

BR100-M1-15L Microbial Fermentation System

Technical Specifications

Prepared by Labfirst Scientific, October 2023

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1. General Information

Items Included	Control Console	BR100-M1
	Culture Vessel	15L Boro3.3 glass vessel with top mechanical stirring (25~75% working volume), SS316L cover
	Sensors	PT100, DO, foam, pH
	Feeding Pumps	4 peristaltic pump heads, controlled
	Gas Inlet	<ul style="list-style-type: none"> · Sparger from the bottom (Air +O2); · Air inlet controlled by rotameter (manually); · O2 inlet controlled by rotameter and electromagnetic valve
	Heating & Cooling	Heated by bottom electric hot plate; cooled by stainless steel cooling tube (chilled water)
	Accessories	4 supplement bottles, SS316L feeding needle, etc.
	Consumables	O-rings, fuses, silicone stoppers, inlet air filter, vent filter, 20m silicone tubing, etc.

Sensors Included	pH	Gel-filled pH electrode by Hamilton / Mettler Brand (steam sterilizable), with 1m electrode wire
	DO	Sterilizable probe by Hamilton / Mettler Brand, with 1 meter electrode wire
	Temperature	German made PT100 sensor, sterilizable
	Foam	Foam probe, made in China

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2. Specific Information

Functions Included	Temperature	<ul style="list-style-type: none"> · Robust PID algorithm; · Electrical-heating by SS316L electric hot plate at vessel bottom, chilled by tap or chilled water supply; · Sequential control coupled with fermentation process
	pH	<ul style="list-style-type: none"> · pH control coupled with peristaltic pump; · Manual pH control by peristaltic pump
	DO	<ul style="list-style-type: none"> · Cascade control, coupled with different parameters (agitation, gas inlet and peristaltic pump)
	Agitation	<ul style="list-style-type: none"> · Robust PID algorithm; · Manual speed control or speed control coupled with other parameters; · Agitation speed control coupled with other parameters (like DO)
	Foam	<ul style="list-style-type: none"> · Foam control coupled with peristaltic pump; (anti-foam); · Mechanical defoaming blade;
	Feeding (peristaltic pump)	<ul style="list-style-type: none"> · Accumulation volume control; · Manual control or control by plan (pre-set) curve; · Coupled with other parameters (DO, pH, etc)
	Fermentation Sequence	Pre-set fermentation sequences along with timeline (pH, DO, agitation, temperature, etc)
Others	<ul style="list-style-type: none"> · Historical data export and curves; · Fermentation/culture batch record; · Calibration of sensors and peristaltic pumps; · 3-level authority setting & control; · Record historical operations 	

2.1 Control Console

General Info	Model	BR100-M1
	Description	Desktop control console for microbial fermentation, 1 console for 1 vessel
	Dimension	380×500×730mm
	Net Weight	60 Kg
	Touch Screen	PLC based 10" touch screen
	Communication	USB (data export), Ethernet interface, RS485
	Electricity	208V-240V, 50-60Hz, single phase, 1.8 kW

Gas Inlet	Control	<ul style="list-style-type: none"> · Sparger from the bottom (Air +O₂); · Air inlet controlled by rotameter (manually); · O₂ inlet controlled by rotameter and electromagnetic valve
	Flow Rate	2 vvm
	Filtration	0.2 um
	Connection	8mm hose barb

Temperature	Range	8C above coolant to 40C above ambient (0-65C absolute)
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	Control Accuracy	+/- 0.1C
pH	Range	2.00~12.00 (resolution 0.01)
	Control Accuracy	+/- 0.1
DO	Range	0~150% (resolution 0.1%)
	Control Accuracy	+/- 3%
Upgrades	Analysis or Control	OUR, CER, KLa, RQ,ORP, methanol, exhaust gas (O2, CO2), glucose,
	Gas Inlet	Up to 4 channels (O2, CO2, N2 & air)
	Gas Supply Control	TMFC control (flow rate - automatic)
	Peristaltic Pump	More peristaltic pumps for different function; Upgrade to Watson-Marlow peristaltic pump heads;
	Scale	Tank weight / replenishing
	Light	Light source can be selected from red, blue, and white. Its intensity is adjustable [0-100%]

2.2 Vessel Information

General Info	Volume	15L max, with 25-75% working volume
	Material	Boro3.3 glass and SS316L (polishing better than Ra 0.4 um)
	Ratio	Diameter to height, about 1:2
	Rated Pressure	0.15 Mpa
	Working Pressure	<0.1Mpa
	Ports	1 x fire ring, 1 x pH, 1 x DO, 1 x PT100, 1 x foam sensor, 1 x exhaust with condenser, spares
	Sterilization	Off-site sterilization (autoclavable)
	Sparge	SS316L ring sparger in the bottom
	Dimension	300×315×819mm
	Net Weight	35 Kg

Agitation	Seal	Top mechanical sealing
	Speed	50 - 1000 rpm
	Blades	3 detachable layers (top: foam breaker; middle: 4-blade pitched impeller; bottom: 6-blade Rushton impeller)
	Baffles	4pcs

Upgrades	Vessel Type	· Single-layer vessel with electric blanket heating; · Jacketed vessel with water (jacket) heating
	Drive	Top Magnetic drive
	Blades	Customizable blades from different options (Spin filter, Cell-lift impeller, Basket impeller, Pitched Blade Impeller, Marine Blade Impeller)

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