240/320kW Series DC Charger

Instruction Manual

Zhengzhou Shanxiang New Energy Technology Co., Ltd.

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Dear users,

Thank you for choosing charging products made by Shanxiang. We sincerely appreciate your support to the products from Zhengzhou Shanxiang New Energy Technology Co., Ltd.

Zhengzhou Shanxiang New Energy Technology Co., Ltd. is a subsidiary of Yutong Group, specializing in battery charging and swap solutions. Our core team has gone deep into the field of battery charging and swap solutions for more than 10 years and has rich product R&D and project operation experience. By over 100,000 new energy vehicles in total we served, we contribute to sound development of new energy ecology and are committed to providing customers with high quality products and efficient operation solutions.

Please read this manual carefully and follow the steps in the manual for your better use and maintenance of this product (hereinafter referred to as the charger).

Since internal structure of the charger is complex, never remove or modify its circuit by yourself. Otherwise, any resulting failure will not be covered by warranty of the Company, and any resulting personal injury has nothing to do with the Company. Therefore, the Company will not assume any responsibility.

Please note that the charger you purchased may not be exactly as described in the manual due to product upgrade.

Table of Contents

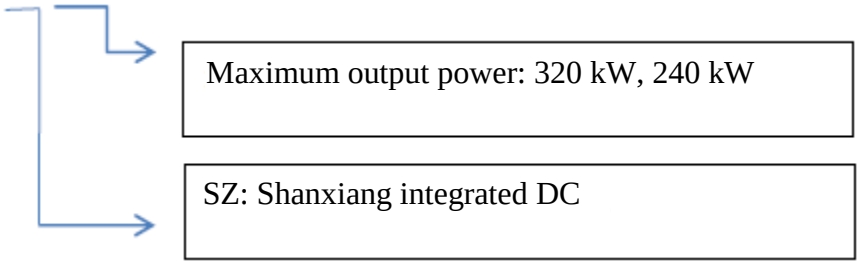
I. Introduction to product

1.1 Brief introduction to product

The SZ series integrated DC charging pile produced by Zhengzhou Shanxiang New Energy Technology Co., Ltd. is mainly used for fast DC charging of electric vehicles, integrating power conversion, charging control, man-machine interactive control, communication, billing and metering. Boasting robust dustproof and waterproof capabilities, with protection grade of IP55, it can operate and is maintained safely outdoors. The power conversion unit of the charger adopts modular design, and it can be flexibly configured within power output range of 240kW to 320kW, so as to meet charging needs of electric vehicles with different capacities and meet the charging needs of users in various scenarios.

1.2 Product model

SZ-320, SZ-240



1.3 Technical parameters

Item	Product model	SZ-320	SZ-240
Input parameters	Input voltage	380 V ±15% AC	
	Input frequency	50 Hz ±10%	
	Connection mode	Three-phase five-wire system	
	Input power factor	≥0.99	
Output parameters	Rated output power	320kW	240kW
	Output voltage range	100 to 1000 VDC	
	Output constant power range	300 to 1000 VDC	
	Maximum current output	250A (single gun) 500A (whole equipment)	
	Charging gun quantity	2	
	Charging gun length	7 m or 7.5 m	
	Overall efficiency	≥95%	
	Output voltage error	≤0.5%	
	Output current error	≤±1% (I≥30A) ≤±0.3A (I<30A)	
	Voltage stabilization precision	≤0.5%	
	Stabilized current precision	≤1%	
	Ripple coefficient	≤1%	
	Accuracy class	Class 1	

Working environment	Protection grade	IP55
	Working temperature	-30 to 55 ℃
	Altitude	≤5,000 m. Derating output if above 2,500m
	Noise	≤65dB
Other parameters	Display size	7 inches, 800*480
	Communication port	4G/wifi/LAN
	Overall dimension (mm)	900*850*1600

Notice:

Do not use it in the following environments:

1. Do not use it at sea or near sources of pollution;

2. Do not use it if there is corrosive substance or substance that can destroy insulation;

3. Do not use it if there is conductive dust and corrosive gas. Do not use it in environments where there is a risk of explosion.

1.4 Reference standards

Standard No.	Standard name
GB/T 18487.1-2015	Electric vehicle conductive charging system - Part 1: General requirements
GB/T 18487.2-2015	Electric vehicle conductive charging system - Part 2: EMC requirements for off-board electric vehicle supply equipment
GB/T 27930-2015	Digital communication protocols between electric vehicle off-board conductive charger and battery management system
GB/T 20234.1-2015	Connection set of conductive charging for electric vehicles - Part 1: General requirements
GB/T 20234.3-2015	Connection set of conductive charging for electric vehicles - Part 3: DC charging coupler
GB/T 34657.1-2017	Interoperability test specifications of electric vehicle conductive charging - Part 1: Supply equipment
GB/T 34658-2017	Conformance test for communication protocols between off-board conductive charger and battery management system for electric vehicle
GB/T 20234.1-2015	Connection set of conductive charging for electric vehicles - Part 1: General requirements
GB/T 20234.3-2015	Connection set of conductive charging for electric vehicles - Part 3: DC charging coupler
JJG 1149-2022	Calibrator of off-board chargers for electric vehicles
NB/T 33001-2018	Specification for electric vehicle off-board conductive charger
NB/T 33008.1-2018	Inspection and test specifications for electric vehicle charging equipment - Part 1: Off-board charger

II. Installation instructions

2.1 Installation conditions

➢ The site selection, installation and construction of the charger should comply with national laws, regulations and relevant standards. When installing, do not close the ventilation side and the door opening side to walls. Professional installation personnel and qualified construction units should be selected;

➢ Installation environment of the charger should match the protection grade of the charger housing. The charger should be away from water, explosive environment, heat sources and corrosive environment.

➢ After installation, there should be adequate space reserved around the charger;

➢ Make sure there is sufficient power access load capacity in charger operation site;

➢ The grounding system connected to the charger should be TN-S system, and the grounding resistance should be less than 4 Ω;

➢ If circuit breaker at power supply end of the charger is a electricity leakage breaker, 4P electricity leakage breaker must be used;

➢ The charger input adopts three-phase five-wire AC power supply. Cable requirements are shown in table below:

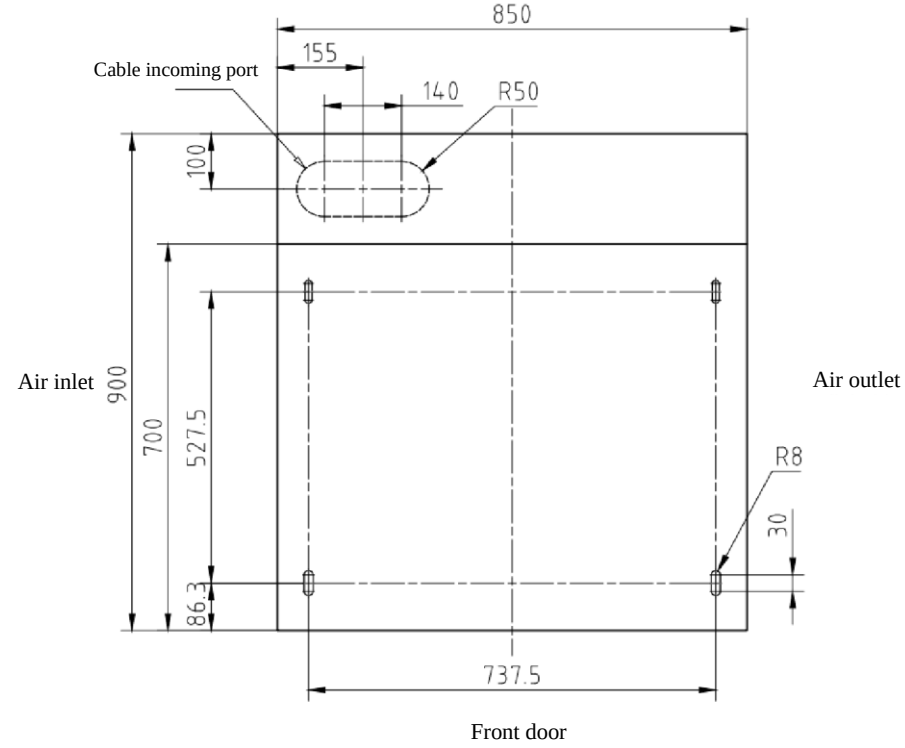
Power	Rated input current	Specifications of recommended power cable (copper core cable)	Specifications of recommended plastic-housing circuit breaker for distribution box
240kW	390A	YJV-3*185+2*95	500A
320kW	520A	YJV-3*120mm²+2*70mm²double parallel or YJV-3*300mm²+2*150mm²	630A

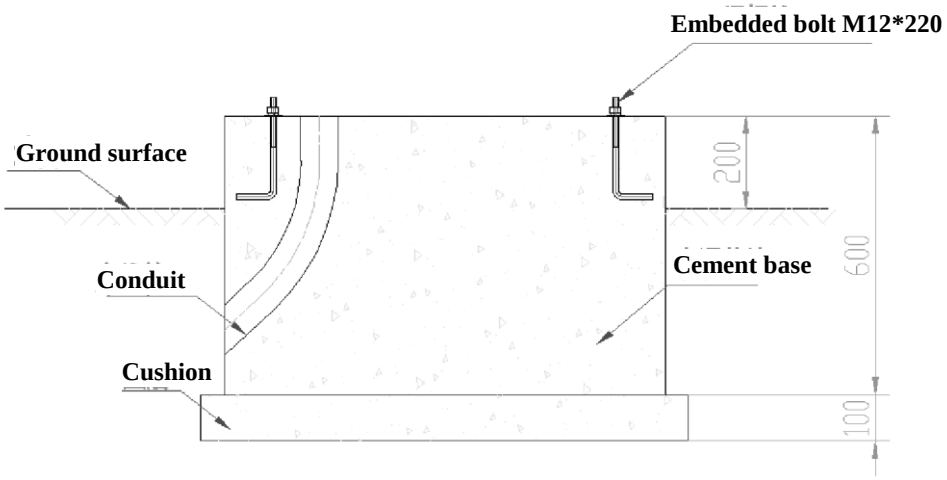
Note: The number before * indicates the number of cables, and the numbers after * indicates the diameter of each cable. "YJV" stands for copper conductor XLPE insulated PVC sheathed power cable.

Notice: If the length of an AC input cable exceeds 100 m, its specification should be improved by one level. The above cable specifications and models are recommended according to direct burial manner of the cable in soil. The actual construction shall be subject to the site application environment and the drawings of the design institute.

2.2 Cabinet installation instructions

1) The charger adopts ground installation. When installing, make sure the installation is reliable and firm. The recommended foundation drawing is shown below:





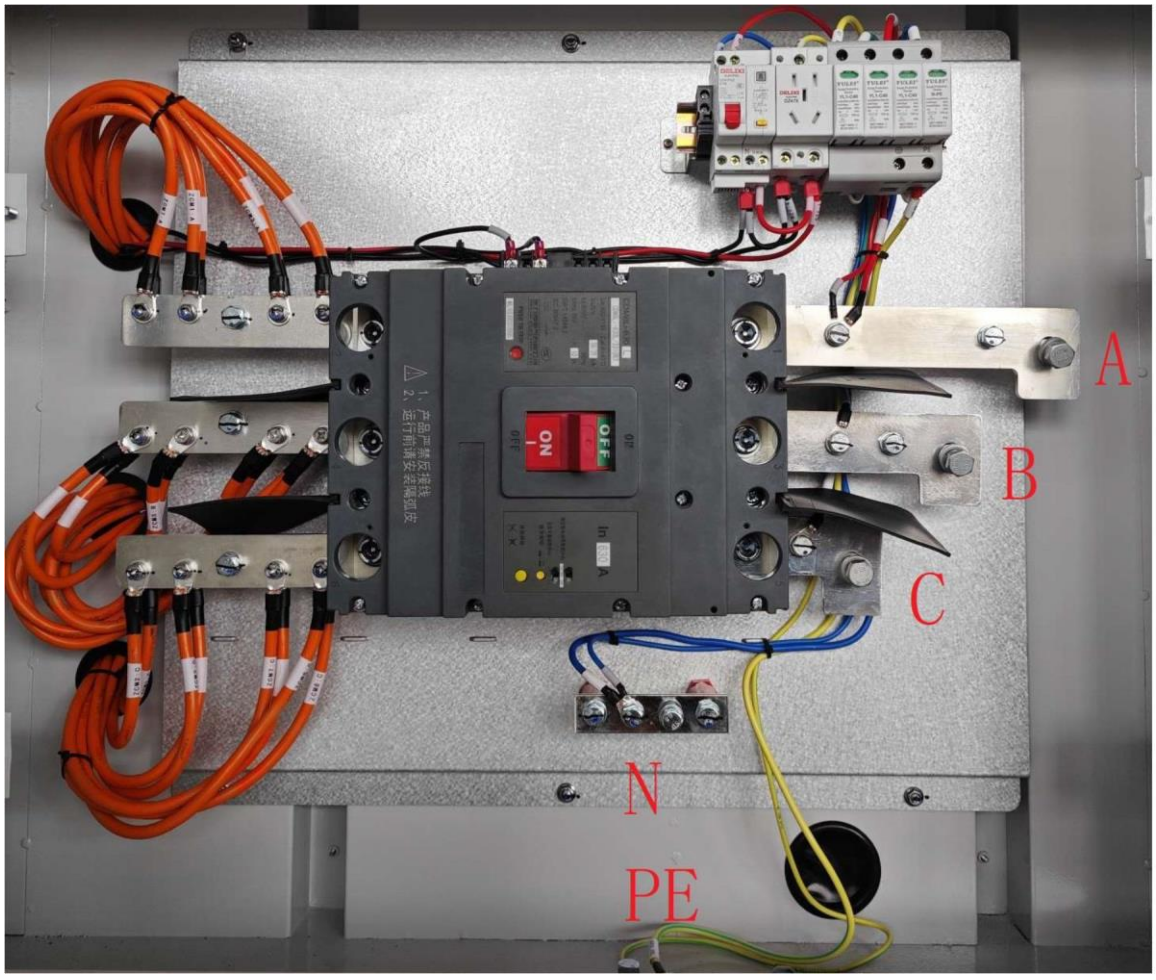
Charger Foundation Drawing

2) When installing, remove the charger tray and bottom protection plate. After that, transfer the charger to foundation platform with a forklift and fix the charger. After fixing, install the protection plate back.

Notice: After the charger is fixed to the platform, its installation vertical inclination should not be greater than 5%. When fixing, the recommended tightening torque is 50±5 N•m.

2.3 Electrical cable installation instructions

Open the front door of the charger cabinet and remove the baffle plate. Make the input three-phase AC cable enter from bottom of the charger, connect the copper bars and tighten. Connect cables A, B, C, N and PE positions respectively shown in the following figure.



AC charging input cable installation position figure

Notice:

1) The AC input cable must be connected as shown in the figure. Do not connect the neutral cable and phase cable inversely. Otherwise, it will lead to charger failure beyond repair;

2) The recommended tightening torque for bolts of copper bar of phase A, B, and C cables is 30±2N• m. The recommended tightening torque for copper bar bolts for ground cables is 15±1N• m;

3**) After installing AC input cables, seal the cable entry hole with fireproof mud at bottom in the cabinet, to prevent foreign bodies, moisture and others from entering the charger, which will cause charger malfunction and damage.**

2.4 Preparations for power-on

2.4.1 Personnel requirement

After passing the operation training, the operator can use the charger. During working, always wear work clothes and insulation shoes according to requirements. An operator with long hair should wear a safety helmet.

2.4.2 Inspections before use

Check interior of the charger cabinet for electrical damage and position movement. Make sure the terminals are firmly fixed without damage and ablation.

Open the door of the cabinet, close the air switch on the control circuit and turn the circuit breaker to ON to carry out continuity test, so as to make sure there is no short circuit.

Before powering the AC input cables, check that the emergency stop switch is screwed out. All doors are closed except the front door, and circuit breaker and air switch are off.

After powering on the AC input cables, firstly measure if voltage between A, B, C, neutral cable, and ground cable is normal with a multimeter, to ensure that the input AC power supply is free from phase loss, there is no short circuit, and that the neutral cable, phase cable and ground cable are not connected reversely. After check that there is no abnormality, close the circuit breaker and air switch.

Before charging, check that there are no foreign objects in the charging gun, charging seat insulator, pin and holes. If any, remove according to instructions.

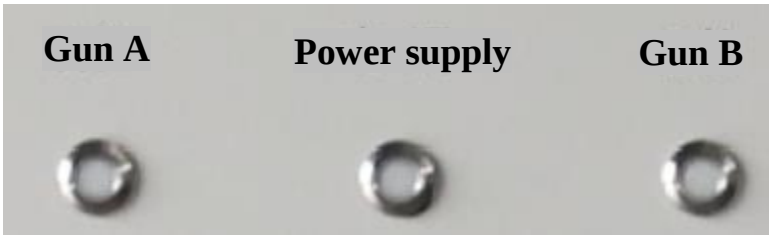
2.5 Brief introduction to charging system

2.5.1 Welcome home screen

The power indicator can be in green or red. After turning on the power supply, the power indicator comes on in green, indicating that the charger is powered on. When the emergency stop button is pressed or the cabinet door with the limit switch is open, the power indicator comes on in red, indicating that the charger is faulty.

The gun A indicator and gun B indicator for can be in green or red. When an indicator comes on in green, it indicates the corresponding gun is charging. When an indicator comes on in red, it indicates the corresponding gun is faulty. When an indicator is off, it indicates the corresponding gun is not in use.

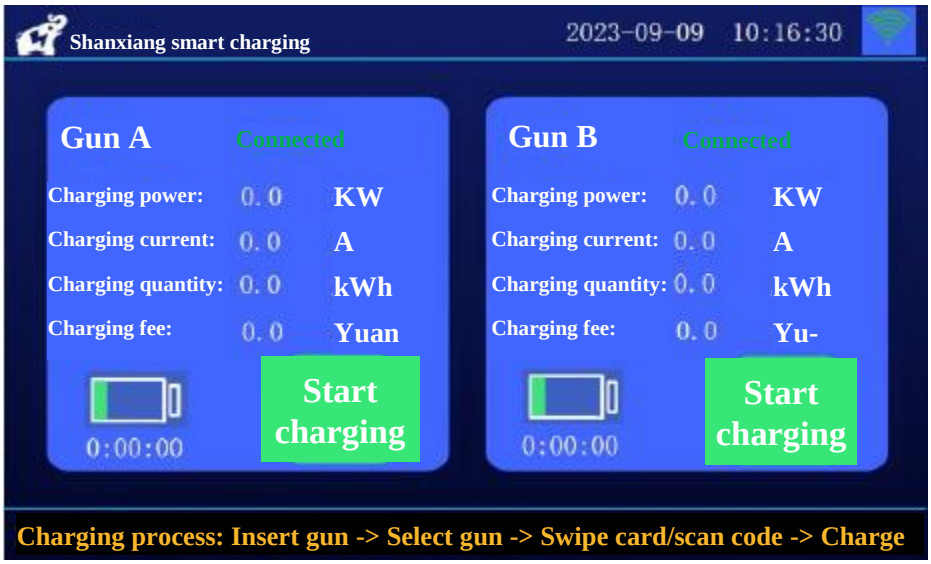
Indicators of the charger are shown in the figure below.



Charger Indicator Figure

2.5.2 Charging gun selection

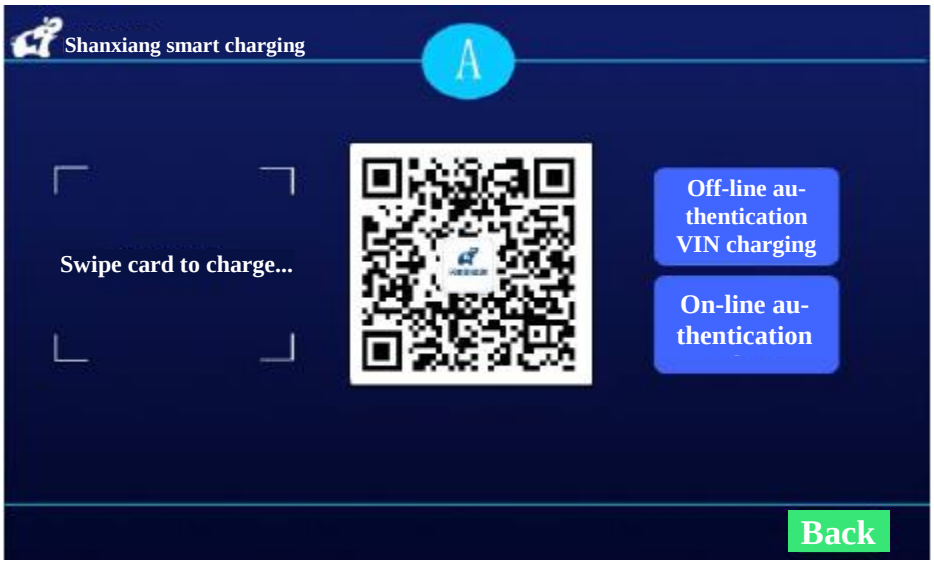
After the charger is powered on, insert the charging gun into socket of the vehicle to be charged, and the charger display shows status of the corresponding charging gun as “Connected”. Click the “Start to charge” button of the gun on the screen. Please refer to the figure below:



Charging Gun Selection Screen

2.5.3 Charging method selection

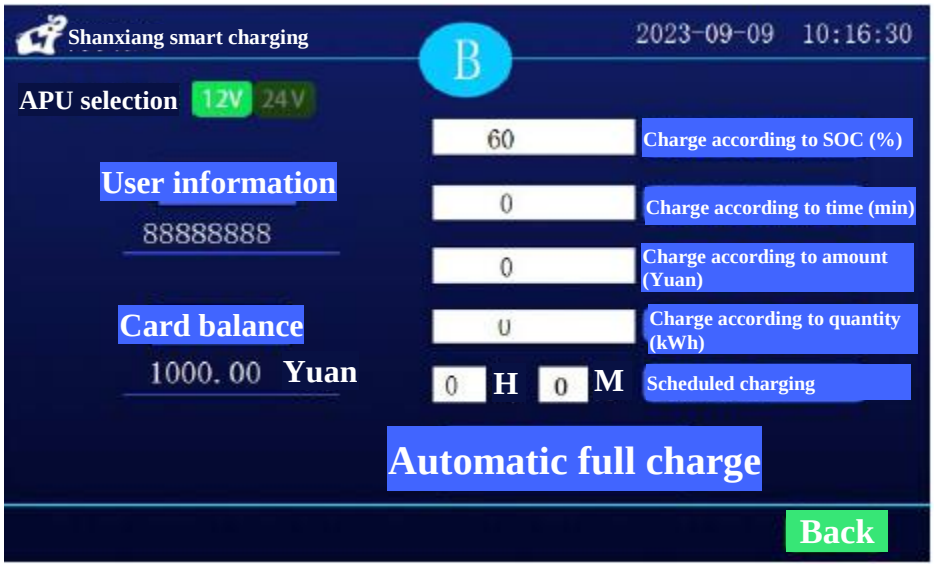
Click the “Start to charge” button, and then charging method selection screen (including card swipe, code scan, VIN) pops up on the screen. The user can select a charging method according to charging requirements. The charging method is shown in figure below:



Charging Method Selection Screen

2.5.4 Charging mode selection

Select a charging method, and then charging mode selection screen pops up. The user can select a charging mode according to charging requirements: Ancillary selection, automatic full charge, charge according to SOC, charge according to time, charge according to amount, charge according to quantity, and charge according to schedule. The charging mode is shown in figure below:



Charging Mode Selection Screen Figure

2.5.5 Charging

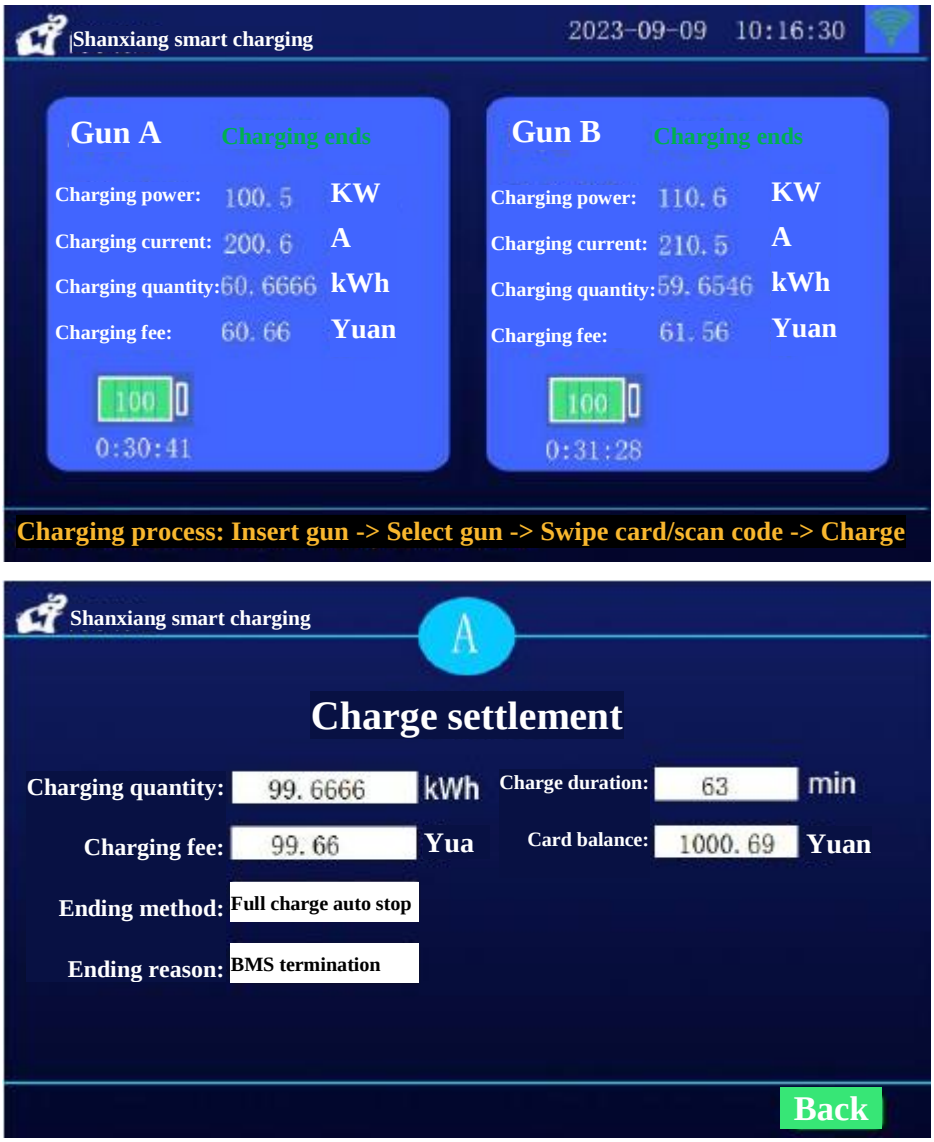
When the charging mode is selected, the charger starts to charge. During charging, the following information is displayed: charging power, charging current, charging quantity, charging fee, charging time and SOC. Click the gun No. to display detailed charging data as shown in the following figure:

Charging Process Data Display Figure

While charging, if you need to stop the charging, click the “End charging” button to manually terminate the charging.

2.5.6 Charge settlement

When charging is complete or manually terminated, click your gun No. to enter settlement screen. The followings are displayed on the screen: charging quantity, charging duration, charging fee, card balance, ending method, ending reason and others as shown in figure below:



Charge Settlement Screen Figure

2.5.7 Operations after charging

After charging, pull out the charging gun and put it back in place.

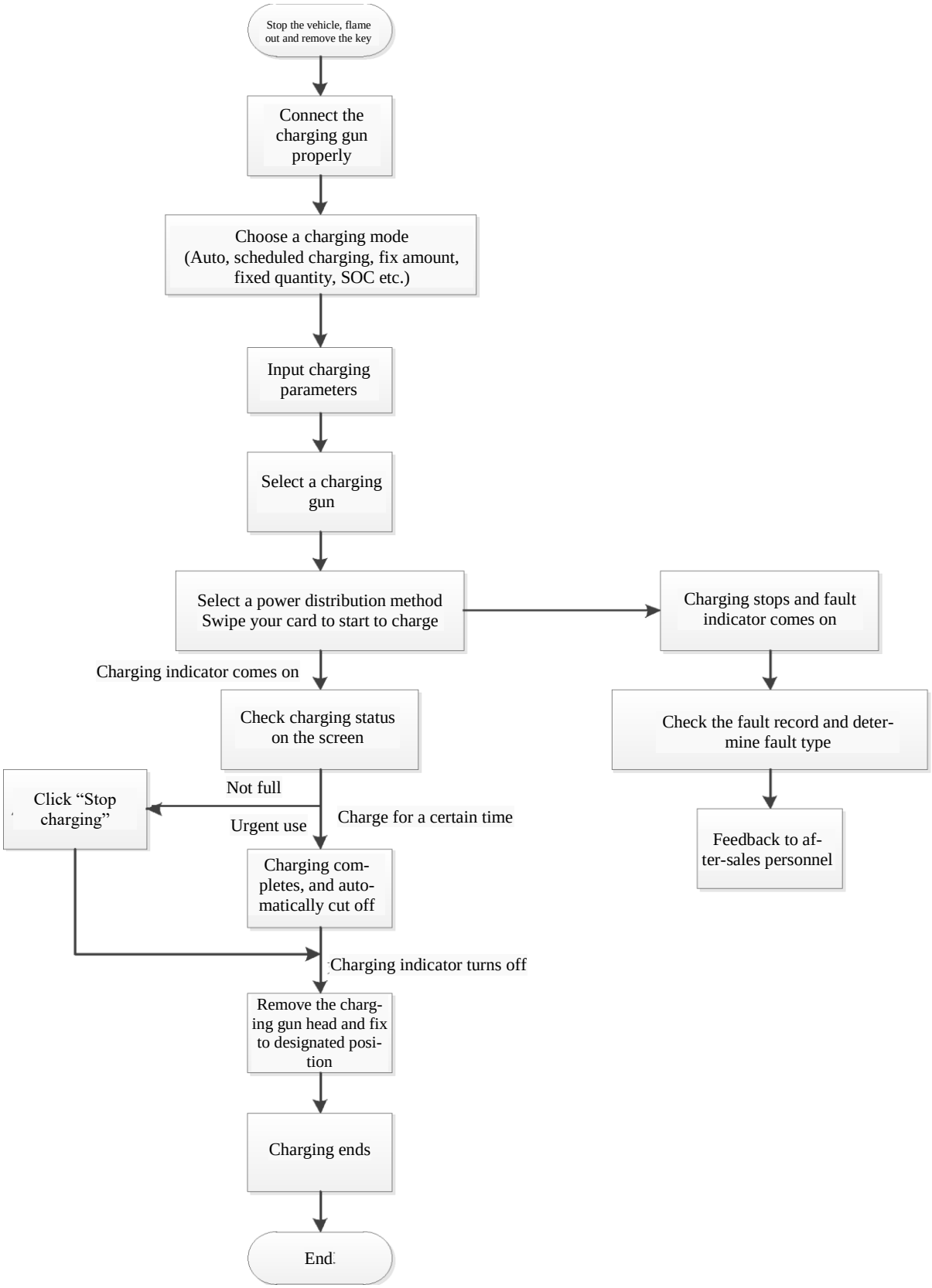
Notice: Please insert the charging gun head sheath in time, or insert the charging gun to the gun seat of the charger, to prevent it from being wet and damp in rain and snow, and to prevent dust from entering. Otherwise, it cannot be used properly.

2.5.8 Introduction to charging mode

The charger supports different operation modes: single gun charging, double-gun separate charging, and double-gun parallel charging. When adopting double-gun parallel charging,

make sure both of the guns are inserted properly and then start to charge.

2.5.9 Operation procedures



III. Charger storage and maintenance instructions

3.1 Charger storage

The packaged charger should be stored at a well ventilated site with temperature between -35℃ to 55℃ and average monthly relative humidity not more than 90%.

There should be no corrosive and explosive gas in the storage site. Never store the charger and corrosive items in the same site. During storage, protect the charger from rain, exposure, condensation and frost.

Storage duration:

Equipment name	Limited storage period in environment of category I (year(s))	Limited storage period in environment of category II (year(s))	Limited storage period in environment of category III (year(s))
Charger	1	0.8	0.5

Storage environment conditions relationship:

Category of Storage Environmental Conditions	Temperature (℃)	Relative Humidity %
Category I	15 to 25 ℃	≤ 65 %
Category II	-5 to 30 ℃	≤ 75 %
Category III	-35 to 55 ℃	≤ 90 %

3.2 Charger maintenance

In order to ensure service life of the charger and reduce risks during use, maintain the charger regularly and troubleshoot in time. The maintenance periods are recommended ones. If its working environment is harsh (such as: dust, catkins, poplar catkins, dusty environment, etc.), please shorten the maintenance periods as appropriate.

Inspection Item	Recommended Period	Inspection Method	Operation Instruction
Check whether the air inlet strainer is normal	Once every month	Visual inspection	Check whether air can pass through the air inlet strainer smoothly. Remove the air inlet strainer unit from the cabinet. And then clean the strainer with a water gun/air gun. Finally, remove poplar/willow catkins from air inlet and outlet. If the strainer is blocked seriously, replace the air inlet strainer unit of the system
Check whether the radiator fan of the charging module works properly	Once half a year	Visual inspection	Check crystal display of the charger. Check whether temperature and heat dissipation of the charging module are normal;
Check whether the charging module works properly	Once half a year	Visual inspection	Check crystal display of the charger. Check whether the charging module operates normally;
Check whether the charging gun is normal	Once every month	Visual inspection	Check whether the charging gun head and the gun cable are worn and damaged. Check whether the charging gun terminals are black or arc discharged. Check whether lock rod of the charging gun is stuck;

IV. Safety instructions

In order to ensure the normal service life of the charging pile and reduce risks during use, always inspect and maintain it within the specified period. The equipment should be checked and repaired by professional personnel using qualified and safe maintenance tools.

4.1 Installation risk notification

➢ Please conduct construction in accordance with relevant construction safety regulations and standards to avoid safety accidents;

➢ The selected installation site is not located in a low-lying position prone to water accumulation and keeps a safe distance from the surrounding fire explosive facilities and underground pipelines. The installation location should be away from open flame, high temperature, dust and corrosive environment. The protection grade of the selected product housing should be adapted to the installation environment;

➢ Strength of the installation position must meet the requirements, and all fixing bolts must be tightened. Otherwise, it could drop or fall over. When transporting with a forklift, the forklift should meet the cabinet weight requirements. Cables, terminals and other components selected for installation should meet the current requirements. Before and after installation, make sure all cables of the charger are tight, all terminals should not be stressed, with good the insulation and correct wiring, and without risk of wear and extrusion damage. Otherwise, there is a risk of fire and electric shock;

➢ After wiring, make sure all holes entering the charger are well sealed. Otherwise there is the risk of cable secondary combustion;

➢ Before powering on the equipment, check whether the input power supply voltage is normal, and whether the equipment is properly grounded to avoid electric shock;

➢ After the installation, cheek that all the protective casings, insulation sleeves and other devices of electrical components are not lost. Otherwise, there will be the risk of electric shock;

➢ During installation, if any parts are damaged, repair and replace them in time to avoid use with faults.

➢ After installation, check whether metal tools or combustible materials are left in the cabinet. Otherwise, there is a risk of fire.

4.2 Operation and maintenance risk notification

➢ Do not remove or modify the charging facilities and wiring without permission. Otherwise, there is a risk of fire and electric shock;

➢ When power is cut off due to failures, it must be repaired by our professional personnel

or our authorized operation and maintenance personnel. Otherwise, there is a risk of electric shock;

➢ Do not maintain the charging equipment when the power is not cut off. Otherwise, there is a risk of electric shock;

➢ Operation and maintenance personnel should check and maintain the emergency stop switch regularly to ensure that the emergency stop switch is workable;

➢ There should be no combustible materials around the charger. The operation and maintenance personnel should remove such items in time. Otherwise, there is a risk of fire.

4.3 Use risk notification

➢ Before using, please check whether parameters of the electric vehicle and the charging equipment match. Otherwise, the vehicle could be damaged;

➢ Do not use the charger when it is faulty. Do not operate the charger without permission when it is abnormal.

➢ Please strictly follow process and instructions shown on the charger. Otherwise, there is a risk of electric shock and fire. When an accident such as fire or soaking occurs, do not approach the charger. Contact the personnel familiar with the equipment and emergency treatment methods for emergency handling;

➢ Lock the charger at ordinary times. It is strictly forbidden to open, connect, modify or destroy the charging equipment without permission. Otherwise, there is a risk of electric shock;

➢ When a child is near the charging facilities, guardians should take good care of the child to avoid accidents such as electric shock.

VI. Warranty

6.1 General rules of warranty

During the warranty period, under the premise that you comply with regulations covered in the DC Charger Instruction Manual, for quality problem of the charger caused by its material and manufacturing process and other quality problems caused by the equipment itself, after confirmed by Shanxiang New Energy, we will provide you with free warranty service. For details of the rules, see the warranty provisions.

In order to ensure the after-sales warranty meets the relevant technical standards and safety requirements, Shanxiang New Energy will independently determine the warranty scheme of the faulty charger according to conditions of the equipment, including but not limited to repair or replacement of relevant parts.

6.2 Warranty period

The warranty period is subject to the purchase contract between the two parties, except for consumable parts.

6.3 Warranty conditions and restrictions

➢ Preconditions of the product warranty:

① The product must be within the specified warranty period. Damage caused by human factors, improper maintenance and other non-product reasons, including appearance and function of the whole equipment and parts, is not covered by the warranty.

② Only Shanxiang New Energy and Shanxiang New Energy authorized service providers have the right to accept warranty applications submitted by users. Once the product fails, please contact the above departments and personnel immediately to determine whether the warranty is available.

③ After a fault occurs, the user should retain the necessary original state of the fault according to the principle of "not affecting the identification of the fault liability". If the fault state is destroyed by the user to a degree that the fault liability and initial degree cannot or is difficult to be identified or determined, Shanxiang New Energy will take no responsibility for the faulted product.

④ Due to special reasons, after a fault occurs, if the Shanxiang New Energy after-sales service personnel (including inspectors of the Shanxiang New Energy service station) cannot carry out on-site identification, the user needs to deal with the fault first. However, it is necessary to obtain consent of the Shanxiang New Energy after-sales service personnel in advance, and carry out according to the plan determined by the Shanxiang New Energy. If the user handles the fault by himself without consent of Shanxiang New Energy, or if the fault status is destroyed by not processing by the users according to the plan determined by Shanxiang New Energy, Shanxiang New Energy only provides warranty for the parts whose initial failure status can be clearly determined. In addition, the failure must be caused by the product itself.

➢ If the user carries out the following operations without the permission of Shanxiang New Energy within the warranty period, the user will automatically waive the warranty rights provided for repair, disassembly of the whole equipment, removal of any parts, replacement of any parts, assembly. In this case, the charger will not be guaranteed. Any fault occurring to the unauthorized repair parts and resulting losses are at the user's own expense.

➢ During product use, indirect losses caused by product quality problems (such as parking fees, telephone charges, towing fees, fines, loss of work, etc.), Shanxiang New Energy

will not be compensated.

➢ During the warranty period, the maintenance accessories that need to be replaced or supplemented during the maintenance process and normal consumption are borne by the user, such as incoming cables and electricity charges.

➢ The faulty parts replaced during the warranty period shall be owned by Shanxiang New Energy.

➢ Shanxiang New Energy does not pay for other maintenance costs during use of the product, such as the cost of inspection, adjustment, and maintenance required according to the Instruction Manual and other materials.

➢ During the warranty period, if the user uses parts not designated by Shanxiang New Energy for repair, there will be no warranty and compensation.

➢ Any damage such as rust, scratches, coating paint fading and peeling during preservation, storage and use after delivery will not be covered by warranty.

➢ Product damage caused by operation not in accordance with instructions specified is not covered by the warranty.

➢ Damage caused by force majeure (such as flood, earthquake, fire, high temperature, acid rain, avalanche, heavy rain and other harsh environment) and the resulting failure is not covered by the warranty. Damage caused by human factors and the resulting failure is not covered by the warranty. Shanxiang New Energy does not assume any responsibility and loss caused by the above factors.

➢ If the user applies for after-sales warranty, but prevents Shanxiang New Energy after-sales service personnel (including Shanxiang New Energy service station maintenance and identification personnel) from normal inspection, analysis and identification of product faults, the user will bear the corresponding losses and responsibilities.

➢ If the user finds an anomaly, always contact the after-sales service in time to avoid charger damage caused by the abnormal cause. No warranty or compensation will be provided for damage or accidents if the user makes the charger operate with a malfunction.

6.4 Quality judgment

➢ When there are objections about the fault liability identification conclusions, the department with corresponding qualification mutually agreed by both parties can be entrusted to conduct identification, and costs should be borne by the responsible party.

➢ Disputes arising from quality problems, in the absence of other agreements, shall be under the jurisdiction of the court of abode of Shanxiang New Energy.

➢ If it's temporarily hard to draw the identification conclusion, the user can request replacement and repair beforehand without influencing the proceeding of identification. However, the corresponding fees must be paid in advance.

6.5. Additional warranty regulations

➢ Shanxiang New Energy part warranty mainly provides repair services. If it is beyond repair, carry out replacement. The replacement follows the principle that as long as parts can be replaced, never replace the assembly.

➢ During warranty period of the whole equipment, failure of covering parts caused by quality problems, such as rust, deformation, surface paint off, blister, cracks, we provide repair services.

6.6. Warranty procedures

➢ During the warranty period, after the product fails, the user can apply for warranty through Shanxiang after-sales service personnel.

➢ When the user applies for warranty, please assist the Shanxiang New Energy after-sales service personnel or service personnel of the service station to check the factory number, delivery date and other relevant information.

➢ Shanxiang New Energy after-sales service personnel or service personnel of Shanxiang New Energy service station will identify the fault status of the faulty product. If it is caused by Shanxiang New Energy, Shanxiang New Energy is responsible for warranty. If not, but the user requires Shanxiang New Energy to provide repair services, Shanxiang New Energy has the right to charge labor, materials, accessories and other expenses.

6.7. Supplementary provisions

➢ This Manual is an agreement to clarify the generation, change and termination of rights and obligations related to quality warranty liability, period and after-sales service of Shanxiang New Energy products between the Shanxiang New Energy and users.

➢ This Manual is an agreement between Shanxiang New Energy and the users who purchase charger. It takes effect from the date of purchase.

➢ Warranty period of consumable parts in the charger is shown in the following table:

S/N	Warranty item	Warranty period (months)	Note
1	Display screen	12	Consumables
2	Dust sponge	12	Consumables
3	Charging gun	12	Consumables

➢ The Internet of Things card used in the charger is free of charge for 1 year data flow (Date on the factory nameplate shall prevail).

➢ Never operate in live status. Non-professional personnel are strictly prohibited from

removing high-pressure components. If the charger is not used for a long time, please turn off the charger input switch. Otherwise, standby power consumption will be generated. In addition, it may cause power factor to exceed the standard, which could be fined by the power supply bureau.

Attached: Common fault code table

Fault code	Fault cause	Fault code	Fault cause
37	Fault code 37 address duplication	704	BMS communication timeout
101	Positive contactor close failure	705	Connector failure
102	Negative contactor close failure	711	SOC anomaly
208	Positive circuit insulation fault	712	Excessive cell temperature
209	Negative circuit insulation fault	713	Cell overvoltage
310	Head unit communication failure	714	Constant voltage mode overcharge
401	Gun lock failure	716	Inverse battery polarity
502	RAM memory failure	717	BSD message not received
503	FLASH memory failure	718	High battery voltage
521	Bus output above allowable current	720	BMS active fault suspended
522	Bus output above allowable voltage	721	BRO message error
526	Bus input overvoltage	722	BCP message battery parameter error
528	Bus input undervoltage	723	High gun cable temperature
529	Bus output above demand voltage	724	Charging over 10 hours
530	Bus output above demand current	725	Door control ON
601	Hardware communication failure	801	Reading charge record number error
603	Hardware password not correct	802	Reading channel parameter error
701	Battery voltage not detected	803	Time-of-use rate reading failure
804	Gun 1 emergency stop pressed	805	Gun 2 emergency stop pressed
808	Reading fault record number error	901	ADC sampling failure
902	Sampling calibration failure	903	CCS sampling anomaly
1001	Network connection interruption	1002	Send timeout
1101	Bus relay failure	1104	Power module response timeout
1105	Power module shutdown failure	1120	Switching relay adhesion
1121	Switching relay close failure		