

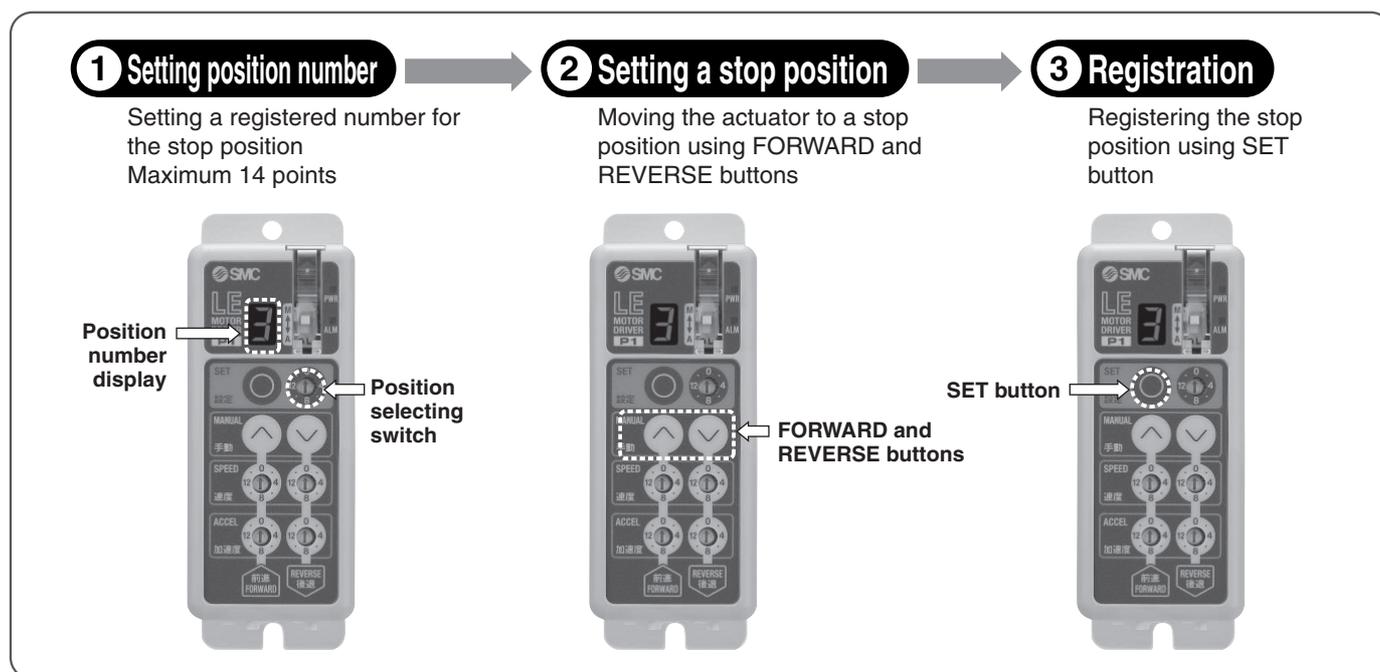


Programless Controller

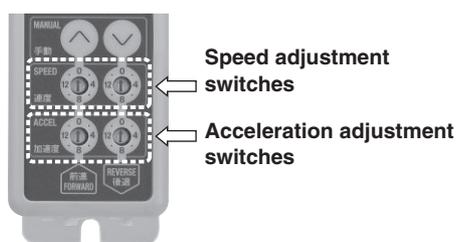


- Applicable to 14 points of positioning
- No programming

Capable of setting up an electric actuator operation without using a PC or teaching box



Speed/acceleration 16-level adjustment



- Compatible with actuators with locks
- Setting 3-level pushing force
- Compatible electric actuator

Compatible actuators	Catalogue No.
Electric Grippers Series LEH	EUS100-77
Electric Slide Table Series LES	EUS100-78
Electric Actuator/ Rod Type Series LEY	EUS100-83
Electric Actuator/ Slider Type Series LEF	EUS100-87
Electric Actuator/ Guide Rod Slider Series LEL	EUS100-101
Electric Actuator/ Low Profile Slider Type Series LEM	EUS100-98
Electric Actuator/ Miniature Rod Type Series LEP	EUS100-92
Electric Rotary Table Series LER	EUS100-94

LECP1 Series

Controller with actuator

LEFS16B-100-R3

1N

1

Actuator type

Refer to "How to Order" in the actuator catalogue and indicate the model.
For compatible actuators, refer to the table below.
Example: LEFS16B-100-R31N1

Compatible actuators

LEF LEL LEM LER LEY LES LEP LEH

Controller type

—	Without controller
1N	With programless controller (NPN)
1P	With programless controller (PNP)

I/O cable length [m]

—	Without cable
1	1.5
3	3
5	5

Part number for actuator and controller set.

Controller

LECP1P1 - **LEFS16A-400**

Controller

Compatible motor

P	Step motor (Servo/24 VDC)
----------	---------------------------

Number of step data (Points)

1	14 (Programless)
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Parallel I/O type

N	NPN
P	PNP

Option

—	Screw mounting
D (Note)	DIN rail mounting

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

I/O cable length [m]

—	Without cable
1	1.5
3	3
5	5

Actuator part number

(Except cable specifications and actuator options)
Example: Enter "LEFS16A-400" for the
LEFS16A-400B-R11N1.

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

Caution

[CE-compliant products]

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

[UL-compliant products]

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

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

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

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

Specifications

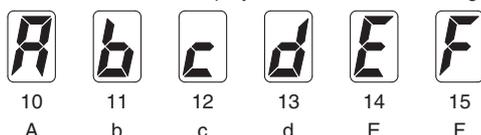
Basic Specifications

Item	LECP1
Compatible motor	Step motor (Servo/24 VDC)
Power supply ^{Note 1)}	Power supply voltage: 24 VDC $\pm 10\%$ ^{Note 2)} [Including the motor drive power, control power supply, stop, lock release]
Parallel input	6 inputs (Photo-coupler isolation)
Parallel output	6 outputs (Photo-coupler isolation)
Stop points	14 points (Position number 1 to 14(E))
Compatible encoder	Incremental A/B phase (800 pulse/rotation)
Memory	EEPROM
LED indicator	LED (Green/Red) one of each
7-segment LED display ^{Note 3)}	1 digit, 7-segment display (Red) Figures are expressed in hexadecimal ("10" to "15" in decimal number are expressed as "A" to "F")
Lock control	Forced-lock release terminal ^{Note 4)}
Cable length [m]	I/O cable: 5 or less, Actuator cable: 20 or less
Cooling system	Natural air cooling
Operating temperature range [°C]	0 to 40 (No freezing)
Operating humidity range [%RH]	90 or less (No condensation)
Storage temperature range [°C]	-10 to 60 (No freezing)
Storage humidity range [%RH]	90 or less (No condensation)
Insulation resistance [MΩ]	Between the housing and SG terminal: 50 (500 VDC)
Weight [g]	130 (Screw mounting), 150 (DIN rail mounting)

Note 1) Do not use the power supply of "inrush current prevention type" for the controller input power supply. When conformity to UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

Note 2) The power consumption changes depending on the actuator model. Refer to the each actuator's operation manual etc. for details.

Note 3) "10" to "15" in decimal number are displayed as follows in the 7-segment LED.

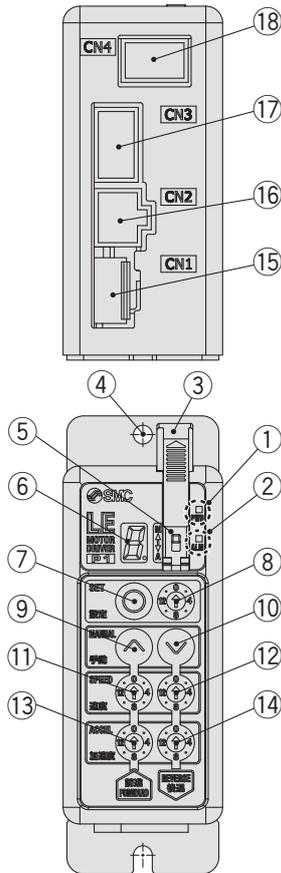


Decimal display

Hexadecimal display

Note 4) Applicable to non-magnetizing lock.

Controller Details



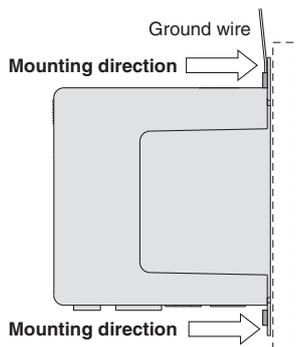
No.	Display	Description	Details
①	PWR	Power supply LED	Power supply ON/Servo ON : Green turns on Power supply ON/Servo OFF: Green flashes
②	ALM	Alarm LED	With alarm : Red turns on Parameter setting : Red flashes
③	—	Cover	Change and protection of the mode switch (Close the cover after changing switch)
④	—	FG	Frame ground (Tighten the bolt with the nut when mounting the controller. Connect the ground wire.)
⑤	—	Mode switch	Switch the mode between manual and auto.
⑥	—	7-segment LED	Stop position, the value set by ⑧ and alarm information are displayed.
⑦	SET	Set button	Decide the settings or drive operation in Manual mode.
⑧	—	Position selecting switch	Assign the position to drive (1 to 14), and the origin position (15).
⑨	MANUAL	Manual forward button	Perform forward jog and inching.
⑩		Manual reverse button	Perform reverse jog and inching.
⑪	SPEED	Forward speed switch	16 forward speeds are available.
⑫		Reverse speed switch	16 reverse speeds are available.
⑬	ACCEL	Forward acceleration switch	16 forward acceleration steps are available.
⑭		Reverse acceleration switch	16 reverse acceleration steps are available.
⑮	CN1	Power supply connector	Connect the power supply cable.
⑯	CN2	Motor connector	Connect the motor connector.
⑰	CN3	Encoder connector	Connect the encoder connector.
⑱	CN4	I/O connector	Connect I/O cable.

How to Mount

Controller mounting shown below.

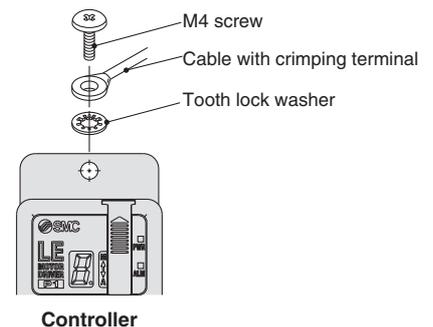
1. Mounting screw (LECP1□□-□)

(Installation with two M4 screws)



2. Grounding

Tighten the bolt with the nut when mounting the ground wire as shown below.



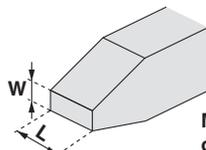
Note) When size 25 or more of the LE series are used, the space between the controllers should be 10 mm or more.

⚠ Caution

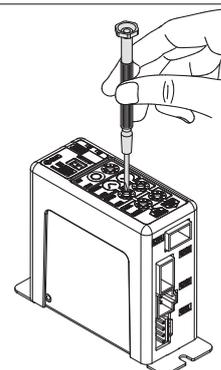
- M4 screws, cable with crimping terminal and tooth lock washer are not included. Be sure to carry out grounding earth in order to ensure the noise tolerance.
- Use a watchmaker's screwdriver of the size shown below when changing position switch ⑧ and the set value of the speed/acceleration switch ⑪ to ⑭.

Size

End width L: 2.0 to 2.4 [mm]
End thickness W: 0.5 to 0.6 [mm]



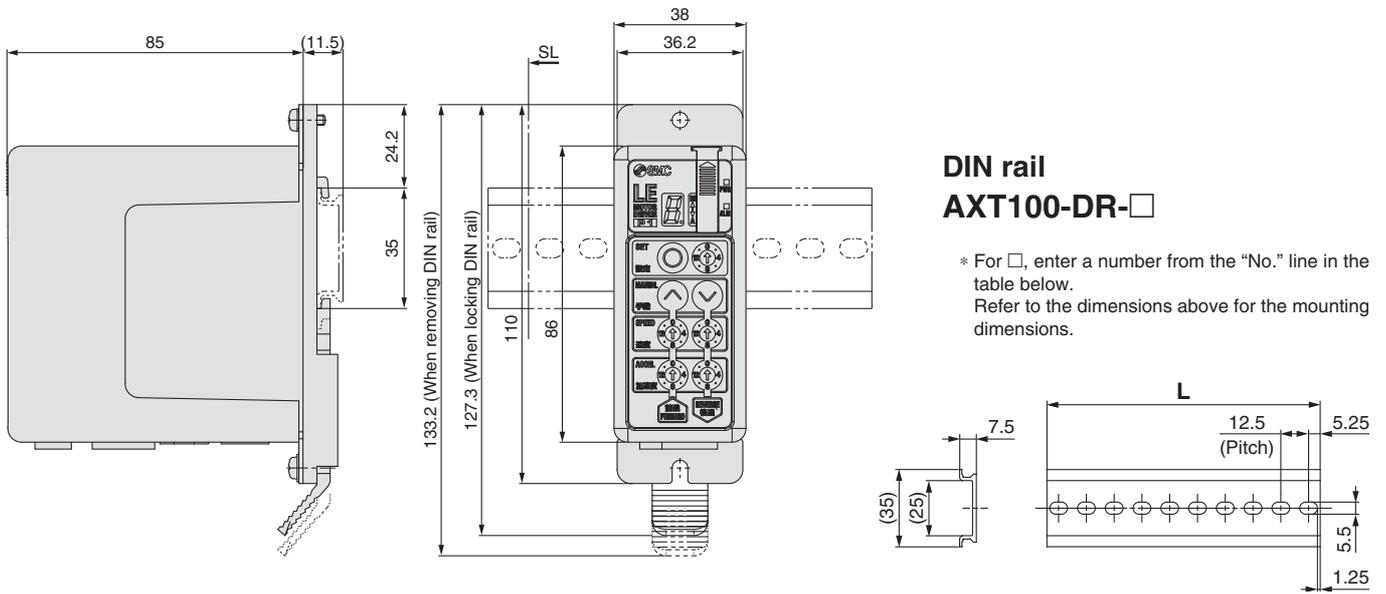
Magnified view of the end of the screwdriver



LECP1 Series

Dimensions

DIN rail mounting (LEC□1□□D-□)



L Dimension [mm]

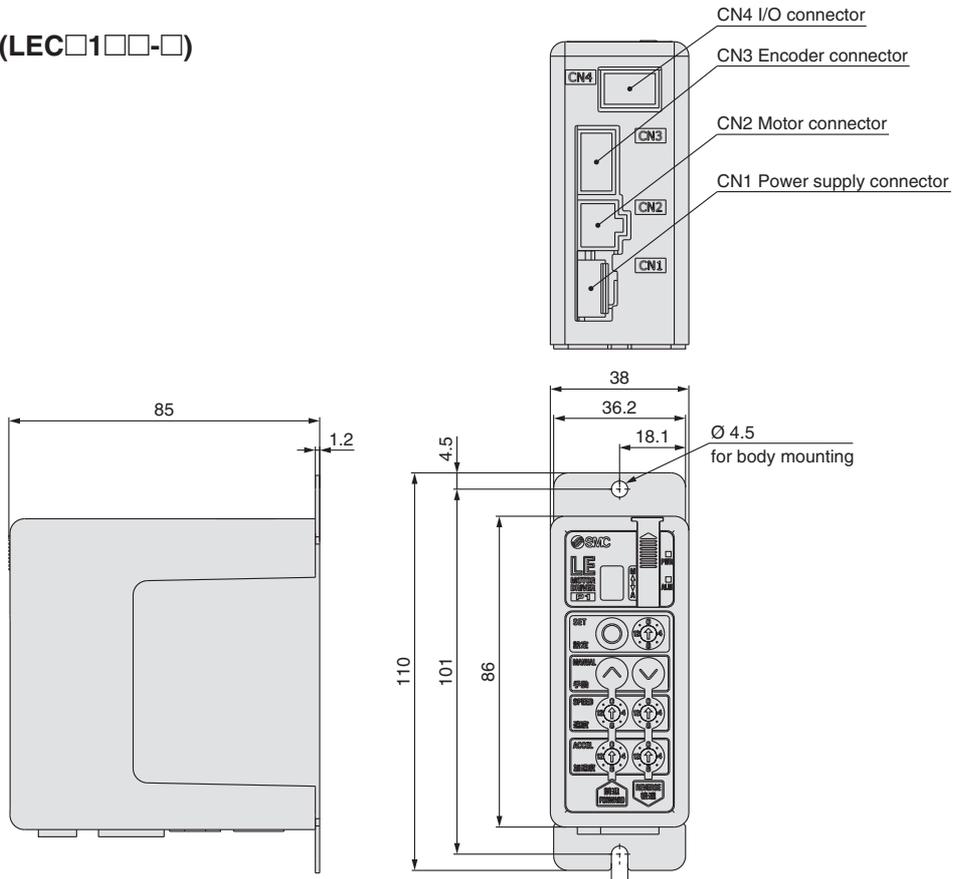
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
L	23	35.5	48	60.5	73	85.5	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5	273
No.	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
L	285.5	298	310.5	323	335.5	348	360.5	373	385.5	398	410.5	423	435.5	448	460.5	473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

DIN rail mounting adapter

LEC-1-D0 (with 2 mounting screws)

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

Screw mounting (LEC□1□□-□)



Wiring Example 1

Power Supply Connector: CN1 * When you connect a CN1 power supply connector, use the power supply cable (LEC-CK1-1).
 * Power supply cable (LEC-CK1-1) is an accessory.

CN1 Power Supply Connector Terminal for LECP1

Terminal name	Cable colour	Function	Details
0V	Blue	Common supply (-)	M 24V terminal/C 24V terminal/BK RLS terminal are common (-).
M 24V	White	Motor power supply (+)	Motor power supply (+) supplied to the controller
C 24V	Brown	Control power supply (+)	Control power supply (+) supplied to the controller
BK RLS	Black	Lock release (+)	Input (+) for releasing the lock

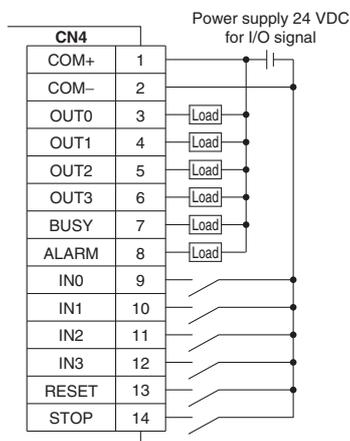
Power supply cable for LECP1 (LEC-CK1-1)



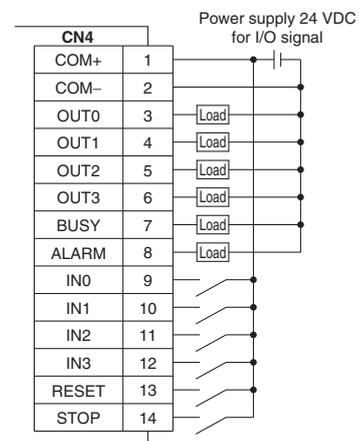
Wiring Example 2

Parallel I/O Connector: CN4 * When you connect a PLC etc., to the CN4 parallel I/O connector, use the I/O cable (LEC-CK4-□).
 * The wiring should be changed depending on the type of the parallel I/O (NPN or PNP).

■ NPN



■ PNP



Input Signal

Name	Details								
COM+	Connects the power supply 24 V for input/output signal								
COM-	Connects the power supply 0 V for input/output signal								
IN0 to IN3	<ul style="list-style-type: none"> Instruction to drive (input as a combination of IN0 to IN3) Instruction to return to origin (IN0 to IN3 all ON simultaneously) Example - (instruction to drive for position no. 5) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>IN3</th> <th>IN2</th> <th>IN1</th> <th>IN0</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>ON</td> <td>OFF</td> <td>ON</td> </tr> </tbody> </table>	IN3	IN2	IN1	IN0	OFF	ON	OFF	ON
IN3	IN2	IN1	IN0						
OFF	ON	OFF	ON						
RESET	Alarm reset and operation interruption During operation: deceleration stop from position at which signal is input (servo ON maintained) While alarm is active: alarm reset								
STOP	Instruction to stop (after maximum deceleration stop, servo OFF)								

Output Signal

Name	Details								
OUT0 to OUT3	Turns on when the positioning or pushing is completed. (Output is instructed in the combination of OUT0 to 3.) Example - (operation complete for position no. 3) <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>OUT3</th> <th>OUT2</th> <th>OUT1</th> <th>OUT0</th> </tr> </thead> <tbody> <tr> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table>	OUT3	OUT2	OUT1	OUT0	OFF	OFF	ON	ON
OUT3	OUT2	OUT1	OUT0						
OFF	OFF	ON	ON						
BUSY	Outputs when the actuator is moving								
*ALARM (Note)	Not output when alarm is active or servo OFF								

Note) Signal of negative-logic circuit (N.C.)

Input Signal [IN0 - IN3] Position Number Chart ○: OFF ●: ON

Position number	IN3	IN2	IN1	IN0
1	○	○	○	●
2	○	○	●	○
3	○	○	●	●
4	○	●	○	○
5	○	●	○	●
6	○	●	●	○
7	○	●	●	●
8	●	○	○	○
9	●	○	○	●
10 (A)	●	○	●	○
11 (B)	●	○	●	●
12 (C)	●	●	○	○
13 (D)	●	●	○	●
14 (E)	●	●	●	○
Return to origin	●	●	●	●

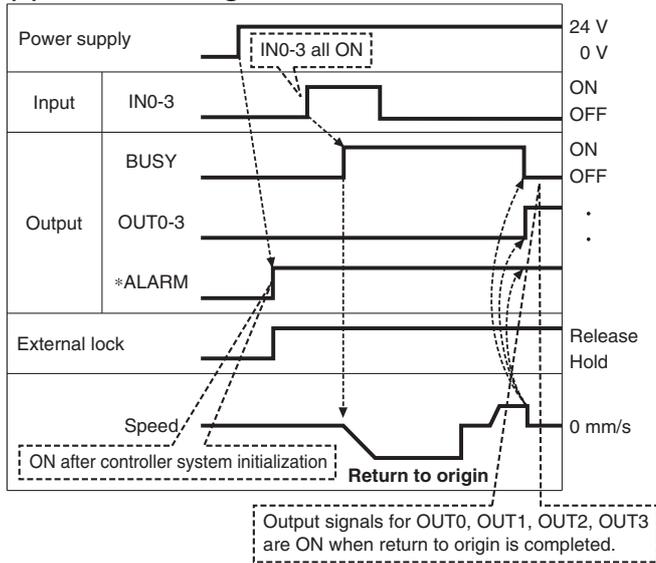
Output Signal [OUT0 - OUT3] Position Number Chart ○: OFF ●: ON

Position number	OUT3	OUT2	OUT1	OUT0
1	○	○	○	●
2	○	○	●	○
3	○	○	●	●
4	○	●	○	○
5	○	●	○	●
6	○	●	●	○
7	○	●	●	●
8	●	○	○	○
9	●	○	○	●
10 (A)	●	○	●	○
11 (B)	●	○	●	●
12 (C)	●	●	○	○
13 (D)	●	●	○	●
14 (E)	●	●	●	○
Return to origin	●	●	●	●

LECP1 Series

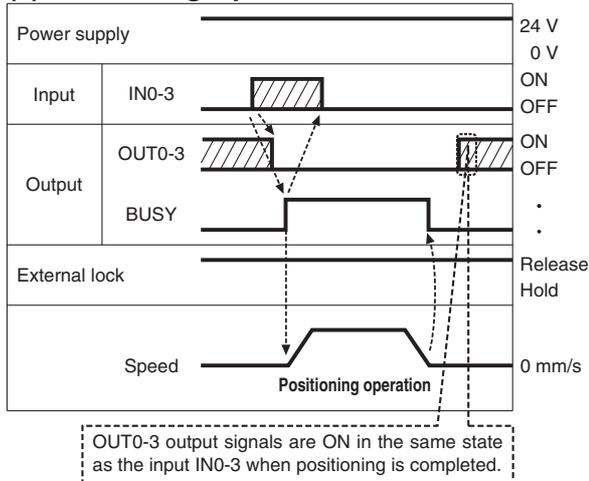
Signal Timing

(1) Return to Origin

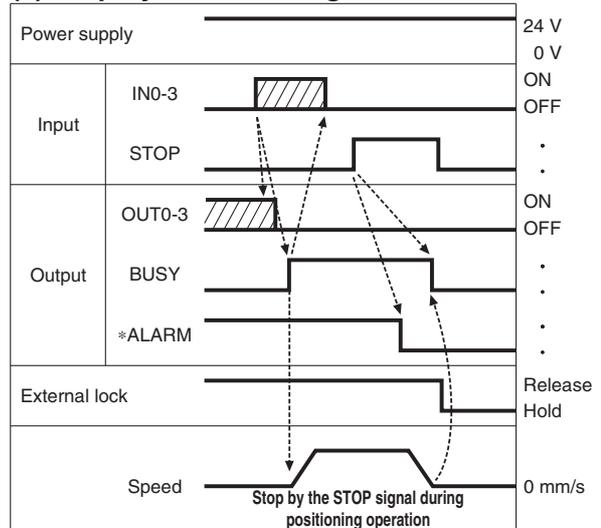


* *ALARM" is expressed as negative-logic circuit.

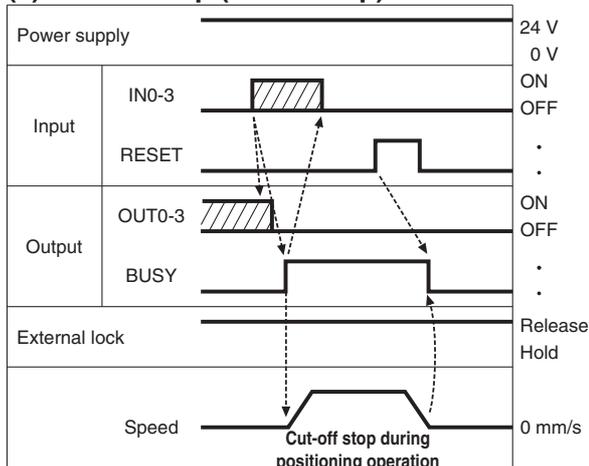
(2) Positioning Operation



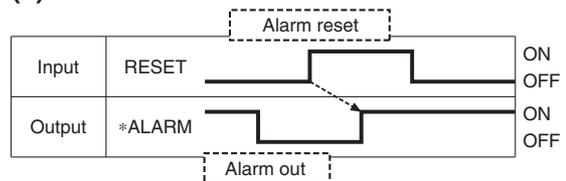
(4) Stop by the STOP Signal



(3) Cut-off Stop (Reset Stop)



(5) Alarm Reset



* *ALARM" is expressed as negative-logic circuit.

Options: Actuator Cable

[Robotic cable, standard cable for step motor (Servo/24 VDC)]

LE-CP-1- 1 -

Cable length (L) [m]

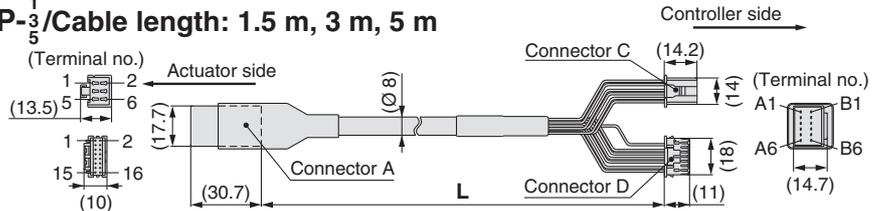
1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order (Robotic cable only)

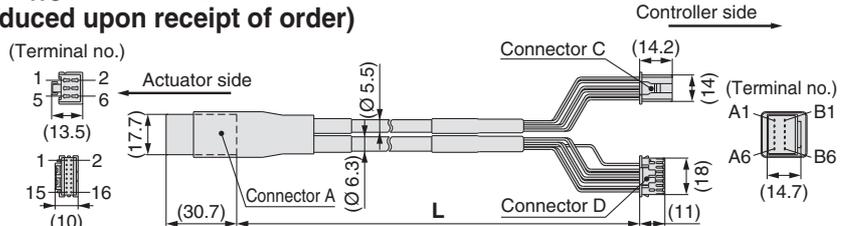
Cable type

-	Robotic cable (Flexible cable)
S	Standard cable

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



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



Signal	Connector A terminal no.	Cable colour	Connector C terminal no.
A	B-1	Brown	2
A	A-1	Red	1
B	B-2	Orange	6
B	A-2	Yellow	5
COM-A/COM	B-3	Green	3
COM-B/-	A-3	Blue	4
Shield			
Signal	Connector B terminal no.	Cable colour	Connector D terminal no.
Vcc	B-4	Brown	12
GND	A-4	Black	13
A	B-5	Red	7
A	A-5	Black	6
B	B-6	Orange	9
B	A-6	Black	8
		-	3

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

LE-CP-1-B- 1 - B -

Cable length (L) [m]

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

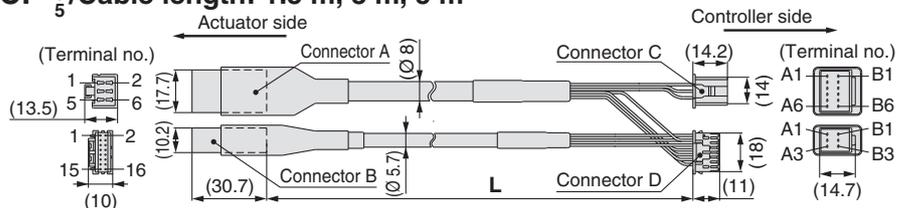
* Produced upon receipt of order (Robotic cable only)

With lock and sensor

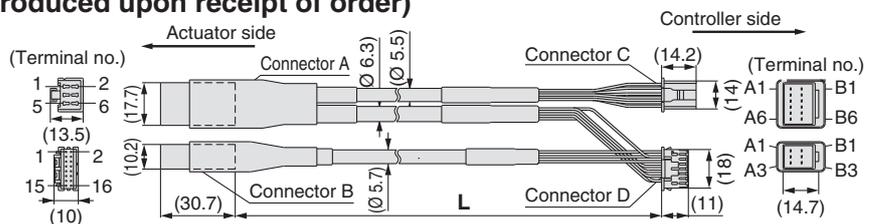
Cable type

-	Robotic cable (Flexible cable)
S	Standard cable

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



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



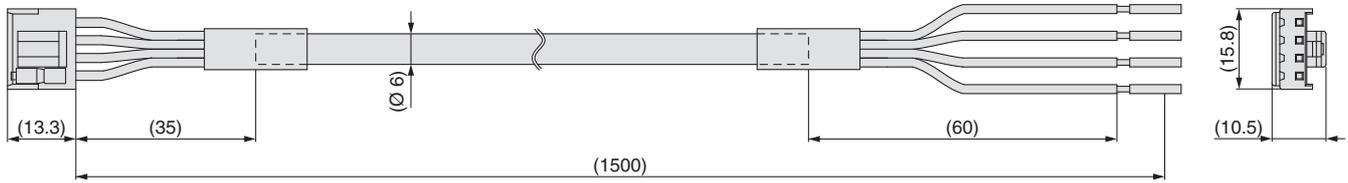
Signal	Connector A terminal no.	Cable colour	Connector C terminal no.
A	B-1	Brown	2
A	A-1	Red	1
B	B-2	Orange	6
B	A-2	Yellow	5
COM-A/COM	B-3	Green	3
COM-B/-	A-3	Blue	4
Shield			
Signal	Connector B terminal no.	Cable colour	Connector D terminal no.
Vcc	B-4	Brown	12
GND	A-4	Black	13
A	B-5	Red	7
A	A-5	Black	6
B	B-6	Orange	9
B	A-6	Black	8
		-	3
Signal	Connector B terminal no.	Cable colour	Connector D terminal no.
Lock (+)	B-1	Red	4
Lock (-)	A-1	Black	5
Sensor (+) (Note)	B-3	Brown	1
Sensor (-) (Note)	A-3	Blue	2

LECP1 Series

Options

[Power supply cable]

LEC-CK1-1



Terminal name	Covered colour	Function
0V	Blue	Common supply (-)
M 24V	White	Motor power supply (+)
C 24V	Brown	Control power supply (+)
BK RLS	Black	Lock release (+)

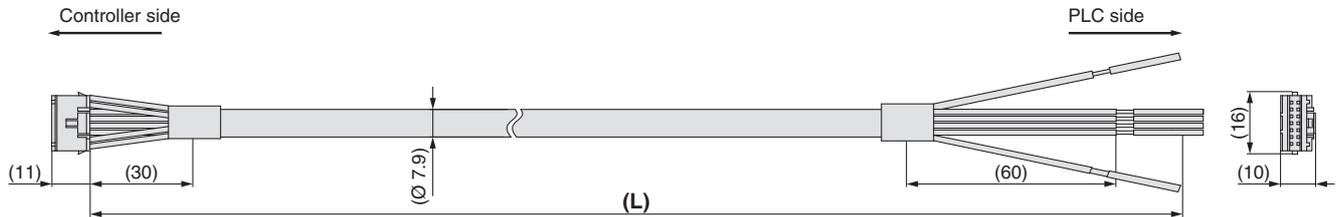
* Conductor size: AWG20

[I/O cable]

LEC-CK4-

Cable length (L) [m]

1	1.5
3	3
5	5



Terminal no.	Insulation colour	Dot mark	Dot colour	Function
1	Light brown	■	Black	COM+
2	Light brown	■	Red	COM-
3	Yellow	■	Black	OUT0
4	Yellow	■	Red	OUT1
5	Light green	■	Black	OUT2
6	Light green	■	Red	OUT3
7	Grey	■	Black	BUSY
8	Grey	■	Red	ALARM
9	White	■	Black	IN0
10	White	■	Red	IN1
11	Light brown	■ ■	Black	IN2
12	Light brown	■ ■	Red	IN3
13	Yellow	■ ■	Black	RESET
14	Yellow	■ ■	Red	STOP

* Conductor size: AWG26

* Parallel I/O signal is valid in auto mode. While the test function operates at manual mode, only the output is valid.

With Input Signals to Perform Jog Operations, Step Motor controller **LECP1-XB182**

Jog operation can be performed using parallel input signals.

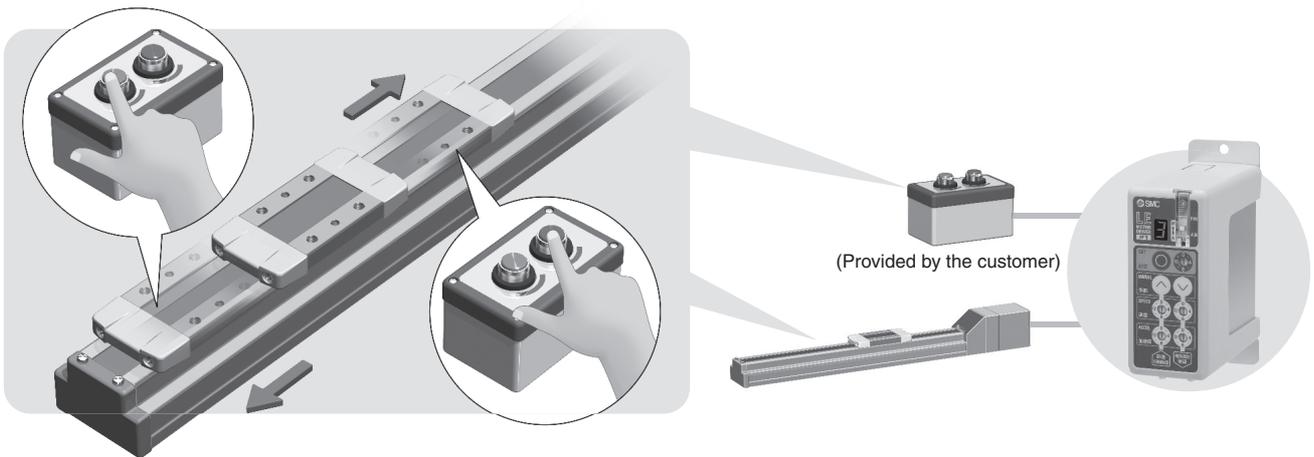
Jog operations that could previously only be performed using the button on the front face can now be performed using the ON/OFF status of the input signal.

* Input signals "JOG+" and "JOG-" are used as motion instructions.



Application Examples

Optimal for adjusting the feed value using a button operation while checking the motion of the actuator



Specifications

Model		LECP1□-□-XB182
Compatible motor		Step motor (Servo/24 VDC)
Power supply		Power voltage: 24 VDC ±10 %*1 [Including motor drive power, control power, stop, lock release]
Parallel input		6 inputs (Photo-coupler isolation)
Parallel output		6 outputs (Photo-coupler isolation)
Function	Number of positioning points	2 points
	Jog input	Yes
Operating temperature range [°C]		0 to 40 (No freezing)
Operating humidity range [%RH]		90 or less (No condensation)
Storage temperature range [°C]		-10 to 60 (No freezing)
Storage humidity range [%RH]		90 or less (No condensation)
Weight [g]		130 (Screw mounting), 150 (DIN rail mounting)

*1 The power consumption changes depending on the actuator model. Refer to the actuator specifications for more details.

Specifications not listed are the same as those of the standard product. For details, refer to the [Web Catalogue](#).

Control Timing Chart

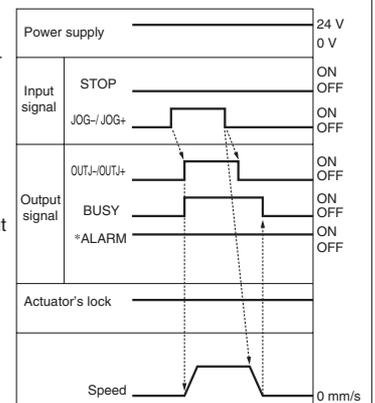
Jog

– Procedure –

- ① When an alarm is not being generated (ALARM output ON), and the STOP input is OFF, set the JOG- input or the JOG+ input to ON.
- ↓
- ② The OUTJ- output or the OUTJ+ output goes ON, and motion starts. The BUSY output goes ON.
- ↓
- ③ Set the JOG- input or the JOG+ input to OFF.
- ↓
- ④ The OUTJ- output or the OUTJ+ output goes OFF, and speed reduction starts.
- ↓
- ⑤ Motion stops, and the BUSY output goes OFF.

* A JOG- input and a JOG+ input cannot be turned ON simultaneously.

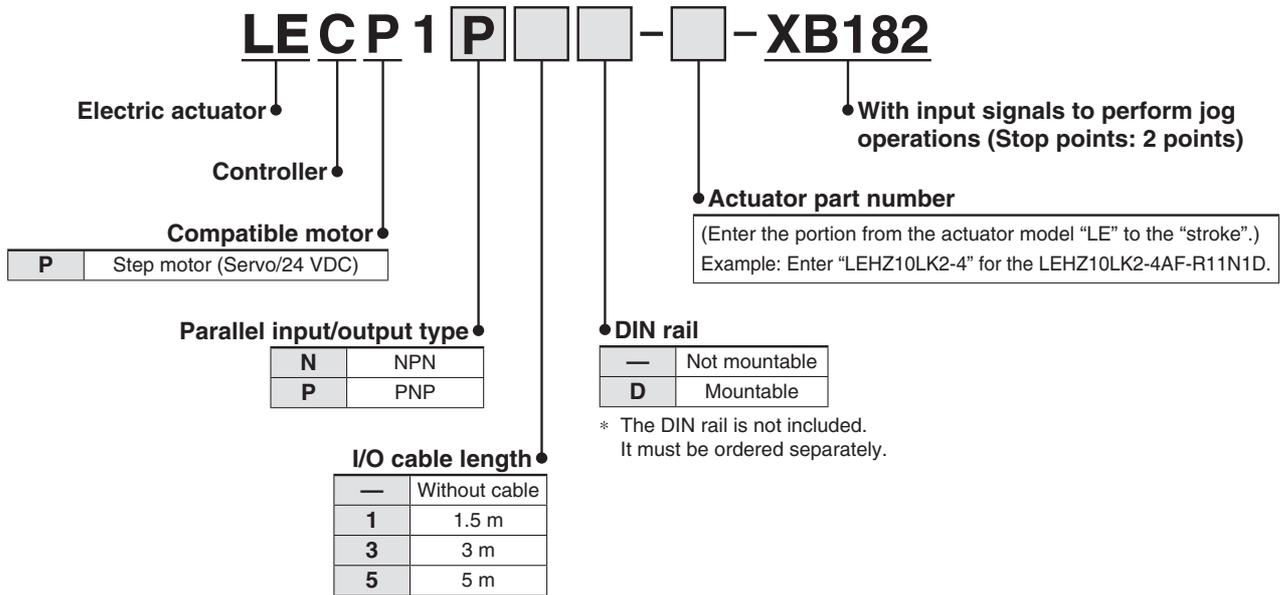
– Timing Chart –



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

LECP1-XB182

How to Order

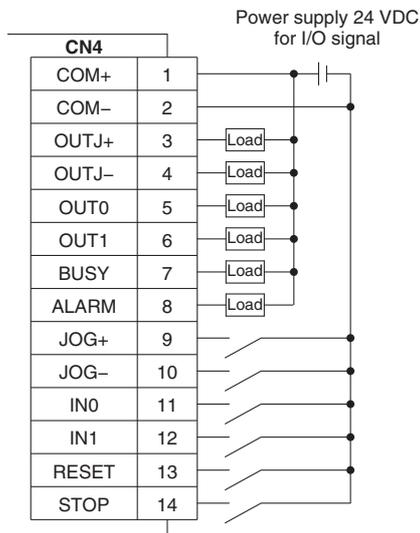


Wiring Diagram

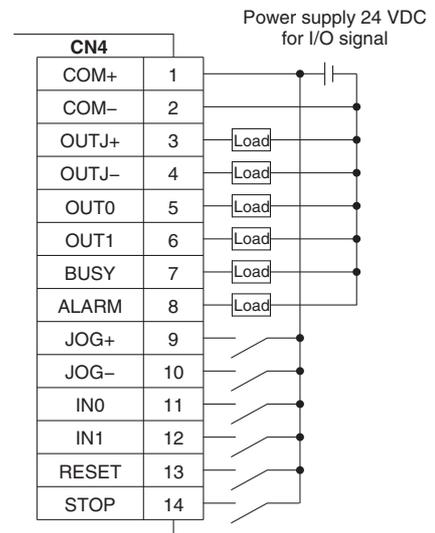
Parallel I/O connector: CN4

- * When you connect a PLC to the CN4 parallel I/O connector, use the I/O cable (LEC-CK4-□).
- * The wiring changes depending on the type of parallel I/O (NPN or PNP).

■ NPN

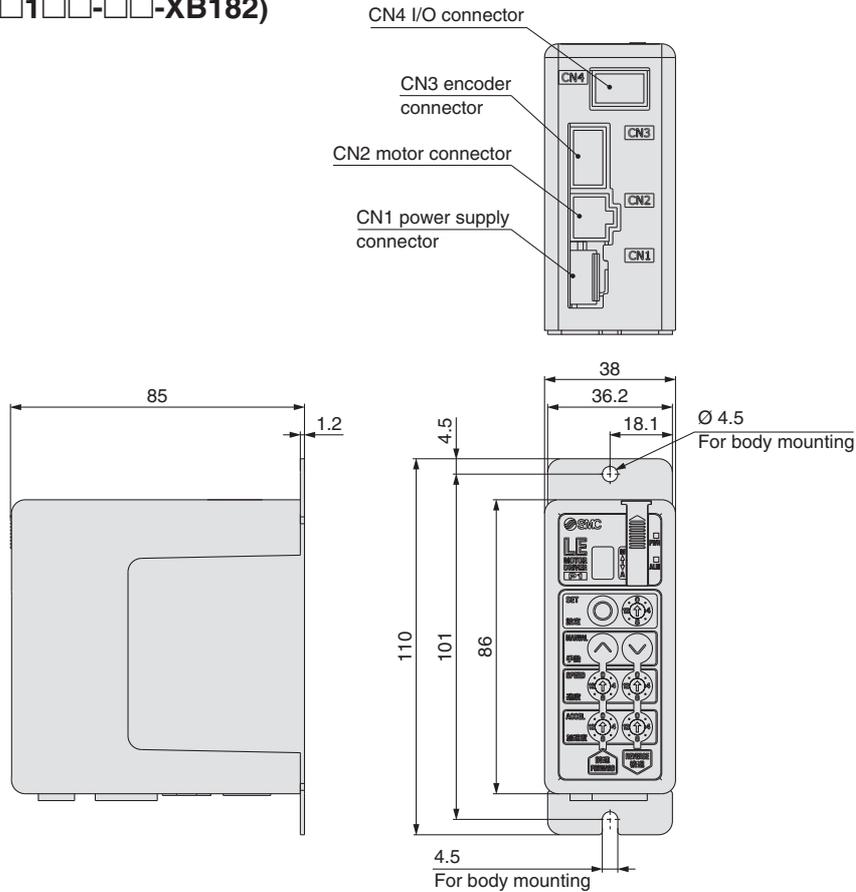


■ PNP

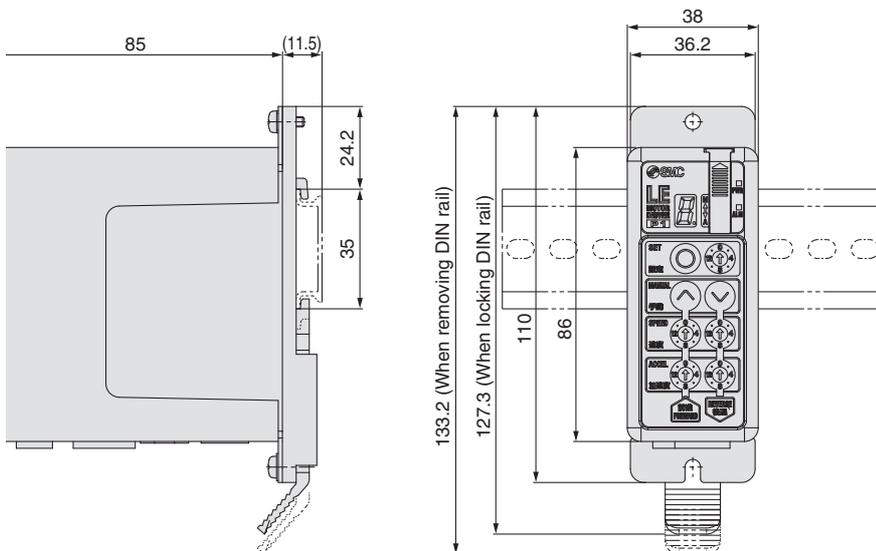


Dimensions

Screw mounting (LECP1□□-□□-XB182)

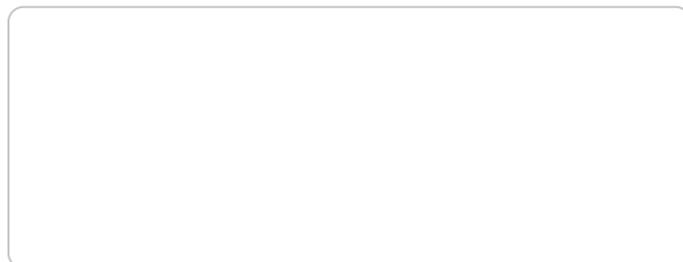


DIN rail mounting (LECP1□□D-□□-XB182)



⚠ Caution

- ① **Jog operation is a function that is provided mainly for checking the operation of the machine when adjusting, inspecting, or performing maintenance on it.**
While a jog operation is taking place, the alarm related to operation will not be detected. For this reason, it is not recommended to use this function during automatic operation of the machine.
- ② **If the moving part of the electric actuator is caused to collide with an object during a jog operation, the electric actuator is likely to break down.**
Before using the actuator, carefully check that it will not collide with any objects.



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