

PUROSEP™ Infinity

Tangential Flow Filtration System

The most versatile system!



- **Two pump design for an infinite range of volumes and applications**
- **Low hold up volume with complete drainability**
- **cGMP turnover package**
- **Modular design to accommodate OPTISEP® 1000, 3000, 7000, and 11000 holders and modules**
- **Designed to operate multiple membrane formats such as cassettes, hollow fibers, and ceramics**

As one of the industry's leading innovators of filtration technology, SmartFlow Technologies has designed and built the PUROSEP™ Infinity to provide the most versatile system available for membrane filtration processes available today. This system has been designed with two pumps to support an infinite range of volumes and application. By providing a platform to perform basic membrane selection studies, use only one pump to model feed and bleed production schemes, and perform simultaneous MF and UF processes utilizing both pumps, the PUROSEP Infinity offers unparalleled capabilities for the development facility. Mounted on a mobile cart with a small footprint, the Infinity offers the utmost in flexibility, performance, and reliability on a small mobile platform. Regardless of your selection of a manual system or a fully automated control package, this system is the perfect choice for 2.0L process investigation or 500L production runs.

The design of this system emulates a full-scale production solution by utilizing high-end components, such as sanitary pumps, self-draining, 316L stainless steel fluid path components, and high-resolution instrumentation. Intuitive, easy to use automation packages allow for precise process control and accurate measurement of operating conditions and membrane performance to assist you when scaling up to production level or scaling down for process optimization studies.

The PUROSEP Infinity is delivered with multiple retentate loop configuration options. For lower hold up volumes, the mini tri-clamp fittings and OPTISEP® 1000 filter holder are perfect. Utilizing the OPTISEP 11000 and the feed and bleed loop configuration is ideal for 250L fermentation harvests. In addition to SmartFlow Technologies' cutting edge, patented OPTISEP® filter modules and holders, the Infinity will operate other filter module formats.

Applications

- Ultrafiltration
- Microfiltration
- Nanofiltration
- Diafiltration

Automation Packages

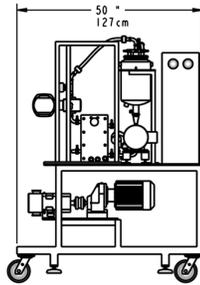
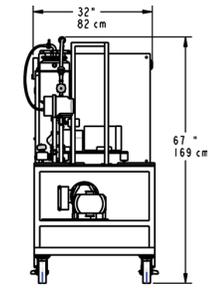
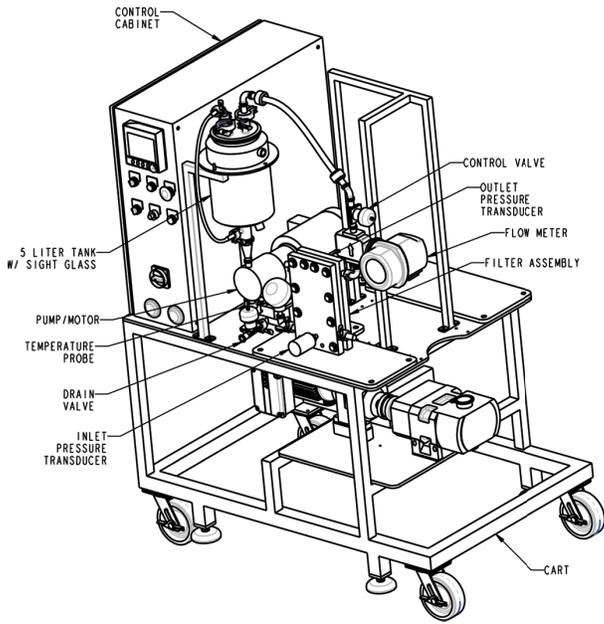
Automation Package	Benefits
Infinity (Manual)	Economic solution providing manual control for system functions and two displays with alarms for process monitoring and protection
Infinity Manager (Operation Level Automation)	Programmable HMI for automated control of recirculation flow and trans membrane pressure (TMP) control
Infinity Controller (Procedure Level Automation)	Robust recipe building capabilities for complete walk away functionality
“Plus” Option (Data Recorder)	Add the “Plus” option to any of the above configurations to include integrated 21CFR Part 11 data recording
Infinity Integrator	Completely automated process control combining the functionality of the Controller package above with integrated 21 CFR Part 11 data recording, and full PC based historian package

SmartFlow Technologies makes configuring the optimal system for your process easy by providing standard automation packages comprised of all required components to ensure the best solution possible. These packages include manual control (Manual), automated flow and TMP control (Manager Package), and fully automated control with recipe mode for complete walk away functionality (Controller Package). Integration with your existing SCADA or process network is also possible with these automation packages. In addition to the standard automation offerings, SmartFlow Technologies offers a host of additional hardware accessories to accommodate the most demanding process. These accessories include:

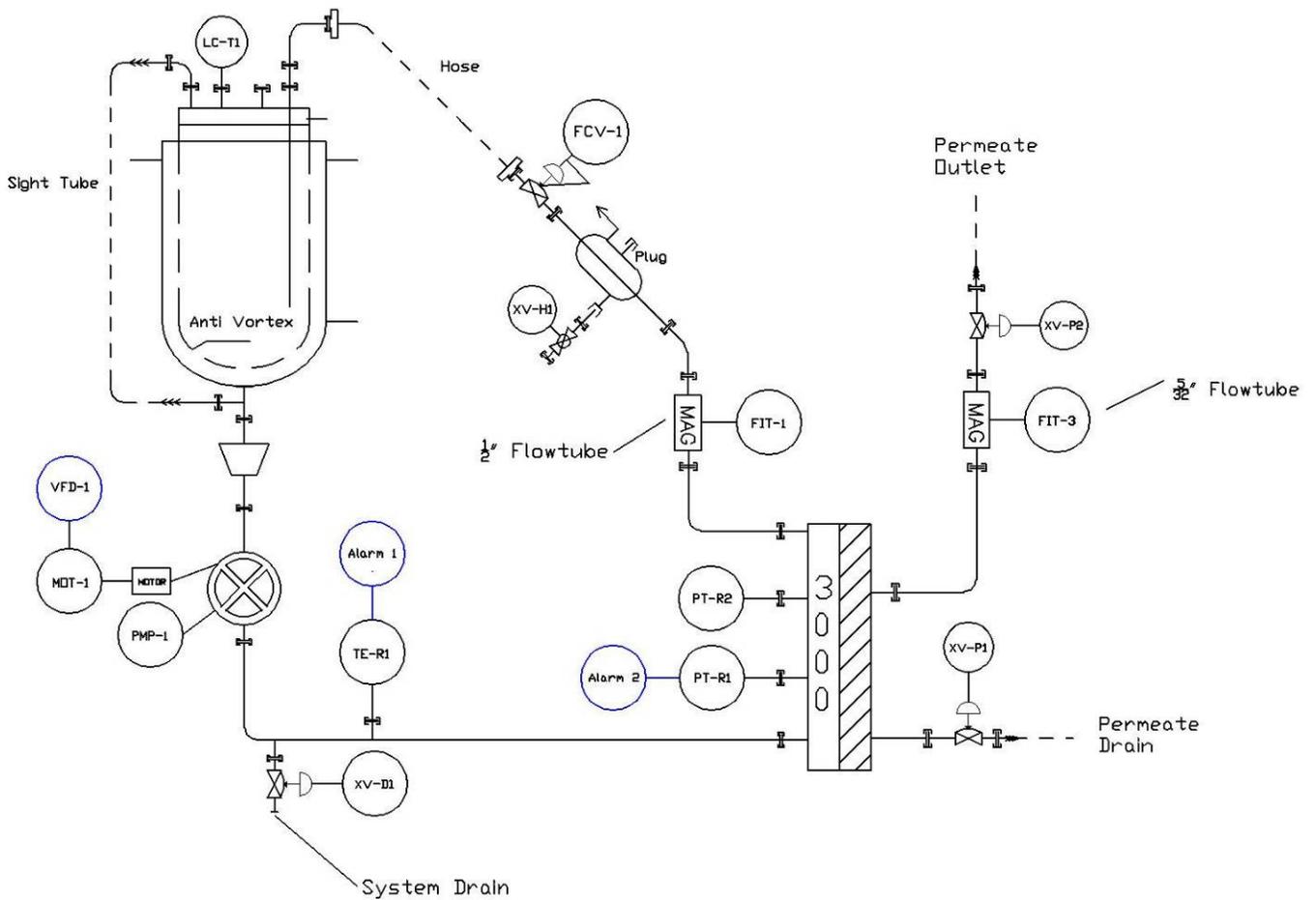
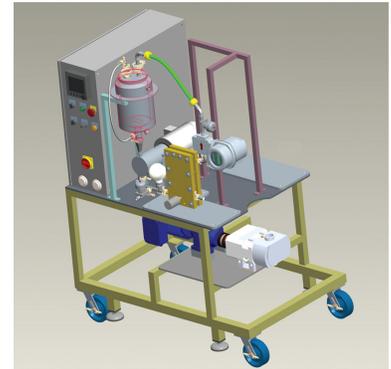
- Multiple Tank Options Available
- Dual Point Level Control
- Steam in Place
- pH / UV / Conductivity Sensors
- 21 CFR Part 11 Compliant Video Recorder
- OPTISEP 1000 / OPTISEP 3000 / OPTISEP 7000 / OPTISEP 11000 Filter Holder and Module

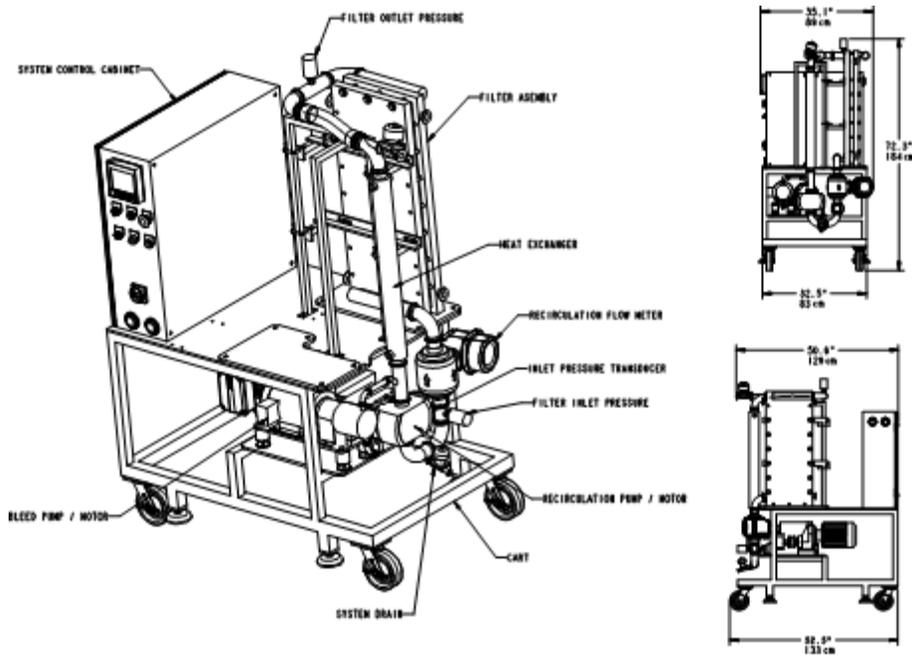
By incorporating the dual point level control, the functionality of controlling a third pump or second system is added. With this configuration, the liquid level within the PUROSEP Infinity tank would control an electrical outlet on the back of the system capable of activating an ancillary pump to add starting material or buffer to the tank as the process requires. This feature also adds the advanced capability of automating diafiltration processes or simultaneous processing with two or more systems. In addition to providing the most robust and technically superior process development solution, the Infinity is also backed by SmartFlow Technologies’ professionally trained applications and technical support staff.

When partnering with SmartFlow Technologies, you gain the advantage of decades of innovation and quality enhancements in both systems and filter modules. For a complete, high quality, turn-key solution, you can trust SmartFlow Technologies to deliver.

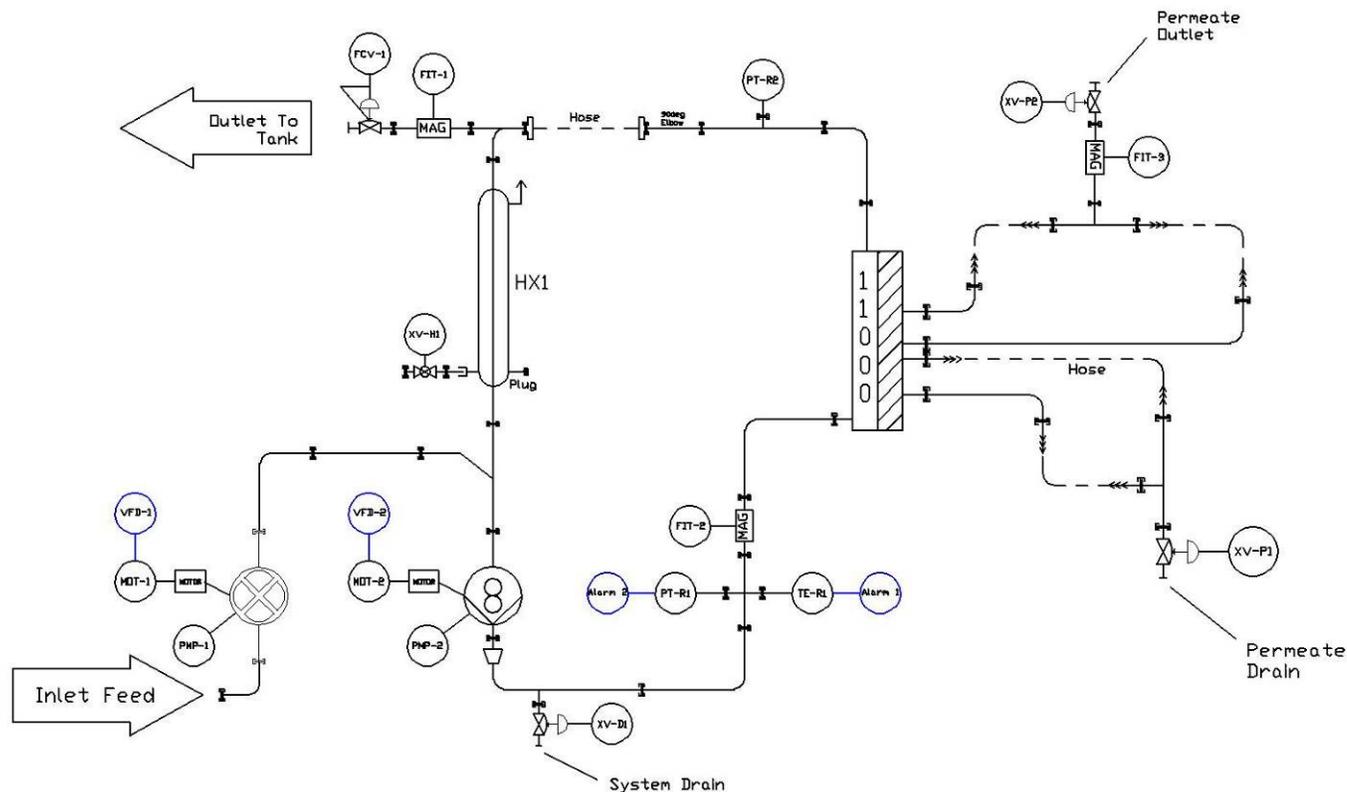
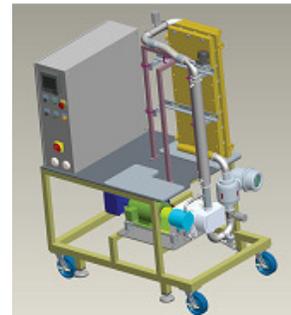


The Infinity configuration on this page includes a diaphragm pump with the OPTISEP 3000 suited for process volumes from 1 to 30 Liters.





The Infinity on this page includes the OPTISEP 11000 in a feed and bleed configuration for process development and low volume production with volumes from 15 to 500 Liters.



Recommended PUROSEP Infinity Volume Ranges

Pump	Filter Module	Volume Ranges
Diaphragm	OPTISEP 1000 (0.45m ²)	1L to 5L
Diaphragm	OPTISEP 1000 (0.075m ²)	1L to 10L
Diaphragm	OPTISEP 3000 (0.10m ²)	1L to 10L
Diaphragm or Lobe	OPTISEP 3000 (0.19m ²)	2L to 30L
Lobe	OPTISEP 7000 (0.5m ²)	5L to 50L
Diaphragm and Lobe	OPTISEP 7000 (Feed & Bleed 0.9m ²)	10L to 250L
Diaphragm and Lobe	OPTISEP 11000 (Feed & Bleed 0.9m ²)	15L to 250L
Diaphragm and Lobe	OPTISEP 11000 (Feed & Bleed 2.4m ²)	25L to 500L

Specifications

Tank	Multiple tanks available 2L Polysulfone 5L to 500L Stainless Steel Jacketed
Pump #1	4-Diaphragm Piston Pump
Pump Performance LPM at Pressure	16.6 LPM @ 0 psig (0 Bar) 15.0 LPM @ 90 psig (6 Bar)
Motor	0.5HP (0.373 kW)
Pump #2	Positive Displacement Rotary Lobe Pump
Pump Performance LPM at Pressure	200 LPM, 609 RPM @ 0 psig (0 Bar) 132 LPM, 609 RPM @ 30 psig (2 Bar)
Motor	0.5 HP (0.37 kW) motor for diaphragm pump 3 HP (2.2 kW) motor for rotary lobe pump
Flow Meter	Magnetic, local and remote display on video recorder / 4-20 mA
Retentate Flow Path	316L SS, 15 Ra electro-polished (EP) ID, 32 Ra max OD / Sanitary, re-sealable silicone tubing
Filter Holders	SmartFlow Technologies OPTISEP 1000 / OPTISEP 3000 / OPTISEP 7000 / OPTISEP 11000, hollow fiber, cassettes, ceramic, and spiral
Retentate Loop Size	Low Hold Up Volume 3/4" Loop with OPTISEP 1000 1" Loop with OPTISEP 3000 2" Loop with OPTISEP 7000 / OPTISEP 11000
Optional Level Control	Dual channel control for conductive liquids
Electrical Requirements	208 VAC, 15 amp, 3 phase, 60Hz OR 380 VAC, 10 amp, 3 phase, 50Hz
Dimensions (Based on OPTISEP 11000 feed and bleed configuration)	Length: 52.8in. (134cm) Width: 35.1in. (89cm) Height: 72.3in. (184cm) Weight: 700lbs. (318kg)
Number of Configurations and Uses	Infinite



System and Options

Validation and Support

In addition to its market leading Applications and Technical Support, SmartFlow Technologies also offers Validation Support. These programs provide experienced and dedicated Application Specialists, Process Engineers, and Validation Support Engineers to assist you with process development and process optimization programs as well as integrating PUROSEP systems and OPTISEP filter modules into your process so that you can more easily and quickly realize the benefits provided by *SmartFlow-TFF*.

Description	Catalogue Number
PUROSEP Infinity	Infinity-BR01-0002
OPTISEP® 1000 Holder ½" TC Inlet / Outlet	30-900-2050
OPTISEP 3000 Holder ¾" TC Inlet / Outlet	50-900-2075
OPTISEP 7000 Holder 1" TC Inlet / Outlet	40-900-2100
OPTISEP 7000 Holder 2" TC Inlet/Outlet	40-900-2200
OPTISEP 11000 Holder 3" TC Inlet/Outlet	70-900-2300
5L SS Jacketed Tank	59JT-ST-01
Level Control	LTLC-BR01-01
UV Absorbance Sensor	NSUB-05-01
pH & Conductivity Sensor	NSUB-05-30
Permeate Flow Meter	LTFM-BR01-01

To Place an Order or Receive Additional Information, please contact our global headquarters:

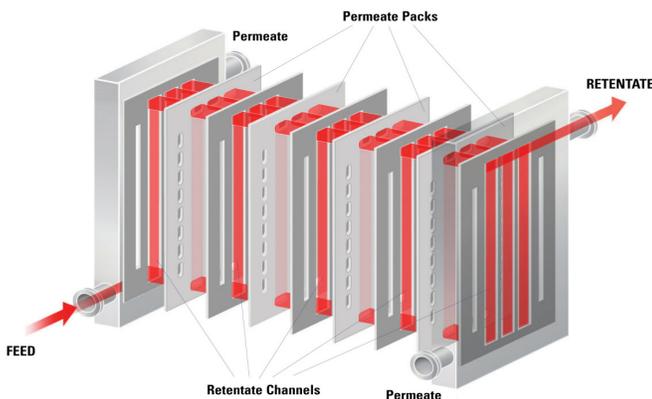
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SmartFlow™ TFF: "Delivering the promise of TRUE TFF Functionality"

The *SmartFlow*™ performance advantage comes from the patented *SmartFlow* tangential flow filtration technology. The *SmartFlow* technology in the OPTISEP® filter modules is comprised of two primary developments: 1) unique flow channels and 2) diagonally opposed inlet and outlet ports provide uniform fluid dynamics. These advancements allow for consistent fluid distribution across the entire membrane surface. The benefits of *SmartFlow* technology include: improved cleaning, increased flux rate, true linear scalability, and increased yields resulting in more efficient downstream processes than in traditional TFF.

