

# **CO<sub>2</sub> Incubator** ( Air Jacket )

## **User Manual**



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## I. Application range

The CO<sub>2</sub> incubator is used for incubation of biology cells, tissues, bacteria in modern medicine, pharmacy, biochemist try, agricultural science research and industry.

## II. Features

1. The equipment is stuffed with heat insulator material which forms an air jacket. In the chamber it's equipped with electric fan for forced air convection which improves the temperature uniformity and CO<sub>2</sub> concentration uniformity.
2. The imported gold plated infrared wave-guided sensor is adopted to ensure the accuracy of measurement. The sensor's life is up to 15 years.
3. The CO<sub>2</sub> concentration can be set in the range of ( 0 ~ 20 ) % . To prevent contamination and improve the measurement accuracy the inner circulation air filter system is adopted.
4. When the door is opened the electric fan, CO<sub>2</sub> inlet valve and heating are closed to save CO<sub>2</sub> consumption, insulated the chamber with ambient air and reduce the contamination of inlet air. To reduce warm stamping, the heating will be restarted in 1 min after the door is closed (the delay time can be adjusted).
5. The temperature and CO<sub>2</sub> concentration are controlled with microprocessor data analysis and intelligent PID so the interference is avoided. Two sensors are adopted for the temperature control separately for chamber and door temperature to reduce the chamber temperature fluctuation.
6. Convenient touch switch.
7. Individual door temperature control to reduce the influence of changing ambient temperature on the chamber thermal system and to avoid the frost of outer glass door.
8. Natural vapor humidifying system to keep ideal humidity.
9. The parameters of inner temperature, CO<sub>2</sub> concentration and other set parameters are digital displayed. The status of door heating, CO<sub>2</sub> inflow, UV light is displayed with LCD so it's directviewing.
10. Multiple protection function for overheating, gas stopping, etc. to ensure the safety operation of the equipment.

## III. Main technical parameters.

Items	Incubator (Air Jacket)
Volume (L)	160
Temperature range(°C)	RT+3~60
Temperature fluctuation (°C)	≤±0.2
Temperature uniformity (°C)	≤±0.3
Timing Range	1~9999min or no timing
CO <sub>2</sub> concentration range (%)	0~20

CO <sub>2</sub> Measuring accuracy (%)	±0.1
CO <sub>2</sub> Concentration acquirement time	<10min (5%)
Power supply	AC220V 50Hz
Power consumption(W)	900
Chamber size (cm <sup>3</sup> )	50×50×65
Outer size (cm <sup>3</sup> )	69×65×108
N.W./G.W. (kg)	80/115

Performance parameters tested in the idle load conditions: Ambient temperature is 20°C, humidity is 50%.

#### IV. Installation.

1. The equipment should be placed in a dry, even environment without toxic gas. Direct sunshine should be avoided. Enough room is spared around the equipment for maintenance.
2. The 99.9% high purity CO<sub>2</sub> cylinder with pressure reducing valve should be equipped for the working of this incubator. (Cylinder and valve are prepared by the users) The cylinder should be placed near the incubator and be connected with a silicon soft tube to the “CO<sub>2</sub> inlet” on the back of the incubator.
3. The ideal ambient temperature is 20~25°C. The lowest ambient temperature is 5°C.
4. The power outlet should be well earthed and be compatible to the incubator plug.

#### V. Operation procedures.

After installation of the incubator, follow the procedures below to operate.

1. Open the door and clean the inner chamber. Mount the shelves.
2. Fill water to the humidifying to 2/3 level and place it to the bottom of the chamber when humidifying is needed.
3. Turn on the switch on the back of the incubator. The temperature will be displayed.
4. Press “UV”key to disinfect the chamber. (Do not press it when there’s incubation samples inside!)
5. Set the required temperature. (Refer to the attached controller manual)
6. When the temperature is stable, put the sample in.
7. Turn on the CO<sub>2</sub> cylinder switch and adjust the pressure reducing valve to get 0.06 ~ 0.1Mpa on the second pressure manometer. If the CO<sub>2</sub> pressure is too high then the rise of CO<sub>2</sub> concentration is too quick and the gas fluctuation will be high too. But if the CO<sub>2</sub> pressure is too low it will trigger the alarm. In 1 minute you can see the CO<sub>2</sub> concentration is increasing and in 10 mins it will reach 5.0% (if set to 5.0%).
8. Refer to the controller manual for detailed operation methods.
9. When stop using the incubator please follow the procedures below:
  - 1) Turn off the CO<sub>2</sub> Cylinder valve and the pressure reducing valve.
  - 2) Turn off the controller of the incubator.
  - 3) Open the door and get the humidifying plate out. Press the door switch to make it continue working for several minutes with the door open to dissipate the humidity in the chamber.
  - 4) Close the door and keep it heating for about 10 minutes then turn off the power switch and clean the inner chamber.

#### VI. Important information.

1. The equipment should be installed in a clean and temperature-stable place.
2. Read the manual carefully and master the correct using methods before turn the power on.

3. Please do not adjust the pressure reducing valve at will to avoid influencing the CO<sub>2</sub> concentration control. Adjust the pressure reducing valve to get 0.06~0.08MPa then adjust the pressure reducing valve if the CO<sub>2</sub> concentration rise is too quick or slow (clockwise to increase and anticlockwise to decrease).
4. Connect the CO<sub>2</sub> cylinder, incubator CO<sub>2</sub> inlet with silicon soft tube and tie it up to avoid gas leakage. The pressure should be controlled to 0.06~0.08MPa of the second pressure reducing valve(maximum to 0.1Mpa).
5. When there are incubation samples inside of the chamber, do not open the UV light, otherwise the samples are damaged.
- 6.To reduce the temperature fluctuation and to avoid influencing of temperature uniformity in the working chamber, please do not open and close the door frequently.
7. The equipment should be well earthed. Check the earth wire carefully before using.

## VII. Malfunction handling.

Malfunction	Cause	Handling
1.Alarm when turning on.	Sensor error.	Refer to malfunction 2
2.Erro display	ER1	Chamber sensor error or short circuit.
	ER2	Door sensor error or short circuit.
3. No power	Not plugged or wire broken.	Plug it or check the wire.
	Fuse open circuit.	Change the same type fuse.
4. No heating.	Preset temperature too low.	Reset the temperature.
	Door open or door switch error.	Close the door or replace the door switch.
	Heater error.	Replace the same type heater.
5.CO <sub>2</sub> alarm	CO <sub>2</sub> Cylinder pressure too low.	Adjust the pressure reducing valve to get 0.06~0.08MPa
	CO <sub>2</sub> Concentration rise too slow.	Pressure reducing valve too low. Adjust the pressure reducing valve clockwise.
	CO <sub>2</sub> Concentration too high.	Pressure reducing valve too high.(turn pressure reducing valve anticlockwise to decrease it)
6.CO <sub>2</sub> Concentration no increase.	Door open. (Fan not works).	Close the door or fix the door switch.
	Sensor error.	Replace the same type sensor.
	Solenoid valve error.	Replace the solenoid valve.
7. Temperature not accurate.	No revision.	Revise according to the manual.
8.CO <sub>2</sub> Concentration not accurate.	No revision.	Revise according to the manual.

### VIII. Storage and transportation.

The incubator should be stored in well ventilated room with the RH no more than 80% and without erosive gas. Shockproof, moistureproof and other protection measurements should be taken during the transportation.

### IX. After-sales service.

We guarantee free repairs, changing and returning back in one year period (except for heating units). In the guarantee time if the equipment is not valid due to quality problems, we will fix or change parts for free. After one year's guarantee time, we will try to help with the customer service first spirit.

## Packing list

Item	Description	Category	Quantity	Notes
1	WJ-2 CO <sub>2</sub> Incubator	Main equipment	1	
2	Humidifying plate	Part	1	
3	Shelves	Part		80L:2; 160L:3
4	Soft silicon tube for CO <sub>2</sub>	Part	1	
5	Fuse (Φ5×20)	Spare part	2	
6	This manual	Document	1	
7	This packing list	Document	1	

The parts listed above are in accordance with the actually packed goods.

### Equipment commissioning requirements:

1. Customer-provided 40L CO<sub>2</sub> cylinder with the CO<sub>2</sub> concentration of 99.9%.
2. Customer-provided pressure reducing valve (output pressure is about 0.1Mpa).



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