

**PROJECTA**

**INTELLI-CHARGE**

# **DC/SOLAR BATTERY CHARGER**

**25 Amp, 5 Stage Switchmode**



P/No. IDC25L

## **WARNINGS**

- 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 LITHIUM IRON PHOSPHATE BATTERIES ONLY
- Do not attempt to charge non-rechargeable batteries
- Never charge a frozen battery or when ambient temperature is below 0°C
- Corrosive and/or toxic 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 IDC25L DC-DC charger is purposely designed for charging auxiliary batteries. It includes all the features needed to maintain the auxiliary battery to its optimum condition and to prolong the battery life.

### **SWITCHMODE TECHNOLOGY**

The IDC25L converts your vehicle's 12VDC/24VDC alternator power to the voltage level allowing your batteries to be fully charged, prolonging battery life and reliability. With the latest synchronous switching technology, efficiency of IDC25L exceeds 94% at typical full load condition.

### **DUAL INPUT OPERATION**

Allows two energy sources to power the IDC25L simultaneously. Solar input takes precedence if solar and alternator inputs are present. When solar input cannot provide enough energy to the load, the IDC25L will draw power from solar and alternator simultaneously.

### **SOLAR MPPT**

The IDC25L utilises sophisticated MPPT (Maximum Power Point Tracking) solar regulator technology. MPPT maximises the power generated from the solar panels to the auxiliary battery.

## **POWER SUPPLY (CONSTANT VOLTAGE OF 13.8 VOLTS)**

This sets the charge in power supply mode giving a constant voltage of 13.8VDC. This mode is best used where appliances are drawing power from the battery, for example a fridge.

Power supply mode can also be used to reactivate a lithium iron phosphate battery which is on internal low voltage disconnect mode. Currently, most high capacity 12V lithium iron phosphate batteries have an in-built battery management system (BMS). When you discharge a 12V lithium iron phosphate battery to very low output voltage, it will activate the battery's internal low voltage disconnect protection – the battery will be disconnected from the charger and load. However, in charge mode, the IDC25L will only start charging if it detects the battery is connected. To overcome this, set the IDC25L to power supply mode until the battery internal low voltage disconnect protection is deactivated.

## **SUPERIOR 5 STAGE CHARGING**

Using high speed microcontroller and proprietary charging algorithm, the IDC25L delivers a sophisticated 5 stage charging process resulting in a faster and more powerful charge, ideal for deep cycle batteries. The first two stages increase battery life by gently starting to charge the battery at 5% and 25% of the bulk charge respectively. The third stage, bulk (constant current), charges the battery much faster while the fourth 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 ignition connection activates the lower input voltage operation to suit vehicles with smart (variable voltage) alternators.

## **TEMPERATURE COMPENSATION**

The IDC25L is supplied with a 2 metre temperature sensor. The sensor monitors the battery temperature and adjusts (compensates) the charger's output to prevent overcharging. This is ideal for batteries used in warmer/cooler climates or environments.

## **REMOTE CHARGER STATUS INDICATION**

A pink wire is provided for driving an external panel mount LED indicator (Eg Narva P/No. 62090BL) to show the status of the charger. It shows whether the auxiliary battery is on charge (Solid Colour) or the charger is in a fault condition (Flashing).

## **PROTECTIVE FEATURES**

### **Spark-Free Protection**

The IDC25L will not start charging the battery (no output) unless the load is securely connected. It prevents the output leads from sparking due to accidental short circuit making the charger safer to use around batteries.

### **Reverse Connection Protection**

Reverse connection on input and output terminals does not damage IDC25L internal circuit. The IDC25L detects reverse connection condition and indicates whether input or output connection is reversed.

### **Over and Under Voltage Protection**

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

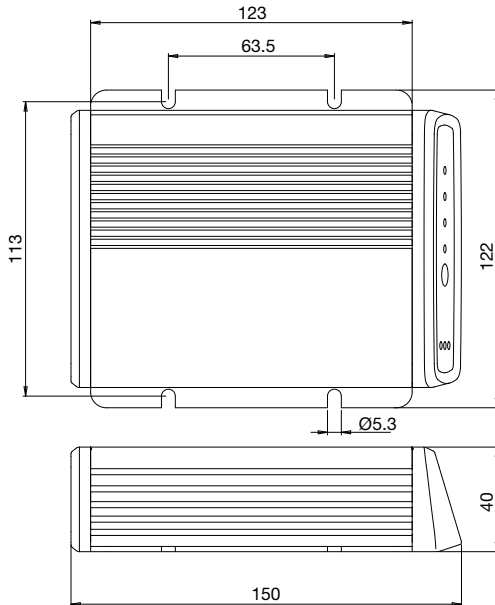
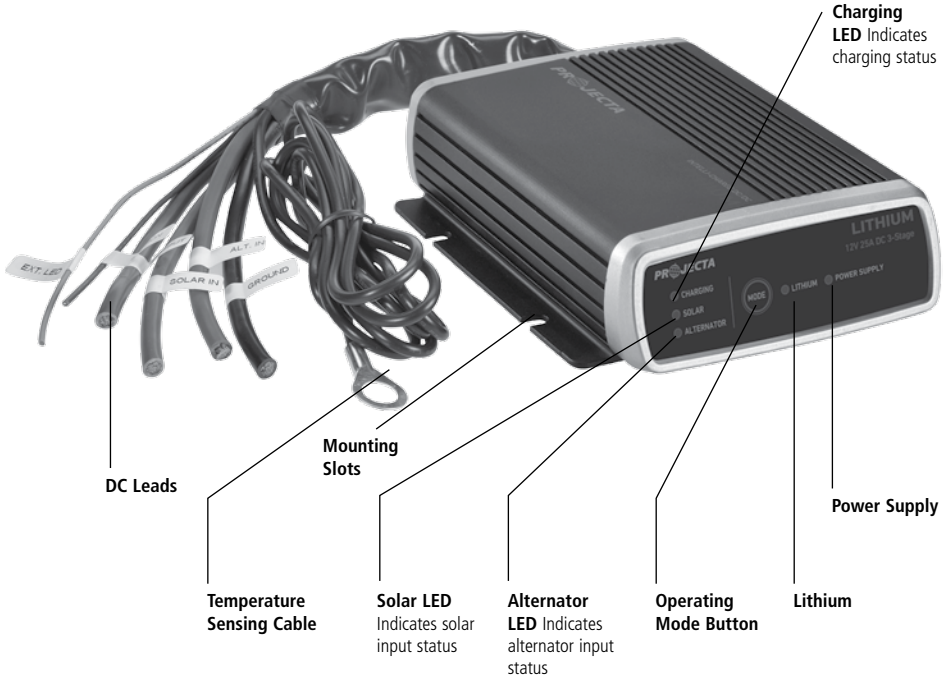
### **Over Temperature Protection**

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

# SPECIFICATIONS

<b>Operating Conditions</b>				
Alternator Input Voltage	9–32Vdc			
Maximum Solar Input Voltage	28Vdc			
Maximum Input Current	40A			
Input Current (No Load)	20mA			
Back Drain on Auxiliary Battery	9.5 – 10.5mA			
External LED Output – Constant Current	4 mA			
Output Current	Input 9–11Vdc: 20A Input 11V–32dc: 25A			
Input Fuse Rating	50A (Not supplied)			
Output Fuse Rating	50A (Not supplied)			
Maximum Output Power	362.5W			
Solar Input Turn On Voltage	9V			
Size	149 x 122 x 42 mm			
Weight	800g			
Operating Temperature (Derated from 55°C)	-10 to +80°C (Ambient Temperature)			
<b>Charge Mode</b>				
Charge Type	5 Stage			
Soft Start 1	Constant 1.25A if 2V< Auxiliary Battery Voltage <8V			
Soft Start 2	Constant 6.25A if 8V< Auxiliary Battery Voltage <10V			
Bulk *20A at 9-11Vdc, 25A at 11-32Vdc	*Constant Current up to: 14.5V			
Absorption	Constant Voltage until current drop to 2.5A 14.5V			
Float	Keep Constant Voltage at 13.5V			
<b>Power Supply Mode</b>				
Output	Constant 13.8V (current limited to 25A)			
<b>Battery Range</b>				
Battery Capacity	75–300Ah			
Type of Batteries Supported	Lithium Iron Phosphate (LiFePO <sub>4</sub> )			
<b>Operating Mode</b>				
	12V Vehicle		24V Vehicle	
VSR Mode – Default (Ignition Override Not Connected)	Turn on 13.4-20V	Turn off <12.8V	Turn on 26.8-32V	Turn off < 25.6V
Low Voltage Mode – Ignition Override cable connected to ignition switch (ignition on)	Turn on 12.2-20V	Turn off <11.9V	Turn on 24.4-32V	Turn off <24V
<b>Standards</b>				
EMC	C-Tick, AS/NZS CISPR11:2011 Class B			
IP Rating	IP67			

# PRODUCT OVERVIEW



# INSTALLATION

## MOUNTING

The rugged design of the IDC25L affords it to be mounted wherever best suits the application. By using advanced potting technology the unit is resistant to shock, vibration, dust and water allows for under-bonnet or in-vehicle installation. Clever 'side extrusions' incorporated within the enclosure allow the unit to be mounted to flat surfaces as close to the auxiliary battery as possible. It is advisable however to keep the charger as far away from exhausts, turbo's or any other high temperature components to ensure improved performance.

## WIRING

To make sound electrical connections, battery cables will need to be made to the correct length. Cable lugs should be crimped or soldered to the stripped battery cable and then protected with the supplied heatshrink. Butt splices should be used for cable extension.

Recommended cable size for wiring:

	Cable Size
Alternator Input Cable (Red)	8mm <sup>2</sup> (8 B&S)
Solar Input Cable (Green)	8mm <sup>2</sup> (8 B&S)
Output Cable (Grey)	8mm <sup>2</sup> (8 B&S)
Common Ground (Black)	8mm <sup>2</sup> (8 B&S)
Ignition Override (Blue)	1-1.5mm <sup>2</sup>
External LED (Pink)	1-1.5mm <sup>2</sup>

Note the above recommendation is valid for cable length up to 12m.

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 Output Cable (grey colour) from IDC25L. Fit a 50A fuse to the cable as close as possible to the Auxiliary Battery positive (+) terminal.
3. Connect the Auxiliary Battery negative (-) terminal to the IDC25L Common Ground cable (black colour). Alternatively connect both Auxiliary Battery negative (-) terminals and IDC25L Common Ground cable to vehicle chassis ground.
4. Connect the Starter Battery positive (+) terminal to the IDC25L Alternator Input cable (red colour). Fit a 50A fuse to the cable as close as possible to the Starter Battery positive (+) terminal.
5. If your vehicle has fixed voltage or temperature compensating alternator installed, leave the Ignition Override cable (blue colour) open.

If your vehicle has smart (variable voltage) alternator installed, the Ignition Override cable must be connected to the vehicle's ignition. The IDC25L will only operate when the vehicle's ignition is turned on.

However, if solar panels are connected to IDC25L, the IDC25L will operate and only draw power from solar panels (assuming vehicle's ignition is turned off). Fit a 1-2A fuse to the cable as close as possible to the vehicle's ignition. Consult the vehicle manufacturer for type of alternator installed in your vehicle.

6. When 12V solar panels are present, connect the solar panel positive terminal (+) to the IDC25L Solar Input cable (green colour). Fit a 50A fuse to the cable as close as possible to the Solar Panel positive (+) terminal.

Then, connect the Solar Panel negative (-) terminal to the IDC25L Common Ground cable (black colour). Alternatively connect both Solar Panel negative (-) terminals and IDC25L Common Ground cable to vehicle chassis ground.

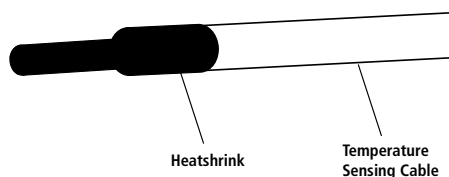
7. The external LED wire provides 4mA constant current output. It can power an LED panel mount indicator with or without an internal resistor.

Leave External LED cable open if you do not need the external LED indication. If external LED indication is required, connect the positive (+) terminal of a LED Indicator to the External LED cable.

Then, connect the negative terminal of LED Indicator to the vehicle chassis ground.

8. Cut/remove Temperature Sensing cable if temperature compensated battery charging is not needed. Use supplied heatshrink to insulate the open end of Temperature Sensing cable.

If temperature compensated charging is required, attach the ring terminal of the Temperature Sensing cable to the auxiliary battery terminal. For best results, attach the ring terminal to the auxiliary battery plastic surface with thermal conductive adhesive such as 3M TC-2810 or equivalent.



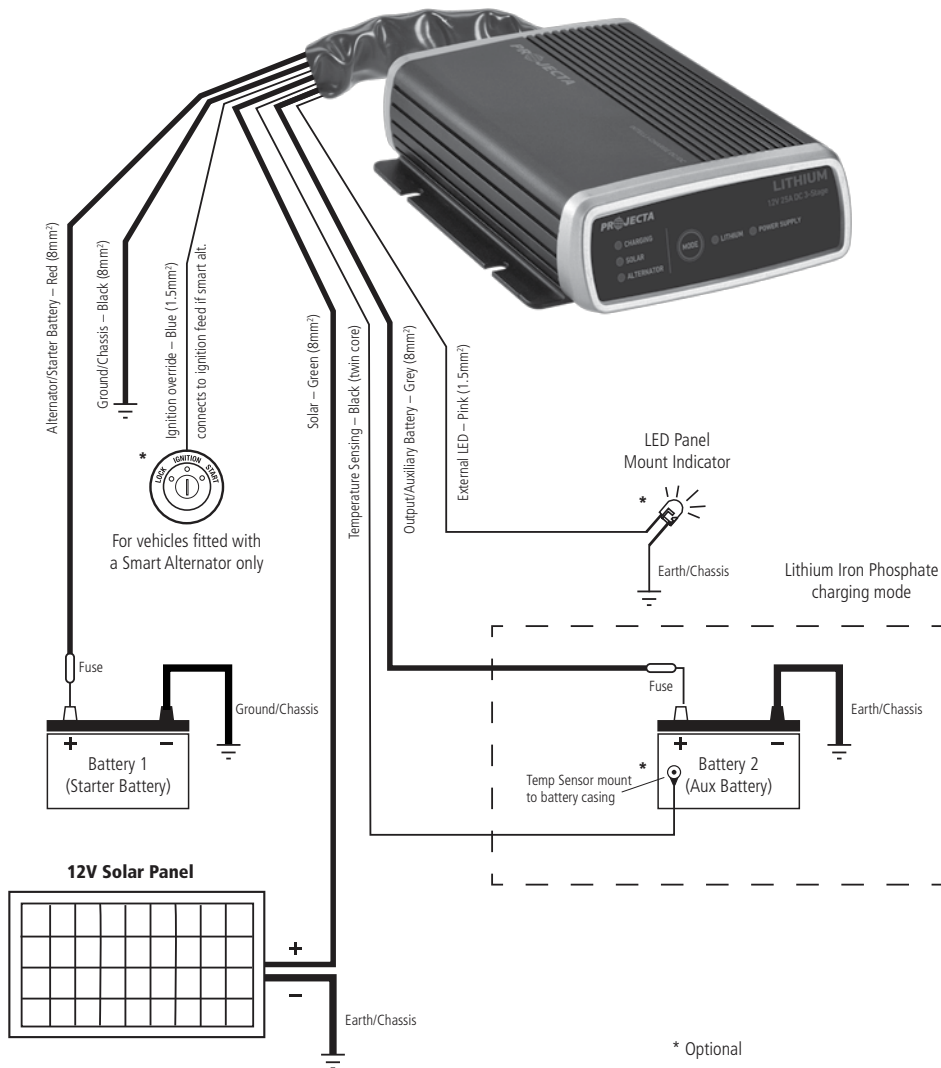
## SELECTION OF OPERATING MODE

Press the Mode button on the front panel until all operating mode indicators (LEDs) are flashing. Keep pressing the button momentarily until the Operating Mode LED you want is flashing. After you release the button, your selection is entered and saved. Your selection will be restored automatically even after the IDC25L is fully disconnected and reconnected. Lithium charging is the default mode.

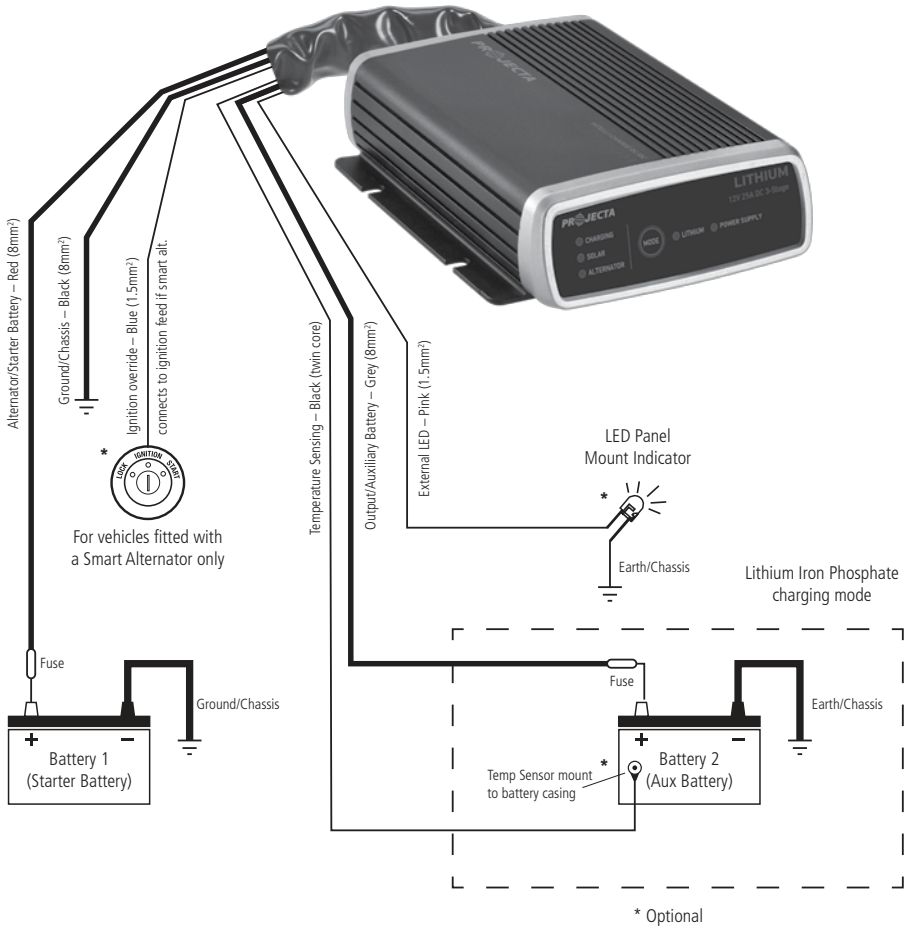


# TYPICAL WIRING INSTALLATION

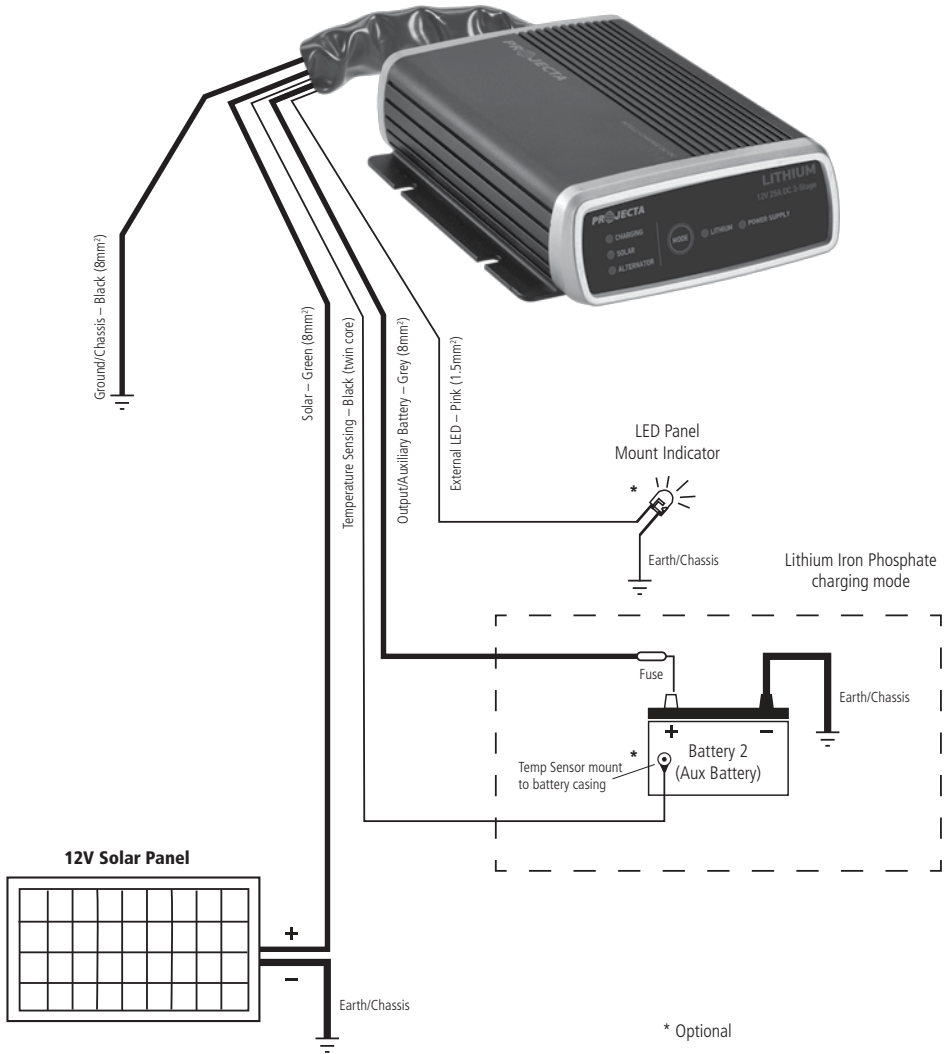
## 1. Full System



## 2. Alternator/Starter Battery Input Only



### 3. Solar Battery Input Only



## HOW TO READ LED DISPLAY



### LED Charge Indicators

Charging LED	Operating Mode LED	Charging Stage
GREEN Flashing	Solid BLUE	Soft Start/Bulk Charge
GREEN Flashing	BLUE Flashing	Adsorption Charge
Solid GREEN	Solid BLUE	Float Charge

### Fault LED Indicators

Charging LED	Solar LED	Alterator LED	Operating Mode LED	Fault	Remedy
Solid RED				The unit is faulty	Check if there is any output current from the unit
Amber Flashing				Bulking charging time out	Auxiliary battery may be faulty or heavy load is connected to the battery for long time
Solid RED			BLUE Flashing	Output battery is reversely Connected	Check output cable connection
RED Flashing			BLUE Flashing	Overvoltage is detected at output	Check auxiliary battery voltage
Solid AMBER			BLUE Flashing	Output open circuit or dead Battery	Check auxiliary battery voltage & cable connections
	Solid RED			Solar Input is reversely connected	Check Solar input connection
	RED Flashing			Overvoltage is detected at Solar Input	Check solar panel open circuit voltage
		Solid RED		Alternator Input is reversely connected	Check Alternator input connection
		RED Flashing		Overvoltage is detected at Alterantor	Check vehicle battery voltage

## **FREQUENTLY ASKED QUESTIONS**

### **Q. Is the IDC25L waterproof?**

- A. The Projecta IDC25L is designed to be dust and weather proof. Normal use including river crossings and light engine washing will not pose any problem. Direct high pressure washing of the IDC25L unit or submersion for a period of 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. High Capacity 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 IDC25L 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. When Charging LED is in Solid Green and one of the operating mode LED is in Solid Blue, it indicates the auxiliary battery is in full charged.

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

- A. Check the cable size. The IDC25L is designed to power on and charge from an input source as little as 9V. If small size cables are used for wiring, the voltage might drop below 9V when IDC25L is attempting to start up. Please refer to Installation – wiring section for recommended cable size.

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

- A. In some cases batteries can be discharged 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 IDC25L is designed to charge an auxiliary battery from as little as 2 Volts. If the voltage is lower than 2 Volts use a pair of booster cables to connect between two batteries to provide more than 2 Volts to the battery being charged. The IDC25L 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 discharged 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 may not recover.

**Q. What is a Faulty Cell?**

- A. 12 Volt Lithium Iron Phosphate batteries contain 4 cells and one faulty cell is enough to ruin your battery. The battery must be replaced if a faulty cell occurs.

**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).