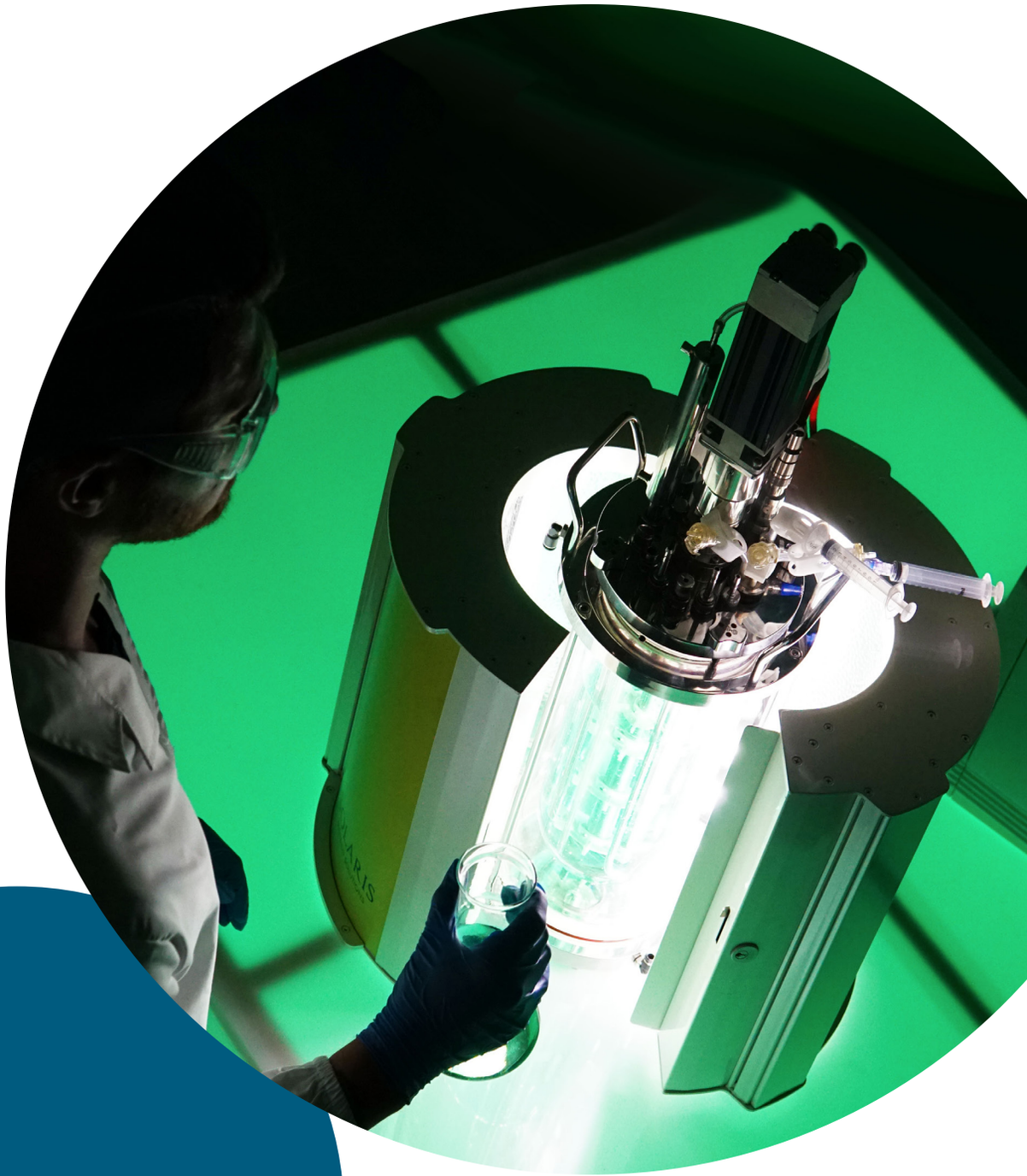


Elara St

PHOTOBIOREACTORS

SOLARIS
BIOTECH SOLUTIONS

STIRRED AUTOCLAVABLE PHOTOBIOREACTORS

ELARA ST

ELARA ST photobioreactor series is ideal for phototrophic organisms such as moss, microalgae, bacteria and plant cells. The light spectrum and intensity is adjustable 0-100% up to 3000 µmol(photon)/m2.

ELARA st typical applications includes the following:
Education & Basic research
Scale-up and scale-down studies
Process development and optimization

ELARA St can be used for:
Algae
Phototrophic bacteria
Plant cells

INNOVATIVE SOLUTION
to improve your microalgae culture

WHY TO INVEST
IN THIS PRODUCT

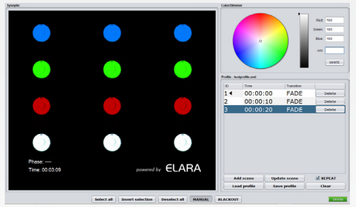
High power **LED lighting,** spectrum selectable and dimmable 0-100%

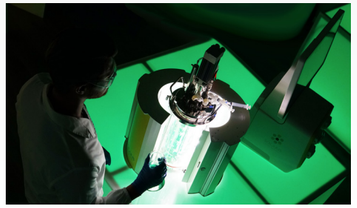
FLEXIBILITY
The **fully removable** light module allows to use Elara as a traditional fermenter

STIRRED AUTOCLAVABLE PHOTOBIOREACTORS

ELARA ST

Benefits





Up to 24 units managed with one HMI with innovative PARALLEL process control LEONARDO: smart controller designed to provide an high level of automated management of the fermentation processes Batch, Fed batch or continous processes

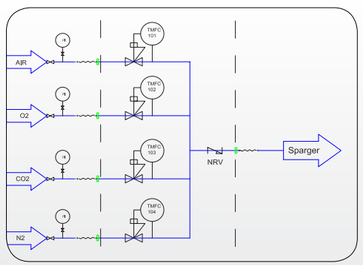
Automatic and manual control of RBW light intensity and circadian cycle simulation

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.

Modbus Digital Hamilton sensors

LEDA safe sterile sampling system
The needle free connector is designed to reduce the risk of contamination during sampling.
The sterile combination of a syringe (3-5-10-30 ml) and a non return valve guarantees the sterility after sampling until the next use.

Different gas mixing strategies with up to 5 TMFC



Safety: pressure relief valve included in each unit.

Compact and modular PCS

24" touch HMI.

N.4 assignable Watson Marlow pumps in entry level

Additional External modular box:
OD, dCO2, weight, thermobox, peristaltic pumps

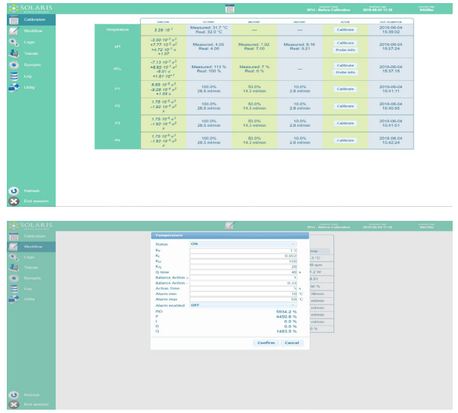
Remote control via PC, tablet and smartphone for process management and after sale assistance

Fully removable and cleanable jacket

Modbus Hamilton sensors

Why a digital sensor?

Hamilton sensors (including Cell Density products) have been digitally 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.

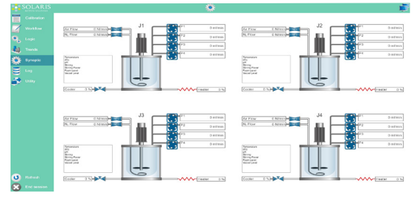
- n.1 TMFC included in "entry" level system; additional available as optional.
- Various agitator and baffle designs available
- Automatic gas mixing algorithms
- Toro, sintered and other spargers available

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.

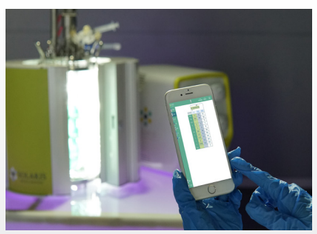
Do it parallel: smarter..faster

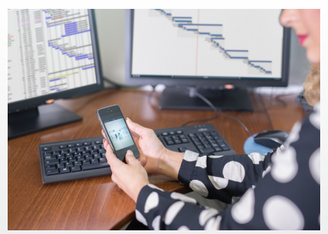
Leonardo allows intuitive and time-saving parallel operations. Up to 24 indipendent fermentations/cultivations can be carried out simultaneously.



Do it wireless!

Increase mobility: users have the option to access the platform remotely via PC, tablet, phone. Remote access is multi-level password protected.





STIRRED AUTOCLAVABLE PHOTOBIOREACTORS

ELARA ST

Data sheet

Vessel	
Photobioreactor type	**Stirred**
Total Volume (liters)	4,00
Ratio D/H	1:3,0
Min. Working Volume (liters)	0,60
Max. Working Volume (liters)	3,00
Max. temperature	135 °C
Operating pressure	< 0,5 bar
Ports	n.1 port, Gas Sparger Input n.1 port, Gas overlay n.1 port, Gas Out n.1 port, Harvesting system n. 1 port, Sampling system n.1 port, Temperature Sensor n.1 port, multi addition (4) needle free connectors n.5 ports, spares probes n.1 port, single addition needle free connector n.1 port, Agitation Group
Design	Borosilicate Glass Jacketed Vessel
Materials	Borosilicate Glass and AISI 316 L

Sensors lenght (mm)	
pH	325
dO_2	325

Dimensions for autoclave (with Condenser)	
Height (mm)	655
Diameter (mm)	225

Stirring	
Drive	Brushless Motor, Direct Assembly , 1-2000 rpm (bacterial), 1-500 (cell cultures)
Power (P_N)	266 W
Impellers	Select from: Rushtons impellers, Marine Impellers, Pitched blade

Thermoregulation	
Control	PID Control - Accuracy 0,1 °C
	Thermobox (flat) / water jacketed with electric heaters (stirred vessel)

Gas Control & Gas Mixing	
Sparger and overlay Gas Control	TMFC
Gas Mixing (Air,CO_2,O_2,N_2)	n.1 TMFC + n. solenoid valves or n° of TMFC
Aeration system	Toro ring or sintered (microbubbling) sparger with 0,2 µm filter
Exhaust	Condenser and 0,2 µm filter

Peristaltic Pumps	
Peristaltic pumps	4 Watson Marlow 114, fixed speed or speed controlled, application assignable from software
Variable speed	10 - 60 rpm

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

Controls

INTEGRATED IN S CUBE

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

pH	
Sensor	Digital Hamilton 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 Hamilton 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 Hamilton sensor
Control system	Measuring resident in Leonardo 3.0 software
Control range	±2000 mV
Operation temperature	- 10 -130°C

EXTERNAL MODULAR BOX

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

dCO_2	
Sensor	Mettler Toledo 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

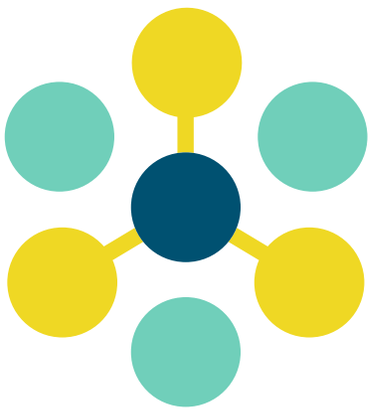
Weight	
Sensor	load cells
Control	Measuring resident in Leonardo 3.0 software

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

Chiller

- Optionally ELARA 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



SOLARIS

BIOTECH SOLUTIONS

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