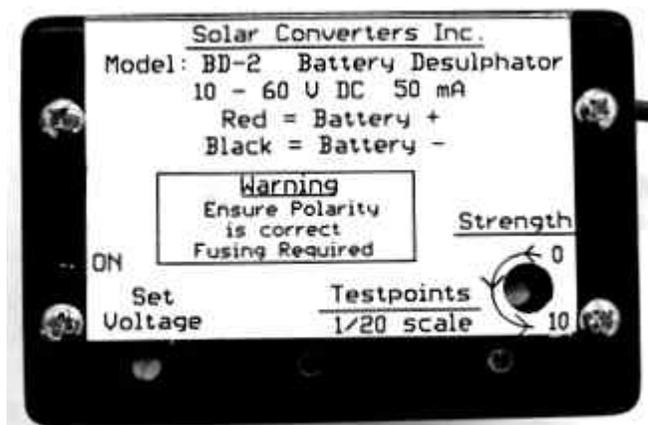


## BATTERY DESULPHATOR



(MODEL BD-2 MADE BY "SOLAR CONVERTERS")

This is a remarkable invention came on the market about a year ago and has caused considerable enthusiasm and rave reviews. It will insure that batteries last for many years and work up to full capacity all of the time. The sulfation process, described below, ruins battery performance and is very hard to keep under control. We know, we have had a lot of trouble with it, and wish such a product had been available to us when we started.

We purchased this unit for \$75 from [John Drake Services, Inc.](#) in Los Angeles (these people really know their stuff and are always available to help if you have questions).

### Application

When batteries age and/or spend time in a discharged or abused state, sulfate crystals can form on the battery plates which impede the flow of electricity and is the main cause of poor battery performance. In fact, running a battery down close to empty for just one day starts the sulfation process, and the battery will not take as much of a charge anymore. The BD-2 is a basic battery desulphator, but with advanced control techniques. The unit offers both very low cost and premium performance.

### Basic Operation

Sulfite crystals form when the battery charge is reduced and/or the discharge cycles are not well suited for the battery. These sulfite crystals act as insulators to the flow of electricity in the battery, seriously degrading the capability of the battery to have electricity flow in it, reducing its charging and discharge capability.

Like most battery desulphators, this unit uses a sharp pulse of current forced into the battery suddenly to "jar" the sulfite crystals and cause internal resonances, both mechanical and electrical, to grind down the sulfite crystals that form so they can be recombined into the battery acid.

For increased performance, this unit precisely controls the magnitude of the sharp pulse of current, which is adjustable by the user. This adjustment is important as no 2 batteries are the same and no 2 battery setups are the same. As well, battery desulphators, as they work with current spikes, may interfere with equipment connected to the unit. This adjustment allow the user to taylor the both the current spike and at what voltage it is present.

## Features

- \* Single unit 12 to 48 V nominal systems
- \* Adjustable pulse strength
- \* 0.0 Amp pulse to 10 amp pulse
- \* LED to indicate unit operating
- \* LED to indicate relative strength of battery
- \* Adjustable on/off voltage
- \* Can be adjusted to only operate when battery is near full.
- \* EXTREMELY low draw

### Electrical Specifications

Nominal battery voltages (V) 12 - 48 V DC

Maximum Input (V) 63 V DC

Maximum Pulse Current(A) 10 amps

Range of Pulse Current 0.0 Amps to 10 amps

Adjustable with small screwdriver

Range of On/Off Control 0 V to 70 V

Adjustable with Voltmeter and small screwdriver

Self Consumption < 0.05 ma from battery at full pulse

Efficiency >96% over 20% pulse load

### Mechanical Specifications

Weight:

0.3 lbs.

Size:

3" X 2" X 1.5"

Connections:

Power #16 AWG Flying Leads

Operating Temperature:

-40 to 60 deg. C

Humidity: 0 - 90% non-condensing

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## HOW TO USE THE DESULFATOR

(technical stuff)

### ***Turn on Voltage:***

Use a meter inserted into the 2 test points. Determine the voltage that you wish to operate the unit at. This is usually the battery float voltage less .5 V. The unit has a 1/20th scale

factor so divide the voltage you wish to operate at or above by 20. This voltage (1/20th scale) is the setting of the V-on pot. Adjust the set pot to set the desired voltage calculated above. The unit will now operate only when the voltage is above this set voltage. For example, a 12 V battery floats at 14 V. Thus the unit should operate at above 13.5 V (14 -0.5). Using the TP and GND setpoints and a digital multi-meter, adjust the V-On voltage set voltage using a small screwdriver to 0.65 V ( $13.5 / 20 = 0.65$  V). It is factory set to 0.65 V

### ***Pulse Strength:***

The Pot marked strength controls the magnitude of the current pulse. Its usual setting is in the middle for a 5-amp pulse. By moving the Pot to 0, the unit put out 0 amp pulses (essentially off). By moving the POT to full the unit puts out 10 amp pulses. Note: If the equipment is connected to the same battery, it may be affected in operation. This adjustment may be used to reduce interference while still having the benefits of the desulphation action.

### ***Application Notes:***

For best results and performance, the unit should only supply its pulses when the battery voltage is at or near its float voltage. Some charging sources are better than others and batteries may be of different health to begin with.

1) New batteries or batteries that will still hold over 25 % charge.

No special care is required of the setup. The battery is sufficiently strong to tame the output voltage variations of almost any charger independent of its quality that would reasonably be used with a battery of that size. Attaching the desulphators will prevent desulphation of these batteries as they go through their usual charge/ discharge cycles.

2) Badly desulphated battery

If the battery is very sulfated i.e. it cannot hold much of a charge itself, extra care to recover the battery must be taken as typical lower quality charging sources like hardware store car battery chargers or standard PWM controllers will over charge the battery as the battery does not have the capacity to “tame” the higher voltage pulses these units put out with no or very little battery attached causing other failures while it is being desulphated.

In this case, make a coil of wire by wrapping 10 turns of the wire around your hand and use this coiled wire to connect the dead battery to a good battery that has a charge controller attached to it. Connect the desulphators to the bad battery.

The wire coil forms an inductor which will block the pulses from going into the good battery so it goes into the poor battery, and the good battery with its charger will keep the bad battery from being over charged or damaged by the voltage wide variations of a lower quality charger source.

If the charger has a clean DC output (very little ripple) regulated to the float charge voltage like a DC power supply or one of Solar Converters Inc. MPPT charge controllers, the desulphators and battery can be directly connected without the need for an additional battery to tame the charger.