Operation Manual

BCAJ-301 & BCAJ-304

CO2 Incubator Air Jacketed

Thank you for Choosing Biolab products. Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation.

Environmental conditions
* Indoors use.
* Altitude up to 2,000 m.
* The work's Temperature surrounding must be in 18℃-30℃ when the unit work in 37℃.
* Maximum relative humidity 80% for temperatures up to 30℃.
* MAINS supply voltage fluctuations up to ±10& of the nominal voltage.
* Transient over-voltages typically present on the MAINS supply category II.
* Applicable RATED POLLUTION degree 2.
* The room must be equipped with adequate ventilation.
* The setup surface must be firm, level, and nonflammable.
* The unit must be set up where it will not be in direct sunlight.
* There is not any hot source nearby the unit.

Safety Information
* It is important for you to read these Instruction Manual carefully before using the unit for the first time.
* The CO2 Incubator may only be operated by trained, authorized personnel.
* Maintenance work on the unit may only be performed by the Biolab or authorized agents.
* Tissue, materials, or liquids: Which are highly flammable or potentially explosive; Whose vapors form flammable or explosive mixtures with air; Which release toxins; May not be used!
* The pressure of the CO2 supply can be adjusted to a range of 0.8-1 bar ,and cannot be altered.
* CO2 is a kind of gas be representing potential health hazard. The unit is to be repeated at suitable intervals.
* Only qualified personnel using suitable tools may work on supply lines and compressed gas container, bottles, or collective systems in which CO2 is stored for use with the incubator.

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* CO_2 is a kind of gas be representing potential health hazard. The unit is to be repeated at suitable intervals.
* Only qualified personnel using suitable tools may work on supply lines and compressed gas container, bottles, or collective systems in which CO_2 is stored for use with the incubator.

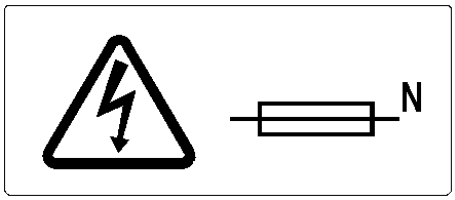
Warning：

Warning: Important operating and/or maintenance instructions. Read the accompanying text carefully.

Caution: hot surface.

Warning: be careful of the glass.

Caution: risk of electric shock.



CAUTION: fuse.

Protective GND indicator !

Simple Operational Procedure of BCAJ-301 & BCAJ-304 CO_2 Incubator.

Default set: Temperature———37.0℃, %CO_2———0 %

Please perform 90℃ moist heat disinfection before first using (refer to P.22). Then the following procedures should be strictly followed:

1. Open the outer door and the glass door, and input distilled water (3L) into the

pool. Close the doors after doing so.

2. Connect the unit to the source of CO_2.
3. Connect the power supply and switch on.
4. Self-checking will be done automatically.[%CO_2] and [℃] will display [888] and version number. The checking will be terminated after 40s. [%CO_2] and [℃] display the setting data inside the unit.
5. Press the [auto-start] for about 10s, then the “auto-start” light will be lit.
6. Please open the glass door according to the hints of the [%CO_2]and [℃] display windows.
7. Close the glass door after 1 minute, and the unit will do AUTO-START.
8. Wait for 16 to 24 hours.
9. Adjust the exit pressure of CO_2 source to 1bar（0.1MPa）.
10. Press [%CO_2] and [▼] /[▲] to input CO_2 setting value（eg.5.0%,7.0% or 0%）.
11. Unit will input the CO_2 gas until the setting value.
12. Now, the unit can be used in incubating work.
13. You must set the CO_2 value to [.0%] according to the “Step 10” after operating before switching off.
14. Open the glass window to spill out the gas, and dry the inner chamber.

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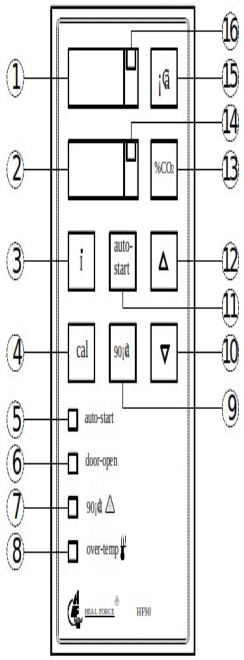
01 Control Panel

Picture 1:BCAJ-301 Display Panel

Simple Introduction of Display Panel：
1. “℃” display window
Displays the actual value at normal condition. The SET value can be displayed by pressing [℃] key.

The code of temperature malfunction can be displayed by pressing [i] key; you can also switch to the special function mode by pressing [cal] key (See Function Select, P.19).



2. “%CO2” display window
Displays the actual value of CO2 concentration; the SET value can be seen by pressing [%CO2] key.

The code of CO2 malfunction can be displayed by pressing [i] key; you can also switch to the special function mode by pressing [cal] key (See Function Select, P.19).

3. Press [i] key will display the malfunction code.

4. Press [cal] key to enter the adjusting mode. Select special functions together with [▼] and [▲] key.

5. “Auto-start” light will lighten when the equipment begins Auto-starting.

6. “Door-open” light will lighten when the glass door is opened.

7. “90℃” light will lighten when the equipment begins disinfection at 90℃.

8. “Over-temp” will lighten if the temperature is over the set value and the heating progress will be terminated.

9. Press [90℃] key for 10s to enter the disinfection at 90℃ (See P.22)

10.[▼] is used to reduce the value.

11. Press [auto-start] key for 10s to enter the Auto-start mode.

12.[▲] is used to increase the value.

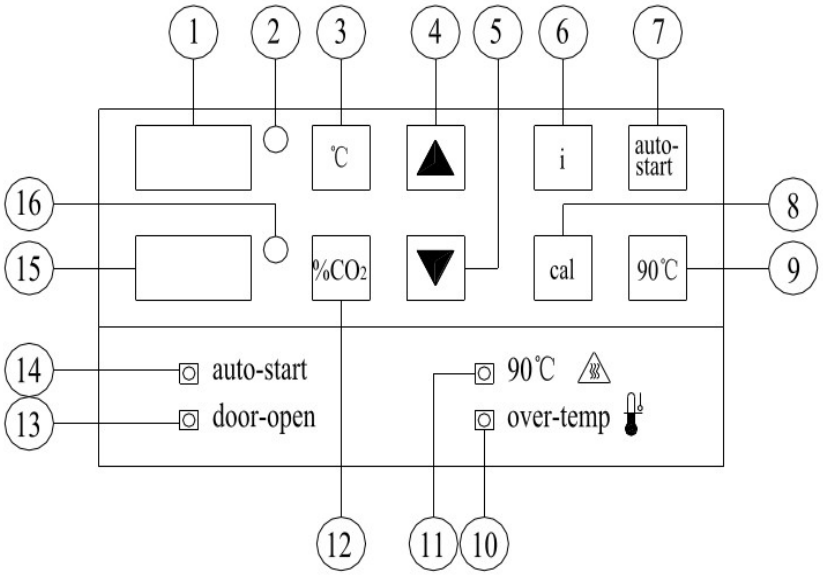
13.[%CO2] is used to set concentration of CO2

14. GAS light will lighten when the gas comes in.

15.[℃] is used to set the temperature.

16. Heating light will lighten in heating progress.

Picture 2：BCAJ-304 Display Panel



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2. Heating light will lighten in heating progress.

3. [℃] is used to set the temperature.

4. [▲] is used to increase the value.

5. [▼] is used to reduce the value.

6. Press [i] key will display the malfunction code.

7. Press [auto-start] key for 10s to enter the Auto-start mode.

8. Press [cal] key for over 5 seconds to enter the adjusting mode. Select special functions together with [▼] and [▲] key.

9. Press [90℃] key for 10s to enter the disinfection at 90℃ (See P.22)

10. “Over-temp” will lighten if the temperature is over the set value and the heating progress will be terminated.

11. “90℃” light will lighten when the equipment begins disinfection at 90℃.

12. [%CO2] is used to set concentration of CO2

13. “Door-open” light will lighten when the glass door is opened.

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16. GAS light will lighten when the gas comes in.

02 Introduction

BCAJ-301&BCAJ-304 Incubator is a delicate lab equipment mainly used in medical area and incubation of cells、tissues and bacilli. There are new functions like disinfection at 90℃, the control of CO2 concentration, and the Micro Control System, which improve the incubation of cells、tissues and other materials. It is an important equipment of High Leveled biological and medical experiments.

Please carefully read this manual before using in order to prevent the inconvenience and the damage to the equipment.

Only the personnel authorized by Biolab can do the necessary test or maintenance work in order to keep the incubator work normally and accord with the corresponding safety standards.

Please note the Serial No. when handling the malfunction report or speak for components.

Only authorized or trained personnel can operate the equipment.

Please keep the incubator in steady environment without acute change of temperature, which is helpful to the incubation.

The equipment quotes the following standards:
* Q/TEUC8-2002 (BCAJ-301)
* Q/TEUC14-2003 (BCAJ-304)
* EN 61010-2-010

Sorts of equipment:
Common equipment of Class I.
The important part is labeled by ⚠

Application

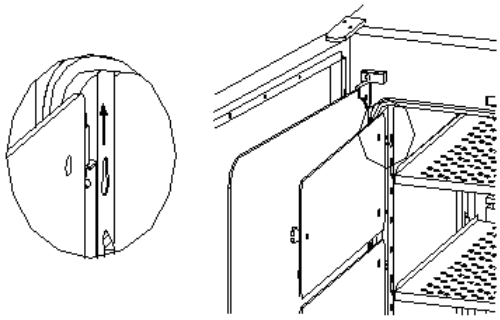
The incubator can simulate the natural data of cells and tissues. The equipment CANNOT be used to incubate flammable materials.

Equipment Description

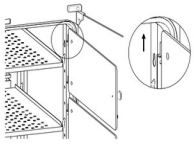
Fabric Shell Electrolyzed galvanization steel(RAL 9002).
Control parts are made of plastic.
Stainless steel is used in inner chamber.

■ Inner Components

The insert shelves are shake resisted, and can be adjusted at 50mm height. You can remove the shelves and support frame simultaneously without any additional tools.



Picture 3-1-1：BCAJ-301 doors opened to the left Three Small doors



Picture 3-1-2：BCAJ-301 doors opened to the right Three Small doors

■ Three small doors (BCAJ-301)

There are three small doors located in the front of the inner chamber. The unique design can reduce the gas and the temperature lost when the front door is opened. Way of teardown:(Refer to Figure 3-1-1&3-1-2). Open the small glass door at 45°,and lift slowly until it is completely removded.

Six small doors (Option for BCAJ-304 door opened to

There are six small doors opened to the right located in the front of the inner chamber. The unique design can reduce the gas and the temperature lost when the front door is opened. Way of teardown:(Refer to Figure 3-2). Open the small glass

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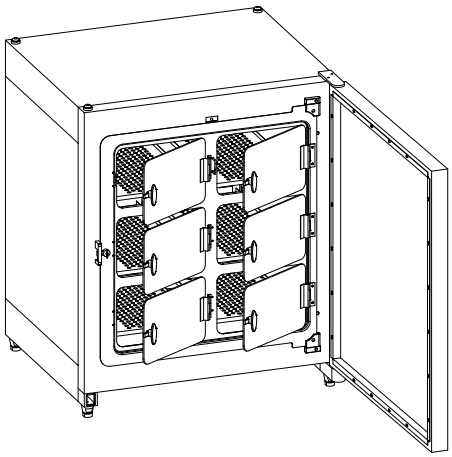


Picture 3-2：BCAJ-304 doors opened to the right
Six Small doors

03 Equipment Description

Heating System:
The heating system is spreaded on the surface of inner chamber to heat it. The heating system is normally placed at the top, back, front, left, right sides of the pool and the front of the outer door.

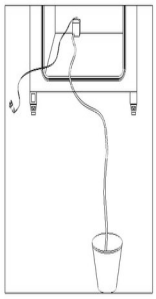
The condensed water will not appear because the outer door is also heated so that it will keep clear. On the contrary, there will be condensed water on the outer door.

The main heating system allows the equipment to run at the temperature 8 ℃ above the Room temperature. If you hope to operate at a lower temperature, you can switch off the door heating to make the equipment work at the temperature 5℃ above the surrounding. There will be condensed water formed at the corner of the glass door. The door-heating switch is “ON” at normal condition (refer to function 5, P19), and the additional heating system is always on the new added slowly heating and normally heating mode could make the incubator work at the different temperature. Anyway, normal heating mode is suggested.

Humidity:
The distilled water in the pool vaporize and humid the air inside the chamber, and the humidity at normal condition is ≥95%.

The condensed water will not appear at the top of the chamber and on the door because the particular heating system is used. Instead, it will gather at the other sides of the inner chamber.

The container of the pool: 3L distilled water.



Picture 4:Draining

Please ensure that there is no chemical material in the water or it will canker the pool.

Each incubator is equipped with an electric suction pump.
Steps of using:

※Take out the draining pipe in the bag.
※Remove the lower shelf inside the chamber.
※Connect one point of the pipe to the discharge port of the electric suction pump.

- Put the other point into the bucket.
- Install the four osculums onto the back of chamber (below the wind channel) and put the bottom into the water.

※Educe the plug and put it into the 220V power jacket.
※The pump begins to work until the c hamber is dried.
※Take off the plug and remove the pump from the chamber.

- Unplug the drainpipe and dry the pump.

※ Dry the pool.

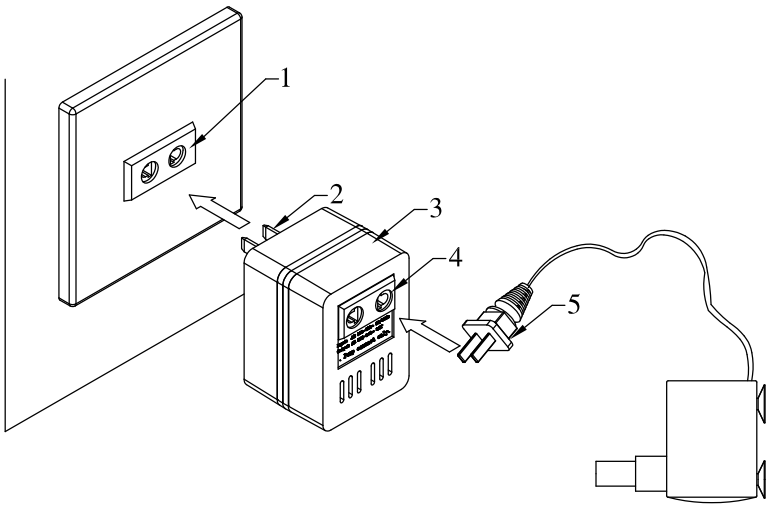
Attention of using the pump:
Picture 5 : Electric Suction Pump
1 · Drainpipe
2 · Bottom of pump
3 · Osculum
4. Plug

★The pump cannot run without sopping up.
★Do not make the pump run for more than 10 minutes.
★Drainpipe must be connected when draining.
★Dry the pump after draining.
★Don’t take water to the plug of pump because of the AC 220V working voltage.

Gas Source
The joint of the gas entrance is at the back panel of the equipment (refer to Picture 6).
The max input press is 1 bar.
Please carefully check the joint of gas entrance!
The gas will pass a filter and enter the chamber after the grain larger than 0.3μm being sieved. The sieving ratio is 99.998%, and the blower mixes the inputting gas and air inside.

CO2 gas should be high pure food-class gas.

Picture 6:CO2 entrance
Door Switch:
There is a switch at the back of the glass door. This switch will cut the gas supply and the heating system to prevent the inputting gas and overheating. All the display will glitter until the door is closed. If the door remains open for 5 minutes, the equipment will give out an alarm. The outer door can only be closed when the glass door is closed and gastight.



Picture ：Electric Suction Pump

1 · Power Jack
2. Alternating current adapter's plug
3. Alternating current adapter(Input: 110-120V~ 50/60Hz ,Output: 220-240V~ 30W)
4. Alternating current adapter's jacket
5 Pump

Press Compensation:
The press compensation hole prevents the abnormal press when the gas enters

and assimilating of air when glass door is open (See Picture 7).

The equipment should be placed with good compensation to ensure the gas letting by valve can be cleaned in time.

04 Micro Control System

The System includes the following separated control function:

a) Data Control:
Set Range:
※Temperature : 5.0℃...50.0℃
※CO2 : 0.0%...20.0%

b) CO2 Zeroing
Adjust the CO2 testing system

c) Supervisor:
※ Door Control
※ Wrong Message
※ Malfunctions Restoration
※ Codes of Malfunction

d) Special Function
※ Buzzer: On/Off
※ Gas Supply: On/Off
※ CO2 Adjusting
※ Set Point: Lock
※ Heating Mode: Slowly/Normally
※ Door Heating: On/Off

a) Data Control

Temperature
A Pt1000 resistance of Micro Control system controls the chamber temperature.

CO2 Control:
In order to keep the stabilization of pH value of the samples, the concentration of CO2 in the chamber should be controlled. The concentration of CO2 depends on the expected pH value and the content of buffer solution of NaHCO3 in the incubation medium. The measure of CO2 is a continuous process based on the thermal conductivity of inner chamber. Thus, the input of CO2 will cause the change of the thermal conductivity inside the chamber and form a signal indicates that there is a direct ratio between thermal conductivity and concentration.

b) Self-adjusting of Measuring System

Regular AUTO-START function

The Measuring System needs adjusting before operating or modifying the SET temperature. It will be preceded when AUTO-STARTING.

The equipment will do self-adjusting to the measuring system when the temperature and humidity both reach steady state. The process costs 15 hours if it is started at the room temperature. Please ensure that the chamber is only filled with air.

Suggestions : Do AUTO-START every six weeks or whenever the temperature is changed!

c) Supervisor Function:

※ Door Control:

All the actual values displayed will glitter until the glass door is closed. The 5 minutes' lasting of door open will be considered as malfunction and a malfunction code will be given out.

※ Malfunction Identification:

Micro Control System supervises all the data and possible malfunctions.

All the SET value has a range, and the equipment will give an alarm together with the wrong message if the actual value is out of the range.

※ Error Range:

- Temperature: 0.5℃
- CO2: 1.0%CO2

※ Wrong Message:

Each malfunction identified by Micro Control System has a special code that will help you recognize the reason of malfunction.

The radiation digital tube will glitter when malfunction occurs to inform you the situation, and if the buzzer is connected, you will also hear sound signal. If you keep pressing [i] key, you will get the code of malfunction on the display, and if there is no faults, it will display [- - -].

※ Attention:

Please press [i] key to get the code at first when malfunction occurs.

Following actions may interrupt wrong Message:

* Change the SET value
* Switch on/off the equipment

Code Table of Malfunction:

Code of Malfunction	Possible Reason	Solutions
99 Glass door is open	Glass door is not closed	Close the door
100 Temperature too low (Set point)	Door heating is switched off	Switch on the door heating (Function 5)
101 Temperature too high (Set point)	Surrounding temperature too high	Switch off the door heating (Function 5)
200 CO_2 too low (Set point)	CO_2 not connected CO_2 is used up Low press of CO_2 entrance	Connect the gas Replace the CO_2 bottle Adjust the press to 1bar
201 CO_2 too high (Set point)	High press of CO_2 entrance	Adjust the press to 1bar

d) Special Function:
Adjusting Page 19
Choose the following functions by [cal]+[▼] or [▲]

■Buzzer: On/Off
■Function 1:
You will hear a sound signal when malfunction occurs if the buzzer is on.
Switch off the buzzer: “Silent”.

Default set: Buzzer is on

■Gas supply On/Off
■Function 2:
The gas source will be cut off if you choose “Gas OFF”, and the green diode “Gas”will crush out.

Default set: Gas On; the green diode “Gas” lights when the gas enters.

- CO2 zeroes
- Function 3

If the warp of CO2 display is too large, the function allows manual zeroing CO2.

■Lock the SET point:
■Function 4:
This function allows you lock the SET point of temperature and CO2 SET value and these points will not change when the equipment is wrongly operated.

Default set: Unlocked

Door Heating: On/Off
■Function 5:
The main heating system allows the equipment working at the temperature 8℃ higher than the surrounding. If you want to operate at the temperature 5℃ higher than the surrounding, you can simply switch off the door heating system. But

condensed water will form on the glass door.

Default set: Door heating system on.

- Heating Way: Normally/Slowly
- Function 6：

The two different heating ways ensure the equipment working normally at different temperature. The Slowly Heating Way is suitable for high-temperature situation. Normally Heating Way is suggested.

Default Set: Slowly Heating

■Operational Way: Default Set
■Function 7 :
This Set id to test the function of the incubator, please set to 1.

Default Set: 1

■Operational Way: Monitoring the surrounding temperature
■Function 8 :
Monitor the surrounding temperature to make the temperature inside the chamber steadier.

Default Set: Monitoring the surrounding temperature

Overheat Protection

Temperature Limit Controller (TLC):
There is a separated TLC to protect the incubator.

When the temperature control circuit is out of control, the TLC will control the power in case it is 1.5℃ higher than the set value.

The red light (over-temp) will be lit when the TLC responds.

If the TLC is charged with the controlling, please refer to the code table of malfunction to find out the reason.

Placing Position and Installation

Open the box and take out the components.

■ Positioning:

The incubator must be put at the irremovable place.

Avoid direct irradiation from the sun.

The placing position should keep dry and the surrounding temperature cannot be higher than 30℃ (18℃-30℃ is the most suitable).

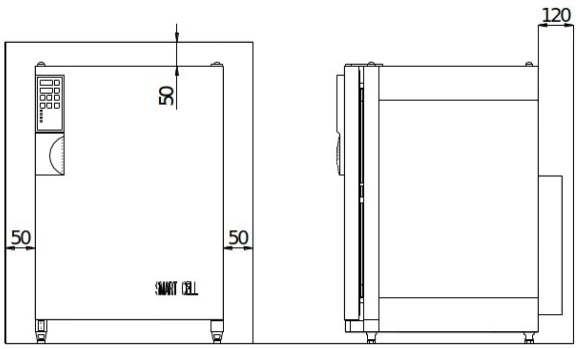
Keep the equipment at a level place and the bracket should be shake resistant and apyrous.

CO2 is needed when the incubator is working while CO2 is also harmful to health, so the placing position must be good ventilation. The gas discharged from the back panel must be immediately carried off.

The equipment cannot work without ventilation device, thus, if several equipments are in the same room or the equipment is placed at the bottom of the lab, additional ventilation device is needed.

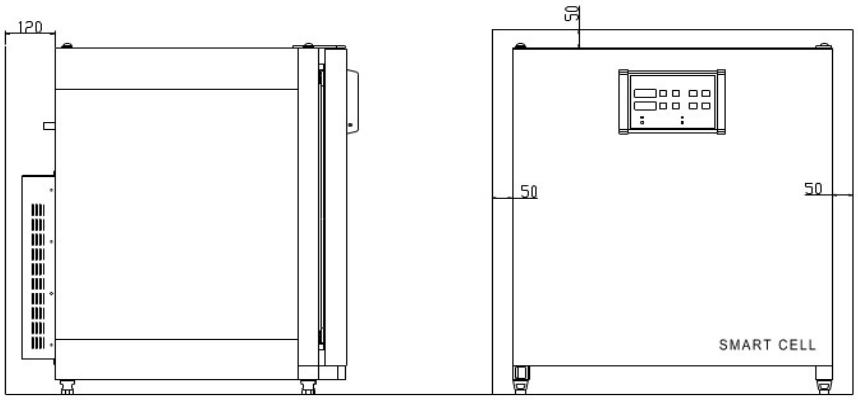
For the detail of gas releasing, please refer to the appendix.

■Space:
There should be some space left between the equipment and the wall or other instruments. (refer to picture 8,9)



Picture 8: Space between the BCAJ-301 incubator and the wall（mm）

Placing Position and Installation



Picture 9: Space between the BCAJ-304 incubator and the wall（mm）

The press compensation hole at the back panel cannot be jammed.

■ Stacking: (See picture 11 P30, picture 12 P31)

■ Installation and Connection of Gas Source:
The correspondent-connecting interface is at the back of equipment (See picture 6 P10). The connecting pipe is included with the unit.
The gas entering the equipment should first pass a reduction valve to reduce the press to 1 bar.
The press of 1bar cannot be changed for safety reason.

■ CO2:
Connect the reduction valve to the equipment again.

■ Attention:
CO2 gas should be food class and its purity is at least 99.5%. CO2 Cylinder with cat is not allowed.
The sensor with high sensitivity is used in this incubator, and it cannot be used under electromagnet interference (e.g. mobile phone).

■ Put through the Main Power:
Please ensure the power supply matches the power written on the nameplate before putting through the power.
There is a grounded power cable together with the incubator.
The main power needs 2 4A fuses.

Startup

The surrounding temperature is at least 8℃ lower than the SET value.

※ Keep the outer door and glass door open.

■ Distilled water used:
※ Pour the distilled water into the pool (approach the room temperature)

Input Quantity: 3L

Avoid overflow during the inputting.

Ensure the humidity inside the chamber will not change.

※ Open the cutoff valve of the bottle

※ Switch on the main power

- The green light is on
- [888] will be displayed for about 40s.
- Regular Self-checking
- Actual value will be displayed after Self-checking.

■ Adjust the SET Point:
Keys used: [℃] , [▼]/[▲]
※ Keep pressing [℃] key to adjust the [℃] value:
※ Keep pressing [%CO2] key to adjust the [%CO2] value:
- Display the value being set last time
- The last number of the display glitters
- Set the expected value by [▼] or [▲] key, and the value will be stored after loosening the SET keys and the actual value will be again displayed.

• Default Set:
Temperature: 37.0℃
CO2: 0.0%

Attention!
Only air gas can be in the chamber.

AUTO-START
※ Keep pressing the [auto-start] on the control panel for 10s.
• “OPEN DOOR”: The temperature display panel will show 〖opE〗, “%CO2” display panel will show 〖dor〗, and open the outer door and glass door for about 60s.
• The Auto-start mode is activated and the “%CO2” display panel will show [0.0] and the “℃” display panel will show the actual value after closing the doors.
• “GAS” light is off and “AUTO-START” light will be on.
※ Close the doors

Startup

Attention:
Heat the equipment to the SET value and establish the relative humidity.

After regular AUTO-START:
- “Auto-start” light will be off
- Actual value displayed

The equipment will continuously input the gas until it reaches the SET value that has been set.

- The equipment can now be used in incubating work.

■ Special Functions:
[cal] and [▼] or [▲] keys

You can choose and set the special function by [▼] and [▲] key when keeping pressing the [cal] key.

“℃” will display the Function code [1], and press [cal]again after loosen it, “%CO_2” display window will show the actual mode. The mode can be changed by pressing [cal]+[▼]/[▲].

Function Name	“°C” Display Window	“%CO_2” Display Window	Function	Default Set
1 Buzzer	[1]	[A 1] [A 0]	On Off	On
2 Ventilation	[2]	[G 1] [G 0]	On Off	On
3 CO_2 Zeroing	[3]	[0]	CO_2 Zeroing	
4 Opening Set	[4]	[S 0] [S 1]	Not Opened Opened	Opened
5 Door Heating Switch	[5]	[d 1] [d 0]	On Off	On
6 Heating Way	[6]	[h 0] [h 1]	Slowly Normally	Slowly
8 Monitor the Surrounding Temperature	[8]	[P 1] [P 0]	Not Monitoring Monitoring	Monitoring

Please refer to Page13-Page14 for details.

Startup

Attention:

■ Temperature:
Please restart AUTO-START for calibration when setting temperature is over 1℃, which make the unit works precisely.

■CO2 Comparison
If the value of CO2 concentration measured is different from the value showed on the [%CO2], you can adjust CO2 zeroing by manual. Unit will recover to the original CO2 zeroing after next AUTO-START operation.

■ Example for Reference:
CO2 display value: 7.0% CO2
CO2 actual value: 6.2% CO2

※Choose function No. 3 by [cal] key and [▲] key.
※Loosen the [cal] key
※Press the [cal] key again

- The [℃] displays [3] and glitters.
- “%CO2” display window shows [0]
※Input the actual CO2 concentration value into the temperature display window by [cal]+[▼]/[▲].
※Loosen the [cal] key.
※Press [i]to confirm.

CO2 will display the modified concentration. If the actual value is higher than the SET one, please keep the door open for one minute to let the extra gas out.

■ Important:
※Please pour out the water in the pool and dry the chamber if the equipment is not to use for a period of time.

※Do not switch on/off the equipment continuously.

※Please keep the door closed and try to shorten the opening time when necessary to ensure the best situation of the chamber.

■[i] key
If any malfunction occurs during work time, the corresponding display will glitter, and if the buzzer is connected, you will hear a sound alarm at the same time. You can know the reason of malfunction by pressing [i] key, and the display window will show the code of malfunction.
(Refer to the table of malfunction code Page21)

Table of Malfunction Code

Please check the following to solve the problem more quickly.

Code of Malfunction	Reason of Malfunction	Solutions
99 Glass door is Open	Glass door is not closed	Close the door
100 Temperature too low (SET point)	Door heating is switched off	Switch on the door heating (Function 5)
101 Temperature too high (SET point)	Surrounding temperature too high	Switch off the door heating (Function 5)
200 CO_2 too low (SET point)	CO_2 gas not connected CO_2 bottle is used off CO_2 entrance press too low	Connect the gas input Replace the CO_2 bottle Adjust the entrance press to 1bar
201 CO_2 too high (SET point)	CO_2 entrance press too high	Adjust the entrance press to 1bar

Please contact the maintaining engineer if the table above cannot solve the problem.

■ Malfunction that cannot be shown by the equipment

Malfunction	Way of Checking
* Equipment does not heat	- Check the SET value
* No gas entrance	- Check the diode GAS. *Check if the input is switched off. - Check the SET value
*Buzzer does not give out alarm when malfunction occurs.	- Check if the buzzer is switched on. Please check the special function.
*SET value cannot be changed	- SET point is locked. Please check the special function.
*There is much water on the glass door.	- Check if the door heating is switched on.

Switch Off:
* Switch off the main power
* Switch the gas reduction valve

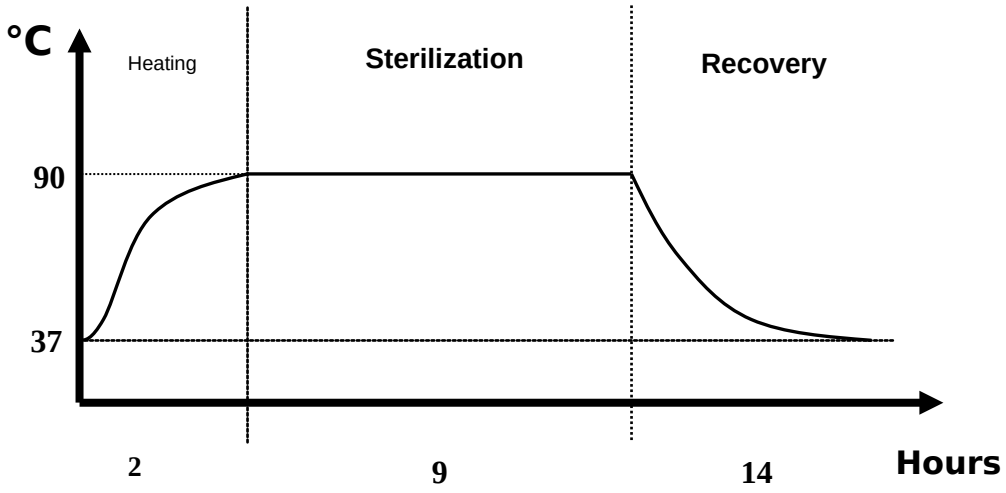
Disinfection, Cleanness, and Examine

Warning: Hot surface in Disinfection mode, don't touch and open the door.

Need to Do Once a Week:
* Check the water level of the pool.
* Check if the entrance press is 1bar.

• Clean the Chamber
with 90℃ moist heat disinfection (suggestion：once per 2 months)
* Switch off
* Open the glass door
* Dry the chamber
* 90℃ moist heat disinfection

★ The whole procedure of 90℃ moist heat disinfection.



Picture 10: The procedure of the 90℃ moist heat disinfection

Way of 90℃ moist heat disinfection:
• Open the outer door and glass door, and take out all the materials inside the incubator!
• Dry and clean the incubator, and input 300ml distilled water.
• Close the glass door and outer door. Turn on the power supply.
• Keep pressing the [90℃] button on the display panel until the green light "90℃" on the display panel lightens.
• Wait for about 10s, the "℃" display window will show [OPE] and "%CO2" display window will show [dor]. Please check id there is anything left inside the

incubator! Please do this after opening the outer door and glass door.

• After keeping opening for one minute, the “%CO2” window will show [-25] and “℃” window will show the actual value of temperature and glitter, which indicates the disinfection procedure will last for 25 hours. Please close the doors!

• The equipment now begins the disinfection.

Explanation of 90℃ moist heat disinfection.

The whole procedure is divided into three phases:

1 Heating ---The heating procedure will increase the temperature to 90℃, and the procedure will last for 2 hours (based on surrounding temperature)

2 Sterilization---The temperature has arrived 90℃, and the sterilization will last for 9 hours.

3 Recovery---The equipment will return to the incubation mode (decrease the temperature), and the procedure will last for 14 hours.

Note: The procedure of disinfection may last for longer time in the conditions where the heat is difficult to emit. If the procedure is over 25 hours while the temperature has not recover to 37℃, then “%CO2” will always display [-4] (4 hours remains). At that time, operator can terminate the disinfection manually by keeping pressing [90℃] key until the light goes out, which will not affect the disinfection.

Input 3L distilled water and do “AUTO-START” after disinfection! Incubation can only be started after “AUTO-START”!

The “℃” window displays the actual value of temperature while the “%CO2” window has three displays show the remaining time and remind you the current phase.

Phase 1, the cursor of the “%CO2” window is climbing in ①.

E.g.：[-25]　[-25]　[-25]；

Phase 2, the cursor of the “%CO2” window is at the middle and glittering in ②.

E.g.：[-23]　[-23]；

Phase 3, the cursor of the “%CO2” window is descending in ③.

E.g.:[-14]　[-14]　[-14].

Warning:

Please do the cleaning and disinfecting before informing the maintaining engineer. As the anti-rust free disinfectant with chlorine ingredient is corrosive to metals, it is absolutely prohibited to make use of it to disinfect both interior and exterior parts of any equipment.

In the event that the rust preventative disinfectant with chlorine ingredient is used to disinfect both interior and exterior parts of any equipment, it is necessary to rinse out the disinfected parts with asepsis distilled water and swab up the equipment prior to further utilization.

Maintenance

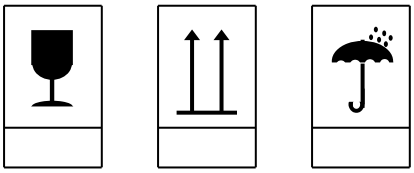
We can assure the normal condition of the equipment only when it is maintained or improved by engineers authorized by Biolab. The equipment should be overhauled every a certain time to ensure the normal condition.

Suggestion：The equipment needs an annually check to keep working properly. Each Incubator is strictly checked before being putting into use, and it can suit your daily needs. Please contact the engineer of Biolab if you want to keep it at top precision.
※ Condition for Normal Use：
A． Ambient temperature： 18℃-30℃
B． Relative humidity：<80%
C． There is no violent shake or corrosive gas near the equipment.
D． No effects from sunshine or other heat or cooling source.
※ Biolab reserves all the rights of updating and improving of the product.

Warranty

- The warranty period is one year after purchasing.
- Our company will not take responsibilities if the malfunctions are caused by improper use even it is within the warranty period.
- Our company will responsible for the maintenance after the warranty period, but a certain amount of cost will be provided.
- Please show the related materials to the authorized personnel.

◆Protection Signals：



Avoid shaking, knocking and water during the transporting.
Condition of transportation and restoration: Temperature: -40℃～+55℃, humidity: ≤95%
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Adjust the Data:
The equipment should be adjusted regularly to ensure the best working condition. The user could adjust the equipment under the help of professional personnel at least once a year.

Condition of Temperature Adjusting：

Put a thermometer with the minimum scale as 0.1℃ into the center of the incubator. Wait for another 2 hours after the temperature value is steady, and note the actual value.

Way of Temperature Adjusting：

- Open the outer door, observe the temperature inside the chamber and note it down.
- Close the outer door and keep pressing the [cal] key for more than 5s.
- Loosen the [CAL] key when the glittering “cal” appears on the display window.
- The “%CO2” window will display the temperature value if you press the [℃] key.
- Adjust the temperature according to the noted actual value by pressing [▲] or [▼] key.
- Confirm by pressing [i] key.
- Repeat the above steps until the precise temperature.

Condition of %CO2 adjustment：
The temperature and humidity of incubator is steady and keep the situation for more than 2 hours. The concentration of CO2 should be 0%.

%CO2 zero adjusting：

- Press [%CO2]+[▼] to set “%CO2” to “.0”
- Press [cal] key for more than 5s
- Loose the [cal] key when “CAL” is glittering in the temperature display window.
- Press [AUTO-START] once to make “0.0” appear in the window.
- Loose [AUTO-START] and press [i] until the “0.0” is glittering in the window.
- The procedure will be completed after two or three minutes.

Adjust the concentration of %CO2：
(The concentration should be higher than 2%, usually is 5%-7%)

- To set the concentration of CO2 5.0%. Wait for more than 0.5 hour for stabilization, then measure the real concentration.
- Press [cal] for more than 5s
- Loose the [cal] key when “CAL” is glittering in the temperature display window.
- Press [%CO2] once and the concentration will be displayed in “%CO2” window.
- Adjust the concentration by pressing [▲] or [▼] according to the actual value.
- Confirm by pressing [i] key.
- Repeat the steps above until the value is according with the precision.

BCAJ-301 Technical Data:

	DATA	UNIT
Size		
Shell Width	637	mm
High	909	mm
Depth	762	mm
Chamber Width	470	mm
High	607	mm
Depth	530	mm
Cubage	151	L
Shelf		
Number of Shelves		
Standard	3	Floor
At most	10	Floor
Size		
Width	423	mm
Depth	445	mm
Net Weight	85	Kg
Electric Data		
Rated input voltage	110	V~

Rated Power	0.65	kW
Rated Power Frequency	60	Hz
FUSE	AC250V F6.3 A	
Digital Temperature Control		
Range	+5—50	℃
Power Cost at 50℃	0.1	kW
Chamber Deviation (DIN 12880)		
Transient Deviation (DIN 12880)	□0.4	℃
	□0.1	℃

	DATA	UNIT
Digital CO_2 Control		
Set Range	0—20	$\%CO_2$
Set Precision	±0.1	$\%CO_2$
Recovery Time	About 1	$\%CO_2$/min
Gas Source	About 3.7	L/min
Humidity		
Relative Humidity	>95	%
Coat		
Texture Paint	9002	RAL
Data of Gas Source		
Filter Ratio	99.998	%
Grain	>0.3	μm
Strained Purity Ratio	99.5	%
At Least Entrance Press	1	bar
Yawp	< 60	dB (A)
Capacity of Distilled Water	3	L

BCAJ-304 Technical Data:

	DATA	UNIT
Size		
Shell Width	780	mm
High	944	mm
Depth	820	mm
Chamber Width	607	mm
High	670	mm
Depth	583	mm
Cubage	240	L
Shelf		
Number of Shelves		
Standard	3	Floor
At most	12	Floor
Size		
Width	554	mm
Depth	503	mm
Net Weight	98	Kg
Electric Data		
Rated input voltage	110	V~

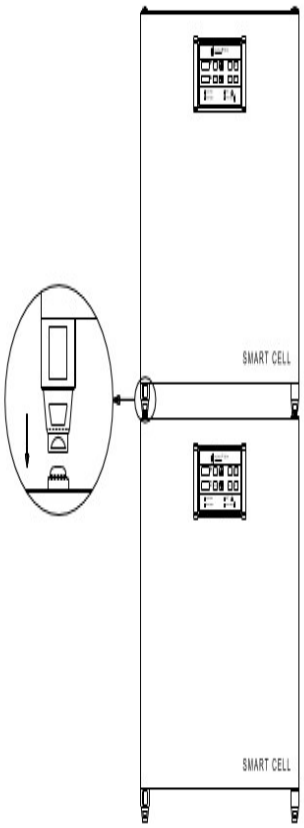
Rated Power	0.735	kW
Rated Power Frequency	60	Hz
FUSE	AC250V F6.3 A	
Digital Temperature Control		
Range	+5—50	℃
Power Cost at 50℃	0.1	kW
Chamber Deviation (DIN 12880)		
Transient Deviation (DIN 12880)	□0.4	℃
	□0.1	℃

	DATA	UNIT
Digital CO_2 Control		
Set Range	0—20	$\%CO_2$
Set Precision	±0.1	$\%CO_2$
Recovery Time	About 1	$\%CO_2$/min
Gas Source	About 3.7	L/min
Humidity		
Relative Humidity	>95	%
Coat		
Texture Paint	9002	RAL
Data of Gas Source		
Filter Ratio	99.998	%
Grain	>0.3	μm
Strained Purity Ratio	99.5	%
At Least Entrance Press	1	bar
Yawp	< 60	dB (A)
Capacity of Distilled Water	3	L

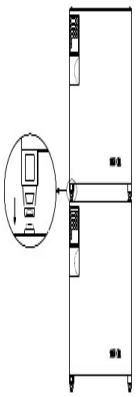
Appendix

The stacking of incubators (refer to picture 11,12).
* Capacity of gas under normal and abnormal condition.
* Appendix of CO2 aeration (refer to picture 13 P.33).
* PH value based on the concentration of CO2 (refer to picture 14 P.33).

Stacking Picture of BCAJ-304



Picture 11：Stacking figure of BCAJ-304



Stacking of Incubators (refer to Figure 11,12)

Additional aeration is needed if there are several equipments in one room or the equipment is installed at the ground floor of the lab.

The two equipment's can be stack together by the piling feet, which are riveted on the top of the equipment.

■ Capacity of gas under normal and abnormal condition.

(*1) Gas required: The necessary gas quantity for SET point

(*2) Gas cost: The gas quantity at max SET point

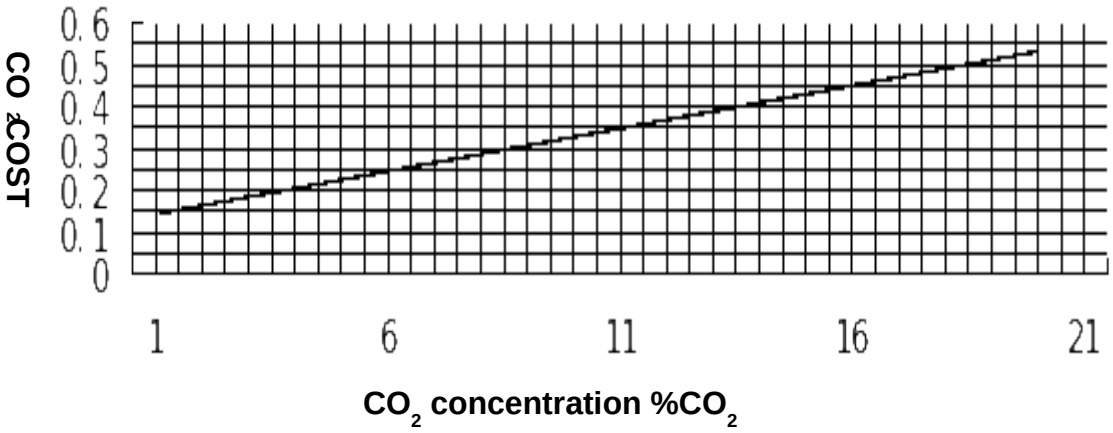
(*3) Malfunction: Gas output at the max SET point and in case of sound and light alarm (2h when malfunction).

(*4) Runoff the gas: The max gas input through the capillary per hour when the valve is open.

Type of Gas	Press of Entrance	Capillary	Excretion of Gas (*4)	Requirement of Gas (*1)
CO_2	1bar	0.65mm	222L/h	～ 50L

Type of Gas	Cost of Gas (*2)	Excretion of Gas when Malfunction (*3)	High-point
CO_2	～0.52L/h	444L	5L/m^3

★Consume of CO_2 (door closed)

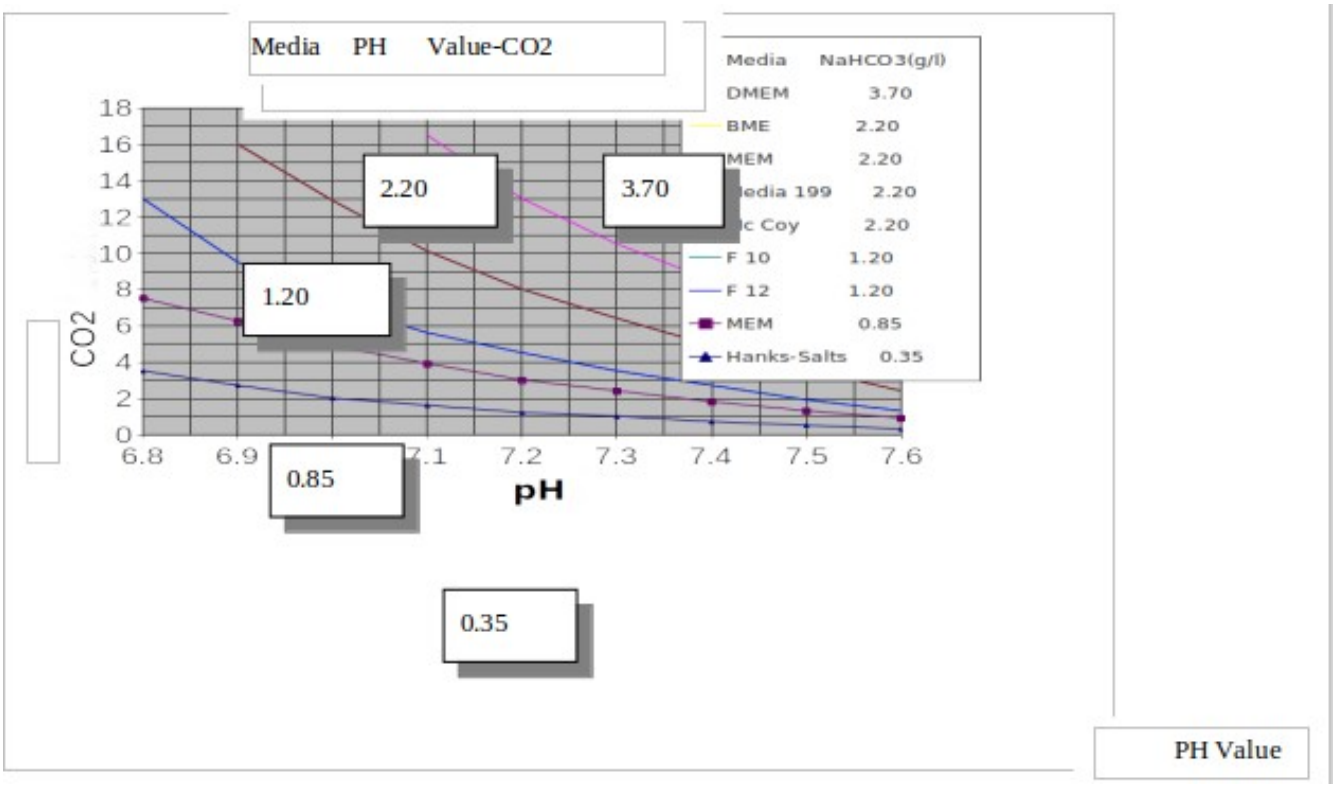


Picture 13：Consume of CO_2 (door closed)

★ PH value of incubation liquid

The pH value is affected by the concentration of CO_2 inside the incubator. The following picture shows the relationship between pH value and CO_2 concentration.

Picture 14：PH value-concentration of CO2 inside the incubator



Quality policy:

- Biolab is entitled to make alternation to the performance of the machine at any time without appropriate notification.
- If there is something wrong with our products, please contact staff of our company and you will enjoy satisfactory service.

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