StonyLab®

Forced Air Drying Oven

Operation Manual

(Please read the instruction carefully before you use the machine)

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I. Summary

Drying Oven is widely used for drying, baking, melting, sterilizing and curing in labs of industrial enterprises, scientific research institutions, and health and medicine units etc.

II. Structure Features

1. High-quality cold rolling steel case with electrostatic spraying surface ensures the aesthetics and longevity of the product.
2. Favin stainless steel working room; foursquare semicircle transition; adjustable shelf, airduct lateral plate and bottom heater covering are knock-down construction, which is convenient for cleaning.
3. PID digital intelligent temperature controller with function of temperature setting, time dual screen displaying, over-temperature alarming and timing.
4. The heater and fan are reasonably constructed by placing them under the working room; circulation fan will be closed when it reaches the target temperature to prevent the powdery sample from blowing away.
5. Independent temperature limiter alarm, which can auto-switch with temperature controller and alarm when over temperature limit.
6. Air-tightness adjustable buckle lock door to ensure good sealability.

   Optional accessories:

   a. RS485/232 interface for connecting computer by principal computer software to control

temperature switch.

b. Micro type printer, which can continuously print the temperature record of the running machine.

c. Independent power cut alarm system to help the user process sample immediately.

d. Independent temperature limit alarm system; auto-break-off when over temperature limit.

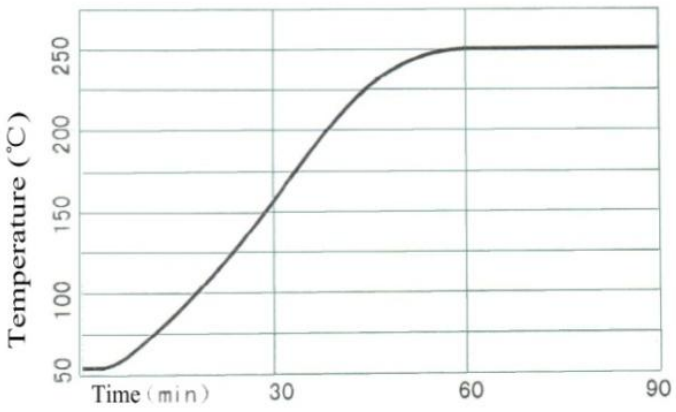
III. Product Structure Diagram and Parameters

i. Structure Diagram

ii. Main Technical Parameters

Model		WGLL-30BE	WGLL-45BE	WGLL-65BE	WGLL-85BE	WGLL-125BE
Cycle Mode		Forced convection				
Function	temperature Range	RT+10-300℃				
	temperature Resolution Ratio	0.1℃				
	temperature Motion	±1℃				
	temperature Uniformity	±2.5%				
Structure	Inner Chamber	Mirror Stainless Steel				
	Outer Shell	Cold rolling steel electrostatic spraying exterior				
	Insulation layer	High quality rock wool board (with CE)				
	Heater	Stainless steel heater				
	Power rating	0.8kW	1.2kW	1.6kW	2.0kW	2.3kW
	Exhaust hole	φ28mmtop (with function of test hole)				
	Timer	0-9999min (with timing wait function)				
	Sensor	pt100				
Specification	Inner Chamber size (W*L*H)(mm)	310*310*310	350*350*350	400*360*450	450*420*450	500*450*550
	Exterior size (W*L*H)(mm)	450*500*690	490*540*730	540*550*830	590*610*830	640*640*930
	Packing size (W*L*H)(mm)	550*585*845	590*625*885	640*635*985	690*695*985	740*725*1085
	Volume	30L	45L	65L	85L	125L
	Shelf number	5	6	8	8	11
	Load per rack	15kg				
	Shelf space	40mm				
	Power rating (50/60HZ)	AC220V 3.6A	AC220V 5.5A	AC220V 7.2A	AC220V 9.0A	AC220V 10.5A
	NW/GW (kg）	33/37	37/43	44/49	50/56	60/66
Accessory	Shelf	2				
	Shelf frame	4				

iii. Temperature Profile



Note: according to the different model type, the time of warming up is different

IV. Working Conditions

The drying oven works under the following conditions:

1. Temperature ranges between 5~40℃;
2. Relative humidity less than 85% RH;
3. Power: voltage 220-240V, frequency 50-60Hz;
4. No violent vibrations and corrosive gas surround the oven.

V. Attentions

	Install the outer ground protection to ensure safety of machine and experiment; ensure power as the machine required.
	This equipment is forbid to use in inflammable and explosive, poisonous and strong corrosive experiments.
	Make sure horizontal installation.
	Non-professionals are not allowed to disassemble and repair this machine.
	Pay attention to the setting temperature when dealing with inflammable matters.
	Make sure dry the resin container, if the temperature is setting too high by accident, the container would be dissolved and then fall on the heater, which will cause fire.
	Overfilled of sample will lead to overheat of working room under part, which will dissolve the inflammable material and cause fire.
	While the machine is working, don’t touch the device top, as well as observation window and exhaust port to keep away from high-temperature burns.
	Read the instruction book before operation.

VI. Operational Notes

1. Put the material needs drying into container (advice: size of drying material should not over 2/3 of the shelf); then close the container door and switch power, and next switch on the blower.
2. Heating

   Set the temperature as needs (see details in meter instruction), then the temperature starts to rise; when temperature inside working room reaches the set point, the indication light will go out, after constant temperature for 30min, the working room goes into constant temperature state.

   Note: don’t close blower when the temperature is rising, or else it will accelerate ageing of heater.
3. Working time:

   Decide the drying time according to humidity of sample.

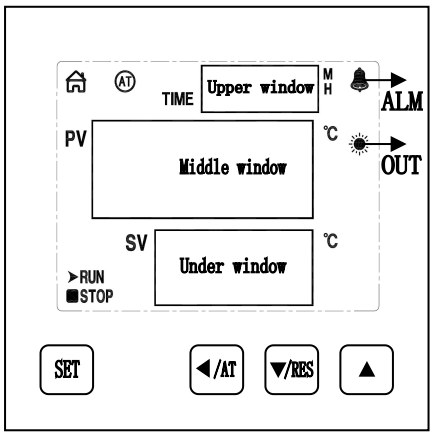
   Note: for example, if the sample humidity is big, the sample on each layer should not be too thick to ensure intensive drying of sample.
4. After finishing drying, turn off power, and then bring the sample out.
5. Keep the drying oven clean, wipe the container sealing rubber strip by soft cloth and clear the dirt out; avoid cleaning it by chemical solution to prevent chemical reaction damage on sealing rubber strip.
6. If the oven is unused for a long time, daub neutral grease or Vaseline on galvanized parts to prevent corrosion; cover the oven with plastic dust cap, and store it in the dry room to keep the electric device against wet.

VII. Fault Treatment

Phenomena	Causation	Treatment Method
1. No power supply	a. poor plug contact or line broke.	a. Connect the plug and line.
	b. Fuse protector is broken.	b. Change the fuse protector.
2. No temperature rising inside container	a. Low setting temperature.	a. Readjust and set temperature.
	b. Heater is broken.	b. Change the heater.
	c. Temperature controller is broken.	c. Change the temperature controller.
	d. Temperature sensor is loose.	d. Screw up the sensor nut.
	e. Temperature sensor is broken.	e. Change the temperature sensor.
3. No temperature rising alarm	a. Set temperature of Detached temperature limiter is low.	a. Readjust the temperature 30℃ above setting temperature.
	b. Detached temperature limiter sensor is broken.	b. Change the detached temperature limiter sensor.
4. Temperature cannot reach the setting point	a. Exhaust port is fully opened.	a. Shut off the exhaust port.
	b.The container is overfilled, no hot air convection.	b. Decrease amount of sample to improve convection condition.
5. The fan doesn't work	The fan motor is broken.	Stop work and check electric capacity and motor.
6. Displaying--------	The sensor is broken.	Change the sensor.
7. Display STOP	Time-up.	Press the program key for 3s to start.

VIII. Temperature Controller Instruction

i. Main Panel Instructions



【PCD-D8000】

Indicator function

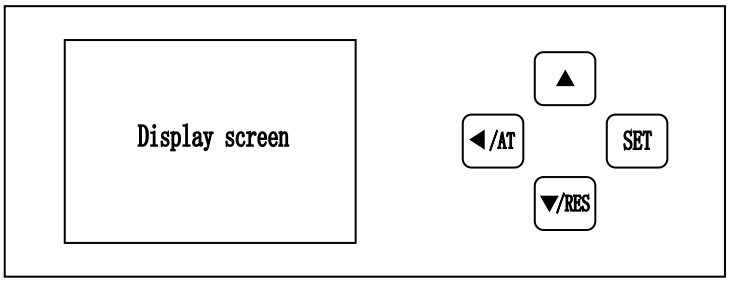
: It turns on in normal state, it turns off in setting state.

AT: It flickers during self-tuning, it is not bright in any other state.

ALM: When there is a temperature alarm, it is lit.

OUT: It is lit when heating output.

RUN&STOP: When the timer ends, "STOP" is lit, "RUN" is lit in any other state.



【PCH(B)-D8000】

Button function

1)【SET】: In normal state, press this button to enter the setting state.

2)【◄/AT】: "SHIFT" button. In the setting state, click this button to shift the set value. In normal state, press this button for 6 seconds to enter the auto-tuning selection state.

3)【▼/RES】: "DEC" button. In the setting state, click this button to reduce the set value. If you keep pressing this button, the value will reduce continuously. In the normal state, when the timer ends, press this button for 3 seconds, the controller will restart to work .

4)【▲】: "INC" button. In the setting state, click this button to increase the set value. If you keep pressing this button, the value will increase continuously.

1. Operation and using

1-1. When the controller is switched on, display windows show the version number and controller model for 2 seconds, then it starts running.

1-2. Temperature and Time Setting

1) Without Timing Function:

In the normal state, press the "SET" button to enter the temperature setting state, middle window displays the prompt "SP", under window displays the temperature set point value. Using the "SHIFT", "DEC" and "INC" buttons, user can edit the temperature set value. Press

the "SET" button again, the controller will return to its normal state, the setting value will be saved automatically.

2) With Timing Function:

In the normal state, press the "SET" button to enter the temperature setting state, middle window displays the prompt "SP", under window displays the temperature set point value. Re-press the "SET" button to enter the time setting state, middle window displays the prompt "ST", upper window displays the time set point value. Press the "SET" button again, the controller will return to its normal state, the set values will be saved automatically.

When the time is set to "0", it indicates the timer is inoperative, the controller will run continuously, upper window always displays "0". If there is time set, the upper window will display the running time, when the timer starts, time unit flickers. When the timer ends, upper window will display the "End" prompt, the buzzer will sound for EST (In Parameter Table 2) seconds, it can be muted by pressing any button, press the "DEC" button for 3 seconds, the controller will restart to work .

1-3. If the middle window show the prompt "**---**", it indicates that the temperature sensor has faults or temperature exceeds the measuring range or the controller itself is faulty, the controller will cut off the heat output automatically, the buzzer will sounds continuously, "ALM" indicator is lit, Please check the temperature sensor and its wiring carefully.

1-4. When over temperature alarm, the buzzer beeps, "ALM" indicator is lit, the heat output is cut off. When under temperature alarm, "ALM" indicator flickers, the buzzer beeps. If the over temperature alarm is caused by the change of the temperature setting value, "ALM" indicator is lit, but the buzzer does not beep.

1-5. When the buzzer sounds, press any key to mute.

2. Auto-tuning

In the normal state, press the "SHIFT" button for 6 seconds, the controller will enter the auto-tuning selection state, the middle window displays the prompt "AT", the under window displays "0", change "0" to "1" by pressing the "INC" button, then press the "SET" button, the controller will run the auto-tuning program, the "AT" indicator flickers. After auto-tuning end, the indicator stops flickering, PID parameter value is saved automatically. In the auto-tuning process, press the "SHIFT" button for another 6 seconds, the controller will stop the auto-tuning program.

During the Auto-tuning process, if over temperature alarm, the buzzer does not beep, "ALM" indicator is not lit, the heat output will be cut off, the "SET" button is invalid.

3. Internal parameters settings

In the normal state, press the "SET" button for 3 seconds, windows will display the prompt "Lc" and the password value. Adjust the password to the required value, then press the "SET" button again, it will enter the internal parameters setting state. Press the "SET" button for another 3 seconds, it will return to the normal state, the set value will be saved automatically.

Parameter table 1

Name	Function description	(Setting range) Factory value
Password key	When "Lc=3", enter the next parameters.	0

Over-temp alarm	If "PV>SV+ALH", the ALM indicator turns on. The buzzer sounds and the heat output turn off.	(0 ~ 100.0℃) 20.0
Under-temp alarm	If "PV<SV–ALL", the ALM indicator flickers, the buzzer sounds. When "ALL=0", the function is invalid.	(0 ~ 100.0℃) 0
Proportional band	Adjustment of proportional function.	(0 ~ 300.0℃) 35.0
Integration time	Adjustment of integration function.	(1 ~ 2000S) 300
Differential time	Adjustment of differential function.	(0 ~ 1000S) 200
Control cycle	The temperature control cycle.	(1 ~ 60S)
Temperature deviation correction	It is usually used to correct errors in low temperature measurement. Pb = Actual value – PV	(-50.0 ~ 50.0℃) 0
Temperature slope correction	It is usually used to correct errors in high temperature measurement. PK = 1000 x (Actual value – PV) ÷ PV	(-999 ~ 999) 0
Communication address	The communication address of this instrument.	(1 ~ 32) 1
Setting lock	0: Enable to set temperature and time. 1: Disable to set temperature and time.	(0 ~ 1) 0

Parameter table 2

Prompt	**Name**	**Function description**	**(Setting range) Factory value**
Lc	Password key	When "Lc=9", enter the next parameters.	0
ndA	Temperature alarm mode	0: With over-temp alarm only. 1: With over-temp alarm and under-temp alarm at the same time.	(0 ~ 1) 0
doT	Temperature decimal point	0: No decimal point display. 1: With decimal point display	(0 ~ 1) 1
ndT	Timer mode	0: No timer function. 1: Start timing when the temp reaches the set value. 2: Start timing as soon as the controller	(0 ~ 2) 1

Hn	Timer unit	0: Minute. 1: Hour.	(0 ~ 1) 0
SPd	Timer parameter	If "ndT=1", Start timing when "SV - SPd≤PV≤SV + SPd"	(0.1 ~ 50.0℃) 0.5
SPT	Const-Temp buzzer time	If enter the Const-Temp State, the Buzzer will beep for SPT seconds. if "SPT=9999", it means the buzzer will beep continuously.	(0 ~ 9999S) 0
EST	Timing Over Buzzer time	When the timer ends, the Buzzer will beep for EST seconds. if "EST=9999", it means the buzzer will beep continuously.	(0 ~ 9999S) 60
EH	Timer end mode	0: Continue to control the temperature. 1: Stop temperature control.	(0 ~ 1) 0
ndo	Relay output mode	0: When the timer ends. 1: When there is a temperature alarm. 2: When the temperature is constant.	(0 ~ 2) 1
oPn	Door parameter	Automatic judge door opening. 0: invalid; 1: valid	(0 ~ 1) 0
nP	Power percentage	Percentage of max heating power output.	(0 ~ 100%) 100
Co	Heating prohibited deviation	When "PV≥SV+Co", heating output will be cut off.	(0 ~ 50.0℃) 50.0
SPL	Min set value	The minimum temperature set point value.	0.0
SPH	Max set value	The maximum temperature set point value.	(0 ~ 400.0℃) 300.0

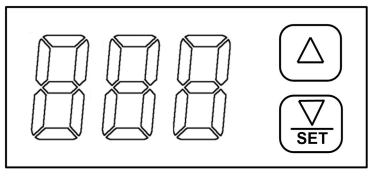
Parameter table 3

Prompt	Name	Function description	(Setting range) Factory value
Lc	Password key	When "Lc=27", enter the next parameters.	0
FC	Temperature unit	0: Centigrade; 1: Fahrenheit	(0 ~ 1) 0

Parameter table 4

Prompt	Name	Function description	(Setting range) Factory value
Lc	Password key	When "Lc=567", enter the next parameters.	0
rST	Factory reset	0: cancel; 1: confirm	(0~1) 0

ii. Digital Temperature Limiter Panel Instructions



Button function

1) 【▲】: "INC" button. In the setting state, click this button to increase the set value. If you keep pressing this button, the value will increase continuously.

2) 【▼/SET】: "DEC" button. In the setting state, click this button to reduce the set value. If you keep pressing this button, the value will reduce continuously.

It has the setting function when modifying internal parameters.

1. Operation and using

1-1. When the controller is switched on, display window shows the version number for 2 seconds, then it starts running.

1-2. Alarm temperature setting

Under the normal state, window displays temperature alarm set value. Click the "INC" or "DEC" button, the set value starts flashing, at this point, the required temperature alarm setting can be modified through the "INC" and "DEC" button. About 2 seconds after stopping operation, the controller will return to the normal state, the set value will be saved automatically.

1-3. View temperature measurement

In the normal state, press the "INC" and "DEC" button for about 3 seconds, The right decimal point will light up. At this point, the window displays the measured temperature value. Click the "INC" or "DEC" button again, the controller will return to the normal state.

1-4. Over temperature alarm

In the normal state, when the temperature measurement exceeds the alarm temperature setting value, the window alternately displays " - A - " and alarm setting value, the controller will cut off the output automatically, the buzzer beeps.

1-5. Abnormal temperature measurement alarm

If the window show the prompt "---", it indicates that the temperature sensor has faults or temperature exceeds the measuring range or the controller itself is faulty, the controller will cut off the output automatically, the buzzer will sounds continuously. Please check the

temperature sensor and its wiring carefully.

1-6. When the buzzer sounds, press any button to mute.

2. View and set internal parameters

In the normal state, press the "INC" and "DEC" button for about 6 seconds, the window alternately displays "Lc" and password value, the required password value can be modified only by the "INC" button. Then click the "DEC" button, the controller will enter the internal parameters setting state. Press the "DEC" button for 3 seconds, it will return to the normal state, the set value will be saved automatically.

Parameter table

Prompt	Name	Function description	(Setting range) Factory value
Lc	Password key	When "Lc=3", enter the next parameters.	0
Pb	Temperature deviation correction	It is usually used to correct errors in low temperature measurement. Pb = Actual value – PV	(-50 ~ 50℃) 0
PL	Temperature slope correction	It is usually used to correct errors in high temperature measurement. PK = 1000 x (Actual value – PV) ÷ PV	(-199 ~ 199) 0
SPH	Max set value	The maximum temperature set point value.	(0 ~ 400) 400