

BEDAZZLED

LOW VOLTAGE LED LIGHTS NEED SPECIAL CONSIDERATION ON BOATS

Sounds simple doesn't it? Pull out the old bulb and fit the LED version! NOT SO! There are many pitfalls that can destroy the sensitive LEDs and ruin the dream of low power, long lasting and environmentally friendly lighting! The extremes of voltages on boats have been investigated by Bedazzled with some unexpected results showing peak voltages from 25 to 125 volts! We have tried to address each new problem as they have occurred (to Bedazzled's great cost) and continue to improve our products by influencing the manufacturers. This article is intended to explain the causes and solutions to ensure a long and satisfactory life to any of our LED products.

There are two main causes of the over-voltages on a boat as follows:

1. **LOAD DUMP:** 25 to 125 volts – When a heavy load is disconnected or turned off
2. **SHORT LIVED TRANSIENTS:** -300 to +80 volts – caused by pumps, fridges, motors and alternator (at turn off)

LOAD DUMP happens when any heavy load is turned off (or, like an electric fridge, is automatically turning on and off). What happens is that the alternator which was trying to supply the power to the load, takes a short time to respond to the reduced load and generates an excessively high voltage until its internal regulator has time to adjust. Independent studies by the Society of Automobile engineers (SAE) have shown that voltage spikes between 25v to 125v can easily be generated and could last anywhere from 0.04 to 0.4 seconds! This can even happen when your batteries are temporarily disconnected from the alternator when you use manual starter/leisure battery selectors (the rotary switch types that show 1, 2, Both or Off). Some automatic charge control relays can also produce similar voltage spikes. We don't yet have transient figures for the automatic alternator charge controllers fitted to many boats but are continuing our investigations!

SHORT LIVED TRANSIENTS happen every time a relay or switch is turned on/off or from fuses or trips opening which cause extremely short lived bursts (0.0003 seconds) but with voltages as low as -300v to +85v.

These voltages are potentially lethal to almost ANY electronic component which need careful filtering and spike suppression to ensure a long and reliable life. LEDs are similarly susceptible to damage from these high voltages even with internal regulators built into all of our products. Bedazzled now recommend fitting Transient Suppressors to remove the threat in a boat environment and, to this end, have introduced a simple low cost Transient Suppressors circuit that can be added to any light fitting at the point of connection to the boat's wiring. Without this added protection your LED lights could result in partial or total failure of the bulb. Our Transient Suppressors Circuit also includes a local in-line resettable fuse to further protect your boat!

Future Bedazzled products will include Transient Suppressors but until then, always fit Transient Suppressors to existing non-suppressed LED bulbs. Bedazzled offer our Transient Suppressors Circuit at a massive 50% discount to all our existing customers (for a quantity matching their previous purchases). For further advice, please don't hesitate to contact us – we will do our best to advise you on the best solution for your boat!

***For further information please call Bedazzled on 01327 844735
Our website and on-line shop is www.bedazzled.uk.com***