

Enclosed Limit Switches

User's Manual

Read this User's Manual and Specifications, and use within the ranges indicated in the specifications to ensure safe and correct use of this product.

RESTRICTIONS ON USE

This product has been designed, developed and manufactured for general-purpose application in machinery and equipment.

Accordingly, when used in applications outlined below, special care should be taken to implement a fail-safe and/or redundant design concept as well as a periodic maintenance program.

- Safety devices for plant worker protection
- Start/stop control devices for transportation and material handling machines
- Aeronautical/aerospace machines
- Control devices for nuclear reactors

Never use this product in applications where human safety may be put at risk.

WARNING

- Be sure to turn the power supply of the equipment OFF before wiring the limit switch. Failure to do so might result in electrical shock depending on power supply voltage or involved in unsafe condition such as unintentional machine start.

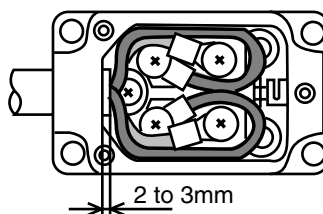
CAUTION

- Take sufficient safety measures such as the provision of an interlock circuit in the control circuit to prevent mechanical damage or injury in the event that the limit switch malfunctions.
- If the cover or the outer housing of the limit switch becomes depressed or cracked, replace the limit switch immediately.
Failure to do so might result in loss of seal performance or operating characteristics.
- Firmly tighten the cover and conduit. Insufficient tightening not only impairs the sealing performance and insulation, but also switching performance.
- Never use or leave the limit switch unattended with the cover or conduit open.
Doing so might allow ingress of water or dust, resulting in defective operation.
- Do not apply excessive force to the actuator beyond the operating limits.
Doing so might damage the switch.

1. Wiring

CAUTION

- Wire the limit switch using crimp terminals with insulation sleeve so as not to contact the cover and housing. If the crimped terminals contact the cover, the cover sometimes can no longer be attached, or a short-circuit might result.
- When assemble the cover with indicator, pay special attention not to bend the contact springs excessively. Otherwise, this may result in short-circuit or ground fault.
- Tighten the compression nut so that the cable sheath protrude 2 to 3mm from the edge of connector or inner surface of housing as shown bellow.
- Do not use silicon rubber cable, silicon adhesive or grease that contains silicon. Using such items might impair electrical continuity.
- Wire the switch as shown in the figure below. (This figure is for the LS series.)



2. Installation

CAUTION

- Tighten the screws according to the tightening torques indicated in the product specifications. Take care not to over-tighten the screws. Over-tightening may strip threads and damage other parts. Also, under-tightening may impair performance such as the sealability of switches and other characteristics.
- When the limit switch is used in locations where it is subject to water, oil, dust or chips, it may allow ingress of them through conduit switch via the conduit. For this reason, take measures such as covering the switch after installation until wiring is completed. Be sure to use seal connectors that are compatible with the cable size when wiring.

Typical Tightening Torques

Item \ Series	LS	14CE	SL1
Housing (front mounting screw)	M5 5 to 6 N•m	M5 5 to 6 N•m	M4 1.3 to 1.7 N•m
Housing (rear mounting screw)	M6 5 to 6 N•m	-	M4nut 4 to 6 N•m **
Cover	M4 1.3 to 1.7 N•m	-	-
Head	M3.5 0.8 to 1.2 N•m	M3.5 0.8 to 1.2 N•m *	-
Switch terminal	M4 1.0 to 1.4 N•m	-	M3 0.4 to 0.6 N•m
Lever (roller lever)	M5 4 to 5.2 N•m	M5 4 to 5.2 N•m	-

* Applicable only to 14CE. ** Attachment of nut on SL1 plunger type - None

3. Adjustment, Maintenance & Inspection

CAUTION

- Set overtravel (OT) between 70 to 100% of the stipulated characteristic value. If OT is set too small, vibrations or impact may result in chattering of contact or contact failure.
- Prevents dogs from touching the lever. Failure to do so might result in the operating shaft deforming or faulty switch resetting.

4. Treating Conduits (Switches Not Provided With Cable)

CAUTION

- Use seal connectors (PA1 series, to be ordered separately) or flexible piping (PA3 series, to be ordered separately) that ensure a sealing performance equivalent to or higher than IP67 for the conduits.
- Select connectors that match the outer diameter of the cable in use.
- Tighten connectors with a tightening torque of 8 to 12N•m.
- Turn the connector compression nut 1.5 or 2 turns further after the cable feels firmly tightened.

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Specifications are subject to change without notice. (08)

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