Huiaipaic HSK-12V/24V-Yellow(US)

User Manual: 12-Amp Smart Battery Charger

Brand: Huiaipaic | **Model:** HSK-12V/24V-Yellow(US)

1. Introduction

This manual provides essential information for the safe and effective operation of your Huiaipaic 12-Amp Smart Battery Charger. This versatile device is designed to charge and maintain 12V and 24V batteries, including Lithium-ion, Lead-Acid (AGM/Gel/SLA), and can also perform pulse repair functions. It is suitable for a wide range of vehicles such as cars, motorcycles, boats, lawn mowers, ATVs, trucks, and tractors.

Figure 1.1: Huiaipaic 12-Amp Smart Battery Charger. This image displays the main unit with its attached battery clamps (red for positive, black for negative) and the power cord. The charger features an LCD screen and control buttons.

2. Safety Information

Always observe the following safety precautions to prevent injury or damage to the charger or battery:

- Read all instructions before using the charger.
- Ensure proper ventilation during charging. Do not operate in an enclosed area.
- Avoid open flames or sparks near the battery during charging, as batteries can produce explosive gases.
- Wear eye protection and gloves when working with batteries.
- Do not charge frozen batteries.
- Disconnect the AC power before connecting or disconnecting the battery clamps.
- This charger is equipped with multiple protections including reverse polarity, sparks, overcharging, low voltage, over-current, interruption, short circuit, and overheating. However, always exercise caution.
- Keep out of reach of children.

Figure 2.1: Safety Features. This image illustrates the 8 smart protections integrated into the charger, including Smart Control, Temperature Compensation, Reverse Polarity Protection, Cooling System, Fireproof Material, Over Current Protection, Over Voltage Protection, and Short Circuit Protection.

3. Product Overview

The Huiaipaic Smart Battery Charger features a robust design and intuitive controls for efficient battery management.

Key Components:

- **LCD Screen:** Displays charging status, battery voltage, current, cumulative charge, and selected mode.
- **Control Buttons:** Buttons for selecting different charging modes (Lithium, Ordinary, AGM, Maintenance).
- **Battery Clamps:** Red (+) and Black (-) clamps for connecting to battery terminals.
- **Power Cord:** For connecting the charger to an AC power source (110-230V).
- **Cooling Fan:** Built-in fan for efficient heat dissipation.
- **Durable Metal Case:** Stainless steel metal case for enhanced durability.

Figure 3.1: Charger Components. This image highlights the durable construction features including the stainless steel metal case, built-in cooling fan, upgraded cable clamps, and a longer AC power cable.

4. Setup

Follow these steps for initial setup and connection:

1. **Connect to Battery:** Ensure the charger is unplugged from the AC source. Connect the red (+) clamp to the positive battery terminal and the black (-) clamp to the negative battery terminal. Ensure a secure connection.
2. **Plug into AC Source:** Plug the charger's power cord into a standard 110-230V (50-60Hz) AC outlet. The LCD screen will illuminate.
3. **Automatic Voltage Detection:** The charger will automatically detect if the connected battery is 12V or 24V.

Figure 4.1: Safe and Easy Charging Steps. This image visually guides the user through connecting the charger to the battery, plugging it into an AC source, selecting the charging mode, and noting the automatic stop feature when fully charged.

5. Operating Instructions

The charger offers four distinct charging modes to suit various battery types and conditions.

Mode Selection:

After connecting the battery and power, use the mode selection buttons on the charger to choose the appropriate mode:

- **LITHIUM Mode:** For charging 12.6V / 25.2V Lithium-ion batteries.
- **ORDINARY Mode:** For charging 12V/24V SLA batteries including Wet, MF, Gel, Flooded, deep cycle, and VRLA maintenance-free lead-acid batteries.
- **AGM Mode:** For charging 14.8V / 29.6V AGM/EFB batteries.
- **MAINTENANCE Mode (Pulse Repair):** Used to recover and repair deeply discharged or sulfated batteries. This process typically takes about 1 hour before transitioning to automatic charging.

Figure 5.1: Four Modes Selection. This image shows the four distinct buttons for selecting Lithium, Ordinary, AGM, and Maintenance modes, along with a brief explanation of how to use the Maintenance (Repair) mode.

Figure 5.2: Three Battery Types State of Charge. This image illustrates how the charger displays the state of charge for Lead-Acid/GEL/Flooded (Ordinary), 12.6V Lithium, and AGM/EFB batteries on its LCD screen.

Figure 5.3: Battery Compatibility. This image shows the charger's compatibility with various battery types, including Lithium, Gel, AGM, and Lead-Acid batteries, emphasizing its ability to charge and repair 12V or 24V SLA batteries and 12.6V Lithium batteries.

Once the mode is selected, the charger will automatically begin the charging process. It employs a 7-step charging sequence to detect, charge, desulfate, and maintain your vehicle battery automatically. The charger will automatically adjust the charge current based on ambient temperature.

When the battery is fully charged, the charger will automatically switch to float charge mode, extending battery service life. The LCD display will indicate full charge (current drops below 0.5A and the indicator stops flashing).

6. Maintenance

Proper maintenance ensures the longevity and optimal performance of your battery charger and batteries.

- **Cleaning:** Disconnect the charger from power and battery. Wipe the casing with a soft, dry cloth. Do not use harsh chemicals or abrasives.
- **Storage:** Store the charger in a cool, dry place when not in use. Ensure cables are neatly coiled and not kinked.
- **Battery Maintenance:** Regularly check battery terminals for corrosion and clean as necessary. Ensure battery fluid levels are adequate for non-sealed batteries.
- **Pulse Repair (Maintenance Mode):** Utilize the MAINTENANCE mode periodically to help desulfate and recover older or underperforming batteries, which can extend their lifespan.

7. Troubleshooting

If you encounter issues with your charger, refer to the following common problems and solutions:

Problem	Possible Cause	Solution
Charger not turning on / LCD blank	No AC power; loose connection; faulty outlet.	Check power cord connection; try a different outlet; ensure power is supplied to the outlet.
Charger not charging battery	Incorrect mode selected; poor clamp connection; battery too deeply discharged or damaged; reverse polarity.	Select correct mode for battery type; ensure clamps are securely connected to correct terminals; try MAINTENANCE mode for deeply discharged batteries; check for reverse polarity (charger has protection).
"Error" message on LCD	Internal fault; battery fault; short circuit.	Disconnect charger, wait a few minutes, then reconnect. If error persists, the battery may be faulty or contact customer support.
Charger gets hot during operation	Normal operation (especially during high current charging); poor ventilation.	Ensure adequate ventilation around the charger. The built-in fan should manage heat. If excessively hot, disconnect and contact support.

The charger's pulse repair function can help diagnose and rescue batteries that have lost capacity due to sulfation. If a battery does not respond to charging or repair, it may need replacement.

8. Specifications

Technical specifications for the Huiaipaic 12-Amp Smart Battery Charger:

Feature	Detail
Input Voltage	110-230V (50-60Hz)
Output Voltage	12V / 24V (Auto-detection)
Charge Voltage	12V: 14V±0.3V; 24V: 28V±0.3V
Peak Charge Current	12V/10A; 24V/7.5A
Operating Temperature	-30°C to +50°C
Cooling	Built-in Fan
Charging Process	4-stage (Constant current, constant voltage, trickle charge, float charge)
Compatible Battery Types	All 12V/24V SLA batteries (Wet, MF, Gel, VRLA, Flooded), 12.6V Lithium battery, AGM/EFB battery
Battery Capacity Range	4Ah - 105Ah

Feature	Detail
Product Dimensions	7.48 x 5.51 x 2.76 inches (190 x 140 x 70 mm)
Item Weight	1.76 pounds
Certifications	CE, RoHS, FCC, IEC60335, EN61000, EN55014

Figure 8.1: Charging Stages and Specifications. This image provides a visual summary of the 4-stage charging process and a table detailing key specifications of the charger.

9. Warranty and Support

Huiaipaic provides a **24-month warranty** for this smart battery charger. This warranty covers defects in materials and workmanship under normal use.

For any questions, technical assistance, or warranty claims, please contact Huiaipaic customer service. We are committed to providing prompt and satisfactory solutions.

Please refer to your purchase documentation for specific contact details or visit the official Huiaipaic website for support information.

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