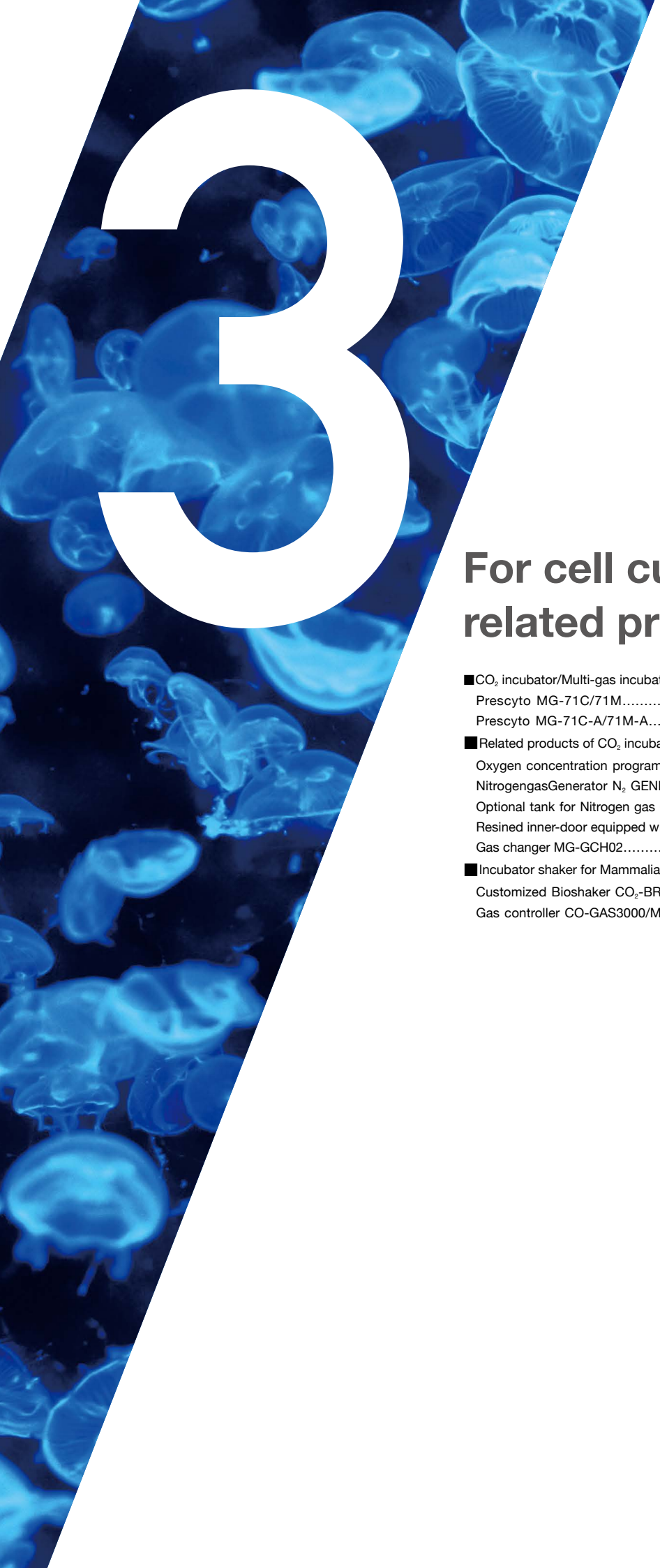


For cell culture related products

Prescyto MG-71C/71M

Multi-gas incubator equipped with a new "Low oxygen booster" function that makes Hypoxia conditions return quickly after the door opens and closes (4-times faster than the conventional one. *Patent pending).

•Shaker for High humidity "CS-LR" that can be inside the Chamber --> P.066 •Optional accessories and Related products --> P.050-052

MG-71M

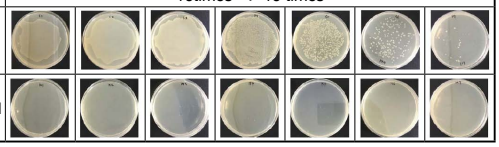
Features

- Low oxygen booster makes Hypoxia conditions return quickly (71M)
- Oxygen sensor simple checking function (71M)
- Equipped with Connection holes to the Chamber
- Switches Gas cylinders automatically with the Optional "MG-GCH02"
- Stackable up to 2 levels

Applications

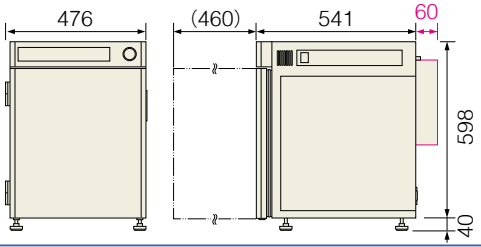
- Hypoxic culture of Stem cells and Tumor cells (71M)
- Cultivation of Obligatory anaerobe (71M)
- Cultivation of Adherent cells such as mammals

Antibacterial test results on the shelf

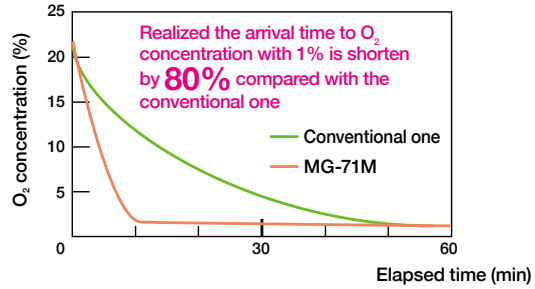
Dilution	10times --> 10^7times
Usual	
Antibacterial	

External dimensions

Black: Common in MG-71 series Red: MG-71C-A/M-A



The arrival time to O_2 concentration with 1% by Low oxygen booster



Multi-gas incubator equipped with a new "Low oxygen booster (MG-71M) function" makes Hypoxia conditions return quickly after increasing oxygen concentration by opening and closing the door. Realized the arrival time to O_2 concentration with 1% is shorten by 80% compared with the conventional one.

Product name	CO_2 incubator	Multi-gas incubator
Model	MG-71C	MG-71M
Temperature range/accuracy	5°C above RT to 50°C, ±0.2°C (*1)	
Heating method	Air Jacket type (6 Heaters)	
Gas control range	CO_2: Atmospheric concentration to 20% (Set in 0.1%) (*2)	CO_2: Atmospheric concentration to 20% (Set in 0.1%) (*2) O_2: 1% to 20% (Set in 0.1%) (*3)
Ambient temp. range	+15°C to +35°C	
Humidification method	Natural evaporation by the Humidity pan	
Inner Dimensions(W×D×H)/ Chamber volume	Chamber: 354 × 425 × 418 mm, Approx. 53 L	
Example of Capacity	Per shelf: Petri Dish ϕ35 mm ×49 , Well plate ×6 , 14 × 25 cm^2 of TC flask	
Other functions	Connection holes (inner dia. ϕ30 mm)× 2 pcs, Outlet for external supply (Max. 3 A), RS-232C terminal, Low oxygen booster (71M), Oxygen sensor simple checking function (71M)	
Gas connection port	Barbed nozzle ϕ9 mm (Replaceable: 1/4Rc)	
Dimensions(W×D×H)/Weight	476 × 578 × 638 mm, Approx. 51 kg	
Standard accessories	Shelf (Antibacterial treatment × 3 pcs(*4), Shelf support× 6 pcs, Humidity pan×1 pc, Gas supply tube (5 m)×1 pc, Hose band× 2 pcs	Shelf (Antibacterial treatment)× 3 pcs(*4),Shelf support × 6 pcs, Humidity pan ×1 pc, Gas supply tube (10 m)×1 pc, Hose band× 4 pcs
Power supply	AC100V/3.5A/Max.6.5A (Need a step-down transformer)	

(*1)The value at the ambient temperature 25°C and operation temperature 37°C/CO_2 5%. (*2)Measured by Infrared type CO_2 sensor. (*3)Measured by Zirconia type oxygen sensor.
(*4)Up to Six shelves can be stored.
•"Multi-gas" is a specification that controls CO_2 and O_2 Concentration by connecting CO_2 Gas and N_2 Gas or O_2 Gas.

We contribute to the development of research and industry.

Prescyto MG-71C-A/71M-A

Our proprietary technology "Active Gas Ventilation" CO_2/Multi-gas incubator. Optimal for Large scale and Hypoxic culture with Multilayer culture plates

•Shaker for High humidity "CS-LR" that can be inside Chamber --> P.066 •Optional accessories and Related products --> P.050-052

Features

- Excellent Culture efficiency by our proprietary "Active Gas Ventilation"
- Switches Gas cylinders automatically with the Optional "MG-GCH02"
- Stackable up to 2 levels

Applications

- Large scale of iPS cell culture with Multilayer plates
- Large scale and Hypoxic culture of adherent cells with Multilayer plate [71M-A]
- Hypoxic culture of floating cells with Erlenmeyer flasks [71M-A]

MG-71M-A with Multilayer culture plate

Our proprietary technology "Active Gas Ventilation (PAT.P)" Excellent gas replacement efficiency

Forced aeration (AGV = Active Gas Ventilation) is a method in which the gas is directly fed into the culture plate. As this method is better than that of normal gas replacement in efficiency, it should be optimum for Low-oxygenation and Large scale culture of adhesion cells with Multilayer culture plate. Large scale and Hypoxic culture of floating cells can also be done (Shaker and Stirrer required). Thermo Fisher Scientific Cell Factory (AGV type: Up to 10 layers) can be used as Multilayer culture plate.

The effect of Active Gas Ventilation in Large scale culture with Multilayer culture plate

The differences between Normal Gus Ventilation and Active Gus Ventilation visualized in Multilayer culture plate as well as compared to the culture results.

Figure 1 and 2 show the changes in O_2 concentration in Multilayer culture plate. The change was quite slow in which O_2 concentration reached only around 20% in 1 day. In contrast, the change in O_2 concentration by AGV in Figures 3 and 4 made any layers with Hypoxic conditions within 4 hours.

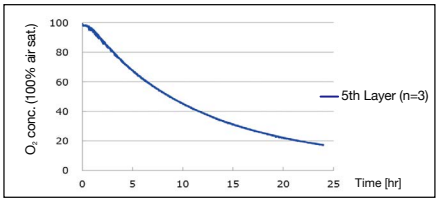


Figure 1. The change in O_2 concentration in Multilayer culture plate by NGV

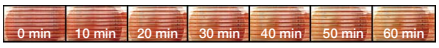


Figure 2. The change in color by NGV (Captured image, Saturation adjusted)

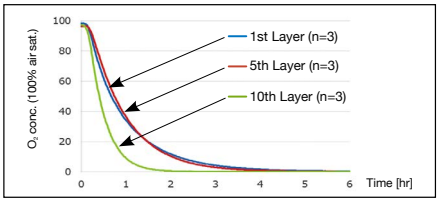


Figure 3. The change in O_2 concentration in Multilayer culture plate by AGV

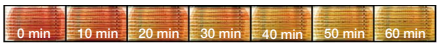
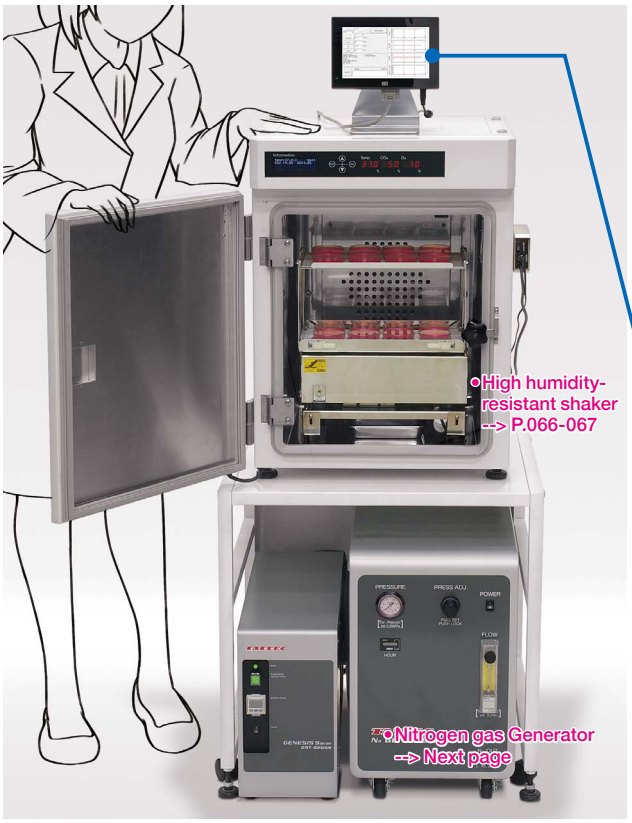


Figure 4. The change in color by AGV (Captured image, Saturation adjusted)

Product name	Active Gas Ventilation CO_2 incubator	Active Gas Ventilation Multi-gas incubator
Model	MG-71C-A	MG-71M-A
Temperature range/accuracy	5°C above RT to 50°C, ±0.2°C (*1)	
Heating method	Air Jacket type (6 Heaters)	
Gas control range	CO_2: 3% to 10% (Set in 0.1%) (*2)	CO_2: 3% to 10% (Set in 0.1%) (*2) O_2: 1% to 25% (Set in 0.1%) (*3)
Gas flow rate control range	20 to 500 mL/min (set by 1 mL/min)	
Ambient temp. range	+15°C to +35°C	
Inner Dimensions(W×D×H)/ Chamber volume	Chamber: 354 × 425 × 418 mm, Approx. 69 L	
Example of Capacity	Up to 10 layers of Multilayer culture plate × 1 pc (*4), Erlenmeyer flask 250 mL × 6	
Other functions	Connection holes (inner dia. ϕ30 mm)× 2 pcs, Outlet for external supply (Max. 3 A), RS-232C terminal	
Gas connection port	Barbed nozzle ϕ9 mm (Replaceable: 1/4 Rc)	
Dimensions(W×D×H)/Weight	476 × 578 × 638 mm, Approx. 51 kg	
Standard accessories	Supply tube for Culture (5 m)×1 pc, Gas supply tube (5 m)×1 pc, Hose band× 2 pcs	Supply tube for Culture (5 m)×1 pc, Gas supply tube (10 m)×1 pc, Hose band× 4 pcs
Power supply	AC100V/3.5A/Max.6.5A (Need a step-down transformer)	

(*1)The value at the ambient temperature 25°C and operation temperature 37°C/CO_2 5%. (*2)Measured by Infrared type CO_2 sensor. (*3)Measured by Zirconia type oxygen sensor. (*4)Please use commercially available Multilayer culture plates that are compatible with forced aeration.
•"Multi-gas" is a specification that controls CO_2 and O_2 Concentration by connecting CO_2 Gas and N_2 Gas or O_2 Gas.

Oxygen concentration program unit MG-PU01



Enables Various patterns of oxygen concentration change by connecting to the Multi-gas incubator MG-71M!

•Multi-gas incubator MG-71M --> P.048

Features and Applications

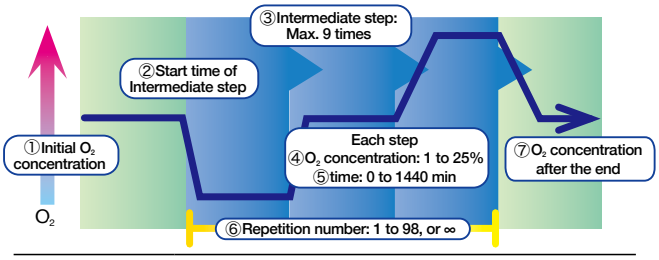
- Reproduction In vivo environment by changing oxygen
- Recording of Gas concentration and temperature

Operation with Touch panel

Model	MG-PU01
Applicable model	MG-71M
Configuration	Touch panel PC (Built-in Control software), Connection cable, AC adapter, Power cable, Stylus pen
System requirements	MG-71M, N_2/O_2/CO_2 Gas (O_2 Gas not required if no Step in which O_2 concentration is boosted)

Program specifications	
Protocol setting	①Initial O_2 concentration ③Intermediate step: Max. 9 times ⑦O_2 concentration after the end. Up to 5 programs can be saved and invoked.
Step setting	④O_2 concentration and ⑤Connection time are set as 1 step.
O_2 concentration setting	1 to 25%, Set in 0.1%
Connection time setting	0 to 1440 min (24 hours), Set in 1 min
Repetition setting	"⑥Repetition number: 1 to 98 arbitrarily set" in "Intermediate step: Max. 9 times". Setting "1" makes each step only one time. Entering "0" keeps Initial O_2 concentration.
Start time setting	②Start time of the Intermediate step or Immediately after the Data log starts
Data log	The temperature and the concentration of O_2 and CO_2 inside the MG-71M chamber can be logged at 1-minute intervals and its data written in USB memory.

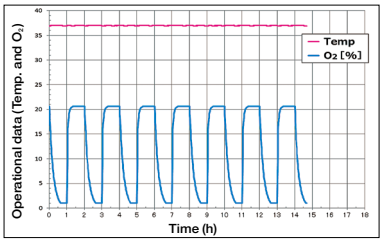
Schematic diagram



Reference performance	
O_2 Concentration change range	1% to approx. 20.9% (Atmospheric concentration)
O_2 control accuracy	Conformed to MG-71M accuracy (0.2%)
O_2 rise speed	Depends on the supply flow rate to MG-71M, 1% --> 20%: Around 5 min (When O_2 Gas cylinder is used)
O_2 drop speed	Depends on the supply flow rate to MG-71M, 20% --> 1%: Within 15 min (When N_2 Gas cylinder is used) 60 to 90 min (When N_2 GENESIS is used)

Changes oxygen concentration according to the duration

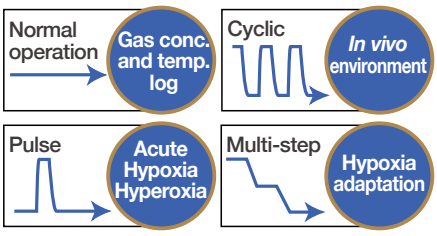
Oxygen concentration program unit can be connected to the Multi-gas incubator MG-71M to change the oxygen concentration inside the chamber. The change of blood flow and oxygen such as inside a tumor can be simulated.



Experimental result

The pattern of oxygen concentration changes in high flexibility

The pattern of oxygen concentration changes can be created with high flexibility. Not only periodical hypoxic condition but also multi-step change and repetition number can be set. As a Data logger for Temp. and Gas concentration inside the Chamber. The temperature and concentration of O_2 and CO_2 inside the MG-71M chamber can be logged at 1-minute intervals and its data written in USB memory.



As a Data logger for Temp. and Gas concentration inside the Chamber

The temperature and the concentration of O_2 and CO_2 inside the MG-71M chamber can be logged at 1-minute intervals and its data written in USB memory.

Nitrogen gas Generator N_2 GENESIS 200/Optional tank for Nitrogen gas Generator GST-0205M

Up to 99.9% of Nitrogen gas in atmosphere can be concentrated and supplied to the equipment. The frequency of maintenance can be reduced by approx. 3 times when using together with the Optional tank.

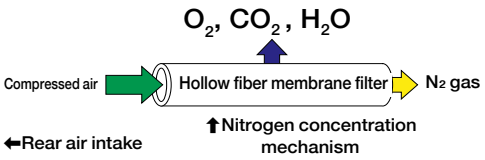
•"Evaporation head EN1 series" that the solvent can be concentrated to dryness by spraying the nitrogen gas --> P.103

Features and Applications

- Nitrogen gas in atmosphere can be concentrated and supplied to the equipment
- Supplies Nitrogen gas to MG-71M/M-A
- Supply of nitrogen to culture equipment for microaerophilic and anaerobic microorganisms
- Nitrogen purging in centrifugal concentration and freeze-drying

Up to 99.9% of Nitrogen gas in atmosphere can be concentrated (N_2 GENESIS 200)

Nitrogen gas in the atmosphere can be concentrated and supplied to the equipment. Only nitrogen is separated and concentrated by passing it through a filter made of a hollow fiber membrane. Up to 99.9% of Nitrogen gas can be supplied, but it varies depending on the supplied flow rate.
Also, a gas cylinder is not required so you can be worry free of the remaining gas amount.



Cost-saving optional tank for GST-0205M

The optional GENESIS Saver GST-0205M can be used with the Nitrogen gas Generator N_2 GENESIS 200. It is equipped with a small pressure vessel that can store nitrogen gas generated from the N_2 GENESIS 200. While using the stored nitrogen gas, you can turn off the operation of the N_2 GENESIS 200. As a result, the operation time for N_2 GENESIS 200 is reduced and minimizes frequent maintenance, power consumption, and operating noise that can recoup your initial investment as Cost savings.

Nitrogen gas Generator
N_2 GENESIS 200

Optional tank for Nitrogen gas Generator
GST-0205M

Model	N_2 GENESIS 200
Supply pressure/ Flow rate/Concentration	Max. 0.5 Mpa, 99.9% at 1 L/min, 99.5% at 3 L/min
Connection dia./ Dimensions(W×D×H)/ Weight	φ6 mm (Pisco tube), 300 × 526 × 481 mm, Approx. 35 kg
Power supply	AC100V/7.5A (Need a step-down transformer)
Standard accessories	Spare Air filter×1 pc, Pisco tube (φ6 mm × 5 m)×1 pc

•When using together with the Nitrogen sprayer (page 103), the number of spray nozzles should be within 12.
•Required a convert nozzle when connecting to MG-71 series. •The clogging of Filter and the deterioration of Compressor can lead to the decline of Supply pressure and Nitrogen gas concentration; The maintenance and replacement of Filter depending on their condition should be recommended. Since the Compressor is likely to deteriorate regardless of being used or not, it should be maintained once per year for frequent usage and once every 2 years to 3 years for non-usage.

Product Name/Model	GENESIS Saver GST-0205M
Ambient temp. range	15°C to 35°C
Gas tank capacity/ internal pressure	Approx. 5 L (except for Class II pressure vessels), max. 0.48 MPa
Dimensions(W×D×H)/ Weight	202 × 539 × 340 mm, Approx. 15 kg
Power supply	AC100V/0.5A/Max.10A (Need a step-down transformer)

•The convert nozzle to connect to MG series comes with.

Resined inner-door equipped with Gloves MG-GD

Suitable for light work in the chamber, such as sampling, with the inner door closed.

It allows for light work with gloves in the chamber while the gas concentration is kept. The Resined inner-door can be exchanged from the standard inner-door of the MG-71 series. Two shelves (316 × 150 × 10H mm) with a shorter depth than that of the standard MG-71 series make it easy to work in the cabinet.

Model	MG-GD

Gas changer MG-GCH02

Automatic switching before the gas cylinder that is connected to the CO_2 incubator becomes empty. Optimal for long-term culture experiments in which the gas is constantly supplied.

•CO_2 incubator/Multi-gas incubator --> P.048-049

Features and Applications

- Gas pressure is displayed digitally
- Sets the gas pressure of another one to be switched
- Gas hose connection port can be replaced from the back of the main unit to the left or right side of the unit
- Automatic switching of gas cylinders in CO_2/ Multi-gas incubators

Usage of the Gas changer

①Connect 2 gas cylinders to the Gas changer
②Automatic switching to the another gas cylinder when one gas cylinder becomes empty.
③Alarm lamp lights up when the pressure of the cylinder is lower than the set pressure (The lamp blinks when the gas pressure is not applied).
④Replace the empty cylinder and connect a new one to the Gas changer

Gas pressure is displayed digitally

Gas pressure of two cylinders is displayed in real time respectively.

Gas hose connection port can be moved from the back of the main unit to the left or right side of the unit

The gas hose connection port can be moved from the back of the main unit to the left or right side of the unit, depending on the installation situation of the CO_2 incubator.

Model	MG-GCH02
Usage gas	CO_2/N_2 (Customizable for O_2)
Gas pressure range	0 to 0.2 Mpa
Gas connection port	Barbed nozzle ϕ9 mm (Replaceable: 1/8Rc)
Alarm functions	Red LED display, Buzzer
External output	Relay contact output, analog output, RS-232C
Dimensions(W×D×H) /Weight	200 × 245 (Nozzles included) × 90 mm, Approx. 1.7 kg
Power supply	AC100V/1A (Need a step-down transformer)

Optional Accessories for MG series

Product Name/Model	Remarks	Applicable models
Regulator (ϕ9 mm barbed nozzle)	1 pc is required for each cylinder.	ALL
Shelves for MG	Shelf ×1 pc,Shelf board × 2 pcs, if necessary.	MG-71C, MG-71M
Stackable base for MG	The fixing tool when stacking in use.	All
Single stand for MG	To utilize the space effectively (see dimensions on the right)	All (Up to 520 × 500 × 560H mm of ones can be stored in the space.)
Dual stand for MG	To avoid placing the unit on the floor directly.	All
Support rack for Multilayer culture plates	with 1 × supply hose for Multilayer culture vessels	MG-71C-A, MG-71M-A (When using Multilayer culture plates)
Branch unit with mounting brackets for MG	Six branch gas tube, with Connection hose and Mounting brackets	MG-71C-A, MG-71M-A (When using Erlenmeyer flasks, up to 6 pcs)
Supply hose for MG	Supply hose for Erlenmeyer flasks, 6 pcs	MG-71C-A, MG-71M-A (When using Erlenmeyer flasks, up to 6 pcs)
Flask Cap B	For 125/250 mL Disposable flasks, 6 pcs	MG-71C-A, MG-71M-A (When using Erlenmeyer flasks, up to 6 pcs)
Spinner flask ventilation cap for MG	GL45, for 500 mL to 3 L, 6 pcs	MG-71C-A, MG-71M-A (When using Spinner flasks)
Syringe filter E255	Required for "Active Gas Ventilation", consumables, 50 pcs	for Flask Cap B and Spinner flask ventilation cap (When the standard ones are consumed)
External fan unit for MG	Required when the shaker or stirrer is put inside the unit. (*)	MG-71C-A, MG-71M-A

(*)Not required for Shaker for high humidity CS-LR (page 52) as its heat generation is low.
•Branch unit with mounting brackets for MG/Spinner flask ventilation cap for MG/Flask Cap B are collectively available as "Branch tube set for MG".

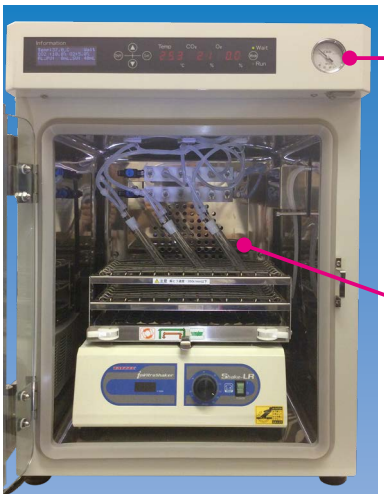
The examples of Customization

Obligatory anaerobe culture system

Enables the cultivation of Obligatory anaerobe with multiple test tubes with the same conditions. Shaking culture can be performed while aerating controlled gas with O_2/CO_2 concentration into each test tube. We have a delivery record for Campylobacter culture.

MG-71M-A Obligatory anaerobe culture system

Active gas ventilation CO_2 incubator **MG-71M-A**
Oxygen concentration program unit **MG-PU01**
Shaker for high humidity **CS-LR**
Spring net shaking platform **MR-2030**
Test tube cap
Gas supply hose set
Syringe filter

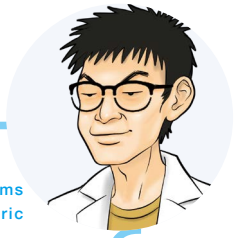


Equipped with a Precision regulator to fine-adjust the gas flow.

The gas controlled with O_2/CO_2 concentration is supplied aseptically into each test tube.

Up to 12 gas tubes are possible.

Adjustment dial for the precise regulator is located on the side.



USER'S VOICE

Obligate anaerobes are microorganisms that cannot grow in normal atmospheric concentrations of oxygen.

Ultra-hypoxia culture system

This system can be used with O_2 concentration by 0.5%.
Since Hypoxic culture consumes a large amount of N_2 gas, the N_2 gas cylinder in addition to the Nitrogen gas generator "N_2 GENESIS 200" and optional tank "GST-0205M" are incorporated in combination in this system for supplying N_2 sufficiently.

- N_2 gas cylinder starts to work when the present concentration with the low oxygen booster function of MG-71M quickly shifts it to low oxygen.
- In a stable O_2 condition, the N_2 GENESIS 200 enables ultra-low oxygen culture while reducing the consumption of nitrogen gas.

MG-71M Ultra-low oxygen culture system

Multi-gas incubator **MG-71M**
Oxygen concentration program unit **MG-PU01**
Gas changer **MG-GCH02**
Nitrogen gas generator **N_2 GENESIS 200**
Optional tank for N_2 genesis **GST-0205M**
Single stand for MG

USER'S VOICE

Very useful for Cell culture at oxygen concentrations that are even lower than 1%. N_2 is stably supplied thanks to the nitrogen generator. Makes sense!

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-40LF
with Gas controller (Optional)

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

CO_2-BR-180LF
with 4 pcs of 5 L Disposable flask
and Gas controller (Optional)

CO_2-BR-180LF can also be made with a built-in Gas controller (only for 500 mL flasks or smaller).

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-BR-180LF
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-40LF	CO_2-BR-43FL-MR/MT	CO_2-BR-180LF
Temperature range/accuracy (*1)	4°C to 50°C, ±0.3 to ±1.0°C		
Shaking motion/speed	Switchable Reciprocal/Orbital, 20 to 200 r/min		Switchable Reciprocal/Orbital, 25 to 250 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)		12 pcs. About the applicable vessels and capacity, refer to the right page (*2)
Door	Swing lift-up door (Easily viewable)	Single swing door (Leftward open, Easy to make the chamber dark, Can be changed to rightward open) (*3)	Clamshell split door (Accessible for large vessels)
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)	AC220-240V/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 (12 pcs) GH-0635-180LF Universal shaking platform MT-7050 Light shielding plate for Door
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× 6 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

Multi-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 (*2)	
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.
(*2)50 to 500 mL/min is available as an option to be built in the CO_2-BR-180LF.

CO_2-BR Series Reference Materials

Compatibility Chart of Disposable Erlenmeyer Flask and Flask Cap

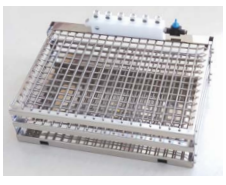
The type of flask cap that fits each size of Erlenmeyer flask, the necessary clamps for fixing, and the capacity of vessels can be fixed to the shaking platform

Flask cap model	Applicable flasks (model of the vent cap for CORNING)	CO_2-BR-40LF	CO_2-BR-43FL, 53FP			CO_2-BR-180LF
		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 CF-0100	12 pcs (*4) CF-0100
	CORNING 250 mL (431144, 431407) (*1)	6 pcs Clamps used: CF-0250			6 pcs CF-0250	12 pcs CF-0250
	Disposal centrifuge tubes 50 mL	6 pcs Angle rack for Disposable centrifugal tubes: AT-3518		N/A	6 pcs AT-3518	12 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 CF-0100	12 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 CF-0250	12 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 CF-0500	12 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 CF-1000	12 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 CF-2000	8 pcs CF-2000
	CORNING 3 L (431252, 431253) (*1)	1 pc Clamps used: CF-3000DSP		N/A	1 pc CF-3000DSP	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 CF-1000	12 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 CF-2000	8 pcs CF-2000
	Thomson 5L (OGF 931116) (*2)	1 pc Clamps used: CF-3000DSP		N/A	1 pc CF-3000DSP	5 pcs (*3) CF-3000DSP
	CORNING 5 L (431685) (*1)	1 pc Clamp used: Special clamps		N/A	N/A	5 pcs Special clamps
Flask cap F (Contains 2 pcs) 	Thomson 250 mL (OGF 931111) (*2)	6 pcs Clamps used: CF-0250			6 pcs CF-0250	12 pcs CF-0250
	Thomson 500 mL (OGF 931112) (*2)	6 pcs Clamps used: CF-0500			6 pcs CF-0500	12 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 CF-2000	8 pcs CF-2000

(*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



CO_2-BR-180LF Example of Use for CORNING 3 L

Adjustment of ventilation volume

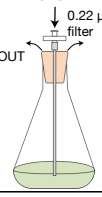
As a guideline for considering ventilation conditions, refer to 25 mL/min/one pc for 500 mL flasks or smaller, 40 mL/min/one pc or more for 1 L and 3 L flasks, and 80 mL/min/one pc or more for 5 L flasks.

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.

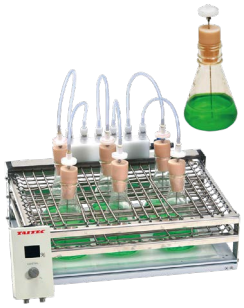
Algae Culture Systems Compatibility Chart of Flask caps with needles

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	BR-40LF BR-43FL	BR-180LF GBR-200/300	BR-3300S series
			Spring net shaking platform MR-4030 Up to 1 pc of LED unit	See P.032 for LED installation. Up to 2 pcs of LED units	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	6 pcs	12 pcs	24 pcs
	NC200	Glass flask 200 mL (*) Flask inner diameter 24 to 30 mm			
	NC300	Glass flask 300 mL (*) Flask inner diameter 24 to 30 mm			
	NC500	Glass flask 500 mL (*) Flask inner diameter 28 to 36 mm			
	NC1000	Glass flask 1 L (*) Flask inner diameter 32 to 42 mm	3 pcs	6 pcs	12 pcs

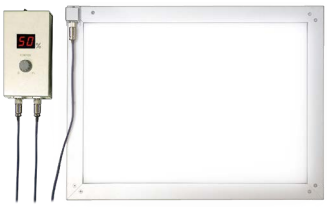
(*)Needle cap should be the matching size for the size of the flask.

For CO_2-BR-43FL
Example of irradiation set



About LED irradiation units and controllers

The LED irradiation unit has been renewed. The illuminance (light intensity) of the new 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

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.
Light shielding plate SHP-180LF	For shielding the Door and Window of the CO_2-BR-180LF from a light, 2 pcs, Included in the CO_2-BR-180LF, For repair
LED irradiation unit LC-450EXP	LED Color: White, Peak wavelength: 450 nm, Photon flux density: Approx. 310 μmol/m^2/s (See page 045 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.
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-40LF/43FL, 6 pcs × Hose (25 cm length) with connection connector. For replacement when the accessories are worn.
	Gas supply hose set (12 pcs) GH-0635-180LF	For CO_2-BR-180LF, 12 pcs × Hose (35 cm length) with connection connector. For replacement when the accessories are worn.

CO_2-BR Series Experimental data

FreeStyle 293 cell culture and Antibody production

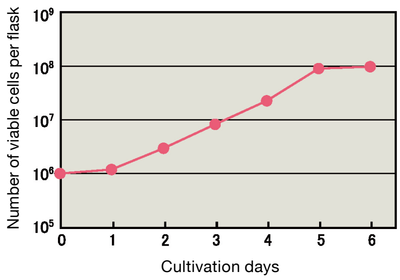

CO_2-BR-40LF + CO-GAS3000

[Fig. 1] Proliferation curve of FreeStyle 293 cells by CO_2-BR-40LF
FreeStyle 293 cells were transferred into 20 mL medium/125mL Erlenmeyer flasks, and cultured at 8% CO_2, 37°C, 125 r/min.

[Fig. 2] SDS-PAGE of purified expressed protein (38 kDa).
The gene for Flag-tagged protein was transfected into 30 mL (3 × 106 cells) of logarithmically growing FreeStyle 293 cells. The cells were then cultured for 2 days, and the target protein was purified from the supernatant with anti-Flag antibody.

600 μg of purified protein was obtained per flask.

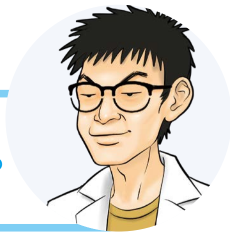
[Figure 1]



[Figure 2]

USER'S VOICE

It is used for the cultivation of 293 and CHO cell lines. You can scale up to a flask of 5 L.



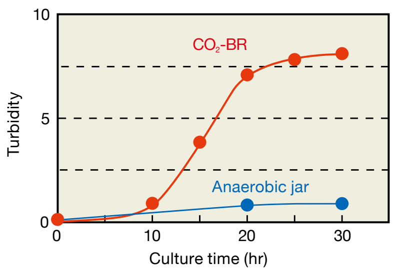
Hypoxic culture of bifidobacteria

Conventional anaerobic jar

CO_2-BR-40LF + Multi-GAS3000
+ Nitrogen gas generator and optional tank

Anaerobic jars are used to culture bifidobacteria, which are anaerobic bacteria, but have drawbacks. The preparation for culture is time-consuming (vacuum pump to reduce pressure and then fill with mixed gas) and growth is slow.
Cultivation was performed under hypoxic conditions with forced aeration of mixed gas in CO_2-BR, and then compared with anaerobic jars. After 30 hours of incubation, the turbidity of bifidobacteria cultured in CO_2-BR was 10 times higher than that of the anaerobic jar culture.

[Culture Results]



Strain: ***Bifidobacterium boum***
Medium: ABCM broth
Culture conditions of CO_2-BR:
10 mL medium/250 mL flask, mixed gas (15% CO_2/85% N_2) forced aeration at 20 mL/min, 37°C, orbital shaking at 125 r/min
Culture conditions of Anaerobic jar:
800 mL medium/1 L jar, filled with 15% CO_2 and 85% N_2 gas, and placed at 37°C

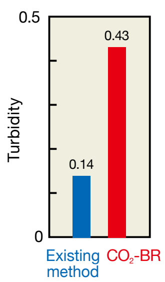
Hypoxic culture of H. pylori

Conventional method:
Shaking culture of Erlenmeyer flasks with hypoxia in the chamber using Anaero Pack, etc.

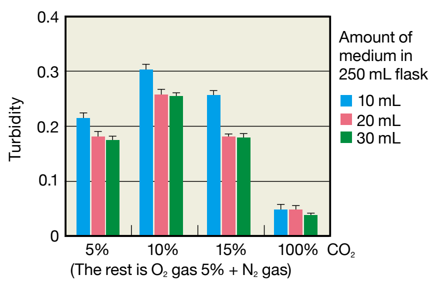
CO_2-BR-40LF + Multi-GAS3000
+ Nitrogen gas generator and optional tank

For B. pylori, which is a microaerophilic bacterium, petri dishes are used for clinical small-volume cultures. When larger quantities are needed, a hypoxic environment is created in a chamber and the culture is performed in flasks with shaking, but this has the disadvantage of slow growth. Therefore, when the culture was done by forced aeration of a mixed gas of 5% O_2 with CO_2-BR, good growth results were obtained. It was also found that the amount of medium (affecting the contact area between the gas and the medium) and CO_2 concentration also affected the growth.

[Figure 1]
Incubation 72hr



[Figure 2] Changed the medium volume and CO_2 concentration conditions, and culture 48hr



Strain: ***Helicobactor Pylori***
Medium: BBL Brucella broth with 5% deactivated horse serum
Culture conditions of CO_2-BR:
Figure 1) 20 mL medium/250 mL flask, mixed gas (5% O_2/15% CO_2/80% N_2) forced aeration at 20 mL/min. 37°C, orbital shaking at 180 r/min.
Figure 2) Culture by the existing method, in which the medium volume and gas conditions are changed as shown in the figure, 37°C, orbital shaking at 180 r/min: 20 mL medium/250 mL flasks in anaerobic Box with Anaero Pack (5% O_2/15% CO_2/80% N_2 gas) at 37°C, 180 r/min with orbital shaking.

Note

Date *Author*

Title