

# Sartoflow<sup>®</sup> Advanced

Full Flexibility and  
Outstanding Crossflow  
Filtration Performance  
Combined



## Description

The system is suitable for flexible use in laboratory environments for process development and clinical trials, as well as for small-scale production batches. Several standardized options are available to enable you to obtain just the right system, exactly tailored to meet your individual requirements. The system can also be upgraded with additional options if your requirements change during process development or production.

## Product Information

The Sartoflow<sup>®</sup> Advanced is a modular benchtop crossflow system optimized for ultrafiltration, microfiltration and diafiltration applications used in many downstream processes, such as purification of vaccines, monoclonal antibodies and recombinant proteins.

This crossflow system is equipped with our proven DCU-4 control unit that readily communicates with BioPAT® MFCS software.

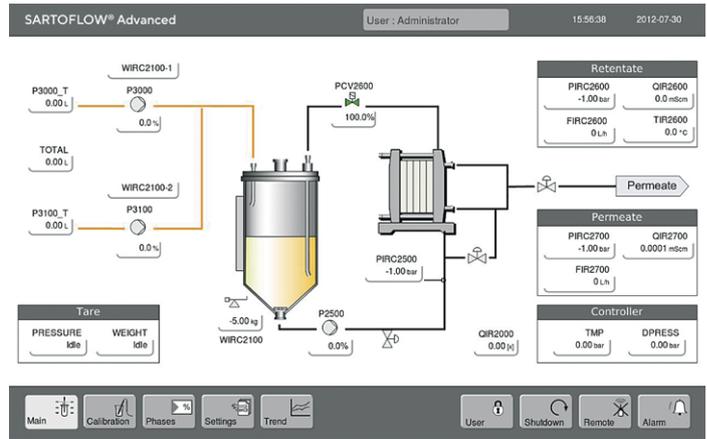
The Sartoflow® Advanced can be configured to accept either Sartococon® Slice or full-sized Sartococon® cassettes. As a result, this gives you an exceptionally wide range of membrane surface areas. Since all Sartococon® crossflow cassettes have the same hydrodynamic flow path length, the Sartoflow® Advanced can be linearly scaled up from 0.1 to 2.1 m<sup>2</sup> of membrane area. Its unique compact design has an ultra-low loop volume of ~200 ml, making it possible to concentrate even small process batches.

The Sartoflow® Advanced can be run in demanding production environments. Moreover, the unit and its touch screen is built to withstand continuous use in under laboratory and production conditions.

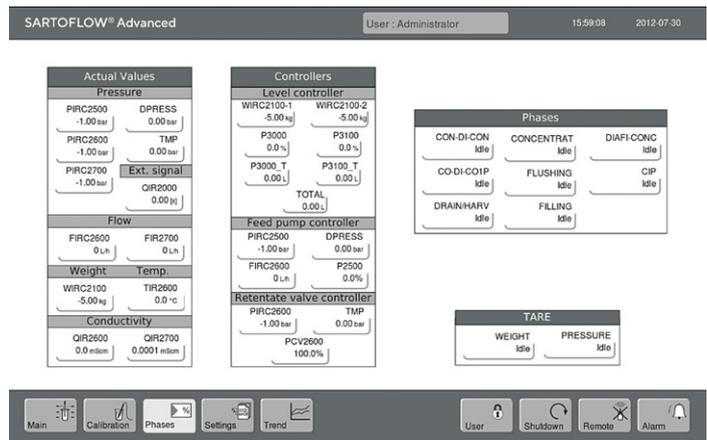
## Filtration Module

The filtration module includes a Sartococon® Slice holder – or as an option, a holder for full-sized Sartococon® Eco cassettes – TMP control, delta P control, retentate flow control, three pressure sensors, a flow meter in the permeate line, with one positioning valve in retentate line, a four-piston diaphragm recirculation pump (0.7 m<sup>3</sup>/h @ 4 bar), a temperature transmitter and a load cell for level control.

The DCU-4 control includes a 12" touch panel. One peristaltic feed pump is located below the touch screen, making it possible to load product or buffer as a discrete process step. A second peristaltic pump is optionally available.



DCU-4 Touch Screen



Process Sequences

## Recirculation Module

The recirculation tank utilizes a load cell for level control and can be replaced by a recirculation bag stand with a crossflow bag. All control functions are fully operable whether you run the system with a stainless steel tank or a single-use bag.

A cylindrical 10 L stainless steel tank with a conical base – with or without a sight glass for visual monitoring – and a double-jacketed vessel for cooling, or a bag stand for 5 L, 10 L or 20 L single-use crossflow bags, are available as recirculation modules. Both types of vessel with a sight glass are equipped with a vortex breaker and a dip tube to prevent foaming.

## Control Functions

All control and alarm functions are set and displayed on the 12" touch screen. The screen displays all signal readouts, set point controllers and trend curves, ensuring user-friendly operation. It enables immediate process control, even when you change parameters on the fly. Active controllers and alarms are visualized on the main display.

The logbook function stores alarms, set points and user logs. All logbook inputs can be read into the optional available BioPAT® MFCS | win Scada software program and can be personalized using three-level password protection.



Tank



Bag

## Process Sequences

You can use predefined parameters to automatically run customized sequences for concentration, diafiltration (UF | DF), rinsing, filling, draining, CIP steps and tare functions.

All Sartoflow® Advanced units are equipped with feed pressure and level controllers for operating the system at user-defined set points. The feed pressure controller keeps the feed pressure constant by controlling the pump speed (the feed pressure is the defined value). Delta P and the retentate flow are controlled by the recirculation pump speed.

The TMP option permits control of the feed and retentate pressure at predefined set points using the pump speed and the positioning valve. The retentate flow option lets you run processes at specified retentate flow rates by adjusting the feed pump speed. The level controller can run two peristaltic pumps to keep the volume in the recirculation bag constant. The system's software architecture is designed to enable you to conduct optimization trials at constant recirculation flow rates and TMP values.

## Data Acquisition

Data are collected using an external PC (not part of the equipment supplied) connected to the Sartoflow® Advanced system over an ethernet interface. BioPAT® MFCS software for data acquisition and trend monitoring is included in the Sartoflow® Advanced package.

## cGMP Production Environment

Optionally validated BioPAT® MFCS | win software can be upgraded with our 21 CFR Part 11 and S88 recipe control modules. The BioPAT® MFCS | win additional software modules based on OPC® technology specify the communication of real-time data between control devices from major third-party products. This convenient option offers you the possibility of connecting the Sartoflow® Advanced to Delta V.

The following phases are provided by the system:

Con-Di-Con	Used to concentrate the product to a predefined level and to diafilter the product subsequently - followed by concentration to a final level.
Concentration	Used to concentrate the product to a predefined final level.
Diafi-Conc	Diafiltration of the product. At the end of this phase, the product is concentrated to a predefined volume.
CIP	Used to clean the system, including all valves, pipework and tank, by using WFI, acidic or alkaline solutions.
Flushing	Used to rinse the system by flushing the pipework and tank with WFI, acidic or alkaline solutions.
Drain   harv	Used to drain or harvest the product from the system.
Filling	Used to fill the tank or bag with the product.
Weight	Automatically zeros the load cell before changing to a different phase.
Pressure	Automatically zeros all pressure sensors before using a different phase.

Just select and start the phases on the control panel and the DCU-4 will then execute the steps automatically. Interactions or process end will be indicated by text messages.

# Technical Data

## Specifications

Pump output	700 l/h @ 4 bar (60 psi)
Filter area	0.1-0.5 m <sup>2</sup> (optional 0.7 – 2.1 m <sup>2</sup> )
Minimum recirculation volume	~200 ml
Max. inlet pressure	4 bar (60 psi)
Dimensions (H × L × W)	1,100 mm × 800 mm × 680 mm
Weight	~120 kg (~265 lbs.)
Electrical requirements	230 VAC   50 Hz 2.5 amp; 120 VAC   60 Hz 4 amp
IP-Standard	33
Piping connections	Tri-Clamp (½")

Sartoflow® Advanced is a modular system offering numerous standard and optional features:

## Modules

- Standard module  
Filtration module 230 V – 50 Hz or 115 V- 60 Hz: four-piston diaphragm feed pump, Sartococon® Slice filter holder, three pressure sensors, one flow meter in the permeate line, one load cell, one peristaltic pump, a temperature sensor in the retentate line, one proportional valve in the retentate line, touch screen, DCU-4.
- Recirculation modules
- 10 L stainless steel tank
- 10 L stainless steel tank with a sight glass
- 10 L stainless steel double-jacketed tank with a sight glass
- Bag holder

## Options

- Flow meter in the retentate line
- Conductivity probe in the retentate line
- Conductivity probe in the permeate line
- 2<sup>nd</sup> peristaltic pump
- Sartococon® filter holder for up to three full-sized Sartococon® Eco cassettes

## Optional Software

- BioPAT® MFCS | win standard package
- Recipe Control (S88) module for BioPAT® MFCS | win
- 21 CFR Part 11 Module for BioPAT® MFCS | win
- BioPAT® MFCS | win OPC® modules



Sartoflow® Advanced filtration module and tank module

## Consumables

Order No.	Crossflow Bag Specification
FBB111332	5 liters
FBB111333	10 liters
FBB111334	20 liters

# Order Information

## Sartocon® Eco New Hydrosart® Ultrafiltration Cassettes

Available types and order numbers

Type	Filter Area	Cut-off	Order No.
Sartocon® cassettes	0.7 m <sup>2</sup>	10 kD	3M21443907E--SW
Sartocon® cassettes	0.7 m <sup>2</sup>	30 kD	3M21445907E--SW
Sartocon® cassettes	0.7 m <sup>2</sup>	100 kD	3M21446807E--SW
Sartocon® Slice cassettes	0.14 m <sup>2</sup>	10 kD	3M51443901E--SW
Sartocon® Slice cassettes	0.14 m <sup>2</sup>	30 kD	3M51445901E--SW
Sartocon® Slice cassettes	0.14 m <sup>2</sup>	100 kD	3M51446801E--SW

## Sartocon® Slice Cassettes

	Filter Area	MWCO	Order No.
<b>Ultrafilter Membrane</b>			
Hydrosart® UF	0.1 m <sup>2</sup>	2 kD	3051441901E--SW
Hydrosart® UF	0.1 m <sup>2</sup>	5 kD	3051442901E--SW
Hydrosart® UF	0.1 m <sup>2</sup>	10 kD	3051443901E--SW
Hydrosart® UF	0.1 m <sup>2</sup>	30 kD	3051445901E--SW
Hydrosart® UF	0.1 m <sup>2</sup>	100 kD	3051446801E--SW
PESU UF	0.1 m <sup>2</sup>	1 kD	3051460901E--SW
PESU UF	0.1 m <sup>2</sup>	5 kD	3051462901E--SW
PESU UF	0.1 m <sup>2</sup>	8 kD	3051463401E--SW
PESU UF	0.1 m <sup>2</sup>	10 kD	3051463901E--SW
PESU UF	0.1 m <sup>2</sup>	30 kD	3051465901E--SW
PESU UF	0.1 m <sup>2</sup>	50 kD	3051465001E--SW
PESU UF	0.1 m <sup>2</sup>	100 kD	3051466801E--SW
PESU UF	0.1 m <sup>2</sup>	300 kD	3051467901E--SW
PESU UF	0.1 m <sup>2</sup>	Albumin	305146AI01K--SW
<b>Microfilter Membrane</b>			
Hydrosart® MF	0.1 m <sup>2</sup>	0.2 µm	3051860701W--SW
Hydrosart® MF	0.1 m <sup>2</sup>	0.45 µm	3051860601W--SW
PESU MF	0.1 m <sup>2</sup>	0.1 µm	3051545801W--SW

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