

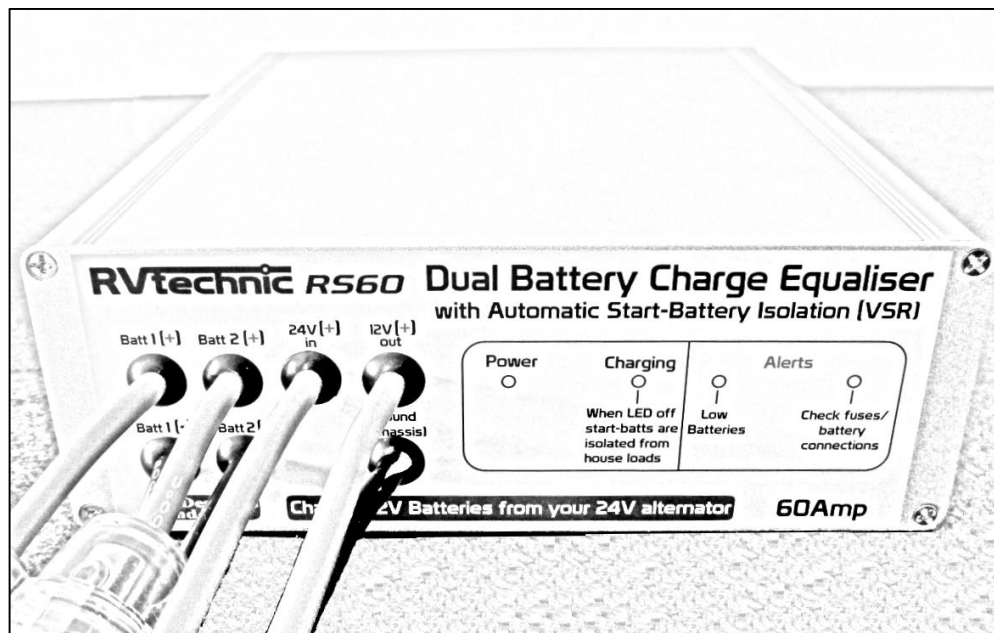
RVtechnicTM RS60

User Manual &
Installation Guide

Dual Battery Charge Equaliser for 24volt RVs

HEAVY DUTY 60amp with Automatic Start-Battery Isolation (VSR)

- Up to 60amp charging and equalising of 12V house-batteries from 24V alternator / charger
- Enables running of 12volt appliances in 24volt RVs
- Isolates start-batteries automatically from house appliances when engine is off so no more flat start-batteries
- Fully automatic, set and forget
- Alarms when house-battery voltage is low



Proudly Designed and Manufactured in New Zealand

2 Year Warranty

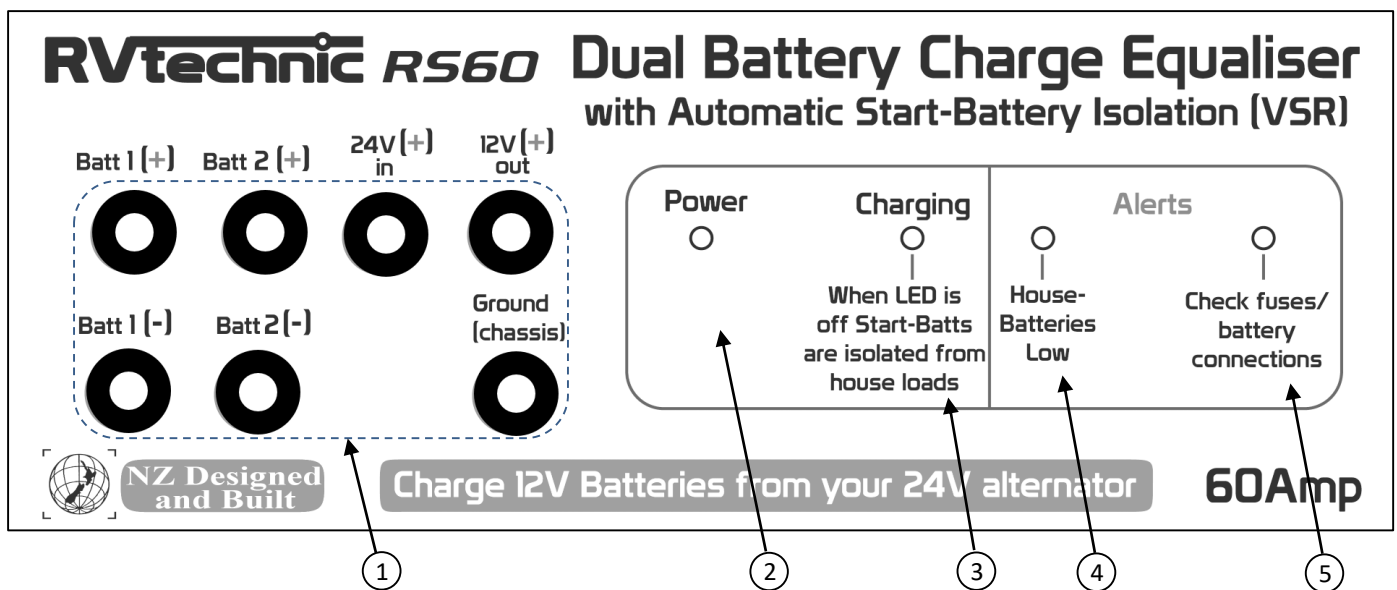
High efficiency design

Thank you for purchasing an RVtechnic RS60 Dual Battery Charge Equaliser. We trust the product will provide excellent convenience, functionality and reliability for your motorhome or marine vessel.

Important :

- Please read this guide in full prior to installation and use
- Installation must be carried out in direct accordance with this guide.
- To avoid risk of serious damage, fuses must be replaced with correct fuse type and 60amp rating (refer to Trouble Shooting Guide in this manual).

1. Front Panel Functions



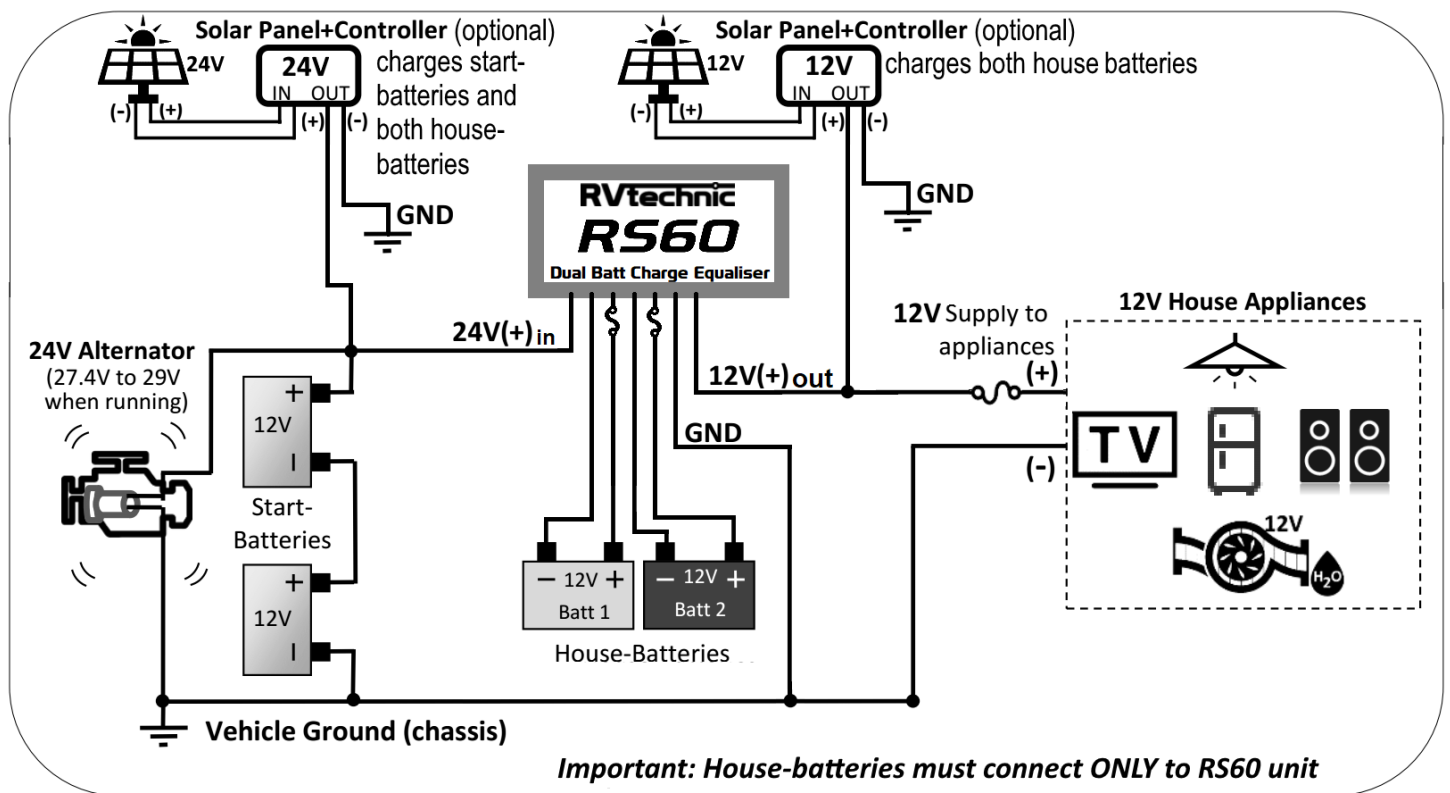
Key:

- 1) Cable entries (note: **Batt 1** and **Batt 2** connections go to house-batteries only)
- 2) **Power** LED blinks every 2 secs when RS60 is powered on
- 3) **Charging** LED is on when house-batteries are charging from 24V input
- 4) **Alert** LED is on when both house-batteries are below 11.5V (alarm also sounds)
- 5) **Alert** LED is on when house-battery fuse is blown or house-battery connection is poor/broken (alarm also sounds)

2. Installation

- House-batteries must connect **ONLY** to the RS60 unit
(House-battery connections: **Batt 1 (+)** , **Batt 1 (-)** , **Batt 2 (+)** , **Batt 2 (-)**).
Connecting house-battery terminals to ground or anything other than the RS60 can result in blown fuses and/or product fault during operation.
- Connect extension cables to the RS60 **before** connecting cables to batteries – to reduce risk of damage from energised wires shorting together during install.
- Installation should only be performed by those familiar with wiring DC electrical equipment.
If unfamiliar, please use an automotive electrician or similarly qualified person.

RS60 Connections in a 24volt RV



Note:

To charge both house-batteries using a 12V charger or 12V solar:
Connect 12V charger/solar (+) output to RS60 "12V(+)" out" wire
Connect charger/solar (-) output to **Ground (chassis)**
(as shown in diagram above)

To charge both house-batteries using a 24V charger or 24V solar:
(note: charger/solar no-load output must be at least 27.4V)
Connect 24V charger/solar (+) output to RS60 "24V(+)" in" wire
Connect charger/solar (-) output to **Ground (chassis)**

Installation Notes:

1) House-Battery Sizing:

- Either flooded lead-acid, SLA or AGM batteries (deep-cycle or standard) can be used
- Minimum 100Ah capacity per house-battery is necessary to enable proper battery equalising while running a fridge or other high-drain 12V appliances during driving. Otherwise, lower Amp-hour house-batteries may be used (recommended minimum 50Ah).
- Each house-battery must be rated 12volts. Two 6volt batteries connected in series can be used as one house-battery.

2) Cable Sizing:

Recommended minimum AWG10 (5.2mm² conductor)

3. Alarms

House-battery voltage	Alarm
11.2V to 11.5V	"Batteries Low" LED illuminates Alarm sounds every 40 seconds
Below 11.2V	"Batteries Low" LED illuminates Alarm sounds every 20 seconds

Condition	Alarm
Fuse blown (in house-battery entry cable), or poor house-battery connection	"Check fuses/battery connections" LED illuminates. Alarm sounds once per minute

4. Electrical Specifications

Item	Specification
Recommended house-battery specifications	12volt flooded lead-acid, SLA or AGM batteries (deep-cycle or standard) can be used 2 x 6V batteries connected in series may also be used in place of each 12V house-battery. <u>Amp hour (Ah) Capacity Recommendation:</u> Minimum 100Ah per house-battery (if running fridge or other high-drain 12V appliances while driving) Otherwise: recommended minimum 50Ah per house-battery
RS60 current consumption (while active and off-charge)	5mA
"24V" RV alternator output voltage when running	27.4V to 29.0V (required for charging house-batteries via RS60 unit)
Fuse rating (in Batt1+ and Batt2+ cable inputs)	60Amp automotive AGU type. To avoid risk of serious damage, fuses must be replaced with correct fuse type and rating

Conditions enabling switching in/out of Charging mode:

	12V(+) OUT	24V(+) IN	Notes
Switch into Charging mode when	n/a	> 27.2V	
Switch out of Charging mode when Either:	n/a	<25.9V	Equivalent to <12.95V per house-battery
Or:	<12.9V	< 26.2V	

5. Trouble Shooting Guide

Problem	Possible cause(s)	Solution(s)
<p><u>While RV engine is not running:</u> Alarm sounds once every 20seconds or once every 40seconds</p> <p><i>Note: 12V lead-acid, SLA and AGM batteries can be degraded or damaged if voltage is kept below 12V or above 15V for long periods.</i></p>	<p>House-battery voltage is too low or high (refer to Alarms section)</p> <p><i>Note: When RV engine is off, both house-batteries are connected in parallel by the RS60. Therefore both house-batteries will have the same voltage</i></p>	<p>It is recommended that loads are switched off and batteries charged.</p> <p><i>Note: 3-way or 2-way fridges (running on 12V supply) draw 10 to 15 Amps and will usually flatten house-batteries quickly without RV engine running.</i></p>
<p><u>While RV engine is running:</u> RS60 Charging LED blinks off for ½ a second then back on and internal relay clicks are heard (repeats continuously every 5 seconds or less).</p> <p><i>Note: This operation is normal, it is part of the house-battery equalisation process. It may occur as often as every 20 or 30 seconds if 12V appliances are drawing power. If it occurs every 5 seconds or less, then this section of trouble shooting guide should be followed.</i></p>	<p>12V appliance loads are too heavy</p> <p>Or house-battery condition is poor</p> <p>Or house-battery size is insufficient for the 12V appliances that are being run while engine is running</p> <p>Or wire gauge is too light for start-battery and/or house-battery connections to RS60 (in particular: long-run wires) causing excessive voltage drop in cables</p>	<p>Switch off high-drain appliances (ie.12V fridge)</p> <p>Or upgrade house-batteries if high-drain appliances do need to be run while driving RV (minimum 100Ah capacity per house-battery).</p> <p>Or you may operate the RS60 continuously in this manner (not recommended though)</p> <p>Increase wire gauge size for RS60 In particular, connections to: house-batteries, start-batteries, GND.</p>
<p><u>While RV engine is running:</u> RS60 switches in then out of charging mode (Charging LED on for a few seconds then off for a few seconds repeatedly).</p>	<p>House-batteries are heavily discharged causing start-battery voltage to dip excessively when RS60 goes into charging mode.</p>	<p>Charge house-batteries (using mains battery-charger / solar etc) prior to starting RV engine.</p>
<p>Alarm sounds once every 1minute. "Check fuses / battery connections" LED is illuminated</p>	<p>House battery input-cable fuse is blown Or, poor connection to house-battery</p>	<p>Replace blown fuse(s) 60Amp AGU type Check connections to house-batteries</p>
<p>House-batteries not charging (no voltage increase) when engine is running and RS60 Charging LED is on</p>	<p>House battery input-cable fuse is blown Or, poor connection to house-battery</p>	<p>Replace blown fuse(s) 60Amp AGU type Check connections to house-batteries</p>

6. Warranty Information

Before calling for service or assistance please carefully check the Troubleshooting Guide and Installation information contained in this document.

1. In this warranty:
 - (a) "RVtechnic" means RVtechnic Ltd NZBN: 9429030541535;
 - (b) "you" means the purchaser of the Product not having purchased the Product for re-sale, and "your" has a corresponding meaning;
 - (c) "Product" means the RVtechnic product purchased by you accompanied by this document;

2. RVtechnic issues this limited warranty to the original purchaser of this product. This limited warranty is not transferable. The warranty applies to manufacturing faults and material defects for 2 years from the date of purchase.
The purchaser must return the product for inspection together with the receipt of purchase to either the retailer if purchased from a retail outlet, or to RVtechnic.

3. RVtechnic is not liable in the following situations (which are not exhaustive):
 - (a) the Product is damaged by:
 - (i) accident
 - (ii) misuse or abuse
 - (iii) normal wear and tear
 - (iv) incorrect power supply
 - (v) incomplete or improper installation
 - (vi) incorrect, improper or inappropriate use, application or operation
 - (vii) insect or vermin infestation
 - (viii) failure to comply with any additional instructions supplied with the product;
 - (b) the Product is modified without authority from RVtechnic in writing;
 - (c) the Product's serial number or warranty seal has been removed or defaced;
 - (d) the Product was serviced or repaired by anyone other than RVtechnic or an RVtechnic authorised repairer.

4. RVtechnic will, at its sole discretion, either (i) return the Product to you if it is not determined to be defective, or (ii) without regard to whether or not the original Product is determined to be defective, either (A) provide you with a replacement product of the same or comparable model, or (B) provide you with a refurbished or repaired Product

5. To the extent permitted by law: (a) RVtechnic excludes all warranties other than as contained in this document; (b) RVtechnic shall not be liable for any loss or damage whether direct or indirect or consequential arising from your purchase, use or non-use of the Product.

For service, please email: service@rvtechnic.co.nz

Or call (in NZ) 021-1542255, (outside of NZ) +64-21-1542255

For further contact details go to our website: www.rvtechnic.co.nz