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Miniature-scale research & development technology

HTST/UHT SYSTEM

FT74XTS

Touchscreen operated HTST/UHT system



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ISO 9001:2008

2YR EXTENDED WARRANTY



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

## FEATURES

- Touchscreen full colour control panel (High-resolution widescreen (800 x 480px))
- Graphical display of temperatures
- 32 storage memories (presets)
- Temperature data can be saved to USB datastick (as standard) – Advanced data logging and display option for saving to PC
- Calculated flow display (as standard) – Electromagnetic flow sensor option
- Hold time displayed
- $f_0$  display
- Progressing cavity pump
- Compact, mobile, easy to install
- UHT throughputs up to 20 l/hr for product and 120 l/hr for CIP
- Pasteurisation throughputs up to 50 l/hr (plate heat exchanger)
- Process temperatures up to 150°C
- On-board pressurised hot water circulator
- Variable holding tube option
- 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
- Two-stage cooling options
- Manual preheat temperature control

## BENEFITS

- Requires a small space and installs quickly
- Low product hold-up
- Carries out tests on a few litres of product
- Many products can be tested with versatile plate or tubular system
- Can form part of a complete processing line (aseptic and non-aseptic)

ISSUE 3



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### **FT74XTS HTST/UHT service unit**

*The FT74XTS service unit provides 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 interchanged easily in just a few minutes.*

*The service unit comprises a feed tank, a product pump, instrumentation for the heat exchangers and an electrically powered hot water boiler with a recirculation pump. It is controlled by an integral programmable logic controller (PLC) with a high-resolution full-colour touchscreen panel providing the operator interface.*

*A novel feature is the feed pump, which has two speed ranges. A low speed range for UHT processing and a higher range for Clean-In-Place (CIP) or for processing at higher throughputs and lower temperatures. The flow rate is fully variable in each range. The feed pump is a hygienic progressing cavity pump controlled by a state-of-the-art frequency inverter, which compensates for any slip in the pump drive motor. Thus the flow rate of the product can be determined to an accuracy sufficient for many purposes directly from the pump speed setting. This calculated flow rate is displayed on the screen.*

*An electromagnetic flow meter option is also available (FT74-40).*

*The standard FT74XTS permits the temperature history to be recorded onto a USB datastick for subsequent analysis. Also available is an advanced data logging system with software, enabling temperatures, product pressure, pump speed etc to be recorded directly onto a Windows PC (not provided). The accompanying software provides a range of sophisticated real-time graphical and tabular display facilities, see [www.armfield.co.uk/armsoft](http://www.armfield.co.uk/armsoft) for more details.*

### **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 preheat 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 (@ 10 l/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 (eg 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 eight cooling tubes (4+4). When used with a chilled water/glycol supply on the second four 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**

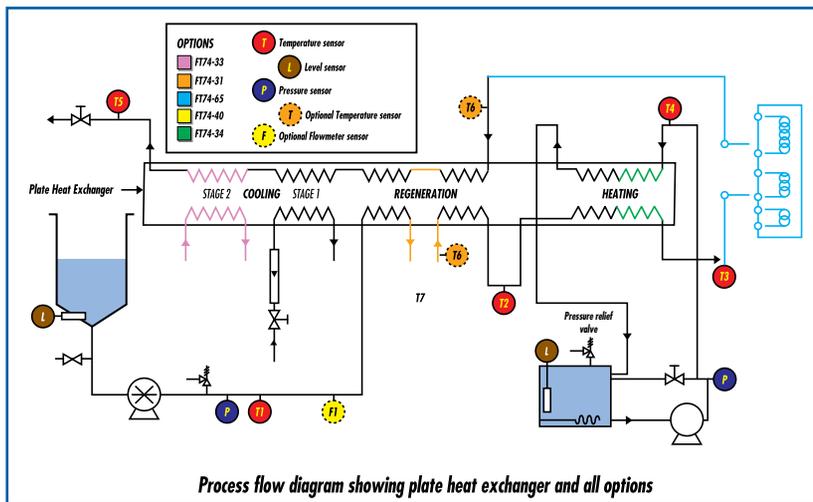
*The FT74-30-MkIII is the standard plate heat exchanger, comprising a regeneration section, a heating section and a cooling section. It is based on miniature 316 stainless steel plates specifically developed for this application. The chevron pattern mimics the turbulence and shear rate of industrial-scale 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 retrofit by the user.*

*The FT74-31 Homogeniser interconnecting plate can be fitted into the regeneration section and permits connections to an upstream (ie 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 enables the homogeniser to be connected after the heat treatment (downstream).*

**Note:** Only one interconnecting plate can be fitted at a time.



FT74-30 Plate heat exchanger module



APPLICATIONS	
● Baby foods	● Fruit and vegetable purees
● Beer	● Fruit juices and cordials
● Beverages	● Sauces and soups
● Condiments	● Gravies
● Confectionery	● Gelatine products
● Milk	● Pet food
● Cream	● Health and nutritional products
● Ice-cream	● Culture media
● Yoghurts	● Proteins
● Desserts and puddings	● Pharmaceuticals

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 (eg Armfield FT63) for the best possible product cooling. Output temperatures below 5°C are possible, dependent on the product and the flow rate. An interconnecting link is provided to permit 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 desired.

#### 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 (@10 l/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 from the holding tube to be displayed on the screen.

#### FT74-53 Suction Feed Assembly with automatic changeover

The FT74-53 adds an automatic water feed to the suction feed assembly (FT174-41). Should a low feed-level situation occur then the unit can switch to a pressurised water feed automatically. This therefore means that the operation of the HTST system is not interrupted.

#### 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 FT74XTS. 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.

#### FT74-41 Suction Feed Assembly

The FT74-41 is used in place of the feed hopper. The suction feed assembly allows the system to be connected to a feed tank. The assembly includes an in-line level sensor to protect the feed pump from running dry.

#### 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 (see separate data sheets)

A wide range of equipment is available for use in conjunction with the FT74XTS system to enhance the overall processing capability.

##### FT90/91 Homogenisation Subsystems

##### FT83 Sterile Filling System

##### FT63 Process Chiller

##### FT140 Mixing Vessels

#### 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.

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Armfield R&D products include:

- Hygienic connections as standard ✓
- 316 Stainless steel ✓
- Advanced CIP ✓
- CE certification ✓
- Extended warranty as standard ✓



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## FT74XTS Heat Exchanger Service Unit

### Feed pump:

Progressing cavity variable-speed pump, with standard and high flow modes.

Particulate handling:	0.8mm
Fibre handling:	25mm
Standard flow:	10-30 l/hr
High flow:	Up to 120 l/hr

### Pressurised water circulator:

Water capacity:	4.0 litres
Pump circulation rate:	Variable up to 6 l/m
Water temperature:	165 °C maximum
Safety cutouts:	Low level, High pressure Mechanical pressure relief valve
Heating duty:	4kW maximum

### Sensors and instruments

Temperature measurement channels:

- Inlet
- Preheat
- Main heat
- Hot water
- Outlet
- Plus one unallocated

Product pressure:	Pressure transducer
Cold water flow:	Manual

### Requirements

#### Services - Electrical

FT74XTS-A:	220-240V/1ph/50Hz (30A max)
FT74XTS-G:	220-240V/1ph/60Hz (30A max)
FT74XTS-E:	380V/3ph/50Hz (16A max)
FT74XTS-F:	220-240V/3ph/60Hz (25A max)

### Water

Town water is required for product cooling, typically 5 l/min (or FT63 Process Chiller).

## Tubular heat exchangers

### Number of tubes:

FT74-20-MkIII:	10 (2 preheat, 4 heating, 4 cooling)
FT74-24-MkIII:	14 (2 preheat, 4 heating, 4 cooling, 4 chilling)

Tube diameter (product side):	8.1mm
Overall diameter:	15.8mm
Length (heated):	0.4m
Material:	316 stainless steel
Assembled test pressure:	10 bar
Working pressure:	15 bar (maximum)
Standard holding tubes:	2s and 15s

### 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 (@10 l/hr):  
30, 40, 60, 70, 90, 100, 120 seconds

Other holding tubes available on request.

### Overall dimensions

Height:	1.40m
Width:	0.85m (1.10m 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.