PROJECTA

INTELLI-CHARGE WORKSHOP

BATTERY MANAGER

35A 12/24V & 150A 12V

P/No.s HDBM35, HDBM150

GENERAL INFORMATION

OVERVIEW

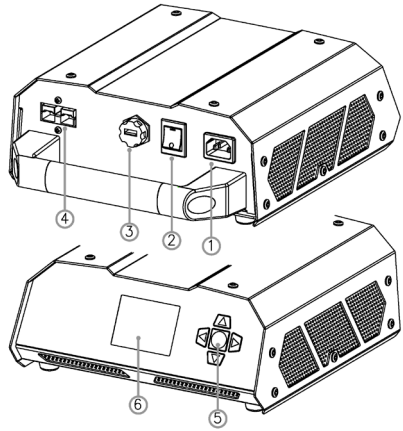
This series of workshop chargers are designed for industrial usage in the modern workshop environment. They can be used for a range of applications from Battery Charging & Maintenance, Diagnostics & Power Supply, Showroom Battery Support and Battery Testing. They are compatible with different Lead-Acid chemistries as well as new $LiFePo_4$ lithium batteries. In Diagnostic mode they can output constant voltage for various vehicle service operations such as fault finding, module re-programming and battery support during other operations. In the Showroom mode they can supply the current needed by a vehicle in Demonstration mode allowing all of the features of the vehicle to be shown without draining the battery. The Test function can be used to check the condition of the vehicle's starting battery as well as the starter motor. The workshop chargers also feature a self-calibration mode in the event of any component changes.

MAIN FEATURES

- Advanced SMPS technology and patented battery charging and reconditioning technology.
- Power factor correction (PFC).
- Automatic multi step charging mode.
- Ability to properly charge multiple battery types: Flooded, AGM, EFB, GEL and Lithium ($LiFePo_4$) batteries.
- Multiple rates of charge and charging parameters to suit various battery capacities.
- Automatic detection of: short-circuited battery cells and sulphated batteries.
- Automatic reconditioning and cell balancing.
- Diagnostic mode featuring constant voltage output.
- Showroom mode ensures power compensation for a vehicle in Demonstration mode.
- Modern Color TFT display and intuitive user interface.
- Auto-detect – automatic restart function in both Charge and Showroom mode following a cut in AC power.
- Charge and Showroom mode settings automatically memorised by Auto-detect system.
- DC Output charging cable integrity check function.
- Firmware update compatible through USB port.

PRODUCT OVERVIEW

1. AC Input Socket
2. Main On/Off Switch
3. USB Firmware Update Port
4. DC Output Sockets (+/-)
5. Menu Navigation Keys
6. TFT Display



IMPORTANT SAFETY INFORMATION

SAVE THESE INSTRUCTIONS, THIS MANUAL CONTAINS IMPORTANT SAFETY AND OPERATING INSTRUCTIONS KEEP IT WITH OR NEAR THE CHARGER AT ALL TIMES.

WARNING

- RISK OF EXPLOSIVE GASES WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. EXPLOSIVE GASES DEVELOP DURING NORMAL BATTERY OPERATION. IT IS IMPORTANT THAT EACH TIME BEFORE USING YOUR CHARGER, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.

  This device has been designed for trained professionals and according to the codes of practice valid at that time. It is safe to operate, but please make sure to read and understand this user manual beforehand. It can be dangerous if it is used by non-professionally trained personnel or in an incorrect way. The manufacturer cannot be held responsible for the incorrect use of this device. Please follow these steps for maximum safety.
- For indoor use. Do not expose to rain.
- Always wear safety equipment: goggles, gloves, ear protection and appropriate attire.
- Only use accessories or attachments approved by the manufacturer.
- Modifications or alterations to this device are forbidden. Repairs and service can only be performed by an official authorized center. Damaged cords, cables, chargers or devices must be immediately fixed or replaced.
- Explosive gases may be released by a battery when charging - it must be placed in a well-ventilated area, away from flames and sparks.
- Avoid short circuits and never have the clamps touch each other, or any metal part at the same time.
- This appliance can be used by children from 8 years and above and persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, only if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children shall not play with the appliance and should be supervised to ensure this.

- Cleaning and user maintenance shall not be made by children without supervision.
- To reduce risk of a battery explosion, follow these instructions and those published by the battery manufacturer and/or the manufacturer of any equipment you intend to use or have nearby. Review all the cautionary markings.
- Do not expose charger to rain, snow, or liquids. Never submerge in water, burn or throw away in domestic waste.
- Safety equipment, such as fire extinguisher or water to rinse eyes, should always be nearby. Also make sure someone else is nearby in case of emergency.
- If battery acid enters in contact with your eyes, skin or clothing, wash immediately with soap and water. If acid enters in contact with your eyes, immediately flush them with running cold water for at least 10 minutes and get medical attention immediately.
- Remove personal metal items when working near engines/motors and batteries.
- Always read the vehicle's user manual before connecting any charger to the vehicle or its battery.
- Do not attempt to charge a marine (boat) battery while the boat is on or near the water. A boat must be on a trailer and located indoors before attempting to charge its battery(s). The boat manufacturer's instructions must be followed exactly.
- To reduce risk of damage to the electric plug and cord, pull the plug rather than the cord when disconnecting the charger.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent, or similarly qualified persons in order to avoid a hazard.
- An extension cord should not be used unless absolutely necessary. Use of improper extension cord could result in a risk of fire and electric shock. If an extension cord must be used, make sure that the pins on plug of the extension are the same as on the charger, and that the extension cord is properly wired and in good electrical condition. The wire size must be large enough and related to the AC amperage rating of the charger.
- If this device has been dropped, is damaged or is leaking, please have it controlled right away by an authorized agent.
- Appliances containing batteries which contain hazardous materials for the environment:
  a) Batteries contain lead and dilute sulfuric acid. Dispose of the battery in accordance with federal, state and local regulations. Do not dispose of the battery in a landfill, lake or natural environment. It must be recycled properly.
  b) Scrap and replace the VRLA battery at or before the time indicated on the battery or in the user's manual. Usage beyond the required time of service can cause fluid leakage due to damages to the container, or cause fire due to power leakage.
- Battery chargers for charging automobile batteries:
  a) The battery terminal not connected to the chassis has to be connected first. The other connection is to be made to the chassis, remote from the battery and fuel line. The battery charger is then to be connected to the supply mains.
  b) After charging, disconnect the battery charger from the supply mains. Then remove the chassis connection and then the battery connection.

- NEVER smoke, allow a spark or flame in vicinity of battery or engine.
- Do not use the battery charger for recharging dry-cell or non-rechargeable batteries that are commonly used with home appliances. These batteries may burst and cause personal injuries and/or property damages.
- NEVER charge an inappropriate type of battery, or an inappropriate voltage.
- Always store the clamps correctly after each use.
- Battery acid and gases can be dangerous, never touch or inhale them. Be careful when operating inside engine bays. Moving parts may cause injuries. Never use this device to start or recharge a frozen (very cold) battery. It could be very dangerous.
- Always check the voltage of the vehicle's battery before trying to recharge it.
- Please recycle this device, batteries and their packaging properly. Always keep the device at room temperature.

PREPARING TO CHARGE

- If it is necessary to remove the battery from the vehicle before charging, ensure that the vehicle is off before disconnecting the battery. When disconnecting, always remove the negative battery connection first. Ensure that the environment around the battery and charger is well ventilated.
- Clean the battery terminals (Be careful to keep any dislodged corrosion away from your skin and eyes). If needed, add distilled water to each battery cell until the acid reaches the level specified by the battery manufacturer. This helps purge excessive gas from the cells. Do not overfill. Carefully read and follow the vehicle and battery manufacturer's recharging instructions. Specific precautions, such as removing or not removing the cell caps while charging and recommended rates of charge should be followed.
- Determine the voltage of the battery, according to the vehicle's or battery manufacturer and ensure it matches the output characteristics of the battery charger.

CHARGER LOCATION AND CONNECTION PRECAUTIONS

- Place the charger as far away from battery as the cables permit. Never place the charger directly above the battery being charged, or vice versa. Gases from the battery will damage the charger, never allow battery acid to drip on the charger.
- Do not operate the charger in a closed area or without adequate ventilation.
- The charger must be disconnected from the AC supply before connecting or disconnecting from a battery.
- Never allow the clamps or output terminals to touch each other creating a short circuit.
- If problems arise connecting the output leads, solicit the aid of your Dealer to find a solution for your application.

STEPS WHEN A BATTERY IS INSTALLED INSIDE THE VEHICLE.

A SPARK NEAR A BATTERY MAY BE DANGEROUS. HOW TO REDUCE THIS RISK:

- Ensure that any cables are far from moving parts or pinch points when using the charger.
- Stay clear of fan blades, belts, pulleys, and any other parts that could cause personal injury.
- Ensure that the polarity of the connections is correct: the POSITIVE (Red, POS., P, +) post usually has a larger diameter than the NEGATIVE (Black, NEG., N, -). If you are unsure, use a voltmeter to check the terminal polarities.
- Determine which post of battery is grounded (connected) to chassis; For negative-grounded vehicles, first connect the POSITIVE clamp to the POSITIVE (POS., P, +) ungrounded terminal of battery. Then connect the NEGATIVE clamp to the vehicle's chassis or engine block away from the battery.
- Do not connect the charger to any part of the vehicle other than the battery terminals or negative ground post.
- Connect charger AC supply cord to electrical outlet
- When disconnecting charger, turn the charger off, disconnect the charger from the AC power, remove the clamp from the chassis, and then remove the clamp connected to the battery terminal. See operating instructions for duration of charge information.

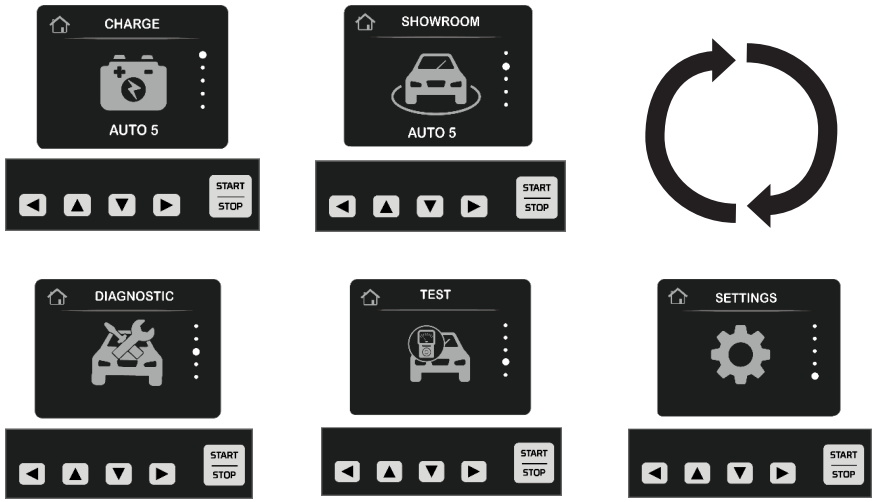
FOLLOW THESE STEPS WHEN THE BATTERY IS OUTSIDE THE VEHICLE.

WARNING: SPARKS NEAR A BATTERY MAY CAUSE EXPLOSIONS.

- Check the polarity of the battery terminals. (+ / -)
- Connect the Positive clamp to the Positive battery terminal.
- Position yourself as far away from battery as possible and connect the Negative clamp to the Negative battery terminal.
- Do not face the battery when completing the connections.
- Connect the AC supply cable to the electric socket and turn the charger on.
- When disconnecting the charger, complete the steps in reverse.

OPERATING INSTRUCTIONS

1. BROWSING THE MAIN INTERFACE



2. MAIN INTERFACE MODE

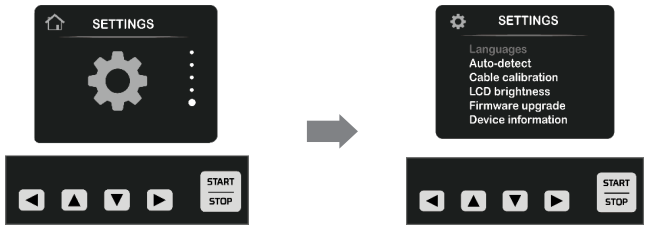
The device provides 5 Main Interface with the following modes:

CHARGE MODE ➡ SHOWROOM MODE ➡ DIAGNOSTIC MODE ➡ TEST MODE ➡ SETTINGS MODE

Press ◀ ▶ to enter the Main menu or return to the previous menu.

Press ▲ ▼ to cycle between the various modes and settings

3. SETTINGS



Operation:

Step 1: Press ▶ to ENTER the SETTING submenu.

Step 2: Press ▲ ▼ to Select the desired setting.

Step 3: Press ▶ to CONFIRM and proceed into the desired settings menu.

Settings Displayed: LANGUAGE; AUTO-DETECT; CABLE CALIBRATION; LCD BRIGHTNESS; FIRMWARE UPDATE; DEVICE INFO

LANGUAGE SETTINGS

Operation:

Step 1: Press ▶ to ENTER the LANGUAGE Submenu.

Step 2: Press ▲ ▼ to Select the desired language.

Step 3: Press ▶ to Confirm the selected language.

Languages Displayed: English; French, Germany, Spanish, Russian, Italian, Dutch

AUTO-DETECT SETTING

Operation:

Step 1: Press ▶ to ENTER the AUTO - DETECT Submenu.

Step 2: Press ▲ ▼ to Select the desired setting.

Step 3: Press ▶ to Confirm the AUTO - DETECT setting.

Settings Displayed: CHARGE ON / OFF; SHOWROOM ON / OFF

If the AUTO-DETECT is ON, the charger will automatically restart the CHARGE or SHOWROOM modes following an AC power cut. Please see the CHARGE MODE or SHOWROOM MODE introduce in the sections 4. and 6.

CABLE CALIBRATION SETTING

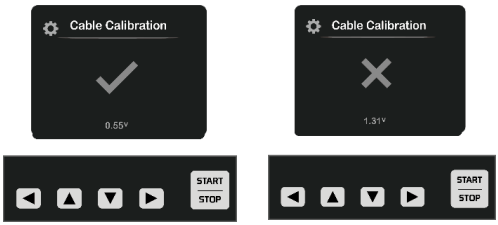
Operation:

Step 1: Press ▶ to ENTER the CABLE CALIBRATION Submenu.

Step 2: Connect the positive and negative clamps together ensuring a solid connection.

Step 3: Press the Start/Stop button. The charger will automatically test the output cables.

Settings Displayed:



Important: If the DC output cables need to be replaced, consult your distributor to order a replacement set. Only DC output cables approved by the manufacturer can be used with this device, once the cables have been replaced, they must be calibrated as shown above.

LCD BRIGHTNESS SETTING

Operation:

Step 1: Press ▶ to ENTER the LCD BRIGHTNESS Submenu

Step 2: Press ▶ to Set the desired brightness level.

The default setting is set at 50%.

FIRMWARE UPDATE SETTING

Operation:

Do not attempt to update the Firmware with any other updates than those released by the manufacturer. Critical damage can occur if unapproved updates are applied or updates are applied incorrectly.

Step 1: Download the firmware update onto an empty USB storage device. Connect the storage device to the Charger through the USB port.

Step 2: Press ▶ to Enter the Firmware update submenu

Step 3: Press ▲ ▼ to set the four-digit code provided by the manufacturer to unlock the update mode.

Step 4: Press the Start/Stop button. The device will automatically update the firmware version.

Step 5: Once the firmware update is complete, press any key to restart the charger with the updated software.

DEVICE INFORMATION

Operation:

Press ▶ to Enter the Device information display:

Display: Firmware version, the TFT firmware version, the Product rating, etc.

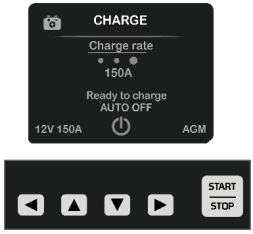
4. CHARGE MODE

The chargers advanced software is optimized to correctly and completely charge a wide variety of battery types and chemistries; including Lead-Acid (WET/Flooded, AGM, EFB, GEL) and Lithium ($LiFePo_4$).

Once the CHARGE Mode is selected, the charging voltage, battery type and charging voltage can be entered.

Ensure that the input parameters (nominal voltage, battery type, charging current) are correct for the battery that you are attempting to charge, that they meet the battery manufacturer's specifications and that you have read the battery's recharging instructions. Failure to respect the battery specifications may result in damage to the charger, the battery, the vehicle, property, or personal injury.

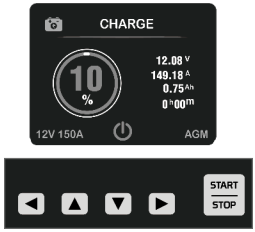
Charging Mode Operation:



Step 1: Press ► ◄ to ENTER or EXIT the charge mode

Step 2: Press ▲ ▼ to Select the desired parameter

Step 3: Press START/STOP to Start or Stop the charging process.



Displayed Values During Charging:

Charging Percentage: indicates percentage of charge (%).

Current: displays the charging current (A)

Voltage: displays the charging voltage (V)

Ah: displays the Amp-hours recharged.

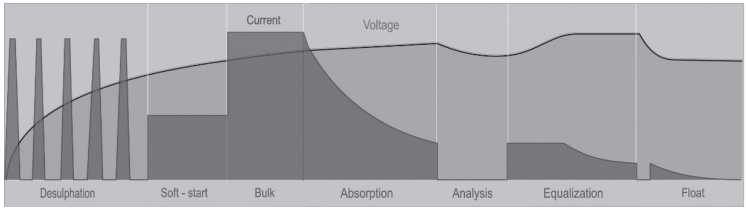
Time: displays the duration of charge

Smart Charging Process:

Important: Ensure the selected mode and parameters match the type of battery you are attempting to charge

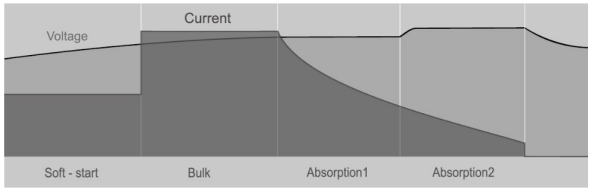
7-stage charging process for Lead-Acid Batteries:

De-Sulphation (if needed) ➡ Soft-Start ➡ Bulk Charge ➡ Absorption ➡ Analysis ➡ Equalization ➡ Float Charge ➡ (21 Days reset period)



5-stage charging process for LiFePO4 Lithium Batteries

Soft-Start ➡ Bulk Charge ➡ Absorption (CV1+CV2) ➡ Recharge ➡ 21 Days reset period



Charging Processes:

De-Sulphation:

In this stage rising voltage and high current pulses are applied to the battery to recover sulphated batteries.

De-sulphation current control: 25% of Bulk current delivered.

Soft-Start:

In this stage rising voltage and a maximum of 50% of bulk stage current is applied to the battery to begin the charging process.

Bulk Charge:

In this stage rising voltage and maximum user defined current is applied to the battery.

- 5~100Amp adjustable for the HDBM150
- 1~35Amp adjustable for the HDBM35

Absorption:

In this stage a constant voltage and tapering current is applied to the battery to ensure it reaches 80% state of charge.

Absorption stage voltages for each battery chemistry:

GEL Battery	14.1V
AGM Battery	14.4V
EFB Battery	14.5V
WET/Flooded Battery	14.7V
$LiFePO_4$ Battery	Absorption CV1 =14.0V
	Absorption CV2 =14.2V

x2 for 24V mode (HDBM35 only)

Analysis:

In this stage the charger tests the battery again in order to detect bad cells and high levels of sulphation (only for Lead-Acid batteries).

Equalization:

In this stage a higher voltage and low current is applied in order to balance the internal cells of the battery (only for Lead-Acid batteries).

Maximum equalization stage voltages for each battery chemistry:

AGM BATT	14.5V
WET/Flooded Battery	14.6V
Flooded BATT	15.5V
Equalization current control	15% of Bulk Current

x2 for 24V mode (HDBM35 only)

Remarks: the interface will display 80~99% charged during the Absorption and Equalization stage.

Float:

Compatible only with Lead-Acid batteries this stage is used for long term battery maintenance.

Float Voltage: 13.6V

Remarks: the interface will display 100% charged during the Float stage. If the voltage falls below 12.5V, the charger will automatically return to the Bulk mode.

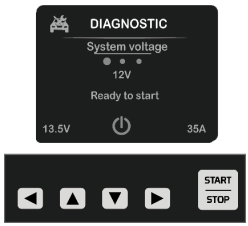
LiFePo$_4$ Recharge Stage:

If the battery voltage falls below 12.8V, the charger will automatically return to the Bulk mode.

If AUTO-DETECT is ON: the charger will automatically restart the charging process from where it was interrupted in case of a cut in AC power.

5. DIAGNOSTIC MODE (POWER SUPPLY MODE)

The charger will act as a stable, configurable power supply during vehicle diagnostics, repair and module programming.

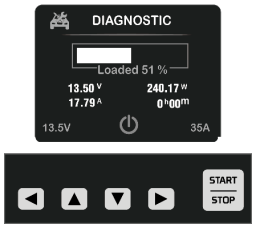


Step 1: Press ► ◄ to Enter or Exit this Mode.

Step 2: Press ▲ ▼ to Select the desired parameters:

Battery Voltage; Output voltage, Maximum Output Current.

Step 3: Press START/STOP to Start or Stop the mode.



Displayed Values During Diagnostics:

Load percentage: displays the load on the charger (%)

Current: displays the output current (A)

Voltage: displays the output voltage (V)

Watt: displays the output power (W)

Time: displays the duration

Output voltage control: 12~15v (x2 for 24V mode) adjustable

Output Current Control: 5~150Amp adjustable for the HDBM150 units / 1~35Amp adjustable for the HDBM35 units.

6. SHOWROOM MODE (POWER SUPPLY MODE)

Supply power to, and maintain the battery of vehicles in demonstration mode:

Step 1: Press ▶ ◀ to Enter or Exit the mode.

Step 2: Press ▲ ▼ to Select the desired parameter:

Battery Voltage; Output voltage, Output current.

Step 3: Press START/STOP to Start or Stop Showroom mode.

Display in Showroom Mode:

Load percentage: displays the load on the charger (%)

Current: displays the output current (A)

Voltage: displays the output voltage (V)

Watt: displays the output power (W)

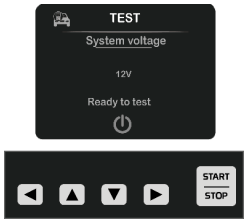
Time: displays the duration

Output Voltage: Adjustable between 12.6 - 14.5V (x2 for 24V mode HDBM35 only).

Output Current: Adjustable between 5 – 150Amp for the HDBM150 and 1 – 35Amp for the HDBM35.

7. TEST MODE

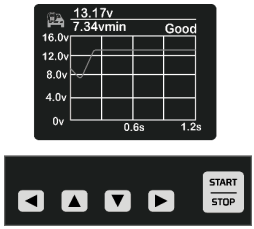
Test both the vehicle's battery and starting system performance. (Voltage and waveform)



Step 1: Press ▶ ◀ to Enter or Exit this mode.

Step 2: Press ▲ ▼ Select the correct voltage:

Step 3: Press START/STOP to Start or Stop the Testing process.



Display in Test Mode:

Battery Voltage: displays the vehicle's battery voltage (V)

Starting System: displays the voltage waveform and minimum voltage

Test Result: Excellent, Good, Needs to be recharged, Bad

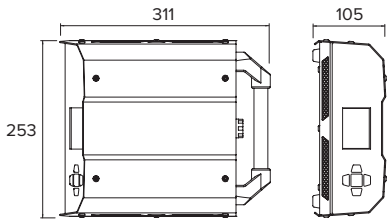
8. ABNORMAL DISPLAY AND TROUBLE SHOOTING

Abnormal Condition	Possible Cause	Suggested Solution
No battery detected	Loose connection	Check the battery and terminal connections
Battery short circuit	Incorrect connection	Check the battery and cables connections
Inverse battery connections	Incorrect connection	Reverse the polarity of the connection to the battery
Voltage is too low	If the battery voltage is less than 2-4V, the charger will not start to recharge the battery automatically	Press and hold START STOP for 3 seconds to force the charging process to start (Check the connections before activating this function)
Voltage is too high	12V batt. set with the 24V mode	Change to the correct 12/24V mode
Battery bad cell protection	Battery has failed	Replace the battery
Over-temperature protection	The charger needs to be checked	Contact your distributor
Over voltage control protection	The charger needs to be checked	Contact your distributor
Over current control protection	The charger needs to be checked	Contact your distributor
Bad battery (in Test mode)	Battery is short circuited or has failed	Replace the battery
Need to charge (in Test mode)	Deeply discharged or sulphated battery	Use the Charge mode to recharge the battery

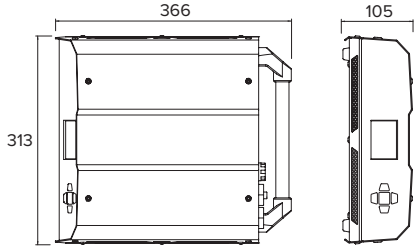
SPECIFICATIONS

Input voltage	220-240Vac 50/60Hz
Rated output	12/24Vdc 35A for HDBM35 12V Peak- 150A, Continuous 100A for HDBM150
Battery type	Lead-Acid (WET/Flooded, AGM, EFB, GEL.) or Lithium ($LiFePO_4$) starter batteries.
Suitable for battery size	5-700Ah for HDBM35 20-2000Ah for HDBM150
Operating environmental	-10~40°C, 0-90% RH.
Storage environmental	-20~85°C, 0-90% RH.
Input cable size	$1.0mm^2$ 3C WITH 3Pin SAA Plug plus IEC-C14
Output cable size	3 metre $8mm^2$ 105°C with clamps for HDBM35 3 metre $25mm^2$ 105°C with clamps for HDBM150
Net weight	Approx. 5.3 Kg for HDBM35 Approx. 9.2 Kg for HDBM150
Safety standards	EN 60335-1, EN 60335-2-29, EMC Standards: EN55014
Dimensions	HDBM35 (LxWxH: 311*253*105mm) HDBM150 (LxWxH: 366*313*105mm)

HDBM35



HDBM150



WARRANTY STATEMENT

Applicable only to product sold in Australia.

Brown & Watson International Pty Ltd of 1500 Ferntree Gully Road, Knoxfield, Vic., telephone (03) 9730 6000, fax (03) 9730 6050, warrants that all products described in its current catalogue (save and except for all bulbs and lenses whether made of glass or some other substance) will under normal use and service be free of failures in material and workmanship for a period of one (1) year (unless this period has been extended as indicated elsewhere) from the date of the original purchase by the consumer as marked on the invoice. This warranty does not cover ordinary wear and tear, abuse, alteration of products or damage caused by the consumer.

To make a warranty claim the consumer must deliver the product at their cost to the original place of purchase or to any other place which may be nominated by either BWI or the retailer from where the product was bought in order that a warranty assessment may be performed. The consumer must also deliver the original invoice evidencing the date and place of purchase together with an explanation in writing as to the nature of the claim.

In the event that the claim is determined to be for a minor failure of the product then BWI reserves the right to repair or replace it at its discretion. In the event that a major failure is determined the consumer will be entitled to a replacement or a refund as well as compensation for any other reasonably foreseeable loss or damage.

This warranty is in addition to any other rights or remedies that the consumer may have under State or Federal legislation.

IMPORTANT NOTE

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.

Distributed by

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