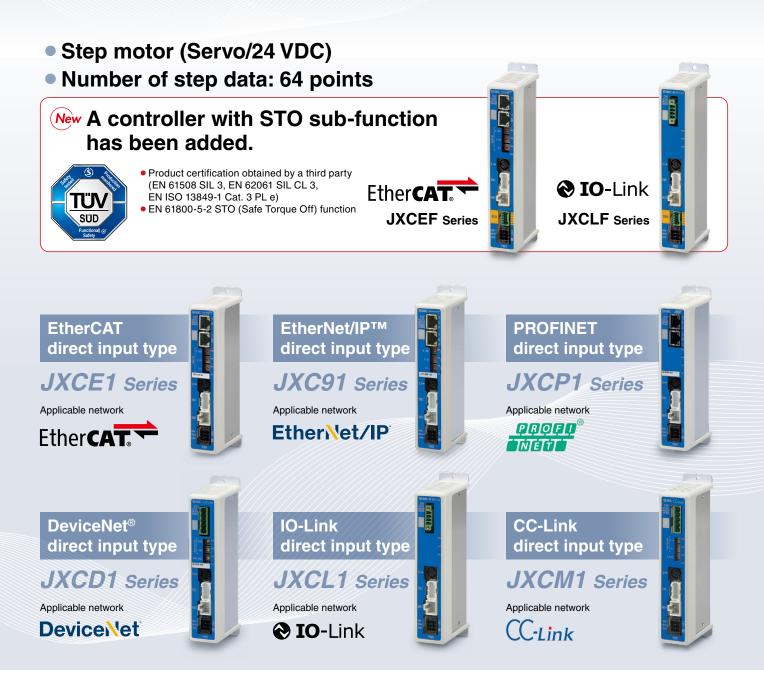
# **Step Motor Controller**

- Parallel I/O
- Step motor (Servo/24 VDC)
- Number of step data: 64 points

Step data input type

JXC51/61 Series





Excluding the JXC□F

RoHS



# Step Data Input Type JXC51/61 Series

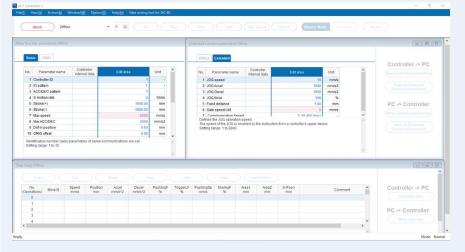
# ACT

Controller Setting Software ACT Controller 2

# Easy-to-use setting software ACT Controller 2 (For PC)

# Various functions available in normal mode (Compared with the existing ACT Controller)

### Parameter and step data setting



\* Customers operating computers with specifications other than Windows 10/64 bit and Windows 11 should use the existing ACT Controller.

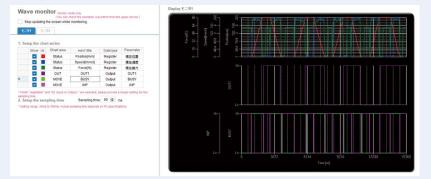
## Alarm confirmation

Current	History	Alarms and counterme		Alarr	m Data		
No. Code	Ala	Name	Operation data error	Tall	2	97	
1 01-051	The step data i	Contents	The step data is not registered.	Total (	Jount	97	
2		Condition	number of the step data is not registered.	# 🔺	Cumulative operating time	Alarm Data	
4			(When operation is commanded through PLC, this alarm will be generated depending on the input signal interval and the holding	27	0:00:00	192: Encoder error	
5			time of signals)	28	0:00:00	192: Encoder error	14
6			<for controllers="" lecpa=""></for>	29	0:00:00	192: Encoder error	18
8			Generated when test operation is performed by the teaching box or Controllersetting kit.	30	0:00:07	193: Polarity not found	
		Countermeasure	(1) Make sure that the "Movement MOD" of the step data is not	31	1:00:00	192: Encoder error	
	1 / 16 >	Countermeasure	"Blank (Disabled)".	32	3:00:00	192: Encoder error	
			(2) Process delay of PLC or scanning delay of the controller may occur. Keep the input signal combination for 15 ms (30 ms if	33	3:00:00	153: AbEnc ID ALM	
		-	possible) or longer.	34	3:03:28	144: Over speed	
			<for controllers="" lecpa=""> (1) Check if "Operation" of the step data is "Blank (Irvalid data)". (2) This product cannot perform test operation by the teaching box or Controller setting kit.</for>	require	ess to Log Data es: No Alarms are and Servo OFF. ported controller: JX		
		How to deactivate	RESET input		alarms in alarm gro	Du ( Get Log Data	

When an alarm is generated, the alarm details and countermeasures can be confirmed.

When an alarm is generated, the cumulative startup time of the controller can be confirmed.

### Waveform monitoring



The position, speed, force, and input/output signals' waveform data during operation can be measured.

\* When using the ACT Controller 2 test operation function, waveform monitoring is not available.



Controller Setting Software ACT C	controller 2			
The JXC-BC writing tool	Custon	nizable plug-in f	unctions	i
Here controllers  Here controllers  Here controllers  Here controller  He	Setup Basic settings Comms settings Plugins	Plugins available Data writing tool for JXC-BC Data Log Viewer Parameter Status Status Step Data Teaching Wave Monitor Data writing tool for JXC-BC Initialize the actuator parameters.	12.0.0 (V1.10) 1.0.0 1.2.0.0 (V1.20) 1.0.0 (V1.20) 1.2.0.0 (V1.00) 1.2.0.0 (V1.00) 1.2.0.0	Move Move I Add
White Contents.     Maranteer     StepData			Cancel	$) \subset$

The writing tool can be used to write the connected actuator's parameters and step data to a JXC series blank controller.

### der e.

ram operation, jogging, moving of the constant rate, etc.), signal status monitoring, one-touch switching between Japanese and English, and other functions are available.

# For immediate use, operate in easy mode.

Controller with

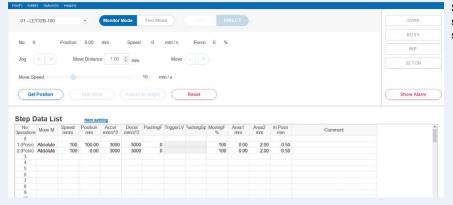
STO sub-function

JXC F Series

Pulse input

**LECPA** Series

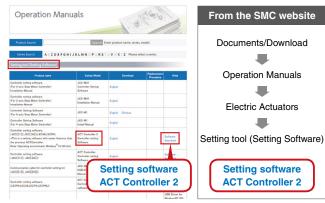
type



Step data setting, various test operations, and status confirmation can be done on a single screen.

# How to download the setting software

### Click here for details.



**Applicable controllers** 

**≜**Caution

Step motor

JXC 1 Series

controller

Step data

input type

LECA6 Series

Customers using a controller other than those listed above should use the existing controller setting software ACT Controller.

Hardware Requirements Windows®10 (64 bit), Windows®11



**SMC** 



# ONORMAL Mode

- Multiple step data can be stored in the teaching box and transferred to the controller.
- Continuous test drive by up to 5 step data

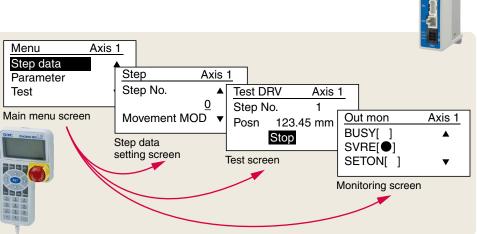
# **Teaching box screen**

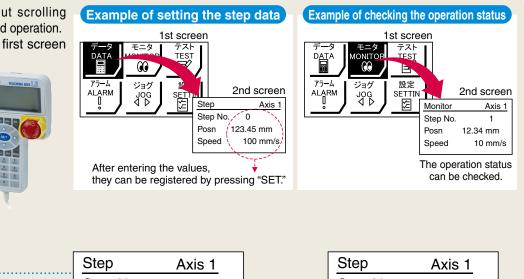
 Each function (step data setting, test drive, monitoring, etc.) can be selected from the main menu.

## Easy Mode

- The simple screen without scrolling promotes ease of setting and operation.
- Choose an icon from the first screen to select a function.
- Set the step data and check the monitor on the second screen.

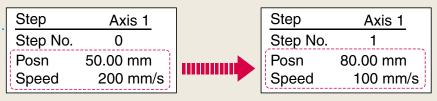






## **Teaching box screen**

 Data can be set by inputting only the position and speed. (Other conditions are preset.)

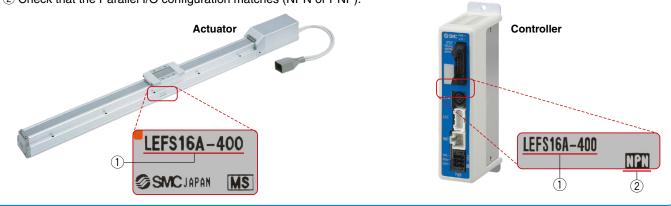


# The actuator and controller are provided as a set. (They can be ordered separately as well.)

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

### <Check the following before use.>

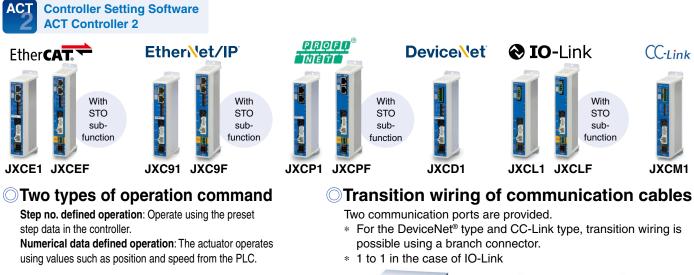
- ① Check the actuator label for the model number. This number should match that of the controller.
- 2 Check that the Parallel I/O configuration matches (NPN or PNP).



# Step Motor Controller JXC Series

# **Fieldbus Network**

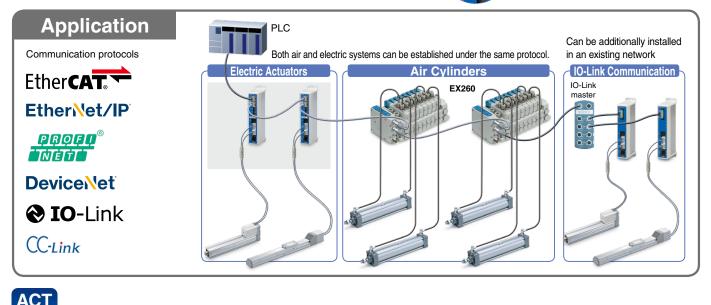
# EtherCAT/EtherNet/IP™/PROFINET/ DeviceNet®/IO-Link/CC-Link Direct Input Type Step Motor Controller/JXC□ Series **□**18



# ONumerical monitoring available

Numerical information, such as the current speed, current position, and alarm codes, can be monitored on the PLC.





# Easy-to-use setting software ACT Controller 2 (For PC)

Controller Setting Software ACT Controller 2 From p. 1

# Various functions available in normal mode (Compared with the existing ACT Controller)

- Parameter and step data setting
- Alarm confirmation
- Waveform monitoring
- The JXC-BC writing tool
- Customizable plug-in functions

<sup>\*</sup> Customers operating computers with specifications other than Windows 10/64 bit and Windows 11 should use the existing ACT Controller.



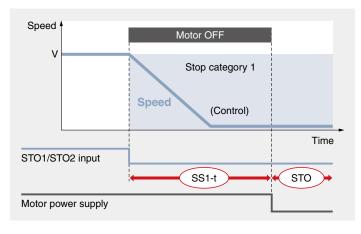
# Controller with STO Sub-Function JXC F Series

ACT Controller Setting Software ACT Controller 2

# Safety function/STO, SS1-t (EN 61800-5-2)

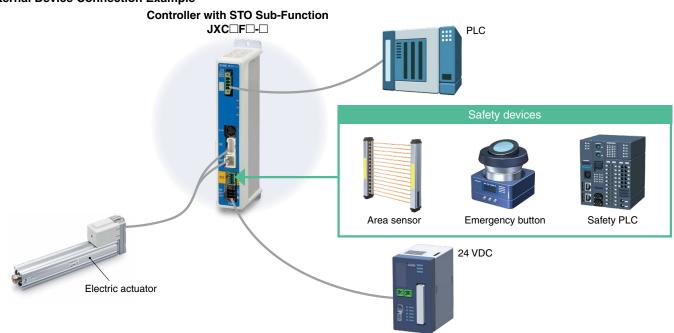
.....

When the STO signal is input from the safety device, after the SS1-t operation is completed, the unit shifts to the STO operation and the power supply of the motor is turned OFF.



SS1-t operation: Safe Stop 1—After deceleration, a shift to the STO operation occurs. STO operation: Safe Torque Off—The power supply of the motor is turned OFF.

### **External Device Connection Example**



# Certified by a third-party organization

Facilitates the safety designing of equipment and facilities (compliant with ISO/IEC standards)



EN 61508 SIL 3\*1 EN 62061 SIL CL 3\*1 EN ISO 13849-1 Cat. 3 PL e EN 61800-5-2 STO, SS1-t

### SIL (Safety Integrity Level)

A safety integrity level as defined by international standard IEC 61508/62061 There are 4 levels of safety, with the lowest being SIL 1 and the highest being SIL 4.

### PL (Performance Level)

A scale used to define the capability of safety-related parts to perform a safety function as defined by international standard ISO 13849

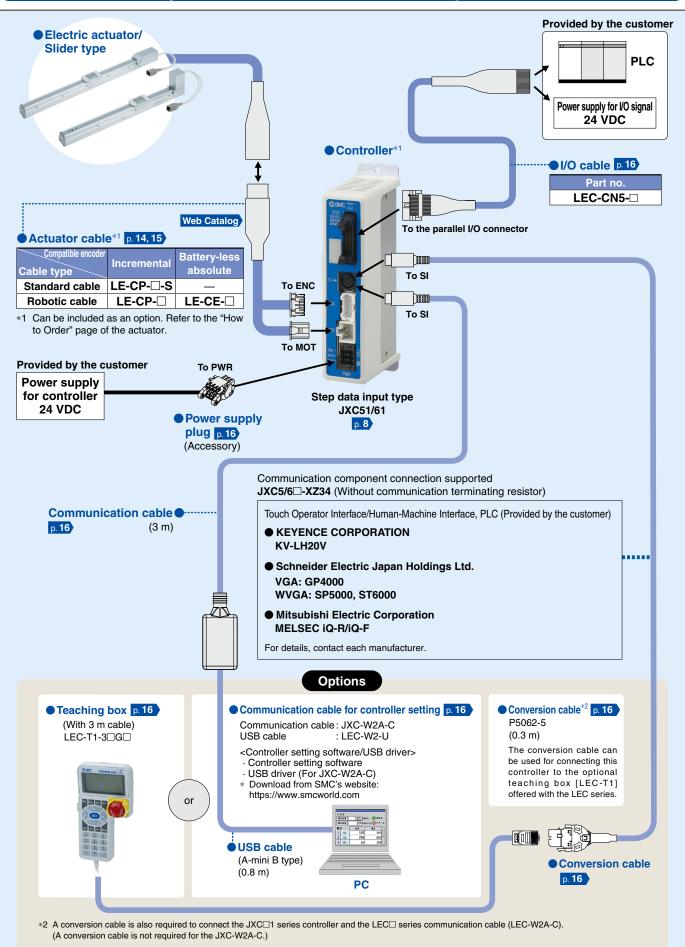
There are 5 levels of safety function, with the lowest being PL a and the highest being PL e.

\*1 The above safety integrity level is the max. value. The achievable level varies depending on the configuration and inspection method of the component. Be sure to refer to "Safety Manual: JXC#-OMY0009" for more information.



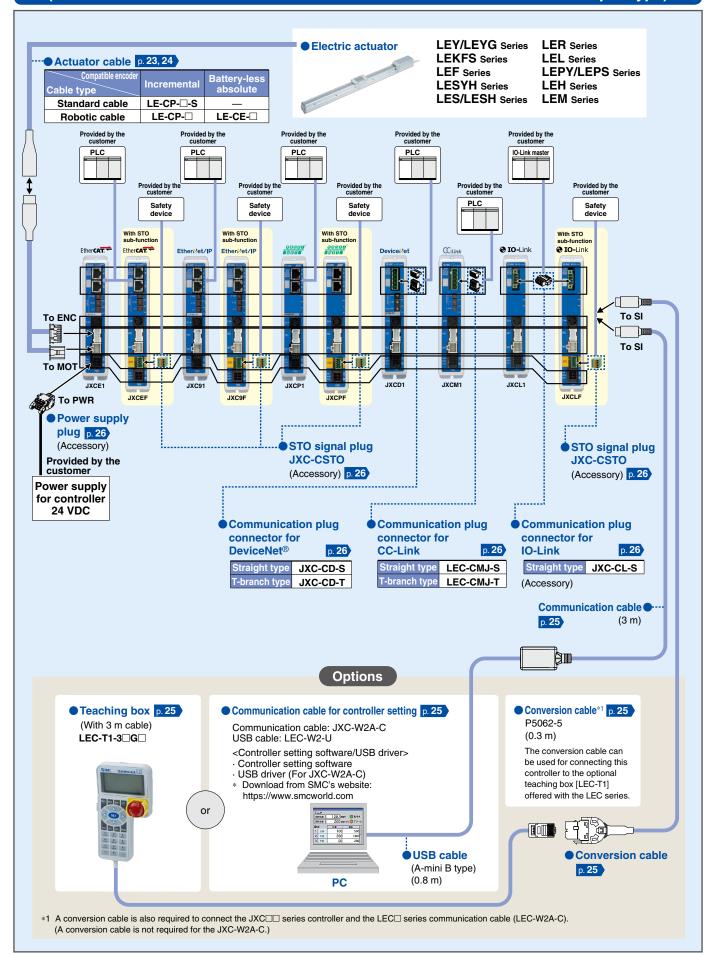
# Step Motor Controller JXC Series





## System Construction/Fieldbus Network (EtherCAT/EtherNet/IP<sup>TM</sup>/PROFINET/DeviceNet<sup>®</sup>/IO-Link/CC-Link Direct Input Type)

.....





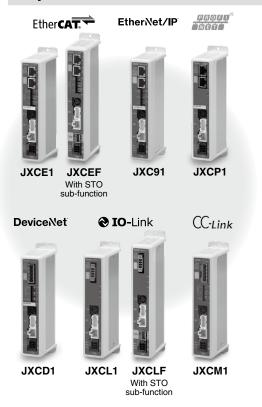
# **CONTENTS**

# Controller (Step Data Input Type) JXC51/61 Series



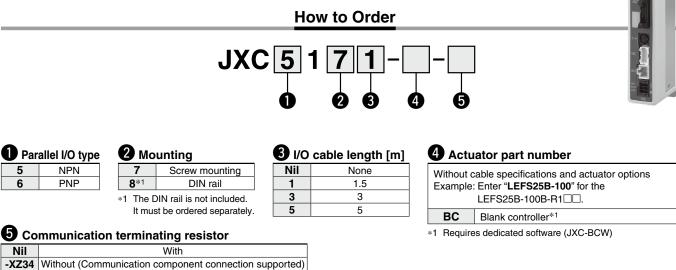
How to Orderp. 8Specificationsp. 8How to Mountp. 9Dimensionsp. 10Wiring Examplep. 11Step Data Settingp. 12Signal Timingp. 13Actuator Cablep. 14Options: Actuator Cablep. 15Optionsp. 16

# Step Motor Controller JXCE /91/P1/D1/L /M1 Series



How to Order p. 18
Specifications p. 19
Example of Operation Command
Dimensions p. 20
Actuator Cable p. 23
Options: Actuator Cable p. 24
Options p. 25

# Controller (Step Data Input Type) JXC51/61 Series



NPN

(2)

The "-XZ34" does not have a set product number, so the controller will need to be ordered separately.

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

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

### <Check the following before use.>

(1) Check the actuator label for the model number. This number should match that of the controller. 2 Check that the Parallel I/O

LEFS25A-400 (1) configuration matches (NPN or PNP).

Refer to the operation manual for using the products. Please download it via our website: https://www.smcworld.com

# Specifications

Model	JXC51 JXC61
Compatible motor	Step motor (Servo/24 VDC)
Power supply	Power voltage: 24 VDC ±10%
Current consumption (Controller)	100 mA or less
Compatible encoder	Incremental/Battery-less absolute
Parallel input	11 inputs (Photo-coupler isolation)
Parallel output	13 outputs (Photo-coupler isolation)
Serial communication	RS485 (Only for the LEC-T1 and JXC-W2)
Memory	EEPROM
LED indicator	PWR, ALM
Cable length [m]	Actuator cable: 20 or less
Cooling system	Natural air cooling
Operating temperature range [°C]	0 to 55°C (No freezing)
Operating humidity range [%RH]	90 or less (No condensation)
Insulation resistance [M $\Omega$ ]	Between all external terminals and the case: 50 (500 VDC)
Weight [g]	150 (Screw mounting), 170 (DIN rail mounting)

### Precautions for blank controllers (JXC□1□□-BC)

A blank controller is a controller to which the customer can write the data of the actuator it is to be combined and used with. For data writing, use the controller setting software ACT Controller 2 or the dedicated software JXC-BCW.

- Both ACT Controller 2 and JXC-BCW can be downloaded from the SMC website.
- To use this software, order the communication cable for controller setting (JXC-W2A-C) and the USB cable (LEC-W2-U) separately.

### **Hardware Requirements**

OS	Windows <sup>®</sup> 10 (64 bit)	Windows®7 Windows <sup>®</sup> 8
	Windows <sup>®</sup> 11	Windows®10
Software	ACT Controller 2 (With JXC-BCW function)	JXC-BCW

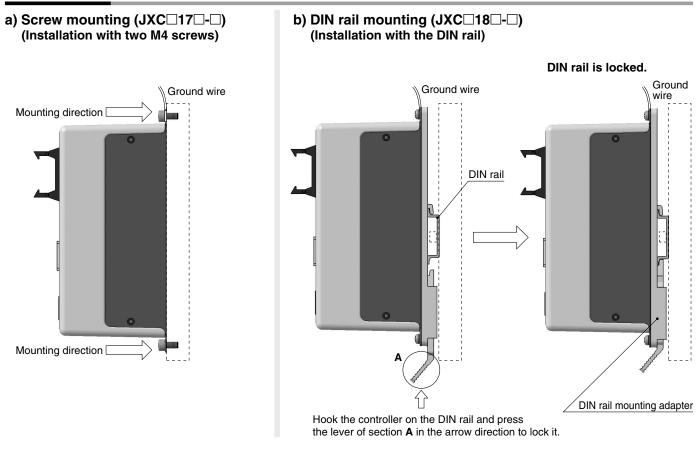
Windows®7, Windows®8, Windows®10, and Windows®11 are registered trademarks of Microsoft Corporation in the United States.

> SMC website https://www.smcworld.com

**SMC** 

# JXC51/61 Series

### How to Mount



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

## DIN rail AXT100-DR-⊡

∗ For □, enter a number from the No. line in the table below. Refer to the dimension drawings on page 10 for the mounting dimensions.

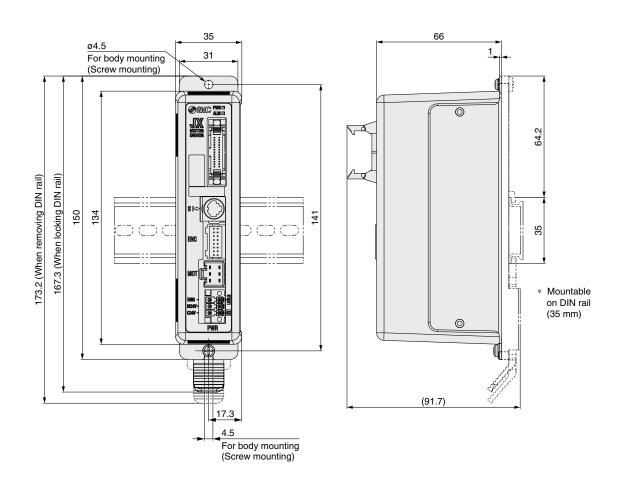
-	L			
	12.5		5.25	7.5
	(Pitch)			→ <u></u>
		+		
4	+ + + + + + + + + + + + + + + + + + +	$\overset{-}{\vdash}$	- 1	(35)
Т		Т	5.	
			5.	
		_	1.25	

L Dimer	nsions	s [mm]													- <b>&gt;</b>	25				
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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
No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
L	273	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-D0 (with 2 mounting screws)

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

# Controller (Step Data Input Type) **JXC51/61** Series



# JXC51/61 Series

## Wiring Example

 \* When you connect a PLC to the parallel I/O connector, use the I/O cable (LEC-CN5-□).
 \* The wiring changes depending on the type of parallel I/O (NPN or PNP). Parallel I/O Connector

### Wiring diagram JXC51 🗆 - 🗆 (

(NPN)		Deven even h 01 \/DO
CN5		Power supply 24 VDC for I/O signal
COM+	A1	
COM-	A2	
INO	A3	
IN1	A4	
IN2	A5	
IN3	A6	
IN4	A7	
IN5	A8	
SETUP	A9	
HOLD	A10	
DRIVE	A11	
RESET	A12	
SVON	A13	
OUT0	B1	Load
OUT1	B2	Load
OUT2	B3	Load
OUT3	B4	Load
OUT4	B5	Load
OUT5	B6	Load
BUSY	B7	Load
AREA	B8	Load
SETON	B9	Load
INP	B10	Load
SVRE	B11	Load
*ESTOP	B12	Load
*ALARM	B13	Load
		Details

### JXC61 C-C (PNP)

 • /		Power supply 24 VDC
CN5		for I/O signal
COM+	A1	<u>}</u> + ⊢_
COM-	A2	<u>├</u> ───┤─── <b>∲</b>
IN0	A3	
IN1	A4	
IN2	A5	
IN3	A6	
IN4	A7	
IN5	A8	
SETUP	A9	
HOLD	A10	
DRIVE	A11	
RESET	A12	
SVON	A13	
OUT0	B1	Load
OUT1	B2	Load
OUT2	B3	Load
OUT3	B4	Load
OUT4	B5	Load
OUT5	B6	Load
BUSY	B7	Load
AREA	B8	Load
SETON	B9	Load
INP	B10	Load
SVRE	B11	Load
*ESTOP	B12	Load
*ALARM	B13	Load

### 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 IN5	Step data specified bit no.
	(Input is instructed by combining IN0 to 5.)
SETUP	Instruction to return to origin
HOLD	Temporarily stops operation
DRIVE	Instruction to drive
RESET	Resets alarm and interrupts operation
SVON	Servo ON instruction

### **Output Signal**

Name	Details
OUT0 to OUT5	Outputs the step data no. during operation
BUSY	Outputs when the actuator is moving
AREA	Outputs within the step data area output setting range
SETON	Outputs when returning to origin
INP	Outputs when target position or target force is reached (Turns on when the positioning or pushing is completed.)
SVRE	Outputs when servo is on
*ESTOP*1	OFF when EMG stop is instructed
*ALARM*1	OFF when alarm is generated

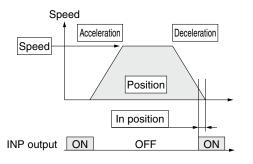
\*1 Signal of negative-logic circuit (N.C.)

## Step Data Setting

### 1. Step data setting for positioning

In this setting, the actuator moves toward and stops at the target position.

The following diagram shows the setting items and operation. The setting items and set values for this operation are stated below.



◎ : Need to be set.
○: Need to be adjusted as required.
-: Setting is not required.

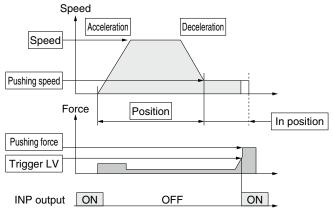
Step Data (Positioning)

,		
Necessity	Item	Details
O	Movement MOD	When the absolute position is required, set Absolute. When the relative position is required, set Relative.
O	Speed	Transfer speed to the target position
O	Position	Target position
0	Acceleration	Parameter which defines how rapidly the actuator reaches the speed set. The higher the set value, the faster it reaches the speed set.
0	Deceleration	Parameter which defines how rapidly the actuator comes to stop. The higher the set value, the quicker it stops.
O	Pushing force	Set 0. (If values 1 to 100 are set, the operation will be changed to the pushing operation.)
_	Trigger LV	Setting is not required.
_	Pushing speed	Setting is not required.
0	Moving force	Max. torque during the positioning operation (No specific change is required.)
0	Area 1, Area 2	Condition that turns on the AREA output signal.
0	In position	Condition that turns on the INP output signal. When the actuator enters the range of [in position], the INP output signal turns on. (It is unnecessary to change this from the initial value.) When it is necessary to output the arrival signal before the operation is completed, make the value larger.

### 2. Step data setting for pushing

The actuator moves toward the pushing start position, and when it reaches that position, it starts pushing with the set force or less.

The following diagram shows the setting items and operation. The setting items and set values for this operation are stated below.



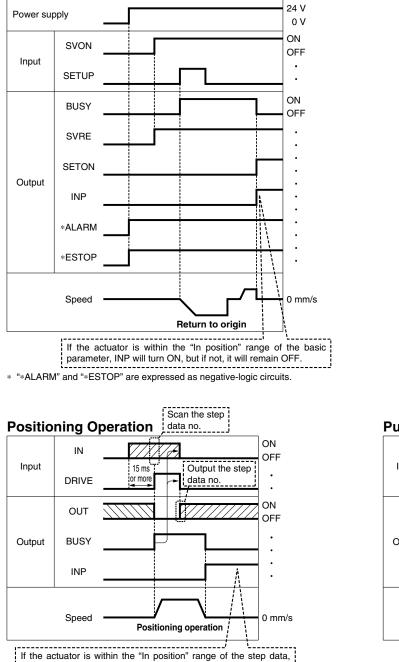
Step	Data (Pushing)	$\odot$ : Need to be set. $\bigcirc$ : Need to be adjusted as required.
Necessity	Item	Details
0	Movement MOD	When the absolute position is required, set Absolute. When the relative position is required, set Relative.
O	Speed	Transfer speed to the pushing start position
0	Position	Pushing start position
0	Acceleration	Parameter which defines how rapidly the actuator reaches the speed set. The higher the set value, the faster it reaches the speed set.
0	Deceleration	Parameter which defines how rapidly the actuator comes to stop. The higher the set value, the quicker it stops.
Ø	Pushing force	Pushing force ratio is defined. The setting range differs depending on the electric actuator type. Refer to the operation manual for the electric actuator.
Ø	Trigger LV	Condition that turns on the INP output signal. The INP output signal turns on when the generated force exceeds the value. Trigger level should be the pushing force or less.
0	Pushing speed	Pushing speed during pushing. When the speed is set fast, the electric actuator and workpieces might be damaged due to the impact when they hit the end, so this set value should be smaller. Refer to the operation manual for the electric actuator.
0	Moving force	Max. torque during the positioning operation (No specific change is required.)
0	Area 1, Area 2	Condition that turns on the AREA output signal.
Ø	In position	Transfer distance during pushing. If the transferred distance exceeds the setting, it stops even if it is not pushing. If the transfer distance is exceeded, the INP output signal will not turn on.

**JXC51/61** Series

# JXC51/61 Series

# Signal Timing

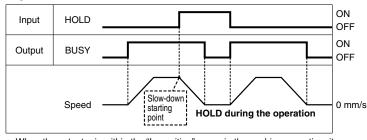
**Return to Origin** 



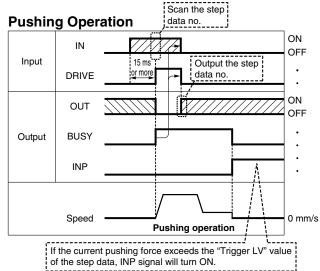
"OUT" is output when "DRIVE" is changed from ON to OFF.

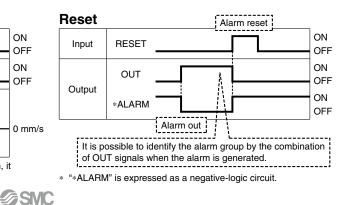
\* "OUT is output when "DRIVE is changed from ON to OFF. Refer to the operation manual for details on the controller for the LEM series. (When power supply is applied, "DRIVE" or "RESET" is turned ON or "\*ESTOP" is turned OFF, all of the "OUT" outputs are OFF.)

### HOLD



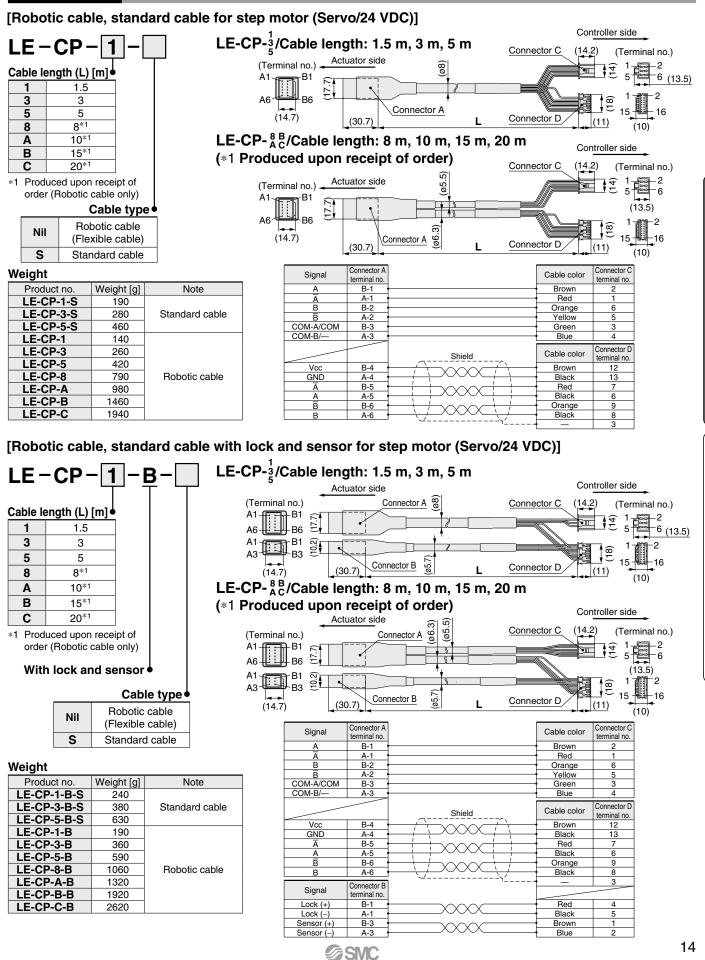
\* When the actuator is within the "In position" range in the pushing operation, it does not stop even if HOLD signal is input.





# Controller (Step Data Input Type) **JXC51/61** Series

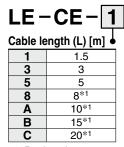
## **Actuator Cable**



# JXC51/61 Series

# **Options: Actuator Cable**

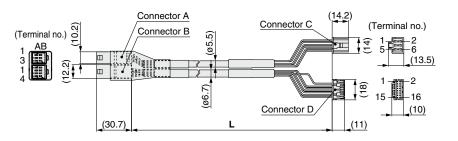
## [Robotic cable for battery-less absolute (Step motor 24 VDC)]

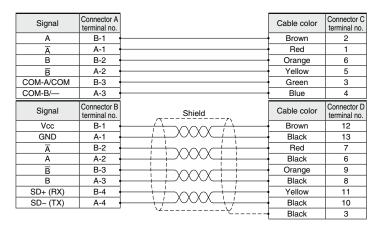


\*1 Produced upon receipt of order

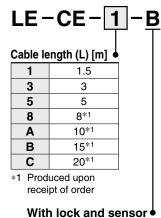
### Weight

Product no.	Weight [g]	Note
LE-CE-1	190	
LE-CE-3	360	
LE-CE-5	570	
LE-CE-8	900	Robotic cable
LE-CE-A	1120	
LE-CE-B	1680	
LE-CE-C	2210	





## [Robotic cable with lock for battery-less absolute (Step motor 24 VDC)]



### Connector A (Terminal no.) Connector B (14.2)(ø5.5) (ø6.7) (Terminal no.) Connector D AF -2 -6 (<u>13.5)</u> 12.2) 5 -2 him 1 (18) -16 AB 15 Connector C (10.2) Connector E (10) (14.7) (30.7) (11)

Weight				
Product no.	Weight [g]	Note		
LE-CE-1-B	240			
LE-CE-3-B	460			
LE-CE-5-B	740			
LE-CE-8-B	1170	Robotic cable		
LE-CE-A-B	1460			
LE-CE-B-B	2120			
LE-CE-C-B	2890			

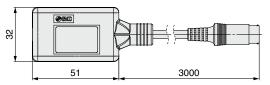
Signal	Connector A terminal no.		Cable color	Connector D terminal no.
A	B-1		Brown	2
Ā	A-1		Red	1
В	B-2		Orange	6
B	A-2		Yellow	5
COM-A/COM	B-3		Green	3
COM-B/	A-3		Blue	4
Signal	Connector B terminal no.	Shield	Cable color	Connector E terminal no.
Vcc	B-1 ·		Brown	12
GND	A-1		Black	13
Ā	B-2		Red	7
A	A-2		Black	6
B	B-3		Orange	9
В	A-3		Black	8
SD+ (RX)	B-4		Yellow	11
SD- (TX)	A-4		Black	10
	Connector C	· ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ ـ	Black	3
Signal	terminal no.			
Lock (+)	B-1		Red	4
Lock (-)	A-1		Black	5
Sensor (+)	B-3		Brown	1
Sensor (-)	A-3		Blue	2



## Options

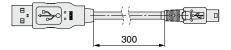
## Communication cable for controller setting

(1) Communication cable JXC-W2A-C



\* It can be connected to the controller directly.

### 2 USB cable LEC-W2-U



### ③ Controller setting kit JXC-W2A

A set which includes a communication cable (JXC-W2A-C) and a USB cable (LEC-W2-U)

### <Controller setting software/USB driver>

- · Controller setting software
- · USB driver (For JXC-W2A-C)

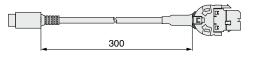
Download from SMC's website: https://www.smcworld.com

### **Hardware Requirements**

OS	Windows <sup>®</sup> 7, Windows <sup>®</sup> 8.1, Windows <sup>®</sup> 10
Communication interface	USB 1.1 or USB 2.0 ports
Display	1024 x 768 or more

Windows®7, Windows®8.1, and Windows®10 are registered trademarks of Microsoft Corporation in the United States.

### ■ Conversion cable P5062-5 (Cable length: 300 mm)



\* To connect the teaching box (LEC-T1-3□G□) or communication cable for controller setting (LEC-W2A-C) to the controller, a conversion cable is required.

(Terminal no.)

B13 Å13

B1 A1 Controller side

Connector

pin no.

A1

A2

A3

A4

A5

A6

Α7

A8

A9

A10

A11

A12

A13

Insulation

color

Light brown

Light brown

Yellow

Yellow

Light green

Light green

Gray

Gray

White

White

(14.4)

### I/O Cable

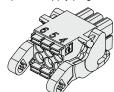
L	EC	-CN5-1			
Cable length (L) [m]					
	1	1.5			
	3	3			
	5	5			

\* Conductor size: AWG28

Weight		
Product no.	Weight [g]	
LEC-CN5-1	170	
LEC-CN5-3	320	
LEC-CN5-5	520	

## Power supply plug JXC-CPW

\* The power supply plug is an accessory.



AWG20 (0.5 mm <sup>2</sup> ), cover diameter 2.0 mm or less				
654 321	<ol> <li>C24V</li> <li>M24V</li> <li>M24V</li> </ol>	(4) 0V (5) N.C.		

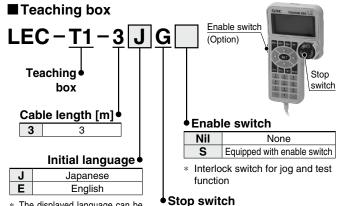
(3) EMG

(6) LK RLS

<Applicable cable size>

### Power supply plug

Terminal name	Function	Details
٥V	Common supply (–)	The M24V terminal, C24V terminal, EMG terminal, and LK RLS terminal are common (–).
M24V	Motor power supply (+)	Motor power supply (+) of the controller
C24V	Control power supply (+)	Control power supply (+) of the controller
EMG	Stop (+)	Connection terminal of the external stop circuit
LK RLS	Lock release (+)	Connection terminal of the lock release switch



The displayed language can be changed to English or Japanese.

### Specifications

6

08.

Dot

color

Black

Red

Black

Red

Black

Red

Black

Red

Black

Red

Item	Description
Switch	Stop switch, Enable switch (Option)
Cable length [m]	3
Enclosure	IP64 (Except connector)
Operating temperature range [°C]	5 to 50
Operating humidity range [%RH]	90 or less (No condensation)
Weight [g]	350 (Except cable)

B9

B10

B11

B12

B13

Yellow

Yellow

Light green

Light green

PLC side A1 A13 Β1 L B13 Connecto pin no. B1 B2 B3 B4 B5 B6 B7 B8

**G** Equipped with stop switch

IXC51/61 Series

Light brown	Black
Light brown	Red
Yellow	Black

Dot

mark

or	Insulation	Dot	Dot	
	color	mark	color	
	Yellow		Red	]
	Light green		Black	
	Light green		Red	
	Gray		Black	
	Gray		Red	
	White		Black	
	White		Red	
	Light brown		Black	]
	Light brown		Red	

Shield

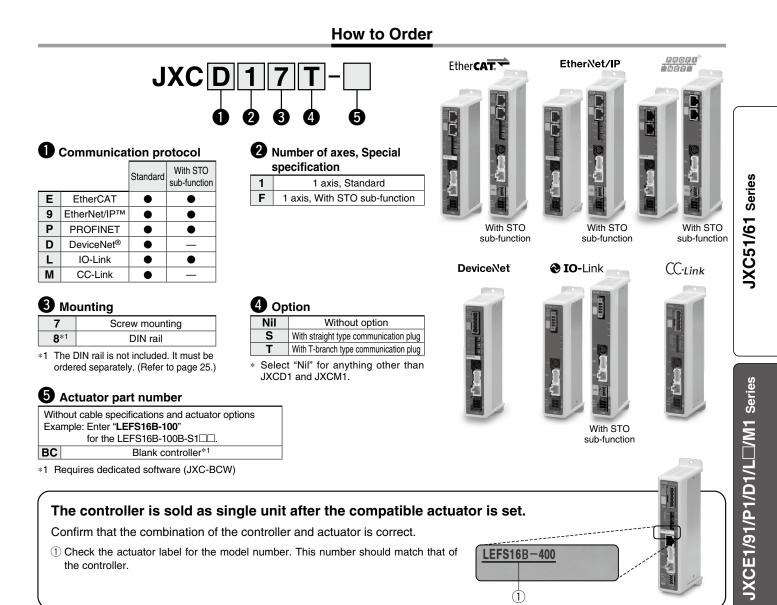
Black

Red

Black

Red

# Step Motor Controller $( \in \bigcup_{i \in X \cup Y} (i \in X))$ $JXCE \square /9 \square /P \square /D1/L \square /M1$ Series $( \square Y \square Y)$



\* Refer to the operation manual for using the products. Please download it via our website: https://www.smcworld.com

### Precautions for blank controllers (JXC ----------BC)

A blank controller is a controller to which the customer can write the data of the actuator it is to be combined and used with. For data writing, use the controller setting software ACT Controller 2 or the dedicated software JXC-BCW.

- Both ACT Controller 2 and JXC-BCW can be downloaded from the SMC website.
- To use this software, order the communication cable for controller setting (JXC-W2A-C) and the USB cable (LEC-W2-U) separately.

### Hardware Requirements

OS	Windows <sup>®</sup> 10 (64 bit)	Windows®11	Windows®7	Windows <sup>®</sup> 8	Windows <sup>®</sup> 10			
Software		ntroller 2 CW function)	JXC-BCW					
* Window	* Windows®7, Windows®8, Windows®10, and Windows®11 are registered trademarks of Microsoft							

Corporation in the United States.

SMC website: https://www.smcworld.com



# JXCE /9 /P /D1/L /M1 Series

# Specifications

	Mc	odel	JXCE1	JXCEF	JXC91	JXC9F	JXCP1	JXCPF	JXCD1	JXCL1	JXCLF	JXCM1		
Ne	twork		Ethe	rCAT	EtherN	et/IP™	PRO	INET	DeviceNet®	10-	IO-Link			
Co	mpatib	ole motor	Step motor (Servo/24 VDC)											
Po	wer su	pply	Power voltage: 24 VDC ±10%           200 mA or less         130 mA or less         200 mA or less         100 mA or less         100 mA or less         100 mA or less											
Curr	ent consum	ption (Controller)	200 mA	A or less	130 mA	or less	200 mA	or less	100 mA or less	100 mA	100 mA or less			
Co	mpatib	le encoder	Incremental/Battery-less absolute											
Applicable Protocol			Ether	CAT*2	EtherNe	et/IP™*2	PROF	INET*2	DeviceNet®	10-	Link	CC-Link		
gi	system	Version*1	Conform	ance Test	Volume 1 (E	Edition 3.14)		ication	Volume 1 (Edition 3.14)	Versi	on 1.1	Ver. 1.10		
ific	system	Version	Record	V.1.2.6	Volume 2 (E	Edition 1.15)	Versic	on 2.32	Volume 3 (Edition 1.13)	Port C	lass A	Vel. 1.10		
Communication specifications	Comm	nunication			10/100	Mbps*2		-	125/250/500	230.4	kbps	156 kbps, 625 kbps,		
ns	speed		100 N	lbps* <sup>2</sup>		negotiation)	100 N	lbps*²	kbps		M3)	2.5 Mbps, 5 Mbps,		
Ę:	·				`	0 ,				,	10 Mbps			
ië.		uration file*3		l file		S file		ML file	EDS file	IOD	CSP+ file			
L D	I/O oco	cupation		0 bytes		6 bytes	Input 36 bytes		Input 4, 10, 20 bytes	Input 14 bytes		1 station, 2 stations,		
Ē	area		Output	36 bytes	Output :	36 bytes	Output 36 bytes		Output 4, 12, 20, 36 bytes	Output 22 bytes		4 stations		
ပိ	Termina	ating resistor	Not included											
Me	emory		EEPROM											
LE	D indic	ator	PWR, RUN	, ALM, ERR	PWR, ALI	M, MS, NS	PWR, ALM, SF, BF PWR, ALM			PWR, Al	M, COM	PWR, ALM, LERR, LRUN		
Ca	ble len	gth [m]	Actuator cable: 20 or less											
Co	oling s	system	Natural air cooling											
Ope	rating tempe	erature range [°C]	0 to 55 (No freezing)*4											
Ope	rating humi	idity range [%RH]	90 or less (No condensation)											
Ins	ulation re	sistance [M $\Omega$ ]			Be	tween all exte	ernal terminal	s and the cas	e: 50 (500 VD	C)				
Safety function		—	STO,SS1-t	—	STO,SS1-t	—	STO,SS1-t		_	STO, SS1-t	—			
				EN61508 SIL3*5		EN61508 SIL3*5		EN61508 SIL3*5			EN 61508 SIL 3*5			
Safety standards		_	EN62061 SIL CL3*5			_	EN62061 SIL CL3*5	_		EN 62061 SIL CL 3*5	_			
						EN ISO13849-1 Cat.3 PLe*5	EN ISO13849-1 Cat.3 PLe*5				EN ISO 13849-1 Cat. 3 PL e*5			
We	eight	Screw mounting	220	250	210	240	220	250	210	190	220	170		
[g]		DIN rail mounting	240	270	230	260	240	270	230	210	240	190		

\*1 Please note that versions are subject to change.

\*2 Use a shielded communication cable with CAT5 or higher for the PROFINET, EtherNet/IP™, and EtherCAT.

\*3 The files can be downloaded from the SMC website.

\*4 The operating temperature range for both controller version 1 products and controller version 2 products is 0 to 40°C. Refer to the Web Catalog for details on identifying controller version symbols.

\*5 The above safety integrity level is the max. value. The achievable level varies depending on the configuration and inspection method of the component. Be sure to refer to "Safety Manual: JXC#-OMY0009" for more information.

### Trademark

EtherNet/IP® is a registered trademark of ODVA, Inc.

DeviceNet® is a registered trademark of ODVA, Inc.

EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

## **Example of Operation Command**

In addition to the step data input of 64 points maximum in each communication protocol, the changing of each parameter can be performed in real time via numerical data defined operation. \* Numerical values other than "Moving force," "Area 1," and "Area 2" can be used to perform operation under numerical instructions from JXCL.

### <Application example> Movement between 2 points

No.	Movement mode	Speed	Position	Acceleration	Deceleration	Pushing force	Trigger LV	Pushing speed	Moving force	Area 1	Area 2	In position
0	1: Absolute	100	10	3000	3000	0	0	0	100	0	0	0.50
1	1: Absolute	100	100	3000	3000	0	0	0	100	0	0	0.50

### <Step no. defined operation>

Sequence 1: Servo ON instruction

Sequence 2: Instruction to return to origin

Sequence 3: Specify step data No. 0 to input the DRIVE signal.

Sequence 4: Specify step data No. 1 after the DRIVE signal has been temporarily turned OFF to input the DRIVE signal.

### <Numerical data defined operation>

Sequence 1: Servo ON instruction

Sequence 2: Instruction to return to origin

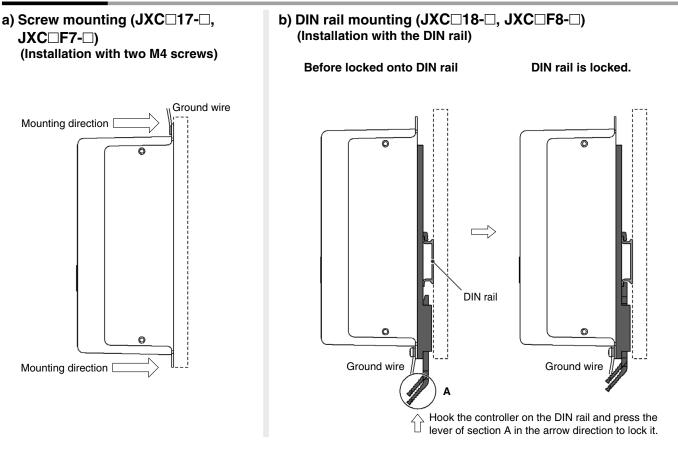
Sequence 3: Specify step data No. 0 and turn ON the input instruction flag (position). Input 10 in the target position. Subsequently the start flag turns ON.

Sequence 4: Turn ON step data No. 0 and the input instruction flag (position) to change the target position to 100 while the start flag is ON.

The same operation can be performed with any operation command.

Sequence 1→		
Sequence $2 \rightarrow$	←	
Sequence 3→	<b>▶</b>	
Sequence $4 \rightarrow$		
	0 10	100
	SMC	

### How to Mount



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

## DIN rail AXT100-DR-⊡

\* For □, enter a number from the No. line in the table below. Refer to the dimension drawings on pages 20 to 22 for the mounting dimensions.

	L L	H	
	12.5	5.25	7.5
	(Pitch)		
ŀ		5.5	
-			(35)
		<b>≜</b>	
L		1.25	
	-	<b>1</b> .25	

L Dimer	nsions	s [mm]																		
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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
No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
L	273	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

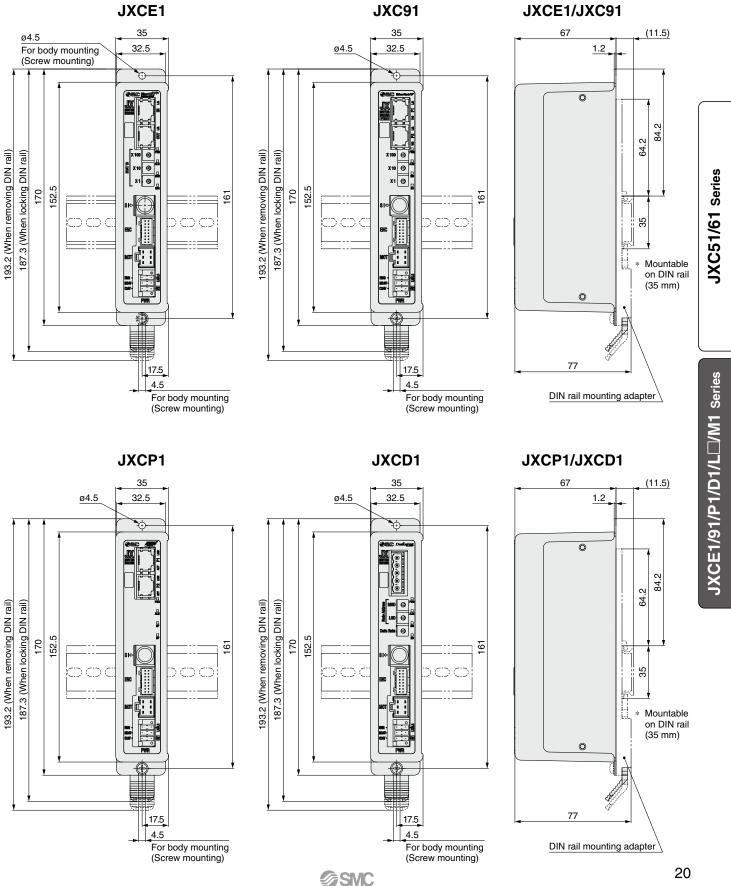
# DIN rail mounting adapter

### LEC-3-D0 (with 2 mounting screws)

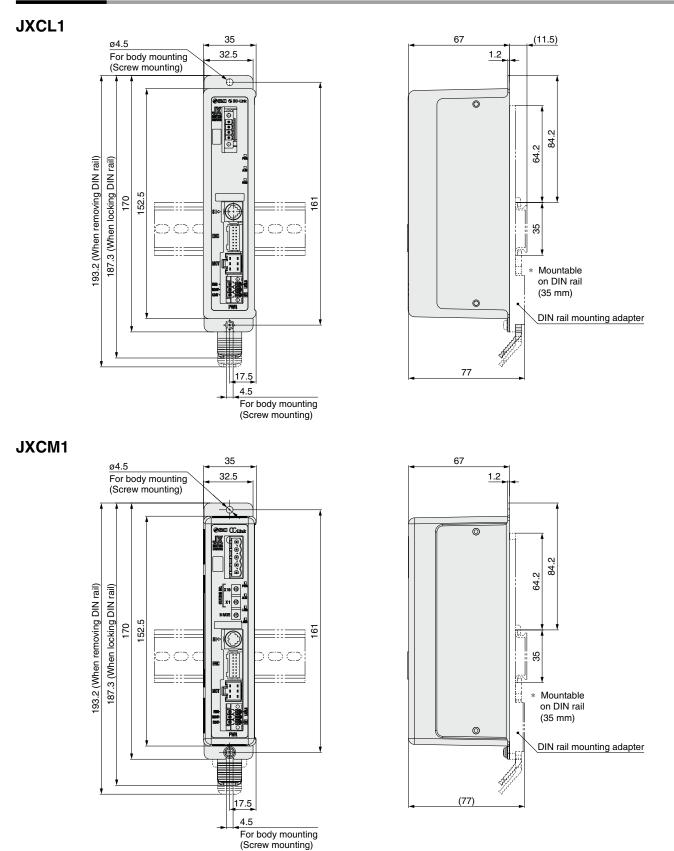
This should be used when the DIN rail mounting adapter is mounted onto a screw mounting type controller afterward.

**SMC** 

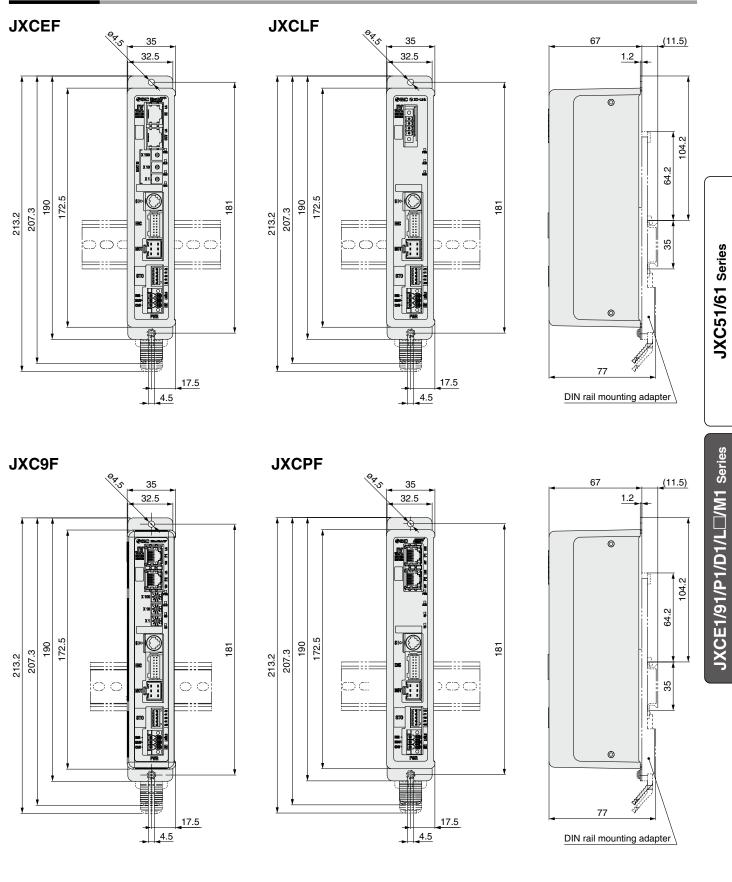
# Step Motor Controller JXCE1/91/P1/D1/L /M1 Series



# JXCE1/91/P1/D1/L□/M1 Series

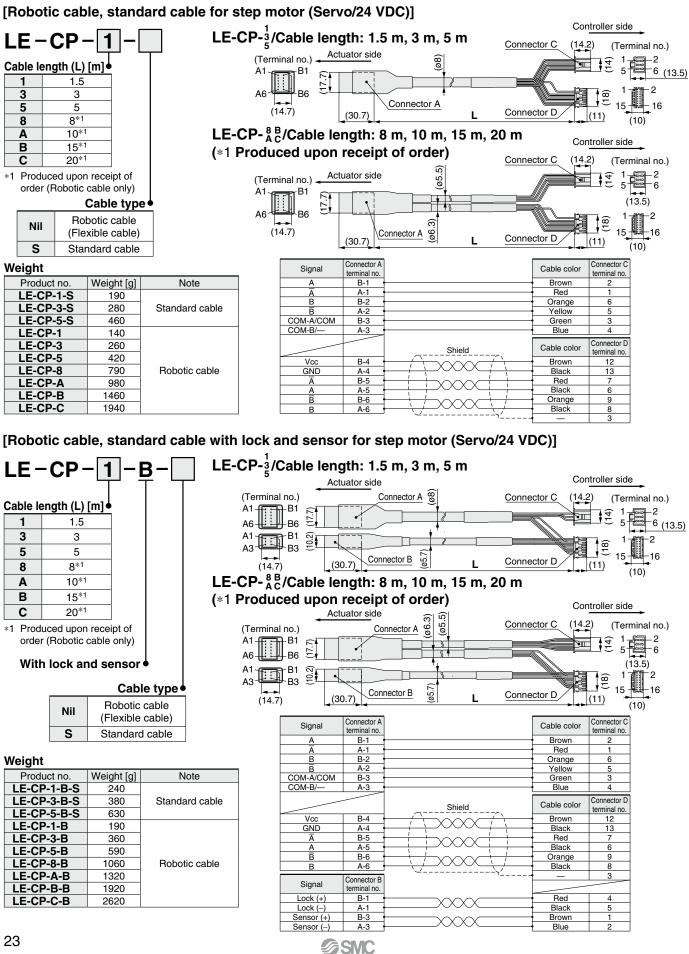


# Step Motor Controller JXCE /9 /P /D1/L /M1 Series



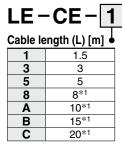
# JXCE1/91/P1/D1/L /M1 Series

## Actuator Cable



# **Options: Actuator Cable**

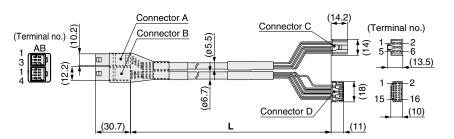
### [Robotic cable for battery-less absolute (Step motor 24 VDC)]

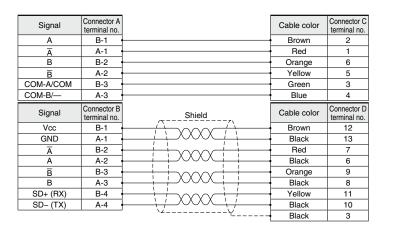


\*1 Produced upon receipt of order

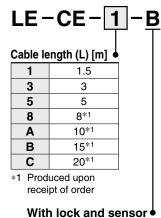
### Weight

Product no.	Weight [g]	Note
LE-CE-1	190	
LE-CE-3	360	
LE-CE-5	570	
LE-CE-8	900	Robotic cable
LE-CE-A	1120	
LE-CE-B	1680	
LE-CE-C	2210	





## [Robotic cable with lock for battery-less absolute (Step motor 24 VDC)]



Connector A (Terminal no.) Connector B (14.2)(ø5.5) (ø6.7) (Terminal no.) Connector D -2 -6 (<u>13.5)</u> 12.2) 5 -2 him 1 (18) 15 -16 AB Connector C (10.2) (10) (14.7) Connector E (30.7) (11)

Weight							
Product no.	Weight [g]	Note					
LE-CE-1-B	240						
LE-CE-3-B	460						
LE-CE-5-B	740						
LE-CE-8-B	1170	Robotic cable					
LE-CE-A-B	1460						
LE-CE-B-B	2120						
LE-CE-C-B	2890						

Signal	Connector A terminal no.		Cable color	Connector D terminal no.
A	B-1		Brown	2
Ā	A-1		Red	1
В	B-2		Orange	6
B	A-2		Yellow	5
COM-A/COM	B-3		Green	3
COM-B/	A-3		Blue	4
Signal	Connector B terminal no.	Shield	Cable color	Connector E terminal no.
Vcc	B-1 ·		Brown	12
GND	A-1		Black	13
Ā	B-2		Red	7
A	A-2		Black	6
B	B-3		Orange	9
В	A-3		Black	8
SD+ (RX)	B-4		Yellow	11
SD- (TX)	A-4		Black	10
	Connector C	·z	Black	3
Signal	terminal no.			
Lock (+)	B-1 ·		Red	4
Lock (-)	A-1		Black	5
Sensor (+)	B-3		Brown	1
Sensor (-)	A-3		Blue	2

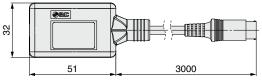
**SMC** 

# JXCE1/91/P1/D1/L /M1 Series

## Options

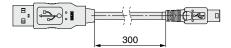
## Communication cable for controller setting

**(1)** Communication cable JXC-W2A-C



\* It can be connected to the controller directly.

### ② USB cable LEC-W2-U



### **③** Controller setting kit JXC-W2A

A set which includes a communication cable (JXC-W2A-C) and a USB cable (LEC-W2-U)

### <Controller setting software/USB driver>

Controller setting software

· USB driver (For JXC-W2A-C)

Download from SMC's website: https://www.smcworld.com

### **Hardware Requirements**

OS	Windows <sup>®</sup> 7, Windows <sup>®</sup> 8.1, Windows <sup>®</sup> 10
05	windows <sup>o</sup> 7, windows <sup>o</sup> 8.1, windows <sup>o</sup> 10
Communication interface	USB 1.1 or USB 2.0 ports
Display	1024 x 768 or more
_	

\* Windows®7, Windows®8.1, and Windows®10 are registered trademarks of Microsoft Corporation in the United States.

### Conversion cable P5062-5 (Cable length: 300 mm)



∗ To connect the teaching box (LEC-T1-3□G□) or communication cable for controller setting (LEC-W2A-C) to the controller, a conversion cable is required.

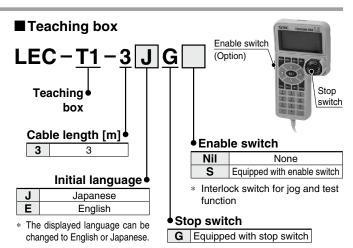
### ■ DIN rail mounting adapter LEC-3-D0

\* With 2 mounting screws

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

## ■ DIN rail AXT100-DR-□

 For □, enter a number from the No. line in the table on page 22. Refer to the dimension drawings on pages 20 to 22 for the mounting dimensions.



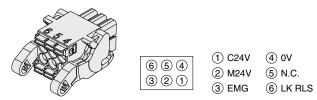
### Specifications

Item	Description				
Switch	Stop switch, Enable switch (Option)				
Cable length [m]	3				
Enclosure	IP64 (Except connector)				
Operating temperature range [°C]	5 to 50				
Operating humidity range [%RH]	90 or less (No condensation)				
Weight [g]	350 (Except cable)				

## Options

## Power supply plug JXC-CPW

\* The power supply plug is an accessory.



### Power supply plug

Terminal name	Function	Details						
0V	Common supply (–)	The M24V terminal, C24V terminal, EMG terminal, and LK RLS terminal are common (–).						
M24V	Motor power supply (+)	y (+) Motor power supply (+) of the controller						
C24V	Control power supply (+)	Control power supply (+) of the controller						
EMG	Stop (+)	Connection terminal of the external stop circuit						
LK RLS Lock release (+)		Connection terminal of the lock release switch						

### Communication plug connector

### For DeviceNet®

Straight type T-branch type Communication plug JXC-CD-S

### connector for DeviceNet® JXC-CD-T Terminal name

V+

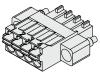
CAN\_L

V-



### For IO-Link Straight type JXC-CL-S

\* The communication plug connector for IO-Link is an accessory.



### **Communication plug** connector for IO-Link

Details

Power supply (+) for DeviceNet® CAN\_H Communication wire (High) Drain Grounding wire/Shielded wire

Communication wire (Low)

Power supply (-) for DeviceNet®

Terminal no.	Terminal name	Details		
1	L+	+24 V		
2	NC	N/A		
3	L–	0 V		
4	C/Q	IO-Link signal		

### For CC-Link Straight type T-branch type Communication plug LEC-CMJ-S



## LEC-CMJ-T connector for CC-Link

Terminal name	Details					
DA	CC-Link communication line A					
DB	CC-Link communication line B					
DG	CC-Link ground line					
SLD	CC-Link shield					
FG	Frame ground					

## ■STO signal plug JXC-CSTO



### STO signal plug

<u> </u>		
Pin no.	Signal name	Details
1	24V	+24 V output (Max. 100 mA)
2	STO1	STO input 1
3	STO2	STO input 2
4	Feedback 1	STO1 feedback signal
5	Feedback 2	STO2 feedback signal

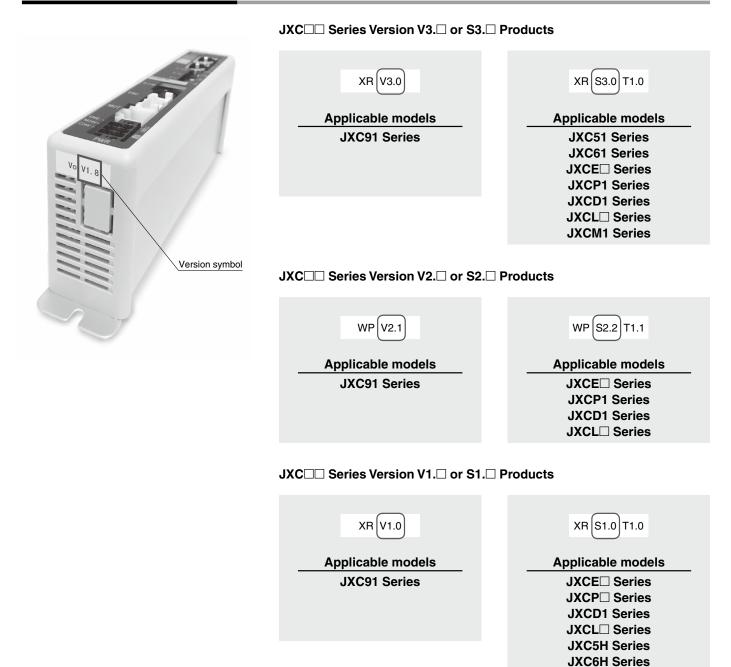
# $\triangle$

# *JXC 1/JXC F/JXC H series* Precautions Relating to Differences in Controller Versions

### As the controller version of the JXC series differs, the internal parameters are not compatible.

- If using the JXC□1□-BC, please use the latest version of the JXC-BCW (parameter writing tool).
- There are currently 3 versions available: version 1 products (V1.□ or S1.□), version 2 products (V2.□ or S2.□), and version 3 products (V3.□ or S3.□). Keep in mind that in order to write a backup file (.bkp) to another controller with the JXC-BCW, it needs to be the same version as the controller that created the file. (For example, a backup file created by a version 1 product can only be written to another version 1 product, and so on.)

## **Identifying Version Symbols**



# Precautions Relating to Differences in Controller Versions JXC 1/JXC F/JXC H Series

### Blank Controller Versions and Applicable Battery-less Absolute Type Electric Actuator Sizes

The applicable battery-less absolute type electric actuator size range differs depending on the controller version. Be sure to confirm the controller version before using a blank controller.

### Blank Controller Versions/Applicable Electric Actuator Sizes (JXC□1/JXC□F Series)

Blank con	troller	Applicable electric actuator size										
Series	Controller version	LEFS□E	LEFB□E	LEKFS□E	LEY□E	LEY E-X8	LEYG□E	LES□E	LESH□E	LESYH□E	LER□E	LEHF□E
JXC91 series JXCD1 series JXCE1 series	Version 3.4 (V3.4, S3.4) Version 3.5 (V3.5, S3.5)	25, 32, 40	25, 32, 40	25, 32, 40	25, 32, 40	25, 32, 40	25, 32, 40			16, 25	50	32, 40
JXCP1 series JXCL1 series	Version 3.6 (V3.6, S3.6) or higher	16, 25, 32, 40	16, 25, 32, 40		16, 25, 32, 40		16, 25, 32, 40		25	8, 16, 25		
JXCM1 series JXC51/61 series	Version 3.4 (V3.4, S3.4)	25, 32, 40	25, 32, 40		25, 32, 40		25, 32, 40	25		16, 25		
	Version 3.5 (V3.5, S3.5) or higher	16, 25,	16, 25,		16, 25,		16, 25,			8, 16, 25		
JXC⊡F series	series     All versions	32, 40		32, 40			0, 10, 25					

### Blank Controller Versions/Applicable Electric Actuator Sizes (JXC H Series)

Blank cor	ntroller	Applicable electric actuator size								
Series Controller version L		LEFS□G	LEKF□G	LEY□G	LEG	LESYH□G				
JXC9H series JXCEH series JXCPH series	All versions	16, 25, 32, 40	25 22 40	16, 25, 40	25, 32, 40	8, 16, 25				
	Version 1.0	25, 32, 40	25, 32, 40	25, 40	25, 32, 40	16, 25				
JXC5H/6H series	Version 1.1 or higher	16, 25, 32, 40		16, 25, 40		8, 16, 25				

# ▲ 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)<sup>\*1</sup>, and other safety regulations.

- 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** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

## **A**Warning

1. 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 catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. 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.

- 3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.
  - 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.
  - Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

# 4. 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, combustion 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 specifications described in the product catalog.
- 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.

- \*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.

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 The product is provided for use in manufacturing industries. 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.

## 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

- The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2) 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.
- Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.
  - 2) Vacuum pads are excluded from this 1 year warranty. 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.
- 2. 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.

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# 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.



Edition B \* The JXCLF series controller with STO sub-function has been added. \* Number of pages has been increased from 24 to 32.

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A Safety Instructions Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.

# SMC Corporation

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