



# Operation Manual

## PRODUCT NAME

Electric Actuator / Rod Type  
Battery-less absolute encoder

## MODEL / Series / Product Number

### LEY Series

Applicable models: LEY□E, LEYG□E,

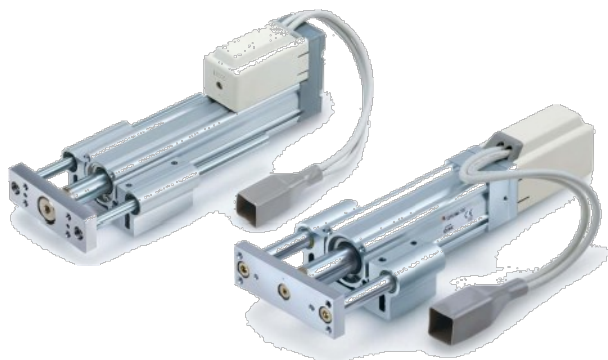
#### **LEY Series**

(Rod type)



#### **LEYG Series**

(Guide Rod type)



#This manual describes the dedicated terms for "LEY□E" and "LEYG□E".

Refer to the manual of LEY series about other details.

(No.LEY-OM00212)

#Refer to the manual relevant to the controller being used for full operating instructions.

## SMC Corporation

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# LEY/LEYG Series / Electric Actuator

## 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: Manipulating industrial robots -Safety.

etc.



### 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

### 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.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### 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.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



# LEY/LEYG Series / Electric Actuator

## Safety Instructions

### **Caution**

**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

1. 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.

3. 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

1. 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 regulation of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

### **Caution**

**SMC products are not intended for use as instruments for legal metrology.**

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

# 1. Rod type / LEY Series

## 1.1 Specification

### Battery-less Absolute (Step Motor 24 VDC)

Model				LEY25□E			LEY32□E			LEY40□E		
Actuator specifications	Work load [kg]*1	Horizontal	(3000 [mm/s²])	20	40	60	30	45	60	50	60	80
			(2000 [mm/s²])	30	55	70	40	60	80	60	70	90
		Vertical	(3000 [mm/s²])	8	16	30	11	22	43	13	27	53
	Pushing force [N]*2+3+4			63 to 122	126 to 238	232 to 452	80 to 189	156 to 370	296 to 707	132 to 283	266 to 553	562 to 1058
	Speed [mm/s]*4			18 to 500	9 to 250	5 to 125	24 to 500	12 to 300	6 to 150	24 to 500	12 to 300	6 to 150
	Max. acceleration/deceleration [mm/s²]			3000								
	Pushing speed [mm/s]*5			35 or less			30 or less			30 or less		
	Positioning repeatability [mm]			±0.02								
	Lost motion [mm]*6			0.1 or less								
	Screw lead [mm]			12	6	3	16	8	4	16	8	4
	Impact/Vibration resistance [m/s²]*7			50/20								
	Actuation type			Ball screw + Belt (LEY□□)/Ball screw (LEY□□D)								
Guide type			Sliding bushing (Piston rod)									
Operating temperature range [°C]			5 to 40									
Operating humidity range [%RH]			90 or less (No condensation)									
Electric specifications	Motor size			□42			□56.4			□56.4		
	Motor type			Battery-less absolute (Step motor 24 VDC)								
	Encoder			Battery-less absolute (4096 pulse/rotation)								
	Rated voltage [V]			24 VDC ±10%								
	Power consumption [W]*8			40			50			50		
	Standby power consumption when operating [W]*9			15			48			48		
	Max. instantaneous power consumption [W]*10			48			104			106		
Lock unit specifications	Type*11			Non-magnetizing lock								
	Holding force [N]			78	157	294	108	216	421	127	265	519
	Power consumption [W]*12			5			5			5		
	Rated voltage [V]			24 VDC ±10%								

- \*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.  
Vertical: Speed changes according to the work load. Check "Model Selection" in the Catalog.  
The values shown in ( ) are the acceleration/deceleration. Set these values to be 3000 [mm/s<sup>2</sup>] or less.
- \*2 Pushing force accuracy is ±20% (F.S.).
- \*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 values change according to the duty ratio and pushing speed. Check "Model Selection" in the Catalog.
- \*4 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%)
- \*5 The allowable speed for pushing operation.
- \*6 A reference value for correcting an error in reciprocal operation
- \*7 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 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 actuator in the initial state.)
- \*8 The power consumption (including the controller) is for when the actuator is operating.
- \*9 The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation. Except during the pushing operation
- \*10 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.
- \*11 With lock only
- \*12 For an actuator with lock, add the power consumption for the lock.

## 1.2 How to Order

LEY **25** **E** **B** — **30** **C** — **R1** **CD17T**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

### ① Size ② Motor mounting position

25	Nil	Top mounting
32	D	In-line
40		

### ③ Motor type

Symbol	Type
E	Battery-less absolute (Step motor 24 VDC)

### ④ Lead[mm]

symbol	LEY25	LEY32/40
A	12	16
B	6	8
C	3	4

### ⑤ Stroke [mm]

Stroke	Note	
	Size	Applicable stroke
30 to 400	25	30,50,100,150,200,250,300,350,400
30 to 500	32/40	30,50,100,150,200,250,300,350,400,450,500

### ⑥ Motor option

C	With motor cover
W	With lock/motor cover

\*When "With lock/motor cover" is selected for the top mounting type, the motor body will stick out from the end of the body for size 40 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.

### ⑦ Rod end thread

Nil	Rod end female thread
M	Rod end male thread (1 rod end nut included)

### ⑧ Mounting

Symbol	Type	Motor mounting	
		Parallel	In-line
Nil	Ends tapped / Body bottom tapped	●	●
L	Foot	●	-
F	Rod flange	●	●
G	Head flange	●	-
D	Double clevis	●	-

\* Mounting bracket is shipped together, (but not assembled).

\* When mounting styles are [Rod/Head flange] or [Ends tapped] with horizontal cantilever, use it within the following stroke.

• LEY25:200 or less • LEY32/40:100 or less

\* In case of [Double clevis], use the actuator within the following stroke limit.

• LEY25:200 or less • LEY32/40:200 or less

\* "G" Head flange is not available for LEY32/40

### ⑨ Actuator cable type/length

Robotic cable

Nil	None	R8	8*
R1	1.5	RA	10*
R3	3	RB	15*
R5	5	RC	20*

\*Produced upon receipt of order

### ⑩ Controller

\*Refer to catalog

## ! Caution

**Actuator and controller are sold as a set.**

**When purchasing without controller,**

**make sure that the combination of actuator and controller is correct.**

<Be sure to check the following before use.>

① "Actuator" matches "Actuator part number described in controller."

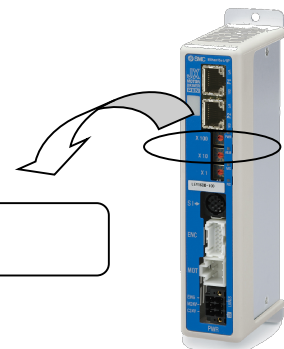
Example) Actuator number

LEY25EB-30C-R1CD17T

①

①

LEY25EB-30





## 2. Guide rod type / LEYG Series

### 2.1 Specification

#### Battery-less Absolute (Step Motor 24 VDC)

Model				LEYG25 <sup>M</sup> □□E			LEYG32 <sup>M</sup> □□E			LEYG40 <sup>M</sup> □□E		
Actuator specifications	Work load [kg]*1	Horizontal	Acceleration/Deceleration at 3000 [mm/s <sup>2</sup> ]	20	40	60	30	45	60	50	60	80
			Acceleration/Deceleration at 2000 [mm/s <sup>2</sup> ]	30	55	70	40	60	80	60	70	90
		Vertical	Acceleration/Deceleration at 3000 [mm/s <sup>2</sup> ]	7	15	29	9	20	41	11	25	51
	Pushing force [N]*2+3+4			63 to 122	126 to 238	232 to 452	80 to 189	156 to 370	296 to 707	132 to 283	266 to 553	562 to 1058
	Speed [mm/s]*4			18 to 500	9 to 250	5 to 125	24 to 500	12 to 300	6 to 150	24 to 500	12 to 300	6 to 150
	Max. acceleration/deceleration [mm/s <sup>2</sup> ]			3000								
	Pushing speed [mm/s]*5			35 or less			30 or less			30 or less		
	Positioning repeatability [mm]			±0.02								
	Lost motion [mm]*6			0.1 or less								
	Screw lead [mm]			12	6	3	16	8	4	16	8	4
Impact/Vibration resistance [m/s <sup>2</sup> ]*7			50/20									
Actuation type			Ball screw + Belt (LEYG□□□), Ball screw (LEYG□□□D)									
Guide type			Sliding bearing (LEYG□□M), Ball bushing bearing (LEYG□□L)									
Operating temp. range [°C]			5 to 40									
Operating humidity range [%RH]			90 or less (No condensation)									
Electric specifications	Motor size			□42			□56.4			□56.4		
	Motor type			Battery-less absolute (Step motor 24 VDC)								
	Encoder			Battery-less absolute (4096 pulse/rotation)								
	Rated voltage [V]			24 VDC ±10%								
	Power consumption [W]*8			40			50			50		
	Standby power consumption when operating [W]*9			15			48			48		
	Max. instantaneous power consumption [W]*10			48			104			106		
Lock unit specifications	Type*11			Non-magnetizing lock								
	Holding force [N]			78	157	294	108	216	421	127	265	519
	Power consumption [W]*12			5			5			5		
	Rated voltage [V]			24 VDC ±10%								

\*1 Horizontal: 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.

Vertical: Speed changes according to the work load. Check "Model Selection" in the Catalog.

Set the acceleration/deceleration values to be 3000 [mm/s<sup>2</sup>] or less.

\*2 Pushing force accuracy is ±20% (F.S.).

\*3 The pushing force values for LEYG25□□E is 30% to 50%, for LEYG32□□E is 30% to 70%, and for LEYG40□□E is 35% to 65%.

The pushing force values change according to the pushing speed. Check "Model Selection" in the Catalog.

\*4 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%)

When [M: Sliding bearing] is selected, the maximum speed of lead [A] is 400 mm/s (at no-load, horizontal mounting).

The speed is also restricted with a horizontal/moment load. Refer to "Model Selection" in the Catalog.

\*5 The allowable speed for the pushing operation

\*6 A reference value for correcting an error in reciprocal operation

\*7 Impact resistance: No malfunction occurred when it 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 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 actuator in the initial state.)

\*8 The power consumption (including the controller) is for when the actuator is operating.

\*9 The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation. Except during the pushing operation

\*10 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.

\*11 With lock only

\*12 For an actuator with lock, add the power consumption for the lock.

## 2.2 How to Order

LEYG **25** **M** **E** **B** — **50** **C** — **R1** **CD17T**

①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧      ⑨      ⑩

### ① Size

<b>25</b>
<b>32</b>
<b>40</b>

### ② Bearing type

<b>M</b>	Sliding bearing
<b>L</b>	Ball bushing bearing

### ③ Motor mounting position

<b>Nil</b>	Top mounting
<b>D</b>	In-line

### ④ Motor type

Symbol	Type
<b>Nil</b>	Battery-less absolute (Step motor 24 VDC)

### ⑤ Lead [mm]

symbol	LEYG25	LEYG32/40
<b>A</b>	12	16
<b>B</b>	6	8
<b>C</b>	3	4

### ⑥ Stroke [mm]

Stroke	Applicable stroke
<b>30 to 300</b>	30,50,100,150,200,250,300

### ⑦ Motor option

<b>C</b>	With motor cover
<b>W</b>	With lock/motor cover

\*When "With lock/motor cover" is selected for the top mounting type, the motor body will stick out from the end of the body for size 40 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.

### ⑧ Guide option

<b>Nil</b>	Without option
<b>F</b>	With grease holding function

\* Only available for slide bearings

### ⑨ Actuator cable type/length

Robotic cable

Nil	None	R8	8*
<b>R1</b>	1.5	<b>RA</b>	10*
<b>R3</b>	3	<b>RB</b>	15*
<b>R5</b>	5	<b>RC</b>	20*

\*Produced upon receipt of order

### ⑩ Controller

\*Refer to catalog

## ! Caution

Actuator and controller are sold as a set.

When purchasing without controller,

make sure that the combination of actuator and controller is correct.

<Be sure to check the following before use.>

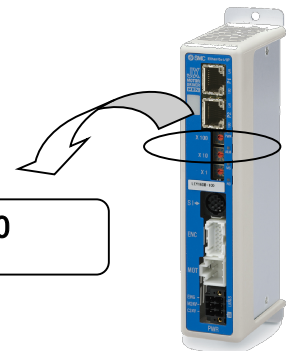
- ① "Actuator" matches "Actuator part number described in controller."

Example) Actuator number

LEYG25MEB-50C-R1CD17T

①

①  
**LEYG25MEB-50**



## 3. Specific product precautions

About precautions for installation of actuator, refer to [Specific precautions for Battery-less absolute encoder] that is described in the manual of used controller.



Revision history

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

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