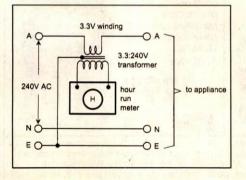
## **Energy monitor**

Living with alternative energy (hydro and solar power) means it's often necessary to measure power consumption, to ensure that power inverters and generators are not overloaded. The measurement of energy consumption of individual appliances is also needed to calculate the amount of battery storage needed, as well as charging options etc.

The measurement of power consumption is straightforward using a moving iron ammeter (giving a true RMS response to the waveform of an inverter). However, the measurement of energy consumption involves time and isn't so easy.

This circuit is a very simple way of measuring energy consumption. A transformer is connected as a current transformer and supplies power to an hour run meter, a Warburton-Franki type obtained from Oatley Electronics for \$15. This device is similar to the odometer of a car, in that it registers time on a number of wheels, to 0.01 of an hour. It operates only while power is applied, so the length of time an appliance consumes energy over a given period is recorded.

I used a transformer designed for a Scope soldering iron. However, the secondary voltage rating can be between



three and 12 volts, as this rating only affects the lowest power the hour meter will respond to. The current rating of this winding should equal or exceed the full load current being measured. A refrigerator draws around 300 watts or 1.2A at 240 volts, so the winding must be able to carry that current.

Be careful if running the transformer without a load connected to the 240 volt winding, as a high voltage can be developed (more than 1kV in some cases). If using a multi-tap transformer, such as from an old radio or TV, terminate the unused windings with a suitably rated load resistor. By using this device you can check the energy ratings of appliances and compare it to the published rating. The prototype responded to a minimum power of 30 watts or so.

Peter Laughton,

Albion Park, NSW.

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