ELARA
PHOTOBIOREACTORS

SOLARIS
BIOTECH SOLUTIONS

PHOTOBIOREACTORS

ELARA

INNOVATIVE SOLUTION TO IMPROVE YOUR MICROALGAE CULTURE

ELARA Flat photobioreactors is ideal for phototrophic organisms as moss, microalgae, bacteria and plant cells under optimum conditions. The light intensity is dimmable from 0-100% up to 3000 µmol(photon)/m² .Luminostat mode via radiation sensor.

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

Homogeneous **Light distribution**

WHY TO INVEST IN THIS PRODUCT

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

Higly resistant to salty water
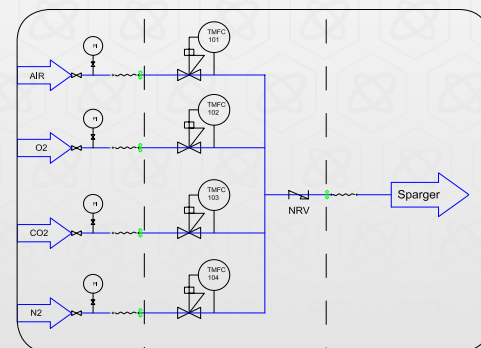
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ELARAFLAT

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/cultivation processes
Batch, Fed batch or continous processes

Assymetric shape to prevent foam formation

Homogeneous light distribution
Automatic and manual control of light intensity and circadian cycle simulation

LEDA safe sterile sampling system

Modbus Digital Hamilton sensors

23" (single unit) or
27" (multi system) **multi touch HMI**.

Safety: pressure releaf valve included in each unit.

Compact and modular PCS (350x350x350 mm)

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

Airlift mixing process Different gas mixing strategies with up to 5 TMFC

N.4 assignable Watson Marlow pumps, all speed controlled in entry level

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

Parts in contact with the culture made in borosilicate glass and Super duplex SAF 2507 highly resistant to salty water

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Modbus Hamilton sensors

Why a digital sensor?

Hamilton sensors (including Cell Density) 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 directly to Solaris Leonardo software.

Sensor life traceability

Reducing background noise

pH

The electrolyte of the EasyFerm Bio sensors is prepressurized to prevent the diffusion of sample into the sensor. The Everef-F reference cartridge ensures that the reference electrolyte remains free of silver and precipitation of proteins.

dO2

The VisiFerm DO is the first optical oxygen sensor with integrated opto-electronics. The visiFerm requires less maintenance than a classical oxygen sensor as it does not have a mechanically sensitive membrane or a corrosive electrolyte.

ORP

The ORP sensor through a pre-pressurized reference electrolyte has a clog-free diaphragm. The sensor ensures a stable measurement signals after steam sterilization, autoclavation and CIP cleanings qith almost drift-free measurement.

Conductivity

All wetted conductivity sensor parts are FDA approved, can be cleaned easily and withstand CIP cleanings and autoclavations. The sensor shows a very good linearity over a broad measuring range.
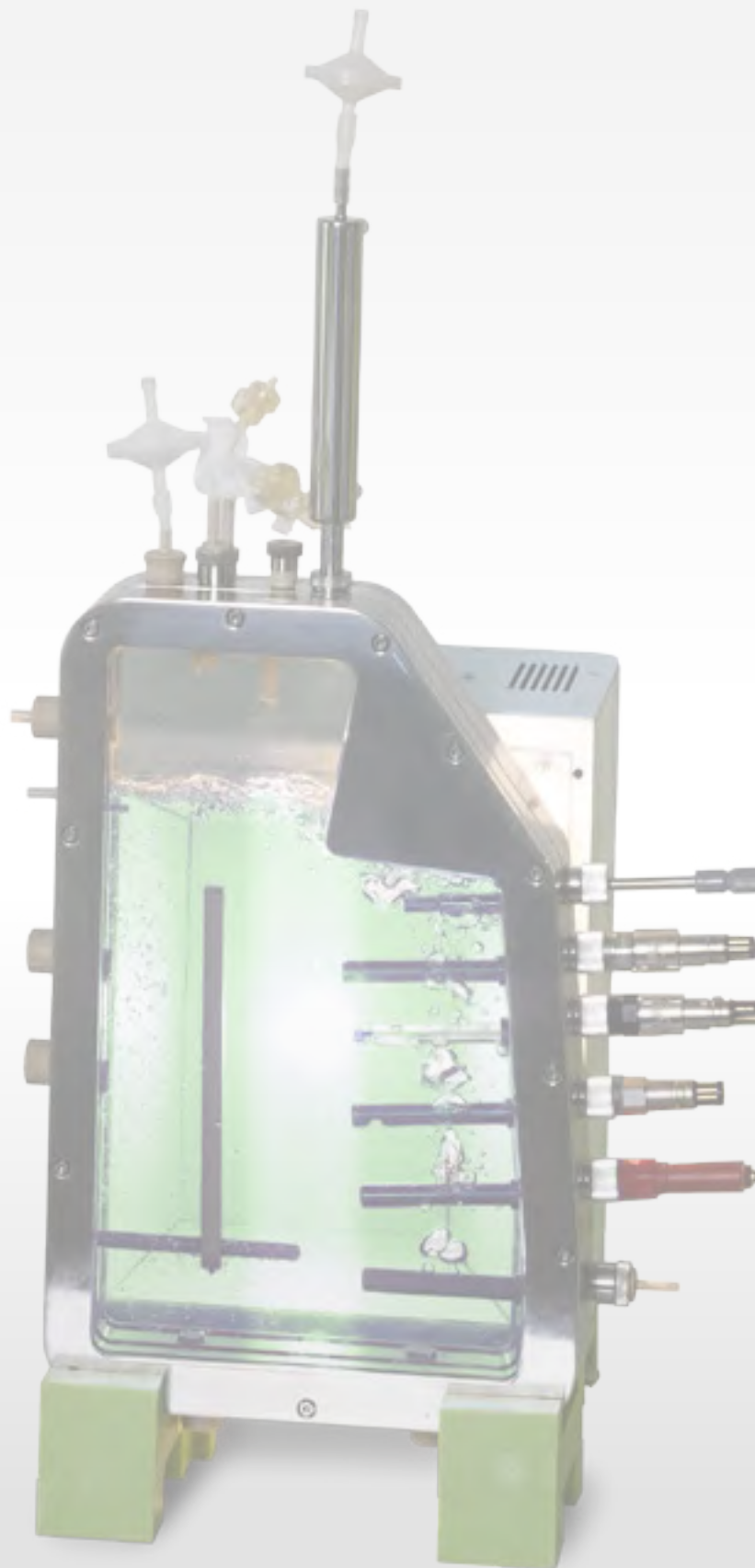
GAS MIXING

Various controller and hardware configurations enable aeration strategies using air, oxygen, nitrogen or a mixture of these to enrich the air. The mass-flow controller allows the exact flow rate control of individual gases. The flexible aeration options integrated in the fermenter/bioreactor permit a wide range of different application giving to this system a substantial versatility.

- **Thermal Mass Flow Controller in entry model**
- **Gas mixing through TMFC and solenoid valves or numbers of TMFC**
- **Automatic gas mixing algorithms**

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USER-FRIENDLY SOFTWARE

The software is the user's best friend in experimental design planning and performing trial runs, as well as analyzing and optimizing media and parameters for cultivation.

The graphical user interface enables you to select the software functions intuitively. Data extracted are compatible with Windows Excel. However, Solaris has developed Leonardo data viewer, a platform where to easily and quickly manage fermentation data. The software is included in the fermenter supply and can be installed on unlimited number of client's PC or laptop.

HOMOGENEOUS LIGHT DISTRIBUTION

The flat design with the minimum thickness allows an homogenueous light distribution even at high viscosity.
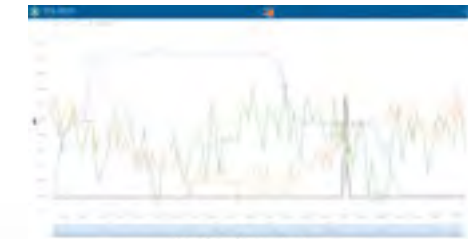
Do it parallel: smarter..faster

Leonardo can be used for process development (i.e. time-saving · parallel fermentation approaches)
Up to 24 indipendent fermentations/cultivations can be carried out simultaneously.can be carried out simultaneously.
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AIRLIFT

Gentle mix performed through the air lift prevents the demages at the cell membrane ensuring an efficient homogenization.

ASYMMETRICAL SHAPE

Facing the foam formation problem the asymmetrical shape is your best ally.

Parallel synoptic

Parallel trends comparison between units, current and old batches

Do it wireless!

Increased mobility: users can roam around lab or reaching office or home without losing their connection with the running batch

MATERIAL

Parts in contact with the culture made in borosilicate glass and Super duplex SAF 2507 give high resistant to salty water.

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ELARA FLAT

Data sheet

Controls

Chiller

Vessel

Photobioreactor type	Flat
Total Volume (liters)	1,60
Ratio D/H	1:2,4
Min. Working Volume (liters)	1,30
Max. Working Volume (liters)	1,40
Max. temperature	50 °C
Operating pressure	< 0,5 bar
Ports	n.1 port, Gas out Condenser n.1 port, Antifoam probe n.1 port, multi addition (3) needle free connectors n.1 port, single addition needle free connector n.4 port, Hygienic Socket Solaris, Spare probes n.1 port, temp. housing, PT100 n.2 ports, Sampling system n.1 port, Gas Sparger Input n.1 port, Baffle n.3 ports, Spares (1bottom,2short) n.1 port, Harvest valve
Design	Borosilicate Glass Jacketed Vessel with AISI316 and Super Duplex
Materials	Borosilicate Glass, AISI316 and Super Duplex

Sensors lenght (mm)

pH	225

Dimensions for autoclave (with Condenser)

Height (mm)	660
Diameter (mm)	280

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	Micro holes Type 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 - Dimensions Height: 350 mm Largeness: 350 mm Depth: 350 mm
HMI with Leonardo software	23'' for single unit , 27'' for multi system parallel

INTEGRATED IN S CUBE

Temperature

Sensor	PT100
Control system	Measuring resident in Leonardo 2.0 software

pH

Sensor	Digital Hamilton sensor
Control system	Measuring resident in Leonardo 2.0 software
Control range	0 - 14
Operation temperature	0 - 130°C

dO_2

Sensor	Digital Optical Hamilton sensor
Control system	Measuring resident in Leonardo 2.0 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 2.0 software

Redox (ORP)

Sensor	Digital Hamilton sensor
Control system	Measuring resident in Leonardo 2.0 software
Control range	±2000 mV
Operation temperature	- 10 -130°C
Pressure range	≤ 6 bar

Conductivity

Sensor	Digital Hamilton sensor
Control system	Measuring resident in Leonardo 2.0 software
Control range	1 - 3000 μS/cm
Operation temperature	0 -130°C
Pressure range	0 - 20 bar

EXTERNAL MODULAR BOX

dCO_2

Sensor	Mettler Toledo sensor
Control system	Measuring resident in Leonardo 2.0 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 2.0 software

Peristaltic pumps

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

- 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
Cooling output at -10°C measured with ethanol	0.09-0.15 kW

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