

PUROSEP™ Phoenix Tangential-Flow Filtration System



- **Bench/Cart-top unit with SmartFlow Technologies' complete family of automation packages available**
- **Low hold up volume**
- **Complete cGMP turnover package**
- **Modular design to accommodate OPTISEP® 3000, 7000, and 11000 holders and modules**
- **Designed to operate multiple membrane formats such as cassettes, hollow fibers, and ceramics**

State-of-the-art system with the versatility to perform both process development and small volume production

As one of the industry's leading innovators of filtration technology, SmartFlow Technologies has designed and built the PUROSEP™ Phoenix to provide a compact, easy to use, robust platform offering unparalleled flexibility and performance at a value you cannot ignore. The Phoenix is the perfect choice for process development optimization and small / pilot scale production runs.

The design of this system emulates a full scale production solution by utilizing high end components such as a self draining, sanitary, positive displacement pump, 316L stainless steel fluid path components, high resolution instrumentation, and intuitive, easy to use automation packages. This allows for the accurate measurement of operating conditions and membrane performance to assist you when scaling up to production level or scaling down for process optimization studies. In addition, the Phoenix has the option to mount the pump, controls, and instruments on one frame such that various brands and types of filter elements can be quickly and easily rolled up and clamped into place for fast versatile turn around times regardless of the brand of filter element employed.

The PUROSEP Phoenix is offered in five standard retentate loop sizes of ¾", 1", 1 ½", 2", and 3". For lower hold up volume, the ¾" retentate loop size may be used in conjunction with the OPTISEP® 3000 filter holder and module. In addition to SmartFlow Technologies' cutting edge, patented OPTISEP filter modules and holders, the PUROSEP Phoenix also incorporates the ability to operate other filter module formats such as hollow fiber, ceramic, cassette, and spiral. This flexibility makes the Phoenix the ideal process development system for your current and future projects.

Applications

- Clarification
- Ultrafiltration
- Microfiltration
- Concentration
- Diafiltration

Automation Packages

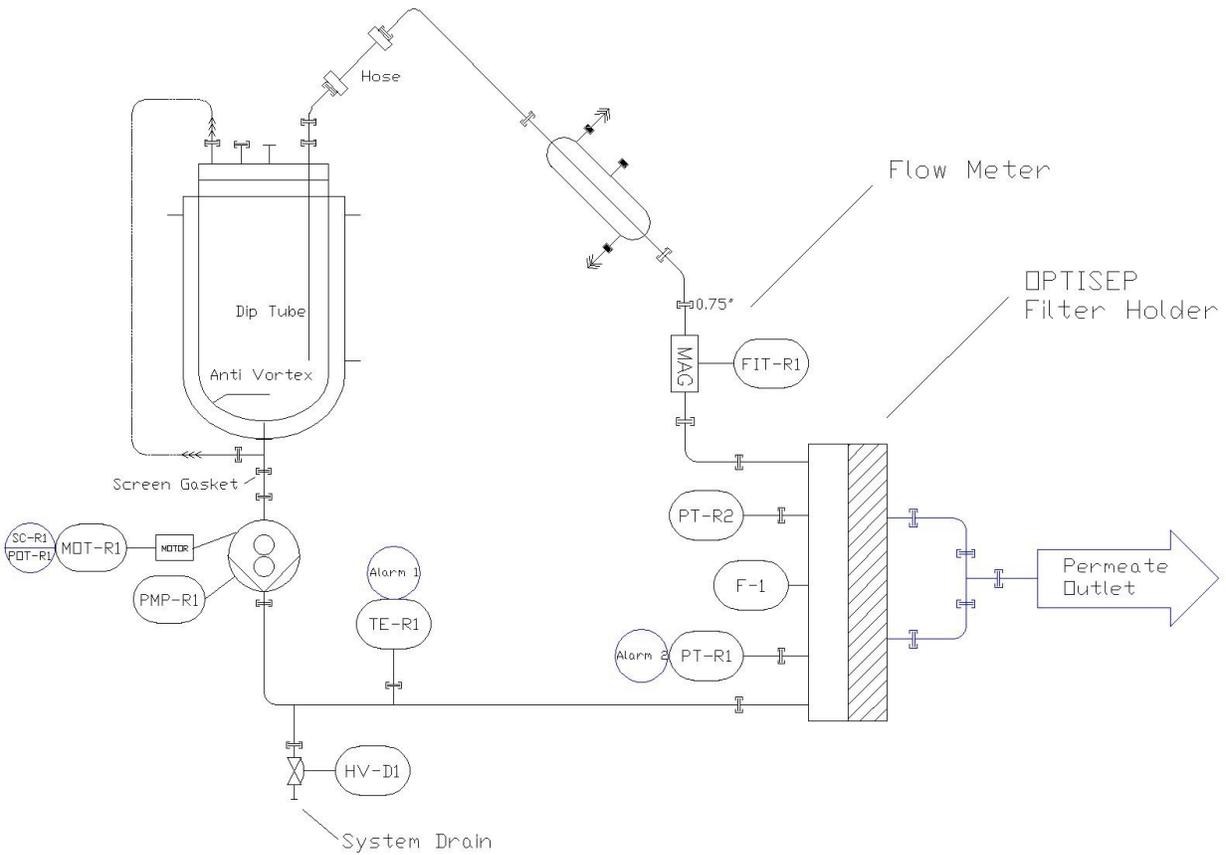
Automation Package	Benefits
Phoenix (Manual)	Economic solution providing manual control for system functions and two displays with alarms for process monitoring and protection
Phoenix Manager (Operation Level Automation)	Programmable HMI for automated control of recirculation flow and trans membrane pressure (TMP) control
Phoenix 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
Phoenix 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:

- Stainless Steel Jacket Tanks
- Steam in Place
- Dual Point Level Control
- Permeate Flow Meter
- pH / UV / Conductivity Sensors
- 21 CFR Part 11 Compliant Video Recorder
- OPTISEP 3000 / OPTISEP 7000 / OPTISEP 11000 Filter Holder and Module

By incorporating the dual point level control, the functionality of controlling a second pump or system is added. With this configuration, the liquid level within the PUROSEP Phoenix 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. Use of our most popular automation package, the Controller, provides the ability to incorporate multiple process recipes for varied membrane elements. In addition to providing the most robust and low volume solution, the Phoenix 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.



Specifications

Tank	5L Stainless Steel Jacketed Tank
Pump	Positive Displacement Rotary Lobe Pump
Pump Performance LPM at Pressure	Positive Displacement Rotary Lobe Pump per specification Capacities from 10 LPM to 400 LPM
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, 3/4", 1", 1 1/2", 2", or 3" loop sizes available
Filter Holder	SmartFlow Technologies OPTISEP 3000 / OPTISEP 7000 / OPTISEP 11000, hollow fiber, cassettes, ceramic, and spiral
Retentate Loop Size	Low Hold Up Volume 3/4" Loop 1" Loop with OPTISEP 3000 / OPTISEP 7000 / OPTISEP 11000
Optional Level Control	Dual channel control for conductive liquids
Electrical Requirements	115 VAC, 12 amp, 1 phase, 60Hz 220 VAC, 12 amp, 1 phase, 50Hz Others available upon request
Dimensions (Including Mobile Cart and Tank)	Length: 47in. (119cm) Width: 37in. (94cm) Height: 65 in. (165cm) Weight: 360 lbs. (163kg)



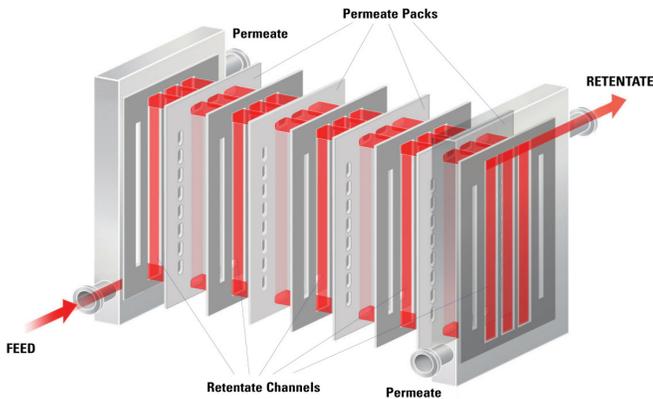
System and Options

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 Phoenix	2P-BR01-0001
OPTISEP 3000 Holder	50-900-2075
OPTISEP 7000 Holder 1" Inlet/Outlet	40-900-2100
OPTISEP 7000 Holder 2" Inlet/Outlet	40-900-2200
OPTISEP 11000 Holder 3" TC Inlet/Outlet	70-900-2300
5L SS Jacketed Tank	59JT-ST-01
Level Control	LTLK-BR01-01
UV Absorbance Sensor	NSUB-05-01
pH & Conductivity Sensor	NSUB-05-30
Permeate Flow Meter	LTFM-BR01-01
Mobile Cart	0010-60-15

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.

