



Tetra Therm® Aseptic Flex

Indirect UHT treatment



Application

Tetra Therm® Aseptic Flex is a top-of-the-line processing unit for high-performance continuous indirect UHT treatment. The unit uses a tubular or plate heat exchanger under aseptic conditions to obtain a product that can be stored at ambient temperatures. Tetra Therm Aseptic Flex is suitable for dairy products such as milk, flavoured milk, cream, yoghurt drinks, buffalo milk and formulated dairy products, as well as for other applications such as juice, soy milk, tea and coffee.

Tetra Therm Aseptic Flex is available as a stand-alone unit or as part of a complete line solution.

Highlights

- More efficient CIP – IntelliCIP™ 2.0 – with in-line monitoring of results, thanks to new technology (international patent pending, WO2013092414)
- Lower product loss thanks to mix-phase tuning
- Lower water consumption thanks to deaerator eco-mode
- Reduced utility consumption in pre-sterilization and hibernation
- More consistent detergent dosing in balance tank

- User-friendly recipe overview
- Wide selection of performance-enhancing options
- Highest level of indirect UHT performance

Working principle

The module is fully automated to safeguard aseptic status while in production. The operation is divided into four steps:

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

Before production can start, it is necessary to sterilize the aseptic area by circulating pressurized hot water. In the tubular version, the aseptic part is equipped with an internal sterilization loop to minimize energy consumption and start-up time. After sterilization, the unit is cooled to production temperature. Finally, sterile water is circulated through the production unit.

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 in a Tetra Spiraflo® tubular heat exchanger, or alternatively in a Tetra Plex® plate heat exchanger, before being homogenized in a Tetra Alex® homogenizer. Final heating takes place by means of an indirect hot water circuit. The product is held in a holding tube for the required period of time. Regenerative cooling to packaging temperature occurs in the heat exchanger.

Tubular-based versions use heat-efficient, product-to-product regeneration in a Tetra Spiraflo CMR tubular heat exchanger. Tetra Spiraflo CM with two water circuits can be used for specific products or to prolong production time.

Aseptic intermediate cleaning (AIC) can be performed to extend the production period between full CIP. When AIC is selected, the product is displaced by sterile water before cleaning starts. During AIC sequences, the holding tube is kept at sterilization temperature, keeping the aseptic parts of the unit sterile. AIC can be performed with lye or with a lye/acid flush. After each production run, the unit undergoes CIP with both lye and acid. In the event of product supply failure or filling machine stop, the unit goes into sterile water circulation.

Basic unit

Tetra Therm Aseptic Flex continues to have the best possible scope of supply in terms of the highest efficiency, with the lowest total cost of ownership through the complete production lifecycle.

The new version of Tetra Therm Aseptic Flex improves efficiency and lowers environmental load by reducing operational cost in terms of energy and water consumption, and product savings. Further, the uptime for production can be significantly increased with the new IntelliCIP 2.0 optimization solution (international patent pending, WO2013092414).

Standard components

- Batch header tank for CIP dosing system
- Product balance tank with level control and product bowl
- Centrifugal product pump
- Product flow meter
- Centrifugal water pump
- Water flow meter
- Brazed plate heat exchangers for heating in the water circuit
- Centrifugal CIP booster pump

- Valves, pipes, fittings
- Frequency converters, mounted on the frame
- Pre-wired, signal/power cables
- Heat exchanger, tubular (Tetra Spiraflo) or plate (Tetra Plex)
- Control panel (see below) mounted on the main module
- TPOP human-machine interface (HMI), mounted on the control panel
- 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-erection of the UHT system
- Factory pre-assembled and tested before delivery
- Engineering, programming
- Technical documentation in EEA languages

Control panel

Tetra Therm Aseptic Flex is controlled by Allen Bradley Compact Logix or Siemens S7 control system, and is prepared for easy integration with Tetra PlantMaster™.

Capacity

Standard modules with fixed capacities from 4,000 up to 32,000 L/h. Variable capacity (see under "Options").

Options

Miscellaneous

- Two pneumatic transport pumps for CIP concentrate, stand-alone or mounted on 300-litre plastic containers with manual agitator
- Flow meter on the return line to sort mixphases
- Non-standard layout

Control panel

- Communication with Ethernet
- Remote HMI (TPOP) panel
- Additional information and communication with the 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 for CIP control
- Pressure differential measurement
- Uninterrupted power supply (UPS)
- Air cooling unit with compressor
- Sight glass
- Coarse strainer
- Product revert valve

Product information

- Digital paperless recorder
- Display of water flow meter signal in operator panel
- Additional human-machine interface (HMI), type Tetra PlantMaster ME

Capacity

- Variable capacity 1:3 max.
- Variable capacity incl. split heater
- Variable capacity incl. split heater with F_0 control
- Variable capacity including manual reduction of heat area with swing-bend

Improved production time

- IntelliCIP 2.0
- Protein-stabilization holding tube
- Temperature control for protein-stabilization holding tube
- Inlet temperature control to final heating section
- Additional heating area
- Controlled hot water flow to minimize ΔT

Reduced product losses

- Turbidity meter for fine-tuning mixphases

Improved energy efficiency

- Additional tubes in regenerative sections
- Aseptic hibernation mode
- Insulation of tubular heat exchanger (THE)

Special product treatment

- Deaeration module
- Deaeration module with eco-mode for reduced water consumption
- Extra holding tube, for holding time up to 30 seconds
- CMRF product-to-product tubes (replacing CMR tubes) for fibres
- Extra heater for second water circuits, to be used for high-viscosity products
- Additional heating section in the tubular heat exchanger tubes for drinking yoghurt (includes automatic on/off valve to homogenize at 75°C)
- Turbo tubes to optimize thermal impact on the processed product

Reduced outlet temperature

- Extra final cooling section, tubular heat exchanger for filling temperature below 30°C
- Extra final cooling section, plate heat exchanger for filling temperature below 10°C

Homogenizer

- Aseptic (optional) or non-aseptic (standard)
- Aseptic or non-aseptic, changeable by swing-bends
- Aseptic and non-aseptic
- Split homogenization
- Timing pump with flow control, required when arranged for non-aseptic homogenization and the homogenizer is not connected
- Timing pump with flow control, required when arranged for aseptic homogenization and the homogenizer is not connected
- Automatic CIP and refill of homogenizer damper for increasing overall equipment effectiveness

For juice treatment

- CIP backflush, required after treatment of juice with fibres >10mm, in tubular heat exchangers

Technical documentation

- Other languages than EEA languages
- CE marking for countries outside of the European Economic Area

Please note that most of the above options are also available as upgrades.

Consumption data

Approx. consumption data for tubular heat exchanger-based module with product-to-product heat regeneration up to 125°C (CMR>125) (per 1,000 litres of product)

- **Electrical power (400 V, 50 Hz)**
 - 23 - 60 kW, excluding homogenizer
- **Rinsing water at 300 kPa (3 bar)**
 - 1,000 - 2,000 L/h during CIP rinsing (depending on heat exchanger size and configuration)
- **Cooling water at 300 kPa (3 bar), 20°C**
 - 0 - 100 L/h during production (increases with fouling in the unit)
 - No consumption during pre-sterilization
 - 500 L/h during cooling
- **Steam at 700 kPa (7 bar)**
 - 22 kg/h can be reduced with options, peak 110 kg/h during heating to sterilization temperature
- **Instrument air**
 - 50 NI/min, total, regardless of capacity

Layout

Approx. measurements (including required service area) in mm.

Capacity: 14,000 L/h

