

M series STANDARD PILOT STERILIZABLE IN PLACE SOLUTIONS

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M SERIES

M series bioreactors and fermenters are Solaris' "standard" pilot plant scale platforms. There are 6 available standard vessel sizes ranging from 30 up to 200 L total volumes, completely configurable with an extensive range of options and accessories.

M Series typical applications includes the following: Scale-up and scale-down studies Pilot plant Small productions

M series can be used for: Biopharmaceutical Biofuels Food industry Bioremediation Bioplastic Cosmeceutical Nutraceutical







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M SERIES

Automatic mechanical seal lubrication with steam condensate loop



19" coloured touch screen industrial HMI SBC16: smart controller designed to provide an high level of automated management of the fermentation/ cultivation processes **Customizable PID** or factory default

N.2 heat exchangers and recirculating pump



Separate drains cooling return, condense to waste, hot condense return

Compact design

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.



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

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 numer of the client's PC or laptops.



SERIES





Workflow page

Data sheet

Vessel						
Solaris Code	M serie 30	M serie 50	M serie 75	M serie 100	M serie 150	M serie 200
Total Volume (liters)	30,00	50,00	75,00	100,00	150,00	200,00
Ratio D/H	1:3.0	1:3.0	1:3.0	1:3.0	1:3.0	1:3.0
Min. Working Volume (liters)	4,50	7,50	11,00	15,00	22,00	30,00
Max. Working Volume (liters)	21,00	36,00	55,00	75,00	110,00	145,00
Working temperature range	0-135°C					
Working pressure range	Up to 2 bar					
Design	Stainless Steel Jacketed Vessel					
Materials	Parts in contact with the culture AISI 316 L - other parts AISI 304					
Stirring						
Drive	Brushless Motor, Top Direct Assembly					
Impellers	Select from: Rushtons impellers, Marine Impellers, Pitched blade					
Thermoregulation						
Control	PID Control - Accuracy 0,1 °C					
	Jacket steam and electric heaters / cooling source					
Gas control & gas mixing						
Sparger and overlay Gas	TMFC.					
Gas Mixing (Air,CO ₂ ,O ₂ ,N ₂)	n.1 TMFC + n.4 solenoid valves, n° of TMFC					
Sparger type	Select from: Toro type (ring), syntered microbubbling both provided with 0,2 μ m filter					
Exhaust	Condenser and 0,2 µm filter (option)					
Options						
Double mechanical seal						
Vessel empty sterilization						
Electrical heaters						
Resterilizable addition system:	Steam bridge (m	anual or automati	C)			
Peristaltic pumps (WM 114, WM	1 313, WM 520)					
Gravimetric flow control (feed	rate controlled t	hrough weight me	asurement)			
Manual and automatic SIP harv	vest and sampling	g valves				
CIP system: removable spray balls or integrated system (recirculating pump and n.2 removable spray balls + software automation)						

Controls

Temperature				
Sensor				
Control system	Measuring resid			
Control range				
рН				
Sensor				
Control system	Measuring re			
Control range	incusuring re.			
Operation temperature				
Pressure range				
	Cascade to peris			
Actuator	acid/base			
40				
dO ₂	Diai			
Control system	Massuring ros			
Control range				
Operation temperature	0,00			
Pressure range				
Actuator	Cascade to RP			
400				
Sonsor				
Control system	Mossuring re			
Control range	Measuring re			
Operation temperature	0,0			
Pressure range				
Cell density				
Sensor	Di			
Control system	Measuring reside			
Pressure range	0-3 bar (option			
	Total cell density			
Option 1 (Two ranges: 10/	^5 to 10^8 mammalia			
Option 2 (Two ranges: 5x10	viable cell density b			
	0.000,420 0.110,111			
Redox (ORP)				
Sensor Control evictore				
Control system	measuring re			
Pressure range				
Conductivity				
Sensor				
Control system	Measuring res			
Control range	1			
Operation temperature				
Pressure range				
Weight				
Sensor	n			
Control	Measuring resid			
Antifoam/Level	C.			
Serisor	Measuring resid			
Control	measuring resid			

M SERIES

Set up your M series

PT100 dent in Leonardo software 0 - 150°C

Digital sensor esident in Leonardo software 0 - 14 0 - 130°C 0 - 6 bar staltic pumps for the addition of se solutions or gas (CO₂)

gital Optical sensor esident in Leonardo software - 300% air saturation -10 - 130°C 0 - 12 bar PM, Gas Control, feedings,ect

Analog sensor esident in Leonardo software 00-200% saturation -20.0-150°C 0 - 4 bar

vigital sensor dent in Leonardo software on 1) , 0-10 bar (option 2)

v based on turbidity ian cells/ml - 0.5 to 100 g/L dry weight)

based on capacitance malian cells/ml - 5 to 200 g/L dry weight)

Digital sensor esident in Leonardo software ±2000 mV - 10 -130°C ≤ 6 bar

Digital sensor esident in Leonardo software 1 - 3000 µS/cm 0 -130°C 0 - 20 bar

n.3 load cells dent in Leonardo software

olaris sensor dent in Leonardo software









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