



Operation Manual

PRODUCT NAME

**Electric Actuator / Slider Type
Dust-tight / Water-jet-proof
(IP65 Equivalent)**

MODEL / Series / Product number

LEFSW Series



**Controller
JXC □ Series**



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

SMC Corporation

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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)*1), and other safety regulations.

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots
etc.



Danger

Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



Warning

Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



Caution

Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

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

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

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

4. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments.

Use under such conditions or environments is not covered.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.

3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.



Slider Type Safety Instructions

Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing business.

Use in non-manufacturing business is not covered.

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

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

***2) Vacuum pads are excluded from this 1 year warranty.**

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulation of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Product specific notes

Product specific notes

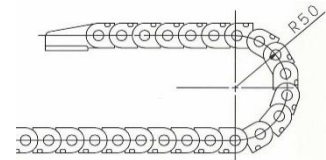
Wiring and cables / Common precautions

⚠ 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. **When repeated bending of the actuator cable is required, do not put cables into a flexible moving tube with a radius smaller than the specified value (50 mm or longer).**
Electric shock, wire breakage, contact failure, or a loss of product control may occur if “standard cables” are used for repeated bending.



9. **Confirm proper wiring of the product.**
Poor insulation (interference with other circuits, poor insulation between terminals, and.) can apply excessive voltage or current to the product causing damage.
10. **The electric actuator speed and force may change depending on the cable length, load, and mounting conditions.**
Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for every additional 5 m. (If cable length is 15m: Maximum 20% reduction.)
11. **When checking the conductivity of the cable, be careful not to deform the connector's mating hole and terminals.**
Inserting a non-compatible connector, tool, cylinder-shaped object, etc., into the connector's mating hole can cause the mating hole or terminals to become deformed, which may cause contact failure or disconnection.
12. **Refrain from plugging in and unplugging the connector frequently.**
Doing so may result in contact failure or disconnection.
13. **Do not connect wires while the power is ON.**
It may cause the electric actuator or its peripheral devices to be damaged, causing a malfunction.

[Transportation]

⚠ Caution

1. **Do not carry or swing the product by the motor or cable.**

Electric actuators / Common precautions

Design and selection

Warning

- 1. Be sure to read the Operation Manual (this manual and the one for the driver: JXC 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. Never disassemble or modify (including additional machining) the product.**
An injury or failure can result. It will cause the loss of the product performance.
- 9. Do not use the stop signal as the emergency stop of the system.**
Stop by shutdown of M24V is for stopping the electric actuator with deceleration.
For the emergency stop of the equipment, design the system with a separate emergency stop circuit conforming to relevant safety standards.
- 10. Do not exceed the product specifications even if a work load is supported by external guides.**
Although the Electric actuator moment is reduced by the external guides, the required transport ability (the relationship between the speed and the work load) is not reduced.
- 11. In order to prevent danger and damage due to the breakdown and the malfunction of this product, which may occur at a certain probability, a backup system should be established in advance by giving a multiple-layered structure or a fail-safe design to the equipment, etc.**
- 12. Avoid designing a system that allows the driving part of an electric actuator to operate with a spring or other external force.**

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, lubrication can run out. Operate it at a full stroke at least once or more a day or every 1000 strokes.**
Otherwise, lubrication may 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.**
Each component that includes motor is made with accurate tolerance. So even slightly deformed or miss-alignment of component may lead operation failure of the product.
4. **When UL compliance is required, the electric actuator and controller/driver should be used with a UL1310 class 2 power supply.**
5. **Do not exceed the product specifications even if a work load is supported by external guides.**
Although the actuator moment is reduced by external guides, the required trans- port ability (the relationship between the speed and the work load) is not reduced.

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 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.
5. **Prevent the seizure of rotating parts.**
Prevent the seizure of rotating parts (pins, etc.) by applying grease.
6. **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.
7. **Do not use in cantilevered fixation.**
When the actuator is operated at high speed while it is fixed at one end and free at the other end (flange type, wall type, ceiling type), a bending moment may act on the actuator due to vibration generated at the stroke end, which can damage the actuator. Be sure to secure both sides with our mounting supports.
8. **When mounting the actuator or attaching the work piece, do not apply strong impact or large moment.**
If an external force over the allowable moment is applied, it may cause looseness in the guide unit, an increase in sliding resistance or other problems.
9. **Maintenance space**
Allow sufficient space for maintenance and inspection.
10. **The electric actuator and its peripheral devices should be installed on a fire-proof material.**
Direct installation on or near a flammable material may cause a fire.
11. **Do not install the product in a place subject to vibrations and impacts.**
It will cause failure or malfunction.
12. **Take measures to ensure that the operating temperatures of the electric actuator and its peripheral devices are within the range of the specifications. also, should be installed with 50mm or larger spaces between each side of it and the other structures or components.**
It may cause a malfunction of the controller and its peripheral devices and a fire.
13. **Do not mount the controller and its peripheral devices near a large electromagnetic contactor or no-fuse breaker which generates vibration on the same panel. Mount them on different panels or keep the controller and its peripheral devices away from such a vibration source.**

14. Install the electric actuator and its peripheral devices on a flat surface.

If the mounting surface is distorted or uneven, an unacceptable force may be added to the housing, etc., causing problems.

Handling

Warning

1. Do not touch the motor while in operation.

The surface temperature of the motor can increase to approx. 80°C due to operating conditions. Energizing alone may also cause this temperature increase. Do not touch the motor when in operation as it may cause burns.

2. If abnormal heating, smoking, fire, or etc., occurs in the product, immediately shut off the power supply.

3. 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.

4. 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.

5. 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.

6. The inside of the electric actuator and its connector should not be touched.

It may cause an electric shock or damage to the controller.

7. Do not perform the operation or setting of the product with wet hands.

Doing so may cause an electric shock.

8. Products with damage or those missing any components should not be used.

An electric shock, fire, or injury may result.

9. Be careful not to be caught or hit by the workpiece while the electric actuator is moving.

It may cause an injury.

10. Do not connect the power supply to the product before confirming the area to which the workpiece moves are safe.

The movement of the workpiece may cause an accident.

11. Before installation, wiring, and maintenance, the voltage should be checked with a tester 5 minutes after the power supply has been turned off.

Otherwise, an electric shock, fire, or injury may result.

12. Do not use the product in an area where a magnetic field is generated.

It will cause failure or malfunction.

13. Do not install the product in an environment containing flammable gas, explosive gas, or corrosive gas.

It could lead to fire explosion and corrosion.

14. Radiant heat from strong heat sources, such as a furnace, direct sunlight, etc., should not be applied to the product.

It will cause failure of the electric actuator or its peripheral devices.

15. Do not use the product in an environment subject to a temperature cycle.

It will cause failure of the electric actuator or its peripheral devices.

16. Do not use the product in a place where electrical surges are generated.

When there are units that generate a large amount of surge around the product (e.g. solenoid type lifters, high-frequency induction furnaces, motors, etc.), this may cause deterioration or damage to the product's internal circuit. Avoid sources of surge generation and crossed lines.

17. Do not install the product in an environment under the effect of vibrations and impacts.

It will cause failure or malfunction.

18. When a surge-generating load, such as a relay or solenoid valve, is driven directly, use a product that incorporates a surge protection device.

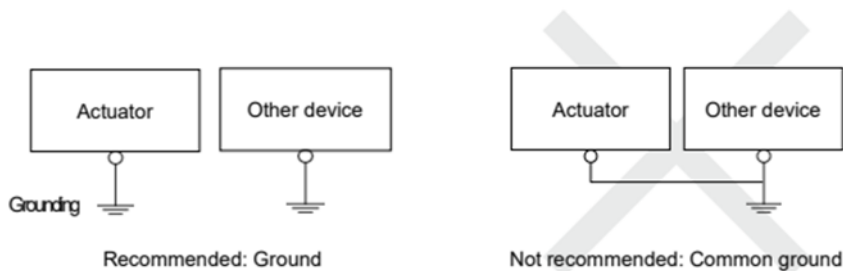
Caution

- 1. Keep the controller and the actuator combined as delivered for use.**
The actuator's parameters are set at the time of shipment. If it is combined with a different set of parameters, 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 controller /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.

Grounding

Warning

- 1. Be certain to ground the actuator.**
Otherwise, it may cause an electric shock or fire.
- 2. Dedicated grounding should be used.**
Grounding should be to a D-class ground. (Ground resistance of 100 ohm or less.)
- 3. Grounding should be performed near the actuator to shorten the grounding distance.**
- 4. The cross-sectional area of this wire shall be a minimum of 2 mm².**
- 5. In the unlikely event that malfunction is caused by the ground connection, then it may be disconnected.**
- 6. Avoid common grounding with other devices.**



Power supply

Caution

- 1. Use a power supply that has low noise between lines and between the power and ground.**
In cases where noise is high, an isolation transformer should be used.
- 2. The grounding point should be as near as possible to the electric actuator.**
If the power supply is of the "inrush-current control" type, a voltage drop may occur during the acceleration or deceleration of the actuator.

3. **Appropriate measures should be taken prevent lightning surges. Ground the surge absorber for lightning separately from the grounding of the electric actuator and its peripheral devices.**

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.

Operating environment



Warning

1. **Avoid use in the following environments.**

- a. Locations where a large amount of cutting chips.
- 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, or 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 exposed to splashes of oil drops.
- h. Areas exposed to direct sunlight (ultraviolet ray).
- i. Environment at an altitude of 1000 meters or higher.

Heat dissipation and withstand voltage will decrease.

2. **Install a protective cover when the product is used in an environment directly exposed to foreign matters such as cutting chips and spatter.**

Play or increased sliding resistance can result.

3. **Shade the sunlight in the place where the product is applied with direct sunshine.**

4. **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.

5. **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 35 to 85%RH or less No condensation or freezing).**
3. **Do not apply vibration and impact to the product during storage.**

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.**
Use specified grease for lubrication.

Electric actuators / Slider type Common precautions

Design/ Selection

Caution

- 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 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. This 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.**
This can lead to premature failure of the product.
- 4. When the actuator repeatedly cycles with partial strokes (see the table below), operate it at a full stroke at least once or more a day or every 1000 strokes.**
Otherwise, lubrication can be lost.

Model	Partial stroke
LEFSW16	40mm or less
LEFSW25	50mm or less
LEFSW32	50mm or less
LEFSW40	105mm or less

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

Air supply

Warning

- 1. Type of fluids.**
Use compressed air as the fluid.
- 2. When there is a large amount of drainage.**
Compressed air containing a large amount of drainage can cause the malfunction of pneumatic equipment. An air dryer or water separator should be installed upstream from filters.
- 3. Drain flushing.**
If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensation to enter the compressed air lines. This causes the malfunction of equipment. If the drain bowl is difficult to check and remove, the installation of a drain bowl with an auto drain option is recommended.
For compressed air quality, refer to the SMC Best Pneumatics No. 6 catalog.
- 4. Use clean air.**
Do not use compressed air that contains chemicals, synthetic oils that include organic solvents, salt, corrosive gases, etc., as it can cause damage or malfunction.

Caution

- 1. When extremely dry air is used as the fluid, degradation of the lubrication properties inside the equipment may occur, resulting in reduced reliability (or reduced service life) of the equipment.**
- 2. Install an air filter.**
Install an air filter upstream near the valve. Select an air filter with a filtration size of 5 µm or smaller.
- 3. Take measures to ensure air quality, such as by installing an aftercooler, air dryer, or water separator.**
Compressed air that contains a large amount of drainage can cause the malfunction of pneumatic equipment, such as valves. Therefore, take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer, or water separator.

4. **Ensure that the fluid and ambient temperatures are within the specified range.**
If the fluid temperature is 5°C or less, the moisture in the circuit could freeze, causing damage to the seals or equipment malfunction. Therefore, take appropriate measures to prevent freezing.
For compressed air quality, refer to the SMC Best Pneumatics No. 6 catalog.
5. **Precautionary measures against condensation.**
Moisture condensation can occur inside pneumatic systems due to a drop in temperatures caused by the piping or operating conditions. This can degrade or wash away grease, resulting in a shortened service life or a malfunction.
For details, refer to the catalog "Precautionary measures against condensation in a pneumatic system" (CAT.P-E01-11).

Handling

⚠ Caution

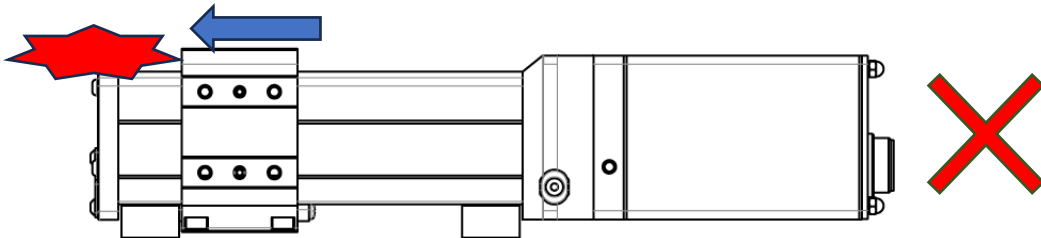
1. INP output signal.

Positioning operation.

When the product comes within the set range by step data [In position], output signal will be turned on. Set to [0.50] for or higher. It may cause malfunction.

2. Never allow the table to collide with the stroke end except during return to origin.

When incorrect instructions are inputted, such as those which cause the product to operate outside of the specification limits or outside of the actual stroke through changes in the controller settings or origin position, the table may collide with the stroke end of the actuator. Be sure to check these points before use. If the table collides with the stroke end of the actuator, the guide or internal stopper may break. It will not operate properly.



3. Do not change the positioning force from initial setting.

If the positioning force is changed, it may cause a decrease in performance.

4. 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.

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

6. The actual speed of this actuator is affected by the work load and stroke.

Check the model selection section of the catalog.

7. Do not apply load or impact or resistance in addition to the transferred during return to origin.

8. Do not scratch or cause other damage to the body and table mounting surfaces.

9. Do not hit the table with the workpiece in the positioning operation and positioning range.

10. When purging, please flow air from the purge air port, flow rate: 20 L/min (ANR). When not in use, close the port with a plug.

11. In an environment where liquids other than water are splashed, it is recommended that appropriate protective measures be taken.

12. In an environment where steam is generated, there is a possibility of abnormal wear due to grease leaking from the seal or rusting of metal parts due to unexpected intrusion into the product interior.

13. Connect all actuator cables to the electric actuator before use. If the actuator cables are not connected, the actuator will not provide a protective structure.

14. The controller and the connectors on the controller side are not covered by IP protection. Take measures to protect them from water and dust.

15. When this product is ceiling-suspended, direct exposure to water or water vapor may cause grease to spill from the openings on the underside of the actuator or result in failure.

Take measures such as installing the actuator in a different position or providing a cover to prevent direct contact with the product.

Mounting

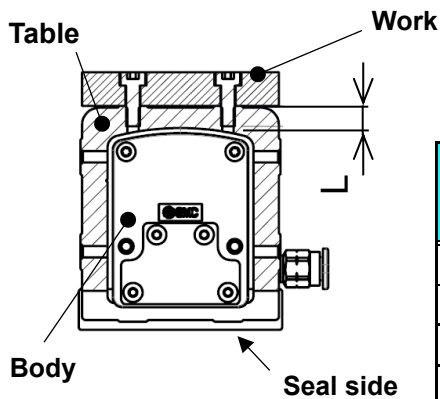
⚠ Warning

- 1. When wall or ceiling mounting, select a dedicated mounting support type.**
Installing the floor mounting support type on a wall or ceiling, or tilting the main unit, it will not be dust-tight and water-jet-proof, causing problems.
- 2. Vertical mounting is not supported.**
Vertical mounting will result in failure of dust-tight and water-jet-proof.
- 3. Install the electric actuator in an ambient temperature of 40°C or less.**
This can lead to premature failure of the product.

⚠ 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.

Workpiece mounting



Size	Screw size	Maximum tightening torque [Nm]	L(Maximum screw-in depth) [mm]
LEFSW16	M4x0.7	1.5	7 (5) *
LEFSW25	M5x0.8	3.0	6.5 (6) *
LEFSW32	M6x1.0	5.2	9.5 (7) *
LEFSW40	M8x1.25	12.5	10 (10) *

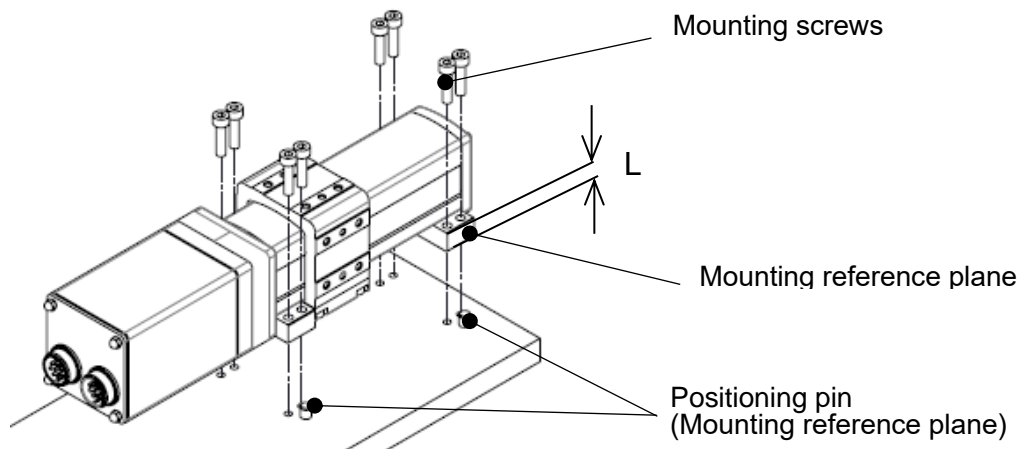
*Mounting screw-in depth on the seal side are shown in ().

Use screws with adequate length, but with a length less than the maximum thread depth.
The use of screws which are too long can touch the body and cause malfunction.
(Approximate screw length: 0.5 mm or more shorter than the maximum thread depth)

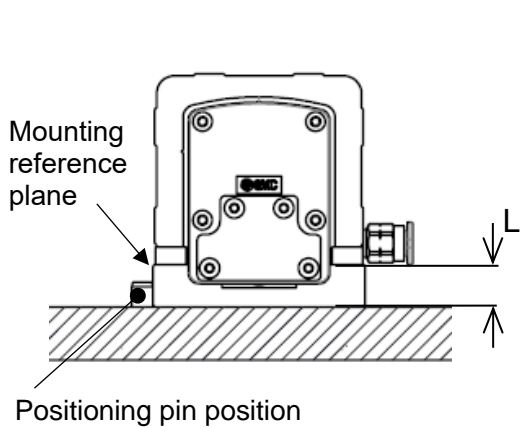
3. When mounting the actuator tighten the fixing screws with adequate torque within the specified torque range.

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.

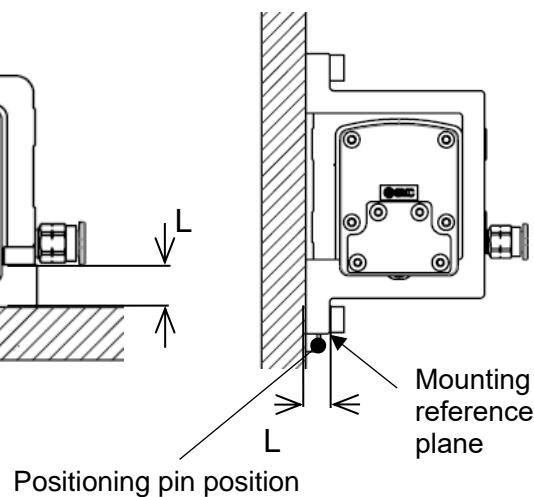
Actuator mounting



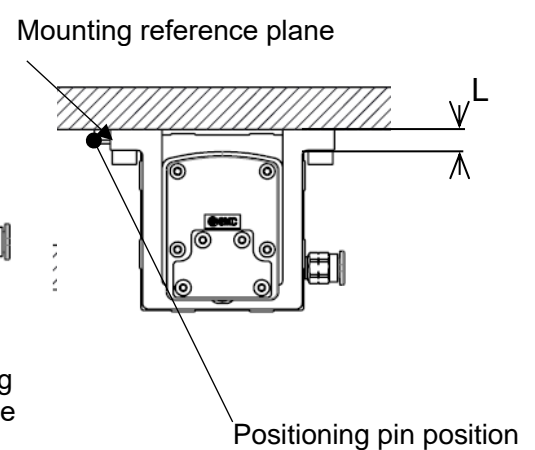
Floor mounting



Wall mounting



Ceiling mounting



Body mounting reference plane is the datum level for running parallelism.

If the running parallelism of the table is required, install it by pressing the datum level against parallel pins or similar.

Size	Screw size	Maximum tightening torque [Nm]	L[mm]		
			Floor mounting	Wall mounting	Ceiling mounting
LEFSW16	M4	1.5	12	8.5	7.9
LEFSW25	M5	3.0	12	9	9.5
LEFSW32	M6	5.2	12	9.5	9..5
LEFSW40	M8	12.5	18	12.5	12.5

4. When installing the main unit, ensure that the cable bends at the specified radius50 (50 mm or more).

Precaution on maintenance

Warning

1. Turn off the power supply and remove the workpiece 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
Inspection before daily operation	○	
Inspection every six months / 1000km / 5million cycle *	○	○

*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.
2. Loose or mechanical play in fixed parts or fixing screws.
3. Lubricant condition, wearing, dirt, and deformed on seal band.
For lubrication, refer to 6 Optional parts (sold separately) for grease pack.
Replacement of seal band, refer to 6 Optional parts (sold separately) for seal band.

[Items for seal band check]

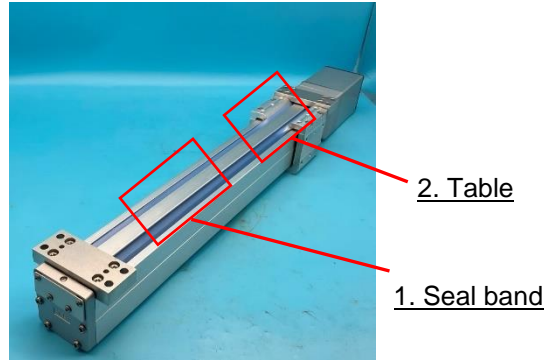
Check the seal band regularly as shown in “maintenance frequency”.

When the seal band appears to be like the photographs shown below, it should be replaced immediately.

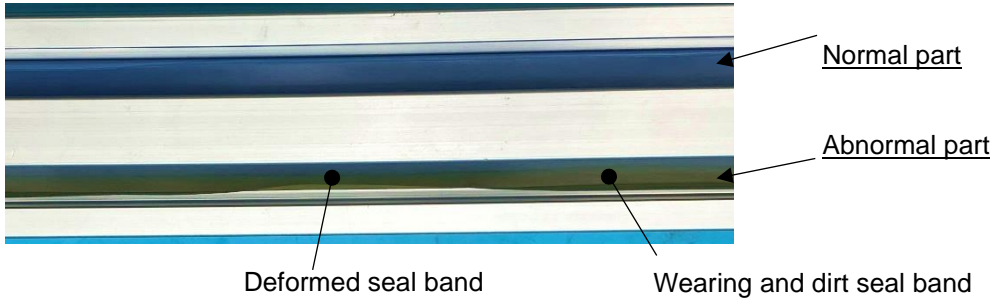
Top



Bottom(seal band side)



1. Seal band



2. Table

Normal(Good condition)



Table Seal separator Grease

Abnormal (Grease is dirty)



Grease is dirty

Abnormal (Grease is lost)



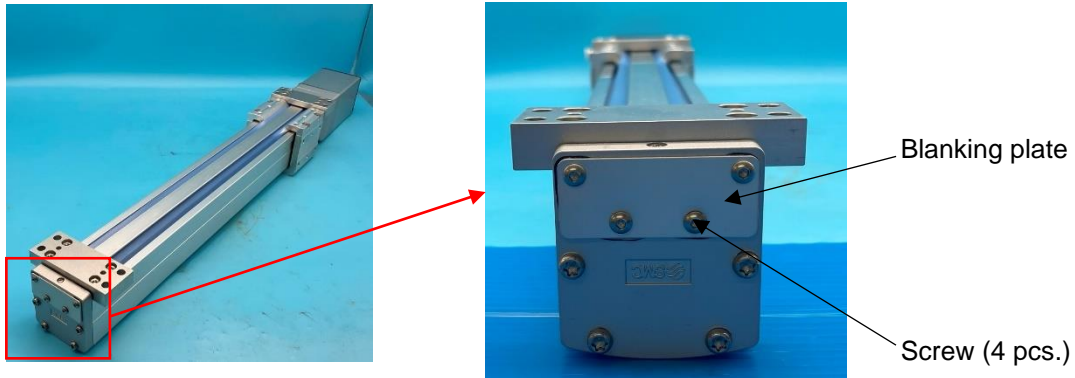
Grease is lost

Replacement of seal band

Please note that the seal band replacement is partially different for the LEFSW16 size and LEFSW25, 32, and 40.

When using grease, wear gloves and protective glasses. Take care to prevent dust, etc. from adhering to the grease.

1. With the actuator on the bottom side (seal band side), remove the hex socket button head cap screws (4 pcs.) securing the blanking plate.

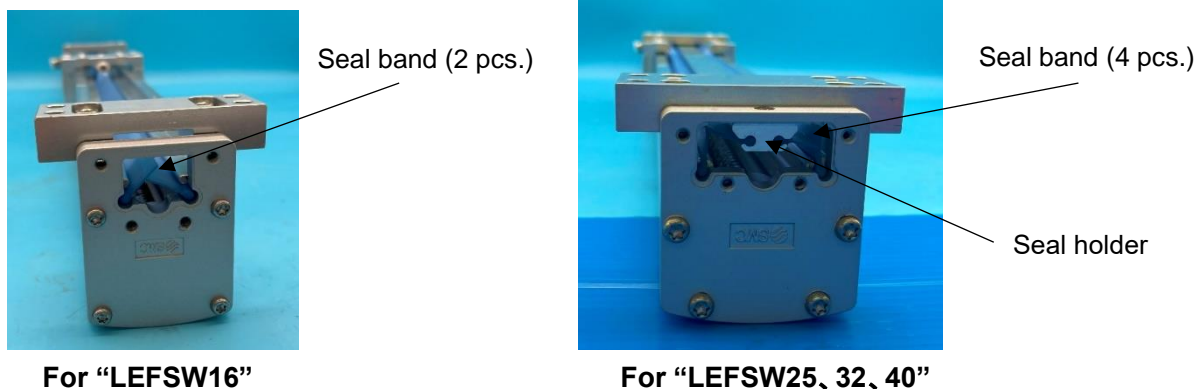


Screw type	Screw size	Qty.	Tightening torque [Nm]
Hex socket button head cap screw	M3x6	4	0.36±10%

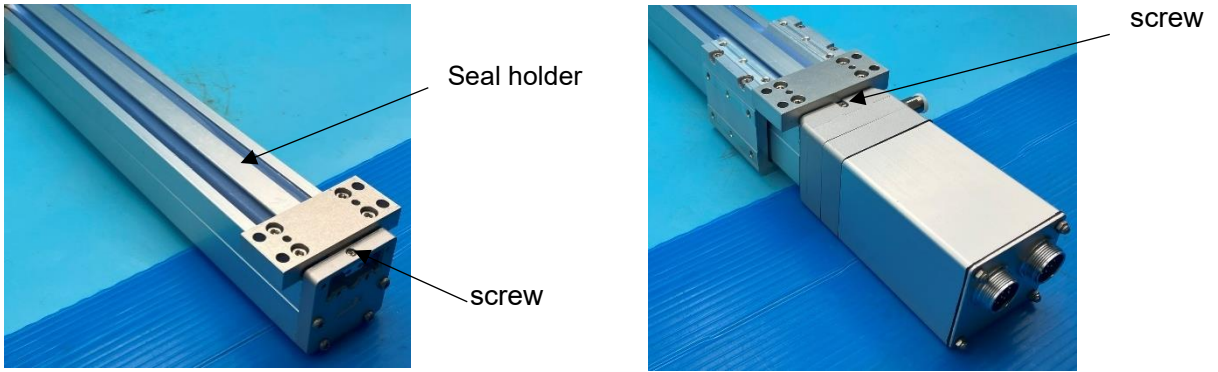
2. If the blanking plate does not come off even after removing the screws, gently push the blanking plate with a hexagon wrench or the like from the seal band side to remove it.



3. Remove the blanking plate to see the seal band.
In the case of "LEFSW16", there is no seal holder, so skip to step "7."

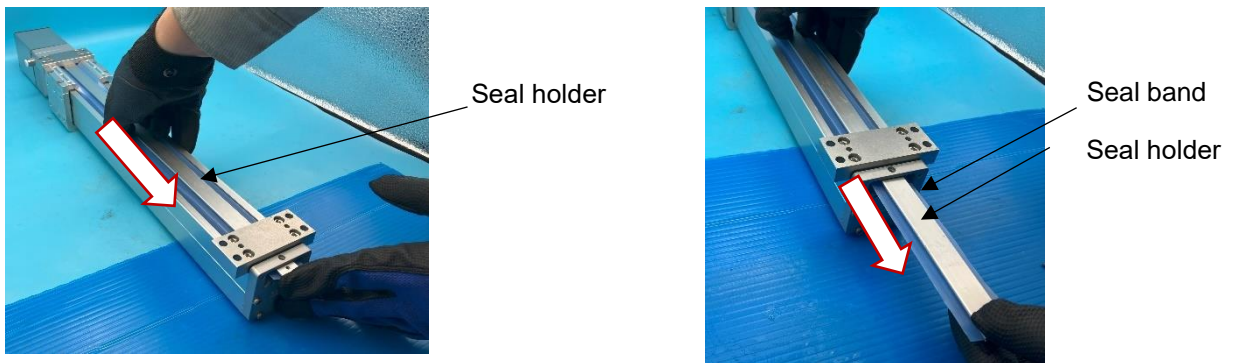


4. [For LEFSW25,32,40]
Remove the cross recessed round head screws securing the seal holder.



Actuator size	Screw type	Screw size	Qty.	Tightening torque [Nm]
LEFSW25,32	Cross recessed round head screw	M2.5x6	2	0.36±10%
LEFSW40		M2.5x6	4	

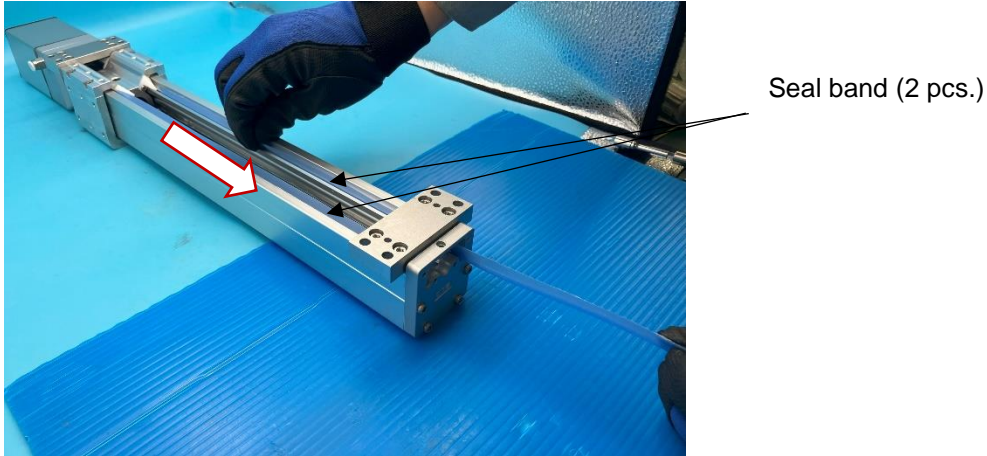
5. [For LEFSW25,32,40]
Remove the seal holder by pulling it out.



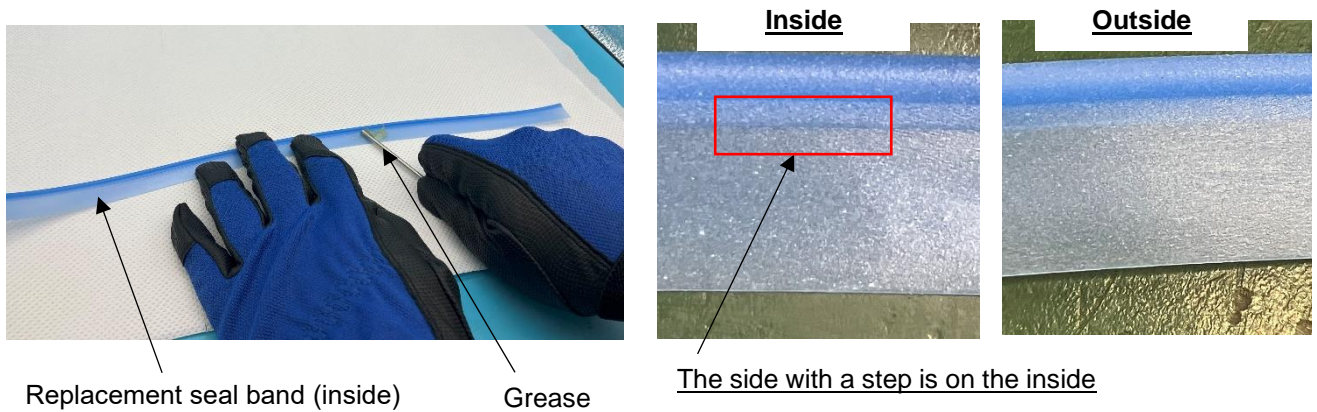
6. [For LEFSW25,32,40]
Remove the seal bands (2 pcs.) attached to the removed seal holder.



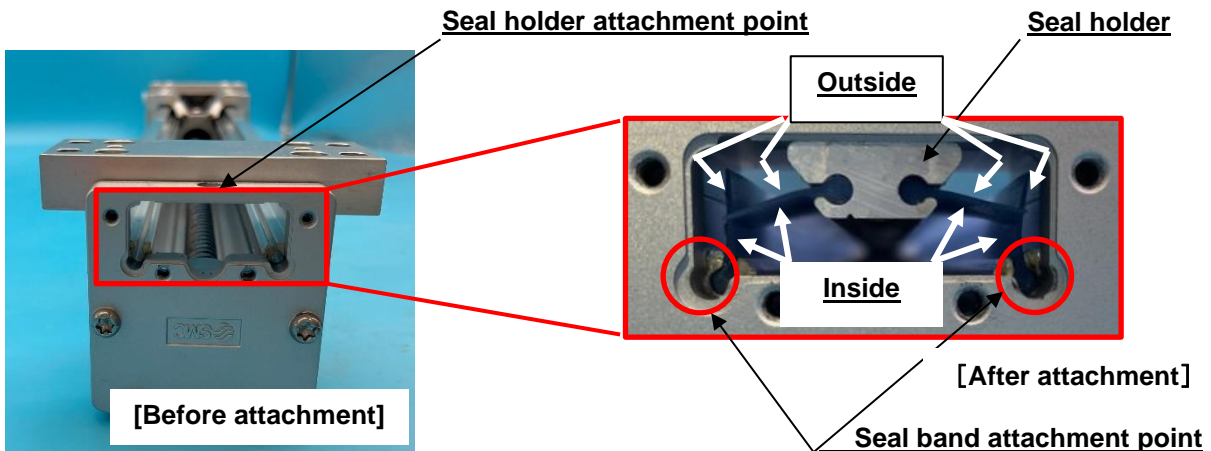
7. Remove the seal bands (2 pcs.) attached to the actuator.



8. Prepare a replacement seal band and apply grease to the inside of the seal band. The seal band has an inside and outside, so the side with the step should be the inside surface. Replacement seal bands will be 2 for LEFSW 16 size and 4 for LEFSW 25, 32, and 40 sizes. (Please refer to “6. Optional part (sold separately)” for seal band and grease pack.)



9. Insert the replacement seal band into the actuator and seal holder. Insert with care in the direction (inside or outside).



10. For assembly, perform steps 1. through 7. in reverse order.

Specific precautions for Battery-less absolute encode

⚠ Warning

1. Do not use in an environment where strong magnetic fields are present.

A magnetic sensor is used in the encoder.

Therefore, if the actuator motor is used in a strong magnetic field environment, malfunction or failure may occur.

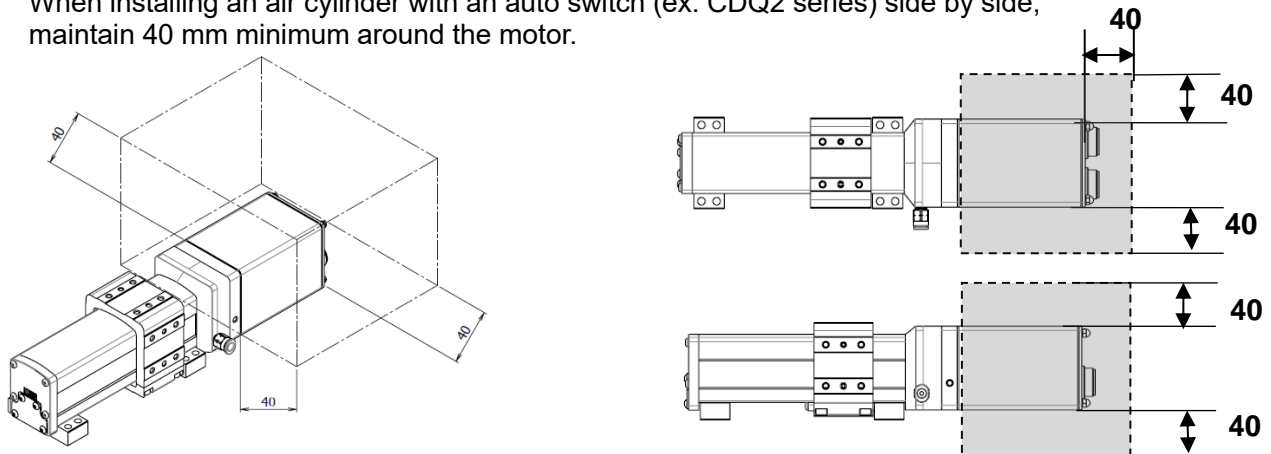
The major failure is described below.

- Reduction of transporting ability (pushing force, speed)
- Damage to the actuator due to collision to the workpiece by positional displacement occurred.

Do not expose the actuator motor to a magnetic field with a magnetic flux density of 13 mT or more.

(Example 1)

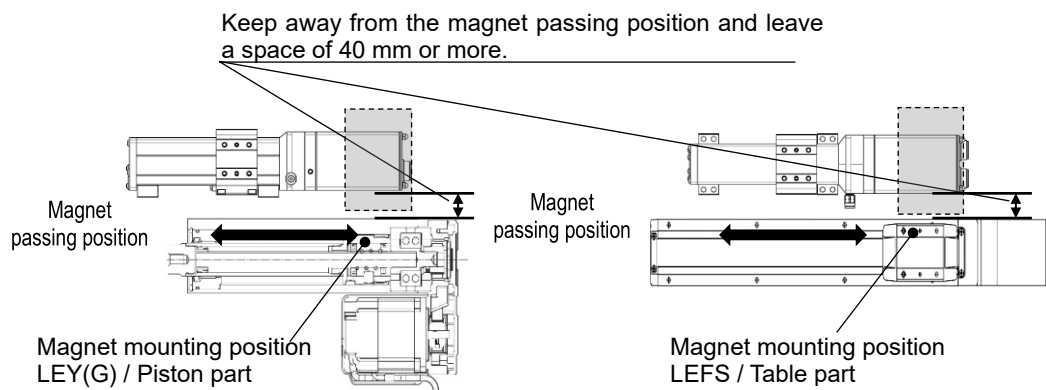
When installing an air cylinder with an auto switch (ex. CDQ2 series) side by side, maintain 40 mm minimum around the motor.



Air cylinder installation with an auto switch is forbidden in the shaded area.

(Example 2)

When installing electric actuator LEY(G) or LEF, EQF, EQY series with an auto switch by side, leave a gap of 40 mm or more with respect to the position where the magnet passes.



⚠ Caution

1. Supply power when the actuator is stationary.

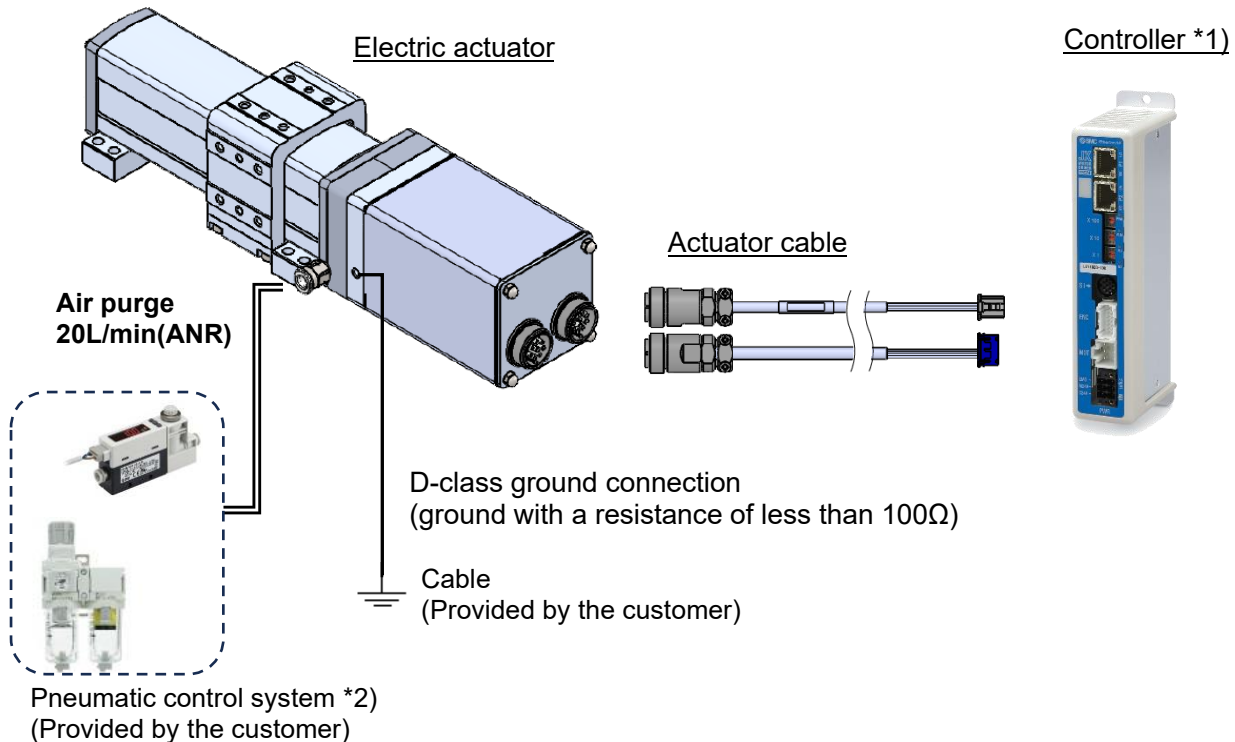
The electric actuator acquires the absolute position data from the absolute encoder when power is applied.

Therefore, if the power is applied to the electric actuator when the actuator is moving with an external force, the controller fails to acquire the absolute position data, which generates an alarm.

1. Product Outline

1.1 System construction

An example of a system configuration using the electric actuator is shown below.



*1) For a controller system configuration, please refer to the " Product configuration" in the controller manual.

*2) Pneumatic control system should be provided according to the customer's system.

1.2 Features

Features of the electric actuator.

For a controller features, please refer to the " Product features" in the controller manual.

- **Enclosure: IP65 equivalent**

Prevents dust and water droplets.

- **Circular metal connector**

Prevents dust and water droplets from entering between the cable and motor cover.
User friendly lock with superior.

- **Applicable for the Battery-Less Absolute Encoder**

When using the electric actuator compatible with battery-less absolute encoder, detection of the absolute position enables the encoder to detect the actuator position when power is supplied, so operation is available with no return to origin operation.

- **Supports a variety of controllers.**

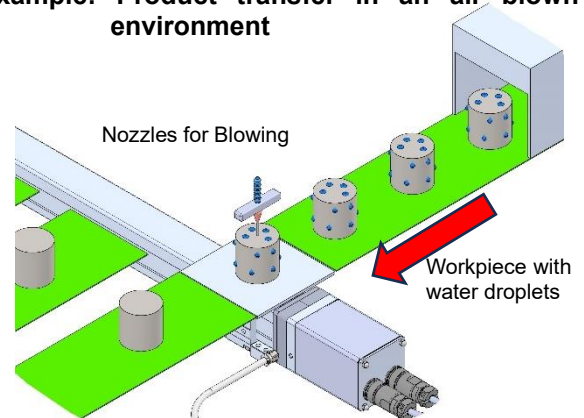
Parallel input/output type and various fieldbus types are supported.

1.3 Application

Examples of use in the following environments.

- Transfer of workpieces with water droplets or dust on them.
- Transfer of workpieces in an environment where water droplets and dust are scattered by blowers.
- Transfer of workpieces in environments where wood and plastic processing debris are scattered.
- Transfer of workpieces where water droplets splash, such as cleaning equipment and processing machines.

Example: Product transfer in an air blown environment

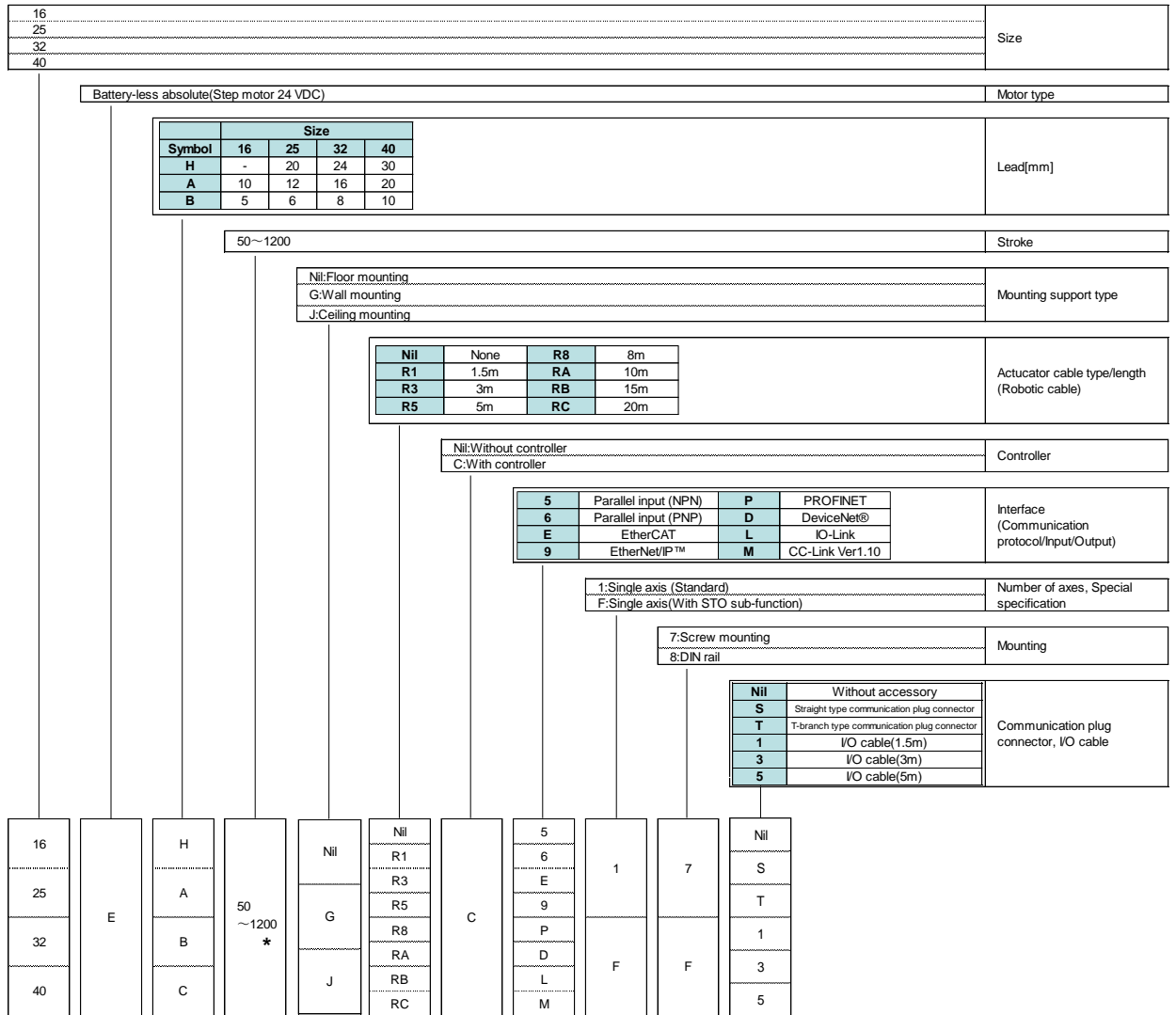


Electric actuator: LEFSW Series

1.3 How to Order

How to order is shown below.

LEFSW 25 E A 400 - R1 C 5 1 7 1



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

Applicable stroke table

Size	Stroke																						
	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1100	1200	
16	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-
25	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-	-
32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-
40	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

1.4 Specification

LEFSW Battery-less absolute encoder type (Step motor 24 VDC)

Model			LEFSW16E			LEFSW25E			LEFSW32E			LEFSW40E		
Actuator specifications	Stroke [mm] *1		50 to 500			50 to 800			50 to 1000			150 to 1200		
	Work load [kg] *2		14	15	8	25	30	18	40	50	20	55	65	
	Max. speed [mm/s]	Stroke range	to 450	700	300	750	640	350	850	700	400	800	650	280
			451 to 500	600	300	750	640	350	850	700	400	800	650	280
			501 to 600	-	-	750	540	270	850	700	400	800	650	280
			601 to 700	-	-	630	420	230	850	620	310	800	650	280
			701 to 800	-	-	550	330	180	750	500	250	800	650	280
			801 to 900	-	-	-	-	-	610	410	200	800	620	280
			901 to 1000	-	-	-	-	-	500	340	170	780	520	250
			1001 to 1100	-	-	-	-	-	-	-	-	660	440	220
			1101 to 1200	-	-	-	-	-	-	-	-	570	380	190
	Min. speed [mm/s]		10	5	20	12	6	24	16	8	30	20	10	
	Max. acceleration/deceleration [mm/s ²]		3000											
	Positioning repeatability [mm]		± 0.02											
	Lost motion[mm] *3		0.1 or less											
	Lead [mm]		10	5	20	12	6	24	16	8	30	20	10	
	Impact/Vibration resistance [m/s ²] *4		50/20											
	Actuation type		Ball screw											
	Guide type		Linear guide											
	Enclosure		IP65 equivalent											
Air purge flow[L/min(ANR)] *5		20												
Static allowable moment *6 [N·m]	Mep(Pitching)	10			27			46			110			
	Mey(Yawing)	10			27			46			110			
	Mer(Rolling)	20			52			101			207			
Operating temperature range [°C]		5 to 40												
Operating humidity range [%RH]		90 or less (No condensation)												
Electric specification	Motor size		□28			□42			□56					
	Motor type		Battery-less Absolute (Step motor 24VDC)											
	Encoder		Battery-less Absolute											
	Power supply voltage [V]		24VDC ± 10%											
	Max power [W] *7		49			45			99			97		

*1 Please contact SMC for non-standard strokes as they are produced as special orders.

*2 For details, refer to the "Speed-Work Load Graph (Guide)" in the catalog.

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

*3 A reference value for correcting errors in reciprocal operation.

*4 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.) Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)

*5 When purging, please flow air from the purge air port. When not in use, close the port with a plug (KQ2P-06).

*6 The static allowable moment is the amount of static moment which can be applied to the actuator when it is stopped. If the product is exposed to impact or repeated load, be sure to take adequate safety measures when using the product.

*7 Power indicates the maximum power during operation including the controller. Use this when selecting the power supply capacity.

Weight

Model	LEFSW16									
Stroke[mm]	50	100	150	200	250	300	350	400	450	500
Product weight[kg]	1.5	1.6	1.7	1.9	2	2.1	2.3	2.4	2.5	2.6

Model	LEFSW25															
Stroke[mm]	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Product weight[kg]	2.3	2.4	2.6	2.8	2.9	3.1	3.3	3.5	3.6	3.8	4	4.1	4.3	4.5	4.7	4.8

Model	LEFSW32																			
Stroke[mm]	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Product weight[kg]	4.3	4.5	4.8	5.1	5.4	5.6	5.9	6.2	6.5	6.8	7	7.3	7.6	7.9	8.2	8.4	8.7	9	9.3	9.6

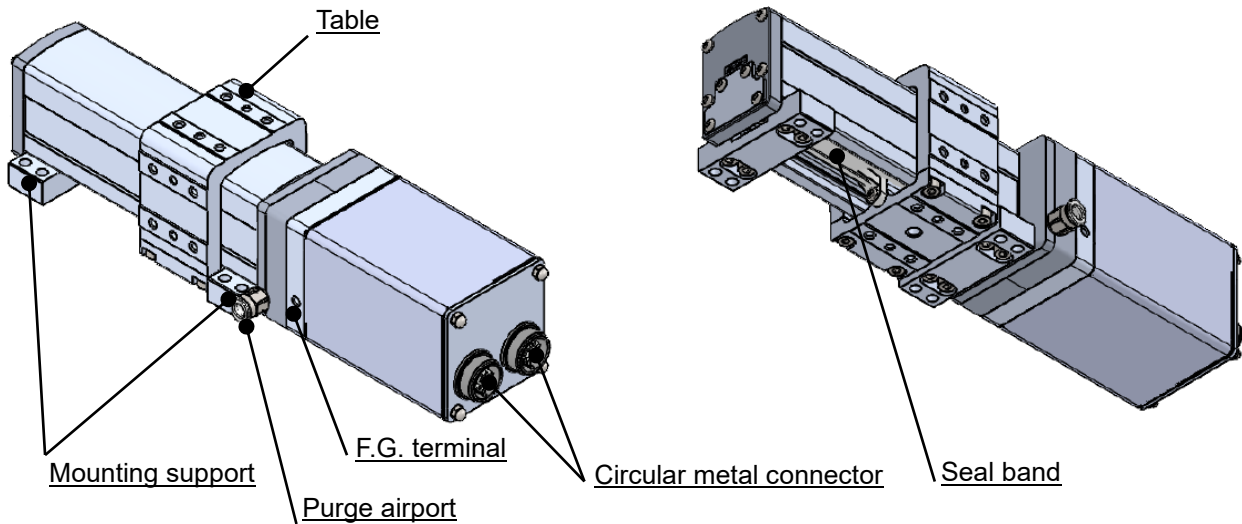
Model	LEFSW40																					
Stroke[mm]	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1100	1200		
Product weight[kg]	6.9	7.2	7.6	7.9	8.3	8.6	9	9.3	9.7	10	10.4	10.7	11.1	11.4	11.7	12.1	12.4	12.8	13.5	14.2		

1.5 Construction

Components

Top

Bottom



1.6 Accessories

Mounting support

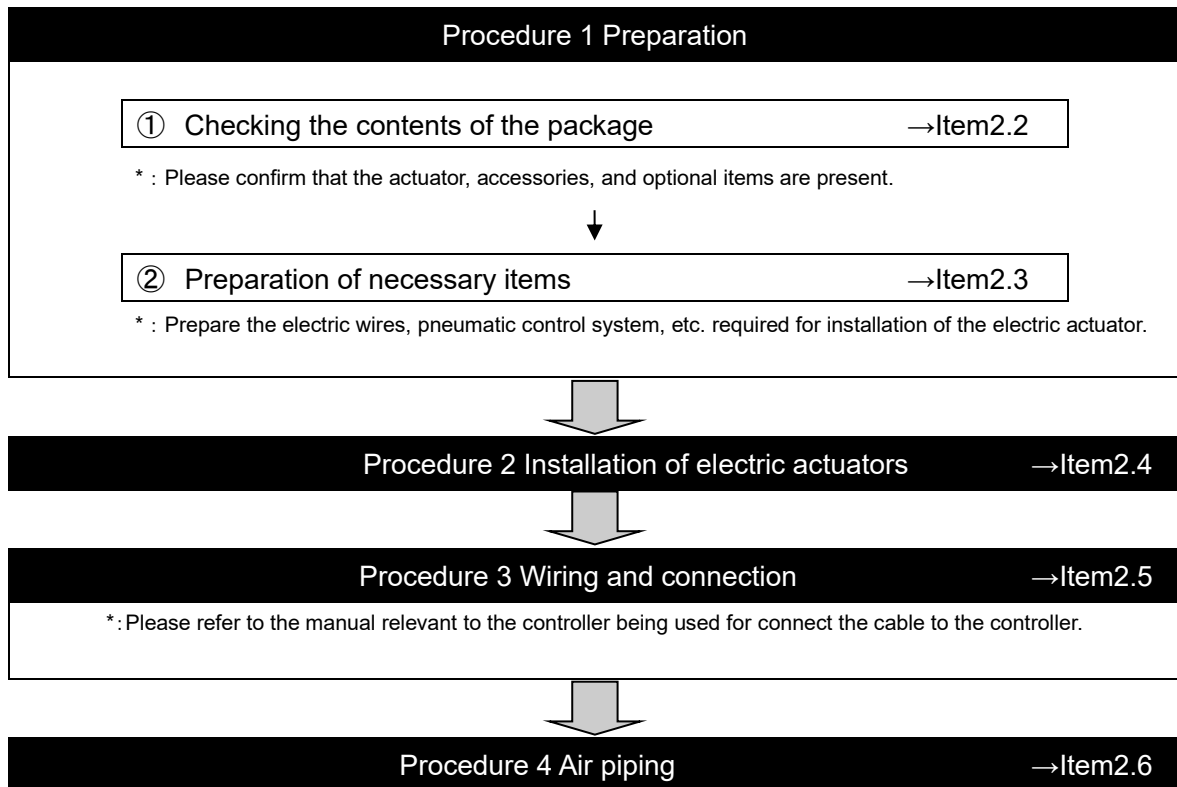
type	Part name	Size	Order number
Floor mounting	Floor foot Ass'y Floor foot : 2 Mounting screws : 8 Positioning pin : 4	LEFSW16	LEFSW-D-2-1
		LEFSW25	LEFSW-D-2-2
		LEFSW32	LEFSW-D-2-3
		LEFSW40	LEFSW-D-2-4
Wall mounting	Wall bracket Ass'y Wall bracket : 2 Mounting screws : 8 Positioning pin : 4	LEFSW16	LEFSW-D-2-1G
		LEFSW25	LEFSW-D-2-2G
		LEFSW32	LEFSW-D-2-3G
		LEFSW40	LEFSW-D-2-4G
Ceiling mounting	Ceiling bracket Ass'y Ceiling bracket : 2 Mounting screws : 8 Positioning pin : 4	LEFSW16	LEFSW-D-2-1J
		LEFSW25	LEFSW-D-2-2J
		LEFSW32	LEFSW-D-2-3J
		LEFSW40	LEFSW-D-2-4J

Please refer to "6 Optional parts (sold separately)" for details of actuator cable.

2. Installation

2.1 Flow procedure from installation

Be sure to check the procedure below before use.

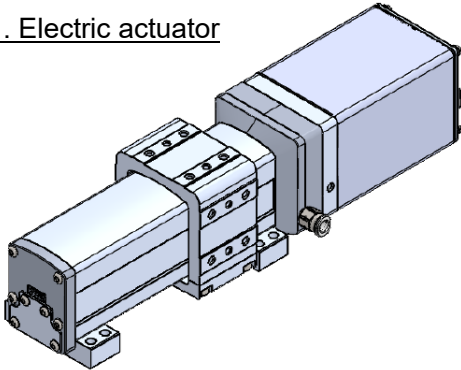


2.2 Check the contents of the package

After unpacking everything, check the description on the label to identify the electric actuator and the number of accessories. If any parts are missing or damaged, please contact your distributor. Please refer to the " Confirmation of the package content " in the controller manual for the contents of the package.

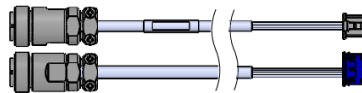
No.	Product Name and Number	Quantity
1	Electric actuator / LEFSW Series	1pce
2	Actuator cable	1set (in case with cable)
3	Controller	1set (in case with controller)

1. Electric actuator



2. Actuator cable

- Encoder cable 1pce
- Motor cable 1pce



3. Controller *1



*1 The controller content depends on the selection, so refer to the manual relevant to the controller.

2.3 Preparation of necessary items

Please prepare the following items for installation and wiring.
Please refer to the manual relevant to the controller being used.

- Wiring cables
- M4 screws
- Cable with crimping terminals
- Toothed washers

Please provide the following equipment to use the air purge.

- Compressed air source (0.1MPa~)
- Air filter
- Regulator
- Valves
- Flow Switch
- Flow adjustment valve
- Fittings
- Tubing

Please provide the following equipment to run the system.

- 24 VDC power supply
- PC
- PLC

2.4 Installation of electric actuators

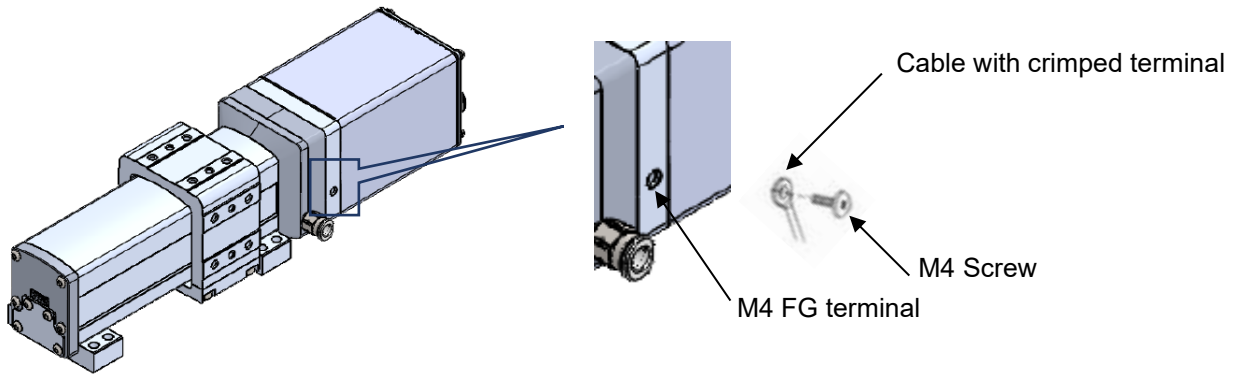
Install the electric actuator at the installation location using the following method.

(1) Mounting

Please refer to "Mounting" in "Precautions for product specific" for information on screws and tightening torques to be used for mounting workpieces and tools and for mounting the actuator.

(2) Connection to ground

Install the grounding cable as shown in the figure.

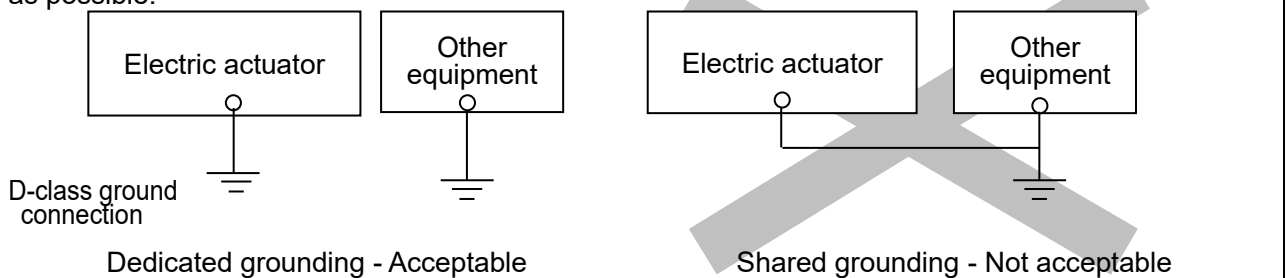


⚠ Caution

The M4 screw, cable with crimped terminal and toothed washer must be prepared by the user. The actuator must be connected to Ground to reduce noise. If further noise resistance is required, consider measures such as grounding the 0 V (signal ground). When grounding the 0V, avoid flowing noise from the ground to the 0 V.

⚠ Caution

The earth should be a dedicated earth connection. Use a D-class ground connection (ground with a resistance of less than 100 ohm). The cross sectional area of the grounding cable shall be 2mm² minimum. The Grounding point should be as near as possible to the actuator. Keep the grounding cable as short as possible.



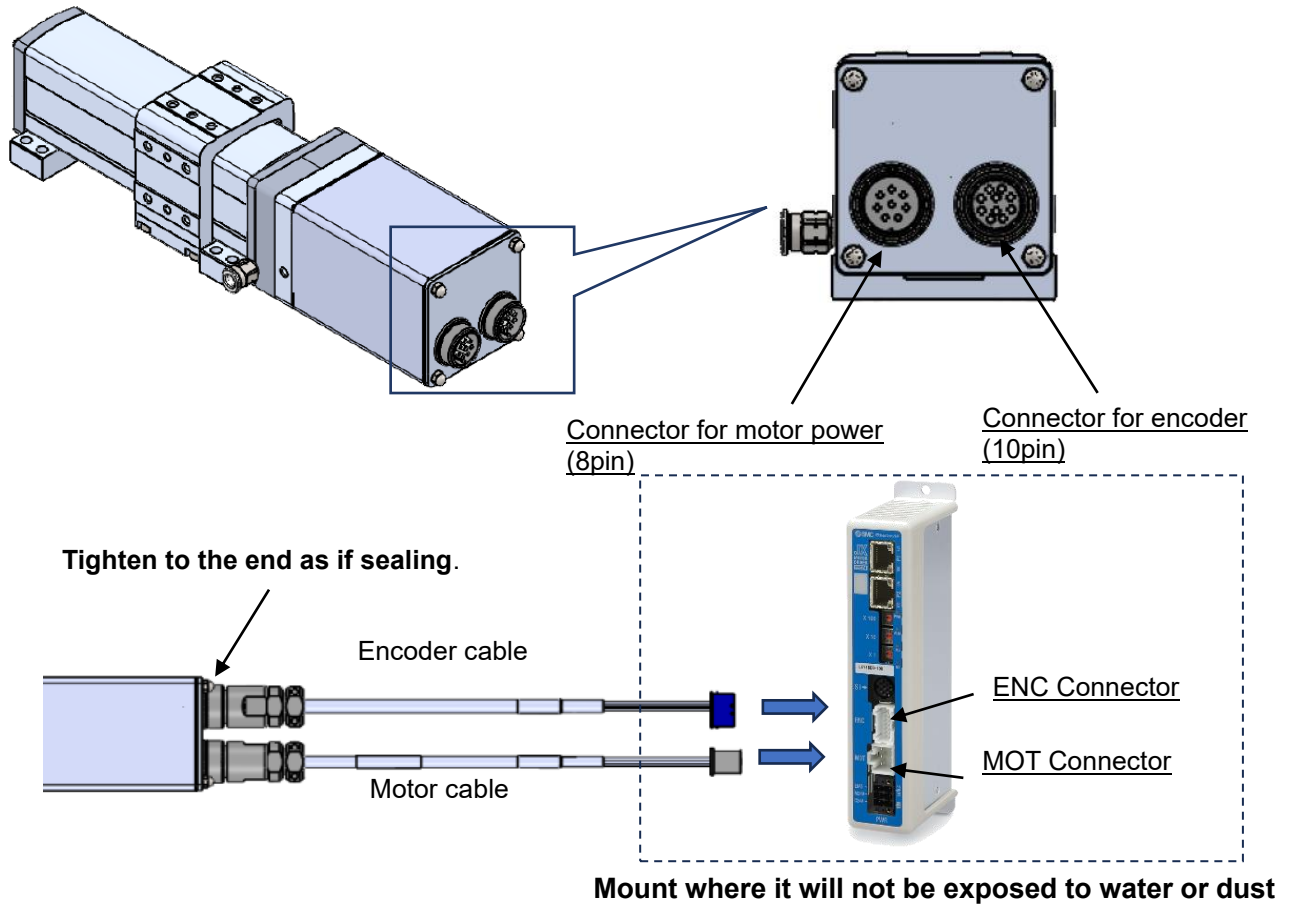
(3) Precautions for electric actuator compatible with battery-less absolute encoder installation

Please refer to "Individual precautions for battery-less absolute encoder" in "Precautions for product specific".

2.5 Wiring and connection

Connect the cable to the connector part of the electric actuator. Metal connectors should be screwed in all the way and sealed to prevent water from entering.

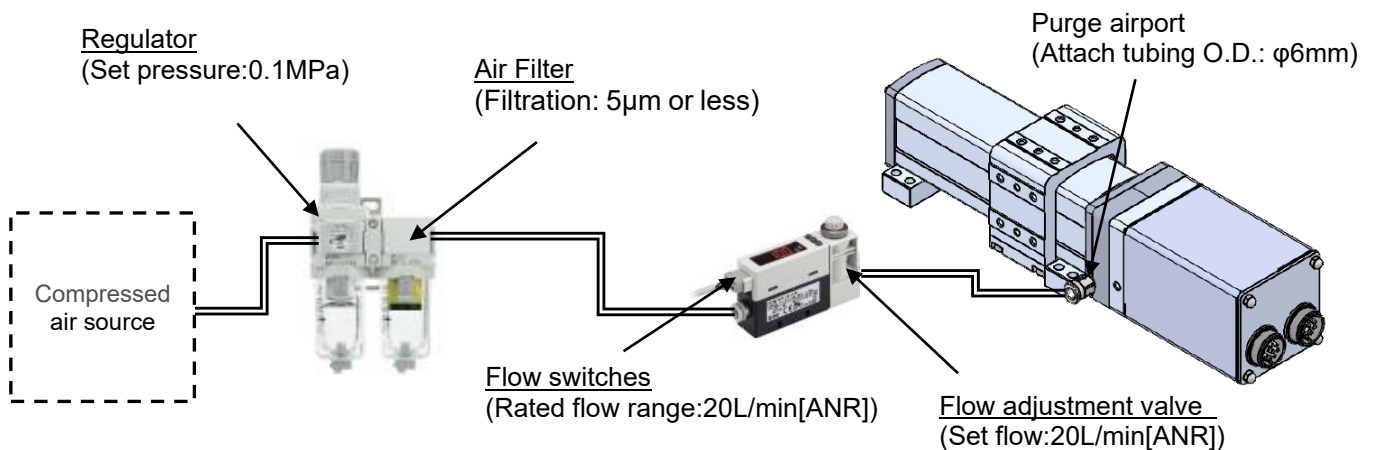
Please refer to the "Wiring and connection" in the controller manual for connect the cable to the controller. The controller and the connectors on the controller side are not covered by IP protection. Mount where it will not be exposed to water or dust.



2.6 Air piping

Connect the pneumatic control system to the purge airport of the electric actuator.

Please refer to "Air supply" in "Precautions for product specific" for compressed air source.



3. Operation

Please refer to the " Operation instruction" in the controller manual to the controller being used.

4. Alarm detection

Please refer to the " Alarm detection" in the controller manual to the controller being used.

5. Troubleshooting

Please refer to the " Troubleshooting" in the controller manual to the controller being used.

6. Optional parts (sold separately)

The optional parts described below are available (sold separately).

- Actuator cable
- Grease pack
- Seal band

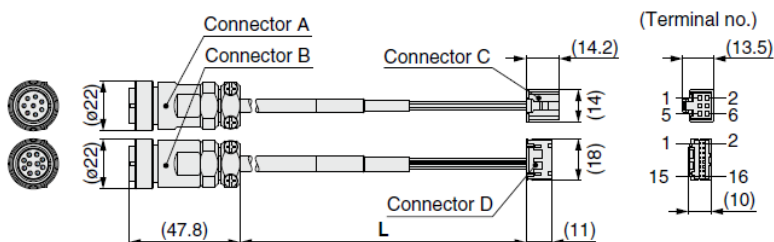
6.1 Actuator cable

LE-CE-1-X4

Cable length (L) [m]

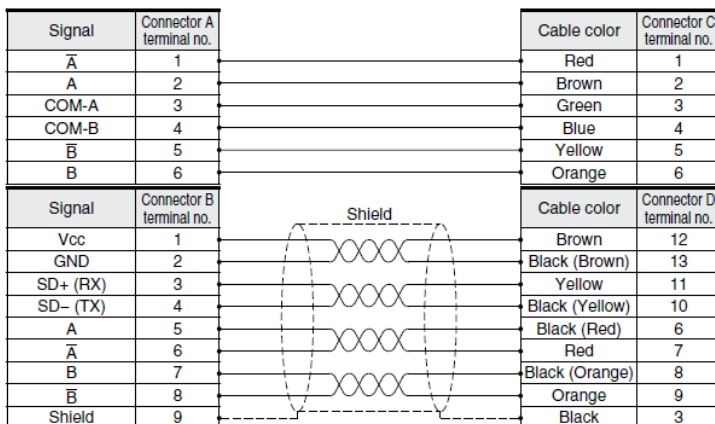
1	1.5
3	3
5	5
8	8*1
A	10*1
B	15*1
C	20*1

*1 Produced upon receipt of order



Weight

Product no.	Weight [g]	Note
LE-CE-1-X4	270	Robotic cable
LE-CE-3-X4	440	
LE-CE-5-X4	650	
LE-CE-8-X4	980	
LE-CE-A-X4	1200	
LE-CE-B-X4	1760	
LE-CE-C-X4	2290	



6.2 Grease pack

Applied portion	Order no.	Volume
Seal Ball screw shaft	GR-S-010	10g
	GR-S-020	20g
	GR-S-050	50g

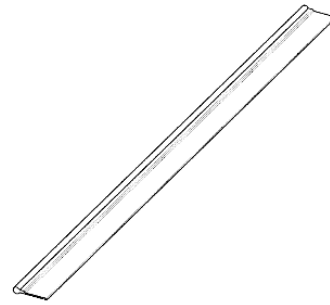
6.3 Seal band

L E F S W - DS 16 - 300

●

Size

16
25
32
40



Stroke[mm]

Size	Stroke[mm]																					
	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1100	1200
16	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-	-	-	-	-	-	-	-
25	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-	-	-	-	-
32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	-
40	-	-	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

*Size 16 comes in a set of 2 seal bands (for 1 unit).

*Size 25, 32, and 40 come in sets of 4 seal bands (for 1 unit).

Revision history

March 2024 : Frist edition

SMC Corporation

4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021 JAPAN

Tel: + 81 3 5207 8249 Fax: +81 3 5298 5362

URL <http://www.smcworld.com>

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

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