2□	2	80
LE-CSB-S5□	5	200
LE-CSB-SA□	10	400
LE-CSB-R2□	2	80
LE-CSB-R5□	5	200
LE-CSB-RA□	10	400

LE-CSE-□□: Encoder cable

Weight

Product no.	Length [m]	Weight [g]
LE-CSE-S2□	2	220
LE-CSE-S5□	5	600
LE-CSE-SA□	10	1200
LE-CSE-R2□	2	220
LE-CSE-R5□	5	600
LE-CSE-RA□	10	1200

*1 If using an actuator with a lock, a lock cable is required.

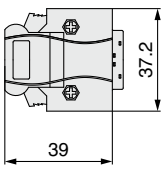
I/O connector (Without cable, Connector only)

LE − CSN A

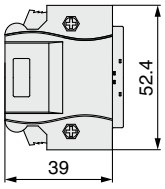
Driver type

A	**LECSA□, LECSC2-T□**
B	**LECSB2-T□**
S	**LECSN2-T, LECSS2-T□**

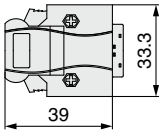
LE-CSNA



LE-CSNB



LE-CSNS



Weight

Product no.	Weight [g]
LE-CSNA	25
LE-CSNB	30
LE-CSNS	16

* LE-CSNA: 10126-3000PE (connector)/10326-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
  LE-CSNB: 10150-3000PE (connector)/10350-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
  LE-CSNS: 10120-3000PE (connector)/10320-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
* Applicable conductor size: AWG24 to 30
* If using the LECSB-T in any mode other than positioning mode, forced stop (EM2) wiring is required in all cases. (The electric actuator will not operate without the wiring.)
  Prepare an I/O connector or an I/O cable in advance.

Options

SSCNET Ⅲ optical cable (LECSS2-T□)

LE − CSS − 1

Motor type

S	AC servo motor

Cable description

S	SSCNET Ⅲ optical cable

Cable length

L	0.15 m
K	0.3 m
J	0.5 m
1	1 m
3	3 m

∗ LE-CSS-□ is MR-J3BUS□M manufactured by Mitsubishi Electric Corporation.

Weight

Product no.	Length [m]	Weight [g]
LE-CSS-L	0.15	100
LE-CSS-K	0.3	100
LE-CSS-J	0.5	200
LE-CSS-1	1	200
LE-CSS-3	3	200

I/O cable

LEC − CSN A − 1

Driver type

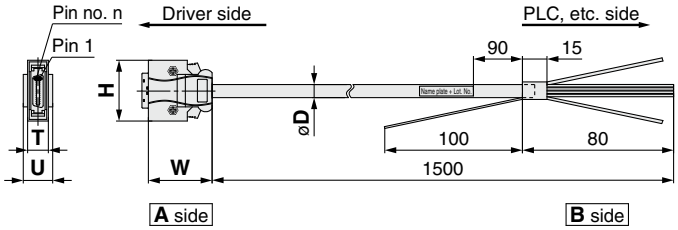
A	**LECSA□, LECSC2-T□**
B	**LECSB2-T□**
S	**LECSN2-T, LECSS2-T□**

Cable length (L) [m]

1	1.5

Weight

Product no.	Weight [g]
LEC-CSNA-1	303
LEC-CSNB-1	472
LEC-CSNS-1	221



∗ LEC-CSNA-1: 10126-3000PE (connector)/10326-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
LEC-CSNB-1: 10150-3000PE (connector)/10350-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
LEC-CSNS-1: 10120-3000PE (connector)/10320-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
∗ Conductor size: AWG24
∗ If using the LECSB-T in any mode other than positioning mode, forced stop (EM2) wiring is required in all cases. (The electric actuator will not operate without the wiring.)
Prepare an I/O connector or an I/O cable in advance.

Cable O.D.

Product no.	øD
LEC-CSNA-1	11.1
LEC-CSNB-1	13.8
LEC-CSNS-1	9.1

Dimensions/Pin Nos.

Product no.	W	H	T	U	Pin no. n
LEC-CSNA-1	39	37.2	12.7	14	14
LEC-CSNB-1		52.4		18	26
LEC-CSNS-1		33.3		14	21

Wiring

LEC-CSNA-1: Pin nos. 1 to 26
LEC-CSNB-1: Pin nos. 1 to 50
LEC-CSNS-1: Pin nos. 1 to 20

	Connector pin no.	Pair no. of wire	Insulation color	Dot mark	Dot color
A side	1	1	Orange	▬	Red
	2			▬	Black
	3	2	Light gray	▬	Red
	4			▬	Black
	5	3	White	▬	Red
	6			▬	Black
	7	4	Yellow	▬	Red
	8			▬	Black
	9	5	Pink	▬	Red
	10			▬	Black
	11	6	Orange	▬ ▬	Red
	12			▬ ▬	Black
	13	7	Light gray	▬ ▬	Red
	14			▬ ▬	Black
	15	8	White	▬ ▬	Red
	16			▬ ▬	Black
	17	9	Yellow	▬ ▬	Red
	18			▬ ▬	Black

	Connector pin no.	Pair no. of wire	Insulation color	Dot mark	Dot color
A side	19	10	Pink	▬ ▬	Red
	20			▬ ▬	Black
	21	11	Orange	▬ ▬ ▬	Red
	22			▬ ▬ ▬	Black
	23	12	Light gray	▬ ▬ ▬	Red
	24			▬ ▬ ▬	Black
	25	13	White	▬ ▬ ▬	Red
	26			▬ ▬ ▬	Black
	27	14	Yellow	▬ ▬ ▬	Red
	28			▬ ▬ ▬	Black
	29	15	Pink	▬ ▬ ▬	Red
	30			▬ ▬ ▬	Black
	31	16	Orange	▬ ▬ ▬ ▬	Red
	32			▬ ▬ ▬ ▬	Black
	33	17	Light gray	▬ ▬ ▬ ▬	Red
	34			▬ ▬ ▬ ▬	Black

	Connector pin no.	Pair no. of wire	Insulation color	Dot mark	Dot color
A side	35	18	White	▬ ▬ ▬ ▬	Red
	36			▬ ▬ ▬ ▬	Black
	37	19	Yellow	▬ ▬ ▬ ▬	Red
	38			▬ ▬ ▬ ▬	Black
	39	20	Pink	▬ ▬ ▬ ▬	Red
	40			▬ ▬ ▬ ▬	Black
	41	21	Orange	▬ ▬ ▬ ▬ ▬	Red
	42			▬ ▬ ▬ ▬ ▬	Black
	43	22	Light gray	▬ ▬ ▬ ▬ ▬	Red
	44			▬ ▬ ▬ ▬ ▬	Black
	45	23	White	▬ ▬ ▬ ▬ ▬	Red
	46			▬ ▬ ▬ ▬ ▬	Black
	47	24	Yellow	▬ ▬ ▬ ▬ ▬	Red
	48			▬ ▬ ▬ ▬ ▬	Black
	49	25	Pink	▬ ▬ ▬ ▬ ▬	Red
	50			▬ ▬ ▬ ▬ ▬	Black

Options

Regeneration option (LECS□ common)

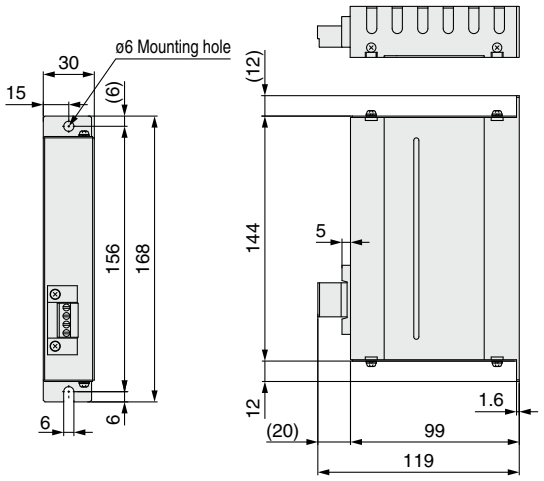
LEC − MR − RB − 12

Regeneration option type

032	Allowable regenerative power 30 W
12	Allowable regenerative power 100 W

∗ Confirm regeneration option to be used in "Model Selection."

LEC-MR-RB-032

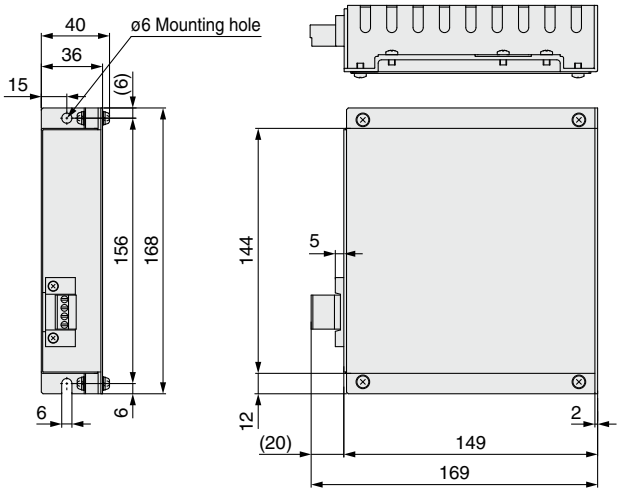


Weight

Product no.	Weight [kg]
LEC-MR-RB-032	0.5

∗ MR-RB032 manufactured by Mitsubishi Electric Corporation

LEC-MR-RB-12



Weight

Product no.	Weight [kg]
LEC-MR-RB-12	1.1

∗ MR-RB12 manufactured by Mitsubishi Electric Corporation

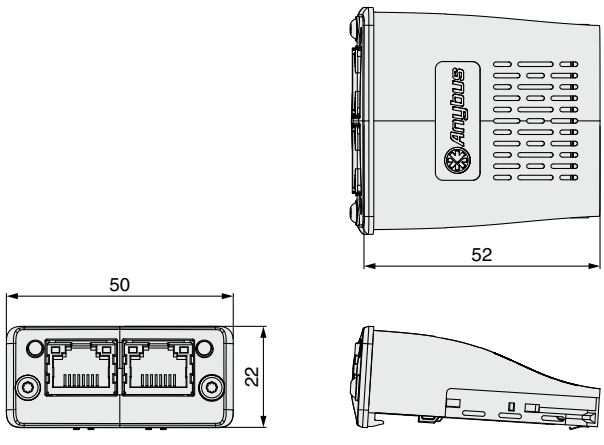
Network card (LECSN2-T□)

LEC − S − N9

Network card type

NE	EtherCAT
N9	EtherNet/IP™
NP	PROFINET

LEC-S-□ common



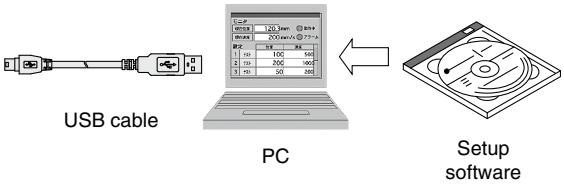
Weight

Product no.	Weight [g]
LEC-S-□	30

Options

LECSA LECSB2-T□ LECSC2-T□ LECSS2-T□ LECSN2-T□

Drivers



Setup software (MR Configurator2™) (LECSA, LECSB2-T□, LECSC2-T□, LECSS-T, LECSN2-T□ common)

LEC−MRC2□

Display language

Nil	Japanese version
E	English version
C	Chinese version

∗ SW1DNC-MRC2-□ manufactured by Mitsubishi Electric Corporation
Refer to Mitsubishi Electric Corporation's website for operating environment and version upgrade information.
MR Configurator2™ is a registered trademark or trademark of Mitsubishi Electric Corporation.

Adjustment, waveform display, diagnostics, parameter read/write, and test operation can be performed upon a PC.

Compatible PC

When using setup software (MR Configurator2™), use an IBM PC/AT compatible PC that meets the following operating conditions.

Hardware Requirements

Equipment		Setup software (MR Configurator2™) **LEC-MRC2□**
∗1, 2, 3, 4, 5, 6, 7, 8, 9, 10 PC	OS	Microsoft® Windows® 10 Edition Microsoft® Windows® 10 Enterprise Microsoft® Windows® 10 Pro Microsoft® Windows® 10 Home Microsoft® Windows® 8.1 Enterprise Microsoft® Windows® 8.1 Pro Microsoft® Windows® 8.1 Microsoft® Windows® 8 Enterprise Microsoft® Windows® 8 Pro Microsoft® Windows® 8 Microsoft® Windows® 7 Ultimate Microsoft® Windows® 7 Enterprise Microsoft® Windows® 7 Professional Microsoft® Windows® 7 Home Premium Microsoft® Windows® 7 Starter Microsoft® Windows Vista® Ultimate Microsoft® Windows Vista® Enterprise Microsoft® Windows Vista® Business Microsoft® Windows Vista® Home Premium Microsoft® Windows Vista® Home Basic Microsoft® Windows® XP Professional, Service Pack 3 or later Microsoft® Windows® XP Home Edition, Service Pack 3 or later
	Hard disk	1 GB or more of free space
	Communication interface	Use USB port.
Display		Resolution 1024 x 768 or more Must be capable of high color (16-bit) display. Connectable with the PC above
Keyboard		Connectable with the PC above
Mouse		Connectable with the PC above
Printer		Connectable with the PC above
USB cable∗11		LEC-MR-J3USB

∗1 Before using a PC for setting LECSA point table method/program operation method, upgrade to version 1.18U (Japanese version)/ version 1.19V (English version) or later. Refer to Mitsubishi Electric Corporation's website for version upgrade information.
∗2 Windows® and Windows Vista® are registered trademarks of Microsoft Corporation in the United States and other countries.
∗3 On some PCs, setup software (MR Configurator2™) may not run properly.
∗4 The following functions cannot be used. If any of the following functions is used, this product may not operate normally.
· Start of application in Windows® compatible mode
· Fast User Switching
· Remote Desktop
· Windows XP Mode
· Windows Touch or Touch
· Modern UI
· Client Hyper-V
· Tablet Mode
· Virtual desktop
· 64-bit OSs are not supported, except for Microsoft® Windows®7 or later.
∗5 Multi-display is set, the screen of this product may not operate normally.
∗6 The size of the text or other items on the screen is not changed to the specified value (96 DPI, 100%, 9 pt, etc.), the screen of this product may not operate normally.
∗7 Changed the resolution of the screen during operating, the screen of this product may not operate normally.
∗8 Please use by "Standard User," "Administrator" in Windows Vista® or later.
∗9 Using a PC for setting Windows®10, upgrade to version 1.52E or later.
Using a PC for setting Windows®8.1, upgrade to version 1.25B or later.
Using a PC for setting Windows®8, upgrade to version 1.20W or later.
Refer to Mitsubishi Electric Corporation's website for version upgrade information.
∗10 If .NET Framework 3.5 (including .NET 2.0 and 3.0) have been disabled in Windows®7 or later, it is necessary to enable it.
∗11 Order USB cable separately.
· This cable is compatible with the setup software (MR Configurator™: LEC-MR-SETUP221□).

Setup Software Compatible Drivers

Compatible driver	Setup software	
	MR Configurator™	MR Configurator2™
	LEC-MR-SETUP221□	LEC-MRC2□
LECSA	○	○
LECSB2-T□	—	○
LECSC2-T□	—	○
LECSS2-T□	—	○
LECSN2-T□	—	○

Options

USB cable (3 m)
(LECSA, LECSB-T, LECSC-T, LECSN-T, LECSS-T common)

LEC−MR−J3USB

∗ MR-J3USBCBL3M manufactured by Mitsubishi Electric Corporation

Weight: 140 g

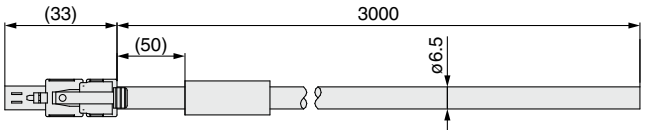
Cable for connecting PC and driver when using the setup software (MR Configurator2™)
Do not use any cable other than this cable.

STO cable (3 m)
(Only for LECSB2-T□, LECSN2-T□, and LECSS2-T□)

LEC−MR−D05UDL3M

∗ MR-D05UDL3M manufactured by Mitsubishi Electric Corporation

Cable for connecting the driver and device, when using the safety function
Do not use any cable other than this cable.



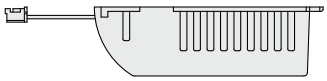
Weight: 500 g

Battery

LEC−MR−J3BAT

∗ MR-J3BAT manufactured by Mitsubishi Electric Corporation

Battery for replacement
Absolute position data is maintained by installing the battery to the driver.



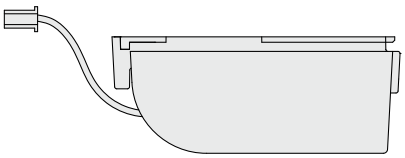
Weight: 30 g

∗ The LEC-MR-J3BAT is a single battery that uses lithium metal battery ER6V. When transporting lithium metal batteries and devices with built-in lithium metal batteries by a method subject to UN regulations, it is necessary to apply measures according to the regulations stipulated in the United Nations Recommendations on the Transport of Dangerous Goods, the Technical Instructions (ICAO-TI) of the International Civil Aviation Organization (ICAO), and the International Maritime Dangerous Goods Code (IMDG CODE) of the International Maritime Organization (IMO). If a customer is transporting products such as shown above, it is necessary to confirm the latest regulations, or the laws and regulations of the country of transport on your own, in order to apply the proper measures. Please contact SMC sales representative for details.

LEC−MR−BAT6V1SET

∗ MR-BAT6V1SET manufactured by Mitsubishi Electric Corporation

Battery for replacement
Absolute position data is maintained by installing the battery to the driver.

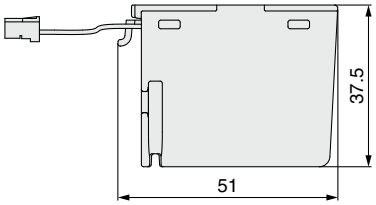


Weight: 60 g

LEC−MR−BAT6V1SET-A

∗ MR-BAT6V1SET-A manufactured by Mitsubishi Electric Corporation

Battery for replacement
Absolute position data is maintained by installing the battery to the driver.



Weight: 60 g

∗ The LEC-MR-BAT6V1SET and LEC-MR-BAT6V1SET-A are assembled batteries that use lithium metal battery 2CR17335A.
When transporting lithium metal batteries and devices with built-in lithium metal batteries by a method subject to UN regulations, it is necessary to apply measures according to the regulations stipulated in the United Nations Recommendations on the Transport of Dangerous Goods, the Technical Instructions (ICAO-TI) of the International Civil Aviation Organization (ICAO), and the International Maritime Dangerous Goods Code (IMDG CODE) of the International Maritime Organization (IMO). If a customer is transporting products such as shown above, it is necessary to confirm the latest regulations, or the laws and regulations of the country of transport on your own, in order to apply the proper measures. Please contact SMC sales representative for details.

Battery Types and Compatible Drivers

Compatible driver	Battery type		
	LEC-MR-J3BAT	LEC-MR-BAT6V1SET	LEC-MR-BAT6V1SET-A
LECSB□-T□	—	○	—
LECSC□-T□	○	—	—
LECSS□-T□	—	○	—
LECSN□-T□	—	—	○

MECHATROLINK Compatible

AC Servo Motor Driver
Absolute Type
LECYM/LECYU Series

(MECHATROLINK-Ⅱ Type) (MECHATROLINK-Ⅲ Type)

LECYM LECYU

CE RoHS

∗ For details, refer to page 116 and onwards.

How to Order

Driver LECY **M** **2** – □

Driver type

M	MECHATROLINK-Ⅱ type (For absolute encoder)
U	MECHATROLINK-Ⅲ type (For absolute encoder)

Power supply voltage

2	200 to 230 VAC, 50/60 Hz

∗ **If an I/O connector (CN1) is required, order the part number "LE-CYNA" separately.**
∗ **If an I/O cable (CN1) is required, order the part number "LEC-CSNA-1" separately.**

Compatible motor type

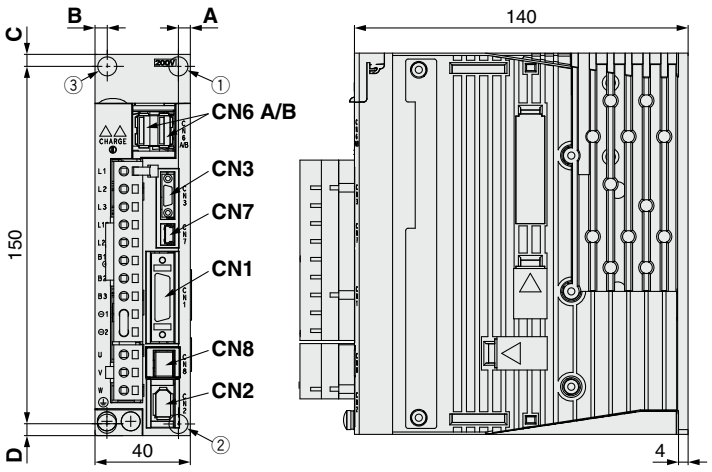
Symbol	Type	Capacity	Encoder
V5	AC servo motor (V6∗1)	100 W	Absolute
V7	AC servo motor (V7∗1)	200 W	

∗1 The symbol shows the motor type (actuator).

Dimensions

MECHATROLINK-Ⅱ type

LECYM2-V□



Connector name	Description
CN1	I/O signal connector
CN2	Encoder connector
CN3∗1	Digital operator connector
CN6A	MECHATROLINK-Ⅱ communication connector
CN6B	MECHATROLINK-Ⅱ communication connector
CN7	PC connector
CN8	Safety connector

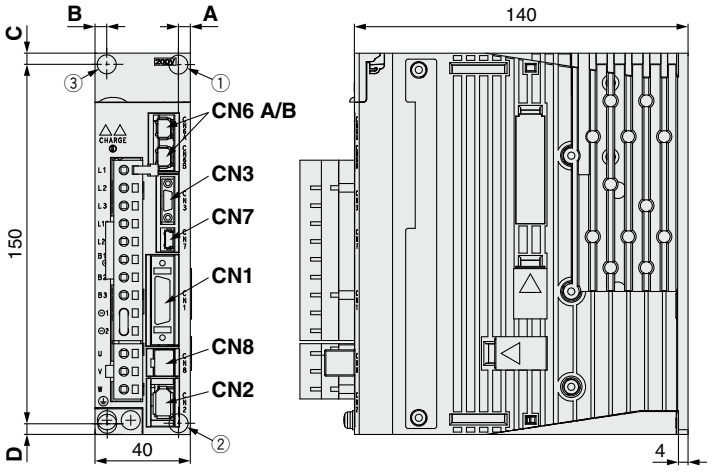
∗1 Digital operator is JUSP-OP05A-1-E manufactured by YASKAWA Electric Corporation. When using the digital operator, it should be provided by the customer.

Motor capacity	Hole position	Mounting dimensions A	B	C	D	Mounting hole
V5 (100 W)	①②	5	—	5	5	ø5
V7 (200 W)	①②	5	—	5	5	

∗ The mounting hole position varies depending on the motor capacity.

MECHATROLINK-Ⅲ type

LECYU2-V□



Connector name	Description
CN1	I/O signal connector
CN2	Encoder connector
CN3∗1	Digital operator connector
CN6A	MECHATROLINK-Ⅲ communication connector
CN6B	MECHATROLINK-Ⅲ communication connector
CN7	PC connector
CN8	Safety connector

∗1 Digital operator is JUSP-OP05A-1-E manufactured by YASKAWA Electric Corporation. When using the digital operator, it should be provided by the customer.

Motor capacity	Hole position	Mounting dimensions A	B	C	D	Mounting hole
V5 (100 W)	①②	5	—	5	5	ø5
V7 (200 W)	①②	5	—	5	5	

∗ The mounting hole position varies depending on the motor capacity.

Specifications

MECHATROLINK-Ⅱ Type

Model			LECYM2-V5	LECYM2-V7
Compatible motor capacity [W]			100	200
Compatible encoder			Absolute 20-bit encoder (Resolution: 1048576 p/rev)	
Main circuit power supply	Power voltage [V]		Three phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]		Three phase 170 to 253 VAC	
Control power supply	Power voltage [V]		Single phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]		Single phase 170 to 253 VAC	
Power supply capacity (at rated output) [A]			0.91	1.6
Input circuit			NPN (Sink circuit)/PNP (Source circuit)	
Parallel input (7 inputs)	Number of optional allocations	7 inputs	[Initial allocation] · Homing deceleration switch (/DEC) · External latch (/EXT 1 to 3) · Forward run prohibited (P-OT), reverse run prohibited (N-OT) [Can be allocated by setting the parameters] · Forward external torque limit (/P-CL), reverse external torque limit (/N-CL) Signal allocations can be performed, and positive and negative logic can be changed.	
Parallel output (4 outputs)	Number of fixed allocations	1 output	· Servo alarm (ALM)	
	Number of optional allocations	3 outputs	[Initial allocation] · Lock (/BK) [Can be allocated by setting the parameters] · Positioning completion (/COIN) · Speed limit detection (/VLT) · Speed coincidence detection (/V-CMP) · Rotation detection (/TGON) · Warning (/WARN) · Servo ready (/S-RDY) · Near (/NEAR) · Torque limit detection (/CLT) Signal allocations can be performed, and positive and negative logic can be changed.	
MECHATROLINK communication	Communication protocol		MECHATROLINK-Ⅱ	
	Station address		41H to 5FH	
	Transmission speed		10 Mbps	
	Transmission cycle		250 μs, 0.5 ms to 4 ms (Multiples of 0.5 ms)	
	Number of transmission bytes		17 bytes, 32 bytes	
	Max. number of stations		30	
	Cable length		Overall cable length: 50 m or less, Cable length between the stations: 0.5 m or more	
Command method	Control method		Position, speed, or torque control with MECHATROLINK-Ⅱ communication	
	Command input		MECHATROLINK-Ⅱ command (Motion, data setting, monitoring, or adjustment)	
Function	Gain adjustment		Tuning-less/Advanced auto tuning/One-parameter tuning	
	Communication setting		USB communication, RS-422 communication	
	Torque limit		Internal torque limit, external torque limit, and torque limit by analog command	
	Encoder output		Phase A, B, Z: Line driver output	
	Emergency stop		CN8 Safety function	
	Overtravel		Dynamic brake stop, deceleration to a stop, or free run to a stop at P-OT or N-OT	
	Alarm		Alarm signal, MECHATROLINK-Ⅱ command	
Operating temperature range [°C]			0 to 55 (No freezing)	
Operating humidity range [%RH]			90 or less (No condensation)	
Storage temperature range [°C]			–20 to 85 (No freezing)	
Storage humidity range [%RH]			90 or less (No condensation)	
Insulation resistance [MΩ]			10 MΩ (500 VDC)	
Safety function			STO (IEC 61800-5-2)	
Safety standards*1			EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL2, IEC 62061 SIL CL2, IEC 61800-5-2	
Weight [g]			900	

*1 Refer to the LECYM operation manual for details.

Specifications

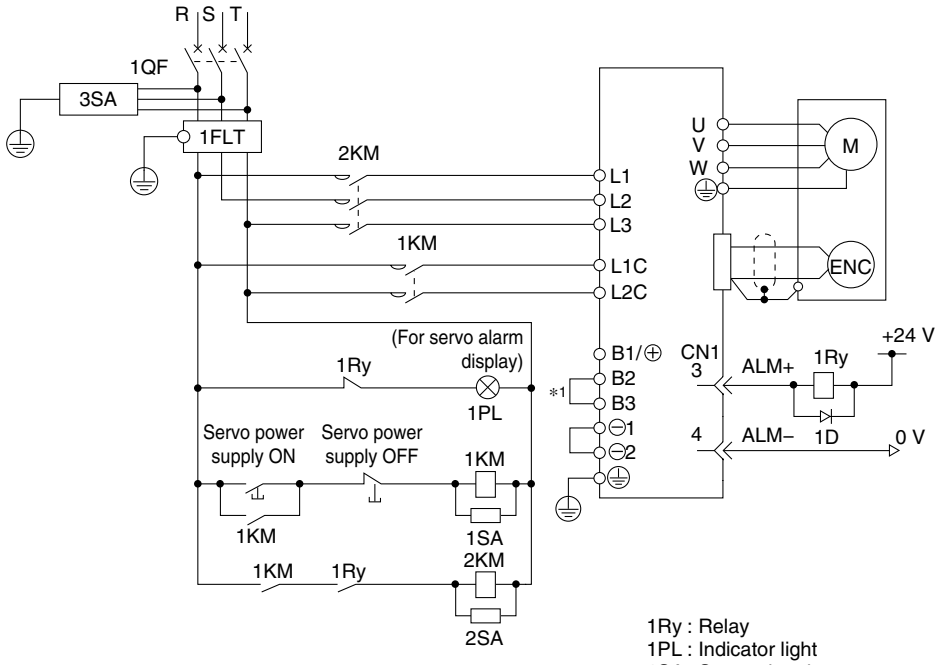
MECHATROLINK-Ⅲ Type

Model			LECYU2-V5	LECYU2-V7
Compatible motor capacity [W]			100	200
Compatible encoder			Absolute 20-bit encoder (Resolution: 1048576 p/rev)	
Main circuit power supply	Power voltage [V]		Three phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]		Three phase 170 to 253 VAC	
Control power supply	Power voltage [V]		Single phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage fluctuation [V]		Single phase 170 to 253 VAC	
Power supply capacity (at rated output) [A]			0.91	1.6
Input circuit			NPN (Sink circuit)/PNP (Source circuit)	
Parallel input (7 inputs)	Number of optional allocations	7 inputs	[Initial allocation] · Homing deceleration switch (/DEC) · External latch (/EXT 1 to 3) · Forward run prohibited (P-OT), reverse run prohibited (N-OT) [Can be allocated by setting the parameters] · Forward external torque limit (/P-CL), reverse external torque limit (/N-CL) Signal allocations can be performed, and positive and negative logic can be changed.	
Parallel output (4 outputs)	Number of fixed allocations	1 output	· Servo alarm (ALM)	
	Number of optional allocations	3 outputs	[Initial allocation] · Lock (/BK) [Can be allocated by setting the parameters] · Positioning completion (/COIN) · Speed limit detection (/VLT) · Speed coincidence detection (/V-CMP) · Rotation detection (/TGON) · Warning (/WARN) · Servo ready (/S-RDY) · Near (/NEAR) · Torque limit detection (/CLT) Signal allocations can be performed, and positive and negative logic can be changed.	
MECHATROLINK communication	Communication protocol		MECHATROLINK-Ⅲ	
	Station address		03H to EFH	
	Transmission speed		100 Mbps	
	Transmission cycle		125 μs, 250 μs, 500 μs, 750 μs, 1 ms to 4 ms (Multiples of 0.5 ms)	
	Number of transmission bytes		16 bytes, 32 bytes, 48 bytes	
	Max. number of stations		62	
	Cable length		Cable length between the stations: 0.5 m or more, 75 m or less	
Command method	Control method		Position, speed, or torque control with MECHATROLINK-Ⅲ communication	
	Command input		MECHATROLINK-Ⅲ command (Motion, data setting, monitoring, or adjustment)	
Function	Gain adjustment		Tuning-less/Advanced auto tuning/One-parameter tuning	
	Communication setting		USB communication, RS-422 communication	
	Torque limit		Internal torque limit, external torque limit, and torque limit by analog command	
	Encoder output		Phase A, B, Z: Line driver output	
	Emergency stop		CN8 Safety function	
	Overtravel		Dynamic brake stop, deceleration to a stop, or free run to a stop at P-OT or N-OT	
	Alarm		Alarm signal, MECHATROLINK-Ⅲ command	
Operating temperature range [°C]			0 to 55 (No freezing)	
Operating humidity range [%RH]			90 or less (No condensation)	
Storage temperature range [°C]			–20 to 85 (No freezing)	
Storage humidity range [%RH]			90 or less (No condensation)	
Insulation resistance [MΩ]			10 MΩ (500 VDC)	
Safety function			STO (IEC 61800-5-2)	
Safety standards*1			EN ISO 13849-1 Category 3 PL d, IEC 61508 SIL2, IEC 62061 SIL CL2, IEC 61800-5-2	
Weight [g]			900	

*1 Refer to the LECYU operation manual for details.

Power Supply Wiring Example: LECY□

■Three phase 200 V LECYM2-□ LECYU2-□



1QF : Molded-case circuit breaker
1FLT: Noise filter
1KM : Magnetic contactor (for control power supply)
2KM : Magnetic contactor (for main circuit power supply)

1Ry : Relay
1PL : Indicator light
1SA : Surge absorber
2SA : Surge absorber
3SA : Surge absorber
1D : Flywheel diode

*1 For the LECY□2-V5 and LECY□2-V7, terminals B2 and B3 are not short-circuited. Do not short-circuit these terminals.

Main Circuit Power Supply Connector * Accessory

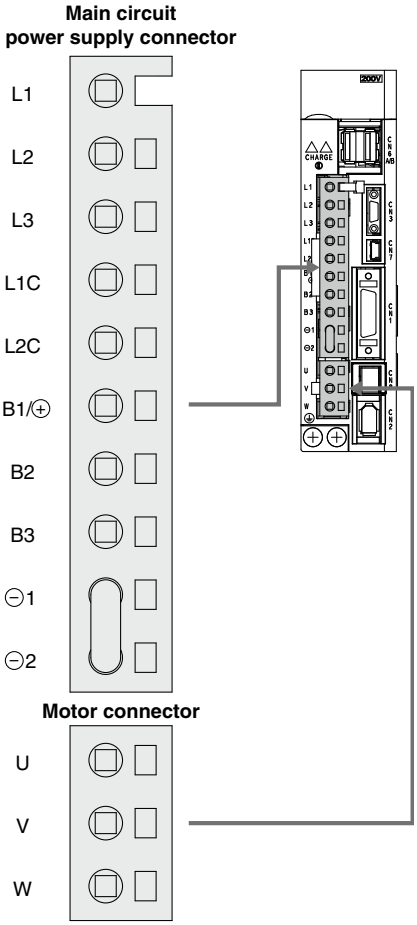
Terminal name	Function	Details
L1	Main circuit power supply	Connect the main circuit power supply. Single phase 200 to 230 VAC, 50/60 Hz Connection terminal: L1, L2 Three phase 200 to 230 VAC, 50/60 Hz Connection terminal: L1, L2, L3
L2		
L3		
L1C	Control power supply	Connect the control power supply. Single phase 200 to 230 VAC, 50/60 Hz Connection terminal: L1C, L2C
L2C		
B1/⊕	External regenerative resistor connection terminal	When the regenerative resistor is required, connect it between terminals B1⊕ and B2.
B2		
B3		
⊖1	Main circuit negative terminal	⊖1 and ⊖2 are connected at shipment.
⊖2		

Motor Connector * Accessory

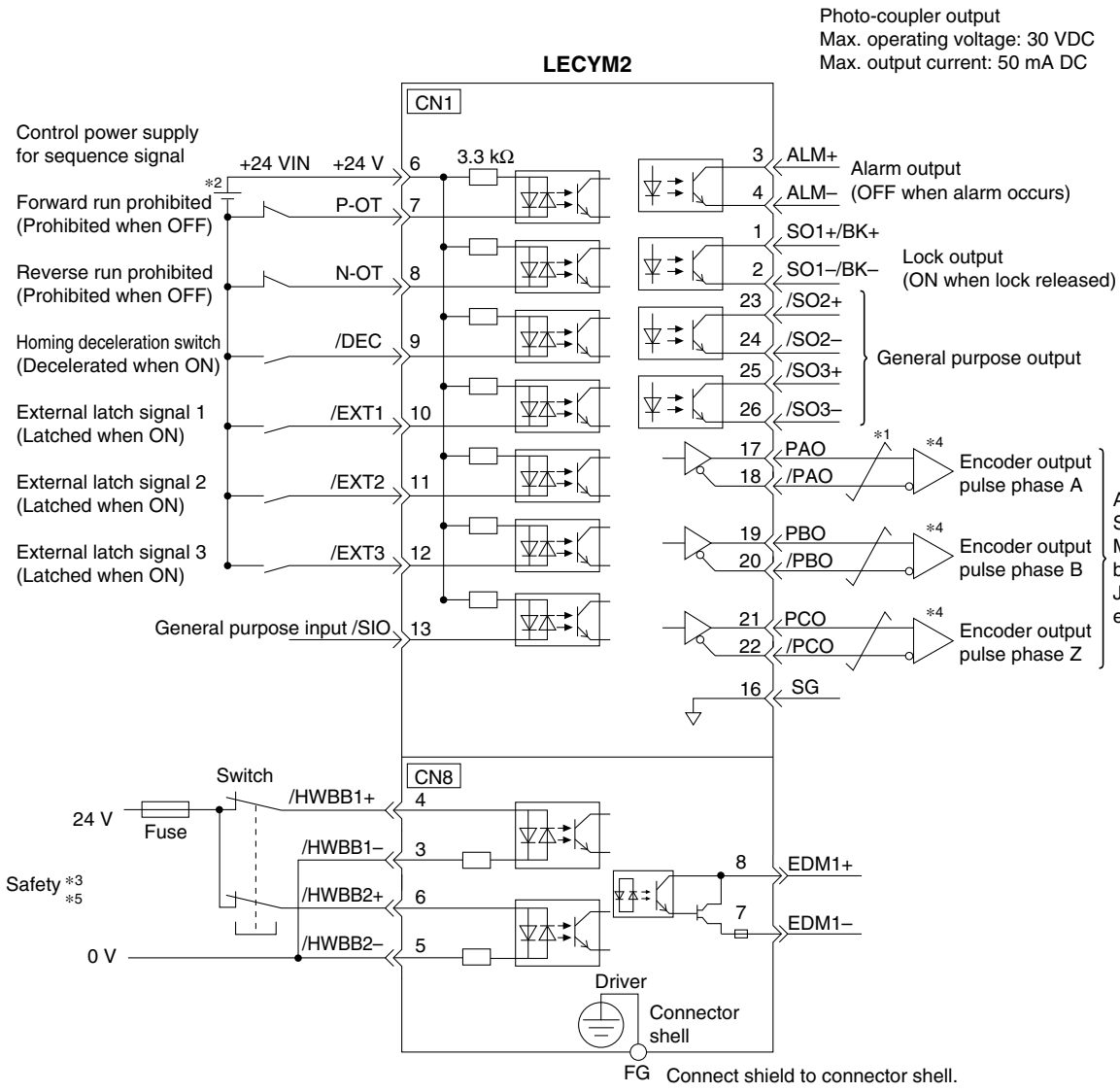
Terminal name	Function	Details
U	Servo motor power (U)	Connect to motor cable (U, V, W).
V	Servo motor power (V)	
W	Servo motor power (W)	

Power Supply Wire Specifications

Item	Specifications
Applicable wire size	L1, L2, L3, L1C, L2C Single wire, Twisted wire, AWG14 (2.0 mm^2)
Stripped wire length	8 to 9 mm



Control Signal Wiring Example: LECYM



*1 ⫽ shows twisted-pair wires.

*2 The 24 VDC power supply is not included. Use a 24 VDC power supply with double insulation or reinforced insulation.

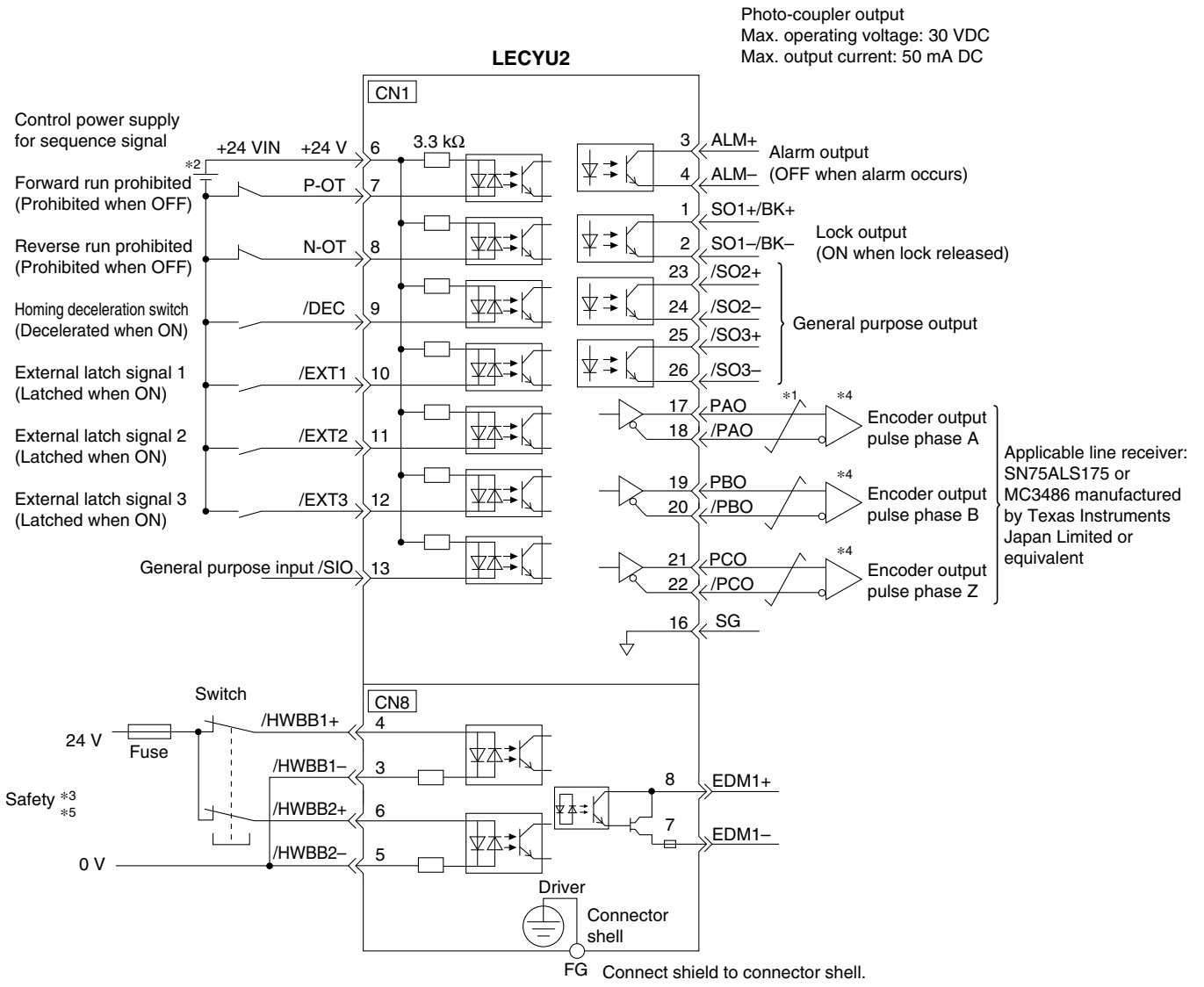
*3 When using the safety function, a safety function device must be connected to the wiring that is necessary to activate the safety function. Otherwise, the servo motor is not turned ON. When not using the safety function, use the driver with the Safety Jumper Connector (provided as an accessory) inserted into the CN8.

*4 Always use line receivers to receive the output signals.

** The functions allocated to the input signals /DEC, P-OT, N-OT, /EXT1, /EXT2, and /EXT3, and the output signals /SO1, /SO2, and /SO3 can be changed by setting the parameters.

*5 It is a safety function equivalent to the STO function (IEC 61800-5-2) using the hard wire base block function (HWBB).

Control Signal Wiring Example: LECYU



*1 ⫽ shows twisted-pair wires.

*2 The 24 VDC power supply is not included. Use a 24 VDC power supply with double insulation or reinforced insulation.

*3 When using the safety function, a safety function device must be connected to the wiring that is necessary to activate the safety function. Otherwise, the servo motor is not turned ON. When not using the safety function, use the driver with the Safety Jumper Connector (provided as an accessory) inserted into the CN8.

*4 Always use line receivers to receive the output signals.

** The functions allocated to the input signals /DEC, P-OT, N-OT, /EXT1, /EXT2, and /EXT3, and the output signals /SO1, /SO2, and /SO3 can be changed by setting the parameters.

*5 It is a safety function equivalent to the STO function (IEC 61800-5-2) using the hard wire base block function (HWBB).

Options

Motor cable, Motor cable for lock option, Encoder cable (LECYM/LECYU common)

LE − CY M − S 5 A − 5

Motor type

Y	AC servo motor

Cable description

M	Motor cable
B	Motor cable for lock option
E	Encoder cable (With battery case)

Cable type

S	Standard cable
R	Robotic cable

Cable length (L) [m]

3	3
5	5
A	10
C	20

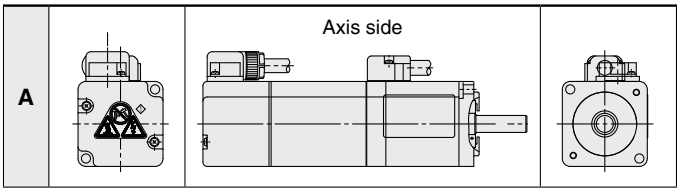
Motor capacity

5	100 W
7	200 W

∗ For encoder cable, the suffix "–□" (Motor capacity) is not necessary.

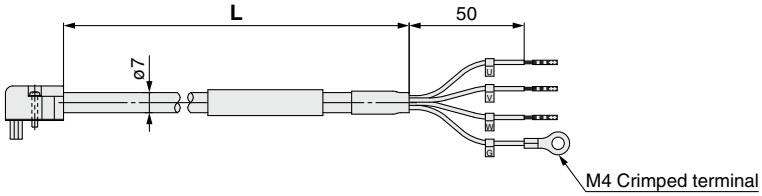
Direction of connector

A



∗ The cable entry direction is axis side only.

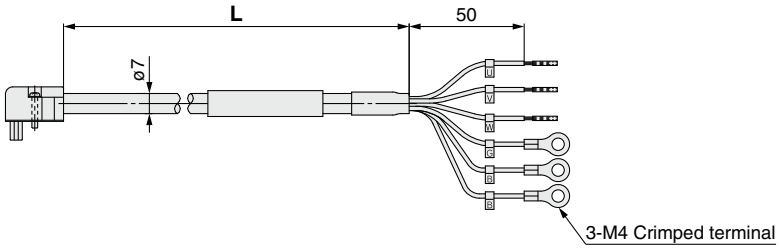
LE-CYM-□□A-□: Motor cable



Weight

Product no.	Length [m]	Weight [g]	Note
LE-CYM-S3A-5	3	250	100 W
LE-CYM-S5A-5	5	390	
LE-CYM-SAA-5	10	750	
LE-CYM-SCA-5	20	1500	
LE-CYM-S3A-7	3	250	200 W
LE-CYM-S5A-7	5	390	
LE-CYM-SAA-7	10	750	
LE-CYM-SCA-7	20	1500	
LE-CYM-R3A-5	3	220	100 W
LE-CYM-R5A-5	5	350	
LE-CYM-RAA-5	10	670	
LE-CYM-RCA-5	20	1300	
LE-CYM-R3A-7	3	220	200 W
LE-CYM-R5A-7	5	350	
LE-CYM-RAA-7	10	670	
LE-CYM-RCA-7	20	1300	

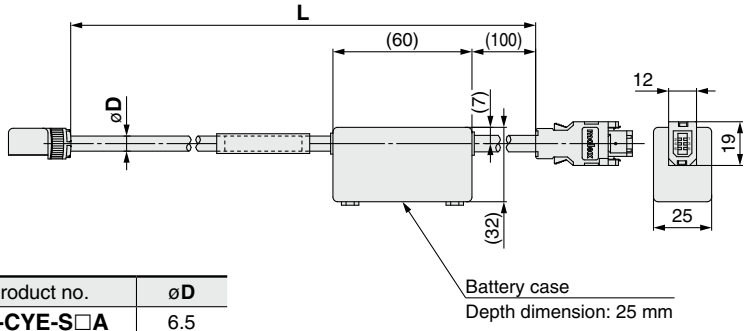
LE-CYB-□□A-□: Motor cable for lock option



Weight

Product no.	Length [m]	Weight [g]	Note
LE-CYB-S3A-5	3	240	100 W
LE-CYB-S5A-5	5	390	
LE-CYB-SAA-5	10	750	
LE-CYB-SCA-5	20	1490	
LE-CYB-S3A-7	3	240	200 W
LE-CYB-S5A-7	5	390	
LE-CYB-SAA-7	10	750	
LE-CYB-SCA-7	20	1490	
LE-CYB-R3A-5	3	220	100 W
LE-CYB-R5A-5	5	350	
LE-CYB-RAA-5	10	670	
LE-CYB-RCA-5	20	1300	
LE-CYB-R3A-7	3	220	200 W
LE-CYB-R5A-7	5	350	
LE-CYB-RAA-7	10	670	
LE-CYB-RCA-7	20	1300	

LE-CYE-□□A: Encoder cable



Product no.	øD
LE-CYE-S□A	6.5
LE-CYE-R□A	6.8

Weight

Product no.	Length [m]	Weight [g]
LE-CYE-S3A	3	230
LE-CYE-S5A	5	360
LE-CYE-SAA	10	680
LE-CYE-SCA	20	1250
LE-CYE-R3A	3	220
LE-CYE-R5A	5	330
LE-CYE-RAA	10	660
LE-CYE-RCA	20	1240

∗ LE-CYM-S□A-□ is JZSP-CSM0□-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
LE-CYB-S□A-□ is JZSP-CSM1□-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
LE-CYE-S□A is JZSP-CSP05-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
LE-CYM-R□A-□ is JZSP-CSM2□-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
LE-CYB-R□A-□ is JZSP-CSM3□-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
LE-CYE-R□A is JZSP-CSP25-□□-E manufactured by YASKAWA CONTROLS CO., LTD.

Options

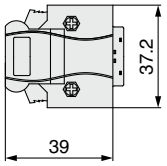
I/O connector (Without cable, Connector only)

LE − CYN A

Driver type

A	**For LECYM2, LECYU2**

LE-CYNA



Weight

Product no.	Weight [g]
LE-CYNA	25

∗ LE-CYNA: 10126-3000PE (connector)/10326-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
∗ Conductor size: AWG24 to 30

I/O cable

LEC − CSN A − 1

Driver type

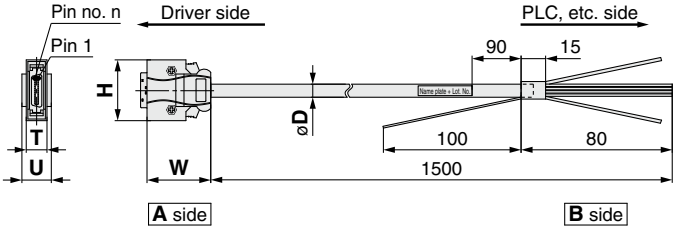
A	**For LECYM2, LECYU2**

Cable length (L) [m]

1	1.5

Weight

Product no.	Weight [g]
LEC-CSNA-1	303



∗ LEC-CSNA-1: 10126-3000PE (connector)/10326-52F0-008 (shell kit) manufactured by 3M Japan Limited or equivalent
∗ Conductor size: AWG24

Wiring

LEC-CSNA-1: Pin nos. 1 to 26

Connector pin no.		Pair no. of wire	Insulation color	Dot mark	Dot color
A side	1	1	Orange	▬	Red
	2			▬	Black
	3	2	Light gray	▬	Red
	4			▬	Black
	5	3	White	▬	Red
	6			▬	Black
	7	4	Yellow	▬	Red
	8			▬	Black
	9	5	Pink	▬	Red
	10			▬	Black

Connector pin no.		Pair no. of wire	Insulation color	Dot mark	Dot color
A side	11	6	Orange	▬ ▬	Red
	12			▬ ▬	Black
	13	7	Light gray	▬ ▬	Red
	14			▬ ▬	Black
	15	8	White	▬ ▬	Red
	16			▬ ▬	Black
	17	9	Yellow	▬ ▬	Red
	18			▬ ▬	Black
	19	10	Pink	▬ ▬	Red
	20			▬ ▬	Black

Connector pin no.		Pair no. of wire	Insulation color	Dot mark	Dot color
A side	21	11	Orange	▬ ▬ ▬	Red
	22			▬ ▬ ▬	Black
	23	12	Light gray	▬ ▬ ▬	Red
	24			▬ ▬ ▬	Black
	25	13	White	▬ ▬ ▬	Red
	26			▬ ▬ ▬	Black

Cable O.D.

Product no.	øD
LEC-CSNA-1	11.1

Dimensions/Pin No.

Product no.	W	H	T	U	Pin no. n
LEC-CSNA-1	39	37.2	12.7	14	14

Options

MECHATROLINK cable type

LEC−CY M − 1

Motor type

Y	AC servo motor

Cable description

M	MECHATROLINK-Ⅱ cable
U	MECHATROLINK-Ⅲ cable

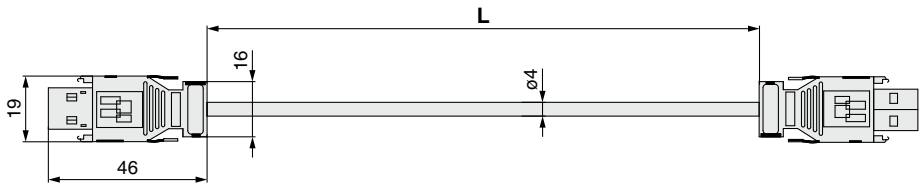
Cable length (L)

L∗1	0.2 m
J	0.5 m
1	1 m
3	3 m

∗1 Not available for the MECHATROLINK-Ⅱ cable

∗ LEC-CYM-□ is JEPMC-W6002-□□-E manufactured by YASKAWA CONTROLS CO., LTD.
∗ LEC-CYU-□ is JEPMC-W6012-□□-E manufactured by YASKAWA CONTROLS CO., LTD.

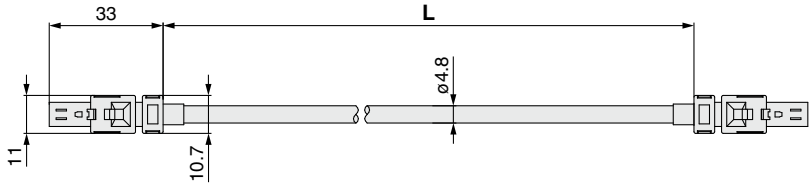
MECHATROLINK-Ⅱ cable



Weight

Product no.	Length [m]	Weight [g]
LEC-CYM-J	0.5	50
LEC-CYM-1	1	80
LEC-CYM-3	3	200

MECHATROLINK-Ⅲ cable



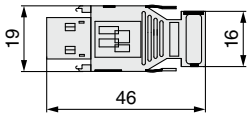
Weight

Product no.	Length [m]	Weight [g]
LEC-CYU-L	0.2	21
LEC-CYU-J	0.5	41
LEC-CYU-1	1	75
LEC-CYU-3	3	205

Terminating connector for MECHATROLINK-Ⅱ

LEC−CYRM

∗ LEC-CYRM is JEPMC-W6022-E manufactured by YASKAWA CONTROLS CO., LTD.



Weight: 10 g

Options

LECYM2 LECYU2
Drivers

USB cable

PC

Setup software (SigmaWin+™) (LECYM/LECYU common)

∗ Please download the SigmaWin+™ via our website.
SigmaWin+™ is a registered trademark or trademark of YASKAWA Electric Corporation.

Adjustment, waveform display, parameter read/write, and test operation can be performed upon a PC.

Compatible PC

When using setup software (SigmaWin+™), use an IBM PC/AT compatible PC that meets the following operating conditions.

Hardware Requirements

Equipment		Setup software (SigmaWin+™)
PC ∗1, 2, 3, 4	OS	Windows® XP∗5, Windows Vista®, Windows® 7 (32-bit/64-bit)
	Available HD space	350 MB or more (When the software is installed, 400 MB or more is recommended.)
	Communication interface	Use USB port.
Display		XVGA monitor (1024 x 768 or more, "The small font is used.") 256 color or more (65536 color or more is recommended.) Connectable with the PC above
Keyboard		Connectable with the PC above
Mouse		Connectable with the PC above
Printer		Connectable with the PC above
USB cable		LEC-JZ-CVUSB∗6
Other		Adobe Reader Ver. 5.0 or higher (∗ Except Ver. 6.0)

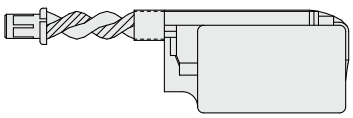
∗1 Windows, Windows Vista®, Windows® 7 are registered trademarks of Microsoft Corporation in the United States and/or other countries.
∗2 On some PCs, this software may not run properly.
∗3 Not compatible with 64-bit Windows® XP and 64-bit Windows Vista®
∗4 For Windows® XP, please use it by the administrator authority (When installing and using it.).
∗5 In PC that uses the program to correct the problem of HotfixQ328310, it is likely to fail in the installation. In that case, please use the program to correct the problem of HotfixQ329623.
∗6 Order USB cable separately.

Battery (LECYM/LECYU common)

LEC−JZ−CVBAT

∗ JZSP-BA01 manufactured by YASKAWA CONTROLS CO., LTD.

Battery for replacement
Absolute position data is maintained by installing the battery to the battery case of the encoder cable.



Weight: 10 g

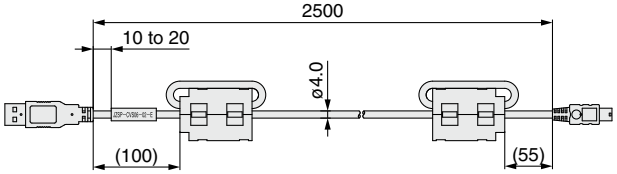
∗ The LEC-JZ-CVBAT is a single battery that uses lithium metal battery ER3V.
When transporting lithium metal batteries and devices with built-in lithium metal batteries by a method subject to UN regulations, it is necessary to apply measures according to the regulations stipulated in the United Nations Recommendations on the Transport of Dangerous Goods, the Technical Instructions (ICAO-TI) of the International Civil Aviation Organization (ICAO), and the International Maritime Dangerous Goods Code (IMDG CODE) of the International Maritime Organization (IMO). If a customer is transporting products such as shown above, it is necessary to confirm the latest regulations, or the laws and regulations of the country of transport on your own, in order to apply the proper measures. Please contact SMC sales representative for details.

USB cable (2.5 m)

LEC−JZ−CVUSB

∗ JZSP-CVS06-02-E manufactured by YASKAWA CONTROLS CO., LTD.

Cable for connecting PC and driver when using the setup software (SigmaWin+™)
Do not use any cable other than this cable.



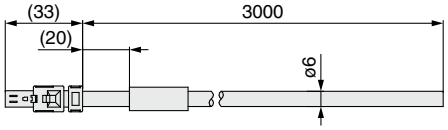
Weight: 150 g

Cable for safety function device (3 m)

LEC−JZ−CVSAF

∗ JZSP-CVH03-03-E manufactured by YASKAWA CONTROLS CO., LTD.

Cable for connecting the driver and device when using the safety function
Do not use any cable other than this cable.



Weight: 160 g

LECSA/LECS□-T/LECY□ 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 / Selection

⚠Warning

1. Be sure to apply the specified voltage.
Otherwise, malfunction or breakage may occur. If the applied voltage is lower than the specified voltage, it is possible that the load will not be able to be moved due to an internal voltage drop of the driver. Please check the operating voltage before use.

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

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

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

5. If the danger of human injury is expected due to abnormal heat generation, smoking, ignition, etc., of the driver and its peripheral devices, cut off the power supply of the product and the system immediately.

6. The parameters of the driver are set to initial values. Please change the parameters according to the specifications of the customer's equipment before use. Refer to the operation manual for parameter details.

Handling

⚠Warning

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

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

3. Products with damage or those missing any components should not be used.
An electric shock, fire, or injury may result.

4. Use only the specified combination between the electric actuator and the driver.
Failure to do so may cause damage to the actuator or the driver.

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

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

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

8. Before installation, wiring, and maintenance, the voltage should be checked with a tester 5 minutes after the power supply has been turned off.
Otherwise, an electric shock, fire, or injury may result.

Handling

⚠Warning

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

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

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

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

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

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

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

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

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

Installation

⚠Warning

1. Install the driver and its peripheral devices on a fireproof material.
Direct installation on or near a flammable material may cause a fire.

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

3. The driver should be mounted on a vertical wall in a vertical direction. Also, be sure not to cover the driver's suction/exhaust ports.

4. Install the driver and its peripheral devices on a flat surface.
If the mounting surface is distorted or uneven, an unacceptable force may be added to the housing, etc., causing problems.

LECSA/LECS□-T/LECY□ 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

Power Supply

⚠Caution

1. **Use a power supply that has low noise between lines and between the power and ground.**
   In cases where noise is high, an isolation transformer should be used.
2. **To prevent lightning surges, appropriate measures should be taken. Ground the surge absorber for lightning separately from the grounding of the driver and its peripheral devices.**

Wiring

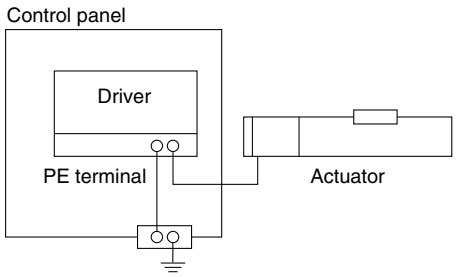
⚠Warning

1. **The driver will be damaged if a commercial power supply (100/200 V) is added to the driver's servo motor power (U, V, and W). Be sure to check wiring for mistakes when the power supply is turned on.**
2. **Connect the ends of the U, V, and W wires of the motor cable correctly to the phases (U, V, and W) of the servo motor power. If these wires do not match up, the servo motor cannot be controlled.**

Grounding

⚠Warning

1. **For grounding the actuator, connect the copper wire of the actuator to the driver's protective earth (PE) terminal and connect the copper wire of the driver to the earth via the control panel's protective earth (PE) terminal.**
   Do not connect them directly to the control panel's protective earth (PE) terminal.



2. **In the unlikely event that a malfunction is caused by the ground, please disconnect it.**

Maintenance

⚠Warning

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

CE/UL-compliance List

∗ For CE/UL-compliant products, refer to the tables below and the following pages.

■ Controller "○": Compliant "×": Not compliant

As of September 2021

Compatible motor	Series	CE	c RU us	
			Compliance	No.
Step motor (Incremental)	**JXCE1**	○	○	E480340
	JXC91	○	○	E480340
	JXCP1	○	○	E480340
	JXCD1	○	○	E480340
	JXCL1	○	○	E480340
	LECP1	○	○	E339743
	LECP2	○	○	E339743
	LECPA	○	○	E339743
Step motor (Battery-less absolute)	**JXC51/61**	○	○	E480340
	JXCE1	○	○	E480340
	JXC91	○	○	E480340
	JXCP1	○	○	E480340
	JXCD1	○	○	E480340
	JXCL1	○	○	E480340
	JXCM1	○	○	E480340
High performance step motor (24 VDC)	**JXC5H/6H**	○	○	E480340
	JXCEH	○	○	E480340
	JXC9H	○	○	E480340
	JXCPH	○	○	E480340
Servo motor (24 VDC)	**LECA6**	○	○	E339743
Multi-axis step motor controller	**JXC73**	○	×	—
	JXC83	○	×	—
	JXC93	○	×	—
	JXC92	○	×	—

Compatible motor	Series	CE	c UL us LISTED	
			Compliance	No.
AC servo motor	**LECSA**	○	○	E466261
	LECSB	○	×	—
	LECSC	○	×	—
	LECSS	○	×	—
	LECSB-T	○	○	E466261
	LECSC-T	○	○	E466261
	LECSN-T	○	○∗1	E466261
	LECSS-T	○	○	E466261
	LECYM	○	×	—
	LECYU	○	×	—

∗1 Only the "Without network card" option is UL compliant.

■ Actuator "○": Compliant "×": Not compliant

As of September 2021

Compatible motor	Series	CE	c RU us	
			Compliance	No.
Step motor (Incremental)	**LEFS**	○	×	—
	11-LEFS	○	×	—
	25A-LEFS	○	×	—
	LEFB	○	×	—
	LEL	○	×	—
	LEM	○	×	—
	LEY	○	×	—
	25A-LEY	○	×	—
	LEY-X5/X7	○	×	—
	LEYG	○	×	—
	LES	○	×	—
	LESH	○	×	—
	LEPY	○	×	—
	LEPS	○	×	—
	LER	○	×	—
	LEHZ	○	×	—
	LEHZJ	○	×	—
	LEHF	○	×	—
	LEHS	○	×	—
Step motor (Battery-less absolute)	**LEFS**	○	×	—
	LEFB	○	×	—
	LEKFS	○	×	—
	LEY	○	×	—
	LEY-X8	○	×	—
	LEYG	○	×	—
	LES	○	×	—
	LESH	○	×	—
	LESYH	○	×	—
	LER	○	×	—
	LEHF	○	×	—

Compatible motor	Series	CE	c RU us	
			Compliance	No.
High performance step motor (24 VDC)	**LEFS**	○	×	—
Servo motor (24 VDC)	**LEFS**	○	×	—
	11-LEFS	○	×	—
	25A-LEFS	○	×	—
	LEFB	○	×	—
	LEY	○	×	—
	LEY-X5/X7	○	×	—
	LEYG	○	×	—
	LES	○	×	—
	LESH	○	×	—
	LEPY	○	×	—
	LEPS	○	×	—
AC servo motor	**LEFS**	○	×	—
	11-LEFS	○	×	—
	25A-LEFS	○	×	—
	LEFB	○	×	—
	LEJS	○	×	—
	11-LEJS	○	×	—
	25A-LEJS	○	×	—
	LEJB	○	×	—
	LEY25/32/63	○	×	—
	LEY100	○	×	—
	LEYG	○	×	—
	LESYH	○	×	—

∗ Actuators ordered as single units are not UL compliant.

CE/UL-compliance List

■ Actuator (When ordered with a controller)

"○": Compliant "×": Not compliant "—": Not applicable

As of September 2021

Compatible motor	Series	JXC51/61			JXCE1			JXC91			JXCP1			JXCD1		
		CE	cULus		CE	cULus		CE	cULus		CE	cULus		CE	cULus	
			Compliance	No.		Compliance	No.		Compliance	No.		Compliance	No.		Compliance	No.
Step motor (Incremental)	**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	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	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	cULus		CE	cULus		CE	cULus		CE	cULus		CE	cULus	
			Compliance	No.		Compliance	No.		Compliance	No.		Compliance	No.		Compliance	No.
Step motor (Incremental)	**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	○	×	—	○	×	—	○	×	—	×	×	—	○	×	—
	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

Compatible motor	Series	JXC51/61			JXCE1			JXC91			JXCP1			JXCD1		
		CE	cULus		CE	cULus		CE	cULus		CE	cULus		CE	cULus	
			Compliance	No.		Compliance	No.		Compliance	No.		Compliance	No.		Compliance	No.
Step motor (Battery-less absolute)	**LEFS**	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	LEFB	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	LEKFS	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	LEY	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	LEY-X8	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	LEYG	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	LES	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	LESH	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	LESYH	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	LER	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—
	LEHF	○	×	—	○	×	—	○	×	—	○	×	—	○	×	—

Compatible motor	Series	JXCL1			JXCM1		
		CE	cULus		CE	cULus	
			Compliance	No.		Compliance	No.
Step motor (Battery-less absolute)	**LEFS**	○	×	—	○	×	—
	LEFB	○	×	—	○	×	—
	LEKFS	○	×	—	○	×	—
	LEY	○	×	—	○	×	—
	LEY-X8	○	×	—	○	×	—
	LEYG	○	×	—	○	×	—
	LES	○	×	—	○	×	—
	LESH	○	×	—	○	×	—
	LESYH	○	×	—	○	×	—
	LER	○	×	—	○	×	—
	LEHF	○	×	—	○	×	—

■ Actuator (When ordered with a controller)

"○": Compliant "×": Not compliant "—": Not applicable As of September 2021

Compatible motor	Series	JXC5H/6H			JXCEH			JXC9H			JXCPH		
		CE	c UL us		CE	c UL us		CE	c UL us		CE	c UL us	
			Compliance	No.		Compliance	No.		Compliance	No.		Compliance	No.
High performance step motor (24 VDC)	**LEF**	○	○	E339743	○	○	E339743	○	○	E339743	○	○	E339743

Compatible motor	Series	LECA6		
		CE	c UL us	
			Compliance	No.
Servo motor (24 VDC)	**LEFS**	○	○	E339743
	11-LEFS	○	○	E339743
	25A-LEFS	○	○	E339743
	LEFB	○	○	E339743
	LEY	○	○	E339743
	LEY-X7	○	×	—
	LEYG	○	○	E339743
	LES	○	○	E339743
	LESH	○	○	E339743

Compatible motor	Series	LECSA*1			LECSB			LECSC			LECSS			LECSB-T*1		
		CE	c UL us		CE	c UL us		CE	c UL us		CE	c UL us		CE	c UL us	
			Compliance	No.		Compliance	No.		Compliance	No.		Compliance	No.		Compliance	No.
AC servo motor	**LEFS**	○	○	E339743	○	×	—	○	×	—	○	×	—	○	×	—
	11-LEFS	○	○	E339743	○	×	—	○	×	—	○	×	—	○	×	—
	25A-LEFS	○	○	E339743	○	×	—	○	×	—	○	×	—	○	×	—
	LEFB	○	○	E339743	○	×	—	○	×	—	○	×	—	○	×	—
	LEJS	○	○	E339743	○	×	—	○	×	—	○	×	—	○	×	—
	11-LEJS	○	○	E339743	○	×	—	○	×	—	○	×	—	○	×	—
	25A-LEJS	○	○	E339743	○	×	—	○	×	—	○	×	—	○	×	—
	LEJB	○	○	E339743	○	×	—	○	×	—	○	×	—	○	×	—
	LEY25/32/63	○	○	E339743	○	×	—	○	×	—	○	×	—	○	×	—
	LEY100	—	—	—	—	—	—	—	—	—	—	—	—	○	×	—
	LEYG	○	○	E339743	○	×	—	○	×	—	○	×	—	○	×	—
	LESYH	○	×	—	—	—	—	—	—	—	—	—	—	○	×	—

Compatible motor	Series	LECSC-T*1			LECSN-T*1			LECSS-T*1		
		CE	c UL us		CE	c UL us		CE	c UL us	
			Compliance	No.		Compliance	No.		Compliance	No.
AC servo motor	**LEFS**	○	×	—	○	×	—	○	○	E339743
	11-LEFS	○	×	—	○	×	—	○	○	E339743
	25A-LEFS	○	×	—	○	×	—	○	○	E339743
	LEFB	○	×	—	○	×	—	○	○	E339743
	LEJS	○	×	—	○	×	—	○	○	E339743
	11-LEJS	○	×	—	○	×	—	○	○	E339743
	25A-LEJS	○	×	—	○	×	—	○	○	E339743
	LEJB	○	×	—	○	×	—	○	○	E339743
	LEY25/32/63	○	×	—	○	×	—	○	○	E339743
	LEY100	○	×	—	○	×	—	○	×	—
	LEYG	○	×	—	○	×	—	○	○	E339743
	LESYH	○	×	—	○	×	—	○	×	—

*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.