



# 6/12/24 VOLT AUTOMATIC/MANUAL WORKSHOP BATTERY CHARGER



## **WARNING**

- Explosive gases. Prevent flames and sparks. Provide adequate ventilation during charging.
- Before charging, read the instructions.
- For indoor use. Do not expose to rain.
- For charging lead acid batteries ONLY (of the size & voltage specified in the specifications table).
- Always charge the battery on the correct voltage setting. Never set the charger to a higher voltage than the battery.
- Disconnect the 240V mains supply before making or breaking the connections to the battery.
- Do not attempt to charge non-rechargeable batteries.
- Never charge a frozen battery.
- 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.
- Charge the battery in a suitable area, as the battery may give off corrosive fumes which could damage delicate surfaces.
- Ensure all vehicle accessories and lights are turned off prior to charging.
- If the AC cord is damaged, it must be returned to an authorized Service Center.

# FEATURES

## Automatic Charging

When in automatic mode the charger will stop charging the battery when the battery is fully charged. You can leave the charger connected to the battery without risk of overcharging. Once the battery is full, the battery charger will automatically start to maintain the battery. The charger monitors the battery voltage and continues to top up the battery, keeping it fully charged and ready for use.

## Manual Charging

The charger in this mode will continue to charge the battery until the timer finishes or is turned off and requires the user to monitor the charging battery. When used by experienced users it can deliver an equalization charge to balance the voltage in the battery's cells.

## LED Indication

- |                               |  |
|-------------------------------|--|
| OVERLOAD (Red LED Flashing):  | The LED will flash when the transformer or the current regulators (SCR's) have got too hot |
| POWER ON (Red LED ON):        | The LED comes on when connected to power and the charger is switched on                    |
| POWER ON (Red LED Flashing):  | Indicates that the battery clamps have been connected in reverse polarity                  |
| Charging (Orange LED on):     | The LED comes on indicating charging   |
| Fully charged (Green LED on): | The LED comes on when the battery is charged   |
| VOLT (Red LED ON):            | The LED indicates that Voltage is being displayed  |
| AMP (Red LED ON):             | The LED indicates that Amps or current is being displayed                                  |

## LED Voltage/Amp Display

The charger has a VOLT and AMP meter built in. When the charger is initially powered up the display will show voltage. When the VOLT / AMP button is pressed the Amps will be displayed, press the button again the display will go back to Volts. When Volts is displayed this indicates the state of charge of the battery, when Amps is displayed this indicates how much charge is being accepted by the battery.

## Override Button

The battery charger measures the battery voltage at the clamps to determine if the battery is correctly connected. A reading above 3V will activate the battery charger. In some instances where the battery is extremely flat, it is possible to have correct connection and the battery to be below the 3V limit. In this instance check the battery leads to ensure they are connected correctly and press the OVERRIDE button to activate the battery charger.

## Multi Voltage

Suitable for charging 6V, 12V & 24V batteries.

## Engine Start

If you need to get going and the battery is flat then the engine start will help you out. Connect the charger to the battery, set it to engine start mode for 5 minutes, then start your engine.

## 0–14 Hour timer

Automatically turns the battery charger off after a set time. The timer has 1 hour intervals with a maximum of 14 hours. This switch can also be set to permanently ON.

## Toroidal Transformer

Using the latest technology in transformer design, toroidal transformers don't use a solid iron core (like traditional transformers) making them lighter and more compact. They deliver more power than a traditional transformer charger of the same size.

## Protection features

The charger is fitted with the following protection features:

1. Reverse polarity protection – Where the battery leads are connected incorrectly the charger will flash the power LED and not charge the battery.
2. Short circuit protection – There is no voltage at the leads until the battery clamps are connected to the battery.
3. Overload protection – To prevent damage to the electronics the charger will switch off when overloaded, it will automatically reset when safe. The overload LED will flash in these times.

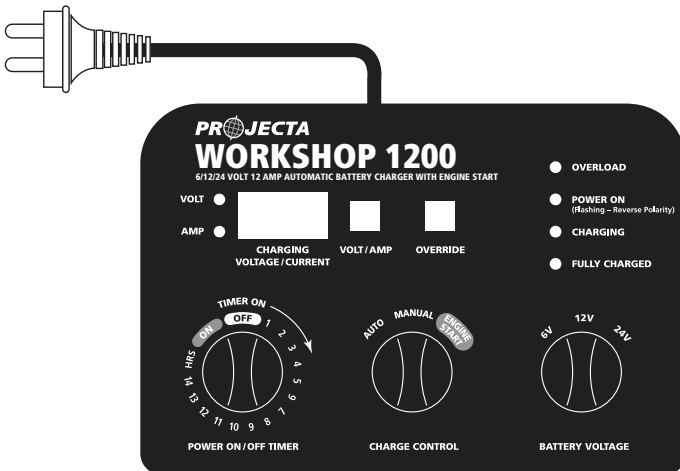


Image of HDBC20 (HDBC35 not shown)

# SPECIFICATIONS

PART NO.	HDBC20	HDBC35
Type:	Manual and Automatic	Manual and Automatic
Input: Input power:	240VAC 50HZ 1.35A (324W)	240VAC 50HZ 2.65A (636W)
Output Voltage: (Nominal) Output Current: (Continuous)	6VDC/12VDC/24VDC 12A @ 6VDC 12A @ 12VDC 7.7A @ 26VDC	6VDC/12VDC/24VDC 21A @ 6VDC 21A @ 12.5VDC 13.5A @ 26VDC
Suitable for charging	6V, 12V, 24V, lead acid batteries	
Battery Range: (CCA) (MCA) (Ah)	450–1200 600–1400 65–160	550–2000 700–2500 75–250
Minium Start Voltage:	0V	0V
Charge control: Cut Out 6V 12V 24V Cut In 6V 12V 24V	7.1V 14.2V 28.4V 6.7V 13.4V 26.8V	7.1V 14.2V 28.4V 6.7V 13.4V 26.8V
Output lead specifications:	6mm <sup>2</sup> cable 183cm	6mm <sup>2</sup> cable 183cm
Size:	301 x 264 x 161mm	301 x 264 x 161mm
Weight:	8.6kg	11.5kg

# CHARGING & ENGINE START INSTRUCTIONS

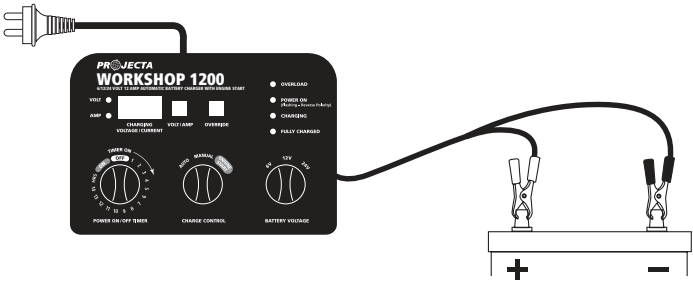
## STEP 1 – CHECK THE ELECTROLYTE LEVEL

Prior to charging the battery, remove the vent caps and check the electrolyte level. (Not required on sealed & maintenance free batteries). The electrolyte should be 6mm (1/4") above the battery's plates. If low, top up the electrolyte with distilled water to the correct level and refit the vent caps.

## STEP 2A – CONNECTION OUT OF VEHICLE

Connect the RED lead (battery clip) from the charger to the Positive (+) battery post.  
Connect the BLACK lead (battery clip) from the charger to the Negative (-) battery post.

### CONNECTION OUT OF VEHICLE



## STEP 2B – CONNECTION IN VEHICLE

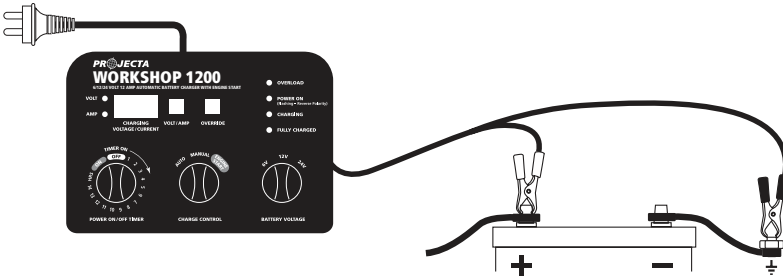
Determine if the vehicle is Positively (+) or Negatively (-) earthed. Negatively earthed vehicles have a cable (usually black) from the Negative battery terminal to the vehicle's chassis.

### Negatively earthed (Most Vehicles)

Connect the RED lead (battery clip) from the charger to the Positive (+) battery terminal.

Connect the BLACK lead (battery clip) from the charger to the vehicle's chassis away from the fuel line or moving parts.

#### CONNECTION IN VEHICLE (NEGATIVELY EARTHED)

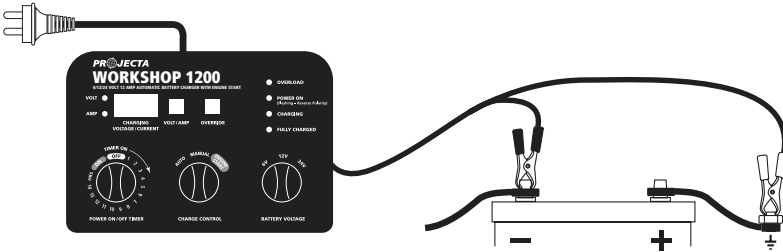


### Positively earthed

Connect the BLACK lead (battery clip) from the charger to the Negative (-) battery terminal.

Connect the RED lead (battery clip) from the charger to the vehicle's chassis away from the fuel line or moving parts.

#### CONNECTION IN VEHICLE (POSITIVELY EARTHED)



### STEP 3 – CONNECT TO 240V MAINS POWER

Connect the battery charger to the 240V mains power (ensure the battery charger POWER ON/OFF TIMER is set to the OFF position).

### STEP 4 – SET BATTERY VOLTAGE

Set BATTERY VOLTAGE switch to either 6V, 12V or 24V.

### STEP 5 – SET CHARGE CONTROL

#### AUTO

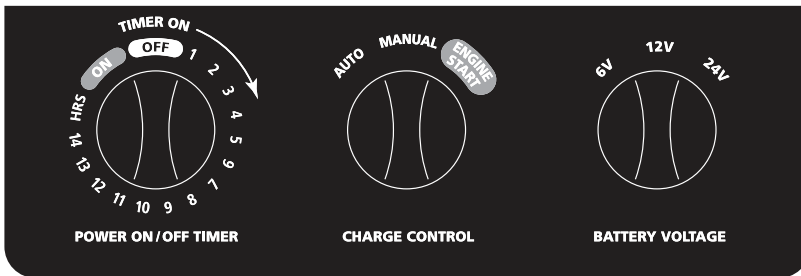
It is recommended to run AUTO mode when the battery is in the vehicle.

#### MANUAL

In this mode the charger continues to operate and may in time overcharge and damage the battery. It is recommended to use the timer with this mode.

#### ENGINE START

Use this mode to provide a rapid charge. Constant Supervision is recommended.



### STEP 6 – SET the POWER ON/OFF TIMER switch

#### ON

The charger will remain on. It is recommended using in AUTOMATIC mode.

#### TIMER

Can be used in any charging mode.



## STEP 7A – CHARGING

The POWER and CHARGING LED's will illuminate.

When the FULLY CHARGED LED illuminates charging is complete.

### Manual mode

Note: Charging will continue until the timer finishes or the power is turned off to the charger. The battery needs to be monitored to ensure it does not overcharge.

## STEP 7B – ENGINE START

- Allow the charger to boost charge the battery for 5 minutes.
- Turn the cars ignition key to start the engine.
- If engine fails to start after 3 seconds, wait 5 minutes before attempting to start the engine again.

NOTE: Do not repeat this operation more than 5 times.

## STEP 8 – DISCONNECTION.

Ensure the power selection switch is set to the OFF position and disconnect from the 240V supply.

### Battery out of vehicle

Remove the BLACK lead (battery clip) from the battery. Remove the RED lead (battery clip) from the battery.

### Battery in vehicle

Remove the chassis connection. Remove the battery terminal connection.

## CALCIUM BATTERY CHARGING OR EQUALIZATION CHARGE

Calcium batteries are becoming more commonly sold as they have a longer shelf life (4 times longer than a lead antimony battery), they also have a better ability to withstand higher engine bay temperatures, and have increased cranking output. They also require a different charging technique when left flat or when deeply discharged.

## STEP 1 to 3

Follow STEPS 1 to 3 of the Charging instructions of this booklet. Ensure that the battery is removed from the vehicle to prevent the batteries electrolyte from spilling over and damaging the car or engine bay.

## STEP 4 – SET BATTERY VOLTAGE

Set switch to either 6V or 12V depending on what battery voltage you are charging. For 24V vehicles the batteries should be disconnected and the two 12Volt batteries need to be charged separately.



#### **STEP 5 – SET CHARGE CONTROL TO AUTO**

#### **STEP 6 – SET the POWER ON/OFF TIMER switch to ON**

#### **STEP 7 – WAIT for the 'FULLY CHARGED' LED to illuminate.**

#### **STEP 8 – SET CHARGE CONTROL to MANUAL**

#### **STEP 9 – SET DISPLAY TO READ VOLTAGE**

#### **STEP 10 – CHECK THE BATTERY**

Set the POWER TIMER to 2 hours and check the battery every 30 minutes to ensure it does not get too warm and the batteries electrolyte is not bubbling profusely. You may need to may need to reset the timer after 2 hours.

#### **STEP 10A – CHARGING 6 VOLT BATTERIES**

Wait for the voltage to reach 8.0 Volts and then turn the charger off.

#### **STEP 10B – CHARGING 12 VOLT BATTERIES**

Wait for the voltage to reach 16.0 Volts and then turn the charger off.

#### **STEP 11 – DISCONNECT THE CHARGER FROM THE BATTERY**

- a. Ensure the battery charger is off and is disconnected from the 240V supply.
- b. Remove the leads from the battery.
- c. Check the electrolyte if possible. The electrolyte may need to be topped up after charging.

## FREQUENTLY ASKED QUESTIONS

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

- A. The battery charger's GREEN 'FULLY CHARGED' LED will illuminate to indicate when the battery is fully charged. 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. Why does the battery charger have two ratings?

- A. Battery chargers for automotive use have traditionally been given an RMS rating in the past. This rating is now used as an industry reference only. Australian Standards now require all battery chargers to be rated at the charger's continuous output at a nominated voltage, we express this as mA (milliamps) rather than A (Amps) to avoid confusion.

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

- A. There are four 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.
  4. The BATTERY VOLTAGE setting on the charger is set lower than the battery voltage.

### 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 while. 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 eight 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, as the battery needs replacing.

### Q. I have connected the charger properly but the 'Orange' charging light does not come on?

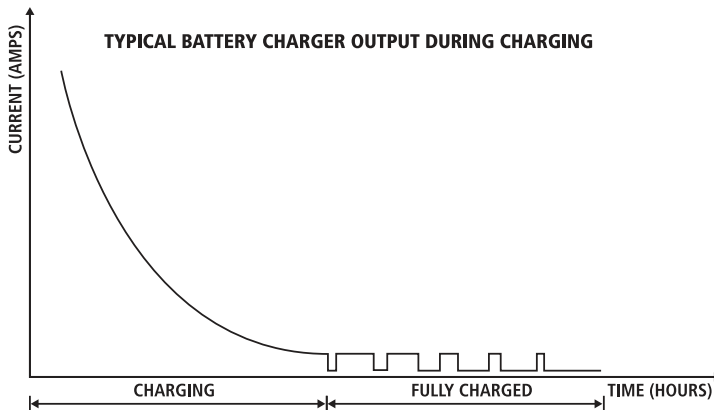
- A. In some cases batteries can be flattened to the point where they have very little or no Voltage. This can occur if a small amount of power is used for a long time, for example a map reading light is left on for a week or more. Projecta automatic chargers are designed to charge from as little as 3 Volts. If the voltage is lower than 3.0V press the override button to start the charger.

**Q. Can I use the charger as a power supply?**

A. Projecta automatic chargers are designed to only supply power to the battery clips when they are correctly connected to a battery, this is to prevent sparks or damage to the charger or battery if connected incorrectly by mistake. This safety feature prevents the charger from being used as a 'Power Supply'. No Voltage will be present at the clips.

**Q. In maintenance mode why does the current go high then low again?**

A. While in maintenance mode it is normal for the current to go high and then low. The charger is maintaining the battery voltage between the Cut-In and Cut-Out voltages. The pulses of power are topping up the battery to maintain it fully charged.



**Q. What are Volts and Amps?**

**VOLTS**

The term voltage refers to the electrical force or electric potential to do work between two terminals or a good analogy is water pressure in a pipe. For example a battery has 12 Volts between the positive and negative terminals, or a 6 Volt battery has 6 Volts between the positive and negative terminals.

**AMPS**

The term AMPS is the unit of measure used for current. Which can be described as the flow of electric charge in a circuit. Again if you use the water analogy this would refer to how much water is flowing through the pipe. For example if the current is reading 12 Amps then this is the amount of energy going into the battery.

**Q. How does a typical battery charge?**

- A. A typical flat battery has a low internal resistance, when first connected to a charger the battery will accept a high current. As the battery slowly charges, the voltage and internal resistance will rise causing the battery to accept less and less current.

