



40A DC TO DC 2.0 BATTERY CHARGER WITH SOLAR INPUT

Instruction Manual



PLU: 674159
CODE: DCDY40
Manufactured and packaged for
SRGS PTY LTD
ABN 23 113 230 050
6 Coulthards Avenue,
Strathpine QLD 4500, Australia
MADE IN CHINA

+ Important Safety Instructions



WARNING: To avoid any personal injury, please read the safety instructions below

TO AVOID ANY PERSONAL INJURY, PLEASE READ THE SAFETY INSTRUCTIONS BELOW.

This battery charger is not intended for use by children or infirm persons without supervision.

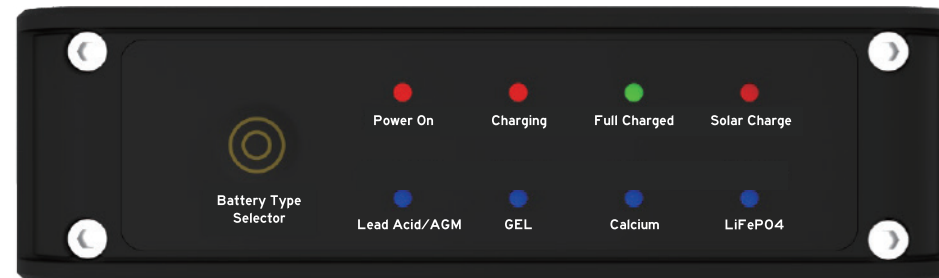
FOR AUTOMOTIVE AND RECREATIONAL VEHICLE 12V DEEP CYCLE BATTERY USE ONLY.
NOT TO BE USED WITH DRY CELL BATTERIES.

- + During the charging process, do not use a naked flame near a battery. Batteries generate explosive gasses during the charging process that may explode.
- + Never smoke or light cigarettes near a battery.
- + Do not place tools on top of a battery or allow tools to fall on the battery to prevent the chance of a short circuit and sparks.
- + Always wear eye protection when charging a battery.
- + Ensure charging and testing is conducted in a well-ventilated area.
- + Inadequate ventilation may over-heat the charger and cause in-efficient operation.
- + This battery charger is not intended for outdoor operation. Do not expose it to moisture or extreme weather conditions.
- + The ACID/FLUID within a battery is highly corrosive and poisonous. It can produce flammable and toxic gases when recharged and will explode if ignited. When working with batteries, always wear eye protection, remove jewellery and ensure the area is well ventilated. If spilt - it will cause severe burning to eyes, skin, clothing, damage paintwork and corrode many metals. Ensure that power is disconnected from any appliance in the vicinity of the spill and immediately wash any area that has been affected with water.

The warnings, cautions and instructions detailed in this instruction manual cannot cover all possible conditions and situations that may occur. Common sense and caution are factors which cannot be built into this product and must be supplied by the operator.

+ Key Charger Features

This charger is a sophisticated 6 stage charger, utilising switch mode and fully automatic computerised control, designed to charge most 12 Volts Lead Acid/AGM, Gel, Calcium and LiON(LiFeO4) batteries.



- + Heavy duty aluminium case
- + Microchip monitoring and control
- + Fully automatic high frequency multi stage charging
- + Pulse mode technology that reduces oxidation, evens electrolyte consistency and minimises temperature equating to longer battery life
- + Easy push button chemistry select: Lead Acid/AGM(Including VRLA and conventional flooded batteries), Gel, Calcium and LifePO4
- + Internal charger temperature monitoring and power output control
- + LED indicators showing state of charge
- + Over charging, short circuit and over temperature protection
- + Reverse polarity protection:
 1. Input reverse polarity protection
 2. Output reverse polarity protection
- + Thermal overload protection
- + Solar input overload protection
- + IP65 dust proof and water resistant
- + Memory function memorizes the battery type status and applies this battery type as the default status for the next charge cycle
- + Press "Battery Type Selector" to select the corresponding battery type, and batteries can be re-selected during charging by long pressing the button
- + MPPT solar regulator input

+ Installation Options / Instructions

+ INSTALLING THE CHARGER

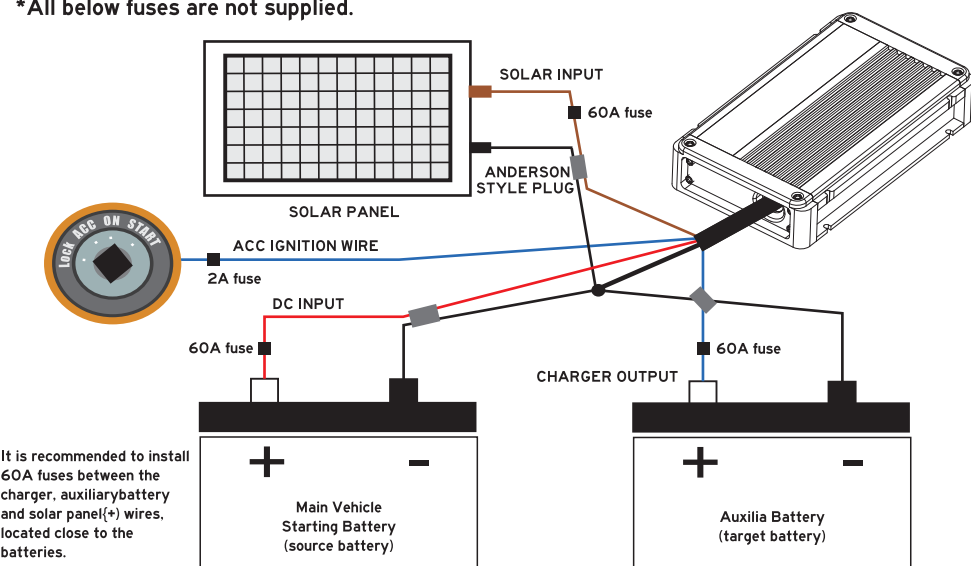
Installation of this unit will require twin core wiring - and suitable cable connectors (not included). Suggest ground circuits can be connected to chassis to shorten cable length.

See specifications page for details.

Any existing cables used in conjunction with this charger are required to be checked to ensure they are a suitable gauge.

If the gauge does not meet the minimum required specification in table on page 6, please replace them.

*All below fuses are not supplied.



+ Locate where you are going to install the DC-DC charger. Ensure the charger is located in a suitable dry area in the vehicle or caravan.

+ Ensure the charger is securely mounted. Charger can be mounted overhead, vertically or horizontally.

+ Next, measure required cable length from the main vehicle battery through to the location of the DC-DC charger.

+ Ensure ALL cabling meets specification and will not be exposed to excessive heat/moving parts or abrasion.

+ You can connect the optional ACC wire to the ignition of your vehicle via a fuse.



+ Measure the distance from the starting battery to the charger; the distance between the charger and the auxiliary battery; the distance between the solar panel output and the charger. Source cable and terminations to suit. A minimum of 10mm², twin-core cable is recommended for this application, twin cable for the solar panel, single cable between batteries and charger ground wire as short as possible.

+ If the charger is located in a camper/caravan we recommend the use of an Anderson style plug between the tow vehicle and the camper/caravan as shown below.

+ Fit Anderson style plug connectors on either end of the twin core cables.

+ Connect the main battery to the charger — make sure polarity (+ & -) are correct.

+ Connect the solar panels to the charger — make sure polarity (+ & -) are correct.

+ Connect the auxiliary battery to the charger — make sure polarity (+ & -) are correct.

+ Ensure unused cables (e.g. ACC wire) are insulated and secured against movement.

+ It is recommended that 60Amp fuses required at both batteries and charger connections and solar connection (+).

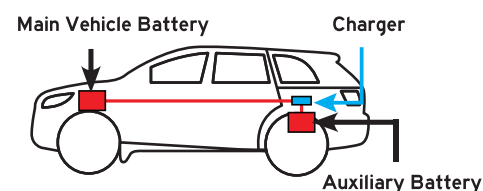
+ Check all connections are tight.

+ LOW OR VARIABLE VOLTAGE ALTERNATORS

+ If the vehicle is fitted with a low voltage or variable voltage alternator, the ignition sensing wire will need to be connected. This will allow the charger to continue to operate when it senses much lower voltages (as low as 10.8V) from the main battery because it can sense the engine running.

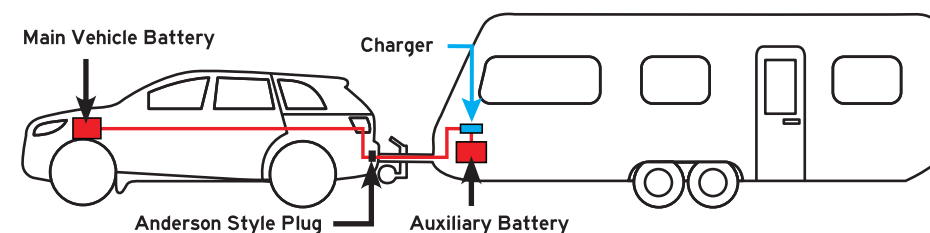
Using 2mm automotive cable, connect the small blue ignition wire from the back of the charger to an ignition power source with a fuse. This can be complicated and may require the assistance of an auto electrician or qualified installer. Once the charger senses ignition power it will start charging.

Suggested installation to vehicle only



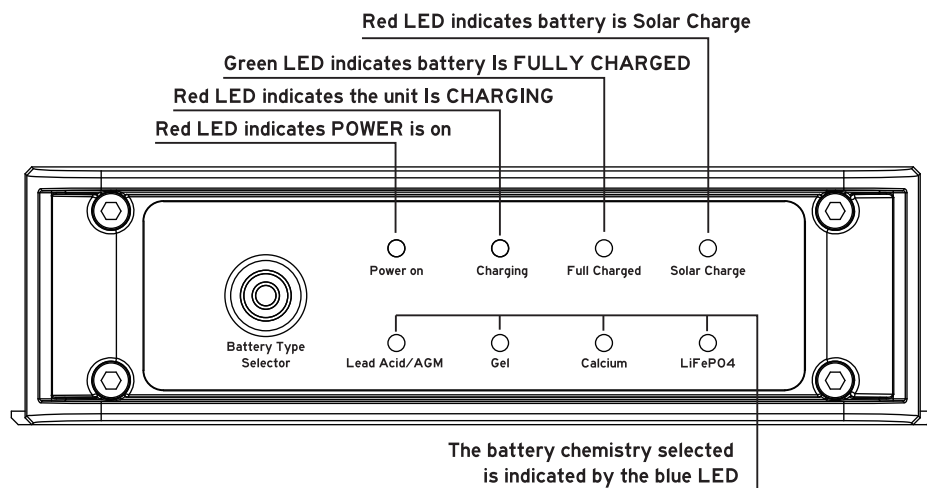
It is recommended to install 60A fuses or circuit breakers between the charger and each battery on the (+) wires, located close to the batteries.

Suggested installation to vehicle with caravan



+ Operating The Charger

+ CHARGER DISPLAY



+ 1. DC BATTERY

Once correctly installed, charger will apply DC charge in priority automatically.

- + Start the vehicle and let it idle.
- + The charger will now recognise that there is charge being applied to the main starting battery.
- + Once the main battery has reached 13.0V the charger will begin to charge the auxiliary battery, once the starting battery has dropped to 12.4V the charger will automatically shut off.
- + The initial default setting is for Lead Lead Acid/AGM batteries (Select battery type before connecting to auxiliary battery).
- + If you are charging a battery with a different chemistry simply change the battery type by pressing the battery type selector button on the front panel of the charger. (Select battery type before connect to auxiliary battery. Change battery type by a long button press if connected to auxiliary battery already).
- + Once selected, the charger remain on this battery type until it is changed.
- + If the ACC ignition signal is detected, the charger will begin to charge the auxiliary battery once the main battery has reached 11.5V and charger will automatically switch off once the main battery falls below 10.8V.

+ 2. SOLAR INPUT (WORKS ONLY WHEN DC BATTERY INPUT IS NOT AVAILABLE)

- + Once the input plug is connected with the solar panel, the charger will transfer to solar charge mode.
- + Solar charging requires an input of 13.5V - 25V from solar panels. When available solar panel voltage falls below 13.5V no charge will be delivered to auxiliary battery.

+ Specifications

	40 Amp
Charge Type	Multi-Stage
Input Voltage (V) DC	Battery 10.8 - 16.0
	Solar 13.5 - 25.0
Cut in/out Voltage with Ignition lead (V)DC	11.5 - 10.8
Cut in/out Voltage NO Ignition lead (V)DC	13.0 - 12.4
Output Current (A)	40
Minimum Start Voltage (V)DC	2
Soft Start Charging	Yes
BULK CHARGE VOLTAGES(V)DC	
Gel	14.3
Lead Acid /AGM	14.7
Calcium	15.3
LiFePO4	14.4
Float Charge Voltage (V)DC	13.5
Float Charge Current (mA)	100
Suits battery capacity (AH)	40 - 400
Case Construction	Aluminium
Ingress protection (IP) rating	IP65
Max operating temp (Deg C)	70
Weight (Kg)	1.65
Dimensions (mm)	194X 119.5X37.5
MIN RECOMMENDED CABLE LENGTH VS SIZE (BIGGER IS ALWAYS BETTER...)	
0 - 1 Metres	8AWG or 8mm ²
1 - 5 Metres	6AWG or 13mm ²
5 + Metres	4 AWG or 25mm ²

* LiFePO4 has 5 charge stages.

WARNING: Failure to use recommended wiring will severely impact on performance of DC to DC charger.

+ 6 Charging Stage

1. Qualification

The charger will test the battery for faults. If the battery voltage lower than 2V, it cannot be charged. Where the voltage is higher than 2V, move to step 2.
If battery voltage between 2V and 12V but fully charged in 5 minutes, charger will identify this is faulty battery and be beeping and POWER ON light flashing.

2. Recondition

After the charger identifies the battery voltage, it will start to charge the battery with a small current to activate the battery and improve battery charging efficiency.

3. Bulk Charge (Constant Current Stage)

Maximum charge current is delivered to the battery, minimizing charge time.

4. Absorption (Constant Voltage)

With the increase of battery voltage, the charging current to the battery will then reduce in order to avoid battery overcharge.

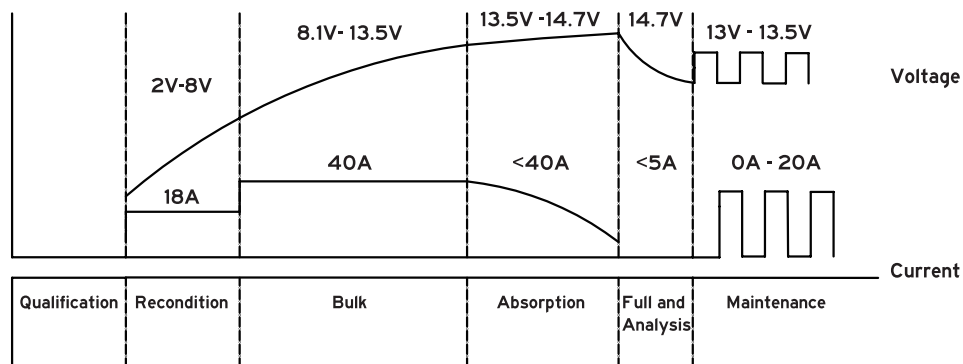
5. Full and Analysis

When the battery voltage level reaches a fully charged state, the charging current will drop to 0. The charger will then shut off all output and measure the voltage drop over 1 minute, before entering the next charging stage.

6. Maintenance

The charger will continue sending small pulse current charge to the battery, keeping voltage on about 13.5V. If voltage drops 13V, stages 1-5 will repeat.

Note: The battery charger will analyze the condition of the battery in stage 5 and may not perform this function.



Charging algorithm will change according to battery type.

+ Charging voltages

	Lead Acid/AGM	GEL	CALCIUM	Lion (LifePo4)
BOOST	14.0V	14.3V	15.0V	14.0V
CHARGING	14.7V	14.3V	15.3V	14.4V
MAINTENANCE	13.5V	13.5V	13.5V	-

NOTE: Battery manufacturers sometimes specify charging voltages.

Not observing their charging instructions may void your battery warranty.

+ Additional information

DEEP CYCLE BATTERIES

It is expected that this charger will be used to charge a deep cycle type auxiliary battery. Deep cycle batteries are designed to provide battery power to run items like fridges and lighting in caravans and campers.

It is generally accepted that the life of a deep cycle battery can be extended if it is not discharged below 50% of its full capacity. A fully charged 100Ah Hour (Ah) battery in good condition should offer 50 amp hours of power without impacting on its normal life expectancy.

Your average compressor style fridge uses up to 5 amps. Over a 24 hour period it should use approximately 30 amp hours. Therefore if the 100AH battery is operating only the fridge (and receives no additional charge) it ideally will require recharging after 48 hours.

To replenish these 60 amp hours using a 20 amp DC-DC charger will require at least 4 hours of driving. The last 10-20% of battery charging is slow, the closer it gets to 100% the slower it is.

Undercharging a battery and discharging to below 50% can severely impact on life expectancy of most deep cycle batteries.

Approximate state-of-charge	Average specific gravity	Open circuit voltage 12V
100%	1.265	12.65
75%	1.225	12.45
50%	1.190	12.24
25%	1.155	12.06
0%	1.120	11.89

The readings are taken at room temperature of 26°C(78F); the battery had rested for 24 hours after charge or discharge. Voltage reading and specific gravity of electrolyte (lead acid batteries) can give an indication of your battery's state of charge.

+ Trouble Shooting



- | | |
|---|---|
| <p>+ Charger won't indicate charging.</p> | <p>+ Charger not connected to battery.
 + Check terminal connection.
 + Battery is not 12V.</p> |
| <p>+ Battery won't charge.</p> | <p>+ Verify that all wiring meets specifications.
 + Check condition of batteries.
 + Check performance of alternator.</p> |
| <p>+ Battery won't fully charge or hold charge.</p> | <p>+ Batteries that are over 3 years old; severely discharged (or previously been severely discharged); not regularly recharged; over-heated; low in electrolyte; undercharged; overcharged or sulphated may not accept or hold a charge.</p> |
| <p>+ Lithium-Ion Batteries in Sleep Mode:</p> | <p>+ This DC-DC charger cannot charge a lithium-ion (LiFePo4) battery in sleep mode. To charge the lithium-ion (LiFePo4) battery, first make sure the DC-DC charger is correctly connected to the battery. Then select the "LiFePo4" mode, and long press "POWER" for 5s. The "charging" (red) indicator will flash for 10s. Once the battery is out of sleep mode, the "charging" (red) indicator will be constantly on and the DC-DC charger begins to charge the battery. Otherwise, the DC-DC charger will enter the standby state and the "Power On" indicator will be on.</p> |
| <p>+ Beeping :</p> | <p>+ When the charger and battery are reverse connected, the charger has no output (reverse polarity protection).</p> |

+ Warranty

Our product is guaranteed to be free from quality and manufacturing defects for a period of 12 months.

If your product becomes defective during this period, SRGS PTY LTD will offer you either a replacement, credit or refund where a product is faulty; wrongly described; different from the sample shown to you or do not do what they are supposed to do.

This warranty will not cover substantially modified product; misuse or abuse of the product contrary to user instructions or packaging label; change of mind and normal wear and tear.

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 for 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 failure does not amount to a major failure. To claim the warranty, take the product to the front Service Desk of your nearest store of purchase. You will need to show receipt or other proof of purchase. Additional information may be required to process your claim. Should you not be able to provide proof of purchase with a receipt or bank statement, identification showing name, address and signature may be required to process your claim.

Any expenses relating to the return of your product to the store will normally have to be paid by you. For online store purchases, SRGS PTY LTD will pay for the return freight for any product assessed as having a major failure.

The benefits to the customer given by this warranty are in addition to other rights and remedies of the Australian Consumer Law in relation to the goods or services to which this warranty relates.

This warranty is provided by SRGS PTY LTD, 6 Coulthards Avenue, Strathpine QLD 4500, Australia. Phone: 1300 880 764.