

# 2ch Oven Controller

Model : **BOC-600**

■ **Model**

Name: 2ch oven controller

Model:

	Relay contact output	Non-contact voltage output
ON/OFF control action	BOC-610-2R/E	BOC-610-2S/E
PD control action	BOC-620-2R/E	BOC-620-2S/E

■ **Rating**

Rated Scale: 0 to 600°C

Input: Thermocouple K (External resistance: 100Ω or less)

Supply Voltage: 100 to 240V AC 50/60Hz

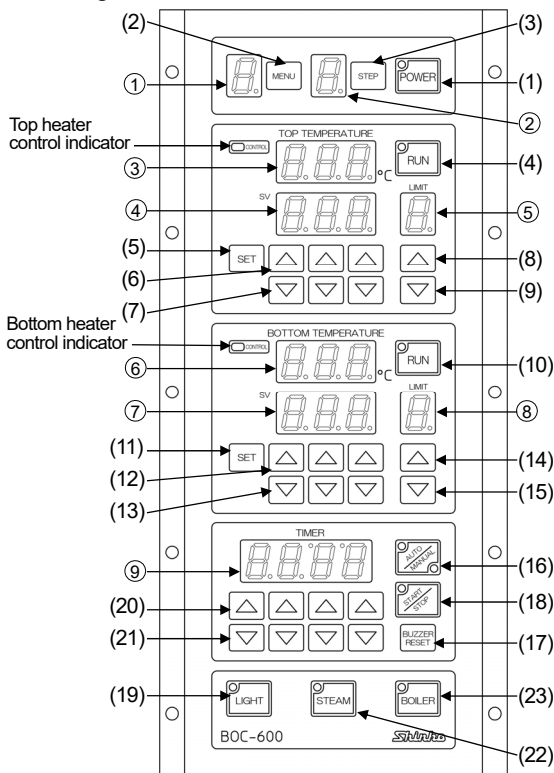
Allowable fluctuation range: 85 to 264V AC

■ **General Structure**

Dimensions: W140 x H310 x D79.6mm

Mounting: Flush, Front panel: Membrane sheet

■ **Indicating Structure**



① to ⑨ : See the displays below. (1) to (23): See the setting structure.

**Displays:**

- ① Menu display:  
7-segments red LED display 1-digit  
Character size 14.3x8mm (HxW)
- ② Step display:  
7-segments green LED display 1-digit  
Character size 14.3x8mm (HxW)
- ③ Top heater temperature display:  
7-segments red LED display 3-digits  
Character size 14.3x8mm (HxW)
- ④ Top heater SV display:  
7-segments green LED display 3-digits  
Character size 14.3x8mm (HxW)
- ⑤ Top heater output limit display:  
7-segments Red LED display 1-digit  
Character size 14.3x8mm (HxW)



- ⑥ Bottom heater temperature display:  
7-segments red LED display 3-digits  
Character size, 14.3x8mm (HxW)
- ⑦ Bottom heater SV display:  
7-segments green LED display 3-digits  
Character size, 14.3x8mm (HxW)
- ⑧ Bottom heater output limit display:  
7-segments red LED display 1-digit  
Character size, 14.3x8mm (HxW)
- ⑨ Timer display:  
7-segments red LED display 4-digits  
Character size, 14.3x8mm (HxW)

**Action Indicators:**

- Power indicator (Green): Lights when the power is turned ON.
- Top heater control indicator (Red): Lights when top heater control output is ON.
- Top heater control indicator (Red): Lights when bottom heater control output is ON.
- Top heater run indicator (Green): Lights while top heater is operating.
- Bottom heater run indicator (Green): Lights while bottom heater is operating.
- Automatic run indicator (Red): Lights during automatic operation.
- Manual run indicator (Green): Lights during manual operation.
- Start indicator (Green): Flashes while timer is working  
(Lights when the timer is suspended or while time is up.)
- Lighting indicator (Green): Lights when lighting output is ON.
- Steam indicator (Green): Lights when steam output is ON.
- Boiler indicator (Green): Lights when boiler output is ON.

■ **Setting Structure**

**Function Keys**

- (1) Power Key: Turns the power ON or OFF.
- (2) Menu Key: Retrieves the menu by number (cannot retrieve during each setting mode or while in operation).
- (3) Step Key: Retrieves the step number. (cannot retrieve during each setting mode or while timer is counting).
- (4) Top heater run Key: Starts or stops top heater operation.
- (5) Top heater setting Key: Retrieves the top heater setting mode, or registers the set value.
- (6) Top heater up Key: Increases the top heater temperature.
- (7) Top heater down Key: Decreases the top heater temperature.
- (8) Top heater output limit up Key: Increases the top heater output limit value.
- (9) Top heater output limit down Key: Decreases the top heater output limit value.
- (10) Bottom heater run Key: Starts or stops bottom heater operation.

- (11) Bottom heater setting Key: Retrieves the bottom heater setting mode, or registers the set value.
- (12) Bottom heater up Key: Increases the bottom heater temperature.
- (13) Bottom heater down Key: Decreases the bottom heater temperature.
- (14) Bottom heater output limit up Key: Increases the bottom heater output limit value.
- (15) Bottom heater output limit down Key: Decreases the bottom heater output limit value.
- (16) Auto/Manual Key: Switches automatic or manual operation.
- (17) Buzzer reset Key: Turns Buzzer output OFF, and resets the timer.
- (18) Start/Stop Key: Starts the timer. (Suspends temporarily while timer is counting. Resumes the timer from the stopped position by pressing again.)
- (19) Lighting Key: Turns the lighting output ON or OFF.
- (20) Timer up Key: Increases the timer set value.
- (21) Timer down Key: Decreases the timer set value.
- (22) Steam Key: If steam output time is set, the steam output is turned ON for the time steam output is set. (If this key is pressed again while the steam output is ON, the steam output is turned OFF.)
- (23) Boiler Key: Turns the boiler output ON or OFF.

### ■ Indicating Performance

Indicating accuracy:  $\pm 2^{\circ}\text{C}$  (at  $23^{\circ}\text{C}$  of ambient temperature)  
 (Equivalent to  $\pm 0.2\%$  of full scale +1 digit)  
 Cold junction compensation accuracy: Within  $\pm 1^{\circ}\text{C}$  at 0 to  $50^{\circ}\text{C}$   
 Temperature coefficient: Within  $\pm 0.015\%/^{\circ}\text{C}$   
 Input sampling period: 0.5 sec  
 Time accuracy:  $\pm 0.5\%$  of setting time (at  $23^{\circ}\text{C}$  of ambient temperature)  
 Time error after power restoration: Max. 1 minute

### ■ Controlling Performance

Temperature control of the top heater, bottom heater  
 Setting accuracy: The same as the indicating accuracy  
 Control action: PD control action  
 ON/OFF control action (When proportional band is set to 0)  
 Control parameter (individual setting for top and bottom heater):  
 Proportional band (P): 0.0 to  $99.9^{\circ}\text{C}$  (Default:  $10.0^{\circ}\text{C}$ )  
 (ON/OFF control when set to 0.0.)  
 Derivative time (D): 0 to 300 sec (Default: 32 sec)  
 Manual reset:  $-19.9$  to  $99.9$  (Default:  $5.0^{\circ}\text{C}$ )  
 Proportional cycle (\*): 1 to 120 sec (Default: Relay output: 30 sec,  
 Non-contact voltage output: 3 sec)  
 ON/OFF hysteresis (\*):  $0.1$  to  $10.0^{\circ}\text{C}$  (Default:  $1.0^{\circ}\text{C}$ )  
 (\*): Common to the Top and Bottom heaters  
 Control output: Relay contact output: 1a 1b  
 Control capacity: 3A 250V AC (resistive load)  
 1A 250V AC (inductive load  $\cos\phi=0.4$ )  
 Electrical life: 100,000 cycles  
 Non-contact voltage output: 12V DC  $\pm 15\%$   
 Maximum load current: 40mA (short circuit protected)  
 Buzzer output: Relay contact output, 1a  
 Control capacity: 3A 250V AC (resistive load)  
 1A 250V AC (inductive load  $\cos\phi=0.4$ )  
 Boiler output: The same as the buzzer output  
 Steam output: The same as the buzzer output  
 Fan output: The same as the buzzer output  
 Lighting output: The same as the buzzer output

### ■ Memory Function

If memory function is selected during control type selection, it can hold 15 memories. If the M30 option is added, 30 memories can be set. The step display indicates "M". One memory includes step temperature (top heater, bottom heater temperature), timer setting time, output limit (top heater, bottom heater output), high limit alarm value (when the AH option is added) and steam time.

### ■ Program Function

When program function is selected during control type selection, 15 menus (8-steps per menu) can be set. If the M30 option is added, 30 menus (8-steps per menu) can be set. In automatic run, 8 steps are automatically performed. However, for manual run, one step can be performed every time it is set. One step includes step temperature (top heater, bottom heater temperature), timer setting time, output limit (top heater, bottom heater output), high limit alarm value (when the AH option is added) and steam time. If the timer is set to 0 for a step, the step will be skipped, and the unit will proceed to the next step. Program time: 0 sec to 99 min 50 sec (in units of 1 sec)/Step

### ■ Standard Function

Memory function, program function, output limit function, buzzer output, boiler output, steam output, fan output, lighting output, door open input [if the RM (remote input) option is added, the door open input will be disabled.]

### ■ Optional Function

30-memories (M30 option), remote input (RM option), high limit alarm output (AH option)

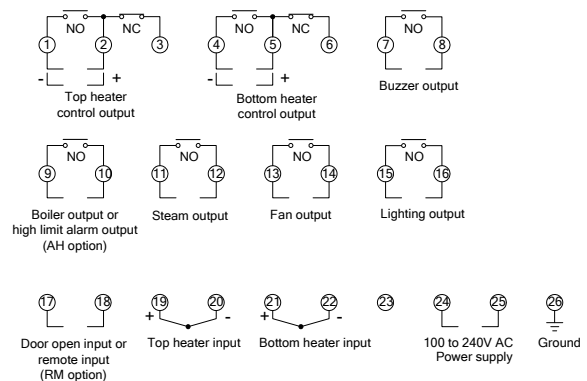
### ■ Attached Functions

Warm-up indication, temperature (top heater, bottom heater) setting high limit function, temperature (top heater, bottom heater) setting low limit function, Sensor correction function, power failure countermeasure, self diagnosis, automatic cold junction temperature compensation, burnout, input error, memory error.

### ■ Installation Specification

Ambient temperature: 0 to  $50^{\circ}\text{C}$   
 Ambient humidity: 35 to 85%RH (non-condensing)

### ■ Terminal Arrangement



### ■ Dimensions (Scale: mm)

