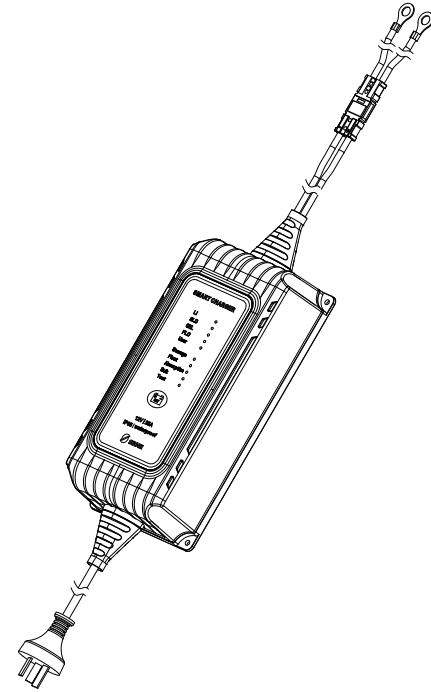











# Waterproof AC-DC Smart Charger User Manual




Dear users:

Thank you for choosing our products!

### Safety Instructions

-  1. The charger only applies to rechargeable lead-acid batteries and lithium batteries, and charging non-rechargeable batteries is prohibited.
-  2. When wiring, the battery port shall be connected first and then the AC port; when disconnecting, the AC port shall be disconnected first and then the battery port. It is prohibited to operate with wet hands to avoid electric shock. Users shall read the Manual carefully before operation, and operate after understanding safety instructions and safety training.
-  3. Users shall ensure that the battery polarity and system voltage are correctly connected, otherwise, incorrect connection may cause damage to the charger.
-  4. It is recommended to install a fuse or circuit breaker in the charger.
-  5. The charger shall be put in a well-ventilated place.
-  6. After installation, check whether all wiring is tightly connected to avoid the danger of heat accumulation due to loose connection.
-  7. After installation, check whether all wiring is tightly connected to avoid the danger of heat accumulation due to loose connection.
-  8. Users shall not disassemble and repair the charger by themselves.
-  9. This appliance is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.  
Children should be supervised to ensure that they do not play with the appliance.

 **Warning:** Indicating dangerous operation, and safety preparation is required before operating.

 **Attention:** Indicates destructive operation.

 **Tips:** Indicates suggestions and tips to the operator.

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## 1. Product Introduction

### 1.1 Product overview

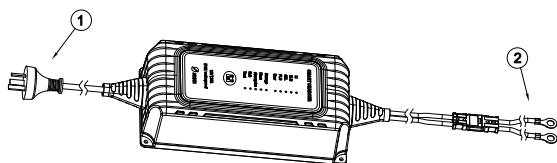
The waterproof AC-DC charger applies to multiple battery types, with a 6-segment smart charging curve, it features overvoltage protection, overcurrent protection, over-temperature protection, under-temperature protection, output short-circuit protection, and output reverse protection.

Equipped with Bluetooth (BLE) as standard configuration, it can be used in conjunction with APP to view operation state and data, and set parameters in real time.

### 1.2 Product features

- ◆ Applies to lead-acid batteries and lithium batteries
- ◆ 6-segment charging
- ◆ Overcurrent protection
- ◆ Over-temperature protection
- ◆ Under-temperature protection
- ◆ Output reverse protection
- ◆ Output short-circuit protection
- ◆ LED indicator
- ◆ Standard Bluetooth
- ◆ Waterproof level of IP65

### 1.3 Appearance and interfaces



S/N	Name
①	AC plug
②	Battery interface

## 2. Key and Indicator

### 2.1 Key

Key	Function
Short press	Battery type selection
Long press for 8s	System restart
Long press for 20s	Factory reset

### 2.2 Indicator

Battery type		
Indicator	State	Meaning
LI	Normally on	Lithium battery mode
SLD	Normally on	Sealed lead-acid battery
GEL	Normally on	Gel lead-acid battery
FLD	Normally on	Flooded lead-acid battery
User	Normally on	Custom lead-acid

Charging state		
Indicator	State	Meaning
Charging state indicator	OFF	No charging
Storage	Single flash	Full charging
	Normally on	Storage charging
Float	Normally on	Floating charging
Absorption	Normally on	Boost charging
Bulk	Normally on	Bulk charging
Test	Normally on	Test charging

Other indications		
Indicator	State	Meaning
Battery type and charging state	Flashing	System overvoltage/ overcurrent/over-temperature/ under-temperature protection
Charging state	Flashing	Data storage

### 3. Function Introduction

#### 3.1 Charging curve

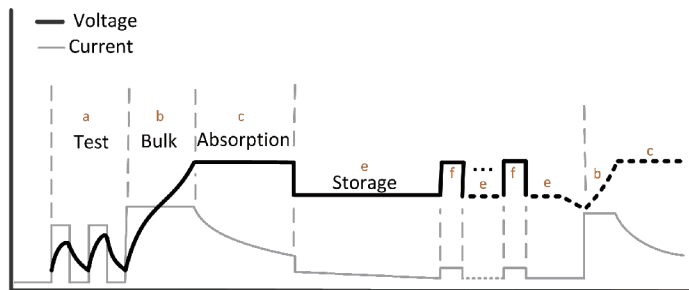


Figure 1 Charging curve of lithium battery

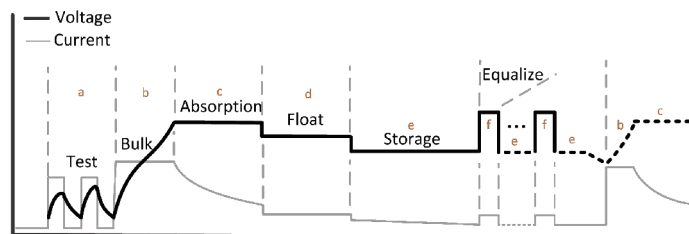


Figure 2 Charging curve of lead-acid battery

#### 3.2 Charging state

##### 3.2.1 Test

Lead-acid or lithium batteries have been deeply discharged or have not been charged for a long time, resulting in very low battery voltage, even dropping to 0V. The charger will limit the charging current to 8% of the set current and charge the battery through pulse voltage. When the battery voltage reaches 10.5V, it will switch to the normal charging mode.

##### 3.2.2 Bulk

When the battery voltage is lower than the target charging voltage, the charger will charge at the rated current constant current. When the battery voltage is higher than the target charging voltage, it will switch to the absorption charging mode.

##### 3.2.3 Absorption

When the charging voltage reaches the boost charging voltage and the duration is greater than the set value time:

Lead-acid battery: It will switch to float charging mode;

Lithium battery: When the charging current is less than 5% of the set current, it will switch to storage charging mode, further reducing charging voltage to prevent damage to the battery. When the charging current is greater than 5% of the set current, it will continue to be maintained in float charging mode, and switch to storage charging mode after more than 48 h, thus further reducing the charging voltage.

##### 3.2.4 Float

Lead-acid battery: When the charging current is less than 5% of the set current with the float charging voltage reaching the set value, it will enter the storage charging mode, further reducing the charging voltage to prevent damage to the battery. When the charging current is greater than 5% of the set current, it will continue to be maintained in float charging mode, and switch to storage charging mode after more than 48h, thus further reducing the charging voltage.

##### 3.2.5 Equalize

After the storage charging is completed, the battery defaults to perform periodic equalize charging for 1h every 7 days or after reaching the set value. If the AC charging plug is disconnected, the charging time will be recalculated. (At this stage, the charging voltage of lead-acid batteries is equalizing charging voltage, while the charging voltage of lithium batteries is boost charging voltage.)

##### 3.2.6 Storage

The battery exits storage charging mode when one of the following conditions is met:

- 1) If the charging current exceeds 5% of the set current for about 10s, the battery exits the storage charging mode and enters a new charging cycle.
- 2) If the battery voltage is lower than the "storage charging voltage minus 0.3V" for about 10s, the battery exits the storage charging mode and enters a new charging cycle.

## 4. Electrical Parameters

Parameter	Parameter Value
Model	AC1225C
Charging current	25A
Charging method	6-segment charging
Stand-by power consumption	<5W
System voltage	12V
Battery voltage	9V ~ 17V
Input voltage	180 ~ 264VAC/45~65Hz
Lithium battery activation	Supported
Under-temperature charging of lithium battery	Enabled by default
Full-charging setting	Disabled by default
Communication method	Built-in Bluetooth
Key	Battery type selection/restart/factory reset
Indicating method	5 battery type indicators + 5 charging state indicators
Protection function	Output reverse protection, output overvoltage protection, over-temperature protection, and under-temperature protection
Operating temperature	-35°C ~ 65°C
Waterproof level	IP65
Altitude	≤2000m
Weight	1.7kg
Product dimensions	347.7*124.1*66.0mm

## 5. Bluetooth Communication

Bluetooth is integrated into the controller, therefore, users can download the APP in the following ways for data monitoring, settings, etc.

Download method	Google Play(Android)
Download search	Keyword : SRNE
Download link	<a href="https://play.google.com/store/apps/details?id=com.srne.androidapp">https://play.google.com/store/apps/details?id=com.srne.androidapp</a>
Download method	APP Store(iOS)
Download search	Keyword : SRNE
Download link	<a href="https://apps.apple.com/us/app/srne/id1635684571">https://apps.apple.com/us/app/srne/id1635684571</a>

## 6. Parameter Setting

### 6.1 Battery type

Press the button to select the battery type.

Parameter table:

Battery type	Sealed Lead-acid Battery	Gel lead-acid battery	Flooded Lead-acid Battery	Lithium Battery	Customized
Indicator	SLD	GEL	FLD	LI	User
Overvoltage disconnection voltage	16.0V	16.0V	16.0V	16.0V	9.0 ~ 17.0V
Limited charging voltage	15.5V	15.5V	15.5V	-	9.0 ~ 17.0V
Equalizing voltage	14.6V	-	14.8V	-	9.0 ~ 17.0V
Boost voltage	14.4V	14.2V	14.6V	14.4V	9.0 ~ 17.0V
Floating voltage	13.8V	13.8V	13.8V	-	9.0 ~ 17.0V
Storage voltage	13.2V	13.2V	13.2V	13.5V	9.0 ~ 17.0V
Equalizing charging interval	7days	7days	7days	-	0 ~ 60days (0 indicates off)
Equalizing charging time	60min	60min	60min	-	0 ~ 60min
Boost charging time Floating charging time	120min	120min	120min	120min	10 ~ 600min

### 6.2 Battery type

In the constant voltage charging stage (as shown in the "c/d" stage in Figures 1 and 2), the charger will stop charging if the charging current is less than the "full cutoff current" for 1 min. If the battery voltage is lower than that of the boost charging reverse mode, it will reenter the "b/c" charging stage.

### 6.3 Under-temperature charging of lithium battery

1) Start: When the battery temperature is below 0°C, it will stop charging; when the temperature exceeds 2°C, it will resume charging.

2) Close: When the battery operates according to the set operating temperature, it will exit the under-temperature charging mode.

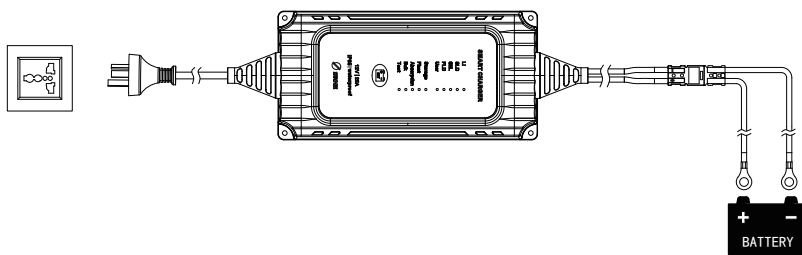
## 7. Protection Function

- **Protection Class**  
IP65
- **Charging overcurrent protection**  
If the charging power is too high, the charger enters overcurrent protection mode and stops charging.
- **Overvoltage protection**  
If the battery voltage is higher than the overvoltage voltage, the charger stops charging.
- **Over-temperature protection**  
When the temperature is too high, the charger gradually reduces the charging power.
- **Under-temperature protection of lithium battery**  
Lithium batteries can be set to prohibit charging if the temperature is at 0°C.
- **Output short circuit protection**  
Lithium batteries can be set to prohibit charging if the temperature is at 0°C.
- **Output reverse protection**  
The short circuit at the output terminal will not damage the charger, and it will automatically recover after the fault is removed.

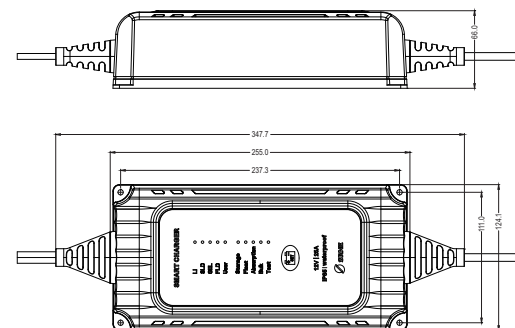
## 8. Common Problems and Solutions

Phenomenon	Description	Troubleshooting
Indicators of battery type and charging state flashing simultaneously	Battery overvoltage	Automatically recover after the battery voltage drops to the overvoltage value minus 1V
	Overcurrent protection	Automatically recover after protection
	Over-temperature protection	Stop charging when the temperature is higher than 82°C, and recover charging when the temperature is below 70°C
	Under-temperature protection	The charger operates at the set value for under-temperature protection (-35°C by default)
No charging	Normal system and indicators, but no charging	1) Check the charging state for on/off and whether it is in the OFF state with APP 2) Check whether the "under-temperature charging of the lithium battery" function is enabled 3) Check whether the "full charging setting" is enabled and the battery is fully charged

## 9. Application Diagram



## 10. Dimensions



Product dimensions : 255\*124\*66mm

Mounting dimensions : 237\*111mm

## 11. Installation Diagram

