

# **VORSPRUNG**<sup>®</sup>

## Electric Vehicle AC Charging Unit



## User Manual

Model: 20179



Thank you for choosing one of our Vorsprung AC charging units. To help you correctly use, operate, maintain, check and troubleshoot this AC charging unit, please carefully read this User Manual before use, operate according to this User Manual only, and keep safe for future use.

## This Unit must only be installed & fitted by a Certified Engineer

Installation must only be performed by a Certified Engineer competent in accordance with the current legislation in force in the geographical location of the installation.

- Advice provided in this manual does not override any legislation.
- If the advice in this manual is not understood, contact the distributor for further advice and/or training before attempting installation/operation of the equipment.

The manufacturer/distributor cannot accept any responsibility for improper installation or any problems arising from improper installation.

**NOTE:** Damage to the equipment, connected systems or to property caused by improper installation are the responsibility of the engineer.

**NOTE:** All electrical work must be performed in accordance with the current Electrical Wiring Regulations in your geographic area.

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**WARNING**



The input and output voltage of this equipment is risk high voltage; this will endanger people's life. Please strictly follow all warnings and operating instructions on the machine and in this manual. Never disassemble the outer cover of this machine.

# 1- Safety Precautions

## **Installation of this Unit must be Performed by a Certified Engineer**

- 1.1. Turn off the power supply prior to and during the installation, to prevent electric shock.
- 1.2. The charging unit's power cable must be firmly connected and well insulated. Loose connection and damages will cause circuit failure, which may cause a fire or casualties in severe cases.
- 1.3. The installation of the charging unit and connection to the power grid must be conducted by a trained, certified professional.
- 1.4. If the unit is dropped at any point prior to installation, it should not be installed until the engineer has inspected the unit to determine whether or not it can safely be installed.
- 1.5. Do not wash or cover the charging unit with any liquid. To clean the charging body, wipe gently with a lightly damp cloth, avoiding the connector area.
- 1.6. Any faults which arise that may impact the safety of the unit should be addressed by a certified engineer. Please do not attempt any repairs yourself.
- 1.7. The charging unit should only be installed by a certified engineer. The seller will not bear any responsibility for any loss caused by uncertified engineers and personnel for any modifications.

## 2- Introduction

This product is a three-phase AC charging unit, mainly used for AC fast charging of electric vehicles. The design of the product is simple. It provides card swiping, plug & play charging modes and online charge control. The principle of industrial design is adopted for the equipment, with the original function of toppling protection to ensure safe operation of the equipment. The protection level of the whole equipment reaches IP55, and it has good dustproofing and waterproofing functions and can be safely operated and maintained outdoors.

The charging unit is intelligent, with timing, billing (optional), electricity metering, and human-computer interaction interface.

This product is a single gun 22kW AC charging unit, with OCPP for commercial operation , advance WIFI/App/Bluetooth/RFID control features and Tamper proof sensor.

It provides AC charge to EVs, and features an intuitive, interactive touch screen, card reader, electric power metering module and network communication module.

The customer is the one who purchases the charger and is responsible for its operation and maintenance. On the other hand, the user is the individual who uses the charger to charge their electric vehicle.

This EV charger has OCPP, which allows the customer to integrate the charger with various billing systems or apps for easier payment and management. However, even if the customer does not set up OCPP, they can still manually input prices and charge their users based on those prices. In such cases, an external payment meter would be required for billing purposes.

It's worth noting that setting up OCPP is highly recommended, as it provides a streamlined and automated billing system, making it much easier for the customer to manage the charger and its users.

This unit comes with a built in electricity meter, providing detailed insight into electricity usage and expenditure. Perfect for keeping track of how much electricity your charger has consumed.

This unit comes with a built-in Tamper-proof sensor, The device records any attempts to remove the front cover and notifies the charge point's owner.

## **2.1. Composition**

The charging unit is mainly composed of shell, back cover, main control board, human-computer interface, display module, card swiping module, communication module, fuse, emergency stop switch, charging interface, charging gun line, gun line hanging plate, etc.

## **2.2. Main Features**

2.2.1. Modular design, stable and reliable: Modular design principle is adopted for the equipment, with flexible configuration and convenient maintenance.

- 2.2.2. All-round protection and safe operation: It has over-voltage protection, under-voltage protection, overload protection, earth leakage protection, grounding protection, over-temperature protection, low-temperature protection, lightning protection and toppling protection, ensuring safe and reliable operation of the equipment and effectively preventing accidents.
- 2.2.3. Easy to use: Easy to install and use.
- 2.2.4. High protection level: IP55, supporting outdoor harsh environment, not needing to set up additional canopy, etc.
- 2.2.5. Low power consumption: The standby power consumption of the equipment is as low as 3W, energy saving and low consumption.
- 2.2.6. Compatibility: The equipment is a simple home version and is configured in swipe, online control mode or plug & play operating modes.
- 2.2.7. Structure: Occupying a small space, is lightweight, the equipment is to be installed to a solid wall or to a compatible floor mount.

### 3- Design Specification

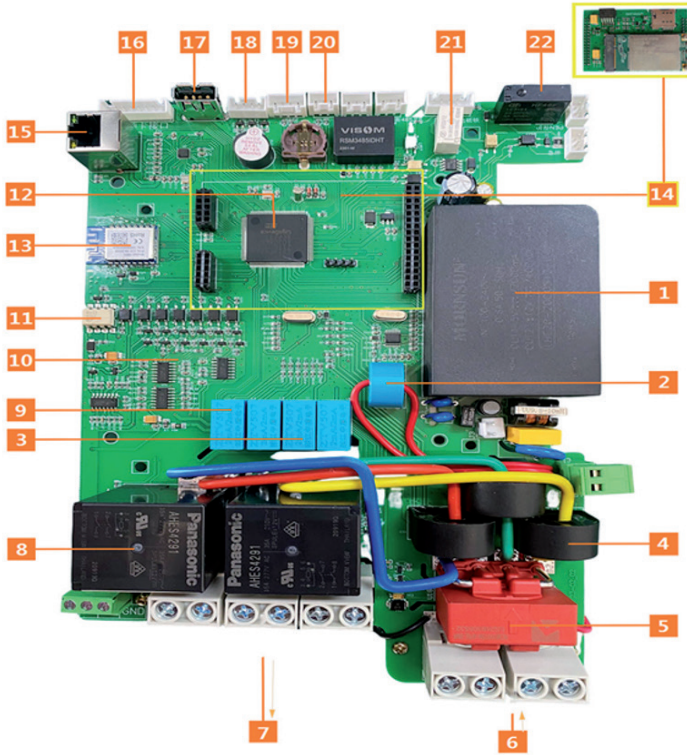


# 4- Technical Specification

Table-1 Technical Specification of AC charging unit

Name	Single-phase
Maximum output power	22KW
Input voltage	AC 380V
Input voltage frequency	50Hz/60Hz
Output voltage	AC 380V
Output current	32A
Efficiency	≥98%
Insulation resistance	≥10MΩ
Power consumption of control module	≤22kW
AC & DC Fault Protection	AC: Type A 30mA RCD + DC: 6mA
Earthing Protection	PEN Protection Built In – No Earth Rod Needed
Operating ambient temperature	-30°C~+50°C
Storage ambient temperature	-40°C~+80°C
Ambient humidity	5% ~95% No frost, no condensation
Altitude	Not more than 2000 meters
Status indication	LED indicator
Screen	4.3-inch LCD color screen
Charging interface	IEC 62196 Type 2
Degree of protection	IP55, IK10
Safety protections	Overvoltage protection, undervoltage protection, grounding protection, lightning protection, leakage protection, flame retardant protection, vercurrent protection
Cable Length	5 meters
Weight	6.5KG

# 4.1. PCB Information



- 1 Power supply
- 2 Load balancing transformer
- 3 Voltage transformer: PT
- 4 Current transformer: CT
- 5 Leakage protection : AC 30ma Type A protection& 6MA DC protection
- 6 Input
- 7 Output
- 8 Relay
- 9 PEN protection transformer: Collecting voltage data
- 10 Charger communication device
- 11 CP
- 12 CPU
- 13 WIFI, Bluetooth, Tamper proof sensor
- 14 Separate 4G modules can be inserted in this area
- 15 Connecting network: Ethernet
- 16 RFID connection port
- 17 USB interface: Can update the recognition system and import data
- 18 Indicator connection port
- 19 Display screen connection port
- 10 External electricity meter connection port
- 21 Double gun electromagnetic lock
- 22 PEN protection: Controlled tripping




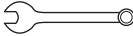
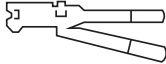
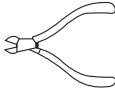
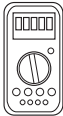


# 5- Installation

## 5.1. Site Requirements

- 5.2.1. The charging unit meets the IP55 protection level and can be installed both indoors & outdoors.
- 5.2.2. Please ensure that the ambient temperature is within the range of - 30°C~+50°C.
- 5.2.3. The altitude of the installation site shall not be higher than 2000 meters.
- 5.2.4. There should be no vibration, flammables, and explosives near the installation site.
- 5.2.5. The installation site should not be located in low-lying areas or areas prone to water accumulation or flooding.
- 5.2.6. The unit must be installed onto a wall. If there is no wall support, it is recommended to use a special EV floor post for installation and fitting.
- 5.2.7. The unit must be installed vertical, the centre point of the gun base to the horizontal ground should be between 1200~1300mm.

## 5.2. Preparation for Installation

For the sake of safety, only a Certified Engineer can install and fit the charging unit. Please do not attempt to install it yourself.

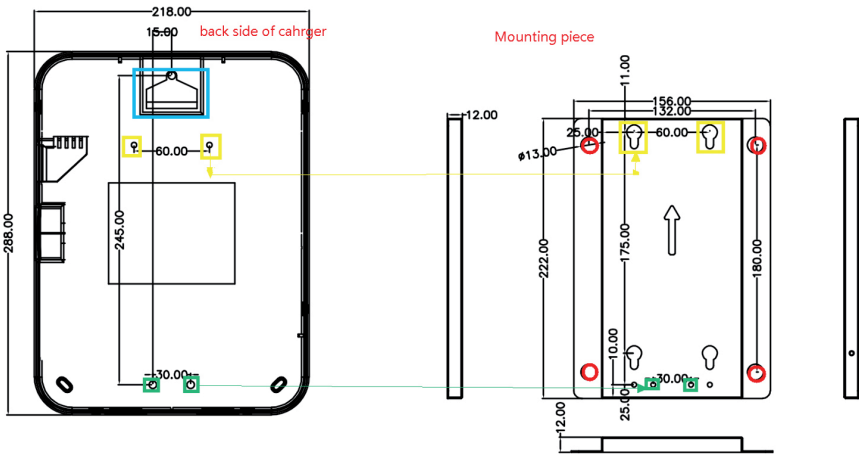
Tool Name	Picture	
Insulation torque spanner		Fastening the bolts
Combination spanner		Fastening the bolts
Hydraulic tongs		Fastening the bolts
Diagonal pliers		Cutting off the cables
Multi-meter		Checking electrical connection and electrical parameters
Cross screwdriver (PH2×150mm, PH3×250mm)		Fastening the screws
Insulation adjustable spanner		Fastening the bolts

## Preparation of Cables

The following cable specifications for charging unit power supply is recommended:

Cable Name	Cable Specification	
Power line	Minimum Requirement: three-phase 5-core 10mm <sup>2</sup> power cable	Subject to the specific construction length
Circuit breaker	One-phase 40A circuit breaker	

## 5.3. Installation Process



## 5.4. Installation Options

Please check you have all parts before installation

### 5.4.1. Installation Option -1: Wall Mounted Bracket

#### Accessories:

- Mounting Plate: 1 piece
- Screws M5\*10mm: 2pcs
- Expansion screws M8\*80mm: 4pcs
- Screws M4\*8mm: 2pcs

#### Installation method:

1. Drill 4 holes (red) to fix the wall mounted bracket on the wall; Use the M8\*80MM expansion screws.

2. Secure the 2x M5 screws to the two 'yellow' holes of the charger, and then hang the charger on the 'yellow' hole of the wall mounted bracket and pull the charger down to ensure that the screws have latched onto the bracket safely.
3. Remove the shell of the charger and secure the 2x M4 screws in the 'green' hole to secure the charger against the wall mounted bracket.
4. Secure the shell of the charger and check to make sure the installation is secure.

#### **5.4.2. Installation Option -2: Direct to Wall**

##### **Accessories:**

Expansion screw M6 \* 40mm: 1 piece

Expansion Screws M4\*8mm: 2pcs

##### **Installation method:**

1. Install one expansion screw M6 \* 40MM, ensuring it is extending out of the wall by 3mm
2. Secure the charger to this protruding expansion screw by lining it up with the 'blue' hanging section and pull it down to ensure that the screw is securely in the 'blue' hole
3. Remove the shell of the charger, install M4 screws in the 'green' holes inside the charger to fix it firmly against the wall.
4. Secure the shell of the charger and check to make sure the installation is secure.

### **5.5. Wiring mode**

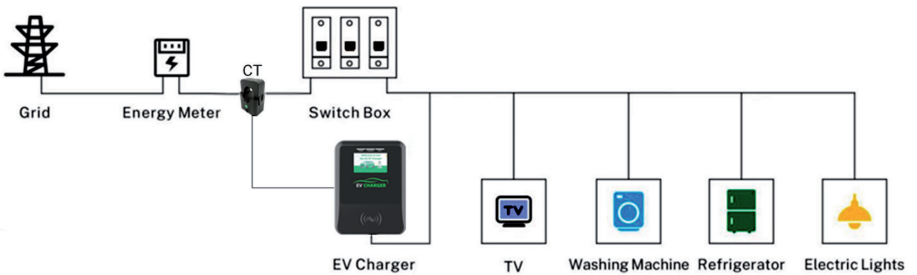
- 5.5.1. The charging unit comes with an independent power circuit which cannot be shared with any other electrical devices.
- 5.5.2. When installing; use a Phillips screwdriver to open the rear wiring cover on the charging unit, connect the three cables (live wire L, neutral wire N and ground wire PE) to the terminal according to the wiring markings.
- 5.5.3. To prevent the risk of electric shock, the equipment should ensure that the input ground wire is firmly grounded.

# 1- Regular Connection

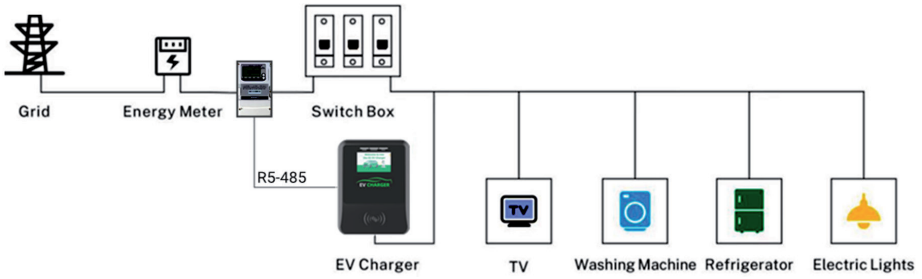


# 2- Connection by Load Limiting

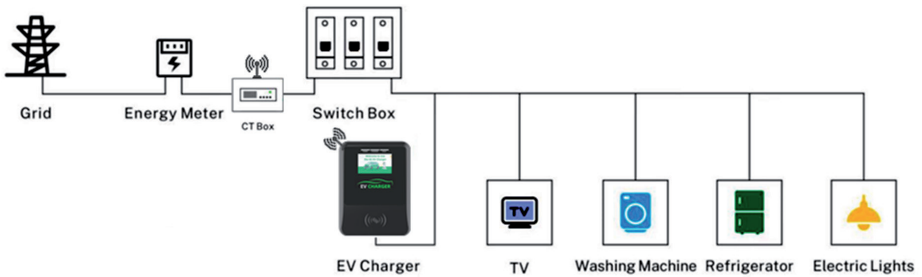
## 2.1- Connection by CT



## 2.2- Connection by Electric Meter (Optional)



## 2.3- Connection by Wireless CT



## 5.6. Before Initial Use

### 1) Pre-operating inspection

5.5.1. Before starting the AC unit, make sure of the following things:

5.5.2. The AC unit is installed in a convenient location for maintenance and operation.

5.5.3. The AC unit and accessories are properly connected and firmly installed.

5.5.4. The earth leakage circuit breaker at the AC incoming terminal is suitable for the application.

5.5.5. There are no external objects or parts left on top of the AC unit.

5.5.6. Confirm that all the above items meet the requirements before operation.

5.5.7. Close the earth leakage circuit breaker of incoming power line.

## 5.7. Initial Screen Set Up

When the device is powered up, the display will prompt the user to insert the charging gun. There is no need to insert the charger just yet, until the initial set up is complete.

**Query charging and service fees at different times**

Time	Unit Price	Service Fee
: : - : :		
: : - : :		
: : - : :		
: : - : :		

**Query charging history**

Please Insert the Charging Gun

Charge Query Record Query Unlock Card

**Fee Details**

Time	Unit Price	Service Fee
: : - : :		
: : - : :		
: : - : :		
: : - : :		

**Record Information**

Number [Last Ten] [Next Ten]

Card Balance :  USD Card Number :

Status :  Charging Mode :

Transaction NO. :  Interface NO. :

Electricity :  KW·h Cost :  USD

Stop Reason :

Start at :  End at :

Please Enter the Administrator Password

7 8 9 Esc

4 5 6 ←

1 2 3 Enter

0 .

wipe to unlock

### 5.7.1. Three Charging Configurations

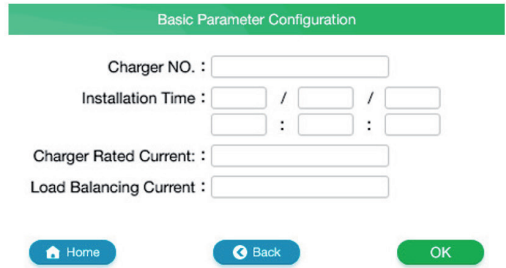
**System Settings**

Basic Parameter Communication Data Basic Function

Home Back

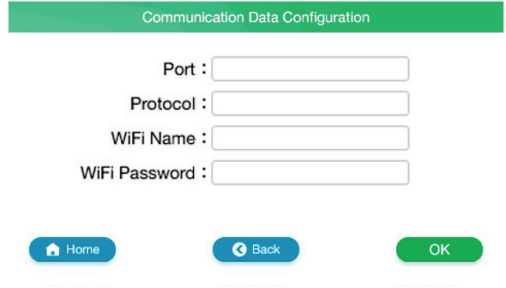
## 1- Basic Paramater Configuration

In the "Basic Parameter" section, users can input information such as the charger number, local time, rated current and load balancing current.



## 2- Communication Data Configuration

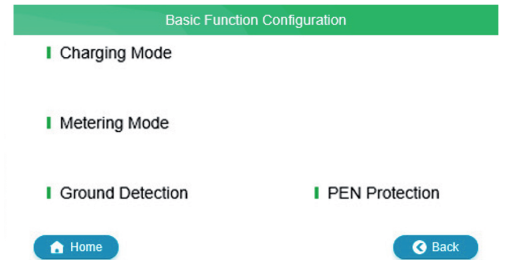
In the "Basic Parameter" section, users can input information such as the charger number, local time, rated current and load balancing current.



## 3- Basic Function Configuration

There are 4 charging modes, which will be explained in greater detail below.

- Metering mode: internal meter/ external meter
- Ground detection and PEN protection: use/prohibition



## 5.8. Operating Modes

**Online Mode:** This mode enables users to schedule and monitor charging sessions through the "Smart Life" App. With this mode, users can set up charging schedules for their electric vehicle, track the progress of their charging session, and receive notifications about their session's status.

**RFID Mode:** In this mode, users can swipe their personal RFID (Radio Frequency Identification) cards to access the charger. This mode allows the customer to track usage by individual users and charge them for the amount of energy they use.

**Reserved Mode:** This mode provides users with more control over their charging experience. Users can choose to reserve a fixed amount of power to be charged, a fixed

amount of money to be spent, a fixed period of time (e.g., 2 hours), or a specific time frame (e.g., from 12 am to 6 am). This mode helps users manage their charging sessions more efficiently and can also help reduce waiting times for charging stations.

**Plug and Charge Mode:** This mode is the most straightforward mode, allowing users to simply plug in their electric vehicle and start charging without any additional setup or requirements.

Select the preferred charging mode, then connect the charging gun.



### 5.8.1. Online Option

From Google play or Apple Store, download either of the following Apps: Smart Life, Tuya or Vorsprung app for IOS only.




Smart Life

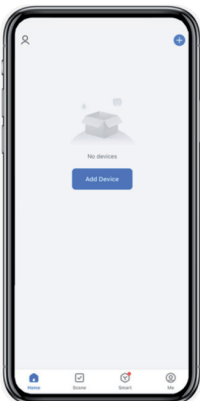


Tuya

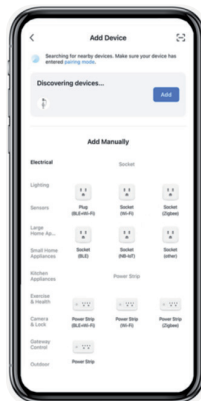


Vorsprung

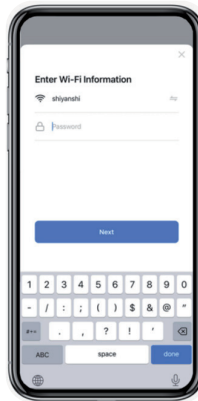
1. Download the App and create an account.
2. Select the plus sign in the top right corner to automatically discover the device.
3. Go to profile settings , enter activation password: 888888
4. Enable Wi-Fi and Bluetooth permissions.
5. Enter your Wi-Fi information to connect wall socket to the Internet.
6. Wait for the connection to load completely before you start any applications.



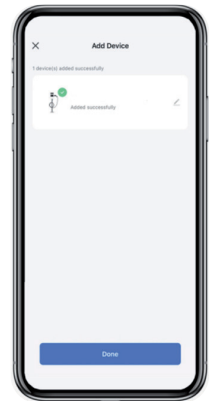
1-Add Device



2-Search Device



3-Enter Password

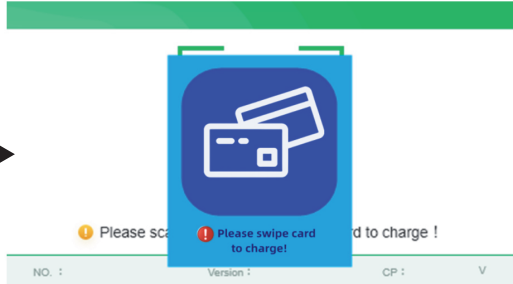


4-Added Successfully

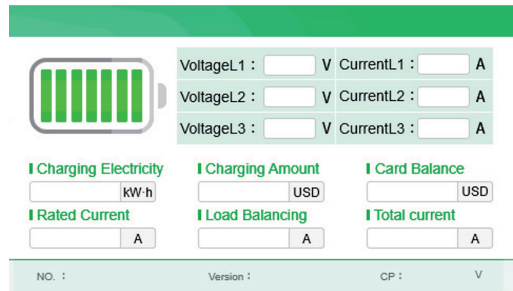


## 5.8.2. Single Mode Option - Charge by RFID Card

When the user inserts the charging gun, they will be prompted to swipe their RFID card to pay.

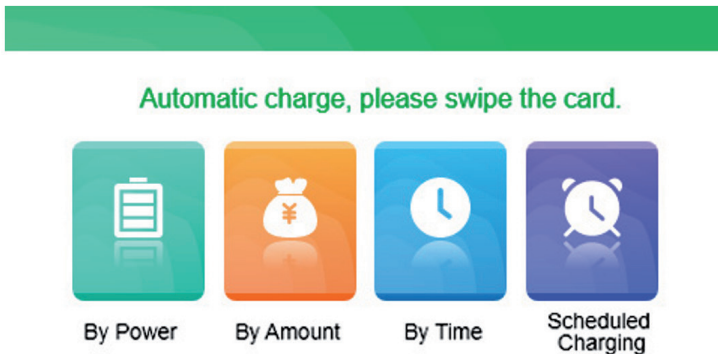


This screen will display relevant charging information.



Please swipe the card to end charging.

## 5.8.3. Reservation Charging Option Using RFID Cards



Select a preferred amount of power and have the charger supply that exact amount of power to your battery.

### Reservation Electricity

kW-h

(If you need to customize the electricity, please click the blank box and enter it manually)

Confirm

Back

Select a preferred amount of money to spend on charging and have the charger supply that exact cost of charging to your battery GBP.

### Reservation Amount

USD-Stop Charging

(If you need to customize the amount, please click the blank box and enter it manually)

Confirm

Back

Select a preferred amount of time to charge your vehicle for.

### Reservation Time

minutes Stop Charging

(If you need to customize the time, please click the blank box and enter it manually)

Confirm

Back

Reserve a charging slot by scheduling charge for a certain time of day or night.

### Scheduled Charging

to Start Charging (0-23)

(If you need to customize the time, please click the blank box and enter it manually)

Confirm

Back



Reserving for charging, please do not draw the gun!  
(Swipe the card to cancel the reservation.)

NO. : Version : CP : V

## 5.8.4. Plug & Charge Option

With the plug and charge mode, simply insert the charging gun to your vehicles socket and charging will begin.

## 5.8.5. Failure page

1. If the equipment fails, the failure page will display and inform the user of the reason behind the fault.
2. The unit will not charge until the reason for the failure has been resolved.



Charger failure, service suspended !

NO. : Version : CP : V

# 6- Troubleshooting

Fault phenomenon	Possible causes	Solution
AC over-voltage	AC input voltage is too high	1- Ask an electrician to test the input voltage of air switch.
		2- If the actual voltage is greater than 264Vac for a short time, wait for the peer-to-peer network to recover to the normal voltage range.
		3- If the actual voltage is greater than 264Vac for a long time, please contact the power supply department.
		4- If the actual voltage is less than 264Vac, please contact Seller;

AC under-voltage	AC input voltage is too low	1- Ask an electrician to test the input voltage of air switch.
		2- If the voltage is lower than 85Vac for a short time, wait for the peer-to-peer network to recover to the normal voltage range.
		3- If the actual voltage is less than 85Vac for a long time, please contact the power supply department.
		4- If the actual voltage is greater than 85Vac, please contact Seller;
AC over-voltage	AC input current is too high	1- Immediately turn off the leakage/over- current protection switch of the distribution box.
		2- Check whether there is a low-impedance connection between two output lines of AC unit.
		3- After the above problems are eliminated, power on again. If the fault still exists, please contact Seller.
Over-temperature	The interior temperature is greater than 85°C	1- Check the installation environment of AC unit to see whether there is heating equipment or devices nearby, and ensure the ambient temperature is below 60°C.
		2- If the fault can't be eliminated, please contact Seller;
Leakage current exceeds the limit	The leakage current is greater than 30mA	1- Immediately disconnect the leakage/ over-current protection switch of the distribution box.
		2- Check whether the output line of AC unit is damaged or has low-impedance connection to the ground.
		3- After the above problems are eliminated, reset the reset switch of leakage current protector, and power on again. If the fault still exists, please contact Seller;
Leakage current sensor is abnormal	The sensor for detecting the leakage current is abnormal	1- Immediately disconnect the leakage/ over-current protection switch of the distribution box.
		2- Check whether the output line of AC unit is damaged or has low-impedance connection to the ground.
		3- After the above problems are eliminated, power on again. If the fault still exists, please contact Seller;
Ground fault	The input/output grounding is poor or the input L/N connection is reverse	1- Immediately disconnect the leakage/ over-current protection switch of the distribution box.
		2- Check whether the grounding of AC unit input/output line is normal and whether the input L/N is connected according to normal sequence.
		3- After the above problems are eliminated, power on again. If the fault still exists, please contact Seller;

## 6.1. Troubleshooting of General Faults

In case of any abnormality during use, If you still cannot troubleshoot a certain fault, please cut off the power supply of the charging unit and contact our customer service center.

# 7- Guarantee

Subject to the provisions described below, this product is protected for 12 months from the date of purchase against defects in parts. Any labour cost to the consumer is not and with not be covered.

Prior to returning any defective products to Vorsprung, the end user must report the faulty product to Vorsprung. This can be done via e-mail: [info@vorsprungofficial.com](mailto:info@vorsprungofficial.com). If Vorsprung agrees that the product should be returned, it will Issue a Returns Authorisation Number. This number must be clearly marked on the packaging of the product to be returned. The customer will return the product at their own cost.

Should the product fail to perform as described within the relevant guaranteed period as set out above, it will be repaired or replaced with the same or functionally equivalent product by Vorsprung at its discretion, free of charge, provided the customer:

- 1) Provides Vorsprung with proof of purchase.
- 2) Returns the failed product to Vorsprung with shipping charge prepaid.

Replacement products may be refurbished or contain refurbished materials. If Vorsprung, by its sole determination, is unable to repair or replace the defective product, it will replace or refund the purchase price of the product at their discretion.

The guarantee does not apply and will be null and void if, in judgement to Vorsprung, the product fails due to damage from storage, incorrect installation, accident, inappropriate use or cleaning of the product, relocation of the product after its first installation, abuse, misuse, or if it has been used or maintained in a manner not conforming to product manual instructions. Damage or failure caused by foreign matters entering the unit. Damage caused by dismantling the unit by a non-certified EV Engineer. Damage caused by force majeure (such as lightning, high voltage, earthquake, fire, flood, and other natural disasters). Damage caused by water entering the equipment or other solutions due to improper installation & use. Damage caused by using power supply and voltage other than those specified. Has been modified in any way, or has had any serial number or other identification markings removed or defaced.

Repair by anyone other than a certified engineer will void this guarantee. Proof of installation may be requested.

All defective products should be returned to Vorsprung with shipping charges prepaid.

Should an issue be found with your unit. Vorsprung will return your repaired/replaced unit free-of-charge to any UK address. Should the return address be outside of the UK; return postage will be at Vorsprung's discretion. If the unit is found not to be defective return postage will need to be paid by the customer/sender.

Nothing in this agreement will affect the end consumer's statutory rights. Vorsprung only supply products for domestic, light commercial and private use.

Vorsprung accept no liability to the end consumer for any loss of profit, loss of business, business interruption, loss of business opportunity or time travel incurred.





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