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Miniature-scale research & development technology

HTST/UHT MINI PILOT SYSTEM FT94LT

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ISO 9001:2008

2YR EXTENDED WARRANTY

AL ASEPTIC LINE COMPONENT

FEATURES

- Indirect heating, tube in tube UHT heat exchanger system
- Throughputs from < 20 to >100 l/hr (dependent on conditions)
- Process temperatures up to 150°C
- Touch screen control for ease of use
- Continuous operation
- Capable of aseptic operation
- Fully instrumented
- Preheating by vacuum steam
- Main heating by steam
- Controlled product preheat option
- Automatic product divert with temperature option
- Hygienic connections
- Built-in Clean In Place (CIP)
- Sterilisation In Place (SIP) option
- Simple linkage to sterile filling bench
- USB data logging option
- Electronic flowmeter option
- Suction feed with in-line level sensor

BENEFITS

- Cost effective laboratory system
- Compact design and easy installation
- Low product hold up (can operate with as little as 15 litre process batches)
- Suitable for producing large batches of material for extensive product testing
- Rapid start up
- Designed for easy integration into a process line
- Links directly to sterile filling bench

ISSUE - 3

Scan to learn more

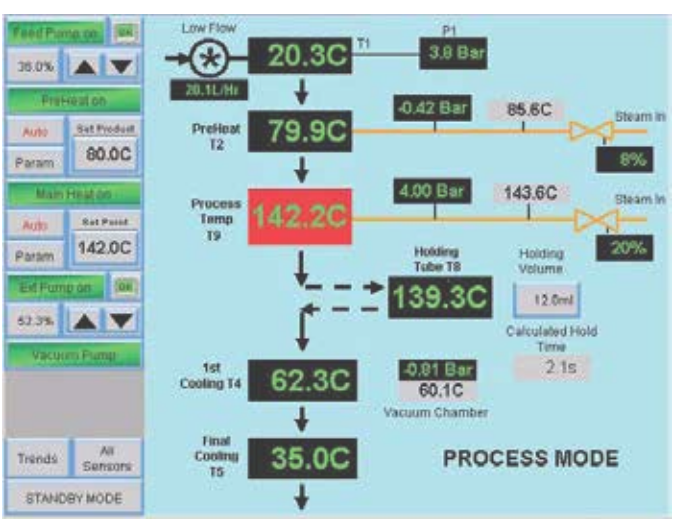
The FT94LT comprises a three stage heat exchanger complete with the services, controls and instrumentation required to operate the system. The heat exchanger, control panel and feed pump are mounted on top of a stainless steel table with all scervices and electrical cabinet located below.

The tubular heat exchanger design uses ten concentric 316 stainless steel tubes for product preheating (two tubes), final heating (four tubes) and cooling (four tubes). In all cases the product passes down the inner tube and the heating/cooling medium passes through the annulus in a counter current direction. As with all Armfield systems, it comes with hygienic fittings throughout as standard; it is easy to clean and very flexible in use.

For the main heating, steam is applied to the service side of the heating section using an electro-pneumatic steam control valve. The product temperature is measured at the end of the heat exchanger (or holding tube). This value is used by a Proportional, Integral and Derivative (PID) control algorithm (implemented in the Programmable Logic Controller (PLC)), to control the steam regulating valve, hence ensuring the user defined set point is maintained.

In order to provide a gentle preheat action, steam at sub-atmospheric pressure (and hence low temperature) is applied to the service side of the preheat section. In this way, steam temperatures at or significantly below 100°C can be produced, and low differentials between steam temperature and product temperature are achieved. Stable preheat temperatures of 60°C or less are feasible. Control of the steam pressure/temperature is achieved by a manual steam control valve, and automatic PID control is an available option.

Cooling water is applied to the cooling section of the product heat exchanger via a rotameter. For applications requiring chilled exit temperature, the system can be configured to use two initial cooling tubes using city water, and two final cooling tubes using a source of chilled water (Armfield can provide a recirculating water chiller if required).



The system is PLC controlled, with a high resolution TFT 8"colour touch screen panel making it extremely user-friendly to configure and monitor processing parameters. The operator is prompted at every stage whenever intervention is required.

All operation functions are controlled from this panel, including configuration and mode of operation (sterilisation, process or Clean In Place).

Different sets of processing parameters can be edited, stored and quickly recalled using the menu capability of the system.

Similarly, the ancillary items, such as the homogeniser and sterile filler, are also controlled from this panel. The system can be quickly and easily interfaced to other free-standing Armfield process items such as a mixing vessel, a chiller or a sterile filling system.

Options

Product Divert Option (FT94LT-22)

The FT94LT-22 Product Divert option enables product that has not been processed to a sufficiently high temperature to be diverted to drain thus ensuring product quality and heat treatment. The divert temperature is adjustable. Diversion is achieved using a low hold-up twin diaphragm valve block operated by compressed air and PLC controlled. Diverted product is cooled in a tubular heat exchanger before being led to drain.

Flowmeter Option (FT94LT-40)

The standard unit displays an estimated flow rate calculated from the feed pump speed. This is accurate enough for many applications, but where more accuracy is required, a flowmeter is available for measuring the product flow rate.

Sterilisation Option (FT94LT-45)

Sterilisation is achieved by applying steam onto the outside of the cooling tubes instead of cold water. This sterilises the cooling tubes and gives the power to sterilise a downstream homogeniser. The FT94LT-45 option provides the switching valves necessary to perform this.

Controllable Preheat Option (FT94LT-46)

This option is required when it is necessary to achieve an accurate preheat temperature (e.g. when it is important to homogenise at a particular temperature), or when using the preheat facility by itself for pasteurising at lower temperatures.

It replaces the standard manual preheat control valve with an automatically controlled electro-pneumatic valve. A PID loop is used to control the temperature to the operator's desired set point by actuation of the valve. The option also includes an electronic pressure sensor to measure the steam pressure. This pressure and its equivalent temperature (determined in the PLC) are displayed on the control panel.

Data Logging Option (FT94LT-44)

A sophisticated data logging package enables the measured data to be recorded onto a standard Windows PC (not supplied). The software records all temperatures, product and steam pressures, feed pump speed and many other sensor values. Data from optional accessories (e.g. the flowmeter) is also recorded. Data may be displayed in tables and graphs (both real time and comparisons across previous runs), and may also be exported to MS Excel.

Particulate Valve Accessory (FT94LT-42)

The FT94LT-42 is a manually controlled pinch valve, which provides much better performance than the standard back pressure valve when used with products containing particulates.

Accessories

Static Mixers (FT94LT-21)

The FT94LT-21 is a set of static mixers for two heat exchanger tubes. These significantly improve heat transfer with more viscous products and can be used for improving both heating and cooling efficiency. Multiple sets can be used to optimise both heating and cooling performance.

Holding Tubes (FT94LT-60 / 61 / 62)

FT94LT-60	15s at 50l/hr
FT94LT-61	30s at 50l/hr
FT94LT-62	2s at 50l/hr

Holding tubes can also be provided to suit your holding time and flow rate requirements. Please contact us with your specific requirements.

Feed Vessel (FT94LT-51)

The FT94LT-51 Feed Vessel option is a 50 litre stainless steel vessel with lid, fitted with a product outlet valve and a drain (or recirculation) valve. The assembly is mounted on castors for ease of movement.

Homogenisation Sub-system (FT91-94L)

In-line homogeniser can be provided for use with the FT94LT. Controls for the homogeniser are fully integrated into the FT94LT and its speed can be automatically matched to the FT94LT throughput. The homogeniser is fully sterilisable and can be positioned adjacent to the FT94LT.

Sterile Filler (FT83-94)

When used with the sterile options, the FT83 can be used to fill presterilised containers in a sterile environment. The FT83-94 version is completely compatible with the FT94LT and is controlled from the FT94LT's touch screen.

The FT94LT contains all the necessary functionality to sterilise the FT83-94. The FT94LT can also be interfaced directly to a sterile sealed bag filling system. Contact Armfield for details.

Recirculating Chillers (FT63, FT64)

A recirculating chiller enables product to be output at reduced temperatures. The FT63 is suitable for lower flow rates, but the FT64 is recommended for higher flows.

Mixing Tanks

Armfield can offer arrange of mixing tanks with low speed agitators, optional heated jackets and optional high shear mixing. Standard sizes are 50l and 100l.

Please contact us with your specific requirements.

APPLICATIONS

- Baby foods
- Beer
- Condiments
- Confectionery
- Culture media
- Desserts and puddings
- Fruit and vegetable purees
- Health and nutritional products
- Fruit juices and cordials
- Gelatine products
- Gravies
- Cream
- Ice cream
- Sauces and soups
- Yoghurts
- Meat pie fillings
- Milk
- Pet food
- Pharmaceuticals
- Ready meals

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Armfield R&D products include:

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

FT94LT Service Unit Technical Specifications

Feed pump

Progressive cavity variable speed pump

Flow rate:	30-100 l/hr
Discharge pressure:	18 bar (max)

Heating system

External steam supply

Maximum temp:	165°C
Safety cut outs:	Relief valve (7 barg)
Max product heating duty: (preheat + heating)	17 kW

Tubular Heat Exchanger

Number of tubes: 10
- 2 preheat
- 4 heating
- 4 cooling

Tube diameter

Product side:	8.1 mm
Overall diameter:	22 mm
Length (heated):	1.46 m
Product volume:	1.0 l
Material:	316 Stainless steel
Assembled test pressure:	30 bar
Working pressure:	24 bar (max)

Flowmeter Option (FT94LT-40)

Type:	Electromagnetic
Flow range:	30-100 l/hr

Requirements

Electrical supply:
FT94LT-A: 230V/1ph/50Hz (10 A)
FT94LT-G: 230V/1ph/60Hz (10 A)

Steam supply:
Heat output of 30kW (min 6.0 bar) – heating medium

Compressed air:
7 l/s (min 7.0 bar, max 10.0 bar) – valve operation

Cooling water:
10 l/min at 2 bar – product cooling

Chilled water:
Required for two-stage cooling configurations.
Optional Armfield FT63/FT64 chiller units are available.

Overall Dimensions

Height:	1.50 m
Width:	1.95 m
Depth:	0.80 m

Shipping Specification

Volume:	4.0 m^3
Gross Weight:	600 kg

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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