OPERATING MANUAL

FORCED CONVECTION OVEN

BOFC-103 BOFC-102 BOFC-103 BOFC-104 BOFC-105 BOFC-106

CE ISO9001 CERTIFIED

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INDEX

1. Safety warning before use

 Must prohibit items

1. Do not store volatile, flammable, or explosive materials in this device, as it may cause explosions or fires.

2.Do not place this device in a place that is exposed to rain, moisture, or may splash water, otherwise it may cause accidents such as leakage, short circuit, or electric shock.

3.Non professional technicians are not allowed to disassemble, repair, or modify equipment, otherwise improper operation may cause fire or electric shock accidents to personnel.

 Must comply with items

1.This device should be installed on solid ground. If the ground is not solid enough or the installation location is not suitable, personnel may be injured due to equipment overturning.

2. Please use the dedicated power supply indicated on the nameplate of this device, and the power socket must be grounded. This device must be reliably grounded to prevent accidental electrical leakage that may cause electric shock or fire.

3. Before carrying out any repairs or maintenance on this equipment, be sure to disconnect the power supply to prevent electric shock or personal injury.

4. When repairing or maintaining equipment, it is necessary to wear gloves to prevent personal injury caused by touching edges or sharp corners.

5.If any abnormalities are found in the operation of the device, immediately unplug the power plug and stop the device from running. Operating under abnormal conditions may cause electric shock or fire.

2. Main features of product

1. Unique vertical dual duct circulating horizontal air supply, high drying efficiency, and uniform temperature distribution in the studio.
2. Standard fan switch, high brightness LED instrument operation indicator light, and high-temperature resistant blower motor.
3. Adopting a new type of anti scald handle, the studio adopts high-quality mirror stainless steel processing to form, and the four corner arc transition is easy to clean.
4. The LCD screen of the temperature controller displays and drives the solid-state relay output to control heating, making it safer and more reliable.
5. A 4-speed 3- speed adjustable fan can adjust the required air volume according to different experimental requirements of users, thereby drying various types of samples.
6. Independent over temperature protection system: When the temperature in the studio exceeds the set alarm value of the instrument, the bright LED red alarm light will light up and cut off the main heating circuit, improving the safety of product use.
7. Independent temperature limiter: Digital electronic temperature limiter, set to limit the temperature of the studio, providing dual safety protection for the product.

3. Technical Specification

Model		BOFC-101	BOFC-102	BOFC-103	BER-104	BOFC-104	BOFC-105	BOFC-106
		BODR-301	BODR-302	BODR-303	BER-111	BODR-304	BODR-305	BODR-306
Cycle Mode		Forced convection						
Function	Temp. Range	RT+10-300°C						
	Temp. Resolution Ratio	0.1°C						
	Temp. Motion	±1°C						
	Temp. 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	3.0kW	5.0kW
	Exhaust hole	Φ35mmtop(with function of test hole)					Rear exhaust	Top double exhaust

Controller	Temp. control mode	Two temperature section PID intelligent						
	Temp. setting mode	Touch button setting						
	Temp. display mode	B model: Measuring temperature: display on the four digital tubes upper row, setting temperature: display on the lower row						
		BE model: Measuring temperature display on upper LCD screen, setting temperature display on the lower row						
	Timer	0-9999min(with timing wait function)						
	Operation function	Fixed temperature operation, timing function, auto stop.						
	Additional function	B model: Sensor deviation correction, temperature overshoot self-tuning, internal parameter locking, power-off parameter memory						
		BE model: High precision digital independent temperature limiter, 4 grade 3speed adjustable-speed fan (230 and 625model BE without fan speed adjustor),sensor deviation correction, temperature overshoot self-tuning, internal parameter locking, power-off parameter memory						
	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	600*500*750	660*760*1250
	Exterior size (W*L*H)(mm)	450*500*690	490*540*730	540*550*830	590*610*830	640*640*930	735*835*1115	902*942*1677
	Packing size (W*L*H)(mm)	540*575 *855	580*615 *895	635*625 *995	680*685 *1000	710*730 *1100	857*885*1287	1061*1000*1925
	Volume	30L	45L	65L	85L	125L	230L	625L
	Shelf number	5	6	8	8	11	17	11
	Load per rack	15kg						
	Shelf space	40mm						100mm
	Power rating (50/60HZ)	AC220V/3.6A	AC220V/5.5A	AC220V/7.2A	AC220V/9.0A	AC220V/10.5A	AC220V/13.6A	AC380V/13.2A
	NW/GW (kg)	33/37	37/43	44/49	50/56	60/66	94/120	150/190
Accessory	Shelf	2						
	Shelf frame	4						
optional accessories		B model: Spare Shelf; BE model: Spare Shelf, RS485 Interface, Printer, Program controller, U-disk storage; 3.5-inch color touch screen temperature controller						

Table 1

4.Instrument operation and display instructions

1.Instrument operation and usage

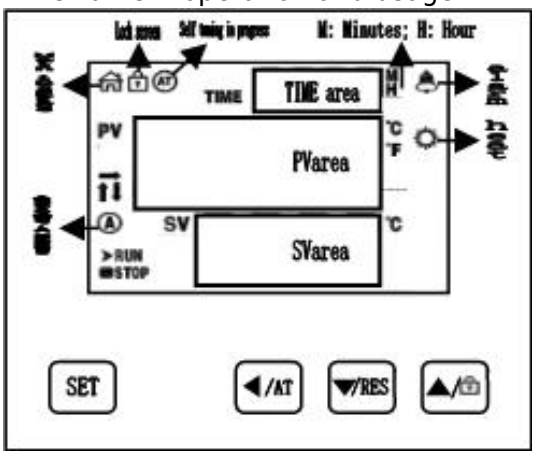

Figure 1

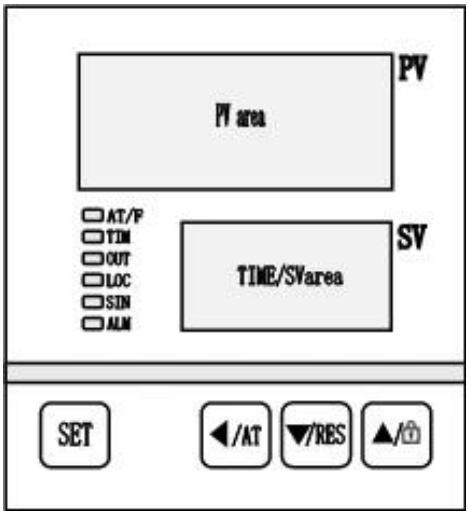

Figure 2

Key Definition

1. [SET]: Set button. When the main interface displays the status, click this button to enter the temperature and time target value setting state. Long press this button f
or 3 seconds to enter the internal parameter setting state.

2. [◀ /AT]: Shift/self-tuning key. Clicking this key in the set state can cause the set value to shift and flash for modification.

In the main interface display state, long press this button for 6 seconds to enter the temperature self-tuning selection state.

3. [▼ /RES]: The decrease/rerun button can be used to decrease the set value by clicking or long pressing it in the set state.

Press and hold this button for 3 seconds in the main interface and at the end of the run state to restart the operation.

4. []: Add/lock screen button, click or long press this button in the set state to gradually increase the set value.
If the lock screen function is selected, in the main interface display state, click this button to lock or unlock the screen.

Definition of LCD instrument indicator lights:
1. [Main interface] Indicator light: This light will light up in normal working state (not set state), and turn off in reverse.
2. [Lock] indicator light: It lights up in the lock screen state, and goes off in the opposite direction.
3. [AT] indicator light: During the temperature self-tuning process, this light flashes, otherwise it goes out.
4. [Alarm] Indicator light: When there is a temperature deviation alarm or abnormal temperature measurement, this light will turn on. When there is a temperature deviation alarm, this light will flash. Under normal conditions, this light will turn off.
5. [Heating] Indicator light: When there is heating output, this light will turn on, and vice versa, it will turn off.
6. [A] Indicator light: This light flashes during the reservation timing process, and goes off if not.
7. [RUN/STOP] indicator light: STOP will only light up after the timer ends, and RUN will light up in other states.
8. [↑/→/↓] Indicator lights: They flash respectively during heating, constant temperature, and cooling.

Definition of digital tube display type instrument indicator lights:
1. [AT/F] indicator light: This light comes on when the temperature unit is Fahrenheit, flashes during the temperature self-tuning process, and goes off in other states.
2. [TIM] indicator light: It lights up when there is a timing setting, flashes during the reservation timing process, and goes off when there is no timing function.
3. [OUT] indicator light: When there is heating output, this light will turn on, and vice versa, it will turn off.
4. [LOC] indicator light: lights up in lock screen mode, otherwise goes off.
5. [SIN] indicator light: Invalid reservation.
6. [ALM] indicator light: When there is a temperature deviation alarm or abnormal temperature measurement, this light will turn on. When there is a temperature deviation alarm, this light will flash. Under normal conditions, this light will turn off.

2. Operation and usage methods
In the main interface display state, click the [Set] button to enter the temperature setting state. The PV area displays the prompt SP, and the SV area displays the temperature setting value. The desired setting value can be modified by using the [Shift], [Increase], and [Decrease] keys; Click the 【 Settings 】 button again to enter the time setting state. The PV area displays the prompt ST, and the TIME area displays the time setting value. Use the 【 Shift 】, 【 Increase 】, and 【 Reduce 】 keys to modify to the desired setting value; Click the [Settings] button again to exit this setting state, and the set values will be automatically saved.
Explanation: LCD type, "symbol" represents "time unit";
Digital type, with the symbol "TIME display area decimal point".

3. Reference and setting of internal temperature parameters
In the main interface display state, long press and hold the [Set] button for 3 seconds. The password

prompt Lc will be displayed in the PV area, and the password value will be displayed in the SV area. Use [Increase], [Reduce], and [Shift] to modify the desired password value. Then click the [Set] button. If the password value is incorrect, the instrument will automatically return to the main interface display state. If the password value is correct, enter the internal parameter setting state, and click the [Set] button to modify each parameter in sequence. During this process, long press the [Set] button for 3 seconds to exit this state, and the parameter values will be automatically saved. Please refer to the table below for details:
Explanation: In the parameter table, the temperature setting value is abbreviated as SP, and the temperature measurement value is abbreviated as PV.

Indicator	Parameter Name	Indicator	(Scope) Factory value
Lc	password	When Lc=3, parameter values can be viewed and modified.	0
ALH	upper deviation over temperature alarm.	When PV>SP+ALH, there is an upper deviation over temperature alarm.	(0~100.0°C) 20.0
ALL	Lower deviation over temperature alarm	When PV < SP-ALL, there is a lower deviation over the temperature alarm. Explanation: When ALL=0, the lower deviation alarm is invalid.	(0~100.0°C) 0
Pb	Correction of measurement temperature deviation	Used to correct errors generated during temperature measurement. Pb=actual temperature value - PV	(-50.0~50.0°C) 0
PL	Correction of Measurement temperature slope deviation	Usually used to correct errors generated during high-temperature measurements. PL=1000 * (actual temperature value - PV) ÷ PV	(-999~999) 0
ndT	Timing method	0: No timing; 1: Constant temperature timing; 2: Run timing	(0~2) 1
Tdn	Timing direction	0: Positive timing; 1: Countdown	(0~1) 0
Hn	Timing unit	0: minutes; 1: Hour	(0~1) 0
SPd	Constant temperature deviation	When SP SPd ≤ PV ≤ SP+SPd, enter a constant temperature state	(0.1~50.0°C) 0.5
EST	End Timing Prompt Time	When the timing ends, the buzzer indicates the time. Note: when the EST = 9999, said a permanent reminder	(0~9999) 60
EH	End Timing Constant Temperature Controller	0: Turn off the heating output after timing; 1: Keep constant temperature controlling after timing	(0~1) 0
LF	Lock Screen Function	0: Lockless screen function; 1: Lock screen function, unlock without password. 2: Lock screen function, need password to unlocked.	(0~2) 0

LdT	Lock Screen Delay	In the main screen state, if no key is pressed in the delay LDT time, the controller will automatically lock the screen. Description: LDT = 600, the delay screen locking function is invalid	(10~600s) 30
PAd	Unlock Password	The password must be entered to unlock it.	(0~9999) 1
Add	Mail Address	Local Address Description: PC-E9000 has no communication function.	(1~32) 1

Table 2

Indicator	Parameter Name	Indicator	(Scope) Factory value
Lc	password	When Lc=567, parameter values can be viewed and modified.	0
rST	factory reset	0: Cancel; 1: Confirm.	(0~1) 0

Table 3

5. Instrument wiring diagram

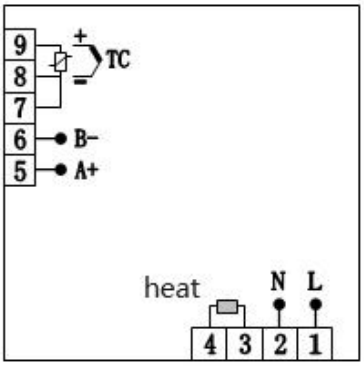

Figure 3

6. General faults and troubleshooting methods

Fault phenomenon	Fault inference	Fault handling methods
No display on startup The measured temperature is higher than the set temperature or the instrument enters a high temperature alarm state After turning on, the temperature does not display and does not rise Fault phenomenon	Power supply not connected	Check for voltage in the power socket
	The power plug is not properly plugged in	Check if the contact between the power plug and the socket is reliable
	The power switch is not turned on	Turn on the power switch on the right side of the instrument
	The fuse on the box is damaged	Replace the power fuse with the same specification
No display on startup The measured temperature is higher than the set temperature or the instrument enters a high temperature alarm state	The box door is not tightly closed	Close the box door tightly
	The instrument has not yet entered a constant temperature state	Wait for a moment before making an observation
After turning on, the temperature does not display and does not rise	The power cord is not properly plugged in	Insert the power cord properly
	Sensor malfunction	Notify the factory for repair
	The heater is broken	Notify the factory for repair

Table 4

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