



Operation Manual

PRODUCT NAME

Electric Actuator / Slider type

《High performance Battery-less absolute encoder type》

MODEL / Series / Product Number

LEKF Series

Applicable models : LEKFS*G



#This manual describes the dedicated terms for “LEKF*G”.

Refer to manual of LEKF series about other details.

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

SMC Corporation

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LEKFS 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.



LEKFS 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. Specification

LEKFS*G

| Model | | | LEKFS25 | | | LEKFS32 | | | LEKFS40 | | | |
|---|--|--|--|------------|-----------|------------|------------|------------|-------------|------------|------------|-----------|
| Actuator specification | Stroke [mm] | | 50 to 800 | | | 50 to 1000 | | | 150 to 1200 | | | |
| | Work load [kg] ^{Note2)} | | Horizontal | 15 | 28 | 40 | 40 | 50 | 68 | 26 | 60 | 75 |
| | | | Vertical | 3 | 7.5 | 15 | 4 | 10 | 18 | 4.5 | 4.5 | 25 |
| | Speed [mm/s] | Stroke range | Up to 400 | 20 to 1500 | 12 to 750 | 6 to 500 | 24 to 1300 | 16 to 1000 | 8 to 500 | 30 to 1200 | 20 to 1000 | 10 to 500 |
| | | | 401 to 500 | 20 to 1100 | 12 to 750 | 6 to 400 | 24 to 1300 | 16 to 950 | 8 to 500 | 30 to 1200 | 20 to 1000 | 10 to 500 |
| | | | 501 to 600 | 20 to 900 | 20 to 540 | 20 to 270 | 24 to 1200 | 16 to 800 | 8 to 400 | 30 to 1200 | 20 to 1000 | 10 to 500 |
| | | | 601 to 700 | 20 to 630 | 20 to 420 | 20 to 230 | 24 to 930 | 16 to 620 | 8 to 310 | 30 to 1200 | 20 to 900 | 10 to 440 |
| | | | 701 to 800 | 20 to 550 | 20 to 330 | 20 to 180 | 24 to 750 | 16 to 500 | 8 to 250 | 30 to 1140 | 20 to 760 | 10 to 350 |
| | | | 801 to 900 | - | - | - | 24 to 610 | 16 to 410 | 8 to 200 | 30 to 930 | 20 to 620 | 10 to 280 |
| | | | 901 to 1000 | - | - | - | 24 to 500 | 16 to 340 | 8 to 170 | 30 to 780 | 20 to 520 | 10 to 250 |
| | | | 1001 to 1100 | - | - | - | - | - | - | 30 to 660 | 20 to 440 | 10 to 220 |
| | 1101 to 1200 | - | - | - | - | - | - | 30 to 570 | 20 to 380 | 10 to 190 | | |
| | Max acceleration/deceleration [mm/s ²] | | 10000 | | | | | | | | | |
| | | | 5000 | | | | | | | | | |
| | Positioning repeatability [mm] | | ±0.01 (Lead H: ±0.02) | | | | | | | | | |
| Lost motion [mm] ^{Note3)} | | 0.05 | | | | | | | | | | |
| Lead [mm] | | 20 | 12 | 6 | 24 | 16 | 8 | 30 | 20 | 10 | | |
| Impact/Vibration resistance [m/s ²] ^{Note4)} | | 50/20 | | | | | | | | | | |
| Actuation type | | Ball screw(LEKFS□), Ball screw + Belt(LEKFS□ ^R _L) | | | | | | | | | | |
| Guide type | | Linear guide | | | | | | | | | | |
| Operating temperature [°C] | | 5 to 40 | | | | | | | | | | |
| Operating humidity [%RH] | | 90 or less(No condensation) | | | | | | | | | | |
| Electric specification | Motor size | | □42 | | | □56.4 | | | | | | |
| | Motor type | | Battery-less Absolute (Step Motor 24VDC) | | | | | | | | | |
| | Encoder | | Battery-less Absolute | | | | | | | | | |
| | Power supply voltage [V] | | 24VDC±10% | | | | | | | | | |
| | Power [W] ^{Note5)7)} | | Max. 126 | | | Max. 222 | | | Max. 222 | | | |
| Lock unit specification | Type ^{Note6)} | | Non-magnetizing lock | | | | | | | | | |
| | Holding force [N] | | 47 | 78 | 157 | 72 | 108 | 216 | 75 | 113 | 245 | |
| | Power consumption [W] ^{Note7)} | | 5 | | | 5 | | | 5 | | | |
| | Power supply voltage [V] | | 24VDC±10% | | | | | | | | | |

Note1) Please consult with SMC for non-standard strokes as they are produced as special orders.

Note2) The maximum work load at 3000mm/s².

Speed changes according to the work load. Check "Speed-Work Load Graph (Guide)" on pages # and #.

Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m.

Note3) A reference value for correcting an error in reciprocal operation

Note4) 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.)

Note5) The power is for when the actuator is operating. This value can be used for the selection

Note6) With lock only

Note7) For an actuator with lock, add the power consumption for the lock.

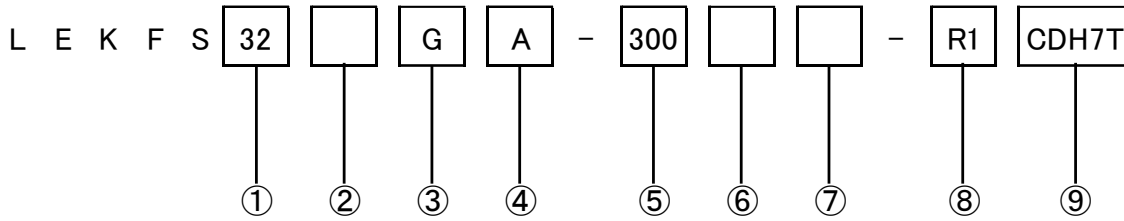
Weight

| Series | LEKFS25 | | | | | | | | | | | | |
|----------------------------------|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Stroke [mm] | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 |
| Product weight [kg] | 1.7 | 1.8 | 2.0 | 2.1 | 2.3 | 2.4 | 2.5 | 2.6 | 2.8 | 2.9 | 3.2 | 3.5 | 3.8 |
| Additional weight with lock [kg] | 0.26 | | | | | | | | | | | | |

| Series | LEKFS32 | | | | | | | | | | | | | | |
|----------------------------------|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Stroke [mm] | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 | 900 | 1000 |
| Product weight [kg] | 3.6 | 3.8 | 4.0 | 4.2 | 4.5 | 4.7 | 4.9 | 5.1 | 5.3 | 5.5 | 5.9 | 6.3 | 6.7 | 7.1 | 7.5 |
| Additional weight with lock [kg] | 0.53 | | | | | | | | | | | | | | |

| Series | LEKFS40 | | | | | | | | | | | | | | |
|----------------------------------|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| Stroke [mm] | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 |
| Product weight [kg] | 5.5 | 5.8 | 6.1 | 6.4 | 6.7 | 7.0 | 7.3 | 7.6 | 8.2 | 8.8 | 9.4 | 10.0 | 10.6 | 11.2 | 11.8 |
| Additional weight with lock [kg] | 0.53 | | | | | | | | | | | | | | |

2. How to order



① Size

| |
|----|
| 25 |
| 32 |
| 40 |

② Motor mounting position

| | |
|-----|---------------------|
| Nil | In-line |
| R | Right side parallel |
| L | Left side parallel |

③ Motor type

| | |
|---|---|
| G | High performance Battery-less Absolute (Step Motor 24VDC) |
|---|---|

④ Lead[mm]

| Symbol | LEKFS25 | LEKFS32 | LEKFS40 |
|--------|---------|---------|---------|
| H | 20 | 24 | 30 |
| A | 12 | 16 | 20 |
| B | 6 | 8 | 10 |

⑤ Stroke

| | |
|------|------|
| 50 | 50 |
| to | to |
| 1200 | 1200 |

*For details, refer to the applicable stroke table below.

⑥ Motor option

| | |
|-----|----------------|
| Nil | Without option |
| B | With lock |

⑧ Actuator cable type/length

| Robotic cable | | [m] | |
|---------------|------|-----|----|
| Nil | None | R8 | 8 |
| R1 | 1.5 | RA | 10 |
| R3 | 3 | RB | 15 |
| R5 | 5 | RC | 20 |

⑦ Grease application (Seal band part)

| | |
|-----|--------------------------------|
| Nil | With |
| N | Without (Roller specification) |

Applicable Stroke Table

| Size | Stroke | | | | | | | | | | | | | | | | |
|------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 |
| 25 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | - | - | - | - |
| 32 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | - | - |
| 40 | - | - | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

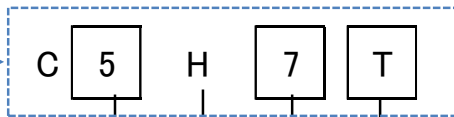
⑨ Controller

| | |
|-------|--------------------|
| Nil | Without controller |
| C□H□□ | With controller |

Interface

(Communication protocol /Input/Output)

| | |
|---|----------------------|
| 5 | Parallel input (NPN) |
| 6 | Parallel input (PNP) |
| E | EtherCAT® |
| 9 | EtherNet/IP™ |
| P | PROFINET |



Communication plug connector I/O cable^{*2}

| Symbol | Type | Applicable interface |
|--------|-------------------|--|
| Nil | Without accessory | - |
| 1 | I/O cable (1.5m) | Parallel input (NPN) Parallel input (PNP) |
| 3 | I/O cable (3m) | |
| 5 | I/O cable (5m) | |

Controller mounting

| | |
|-----------------|----------------|
| 7 | Screw mounting |
| 8 ^{*1} | DIN rail |

● Single axis

/High performance

*1 The DIN rail is not included. Order it separately.

*2 Select "Nil" for anything other than Parallel input.

Select "Nil", "1", "3", or "5" for Parallel input.

Caution

Actuator and controller are sold as a set.

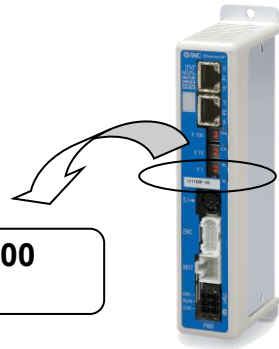
When purchasing without controller,
make sure that the combination of actuator and controller is correct.

<Be sure to check the following before use.>

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

(1)

LEKFS32GA-300



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 |
|--|
| <u>No.LEKF-OMZ0037</u> Mar. / 2022 1st printing |
| <u>No.LEKF-OMZ0037-A</u> Mar. / 2022 Revision |
| <u>No.LEKF-OMZ0037-B</u> Feb. / 2023 Revision |

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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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