Tetra Therm® Aseptic Drink 1

Aseptic pasteurisation module
for juices, nectars and still drinks

Applications

The Tetra Therm Aseptic Drink 1 is a pasteurisation module for gentle and safe production of high-acid (pH < 4,6) beverages such as juices, nectars and still drinks under aseptic conditions prior to aseptic filling.

Versions based on Tetra Plex C and Tetra Plex CW plate heat exchangers are available.

Working Principle

The Tetra Therm Aseptic Drink 1 is a manually-operated pasteuriser with automatic functions for ensuring product safety.

The operator controls the pumps and valves individually and enables the automatic divert function from the control panel. Pasteurisation/sterilisation temperature, flow rate and the position of the flow diversion valve are continuously supervised and recorded in order to ensure safe production.

The module has the following process operations:

- Pre-sterilisation
- Production
- Cleaning-in-place (CIP)

The established and validated design developed over a number of years ensures high availability for production.

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Tetra Therm Aseptic Drink 1 – Aseptic pasteurisation module for juices,

Pre-sterilisation

Before production can commence, the Tetra Therm Aseptic Drink 1 is rinsed with water. This is followed by pre-sterilisation of the module's aseptic area by circulating pressurised water at 95 °C for approx. 30 minutes. The module is then cooled down to production temperatures. When the production temperatures are reached, aseptic water is pumped through the product circuit and the module is ready to receive product.

Sterilisation of the module is secured by automatic supervision and control of temperature and time during the sterilisation sequence.

Production

Filling the module with product via the balance tank is the first step in the production sequence. When the downstream filling machine is ready, production can begin.

During production, the pasteurisation temperature and product capacity are automatically controlled. Product routing is manually controlled. A flow divert function ensures that product exposed to low pasteurisation temperature will not be used in filling. An automatic flow diversion valve is placed within the module downstream from the holding tube and divert the flow back to the balance tank.

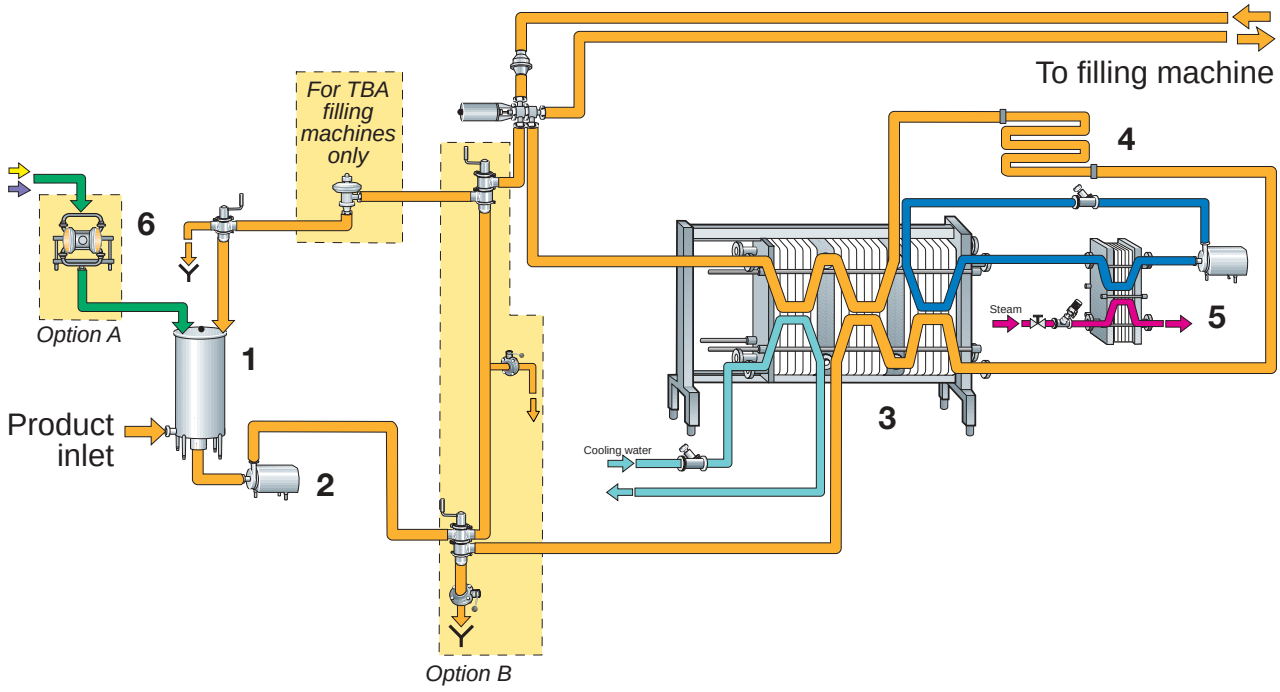
On the control panel is a colour screen recorder, which documents pasteurisation temperature, pre-sterilisation temperature, flow rate and position of the diversion valve.

The product is first regeneratively pre-heated and then heated to pasteurisation temperature in a final heating stage by means of circulating hot water. After being kept at the pasteurisation temperature in the holding tube for the required period of time, the product is regeneratively cooled and then cooled to the filling temperature by cold water.

Energy regeneration means energy consumption is minimised. Energy recovery of 80 – 85 % is common for aseptically-filled single-strength fruit juice.

At the end of a production run, the unit is emptied of product by water. Circulating sterile water is replaced by a new product or CIP cleaning detergent.

Production Flowchart



Main flowchart items

1 Balance tank
2 Feed pump
3 Tetra Plex plate heat exchanger
4 Holding tube
5 Hot water unit
6 Optional CIP dosing unit

, nectars and still drinks

Cleaning (CIP)
The Tetra Therm Aseptic Drink 1 is cleaned internally by circulation of CIP liquid. This liquid is dosed into the balance tank and heated by the pasteuriser's heat exchanger.

Processing parameters
Single strength fruit juice, still drink or nectar

CA version
Fruit cells/fibres length 0 – 1 mm
Sinking pulp (suspended pulp) max. 10 % V/V

WA version
Fruit cells/fibres length 0 – 5 mm, max. 5 % w/w
Sinking pulp (suspended pulp) max. 30 % V/V

Time/temperature program

Pre-sterilisation, °C	95
Inlet, °C	20
Pasteurisation, °C	95
Holding time, s	30
Outlet, °C	25

Capacity
One capacity within the range:

CA 4 000 and WA 4 000, l/h	1 500 – 4 000
CA 8 000 and WA 8 000, l/h	4 000 – 8 000

Basic version
Tetra Therm Aseptic Drink 1 is a pre-assembled, skid-mounted pasteurisation module. Its heat exchanger is placed separately outside the module. The process is tested with water prior to delivery.

Main components
- Balance tank for incoming product
- Product feed pump, frequency-controlled
- Magnetic inductive flow meter
- Plate heat exchanger:
  CA = Tetra Plex C
  WA = Tetra Plex CW, with wide stream plates designed for processing products containing fibres
- Hot water set for generation of hot water by means of steam containing:
  - Brazed PHE for heating in the water circuit
  - Centrifugal pump
  - Regulating valve
  - Steam regulating valve
- Holding tube on top of the module
- Control panel in stainless steel containing:
  - Colour screen recorder
  - Motor starters
  - Push buttons and selector switches for operator actions
- Set of valves, pipes and fittings containing:
  - Sanitary manually-controlled valves
  - Process pipes in AISI 316 stainless steel
  - Steam and cooling water valves
- Skid mounting comprising:
  - Frame in stainless steel
  - Motor and control cables
- Commissioning kit
- Technical documentation

Options
A Pneumatic CIP dosing pump
B Manual back-flush cleaning
C Adjustable holding tube
D Start and stop of external feed pump

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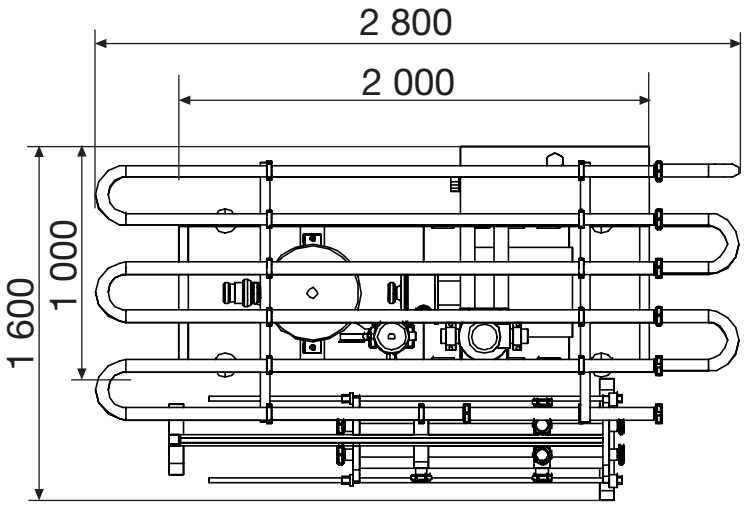
Consumption data

Type of heat exchanger	CA	CA	WA	WA
Capacity, l/h	4 000	8 000	4 000	8 000
Steam, 300 kPa				
– pre-sterilisation, kg/h	150	300	150	300
– production, kg/h	85	150	100	180
– CIP, kg/h	200	400	200	400
Cooling water, 15 °C, 300 kPa, l/h	2 000	2 400	1 800	3 800
Mains for CIP, 300 kPa, l/h	4 200	8 000	4 200	8 000
Instrument air, 600 kPa, n l/min	50	50	50	50
Electricity (installed power), 400/230 V, AC, 50 Hz, kW	9	10	9	10

Dimensions

Measurements in mm.
Height 2 500 mm



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