

The FT74XA is a highly flexible, miniature-scale HTST/UHT processing system which makes it ideal for new liquid product development in the laboratory.

It has a wide range of options to suit all needs and can be operated independently or as part of a continuous-operation process with other Armfield equipment.

TOUCHSCREEN OPERATED HTST/UHT SYSTEM



FT74XA control touch screen



Features / benefits

- ▶ Touchscreen control of all operations (15 inch, 1366x768)
- ▶ Tubular and or plate heat exchanger options
- ▶ Low product hold-up means that tests can be made with a few litres of product
- ▶ Variable holding tube option (FT74-65)
- ▶ Platinum resistance (PT100) temperature sensors for high accuracy
- ▶ Fully instrumented: product pressure and flowrate (electromagnetic flow meter – FT74-40) and temperatures throughout the process and hot water/cold water service temperatures
- ▶ Seamless homogenisation integration (FT74-91) upstream or downstream with automatic speed control through the FT74XA touchscreen
- ▶ Independent operation or within a continuous process in both aseptic and non-aseptic modes
- ▶ Automated SIP capability (FT74-45) for system sterilisation prior to aseptic operation
- ▶ On-screen calculation of holding times from flow meter reading and display of Fo value based on holding time and temperature
- ▶ Controlled cooling (FT74-51) – product outlet temperature from the secondary cooling stage is automatically controlled to the value chosen by the operator
- ▶ Recipes saved in the system for instant set-up of operating parameters for particular products
- ▶ Two-stage cooling capability for plate and tubular heat exchangers (eg towns water then glycol – Armfield FT63) – optional
- ▶ Rapid switch-over between heat exchanger types
- ▶ Backpressure control using a sprung diaphragm valve or pinch valve (FT74-42) for products containing solids
- ▶ Suction feed capability (FT74-41 or FT74-53) to operate in conjunction with an external feed tank. Independent pre-heat hot water loop and product temperature control (FT74-46)
- ▶ Inclined tubular arrangement for FT74-20 for self-draining

FT74XA HTST/UHT service unit

The FT74XA is compact, mobile and easy to install. It has an integral pressurised hot water generator and requires only electricity and cooling water to operate making it ideal for confined spaces with limited services available in some laboratories.

Operation with either plate or tubular heat exchangers means a wide range of product viscosities can be handled. A progressive cavity feed pump ensures that flow rates are independent of viscosity/backpressure changes and allow a maximum operating pressure of 10 bar.

Typical processing flow rates are 10-20 L/h with holding temperatures up to 150°C. At pasteurisation temperatures flow rates of up to 60 L/h are achievable.

Cleaning in place (CIP) utilises the feed pump in high flow rate mode and there is a centrifugal pump CIP option (FT74-52) which generates very high cleaning velocities to deal with products that are particularly difficult to clean.

Sterilisation (SIP) of the system is controlled from the touchscreen. System sterilization time and temperature are defined and key temperature sensors are monitored to ensure the entire system satisfactorily completes the SIP cycle.

Automatic pre-heat control (FT74-46) offers an independent hot water circuit and the product pre-heat temperature is set via the touchscreen. The system is well instrumented for both process and services with all sensors displayed on the touchscreen and recorded values can be seen graphically and saved to USB datastick for further analysis.



FT74XA Self draining heat exchangers

- ▶ The FT74XA service unit provides the heating and cooling 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 (4kw standard with 6 kW with FT74-46 controllable pre-heat option) with a recirculation pump. It is controlled by an integral programmable logic controller (PLC) with a 15" high resolution (1366x768) full colour touchscreen panel interface for the operator
- ▶ Operating modes include Processing, CIP and SIP. There is also a Maintenance mode for service and set-up
- ▶ All sensor values and set points are shown and input on the screen. Sensor values can be recorded to a datafile to be downloaded by USB stick and then imported into Ms Excel. Sensor values can be observed in a graphical format on the touchscreen. The variables displayed and timescales of interest can be adjusted by the operator
- ▶ Operating parameters for a particular product can be saved as a recipe to be called up for easy equipment set-up
- ▶ The holding time is calculated from the measured flow rate and displayed on the touchscreen along with the Fo value calculated from the holding time and temperature

Options to enhance the functionality of the FT74XA base unit include:

- ▶ **Suction feed (FT74-41/53)** – These two options allow the unit to be connected to a feed tank instead of using the hopper (-41). An automated valve can also be used to add water when product runs out (-53)
- ▶ **Product divert valve (FT74-22)** - enables the product to be diverted away from the downstream process if the maximum temperature drops below a critical value. This enables the downstream process line to maintain its sterility. This value can be adjusted by the operator to suit the process
- ▶ **Electromagnetic product flow meter (FT74-40)** – with readings datalogged
- ▶ **Pneumatic pinch valve (FT74-42)** – this replaces the standard sprung backpressure valve when processing with particulate-containing products (requires a compressed air supply)
- ▶ **Sterilisation link (FT74-45)** – this enables the FT74XA to provide sufficient heat to sterilise the Armfield FT83 sterile filler
- ▶ **Variable holding tube (FT74-65)** – This comprises three separate holding tubes mounted inside an insulated stainless steel housing. The coils, used independently or in conjunction, provide seven different holding times between 30s and 120s at 10 L/h. Intermediate holding times are possible by varying the product flow rate.
It can be used with both the tubular and plate heat exchanger. And is supplied with a temperature sensor so that the temperatures in and out of the holding tube are monitored and recorded. Other holding tubes are available on request

Applications

- ▶ Baby foods
- ▶ Beer
- ▶ Beverages
- ▶ Condiments
- ▶ Confectionery
- ▶ Milk
- ▶ Cream
- ▶ Ice-cream
- ▶ Yoghurt
- ▶ Desserts and puddings
- ▶ Fruit and vegetable purées
- ▶ Fruit juices and cordials
- ▶ Sauces and soups
- ▶ Gravies
- ▶ Gelatine products
- ▶ Pet food
- ▶ Health and nutritional products
- ▶ Culture media
- ▶ Protein drinks
- ▶ Pharmaceuticals

Tubular heat exchangers FT74-20

- ▶ Consists of a series of industrial standard 316 stainless steel concentric tubes split into product pre-heat, main heat and cooling stages. With the standard tubular heat exchanger (5 tubes) the product pre-heat temperature is controlled manually using a needle valve to control hot water flow
- ▶ Product flows down the middle of the inner tube and the heating or cooling medium flows counter-currently through the annulus
- ▶ The surface area for cooling can be doubled (2 extra tubes) by specifying the -24 option
- ▶ A double area heat exchanger (FT74-20-DUAL, 10 tubes) is available (Requires FT74-46 option)



Miniature plate heat exchanger FT74-30-MkIII

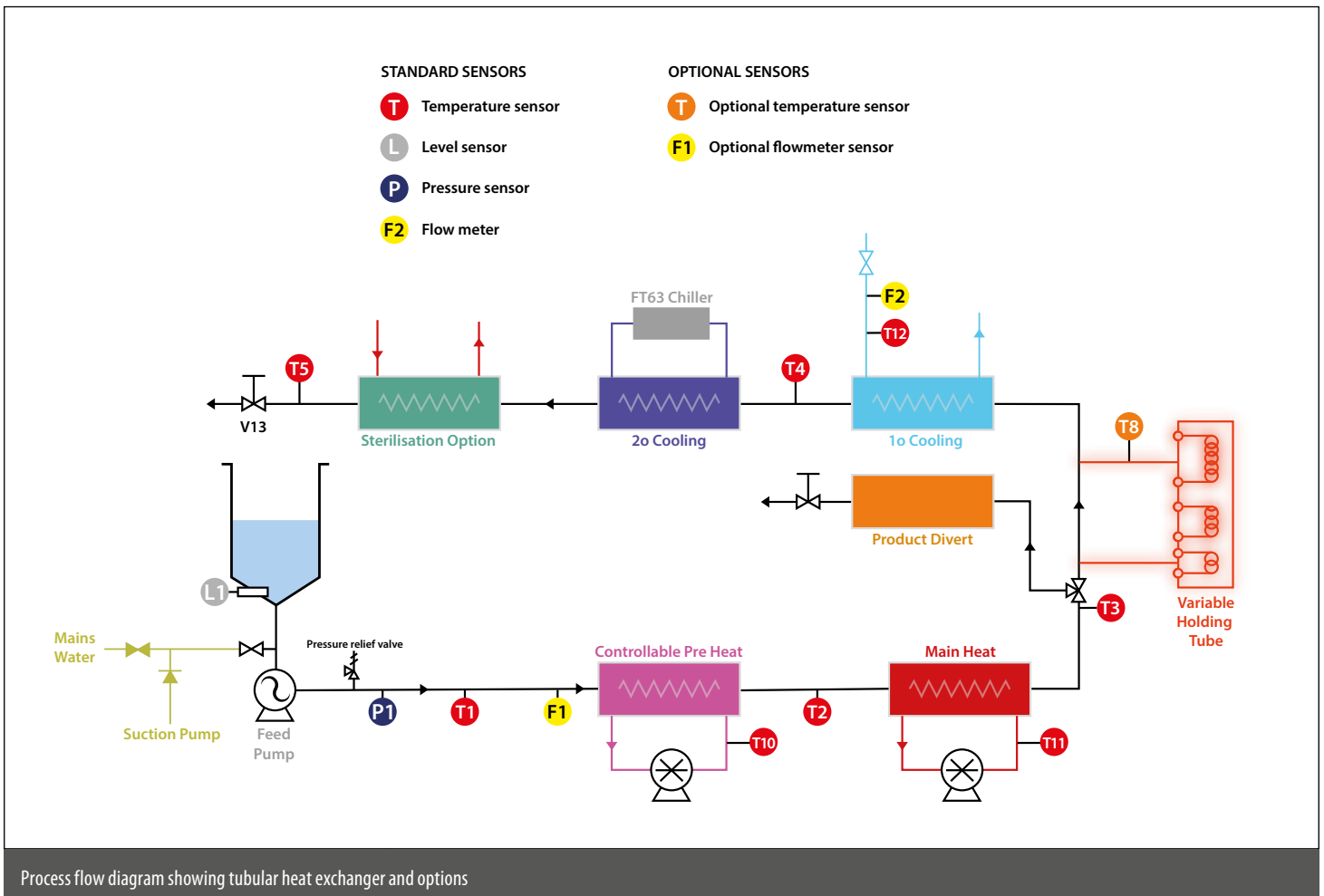
- ▶ The standard FT74-30 has a regeneration section that uses heat from hot product to heat incoming product. There is also a main heat and cooling stage. A number of options can be added:
 - ▶ FT74-31/32 Homogeniser plate upstream (-31) of main heat and downstream (-32) of main heat
 - ▶ FT74-33 Dual stage cooling gives an extra cooling stage (can be serviced by Armfield FT63 recirculating glycol chiller) to enable very low (< 5°C) product outlet temperatures
 - ▶ FT74-34 provides extra plates in the pre-heat and main heat sections which can be beneficial when operating at higher product flow rates for pasteurisations
- ▶ When FT74 is fitted with controllable pre-heat (-46) then the plate heat exchanger does not have regeneration and instead initial heating of the product is by the pre-heat hot water loop and the desired product pre-heat temperature is set using the touchscreen

Associated equipment (see separate data sheets)

A wide range of equipment is available for use in conjunction with the FT74XA system to enhance the overall processing capability.

- ▶ FT90/91 Homogenisation Subsystems
- ▶ FT83 Sterile Filling System
- ▶ FT63 Process Chiller
- ▶ FT140 Mixing Vessels
- ▶ Integrated systems

In addition to our standard offering, Armfield offer a service to design and build complete bespoke integrated processing lines optimized to your specific requirements.



Process flow diagram showing tubular heat exchanger and options

Technical specifications

FT74XA Heat Exchanger Service Unit

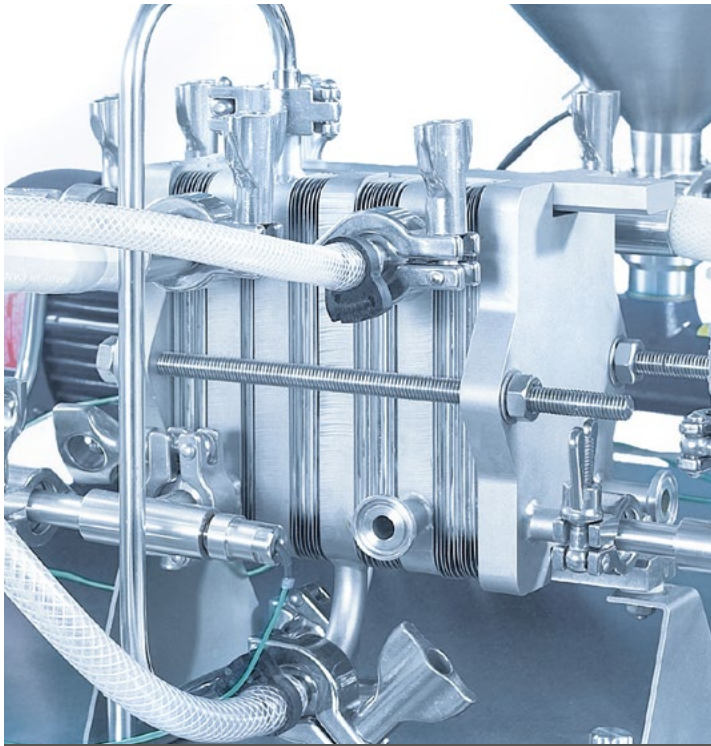
Feed pump

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	4 or 6 kW



FT74-30 Plate heat exchanger module

Overall dimensions

Length	0.90m
Width	0.85m
Height	1.40m

Packed and crated shipping specifications

Volume	2.1m ³
Gross weight	380Kg

Requirements

Scale



- ▶ Electricity supply: Single or Three phase (see ordering codes)
- ▶ Water supply: Required for product cooling, typically 5 l/min (or FT63 Process Chiller)

Number of tubes

Option	Pre-Heat	Main	Cooling	Chilling
FT74XA-20	1	2	2	
FT74XA-24	1	2	2	2
FT74XA-25-46	2	4	2	2

Tube diameter

(product side)	8.1mm
Overall diameter	15.8mm
Length (heated):	800mm
Material	316 stainless steel
Assembled test pressure	15 bar
Working pressure	10 bar (maximum)
Standard holding tubes	2s and 15s

Number of plates

Option	Regen/ Pre-Heat	Main	Cooling	Chilling
FT74-30	10	9	10	
FT74-30 + (-33)	10	9	10	10
FT74-30 + (-34)	10 +4	9 +4	10	
FT74-30 + (-33) + (-34)	10 +4	9 +4	10	10

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

Ordering codes

- ▶ FT74XA-A: 220-240V/1ph/50Hz (40A max)
- ▶ FT74XA-G: 220-240V/1ph/60Hz (40A max)
- ▶ FT74XA-E: 380V/3ph/50Hz (25A per phase max)
- ▶ FT74XA-F: 220-240V/3ph/60Hz (30A per phase max)

Knowledge base

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

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