



# Jupiter

SINGLE & PARALLEL  
FERMENTERS/  
BIOREACTORS



SOLARIS  
BIOTECH SOLUTIONS

# SINGLE & PARALLEL FERMENTERS/BIOREACTORS

## JUPITER

The **JUPITER** platform offers multiple autoclavable vessel sizes and designs from 2 up to 10 L total volume. Various aspect ratios are also available.

Additionally, the **JUPITER** platform offers the capability of pressure control in the 2 and 4 L volumes.

The system is highly configurable, built with high quality components, and offered at a competitive price with no strings attached.



**JUPITER** typical applications includes the following:

- Education & Basic research
- Scale-up and scale-down studies
- Process development and optimization

**JUPITER** can be used for:

- Biopharmaceutical
- Biofuels
- Food industry
- Bioremediation
- Bioplastic
- Cosmeceutical
- Nutraceutical



# SINGLE & PARALLEL FERMENTERS/BIOREACTORS

JUPITER

## Benefits

**Jupiter 2.0 & 4.0:**  
**Pressure controlled up to 1.6 bar**  
 Easier scaling up  
 Higher oxygen transfer

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

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 sensors

LEDA safe sterile sampling system (only for atmospheric pressure vessels)

Safety: pressure relief valve included in each unit

Compact and modular PCS

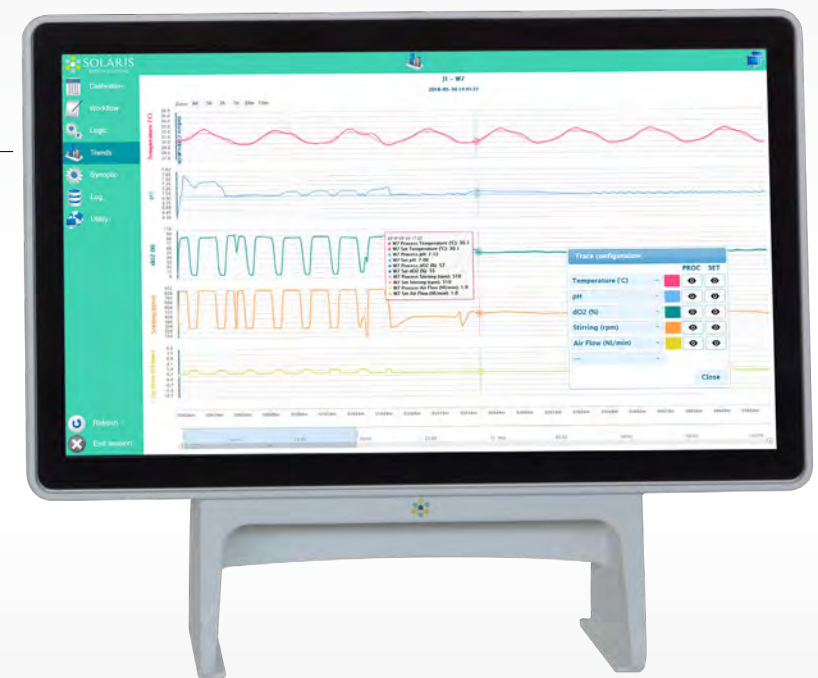
Additional parameter in modular external boxes for future PCS upgrade including dCO<sub>2</sub>, cell density, weight, peristaltic pumps, ect



N.4 assignable Watson Marlow pumps in entry level

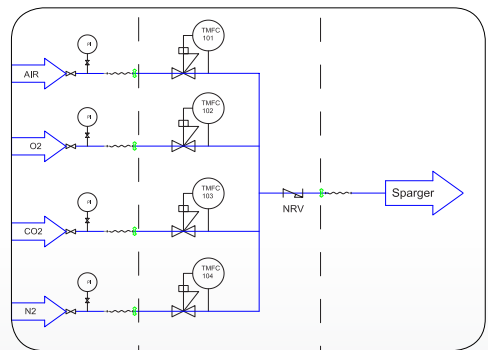
Wide range of options, 5 different volumes and 2 different ratio H/D

Fully removable and cleanable glass jacket for an improved heat transfer during autoclaving



24" touch HMI

Different gas mixing strategies with up to 5 TMFC



Remote access via PC, tablet/smartphone  
 Remote control for after sale assistance

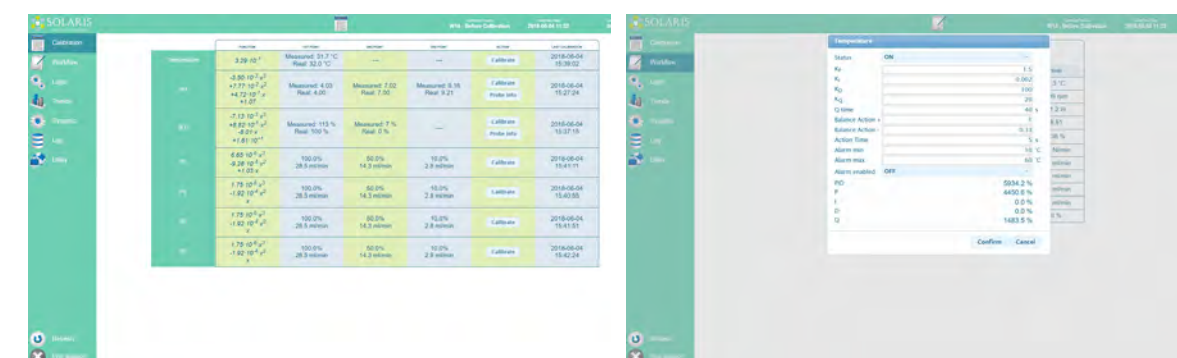




## Modbus Digital sensors

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

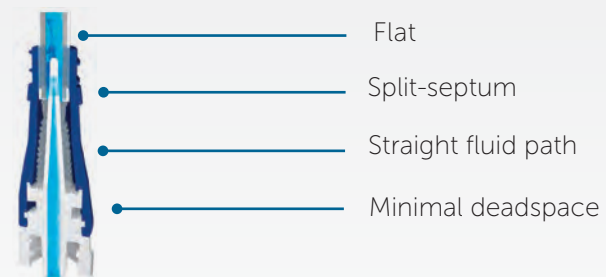


## LEDA sterile sampling system

ONLY FOR ATMOSPHERIC PRESSURE VESSELS

### Technical specifications

|                 |  |
|-----------------|--|
| Material        | VALOX resin (external) silicone (internal) |
| Autoclavable    | 121-133°C (up to 30 minutes)               |
| Residual volume | 0.04 mL                                    |
| Flow rate       | 165 mL/minute                              |



- Sterile single use sampling system up to 180 sterile sampling per batch.
- Needlefree 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

## Smart PCS



Solaris new modular product design strategy decreases time to market and the number of unique parts in the product architecture, increasing the number of product variants. The result is a lean, flexible and smart PCS, which can be stacked in case of parallel processes through a dedicated support.

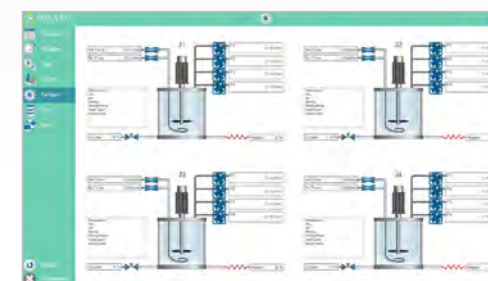


Additional parameters in modular external boxes for future PCS upgrade including dCO<sub>2</sub>, Cell Density, Weight, Peristaltic pumps, ect.

## 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.



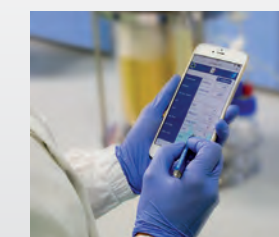
Parallel synoptic.

### Do it parallel: smarter..faster

Leonardo allows intuitive and time-saving parallel operations. Up to 24 independent 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.



## Data sheet

| Vessel  |  |             |             |             |              |
|---|--|-------------|-------------|-------------|--------------|
| Solaris Code  | Jupiter 2.0  | Jupiter 4.0 | Jupiter 6.5 | Jupiter 8.0 | Jupiter 10.0 |
| Production Code   | jpt110300  | jpt130395   | jpt160395   | jpt160480   | jpt180480    |
| Total Volume (L)  | 2,00   | 4,00        | 6,50        | 8,00        | 10,00        |
| Ratio D/H   | 1:3,0  | 1:3,0       | 1:2,5       | 1:3,0       | 1:3,0        |
| Min. Working Volume (L)   | 0,35   | 0,60        | 1,10        | 1,10        | 1,60         |
| Max. Working Volume (L)   | 1,40   | 2,80        | 4,50        | 5,50        | 7,0          |
| Max. temperature  | 70°C   |             |             |             |              |
| Operating pressure  | < 0,5 bar<br>Jupiter 2.0 and 4.0: optionally < 1.6 bar   |             |             |             |              |
| Headplate Ports (n.10 in Jupiter 2.0; n.13 in the others)         | 10: n. 1 Agitation Group, n.1 Gas Sparger, n.1 Gas Overlay, n.1 Gas Out/Condenser, n.1 Sampling/Harvesting, n.1 Temperature, n.1 Multifeed. n.2 Sensors DN12, n.1 Spare.<br>13: n.1 Agitation Group, n.1 Gas Sparger, n.1 Gas Overlay, n.1 Gas Out/Condenser, n.1 Sampling/Harvesting, n.1 Sterile Sampling System, n.1 Temperature, n.1 Multifeed, n.2 Sensors DN12, n.3 Spare. |             |             |             |              |
| Design  | Borosilicate Glass Jacketed Vessel   |             |             |             |              |
| Materials   | Borosilicate Glass and AISI 316 L  |             |             |             |              |
| Sensors length (mm)   |  |             |             |             |              |
| pH  | 325  | 425         | 425         | 425         | 425          |
| dO <sub>2</sub>   | 325  | 425         | 425         | 425         | 425          |
| Dimensions for autoclave (with Condenser)                         |  |             |             |             |              |
| Height (mm)   | 610  | 705         | 705         | 790         | 790          |
| Diameter (mm)   | 275  | 285         | 315         | 315         | 335          |
| Stirring  |  |             |             |             |              |
| Drive   | Brushless Motor  |             |             |             |              |
| Speed (rpm)   | 1-1900   | 1-1800      | 1-1700      | 1-1700      | 1-1700       |
| Nominal Torque (Nm)   | 0,9  | 0,9         | 0,9         | 1,1         | 1,1          |
| Impellers   | Select from: Rushtons impellers, Marine Impellers, Pitched blade   |             |             |             |              |
| Thermoregulation  |  |             |             |             |              |
| Control   | PID Control - Accuracy 0,1 °C - Jacketed with n. 2 Electric Cartridge Heaters and cooling valve  |             |             |             |              |
| Total Heater Power (W)  | 400  | 600         | 700         | 700         | 700          |
| Gas Control & Gas Mixing  |  |             |             |             |              |
| Sparger and overlay Gas Control                                   | TMFC   |             |             |             |              |
| Gas Mixing (Air,CO <sub>2</sub> ,O <sub>2</sub> ,N <sub>2</sub> ) | n.1 TMFC (included in entry level) + n.4 solenoid valves or + n. of additional TMFC (up to n.4)  |             |             |             |              |
| Sparger type  | Select from: Toro type (ring), sintered microbubbling - both provided with 0,22 µm sintered filter   |             |             |             |              |
| Gas Out   | n. 1 Condenser + 0,22 µm sinterized filter   |             |             |             |              |
| Peristaltic Pumps   |  |             |             |             |              |
|   | n.4 Watson Marlow type 114, fixed speed, max. 60 rpm, volumetric flow 0,5-51 ml/min, function assignable from software   |             |             |             |              |
|   | (optional) Watson Marlow type 313 FDM/D, max. speed 350 rpm, volumetric flow 1,5-1750 ml/min, function assignable from software  |             |             |             |              |
| Controller  |  |             |             |             |              |
| Master Control Module   | From 1 to 24 units - 35x37xh36 cm  |             |             |             |              |
| HMI with Leonardo software  | Operate interface 58x15xh48 cm with 24" monitor  |             |             |             |              |

## Controls

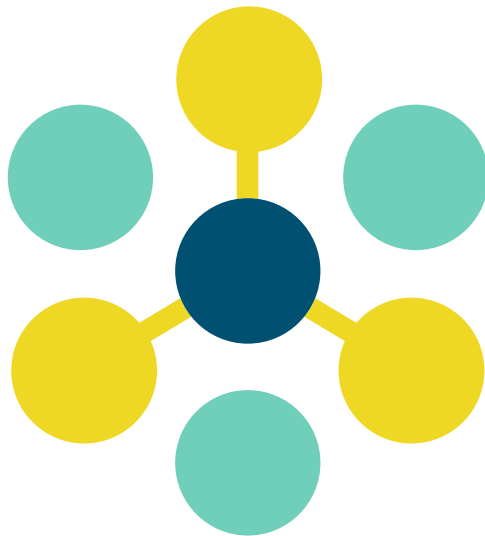
| INTEGRATED IN THE PCS | Temperature  |   |
|-----------------------|--|---|
|                       | Sensor   | PT100   |
|                       | Accuracy   | 0,1 °C  |
|                       | Control system   | Measuring resident in Leonardo 3.0 software   |
|                       | Control range  | 0 - 70°C  |
|                       | pH   |   |
|                       | Sensor   | Digital sensor  |
|                       | Sensitivity  | 57 to 59 mV/pH  |
|                       | Control system   | Measuring resident in Leonardo 3.0 software   |
|                       | Control range  | 0 - 14  |
| Operation temperature | 0 - 130°C  |   |
| Pressure range        | 0 - 6 bar  |   |
| INTEGRATED IN THE PCS | dO <sub>2</sub>  |   |
|                       | Sensor   | Digital Optical sensor  |
|                       | Accuracy   | ±0.05%-vol, 21±0.2%-vol, 50±0.5%-vol  |
|                       | 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  |
|                       | Antifoam/Level   |   |
|                       | Sensor   | Solaris sensor  |
|                       | Control  | Measuring resident in Leonardo 3.0 software   |
| INTEGRATED IN THE PCS | Redox (ORP)  |   |
|                       | Sensor   | Digital sensor  |
|                       | Sensitivity  | 57 to 59 mV/pH  |
|                       | 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  |
|                       | Accuracy   | ±3%   |
| 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   |   |
| EXTERNAL MODULAR BOX  | dCO <sub>2</sub>   |   |
|                       | Sensor   | Analog sensor   |
|                       | Accuracy   | ±10% (pCO <sub>2</sub> 10-900 mbar) ≥ ±10%(pCO <sub>2</sub> > 900 mbar))                      |
|                       | Control system   | Measuring resident in Leonardo 3.0 software   |
|                       | Control range  | 0,00-200% saturation  |
|                       | Operation temperature  | -20.0-150°C   |
|                       | Cell density   |   |
|                       | Sensor   | Digital sensor  |
|                       | Accuracy   | Mammalian cells in suspension ±5·10 <sup>4</sup> cells/ml - Fermentation ±0.05 g/l dry weight |
|                       | 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 <sup>4</sup> to 10 <sup>8</sup> mammalian cells/ml - 0.5 to 100 g/L dry weight)    |   |
| Option 2              | Incyte: Viable cell density based on capacitance (Two ranges: 5x10 <sup>4</sup> to 8x10 <sup>8</sup> mammalian cells/ml - 5 to 200 g/L dry weight) |   |
| EXTERNAL MODULAR BOX  | Weight   |   |
|                       | Sensor   | Digital balance   |
|                       | Accuracy   | ±0.2 g  |
|                       | Control  | Measuring resident in Leonardo 3.0 software   |
|                       | Peristaltic pumps  |   |
|                       | WM 114   | 10-60 rpm   |

## Chiller

- Optionally JUPITER 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

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