ALVOLTA
BUILT FOR POWER

# OWNER'S MANUAL




## ALVOLTA AERO 12V 25A BT AC CHARGER

### ALV-AC1225BT

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## DISCLAIMER

All data and specifications provided in this maunal are tested under standard test conditions, and may deviate marginally from actual values. Alvolta and its associates reserve the right to make modifications to the provided information without notice. Alvolta maintains the goal to supply customers with recent information regarding its products.

# SAFETY INSTRUCTIONS

## IMPORTANT, READ CAREFULLY & RETAIN FOR REFERENCE

- WARNING: It is very important to review this manual thoroughly before attempting installation.
- Do NOT exceed the electrical specifications of this device.
- Do NOT leave the battery disconnected while a solar input is connected for an extended period of time. Doing so may result in damage to the unit.
- Ensure children are kept away from this device at all times.
- Take care when installing or working with batteries. Wear protective clothing and eyewear, and wash you hands when installation is complete. If contact with battery acid is made, rinse with water immediately.
- Ensure external metal objects are removed when working with batteries, and take care when using metal tools to work on batteries. If external metal objects are dropped into a battery, a short-circuit or damage to the battery may occur.
- Ensure the ambient environment is well ventilated, because the battery may produce acid gas when charging.
- Do NOT connect lithium batteries in reverse polarity. Doing so may result in fire or damage to the device.
- Stay away from sparks, as the battery may produce combustible gases.
- During outdoor installation, avoid direct sunlight and rainwater infiltration.
- Ensure that cable connections are tightened and cables are fixed in the system correctly. False connections and corroded cables may cause extreme heat that can melt the cable insulation, burn surrounding areas or cause a fire.
- Ensure the device is installed by competent and trained professionals where required.
- Ensure appropriately sized wiring, fuses and circuit protection devices are used in the installation of this device.
- Connecting live equipment to this device, such as solar panels or batteries, can cause arcing to occur. Ensure all devices are isolated prior to installation where possible and ensure appropriate PPE is worn at all times.

# OVERVIEW

The Alvolta Aero charger is a high-performance AC charger designed for 12V systems. Featuring an efficient 6-stage charging algorithm, IP65 rating and support for both lithium and lead-acid batteries, this AC charger is suitable for a wide variety of 12V applications.

The Alvolta Aero charger incorporates comprehensive fault detection and protection features to safeguard against damage caused by installation errors, wiring faults, or abnormal system conditions. These built-in protections help ensure reliable operation and extend the service life of both the controller and connected equipment.

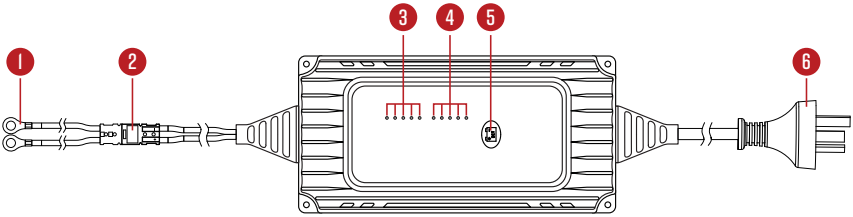
The Alvolta Aero charger also supports monitoring, data logging, and parameter configuration through the Alvolta app, PC software, and other compatible communication interfaces, allowing users to manage the system locally or remotely.

# FEATURES

- The charger features an efficient 6-stage charging algorithm.
- Supports multiple battery types including lithium batteries, sealed lead-acid batteries, flooded lead-acid, gel batteries and user-defined options.
- The charger features a built-in over-temperature protection mechanism, which switches the charging power to a linear decline when the temperature exceeds a set value.
- Uses a built-in 4.0BLE Bluetooth module, allowing for connection and interaction with the Alvolta app.
- The charger is IP65 rated, ensuring it can operate reliably and efficiently in various working conditions.
- The charger features over-current protection, reverse-polarity protection and short-circuit protection.
- The charger features convenient LED indicators to signal battery type and charging

# INTERFACE & INDICATORS

## MAIN INTERFACE




| | |
|---|---|
| 1 | Battery connection (ring terminals) |
| 2 | Connector |
| 3 | Battery type indicators |
| 4 | Charging state indicators |
| 5 | Key |
| 6 | AC plug |

# INDICATOR LIGHTS

## Indicator Light Specifications:

### Battery Type Indicator

| Indicator | Light Indication | Indication Description |
|---|---|---|
| LI | On normally | Lithium battery mode selected |
| SLD | On normally | Sealed lead-acid battery mode selected |
| GEL | On normally | Gel lead-acid battery mode selected |
| FLD | On normally | Flooded lead-acid battery mode selected |
| User | On normally | Custom lead-acid battery mode selected |

### Charging State Indicator

| Indicator | Light Indication | Indication Description |
|---|---|---|
| Charging State | Off | No charging |
| Storage | Single Flash | Fully charged |
| | On normally | Storage charging mode |
| Float | On normally | Floating charging mode |
| Absorption | On normally | Boost charging mode |
| Bulk | On normally | Bulk charging mode |
| Test | On normally | Test charging mode |

# KEY FUNCTION

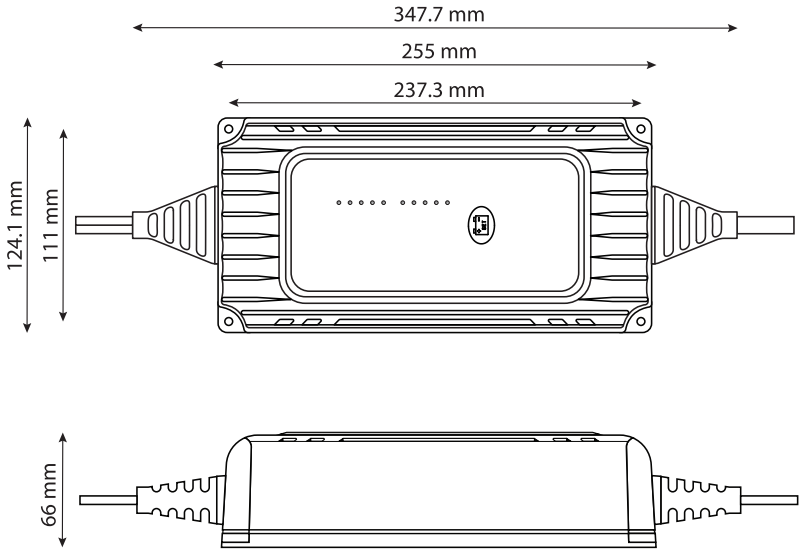
## Key Specifications:

| Button Function | Button Action |
|---|---|
| Short Press | Battery type selection |
| Long Press for 8s | System restart |
| Long Press for 20s | Factory reset |

# SPECIFICATIONS

| Specifications: | |
|---|---|
| Charging Current | 25A |
| Charging Method | 6 step charging algorithm |
| Stand-by Power Consumption | < 5W |
| System Voltage | 12V |
| Battery Voltage | 9V - 17V |
| Input Voltage | 180 - 265V AC / 45 - 65Hz |
| Connection Type | M8 Ring Terminals |
| Maximum Cable Size | 6mm² (10AWG) |
| Lithium Battery Activation | Supported |
| Under-temperature Charging (Li) | Enabled by default |
| Full-charging Setting | Disabled by default |
| Communication Method | Built-in Bluetooth |
| Key | Battery Type Selection / Restart / Factory Reset |
| Indicating Method | 5 Battery Type Indicators + 5 Charging State Indicators |
| Protection Function | Over-voltage, Over-temperature, Under-temperature & Output Reverse Protection |
| Operating Temperature Range | -35°C - +65°C |
| Ingress Protection | IP65 |
| Altitude | < 2000m |
| Colour | Black |
| Dimensions (w x h x d) | 347.7 x 124.1 x 66mm |
| Weight | 1.7kg |
| Warranty | 3 Years |

## Model Dimensions:



# BATTERY PARAMETERS

**Battery Type Parameters:**

| Battery Type | Lithium | Sealed Lead-Acid | Gel Lead-Acid | Flooded Lead-Acid | Customised |
|---|---|---|---|---|---|
| Indicator | LI | SLD | GEL | FLD | User |
| Over-voltage Disconnection Voltage | 16.0 V | 16.0 V | 16.0 V | 16.0 V | 9.0 - 17.0 V |
| Limited Charging Voltage | - | 15.5 V | 15.5 V | 15.5 V | 9.0 - 17.0 V |
| Equalising Voltage | - | 14.6 V | - | 14.8 V | 9.0 - 17.0 V |
| Boost Voltage | 14.4 V | 14.4 V | 14.2 V | 14.6 V | 9.0 - 17.0 V |
| Floating Voltage | - | 13.8 V | 13.8 V | 13.8 V | 9.0 - 17.0 V |
| Storage Voltage | 13.5 V | 13.2 V | 13.2 V | 13.2 V | 9.0 - 17.0 V |
| Equalising Charging Interval | - | 7 days | 7 days | 7 days | 0 - 60 days |
| Equalising Charging Time | - | 60 min | 60 min | 60 min | 0 - 60 min |
| Boost/Floating Charging Time | 120 min | 120 min | 120 min | 120 min | 0 - 600 min |

In the constant voltage charging stage (as shown in the "c/d" stage in Figures 1 and 2), the charger will stop charging if the charging current is less than the "full cutoff current" for 1 min. If the battery voltage is lower than that of the boost charging reverse mode, it will reenter the "b/c" charging stage.

# UNDER-TEMPERATURE CHARGING (LI BATTERY)

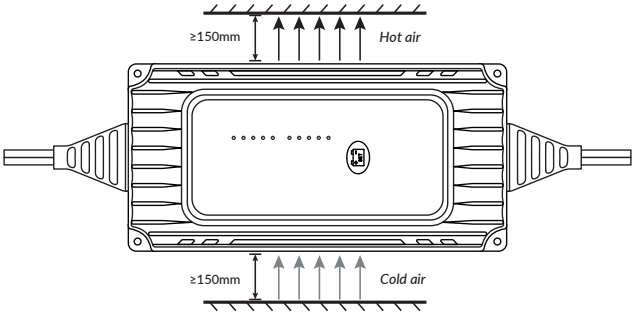
- Start: When the battery temperature is below 0°C, it will stop charging; when the temperature exceeds 2°C, it will resume charging.
- Close: When the battery operates according to the set operating temperature, it will exit the under-temperature charging mode.

## PRE-INSTALLATION PRECAUTIONS

- PV arrays may generate very high open circuit voltages. Disconnect the circuit breaker or fuse before wiring and be very careful during wiring. Ensure that solar panels are completely covered from sunlight during installation.
- Never install the charger and a vented battery in the same enclosed space.
- The battery terminals on the charger can be connected to either a single battery or a battery bank. Subsequent instructions in this manual apply to systems using a single battery, but are equally applicable to systems using a battery bank.
- Follow the safety recommendations of the battery manufacturer.
- Select the system connection wire with a current density of no less than 4A/mm².
- This device has a common negative design. If grounding is required, enure that the negative terminal is grounded.

## CHARGER INSTALLATION

When installing the charger, ensure that the installation will provide adequate airflow around the charger, and reserve at least a 150mm space above and below the charger for natural convection cooling. If installed in a closed container, ensure there is reliable heat dissipation through the container.



## 1. Select an installation location

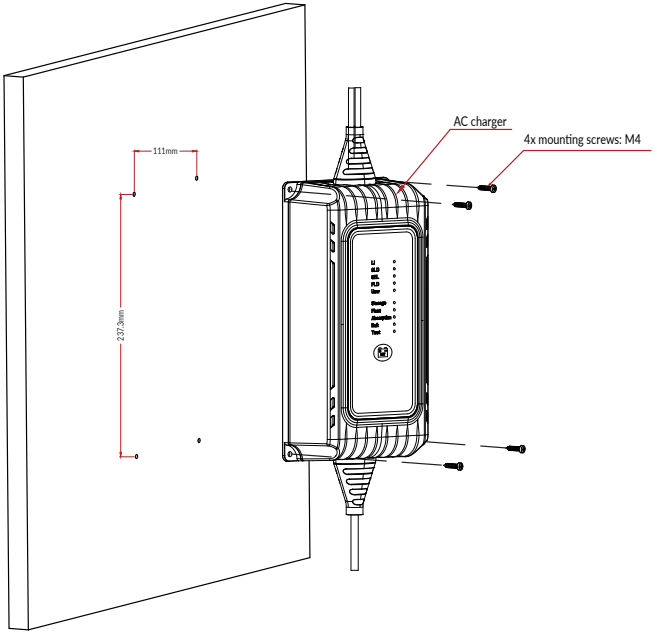
a. Choose a location that will avoid direct sunlight, minimise exposure to high temperatures, and is suitably ventilated.

## 2. Install mounting screws

a. Mark the mounting position according to the mounting dimensions of the charger, drill two mounting holes of suitable size at the two marks and fix the screws on the two mounting holes.

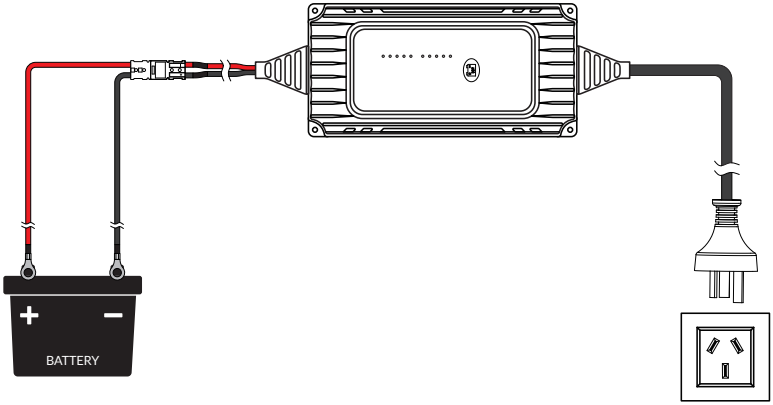
## 3. Install the controller

a. Align the charger fixing holes with the two pre-fixed screws to hang the charger up, and then fix the two screws below.



## 4. Wire the controller

a. Access the corresponding interface according to the screen mark of each terminal, and pay attention not to connect the positive and negative in reverse.



# PROTECTION FEATURES

Waterproofing protection:
- IP65 rated

Charging overcurrent protection:
- If the charging power is too high, the charger enters overcurrent protection mode and stops charging.

Battery over-voltage protection:
- If the battery voltage is higher than the over-voltage voltage, the charger stops charging.

Over-temperature protection:
- When the temperature of the charger exceeds the set value, it will reduce charging power or stop charging.

Under-temperature protection of lithium batteries:
- Lithium batteries can be set to prohibit charging if the temperature is at 0°C.

Output short circuit protection:
- If the output voltage is short circuited, the charger will turn off charging; after short circuit is removed, charging will automatically recover.

# SYSTEM MAINTENANCE

- In order to maintain the best long-term performance for chargers, it is recommended to conduct inspections twice a year.
- Make sure the airflow around the charger is not obstructed and remove any dirt or debris from the heat sink.
- Check if the insulation layers of all exposed cables are damaged due to sun exposure, friction with other objects nearby, dry rot, destruction of insects or rodents, etc. If so, it is necessary to repair or replace the cable.
- Verify if indicators are consistent with the device operations. Please note to take corrective actions for any malfunctions or error indications if necessary.
- Check all wiring terminals for corrosion, insulation damage, signs of high temperature or burning/discoloration.
- Tighten terminal screws.
- Check for dirt, insects nesting and corrosion and clean as required.
- If the lightning arrester has failed, replace it in time to protect the charger and other devices in the system from being damaged by lightning or electrical spikes.

Warning: To carry out any of the operations above, please ensure that all power to the charger has been disconnected. Afterwards, perform a final inspection and commence operation. Operation and maintenance should only be handled by trained professionals where necessary.

# TROUBLESHOOTING

## Common Troubleshooting:

| Issue | Description | Troubleshooting |
|---|---|---|
| Indicators of battery type and charging state flashing simultaneously | Battery over-voltage | Automatically recover after the battery voltage drops to the over-voltage value minus 1V |
| | Over-current protection | Automatically recover after protection |
| | Over-temperature protection | Stop charging when the temperature is higher than 82°C, and recover charging when the temperature is below 70°C |
| | Under-temperature protection | The charger operates at the set value for under-temperature protection (-35°C, for the charger, by default) |
| No charging | Over-current protection | 1) Check the charging state for on/off and whether it is in the OFF state in the Alvolta app<br>2) Check whether the "under-temperature charging of the lithium battery" function is enabled<br>3) Check whether the "full charging setting" is enabled and the battery is fully charged |

# WARRANTY INFO

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3 YEAR WARRANTY

At Alvolta, we build all our gear for reliable power. We stand behind the quality and durability of our components. Our product development team rigorously tests our products to ensure they will perform in the Australian climate.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonable foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Alvolta warrants that our products are free from manufacturing defects in material and workmanship for the warranty period. The warranty commences on the date of purchase by the original purchaser. If a defect arises during the warranty period, we will repair, replace or provide an appropriate remedy in accordance with the Australian Consumer Law.

To access the benefits of this warranty, you must retain your proof of purchase and follow any other direction we reasonably give you.

## Processing a Warranty Claim

If you believe your product is defective, it must be returned to us for inspection by our warranty claims department. Please contact our customer service team to provide details of the defect. They will assist you through the process of your warranty claim, including how to return the product for inspection.

Once we receive your returned product, our technicians will inspect it. We will then notify you of the outcome of your claim.

If we accept your warranty claim, we will either repair, replace or refund the goods at our discretion. We will also reimburse you for the shipping costs you incurred in sending the goods back to us. Any products that we choose to replace or refund become the property of our company.

If we do not accept your claim, we will advise you of the reason and hold your product for collection. You will need to arrange and pay for the product to be shipped back to you. If your product is not collected within 30 days of your warranty claim being finalised, we may destroy it.

Your warranty is voided if we (at our sole discretion) determine that there is evidence of one or more of the following:

**Negligence:** Improper installation, improper or extreme use, use that contravenes this instruction manual, etc.

**Abuse:** Road hazards, damage beyond the limits of “normal wear and tear.”

**Unauthorised Repair:** Repair service performed by an unauthorised service centre.

**Disassembly:** Any attempt to open, tamper with or otherwise compromise the integrity of the product.

**Consequential Damage:** Damage to this product caused by the failure of another component of the vehicle or device in which this product is installed.

Note regarding exterior finishes: we use the highest quality materials available, but depending on location, environment and exposure, the colour of exterior surfaces can fade. We will not approve any warranty claims that relate to colour fading.

## Discontinued Items

Discontinued items that are still under warranty will be reviewed by our company. If a discontinued item is covered under warranty it may be replaced by an equivalent or superior item. If an equivalent item is not available our company will determine terms of resolution on a case-by-case basis.




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