Dry Heating System with Single Wall Dish Bottom Vessel and Heating Blanket

Description

This system is designed to cover a wide range of applications such as microbial and cell culture. Based on the cell types, customers are able to choose between different impellers and motor speeds. The blanket heating method provides a precise and sophisticated temperature control. Similar to other systems, a controlled fermentation process can be easily done using the manual or automatic mode from touch screen interface. Compared to pricy SIP systems, we offer large vessel volumes (15 and 20 liter) as an economical and alternative option for your scale-up process. The FS series gives you a high yield, great reproducibility and performance of your fermentation process.

Features

- Large culture volume (15 and 20 liter) to facilitate your scale-up process
- Interchangeable impeller options provide flexibility and high yields for different cell types
- Colorful touch screen and Graphical user interface for easy operation
- Real-time trend data recording ensures best fermentation performance
- 2-stage DO cascade for precise DO(Dissolved oxygen) level control
- Ethernet remote control ability allows you navigate and operate your fermentation process from desktop
- No additional software required
- Low voltage DC brushless motor
- Quick connectors for easy operation
- 4 built-in assignable and programmable peristaltic pumps for automatic pH, Antifoam and Feeding control
- Full accessories are offered as a standard package

Application:
Ideal for aerobic and anaerobic microbial (Bacteria, Yeast), temperature sensitive and shear-force sensitive (Mammalian, Insect) cell culture.

Dry Heating System with Single Wall Dish Bottom Vessel and Heating Blanket includes:

<table>
<thead>
<tr>
<th>Controller</th>
<th>Dry Heating System Controller</th>
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</thead>
<tbody>
<tr>
<td>Vessel</td>
<td>Single wall dish bottom vessel with heating blanket (includes glass body, head plate, T handing bar, 2 probe adaptors)</td>
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<tr>
<td></td>
<td>3 pcs of adjustable Ruston-type impeller</td>
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<tr>
<td></td>
<td>Baffle assembly</td>
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<td></td>
<td>Condenser assembly</td>
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<tr>
<td></td>
<td>Air sparger</td>
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<tr>
<td>Motor</td>
<td>Agitation Motor</td>
</tr>
<tr>
<td>Probes</td>
<td>1x pH probe and 1x pH cable</td>
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<tr>
<td></td>
<td>1x DO probe and 1x DO cable</td>
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<tr>
<td></td>
<td>1x Temperature probe and 1x Temperature cable</td>
</tr>
<tr>
<td></td>
<td>1x Foam/Level Sensor and 1x Foam/Level Sensor cable</td>
</tr>
<tr>
<td>Start-up Kit</td>
<td>Please see Page 43</td>
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</tbody>
</table>
### Dry Heating System with Single Wall Dish Bottom Vessel and Heating Blanket

#### Specification

<table>
<thead>
<tr>
<th>Vessel</th>
<th>Working volume (Liter)</th>
<th>3L</th>
<th>5L</th>
<th>7L</th>
<th>10L</th>
<th>15L</th>
<th>20L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total volume (Liter)</td>
<td></td>
<td>3.8</td>
<td>6.8</td>
<td>8.9</td>
<td>12.5</td>
<td>18</td>
<td>24.4</td>
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</tbody>
</table>

- Material: Borosilicate glass / 316L stainless steel for headplate and all fittings
- Control panel: 10.4" Color Touch-screen Interface
- Communication port: Remote control through Ethernet (SCADA)
- Program storage: Up to 59,994 process programs
- Log data storage: Up to 10 process monitoring data files
- Cabinet material: ABS front panel and painted iron housing
- Dimension: Footprint: W x D = 400 x 500 mm (15.75" x 19.69")
- Rated voltage: 110V or 220V ; 50/60 Hz

#### Aeration

- Inlet gas flow-meter: 0, 1 – 10 LPM | 0, 2 – 20 LPM | 0, 4 – 50 LPM
- Baffle: Orifice ring
- Heating: Heating blanket
- Cooling: Cooling coil
- Range: 5°C (41°F) above coolant up to 60°C (140°F)
- Resolution: 0.1°C
- Probe: Platinum RTD probe (Pt 100)
- Control mode: Programmable 15 steps PID control
- Drive: Removable top brushless motor

#### Temperature

- Speed range: Two agitation motor types:
  a. For fermentation and cell culture: 30 – 1200 rpm
  b. For shear-force sensitive cell culture line: 5 - 300 rpm (optional)
- Resolution: 1 rpm
- Impeller:
  a. For fermentation: 3 pcs of adjustable Rushton-type impeller
  b. For shear-force sensitive cell culture: 2 pcs of adjustable Pitched-bladeimpeller (optional)
- Control mode: Programmable 15 steps PID control

#### pH

- Range: 2 - 14pH
- Resolution: 0.01 pH
- Probe: Gel-filled electrode; Autoclavable
- Control mode: PID, One point control with adjustable head band

#### DO

- Range: 0 – 200%
- Resolution: 0.1%
- Probe: Polarographic DO sensor; Autoclavable
- Control mode:
  a. Increase or decrease agitation speed
  b. Oxygen enrichment module (optional)
  c. Start substrate feeding program

#### ORP

- Measurement range: +/- 2000 mV
- Resolution: 1 mV
- Probe: Gel-filled electrode; Autoclavable (optional)

#### Foam

- Probe: 316L stainless steel with insulated teflon tube; On/Off control

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## Ordering Information

<table>
<thead>
<tr>
<th>Cat. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS-02-B03P-110/220V</td>
<td>Complete Dry Heating Fermentation System for 3L Single Wall Dish Bottom Vessel, 110V/220V</td>
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<tr>
<td>FS-02-B05P-110/220V</td>
<td>Complete Dry Heating Fermentation System for 5L Single Wall Dish Bottom Vessel, 110V/220V</td>
</tr>
<tr>
<td>FS-02-B07P-110/220V</td>
<td>Complete Dry Heating Fermentation System for 7L Single Wall Dish Bottom Vessel, 110V/220V</td>
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<tr>
<td>FS-02-B10P-110/220V</td>
<td>Complete Dry Heating Fermentation System for 10L Single Wall Dish Bottom Vessel, 110V/220V</td>
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<tr>
<td>FS-02-B15P-110/220V</td>
<td>Complete Dry Heating Fermentation System for 15L Single Wall Dish Bottom Vessel, 110V/220V</td>
</tr>
<tr>
<td>FS-02-B20P-110/220V</td>
<td>Complete Dry Heating Fermentation System for 20L Single Wall Dish Bottom Vessel, 110V/220V</td>
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</tbody>
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### Controller (includes Dry Heating System Controller, Built-in rotameter and 4x built-in pump head)

- FS-02-110/220V: Winpact Dry Heating System Controller, 110V/220V

### Vessels (includes Single wall dish bottom vessel with heating blanket, 3 pcs of adjustable Ruston-type impeller, Baffle assembly and Air sparger)

- FS-V-B03: 3L Single Wall Dish Bottom Vessel
- FS-V-B05: 5L Single Wall Dish Bottom Vessel
- FS-V-B07: 7L Single Wall Dish Bottom Vessel
- FS-V-B10: 10L Single Wall Dish Bottom Vessel
- FS-V-B15: 15L Single Wall Dish Bottom Vessel
- FS-V-B20: 20L Single Wall Dish Bottom Vessel

### External Heating Device

- FS-H103-110 / 220: Heating Blanket for 3L Single Wall Dish Bottom Vessel
- FS-H105-110 / 220: Heating Blanket for 5L Single Wall Dish Bottom Vessel
- FS-H107-110 / 220: Heating Blanket for 7L Single Wall Dish Bottom Vessel
- FS-H110-110 / 220: Heating Blanket for 10L Single Wall Dish Bottom Vessel
- FS-H115-110 / 220: Heating Blanket for 15L Single Wall Dish Bottom Vessel
- FS-H120-110 / 220: Heating Blanket for 20L Single Wall Dish Bottom Vessel

### Optional item

- FS-O-ORP-101: ORP monitoring kit, includes 120mm ORP probe, ORP probe cable, probe adaptor
- FS-O-ORP-102: ORP monitoring kit, includes 225mm ORP probe, ORP probe cable, probe adaptor
- FS-O-ORP-103: ORP monitoring kit, includes 325mm ORP probe, ORP probe cable, probe adaptor
- FS-O-ORP-104: ORP monitoring kit, includes 425mm ORP probe, ORP probe cable, probe adaptor
- FS-O-M3: Agitation Motor, 5-300rpm for 3, 5, 7, 10L Vessel
- FS-O-M4: Agitation Motor, 5-300rpm for 15, 20L Vessel
- FS-O-OE: Ox Enrichment Module, includes Oxygen Enrichment Valve and Adjustable Flow Meter