

# FT74X UHT/HTST SYSTEM



A miniature scale UHT processing system optimised for product development use. The system is highly flexible and has a wide range of options.

# features

- 🥟 Compact, mobile, easy to install
- UHT throughputs up to 20lph for product and 120lph for CIP
- Pasteurisation throughputs up to 50lph (Plate Heat Exchanger)
- Process temperatures up to 150°C
- On board pressurised hot water circulator
- 🥟 Variable holding tube
- Membrane control console
- Fully enclosed hoseable cabinet
- Interchangeable pressed chevron plate heat exchanger and tubular heat exchanger
- Regeneration stage (plate heat exchanger)
- Fully instrumented
- Rapid switch over between heat exchangers
- Feed tank level sensor
- Integral USB Data logging and software option
- 2 stage cooling options
- *—* Electronic flow meter option

## benefits

- Requires a small space and installs quickly
- Low product hold up
- Carries out tests on a few litres of product
- 🥟 Can be positioned in a 'wet' area
- Many products can be tested with versatile plate or tubular system
- Can form part of a complete processing line



# FT74X HTST/UHT Service Unit

The **FT74X** service unit contains the services, controls and instrumentation to run the Armfield miniature scale heat exchangers as described below. The heat exchangers fit on top of the service unit and can be simply interchanged in a few minutes.

The service unit comprises a feed tank, a variable speed product feed pump, an electric powered hot water boiler and pump, plus a membrane control panel with all the controls and displays. A novel two speed-range pump allows clean in place (CIP) to take place using the same pump and feed tank as for product processing.

The **FT74-40** Flow meter option adds an electromagnetic flow meter to accurately measure the product flow rate.

The **FT74-44** Data logger option allows the various temperatures, product pressure, the feed pump speed and the system status to be recorded on a standard Windows PC (not provided). Windows 98 or above and a USB interface are required. (Note, the FT74-40 and FT74-44 options must be specified at time of order.)

# Miniature Tubular Heat Exchangers

The **FT74-20-MkIII** is the standard tubular heat exchanger, and uses a series of concentric 316 stainless steel tubes to heat and cool the product. A gentle pre-heat can be achieved by adjusting the hot water flow to the first two tubes. Four further heating tubes are used and both 2s and 15s (@ 10L/hr) holding tubes are provided as standard.

The four cooling tubes can be used either as a single cooling stage, or split into two stages of two tubes each for enhanced cooling when used in conjunction with a cooling water supply and a chilled water/glycol supply (e.g. Armfield FT63). The FT74-20-MkIII can be upgraded to the FT74-24-MkIII (below) at a later date.

The **FT74-24-MkIII** is an extended version of the FT74-20-MkIII, with a total of 8 cooling tubes (4+4). When used with a chilled water/ glycol supply on the second 4 tubes, and with the static mixer options, this heat exchanger can give product output temperatures below 10 °C, dependent on product, flow rate and processing temperature.

The **FT74-21** is a set of static mixers for two tubes, and can be used with either tubular heat exchanger to improve the heat transfer. This is particularly useful when trying to get maximum heating or cooling with viscous products. Multiple sets can be used to optimise both heating and cooling performance. Additional static mixers can be added at any time.

# Miniature Plate Heat Exchanger

The **FT74-30-MkIII** is the standard plate heat exchanger, comprising a regeneration section, a heating section and a cooling section. It is based on miniature 316 stainless steel plates specifically developed for this application. The chevron pattern mimics the turbulence and shear rate of industrial scale systems. Holding tubes of 2s and 15s (@10L/hr) are provided as standard.

A number of options can be provided to enhance the performance of the standard plate heat exchanger. These options involve additional plate configurations and are easy to retro-fit by the user.



*The* **FT74-31** *Homogeniser interconnecting plate can be fitted into the regeneration section and allows connections to an upstream (i.e. before heat treatment) homogeniser to be made.* 

It includes a temperature sensor on the homogeniser return which can be displayed on the FT74-44 data logger.

*The* **FT74-32** *Homogeniser interconnecting plate allows the homogeniser to be connected after the heat treatment (downstream). Note: only one interconnecting plate can be fitted at a time.* 

The **FT74-33** Two stage cooling option provides a complete additional cooling stage. The second cooling stage can be used in conjunction with a chilled water/glycol supply (e.g. Armfield FT63) for the best possible product cooling. Output temperatures below  $5^{\circ}$ C are possible, dependant on the product and the flow rate. An interconnecting link is provided to allow single stage cooling.

*The* **FT74-34** *Additional heating option provides extra plates in both the heating and regeneration sections. This is useful for difficult products at high temperatures, or where higher throughputs are desirable.* 



FT74-30 Plate heat exchanger module

# FT74-65 Variable Holding Tube

Comprising three different holding tube coils, packaged together in an insulated canister, the FT74-65 can be easily configured to provide seven different holding times between 30s and 120s (@10L/hr). Intermediate holding times can be achieved by varying the feed flow rate.

The variable holding tube can be used with all the plate and tubular heat exchangers described above. It is supplied with an additional temperature sensor to enable the product temperature into the holding tube to be displayed on the FT74-44 data logger.

### FT74-45 Sterilisation Link

The FT74-45 is an additional heat exchanger which can be used with the FT74-20-MkIII or FT74-30-MkIII to sterilise the complete system including the cooling section. The heating power is derived from the hot water boiler used in the FT74X. It can also be used to link to and sterilise an aseptic filler such as the Armfield FT83.

*Note: if using an in-line homogeniser, the additional cooling tubes of the FT74-24-MkIII, or holding times in excess of 45s, then additional measures will be required to completely sterilise the system. Please consult Armfield with your specific requirements.* 

### FT74-22 Pneumatic Back Pressure Valve

When working with particulate products and the tubular heat exchanger, the standard mechanical back pressure valve can be replaced by the FT74-22 to give much more stable flow and back pressure. (Requires a supply of compressed air).

### **Associated Equipment**

A wide range of equipment is available for use in conjunction with the FT74X systems to enhance the overall processing capability.

### FT90/91 Homogenisation Sub-Systems

*When used with an FT74X, the FT90 or FT91 gives a complete in-line homogenisation capability upstream or downstream. See separate data sheet for details.* 

### FT83 Sterile Filling System

*The FT83 allows sterile product produced by the FT74X to be packaged into pre-sterilised containers in an aseptic environment, see separate data sheet. The FT74-45 is also required to sterilise the overall system.* 

### FT63 Process Chiller

*Provides a supply of chilled water for use with the tubular heat exchangers, or with the second stage cooling option of the plate heat exchanger. See separate data sheet.* 

### Integrated systems

The majority of customer requirements can be easily and simply implemented from the standard items listed above using a modular approach. However, there will be situations when these standard items will not meet the full needs of a specific customer. Armfield offer a service to design and build complete bespoke integrated processing lines optimised to your requirements.





Miniature-scale R & D technology

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# FT74X Heat Exchanger Service Unit

Feed pump Progressive cavity variable speed pump, with standard and High Flow modes.

Particulate handling: 0.8mm *Fibre handling:* 25mm Standard flow: 10-30L/h High flow: up to 120L/h

### Pressurised water circulator

Water capacity: *Pump circulation rate:* Water temperature: Safety cutouts

4.0 litres Variable up to 6.0lpm 165 °C maximum Low level. High pressure Mechanical pressure relief valve 4kW maximum

### Requirements Electrical

Heating duty:

FT74X-A: 220-240V/1ph/50Hz (30A max) FT74X-G: 220V/1ph/60Hz (30A max) FT74X-C: 415V/3ph/50Hz (16A max) FT74X-D: 208V/3ph/60Hz (20A max) FT74X-E: 380V/3ph/50Hz (16A max) FT74X-F: 220V/3ph/60Hz (20A max)

### Water

A flow of cooling water is required, typically 5L/min.

### **Tubular Heat Exchangers**

Number of tubes: FT74-20-MkIII:

FT74-24-MkIII:

Tube diameter (product side): **Overall diameter:** Length (heated): Material: Assembled test pressure: 10 bar Working pressure: Standard Holding Tubes: 2s and 15s

10 (2 Preheat, 4 Heating, 4 Cooling) 14 (2 Preheat, 4 Heating, 4 Cooling, 4 Chilling)

8.1*mm* 15.8mm 0.4m 316 Stainless steel 15 bar (maximum)

### **Plate Heat Exchangers**

Plate overall dimensions: 75 x 115mm **Effective diameter:** 3.0mm Plate thickness: 0.5mm Wetted perimeter: 153.0mm Materials:-Plates: 316 Stainless steel Gaskets: Food grade silicone Working pressure: 10 bar (max) Standard Holding Tubes: 2s and 15s Number of plates: FT74-30-MkIII: 9 Heating, 10 Cooling, **10 Regeneration** FT74-33-MkIII: 11 Second stage cooling FT74-34-MkIII: 4 Additional heating, 4 Additional regeneration

# FT74-65 Variable holding tube

Nominal holding times (@10L/h): 30, 40, 60, 70, 90, 100, 120 seconds Other holding tubes available on request.

# **Overall dimensions**

Height:	1.40m
Width:	0.85m (1.1m with FT74-45 fitted)
Depth:	0.90m

# **Shipping specification**

Volume: 2.1m<sup>3</sup> Gross weight: 380kg

The Armfield range includes HTST/UHT/aseptic systems, carbonator/filler/cappers, spray dryers/chillers, multifunction batch processors, ice cream freezers, margarine crystallisers, extractors, edible oils processors and more. For further information about our products and services, or to book a trial at one of our trials facilities, please contact us.

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