



Instruction Manual
Electric Actuator / Rotary Table
Series LER* / LERH*



The intended use of this Electrical Actuator is to convert an electrical input signal into mechanical rotary 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) ⁽¹⁾, 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.

- 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.

	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

- 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.
- Electromagnetic compatibility: This product is class A equipment that is intended for use in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbances.
- Keep the controller and actuator combined as delivered for use. The product is set with parameters for shipment. If it is combined with a different product failure can result.

2 Specifications

2.1 LER(H) series

Model		10K	10J	30K	30J	50K	50J	
Actuator specification	Rotation Angle (°)	310			320			
	Gear rate (°)	8	12	8	12	7.5	12	
	Max. Rotation Torque (N·m)	0.32	0.22	1.2	0.8	10.0	6.6	
	Max. Pushing Torque (N·m) ^{Note 1)3)}	0.16	0.11	0.6	0.4	5.0	3.3	
	Max. Moment of Inertia (kg·m ²) ^{Note 2)}	LECP6 /1/MJ JXC*	0.004	0.0018	0.035	0.015	0.13	0.05
		LECPA			0.027	0.012	0.10	0.04
		Rotation Speed (°/sec) ^{Note 2)3)}			20 to 280	30 to 420	20 to 280	30 to 420
	Pushing Speed (°/sec)	20	30	20	30	20	30	
	Angular acceleration / deceleration (°/sec ²) ^{Note 2)}	3,000						
	Backlash (°)	Basic				± 0.2		
		High precision	± 0.3			± 0.1		
	Repeatability (°)	Basic				± 0.05		
		High precision	± 0.05			± 0.03		
	Lost motion (°) ^{Note 4)}	Basic				0.3 or less		
		High precision	0.3 or less			0.2 or less		
Impact resistance / vibration resistance (m/sec ²) ^{Note 5)}	150/30							
Actuation type		Worm gear and belt						
Table allowable load	Radial load (N)	Basic	78	196	314			
		High precision	86	233	378			
	Thrust load / Push (N)	Basic	78	363	451			
		High precision	107	398	517			
	Thrust load / Pull (N)	Basic	74			197		296
		High precision	2.4			5.3		9.7
Moment (N·m)	Basic	2.9			6.4		12.0	
	High precision							
Max. operating frequency (c.p.m)	60							
Operating temperature range (°C)	5 to 40							
Operating humidity range (%)	90 or less (No condensation)							
Weight (kg)	Basic	0.49	1.1	2.2				
	High precision	0.52	1.2	2.4				
External stopper	Rotation Angle (°)	*(-2) with 1 Arm			180			
		*(-3) with 2 Arms			90			
	Repeatability at the end (°)				± 0.01			
Range of external stopper (°)	± 2							
Weight (kg)	Basic	0.55	1.2	2.5				
	*(-2) with 1 Arm	High precision	0.61	1.4	2.7			
	*(-3) with 2 Arms	Basic	0.57	1.2	2.6			
	High precision	0.63	1.4	2.8				

2 Specifications - continued

2.2 LER(H) series

Model		10K	10J	30K	30J	50K	50J
360° type	Rotation Angle (°) ^{Note 7)}	360					
	Angle range (°) ^{Note 7)}	± 20000000					
	Proximity sensor (for return to original position) / Input circuit	2 wire					
	Proximity sensor (for return to original position) / Input number	1 outputs					
	Weight (kg)	Basic	0.51	1.2	2.3		
High precision		0.55	1.3	2.5			

2.3 Electrical specification

Model		10K	10J	30K	30J	50K	50J	
Electrical	Motor size	□20	□28	□42				
	Motor	Step motor (Servo 24 VDC)						
	Encoder (Angular displacement sensor)	Incremental				Incremental / Battery-less absolute		
	Power supply voltage (V)	24 VDC ± 10%						
	Power (W) ^{Note 8)}	19	42	57				

- Note 1) Pushing Torque accuracy is ± 30% (F.S.) for LER10, ± 25% (F.S.) for LER30, ± 20% (F.S.) for LER50.
- Note 2) The Angular acceleration, angular deceleration and angular speed may fluctuate due to variations in the moment of inertia. Refer to the catalogue.
- Note 3) The speed and force may change depending on the cable length, load and mounting conditions. Furthermore, if the cable length exceeds 5 m then it will decrease by up to 10% for each 5 m. (at 15 m : Reduced by up to 20%).
- Note 4) A reference value for correcting an error in reciprocal operation.
- Note 5) Impact resistance: No malfunction occurred when the rotary 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 rotary actuator in the initial state).
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 rotary actuator in the initial state).
- Note 6) The "Momentary max. 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 7) The Monitor angle is reset to 0° every 360°
Select INC for setting the angle (position).
If setting the angle above 360° with ABS (Absolute), the actuator will not operate correctly.
- Note 8) Indicates the maximum power during operation including the controller. Please use when selecting the power supply capacity.

Warning

Special products (-X#, -D#) might have specifications different from those shown in this section. Contact SMC for specific drawings.

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 in excess of its allowable specification.
- 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 work is happening.
- When mounting the actuator, use all mounting holes.
If all mounting holes are not used, this will not maintain the specified performance. e.g. the amount of displacement of the table will increase.
- Do not drop or hit the rotary actuator to avoid scratching and denting the mounting surfaces.
Even slight deformation can cause the deterioration of accuracy and operation failure.
- When mounting the actuator, use screws with adequate length and tighten them with the required torque.
Tightening the screws with a torque higher than recommended may cause malfunction, whilst tightening with a torque lower than recommended can cause displacement of the mounting position, or dropping of the work piece.

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.
- Prevent foreign particles from entering the product.

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.
- When attaching the work piece, do not apply strong impact or large moment.
If an external force over the allowable moment is applied, it may cause looseness in the guide unit, an increase in sliding resistance or other problems.

3.4 Actuator mounting (through holes)

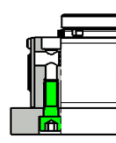
Model	Screw	Max. tightening torque [N·m]
LER*10	M5 x 0.8	3.0
LER*30	M6 x 1.0	5.0
LER*50	M8 x 1.25	12.0



3 Installation - continued

3.5 Actuator mounting (bottom tapped holes)

Model	Screw	Max. tightening torque [N·m]	Max. thread depth L [mm]
LER*10	M6 x 1.0	5.0	12
LER*30	M8 x 1.25	12.0	16
LER*50	M10 x 1.5	25.0	20



3.6 Mounting the Workpiece on the rotary table

Mount the workpiece to the table using the screw length and tightening torque specified in the table below. Using long screws which interfere with the body may cause operation failure.

Model	Screw	Screw length [mm]	Max. tightening torque [N·m]
LER*10	M4 x 0.7	6	1.4
LER*30	M5 x 0.8	8	3.0
LER*50	M6 x 1.0	10	5.0

- The rotary table mounting face has holes and slots for positioning. If required use them for accurate positioning of the rotary actuator.
- If it is necessary to operate the product when it is not energized, use the manual override screws. When the product is operated with the manual override screws, check the position of the manual override of the table, and leave necessary space. Do not apply excessive torque to the manual override screws that could lead to damage and malfunction of the product.

3.7 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

4 Wiring

4.1 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.

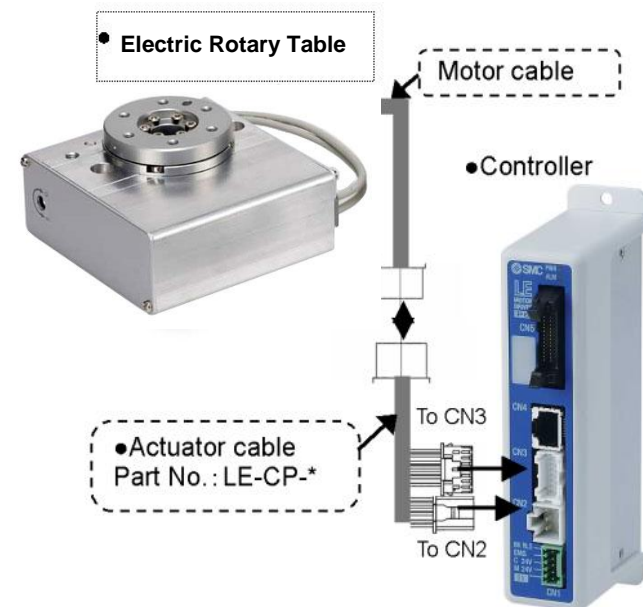
Caution

- 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.
- 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.
- 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.
- Do not use the product in a place where electrical surges are generated.

4 Wiring (continued)

- Use suitable surge protection when a surge generating load such as a solenoid valve is to be directly driven.
- Use a precision screwdriver with flat blade to adjust the DIP switch.
- Close the cover over the switches before power is turned on. Do not clean the product with chemicals such as benzene or thinners.
- Refer to the auto switch references in "Best Pneumatics" when an auto switch is to be used.

4.2 Wiring of Actuator to Controller

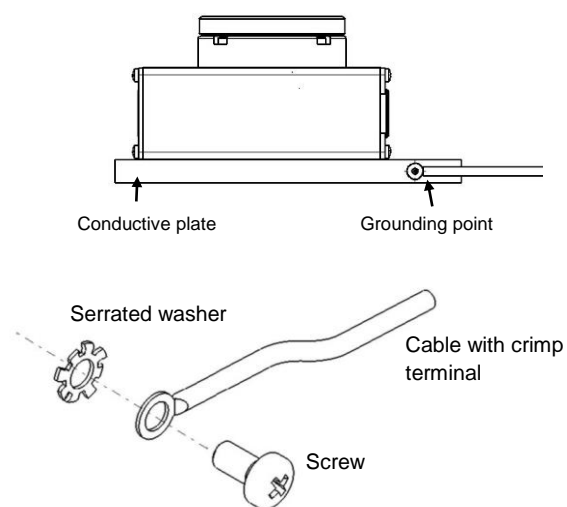


4.3 Actuator Ground connection

Caution

- The Actuator must be mounted to a conductive plate and connected to ground to shield the actuator from electrical noise.
- Dedicated grounding should be used. Grounding should be to a D-class ground (resistance of 100Ω or less).
- Grounding should be performed near the actuator to shorten the wiring distance. The cross-sectional area of the ground wire shall be a minimum of 2 mm². Avoid common grounding with other devices.
- The screw, cable with crimping terminal and shakeproof washer must be provided by the user.

Location of grounding point



5 How to Order

Refer to the operation manual or catalogue on the SMC website (URL: <https://www.smcworld.com>) for the How to Order information.

6 Outline Dimensions (mm)

Refer to the drawings / operation manual on the SMC website (URL: <https://www.smcworld.com>) for outline dimensions.

7 Maintenance

7.1 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.

- Maintenance should be performed according to the procedure indicated in the Operating Manual. Improper handling can cause injury, damage or malfunction of equipment and machinery.
- Removal of product. When the equipment is serviced, first confirm that measures are in place to prevent dropping of work pieces and run-away of equipment, etc, and then turn off the power supply to the system. When the machinery is restarted, check that the operation is normal with the rotary actuator in a safe position.

8 Limitations of Use

8.1 Limited warranty and Disclaimer/Compliance Requirements

- Refer to Handling Precautions for SMC Products.

9 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.

10 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

SMC Corporation

URL : <http://www.smcworld.com> (Global) <http://www.smc.eu> (Europe)
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Specifications are subject to change without prior notice from the manufacturer.
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