



Installation and Maintenance Manual

Electric Actuator / Slider Type

Series LEF

Applicable model number:

(*)LEFS**(S/T/V) ** -***

(*)LEFB**(S/T/V)*S-***



1 Safety Instructions

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product to ensure correct handling and also read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard by label of “Caution”, “Warning” or “Danger”, followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

Caution	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
Warning	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
Danger	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- Electromagnetic compatibility: This product is class A equipment that is intended for use in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbances.

Warning

- **Do not disassemble, modify (including change of printed circuit board) or repair the product.**
An injury or product failure may result.
- **Do not operate the product beyond the specification range.**
Fire, malfunction or equipment damage may result.
Use the product only after confirming the specifications.
- **Do not use the product in the presence of flammable, explosive or corrosive gas.**
Fire, explosion or corrosion may result.
This product does not have an explosion proof construction.
- **When using the product as part of an interlocking system:**
Provide a double interlocking system, for example a mechanical system.
Check the product regularly to ensure correct operation.
- **Before performing maintenance, be sure of the following:**
Turn off the power supply.

Caution

- **Always perform a system check after maintenance.**
Do not use the product if any error occurs.
Safety cannot be assured if caused by un-intentional malfunction.
- **Provide grounding to ensure correct operation and to improve noise resistance of the product.**
This product should be individually grounded using a short cable.
- **Follow the instructions given below when handling the product.**
Failing to do so may result in product damage.
- **Maintenance space should always be provided around the product.**
- **Do not remove labels from the product.**
- **Do not drop, hit or apply excessive shock to the product.**
- **Unless stated otherwise, follow all specified tightening torques.**
- **Do not bend, apply tensile force, or apply force by placing heavy loads on the cables.**

1 Safety Instructions (continued)

- **Connect wires and cables correctly and do not connect while the power is turned on.**
- **Do not route input/output wires and cables together with power or high-voltage cables.**
- **Check the insulation of wires and cables.**
- **Take appropriate measures against noise, such as noise filters, when the product is incorporated into other equipment or devices.**
- **Take sufficient shielding measures when the product is to be used in the following conditions:**
 - Where noise due to static electricity is generated.
 - Where electro-magnetic field strength is high.
 - Where radioactivity is present.
 - Where power lines are located.
- **Do not use the product in a place where electrical surges are generated.**
- **Use suitable surge protection when a surge generating load such as a solenoid valve is to be directly driven.**
- **Prevent any foreign matter from entering this product.**
- **Do not expose the product to vibration or impact.**
- **Use the product within the specified ambient temperature range.**
- **Do not expose the product to any heat radiation.**
- **Use a precision screwdriver with flat blade to adjust the DIP switch.**
- **Close the cover over the switches before power is turned on.**
- **Do not clean the product with chemicals such as benzene or thinners.**

2 General Instructions

2.1 Wiring

Warning

- **Adjusting, mounting or wiring change should not be done before disconnecting the power supply to the product.**
Electrical shock, malfunction and damage can result.
- **Do not disassemble the cables.**
- **Use only specified cables.**

- **Do not connect or disconnect the wires, cables and connectors when the power is turned on.**

Caution

- **Wire the connector securely.**
Check the connector for polarity and do not apply any voltage to the terminals other than those specified in the Operation Manual.
- **Take appropriate measures against noise.**
Noise in a signal line may cause malfunction. As a countermeasure separate the high voltage and low voltage cables, and shorten the wiring lengths, etc.
- **Do not route input/output wires and cables together with power or high voltage cables.**
The product can malfunction due to 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.
- **Take care that actuator movement does not catch cables.**
- **Operate with all wires and cables secured.**
- **Avoid bending cables at sharp angles where they enter the product.**
- **Avoid twisting, folding, rotating or applying an external force to the cable.**
Risk of electric shock, wire breakage, contact failure and loss of control of the product can happen.
- **Select “Robotic cables” in applications where cables are moving repeatedly (encoder/ motor/ lock).**
Refer to the relevant operation manual for the bending life of the cable.
- **Confirm correct insulation of the product.**
Poor insulation of wires, cables, connectors, terminals, etc. can cause interference with other circuits. Also, there is the possibility that excessive voltage or current may be applied to the product causing damage.

2 General Instructions (continued)

2.2 Transportation

Caution

- **Do not carry or swing the product by the cables.**

2.3 Mounting

Warning

- **Observe the tightening torque for screws.**
Unless stated otherwise, tighten the screws to the recommended torque for mounting the product.
- **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.
- **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 table or mounting face etc., by striking or holding them with other objects. The components are manufactured to precise tolerances, so that even a slight deformation may cause faulty operation or seizure.
- **Do not use the product until you verify that the equipment can be operated correctly.**
After mounting or repair, connect the power supply to the product and perform appropriate functional inspections to check it is mounted correctly.
- **When attaching to the work piece, do not apply strong impact or large moment.**
If an external force over the allowable moment is applied, it may cause looseness in the guide unit, an increase in sliding resistance or other problems.
- **Maintenance space**
Allow sufficient space for maintenance and inspection.

2.4 Handling

Warning

- **Do not touch the motor while in operation.**
The surface temperature of the motor can increase to approx. 90°C to 100°C due to operating conditions.
Energizing alone may also cause this temperature increase.
As it may cause burns, do not touch the motor when in operation.
- **If abnormal heating, smoking or fire, etc. occurs in the product, immediately turn off the power supply.**
- **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.
- **Never touch the rotating part of the motor or the moving part of the actuator while in operation.**
There is a serious risk of injury.
- **When installing, adjusting, inspecting or performing maintenance on the product, driver and related equipment, be sure to turn off the power supply to each of 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

- **Keep the driver and product combined as delivered for use.**
The product parameters are set before shipment.
If it is combined with a different product, parameter failure can result.

2 General Instructions (continued)

Caution

- **Check the product for the following points before operation.**
 - Damage to electric driving line and signal lines.
 - Looseness of the driver to each power line and signal line.
 - Looseness of the actuator/cylinder and driver mounting.
 - Abnormal operation.
 - Stop function
- **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 the work, other than those performing the work.**
- **An operation test should be performed at low speed, start the test at a predefined speed, after confirming there are no problems.**
- **Actual speed of the product will be changed by the workload.**
Before selecting a product, check the catalogue for the instructions regarding selection and specifications.
- **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.
- **Do not remove the nameplate.**

2.5 Actuator with lock

Warning

- **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.
- **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.

- **“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.**
- **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 situation will happen when the lock slips due to a force higher than its holding force, as this will accelerate the wear to the lock.
- **Do not apply liquid, oil or grease to the lock or its surroundings.**
When liquid, oil or grease is applied to the sliding part of the lock, its holding force will be reduced significantly.
- **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.

2.6 Please refer to the auto switch references in “Best Pneumatics “ when an auto switch is to be used.

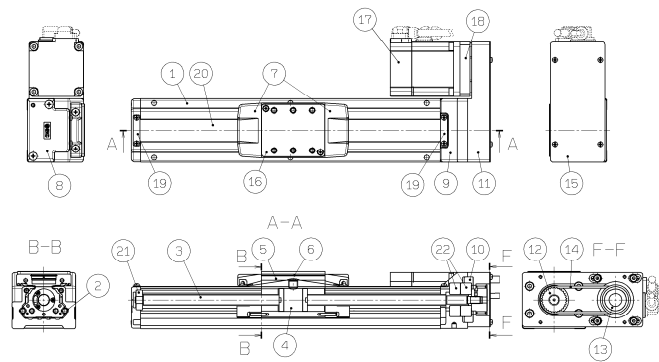
2.7 Unpacking

Caution

- **Check the received product is as ordered.**
If a different product is installed from the one ordered, injury or damage could result.

5 Names and Functions of Individual Parts (continued)

LEFS(25/32/40)R(L) series – Ball screw drive



Parts list for LEFS(25/32/40)

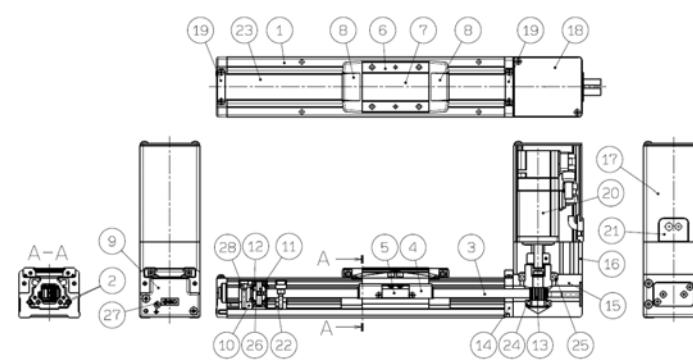
No.	Part	Material	Remarks
1	Body	Aluminium alloy	Anodized
2	Rail guide	-	
3	Ball screw shaft	-	
4	Ball screw nut	-	
5	Table	Aluminium alloy	Anodized
6	Blanking plate	Aluminium alloy	Anodized
7	Seal band stopper	Synthetic resin	
8	Housing A	Aluminium die-cast	Coating
9	Housing B	Aluminium die-cast	Coating
10	Bearing stopper	Aluminium alloy	
11	Return plate	Aluminium alloy	Anodized
12	Pulley	Aluminium alloy	
13	Pulley	Aluminium alloy	
14	Timing belt	-	
15	Cover plate	Aluminium alloy	Anodized
16	Table spacer	Aluminium alloy	Anodized

17	Motor (Absolute encoder)	-	
	Motor (Incremental encoder)	-	
18	Motor adapter	Aluminium alloy	Anodized
19	Band stopper	Stainless steel	
20	Dust seal band	Stainless steel	
21	Bearing	-	
22	Bearing	-	

This figure shows LEFS[R] *. The composition is the same for [L].

5 Names and Functions of Individual Parts (continued)

LEFB25 series – Belt drive



Parts list for LEFB25

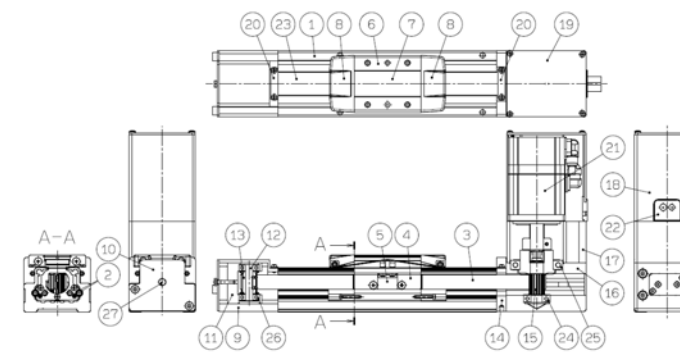
No.	Part	Material	Remarks
1	Body	Aluminium alloy	Anodized
2	Rail guide	-	
3	Belt	-	
4	Belt holder	Carbon steel	Chromated
5	Belt stopper	Aluminium alloy	-
6	Table	Aluminium alloy	Anodized
7	Blanking plate	Aluminium alloy	Anodized
8	Seal band stopper	Stainless steel	Chromated
9	Housing A	Aluminium die-cast	Coating
10	Pulley holder	Aluminium alloy	-
11	Pulley shaft	Stainless steel	-
12	End pulley	Aluminium alloy	Anodized
13	Motor pulley	Aluminium alloy	Anodized
14	Turn flange	Aluminium alloy	Coating
15	Housing	Aluminium alloy	Coating
16	Motor mount	Aluminium alloy	Coating
17	Motor cover	Aluminium alloy	Anodized

18	Motor end cover	Aluminium alloy	Anodized
19	Band stopper	Aluminium alloy	-
20	AC servo motor	-	-
21	Rubber bushing	NBR	-
22	Stopper	Aluminium alloy	-
23	Dust seal band	Stainless steel	-
24	Bearing	-	-
25	Bearing	-	-
26	Bearing	-	-
27	Tension adjust screw	-	Chromated
28	Pulley fixing screw	-	Chromated

*This figure shows LEFB[nill] *. The composition is the same for [U].

5 Names and Functions of Individual Parts (continued)

LEFB(32/40) series – Belt drive



Parts list for LEFB(32/40)

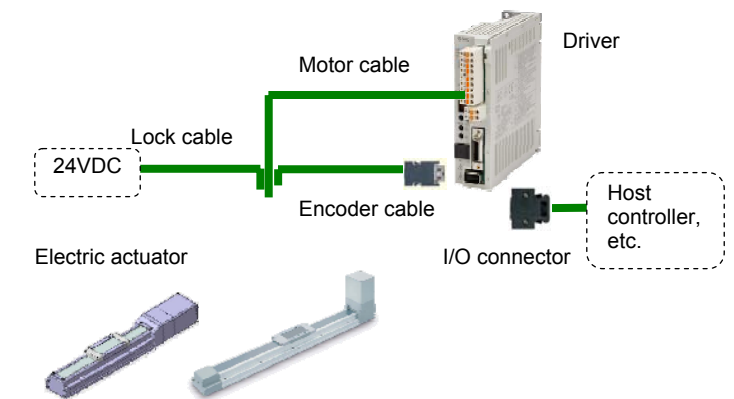
No.	Part	Material	Remarks
1	Body	Aluminium alloy	Anodized
2	Rail guide	-	
3	Belt	-	
4	Belt holder	Carbon steel	Chromated
5	Belt stopper	Aluminium alloy	-
6	Table	Aluminium alloy	Anodized
7	Blanking plate	Aluminium alloy	Anodized
8	Seal Band stopper	Stainless steel	Chromated
9	End block	Aluminium alloy	Coating
10	End block cover	Aluminium alloy	Anodized
11	Pulley holder	Aluminium alloy	-
12	Pulley shaft	Stainless steel	-
13	End pulley	Aluminium alloy	Anodized
14	Motor pulley	Aluminium alloy	Anodized
15	Turn flange	Aluminium alloy	Coating
16	Housing	Aluminium alloy	Coating
17	Motor mount	Aluminium alloy	Coating

18	Motor cover	Aluminium alloy	Anodized
19	Motor end cover	Aluminium alloy	Anodized
20	Band stopper	Aluminium alloy	-
21	AC servo motor	-	-
22	Rubber bushing	NBR	-
23	Dust seal band	Stainless steel	-
24	Bearing	-	-
25	Bearing	-	-
26	Bearing	-	-
27	Tension adjust screw	-	Chromated

*This figure shows LEFB[nill] *. The composition is the same for [U].

6 Wiring

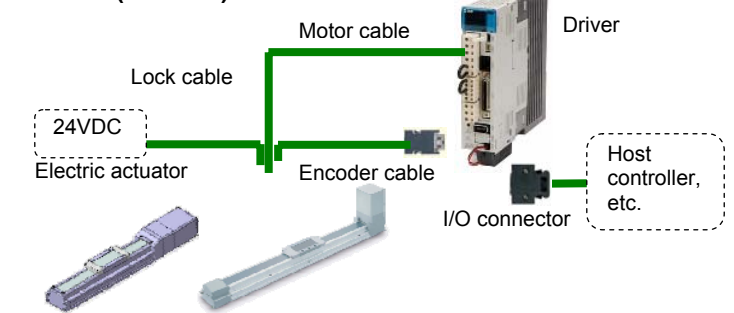
LECSA (Pulse input / Positioning) driver



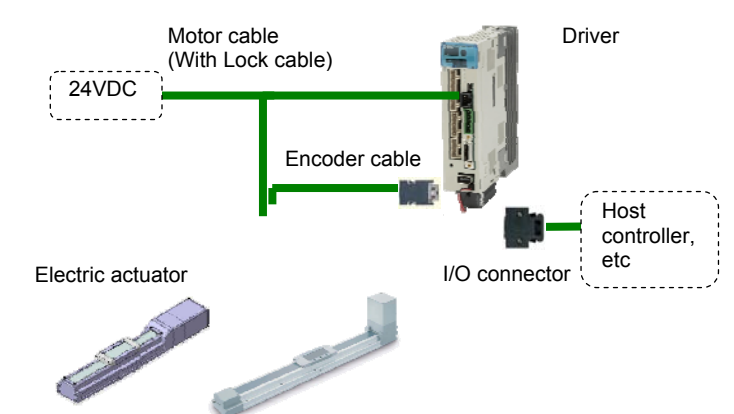
LECSB (Pulse input) driver

LECSA (CC-Link) driver

LECSA (SSCNET) driver



LECYM/LECYU (MECHATROLINK) driver

**Warning**

Use only specified cables otherwise there may be a risk of fire and damage.

7 Maintenance

Warning

- **Do not disassemble or repair the product.**
Fire or electric shock can result.
- **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

- **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.
- **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 turn off the power supply to the system.
When machinery is restarted, check that operation is normal with actuators in the correct positions.
- **The product has been lubricated for life at manufacturer, and does not require lubrication in service.**
In case that the product requires lubrication according to condition of use, refer to below.
- **Turn off the power supply and remove the work piece before maintenance and replacement of the product.**

Maintenance frequency

Perform maintenance according to the table below.
Contact SMC if any abnormality is found.

Frequency	Visual appearance check	Internal check	Belt check
Inspection before daily operation	○	○	○
Inspection every 6 months / 1000 km / 5 million cycles *	○	○	○

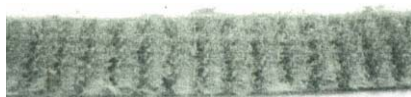
* Whichever occurs first.

- **Items for visual appearance check**
 1. Loose screws. Abnormal dirt.
 2. Check of flaws/faults and cable connections.
 3. Vibration, noise.
- **Items for internal check**
 1. Lubricant condition and dirt on moving parts.
For lubrication, use lithium grease No. 2.
 2. Loose or mechanical play in fixed parts or fixing screws.

- **Items for belt check**
Stop operation immediately and replace the belt when the belt appears damaged, as described and shown in the pictures below.
Further, ensure your operating environment and conditions satisfy the requirements specified for the product.
When replacing the belt, contact SMC for the instruction manual, as adjustment of the motor origin, belt tension, etc. is difficult. Therefore, it is recommended that the actuator be returned to SMC for the belt to be replaced.

a. Tooth shape canvas is worn out.

Canvas fibre becomes fuzzy.
Rubber is removed and the fibre becomes whitish.
Lines of fibre become unclear.



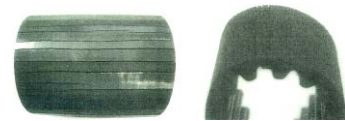
b. Peeling off or wearing of the side of the belt.

Belt corner becomes round and frayed threads stick out.



7 Maintenance (continued)

- c. **Belt partially cut.**
Belt partially cut.
Foreign matter 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**



• How to detach and attach the dust seal band

For the purpose of internally checking the actuator as recommended in the maintenance frequency schedule, the method of detaching and attaching the dust seal band is explained below.

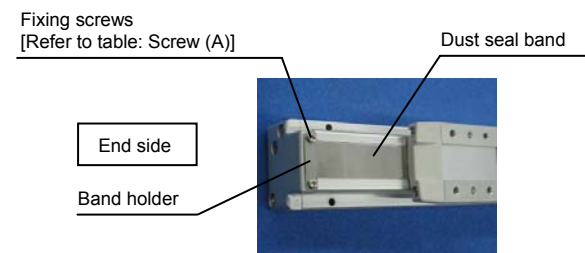
• Disassembly

Loosen the fixing screws at the end side of the band holder.

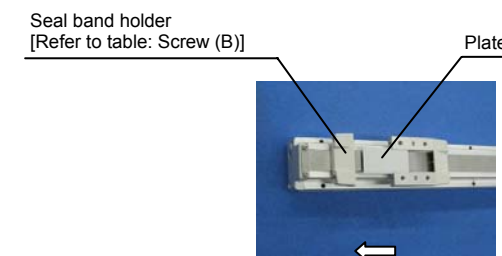
(The picture shows LEFB, but the instructions are the same for LEFS.)

Pay attention, as the edges of the dust seal band are sharp and could cause injury.

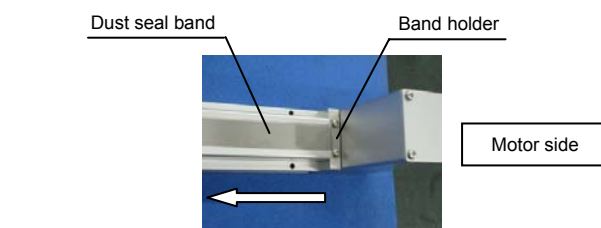
Note: The dust seal band can only be removed by loosening the band holder screw.



Remove the seal band holder and the plate, as shown.



Loosen the fixing screws at the motor side of the band holder and then remove the dust seal band.



• Re-assembly:

To re-assemble reverse the disassembly procedure.

Screw (A)

Model	Type of screw	Size
LEFS25S*	Round head combination screw	M3 x 6
LEFS32S*		M3 x 6
LEFS40S*		M3 x 6

Screw (B)

Model	Type of screw	Size
LEFS25S*	Cross recessed round head screw	M3 x 20
LEFS32S*		M4 x 30
LEFS40S*		M4 x 35

8 CE Directives

• Electromagnetic Compatibility (EMC) Directive 2004/108/EC

The LE series of actuators and drivers conform to the EMC Directive. These components are intended for incorporation into machinery and assemblies forming part of a larger system.
Refer to the relevant manuals for installation guidelines.

Please note that the EMC performance changes according to the configuration of the customer's control panel and the relationship with other electrical equipment and wiring.

Therefore, conformity to the EMC Directive cannot be certified for SMC components incorporated into the customer's equipment under actual operating conditions. As a result, it is necessary for the customer to verify conformity to the EMC Directive for machinery and equipment as a whole.

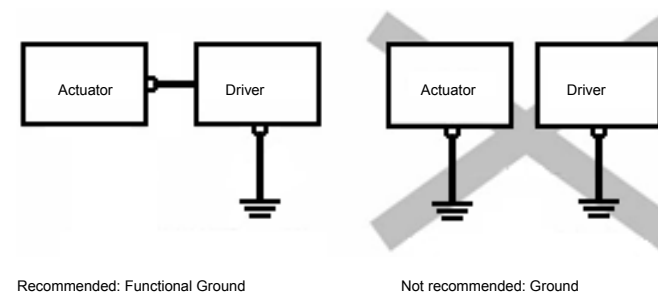
• Low Voltage Directive (LVD) 2006/95/EC

The LE series of actuators and drivers are in compliance with the LVD. Refer to the relevant manuals for installation guidelines.

Caution

• Do not connect the actuator directly to ground.

For single point ground connection of the motor and the driver, connect to ground only from the driver.
(The motor ground connection is satisfied by connection with the driver via the motor cable).



• Driver Ground connection

Please refer to the manual for the LEC driver being used for information on connecting the driver to ground.

9 Contacts

AUSTRIA	(43) 2262 62280-0	LATVIA	(371) 781 77 00
BELGIUM	(32) 3 355 1464	LITHUANIA	(370) 5 264 8126
BULGARIA	(359) 2 974 4492	NETHERLANDS	(31) 20 531 8888
CZECH REP.	(420) 541 424 611	NORWAY	(47) 67 12 90 20
DENMARK	(45) 7025 2900	POLAND	(48) 22 211 9600
ESTONIA	(372) 651 0370	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	ROMANIA	(40) 21 320 5111
FRANCE	(33) 1 6476 1000	SLOVAKIA	(421) 2 444 56725
GERMANY	(49) 6103 4020	SLOVENIA	(386) 73 885 412
GREECE	(30) 210 271 7265	SPAIN	(34) 945 184 100
HUNGARY	(36) 23 511 390	SWEDEN	(46) 8 603 1200
IRELAND	(353) 1 403 9000	SWITZERLAND	(41) 52 396 3131
ITALY	(39) 02 92711	UNITED KINGDOM	(44) 1908 563888

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