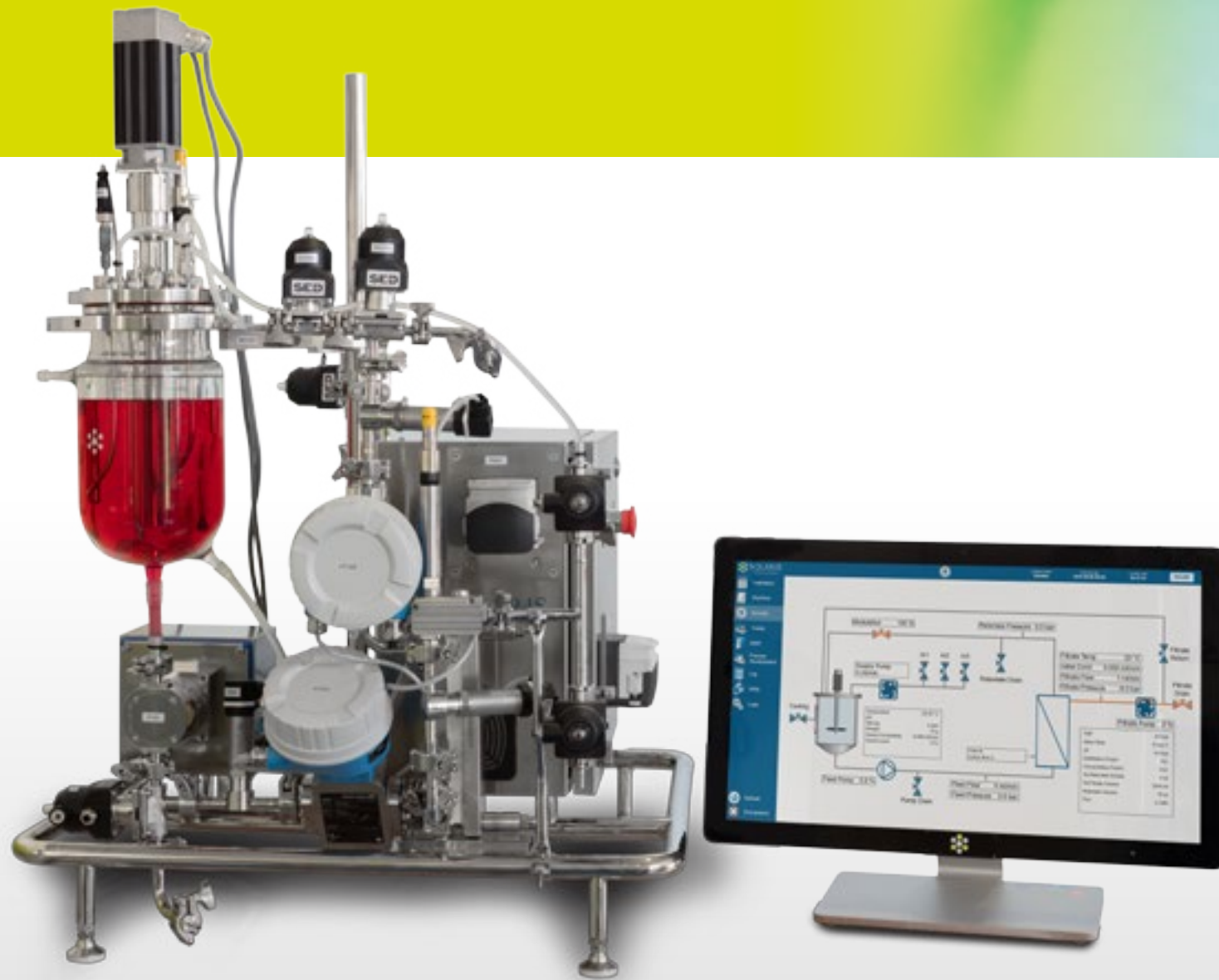




SOLARIS
BIOTECH SOLUTIONS

AUTOMATIC AND FLEXIBLE TANGENTIAL FLOW FILTRATION SYSTEM

KRONOS



KRONOS is a benchtop automatic Tangential Flow Filtration (TFF) system.

KRONOS can handle up to 0.5 m² total filtration area and is equipped with multiple modules make it so the ideal system for innovative process development as long as for automatic process sequence.

Kronos covers a wide range of applications such batch and fed batch ultrafiltration, microfiltration and diafiltration.

Typical applications includes the following:

- Basic research**
- Scale-up and scale-down studies**
- Process development and optimization**

KRONOS can be used for:

- Biopharmaceutical**
- Biofuels research and manufacturing**
- Vaccines**
- Food and beverage biotechnologies**
- Bioremediation**
- Bioplastics**
- Cosmeceutical**
- Nutraceutical**

Flexibility
the best membrane
for each separation
process

OPTIMIZING
The ratio
cost/profit

Benefits

Powerful/ Accurate **brushless motor**, from 1 to 2000 RPM. Online absorbed Torques (Nm) and Power (W) measurements obtaining an indirect density indication of the culture broth

Available in 3 different volumes:
2L, 5L, 10L.
Removable vessel

Integrated NPW test

Automatic process sequence
Filtrate flow control

Flexibility
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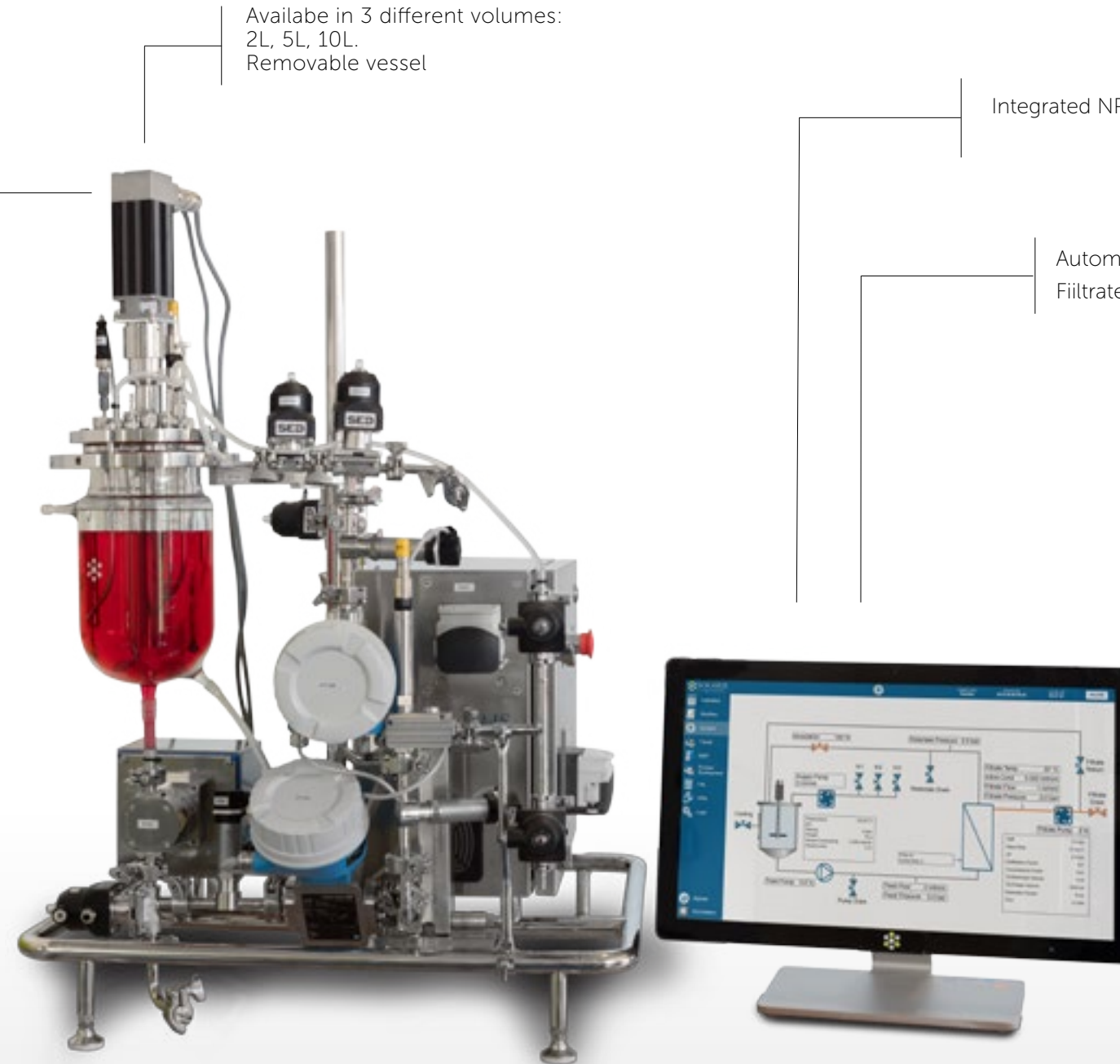
Modbus Digital Hamilton sensors

Fully removable and
cleanable jacket

Small foot print to maximize lab
space efficiency

Safety: pressure relief valve
included in each unit

Remote access via PC, tablet/smartphone
Remote control for after sale assistance



Flexibility

Kronos can be equipped with **several type of membranes** (hollow fiber, cassettes, ceramic) and is designed following the most updated criteria of cGMP.

The control cabinet includes all the functions for parameters measurement and control: intelligent sensors, wireless connection, easy load pumps, recirculation vessels and valves module conveniently located.



Solaris technicians are on tap to evaluate together with the customer the best membranes available on the market (in terms of materials, geometrical configuration and operative parameters), for:

- concentrating with the best efficiency
- avoiding the problem of the gel layer
- increasing the efficiency in Diafiltration choosing the most suitable membrane.

Flexibility
the best membrane
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Modbus Hamilton sensors

Why a digital sensor?

Hamilton sensors has been integrated into Solaris PCS and Leonardo software giving the user the benefit of having a unique platform.

Fully compensated digital sensors, store and transmit all relevant sensor data, including calibration and diagnostic information.

Parameter	Unit	Value	Min	Max	Alarm	Filter	Unit
pH	0.0 °C	100%	---	---	---	---	---
pH	0.0 °C	100%	---	---	---	---	---
pH	0.0 °C	100%	---	---	---	---	---
pH	0.0 °C	100%	---	---	---	---	---
pH	0.0 °C	100%	---	---	---	---	---



Sensor life traceability

Reducing background noise

Data sheet

Kronos 0.5			
Total Volume (liters)	2,00	5,00	10,00
Hold up volume	70 ml		
Pump output	4-180 l/h		
Max. operating pressure	4 bar (g)		
Membranes available	Cassettes, Hollow fiber, Ceramic		
Vessel Data			
Design	Borosilicate Glass Vessel with conical bottom		
Materials	Vessel: Borosilicate Glass Lid: AISI 316L		
Drive	Brushless Motor Direct Assembly		
RPM	1-2600 RPM, Accuracy 1RPM		
Impeller	Marine impeller		
Weight	Load cell		

PCS and Software

PCS	S.S Cabinet AISI 304
HMI	23" Touch screen
Software	SCADA Solaris Software Control Galileo
Data Extraction	Through USB port or Ethernet
Graph trends, On line displaying and Printing	
On line parameter calibration	
Alarms Management	
Event recording	
Multipasspasswords level	
Integrated NPW test	

Options

Transfer module

Supply pump	Peristaltic pump. For diafiltration and large volume ultrafiltration.
Triple inlet valve	Automated valves for highly automated filtration process

Permeate module

Filtrate pressure flow control pump Included flow meter	Prevent membrane fouling in microfiltration
pH measurement	Inline pH sensor
Conductivity measurement	Inline conductivity sensor

Vessel upgrade options

pH measurement	
Weight measurement through load cell	
Conductivity measurement	
Temperature measurement	
Level control via Sensor	Extra safety during manual operation

Holder option

Hollow fiber holder	For single hollow fiber cartridge
Manifold for 3 hollow fiber cartridges	
Cassette holder	From various manufacturers

Chiller

- Optionally KRONOS can be equipped with a chiller for heat removal from your culture minimizing lab water usage
- Using this system you don't need a water supply line in your lab
- Cost-effective cooling of fermenters
- Easy operation
- Refrigerant level monitoring



Chiller data sheet

Working temperature range	-10°C / +40°C
Temperature stability	±0.5
Power consumption	0.7 kW
Filling volume range	2-8 L
Cooling output at 20°C measured with ethanol	0.25-0.60 kW
Cooling output at 10°C measured with ethanol	0.20-0.50 kW
Cooling output at 0°C measured with ethanol	0.15-0.36 kW
Cooling output at -10°C measured with ethanol	0.09-0.15 kW
Pump pressure max.	0.35-1.30 bar
Pump flow max.	16-35 L/min.
Dimensions (WxDxH)	200x350x465 mm



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