

## Cross Flow Heat Exchanger - HT35

### Description - requires HT30XC base unit

The cross flow heat exchanger is commonly used in applications such as heating, ventilating and air conditioning. It is also encountered as vehicle engine radiator.

This type of heat exchange occurs when the flow direction of the two fluids cross each other. In the HT35, hot water flows in and out of a radiator, perpendicular to air stream, which is being pulled into the radiator by an axial fan.

The convection between the two fluids through fins surface on the radiator implements the heat exchange.

### Technical Details

- ▶ This unit consists of a PVC rectangular duct, axial fan and a single fan radiator
- ▶ The radiator is accommodated in the middle and across the air duct
- ▶ The axial fan is located between the radiator and one edge of the duct. It can provide max air velocity of 2m/s
- ▶ The fins of the radiator are made from copper and shine in the light, and allow a heat transfer area of 14,000mm<sup>2</sup>.
- ▶ Four thermocouples measure input and output water and air temperatures
- ▶ Quick release hot fluid connections allow rapid connection to HT30XC as well as connection to the HT35 software.
- ▶ The exercises proposed with the HT35 provide function of basic engineering concepts such as psychrometric properties and mathematical iteration
- ▶ The HT35 software includes application of the LMTD (Log Mean Temperature Difference) method for cross flow heat exchanger as well as the effectiveness - NTU (Number of Transfer Units) method
- ▶ An air velocity sensor provides measurement of air flow inside the duct, which can be directly observed on the units software
- ▶ The HT35 software is an interactive tool for high understanding of the factors and variables involved in the cross flow heat exchange

### Overall dimensions

Length	0.15 m
Width	0.75 m
Height	0.40 m
<b>Packed and created shipping specifications</b>	
Volume	0.09 m <sup>3</sup>
Gross weight	6 kg

### Ordering codes

- ▶ HT35 - Cross flow heat exchanger - See HT30XC for power options

### Features

- ▶ A small scale cross flow heat exchanger system for use with the Armfield Heat Exchanger Service unit to teach the fundamentals concepts of heat transfer
- ▶ Some parts in the heat exchanger such as probes and axial fan can be easily removed for cleaning
- ▶ The HT35 enables variation of the parameters involved in the cross flow exchange process and therefore a complete analysis of the phenomena
- ▶ K-type thermocouples measure the inlet and outlet water and air temperatures, as well as permitting the connection of the air velocity sensor to the HT30XC
- ▶ The air mass flow rate is derived using an air velocity sensor
- ▶ The HT35 is mounted on a PVC baseplate which is designed to be installed on the plinth of the Heat Exchanger Unit without the need for tools
- ▶ A comprehensive instruction manual is included

### HT35 Essential Accessories

- ▶ HT30XC Computer controlled service unit

