

AN009 - Energy Meter

Abstract

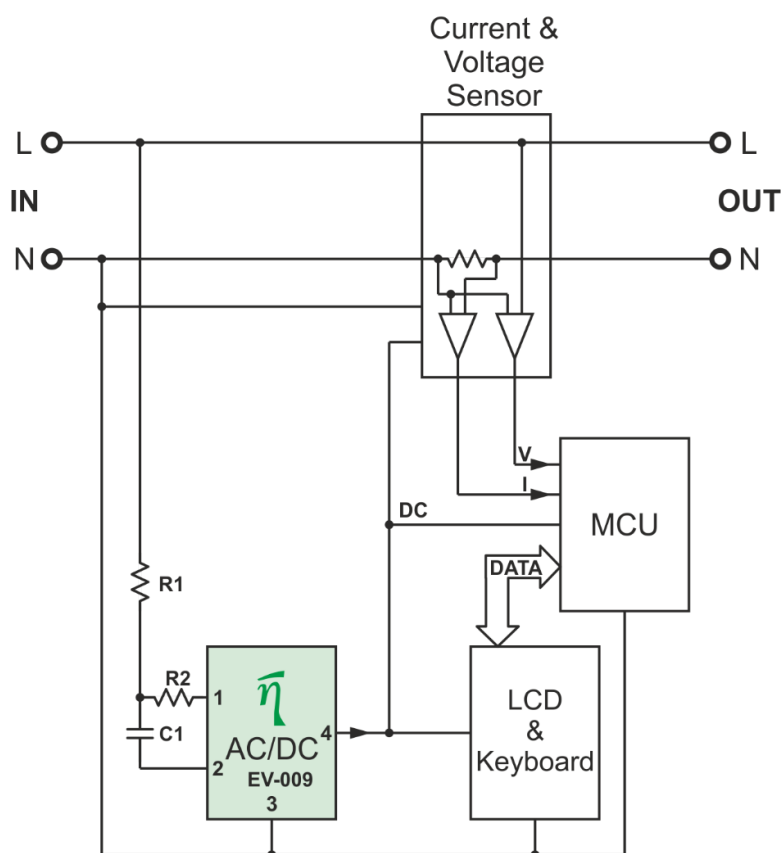
Energy meters for power line require non-isolated power supply with common ground for the input and the output. A typical energy meter power supply is capacitive power supply with a half wave rectifier topology. The serial voltage drop capacitor of this power supply has a high capacitance value, which leads to large size, high price and high VAR consumption.

The DC output voltage regulation of this power supply is based on a Zener diode which dissipates heat. A wide operation voltage range increases the heat dissipation. The heat dissipation effects are: large size (to cool the diode) and high standby power.

Eta-Bar's EV-009 is an AC to DC power supply for energy meters. Its main features are: **Zero-Standby***, non-isolated, common ground for the input & output, high efficiency, wide range of operation voltage, inductor-less AC to DC converter and regulated DC output.

The capacitance of a serial voltage drop capacitor is much smaller than typical solutions, resulting in smaller size, lower price and lower VAR. In addition, the DC output voltage regulation is not based on a Zener diode, thus the wide operation voltage range does not increase the heat dissipation.

The result is smaller and cheaper power supply with low standby power. EV-009 operates in wide temperature range and AC input voltage range.



* **Zero-Standby** - According to the IEC 62301 Clause 4.5 regards measurements of less than 5 mW as zero power

Main Features:

- Topology : Capacitive power supply (inductor-less),
Non-isolated power supply,
Common ground for the input and output
- Input voltage range : 85 to 265 VAC ; 50 to 60 Hz
- DC output : Regulated voltage: adjustable 0.7 to 5 V DC
Output current capabilities: average current: up to 10 mA
- Efficiency : >85% (Condition: for all input voltage and frequency range and at nominal voltage output)
- Standby power : less than 5mWatt (Conditions: $R_1 < 1\Omega$)
- EMI filters : Not required