

## **High-efficiency voltage regulator for rural networks**

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### **Abstract-**

**This paper presents a high-efficiency voltage regulator, which combines robustness, low costs and easy maintenance without power electronics components. These characteristics make it suitable for rural networks, where investments and operational cost in power quality improvement are limited. The regulator consists of a multiwinding reduced-power transformer, and provides serial voltage compensation. Different voltage compensation steps are obtained by modifying the connection and the polarity between the primary and secondary windings. The transformer design has been optimized to obtain a high-efficiency and low-cost regulator. An automatic controller monitors the output voltage and sets the optimal compensation step. At present more than 400 units of the voltage regulator are in operation. Field test results are presented to show the operation of the voltage regulator.**

**Index Terms- Power distribution control, power quality, power transformers, rural areas, voltage control**

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