



### Heat Pipe Training Apparatus

The equipment consists of three linear conductors of similar configuration, a heat pipe, a copper rod and a steel rod. The high thermal conductivity characteristics of the heat pipe is demonstrated using the apparatus. All three conductors are mounted vertically.

Category: Teaching Equipment

Courses: Heat Transfer, Energy Systems Laboratory, Heat Transfer Systems



### Linear Heat Conduction Apparatus

Evaluates heat conduction in one dimension. The apparatus has ability to find conductivity and temperature profile about an insulated cylinder with heat transfer occurring axially. It is to be operated in conjunction with the H 111 heat transfer service unit

Category: Teaching Equipment

Courses: Heat Transfer



### Radial Heat Conduction Apparatus

Heat flows radially outwards and the temperature profile is used to evaluate radial heat transfer characteristics. Fourier law is also verified using this apparatus. It is used in conjunction with the H111 Heat Transfer service unit from P. H Hilton

Category: Teaching Equipment

Courses: Heat Transfer



### Free and Forced Heat Convection Apparatus

The equipment has been designed for students to study the phenomenon of natural and forced convection. The unit consists of mainly a bench mounted vertical air duct and a control panel. Demonstration of convection is achieved in this apparatus by studying temperature profiles and heat flux in the air duct with three alternative heat transfer surfaces, i.e. vertical flat plate, array of cylindrical pins and finned surface.

Category: Teaching Equipment

Courses: Heat Transfer

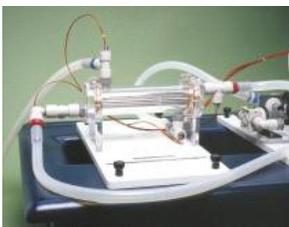


### Tubular Heat Exchanger

The tubular heat exchanger is the simplest form of heat exchanger and consists of two concentric (coaxial) tubes carrying the hot and cold fluids. HT31 is a basic version with two sections and a single interim temperature measurement point. It can work in parallel or counter flow patterns. Works in conjunction with the Heat Exchanger service unit HT 30XC. Temperature of hot water, flow rate of hot and cold water etc can be controlled using PC interface.

Category: Teaching Equipment

Courses: Energy Systems Laboratory, Heat Transfer Systems

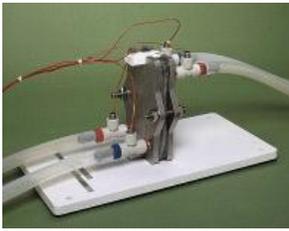


### Shell and Tube Heat Exchanger

Shell and Tube heat exchanger with 3 shell passes. Works in conjunction with the Heat Exchanger service unit HT 30XC. Temperature of hot water, flow rate of hot and cold water etc can be controlled using PC interface.

Category: Teaching Equipment

Courses: Energy Systems Laboratory, Heat Transfer Systems



### Plate Heat Exchanger

Works in conjunction with the Heat Exchanger service unit HT 30XC. Temperature of hot water, flow rate of hot and cold water etc can be controlled using PC interface. The exchanger supplied consists of a pack of plates with sealing gaskets held together in a frame between end plates. Hot and cold fluids flow between channels on alternate sides of the plates to promote heat transfer. The HT32 has a single heating section configured for multi-pass operation with passes in series.

Category: Teaching Equipment

Courses: Energy Systems Laboratory, Heat Transfer Systems



### Jacketed Vessel Heat Exchanger

Jacketed vessel heat exchanger. Works in conjunction with the Heat Exchanger service unit HT 30XC. Temperature of hot water, flow rate of hot and cold water etc can be controlled using PC interface.

Category: Teaching Equipment

Courses: Energy Systems Laboratory, Heat Transfer Systems



### Unsteady State Heat Transfer Unit

It is used for analyzing unsteady heat transfer for various small objects like cylinders, spheres, slabs, etc made of various metals like aluminium, steel, brass etc. Analytical temperature/heat flow charts are used to analyse the temperature variation of the various solid shapes.

Category: Teaching Equipment

Courses: Heat Transfer



### Temperature Controlled Refr/ Heating Circulator

A device to give constant temperature water supply for the cooling side of the heat exchangers or heat conduction apparatus.

Category: Auxilliary

Courses: Heat Transfer, Energy Systems Laboratory, Heat Transfer Systems



### Cross Flow heat exchanger

The unit is to investigate steady state rates of free and forced convective heat transfer at various air velocities and is supplied complete with a separate instrumentation console and a variable speed fan as standard. A single plain tube plate, six row plain tube bundle, four row finned tube plate, local heat transfer cylinder and mounting plate are available as individual optional extras for detailed investigation. In addition a flat plate, pinned plate and finned plate are available as well as a heat pipe evaluation plate for entry level students.

Category: Teaching Equipment

Courses:



### Heat Transfer Service Unit

The service unit, is essential equipment designed to allow operation of small scale heat transfer accessories. Each of the heat transfer accessories may be separately connected to the common service unit which incorporates the following features:-All electrical/electronic components mounted. Electrical circuits protected by RCD and appropriate circuit breakers. Regulated low voltage DC power supply 0-24VDC. Temperature measurement of up to twelve type K thermocouples installed on the appropriate accessory.

Category: Service Units

Courses: Heat Transfer



### Heat Transfer service unit

This service unit together with the optional demonstration units allows students to study various aspects of Conduction, Convection and Radiation both numerically and visually. The optional demonstration units available include

Category: Service Units

Courses: Heat Transfer



### Heat Exchanger Service Unit

The HT30XC is a service unit, to allow the operation of one of the Armfield range of small scale heat exchanger systems. It provides bi-directional hot water flow and the Instrumentation required to do a series of in-depth investigations into heat exchanger performance. The individual heat exchangers can be quickly changed over, to allow comparisons between different types of heat exchanger to be made.

Category: Service Units

Courses: Energy Systems Laboratory, Heat Transfer Systems



### Radiation Apparatus

Radiation from heat and light sources can be measured using this equipment. It has to be used in conjunction with H 111 service Unit. Two appropriate detectors, light filters, target plates of different emissivity and aperture plates each mounted on suitable carriages on a parallel graduated track, allow simple and rapid experimental procedures.

Category: Teaching Equipment

Courses: Heat Transfer



### Free and Forced Heat Convection Apparatus

The equipment has been designed for students to study the phenomenon of natural and forced convection. The unit consists of mainly a bench mounted vertical air duct and a control panel. Demonstration of convection is achieved in this apparatus by studying temperature profiles and heat flux in the air duct with three alternative heat transfer surfaces, i.e. vertical flat plate, array of cylindrical pins and finned surface.

Category: Teaching Equipment

Courses: Heat Transfer



### Heat Exchanger Unit

This experimental unit can be used to investigate and compare different heat exchanger designs. It consists of two main elements, a supply and control unit and choice of heat exchanger: Tubular heat exchanger, Plate heat exchanger, Shell and Tube heat exchanger and Jacketed vessel with stirrer and coil.

Category : Teaching Equipment

Courses: Energy Systems Laboratory, Heat Transfer Systems



### Computer Controlled Boiling Heat Transfer Unit

To visualize and analyze convectional, nucleate and film boiling.

Category : Teaching Equipment

Courses: Heat Transfer Systems

Faculty In Charge: Dr. Mohammed Al-Khawaja

Teaching Assistant In Charge: Eng. Ranees Muhammed

---



### Flow Boiling Demonstration Unit

The unit has been produced to provide the students with a clear visual demonstration of what is happening inside the vapour generating tubes of practical plants. In this unit it is possible to see all the processes and type of flow involved in an actual evaporation process, from sub-cooled liquid to superheated vapour.

Category: Teaching Equipment

Courses: Heat Transfer  
Systems

---



### Temperature Controlled Refr/ Heating Circulator

A device to give constant temperature water supply for the cooling side of the heat exchangers or heat conduction apparatus. Chillers also reduce water consumption.

Category: Auxilliary

Courses: Heat Transfer, Energy Systems Laboratory, Heat Transfer Systems