YUHESEN

CHG-4820G Charging Station

User manual v1.0.0

Shenzhen YuhesenTechnology Co., Ltd.

CONTENTS

1. Foreword

(1) Thank you for purchasing our product, this user manual is applicable to CHG-4820G charging station (hereby referred to as "CHG-4820G").

(2) Before use, please carefully read this user manual and attentions, and correctly use strictly in accordance with this manual.

(3) For the loses caused by serious violation of this user manual, we undertake no responsibilities.

(4) Please well keep this manual for user reference during your operation.

(5) Professionals are required for commissioning, connection and installation of the charging station to avoid irretrievable loses.

(6) DO NOT install, remove or replace equipment lines with electricity. If it is necessary to commission this product with electricity, please select the special commissioning tools with good insulation.

(7) Please use this product under the conditions allowed by laws and regulations, so that the public property or life safety will not be affected.

(8) We will irregularly update this product, the contents of update will be added into the new manual without notification.

(9) This manual may contain the contents which are not correct in technology or which do not comply with the operation. In case of problems which cannot be solved during use of this manual, please contact with the customer service or technical department of us.

(10) As for the contents of this manual, we will try our best to ensure that they are correct and accurate. In case of any improper or incorrect contents, please contact us for confirmation, thank you!

Safety Information

The information in this manual does not include the design, installation, and operation of a complete charging station application, nor does it include all peripheral equipment that may affect the safety of the charging station. The design and use of the charging station application system must comply with the safety requirements established in the standards and regulations of the country where the charging station is installed. The integrator and end customer of CHG-4820G are responsible for ensuring compliance with relevant national laws and regulations to ensure that there are no significant risks in the complete charging station application instance. This includes, but is not limited to, the following:

■ . Effectiveness and responsibilities:

- Conduct a risk assessment of the entire charging station system and connect any additional safety equipment defined by the risk assessment. Confirm the accurate design and installation of peripheral devices, including software and hardware systems, for the entire charging station system.
- This charging station must be used with our company's standard products and cannot be disassembled or used interchangeably to ensure that there are no significant risks or safety hazards in the actual application of the charging station.
- Collect all documents in the technical documentation, including the risk assessment and this manual. Be aware of potential safety risks before operating and using the equipment.

■ . Environments:

- For first use, please carefully read this manual to understand the basic contents and operation specifications.
- The IP protection grade of this charging station is IP23.

■ . Inspection:

- Check that the external power supply is functioning normally and the voltage meets the input requirements of the charging adapter.
- Verify that the output voltage of the power adapter meets the input voltage requirement of the charging station.
- If possible, use a multimeter to check the accuracy of the definitions of the power and charging connectors before the first use, to avoid damage caused by positive and negative polarity errors.
- Check that the installation of the charging station is secure, the connector rebound is normal, and ensure that the charging station itself has no obvious abnormalities.
- Check that the metal docking connectors on both sides of the charging station and the power supply are properly connected without any deviation.

■ . Operation:

- Ensure that the area around the charging station installation point is relatively open and unobstructed when connecting;
- When using the charging station, pay attention to the input voltage marked on the charging station and be sure to use a power adapter that matches the voltage;
- If the device experiences charging abnormalities or cannot charge, stop using it immediately to avoid secondary injuries;
- In case of equipment abnormality, please contact relevant technicians, DO NOT process without permission;
- Please use the equipment in the environment which meets the IP protection grade requirements of the equipment;
- The charging station is equipped with a buffer elastic device. To ensure the safety of the charging station, do not exceed a vehicle speed of 0.3m/s when connecting;
- The charging station can be used in an ambient temperature range of -20°C to 60°C. When charging, please follow the allowable charging temperature of the battery (conventional

battery charging temperature is 0°C to 40°C).

■ . Maintenance:

- If the rebound effect of the charging station connector weakens or there is no rebound force, please replace it in a timely manner.
- If the charging station is not used for a long time, please store it in a dry and clean environment.

2. Introduction

CHG-4820G is a standard type of docking charging station that is suitable for multiple heights. It uses two contact-type docking connectors with rebound devices to connect and charge at both ends. The charging electrode height can be adjusted to adapt to different vehicle height requirements.

2.1 Product list

After receiving the goods, please carefully confirm the product list:

Charging station *1	Power input receiver *1
	
Charging adapter*1	User manual*1
	

2.2 Performance parameters

Parameter type	Performance	Parameter
Structural size and weight	Dimensions(W*D*L)	245*145*425mm
	Weight	8kg
	Structural form	Docking charging, elastic device
	Material	Q235
	Ground clearance of the charging center point	105~285mm(Continuously adjustable)
	Rebound distance	20mm
	Center distance of the docking charging bar	90mm
Performance parameters	Overcurrent protection	√
	Shortcircuit protection	√
	Reverse connection protection (power input receiver)	√
	Rated current	≤20A
	Input voltage	DC 18.5V ~ 60V
	Charging deviation	±35mm
	Angle deviation	±5°
	Maximum docking speed	0.3m/s
	OC signal	Optocoupler C (IO), E (AGND) passive output
	IP Rating	IP23
	Working temperature	-20℃~60℃(*Note the battery charging

		temperature)
	Storage temperature	-20℃~60℃

Table 2-1 CHG-4820G Performance parameter table

3. Product presentation

This section provides a basic introduction to the CHG-4820G charging station model, which is helpful for users and developers to have a basic understanding of the CHG-4820G. As shown in Figures 3-1 and 3-2 below, these are an overview of the entire charging station body and the power input end.

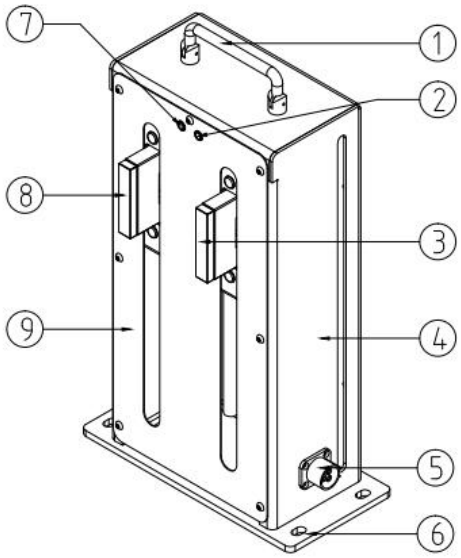

Figure 3-1 Overview of the charging station body

Note: ①handle; ②charging protection indicator light; ③charging output -VCC; ④cover shell; ⑤power input port; ⑥base; ⑦charging indicator; ⑧charging outpur +VCC; ⑨front cover;

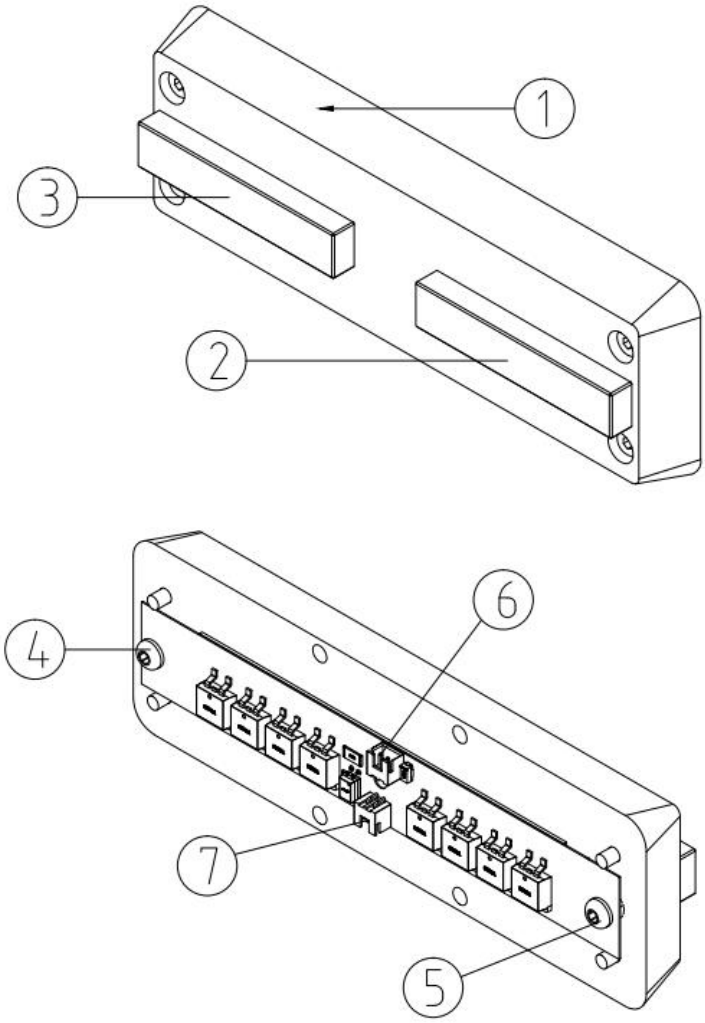

Figure 3-2 Overview of the power input end

Note: ①receiver base; ②positive electrode plate of the power input end; ③negative electrode plate of the power input end; ④Copper screw; ⑤Copper screw; ⑥Output signal connector; ⑦Cooling fan connector.

The CHG-4820G is mainly made of steel, which has strong overall impact resistance. After installation, it is not easy to deform or shift, ensuring long-term stability and safety of use.

In terms of structure, the CHG-4820G uses a two-core docking style. After the charging station is connected and powered on, this group will provide an OC signal, which can provide the correct power-on signal to the power input end.

3.1 State indicator

Users can determine whether the robot has started charging by the charging station's indicator light.

After successful docking, the charging station will display a green light, and the power adapter will start charging. At this time, the power adapter will turn red to indicate that it is charging. After the charging is completed, the power adapter will stop working and return to the green light state.

3.2 Instructions of electrical interface

3.2.1 Electrical interface instructions for power input

The power adapter configured for the CHG-4820G can be customized for input according to customer requirements. The normal default configuration is 220V input. Customers should use the input voltage purchased to connect to the power adapter to avoid damage.

The power adapter and the charging station body are connected using a three-core waterproof plug. It is recommended that customers also install a plug with the same interface on the power input end, which makes it easier to connect the power adapter directly to the manual charging port for charging after plugging and unplugging.

Figura 3-3 Overview of the power adapter

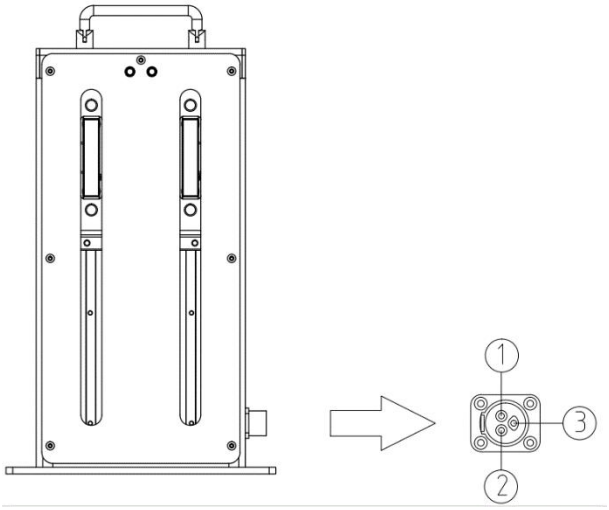

Figure 3-4 Overview of the plug connector between the power adapter and the charging station

Note: ①positive electrode of the charging port; ②negative electrode of the charging port; ③GND.

3.2.2 Explanation of the charging electrode

The charging electrode consists of two docking electrodes, which are the charging output +VCC and -VCC. Customers must ensure that the polarity of the two power input electrodes is consistent with the polarity of the charging station shown in the figure below when installing the power input end to avoid damage caused by incorrect connection.

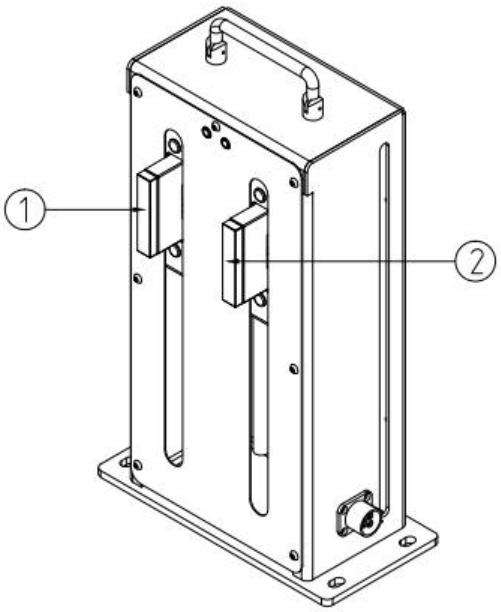

Figure 3-5 Overview of the charging station electrode

3.2.3 Explanation of the power input end interface functions

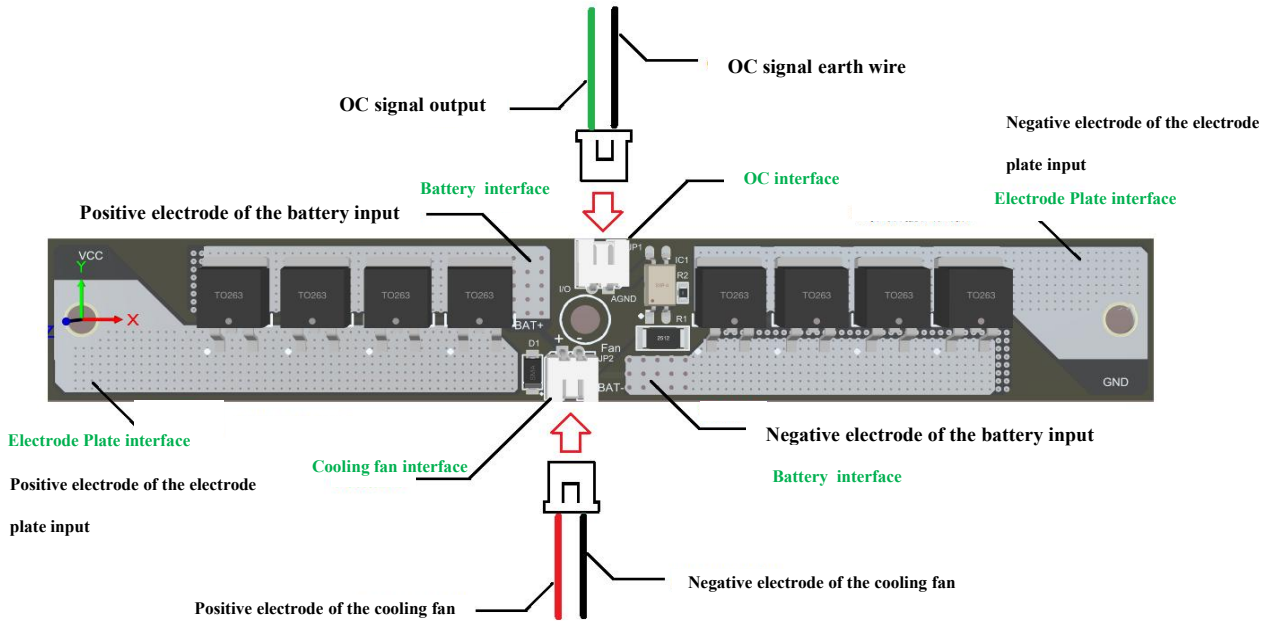

Figure 3-6 Introduction of the power input end

Interface	Description
Cooling fan interface	The power output of the fan and the rated voltage of the fan should be compatible with the output voltage of the charging station electrodes.

OC interface	Connect the OC signal output port to the input port of the electrical signal IO (EC box).
Battery interface	Connect to the input port for battery charging.
Electrode plate interface	The copper screws are fixed between the PCB and the electrode plate, serving the purpose of fixation and electrical conduction.

Table 3-1 Functional description of power input end's interface

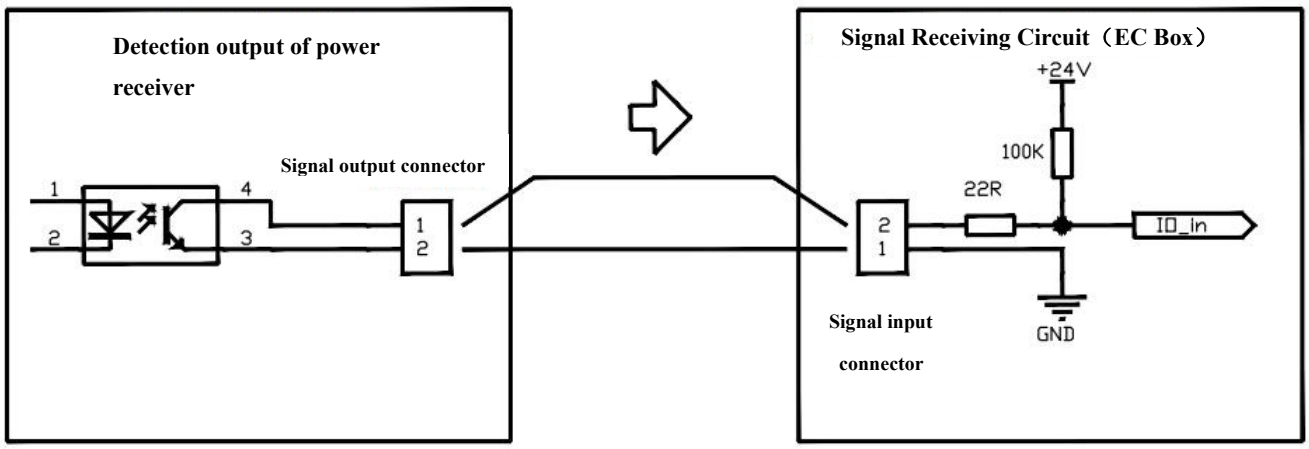

Figure 3-7 Schematic diagram of power-on signal on power receiver

As shown in Figure 3-7: When there is a voltage input on the power receiver and the battery information is charged through the electrode plate, the power receiver will output a power-on signal to the signal detection end to inform the control end of the charging status of the power receiver.

4. Getting Started

This section mainly introduces the basic operation and use of CHG-4820G.

CHG-4820G needs to be used with a corresponding power adapter.

The specific charging operation steps are as follows:

1) The charging pile can be deployed in two ways: fixed on the ground with 4 M8 bolts or fixed against wall. The deployment location should have no obstacles within 5 meters, and customers can choose to use according to their application scenarios. When the weight of the robot is ≥200kg, the charging pile needs to be reinforced with additional devices;

2) Before charging, please make sure that the power adapter is connected to the power supply, and the height of the connecting electrode is consistent without deviation. The electrode height can be adjusted by the 4 tightening screws in the U-shaped grooves on both sides;

3) After fixing the charging station, manually manipulate the vehicle or use navigation positioning to align the two end electrodes. When the electrodes are in contact and under force compression, and the green indicator on the charging pile lights up, please stop;

4) After charging is completed, please remove the charging equipment. Do not keep it in the triggered state for a long time;

5) Do not perform power-off and reboot operations on the robot during charging to avoid the charging station entering the protection state. If the above issue occurs, first disconnect the robot from the charging station, and then restart the charging station to resume charging;

6) The working status indicators of the adapter are shown in Table 4-1.

LED Indicator Status	**Adapter Status**
LED1 is in bright red	The input connector of the adapter is powered on.
LED2 is in bright red	The adapter is charging.
LED2 is in bright green	The battery capacity is ≥95%.

Table 4-1 Instructions of LED indicator for charging adapter status

7) If the charging environment temperature is too high, the adapter may enter temperature protection mode. Please move the adapter to a shaded or ventilated area to use it. The adapter will resume normal charging when the internal temperature drops to 60℃. The protection functions of the adapter are explained in Table 4-2:

Protection Contents	Description
Over temperature protection	When the internal temperature of the adapter reaches the over-temperature protection point, the adapter will automatically stop charging.
Output short circuit protection	when an unexpected short circuit occurs in the adapter output, the adapter will automatically shut off the output.
Output reverse connection protection	when the battery is reverse-connected, the adapter will disconnect the internal circuit from the battery.
Output overvoltage protection	when the adapter output has overvoltage, the adapter will automatically shut off the output.

Table 4-2 Explanation of adapter protection functions

When the charging pile is on charging, the charging pile indicator light will be green. When the charging pile triggers protection, the indicator light will turn red. At this time, you need to disconnect the charging pile for 5-10 seconds. After the red light goes out, turn on the power again to exit the protection mode. See Table 4-3 for details. The protection functions of the charging pile are explained in Table 4-4.

Indicator Light Status	Charging Pile Status
Green light on, red light off	The robot is charging normally.
Green light off, red light on	The charging pile has entered protection mode.
Green light off, red light off	The robot has not moved to a valid charging position and is in standby mode.

Table 4-3 Instructions of LED indicator for charging pile status

Protection Contents	Description
Overcurrent protection	When the charging current of the charging equipment reaches the overcurrent protection point, the charging pile will automatically shut off the output.
Short circuit protection	When an unexpected short circuit occurs at the output end of the charging pile, the charging pile will automatically shut off the output.

Table 4-4 Explanation of charging station protection functions

5. Attention

This section contains some things to note when using and storing CHG-4820G.

5.1 Attentions for charging

▲ Use only the specified power adapter to charge the CHG-4820G. Do not use non-original power adapters to avoid malfunctions. Please confirm the battery model and charging specifications with our company before purchasing to avoid incompatibility issues.

▲ The charging pile can be used in an environment temperature range of -20℃60℃. Please charge the battery according to the allowed charging temperature range. The normal charging temperature range for batteries is 0℃40℃. Charging outside this temperature range may cause battery leakage, overheating, or severe damage, accelerating the performance and life degradation of the battery.

▲ If the adapter or battery becomes abnormal or damaged during charging, immediately unplug the adapter input power cord and output power cord.

▲ If the charging process cannot be completed within the specified time, the charging process should be stopped. Otherwise, the battery may generate heat, smoke, catch fire (or explode).

▲ It is strictly forbidden to charge the battery in thunderstorm weather.

▲ It is strictly forbidden to charge the battery in humid, rainy, or water-immersed places.

▲ It is strictly forbidden to charge the battery in high-temperature environments such as heat sources or direct sunlight.

▲ Charge in a well-ventilated and dust-free area.

▲ During charging, do not cover the air inlet and outlet of the power adapter, leaving at least 10cm of space.

▲ It is strictly forbidden to power off and restart the robot during the charging process to prevent the charging pile from entering protection mode. If this happens accidentally, first disconnect the robot from the charging pile, and then restart the charging pile to resume charging.

5.2 Attentions for usage environment

▲ The operating temperature of CHG-4820G is -20℃60℃. Do not use it in environments below -20℃ or above 60℃. Please charge the battery according to the allowed charging temperature range. (The normal charging temperature range for batteries is 0℃40℃).

▲ The storage temperature of CHG-4820G is -20℃60℃. (The optimal storage temperature is 0℃25℃).

▲ Do not store or use CHG-4820G in environments with corrosive, flammable, or explosive gases.

▲ Keep CHG-4820G away from heat sources and fire sources during use and storage.

▲ Except for special customized versions (with IP protection level customization), the waterproof function of CHG-4820G is limited. Do not use it in outdoor environments.

5.3 Other attentions

▲ Do not drop or invert CHG-4820G during transportation or when setting it up for operation.

▲ Non-professionals should not disassemble CHG-4820G without authorization.

▲ When not in use for a long time, please disconnect the power supply and store it properly.

▲ If any abnormality occurs during use, please immediately disconnect the power supply and stop using CHG-4820G.

6. Common Q&A

Q: The green and red indicator lights of the adapter are not on.

A: First, check if the input line interface of the power adapter is connected correctly and firmly, and whether there is AC power input.

1. Check if the battery has not been used for a long time, discharged excessively, or damaged.

2. Re-plug the input and output plugs with an interval of more than 10 seconds and check if the power adapter is in protection mode.

3. Unplug the power adapter plug and connect it directly to the reserved manual charging port for charging. If it can be charged, it indicates that the charging pile is malfunctioning and needs to be repaired.

Q: The charging pile indicator light does not turn on and does not charge after the robot makes contact with the charging pile.

A: If there is no protection light on the adapter, check if the contact travel sensor is malfunctioning. Detection method: Use an insulated rod to press the charging pile electrode plate to the end point at the same time.

Condition 1: If the green light of the charging pile is on, the travel sensor and the charging pile function normally.

Condition 2: If the green light is not on, the sensor is malfunctioning.

Q: The charging pile enters protection mode as soon as it makes contact with the robot.

A: Check if there is a short circuit or damage in the vehicle or client device circuit.

7. Specifications

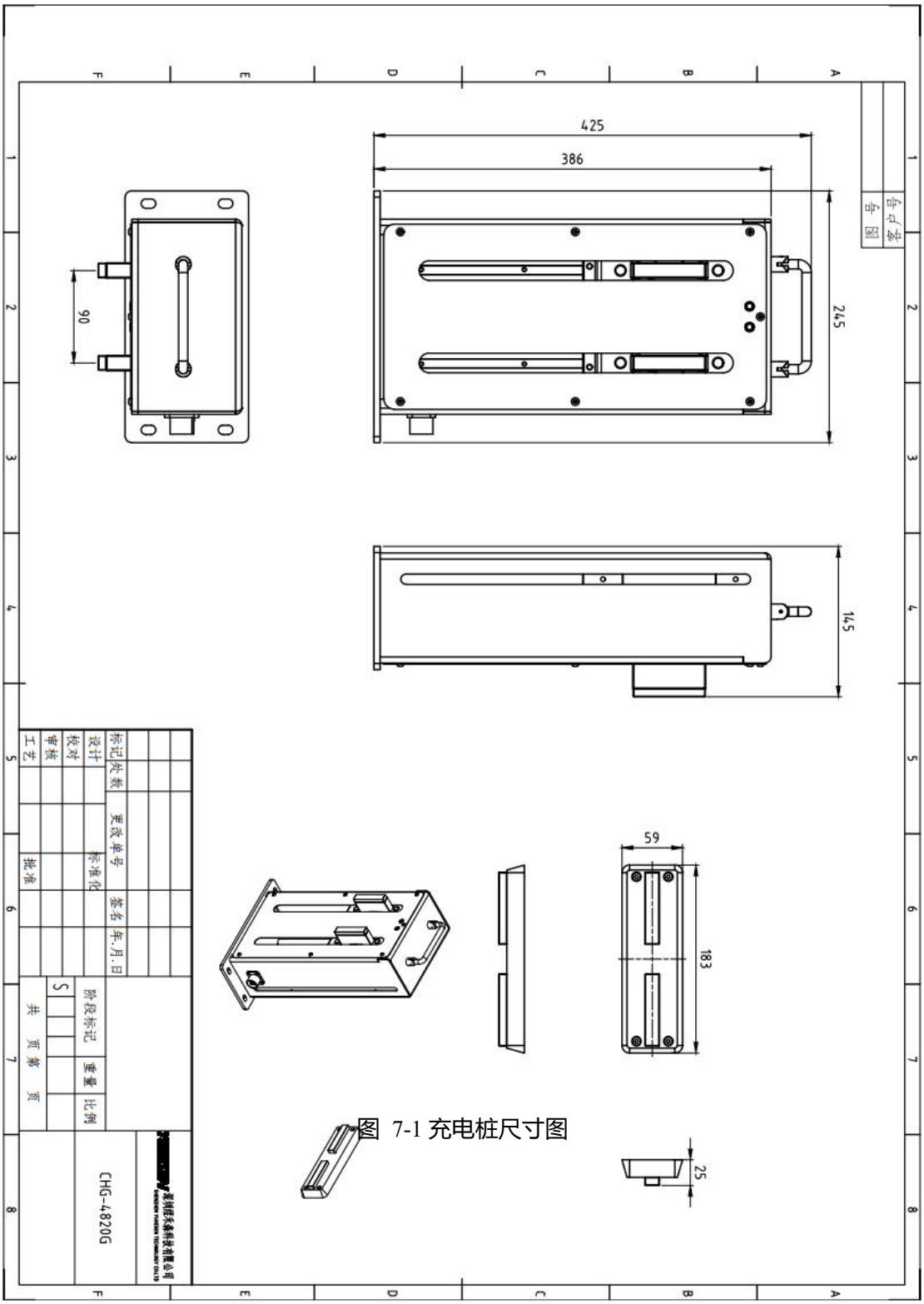

图 7-1 充电桩尺寸图

Tel.: 0755-28468956
Fax: 0755-28468956
Web: www.yuhesen.com
Email: sales01@yuhesen.com
Address: Floor 5, Building 1, Chuangwei Qunxin Industrial Park, No. 1, Baolong 6th Road, Longgang District, Shenzhen City

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Shenzhen Yuhesen Technology Co., Ltd.