



Tetra Therm® Aseptic VTIS

Direct UHT treatment unit



Application

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

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

The process is also suitable for smooth products like soups, sauces, non-dairy cream and other starch based products and can handle smaller particles.

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.

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Working principle

When an aseptic tank or filling machine is ready, production can start. The product is regeneratively pre-heated to about 80 °C (application dependant) in a Tetra Pak® Tubular Heat Exchanger or, as an alternative, in a Tetra Pak® 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.

Standard equipment

Main module

- Batch header tank CIP dosing system
- Product balance tank with level control and product bowl
- Centrifugal pump with frequency converter for product timing pump
- Centrifugal pump for water
- Brazed plate heat exchanger for heating in the water circuit
- Pre-wired, signal/power cables
- Frequency converter, mounted on the frame
- Flow meter for water
- Flow meter for product
- Valves, pipes, fittings
- Control panel with Allen Bradley Control Logix or Siemens S7, mounted on main module
- HMI, type Tetra Pak® PlantMaster ME for data logging and remote control, PC, In-Touch software, communication included.

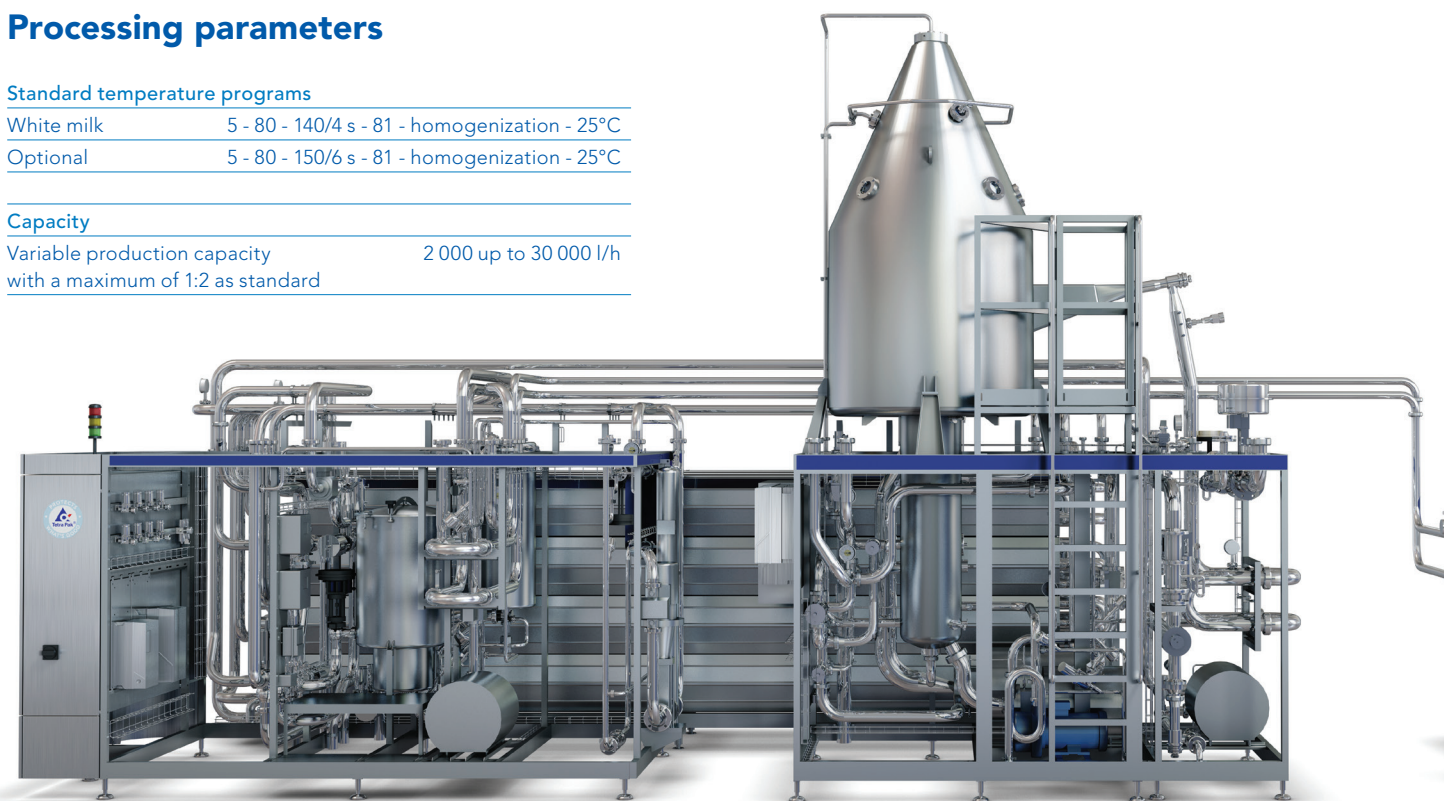
Processing parameters

Standard temperature programs

White milk	5 - 80 - 140/4 s - 81 - homogenization - 25°C
Optional	5 - 80 - 150/6 s - 81 - homogenization - 25°C

Capacity

Variable production capacity with a maximum of 1:2 as standard	2 000 up to 30 000 l/h
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Direct heating module

- 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
- A platform and ladder for easy access to the flash vessel
- 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

- Tetra Pak Tubular Heat Exchanger or Tetra Pak Plate Heat Exchanger
- Pneumatic, remote controlled sanitary valves
- Pneumatic tools for the plate heat exchanger (if PHE)
- Product piping in AISI 316

- Product pipe connection in SMS or DIN 11864-1
- Set of pipes, bends, valves, internal signal wiring, pipes for signal wiring and fittings required for the pre-erection of the UHT system.
- Factory pre-assembled and tested before delivery
- Engineering, programming
- Technical documentation

Optional equipment

Miscellaneous

- Two pneumatic transport pumps for CIP concentrate stand-alone or mounted on 300 l plastic containers with manual agitator
- Flow meter on the return line
- Service tool kit for the flash vessel
- Non-standard layout

Control panel

- Communication with supervisory system via BUS communication
- Remote HMI (TPOP) panel
- Additional information and communication from homogenizer
- Extra security switches for each motor
- TPOP with detailed flowchart and activation indication
- Extra control panel to use I/O communication with external objects

Production safety

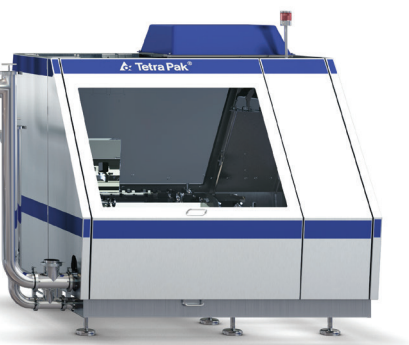
- Closed product balance tank with CIP device
- Conductivity meter to secure a fully completed rinse
- Pressure differential measurement
- Uninterrupted Power Supply (UPS)
- Air cooling unit with compressor
- Sight glass
- Coarse strainer
- Product revert valve
- Steam barrier and temperature guards on the aseptic side

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.

Improved production time

- Holding tube for stabilization of proteins
- Additional heating area
- IntelliCIP™, software tool for production-adapted CIP



Reduced product losses

- Turbidity meter for fine-tuning mix-phases

Special product treatment

- Automatic control of F0 value
- Extra holding tubes
- Automatic controlled holding tube pressure
- Automatic controlled homogenizer inlet pressure
- Direct heating by steam infusion

Improved energy efficiency

- Additional tubes in regenerative sections
- Aseptic hibernation mode

Homogenization

- Automatic cleaning and refill of homogenizer damper for increasing overall equipment effectiveness

Reduced outlet temperature

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

Reuse of cooling water for flash cooling

- Additional section in the plate heat exchanger, for cooling of re-circulating water
- Automatic temperature control on cooling of re-circulating water

Filter equipment

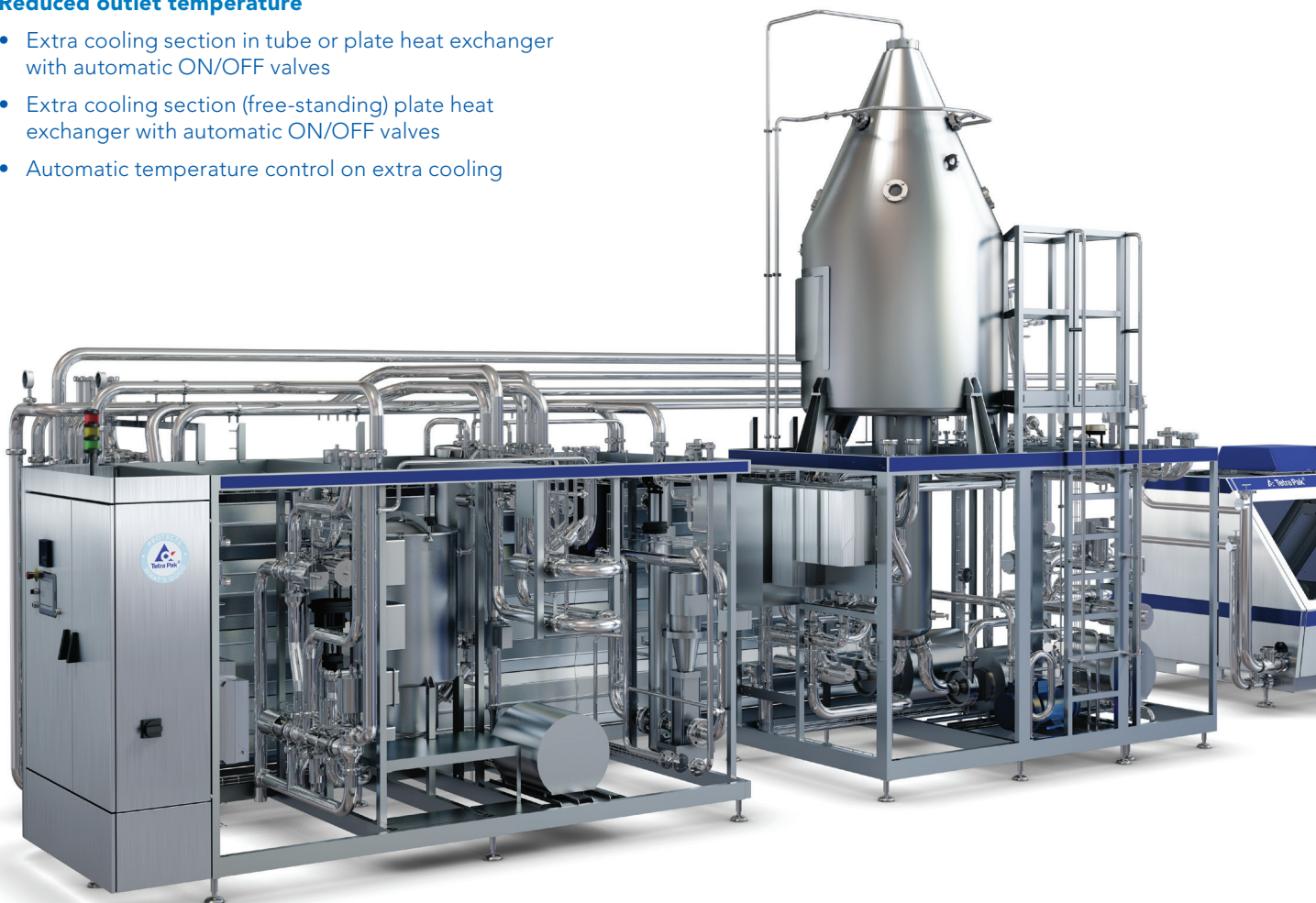
- Particle steam filter in stainless steel
- Steam separator

Extended shelf life

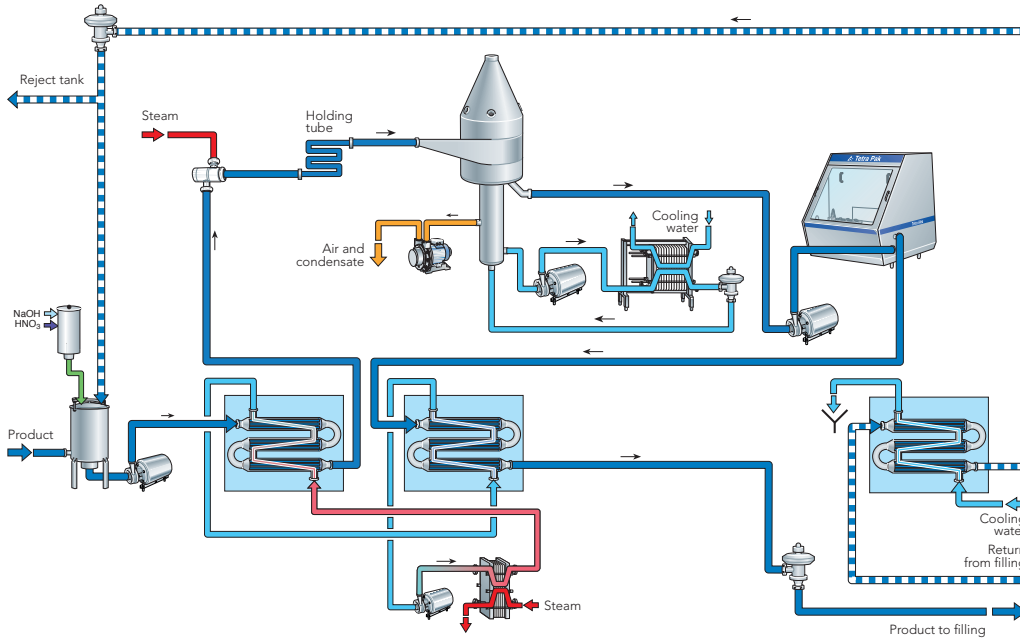
- Holding tube for improved enzymatic stability

Technical documentation

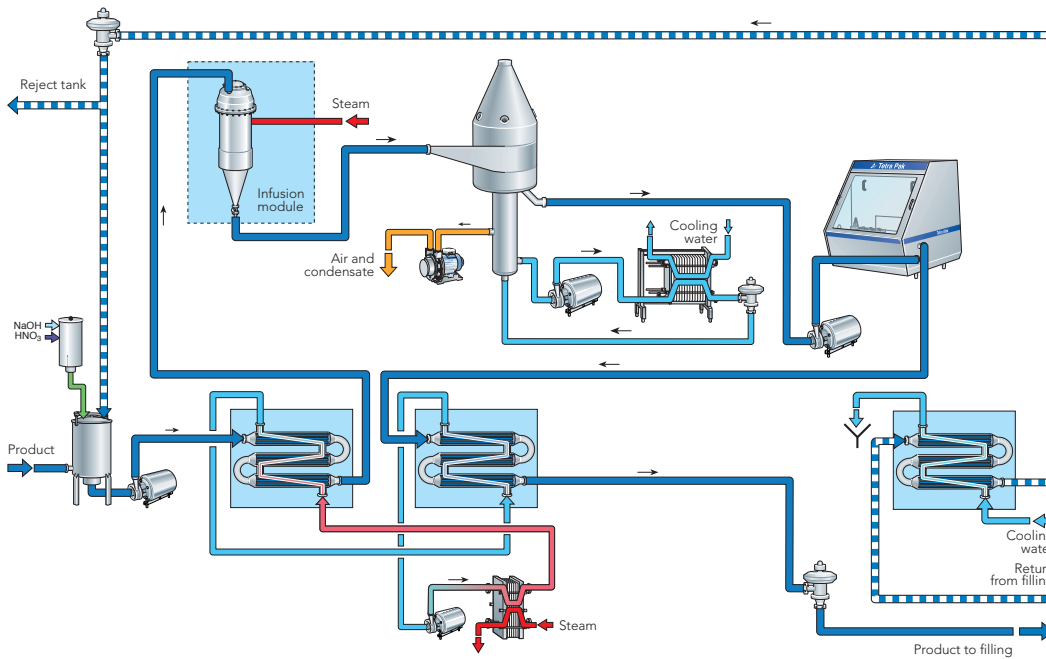
- Other languages than European Economic Area (EEA)
- CE marking



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



Flow chart for Tetra Therm Aseptic VTIS based on tubular heat exchanger and steam infusion (option)



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Technical data

The consumption data below is per 1,000 litres of product processed with two different temperature programs – at a capacity of 2 000-30 000 litres per hour in either tubular or

plate heat exchanger units. The figures can vary depending on capacity, options and the processed product.

Standard

5 - 80 - 140/4 s - 81 - Homogenization - 25°C

Steam consumption

Steam	7 bar, 125 kg/h
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Water consumption

Cooling water	3 bar, 29°C
Production	1 500 l/h
Pre-sterilization & cooling	1 000 l/h

Rinsing water

	3 bar
CIP (depending on size and type of heat exchanger)	1 000-1 500 l/h

Air consumption

Instrument air (regardless of capacity)	6 bar, 100 NI/min
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Electricity (excl. homogenizer)	380/400 V AC 50 Hz, 36 - 75 kW
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Optional

5 - 80 - 150/6 s - 81 - Homogenization - 25°C

Steam consumption

Steam	7 bar, 146 kg/h
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Water consumption

Cooling water	3 bar, 29°C
Production	1 750 l/h
Pre-sterilization & cooling	1 000 l/h

Rinsing water

	3 bar
CIP (depending on size and type of heat exchanger)	1 000-1 500 l/h

Air consumption

Instrument air (regardless of capacity)	6 bar, 100 NI/min
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Electricity (excl. homogenizer)	380/400 V AC 50 Hz, 36 - 75 kW
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Dimensions

Approx. measurements in mm including required service area.
Capacity (based on tubular heat exchanger) 15 000 l/h

