

# Heat Transfer Training Systems

Educational Training Equipment for the 21st Century

Bulletin 687-2C

## H-6872 Film & Drop Condensation Demonstrator

### Purpose

The Hampden **Model H-6872** Film & Drop Condensation Demonstrator has been developed to investigate the mechanisms involved in heat transfer with systems that undergo a phase change. The student is able to observe condensation phenomena and correlate the results with film condensation theory. The trainer is designed to provide both film and drop condensation.

### Experiment Capabilities

- Coolant temperature
- Coolant volumetric and mass flow rates
- Shell pressure
- Boiling point of liquid feed
- Heat transfer coefficients of films & drops

### Description

The **Model H-6872** Film & Drop Condensation Demonstrator consists of two 1/2" dia., 9" long water cooled condensers, each complete with three type T thermocouples internally imbedded into the exposed side wall for taking condenser surface temperatures. Each condenser is also fitted with two additional type T thermocouples for taking the cooling fluid input and exit temperatures. Each thermocouple incorporates a plug with associated receptacle allowing the condensers to be removed if required. The dropwise condenser is plated and filmwise condenser is left natural. Each of the condensers are incorporated in the steam chamber.

The steam chamber consists of a 4" dia. 18" Corning Pyrex® heavy wall conical system with associated cast iron flange adapters, TFE type T gaskets and 3/8" hard brass end plates. It incorporates a three-tier stainless steel baffle assembly, two 1500 watt heaters with plug assembly, type T thermocouple, quick-disconnect water lines, and pressure relief valve with gauge interface.

The control panel consists of two 1 gal/min flowmeters with control valves, one 30-0-30 compound gauge, one digital temperature indicator with type T ten position selector switch, fill and drain valves, one main GFI circuit breaker with pilot light, and one microprocessor-based temperature controller with dual digital displays, type T thermocouple input and solid-state relay. The system incorporates a thermal protection system which shuts the trainer down if the thermocouple is broken or if the temperature exceeds the system maximum temperature setpoint.

The demonstrator is constructed of a 14 gauge furniture stock steel enclosure finished in instrument tan texture. The control panel is 12 gauge furniture stock steel finished in instrument white enamel. Provided is a cord rack for the power cord, water input and exit quick disconnect ports. Two legs are provided with levelers so the unit can be table-top mounted.

Nomenclature is silkscreened in black KEM enamel.

This unit is provided with a complete Operating Instruction and Maintenance manual, Bulletin 687-20I.

### Services Required

Electrical: 120V AC-1 $\phi$ -60Hz- 30A

Water Source: 1.5 gal/min max.



**Model H-6872-CDL**  
Film & Drop Condensation Demonstrator with CDL option  
Dimensions: 36"H x 36"W x 20"D  
Shipping Weight: 300 lbs.

### Computer Data Logging Option

#### Model H-6872-CDL

Film & Drop Condensation Demonstrator with Computer Data Logging Package.

The Computer Data Logging Package has eleven inputs to measure temperature, one to measure pressure and two to measure flow. One interface package containing National Instruments I/O modules and LabVIEW® templates for control software are provided for interfacing into an IBM compatible computer through the RS-232 port. Computer is not included.

Specify **H-6872-CDL** at time of order.

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

**Hampden**  
ENGINEERING CORPORATION

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