

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

| | | | | | | | |
|---------------------|---|--|---|---|--|--------------------------|--|
| Controller | Duo heating system controller | | | | | | |
| | Built-in rotameter | | | | | | |
| Vessel | 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 | | | | |
| | Agitation motor | Brushless motor | N / A | Brushless motor | Brushless motor | | |
| | Probes | 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 | |
| Start-up kit | 1x anti-foam/level sensor and 1x probe cable | | | | | N / A | |
| Start-up kit | Complete start-up kit includes silicone tubes, tube clamps, metal connector and autoclavable disc filters. Please see p.35 for details. | | | | | | |

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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).

| | | |
|-------------------------|----------------------|--|
| Control unit | 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 |
| Aeration | 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 |
| Temperature | 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 |
| Agitation | 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 |
| pH | 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 |
| DO | 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 |
| ORP (optional) | Measurement range | ± 2000 mV |
| | Resolution | 1 mV |
| | Probe | Gel-filled electrode: autoclavable |
| Foam / level | 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 |
| Peristaltic pump | 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 |
| Exhaust | 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

| | |
|----------------------|--|
| Power source | 210-230V, 50-60Hz with electrical safety cutoff switch |
| Water source | 0.4-1 bar (5.8-14.5 psi); water supplied to fermentors should be at least 15°C below the set operating temperature |
| Air source | 0.5-2 bar, must be dry, oil-free and filtered. |
| Sterilization | 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 ₂ 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 |



Consumable Kit

Other Optional Devices:

- Antifoam Probe
- 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)
- Sampling Devices
Triport Sampling Device
Dual Ports Sampling Device
Ball Valve Sampling Device
Pneumatic Sampling Device
- EZScript Software
- Optical Density Sensor Modules
- Quad Loading Port
- Stainless Steel Condenser
- Protective Cover for Sterilization (solid state only)