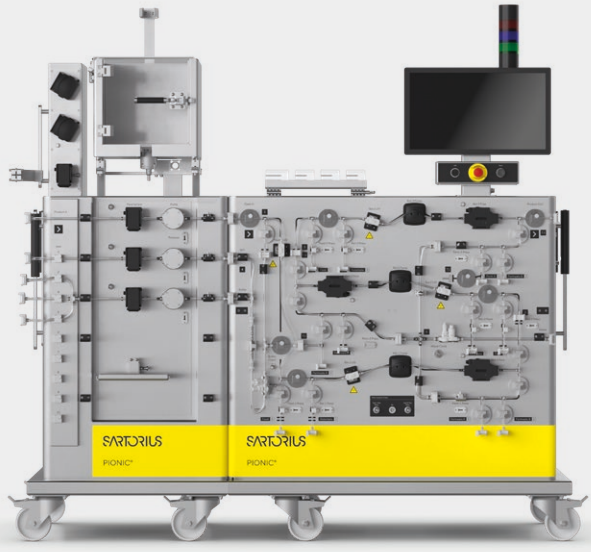
SARTORIUS

Product Datasheet

Pionic® Cross

Versatile single-pass TFF system for continuous downstream processing



Product Information

Pionic® Cross is a single-pass tangential flow filtration (TFF) system for efficient downstream processing across a wide operating range. The system performs final ultrafiltration and diafiltration (UF | DF) and intermediate TFF steps in one pass, simplifying purification and concentration. Biobrain® software enables automated operation with real-time monitoring and minimal operator input for consistent product quality. Flexible flow kit options adapt to varied process needs, allowing users to optimize costs. Combined with Pionic® Flow pumping module, the system enables advanced functions such as inline buffer dilution and precise fluid management for efficient continuous downstream processing.

Features and Benefits

- **Versatility:** Combines multiple single-pass TFF steps (UF | DF) in one unit operation.
- **Process flexibility:** Scalable and wide operating range for multi-product and varying flow demands.
- **Controlled product concentration and quality:** Biobrain® automation ensures precise control.
- **Enhanced productivity:** Continuous processing increases utilization and throughput and reduces downtime.

Relevant applications

- Integrated continuous biomanufacturing of monoclonal antibodies (mAbs) at clinical or commercial scale

Relevant process steps

- Single-pass TFF process steps
  - Final UF | DF
  - Intermediate concentration
  - Intermediate DF

Overview

Pionic® Cross enables integration of UF1, DF, and UF2 or intermediate TFF steps into a single continuous process. By consolidating multiple unit operations within one streamlined platform, Pionic® Cross reduces system complexity and enhances operational efficiency and process control.

Pionic® Cross is built for modern biomanufacturing environments and delivers flexibility across a wide range of applications. The system supports multi-product and multi-volume processing, and is equally effective for high-flow, single-product demands. Pionic® Cross has a consumable-agnostic design and is compatible with dedicated flow kits that are developed for extended operations of up to 28 days, enabling smooth integration into diverse workflows and optimization of operational expenditure.

Pionic® Cross is driven by Biobrain® automation to minimize operator intervention through intelligent process control and real-time monitoring. Continuous operation eliminates intermediate hold steps, which maximizes time utilization, increases throughput, and accelerates time to market — all within a reduced system footprint.

Product highlights

- **Process flexibility and coverage:** Built for maximum flexibility, Pionic® Cross covers the full operating range of two conventional TFF systems in a single platform, enabling multi-product, multi-volume processing, as well as high-flow applications in a single configurable UF | DF unit.
- **Controlled product concentration and quality:** Continuous live data monitoring with Biobrain® automation enables precise real-time control of product concentration, delivering consistent quality and low variability across continuous runs of up to 28 days.
- **Enhanced throughput and productivity:** By enabling continuous UF | DF operation and eliminating intermediate hold steps, the system maintains steady-state conditions, maximizes equipment utilization, and significantly increases product output per installed membrane area, delivering more throughput in less time — without requiring a larger footprint or system size.

Technical Specifications

System specification

System features	Details
Dimensions, Pionic® Cross (w × d × h) [mm] Dimensions, Pionic® Flow (w × d × h) [mm]	1,200 × 800 × 1,925 700 × 800 × 1,894
Maximum number of steps	3
Number of fluid adjustment pumps	2
Flow range, feed [L/h]	1 – 150
Flow range, retentate [L/h]	0.3 – 11.7
Number of process pumps	3 (feed, WFI, buffer)
HMI	21" touch screen
IP rating	IP54
Power needed [V]	120 or 240
Air supply [barg]	8
Maximum pressure, Pionic® Cross [bar]	1.9
Maximum pressure feed | buffer, Pionic® Flow [bar]	3
Generic connectors	AseptiQuik® S sterile connectors

Ready-for-use flow kits

System name	Pionic® Flow	Pionic® Cross
Application	Pumping unit	Single-pass TFF
Connectors	AseptiQuik® S sterile connectors	AseptiQuik® S sterile connectors
Tubes	▪ Fluid adjustment: PharMed® PBT tubing (¼" × ⅝") ▪ Bag: Tuflux® silicone (¼" × 7/16", ½" × ¾", ⅜" × ⅝") ▪ Flow kit: Liveo™ Pharma 80 (¼" × ⅜", ⅛" × ¼")	▪ Flow kit Liveo™ Pharma 80 (⅛" × ¼", ¼" × ⅜", ⅜" × ⅝") ▪ Retentate pumps: Bioprene® pump tube (⅛" × ¼")
Airfilter	Sartopore® Air Gamma Midicaps® size 7	–
Fluid adjustment pump	Watson Marlow® 314	–
Retentate pumps	–	Watson Marlow® 114 ⅛"
Valves	Carten® pinch valves ⅛" | ¼"	Carten® pinch valves ⅛" | ¼"
SU pump head	■	–
Pressure sensors	■	■
Flow sensor	■	■
Conductivity sensors	■	■
pH sensor	■	–
Bag	Flexsafe® 20 L	–
Empty line detection	■	■

Pionic® Cross

Specification	Details
Flow kit and tubing connections	Closed processing sterile connectors
Size	⅛" | ¼"
Valves	Carten® pinch valves insert ⅛" | ¼"
Pressure sensors	PendoTECH® pressure sensor ⅛" HB
Conductivity sensors	BioPAT® Conductivity ¼" flow through w. plug
UV flowcell	BioPAT® Spectro flow through ⅛"
UV spectrometer	BioPAT® Spectro UV Spectrometer 190 – 390 nm
Flow sensor	Levitronix® LFC-iY.1 LFS-03SU ⅛"
Retentate pumps	Watson Marlow® 314

Pionic® Flow

Specification	Details
Flow kit and tubing connections	Closed processing sterile connectors
Mixing technology	3D 20 L mixing bag active bottom impeller driven
Size	⅛" | ¼"
Process pumps	Quattroflow® Pumphead QF30DM ⅛" | QF150DM ¼" HB single-use
Fluid adjustment pumps	Watson Marlow® 314
Valves	Carten® pinch valves insert ⅛" | ¼"
Pressure sensors	PendoTECH® pressure sensor ⅛" | ¼" HB
Flow sensor	Levitronix® flow sensor ⅛" | ¼" HB HB
Conductivity sensors	BioPAT® Conductivity | pH flow through ⅛" | ¼"
pH sensors	BioPAT® Conductivity | pH flow through ⅛" | ¼"
pH sensor (calibration) (w/mixing bag)	1-point reference calibration
Empty line detection	Yes
Conductivity sensor bag	BioPAT® Conductivity | pH
pH sensor bag	BioPAT® Conductivity | pH

Ordering Information

Pionic® Cross

Application	Item	Description	Units required	Article No.
Single-pass TFF	Hardware	Pionic® Cross 150	1	ETO-CROSS-SY-150
Three-step single-pass TFF	Flow kit	Pionic® Cross 30 (EMA) 3-Step UF1	1	FKTX6000030
		Pionic® Cross 30 (EMA) 3-Step DF	1	FKTX6000031
		Pionic® Cross 30 (EMA) 3-Step UF2	1	FKTX6000032
		Pionic® Cross 150 (EMA) Permeate	1	FKTX6000037
		Pionic® Cross 150 (EMA) Buffer	1	FKTX6000038
		Pionic® Cross 30 (EMA) Consumable Line	12 or 4*	FKTX6000040
One-step single-pass TFF		Pionic® Cross 30 (EMA) Single-Step	1	FKTX6000035
		Pionic® Cross 150 (EMA) Adapter Line	1	FKTX6000039

*Depending on single-step or three-step configuration.

Pionic® Flow

Application	Item	Description	Units required	Article No.
Filtration and chromatography	Hardware	Pionic® Flow 150, 3 Pumps (EMA)	1	ETO-FLOW-SY-3P-150
Filtration and chromatography ¼"	Mixing bag	Pionic® Flow (EMA) Flexsafe® Mixing 20 L	1	FMS320975
		Pionic® Flow 150 (EMA) Feed In Tank	1	FKTX6000021
Filtration and chromatography ⅜"	Mixing bag	Pionic® Flow (EMA) Flexsafe® Mixing 20 L	1	FMS320975
		Pionic® Flow 30 (EMA) Feed In Tank	1	FKTX6000020
Filtration	Flow kit	Pionic® Flow 30 (EMA) Feed Line Accu.	2	FKTX6000044
		Pionic® Flow 30 (EMA) Filtration Accu.	1	FKTX6000043
		Pionic® Flow 30 (EMA) Feed In Tank Accu.	1	FKTX6000042
		Pionic® Flow 150 (EMA) Feed Line	2	FKTX6000003
		Pionic® Flow 150 (EMA) Filtration	1	FKTX6000004
		Pionic® Flow 150 (EMA) Feed In Tank	1	FKTX6000021

Peripherals and Accessories

Application	Item	Description	Units required	Article No.
Filtration and chromatography	Clipster® disconnectors	Clipster® large packaging — XS (1 box of 200)	1*	642 XS 200 N
	Holder	Filter trolley, single	**	CROSS-SY-HLD-S
		Filter trolley, double	**	CROSS-SY-HLD-D

* Depending on disassembly method.
** Only required for Sartocon® SP cassettes. Size depends on number of single-pass TFF steps with cassettes.

Services

Pionic® Cross

Service	Details	Article No.
Pionic® Cross Installation	System installation	S877LINST
Pionic® Cross Installation Pack (incl. travel exp.)	System installation (includes travel expenses)	S877LINSTP
Pionic® Cross Qualification — SAT	Site acceptance test	S877LSAT
Pionic® Cross Qualification — SAT Pack (incl. travel exp.)	Site acceptance test (includes travel expenses)	S877LSATP
Single Maintenance	Preventive maintenance	S877LSM
Service Level Agreement | Essential	Service level agreement including preventive maintenance, help desk response within 1 business day, priority on-site support, 10% discount on labor | travel costs | spare parts	S877LSLAE
Service Level Agreement | Advanced	Service level agreement including preventive maintenance, help desk response within 8 hours, on-site support within 72 hours, labor | travel costs covered, 10% discount on spare parts	S877LSLAA
Service Level Agreement | Comprehensive	Service level agreement including preventive maintenance, help desk response within 4 hours, on-site support within 48 hours, all costs covered (labor | travel | spare parts)	S877LSLAC

Pionic® Flow

Service	Details	Article No.
Pionic® Flow Installation	System installation	S877GINST
Pionic® Flow Installation Pack (incl. travel exp.)	System installation (includes travel expenses)	S877GINSTP
Pionic® Flow Qualification — SAT	Site acceptance test	S877GSAT
Pionic® Flow Qualification — SAT Pack (incl. travel exp.)	Site acceptance test (includes travel expenses)	S877GSATP
Single Maintenance	Preventive maintenance	S877GSM
Service Level Agreement | Essential	Service level agreement including preventive maintenance, help desk response within 1 business day, priority on-site support, 10% discount on labor | travel costs | spare parts	S877GSLAE
Service Level Agreement | Advanced	Service level agreement including preventive maintenance, help desk response within 8 hours, on-site support within 72 hours, labor | travel costs covered, 10% discount on spare parts	S877GSLAA
Service Level Agreement | Comprehensive	Service level agreement including preventive maintenance, help desk response within 4 hours, on-site support within 48 hours, all costs covered (labor | travel | spare parts)	S877GSLAC

For more information, visit
sartorius.com/pionic

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