

## Laboratory Fermentors

LiFlus GX / GM

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# LiFlus GX

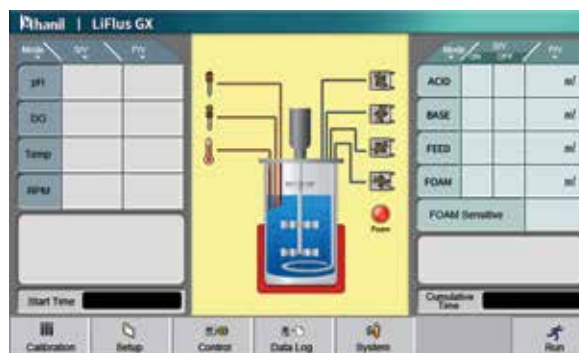
- Optimized for high density microbial growth
- Wide ranges of vessels of single, double or bowl types from 1.5 L to 14 L
- Individually controlled four peristaltic pumps for pH, DO, anti-foam and feeding
- Intuitive control with 7" touch screen display
- Accurate PID temperature control



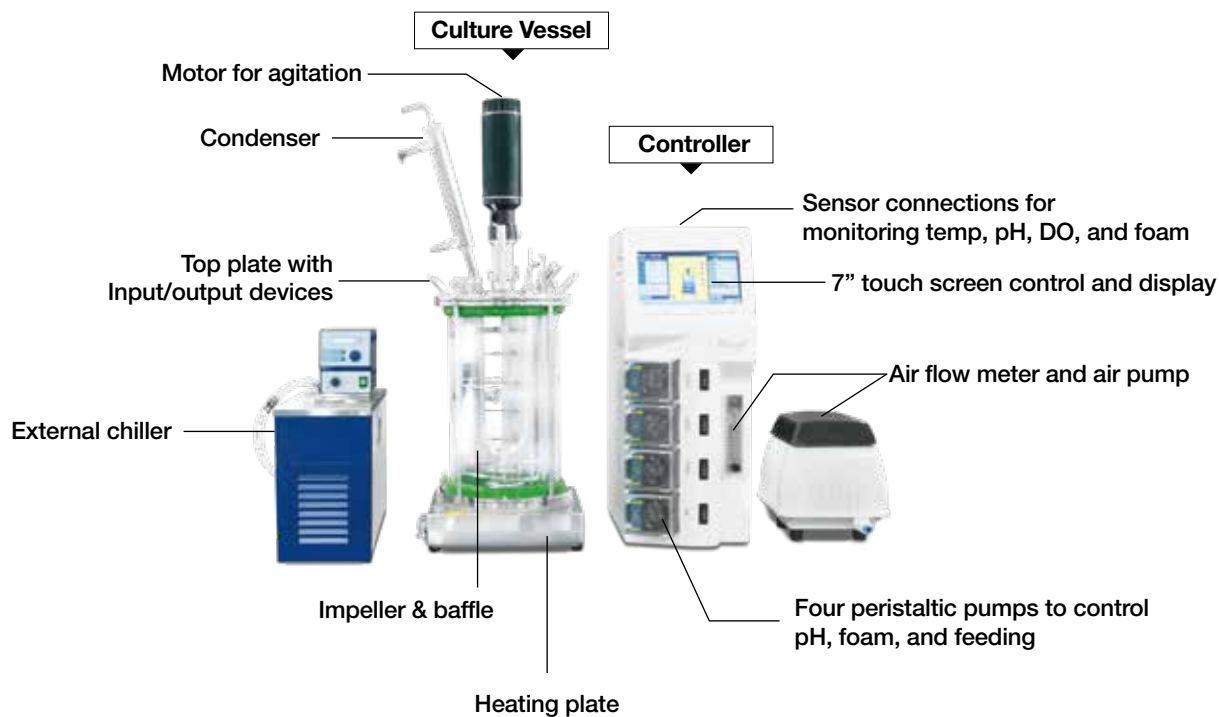
### Applications

- Microbial fermentation
- Cell cultivation
- Production of biomass
- Extracellular metabolites
- Intracellular components

### Main Control Screen



## Structure of Laboratory Fermentor, LiFlus GX



## Availability of Vessel Types and Sizes

Vessel Type	1.5L	2L	3L	5L	7L	10L	14L
Single	●		●	●	●	●	
Single round		●	●	●	●		
Double			●	●	●	●	●
Bowl type						●	●



Single



Single Round



Double

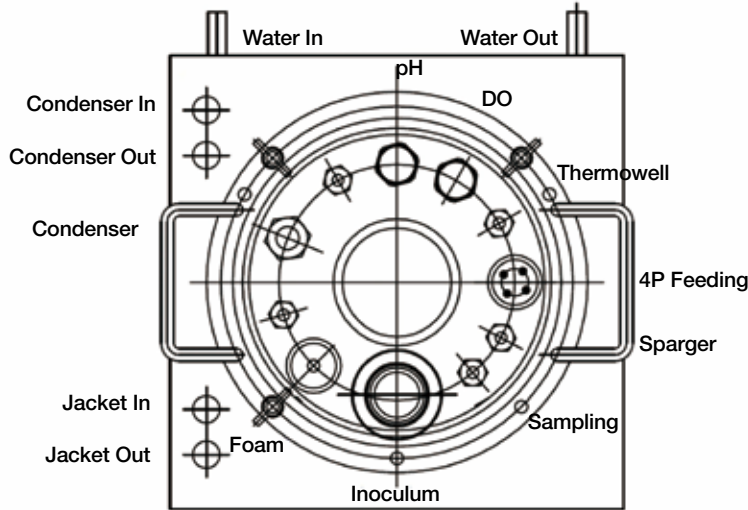


Bowl

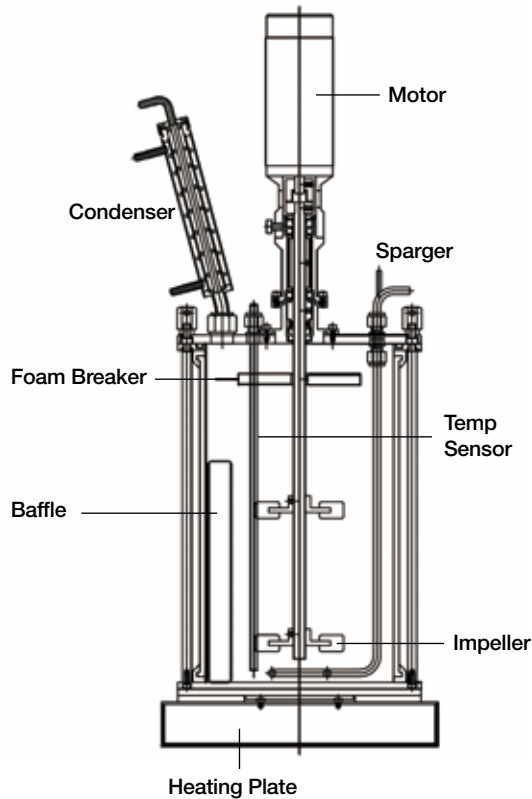
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## Basic Diagram of Culture Vessel and Variations



- Ports on the top plate can be composed by the necessities of controls and inputs /outputs.



- A motor power and condenser size need to be selected by the vessel size.
- Sparger type and the size of foam breaker should be selected by growing sample's requirements.
- Heating method can be selected between direct heating plate, heating blanket, or double vessel.

### Technical Specifications

		LiFlus GX	LiFlus GM
Type		Single system	Multi system
Controller	Control & Display	7" wide touch screen	
	Feeding Pumps	Up to 4 peristaltic pumps per one controller	
	Dimension (W x D x H, mm)	190 x 350 x 480 mm	
	Net Weight	12 kg	
	Power consumption	500 W	
Vessels	Type	Single flat bottom, Single round, Double, Bowl types	
	Capacity	1.5L, 3L, 5L, 7L, 10L or 14L	
Agitation	Range	100 ~ 1,200 rpm	
	Motor	DC motor, 60 or 150W	
	Impeller Type	Rushton, Pitched-paddle, Marine-blade, or Varied type	
Temperature Control	Control range	8 ~ 70°C	
	Thermostat system	8 ~ 70°C (±0.1°C) / Pt-100 probe heating & cooling PID control / built-in heat exchanger / automatic cooling water valve	
	Heating	Heating plate or blanket pad	
	Cooling	By internal cold finger and/or external chiller	
Aeration		By air sparger and air pump with air flow meter	
pH Range		pH 2.0~12.0	
DO Range		0 ~200%, DO cascade to agitation	
Anti-foam Sensing		Conductivity type	

- Impeller type should be chosen by the characteristics of growing sample from Rushton turbine, pitched blade, or marine-blade, or varied impeller.



Rushton  
Turbine Impeller



Pitched  
Paddle Impeller



Marine Impeller



Varied Impeller

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## Ordering Information (1)

Cat. No.	Description
<b>Controller and Accessories</b>	
FE1002	LiFlus GX controller, without pumps and air flow meter
FE3081	Peristaltic pump (upto 4 pumps can be installed on one controller), 14 rpm
FE3051	Air flow meter (rotameter), 200~2,500 cc/min for 1.5L (w.v.1L)
FE3052	Air flow meter (rotameter), 200~2,500 cc/min for 3L (w.v.2.1L)
FE3053	Air flow meter (rotameter), 0.5~ 5L/min for 5L (w.v.3L)
FE3054	Air flow meter (rotameter), 1~ 10L/min for 7L (w.v.5L) or 10L (w.v.7L)
FE3055	Air flow meter (rotameter), 1~25L/min for 14L (w.v.10L)
FE2106	Air compressor (air flow 20 L/min, pressure 0.1kgf/cm <sup>2</sup> , input 18 W for 1.5~14L)
<b>Single Vessel, borosilicate glass vessel with top SUS plate</b> pH, DO, antifoam, thermo, inoculation, sampling, and 4 feeding ports, silicone connecting tubes and cold finger (over 3L)	
FE1102	Single vessel 1.5L, vessel (I.D 115 mm, V.H 135 mm, 1:1.2), top plate (180 D/mm, SUS)
FE1103	Single vessel 3L, vessel (I.D 133 mm, V.H 220 mm, 1:1.7), top plate (220 D/mm, SUS)
FE1104	Single vessel 5L, vessel (I.D 170 mm, V.H 220 mm, 1:1.3), top plate (220 D/mm, SUS)
FE1105	Single vessel 7L, vessel (I.D 170 mm, V.H 310 mm, 1:1.8), top plate (220 D/mm, SUS)
FE1106	Single vessel 10L, vessel (I.D 190 mm, V.H 355 mm, 1:1.8), top plate (220 D/mm, SUS)
FE1107	Single vessel 14L, vessel (I.D 190 mm, V.H 355 mm, 1:1.8), top plate (220 D/mm, SUS)
<b>Single Round Vessel, borosilicate glass vessel with SUS vessel supporter and top plate</b> pH, DO, antifoam, thermo, inoculation, sampling, and 4 feeding ports, silicone connecting tubes and cold finger (over 3L)	
FE1131	Single round vessel 2L, vessel (I.D 115 mm, V.H 135 mm, 1:1.2), top plate (180 D/mm, SUS)
FE1132	Single round vessel 3L, vessel (I.D 133 mm, V.H 220 mm, 1:1.7), top plate (220 D/mm, SUS)
FE1133	Single round vessel 5L, vessel (I.D 170 mm, V.H 220 mm, 1:1.3), top plate (220 D/mm, SUS)
FE1134	Single round vessel 7L, vessel (I.D 170 mm, V.H 310 mm, 1:1.8), top plate (220 D/mm, SUS)
<b>Double Vessel, borosilicate glass double vessel with SUS vessel supporter and top plate</b> pH, DO, antifoam, thermo, inoculation, sampling, and 4 feeding ports, silicone connecting tubes and cold finger (over 3L)	
FE1112	Double vessel 3L, vessel (I.D 130 mm, V.H 220 mm, 1:1.7), top plate (220 D/mm, SUS)
FE1113	Double vessel 5L, vessel (I.D 145 mm, V.H 300 mm, 1:1.2), top plate (220 D/mm, SUS)
FE1114	Double vessel 7L, vessel (I.D 160 mm, V.H 330 mm, 1:1.7), top plate (220 D/mm, SUS)
FE1115	Double vessel 10L, vessel (I.D 230 mm, V.H 350 mm, 1:1.7), top plate (220 D/mm, SUS)
FE1116	Double vessel 14L, vessel (I.D 270 mm, V.H 375 mm, 1:1.7), top plate (220 D/mm, SUS)
<b>Bowl Type Vessel, borosilicate glass double vessel with bowl type SUS base and top SUS plate</b> pH, DO, antifoam, thermo, inoculation, sampling, and 4 feeding ports, silicone connecting tubes and cold finger (over 3L)	
FE1121	Bowl vessel 10L, vessel (I.D 190mm, V.H 355mm, 1:1.8), top plate (220 D/mm, SUS)
FE1122	Bowl vessel 14L, vessel (I.D 190mm, V.H 500mm, 1:2.6), top plate (220 D/mm, SUS)
<b>Heating and Cooling Apparatus</b>	
FE1151	Heating plate with water in/out port for single vessel, 1.5L (210 x 210 x 40 mm)
FE1152	Heating plate with water in/out port for single vessel, 3L (220 x 220 x 40 mm)
FE1153	Heating plate with water in/out port for single vessel, 5L, 7L (250 x 250 x 40 mm)
FE1154	Heating plate with water in/out port for single vessel, 10L (280 x 280 x 40 mm)
FE1161	Heating blanket for single round vessel, 2L
FE1162	Heating blanket for single and single round vessels, 5L
FE1163	Heating blanket for single and single round vessels, 7L
FE1164	Heating blanket for single vessel, 10L
FE2001	6L chiller for single vessel, 3L, 5L
FE2002	8L chiller for single vessel, 7L
FE2003	12L chiller for single vessel, 10L

## Ordering Information (2)

Cat. No.	Description
<b>Motor for Agitation</b>	
FE1201	DC motor for 1.5~7L vessel (60 W, DC 24V 3A, 100~850 rpm)
FE1202	DC motor for 10~14L vessel (150 W, DC 24V 8A, 100~850 rpm)
<b>Impeller for Agitation, SUS</b>	
FE1402	Rushton turbine impeller (O.D. 60 mm) for double 5L vessel
FE1403	Rushton turbine impeller (O.D. 80 mm) for single 5L, 7L, double 7L vessels
FE1407	Rushton turbine impeller (O.D. 100 mm) for single 10L, bowl 10L, 14L vessels
FE1411	Pitched-paddle impeller (O.D. 65 mm) for single 1.5L, 3L, double 3L vessels
FE1412	Pitched-paddle impeller (O.D. 80 mm) for single 5L, 7L, double 5L vessels
FE1413	Pitched-paddle impeller (O.D. 100 mm) for 10L, 14L vessels
FE1421	Marine-blade impeller (O.D. 65 mm) for single 1.5L, 3L, double 3L vessels
FE1422	Marine-blade impeller (O.D. 80 mm) for double 5L Vessels
FE1423	Marine-blade impeller (O.D. 100 mm) for single 5L, 7L, double 7L, bowl 10L, 14L vessels
FE1431	Varied impeller (O.D. 65 mm) for single 1.5L, 3L, double 3L vessels
FE1432	Varied impeller (O.D. 80 mm) for single 5L, 7L, double 5L vessels
FE1433	Varied impeller (O.D. 100 mm) for 10L, 14L vessels
<b>Foam Breaker, SUS</b>	
FE1501	Foam breaker (O.D. 75 mm) for single 1.5L, 3L, double 3L vessels
FE1502	Foam breaker (O.D. 90 mm) for single 5L, 7L, double 5L vessels
FE1503	Foam breaker (O.D. 110 mm) for 10L, 14L vessels
<b>Sparger, SUS</b>	
FE4011	Ring type sparger, removable
FE4012	Linear type sparger, removable
FE4013	Micro sparger with 20 µm holes
<b>Condenser, SUS</b>	
FE1701	Standard condenser
FE1703	Big size condenser for 10L, 14L vessels
<b>Sensors</b>	
FE153X	pH electrode, length 120, 225, 325, or 425 mm
FE154X	Cable for pH Electrode, 1 m or 3 m
FE157X	DO (dissolved oxygen) electrode, length 120, 220, 320, or 420 mm
FE158X	Cable for DO electrode, 1 m or 3 m
FE163X	Temperature sensor, Length 160, 220, 260, 320, 360, 510 mm
FE1601	Anti foam electrode, L100 DIA7 PORT 12 for 1.5L Vessel
FE1602	Anti foam electrode, L150 DIA7 PORT 12 for 3, 5, 7, 10, 14L Vessels
FE161X	Cable for anti foam electrode, length 1 m or 1.5 m
<b>Reagent Bottle, Pyrex, 0.2 µm PTFE Filter (Ø 25mm) included</b>	
FE1801	250 mL reagent bottle, 4 ea/set
FE1802	500 mL reagent bottle, 4 ea/set
FE1803	1,000 mL reagent bottle, 4 ea/set