armfield

Research & Development Technology

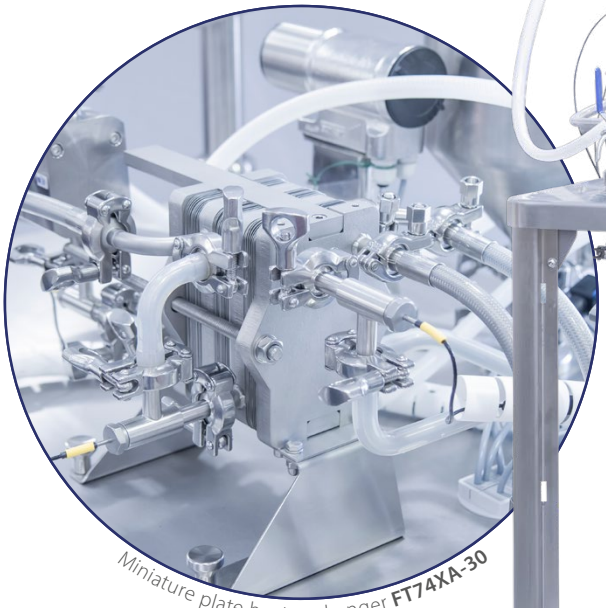
FT SERIES

HTST/UHT System – FT74XA

The FT74XA is a highly flexible, miniature-scale HTST/UHT processing system which is 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



Miniature plate heat exchanger **FT74XA-30**

Features / benefits

- Touchscreen control of all operations (15 inch)
- Tubular and plate heat exchanger options with rapid switch over
- Low product hold-up
- Variable holding tube option (FT74XA-65)
- High accuracy temperature sensors (PT100)
- Fully instrumented
- Upstream and downstream homogenisation
- Aseptic and non-aseptic modes
- Automated SIP option
- On-screen calculation of holding times and F_o value based on holding time and temperature
- Controlled cooling on the outlet (option)
- Recipes system as standard
- Two-stage cooling option
- Backpressure control using a sprung diaphragm valve or pinch valve (FT74XA-42) for products containing particulates
- Suction feed options for increased automation and batch size

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Issue: 3 **URL: http://www.armfield.co.uk/ft74xa**

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.

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.

Cleaning is in place (CIP) utilises the feed pump in high flow rate mode and there is a centrifugal pump CIP option (FT74XA-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 sterilisation 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 (FT74XA-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 data stick for further analysis.

FT74XA Tubular heat exchangers

- The FT74XA base unit provides the heating and cooling services, controls and instrumentation to run the heat exchangers. The heat exchangers fit on top of the base unit and can be interchanged easily in just a few minutes
- All sensor values and set points are shown and input on the screen
- Values can be recorded and extracted at a later date. These data can be viewed in real time as a graph or a table.

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

- **Suction feed (FT74XA-41/53)** – These two options allow the unit to be connected to a feed tank instead of the hopper (-41). An automated valve is used to add water when product runs out (-53)
- **Product divert valve (FT74XA-22)** - maintains downstream sterility when main heat temperature drops bellow the set point
- **Pneumatic pinch valve (FT74XA-42)** – for use with products that contain particulates
- **Equipment Sterilisation Option (FT74XA-45)** – this enables the FT74XA to provide sufficient heat to sterilise the Armfield FT83 sterile filler
- **Variable holding tube (FT74XA-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
- **Electromagnetic product flow meter (FT74XA-40)** – with readings data logged
- **Controlled Cooling (FT74XA-51)** - control the final temperature with a desired set point
- **CIP System (FT74XA-52)** - Clean with high velocity for especially fouling products

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
- Plant-based Beverages

Tubular heat exchangers FT74XA-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 anulus
- The surface area for cooling can be doubled by specifying the -24 option
- A double area heat exchanger (10 tubes) is available

Miniature plate heat exchanger FT74XA-30

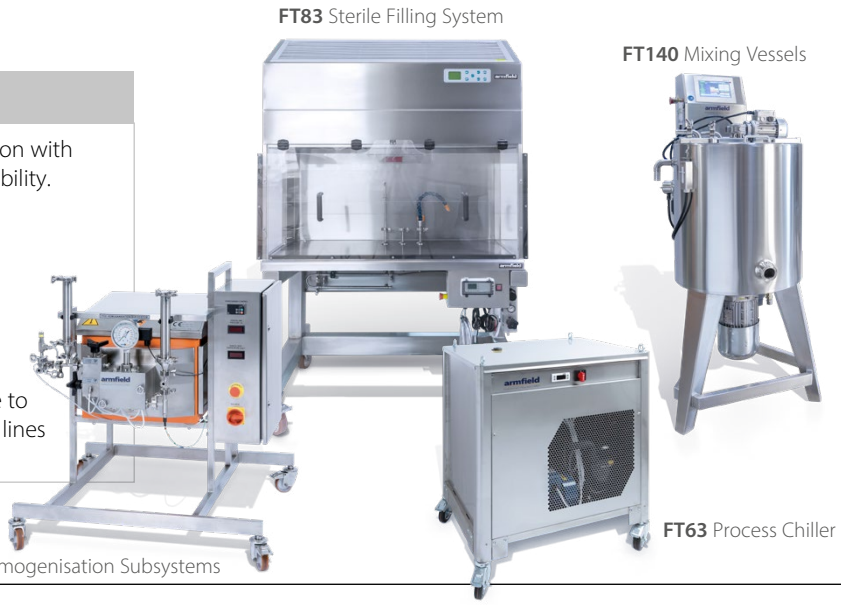
- The standard FT74XA-30 has a regeneration section that uses heat from hot product to heat incoming product. There is also a main heat and cooling stage. A number of options can be added:
  - FT74XA-31/32 Homogeniser plate upstream (-31) of main heat and downstream (-32) of main heat
  - FT74XA-33 Dual 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
  - FT74XA-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

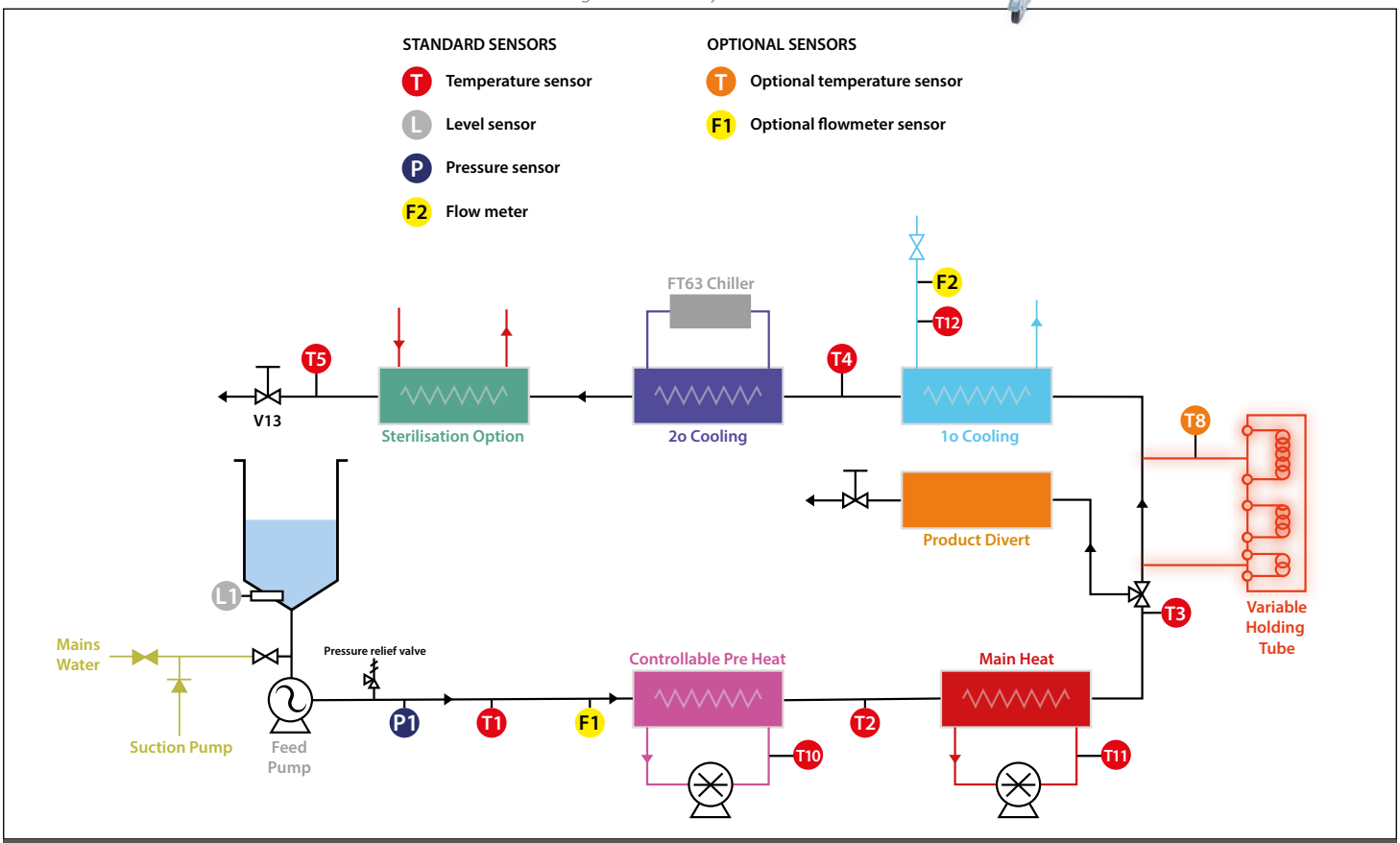
Associated equipment (see separate data sheets)

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

- FT91 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 optimised 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/h
High flow	Up to 120 L/h
Pressurised water circulator	
Water capacity	4.0 litres
Pump circulation rate	Variable up to 6 L/min
Water temperature	165˚C maximum
Safety cutouts	Low level
	High pressure
	Mechanical pressure relief valve
Heating duty	4 or 6 kW

FT74XA installed in a laboratory

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

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**
FT74XA-30	**10**	**9**	**10**	
FT74XA-30 + (-33)	**10**	**9**	**10**	**10**
FT74XA-30 + (-34)	**10 +4**	**9 +4**	**10**	
FT74XA-30 + (-33) + (-34)	**10 +4**	**9 +4**	**10**	**10**

Plate heat exchangers	
Plate overall dimensions	75 x 115mm
Plate Gap	2.0mm
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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