Customized Bioshaker CO_2-BR series (MADE-TO-ORDER)

A culture equipment for culturing floating cells using Erlenmeyer flasks. This series is designed to efficiently culture mammalian cells, such as CHO and HEK293, or microalgae, such as cyanobacteria, in Erlenmeyer flasks instead of process bags.



CO_2-BR-40UL
with Gas controller (Optional)



CO_2-BR-43FL-MR
with Gas controller (Optional)
and LED Irradiation unit (Optional)



CO_2-G･BR-200
with 4 pcs of 5 L Disposable flask
and Gas controller (Optional)

Features and Applications

- Aeration culture method, which is similar to the processing culture, where a gas mixture is fed directly into the flask
- Flask cap with filter prevents contamination on both IN and OUT. Handling, such as transplantation, is as easy as the bacteria culture.
- Irradiation type is optimal for culturing cyanobacteria, etc. Possible to culture from low light levels during strain separation

Large working volume (W.V.) even in flasks

Example: CO_2-G･BR-200
Volume of culture fluid in Thomson Optimum Growth flasks
When using 12 × 1.6 L flasks (@W.V. 800 mL): Approx. 9.6 L
When using 8 × 2.8 L flasks (@W.V. 1.4 L): Approx. 11.2 L
When using 5 × 5 L flasks (@W.V. 2.5 L): Approx. 12.5 L

Model (Shaking incubator)	CO_2-BR-40UL	CO_2-BR-43FL-MR/MT	CO_2-BR-53FL-MR/MT	CO_2-G･BR-200
Temperature range/accuracy (*1)	4°C to 50°C, ±0.3 to ±1.0°C (53FP:15°C to 50°C,±0.3)			
Shaking motion/speed	Switchable Reciprocal/Orbital, 20 to 200 r/min			Switchable Reciprocal/Orbital, 25 to 200 r/min
Number of Gas supply tube	6 pcs (Standard)/Up to 12 pcs (Optional), About the applicable vessels and capacity, refer to the right page (*2)			
Door	Transparent lift-up door(easy to check inside)	Front door open from left(easy to shelter inside,possible to change the door open from right. (*3)		Swing lift-up door
Dimensions(W×D×H)	585 × 630 × 660 mm	600 × 732 × 643 mm		1110 × 716 × 990 mm
Power supply	AC100V/9A (Need a step-down transformer)	AC100V/12A (Need a step-down transformer)	AC100V･7A (Need a step-down transformer)	AC100V/AC220V-240V/12A (built-in down transformer)
Standard accessories	Gas supply hose set (6 pcs) GH-0625 Universal shaking platform MT-4030	Gas supply hose set (6 pcs) GH-0625 Spring net shaking platform MR-4030 (MR) Universal shaking platform MT-4030 (MT)		Gas supply hose set. Universal shaking platform MT-7050
Recommended Gas controller	CO-GAS3000 (Air & CO_2) or Multi-GAS3000 (O_2 & CO_2 &Air). Both are optional, see below.			
Response to irradiation	LC-450EXP (Optional) ×1 pc, Example of capacity: Erlenmeyer flasks 300 mL × 6pcs			LC-450EXP (Optional) × 2 pcs, Example of capacity: 300 mL Erlenmeyer flasks× 12 pcs

(*1)The temp. for the defrost function is not included. Ambient temperature is 5°C to 35°C. (*2)For mammalian cells, flask caps for gas supply connection are designed assuming disposable type flasks (CORNING and Scrum/Thomson, USA). (*3)Distributor can make necessary changes.

Gas controller



CO-GAS3000

Model	CO-GAS3000	Multi-GAS3000
CO_2 Control range/accuracy	Atmospheric concentration up to 15%, ±1%	
O_2 Control range/accuracy	-	1% to 50%, ±1% (*1)
Flow rate	30 to 300 mL/min	
Dimensions (W × D × H)	200 × 300 × 260 mm	
Weight	approx. 11 kg,	
Power supply	AC100V/2A (Need a step-down transformer)	
Standard accessories	Air filter ×2 pcs, Silicon tube ×1 pc (5 m), Gus supply tube ×1 pc (5 m), Gus cap×1 pc, Tube fitting×1 pc, Hose joint ×1 pc	

(*1)Above atmospheric concentration can be set. CO_2 and O_2 concentration are controlled by connecting N_2 or O_2 gas in the Multi-GAS3000.

CO_2-BR Series Reference Materials

Compatibility Chart of Disposable Erlenmeyer Flask and Flask Cap

The type of flask cap that fits each size of Erlenmeyer flask, the necessary clamps for fixing, and the capacity of vessels can be fixed to the shaking platform

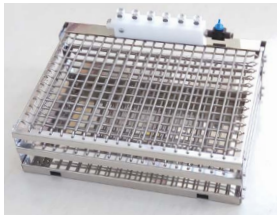
Flask cap model	Applicable flasks (model of the vent cap for CORNING)	CO_2-BR-40UL	CO_2-BR-43FL, 53FP			CO_2-G・BR-200
		Universal shaking platform MT-4030 Capacity in use	Universal shaking platform MT-4030 Capacity in use	Universal shaking platform MT-4430 Capacity in use	Spring net shaking platform MR-4030 Capacity in use	Universal shaking platform MT-7050 Capacity in use
Flask cap B (Contains 6 pcs) 	CORNING 125 mL (431143, 431405) (*1) Thomson 125 mL (Ultra Yield 931147) AS ONE VIOLAMO SEF125V	6 pcs (Up to 12 pcs available for special models) Clamps used: CF-0100		6 pcs CF-0100	6 pcs	6 pcs (*4) CF-0100
	CORNING 250 mL (431144, 431407) (*1)	6 pcs Clamps used: CF-0250			6 pcs	6 pcs CF-0250
	Disposal centrifuge tubes 50 mL	6 pcs Angle rack for Disposable centrifugal tubes: AT-3518		N/A	6 pcs	6 pcs AT-3518
Flask cap C (Contains 6 pcs) 	BM Equipment 125 mL WNB (781001,781011)	6 pcs (Up to 12 pcs available for special models) Clamps used: CF-0100		6 pcs CF-0100	6 pcs	6 pcs (*4) CF-0100
	CORNING 250 mL (431144, 431407) (*1) Thomson 250 mL (Ultra Yield 931143) BM Equipment 250 mL WNB (782001,782011)	6 pcs Clamps used: CF-0250			6 pcs	6 pcs CF-0250
	CORNING 500 mL (431145, 431401) (*1) Thermo Fisher 500 mL (4112-0500) BM Equipment 500 mL WNB (783001,783011)	6 pcs Clamps used: CF-0500			4 pcs	6 pcs CF-0500
	CORNING 1 L (431147, 431403) (*1) Thermo Fisher 1 L (4112-1000) BM Equipment 1 L WNB (784001,784011)	4 pcs Clamps used: CF-1000		6 pcs CF-1000	3 pcs	6 pcs CF-1000
Flask cap D (Contains 6 pcs) 	BM Equipment 2 L Low WNB (785101,785111)	4 pcs Clamps used: CF-2000		N/A	2 pcs	6 pcs CF-2000
	CORNING 3 L (431252, 431253) (*1)	1 pc Clamps used: CF-3000DSP		N/A	1 pc	5 pcs CF-3000DSP
Flask cap E (Contains 2 pcs) 	Thomson 1.6 L (OGF 931113) (*2)	4 pcs Clamps used: CF-1000		6 pcs (*3) CF-1000	3 pcs	6 pcs (*3) CF-1000
	Thomson 2.8 L (OGF 931114) (*2) BM Equipment 3 L Wide mouth WNB (786501,786511)	2 pcs Clamps used: CF-2000		N/A	1 pc	6 pcs CF-2000
	Thomson 5L (OGF 931116) (*2)	1 pc Clamps used: CF-3000DSP		N/A	1 pc	5 pcs (*3) CF-3000DSP
	CORNING 5 L (431685) (*1)	1 pc Clamp used: Special clamps		N/A	N/A	N/A
Flask cap F (Contains 2 pcs) 	Thomson 250 mL (OGF 931111) (*2)	6 pcs Clamps used: CF-0250			6 pcs	6 pcs CF-0250
	Thomson 500 mL (OGF 931112) (*2)	6 pcs Clamps used: CF-0500			6 pcs	6 pcs CF-0500
	CORNING 2 L (431255, 431256) (*1) BM Equipment 2 L High WNB (785001)	N/A	2 pcs Clamps used: CF-2000	N/A	1 pc	N/A

(*1)CORNING flasks other than the product codes listed here are also compatible as long as they are of the same capacity. (*2)The name of the Thomson Erlenmeyer flask is Optimum Growth Flask.
(*3)The combination of flasks and liquid volume will easily maximize W.V. (*4)The gas supply hose included with CO_2-BR (tube for connecting the device and flask) is not long enough, so it is required to perform production separately.

Example of Use for MT-4430 and Thomson 1.6 L



MR-4030 and Branch gas tube included with CO_2-BR-43FL-MR



Adjustment of ventilation volume

As a guideline for considering ventilation conditions,
refer to 20 mL/min/one pc for 125 mL and 250 mL flasks,
25 mL/min/one pc for 500mL flasks,
40 mL/min/one pc 1 L and 3 L flasks,
and 60 to 80 mL/min/one pc for 5 L flasks.

Evaporation of culture fluid

Evaporation of the culture fluid increases relative to the increase in ventilation volume.
In a 500 mL flask at 37°C and a ventilation volume of 25 mL/min, the evaporation rate is approximately 1 mL/day. When culturing in small flasks, replenishing the culture fluid at the time of dilution can be expected to result in highly efficient culture.
If the duration of cell culture is 7 days, we recommend replacing the filter on the OUT side during dilution and sampling.

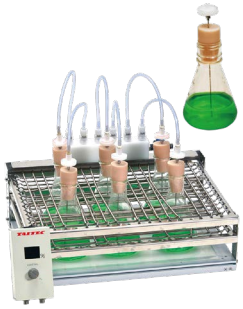
Algae Culture Systems Compatibility Chart of Flask caps with needles

This cap is a combination of a needle and a silicone stopper to fit the flask size.

Needle cap	Model	Applicable flask and vessel size	Included needle length	BR-40UL BR-43FL Spring net shaking platform MR-4030 Up to 1 pc of LED unit	GBR-200/300 See P.032 for LED installation. Up to 2 pcs of LED units	BR-3300S series See P.032 for LED installation. Up to 4 pcs of LED units
(Contains 12 pcs) GAS IN 0.22 µm filter GAS OUT	NC100	Glass flask 100 mL (*) Flask inner diameter 22 to 26 mm	140mmL	6 pcs	12 pcs	24 pcs
	NC200	Glass flask 200 mL (*) Flask inner diameter 24 to 30 mm	150mmL			
	NC300	Glass flask 300 mL (*) Flask inner diameter 24 to 30 mm	170mmL			
	NC500	Glass flask 500 mL (*) Flask inner diameter 28 to 36 mm	200mmL			
	NC1000	Glass flask 1 L (*) Flask inner diameter 32 to 42 mm	280mmL	3 pcs	6 pcs	12 pcs

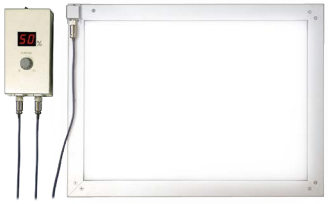
(*)Needle cap should be the matching size for the size of the flask.

For CO_2-BR-43FL
Example of irradiation set



About LED irradiation units and controllers

The illuminance (light intensity) of the LC-450EXP has been greatly increased from approximately 215 µmol of our previous model to approximately 310 µmol. The light intensity can be controlled in 1% increments within the range of 10 to 100% with a dedicated controller (optional).
Two types of optional controllers are available:
a type that controls the light intensity of a single LED irradiation unit (for use with medium-sized BRs) and a type that can control 1 to 4 units at the same output (%) (for large-sized BRs).
See P.032 and P.045 for details.



LED irradiation unit LC-450EXP and optional controller LC-LED-CON1



Optional controller LC-LED-CON4 that enables irradiation of up to 4 units with the same output

CO_2-BR series Optional accessories

Optional



Regulator



Light shielding plate SB-5338



LED irradiation unit LC-450EXP



Controller mounting bracket LC-ST1



Nitrogen gas generator N_2 GENESIS 200 (Left)
Dedicated optional tank GST-0205M (Right)



System frame F
Example of combination with a gas controller

Product Name/Model	Remarks
Regulator (One-touch joint ϕ6 mm)	Needle valve type, Inner diameter 4 mm/Outer diameter 6 mm for PISCO Hoses
Light shielding plate SB-5338	For BR-43FL, magnet type for easy attaching/detaching. The surface can be used as a whiteboard, and notes can be written on it or magnets can be attached.
LED irradiation unit LC-450EXP	LED Color: White, Peak wavelength: 450 nm, Photon flux density: Approx. 310 µmol/m^2/s (See page 037 for details)
Dedicated controller for LED irradiation unit LC-LED-CON1	Controller for LED irradiation unit LC-450EXP, controlling the light intensity of a single LED irradiation unit. For use with medium-sized BRs.
Dedicated controller for LED irradiation unit LC-LED-CON4	Controller for LED irradiation unit LC-450EXP, capable of controlling 1 to 4 LED irradiation units simultaneously at the same output (%). Suitable for combination with large-sized BRs.
Spring net shaking platform MR-4030	Remove the bottom plate and fix the LC-LED plate with screws. See page 023 for vessels capacity/qty.
Transparent Sticky sheet for LC-LED	Transparent Sticky sheet for protecting LC-LED plate and holding flat bottom vessels. It can be used up to 100 r/min.
Mounting bracket for LED top irradiation RSB-3424LED	Mounting brackets for attaching the LED irradiation unit to the inside top surface of the BR-41/42/43/53 series chamber. The height can be adjusted to 4 levels.
LED irradiation unit mounting bracket LC-0950BR	Mounting brackets for attaching the LED irradiation unit to the Universal shaking platform MT-6040/7050/8060 for large size BRs. One set is required per one LED irradiation unit.
Controller mounting bracket LC-ST1	A bracket for securing the LED light irradiation unit controller to the large BR. (See page 045 for details)
Nitrogen gas Generator N_2 GENESIS 200	Concentrates the atmospheric nitrogen and supplies it; It can be directly connected to the CO_2-BR or via Multi-GAS3000 (See page 051 for details)
Optional tank for Nitrogen gas Generator GST-0205M	Stores nitrogen gas generated from the N_2 GENESIS 200 in a small pressure vessel and stops N_2 GENESIS 200 while the stored nitrogen gas is used. Reduced operating time reduces long-term maintenance costs. (For details, see p.051)
System frame F	Enables installation of gas controllers together. Up to 2 gas controllers can be installed. 320 × 330 × 730H mm

Optional accessories • Replacement and Consumable parts

Product Name/Model	Remarks
 **Syringe filter E255**	Consumables for Flask caps, Lure lock type, Correspond to Autoclave, Pore size 0.2 µm, Contains 50 pcs
 **Gas supply hose set (6 pcs) GH-0625**	For CO_2-BR-40UL/43FL/53FP, 6 pcs × Hose (25 cm length) with connection connector. For replacement when the accessories are worn.