



Electric Actuators Precautions 1

Be sure to read before handling.

Wiring and Cables

⚠ Warning

1. **Adjustment, installation, or wiring changes should be conducted after power supply to this product is turned off.**

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. **Wiring should be done correctly.**

For each terminal, voltages other than stipulated in the operation manual should not be applied.

2. **Connect the connector securely.**

Check for correct connector wiring and polarity.

3. **Treat the noise securely.**

If the noise is at the same wavelength as the signal lines, it will lead to malfunction. As a countermeasure, separate the high and low electrical lines and shorten the length of wiring, 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.

5. **Be careful that cables are not caught by actuator movement.**

6. **Operate with cables such that they are not easily moved.**

Avoid bending cables at sharp angles where they enter the product.

7. **Avoid twisting, folding, rotating or applying an external force to the cable.**

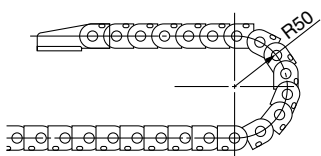
Risk of electric shock, wire break, contact failure and lost of control for the product can happen.

8. **Fix the motor cable protruding from the product in place before using.**

The motor cables are not robotic type cables, and can be damaged when moved.

Placing them into a flexible moving tube is also unacceptable.

9. **The cable connecting the product and controller is superior in bending resistance, but should not be placed into a flexible moving tube with a radius smaller than the specified value. (Min. 50 mm)**



10. **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.

11. In case of the actuator with servo motor (24 VDC), "motor phase detection step" is done by inputting the servo on signal just after controller power is on.

This motor phase detection step operates the table to the maximum distance of the ± 1 lead of the screw. (The motor rotates in the reverse direction if the table hits an obstacle such as the end damper.) Take this motor phase detection step into consideration for installation and operation of this actuator.

[Transportation]

⚠ Caution

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

Design and Selection

⚠ Warning

1. **Be sure to read the operation manual (this manual and the one for the controller: 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 emergency stops.**

Design so that human injury and/or damage to machinery and equipment will not be caused when machinery is stopped by a safety device under abnormal conditions such as a power outage or a manual emergency stop.

7. **Consider the action 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 table may fall due to the weight of work. The safety device should not interfere with normal operation of the machine.

10. **Do not use the stop signal, "EMG" of the controller and stop switch on the teaching box as the emergency stop of system.**

The stop signal, "EMG" of controller and the stop switch on the teaching box are for decelerating and stopping the actuator.

Design the system with an emergency stop circuit which is applied relevant safety standard separately.



Electric Actuators Precautions 2

Be sure to read before handling.

Design and Selection

⚠ 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. During operation (positioning operation or thrust control), it cannot be returned to the home position.**
- 5. Refer to Auto Switches Precautions (Best Pneumatics No. 2) when an auto switch is built in and used.**

Mounting

⚠ Warning

- 1. Keep the manual in a safe place future reference.**
The product should be mounted and operated after thoroughly reading the operation manual and understanding its contents.
- 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. Connect the rod axis and the load and the direction of the movement being sure to match it.**
It causes to cause the complication in the ball screw, to be worn out, and to damage it when not matching.
- 5. When an external guide is used, connect the moving parts of the actuator 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 (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. When one side is fixed**
There is a possibility that the power at the bending moment will damage the actuator when operated at high speeds with one side mounted fixed and the other side free (basic, flange or direct mount types). The support bracket that suppress the vibration of the main body of the actuator are installed. Lower and use speed for the state that the actuator doesn't vibrate. In addition, when moving the body of the actuator or mounting along stroke actuator horizontally with one side fixed, please use a support bracket.

Mounting

⚠ Warning

- 9. When attaching a workpiece, do not apply strong impact shock or a large moment.**
If an outside force exceeding the allowable moment is applied, this 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.

Handling

⚠ Warning

- 1. Do not touch the motor in operation.**
The surface temperature of the motor can increase to approx. 90°C to 100°C due to operating conditions. This temperature increase may also be caused by energizing alone. As it may cause burns, do not touch the motor when in operation.
- 2. If abnormal heating, smoking or fire, etc., occurs in the product, immediately shut off the power supply.**
- 3. Stop operation at once if there are abnormal noises or vibrations.**
Abnormal noises or vibrations may mean that the product is not properly mounted, and if allowed to continue in this state, damage to the equipment may occur.
- 4. Never touch the rotating part of the motor while in operation.**
- 5. When installing, adjusting, inspecting or performing maintenance on the product, controller 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 controller and the actuator combined as delivered for use.**
The actuator is set in parameters for shipment. If it is combined with a different parameter, failure can result.
- 2. Conduct the following inspection before operation.**
 - a) Confirm that the power supply line or each signal line is not broken.
 - b) Confirm that the power supply line or each signal line is not loosened.
 - c) Confirm that the electric actuator/cylinder/controller/driver is not mounted loosely.
 - d) Confirm that the electric actuator/cylinder/controller/driver is operated correctly.
 - e) Confirm the function of the emergency stop of the total system.
- 3. In case several persons are doing the job, determine the procedure, signs, measures against abnormality and restarting measures in advance. Then, let the person who is not doing the job, supervise that job.**
- 4. The product can operate at a different speed from the set speed depending on load and resistance.**
When 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 home position.**
The product is made return to home position by pushing force, which causes the displacement of home position.
- 6. Do not remove the name plate.**
- 7. Operation test should be done by low speed. Start operation by predefined speed after confirming there is no trouble.**

LJ1

LG1

LTF

LC1

LC7

LC8

LXF

LXP

LXS

LC6□

LZ□

LC3F2

X□

D-□

E-MY



Electric Actuators Precautions 3

Be sure to read before handling.

Handling

[Grounding]

⚠ Warning

1. Be certain to ground the actuator.
2. Dedicated grounding should be used.
Grounding should be to a D-class ground. (Ground resistance of 100 Ω or less.)
3. Grounding should be performed near the actuator to shorten the grounding distance.

[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 the ambient temperature exceeds the specified range. (Refer to the specifications.)
 - b. Locations where the ambient humidity exceeds the specified range. (Refer to the specifications.)
 - c. Locations where corrosive gas, flammable gas, sea water, water and steam are present.
 - d. Locations where strong magnetic or electric fields are generated.
 - e. Locations where direct vibration or impact shock is applied to the product.
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.
Looseness or increased sliding resistance can result.
4. Shade the sunlight in the place where the product is applied with direct sunshine.
5. In locations near heat sources, block off them.
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 35 to 85% 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. Perform maintenance inspection according to the procedures indicated in the operation manual.
Improper handling can cause an injury, damage or malfunction of equipment and machinery.
2. Removal of equipment
When equipment is removed, first confirm that measures are in place to prevent dropping or runaway of driven objects, etc., and then proceed after cutting off the electric power. When starting up again, proceed with caution after confirming that conditions are safe.

[Lubrication]

⚠ Caution

1. The product has been lubricated for life at manufacturer, and does not require any further lubrication.
When lubrication is applied, special grease must be used. Please read the maintenance manual of each actuator.

Actuator with Lock

⚠ Warning

1. Do not use the lock as a safety brake or a control that requires a locking force.
The lock used for the product with lock is designed to prevent dropping of work piece.
2. For vertical mounting, use the product with lock.
If the product is not equipped with lock, the product will move and drop the work piece when the power is removed. Please ensure that your safe equipment designs include measures against falling work pieces.
3. “Drop prevention” 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 shortening of lifespan can result. The same situations will happen when the lock slips due to a force over the holding force, as this accelerates 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 reduce 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.



Electric Actuators Precautions 4

Be sure to read before handling.

Controller and Peripheral Devices

Design and Selection

⚠ Warning

- 1. Be sure to apply the specified voltage.**
Otherwise, malfunction and breakage may be caused. If the applied voltage is lower than the specified, it is possible that the load cannot be moved due to an internal voltage drop of the controller. Please check the operating voltage before use.
- 2. Do not operate the product beyond the specifications.**
Otherwise, a fire, malfunction or actuator damage can result. Please check the specifications before use.
- 3. Install an emergency stop circuit outside of the enclosure.**
Please install an emergency stop outside of the enclosure so that it can stop the system operation immediately and intercept the power supply.
- 4. In order to prevent damage due to the breakdown and the malfunction of the controller and its peripheral devices, a backup system should be established previously by giving a multiple-layered structure or a fail-safe design to the equipment, etc.**
- 5. If a danger against the personnel is expected due to an abnormal heat generation, smoking, ignition, etc., of the controller and its peripheral devices, cut off the power supply for the product and the system immediately.**

Handling

⚠ Warning

- 1. Do not touch the inside of the controller and its peripheral devices.**
It may cause an electric shock or damage to the controller.
- 2. Do not perform the operation or setting of the product with wet hands.**
It may cause an electric shock.
- 3. Product with damage or the one lacking of any components should not be used.**
It may cause an electric shock, fire, or injury.
- 4. Use only the specified combination between the electric actuator and controller.**
It may cause damage to the actuator or the controller.
- 5. Be careful not to be caught or hit by the workpiece while the actuator is moving.**
It may cause an injury.
- 6. Do not connect the power supply or power on the product before confirming the area to which the workpiece moves is safe.**
The movement of the workpiece may cause an accident.
- 7. Do not touch the product when it is energized and for some time after power has been disconnected, as it is very hot.**
It may lead to a burn due to the high temperature.
- 8. Check the voltage using a tester for more than 5 minutes after power-off in case of installation, wiring and maintenance.**
It may cause an electric shock, fire, or injury.

Handling

⚠ Warning

- 9. Static electricity may cause malfunction or break the controller. Do not touch the controller while power is supplied.**
When touching the controller for maintenance, take sufficient measures to eliminate static electricity.
- 10. Do not use the product in an area where dust, powder dust, water, chemicals or oil is in the air.**
It will cause failure or malfunction.
- 11. Do not use the product in an area where a magnetic field is generated.**
It will cause failure or malfunction.
- 12. Do not install the product in the environment of flammable gas, explosive gas and corrosive gas.**
It could lead to fire, explosion and corrosion.
- 13. Radiant heat from strong heat supplies such as a furnace, direct sunlight, etc., should not be applied to the product.**
It will cause failure of the controller or its peripheral devices.
- 14. Do not use the product in an environment subject to a temperature cycle.**
It will cause failure of the controller or its peripheral devices.
- 15. Do not use the product in a place where 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 supplies of surge generation and crossed lines.
- 16. Do not install the product in an environment under the effect of vibrations and impacts.**
It will cause failure or malfunction.
- 17. When a surge generating load such as a relay or solenoid valve is directly driven, use a product that incorporates a surge absorption element.**

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E-MY



Electric Actuators Precautions 5

Be sure to read before handling.

Controller and Peripheral Devices

Installation

Warning

- 1. Install the controller and its peripheral devices on a fire-proof material.**
A direct installation on or near a flammable material may cause fire.
- 2. Do not install the product in a place subject to vibrations and impacts.**
It will cause failure or malfunction.
- 3. Do not mount the controller and its peripheral devices together with a large-sized 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 supply.**
- 4. Install the controller and its peripheral devices on a flat surface.**
If the mounting surface is distorted or not flat, an unacceptable force may be added to the housing, etc., to cause troubles.

Power Supply

Caution

- 1. Use a power supply that has low noise between lines and between power and ground.**
In cases where noise is high, an isolation transformer should be used.
- 2. To prevent surges from lightning, an appropriate measure should be taken. Ground the surge absorber for lightning separately from the grounding of the controller and its peripheral devices.**

Grounding

Warning

- 1. Be sure to carry out grounding in order to ensure the noise tolerance.**
- 2. Dedicated grounding should be used.**
Grounding should be to a D-class ground. (Ground resistance of 100 Ω or less)
- 3. Grounding should be performed near the controller and its peripheral devices to shorten the grounding distance.**

Maintenance

Warning

- 1. Perform a maintenance check periodically.**
Confirm wiring and screws are not loose.
Loose screws or wires may cause unintentional malfunction.
- 2. Conduct an appropriate functional inspection after completing the maintenance.**
At times where the equipment or machinery does not operate properly, conduct an emergency stop of the system. Otherwise, an unexpected malfunction may occur and it will become impossible to secure the safety. Conduct a test of the emergency stop in order to confirm the safety of the equipment.
- 3. Do not disassemble, modify or repair the controller and its peripheral devices.**
- 4. Do not put anything conductive or flammable inside of the controller.**
It may cause a fire.
- 5. Do not conduct an insulation resistance test and withstand voltage test on this product.**
- 6. Ensure sufficient space for maintenance activities.**
Design the system that allows required space for maintenance.



Auto Switches Precautions 1

Be sure to read this before handling.

Design / Selection

Warning

1. Confirm the specifications.

Read the specifications carefully and use this product appropriately. The product may be damaged or malfunction if it is used outside the specification range for current load, voltage, temperature or impact.

We do not guarantee against any damage if the product is used outside of the specification range.

2. Cautions for use in an interlock circuit

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to avoid trouble by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch. Also, perform periodic maintenance and confirm proper operation.

3. Do not make any modifications (including exchanging the printed circuit boards) to the product.

It may cause human injuries and accidents.

Caution

1. Pay attention to the length of time that a switch is ON at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate, but if the speed is too great the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

$$V \text{ (mm/s)} = \frac{\text{Auto switch operating range (mm)}}{\text{Time load applied (ms)}} \times 1000$$

In cases of high piston speed, the use of an auto switch (D-F5NTL, F7NTL, G5NTL, M5NTL, M5PTL) with a built-in OFF delay timer (≈ 200 ms) makes it possible to extend the load operating time.

The wide-range detection type D-G5NBL (operating range 35 to 50 mm) may also be useful, depending on the application. Please consult with SMC for other models.

2. Keep wiring as short as possible.

<Reed>

As the length of the wiring to a load gets longer, the rush current at switching ON becomes greater, and this may shorten the product's life. (The switch will stay ON all the time.)

1) Use a contact protection box when the wire length is 5 m or longer.

2) Even if an auto switch has a built-in contact protection circuit, when the wiring is more than 30 m long, it is not able to adequately absorb the rush current and its life may be reduced. It is again necessary to connect a contact protection box in order to extend its life. Please consult with SMC in this case.

Caution

<Solid state>

3) Although wire length should not affect switch function, use a wire 100 m or shorter.

If the wiring is longer it will likely increase noise although the length is less than 100 m.

When the wire length is long, we recommend the ferrite core is attached to the both ends of the lead wire to prevent excess noise.

A contact protection box is not necessary for solid state switches due to the nature of this product construction.

3. Do not use a load that generates surge voltage. If a surge voltage is generated, the discharge occurs at the contact, possibly resulting in the shortening of product life.

If driving a load such as a relay that generates a surge voltage,

<Reed>

Use an auto switch with built-in contact protection circuit or use a contact protection box.

<Solid state>

Use a built-in surge absorbing element type device.

4. Take precautions when multiple cylinders/actuators are used close together.

When multiple auto switch cylinders/actuators are used in close proximity, magnetic field interference may cause the auto switches to malfunction. Maintain a minimum cylinder separation of 40 mm. (When the allowable interval is specified for each cylinder series, use the indicated value.)

The auto switches may malfunction due to the interference from the magnetic fields.

Use of a magnetic screen plate (MU-S025) or commercially available magnetic screen tape can reduce the interference of magnetic force.

5. Pay attention to the internal voltage drop of the auto switch.

<Reed>

1) Auto switch with an indicator light (Except D-A56, A76H, A96, A96V, C76, E76A, Z76)

• If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diodes. (Refer to the internal voltage drop in the auto switch specifications.) [The voltage drop will be "n" times larger when "n" auto switches are connected.]

Even though an auto switch operates normally, the load may not operate.



• In the same way, when operating under a specified voltage, although an auto switch may operate normally, the load may not operate. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

$$\text{Supply voltage} - \text{Internal voltage drop of auto switch} > \text{Minimum operating voltage of load}$$

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E-MY



Auto Switches Precautions 2

Be sure to read this before handling.

Design / Selection

⚠ Caution

- 2) If the internal resistance of a light emitting diode causes a problem, select an auto switch without an indicator light (D-A6□, A80, A80H, A90, A90V, C80, R80, 90, E80A, Z80).

<Solid state/2-wire type>

- 3) Generally, the internal voltage drop will be greater with a 2-wire solid state auto switch than with a reed auto switch. Take the same precautions as in 1).

Also, take note that a 12 VDC relay is not applicable.

6. Pay attention to leakage current.

<Solid state/2-wire type>

Current (leakage current) flows to the load to operate the internal circuit when in the OFF state.

Operating current of load (OFF condition) > Leakage current

If the criteria given in the above formula are not met, it will not reset correctly (stays ON). Use a 3-wire auto switch if this specification will not be satisfied.

Moreover, leakage current flow to the load will be “n” times larger when “n” auto switches are connected in parallel.

7. Ensure sufficient clearance for maintenance activities.

When designing an application, be certain to allow sufficient clearance for maintenance.

8. When multiple auto switches are required.

“n” indicates the number of auto switches which can be physically mounted on the cylinders/actuators. Detection intervals depends on the auto switch mounting structure and set position, therefore some required interval and set positions may not be available.

9. Limitations of detectable positioning

When using certain mounting brackets, the surface and position where an auto switch can be mounted maybe restricted due to physical interference. For example, when using some bracket types the auto switch cannot be surface mounted at the bottom side of foot bracket, etc.

Select the set position of the auto switch so that it does not interfere with the mounting bracket of the cylinders/actuators (such as trunnion or reinforcement ring).

10. Use the cylinder and auto switch in proper combination.

The auto switch is pre-adjusted to activate properly for an auto-switch-capable SMC cylinder/actuator.

If the auto switch is mounted improperly, used for another brand of cylinders/actuators or used after the alternation of the machine installation, the auto switch may not activate properly.

Mounting / Adjustment

⚠ Caution

1. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300 m/s² or more for reed auto switches and 1000 m/s² or more for solid state auto switches) while handling. Although the body of the auto switch may not be damaged, the inside of the auto switch could be damaged and cause malfunction.

2. Observe the proper tightening torque for mounting an auto switch.

When an auto switch is tightened beyond the range of tightening torque, auto switch mounting screws, auto switch mounting brackets or auto switch may be damaged.

On the other hand, tightening below the range of tightening torque may allow the auto switch to slip out of position.

3. Do not carry a cylinder by the auto switch lead wires.

Never carry a cylinder by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the auto switch to be damaged by the stress.

4. Fix the auto switch with appropriate screw installed on the switch body. If using other screws, auto switch may be damaged.

5. Mount an auto switch at the center of the operating range. In the case of 2-color display auto switch, mount it at the center of the green LED illuminating range.

Adjust the mounting position of the auto switch so that the piston stops at the center of the operating range. (The mounting position shown in the catalog indicates the optimum position at stroke end.)

If mounted at the end of the operating range (around the borderline of ON and OFF), operation will be unstable depending on the operating environment. Also there are some cylinders or actuators with individual setting methods for auto switches. If so, mount it in accordance with the indicated method.

Even if 2-color indication solid state auto switches are fixed at a proper operating range (the green light lights up), the operation may become unstable depending on the installation environment or magnetic field disturbance.

(Magnetic body, external magnetic field, proximal installation of cylinders with built-in magnet and actuators, temperature change, other factors for magnetic force fluctuation during operation, etc.)



Auto Switches Precautions 3

Be sure to read before handling.

Wiring

⚠ Caution

1. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

2. Do not wire with power lines or high voltage lines.

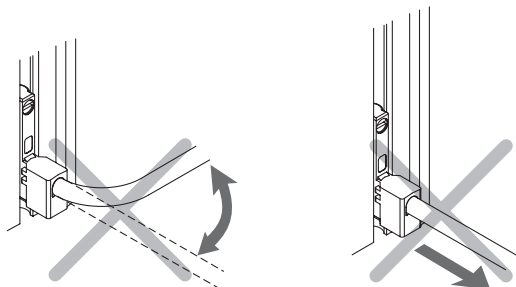
Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits containing auto switches may malfunction due to noise from these other lines.

3. Avoid repeatedly bending or stretching lead wires.

Broken lead wires will result from repeatedly applying bending stress or stretching force to the lead wires.

Stress and tensile force applied to the connection between the cable and auto switch increases the possibility of disconnection.

Fix the cable in the middle so that it is not movable in the area where it connects with the auto switch.



4. Be certain to connect the load before power is applied.

<2-wire type>

If the power is turned ON when an auto switch is not connected to a load, the auto switch will be instantly damaged because of excess current (short circuit).

It is the same as when the 2-wire brown lead wire (+, output) is directly connected to the (+) power supply terminal.

5. Do not allow short-circuit of loads.

<Reed>

If the power is turned ON with a load in a short circuited condition, the auto switch will be instantly damaged because of

6. Avoid incorrect wiring.

<Reed>

A 24 VDC auto switch with indicator light has polarity. The brown lead wire or terminal No. 1 is (+), and the blue lead wire or terminal No. 2 is (-).

[For D-97, (+) is on the no-displayed side, (-) is on the black line side.]

1) If connections are reversed, an auto switch will operate, however, the light emitting diode will not light up.

Also, take note that a current greater than that specified will damage a light emitting diode and it will no longer operate.

Applicable model:

D-A73, A73H, A73C, C73, C73C, E73A, Z73

D-R73, R73C, 97, 93A, A93, A93V

D-A33, A34, A33A, A34A, A44, A44A

D-A53, A54, B53, B54

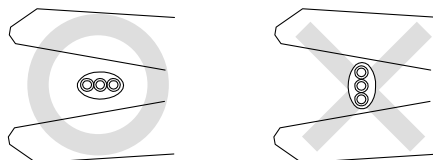
2) When using a 2-color indicator type auto switch (D-A79W, A59W and B59W), the auto switch will constantly remain ON if the connections are reversed.

<Solid state>

1) If connections are reversed on a 2-wire type auto switch, the auto switch will not be damaged if protected by a protection circuit, but the auto switch will always stay in an ON state. However, it is still necessary to avoid reversed connections, since the auto switch could be damaged by a load short circuit in this condition.

2) If connections are reversed (power supply line + and power supply line -) on a 3-wire type auto switch, the auto switch will be protected by a protection circuit. However, if the power supply line (+) is connected to the blue wire and the power supply line (-) is connected to the black wire, the auto switch will be damaged.

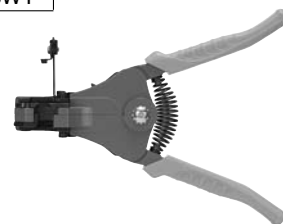
7. When the cable sheath is stripped, confirm the stripping direction. The insulator may be split or damaged depending on the direction. (D-M9□ only)



Recommended Tool

Description	Model
Wire stripper	D-M9N-SWY

* Stripper for a round cable (ø2.0) can be used for a 2-wire type cable.



LJ1

LG1

LTF

LC1

LC7

LC8

LXF

LXP

LXS

LC6□

LZ□

LC3F2

X□

D-□

E-MY



Auto Switches Precautions 4

Be sure to read this before handling.

Operating Environment

⚠ Warning

1. Never use in an atmosphere of explosive gases.

The structure of auto switches is not intended to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

Please contact SMC concerning ATEX compliant products.

⚠ Caution

1. Do not use in an area where a magnetic field is generated.

Auto switches will malfunction or magnets inside cylinders/actuators will become demagnetized. (Please consult with SMC if a magnetic field resistant auto switch can be used.)

2. Do not use in an environment where the auto switch will be continually exposed to water.

Although auto switches satisfy IEC standard IP67 construction except some models (D-A3□, A44□, G39□, K39□, RNK, RPK) do not use auto switches in applications where continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside auto switches may cause malfunction.

3. Do not use in an environment with oil or chemicals.

Please consult with SMC if auto switches will be used in an environment with coolant, cleaning solvent, various oils or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by improper insulation, malfunction due to swelling of the potting resin, or hardening of the lead wires.

4. Do not use in an environment with temperature cycles.

Please consult with SMC if auto switches are used where there are temperature cycles other than normal temperature changes, as there may be adverse effects inside the auto switches.

5. Do not use in an environment where there is excessive impact shock.

<Reed>

When excessive impact (300 m/s² or more) is applied to a reed auto switch during operation, the contact point will malfunction and generate or cut off a signal momentarily (1 ms or less). Please consult with SMC if a solid state auto switch can be used according to the environment.

6. Do not use in an area where surges are generated.

<Solid state>

When there are units (solenoid type lifter, high frequency induction furnace, motor, radio equipment etc.) which generate a large amount of surge in the area around cylinders/actuators with solid state auto switches, this may cause deterioration or damage to the auto switch's internal circuit elements. Avoid sources of surge generation and disorganized lines.

⚠ Caution

7. Avoid accumulation of iron waste or close contact with magnetic substances.

When a large amount of iron waste such as machining chips or spatter is accumulated, or a magnetic substance (something attracted by a magnet) is brought into close proximity with a cylinder with auto switches, or an actuator, it may cause the auto switch to malfunction due to a loss of the magnetic force inside the cylinder/actuator.

8. Please contact SMC concerning water resistance, elasticity of lead wires, usage at welding sites, etc.

9. Do not use in direct sunlight.

10. Do not mount the product in locations where it is exposed to radiant heat.

Maintenance

⚠ Warning

1. Removal of equipment, and supply/exhaust of compressed air

Before any machinery or equipment is removed, first ensure that the appropriate measures are in place to prevent the fall or erratic movement of driven objects and equipment, then cut off the electric power and reduce the pressure in the system to zero. Only then should you proceed with the removal of any machinery and equipment.

When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent actuators from moving suddenly.

⚠ Caution

1. Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.

1) Secure and tighten auto switch mounting screws.

If screws become loose or the mounting position is dislocated, retighten them after readjusting the mounting position.

2) Confirm that there is no damage to lead wires.

To prevent faulty insulation, replace auto switches or repair lead wires, etc., if damage is discovered.

3) Confirm the display of the green light on the 2-color display auto switch.

Confirm that the piston stops at the center of the operating range (the green LED is on). If the red LED is on, the mounting position is not appropriate.

Readjust to the center of the operating range. Also there are some cylinders or actuators with individual setting methods for auto switches. If so, mount it in accordance with the indicated method.