



# Tetra Pak® Indirect UHT unit DC

Smart value today, ready for tomorrow



## Application

Tetra Pak® Indirect UHT unit is a processing unit offering smarter and smoother operation for ultra-high temperature treatment of dairy products. The unit is of aseptic design, and a tubular heat exchanger is used for indirect heating to obtain a product that can be stored at ambient temperatures. Tetra Pak® Indirect UHT unit is suitable for dairy products such as milk, flavoured milk, cream, yoghurt drinks, buffalo milk and formulated dairy products, as well as for other low acid products such as soy milk. Combinations with non-dairy applications such as juice, tea and coffee are also possible.

Tetra Pak® Indirect UHT unit is available as a stand-alone unit or as part of a complete line solution.

## Highlights

- Value for money with direct steam in the final heater
- Optimized steam consumption using product-to-product heat regeneration
- Minimized product losses via low-loss balance tank function
- Optimal product quality
- Safety in focus at all times
- Smart automation with full production overview and control of the heating unit from the operator interface
- Easy to upgrade, creating new possibilities for tomorrow
- Speed to operation

## Streamlined, robust and reliable

Tetra Pak® Indirect UHT unit offers a smart, well proven solution, with value for money. The direct steam in the final heater, together with product-to-product heat regeneration, offers reliable technology with low steam consumption. Product loss is minimized at phase change thanks to a bottom-filling balance tank. The streamlined model offers optimal heat load for the right product quality, and safety is secured from each individual component throughout the complete design. Additionally, productivity is always safeguarded as a result of full control in the holding tube and over-pressure on the aseptic side.

The graphical user interface displays information effectively for everything from layout to screen colors and symbols. The interaction between humans and the computer puts the whole process in seamless synergy, making sure operators of every experience level do the right things at the right time.

Tetra Pak® Indirect UHT unit is designed to grow along with your capabilities throughout the product lifecycle. A wide selection of powerful features is available when you need them. Every aspect is produced with efficient, world class manufacturing and always tested before delivery to offer the fastest speed to operation.

## Working principle

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

- Pre-sterilization
- Production
- Intermediate cleaning (IC)
- Cleaning-in-place (CIP)

Before production can start, it is necessary to sterilize the aseptic area by circulating pressurized hot water. 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.

When an aseptic tank or filling machine is ready, production can start. 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 with bottom filling minimizes the amount of product loss. The balance tank includes level control and CIP device, which safeguards the gentle treatment of the product and ensures a high degree of cleanability.

The product is regeneratively pre-heated in a Tetra Pak® Tubular Heat Exchanger before being homogenized in a Tetra Pak® Homogenizer. Final heating takes place by means with direct steam in the final heater. The product is held in a holding tube for the required period of time. Regenerative cooling to packaging temperature occurs in the heat exchanger. If required, the product is further cooled by ice or tower water in the final cooling section.

Intermediate cleaning (IC) can be performed to extend the production period between full cleaning-in-place (CIP). When IC is selected, the product is displaced by sterile water before cleaning starts. During IC sequences, the holding tube is kept at sterilization temperature, keeping the aseptic parts of the unit sterile. IC can be performed with lye or with a lye/acid flush. After each production run, the unit undergoes CIP with both lye and acid. These can be supplied by a central CIP system, or the chemicals may be automatically dosed directly into the balance tank by an internal cleaning system. In the event of a product supply failure, the unit goes into sterile water circulation.

The operator interface is used for process monitoring and the selection of required functions. The process controller controls and supervises both the basic process and optional units for deaeration and homogenization.

A data logging system in the unit keeps track of date of production, processed volumes, processing times, type of CIP performed, etc. Using a serial protocol, or optional I/O connections, the process controller can communicate with objects like aseptic tanks and filling machines.

## Processing parameters

The temperature program is specifically designed for each product, for example:

UHT Milk: 5–75 (Homogenization) – 137 – holding time 4s. –20/25°C

## Capacities

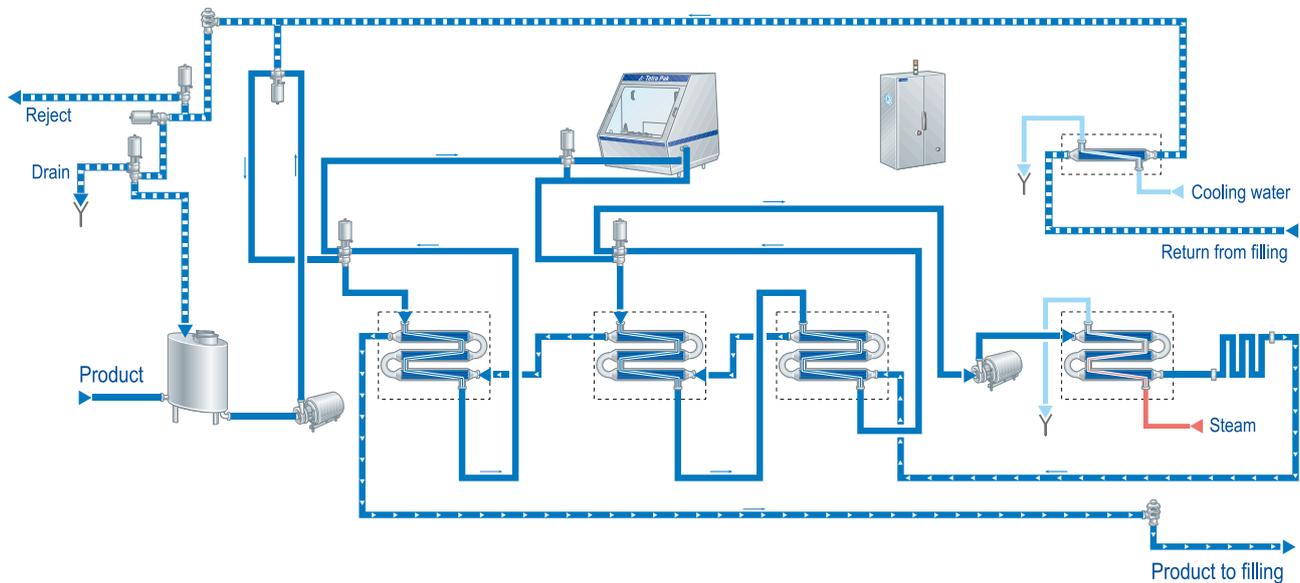
The Tetra Pak Indirect UHT unit is available with variable capacity and can run capacities from 1,000 L/h up to 40,000 L/h.

## Scope of supply

- Product balance tank (BT) with level control
- Frequency controlled centrifugal product feed pump
- Centrifugal booster pump
- Flow controlled by electronic flow meter
- Centrifugal booster pump
- Free-standing Tetra Pak® Tubular Heat Exchanger (THE) with floating connections including protection panels
- Control panel in stainless steel including process controller (PLC), solenoid valves and motor starters
- Automated PLC operated sequences
- Automated process interaction with downstream equipment
- Automated fault supervision and action for pumps, temperatures
- Registration of sterilization and outlet temperatures
- Valves, pipes, fittings
- Frequency converters, mounted on the frame
- Pre-wired, signal/power cables
- 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
- Technical documentation in EEA languages

## Example flowchart

### Tubular heat exchanger with product-to-product heat regeneration up to 125°C



## Optional features

### Automation and control

- PLC Control system: Siemens
- 21" Industrial PC operator panel mounted in the control cabinet
- Free standing PC as operator interface (HMI)
- Tetra Pak® PlantMaster integration
- Uninterrupted power supply (UPS)
- Control panel air cooling
- Digital paperless recorder

### Production efficiency

- Reduced steam consumption with Eco heating
- Protein denaturation holding tube for controlled fouling
- Temperature control for protein denaturation holding tube
- Additional heating area in the final heating section
- Hot water circuit in the final heating section
- Correction cooler to homogenizer

### Production flexibility

- Variable capacity 1:3 max.
- Variable capacity incl. split heater
- Extra holding time in additional tubes

### Reduced outlet temperature

- Automatic media control
- Final cooler with manual or automatic valves

### Production safety and convenience

- Coarse strainer after product feed pump

### Deaerator

- Deaerator on separate skid

### Homogenizer

- Aseptic homogenization
- Aseptic or non-aseptic, changeable by swing-bends

### Cleaning

- CIP from CIP station or from internal CIP system
- Internal CIP system with automated addition of CIP detergent into the balance tank via time-control dosing
- CIP recipe editor with possibility to design unique cleaning recipes

### 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.

## Technical Data

Approx. consumption data for tubular heat exchanger-based module with product-to-product heat regeneration up to 125°C (per 1,000 litres of product), with a temperature program of 5–75 (Homogenization) –137 – holding time 4s. –20°C

- **Steam (700 kPa)**
  - 30 kg/h
- **Cooling water (300 kPa, 20°C):**
  - 0–100 L/h during production (increases with fouling in the unit)
  - No consumption during pre-sterilization
  - 500 L/h during cooling

## Environment

- Tetra Pak® Indirect UHT unit is built in a modular design, which makes it easy to rebuild and adopt for new duties
- The unit consists of parts that can be separated for recycling purposes.

- **Rinsing water CIP (300 kPa):**
  - 1,000–2,000 L/h during CIP rinsing (depending on heat exchanger size and configuration)
- **Instrument air (600 kPa):**
  - 50 NI/min, total, regardless of capacity
- **Electricity (380V/50Hz):**
  - 9–22 kW, excluding homogenizer

## Dimensions

- Approximate measurements including required service are in mm.
- Dimensional drawing shows optional sub-units for homogenization, deaeration and PHE cooler
- Specific measurements will vary depending on capacity and configuration

