Operation Manual

Series 100

Plant Growth Chamber

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

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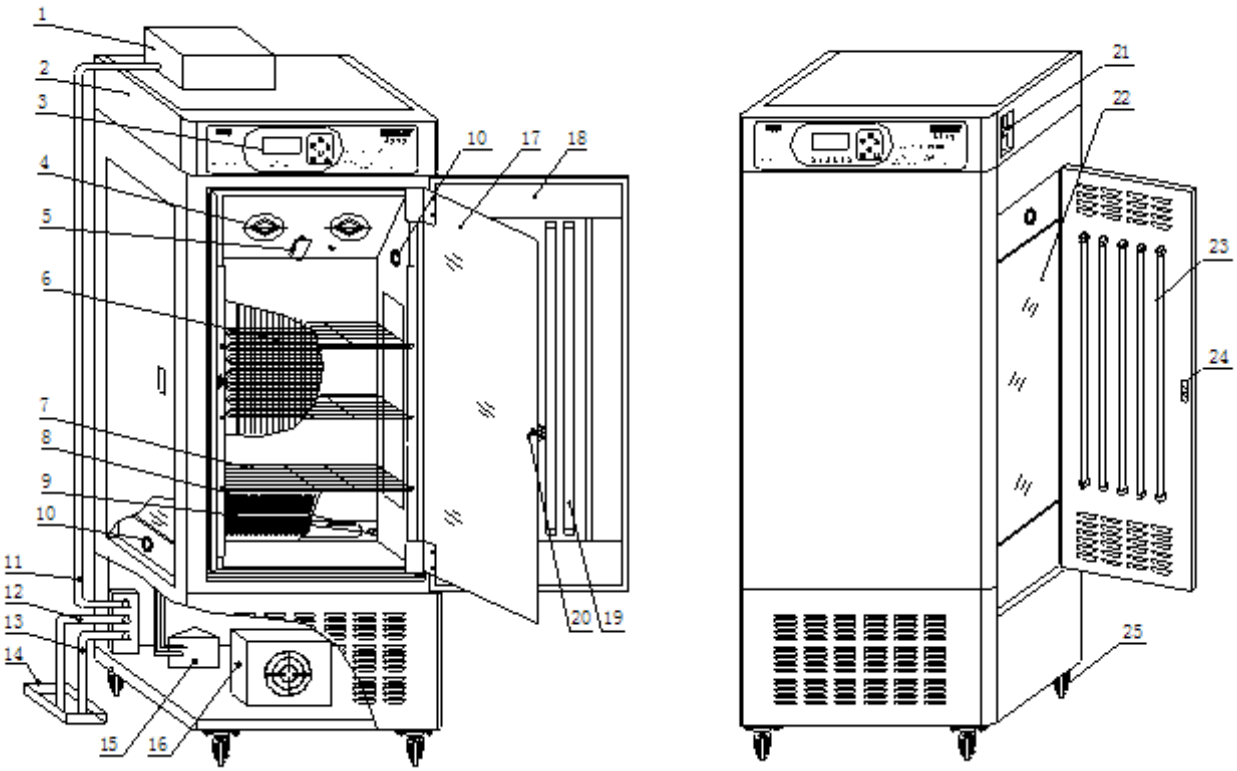
01 Application

Plant Growth Chamber is a high precision constant temperature equipment with hot and cold and lighting control function, can be used for plant cultivation, breeding experiment, bacteria, mold, microbial cultivation and preservation, water analysis in determining BOD test. is the ideal test equipment for biological engineering, medical, health institution, drug testing, animal husbandry, fishery and other scientific research units.

02 Product Drawing



1. Water Tank
2. Electrical Box
3. LCD display
4.Axial Fan
5. humidity Sensor
6. Evaporator
7.shelf
8.Humidifying Heating Tube
9. Water level switch
10. port of air
11. water pipe
12. blow-off water pipe
13. overflow water pipe
14. water basin
15. Compressor
16. condenser
17. Glass window
18. Outer Door
19. LED lamp
20. glass window knob
21. power switch
22. Hollow glass
23. LED lamp
24. door button
25. carsters

03 Structure

The machine body is made of high quality sheet processing, the coating in surface is firm and looks beautiful. It is with built-in interior glass d**Preparation before operation** oor and lighting in the chamber. Interior is of stainless steel material, match with the movable shelves, the machine is durable and easy to clean. With Three surface light structure and multispectral daylight lamp, electric humidification, electric heating and cooling system.

To ensure that the humidity and temperature accurate. Special air duct design to ensure that the temperature in the cabinet small fluctuations, uniformity, meet the demand of training and experiment.

Temperature controller adopts new intelligent digital display temperature controller with single-chip microcomputer technology, User can chose according to the different options,. cycle, intensity of illumination, segmentation, timing, Chinese and English display is optional .Large LCD Display, the interface is clear and humanized operation, users can set temperature, humidity, time through manipulating the touch control panel keys to reach the purpose of the test.

04 Working Principle

The working principle of Plant Growth Chamber is to feel the actual temperature and humidity, then convert into electrical signals through temperature and humidity sensor, At the same time can be preset light intensity and electrical signals, under the microcomputer control (heater or humidifier) The Lamp quantity or refrigeration compressor), to achieve the required temperature, humidity and illumination.

05 Run Preparation

Before the initial operation of this machine, please follow procedures as below:
1. Take out the shelves and other accessories inside the chamber.
2. Use gauze with soaked alcohol to wipe the cabinet to disinfection, then using a dry gauze to wipe the alcohol.
3. Put the shelves inside equipment according to the experimental requirements.

4. Water tank should be placed on the top of the equipment, then insert pipes to water inlet and overflow in the chamber back (refer to the parts diagram), and place water basin for use under the overflow port.
5.Inject enough pure water into the water tank.

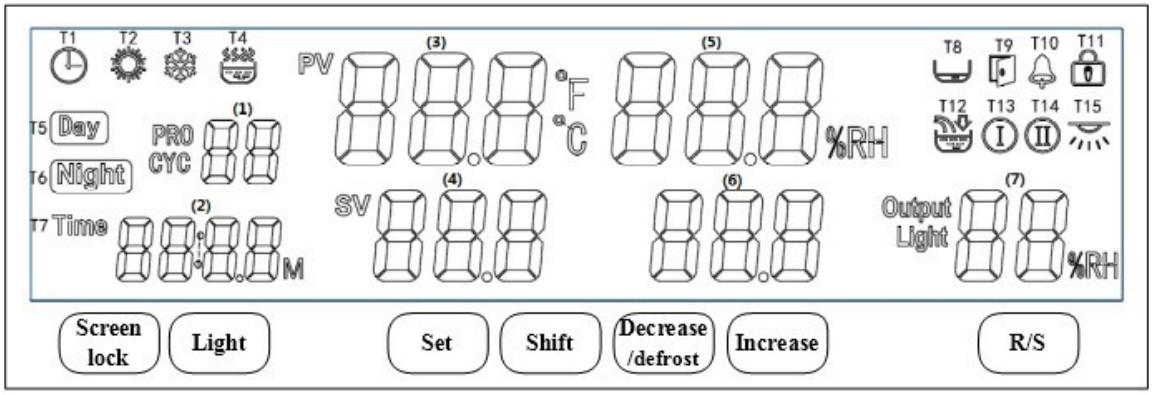
06 Technical Parameters

1. Temp. Range: without lighting and humidity 5~50°C; (with lighting and humidity 10~60°C)
2. Temp. accuracy: ±0.1°C;
3. Temp. Fluctuation: ±1~1.5°C (10°C~40°C) ;
4. Temp. Uniformity: ±1°C(150/250S) 、 ±1.5°C(350S) (10°C~40°C) ;
5. Humidity range: 40-90%RH (10°C~40°C) ;**Preparation before operation**
6. Humidity fluctuation: ±3%;
7. Voltage: Single phase220V/50HZ
8. Power: 900W (150L) 1000W (250L) 1200W (350L) ;
9. Working environment: ambient temperature 10~30°C humidity below 70%
10. Refrigeration fluid: R134
11. Device Class: Class I.
12. Note: this machine has low temperature defrost function, temperature and humidity in low temperature will automatically defrost, there will be some fluctuation.

07 Equipment Installation

1. The device should be installed in the ventilated room to avoid direct sunlight, and equipment must have at least 10 cm distance away from wall.
2. It is equipped with universal wheels on the bottom, when move the chamber please lock the front two brake pedals to make the replacement stable.
3. This equipment use 220 v / 50 hz ac power supply, power supply circuit must be reliable grounding line, ensure use safety.

08 Control Panel



Symbol definition

T1: appointment: its twinkling means the controller enter into appointment mode, meanwhile, the (2) area displays appointment time (count down).
T2: heat: its lightening means heater working.
T3: refrigeration: its lightening means air compressor working.
T4: humidity: its lightening means humidifier working.
T5: daytime: its lightening means the machine is in daytime mode.
T6: night: its lightening means the machine is in night mode.
T7: timer: its twinkling means the timer working, meanwhile, the (2) area displays setting time(count down).
T8: lack of water: its lightening means lack of water, its twinkling means low-level water alarm.
T9: door open: its lightening means the door is open
T10: alarm: its lightening means temperature or humidity alarm; its twinkling means low-temperature or high-temperature protection.
T11: screen lock: its lightening means screen is locked, one can not change any setting value before unlock it.
T12: watering: its lightening means water pump working.
T13: defrosting: its lightening means the defrosting system working.
T14: valve: its lightening means valve working.
T15: illumination/sterilization: its lightening means lamp working, its twinkling means UV lamp working.

Display window

(1) Area: cycle/segment
(2) Area: timer or setting time
(3) Area: current temperature value
(4) Area: temperature setting value
(5) Area: current humidity value
(6) Area: humidity setting value
(7) Area: illumination or heating output power

Button definition

Screen lock: in normal mode, one can press on this button for 2 seconds to lock or unlock the screen.
Light: in normal mode, one can click on this button to switch on/off the lamp.
Set: in normal mode, one can click on this button to set value of temperature, humidity, illumination and others; or press on this button for 3 seconds to enter into inner parameters.
Shift: in setting mode, one can click on this button to shift digit position; in normal mode, one can click on this button to shift daytime or night mode; in programmable mode, one can click on this button to inquire cycles and segments.
Decrease/defrost: in setting mode, one can click on this button to decrease setting value; in normal mode, one can press on this button for several seconds to activate defrosting function.
Increase: in setting mode, one can click on this button to increase setting value
R/S: in normal mode, one can click or press on this button to start or stop the controller running.

Operation and usage

1. After power on, (3) area displays “PS”, (5) area displays “V01”, the buzzer beeps, and then ,after 2 seconds, the controller will enter into normal mode.

2. Setting values: after clicking on set button in normal mode, symbols “TIME”and“SV” twinkle, one can modify the setting value (digit position twinkling), by shift, decrease, increase buttons, and one can shift to next group value by another clicking on set button. After modification, one can press on set button for 1 seconds to quit setting mode, the setting value will be saved automatically.

In programmable mode, segment value position twinkles after clicking on the set button. In this time, one can modify the segment number by decrease or increase button, and inquire setting value of time, humidity, temperature, and illumination

in every segment.

In day/night mode, after clicking on set button, “DAY”symbol will twinkle, then, one can choose daytime or night mode by decrease or increase button, after another click on set button, one can inquire and modify every value of current mode, by increase and decrease buttons.

3. Setting of cycles and segments: in programmable mode or day/night mode, when the controller is in stop situation, after pressing on “set” button for 3 seconds, the (1) area displays “Lc”, the (2) area displays “0”, users can adjust the password to 3 by increase/decrease buttons, so that the controller enters cycle and segment setting mode. PRO----total program number, CYC----total cycle number.

4. fault reminder:

Temperature alarm: symbol “°C” flashes quickly when upper deviation occurs，symbol“°C”flashes slowly when lower deviation occurs;

Humidity alarm: symbol“%RH”flashes quickly when upper deviation occurs，symbol“%RH”flashes slowly when lower deviation occurs;

If the (3) area displays “---”,user should check the sensor and controller.

09 Installation

1. Unpacking

Remove packing materials ,open the door for ventilation. Please use neutral detergent to clean if the shell and panel is dirty. then wipe with wet cloth and at last with dry and clean cloth.

2. level equipment

Fix equipment with the front brake-wheel after installation in case equipment moves

3 Earthing

Warning:

Please use power socket that has protective conductor terminal in case of electric shock. If it is not connected, has to install protective conductor terminal by licensed technician.

Do not connect protective conductor terminal through gas, water pipe, telephone line or lighting arrester which will cause electric shock.

4. Idle equipment
Before setting equipment aside, empty water in the humidifier and remove internal, moisture thoroughly. Be sure the inner chamber is dry and cool before closing the door.
5. Move equipment
Before moving equipment, empty water in the humidifier or it will cause creepage or electric shock because of overflow water or splashed water.

Preparation before operation

When equipment running in the first time, please operate as belows:
1.Take out the shelves or other accessories
2.Clean the inner wall with gauze which is soaked by alcohol and then use dry cloth to wipe-dry
3.Put the shelves into inner chamber according to your experiment of requirement
4.Put water tank on the top of equipment before using ,please connect water pipe with water inlet and overflow outlet which in the left of equipment (refer to component picture), and put storage water tank under the overflow pipe and water outlet for spare use
5.Pour enough pure water into water tank

Notice : don’t use NaCl or other Halide solution to clean equipment ,or it will cause rust

10 Inner Technical Parameters

In normal mode, press on set button for 3 seconds, the (1) area will display “Lc”,users can input right code and click on the set button one more time to enter different inner parameters. After adjusting the value of parameters, please do remember to press on the set button for another 3 seconds to quit setting mode. The value adjusted will be saved automatically.

Parameter-1

symbol	**name**	**function**	**（range） factory value**
Lc	password	when“**Lc=9**”,this parameter group can be inquired and adjusted.	0
U1	Running mode	0: constant value mode; 1: day/night mode, 99 cycles; 2: program mode, 1~30 segments，0~99 cycles	(0~2) 0
U2	Power down protection	0: no operation; 1: begin with the first segment; 2: restart from the power down time	(0~2) 0
U3	Timer adjust	Modification value=【display value（s）-real value（s）】*10 ÷ real value（m）。	(-999~999) 0
U4Parameter-1	Timing unit	1: minute 0~9999; 2: hour 0~9999	(1~2) 1
U5	Timing temperature point	When **U5= display temperature-setting temperature, timer starts to work**	(0~10.0°C) 0

U6	Timing humidity point	When **U6= display temperature-setting temperature, timer starts to work**	(0~50.0%) 0
U7	**【R/S】**time	Press on the **【R/S】**for U7 time to run/stop	(0~10s) 0
U8	Lock screen time	Lock screen time, 0 means unlock	(0~300s) 0
U9	Reminder time (stop)	The buzzer beeps for U9 seconds when running stop. **0 means buzzer beeps continuously**	(0~300s) 0
UA	Illumination time	Illumination time, 0 means manual operation	(0~9999min) 0
Ub	address	Communication address	(1~16) 1

Parameter-2

symbol	**name**	**function**	**(range) factory value**
Lc	password	when“**Lc=103**”,this parameter group can be inquired and adjusted.	0
TH	Temperature upper deviation alarm	when“display value > set value+**TH**”, upper alarm occurs, heating and humidity cut down User can click on any button to stop buzzer	(0~20.0°C) 5.0
TL	Temperature lower deviation alarm	when“display value < set value+**TH**”, lower alarm occurs, heating and humidity cut down User can click on any button to stop buzzer	(-50.0~0°C) 0

Tb	Zero adjust(low temperature)	**Tb =** real temperature **-** display temperature	(-99.9~99.9°C) 0
TA	Full adjust(high temperature)	**TA = 1000 *** (real temperature **-** display temperature) ÷display temperature	(-999~999) 0
TP	Proportional band	Adjustment of proportional function.	(0.1~50.0) 8.0
TI	Integration time	Adjustment of integration function	(1~2000s) 500
TD	Differential time	Adjustment of differential function.	(0~2000s) 200
TT	Heat period	Heating control period	(1~60s) 5
Tc	Low temperature cutoff	Heating cutoff point.	(-2.0~0°C) -0.5
To	Heat power	Heating max power percentage	(0~100%) 100

Parameter-3

symbol	**name**	**function**	**(range)** **factory value**
Lc	password	when“**Lc=203**”,this parameter group can be inquired and adjusted.	0
HH	Humidity upper deviation alarm	when“display value > set value+**TH**”, upper alarm occurs, heating and humidity cut down User can click on any button to stop buzzer	(0~50.0%) 20.0
HL	Humidity lower deviation alarm	When “display value < set value+**TH**”, lower alarm occurs, heating and humidity cut down User can click on any button to stop buzzer	(-50.0~0%) 0

Hb	Zero adjust(low humidity)	**Tb =** real humidity **-** display humidity	(-99.9~99.9%) 0
HA	Full adjust(high humidity)	**TA = 1000 *** (real humidity **-** display humidity) ÷display humidity	(-999~999) 0
HP	Proportional band	Adjustment of proportional function.	(0.0~90.0) 10.0
HI	Integration time	Adjustment of integration function	(1~999s) 200
Hd	Differential time	Adjustment of differential function.	(0~999s) 30
HT	Heat period	Heating control period	(0~60s) 5
Hc	Low temperature cutoff	humidity cutoff point.	(-50.0~50.0%) 0.0
Ho	humidity power	Humidity max power percentage	(0~100%) 100

Parameter-4

symbol	**name**	**function**	(**range**) **factory value**
Lc	password	When "**Lc=72**",this parameter group can be inquired and adjusted.	0
Sr	Sterilizing	0: off; 1: on	(0~1) 0
ST	Sterilizing time	sterilizing time, 0 means manual operation	(0~9999min) 0

11 Notice and Maintenance

1. Avoid putting down the chamber over 45 degrees or inversion when move it .
2. Do not change frequently of the using values, to avoid compressor frequently open and overload , affect the service life of the equipment.
3. The machine have the power switch, in case of failure operation, please cut off power supply, to check whether the control circuit is in good condition, then check the other parts.(see diagram)
4. Be sure to close the inner door, before close the outdoor. If the inner door didn't close well, even if close the outdoor, the device may not be able to maximum work performance, please be careful when close the door.
5. Recommend to use the pure water or distilled water to fill in the tank, ensure the water is clean.
6. In order to maintain the appearance of the equipment, do not use corrosive solution to clean the machine, use dry cloth or alcohol to wipe to keep chamber clean.
7. Please keep chamber dry and cut off power supply when the equipment is not using.
8. In order to ensure the cabinet uniformity inside, should often check whether the axial flow fan is running normally .When doing the experiment, should not put too many articles to stop the fan outlet, make sure the air circulation in the chamber is in good condition. Do not touch the thermal probe in the collision to cause temperature abuse.
9. Make sure shelf is fixed well, otherwise may make articles damage.
10. Don not lean on the glass or press to the glass, it may cause harm to personnel
11. Do not lean on door to avoid the equipment overturned or door broken, making people harm or machine broken.
12. When equipment fails to work, please ask professional technician or the factory sales department for help. Please Do not do anything by yourself.

Plant Growth Chamber

a) Must be fully read and understand this manual before use. Because the wrong operation can cause the damage of the equipment or device abnormal operation.

b) Equipment should be used with independent power socket.

c) Do not pull out the plug by pulling power cord. Pulling the power cord can

cause overheating or fire

d) Before using, please confirm power supply voltage. The incorrect voltage will cause equipment damage or not work properly.

e) Parallel moving equipment, any direction Angle should be less than 45 degrees. Otherwise, it can lead to compressor damage or abnormal cooling performance.

f) After installation machine should be vertical and static for 2 hours, otherwise ,it can lead to refrigeration compressor or refrigeration function abnormal

g) Make sure to fasten the shelf, take and put items should be handled carefully and hold shelf's bottom.

One of the following circumstances happens, you must plug off:

a) When opening the cover in the right side, it will cause electric shock if Do not pull off plug.

b) When replacing the fuse.the plug should be pulled off.

c) When equipment is failure working ,please do not false start .

d) When the equipment is kept for a long time. The dust at the plug of the power supply may also cause leakage and fire.

1. Relevant matters might affect the service life of equipment and normal use.
2. Do not change setting value frequently , in case to cause compressor overload, affect the service life of the equipment
3. Vertically open and close the box, inner glass door, the side door is easy to cause the damage of the door hinge, door, tubes.
4. Equipment should be on plane firmly, and ensure it is in level situation.
5. Equipment away from wall must keep a distance about 20 cm.
6. Do not put equipment near the stove next to the device such as a fever or direct sunlight.
7. Equipment placed environment should be ventilated, Strictly no ventilation environment or area of not less than 4 square meters should be equipped with ventilation device.
8. Equipment with cooling and humidifying function, if equipment stop using, must do tidal heating flooding process
9. In order to ensure the humidification effect, it is recommended that the humidifying water tank and the tank bottom should be cleaned once every six months.
10. In order to ensure the temperature uniform in the cabinet, should check often whether the axial flow fan is running. When do the experiment, the article should not be too close and do not stop the fan outlet, to facilitate the air circulation in the machine.
11. In order to ensure the refrigeration , it is recommended that the cooling condenser shall be cleaned the dust inside once every 12 months
12. Equipment surface shall not contact with volatile chemicals such as gasoline, banana oil.

13. Equipment does not suggest to open door frequently, otherwise it will affect the illumination and temperature effect.

14. Keep the box inside and outside clean, always clean up debris, stains.

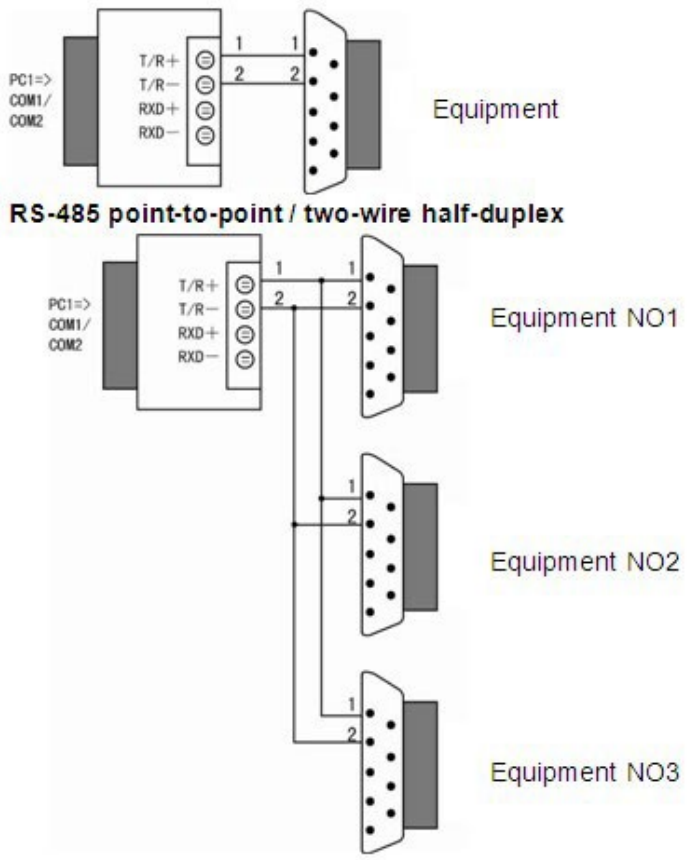
Equipment happen failure, should ask for professional maintenance or contact our sales department, users do not any overhaul.

12 External Configuration Connection

RS-232/RS-485 converter instruction

• In order to proceed with data communication between the different standard serial interface to the computer, an external device or smart instrument, must provide conversion of standard serial interface. The converter is compatible with RS-232, RS-485 standard, capable of converting single-ended RS-232 signal to a balanced differential RS-485 signals.(it can connect 16 controller of this series together at the same time)

RS-485 point-to-point / two-wire half-duplex



13 Trouble shooting

• Data communication failure

(1)Check if RS-232 port inside connection is correct.

(2)Check if RS-485 port inside connection is correct.

(3)Check if port is connected.

• Data is missing or incorrect

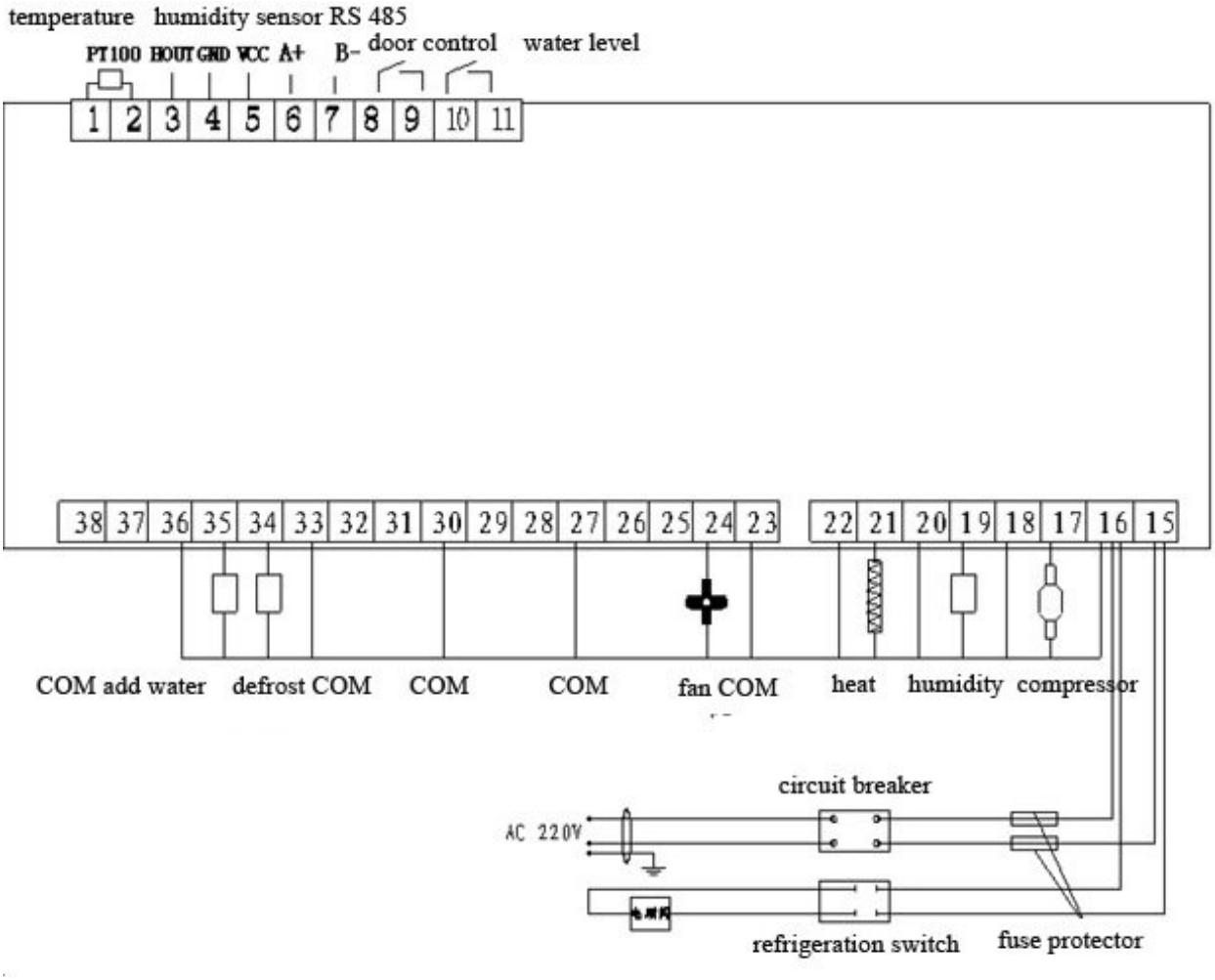
Please check if data communication equipment rate and format is accordance.

1. Trouble shooting

Trouble	Handling
Sensor failure warning	·Heating sensor abnormal, please check heating sensor (model: PT100) ·Humidity sensor abnormal, please check humidity sensor
Temperature fluctuation is less than the set value or very slow	·Check the electric heating tube; check whether the cooling system is normal working (compressor is not running, refrigeration system leakage, condenser fan is not running, the excessive dust); Check the inner chamber Fan if not running Fan is not running or damage;
Humidity can not reach the set value	check the water level, the water level should be upper in heating tube; Check the humidifying electric heat pipe.
Screen displays nothing	·Please check if socket is 220V ·Please check if power is connected ·Please check if power switch, if it is tripping operation, please check wring layout.
The display shows lack of water and the buzzer alarm	Whether the valve has opened, Check the water is lack or not ; open the left side of the box and open the drain valve, look if water is out. Without water, according to the figure check water pipe or add water

	electromagnetic valve failure. If water is out, water level switch failure (water level switch on the sink the tank).
Display shows lack of water overflow And the buzzer alarm.	The water level switch fault (water level switch in the tank in the sink). Electromagnetic valve, electromagnetic valve cannot close the water damage, there is no switch signal, check the fault according to the wiring diagram.
The light bulb is not bright	Check the lighting setting, whether open or light has finished according to the cycle running; check the bulb or lamp are in good condition or not; Check the wiring diagram.

14 Wiring Layout



Plant Growth Chamber
Packing List

No.	Name	Quantity	Note
1	product	1	
2	manual	1	

3	shelf	2	
4	Water Basin	1	
5	Inlet pipe	1(0.3m)	With a hose hoopφ8-20
6	Overflow pipe	1(0.3m)	With a hose hoopφ8-20

15 After Service

1. Quality warranty is one year, life-long maintenance service.
2. Failure or damage caused by improper use of the customer is not involved the warranty.

BIOLAB SCIENTIFIC LTD.
3660 Midland Avenue, Suite 300, Toronto, Ontario M1V 0B8 Canada
Email: contact@biolabscientific.com Tel: +1 707 533 1445
Website: www.biolabscientific.com