SMART BATTERY CHARGER

SC-800 USER GUIDE



MASHIN

MASHIN ELECTRIC CORP.



MASHIN ELECTRIC CORP.

Established in 1996 in Madou District, Tainan City, Mashin Electric Corp. begins as a manufacturer of car chargers. Over the years, Mashin becomes a professional battery charger manufacturer for Automotive, Motorcycle, Industry, Jump Starter and functional battery chargers. Especially the car chargers stand the first selling position in domestic market. Recently, we have committed into more and more product lines for battery chargers.

We specialized in Battery Charger, Adaptor, Transformer, Switching Power, DC to AC Inverter, LiFePO4 Lithium Battery Pack, Battery Analyzer, Booster Cable, Jump Starter and related electronic products. With more than 20 years' factory experiences, we received customers' reliance for automotive market around the world. Mashin can do OEM services and also has the capability for ODM. Our products are followed by high SOP standards throughout the whole production process. Besides, we put into the newest equipment and focus on employees training in order to provide the best service and products to our customers.

Creativity and experiences are our advantages to receive customers' trust.
Besides, our engineers have decades of experiences and contributed in developing our own battery chargers. Every year, we will have more than 5% R&D developing fees for our new products. What we want is to provide our customers a more convenient life.

We take the four policies, "Total Quality Assurance, Quality First, Service First, Customer Satisfy" as our company goals. From R&D, purchasing, production to the sales and delivery, we all have completely Quality Management System. In addition, most of our products obtained UL, CE, CB, FCC, PSE, SAA, RoHs, and CEC certifications and safety regulations. Strict company policy and management obtain the certification of French (ANFOR) ISO-9001 and be the Japan PSE and U.S. UL certified factory.

Since the factory established, Mashin has actively built up our own brand and strives to develop the best products on a daily basis. It wasn't easy to keep the faith after several decades, but we did.
In the future, we will maintain our creativity, keep developing new types of chargers and extend the international market. It's our responsibility to feed back to the world.

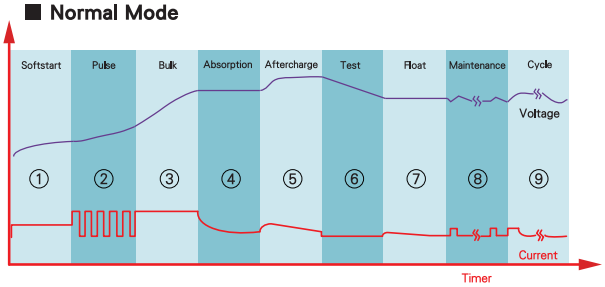
CONTENT

- **Features** 2.
  - 9 Stages Charging Mode
  - Safety Instructions
  - Safety Notes 3.
  - Accessory 4.
  - Parts Indicator 5.
  - LCD Display Panel and Function 6.
- **Operating Instruction**
  - Before Connecting 7.
  - Battery Status 8.
  - Charging Function 9.
    - Normal Mode
    - Snow Mode 10.
    - Boost Mode 11.
    - ISS Mode 12.
  - DC Supply 13.
- **General Information** 14.
- **Specification** 15.
  - Spec. Chart
  - Available Battery
- **Troubleshooting** 16.
  - Warranty

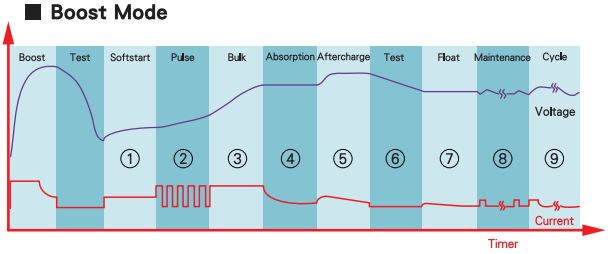
Features

9 Stages Charging Mode

■ Normal Mode



■ Boost Mode



① Soft Start:
Tests if the battery can accept charge, charging will commence if battery is okay.
* Boost Mode will charge by high voltage.

② Pulse:
Pulsing current removes sulphates from the battery plates and restores battery efficiency and capacity.

③ Bulk Charge:
Charging with maximum constant current until approximately 80% of capacity.

④ Absorption:
Charging with constant voltage and declining current to equalize and maximize up the battery capacity.

⑤ Aftercharge:
Charging by equalizing the battery plates in order to increase the battery efficiency and extend service life.

⑥ Test:
Tests if the battery can hold charge. If the battery voltage drops below 12.3V within 2 minutes, battery is faulty.

⑦ Float:
Keep the battery voltage at maximum level by providing a constant voltage charge.

⑧ Maintenance:
Battery maintenance mode active when the battery voltage is lower than 12.6V, the charger will begin maintenance charging automatically.

⑨ Cycle Recharge:
A continuation of the Maintenance mode that monitors battery voltage and will gently pulse current and increase voltage. It will charge automatically every 15 days.

Safety Instructions

- Before removing the battery from the vehicle, please check your codes for audio, security systems…etc.
- Before removing the battery from the vehicle, please make sure to disconnect the earth (ground) terminal first. All accessories in the vehicle must be turned off to avoid sparks.

Warning:

- It is dangerous to work near a lead-acid battery. A battery will generate explosive gases during normal operation and gases increase when charging.
- Make sure working area is well ventilated.
- Make sure there is no possibility to cause gases being ignited. Must be no naked flames, cigarettes, flame heaters, blowtorches…etc. near the battery or working area.
- The gases can be ignited by sparks, please disconnect the chargers from the mains before disconnecting the leads from the battery.
- Must wear approved safety eyewear when connecting or disconnecting battery / battery charger leads.
- Avoid touching eyes while working with batteries.
- Do not smoke near the battery or engine.

Safety Notes

- This charger is designed for charging lead-acid battery of vehicles, do not charge the battery of home appliances.
- 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.
  (The EN variation to this instruction is not the same as it redefines the meaning of children).
- Place chargers as far away from the battery as the charger cables permit.
- When working with or near a lead-acid battery, make sure there is someone nearby to come to your aid if necessary.
- If battery acids contacts skin or clothing, wash immediately with soap and plenty of fresh water.
- If acids enter an eye, flushing eyes immediately with plenty of cold, clean water and get medical attention.
- When working with lead-acid battery, make sure to remove personal metal items, such as watch straps, rings, bracelets, necklaces…etc. A short circuit across from one of above will cause severe burns.
- Do not put the battery on top of the charger.
- Never touch the clamps when the charger is working.
- Never allow the clamps to touch each other or to contact a piece of metal that could bridge them.
- If you need to remove a battery, always remove the ground terminal from the battery first. Make sure all accessories are off to minimize the potential of a spark.

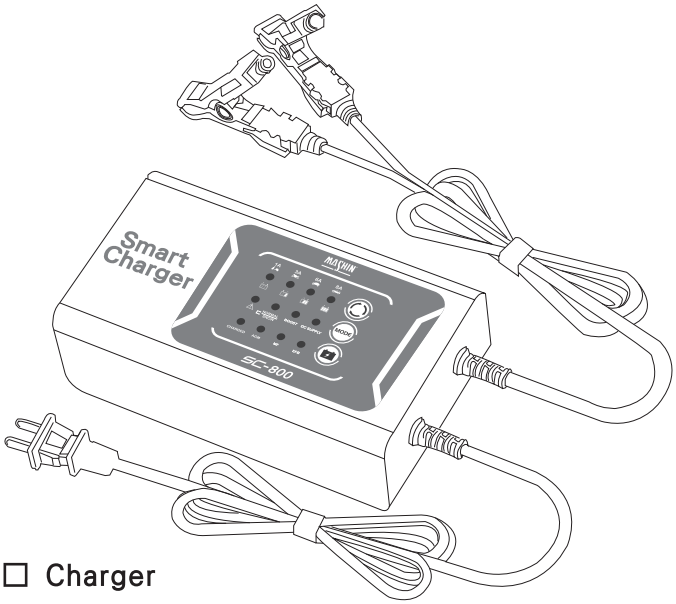
It is the operator's responsibility to comply with the following:

- Do not disassemble the charger without qualified professional when service or repair is required.
- Inspect all power supply leads, plugs and all electrical connections for wear and /or damage.
- Before use, inspect the insulation on the charger cable and check the charger and plug before connecting to the mains supply.
- Also regularly inspect power supply sockets, extension leads and connectors.
- Ensure that the mains voltage marked on the charger is the same as the electrical power supply to be used.
- Do not carry the charger by its power lead.
- Do not pull the power plug from the socket by the power lead.
- Extension lead reels: when a cable extension lead reel is used it should be fully unwound before connection. We recommend the cable reel has an RCD fitted. Be sure that the capacity of the cable reel is suitable for the product.

If in any doubt about electrical safety, consult a qualified electrician.

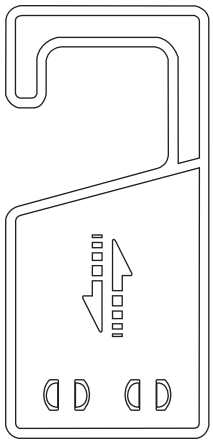
- Disconnect equipment from power supply before cleaning. Do not use any liquid or aerosol cleaner. Use only moisture cloth.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Accessory

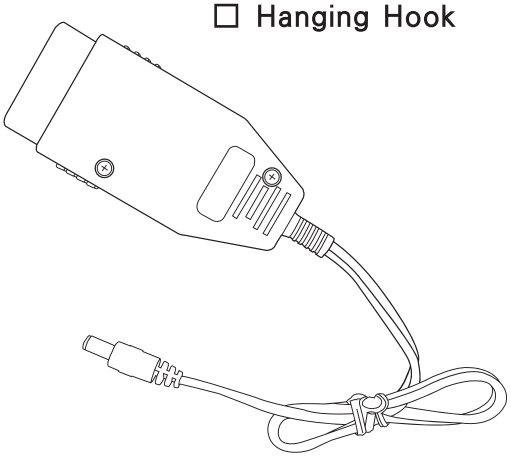


☐ Charger

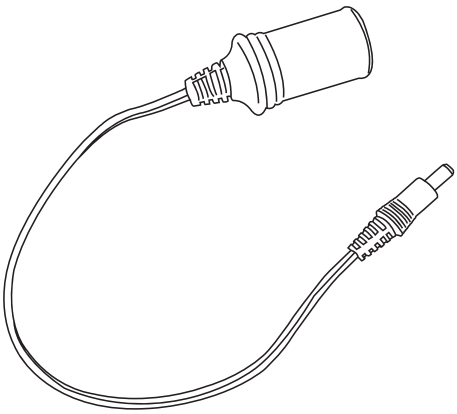
☐ User Manual



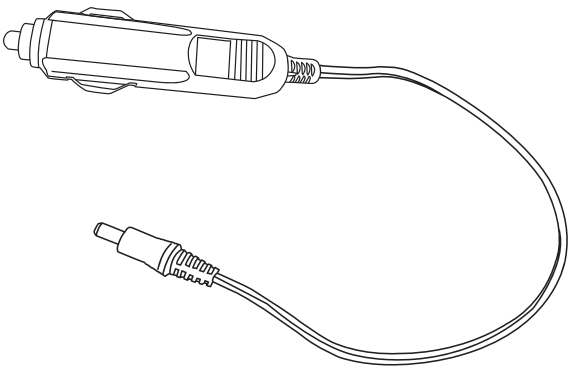
☐ Hanging Hook



☐ OBD II （Option）

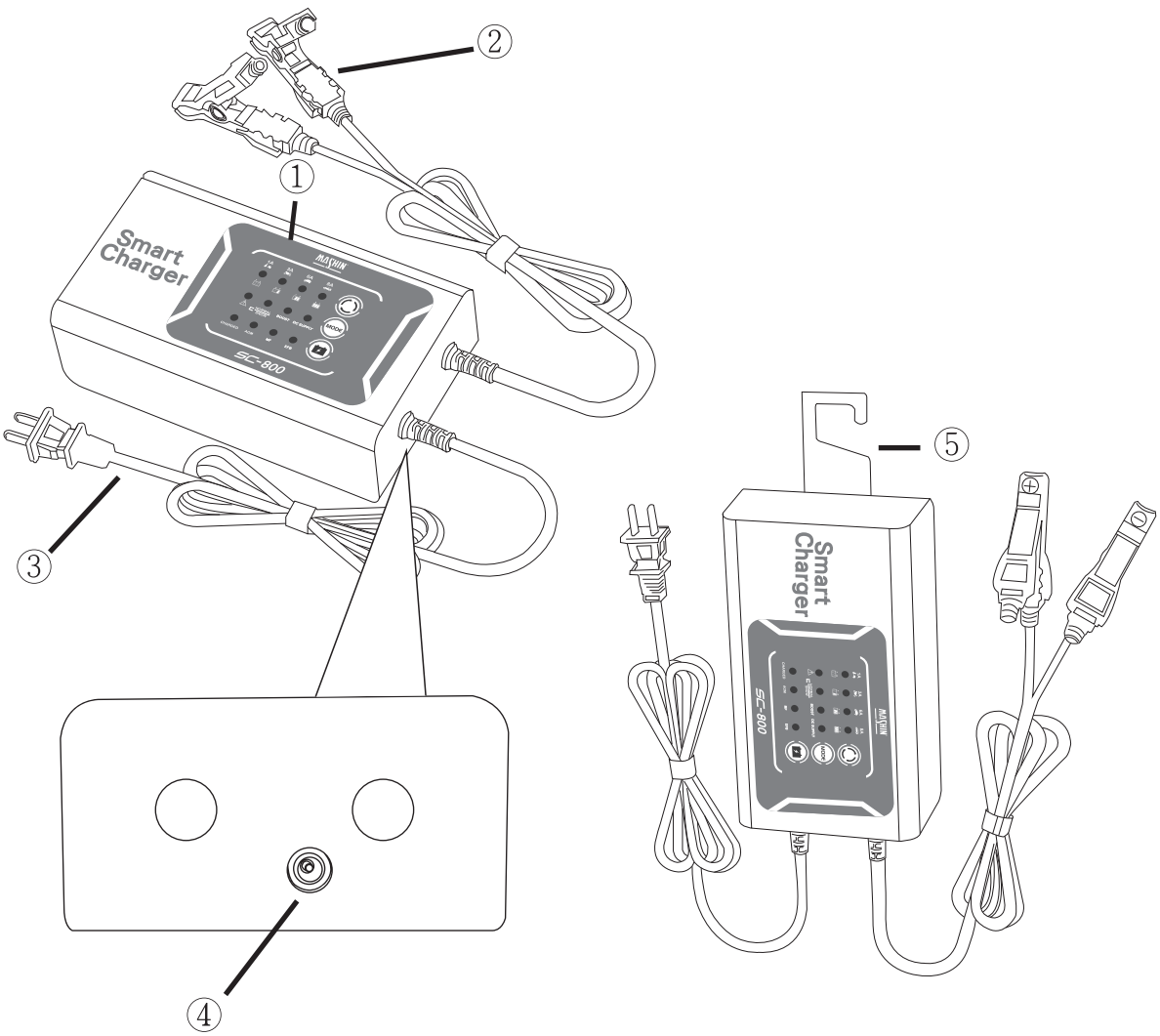


☐ Female Cigarette Socket（Option）



☐ Cigatette Connector（Option）

Parts Indicator



1. LED Display Panel and Button

＊ There is a protector on the panel, user can tear it off before using.

2. Clamps

Connect with battery positive and negative terminal. (Do not reverse polarity).

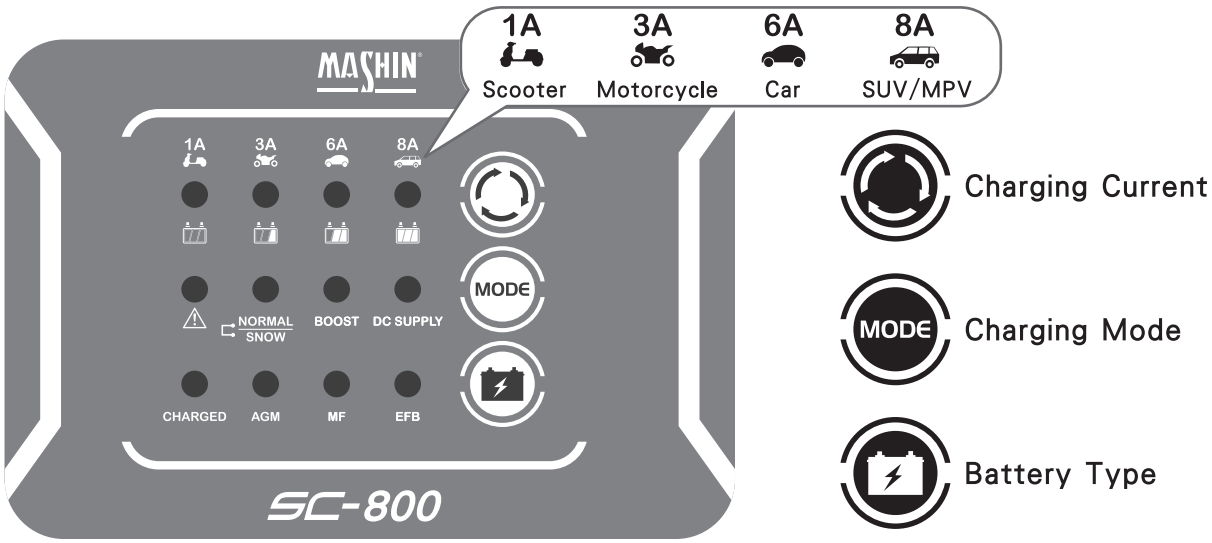
3. AC Power Cord

4. DC Port

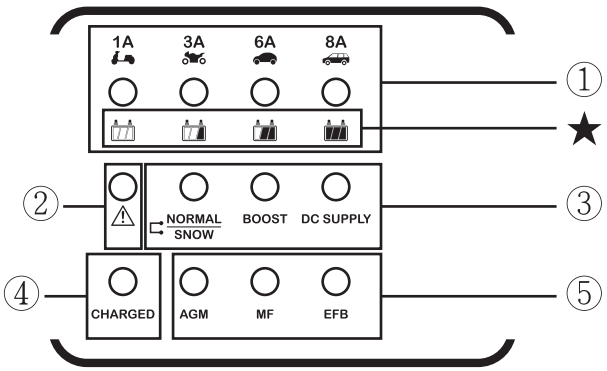
＊ Cigarette Female Socket (Option)
＊ Cigarette Connector (Option)
＊ OBD II (Option)

5. Hanging Hook

LED Display Panel and Function



Signal Indicator



★ Battery Status
① Charging Current
② Error Signal
③ Charging Mode
④ Charging Status
⑤ Battery Signal

★ Battery Status

Battery Capacity — Connect clamps with battery positive and negative termainal without AC power to check battery status.

① Charging Current

Current Selection — Select charging current. 1A / 3A / 6A / 8A

② Error Signal

Reverse Polarity — The Red LED will light on when reversing polarity.

Battery Error — The Red LED will flash when battery is error.

③ Charging Mode

Normal Mode — Charging in a normal condition.

Snow Mode — It is recommended to charge in low temperature. The signal will flash when selecting.

Boost Mode — It is used when battery cannot charge in normal condition or the battery voltage is lower than 2V. Boost mode will charge a battery by higher voltage.

④ Charging Status

Charging Signal — The signal will flash when charging and light on when charging is completed.

⑤ Battery Signal

Battery Selection — Default (No signal), AGM, MF and EFB.

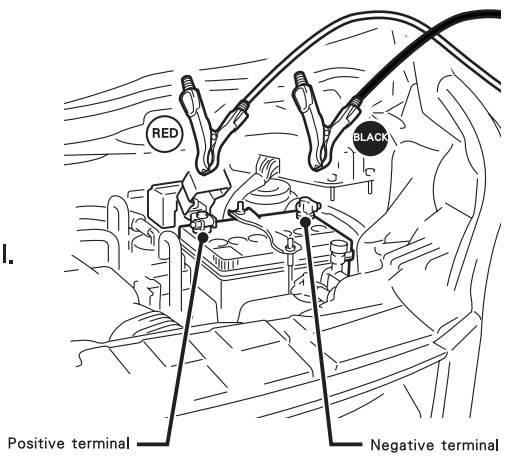
Operating Instruction

Before Connecting

- Please make sure battery types and capacity of your vehicles before selecting charging current and mode.
- Please clean the battery vent tube before using.
- If acids enter an eye, flushing eyes immediately with plenty of cold, clean water and get medical attention.
- Make sure working area is well ventilated.
- Please make sure the battery electrolyte is within the range.
- When removing the battery from the car, please disconnect the negative terminal first.
- Please make sure all the electronic devices are in OFF position.
- Do not bind the cable to use.
- Connect the red clamps with positive terminal first.
- Do not use the other cables instead of Mashin’ s standard when connecting.
- Ensure there is no cracks or dirts on the clamps.
- The battery terminals might get rusty, please clean the terminals before charging.
- Never touch the cables and battery in wet hands.

Before Charging

① Please identify the correct polarity of your battery.
② Connect the red clamp with positive terminal.
③ Connect the black clamp with negative terminal.



※ Please make sure clamps are well-connected.

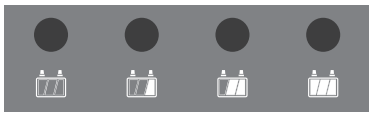
Signal Indicator

○	OFF
●	Light
☀	Flash

Battery Status

① Connect clamps with battery positive and positive terminal. **No need to connect with AC power.**

② Charger will detect the battery capacity automatically and display as follows:

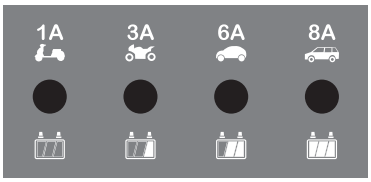


100%	●	●	●	●
75%	●	●	●	○
50%	●	●	○	○
25%	●	○	○	○

○ Off ● Light

※ If battery is damaged or deterioration, charging by Boost Mode might be invalid.

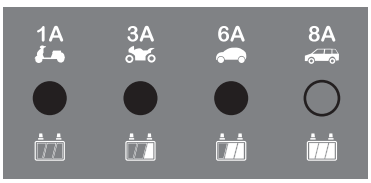
◆ Battery Level 100%



Fully charged battery.

◆ Battery Level 75%

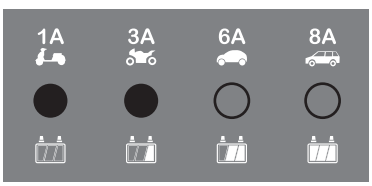
Please charge your battery by Normal or Snow Mode.



Charging is recommended to extend battery life.

◆ Battery Level 50%

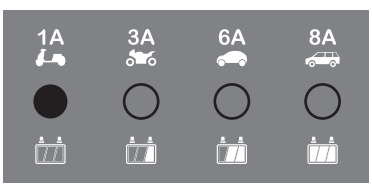
Please charge your battery by Normal or Snow Mode.



Low battery, please charge.

◆ Battery Level 25%

Battery is discharged or deterioration.
Please charge your battery by Normal, Snow or Boost Mode.



Charge battery as soon as possible.

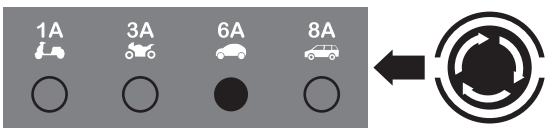
Charging Function - Normal Mode

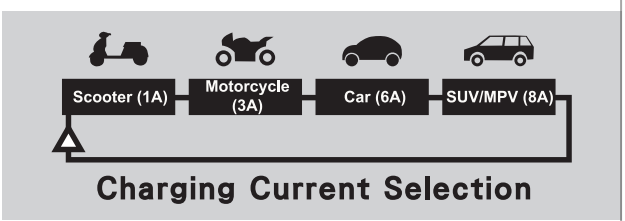
① Connect with AC power and connect clamps with battery positive and negative terminal.

② Press button to NORMAL.

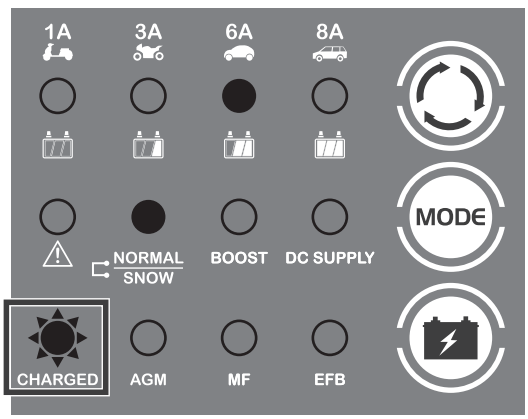


③ Press button to select charging current.



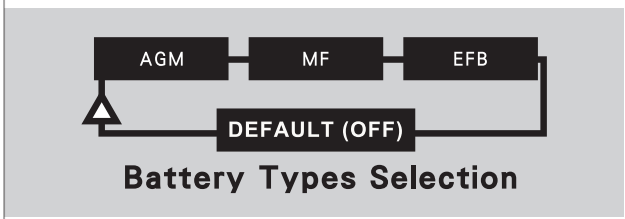


④ The signal (CHARGED) will flash when charging begins.

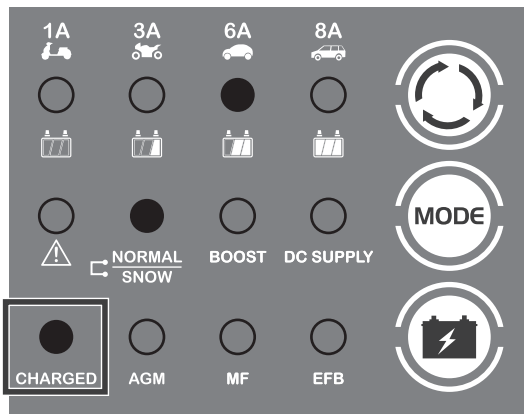


⑤ Press button to select your battery types, such as AGM, MF or EFB...etc.





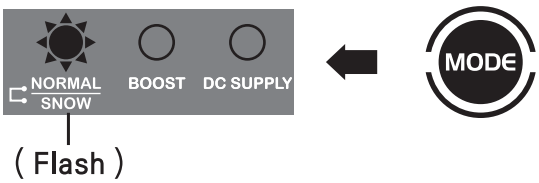
⑥ The signal (CHARGED) will light when charging is completed.



Snow Mode

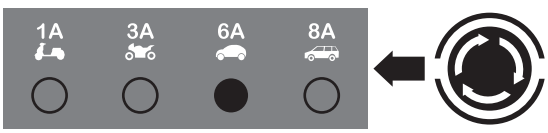
① Connect with AC power and connect clamps with battery positive and negative terminal.

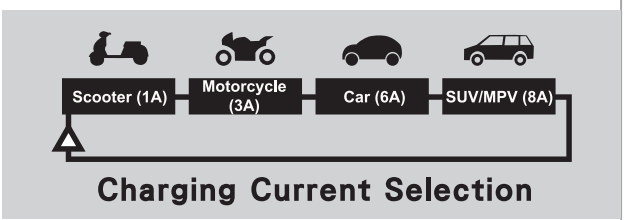
② Press button to NORMAL then long press for 3-5 seconds, the signal will flash.



(Flash)

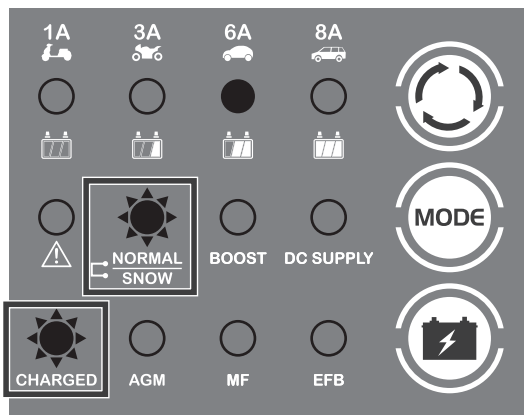
③ Press button to select charging current.





Charging Current Selection

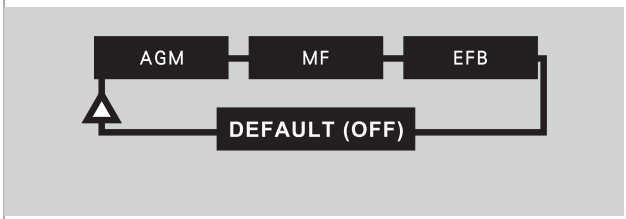
④ The signal (CHARGED) will flash when charging begins.



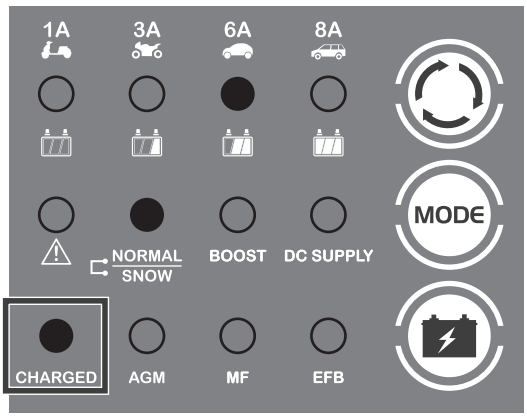
(Flash)

⑤ Press button to selecy your battery types, such as AGM, MF or EFB...etc.





⑥ The signal (CHARGED) will flash when charging is completed.



Boost Mode

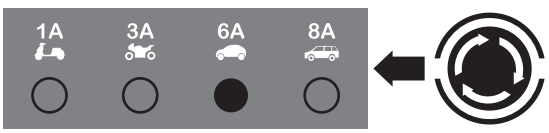
① Boost Mode is used when battery is lower than 2V, over-discharged or deterioration and cannot work in normal condition.

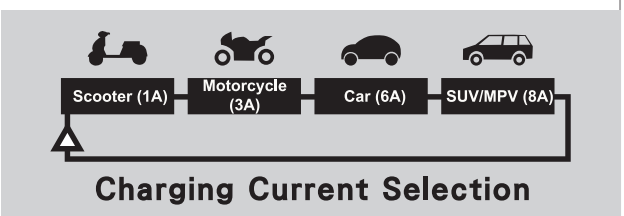
② Connect with AC power and connect clamps with battery positive and negative terminal.

③ Press button MODE to BOOST.



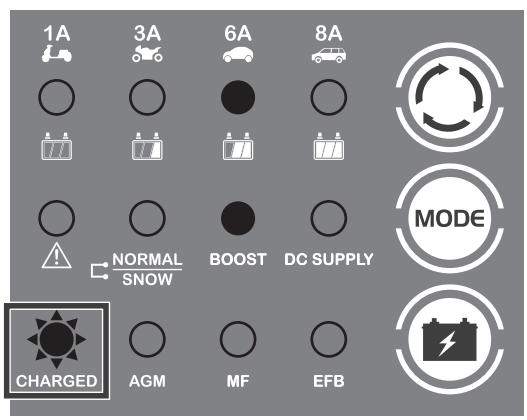
④ Press button to select charging current.





Charging Current Selection

⑤ The signal (CHARGED) will flash when charging begins.



⑥ It will do at most four times boost charging by 16.5V, if battery is recovered, it will back to Normal Mode charging. Otherwise, the charger will stop and the Error signal lights.



※ Only available for Lead-acid battery.

※ Cannot assure battery will back to normal condition.

※ Cannot select battery types at this mode.

❗ Please remove battery from your car before charging.

⚠ Remove car battery might casue data loss of your car ECU and electronic devices. It is recommended to use OBD II to supply power for your car.

I Start Stop (ISS) System Charging

◆ Before Charging

※ Please make sure your battery types, either AGM or EFB battery.

◎ AGM Battery :
Please refer to Page 9 Normal Mode and select battery type to AGM for charging.

◎ EFB Battery :
Please refer to Page 9 Normal Mode and select battery type to EFB for charging.

◆ ISS (I Start Stop Mode)

※ Please remove battery from your car before charging. This mode will charge a battery by a high voltage 15.8V, if you didn' t remove your battery from your car might cause the damage of your electronic devices.

※ This is designed for Japanese EFB batteries.

⚠ Remove the car battery might cause the data loss of your car ECU and electronic devices. It is recommended to use OBD II to supply power for your car.

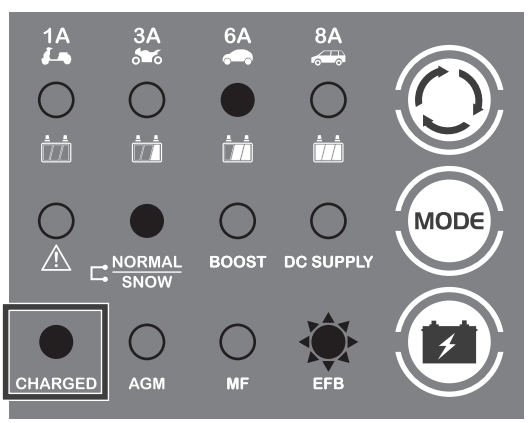
① Connect with AC power and connect clamps with battery positive and negative terminal.

② Press button MODE to NORMAL and press button to select charging current.

③ Press button to EFB then long press button for 3-5 seconds to get into ISS mode and the signal will flash.



④ The signal (CHARGED) will light on when charging is completed.



DC Supply

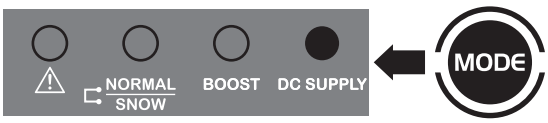
◆ OBD II / Cigarette Connector (Option)

① Connect with AC power.

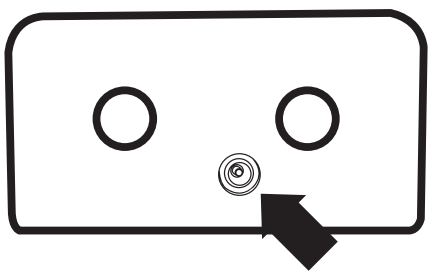
② Connect OBD II with OBD II port or Cigarette Connector with cigarette lighter socket, and one signal will light on.



③ Press button MODE to DC SUPPLY then long press button for 3-5 seconds, the (CHARGED) signal will light on.



④ Plug the OBD II DC connector or Cigarette DC connector into the DC port.



⑤ When the other signal of OBD II lights on, connection is completed. You can change your battery now.



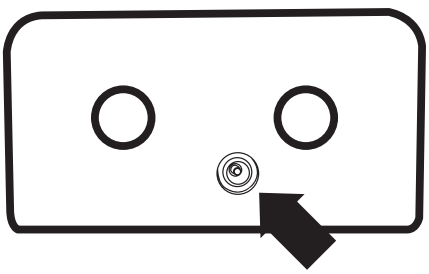
※ Maximum output is 5A.

◆ Cigarette Female Socket (Option)

① Connect with AC power.

② Press button MODE to DC SUPPLY.

③ Plug the DC connector of Cigarette Female Socket into the DC port.





④ Connect the cigarette connector of electronic devices with female socket.

⑤ Start to charge car electronic devices.

General Information

① Why battery needs to charge ?

Batteries will be affected by self-discharge even unused, therefore, it is necessary to use a charger to charge batteries. Proper charging can increase battery efficiency and extend its service life.

② What is the voltage for a fully charged battery ?

Normally the voltage should be over 12.6V for a 12V battery, if it is between 12.3~12.6V which means it is not fully charged, please charge it.

If the voltage does not over 12.6V after charging, the battery capacity is reduced.

③ How to remove the battery terminal corrosion ?

Please disconnect the terminals from the battery first.

Then wearing the gloves to wash terminals with 100℃ hot water and clean it with a steel brush or a sandpaper. Finally, you can rub some rust preventive oil on the terminals.

④ Precaution for standard type batteries ?

Remember to check the electrolyte level as often as you can. When the level is lower, please refill the liquid (pure water or distilled water) .

⑤ Precaution for replacing a battery ?

To reomve a battery, please disconnect the negative terminal first then disconnect the positive terminal.

When installing, please connect with positive terminal then connect with negative terminal.

Do not reverse polarity.

⑥ Precaution for charging a battery ?

Please make sure the battery electrolyte is within the range.

◎ Make sure working area is well ventilated.

◎ If you are charging a standard type battery, please open the vent plug to charge.

◎ If the battery acid is leaking out when charging, please clean it.

◎ Please identify the correct polarity of your battery.

◎ If the battery temperature is over 45℃, please stop charging.

◎ Make sure the clamps and battery are well-connected.

⑦ How to set up the charging current of a battery ?

Normally the charging current will be 1/10~1/6 of a battery capacity.

(Eg. 60Ah battery can charge by 6A~10A) .

Specification

Spec. Chart

MODEL	SC-800
Input Power	AC100V ~ AC240V 50 / 60HZ
Normal Voltage	DC12V
Charging Voltage	Normal Mode = max.DC14V ~ 15V Snow Mode = max.DC14.6V ~ 15.5V Boost Mode = max.DC16.5V
DC Supply	DC 13.5V 5A (max.)
Charging Current	1A /3A / 6A /8A
Protection	1. Short Circuit Protection 2. Over-temperature Protection 3. Spark Protection 4. Over-charge Protection 5. Over-voltage Protection 6. Reverse Polarity Protection 7. Disconnecting Protection 8. Over-current Protection
Battery Types	MF / AGM / EFB
Operating Temperature	-20 ~ 40℃, Humidity 90%
Dimension (L* W * H)	197 x 113 x 61 mm ± 2mm
Weight	0.95 kgs

Available Battery

◆ Battery Voltage DC12V

◆ Battery Types

- Lead-acid battery for Vehicles
- EFB Battery
- AGM Battery
- MF Battery

Non starter lead-acid batteries, please charge without selecting battery types.

◆ Battery Capacity

- 3Ah ~ 100Ah

◆ Recharging Battery Capacity

- 3Ah ~ 150Ah

■ Warning

- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved
- Children shall not play with the appliance
- Cleaning and user maintenance shall not be made by children without supervision
- This appliance can not be used for non-rechargeable batteries
- Disconnect equipment from power supply before cleaning. Do not use any liquid or aerosol cleaner. Use only moisture cloth.
- If the supply cord is damaged, it must be replaced by the manufacturer.
- The battery terminal not connected to the chassis has to be connected first. The other connection is to be made to the classis, remote from the battery and fuel line. The battery charger is then to be connected to the supply mains.
- After charging, disconnect the battery from the supply mains. Then remove the chassis connection and then the battery connection.

Troubleshooting

Q：Connect with AC power but the charger does not turn on?

A：Check if connecting with AC power correctly.
Check if there is no electricity in AC outlet.

Q：Battery Error lights on?

A：Check if battery is defective or deteriorative.
Check if battery is DC12V.

Q：Reverse polarity lights on?

A：Check if connection is reversed.

Q：Battery gets hot or having smell when charging?

A：Check if battery is defective or deteriorative.

Q：Battery can not fully charging?

A：Check if settings are correct.
Check if battery is defective or deteriorative.

Warranty

The warranty is void if the product is misused, careless handling, or repaired by anyone other than Mashin Electric Corp. or its authorized representative.

Mashin Electric Corp.
Tel：+886-6-5702066
Fax: +886-6-5702840
Email: mashin@mashin.com.tw









MEMO

SC-800

www.mashin.com.tw

E-mail: mashin@mashin.com.tw
Tel: +886-6-5702066
Fax: +886-6-5702840
Address:
No. 10-33, Dashanjiao, Madou Dist.,
Tainan City 721, TAIWAN R.O.C

Ver.200416_B