

Product Specifications

Part ID: SYS-RPM-KR2i



KrosFlo® KR2i RPM™ System

Overview

The KrosFlo® KR2i RPM™ System is the first Tangential Flow Filtration (TFF) lab scale system with integrated Real-time Process Management. The system combines the KrosFlo® KR2i TFF system and the CTech™ FlowVPX® Variable Pathlength Technology (VPT) UV-Visible spectrophotometer to provide automated, real-time, in-line concentration monitoring and end point control. The seamless integration of the KR2i and FlowVPX systems delivers improved process control and efficiency with reduced process risk.

- Strengthen process control with high quality and highly reproducible concentration results.
- Increase process efficiency by reducing cycling time, increasing yield, throughput, and eliminating the need for time consuming off-line pre and post run concentration measurements and dilution.
- Reduce process risk by ensuring accurate concentration throughout the TFF process.



Power of Automation

The automated KR2i TFF System is a performance-proven, bi-directional, self-priming TFF system with low shear. It is ideal for processes up to 10 L, as well as for small-volume microfiltration and ultrafiltration with a recirculation volume as low as 2 ml. The system has high volumetric efficiency and a motor speed repeatability of 0.1%, enabling consistent productivity.

The system base pump can handle a variety of sample materials with minimal wear, including abrasive slurries, nanoparticles, corrosive fluids, and highly viscous fluids. The system is also capable of running dry or pumping fluids with high quantities of entrained air. The peristaltic pumps, backpressure control valve, and easy-to-install single-use flow paths minimize contact materials and eliminate the need for flow-through valves that can clog or leak.

Real-Time Concentration Insights

The FlowVPX in-line spectrophotometer uses variable pathlength technology to monitor and optimize critical process parameters in real-time for improved quality and consistency. Slope-based concentration measurements increase the efficiency of the process and avoid costly dilution and background correction steps, while in-line measurements enable real-time, automated decisions, potentially eliminating out-of-spec results and costly, time-consuming deviation reports.

By integrating the FlowVPX with the KR2i TFF System, the new KrosFlo KR2i RPM System helps to reveal process characteristics previously hidden from commonly used, in-line, fixed-pathlength sensors. Capable of fixed-point measurements at wavelengths between 190 nm and 1100 nm with varying pathlengths, the KR2i RPM System is adaptable to a wide range of sample types and the highest concentrations found in the biopharmaceutical industry.

The proprietary KrosFlo® RPM™ Software enables the combined functionality of the KR2i and FlowVPX systems. The software can execute complicated TFF processes using real-time concentration data through user-specified set points for the system auxiliary pumps, scales, and backpressure valve. This level of system programmability results in improved accuracy, method reproducibility, and process efficiency.

KrosFlo TFF System

Filter Mode	Hollow Fiber	Flat Sheet Cassettes
Recommended Process Volume	2 mL–10 L	12 mL–15 L
Filter Surface Area	13 cm ² –3700 cm ²	100 cm ² –5000 cm ²
Main Drive / Feed Pump and Stand	Easy-Load Pump Head – up to 2.3 LPM (600 RPM) Use with tubing sizes #13, #14, #16, #17, #18 and #25. Integrated stand for hollow fibers	
Automatic Backpressure Control Valve (ABV)	Controls user-set process TMP or permeate pressure	
Tablet as HMI	Microsoft® Surface Pro® with Krosflo® RPM™ control and data acquisition software	
Auxiliary Pump	KrosFlo® Junior, flowrates up to 0.3 LPM	
System Scales	Maximum Weight:	20,000 g
	Readability:	0.1 g
	Platform Dimensions:	7.7" x 7.7" (17.8 cm x 17.8 cm)
Enclosures	IP33 rated plastic enclosure. Wipe down cleanable.	
Environmental Requirements	Operating Temperature:	0°C–40°C
	Relative Humidity:	10%–90%

CTech FlowVPX System

Linear Range-Finder Technology	Automatically identifies linear region of absorbance data to verify compliance with Beer-Lambert Law	
Integration Options	3 digital input channels 3 digital output channels 2 analog output channels	
Flow Cell Volume	3 mm Flow Cell:	0.6 mL
	10 mm Flow Cell:	9.0 mL
Spectroscopic Engine	Agilent Cary 60	
Qualification Slope Range	0.10 Au/mm to 46 Au/mm using NIST-traceable slope standards	
Qualification Slope Repeatability	±2%	
Maximum Pathlength	3 mm Flow Cell:	3.000 mm
	10 mm Flow Cell:	5.000 mm
Minimum Pathlength Step	0.001 mm	
Delivery Fiber Length	3 m (optional 6 m cable available upon request)	

KONDUiT Add-On Monitor

Inputs	2 Conductivity Inputs 2 Temperature Inputs	
Sensor Size	1/4" HB and 1/2" HB	
Conductivity Range	0.1 to 100 mS/cm	
Conductivity Accuracy	0.1 mS/cm–2 mS/cm:	±0.1 mS/cm
	2 mS/cm–50 mS/cm:	±5%
	50 mS/cm–100 mS/cm:	±5% (Typical)
Temperature Range	0°C–70°C	
Temperature Accuracy	±0.2°C or better	

Auxiliary Components

Pressure transducer	Up to 3 single-use sensors Pressure Range: -7 to 75 psi (-0.48 to 5.2 bar) Polysulfone, luer-style ports
Tubing	PharmaPure, TPE, size #14 and #16
Stand	Integrated stand with hollow fiber holder
Auxiliary Component Octopus cable	Allows for connectivity of scales, auxiliary pumps, and KONDUiT System
Reservoirs (Optional)	15 mL, 50 mL, 250 mL, 500 mL polypropylene conical containers, caps with ported inlets, conical holders
High-Performance pump head (Optional)	High-performance pump head, up to 2.9 LPM For use with tubing sizes #15, #24, #35, and #36 Note: Pump will accept up to two (2) pump heads

Power Requirements

KR2i System	Supply voltage: 90–260 V _{rms} @ 50/60 Hz (universal input) Max current: 2.2 A @ 115 V _{rms} or 1.1 A @ 230 V _{rms}
Cary 60	90 VAC–265 VAC, frequency 47 Hz–63 Hz
FlowVPX	Power supply input: 100 VAC–230 VAC Frequency: 50 Hz–60 Hz VPX power input: 24 VDC, 0.6 A max current draw
KONDUiT	Input power supply range: 100 VAC–240 VAC Input Frequency: 47 Hz–63 Hz KONDUiT Power input: 24 VDC, 0.625 A max current draw

General

Dimensions	KR2i Main pump:	267 × 203 × 203 mm (10.5" × 8" × 8")
	Auxiliary Pumps (2):	140 × 178 × 160 mm (5.5" × 7" × 6.3")
	KONDUiT:	197 × 120 × 114 mm (7.75" × 4.75" × 4.5")
	Scales (2):	330 × 203 × 97 mm (13" × 8" × 3.8")
	FlowVPX:	120 × 100 × 230 mm (4.72" × 3.94" × 9.06")
	Cary 60:	483 × 559 × 203 mm (22" × 8" × 19")

Weights	KR2i Main pump	5.9 kg (13 lb)
	Auxiliary Pumps (ea)	2.2 kg (4.8 lb)
	Konduit	1.6 kg (3.53 lb)
	Scales (ea)	2.7 kg (6 lb)
	Cary 60	18.1 kg (40lb)
	FlowVPX (3 mm flow cell):	4.31 kg (9.5 lb)

Compliance

ETL Mark UL 61010-1, CAN/CSA C22.2 No. 61010-1

CE Mark Low Voltage Directive 2014/35/EU
Electromagnetic Compatibility Directive 2014/30/EU
RoHS Directive 2011/65/EU

Environmental Compliance WEEE (Directive 2012/19/EU)
REACH Regulation (EC) No. 1907/2006
California Proposition 65

Customer Support

Support and Training: Repligen is committed to customer success from predelivery through installation and training.

Included with purchase:

- IQOQ
- Full 12-month warranty support
- Post-obsolescence seven-year hardware support
- Single- and multi-year service contract options, which include an annual PM service
- Preventative Maintenance (PM) service options
- Remote and on-site training and support
- Software support
- Two Flow Cells and Flow Fibrette® Optical Components

Customer Support (cont.)

More information: Final application suitability of all materials and ratings are the sole responsibility of the user. Specified pressure and temperature ratings may be subject to limitations. Contact a Repligen analytical sales representative for more information.

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