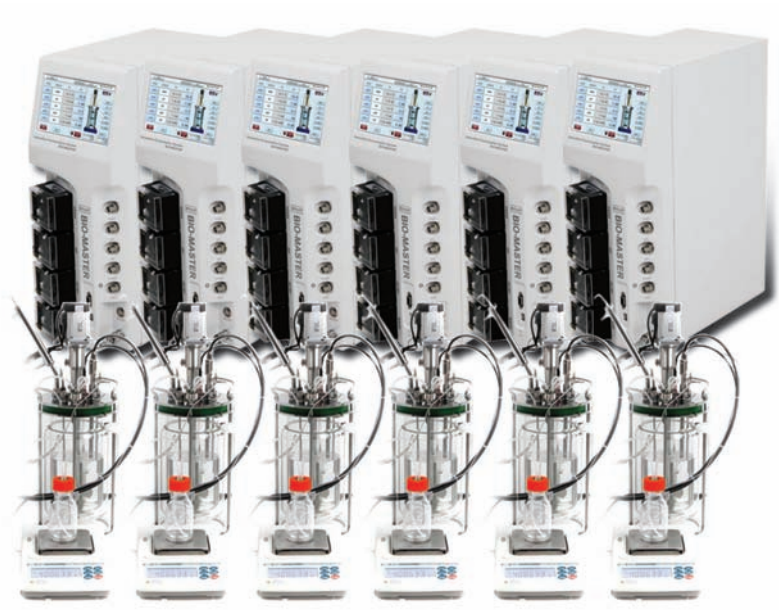
Multiple fermentation system

Bio Master Multi



Ciller

GasMixer

Gas Sensor

Pressure Sensor

EX Pump

MFC
(Mass Flow Control)

1. Easy to Calibrate Temperature, pH,DO,Foam Sensors in use of Main Control Screen
2. Easy control of external device by fermentation controlller
   (O_2/CO_2analyzer,gasmixer,Balancer,Level,External pump,Analog printer)
3. Operation method Touch Screen Controller and the easy way Compact design takes up only a small space, even a small laboratory space can be used efficiently.
4. Intelligent self diagnostic system to maintain fermantation process from start to the end(diagnostic,setup,dead band,offset, warning,feeding, temperature for each stage to the end of the fermentation process)
5. 500ml ~ 14L Total Vol. Vessel is available in a wide range.
6. Single Jacket / Double Jacket and can be used to select the drive motor.
7. Vessels can be easily disassembled and made the operation and the sensor and pump, analyzer, such as in / output is easy.
8. Eight ways microprocessor controller system using parallel communication software Data Logging, Remote Control, including integrated control.
9. Agitation, Temp, Ph, DO, ORP, O2, Antifoam, MFC, Feed Pump, GasMixer and additional parameters such as analog signals and can be controlled through a variety.
10. Feed function is linked to the DO Cascade and the culture of a variety of conditions that can be applied to the linked control program.
11. 4Gas Signals available to send control signals to directly 4gas controller from main control system.
12. One PC or one Multi board can monitor and manage all of data by network even each controller is scattered. (1ch~6ch)

specifications

Vessel	Type	Single & Double 500ml~14L Total Vol. STS316L Top Plate Vessel, Borosilicate glass Autoclavable pH, DO, Foam,Level,Pressure Probe, Addtion Ports, Exhaust Port, Baffles 316L,Condenser
Aeration	Flow rate	Rotameters : 0~5LPM
	Option	Mass Flow Controller / Mass Flow Manual
	Sparger	Standard : Ring Sparger/Micro Sparger
	Inlet Filter	0.2㎛ Disposable Hydrophobic Filter
Agitation	Drive	Direct Top Drive Servo Motor 200W~400W,BLDC Motor / Single Mechanical seal
	Range	10~1500rpm
	Impellers	Rushton Standard With Fermentation / Pitched Blade Standard With Cell Culture Marine Blade or Spin Filter
Temperature	Thermostat system	0~150℃ ±0.1℃ / pt100Ω Probe Heating&Cooling PID Control / Built-in Heat Exchanger / Automatic Cooling Water Valve
pH	Range / Sensor	0~14pH±0.01 / InPro 3030 / Mettler Toledo temperature range - 0 ~ 140'C, the maximum pressure - 6bar
DO	Range / Sensor	0 to 200%, accuracy 1% or 4ppb, 0.0 ~ 100.0% O2, maximum pressure - 12bar PID Control DO Cascade to Agitation, Mas Flow Control, Feeding Pump Control Polarographic Galvanic Oxygen Sensor -> Mettler Toledo
ORP	Range / Sensor	Measuring range - 1000 ~ -1000 mv, Temperature range - 0 ~ 140'C, the maximum, pressure - 2.5bar (Redox potential -> Oxidation of measurements) / Mettler Toledo
Anti Foam	Range / Sensor	Conductivity 0 ~ 300kΩ (Measuring the amount of foam)
OD (Optional)	Range / Sensor	Measuring range 0 ... 100 EBC 0 ... 100 EBC0 ... 400 FTU (Turbidity measurement)
MFM or MFC (Optional)	Range / Sensor	0~5 l/min (Air flow measurement) / MFC(FCM-0005AIH61AN1K)
O2, CO2 (Optional)	Range / Sensor	**Concentration ranges :** 1. CO2: 0 - 10 Vol.%, O2: 0.1 - 25 Vol.% 2. CO2: 0 - 25 Vol.%, O2: 0.1 - 25 Vol.% 3. CO2: 0 - 10 Vol.%, O2: 1 - 50 Vol.% 4. CO2: 0 - 25 Vol.%, O2: 1 - 50 Vol.% **Measuring principle** : IR(CO2), ZrO2 (O2) **Temperature inside of the sensor unit :** 580°C/1076°F (O2 sensor unit)
Feed Control Mode	Control	Fed-Batch Culture by DO,pH Interlock pump Control 4 x Built-in Feeding Pump(Watsom-Malow : England) External pump 2ea
Level Control (Optional)	Control	Electrode type Hi/Low Level control
Balancer (Optional)	Controll	9,999.99g / RS232C Measured by the amount of weight on the scale output

Accessory

Single Vessel

- Basic vessel for microorganism fermentation
- High-speed agitation by applying durable Tob Drive Motor
- Single glass type : Pyrex / Stainless 316
- Temperature control : Heater plate in underbody, coldfinger(from 3L) inside

Volume	Order No.	Description
Single 1.5L	101 0102	I.D 115mm, V.H 170mm, 1:1.5
Single 3L	101 0103	I.D 133mm, V.H 220mm, 1:1.7
Single 5L	101 0104	I.D 170mm, V.H 220mm, 1:1.3
Single 7L	101 0105	I.D 170mm, V.H 310mm, 1:1.8
Single 10	101 0106	I.D 190mm, V.H 355mm, 1:1.8

500ml Single Vessel

- Small vessel for microorganism fermentation
- High-speed agitation by applying durable Tob Drive Motor
- Single glass type : Pyrex / Stainless 316
- Temperature control: Heater plate in underbody
- Applied pH, DO, Inoculum port on side wall

Volume	Order No.	Description
Single 500ml	101 0101	I.D 85mm, V.H 120mm

Double Vessel

- Double glass type vessel
- Circulating water in double jacket for effective temperature control by large contact surface
- Connected to extra Water Bath for temperature control

Volume	Order No.	Description
Double 1.5L	101 0201	I.D 110mm, V.H 150mm, 1:1.3
Double 3L	101 0202	I.D 130mm, V.H 220mm, 1:1.7
Double 5L	101 0203	I.D 145mm, V.H 300mm, 1:1.2
Double 7L	101 0204	I.D 160mm, V.H 330mm, 1:1.7

Bowl Vessel

- Stainless Double Jacket in upper body, Single Glass in under body
- Circulating water in double jacket for effective temperature control by large contact surface
- Connected to extra Water Bath for temperature

Volume	Order No.	Description
Bowl 10L	101 0301	I.D 190mm, V.H 355mm, 1:1.8
Bowl 14L	101 0302	I.D 190mm, V.H 500mm, 1:2.6

Single Round Vessel

- Single round vessel: round type under body
- Temperature control: Glass surrounding heating blanket
- Usually applied in animal cell fermentation

Volume	Order No.	Description
Single Round 2L	101 0405	I.D 115mm
Single Round 3L	101 0402	I.D 133mm
Single Round 5L	101 0403	I.D 170mm
Single Round 7L	101 0404	I.D 170mm

PBR Single Vessel

- Single vessel type, LED Bar inside to make growth by exposing light into algae
- LED inside / flourscent jacke

Volume	Order No.	Description
Single 1.5L	101 0102	I.D 115mm, V.H 170mm, 1:1.5
Single 3L	101 0103	I.D 133mm, V.H 220mm, 1:1.7
Single 5L	101 0104	I.D 170mm, V.H 220mm, 1:1.3
Single 7L	101 0105	I.D 170mm, V.H 310mm, 1:1.8
Single 10	101 0106	I.D 190mm, V.H 355mm, 1:1.8

Rushton turbine impeller

- Rushton turbine impeller is located from middle to bottom and basically used to agitate liquid in vessel.
- It makes the flow to the same direction with turning radius and has features of paddle and propeller types to be available for high-speed rotation by minimizing resistance.
- General model to be used due to the highest ventilation efficiency

Foam Breaker

- Installed in upper side of inside shaft, used in bursting fermentation foam.
- It is not used in the case of animal cell fermentation since there is barely any foam.
- 1 ea / 1 vessel

Marine Impeller

- Applied to damageable cell
- It stirs liquid from down to up rotating in low-speed since it has the large surface of wings

Hollowed Paddle Impeller

- It stirs liquid from up to down rotating in low-speed since it has the large surface of wings.
- Extra additional it