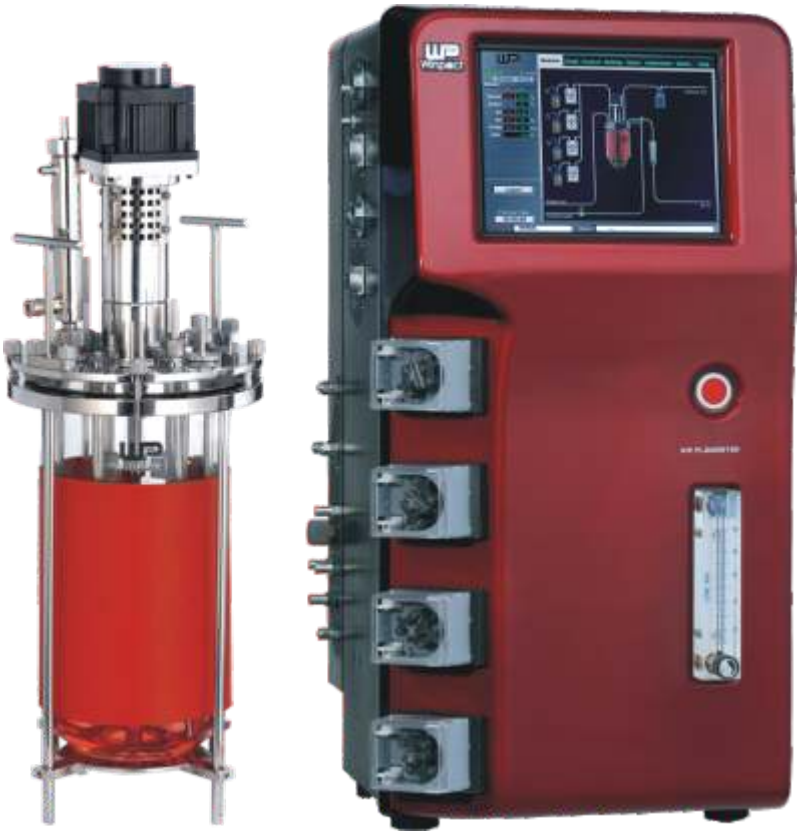
Dry Heating System with Single Wall Dish Bottom Vessel and Heating Blanket

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.

INNOVATIVE CULTIVATION SOLUTIONS

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

Controller	Dry Heating System Controller
	Built-in rotameter
	4x built-in pump head
Vessel	Single wall dish bottom vessel with heating blanket (includes glass body, head plate, T handing bar, 2 probe adaptors)
	3 pcs of adjustable Ruston-type impeller
	Baffle assembly
	Condenser assembly
	Air sparger
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 43

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

Specification

Vessel	Working volume(Liter)	**3L**	**5L**	**7L**	**10L**	**15L**	**20L**
	Total volume(Liter)	3.8	6.8	8.9	12.5	18	24.4
	Material	Borosilicate glass / 316L stainless steel for headplate and all fittings					
Control unit	Control panel	10.4” Color Touch-screen Interface					
	Communication port	Remote control through Ethernet (SCADA) Data export through USB port RS-485 port for system extension					
	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”) Height = 740 mm (29.13”)					
	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	
	Sparger	Orifice ring					
	Baffle	Removable 316L stainless steel baffles					
Temperature	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					
Agitation	Drive	Removable top brushless motor					
	Speed range	Two agitation motor types: a. For fermentation and cell culture: 30 – 1200 rpm b. For extremely shear-force sensitive cell line: 5 – 300 rpm **(optional)**					
	Resolution	1 rpm					
	Impeller	Two impeller types: a. For fermentation: 3 pcs of adjustable Rushton-type impeller b. For shear-force sensitive cell culture: 2 pcs of adjustable Pitched-blade impeller **(optional)** Note: Customized impellers are available					
	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	Cascade function to response to 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					

Peristaltic pump	Pump number	4 built-in pumps; One external pump **(optional, RS-485 interface with relay output**
	Motor type	Precise stepping motor; minimum speed is 1 rpm
	Speed range	0 – 65 rpm
	Resolution	1 rpm
	Control mode	a. Programmable 15 steps feeding control; b. Pump can be assigned for Acid, Base, Antifoam and Substrate
Exhaust	Device type	316L stainless steel condenser
Utility requirement	Power supply	100-120V 50/60Hz or 210-230V 50/60Hz with electrical safety cutoff switch
	Water	2 Bar maximum (29 psi)
	Air	1 Bar maximum, must be dry, oil-free and filtered (14.5 psi)
	Autoclave	For sterilization

Ordering Information

Cat. No.	Description
FS-02-B03P-110/ 220V	Complete Dry Heating Fermentation System for 3L Single Wall Dish Bottom Vessel, 110V/ 220V
FS-02-B05P-110/ 220V	Complete Dry Heating Fermentation System for 5L Single Wall Dish Bottom Vessel, 110V/ 220V
FS-02-B07P-110/ 220V	Complete Dry Heating Fermentation System for 7L Single Wall Dish Bottom Vessel, 110V/ 220V
FS-02-B10P-110/ 220V	Complete Dry Heating Fermentation System for 10L Single Wall Dish Bottom Vessel, 110V/ 220V
FS-02-B15P-110/ 220V	Complete Dry Heating Fermentation System for 15L Single Wall Dish Bottom Vessel, 110V/ 220V
FS-02-B20P-110/ 220V	Complete Dry Heating Fermentation System for 20L Single Wall Dish 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 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	O_2 Enrichment Module, includes Oxygen Enrichment Valve and Adjustable Flow Meter

pH probe

Description

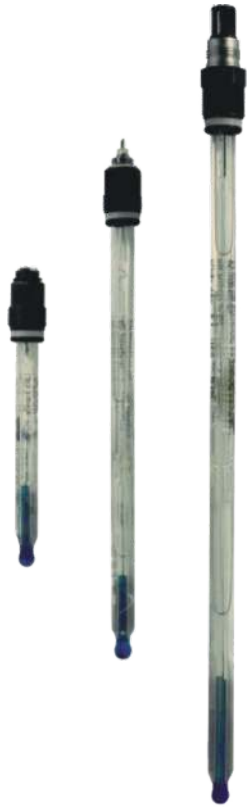
The glass body pH electrode is designed for improved performance. The automated manufacturing process results in better repeatability and increases reliability of these electrodes in bioprocess applications such as cell culture and fermentation.

Features

- Fast response
- Highly repeatable
- Proven reliability
- High resolution
- Suitable for autoclave, SIP and CIP

Specification

pH	0 - 14 (2 - 12 for maximum precision)
Temperature	0 - 135°C (275°F)
Resolution of pH	0.01
Pressure	6 bar maximum
Shaft Diameter	12 mm
Connection	Pg 13.5
Temperature Compensation	Integral Pt100 (VP model)



Ordering Information

Cat. No.	Description
FS-A-PPH00	pH Probe Cable, 6ft.
FS-A-PPH01	120mm pH Probe
FS-A-PPH02	225mm pH Probe
FS-A-PPH03	325mm pH Probe
FS-A-PPH04	425mm pH Probe

DO probe

Description

The re-buildable dissolved oxygen sensors is designed for superior performance. The semi-automated manufacturing process results in repeatability and improves reliability of these sensors in bioprocess applications such as cell culture and fermentation.

Features

- Fast response
- Highly repeatable
- Proven reliability
- High resolution
- Suitable for autoclave, SIP and CIP

Specification

Measurement	Polarographic
Dissolved Oxygen	0.1 - 200% air saturation 10 ppb to saturation
Temperature	0 - 135°C (275°F)
Resolution	0.1%
Pressure	4 bar maximum
Temperature Compensation	22 kohm thermistor
Wetted Materials	316L S.S.
Shaft Diameter	12mm
Surface Finish	Ra 12 (electro-polish)

Ordering Information

Cat. No.	Description
FS-A-PDO00	DO Probe Cable, 6ft., D4 Type
FS-A-PDO01	120mm DO Probe
FS-A-PDO02	225mm DO Probe
FS-A-PDO03	325mm DO Probe
FS-A-PDO04	425mm DO Probe

Temperature probe

Description

This temperature probe will be put in a stainless steel tube to detect the vessel temperature through the surrounding liquid, like water. It can be used in all kinds of fermentation situation.

Features

- High accuracy Pt100 sensors - Platinum resistance thermometers (PRTs)
- Customized length - we offer the most suitable probe lengths for different vessel sizes.
- Highly repeatable
- Proven reliability

Specification

Housing Material	316L stainless steel
Accuracy	+/- 0.2°C
Resolution	0.1°C

Ordering Information

Cat. No.	Description
FS-A-PPT00	Temperature Probe Cable
FS-A-PPT02	250mm Temperature Probe
FS-A-PPT03	350mm Temperature Probe
FS-A-PPT05	550mm Temperature Probe

Antifoam probe

Description

The antifoam probe can be equipped with our controllers and all kinds of vessels. The presence of foam in the reactor vessel is detected by measurement of the electrical conductivity, and then the controller will pump some defoamer to clean the foam to ensure the experiment goes well.

Features

- Height can be adjusted
- Made up with stainless steel tips and Teflon body
- Highly repeatable
- Proven reliability

Specification

Housing Material	Stainless steel tips and Teflon body
Sensitivity	Adjustable

Ordering Information

Cat. No.	Description
FS-A-PLV00	Foam/Level Sensor Cable
FS-A-PLV01	Foam/Level Sensor

Brushless motor

Description

The brushless motor can be equipped with our different fermentation controllers to avoid adding carbon powder. The lower voltage design also provides higher safety concerns to the operators.

Features

- Low noise
- Low vibration
- Proper torque
- Smooth run
- Long life time

Specification

Motor Type	24V DC Brushless motor
Connection with vessel	Quick connector, no tools required

Ordering Information

Cat. No.	Description
FS-M1	Agitation Motor, 30-1200rpm for 3, 5, 7 ,10L Vessel (Standard)
FS-M2	Agitation Motor, 30-1200rpm for 15, 20L Vessel (Standard)
FS-O-M3	Agitation Motor, 5-300rpm for 3, 5, 7 ,10L Vessel (Optional)
FS-O-M4	Agitation Motor, 5-300rpm for 15, 20L Vessel (Optional)

Impeller

Description

We offer two modes of impeller, the rushton 6-blade impeller and the pitched blade impeller. We are also capable to deliver the customized impellers.

Features

■ Rushton 6-Blade Impeller

1. Available for the agitator assemblies, both lipseal and magnetically coupled types
2. Fits onto the standard 8 mm diameter shaft
3. M3 x 5 mm hex set-screw

■ Pitched Blade Impeller

1. More efficient than flat blade impeller
2. Flow is discharged both axially and radially depending on the angle

Ordering Information

Cat. No.	Description
FS-A-IM103	Rushton 6-Blade Impeller for 3 Liter Vessel, 3 ea/pk
FS-A-IM105	Rushton 6-Blade Impeller for 5 Liter Vessel, 3 ea/pk
FS-A-IM107	Rushton 6-Blade Impeller for 7 Liter Vessel, 3 ea/pk
FS-A-IM110	Rushton 6-Blade Impeller for 10 Liter Vessel, 3 ea/pk
FS-A-IM115	Rushton 6-Blade Impeller for 15 Liter Vessel, 3 ea/pk
FS-A-IM120	Rushton 6-Blade Impeller for 20 Liter Vessel, 3 ea/pk

Rushton 6-Blade Impeller

Cat. No.	Description
FS-A-IM203	Pitched Blade Impeller for 3 Liter Vessel, 2 ea/pk
FS-A-IM205	Pitched Blade Impeller for 5 Liter Vessel, 2 ea/pk
FS-A-IM207	Pitched Blade Impeller for 7 Liter Vessel, 2 ea/pk
FS-A-IM210	Pitched Blade Impeller for 10 Liter Vessel, 2 ea/pk
FS-A-IM215	Pitched Blade Impeller for 15 Liter Vessel, 2 ea/pk
FS-A-IM220	Pitched Blade Impeller for 20 Liter Vessel, 2 ea/pk

Pitched Blade Impeller

ORP probe

Description

The ORP probe with gel-type or liquid-type electrolyte or solid polymer reference system, all with open junction, obviate the need to pressurize the electrode through the housing. The gel electrode is pre-pressurized and the polymer reference system is (process) pressure-resistant. These types of electrode cannot be refilled and therefore require reduced maintenance.

It is widely used for routine measurements, particularly in applications involving media with a high fouling potential. Many models enable temperature-compensated measurements and enhanced sensor diagnostics.

Features

- Longer lifetime: Open junction design instead of fine-pore ceramic diaphragm(s), as the junction is less likely to clog. Ideal for applications in media with high contaminating potential, such as emulsions, suspensions etc..
- Patented silver-ion trap: Patented silver-ion trap in certain models, for use in solutions with strong sulfide content.
- Better process control: Through models with temperature compensation feature (RTD).
- Versions with higher temperature resistance: Suitable for sterilization, autoclaving and CIP procedures.

Ordering Information

Cat. No.	Description
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

Accessories	
FS-A-PORP01	120mm ORP Probe, Measurement Range from -2000~2000mV
FS-A-PORP02	225mm ORP Probe, Measurement Range from -2000~2000mV
FS-A-PORP03	325mm ORP Probe, Measurement Range from -2000~2000mV
FS-A-PORP04	425mm ORP Probe, Measurement Range from -2000~2000mV

External Pump

Description

MU-D digital controlled peristaltic pump series is not only an ideal instrument for a variety of applications, but also a designed device as the external pump for the Winpact product portfolio.

MU-D series is capable to connect with the Winpact system and to be controlled from the Winpact system.

The easy-to-use pump design allows for several different silicon tubing sizes to be fitted. This gives the user a wider variety of flow rates. The MU-D series is also reversible providing better convenience and flexibility to the user. The digital control provides high accurate speed performance.

Features

- Microprocessor controller
- Compact size
- Easy load pump head
- Wide applications
- Reversible for purging

Specification

Peristaltic pump	MU-D01	MU-D02
Rpm	20-300rpm	5-600rpm
Motor size	50W	100W
Motor type	DC Brushless motor	
Number of rollers	3	
Variable flow rate	1.2 ~1,140ml/min	0.3 ~2,280ml/min
Operating temperature	Ambient to 40°C (104°F)	
Unit material	Painted iron metal	
Unit dimension	200 x 340 x 130mm (W x L x H)	
Rated voltages	110V / 220V selectable	100~240V
Weight	approx. 5.6kg	

Ordering Information

Cat. No.	Description
MU-D01	MU-D01 Peristaltic Pump, 110V / 220V
MU-D02	MU-D02 Peristaltic Pump, 100V~ 240V

Accessories	
MU-S13	Silicon tube I.D. 1/32” (0.8 mm), 25 ft (7.6 m)
MU-S14	Silicon tube I.D. 1/16” (1.6 mm), 25 ft (7.6 m)
MU-S16	Silicon tube I.D. 1/8” (3.1 mm), 25 ft (7.6 m)
MU-S25	Silicon tube I.D. 3/16” (4.8 mm), 25 ft (7.6 m)
MU-S17	Silicon tube I.D. 1/4” (6.4 mm), 25 ft (7.6 m)
MU-S18	Silicon tube I.D. 3/8” (9.5 mm), 25 ft (7.6 m)

Cat. No. :MU-D01

Cat. No. :MU-D02

O_2 Enrichment Module

Description

The O_2 enrichment module is an optional device for aerobic fermentation process. It enables the Winpact system to provide the environment for higher oxygen required cells and high cell density fermentation process.

Features

- Aerobic environment maintenance
- Designed for high oxygen required cells and high cell density
- Precisely control DO level

Ordering Information

Cat. No.	Description
FS-O-OE	O_2 Enrichment Module, includes Oxygen Enrichment Valve and Adjustable Flow Meter

Consumable Parts

Ordering Information

Cat. No	Description
FS-A-SK	Winpact Fermentation System Start-up Kit,
	Includes 4 x 250 ml Glass Feeding Bottles, 1 x 500 ml Glass Feeding Bottle, 10 x 45 mm 0.2 µm Autoclavable Disc Type Filters, 15 x Connecting Tubes, 20 x Silicon Tubing Clamps, 25 ft of 1/8 inch (3.1 mm) Silicon Tube, 1 x Handy Burner, 1 x 2 mm Hex Wrench , and 1 x 12 mm & 14 mm Double Open-end Wrench
FS-A-SK01	250 ml Glass Feeding Bottle, Includes Two Stainless Steel Connecting Ports
FS-A-SK02	500 ml Glass Feeding Bottle, Includes Two Stainless Steel Connecting Ports
FS-A-SK03	45 mm, 0. 2 µm Autoclavable Disc Filter, 10 ea/pk
FS-A-SK04	50 mm, 4.5 mm (L) Stainless Steel Connecting Tube, 15 ea/pk
FS-A-SK05	Handy Burner
FS-A-SK06	Silicon Tubing Clamp, 20 ea/pk
FS-A-SK07	2 mm Hex Wrench
FS-A-SK08	12 mm & 14 mm Double Open-end Wrench
MU-S13	Silicon tube, I.D. 1/32"(0.8 mm) 25 ft (7.6 m)
MU-S14	Silicon tube, I.D. 1/16"(1.6 mm)25 ft (7.6 m)
MU-S16	Silicon tube, I.D. 1/8"(3.1 mm) 25 ft (7.6 m)
MU-S25	Silicon tube, I.D. 3/16" (4.8 mm) 25ft (7.6 m)
MU-S17	Silicon tube, I.D. 1/4" (6.4 mm)25 ft (7.6 m)
MU-S18	Silicon tube, I.D. 5/16"(7.9 mm) 25 ft (7.6 m)

Silicon Tube and Typical Rate

Cat. No.	MU-S13	MU-S14	MU-S16	MU-S25	MU-S17	MU-S18
Inside diameter in. (mm)	0.03 (0.8)	0.06 (1.6)	0.12 (3.1)	0.19 (4.8)	0.25 (6.4)	0.31 (7.9)
Hose barb size in. (mm)	1/16 (1.6)	1/16 (1.6)	1/8 (3.2)	3/16 (4.8)	1/4 (6.4)	3/8 (9.5)
Flow range with 6 to 600 rpm drive mL/min	0.36 to 36	1.3 to 130	4.8 to 480	10 to 1000	17 to 1700	23 to 2300
Maximum pressure, continuous	25 psig (1.7 bar)			20 psig (1.4 bar)	15 psig (1.0 bar)	10 psig (0.7 bar)
Maximum pressure, intermittent	40 psig (2.7 bar)			35 psig (2.4 bar)	20 psig (1.4 bar)	15 psig (1.0 bar)
Maximum vacuum	26" Hg (660 mm Hg)				20" Hg (510 mm Hg)	
Suction lift	29 ft H_2O (8.8 m H_2O)				22 ft H_2O (6.7 m H_2O)	

Winpact

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