



3 STAGE AUTOMATIC

12V TO 12V

20 AMP BATTERY CHARGER



WARNING

- Explosive gases may escape from the battery during charging. Prevent flames and sparks and provide adequate ventilation.
- Before charging, read the instructions.
- **FOR CHARGING 12 VOLT LEAD ACID BATTERIES ONLY.**
- Do not attempt to charge non-rechargeable batteries.
- Never charge a frozen battery.
- Corrosive substances may escape from the battery during charging and damage delicate surfaces. Store and charge in a suitable area.
- This appliance is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use the appliance safely.
- Young children should be supervised to ensure that they do not play with the appliance.
- Fit fuses as close to the batteries as possible to protect the cable in case of short circuit.

FEATURES

The DC20 charger overcomes the problem of voltage drop associated with long cables commonly used with auxiliary battery installations. By 'stepping up' the dropped voltage using switchmode charging technology, the DC20 delivers a full three stage charge to your auxiliary battery.

SWITCHMODE TECHNOLOGY

Using the latest switchmode technology, the DC20 converts your vehicle's 12VDC alternator power up to 14.4VDC allowing your batteries to be fully charged, prolonging battery life and reliability. Switchmode charging uses electronic components allowing the charger to be lightweight and compact without sacrificing on performance.

SUPERIOR 3 STAGE CHARGING

Using electronic control, the charger delivers 3 stage charging resulting in a faster and more powerful charge, making it ideal for deep cycle batteries. The first stage, bulk (constant current), charges the battery faster while the second stage, absorption (constant voltage), ensures the battery is thoroughly charged. The final stage, float, maintains the battery at a safe voltage allowing it to be maintained and ready for use indefinitely.

IGNITION CONNECTION

The DC20 can be wired to the vehicle's ignition allowing it to operate only when the ignition is turned on. Alternatively you can connect the ignition and input terminals for continuous operation.

PROTECTIVE FEATURES

Spark-Free Protection

Prevents the output leads from sparking due to accidental short circuit making the charger safer to use around batteries.

Reverse Connection Protection

Fuse protected to prevent damage to internal electronics in case of accidental reverse connection.

Over and Under Voltage Protection

The charger will automatically shut down if there is an over voltage or under voltage problem.

Over Temperature Protection

The charger will lower its output current if the temperature of the unit begins to overheat.

EASY MOUNTING

The battery charger side extrusions allow for quick and easy mounting for permanent installations.

LED DISPLAY

The easy to read LED panel displays a range of information to ensure safe operation and to inform you of the battery status.

- **Input:** indicates if the input battery is correctly connected
- **Output:** indicates if the output battery is correctly connected.
- **Fault:** indicates internal damage requiring repair.
- **Charging:** illuminates when charging.
- **Fully Charged:** illuminates when fully charged.

SPECIFICATIONS

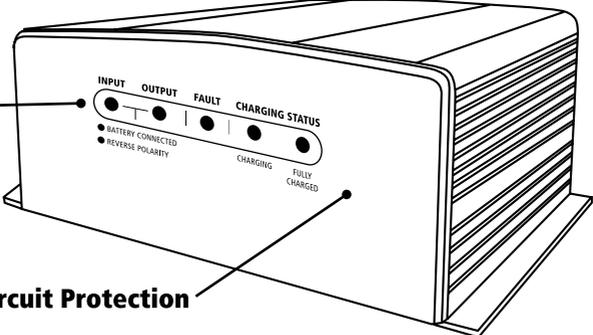
Charge Type	3 Stage
Input Voltage	9-17VDC
Input Current (Max Load)	28.5A
Input Current (No Load)	150mA
Output Voltage (Nominal)	12 Volts DC
Output Current	Input 9-11V: 15A Input 11-17V: 20A
Minimum Start Voltage	5V on Auxiliary Battery 9V on Main Battery 10V to Ignition Connection
Back Drain on Auxiliary Battery	10mA
Input Fuse	2 x 20A Blade Fuses
Output Fuse	2 x 15A Blade Fuses
Size (mm)	Length 260 x Width 190 x Height 82
Weight	2.2kg
Charge Control	
Bulk	Input 9-11V: 15-20A up to 14.4VDC Input 11-17V: 20A up to 14.4VDC
Absorption	14.4VDC Constant Voltage. Changes to Float mode when current draw is less than 3A
Float	13.7VDC
Battery Range	
Deep Cycle	85 – 300 Ah
Automotive	500 – 2000 CCA
Marine	700 –2500 MCA
Types of Batteries	Most types of lead acid batteries including Calcium, GEL, AGM, MF & Flooded

PRODUCT OVERVIEW

FRONT VIEW

LED Display
Indicates charge and connection status

Short Circuit Protection



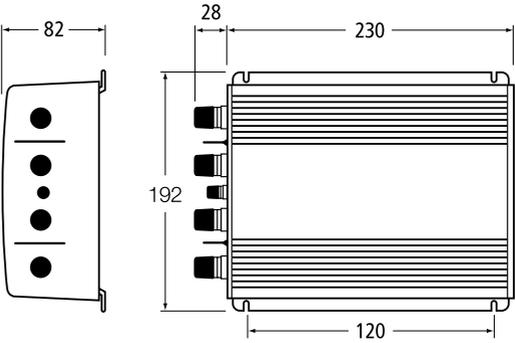
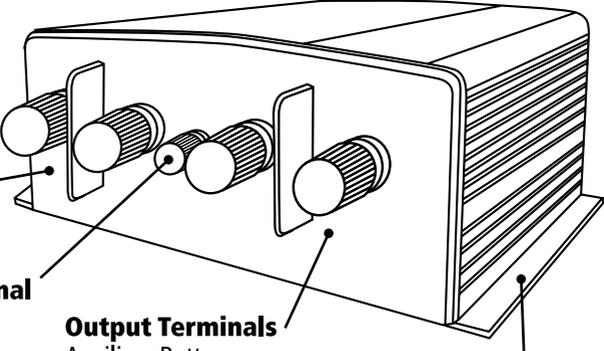
BACK VIEW

Input Terminals
Starter Battery connection

Ignition Terminal

Output Terminals
Auxiliary Battery connection

Side Mounting Extrusions



INSTALLATION – MOUNTING

1. Disconnect the negative battery cable (Earth) from the vehicle’s starting battery or disconnect power to the trailer.

Note: To prevent the loss of vehicle electronic memories, radio presets & security codes, it is recommended that an “Electrical System Memory Protector” be used.

2. Mount the DC20 using the ‘side extrusions’ of the unit. Mount to a flat surface in a convenient location as close to the output (auxiliary) battery as possible. The DC20 enclosure is weatherproof, but should be protected from rain and submersion. Keep the DC20 as far away as possible from the exhaust manifold, turbo or any other high temperature components.

DO NOT MOUNT ON THE ENGINE

INSTALLATION – WIRING

To make the electrical connections, battery cables will need to be made to the correct length using cable lugs and heatshrink. Cable lugs should be crimped or soldered to the stripped battery cable and then protected with the heatshrink.

The input cable should be able to handle 28.5 Amps and have maximum voltage drop of 2V. For lengths up to 12 metres we recommend using 6mm cable (4.58mm²).

Output cable should have a maximum voltage drop of 0.25V. See table below for the recommended cable size per length.

Output Cable

	0-1m	1-3m	3m+
Size	5mm	8 B&S	Not recommended
mm ²	2.90	8	

1. Disconnect the negative battery cable (Earth) from the vehicle’s starting battery or disconnect power to the trailer.

Note: To prevent the loss of vehicle electronic memories, radio presets & security codes, it is recommended that an “Electrical System Memory Protector” be used.

2. Connect the Auxiliary Battery positive (+) terminal to the DC20 positive (+) output terminal. Fit a 25A fuse to the cable as close as possible to the Auxiliary Battery positive (+) terminal.

Note: Do not over-tighten the terminal studs on the DC20.

3. Connect the Auxiliary Battery negative (-) terminal to the DC20 negative (-) output terminal. Alternatively connect both negative (-) terminals (Aux Battery & DC20 Output) to chassis ground.

4. Connect the DC20 negative (-) input terminal to chassis ground.

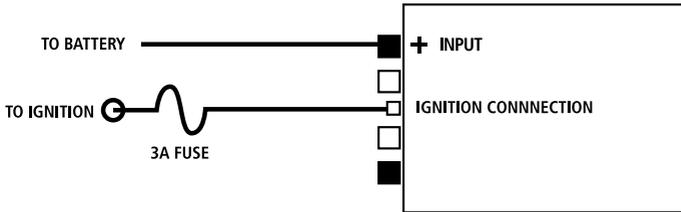
5. Connect the Starter Battery positive (+) terminal to the DC20 positive (+) input terminal.

Fit a 40A fuse to the cable as close as possible to the Starter Battery positive (+) terminal.

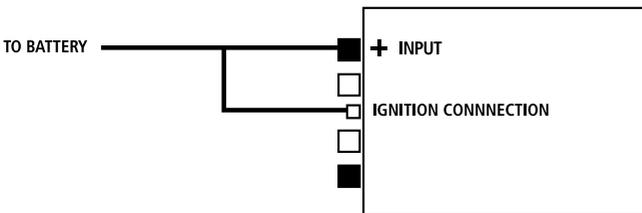
6. The Ignition terminal must be connected to a positive power source between 10V and 17V for the DC20 to operate (19B&S or 0.64mm² cable is sufficient).

This can be done in two ways:

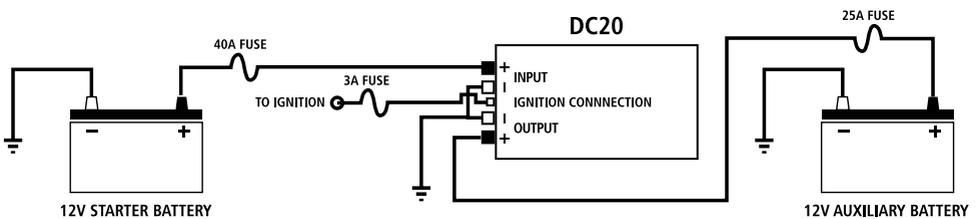
a) Connect ignition terminal to the vehicle's ignition. The DC20 will operate only when the vehicle's ignition is turned on. Fit a 3A fuse to the cable as close as possible to the vehicle's ignition.



b) For continuous operation connect the ignition terminal to the DC20 positive input terminal. This can be done by connecting a short piece of wire fitted with ring terminals directly to the ignition and DC20 positive input terminals.



Typical Wiring installation



HOW TO READ LED DISPLAY

Input LED (bi-colour)

YELLOW: Input battery is correctly connected.

RED: Input battery is reverse connected (Note: input fuses have blown). Check battery connections and replace internal input fuses.

Output LED (bi-colour)

YELLOW: Output battery is correctly connected.

RED: Output battery is reverse connected (Note: output fuses have blown). Check battery connections and replace internal output fuses.

Fault LED

RED: A fault has been detected. Check internal fuses are intact and wiring to the DC20 is correct. If fault LED is still on the unit is damaged. Do not attempt to repair.

Charging LED

YELLOW ON: Charging.

YELLOW ON & GREEN FLASHING: Charger is in 'absorption' mode. Charging is almost complete.

Fully Charged LED

GREEN: Battery is fully charged. The charger is in float mode and can be left connected without risk of overcharging.

Charging & Fully Charged LEDs Flashing

The charger has exceeded the 12 hour (bulk) timeout and has stopped charging. Reset by disconnecting and reconnecting ignition connection.

HOW TO CHANGE INTERNAL FUSES

1. Determine which fuses need replacing (i.e. input or output fuses).
Refer to previous section "How To Read LED Display".
2. Disconnect the wires from the DC20 connections and remove the DC20 from its mount.
Take note of input/output wires for easier re-installation.
3. Change fuses. For input fuses go to step (a), for output fuses go to step (b):
 - a. **INPUT FUSE REPLACEMENT**
Remove the screws from the back of the DC20. Remove and re-fit 2 x 20A fuses.
Replace back of the DC20.
 - b. **OUTPUT FUSE REPLACEMENT**
Remove the screws from the front of the DC20. Remove and re-fit 2 x 15A fuses.
Replace front of the DC20.

TROUBLESHOOTING / FAQ:

Q. Is the DC20 waterproof?

A. The Projecta DC20 is designed to be dust and shower proof. Normal use including river crossings and light engine washing will not pose any problem. Direct high pressure washing of the DC20 unit or submersion for a period of the time may cause some water damage and will not be covered under warranty.

Q. Why do the positive cables from the batteries need to be fused?

A. 12V batteries can produce large amounts of power and are capable of melting cable insulation and catching fire in the case of a short circuit. Each positive (+) cable connected to the battery must be protected by a fuse.

Q. Is the charger safe to use with modern 'electronic' vehicles?

A. The Projecta DC20 has been designed to work with all vehicles, especially new vehicles with EFI and computer management systems. The charger utilises sophisticated electronics that ensures complete safety for you and your vehicle.

Q. How do I know if the battery is charged?

A. The 'FULLY CHARGED' LED will remain on. Alternatively use a Battery Hydrometer (Projecta Part No. BH100). A reading of 1.250 or more in each cell indicates a fully charged battery.

Q. I have connected the charger properly but the 'INPUT LED' does not come on?

A. The DC20 is designed to charge from a starter battery that has as little as 9V. If the voltage is below 9V, start the vehicle to allow the alternator to begin charging the battery or alternatively charge the battery using a suitable battery charger.

Note: if the ignition connection is wired to the input positive terminal, and the starter battery voltage is below 10V, the unit will not operate. The ignition connection requires 10V before allowing the unit to start. Once in operation, the voltage to the ignition connection can fall as low as 9V before it switches the unit off.

Q. I have connected the charger properly but the 'OUTPUT LED' does not come on?

A. In some cases batteries can be flattened to the point where they have very little or no voltage. This can occur if a small amount of power is used for a long time, for example a map reading light is left on for a week or more. The DC20 is designed to charge an auxiliary battery from as little as 5 Volts. If the voltage is lower than 5 Volts use a pair of booster cables to connect between two batteries to provide more than 5 Volts to the battery being charged. The DC20 can then start to charge the battery and the booster cables can be removed.

Q. Why does the 'FULLY CHARGED' LED come on straight away?

A. There are three possible reasons why the 'FULLY CHARGED' LED may come on straight away.

1. The battery is fully charged.
2. The battery has taken a surface charge.
3. The battery has a faulty cell.

Q. What is Surface Charge?

A. Batteries unused or left flat for some time build up a resistance to being recharged. When the charger is first connected, these batteries will take a surface charge, and the 'FULLY CHARGED' LED will illuminate within a short period of time. The battery however is not fully charged. The charger is voltage sensitive and cannot differentiate between a surface charge and a fully charged battery. After a few hours the battery may start to accept some charge but most batteries with this condition will not recover.

Q. What is a Faulty Cell?

A. 12 Volt batteries contain 6 cells and one faulty cell is enough to ruin your battery. If after twelve hours of charging your battery is still flat, you should test the cells using a hydrometer. If one reading is lower than the rest it indicates a faulty cell. It is pointless to continue charging; the battery needs replacing.

Q. Why is there no output at the charger's terminals?

A. The charger incorporates short circuit protection that makes it much safer to use. For this reason the charger will only output power when properly connected to a battery. To check if the charger is functioning, follow the instructions to connect and operate the charger as normal on a flat battery. While the battery is charging measure the battery voltage with a volt or multi-meter. Charging can be confirmed if the voltage is increasing (within the voltage parameters set out in the specifications).

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