



UNSTEADY-STATE HEAT TRANSFER TRAINER IC-RW-HT-102

INTEGRATED CIRCUITS

ELECTROINC INDUSTRIES

2024

1. Overview

The IC-RW-HT-102 – Unsteady State Device is a heat conduction and convection transfer trainer that enables learners to investigate the fundamental principles of unsteady (transient) heat transfer. Through practical experiments and simulations, users explore how temperature changes over time in different materials and systems. This trainer enhances skills in analyzing and optimizing thermal processes, making it ideal for applications in thermal



Fig: IC-RW-HT-102

2. Specification

- Hot water tank: Approx. 30 L, stainless steel.
- Hot water pump: Variable speed.
- Heater: 3,000 W.
- Solid shape: three shapes with two different materials.
- Cylinder:
 - 20 mm diameter × 100 mm brass and stainless steel.
 - 30 mm diameter × 100 mm stainless steel.
- Sphere: 45 mm diameter brass and stainless steel.
- Slab: 15 × 70 × 76 mm (W × L × H) brass and stainless steel
- Sensors with digital display: Voltage and current for input power Measurement, Temperatures.
- Power supply: 220 V, 1 Ph, 50 Hz.

3. Experiments will be done

- 1- To observe unsteady state conduction of heat to the centre of a solid shape, when a step change is applied to the temperature at the surface of the shape.
- 2- Using analytical transient-temperature/heat flow charts to determine the conductivity in cylinders with different conductivity.
- 3- Investigating the effect of shape, size and material properties on unsteady heat flow using analytical transient-temperature/heat flow charts.