Electric Actuator /Slider Type

AC Servo Motor

LEF Series
Applicable models: LEFS/LEFB

AC Servo Motor Driver

LECS Series

LECSA (Pulse input / Positioning)
LECSB (Pulse input)
LECSC (CC-Link)
LECSS (SSCNETⅢ)

SMC Corporation
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<td>7. Electric actuators / Slider type Common precautions ........................... 30</td>
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<tr>
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</tr>
</tbody>
</table>
LEF Series / Slider type
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), Japan Industrial Standards (JIS)*1) and other safety regulations*2).

*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 10218-1992: Manipulating industrial robots -- Safety
   JIS B 8370: General rules for pneumatic equipment.
   JIS B 8361: General rules for hydraulic equipment.
   JIS B 9960-1: Safety of machinery -- Electrical equipment for machines. (Part 1: General requirements)
   JIS B 8433-1993: Manipulating industrial robots - Safety. etc.

*2) Labor Safety and Sanitation Law, 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.

<table>
<thead>
<tr>
<th>Warning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.</td>
</tr>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

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. 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. 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. 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.
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
The warranty period of the product is 1 year in service or 1.5 years after the product is
delivered, whichever is first.*3)
Also, the product may have specified durability, running distance or replacement parts. Please
consult your nearest sales branch.

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.

Prior to using SMC products, please read and understand the warranty terms and disclaimers noted
in the specified catalog for the particular products.

*3) 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
When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and
Industry (Foreign Exchange and Foreign Trade Control Law).
1. Procedure before operation

1.1 Preparation

(1) Items to be prepared

Please check on the label, and the quantity of accessories, to confirm that it is the product that was ordered.

Table 1. Components

<table>
<thead>
<tr>
<th>No.</th>
<th>Part name</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Electric Actuator / LEF Series</td>
<td>1</td>
</tr>
<tr>
<td>(2)</td>
<td>Driver / LECS Series</td>
<td>1 (in case with driver)</td>
</tr>
<tr>
<td>(3)</td>
<td>Motor cable</td>
<td>Pre-installed (1) (in case with cable)</td>
</tr>
<tr>
<td>(4)</td>
<td>Encoder cable</td>
<td></td>
</tr>
<tr>
<td>(5)</td>
<td>Lock cable</td>
<td></td>
</tr>
<tr>
<td>(6)</td>
<td>I/O Connector</td>
<td>1 (in case with I/O connector)</td>
</tr>
</tbody>
</table>

LECSA (Pulse input / Positioning)

[Diagram of LECSA connection showing components (1) Electric Actuator, (2) Driver, (3) Motor cable, (4) Encoder cable, (5) Lock cable, (6) I/O Connector, with DC24V and Host controller, etc connections marked]

LECSB (Pulse input)

[Diagram of LECSB connection showing components (1) Electric Actuator, (2) Driver, (3) Motor cable, (4) Encoder cable, (5) Lock cable, (6) I/O Connector, with DC24V and Host controller, etc connections marked]
LECSC (CC-Link)

(1) Electric Actuator

DC24V

(2) Driver

(3) Motor cable

(4) Encoder cable

(5) Lock cable

Host controller, etc

(6) I/O Connector

LECSS (SSCNET III)

(1) Electric Actuator

DC24V

(2) Driver

(3) Motor cable

(4) Encoder cable

(5) Lock cable

Host controller, etc

(6) I/O Connector
1.2 Startup

When switching the power on for the first time, follow the startup procedure below. Refer to the “Driver operation manual” for wiring method and detailed procedure.

1) CC-Link cable (LECSC), SSCNETIII cable (LECSS)
2) When using test operation mode (JOG operation), the LECSC and LECSS need the MR-Configurator.
1.3 Gain tuning

1.3.1 Procedure

Here are the steps for basic gain tuning. Refer to the “Driver operation manual” for details and for tuning methods other than shown below.

● For LECSA (Pulse input / Positioning)
  A. One-touch tuning
     During motor driving, push “AUTO” button on the front of the driver for three seconds.
     When display panel becomes "", push “AUTO” button again.
     ⇒ The gain (including filter, etc) is adjusted automatically.
     When the error occurs, refer to the “Driver operation manual”.
  B. Auto tuning (Mode1) 1)
     Do this operation, if you are not satisfied with the result of “One-touch tuning”.
     Set parameter No.PA08 “001”. Afterwards, do 1 and 2 alternately.
     1. Reduce value of parameter No.PA09 to be less than present value.
     2. Operate and ascertain the situation.
     ⇒ The gain is adjusted automatically.

● For LECSB (Pulse input), LECSC (CC-Link), LECSS(SSCNETIII)
  A. Adaptive filter II
     Set parameter No.PB01 “0001” and drive the motor.
     ⇒ The filter is adjusted automatically.
  B. Auto tuning (Mode1)
     Do this operation, if you are not satisfied with the result of “Adaptive filter II”.
     Set parameter No.PA08 “0001”. Afterwards, do 1 and 2 alternately.
     1. Reduce value of parameter No.PA09 to be less than present value.
     2. Operate and ascertain the situation.
     ⇒ The gain is adjusted automatically.

⚠️ Warning

A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the appropriate parameter in the initial setting. Refer to "The recommended the parameter for each driver" for the parameter.

1) The auto tuning mode 1 may not be performed properly if the following conditions are not satisfied.
   • Time to reach 2,000rpm is the acceleration/deceleration time constant of 5[sec] or less.
   • Speed is 150rpm or higher.
   • Load to motor inertia is 100 times or less.
   • The acceleration/deceleration is 10% or more of the rated torque.
### 1.3.2 The recommended parameter for each driver

The recommended parameter for each driver. Please change the parameter values by use of the customer. Please refer to the manual of the driver for more details.

#### [LECSA/In the case of a ball screw drive]

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Para No</th>
<th>Initial value</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of command input pulses per revolution *3</td>
<td>PA05</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Electronic gear numerator *3</td>
<td>PA06</td>
<td>1</td>
<td>100(Positioning mode: 10)</td>
</tr>
<tr>
<td>Electronic gear denominator *3</td>
<td>PA07</td>
<td>1</td>
<td>20 12 6 24 16 8 30 20 10</td>
</tr>
<tr>
<td>Feel length multiplication (STM) (Multiplier)</td>
<td>PE02</td>
<td>0000</td>
<td>0000(Less than stroke 1000)/0001(Stroke 1000 or more)</td>
</tr>
<tr>
<td>Home position return type</td>
<td>PE03</td>
<td>0010</td>
<td>□□3(Stopper type)</td>
</tr>
<tr>
<td>Home position return direction</td>
<td>PE03</td>
<td>0010</td>
<td>□□1(Stopper type)</td>
</tr>
<tr>
<td>Home position return Speed (rpm)</td>
<td>PE04</td>
<td>500</td>
<td>90 150 300 75 113 225 60 90 180</td>
</tr>
<tr>
<td>Home position return/JOG operation acceleration/deceleration time constants (msec)</td>
<td>PE07</td>
<td>100</td>
<td>1000 600 300 1200 800 400 1500 1000 500</td>
</tr>
<tr>
<td>Home position return position data (μm)</td>
<td>PE08</td>
<td>0</td>
<td>~2000(Less than stroke 1000)/~200(Stroke 1000 or more)</td>
</tr>
<tr>
<td>Stopper type home position return stopper time (msec)</td>
<td>PE10</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Stopper type home position return torque limit value (%)</td>
<td>PE11</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Regenerative option</td>
<td>PA02</td>
<td>000</td>
<td>000(Non) / 002(LEC-MR-RB-032)</td>
</tr>
<tr>
<td>Rotation direction selection</td>
<td>PA14</td>
<td>0</td>
<td>1(+:Counter motors side)</td>
</tr>
<tr>
<td>Adaptive tuning mode</td>
<td>PB01</td>
<td>000</td>
<td>000</td>
</tr>
<tr>
<td>Load to motor inertia moment ratio</td>
<td>PB06</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Machine resonance suppression filter 1</td>
<td>PB13</td>
<td>4500</td>
<td>4500</td>
</tr>
<tr>
<td>Notch shape selection 1</td>
<td>PB14</td>
<td>000</td>
<td>000</td>
</tr>
</tbody>
</table>

*1 Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.
*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.
*3 When the positioning mode is not set: The travel distance of the actuator per 1 pulse should be 10 [μm/pulse]. When the positioning mode is set: The minimum unit of the travel distance of the actuator should be 1 [μm].
### LECSA/In the case of a belt drive

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Para No</th>
<th>Initial value</th>
<th>Recommended value</th>
</tr>
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<tr>
<td>Number of command input pulses per revolution *3</td>
<td>PA05</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Electronic gear numerator *3</td>
<td>PA06</td>
<td>1</td>
<td>100 (Positioning mode: 10)</td>
</tr>
<tr>
<td>Electronic gear denominator *3</td>
<td>PA07</td>
<td>1</td>
<td>54</td>
</tr>
<tr>
<td>Feel length multiplication (STM) (Multiplier)</td>
<td>PE02</td>
<td>0000</td>
<td>0000 (Less than stroke 1000)/0001 (Stroke 1000 or more)</td>
</tr>
<tr>
<td>Home position return type</td>
<td>PE03</td>
<td>0010</td>
<td>□□□3 (Stopper type)</td>
</tr>
<tr>
<td>Home position return direction</td>
<td>PE03</td>
<td>0010</td>
<td>□□1□ (Motor side)</td>
</tr>
<tr>
<td>Home position return Speed (rpm)</td>
<td>PE04</td>
<td>500</td>
<td>33</td>
</tr>
<tr>
<td>Home position return/JOG operation acceleration/deceleration time constants (msec)</td>
<td>PE07</td>
<td>100</td>
<td>2700</td>
</tr>
<tr>
<td>Home position return position data (μm)</td>
<td>PE08</td>
<td>0</td>
<td>~3000 (Less than stroke 1000)/~300 (Stroke 1000 or more)</td>
</tr>
<tr>
<td>Stopper type home position return stopper time (msec)</td>
<td>PE10</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Stopper type home position return torque limit value (%)</td>
<td>PE11</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Regenerative option</td>
<td>PA02</td>
<td>000</td>
<td>000 (Non) / 002 (LEC-MR-RB-032)</td>
</tr>
<tr>
<td>Rotation direction selection</td>
<td>PA14</td>
<td>0</td>
<td>1(+: Counter motors side) 0(+: Counter motors side) 1(+: Counter motors side) 0(+: Counter motors side) 1(+: Counter motors side) 0(+: Counter motors side)</td>
</tr>
<tr>
<td>★Adaptive tuning mode</td>
<td>PB01</td>
<td>000</td>
<td>002</td>
</tr>
<tr>
<td>★Load to motor inertia moment ratio</td>
<td>PB06</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>★Machine resonance suppression filter 1</td>
<td>PB13</td>
<td>4500</td>
<td>400</td>
</tr>
<tr>
<td>★Notch shape selection 1</td>
<td>PB14</td>
<td>000</td>
<td>030</td>
</tr>
</tbody>
</table>

★: Parameter should be changed.

*1 Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.
*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.
*3 When the positioning mode is not set: The travel distance of the actuator per 1 pulse should be 10 [μm/pulse]. When the positioning mode is set: The minimum unit of the travel distance of the actuator should be 1 [μm].
### In the case of a ball screw drive

<table>
<thead>
<tr>
<th>Parameter</th>
<th>LEFS25</th>
<th>LEFS32</th>
<th>LEFS40</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of command input pulses per revolution</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td>PA05</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Electronic gear numerator</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td>PA06</td>
<td>1</td>
<td>32768</td>
</tr>
<tr>
<td><strong>Electronic gear denominator</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td>PA07</td>
<td>1</td>
<td>250 150 75 300 200 100 375 250 125</td>
</tr>
<tr>
<td><strong>Regenerative option</strong></td>
<td>PA02</td>
<td>0000</td>
<td>0000(Non) / 0002(LEC-MR-RB-032)</td>
</tr>
<tr>
<td><strong>Rotation direction selection</strong></td>
<td>PA14</td>
<td>0</td>
<td>1(+: Counter motors side)</td>
</tr>
<tr>
<td><strong>Adaptive tuning mode</strong></td>
<td>PB01</td>
<td>0000</td>
<td>0000</td>
</tr>
<tr>
<td><strong>Load to motor inertia moment ratio</strong></td>
<td>PB06</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td><strong>Machine resonance suppression filter</strong></td>
<td>PB13</td>
<td>4500</td>
<td>4500</td>
</tr>
<tr>
<td><strong>Notch shape selection</strong></td>
<td>PB14</td>
<td>0000</td>
<td>0000</td>
</tr>
</tbody>
</table>

### In the case of a belt drive

<table>
<thead>
<tr>
<th>Parameter</th>
<th>LEFB25</th>
<th>LEFB25U</th>
<th>LEFB32</th>
<th>LEFB32U</th>
<th>LEFB40</th>
<th>LEFB40U</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of command input pulses per revolution</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td>PA05</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electronic gear numerator</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td>PA06</td>
<td>1</td>
<td>32768</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electronic gear denominator</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td>PA07</td>
<td>1</td>
<td>675</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Regenerative option</strong></td>
<td>PA02</td>
<td>0000</td>
<td>0000(Non) / 0002(LEC-MR-RB-032)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rotation direction selection</strong></td>
<td>PA14</td>
<td>0</td>
<td>1(+: Counter motors side)</td>
<td>0(+: Counter motors side)</td>
<td>1(+: Counter motors side)</td>
<td>0(+: Counter motors side)</td>
</tr>
<tr>
<td><strong>Adaptive tuning mode</strong></td>
<td>PB01</td>
<td>0000</td>
<td>0002</td>
<td>0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Load to motor inertia moment ratio</strong></td>
<td>PB06</td>
<td>7</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Machine resonance suppression filter</strong></td>
<td>PB13</td>
<td>4500</td>
<td>400</td>
<td>4500</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Notch shape selection</strong></td>
<td>PB14</td>
<td>0000</td>
<td>0030</td>
<td>0000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

★: Parameter should be changed.

1. Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.
2. A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.
3. The travel distance of the actuator per 1 pulse should be 10 [μm/pulse].
### LECSC/In the case of a ball screw drive

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Para. No.</th>
<th>Initial value</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic gear numerator *3</td>
<td>PA06 1</td>
<td></td>
<td>32768</td>
</tr>
<tr>
<td>Electronic gear denominator *3</td>
<td>PA07 1</td>
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<td></td>
</tr>
<tr>
<td>Feel length multiplication (STM) (Multiplier)</td>
<td>PA05 0000</td>
<td></td>
<td>0000 (Less than stroke 1000)/ 0001 (Stroke 1000 or more)</td>
</tr>
<tr>
<td>Home position return type</td>
<td>PC02 0000</td>
<td></td>
<td>□□□3 (Stopper type)</td>
</tr>
<tr>
<td>Home position return direction</td>
<td>PC03 0001</td>
<td></td>
<td>□□□1 (Motor side)</td>
</tr>
<tr>
<td>Home position return Speed (rpm)</td>
<td>PC04 500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home position return position data (μm)</td>
<td>PC07 0</td>
<td></td>
<td>-2000 (Less than stroke 1000)/ -200 (Stroke 1000 or more)</td>
</tr>
<tr>
<td>Stopper type home position return stopper time (msec)</td>
<td>PC09 100</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>Stopper type home position return torque limit value (%)</td>
<td>PC10 15</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>Regenerative option</td>
<td>PA02 0000</td>
<td></td>
<td>0000 (Non) / 0002 (LEC-MR-RB-032)</td>
</tr>
<tr>
<td>Rotation direction selection</td>
<td>PA14 0</td>
<td></td>
<td>1 (+: Counter motors side)</td>
</tr>
<tr>
<td>Adaptive tuning mode</td>
<td>PB01 0000</td>
<td></td>
<td>0000</td>
</tr>
<tr>
<td>Load to motor inertia moment ratio</td>
<td>PB06 7</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Machine resonance suppression filter 1</td>
<td>PB13 4500</td>
<td></td>
<td>4500</td>
</tr>
<tr>
<td>Notch shape selection 1</td>
<td>PB14 0000</td>
<td></td>
<td>0000</td>
</tr>
</tbody>
</table>

*1 Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.

*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.

*3 The travel distance of the actuator per 1 pulse should be 10 [μm/pulse].
In the case of a belt drive

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter No.</th>
<th>Initial value</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic gear numerator *3</td>
<td>PA06</td>
<td>1</td>
<td>32768</td>
</tr>
<tr>
<td>Electronic gear denominator *3</td>
<td>PA07</td>
<td>1</td>
<td>6750</td>
</tr>
<tr>
<td>Feel length multiplication (STM) (Multiplier)</td>
<td>PA05</td>
<td>0000</td>
<td>0000(Less than stroke 1000)/0001(Stroke 1000 or more)</td>
</tr>
<tr>
<td>Home position return type</td>
<td>PC02</td>
<td>0000</td>
<td>□□□3(Stopper type)</td>
</tr>
<tr>
<td>Home position return direction</td>
<td>PC03</td>
<td>0001</td>
<td>□□□1 (Motor side)</td>
</tr>
<tr>
<td>Home position return Speed (rpm)</td>
<td>PC04</td>
<td>500</td>
<td>33</td>
</tr>
<tr>
<td>Home position return position data (μm)</td>
<td>PC07</td>
<td>0</td>
<td>~3000(Less than stroke 1000)/~300(Stroke 1000 or more)</td>
</tr>
<tr>
<td>Stopper type home position return stopper time (msec)</td>
<td>PC09</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>Stopper type home position return torque limit value (%)</td>
<td>PC10</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Regenerative option</td>
<td>PA02</td>
<td>0000</td>
<td>0000(Non) / 0002(LEC-MR-RB-032)</td>
</tr>
</tbody>
</table>

Rotation direction selection

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter No.</th>
<th>Initial value</th>
<th>1(+: Counter motors side)</th>
<th>0(+: Counter motors side)</th>
<th>1(+: Counter motors side)</th>
<th>0(+: Counter motors side)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptive tuning mode</td>
<td>PB01</td>
<td>0000</td>
<td>0002</td>
<td>0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load to motor inertia moment ratio</td>
<td>PB06</td>
<td>7</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine resonance suppression filter 1</td>
<td>PB13</td>
<td>4500</td>
<td>400</td>
<td>4500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notch shape selection 1</td>
<td>PB14</td>
<td>0000</td>
<td>0030</td>
<td>0000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

★: Parameter should be changed.

*1 Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.
*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.
*3 The travel distance of the actuator per 1 pulse should be 10 [μm/pulse].
### In the case of a ball screw drive

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Para. No.</th>
<th>Initial value</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regenerative option</td>
<td>PA02</td>
<td>0000</td>
<td>0000(Non) / 0002(LEC-MR-RB-032)</td>
</tr>
<tr>
<td>Rotation direction selection</td>
<td>PA14</td>
<td>0</td>
<td>1(+: Counter motors side)</td>
</tr>
<tr>
<td>Adaptive tuning mode</td>
<td>PB01</td>
<td>0000</td>
<td>0000</td>
</tr>
<tr>
<td>Load to motor inertia moment ratio</td>
<td>PB06</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Machine resonance suppression filter 1</td>
<td>PB13</td>
<td>4500</td>
<td>4500</td>
</tr>
<tr>
<td>Notch shape selection 1</td>
<td>PB14</td>
<td>0000</td>
<td>0000</td>
</tr>
</tbody>
</table>

### In the case of a belt drive

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Para. No.</th>
<th>Initial value</th>
<th>Recommended value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regenerative option</td>
<td>PA02</td>
<td>0000</td>
<td>0000(Non) / 0002(LEC-MR-RB-032)</td>
</tr>
<tr>
<td>Rotation direction selection</td>
<td>PA14</td>
<td>0</td>
<td>1(+: Counter motors side)</td>
</tr>
<tr>
<td>Adaptive tuning mode</td>
<td>PB01</td>
<td>0000</td>
<td>0002</td>
</tr>
<tr>
<td>Load to motor inertia moment ratio</td>
<td>PB06</td>
<td>7</td>
<td>50</td>
</tr>
<tr>
<td>Machine resonance suppression filter 1</td>
<td>PB13</td>
<td>4500</td>
<td>400</td>
</tr>
<tr>
<td>Notch shape selection 1</td>
<td>PB14</td>
<td>0000</td>
<td>0030</td>
</tr>
</tbody>
</table>

★: Parameter should be changed.

*1 Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.

*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.

* For LECSS, please set the electronic gear with PC, PLC etc. in your application.
# 2. Slider type LEFS series

## 2.1 Specification

### LEFS25,32,40 AC servo motor (100W / 200W/400W/)

<table>
<thead>
<tr>
<th>Model</th>
<th>LEF25S*</th>
<th>LEF32S*</th>
<th>LEF40S*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor type</strong></td>
<td>Electric</td>
<td>Electric</td>
<td>Electric</td>
</tr>
<tr>
<td><strong>Work load [kg]</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50~800</td>
<td>10</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>50~1000</td>
<td>30</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>150~1200</td>
<td>30</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td><strong>Vertical</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>15</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td><strong>Stroke [mm]</strong></td>
<td>401~500</td>
<td>1200</td>
<td>720</td>
</tr>
<tr>
<td></td>
<td>360</td>
<td>1500</td>
<td>500</td>
</tr>
<tr>
<td><strong>Maximum Speed</strong></td>
<td>501~600</td>
<td>900</td>
<td>540</td>
</tr>
<tr>
<td>[mm/s]</td>
<td>270</td>
<td>1200</td>
<td>800</td>
</tr>
<tr>
<td></td>
<td>400</td>
<td>1500</td>
<td>500</td>
</tr>
<tr>
<td><strong>Maximum Speed</strong></td>
<td>601~700</td>
<td>700</td>
<td>420</td>
</tr>
<tr>
<td>[mm/s]</td>
<td>210</td>
<td>930</td>
<td>620</td>
</tr>
<tr>
<td>701~800</td>
<td>550</td>
<td>330</td>
<td></td>
</tr>
<tr>
<td></td>
<td>160</td>
<td>750</td>
<td></td>
</tr>
<tr>
<td></td>
<td>250</td>
<td>1140</td>
<td></td>
</tr>
<tr>
<td>801~900</td>
<td>-</td>
<td>-</td>
<td>610</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>930</td>
<td></td>
</tr>
<tr>
<td></td>
<td>310</td>
<td>1410</td>
<td></td>
</tr>
<tr>
<td></td>
<td>470</td>
<td>940</td>
<td></td>
</tr>
<tr>
<td>901~1000</td>
<td>-</td>
<td>-</td>
<td>510</td>
</tr>
<tr>
<td></td>
<td>170</td>
<td>370</td>
<td></td>
</tr>
<tr>
<td></td>
<td>260</td>
<td>780</td>
<td></td>
</tr>
<tr>
<td>1001~1100</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>220</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td></td>
<td>380</td>
<td>190</td>
<td></td>
</tr>
<tr>
<td><strong>Positioning repeatability [mm/s]</strong></td>
<td>20000 (Refer catalog about limit according to work load and duty rate.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact resistance/vibration Resistance [m/s²]</strong></td>
<td>Basic type: ±0.02/High precision type: ±0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drive method</strong></td>
<td>Ball screw (LEFS□)、 Ball screw + Belt (LEFS□R)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Encoder</strong></td>
<td>Incremental 17bit encoder (Resolution: 131072 p/rev)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating temperature range [℃]</strong></td>
<td>5 to 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating humidity range [%RH]</strong></td>
<td>90 or less (No condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Motor output [W] / size [mm]</strong></td>
<td>100/40</td>
<td>200/60</td>
<td>400/80</td>
</tr>
<tr>
<td><strong>Type of Motor</strong></td>
<td>AC servo motor (100/200VAC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>No excitation operating type</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Holding force [N]</strong></td>
<td>78</td>
<td>131</td>
<td>255</td>
</tr>
<tr>
<td></td>
<td>197</td>
<td>385</td>
<td>220</td>
</tr>
<tr>
<td></td>
<td>330</td>
<td>660</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6.3</td>
<td>7.9</td>
<td></td>
</tr>
<tr>
<td><strong>Power consumption [W] at 20 ℃</strong></td>
<td>24 V, 10%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Product Weight [kg]

### Series LEFS25S*

<table>
<thead>
<tr>
<th>Stroke (mm)</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>450</th>
<th>500</th>
<th>550</th>
<th>600</th>
<th>650</th>
<th>700</th>
<th>750</th>
<th>800</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor type</strong></td>
<td>S2</td>
<td>2.00</td>
<td>2.14</td>
<td>2.28</td>
<td>2.44</td>
<td>2.56</td>
<td>2.69</td>
<td>2.84</td>
<td>2.99</td>
<td>3.12</td>
<td>3.24</td>
<td>3.40</td>
<td>3.54</td>
<td>3.68</td>
<td>3.82</td>
<td>3.96</td>
</tr>
<tr>
<td></td>
<td>S3</td>
<td>2.06</td>
<td>2.20</td>
<td>2.34</td>
<td>2.50</td>
<td>2.62</td>
<td>2.75</td>
<td>2.90</td>
<td>3.05</td>
<td>3.18</td>
<td>3.30</td>
<td>3.46</td>
<td>3.60</td>
<td>3.74</td>
<td>3.88</td>
<td>4.02</td>
</tr>
<tr>
<td><strong>Additional weight for lock [kg]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S2.0</td>
<td>S6.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Series LEFS32S*

| Stroke (mm) | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|-------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| **Motor type** | S3 | 3.40 | 3.60 | 3.80 | 4.00 | 4.20 | 4.40 | 4.60 | 4.80 | 5.00 | 5.20 | 5.40 | 5.60 | 5.80 | 6.00 | 6.20 | 6.40 | 6.60 | 6.80 | 7.00 |
| | S7 | 3.34 | 3.54 | 3.74 | 3.94 | 4.14 | 4.34 | 4.54 | 4.74 | 4.94 | 5.14 | 5.34 | 5.54 | 5.74 | 5.94 | 6.14 | 6.34 | 6.54 | 6.74 | 6.94 |
| **Additional weight for lock [kg]** | | | | | | | | | | | | | | | | | | | | | | |
| | S3.0 | S7.0 | |

### Series LEFS40S*

<table>
<thead>
<tr>
<th>Stroke (mm)</th>
<th>150</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>450</th>
<th>500</th>
<th>550</th>
<th>600</th>
<th>650</th>
<th>700</th>
<th>750</th>
<th>800</th>
<th>850</th>
<th>900</th>
<th>950</th>
<th>1000</th>
<th>1100</th>
<th>1200</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor type</strong></td>
<td>S4</td>
<td>5.92</td>
<td>6.10</td>
<td>6.38</td>
<td>6.65</td>
<td>6.95</td>
<td>7.25</td>
<td>7.51</td>
<td>7.80</td>
<td>8.07</td>
<td>8.25</td>
<td>8.43</td>
<td>8.69</td>
<td>8.90</td>
<td>9.20</td>
<td>9.45</td>
<td>9.76</td>
<td>10.05</td>
<td>10.32</td>
<td>10.60</td>
</tr>
<tr>
<td></td>
<td>S8</td>
<td>5.92</td>
<td>6.20</td>
<td>6.48</td>
<td>6.75</td>
<td>7.05</td>
<td>7.35</td>
<td>7.61</td>
<td>7.89</td>
<td>8.17</td>
<td>8.35</td>
<td>8.56</td>
<td>8.77</td>
<td>9.00</td>
<td>9.30</td>
<td>9.76</td>
<td>9.80</td>
<td>10.13</td>
<td>10.42</td>
<td>10.70</td>
</tr>
<tr>
<td><strong>Additional weight for lock [kg]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S4.0</td>
<td>S8.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note 1)** The middle stroke other than the above are produced upon receipt of order.

**Note 2)** The maximum value of the horizontal workload. (An external guide is necessary.)

**Note 3)** The actual workload will depend on the type of external guide.

**Note 4)** The allowable speed changes by the stroke.

**Impact resistance:**

No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and 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 range between 45 to 2000 Hz, when the actuator was tested in both an axial direction.
and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)

Note 5) Only when the motor option, “with lock”, is selected.
Note 6) For an actuator with lock, add the power consumption for the lock.

2.2 How to Order

<Ball screw drive>

LEFS

<table>
<thead>
<tr>
<th>Accuracy</th>
<th>Size</th>
<th>Motor mounting position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>25</td>
<td>H In-line</td>
</tr>
<tr>
<td>H</td>
<td>32</td>
<td>R Right side parallel</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>L Left side parallel</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Motor type</th>
</tr>
</thead>
<tbody>
<tr>
<td>symbol</td>
</tr>
<tr>
<td>S2</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>S6</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stroke [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-1200</td>
</tr>
</tbody>
</table>

Motor option

<table>
<thead>
<tr>
<th>Motor option</th>
<th>LEFS25</th>
<th>LEFS32</th>
<th>LEFS40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Without option</td>
<td>Without option</td>
<td>Without option</td>
</tr>
<tr>
<td>B</td>
<td>With lock</td>
<td>With lock</td>
<td>With lock</td>
</tr>
</tbody>
</table>

Seal band holder type

<table>
<thead>
<tr>
<th>Seal band holder type</th>
<th>LEFS25</th>
<th>LEFS32</th>
<th>LEFS40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Basic type</td>
<td>Basic type</td>
<td>Basic type</td>
</tr>
<tr>
<td>N</td>
<td>Seal band holder roller type</td>
<td>Seal band holder roller type</td>
<td>Seal band holder roller type</td>
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</tbody>
</table>

Driver type

<table>
<thead>
<tr>
<th>Driver type</th>
<th>Compatible driver</th>
<th>Power supply voltage (V)</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Without driver</td>
<td>-</td>
<td>25 32 40</td>
</tr>
<tr>
<td>A1</td>
<td>LECSA1-S□</td>
<td>100 to 120</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>A2</td>
<td>LECSA2-S□</td>
<td>200 to 230</td>
<td>● ● ●</td>
</tr>
<tr>
<td>B1</td>
<td>LECSB1-S□</td>
<td>100 to 120</td>
<td>● ● ●</td>
</tr>
<tr>
<td>B2</td>
<td>LECSB2-S□</td>
<td>200 to 230</td>
<td>● ● ●</td>
</tr>
<tr>
<td>C1</td>
<td>LECSG1-S□</td>
<td>100 to 120</td>
<td>● ● ●</td>
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<tr>
<td>C2</td>
<td>LECSG2-S□</td>
<td>200 to 230</td>
<td>● ● ●</td>
</tr>
<tr>
<td>S1</td>
<td>LECSS1-S□</td>
<td>100 to 120</td>
<td>● ● ●</td>
</tr>
<tr>
<td>S2</td>
<td>LECSS2-S□</td>
<td>200 to 230</td>
<td>● ● ●</td>
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</table>

Applicable Stroke Table

<table>
<thead>
<tr>
<th>LEFS25</th>
<th>LEFS32</th>
<th>LEFS40</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 100 150 200 250 300 350 400 450 500 550 600 650 700 750 800 850 900 950 1000 1100 1200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● ● ● ●● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.3 Construction
LEFS□□S□□  <Ball screw drive>  In-line mounting type

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>2</td>
<td>Rail guide</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ball screw shaft</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ball screw nut</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Table</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>6</td>
<td>Blanking plate</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>7</td>
<td>Seal band holder</td>
<td>Synthetic resin</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Housing A</td>
<td>Aluminum die-cast</td>
<td>Coating</td>
</tr>
<tr>
<td>9</td>
<td>Housing B</td>
<td>Aluminum die-cast</td>
<td>Coating</td>
</tr>
<tr>
<td>10</td>
<td>Bearing holder</td>
<td>Aluminum alloy</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Motor mount</td>
<td>Aluminum alloy</td>
<td>Coating</td>
</tr>
<tr>
<td>12</td>
<td>Coupling</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Motor cover</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>14</td>
<td>Motor end cover</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>15</td>
<td>Motor</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Grommet</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Band holder</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Dust seal band</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Sliding bearing</td>
<td>Synthetic resin</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Bearing</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Auto switch</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td></td>
<td>mounting bracket</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Auto switch</td>
<td>Carbon steel</td>
<td>Chromating</td>
</tr>
<tr>
<td></td>
<td>mounting bracket</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fixing bolt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Magnet</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Magnet holder</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Roller shaft</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Roller</td>
<td>Synthetic resin</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Bearing</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
## <Ball screw drive>  Right / Left side parallel type

### Parts list

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>2</td>
<td>Rail guide</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>3</td>
<td>Ball screw shaft</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>4</td>
<td>Ball screw nut</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>5</td>
<td>Table</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>6</td>
<td>Blanking plate</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>7</td>
<td>Seal band holder</td>
<td>Synthetic resin</td>
<td>–</td>
</tr>
<tr>
<td>8</td>
<td>Housing A</td>
<td>Aluminum die-casted</td>
<td>Coating</td>
</tr>
<tr>
<td>9</td>
<td>Housing B</td>
<td>Aluminum die-casted</td>
<td>Coating</td>
</tr>
<tr>
<td>10</td>
<td>Bearing holder</td>
<td>Aluminum alloy</td>
<td>–</td>
</tr>
<tr>
<td>11</td>
<td>Return plate</td>
<td>Aluminum die-casted</td>
<td>Coating</td>
</tr>
<tr>
<td>12</td>
<td>Pulley</td>
<td>Aluminum alloy</td>
<td>–</td>
</tr>
<tr>
<td>13</td>
<td>Pulley</td>
<td>Aluminum alloy</td>
<td>–</td>
</tr>
<tr>
<td>14</td>
<td>Belt</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>15</td>
<td>Cover plate</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>16</td>
<td>Table spacer</td>
<td>Aluminum alloy</td>
<td>Only LEFS32</td>
</tr>
<tr>
<td>17</td>
<td>Motor</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>18</td>
<td>Motor adaptor</td>
<td>Aluminum alloy</td>
<td>Coating</td>
</tr>
<tr>
<td>19</td>
<td>Band holder</td>
<td>Stainless steel</td>
<td>–</td>
</tr>
<tr>
<td>20</td>
<td>Dust seal band</td>
<td>Stainless steel</td>
<td>–</td>
</tr>
<tr>
<td>21</td>
<td>Sliding bearing</td>
<td>Synthetic resin</td>
<td>–</td>
</tr>
<tr>
<td>22</td>
<td>Bearing</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>23</td>
<td>Auto switch mounting bracket</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>24</td>
<td>Auto switch mounting bracket fix</td>
<td>Carbon steel</td>
<td>Chromating</td>
</tr>
<tr>
<td>25</td>
<td>Magnet</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>26</td>
<td>Magnet holder</td>
<td>Stainless steel</td>
<td>–</td>
</tr>
<tr>
<td>27</td>
<td>Roller shaft</td>
<td>Stainless steel</td>
<td>–</td>
</tr>
<tr>
<td>28</td>
<td>Roller</td>
<td>Synthetic resin</td>
<td>–</td>
</tr>
<tr>
<td>29</td>
<td>Bearing</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
3. Slider type LEFB series

3.1 Specification

### LEFB25, 32, 40 AC servo motor (100W / 200W / 400W)

<table>
<thead>
<tr>
<th>Model</th>
<th>LEFB25S*</th>
<th>LEFB32S*</th>
<th>LEFB40S*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke [mm]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note 1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work load [kg]</td>
<td>Horizontal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note 2)</td>
<td>5</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Maximum Speed</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Note 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceleration/ deceleration [mm/s²]</td>
<td>20,000 *note 2)</td>
<td>20,000 *note 2)</td>
<td>20,000 *note 2)</td>
</tr>
<tr>
<td>Positioning repeatability [mm]</td>
<td>±0.06</td>
<td>±0.06</td>
<td>±0.06</td>
</tr>
<tr>
<td>Lost motion [mm]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead [mm]</td>
<td>54</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Impact resistance/vibration Resistance [m/s²]</td>
<td>50 / 20</td>
<td>50 / 20</td>
<td>50 / 20</td>
</tr>
<tr>
<td>Drive method</td>
<td>Belt</td>
<td>Belt</td>
<td>Belt</td>
</tr>
<tr>
<td>Guide type</td>
<td>Liner guide</td>
<td>Liner guide</td>
<td>Liner guide</td>
</tr>
<tr>
<td>Operating temperature range [℃]</td>
<td>5 to 40</td>
<td>5 to 40</td>
<td>5 to 40</td>
</tr>
<tr>
<td>Operating humidity range [%RH]</td>
<td>90 or less (No condensation)</td>
<td>90 or less (No condensation)</td>
<td>90 or less (No condensation)</td>
</tr>
<tr>
<td>Motor output/size</td>
<td>100W / □ 40</td>
<td>200W / □ 60</td>
<td>400W / □ 60</td>
</tr>
<tr>
<td>Type of Motor</td>
<td>AC servo motor (100/200VAC)</td>
<td>AC servo motor (100/200VAC)</td>
<td>AC servo motor (100/200VAC)</td>
</tr>
<tr>
<td>Encoder Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Note 5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type (Note 5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Holding force [N]</td>
<td>27</td>
<td>54</td>
<td>110</td>
</tr>
<tr>
<td>Power consumption [W] at 20℃ (Note 6)</td>
<td>6.3</td>
<td>7.9</td>
<td>7.9</td>
</tr>
<tr>
<td>Rated voltage [VDC]</td>
<td>24 V -10%</td>
<td>24 V -10%</td>
<td>24 V -10%</td>
</tr>
</tbody>
</table>

### Model Weight

<table>
<thead>
<tr>
<th>Model</th>
<th>LEFB25S*</th>
<th>LEFB32S*</th>
<th>LEFB40S*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke [mm]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>32</td>
<td>36</td>
<td>74</td>
</tr>
<tr>
<td>Additional weight for lock [kg]</td>
<td>0.2</td>
<td>0.3</td>
<td>0.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>LEFB32S*</th>
<th>LEFB40S*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke [mm]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>52</td>
<td>57</td>
</tr>
<tr>
<td>Additional weight for lock [kg]</td>
<td>0.7</td>
<td>0.7</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>LEFB40S*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke [mm]</td>
<td></td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>54</td>
</tr>
<tr>
<td>Additional weight for lock [kg]</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Note 1) The middle stroke other than the above are produced upon receipt of order.

Note 2) The maximum value of the horizontal workload. (An external guide is necessary). The actual workload will depend on the type of external guide.

Note 3) The allowable speed changes by the stroke.

Note 4) Impact resistance:
No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and 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, when the actuator was tested in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)

Note 5) Only when the motor option, "with lock", is selected.

Note 6) For an actuator with lock, add the power consumption for the lock.

Product Weight
### 3.2 How to Order

**<Belt drive>**

#### LEFB

<table>
<thead>
<tr>
<th>Size</th>
<th>Motor mounting position</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>Nil (Top mounting)</td>
</tr>
<tr>
<td>32</td>
<td>U (Bottom mounting)</td>
</tr>
<tr>
<td>40</td>
<td></td>
</tr>
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</table>

#### 3. Motor type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Type</th>
<th>Output [W]</th>
<th>Actuator size</th>
<th>Compatible driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2</td>
<td>AC servo motor (Incremental encoder)</td>
<td>100</td>
<td>25</td>
<td>LECSA1-S1</td>
</tr>
<tr>
<td>S3</td>
<td>AC servo motor (Incremental encoder)</td>
<td>200</td>
<td>32</td>
<td>LECSA2-S3</td>
</tr>
<tr>
<td>S4</td>
<td>AC servo motor (Incremental encoder)</td>
<td>400</td>
<td>40</td>
<td>LECSA2-S4</td>
</tr>
<tr>
<td>S6</td>
<td>AC servo motor (Absolute encoder)</td>
<td>100</td>
<td>25</td>
<td>LECSB1-S5</td>
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<tr>
<td>S7</td>
<td>AC servo motor (Absolute encoder)</td>
<td>200</td>
<td>32</td>
<td>LECSB2-S7</td>
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<tr>
<td>S8</td>
<td>AC servo motor (Absolute encoder)</td>
<td>400</td>
<td>40</td>
<td>LECSB2-S8</td>
</tr>
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</table>

#### 4. Equivalent lead

- **S**: 54

#### 5. Stroke [mm]

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>to</td>
<td>to</td>
</tr>
<tr>
<td>3000</td>
<td>3000</td>
</tr>
</tbody>
</table>

#### 6. Motor option

<table>
<thead>
<tr>
<th>Nil</th>
<th>Without option</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>With lock</td>
</tr>
</tbody>
</table>

#### 7. Auto switch mounting bracket

- **Nil**: Without option
- **C**: With Auto switch mounting bracket (1 p.c./Accessory)

#### 8. Cable type

<table>
<thead>
<tr>
<th>Nil</th>
<th>Without cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Standard cable</td>
</tr>
<tr>
<td>R</td>
<td>Robotic cable (Flexible cable)</td>
</tr>
</tbody>
</table>

#### 9. Cable length [m]

<table>
<thead>
<tr>
<th>Nil</th>
<th>Without cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>A</td>
<td>10</td>
</tr>
</tbody>
</table>

#### 10. I/O cable length [m]

<table>
<thead>
<tr>
<th>Nil</th>
<th>Without cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Without cable (Connector only)</td>
</tr>
<tr>
<td>1</td>
<td>1.5</td>
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#### 12. Driver type

<table>
<thead>
<tr>
<th>Nil</th>
<th>Without driver</th>
<th>Power supply voltage (V)</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>LECSA1-S</td>
<td>100 to 120</td>
<td>25</td>
</tr>
<tr>
<td>A2</td>
<td>LECSA2-S</td>
<td>200 to 230</td>
<td>32</td>
</tr>
<tr>
<td>B1</td>
<td>LECSB1-S</td>
<td>100 to 120</td>
<td>40</td>
</tr>
<tr>
<td>B2</td>
<td>LECSB2-S</td>
<td>200 to 230</td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>LECSB2-S</td>
<td>100 to 120</td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>LECSB2-S</td>
<td>200 to 230</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>LECSB2-S</td>
<td>100 to 120</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>LECSB2-S</td>
<td>200 to 230</td>
<td></td>
</tr>
</tbody>
</table>

#### Applicable Stroke Table

<table>
<thead>
<tr>
<th>LEFB25</th>
<th>LEFB32</th>
<th>LEFB40</th>
</tr>
</thead>
<tbody>
<tr>
<td>● ● ● ●● ● ● ● ●● ● ● ● ●● ● ●● ●● ● ●● ● ●● ●● ● ●● ●● ● ●● ●● ● ●● ●● ● ●● ●● ● ●● ●● ● ●●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3.3 Construction

**LEFB25□□□S <Belt drive>**

![Diagram of construction](image)

**Parts list**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>2</td>
<td>Rail guide</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Belt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Belt holder</td>
<td>Carbon steel</td>
<td>Chromating</td>
</tr>
<tr>
<td>5</td>
<td>Belt stopper</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>6</td>
<td>Table</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>7</td>
<td>Blanking plate</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>8</td>
<td>Seal band holder</td>
<td>Synthetic resin</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Housing A</td>
<td>Aluminum die-cast</td>
<td>Coating</td>
</tr>
<tr>
<td>10</td>
<td>Pulley holder</td>
<td>Aluminum alloy</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pulley shaft</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>End pulley</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>13</td>
<td>Motor pulley</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>14</td>
<td>Return flange</td>
<td>Aluminum alloy</td>
<td>Coating</td>
</tr>
<tr>
<td>15</td>
<td>Housing</td>
<td>Aluminum alloy</td>
<td>Coating</td>
</tr>
<tr>
<td>16</td>
<td>Motor mount</td>
<td>Aluminum alloy</td>
<td>Coating</td>
</tr>
<tr>
<td>17</td>
<td>Motor cover</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>18</td>
<td>Motor end cover</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Band holder</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Motor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Grommet</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Stopper</td>
<td>Aluminum alloy</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Dust seal band</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Bearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Bearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Spacer</td>
<td>Aluminum alloy</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Tension adjustment bolt</td>
<td>Carbon steel</td>
<td>Chromating</td>
</tr>
<tr>
<td>28</td>
<td>Pulley fixing bolt</td>
<td>Carbon steel</td>
<td>Chromating</td>
</tr>
<tr>
<td>29</td>
<td>Roller shaft</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Roller</td>
<td>Synthetic resin</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Bearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Auto switch mounting bracket</td>
<td>Aluminum alloy</td>
<td>Anodized</td>
</tr>
<tr>
<td>33</td>
<td>Auto switch mounting bracket fixing bolt</td>
<td>Carbon steel</td>
<td>Chromating</td>
</tr>
<tr>
<td>34</td>
<td>Magnet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Magnet holder</td>
<td>Stainless steel</td>
<td></td>
</tr>
</tbody>
</table>

* Motor bottom mounting type is the same.
### Description of Components

**Component** | **Material** | **Note**
--- | --- | ---
1. Body | Aluminum alloy | Anodized
2. Rail guide | — | —
3. Belt | — | —
4. Belt holder | Carbon steel | Chromating
5. Belt stopper | Aluminum alloy | Anodized
6. Table | Aluminum alloy | Anodized
7. Blanking plate | Aluminum alloy | Anodized
8. Seal band holder | Synthetic resin | —
9. End block | Aluminum alloy | Coating
10. End block cover | Aluminum alloy | Anodized
11. Pulley holder | Aluminum alloy | —
12. Pulley shaft | Stainless steel | —
13. End pulley | Aluminum alloy | Anodized
14. Motor pulley | Aluminum alloy | Anodized
15. Return flange | Aluminum alloy | Coating
16. Housing | Aluminum alloy | Coating
17. Motor mount | Aluminum alloy | Coating
18. Motor cover | Aluminum alloy | Anodized
19. Motor end cover | Aluminum alloy | Anodized
20. Band holder | Stainless steel | —
21. Motor | — | —
22. Grommet | NBR | —
23. Dust seal band | Stainless steel | —
24. Bearing | — | —
25. Bearing | — | —
26. Bearing | — | —
27. Tension adjustment bolt | Carbon steel | Chromating
28. Roller shaft | Stainless steel | —
29. Roller | Synthetic resin | —
30. Bearing | — | —
31. Auto switch mounting bracket | Aluminum alloy | Anodized
32. Auto switch mounting bracket fixing bolt | Carbon steel | Chromating
33. Magnet | — | —
34. Magnet holder | Stainless steel | —
4. Product Outline

4.1 System construction

Incremental Encoder
(Pulse input / Positioning)

**LECSA Series**

- **Power supply**
  - 1-phase 100 to 120VAC (50/60Hz)
  - 200 to 230VAC (50/60Hz)

- **Motor cable**

- **Lock cable**

- **Electric actuator**
  - Slider type: LEF series

- **Encoder cable**

**Prepared by user**

- Control circuit power connector (accessory)
- Main circuit power connector (accessory)

**Setup software**
(MR Configurator2™)
LECMR-C2

- USB cable: LEC-MR-J3USB
- Option

- When using this software, order USB cable separately.

**Driver**
DC24V

**Absolute Encoder**
(Pulse input)

**LECSB Series**

- **Power supply**
  - 1-phase 100 to 120VAC (50/60Hz)
  - 200 to 230VAC (50/60Hz)
  - 3-phase 200 to 230VAC (50/60Hz)

- **Motor cable**

- **Lock cable**

- **Electric actuator**
  - Slider type: LEF series

- **Encoder cable**

**Prepared by user**

- Control circuit power connector (accessory)
- Motor connector (accessory)
- Main circuit power connector (accessory)

**Setup software**
(MR Configurator2™)
LECMR-C2

- USB cable: LEC-MR-J3USB
- Option

- When using this software, order USB cable separately.

**Driver**
DC24V

**Battery**
LE-MR-J3BAT (accessory)

**Option**

- Analog monitor output
  - RS-422 interface

**Battery**
LE-MR-J3BAT (accessory)
### 4.2 Function/Configuration

The following control mode can be selected for applicable drivers. Refer to the “Driver Operation Manual” about wiring and parameter setting.

#### Table 4-1. Applicable control mode

<table>
<thead>
<tr>
<th>Driver</th>
<th>Control mode (Encoder)</th>
<th>Positioning method</th>
<th>Parameter select</th>
</tr>
</thead>
<tbody>
<tr>
<td>LECSA (Pulse input / positioning)</td>
<td>Pulse train Incremental</td>
<td>ON/OFF signal 3 points (max. 7 points)</td>
<td>PA01</td>
</tr>
<tr>
<td>LECSB (Pulse input)</td>
<td>Pulse train Absolute</td>
<td>-</td>
<td>PA01</td>
</tr>
<tr>
<td>LECSC (CC-Link) (When 2 stations are occupied)</td>
<td>Absolute</td>
<td>CC-Link 31 points (When 1 station is occupied) 255 points (When 2 stations are occupied)</td>
<td>PC30</td>
</tr>
<tr>
<td>LECSS (SSCNET III)</td>
<td>SSCNET III Absolute</td>
<td>-</td>
<td>Note4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operation method</th>
<th>Positioning operation</th>
<th>Positioning operation by point table No. setting</th>
<th>Positioning operation by program No. setting</th>
</tr>
</thead>
</table>

**Note1)** Only the position control can be used.

**Note2)** To set the maximum value for each method, it is necessary to change the setting. Please refer “Driver Operation Manual”.

**Note3)** The MR Configurator2 is necessary to control by the program method. Order separately.

- MR Configurator2 (Setup software Japanese version) / LEC-MRC2
- MR Configurator2 (Setup software English version) / LEC-MRC2E
- MR Configurator2 (Setup software Chinese version) / LEC-MRC2C
- USB cable for Setup software (3m) / LEC-MR-J3USB

**Note4)** The LECSS is set by upper positioning unit or motion controller.
5. Wiring of cables / Common precautions

⚠️ Warning
1. Adjusting, mounting or wiring change should never be done before shutting off the power supply to the product.
   Electrical shock, malfunction and damaged can result.
2. Never disassemble the cable. Use only specified cables.
3. Never connect or disconnect the cable or connector with power on.

⚠️ Caution
1. Wire the connector securely. Do not apply any voltage to the terminals other than those specified in the product manual.
2. Wire the connector securely.
   Check for correct connector wiring and polarity.
3. Take appropriate measures against noise.
   Noise in a signal line may cause malfunction. As a countermeasure, separate high voltage and low voltage cables, and shorten wiring lengths, etc.
4. Do not route wires and cables together with power or high voltage cables.
   The product can malfunction due to interference of noise and surge voltage from power and high voltage cables to the signal line. Route the wires of the product separately from power or high voltage cables.
5. Take care that actuator movement does not catch cables.
6. Operate with cables secured. Avoid bending cables at sharp angles where they enter the product.
7. Avoid twisting, folding, rotating or applying an external force to the cable.
   Risk of electric shock, wire break, contact failure and loss of control for the product can happen.
8. Select “Robotic type cables” in case of inflecting cable(encoder/motor/rock) repeatedly.
   Refer to the “Driver operation manual” for the bending life of the bending radius of the cable.
9. Confirm proper wiring of the product.
   Poor insulation (interference with other circuits, poor insulation between terminals and etc.) can apply excessive voltage or current to the product causing damage.

[Transportation]

⚠️ Caution
1. Do not carry or swing the product by the cable.
6. Electric actuators / Common precautions

6.1 Design and selection

⚠️ Warning

1. **Be sure to read the Operation Manual (this manual and the one for the driver: LEC series).**
   Handling or usage/operation other than that specified in the Operation Manual may lead to breakage and operation failure of the product.
   Any damage attributed to the use beyond the specifications is not guaranteed.

2. **There is a possibility of dangerous sudden action by the product if sliding parts of machinery are twisted due to external forces etc.**
   In such cases, human injury may occur, such as by catching hands or feet in the machinery, or damage to the machinery itself may occur. Design the machinery should be designed to avoid such dangers.

3. **A protective cover is recommended to minimize the risk of personal injury.**
   If a driven object and moving parts of the product are in close proximity, personal injury may occur. Design the system to avoid contact with the human body.

4. **Securely tighten all stationary parts and connected parts so that they will not become loose.**
   When the product operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

5. **Consider a possible loss of power source.**
   Take measures to prevent injury and equipment damage even in the case of a power source failure.

6. **Consider behavior of emergency stop of whole system.**
   Design the system so that human injury and/or damage to machinery and equipment will not be caused, when it is stopped by a safety device for abnormal conditions such as a power outage or a manual emergency stop of whole system.

7. **Consider the action when operation is restarted after an emergency stop or abnormal stop of whole system.**
   Design the system so that human injury or equipment damage will not occur upon restart of operation of whole system.

8. **Disassembly and modification is prohibited**
   Do not modify or reconstruct (including additional machining) the product. An injury or failure can result.

9. **When using it for vertical application, it is necessary to build in a safety device.**
   The rod may fall due to the weight of work. The safety device should not interfere with normal operation of the machine.

10. **Do not exceed product specification, even if work load is supported by external linear guides.**
    The moment to actuator is reduced by external guide, but required ability for transport (relationship between speed and work load) is not reduced.

⚠️ Caution

1. **Operate within the limits of the maximum usable stroke.**
   The product will be damaged if it is used with the stroke which is over the maximum stroke. Refer to the specifications of the product.

2. **When the product repeatedly cycles with partial strokes, operate it at a full stroke at least once every 10 strokes.**
   Otherwise, lubrication can run out.

3. **Do not use the product in applications where excessive external force or impact force is applied to it.**
   The product can be damaged.

4. **Refer to a common auto switch /matter (Best Pneumatics No 2) when an auto switch is built in and used.**

6.2 Mounting

⚠️ Warning

1. **Install and operate the product only after reading the Operation Manual carefully and understanding its contents.** Keep the manual in a safe place future reference.

2. **Observe the tightening torque for screws.**
   Tighten the screws to the recommended torque for mounting the product.
3. Do not make any alterations to this product.
   Alterations made to this product may lead to a loss of durability and damage to the product, which can lead to human injury and damage to other equipment and machinery.

4. When using external guide, the guide axis should be parallel to the actuator axis.
   There will be damage/excessive wear on the lead screw if the external guide is not parallel.

5. 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.

6. Prevent the seizure of rotating parts.
   Prevent the seizure of rotating parts (pins, etc.) by applying grease.

7. Do not use the product until you verify that the equipment can operate properly.
   After mounting or repair, connect the power supply to the product and perform appropriate functional inspections to check it is mounted properly.

8. Cantilever
   When the actuator is operated at high speed while it is fixed at one end and free at the other end (flange type, foot type, double clevis type, direct mount type), a bending moment may act on the actuator due to vibration generated at the stroke end, which can damage the actuator. In such a case, install a support bracket to suppress the vibration of the actuator body or reduce the speed so that the actuator does not vibrate. Use a support bracket also when moving the actuator body or when a long stroke actuator is mounted horizontally and fixed at one end.

9. When attaching 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.

10. Maintenance space
    Allow sufficient space for maintenance and inspection.

6.3 Handling

⚠️ Warning
1. If abnormal heating, smoking or fire, etc., occurs in the product, immediately shut off the power supply.
2. Immediately stop operation if abnormal operation noise or vibration occurs.
   If abnormal operation noise or vibration occurs, the product may have been mounted incorrectly. Unless operation of the product is stopped for inspection, the product can be seriously damaged.
3. Never touch the rotating part of the motor or moving part of the actuator while in operation.
   Alterations made to this product may lead to a loss of durability and damage to the product, which can lead to human injury and damage to other equipment and machinery.
4. When installing, adjusting, inspecting or performing maintenance on the product, driver and related equipment, be sure to shut off the power supply to them. Then, lock it so that no one other than the person working can turn the power on, or implement measures such as a safety plug.

⚠️ Caution
1. Keep the driver and product combined as delivered for use.
   The product is set in parameters for shipment. If it is combined with a different parameter, failure can result.
2. Check the product for the following points before operation.
   a) Damage to power supply line and signal line.
   b) Looseness of the connector to each power line and signal line.
   c) Looseness of the actuator/cylinder and driver/driver mounting.
   d) Abnormal operation.
   e) Emergency stop of the total system.
3. When more than one person is performing work, decide on the procedures, signals, measures and resolution for abnormal conditions before beginning the work. Also, designate a person to supervise work other than those performing work.
4. Actual speed of the product will be changed by the workload.
   Before selecting a product, check the catalog for the instructions regarding selection and specifications.
5. Do not apply a load, impact or resistance in addition to a transferred load during return to origin. In the case of the return to origin by pushing force, additional force will cause displacement of the origin position since it is based on detected motor torque.

6. Do not remove the nameplate.

7. Operation test should be done by low speed. Start operation by predefined speed after confirming there is no trouble.

8. Do not apply impact/collision/resistance for mover of actuator in operation. It will cause decrease of product’s life, damage to product, and so on.

[Ground]
⚠️ Warning
1. Please do the earth construction surely.
2. Please refer to the driver manual for the grounding procedure and notes.

[Unpackaging]
⚠️ Caution
1. Check the received product is as ordered
If the different product is installed from the one ordered, injury or damage can result.

6.4 Operating environment
⚠️ Warning
1. Avoid use in the following environments.
   a. Locations where a large amount of dusts and cutting chips are airborne.
   b. Locations where the ambient temperature is outside the range of the temperature specification (refer to specifications).
   c. Locations where the ambient humidity is outside the range of the humidity specification (refer to specifications).
   d. Locations where corrosive gas, flammable gas, sea water, water and steam are present.
   e. Locations where strong magnetic or electric fields are generated.
   f. Locations where direct vibration or impact is applied to the product.
   g. Areas that are dusty, or are exposed to splashes of water and oil drops.
   h. Areas exposed to direct sunlight (ultraviolet ray).
2. 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.
3. 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.
4. Shade the sunlight in the place where the product is applied with direct sunshine.
5. Shield the product if there is a heat source nearby.
   When there is a heat source surrounding the product, the radiated heat from the heat source can increase the temperature of the product beyond the operating temperature range. Protect it with a cover, etc.
6. Grease oil can be decreased due to external environment and operating conditions, and it deteriorates lubrication performance to shorten the life of the product.

[Storage]
⚠️ Warning
1. Do not store the product in a place in direct contact with rain or water drops or is exposed to harmful gas or liquid.
2. Store in an area that is shaded from direct sunlight and has a temperature and humidity within the specified range (-10°C to 60°C and 90%RH or less No condensation or freezing).
3. Do not apply vibration and impact to the product during storage.

6.5 Maintenance
⚠️ Warning
1. Do not disassemble or repair the product.
   Fire or electric shock can result.
2. Before modifying or checking the wiring, the voltage should be checked with a tester 5 minutes after the power supply is turned off. Electrical shock can result.

⚠️ Caution
1. Maintenance should be performed according to the procedure indicated in the Operating Manual. Incorrect handling can cause an injury, damage or malfunction of equipment and machinery.
2. Removal of product.
   When equipment is serviced, first confirm that measures are in place to prevent dropping of work pieces and run-away of equipment, etc, and then cut the power supply to the system. When machinery is restarted, check that operation is normal with actuators in the proper positions.

[Lubrication]

⚠️ Caution
1. The product has been lubricated for life at manufacturer, and does not require lubrication in service. Contact SMC if lubrication will be applied.

6.6 Precautions for actuator with lock

⚠️ Warning
1. Do not use the lock as a safety lock or a control that requires a locking force. The lock used for the product with a lock is designed to prevent dropping of work piece.
2. For vertical mounting, use the product with a lock. If the product is not equipped with a lock, the product will move and drop the work piece when the power is removed.
3. "Measures against drops" means preventing a work piece from dropping due to its weight when the product operation is stopped and the power supply is turned off.
4. Do not apply an impact load or strong vibration while the lock is activated. If an external impact load or strong vibration is applied to the product, the lock will lose its holding force and damage to the sliding part of the lock or reduced lifetime can result. The same situations will happen when the lock slips due to a force high than its holding force, as this will accelerate the wear to the lock.
5. Do not apply liquid or oil and grease to the lock or its surrounding. When liquid or oil and grease is applied to the sliding part of the lock, its holding force will be reduced significantly.
6. Take measures against drops and check that safety is assured before mounting, adjustment and inspection of the product. If the lock is released with the product mounted vertically, a work piece can drop due to its weight.
7. Electric actuators / Slider type Common precautions

7.1 Design and selection

⚠️ Warning
1. **Do not apply a load in excess of the actuator specification.**
   A product should be selected based on the maximum work load and allowable moment.
   If the product is used outside of the operating specification, eccentric load applied to the guide will become excessive and have adverse effects such as creating play in the guide, reduced accuracy and reduced product life.

2. **Do not exceed the speed limit of the actuator specification.**
   Select a suitable actuator by the relationship of allowable work load and speed.
   Noise or reduction of accuracy may occur if the actuator is operated in excess of its specification and could lead to reduced accuracy and reduced product life.

3. **Do not use the product in applications where excessive external force or impact force is applied to it.**
   This can lead to premature failure of the product.

4. **When the product repeatedly cycles with partial strokes (see the table below), operate it at a full stroke at least once every 10 strokes.**
   Otherwise, lubrication can run out.

<table>
<thead>
<tr>
<th>Model</th>
<th>Partial stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEF 25</td>
<td>65mm or less</td>
</tr>
<tr>
<td>LEF 32</td>
<td>70mm or less</td>
</tr>
<tr>
<td>LEF 40</td>
<td>105mm or less</td>
</tr>
</tbody>
</table>

5. **Actuator sizing is necessary with the total workload including the external force if external force is added on the actuator table.**
   When mounting cable-duct to actuator, the resistance of actuator table may increase. It causes an overload alarm, so pay attention to the resistance.

7.2 Handling

⚠️ Caution
1. **Do not use the lock as a safety lock or a control that requires a locking force.**
   1) **Positioning operation**
      When the product comes within the set range by step data [In positon], output signal will be turned on. Set to [0.50] for LEFS and [1] for LEFB, or higher.

2. **Do not change the positioning force from initial setting.**
   If the positioning force is changed, it may cause a decrease in performance.

3. **Do not operate by fixing the table and moving the actuator body.**
   An excessive load will be applied to the table, which could lead to damage to the actuator and reduced accuracy and reduced product life.

4. **Belt drive actuator cannot be used for vertically mounted applications.**

5. **Check the specification for the minimum speed of each actuator.**

6. **In the case of the belt driven actuator, vibration may occur during operation at speeds within the actuator specification, this could be caused by the operating conditions.**
   Change the speed setting to a speed that does not cause vibration.

7. **When the fluctuation of load is caused during operation, malfunction/noise/alarm may occur.**
   *(In case of AC servo motor)*
   The tuning of gain may not suit for fluctuation load. Adjust the gain properly by following the manual of driver.
7.3 Mounting

⚠️ Caution

1. **Keep the flatness of mounting surface to within [0.1mm or less for length 500mm].**
   Insufficient flatness of the work piece or the surface onto which the actuator body is to be mounted can cause play in the guide and increased sliding resistance.

2. **When mounting the workpiece or other device to the actuator tighten the fixing screws with adequate torque within the specified torque range**
   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 in extreme conditions detaching of the work piece.

<table>
<thead>
<tr>
<th>Model</th>
<th>Bolt size</th>
<th>Maximum tightening torque [Nm]</th>
<th>ℓ (Maximum thread depth [mm])</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEF□25</td>
<td>M5x0.8</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>LEF□32</td>
<td>M6x1</td>
<td>5.2</td>
<td>9</td>
</tr>
<tr>
<td>LEF□40</td>
<td>M8x1.25</td>
<td>12.5</td>
<td>14</td>
</tr>
</tbody>
</table>

Use screws with adequate length, but with length less than the maximum thread depth.
The use of screws that are too long can touch the body and cause malfunction.

3. **When mounting the actuator, use screws with adequate length and tighten them to the adequate torque. And use all mounting holes to maintain the catalogue performance.**
   Tightening the screws with a higher torque than recommended may cause malfunction, whilst the tightening with lower torque can cause the displacement of mounting position or in extreme conditions the actuator could become detached from its mounting position.

<table>
<thead>
<tr>
<th>Model</th>
<th>Bolt size</th>
<th>φA(mm)</th>
<th>ℓ(mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEF□25</td>
<td>M4</td>
<td>4.5</td>
<td>24</td>
</tr>
<tr>
<td>LEF□32</td>
<td>M5</td>
<td>5.5</td>
<td>30</td>
</tr>
<tr>
<td>LEF□40</td>
<td>M6</td>
<td>6.6</td>
<td>31</td>
</tr>
</tbody>
</table>

4. **When mounting the actuator, leave a gap of 40mm or more to allow for bending of the actuator cable.**
7.4 Auto Switch Mounting

**Caution**

1. **Auto Switch Proper Mounting Position**

- The applicable auto switches are D-M9 (N/P/B) (M/L/Z)-985, D-M9 (N/P/B) W (M/L/Z)-985.
- The operating ranges which include hysteresis are for guideline purposes only, they are not guaranteed. There may be the case it will vary substantially depending on an ambient environment.
- In the actual setting, adjust the auto switch after confirming the auto switch is properly activated.

2. **Auto Switch Mounting**

   Rotate the bolts for auto switch mounting bracket three to four times to loosen them (it is not required to remove them), and slide and remove the auto switch mounting bracket. Then, insert a switch into the groove on the mounting bracket. As the mounting bolts for installing the actuator body interfere with the auto switch mounting bracket, mount the auto switch mounting bracket after installing the actuator body. After installing actuator body, tighten the bolts for auto switch mounting bracket.

   Confirm the position of the auto switch, then tighten the auto switch mounting screw using a flat blade screwdriver to firmly mount the auto switch.

   - The applicable auto switches are D-M9 (N/P/B) (M/L/Z)-985, D-M9 (N/P/B) W (M/L/Z)-985.
   - The direction of the lead wire entry is specified. If it is mounted in opposite direction, the auto switch may malfunction.
   - Tighten the auto switch mounting screws (provided together with the auto switch), using a precision screwdriver with a handle diameter of approximately 5 to 6 mm.
   - If more than two auto switch mounting brackets are required, please order them separately. All eight bolts for mounting the auto switch mounting bracket at the stroke end are tightened into the body when the product is shipped. For 50-mm stroke type, only four bolts are tightened on the motor side.
7.5 Precaution on maintenance

⚠️ Warning

1. Turn off the power supply before maintenance and replacement of the product.
2. Put on protective goggles when applying grease.

[Maintenance frequency]
Perform maintenance according to the table below. Contact SMC if any abnormality is found.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Appearance check</th>
<th>Internal check</th>
<th>Belt check</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspection before daily operation</td>
<td>○</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inspection every six months / 1000km / 5 million cycle *</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

*Whichever occurs first.

[Items for visual appearance check]
1. Loose screws. Abnormal dirt.
2. Check of flaws/faults and cable connections.

[Items for internal check]
1. Lubricant condition on moving parts
2. Loose or mechanical play in fixed parts or fixing screws.

[Items for belt check]
Stop operation immediately when the belt appears to be like malfunction shown in the pictures below.
If it occurs in the first stage of use, confirm it is within the range of the product specification, the system requirements and conditions of use.
SMC will exchange belt for repair correspondence.
(When exchanging the belt yourself, contact SMC. Because it is difficult, adjustment for the motor origin, adjustment of the belt tension, etc. is accompanied, the repair correspondence is recommended.)

a. Wear-out of tooth shape canvas
   - Canvas fiber becomes fuzzy.
   - Rubber is removed and the fiber becomes whitish.
   - Lines of fiber become unclear.

b. Peeling off or wearing of the side of the belt
   - Belt corner becomes round and frayed threads stick out.

c. Belt partially cut
   - Belt is partially cut.
   - Foreign matter is caught in the teeth other than the cut part causes flaw.

d. Vertical line of belt teeth
   - Flaw, which is made when the belt runs on the flange.

e. The rubber back of the belt is softened and sticky.
f. Crack on the back of the belt
7.6 How to detach and attach the dust seal band

For the internal-check as the maintenance, the method of detaching and attaching the dust seal band is shown as the following.

<Dis-assembly>

1. Loosen the fixing bolts of end side of the “Band holder”.
   (The picture shows LEFB, but LEFS is same instruction as LEFB.)
   Pay attention to not cut hand on the edges of the "Dust seal band".
   Note: The "Dust seal band" can only be removed by loosening the "Band holder" bolts.

   ![Disassembly Diagram](image)

2. Remove the “Seal band holder” and the “plate” as shown.

   ![Assembly Diagram](image)

3. Loosen the fixing bolts of motor side of the “Band holder” and then remove the “Dust seal band”.

   ![Assembly Diagram](image)

<Re-assembly>

The re-assembly is completed by the reverse procedure of “Dis-assembly” sections 1, 2 and 3.

<table>
<thead>
<tr>
<th>Model</th>
<th>Type of bolt</th>
<th>Bolt size</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEF□25</td>
<td>Round head combination screw</td>
<td>M3x6</td>
</tr>
<tr>
<td>LEF□32</td>
<td>Round head combination screw</td>
<td>M3x6</td>
</tr>
<tr>
<td>LEFS40</td>
<td>Round head combination screw</td>
<td>M3x6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Type of bolt</th>
<th>Bolt size</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEF□25</td>
<td>Cross recessed round head screw</td>
<td>M3x20</td>
</tr>
<tr>
<td>LEF□32</td>
<td>Cross recessed round head screw</td>
<td>M4x30</td>
</tr>
<tr>
<td>LEFS40</td>
<td>Round head combination screw</td>
<td>M4x35</td>
</tr>
</tbody>
</table>
7.7 Replacement of belt

1. After Bolt is removed, "Pulley plate" is removed.

2. "Motor cover" and "Grommet" are removed. (Only "With motor cover")

3. After "Belt" is installed, and the bearing support is obtained, the root of "Motor" is pulled in a string or a long banding band. With tensile force adjusted, tighten the bolts which fix the actuator to the motor. (See the table below)

4. "Pulley plate" is installed.

<table>
<thead>
<tr>
<th>Size</th>
<th>Belt Part number</th>
<th>Belt tension (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEF25</td>
<td>LE-D-6-2</td>
<td>19.6</td>
</tr>
<tr>
<td>LEF32</td>
<td>LE-D-6-3</td>
<td>49.0</td>
</tr>
<tr>
<td>LEF40</td>
<td>LE-D-6-4</td>
<td>98.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Tightening torque (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3</td>
<td>0.63±10%</td>
</tr>
<tr>
<td>M4</td>
<td>1.5±10%</td>
</tr>
<tr>
<td>M5</td>
<td>3±10%</td>
</tr>
</tbody>
</table>
### 8. Troubleshooting

**8.1 Alarms and Warning**

When a fault occurs during the operation, the corresponding alarm or warning is displayed. If any alarm or warning has occurred, refer to the Driver Operation Manual and take the appropriate action. After removing the cause of the alarm, the alarm can be deactivated in any of the methods marked ○ in the alarm deactivation column.

- **LECSA (Pulse input / Positioning)**

<table>
<thead>
<tr>
<th>Display</th>
<th>Name</th>
<th>Alarm deactivation</th>
<th>Alarm reset (RES)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Power OFF→ON</td>
<td>Press &quot;SET&quot; on current alarm screen.</td>
</tr>
<tr>
<td>A.10</td>
<td>Undervoltage</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>A.12</td>
<td>Memory error 1 (RAM)</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.13</td>
<td>Clock error</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.15</td>
<td>Memory error 2 (EEP-ROM)</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.16</td>
<td>Encoder initial communication error1</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.17</td>
<td>Board error</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.19</td>
<td>Memory error 3 (Flash-ROM)</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.1A</td>
<td>Motor combination error</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.1C</td>
<td>Software combination error</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.1E</td>
<td>Encoder initial communication error 2</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.1F</td>
<td>Encoder initial communication error 3</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.20</td>
<td>Encoder normal communication error 1</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.21</td>
<td>Encoder normal communication error 2</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.24</td>
<td>Main circuit error</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>A.30</td>
<td>Regenerative error</td>
<td>○ (Note1)</td>
<td>○ (Note1)</td>
</tr>
<tr>
<td>A.31</td>
<td>Overspeed</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>A.32</td>
<td>Overcurrent</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.33</td>
<td>Overvoltage</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>A.35</td>
<td>Command frequency error</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>A.37</td>
<td>Parameter error</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.39</td>
<td>Program error</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.45</td>
<td>Main circuit device overheat</td>
<td>○ (Note1)</td>
<td>○ (Note1)</td>
</tr>
<tr>
<td>A.46</td>
<td>Servo motor overheat</td>
<td>○ (Note1)</td>
<td>○ (Note1)</td>
</tr>
<tr>
<td>A.50</td>
<td>Overload 1</td>
<td>○ (Note1)</td>
<td>○ (Note1)</td>
</tr>
<tr>
<td>A.51</td>
<td>Overload 2</td>
<td>○ (Note1)</td>
<td>○ (Note1)</td>
</tr>
<tr>
<td>A.52</td>
<td>Error excessive</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>A.61</td>
<td>Operation alarm</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>A.8E</td>
<td>USB communication error</td>
<td>○</td>
<td>-</td>
</tr>
<tr>
<td>888</td>
<td>Watchdog</td>
<td>○</td>
<td>-</td>
</tr>
</tbody>
</table>

**Warning**

<table>
<thead>
<tr>
<th>Display</th>
<th>Name</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.90</td>
<td>Amplifier overheat warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.91</td>
<td>Stroke limit warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.96</td>
<td>Excessive regeneration warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.97</td>
<td>Overload warning 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.98</td>
<td>Servo forced stop warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.99</td>
<td>Main circuit off warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.E0</td>
<td>Overload warning 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.E1</td>
<td>Output watt excess warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.E6</td>
<td>Tough drive warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.E9</td>
<td>Amplifier overheat warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.EC</td>
<td>Stroke limit warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.ED</td>
<td>Excessive regeneration warning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.F0</td>
<td>Overload warning 1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note1.** Deactivate the alarm about 30 minutes of cooling time after removing the cause of occurrence.
## LECSB (Pulse input)

### Alarms

<table>
<thead>
<tr>
<th>Display</th>
<th>Name</th>
<th>Power OFF→ON</th>
<th>Press &quot;SET&quot; on current alarm screen.</th>
<th>Alarm reset (RES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL.10</td>
<td>Undervoltage</td>
<td>○</td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>AL.12</td>
<td>Memory error 1 (RAM)</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.13</td>
<td>Clock error</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.15</td>
<td>Memory error 2 (EEP-ROM)</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.16</td>
<td>Encoder error 1 (At power on)</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.17</td>
<td>Board error</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.19</td>
<td>Memory error 3(Flash-ROM)</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.1A</td>
<td>Motor combination error</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.20</td>
<td>Encoder error 2(during runtime)</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.21</td>
<td>Encoder error 3(during runtime)</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.24</td>
<td>Main circuit error</td>
<td>○</td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>AL.25</td>
<td>Absolute position erase</td>
<td>○</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>AL.30</td>
<td>Regenerative error (Note1)</td>
<td>○(Note1)</td>
<td></td>
<td>○(Note1)</td>
</tr>
<tr>
<td>AL.31</td>
<td>Overspeed</td>
<td>○</td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>AL.32</td>
<td>Overcurrent</td>
<td>○</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>AL.33</td>
<td>Overvoltage</td>
<td>○</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>AL.35</td>
<td>Command pulse frequency alarm</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.37</td>
<td>Parameter error</td>
<td>○</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AL.45</td>
<td>Main circuit device overheat (Note1)</td>
<td>○(Note1)</td>
<td>○(Note1)</td>
<td>○(Note1)</td>
</tr>
<tr>
<td>AL.46</td>
<td>Servo motor overheat</td>
<td>○(Note1)</td>
<td>○(Note1)</td>
<td>○(Note1)</td>
</tr>
<tr>
<td>AL.47</td>
<td>Cooling fan alarm</td>
<td>○</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>AL.50</td>
<td>Overload 1</td>
<td>○(Note1)</td>
<td>○(Note1)</td>
<td>○(Note1)</td>
</tr>
<tr>
<td>AL.51</td>
<td>Overload 2</td>
<td>○(Note1)</td>
<td>○(Note1)</td>
<td>○(Note1)</td>
</tr>
<tr>
<td>AL.52</td>
<td>Error excessive</td>
<td>○</td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>AL.8A</td>
<td>Serial communication time-out error</td>
<td>○</td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>AL.8E</td>
<td>Serial communication error</td>
<td>○</td>
<td></td>
<td>○</td>
</tr>
<tr>
<td>88888</td>
<td>Watchdog</td>
<td>○</td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

*Note1.* Deactivate the alarm about 30 minutes of cooling time after removing the cause of occurrence.

### Warning

<table>
<thead>
<tr>
<th>Display</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.92</td>
<td>Battery cable disconnection warning</td>
</tr>
<tr>
<td>A.96</td>
<td>Home position setting error</td>
</tr>
<tr>
<td>A.99</td>
<td>Stroke limit warning</td>
</tr>
<tr>
<td>A.9F</td>
<td>Battery warning</td>
</tr>
<tr>
<td>A.E0</td>
<td>Excessive regeneration warning</td>
</tr>
<tr>
<td>A.E1</td>
<td>Overload warning 1</td>
</tr>
<tr>
<td>A.E3</td>
<td>Absolute position counter warning</td>
</tr>
<tr>
<td>A.E5</td>
<td>ABS time-out warning</td>
</tr>
<tr>
<td>A.E6</td>
<td>Servo emergency stop warning</td>
</tr>
<tr>
<td>A.E8</td>
<td>Cooling fan speed reduction warning</td>
</tr>
<tr>
<td>A.E9</td>
<td>Main circuit off warning</td>
</tr>
<tr>
<td>A.EA</td>
<td>ABS servo on warning</td>
</tr>
<tr>
<td>A.ED</td>
<td>Output watt excess warning</td>
</tr>
<tr>
<td>A.EC</td>
<td>Overload warning 2</td>
</tr>
<tr>
<td>A.ED</td>
<td>Output watt excess warning</td>
</tr>
</tbody>
</table>

---
### Alarms

<table>
<thead>
<tr>
<th>Display</th>
<th>Name</th>
<th>Power OFF→ON</th>
<th>MR Configurator2 parameter unit(Note3)</th>
<th>Alarm reset (Note2)</th>
</tr>
</thead>
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**Note1.** Deactivate the alarm about 30 minutes of cooling time after removing the cause of occurrence.

**Note2.** Turns on RY(n+1)A or RY(n+3)A.

**Note3.** Clicking the “Occurring alarm reset” button on the “Alarm display” screen of MR Configurator2 allows an alarm to be deactivated. Pressing the “STOP RESET” key of the parameter unit allows an alarm to be deactivated.
<table>
<thead>
<tr>
<th>Display</th>
<th>Name</th>
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<th>Error reset</th>
<th>CPU reset</th>
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<td>25</td>
<td>Absolute position erase</td>
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Note 1. Deactivate the alarm about 30 minutes of cooling time after removing the cause of occurrence.

Note 2. In some controller communication status, the alarm factor may not be removed.
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<th>Revision History</th>
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<tr>
<td>No.LEF-OM00402</td>
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<td>Sep/ 2011 Revision</td>
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