

# Lab Scale Fermentor

-----Lab Fermentor (1.5L~10L)

Silver Double Limited manufactures various equipment related to bio-process for biotechnology, biochemical, pharmaceutical, agricultural, environment, life science industry. Especially, SiDoLim's high performance of bioreactor system is applicable for both research and industrial bio-processing facilities.

The SiDoLim bioreactor is a price compatible lab scale fermentation system for microorganisms which has functions of temperature control, air supply, agitation, pH measuring and control.

The 1.5 to 10 liters single-wall-glass type vessel can be applied to SiDoLim bioreactor. The temperature is controlled by the heater plate, which is located at the bottom of the vessel. The digital PID controlled 200 Watt heater and two air cooling fans are located beneath the heater plate that accurate temperature control is realized. Furthermore, a solenoid valve controls the flow rate of the cold finger, which is attached at the head plate that precise temperature control is possible even for the exothermic reaction. Cold water can be feed to the condenser that media loss by the evaporation can be protected.

The 60 Watt (100Watt is optional) DC servo motor gives wide agitation speed control ranges. The agitation motor is installed at the top plate and double seal protect the contamination. Built-in diaphragm type air pump supplies oil-less air to the reactor. Digital microcomputer measure and control the pH value of the media with using a Mettler-Toledo pH probe for measuring and two Watson-Marlow peristaltic pumps for acid/base feeding. All the setting parameters and measured values are handled by PID series standalone type microcomputers and displayed by LCD displays. RS232C serial communication gives all the measured data to the computer or other instruments and analog outputs (0 to 5 Volts) are also supplied.

Furthermore, the DO and antifoam modules are also supplied that the Value-Plus can be extended to the full-scale fermentation system.

## Features and Benefits

- ◆ Price compatible lab scale fermentation system
- ◆ Easy operation & Space savings
- ◆ Digital controllers and one LCD displays
- ◆ Various size of vessels can be applied
- ◆ Top mounted DC servo motor gives wide agitation speed control ranges
- ◆ Built-in diaphragm type air pump protects the oil contamination by air supply
- ◆ Digital PID temperature controller gives the accurate and stable temperature condition of bioreactor
- ◆ pH value is digitally measured and controlled
- ◆ RS232-C and analog outputs for the temperature and pH value
- ◆ The DO meter and antifoam module are also supplied



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## Specifications

Vessel	Total Volume	3	5	7	10
	Working Vol.	2	3	5	7
	Head Plate	thermowell, aeration, sampling, spare ports pH, DO and foam probe ports 4 feeding ports and 2 general purpose ports			
	Vessel	Single wall bottom heating			
Aeration	Flow rate	0~5 LPM			
	Sparger	Removable ring sparger			
	Inlet Filter	0.2µm filter interchangeable			
	Air Pump	Diaphragm pump			
	Condenser	Water cooled condenser			
	Air flow meter	0~5LPM, vertical type			
Agitation	Servo Motor	Top drive DC motor 60W(100W option) Magnetic Hall sensor, PWM control			
	Impellers	2-rushton turbine impellers, 1 foam breaker			
	Indication	LCD display in 10 rpm increments			
Temperature Controller	Control range	3°C above ambient temperature to 80°C			
	Accuracy	±0.1 °C			
	Sensor	RTD(Pt-100)			
	Control Algorithm	PID			
	Heating	200 Watt heater			
	Cooling	Air fan and fin for air cooling and Solenoid valve for water cooling			
	Interface	RS232-C			
	Output Signal	0 to 5V analog signal for data recorder			
pH controller	Probe	Mettler-Toledo pH: 2.0~12.0			
	Calibration method	(4,7), (4,7,10), (7,10) and manual adjust			
	Measuring	pH 0.01 resolution			
	Control	Digital PWM, pH 0.1 accuracy			
	Peristaltic pump	2- Watson-Marlow 102R peristaltic pump			
DO controller	Set point Range	0~200%			
	Display Range	0~200%			
	Control Mode	PID			
	Resolution	0.1			
Accessory	4 reagent bottle, Reagent bottle holder				
Power	110~220Volt/50~60Hz				
Dimension	D×W×H(mm)	450×250×670			
Weight	Kg	100			



## Vessel Selection

### Single Vessel

Top Plate (pH, DO, anti-foam, Thermo well, Inoculation, Sampling 4 point feeding ports)

Ports Cap, Blade, Foam Breaker, Pyrex Glass condenser, Ring type Sparger, Removal Baffle Powerful DC Motor, Single Mechanical Seal, Pyrex Glass Vessel silicon Tube, Vessel Packing, cold Finger Heating Plate (Heater, Water in/out ports)



\* Please refer to the below for the specification/price according to volume & type of each item

\* Price depends on the type, but some of items have the same price regardless of type.

Catalog Number	Total Vol. (working Vol.)	Inner Dia. (mm)	Inner Height (mm)	Electrode Length (mm)	Min Vol. (L)	Impeller Diameter (mm)	D/P (%)	H:D
		D	H			P		
SL02	1.5L (1L)	110	150	120	0.3	60	55	1.3 :1
SL03	3L (2.5L)	130	220	120	0.5	60	45	1.7 :1
SL05	5L (3L)	145	300	225	1.5	60	42	1.2 :1
SL07	7L (5L)	170	310	225	3.2	72	45	1.7 :1
SL10	10L (7L)	190	355	320	6	80	42	1.8 :1

### Double Vessel

Pyrex Glass double Vessel Assembly with Vessel supporter Top Plate (pH, DO, Anti-foam, Thermo well, Inoculation, Sampling 4point feeding points). Ports, Blade, Foam Breaker Pyrex Glass Condenser, Ring type Sparger, Removal Baffle Powerful DC Motor, Seal, Pyrex Glass Vessel Silicon Tube, Vessel packing, Cold Finger Heating Plate (Heater, water in/out ports).



\* Double vessel doesn't need Heating Plate but Water bath for exclusive use.

Catalog Number	Total Vol. (working Vol.)	Inner Dia. (mm)	Inner Height (mm)	Electrode Length (mm)	Min Vol. (L)	Impeller Diameter (mm)	D/P (%)	H:D
		D	H			P		
DL02	1.5L (1L)	110	150	120	0.3	60	55	1.3 :1
DL03	3L (2.5L)	130	220	120	0.5	60	45	1.7 :1
DL05	5L (3L)	145	300	225	1.5	60	42	1.2 :1
DL07	7L (5L)	170	310	225	3.2	72	45	1.7 :1



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## Bowl Vessel

Pyrex glass single Vessel with BOWL type low plate Top Plate (pH, DO, Anti-foam, Thermo well, Inoculation, Sampling 4 point feeding ports SUS ports Cap, Blade, Foam Breaker Pyrex Glass Condenser, Ring type sparger, Removal Baffle Powerful DC Motor, Single Mechanical Seal, Pyrex Glass Vessel Silicon Tube, Quick coupling, Vessel Packing Heating Plate (Heater, Water in/out ports)



\* Single/Double vessel has the range up to 10L, impossible for the bigger volume to control the Temp with Cold Finger. Bowl vessel is excellent at freezing vessel because the bottom plate is made of round SUS

\* BOWL Vessel doesn't need Heating Plate but Water Bath for exclusive use

Catalog Number	Total Vol. (working Vol.)	Inner Dia. (mm)	Inner Height (mm)	Electrode Length (mm)	Min Vol. (L)	Impeller Diameter (mm)	D/P (%)
		D	H			P	
PL07	10L (7L)	190	355	320	6	80	42
PL07	14L (10L)	190	500	425	6	80	42



### Animal cell Vessel (Depth filter setting)

Mass cultivation of animal cells has intensively been investigated even though cell culture techniques have been developed for long times.

There have been several difficulties in maintaining large quantities of live cells, especially more than million of cells per m<sup>3</sup> in over five liter vessel. Fragility of animal cell, sophisticated culture conditions less economical feasibility of being scaled-up were major bottle necks in industrializing cell culture technologies to produce a large amount of pharmaceuticals, TPA, interferon, EPO and many other MAB.

