

2


Constant temperature incubator shaker OD Monitor

■ Model selection guide.....	20
■ Compact size constant temperature incubator shaker for Well plate and Microtube Maximizer MBR-022R/K.....	22
■ Constant temperature incubator shaker with New Max drive DWMMax MBR Series.....	23
■ Medium size constant temperature incubator shaker for Well plate Maximizer MBR-430FL.....	25
Maximizer MBR-430FP.....	25
■ Constant temperature incubator shaker with New Max drive DWMMax VBR-104.....	26
■ Small size constant temperature incubator shaker Bioshaker BR-21/22/23 Series.....	27
■ Medium size constant temperature incubator shaker Bioshaker BR-53FP.....	28
Bioshaker BR-40/41/42/43 Series.....	29
■ Large size constant temperature incubator shaker Bioshaker BR-180LF/BR-180LF-70RT.....	30
Bioshaker GBR-200/GBR-300.....	31
Bioshaker BR-300LF/Double platform BR-300LF.....	33
Bioshaker BR-3300 Series.....	34
■ Non-contact turbidimeter for Shaking culture (OD-Monitor) OD-Monitor A&S/C&T.....	42
OD-Monitor B&L.....	43
OD-Monitor for Continuous culture systemA/B.....	43
■ LED irradiation unit LED irradiation unit LC-450EXP.....	45

NEW

NEXT

Maximizer
MBR-022R/K



New Max drive

DWMax
MBR Series




DWMax
VBR-104



for Deep-well plate

Maximizer
MBR-430FL
MBR-430FP



Small size


Low temp.

FP Type



Middle temp.

UM Type



High temp.


FH Type



Medium size


Low temp.

LF/FL/FP Type



Middle temp.

FM Type



High temp.

FH Type



Large size


Bioshaker
BR-180LF
Series



Bioshaker
GBR
Series



Bioshaker
BR-300LF
Series



Bioshaker
BR-3300LF
Series



Constant temperature incubator shaker series

Widely used for Cultivation of microbes such as Yeasts, E. coli, etc. that require temperature control.

For Well plate and Microtube

Page	Model	Door type	Cooling method	Temperature range
P.022	③MBR-022R	•Lift-up door	Peltier element	•+15°C to +60°C
	③MBR-022K		N/A	•+7°C above Room temperature to +60°C
P.023	①MBR-034P		Peltier element	•+7°C below Room temperature to +60°C
	①MBR-034		N/A	•+7°C above Room temperature to +60°C
P.026	②MBR-032P		Peltier element	•+15°C to +60°C
	②MBR-032		N/A	•+7°C above Room temperature to +60°C
	①MBR-104P		Peltier element	•+7°C below Room temperature to +60°C
	⑤VBR-104		N/A	•+8°C above Room temperature to +60°C

For Well plate

Page	Model	Door type	Cooling method	Temperature range
P.025	⑤MBR-430FL	•Single swing door	✓	•+4°C to +70°C
	⑤MBR-430FP		Peltier element	•+20°C to +50°C

Bioshaker (Small size)

Page	Model	Door type	Cooling method	Temperature range	
P.027	③BR-21FP	•Single swing door (Leftward open)	Peltier element	•+15°C to +60°C	
	③BR-22FP				
	③BR-23FP				
P.027	⑦BR-21UM	•Lift-up door	N/A	•+5°C above Room temperature to +70°C	
	⑦BR-22UM				
	⑦BR-23UM				
P.027	③BR-21FH	•Single swing door (Leftward open)		N/A	•+5°C above Room temperature to +100°C
	③BR-22FH				
	③BR-23FH				

Bioshaker (Medium size)

Page	Model	Door type	Cooling method	Temperature range
P.028	⑤BR-53FP	•Single swing door (Leftward open, Can be changed to rightward open)	Peltier element	•+15°C to +55°C (*)
P.029	③BR-40LF	•Lift-up door	✓	•+4°C to +70°C
	⑤BR-41FL			
	⑤BR-42FL			
P.029	⑤BR-43FL	•Single swing door (Leftward open, Can be changed to rightward open)	N/A	•+5°C above Room temperature to +70°C
	⑤BR-41FM			
	⑤BR-42FM			
P.029	⑤BR-43FM			•+5°C above Room temperature to +100°C

Bioshaker (Large size with Double platform)

Page	Model	Door type	Cooling method	Temperature range
P.030	⑩BR-180LF	•Clamshell split door (Divided into Upper and Lower, Upward opening and Front opening)	✓	•+4°C to +70°C
	⑩BR-180LF-70RT			•+4°C to +80°C
P.031	⑪GBR-200	•Swing lift-up door		•+4°C to +70°C
	⑪GBR-300			•+4°C to +60°C
P.033	⑨BR-300LF	•Single swing door (Leftward open)		•+4°C to +70°C
	⑩Double platform BR-300LF			•+4°C to +70°C
	⑫BR-3300			•+4°C to +60°C
P.034	⑫BR-3300B	•Double swing door		•+4°C to +70°C
	⑫BR-3300S			•+4°C to +60°C
	⑫BR-3300W			•+4°C to +70°C
	⑫BR-3300BW		•+4°C to +70°C	
	⑫BR-3300SW		•+4°C to +60°C	

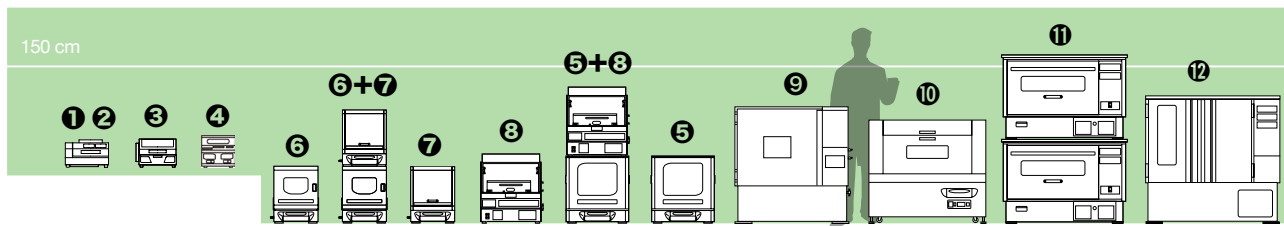
LED irradiation unit

The LED irradiation unit is optimally used in combination with a Middle or Large sized Bioshaker.

--> P.045



Compact size Small size Medium size Large size



	Shaking motion	Speed range	Capacity	Applications	Page
●	●Horizontal eccentric shaking	●300 to 2500 r/min	●Well plate × 2 ●Microtube rack × 2	●Shaking culture with Deep-well plate and Microtube rack ●ELISA and Phage display method	P.022
		●200 to 1600 r/min	●Well plate × 4 ●Microtube rack × 4	●Cold-Shock expression for E.coli ●Shaking Culture with Deep well plate or Microtube	P.023
	●Well plate × 2 ●Microtube rack × 2		●Cold-Shock expression for E.coli ●Shaking Culture with Deep well plate or Microtube		
●Orbital	●50 to 500 r/min	●15 mL disposable tube × 16 ●50 mL disposable tube × 8 ●100 mL Erlenmeyer flask × 6 (Each requires optional accessories.)	●Enzyme digestion, Biodegradation test ●Cultivation of Microbes such as E.coli	P.026	

	Shaking motion	Speed range	Capacity	Applications	Page
●	●Horizontal eccentric shaking	●200 to 1500 r/min	●Deep-well plate × 12 ●Microplate × 24	●Shaking culture with Deep-well plate ●ELISA and Phage display method	P.025

	Shaking motion	Speed range	Shaking width	Features/Capacity	Applications	Page
●	●Reciprocal	●20 to 300 r/min	●25 mm	●Peltier cooling with CFC-free (FP type) ●500 mL Erlenmeyer flask × 4 ●2 L Erlenmeyer flask × 1	●Cultivation of yeasts and insect cells	P.027
	●Orbital					
	●Reciprocal/Orbital				●Cultivation of Microbes such as E.coli	P.027
	●Reciprocal					
	●Orbital				●Cultivation of Thermophile and Hybridization	P.027
	●Reciprocal/Orbital					
	●Reciprocal					
	●Orbital					
●Reciprocal/Orbital						

	Shaking motion	Speed range	Shaking width	Features/Capacity	Applications	Page
●	●Reciprocal/Orbital	●20 to 300 r/min	●25 mm	●Peltier cooling with CFC-free (BR-53FP)	●Low temperature cultivation of protein expression vector for E. coli	P.028
●	●Reciprocal/Orbital	●20 to 300 r/min	●10 to 40 mm	●500 mL Erlenmeyer flask × 6 ●2 L Erlenmeyer flask × 2	●Cultivation of Microbes such as E.coli ●Cultivation of yeasts and insect cells	P.029
	●Reciprocal					
●	●Orbital	●20 to 300 r/min	●25 mm	●BR-41/42/43FL are equipped with a compressor and can be cooled down to +4°C ●500 mL Erlenmeyer flask × 8 ●5 L Erlenmeyer flask × 1	●Cultivation of Microbes such as E.coli	P.029
	●Reciprocal/Orbital					
●	●Reciprocal/Orbital				●Cultivation of Thermophile and Hybridization	P.029

(*)The value at 25°C of the rear surface intake temp. The temperature range of the unit is 10°C below RT to 30°C above RT, or within the operating temperature range.

	Shaking motion	Speed range	Shaking width	Features/Capacity	Applications	Page
●	●Reciprocal/Orbital	●25 to 250 r/min (*)	●25/50 mm	●500 mL Erlenmeyer flask × 24 ●5 L Erlenmeyer flask × 4	●Cultivation of microbes such as E. Coli, etc. ●Cultivation of actinomycete	P.030
	●Reciprocal	●25 to 250 r/min	●70 mm			
●	●Reciprocal/Orbital	●25 to 200 r/min	●25/50 mm	●For as a laboratory bench. Stackable up to Two stage. ●500 mL Erlenmeyer flask × 24 ●5 L Erlenmeyer flask × 4	●Cultivation of E. coli, yeasts, and insect cells ●Cultivation of Thermophile and Hybridization	P.031
		●25 to 300 r/min				
●	●Reciprocal/Orbital	●25 to 250 r/min	●10 to 50 mm	●500 mL Erlenmeyer flask × 15 ●5 L Erlenmeyer flask × 3 ●500 mL Erlenmeyer flask × 30 ●1 L Erlenmeyer flask × 18	●Cultivation of microbes such as E. Coli, etc. ●Cultivation of microbes such as E. Coli, etc.	P.033
		●25 to 160 r/min				
●	●Reciprocal/Orbital	●25 to 250 r/min	●10 to 50 mm	●BR-3300B with top board ●3300S with top board and safety door lock function ●500 mL Erlenmeyer flask × 32 ●5 L Erlenmeyer flask × 4 ●Double platform ●BR-3300B with top board ●3300S with top board and safety door lock function ●500 mL Erlenmeyer flask × 64 ●1 L Erlenmeyer flask × 36	●Cultivation of Microbes such as E.coli ●Cultivation of Yeasts, Psychrophiles, and Insect cells ●Transportation testing of food and other products	P.034
		●30 to 250 r/min				
		●25 to 160 r/min				
		●30 to 160 r/min				

(*)When the width is 25 mm, only orbital can be 25 to 400 r/min.

OD-Monitor Series

Non-contact turbidimeter that realizes to measure the turbidity of sample at OD₆₀₀ while shaking in noncontact. Available in 3 models for Large and Small Erlenmeyer flask and Test tube.

--> P.042



NEW

Constant temperature incubator/shaker OD Monitor

For cell culture related products

Shaker

Mixer Rotor Stirrer

Bead beater Ultrasonic homogenizer

Aluminum block Bath Mini-size Bath

Water bath Shaking Water bath Immersion cooler

Hybridization Incubator Constant temperature Chambers

Centrifugal Concentrators Cold Trap

Freeze dryers

Substrate Electrophoresis apparatus Blotting device for hybridization

Constant-temperature water circulating system [Chilled]

Appendix

NEW

Maximizer MBR-022R/K

Optimum for Well plate, Microtube rack, and Vial. For Type R, it is possible to control Temp below R.T. For Multi-specimen processing that requires high-speed micro vibrations.

•Without temp. control "Micro mixer E-022" --> P.062



MBR-022R

MBR-022K

Please prepare an electrical adapter compatible with your country for use.

Model	MBR-022R	MBR-022K
Temperature range (*1)	+15°C to +60°C	+7°C above RT to +60°C
Temp. control accuracy (*2)	±0.5°C to ±1.0°C	
Shaking motion	Horizontal eccentric shaking (S-Max drive)	
Speed range	300 to 2500 r/min	
Capacity	Well plate x2pcs Microtube rack (24 pcs) x2pcs	
Ambient temp. range	+5°C to +30°C	
Heating cooling method	Peltier element	Heater unit (for heating only)
Display (Temp./Speed)	Digital display	
Safety devices/functions	Fuse, high temperature, braking when hood open, motor overload, motor overvoltage, sample protection alarm (high/low temperature), non-volatile memory error, sensor disconnection diagnosis, auto-tuning error, alarm setting error, speed limit error, out-of-range display/measurement error	
Dimensions (W × D × H)	244 × 417 × 240 mm	244 × 392 × 240 mm
Weight	Approx. 15 kg	Approx. 13 kg
Power supply	AC100V to 240 V	
Standard accessories	Power cable x1pc, plate adapter x1pc, fuse x1pc, drain tray x1pc	

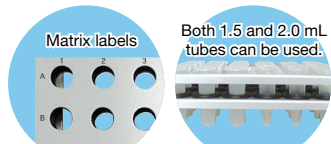
(*1)The limits on the temperature range are the room temperature minus 7°C for cooling and plus 40°C for heating. (*2)The value at the ambient temperature is 25°C as the standard.

•Since it is designed for 96-well plate, the agitating effectiveness will be different when using different well sizes such as 24-well and 384-well plate.

Optional parts: Microtube racks/Vial rack



EM-1524



- Same footprint as the well plates
- EM-1524 can be used for both 1.5 and 2.0 mL
- Available as a tube stand

Product Name/Model	Microtube rack		
	EM-0524	EM-1524	EM-1515
Capacity	0.5 mL × 24	1.5/2.0 mL × 24	5.0 mL × 12
Dimensions	126 × 86 × 28.5H mm	126 × 86 × 40.5H mm	126 × 86 × 55.5H mm

•0.5 and 1.5 mL microtubes must be Eppendorf tubes.

Features

- Optimum for stirring of 96-well plate and/or Microtube
- Enables Shaking culture with 96-deep well plate
- For Type R, Peltier cooling enables temp. control from 15°C

Applications

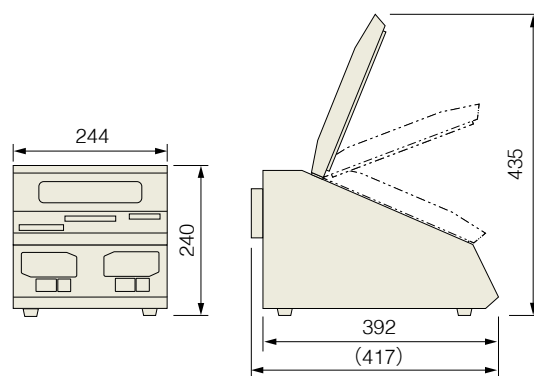
- Shaking culture with Deep-well plate and Microtube rack
- ELISA and Phage display method
- Enzymatic digestion, Biodegradability tests, Metabolome analysis, etc.

The S-Max drive enables highly efficient stirring/culturing

The S-Max drive is a mechanism that improves the accuracy of vibration speed and reduces wobbling in the vertical direction by employing a special rubber and crankshaft structure. It prevents the main unit from moving due to the vibration during operation and also lessens noise. The vibration and noise of the main unit are reduced by 50% or more, as compared with existing devices.

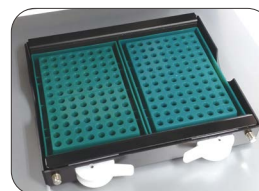


Dimensions



() is MBR-022R

Applicable vessels



When shaking non-skirted PCR plates or semi-skirted well plates, you can use off-the-shelf tube racks for stirring. The vibration speed should be up to 1200 r/min when using them.

(*) Semi-skirted low-profile types cannot be used in this combination.

DWMax MBR-034P/034/032P/032/104P

Powerful, Uniform, and Silent! Our proprietary technology "New Max drive" enables Excellent aeration effectiveness of 96-well plate, microtube, and disposable centrifuge tube.

•Experimental data --> P.024



[P type]



MBR-034P
Deep well plate



MBR-032P
Microtube rack (Optional)



MBR-104P
Shaking platform (Optional)

Features

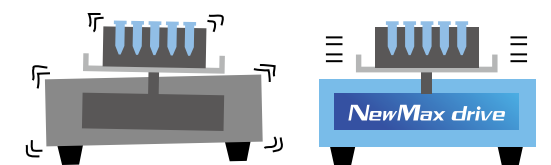
- Optimum for using 96-well plate and stirring for microtube [Model 03]
- Optimum for stirring of Microtube and/or Centrifuge tube [Model 10]
- Temperature control below R.T. by peltier cooling [P Type]

Our proprietary technology "New Max drive™" enables great stirring effectiveness to prevent wobbling.

A shaker can synergistically generate the wobble by its vibration and the wobbling of the platform by inertia. The wobble can sometimes decrease the effectiveness of shaking and stirring. The New Max drive can realize less wobbling of the Shaker. For example, we obtained dramatic effectiveness in which the variation between wells in the cultivation by using well plate rack improved (see the next page).

Applications

- Shaking Culture with Deep well plate or Microtube
- Cold-Shock expression for E. coli [Model-032/034P], ELISA, etc.
- Enzyme digestion, Biodegradation test, Metabolomic analysis, etc.



Capacity	Well plate x4 (*1) or Microtube rack x4		Well plate x2(*1) or Microtube rack x2		1.5 or 2 mL microtube rack and 15 or 50 mL disposable centrifuge tube by changing the platform.
Model	MBR-034P	MBR-034	MBR-032P	MBR-032	MBR-104P
Temperature range	+7°C below RT (*2) to +60°C	+7°C above RT (*2) to +60°C	+15°C to +60°C (*3)	+7°C above RT (*2) to +60°C	+7°C below RT (*2) to +60°C
Temp. control accuracy	±0.5°C to ±1.0°C (*3)				
Shaking motion/Speed range	Horizontal eccentric shaking, 200 to 1600 r/min				Orbital, 50 to 500 r/min
Platform size	-				240 × 220 mm (Max. inside height : 100 mm)
Ambient temp. range	+5°C to +30°C				
Heating method	Heater 70 W		Peltier element		Heater 70 W
Cooling method	Peltier element		-		Peltier element
Other functions	Digital display of temperature and speed, 1 × Memory function of temperature and speed				
Safety devices/functions	Fuse, Self-diagnosis function for temp. control error, Braking when hood open, Motor overload/Over-voltage protection				
Dimensions (W × D × H)	405 × 445 × 230 mm	405 × 402 × 230 mm	365 × 400 × 230 mm	365 × 347 × 230 mm	405 × 445 × 230 mm
Weight	Approx. 18 kg	Approx. 16 kg	Approx. 15 kg	Approx. 13 kg	Approx. 18 kg
Power supply	AC100V-240V/1.5A (universal power supply)				
Standard accessories	-				Sticky sheet x1pc

(*1) Equipped with the platform for Well plate. Since it is designed for 96-well plate, the agitating effectiveness will be different when using different well sizes such as 24-well and 384-well Plates. (*2) The limits on the temperature range are the room temperature minus 7°C for cooling and plus 40°C for heating. (*3) Values for when the ambient temperature is around +25°C. (*4) Micro tube racks for the 03 model and shaking tables for the 10 model are sold separately (see below).

Optional parts

Product Name/Model	Capacity of Vessels
Microtube rack EM-0524	0.5 mL Microtube × 24
Microtube rack EM-1524	1.5/2 mL Microtube × 24
Microtube rack EM-1515 (*)	5 mL tube × 12

Product Name/Model	Capacity of Vessels
Shaking platform for 1.5mL Microtube VBR-1140	1.5/2 mL Microtube × 40
Horizontal shaking platform for 15mL centrifuge tube VBR-1816	15 mL disposable tube × 16
Horizontal shaking platform for 50mL centrifuge tube VBR-3508	50 mL disposable tube × 8

(*) Suitable 5 mL Microtubes are WATSON (Japan) and Argos (USA), but not Eppendorf (Germany).
•The Microtube racks are for 03 models (034P/034/032P/032) and the shaking platform is for 10 model (104P).

NEW

Constant temperature incubator shaker OD Monitor

For cell culture related products

Shaker

Mixer Rotator Stirrer

Bead beater homogenizer Ultrasonic homogenizer

Aluminum block Bath Mini-size Bath

Water bath Shaking Water bath Immersion cooler

Hybridization Incubator Constant temperature Chambers

Centrifugal Concentrators Cold Trap

Freeze dryers

Substrate Electroporation apparatus Blotting device for hybridization

Constant-temperature water circulating system [Chilled]

Appendix

DWMax experimental data

History for shaking culture with Deep well plate

Deep well plate (hereinafter, DWP) is a container originally used to store samples. However, when the method of High-throughput screening (HTS) was developed around the year 2000, it started being used not only for Storage but also for other applications such as Cultivation and Reaction. At that time, we received a customer's inquiry "Do you have any idea on how to perform a shaking culture with DWP effectively?" Thereafter, we managed to develop the "Bioshaker"® MBR-024 for DWP," which was the predecessor of the current Bioshaker®.

USER'S VOICE

I was really amazed that an effective shaking culture of heavy yeast in such a small well of the Deep well plate can be realized!

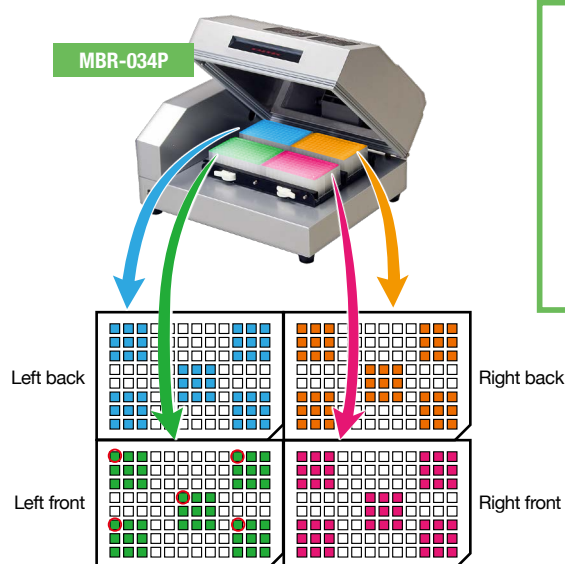


The verification for the mounting position and the variation among the wells and the effectiveness of shaking culture of yeast with 96-DWP.

Validation for New Max drive. To reduce the variations due to the position of vessels and wells.

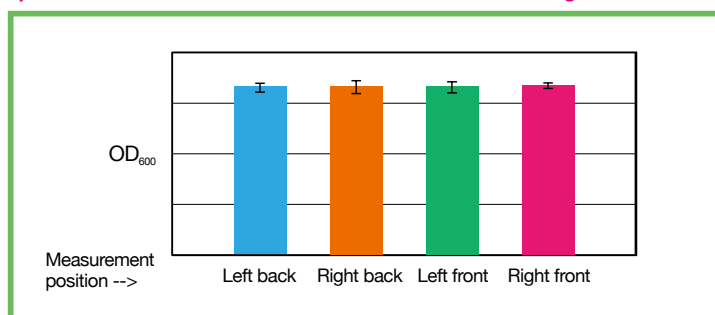
We verified the variation in turbidity (OD_{600}) for the yeast in four wells out of 96-deep well plate (squared well). Since yeast has a larger cell than E. coli, it is inclined to sink to the bottom of the well, in particular, the shaking culture with DWP if the stirring effectiveness is poor, which causes the variation in turbidity. At the same time, we also compared the popular shaking culture method using an Erlenmeyer flask to 96-deep well plate in turbidity (OD_{600}). The variation among the positions of deep wells are indicated in the bar graph. The deviation of each well plate in the same DWP is indicated in error bars in black (Fig.1). As a result, each well plate had no big difference in deviation. We have concluded that the stirring effectiveness at any positions in DWP made it uniform. We then compared it with the Erlenmeyer flask in turbidity, and finally a doubled value (OD_{600} =above 8) of the upper value in the Erlenmeyer flask was obtained (Figure.2).

[Measurement position of OD_{600}]

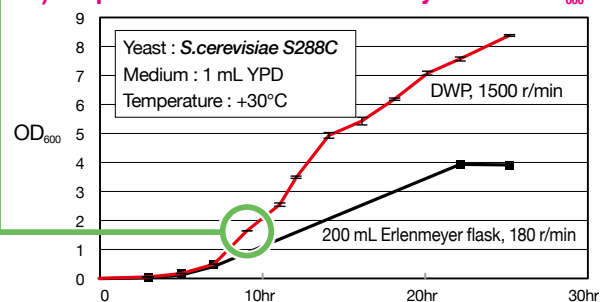


The six wells per group were respectively allocated at the four corners and at the center of DWP. Measured the five deep wells allocated among from respectively five groups at the four corners and at the center of DWP. *The deep well that is circled in red is measured for variation in the Front Left, in addition to the Left back, Right front, and Right back.

1) Variations were measured for 9 hours since the shaking culture started.



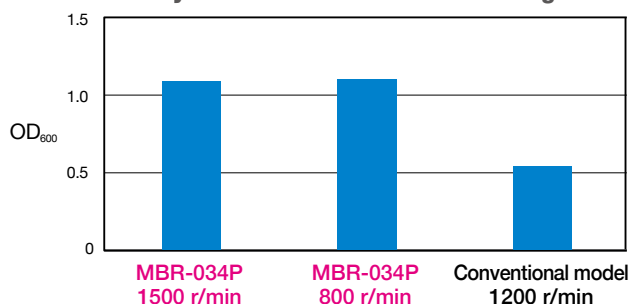
2) Comparison between DWP and Erlenmeyer flasks in OD_{600} .



Comparison with the conventional model: Shaking culture of E. coli with 96-well plate

We made shaking culture of E. coli using MBR-034P and the conventional model with 96-well plate for comparison. 4 hours after the start of shaking culture, we measured the turbidity. As a result, we discovered that OD_{600} of MBR-034P reached " $OD_{600}=1.0$ " in half the time earlier than the conventional model, even at a slower shaking speed.

Turbidity 4 hours after the start of shaking culture



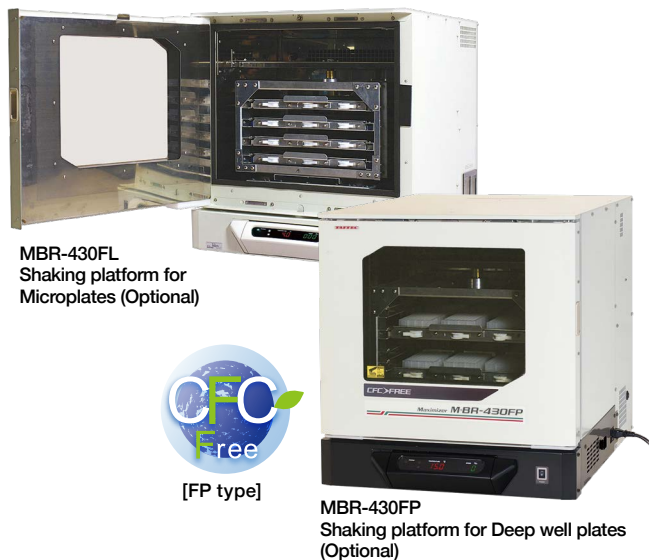
[Conditions] *All models in common

- 96-deep well plate: Square hole (conical bottom), Capacity approx. 2 mL per well
 - Sealing: Gas Permeable Adhesive Seals
 - Cultivation volume: 1 mL (approx. 50% of the well volume is optimal for aeration).
- > In the case of 1 mL, the solution does not reach the sealing when shaking up to 1500 r/min, but reaches the sealing at 1600 r/min.

Maximizer MBR-430FL/430FP

Up to 24 pcs for Microplates! Large capacity constant temperature incubator shaker for 96-well plates.
The FL type can be temperature-controlled from +4°C. The FP type is CFC-free and energy-saving thanks to Peltier cooling.

•Powerful, Uniform, and Silent!. Compact tabletop machine for 2 to 4 well plates --> P.022-023



MBR-430FL
Shaking platform for
Microplates (Optional)



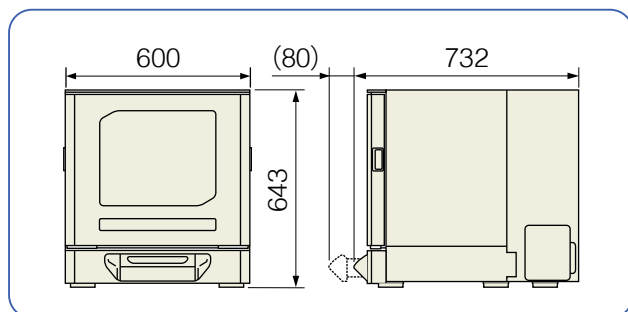
[FP type]

MBR-430FP
Shaking platform for Deep well plates
(Optional)

Model	MBR-430FL	MBR-430FP
Temperature range	+4°C to +70°C	+20°C to +50°C (*1) (5°C below RT to 25°C above RT)
Temp. control accuracy	±0.3°C to ±1.0°C (*2)	±0.5°C
Shaking motion	Horizontal eccentric shaking (Inverting function)	
Speed range	200 to 1500 r/min (Up to 1000 r/min at inverting shaking)	
Capacity (*3)	Well plate ×12 or Microplate ×24	
Ambient temp. range (*4)	+5°C to +35°C	+5°C to +30°C
Shaking inverting function	The time and speed for inverting can be set up.	
Heating method	Heater 800 W	Peltier element
Cooling method	Compressor 140 W	
Display (Temp./Speed)	Digital display	
Program functions	4 programs, 9 segments: Temp., Shaking speed, and time/per segment (Setting range: 00 h 00 min to 99 h 59 min), Wait function (*5)	
Safety devices/ functions	Leakage/Overcurrent breaker, Fuse, Alarm of abnormal sample temp. (Set as desired), Detecting the door opening and closing, Self-diagnosis function for sensor error, Motor current limiter, Compressor overheating cut-off circuit (FL)	
Dimensions (W × D × H)	600 × 732 × 643 mm	
Weight	110 kg (Platform not included)	105 kg (Platform not included)
Power supply	AC100V/12A (Need a step-down transformer)	AC100V/AC220V-240V/7A

(*1)The value at 25°C of the rear surface intake temp. The temperature range of the unit is 5°C below RT to 25°C above RT, or within the operating temperature range. (*2)The temp. of defrost function that just starting is not included. (*3)Shaking platform (Optional) is required to fix the plates. The capacity varies depending on the number of shaking platforms (Optional). (*4)No condensation. (*5)Shaking will start when reaching the preset temp.
 •External output and 240 V specifications are also available by special order (FP only). Please contact us for details.

Dimensions



Features

- Possible for shaking culture with 96-deep well plate
- Inverting function of shaking (Up to 1000 r/min)
- Renewed to improve the stability of the main body, Made it much quieter

Applications

- Shaking culture with Deep well plates
- ELISA and Phage display method
- Enzymatic digestion, Biodegradability tests, etc.

Much quieter than conventional models. FP type uses Peltier cooling to save energy.

The balance of the shaking platform has been thoroughly improved, making it much more stable and quieter than our previous models (noise level at 1500 r/min is about 1/2). 430FL can be temperature-controlled from +4°C, enabling low-temperature cultivation or storage at low temperature after cultivation at 37°C. 430FP can be temperature-controlled from +20°C and consumes only about 1/5 of power (at 37°C and 1500 r/min) and 7 A of power supply capacity, making it very energy-efficient.

Model	Power supply	Power consumption	Temperature range
MBR-430FL	12 A	598 Wh (at +37°C, 1500 r/min)	4°C to 70°C
MBR-430FP	7 A	103 Wh (at +37°C, 1500 r/min)	20°C to 50°C

Optional parts: Shaking platform



Shaking platform for Microplates
6 plates can be placed on the platform. 4 sets of platforms can be attached to the unit.



Shaking platform for Deep well plates
6 plates can be placed on the platform. 2 sets of platforms can be attached to the unit.

Product Name/Model	Capacity of Vessels/ Remarks	Mounting qty	Capacity of vessel per platform	Maximum number of vessels
Shaking platform for Deep well plates DWP-2412N (*1)	Standard deep well plat	2	6	12
Adapter ADP-2412	Required for mounting Deep Well plate with rims (*2) to DWP-2412, 2 sets.	2 sets of adapters per platform	-	-
Shaking platform for Microplates MTP-2412N (*1)	Standard microplate (Do not use the lid, Sealing films are recommended)	4	6	24
Sticky sheet shaking platform SR-2412N (*1)	Flat bottoms such as a Petri dish can be held simply by placing it on the platform. Max shaking speed 1000 r/min.	4	-	-

(*1)Not compatible with the former product MBR-420FL. (*2)Deep wells are available in the shapes shown below. For mounting Deep well plate with rims, adapter ADP-2412 is required.



General Deep well plate



With rims (designated by TAITEC)

NEW

Constant temperature incubator shaker
OD Monitor

For cell culture related products

Shaker

Mixer
Rotator
Stirrer

Bead beater
homogenizer
Ultrasonic homogenizer

Aluminum block Bath
Mini-size Bath

Water bath
Shaking Water bath
Immersion cooler

Hybridization
Incubator
Constant temperature Chambers

Centrifugal
Concentrators
Cold Trap

Freeze dryers

Substrate
Electrophoresis apparatus
Blotting device for hybridization

Constant-temperature water circulating system [Chilled]

Appendix

NEW

DWMax VBR-104

Our proprietary technology "New Max drive" enables excellent aeration effectiveness with Max. 500 r/min.
Optimum for bacteriophage culture and small-scale cultivation.



Features

- Excellent aeration effectiveness
- Suitable for small Erlenmeyer flask, Centrifuge tube, and Microtube
- Compact bench-top unit is easy to handle

Applications

- Cultivation of Bacteriophage
- Cultivation of Microbes such as E. coli
- Solubility test for Refractory

Easy to detach from the platform. Plenty of variations.

Comes with Sticky sheet, Spring net shaking platform, and Universal shaking platform. Other optional parts are available.

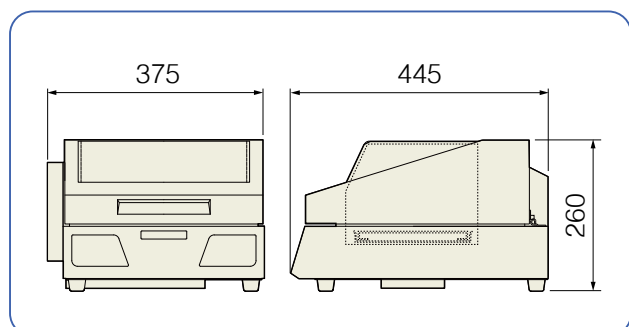
Our proprietary technology "New Max drive" enables great stirring effectiveness to preventing wobbling.

A shaker can synergistically generate the wobble by its vibration and the wobbling of the platform by inertia. The wobble can sometimes decrease the effectiveness of shaking and stirring. The New Max drive can realize less wobbling of the shaker. For example, we obtained dramatic effectiveness in which the variation between wells in the cultivation by using deep wells improved (see the P.024).

Model	VBR-104
Temperature range (*1)	+8°C above RT to +60°C
Temp. control accuracy (*2)	±0.5°C to ±1.0°C
Shaking motion	Orbital shaking
Speed range	50 to 500 r/min
Platform size	240 x 200 mm (Max. inside height: 168 mm)
Ambient temp. range	+5°C to +30°C
Heating method	Heater 80 W
Safety devices/functions	Fuse, Self-diagnosis function for temp. control error, Braking when hood open, Motor overload/Over-voltage protection
Dimensions (W x D x H)	375 x 445 x 260 mm
Maximum load	1 kg (Platform included)
Weight	Approx. 20 kg
Power supply	AC100V-240V/2A (universal power supply)
Standard accessories	Sticky sheet x1pc

(*1) It may not reach the maximum temperature by the surroundings. (*2) The value at the ambient temperature of 25°C.

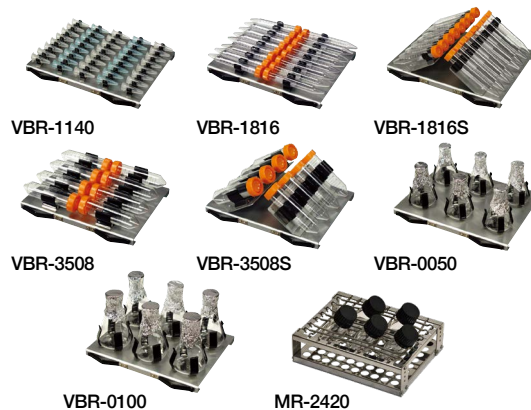
Dimensions



Spring net shaking platform
MR-2420 (Optional)



Optional parts: Platforms



Product Name/Model	Capacity of Vessels
Shaking platform for 1.5 mL Microtube VBR-1140	1.5 mL Microtube x 40
Horizontal shaking platform for 15 mL centrifuge tube VBR-1816	15 mL disposable tube x 16
Diagonal shaking platform table for 15 mL centrifuge tube VBR-1816S	15 mL disposable tube x 16
Horizontal shaking platform for 50 mL centrifuge tube VBR-3508	50 mL disposable tube x 8
Diagonal shaking platform table for 50 mL centrifuge tube VBR-3508S	50 mL disposable tube x 8
Shaking platform for 50 mL Erlenmeyer flask VBR-0050	50 mL Erlenmeyer flask x 6
Shaking platform for 100 mL Erlenmeyer flask VBR-0100	100 mL Erlenmeyer flask x 6
Spring net shaking platform MR-2420	100 mL Erlenmeyer flask x 6

Bioshaker BR-21/22/23 Series

Widely used for Cultivation of microbes, etc. that require temp. control. Its compact sized can be placed under and on the Lab bench.

- Dimensions --> P.046 •Non-contact turbidimeter "OD-Monitor" series --> P.042-043
- Without temp. control "NR-1/2/3" --> P.074

Features

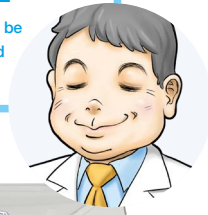
- "9 models" can be selected by temp. range, shaking motion, and door
- Stackable up to Two levels, The platform can be changed
- Capacity: Erlenmeyer flask 500 mL × 4 pcs, 2 L × 1 pc
Details of optional parts and capacity --> P.036-037

Applications

- Cultivation of Microbes such as E. Coli.
- Cultivation of Yeasts and Insect cells (FP)
- Cultivation of Thermophile and Hybridization (FH)

USER'S VOICE

The FP type is CFC-free, so we can be worry free from the gas leakage and the procedures for disposal.



Its compact size can be placed under and on the Lab bench. (Photo shows BR-23FP and the optional spring net shaking platform)



Lift-up door allows for good visibility inside the chamber. (Photo shows BR-23UM and the optional spring net shaking platform)

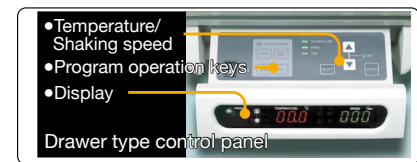


Compact design and Stackable

Its compact size can be placed under the Lab bench. It is stackable up to Two levels with "Stackable base (Optional)." The Lift-up door type is only for the upper of stacked units. Excellent performance for microbial cultures thanks to the shaking speed Max. 300 r/min even 200 r/min at the upper of stacked units.

Sliding retractable control panel

The sliding retractable control panel allows for space saving and excellent operability. The settings for Temperature, Shaking speed, and Operation program are easy to perform (see P.040).



Temperature range	FP type: +15°C to +60°C (*1)			UM type: +5°C above RT to +70°C			FH type: +5°C above RT to +100°C		
Model	BR-21FP	BR-22FP	BR-23FP	BR-21UM	BR-22UM	BR-23UM	BR-21FH	BR-22FH	BR-23FH
Shaking motion	Reciprocal	Orbital	Reciprocal/Orbital	Reciprocal	Orbital	Reciprocal/Orbital	Reciprocal	Orbital	Reciprocal/Orbital
Temp. control accuracy (*1)	±0.2°C			±0.2 to ±0.4°C			±0.1 to ±0.5°C		
Speed range/Shaking width	20 to 300 r/min (200 r/min at the upper of stacked units), 25 mm								
Platform size/Capacity	290 × 250 mm (Max. inside height: FP/FH = 270 mm, UM = 315 mm), Erlenmeyer flask 500 mL × 4, 2 L × 1								
Door type	Single swing door (Leftward open)			Swing lift-up door			Single swing door (Leftward open)		
Maximum load	Approx. 3.5 kg (Platform and Vessel holder included)								
Ambient temp. range	+5°C to +35°C								
Heating method	Peltier element (70 W × 4)			Heater (350 W)					
Cooling method				-					
Display (Temp./Speed)	Digital display								
Program functions	1 program, 9 segments: Temp., Shaking speed and time/per segment (Setting range: 00 h 00 min to 99 h 59 min), Temp. gradient function (*2)								
Safety devices/functions	Leakage/Overcurrent breaker, Fuse, Alarm of abnormal sample temp. (Set as desired), Detecting the door opening and closing, Self-diagnosis function for sensor error, Motor current limiter, Overcurrent protection of Peltier (FP)								
Dimensions (W × D × H)	437 × 585 × 545H mm			422 × 550 × 540H mm			437 × 550 × 545H mm		
Weight	Approx. 48 kg	Approx. 49 kg	Approx. 49.5 kg	Approx. 41.5 kg	Approx. 42.5 kg	Approx. 43 kg	Approx. 42 kg	Approx. 43 kg	Approx. 43.5 kg
Power supply (*3)	AC100V/5A (Need a step-down transformer)								
Standard accessories	Drain nozzle ×1pc, Drain hose ×1pc (*Shaking platform sold separately, see P.037)								

(*1)The value at the ambient temperature is 25°C. Also, the specifications may not be met outside of the ambient temperature range. (*2)The transfer time of temperature can be set up. (*3)Voltage variation rate is ±5% for AC 100 V.

NEW

Constant temperature incubator shaker OD Monitor

For cell culture related products

Shaker

Mixer Rotator Stirrer

Bead beater homogenizer Ultrasonic homogenizer

Aluminum block Bath Mini-size Bath

Water bath Shaking Water bath Immersion cooler

Hybridization Incubator Constant temperature Chambers

Centrifugal Concentrators Cold Trap

Freeze dryers

Submarine Electroporosis apparatus Blotting device for hybridization

Constant-temperature water circulating system [Chilled]

Appendix

Bioshaker BR-53FP

Peltier cooling with CFC-free. Temperature range ensures 15°C to 55°C. Cut power consumption by 80% with the conventional one.

•Dimensions --> P.046 •OD-Monitor Turbidimeter while shaking --> P.042-043



BR-53FP



<Special type example: Clean room support>
A HEPA filter can be installed to meet the EU-GMP Grade B standard. We have actual experience of installing HEPA filters in clean rooms at the Cell Processing Center (CPC).

Peltier cooling with CFC-free, GWP=0

In recent years, environmental considerations in the manufacture and use of products as well as the need to become carbon neutral have become increasingly important issues. The Global Warming Potential (GWP) is a coefficient that indicates the greenhouse effect of gases used in products, etc., based on carbon dioxide. The BR-53FP does not use chlorofluorocarbons by clarifying the purpose of use (operating temperature range: +15°C to 55°C, sufficient for general cultivation) and achieves a GWP=0.

Significantly more energy-efficient than conventional models

Cut power consumption by 80% compared with the conventional one (100 r/min at 37°C). Energy saving with 7 A. CFC-free relieves you from the gas leakage and the procedures for disposal.

Model	Heating cooling method	Size	Power supply	Power consumption
BR-53FP	Peltier element	Medium	7 A	90 Wh (at +37°C, 100 r/min)
BR-43FL	Heater/Compressor	Medium	12 A	510 Wh (at +37°C, 100 r/min)
BR-43FH	Heater (heating only)	Medium	9 A	105 Wh (at +37°C, 100 r/min)

Model	BR-53FP
Temperature range (*1)	+15°C to +55°C (room temperature -10°C to room temperature +30°C)
Shaking motion	Switchable Reciprocal/Orbital shaking
Temp. control accuracy	±0.3°C
Speed range/Shaking width	20 to 300 r/min (200 r/min at the upper of stacked units) / 25 mm
Capacity	Universal shaking platform MT-4430: Erlenmeyer flask 500 mL × 8 pcs Universal shaking platform MT-4030: Erlenmeyer flask 500 mL × 6 or 5 L × 1
Door type	Single swing door (Leftward open, Can be changed to rightward open) (*2)
Maximum load	Approx. 7 kg (Platform included)
Ambient temp. range (*3)	+5°C to +30°C
Heating cooling method	Peltier element
Program functions	1 program, 9 segments: Temp., Shaking speed and time/per segment (Setting range: 00 h 00 min to 99 h 59 min), Temp. gradient function (*4)
Safety devices/functions	Leakage/Overcurrent breaker, Fuse, Alarm of abnormal sample temp. (Set as desired), Detecting the door opening and closing, Self-diagnosis function for sensor error, Motor current limiter
Dimensions (W × D × H)/Weight	600 × 732 × 643 mm, Approx. 86 kg
Power supply (*5)	AC100V/AC220V-240V/7A
Standard accessories	Power cable ×1pc (*Shaking platform sold separately, see page 038)

(*1)The value at 25°C of the rear surface intake temp. The temperature range of the unit is 10°C below RT to 30°C above RT, or within the operating temperature range. When using the LC-450EXP LED irradiation unit, the temperature range is +20°C to +50°C (room temperature -5°C to room temperature +25°C). If a low temperature of +4°C or +55°C or higher is required, please refer to the existing medium-sized BR group (see P.029). (*2)Distributor can make necessary changes. (*3)No condensation. (*4)The transfer time of temperature can be set up. (*5)200 V or 240 V specifications are also available by special order.

USER'S VOICE

CFC-free relieves us from gas leakage and the procedures for disposal. We should apply for "Subsidy scheme for energy efficiency".



Features

- Peltier cooling with CFC-free, Battery friendly
- Stackable up to two levels, Wide variation of platforms are available as an option
- Capacity : Erlenmeyer flask 500 mL × 8 pcs, 5 L × 1 pc
Details of optional parts and capacity --> P.036-038

Applications

- Cultivation of microbes such as Yeast, Insect cell, E.Coli. etc.
- Low temperature cultivation of protein expression vector for E. coli
- Food testing system and inspection for QC

A wide variety of shaking tables (sold separately) are available (--> P.038)



General-purpose spring net shaking platform that is easy to install regardless of vessel shape. Universal shaking platforms that can securely hold Erlenmeyer flasks and have a large capacity. We have a wide variety of Sticky sheet shaking platforms that can fix any flat-bottomed vessel by simply placing it on the platform.

Stackable up to two levels. Unique door

Stackable base (sold separately) can be used to stack up to two levels. This can contribute to space saving in the laboratory. The blacked-out panel design enhances the visibility of the display. The front door opens to the left, but the "LR Select Door" can be changed to open to the right for your convenience.

Bioshaker BR-40/41/42/43 Series

Widely used for Cultivation of microbes such as Yeasts, E. coli, etc. that require temp. control and shaking. Sufficient capacity, Space saving, and High versatility.

- Dimensions --> P.046 •OD-Monitor Turbidimeter while shaking --> P.042-043 •LED irradiation unit --> P.045
- Without temp. control "NR-10/20/30" --> P.076

Features

- 8 models" can be selected by temp. range and shaking motion
 - Stackable up to Two levels, Platform can be changed
 - Capacity : Erlenmeyer flask 500 mL × 8 pcs, 5 L × 1 pc
- Details of optional parts and capacity --> P.036-038

Applications

- Cultivation of microbes such as E. Coli, etc.
- Cultivation of Yeasts and Insect cells (LF/FL)
- Cultivation of Thermophile and Hybridization (FH)

Lift-up door offers allows good visibility inside the chamber (BR-40LF)



Single swing door (Leftward open) for easy shading
BR-40/41/42/43 series

Single swing door (Leftward open) for easy shading

The front door opens to the left, but it can be changed to open to the right for your convenience with the "LR Select Door" (distributor will make the change, please contact us). Combined with two-tiered stacking, it contributes to space saving (optional stackable base is required; the Lift-up door type is only for the upper of stacked units). Excellent performance for microbial cultures thanks to the shaking speed of Max. 300 r/min as well as 200 r/min at the upper of stacked units. Except for 40LF, the program function (see P.040) is also available.

LED irradiation unit is available as an option.

LED (Light emitting diode) irradiation unit is available as an option. Good effect on photosynthesis. *Recommended to use with Small and Medium sized unit (See 45 page for details)



Temperature range	For low to medium temperatures, +4°C to +70°C				For medium temperatures, +5°C above RT to +70°C			For medium to high temperatures, +5°C above RT to +100°C
Model	BR-40LF	BR-41FL	BR-42FL	BR-43FL	BR-41FM	BR-42FM	BR-43FM	BR-43FH
Shaking motion	Reciprocal/Orbital	Reciprocal	Orbital	Reciprocal/Orbital	Reciprocal	Orbital	Reciprocal/Orbital	Reciprocal/Orbital
Temp. control accuracy (*1)	±0.3 to ±1.0°C							
Speed range	20 to 200 r/min	20 to 300 r/min (200 r/min at the upper of stacked units)						
Shaking width	10 to 40 mm	25 mm						
Capacity	Universal shaking platform MT-4430: Erlenmeyer flask 500 mL × 8, Universal shaking platform MT-4030: Erlenmeyer flask 5 L × 1 *BR-40LF: 2 L × 2 (*2)							
Door type	Swing lift-up door	Single swing door (Leftward open, Can be changed to rightward open) (*3)						
Maximum load	approx. 7 kg (Platform and Vessel holder included)							
Ambient temp. range	+5°C to +30°C	+5°C to +35°C						
Heating method	Heater 500 W	Heater 800 W						
Cooling method	Compressor 75 W	Compressor 140 W					-	
Timer/Program functions	BR-40LF (Timer): Temp. transition time and ON-OFF changeover (Non-functional by only temp. transition time *e.g.: Shaking at 37°C --> Shaking stop at 4°C.) BR-41/42/43 (Program): 1 program, 9 segments: Temp., Shaking speed and time/per segment (Setting range: 00 h 00 min to 99 h 59 min), Temp. gradient function (*4)							
Safety devices/functions	Leakage/Overcurrent breaker, Fuse, High temp, Alarm of abnormal sample temp. (Set as desired), Detecting the door opening and closing, Self-diagnosis function for sensor error, Motor current limiter, Compressor overheating cut-off circuit (BR-40LF and FL)							
Dimensions (W × D × H)	586 × 630 × 679 mm		600 × 732 × 643 mm					
Weight	Approx. 70 kg	Approx. 95 kg	Approx. 98 kg		Approx. 77 kg	Approx. 80 kg		Approx. 81 kg
Power supply	AC100V/9A (Need a step-down transformer)		AC100V/12A (Need a step-down transformer)			AC100V/9A (Need a step-down transformer)		
Standard accessories	Drain-reception plastic bottle with hose ×1pc (BR-40LF)							

(*1) The temp. of defrost function that just starting is not included. Also, the specifications may not be met outside of the ambient temperature range. (*2) Maximum inside height are 331 mm (40LF) and 350 mm (41/42/43). (*3) Distributor can make necessary changes. (*4) The transfer time of temperature can be set up. (Within the capabilities. Cannot be set for Step 1)

•Temp. range and Temp. stability may not be able to meet the specs when it is frozen by continuous operation. Required to defrost it regularly.

NEW

Constant temperature incubator shaker OD Monitor

For cell culture related products

Shaker

Mixer Rotator Stirrer

Bead beater homogenizer Ultrasonic

Aluminum block Bath Mini-size Bath

Water bath Shaking Water bath Immersion cooler

Hybridization Incubator Constant temperature Chambers

Centrifugal Concentrators Cold Trap

Freeze dryers

Substrate Electrophoresis apparatus Blotting device for hybridization

Constant-temperature water circulating system [Chilled]

Appendix

Bioshaker BR-180LF/BR-180LF-70RT

Split doors enable large vessels to be taken in and out easily. Can be modified to Forced ventilation system of carbon dioxide. Shaking width 70 mm is effective on the cultivation of Actinomycete (BR-180LF-70RT).

•Dimensions --> P.046 •OD-Monitor Turbidimeter while shaking --> P.042-043 •Forced ventilation system of carbon dioxide --> P.054



BR-180LF



BR-180LF-70RT

(The shaking platform cannot be pulled out to prevent high loads.)

Features

- Max. speed 400 r/min, Split doors enable easy to take large vessels
- Capacity: Erlenmeyer flask 500 mL × 24 pcs, 5 L × 4 pcs

Details of optional parts and capacity --> P.036-039

Applications

- Cultivation of E. coli and yeasts
- Cultivation of Actinomycete (70RT)



Easy to take large vessels in and out

"Clamshell split doors" enable large vessels to be taken in and out easily. Equipped casters enable easy to move (BR-180LF). The Max. speed 400 r/min.

70RT (orbital shaking/shaking width 70 mm) can be shaken up to 250 r/min with optimum for especially Cultivation of microbe with Erlenmeyer flask.

Sliding retractable control pane

This is a common for small/medium size. Setting for Temperature, Shaking speed and Operation program is easy (see P.040).



Drawer type control panel

Model	BR-180LF	BR-180LF-70RT
Shaking motion	Switchable Reciprocal/Orbital shaking	Orbital shaking
Temperature range	+4°C to +70°C	+4°C to +70°C
Temp. control accuracy (*1)	±0.3°C to ±1.0°C	
Speed range (*2)	25 to 250 r/min, 25 to 400 r/min at 25 mm/orbital	25 to 250 r/min
Shaking width	Switchable 25/50 mm (Default: 25 mm)	70 mm
Platform size/Capacity	700 × 500 mm (70RT: 680 × 480 mm) (Max. inside height: 420mm), Erlenmeyer flask 500 mL × 24, 5 L × 4	
Door type	Clamshell split door (Divided into Upper and Lower, Upward opening and Front opening)	
Maximum load	approx. 10 kg (Platform not included)	
Ambient temp. range (*1)	+5°C to +30°C	
Heating/Cooling method	Heater 700 W/Compressor 125 W	
Program functions	1 program, 9 segments (4 combinations can be saved): Temp., Shaking speed, and Time/per segment (Setting range: 00 h 00 min to 99 h 59 min), Temp. gradient function (*3)	
Safety devices/functions	Leakage/Overcurrent breaker, Compressor overheating cut-off circuit, Alarm of abnormal sample temp. (Set as desired), Overload/Overvoltage protection, Fuse, Current limiter, Detecting the door opening and closing, Self-diagnosis function for temperature sensor error, Nonvolatile memory error, Breaking device when motor runaway	
Dimensions (W × D × H)/Weight	1110 × 716 × 990 mm, Approx. 180 kg	1110 (*4) × 716 × 930 mm, Approx. 190 kg
Power supply	AC100V/AC220V-240V/12A (built-in down transformer)	
Standard accessories	Universal shaking platform MT-7050 ×1 pc (LF)/ MT-6848 ×1 pc (LF-70RT) (*5), Drip tray ×1pc (LF)/Drain-reception plastic bottle with hose (LF-70RT), Vibration absorbing pad × 4 pcs, Spacer × 4 pcs (LF-70RT)	

(*1)The temp. of the defrost function is not included. Also, the specifications may not be met outside of the ambient temperature range. (*2)There is the limitation depending on the volume of vessels and the shaking diameter. See page 040. (*3)The transfer time of temperature can be set up (within their capabilities). (*4)Approx. 1550 mm when a delivery cart (not included) is installed. (*5)Clamps are not included. •Temp. range and Temp. stability may not be able to meet the specs when it is frozen by continuous operation. Required to defrost it regularly. •Due to the large size and weight of this product, transportation and installation costs will be charged separately.

Bioshaker GBR-200/GBR-300

Enables to use widely for Cultivation of microbes such as Yeasts, E. coli, etc. that require temp. control and shaking. High-end model that features for stackable, wide range of temp. range, and speed. Cut power consumption by 75% with the conventional one!

•Dimensions --> P.046 •OD-Monitor Turbidimeter while shaking --> P.042-043 •LED irradiation unit --> P.045

Features

- Max. speed 200 r/min (GBR-200) and 300 r/min (GBR-300)
- For as a laboratory bench, Stackable up to Two levels
- Capacity: Erlenmeyer flask 500 mL × 24 pcs, 5 L × 4 pcs
Details of optional parts and capacity --> P.036/039

Applications

- Cultivation of microbes such as E. coli, etc.
- Cultivation of Thermophile and Hybridization
- Cultivation of Yeasts, Psychrophiles, and Insect cells

The top board can be practically used for Lab bench

Adopted the same material of Lab bench top board. The top board height is almost the same that of Lab bench.

It is not suitable for precision work, but it can be used as an auxiliary Lab bench.



Stackable up to Two levels

Swing lift-up door and Stackable up to Two levels

Swing lift-up door and Stackable up to Two levels contribute space-saving while keeping large capacity. It can be shaken up to 300 r/min (200 r/min at the upper of stacked units) that is optimum for shaking culture.



Contributes to saving energy

When set above 10°C above RT, the compressor will not run, while the heater runs for temp. control that is energy saving. It cuts power consumption by 75% with the conventional one!

Optional parts: Junction pipe



Model	JCP-3687
Applications	This part is used to provide a communication hole to the outside for the main unit (no lid). It is used to pass sensors, tubes, etc. through the main unit. It is not recommended to put electrical equipment inside the main unit. Use at temperatures below +50°C.

Model	GBR-200	GBR-300
Shaking motion	Switchable Reciprocal/Orbital shaking	
Temperature range	+4°C to +80°C	
Temp. control accuracy (*1)	±0.3°C to ±1.0°C	
Speed range (*2)	25 to 200 r/min	25 to 300 r/min (200 r/min at the upper of stacked units)
Shaking width	Switchable 25/50 mm (Default: 25 mm)	
Platform size/Capacity	700 × 500 mm (Max. inside height: 385 mm), Erlenmeyer flask 500 mL × 24, 5 L × 4	
Door type	Swing lift-up door	
Maximum load	approx. 10 kg (Platform not included)	
Ambient temp. range (*1)	+5°C to +35°C	
Heating/Cooling method	Heater 700 W/Compressor 125 W	
Program functions	1 pattern, 9 segments (4 combinations can be saved): Temp., Shaking speed and Time/per segment (Setting range: 00 h 00 min to 99 h 59 min), Wait function (*3)	
Safety devices/functions	Leakage/Overcurrent breaker, Compressor overheating cut-off circuit, Alarm of abnormal sample temp. (Set as desired), Overload/Overvoltage protection, Fuse, Current limiter, Detecting the door opening and closing, Self-diagnosis function for temperature sensor error, Nonvolatile memory error, Breaking device when motor runaway, Self-check/lamp of filter	
Dimensions (W × D × H)/Weight	1200 (*4) × 800 × 810 mm (Including Top board: 1200 × 750 × 25 mm), Approx. 235 kg	
Power supply	AC100V/AC220V-240V/12A (built-in down transformer)	
Standard accessories	Universal shaking platform MT-7050 × 1 pc (*5), 2 types Spacer × 2 pcs, Fixing bracket for stackable (*6)	

(*1)The temp. of defrost function is not included. Also, the specifications may not be met outside of the ambient temperature range. (*2)There is a limitation depending on the volume of vessels and the shaking width. See P.040. (*3)Shaking will start when reaching the preset temp. (*4)Approximately 1800 mm when a delivery cart (not included) is installed. (*5)Clamps are not included. (*6)Included when stacking is desired. •Temp. range and Temp. stability may not be able to meet the specs when it is frozen by continuous operation. Required to defrost it regularly. •Due to the large size and weight of this product, transportation and installation costs will be charged separately.

NEW

Constant temperature incubator shaker
OD Monitor

For cell culture related products

Shaker

Mixer
Rotator
Stirrer

Bead beater
homogenizer
Ultrasonic homogenizer

Aluminum block Bath
Mini-size Bath

Water bath
Shaking Water bath
Immersion cooler

Hybridization
Incubator
Constant temperature Chambers

Centrifugal Concentrators
Cold Trap

Freeze dryers

Submarine Electrophoresis apparatus
Blotting device for hybridization

Constant-temperature water circulating system [Chilled]

Appendix

NEW

Installation of LED irradiation unit on the Large sized BR Series

Upgrade to light irradiation by installing the LED irradiation unit (P.045).



LED mounting bracket on the shaking platform



By adding an LED irradiation unit & controller, a mounting bracket for a large sized BR, and a Spring net shaking platform to the Universal shaking platform included with the equipment, it can be used for light irradiation from the bottom.

*Select LC-LED-CON4 as the controller for the LED irradiation unit, which can control 1 to 4 pcs at the same output (%).

G-BR-200 system example

Number of LED irradiation units that can be installed: Up to 2 units.
The top board is made of the same material as the Lab bench and can be used as an auxiliary Lab bench.



G-BR-200 Main unit

LC-450EXP (LED irradiation unit) × 2

LC-LED-CON4 (Controller)

MR-4030 (Spring net shaking platform) × 2

Transparent Sticky sheet for LC-LED × 2

LED irradiation unit mounting bracket LC-0950BR × 2

BR-180LF system example

Number of LED light-emitting units that can be installed: Up to 2 units.
The upper and lower split "clamshell doors" allow for easy loading and unloading of containers.



BR-180LF Main unit

LC-450EXP (LED light illumination unit) × 2

LC-LED-CON4 (Controller)

MR-4030 (Spring net shaking table) × 2

Transparent Sticky sheet for LC-LED × 2

LED light illumination unit mounting bracket LC-0950BR × 2

If you own an incubator shaker, you can perform light irradiation by adding an LED irradiation unit & controller, a Spring net shaking platform, a Transparent sheet for LED protection, and mounting bracket for large sized BRs.

Number of LED irradiation units that can be attached to the large sized BR series

Model	Number of LED irradiation units that can be installed
BR-180LF	Up to 2 units (LED irradiation unit LC-450EXP ×2 Controller LC-LED-CON4 ×1 Spring net shaking platform MR-4030 ×2 Transparent Sticky sheet for LC-LED ×2 Mounting bracket LC-0950BR) ×2
G-BR-200/300	Up to 2 units (ditto)
BR-300LF	Up to 2 units (ditto)
Double platform BR-300LF	Up to 4 units (LED irradiation unit LC-450EXP ×4 Controller LC-LED-CON4 ×1 Spring net shaking platform MR-4030 ×4 Transparent Sticky sheet for LC-LED ×4 Mounting bracket LC-0950BR) ×4
BR-3300/B/S	Up to 4 units (ditto)
BR-3300W/BW/SW	Up to 8 units (LED irradiation unit LC-450EXP ×8 Controller LC-LED-CON4 ×2 Spring net shaking platform MR-4030 ×8 Transparent Sticky sheet for LC-LED ×8 Mounting bracket LC-0950BR) ×8

*The LED irradiation unit should be used at a shaking speed up to 200 r/min. In the case of double platform, it may be necessary to reduce the speed further depending on the maximum load.



BR-3300B can mount four irradiation units on one level

*In the double platform, it may be necessary to reduce the amount of light irradiated depending on the set internal temperature and cooling capability. The shaking speed should also be adjusted according to the maximum load.

Bioshaker BR-300LF/Double platform BR-300LF

Enables to use widely for Cultivation of microbes such as Yeasts, E. coli, etc. that require temp. control and shaking. Equipped with double platform, the capacity is doubled with BR-300LF (Single platform).

•Dimensions --> P.046 •OD-Monitor Turbidimeter while shaking --> P.042-043 •Double Shaker NR-150N --> P.078

Features

- Wide temperature range from 4°C to 70°C
- Shaking width adjustable in stepless between 10 mm to 50 mm
- BR-300LF: Erlenmeyer flask 500 mL × 15 pcs
Double platform BR-300LF: Erlenmeyer flask 500 mL × 30 pcs
Details of optional parts and capacity --> P.036/039

Applications

- Cultivation of microbes such as E. coli, etc.
- Cultivation of Yeasts, Psychrophiles, and Insect cells
- The other samples that require shaking and temp. control

Long-selling Large sized Bioshakers

Widely used for Cultivation of microbes such as Yeasts, E. coli, etc. that require temp. control and shaking. Large Bioshakers are long time sellers because of the continued improvements such as the Shaking platform drawer lever. Universal shaking platform is included, and a Spring net shaking platform is also available (sold separately).

Double platform realizes twice the capacity with BR-300LF (Single platform)

The capacity (Up to 1 liter Erlenmeyer flask) is doubled with BR-300LF (Single platform). Note: The upper platform should be removed when above 2 L Erlenmeyer flask and 1L Shake flask are placed. (Ask us for details).



BR-300LF



Double platform BR-300LF

Shaking platforms are available in a wide variety of drawer-type variations

The current model has a shaking platform that can be easily pulled out. This allows for easy replacement of Vessel holders, etc.



Shaking platform drawer lever

Model	BR-300LF	Double platform BR-300LF
Temperature range	+4°C to +70°C	
Temp. control accuracy (*1)	±0.3°C to ±1.0°C	
Shaking motion	Switchable Reciprocal/Orbital shaking	
Speed range	25 to 250 r/min	25 to 160 r/min
Shaking width	10 to 50 mm (stepless)	
Platform size/Capacity	600 × 400 mm (Max. inside height: 575 mm), Erlenmeyer flask 500 mL × 15, 5 L × 3	600 × 400 mm (Capable/Max. vessel size: Up to 1 L Erlenmeyer flask and 500 mL Shake flask), Erlenmeyer flask 500 mL × 30, 1 L × 18
Door type	Single swing door (Leftward open)	
Maximum load	Approx. 10 kg (Platform not included)	Approx. 10 kg/per platform (Platform not included)
Ambient temp. range (*1)	+5°C to +35°C	
Display (Temp./Speed)	Digital display (Switchable Set temp./Chamber temp.)	
Heating/Cooling method	Heater 700 W/Compressor 125 W	
Other functions	Shaking duration integrator (0.1 h to 999.9 h, with Automatic resetting function), Remote temperature settings (Requires optional program unit for use), Chamber lamp	
Safety devices/functions	Leakage/Overcurrent breaker, Compressor overheating cut-off circuit, Alarm of abnormal sample temp. (Set as desired), High/Low temp., Display of deviation from set value (upper/lower limit), Self-diagnosis function for temperature sensor error	
Dimensions (W × D × H)/Weight	1110 (*2) × 682 × 1120 mm, Approx. 210 kg	1100 (*2) × 682 × 1120 mm, Approx. 220 kg
Power supply	AC100V/AC220V-240V/11A (built-in down transformer)	
Standard accessories	Universal shaking platform MT-6040E × 1 pc(*3), Vibration absorbing pad × 4 pcs, Spacer × 4 pcs, Drain-reception plastic bottle × 1 pc (With hose)	Universal shaking platform MT-6040E × 2 pcs(*3), 4 × Vibration absorbing pad × 4 pcs, Spacer × 4 pcs, Drain-reception plastic bottle (With hose) × 1 pc

(*1)The temp. of the defrost function is not included. Also, the specifications may not be met outside the ambient temperature range. (*2)Approx. 1600 mm when a delivery cart (not included) is installed.

(*3)Clamps are not included.

•Temp. range and Temp. stability may not be able to meet the specs when it is frozen by continuous operation. Required to defrost it regularly. •Due to the large size and weight of this product, transportation and installation costs will be charged separately.

NEW

Constant temperature incubator shaker OD Monitor

For cell culture related products

Shaker

Mixer Rotator Stirrer

Bead beater Ultrasonic homogenizer

Aluminum block Bath Mini-size Bath

Water bath Shaking Water bath Immersion cooler

Hybridization Incubator Constant temperature Chambers

Centrifugal Concentrators Cold Trap

Freeze dryers

Substrate Electrophoresis apparatus Blotting device for hybridization

Constant-temperature water circulating system [Chilled]

Appendix

Bioshaker BR-3300 Series

TAITEC's largest capacity Bioshaker, remodeled with improved usability.

- Dimensions --> P.046 •OD-Monitor Turbidimeter while shaking --> P.042-043
- LED Light irradiation unit --> P.045



BR-3300
One-tier platform, Basic Model



BR-3300SW
Two-tier platform, With top board and door lock function

Features

- Significant power savings with the new "Eco-Drive" function
- Programmable functions for various cultivation plans
- Capacity: Erlenmeyer flask 500 mL × 32 pcs, 64 pcs for double platform

Details of optional parts and capacity --> P.036/039

Applications

- Cultivation of microbes such as E. coli, etc.
- Cultivation of Yeasts, Psychrophiles, and Insect cells
- Transportation testing of food and other products

The large double platform with maximum capacity is further doubled. Renewed and improved usability of conventional models.

This is TAITEC's largest capacity Bioshaker that has undergone continuous improvement. In addition to switching between Reciprocal/Orbital shaking, the shaking width can be finely adjusted for optimum shaking effects according to the type of microbes and vessel size. Variations include a double platform for mass cultivation, a top board made of the same material as the laboratory bench on which lightweight equipment and items can be placed, and a safety door lock to prevent accidental opening (see the right page).

Number of shaking platforms	One-tier			Two-tier		
	BR-3300	BR-3300B	BR-3300S	BR-3300W	BR-3300BW	BR-3300SW
Eco-Drive	●	●	●	●	●	●
Top board (laboratory bench top board)	×	●	●	×	●	●
Safety door locks	×	×	●	×	×	●
Door unlocking notification	×	×	●	×	×	●
Shaking motion/Shaking width/Door type	Switchable Reciprocal/Orbital shaking, 10 to 50 mm (stepless), Double swing door					
Temperature range (*1)	+4°C to +70°C		+4°C to +60°C	+4°C to +70°C		+4°C to +60°C
Temp. control accuracy (*2)	±0.3°C to ±1.0°C					
Speed range (*3)	25 to 250 r/min		30 to 250 r/min	25 to 160 r/min		30 to 160 r/min
Platform size/Capacity	800 × 600 mm (Max. inside height: 601 mm), Erlenmeyer flask 500 mL × 32, 5 L × 6			800 × 600 mm (Capable/Max. vessel size: Up to 1 L Erlenmeyer flask and 500 mL Shake flask), Erlenmeyer flask 500 mL × 64, 1 L × 36		
Maximum load	Approx. 17 kg (Platform not included)			Approx. 17 kg/per platform (Platform not included)		
Ambient temp. range (*1)	5°C to 35°C					
Heating/Cooling method	Heater 800 W/Compressor 125 W					
Program functions	Number of stored programs: 4 programs, number of steps: 9 steps (per program) Setting contents (*4): Temperature, shaking speed, and time (per step) with weight function (time setting range: 00 h 00 min to 99 h 59 min)					
Safety devices/functions	Leakage breaker 15 mA (15 A for overcurrent protection), High temperature safety device, High temperature cut circuit for compressor, Motor current limiter, Motor overload protection, Over-voltage protection, Fuse, Filter check function, Shaking stop function upon abnormal vibration detection, Self-diagnosis function for temperature sensor error, Nonvolatile memory error, Alarm of abnormal sample temp. (Set as desired), Detecting the door opening and closing, Breaking device when motor runaway					
Other functions (*5)	Eco-Drive function, Automatic lighting of the chamber light, Communication holes in the chamber (2 holes), Automatic drying of condensation water (*6)					
Dimensions (W × D × H)	1327 × 835 × 1234 mm	1327 × 835 × 1256 mm (with top board installed)		1327 × 835 × 1234 mm	1327 × 835 × 1256 mm (with top board installed)	
Weight	Approx. 307 kg	Approx. 326 kg	Approx. 328 kg	Approx. 327 kg	Approx. 346 kg	Approx. 348 kg
Power supply	AC100V/AC220V-240V/12A (built-in down transformer)					
Standard accessories	Universal shaking platform MT-8060A × 1 pc, Vibration absorbing pad × 4 pcs, Spacer × 4 pcs			Universal shaking platform MT-8060A × 2 pcs, Vibration absorbing pad × 4 pcs, Spacer × 4 pcs, Hexagonal bar spanner × 4 pcs		

(*1) If the product is to be used at a temperature setting of +10.0°C or lower, the ambient temperature should be +30°C or lower. The specifications of this product are the performance values based on the measurement method specified by our company. (*2) Temperature change immediately after the defrosting function is activated is not included. (*3) Shaking speed for both reciprocal/orbital. (*4) The weight function is a function that allows shaking to begin after the inside of the chamber reaches a set temperature. This product does not have a temperature gradient (tilt) function. (*5) Transmission output signal (analog signal) 1 to 5 V and alarm output signal (DCV) are also available by special order. (*6) Depending on usage conditions, automatic drying may not be able to keep up and manual drainage may be required.

Bioshaker BR-3300 Series

Large observation window, bright LED chamber light

The new BR-3300 series inherits the reliability of its predecessor while improving its detailed usability.

The external dimensions, internal volume, and capacity are the same as those of the previous BR-3000LF series, but the "internal observation window" has been enlarged to facilitate viewing of the inside of the chamber.

The new "LED chamber light" with improved placement makes it easier to see both the upper and lower levels of the shake platform.

Shaking platform can be pulled out with a drawer lever. Double platform [BR-3300W/BW/SW] doubles the capacity.

The shaking platform can be pulled forward with a lever for easy access to vessels in the back.

The two platform BR-3300W/BW/SW can hold twice as many Erlenmeyer flasks of sizes up to 1 L (for Erlenmeyer flasks larger than 2 L and Shake flasks larger than 1 L, the upper stage must be removed).



Shaking platform drawer lever


Top board made of the same material as the lab bench [3300B/S/BW/SW].




BR-3300B/S/BW/SW is equipped with a thick top board made of the same material as the lab bench. It can be used for simple items such as consumables.

Options for BR-3300 series

Optional parts: Inner rack

Model	RSB-3129
	This rack can be attached to the upper part of the BR-3300 series chamber. By attaching an inner rack to the chamber as shown in the photo, the chamber can be effectively utilized by shaking flasks below while placing Petri dishes statically on the rack. *After installation, be sure to check that the shaking vessels and the rack do not collide.
Shelf Dimensions	316 × 292 × 149 mm

Optional parts: Heat-insulating and shading plate

Model	HIS-6029
	Heat-insulating and shading plate for BR-3300 series door window. When the window of the BR-3300 series door is to be shaded, it is fixed to the inside of the door (inside of the chamber) with screws.

Contributes to energy conservation

All BR-3300 series models are equipped with the "Eco-Drive" function that automatically controls and optimizes compressor and heater output. Compared to our previous models (manufactured in 2004), the BR-3300 series saves up to 1/6 of energy.

Notification when doors are locked & unlocked when driving [3300S/SW]

BR-3300S, the top-of-the-line single platform model, and BR-3300SW, the top-of-the-line double platform model, are equipped with a top board made of the same material as the laboratory bench and a "safety door lock function" that locks the door during shaking as a safety function to prevent the door from being opened unexpectedly during experiments. The door automatically locks when shaking is started, and an LED lamp and melody notifying the user when shaking has completely stopped and the door is unlocked.

Program functionality added

The BR-3300 series is now available with a program function.


The "temperature, shaking speed, and time" can be programmed up to 9 steps (see P.040 for the setting method).

USER'S VOICE

I'm glad the program function is added.
If you set up the cultivation on a holiday to be kept at 4°C, the experiment can proceed from the next step immediately after vacation.
I wonder if I should use a 1-stage shaking table that can shake up to 250 r/min or a 2-stage shaking table that can shake up to 160 r/min and has a large number of capacities.



Optional parts: Strong Sticky sheet

Model	ST-4030S
	If the vessel has a flat bottom, such as an Erlenmeyer flask or a medium bottle, it can be fixed/held simply by placing it on the surface. (Since the adhesive strength of this product is strong, Petri dishes and well plates are not suitable because the lid will open when peeling off.) The adhesive strength of the sheet, which is weakened by dirt, can be restored by washing it with water and drying. Stronger adhesion than Sticky sheet ST-4030.
Four sheets attached to the Universal shaking platform MT-8060A for BR-3300	
Max. shaking speed	200 r/min (*)
Dimensions (W × D)/Weight	390 × 300 mm, Approx. 0.4 kg
Temperature range	4°C to 40°C

(*) Depending on the vessel used, the amount of sample and the condition of the shaker, the vessel may topple over even within the above values. Please consider the above speeds as a guide only. This product is a simple vessel holder. If you want to prevent vessels from tipping over, please consider using a Clamps/Universal shaking platform that is compatible with the size of the vessel.

Optional parts: Clamps (for disposable large flasks)



Clamps for Corning and Thomson disposable Erlenmeyer flasks (up to 5 L, see the next page) are also available.

NEW

Constant temperature incubator shaker OD Monitor

For cell culture related products

Shaker

Mixer Rotator Stirrer

Bead beater homogenizer Ultrasonic homogenizer

Aluminum block Bath Mini-size Bath

Water bath Shaking Water bath Immersion cooler

Hybridization Incubator Constant temperature Chambers

Centrifugal Concentrators Cold Trap

Freeze dryers

Substrate Electrophoresis apparatus Blotting device for hybridization

Constant-temperature water circulating system [Chilled]

Appendix

Common Options for BR series

Clamps

(Mounted on Shaking platforms and Angle rack for Erlenmeyer flasks for use)



Above, 300 mL Clamps comes with Spring and 500 mL comes with Octagonal rubber sheet.



MT-4030 with Multiple clamps mounted



Clamps for Sakaguchi flask and Sakaguchi flask

Vessels	Model
50 mL	CF-0050
100 mL [Disposable flasks] Corning Disposable 125 mL Thermo Fisher Disposable 125 mL (*)	CF-0100
200 mL [Disposable flasks] Thomson Disposable 250 mL (*)	CF-0200
250 mL [Disposable flasks] Corning Disposable 250 mL Thermo Fisher Disposable 250 mL (*) Thomson Disposable 250 mL (*)	CF-0250
300 mL	CF-0300
500 mL [Disposable flasks] Corning Disposable 500 mL Thermo Fisher Disposable 500 mL (*) Thomson Disposable 500 mL (*, 3)	CF-0500
1 L [Disposable flasks] Corning Disposable 1 L Thermo Fisher Disposable 1 L (*) Thomson Disposable 1.5 L (*, 2), 1.6 L (*)	CF-1000
2 L [Disposable flasks] Corning Disposable 2 L Thermo Fisher Disposable 2 L (*) Thomson Disposable 2.5 L (*, 2), 2.8 L (*)	CF-2000
3 L	CF-3000
5 L	CF-5000
[Disposable flasks] Corning Disposable 3 L Thermo Fisher Disposable 5 L (*)	CF-3000DSP
500 mL	SF-0500
1 L	SF-1000
2 L	SF-2000
3 L	SF-3000

•Up to 2 L sets of Erlenmeyer flask can be used in BR-21/22/23 series and BR-40LF.
(*)Thermo Fisher PETG Erlenmeyer flask 411X-0125/0250/0500/1000/2000 type (*)Thomson Ultra Yield flask (*)Thomson Optimum Growth flask

Tube holders (Mounted on MT-2925 for use)



Tube holder M-0015

3 sets × 8 racks for 1.5/2.0 mL Microtube and Micro Vial

Tube holder M-0150

Disposable Centrifuge tube for 15 mL
3 sets × 6 racks (*)

Tube holder M-0500

Disposable Centrifuge tube for 50 mL
3 sets × 4 racks (*)

(*)Up to two can be attached to MT-2925 for BR-21/22/23 series. (If three are installed, the tip of the vessels will protrude from MT-2925 and may hit the inside of the chamber during shaking.)

Angle rack for Erlenmeyer flasks

(Mounted on Shaking platforms *Clamps required)

Model	AF-2070	AF-2570
Capacity	50 mL: 4, 100 mL: 3, 200 to 300 mL: 2, 500 mL: 1	50 mL: 5, 100 mL: 4, 200 mL: 3, 250 to 500 mL: 2
AF-2070		
Mounting qty on MT-2925	2 (*)	-
Mounting qty on MT-4030	2 (*)	2 (*)
Mounting qty on MT-6040E	4 (*)	4 (*)
Mounting qty on MT-7050	4 (*)	4 (*)
Mounting qty on MT-8060A	10 (*)	5 (*)
External dimension	250 × 110 × 50H mm	300 × 110 × 50H mm
Weight	Apporx. 0.8 kg	Apporx. 0.9 kg

(*)The qty when Angle rack is tilted 30°.

Angle rack for Disposable Centrifuge tubess

(Mounted on Shaking platforms for use)

Model	AT-3518
Capacity	50 mL × 18
Mounting qty on MT-2925	1
Mounting qty on MT-4030	2 (When Angle rack is tilted 45°)
Mounting qty on MT-6040E	4 (When Angle rack is tilted 45°)
Mounting qty on MT-7050	4 (When Angle rack is tilted 45°)
Mounting qty on MT-8060A	8 (When Angle rack is tilted 45°)
External dimension/Weight	285 × 110 × 102H mm, Apporx. 0.8 kg
Remarks	Be sure to use below 50°C.

Angle rack for Test tubes

(Mounted on Shaking platforms for use)

Model	AT-1250	AT-1620	AT-1650	AT-1820
Capacity	φ12 mm × 50	φ16.5 mm × 20	φ16.5 mm × 50	φ18 mm × 20
AT-1250				
Mounting qty on MT-2925	1	2	1	-
Mounting qty on MT-4030	2	3	2	3
Mounting qty on MT-6040E	4	6	4	5
Mounting qty on MT-7050	4	6	4	6
Mounting qty on MT-8060A	10	16	8	6
External dimension (mm)	250 × 100 × 95H	285 × 70 × 80H	286 × 110 × 100H	320 × 70 × 80H
Weight	Apporx. 0.8 kg	Apporx. 0.6 kg	Apporx. 0.9 kg	Apporx. 0.7 kg

*The qty when Angle rack with 160 mm test tube is tilted 45°.

The mounting direction of Angle rack.


The tilt direction of Angle rack should be mounted orthogonal to the shaking direction (direction of shaking efficiency decreases) when reciprocating due to the inside dimension of the chamber.

AT-3518




Options for the compact BR (BR-21/22/23) series

Spring net shaking platform and Capacity/Qty of Vessels


Model	MR-2925			
	Vessels can be easily mounted on regardless of its shape. It can be used by removing some springs and changing the height of the spring net as necessary. Universal shaking platform (w/ o Clamp *It is optional) is recommended if vessel should be tightly held.			
Spring net Pitch	20 mm			
Spring net stage	1 stage (Height is changeable.)			
External dimension	290 × 250 × 108H mm			
Weight	Apprx. 1.1 kg			
Capacity of Vessel	φ16 mm test tubes (*1)	50 (*2)	Erlenmeyer flask 300 mL	5
	Disposable Centrifuge tube for 50 mL	20 (*2)	Erlenmeyer flask 500 mL	4
	Erlenmeyer flask 50 mL	20	Erlenmeyer flask 1 L	2
	Erlenmeyer flask 100 mL	10	Erlenmeyer flask 2 L	1
	Erlenmeyer flask 200 mL	9	Sakaguchi flask 500 mL (*3)	2
	Erlenmeyer flask 250 mL	5		

(*1) φ16 mm or less should be with the stand to be mounted on in Spring net. (*2) The qty when Angle rack is tilted 45°. (*3) Be careful when using Shake flasks as they are fragile.

Universal shaking platform and Capacity/Qty of Flasks

Model	MT-2925			
	It is used together with Clamps, Angle racks and "ODMonitor" series (Clamps of Erlenmeyer flask and Shake flask are available). It can hold flasks tightly compared to the Spring shaking platform.			
External dimension	290 × 250 × 23H mm			
Weight	Apprx. 0.9 kg			
Capacity of Flask	Erlenmeyer flask 50 mL	20	Erlenmeyer flask 500 mL	4
	Erlenmeyer flask 100 mL	10	Erlenmeyer flask 1 L	2
	Erlenmeyer flask 200 mL	9	Erlenmeyer flask 2 L	1
	Erlenmeyer flask 250 mL	5	Sakaguchi flask 500 mL	3
	Erlenmeyer flask 300 mL	5		

Sticky sheet shaking platform

Model	SR-2925	
	Flat bottoms such as Erlenmeyer flasks and Petri dishes can be held simply by placing them on the platform. The decreasing an adhesive force by dirt can be recovered by washing with water and drying it.	
Max. shaking speed	100 r/min	
External dimension/Weight	290 × 250 × 30H mm / Apprx. 1.1 kg	
Standard accessories	Sticky sheet × 1	




Sticky sheet

Sticky sheet (ST-2925) above is also available and sold separately.

Model	ST-2925
External dimension	290 × 250 mm




*Up to 2 L of Erlenmeyer flask can be used with the BR-21/22/23 series.

Other optional accessories

Shading plate for BR SB-3625	Stackable base STB-4842	Inner rack RSB-3430
		
Shade plate for small BR (front door type) doors. Easy to attach and detach with magnet type. The surface can be used as a white board, and magnets can be affixed. 360 × 250 × 10H mm. (BR should be used at temperatures below 70°C when mounted).	The fixing tool that prevents slippage when the stackable base is in use (Required when stacked)	It can be installed to the upper of the chamber. The height of space that the sample is placed differs depending on the mounting position.

Options for the medium-sized BR (BR-40/41/42/43/53) series

Stackable base (The fixing tool for Two stages.)

Stackable base A	STB-6070	STB-6070S
		
For stacking of BR-40LF + BR-41/42/43/53	For two-tier stacking of BR-41/42/43/53	For small size BR (21/22/23) + medium size BR (41/42/43/53)

Inner rack

RSB-5032
It can be installed to the upper chamber. The Maximum load is 1 kg.



LED irradiation unit (Mounted to MR-4030 and RSB-3424LED for use)

Model	LC-450EXP
LED Color	White
Peak wavelength	450 nm
Dimensions of Light source	340 × 240 mm

*See details on P.045. Optional controller (LC-LED-CON1 for 1 unit or LC-LED-CON4 for 1 to 4 units) is required.

Mounting bracket for LED top irradiation

RSB-3424LED
Mounting brackets for attaching the LED irradiation unit (LC-450EXP) to the inside top surface of the BR-41/42/43/53 series chamber. Use it when you want to irradiate light from the top surface. The height can be adjusted to 4 levels.



LED irradiation unit installed on the upper surface of the chamber

*The space height from the LED panel to the bottom of the shaking platform varies depending on the rail mounting position.
*After installation, be sure to check that the LED panel does not collide with the vessel to be shaken.

NEW

Constant temperature incubator shaker
OD Monitor

For cell culture related products

Shaker

Mixer
Rotator
Stirrer

Bead beater
homogenizer
Ultrasonic
homogenizer

Aluminum
block Bath
Mini-size Bath

Water bath
Shaking Water bath
Immersion cooler

Hybridization
Incubator
Constant temperature
Chambers

Centrifugal
Concentrators
Cold Trap

Freeze dryers


Substrate
Electroporation apparatus
Blotting device for
hybridization

Constant-temperature
water circulating
system [Chilled]

Appendix



Options for the medium size BR (BR-40/41/42/43/53) series

Spring net shaking platform and Capacity/Qty of Vessels

Model	MR-4030			
	Vessels can be easily mounted on regardless of its shape. It can be used by removing some springs and changing the height of the spring net as necessary. Universal shaking platform recommended for 5 L Erlenmeyer flask or 1 to 2 L Shake flask.			
Spring net Pitch	20 mm			
Spring net stage	2 stages (Height is changeable.)			
External dimension/Weight	400 × 300 × 108H mm, Approx. 3.3 kg			
Capacity of Vessel	φ16 mm test tubes (*1)	96 (*2)	Erlenmeyer flask 300 mL	9
	Disposable Centrifuge tube for 50 mL	48 (*2)	Erlenmeyer flask 500 mL	6
	Erlenmeyer flask 50 mL	24	Erlenmeyer flask 1 L	3
	Erlenmeyer flask 100 mL	20	Erlenmeyer flask 2 L	2
	Erlenmeyer flask 200 mL	12	Erlenmeyer flask 3 L (*3)	1
	Erlenmeyer flask 250 mL	9	Sakaguchi flask 500 mL	6


(*1) φ16 mm or less should be used with the stand to be mounted on Spring net. (*2) The qty when Angle rack is tilted 45°. (*3) It cannot be used with BR-40LF.

Shaking platforms and Capacity of Flasks


Model	MT-4030/MT-4430			
	MT-4030 is used together Clamps, Angle racks and "OD-Monitor" series (P.042-043).			
	In MT-4430 the mounting position for Flasks are fixed and the capacity (Num. of flasks) is larger than that of MT-4030. It can hold flasks tightly compared to the Spring net shaking platform.			
External dimension /Weight	400/440 × 300 × 23H mm, Approx. 1.4 kg			
Capacity of Flask	Erlenmeyer flask 50 mL	35/ -	Erlenmeyer flask 2 L	2/ -
	Erlenmeyer flask 100 mL	18/ -	Erlenmeyer flask 3 L (*1)	2/ -
	Erlenmeyer flask 200 mL	12/ -	Erlenmeyer flask 5 L (*1)(*2)	1/ -
	Erlenmeyer flask 250 mL	9/12	Sakaguchi flask 500 mL	6/ -
	Erlenmeyer flask 300 mL	9/12	Sakaguchi flask 1 L	4/ -
	Erlenmeyer flask 500 mL	6/ 8	Sakaguchi flask 2 L	2/ -
	Erlenmeyer flask 1 L	4/ 6		

(*1) It cannot be used with BR-40LF. (*2) The height is up to 350 mm.


Shading plate

Model	SB-5338	
	Shade plate for BR-41/42/43/53 series doors. Shades external light to the inside of the chamber. Easy to attach and detach with a magnet. The surface can be used as a white board, and notes can be written or erased, or magnets can be attached. (BR should be used at temperatures below 70°C when installed.)	
External dimension/Weight	530 × 380 × 10H mm, 1.53 kg	

Junction pipe

Model	JCP-3657	
	The pipe (w/o Lid) for connection to the outside. It is for installing such as the sensor of recorder inside the chamber. Electrical equipment should not be placed inside the chamber. Be sure to use below 50°C.	

Sticky sheet shaking platform

Model	SR-4030	
	Flat bottoms such as Erlenmeyer flasks and Petri dishes can be held simply by placing them on the platform. The decreasing an adhesive force by dirt can be recovered by washing with water and drying it.	
Max. shaking speed	100 r/min	
External dimension/Weight	400 × 300 × 30H mm, Approx. 1.7 kg	
Standard accessories	Sticky sheet ST-4030 ×1 pc	


Sticky sheet

Sticky sheet (ST-4030) above is also available and sold separately.

Model	ST-4030	
External dimension	400 × 300 mm	

*Up to 2 L of Erlenmeyer flask can be used with the BR-40LF.


Sticky sheet shaking platform (Double)

Model	SR-4030W	
	Double Sticky sheet shaking platform. The height can be adjusted to 4 levels. Two Sticky sheets ST-4030 are included.	
Max. shaking speed	100 r/min	
External dimension	400 × 300 × 220H mm	
Standard accessories	Sticky sheet ST-4030 × 2	

*The center of gravity of the shaking platform (shaker) is higher due to the double design. When the set speed is reached, be sure to check that there is nothing wrong with the sample vessel or the main unit of the shaker, and then leave the area.

*When using a medium-sized BR, placing the sample vessel near the air outlet on the back of the chamber may cause direct exposure to the stirring air. This may cause the temperature of the sample solution to be higher than the set temperature in the chamber, and the accuracy of the temperature in the chamber may be more erratic than usual. Please be careful.

Strong Sticky sheet shaking platform

Model	SR-4030S	
	Stronger adhesion than the Sticky sheet ST-4030. If the vessel has a flat bottom, such as an Erlenmeyer flask or a medium bottle, it can be fixed/held simply by placing it on the surface. (Since the adhesive strength of this product is strong, Petri dishes and well plates are not suitable because the lid will open when peeling off.) The adhesive strength of the sheet, which is weakened by dirt, can be restored by washing with water and drying.	
Max. shaking speed	200 r/min (*)	
External dimension/Weight	400 × 300 × 30H mm, Approx. 1.8 kg	
Temperature range	4°C to 40°C	


(*) Depending on the vessel used, the amount of sample, and the condition of the shaker, there is a possibility that the vessel may topple over even within the following values. Please consider the following speeds as a guide. This product is a simple vessel holder. If you want to prevent the vessels from tipping over, please consider using a Clamp or Universal shaking platform corresponding to the size of the vessel.

Optional parts: Strong Sticky sheet

Model	ST-4030S	
External dimension/Weight	390 × 300 mm, Approx. 0.4 kg	

Options for large size BR (BR-180/300/3300/G-BR) series

Spring net shaking platform and Capacity/Qty of Vessels (Mounted on Shaking platform for use)


Model	MR-4030L
	The usable Shaking platform where Vessels can be easily mounted on regardless of its shape. Fixed with the screws to Platform MT-7050 for using. (Not used with BR-180LF-70RT) •MT-6040E: Up to 2 pcs per one sheet •MT-7050: Up to 2 pcs per one sheet •MT-8060A: Up to 4 pcs per one sheet.
4 pcs installed on MT-8060A	
Spring net Pitch	20 mm
Spring net stage	2 stage (Height is changeable.)
External dimension/Weight	400 × 300 × 108H mm, Approx. 2 kg

(*)The Capacity/Qty of vessels are less than those of Universal platform. The capacity is doubled in the double platform. (**)The qty when Angle rack is tilted 45°. φ16 mm or less test tube should be fixed with the stand per net.

Mounting Qty of MR-4030L		1	2	4	
Capacity of Vessels (*)	Erlenmeyer flask	φ16 mm test tubes (**)	96 pcs	192 pcs	384 pcs
		Disposable Centrifuge tube for 50 mL (**)	48 pcs	96 pcs	192 pcs
		50 mL	24 pcs	48 pcs	96 pcs
		100 mL	20 pcs	40 pcs	80 pcs
		200 mL	12 pcs	24 pcs	48 pcs
		250 mL	9 pcs	18 pcs	36 pcs
		300 mL	9 pcs	18 pcs	36 pcs
		500 mL	6 pcs	12 pcs	24 pcs
		1 L	3 pcs	6 pcs	12 pcs
			Sakaguchi flask 500 mL	6 pcs	12 pcs

Shaking platform and Capacity/Qty of Flasks


For BR-180LF, GBR-200/300

Model	MT-7050			
	It is used together with Clamps, Angle racks and "ODMonitor" series (Clamps of Erlenmeyer flasks and Sakaguchi flasks are available). It can hold flasks tightly compared to Spring shaking platform.			
External dimension/Weight	700 × 500 × 22H mm, Apporx. 6 kg			
Capacity of Flask	Erlenmeyer flask 50 mL	96	Erlenmeyer flask 2 L	8
	Erlenmeyer flask 100 mL	48	Erlenmeyer flask 3 L	6
	Erlenmeyer flask 200 mL	35	Erlenmeyer flask 5 L/Disposable 3&5 L	4/5
	Erlenmeyer flask 250 mL	28	Sakaguchi flask 500 mL	18
	Erlenmeyer flask 300 mL	28	Sakaguchi flask 1 L	12
	Erlenmeyer flask 500 mL	24	Sakaguchi flask 2 L	6
	Erlenmeyer flask 1 L	13	Sakaguchi flask 3 L	5


For BR-180LF-70RT

Model	MT-6848 (for 70RT, Pre-assembled)
	Designed for BR-180LF-70RT. Fixed with Optional clamps. Not equipped with a Drawer mechanism due to being designed for High load.
External dimension/Weight	680 × 480 × 22H mm, Apporx. 5.2 kg
Capacity	same as MT-7050 (see left)

For BR-3300 Series

Model	MT-8060A			
	It is used together with Optional Clamps, Angle racks, and "OD-Monitor" series. 2 sets used with Double shaking platform type (included in BR-3000LF). The old MT-8060 (before the lever puller type) is also available.			
External dimension/Weight	800 × 600 × 45H mm, Apporx. 9 kg			
Capacity of Flask	Erlenmeyer flask 50 mL	98	Erlenmeyer flask 2 L	12
	Erlenmeyer flask 100 mL	72	Erlenmeyer flask 3 L	9
	Erlenmeyer flask 200 mL	63	Erlenmeyer flask 5 L/Disposable 3&5 L	6/7
	Erlenmeyer flask 250 mL	46	Sakaguchi flask 500 mL	27
	Erlenmeyer flask 300 mL	46	Sakaguchi flask 1 L	18
	Erlenmeyer flask 500 mL	32	Sakaguchi flask 2 L	12
	Erlenmeyer flask 1 L	18	Sakaguchi flask 3 L	9

For BR-300LF, Double platform BR-300LF

Model	MT-6040E			
	It is used together with Clamps, Angle racks and "ODMonitor" series. The old MT-6040A (before the lever puller type) is also available.			
External dimension/Weight	600 × 400 × 42H mm, Apporx. 4 kg			
Capacity of Flask	Erlenmeyer flask 50 mL	70	Erlenmeyer flask 2 L	6
	Erlenmeyer flask 100 mL	35	Erlenmeyer flask 3 L	4
	Erlenmeyer flask 200 mL	28	Erlenmeyer flask 5 L and Disposable 3&5 L	3
	Erlenmeyer flask 250 mL	21	Sakaguchi flask 500 mL	15
	Erlenmeyer flask 300 mL	21	Sakaguchi flask 1 L	9
	Erlenmeyer flask 500 mL	15	Sakaguchi flask 2 L	6
	Erlenmeyer flask 1 L	9	Sakaguchi flask 3 L	4
Total capacity in the Double platform				
Capacity of Flasks (Two stages in total)	Erlenmeyer flask 50 mL	140	Erlenmeyer flask 2 L (*)	6
	Erlenmeyer flask 100 mL	70	Erlenmeyer flask 3 L (*)	4
	Erlenmeyer flask 200 mL	56	Erlenmeyer flask 5 L and Disposable 3&5 L (*)	3
	Erlenmeyer flask 250 mL	42	Sakaguchi flask 500 mL	30
	Erlenmeyer flask 300 mL	42	Sakaguchi flask 1 L (*)	9
	Erlenmeyer flask 500 mL	30	Sakaguchi flask 2 L (*)	6
	Erlenmeyer flask 1 L	18	Sakaguchi flask 3 L (*)	4

(*)It cannot be used on the upper platform but it can be used on the lower platform when the upper is removed.

Total capacity in the Double platform				
Capacity of Flasks (Two stages in total)	Erlenmeyer flask 50 mL	196	Erlenmeyer flask 2 L (*)	12
	Erlenmeyer flask 100 mL	144	Erlenmeyer flask 3 L (*)	9
	Erlenmeyer flask 200 mL	126	Erlenmeyer flask 5 L and Disposable 3&5 L (*)	6/7
	Erlenmeyer flask 250 mL	92	Sakaguchi flask 500 mL	54
	Erlenmeyer flask 300 mL	92	Sakaguchi flask 1 L (*)	18
	Erlenmeyer flask 500 mL	64	Sakaguchi flask 2 L (*)	12
	Erlenmeyer flask 1 L	36	Sakaguchi flask 3 L (*)	9

(*)It cannot be used on the upper platform but it can be used on the lower platform when the upper is removed.

Optional parts: LED light illumination unit mounting bracket

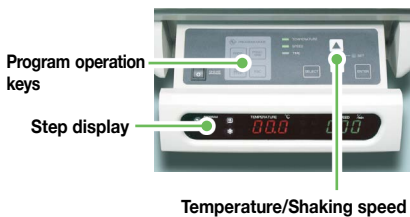
Model	LC-0950BR
External dimension/Weight	Mounting brackets for attaching the LED irradiation unit (LC-450EXP) to the Universal shaking platform MT-6040/7050/8060 for large size BRs. One set is required per one LED irradiation unit.



About delivery cart

With the exception of BR-180LF, carts are attached to both sides of the main unit of the large size BR for delivery. This is not an accessory and will be collected after delivery.

About the BR Series Program Functions



Three types of programs can be set (except BR-40LF and BR-300 series)

- Continuous operation at the last setting after program completion (Cont mode)
- Stops temperature control and shaking after program completion (End mode)
- After the program completion, it is possible to repeat the set program (rPEt mode).

(*Depending on the time of sale, some products may not have the rPEt mode. FM and FH types are not compatible with programs that include cooling.)

Programmed operation is started by pressing and holding the "RUN/STOP" key for at least 1 second.

To exit the programmed operation, press and hold the "ESC" key to return to the normal mode. To reset the program being set, press the "ESC" key in the normal mode for at least 5 seconds.

Example of program setup:
37°C, shaking speed 120 rpm --> After 18 hours, shift to 4°C setting and stop shaking.
 (e.g., if you start the cultivation on a weekend and keep it at 4°C the following week).

- ① Press the "PROG." key to set the step display to "1". Press the "SELECT" key to enter temperature (37.0) and then press the "ENTER" key to confirm. Press the "SELECT" key to enter the speed (120) and press the "ENTER" key to confirm. Press the "SELECT" key to enter time (18.00) and then press the "ENTER" key to confirm.
- ② Press the "PROG." key to set the step display to "2". Press the "SELECT" key to enter temperature (4.0) and then press the "ENTER" key to confirm. Press the "SELECT" key to enter the speed (0) and press the "ENTER" key to confirm. Press the "SELECT" key to enter time (1.00) and then press the "ENTER" key to confirm.
- ③ Press the "PROG." key to set the step display to "3" and then press the "PROG. END." key to set the step display to "E" and the temperature display to "cont" display. (If not, use the arrow up/down keys to set). Press "ENTER" key to confirm. Press the "PROG." key to turn off the step display (to become the normal mode) and then press the "RUN/STOP" key for at least 1 second to start the program.

BR-180LF/70RT Limitation of Shaking speed by Shaking width and Vessel sizes

Machine height of BR-180LF and BR-180LF-70RT



[Note] limitation of Shaking speed by Shaking width and Vessel sizes. (70RT)

Shaking width/ Shaking motion	70 mm, Orbital
~ 500 mL	250 r/min
1 L	250 r/min
2 L	200 r/min
3 L	160 r/min
5 L	150 r/min

[Note] limitation of Shaking speed by Shaking width and Vessel sizes. (BR-180LF)

Shaking width	25 mm			50 mm			
	Reciprocal	Orbital		Reciprocal		Orbital	
r/min	250	250	400	200	250	200	250
~ 500 mL	○	○	○	○	○	○	○
1 L	○	○	x	○	○	○	○
2 L	○	○	x	○	x	○	○
3 L	○	○	x	○	x	○	x
5 L	○	○	x	○	x	170 r/min	x

BR-180LF-70RT are equipped with Vibration absorbing pads but not casters and adjusters unlike BR-180RT. Because of this, the height is slightly lower than BR-180LF.

GBR-200/300 Limitation of Shaking speed by Shaking width and Vessel sizes

[Note] limitation of Shaking speed by Shaking width and Vessel sizes.

Shaking width	25 mm				50 mm			
	Reciprocal		Orbital		Reciprocal		Orbital	
r/min	200	300	200	300	200	300	200	300
~ 500 mL	○	○	○	○	○	○	○	○
1 L	○	○	○	○	○	○	○	○
2 L	○	○	○	○	○	x	○	○
3 L	○	○	○	○	○	x	○	x
5 L	○	○	○	○	170 r/min	x	170 r/min	x



Experimental data: Vessel shape, shaking speed and shaking width, and culture efficiency

Summary

There are various factors involved in shaking culture methods for microbes. The components of the culture medium or the characteristics of the microbes to be cultured (optimal culture temperature, etc.) is not described here, but it is no exaggeration to say that the efficiency of aeration, which is especially important when aerobic conditions are required, determines the speed and yield of the culture. When considering "aeration," the related factors are the shape (type) of the culture vessel, vessel capacity, liquid volume, shaking method, shaking speed, and shaking width. Among these factors, the shaking method is determined by the vessel shape, and since there is a theory for liquid volume, the vessel capacity is also naturally determined. Therefore, the main variables are the vessel shape, shaking speed, and shaking width. In this article, we will present a discussion of these three factors based on our experiments.

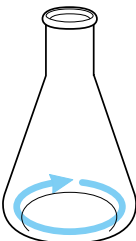
NEW
 Constant temperature incubator shaker OD Monitor
 For cell culture related products
 Shaker
 Mixer Rotator Stirrer
 Bead beater homogenizer Ultrasonic homogenizer
 Aluminum block Bath Mini-size Bath
 Water bath Shaking Water bath Immersion cooler
 Hybridization Incubator Constant temperature Chambers
 Centrifugal Concentrators Cold Trap
 Freeze dryers
 Substrate Electrophoresis apparatus Blotting device for hybridization
 Constant temperature water circulating system [chiller]
 Appendix

Experimental data: Vessel shape, shaking speed and width, and culture efficiency

About Culture Vessels

The following three types of glass vessels commonly used in shaking culture were tested for differences in culture efficiency as a function of shaking speed and amplitude.


Erlenmeyer flask



- Commercially available capacity 50 to 5000 mL
- Recommended liquid volume for shaking culture 1/5 to 1/3 of capacity
- Shaking method for shaking culture Orbital shaking
- Main Alias Erlenmeyer

A vessel frequently used for shaking culture. **Shake orbitally** (perhaps because of bubbling, reciprocating culture is not common). This is often the only way to culture *E. coli* or other bacteria that increase frequently, or if there is no particular concern for culture efficiency.

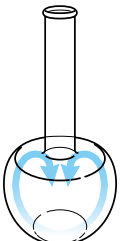
Erlenmeyer flask with baffles



- Commercially available capacity 50 to 2000 mL
- Recommended liquid volume for shaking culture 1/5 to 1/3 of capacity
- Shaking method for shaking culture Orbital shaking
- Main Alias Shaking Erlenmeyer Flask

Aeration efficiency is increased when the culture fluid rotated by **orbital shaking** hits the protruding baffles inside the vessel. If this is inconvenient, it should not be used because it foams violently. In shaking cultures of yeasts, it is often recommended along with the shake flask shown on the right.

Shake flask



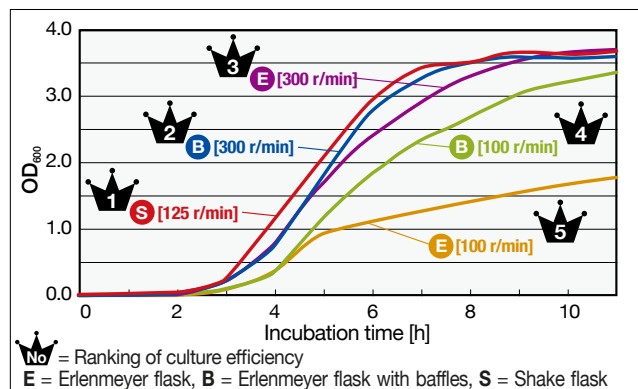
- Commercially available capacity 100 to 2000 mL
- Recommended liquid volume for shaking culture 1/5 to 1/2 of capacity
- Shaking method for shaking culture Reciprocal shaking
- Main Alias Sakaguchi flask

This is a unique Japanese vessel in which high aeration efficiency is achieved by adjusting the shaking speed and width so that the culture fluid moves as shown in the figure by **reciprocal shaking**. It can hold more culture fluid than the Erlenmeyer flasks.

Disadvantages are that they are tall compared to their capacity and that it is difficult to wash the inside of the flask well. Used for cultivation of yeasts and mold.

Experimental Results and Discussion

① Difference in culture efficiency depending on the shape of the vessel (shaking width 25 mm, *E. coli*)



Incubator ... G-BR-300

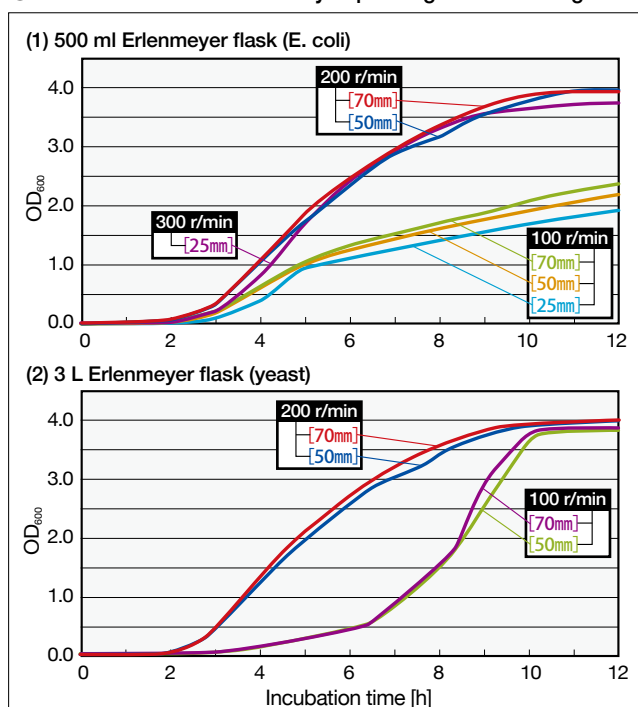
E. coli ... HB101 strain, 1/1000 volume of pre-culture fluid, incubated at +37°C

Culture medium/vessel volume ... LB culture medium 100 mL in 500 mL per each vessel

First, we fixed the volume, liquid volume, and shaking width, and then verified the difference in growth curves depending on the vessel shape. The vessel volume was set to 500 mL, which is a common volume for shaking culture, the liquid volume was set to 1/5 of the volume as the theory goes, and the shaking width was set to 25 mm, which is the most common in the constant temperature incubator shakers available on the market. The Erlenmeyer flask was shaken orbitally at 100 r/min and 300 r/min (the speed limit of a typical constant temperature incubator shaker), and the Shake flask was shaken reciprocally at 125 r/min (only at this speed to allow the aforementioned liquid movement). The result is shown in the figure on the left.

The most efficient flask was the Shake flask, followed by the Erlenmeyer flask with baffles. In the case of ordinary Erlenmeyer flask, it was also found that if the shaking speed could be increased, efficiencies similar to the other two could be obtained.

② Difference in culture efficiency depending on the shaking width



Incubator ... G-BR-300 (shaking width 25/50 mm), BR-180LF-70RT (70 mm) *E. coli* ... HB101 strain, 1/1000 volume of pre-culture fluid, incubated at +37°C

Yeast ... S288C strain, 1/100 volume of pre-culture fluid, incubated at +30°C

Culture medium ... LB medium 100 mL (*E. coli*), YPD culture medium 100 mL (yeast)

The shaking width was then examined.

(1) Comparison of growth curves at orbital shaking and shaking width of 25/50/70 mm. The 500 mL Erlenmeyer flask showed no significant difference at any shaking width, and the effect of the shaking speed was more significant (culture efficiency was lower at 25 mm than at other shaking width, but this was compensated for by the shaking speed).

(2) Yeasts, which have larger particles and sink more easily than *E. coli*, was cultured in 3 L Erlenmeyer flask and the shaking widths of 50 mm and 70 mm were compared. The result showed almost no difference due to the difference in the shaking width, and only a difference in the rise was observed due to the difference in the shaking speed (there was a large difference in the initial growth curve at 100 r/min and 200 r/min, but they reached almost the same turbidity after 12 hours).

Large shaking widths of 50 mm and 70 mm are thought to be used to compensate for the speed in large vessels that cannot be shaken at high speeds, but in the present flask size, no difference was observed between the 50 mm and 70 mm flasks. In the shaking culture of actinomycetes, the shaking width of the shake flask/70 mm is common, and if there is a difference between 50 mm and 70 mm flasks, it may be related to the shape of the vessel and the characteristics of the microbes.

NEW

Constant temperature incubator shaker OD Monitor

For cell culture related products

Shaker

Mixer Rotator Stirrer

Bead beater homogenizer Ultrasonic homogenizer

Aluminum block Bath Mini-size Bath

Water bath Shaking Water bath Immersion cooler

Hybridization Incubator Constant temperature Chambers

Centrifugal Concentrators Cold Trap

Freeze dryers

Substrate Electroporation apparatus Blotting device for hybridization

Constant-temperature water circulating system [Chilled]

Appendix

OD-Monitor A&S/C&T

The industry's first Non-contact turbidimeter that can measure the turbidity of sample at OD₆₀₀ while shaking. Adopted among the hundreds of R&D institutions. Operated with Bioshaker (Incubator shaker) in combination.

•"Bioshaker BR series" --> P.027-035 •Shaker "NR series" --> P.074-078

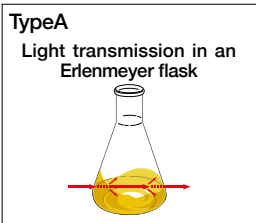


OD-Monitor A&S connected to 2 sets of ODSensor-S



OD-Monitor C&T

In the study of small-scale Erlenmeyer flask expression



OD-Monitor A&S + BR-43LF

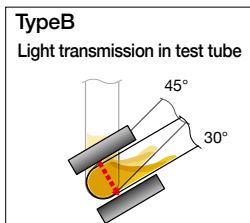
Features (common to B&L on the right page)

- The turbidity can be measured at OD₆₀₀ noncontact in the chamber (Patented)
- Measured and recorded per one test tube, one Erlenmeyer flask
- Operated with Bioshaker (Incubator shaker) in combination

Applications

- Examination and screening of beneficial bacteria [ODM C&T].
- Labor-saving acquisition of growth curve
- Background reduction by sampling

In screening and expression studies in test tubes



OD-Monitor C&T + BR-23FP

Model	OD-Monitor A&S	OD-Monitor C&T
Measurement method/range	Light transmission, 0.00 to 2.55 (OD ₆₀₀)	Light transmission, 0.00 to 2.55 (OD ₆₀₀)
Vessel and Fluid volume	Vessel: Glass Erlenmeyer flask Size: 100/200/300/500 mL Fluid volume: 20/40/60/100 mL	Vessel: Glass Test tube Size: φ16.5/18.0 mL Fluid volume: 5 mL or 10 mL
Shaking method	Orbital shaking	Reciprocal shaking
Shaking conditions	80 to 400 r/min (Shaking width 25 mm)/80 to 200 r/min (Shaking width 30/40 mm) 80 to 250 r/min (Shaking width 50 mm)	100 to 250 r/min (Shaking width 25/50 mm) Angle of Test tube 90/45/30°
Measurement intervals/channel	1/5/10/30/60/120/240 min, 1 to 8 (A&S)/1 to 8 (C&T) (*)	
Ambient temp. range	+15°C to +50°C	
Other functions	Alarm for specific value at OD, Transformation to Spectrophotometer in measurement value, USB flash drive (CSV file), Operation for pump unit (B&L) when above specified OD value	
Power supply	AC100V-240V/1A (universal power supply)	
Standard accessories for ODBox	Flat cable (2 m) x1 pc, *For A&S, Power cable x1 pc	
Standard accessories for ODSensor	Vibration absorbing pad of Flask (large and small) x1 pc, Flat cable (0.5 m) x1 pc	Magnet adapter (2 types) x1 pc, Flat cable (2 m) x 4 pcs

(*A&S equipped with 1 channel per 1 set of ODSensor. Some number of ODSensor should be required depending on the number of samples. C&T equipped with 8 channels per 1 set of ODSensor can be connected with only 1 set of ODBox. ODSensor with maximum number of channels cannot be put in Bioshaker depending on its size. Ask us for details.

Recorded data

OD BOX can record up to 360 points.

(Point=Total measured time ÷ Measurement interval)

The acquired data can be stored in a USB and output to PC In TXT format of CSV.

The turbidity is 0 at the start of measurement and display measured values.

It measures turbidity based on the size of E. coli, you need to correct the turbidity of targeted bacteria by spectrophotometer.

The capacity (number of installation and measurement) of ODSensor in Bioshaker BR-series

A&S and B&L: In BR-series the number of measurement of the unit equal to that of installation of the unit.

C&T: The number of measurement to the number of installation is by 8 times.

BR series	Shaking platform	Sensor-S	Sensor-L	Sensor-T (*)
BR-2X Series	MT-2925	3	1	2 (16 pcs, 2 Boxes)
BR-40 (*)/41/42/43/53	MT-4030	5	2	3 (24 pcs, 3 Boxes)
BR-300LF	MT-6040	8	4	5 (40 pcs, 5 Boxes)
BR-180 (*)/GBR	MT-7050	16 (2 Boxes)	5 (2 Boxes)	12 (96 pcs, 12 Boxes)
BR-3000 Series	MT-8060	20 (3 Boxes)	8 (2 Boxes)	14 (112 pcs, 14 Boxes)

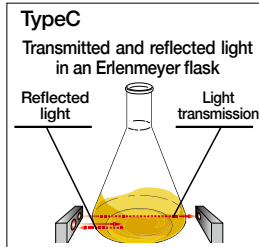
(*)At 45° angle. (**)Up to 2 L of Erlenmeyer flask can be used with the BR-40LF. (***)Excluding BR-180LF-70RT.

OD-Monitor B&L

OD-Monitor B&L can be used with 1L-3L flasks. Operated with Bioshaker (Incubator shaker) in combination.

•"Bioshaker BR series" --> P.027-035 •Shaker "NR series" --> P.074-078

When used with the APU-01 pump (sold separately), the culture medium can be added and sampled at the specified OD.



For 1-3L flasks

OD-Monitor B&L connected to 1 set of ODSensor-L



Reduction of manual background

It reduces the background caused by sampling in large Erlenmeyer flasks, which are inconvenient and time-consuming to handle. By keeping the cells out of the flask chamber, it is possible to reduce stress on the cells during culture.

Released from the cumbersome turbidity measurement

Combined with the optional automatic pump unit [APU-01], sampling and reagent addition can be performed automatically according to a preset turbidity level.



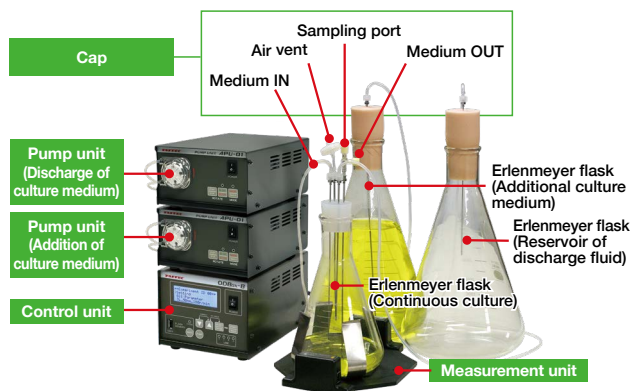
If the pump is set to the discharge side and the sample is received in a centrifuge tube, it is possible to sample at the specified OD value.

Model	OD-Monitor B&L
Measurement method/range	Light transmission/Reflected light, 0.00 to 9.99 (OD ₆₀₀)
Vessel and Fluid volume	Vessel: Glass Erlenmeyer flask Size: 1/2/3 L Fluid volume: 350/700/1000 mL
Shaking method	Orbital shaking
Shaking conditions	100 to 250 r/min (Shaking width 25/50 mm)
Measurement intervals/channel	1/5/10/30/60/120/240 min 1 to 4 (B&L) (*)
Ambient temp. range	+15°C to +50°C
Other functions	Alarm for specific value at OD, Transformation to Spectrophotometer in measurement value, USB flash drive (CSV file), Operation for pump unit (B&L) when above specified OD value
Power supply	AC100V-240V/1A (universal power supply)
Standard accessories for ODBox	Flat cable (2 m) *For A&S x1 pc, Power cable x1 pc
Standard accessories for ODSensor	Vibration absorbing pad of Flask (large and small) x1 pc, Flat cable (0.5 m) x1 pc

(*)B&L equipped with 1 channel per 1 set of ODSensor. Some number of ODSensor should be required depending on the number of samples. C&T equipped with 8 channels per 1 set of ODSensor can be connected with only 1 set of ODBox. ODSensor with maximum number of channels cannot be put in Bioshaker depending on its size. Ask us for details.

Product Name/Model	Remarks
Universal shaking platform MT-4030	Required for using BR-40/41/42/43 series with OD-Monitor series and Turbidostat system
Auto pump unit APU-01	For B&L. Starts to operate when a preset OD value is reached in ODBox-B. It can be used for automatically addition of IPTG and sampling. Manual operation can also be performed.

OD-Monitor for Continuous culture system



OD-Monitor Turbidostat system B (The component units/parts are highlighted in green.)

Realizes Small scale continuous culture at low cost

Simple continuous incubation with constant turbidity can be performed using the OD-Monitor and APU-01 automatic pump unit. Because it is conducted with an Erlenmeyer flask, continuous incubation can be performed on a small scale and at a low cost, reducing cleaning labor and incubation costs.

Model	OD-Monitor Turbidostat system A	OD-Monitor Turbidostat system B
Measurement method	Light transmission	Light transmission/Reflected light
Measurement range	0.00 to 2.55 (OD ₆₀₀)	0.00 to 9.99 (OD ₆₀₀)
Vessel and Fluid volume	Glass Erlenmeyer flask Size: 100/200/300/500 mL Fluid volume: 20/40/60/100 mL	Glass Erlenmeyer flask Size: 1/2/3 L Fluid volume: 350/700/1000 mL
Shaking conditions	Orbital shaking 80 to 400 r/min (Shaking width 25 mm) 80 to 200 r/min (Shaking width 30/40 mm) 80 to 250 r/min (Shaking width 50 mm)	Orbital shaking 100 to 250 r/min (Shaking width 25/50 mm)
Measurement channel	1 to 4	
Ambient temp. range	+15°C to +50°C	
Composition at 1 Channel	Control unit x1 pc, Measurement unit x1 pc, Pump unit 2 x pcs, Turbidostat cap x1 pc (with Pre-assembled Fluid feeding tube and Needle)	

*The tubing to be used should be a Tygon or PharMed tube. The standard thickness for the rollers is up to φ4.2 mm for the outer diameter.

NEW

Constant-temperature incubator/shaker OD-Monitor

For cell culture related products

Shaker

Mixer/Rotator/Stirrer

Bead beater/homogenizer/Ultrasonic homogenizer

Aluminum block/Bath/Mini-size Bath

Water bath/Shaking Water bath/Immersion cooler

Hybridization incubator/Consistent temperature Chambers

Centrifugal concentrators/Cold Trap

Freeze dryers

Substrate Electrophoresis apparatus/Blotting device for hybridization

Constant-temperature water-circulating system [Chilled]

Appendix

LED irradiation unit LC-450EXP

This is an option to update TAITEC's incubator shakers, etc. to irradiation incubators. Can be installed on medium to large Bioshakers and shakers, as well as constant temperature chambers.

- Middle and Large sized Bioshaker series --> P.028-035
- Large sized Shaker "NR-150N Series" --> P.078
- Constant temperature chamber "iB-130/230, M-210/600FD" --> P.154-156

Features

- Wave light equivalent to general LED fluorescent lamps
- Low light level by the irradiation from the bottom resulted in little irradiation difference
- Controller sold separately, 1 ch only and 1-4 ch same irradiation

Applications

- Cultivation of Cyanobacteria and Algae
- Culture of Plant callus
- Plant cell passaging culture

Combined with Middle to Large sized BR series, Shakers and Constant temperature chamber

Optimum for using with the Medium to Large sized Constant temperature incubator shaker BR series, Shaker NR series, and Constant temperature chamber iB/M series. The irradiation from the bottom can be done. See P.032 for installation on Large sized BR, P.078 for Large sized NR, and P.154 to 156 for constant temperature chamber. For BR-41-43/53 series and constant temperature chambers, irradiation from the top of the chamber is also possible by using optional mounting brackets.

Option

Combination example ①: Irradiation from the bottom with Medium sized BR
LC-450EXP
+ Controller LC-LED-CON1
+ Shaking platform MR-4030
+ Transparent Sticky sheet for LC-LED



Basic system of CO₂-BR-43FL for cultivation of Algae combined with CO₂-BR.

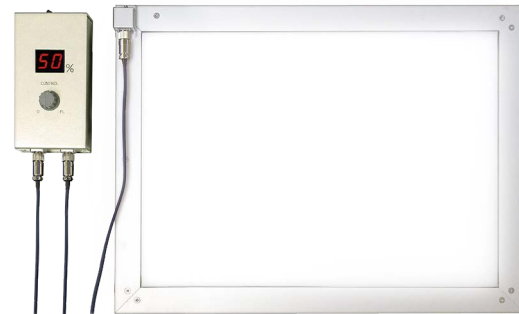
Combination example ②: Irradiation from the top with a Medium sized BR
LC-450EXP
+ Controller LC-LED-CON1
+ Mounting bracket RSB-3424LED



Combination example ③: Irradiation from the bottom with Large sized BR (see the P.032 for details)
LC-450EXP x1 to 4 pcs
+ Controller LC-LED-CON4
+ Mounting bracket LC-0950BR x1 to 4 pcs
+ Shaking platform MR-4030 x1 to 4 pcs
+ Transparent Sticky sheet for LC-LED x1 to 4

Combination example ④: Irradiation from the bottom/top with Medium-sized constant-temperature chamber M-210FD (see P.155 for details)
LC-450EXP + Controller LC-LED-CON1 + Mounting bracket LC-1250SB

Product Name / Model	Remarks
Spring net shaking platform MR-4030	Remove the bottom plate and fix the LC-LED plate with screws. See P.038 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	Brackets for mounting on the top surface of the BR-41/42/43/53 series chamber. Height can be adjusted to 4 levels.
LED light illumination unit mounting bracket LC-0950BR	Brackets for mounting to the Universal shaking platform MT-6040/7050/8060 for Large sized BR. One set of these brackets is required for each LED unit.
LED light illumination unit mounting bracket LC-1250SB	Brackets for mounting to the shelf of the iB and M series constant temperature chamber. One LED unit can be fixed to one shelf.



Example of combination with optional controller LC-LED-CON1 (photo shows when lit)



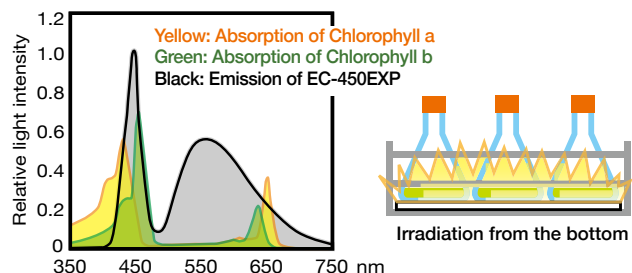
Installation of 4 pcs of LED units into the chamber of the Large sized Bioshaker



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

Optimum as a substitute for white fluorescent light as an upgrade

It contains 450 nm which is the main absorption wavelength of chlorophyll as the primary peak and also contains the required intensity around 660 to 740 nm. Optimum as a substitute for white fluorescent light as an upgrade.



Significantly higher illuminance (photon intensity) than conventional models, dimmable in 1% increments

The photon flux density has been increased from approximately 215 μmol in the previous model (LC-LED450W) to approximately 310 μmol in this model. Light intensity can be controlled in 1% increments within the range of 10 to 100% with a dedicated controller (sold separately).

Model	LC-450EXP
LED	LED Color: White, Peak wavelength: 450 nm Photon flux density: approx. 310 μmol (*1), Irradiated surface average: $\pm 15\%$
Dimensions of LED light source	340 x 240 mm
Use conditions	Temperature range: +4 to +50°C (*2), Shaking speed: Up to 200 r/min
Weight	Approx. 2.5 kg
Power supply	Depends on the dedicated controller (sold separately). *Compatible with the controllers of older models. (A compatibility cable may be required.)

(*1) The photon flux density values are those on the luminous surface. There may be slight individual differences among the irradiation units. Please be aware of this. (*2) Due to the heat generated by the unit, the temperature display of each device may deviate from the actual temperature. When using the product, be sure to measure the actual temperature at the temperature illuminance to be used, and if there seems to be a discrepancy, please offset the temperature.

Dedicated controller model	LC-LED-CON1	LC-LED-CON4
Dimming method, controllable range	PWM method, control in 1% increments, 10 to 100% (*)	
Number of controllable LED irradiation units	Control the amount of light in one piece. For use with Medium sized BR.	Controllable 1 to 4 pcs simultaneously, at the same output (%) For Large sized BR.
Weight	Main unit approx. 0.2 kg, AC adapter approx. 0.2 kg	Main unit approx. 0.7 kg, AC adapter approx. 1 kg
Power supply	AC100V-240V/2A (AC Adapter)	AC100V-240V/5A (AC Adapter)

(*) Settings can be made in the range of 0 to 100%, but reproducibility is poor below 10% due to individual differences in irradiation units.

NEW

Constant
temperature
incubator shaker
OD MonitorFor cell culture
related products

Shaker

Mixer
Rotator
StirrerBead beater
homogenizer
Ultrasonic
homogenizerAluminum
block Bath
Mini-size BathWater bath
Shaking Water bath
Immersion coolerHybridization
Incubator
Constant temperature
ChambersCentrifugal
Concentrators
Cold Trap

Freeze dryers

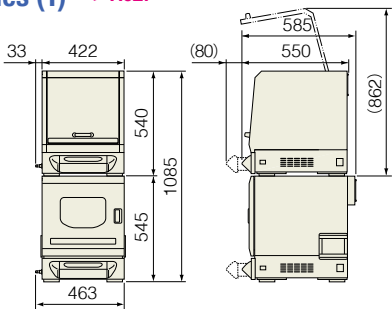
Substrate
Electroporation apparatus
Blotting device for
hybridizationConstant-temperature
water circulating
system [Chilled]

Appendix

Dimensions for Bioshaker BR-series

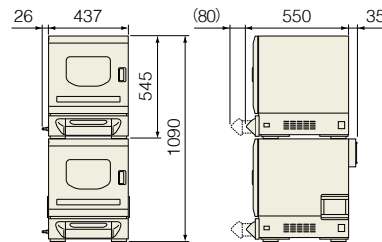
BR-21/22/23 series (1) --> P.027

The drawing shows the units stacked.
 Upper: BR-21UM/22UM/23UM
 Lower: BR-21FP/22FP/23FP



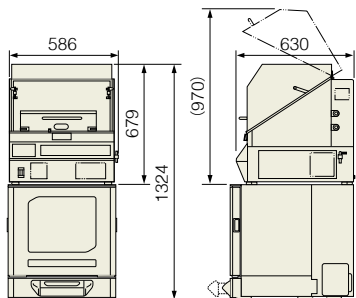
BR-21/22/23 series (2) --> P.027

The drawing shows the units stacked.
 Upper: BR-21FH/22FH/23FH
 Lower: BR-21FP/22FP/23FP



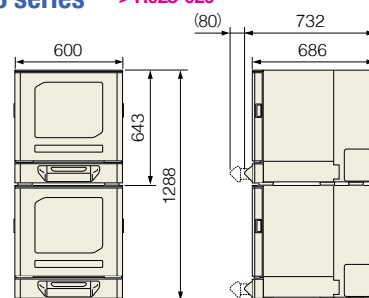
BR-40LF --> P.029

The drawing shows the units stacked.
 Upper: BR-40LF
 Lower: BR-41/42/43series

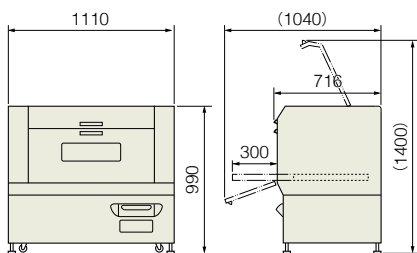


BR-41/42/43/53 series --> P.028-029

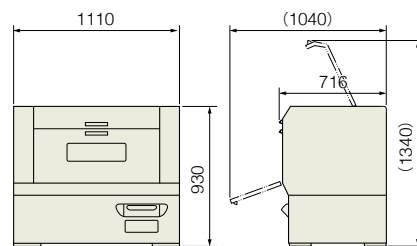
The drawing shows the units stacked.



BR-180LF --> P.030

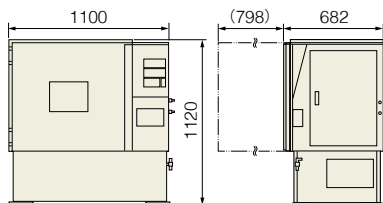


BR-180LF-70RT --> P.030



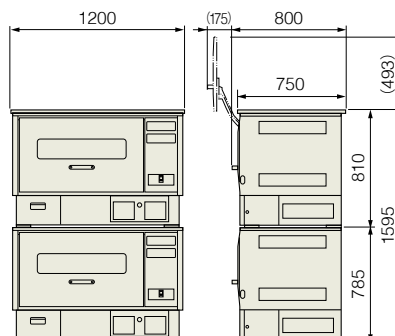
BR-300LF --> P.033

Double platform BR-300LF --> P.033



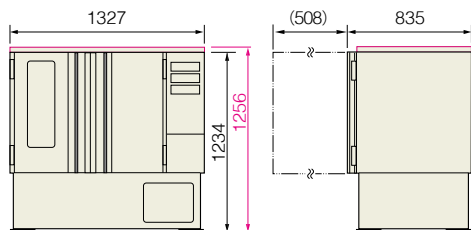
GBR-200/300 --> P.031

The drawing shows the units stacked.



BR-3300 series --> P.034

[Red] BR-3300B/S/BW/SW (with top board attached)



NEW

Constant temperature incubator shaker
 OD Monitor

For cell culture related products

Shaker

Mixer
 Rotator
 Stirrer

Bead beater
 Ultrasonic
 homogenizer

Aluminum
 block bath
 Mini-size Bath

Water bath
 Shaking Water bath
 Immersion cooler

Hybridization
 Incubator
 Constant temperature
 Chambers

Centrifugal
 Concentrators
 Cold Trap

Freeze dryers

Substrate
 Electrophoresis apparatus
 Blotting device for
 hybridization

Constant-temperature
 water circulating
 system [Chiller]

Appendix