



MEGA PULSE

**Disruptive
Power Conditioning
Technology**



www.megapulse.net

What we do

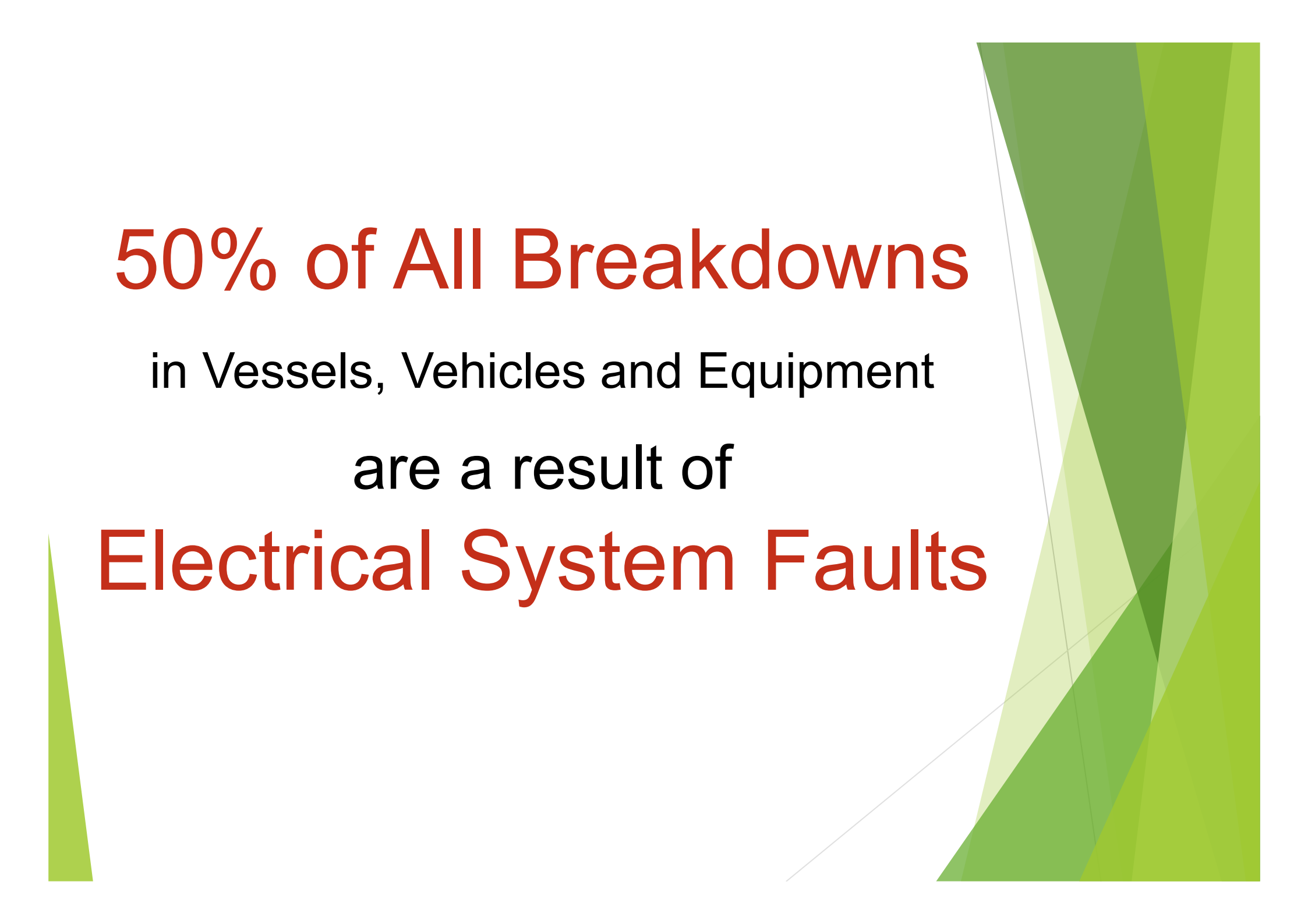


- ▶ Manufacture a Pulse Technology that drastically reduces battery degradation.
- ▶ Megapulse is an on-board, disruptive power conditioning technology.
- ▶ Deployed via an on-board unit installed directly on the battery.

Technology capability

- ▶ The best systems are only as good as their weakest link.
- ▶ Batteries are the heart of all DC electrical systems.
- ▶ Degradation causes batteries to be the weakest link.
- ▶ Degradation causes voltage losses directly affecting electrical system functionality.
- ▶ Megapulse targets degradation, reversing it back into active material.
- ▶ Megapulse increases reliability and safety of vehicles and equipment.
- ▶ Megapulse increases the battery's usable service life.
- ▶ Megapulse helps to maintain maximum system voltage.



The background features abstract, overlapping green geometric shapes, primarily triangles and polygons, in various shades of green, creating a modern, layered effect on the right side of the slide.

50% of All Breakdowns
in Vessels, Vehicles and Equipment
are a result of
Electrical System Faults

The weak link

- ▶ DC Electrical Systems are designed to run efficiently with reliability and longevity built in as an integral part of design parameters.
- ▶ In practice however Electrical Systems in Vessels, Vehicles and Equipment are subjected to voltage losses forcing them to operate outside of design parameters.
- ▶ This leads to Inefficiency, Unreliability and early Failure of Components and Batteries, creating an increase of Unnecessary Maintenance and Repairs.
- ▶ Degraded batteries run hotter due to high internal resistance, creating gassing and electrolyte boil-off which is both corrosive and explosive.

The Problem

- ▶ 80% of battery failures are caused by degradation (crystallized Lead-Sulphate), which is a dense insulating barrier forming on battery plates during normal battery operation.
- ▶ Degradation reduces the battery's ability to carry out the electrochemical power transfer directly affecting the electrical system functionality.
- ▶ Battery plates are grids with lead-oxide paste pressed into them, this paste requires maximum voltage to remain Firm to resist falling out when subjected to wave pounding or road shock. Degradation causes Chronic Undercharging which leads to plate material being soft and falling out of the grid resulting in permanent loss of capacity.
- ▶ Megapulse Technology Eliminates Electrical System Faults plus increases the Cycle and Service Life of Batteries keeping them out of the Recycling Loop 2 to 3 times longer.

Key Clients



Sold to Volvo as VBR brand



Sold to Scania as SBR brand



Sold to Merc. as MBR brand

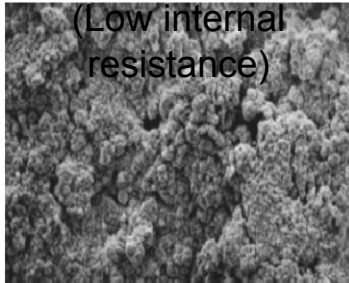


Sold to Keolis as MBR brand

- Ø Megapulse has been fitted to over 100,000 Volvo, Scania and Mercedes trucks since 2012.
- Ø Volvo - Increased battery life from average of 2yr to 5+yr and reduced electrical system faults from average 45% to below 1% over 7 year test, achieving savings of \$1000 per vehicle per annum.
- Ø Scania - Reduced electrical system faults from 56% to 0.3% over a 5 year large scale field test involving 140 trucks, also achieving savings of \$1000 per vehicle per annum.
- Ø Mercedes - installed Megapulse on all Sprinter and Vito vehicles imported into Norway since 2011 after a 24 month field test with similar results.

At the microscopic level

Vehicle works at full
voltage
(Low internal
resistance)



**Healthy Battery
Plate**

Vehicle struggles on depressed
voltage
(High internal resistance)



**Sulphated Battery
Plate**

Vehicle works at full
voltage again
(Low internal resistance)

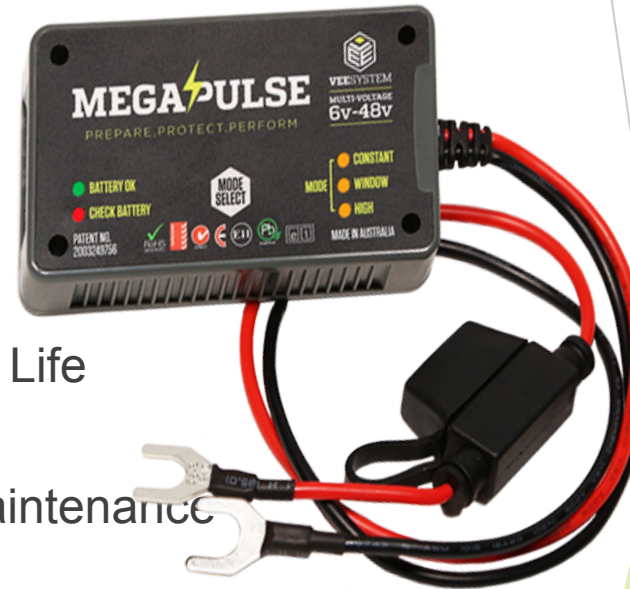


**Pulsed Recovered
Plate**

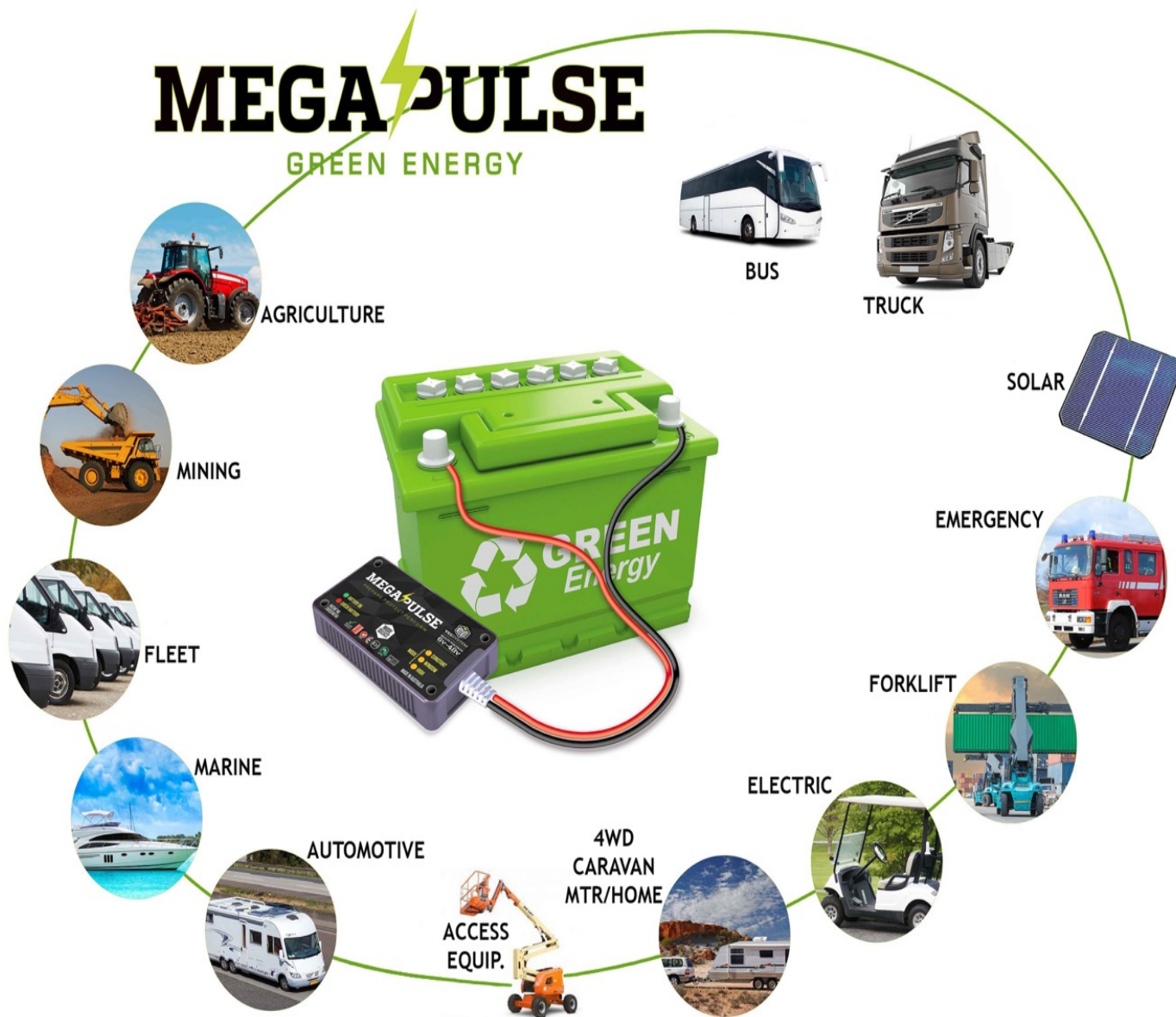


On-Board 24/7 Conditioning

- ▶ Eliminates Electrical System Faults
- ▶ Increases Safety, Reliability & Efficiency
- ▶ Increases the Battery Cycle and Service Life
- ▶ Reduces Unnecessary Down-Time & Maintenance
- ▶ Reduces Greenhouse Emissions and Carbon Footprint
- ▶ Reduces Warranty Costs for OEM's and Running Costs for Operators



Application



Certifications

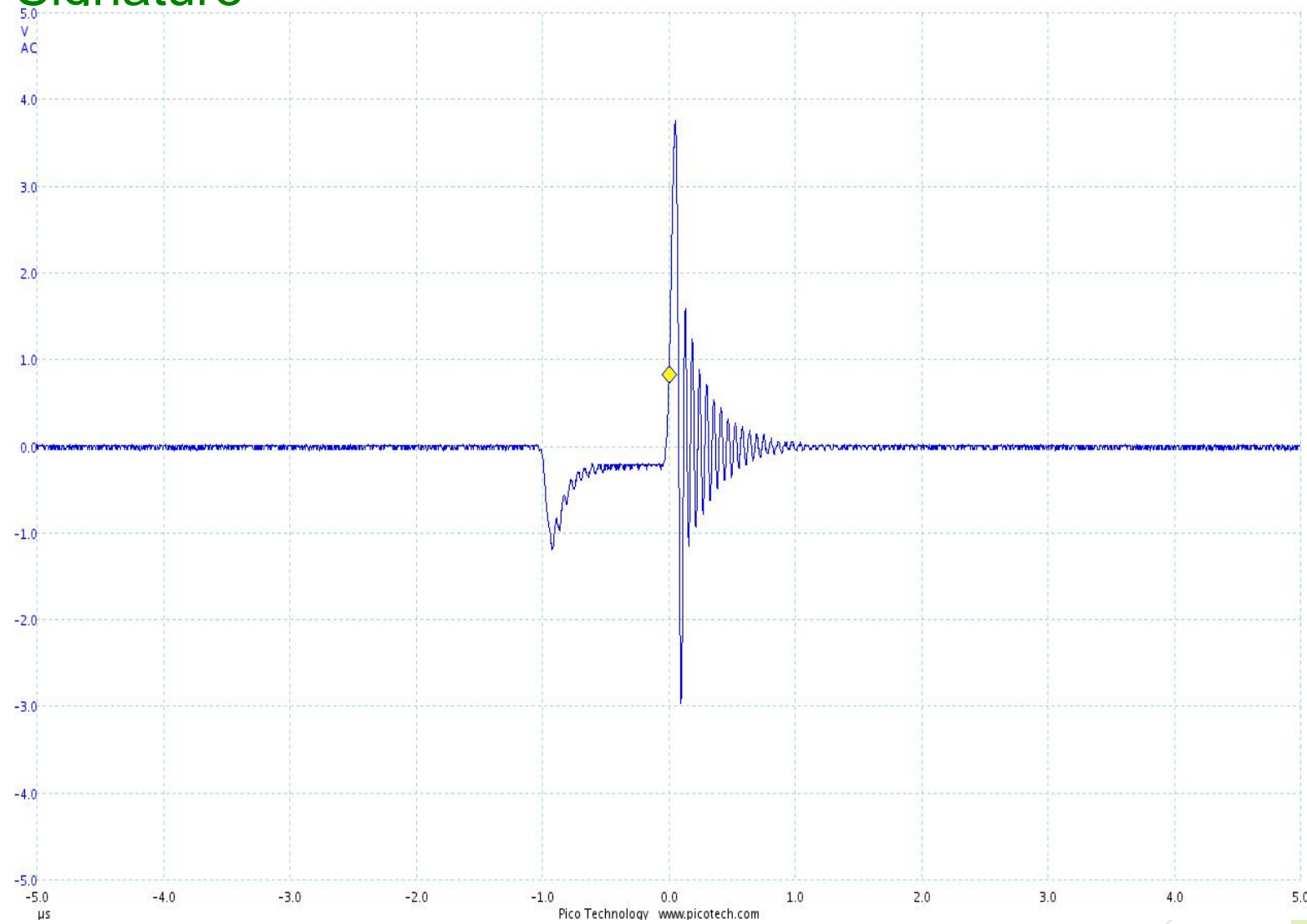


Product Features

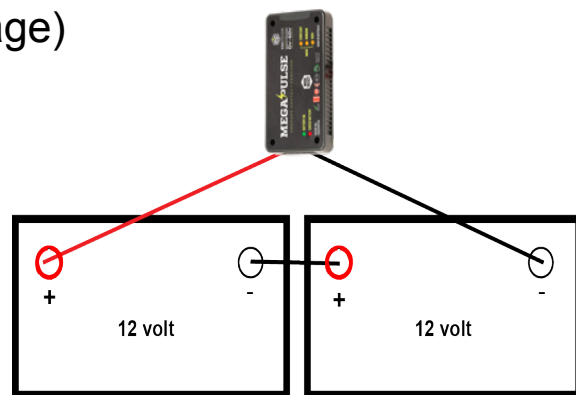
- Ø 2000 Ah conditioning
 - Ø (one unit per application not per battery)
- Ø Multi-mode activation
 - Ø (Automotive, Marine, Stationary and Electric)
- Ø Multi-voltage activation
 - Ø All applications from 6 volt to 48 volt
- Ø 3 second start-up delay
 - Ø (To avoid spark upon connection)
- Ø IP65/67 waterproof rating
- Ø 8mm quick-fit spade terminals
- Ø 1 external plus 3 internal fuses
- Ø On-board load test for 12v & 24v sys.
 - Ø (Test carried out at 21hr interval)
- Ø Average De-sulphation time of 6 weeks
 - Ø (Improvement can be seen within 1 week)
- Ø Multiple units can be installed on systems above 48v



Pulse Signature

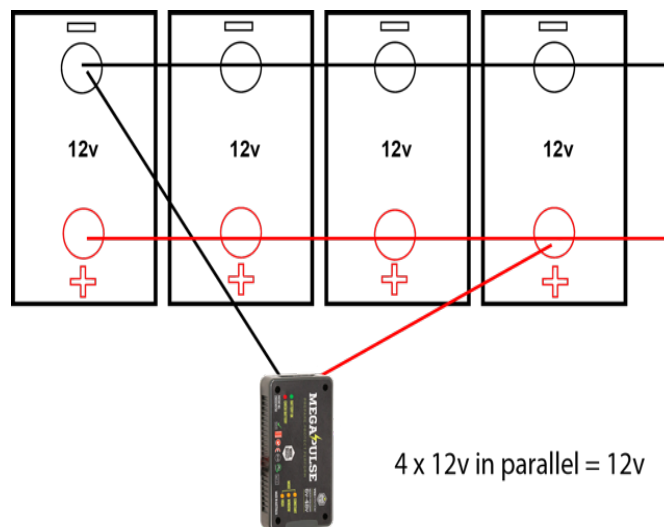


Series
Installation
(Increases
voltage)

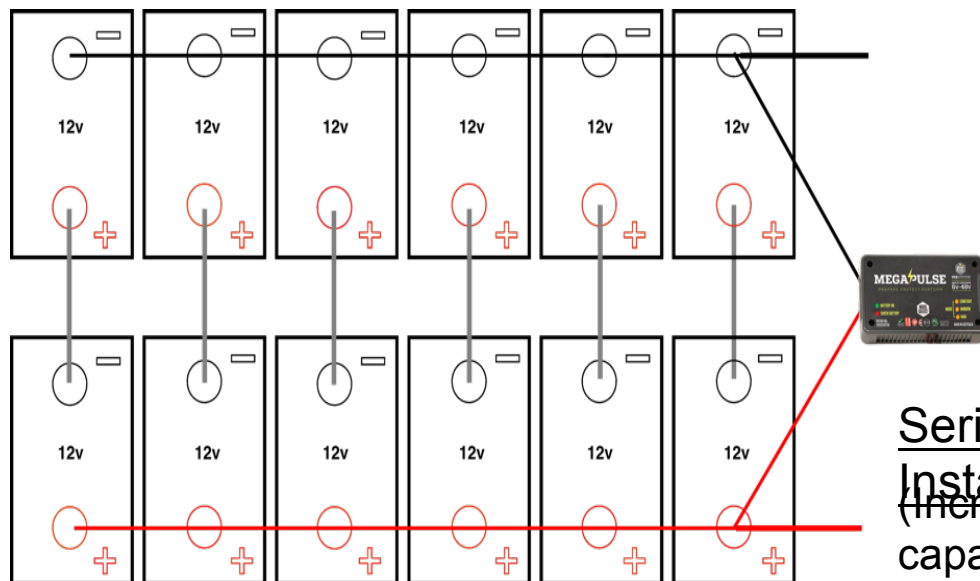


2 x 12v in Series = 24v

Parallel
Installation
(Increases
capacity)



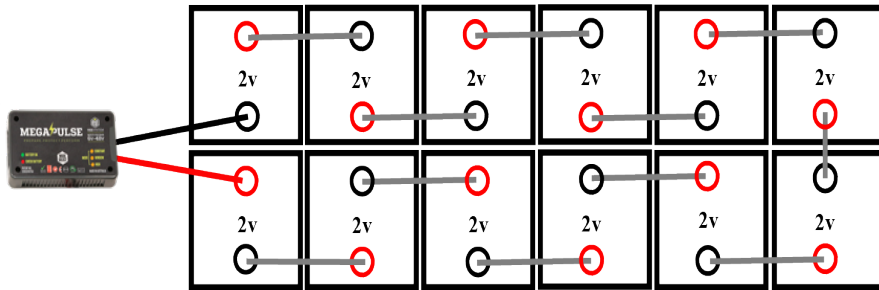
4 x 12v in parallel = 12v



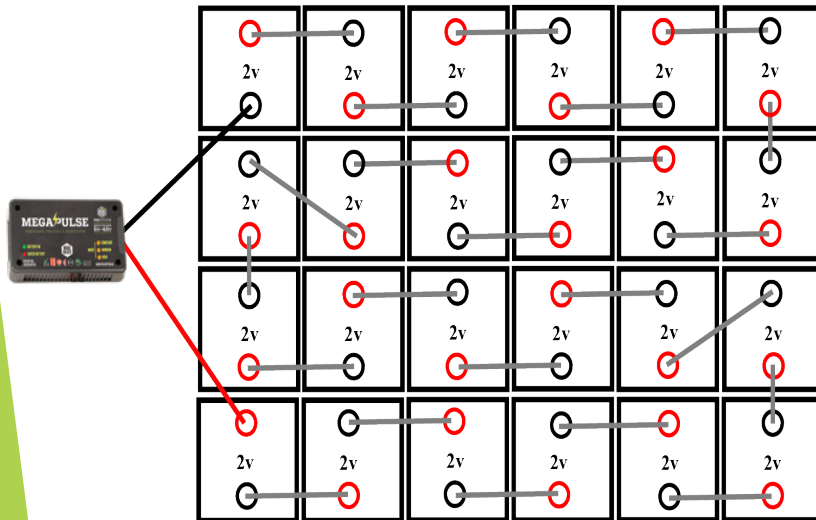
12 x 12v in series and parallel = 24v (6 times capacity)

Series / Parallel
Installation
(Increases voltage &
capacity)

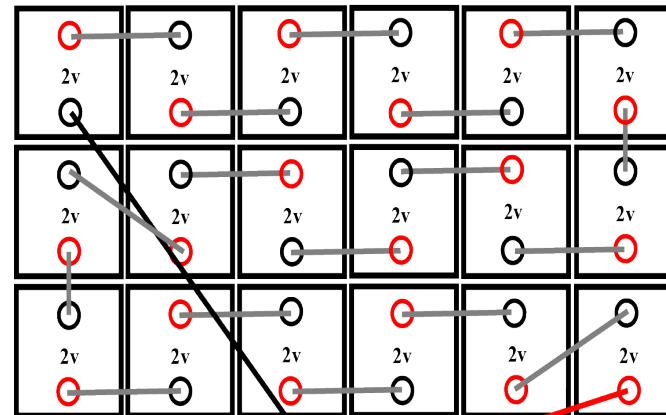
2v Installations



12 x 2v in series = 24v

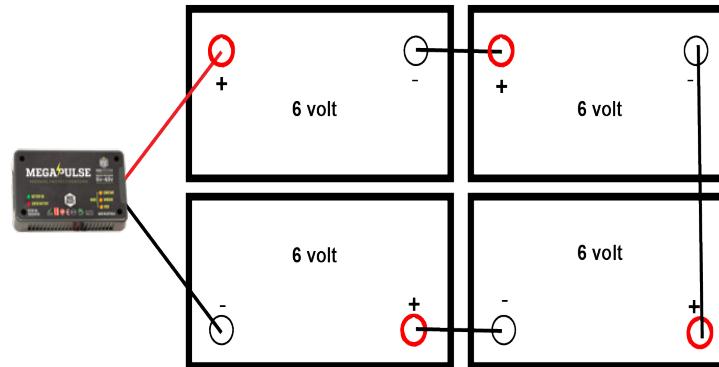
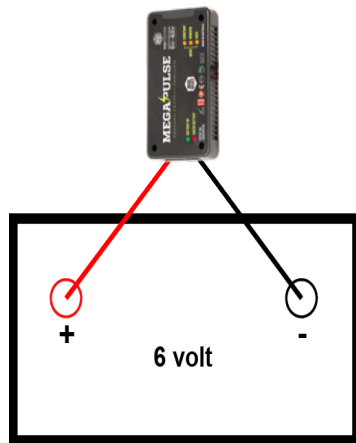


24 x 2v in series = 48v

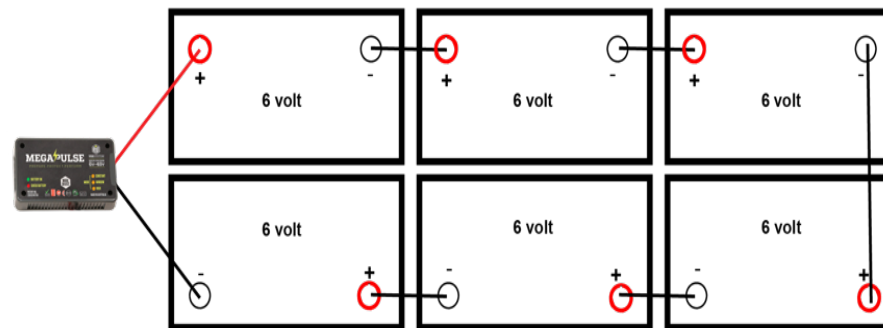


18 x 2v in series = 36v

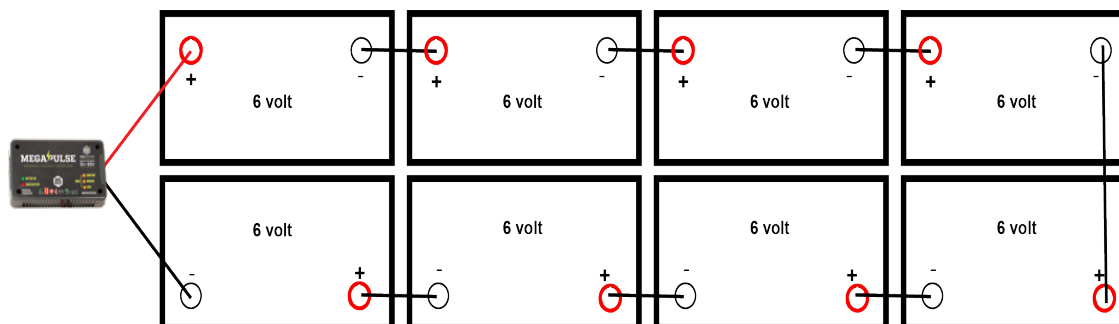
6v Installations



4 x 6v in Series = 24v

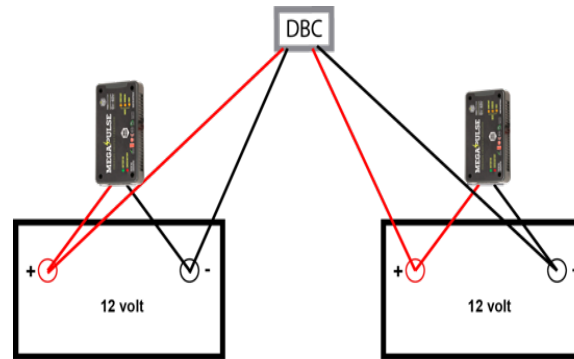
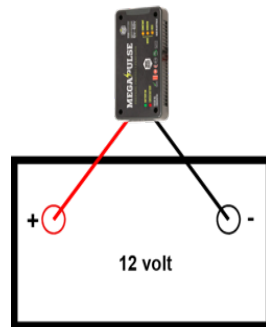


6 x 6v in Series = 36v

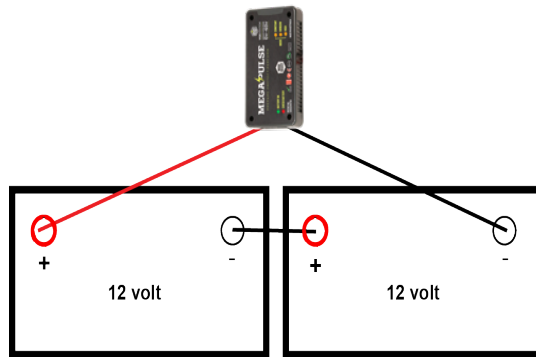


8 x 6v in Series = 48v

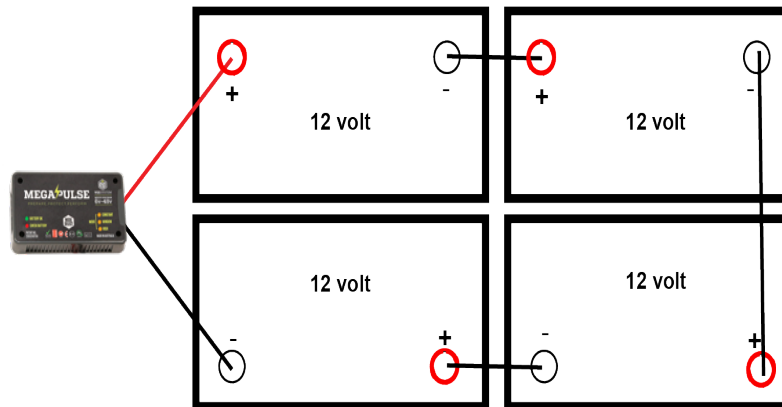
12v Installations



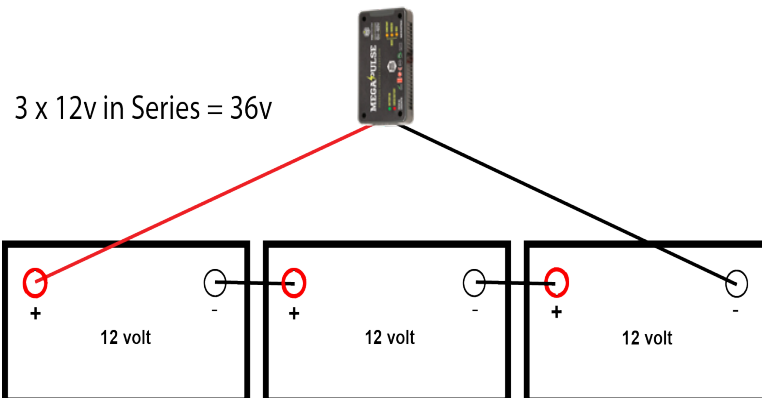
2 x 12v in Parallel through Dual battery Controller = 12v



2 x 12v in Series = 24v



4 x 12v in Series = 48v



3 x 12v in Series = 36v