



SOLARIS™ BIOTECH

By Donaldson



IO CATALOGUE





IO

single & parallel fermenter bioreactor

IO is a fully electrical mini fermenter/bioreactor with a fast and accurate thermoregulation system (without water circulation).

“Having the opportunity to extract real time process data with the lowest step time of 1 second remotely offers to our customer a powerful monitoring tool.”

APPLICATIONS

Our products are utilized across various sectors including **pharmaceuticals, food production, agriculture, biomanufacturing, bioplastics, biofuels, cosmeceuticals**, catering to both research and development and lab production needs

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Our Product IO

This catalogue describes Solaris IO.
For supervisory control and data acquisition
Leonardo software is included.



THE SYSTEM

The system consists of a benchtop, pre-assembled fermenter/bioreactor, supplied with all necessary tubes, valves and instruments, automation, control panel (HMI).

THE DESIGN

The system is designed for aerobic and anaerobic cultivations/fermentations, closed aseptic operations. The control is based on a SCADA control system.

Customizable Configuration

IO is completely electrical.

The thermoregulation (both heating and cooling) is performed through a Peltier Cell, placed on the bottom of the fermenter/bioreactor.

This avoids water circulation (no water source is needed in the lab).

Multiple operations: up to 24 parallel units.



BASIC
RESEARCH



EDUCATION



PROCESS
DEVELOPMENT &
OPTIMIZATION



SCALE UP &
SCALE-DOWN
STUDIES



SMALL
PRODUCTION



Fully electric:
no water circulation.

Up to 24 units managed with one
HMI with innovative PARALLEL
process control.

Single-wall borosilicate glass
vessel, with thermoregulation
performed through a Peltier Cell.

Different configurations available
for microbial and cell culture
applications, with the choice of
Rushton/Marine/Pitched-Blade
impellers and fluted/L-shaped
sparger.

Modbus digital sensors reduce
background noise and guarantee
quick response time.

Suitable for batch, fed-batch and
continuous processes.



Product Description



Different gas mixing strategies
with up to 5 TMFC.

Powerful and accurate (1 RPM)
brushless motor.

Wide range of measurement and
control options.

Optional integration of up to 4
analog input/output connections,
choosing between 0-10 V and 0-20
mA/4-20 mA (e.g. pumps or valves
with power supply independent
from Solaris electrical cabinet).

Extremely compact system
maximizes lab space.

Additional parameter in modular
external boxes for future PCS
upgrade Including dCO₂, cell
density, weight, peristaltic pumps.

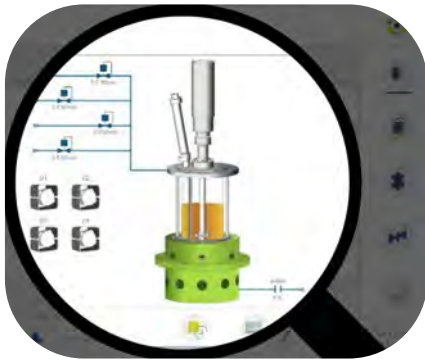
Leonardo Software



The innovative SCADA software Leonardo has a smart and user-friendly controller designed to provide a high level of automated management of the fermentation/cultivation processes.

Full version included with the equipment. Up to 24 units managed in parallel with a unique HMI (24"). Data extraction in .csv format.

Remote control and access via PC, tablet or smartphone, with QR code scanning or via dedicated portal.



SYNOPTIC

- Real time 3D view
- Parallel control
- Manual control



LOGIC PARSER

- Customized logic functions
- Parallel logic blocks and functions



REMOTE CONTROL

- Unlimited number of profiles editor
- Unlimited number of devices to be associated



TRENDS

- Custom acquisition time
- Up to 6 values simultaneously display
- Automatic graph comparison



WORKFLOW

- Custom phase manager
- Parallel visualization
- Cascade settings
- Peristaltic pumps function assignable from software



CALIBRATION

- Up to three-point calibration
- Simultaneous calibration values for parallel work

Technical Data

VESSEL

Solaris Code	IO 200	IO 1000
Total volume (mL)	200	1000
Ratio H/D	1.5/1	2.5/1
Min working volume (mL)	70	360
Max working volume (mL)	150	700
Max temperature	56 °C	
Operating pressure	< 0.5 bar(g)	
Headplate ports	3 ports PG13.5 (sensors, condenser, multi feed, or plugs) 2 ports M11 (sparger, harvest, LEDA, or plugs) 3 ports M12 (anti-foam probe, single feed/overlay, gas out, or plugs)	5 ports PG13.5 (sensors, condenser, adjustable level, multi feed or plugs) 5 M12 (sparger, harvest, gas out, LEDA, antifoam probe, fixed level probe, single feed/overlay or plugs)
Materials	Borosilicate Glass and AISI 316L	

SENSORS LENGTH (mm)

Length	120	225
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DIMENSIONS FOR AUTOCLAVE (with Condenser)

Height (mm)	320	420
Diameter (mm)	170	170

STIRRINGS

Drive and speed (rpm)	Brushless Motor, 1 - 2000 rpm	
Impellers	Select from: Rushton, Marine, Pitched blade	

THERMOREGULATION

Control	PID Control - Accuracy 0.1 °C - Peltier cell	
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GAS CONTROL & GAS MIXING

Sparger and overlay gas control	TMFC
Gas mixing (Air, CO ₂ , O ₂ , N ₂)	1 TMFC (included in entry level) + up to 4 additional TMFC
Sparger type	Select from: Flute type or L-shaped
Gas out	0.2 µm filter

PERISTALTIC PUMPS

Quantity & type	2 Watson Marlow type 400 F/A 2 Watson Marlow type 114 FD/DV
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CONTROLLER

Master control module (w x d x h)	From 1 to 24 units - 35 cm x 35 cm x 35 cm
HMI with Leonardo software	Touch screen PC, 24" color monitor

pH

Sensor	Digital sensor
Sensitivity	57 to 59 mV/pH
Control system	Measuring resident in Leonardo software
Control range	0 - 14
Operating temperature	Up to 130 °C
Pressure range	0 - 6 bar(g)
Actuator	Cascade to peristaltic pumps for the addition of acid/base solutions or gas (CO ₂)

dO₂

Sensor	Digital Optical sensor
Accuracy	1 ± 0.05 %-vol, 21 ± 0.2 %-vol, 50 ± 0.5% -vol
Control system	Measuring resident in Leonardo software
Control range	0 - 300 % air saturation
Operating temperature	Up to 130 °C
Pressure range	0 - 12 bar(g)
Actuator	Cascade to RPM, gas control, feedings

REDOX (ORP)

Sensor	Digital sensor
Control system	Measuring resident in Leonardo software
Control range	± 1500 mV
Operating temperature	Up to 130 °C
Pressure range	0 - 6 bar(g)

TECHNICAL DATA

ANTIFOAM/LEVEL

Sensor	Conductivity based
Control	Measuring resident in Leonardo software

CONDUCTIVITY

Sensor	Digital sensor
Accuracy	$\pm 3\%$ at 1 $\mu\text{S}/\text{cm}$ to 100 mS/cm , $\pm 5\%$ at 100 to 300 mS/cm
Control system	Measuring resident in Leonardo software
Control range	1 - 300 000 $\mu\text{S}/\text{cm}$
Operating temperature	Up to 130 °C
Pressure range	0 - 20 bar(g)

dCO₂

Sensor	Digital sensor
Accuracy	$\pm (10\% \text{ of the reading} + 10 \text{ mbar})$
Control system	Measuring resident in Leonardo software
Control range	0 - 200 % saturation
Operating temperature	Up to 130 °C
Pressure range	0 - 4 bar(g)

CELL DENSITY

Sensor	Digital sensor
Control system	Measuring resident in Leonardo software
Operating temperature	Up to 140 °C
Pressure range	Up to 10 bar(g) (150 psi)
TCD measuring range	0 - 4 AU
VCD measuring range	0.0 to 400 pF/cm

WEIGHT

Sensor	Digital balance
Accuracy	$\pm 0.01 \text{ g}$ (3.6 kg), $\pm 0.1 \text{ g}$ (36.0 kg)
Control system	Measuring resident in Leonardo software

PERISTALTIC PUMPS

WM 120 U Brushless	1 - 100 rpm
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Get in touch



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OUR OFFICES SHOWROOMS





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