Kalstein®

CO2 Incubator
YR02048
Instruction Manual

Thank you very much for purchasing our CO2 Incubator YR02048.

Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the “Warranty” at a hand place for future reference.

 Warning: Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.

Scope:

YR series CO2 incubator is the essential apparatus for immunology, oncology, genetics and bioengineering. widely used in microorganisms, agricultural science, drug research and production.

Structure:

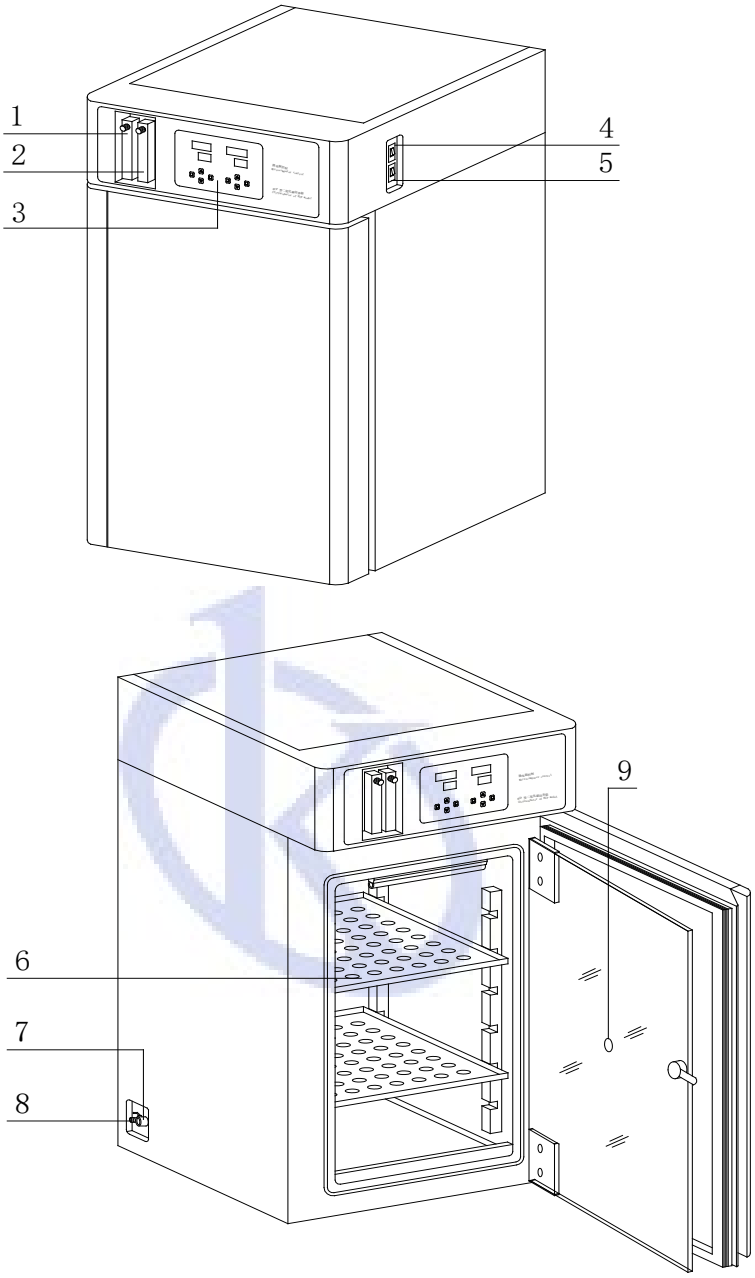
CO2 incubator is made of SUS304 stainless steel cavity and microcomputer PID control system. the pure CO2 cylinder and stable CO2 reducing valve is required when use the machine.CO2 cylinder need to be prepared by users. the reducing valve will be involved to the machine, it is special co2 reducing valve, which can affect the accuracy of the CO2 concentration.

1) Adopting new style carbon fiber yarn heating technology, heating fast and uniformity.
2) PT100 temperature sensor
3) Microcomputer PID control system, LED digital display.
4) Temp control circulation adopts over-temp alarm and cavity temp. Control. when the main control is out of work, the alarm circulation will work with acousto-optic alarm and prompt hint.
5) The special design for co2 circuit can provide fast recovery after opening the door (eg. When setting 5% co2 concentration, the recovery time ≤6mins; setting 10% co2 concentration the recovery time ≤12mins)
6) Double door design, the outdoor is magnetic seal structure, glass door is with separated heating system to prevent frost of glass door.
7) High quality silicone door seal ensures excellent tightness.

Technology Parameter

1.Chamber size:500×400×400（80L）；650×550×500（160L）.
2. Temperature range：±5.0～50.0℃
3.temperature fluctuation: ±0.5℃
4.temperature uniformity: ±1℃
5.setting value: +1℃ tracking alarm, cut off heating power
6.temp. recovery time: ≤15min(37℃)
7.co2 control range:0～20%
8.flow meter: air 100-1000ml/min, co2 10-100ml/min
9.co2 density recovery time: concentration×1.2min
10.power:220V/50Hz
11.power:≤350W（80L）, ≤550W（160L）；
12.external size:835×550×550（80L）； 985×700×650（160L）
13.weight: 36kg（80L）； 57kg（160L）
14.working environment: temp.:5℃～50℃; humidity:≤85%RH

Diagram



1. CO_2 flowmeter 2.air flowmeter 3. controller 4. power switch

5. CO_2 switch 6. shelves 7. water outlet 8. overflow 9. test hole

Operation:

1. Install co2 reducing valve on the cylinder, ensure the connector is not leaking. Putting the rubber hose to the output connector of reducing valve, then tightening it with retainer. the valve of cylinder needn't turn on.
2. Before power-on, you need to clean up the chamber with alcohol, then sterilize by ozone disinfector.
3. Connecting the water pipe to water inlet on the left bottom of the machine, watch the water level in the chamber to 10-15mm.
4. Power on

Power switch to "1", power light is on.

1) Temperature and parameter setting.

After power is connected, it will access normal mode after 3s press main temp. setting button" Tset",it will access to setting mode, in the bottom line of the co2 density window, it will display prompt "SP" of temperature, the setting values in the upper line can be adjusted, re-press the button to log out the setting mode. the setting value will be saved automatically. long press temp setting key "Tset" for 3s, it will access to setting mode of inner parameter, long press for 3s again, log out the mode.

Function of parameters of temperature as below:

Parameter	Name	Function	Range
Lc-	code	When Lc=3,the parameter can be check and adjustable	
AL-	temp. deviation alarm	When PV>=SP+AL， beeper beeps.	(0.0～5.0) 1．0℃
Pb1	Temperature(zero) deviation	Modify the errors come from temp. sensor measuring the low temperature. Pb1=(actual temp. value)-(meter measurement value)	（-9.9~9.9） 0.0
PK1	Temperature(full) deviation	Modify the errors come from temp. sensor measuring the high temperature. PK1=1000*[(actual temp. value)-(meter measurement value)] / (meter measurement value)	（-99～999） 0

Note: modify"Pb1"firstly, then "PK1"

2）Setting for C02 density

Press CO2 density button"Cset",it will access to setting mode, in the bottom line of the co2 concentration window, it will display prompt "SP "of co2 concentration set, the setting values in the upper line can be adjusted, re-press the button to log out the setting mode.

Functions parameters:

Parameter	Name	Instruction	(range)factory default
Lc-	code	When Lc=9, the parameter can be check and adjustable	
T2-	Water temp. test value	Display water temperature test value	
T3-	Door temperature test value	Display door temperature test value	
Ot2	The difference value from water temp. test value and chamber temp. setting value	If "water test temp. ≥ chamber setting value +ot2", shut off water and heating output	(0.0～5.0) 3.0℃
Ot3	The difference value from door temp. setting value and chamber temp. setting value。	door temp. setting value = chamber temp. setting value +ot3；	(-5.0～5.0) 0．0℃
Pb2	Water temp. zero adjustment	Modify the deviation of water temp. sensor measurement （when low temp.） Pb2=（water temp）actual temp. value -（water temp.）display's temp. value	（-9.9～9.9） 0.0
PK2	(Water temp.) full scale adjustment	Modify the deviation of water temp. sensor measurement （when high temp.） PK2=1000 * [water actual temp. value - water test value from display] / water test value from display	（-99～999） 0
Pb3	Door temp. zero adjustment	Modify the deviation of door temp. sensor measurement （when low temp.） Pb3=（door temp.）actual value-（door temp.）test value	（-9.9～9.9） 0.0
PK3	Door temp. full scale adjustment	Modify the deviation of door temp. sensor measurement （when high temp.） PK3=1000 * [（door temp.）actual value -（door temp.）test value] /（door temp.）test value from display	（-99～999） 0

Remark: modify "Pbx" firstly, then modify "PKx".

At setting condition, if no actions in 30s, the controller will exist the setting menu without data store.

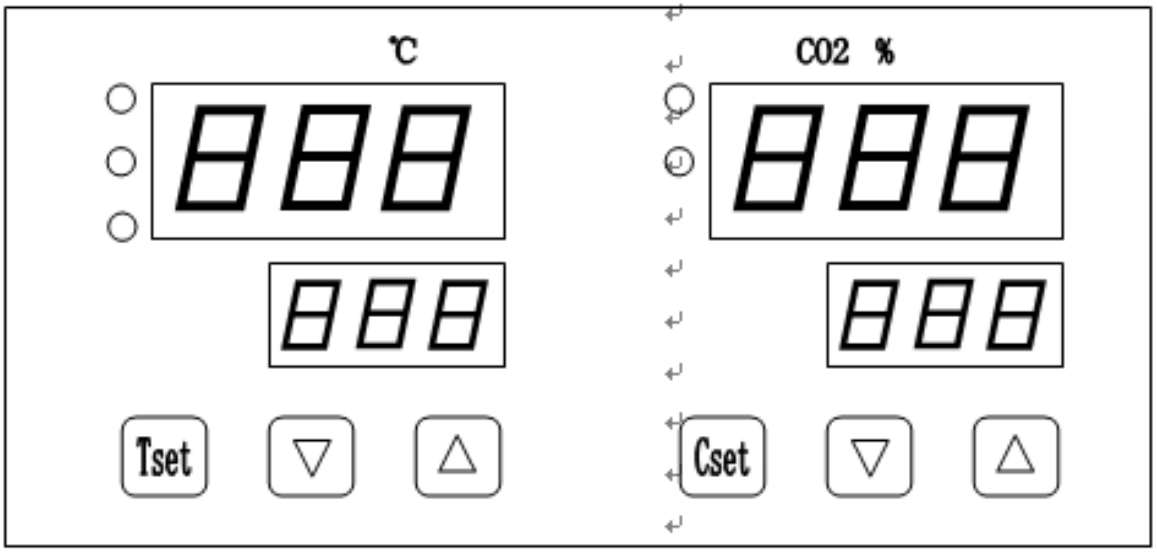
1) Heating lamp is on with green color, that means it is heating.
2) Put the co2 valve to “0”. (shut valve, because when valve is on in no culture condition, their lifetime will be reduced), then put co2 concentration to “0”.
3) When the temperature arrive the setting value, open the co2 cylinder. (before open, loose the pressure reducing valve, avoid the high pressure on valve).The pressure gauge on the inlet of the pressure gauge indicates the pressure of co2 in the cylinder, and the pressure reducing valve knob is slowly clockwise rotating.The pressure value in reduce valve is indicated as 0.05Mpa, and the pointer is in the middle of the line.At this point, the co2 inlet switch is opened by setting the required co2 concentration (for example, 5%).Open the co2 inlet switch, when there is carbon dioxide coming into the room.As the concentration increases, LED shows the concentration of co2. When reach to set value, the solenoid valve is cut off to air and co2 supply.At this time the air flow meter float should be indicated at 760ml/min, co2 meter float should be indicated at 40ml/min,If the float deviates from the above value,use metering pin valve to regulate fine 760ml/min (air) and 40ml/min (co2).

(4) For CO2 concentration, please refer to Appendix 2.。

(5) When the temperature reaches the setting value, fluctuates ≤ 0.5℃, and the CO2 concentration is also up to the requirement, cell culture can be carried out, and put into the water tray, so that the humidity meets the requirements, and the natural evaporation can generally reach.

(6) After the first use of this machine or a longer period of use, it should be operated according to the above requirements and should be examined for the inspection of the inside of the chamber before the official training.

Diagram:



keys and indicator lights,

1） “Tset”： press this key to set temperature ,co2 concentration and relative parameters,

2） “▽”： in setting interface, press this key to decrease, long press this key to continuously decrease；

3） “△”： in setting interface, press this to increase, long press this key to continuously increase

4） “Cset” : setting key for CO2 concentration ;

5） “heating”light : it is on when water heating is in output.

6） “alarm” light : it is on when the temperature is over.

7） “water level”light : it is on when water is lack of.

8） “inlet”light : the light is on, when co2 is filling.

9） “supply”light : the light is on, when co2 is supplying.

1. Alarm

A. when chamber temp. display is over 1℃ compared setting temp., controller will alarm visually and audibly, and electricity will be cut down.

B. when the alarm beeps, press any key to muse. But the alarm indicator will be on still.

2. setting for co2 concentration display when fill the co2.

Press Cset", it will access to co2 density setting, the bottom window shows “SP”(Prompt for setting value of co2 concentration), the upper window shows the display value of co2 concentration.users can adjust the parameter, after adjustment, press the key“Cset”to exist.

Co2 concentration should be accordance with flow meter ratio, pls refer to the appendix 2.

Appendix 1

Examination to chamber pollution: using 2 culture dishes with culture, one is polluted, then covered it and put it into chamber: the other is without pollution, covered half and put into chamber. The polluted one will occur bacterium. The other one without polluted is no bacterium. In that condition, it means the chamber have been clear, the gas injected won't be brought bacterium.

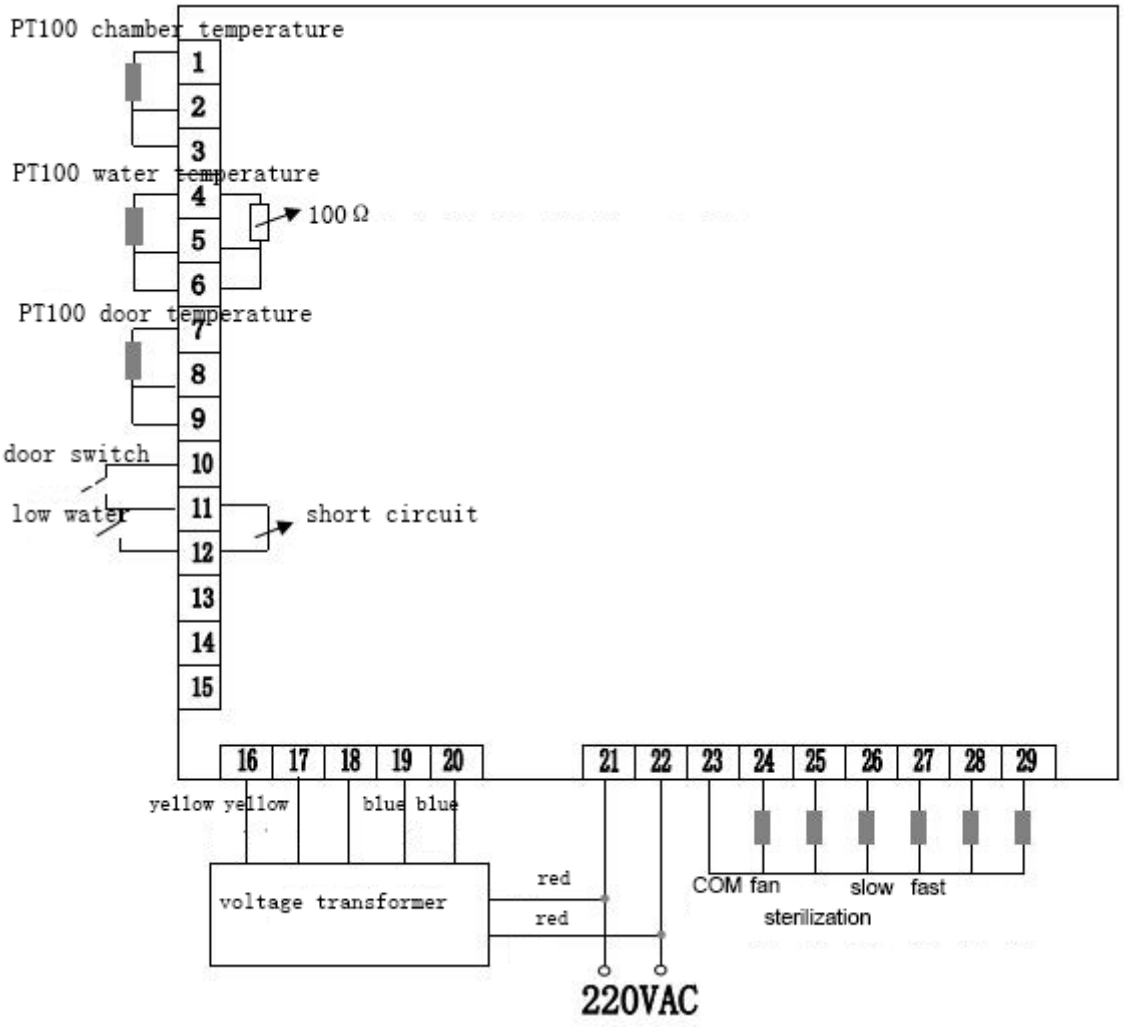
Appendix 2

Co2 concentration formula

Co2 concentration= co2 flux/min / (co2 flux/min + air flux/min)

Eg. 5% air 760ml/min co2 40ml/min
10% air 720ml/min co2 80ml/min
15% air 510ml/min co2 90ml/min
20% air 400ml/min co2 100ml/min

Wiring


PT100 chamber temperature
1
2
3
PT100 water temperature
4
5
6
100 Ω
PT100 door temperature
7
8
9
door switch
10
low water
11
12
short circuit
13
14
15
16 17 18 19 20
21 22 23 24 25 26 27 28 29
yellow yellow
blue blue
voltage transformer
red
red
COM fan
slow fast
sterilization
220VAC

Packing list

serial	Name	qty	remark
1	Machine	1 set	
2	Manual	1 pcs	
3	CO2 reducing valve	1 set	
4	Water pan for supply	1 pcs	1m water pipe
5	Shelves	2 pcs	
6	Gas pipe	2m	
7	Water pipe	1 pcs	
8	Power cord	1 pcs	
9	Water basin	1 pcs	0.2m water pipe