Alfa Laval CultureOne Maxi

Separation system for single use processing

Introduction

For over 100 years, Alfa Laval has delivered separators for demanding applications across a wide range of industries. Today, Alfa Laval offers the most comprehensive and diverse portfolio of separators—each fully optimized for its specific duty and delivered with all necessary auxiliary systems and key components .

Alfa Laval CultureOne™ separators are compact disc stack centrifuge systems developed for recovery of biological materials. The product contact surfaces are designed as consumable parts for single use batch processing.



Application

CultureOne is designed primarily for harvesting cell cultures from bioreactors and can handle a wide range of operating conditions, cell densities, and viabilities. The CultureOne Maxi separator matches the capacity of the largest single use bioreactors available. It ensures gentle product handling and excellent clarification, also in large volume GMP manufacturing environments.

Benefits

- High yield
- Handles a wide range of volume and cell densities
- Small footprint
- Easy to install
- Easy to operate
- Reduced waste over filtration
- Sterilized consumables/ product-contact parts

Design

CultureOne Maxi is a plug-and-play mobile unit with quick connections to upstream and downstream equipment.

The core component is the single-use Spinsert™, where the separation takes place. High centrifugal force, large separation area, and Hermetic Design™ ensures gentle, foam free handling delivering high separation efficiency. Our TopStream™ technology enables continuous discharge of the concentrated solids phase, allowing for processing of highly intensified cell material and improved clarified liquid quality.

Feed and discharge lines integrate easily with upstream and downstream equipment. Aseptic connectors ensure safe and efficient exchange between batches. The only product-contact components are the Spinsert™ and tubing kits, which are replaced between product runs. These consumables are made from medical-grade polymers, supplied sterilized and can be installed in just a few minutes.

Working principle

The separator system priming (de aeration), is done using purified water via a sterile connection (2), which also allows purging at the end of a process run to recover all processed product. Cell culture broth enters the system via a sterile connector (1).

A single-use centrifugal pump (8) in the feedline delivers the broth to the separator. The feed enters the separator bowl insert

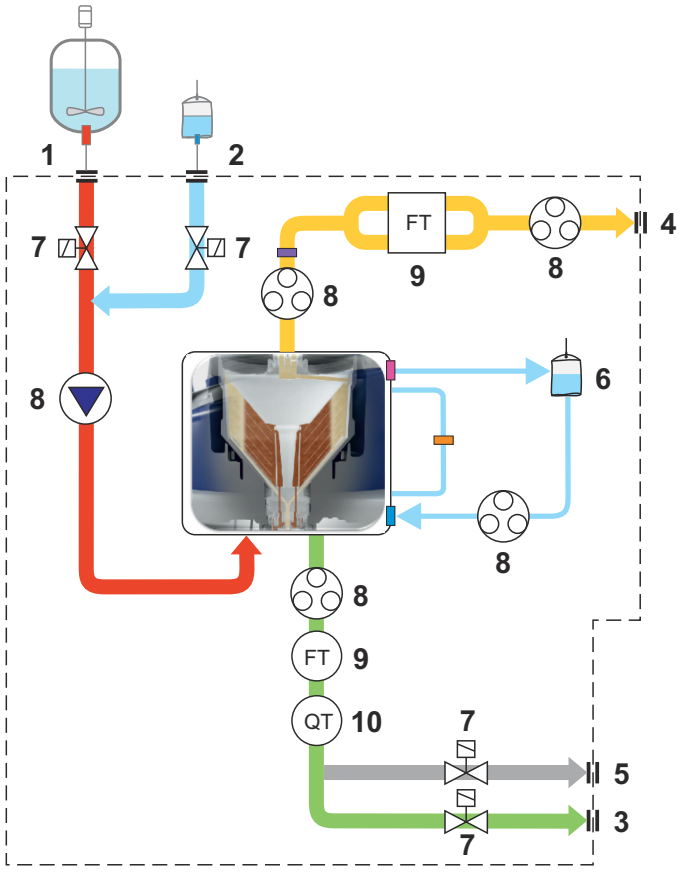
from below. Separation occurs between a stack of many closely spaced bowl discs, where the short settling distance enhances efficiency as centrifugal force drives solids toward the periphery. Clarified liquid is pumped out by a peristaltic pump (8) through outlet (3). The light phase flow is regulated via a flow sensor (9), while a turbidity sensor (10) in the outlet verifies separation quality.

Separated solids are driven to the periphery of the Spinsert™ and discharged continuously as a concentrated solids stream. This highly concentrated biomass exits the system via a peristaltic pump (8) through outlet (4). The heavy phase flow is precisely measured using a mass flowmeter (9).

Temperature and pressure are continuously monitored across the feed, clarified liquid, and concentrated solids streams.



Spinsert™ separation insert for CultureOne



1. Feed (cell culture) inlet
2. De-aeration liquid (WFI/Buffer)
3. Light phase (clarified liquid) outlet
4. Heavy phase (concentrated solids) outlet
5. Divert line/drain
6. Seal cooling liquid (WFI/Buffer)
7. Valves
8. Pumps
9. Flow meter
10. Turbidity transmitter

Technical data

Performance data[1]	
Hydraulic capacity[2]	2–14 lpml, (120–840 l/h)
Motor capacity	2.2 kW
Power supply	200–240 V / 50–60 Hz / 16 A
Power consumption (motor)	1.3 kW
Sound pressure level	<70 dB (A)
Required air supply	4–8 bar(g)

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

[2] Designed to process the harvest of bioreactors with 500–4000 liters capacity.

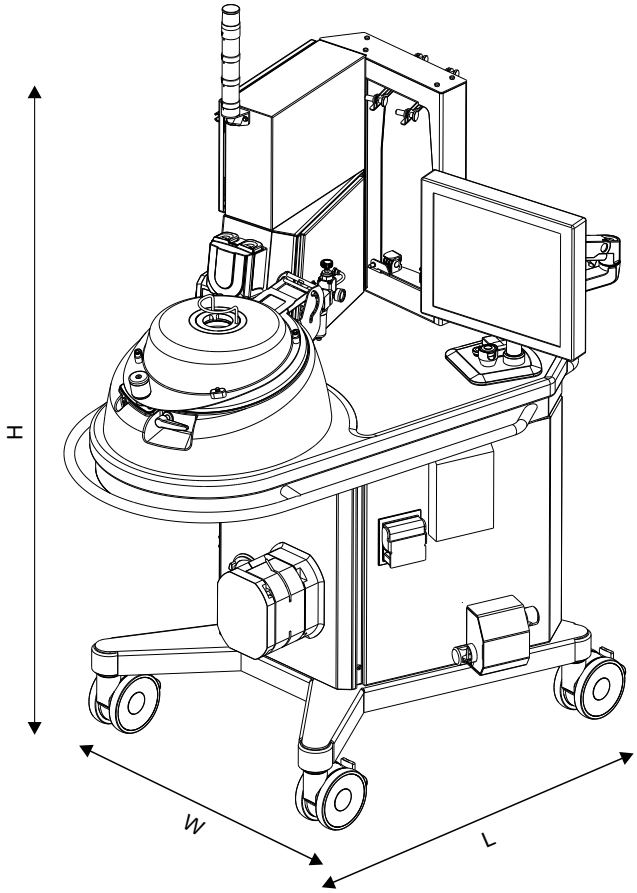
Connections	
Feed inlet and light phase outlet	Ø1/2" (12.7 mm) I.D, CPC AseptiQuik® G
Heavy phase (solids) outlet	Ø3/8" (9.5 mm) I.D, CPC AseptiQuik® G

Weights	
System weight	380 kg (840 lbs)
Spinsert weight	5.3 kg (11.7 lbs)
Total process liquid hold-up volume	4.5 litres

Material data	
Bowl body, hood	High grade stainless steel
Frame	Stainless steel
Process and utility tube kits	Medical grade tubing, weldable
Spinsert	Medical grade polymers

Single use consumables qualification	
Sterilization	X-ray, 25-40 kGy
Functional testing	
Regulator statements	ADI free, BPA, etc.
Bio compatibility	USP Class VI <88>
Bacterial Endotoxin	USP <85>
Particulates	USP <788>
Physiochemical	USP <661>
Extractables	USP <665>
Sterilization	AAMI / ISO 11737
Packaging	ASTM D4169 / ISTA 2A

Dimensional drawing



Dimensions	
H	1800 mm (71 inches)
L	1340 mm (53 inches)
W	880 mm (35 inches)

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