

THERMOELECTRIC HEAT PUMP

H112Q



Year 1
study

Description

A bench top accessory designed to allow students to experimentally investigate the performance of a thermoelectric cooler module. A thermoelectric device has no moving parts and uses a direct electrical current to transfer heat from one face of the device to the other. In the H112Q, the thermoelectric module is held between a heated block and a water cooled plate. The module extracts heat from the block and transfers this, and the input power, to the water cooled plate. An insulated hinged enclosure allows student examination and minimises heat gains/losses from the system. The module will also act in reverse and generate a small amount of electrical power if one face is maintained at a higher temperature than the other. This can also be demonstrated. Instrumentation is provided with the unit that allows measurement of the DC power supplied to the module, the temperatures either side of the module, the cooling water flow rate and the cooling water temperature rise. Controllable power for the module and heater is supplied by the H112 Heat Transfer Service Unit.

Related Laws/Applications

- Peltier Effect
- Thomson or Lenz Effect
- Seebeck Effect

Learning capabilities

- Investigation of the effects upon the surface temperature of either face of the module with increasing power. (Peltier Effect)
- Investigation of the effect upon heat transfer direction of reversing the polarity of the power supply to the module. (Thomson or Lenz Effect).
- Investigation of the variation in open circuit voltage across the module due to the variation in surface temperature difference. (Seebeck Effect).
- Investigation of the power generating performance of the module with a steady load and increasing temperature difference.
- Estimation of the coefficient of performance of the module when acting as a refrigerator.
- Conducting a full energy balance for the module.

Technical Specification

- Nominal Peltier Cooling Capacity 82W @ 15V

Essential Ancillaries

- H112

What's in the Box?

- 1 x H112Q
- 1 x Spare Bulb
- Instruction manual
- Packing List
- Test sheet

Weights & Dimensions

- Weight: 20 kg
- Length: 240mm
- Width: 240mm
- Height: 305mm

Essential Services

- H112

Ordering information

To order this product, please call PA Hilton quoting the following code:
H112Q

All brand and/or product names are trademarks of their respective owners. Specifications and external appearance are subject to change without notice. The colour of the actual product may vary from the colour shown in the brochure.

Copyright © 2018 P.A. Hilton Limited. All rights reserved. This technical leaflet, its contents and/or layout may not be modified and/or adapted, copied in part or in whole and/or incorporated into other works without the prior written permission of P. A. Hilton Limited. Hi-Tech Education is a registered trade mark of P. A. Hilton Limited.

COUNTRY OF ORIGIN - UK WARRANTY PERIOD - 5 YEARS