Alfa Laval Explorer

Pilot-Scale disc stack separation system

Introduction

For more than 100 years, Alfa Laval has been a leading supplier of separators for various industries. Today, Alfa Laval has the most complete and diverse offering of separators for the Food, Life Science, Marine and Energy sectors.

Alfa Laval Explorer is a pilot scale separator system based on disc stack separation technology. With its flexible configurations and ease of use, covering all common separation duties, it is ideal for pilot scale testing and process development. The results from the pilot testing using the Alfa Laval Explorer are translated into a large scale machine performance for virtually any process.

Application

The Alfa Laval Explorer with its flexibility in design can perform many different separation duties which makes it suitable for test work for most separation applications, including, but not limited to, the following:

- Vital yeast recovery in breweries
- Depulping
- Fruit juice clarification
- Coffee de-oiling
- Cecllular agriculture
- Cell cultures
- Biobased processing
- Plant-based protein
- Plant-based drinks
- Baker's yeast
- Dairy
- Renewable fuel
- Plastic recycling
- Battery recycling
- Crude oil clarification

Benefits

- Scalability to larger productions volume
- Small footprint
- Easy to operate
- Flexible configuration
- Easy to connect, mobile
- Gentle treatment of the product

Design

The Alfa Laval Explorer is designed to be a premium pilot scale testing system, based on the unique bottom feed

design. The machine can be configured for different separation duties, different disc angles and different solid/heavy phase removal by different conversion kits. The Alfa Laval Explorer can be configured for two-phase separation as well as three-phase separation, with solids removal by discharge or using the Alfa Laval TopStream technology for continuous solids/heavy phase removal.

The air free inlet is ideal for processing shear sensitive particles, preventing formation of emulsions, and for minimizing oxygen pick-up. The system also provides separation at the lowest possible power consumption.

The Alfa Laval Explorer system is skid mounted and equipped with all associated piping, valves and components to provide an easy to operate manual system.

The separator has intermittent solid discharge system which discharge the full bowl volume to keep the bowl clean.

All metal parts in contact with the process liquid are made of stainless steel. Some parts in contact with the process liquid are made of plastic.

The electric motor is suitable for variable frequency drive. The drive system is direct drive with pre-lubricated bearings.

Scope of supply

The Alfa Laval explorer skid mounted system includes the following main components:

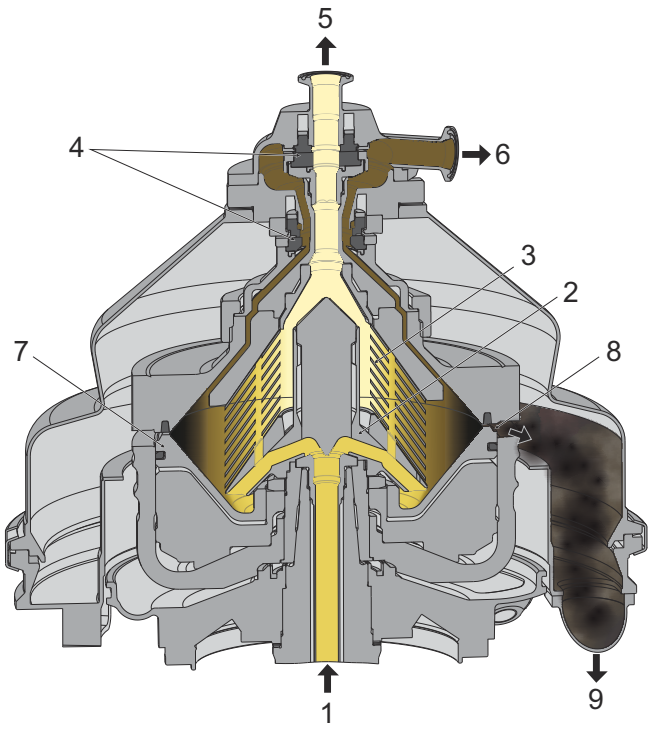
- Disc stack centrifuge
- Auxiliary system:
  - Valves
  - Flow meter
  - Temperature and pressure transmitters
  - Sight glasses
  - Sample valves
- Electrical & control system:
  - Skid mounted VFD
  - Speed control
  - Bearing temperature and vibration monitoring
- Set of tools
- Commissioning spares
- Documentation

Options

- Conversion kits for different configuration for example Clarifier, Purifier, Concentrator and more
- PC logger to log and collect data for example flow, pressure and speed
- Service
  - Commissioning
  - Operators training (basic and advanced level)

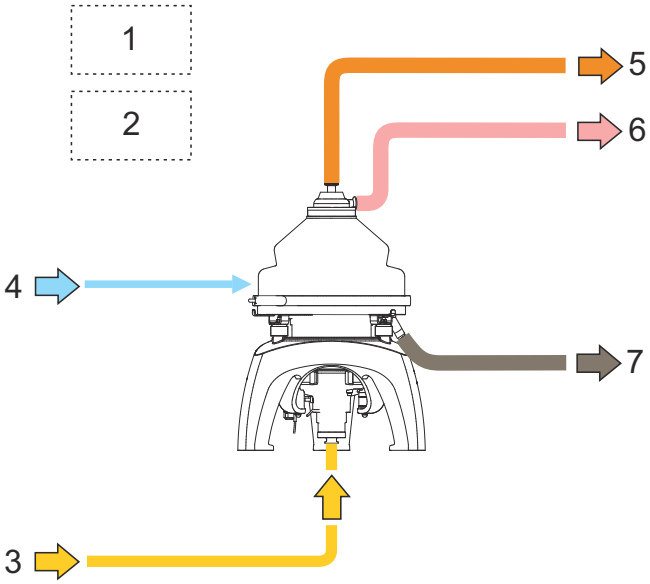
Working principle

Separation takes place inside a rotating bowl. The untreated feed is introduced to the bowl from the bottom through a hollow spindle (1) and is accelerated in the distributor (2) before entering the disc stack (3). The separation of the solids takes place in between the discs. The light phase moves towards the centre and is discharged (5). The heavy phase moves to the periphery and is discharged over a top disc. The heavy solids phase is collected at the periphery and is ejected from the bowl intermittently at full operating speed. The total volume discharge is achieved by a hydraulic system below the separation space. At pre-set intervals, this system forces the sliding bowl bottom (7) to drop down, thus opening the solids ports (8) at the periphery.



Typical bowl drawing for a solids-ejecting separator. The details illustrated do not necessarily correspond to the separator described.

1. Inlet
2. Distributor
3. Disc stack
4. Hermetic seal
5. Light liquid phase outlet
6. Heavy liquid phase outlet
7. Sliding bowl bottom
8. Solids discharge ports
9. Solids outlet



Typical flow chart of a separator system. The details may differ based on the actual order.

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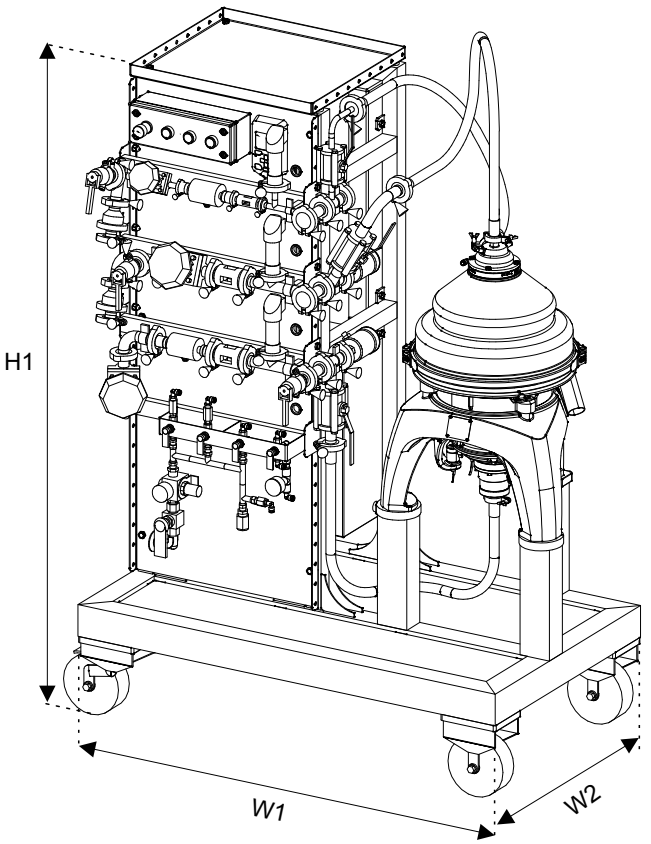
1. Electrical cabinet
2. Variable Frequency Drive (VFD)
3. Product inlet
4. Operating water
5. Light phase outlet
6. Heavy phase outlet
7. Solids outlet

Technical data

Material data	
Feed inlet	Tri Clamps, 1 inch
Product outlet	Tri Clamps, 1 inch
Discharge solids outlet — Pipe, diam	41 mm
Bowl body	Stainless steel EN 1.4462
Frame top part	Stainless steel 316, EN 1.4401
Frame bottom part	Cast aluminium, painted

Weights	
System incl. separator, without bowl	300 kg (661 lbs)
Bowl	35 kg (77 lbs)

Dimensional drawing



Dimensions	
H1	1575 mm (62 inches)
W1	1140 mm (44.88 inches)
W2	670 mm (26.38 inches)

How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com