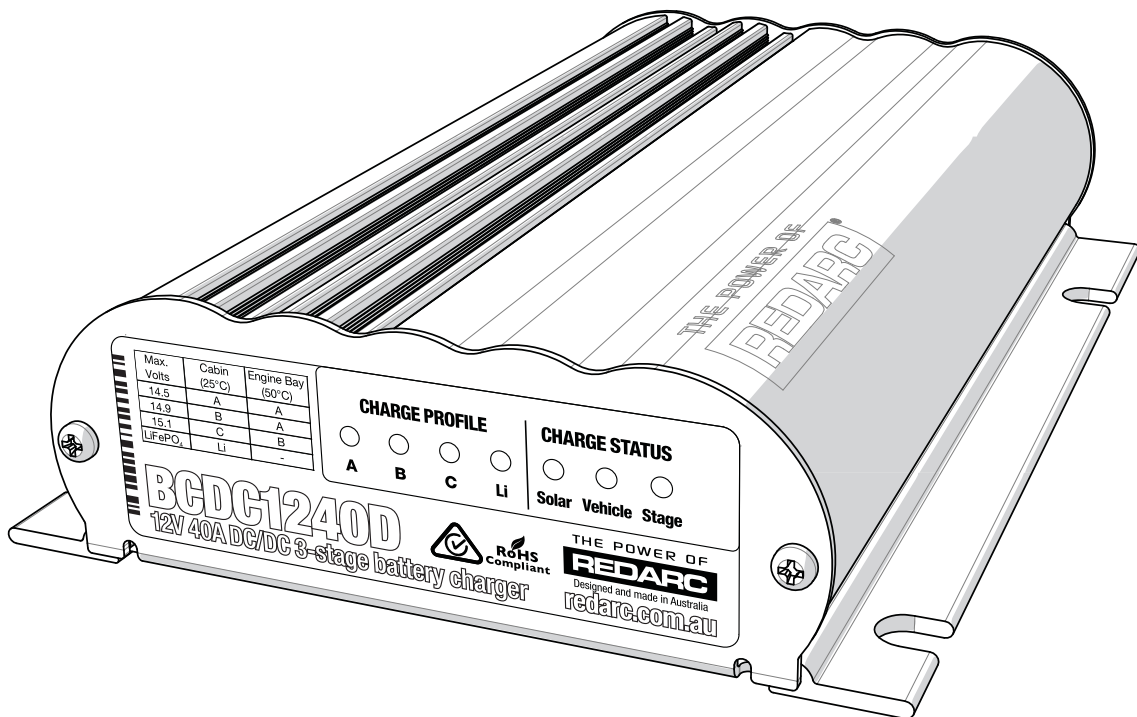


THE POWER OF

REDARC[®]

Dual Input Multi-stage 12V In-vehicle Battery Charger

BCDC1225D, BCDC1240D



THE BCDC1225D & BCDC1240D

The BCDC1225D/BCDC1240D Dual Input In-vehicle Battery Chargers feature technology designed to charge your auxiliary batteries to 100%, regardless of their type or size.

The Dual Input In-vehicle Battery Chargers also feature a Maximum Power Point Tracking (MPPT) solar regulator. The unit will always take as much power from the Solar input as it can before supplementing that power, up to the maximum rated output, from Vehicle power input.

The Dual Input In-vehicle Battery Chargers are suitable for all common types of automotive lead acid batteries and LiFePO₄ lithium type batteries.

WARNING & SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS - This manual contains **IMPORTANT SAFETY INSTRUCTIONS** for the BCDC1225D/BCDC1240D battery chargers.

DO NOT OPERATE THE BATTERY CHARGER UNLESS YOU HAVE READ AND UNDERSTOOD THIS MANUAL AND THE CHARGER IS INSTALLED AS PER THESE INSTALLATION INSTRUCTIONS. REDARC RECOMMENDS THAT THE CHARGER BE INSTALLED BY A SUITABLY QUALIFIED PERSON.

WARNING

RISK OF EXPLOSIVE GASES:

WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT YOU FOLLOW THE INSTRUCTIONS WHEN INSTALLING AND USING THE CHARGER.

CAUTION

1. The Battery Charger should not be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are supervised or have been instructed on how to use the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the Battery Charger.
2. Do NOT alter or disassemble the Battery Charger under any circumstances. All faulty units must be returned to REDARC for repair. Incorrect handling or reassembly may result in a risk of electric shock or fire and may void the unit warranty.
3. Only use the Battery Charger for charging Standard Automotive Lead Acid, Calcium Content, Gel, AGM, SLI, Deep Cycle or Lithium Iron Phosphate type 12V batteries.
4. Check the manufacturers data for your battery and ensure that the 'Maximum' voltage of the profile you select does not exceed the manufacturers recommended maximum charging voltage. If the 'Maximum' voltage is too high for your battery type, please select another charging profile.
5. When using the Battery Charger to charge a Lithium Iron Phosphate battery, only batteries that feature an inbuilt battery management system featuring inbuilt under and over voltage protection and cell balancing are suitable.
6. The Battery Charger is not intended to supply power to a low voltage electrical system other than to charge a battery.
7. Cable and fuse sizes are specified by various codes and standards which depend on the type of vehicle the Battery Charger is installed into. Selecting the wrong cable or fuse size could result in harm to the installer or user and/or damage to the Battery Charger or other equipment installed in the system. The installer is responsible for ensuring that the correct cable and fuse sizes are used when installing this Battery Charger.
8. NEVER smoke or allow a spark or flame in vicinity of battery or engine. This may cause the battery to explode.
9. **PERSONAL SAFETY PRECAUTIONS**
To assist with the safe operation and use of the Battery Charger when connected to the battery:
 - a) Wear complete eye protection and clothing protection. Avoid touching eyes while working near a battery.
 - b) If battery acid contacts your skin or clothing, remove the affected clothing and wash the affected area of your skin immediately with soap and water. If battery acid enters your eye, immediately flood the eye with running cold water for at least 10 minutes and seek medical assistance immediately.

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SPECIFICATIONS

Part Number	BCDC1225D		BCDC1240D	
Continuous Current Rating	25A		40A	
Vehicle Input Fuse Rating	40A (Not Supplied)		60A (Not supplied)	
Output Fuse Rating	<i>REDARC FK40 recommended</i>		<i>REDARC FK60 recommended</i>	
Output Power	375W		600W	
Vehicle Input Voltage Range* ¹	9-32V			
Solar Input Voltage Range* ¹	9-32V			
Output Battery Type	Standard Lead Acid, Calcium content, Gel, AGM or LiFePO ₄ type only			
Charging Profile	A	B	C	Li
- Maximum Voltage* ¹ (refer to section 1.2.1)	14.6V	15.0V	15.3V	14.5V
- Float Voltage* ¹	13.3V			13.6V
No Load Current	<100mA			
Standby Current	<8mA			
Operating Temperature	-10°C to 80°C / 14°F to 175°F			
Minimum O/P Battery Volts	4.2V			
Weight	850g			
Dimensions	165x120x37mm			
Warranty	2 years			
Standards	CISPR11, ECE Reg. 10			

*¹ Voltages Specified are ±100mV

1 PRODUCT FUNCTION

The BCDC1225D/BCDC1240D is a three-stage, 12V DC-DC battery charger that operates from an alternator input of 12V or 24V and a 12V nominal solar panel input. The input voltage of the BCDC1225D/BCDC1240D can be above, below or equal to the output voltage making it ideal for charging an auxiliary 12V battery where the distance from the main battery may cause a significant voltage drop. The BCDC1225D/BCDC1240D is also designed to isolate the main battery from the auxiliary battery, to avoid over-discharging the main battery.

1.1 Display Panel

The front panel features 7 LEDs to display the charge profile and charge status.

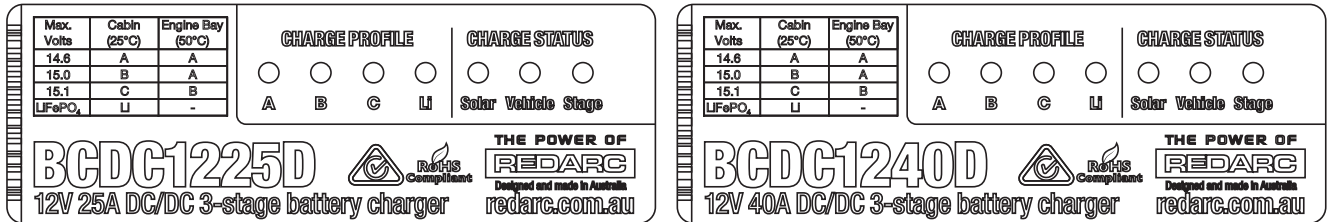


Figure 1.1.1 - The BCDC1225D and BCDC1240D Front Panels

1.2 Charge Profile LEDs

The Dual Input In-vehicle Battery Chargers feature 4 different charging profiles designed to suit your battery's charging requirements. It is recommended to refer to the charging specifications stated by the battery manufacturer and the installation temperature chart below (Figure 1.2.1) before selecting the profile for your installation.

The selected Profile LED will be on solid when the unit is ON and charging. A flashing profile LED indicates that the unit is in standby mode and NOT charging.

Maximum Battery Voltage Specification	Auxiliary Battery Location	
	Cabin Install 25°C 75°F	Engine Bay Install 50°C+ 120°F+
14.6	A	A
15.0	B	A
15.3	C	B
14.5 (LiFePO ₄)	Li	Not Recommended

Figure 1.2.1 - Charge Profile Selection

⚠ CAUTION

Check the manufacturer's data for your battery and ensure that the 'Maximum' voltage of the profile you select does not exceed the manufacturer's recommended maximum charging voltage. If the 'Maximum' voltage is too high for your battery type, please select another charging profile.

1 PRODUCT FUNCTION

1.3 Charge Status LEDs

The Charge Status LEDs indicate to the user which inputs are available and what stage of the charge process is currently in.

1.3.1 Solar & Vehicle LEDs

The Solar and Vehicle LEDs will be ON when the input is available and in use and OFF when the input is not available or not in use.

If both LEDs are ON, both input sources are available and in use.

The Dual Input In-vehicle Battery Charger uses Green Power Priority technology. This means the unit will always supply as much power as possible from the Solar input before supplementing this with power from the Vehicle input, to the maximum output of the unit or required by the battery at the time.

1.3.2 Stage LED

The Stage LED indicates the charge profile stage. With any profile selected the charger will output a 3-Stage type charging profile with *Boost*, *Absorption* and *Float* Stages.

Figure 1.3.2.1 outlines the LED sequences which indicate these stages and figure 1.3.3.1 explains the Charging Process.

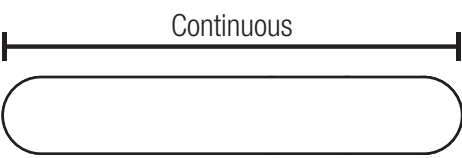

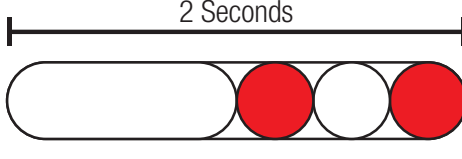
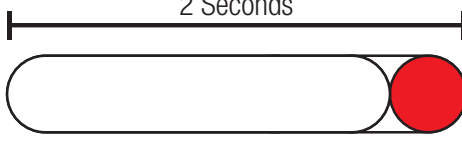
LED Sequence	Profile Stage (Lithium)
 <p>Continuous</p>	OFF / No Output
 <p>Continuous</p>	<i>Boost (Constant Current)</i>
 <p>2 Seconds</p>	<i>Absorption (Constant Voltage)</i>
 <p>2 Seconds</p>	<i>Float</i>

Figure 1.3.2.1 - Charge Stage LED Sequences

1 PRODUCT FUNCTION

1.3.3 Charging Process

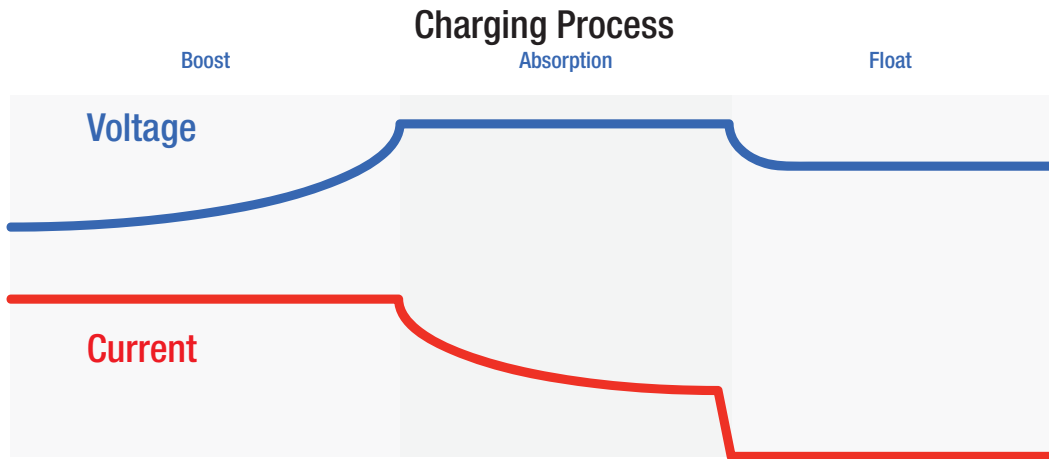


Figure 1.3.3.1 - Charging Process

When the Charger is turned on, it will move into the *Boost* stage. The *Boost* stage maintains a constant current until the battery voltage reaches its Absorption Voltage. The current in *Boost* stage may vary during operation in order to maintain safe operating temperature, or to limit the difference between input and output voltages. The Charger will then move to *Absorption* stage which maintains a constant voltage level for a predetermined period of time or until the current being drawn by the output battery drops to less than 4A for 30 seconds; after which the Charger will enter *Float* stage.

Float stage maintains 13.3V (13.6V for LiFePO₄) on the output battery, keeping the battery topped up. This counteracts the battery's self discharging or loads applied to the battery. When the battery loses charge, the Charger will move back into the *Boost* stage.

⚠ CAUTION

When using the Battery Charger to charge a Lithium Iron Phosphate battery, only batteries that feature an inbuilt battery management system featuring inbuilt under and over voltage protection and cell balancing are suitable.

1 PRODUCT FUNCTION

1.4 Turn On/Off Thresholds

	Input	12V Vehicle Input		24V Vehicle Input		Solar
	Input Trigger Settings	Standard	Low Voltage	Standard	Low Voltage	N/A
Input Open Circuit Low voltage conditions *1	Turn ON ABOVE	13.2V	12.0V	26.4V	24.0V	9.0V
	Turn OFF BELOW	12.7V	11.9V	25.4V	23.8V	9.0V
Input Loaded Low voltage conditions *2	Turn OFF instantly BELOW	8.0V		16.0V		9.0V
	Turn OFF after 20s BELOW	9.0V		18.0V		N/A
Input Over voltage shutdown	Turn ON BELOW	15.5V		32V		
	Turn OFF instantly ABOVE	16.0V		32.5V		33.0V
	Turn OFF after 20s ABOVE	15.6V		32.1V		N/A
Output Under voltage shutdown *1	Shutdown if Output Battery < 4V					

*1 Tested every 100 Seconds.

*2 Constantly tested.

There is a maximum 20 second delay before the charger will produce an output any time a source is introduced into the system, this allows the unit to provide optimum input sharing and effective battery isolation.

1.5 Error Codes

In the event of a fault with the unit installation, either battery or solar panel, ALL the LEDs on the unit will flash to indicate the fault type. Flashing sequences are described in the table below.

LED State	Description
1 flash (1 flash followed by 3.5 second off)	Internal Hardware Fault
2 flash (2 flash followed by 3.5 second off)	Unit under temp fault
3 flash (3 flash followed by 3.5 second off)	Unit over temp fault
4 flash (4 flash followed by 3.5 second off)	Output Battery Fault (Volts too high)
5 flash (5 flash followed by 3.5 second off)	Input under voltage (Battery)
6 flash (6 flash followed by 3.5 second off)	Input over voltage (Battery or Solar panel)

1 PRODUCT FUNCTION

1.6 Battery Test Mode

The unit features a battery test mode which occurs every 100 seconds. The test mode is designed to both test that the input conditions are still met and check for the presence of a battery on the output of the unit. This feature is designed to protect the vehicle battery from over discharge and protect the vehicle and wiring in the event of damage to the output connection. During low output current situations (when in Float mode for example) this battery test may take up to 60 seconds to complete.

2 INSTALLATION

2.1 Install Location

The charger is suitable for mounting in the cabin of the vehicle, along a chassis rail or in the engine bay (ensure the unit does not become covered by a build up of mud or other). It is important to ensure the charger is mounted as close as possible to the battery being charged (auxiliary battery). Certain batteries are better suited to each of these types of installations so it is important to select the correct battery type. For more information consult your battery manufacturer's specifications.

Lithium type (LiFePO_4) batteries are not suitable for engine bay installations.

Refer to figure 1.2.1 for selecting the best Charge Profile for your installation.

The charger should be mounted in any orientation (so that the front decal is visible) using the 4 mounting tabs provided on the heatsink (refer figure 2.1.1) using suitably sized screws.

The unit will operate optimally below $55^\circ\text{C}/130^\circ\text{F}$ with good airflow. At higher temperatures the unit will de-rate output current up to $80^\circ\text{C}/175^\circ\text{F}$ at which point the unit will turn OFF.

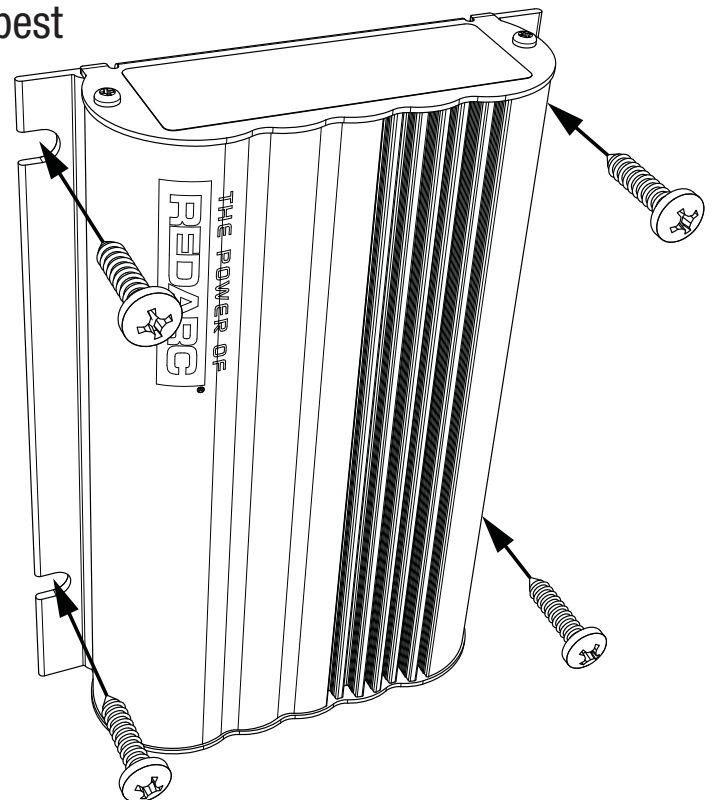


Figure 2.1.1 - Mounting the Charger

2 INSTALLATION

2.2 Charge Profile Selection (ORANGE Wire)

The ORANGE wire is used to select the *Maximum* output voltage. This is achieved by connecting in the following way:

To select **Profile A** leave the ORANGE wire disconnected. This will set the *Maximum* voltage to 14.6V.

To select **Profile B** connect the ORANGE wire to Common Ground. This will set the *Maximum* voltage to 15.0V.

To select **Profile C** connect the ORANGE wire to the RED wire (Input source positive). This will set the *Maximum* voltage to 15.3V.

To select the **Li Profile** connect the ORANGE wire to the GREEN wire (LED output). This will set the charger to *Lithium mode*.

⚠ CAUTION

Check the manufacturer's data for your battery and ensure that the *Maximum* voltage of the profile you select does not exceed the manufacturer's recommended maximum charging voltage. If the *Maximum* voltage is too high for your battery type, please select another charging profile.

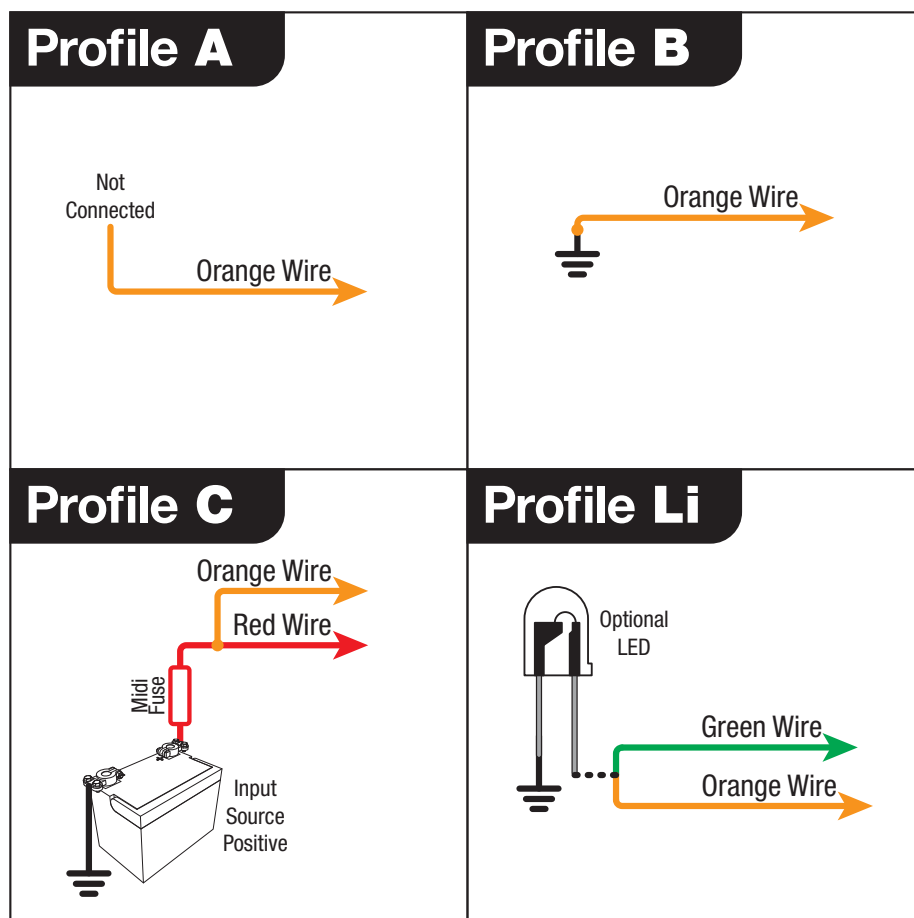


Figure 2.2.1 - Charge Profile Selection

2 INSTALLATION

2.3 Input Trigger Settings (BLUE Wire)

The BLUE wire is used to select between the Standard turn ON trigger settings and the Low Voltage turn ON trigger settings (suitable for Variable Voltage and Smart Alternators) on the Vehicle Input.

Standard trigger settings: Leave the BLUE wire *disconnected*.

This will set the trigger settings to **13.2V turn ON** and **12.7V turn OFF** for a 12V installation or **26.4V turn ON** and **25.4V turn OFF** for a 24V installation.

Low Voltage trigger settings: Connect the BLUE wire to the **Vehicle Ignition**.

This will set the trigger settings to **12.0V turn ON** and **11.9V turn OFF** when **Ignition is ON** for a 12V installation or **24.0V turn ON** and **23.8V turn OFF** when **Ignition is ON** for a 24V installation.

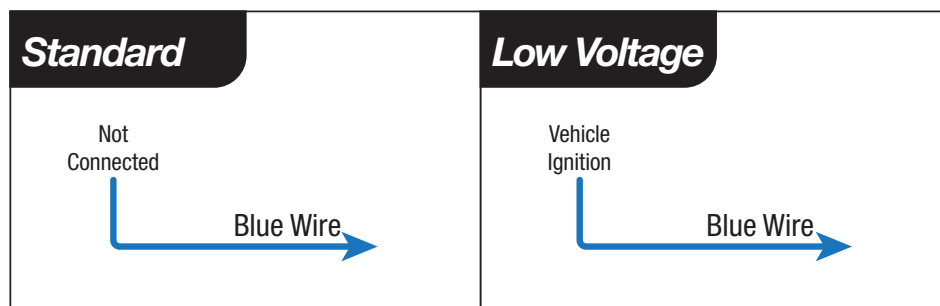


Figure 2.3.1 - Setting the Input Trigger Settings

2.4 Cable sizing

Below is a table outlining the required cable size for a given cable install length. Please refer to this table for Vehicle Input, Solar Input, Ground and Battery Output cable thickness requirements.

Always choose a wire diameter equal to or greater than what is specified below.

Part Number	Cable Install Length		Recommended Wire Size (mm ²)	Closest (BAE, B&S, AWG)
	(m)	(ft)		
BCDC1225D	1 - 5	3 - 16	7.71	8
	5 - 9	16 - 30	13.56	6
BCDC1240D	1 - 5	3 - 16	13.56	6
	5 - 9	16 - 30	20.28	4

⚠ CAUTION

Cable and fuse sizes are specified by various codes and standards which depend on the type of vehicle the Battery Charger is installed into. Selecting the wrong cable or fuse size could result in harm to the installer or user and/or damage to the Battery Charger or other equipment installed in the system. The installer is responsible for ensuring that the correct cable and fuse sizes are used when installing this Battery Charger.

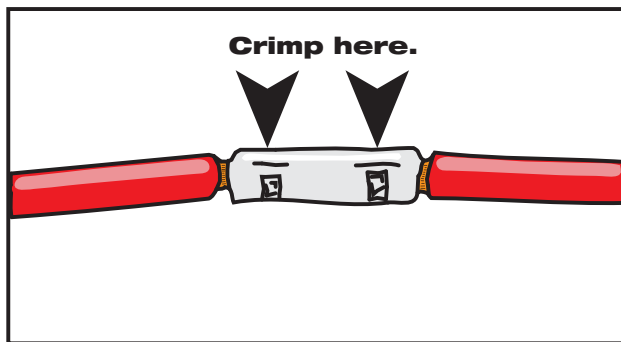
2 INSTALLATION

2.5 Wiring

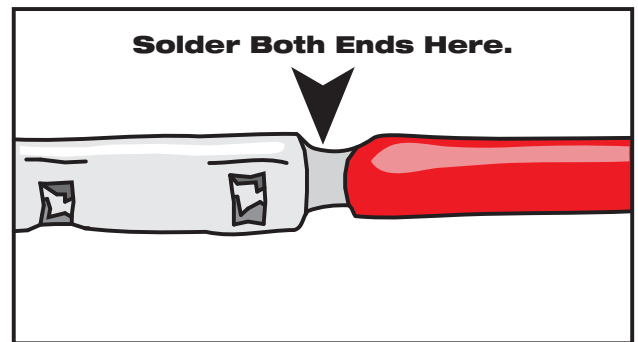
The heavy gauge wires on the BCDC1225D and BCDC1240D unit carry peak currents of up to 35 and 50 Amps respectively, and it is important to make a good, low resistance, electrical connection that will not degrade over time. Failure to make a good, reliable contact may result in breakdown of the wire insulation and cause a short circuit, or worst case a fire. We recommend that this activity be undertaken by an appropriately trained person.

REDARC recommends using a soldered butt splice crimp connection that is covered with heatshrink. See Figure 2.5.1. REDARC does not recommend using standard red/blue/yellow blade connections as they are not rated for either the current required or gauge of wire supplied on the unit.

Crimping provides good mechanical connection, soldering provides a long lasting electrical connection and forming of the heatshrink will prevent any shorting/contact with your vehicle chassis.



Crimp both wires to the butt splice using indent type crimpers.



Solder the wires to the butt splice. Ensure that a good connection is made. Keep heatshrink away until after soldering is complete and has cooled.

Figure 2.5.1 - Ensuring a good wiring connection

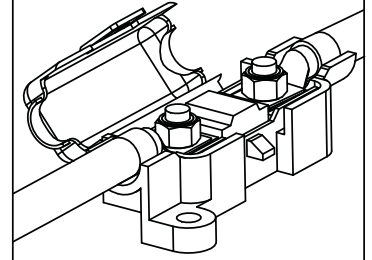
2.6 Fusing

REDARC recommend using MIDI style bolt down fuses as they ensure a low resistance connection. The REDARC FK40 and FK60 fuse kits are recommended.

Blade type fuses are not recommended as they can result in a high resistance connection which causes excess heat and may damage the fuse holder and/or the wiring.

Self-resetting circuit breakers are not recommended as they may trip prematurely due to the heat generated by the current flowing through the wires.

A single fuse and holder setup from the Fuse Kits available from REDARC. Part number FK40 (40A) or FK60 (60A).



2 INSTALLATION

2.7 Typical Setup

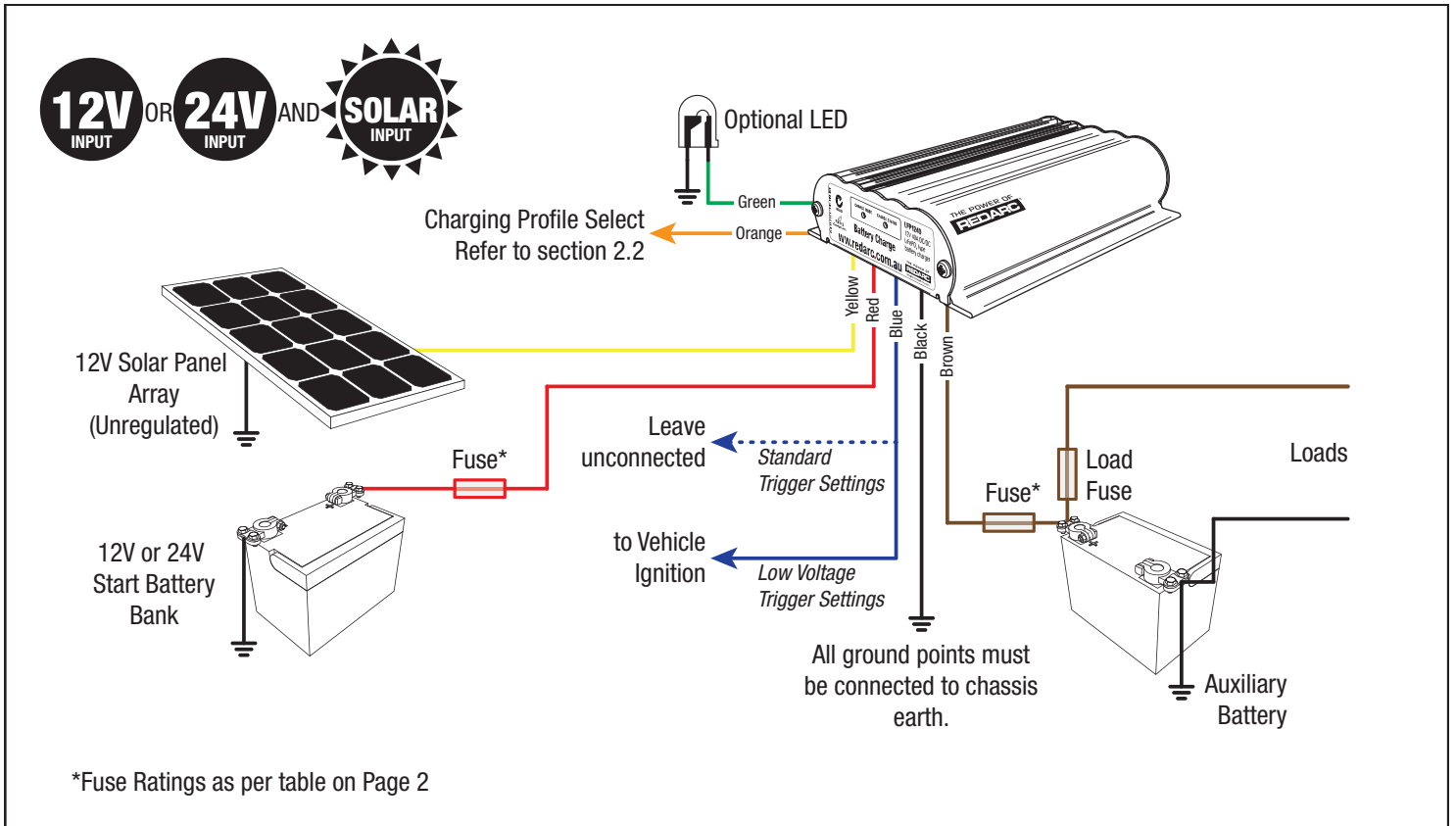


Figure 2.7.1 - Typical Lead Acid type Setup

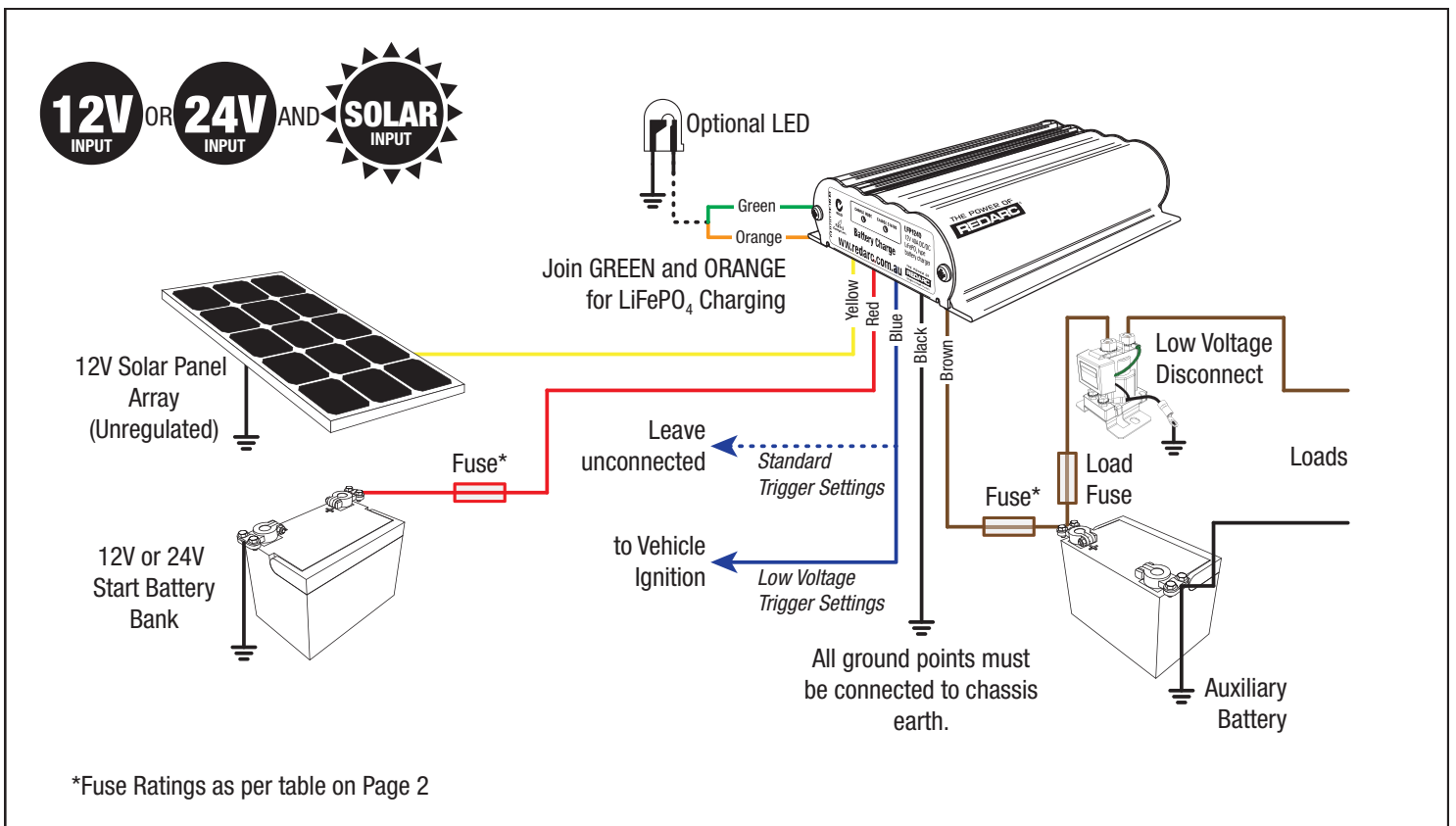


Figure 2.7.2 - Typical LiFePO₄ Setup

There are no LEDs ON at all...

This indicates that there is no battery connected to the output (BROWN wire) or that battery is not at a suitable voltage level to be charged **AND** the input (YELLOW/RED wire) of the charger is not connected.

1. Check the Auxiliary battery is above 4.2V
2. Check all wiring to the charger and battery, particularly the Ground (BLACK wire).
3. Check fuses are intact and properly connected.

If the problem is still evident please contact your local Auto-Electrician.

The 'Charge Profile' LED is flashing...

This indicates that either Output or Input is not valid.

Specifically, an Auxiliary battery, at a suitable voltage level to be charged, is connected to the output of the charger however there is currently no valid charging source **OR** a valid charging source is available but the Auxiliary battery is not at a suitable voltage level to be charged or is not connected.

1. Check that the Vehicle (RED wire) and/or Solar (YELLOW wire) are electrically connected
 1. The Vehicle (RED wire) should connect directly to the Vehicle battery positive terminal via an adequately rated fuse
 2. The Solar (YELLOW wire) should connect directly to the Solar Panel positive terminal/wire.
2. Check that the Ground (BLACK wire) is connected to the Auxiliary battery and Chassis Earth and/or the Solar Panel negative terminal/wire.
3. Check the Auxiliary battery is above 4.2V
4. Check all wiring to the Auxiliary battery, particularly the Ground (BLACK wire).
5. Check fuses are intact and properly connected.

If the problem is still evident please see the relevant points below.

I have Solar connected but the 'Solar' LED is OFF...

This indicates that the required turn ON conditions for this source have not been met. Either the Open Circuit Voltage at the YELLOW wire on the charger is below 9V or there is not sufficient power available from the Solar Panel (due to poor light conditions or a faulty panel).

1. Is the sun out? No or low sunlight levels mean low power to your solar panels.
2. Check that the solar panel is not being shaded (by a tree etc.)
3. Check the voltage at the YELLOW wire, as close as possible to the charger, is above 9V.
4. Check all wiring to the Solar Panel, particularly the Ground (BLACK wire).

Allow up to 2 minutes after any change for the unit to recognise the input, if the problem is still evident please contact your local Auto-Electrician.

The BCDC is connected to the 'Vehicle' but the Vehicle LED is OFF...

This indicates that the required turn ON conditions for this source have not been met **OR** the Solar input is supplying the full input power requirements of the charger. With the BLUE wire left unconnected, the voltage at the RED wire must be above 13.2V for a 12V installation or above 26.4V for a 24V installation. With the BLUE wire connected to Ignition, Ignition must be on and the voltage at the RED wire must be above 12.0V for a 12V installation or above 24.0V for a 24V installation.

1. Check that the vehicle is running.
2. Check the voltage on the RED wire is above the required turn ON threshold for your installation. (See section 1.4 on page 6)
3. Check all wiring to the Vehicle battery, particularly the Ground (BLACK wire).

If the problem is still evident please contact your local Auto-Electrician.

4 FREQUENTLY ASKED QUESTIONS

- Q** The BCDC Dual Input turns ON at 13.2V(12V) and OFF at 12.7V(11.9V), but you say it operates down to 9V, explain?
- A** The BCDC Dual Input will turn OFF for a split second every 100 seconds to measure the unloaded voltage at the battery. When the BCDC Dual Input turns off it is not drawing any load from the start battery, no load means that there is no voltage drop over the cable run. This allows the BCDC Dual Input to measure the actual battery voltage, or the voltage at the battery. If this actual battery voltage is below 12.7V(11.9V), the BCDC Dual Input will turn OFF. At any other time during the charging process, if the voltage at the BCDC Dual Input drops below 9V the BCDC Dual Input will turn OFF.
- Q** How does the BCDC Dual Input charge an Auxiliary battery at 14V when it only gets 9V in?
- A** The BCDC Dual Input can act as both a reducer and a booster, so it can operate from a voltage of above, equal to or below the desired output voltage. The unit is also microprocessor controlled allowing it to output a Redarc proprietary charging algorithm independent of the input. This allows the unit to charge specific to the battery type even if the input voltage is low due to voltage drop.
- Q** Where should I mount the BCDC Dual Input Unit?
- A** The BCDC Dual Input should be mounted as close as possible to the battery being charged (generally called the Auxiliary or House battery). If the Auxiliary battery is located under the bonnet, pick a location for the BCDC Dual Input that is close to the battery and away from any direct engine heat. If the BCDC Dual Input is to be mounted into a Caravan or Camper, near or in the battery compartment is generally the best position. It is also a good idea to mount the BCDC Dual Input to a metal surface if possible to ensure optimal heat dissipation, though this is not crucial.
- Q** What does the charger do if the temperature around it rises above its operating temperature?
- A** As the temperature of the BCDC Dual Input rises above a certain level the current capacity of the output is decreased gradually in order protect both the battery and the BCDC Dual Input unit.
- Q** If I use the BCDC Dual Input to charge my auxiliary battery do I still need to install a battery isolator?
- A** The BCDC Dual Input incorporates the functionality of a battery isolator, it will turn ON and start charging when it senses that the vehicle has started and similarly it will turn OFF when the vehicle is turned OFF.
- Q** I've heard that you shouldn't charge 2 batteries of different chemistries from the same source, will I have any problems charging my AGM or Gel auxiliary battery from my Lead Acid start battery?
- A** The BCDC Dual Input does not 'link' the batteries together like a battery isolator does, it is a DC-DC battery charger. The output from the unit is tailored specifically to the selected output battery type, and therefore allows the optimal charging of the auxiliary battery, no matter what chemistry your start battery is.
- Q** My BCDC Dual Input is setup for 12V Alternator input but will not start when the vehicle is turned On, I've followed the trouble shooting guide and the setup is fine, what's the problem?
- A** The most likely cause of this issue is that the BCDC Dual Input is somehow 'stuck' in 24V mode. Try removing the 'Vehicle' (RED) wire and reconnecting it. If the problem still exists please contact Redarc Electronics.
- Q** Can the BCDC Dual Input charge from Solar and Vehicle power at the same time?
- A** Yes. The BCDC Dual Input will always attempt to supply power from the Solar source first (when available) and will supplement this input with power from the Vehicle source (when available).

5 TWO YEAR PRODUCT WARRANTY

Over the last three decades our company has established a reputation as the power conversion specialist.

A 100% Australian-owned company, we have met the needs of customers in transport and other industries through exciting, innovative thinking.

We believe in total customer satisfaction and practice this by offering our customers:

- Technical advice free of jargon and free of charge
- Prompt turnaround of orders throughout Australia and globally
- Friendly, personalised, professional service and product support

In the unlikely event that a technical issue arises with a Redarc product, customers are encouraged to initially contact the Redarc Technical Support Team on (08) 8322 4848 or power@redarc.com.au for prompt and efficient diagnosis and product support.

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 reasonably 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.

The benefits of this Warranty are in addition to other rights and remedies available at law in respect of the Products and shall not derogate from any applicable mandatory statutory provisions or rights under the Australian Consumer Law.

Redarc Electronics Pty Ltd atf the Redarc Trust trading as Redarc Electronics ("Redarc") offers a warranty in respect of its Products where the Products are purchased from an authorised distributor or reseller of Redarc by a person ("Purchaser"), on the terms and conditions, and for the duration, outlined below in this document ("Warranty").

1. In this Warranty, the term **Products** means:
 - 1.1 all products manufactured or supplied by Redarc (excluding its solar products which are covered by Redarc's Solar Product Warranty); and
 - 1.2 any component of or accessory for any product in clause 1.1 manufactured or supplied by Redarc.

Offer and duration of product warranties

2. Redarc warrants that its Products will be free, under normal application, installation, use and service conditions, from defects in materials and workmanship affecting normal use, for **2 years** from the date of purchase (**Warranty Period**).
3. Where a Product malfunctions or becomes inoperative during the Warranty Period, due to a defect in materials or workmanship, as determined by Redarc, then subject to further rights conferred by the Australian Consumer Law on the Purchaser, Redarc will, in exercise of its sole discretion, either:
 - 3.1 repair the defective Product;
 - 3.2 replace the defective Product; or
 - 3.3 provide a refund to the Purchaser for the purchase price paid for the defective Product,without charge to the Purchaser.
4. The warranty given by Redarc in clause 3 covers the reasonable costs of delivery and installation of any repaired or replaced Products or components of Products to the Purchaser's usual residential address notified to Redarc, together with the reasonable costs of removal and return of any Products determined by Redarc to be defective.
5. If the Purchaser incurs expenses of the nature referred to in clause 4 in the context of making a claim pursuant to this Warranty that is accepted by Redarc, the Purchaser will be entitled to claim for reimbursement of those expenses which Redarc determines, in exercise of its sole discretion, to be reasonably incurred, provided that the claim is notified to Redarc in writing at the postal address or email address specified in clause 21 and includes:
 - 5.1 details of the relevant expenses incurred by the Purchaser; and
 - 5.2 proof of the relevant expenses having been incurred by the Purchaser.

Exclusions and limitations

6. This Warranty will not apply to, or include any defect, damage, fault, failure or malfunction of a Product, which Redarc determines, in exercise of its sole discretion, to be due to:
 - 6.1 normal wear and tear or exposure to weather conditions over time;
 - 6.2 accident, misuse, abuse, negligence, vandalism, alteration or modification;
 - 6.3 non-observance of any of the instructions supplied by Redarc, including instructions concerning installation, configuring, connecting, commissioning, use or application of the Product, including without limitation choice of location;
 - 6.4 failure to ensure proper maintenance of the Product strictly in accordance with Redarc's instructions or failure to ensure proper maintenance of any associated equipment or machinery;
 - 6.5 repairs to the Product that are not strictly in accordance with Redarc's instructions;
 - 6.6 installation, repairs or maintenance of the Product by, or under the supervision of, a person who is not a qualified auto electrician or technician, or if non-genuine or non-approved parts have been fitted;
 - 6.7 faulty power supply, power failure, electrical spikes or surges, lightning, flood, storm, hail, extreme heat, fire or other occurrence outside the control of Redarc;
 - 6.8 use other than for any reasonable purpose for which the Product was manufactured;
 - 6.9 any indirect or incidental damage of whatever nature outside the control of Redarc.
7. Warranty claims in respect of a Product must be made in writing to Redarc at the postal address or email address specified in clause 21 within the Warranty Period. Such claims must include the following:
 - 7.1 details of the alleged defect or fault and the circumstances surrounding the defect or fault;
 - 7.2 evidence of the claim, including photographs of the Product (where the subject of the claim is capable of being photographed);
 - 7.3 the serial number of the Product, specified on the label affixed to the Product; and
 - 7.4 proof of purchase documentation for the Product from an authorised distributor or reseller of Redarc, which clearly shows the date and place of purchase.The return of any Products without the prior written instructions of Redarc will not be accepted by Redarc.

8. Without limiting any other clause in this Warranty, Redarc has the right to reject any Warranty claim made by a Purchaser pursuant to this Warranty where:
 - 8.1 the Purchaser does not notify Redarc in writing of a Warranty claim within the Warranty Period;
 - 8.2 the Purchaser does not notify Redarc in writing of a Warranty claim within 1 month of becoming aware of the relevant circumstances giving rise to the claim, so that any further problems with the Product are minimised;
 - 8.3 the serial number of the Product has been altered, removed or made illegible without the written authority of Redarc;
 - 8.4 the Purchaser is unable to provide proof of purchase documentation in accordance with clause 7.4 or evidence that the Product was properly installed and removed (if relevant), and that proper maintenance has been performed on the Product, by, or under the supervision of, a qualified auto electrician or technician, in accordance with the instructions of Redarc.
9. If the Product is found to be working satisfactorily on return to Redarc or upon investigation by Redarc, the Purchaser must pay Redarc's reasonable costs of testing and investigating the Product in addition to shipping and transportation charges. Where Redarc is in possession of the Product, the Product will be returned to the Purchaser on receipt of the amount charged.
10. Any replaced Products or components of Products shall become the property of Redarc.
11. Redarc may, in exercise of its sole discretion, deliver another type of Product or component of a Product (different in size, colour, shape, weight, brand and/or other specifications) in fulfilling its obligations under this Warranty, in the event that Redarc has discontinued manufacturing or supplying the relevant Product or component at the time of the Warranty claim, or where such Product or component is superior to that originally purchased by the Purchaser.

Other conditions of Warranty

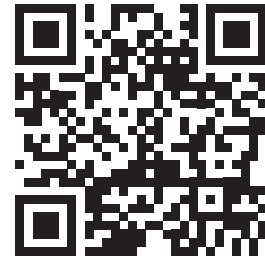
12. If the Purchaser acquired a Product for the purpose of resupply, then this Warranty shall not apply to that Product.
13. In particular, the sale of a Product via an online auction, online store or other internet website by a party that is not an authorised distributor or reseller of the Product will be deemed to be a resupply within the meaning of the Australian Consumer Law and will render this Warranty void, as Redarc has no control over the storage, handling, quality or safety of Products sold by such persons.
14. A Purchaser shall only be entitled to the benefit of this Warranty after all amounts owing in respect of the Product have been paid.
15. While Redarc warrants that the Products will be free from defects in materials and workmanship in the circumstances set out in this Warranty, to the maximum extent permitted by law Redarc does not warrant that the operation of the Products will be uninterrupted or error-free.
16. To the maximum extent permitted by law, Redarc's determination of the existence of any defect and the cause of any defect will be conclusive.
17. Spare parts or materials for the Products are guaranteed to be available for a period of at least 2 years after purchase of the Products.
18. The agents, officers and employees of any distributor or reseller of the Products and of Redarc are not authorised to vary or extend the terms of this Warranty.
19. Redarc shall not be responsible or liable to the Customer or any third party in connection with any non-performance or delay in performance of any terms and conditions of this Warranty, due to acts of God, war, riots, strikes, warlike conditions, plague or other epidemic, fire, flood, blizzard, hurricane, changes of public policies, terrorism and other events which are beyond the control of Redarc. In such circumstances, Redarc may suspend performance of this Warranty without liability for the period of the delay reasonably attributable to such causes.
20. If a clause or part of a clause in this Warranty can be read in a way that makes it illegal, unenforceable or invalid, but can also be read in a way that makes it legal, enforceable and valid, it must be read in the latter way. If any clause or part of a clause in this Warranty is illegal, unenforceable or invalid, that clause or part is to be treated as removed from this Warranty, but the rest of this Warranty is not affected.

Redarc's contact details

21. Redarc's contact details for the sending of Warranty claims under this Warranty are:

Redarc Electronics Pty Ltd
23 Brodie Road (North), Lonsdale SA 5160
Email: power@redarc.com.au
Telephone: +61 8 8322 4848

For specific USA
Warranty terms
please visit:



www.redarcelectronics.com

THE POWER OF
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Free technical assistance!

please contact

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23 Brodie Road North, Lonsdale SA, Australia

+61 8 8322 4848 (Available 8AM - 5:30PM ACST, Mon - Fri)

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