TT Electronics

# Case Study Breas

## Product

Medical Grade Power Adapter PEAMD36SF-13-B1-HDM

Z1 Travel/Portable CPAP machine

BREAS

## The Challenge

Provide a low cost, consumer-priced, AC/DC Medical Adapter for portable CPAP machine.

## How We Delivered

The original power supply used by Breas was not ours. At the time we were contacted, it had about a 10% failure rate in the field. Not acceptable. We received the Z1 CPAP machine and immediately analyzed it in our lab. We found that when the person using the machine coughed into the mask, the CPAP device sent a voltage pulse back into the output of the power supply, thereby shutting it down. We implemented several modifications to our power supply which fixed the problem entirely, allowing Breas to ship problem-free product from then on, until today...and beyond.

## How We Solved the Challenge

The problem was multi-dimensional. The voltage and current spike produced by the back EMF of the CPAP compressor was large enough to trip OCP and OVP limits of the power supply. The amplitude and time of the back EMF generated varied quite a bit depending on the size and duration of the actual 'cough'.

We modified the thresholds and timing of the OCP and and OVP, then added a voltage spike preventative circuit right at the output of the power supply, so that any back EMF would be stopped before it entered the power supply circuitry.

This multi-faceted solution was required to allow the power supply to operate normally and reliably when powering the Breas CPAP machine during normal operation, as well as abnormal operation (i.e. coughing into the mask). This solution was implemented back in 201x, and has been used, problem-free, since that time. We continue to support the Breas CPAP program with this design.

For further information on our full product portfolio, please email us at:
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