Alfa Laval CultureOne Primo

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 culture from bioreactors and can handle a wide range of operating conditions, cell densities, and viabilities. The CultureOne Primo separator model is ideal for small-batch R&D runs, through pilot scale up to medium scale GMP manufacturing. It ensures gentle product handling and excellent clarification.

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 Primo 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 (deaeration), is done using purified water via a sterile connection (2), which also enables purging at the end of a process run to recover all processed product. Cell culture broth enters the system through a sterile connector (1). A single-use centrifugal pump (8) in the feed line delivers the broth to the separator, with flow monitored by a flowmeter (9). The feed gently enters the separator bowl insert from below. Separation occurs within a stack of closely spaced bowl discs, where the

short settling distance enhances efficiency as centrifugal force drives solids toward the periphery.

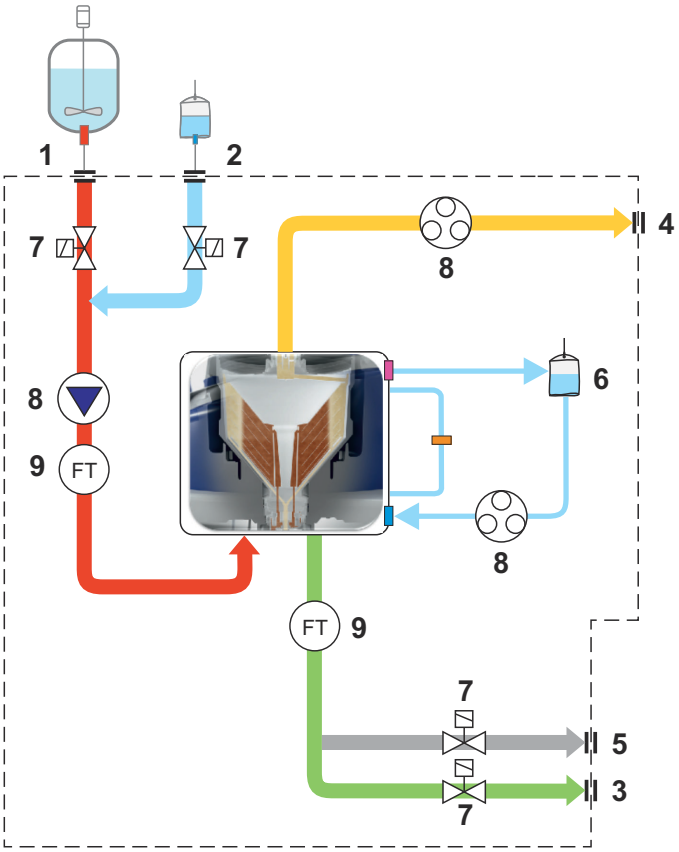
Clarified liquid is continuously removed from the system through an aseptic connection (3), with flow monitored by the flowmeter (9) and regulated by an outlet valve (7).

Separated solids are driven to the periphery of the Spinsert™ and discharged continuously as a concentrated solids stream through outlet (4). The flow and concentration of the biomass are controlled by a peristaltic pump (8).

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. Deaeration water (WFI/ buffer)
3. Light phase (clarified liquid) outlet
4. Heavy phase (Concentrated solids) outlet
5. Divert line/drain
6. Cooling liquid (WFI/buffer)
7. Valves
8. Pumps
9. Flow meters

Technical data

Performance data[1]	
Hydraulic capacity[2]	0.5–4.0 lpm, or 30–240 l/h
Motor capacity	1.5 kW
Power supply	200–240 V / 50–60 Hz / 10 A
Power consumption (motor)	1.0 kW
Sound pressure level	67 dB (A)

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

[2] Designed to process the harvest of bioreactors with 50–1000 litres capacity.

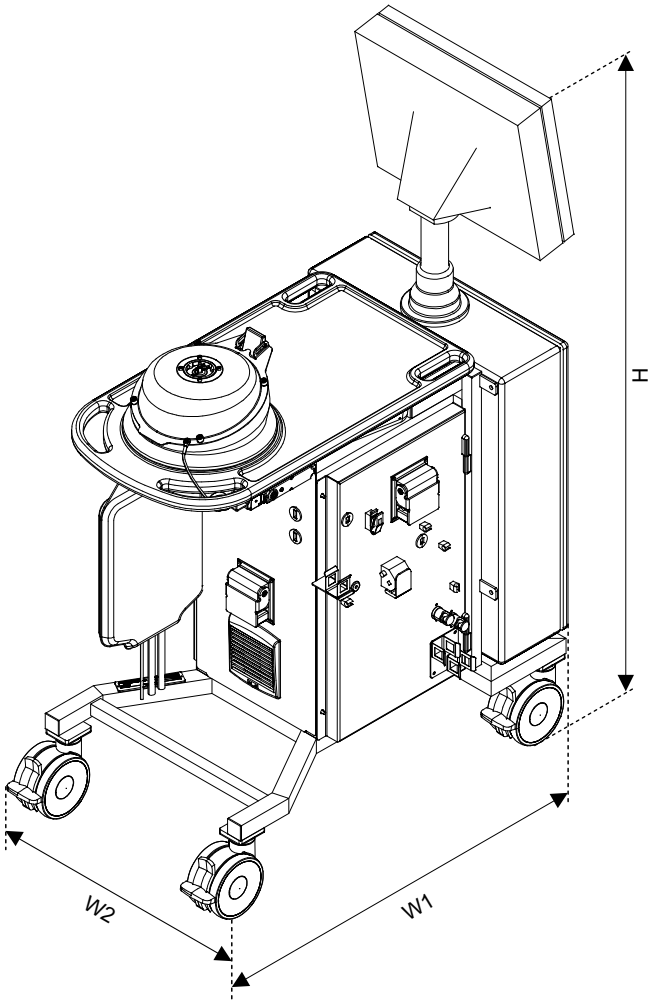
Connections	
Feed (cell culture) inlet	Ø3/8" (9.6mm) I.D, 3/8" CPC AseptiQuik® S
Light phase outlet	Ø1/4" (6.4mm) I.D, 1/4" CPC AseptiQuik® S
Heavy Phase (solids) outlet	Ø3/16" (4.8 mm) I.D, 1/4" CPC AseptiQuik® S

Weights	
System weight	220 kg (485 lbs)
Spinsert weight	2.3 kg (5.1 lbs)
Total process liquid hold-up volume	1.1 litre

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

Single use consumables qualification	
Sterilization	X-ray, 25-40 kGy
Functional testing	
Regulatory statements	ADI free, BPA, etc.
Biocompatibility	USP Class VI <88>
Bacterial Endotoxin	USP <85>
Particulates	USP <788>
Physicochemical	USP <661>
Extractables	USP <665>
Sterilization	AAMI / ISO 11737

Dimensional drawing



Dimensions	
H	1635 mm (64 inches)
L	1100 mm (44 inches)
W	620 mm (25 inches)

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