

**TRANSPORTER ENERGY LITHIUM-ION BATTERY**

**MANUAL AND  
INSTALLATION  
GUIDE**

# CHARGING PARAMETERS

## BULK/ABSORPTION

For your bulk/absorption stage, the ideal voltage is between 14.2V-14.6V. For full charge and balance, the absorption mode should be set to last for at least 20 minutes per battery (for multiple batteries in parallel).

## FLOAT

Our batteries do not need a float stage for charging, but a float voltage between 13.4V and 13.8V can be used when connected to shore power.

## EQUALISATION

Equalisation is not recommended for our batteries. Most chargers will allow you to shut this feature off or use a setting that does not use equalisation. If you cannot turn off this mode, then you will need to adjust the equalisation voltage to below 14.6V

## TEMPERATURE COMPENSATION

Temperature compensation is not needed with our batteries and in some cases, may trigger the built in BMS to go into protect mode. For this reason, we recommend that temperature compensation be shut off or set to 0.

# **BMS BASIC FEATURES**

All Transporter Energy batteries come with a built-in battery management system (BMS) that protects the cells for long-term cycling. The BMS protects against the following conditions:

## **HIGH VOLTAGE: >14.7V**

If an individual cell voltage exceeds a prescribed threshold during charging, the BMS will prevent a charge current from continuing. Discharge is always allowed under this condition.

## **LOW VOLTAGE: <10V**

If an individual cell falls below a prescribed threshold during discharge, the BMS will prevent further discharge. Although the battery is in “low-voltage disconnect” mode, it will still allow a charging current. (Note: many chargers must detect a voltage over 10V to send a charge to the battery).

## **HIGH TEMPERATURE: >57C**

The BMS will not allow a charging or discharging current.

## **LOW TEMPERATURE: <-4C**

The BMS will not allow a charging current.

## **HIGH CURRENT**

The BMS will not allow a current that exceeds 100 (+/- 5%) amps for 30s, or 200 (+/- 10%) amps for 0.5s.

Although these thresholds have been verified with a DC load bank, the 30 second high current threshold may be reduced from 200A to around 150A for certain highly variable loads through an inverter – like a microwave or space heater. After a high current disconnection, the battery will automatically reconnect after 5 seconds.

A passive balancing process is activated by the BMS at the top of each charge cycle, when the battery voltage exceeds around 14V. This ensures that all the cells remain at the same state of charge, which helps pack longevity and performance.

IEC 62133 certification mandates that charging has been certified between 3C and 45C.

# INSTALLATION

The batteries may be mounted in any orientation. But care must be taken in connecting to the battery terminals. The positive and negative terminals are labelled and colour coded (red for +, black for -).

**PLEASE NOTE: DO NOT REVERSE THE POLARITY OF THE BATTERY AS THIS WILL DAMAGE BOTH THE BATTERY AND THE DEVICE BEING CONNECTED!**

The batteries come standard with a flag style terminal post with a 3/8" hole to accommodate a 5/16" bolt and lug sizes up to 2 AWT. Larger lugs may require a 1/4" bolt. All batteries ship with 18-8 stainless steel 5/16 – 18 bolts, brass washers, and 18-8 stainless steel nuts with nylon inserts. If multiple lugs are used, the washers may be removed, or longer bolts may be required in order for the bolt to fully seat into the nylon insert of the nut.

**WHEN CONNECTING TO BATTERY TERMINALS, DO NOT FINGER TIGHTEN. ALL CONNECTIONS MUST BE TIGHTENED TO THE SPECIFICATIONS OF THE BOLT MANUFACTURER. FOR THE BOLTS INCLUDED WITH THE BATTERY, TIGHTEN USING A TORQUE WRENCH TO BETWEEN 9 AND 11ft-lbs. FAILURE TO ADEQUATELY SECURING CONNECTIONS CAN RESULT IN FIRE.**

## **PARALLEL**

Multiple Transporter Energy batteries may be mounted in parallel to increase the current capacity of the system. When batteries are mounted in parallel, the voltage of the system does not change, but the current limits are additive. For example, two Transporter Energy batteries mounted in parallel can deliver 200A continuously and 400A for 30 seconds. Three batteries mounted in parallel can deliver 300A continuously and 600A for 30 seconds. Therefore, all cables and connections **MUST** be able to accommodate the high currents that can be delivered by the battery. Appropriate fuses and circuit breakers are also highly recommended to protect downstream components from current spikes and short circuits.

## **SERIES**

Up to four Transporter Energy batteries may be connected in series to increase the voltage of the system up to a 48V system. When batteries are mounted in series, current capacities remain the same, but the system voltage is additive. Two batteries mounted in series to form a nominally 24V system should be charged using a bulk and absorption voltage of 28.8V, and a float voltage of 27.2V. Four batteries mounted in series to form a nominally 48V system should be charged using a bulk and absorption voltage of 57.6V, and a float voltage below 54.4V.

Batteries to be connected in series should be at the same state of charge before they are connected.

For best results, fully charge each battery using a 12V charger prior to connecting them in series, in order to ensure that they are at the same state of charge.

## **INVERTER/CHARGERS (AND OTHER DEVICES HAVING LARGE INPUT CAPACITANCE <math><10\mu\text{F}</math>)**

Special consideration must be made for connection to devices that have a large input capacitance, because of the tendency of these devices to draw large current spikes upon initial connection to the batteries. This includes inverter/chargers that are greater than 4000 watts in size. This applies to 12V, 24V, and 48V inverter chargers. Transporter Energy batteries require a current surge limiter to be installed with each inverter/charger greater than 4000 watts.

**DO NOT CONNECT BATTERIES TO AN INVERTER/CHARGER THAT IS GREATER THAN 4000 WATTS IN SIZE WITHOUT A CURRENT SURGE LIMITER. FAILURE TO INCLUDE A CURRENT SURGE LIMITER WILL DAMAGE THE BMS AND PRESENT A POTENTIAL FIRE HAZARD.**

**✗ DO NOT SUBMERGE THE BATTERIES**

**✗ DO NOT EXPOSE THE BATTERIES TO EXCESSIVE HEAT**

**✗ DO NOT MISHANDLE, DROP, THROW, OR APPLY EXCESSIVE FORCE TO THE BATTERIES**

**✗ DO NOT SHORT CIRCUIT THE BATTERIES**

**✗ DO NOT REVERSE THE POLARITY**

**✗ DO NOT OPERATE WITH LOOSE TERMINAL CONNECTIONS**

# **STORAGE AND MAINTENANCE**

## **STORAGE**

Storage could not be easier. Simply charge the batteries to at least 50% state of charge and disconnect from any charge or discharge.

## **MAINTENANCE**

Transporter Energy batteries require very little maintenance – if any at all. If your batteries are in series and not being charged by a multi-bank charger it is recommended that you fully charge the batteries individually once a year. This will balance out the entire battery bank to ensure the batteries will reach their expected life span. If your batteries are in parallel this is not necessary. Our BMS has a built-in passive balancing system that will take care of this for you.



# WARRANTY POLICY

In the unlikely event, you are having an issue with one of our batteries we have developed a straightforward warranty policy to help answer any questions you may have.

Transporter Energy batteries offers a 10-year manufacturers defect warranty from the date of purchase (see attached Warranty).

We also warrant all other complementary products (inverters, converters, chargers etc.) we sell are free from defect for 30 days from the date of purchase. After that time it is the responsibility of our manufacturing partners and a standard manufacturer's warranty applies (1 year from date of purchase, unless otherwise stated by the manufacturer).

# RETURN & REFUND POLICY

## YOUR CONSUMER RIGHT OF RETURN AND REFUND

This only applies if you are a consumer.

You have a legal right to cancel a Contract under the Consumer Contracts (Information, Cancellation and Additional Charges) Regulations 2013 during the period set out below. This means that during the relevant period if you change your mind or decide for any other reason that you do not want to receive or keep a Product or receive Services, you can notify us of your decision to cancel the Contract and receive a refund. Advice about your legal right to cancel the Contract is available from your local Citizens' Advice Bureau or Trading Standards office.

However, this cancellation right does not apply in the case of:

- any Product which has been personalised by you or which includes the representation of a date upon it including, but not limited to, trophies, medals, clothing and event numbers.
- sealed audio or sealed video recordings or sealed computer software, once these Products are unsealed after you receive them.
- any Products which become mixed inseparably with other items after their delivery.

Your legal right to cancel a Contract starts from the date of the Dispatch Confirmation (the date on which we e-mail you to confirm our acceptance of your order), which is when the Contract between us is formed. Your deadline for cancelling the Contract then depends on what you have ordered and how it is delivered, as set out in the table below:

Your Contract	End of the cancellation period
Your Contract is for the purchase of a single Product (which is not delivered in instalments on separate days).	<p>The end date is the end of <b>14 days</b> after the day on which you receive the Product.</p> <p>Example: if we provide you with a Dispatch Confirmation on 1 January and you receive the Product on 10 January you may cancel at any time between 1 January and the end of the day on 24 January.</p>
<p>Your Contract is for either of the following:</p> <p>one Product which is delivered in instalments on separate days.</p> <p>Multiple Products which are delivered on separate days.</p>	<p>The end date is <b>14 days</b> after the day on which you receive the last instalment of the Product or the last of the separate Products ordered.</p> <p>Example: if we provide you with a Dispatch Confirmation on 1 January and you receive the first instalment of your Product or the first of your separate Products on 10 January and the last instalment or last separate Product on 15 January you may cancel in respect of all instalments and any or all of the separate Products at any time between 1 January and the end of the day on 29 January.</p>
Your Contract is for the regular delivery of a Product over a set period.	<p>The end date is <b>14 days</b> after the day on which you receive the first delivery of the Products.</p> <p>Example: if we provide you with a Dispatch Confirmation on 1 January in respect of Products to be delivered at regular intervals over a year and you receive the first delivery of your Product on 10 January, you may cancel at any time between 1 January and the end of the day on 24 January. 24 January is the last day of the cancellation period in respect of all Products to arrive during the year.</p>

Your Contract is for the performance of Services.

The end date is **14 days** after the day on which we send you our Order Acknowledgement, or from the date upon which we start supplying Services to you, whichever is the earlier.

To cancel a Contract, you just need to let us know that you have decided to cancel. You can e-mail us at [info@transporterenergy.co.uk](mailto:info@transporterenergy.co.uk) or call on **01323 405 375** or write to Transporter Energy, Lower Dicker, Hailsham, East Sussex, BN21 4BG. If you are e-mailing us or writing to us, please include details of your order to help us to identify it. If you send us your cancellation notice by e-mail or by post, then your cancellation is effective from the date you send us the e-mail or post the letter to us. For example, you will have given us notice in time as long as you get your letter into the last post on the last day of the cancellation period or e-mail us before midnight on that day.

If you cancel your Contract for the purchase or Hire of Products we will:

- refund you the price you paid for the Products. However, please note we are permitted by law to reduce your refund to reflect any reduction in the value of the goods, if this has been caused by your handling them in a way which would not be permitted in a shop.
- refund any delivery costs you have paid, although, as permitted by law, the maximum refund will be the costs of delivery by the least expensive delivery method we offer (provided that this is a common and generally acceptable method). For example, if we offer delivery of a Product within 3-5 days at one cost but you choose to have the Product delivered within 24 hours at a higher cost, then we will only refund what you would have paid for the cheaper delivery option.

- make any refunds due to you as soon as possible and in any event within the deadlines indicated below:
  - if you have received the Product and we have not offered to collect it from you: 14 days after the day on which we receive the Product back from you or, if earlier, the day on which you provide us with evidence that you have sent the Product back to us.
  - if you have not received the Product or you have received it and we have offered to collect it from you: 14 days after you inform us of your decision to cancel the Contract.

If you have authorised us to commence provision of Services which you have ordered, prior to the end of the cancellation period, and you then cancel the Contract you will be liable to pay us for the Services which we have performed and if we have completed the provisions of Services prior to your cancellation you will be liable to pay us for the full value of the Services as set out in the Contract. We will refund you any price you have paid for the Services which have not been performed by us prior to the date of your cancellation. Any sums due to us which have not been paid to you will be payable within 10 days of the date we request payment.

Under the Consumer Rights Act you have an early right to reject goods that are unsatisfactory quality, unfit for purpose or not as described, and get a full refund. This right is limited to 30 days from the date you took ownership of the goods (this could be the date of purchase or the date the goods were delivered to you - whichever is later).

After the initial 30 days, you can't demand a full refund in the first instance, but you still have the right to a repair or replacement - including electrical faulty goods.

If you have returned the Products to us because they are faulty or mis-described, we will refund the price of the Products in full, together with any applicable delivery charges, and any reasonable costs you incur in returning the item to us.

We will refund any sums due to you on the credit card or debit card used by you to pay. If you used vouchers to pay for the Product or Services we may refund you in vouchers.

If a Product has been delivered to you before you decide to cancel your Contract:

- you must return it to us without undue delay and in any event not later than 14 days after the day on which you let us know that you wish to cancel the Contract;
- unless the Product is faulty or not as described, you will be responsible for the cost of returning the Products to us. If the Product is one which cannot be returned by post, we estimate that if you use the carrier which delivered the Product to you, these costs should not exceed the sums we charged you for delivery.

Because you are a consumer, we are under a legal duty to supply Products and/or Services that are in conformity with this Contract. As a consumer, you have legal rights in relation to Products that are faulty or not as described. These legal rights are not affected by your right of return and refund in this clause 9 or anything else in these Terms. Advice about your legal rights is available from your local Citizens' Advice Bureau or Trading Standards office.

## **DELIVERY**

We will contact you with an estimated delivery date, which will be within 30 days after the date of the Dispatch Confirmation (the date on which we e-mail you to confirm our acceptance of your order). Occasionally our delivery to you may be affected by an Event Outside Our Control.

Delivery of an Order shall be completed when we deliver the Products to the address you gave us or complete the provision of Services. Any Products will be your responsibility from that time.

In the case of Products purchased by you, you own the Products once we have received payment in full, including all applicable delivery charges.

This clause only applies if you are a consumer, purchasing Products.

If we miss the 30 day delivery deadline for any Products then you may cancel your Order straight away if any of the following apply:

- we have refused to deliver the Products;
- delivery within the delivery deadline was essential (taking into account all the relevant circumstances);
- or, you told us before we accepted your order that delivery within the delivery deadline was essential.

If you do not wish to cancel your order straight away, or do not have the right to do so, you can give us a new deadline for delivery, which must be reasonable, and you can cancel your Order if we do not meet the new deadline.

If you do choose to cancel your Order for late delivery, you can do so for just some of the Products or all of them, unless splitting them up would significantly reduce their value. If the Products have been delivered to you, you will have to return them to us or allow us to collect them, and we will pay the costs of this. After you cancel your Order we will refund any sums you have paid to us for the cancelled Products and their delivery.



## CONTACT

If you have any further questions, or need help with anything regarding your battery please do not hesitate to contact us.

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