



BlackJar & BlackBox

SINGLE USE
FERMENTERS/
BIOREACTORS



SOLARIS
BIOTECH SOLUTIONS

SINGLE USE FERMENTERS/BIOREACTORS

BLACKJAR & BLACKBOX

BlackJar vessels: configurable and customizable pre-sterilized single use ridged wall bioreactors and fermenters.

BlackBox - Solaris single use PCS, parallel process control platform.

The BlackBox PCS offers a versatile and powerful platform for single use systems. There are multiple configurations available for various process sensor outputs, thermoregulation and agitator connectivity, etc. BlackJar offers standard and customizable fermentation and cell culture configurations. BlackBox and BlackJar are compatible with any SU platform, but offer the most versatility in conjunction with each other.



Benefits

- Eliminate cross contamination risk
- Drastically shorten turnaround time between runs
- Integration of Hamilton digital communication as optional
- Flexible PCS I/O design for many vessel sensor configurations



SINGLE USE FERMENTERS/BIOREACTORS

BLACK JAR

BlackJar vessel series

BlackJar vessels are customizable, pre-sterilized, single-use, ridged wall bioreactor/fermenter vessels available in a range of sizes from 50 ml to 30 L.

Materials

Polycarbonate and Nylon materials

Sterilization and Validation

SU components are sterilized via high precision E-beam irradiated in dual polyester foil bags.
Media contact materials are ISO10993, USP class VI.



Benefits

- Single Use bioreactor and fermenter vessels available in 500 ml, 3.2 L, 5.7 L, 30 L, and other total volumes.
- Option to fully customize head plate configuration, impellers, spargers, thermoregulation system, sensors, etc.
- Standard SU bioreactor (SUB) and SU fermenter (SUF) configurations available.
- Many PG 13.5 head plate ports.
- Optional customer preferred dO2 and pH single use sensors integrated and pre-sterilized.
- Single use optical dO2 solution available.
- Long silicon tubing for head plate inlets and outlets.
- Adaptation to any agitator motor.
- Head plate drive or magnetic bottom drive agitator options available.
- Adaptation to any thermoregulation system, electric or liquid jacket.
- Utilization of the best polycarbonate materials pre-sterilized via e-beam radiation.



SINGLE USE FERMENTERS/BIOREACTORS

BLACKBOX

BlackBox

Unique Process Control System (PCS) for single use

BlackBox is a highly adaptable single use Process Control System (PCS) with a flexible In/out design.

The **BlackBox** PCS offers a versatile and powerful platform for single use systems. There are multiple configurations available for various process sensor outputs, thermoregulation and agitator connectivity.

BlackBox is compatible with any SU vessels on the market like BioBLU®, UniVessel®, CellReady®, etc., but most flexible in conjunction with BlackJar.



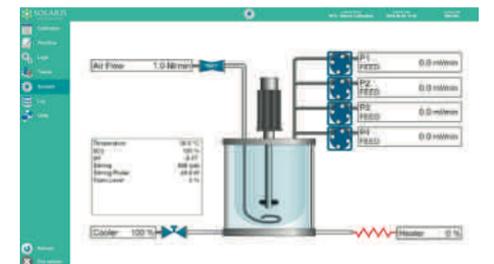
Leonardo 3.0

USER-FRIENDLY SOFTWARE

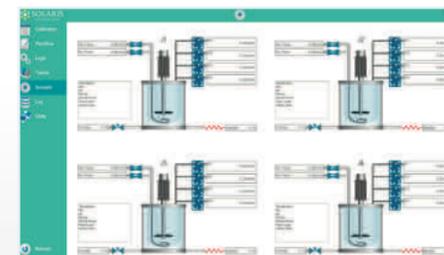
Solaris controlling software offers a simply laid out, yet powerful platform for experimental design planning and process control. The graphical user interface enables the intuitive selection and adjustment of control functions. Extracted data is compatible with Window Excel but, in addition, Solaris 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.



Workflow page



Synoptic page top agitation



Parallel synoptic

Do it parallel: smarter..faster

Leonardo allows intuitive and time-saving parallel operation. Up to 24 independent fermentation/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.

SINGLE USE FERMENTERS/BIOREACTORS

BlackBox Data sheet

DEFAULT SET UP	PCS	
	Cabinet	S Cube -Black Satin Stainless Steel h 350mm; l 350mm, d 350mm
	Stirring	
	Drive	Brushless Motor, 0-500 rpm for cultivation or 0-2.000rpm for fermentation (top direct or MST coupling)
		Magnetic stirred table (MST)
	Aeration	
	Gas control	n.1 TMFC
	Gas mixing (AIR, N2, CO2, O2)	numbers of TMFC (up to 5, sparger/overlay)
	Off-gas filter heater	
	Numbers of TMFC (up to 5)	
	Off-gas filter heater	
	Thermoregulation	
	Temperature sensor Pt100 (length depending from SUB/SUF size)	
	PID Control for Heating and Cooling, Accuracy: 0.1°	
	Heating blanket	
Re-Usable-Jacket with electrical heaters		
Sensors Inputs		
Input for Hamilton VisiFerm dO ARC 220 mm digital sensor (no sensor included)		
Input for Polarographic/Amperometric analogue dO probe (BNC and K8 connectors; no sensor included)		
Input for analogue electrolyte-based pH (BNC and K8 connectors; no sensor included)		
Input for digital electrolyte-based pH (no sensor included)		
Input for level sensor (no sensor included)		
Input for foam control (no sensor included)		
Pumps		
N.4 Watson Marlow peristaltic pumps, fixed speed		
External additional peristaltic pumps		
Weight		
Input for Weight measurement		
Digital balance 0,1 gr. accuracy		
Communication		
n.4 Analog Input 0-10V and 0-20 mA/4-20 mA and n.4 Analog Output 0-10V and 0-20 mA/4-20 mA		
PC & Software		
HMI	From 1 to 24 units - 35x37xh36 cm- HMI with 24" monitor	
Software	SCADA Solaris Software Control Leonardo 3.0	
Solaris Logic Parser Software		
Solaris Fermentation Manager		
Data Extraction	Through USB port or Ethernet/Wi-Fi	
Graphs Trends, On line displaying and Printing		
On line Parameters Calibration		
Alarms Management		
Events Recording		
Multipasswords Levels		

Controls

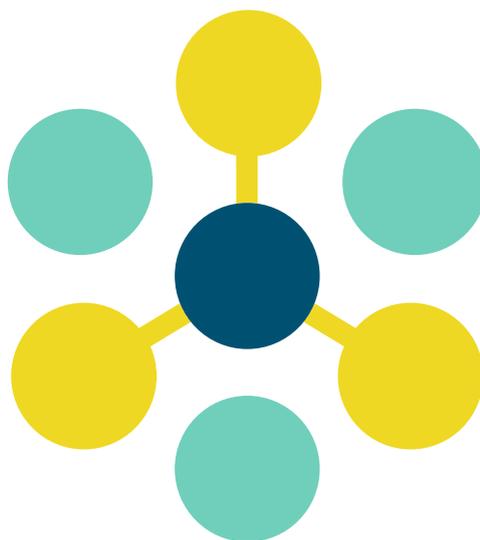
OPTIONAL (BUILT IN)	Gas Mixing	
		up to 5 TMFC's (sparger and overlay)
	Redox (ORP)	
	Sensor	Digital sensor
	Sensitivity	57 to 59 mV/pH
	Control system	Measuring resident in Leonardo 3.0 software
	Control range	±2000 mV
	Operation temperature	- 10 -130°C
	Pressure range	≤ 6 bar
	Conductivity	
	Sensor	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	
Stirring		
	Stirring through Magnetic Stirrer Table	
dCO₂		
Sensor	Analog sensor	
Accuracy	±10% (pCO ₂ 10-900 mbar) ≥ ±10%(pCO ₂ > 900 mbar)	
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	
Accuracy	Mammalian cells in suspension ±5·10 ⁴ cells/ml - Fermentation ±0.05 g/l dry weight	
Control system	Measuring resident in Leonardo 2.0 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 to 10 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 to 8x10 ⁸ mammalian cells/ml - 5 to 200 g/L dry weight)	
Weight		
Sensor	Digital Balance	
Accuracy	±0.2 g	
Control	Measuring resident in Leonardo 2.0 software	
Peristaltic pumps		
WM 114	fixed speed, max. 60 rpm	

Chiller

- Optionally the BlackJar 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

SOLARIS BIOTECHNOLOGY srl
Via Bachelet, 58 - 46047 Porto Mantovano
Mantova - Italy
Phone: +39 0376 408760
Fax: +39 0376 385108
Email: info@solarisbiotech.com
www.solarisbiotech.com