

22. Thermal product treatment VARIOFLASH B 15

Model description

The product is heated in heat exchangers according to the pasteurisation principle, the temperature is kept and then cooled down. During the thermal product treatment the number of bacteria is substantially reduced before filling in order to achieve the required microbiological shelf life of the product. With the heat recovery, which is adapted to customer's requirements, the use of energy can be minimized. In order to disengage the thermal product treatment and the filling process, the line is equipped with a buffer tank. The VARIOFLASH B is mounted on a frame..



System advantages

- Energy recovery of 91 % and more
- 15" touch-screen with the same operator interface as in the complete filling line
- Air-conditioned stainless steel control cabinet
- Line design optimised for maintenance
- Modular design
- Eco-hygienic Sleep Mode: beverage sterile production interruption with continuous maintenance of the thermal barrier layer. This reduces energy and water consumption to a minimum.
- With Krones EvoGuard a high performance valve series of our own production is available. This offers evident advantages in the daily operation and during maintenance processes



Illustrations are only for non-binding information, the text description has precedence.

22. Thermal product treatment VARIOFLASH B 15

Prices

Basic machine

- Control cabinet assembly according to UL508a/CSA
- Electrical documentation in DXF format
- Basic machine VarioFlash

Customer-related expansions

Additional equipment

- Flow meter in product discharge
- Plate heat exchanger for hot water with product pre-heating
- Pressure sensor for monitoring the positive pressure gradient in the heat exchanger
- Conductimetry in product infeed
- Steaming of gas filter and if necessary of the buffer tank
- Double sterile gas filtration
- Pressure reducer for heater steam connection
- Product pre-heating
- Recording separate writer
- Product pump infeed with mount / pressure tank cellar
- Design of sampling valve in the infeed
- Design of sampling valve in the discharge
- Maintenance platform VarioStore

additional software package(s)

- Eco-Hygienic sleep mode
- Output adaptation to the filler
- Direct change from CIP cleaning to production without cooling down

Additional electrical equipment

- Cable design according to UL/CSA standards.
- Main and auxiliary contactors, make: Allen Bradley
- Motor protector, make: Allen Bradley
- Manufacturer hardware switching devices, make: Allen Bradley
- Control and indicating devices, make: Allen Bradley 800E
- Manufacturer signal beam, Allen Bradley
- Conductor cross-section 3-wire min. 14 ampere-turns inside and outside of housings
- Core marking according to contact/terminal numbers with BRADY marker

22. Thermal product treatment VARIOFLASH B 15

- Wire colours, special design
- Software work for foreign line data storage system according to KRONES standard specifications (data is stored in blocks)
- Control cabinet with mechanical door interlock mechanism

Customer requirement

- - pasteurization temp. VarioFlash B 4
--> 71 - 85 °C
- Holding Time VarioFlash B 4
--> bei 30 sek. bei 42,6 hl/h
- Pasteurization Range
--> 20 - 1.985 PU
- Product Inlet Temp. VarioFlash B 4
--> 4 °C

Attention extended delivery time by ASME + CRN

- quotation at 20 – 42,6 hl/h, Krones Standard components!
- beer max. 6,0 g/l CO₂
- 20 - 1.985 PU, 71 - 85 °C with CO₂
- Cl-content: max. < 40 ppm
- 3 stage plate heat exchanger, 91 % energy recovery
- buffer tank, 20 hl, 6 bar g, fully welded insulation: yes
- 4 °C Product Inlet VarioFlash
- 20 °C at the Filler
- without Maintenance platform VarioStore
- Abluft-Ausleitung nach außen mit Dämpfen
- no Smart-Tops on Pneumatic valves
- no isolation of VarioFlash!
- no media measurement
- Krones Standard media connection
- without BBT Pump
- sampling valve infeed and discharge with tank, Krones Standard
- display positive pressure drop
- Production logging
- automatic steaming of filters
- controlled by Allen Bradley

Notes

KRONES points out that the electrical devices used in this machine (e.g. overcurrent protective device) are installed higher than 2.2. meters. These electrical devices are installed inside of housings (e.g. control cabinets). The operation is reserved only for qualified professional for maintenance works. For the access to the devices, the operating company must provide suitable and approved climbing aids.

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VARIOFLASH B/15 WITH COOLING STAGE and PRODUCT WARMING
Krones Standard

Basic data:

Product: beer

22. Thermal product treatment VARIOFLASH B 15

capacity: 36 - 90 hl/h
CO₂/N₂-content: max. 6,0 g/l
Cl-content: < 40 ppm
conductivity: > 20 µs/cm
product inlet temp.: 4 - 6 °C
product outlet temp.: 20 °C
product inlet pressure: 4,0 bar g
energy recovery: approx. 91 %
pasteurization temp.: 71 - 85 °C
PU: 30 - 1.985
holding time: 30 sec. at 90 hl/h

D/A- or process- water inlet pressure: 4,0 bar g
D/A- or process- water inlet temp.: 2 - 8 °C
D/A- or process- water: max. 0,0 g/l CO₂

pasteurization temp. max. 85 °C:
heating requirement with product 4 °C inlet and 20 °C outlet: approx. 153 kW (270 kg/h steam 6 bar g, 165 °C)
cooling requirement with product 4 °C inlet and 20 °C outlet: approx. 0 kW (0 m³/h glycol water -6 to 2 °C)
cooling requirement at 4 °C, water circulation: approx. 75 kW (9 m³/h glycol water -6 to 2 °C)

consisting of:

PLATE HEAT EXCHANGER with 3 stages,
- Recovery stage, energy recuperation
- Pasteurization stage with temperature control
- Cooling stage with temperature control

HEAT RETENTION TUBE
- in one fixed length
- to achieve constant number of PU
- PU control depending on temperature and flow rate (not possible with minimum flow rate!)

HOT WATER CIRCUIT
- incl. separate brazed plate heat exchanger
- temperature control
- circulation pump, expansion vessel and all necessary fittings
- for gentle heating up of product to the pasteurization temperature

All PRODUCT PUMPS sanitary designed
- BBT feeding pump, with degassing lantern, 4,5 bar
- Product feed pump, frequency controlled, for pressure increase
- Booster pump to guarantee a positive pressure drop towards the non-pasteurized product
- product pump, frequency controlled, for conveying product to the filler

BUFFER TANK, vertical design
- net volume: 5.000 ltr.
- max. working pressure: -1 to 4 bar g, 120 °C
- material: 1.4301 (AISI 304)

22. Thermal product treatment VARIOFLASH B 15

- on height adjustable calotte feet
- autom. CO2 regulation
- vacuum proof
- overpressure protection
- cleaning spray ball
- continuous level measurement
- gas sterile filters (0,2 and 0,2 μ), automatic steaming of filters
- insulated (fully welded design): no
- acceptance test by German TÜV

CONNECTION KRONES STANDARD TO BBT / FILLER

- inlet from BBT, pipe with flange and counter flange connection (welded end)
- outlet to FILLER, pipe with flange and counter flange connection (welded end)

PROCESS TECHNOLOGY

- optimal utilization of buffer capacity
- sliding PU-control by analogous level monitoring and constant flow reduction down to 50% of max. capacity

CONTROL SYSTEM

- The equipment is controlled by Allen Bradley.
- Operating and visualization via 15" coloured Touch-Screen (Panelview).
- paperless recorder for 5 actual values (E&H Ecograph)
- following values are recorded as a standard (if not defined differently by customer):
 - actual output VarioFlash
 - level buffer tank
 - gas pressure head space buffer tank
 - temperature HH-tube (pasteurization temperature)
 - PU's

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Angebotswesen Units
Softdrink, Dairy, Water

22. Thermal product treatment VARIOFLASH B 15

Machine data

Machine design

■ Product pressure at infeed	4,0 bar
■ CO2 gas supply	Extension of gas supply of compression-proof pre-run tank with a separate CO2 connection. Reduction of the oxygen uptake pump completely pressure-controlled
■ Product pump, infeed	150 m
■ Pipe length to product pump	7,5 kW
■ Output of product pump, infeed	Decombined CO ² is drained into the open
■ Deaeration device	- Eco Hygienic Sleep Mode: Beverage sterile production interruption with continuous maintenance of the thermal barrier layer. Reduction of energy and water consumption
■ Software packages	- The machine output of the VarioFlash is adapted to the withdrawal quantity of the filler. Increase of buffer tank reserve by additional 20 minutes and thus reduction of product losses - Direct change from CPI cleaning to production without cooling down Increase of machine productivity and engery saving (This function is guaranteed in combination with a CIP unit VarioClean by KRONES, or after examination with an adequate third-party CIP unit provided by the customer) with simple pipe connection for product and CIP. The product admission is carried out automatically with a measuring device, which can be selected optionally.
■ Design of media connection	plate heat exchanger
■ Function of product admission	stainless steel rust-proof and acid-proof/chromium molybdenum steel (similar to AISI 316L)
■ Design of heat exchanger	The VarioFlash is equipped with a temperature-controlled cooling system.
■ Material of heat exchanger *	1 PCE
■ Cooling	The discharge temperature can be adapted by a bypass if it is higher than the constructive determined discharge temperature of the VarioFlash.
■ Number of heat retention sections	91 %
■ Bypass to product pre-heating	5.000 l
■ Energy recovery: *	4,0 bar
■ Net content buffer tank:	without insulation
■ Operating pressure buffer tank: *	rust-proof stainless steel/chromium nickel steel (similar to AISI 304)
■ Buffer tank insulating material	Hot-water circulation with cleaning system, flash pasteuriser, buffer tank, and filler
■ Material of buffer tank *	Commun cleaning of heat exchanger and buffer tank in row
■ Function buffer tank, heating	The maintenance platform is kounted on site.
■ Design of buffer tank cleaning	double sterile gas filtration with two 0.2 µm filter units The sterile filters are programme-controlled pre-sterilised with steam in the housing.
■ Maintenance platform VarioStore	Gas discharge via silencer. Design of line end by companion flange and welded end, with the possibility for the customer to discharge into the open. The cleaning of customer's discharge line is not performed by the
■ Sterile gas filtration	
■ Pre-sterilisation of sterile filters	
■ Design of supersposition gas discharge	

22. Thermal product treatment VARIOFLASH B 15

■ Design of heating steam connection	automatic CIP which is part of the flash pasteuriser. A cleaning connection with manual flap valve is provided. The steam supply to the hot water preparation is controlled by a control valve. The saturated steam is guided through a slanted seat filter and a pressure reducer. The overheating is prevented by a shut-off valve. The separation of steam and condensate is performed in water separators.
■ Selected measuring technology	- Pressure sensor for monitoring the positive pressure drop in the heat exchanger - Flow meter product discharge
■ Design of CIP connection	connection to cleaning unit with recovery water of a CIP system
■ Design of sampling valve buffer tank	Hygienic sample valve for manual sampling, to be opened pneumatically for cleaning
■ Design of sampling valve at the infeed/discharge	Hygienic sampling valve for manual sampling, to be opened pneumatically for cleaning
■ Material of product-contacting pipes and fittings *	stainless steel rust-proof and acid-proof/chromium molybdenum steel (similar to AISI 316L)
■ Control intermediate pressure booster pump	direct control
■ External heat recovery	not included
■ Manufacturer of flap valves	KRONES
■ Seat valves manufacturer	KRONES standard
■ Input booster pump *	KRONES standard
■ Intermediate booster pump *	KRONES standard
■ Product pump to filler *	KRONES standard
■ Hot-water pump *	KRONES standard
■ Product pump infeed *	KRONES standard
■ Sealing material of product-contacting parts:	EPDM
■ Design of explosion protection	is not included in KRONES scope of supply. Machine operation in potentially explosive areas or with potentially explosive material only allowed after KRONES approval
Set-up	
■ LOTO (Lockout/Tagout)locking devices	not included in the scope of supply of the process unit. The partner ordered for the pipe system by the customer is responsible for the provision and proper installation of the disconnecting devices. Lockout/Tagout is a system which ensures that a machine can be disconnected and prevented from any hazardous energy source before any work is done. This system is used to ensure the safety and occupational health of employees when intervening in the danger zone. For that, disconnecting devices must be installed ahead of the machine to be able to isolate the machine from hazardous energy sources.
Finish - pneumatic components - lubrication system	
■ Design Style Guide	yes
■ Finish colour for machine column	RAL 5013 (Cobalt blue)
■ Finish colour for visible three-phase motors and their mounted gears or pumps in the wet line section	RAL 9018 (papyrus white)
■ Manufacturer pneumatic system components	make: Festo
■ Manufacturer pneumatic maintenance unit	Make: Festo
	Customer compressed air quality according to ISO 8573-

22. Thermal product treatment VARIOFLASH B 15

1 class 6.3.1.
Oil-free compressed air supply with a particle size of
max. 40µm

Accessories

- Production data recording and monitoring system data recording by separate writer

Media data

- Pressure, steam feed 6,0 bar
- Pressure - return - condensate - heating steam 1,0 bar
- Pressure - admission - glycol 3,0 bar
- Pressure - return - glycol 1,5 bar
- Temperature - admission - glycol -3 °C
- Temperature - return - glycol 4 °C
- Pressure sterile air 8,0 bar
- CO2 pressure 8,0 bar
- Pressure N2 8,0 bar
- Pressure sterile steam 3,0 bar
- Pressure product water 4,0 bar
- Pressure soft water 6,0 bar
- Pressure, oil-free air 7,0 bar
- Saturation pressure heating temperature 8,9 bar
- Saturation pressure, filling temperature 2,7 bar
- Minimum product pre-run temperature 4 °C
- Maximum product pre-run temperature 6 °C
- Main cooling medium pre-run temperature -3 °C
- Main coolant return temperature 4 °C

Notes

- Plate heat exchanger

Machine design:

- indirect heating by hot water circuit
- heat recovery by secondary hot water circuit
- Section 1: exchanger (heat recovery system)
- Section 2: heating system
- Section 3: chiller (by glycol, etc)

Method of operation:

- gentle product heating up to pasteurisation temperature
- sterilisation with hot water (< 100° C)
- "positive pressure gradient" to unsterile medium is ensured by means of booster pumps as well as counter-pressure valves

- Media connection with buffer tank and service module

Machine design:

- venting device
- product feed pump, frequency-controlled
- product feed pump for pressure increase
- buffer tank as pressure tank
- product feed pump to filler, frequency-controlled
- connection point for heating media (incl. pressure reduction and filter for dirt particles)
- connection point for cooling media (incl. filter for dirt particles)
- expansion tank for secondary hot water circuits

22. Thermal product treatment VARIOFLASH B 15

Method of operation:

- connection point for production, circuit, discharge, CIP cleaning
- expansion tank during sterilisation with hot water
- provision of heating/cooling media for product heat exchanger
- automatic PE control with level control of the buffer tank depending on the withdrawn filler quantity and/or automatic temperature monitoring with continuous flow.
- automatic gas pressure control in the buffer tank

■ Design Features VarioFlash

- product-contacting parts made of rust-proof stainless steel (material AISI 316 L or similar)
- buffer tank as pressure tank made of rust-proof stainless steel (material AISI 304 or similar)
- sealants food grade
- compact design with easy maintenance-friendly access to the components (climbing aids/platforms, e.g. for tanks, are available as separate item)
- internal pipes and components are according to DIN 11850 serial 2

■ Process unit as slave for CIP cleaning

During the cleaning process, the machine is the slave. The CIP system is the master, defines the sequence and the duration of the individual programme steps, thus determining the entire cleaning programme.

■ Pipe system

The individual modules are pre-mounted internally and tested in our factory.
Connecting pipe system between VarioFlash and filler are not subject of this quotation item.

■ Control system

The control is made via a PLC which is included in the air-conditioned control cabinet together with components such as frequency inverter, input/output level, pneumatic components, power supply etc.
The control system is operated via a 15" colour touch-screen.

■ Factory commissioning

The machine undergoes a factory acceptance test before it is delivered.
The individual modules are connected temporarily and the necessary media connected.
The programmes are uploaded and transferred step by step in automatic function.

■ During operation of the machine/system, operating materials, additives and cleaning agents can escape, which are drained off via the floor.

* Features which do not affect pricing of this quotation item within KRONES standard