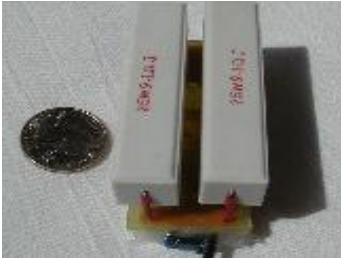


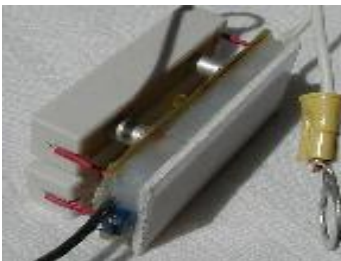
AIR Lab Vreg Battery Voltage Regulator



Comparing size with US quarter. The electronics are sealed from possible water splash. Heavy duty 25-watt cement power resistors are mounted high and away from the electronics to properly dissipate heat and to extend the lives of electronic components. Two power resistors are used to act as redundancies. Even if one of them fails, the battery would still be protected.



Top view. LED is mounted between the power resistors to reduce the overall foot-print and to allow reflection of light on the white surfaces of the power resistors so that it could be viewed from multiple angles. There is no exposed electronic components that could malfunction if wet.



Tilted view. The bottom has no conductive material. This means that it could be safely mounted on any surface without worrying about electrical shorts. Also, industrial grade double sided tapes are included to ensure secure mounting.

Technical Specification

The voltage regulator protects battery from overcharged. When it detects the battery is fully charged 14.8V, it activates its power resistors and by-passes excess current to them. In additional, it increases the regulating voltage to 15.3V slowly during equalization phase to allow for cell equalization within a battery.

Current consumption (idle)	2 mA
Current consumption (regulating)	3 A
Fuse	5 A
Regulating voltage, normal mode	14.8V (factory calibrated)
Regulating voltage, equalization mode	14.8V-15.3V

Installation Instruction

[Click here](#) to download a PDF file of the installation procedures.

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AIR Lab Vreg™ Installation Procedure (Version 03.3)

Installation Procedure

1. For safety purpose, use only electrically isolated tools, wear gloves and avoid making any complete circuit with your body at any time during installation.
2. Vehicle should be fully charged prior to installation. If batteries are brand new, fully charge each battery individually with a smart 12V charger before battery installation.
3. Power off the vehicle by depressing the BRB (big red button). Clean top surface of battery to remove dust and grease.
4. Straighten the legs of power resistors so that the power resistors are fully extended away from the base. They could be extended towards the top of the base as Fig. 1 or towards to sides of the base as Fig. 2. **NOTE: DO NOT INSTALL WITHOUT FULLY EXTENDING THE POWER RESISTORS. IF THEY ARE TOO CLOSE TO THE BASE, THE EXTREME HEAT FROM THEM WOULD DAMAGE SENSITIVE ELECTRONIC COMPONENTS AT THE BASE. WARRANTY IS VOIDED IF THIS INSTRUCTION IS NOT PROPERLY FOLLOWED.**



Fig.1



Fig. 2

5. Remove protective sticker from double sided tape and attach unit securely to battery with respect to terminal orientation indicated in Fig. 3 below. One unit of Vreg™ is needed per battery. To secure Vreg™ to the battery, press on the base with your fingers as shown on Fig. 4. **NOTE: DO NOT PRESS ON THE POWER RESISTORS.** To remove the unit, use a small flat screw driver to lift the unit off the battery as shown on Fig. 5. **NOTE: DO NOT PULL ON THE POWER RESISTORS.**



Fig. 3

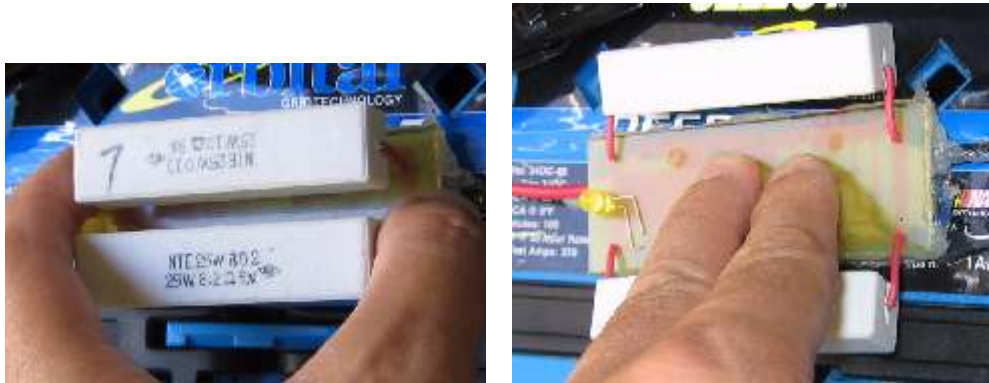


Fig. 4



Fig. 5

6. Attach red lead to terminal (+), black lead to terminal (-) and tighten the screws as in Fig. 6. If your batteries do not have extra terminals as shown, use the provided nuts to piggyback Vreg™ onto the existing connections. **NOTE: DO NOT REVERSE THE TERMINALS. REVERSING THE TERMINALS WILL CAUSE PERMANENT DAMAGE TO THE UNIT AND VOID THE WARRANTY.**



Fig. 6

7. Power on and plug in the vehicle, and observe the LED on Vreg™. It usually takes about 30 minutes or less to enter equalization phase. At which point all Vreg™ would be blinking. Blinking will halt once equalization is completed. Note that blinking duration could differ from battery to battery due to inherent difference in capacity of each battery. **NOTE: THE POWER RESISTORS WOULD BECOME EXTREMELY HOT IN NORMAL OPERATION. DO NOT INSTALL IT IN CLOSE PROXIMITY WITH PLASTIC MATERIALS. THE EXTREME HEAT WOULD DEFORM OR DAMAGE THE MATERIALS.**

Technical Specifications

Current consumption (idle)	2 mA
Current consumption (regulating)	3 A
Fuse	5 A
Regulating voltage, normal mode	14.8V (factory calibrated)
Regulating voltage, equalization mode	14.8V-15.3V