FAITHFUL®

SPX-BIII Series
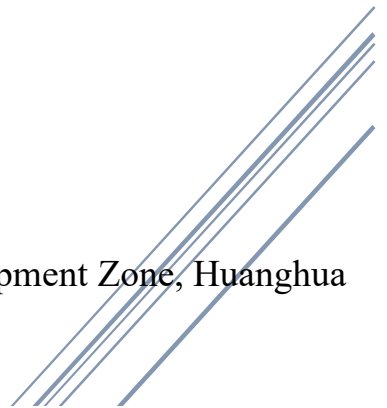## Refrigerated Incubator
(Intelligent LCD Temp. Controller)

User Manual

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Content

I. Summary

This machine was used in department of environment protect、sanitary and ant epidemic, drug supervision, marine lives. It is the special equipment for Liquid test and culture, save the BOD test, Bacillus, Mold, Microorganism.

II. Structure features

1. The case is adopts high quality cold-rolled steel plate with the plastic spraying on the surface.

2. Mirror-stainless working room, easy clean, Shelves can be adjusted.

3. Micro-Computer Temp. Controller and Automatic defrosting system, can make sure the high precise and working continue, big LCD Screen.

4. Sole Temp. limited alarm system、Over-Temp. cut off electric and timing function, can make sure the safety operate.

5. R134A famous compressor and fans.

6. Double doors, inner door is the good quality steel-glass, silicon seal, outside door is the magnetic silicon, easy open and close, make sure the good seal.

7. ∅50mm big test hole, can test the chamber line、power and other condition.

8. Optional function

①RS-485/232 connector, can contact with the computer

②Typer (mini size)

③Alarm system when electric cut off.

④Cut off electric or Alarm function when open the door

⑤Creepage protect

The above Optional parts should be made by our company.

III. Product Specification

Model	SPX-70BIII	SPX-150BIII	SPX-250BIII
Voltage	220~240V 50Hz/60Hz		
Temp. Range	0-65°C		
Temp. Motion	±0.5°C		
Temp. Uniformity	±1°C		
Cryogen	R134a		
Power	800W	1000W	1200W
Inner Chamber size (cm)	41.5*35*50	49*40*75	50*50*95
Exterior Size (cm)	57*56*103	64*62*129	82*76*145

IV.Inner Chamber Temp. Distribution map
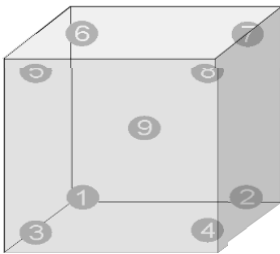
Temp. point	Temp. (°C)	Temp. point	Temp.(°C)
①	36.63	⑤	36.91
②	36.93	⑥	36.86
③	37.50	⑦	36.88
④	37.33	⑧	36.64
⑨	37.15		

V. Freeze Graph

Freeze Characteristic Graph(SPX-250 model)
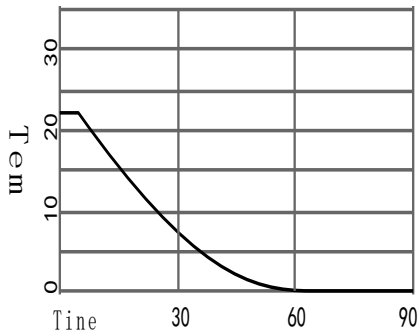
Freeze Characteristic Graph(SPX-250 model)
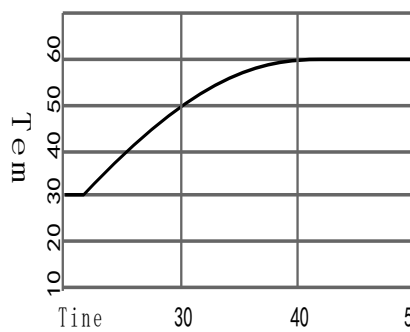
Note:

The above specification testing environment temp.≤25°C, the data just for our products.

It is normal when the Temp. Motion will belong the above graph under the condition

of automatic defrosting.

VI. Working Condition

1. Environment Temp.: 5～32°C (if setting temp.≦10°C，environment≦28°C).

2. Humidity：≦80%RH　　3. Air Presser：　80-106Kpa

4. There was no shake of the incubator and not caustic air around the chamber.

5. Should avoid light and cooling environment.

6. Keep distance of the dust, install horizontal and make sure a distance between the equipment and wall.

7. Good airiness.

VII. Safety information

1. After you received the equipment, to avoid the damage for the compressor during a long transport, please keep the machine leave 1 days and then can use. To make sure equipment and test safety, please install the outer protect and also use the power as the equipment required.

2. Do not test the flammable and combustible、poisonous
and corrosive material.

3. The equipment should be installed horizontal.

4. Only the engineer can disassembly and repair.

5. If put one working equipment into the chamber, once the
power bigger than 2A, please add the power outside, please do not use this equipment power.

6. When the chamber temp.≧50°C, please do not setting the
low temp. to avoid the compressor working, to make sure the compressor can be used long time.

7. Once alarm operates, please resolve this problem; please
do not turn on the machine.

8. Please read this manual operation and then operate this
machine

VIII. Operation cautions

1. There has the test hole (Humidity hole), when put the other equipment into the chamber, please through this hole, and make sure the test hole humid.

2. First turn on the machine, please do not change the
system specification if the manual operation do not refer.

3. U.V. lamp close once do no need use to avoid influence the
Temp.

4. Before do the cooling operate, please dry the chamber 1

hour under the 50 degree.

5. The Chamber with the vertical air system, Please do not
put full material on the shelf, the test material less than 1/3 of the shelf.

6. Once the test environment > 35℃ or Use Temp. > 50℃,
forbid setting the low temp.

7. Please use the pure water clean the chamber and surface
of the machine. When the machine does not used, please cut off the Electricity, and make
sure the inner and outer clean and dry.

IX. Controller operation instruction

i. Controller Specification

1. RS485/232 communication: At one time, only can contact with 32 units meter.

2. Temp. setting range: 0.0-60.0℃. Timer setting range: 0-99minutes 59 minutes.

3.   Display error: ＜0.5%。

4.   Sensor： PT100.

ⅱ. Instruction of panel
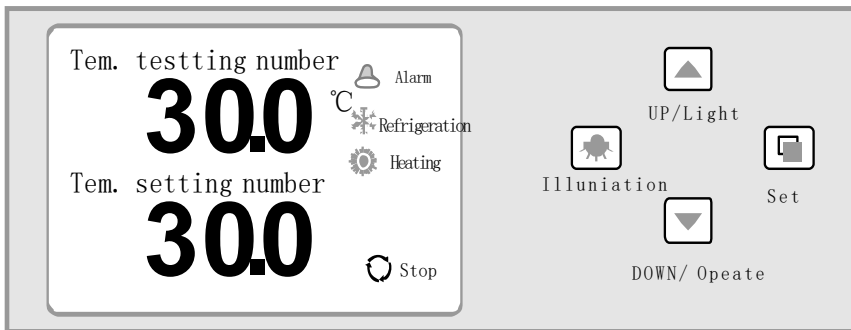
ⅲ. Temperature time operation

Example: Temp. Setting 30℃m, Thermostatic 5 hours later, will cut off the Electricity.

1. Click the set keyboard then into the setting temp. condition, set the temp. is 30℃ through up and down. Click this set keyboard, and then come into the timer set condition, the hour time flicker, change to 5 from 0, once you need setting the minutes, also need use the above step. When the timer shows "0", it is means without the setting function. When the setting do not show"0"，when the test temp. up to the setting temp. the timer will calculate, when the time up to the setting time, the machine will stop. When stop, the light on, the buzzer tweet 30 seconds, press the down keyboard 4 seconds, the system working again, when the buzzer tweeting, can click other keyboard to stop the tweeting.

2. Illumination (Operate), can click the illumine keyboard and then on, click again will

close.
3. LCD Screen, once click add/light keyboard and then can open or close the light.
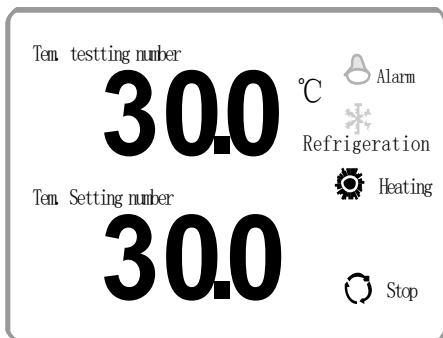
| Without timer setting | With timer setting |
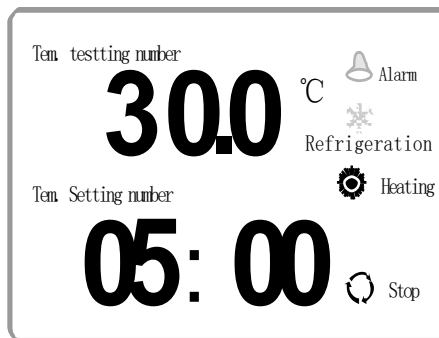
ⅳ. Inner Chamber Specification setting

Press the set keyboard more than 3 seconds, will show "LC", make it to "3" through up and down keyboard, click this keyboard, can come into the chamber temp. Specification. Click the set keyboard and modify each specification, press this keyboards 3 seconds and then can leave this screen, the specification will keep automatic. Once in 30 second, do not click this keyboard, will leave this screen automatic, will not keep the specification

Note:
All the internal parameter has been adjusted when factory test.

Forbidden to modify them except Sensor Correction parameter.

1. The internal parameters as follows:

Parameter	Name Function	Factory Specification
Lc	Password :"Lc=3"can modify the specification	
P--	Proportional band : Time proportional adjust function: Down P, can heat fast, UP P will reduce the over-adjust	(2.0～25.0) 15.0
AL--	Over-Temp. Display error alarm: Under "PV < SP+Al", buzzer tweeting and make refrigeration	(0.0～20.0) 3.0℃
CT--	Compressor operate delay: Compressor delay protect time, operate twice time > = cT minutes	(0.～10.0Min) 3 Min

Up--	Heating refrigeration backlash: compressor in manual mode, when "PV > = SP+uP" and compressor delay time out, then compressor begin to work	(-50.0～50.0) 0.2
Dn--	Cooling refrigeration backlash: compressor in manual model, when "PV< = SP+dn", the compressor shut down.	-51.0~uP-0.1）0
T--	Control cycle	(1～60sec)5
P--	Proportional band	(1.0 ～ measure value) 35
I--	Integration time	(1～1000sec)200
d--	Differential time	(1～1000sec)200
Pb--	"0" adjust: Sensor zero display error adjusts. Pb= actual temp.-display number	(-9.9～9.9)0.0
Pk--	Full adjust: Sensor full error adjusts. PK=1000*(actual temp.-display number)/meter test number	(-999～999)0

Note: 1. To make sure the precise result, can modify the P (range between 10.0～ 20.0), normally no need change, normally use the factory specification.
2. When display error, normally change the Pb, no need change the PK.
3. Please do not change once no big change.

2. Check ambient Temperature

Press the set keyboard more than 3 seconds, will show "LC", make it to "18" through up and down keyboard, click this keyboard, can check the ambient temperature. Press this keyboards 3 seconds and then can leave this screen, the specification will keep automatic. Once in 30 second, do not click this keyboard, will leave this screen automatic, will not keep the specification.

Parameter	Name	Function	(Range)factory value
Lc-	Password	when"Lc=18", we can check the ambient temperature.	
Hd-	Ambient temp.		

3. Compressor operating mode and frost related parameters

Press the set keyboard more than 3 seconds, will show "LC", make it to "123" through up and down keyboard, click this keyboard, can check the internal parameter value. Press the SET key to modify each parameter value and then click this keyboards 3 seconds and then can leave this screen, the specification will keep automatic. Once in 30 second, do not click this keyboard, will leave this screen automatic, will not keep the specification.

Parameter	Parameter Function	(range)Factory value
Lc-	"Lc=123"can see and modify each parameter.	
S-H	When "ambient temp.-SH" > Temp. Setting value, the compressor normally open operation. On the contrary, the compressor break-off work. Note: when" S-H=50.0", the compressor doesn't work.	（-20.0～50.0）40．0
Ft-	Fan delay, stop the fan when frost;After frost melting, fan delay Ft- second start.	(0～99s)50S
dt1	SP≤15℃ Frost interval 1	(0～250Hours) 12Hours
Hs1	Frost melting output 1	(0～250S) 60S
dt2	15℃<SP≤30℃ Frost interval 2	(0～250Hours) 12Hours
Hs2	Frost melting output 2	(0～250S) 55S
HA	Compressor switched on and off automatically. 1 is to automatically judge the switch compressor according to the ambient temperature. 0 is to control the compressor on and off according uP and dn.	（0～1）1
cH	Frosting and evaporator switching options, 0 for frosting, 1 for evaporation switching	（0～1）0

ⅴ. Pay Attention

1. Compressor working method
① After 30 seconds get through of the electrification for the controller, the controller can check how the compressor works automatic.
② When the Temp. change over 3.0℃, the controller can check how the compressor works automatic, if the temp. change less than 3.0℃, the compressor will do not change the working method.

③ Once change the "S-H" number change, should get through of the electricity of controller and then the "S-H" specification works.

2. Alarm function

Get through of the electricity for the controller first time or the temp. setting number down, even "PV > SP+AL", the alarm light will off, the buzzer do not tweeting.

3. Temp. failure

When the temp. testing number show"0000", it means temp. failure, please inspect the sensor, if the sensor without problem, it means the controller problem.

X. Communication connect and Meter Wiring
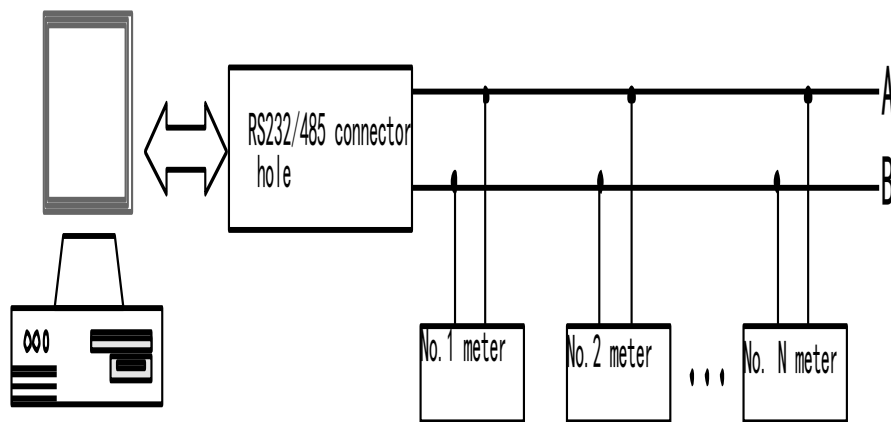
Note: Can contact with 32 units meter, can match the mini-typer

XI. Fault Analysis

Phenomenon	Cause analysis	Treatment
Power director not show	Without power	Inspect the plug
	Fuse broken	Change fuse
Temp. Controller shows"□□□□"	Sensor broken	Change sensor
	Controller broken	Change controller
Evaporator frost or Chamber with frost	Open the door frequently when doing the Low-Temp. test	Over 50 degree make dry and reduce open door
	Left hole with bad seal	Inject the inner hole by rubber
	Door opening	Close the door
Hard to make the Temp. down	Evaporator frost	Dry the chamber
	Environment Temp. too high	Down environment Temp.
	Fan works or not	Check fuse and fan

	Compressor works or not	Change Compressor
	Compressor works but not refrigeration	Check the cryogen Check the ice or oil block
	Specification mixed	Setting correct and restart
Temp. up continue	Evaporator frost	Dry the chamber
Abnormal Knocking	Circle Fans loose	Check and adjust
	Condenser, Fan, compressor loose	Check and adjust or contact with us
Bad evenness degree	Sample hot	Reduce sample quantity
	Evaporator frost、wind block	Dry the chamber、Restart
Controller instability	Power do not match	Change the Power
	Voltage instability	Make sure stability voltage
Hard make Temp. up	Over-Temp. setting too low	Adjust the Temp. correct
	Meter setting too low	Set the Temp. correct
	Meter heating director on but without input function	Change the meter
	Meter heating but the heater doesn't work	Change the heater
	Fan doesn't work	Change fan or fuse
	Sensor broken	Change sensor
Temp. over bigger than setting	Meter setting incorrect	Set again and the manual
	Heater working do not stop	Change Controller