

Positioning Driver  
**Series LC8**  
 For AC Servomotor



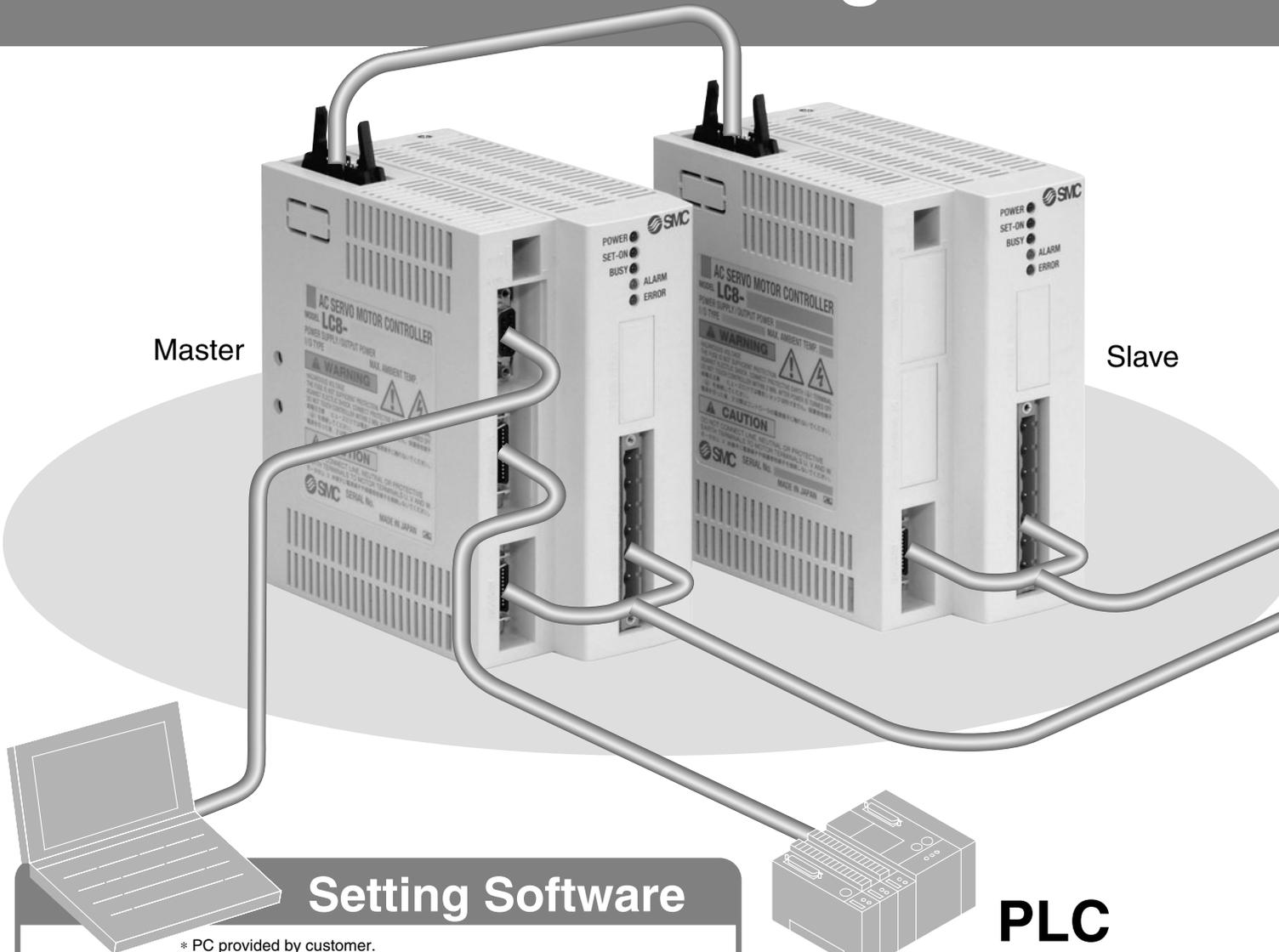
Number of steps: **117**  
 Compliant motor capacity: **50 W, 100 W, 200 W**  
 Power supply voltage: **100/115 VAC**  
**200/230 VAC**  
 Command I/O: **NPN, PNP**

**Compliant with Series LJ1, LG1 and LTF.**



- Application Example Using LC8 \_\_\_\_\_ P.856
- LC8 Controller Setting Software \_\_\_\_\_ P.857
- Programming the Stepping Data and Executing It \_\_\_\_\_ P.858
  - How to Input the Pallet Data \_\_\_\_\_ P.860
- Positioning Driver/For AC Servomotor/LC8 \_\_\_\_\_ P.862

# Positioning Driver /



## Setting Software

\* PC provided by customer.

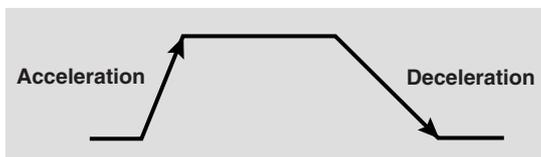
Input positioning data from controller setting software.

### Each data is set collectively from master.

Setting data dedicated for each slave is at one time from setting software after connecting the communications cable with master.

Step Number	Abs. / Rel.	Position (mm)	Velocity (mm/s)	Accel. (mm/s <sup>2</sup> )	Decel. (mm/s <sup>2</sup> )	Torque %
1	A	0.00	500	3000	3000	
2	A	100.00	500	3000	3000	
3	A	200.00	500	3000	3000	
4	A	300.00	200	3000	1000	
5	R	100.00	100	3000	3000	
6	R	-100.00	100	3000	3000	

### The acceleration and the deceleration can be set individually.



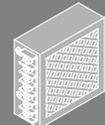
## PLC

PLC



Manipulation panel

\* Provided by customer



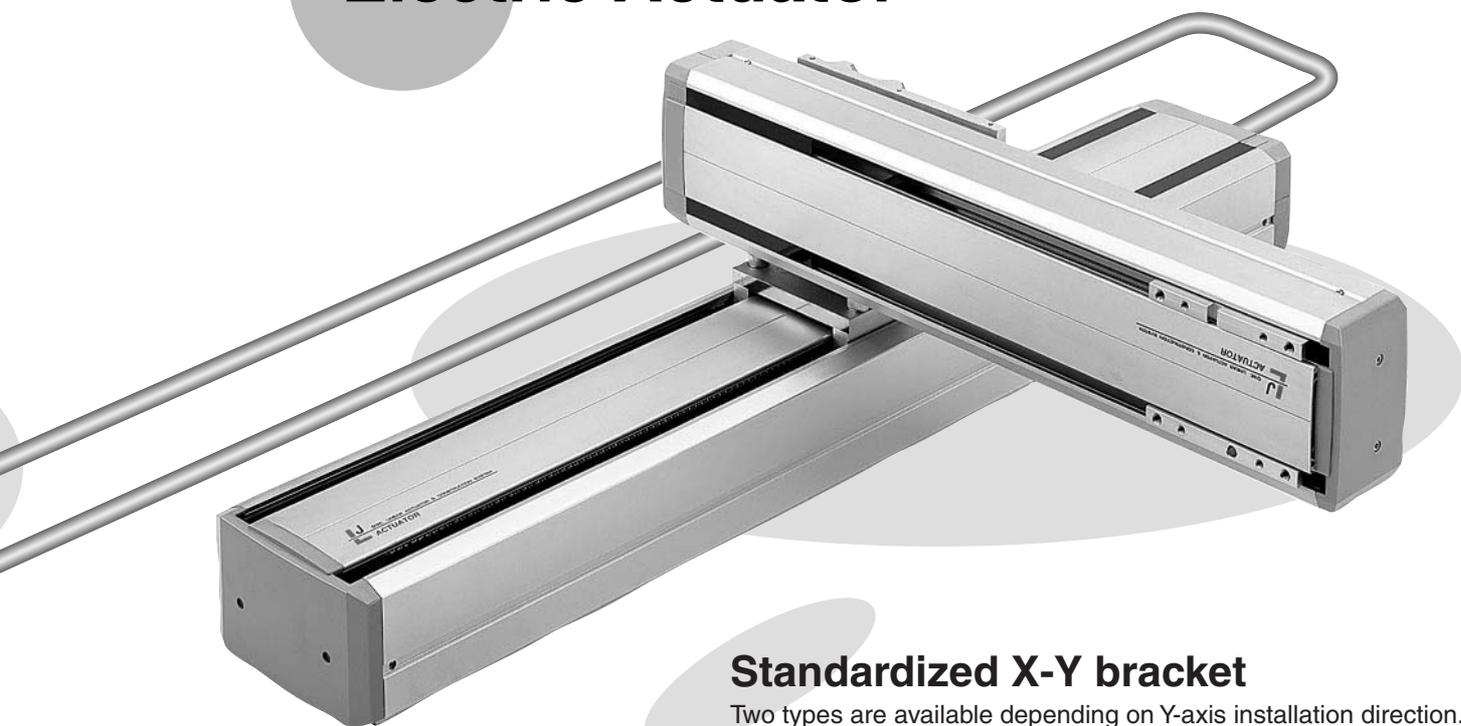
24 VDC voltage

## Stepping Operation

Using I/O of a PLC, able to set the 117 patterns (steps) positioning.

# For AC Servomotor *Series LC8*

## Electric Actuator

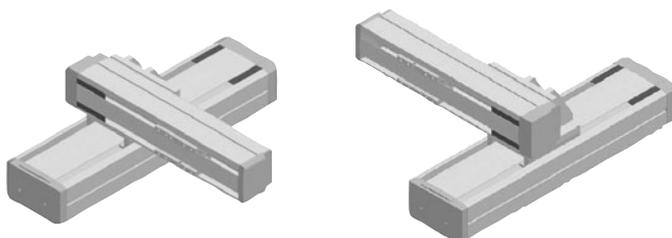


### Standardized X-Y bracket

Two types are available depending on Y-axis installation direction.

### ⚠ Caution

In case of using 3-axis or more, be sure to contact us for operating usage and its condition.



## Compliant Actuators



**Series LJ1**



**Series LG1**



**Series LTF**

## Variations

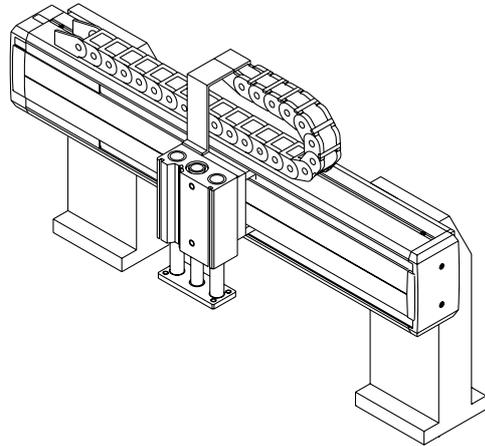
Motor capacity		Series LJ1	Series LG1	Series LTF
50 W	Payload	10 kg	—	—
	Max. speed	600 mm/s	—	—
100 W	Payload	30 kg	30 kg	30 kg
	Max. speed	1000 mm/s	1000 mm/s	500 mm/s
200 W	Payload	60 kg	—	50 kg
	Max. speed	1000 mm/s	—	1000 mm/s

\* For detailed information, please refer to each series.

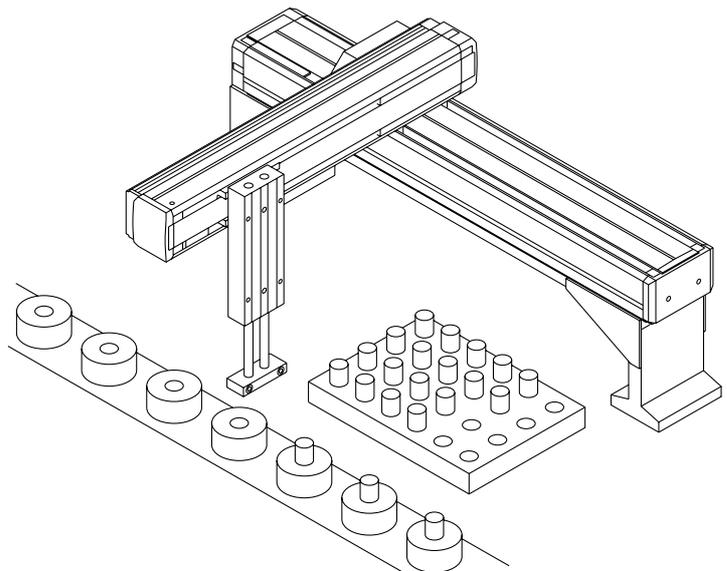
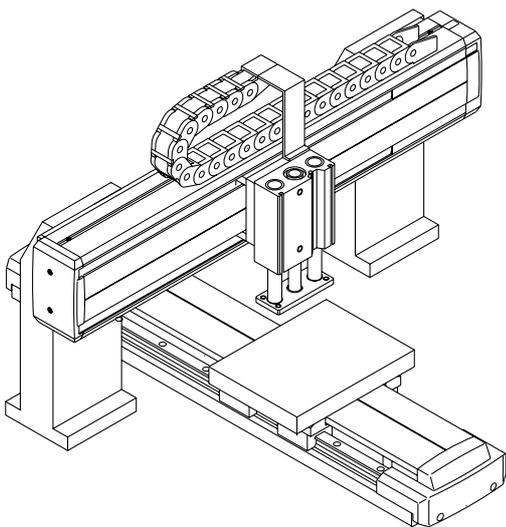
## Application Example Using LC8

### Pick & Place

For multi-point positioning, it can be operated in accordance with the commands from a PLC, etc. by simply programming the operation data into the LC8.



### Palletizing motion



By combining to form 2-axis, a motion such as palletizing is possible.  
If programming the positioning motion into LC8, it will operate in accordance with the command by PLC, etc.  
(Makeup motion cannot be done)

**LC8 Controller Setting Software**

**Principal Functions**

**Operation data**  
Data used during the step operation.

**Actuator data**  
Data for strokes, etc., which is in accordance with the actuator type.

**Pallet data**  
Data entered for palletizing.

**PIP data**  
Used for manually tuning the actuator gain.

**Step test**  
Used to conduct a test run with the data programmed.

**Cycle test**  
Used to conduct 2 operations alternately with the data programmed.

**Operation data programming screen**

**Explanation for operation data programming screen**

No.	Description	Function
①	Inputting data	Program the transfer mode, position, speed, acceleration, deceleration, torque (in torque mode).
②	Returning to home position	Conduct motion to return to home position from software.
③	Transmitting/Receiving the data	Transmit/Receive the data to and from LC8.
④	Exit	Close the program.
⑤	Emergency stop	Emergency stop function, as well as displaying the status of emergency stop.
⑥	Axis programming	Select the axis number.
⑦	Monitor mode	Switch to the monitor mode.
⑧	Reading file/Save	Write/Read the data in/out of the file.
⑨	Selecting step number	Display the step number for operation data.

**Pallet data programming screen**

**Explanation of pallet data programming screen**

No.	Description	Function
⑩	Programming the X-axis	Program the data for the actuator in the X-axis.
⑪	Programming the Y-axis	Program the data for the actuator in the Y-axis.
⑫	Step number	Switches the display between 5 different pallet data.
⑬	Jog	Program the position by jog operation.

## Programming the Stepping Data and Executing It (For details, please refer to the "Instruction Manual".)

### How to Input the Stepping Data

Able to input the stepping data by using controller setting software.

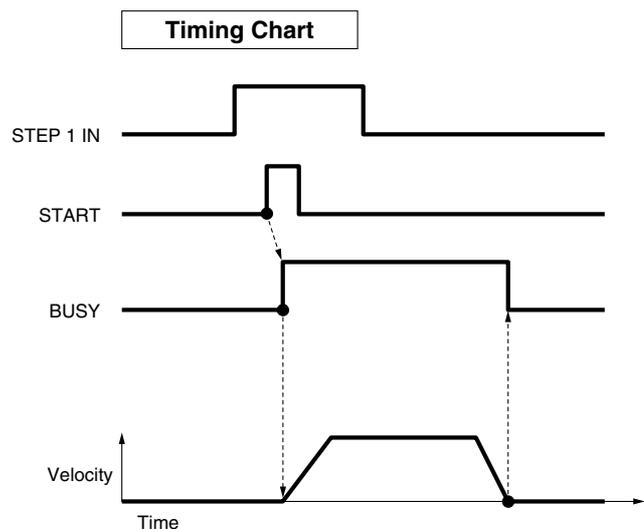
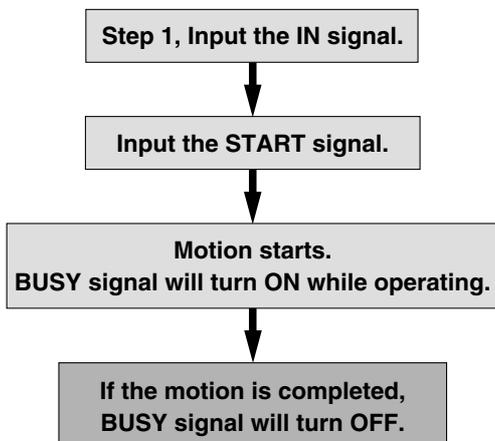
The screenshot shows the 'LC8 Controller Setting Software' window. It features a table for stepping data and various control buttons. The table has columns for Step Number, Abs./Rel., Position (mm), Velocity (mm/s), Acceleration (mm/s²), Deceleration (mm/s²), and Torque (%). Below the table are buttons for Job, Fwd, Rev, Read Position, and Home. At the bottom, there are units (Millimeters/Inches), an EMERGENCY STOP button, Monitor Mode, and an EXIT button. Six numbered callouts point to specific parts of the interface:

- ① Select the stepping number.
- ② Select between the absolute position and relative position.
- ③ Input the position to travel.
- ④ Input the traveling velocity.
- ⑤ Input the acceleration/ deceleration speed when traveling.
- ⑥ Write to the LC8 after inputting is completed.

### How to Operate the Stepping Data

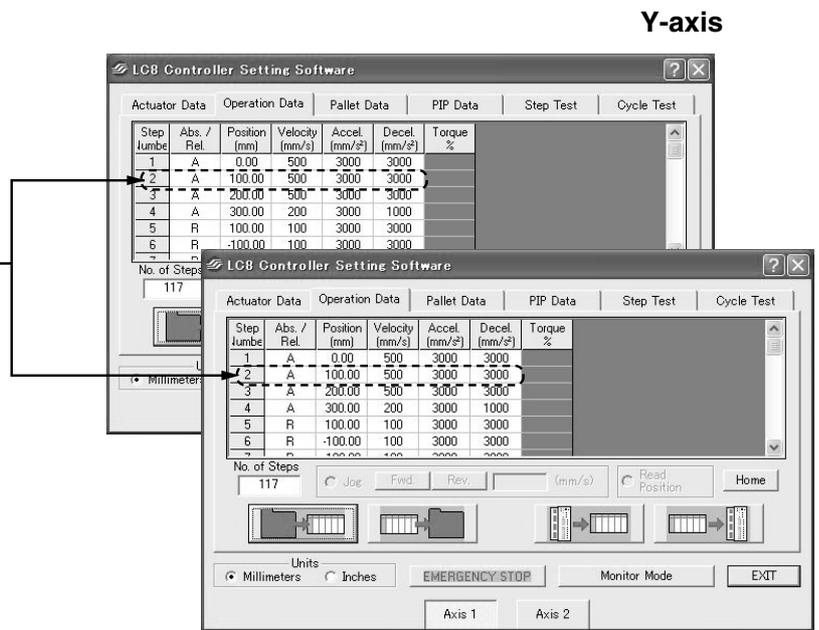
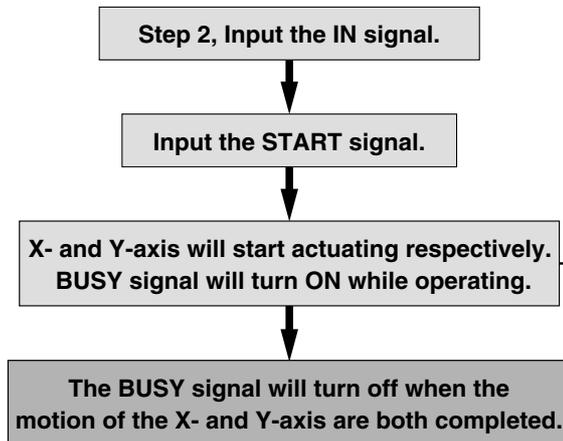
Operate the stepping data input communicated with the signal of a PLC.

Example) In case of operating the motion of step 1.



## 2-Axis Step Operation

Example: In case of operating the motion of step 2.

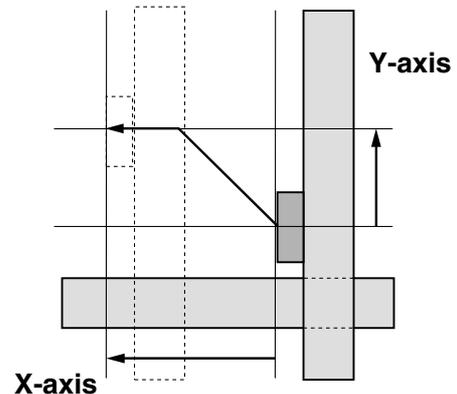


X-axis

Y-axis

In case of using by 2-axis, if the step number is indicated, and START signal is input, motion of transfer will get started in line with the step data for X- and Y-axis respectively.

Although Y-axis motion is first completed, BUSY won't turn OFF until X-axis will complete its motion. Only when X- and Y-axis will be completed, BUSY signal will turn OFF.



### Precautions on Connecting 2-Axis

#### ⚠ Caution

1. Motion for returning to home position starts 2-axis simultaneously. When returning to home position, please design the equipment so that the components inside the equipment should not interfere with each other.
2. In the case of entering step data for "Motion for 1-axis only", enter step data by means of setting the "Relative coordinates to the 0 mm position" for the step data of the stopped axis.

## How to Input the Pallet Data (For details, refer to "Instruction Manual".)

### How to Input the Pallet Data

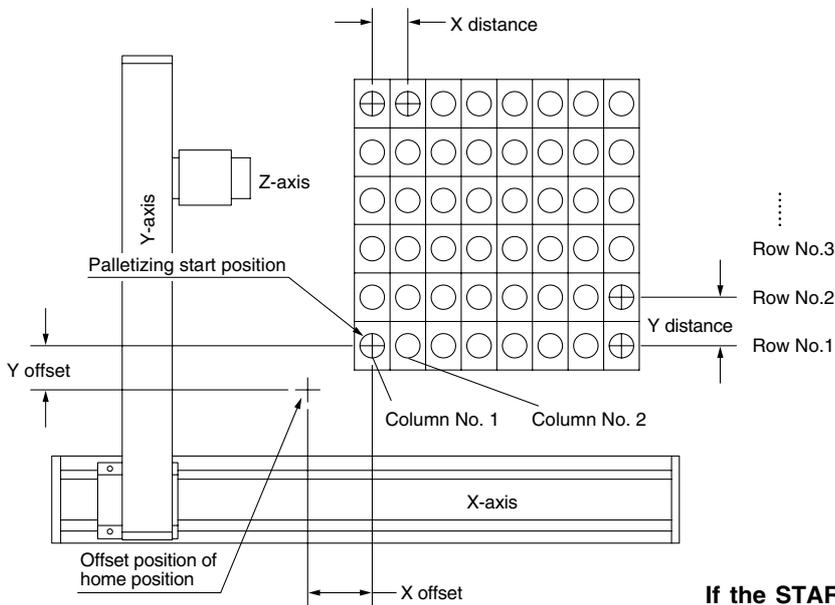
Able to input the pallet data by attached programming software for controller.

The screenshot shows the 'LC8 Controller Setting Software' interface. The 'Pallet Data' tab is active, displaying a table of parameters for X and Y axes. The parameters are:

Parameter	X Axis	Y Axis
Offset (mm)	30.00	30.00
Interval (mm)	10.00	15.00
Velocity (mm/s)	500	500
Accel. (mm/s <sup>2</sup> )	3000	3000
Decel. (mm/s <sup>2</sup> )	3000	3000
No. of Columns	8	6

Below the table are controls for Jog (Fwd, Rev), Home, and Units (Millimeters, Inches). There are also buttons for EMERGENCY STOP, Monitor Mode, and EXIT. The software is running on Axis 1 and Axis 2.

- Program the axis number to be used.
- Input the off-set distance of the home position (palletizing start position).
- Input the distance (pitch) of the pallet.
- Input the traveling velocity.
- Input the acceleration and deceleration when traveling.
- Input the number of line and row for X-axis and Y-axis.
- Write to the LC8 after input is completed.



If the START signal is inputted after the step number of the palletizing data has been inputted, it will move to the 1st row/1st column of the pallet.

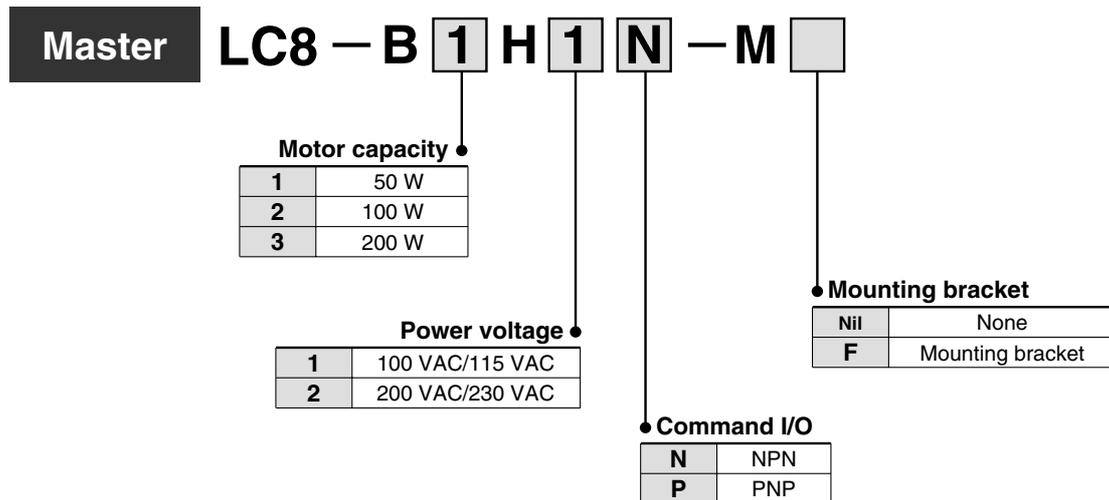
On every input of the START signal by using the same step number, it will move to the 2nd row/1st column, 3rd row/1st column...1st row/2nd column on the pallet. Each respective move is completed when BUSY signal is turned OFF.



# Positioning Driver/For AC Servomotor Series LC8

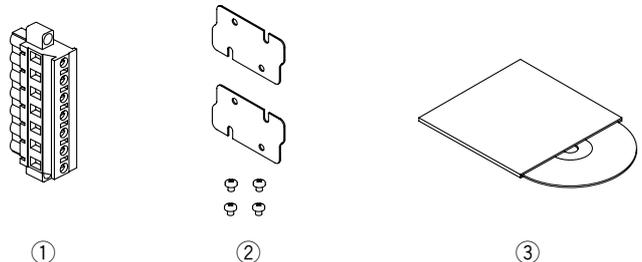
Compliant actuators/Series LJ1, Series LG1, Series LTF, Series LX

## How to Order



## Accessory

①	LC8-1-MP	Motor/Power connector
②	LC8-1-B	Kit for mounting bracket (Designated only with mounting bracket)
③	LC8-1-W1	LC8 controller installation software



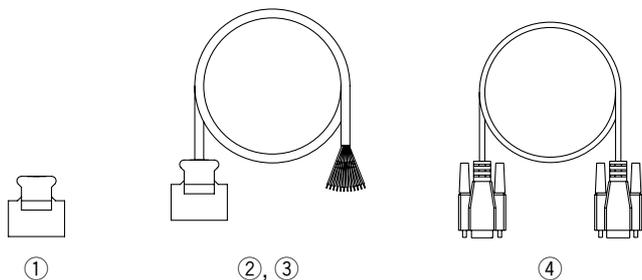
## Option Note) Purchase separately.

①	LC8-1-CN	Command I/O connector
②	LC8-1-1050	Connector with command I/O cable (0.5 m)
③	LC8-1-1300	Connector with command I/O cable (3 m)
④	LC8-1-1050P	With connector stick terminals with command I/O cable (0.5 m)
④	LC8-1-R03C	RS-232C communications cable (3 m)

- ① Made by Sumitomo 3M    Connector: 10126-3000PE  
Shell: 10326-52-A0-008 (or equivalent)
- ② Cable terminal: Individual wires
- ③ Cable terminal: Stick terminals (compliant with PC wiring system) Note 2)

Note 1) Either ① or ② or ③ will be required.

Note 2) As for PC wiring system, please confirm by Electric Products (CAT. 150) catalog.



## Precautions on Using Master

### ⚠ Caution

1. In case of using in 1-axis, use a master. (Slave alone cannot be used.)
2. Regarding the use of 3-axis or more, be sure to contact us for how-to-use and operating conditions.

## How to Order

**Slave** LC8 – B 1 H 1 – V □

**Motor capacity**

1	50 W
2	100 W
3	200 W

**Power voltage**

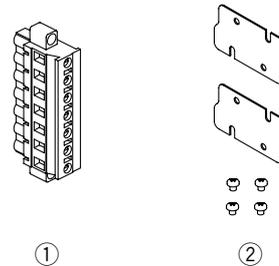
1	100 VAC/115 VAC
2	200 VAC/230 VAC

**Mounting bracket**

Nil	None
F	Mounting bracket

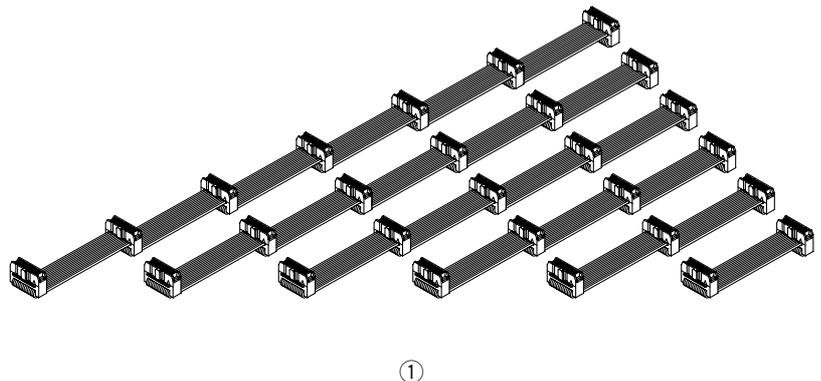
## Accessory

①	LC8-1-MP	Motor/Power connector
②	LC8-1-B	Kit for mounting bracket (Designated only with mounting bracket)



## Option Note) Purchase separately.

①	LC8-1-C2	2-axis communications cable
	LC8-1-C3	3-axis communications cable
	LC8-1-C4	4-axis communications cable
	LC8-1-C5	5-axis communications cable
	LC8-1-C6	6-axis communications cable
	LC8-1-C7	7-axis communications cable



## Precautions on Connecting Slave

### ⚠ Caution

1. Motion for returning to the home position starts simultaneously for master and slave. Design the equipment so that it will not interfere with components in equipment when returning to the home position.
2. If the START signal is input, the designated operation data for all the axes will start to the designated step number. For the operation data of the axis which should not operate, enter "Relative coordinates to the 0 mm position".
3. In case of using with single axis, use a master. (Slave alone cannot be used.)
4. Regarding the use of 3-axis or more, be sure to contact us for how-to-use and operating conditions.

# Series LC8



## Specifications

Model	LC8-B□□□□-□□	LC8-B□□□2□-□□
Power supply	100 to 115 V ± 10% 50/60 Hz	200 to 230 V ± 10% 50/60 Hz
Dimensions	141 mm x 75 mm x 130 mm	
Mass	0.85 kg	

## Electrical Specifications

Model	LC8-B1□1 □-□□	LC8-B2□1 □-□□	LC8-B3□1 □-□□	LC8-B1□2 □-□□	LC8-B2□2 □-□□	LC8-B3□2 □-□□
Motor capacity	50 W	100 W	200 W	50 W	100 W	200 W
Operating ambient temperature	0 to 50°C		0 to 40°C	0 to 50°C		0 to 40°C
Operating ambient humidity	35 to 85% (No condensation)					
Rated power consumption	80 VA	150 VA	320 VA	80 VA	160 VA	300 VA
Max. power consumption	230 VA	450 VA	960 VA	240 VA	460 VA	900 VA
Position detecting method	Incremental encoder					
Withstand voltage	1000 VAC (1 minute between terminal and case)					
Insulation resistance	2 MΩ (500 VDC) (Between terminal and case)					
Anti-noise	1000 Vp-p 1 μs, Start-up time 1 ns					

## Data Input

Item	Performance/Specifications
Number of steps	117 steps at the maximum
Palletizing pattern	5 patterns (when using master, slave)

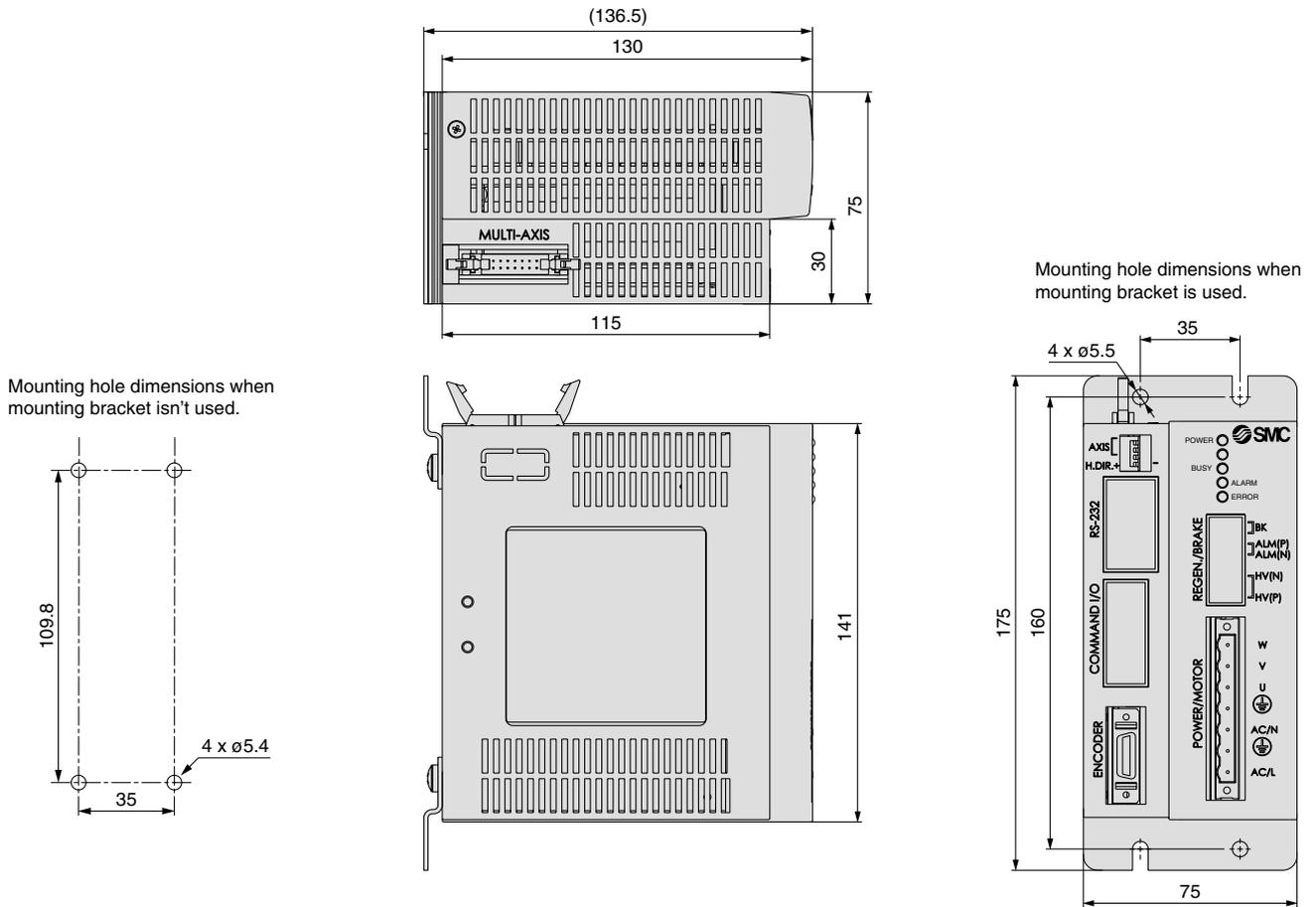
## Command I/O Specifications

Model	LC8-B□□□□N-□□	LC8-B□□□□P-□□
Command I/O input	+24 V common, 24 VDC ± 10%, Minimum 6 mA	PLC GND common, 24 VDC ± 10%, Minimum 6 mA
Command I/O output	NPN open collector (sink type), 24 VDC ± 10%, Maximum 80 mA	PNP open collector (source type), 24 VDC ± 10%, Maximum 80 mA
Minimum input pulse width	10 ms (E. Stop is 100 ms or more.)	
Leakage current	10 μA or less	
Internal voltage drop	0.8 V or less	

## Safety Items

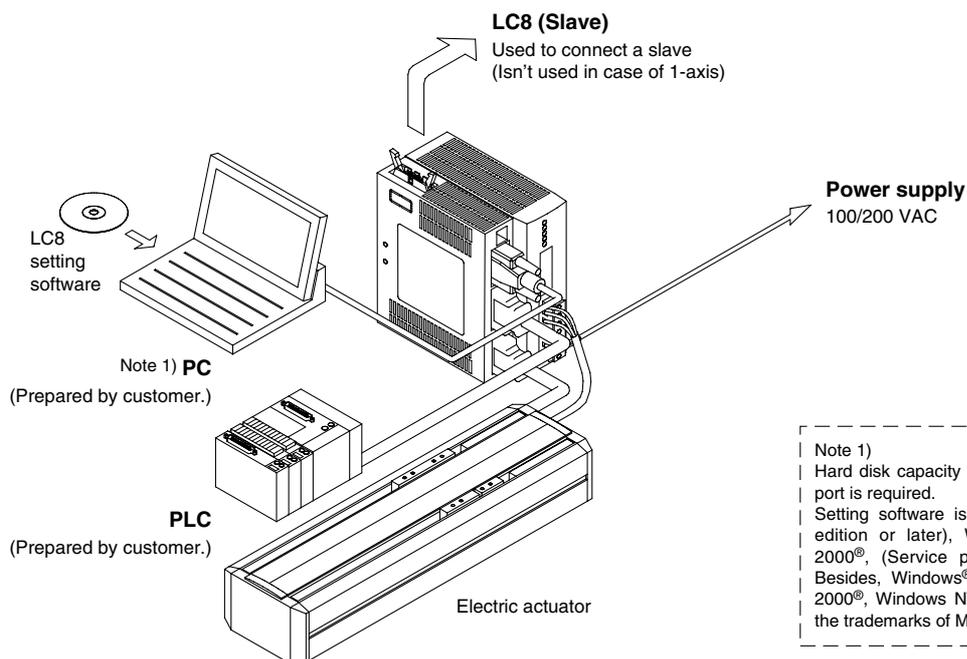
Item	Performance/Specifications
Alarming function	Over voltage/Low voltage, FWD/RVS limit switch, Overload, Motor drive circuit, Encoder connection, Forward soft stroke limit, Absolute home position stroke limit, Communications, Non-returning to home position, Over current, Current limit, Initialization of palletizing data, RS-232 communications
Error function	Emergency stop, Step number

## External Dimensions



## System Composition

Example of using with 1-axis step operation (In case of using with X-Y, a master and a slave is required.)

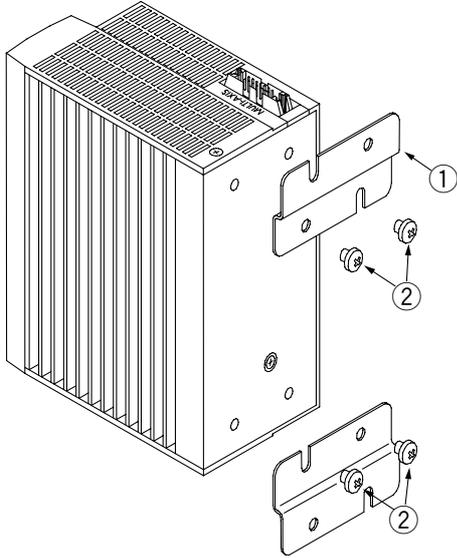


Note 1)  
Hard disk capacity 12 MB, RAM 4 MB or more, and RS232C port is required.  
Setting software is compliant to Microsoft Windows 95® (B edition or later), Windows 98®, Windows NT®, Windows 2000®, (Service pack 6), Windows Me®, Windows XP®. Besides, Windows®, Windows 95®, Windows 98®, Windows 2000®, Windows NT®, Windows Me® and Windows XP® are the trademarks of Microsoft Corporation.

# Series LC8

## Mounting Method

LC8-B□□□□-□F (In the case of a bracket option.)



Perform by mounting the attached bracket. For mounting dimensions please refer to the external dimension on the prior page. For wall mounting, please prepare the required M5 screws (4 pcs.).

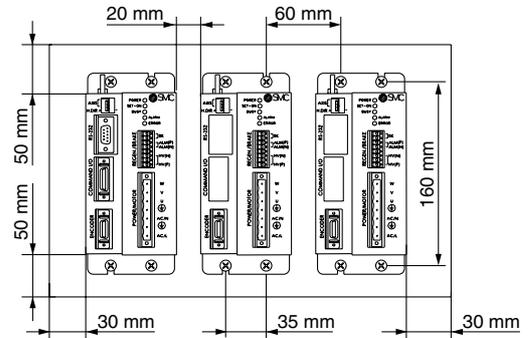
### Accessory Contents

①	Mounting bracket	2 pcs.
②	Mounting screw	4 pcs.

## Mounting

### ⚠ Caution

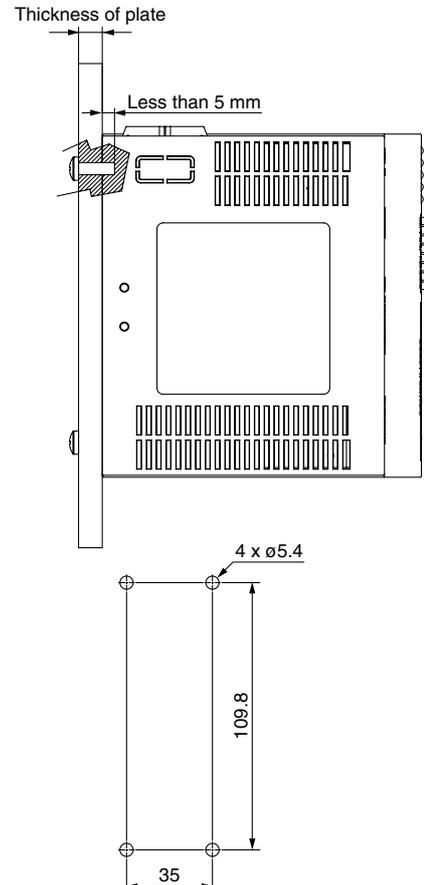
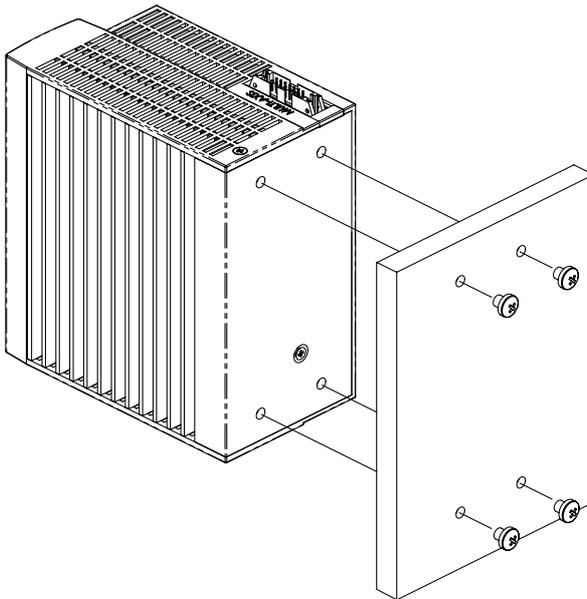
1. Consider the cooling period, so that the operating temperature of main body should be within the range of specifications. Also, allow enough distance from each side of the main body, construction and the parts.



LC8-B□□□□-□ (In case that there is not bracket option.)

Please prepare M5 screws (4 pcs.). Select a screw length that does not exceed the thickness of the plate + 5 mm. Drill holes in the plate with a distance of 35 mm between the width of the holes and 109.8 mm between the height of the hole.

Note) Do not use screws with a longer length than designated. If longer, it is likely to cause an electrical shock or a fire.



### Precautions on Using Multi-axis Cable

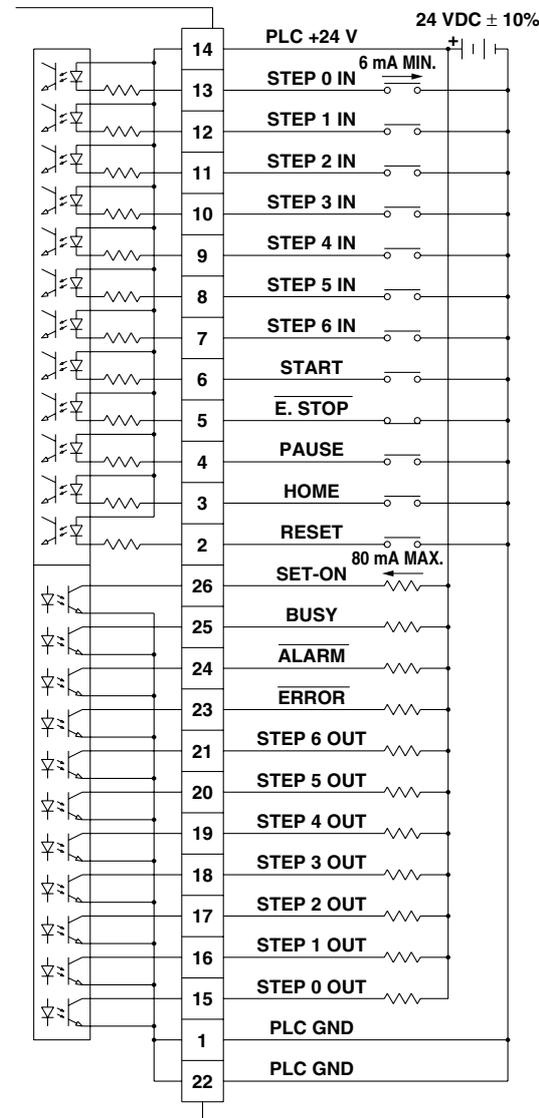
### ⚠ Caution

In case of connecting the LC8 with multi-axis cable, the cable should be 20 mm or longer but less than 30 mm to the driver.

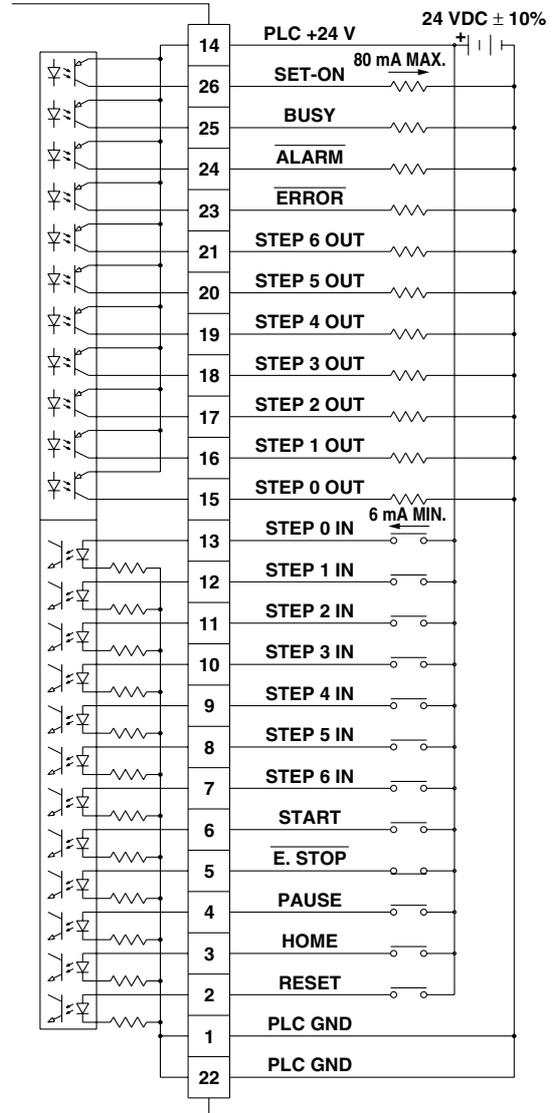
## Command I/O Connector's Wiring

### Wiring diagram

#### LC8-B□□□N-M□ (NPN specification)



#### LC8-B□□□P-M□ (PNP specification)



No.	Name of signals	Contents
14	PLC +24 V	— Connect +24 V for power supply for signal.
1	PLC GND	— Connect 0 V for power supply for signal.
22	PLC GND	
13	STEP 0 IN	Input the step number. (This will be configured in binary digit.)
12	STEP 1 IN	
11	STEP 2 IN	
10	STEP 3 IN	
9	STEP 4 IN	
8	STEP 5 IN	
7	STEP 6 IN	
6	START	Operate the step number.
5	E. STOP	Turn the emergency stop condition to OFF.
4	PAUSE	Motion stops temporarily.
3	HOME	Return to home position.
2	RESET	Reset alarm and error.

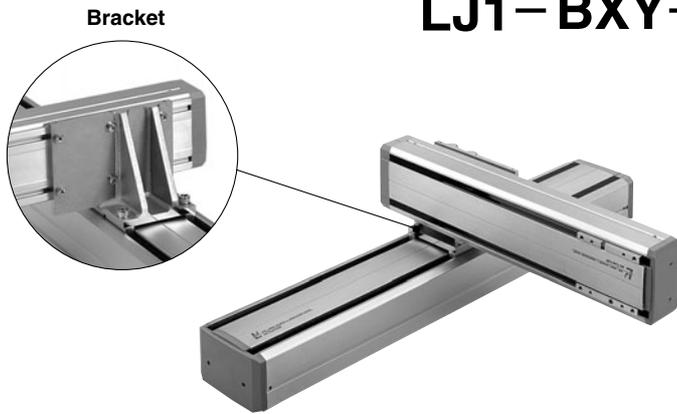
No.	Name of signals	Contents
26	SET-ON	Output Turn ON when returning to home position is completed.
25	BUSY	Output Turn ON while an actuator is traveling.
24	ALARM	Output Turn OFF when alarming
23	ERROR	Output Turn OFF when an error occurs.
21	STEP 6 OUT	Output the step number in motion (The output will be in binary digit.)
20	STEP 5 OUT	
19	STEP 4 OUT	
18	STEP 3 OUT	
17	STEP 2 OUT	
16	STEP 1 OUT	
15	STEP 0 OUT	

Input	24 VDC ± 10% Minimum 6 mA
Output	24 VDC ± 10% Maximum 80 mA

# Series LC8

## X-Y Bracket

Bracket for combining X-axis actuator and Y-axis actuator



**LJ1 – BXY – J2J1 LS**

• Direction for Y-axis installation (Refer to “Table 1”.)

<b>LS</b>	Extended direction: Left
<b>RS</b>	Extended direction: Right

Note) Extended direction viewed from X-axis motor side.

• Applicable actuators

Symbol	X-axis	Y-axis
<b>J2J1</b>	Series L1H20	Series L1H10
<b>J3J2</b>	Series L1H30	Series L1H20

Y-axis, Maximum transferable mass for each stroke (kg)

Y-axis Stroke (mm)	Applicable actuator symbol	
	<b>J2J1</b>	<b>J3J2</b>
100	10	30
200	10	22
300	10	14
400	—	8

Table 1 Y-axis installation direction (Y-axis extended direction viewed from the X-axis motor side)

<b>LS</b>	<p>Extended direction: Left</p>
<b>RS</b>	<p>Extended direction: Right</p>

When selecting X-Y bracket, please contact SMC.