



version 1.0

2021-2022

Catalogue

SIP Fermentation System



INNOVATIVE CULTIVATION SOLUTIONS

(Pilot Scale)

100L System



Mechanical seal with auto generated lubricant and automatic cooling device

Harvest valve
Sanitary level
diaphragm type

Detachable aseptic
feeding device



Pump



* Customized vessel is available

200L System



Winpact offers pilot and production scale bioreactor/fermentation systems for all of your large scale fermentation needs. Our standard SIP Production Scale Fermentation System is constructed with BPE standard piping with orbital welding and top grade automatic valves to allow stable and repeatable result for every experiment. All of our features are designed to provide a high level of productivity and automation while maintaining a low operation cost. All other great features including total sterilization process, mechanical seal break indication, golden vessel ratio design and complete selection of optional devices for optimizing the fermentation process.

Features

- Wide range of vessel selection, from 100L to 1000L working volume
- Multi-lingual 12" colored graphical control interface
- Fully automated process with remote monitoring
- 15-step automatic program setting
- Orbital welding ensures minimal residue buildup
- Highest grade construction with Stainless Steel SUS316L
- Hive jacket design provides astounding temperature control
- Exhaust pressure relief valve for maximum safety precaution
- Multiple safety design integration for peace of mind operation
- Remote monitoring & controlling software free from purchase
- Password protection for multiple users with customized access levels
- Various optional devices for process optimization and needs
- Ethernet communication with Winpact SCADA software, and IP address



- Pneumatic valves for accurate and automatic control
- Orbital welding provides top quality



Monitor page for operation overview



Automatic and manual operation



Automatic sterilization process



Online system calibration

10L / 30L / 50L System

* Customized vessel is available

Motor
Manual or automatic control of constant agitation speed

Peristaltic Pump
Uses four Watson Marlow built-in peristaltic pumps for all your feeding needs

Control Station
Large screen and graphical user interface

Stainless Steel Vessel
Special designed heating jacket provides better heating efficiency



FS-30L

* ASME standard



FS-10L

Harvest valve

Sampling valve

Features

- Wide range of vessel selection, from 10L to 50L working volume
- Colorful interface at 10.4" or above
- Fully automated process with remote monitoring
- 15-step automatic program setting
- Orbital welding ensures minimal residue buildup
- Highest grade construction with 316L stainless steel
- Jacket design provides astounding temperature control
- Exhaust pressure relief valve for maximum safety precaution
- Multiple safety design integration for peace of mind operation
- Remote monitoring & controlling software free from purchase
- Password protection for multiple users with special requirements
- Various optional devices for process optimization and needs
- Ethernet communication with Winpact SCADA software, and IP address



FS-50L

Four-staged DO cascade

15-Step programmable PID control



Immediate visualization on operation overview



Easy and intuitive operation for manual and sequence control



One-Touch automatic sterilization for vessel and system tubing



Online system calibration with system feedback



System expansion with various optional devices

Specification

*For system over 100L, please contact your local distributors for more details.

Capacity	10 L	30 L	50 L	100 L	200 L
Total volume	15 L	42 L	67 L	120 L	268 L
Working volume	10 L	30 L	50 L	100 L	200 L
Vessel and jacket maximum working pressure	3 bar (43.5 psig) / 4 bar (58 psig)			3 bar (43.5 psig) / 3 bar (43.5 psig)	
Type	Double layered fully enclosed capsule-type tank			Double layered fully enclosed capsule-type tank, with an outer temperature protective layer	
Material	Direct contact to medium - 316L stainless steel; all others - 304 stainless steel				
Surface finish	Interior polish ≤ 25 Ra/in (0.6 μ m) Mechanical polishing; Electropolish optional Exterior polish ≤ 32 Ra/in (0.8 μ m) Mechanical polishing; Electropolish optional				
Ports	Ports designed according to user requirements				
Piping and valve materials	<p>Parts that directly contact with the product/medium uses 316L stainless steel (≤ 25 Ra/in) internal polished tubing (BPE standard) :</p> <p>A.) Internal EP polished diaphragm type pneumatic valve and manual valve (BPE standard)</p> <p>B.) Tubing all welded with orbital welding</p> <p>C.) Vessel bottom drain uses a diaphragm valve, to minimize dead volume</p> <p>D.) Piping designed for ease of transfer to scale up (can be used as a seed fermentation system) or downstream process</p> <p>Parts that do not directly contact product/medium</p> <p>A.) Constructed with 304 stainless steel</p>				
Controller	10.4" color industrial touch screen	12" color industrial touch screen			
Setting	<ul style="list-style-type: none"> * User-friendly, graphical control interface * Includes secure user accounts, with different levels of access * Modularized and standardized design (Module Skid): ergonomically designed according to height, ease of vessel clean up, and ease of extraction in relation to vessel bottom valve * Includes maintenance page with system diagnostics * All programmed setting values are automatically stored into the built-in memory; the settings will not be lost in case of power outage/interruption. When power is restored, the interrupted process will automatically resumed 				
DO	<ul style="list-style-type: none"> * 0-200%, Control range:0-100%, adjustable * Software electrode calibration, with automatic temperature compensation function * Includes one set of side-inserted stainless steel autoclavable DO electrode * DO Stat features with intelligent feeding 				
pH	<ul style="list-style-type: none"> * PID control with adjustable deadband * Control range 0 to 14 (2-12 for maximum precision), resolution: 0.01 pH * Calibration function with automatic temperature compensation function * Includes one set of side-inserted, autoclavable pH probe with stainless steel housing * pH Stat features with intelligent feeding 				
Pump	<ul style="list-style-type: none"> * Built-in peristaltic pumps * Each feeding pump can run adjustable 15-step program * Each pump can be adjusted for speed, forward and backward direction, and manual or automatic mode * Each of the four peristaltic pumps can be designated for different functions: acid pump, base pump, antifoam pump, or substrate feeding pump * Optional fifth and six peristaltic pump available 				
Temperature	<ul style="list-style-type: none"> * Vessel temperature is measured with a side-inserted PT-100 temperature probe and maintained using PID control. * Control range: 0-130°C, $\pm 0.1^\circ\text{C}$. Operational range up to 0-60°C 				

Agitation	<ul style="list-style-type: none"> * Manual or automatic control of agitation speed * 15-step program to change speed, or use DO cascade control
Air supply and exhaust	<p>Gas supply and dehumidifier: uses in-house air compressor or air dehumidifier</p> <ul style="list-style-type: none"> * Includes re-useable, autoclavable 0.2µm air filter for gas inlet * Gas Inlet (air) Includes mass flow controller: 2 vvm maximum according to the vessel capacity * Gas Inlet (oxygen) Includes pure oxygen rotameter (manual flow control): 1 vvm maximum according to the vessel capacity * Includes oxygen gas solenoid valve, with automatic pulsed time control <p>Air outlet / Exhaust</p> <ul style="list-style-type: none"> * Exhaust port with stainless steel condenser * Includes re-useable, autoclavable 0.2µm air filter * Includes automated adjustable gas outlet valve to adjust vessel back pressure * Can control manually or automatically via software

Utility Requirement

Capacity	10 L	30 L	50 L	100 L	200 L
Power	Three phase 220V or 380V (note: can be customized to local standard)				
Air	At least 6 bar				
	30 L/min flow rate	90 L/min flow rate	150 L/min flow rate	300 L/min flow rate	600 L/min flow rate
	Dehumidified				
Peripheral factory water supply	Oil-free				
	Cooling water (tap water, at least 15°C below working temperature, must be soft water) ; Pressure at least 2 bar				
Process water	RO Water				
Plant steam	≥ 2 bar; dry steam with no entrained condensate				
Process steam	≥ 2 bar; dry steam with no entrained condensate				
Drain	In situ drain; ≥ 1"			In situ drain; ≥ 2"	

*Customization on the SIP Fermentation system available upon request. Please contact your regional manager for evaluation request.



(Production Scale)

*For system over 200L, please contact Major Science or authorized distributors for more information.



500L System



1000L System



5000L System

■ Gas Mixing Station

The gas mixing station allows the user to optimize cell growth conditions by independently supplying up to four gasses to the fermentation process. Parameters such as dissolved oxygen and pH can be controlled by adjusting the gas composition supplied to the system. Four manually adjusted flow meters control the flow rate of each gas, while the 4 solenoid valves automatically open or close in response to the culture conditions. The Gas Mixing Station can be operated in either manual or automatic modes.

■ Oxygen Mass Flow Controller

Maintain optimal control over culture DO level by installing this optional mass flow controller. The mass flow controller can accurately adjust the flow rate of incoming oxygen and is resistant to fluctuations in gas pressure, ensuring precise control and repeatability of experimental conditions

A.) Cascade control scheme

B.) Integrated into controller for simple and automated operation

■ CO₂ / O₂ Off-gas Analyzer

The CO₂ / O₂ off-gas analyzer provides real-time measurement of carbon dioxide and oxygen concentration of the bioreactor exhaust gas. The CO₂ concentration is determined using a self-calibrating non-dispersion infrared sensor, while an electrochemical sensor monitors the oxygen concentration. Using this information, the user can continuously monitor metabolism and analyze cell growth parameters.

■ Cell Density Monitor

Our special implemented online cell density device allows you to obtain direct and continuous information for cell growth analysis and cell density as they are crucial for eukaryotic cells, yeast and bacteria fermentation. Having trouble determining cell growth rate? Our online cell density is the key to your solution.

■ ORP Probe

The ORP probe measures the oxidation-reduction potential of the fermentation media, which is a crucial indicator of anaerobic conditions/reactions. This low maintenance and sterilizable probe is designed to withstand repeated experiment.



Electropolish (EP) of Vessel Tank

Electropolish of the vessel tank is offered as a higher sanitary grade surface finish. EP surface finish is an addition to the standard mechanical polish (MP) which provides a smoother surface area to minimize residual residue.

**Note that this option MUST be requested at your initial inquiry, later-on additions after completion of construction is not possible*

■ Transfer Piping

Transfer piping of your resulting product/medium between vessels is offered for convenience of operation.

Automated transfer using pressure in addition to directional control with valve regulations offers fast and easy operation.

■ Headplate Lift

For SIP vessel headplate lifting, an device for headplate lifting/removal. Chain-hoist system (manual) for 30 L / 50L.

■ Load Cell

The load cell provides weighing capability to your fermentation process. Weighing the substrate feeding can indicate how much substrate was added during the fermentation process, which allows the user to provide more accurate control accordingly to what the process needs.



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