

# Heat Pulser

(Order Code HP-BTD)

The Heat Pulser is an accessory for the ULI, ULI II, or LabPro for use with the Tools for Scientific Thinking or the RealTime Physics Heat and Temperature curriculum. It is a special switch that allows the LabQuest or LabPro to control power to an immersion heater. Logger *Pro*, MacTemp (older Macintosh) or Temperature (MS-DOS) software allows you to select when and for how long the heater receives power.

Immerse the heater in the liquid. Start the Logger *Pro* software. Plug the Heat Pulser two-prong cord into a standard AC outlet. Connect the Heat Pulser using the adapter provided to the DIG/SONIC1 port on LabPro or LabQuest. The green light, indicating a connection to the data-collection interface, will be on. The red light, indicating power is provided to the heater, should be off. Connect the heater to the Heat Pulser and you are ready to perform your experiment.

**Note:** The adapter used to connect the Heat Pulser to the DIG/SONIC 1 port is the same one used with some Motion Detectors.

## Immersion Heaters

Use an immersion heater such as the ECKO #00426 Immersion Heater. Similar ones are available at ACE hardware, kitchen supply stores, or kitchen supply sections of grocery stores.

Immersion heaters are designed to fail permanently if exposed to air when powered. This failure is almost immediate so it is critical to keep the heater immersed any time it is connected. The Heat Pulser itself will not cause the failure—only operation while the heater is exposed to air.

**NOTE:** Vernier products are designed for educational use. Our products are not designed nor recommended for any industrial, medical, or commercial process such as life support, patient diagnosis, control of a manufacturing process, or industrial testing of any kind.

## IMPORTANT SAFETY INFORMATION

- **Never plug the heater into the Heat Pulser until the heater coil is placed in liquid.** The probe may burn or mar surfaces with which it is in contact. The heater may be destroyed if left out of liquid while power is applied.
- **Unplug the Heat Pulser before removing the immersion heater from liquid.**
- **Do not leave the Heat Pulser and heater connected when not in use.** If you do, other software running may use the control lines and inadvertently turn on the heater.
- **Always use the rubber safety handle when contacting the unit.** Avoid any contact with the metal probe.
- **To avoid electrical hazards, do not allow the cord, plug, or Heat Pulser**

**handle to get wet.** The metal heat probe is the only part that should come in contact with liquid.

- **Allow the probe to cool thoroughly before cleaning or storing.**
- **The Heat Pulser is not intended for use with any device other than an immersion heater.**

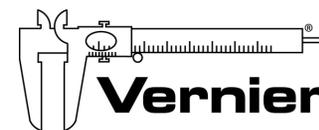
## Specifications

Turn on time:	1/2 Cycle	Turn off time:	1/2 Cycle
Relay voltage range:	24–280VAC	Max. current:	4 Ampere

As a safety precaution, the Heat Pulser will automatically turn off the current after about 15 seconds.

## Warranty

Vernier warrants this product to be free from defects in materials and workmanship for a period of five years from the date of shipment to the customer. This warranty does not cover damage to the product caused by abuse or improper use.



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Rev. 6/5/2012

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