



SPECIFICATION

Model: WYMF2P/WYMF2C

Description: 2.2KW On-Board Intelligent Charger

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1、 Definition of Industry Abbreviations

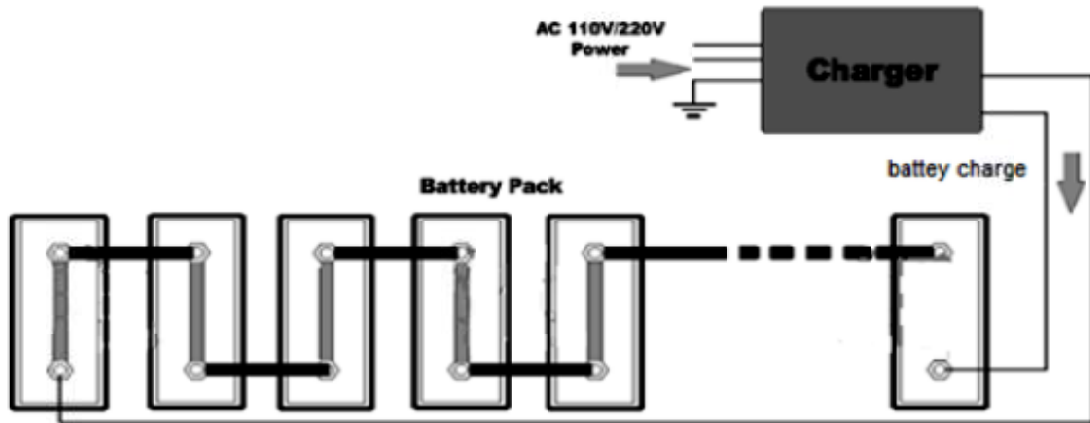
Abbreviations	Full Name in English
PC	Portable Charger
DC/DC	DC/DC Converter
CAN BUS	ControllerArea Network Bus
EV	Electric Vehicle
PFC	Power factor correction

2、 Product Description

WYMF2P/2C series portable intelligent charger is an intelligent charger with small size, high efficiency, high protection grade and high shockproof grade. Its AC input adopts active power factor correction(PFC), power factor is ≥ 0.98 , realizes green power grid. The whole machine adopts LLC resonant soft switching technique, full load efficiency is 93%, less heat, more reliable, smart charging for all kinds of material batteries: built-in microprocessor, judging the relative capacity of the battery and identifying the temperature of the environment during the charging process, using different charging curves according to the relative capacity of the battery and the ambient temperature, the constant current control in the whole process, the good balance of the battery, and effectively prolong the battery life; The product has CAN/485 and other communication functions, and accepts BMS/ECU/VCU protocol instruction / logic control and operation information uploading. It supports multi-channel temperature sensing sampling and testing.(The communication protocols are customized)

This series of chargers are widely used for cycle charging of electric vehicles, forklifts, golf cars, electric sightseeing vehicles, electric cruise ships, electric cleaning equipment and UPS uninterruptible power supply, solar power generation, wind power generation, electric communication railway system, etc.

The connection between the charger and the battery is shown in the following diagram:

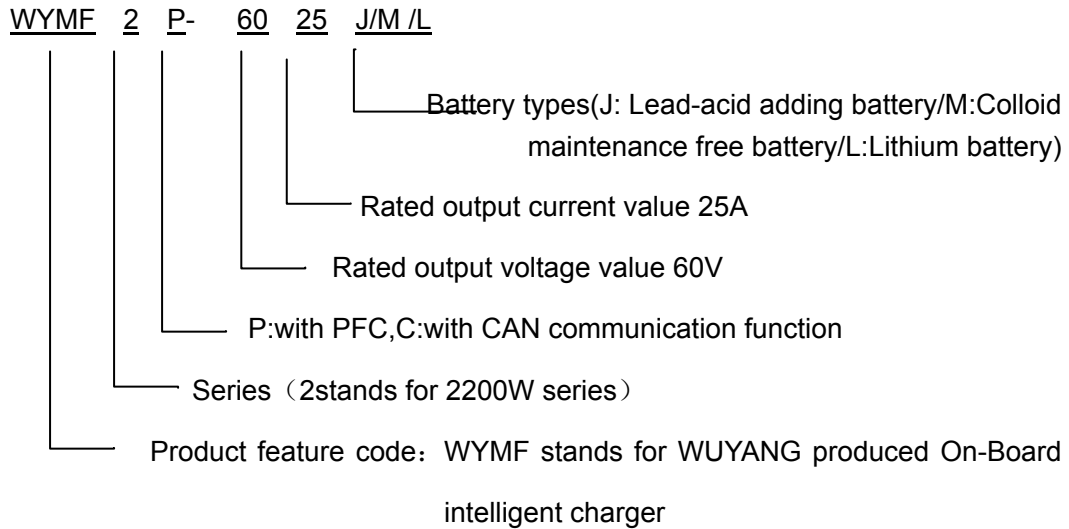


3、 Product Model

3.1 WYMF2P/2C Series Model

Model	Rated Output Voltage	Rated Output Current
WYMF2P-2450	24V	50A
WYMF2P-3640	36V	40A
WYMF2P-4825	48V	25A
WYMF2P-4830	48V	30A
WYMF2P-6025	60V	25A
WYMF2P-6030	60V	30A
WYMF2P-7220	72V	20A
WYMF2P-7225	72V	25A
WYMF2C-2450	24V	50A
WYMF2C-3640	36V	40A
WYMF2C-4825	48V	25A
WYMF2C-4830	48V	30A
WYMF2C-6025	60V	25A
WYMF2C-6030	60V	30A
WYMF2C-7220	72V	20A
WYMF2C-7225	72V	25A

3.2 WYMF2P/2C series charger models naming rule



4、 Working Environment

No.	Item	Technical Indicators
1	Working Temperature	-25℃~+50℃
2	Storage Temperature	-40℃~+90℃
3	Relative Humidity	No condensation in 5%~95% at normal working condition
4	Cooling Mode	Natural air cooling
5	Altitude	3000m

5、 Electrical Characteristics

5.1 Input Characteristics

Input Voltage Range	AC85V~AC265V
Input Current	10A@220V
Input Frequency	45-65Hz

5.2 Output Characteristics

Item	Rated Value	Error Range
Maximum DC Output Power	2200W	/
Maximum Efficiency	≥93%	/
Power Factor	≥0.99	/



Output Voltage	Applicable to 24V/36V/48V/60V/72V batteries etc.	
Current	20A/25A/30A/40A/50A	
Voltage Precision	±1%	
Current Precision	Max.3%@(> 5A); Max.10%@(2-5A)	
Voltage Ripple Coefficient	±1%	

5.3 Protection Characteristics

No.	Item	Protection Features	Remarks
1	Input Overvoltage Protection	Protection point : 270±8VAC ; Recovery point : 265±8VAC	
2	Input Undervoltage Protection	Protection point :85±4VAC ;Recovery point :90±4VAC	
3	Output Overvoltage Protection	When higher than the maximum output voltage + 1%, stop outputting	
4	Output Undervoltage Protection	When lower than the minimum output voltage-5%, stop outputting	
5	Output overcurrent protection	Above 10% of maximum output current, stop output	
6	Output Reverse Protection	Not start work(Charger power on self test)	
7	Over-Temperature Protection	The charger will run at reduced power when the t Charger internal temperature reaches 75°C; The charger will protectively shutdown when the Charger internal temperature exceeds 85°C. Internal temperature is lower than 45 °C, recover output	
8	Battery Over-Temperature Protection	Protection Point : 55°C ; Need power on for recovery	
9	Output Short Circuit Protection	Stop outputting	
10	Grounding Protection	≤0.1Ω	
11	CAN Communication Protection	Automatic stop output in case of CAN communication failure , recoverable	



12	Power-off Protection	Yes	
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5.4 Connector Description

Item	Connector Model	Brand	Plug-in Connector Model	Instruction
AC Input	/	/	/	Or customer specified
DC Output	8-10 copper connector	/	N/A	Or customer specified
Signal Line	/	/	/	Or customer specified

5.5 Harness Requirement

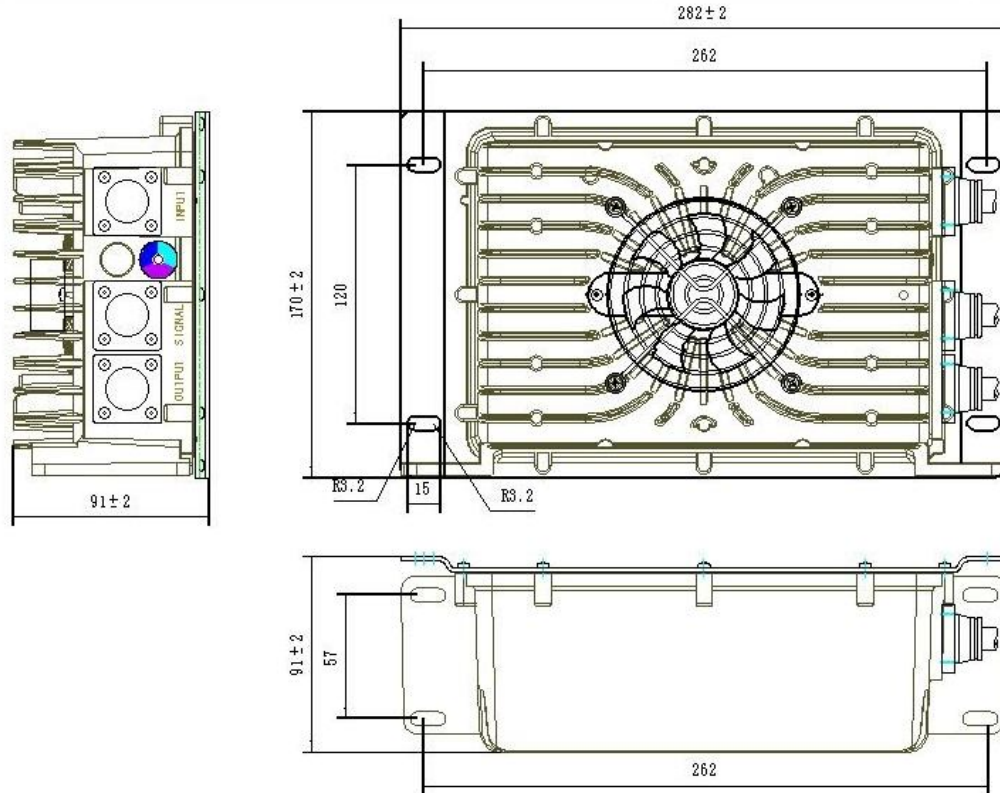
Item	Core	Length	Treatment	Instruction
AC Input	2.5mm ²	/		Or customer specified
DC Output	6mm ²	/		Or customer specified
Signal Line	0.3mm ²	/		

5.6 Other functions

Temperature compensation: battery temperature compensation, charging process standard temperature is 25 degrees, with the decrease or increase of temperature, the voltage adjustment coefficient is $\pm 0.018\text{v/degree}$ (only for lead-acid battery).

6、 Outer Dimension and Wiring Diagram

6.1 Outer Dimensions and Installation

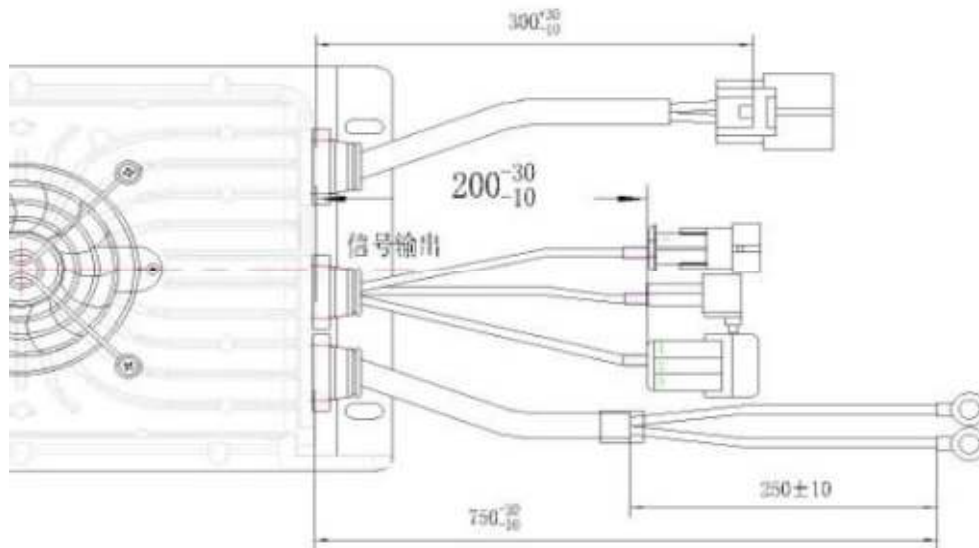


On board intelligent charger outer dimensions

L×W×H (mm) : 282mm*170mm*91mm

Foot installation size (mm) : ①262mm×57mm, ②262mm*120mm

6.2 Wiring Diagram



On board intelligent charger wiring diagram (customized)

7 、 Additional Function

Instruction: Additional functions of the product are added according to the actual requirements of customers

7.1 External Tricolor Indicator Light



The LED indicator is an important sign to determine whether the charger works normally. The following prompts will appear after the charger is on power.

- (1) LED red and green flash alternatively (interval one second): enter into standby mode, charger self test.
- (2) Red light flash: Normal charging, battery capacity <80%.
- (3) Yellow light flash: battery capacity has reached over 80%.
- (4) Green light on: battery capacity achieved 100%.

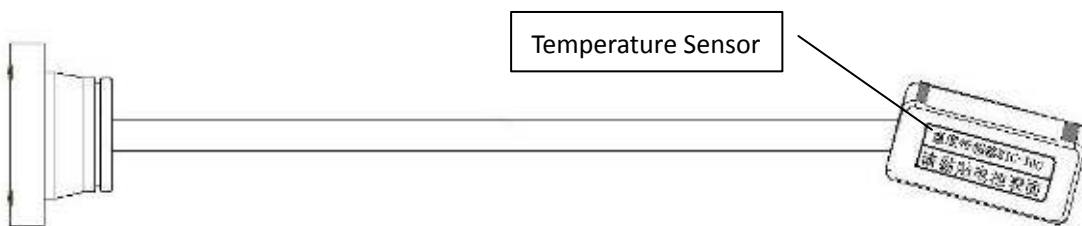
7.2 Recharging lock signal (relay N.C. contact)

The charger provides a set of N.C. contacts as the output signal. When the charger is charged normally, the contact disconnects, and the contact closes when the charger stops working. The rated current of the contact is 1A, the withstand voltage is 30V DC/250V AC



7.3 External temperature sensor

It is suggested that the lead-acid battery charger is equipped with a temperature sensor to detect the battery temperature and compensate the charging voltage. At the same time, the battery overheat protection function is realized. Suggest fix the temperature sensor onto the battery which at the highest temperature. When the temperature sensor is not easy to install on the battery, the temperature sensor can be fixed directly at where the surrounding temperature can be detected, but be noted that it should not be affected by the heat emitted by the charger.



7.4 CAN communication function

Reference standard for CAN communication: National Standard GB/T 27930-2015.

Communication protocol message: to be provided by customers.

Protocol Number	
CAN Baud Rate	250K
Charger accept CAN ID	0x1806E5F4
Charger send CAN ID	0x18FF50E5
Explanation	Compatible with Tiecheng agreement

Message Description:

Message Description 1:

OUT	IN	CAN ID	Cycle (mS)
BMS	Charger	0x1806E5F4	1000

Data		
Location	Data Name	
BYTE1	Maximum allowable charging terminal voltage high byte	0.1V/bit offset: 0 e.g.: Vset=3201, the corresponding voltage is 320.1V
BYTE2	Maximum allowable charging terminal voltage low byte	
BYTE3	Maximum allowable charging current high byte	0.1A/bit offset: 0 e.g.: Iset=102, the corresponding voltage is 10.2A
BYTE4	Maximum allowable charging current low byte	
BYTE5	control	0: charger starts charging 1: battery protection, charger stops outputting
BYTE6	control	0: charging mode 1: heating mode
BYTE7	preserve	
BYTE8	preserve	

Message Description 2:

OUT	IN	CAN ID	Cycle (mS)
CCS	BCA	0x18FF50E5	1000
Data			
Location	Data name		
BYTE1	Output voltage high byte	0.1V/bit offset: 0 e.g.: Vout=3201, the corresponding voltage is 320.1V	
BYTE2	Output voltage low byte		
BYTE3	Output current high byte	0.1A/bit offset: 0 e.g.: Iout=102, the corresponding voltage is 10.2A 。 Highest BIT representative symbol, 0 means charging , 1 means discharging。	
BYTE4	Output current low byte		
BYTE5	STATUS Icon	As following table	
BYTE6	Temp	Internal temperature. Offset 100 e.g.: 150 corresponding temperature is 50℃。	
BYTE7	preserve		
BYTE8	preserve		

STATU S	Symbol	Description
BYTE1	Hardware failure	0: normal, 1: hardware failure
BYTE2	Charger temperature	0: normal, 1: charger over temperature protection
BYTE3	Input voltage	0: input voltage normal, 1: input voltage error, charger stops working
BYTE4	Startup status	0: battery connection normal 1: battery disconnected or connected reversely
BYTE5	Communication status	0: communication normal, 1: communication receiving timeout
BYTE6		
BYTE7		
BYTE8		

7.5 Low Voltage Power Supply Function

The charger outputs a switching power supply of 13.8V 5A, which can supply power to BMS, and can also be used for other purposes.

Low Voltage Output	Output Mode	Constant Voltage
	Output Voltage	13.8V
	Rated Current	5A
	Constant Voltage Precision	±2%
	Output Power	≥62.5W
	Ripple Voltage Coefficient	±1%

7.6 Heat Auxiliary Function

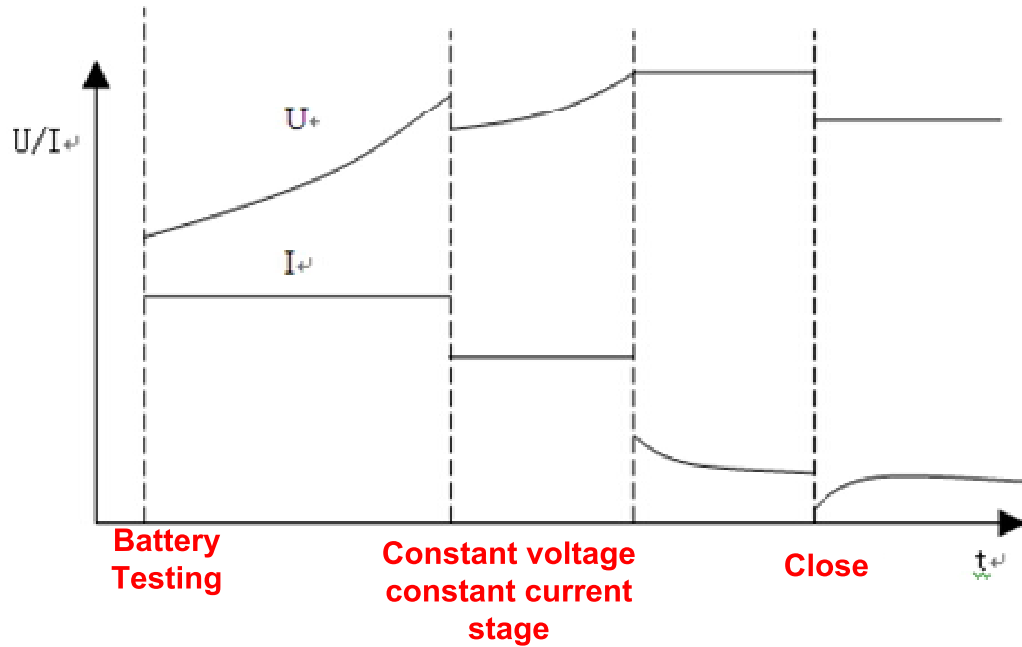
The charger outputs DC current at certain power to supply the battery heating plate PTC. When the charger is power on, it starts heat auxiliary function to warm up battery firstly as long as the battery temperature is detected to be too low (less than 0 degrees), and then the heat auxiliary function is closed when the temperature reaches a certain value. (This function is for lithium batteries only)

8、 Safety Characters

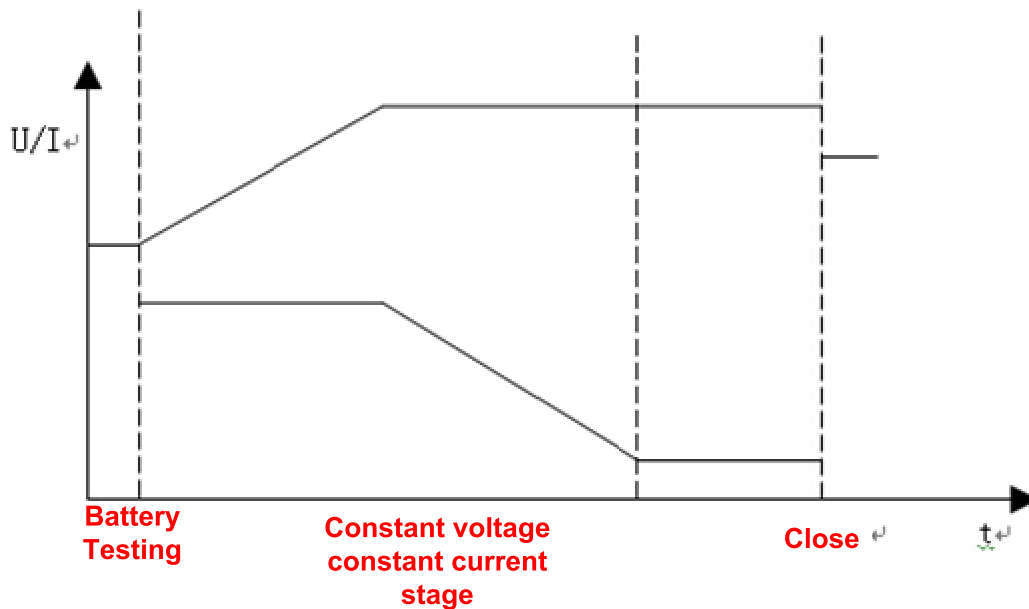
No	Item	Protection characteristics	Remarks
1	Withstand Voltage	Input to output: 2000VDC \leq 10mA Input to ground: 2000VDC \leq 10mA Output to ground: 2000VDC \leq 10mA	Continuous 1min
2	Insulation resistance	Input end, output end and signal end to shell \geq 10m Ω , Test voltage 1000VDC	
3	Electromagnetic immunity	meet GB/T 18487.3-2001 11.3.1	
4	Electromagnetic harassment	meet GB/T 18487.3-2001 11.3.2	
5	Harmonic current	meet GB 17625.1-2003 6.7.1.1	
6	Output voltage rise time	\leq 5S, overshoot \leq 5%	
7	Closing response time	100% to 10% \leq 200mS, 100% to 10% \leq 300mS	
8	Protection grade	IP66	
9	Vibration resistance	Meet QC/T 895-2011	
10	Noise	Meet QC/T 895-2011	
11	Salt fog resistance	Meet QC/T 895-2011	

9、Charging Curve

9.1 Charging Curve of Lead-acid Battery



9.2 Charging Curve of Lithium battery



10、 Label、 Packing、 Transporting、 Storage

10.1 Label

Please check the charger body

10.2 Packing

Packing carton marking content:

- Product name;
- Product model;
- Manufacture information;
- QC marking;
- Ex-factory date;
- Attached factory inspection report, etc.

10.3 Transportation

The product should be transported within a firm packing carton. The outside of the carton should conform to the relevant national standard and should be marked with "Handle with care", light and "Keep from moisture". Packing cartons with products support various transportation tools. Should avoid direct raining, snow and mechanical shock.

10.4 Storage

Product should be stored in the packing carton, the storage environmental temperature is $-10\text{—}50^{\circ}\text{C}$, and the relative humidity should not be higher than 80%. Keep from toxic, corrosive, flammable, explosive gas and chemical, or it might cause fault or failure; Keep from strong mechanical vibration, cold and hot impact, strong magnetic field and strong electric field during storage; The packing box should be at least 20cm high, keep from moisture or it will cause corrosion to the cable joint; Keep at least 50cm away from the wall, heat source, window or air entrance.

The storage period is generally 2 years under the above constraint conditions, and it should be retested after 2 more years.

11、 Use Safety Information and Matters of Attention

- 1) The charger installation board should be fixed on the horizontal surface of the car and keep the radiator vertical. Should keep 10cm space open around the charger radiator to ensure good heat dissipation status.



- 2) To ensure all the air vent unblocked, the heat generated by the charger should be guaranteed to discharge out of the car freely, and the space in which it is located is not sealed or semi sealed to prevent the temperature from being too high and affects the normal work of the charger.
- 3) Please keep the charger away from the heat source. Must keep enough space around the charger to ensure the convenience of plug in and out. It is also necessary to consider dustproof so as to avoid excessive dust accumulation on the surface of the charger and influence the heat dissipation effect of the charger.
- 4) Installation place of the charger needs considered to be waterproof, pay attention to avoid the water of the splash of the wheel and the dripping water of other parts, such as the condenser, so as to avoid the liquid infiltrating into the inner of the charger and affect the normal work of the charger.
- 5) Ensure that the AC power supply voltage and current are in accordance with the allowed input voltage and current of the charger. If there is any question, please contact the supplier or consult the electric power supply bureau.
- 6) For safety and electromagnetic compatibility considerations, the charger is equipped with three hole plugs, suitable for sockets with grounding wires.
- 7) If need extension wire under the AC power supply, it is necessary to ensure that the extension wire can afford the maximum input current of the charger and the length of the extension wire within a certain limit, in order not to affect the normal work of the charger.
- 8) The voltage drop of the connection wire between the charger and the battery should be controlled within 1% of the battery voltage as much as possible, otherwise the charging effect may be affected, and the diameter of the wire should meet the output current value.
- 9) When the battery voltage is being compensated, it is noted that the temperature sensor must be placed at where the cell temperature is at highest, such as the middle area between two batteries.
- 10) If the battery works abnormal or it is damaged, please remove the power adapter and charger interface immediately and contact the supplier.
- 11) It is forbidden to disassemble the charger on your own. Opening the lid of the charger at will will cause electric shock or other injuries.
- 12) In order to prevent the damage of the wire harness of the charger, please do not put the object on the wire harness of the charger or place the wire harness where it is easily trampled. If the harness is found to be worn or destroyed, please replace it immediately.
- 13) The charger enjoys one year warranty, improper use and damage is not within the scope of warranty.