H-6882

Convection Heat Transfer Demonstrator

Purpose

The Hampden **Model H-6882** Convection Heat Transfer Demonstrator permits student investigation of the phenomena of natural (free) and forced convection. Electrically heated test sections are utilized to transfer heat to both still and moving air. The unit allows the student to determine the overall heat transfer coefficient, convective heat transfer coefficient, heat transfer rate, Nusselt Number and Stanton Number.

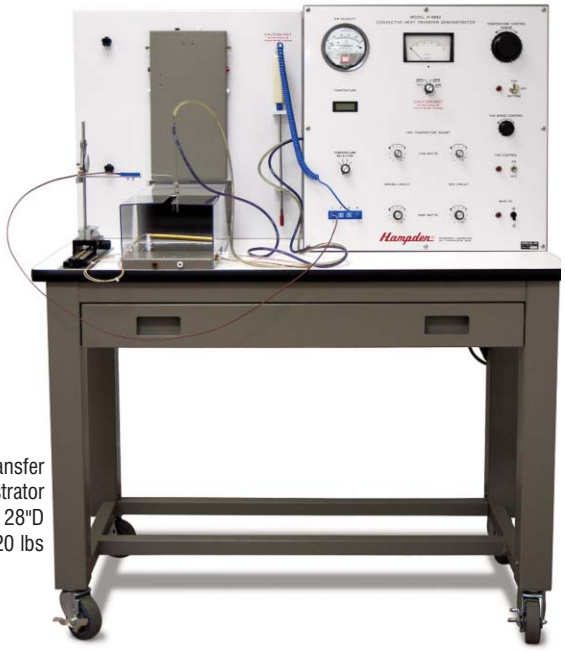
Description

This unit consists of an instrument panel and a test panel mounted on a mobile table.

The instrument panel houses all of the controls and readouts including:

- Digital Temperature Display
- Temperature Selector Switch
- Dial-Type Air Velocity Manometer
- AC Wattmeter
- Test Section Power Control w/ Power Rheostat
- Fan Motor Speed Control
- Main AC Circuit Breaker

The digital temperature display features a reading accuracy of ±0.4°C and a resolution of 0.1°C. The input to this display is chosen with a four position selector switch. A pair of type T, Chromel-Alumel, thermocouple probes are supplied: one being a surface probe and the other an air probe. The air speed in the air tunnel is indicated by an analog air velocity meter with a dual scale (calibrated in both feet per minute and inches of water column) and a ±4% reading accuracy. This meter is used in conjunction with a pitot-static tube which is positioned in the air tunnel. The test section power consumption is regulated by a variable autotransformer and indicated with an analog wattmeter featuring a three-position range switch and a reading accuracy of ±2%. There are also four power rheostats for fine adjustment of the temperature profile of the test device. Finally, there is a fan motor speed control which determines the air flow rate in the air tunnel.



MODEL H-6882 Convection Heat Transfer Demonstrator
Dimensions: 60"H x 48"W x 28"D
Weight: 520 lbs

The test panel includes a pivot-mounted fan and a pair of test stations: one vertical and one horizontal. The different test section can be mounted on either test station. Additionally, they can be orientated parallel to the air flow or perpendicular to the air flow. The air temperature probe is positioned with a thermocouple positioner with graduations every 0.001 inches.

The positioner is mounted on a linear track assembly for traversing the length of any given test section. The entire test station can be shielded with a polycarbonate cover to prevent accidental contact with hot test sections. Also included with the trainer are a number of test sections. They include two flat plates, four circular discs and six cylinders.

Services Required

120V AC-1ϕ-60Hz

Computer Data Logging

This feature adds four thermocouples, one air flow transducer, and one watt transducer into the system. One interface package consisting of National Instruments I/O modules and LabVIEW® software and templates for control software are provided for interfacing into a PC computer through the USB port. Computer not included.

Specify **Model H-6882-CDL**

All Hampden units are available for operation at any voltage or frequency

Hampden® ENGINEERING CORPORATION

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P.O. Box 563, East Longmeadow, MA 01028 • Tel 413-525-3981 • Fax 413-525-4741 • E-mail sales@hampden.com **800-253-2133**

H-6883

Forced Convection Heat Transfer Trainer

Purpose

The Hampden **Model H-6883** Forced Convection Heat Transfer Trainer permits student investigation of the phenomena of forced convection. This unit allows the student to determine the overall heat transfer coefficient, convective heat transfer coefficient, heat transfer rate, Nusselt Number and Stanton Number.

Description

This unit consists of an instrument panel and insulated test duct with pitot traverse assembly.

The **Instrument Panel** consists of:

- Electric heater
- Controller
- Analog wattmeter
- Elapsed timer
- Main circuit breaker with pilot light
- Fan control circuit breaker
- Digital temperature display
- Air velocity manometer

The **Insulated Test Duct** consists of:

- Axial fan complete with motor speed controller
- Electric heater module
- Flow straightener
- Pitot traverse assembly
- Mobile stand

Specifications

Mobile Stand:
Constructed of 14-gauge mechanical steel tubing finished in instrument tan texture. Two locking swivel and two fixed casters are provided along with a storage shelf.

Control Panel:
11-gauge furniture stock steel finished in instrument white enamel

Model H-6883
Forced Convection Heat Transfer Trainer
Dimesnions: 56"H x 72" W x 24" D
Shipping Weight: 514 lbs.

Enclosure:
14-gauge furniture stock steel finished in instrument tan texture.

Insulated Test Duct:
4" I.D. (10.16 cm) by approximately 72" (182.88 cm) long including fan assembly. The test duct includes the flow straightener insert and electric heater element

Fan Assembly:
Axial fan with motor control and speed control

Manometer:
Bench mounted inclined-vertical type

Manual Traverse Unit:
Accuracy of 0.01"

Pitot Tube:
Pitot-static tube

Temperature Sensor:
Type T

Temperature Indicator:
Digital with °C or °F readout

Control On-Off switches:
Circuit breaker type

Indicators:
Omniglow pilot lights

Power:
120V AC, 1ϕ 60Hz

All Hampden units are available for operation at any voltage or frequency

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