## *Computerized Heat Transfer in Natural Convection Apparatus (Product Code: HMTC05)*




### Features

- Extensive range of Experiments
- Comprehensive teaching manual
- Three-year warranty
- Esthetically designed and finished Rig.
- High Quality instrumentation
- To Measure the heat transfer co-efficient in natural convection.

### Product Description

Convection heat transfer occurs by the movement of fluid particles. If the motion of fluid particles occurs by the variation of density of the fluid due to temperature difference, then the heat transfer process is called free or natural convection. The apparatus consists of a vertical stainless steel tube enclosed in a rectangular duct; front side of the duct is made of transparent section to facilitate visual observation. An electrical heating element embedded in a copper tube acts as the heat source. The surface temperature is measured at different heights using thermocouples. The surface of the tube is polished to minimize radiation losses. A voltmeter and an ammeter enable the determination of wattage dissipated by the heater.


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# *Computerized Heat Transfer in Natural Convection Apparatus (Product Code: HMTC05)*

## Product / Component Specification

| | |
|---|---|
| S.S. Tube | 39mm Dia x 500mm Length |
| Enclosure Size | 250 x 250 x 600mm |
| Variac | 2 amps |
| Digital voltmeter | 0-300 volts AC |
| Digital ammeter | 0-5 Amps AC |
| Digital temperature | 0-300 Deg (K Type) |
| Thermocouple | K type |
| Insulation Powder | Asbestos powder |
| Stop watch | Digital |

## Data Acquisition card

| | |
|---|---|
| **Analog Input** | |
| Differential Channels | 12 |
| Resolution | 12 bits |
| Sample Rate | 200 Ks/s |
| Max Voltage | 5 V |
| Number of Ranges | 4 |
| Simultaneous Sampling | Yes |
| On-Board Memory | 5120 samples |
| **Analog Output** | |
| Channels | 2 |
| **Digital I/O** | |
| Input-Only Channels | 30 |
| Output-Only Channels | 12 |
| Timing | Software |
| Logic Levels | TTL |
| Maximum Input Range | 0 V - 5V |
| Maximum Output Range | 0 V - 3.3 V |
| **Counter/Timers** | |
| Counters | 2 |
| Max Source Frequency | 84 MHz |
| Resolution | 12 bits |
| Logic Levels | TTL |
| Total DC output Current on all I/O lines | 130mA |

## Measurement of Temperatures at different points

| | |
|---|---|
| Type | "K" |
| Range | 0-300°C |
| Signal conditioning/transmitter | Standalone |
| Location | Specimen Surface Temperature |
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| Type | "K" |
| Range | 0-300°C |
| Signal conditioning/transmitter | Standalone |
| Location | Specimen Surface Temperature |
| Type | "K" |
| Range | 0-300°C |
| Signal conditioning/transmitter | Standalone |
| Location | Ambient temperature |

## Measurement of Voltage & Current

| | |
|---|---|
| Type | Voltage Transducer |
| Range | 0-300V |
| Signal conditioning/transmitter | Standalone |
| Type | Current Transducer |
| Range | 0-10Amps |
| Signal conditioning/transmitter | Standalone |



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