



Thermoelectric Device

P3-2600

BACKGROUND:

The Arbor Scientific Thermoelectric Device consists of an anodized aluminum heat sink with the thermoelectric module attached. The two terminals are colored red for positive and black for negative. When a current source is connected to the terminals, the module will move heat from or to the heat sink, heating or cooling the surface of the module.

The reason the module works is the Peltier effect (pronounced 'pelt-ee-yay'). The effect is caused when electrons move from one state to another across dissimilar semiconductor or conductor junctions. A thermocouple will exhibit the Peltier effect if a current is forced through it. The temperature change is dependent on the polarity of the current, the amount of current, the ambient (surrounding) temperature, and the types of conductors or semiconductors. This module will produce or absorb 2.9 Watts of power when 2.5 Amperes of current flow through it at 2.06 Volts. It will exhibit a change in temperature of 67 degrees Celsius at that current. Your Thermoelectric Device will work admirably with a Genecon hand generator (P6-2631).

WARNINGS:

WARNING: If you do not use a Genecon, you must be extremely careful to limit the current to the module, particularly if the polarity is reversed (heat mode). The module can easily be damaged by excessive current or heat. The current must be no greater than two amps and must be turned off if the top surface of the module becomes too hot to touch. If you are using a 6V battery you need a 2 Ohm, 10 Watt (approx) series resistor. If you are using 12 Volts, you need a 5 Ohm, 20 watt series resistor.

CAUTION: Do NOT immerse the device without placing it in a sealed container, such as a resealable bag. No part of the device should get wet.

TRY THIS:

Connect the Genecon (or battery) to the module with the positive lead of the Genecon to the positive terminal of the module. Place a drop of tap water on the top surface of the module. Energize the module. After just a few seconds, notice what has happened. Reverse the polarity of the battery, or turn the Genecon handle in the other direction. What happens?

The amount of energy absorbed or released by the module can be measured using a calorimeter. Verify the data with a voltmeter, stopwatch, and ammeter. NOTE: All Thermoelectric Devices have been thoroughly tested for performance.

