TS-EVC Series Smart Mini AC Charging Station

User Manual

Ver 1.0.0

Taisheng Energy Technology Co., Ltd.

August 2024

Teison

Instruction Manual

Thank you for using our company's TS-EVC series Smart Mini AC charging pile . Our products will bring you better charging services and safer charging guarantees.

Scope of application

This manual is applicable to the use of TS-EVC series Smart Mini AC charging piles .

In order to facilitate your proficient operation and use of this product and enable this set of products to better serve you, please read this manual carefully and install, test and operate this product in accordance with the provisions of the manual. If you find that the actual product is different from the product described in this manual during use, please refer to the actual product.

This manual is compiled and published by Taisheng Energy Technology Co., Ltd., which reserves the final right of interpretation for the relevant products.

continuous upgrading of the product , the content of this manual may be slightly different from the actual product, and the upgrade of the manual may not be notified to you in time. We apologize for this! Please pay attention to the discrepancies between the actual product and the description in this manual.

For more product information, please visit the official website : Teison Energy Technology Co., Ltd.

Safety Tips

- This safety notice is applicable to all operations of the TS-EVC series Smart Mini AC charging pile. Before installing and debugging the charger, you should read this instruction manual carefully. The instruction manual contains important information that is conducive to the normal operation of the equipment and avoids incorrect operation.
- This equipment contains dangerous high voltage. Failure to comply with the "Warning" provisions or to operate in accordance with the requirements of this instruction manual may result in significant property damage, serious personal injury or endangerment of life safety.
- The following "Warnings", "Notes" and "Tips" are measures taken to prevent damage to the equipment and its parallel-connected components, and are also provided for your safety.
- Please read these "Warnings", "Notes" and "Tips" carefully, as they will not only help to extend the service life of the charger, but also provide you with property and personal safety protection.

 warn

- Only certified professionals who are familiar with electrical regulations and professionally engaged in electrical work are allowed to install and maintain this equipment.
- This device is a high-voltage device. Do not perform maintenance work when it is powered on. After cutting off the high-voltage power supply of the device, you must perform safety measures such as power testing and grounding to ensure that the device is power-free before you can perform maintenance on the device.
- When the equipment system is running, some parts carry high voltage. It is strictly forbidden to directly contact the internal components or indirectly contact them through wet objects.
- This product is dustproof and waterproof, but if you find water or moisture on the pile, please turn off the power immediately. When operating in a humid environment, strictly prevent moisture from entering the device.
- It is strictly forbidden to carry out outdoor installation and commissioning of equipment during thunderstorms.

 Notice

- This device should only be used for the purpose specified by the manufacturer. Unauthorized modifications and the use of spare parts not sold or recommended by the manufacturer of this device may result in fire, electric shock or other injuries.
- The equipment can only be repaired by Taisheng Energy's after-sales department or certified and authorized personnel. These personnel should be fully familiar with the warnings and correct operating procedures in this

instruction manual.

- Any defective component must be replaced with an identical component.

 hint

- Please place this manual in a conspicuous place near the equipment to ensure that operators can easily read it.
- Before installing and debugging the charging pile, please be sure to carefully read the safety rules and warnings, as well as all warning signs posted on the equipment. If you find that the warning sign is detached or damaged, please replace it in time.

Table of contents

1、Overview

1.1. Product Introduction

TS-EVC series Smart Mini AC charging piles (hereinafter referred to as AC piles) are designed for the American standard market. The products comply with UL2231-2, UL2594-2022, UL1998 and other mainstream American standard charging pile standards; they are suitable for installation in community parking lots, personal garages and public parking lots, and can also be installed in various large, medium and small electric vehicle charging stations. The charging piles can be configured according to user needs to ensure that users are provided with a safe, reliable and intelligent charging experience.

Figure 1.1. TS-EVC Series Smart Mini AC Charging Station (reference picture)

1.2. Performance characteristics

(1) Convenient installation: The device is small and light, and can be installed by one person;

(2) Appearance customization: The appearance color and LOGO

of the device can be customized free of charge to meet the user's brand promotion needs;

(3) Smart response: The device is highly intelligent and can be controlled through mobile phone APP, card reader and OCPP platform .

(4) High-level protection: Protection level IP55, with excellent waterproof, dustproof and explosion-proof functions, and can operate stably under ambient temperature of -30℃~50℃ ; expand the adaptability of the equipment.

(5) All-round protection: The equipment has multiple safety protection measures such as input over/under voltage protection, output over-current/short circuit protection, leakage protection, over-temperature protection, grounding detection, etc. Ensure the safe and reliable operation of the system and effectively prevent accidents.

1.3. Usage Environment

Table 1.1. Equipment working environment

Serial number	project		index	unit	Remark
1	Operating temperature		- 30～ 50	℃	
2	Storage temperature		-40～70	℃	
3	Protection level		Type 3R	-	
4	Relative humidity	Work	≤90%	-	No condensation
		store	≤95%	-	

5	Altitude	≤2000	m	
6	Cooling method	Natural air cooling	-	
8	Surrounding medium	The installation site must not have explosive hazardous media, and the surrounding media must not contain harmful gases and conductive media that corrode metals and damage insulation.	-	

Note: When the equipment needs to work in a special environment, please provide specific environmental parameters in advance so that the on-site environmental conditions can be fully considered during product design.

1.4. Technical Parameters

Model	TS-EVC50-001	TS-EVC48-001	TS-EVC40-001	TS-EVC32-001
Electrical properties				
Output Power	12kW	11kW	9kW	7kW
Input voltage	240V (double live wire)			
Output voltage	240V			
Output Current	50A	48A	40A	32A
Operating frequency	60Hz			
System power consumption	2-6W			
Mechanical properties				
Shell material	PC/V0			
Cooling method	Forced air cooling			
Gun Line	4.5M			
size	228.5*228.5*100 mm			
weight	5kG			
Installation	Wall Mount			
Human-computer interaction				
Network connection	WiFi, Bluetooth			
OCPP	1.6J			
show	LED Light Board			

Credit Card	RFID
Optional Configuration	
Network connection	ETH、4G
Credit Card	3 RFID cards
Load Management	RS485 Load Balancer
Installation	Column

2、Equipment principle and technical indicators

2.1. Electrical principle

The TS-EVC series AC pile inputs 240V AC power. After passing through the internal circuit breaker, the main control board of the device judges the corresponding signal and transmits the electric energy to the AC charging gun, and finally connects to the electric vehicle through the charging gun for charging.

The charger is equipped with an emergency stop function. When an abnormal situation occurs, press the emergency stop button to cut off the input and output power of the charger. After troubleshooting, reset the emergency stop button before resuming charging. （Note: The emergency stop button is only allowed to be pressed in abnormal situations. Do not press the emergency stop button at will in normal charging status!）

2.2. Security protection

2.2.1. Protection principle

Shell protection

The equipment shell is made of V0-grade PC material, which has excellent fireproof performance;

Device protection

The internal components of the equipment are selected from industrial grade and treated with three protections, with good moisture resistance, salt spray resistance and rust resistance.

2.2.2. Protection logic

Conservation Project		Protection Logic
Overvoltage protection	Numeric	Overvoltage protection threshold: 275±5V Recovery threshold: 265V±5V
	logic	When the voltage is higher than the protection threshold for 2S, the protection process begins. At this time, the PWM is turned off and the relay is disconnected after the vehicle-side S2 is disconnected. The maximum waiting time is 3S. When the voltage is lower than the recovery threshold for 5S, charging is resumed.
Undervoltage protection	Numeric	Undervoltage protection threshold: 85±5V Recovery threshold: 95V±5V
	logic	When the voltage is lower than the protection threshold for 2S, the protection process begins. At this time, the PWM is turned off and the relay is disconnected after the vehicle-side S2 is disconnected. The maximum waiting time is 3S. When the voltage is higher than the recovery threshold for 5S, charging is resumed.
Overcurrent protection	Numeric	Level 1 overcurrent protection threshold is the maximum value of current setting + 2A and current setting maximum value * 1.1 times; The level 2 overcurrent protection threshold is the maximum of the current setting maximum value + 5A and the current setting maximum value * 1.2 times.
	logic	Level 1 overcurrent: After exceeding the protection threshold, the protection process begins 2S later. At this time, PWM is turned off, and the relay is disconnected after S2 on the vehicle side is disconnected. The maximum waiting time is 3S. Level 1 overcurrent, the protection will be terminated after 60S when the current falls below the protection threshold; Level 1 overcurrent, you can try to recover 3 times, the

		4th time is irrecoverable, you need to power off and restart before you can use it, the time limit is 1 hour; Level 2 overcurrent: 5S after exceeding the protection threshold, the protection is activated. At this time, PWM is turned off and the relay is disconnected after S2 on the vehicle side is disconnected. The maximum waiting time is 500ms. Level 2 overcurrent, the system cannot be recovered and needs to be powered off and restarted before it can be used. There is no time limit.
Over temperature protection	Numeric	3-way temperature detection, 2 onboard temperature + 1 external temperature (such as electric lock) Protection threshold: 80℃; Derating threshold: 75℃; Recovery threshold: 60℃;
	logic	Depending on the temperature, the system has different response behaviors, and the following logic can be configured: 1. When the temperature is higher than the derating threshold for 10 seconds, the system automatically reduces the charging current to 6A; 2. When the temperature is higher than the protection threshold for 10 seconds, the system stops charging; 3. When the temperature remains below the recovery threshold for 10 seconds, the system resumes charging with the set current; There is no limit on the number of times the temperature protection can be restored.
Leakage protection		AC20mA/CCID20
Grounding protection		Charging is not allowed without grounding
Relay sticking		Support relay adhesion detection and alarm; (Does not affect charging, this function is effective when the grounding is good)
Emergency Stop		Press the emergency stop button, the device will alarm and stop output; emergency stop reset, the device will automatically return to normal standby state

3、Equipment operating instructions

3.1. Start charging

3.1.1. First start

Before starting the equipment for the first time after installation, the following checks should be performed:

1) Check if any screws on the equipment casing are loose or missing ;

2) Check whether the device casing has cracks or deformation ;

3) The equipment cable has wireless skin damage;

4) Whether the equipment is grounded correctly;

5) Is the emergency stop button in the pop-up state?

After all items are checked one by one to ensure they are correct, you can prepare to power on ; the power-on steps are as follows:

1) Close the main circuit breaker;

2) Check whether the device light strip is on; if not, turn off the power and check the wiring location, and repeat the above steps after troubleshooting;

If the above steps are normal, the power-on verification process is completed.

3.1.2. Normal charging operation

After the device is turned on, you can start charging.

Before starting charging, please check whether the device indicator light is blue and solid.

Start charging steps:

1) Insert the charging gun into the corresponding port of the electric vehicle and confirm that it is fully inserted. You will hear a crisp "click" sound when it is fully inserted.

2) Select the corresponding start-up method; if you choose to start by swiping a card, please put the RFID card in the card reader position, and the charging pile will start charging; if you choose to start by APP, please click the start charging button on the APP, and the charging pile will start charging;

3) Start charging and the device starts outputting;

Please check whether the indicator light turns green and flashes during charging;

If the red light is on, it means that the equipment is faulty. At this time, you need to turn off the power and check the equipment, eliminate the fault and power it on again. If the fault cannot be eliminated, please contact the manufacturer's technical staff in time for processing.

3.1.3. Normal shutdown operation

If you choose to swipe the card to start, swipe the card again to stop charging; if you choose to start the app, click

Stop on the app to stop charging; the device will then turn on the blue light, and you can then unplug the charging gun and reset it;

Note: The charging gun can only be unplugged when the indicator light meets the instructions in the table. If the indicator light status does not match, please contact the manufacturer's technical staff in time for processing

3.1.4. Abnormal shutdown operation

When the device fails and cannot be shut down normally, or an emergency occurs and the charging pile needs to be quickly shut down, you can press the emergency stop button of the device. At this time, the device will quickly cut off the output and the indicator light will flash red.

Do not use the emergency stop function under normal conditions to avoid damage to the emergency stop button or other failures that may cause casualties!

3.1.5. Shutdown operation

Under normal use, the device generally does not need to be shut down. If you need to shut down, please follow the steps below:

1) Disconnect the main circuit breaker

2) Check whether all the indicator lights on the device are

off

3）Device shutdown

4、Equipment structure and installation

4.1. Installation drawings and steps

Refer to existing instructions

4.2. Interface requirements

interface	Specification	Line Color	Adapter terminal type	Image Captions
L IN(L1_IN)	10 square/60A	brown	RNB8-6L,62A	
N IN(L2 IN)	10 square/60A	blue	RNB8-6L,62A	
PE_IN	10 square/60A	Yellow Green	RNB8-6L,62A	
L OUT(L1 OUT)	10 square/60A	brown	RNB8-6L,62A	
N OUT(L2 OUT)	10 square/60A	blue	RNB8-6L,62A	
PE_OUT	10 square/60A	Yellow Green	RNB8-6L,62A	
CC	0.5 square / 16A	-	E0506	
CP	0.5 square / 16A	-	E0506	
RS485 1	#22-26AWG electronic wire	-		
RS485_2	#22-26AWG electronic wire	-		
STOP	#22-26AWG electronic wire	-	XHB2.54-Lock Buckle-4P-Male Socket-Straight Pin	
LOCKER/TEMP	#22-27AWG electronic wire	-	XHB2.54-Lock Buckle-6P-Male Socket-Straight Pin	
LED/DELED/RFID	#22-27AWG electronic wire	-	Pitch 2.0 2*10P with locking pin holder	
4G/LCD	#28AWG electronic wire	-	Tape, GH, 1.25mm stand-up, 10pin, pin header	

4.3. Wiring steps

(1) The incoming lines L (live line) and N/L2 (neutral line/live line 2) are fixed on the main control board L_IN and N_IN respectively;

(2) The charging gun/electric lock terminal L passes through the leakage coil and the current coil and is fixed to the main control board L_OUT;

(3) The charging gun/electric lock terminal N passes through the leakage coil and is fixed to the main control board N_OUT;

(4) The charging gun/electric lock end CP is fixed to the CP end;

(5) The charging gun/electric lock terminal PE is fixed to the main control board PE_OUT;

(6) The LOCKER/TEMP interface is connected to the electric lock lead and the charging gun temperature detection socket respectively;

(7) 4G interface connected to external 4G module;

(8) The LED/DSLED/RFID interface is connected to an external custom light board, an external digital screen, and an external card swiping module.

illustrate:

(1) 4G module, STOP emergency stop, RFID card module, LOCKER electric lock, and DSLED digital screen are all optional.

(2) DIP switch settings

SET_ID	Functional Description	Remark
SET_ID0	reserve	
SET_ID1	reserve	
SET_ID2	reserve	
SET_ID3	reserve	

5、Equipment packaging, transportation and storage

5.1. Packaging

The packaging should take into account the requirements of moisture-proof, dust-proof and shock-proof; all parts are shipped together in the pile; the pile body is covered with a plastic bag and supported by foam all around to ensure that the product does not move in the packaging to avoid damage during transportation.

The technical documents supplied with the product in the packaging box include:

Packing list;

Product factory certificate;

Product inspection records;

Product instruction manual;

Warranty card.

5.2. Transportation

During transportation, our company's equipment should be kept away from rain, severe vibration, impact, tumbling and inversion.

The pile body and internal components of our company's equipment are all treated with rust prevention, but they should

still be protected from direct sunlight and rain erosion during transportation.

5.3. Storage

If the product is not used immediately after purchase and needs to be stored for a short or long term, it is recommended to store the equipment in a clean, dry, well-ventilated indoor place at 5℃ ~ 40℃, away from high temperature, humidity, dust, metal powder and corrosive environment. Open-air stacking is strictly prohibited.

5.4. Ordering instructions

If you want to purchase our company's charging equipment, you need to inform the following information:

1) Occasions and uses of the equipment.

2) Product specifications, system parameters (such as input and output voltage range, maximum power, etc.), configuration requirements and order quantity.

3) Special functions and spare parts requirements.

4) Supply and warranty requirements.

6、other description

FCC regulatory conformance:

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit

different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user’s authority to operate the equipment.

RF Exposure

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be collocated or operating in conjunction with any other antenna or transmitter.

IC regulatory conformance:

This device complies with CAN ICES (B)/NMB (B).

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme a la norme CAN ICES (B)/NMB (B).

Cet appareil contient des emetteurs / recepteurs exempt (s) de licence qui sont conformes aux RSS exemptes de licence d'Innovation, Sciences et Developpement economique Canada. Son fonctionnement est soumis aux deux conditions suivantes:

(1) Cet appareil ne doit pas provoquer d'interferences.

(2) Cet appareil doit accepter toute interference, y compris les interferences susceptibles de provoquer un fonctionnement indesirable de l'appareil.

RF Exposure

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be collocated or operating in conjunction with any other antenna or transmitter.

Cet equipement est conforme aux limites d’ exposition aux rayonnements de la IC etablies pour unenvironnement non controe. Cet equipement doit etre installe et fonctionner a au moins 20cm de distance d’un radiateur ou de votre corps.