



**SUNNY**  
LIGHT FOR LIFE

# USER MANUAL

## Central Battery Systems | INV 220V Series



### Features

Central Battery Systems by Inverter 220V is used to detect any abnormalities of the main power distribution system. In case of error or emergency, the unit will convert the battery voltage stored in the chemical form into the electric power and supply it to the inverter where the DC voltage from the battery will be converted into the AC voltage at 220VAC 50Hz to turn on the emergency light. On the other hand, when the main power distribution system resumes its normal operation, the unit will stop supplying the backup power and start recharging the battery for later use in case of another error or for the emergency light test.

**Remark :** Central Battery Systems by Inverter 220V Series has 2 function modes of operation.

1. **MAINTAINED** (Providing lighting constantly throughout the period when the AC line lights are in the normal status and when the AC Line lights are off.)
2. **NON-MAINTAINED** (Providing emergency lighting only when the AC line lights are off.)

## Technical Specifications

Model		INV220 Series										
Rated Capacity (Wattage)		200	300	400	500	700	1000	1200	1500	2000	2500	3000
Mode of Operations		Maintained and Non-Maintained										
Input	Voltage	220Vac ± 10%										
	Frequency	50Hz										
Output	Voltage	AC220V ± 2% ( Battery Mode )										
	Frequency	50Hz ± 1% ( Battery Mode )										
Output wave form		Puer Sine Wave										
Terminal Output		2 Output										
Maximum Power Load @ PF=1 (Wattage)		200	300	400	500	700	1000	1200	1500	2000	2500	3000
Efficiency		>80%										
Battery Type		Sealed Lead - Acid Battery										
Battery Rated Voltage		24V					48V					
Protections		- Overload & Short circuit - Battery Low voltage cut - off - AC Input Low Voltage Protections										
Operate of Temperature		+ 10°C To + 40°C										
Size L x W x H ( mm )		440x230x660		600x250x810		640x250x970		620x400x1200		620x600x1200		800x600x1500

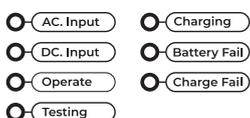
## Indicators



AC.VOLTMETER



DC.VOLTMETER

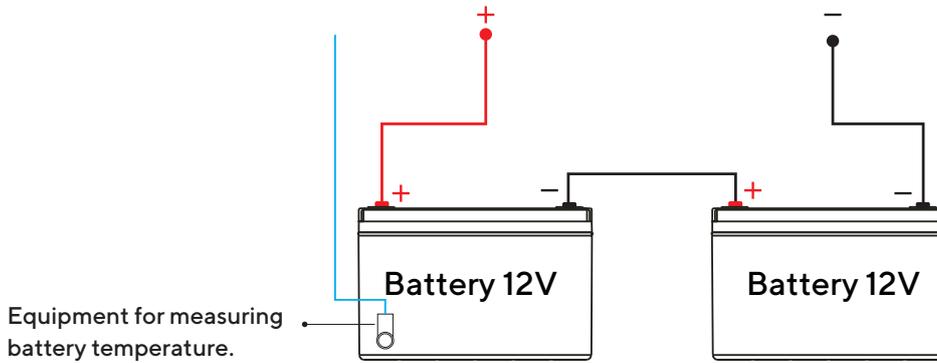


- AC.VOLTMETER ▶ Indicating the input voltage.
- DC.VOLTMETER ▶ Indicating the battery voltage.
- LED AC.Input ▶ Indicating the status of the input voltage of 220 Vac.
- LED DC.Input ▶ Indicating the status of the battery power into the device.
- LED Operate ▶ Indicating the operation status of the inverter unit.
- LED Testing ▶ Indicating automatic battery discharge status.
- LED Charging ▶ Indicating charging status.
- LED Battery Fail ▶ Indicating the failure status of the battery.
- LED Charge Fail ▶ Indicating the failure status of the battery charging.

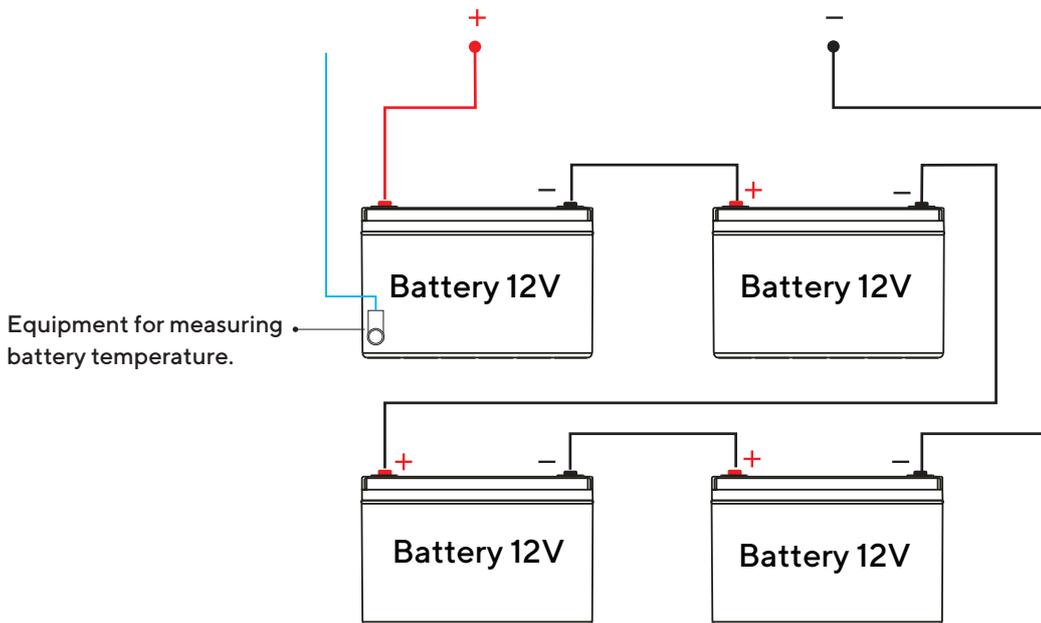
## Installation and Operation

Since the inverter operates at a voltage of 24 Volts and 48 Volts, for maximum efficiency the batteries are connected together to increase its voltage from 12 Volts to 24 and 48 Volts as shown in the diagram connecting the battery with the battery in the box connecting the positive (+) and negative (-) cables correctly.

### Transforming 12 Volt batteries into 24 Volt batteries



### Transforming 12 Volt batteries into 48 Volt batteries



**Caution:** After installation, attach the battery temperature measurement equipment to the front of one of the batteries.

## Things to look out for when connecting the batteries

1. Set all the breakers to Off prior to connecting the batteries.
2. Connect the cables to the correct battery terminal following the wiring diagram.
3. Do not short-circuit the battery terminals.
4. Check the Voltage of the battery after the connection to make sure if it is the desired 24 Volts or 48 Volts.

## Steps for connecting the Input and Output

1. Test the readiness of the output load, for example, check for any short-circuits or if the total wattage exceeds the acceptable load.

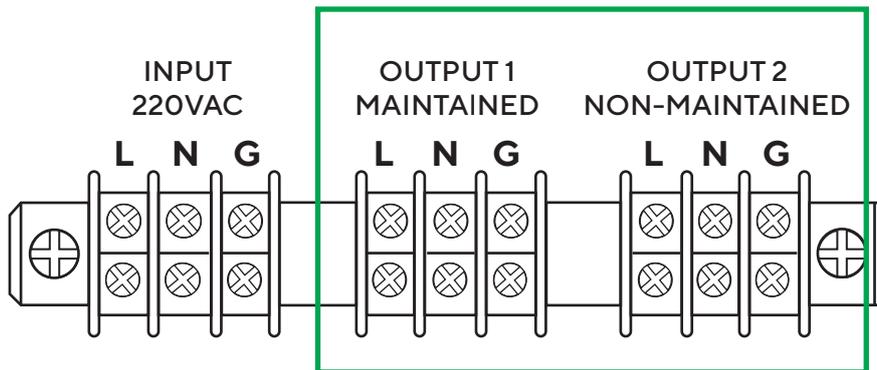
**Caution:** The Output Line and Neutral circuit should be independent from other circuits otherwise damage could occur to the inverter.

2. When connecting to the Load Output in the circuit box there will be 2 outputs to choose from, which are

1. Output Maintained. This connection will provide a constant 220Vac 50Hz current. This is suitable for uses that requires a constant current both during normal conditions and during power outages, for example, providing power for emergency exit signs without a built-in battery or lights that need to be constantly on such as lights installed in fire escapes or in parking lots.
2. Output Non-Maintained. This connection will not provide a 220Vac 50Hz during normal conditions. The connection will only provide power during power outages. This connection is suitable for things such as emergency illumination lamps.

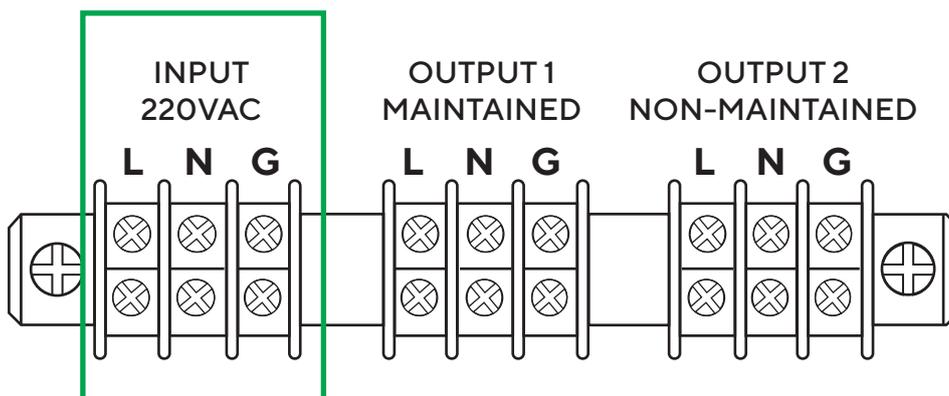
**Caution:** For the correct connection the Line should be connected into L, Neutral should be connected to N and Ground should be connected to G. The cables should be connected securely and no foreign objects should be in the circuit box that could potentially cause a short-circuit.

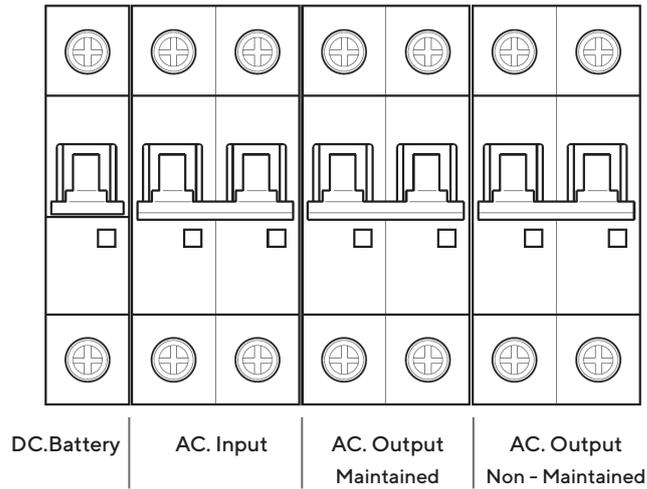
Diagram showing how to correctly connect cables to the output terminal



3. Connect the Input cables to the Input 220VAC terminal inside the green frame inside the circuit box. The Line cable should be connected to the L terminal, the Neutral cable to the N terminal and the Ground cable to the G terminal. The cables should be connected securely and no foreign objects should be in the circuit box that could potentially cause a short-circuit.

Figure showing how to correctly connect cables to the input terminal





## Installation and Operation

1. Set the Breaker DC. Battery to On (shown in the red marking), the inverter will start operation but will not yet provide power to the Output since the Breaker AC. Output is still off. The indicators at the front of the unit should, however, indicate the following.

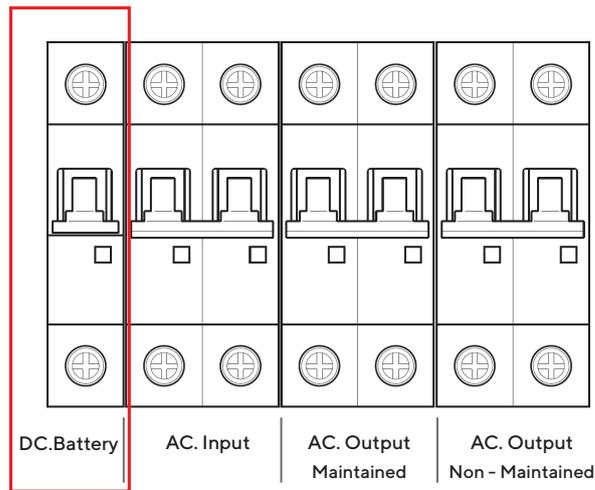


Figure showing the indications at the front of the unit



AC.VOLTMETER



DC.VOLTMETER

- AC. Input
- DC. Input
- Operate
- Testing
- Charging
- Battery Fail
- Charge Fail

**AC.VOLTMETER** ► Shows the current level at the Input to be about 220VAC.

**DC.VOLTMETER** ► Shows a battery Voltage at 24 or 48 Volts.

**LED DC.Input** ► The indicator showing that the battery has been connected to the unit should be on.

**LED Operate** ► The indicator showing that the inverter is operational should be on.

**Caution:** The DC Voltage Meter will change according to the Voltage of the battery being used, for example, 24 Volts or 48 Volts.

2. Set the Breaker AC.Output to ON (shown in the red marking), the unit should now be providing power to the load.

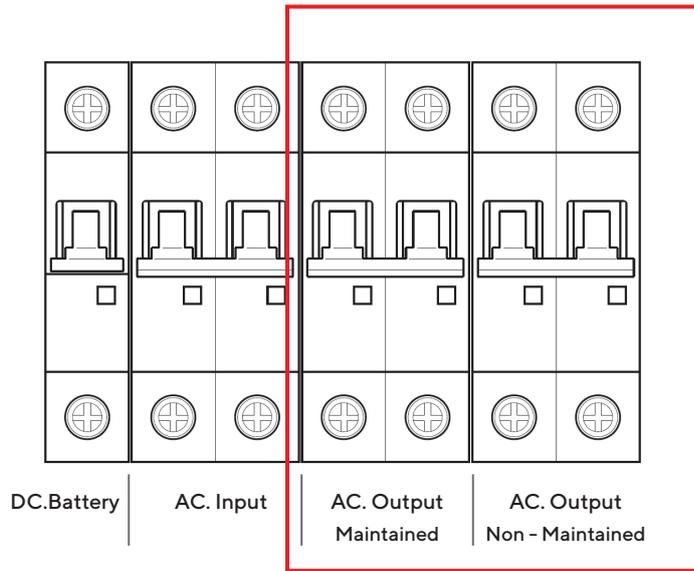


Figure showing the indications at the front of the unit



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DC.VOLTMETER

- AC. Input
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**AC.VOLTMETER** ► Shows the current level at the Input to be about 220VAC.

**DC.VOLTMETER** ► Shows a battery Voltage at 24 or 48 Volts.

**LED DC.Input** ► The indicator showing that the battery has been connected to the unit should be on.

**LED Operate** ► The indicator showing that the inverter is operational should be on.

**Caution:** The DC Voltage Meter will change according to the Voltage of the battery being used, for example, 24 Volts or 48 Volts.

3. Test to see if the overall current level and load stability is at a normal level.
4. Set the Breaker AC.Input to ON (shown in the red marking), after about 5 seconds the unit should stop using the inverter and use the main power supply to provide power instead.

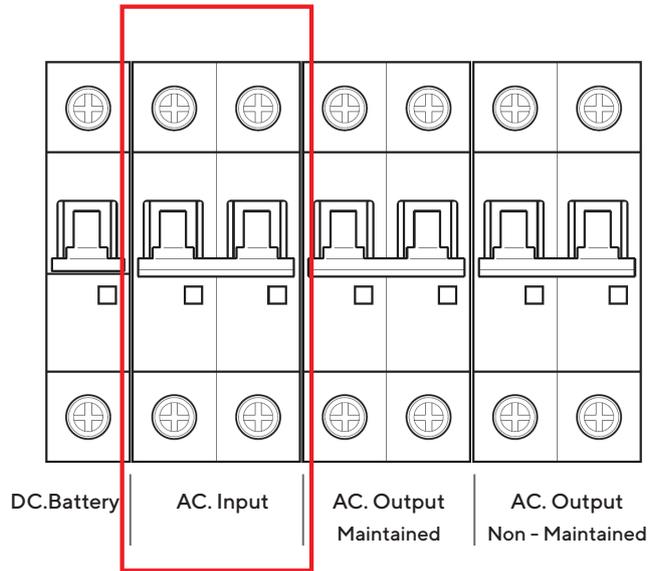


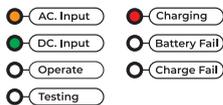
Figure showing the indications at the front of the unit



AC.VOLTMETER



DC.VOLTMETER



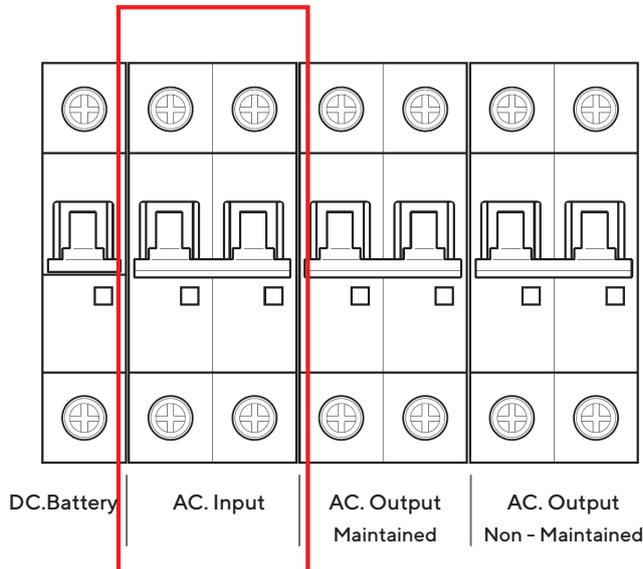
- AC.VOLTMETER** ► Shows the current level at the Output to be about 220VAC.
- DC.VOLTMETER** ► Shows a battery Voltage at 24VDC or 48 VDC.
- LED AC.Input** ► The indicator showing that the unit is receiving a 220VAC current should be on.
- LED DC.Input** ► The indicator showing that the battery has been connected to the unit should be on.
- LED Charging** ► The indicator showing that the battery is charging should be on. If the battery is full, however, the indicator will be off.

**Caution:** The DC Voltage Meter will change according to the Voltage of the battery being used, for example, 24 Volts or 48 Volts.

5. The unit will be in Standby mode ready to provide emergency power during power outages.

## Testing the unit's operability

- To test the unit, the user can set the Circuit Breaker AC Input 220VAC to OFF (shown in the red markings), the unit should start providing backup power to the emergency lights immediately.



- To stop the test, the user can set the Circuit Breaker AC Input 220 VAC back to ON. The inverter should stop operating and the unit should return to standby mode.
- The unit has a built-in self-testing system that will perform 30 minutes self-tests every 30 days. This self-test system should start working once a current from a battery or AC. Input is provided to the unit.

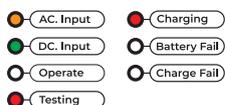
Figure showing the indications at the front of the unit



AC.VOLTMETER



DC.VOLTMETER



- AC.VOLTMETER** ▶ Shows the current level at the Input to be about 220VAC.
- DC.VOLTMETER** ▶ Shows a battery Voltage at 24 or 48 Volts.
- LED AC.Input** ▶ The indicator showing that the unit is receiving a 220VAC current should be on.
- LED DC.Input** ▶ The indicator showing that the battery has been connected to the unit should be on.
- LED Charging** ▶ The indicator showing that the battery is charging should be on. If the battery is full, however, the indicator will be off.
- LED Testing** ▶ The indicator showing that the unit automatically testing itself.

**Caution:** The DC Voltage Meter will change according to the Voltage of the battery being used, for example, 24 Volts or 48 Volts.

4. If during the self-tests the battery is found to be faulty and cannot hold a charge or less charge than normal the unit will show a “Battery Fail” warning.

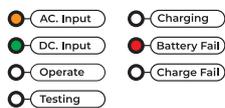
Figure showing the indications at the front of the unit



AC.VOLTMETER



DC.VOLTMETER



AC.VOLTMETER ► Shows the current level at the Input to be about 220VAC.

DC.VOLTMETER ► Shows a battery Voltage at 24 or 48 Volts.

LED AC.Input ► The indicator showing that the unit is receiving a 220VAC current should be on.

LED DC.Input ► The indicator showing that the battery has been connected to the unit should be on.

LED Battery Fail ► The indicator showing that the battery can not provide an electrical charge.

**Caution:** The DC Voltage Meter will change according to the Voltage of the battery being used, for example, 24 Volts or 48 Volts.

To cancel the Battery Fail notification command, turn off and on Circuit Breaker “DC.Battery” once.

5. If the battery charging circuit is found to be faulty, taking longer than 24 hours to charge the battery, the unit will show a “Charging Fail” warning.

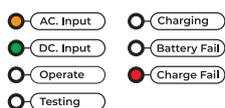
Figure showing the indications at the front of the unit



AC.VOLTMETER



DC.VOLTMETER



AC.VOLTMETER ► Shows the current level at the Input to be about 220VAC.

DC.VOLTMETER ► Shows a battery Voltage at 24 or 48 Volts.

LED AC.Input ► The indicator showing that the unit is receiving a 220VAC current should be on.

LED DC.Input ► The indicator showing that the battery has been connected to the unit should be on.

LED Charging Fail ► The indicator showing that the battery has charged fail.

**Caution:** The DC Voltage Meter will change according to the Voltage of the battery being used, for example, 24 Volts or 48 Volts.

To cancel the Battery Fail notification command, turn off and on Circuit Breaker “DC.Battery” once.

## Maintenance

1. Keep ventilation fan of the unit clean.
2. The unit has an Automatic testing system, automatically enabling 30 minute test every 30 days.  
If your unit does not have a self-test system you should manually test the unit once a month for 30 minutes to make sure the unit is fully operational and to help extend the life of the battery.

## Initial Trouble Shooting

Cause	Problem	What to do
- 220 VAC light not getting to the unit.	<ul style="list-style-type: none"> <li>- The power socket might not have any power.</li> <li>- Circuit Breaker AC. Input is in the OFF status.</li> </ul>	<ul style="list-style-type: none"> <li>- Check to make sure that the power socket of the home or building is providing a 220 VAC current.</li> <li>- Check to make sure that the Circuit Breaker AC. Input is in the ON position.</li> </ul>
- The Backup power supply of the unit has failed.	<ul style="list-style-type: none"> <li>- Circuit Breaker DC. Battery is in the OFF status.</li> <li>- Circuit Breaker AC. Output is in the OFF status.</li> </ul>	<ul style="list-style-type: none"> <li>- Check to make sure that the Circuit Breaker DC. Battery is in the ON position.</li> <li>- Check to make sure that the Circuit Breaker AC. Output is in the ON position.</li> </ul>
- Emergency light only turns on for a short time after the power went out.	<ul style="list-style-type: none"> <li>- The battery is not fully charged.</li> <li>- The battery has degraded.</li> </ul>	<ul style="list-style-type: none"> <li>- Fully charge the battery.</li> <li>- Contact customer service to replace the battery.</li> </ul>

## Important Note on Using the Unit

1. Please read the manual carefully before installation and operation
2. Installation area should be good ventilation.
3. Do not connect the battery in reverse polarity.
4. Check the power load before installing the unit.
5. Do not use with the power load when it is in an unstable condition.
6. The power load must be an emergency light only. Do not use with the other power load that is not approved by the manufacturer.
7. The unit should be stored in temperatures under 25 Degree Celsius and the battery should be charged every 1 month to maintain its operational life.

## Terms for Warranty and Service

1. The product will only be under warranty if the customer fills in the “warranty card” and return the “return part” to the company within 7 days of purchasing the product. If this is not done within the specified time, then the warranty will be considered void.
2. The warranty only covers the unit’s internal parts for the duration specified by the company counting from the date of purchase.
3. Please show the warranty card every time when contacting our service department or the dealer you purchased the unit from.
4. The warranty will be considered void in the following cases.
  - The unit has been used outside of its intended use specified in the manual.
  - The unit has been used with equipment that does not meet the specifications specified within the manual.
  - The unit has been damaged from impact, for example parts are dented, scratched missing or distorted.
  - The unit has been modified or repaired by people not officially certified by our company.
  - The Sticker Warranty Void has been removed or torn.
  - The unit is damaged from negligence or incompetent use, for example, the battery is swollen, the batter has been overcharged, the battery has been damaged from quick charging, the battery has been short-circuited, the battery’s charged has been completely drained.
  - The unit has been stored improperly, for example, it was exposed to moisture causing rust and damage to the internal circuitry.
  - Damaged was caused by a malfunction in the AC power supply.
  - Damage from natural disaster such as fire, moisture, submersion in liquids, chemical damage or from unavoidable circumstances.
  - Damage from animals or insects.

**Note :** Please read the manual carefully before installation and operation to understand how to properly operate the unit.

For any further questions about your product please feel free to contact SUNNY’s customer service department.  
**Tel. (+66) 02-948-4450-2**  
**E-mail: [service@sunnyemergencylight.com](mailto:service@sunnyemergencylight.com)**

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