HOW TO MEASURE POWER WITH A CLAMP-ON WATT METER

Figure 1 – Using a Clamp-on Meter with the AC Line Splitter Model ALS-1

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OPERATING INSTRUCTIONS – AC LINE SPLITTER MODEL ALS-1

FEATURES

- Increases sensitivity of clamp-on current probes ten times in X10 mode
- Direct reading X1 mode
- Voltmeter input jacks
- Integral ground conductor
- 15 ampere capacity

THEORY OF OPERATION

A magnetic field, proportional to the magnitude of current, surrounds all current carrying conductors. In an AC circuit the magnetic field will induce a current in the jaws of a clamp-on current probe when the jaws are closed around the conductor.

If both conductors of the circuit are enclosed by the jaws of the probe the magnetic fields will cancel and no measurement is possible. Most 120 V AC appliances use two conductor cords which make it difficult to isolate a single conductor for measurement. The ALS-1 provides temporary separation of conductors to facilitate measurement of current.

OPERATION

1. Plug the ASL-1 into a grounded type 120V AC receptacle. If a grounding type receptacle is not available, a 2 to 3 wire adapter must be used. Maintain ground wire integrity to minimize the possibility of electrical shock.
2. Plug the appliance line cord into the end of the ALS-1 and turn on the appliance.
3. Place the jaws of the clamp-on current probe through the X1 section of the ALS-1. The current being drawn by the appliance can then be read directly from the indicator of the clamp-on probe.
4. If the magnitude of the reading obtained in step 3 is less than one-tenth of the full scale range of the clamp-on current probe, and difficult to read, place the jaws of the probe through the X10 section. The magnitude of the current drawn by the appliance will be the reading on the current probe meter divided by ten.

   Example:
   With the range switch of the clamp-on current probe set to 6 AMPS, the meter indicates 5.4 amps, and the jaws of the probe are through the X10 section of the ALS-1. The actual current is 0.54 amps (5.4 amps ÷ 10 = 0.54 amps, or 540 mA).

INTERPRETATION OF RESULTS

5. Most appliance manufacturers state the rating of an appliance on the frame, or housing. The rating will be stated either in AMPERES or WATTS.
6. If the rating is stated in AMPERES then this figure may be compared with the reading on the clamp-on current probe. A reading that is significantly LOWER then the manufacturer's rating may indicate low line voltage, corroded terminals, or some other fault, which results in a higher resistance to current. A reading that is significantly HIGHER than the manufacturer's rating may indicate high line voltage, or a partial short in the appliance, which results in a lower resistance to current.

   The line voltage may be easily checked by inserting the test probes of an AC voltmeter into the VOLT CHECK input jacks on the ALS-1.
7. If the appliance rating is stated in WATTS, then multiply the reading in current (taken directly from the clamp-on probe) times the line voltage. The product will be the power consumption in watts.

   Example:
   The clamp-on probe indicates that 8.5 amperes is being drawn by the appliance. The line voltage is measured and found to be 102V AC. The power consumption is 867 watts (8.5 amps x 102 volts = 867 watts).

   A power consumption which is significantly higher, or lower, than the rated power consumption may be due to the factors given in section 2, for low or high current readings.

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