

# Parallel Lab Fermentor / Bioreactor System

The Winpact Parallel Fermentation System is the ultimate and true parallel system for your parallel experiment. Whether you need to run two identical experiment or different experiment at the same time, the duo heating system allows you to run two thermostat heating, two dry heating or one thermostat and one dry heating simultaneously. The state of the art design is constructed with the upmost versatility for you to operate any vessel type and size in any combination you like. The remote software can control up to 16 systems (total 32 vessels) for true parallel operation.

- Duo heating system, thermostat and dry heating combined in one
- True Parallel System, 1 controller controls 2 vessels
- 5 interchangeable types of autoclavable glass vessels
- Control up to 16 systems from a single interface
- Compatible with microbial and cell culture applications
- Intuitive user interface for short learning time
- Ethernet communication with Winpact SCADA software, and IP addressing
- Compatible with vessel volume from 0.5L to 20L
- Full selection of optional devices available
- Auto vessel angle control mechanism for solid state vessel
- Solid state vessel performs 0°- 90° rotation, and 120° for harvest



- 1 Single wall dish bottom vessel, 1 L
- 2 Single wall air lifter vessel, 5 L
- 3 Double jacketed air lifter vessel, 5 L
- 4 Single wall dish bottom vessel with heating blanket, 5 L
- 5 Solid State, 5 L



## System Specification

<b>Controller</b>	Duo heating system controller					
	Built-in rotameter					
<b>Vessel</b>	8 built-in pump heads					
	Double Jacketed Dish Bottom Vessel (includes glass body, head plate, T-handling bar, 2 probe adaptors)	Single Wall Dish Bottom Vessel (includes glass body, head plate, T-handling bar, 2 probe adaptors)	Air Lifter Vessel (includes glass body, head plate, draft tube, T-handling bar, 2 probe adaptors)	Single Wall Dish Bottom Vessel with Heating Blanket (includes glass body, head plate, T-handling bar, 2 probe adaptors and heating blanket)	Single Wall Plain Bottom Vessel with Heating Base Unit (includes glass body, head plate, T-handling bar, 2 probe adaptors and heating base unit)	Solid State (FS-V-SA05P)
	Rushton-type impellers	No impellers	Rushton-type impellers	Multi-Type		
	Baffle assembled	Draft tube assembled	Baffle assembled	N / A		
	Condenser assembled					
	Air sparger assembled	Micro sparger assembled	Air sparger assembled			
<b>Agitation motor</b>	Brushless motor	N / A	Brushless motor	Brushless motor		
<b>Probes</b>	1x pH probe and 1x probe cable				Optional	
	1x DO probe and 1x probe cable				Optional	
	1x Temperature probe and 1x probe cable				N / A	
<b>Start-up kit</b>	1x anti-foam/level sensor and 1x probe cable					N / A
<b>Start-up kit</b> Complete start-up kit includes silicone tubes, tube clamps, metal connector and autoclavable disc filters. Please see p.35 for details.						

# Parallel Lab Fermentor Bioreactor System

## FS-05



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## Specification

\*\*The minimum speed varies from 1-5 rpm depending on actual medium viscosity.  
\* Gas flowrate may be affected by pressure, liquid volume, solution type and characteristic, filter.  
For 15L & 20L glass vessel, we suggest to using optional capsule filter for reach the desired gas flowrate(2 vvm).

<b>Control unit</b>	Control panel	10.4" Color touch-screen interface Remote software control through Ethernet, up to 16 systems per PC
	Communication port	Data export through USB port Analog AUX port for system extension
	Program storage	Up to 59,994 process programs
	Log data storage	Up to 100 process monitoring data files
	Cabinet material	ABS front panel and painted iron housing
	Dimension	Footprint: W x L = 15.75" x 21.61" (400 mm x 549 mm); Height: 29.14" (740 mm)
	Rated voltage	220V~; 50/60 Hz, 10A, 2000W
<b>Aeration</b>	Weight	Approx. 114.6 lb (52 kg)
	Inlet gas flow-meter	0,0.1-1 LPM (500 ml); 0, 0.2-2.5 LPM (1 L); 0, 1-10 LPM (3, 5 L); 0, 2-25 LPM (10 L); 0, 6-50 LPM (15, 20 L) L-shape (500ml, 1L); Ring sparger (3L and above); Micro-sparger (C type vessels); Sparger Center-located sparger (solid state)
	Baffle	316L stainless steel baffles; 0.5-3L vessel: fixed, unmovable; 5L and above vessel: removable
<b>Temperature</b>	Heating	1. Thermostat system: built-in heat exchanger (550W heater, water circulation pump) 2. Dry heating system : external devices (heating blanket or heating base unit)
	Cooling	Built-in water module and external water circulator (optional)
	Range	- FS-V-A/ B / SA05P series: 5°C (41°F) above coolant up to 60°C (140°F) - FS-V-C series (Double Jacketed): 5°C (41°F) above coolant up to 60°C (140°F) - FS-V-C series (Single Wall): without temp control - FS-V-D series : 5°C (41°F) above coolant up to 90°C (194°F)
	Probe	Platinum RTD probe (PT-100), non autoclavable
	Control mode	Manual or programmable 15-step PID control
<b>Agitation</b>	Drive	Removable top brushless motor
	Speed range	a. For Pitched blade impeller: 30-300 rpm b. For Rushton impeller: 30-1800 rpm(0.5, 1L); 30-1200 rpm(3, 5L); 30-1000 rpm(10L); 30-700 rpm(15, 20L) c. For Broken type/Spiral type/Anchor type impellers (only for FS-V-SA05 vessel): 1 – 60 rpm**
	Resolution	1 rpm increment
	Impeller	2 impellers for 0.5-1 L vessel and 0.5-5 L Double Jacketed Vessel 3 impellers for 3 L vessel and above; for 10 L Double Jacketed Vessel Note: customized impellers are available upon ordering
<b>pH</b>	Control mode	Manual or programmable 15-step PID control with adjustable deadband
	Range	0 -14 (2-12 for maximum precision)
	Resolution	0.01 pH
	Probe	Gel-filled electrode, autoclavable
<b>DO</b>	Control mode	Manual/acid start/programmable 15-step PID control
	Range	0-200%, Control range: 0-100%, adjustable
	Resolution	0.1%
	Probe	Polarographic DO sensor; autoclavable 2-stage DO cascade response a. Increase or decrease agitation speed b. Supply external oxygen source (Gas Inlet Control Module required, optional device) c. Adjust DO level using gas mixing control (gas mixing station module required, optional device) - Substrate feeding strategy - DO Stat with smart feeding technology
<b>ORP (optional)</b>	Measurement range	± 2000 mV
	Resolution	1 mV
	Probe	Gel-filled electrode: autoclavable
<b>Foam / level</b>	Probe	316L stainless steel protector with insulated PTFE tube; autoclavable, adjustable sensitivity control
	Control mode	Foam: on/off switch; Level: on/off switch control with wet/dry probe set up
<b>Peristaltic pump</b>	Pump number	4 built-in Watson Marlow pumps per vessel (total 8); Total 4 external pumps expandable: - 2 external pumps: MU-D series required (optional) - 2 external pumps: 4-20mA or DC 0-10V analog input
	Motor type	Precise stepping motor; minimum speed is 1 rpm
	Speed range	0, 1-65rpm
	Resolution	1 rpm
	Control mode	Manual or programmable 15-step feeding control; pump can be assigned for acid,base,antifoam and substrate
<b>Exhaust</b>	Device type	316L stainless steel condenser

## Vessel Specification

Vessel	Double Jacketed (FS-V-A series)					Single Wall (FS-V-B series)				Air Lifter (FS-V-C series)
Working volume	500 ml	1 L	3 L	5 L	10 L	1 L	3 L	5 L	10 L	5 L
Total volume	1 L	1.5 L	3.8 L	6.8 L	12.5 L	1.5 L	3.8 L	6.8 L	12.5 L	7 L





















Vessel	Single Wall with Heating Blanket (FS-V-B series)					Single Wall with Heating Base Unit (FS-V-D series)			
Working volume	1 L	3 L	5 L	10 L	15 L	20 L	3 L	5 L	10 L
Total volume	1.5 L	3.8 L	6.8 L	12.5 L	18.7 L	23.7 L	3.7 L	6.7 L	13.1 L

\*All vessels are made of borosilicate glass and 316L stainless steel for headplate and all fittings.

## Utility Requirement

<b>Power source</b>	210-230V, 50-60Hz with electrical safety cutoff switch
<b>Water source</b>	0.4-1 bar (5.8-14.5 psi); water supplied to fermentors should be at least 15°C below the set operating temperature
<b>Air source</b>	0.5-2 bar, must be dry, oil-free and filtered.
<b>Sterilization</b>	Autoclave; size of the autoclave's inner chamber must be able to accommodate vessel with condenser attached

## Optional Devices and Accessories

				
pH Probe	DO Probe	Temperature Probe	ORP Probe	Gas Inlet Control Module
				
Mass Flow Controller	Winpact Humidifier FS-O-HMD (solid state only)	CO <sub>2</sub> Gas Analyzer	Gas Mixing Station	Gas Mixing Station with Mass Flow Controller
				
External Pump	Brushless Motor	Lighting Module	Composite Handle	Vessel Stand
				
Headplate Stand	Feeding Bottle Loading Port	Fermentation Bottle Holder	Motor Shaft Protection Cap	Stainless Steel Supporting Foot
	<p>Other Optional Devices:</p> <ul style="list-style-type: none"> <li>• Antifoam Probe</li> <li>• Impellers Rushton 6 Blade Impeller Pitched Blade Impeller Foam Breaker Broken Type Impeller (solid state only) Anchor Type Impeller (solid state only) Spiral Type Impeller (solid state only)</li> <li>• Sampling Devices Triport Sampling Device Dual Ports Sampling Device Ball Valve Sampling Device Pneumatic Sampling Device</li> <li>• EZScript Software</li> <li>• Optical Density Sensor Modules</li> <li>• Quad Loading Port</li> <li>• Stainless Steel Condenser</li> <li>• Protective Cover for Sterilization (solid state only)</li> </ul>			
Consumable Kit				

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