Genesis

STANDARD STERILIZABLE IN PLACE SOLUTIONS

SOLARIS
BIOTECH SOLUTIONS

GENESIS

The **GENESIS** series offers a transitional system for scaling from benchtop to SIP systems.
Available in sizes from 7.5 to 20 L total volume, Genesis is meant to offer a SIP platform, on the benchtop space. Sterilization can be achieved via steam or alternatively by electric heaters.

GENESIS is an ideal partner for microbial fermentation as well as animal, plant and insect cell cultivation.
Typical applications includes the following:
Education
Basic research
Scale-up and scale-down studies
Process development and optimization

GENESIS can be used for:
Biopharmaceutical
Biofuels research and manufacturing
Vaccines
Food and beverage biotechnologies
Bioremediation
Bioplastics
Cosmeceutical
Nutraceutical

GMP
GOOD MANUFACTURING PRACTICE

WHY TO INVEST IN THIS PRODUCT

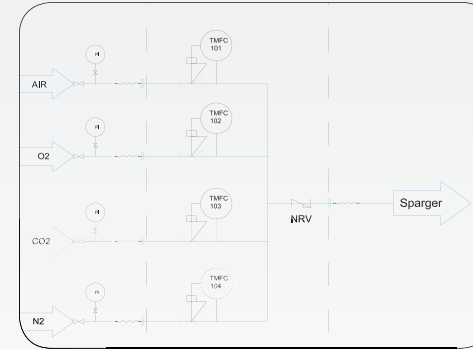The best ratio **Quality/Capability/Price** on the market

Automatic sterilization through electrical heaters (no need for an external steam source) or by steam
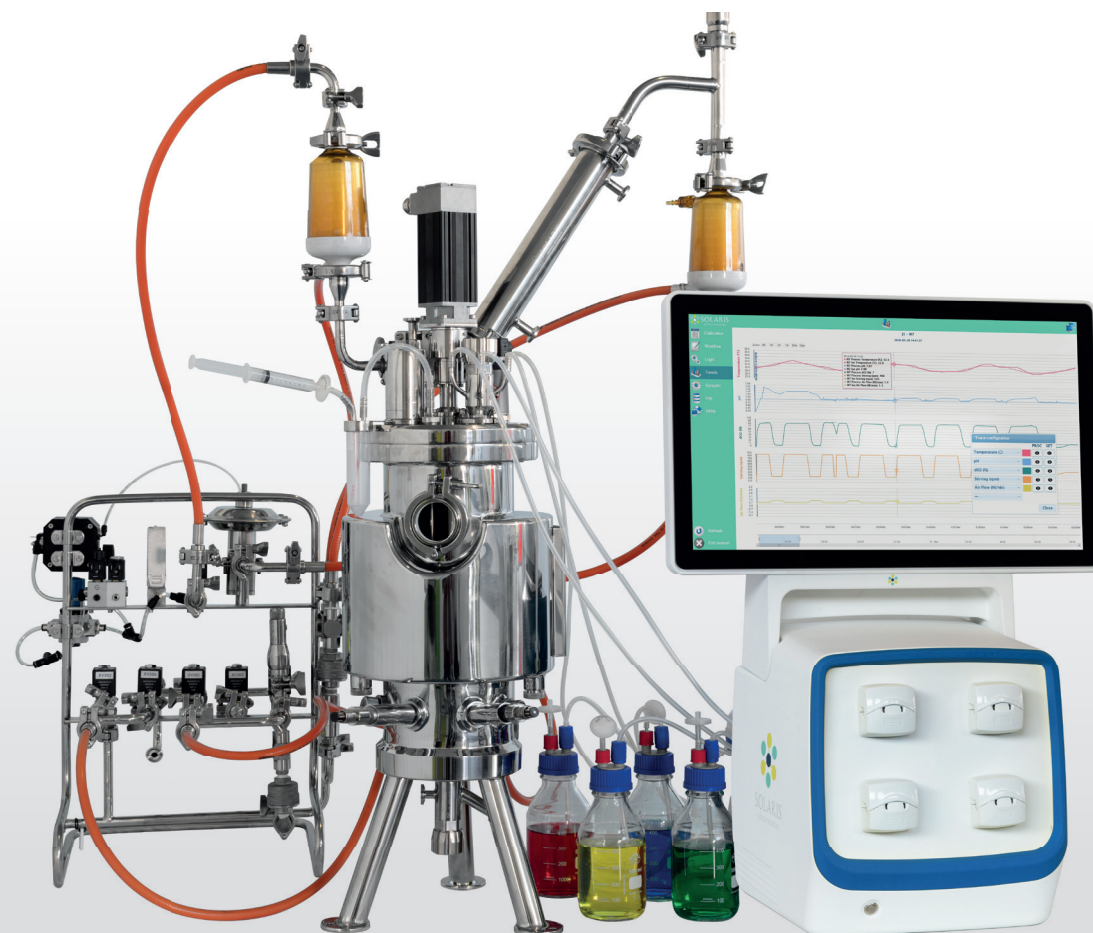
Benefits

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.

Sampling system

Illuminated side glass

Modbus Digital sensors

Different gas mixing strategies with up to 5 TMFC

External additional boxes parameters for future PCS upgrade including dCO_2, Cell Density, Weight, Peristaltic pumps, ect
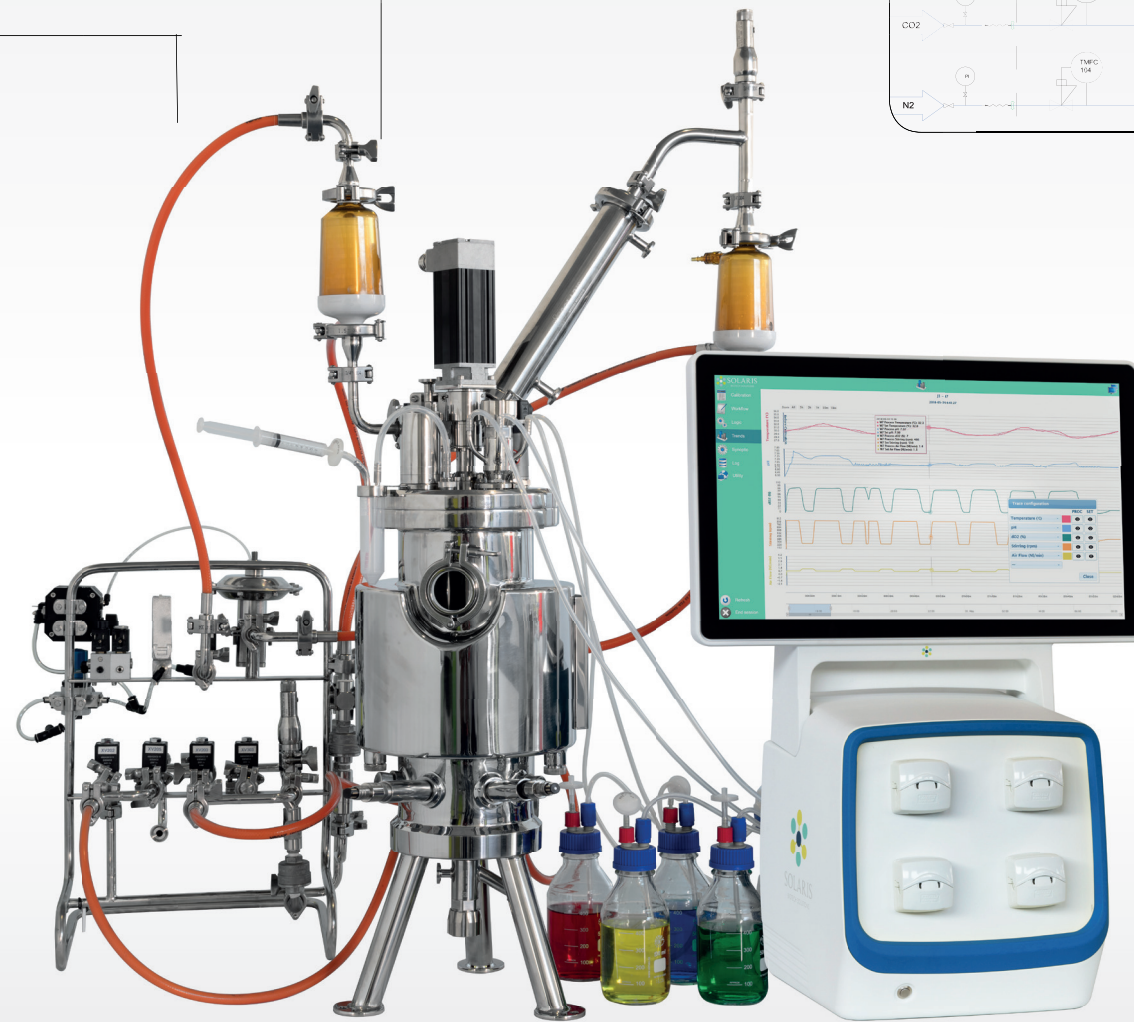
Compact and modular PCS

Double jacket (side-bottom)
Increased heat transfer efficiency
It ensures optimal temperature control and sterilization even at minimum volumes

N.4 assignable Watson Marlow pumps in entry level

Harvest valve in entry level optionally SIP

Automatic sterilization by steam or alternatively through electrical heaters
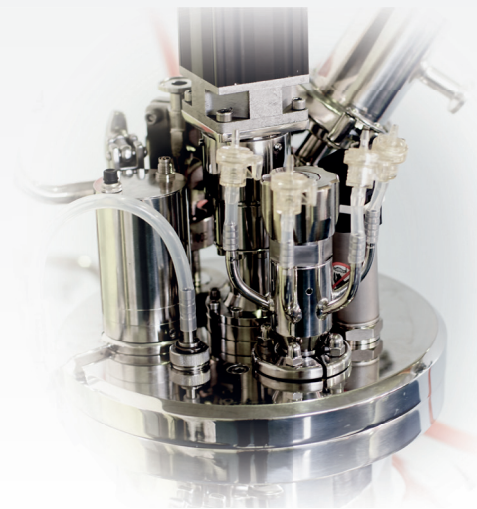
SALAS – Solaris Sterile Needle Free Additions System

Leonardo 3.0

NEEDLE FREE

Genesis is supplied with SALAS, a 4 channel, needle free additions system for inoculums, feedings, pH corrective solutions, antifoam, etc.

SALAS allows an easy and quick connection between the feeding solution and the vessel top lid.

EASY & QUICK OPERATION

USER-FRIENDLY SOFTWARE

Solaris controlling software offers a simply laid out, yet powerful platform for experimental design planning and process control.
The graphical user interface enables the intuitive selection and adjustment of control functions.
Extracted data is compatible with Window Excel but, in addition, Solaris offers a platform where fermentation data can be easily exported in real time and thus managed. This software is included in the supply and can be installed on an unlimited numer of the client's PC or laptops.
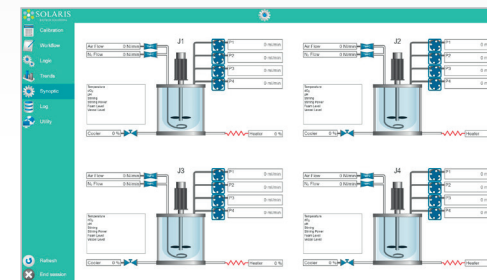
Do it parallel: smarter..faster

Leonardo allows intuitive and time-saving parallel operations. Up to 24 indipendent fermentations/cultivations can be carried out simultaneously.

Why a digital sensor?

Digital sensors (including Cell Density products) have been integrated to the Solaris PCS and Leonardo controlling software, giving the user many benefits over traditional analog sensor outputs. Such benefits include a robust communication protocol not susceptible to signal loss, in-software sensor diagnostic information, parallel calibration/batch calibrations and more.

Sensor life traceability

Reducing background noise

Gas mixing

Hardware and software adaptability are key to enable the best aeration strategy for each process. Thermal mass flow controllers (TMFC) allow precise flow rate control of individual gasses. Up to 5 TMFC's can be configured within each PCS cube and integrated to the controlling software. The powerful software and control platform allows precise cascade adjustment of multiple parameters to manage gas transfer, OTR, kLa, etc.

- n.1 TMFC included in "entry" level system; additional available as optional
- Various agitator and baffle designs available or numbers of TMFC

- Automatic gas mixing algorithms
- Toro, sintered and other spargers available

Data sheet

Vessel

Solaris Code	Genesis 7.5	Genesis 10.0	Genesis 15.0	Genesis 20.0
Total Volume (liters)	7.5	10.0	15.0	20.0
Ratio D/H	1:2,5	1:2,5	1:2,5	1:2,5
Min. Working Volume (liters)	1.3	1.8	2.7	3.6
Max. Working Volume (liters)	5.6	7.5	11.25	15
Working temperature range	0-135°C			
Working pressure range	2 bar			
Design	Stainless Steel Jacketed Vessel			
Materials	Parts in contact with the culture AISI 316 L - other parts AISI 304			
Finishing	All parts in contact with the culture: Ra < 0,5 μm ; External: Ra < 0,6 μm Mirror polished			

Ports and Connections

	Connection	Description
Vessel lid	PG13	Antifoam
	TC 3/4"	Safety valve
	TC 3/4"	Gas-out
	TK 3/4"	SALAS-Solaris Sterile liquid addition
	TC 1"	Pressure probe
	DN 52	Stirrer
	TC 1/2"	Overlay gas inlet
Upper side wall	TC 1/2"	Sparger
	In gold	Sight glass
	In gold	Sight glass
Lower side wall	Hygenic socket	pH probe
	Hygenic socket	dO probe
	Hygenic socket	spare probe
	Hygenic socket	spare probe
	Temperature housing	PT100
Vessel bottom	TC 3/4"	Harvest/sampling valve
Jacket in-out	TC 1/2"	Steam in
	TC 1/2"	Water in
	TC 1/2"	Jacket out
	1/2" G	Electric heaters
	1/2" G	Electric heaters
	1/2" G	Electric heaters

Stirring

Drive	Brushless Motor, Direct Assembly, 1-1500 rpm (bacterial), 1-500 (cell cultures)
Power	208W (7.5-10L) ; 622W (15-20L)
Impellers	Select from: Rushtons impellers , Marine Impellers, Pitched blade

Thermoregulation

Control	PID Control - Accuracy 0,1 °C
	Jacket steam and electric heaters / cooling source

Gas Control & Gas Mixing

Sparger and overlay Gas Control	TMFC
Gas Mixing (Air,CO$_2$,O$_2$,N$_2$)	n.1 TMFC + n.4 solenoid valves, n° of TMFC
Sparger type	Select from: Toro type (ring), syntered microbubbling both provided with 0,2 μm filter
Exhaust	Condenser and 0,2 μm filter

Controller

Master Control Module	From 1 to 24 units - 35x37xh36 cm
HMI with Leonardo software	Operate interface 58x15xh48 cm with 24" monitor

Controls

Temperature

Sensor	PT100
Control system	Measuring resident in Leonardo 3.0 software
Control range	0 - 150°C

pH

Sensor	Digital sensor
Control system	Measuring resident in Leonardo 3.0 software
Control range	0 - 14
Operation temperature	0 - 130°C
Pressure range	0 - 6 bar
Actuator	Cascade to peristaltic pumps for the addition of acid/base solutions or gas (CO$_2$)

dO$_2$

Sensor	Digital Optical sensor
Control system	Measuring resident in Leonardo 3.0 software
Control range	0,05 - 300% air saturation
Operation temperature	-10 - 130°C
Pressure range	0 - 12 bar
Actuator	Cascade to RPM, Gas Control, feedings,ect

Antifoam/Level

Sensor	Solaris sensor
Control	Measuring resident in Leonardo 3.0 software

Redox (ORP)

Sensor	Digital sensor
Control system	Measuring resident in Leonardo 3.0 software
Control range	±2000 mV
Operation temperature	- 10 -130°C
Pressure range	≤ 6 bar

Conductivity

Sensor	Digital sensor
Control system	Measuring resident in Leonardo 3.0 software
Control range	1 - 3000 μS/cm
Operation temperature	0 -130°C
Pressure range	0 - 20 bar

dCO$_2$

Sensor	Analog sensor
Control system	Measuring resident in Leonardo 3.0 software
Control range	0,00-200% saturation
Operation temperature	-20.0-150°C
Pressure range	0 - 4 bar

Cell density

Sensor	Digital sensor
Control system	Measuring resident in Leonardo 3.0 software
Pressure range	0-3 bar (option 1) 0-10 bar (option 2)
Operation temperature	0-60°C (option 1) 0-80°C (option 2) (max. sterilization temperature 135°C)
Option 1	Dencytee: Total cell density based on turbidity (Two ranges: 10^5 to 10^8 mammalian cells/ml - 0.5 to 100 g/L dry weight)
Option 2	Incyte: Viable cell density based on capacitance (Two ranges: 5x10^5 to 8x10^8 mammalian cells/ml - 5 to 200 g/L dry weight)

Weight

Sensor	Digital Balance
Control	Measuring resident in Leonardo 3.0 software

Peristaltic pumps

|	
WM 114	10-60 rpm
WM 313 FDM/D	45-350 rpm

Chiller

- Optionally GENESIS 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

- Refregerant 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.
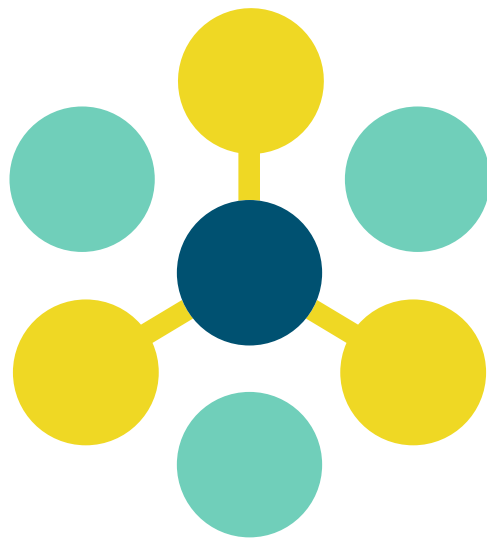
SOLARIS

BIOTECH SOLUTIONS

SOLARIS BIOTECHNOLOGY srl

Via Bachelet, 58 - 46047 Porto Mantovano
Mantova - Italy
Phone: +39 0376 408760
Fax: +39 0376 385108
Email: info@solarisbiotech.com

www.solarisbiotech.com