



ORIGINAL INSTRUCTIONS



Refer to Declaration of Conformity for relevant Directives

Instruction Manual
3-axis Step Motor Controller
(EtherNet / IP™ type)
Series JXC92



The intended use of the 3-axis step motor controller is to control the operation of electric actuators.

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/IEC¹⁾, and other safety regulations.

- 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.

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- To ensure safety of personnel and equipment the safety instructions in this manual must be observed, along with other relevant safety practices.

	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

- **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 catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- **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.
- **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.

1 Safety Instructions - continued

- **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, combustions 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 specification described in the product catalogue.
 - 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.
- **Always ensure compliance with relevant safety laws and standards.**
 All electrical work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

Caution

- **The product is provided for use in manufacturing industries.**
 This product may cause interference if used in residential premises. 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.

2 Specifications

Basic Specifications

Item	Specifications
Number of axes per controller	Maximum. 3axis
Controlled motor	Step motor (servo 24 VDC)
Encoder	Incremental phase A / B (Encoder resolution 800 pulse / rotation)

Power supply specification ^{Note1)}	<ul style="list-style-type: none"> •Control power supply Power supply voltage: 24VDC+/-10% Max. current consumption: 500 mA •Motor drive power supply Power supply voltage: 24VDC+/-10% Max. current consumption: Depends on connected actuator.^{Note2)} 	
Serial communication	USB2.0 (Full Speed 12Mbps)	
Memory	Flash ROM	
LED indicator	LED description	Details
	PWR	Power supply status
	RUN	Operation status
	USB	USB connection status
	ALM	Alarm status
	NS	EtherNet/IP communication status
	MS	Controller status
L/A	Data transmission status	
100	EtherNet/IP communication speed	
Lock control	With forced lock-release terminal ^{Note3)}	
Cable length	Actuator cable: 20m maximum	
Cooling method	Natural air cooling	
Operating temperature range	0 to 40°C (No freezing)	
Operating humidity range	90% RH or less (No condensation)	
Storage temperature range	-10 to 60°C (No freezing)	
Storage humidity range	90% RH or less (No condensation)	
Insulation resistance	Between the external terminals and case 50MΩ (500 VDC)	
Weight	600 g (Direct mounting)	
	650 g (DIN rail mounting)	

- Note 1) Do not use a power supply with "inrush current protection" for the motor drive power supply.
- Note 2) Power consumption depends on the actuator connected. Refer to the actuator specifications for further details.
- Note 3) Applicable to non-magnetizing lock.

2 Specifications - continued

EtherNet/IP Specifications

Item	Specifications
Protocol	EtherNet/IP™ ^{note1)} (Conformance test version CT13)
Communication speed	10Mbps/100 Mbps (automatic negotiation)
Communication method	Full duplex/ Half duplex (automatic negotiation)
Setup file	EDS file
Occupied area	Input 16 bytes / Output 16 bytes
IP address setting	Manual setting by rotary switches: From 192.168.1.1 to 254
	Via DHCP server: Arbitrary address
Vendor ID	7h (SMC Corporation)
Product type	2Bh (Generic Device)
Product code	DEh

Note 1) EtherNet/IP™ is a trademark of ODVA.

3 Installation

3.1 Installation

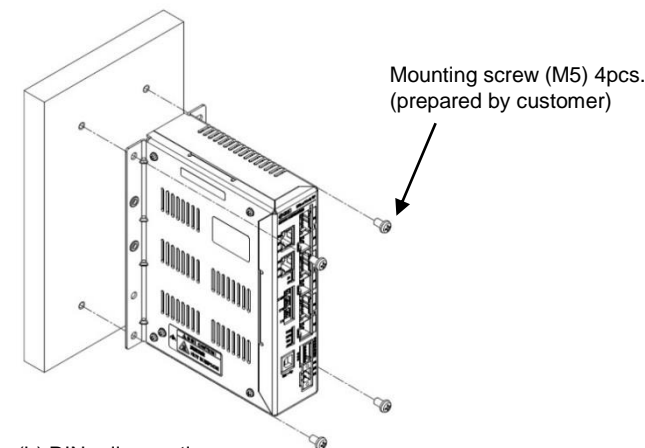
Warning

Do not install the product unless the safety instructions have been read and understood.

(1) Mounting

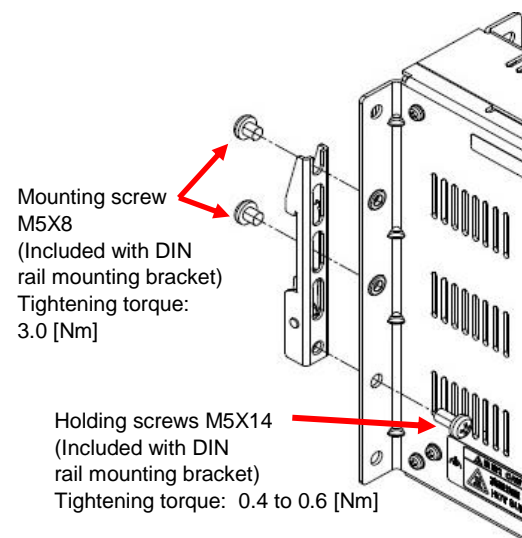
There are two ways to mount the controller, direct mounting with screws and DIN rail mounting. Controller mounting methods are shown below.

(a) Direct Mounting with four M5 screws



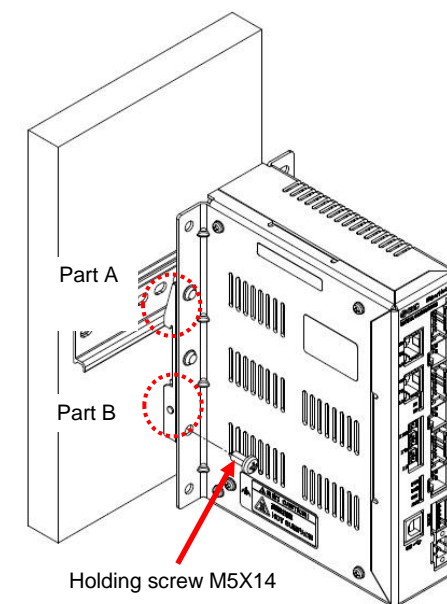
(b) DIN rail mounting

The figure below shows how to mount the DIN rail mounting brackets. Secure the DIN rail mounting bracket using the mounting screws (M5 x 8) two places on each side (4 places on both sides). (Appropriate tightening torque: 3.0 Nm)
 Secure the DIN rail mounting bracket using the holding screws (M5 x 14), one place on each side (2 places on both sides). Tighten for approximately 2 threads. Do not tighten completely.



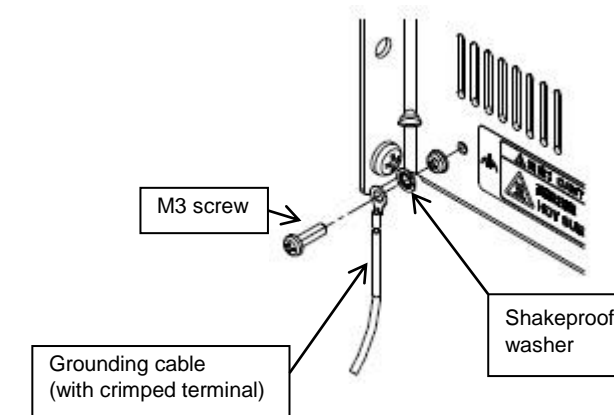
3 Installation - continued

The figure below shows how to mount the controller to the DIN rail. Hook part A on to the DIN rail. Press part B on to the DIN rail and tighten the holding screws (M5 x 14). (Appropriate tightening torque: 0.4 to 0.6Nm)



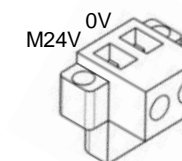
(2) Grounding

Fit the grounding cable with crimped terminal between the M3 screw and shakeproof washer as shown below and tighten the screw.



Power supply connector

- Connector specifications
 The power supply connector type included is shown below.
- (1) Motor drive power connector : M PWR**
 Manufactured by Phoenix Contact (Part number MSTB2,5/2-STF-5,08)

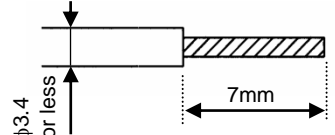


Terminal	Function	Description
0V ^{Note 1)}	Motor drive power supply (-)	Power supply side (-) for motor drive.
M24V	Motor drive power supply (+)	Power supply side (+) for motor drive.

Note 1) Motor drive power supply (-) and control power supply (-) are connected in the controller.

Prepare the electrical wiring according to the following specifications (to be prepared by the user).

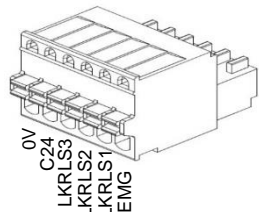
3 Installation - continued

Item	Specifications
Applicable wire size	Single, Stranded wire → AWG16 (1.25 mm ²), The rated temperature of the insulation coating should be 60°C or more.
Stripped wire length	

When the wire is inserted into the motor drive power connector, insert only the stripped part of the wire.

(2) Control power supply connector: CI

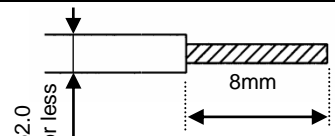
Manufactured by Phoenix Contact
(Part number FK-MC0,5/6-ST-2,5)



Terminal	Function	Functional explanation
0V ^{Note 1)}	Control power supply (-)	Power supply side (-) for C24V, LKRLS and EMG.
C24V	Control power supply (+)	Power supply side (+) for control.
LKRLS3	Unlock(+)	Release the lock status (+) of Axis 3.
LKRLS2	Unlock(+)	Release the lock status (+) of Axis 2.
LKRLS1	Unlock(+)	Release the lock status (+) of Axis 1.
EMG	Stop(+)	Release the stop status (+) of All axes. (Normal operation by applying 24V.)

Note 1) Control power supply (-) and motor drive power supply (-) are connected in the controller.

Prepare the electrical wiring according to the following specifications (to be prepared by the user).

Item	Specifications
Applicable wire size	Single, Stranded wire → AWG20 (0.5mm ²), the rated temperature of the insulation coating should be 60°C or more.
Stripped wire length	

When the wire is inserted into the control power supply connector, insert only the stripped part of the wire.

3.2 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact. Check the product specifications.
- Do not mount in a location exposed to radiant heat.

3.3 Piping

Caution

- Before piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

3.4 Lubrication

Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, use turbine oil Class 1 (no additive), ISO VG32. Once lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away.

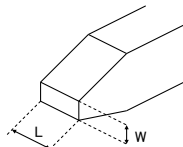
4 Settings

Initial Setting Method • Controller setting (IP address setting)

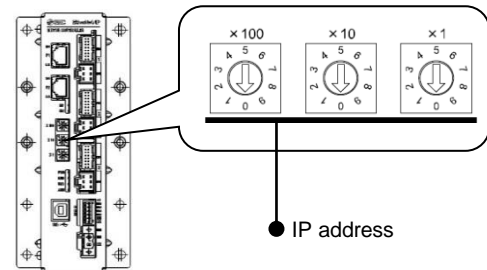
IP address setting is necessary to distinguish the controller on the EtherNet/IP network. The IP address is set by the rotary switches on the controller. Turn OFF the power supply while setting the switches.

Use a small flat blade screwdriver of the size shown below when setting the rotary switches.

< Size > Width L: 2.0 to 2.4 [mm], Thickness W: 0.5 to 0.6 [mm]



Magnified view of the flat blade screwdriver



Setup			Description
x100	x10	x1	
0	0	0	Remote Control mode ^{Note 1)}
0	0	1	192.168.1.1 (Factory default value)
0	0	2	192.168.1.2
:	:	:	:
2	5	4	192.168.1.254
2	5	5	DHCP mode ^{Note 2)}
2	5	6	Unused
:	:	:	
9	9	9	

Note 1) The mode to respond to the commands below of BOOTP/DHCP Server

provided by Rockwell Automation.

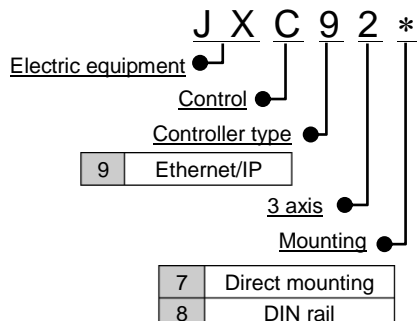
Enable DHCP (labelled 1 below)

Information including IP address can be obtained from BOOTP/DHCP Server. If the power is supplied again in this state, the controller will try to obtain the information including IP address again.

Disable BOOTP/DHCP (labelled 2 below)

Information including IP address is not obtained from BOOTP/DHCP Server. Previous setting can be held if power is supplied under this condition.
Note 2) Obtain IP address from DHCP Server. Obtained IP address is lost when power supply is disconnected.

5 How to Order



•Applicable Actuator

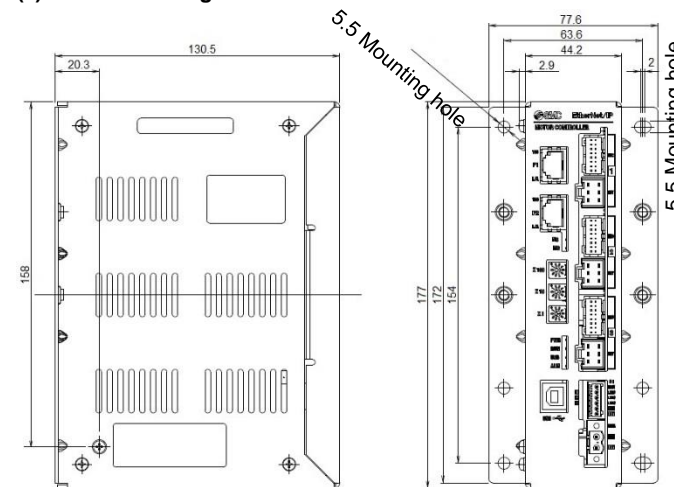
Electric Actuator Rod Type	LEY Series
Electric Actuator Rod Type with Guide	LEYG Series
Electric Actuator Slider Type	LEF Series
Electric Slide Table	LES/LESH Series
Electric Rotary Table	LER Series
Electric Actuator Miniature Type	LEPY/LEPS Series
Electric Gripper (2-Finger Type, 3-Finger Type)	LEH Series

Note) The actuator should be ordered separately, which will include the actuator cable (Example: LEFS16B-100B-S1)

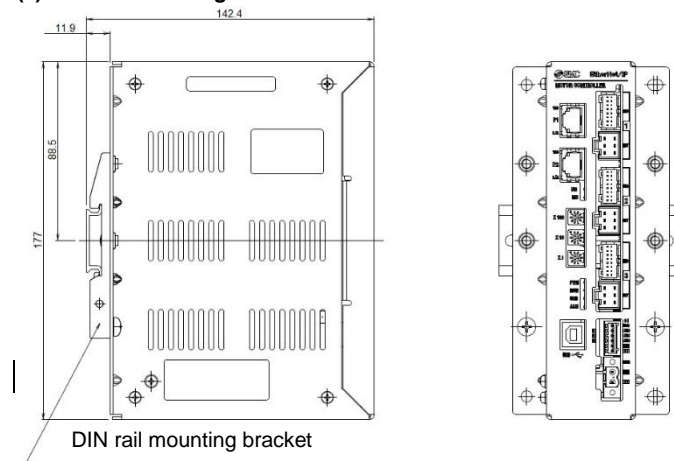
Note) Refer to the SMC website for graphs of speed and transferred workload of electric actuators with the "LECPA" controller.

6 Outline Dimensions (mm)

(1) Direct mounting



(2) DIN rail mounting



Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous. Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- 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.

8 Limitations of Use

8.1 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 ⁽¹⁾. 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 catalogue for the particular products.

⁽¹⁾ Vacuum pads are excluded from this 1 year warranty.

8 Limitations of Use - continued

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

- The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
- 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.

9 Contacts

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CZECH REP.	SMC Industrial Automation CZ s.r.o. Hudcova 78a, CZ-61200 Brno
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SMC Corporation

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