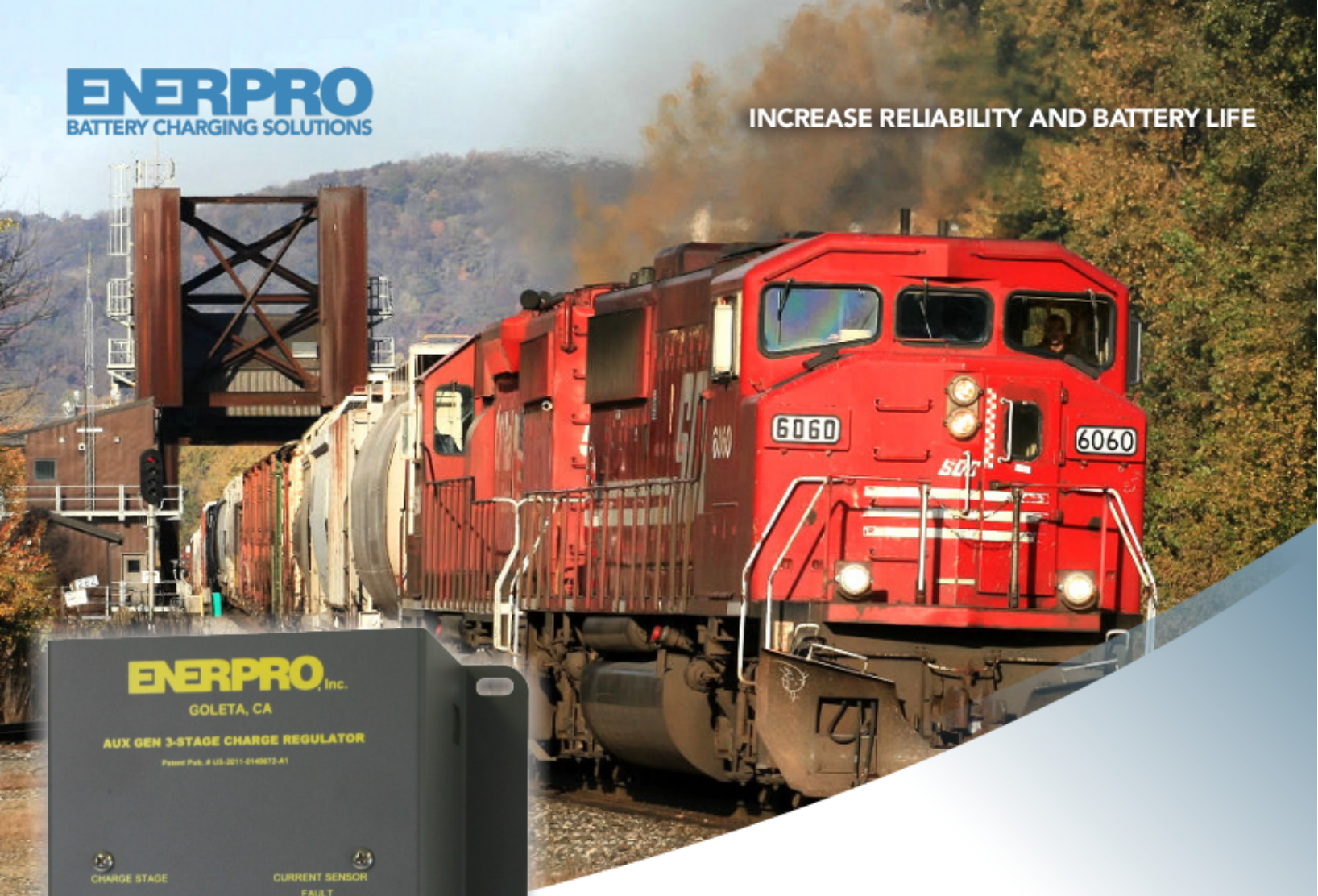
ENERPRO
BATTERY CHARGING SOLUTIONS

INCREASE RELIABILITY AND BATTERY LIFE



LVR31 Three Stage Charge Regulator

Problem

Dead won't starts and short battery life due to frequent locomotive shut downs, high battery drain, and 1-stage charging.

The LVR31 Solution

- 3-stage battery charging upgrade provides the recommended charging profile for cycled batteries.
- LVR31 provides 3-stage charging with a clean, drop-in replacement for older 1-stage with Black Box voltage regulators.
- The only 3-stage Battery Charging Solution for Legacy EMD Locomotives.

Contact Us Today
1-877-648-2114
VRinfo@enerpro-inc.com

www.enerpro-inc.com/LVR31

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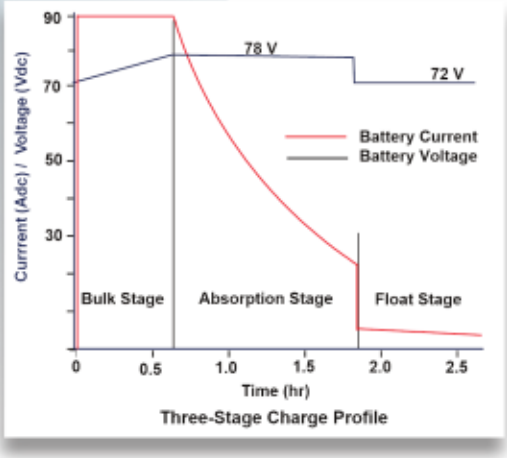
LVR31 Three Stage Charge Regulator

How It Works

Stage 1 (Bulk):	**Constant 90 amps**	**Safe Initial Charge**
Stage 2 (Absorption):	**Constant 78 volts**	**Charge to 95%**
Stage 3 (Float):	**Constant 72 volts**	**Maintain Charge**



Three-Stage Charge Profile

Three stage charging is recommended by battery manufacturers. It delivers the most amp-hours of charge in the shortest amount of time. A current sensor regulates 1st stage battery current at 90 amps regardless of other loads. The higher voltage 2nd stage fully converts battery plate lead sulfate to prevent battery sulfation. The lower voltage 3rd stage maintains full charge and reduces electrolyte loss on long runs.

3-Stage Charge Benefits:

- Reduced Dead Won't Starts ➔ **Operational Savings**
- Reduced Sulfation ➔ **Increased Battery Life**
- Full Battery Capacity ➔ **Fewer AESS Restarts**
- Shorter Charge Time ➔ **Fuel Savings from Reduced Idling**
- Less Electrolyte Loss ➔ **Reduced Maintenance**

LVR31 Benefits:

- Cost Effective: ROI less than 1 year
- Straight Forward Installation
- Patented Overcharging Protection
- Proven Design: Uses VR31 Circuitry With Over 3,000 in Service
- 3 year Unconditional Warranty

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Applications:

- Pre Dash 2 Systems
- Replaces EMD PN 8330790 Black Box
- 10kW to 18kW AC & DC Auxiliary Generators