



ORIGINAL INSTRUCTIONS

Instruction Manual AC Servo Motor Driver Series LECSA



The intended use of the AC servo motor driver is to control the movement of an electrical actuator in response to point table data or electrical inputs.

1 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.

IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)

ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

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.

Warning

- Always ensure compliance with relevant safety laws and standards.**
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.
- Do not operate the product beyond the specification range. Fire, malfunction or equipment damage may result. Use the product only after confirming the specifications.
- When using the product as part of an interlocking system: Provide a double interlocking system, for example a mechanical system. Check the product regularly to ensure correct operation.
- Do not use the lock as a safety lock or a control that requires a locking force.
- Do not drop, hit or apply excessive shock to the product.
- Prevent any foreign matter from entering the product.
- Use the product within the specified ambient temperature range.
- If abnormal heating, smoke or a fire occurs in the product, immediately turn off the power supply.
- Do not operate the driver with the front cover removed. High-voltage terminals and the charging area are exposed. This may result in an electric shock.
- Keep the driver and actuator combined as delivered for use. The driver is set with parameters for the actuator it is shipped with.
- Refer to the operation manual on the SMC website (URL: <https://www.smcworld.com>) for more Safety Instructions.

2 Specifications

2.1 LECSA

Model	LECSA1-S1	LECSA1-S3	LECSA2-S1	LECSA2-S3	LECSA2-S4
Compatible motor capacity (W)	100	200	100	200	400
Compatible encoder	Incremental 17-bit encoder (Resolution: 131072 pulse/rev.)				
Main power supply	Voltage	1 phase 100 to 120 VAC (50/60 Hz)		1 phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage fluctuation	1 phase 85 to 132 VAC		1 phase 170 to 253 VAC	
	Rated current	3.0 A	5.0 A	1.5 A	2.4 A
Control power supply	Voltage	24 VDC ±10%			
	Rated current	0.5 A			
Operating temperature	0 to 55°C (no freezing)				
Storage temperature	-20 to 65°C (no freezing)				
Humidity range	≤ 90 % RH (no condensation)				
Insulation resistance	10 MΩ (500 VDC) between housing and SG				
Weight	600 g				

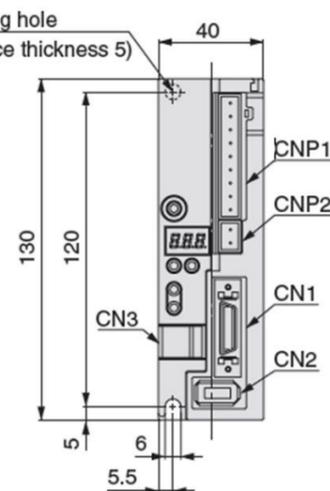
Warning

Special products (-X) might have specifications different from those shown in this section. Contact SMC for specific drawings.

3 Names of Individual Parts

LECSA#

2 x ø6 Mounting hole
(Bearing surface thickness 5)



Connector	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

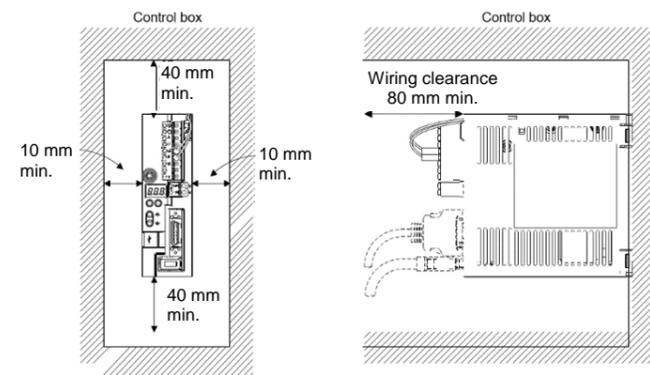
4 Installation

4.1 Installation

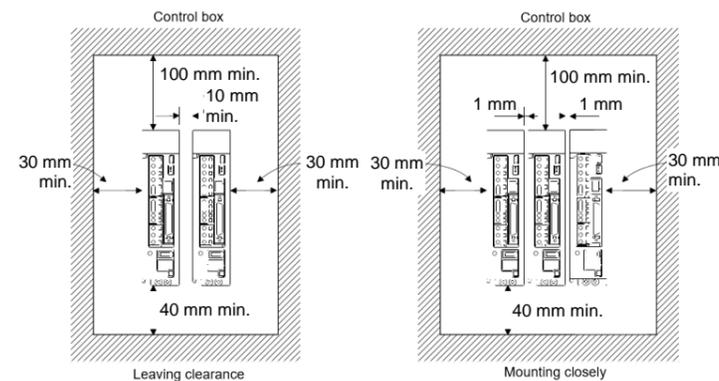
Warning

- Do not install the product unless the safety instructions have been read and understood.
- Design the installation so that the temperature surrounding the driver is within the specified operating temperature. Leave enough space between the drivers so that the operating temperature of the drivers remains within the specification range.
- A regenerative resistor is mounted on the back of the LECSA. The regenerative resistor causes a temperature rise of 100°C relative to the ambient temperature. Fully examine heat dissipation and the installation position before installing the driver.
- Install a cooling fan if necessary.
- The driver must be mounted vertically with sufficient space at the top and bottom of the driver as shown below.
- Allow 80 mm minimum space between the front of the driver and a door (lid) so that the connectors can be connected and disconnected.
- When installing a number of drivers together, leave a minimum of 1 mm between adjacent drivers, allowing for mounting tolerances. In this case, operate the drivers at a reduced ambient temperature of 0°C to 45°C, or at 75 % or less of the effective load ratio.
- The driver must be installed in a metal cabinet (control box).

Installation of single driver



Installation of 2 or more drivers



4.2 Mounting

- The driver should be mounted vertically onto a panel using screws tightened to the required tightening torque.

Caution

If the mounting surface for the driver is not flat or is uneven, excessive stress may be applied to the enclosure, which can cause failure. Be sure to mount on a flat surface.

4.3 Environment

Warning

- Do not use the product in the presence of flammable, explosive or corrosive gases, chemicals, salt water or steam. This product does not have an explosion proof construction.
- Do not expose to direct sunlight. Use a suitable protective cover.

4 Installation (continued)

- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.
- Avoid mounting the driver near a vibration source, such as a large electromagnetic contactor or circuit breaker on the same panel.

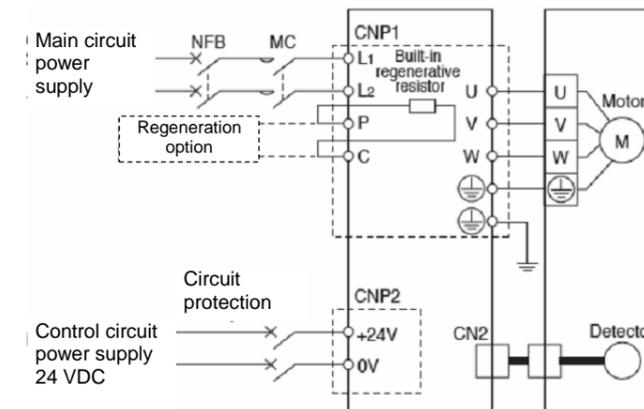
5 Wiring

Caution

- Do not perform wiring while the power is on.
- Confirm proper insulation of wiring.
- Use only the specified cables.
- Ensure that the driver and servo motor are installed securely before wiring commences.
- Wire the connector correctly and securely.
- Check the connector for polarity and do not apply any voltage to the terminals other than those specified.
- Take appropriate measures against noise. Noise in a signal line may cause malfunction.
- Do not route wires and cables together with power or high voltage cables.
- Keep wiring as short as possible to prevent interference from electromagnetic noise and surge voltage.
- Do not use the product in a place where electrical surges are generated.
- Use suitable surge protection when a surge generating load such as a solenoid valve is to be directly driven.
- Take care that actuator movement does not catch the cables.

5.1 Wiring

Single phase 200 to 230 VAC or Single phase 100 to 120 VAC



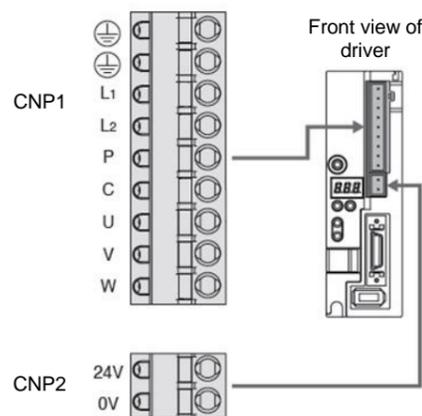
5.2 Ground connection

- Provide grounding to ensure correct operation and to improve noise resistance of the product.
- This product should be individually grounded using a short cable.
- A dedicated Ground connection must be used. Grounding should be to a D-class ground (ground resistance of 100 Ω maximum).
- The cross-sectional area of the ground cable shall be 2 mm² minimum.

Caution

- To prevent an electric shock, always connect the protective earth (PE) terminal (terminal marked ⊕) of the driver to the protective earth (PE) of the control box.

5 Wiring (continued)



Main circuit power supply connector (CNP1)

Terminal	Function	Details
⊕	Protective earth	Provide a ground connection to the servo motor earth terminal and the control panel protective earth.
L1	Main circuit power supply	Connect the main circuit power supply. LECSA1
L2		Single phase 200 to 230 VAC, 50/60 Hz LECSA2 Single phase 100 to 120 VAC, 50/60 Hz
P	Built-in regenerative resistor or Regeneration option	Terminal to connect regeneration option.
C		<ul style="list-style-type: none"> LECSA#-S1: No regeneration option. LECSA#-S3, S4: External regenerative resistor to be connected to P and C. Ensure internal resistor has been disconnected when using external resistor. Internal resistor connected when shipped.
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)

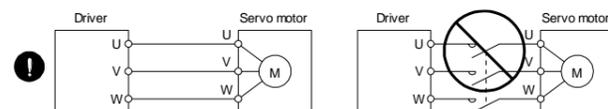
Terminal	Function	Details
24V	Control circuit power supply (24 V)	Control circuit power supply (24 VDC) to driver.
0V	Control circuit power supply (0 V)	Control circuit power supply (0 VDC) to driver.

Warning

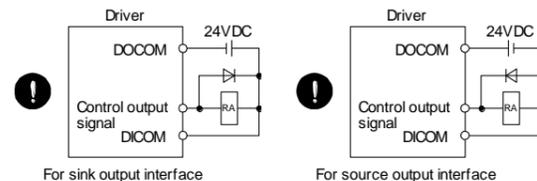
- Do not install the driver, servo motor or the regeneration option, on or near combustible materials.
- Always use a magnetic contactor between the main circuit power supply and the "L" terminals of the driver. Configure the wiring to ensure the power supply can be turned off at the driver. The magnetic contactor prevents a continuous large current flow if the driver malfunctions.
- When a regenerative resistor is used, monitor the resistor temperature and cut the main power to the driver if the temperature exceeds safe levels, otherwise the regenerative resistor will fail and there is a risk of fire.
- Remove the built-in regenerative resistor and it's wiring from the driver when adding an external regeneration unit (LECSA□ series).
- Provide adequate protection to prevent foreign matter from entering the driver and servo motor.
- Always connect a circuit breaker to the power supply of the driver.

5 Wiring (continued)

- Before disconnecting the CNP1 connector from the driver, ensure that the regenerative resistor has been disconnected.
- Install and wire the equipment correctly and securely. Otherwise, the servo motor may operate unexpectedly.
- Do not install a power capacitor, surge suppressor or radio noise filter (FR-BIF option) between the servo motor and the driver.
- Connect the wires to the correct phase terminals (U, V, W) of the driver and servo motor.
- Connect the servo motor power terminal (U, V, W) directly to the servo motor power input terminals (U, V, W). Otherwise a malfunction or fault may occur.



- Do not connect AC power directly to the servo motor. Otherwise, it may cause a malfunction.
- The surge absorbing diode installed to the DC relay for control output should be fitted with correct polarity. Otherwise, the emergency stop and other protective circuits may not operate.



- Tighten the cables to the specified torque. When cables are loose, the cable or terminal block (connector) will generate heat due to poor contact.

6 Setting

In order to move the electric actuator to a specific position, it is necessary to set up the patterns of operation with a PC using the driver setting software. This set up data will be recorded in the memory of the driver.

Point table data describes the data that sets items of operation (such as positioning width) excluding speed, position, acceleration, and deceleration. Point table data will become effective as soon as it is recorded into the driver.

The driver has an LED display to show the servo status and alarm details, and parameter setting switches.

Refer to the Operation Manual on the SMC website (URL: <https://www.smcworld.com>) for further setting details.

7 How to Order

Refer to the catalogue on the SMC website (URL: <https://www.smcworld.com>) for the How to Order information.

8 Outline Dimensions (mm)

Refer to the drawings / operation manual on the SMC website (URL: <https://www.smcworld.com>) for outline dimensions.

9 Maintenance

9.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- Before performing maintenance, turn off the power supply. Wait until the charge lamp turns OFF. Check the voltage with a tester 15 minutes after the power supply is turned OFF. Lock the system so that no other person can turn the power on or implement measures such as a safety plug.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product. Do not disassemble the product, unless required by installation or maintenance instructions.

Caution

- Maintenance should be performed according to the procedure indicated in the Operation Manual.
- When equipment is serviced, first confirm that measures are in place to prevent dropping of work pieces and run-away of equipment, etc, then cut the power supply to the system. When machinery is restarted, check that operation is normal with actuators in the correct position.

Warning

- Perform maintenance checks periodically. Confirm wiring and screws are not loose. Loose screws or wires may cause unexpected malfunction.
- Conduct an appropriate functional inspection and test after completing maintenance. In case of any abnormalities (if the actuator does not move, etc.), stop the operation of the system. Otherwise, an unexpected malfunction may occur and it will become impossible to ensure safety. Operate an emergency stop instruction to confirm safety.

- Do not put anything conductive or flammable inside or near to the driver.
- Ensure sufficient space around the driver for maintenance.
- Always perform a system check after maintenance.

10 Limitations of Use

10.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

10.2 Memory Life

Caution

The number of write times to the memory, which stores parameter settings, etc., is limited to 100,000. If the total number of the following operations exceeds 100,000 the driver may fail when the memory reaches the end of its useful life.

- Writing to the memory due to parameter setting changes
- Writing to the memory due to device changes
- Writing to the memory due to point table changes
- Writing to the memory due to program changes
- Writing to the memory due to data recording by drive recorder

11 Product disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

Dispose of the driver and other options according to local laws and regulations.

12 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

SMC Corporation

URL: <http://www.smcworld.com> (Global) <http://www.smc.eu> (Europe)
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