

Alfa Laval Brew 450

Disc stack separation system for brewery applications

Introduction

For more than 100 years, Alfa Laval has been supplying separators for various industries. Today, Alfa Laval has the most complete and diverse offering of separators – each fully optimized for its specific duty and supplied with all auxiliary systems and key components.

The use of disc stack separators in different brewery applications goes back several decades. Based on the long-term cooperation with the brewery industry, Alfa Laval separators are specifically designed for the requirements and demands of this industry.

Brew separators have a long history of enabling breweries around the world to achieve higher yields, meet shifts in demand and maintain profitability. Used in multiple brewery applications, they ensure minimal levels of oxygen pick up during passage through the separator and the highest standards of hygiene.

Application

Self-cleaning disc stack separation systems in the Brew series are specially designed for green beer and beer pre-clarification or polishing duties with the target to produce the best quality beer with high performance and maximized yield.

Benefits

- High separation efficiency
- No oxygen pick-up
- Gentle treatment of the product
- Low power consumption
- Robust and reliable design

Design

The Brew 450 separation system consists of a separator, a process & service liquid unit, and an electrical & control system.

The unique hermetic bottom fed design ensures superior separation performance and offers the lowest power consumption in the market. The bowl inlet and outlet are sealed mechanically and this prevents any oxygen pick-up in the clarified beer. Adjustable discharge volume function ensures discharge of solids with high dry matter content, thus minimizing product losses.



The system is modularized and it can be configured from a selection of basic and optional features and control functions. The control system includes a PLC and a user-friendly HMI to monitor and control the separation process parameters. The system can be configured for remote operation.

All metallic parts in contact with the process liquid are made of stainless steel. Gaskets and seals in contact with the product are made of FDA approved material and are approved according to food regulations (EC1935/2004).

The separation system is designed for automated Cleaning in Place (CIP).

Scope of supply

The standard Brew 450 modularized system includes the following main components:

- Disc stack separator
- Process & service liquid unit:
 - Valves, instruments and other components
 - Automatic flow and back pressure regulation valves
 - Sight glasses
 - Sample valves
- Electrical & control system:
 - Control cabinet with PLC and touchscreen HMI
 - Motor starter cabinet with VFD
- Commissioning spares
- Set of special tools

- Documentation
- The system is available in two pipe size configurations:
 - DN80 and DN100

Options

- Feed pump
- Solids receiving unit (a collection device and a transfer pump for the discharged solids)
- Turbidity triggered solids discharge function
- Capacity control by inlet turbidity
- Solids control (recirculation of the clarified product)
- Integrated blending by-pass
- WaterSaver CR Sustainability subscription
- Service options:
 - ConditionAlert (TM) — connectivity based subscription
 - Commissioning
 - Operators training (basic and advanced level)
 - Basic service agreement
 - Performance agreement

Working principle

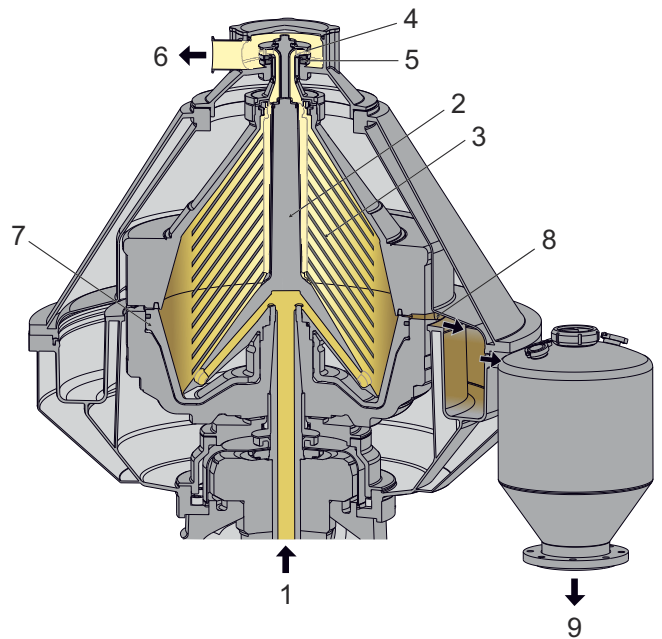
The process & service liquid unit monitors and regulates the flow and pressure of the feed and utility liquids in and out of the separator.

The process liquid is continuously fed from the bottom into the rotating separator bowl through the hollow drive spindle. Separation takes place between the bowl discs due to the centrifugal force. The solids settle towards the periphery of the bowl. The clarified/separated liquid is continuously pumped out of the hermetically sealed separator by an integrated impeller through the outlet at the top of the separator.

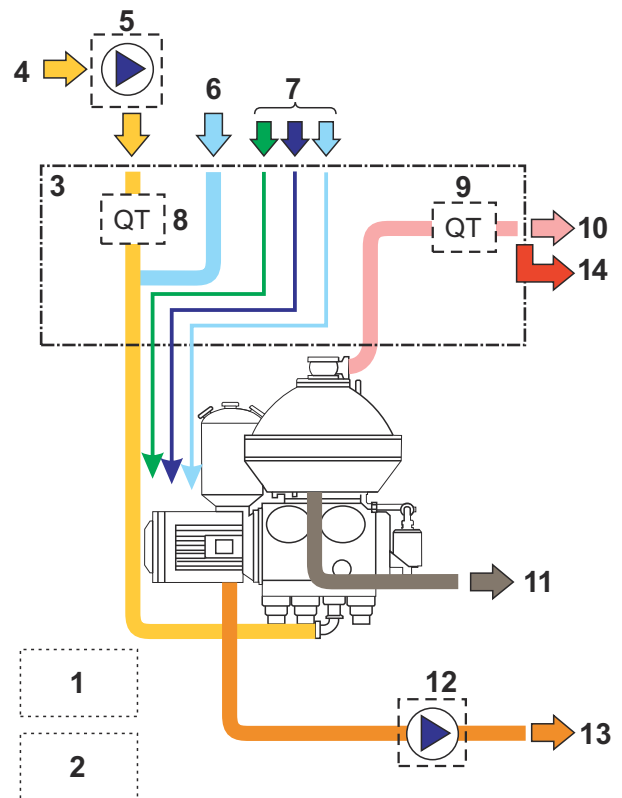
The solids collected in the periphery of the bowl are discharged intermittently through the discharge ports. The discharge is triggered by a turbidity meter placed in the outlet of the system.

Water is used to control the movement of the sliding bowl bottom part that opens and closes the discharge ports. The discharged solids decelerate in the sludge cyclone and can be pumped out of the system by the optional solids receiving unit.

The process & service liquid unit also controls the separator's discharge system, flushing, and CIP.



1. Inlet
2. Distributor
3. Disc stack
4. Impeller
5. Hermetic seal
6. Liquid phase outlet
7. Sliding bowl bottom
8. Solids discharge ports
9. Solids outlet from cyclone



Typical flow chart of a separator system. The details may differ slightly between different systems.

1. Control cabinet
2. Motor starter cabinet and VFD
3. Process & service liquid unit
4. Product inlet
5. Feed pump (optional)
6. Standby/Safety water
7. Utilities
8. Turbidity meter for capacity control (optional)
9. Turbidity meter for discharge triggering
10. Clarified product outlet
11. Separator drain
12. Solids receiving unit (optional)
13. Discharged solids outlet
14. Process and service liquid unit drain

Technical data

Performance data

| | |
|---------------------------|--|
| Max capacity ¹ | DN80: 450 hl/h (384 bbl/h) D100: 550 hl/h (470 bbl/h) |
| Max. motor power | 37 kW (49.6 HP) |

¹ Actual capacity and power consumption depend on application, solids content and operating conditions

Connections

| | |
|----------------|----------------------------|
| Feed inlet | DIN 11851 Union DN80 / 100 |
| Product outlet | DIN 11851 Union DN80 / 100 |
| Solids outlet | DN50 DIN11851 Union |

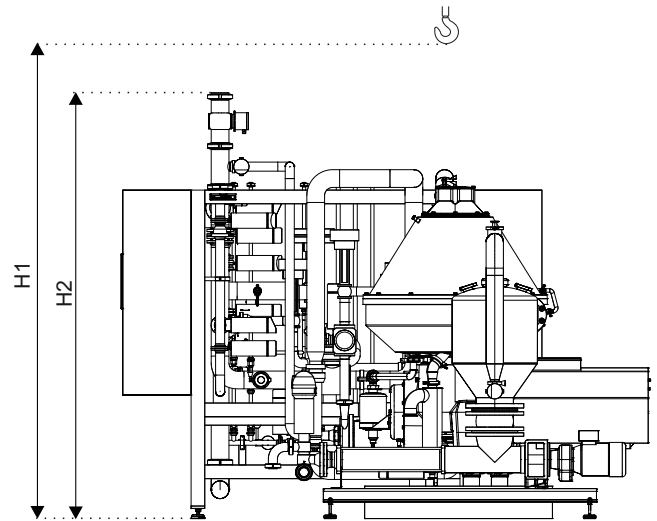
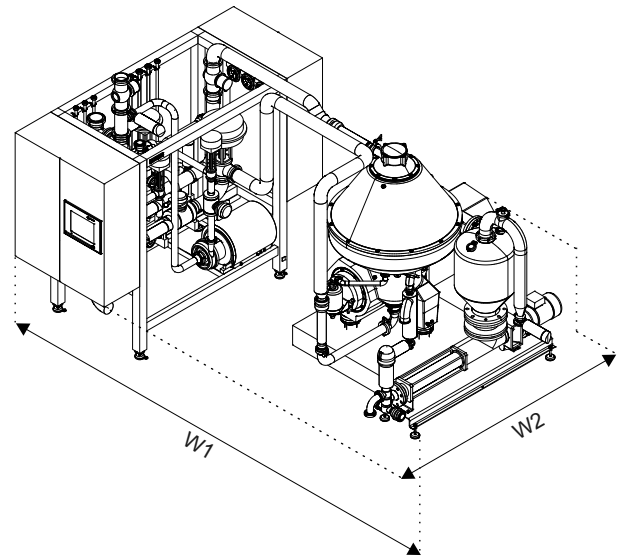
Material data

| | |
|--------------------------|--------------------------------------|
| Bowl body | Stainless Steel, EN 1.4418 |
| Gaskets (product wetted) | NBR and EPDM, FDA approved materials |
| Piping | Stainless steel, AISI 304 |
| Frame and cabinets | Stainless steel, AISI 304 |

Weights

| | |
|--|--------------------|
| System incl, separator, bowl and motor | 3020 kg (6657 lbs) |
| Bowl | 800 kg (1764 lbs) |

Dimensional drawing



Dimensions

| | |
|----|------------------------------|
| H1 | 3000 mm (9 ft 10 1/8 inches) |
| H2 | 2650mm (8 ft 8 5/16 inches) |
| W1 | 3350mm (10 ft 11 7/8 inches) |
| W2 | 2900mm (9 ft 6 3/16 inches) |

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200001264-3-EN-GB

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