



## Dry Heating System with Single Wall Plain Bottom Vessel and Heating Base Unit

The single wall plain bottom vessel is an ideal instrument for your routine culture or educational purposes. Durable stainless steel supporting rods and bottom plate are designed to withstand heavy usage. Fast cooling/heating is achieved through the inner cooling coil and heating base unit. This vessel can be an excellent tool for microbial culture. Different optional devices such as ORP and O<sub>2</sub> enrichment are also available upon request. The controller part also provides manual/programmable modes for easy operation. Full accessories are offered as a standard package to help the user easily set up the fermentation process.



### Features

- **Durable vessel** design for routine and heavy duty jobs
- **Color 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 pump** for automatic pH, antifoam and feeding control
- **Wider temperature control range**, up to 90°C (194°F)
- **Automatic process** allows you to set up your 15 steps programmable control
- **Manual process** allows you to run individual parameters independently
- **Large inoculation port** for easy access
- **Full accessories** are offered as a standard package

### Application:

Ideal for aerobic and anaerobic microbial cultures such as bacteria and yeast.

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## INNOVATIVE CULTIVATION SOLUTIONS

Dry Heating System with Single Wall Plain Bottom Vessel and Heating Base Unit includes:

Controller	Dry Heating System Controller
	Built-in rotameter
	4x built-in pump head
Vessel	Single wall plain bottom vessel (includes glass body, head plate, T handling bar, 2 probe adaptors)
	3 adjustable Rushton-type impellers
	Baffle assembly
	Condenser assembly
Motor	Agitation Motor
Probes	1x pH probe and 1x pH cable
	1x DO probe and 1x DO cable
	1x Temperature probe and 1x Temperature cable
	1x Foam/Level Sensor and 1x Foam/Level Sensor cable
Start-up Kit	Please see page 51



## Dry Heating System with Single Wall Plain Bottom Vessel and Heating Base Unit

### Specification

Vessel	Working volume(Liter)	3L	5L	7L	10L
	Total volume(Liter)	3.7	6.5	9.1	13
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings			
Control unit	Control panel	10.4" Colorful touch-screen interface			
	Communication port	Remote control through Ethernet Data export through USB port RS-485 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 D = 400 x 500 mm (15.75" x 19.69") Height = 740 mm (29.13")			
	Rated voltage	110V~/220V~ ; 50-60Hz			
	Aeration	Inlet gas flow-meter	0, 1 - 10 LPM		0, 2 - 20 LPM
Sparger		Orifice ring			
Baffle		Removable 316L stainless steel baffles			
Temperature	Heating	Bottom heating plate (Base unit)			
	Cooling	cooling coil			
	Range	5°C (41°F) above coolant up to 90°C (140°F)			
	Resolution	0.1°C			
	Probe	Platinum RTD probe (Pt 100)			
	Control mode	Programmable 15 steps PID control			
Agitation	Drive	Removable top brushless motor			
	Speed range	Two agitation speed ranges: For fermentation and cell culture: 30-700 rpm (10L) 30-1200rpm (3~7L)			
	Resolution	1 rpm increment			
	Impeller	3 adjustable Rushton-type impeller (optional)			
	Control mode	Programmable 15 steps PID control			
pH	Range	2 -14 pH			
	Resolution	0.01 pH			
	Probe	Gel-filled electrode; Autoclavable			
	Control mode	Programmable 15 steps PID control			
DO	Range	0 - 200%			
	Resolution	0.1%			
	Probe	Polarographic DO sensor; Autoclavable			
	Control mode	2-stage DO cascade response: a. Increase or decrease agitation speed b. Oxygen enrichment module (optional) c. Gas Mixing Station module (optional) Substrate feeding Strategy			
	Measurement range	-/+ 2000 mV			
ORP (optional)	Resolution	1 mV			
	Probe	Gel-filled electrode; Autoclavable			
Foam	Probe	316L stainless steel protector with insulated teflon tube; On/Off control			
Peristaltic pump	Pump number	4 built-in pumps; one external pump (optional)			

Peristaltic pump	Motor type	Precise stepping motor; minimum speed is 1 rpm
	Speed range	0 - 65 rpm
	Resolution	1 rpm
	Control mode	Programmable 15 step feeding control; Pump can be assigned for Acid, Base, Antifoam and Substrate
Exhaust	Device type	316L stainless steel condenser

Utility requirement	Power source	100-120V~50-60Hz or 210-230V~50-60Hz with electrical safety cutoff switch
	Water source	2 Bar maximum (29 psi); water supplied to fermenter must be at least 15°C below set point operating temperature
	Air source	1 Bar maximum, must be dry, oil-free and filtered For 3-5L, minimum pressure 0.1499 kg/cm <sup>2</sup> and air flow rate 60L/min For 7-10L, minimum pressure 7.0 kg/cm <sup>2</sup> and air flow rate 120L/min
	Sterilization	Autoclave; size of autoclave inner chamber must be able to accommodate vessel with attached condenser

### Ordering Information

Cat. No.	Description
FS-02-D03P-110/ 220V	Complete Dry Heating Fermentation System for 3L Single Wall Plain Bottom Vessel, 110V/ 220V
FS-02-D05P-110/ 220V	Complete Dry Heating Fermentation System for 5L Single Wall Plain Bottom Vessel, 110V/ 220V
FS-02-D07P-110/ 220V	Complete Dry Heating Fermentation System for 7L Single Wall Plain Bottom Vessel, 110V/ 220V
FS-02-D10P-110/ 220V	Complete Dry Heating Fermentation System for 10L Single Wall Plain Bottom Vessel, 110V/ 220V

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 plain bottom vessel, 3 adjustable Rushton-type impellers, Baffle assembly, Condenser assembly and Air sparger)	
FS-V-D03	3L Single Wall Plain Bottom Vessel
FS-V-D05	5L Single Wall Plain Bottom Vessel
FS-V-D07	7L Single Wall Plain Bottom Vessel
FS-V-D10	10L Single Wall Plain Bottom Vessel
External Heating device	
FS-H2-110	Heating Base Unit for Single Wall Plain Bottom Vessel, 110V
FS-H2-220	Heating Base Unit for Single Wall Plain Bottom Vessel, 220V
Optional item :See page 40 ~ 50	