Alfa Laval CultureOne Primo

Separation system for single use cell culture processing

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 biopharma applications goes back several decades. Based on the long-term cooperation with the biopharma industry, Alfa Laval separators are specifically designed for the requirements and demands of this industry.

Alfa Laval CultureOne™ separators are compact disc stack centrifuge systems developed for the harvest of cell culture bioreactors. The product contact surfaces are designed as consumable parts for single use batch processing.

Application

Intended primarily for the harvest of cell culture fermentations, CultureOne can handle a wide range of cell culture densities and viabilities. The CultureOne Primo separator model is designed for a flow capacity between 50 and 200 L/h. With a fully hermetic bottom fed design, the unit provides gentle product handling and excellent clarification.

Benefits

- High separation efficiency
- Continuous clarification with minimal lysis
- Excellent turndown ratio
- Pre-sterilized product wetted parts
- Minimal maintenance
- Low sound level

Design

CultureOne Primo is designed as a plug and play, compact skid. The wheeled skid mounted design, supports easy mobility and simple and quick connection to upstream and downstream equipment. The unit consists of skid-frame, drive unit, automation with HMI, and disposable insert with tube kit.

The heart of the separator is a bowl insert assembly, the Spinsert™, made from fully recyclable biopharmaceutical grade polymers. The Alfa Laval Hermetic Design uses mechanical seals on the inlet and both outlets to insure process containment. Performance of the seals is continually monitored as a measure of system integrity. Feed and discharge lines are made from biopharmaceutical grade polymer tubing and are connected to the bowl insert to create a clean and sterile single use system. These items are the only parts of the system which is in product contact. The complete assembly is placed in side a stainless steel bowl which is mounted in the drive unit. The use of TopStream™ technology provides for continuous solids removal creating the ability to handle high cell densities, and provides consistent centrate quality during harvest.

Scope of supply

- Mobile module
- Drive unit including bowl
- Bowl insert
- Process liquid tube set
- Utility tube set
- Operator panel
- Electrical enclosure
- Seal cooling liquid scale

Options

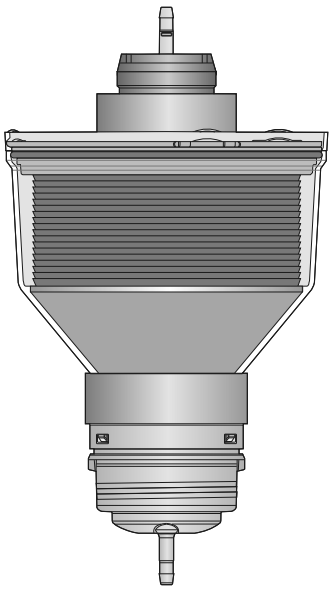
The operating system and interface can be provided with either Siemens or Allen Bradley HMI and PLC.

Working principle

The system is primed via a sterile connection (4). Cell culture broth from the bioreactor enters the system via a sterile connector (3). The feedline is equipped with a single use centrifugal pump (6) and flowmeter (7) to deliver and measure flow to the separator. Product enters the separator bowl insert from below. Separation takes place between the bowl discs as a result of the centrifugal force that causes the solids to move towards the periphery. This clarified liquid is continually removed from the system via single use tubing and another sterile connector (11). A flow regulation device is included in the line (10).

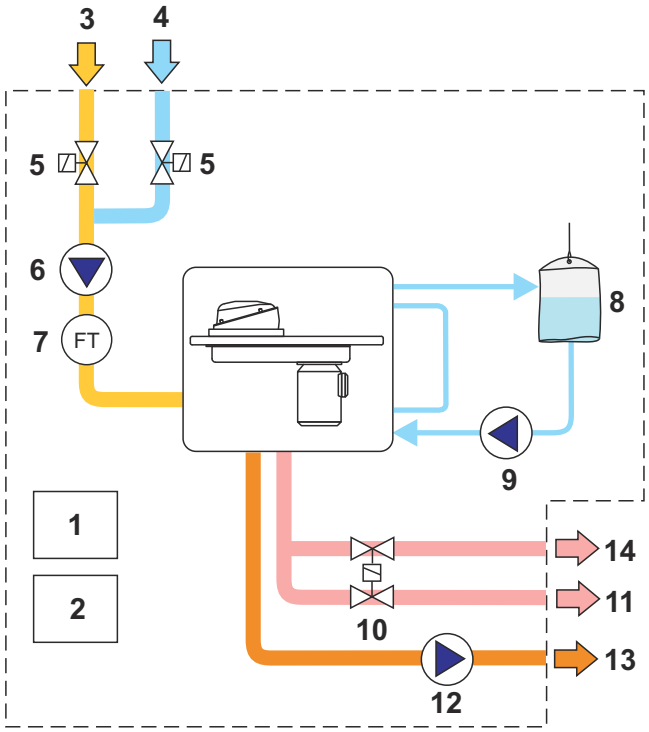
Separated solids move to the periphery of the Spinsert and exit as a concentrated solids stream. This concentrated biomass exits the system continuously via a positive displacement pump (12) to insure controlled and consistent flow.

Temperature and pressure are continually monitored for feed, clarified liquid and concentrated solids.



Spinsert separation insert for CultureOne Primo*

* The details illustrated do not necessarily correspond to the separator described.



1. Control cabinet
2. Motor starter cabinet and VFD
3. Product inlet
4. Priming liquid
5. Valve
6. Feed pump
7. Flow meter
8. Cooling liquid reservoir
9. Pump
10. Flow control valve
11. Liquid product outlet
12. Pump
13. Concentrated outlet
14. Divert line

Technical data

Performance data[1]	
Hydraulic capacity[2]	0.5–5.0 lpm
Maximum motor capacity	1.5 kW
Sound pressure level	67 dB (A[2])

[1] Actual capacity and power consumption depends on operating conditions

[2] Enough to process the harvest of culture bioreactors with 50–1000 liters capacity

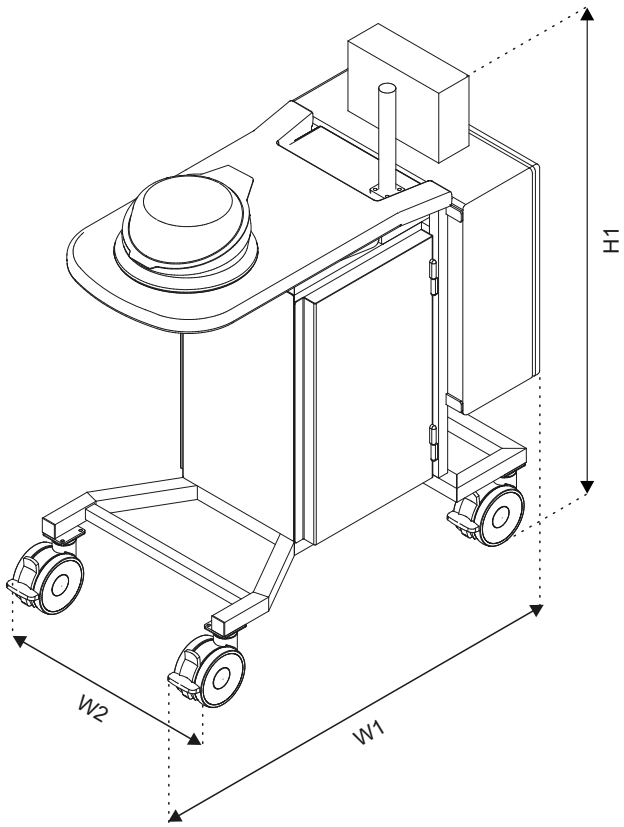
Connections	
Feed inlet	Ø 3/8 inch (9.5 mm) I.D.
Light phase outlet	Ø 3/8 inch (9.5 mm) I.D.
Solids outlet	Ø 3/8 inch (9.5 mm) I.D.

Material data[1]	
Bowl body, hood and lock ring	High grade stainless steel
Solids cover and frame hood	High grade stainless steel
Frame	Stainless steel
Process and Utility tube sets	Medical grade tubing
Insert	Biopharmaceutical polymers

[1] For detailed material information, please consult the respective sales unit

Weights	
System weight including separator, bowl and motor	220 kg (485 lbs)
Insert weight	2.5 kg (5.5 lbs)

Dimensional drawing



Dimensions	
H1	1360 mm
W1	1350 mm
W2	620 mm

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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