

version 1.0



# 2021-2022 BROCHURE

 **major  
science**

*Innovative Life Sciences Tools*



***Laboratory Bioreactor / Fermentor***



# Laboratory Bioreactor / Fermentor

## Winpact Mass Flow Controller

The composition of gas is important for microorganism/cell culture. To maintain different gases at a defined flow rate during bioprocesses, Winpact Mass Flow Controller can provide accurate and stable flow measurement and control. Mass flow controller (MFC) is a precise device which is used to control a specific type of liquid or gas at a particular range of flow rates. MFC is composed of block, flow-splitter or bypass, sensor, printed circuit board (PCB), and control valves.

When gas flows into MFC, the sensor will detect its real volume and compare with the setting value (standard value). If the detection value is lower than setting value, the inner control valve will open slightly for increasing the input flow. Conversely, if the detection value is higher than the setting value, the inner control valve will close slightly to reduce the input flow. Consequently, MFC is able to adjust the flow automatically and precisely.

Overlay (headspace aeration) control is crucial for some fermentation processes process. Winpact Mass Flow Controller also can sparge different gases into the vessel though the headspace and the sparger at the same time.

Now, Winpact Mass Flow Controller could be integrated into Winpact Fermentation system and improves operational efficiency and creates stable environment for different culture conditions.

### Features

- Affordable price
- Self-made, high quality accurate gas control guarantee



FS-O-MF series

## Winpact Parallel (FS-05 Series)

- Control up to 16 systems (total 32 vessels) from a single interface



1L Double Jacketed Vessel

FS-05

10L Single Wall Vessel with Heating base unit



## Winpact One (FS-06 Series)



1L Double Jacketed Vessel

1L Single Wall Vessel

FS-06

- Control up to 16 systems from a single interface

## Winpact Evo (FS-07 Series)



FS-07

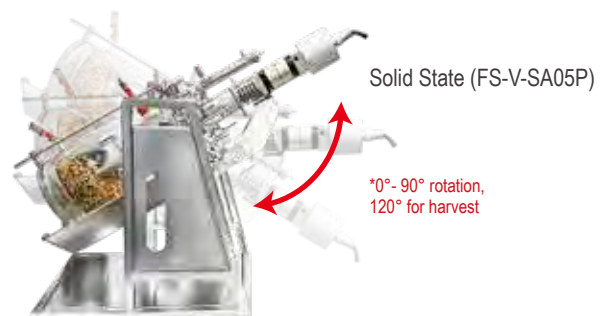
5L Air Lifter Vessel

5L Single Wall Vessel with Heating blanket

- Fully integrated system specifically designed for solid-state fermentation research involving saccharification, hydrolysis and more.
- Programmable angle-adjustable (0-90° for culture control, 120° for harvest control) vessel tilting and stirring mechanism permits superior sample homogeneity
- Impellers are designed to reduce stickiness and it ensures sample integrity during the fermentation process.
- Integrated motor shaft & air sparger assembly creates precise, disturbance-free controls of aeration and mixing
- Chemically resistant double jacketed borosilicate glass vessel design
- Can be used with pH and DO probes to control culture conditions(anchor type impellers only)
- Customizable impellers and aeration controller available

\*For more information, please contact your local distributors.

\*\*The minimum speed varies from 1-5 rpm depending on the medium viscosity.

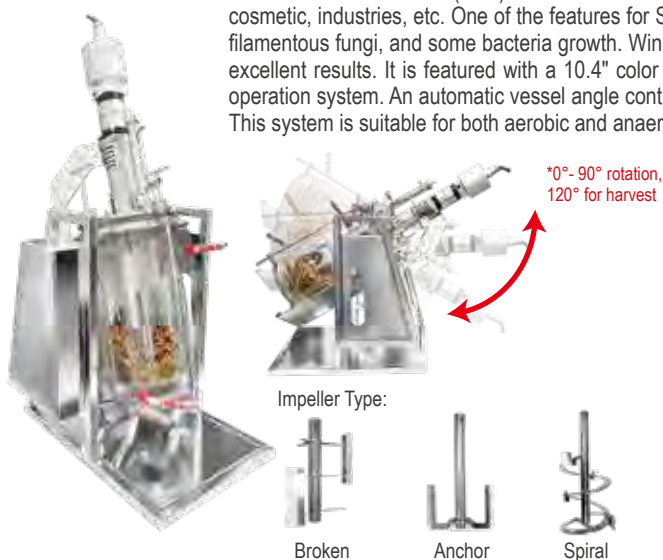


Solid State (FS-V-SA05P)

\*0° - 90° rotation, 120° for harvest

## Winpact Solid State Fermentation System, FS-V-SA05P

Solid state fermentation (SSF) can be used for enzyme, antibiotics, biofuel, and organic acid production in the food, pharmaceutical, cosmetic, industries, etc. One of the features for Solid state fermentation is to create low water level cultivating conditions for fungus, mold, filamentous fungi, and some bacteria growth. Winpact Solid State Fermentation system is designed for the laboratory scale research to get excellent results. It is featured with a 10.4" color touch screen, user-friendly interface and 4 built-in peristaltic pumps on the Linux based operation system. An automatic vessel angle control mechanism provides an outstanding mixing efficiency for solid state material research. This system is suitable for both aerobic and anaerobic fermentation with three kinds of impellers available (Broken, Anchor and Spiral type).



### Features

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- Programmable angle-adjustable (0-90° for culture control, 120° for harvest control) vessel tilting and stirring mechanism permits superior sample homogeneity
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- Customizable impellers and aeration controller available

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Control Unit	Control Panel	10.4" color touch-screen Interface, (Resolution: 800 x 600 pixels)
	Communication Port	Remote control through Ethernet, Analog AUX port for system extension
	Storage Program	Up to 59,994 programs for different kinds of condition.
	Data Internal Storage	Up to 100 data files.
	Data External Storage Interface	USB port
	Cabinet Material	Front panel: ABS / Housing: Painted iron
	Rated Voltage	110V~/ 220V~ ; 50/60 Hz
Aeration	Inlet Gas Flow-meter	0, 1-10LPM
Dimension	Overall Diameter 350mm; Overall Height with Condenser 683 mm; Overall Height without Condenser 448 mm Dimension (with vessel holder) 430mm (L) x 730mm (W) x 780 mm (H)	
Temperature	Heating	Thermostat system: Built-in heat exchanger, 550W heater/water circulation pump
	Cooling	Automatic cooling water valve
	Range	5°C (41°F ) above coolant up to 60°C (140°F )
	Resolution	0.1°C
	Control Mode	Manual or programmable 15-step PID control.
Agitation	Drive	Removable top brushless motor
	Speed Range	0, 1 – 60 rpm
	Resolution	1rpm
	Control Mode	Manual or programmable 15-step PID control.
	Impeller	1. Broken type (FS-A-IM305) 2. Anchor type (FS-A-IM405) 3. Spiral type (FS-A-IM507) (Select one from the above type, and only anchor impeller can be used with pH and DO probes) *Note: Customized impellers are available.
Vessel Swing	Angle Range	Normal operation: 0°~90°, adjustable time interval Harvest mode: 0°/ 120°
	Control Mode	Programmable control

### Vessel Application

Application \ Vessel	FS-V-A series	FS-V-B series	FS-V-C series	FS-V-B series	FS-V-D series	FS-V-SA05P
	Double Jacketed Dish Bottom Vessel	Single Wall Dish Bottom Vessel	Air Lifter Vessel	Single Wall Dish Bottom Vessel with Heating Blanket	Single Wall Plain Bottom Vessel with Heating Base Unit	Solid State
Mammalian cell culture	●●	●○	○○	●○	○○	○○
Aerobic microorganism culture (Note 1)	●●	●●	●●	●●	●●	○○
Micro-aerobic microorganism culture (Note 2)	●●	●●	○○	●●	●●	○○
Anaerobic microorganism culture (Note 3)	●●	●●	○○	●●	●●	○○
Fragile cell culture (Note 4)	●●	●○	●●	●○	○○	○○
Photosynthesis cell culture (Note 5)	●○	●●	●●	○○	●○	○○
Plant cell culture	●○	●○	●●	○○	○○	○○
Insect cell culture	●●	●○	○○	●○	○○	○○
Solid state / semi-solid state	○○	○○	○○	○○	○○	●●

●● Excellent      ●○ Good      ○○ Not recommended

- Note:
1. Some bacteria; yeast; fungi
  2. Facultative culture (i.e. some Lactobacillus; ethanol production)
  3. Same as Note 2
  4. This vessel is excellent for fragile cells, which easily sheared by any type of mechanical impeller
  5. Plant; algae; cyanobacteria (blue-green algae)

## Duo Heating Control: FS-05 / FS-06 / FS-07 serie

- These Winpact controllers can operate with a variety of vessels
- Compatible with microbial and cell culture applications
- Intuitive user-interface for fast learning curve with multi-language support
- Ethernet communication with Winpact SCADA software, and IP addressing



PC remote controlling software connects up to 16 systems



Control multi-vessel systems on one page.

### Controller Specification

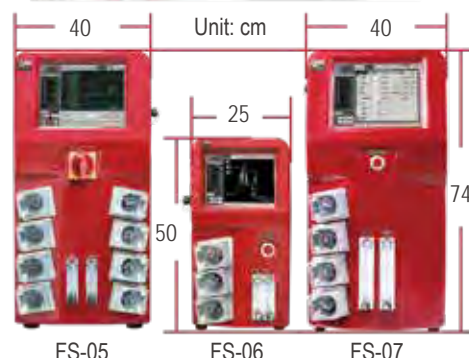
Controller	Duo Heating Control ( FS-05, FS-06, FS-07 )					
Vessel	Double Jacketed (FS-V-A series)	Single Wall (FS-V-B series)	Air Lifter (FS-V-C series)	Single Wall with Heating Blanket (FS-V-B series)	Single Wall with Heating Base Unit (FS-V-D series)	Solid State (FS-V-SA05P)
Agitation Motor	Brushless motor	Brushless motor	N/A	Brushless motor	Brushless motor	Brushless motor
Impeller*	*Rushton-type; Pitched-blade	*Rushton-type; Pitched-blade	N/A	*Rushton-type; Pitched-blade	*Rushton-type; Pitched-blade	Broken type; Anchor type; Spiral type
Temp Range	5 °C above coolant to 60°C	5 °C above coolant to 60°C	Double Jacketed: 5°C above coolant to 60°C Single Wall: without temp control	5°C above coolant to 60°C	5°C above coolant to 90°C	5°C above coolant to 60°C
Vessel Size	500ml - 10L	1 - 10L	5L only, single wall or double jacketed	1 - 20L	3 - 10L	5L only
Speed Range	*Rushton type 30-1800 rpm(0.5, 1L); 30-1200 rpm(3, 5L); 30-1000 rpm(10L) Pitched blade 30-300 rpm	*Rushton type 30-1800 rpm(1L); 30-1200 rpm(3, 5L); 30-1000 rpm(10L) Pitched blade 30-300 rpm	N/A	*Rushton type 30-1800 rpm(1L); 30-1200 rpm(3, 5L); 30-1000 rpm(10L); 30-700 rpm(15, 20L) Pitched blade 30-300 rpm	*Rushton type 30-1200 rpm(3, 5L); 30-1000 rpm(10L) Pitched blade 30-300 rpm	1-60rpm *The minimum speed varies from 1-5 rpm depending on actual medium density.
Heating	Built-in heat exchanger			Heating blanket	Heating base unit	Built-in heat exchanger
Cooling	External chiller, automatic cooling water valve					
Aeration	L-shape or ring sparger	L-shape or ring sparger	Micro-sparger	L-shape or ring sparger	L-shape or ring sparger	Center-located sparger
Grounding Port	No need	No need	Yes	No need	No need	No need
Application	Excellent for temperature sensitive and shear-force sensitive cells such as mammalian and insect cell culture	Great for aerobic or anaerobic microbial culture; suitable for plant cell and photosynthesis cell culture	Excellent for shear-sensitive cells; ideal for plant cells, fungal cells, algae cell and photosynthesis cell culture	Ideal for rapid temperature change aerobic and anaerobic microbial (bacteria and yeast) fermentation	Excellent for aerobic and anaerobic microbial (bacteria, yeast) culture, such as E.coli	Special for the culture of microbial in substrates with low water levels condition , generally suitable for fungi, such as filamentous fungi


\*For FS-V-A, FS-V-B and FS-V-D series, the standard impeller is Rushton type; Pitched blade is available for cell culture upon request.

### Winpact Controller Selection Guide

Model	FS-05	FS-06	FS-06 + FS-06EPM*	FS-07
Product Name	Winpact Parallel	Winpact One	Winpact One	Winpact Evo
Heating System	Duo heating			
Working Volume Range	500ml - 20L	500ml - 10L	500ml - 10L	500ml - 20L
Autoclavable Glass Vessels	Yes			
Interchangeable Vessels	Compatible with all types of vessel, except for 5L solid state which is only usable with FS-05 and FS-07			
Number Of Vessels Controlled Per Controller	2	1	1	1
Number Of Vessels Controlled Via Remote Software	Max 32	Max 16	Max 16	Max 16
Touchscreen Controller	10.4"	8"	8"	10.4"
Number Of Peristaltic Pumps	8	3	3	4
Gas Mixing Options	Available	No	Available, *	Available
Oxygen Enrichment	Available	No	Available, *	Available
Mass Flow Controller	Available	No	No	Available
Off Gas Analyzer	Available	No	No	Available
ORP Probe	Available	No	Available, *	Available
Lighting Module	Available	No	Available, *	Available
External Pump	4 max.	1 max.	2 max.	2 max.
Solid State	Available	No	No	Available

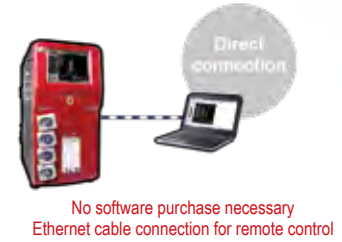
\* Optional expansion module (FS-06-EPM) needed.



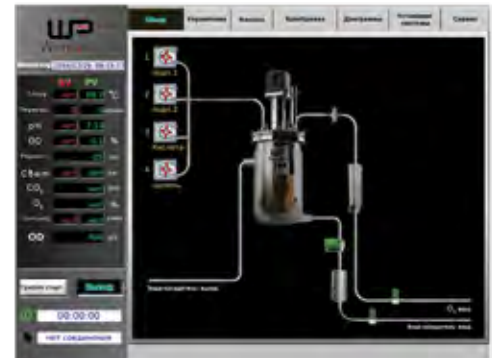
	Vessel type	Double Jacketed Dish Bottom Vessel (FS-V-A series)					
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings					
	Working volume **	500ml	1L	3L	5L	10L	
	Total volume Δ	1L	1.5L	3.8L	6.8L	12.5L	
	Vessel type	Single Wall Dish Bottom Vessel (FS-V-B series)					
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings					
	Working volume **	1L	3L	5L	10L		
	Total volume Δ	1.5L	3.8L	6.8L	12.5L		
	Vessel type	Air Lifter Vessel (FS-V-C series)					
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings					
	Working volume **	5L single wall		5L double jacketed			
	Total volume Δ	7L					
	Vessel type	Single Wall Dish Bottom Vessel With Heating Blanket (FS-V-B series)					
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings					
	Working volume **	1L	3L	5L	10L	15L	20L
	Total volume Δ	1.5L	3.8L	6.8L	12.5L	18.7L	23.7L
	Vessel type	Single Wall Plain Bottom Vessel With Heating Base Unit (FS-V-D series)					
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings					
	Working volume **	3L	5L	10L			
	Total volume Δ	3.7L	6.7L	13.1L			
	Vessel type	Solid State (FS-V-SA05P)					
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings					
	Working volume **	5L					
	Total volume Δ	6.8L					

\*\* Suggested Max.

Δ Total volumes are approximate and may vary slightly.



\*PC and switch hub are not included



Multi-language operation interface (Russian language)

• Winpac \*\*EZScript software for advanced fermentation processes

\*\* Winpac EZScript is a command software specifically designed with user-define programming capability to optimize and control of your process.



Charting  
Real-time data recording and exporting



System Setup  
Set up for optional devices



Calibration  
Easy sensor calibration with assisted menu



Control / Manual  
Manual operation, sequence or EZScript control (optional) of each parameter.


























Control / Sequence



Pumps  
Control speed, direction, total volume and flow rate

\*All technical specifications are subject to change without notice.  
\*Please visit our website at [www.majorsci.com](http://www.majorsci.com) for more product selection and detailed information.

## Optional Devices and Accessories

				
pH Probe	DO Probe	Temperature Probe	ORP Probe	Cell Density Probe
				
Methane Off Gas Analyzer	Winpack Humidifier FS-O-HMD (solid state only)	CO <sub>2</sub> / O <sub>2</sub> Off Gas Analyzer	Gas Mixing Station	Gas Mixing Station with Mass Flow Controller
				
Mass Flow Controller	External Pump	Lighting Module	Composite Handle	Vessel Stand
				
Headplate Stand	Feeding Bottle Loading Port	Fermentation Bottle Holder	Motor Shaft Protection Cap	Stainless Steel Supporting Foot
				
Brushless Motor	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)

\*All technical specifications are subject to change without notice.

\*Please visit our website at [www.majorsci.com](http://www.majorsci.com) for more product selection and detailed information.

\*Please contact Major Science for more information on other optional devices.



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