



Instruction Manual

Electric Actuator / Rod Type

Series LEY\*\*E-X8

Motor: Step motor (servo 24 VDC) with Battery-less absolute encoder.



The intended use of this Electrical Actuator is to convert an electrical input signal into mechanical motion.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)<sup>\*)</sup>, and other safety regulations.

\*) 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.

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

	<b>Caution</b>	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	<b>Warning</b>	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	<b>Danger</b>	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

**Warning**

- **Always ensure compliance with relevant safety laws and standards.**
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

Model		LEY25*E-X8			LEY32*E-X8			LEY40*E-X8					
Actuator	Stroke [mm]	30 to 400			30 to 500			30 to 500					
	Work Load [kg] <sup>*1</sup>	Horizontal (3000 mm <sup>2</sup> /s)			20	40	60	30	45	60	50	60	80
		Horizontal (2000 mm <sup>2</sup> /s)			30	55	70	40	60	80	60	70	90
		Vertical (3000 mm <sup>2</sup> /s)			7	15	59	10	21	42	12	26	52
	Pushing force [N] <sup>*2*3*4</sup>	63 to 122	126 to 238	232 to 452	80 to 189	156 to 370	296 to 707	132 to 283	266 to 553	156 to 370			
	Speed [mm/s]	18 to 400	9 to 200	5 to 100	24 to 400	12 to 200	6 to 100	24 to 400	12 to 230	6 to 110			
	Pushing speed [mm/s] <sup>*5</sup>	35 or less											
	Acceleration / Deceleration [mm/s <sup>2</sup> ]	3000 or less											
	Positioning repeatability [mm]	±0.02											
	Lost motion [mm] <sup>*6</sup>	0.1 or less											
	Lead [mm]	12	6	3	16	8	4	16	8	4			
	Impact / Vibration Resistance [m/s <sup>2</sup> ]	50 / 20											
	Drive method	Ball screw (LEY*D)											
	Guide type	Sliding bush (Piston rod part)											
Enclosure	IP65 / IP67 equivalent <sup>*12</sup>												
Operating temperature range [°C]	5 to 40												
Operating humidity range [% RH]	90 or less (no condensation)												
Electrical	Motor size	□42			□56.4			□56.4					
	Type of Motor	Battery-less absolute (Step servo 24 VDC)											
	Encoder	Battery-less absolute (4096 pulse/rev)											
	Rated voltage [VDC]	24 VDC ±10%											
Lock unit	Max. instantaneous power [W]	48			104			106					
	Lock type <sup>*10</sup>	Non magnetizing lock											
	Holding force [N]	78	157	294	108	216	421	127	265	519			
	Power consumption [W] <sup>*11</sup>	5			5			5					
	Rated voltage [V]	24 VDC ±10%											

2.1 Product weight

LEY25D									
Stroke [mm]	30	50	100	150	200	250	300	350	400
Weight [kg]	1.48	1.55	1.72	1.97	2.15	2.32	2.50	2.67	2.85

LEY32D									
Stroke [mm]	30	50	100	150	200	250	300	350	400
Weight [kg]	2.58	2.69	2.98	3.36	3.65	3.94	4.22	4.51	4.8

LEY40D									
Stroke [mm]	30	50	100	150	200	250	300	350	400
Weight [kg]	2.93	3.04	3.33	3.71	4.0	4.29	4.57	4.86	5.15

2.2 Additional weight [kg]

Size		25	32	40
Lock		0.35	0.65	0.65
Rod end male thread	Male thread	0.03	0.03	0.03
	Nut	0.02	0.02	0.02
Rod flange (including screws)		0.17	0.20	0.20

Note 1) Horizontal: The maximum value of the work load. An external guide is necessary to support the load (friction coefficient of guide: 0.1 or less). The actual work load and transfer speed change according to the condition of the external guide. Also, speed changes according to the work load. Check the “Model Selection” guide in the catalogue.  
Vertical: Speed changes according to the work load. Check the “Model Selection” in the catalogue.  
The values shown in ( ) are the acceleration/deceleration.  
Note 2) Pushing force accuracy is ±20% (F.S.).

2 Specifications (continued)

Note 3) The pushing force values for LEY25\*E is 30 to 50%, for LEY32\*E is 30 to 70%, and for LEY40\*E is 35 to 65%. The pushing force varies according to the duty ratio and pushing speed. Check the “Model Selection” in the catalogue.  
Note 4) The speed and force may vary depending on the cable length, load, and mounting conditions. Furthermore, if the cable length exceeds 5 m, it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)  
Note 5) The allowable speed for pushing operation. When pushing is conveying a workpiece, operate at the vertical work load or less. A reference value for correcting an error in reciprocal operation.  
Note 6) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initialized state).  
Note 7) Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initialized state).  
Note 8) Cannot be used in an environment where oil such as cutting oil splashes or the product is constantly exposed to water. Take appropriate protective measures. For details on enclosure, refer to the “Enclosure” in the catalogue.  
Note 9) The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.  
Note 10) With lock only  
Note 11) For an actuator with lock, add the power consumption for the lock.  
Note 12) Excludes the controller body and the connector on the controller side.

3 Installation

3.1 Installation

**Warning**

- Do not install the product unless the safety instructions have been read and understood.
- Do not use the product outside of it’s allowable specification.

- Ensure the product is sized correctly and is suitable for the application.
- Do not operate the product by fixing the piston rod and moving the actuator body.
- Avoid using the electric actuator in a way that rotational torque would be applied to the piston rod. If rotational torque is applied to the piston rod it will cause deformation, damage and/or reduce the non-rotational accuracy of the product. The allowable rotational torque is listed below.

Allowable Rotational torque (N.m or less)	LEY25	LEY32	LEY40
	1.1	1.4	1.4

- When attaching a bracket or nut to the end of the rod, ensure the piston rod is fully retracted.



- When installing, inspecting or performing maintenance on the product, be sure to turn off the power supplies. Then, lock it so it cannot be tampered with while in operation.

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 in excess of the product’s specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product’s specifications

3 Installation (continued)

3.3 Mounting

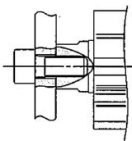
**Warning**

- Observe the required tightening torque for screws. Unless stated otherwise, tighten the screws to the recommended torque for mounting the product.
- Do not make any alterations to the product. Alterations made to this product may lead to a loss of durability and damage to the product, which can lead to injury and damage to other equipment and machinery. Do not scratch or dent the sliding parts of the table or mounting face etc., by striking or holding them with other objects. The components are manufactured to precise tolerances, so that even a slight deformation may cause faulty operation or seizure.
- Do not use the product until it has been verified that the equipment can be operated correctly. After mounting or repair, connect the power supply to the product and perform appropriate functional inspections to check it is mounted correctly.
- Do not use the product until it has been verified that the equipment can be operated correctly. After mounting or repair, connect the power supply to the product and perform appropriate functional inspections to check it is mounted correctly.
- Allow sufficient space for maintenance and inspection.

**Caution**

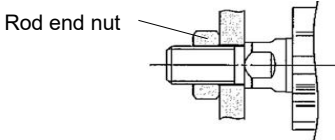
- **When mounting the product, use screws with adequate length and tighten them to the recommended torque.** Tightening with larger torque than the specified range may cause malfunction while the tightening with smaller torque can allow the displacement of actuator position. In extreme conditions the actuator could become detached from it’s mounting position.

Work fixed / Rod end female thread



Model	Screw	Max. tightening torque [Nm]	Max. thread length [mm]	Rod end width across flats [mm]
LEY25	M8 x 1.25	12.5	13	17
LEY32	M8 x 1.25	12.5	13	22
LEY40	M8 x 1.25	12.5	13	22

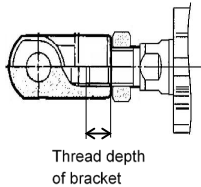
Work fixed / Rod end male thread



Model	Screw	Max. tightening torque [Nm]	Max. thread length [mm]	Rod end width across flats [mm]
LEY25	M14 x 1.5	65.0	20.5	17
LEY32	M14 x 1.5	65.0	20.5	22
LEY40	M14 x 1.5	65.0	20.5	22

3 Installation (continued)

Model	Rod end nut		thread depth of bracket[mm]
	Width across flats [mm]	Length [mm]	
LEY25	22	8	14
LEY32	22	8	14
LEY40	22	8	14

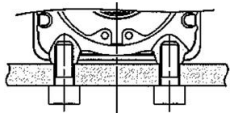


Tighten the product mounting screws to the specified torque.

Tightening to a torque over the specified range can cause operation failure, and insufficient torque can cause displacing or dropping of the attachment.

Mounting / Screw bottom tapped style

Model	Screw	Max. tightening torque [Nm]	Max. thread depth [mm]
LEY25	M5 x 0.8	3.0	6.5
LEY32	M6 x 1.0	5.2	8.5
LEY40	M6 x 1.0	5.2	8.5



- When using the product with IP65/IP67 or equivalent specifications, be sure to mount the tubing to the vent hole, and then place the end of the tubing in an area where it is not exposed to dust or water. If the actuator is used without the tubing to the vent hole, water or dust may enter the inside of the actuator, resulting in a malfunction.

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, refer to catalogue for details.
- The recommended grease is lithium grade No.2

Applied Region	Grease Pack Number	Weight [g]
Piston rod Guide	GR-S-010	10
	GR-S-020	20

3.5 Wiring



Warning

- Adjustment, mounting or wiring changes should not be carried out before disconnecting the power supply to the product.  
Electric shock, malfunction and damage can result.
- Do not disassemble the cables.
- Use only specified cables.  
Use only specified cables otherwise there may be risk of fire and damage.
- Do not connect or disconnect the wires, cables and connectors when the power is turned on.

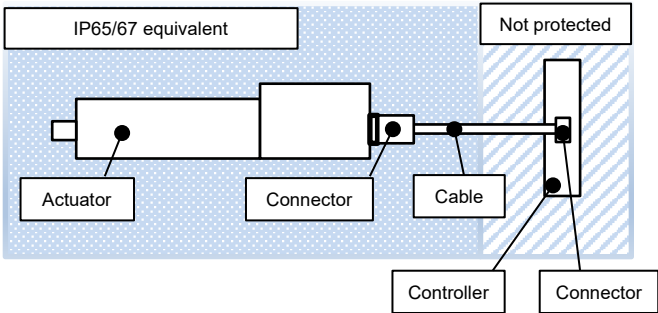


Caution

- Wire the connector correctly and securely.  
Check the connector for polarity and do not apply any voltage to the terminals other than those specified in the Operation Manual.
- Take appropriate measures against noise.  
Noise in a signal line may cause malfunction. As a countermeasure separate the high voltage and low voltage cables, and shorten the wiring lengths, etc.

3 Installation (continued)

- Do not route input/output wires and cables together with power or high voltage cables.  
The product can malfunction due to noise interference and surge voltage from power and high voltage cables close to the signal line. Route the wires of the product separately from power or high voltage cables.
- Take care that actuator movement does not catch cables.
- Operate with all wires and cables secured.
- Avoid bending cables at sharp angles where they enter the product.
- Avoid twisting, folding, rotating or applying an external force to the cable.  
Risk of electric shock, wire breakage, contact failure and loss of control of the product can result.
- Select "Robotic cables" in applications where cables are moving repeatedly (encoder/ motor/ lock).  
Refer to the relevant operation manual for the bending life of the cable.
- Confirm correct insulation.  
Poor insulation of wires, cables, connectors, terminals etc. can cause interference with other circuits. Also there is the possibility that excessive voltage or current may be applied to the product causing damage.
- Refer to the auto switch references in "Best Pneumatics" when an auto switch is to be used
- The actuator has an enclosure rating equivalent to IP65/67, but the controller and cable connections are not protected.  
Install the controller and cable connections in a place where they will not be exposed to water splash or dust.



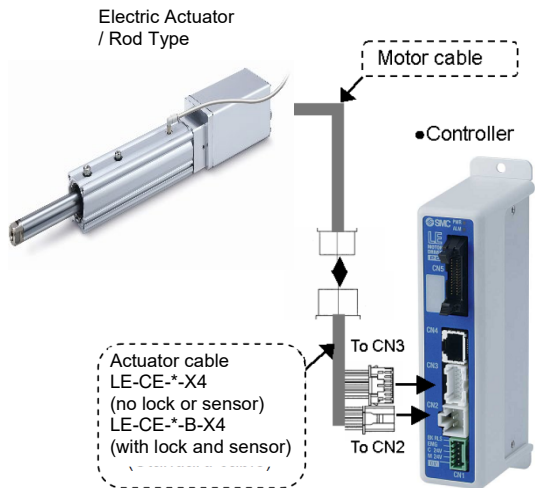
3.6 Actuator Ground connection



Caution

- The Actuator must be connected to ground to shield the actuator from electrical noise. The screw and cable with crimping terminal and toothed washer should be prepared separately by the user.

3.7 Wiring of Actuator to Controller



4 How to Order

- For standard products, refer to the catalogue on the SMC website (URL: <https://www.smcworld.com>) for the how to order information.

5 Outline Dimensions

- For standard products, refer to the catalogue on the SMC website (URL: <https://www.smcworld.com>) for outline dimensions.

6 Maintenance

6.1 General Maintenance



Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly electricity and compressed air can be dangerous.
- Maintenance of electromechanical and 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 power has been discharged and 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 or pneumatic 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.
- Incorrect handling can cause an injury, damage or malfunction of the equipment and machinery, so ensure that the procedure for the task is followed.
- Always allow sufficient space around the product to complete any maintenance and inspection.
- Remove the product from the installation and disconnect the power supply during replacement.
  - \* Tool required is a hexagon wrench set. If no locking adhesive is applied to the bolts or screws take countermeasures against loosening.
  - \* The product is dust proof / water proof (IP65 / IP67). Do not disassemble the motor cover.

The dust proof / water proof specification is not guaranteed once it has been disassembled.

- If grease lubrication performance is reduced due to operating environment or operating conditions, please re-apply grease.

6.2 Periodical Maintenance

- Maintenance should be performed according to the table below:

	Appearance Check	Scraper (piston rod) Check	Ball screw Check
Inspection before daily operation	✓		
Inspection every six months*	✓	✓	✓
Inspection every 200 km*	✓	✓	✓
Inspection every 1 million full strokes*	✓	✓	

\*whichever of these occurs first.

- Following any maintenance, always perform a system check. Do not use the product if any error occurs, as safety cannot be assured if caused by any un-intentional malfunction.

6 Maintenance (continued)

6.3 Appearance Check

- The following items should be visually monitored to ensure that the actuator remains in good condition and there are no concerns flagged;
  - Loose Screws,
  - Abnormal level of dust or dirt,
  - Visual flaws / faults,
  - Cable connections,
  - Abnormal noises or vibrations.

6.4 Scraper (piston rod) Check

- Take off the screw on Grease lubricating hole and apply grease to the piston rod.

6.5 Ball screw shaft Check

- Take off the screw on Grease lubricating hole and apply grease to the ball screw.

7 Limitations of Use

7.1 Limited warranty and disclaimer/compliance requirements

- Refer to Handling Precautions for SMC Products.

8 Product disposal

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

9 Contacts

Refer to [www.smcworld.com](http://www.smcworld.com) or [www.smc.eu](http://www.smc.eu) for your local distributor / importer.

SMC Corporation

URL : [http:// www.smcworld.com](http://www.smcworld.com) (Global) <http:// www.smc.eu> (Europe)  
'SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan  
Specifications are subject to change without prior notice from the manufacturer.  
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