



## Product Troubleshooting and Redesign

### Designing a Better Heating Controller for a Heated Clothing Company

#### OUR CUSTOMER'S ISSUE

A manufacturer of heated clothing was experiencing field failures with their heating controller. Safco was asked to assist in troubleshooting the reason for the failures and to recommend and design a new controller. Given the customer's no questions asked, lifetime guarantee these failures were a serious issue.

#### SAFCO'S ROLE

Safco engineers worked closely with the customer to identify the root issues of the failures

- The controller device had to support 16.5A continuous load.
- The in-line housing was very small and somewhat inadequate for heat dissipation.
- The current design allowed for the controller to be attached to the battery supply backwards. This backward assembly caused catastrophic failure to the chip and PCB.
- Further investigation suggested the current design allowed the user to connect too many accessories into the controller, overloading the circuit.

#### PROJECT DETAILS

Through an innovative Safco design incorporating a microprocessor, the customer's product was upgraded in the following manner

- State of the art microprocessor with dual and single channel outputs was incorporated into the design that facilitated comfortable handling of 16.5A in a very small in-line housing
- The use of the microprocessor facilitated performance of the controller in the customer mandated operating temperature range between -40°C up to +80°C.
- The new design incorporated reverse polarity protection to prevent catastrophic failure if the controller was connected to the battery supply incorrectly.
- Overload/short circuit protection was also included in the new design to prevent failures even if the user connected too many accessories to the controller.
- In addition to these performance benefits designed into the product, the new design also provided better feedback to the user through flashing, multi-color LEDs. These flashing LEDs alerted the user of certain operating conditions and problems.

#### ABOUT SAFCO

Safco is a full-service partner in the design, manufacturing and delivery of custom, low-voltage DC power supplies. Our experience, service and commitment to quality enable us to produce a low-voltage power assembly that offers superior performance and longevity, allowing our customers to focus more on what they do best.

#### CONTACT INFO

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