



ORIGINAL INSTRUCTIONS

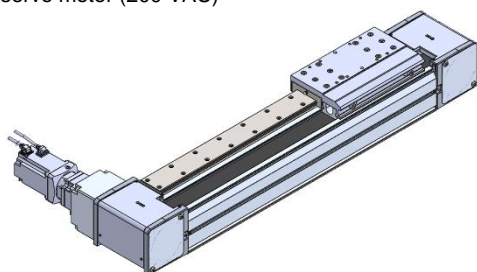
Instruction Manual

Electric Actuator / Slider type Belt Drive

Series LET

Motor: AC servo motor (200 VAC)

Motorless



The intended use of this Electric 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>1)</sup>, and other safety regulations.

- <sup>1)</sup>ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
- ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
- IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
- ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots 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>Danger</b>	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious 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>Caution</b>	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate 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.
- Keep the actuator and driver combined as delivered for use. The product is set in parameters for shipment. If it is combined with a different driver, failure can result.

2 Specifications

2.1 LET80\* / LET100\* – with motor type S\*/T\*/V\*

Model		LET80* (S4/V8/T8)				LET100* (T9)			
Actuator specification	Stroke [mm]	300 to 1000 (in 100 mm steps), 1200, 1500 to 3000 (in 500 mm steps)							
	Max. Workload [kg] <sup>*1)</sup>	Horizontal	15	45	75	1.5	25	100	240
		Vertical	10	21	40	1.5	15	40	70
	Speed [mm/s] <sup>*2)</sup>	2160	1300	720	4000	2400	1330	800	
	Max. acceleration / deceleration [mm/s <sup>2</sup> ]	20000 (refer to catalogue for limit according to workload / duty rate).							
	Positioning repeatability [mm]	±0.08							
	Reduction ratio	1/3	1/5	1/9	1/3	1/5	1/9	1/15	
	Screw Lead [mm]	43.33	26	14.44	80	48	26.67	16	
	Impact / Vibration resistance [m/s <sup>2</sup> ] <sup>*3)</sup>	50 / 5							
	Actuation method	Belt Drive							
Actuator specification	Guide type	Linear guide							
		Static permissible moment [N/m] <sup>*4)</sup>	Mp	380				1157	
	My		380				1157		
	Mr		114				529		
Operating temperature	5 to 40 °C								
Operating humidity	90 %RH or less (no condensation)								
Regenerative option	May be required by speed / workload. Refer to catalogue.								
Enclosure	IP20								
Motor output / size [mm]	400 W / □60				750 W / □80				
Motor type	AC Servo motor (200 VAC)								
Electrical	Encoder <sup>*5)</sup>	S4 motor	Incremental 17 bit (131072 pulse / rev)				-		
		T8 motor	Absolute 22 bit (4194304 pulse / rev) (LECSB2-T*, LECSS2-T*)				-		
	V8 motor	Absolute 18 bit (262144 pulse / rev) (LECS2-T*)				-			
		Absolute 20 bit (1048576 pulse / rev)				-			
	T9 motor	-				Absolute 22 bit (4194304 pulse / rev) (LECSB2-T*, LECSS2-T*)			
Lock	Max. Power [W] <sup>*6)</sup>	1275				1100			
	Lock Type <sup>*7)</sup>	Non magnetizing lock							
	Holding force [N]	153	255	458	153	255	458	763	
	Power consumption [W] @ 20°C <sup>*8)</sup>	S4 motor: 7.9 T8 motor: 7.9 V8 motor: 6.0				T9 motor: 10			
	Rated voltage [V]	24 VDC +0 / -10%							

- \*1) Non-standard strokes are available as special orders, please contact SMC.
- \*2) Refer to the "Speed-Workload Graph" as a Guide in the catalogue.
- \*3) Impact resistance... No malfunction in the belt drive direction and perpendicular direction in the drop impact test (values at the initial stage). Vibration resistance... 45 to 2000 Hz 1 sweep, no malfunction in the belt drive direction and perpendicular direction (value at the beginning).
- \*4) The static permissible moment is the static moment applied when the actuator is stopped. If there is a shock or a repeated load, please use it with sufficient safety in mind.
- \*5) The resolution changes depending on the driver type.
- \*6) Indicates the maximum power consumption during operation, including the driver. Refer to the driver operation manual for power supply selection.
- \*7) Only when the motor option "with lock" is selected.
- \*8) When selecting "with lock", add the power consumption.
- \*9) Do not let the actuator collide with either end of the table movement range. Also, when performing a positioning operation, do not command a range of [LET80:22mm, LET100:25 mm] from both ends.
- \*10) Please contact SMC for manufacturing intermediate strokes (Manufacturing range: LET80/300-3000 mm, LET100/300-3000 mm).
- \*11) The sensor magnet position is the table center position.

2 Specifications (continued)

2.2 LET80\* / LET100\* – without motor (motorless)

Model		LET80NN		LET100NN		
Actuator specification	Stroke [mm]	300 to 1000 (in 100 mm steps), 1200, 1500 to 3000 (in 500 mm steps)				
	Max. Workload [kg]	Horizontal	75		240	
		Vertical	70		200	
	Speed [mm/s]	5000				
	Max. acceleration / deceleration [mm/s <sup>2</sup> ]	50000				
	Positioning repeatability [mm]	±0.08				
	Screw Lead [mm]	130		240		
	Impact / Vibration resistance [m/s <sup>2</sup> ]	50 / 5				
	Actuation method	Belt Drive				
	Guide type	Linear guide				
Static permissible moment [N/m]	Mp	380		1157		
		380		1157		
		114		529		
Operating temperature	5 to 40 °C					
Operating humidity	90 %RH or less (no condensation)					
Enclosure	IP20(exclude motor mounting part)					

2.3 Actuator weight [kg]

Series	Stroke [mm]						
	300	400	500	600	700	800	900
LET80*	14.1	15.8	17.5	19.0	20.7	22.4	23.9
LET100*	36.5	39.3	42.3	45.1	47.9	50.8	53.8

Series	Stroke [mm]					
	1000	1200	1500	2000	2500	3000
LET80*	25.6	28.9	33.8	42.0	50.2	58.4
LET100*	56.6	62.3	70.9	85.3	99.7	114.1

- In the case of a motorless type actuator, only the weight of the actuator is used, and in the case of an actuator with motor, the weight of the actuator plus the additional weight of the motor (and lock) is used.

2.4 Additional weight of motor [kg]

Motor type	Lead [mm]				Additional weight of lock [kg]
	D	L	M	N	
S4	3.2	4.4	4.4	-	0.4
T8	3.2	4.4	4.4	-	0.4
V8	3.1	4.3	4.3	-	0.6
T9	7.4	7.4	8.7	9.1	1.0

Example: LET80NN-300 = 14.1 kg  
 LET80S4D-300 = 14.1+3.2 kg  
 LET80S4D-300B = 14.1+3.2+0.4 kg

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.
- Do not allow the table to hit the end of stroke. If an incorrect input instruction is given, such as using it outside the specification range or changing the controller/driver setting/origin position to give an operation instruction outside the actual stroke, the table (slider) can conflict. Perform a test run at low speed before use.
- Please note that if the table collides with the stroke end, the guide, belt, housing, etc. will be damaged and will not operate normally. Also, take measures against drops since the workpiece will drop freely due to its own weight when it is vertical.

3 Installation (continued)

- Keep the flatness of the mounting surface to within 0.1 mm maximum (for length of 500 mm). Insufficient flatness of a work piece or actuator mounting surface can cause play in the guide and increased sliding resistance.
- When installing this product, fix it with more side supports and T-nuts than the number of installation. Reducing the number of mounting units will affect performance, such as increasing the displacement of the table.

3.2 Mounting

Warning

- When mounting the actuator or workpiece, use screws with adequate length and tighten them with adequate torque. Tightening the screws with a higher torque than the maximum may cause malfunction, whilst tightening with a lower torque can cause the displacement of the mounting position or fall.
- 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.
- When an external guide is used, connect the moving parts of the product and the load in such a way that there is no interference at any point within the stroke. Do not scratch or dent the sliding parts of the product tube or piston rod etc., by striking or grasping them with other objects. Components are manufactured to precise tolerances, so that even a slight deformation may cause faulty operation.
- Do not scratch or dent the sliding parts of the product tube or piston rod etc., by striking or grasping them with other objects. Components are manufactured to precise tolerances, so that even a slight deformation may cause faulty operation.
- Prevent the seizure of rotating parts (pins, etc.) by applying grease.
- Do not operate by fixing the table and moving the actuator body.
- 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 mounting the actuator or 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.

3.3 Actuator mounting

Side support mounting number: N (MY-S50A)

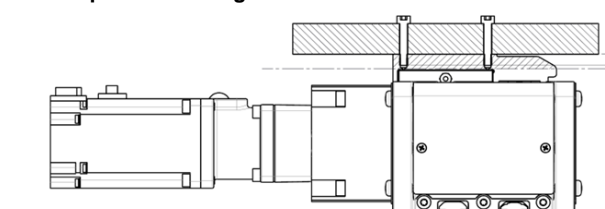


Note: The number of sides supports installed: N is the total number on the left and right side.

Stroke	Screw size	Max. tightening torque [Nm]	L1 [mm]	Mounting quantity	
				LET80*	LET100*
~ 600	M8 x 1.25	12.5	15	6	8
~ 900				8	10
~ 1200				10	12
~ 2000				12	14
~ 3000				14	16

- Arrange the support interval (L) of the side supports at equal intervals.
- Use side support part number MY-S50A for mounting.

Work piece Mounting



## 4 Installation (continued)

Model	Screw size	Max. tightening torque [Nm]	L max. screw depth [mm]
LET80*	M5 x 0.8	3	9
LET100	M8 x 1.25	12.5	15

### 4.1 Environment

#### Warning

- Avoid use in the following environments.
  - Locations where dust and cutting chips are airborne.
  - Locations where the ambient temperature is outside the range of the temperature specification.
  - Locations where the ambient humidity is outside the range of the humidity specification.
  - Locations where corrosive gas, flammable gas, salt water, water and steam are present.
  - Locations where strong magnetic or electric fields are generated.
  - Locations where direct vibration or impact is applied to the product.
  - Areas that are dusty or are exposed to splashes of water and oil drops.
  - Areas exposed to direct sunlight (ultraviolet ray).
- Do not use in an environment where the product is directly exposed to liquid, such as cutting oils. If cutting oils, coolant or oil mist contaminates the product, failure or increased sliding resistance can result.
- Install a protective cover when the product is used in an environment directly exposed to foreign matters such as dust, cutting chips and spatter. Play or increased sliding resistance can result.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Shield the product if there is a heat source nearby. The radiated heat from the heat source can increase the temperature of the product beyond the operating temperature range. Use a protective cover, etc.
- Grease oil can be decreased due to external environment and operating conditions, and it deteriorates lubrication performance to shorten the life of the product.

### 4.2 Lubrication

#### Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is to be used in the system, please contact SMC.

## 5 Wiring

### 5.1 Wiring

#### Warning

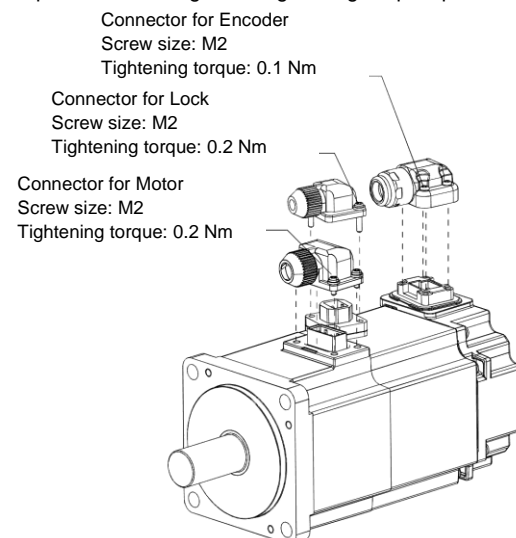
- Adjustment, mounting or wiring changes should not be carried out before disconnecting the power supply to the product. Electric shock, malfunction and damage can result.
- Do not disassemble the cables and use only specified cables.
- Do not connect or disconnect the wires, cables and connectors when 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 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).
- 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.

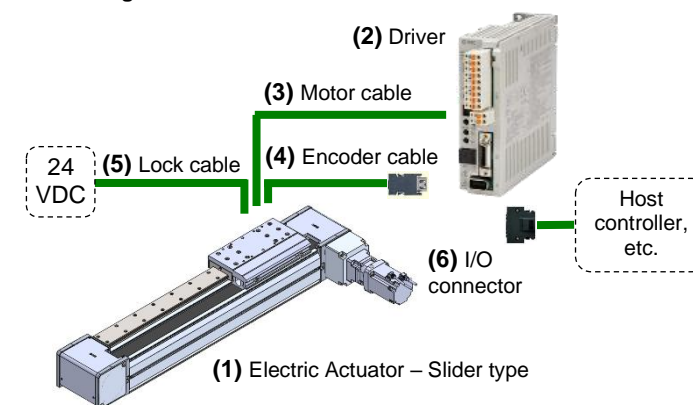
### 5.2 Cable connections

- Connect each cable to the actuator motor as shown.
- When tightening the connector fixing screws, gradually tighten in a crisscross pattern according to the tightening torque specified.



## 4 Wiring (continued)

### 5.3 Wiring of Actuator to Driver



\*1 The picture shows the LECSA driver.

\*2 The shape of the driver and I/O connectors differ depending on the driver type.

### 5.4 Actuator Ground connection

- The Actuator must be connected to ground to shield the actuator from electrical noise.
- Dedicated grounding should be used to a D-class specification (ground resistance of 100 Ω or less).
- The M4 screw and cable with crimping terminal and toothed washer should be prepared separately by the user.
- The ground wire cross sectional area should be 2 mm<sup>2</sup> minimum.
- Avoid common grounding points with other devices.

## 6 How to Order

Refer to the catalogue on the SMC website.

(URL: <https://www.smcworld.com>) for the How to Order information.

## 7 Outline Dimensions (mm)

Refer to the drawings / operation manual on the SMC website.

(URL: <https://www.smcworld.com>) for outline dimensions.

## 8 Maintenance

### 8.1 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.
- Allow sufficient space around the product for maintenance and inspection.

### 8.2 Periodical Maintenance

- Maintenance should be performed according to the table below:

## 7 Maintenance (continued)

Frequency	Appearance Check	Internal check	Belt Check
Before daily operation	✓	✓	✓
Every 6 months*	✓	✓	✓
Every 1,000 km*	✓	✓	✓
Every 5 million cycles*	✓	✓	✓

\*Whichever occurs first.

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

### 8.3 Visual 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.
  - Cable connections.
  - Visual flaws / faults.
  - Abnormal dust or dirt.
  - Abnormal noise or vibrations.

### 8.4 Internal Check

- Lubricant condition and dirt on moving parts. Use lithium grease No.2.
- Loose or mechanical play in fixed parts or fixing screws.

### 8.5 Belt Check

- If one of the 6 conditions below are seen, do not continue operating the actuator, contact SMC immediately.

#### Tooth shaped canvas is worn out.

Canvas fibre becomes "fuzzy," rubber is removed, and the fibre gains a white colour. The lines of fibre become very unclear.



#### Peeling off or wearing of the side of the belt.

The corner of the belt becomes round and frayed, with threads beginning to stick out.

#### Belt is partially cut.

Foreign matter could be caught in the teeth and cause flaws.



#### Vertical line of belt teeth.

Flaw which is made when the belt runs on the flange.

#### Rubber back of the belt is softened and sticky.

#### Cracks on the back of the belt.



## 9 Limitations of Use

### 9.1 Limited warranty and Disclaimer/Compliance Requirements

- Refer to Handling Precautions for SMC Products.

## 10 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.

## 11 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> (Global) / <http://www.smc.eu> (Europe)  
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