



Tetra Therm® Aseptic VTIS

Direct UHT treatment unit



For direct UHT treatment in tubular or plate heat exchangers, available as a separate unit or as an integrated part of a Tetra Lactenso Aseptic dairy production solution, with guaranteed performance.

Application

Aseptic processing unit for continuous UHT treatment with direct steam injection. Mainly for heat-sensitive low-acid products such as milk, enriched milk, cream, soy milk, formulated dairy products, ice-cream mix, dairy desserts as well as ESL (extended shelf life) products.

Working principle

The unit is fully automated to safeguard the aseptic status while in production. The operation can be divided into four steps:

- Pre-sterilization
- Production
- Aseptic intermediate cleaning (AIC)
- Cleaning in place (CIP)

Before production can start, it is necessary to sterilize the aseptic area by circulating pressurized hot water. After sterilization, the unit is cooled down to production temperature. Finally, sterile water is circulated through the product circuit.

Production starts by filling the unit with product via the balance tank. The product displaces the water/product mix to the drain or reject tank. A specially designed balance tank and valve arrangement minimizes the amount of mixed product.

When an aseptic tank or filling machine is ready, production can start. The product is regeneratively pre-heated to about 80 °C in a Tetra Spiraflo tubular heat exchanger or, as an alternative, in a Tetra Plex plate heat exchanger. Instant heating to sterilization temperature takes place in the steam injector by continuous injection of high pressure steam into the product.

The product enters a holding tube where it is held at sterilization temperature for the required period of time. The product then enters the flash vessel where the pressure and temperature drop instantly. The excess water in the form of steam is flashed off.

For optimal product stability, the product passes through an aseptic homogenizer before final cooling in the heat exchanger.

Aseptic intermediate cleaning (AIC) can be performed to prolong the production time between full CIPs. When AIC is selected, the product is displaced by sterile water before cleaning starts. During the AIC sequences, the holding tube is kept at the sterilization temperature, thus keeping the aseptic parts of the unit sterile. The AIC can be performed either with lye only or lye and acid flush. After each production run, the unit undergoes CIP with both lye and acid. If the product supply fails or a stop at a filling machine occurs, the unit goes into sterile water circulation.

Processing parameters

Standard temperature programs for white milk

5 - 80 - 140/4 s - 81 - homogenization - 20/25°C

Optional temperature program

5 - 80 - 150/6 s - 81 - homogenization - 20/25°C

Capacity

Variable production capacity with a maximum of 1:2 within the range of 2,000 up to 30,000 l/h.

Basic unit

Main module with:

- Product balance tank with level control and product bowl
- Centrifugal pump with frequency converter for product
- Centrifugal pump for water
- Flow meter for water
- Flow meter for product
- Brazed plate heat exchanger for heating in the water circuit
- Batch header tank CIP dosing system
- Valves, pipes, fittings
- Frequency converter, mounted on the frame

- Pre-wired, signal/power cables
- Control panel with Allen Bradley Compact Logix or Siemens S7, mounted on main module
- TPOP human-machine interface (HMI), with built-in report function, mounted on the control panel

Direct heating module with:

- Steam injector for direct heating of the product
- Centrifugal pump with frequency converter as product pump after expansion vessel
- Vacuum pump
- Expansion vessel for flash cooling with built-in condenser
- Plate heat exchanger for cooling of recirculating water for the condenser in the expansion vessel.
- Centrifugal pump for cooling water in the circuit for flash vessel
- Valves, pipes, fittings

Tubular (Tetra Spiraflo) or plate (Tetra Plex) heat exchanger

Pneumatic, remote controlled sanitary valves

Product piping in AISI 316

Set of pipes, bends, valves, internal signal wiring, pipes for signal wiring and fittings required for the pre-assembly of the UHT system.

Pre-assembly and water test in factory before delivery

Engineering, programming

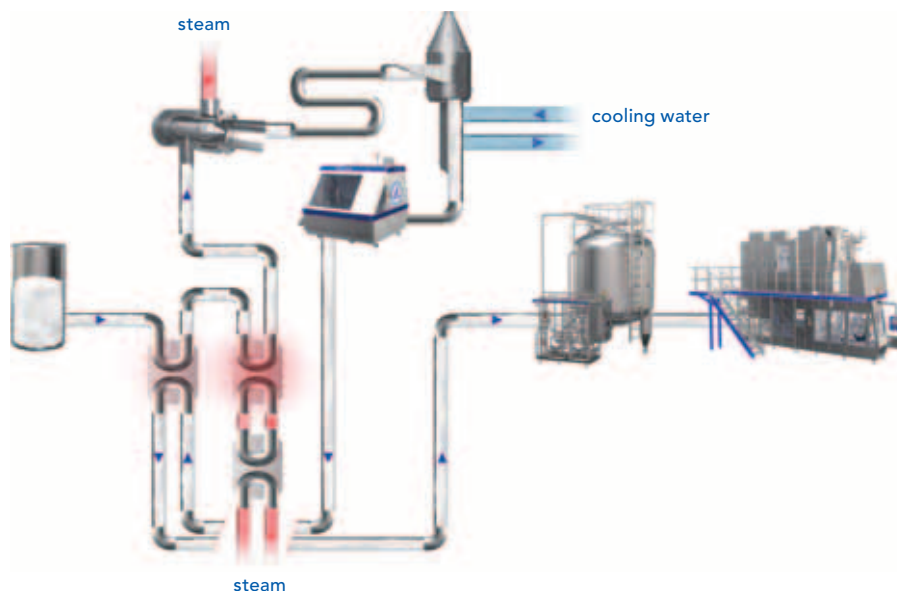
Technical documentation

Options

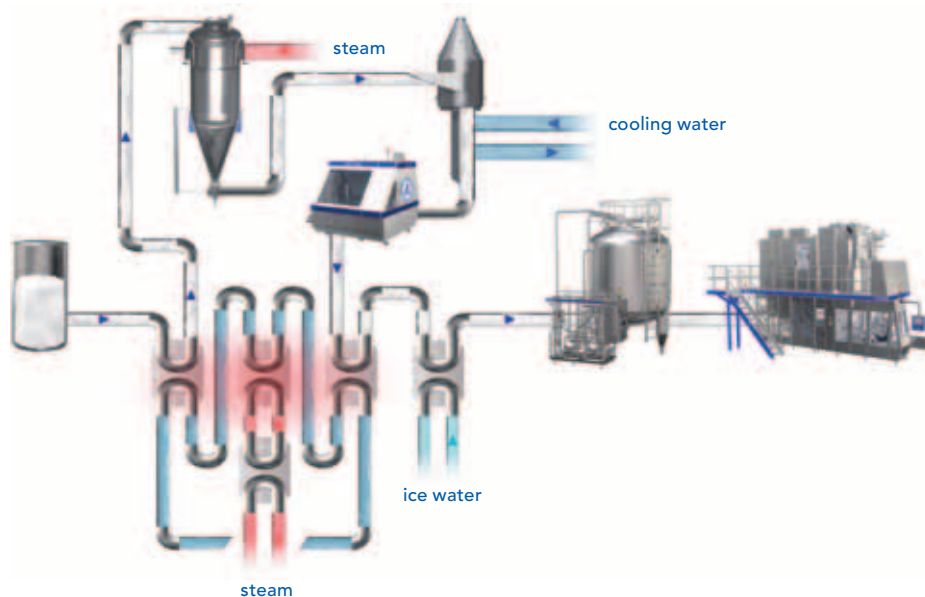
Base platform

- Two pneumatic transport pumps for CIP concentrate stand-alone or mounted on 300 l plastic containers with manual agitator
- Closed product balance tank with CIP device

Flow chart for Tetra Therm Aseptic VTIS based on tubular heat exchanger



Flow chart for Tetra Therm Aseptic VTIS based on tubular heat exchanger (options)



Control panel

- Free-standing control panel with frame and connection box mounted on main module
- Additional information and communication from homogenizer.
- Extra security switches for each motor
- Non-standard layout

Production safety

- Conductivity switch for CIP control
- IntelliCIP, software tool for production-adapted CIP
- Pressure differential measurement
- UPS (uninterrupted power supply) to control panel
- Air cooling unit with compressor cooling in control panel
- Sight glass
- Coarse strainer
- Product revert valve

Product information

- Digital paperless recorder with colour screen
- Display of water flow meter signal in operator panel
- Additional HMI, type Tetra PlantMaster ME for data logging and remote control, PC, In-Touch software, communication included.
- ViewReport tool to view and evaluate logged TPOP data

Improved production time

- Holding tube for stabilization of proteins
- Reduced lactulose value at reduced capacities

Special product treatment

- Direct heating by steam infusion
- Other process temperatures (5 recipes as standard)
- Extra holding tubes

Improved energy efficiency

- Reduced steam and water consumption

Reduced outlet temperature

- Extra cooling section in tube or plate heat exchanger with automatic ON/OFF valves
- Automatic temperature control on extra cooling

Reuse of cooling water for flash cooling

- Automatic temperature control on cooling of recirculating water
- Tube or plate heat exchanger with two sections, for cooling of re-circulating water

Filter equipment

- Particle steam filter in stainless steel
- Steam separator

Technical documentation

- Other languages than EEA languages

Extended shelf life

- Holding tube for improved enzymatic stability.

Tetra Therm Aseptic VTIS – direct UHT treatment

Technical data

Approx. consumption data for tube and plate heat exchanger based unit 2,000 – 30,000 l/h and per 1,000 l of product and standard temperature program 5-80-140/4 s-81-homogenization-20/25°C.

- Steam, 7 bar(g): 135 kg/h
- Cooling water, 3 bar(g), 30°C: 1,500 l/h during production, 1 000 l/h during pre-sterilization and cooling
- Rinsing water, 3 bar(g): 1,000 - 1,500 l/h during CIP rinsing depending on size and type of heat exchanger
- Instrument air: 50 NI/m, total regardless of capacity
- Electricity 380/400 V AC 50 Hz: 36 - 75 kW, excl. homogenizer

Approx. consumption data for tube and plate heat exchanger based unit 2,000 – 30,000 l/h and per 1,000 l of product and standard temperature program 5-80-150/6 s – 81-homogenization –20/25 °C.

- Steam, 7 bar(g): 150 kg/h
- Cooling water, 3 bar, 30°C: 1,750 l/h during production, 1,000 l/h during pre-sterilization and cooling
- Rinsing water, 3 bar(g): 1,000 - 1,500 l/h during CIP rinsing depending on size and type of heat exchanger
- Instrument air: 50 NI/m, total regardless of capacity
- Electricity 380/400 V AC 50 Hz: 36 - 75 kW, excl. homogenizer

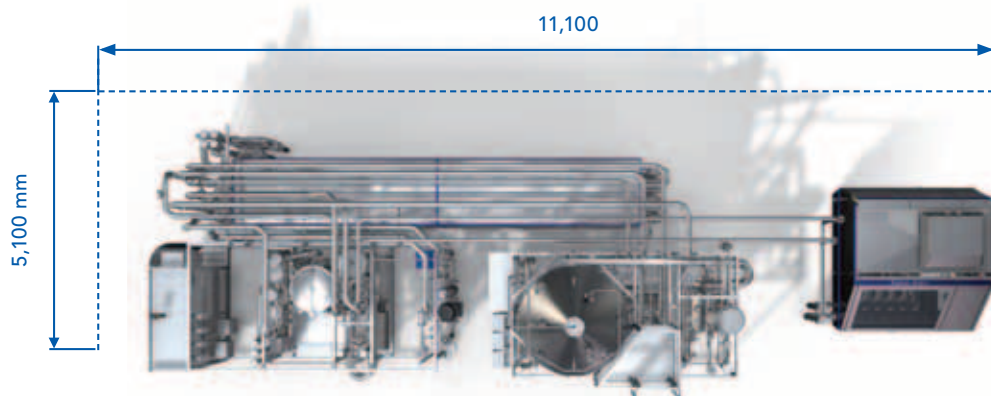
Dimensions


Approx. measurements including required service area in mm

Capacity: 15,000 l/h, based on tubular heat exchanger

Net weight: 8,000 kg

Gross weight: 8,700 kg



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