



Genesis

STANDARD
STERILIZABLE IN PLACE
SOLUTION



SOLARIS
BIOTECH SOLUTIONS

STANDARD STERILIZABLE IN PLACE SOLUTIONS

GENESIS

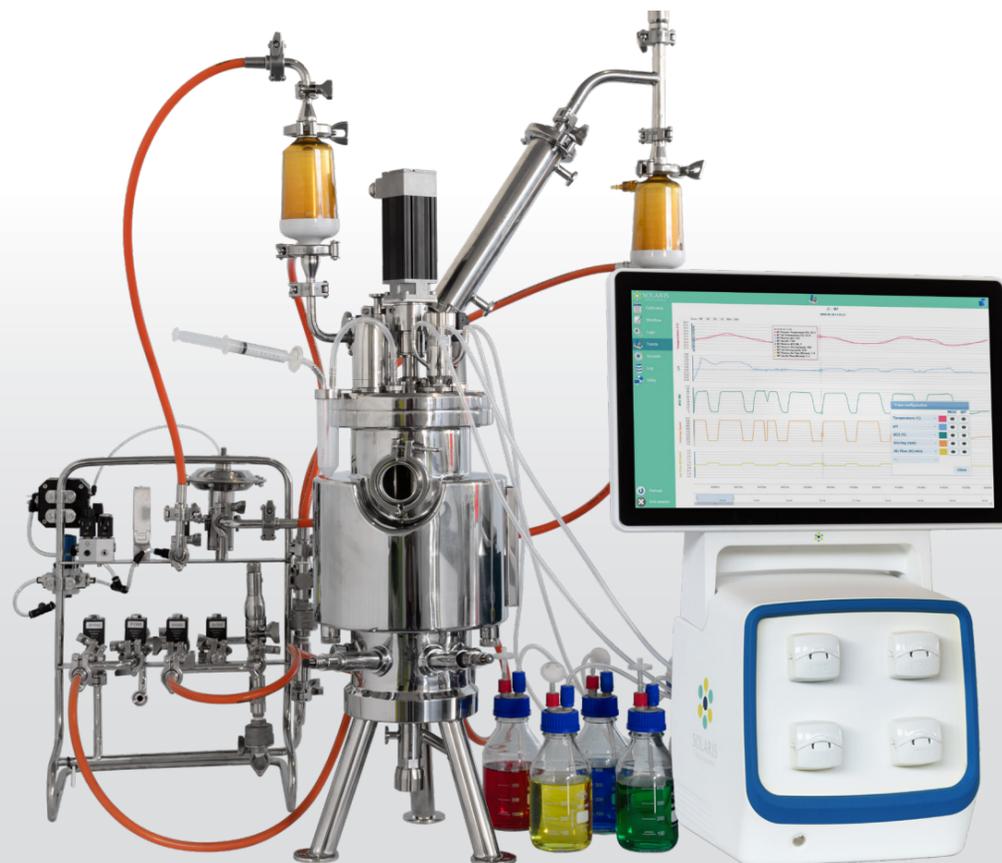
The **GENESIS** series offers a transitional system for scaling from benchtop to SIP systems. Available in sizes from 7.5 to 20 L total volume, Genesis is meant to offer a SIP platform, on the benchtop space. Sterilization can be achieved via steam or alternatively by electric heaters.

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



**WHY TO
INVEST
IN THIS PRODUCT**

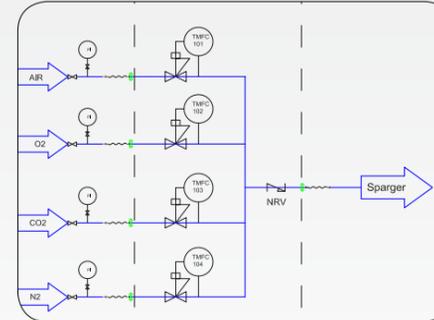
The best ratio
**Quality/
Capability/Price**
on the market

**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.

Different gas mixing strategies with
up to 5 TMFC



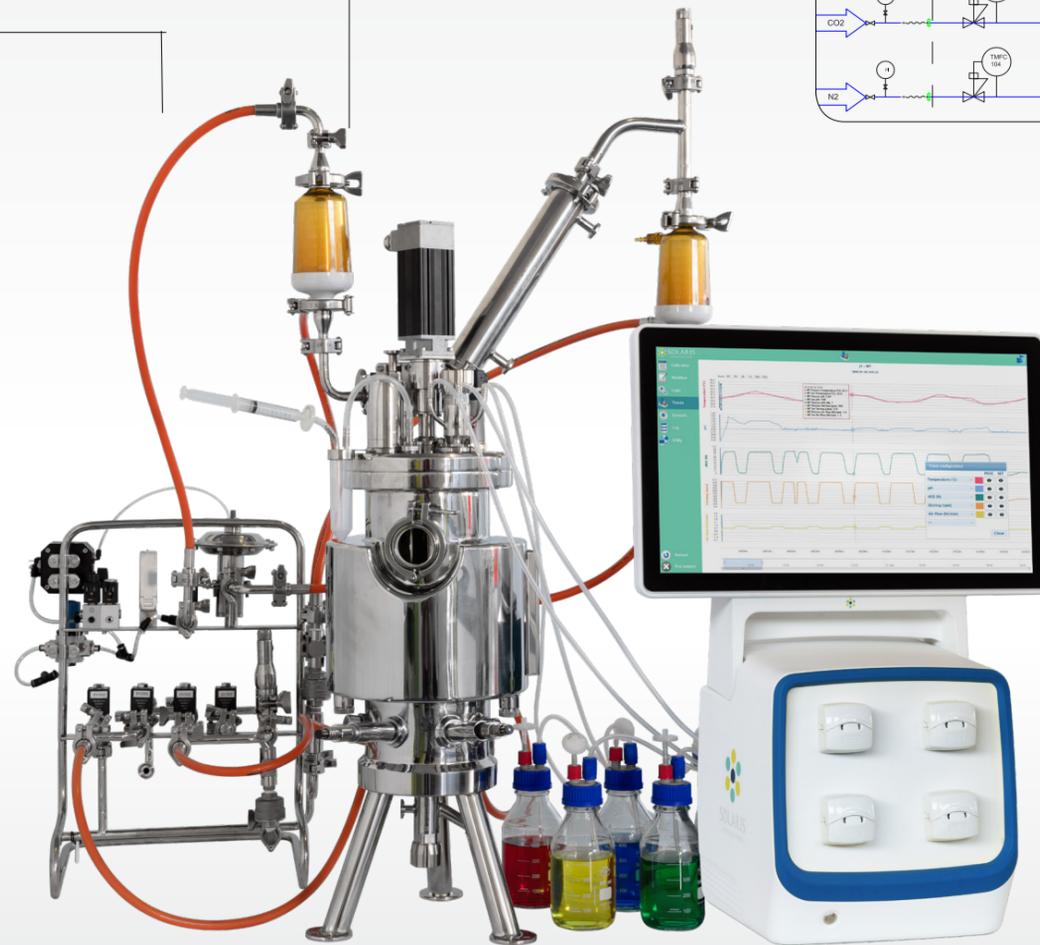
External additional boxes parameters for
future PCS upgrade including dCO₂, Cell
Density, Weight, Peristaltic pumps, ect

Sampling system



Illuminated side glass

Modbus Digital
sensors



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

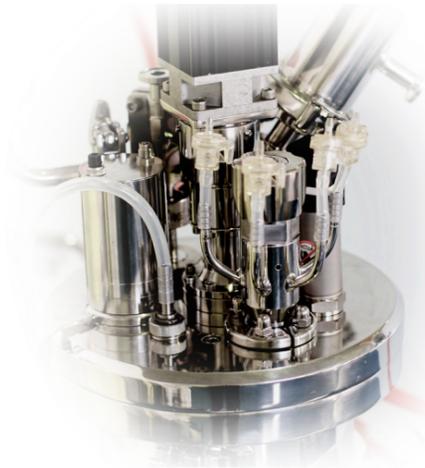
SALAS - Solaris Sterile Needle Free Additions System

**NEEDLE
FREE**

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

**EASY & QUICK
OPERATION**

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



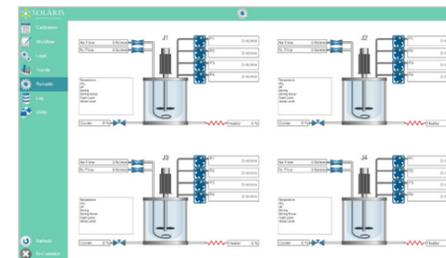
Leonardo 3.0

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 number of the client's PC or laptops.



Do it parallel: smarter..faster

Leonardo allows intuitive and time-saving parallel operations. Up to 24 independent 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
- Automatic gas mixing algorithms
- Various agitator and baffle designs available or numbers of TMFC
- 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		
Upper side wall	DN 52	Stirrer		
	TC 1/2"	Overlay gas inlet		
	TC 1/2"	Sparger		
Lower side wall	In gold	Sight glass		
	In gold	Sight glass		
	Hygenic socket	pH probe		
	Hygenic socket	dO probe		
	Hygenic socket	spare probe		
Vessel bottom	Hygenic socket	spare probe		
	Temperature housing	PT100		
	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), synered microbubbling both provided with 0,2 µm filter			
Exhaust	Condenser and 0,2 µm filter			
Controller				
Master Control Module	From 1 to 24 units - 35x37x36 cm			
HMI with Leonardo software	Operate interface 58x15x48 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 ⁴ 5 to 10 ⁴ 8 mammalian cells/ml - 0.5 to 100 g/L dry weight)
Option 2	Incyte: Viable cell density based on capacitance (Two ranges: 5x10 ⁴ 5 to 8x10 ⁴ 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

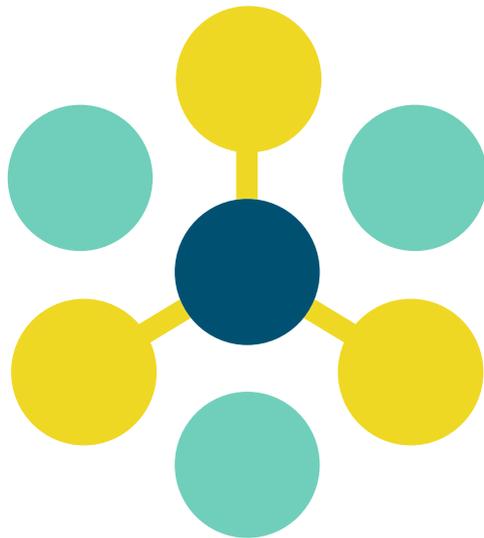
Chiller

- 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
- 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.



SOLARIS

BIOTECH SOLUTIONS

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