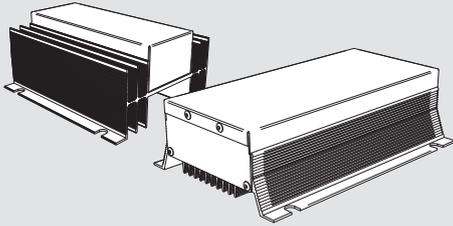


THE POWER OF

REDARC



FEATURES

- High peak current capability
- Fast transient response
- Fully encapsulated

Charge Equalisers

CE3, CE10, CE20, CE30, CE40, CE60

FUNCTION

The Charge Equaliser operates in a two battery 24V DC negative earth system. The Output Voltage of the Charge Equaliser is regulated to half the Input Voltage. 12V power is available from the lower battery in a 24V system via the centre tap (bridging link). The Charge Equaliser ensures that the voltage across the lower 12V battery (i.e. the battery whose negative is connected to ground) is equalised to the voltage across the upper 12V battery in the 24V bank.

Charge Equalisers are ideally suited to loads requiring a safe, clean and stable 12V supply because of their high peak current capability and fast transient response. They are ideal for variable current loads such as winches, motors, lamps, fridges etc. because the 12V supply is taken direct from the lower 12V battery.

SPECIFICATIONS

MODEL	CE3	CE10	CE20	CE30	CE40	CE60
Supply Range	19-33VDC	19-33VDC	19-33VDC	19-33VDC	19-33VDC	19-33VDC
Max. Charge Current	3 Amps	10 Amps	20 Amps	30 Amps	40 Amps	60 Amps
Operating Temp.	-10°C to +50°C					
Dimensions	70x135x75mm	156x135x75mm	200x135x60mm	300x135x75mm	300x135x75mm	450x135x75mm
Weight	400g	800g	1kg	1.5kg	1.5kg	3.5kg
Warranty	2 years					

PROTECTION

The charge equaliser will not be overloaded because of inbuilt fast responding current limiting. The charge equalisers' electronic components are protected internally against the large positive and negative transient voltages usually present in mobile electrical systems. When correctly connected there is NO POSSIBILITY of 24V being applied to the load (equipment), because the 12V equipment is supplied by the 12V battery.

WIRING

For maximum efficiency the Charge Equaliser must be fitted as close as practical to the lower battery. Fuses or circuit breakers (not provided) MUST be fitted to the input and output wires as outlined in the diagram and as per the precautions below. The fuses are essential to ensure the safety of the vehicle's wiring in the event of a short circuit. Connection of the violet wire to 24 volt can be made in two ways;

- If a permanent connection is required, the VIOLET (RED on CE60) wire can be connected to the 24V battery terminal. In this case there is a small standby current and as with any permanent electrical load the fuse should be removed if the vehicle is to be left un-used for extended periods.
- If the Charge Equaliser is to be turned off when the vehicle is not in use or if there is an isolator switch on the positive 24V side, the 24V feed to the violet wire must be via a relay operated by the ignition switch. Failure to use a relay will allow the 12V battery to discharge back via the Charge Equaliser to any other equipment connected to the 24V system.
- An incorrect 24V output reading will be recorded if checking the output without a load attached. Refer to in-vehicle testing.
- It is recommended that the case be insulated if negative isolation of the 24V battery bank is used.

PRECAUTIONS

1. During installation of the Charge Equaliser ensure that the 12V terminal is connected last and disconnected first. A small spark is normal whilst connecting.
2. A sound earth connection is essential (See wiring diagram for fitting the Charge Equaliser).
3. If jump starting the vehicle, the CE must be isolated by removal of the fuses to prevent damage.
4. Avoid direct steam/pressure cleaning of the unit as the chemicals used in the fluids can be corrosive.
5. A fuse must be fitted between the 12V battery terminal and any 12V equipment.
6. If fitted to a vehicle with an isolator switch on the negative earth side the 30, 40 and 60 amp Charge Equalisers' case must then be insulated from chassis and the earth wire of the CE returned to the negative pole of the 12V battery.
7. Do not use in conjunction with a Pulsing Desulphator.

Note: Redarc suggests an ignition controlled relay or SBI24 be fitted to control the 24Volt input to the charge equaliser should the vehicle be left unattended for excessive lengths of time. Doing so this will switch off the charge equaliser protecting the 24Volt output battery from excessive discharge whilst the vehicle is not in operation.

Note: To prevent serious damage to the CE, care must be taken to avoid the following:

Swapping 24V I/P and ground connections

Swapping 24V I/P and 12V O/P connections

Swapping 12V O/P and ground connections

Damage will also occur if:

Any large load is connected to the 24V system while an isolator switch is open. This applies to positive or negative isolator switches in the 24V battery bank.

(To protect against this fit an ignition relay or SBI24 solenoid)

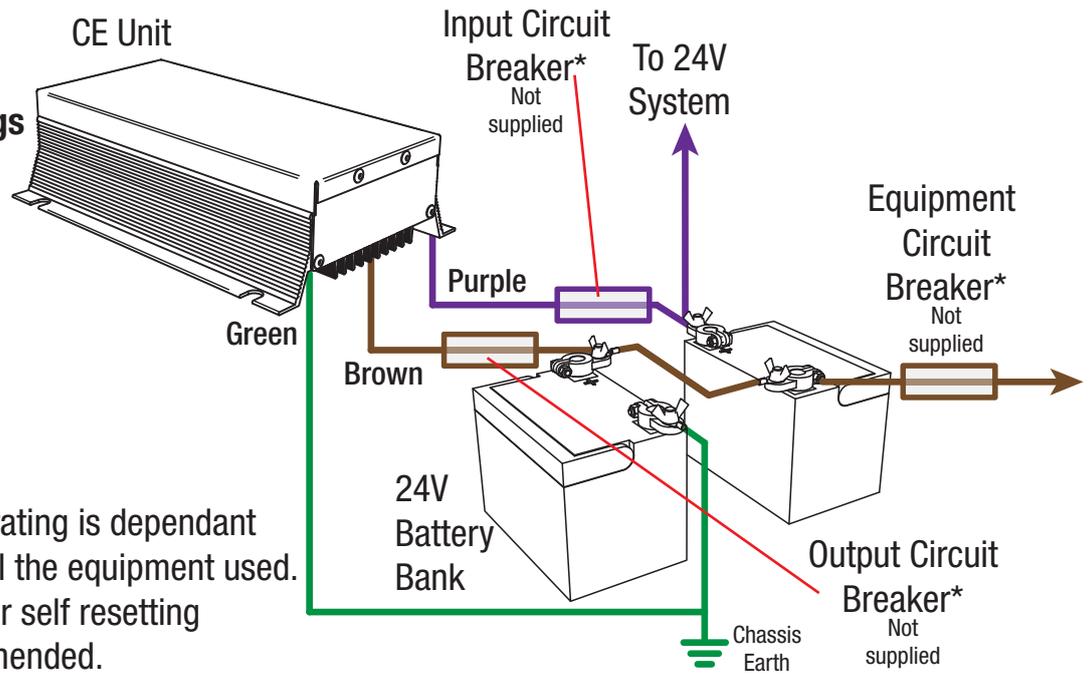
The CE is charging an auxiliary 12V battery and any battery terminal in the 24V battery bank comes loose while 24V load is applied.

WIRING DIAGRAM

*CE Circuit Breaker Ratings

	I/P	O/P
CE3	5A	5A
CE10	15A	15A
CE20	15A	20A
CE30	20A	35A
CE40	30A	50A
CE60	50A	80A

Equipment Circuit Breaker rating is dependant on the total load rating of all the equipment used. Fuses may be used however self resetting circuit breakers are recommended.



IN-VEHICLE TESTING

Equipment needed: Multimeter or voltmeter.
5W/24V test lamp with connection leads/clips.

- Leave input (VIOLET) wire and earth (GREEN) wire connected.
- Disconnect output (BROWN) wire from battery. (Do not allow BROWN wire to contact chassis/earth).
- Connect 5W test lamp between BROWN wire and vehicle chassis/earth.
- The lamp should light up.
- Using a voltmeter, measure voltage on the BROWN wire. (Voltmeter positive wire to BROWN wire, negative wire to chassis/earth)
- Measure voltage on the input (VIOLET) wire 24V connection. (Voltmeter positive to VIOLET wire connection, negative to chassis/earth)
- Voltage on BROWN wire should be half the voltage on the VIOLET wire. (within 0.25V)

Example 1.

With Motor running, if VIOLET wire measures 28V, BROWN wire should be 14V (+/- 0.25V), i.e. BROWN wire voltage should be in range 13.75V to 14.25V.

Example 2.

With Motor not running, if VIOLET wire measures 24V, BROWN wire should be 12V (+/- .25V), i.e. BROWN wire voltage should be in range 11.75V to 12.25V.

If these voltages are OK, it indicates the Charge Equaliser is operating correctly.

If 12V battery does not maintain the correct voltage, check that all connections are sound. If this is all OK, measure the 12V current draws and check that the Charge Equaliser is suitably rated.

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 at 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