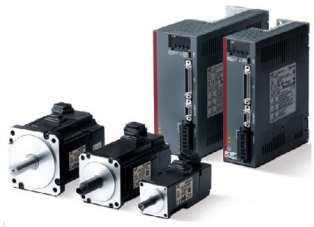
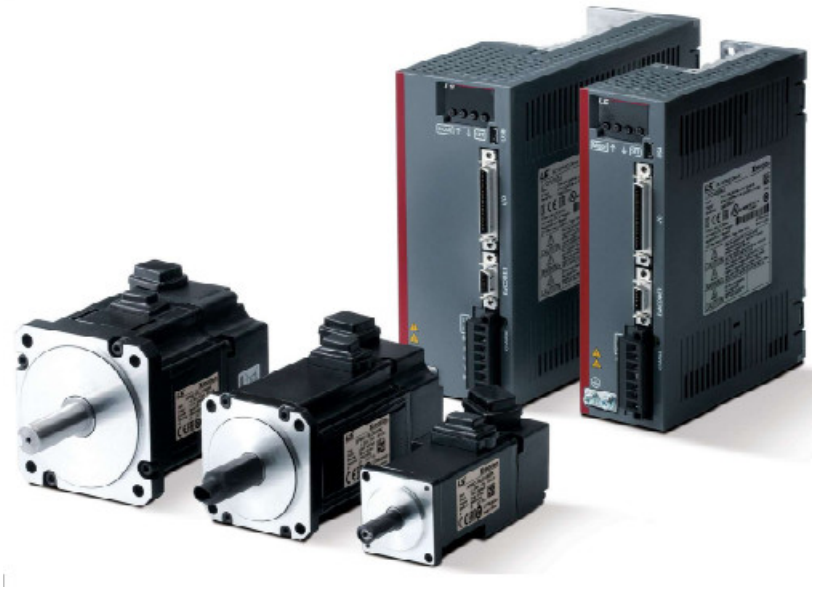


# LS L7C Series L7CA004U AC Servo Controller User Manual



**The Best Choice for the Most Benefit!**
We always try our best to bring the greatest benefit to our customers

**AC Servo User Manual**
**L7C Series**



## Safety Precautions

- Read all safety precautions before using this product.
- After reading this manual, store it in a readily accessible location for future reference.

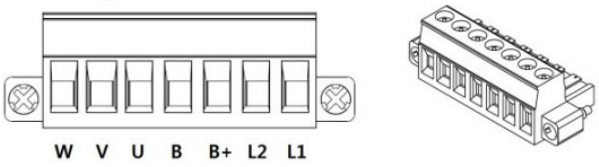
Contents



## Product Introduction

### 1.1 Product Components

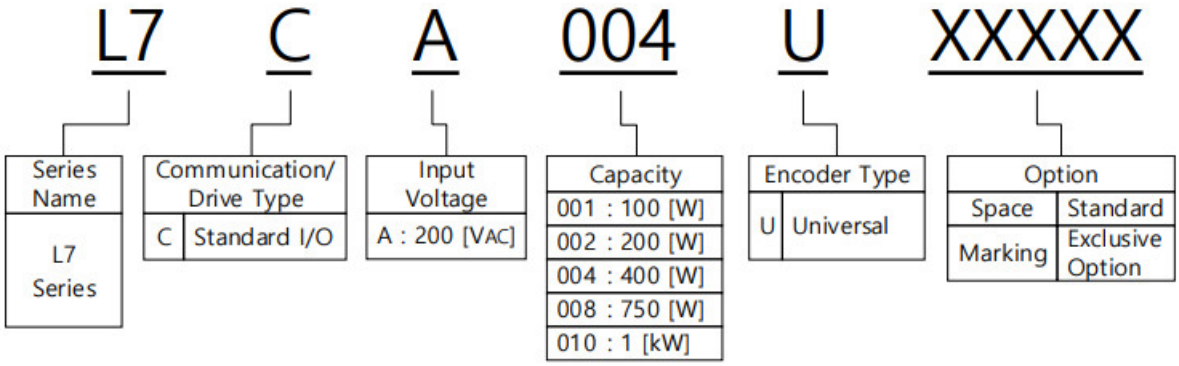
L7C Servo Drive comprises the following components.
Make sure that all components are included in your package.

| Contents | Quantity |
|---|---|
| Servo Drive | 1 |
| Servo Drive power connector(mounted on the Drive)<br>  <br> | 1 |
| PE bolt(M4 x 12, mounted on the Drive) | 2 |
| Servo Drive user manual (this manual) | 1 |

| Signal name | Explanation | Signal name | Explanation |
|---|---|---|---|
| L1 | Main power Input | U | Servo motor power output |
| L2 | | V | |
| B+ | External Regenerative Resistor | W | |
| B | | | |

### 1.2 Notation Conventions

The notation of each segment of L7 Drive is as follows.




**The following is an example of a product label.**
**The product label is attached to the right side cover of the L7C servo drive.**


Certification marks for the standards for which the product has been certified by certification bodies are shown on the product label. Products that do not have the marks are not certified for the standards.

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## Alarm and Warning

**Refer to the user manual on the website for details about alarms and warnings.**

| Alarm Code | Contents |
|---|---|
| AL-10 | Over current(H/W) |
| AL-11 | Power Module over heat |
| AL-14 | Over current(S/W) |
| AL-15 | Abnormal current offset |
| AL-16 | Over current limit (H/W) |
| AL-21 | Continuous overload |
| AL-22 | Drive temperature 1 |
| AL-23 | Regenerative overload |
| AL-24 | Motor cable disconnection |
| AL-25 | Drive temperature 2 |
| AL-30 | Serial Encoder communication error |
| AL-31 | Encoder cable disconnection |
| AL-32 | Encoder data error |
| AL-33 | Motor ID setting error |
| AL-34 | Encoder Z phase open |
| AL-35 | Encoder low battery error |
| AL-38 | Encoder setting error |

| Alarm Code | Contents |
|---|---|
| AL-40 | Low voltage |
| AL-41 | Over voltage |
| AL-42 | Main power fail |
| AL-50 | Over speed limit |
| AL-51 | Position following error |
| AL-53 | Excessive speed deviation |
| AL-63 | Parameter error |
| AL-71 | Factory setting error |

| Warning Code | Contents |
|---|---|
| H01 | Main power phase loss |
| H02 | Encoder low battery |
| H04 | S/W position limit |
| H08 | DB over current warning |
| H10 | Overload warning |
| H20 | Setup warning |
| H80 | Emergency signal |

## Safety Precautions

### Safety Precautions

**– Safety precautions are categorized as either Danger or Caution , depending on the seriousness.**

**Danger** Failure to comply with these guidelines may cause serious injury or death.

**Caution** Failure to comply with these guidelines may cause slight injury or property damage.
※ Certain cases classified as Caution may also cause serious consequences depending on the situation. Therefore, close attention should be given to this category.

### Electric Safety Precautions

- Before wiring or inspection tasks, turn off the power and wait 15 minutes or more until the charge lamp goes off, and then check the voltage with a voltage tester. Enough voltage may remain in the capacitor after the power is off to cause an electric shock.
- Be sure to protect the earth (PE) both the servo drive and the servo motor.
- Only specially trained technicians may perform wiring on this product.
- Install both the servo drive and servo motor before performing any wiring.

- Do not operate the device with wet hands.
- Do not open the servo drive cover during operation.
- Do not operate the device with the servo drive cover removed.
- Even if the power is off, do not remove the servo drive cover

### Fire Safety Precautions

- Install the servo drive, the servo motor, and the regenerative resistor on non-combustible materials.
- Disconnect the input power if the servo drive malfunctions.
- Servo motor over-temperature sensing is not provided by the servo drive. Please use a thermal sensor, etc. for thermal protection of the servo motor.
- To prevent a fire, use a molded-case circuit breaker or fuse for the input power supply.

### Repair and Inspection Precautions

- Before performing servicing tasks, turn off the power. Wait 15 minutes until the charge lamp goes off, and then check the voltage with a voltage tester.
- Only authorized personnel may repair and inspect the device or replace parts.
- Do not modify this device in any way.

## Installation Precautions

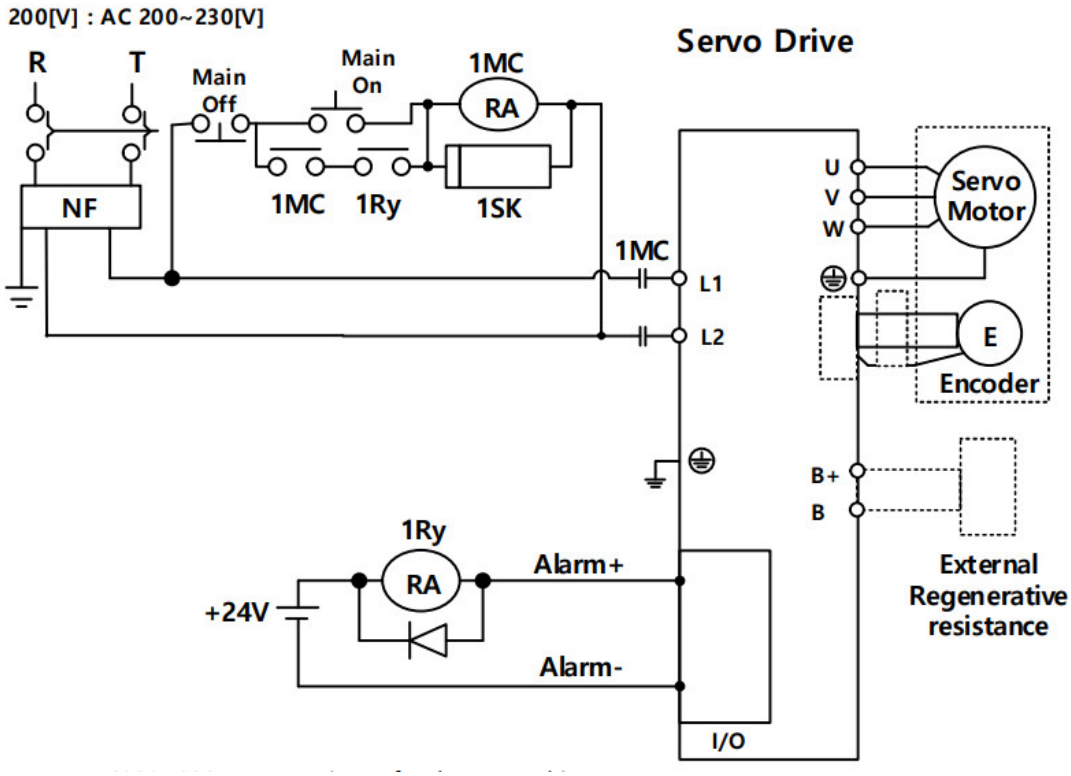
- Install the product in the correct orientation.
- Do not stack more weight than permitted on top of the product.
- Do not drop the product or expose it to hard impact.
- Install this product in a location that is free from water, corrosive gas, combustible gas or flammable materials.
- Install this product in a location capable of supporting the weight of this product.
- Do not stand on the product or place heavy objects on top of it
- The servo drive must be installed in the metal cabinet.
- Always maintain the specified spacing between the servo drive, the cabinet and other devices.
- Ensure that there is no conductive or flammable debris inside the servo drive or the servo motor.
- Firmly attach the servo motor to the machine..
- Install the servo motor with a correctly oriented decelerator.
- Do not touch the rotating unit of the servo motor during operation.
- Do not apply excessive force when connecting the couplings to the servo motor shaft.
- Do not place loads on the servo motor shaft that exceed the specified amount.
- Store and operate servo drive under the following environmental conditions.

| Item | Environment conditions |
|---|---|
| Surrounding Air temperature | 0 – 50 [°C] |
| Storage Temperature | -20 – 65 [°C] |
| Surrounding Air Humidity | Below 90[%] RH (no condensation) |
| Storage Humidity | |
| Altitude | Max. 1000[m] above sea level |
| Spacing | When installing 1 unit:<br>More than 40[mm] at the top and bottom of the control panel, More than 10[mm] on the left and right sides of the control panel.<br>When installing 2 or more units: More than 100[mm] at the top of the control panel, More than 40[mm] at the bottom of the control panel, More than 30[mm] on the left and right sides of the control panel, More than 2[mm] between units. |
| Pollution degree | 2 |
| Overvoltage category | Ⅲ |
| Degree of Protection | IP2X |
| Short Circuit Current Rating(SCCR) | 5kA/240V |
| Others | Ensure the installation location is free from dust, iron, corrosive gas, or combustible gas.<br>Ensure the installation location is free from vibrations or hard impact. |

- The standards related to servo drive are as follows.

| | | |
|---|---|---|
| Global standards | CE | LVD: EN 61800-5-1:2007(2nd Edition)<br>EMC : EN 61800-3:2004/A1:2012 |
| | UL | UL 508C, CSA C22.2 No. 274-13 or No. 14-13 [E479434] |
| Koreastandards | KC | Class A Industrial/Official |
| | | As this equipment has undergone EMC registration for business purposes (“A” class). the seller and/or the buyer is asked to beware of this point and designed to be used in the area, except for home use. |

**Wiring Precautions**




- Always use AC200~230[V] power input for the servo drive.
- Always connect the servo drive to the protective earth (PE) terminal.
- Branch circuit protection shall be provided per the NEC (National Electrical Code).
- Be sure to use a molded-case circuit breaker when you perform wiring for the servo drive.
- When you perform wiring for the servo drive, be sure to install a noise filter on the main power to satisfy EMI specifications.
- Do not connect commercial power directly to the servo motor.
- Do not connect commercial power directly to the U, V, W output terminals of the servo drive.
- Connect the U, V, W output terminals of the servo drive directly to the U, V, W input terminals of the servo motor, but do not install magnetic contactors between the ires.
- For connection, use copper wires.
- Always use pressurized terminals with insulation tubes when connecting the servo drive power terminal.
- When wiring, be sure to separate the U, V, and W cables for the servo motor power and encoder cable. Use our own designated cables. To use other cables, check the rated current of the servo motor, and consider the operating environment to select appropriate cables.
- Be sure to use twisted-pair shield wires for encoder and I/O signal cables.
- Always use the robot cable if the servo motor moves.
- Before wiring the power lines, turn off the input power of the servo drive and then wait until the capacitor is completely discharged.
- L7C Series do not provide an internal regenerative resistor. If the regenerative capacity is higher because of frequent acceleration and deceleration, connect an external regenerative resistor to B and B+.

## Initial Setup Precautions

- Check the input voltage and power unit wiring before supplying power to the device.
- The servo must be in the OFF mode when you turn on the power.

- Be sure to check the motor ID, encoder type, and encoder pulse before supplying power.
- First set the motor ID [0x2000], encoder type [0x2001] and encoder pulse [0x2002] after turning on the power.
- After you complete the above settings, set the drive mode for the servo drive that is connected to the upper-level controller in [0x6060].
- Refer to the manual to perform I/O wiring for the servo drive according to each drive mode.
- You can check the on/off status of each I/O contact point from the digital input of [0x60FD].

**Usage Precautions**

- Install an emergency cut-off switch, which immediately stops operation in an emergency.
- Reset the alarm when the servo is off. Be warned that the system restarts immediately if the alarm is reset while the servo is on.
- Use a noise filter or DC reactor to minimize electromagnetic interference. This prevents nearby electrical devices from malfunctioning due to electromagnetic interference.
- This servo drive has solid-state servo motor overload protection. (Overload protection will be activated when it exceeds 100% of the drive rated current or more than the motor rated current.)
- Do not incinerate the servo drive. Harmful gas may be released if the servo drive is burned.
- Only use approved servo drive and servo motor combinations.
- The electric brake on the servo motor stops operation. Do not use it for ordinary braking.
- For the wiring diagram of the electric brake-type motor, refer to the guidebook on the homepage.
- Brake failure may occur if the electric brake is degraded or the mechanical structure is improper (for example, if the ball screw and servo motor are combined via the timing belt). Install an emergency stop device to ensure mechanical safety.

**Malfunction Precautions**

- Install a servo motor with an electric brake or separate the brake system for use during emergencies or device malfunctions.
- If an alarm occurs, solve the underlying cause of the problem. After ensuring safe operation, deactivate the alarm and resume operation.
- Do not approach the machine until the problem is solved.

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※ Detailed user manuals and software can be downloaded from the website.
※ Specifications in this manual are subject to change without notice due to continuous product development and improvement.


## Documents / Resources

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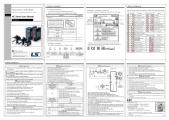
|  | **LS L7C Series L7CA004U AC Servo Controller** [pdf] User Manual<br>L7C Series, L7CA004U, AC Servo Controller |