

## Instruction manual

Product name : Lightning recorder

Type : OLR-31

OTOWA ELECTRIC CO.,LTD.

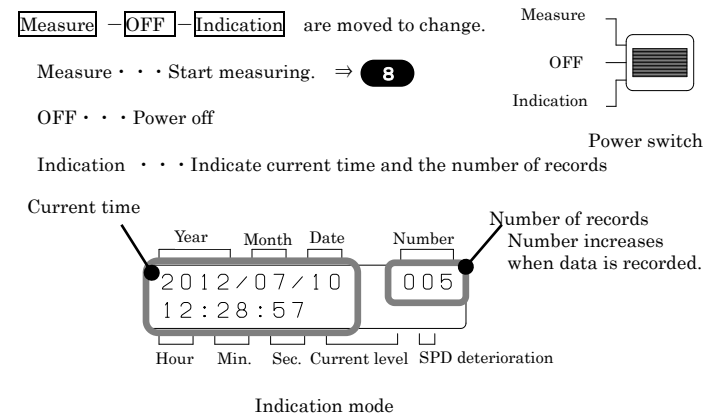
### 1 Safety instruction

- Installation place
  - Indoor use only. Do not use the recorder outside or in the place where it is splashed with water.
  - Do not expose the recorder to dust.
  - Handle the recorder carefully to prevent mechanical shock or drop.
- About the recorder
  - The recorder may break when large lightning current that exceeds value described in the specification flows through CT.
  - Do not dismantle or remodel the recorder.
  - Do not use another CT except attached CT.
  - Insulate CT from a wire. When using bare wire, wind an insulation tape and so on to bare wire to insulate CT.
  - Do not insert another battery into the recorder except AAA battery.
  - DC 5V is applied to output terminal of SPD deterioration when the power switch is moved to measure mode or indication mode.
- Instruction for installation
  - Install the main part of the recorder far from power wires or another wires as much as possible to protect against malfunction by switching surge or noise.
  - Do not tie CT wires or wires connected to input or output contact up with another wires such as power wires and so on to protect against malfunction by switching surge or noise.
  - Power off the switch when connecting wires or replacing batteries.
  - Take care for around the recorder or live part when operating its main part.
  - Confirm the watch setting after replacing the batteries.
- Instruction for operation
  - Move the power switch slowly. Push the button slowly.
  - Power off the switch during inserting or removing the SD memory card.
  - Do not change the data written in the SD memory card by PC and so on.
  - Do not change the format of the SD memory card.
  - If using another SD memory card except attached it, use it with 2GB size. (Recommended manufacturer : Panasonic, Toshiba, SanDisk)
  - If keeping indication mode for a long time, battery power decreases faster.
- Others
  - The recorder has internal calendar until 2099 (including leap year)
  - When replacing batteries, watch indication letters might be corrupted. Set the correct watch by watch setting.

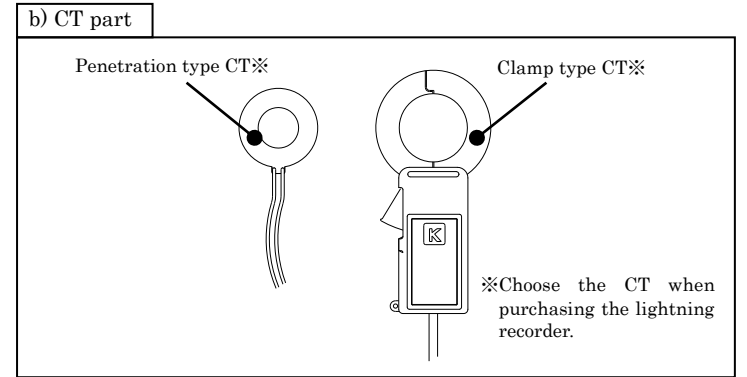
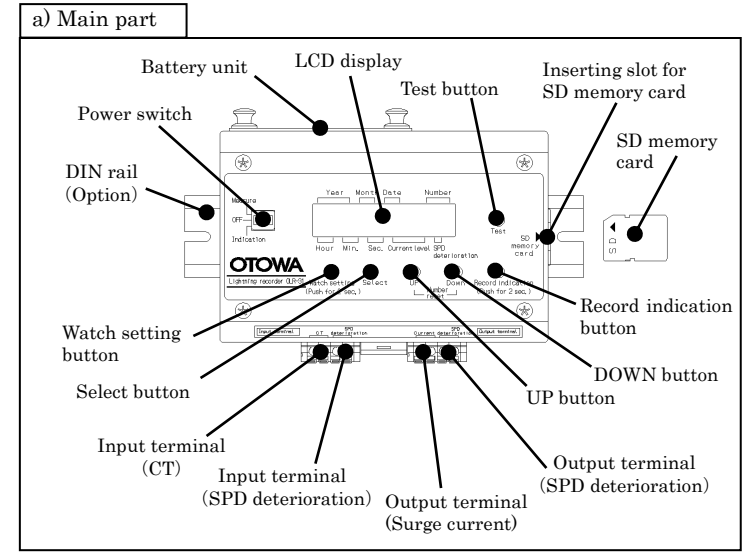
### 2 Operation

- The recorder records the surge current level such as 100A, 500A, and 1000A by CT and their time to the SD memory card and output terminal (Surge current) operates as normal open contact for 1 sec.
- After connecting its input terminal (SPD deterioration) to a deterioration contact terminal of SPD, the time when the deterioration contact terminal of SPD operates is recorded to the SD memory card and its output terminal (SPD deterioration) operates as normal open contact for 1 sec.
- The recorder can indicate the data recorded in the SD memory card on its main part. ⇒ **10**
- The data recorded in the SD memory card can be shown by PC. ⇒ **12**

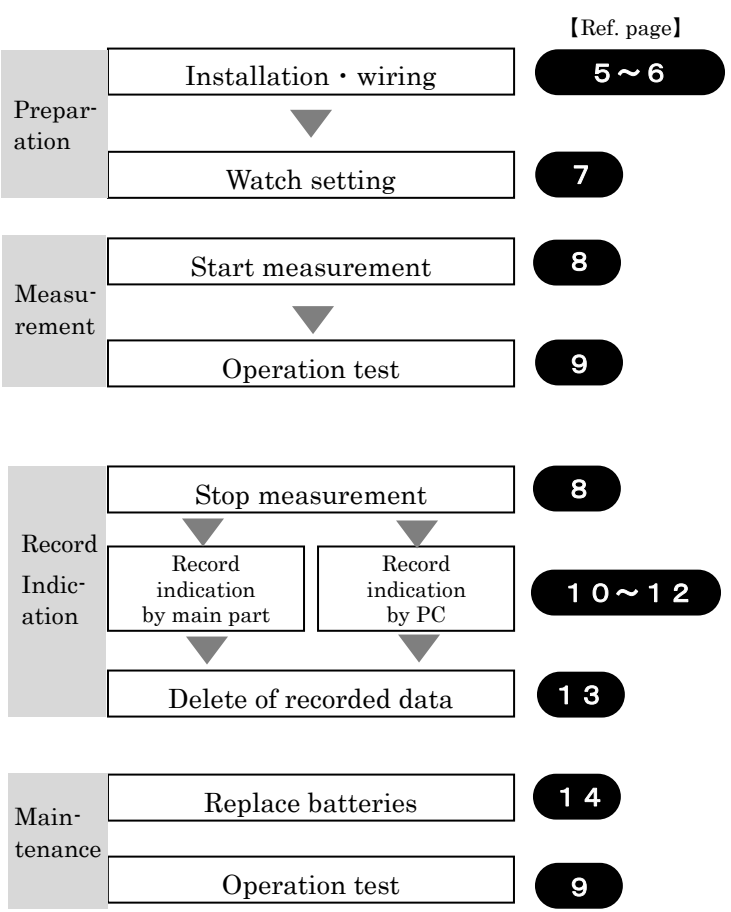
#### Power switch



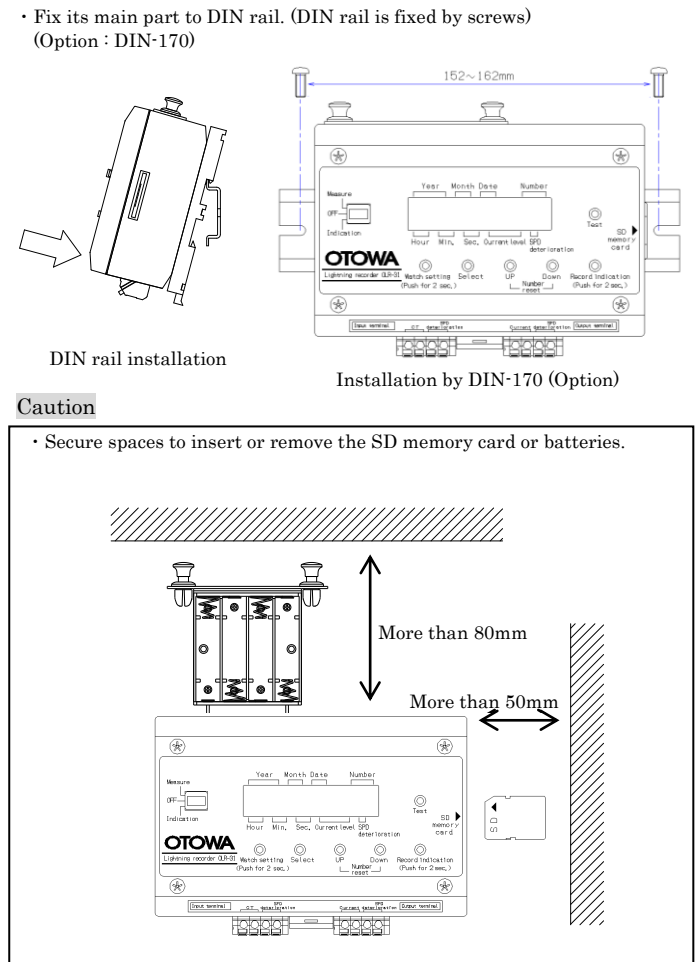
### 3 Name of each part



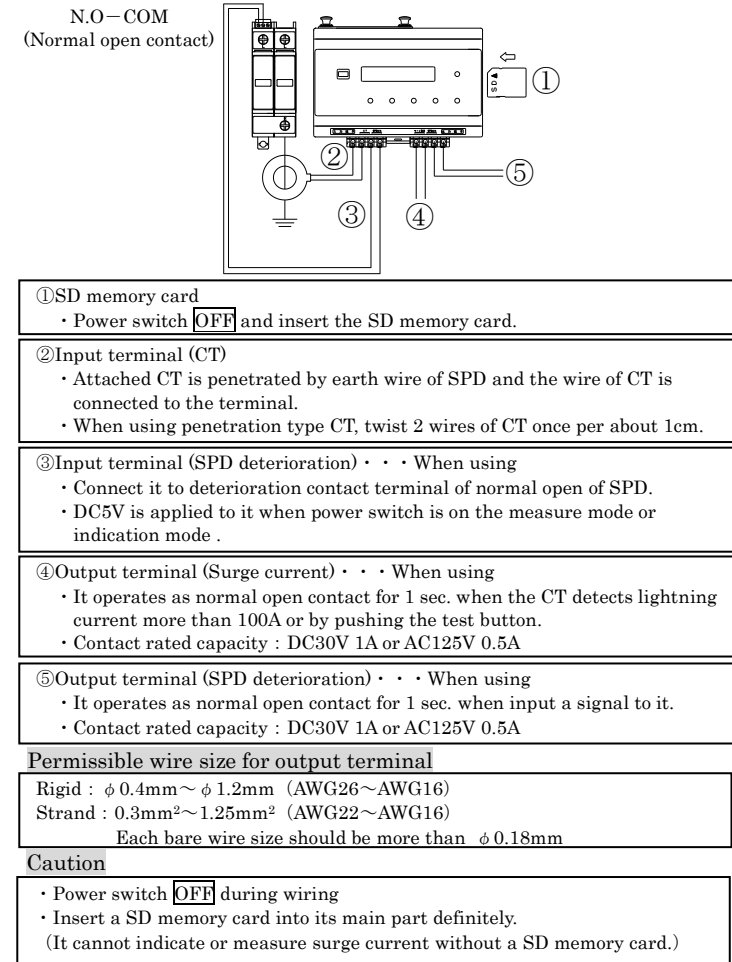
### 4 Operation flow



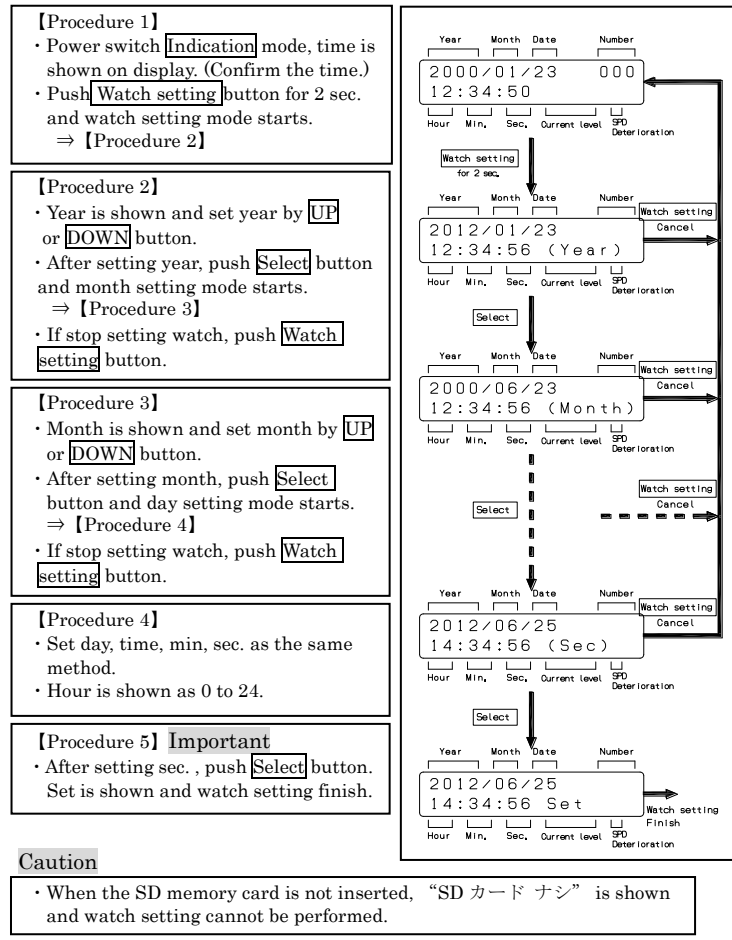
### 5 Installation



### 6 Wiring



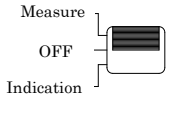
### 7 Watch setting



## 8 Start and stop measurement

**1. Start measurement**

- Power switch **Measure** mode, it starts measuring.
- During measurement, display turns off.
- When detecting surge current or operation of deterioration contact terminal of SPD, data is recorded in the SD memory card.
- After recording, when power switch **Indication**, it is confirmed that the number is increased.



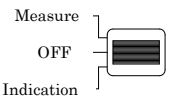
**Recommendation**

- It is recommended that operation test should be performed by pushing the test button to confirm the battery power or the SD memory card is inserted normally.

⇒ **9**

**2. Stop measurement**

- Power switch **OFF**, stop measuring.
- When power switch **OFF**, the recorded data are remained.



### Caution

- Do not insert the SD memory card with LOCK mode (prohibited record).
- Do not insert the SD memory card with change of its format.

## 12 Record indication by PC

- The recorded data are saved as text data in the SD memory card.
- When the data in the SD memory card is shown on PC, it can be shown by "memo pad".

**【Procedure 1】**

- Power switch **OFF** and pull out the SD memory card from its main part.

**【Procedure 2】**

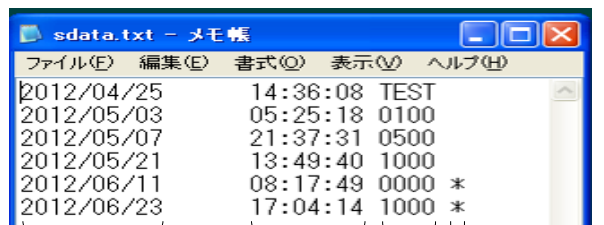
- Open the file "sdata.txt" in the SD memory card.

**【Procedure 3】**

- Recorded data are shown.
- When saving them in the PC, click "file" → "save a file with new name".



**【Example of record indication by PC】**



Annotations:

- Year/Month/Date
- Hour : Min. : Sec.
- Current level or operation test record
- Operation of SPD deterioration contact

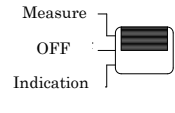
• Half-width space 6 times between "Year/Month/Date" and "Hour : Min. : Sec."

• Half-width space each "Hour : Min. : Sec.", "Surge current level" and "Operation of SPD deterioration contact".

## 9 Operation test

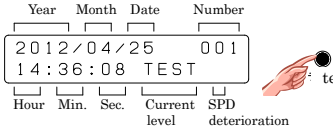
**【Procedure 1】**

- Move the power switch to **Measure**.



**【Procedure 2】**

- Push **Test** button.
- Display is turned on and TEST is shown. The number is increased.



**【Procedure 3】**

- Output terminal of lightning current operates as normal open contact for 1 sec. Output terminal of SPD deterioration does not operate.
- Recorded data of operation test is also recorded in the SD memory card.

**【Procedure 3】**

- Confirm the recorded data by operation test. ⇒ **10**

## 10 Confirmation of recording data

**【Procedure 1】**

- Power switch **Indication** mode, time is shown on the display and the number is shown on its upper right.

**【Procedure 2】**

- When pushing **Record indication** button for 2 sec, the oldest data recorded in the SD memory card is shown.

**【Procedure 3】**

- When pushing **Record indication** button per once, the older data in the SD memory card is shown in order.
- If pushing **Record indication** button for few sec., these data are shown continuously.

**【Procedure 4】**

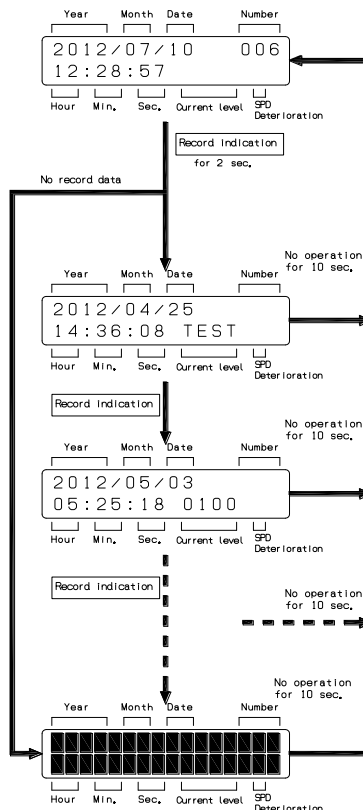
- When pushing **Record indication** button during the newest data is shown or there are no data, display becomes black and go back to watch indication in 10 sec.

**【Procedure 5】**

- When going back to watch indication, wait for 10 sec. or move power switch to **OFF**.

**【Procedure 6】**

- When pushing **UP** and **DOWN** buttons at the same time during indication mode, the number becomes 0.



### Caution

- If the number becomes 0, the data in the SD memory card cannot be deleted. If making the number become 0 in this maintenance, it can be confirmed that new data are recorded by checking in next maintenance.
- Deleting method of the recorded data in the SD memory card ⇒ **13**

## 11 Example of record indication

Recorded year, month and date

Recorded lightning current level

Recorded hour, min. and sec.

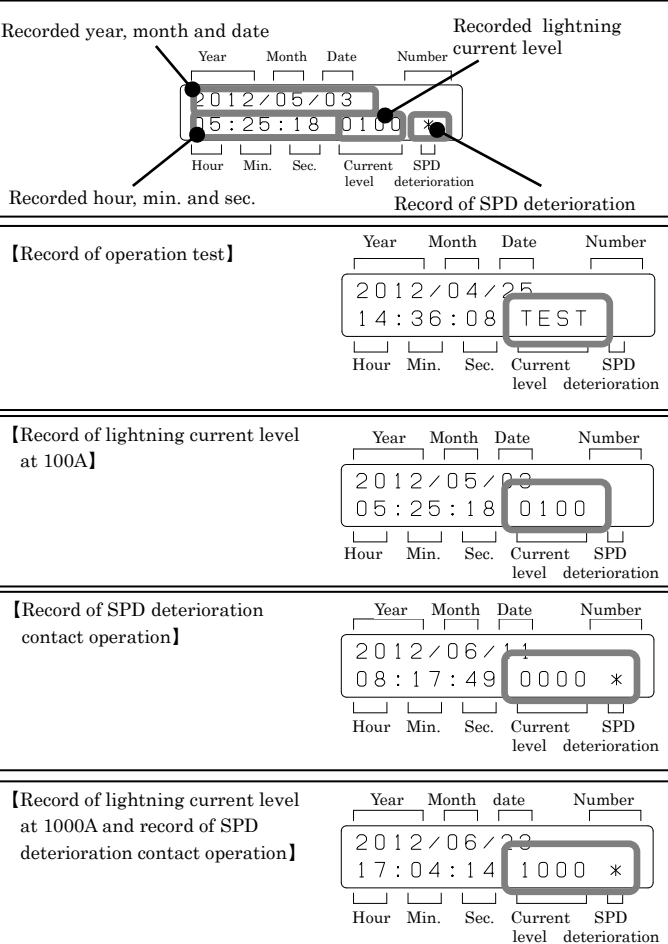
Record of SPD deterioration

**【Record of operation test】**

**【Record of lightning current level at 100A】**

**【Record of SPD deterioration contact operation】**

**【Record of lightning current level at 1000A and record of SPD deterioration contact operation】**



## 13 Delete of recorded data

1. Delete "sdata.txt" by PC if recorded data are deleted.

**Important**

The main part of lightning recorder cannot delete recorded data.

2. If "sdata.txt" in the SD memory card is not delete and it is inserted into the lightning recorder, new data are recorded follow the recorded data

3. After deleting "sdata.txt" and the SD memory card is inserted into the lightning recorder, new "sdata.txt" file is made automatically when new data by operation test or detecting of lightning current are recorded.

4. If pushing **UP** and **DOWN** button at the same time in the indication mode and the current time and the number are shown, the number of lightning recorder becomes 0.

5. If the number of lightning recorder shows 999, it cannot record the data in the SD memory card when detecting lightning current or operation of SPD deterioration contact. It can record the data more than 999 times in the SD memory card when the number of lightning recorder is reset to 0.

### Caution

- Do not change the record data in the SD memory card and do not insert it into the lightning recorder.

## 14 Replace batteries

**【Procedure 1】 Power switch off**

- Move the power switch to **OFF**.

**【Procedure 2】 Release of latch**

- Remove the latches by pulling 2 handles of battery unit.

**【Procedure 3】 Removal of battery unit**

- Pull out the battery holder slowly from its main part. Do not pull it strongly because the wires are connected.

**【Procedure 4】 Insert batteries**

- Insert batteries into battery holder with correct polarity. (AAA alkali battery 4 pieces)

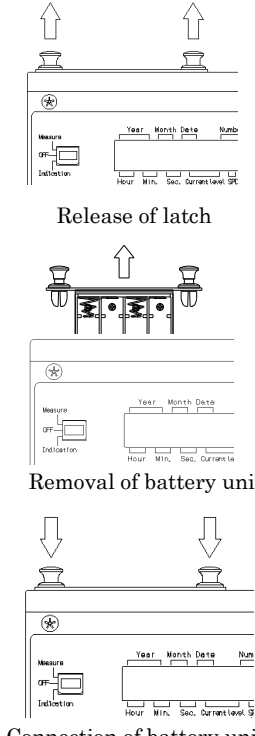
**【Procedure 5】 Connection of battery unit**

- Push the battery unit into its main part not to pinch the wires. Push down the latches and fix it.

**【Procedure 6】 Watch setting**

**Important**

- After replacing the batteries, perform the watch setting again.



### Caution

- Use alkali AAA battery absolutely.
- After confirmation of power switch **OFF**, replace the battery.
- Take care of live parts around the lightning recorder when replacing the battery.

## 15 Relation between test operation, input and output terminal, and record

Operation	Input terminal		Output terminal		Record			
	TEST	CT	SPD deterioration	CT	SPD deterioration	Number	Current level	SPD deterioration
ON	—	—	Output	—	Count	TEST	—	—
ON	—	Input remains	Output	—	Count	TEST	*	—
—	—	Input	—	Output	Count	Current level	—	—
—	—	Input at the same time	Output	Output	Count	Current level	*	*
—	Input	Input remains	Output	—	Count	Current level	*	*

**■Contact** (Handling store or OTOWA)

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