

1. General information

- Installing HD648 is quick, easy and requires no special skills or tools.
- HD648 is compatible with all charging systems and is protected against accidental reverse polarity connection.
- HD648 must be installed directly on the battery or battery bank.
- Multiple Units can be installed in series configuration on large battery banks to achieve voltages above 48v.
- Each HD648 conditions 2000 Ah of capacity, adding more HD648 units in series raises the rating by 2000 Ah each. For specific installation diagrams please email: info@hd648.net
- HD648 will begin to pulse the battery immediately after the commissioning sequence with the correct amount of pulse energy regardless of the load test result.
- HD648 is water, dust and vibration proof, complying to IP67 waterproof rating.

- HD648 is equipped with a 3 second start up delay to eliminate sparking upon connection to the battery.
- HD648 automatically deactivates when the temperature of the internal electronics rises beyond 115 degrees Celsius.
- HD648 is equipped with a push button 3 Mode Activation Switch to easily switch between modes to cover all applications.
- Mode 1 (Full-Time) suitable for all applications. Mode 2 (Part-Time) suitable for when radio interference is experienced on AM band, switching to mode 2 deactivates the unit while driving and re-activates the unit when the engine is off. Mode 3 (E.V.) suitable for electric vehicles if interference is experienced during operation. The factory default setting is mode 1 Full-Time.
- HD648 employs an intelligent state of health detection system, automatically adjusting the pulse output to achieve maximum de-sulphation in the shortest time possible.
- HD648 performs an industry standard battery load test (12v, and 24v applications only).

- Load test result displayed as: Green LED = battery Ok / Red LED = check battery.
- HD648 performs the load test after installation and repeats the test every 21hr (12v, & 24v applications only).
- The on-board battery load test is limited to batteries of 10 Ah capacities and above.
- HD648 is supplied with an external 5 amp blade fuse on the positive cable.

COMMISSIONING SEQUENCE UPON INSTALLATION

1. Orange (Mode) LED's light up to indicate unit start-up.
2. If the battery is below 13v (12v systems) the load test is performed or below 26v for 24v systems.
3. Red or Green LED will flash depending on the battery load test result (12v & 24v applications only).
4. Red or Green LED will flash depending on the battery state of charge test result(6v, 36v & 48v applications only).

2. Changing the Activation Mode

After HD648 has activated, press the Mode Select switch, wait for LED to confirm the activation mode has been changed.

6v system Mode 1 (unit is active above 6v)
Mode 2 (unit is active between 6v and 6.4v and inactive above 6.4v)
Mode 3 (unit is active above 6.4v)

12v system Mode 1 (unit is active above 12v)
Mode 2 (unit is active between 12v and 12.8v and inactive above 12.8v)
Mode 3 (unit is active above 12.8v)

24v system Mode 1 (unit is active above 24v)
Mode 2 (unit is active between 24v and 25.6v and inactive above 25.6v)
Mode 3 (unit is active above 25.6v)

36v system Mode 1 (unit is active above 36v)
Mode 2 (unit is active between 36v and 38.4v and inactive above 38.4v)
Mode 3 (unit is active above 38.4v)

48v system Mode 1 (unit is active above 48v)
Mode 2 (unit is active between 48v and 51.2v and inactive above 51.2v)
Mode 3 (unit is active above 51.2v)

3. Installation instructions

Remove nuts from the battery clamps. Do not remove clamps from the battery, attach the eyelet connector of the Red (+) wire onto the bolt of the positive post clamp. Repeat for Black (-) wire, attaching it to the bolt of the negative post. Diagrams for common configurations are shown on next page, for specific installation instructions please email technical support at info@hd648.net.

4. Troubleshooting

If HD648 does not activate it may be due to one of the following or a combination:

- Unit connected incorrectly (reverse polarity) – change the wires to the correct terminals.
- Bad connection – clean and tighten connection terminals of HD648 unit.
- Battery has a short – have an electrician inspect the problem.
- Battery voltage is below the activation voltage – change to mode 1 constant or recharge the battery.
- 5 amp blade fuse on positive cable is blown, open fuse holder and replace blade fuse.

5. Warning

- HD648 is supplied with wires 450mm/600mm in length so that when spread apart fully, battery terminals which are 1050mm apart can be reached. DO NOT EXTEND WIRES, AS DOING SO WILL RESULT IN LOSS OF PULSE EFFICIENCY AND VOIDING OF WARRANTY. For large battery bank installations multiple units installed in series are required (see diagrams in section 3 or email info@hd648.net for specific installation instructions)
- If checking state of health of multiple individual batteries, allow a cooling down period of 30 sec between each test to avoid damage to unit and voiding of warranty.

6. Important

- Ampere Hours (Ah) is the rating for reserve capacity for auxiliary applications and is not to be confused with Cold Cranking Amp (CCA) the rating for engine starting applications.
- Although HD648 will help reduce electrolyte boil-off, levels should be checked monthly.
- Always use caution and wear protective clothing and eye protection when working with batteries.

- Ensure unit is fixed clear of any moving parts and wires are zip tied to avoid damage.
- Do not use solvents to clean the unit.

7. Warranty

- HD648™ warranty covers defects in workmanship and materials for 10 years from purchase date.
- The warranty is not transferable and does not restart if and when a faulty unit is replaced.
- The warranty does not cover misuse, accident, alteration or abnormal operation.
- No warranty exists for usage outside specifications.
- For warranty replacement return faulty units to a HD648 reseller with proof of purchase.

8. For Applications Using 6v, 36v & 48 volt

- The red LED when used on the above voltage applications indicate that the battery has the reached 80% depth of discharge and should be recharged immediately.

HD648™



INSTALLATION & USER GUIDE

www.HD648.net

CONGRATULATIONS ON PURCHASING THE MOST EFFECTIVE TECHNOLOGY AVAILABLE TODAY FOR ENSURING MAXIMUM RELIABILITY FOR YOUR VEHICLE, VESSEL OR EQUIPMENT ELECTRICAL SYSTEM AND ON-BOARD BATTERIES.



Pulse Technology

HD648™ System is not a charger, it is a proven electronic device using a patented Pulse Technology to help batteries work harder and last longer by preventing a common cause of premature battery failure ‘Sulphation build-up on the battery plates’. Pulse Technology has been independently tested and proven by respected scientific organizations around the world to be an effective remedy against Sulphation. Pulse Technology has also been in Military use since 1974.

HD648™

How to install HD648™

- Simply install the HD648 cables onto the positive and negative battery terminals of a single battery or a battery bank (refer to diagrams in section 3).
- HD648 will start de-sulphation of the battery or batteries immediately after the installation and commissioning sequence has completed.
- Secure HD648 with screws near the battery or use a Nylon zip fastener to secure HD648 to the battery or battery cables.

What you will see after installing

- HD648 will go through a commissioning and battery load test sequence, where it will establish the health of your battery (12v & 24v applications only).
- The battery load test will then be repeated every 21 hours (12v & 24v applications only).
- HD648 will go through a commissioning and battery voltage test sequence, where it will establish the depth of discharge of your battery (6v, 36v & 48v applications only).

- The battery voltage test will then be carried out every 30 seconds so that the state of charge is continually monitored (6v, 36v & 48v applications only).
- After activation HD648 will flash either Green or Red depending on the result of the relevant battery tests mentioned above.

What do Green LED flashes mean?

- Repeated Green LED flashes (12v & 24v applications only) mean your battery successfully passed the load test and will be maintained in peak condition by having HD648 permanently installed.
- Repeated Green LED flashes (6v, 36v & 48v applications only) mean your battery is in a charged state.
- If you move HD648 to other batteries, make sure it is installed for a minimum period of 6 weeks.

What do Red LED flashes mean?

- Red LED flashes (12v & 24v applications only) mean ‘check battery’, (refer to the list of items to check below).

- Red LED flashes (6v, 36v & 48v applications only) mean that the battery or battery bank is discharged to 80% and must be recharged immediately.
- HD648 restores lost capacity due to sulphation within a minimum period of 6 weeks providing the battery is mechanically sound.

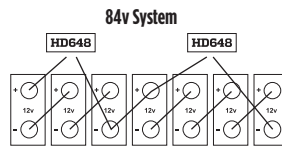
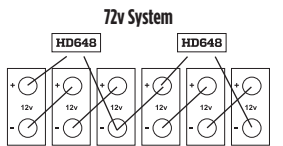
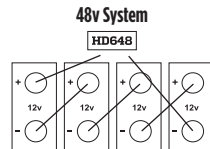
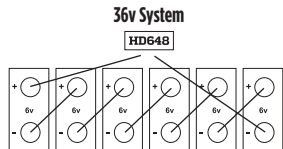
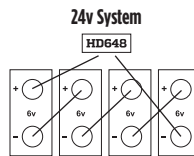
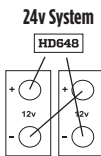
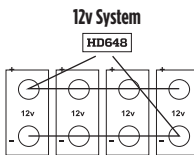
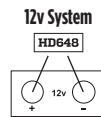
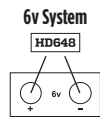
Factors resulting in Red LED Flashes CHECK THE FOLLOWING:

- Low electrolyte – add de-mineralized water to bring cell levels to maximum.
- Battery is low in charge or flat – recharge battery immediately.
- Sulphation – HD648 is designed to eliminate this problem within a minimum period of 6 weeks.
- Poor connections – Check all wires connected to the battery or batteries are firm and clean.
- Battery case distortion – batteries sag over time due to high temperatures in engine bays. Nothing can be done to rectify this problem.

- Battery plate corrosion – over time battery plates will corrode and batteries will eventually fail at the end of their service life from this.
- Plate material shedding – this is due to road vibration combined with chronic under-charging causing the plate material to be soft and fall out of the plate grid.
- By Installing HD648 charging efficiency is maximized, therefore reducing plate material shedding by keeping it firm and in place.

What you can do to help slow down Sulphation

- Keep HD648 permanently installed on your batteries.
- Refrain from discharging batteries below 50% depth of discharge.
- Recharge batteries as soon as possible after discharge.



TURN OVER FOR GENERAL INFORMATION