

INSTRUCTION MANUAL

Surge protective device (SPD)

Type LD-C22EFS

OTOWA
OTOWA ELECTRIC Co., Ltd.

Please read the instructions before installing the product, as this installation manual explains how to use the SPD effectively and safely.

The SPD conforms to the lightning current test specified in class I of IEC61643-1. Please confirm the detailed specification, size, etc. using the brochure or data sheet.

⚠ Safety instruction

● Instruction for use

- Since lightning is a natural phenomenon, in the event of a direct lightning strike exceeding the specification, SPD may break and not protect the equipment connected.
- The SPD should be installed in a grounded metal enclosure (Ex : metal distribution board).
- Do not install the SPD on circuits where it is subjected to voltages above the specified Maximum Continuous Operating Voltage U_c (AC250V).

Do not use the SPD above the peak value at $354 (250 \times \sqrt{2})$ V, if the voltage has incomplete wave shapes.

- Application temperature : $-40^\circ\text{C} \sim +60^\circ\text{C}$

Do not expose the SPD to high temperatures such as direct sunshine and adjacent to hot objects and so on.

- Do not expose the SPD to adverse environmental conditions such as acid, alkali, corrosive object, solvent, cutting oil, grease, dust, and salt.
 - Handle the SPD carefully to prevent mechanical shock (e.g. drop) or vibration, as this may cause cracking of its plastic housing.
- In the unlikely event of failure of the SPD or if there is an operation of the ELCB.
- Immediately contact the relevant authorized personnel but do **NOT** touch the live part and abnormal part of the SPD, ELCB and so on.
 - Authorized personnel should follow "Regular maintenance" on back side.

■ Circuit of SPD

The SPD should be installed as shown in below circuit. And also install a Molded Case Circuit Breaker (MCCB) for the inspection of the SPD (Recommended MCCB: above 225A for both frame and rated current) on the electric input side of the SPD. However, if there are any requests from the customer, please follow them.

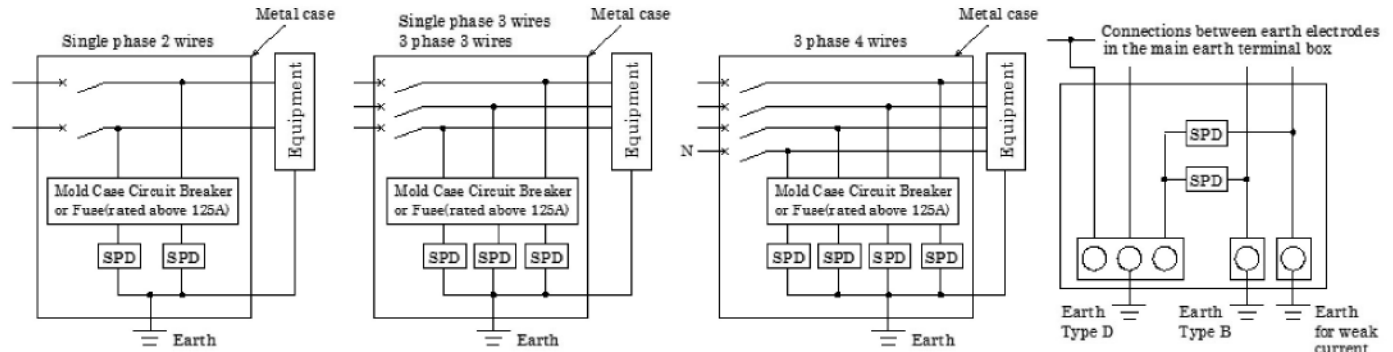
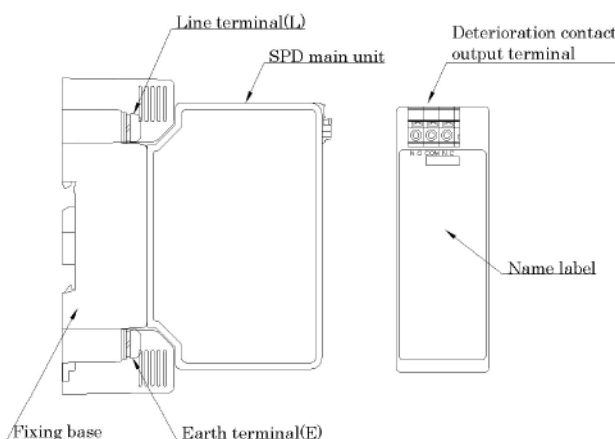
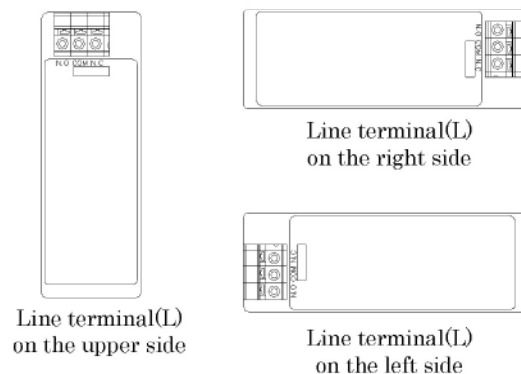


Fig.1 Circuit of the SPD

■ Part name



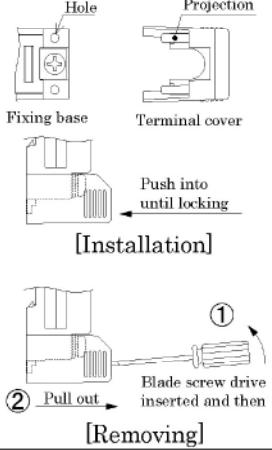
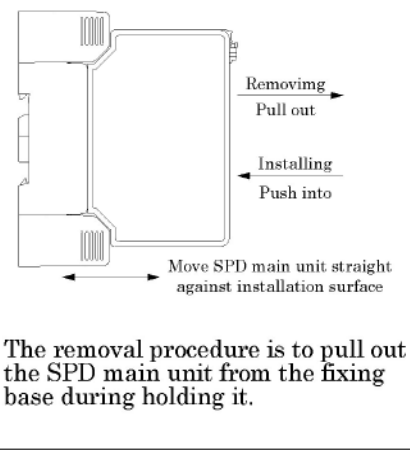
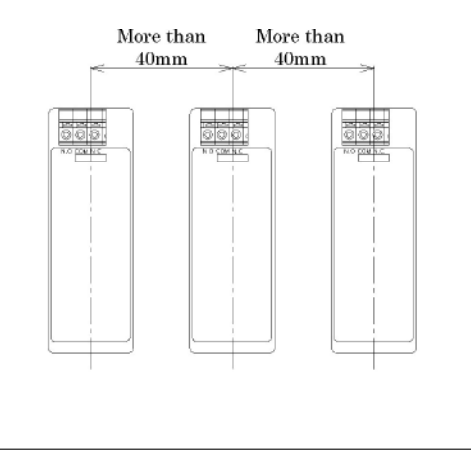
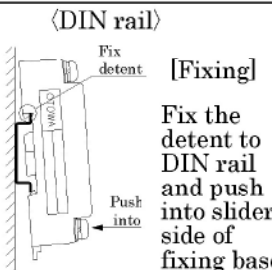
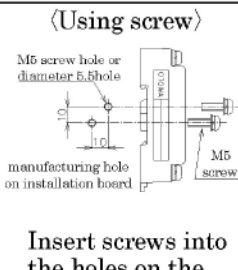
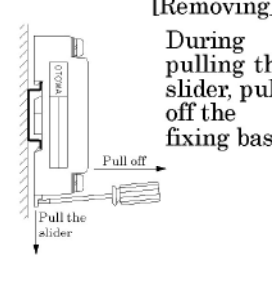
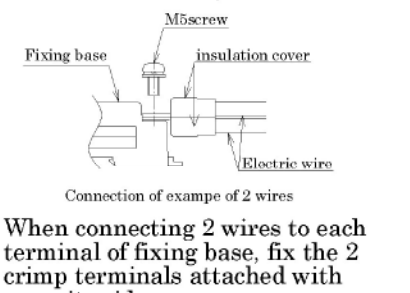
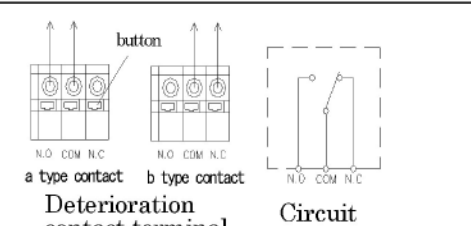
■ Note of installation



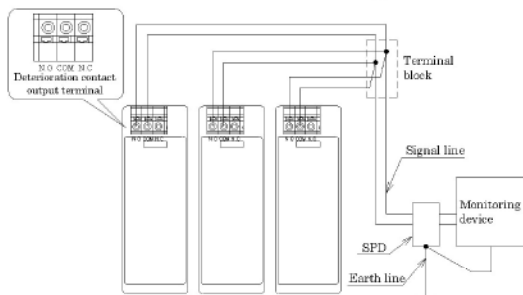
SPD should normally be installed to vertical surface. When SPD is installed to horizontal surface, name label should be on the upper side.

When the distribution board which the SPDs are installed in is transported, fix the SPD main units not to fall off it from the fixing base

■Installation method

Removing and installing the terminal cover	Removing and installing SPD main unit	Spacing of SPDs
 <p>Push the two projections of the terminal cover into the two holes provided on the both side of the terminal of the fixing base.</p> <p>Insert a flat blade screwdriver into the hole and tilt the driver towards to the center of the fixing base. Pull out the cover while tilting the driver.</p>	 <p>The removal procedure is to pull out the SPD main unit from the fixing base during holding it.</p>	 <p>More than 40mm</p> <p>More than 40mm</p>
<p>Installing the fixing base</p> <p>⟨DIN rail⟩  <p>Fix the detent to DIN rail and push into slider side of fixing base</p> <p>⟨Using screw⟩  <p>Insert screws into the holes on the installation board and tighten. (Torque: 2.0~2.5N·m) Wipe off the cutting oil and grease cleanly. (They make plastics deteriorated.)</p> <p>[Removing]  <p>During pulling the slider, pull off the fixing base</p> </p></p></p>	<p>Connect lead wire</p> <p>Connect the lead wire using crimp terminals (provided with insulation cover) (Torque : 2.0~2.5N·m) Use insulation wire with 8~22mm² and keep the wire for connection as short as possible.</p> <p>If use the wire with 22mm², use the small type crimp terminals.</p> <p>JST connector : Model No. 22-S5, 22-5NS, CB22-S5 NICHIFU : Model No. R22-5S, CB22-5S</p>  <p>Connection of example of 2 wires</p> <p>When connecting 2 wires to each terminal of fixing base, fix the 2 crimp terminals attached with opposite side.</p>	<p>Connect to deterioration contact terminal</p>  <p>Deterioration contact terminal</p> <p>Circuit</p> <ul style="list-style-type: none"> • Insert or remove the electric wire during pushing the button. (Electric wire : Rigid $\phi 0.4 \sim \phi 1.2\text{mm}$, or stranded $0.75 \sim 1.25\text{mm}^2$/ Diameter of core wire above 0.18mm, length of core wire 11mm) • Insert the electric wire until the end, and confirm it not to be out from the terminal block. • Maximum rated AC250V 0.5A DC125V 0.2A • When use a stick type crimp terminal, use below model crimp terminal. NICHIFU : Model No. TC 1.25-16S, TMEV TC-1.25-16S, TMEN TC-1.25-16S

■Protection of monitoring device



Installation method for monitoring device (Example of "a" type)

Installation example is shown in above diagram. If monitoring device is far from the SPDs, install the SPD adjacent to the monitoring device to protect it from the lightning surge that invades from signal line.

Recommended SPD for protecting monitoring device

Voltage on signal line	Applied SPD
AC100V	LT-121
AC200V	LT-122
DC12V	SL-GV12J
DC24V	SL-GV24J
DC48V	SL-GV48J
DC100V	LT-121

■Regular maintenance

During the lightning season and after lightning strikes, maintain the SPD as follows.

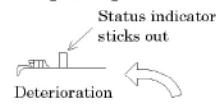
Before maintenance, switch off the isolating switch for inspection (or Earth Leakage Current Breaker (ELCB)) on the electric input side of the SPD.

⟨ Pass criteria for SPD ⟩

Replace the SPD main unit if the SPD is under follow condition. (If the fixing base has also changed color or shape, replace the fixing base.)

○Appearance check

- The plastic housing has changed color or shape.
- Status indicator sticks out. (After status indicator sticks out, the SPD cannot be reused.)



○Leakage current check

- Earth Leakage Circuit Breaker (ELCB) has operated any times. (After replacing SPD, confirm the ELCB has no operation.)

○Measurement of insulation resistance

- After removing the SPD main unit from the fixing base, measure the insulation resistance of the SPD main unit and it is not subjected to the value shown in below table.

	Insulation resistance
250V insulation tester	Above 10M Ω
500V insulation tester	Below 10M Ω

It is recommended that the SPD should be replaced about every 15 years, though the condition of the SPD is determined during regular maintenance. (15 years is the nominal life of the parts, but cannot be guaranteed, due to the differences in service conditions.)

Contact points

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