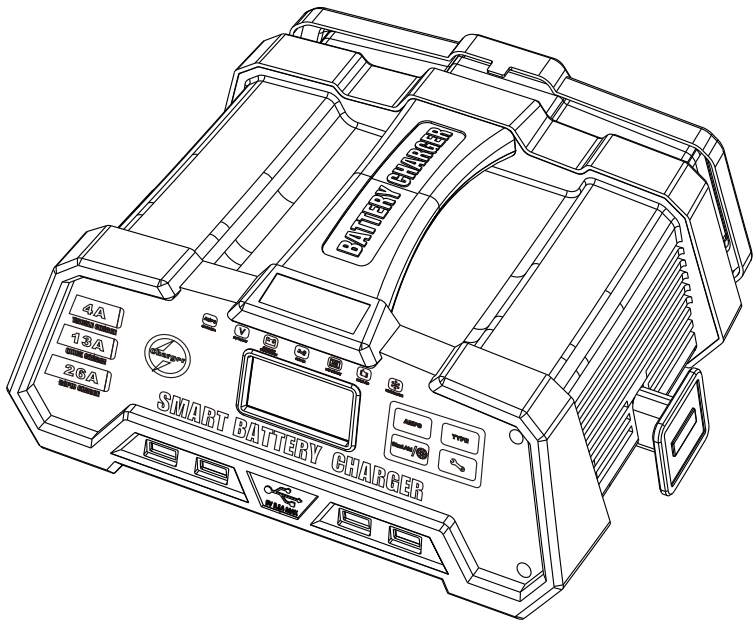


**ATO**.com

# F26000 User Manual



Email: [sales@ATO.com](mailto:sales@ATO.com)  
Phone: +1 800-585-1519  
Website: [www.ATO.com](http://www.ATO.com)

Before using this product, please read this instruction manual carefully. Be sure to keep this book in a safe place so that you can refer to it at any time in the future. Please use it correctly on the basis of a full understanding of the content.

## **warning**

Please keep this manual for future reference. This manual contains all the safety, installation and operation instructions for the battery charger (hereinafter referred to as the "charger").

- Check whether the power supply voltage is consistent with the voltage indicated on the nameplate on the charger.
- When connecting the charger, make sure that it will not cause any short circuit.
- After use, when cleaning or maintaining the charger, the connecting cable must be disconnected.
- Children should not be aware of the dangers of electrical equipment. Please place the charger in a place out of reach of children.
- Do not attempt to disassemble or modify any parts that are not described in this manual. Disassembling or modifying this product may cause serious accidents. Internal inspection, modification or repair should be handled by the distributor of this product or the qualified service personnel designated by the manufacturer.
- Do not touch exposed conductors on the DC side and AC side without protective measures.
- Ensure good ventilation. Always keep at least 5cm vents around the charger. Keep the charger in a dry place. Do not place the charger in a corrosive, salty, flammable and explosive atmosphere, high temperature, rain and moisture. middle.

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## **1. Instructions for use**

### **1.1 Operation steps**

- 1) Insert the charger input plug into the socket of rated voltage;
- 2) Connect the red clip of the charger (marked with "+") to the positive terminal of the battery.
- 3) Connect the black clip (marked with "-") of the charger to the negative terminal of the battery.
- 4) After connecting the battery, the charger automatically detects the battery voltage to select the charging voltage, press the "charge button" to enter the charging, You can also wait for the 15S charger to automatically enter charging;
- 5) If you need to change the battery type, press the "battery mode button" switch, select the appropriate battery type, and press the "charge Button" switch again, select the appropriate battery voltage, and then Press the "charge button" to confirm the battery voltage type;
- 6) In the charging state, press the "current selection key" switch to select the appropriate charging current;
- 7) When the charger is set to the correct voltage, the LCD screen displays "Please confirm the batterytype". At this time, please confirm whether the battery voltage is set correctly. If it is correct, press "Charger";
- 8) Violent charging mode: This mode is mainly aimed at lithium battery BMS entering the protection state, the battery terminal output voltage is less than 1V, the charger cannot detect the battery, after confirming the battery connection is normal, long press the "charge button", the charger activates the BMS to the battery Charging, when the BMS is detected to be activated, it will automatically enter the charging state. If you need to adjust the charging current, press the "current selection button" switch to select the appropriate charging current; this function is also suitable for other types of batteries with a voltage lower than 1V, but the battery When the voltage rises to the normal battery voltage, you need to re-operate step 5 to select the corresponding battery type;
- 9) After charging is finished, first unplug the plug, disconnect the mains, and then remove the clip from the battery.

## 1.2 Panel diagram



## 1.3 Part names and functions

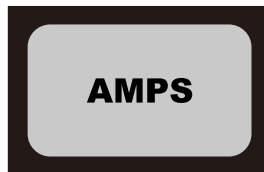
### 1. Charge button

When the AC is connected, the positive and negative clamps are connected to the battery, press the charging button, it will immediately enter the charging state, and press it again to stop the battery.



### 2. Current selection confirmation key

When entering the charging state, press this button to select the charging current. Choosing too much current to charge a small-capacity battery may affect the life of the battery, while selecting a too small current to charge a large-capacity battery will prolong the charging time.



### 3. Battery mode key

If you need to change the battery type, press the "battery mode button" switch, select the appropriate battery type, press the "charge button" to confirm the battery type; press the "battery mode button" switch again, select the appropriate battery voltage, and then press the "charge button" "Confirm the battery voltage type;

Be sure to confirm the battery type in the charging state. The default is to charge a lead-acid battery. If you do not select it properly, it may cause the battery to be dissatisfied.



## TYPE

### 4. Low temperature mode/skip charging mode button

Long press in the non-charging state to enter the skip charging mode, and short press in the charging state to enter the low temperature mode.

After entering the low temperature mode, the battery is charged according to the low temperature mode.

When the skip charging starts, it enters a 120S countdown. After the countdown ends, the car will be reminded to ignite.



Start Aid / ❄️

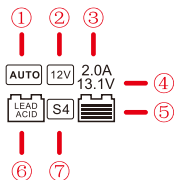
### 5. Battery repair button

When the battery is not used for a long time, the active material in the lead-acid battery drops, and the repair mode can be used.

When charging the lithium battery, press this button after the lithium battery is protected to activate the lithium battery.



## 6. LCD display



- ① Charging current selection gear
- ② Charging voltage selection gear
- ③ Charging current/power percentage
- ④ Battery voltage
- ⑤ Battery power progress bar
- ⑥ Battery type
- ⑦ Charging stage

- ② Charging voltage selection gear
- ④ Battery voltage
- ⑥ Battery type






The whole machine is displayed on the LCD screen, which can display the battery voltage, charging current, charging status, and charging mode during the charging process. If an abnormal condition occurs during the charging process, an error message can be displayed.

## 7. USB interface

USB maximum output 5V3. 1A



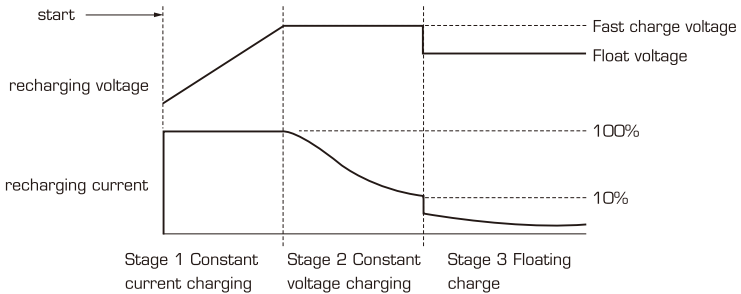
### 1.4 Common faults and treatment

Type of protection	Display content	Failure analysis	Treatment plan
No battery detected		The internal <b>resistance of the battery becomes larger, and the circuit is open</b>	Replace the battery
Battery reverse connection		The charger clip is connected to the battery's positive and negative poles incorrectly	Re-clamp the battery's positive and negative poles
Over temperature protection		<ol style="list-style-type: none"> <li>1. The ambient temperature of the charger is too high</li> <li>2. Block the air inlet or outlet of the fan</li> <li>3. The fan does not rotate</li> </ol>	<ol style="list-style-type: none"> <li>1. Put into the standard charging environment according to the requirements of the charger manual</li> <li>2. Remove blocked items</li> <li>3. If the fan is stuck or broken, replace the fan</li> </ol>
Timeout protection		The battery 24H is not fully charged	<ol style="list-style-type: none"> <li>1. Bad battery</li> <li>2. Because the battery capacity is too large, the charging current file is too small.</li> </ol>
Battery voltage error		Wrong battery voltage selection	If the battery voltage is wrong, please re-select the correct battery voltage

### 1.5 Charging mode

Three-stage charging: Lithium batteries need to go through three stages of constant current charging, constant voltage charging and floating charging during the charging process.

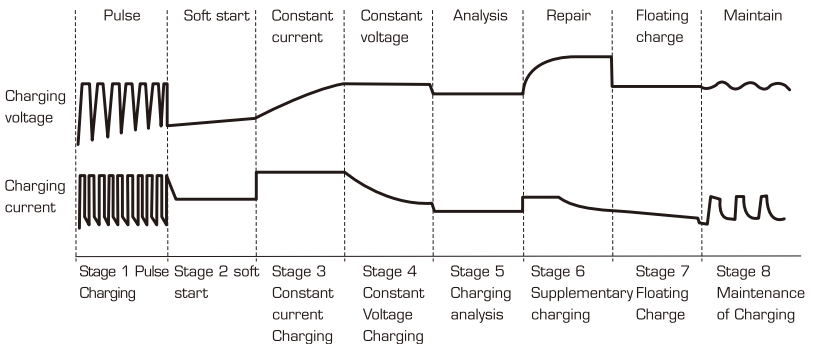
**Three-segment charging curve**



Phase I battery analysis	By detecting the battery voltage, it can be judged whether there is a battery connected or whether the battery is fully charged without recharging.
Stage 1 Constant current charging	At this stage, the battery is quickly charged with a constant current and charged until the battery voltage reaches the constant voltage charging voltage value.
Stage 2 Constant Voltage Charging	At this stage, a constant voltage is provided to charge the battery, so that the charging current slowly drops to 10% of the fast charging current and the charging ends.
Stage 3 Floating Charge	At this stage, the float voltage is maintained at the corresponding float voltage so that the battery can be fully charged.

Eight-stage charging: The battery needs to go through eight stages of pulse charging, soft start, constant current charging, constant voltage charging, charging analysis, supplementary charging, floating charging, and maintaining charging during the charging process.

**Eight-segment charging curve**





<p>Stage 1 Pulse Charging</p>	<p>The phenomenon of precipitation and vulcanization will occur after the battery is used for a period of time, which will affect the charge and discharge and the efficiency of the battery. The first stage of eight-stage charging is desulphurization, eliminating vulcanization phenomenon. let the battery re-can reach 100% charging status.</p>
<p>Stage2 soft start</p>	<p>After desulphurization, the charger will gradually introduce energy. Unlike the fast charger, this stage can protect the battery to extend the battery life.</p>
<p>Stage 3 Constant Current Charging</p>	<p>After a soft start adaptation, the fast charging mode is turned on. This stage quickly introduces energy to 80% charging state in a short time. (Charge current is the rated current of the product and constant current charge)</p>
<p>Stage 4 Constant Voltage Charging</p>	<p>the battery automatic detection function is triggered after the end of the fourth stage of absorption. The battery test phase detects the voltage for 90 seconds to determine whether the charge has been successful.</p>
<p>Stage 5 Replenishment Analysis of Charge Status</p>	<p>the battery automatic detection function is triggered after the end of the fourth stage of absorption. The battery test phase detects the voltage for 90 seconds to determine whether the charge has been successful.</p>
<p>Stage 6 Replenishment</p>	<p>This stage is further feedback for phase 5. If the fifth phase detects a failure to fully charge, it will continue to fill the battery with a small continuous current for four hours. If the fifth-order test OK,, it will skip this stage and move to phase 7. The repair stage can repair the deep discharge state of the battery, improve the performance of the battery and prolong the battery life.</p>
<p>Stage 7 Floating charge</p>	<p>At this stage, the charger keeps the battery 100% charged and does not overcharge or damage the battery. the battery and charger can be connected together for a long time also no problem.</p>
<p>Stage 8 Maintenance of charging</p>	<p>Maintain charging to ensure that the battery remains full in any case.</p>

## 1.6 Battery type and output voltage

Type of battery	6V	6V Floating charge voltage	12V	12V Floating charge voltage	24V	24V Floating charge voltage
Standard lead acid	7.2±0.2V	6.8±0.2V	14.4±0.2V	13.6±0.2V	28.8±0.2V	27.2±0.2V
AGM	7.4±0.2V	6.8±0.2V	14.8±0.2V	13.6±0.2V	29.6±0.2V	27.2±0.2V
GEL	7.0±0.2V	6.6±0.2V	14.1±0.2V	13.6±0.2V	28.2±0.2V	27.2±0.2V
<b>Lifepo4</b>	7.4±0.2V	7.1±0.2V	14.6±0.2V	13.6±0.2V	29.2±0.2V	27.2±0.2V

## 1.7 Output current

When the charger is connected to the working power supply and the output clip is connected to the battery, the default output current is 2A. The user can choose the appropriate current to charge according to the battery capacity. The size of various charging currents is shown in the following table:

Current Voltage	AUTO	2A	4A	6A	8A	12A	13A	24A	26A
6V	✓				✓			✓	
12V	✓		✓			✓			✓
24V	✓	✓		✓			✓		

## 1.8 Reference battery capacity corresponding to charging current

Charging current	Auto/2A	4A	6A	8A	12/13A	24/26A
Battery capacity	0 - 15 Ah	15 - 30 Ah	25 - 50 Ah	30 - 65 Ah	50 - 120 Ah	120 - 350 Ah

## 2. Product function

### 2.1 Fan control function

In the normal charging process, when the charger is in a constant current and constant voltage state (the current is greater than 10A or the temperature is greater than 80°C), the fan works normally.

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## **2.2 Minimum starting voltage**

The charger clip can only be triggered when it is connected to a battery (or other DC power supply) with a certain voltage. The charger enters the working state. The lowest value of the battery voltage is  $2.5 \pm 0.2VDC$ .

## **2.3 Reverse connection protection**

When the charger is in the charging state, the output clip is reversely connected, and the charger will be protected against reverse connection at this time. Over here, the process will not have any adverse effects on the performance of the charger.

## **2.4 Short circuit protection**

When the charger is in the charging state, if the output clip is short-circuited, the charger will short-circuit protection. During this process, it will not have any adverse effects on the performance of the charger.

## **2.5 Over temperature protection**

When the internal temperature of the product reaches the temperature protection point, it will enter the protection state and the output will be turned off. The internal temperature of the charger is naturally lowered, and the output should be able to quickly resume output by itself before cooling to the ambient temperature.

## **2.6 Repair of lead-acid batteries**

Due to improper use or over-discharge of the battery, the internal resistance of the battery will become larger and smaller. The battery repair function can charge the battery for a long time with low current and high voltage, which can reduce the internal resistance of the battery to a certain extent. After the charger is powered on and the clip is correctly connected to the battery, it will automatically determine whether the battery needs repair, that is, after entering the floating charge, it will display the battery voltage: 6V battery < 6V, 12V battery < 12V, 24V battery < 24V, you can enter manually. In the repair state, the repair current is greater than  $1.5 \pm 0.3A$ , and the repair battery voltage is greater than or equal to 2.5V, the repair test can be done.

## **2.7 Jump charging**

This function is only for 12V batteries. Press the "Start Aid" button to quickly charge the over-discharged battery. The charging current can reach up to 40A, and the charging time is 120S. After 120S, the charger will continue to charge the battery. When the battery is not disconnected, the car ignition switch can be activated. It can instantly provide 75A current to start the car motor. After that, reconnect the battery and press this button to quickly charge the battery.

## **2.8 Bluetooth data transmission**

Add Bluetooth data transmission, the charger status and data can be displayed on the APP through the mobile APP (not included by default, optional).

## 2.9 Violent charging

For batteries with a voltage lower than 1V, the default is lithium battery protection with BMS, and the charger cannot recognize the battery. Long press the charge button to enter this function.

## 3. Product parameters

Ac input voltage:	200V~250VAC 50Hz 100V-125VAC 60Hz
Efficiency:	80% Max
Power:	450W Max
Charge voltage:	DC6V/12V/24V(selection)
Charge current:	DC6V:AUTO/8A/24A/52A DC12V:AUTO/4A/12A/26A DC24V:AUTO/2A/6A/13A
USB Output	DC5V 3.1A Max
Low voltage detect:	2.5V(6V) 2.5V(12V) 2.5V(24V)
No-load current:	≤20mA
Environment temperature:	-10°C to+40°C
Charge mode:	8 stages for wet battery 3 stages for Lithium battery
Battery types:	6V & 12V & 24V
Battery types Chemistries:	Wet, Gel, MF, AGM, Lithium battery (Lithium battery with BMS only)
Battery capacity:	Less than 500AH, support all batter size.
Shell protection:	IP20
Cool down:	Cooling fan
Product Size	296*235*135mm
Product net weight:	2.1kg