FS SERIES

Fluid Science Cross Flow FS-3.3

The Fluid Science range is an innovative suite of products designed to enable students to gain an understanding of the fundamentals of Fluid Mechanics and Thermo Fluids by the process of learning via hands-on experimentation.

The high precision elements are supplied as modular tray-based systems which operate in conjunction with the Fluid Science service unit, multifunctional work panel and instrumentation enabling the student to conduct their own individual or group experiments.

The experiments are supplied with a highly visual user-friendly operational guide, allowing the students to understand the theory of the subject by the application of practical experimentation.

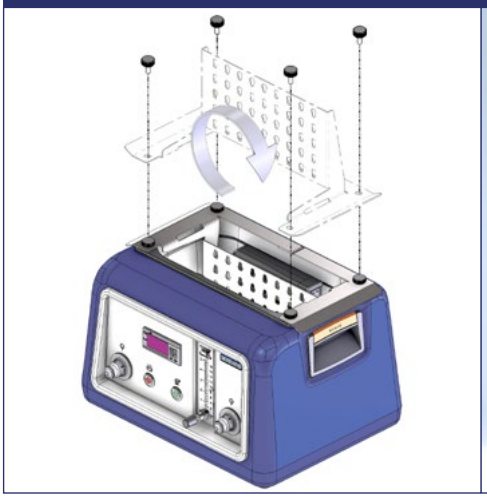
The FS-3.3 Fluid Science Cross Flow Heat Exchanger tray includes experimentation to demonstrate indirect heating or cooling by transfer of heat from hot water to air (fluid to air heat transfer) in a cross flow heat exchanger.

The tray introduces students to concepts such as heat transfer coefficients, thermal resistances, controlling resistance and heat transfer driving forces. The heat exchanger can be used in a co-current or countercurrent configuration.

COST EFFECTIVE MOBILE TEACHING SYSTEM DESIGNED TO INTRODUCE THE BASICS OF MANOMETRY

Experiment trays are sold separately, see **Related Products**

Back plates is easily stored inside the unit



Configurable as hot or cold water supply

Supplied with digital manometer and thermometer

UK office - email: sales@armfield.co.uk tel: +44 (0) 1425 478781 (for ROW)
USA office - email: info@armfield.inc tel: +1 (609) 208-2800 (USA only)

Issue: 1
URL: http://www.armfield.co.uk/ef

Applications: ME ChE CE IP

Description

The Fluid Science Cross Flow Heat Exchanger tray includes experimentation to demonstrate indirect heating or cooling by transfer of heat from hot water to air (fluid to air heat transfer) in a cross flow heat exchanger.

The tray introduces students to concepts such as heat transfer coefficients, thermal resistances, controlling resistance and heat transfer driving forces. The heat exchanger can be used in a co-current or countercurrent configuration.

Experimental content

- To demonstrate indirect heating or cooling by transfer of heat from hot water to air
- To perform an energy balance across the cross flow heat exchanger
- To calculate the overall heat transfer coefficient for a cross flow heat exchanger
- To investigate the effect of changes in the water flow rate on the temperature efficiencies and overall heat transfer coefficients

Requirements

Scale

Electrical supply:

- 100-240V/1 Phase, 50-60Hz
- Level surface
- FS experiment trays

Initial fill of 5ltrs water. Drain to empty water away once experiment is complete. During use, water supply or drainage are not required.

Technical specifications

- **Tube data**
  Material: Copper
  Tube height 2.1mm OD
  Tube width: 13.3mm OD
  Tube length: 11cm
  Number of tubes: 12 (6 passes)
- **Fin data**
  Material: Copper
  Fin spacing: 1.6mm
  Fin thickness: 0.11mm
  Fin length: 3.72mm
- **Thermocouples: 4xK-Type**
  Water in
  Water out
  Air in
  Air out

Overall dimensions

Dimensions tray	
Length	0.430m
Width	0.312m
Height	0.080m
Dimensions set up (excluding power supply)	
Length	0.300m
Width	0.170m
Height	0.140m
Packed and crated shipping specifications	
Net weight	2.15Kg
Gross weight	TBC

Features

- Fully mobile solution
- Each service unit can be used as either a hot or cold-water supply
- Quick connect couplings for easy connection to experiment modules, self-sealing on supply unit to minimise water loss
- Digital manometer and thermometer provided with service unit
- Low voltage within the supply unit to protect users

Benefits

- Applied student learning via experimentation
- Common service unit can be used for either hot or cold-water supply
- Toolless assembly
- Designed to be highly visual and simple to use
- Quick setup
- Suitable for both classroom, laboratory and mobile environments

Related products

Fluid Mechanics Range

- FS-1.1 Flow Measurement
- FS-1.2 Energy Losses - Straight pipes
- FS-1.3 Energy Losses - Bends
- FS-2.1 Manometer - Inclined
- FS-3.2 Heat Exchanger - Tubular
- FS-3.4 Heat Exchanger - Plate
- FS-4.1 Fluidised bed

Essential Accessories / Equipment

One of the range of Fluid Science service trays

FS-2.1: Manometer - Inclined

FS-4.1: Fluidised bed

FS-2.2: Manometer - U tube

FS-3.4: Heat Exchanger - Plate

FS-3.1: Heat Exchanger - Shell and Tube

FS-3.2: Heat Exchanger - Tubular

Ordering codes

FS-SU	FS-3.3

Knowledge base

> 28 years expertise in research & development technology
> 50 years providing engaging engineering teaching equipment

Benefit from our experience, just call or email to discuss your laboratory needs, latest project or application.

An ISO 9001:2015 Company

CE Products CE certified

armfield.co.uk

Aftercare

Installation
Commissioning
Training
Service and maintenance
Support: armfieldassist.com