Winpact Mass Flow Controller

FS-O-MF series

The gas composition 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 for reducing the input flow, for this reason, MFC is able to adjust the flow automatically and more accurately.

Besides this, overlay (headspace aeration) control is also useful for fermentation process. Winpact Mass Flow Controller also can sparge different gases into the reactor though the headspace and the sparger at the same time.

Now, Winpact Mass Flow Controller could be integrated into Winpact Fermentation system and achieve operational efficiency and creative stable environment in culture conditions.

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

Winpact Parallel System

FS-05 Series

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 vessels for true parallel operation.

- Duo heating system, thermostat and dry heating combined in one
- True Parallel System, 1 controller controls 2 vessels
- Interchangeable 5 types of autoclavable glass vessel
- 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

Remote control software connects up to 16 systems (total 32 vessels) at the same time via PC

For more information, please contact your local distributors.

*For more information, please contact your local distributors.
Winpact One System
FS-06 Series

The most versatile, price and space saving fermentation system is now available from our Winpact fermentation product line—the Winpact One Fermentation System. Winpact One is not only compact in size but also provides all the necessary tools as a standard instrument. The duo heating system allows you to choose any vessel type up to 10L for whichever application needs. The optional expansion module allows you to add additional devices to enhance the capability of the system. All necessities such as temperature, anti-foam, pH and DO probe are included in standard package.

Winpact Evo System
FS-07 Series

Winpact Evo System is a one-side version of Winpact Parallel System yet offers cutting edge software. It retains all the features from FS-05 such as duo heating system, 16-system control from a remote computer, 5 types of autoclavable glass vessel ranging from 0.5L to 20L. We also significantly enhanced the functionalities and capabilities of its newly developed controller, including the versatility to accommodate solid state system.

- Duo heating system, thermostat and dry heating combined in one
- Most versatile and compact system on the market ((WxLxH) 250x510x500mm)
- Interchangeable 5 types of autoclavable glass vessel
- Control up to 16 systems from a single interface
- Compatible with microbial and cell culture applications
- Intuitive user interface for self-explanatory time with multi-language support
- Ethernet communication with Winpact SCADA software, and IP addressing
- Expansion module available for system upgrade for optional devices

*For more information, please contact your local distributors.
**Controller Specification**

<table>
<thead>
<tr>
<th>Controller</th>
<th>Duo Heating Control (FS-05, FS-06, FS-07)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agitation Motor</td>
<td>Brushless motor</td>
</tr>
<tr>
<td>Impeller*</td>
<td>*Rushton-type; Pitched-blade</td>
</tr>
<tr>
<td>Temp Range</td>
<td>5 °C above coolant to 60°C</td>
</tr>
<tr>
<td>Vessel Size</td>
<td>500ml - 10L</td>
</tr>
<tr>
<td>Speed Range</td>
<td>*Rushton type 30 - 1800 rpm (0.5, 1L); 30 - 1200 rpm (3, 5L); 30 - 1000 rpm (10L); Pitched blade 30-300 rpm</td>
</tr>
<tr>
<td>Heating</td>
<td>Built-in heat exchanger</td>
</tr>
<tr>
<td>Cooling</td>
<td>External chiller, automatic cooling water valve</td>
</tr>
<tr>
<td>Aeration</td>
<td>L-shape or ring sparger</td>
</tr>
<tr>
<td>Grounding Port</td>
<td>No need</td>
</tr>
<tr>
<td>Application</td>
<td>Excellent for temperature sensitive and shear-force sensitive cells such as mammalian and insect cell culture</td>
</tr>
</tbody>
</table>

*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**

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

* 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.

- Winpact **EZScript software for advanced fermentation process.  
- **EZScript is a command software specifically designed with user-define programming capability to optimize and control of your process.

** Multi-language operation interface (Russian language)

- No software purchase necessary  
- Ethernet cable connection for remote control  
- PC and switch hub are not included

- Real-time data recording and exporting  
- Set up for optional devices  
- Easy sensor calibration with assisted menu  
- Manual operation, sequence or EZScript control (optional) of each parameter.

- Control / Manual  
- Control / Sequence  
- Pumps  

Bioreactor / Fermentor
### Vessel Application

<table>
<thead>
<tr>
<th>Application</th>
<th>Vessel</th>
<th>FS-V-A series</th>
<th>FS-V-B series</th>
<th>FS-V-C series</th>
<th>FS-V-B series</th>
<th>FS-V-D series</th>
<th>FS-V-SA05P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mammalian Cell Culture</td>
<td>Double Jacketed Dish Bottom Vessel</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Aerobic Microorganism Culture (Note 1)</td>
<td>Single Wall Dish Bottom Vessel</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Micro-aerobic Microorganism Culture (Note 2)</td>
<td>Air Lifter Vessel</td>
<td>○</td>
<td>●</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Anaerobic Microorganism Culture (Note 3)</td>
<td>Single Wall Dish Bottom Vessel with Heating Blanket</td>
<td>○</td>
<td>●</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Fragile Cell Culture (Note 4)</td>
<td>Single Wall Plain Dish Bottom Vessel with Heating Base Unit</td>
<td>○</td>
<td>●</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>Photosynthesis Cell Culture (Note 5)</td>
<td>Solid State / Semi-solid State</td>
<td>○</td>
<td>●</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

- ●: Excellent
- ○: Good
- □: Not recommended

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)

### Optional Devices and Accessories

#### pH Probe

- DO Probe
- Temperature Probe
- ORP Probe
- Cell Density Probe

#### Methane Off Gas Analyzer

- Gas Mixing Station
- CO₂ / O₂ Off Gas Analyzer
- Brushless Motor
- Mass Flow Controller

#### Consumable Kit

- 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

#### Other Optional Devices:

- Antifoam Probe
- Impellers
  - Rushton 6 Blade Impeller
  - Pitched Blade Impeller
  - Foam Breaker Impeller
  - Broken Type Impeller (5L only)
  - Anchor Type Impeller (5L only)
  - Spiral Type Impeller (5L 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 Double Jacket 5 Liter Vessel Cover In Sterilization

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